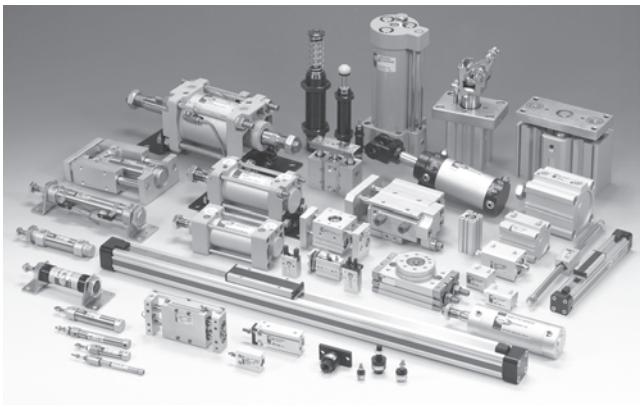
Actuator



● Mini(Pin) Cylinder
Series ACP ····· 41
● Air Cylinder
Series APM ····· 77
● Compact Cylinder (AL Tube)
Series AS ····· 83
● Compact Cylinder With SUS Tube
Series AX ····· 101
● Middle Sized Cylinder With Tie Rod Covered
Series AM2 ····· 172
● Middle Sized Cylinder With Tie Rod Uncovered
Series AM ····· 186
● Large Sized Cylinder
Series AL / ALX ····· 206
● Compact Cylinder (Triangle Shape)
Series AQ ····· 228
● Compact Cylinder (Square Shape)
Series AQ2 / ADQ2 ····· 286
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● Plate Cylinder
Series NP ····· 409
● Double Rod Cylinder
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● Magnet Rodless Cylinder
Series AMR ····· 427
● Direct Mount Cylinder
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● Table Cylinder
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● Air Chuck Cylinder
Series NF ····· 530
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● Air Hydro Converter Cylinder
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● Air Blow Unit
Series NBU ····· 615
● Centering Unit
Series ACU ····· 618
● Sensing Unit
Series SE ····· 621
● Ram Cylinder
Series ARM ····· 623

※ Specifications in this catalogue may be changed for product performance upgrade without notice.
Inquiries can be made to the manufacturer when purchasing the product.

General Precautions and Procedures

Be sure to read the following before specifying and using TPC pneumatic products.

Selection

TPC products are designed to meet most common parameters in machine engineering standards. When designing machines with TPC products refer to the detailed precautions and specifications referenced for each item considered.

Make sure that when you are selecting the right cylinder that the best mounting style is specified while taking into account whether the cylinder is used in thrust or tension, along with stroke length, piston rod diameter, and the method of connection.

If there are any questions regarding the usage of TPC products or if the application exceeds published specifications, please contact TPC trained factory personnel.

Under no circumstances is the product to be used outside of the published specifications without the written support of TPC.

Installation & Maintenance

Proper installation will help to maintain TPC products maximum design life span.

Make sure that when installing TPC products that air cleanliness is maintained and that proper filtration is used. If lubricaton is desired, please verify that the lubricant used is compatable with the materials contained in TPC products.

If water or condensate is present in the air supply or could become present, be sure that precautions are made such at the installation of an air dryer or other suitable component to ensure that clean dry air is maintained.

Make sure that when piping TPC products that the piping or tubing is free of debris and/or contaminants. Any substances, which are not removed, could cause the TPC product to fail prematurely.

TPC products are not meant for "Wash Down" applications if the product is to be used in a "Wash Down" environment please contact the factory so that the design may be reviewed. TPC may have solutions to allow product usage in this environment.

When installing or servicing all TPC products make sure that all OSHA safety procedures are adhered to as are applicable in maintaining TPC products.

DANGER

- TPC products are not designed to work in areas requiring special certifications such as FAA, Nuclear, or where fire or explosion could occur. In these areas please contact a TPC factory trained representative to confirm the usage of TPC products in these applications.
- The temperature operational aspects of TPC products fall within 32 degrees F and 140 degrees F. TPC products are designed to work in most areas within these parameters where the product is protected from external environmental hazards. These can be, but not limited to Salt water spray, temperatures below 32 degrees F or above 140 degrees F, direct sunlight for prolonged periods of time, corrosive gases, chemicals, water, and steam. If questions arise as to whether the environment may be detrimental for use of TPC occur, please contact a factory trained TPC representative.
- If the product is to be mounted where vibration or shock may occur, please contact a factory trained representative.

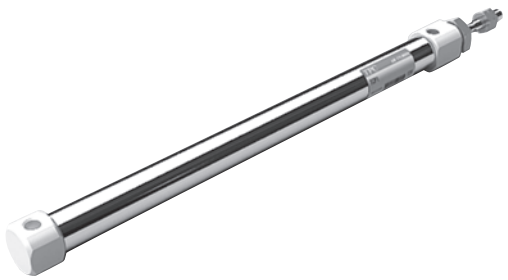
Caution

Only use Factory TPC replacement parts when maintaining TPC products. When maintaining TPC Products please refor to appropriate TPC Cataloged Procedures.

Series ACP

Standard Type/Double Acting : Single Rod

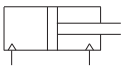
Bore Size(mm) : Ø6, Ø10, Ø16



- STAINLESS STEEL BODY
- HIGH CYCLE LIFE
- LOW BREAKAWAY
- BUMPERS STANDARD
- BUILT IN MAGNET
- COMPACT LIGHT DESIGN

Symbol

Double Acting/Single Rod



How to Order

ACP [1] B [2] 16 [3] — 30 [4] R [5] ( ) [6] — W5 [7] ( ) [8]

1 Air Cylinder
Built-in magnet, Rubber cushions are standard

2 Mounting
B : Standard type
L : Axial foot type
F : Rod side flange type
D : Double clevis type
(Except for ϕ6)

3 Bore Size(mm)
6 : ϕ6
10 : ϕ10
16 : ϕ16

4 Stroke(mm)
ϕ6 : ϕ5,10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 75, 100
ϕ10 : ϕ5,10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 75, 100, 125, 150
ϕ16 : ϕ5,10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 75, 100, 125, 150, 175, 200

5 Port Location on Head Cover

Symbol \ Bore size	ϕ6	ϕ10, ϕ16
R	–	in-line
Blank	in-line	90°

6 Special Options
Blank : Standard
XC16 : Copper-free

7 Auto Switch
(Band mounted type)
W5 : Reed switch, 0.5m Lead Wire
※ W5L : Reed Switch, 3m Lead Wire

8 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

PART No. of Mounting Bracket

Mounting bracket	Bore Size(mm)		
	ϕ6	ϕ10	ϕ16
Foot	TC1P006-19	TC1P010-19	TC1P016-19
Flange	TC1P006-20	TC1P010-20	TC1P016-20

PART No. of Auto Switch Mounting Band

Bore size	PART No. of Auto Switch Mounting Band	Note
ϕ6	TC1P006	Common use to all of W5 types
ϕ10	TC1P010	
ϕ16	TC1P016	

* Standard Type/Single Acting : Single Rod/Series ACPS

Notices for products

Please fully understand the notices prior to utilization, and refer to safety notice and common notice.

Warning

Assembly/Disassembly of Snap Ring

- Please use proper flyer (Attached tool of C-type snap ring) for assembly / disassembly.
- Please be cautious all the time that there is a possible damage to human body or vicinity equipments owing to projection of snap ring at the end of flyer (C-type snap ring) in spite of using proper flyer (Attached tool of C-type snap ring). After checking full connection of snap ring during attachment, supply air.

Specifications

Operation Type		Double Acting Single Rod
Fluid		Air
Proof Pressure		1.05MPa (149.34psi)
Max. Operating Pressure		0.7MPa (99.5psi)
Lubri cation		None (Non-Lube)
Stoke length Tolerance		$^{+1.0}_{0}$
Piston Speed		50~750mm/s (2~29.5in/s)
Min. Operating Pressure	ϕ6	0.12MPa (17.06psi)
	ϕ10, ϕ16	0.06MPa (8.53psi)
Ambinent and Fluid Temperature		40~140°F (5°C~60°C)
Cushion		Rubber Cushion (Standard)

Mounting Accessories

Mounting		Basic type	Axial foot type	Rod side flange type	Double clevis type
Standard	Mounting nut	O	O	O	–
	Rod end nut	O	O	O	O
	Clevis pin	–	–	–	O
Option	Single knuckle joint	O	–	O	O
	Double knuckle joint(with pin)	O	O	O	O
	T mounting	–	–	–	O

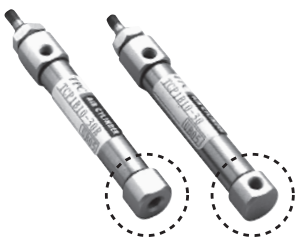
Auto Switch Specification

Mounting	Bore Size	Reed Switch
		Grommet
Band Mounted Type	ϕ6, ϕ10, ϕ16	W5 Type

Rear Port Location On Head Cover

Perpendicular to the cylinder axis or in-line with the cylinder axis locations are available for basic type.
(ϕ6 is not available in perpendicular type)

In-line 90°



Weight Table

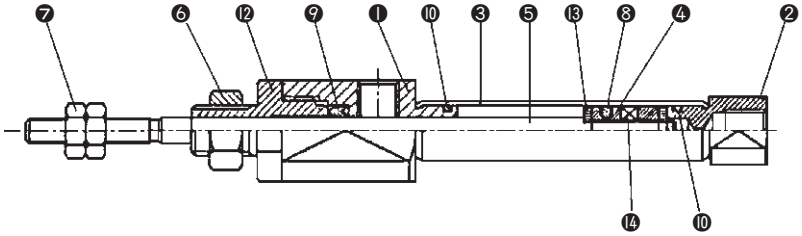
gf(oz)

Bore size(mm)		ϕ6	ϕ10	ϕ16
※ Basic Weight		15(0.52)	24(0.84)	54(1.94)
Additional Weight for each 15mm of stroke		2(0.07)	4(0.14)	6.5(0.23)
Mounting bracket Weight	Foot type	7(0.25)	7(0.25)	19(0.67)
	Rod side flange type	5(0.18)	5(0.18)	13(0.45)
	※※Double clevis type(with pin)	-	2(0.08)	8(0.28)

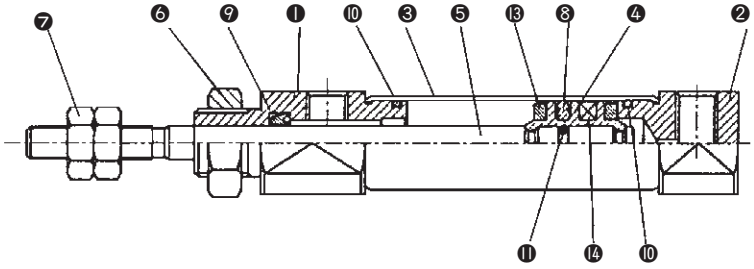
※Including the weights of mounting nut and rod end nut in the reference weight.
※※Doulble clevis type is not included with mounting nut.

Construction/Parts List

ACPB 6



ACPB 10, 16



Parts List

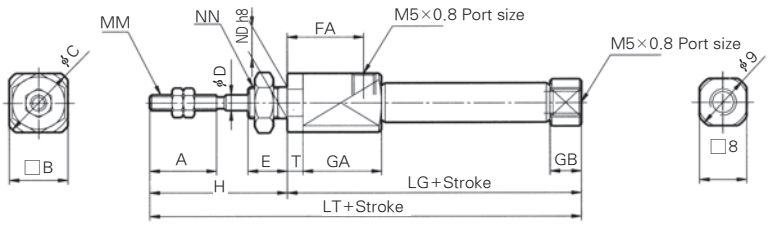
No.	Description	Material	Note
❶	Rod cover	Aluminum Alloy	White Alumite
❷	Head cover	Aluminum Alloy	White Alumite
❸	Cylinder tube	Stainless Steel	-
❹	Piston	Brass	-
❺	Piston rod	Stainless Steel	-
❻	Mounting nut	Brass	Nickel Plated
❼	Rod end nut	Rolled Steel	Nickel Plated
❽	Piston packing	NBR	-

No.	Description	Material	Note
❾	Rod Packing	NBR	-
❿	Tube Gasket	NBR	-
⓫	Piston Gasket	NBR	-
⓬	Packing Retainer	Aluminum Alloy	-
⓭	Bumper	Urethane	-
⓮	Magnet	Neodium	-

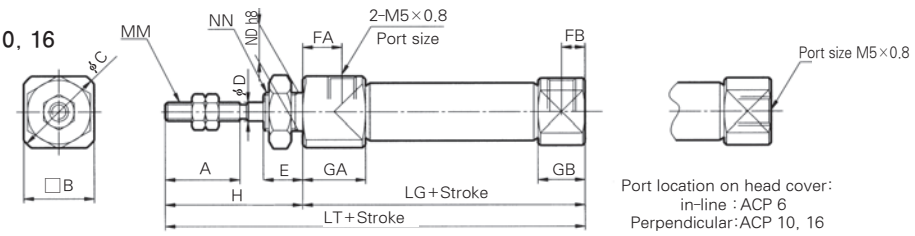
Standard Type (ACPB)

ACPB — Bore size — Stroke — Port Location on Head Cover

ACPB 6



ACPB 10, 16



Port location on head cover:
in-line : ACP 6
Perpendicular: ACP 10, 16

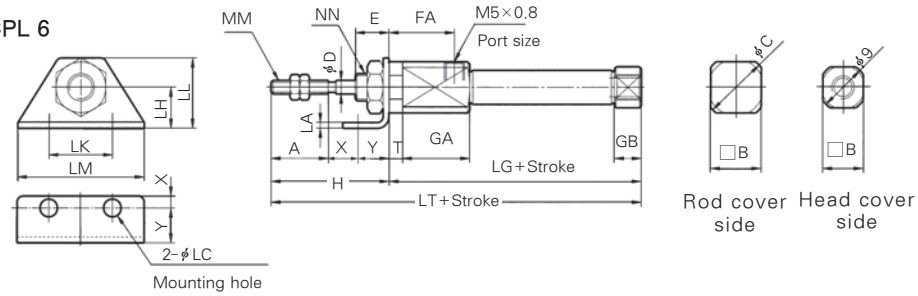
(mm)

Bore size	A	B	C	D	E	FA	FB	H	MM	GA	GB	ND h8	NN	LG	T	LT
φ6	15	12	14	3	8	14.5	-	28	M3×0.5	16	7	$6^{\ 0}_{-0.018}$	M6×1.0	49	3	77
φ10	15	12	14	4	8	8	5	28	M4×0.7	12.5	9.5	$8^{\ 0}_{-0.022}$	M8×1.0	45	-	73
φ16	15	18	20	5	8	8	5	28	M5×0.8	12.5	9.5	$10^{\ 0}_{-0.022}$	M10×1.0	45	-	73

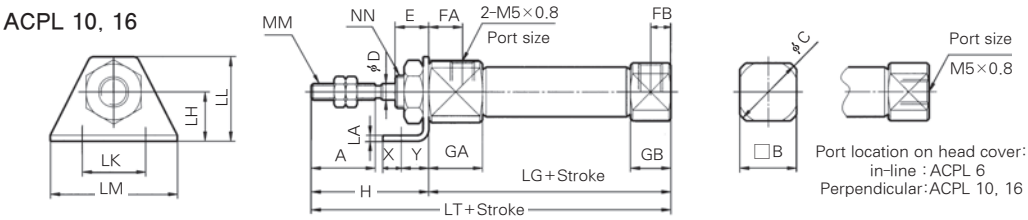
Axial Foot (ACPL)

ACPL — Bore size — Stroke — Port Location on Head Cover

ACPL 6



ACPL 10, 16



Port location on head cover:
in-line : ACPL 6
Perpendicular: ACPL 10, 16

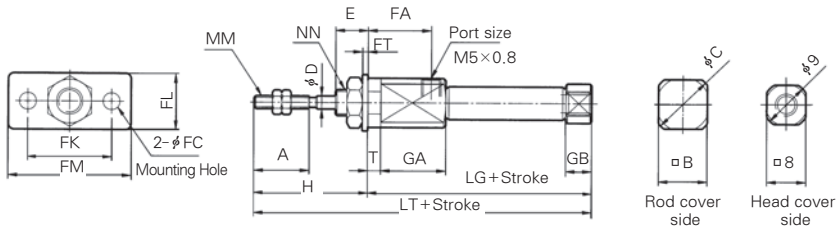
(mm)

Bore size	A	B	C	D	E	FA	FB	H	LC	LH	LA	LK	LL	LM	MM	GA	GB	NN	LG	T	X	Y	LT
φ6	15	12	14	3	8	14.5	-	28	4.5	9	1.6	24	16.5	32	M3×0.5	16	7	M6×1.0	49	3	5	7	77
φ10	15	12	14	4	8	8	5	28	4.5	9	1.6	24	16.5	32	M4×0.7	12.5	9.5	M8×1.0	45	-	5	7	73
φ16	15	18	20	5	8	8	5	28	5.5	14	2.3	33	25	42	M5×0.8	12.5	9.5	M10×1.0	45	-	6	9	73

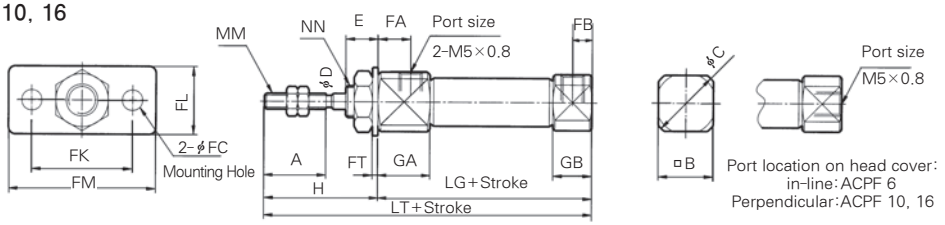
Rod Side Flange Type (ACPF)

ACPF — Bore size — Stroke — Port Location on Head Cover

ACPF 6



ACPF 10, 16



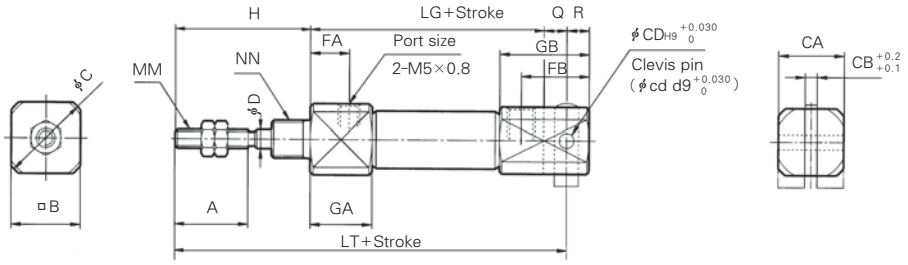
(mm)

Bore size	A	B	C	D	E	FC	FT	FK	FL	FM	FA	FB	H	MM	GA	GB	NN	LG	T	LT
φ6	15	12	14	3	8	4.5	1.6	24	14	32	14.5	–	28	M3×0.5	16	7	M6×1.0	49	3	77
φ10	15	12	14	4	8	4.5	1.6	24	14	32	8	5	28	M4×0.7	12.5	9.5	M8×1.0	45	–	73
φ16	15	18	20	5	8	5.5	2.3	33	20	42	8	5	28	M5×0.8	12.5	9.5	M10×1.0	45	–	73

Double Clevis Type (ACPD)

ACPD — Bore size — Stroke

ACPD 10, 16



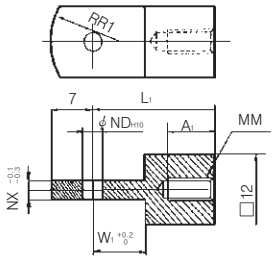
(mm)

Bore size	A	B	C	CD(cd)	CB	CA	D	FA	FB	H	MM	GA	GB	NN	R	LG	Q	LT
φ10	15	12	14	3.3	3.2	12	4	8	18	28	M4×0.7	12.5	22.5	M8×1.0	5	45	8	81
φ16	15	18	20	5	6.5	18	5	8	23	28	M5×0.8	12.5	27.5	M10×1.0	8	45	10	83

Accessaries/Parts List

(mm)

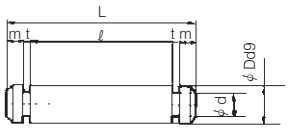
Single Knuckle Joint



Material:Stainless steel

PART No.	Bore	A_1	L_1	MM	ND^{H10}	NX	R_1	W_1
TC1P010-17	ϕ10	8	21	M4×0.7	3.3 +0.048 0	3.1	8	9
TC1P016-17	ϕ16	8	25	M5×0.8	5 +0.048 0	6.4	12	14

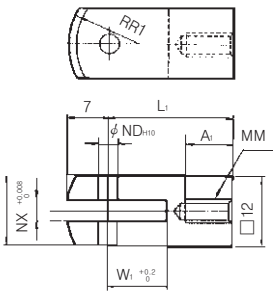
Knuckle Pin



Material:Stainless steel

PART No.	Bore	D^{d9}	d	L	ℓ	m	t	Clib
TC1P010-23A	ϕ10	3.3 -0.030 -0.060	3	16.2	12.2	1.7	0.3	CType 3.2
TC1P016-23A	ϕ16	5 -0.030 -0.060	4.8	16.6	12.2	1.5	0.7	CType 5

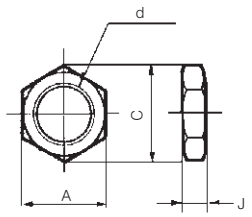
Double Knuckle Joint



Material:Rolled steel

PART No.	Bore	A_1	L_1	MM	ND^{H10}	NX	W_1	R_1
TC1P010-18	ϕ10	8	21	M4×0.7	3.3 +0.048 0	3.2	10	8
TC1P016-18	ϕ16	11	21	M5×0.8	5 +0.048 0	6.5	10	12

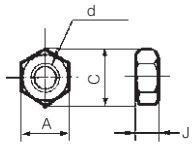
Mounting Nut



Material:Brass

PART No.	Bore	A	C	d	J
TC1P006-13A	ϕ6	8	9.2	M6×1.0	4
TC1P010-13A	ϕ10	11	12.7	M8×1.0	4
TC1P016-13A	ϕ16	14	16.2	M10×1.0	4

Rod End Nut



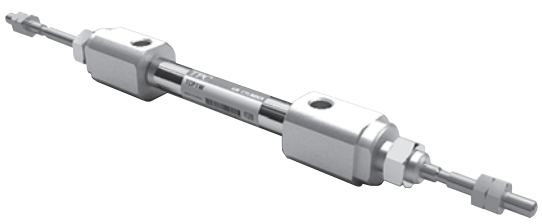
Material:Steel

PART No.	Bore	A	C	d	J
TC1P006-13B	ϕ6	5.5	6.4	M3×0.5	2.4
TC1P010-13B	ϕ10	7	8.1	M4×0.7	3.2
TC1P016-13B	ϕ16	8	9.2	M5×0.8	4

Series ACPW

Standard Type/Double Acting : Double Rod

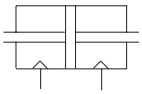
Bore Size(mm) : Ø6, Ø10, Ø16



- STAINLESS STEEL BODY FOR HIGH CYCLE LIFE & LOW BREAKAWAY
- EASY MOUNTING
- BUMPERS STANDARD
- BUILT-IN MAGNET
- LIGHT COMPACT DESIGN

Symbol

Double Acting/Double Rod



How to Order

ACPW [1] B [2] 16 [3] – 60 [4] – ○ [5] – W5 [6] ○ [7]

[1] Air Cylinder
Built-in magnet, Rubber cushions are standard

[2] Mounting
B : Standard type
L : Axial foot type
F : Rod side flange type

[3] Bore Size(mm)
6 : ϕ6
10 : ϕ10
16 : ϕ16

[4] Stroke(mm)
ϕ6 : 10, 15, 20, 25, 30, 35, 40, 45, 50, 60
ϕ10 : 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 75, 100
ϕ16 : 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 75, 100

[5] Special Option
Blank : Standard
XC16 : Copper-free

[6] Auto Switch
(Band mounted type)
W5 : Reed Switch
0.5m Lead wire
※ W5L : Reed Switch, 3m Lead wire

[7] Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

● ACPW Series

Assembled a tube and a cover in a cocking way.

● Double Rod Cylinder

A cylinder with 2 rods at each side.

Notices for products

Please fully understand the notices prior to utilization, and refer to safety notice and common notice.

Warning

Assembly/Disassembly of Snap Ring

- During installation, secure the rod cover and tighten by applying an appropriate tightening force to the retaining nut or to the rod cover body. If the head cover is secured or the head cover body is tightened, the rod could rotate, leading to a deviation.
- Tighten the retaining screws to an appropriate tightening torque within the range given below.
  Ø6 : 2.1~2.5Nm, Ø10 : 5.9 to 6.4Nm,
  Ø16 : 10.8 to 11.8Nm
- To remove and install the snap ring for the knuckle pin or the clevis pin, use an appropriate pair of pliers (tool for installing a C type snap ring). In particular, use a pair of ultra-mini pliers for removing and installing the snap rings on the Ø10 cylinders.

PART No. of Mounting Bracket

Mounting Bracket	Bore size(mm)		
	ϕ6	ϕ10	ϕ16
Foot	TC1P006-19	TC1P010-19	TC1P016-19
Flange	TC1P006-20	TC1P010-20	TC1P016-20

PART No. of Auto Switch Mounting Band

Bore Size	PART No. of auto Switch Mounting Band	Note
ϕ6	TC1P006	Common use to all of W5□ types
ϕ10	TC1P010	
ϕ16	TC1P016	

Standard Type/Double Acting : Double Rod/Series ACPW

Specifications

Action		Double Acting Single Rod
Fluid		Air
Proof Pressure		1.05MPa (150psi)
Max. Operating Pressure		0.7MPa (100psi)
Min. Operating Pressure	ϕ6	0.15MPa (17psi)
	ϕ10, ϕ16	0.1MPa (9psi)
Ambient and Fluid Temperature		40~140°F (5 ~ 60℃)
Cushion		Rubber cushion (Standard)
Lubrication		None (Non-Lube)
Piston Speed		50~750 mm/sec
Stroke length Tolerance		$^{+1.0}_{0}$
Piston Speed		50~750mm/s

Auto Switch Specifications

Mounting	Bore Size	Reed Switch
		Grommet
Band mounted type	ϕ6, ϕ10, ϕ16	W5 type

Mounting Accessories

Mounting		Basic Type	Foot Type	Flange Type
Standard	Mounting Nut	○	○	○
	Rod End Nut	○	○	○
Option	Single Knuckle Joint	○	○	○
	Double Knuckle Joint(With Pin)	○	○	○

Weight Table

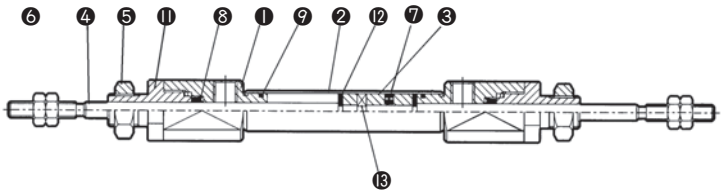
gf(ozf)

Bore Size (mm)		ϕ6	ϕ10	ϕ16
※Basic Weight		27(0.95)	35(1.33)	70(2.40)
Additional Weight for each 15 of Stroke		3(0.11)	6(0.21)	9(0.32)
Mounting Bracket Weight	Foot Type	14(0.49)	14(0.43)	38(1.34)
	Flange Type	5(0.15)	5(0.15)	13(0.46)

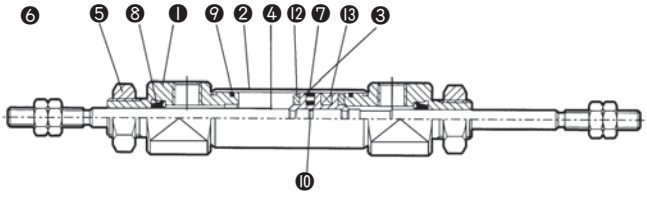
※ Including the weights of mounting nut and rod end nut in the reference weight.
※ Double clevis type is not included with mounting nut.

Construction/Parts List

ACPWB 6



ACPWB 10, 16



Parts List

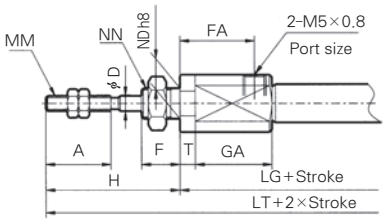
No.	Description	Material	Note
❶	Rod Cover	Aluminum Alloy	White Alumite
❷	Cylinder Tube	Stainless Steel	
❸	Piston	Brass	
❹	Piston Rod	Stainless Steel	
❺	Mounting Nut	Brass	Nickel Plated
❻	Rod end Nut	Rolled Steel	Nickel Plated
❼	Piston Packing	NBR	

No.	Description	Material	Note
❽	Rod packing	NBR	
❾	Tube gasket	NBR	
❿	Piston gasket	NBR	
⓫	Packing retainer	Aluminum alloy	White Alumite
⓬	Bumper	Urethane	
⓭	Magnet	–	

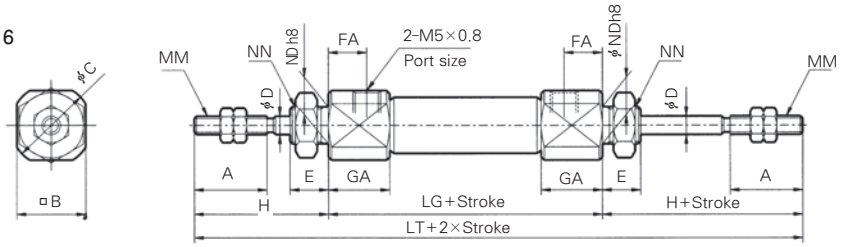
Standard Type (ACPWB)

ACPWB (Bore size)—(Stroke)

ACPWB6
Rod Cover



ACPWB10,16



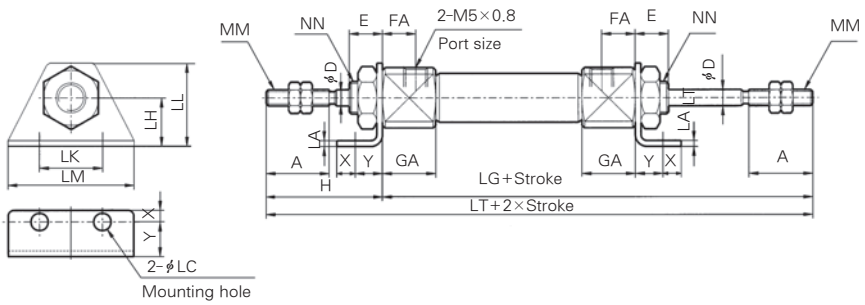
(mm)

Bore size	A	B	C	D	E	FA	H	MM	ND h8	GA	NN	LG	T	LT
φ6	15	12	14	3	8	14.5	28	M3×0.5	$6^{0}_{-0.018}$	16	M6×1.0	68.5	3	124.5
φ10	15	12	14	4	8	8	28	M4×0.7	$8^{0}_{-0.022}$	12.5	M8×1.0	48	–	104
φ16	15	8	20	5	8	8	28	M5×0.8	$10^{0}_{-0.022}$	12.5	M10×1.0	48	–	104

Foot Type (ACPWL)

ACPWL (Bore size)—(Stroke)

ACPWL10,16



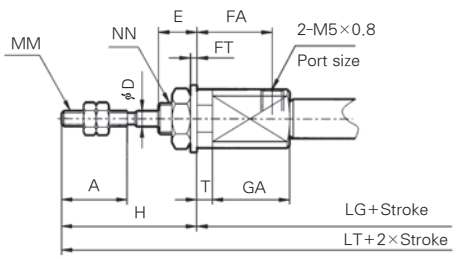
(mm)

Bore size	A	D	E	FA	H	LC	LH	LA	LK	LL	LM	MM	GA	NN	LG	T	X	Y	LT
φ6	15	3	8	14.5	28	4.5	9	1.6	24	16.5	32	M3×0.5	16	M6×1.0	68.5	3	5	7	124.5
φ10	15	4	8	8	28	4.5	9	1.6	24	16.5	32	M4×0.7	12.5	M8×1.0	48	-	5	7	104
φ16	15	5	8	8	28	5.5	14	2.3	33	25	42	M5×0.8	12.5	M10×1.0	48	-	6	9	104

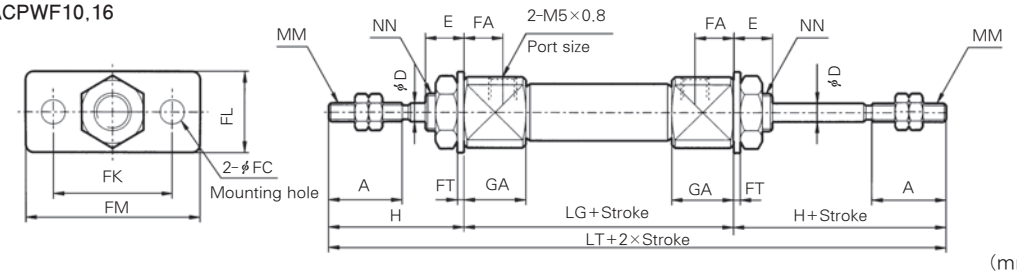
Flange Type (ACPWF)

ACPWF (Bore size)—(Stroke)

ACPWF 6
Rod Cover



ACPWF10,16



(mm)

Bore size	A	D	E	FC	FT	FK	FL	FM	FA	H	MM	GA	NN	LG	T	LT
φ6	15	3	8	4.5	1.6	24	14	32	14.5	28	M3×0.5	16	M6×1.0	68.5	3	124.5
φ10	15	4	8	4.5	1.6	24	14	32	8	28	M4×0.7	12.5	M8×1.0	48	-	104
φ16	15	5	8	5.5	2.3	33	20	42	8	28	M5×0.8	12.5	M10×1.0	48	-	104

Series ACPS

Standard Type/Single Acting Spring Return, Spring Extended

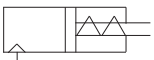
Bore Size(mm) : Ø6, Ø10, Ø16

- STAINLESS STEEL BODY
- HIGH CYCLE LIFE
- BUILT - IN MAGNET
- COMPACT LIGHT DESIGN

Symbol

Single Acting/Single Rod

• Spring Return



• Spring Extended

How to Order

ACPS [1] B [2] 16 [3] – 30 [4] S [5] R [6] – ○ [7] – W5 [8] ○ [9]

[1] Air Cylinder
Built-in magnet, Rubber cushions are standard

[2] Mounting
B : Standard type
L : Axial foot type
F : Rod side flange type
D : Double clevis type
(Except for ϕ6)

[3] Bore Size(mm)
6 : ϕ6
10 : ϕ10
16 : ϕ16

[4] Stroke (mm)
ϕ6 : 15, 30, 45, 60
ϕ10 : 15, 30, 45, 60
ϕ16 : 15, 30, 45, 60

[5] Action
S : Single acting spring return
T : Single acting spring extended
(Not available for ϕ6)

[6] Port Location on Head Cover

Symbol \ Bore size	ϕ6	ϕ10, ϕ16
R	-	in-line
Blank	in-line	90°

[7] Special Options
Blank : Standard
XC16 : Copper-free

[8] Auto switch
(Band mounted type)
W5 : Reed Switch, 0.5m Lead Wire
W5L : Reed Switch, 3m Lead Wire

[9] Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

PART No. of Mounting Bracket

Mounting Bracket	Bore Size		
	ϕ6	ϕ10	ϕ16
Foot	TC1P006-19	TC1P010-19	TC1P016-19
Flange	TC1P006-20	TC1P010-20	TC1P016-20
※T Mounting	-	TC1P010-42B	TC1P016-42B

※T Mounting : Double clevis type(D)

PART No. of Auto Switch Mounting Band

Bore Size	PART No. of Auto Switch Mounting Band	Note
ϕ6	TC1P006	W5
ϕ10	TC1P010	
ϕ16	TC1P016	

Standard Type/Single Acting : Single Rod/Series ACPS

Specifications

Action		Spring Return	Spring Extended
Fluid		Air	
Proof Pressure		1.05MPa(149Psi)	
Max. Operating Pressure		0.7MPa(99Psi)	
Min. Operating Pressure	ϕ6	0.2MPa(28Psi)	0.25MPa(36Psi)
	ϕ10, ϕ16	0.15MPa(21Psi)	
Ambient and Fluid Temperature		40~140°F (5~60℃)	
Cushion		Rubber cushion (Standard)	
Lubrication		None (Non-Lube)	
Piston Speed		50~750 mm/sec, (2~29.5 in/sec)	

Auto Switch Specifications

Mounting	Bore Size	Reed Switch
		Grommet
Band Mounted Type	ϕ6, ϕ10, ϕ16	W5

Spring Retracting Force kgf(lbf)

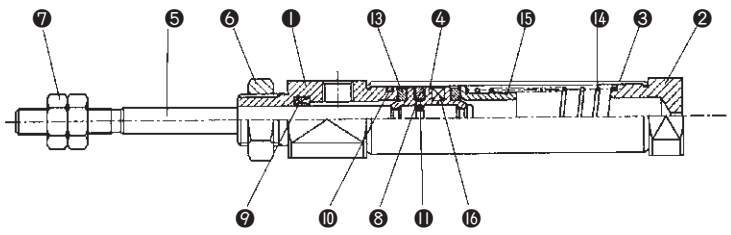
Bore Size	Extended Position	Retracted Position
ϕ6	0.38(0.84)	0.18(0.40)
ϕ10	0.70(1.54)	0.36(0.79)
ϕ16	1.45 (3.20)	0.70(1.54)

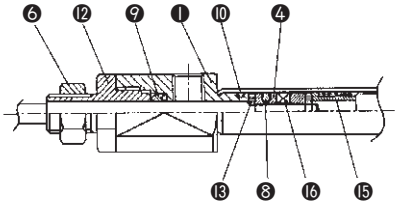
Mounting Accessaries

Mounting		Basic Type	Axial Foot Type	Rod Side Flange Type	Double Clevis Type
Standard	Mounting Nut	○	○	○	-
	Rod end Nut	○	○	○	○
	Clevis Pin	-	-	-	○
Option	Single Knuckle Joint	○	○	○	○
	Double Knuckle Joint(With Pin)	○	○	○	○
	T Mounting	-	-	-	○

Construction/Parts List

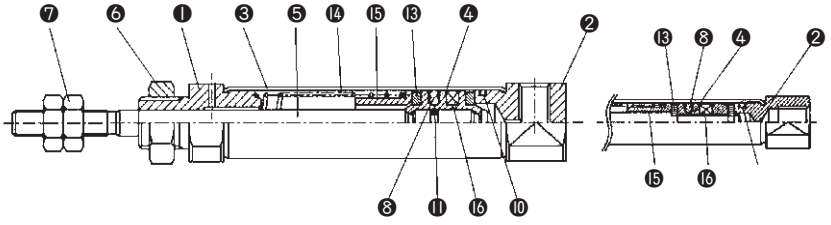
Single Acting/Spring Extended
ACP□□ - □T





ACPS6 Rod Cover, Piston

Single Acting/Spring Return
ACP□□ - □S



ACPS6 Head Cover, Piston

Parts List

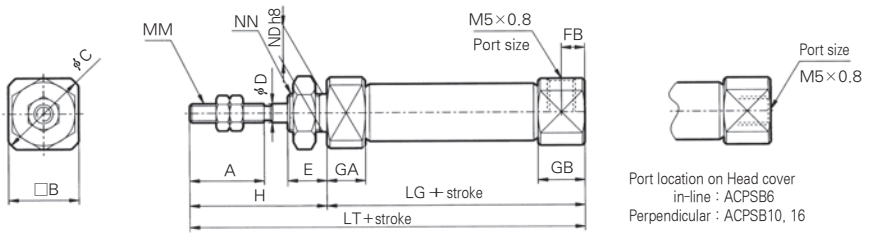
No.	Description	Material	Note
❶	Rod Cover	Aluminum Alloy	White Alumite
❷	Head Cover	Aluminum Alloy	White Alumite
❸	Cylinder Tube	Stainless Steel	-
❹	Piston	Brass	-
❺	Piston Rod	Stainless Steel	-
❻	Mounting Nut	Brass	Nickel Plated
❼	Rod end Nut	Rolled Steel	Nickel Plated
❽	Piston Packing	NBR	-

No.	Description	Material	Note
❾	Rod packing	NBR	-
❿	Tube gasket	NBR	-
⓫	Piston gasket	NBR	-
⓬	Packing retainer	Aluminum Alloy	White Alumite
⓭	Bumper	Urethane	-
⓮	Return spring	Piano Wire	-
⓯	Spring seat	Brass	-
⓰	Magnet	-	-

Standard Type/Single Acting : Single Rod/Series ACPSB

Spring Return/Standard Type(ACPB)

ACPB Bore Size — Stroke — (S) Port Location on Head Cover

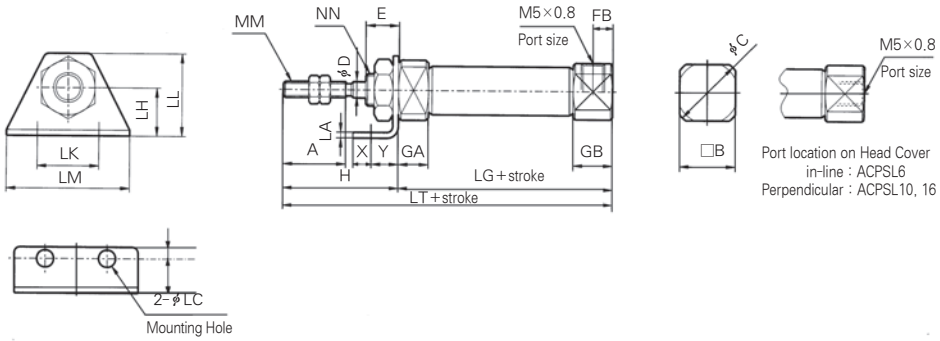


(mm)

Bore size	A	B	C	D	E	FB	H	MM	GA	GB	ND h8	NN	LG				LT			
													5~15 ST	16~30 ST	31~45 ST	46~60 ST	5~15 ST	16~30 ST	31~45 ST	46~60 ST
φ6	15	8	9	3	8	-	28	M3×0.5	3	7	$6^{0}_{-0.018}$	M6×1.0	39.5	48.5	52.5	66.5	67.5	76.5	80.5	94.5
φ10	15	12	14	4	8	5	28	M4×0.7	5.5	9.5	$8^{0}_{-0.022}$	M8×1.0	46.5	54	66	78	74.5	82	94	106
φ16	15	18	20	5	8	5	28	M5×0.8	5.5	9.5	$10^{0}_{-0.022}$	M10×1.0	46	54.5	66.5	78.5	74	82.5	94.5	106.5

Spring Return/Axial Foot Type(ACPL)

ACPL Bore Size — Stroke — (S) Port Location on Head Cover

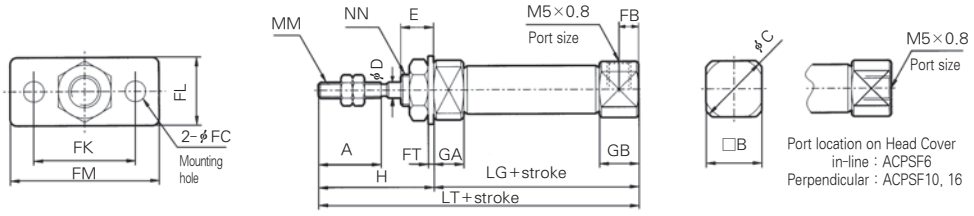


(mm)

Bore size	A	B	C	D	E	FB	H	LC	LH	LA	LK	LL	LM	MM	GA	GB	NN	X	Y	LG				LT			
																				5~15 ST	16~30 ST	31~45 ST	46~60 ST	5~15 ST	16~30 ST	31~45 ST	46~60 ST
φ6	15	8	9	3	8	-	28	4.5	9	1.6	24	16.5	32	M3×0.5	3	7	M6×1.0	5	7	39.5	48.5	52.5	66.5	67.5	76.5	80.5	94.5
φ10	15	12	14	4	8	5	28	4.5	9	1.6	24	16.5	32	M4×0.7	5.5	9.5	M8×1.0	5	7	46.5	54	66	78	74.5	82	94	106
φ16	15	18	20	5	8	5	28	5.5	14	2.3	33	25	42	M5×0.8	5.5	9.5	M10×1.0	6	9	46	54.5	66.5	78.5	74	82.5	94.5	106.5

Spring Return/Rod Side Flange Type(ACPF)

ACPF Bore Size — Stroke S Port Location on Head Cover

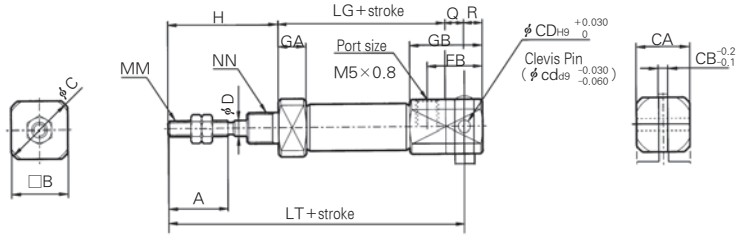


(mm)

Bore size	A	B	C	D	E	FC	FT	FK	FL	FM	FB	H	MM	GA	GB	NN	LG				LT			
																	5~15ST	16~30ST	31~45ST	46~60ST	5~15ST	16~30ST	31~45ST	46~60ST
φ6	15	8	9	3	8	4.5	1.6	24	14	32	-	28	M3×0.5	3	7	M6×1.0	39.5	48.5	52.5	66.5	67.5	76.5	80.5	94.5
φ10	15	12	14	4	8	4.5	1.6	24	14	32	5	28	M4×0.7	5.5	9.5	M8×1.0	46.5	54	66	78	74.5	82	94	106
φ16	15	18	20	5	8	5.5	2.3	33	20	42	5	28	M5×0.8	5.5	9.5	M10×1.0	46	54.5	66.5	78.5	74	82.5	94.5	106.5

Spring Return/Double Clevis Type(ACPD)

ACPD Bore Size — Stroke S Port location on head cover



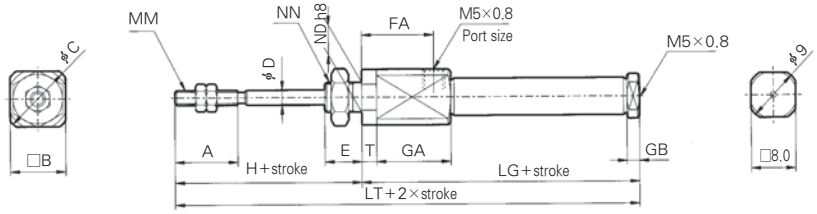
(mm)

Bore size	A	B	C	CA	CB	CD (cd)	D	FB	GA	GB	H	MM	Q	R	LG				LT			
															5~15ST	16~30ST	31~45ST	46~60ST	5~15ST	16~30ST	31~45ST	46~60ST
φ10	15	12	14	12	3.2	3.3	4	18	5.5	22.5	28	M4×0.7	8	5	46.5	54	66	78	82.5	90	102	114
φ16	15	18	20	18	6.5	5	5	23	5.5	27.5	28	M5×0.8	10	8	46	54.5	66.5	78.5	84	92.5	104.5	116.5

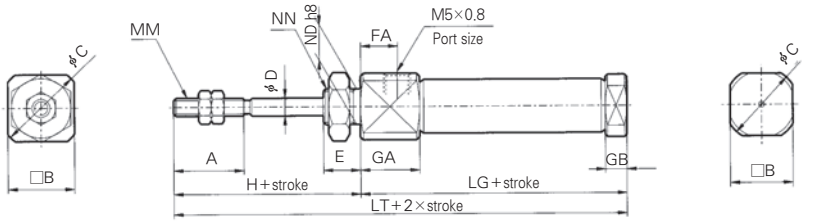
Spring Extended/Standard Type (ACPSB)

ACPB Bore size — Stroke T

ACPB6 - □T



ACPB 10 - □T
16



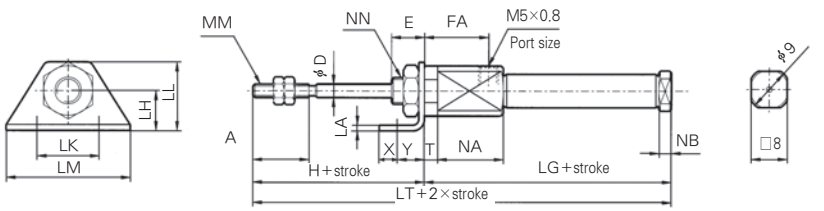
(mm)

Bore size	A	B	C	D	E	FA	H	MM	GA	GB	NDh8	T	NN	LG				LT			
														5~15 ST	6~30 ST	31~45 ST	46~60 ST	5~15 ST	6~30 ST	31~45 ST	46~60 ST
φ6	15	12	14	3	8	14.5	28	M3×0.5	16	3	6 $^{0}_{-0.018}$	3	M6×1.0	51.5	60.5	64.5	78.5	79.5	88.5	92.5	106.5
φ10	15	12	14	4	8	5	28	M4×0.7	12.5	5.5	8 $^{0}_{-0.022}$	-	M8×1.0	49.5	57	69	81	77.5	85	97	109
φ16	15	18	20	5	8	5	28	M5×0.8	12.5	5.5	10 $^{0}_{-0.022}$	-	M10×1.0	49	57.5	69.5	81.5	77	85.5	97.5	109.5

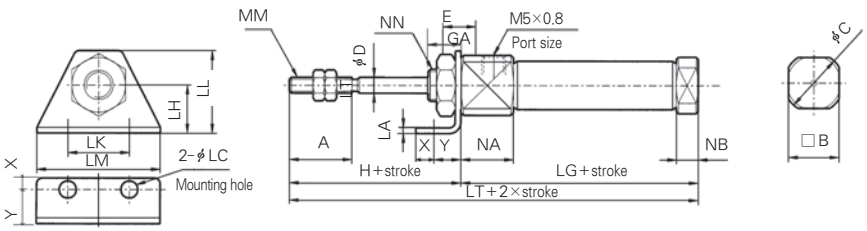
Spring Extended/Axial Foot Type (ACPL)

ACPL Bore size — Stroke T

ACPL6 - □T



ACPB 10 - □T
16

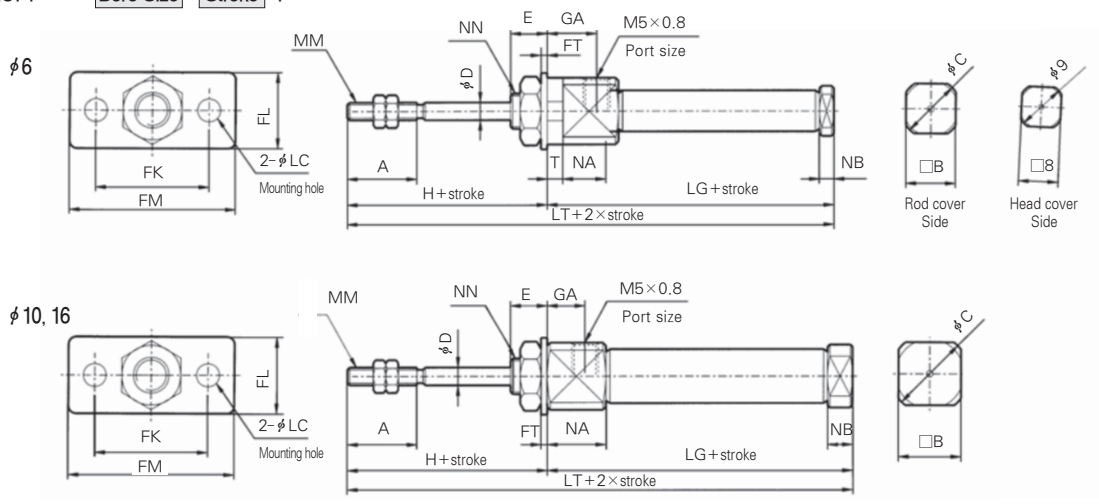


(mm)

Bore size	A	B	C	D	E	GA	H	LC	LH	LA	LK	LL	LM	MM	NA	NB	T	X	Y	NN	LG				LT			
																					5~15ST	16~30ST	31~45ST	46~60ST	5~15ST	16~30ST	31~45ST	46~60ST
φ6	15	12	14	3	8	14.5	28	4.5	9	1.6	24	16.5	32	M3×0.5	16	3	3	5	7	M6×1.0	51.5	60.5	64.5	78.5	79.5	88.5	92.5	106.5
φ10	15	12	14	4	8	8	28	4.5	9	1.6	24	16.5	32	M4×0.7	12.5	5.5	-	5	7	M8×1.0	49.5	57	69	81	77.5	85	97	109
φ16	15	18	20	5	8	8	28	5.5	14	2.3	33	25	42	M5×0.8	12.5	5.5	-	6	9	M10×1.0	49	57.5	69.5	81.5	77	85.5	97.5	109.5

Spring Extended/Rod Side Flange Type (ACPF)

ACPF Bore Size — Stroke T

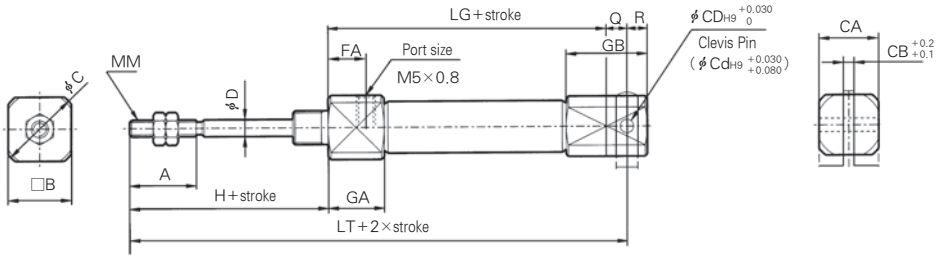


(mm)

Bore size	A	B	C	D	E	LC	FT	FK	FL	FM	GA	H	MM	NA	NB	T	NN	LG				LT			
																		5~15ST	16~30ST	31~45ST	46~60ST	5~15ST	16~30ST	31~45ST	46~60ST
φ6	15	12	14	3	8	4.5	1.6	24	14	32	14.5	28	M3×0.5	16	3	3	M6×1.0	51.5	60.5	64.5	78.5	79.5	88.5	92.5	106.5
φ10	15	12	14	4	8	4.5	1.6	24	14	32	8	28	M4×0.7	12.5	5.5	-	M8×1.0	49.5	57	69	81	77.5	85	97	109
φ16	15	18	20	5	8	5.5	2.3	33	20	42	8	28	M5×0.8	12.5	5.5	-	M10×1.0	49	57.5	69.5	81.5	77	85.5	97.5	109.5

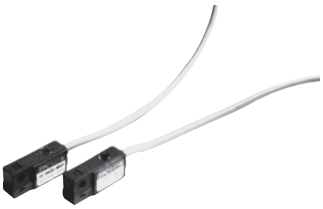
Spring Extended/Double Clevis Type (ACPD)

ACPD Bore Size — Stroke T



(mm)

Bore size	A	B	C	CA	CB	CD (cd)	D	FB	GA	GB	H	MM	Q	R	LG				LT			
															5~15ST	16~30ST	31~45ST	46~60ST	5~15ST	16~30ST	31~45ST	46~60ST
φ10	15	12	14	12	3.2	3.3	4	8	12.5	22.5	28	M4×0.7	8	5	53.5	61	73	85	89.5	97	109	121
φ16	15	18	20	18	6.5	5	5	8	12.5	27.5	28	M5×0.8	10	8	53	61.5	73.5	85.5	91	99.5	111.5	123.5



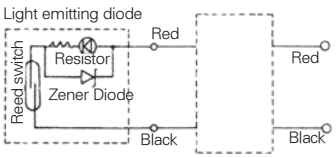
Specifications W5 Type(With indicator lamp)

Auto Switch Model	W5	
Application	Relay, Sequence Control	
Load Voltage	DC24V	AC110V
Max. Load Current/Range of Load Current	5~40mA	5~20mA
Protection Circuit for Contact Breaker Point	None	
Internal Voltage Drop	2.4V or less	
Indicator Lamp	ON:Red light emitting diode	

- Leakage Current – None
- Response Time – 1.2ms
- Lead Wire – Oil proof vinyl, ϕ3.4 0.2㎟, 2 Wire(red, black), 0.5m(18in)
- Impact Resistance– 30G
- Insulation Resistance – 50MΩ or more under the test voltage 500VDC (Between case and cable)
- Withstand Voltage – 1500VAC 1min (between case and cable)
- Ambient Temperature – 14~140°F (-10~60℃)
- Protection Structure – IEC spec IP67, Water-proof(JISCO920), oil-proof.

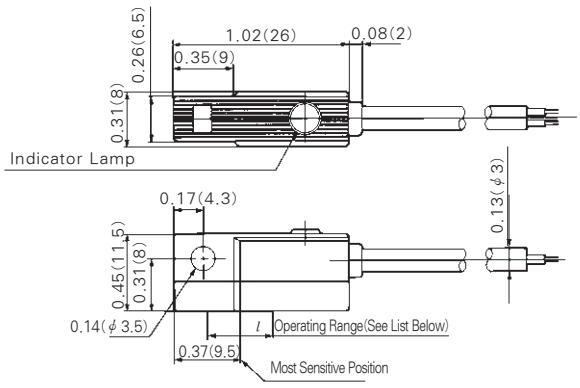
※ If 118inch lead wire is required, L is put at the end of numbers.
Example : W5L

Auto Switch/Internal Circuit



Auto Switch Dimensions

inch(mm)



Operating Range(l Dimension)

(mm)

Series	Bore size		
	ϕ6	ϕ10	ϕ16
ACP	6	7	7

Series UACP

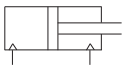
Standard Type/Double Acting : Single Rod

Bore Sizemm(inch) : Ø6(1/4 Nom.), Ø10(3/8 Nom.), Ø16(5/8 Nom.)

- STAINLESS STEEL CYLINDER TUBE
- HIGH CYCLE LIFE
- LOW BREAKAWAY
- BUMPERS STANDARD
- BUILT-IN MAGNET
- COMPACT LIGHT DESIGN

Symbol

Double Acting/Single Rod



How to Order

UACP **B** **16** – **0050** **R** – ○ – **W5** ○

1 2 3 4 5 6 7 8

1 Air cylinder
Built-in magnet, Rubber cushion are standard.

2 Mounting
B : Standard type
L : Axial foot type
F : Rod side flange type
D : Double clevis type
(Except for ϕ6)

3 Bore Size mm(inch)
6 : ϕ6 (1/4 Nom.)
10 : ϕ10 (3/8 Nom.)
16 : ϕ16 (5/8 Nom.)

4 Stroke/Hundredth of an Inch
ϕ6 : 0.050 0.100 0.150 0.200
ϕ10 : 0.050 0.100 0.150 0.200 0.300 0.400 0.500 0.600
ϕ16 : 0.050 0.100 0.150 0.200 0.300 0.400 0.500 0.600 0.700 0.800

5 Port Location on Head Cover

Symbol \ Bore size	ϕ6	ϕ10, ϕ16
R	-	in-line
Blank	in-line	90°

6 Special Options
Blank : Standard
XC16 : Copper-free

7 Auto Switch
(Band mounted type)
W5 : Reed switch, 0.5m Lead Wire
W5L : Reed Switch, 3m Lead Wire

8 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

PART No. of Mounting Bracket

Mounting bracket	Bore Size mm(inch)		
	ϕ6 (1/4 Nom.)	ϕ10 (3/8 Nom.)	ϕ16 (5/8 Nom.)
Foot	TC1P006-19	TC1P010-19	TC1P016-19
Flange	TC1P006-20	TC1P010-20	TC1P016-20
※Double Clevis	-	TC1P010-42B	TC1P016-42B

※T Mounting : Double Clevis Type(D)

PART No. of Auto Switch Mounting Band

Bore size	PART No. of Auto Switch Mounting Band	Note
ϕ6 (1/4 Nom.)	TC1P006	Common use to all of W5 types
ϕ10 (3/8 Nom.)	TC1P010	
ϕ16 (5/8 Nom.)	TC1P016	

Standard Type/Single Acting / Single Rod/Series UACPS

Specifications

Action		Double Acting Single Rod
Fluid		Air
Proof Pressure		1.05 MPa(150 Psi)
Max. Operating Pressure		0.7 MPa(100 Psi)
Min. Operating Pressure	ϕ6	0.12 MPa(17 Psi)
	ϕ10, ϕ16	0.06 MPa(9 Psi)
Ambient and Fluid Temperature		5~60℃(40~140 ° F)
Cushion		Rubber Cushion (Standard)
Lubrication		None (Non-Lube)
Piston Speed		50~750 mm/s, (2~29.5 in/s)

Auto Switch Specifications

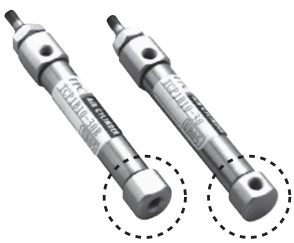
Mounting	Bore Size (2~29.5 in/s)	Reed Switch
		Grommet
Band mounted Type	ϕ6(1/4 Nom.), ϕ10(3/8 Nom.), ϕ16(5/8 Nom.)	W5 Type

Mounting Accessories

Mounting		Basic type	Axial foot type	Rod side flange type	Double clevis type
Standard	Mounting nut	O	O	O	—
	Rod end nut	—	—	—	—
	Clevis pin	—	—	—	O
Option	Single knuckle joint	O	O	O	O
	Double knuckle joint(with pin)	O	O	O	O
	T Mounting	—	—	—	O

Rear Port Location on Head Cover

Perpendicular to the cylinder axis or in-line with the cylinder axis locations are available for basic type.
(ϕ6 is not available in perpendicular type)



In-line 90°

Weight Table

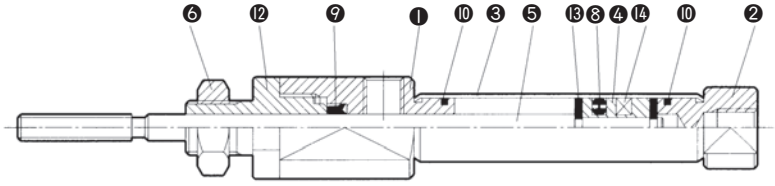
gf(ozf)

Bore size mm(Inch)		ϕ6(1/4 Nom.)	ϕ10(3/8 Nom.)	ϕ16(3/8 Nom.)
※ Basic Weight		15(0.52)	24(0.84)	54(1.94)
Additional Weight for each 1/2" of stroke		2(0.08)	4(0.14)	6.5(0.23)
Mounting bracket Weight	Foot type	7(0.25)	7(0.25)	19(0.67)
	Rod side flange type	5(0.18)	5(0.18)	13(0.45)
	※※Double clevis type(with pin)	-	2(0.08)	8(0.28)

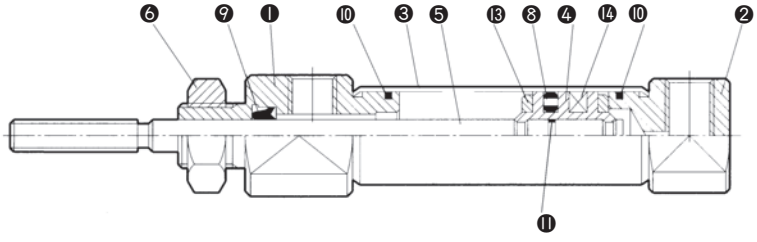
※Including the weights of mounting nut and rod end nut in the reference weight.
※※Doulble clevis type is not included with mounting nut.

Construction/Parts List

UACPB 6



UACPB 10, 16



Parts List

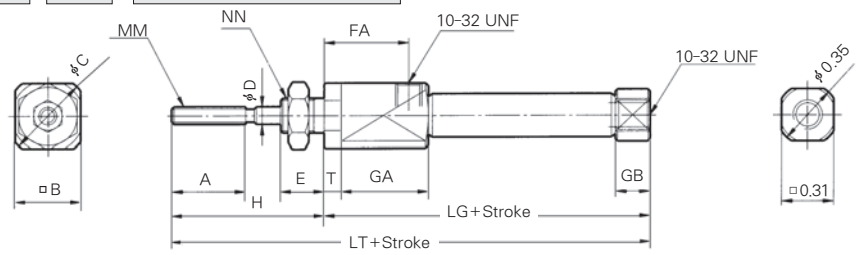
No.	Description	Material	Note
❶	Rod cover	Aluminum Alloy	White Alumite
❷	Head cover	Aluminum Alloy	White Alumite
❸	Cylinder tube	Stainless Steel	-
❹	Piston	Brass	-
❺	Piston rod	Stainless Steel	-
❻	Mounting nut	Brass	Nickel Plated
❽	Piston packing	NBR	-

No.	Description	Material	Note
❾	Rod Packing	NBR	-
❿	Tube Gasket	NBR	-
⓫	Piston Gasket	NBR	-
⓬	Packing Retainer	Aluminum Alloy	White Alumite
⓭	Bumper	Urethane	-
⓮	Magnet	-	-

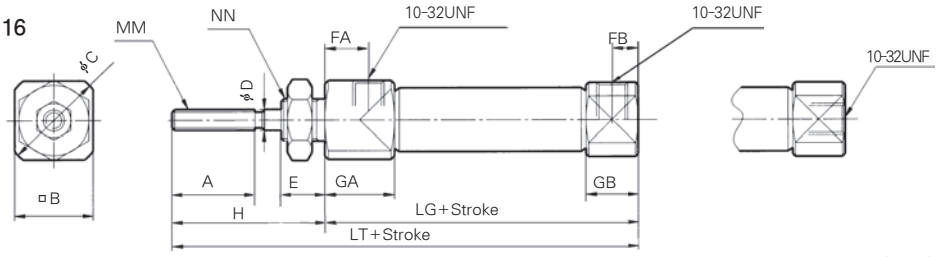
Standard Type (UACPB)

UACPB | Bore Size | Stroke | Port Location on Head Cover

UACPB 6



UACPB 10, 16



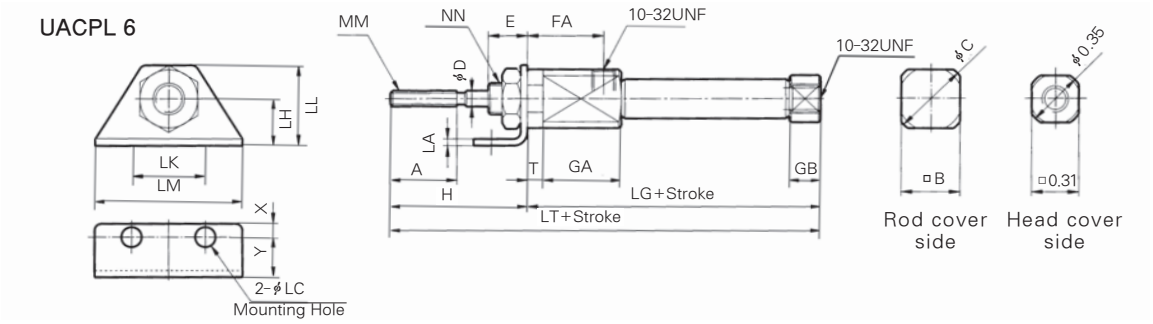
(inch)

Bore size (inch)	A	B	C	D	E	FA	FB	H	MM	GA	GB	NN	LG	T	LT
φ6(1/4 Nom.)	0.59	0.47	0.55	0.12	0.31	0.57	—	1.10	5-40 UNC	0.63	0.28	1/4-28 UNF	1.93	0.12	3.03
φ10(3/8 Nom.)	0.59	0.47	0.55	0.16	0.31	0.31	0.20	1.10	6-40 UNF	0.49	0.37	5/16-24 UNF	1.77	-	2.87
φ16(5/8 Nom.)	0.59	0.71	0.79	0.20	0.31	0.31	0.20	1.10	10-32 UNF	0.49	0.37	3/8-24 UNF	1.77	-	2.87

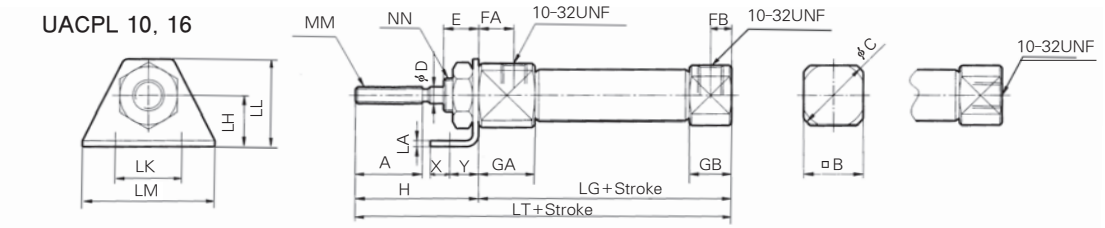
Axial Foot Type (UACPL)

UACPL | Bore Size | Stroke | Port Location on Head Cover

UACPL 6



UACPL 10, 16



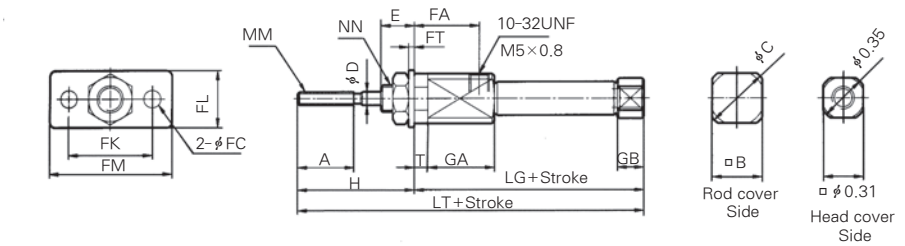
(inch)

Bore size (inch)	A	B	C	D	E	FA	FB	H	LC	LH	LA	LK	LL	LM	MM	GA	GB	NN	LG	T	X	Y	LT
φ6(1/4 Nom.)	0.59	0.47	0.55	0.12	0.31	0.57	-	1.10	0.18	0.35	0.06	0.95	0.65	1.26	5-40 UNF	0.63	0.28	1/4-28 UNF	1.93	0.12	0.20	0.28	3.03
φ10(3/8 Nom.)	0.59	0.47	0.55	0.16	0.31	0.57	0.20	1.10	0.18	0.35	0.06	0.95	0.65	1.26	6-40 UNF	0.49	0.37	5/16-24 UNF	1.77	-	0.20	0.28	2.87
φ16(5/8 Nom.)	0.59	0.71	0.79	0.20	0.31	0.57	0.20	1.10	0.22	0.55	0.09	1.30	0.98	1.65	10-32 UNF	0.49	0.37	3/8-24 UNF	1.77	-	0.24	0.35	2.87

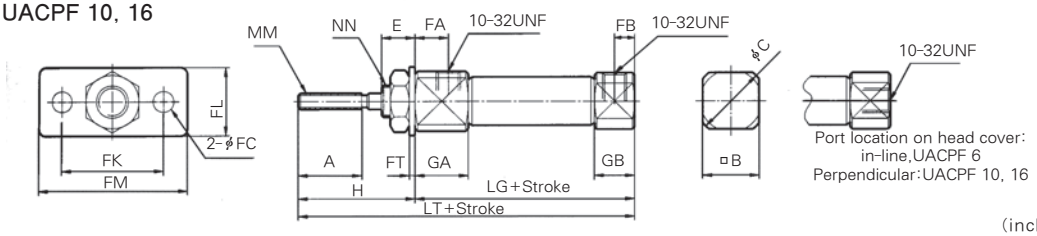
Rod Side Flange Type (UACPF)

UACPF — Bore size — Stroke — Port Location on Head Cover

UACPF 6



UACPF 10, 16



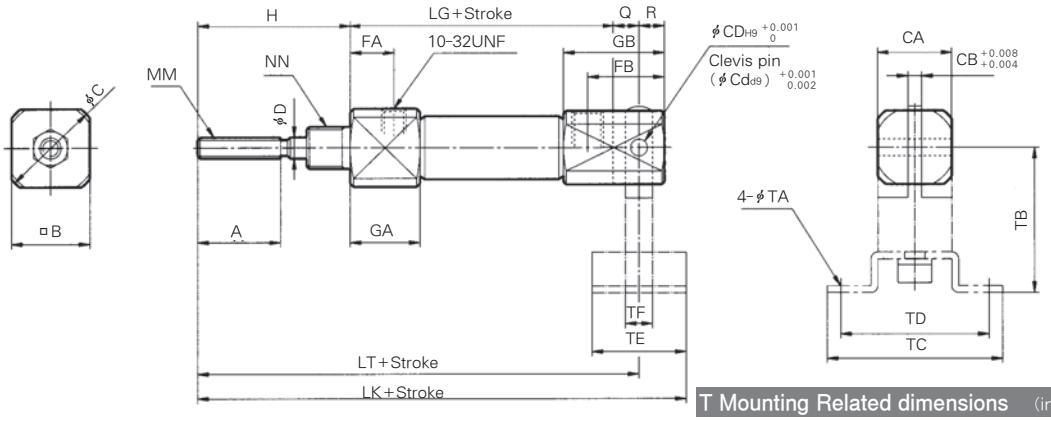
(inch)

Bore size (inch)	A	B	C	D	E	FC	FT	FK	FL	FM	FA	FB	H	MM	GA	GB	NN	LG	T	LT
φ6(1/4 Nom.)	0.59	0.47	0.55	0.12	0.31	0.18	0.06	0.95	0.55	1.26	0.57	-	1.10	5-40 UNC	0.63	0.28	1/4-28 UNF	1.93	0.12	3.03
φ10(3/8 Nom.)	0.59	0.47	0.55	0.16	0.31	0.18	0.06	0.95	0.55	1.26	0.31	0.2	1.10	6-40 UNF	0.49	0.37	5/16-24 UNF	1.77	-	2.87
φ16(5/8 Nom.)	0.59	0.71	0.79	0.20	0.31	0.22	0.09	1.30	0.79	1.65	0.31	0.2	1.10	10-32 UNF	0.49	0.37	3/8-24 UNF	1.77	-	2.87

Double Clevis Type (UACPD)

UACPD — Bore size — Stroke

UACPD 10, 16



T Mounting Related dimensions (inch)

Bore size (inch)	TA	TB	TC	TD	TE	TF
φ10(3/8 Nom.)	0.18	1.14	1.58	1.26	0.87	0.47
φ16(5/8 Nom.)	0.22	1.38	1.89	1.5	1.10	0.63

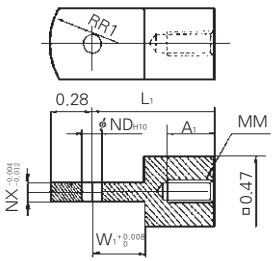
(inch)

Bore size (inch)	A	B	C	CD(cd)	CB	CA	D	FA	FB	H	MM	GA	GB	NN	R	LG	Q	LT	LK
φ10(3/8 Nom.)	0.59	0.47	0.55	0.13	0.13	0.47	0.16	0.32	0.71	1.10	6-40 UNF	0.49	0.89	5/16-24 UNF	0.20	1.77	0.31	3.09	3.62
φ16(5/8 Nom.)	0.59	0.71	0.79	0.20	0.26	0.71	0.20	0.32	0.91	1.10	10-32 UNF	0.49	1.08	3/8-24 UNF	0.31	1.77	0.39	3.27	3.82

Accessaries/Parts List

inch

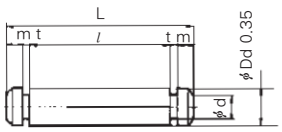
Single Knuckle Joint



Material:Rolled steel

PART No	Bore	A_1	L_1	MM	ND^{H10}	NX	R_1	W_1
UACP 010-17	ϕ10	8.13	21.09	6-40 UNF	3.3 +0.051 0	3.05	21.09	8.89
UACP 016-17	ϕ16	8.13	24.89	10-32 UNF	5.08 +0.051 0	6.35	11.94	13.97

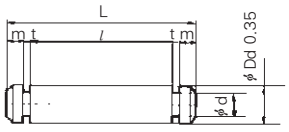
Clevis Pin



Material:Stainless steel

PART No	Bore	$D^{dg(9)}$	d	L	l	m	t	Clib
ACP 010-23A	ϕ10	3.30 -0.025 -0.051	3.3	3.05	15.24	12.2	1.27	CType0.25
ACP 016-23A	ϕ16	5.08 -0.025 -0.051	5.08	4.83	22.61	18.29	1.524	CType 0.76

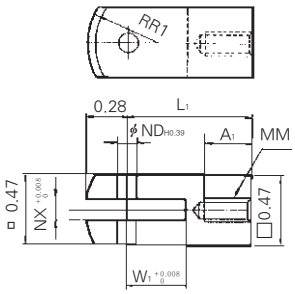
Knuckle Pin



Material:Stainless steel

PART No	Bore	$D^{dg(9)}$	d	L	l	m	t	Clib
ACP 010-23B	ϕ10	3.30 -0.025 -0.051	3.3	3.05	16.26	12.2	1.78	CType 0.01
ACP 016-23B	ϕ16	5.08 -0.025 -0.051	5.08	4.83	21.59	12.2	1.52	CType 0.03

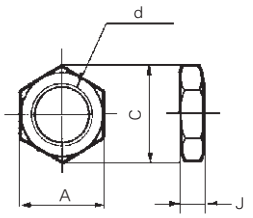
Double Knuckle Joint



Material:Rolled steel

PART No.	Bore	A_1	L_1	MM	ND^{H10}	NX	W_1	R_1
UACP 010-18	ϕ10	0.32	0.93	6-40 UNF	0.13 +0.048 0	0.13	0.39	0.32
UACP 016-18	ϕ16	0.43	0.83	10-32 UNF	0.20 +0.048 0	0.13	0.39	0.47

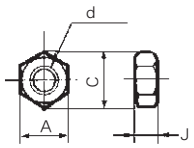
Mounting Nut



Material:Brass

PART No.	Bore	A	C	d	J
UACP 006-13A	ϕ6	0.44	0.50	1/4-28 UNF	0.16
UACP 010-13A	ϕ10	0.50	0.58	5/16-24 UNF	0.19
UACP 016-13A	ϕ16	0.56	0.65	3/8-24 UNF	0.23

Rod End Nut



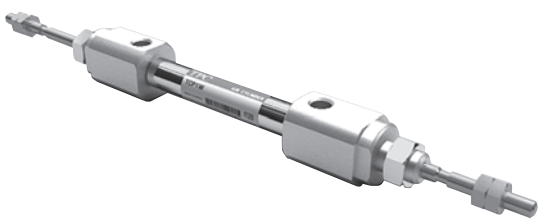
Material:Steel

PART No.	Bore	A	C	d	J
UACP 006-13B	ϕ6	0.31	0.11	5-40 UNC	0.11
UACP 010-13B	ϕ0	0.31	0.36	6-40 UNF	0.11
UACP 016-13B	ϕ16	0.38	0.43	10-32 UNF	0.13

Series UACPW

Standard Type/Double Acting : Double Rod

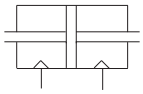
Bore Sizemm(inch) : Ø6(1/4 " Nom.), Ø10(3/8 " Nom.), Ø16(5/8 " Nom.)



- STAINLESS STEEL BODY FOR HIGH CYCLE LIFE & LOW BREAKAWAY
- BUMPERS STANDARD
- EASY MOUNTING
- LOW BREAKAWAY
- LIGHT COMPACT DESIGN

Symbol

Double Acting/Double Rod



How to Order

UACPW **B** **16** – **0100** – **W5**

1 2 3 4 5 6 7

1 Air Cylinder
Built-in magnet, Rubber cushions are standard

2 Mounting
B : Standard type
L : Axial foot type
F : Rod side flange type

3 Bore Size/mm(inch)
6 : ϕ6(1/4 Nom.)
10 : ϕ10(3/8 Nom.)
16 : ϕ16(5/8 Nom.)

4 Stroke (mm)
6 : 5, 10, 15, 20
10 : 5, 10, 15, 20
16 : 5, 10, 15, 20, 30, 40

5 Special Option
Blank : Standard
XC16 : Copper-free

6 Auto Switch
(Band mounted type)
W5 : Reed Switch, 0.5m Lead Wire
※ W5L : Reed Switch, 3m Lead Wire

7 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

PART No. of Mounting Bracket

Mounting Bracket	Bore size mm(inch)		
	6(1/4 Nom.)	10(3/8 Nom.)	16(5/8 Nom.)
Foot	TC1P006-19	TC1P010-19	TC1P016-19
Flange	TC1P006-20	TC1P010-20	TC1P016-20

PART No. of Auto Switch Mounting Band

Bore Size (inch)	PART No. of auto switch mounting band	Note
6(1/4 Nom.)	TC1P006	Common use to all of W5 types
10(3/8 Nom.)	TC1P010	
16(5/8 Nom.)	TC1P016	

Standard Type/Double Acting: Double Rod/Series UACPW

Specifications

Action		Double Acting Single Rod
Fluid		Air
Proof Pressure		1.05MPa(150 Psi)
Max. Operating Pressure		0.70MPa(100 Psi)
Min. Operating Pressure	ϕ6(0.24)	0.15MPa(17 Psi)
	ϕ10(0.39), ϕ16(0.63)	0.1MPa(8.5 Psi)
Ambient and Fluid Temperature		40~140°F (5℃ ~ 60℃)
Cushion		Rubber Cushion (Standard)
Lubrication		None (Non-Lube)
Piston Speed		50~750 mm/sec, (2~29.5 in/sec)

Auto Switch Specifications

Mounting	Bore Size(inch)	Reed Switch
		Grommet
Band Mounted type	ϕ6(1/4 Nom.), ϕ10(3/8 Nom.), ϕ16(5/8 Nom.)	W5

Mounting and Accessories

Mounting		Basic type	Foot type	Flange type
Standard	Mounting nut	o	o	o
	Rod end nut	-	-	-
Option	Single knuckle joint	o	o	o
	Double knuckle joint(with pin)	o	o	o

Weight Table

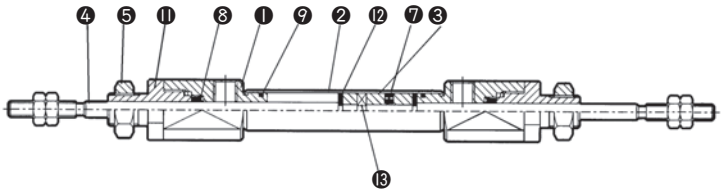
gf(oz)

Bore Size mm(inch)		ϕ6(1/4 Nom.)	ϕ10(1/4 Nom.)	ϕ16(5/8 Nom.)
※Basic Weight		27(0.95)	35(1.33)	70(2.40)
Additional Weight for each 1/2″ of stroke		3(0.08)	6(0.17)	9(0.26)
Mounting Bracket Weight	Foot type	14(0.49)	14(0.49)	38(1.34)
	Flange type	5(0.15)	5(0.15)	13(0.46)

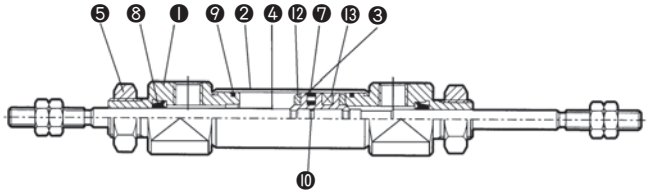
※ Including the weights of mounting nut and rod end nut.

Construction/Parts List

UACPWB 6



UACPWB 10, 16



Parts List

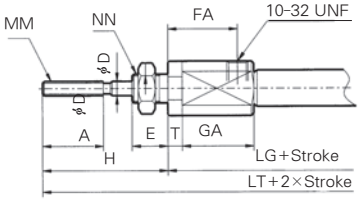
No.	Description	Material	Note
❶	Rod Cover	Aluminum Alloy	White Alumite
❷	Cylinder Tube	Stainless Steel	
❸	Piston	Brass	
❹	Piston Rod	Stainless Steel	
❺	Mounting Nut	Brass	Nickel Plated
❼	Piston Packing	NBR	

No.	Description	Material	Note
❽	Rod Packing	NBR	
❾	Tube Gasket	NBR	
❿	Piston Gasket	NBR	
⓫	Packing Retainer	Aluminum alloy	
⓬	Bumper	Urethane	
⓭	Magnet	–	

Standard Type (UACPWB)

UACPWB (Bore Size)–(Stroke)

UACPWB6
Rod Cover



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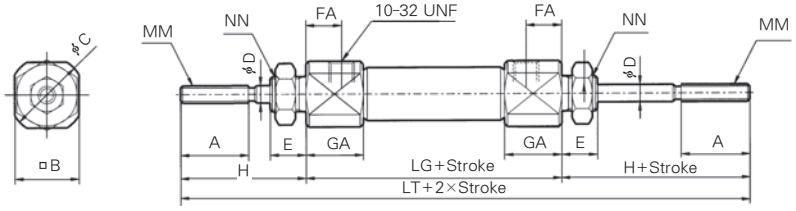


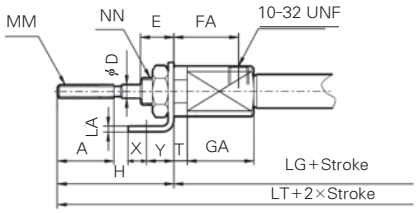
(inch)

Bore size (inch)	A	B	C	D	E	FA	H	MM	GA	NN	LG	T	LT
ϕ6(1/4 Nom.)	0.59	0.47	0.55	0.12	0.31	0.57	1.10	5-40 UNC	0.63	1/4-28 UNF	2.70	0.12	4.90
ϕ10(3/8 Nom.)	0.59	0.47	0.55	0.16	0.31	0.32	1.10	6-40 UNF	0.49	5/16-24 UNF	1.89	–	4.09
ϕ16(5/8 Nom.)	0.59	0.71	0.79	0.20	0.31	0.32	1.10	10-32 UNF	0.49	3/8-24 UNF	1.89	–	4.09

Foot Type (UACPWL)

UACPWL (Bore Size)—(Stroke)

UACPWL6
Rod Cover



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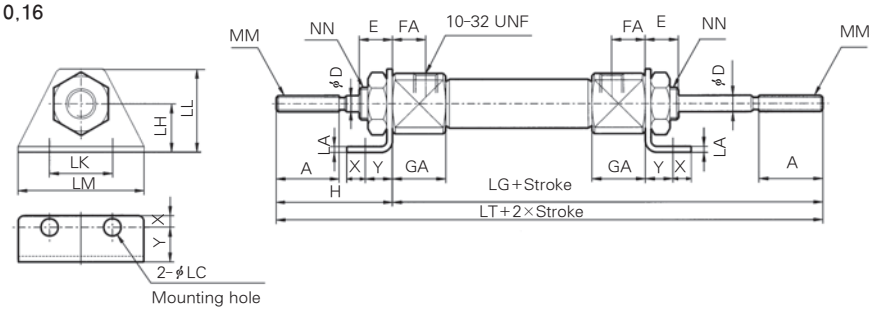


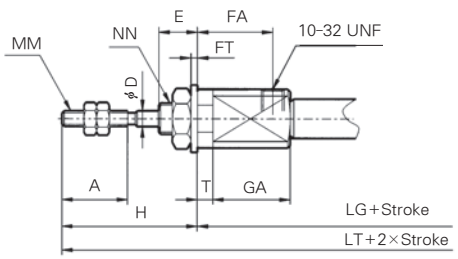
(inch)

Bore size(inch)	A	D	E	FA	H	LC	LH	LA	LK	LL	LM	MM	GA	NN	LG	T	X	Y	LT
φ6(1/4 Nom.)	0.59	0.12	0.31	0.57	1.10	0.18	0.35	0.06	0.95	0.65	1.26	5-40 UNC	0.63	1/4-28 UNF	2.70	0.12	0.20	0.28	4.90
φ10(3/8 Nom.)	0.59	0.16	0.31	0.32	1.10	0.18	0.35	0.06	0.95	0.65	1.26	6-40 UNF	0.49	5/16-24 UNF	1.89	-	0.20	0.28	4.09
φ16(5/8 Nom.)	0.59	0.20	0.31	0.32	1.10	0.22	0.55	0.09	1.30	0.98	1.65	10-32 UNF	0.49	3/8-24 UNF	1.89	-	0.24	0.35	4.09

Flange Type (UACPWF)

ACPWF (Bore Size)—(Stroke)

UACPWF 6
Rod Cover



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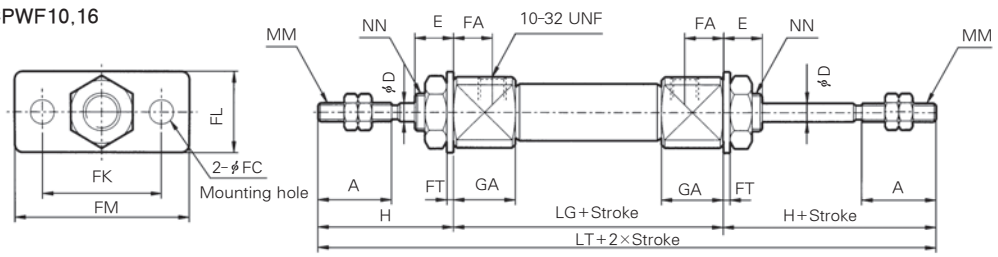


(inch)

Bore size(inch)	A	D	E	FC	FT	FK	FL	FM	FA	H	MM	GA	NN	LG	T	LT
6(1/4 Nom.)	0.59	0.12	0.31	0.18	0.06	0.95	0.55	1.26	0.57	1.10	5-40 UNC	0.63	1/4-28 UNF	2.70	0.12	4.90
10(3/8 Nom.)	0.59	0.16	0.31	0.18	0.06	0.95	0.55	1.26	0.32	1.10	6-40 UNF	0.49	5/16-24 UNF	1.89	-	4.09
16(5/8 Nom.)	0.59	0.20	0.31	0.22	0.09	1.30	0.79	1.65	0.32	1.10	10-32 UNF	0.49	3/8-24 UNF	1.89	-	4.09

Series UACPS

Standard Type/Single Acting Spring Return, Spring Extended

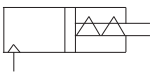
Bore Sizemm(inch) : Ø6(1/4Nom.), Ø10(3/8Nom.), Ø16(5/8Nom.)

- STAINLESS STEEL BODY
- HIGH CYCLE LIFE
- BUMPERS STANDARD
- BUILT - IN MAGNET
- COMPACT LIGHT DESIGN

Symbol

Single Acting/Single Rod

• Spring Return



• Spring Extended

How to Order

UACPS **B** **16** – **20** **S** **R** – ( ) – **W5** ( )

1 2 3 4 5 6 7 8 9

1 Air Cylinder
Built–in magnet, Rubber cushions are standard.

2 Mounting
B : Basic type
L : Axial foot type
F : Rod side flange type
D : Double Clevis type
(Except for ϕ6)

3 Bore Size(inch)
6 : ϕ6(1/4 Nom.)
10 : ϕ10(3/8 Nom.)
16 : ϕ16(5/8 Nom.)

4 Stroke(mm)
6 : 6, 10, 15, 20
10 : 6, 10, 15, 20
16 : 6, 10, 15, 20

5 Action
S : Single Acting Spring Return
T : Single Acting Spring Extended

6 Port Location on Head Cover

Symbol \ Bore size	ϕ6	ϕ10, ϕ16
R	–	in–line
Blank	in–line	90°

7 Special Options
Blank : Standard
XC16 : Copper–free

8 Auto Switch
(Band mounted type)
W5 : Reed Switch, 0.5m Lead Wire
※ W5L : Reed Switch, 3m Lead Wire

9 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

PART No. of Mounting Bracket

Mounting Bracket	Bore Size(inch)		
	ϕ6(1/4 Nom.)	ϕ10(3/8 Nom.)	ϕ16(5/8 Nom.)
Foot	TC1P006-19	TC1P010-19	TC1P016-19
Flange	TC1P006-20	TC1P010-20	TC1P016-20
※T Mounting	-	TC1P010-42B	TC1P016-42B

※T Mounting : Double clevis type(D)

PART No. of Auto Switch Mounting Band

Bore Size mm(inch)	PART No. of Auto Switch Mounting Band	Note
ϕ6(1/4 Nom.)	TC1P006	Common use to all of W5□ types
ϕ10(3/8 Nom.)	TC1P010	
ϕ16(5/8 Nom.)	TC1P016	

Standard Type/Single Acting : Single Rod/Series UACPS

Specifications

Action		Spring Return	Spring Extended
Fluid		Air	
Proof Pressure		1.05MPa(149 Psi)	
Max. Operating Oressure		0.70MPa(100 Psi)	
Min. Operating Pressure	ϕ0.24	0.2MPa(28 Psi)	0.25MPa(36 Psi)
	ϕ0.39, ϕ0.63	0.15MPa(21 Psi)	
Ambient and Fluid Temperature		40~140°F (5~60℃)	
Cushion		Rubber cushion (Standard)	
Lubrication		None (Non-Lube)	
Piston Speed		50~750 mm/sec. (2~29.5 in/sec)	

Auto Switch Specifications

Mounting	Bore Size mm(inch)	Reed Switch
		Grommet
Band Mounted Type	ϕ6(1/4 Nom.), ϕ10(3/8 Nom.), ϕ16(5/8 Nom.)	W5

Spring Retracting Force (lbs)

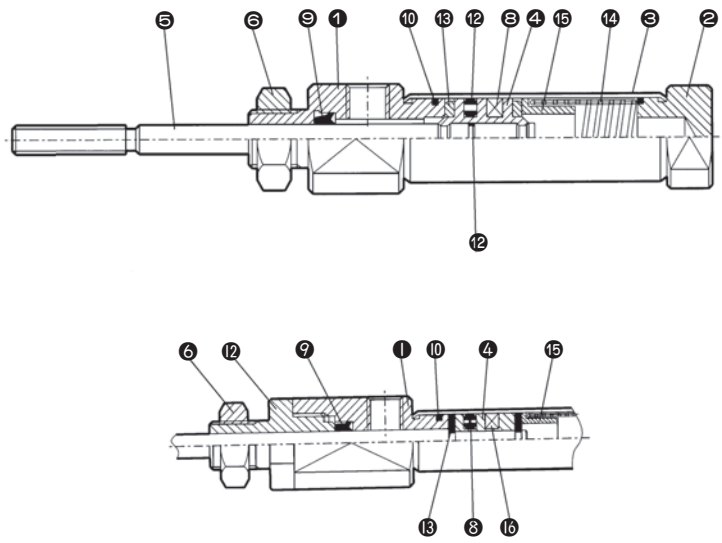
Bore Size mm(inch)	Extended Position	Retracted Position
ϕ6(1/4 Nom.)	0.84	0.40
ϕ10(3/8 Nom.)	1.54	0.79
ϕ16(5/8 Nom.)	3.20	1.54

Mounting and Accessaries

Mounting		Basic Type	Axial Foot Type	Rod Side Flange Type	Double Clevis Type
Standard	Mounting Nut	○	○	○	-
	Rod end Nut	-	-	-	-
	Clevis Pin	-	-	-	○
Option	Single Knuckle Joint	○	○	○	○
	Double Knuckle Joint(with pin)	○	○	○	○
	T Mounting	-	-	-	○

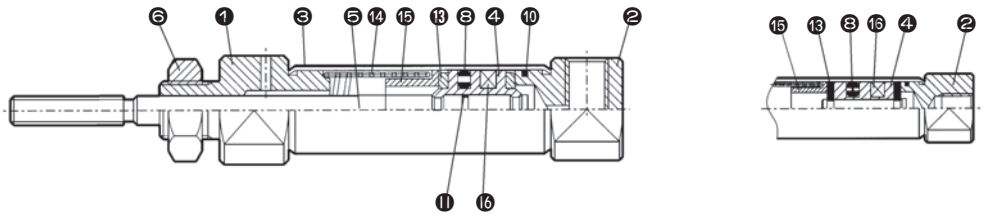
Construction/Parts List

Single Acting/Spring Extended
UACP□□ - □□□ T



UACPS6 Rod Cover, Piston

Single Acting/Spring Return
UACP□□ - □□□ S



UACPS6 Head cover, Piston

Parts List

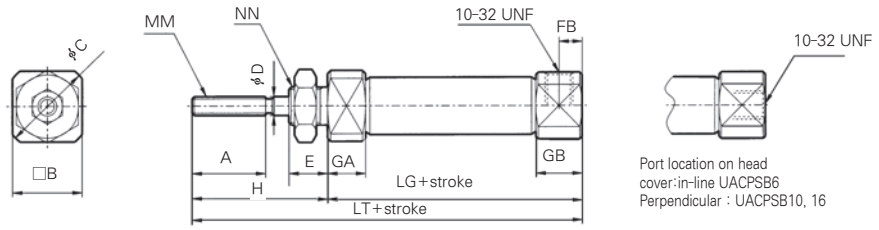
No.	Description	Material	Note
❶	Rod Cover	Aluminum Alloy	White Alumite
❷	Head Cover	Aluminum Alloy	White Alumite
❸	Cylinder Tube	Stainless Steel	-
❹	Piston	Brass	-
❺	Piston Rod	Stainless Steel	-
❻	Mounting Nut	Brass	Nickel Plated
❽	Piston Packing	NBR	-

Standard Type/Single Acting : Single Rod/Series UACPSB

No.	Description	Material	Note
❾	Rod packing	NBR	-
❿	Tube gasket	NBR	-
⓫	Piston gasket	NBR	-
⓬	Packing retainer	Aluminum Alloy	White Alumite
⓭	Bumper	Urethane	-
⓮	Return spring	Piano Wire	-
⓯	Spring seat	Brass	-
⓰	Magnet	-	-

Spring Return/Standard Type(UACPB)

UACPB | Bore Size | Stroke | S | Port location on Head Cover

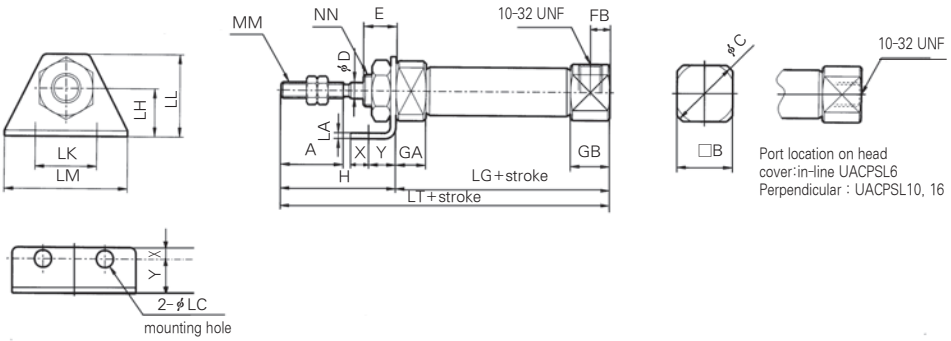


(inch)

Bore size	A	B	C	D	E	FB	H	MM	GA	GB	NN	LG				LT			
												5~15 ST	16~30 ST	31~45 ST	46~60 ST	5~15 ST	16~30 ST	31~45 ST	46~60 ST
φ6(1/4 Nom.)	0.59	0.31	0.35	0.12	0.32	–	1.10	No.5-40 UNC	0.12	0.28	1/4-28 UNC	1.56	1.91	2.07	2.62	2.66	3.01	3.17	3.72
φ10(3/8 Nom.)	0.59	0.47	0.55	0.16	0.32	0.20	1.10	No.6-40 UNF	0.22	0.37	5/16-24 UNC	1.83	2.13	2.60	3.07	2.93	3.23	3.70	4.17
φ16(5/8 Nom.)	0.59	0.71	0.79	0.20	0.32	0.20	1.10	No.10-32 UNF	0.22	0.37	3/8-24 UNC	1.81	2.16	2.62	3.09	2.91	3.25	3.72	4.19

Spring Return/Axial Foot Type (UACPL)

UACPL | Bore Size | Stroke | S | Port Location on Head Cover

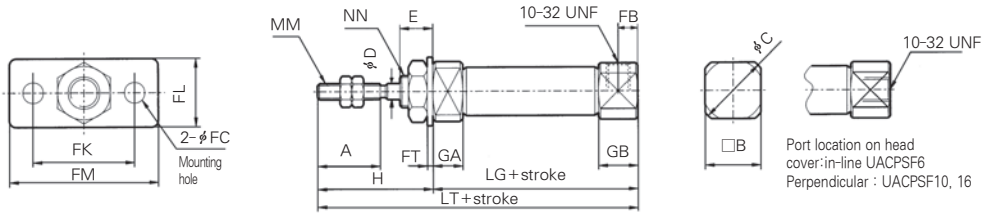


(inch)

Bore size	A	B	C	D	E	FB	H	LC	LH	LA	LK	LL	LM	MM	GA	GB	NN	X	Y	LG				LT			
																				5~15 ST	16~30 ST	31~45 ST	46~60 ST	5~15 ST	16~30 ST	31~45 ST	46~60 ST
φ6(1/4 Nom.)	0.59	0.31	0.35	0.12	0.31	–	1.10	0.18	0.35	0.06	0.95	0.65	1.26	No.5-40 UNC	0.12	0.28	1/4-28 UNF	0.20	0.28	1.56	1.91	2.07	2.62	2.66	3.01	3.17	3.72
φ10(3/8 Nom.)	0.59	0.47	0.55	0.16	0.31	0.20	1.10	0.18	0.35	0.06	0.95	0.65	1.26	No.6-40 UNF	0.22	0.37	5/16-24 UNF	0.20	0.28	1.83	2.13	2.60	3.07	2.93	3.23	3.70	4.17
φ16(5/8 Nom.)	0.59	0.71	0.79	0.20	0.31	0.20	1.10	0.22	0.55	0.09	1.30	0.98	1.65	No.10-32 UNF	0.22	0.37	3/8-24 UNF	0.24	0.35	1.81	2.16	2.62	3.09	2.91	3.25	3.72	4.19

Spring Return/Rod Side Flange Type (UACPF)

UACPF Bore Size — Stroke S Port Location on Head Cover

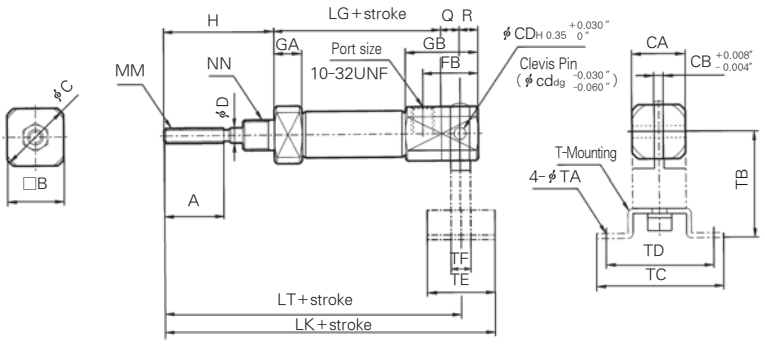


(inch)

Bore size	A	B	C	D	E	FC	FT	FK	FL	FM	FB	H	MM	GA	GB	NN	LG				LT			
																	5~15ST	16~30ST	31~45ST	46~60ST	5~15ST	16~30ST	31~45ST	46~60ST
φ6(1/4 Nom.)	0.59	0.32	0.35	0.12	0.31	0.18	0.06	0.95	0.55	1.26	-	1.10	No.5-40 UNC	0.12	0.28	1/4-28 UNF	1.56	1.91	2.07	2.62	2.66	3.01	3.17	3.72
φ10(3/8 Nom.)	0.59	0.47	0.55	0.16	0.31	0.18	0.06	0.95	0.55	1.26	0.20	1.10	No.6-40 UNF	0.22	0.37	5/16-24 UNF	1.83	2.13	2.60	3.07	2.93	3.23	3.70	4.17
φ16(5/8 Nom.)	0.59	0.71	0.79	0.29	0.31	0.22	0.09	1.30	0.78	1.65	0.20	1.10	No.10-32 UNF	0.22	0.37	3/8-24 UNF	1.81	2.16	2.62	3.09	2.91	3.25	3.72	4.19

Spring Return/Double Clevis Type (UACPD)

UACPD Bore size — Stroke S Port Location on Head Cover



T Mounting (inch)

Bore size	TA	TB	TC	TD	TE	TF
φ10(3/8 Nom.)	0.18	1.42	1.58	1.26	0.87	0.47
φ16(5/8 Nom.)	0.22	1.38	1.89	1.50	1.10	0.63

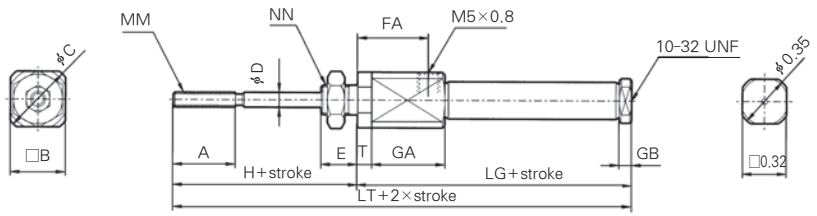
(inch)

Bore size	A	B	C	CA	CB	CD (cd)	D	FB	GA	GB	H	MM	Q	R	LG				LT				LK			
															5~15 ST	16~30 ST	31~45 ST	46~60 ST	5~15 ST	16~30 ST	31~45 ST	46~60 ST	5~15 ST	16~30 ST	31~45 ST	46~60 ST
φ10(3/8 Nom.)	0.59	0.47	0.55	0.47	0.13	0.13	0.16	0.71	0.22	0.89	1.10	No.6-40 UNF	0.32	0.20	1.83	2.13	2.60	3.07	3.25	3.54	4.02	4.49	3.68	3.98	4.45	4.92
φ16(5/8 Nom.)	0.59	0.71	0.79	0.71	0.26	0.20	0.20	0.91	0.22	1.08	1.10	No.10-32 UNF	0.39	0.32	1.81	2.16	2.62	3.09	3.31	3.64	.411	4.59	3.86	4.19	4.67	5.14

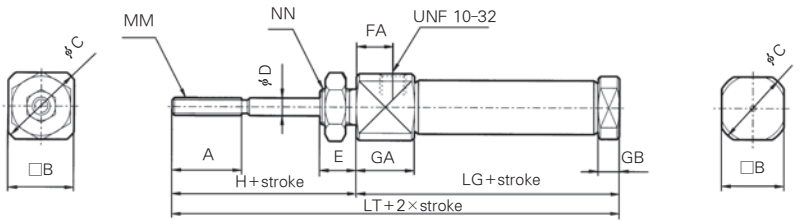
Spring Extended/Basic Type(UACPB)

UACPB | Bore size | Stroke | T

UACPB6 - □T



UACPB 10 - □T
16



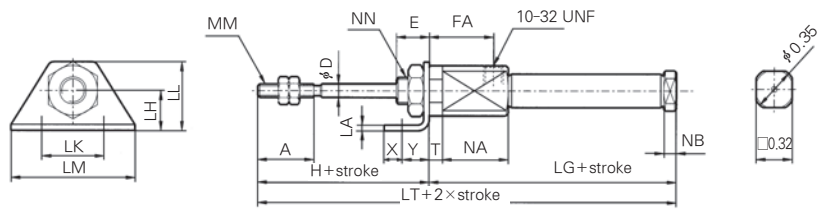
(inch)

Bore size	A	B	C	D	E	FA	H	MM	GA	GB	NDh8	T	NN	LG				LT			
														5~15ST	16~30ST	31~45ST	46~60ST	5~15ST	16~30ST	31~45ST	46~60ST
φ6(1/4 Nom.)	0.59	0.47	0.55	0.12	0.31	0.57	1.10	No.5-40 UNC	0.63	0.12	$0.24^{0}_{-0.018}$	0.12	1/4-28 UNF	2.03	2.38	2.54	3.09	3.13	3.48	3.64	4.19
φ10(3/8 Nom.)	0.59	0.47	0.55	0.16	0.31	0.20	1.10	No.6-40 UNF	0.49	0.22	$0.32^{0}_{-0.022}$	-	5/16-24 UNF	1.95	2.24	2.72	3.19	3.05	3.35	3.82	4.29
φ16(5/8 Nom.)	0.59	0.71	0.79	0.20	0.31	0.20	1.10	No.10-32 UNF	0.49	0.22	$0.39^{0}_{-0.022}$	-	3/8-24 UNF	1.93	2.26	2.74	3.21	3.03	3.37	3.84	4.31

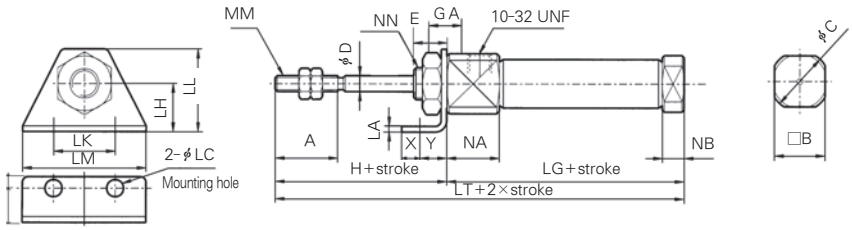
Spring Extended/Axial Foot Type(UACPL)

UACPL | Bore size | Stroke | T

UACPL6 - □T



UACPB 10 - □T
16

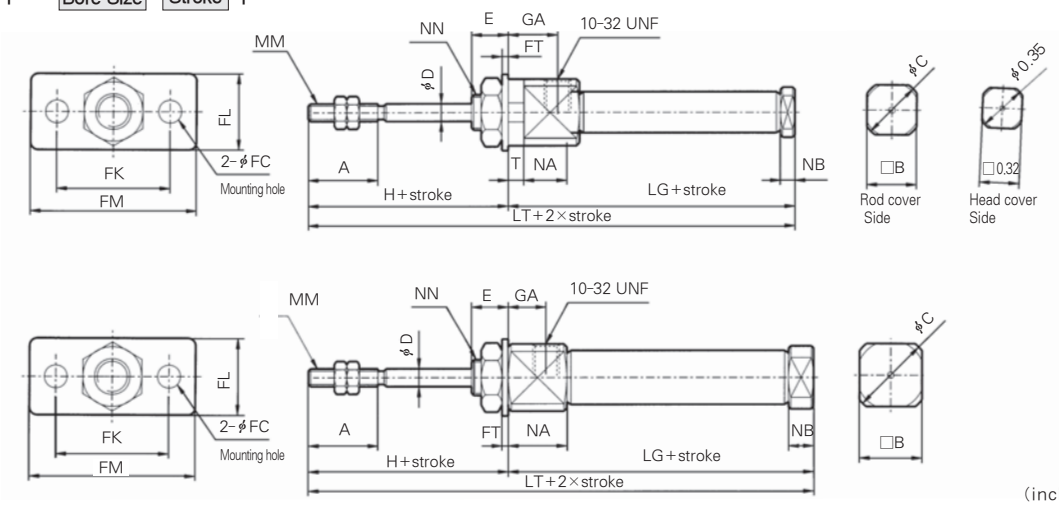


(inch)

Bore size	A	B	C	D	E	GA	H	LC	LH	LA	LK	LL	LM	MM	NA	NB	T	X	Y	NN	LG				LT			
																					5~15ST	16~30ST	31~45ST	46~60ST	5~15ST	16~30ST	31~45ST	46~60ST
φ6(1/4 Nom.)	0.59	0.47	0.55	0.12	0.31	0.57	1.10	0.18	0.35	0.06	0.95	0.65	1.26	No.5-40 UNC	0.63	0.12	0.12	0.20	0.28	1/4-28 UNF	2.03	2.38	2.54	3.09	3.13	3.48	3.64	4.19
φ10(3/8 Nom.)	0.59	0.47	0.55	0.16	0.31	0.32	1.10	0.18	0.35	0.06	0.95	0.65	1.26	No.6-40 UNF	0.49	0.22	-	0.20	0.28	5/16-24 UNF	1.95	2.24	2.72	3.19	3.05	3.35	3.82	4.29
φ16(5/8 Nom.)	0.59	0.71	0.79	0.20	0.31	0.32	1.10	0.22	0.55	0.09	1.30	0.98	1.65	No.10-32 UNF	0.49	0.22	-	0.24	0.35	3/8-24 UNF	1.93	2.26	2.74	3.21	3.03	3.37	3.84	4.31

Spring Extended/Rod Side Flange Type (UACPF)

UACPF Bore Size — Stroke T

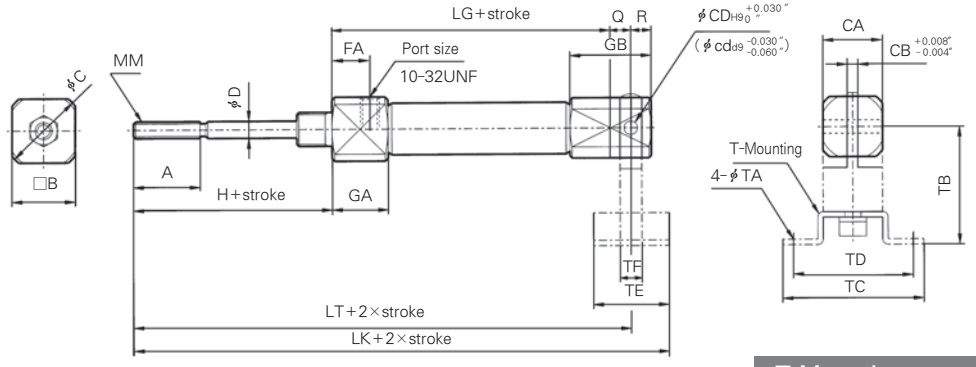


(inch)

Bore size	A	B	C	D	E	FC	FT	FK	FL	FM	GA	H	MM	NA	NB	T	NN	LG 5~15ST	LG 16~30ST	LG 31~45ST	LG 46~60ST	LT 5~15ST	LT 16~30ST	LT 31~45ST	LT 46~60ST
φ6(1/4 Nom.)	0.59	0.47	0.55	0.12	0.31	0.18	0.06	0.95	0.55	1.26	0.57	1.10	No5-40 UNC	0.24	0.12	0.12	1/4-28 UNF	2.03	2.38	2.54	3.09	3.13	3.48	3.64	4.19
φ10(3/8 Nom.)	0.59	0.47	0.55	0.16	0.31	0.18	0.06	0.95	0.55	1.26	0.32	1.10	No6-40 UNF	0.49	0.22	-	5/16-24 UNF	1.95	2.24	2.72	3.19	3.05	3.35	3.82	4.29
φ16(5/8 Nom.)	0.59	0.71	0.79	0.20	0.31	0.22	0.09	1.30	0.79	1.65	0.32	1.10	No.10-32 UNF	0.49	0.22	-	3/8-24 UNF	1.93	2.26	2.74	3.21	3.03	3.37	3.84	4.31

Spring Extended/Double Clevis Type (UACPD)

UACPD Bore size — Stroke T

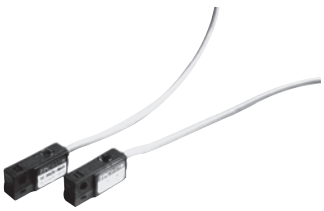


T Mounting (inch)

Bore size	TA	TB	TC	TD	TE	TF
φ10(3/8 Nom.)	0.18	1.14	1.58	1.26	0.87	0.47
φ16(5/8 Nom.)	0.22	1.38	1.89	1.50	1.10	0.63

(inch)

Bore size	A	B	C	CA	CB	CD (cd)	D	FB	GA	GB	H	MM	Q	R	LG 15~15ST	LG 16~30ST	LG 31~45ST	LG 46~60ST	LT 15~15ST	LT 16~30ST	LT 31~45ST	LT 46~60ST	LK 15~15ST	LK 16~30ST	LK 31~45ST	LK 46~60ST
φ10(3/8 Nom.)	0.59	0.47	0.55	0.47	0.13	0.13	0.16	0.32	0.49	0.89	1.10	No 6-40 UNF	0.32	0.20	2.11	2.40	2.87	3.35	3.52	3.82	4.29	4.76	3.96	4.25	4.72	5.20
φ16(5/8 Nom.)	0.59	0.71	0.79	0.71	0.26	0.20	0.20	0.32	0.49	1.08	1.10	No10-32 UNF	0.39	0.32	2.09	2.42	2.89	3.37	3.58	3.92	4.39	4.86	4.13	4.47	4.94	5.41



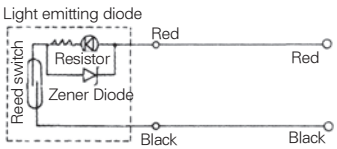
Specifications W5 (With indicator lamp)

Auto Switch Model	W5	
Application	Relay, Sequence Control	
Load Voltage	DC24V	AC110V
Max. Load Current/Range of Load Current	5~40mA	5~20mA
Protection Circuit for Contact Breaker Point	None	
Internal Voltage Drop	2.4V or less	
Indicator Lamp	ON:Red light emitting diode	

- Leakage Current – None
- Response Time – 1.2ms
- Lead Wire – Oil proof vinyl, ϕ3.4 0.2㎟, 2 Wire(red, black), 0.5m(18in)
- Impact Resistance– 30G
- Insulation Resistance – 50MΩ or more under the test voltage 500VDC (Between case and cable)
- Withstand Voltage – 1500VAC 1min (between case and cable)
- Ambient Temperature – 14~140°F (-10~60℃)
- Protection Structure – IEC spec IP67, Water-proof(JISCO920), oil-proof.

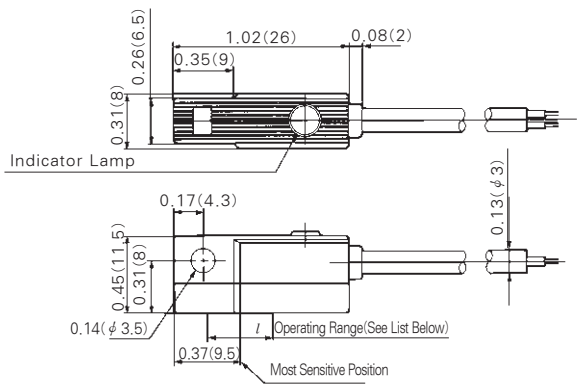
※ If 118 inch lead wire is required, L is put at the end of numbers.
Example : W5L

Auto Switch/Internal Circuit



Auto Switch Dimensions

inch(mm)



Operating Range(ℓ Dimension)

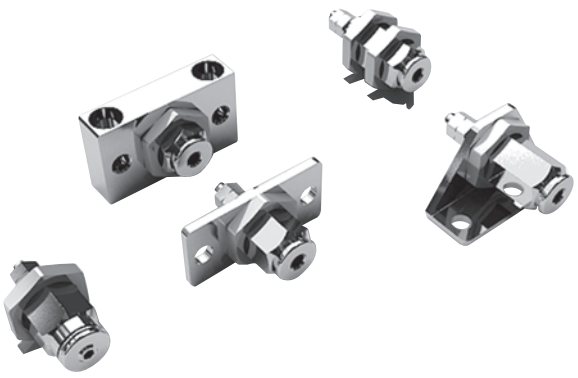
inch(mm)

Series	Bore size		
	ϕ6 (1/4Nom.)	ϕ10 (3/8Nom.))	ϕ16 (5/8Nom.)
UACP	0.28 (7)	0.31 (8)	0.31 (8)

Series APM

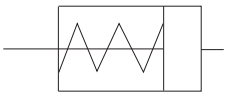
Bulkhead Mounted Mini Cylinder

Bore Size(mm) : Ø6, Ø10, Ø16



- HIGHER SHOCK-ABOSORBENCY WITH SPECIAL COATING ON THE CYLINDER TUBE
- OUTSTANDING DURABILITY WITH A BRONZE ALLOY WITH HIGH WEAR RESISTANCE ON THE ROD COVER
- VARIOUS SPECIAL HOSE NIPPLE OPTIONS

Symbol



Cylinder KS Symbol

How to Order

APM B 6 — 10 — N4 — B

1 2 3 4 5 6

1 Panel Mounting Cylinder

2 Mounting
- B : Standard
- S : Block Insertion
- L : Foot Mount
- F : Flange Mount
- P : Plate Mount

3 Bore Size(㎜)
- 6 : Ø6
- 10 : Ø10
- 15 : Ø15

4 Stroke (㎜)
- 5 : 5㎜
- 10 : 10㎜
- 15 : 15㎜

※ Note) Hose (tube) nipple attachment is not available for the block insertion type.

5 Hose (Tube) Nipple Attachment
Blank : No Nipple

Category	TYPE	Tube O.D	Tube I.D
H4	Cap Type	Ø4	Ø2
H5		Ø4	Ø2.5
H6		Ø6	Ø4
N4	Barb Type	Ø4	Ø2
N5		Ø4	Ø2.5
N6		Ø6	Ø4

※ Refer to the table attached for specific properties and sizes.

6 Rod End Shape
- Blank : Male Thread
- B : No Thread

Specifications

Category	Bore Size(mm)		
	Ø6	Ø10	Ø15
Fluid	Air		
Acting	Single Acting(Spring Return)		
Proof Pressure	1.05Mpa(10.7kgf/㎠)		
Max. Supply Pressure	0.7Mpa(7.1kgf/㎠)		
Min. Operation Pressure	0.2Mpa(2.0kgf/㎠)	0.15Mpa(1.5kgf/㎠)	
Ambient and Fluid Temperature	−10~70℃(No Freeze)		
Rod End Shape	Male Thread(Standard)		
Thread Tolerance	KS Class 2		
Standard Stroke Tolerance	5, 10, 15mm / 0~+1.0mm		
Lubrication	Not required(Non−lube)		
Piston Speed	50~500mm/sec		
Cushion	N/A		

Spring Force

Bore Size(mm)	Strokes (mm)		
	5	10	15
Ø6	4.36/1.47	4.33/1.47	4.21/1.47
Ø10	6.66/2.94	7.55/2.94	7.45/2.45
Ø15	11.86/6.57	12.35/5.40	12.70/5.78

Note) The retrieval of spring is indicated as start of retrieval / end of retrieval of the piston.

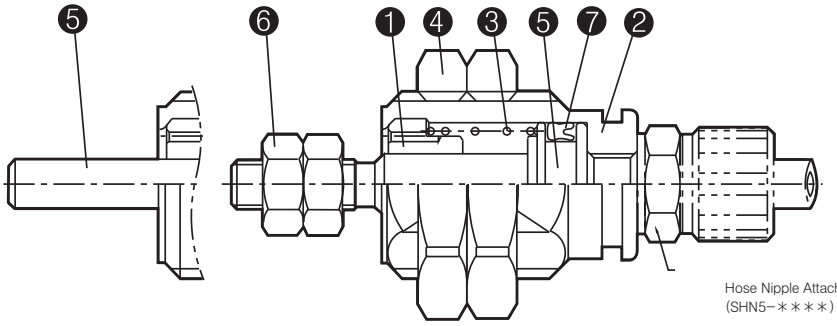
Theoretical Force

Type	Bore Size	Operation Direction	Pressure(Mpa)					
			0.2	0.3	0.4	0.5	0.6	0.7
APM 6	6	Retract(Spring Return)	Max. (Start) 4.33 ~Min. (End) 1.47					
		Extend	1.2	4.0	6.7	9.5	12.3	15.1
APM 10	10	Retract(Spring Return)	Max. (Start) 7.55 ~Min. (End) 2.45					
		Extend	7.8	15.5	23.2	30.9	38.6	46.3
APM 15	15	Retract(Spring Return)	Max. (Start) 12.7 ~Min. (End) 5.4					
		Extend	21.9	39.2	56.5	73.8	91.2	108.5

Note 1N≒0.102kgf, 1MPa≒10.2kgf/㎠

The OUT value bears the maximum load in the retrieval.

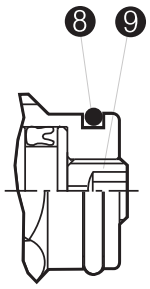
Construction



Components

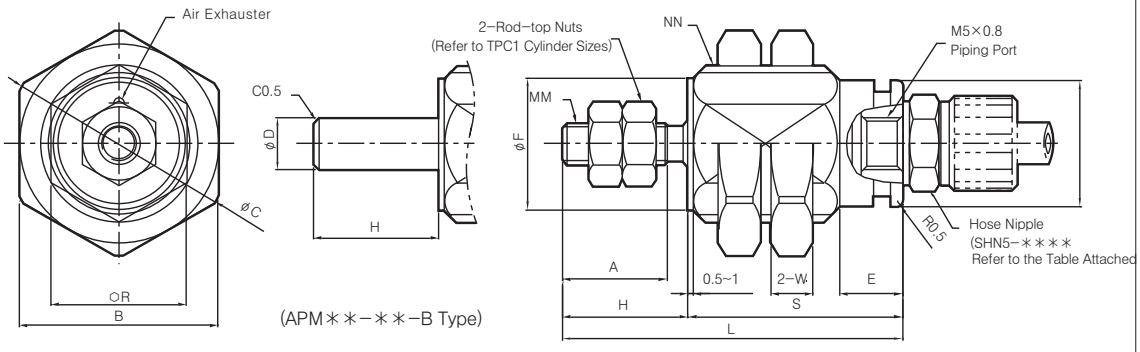
No	Parts	Counts	Materials	Remarks
❶	Rod Cover	1	Bronze Alloy	Non-conductive Nickel Coating
❷	Cylinder Tube	1	Bronze Alloy	Non-conductive Nickel Coating
❸	Return Spring	1	Spring Steel	Zinc Coating
❹	Nut	2	Bronze Alloy	Non-conductive Nickel Coating
❺	Piston & Piston Rod	1	Stainless Steel	Lightweight Chrome Coating
❻	Nut	2	Mild Steel	Nickel Coating
❼	Piston Packing	1	Rubber	
❽	Gasket	1	Rubber	
❾	Orifice Plug	1	Carbon Steel	Nickel Coating

Note) Non Repairable Cylinder.



Block Insertion Type
(APMS∗∗-∗∗ Type)

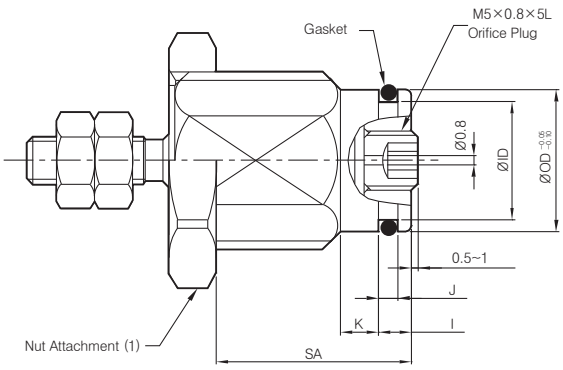
APMB** Standard Cylinder Dimensions

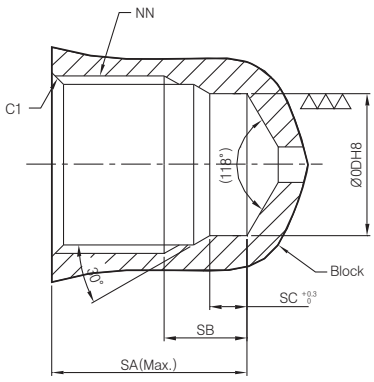


(Unit: mm)

Bore Size (Ø. mm)	A	B	ØC	ØD	E	ØF	ØG	H	L			MM	NN	R	S			W
									5 Strokes	10 Strokes	15 Strokes				5 Strokes	10 Strokes	15 Strokes	
6	7	12	13.9	3	4	8.5	8.5	9	27.5	34.5	41.5	M3×0.5	M10×1.0	9	18.5	25.5	32.5	3
10	10	19	21.5	5	5.5	12.5	12	12	32.5	39	46	M4×0.7	M15×1.5	13	20.5	27	34	4
15	12	27	30.5	6	6	18.5	19	14	37.5	43.5	50	M5×0.8	M22×1.5	20	23.5	29.5	36	5

APMS** (Block Insertion Type) Cylinder Dimensions





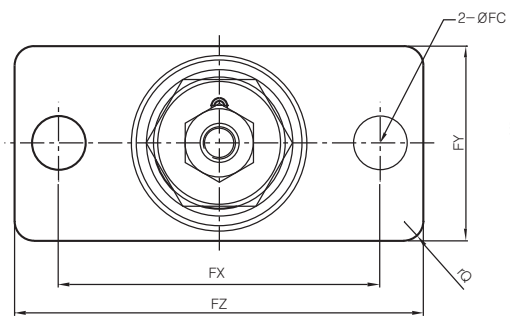
Block Assembly

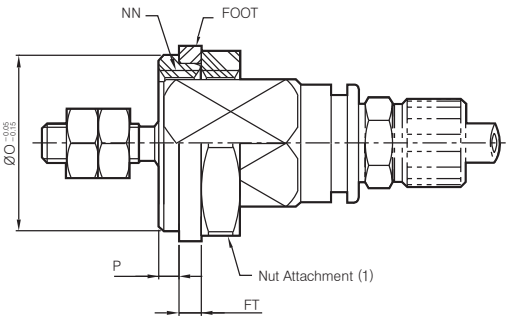
Note) The indications and the cylinder size is identical to those of APMB**.

(Unit: mm)

Bore Size (Ø. mm)	Gasket & Plug Kit No.	I	J	K	ØID	ØOD	SA			SB	SC	NN
							5 Strokes	10 Strokes	15 Strokes			
6	APMS6-CK	2.5	1.4	3	6.7	8.5	15.5	22.5	29.5	5.5	3	M10×1.0
10	APMS10-CK	2.8	1.6	3.2	9.9	12	16.5	23	30	7	3.3	M15×1.5
15	APMS15-CK	3	1.8	4	16.8	19	18.5	24.5	31	7.5	3.5	M22×1.5

APMF** (Flange Attachment Type) Cylinder Dimensions



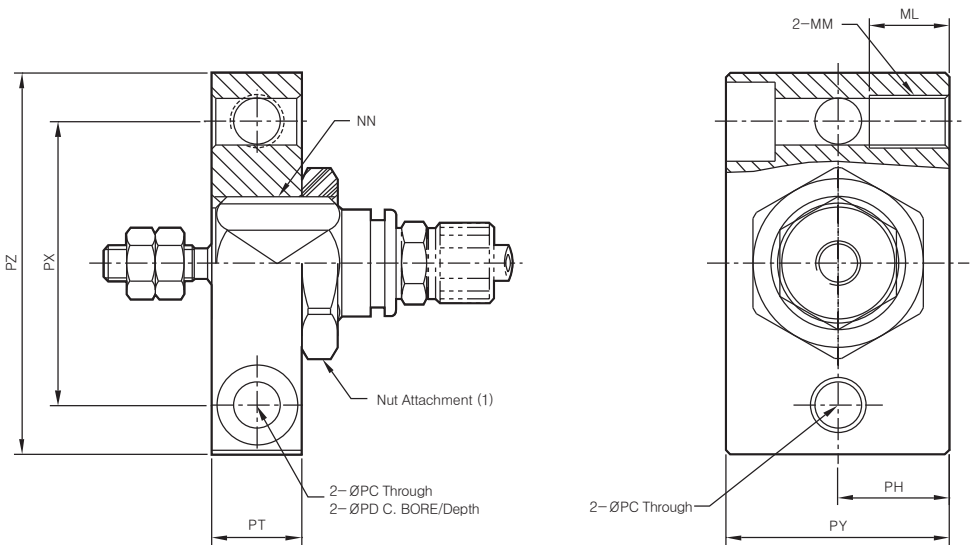


Note) The indications and the cylinder size is identical to those of APMB**.

(Unit: mm)

Cylinder	Flange No.	ØO	P	rQ	ØFC	FT	FX	FY	FZ	NN
APM6	APM6-20A	12	1.5	1.5	4.5	1.6	24	14	32	M10×1.0
APM10	APM10-20A	18	2	2	5.5	2.3	33	20	42	M15×1.5
APM15	APM15-20A	26	2.4	3	7	4	60	34	75	M22×1.5

APMP** (Plate Attachment Type) Cylinder Dimensions



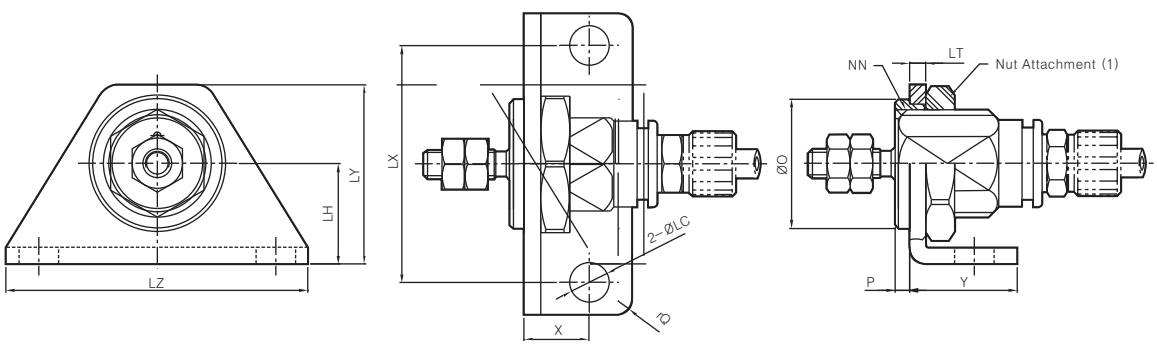
Note) The indications and the cylinder size is identical to those of APMB**.

(Unit: mm)

Cylinder	Plate No.	PH	PT	PX	PY	PZ	ØPC	ØPD / Depth	MM	NN	ML
APM6	APM6-21A	10	9	22	20	32	4.3	7.5 / 4.5	M5×0.8	M10×1.0	7
APM10	APM10-21A	12.5	10	32	25	43	5.2	9 / 5.5	M6×1.0	M15×1.5	9
APM15	APM15-21A	17	12	42	34	56	6.8	10.5 / 6.5	M8×1.25	M22×1.5	13

(* Material: Aluminum Alloy)

APML** (Foot Attachment) Cylinder Dimensions



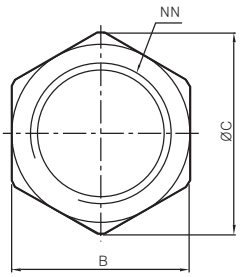
Note) The indications and the cylinder size is identical to those of APMB**.

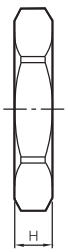
(Unit: mm)

Cylinder	Foot No.	ØO	P	rQ	X	Y	ØLC	LH	LT	LX	LY	LZ	NN
APM6	APM6-19A	12	1.5	1.5	7	12	4.5	9	1.6	24	16.5	32	M10×1.0
APM10	APM10-19A	18	2	2	9	15	5.5	14	2.3	33	25	42	M15×1.5
APM15	APM15-19A	26	2.4	3	20	28	6.8	23	3.2	40	40	55	M22×1.5

(* Material: Cold-rolled Steel)

APM**Cylinder's Nut Attachment Dimensions

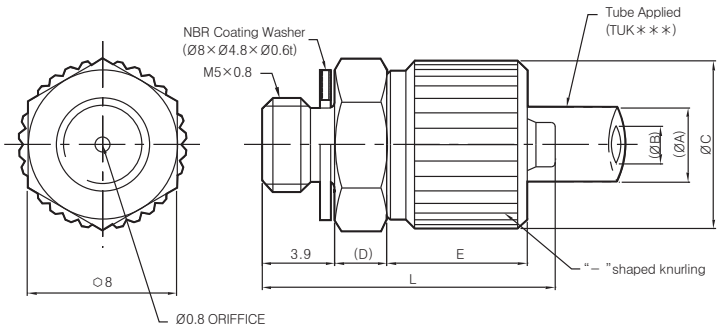




(Unit: mm)

Applicable Bore Size(mm)	Item No.	B	ØC	H	NN
6	APM6-13A	12	13.9	3	M10×1.0
10	APM10-13A	19	21.5	4	M15×1.5
15	APM15-13A	27	30.5	5	M22×1.5

Cap-type Hose Nipple Dimensions

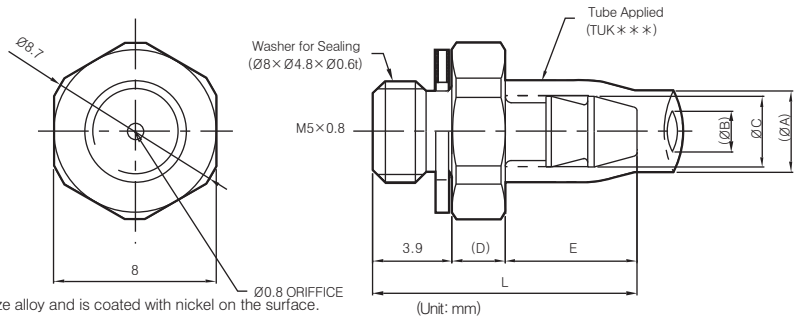


Note) The nipple and the cap are made of bronze alloy and are coated with nickel on the surface.

(Unit: mm)

Item No.	Tube Applied	DEMENSION					
		(ØA)	(ØB)	ØC	D	E	L
SHN5-20402	TUK0402	4	2	9	2.8	7.5	15.7
SHN5-20425	TUK0425		2.5				
SHN5-20604	TUK0604	6	4			8.5	16.7

Barb-type Hose Nipple Dimensions



Note) The nipple is made of bronze alloy and is coated with nickel on the surface.

(Unit: mm)

Item No.	Tube Applied	DEMENSION					
		(ØA)	(ØB)	ØC	(D)	E	L
SHN5-10402	TUK0402	4	2	2.9	2.5	6.3	12.8
SHN5-10425	TUK0425		2.5	3.5		6.5	13
SHN5-10604	TUK0604	6	4	5.2	3	8	15

Series AS

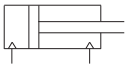
Standard Type/Double Acting, Single Acting : Single Rod

Bore Size(mm) : Ø20, Ø25, Ø30, Ø40

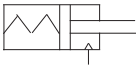
- SUPERIOR LIFE
- POSITION SENSORS
- CORROSION RESISTANT ALUMINUM

Symbol

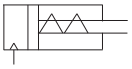
Double Acting



Sigle Acting



(Spring Extended type)



(Spring Return type)

How to Order

AS L N 25 — 100 CJ — W5 ( )

1 2 3 4 5 6 7 8

1 Air Cylinder
Standard(Built-in magnet)

2 Mounting
B : Basic
L : Foot Mount
F : Front flange
G : Rear flange
C : Single clevis
D : Double clevis
T : Rear trunnion
U : Front trunnion

3 Type
Blank : Lubricated
N : Non-lube
H : Air-hydro
A : Air-cushion
(Non-lube type standard)

4 Bore Size (mm)
20 : φ20
25 : φ25
30 : φ30
40 : φ40

5 Stroke (mm)

Type	Bore Size (mm)	Standard Stroke (mm)
Double Acting	20, 25	25, 50, 75, 100, 125
	30, 40	150, 200, 250, 300
Single Acting	20, 25	25, 50, 75, 100, 125, 150
	30	25, 50, 75, 100, 125, 150, 200
	40	50, 75, 100, 125, 150, 200, 250

6 Suffix Symbol for Cylinder
Rod Boot J : Nylon tarpaulin
K : Neoprene cloth
Action S : Single(Return type)
J : Single(Return type)
T : Single(Extended type)
Cushion C : Rubber cushion(1)
※ Single acting type cannot be accepted
★ Suffix in alphabetical sequence when more than two symbols are required.
(1) Not Available with Air Mydro type(H)
※ When knuckles are ordered,
I : Single knuckle attached
Y : Double knuckle attached

7 Auto Switch
Blank : None
W5 : Reed Switch, 0.5m Lead Wire
W5L : Reed Switch, 3m Lead Wire

8 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

Base Material And Surface Treatment

Description		Material	Surface treatment Anodized
Rod cover		Aluminum alloy	Hard black alumite
Cylinder tube		Aluminum alloy	Hard alumite
Seal area	Lube	NBR	O ring
	Non-lube	NBR	DRP(NSD)
	Air-hydro	NBR	DYR
Piston rod		※ Carbon steel	Hard chrome plated
Piston		Aluminum alloy	Chromate

※ With Auto Switch(ϕ 20, 25) : Stainless steel

Model

Model	Type	Action	Cushion			Seal
			None	Rubber	Air	
AS	Lubricated	Double	O	O	-	O-ring
		Single	O	-	-	
AS○N	Non-lube	Double	O	O	O	Special
		Single	O	-	-	
AS○H	Air-hydro	Double	O	-	-	Special

Specifications

Type		Lubricated, Non-lube	Air-hydro
Fluid		Air	L.P Oil
Proof pressure		1.5MPa (213psi)	
Max. operating pressure		1.0MPa (140psi)	
Min.Operating Pressure	Double acting	0.05MPa(7psi)	0.18MPa(25psi)
	Single acting	0.18MPa(25psi)	-
Ambient and fluid temperature		5~60℃ (40~140˚F)	
Piston speed		50~500 ㎜/s	0.5~300 ㎜/s
Cushion		None(Rubber Cushion, Air Cushion Optional)	
Stroke tolerance (mm)		~250st : $^{+1.0}_{0}$, 251~500st : $^{+1.4}_{0}$	
Mounting		Basic, Foot, Front flange, Rear flange, Single clevis, Double clevis, Rear trunnion, Front trunnion	

Parts No. of Mounting Bracket

Bore Size (mm)	20	25	30	40
Foot	TCML20	TCML30	TCML30	TCML40
Flange	TCMF20	TCMF30	TCMF30	TCMF40
Single clevis	TCMC20	TCMC30	TCMC30	TCMC40
Double clevis	TCMD20	TCMD30	TCMD30	TCMD40
Trunnion	TCMT20	TCMT30	TCMT30	TCMT40

Rod Boot/Material

Model	Material	Max. ambient temperature
J	Nylon tarpaulin	60℃(140˚F)
K	Neoprene Cloth	※110℃(230˚F)

※ Maximum ambient temperature for the rod boot only.

With Air Cushion Type/AS ○ A

Built-in air cushion mechanism in both end covers can absorb shock at high loads and velocity, giving little or no ambient vibration and resulting in long cylinder life.

Specifications

Feature	Non-Lubrication type
Bore Size	ϕ20, ϕ25, ϕ30, ϕ40
Operating type	Double acting
Max. Operating pressure	1.0Mpa(140psi)
Min. Operating Pressure	0.05Mpa(7psi)
Piston Speed	1,000mm/s

Cushion

Bore Size(mm)	Effective length mm(in)	Cross sectional area $cm^2(in^2)$	Kinetic energy absorption kgf-cm(lbf-in)
ϕ20	11(0.433)	2.01(0.312)	4.9(4.25)
ϕ25	11(0.433)	3.37(0.522)	7.7(6.68)
ϕ30	10(0.394)	5.53(0.857)	10.8(9.37)
ϕ40	12.3(0.484)	9.42(1.460)	25(21.7)

※Dimensions and mounting band : Same as Series AS/Double acting type.

With Rubber Cushion Type / AS

Feature	Lubrication Non lube
Operating	Double Acting
Max. Operaing Pressure	1MPa(140psi)
Min. Operating Pressure	0.05MPa(7psi)
Piston Speed	750mm/s

Weight/Double Acting

kgf(lbf)

Bore size (mm)		20	25	30	40
Basic Weight	Basic	0.18(0.40)	0.27(0.57)	0.30(0.66)	0.72(1.59)
	Foot	0.29(0.64)	0.38(0.84)	0.42(0.93)	0.92(2.03)
	Flange	0.21(0.44)	0.31(0.66)	0.34(0.75)	0.78(1.70)
	Single clevis	0.21(0.44)	0.29(0.64)	0.33(0.71)	0.76(1.68)
	Double clevis	0.21(0.44)	0.29(0.64)	0.34(0.73)	0.77(1.70)
	Trunnion	0.21(0.44)	0.31(0.68)	0.34(0.75)	0.76(1.68)
Additional weight for each 50 of stroke		0.06(0.13)	0.08(0.18)	0.09(0.20)	0.15(0.33)
Metal accessories	Single knuckle joint	0.06(0.13)	0.07(0.13)	0.07(0.13)	0.23(0.51)
	Double knuckle joint(With pin)	0.08(0.15)	0.08(0.15)	0.08(0.15)	0.21(0.44)

Example

ASL30-100

- Basic weight ····· 0.93(Foot · ϕ30)
- Additional weight ····· 0.20/50st
- Stroke ····· 100st

0.93+0.2×100/50=1.33lbf

Weight/Single Acting

kgf(lbf)

Bore size (mm)		ϕ20	ϕ25	ϕ30	ϕ40
Basic Weight	25st	0.23	0.34	0.42	0.92
	50st	0.31	0.43	0.54	1.00
	75st	0.39	0.55	0.68	1.18
	100st	0.47	0.65	0.85	1.37
	125st	0.57	0.73	0.98	1.61
	150st	0.65	0.82	1.12	1.81
	200st	-	-	1.40	2.19
	250st	-	-	-	2.52
Mounting metals Weight	Foot	0.16	0.17	0.17	0.32
	Flange	0.07	0.08	0.08	0.17
	Single clevis	0.07	0.06	0.06	0.15
	Double clevis	0.07	0.07	0.07	0.16
	Trunnion	0.07	0.09	0.08	0.16
Acces-sories	Single knuckle joint	0.07	0.06	0.06	0.23
	Double knuckle joint(With Pin)	0.08	0.07	0.07	0.20

Example

ASL30-100S

(Basic weight) 0.85+(Mounting weight) 0.16=1.01kgf

Precautions

❶ When mounting, completely flush the piping and be careful that dust and chips do not enter the cylinder.

❷ Load of piston rod should always be aligned parallel with the cylinder axis.

❸ Avoid damage (scratches, nicks) to the piston rod, that lead to damage of rod seal, resulting air leakage.

❹ When disassembling, hold one head cover on the flats in a vise while gripping the opposite cover on the flats with a spanner and turning conterclockwise.

〈Lube Type〉

❺ Lubrication : Use non-additive turbine oil ISO-VG32. Never use machine oil or spindle oil.

〈Air-Hydro Type〉

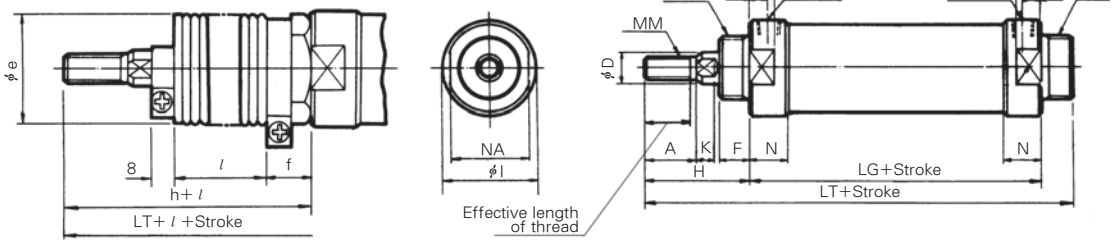
❻ L.P. Oil : Use ISO VG22-46 or equivalent L.P. Oil. Never use machine oil spindle oil.

❼ Air contamination : When lubricating, be careful not to let any air in, Since L.P. Oil Type is not equipped with air exhaust valve, air should be let out beforehand, loosening of the fitting screwed into piping ports.

Double Acting/Basic Type(ASB)

Lube Type(ASB), Non-Lube Type(ASBN), Air-Hydro Type(ASBH)

With Rod Boot



(mm)

Bore size (mm)	Stroke range (mm)	Effective length of thread	A	ϕD	F	GA	GB	ϕI	K	MM	N	NA	NB	NN	P Rc(PT)	LG
ϕ20	~300	15.5	18	10	13	8	8	28	5.0	M8×1.25	15	24	13	M20×1.5	1/8	62
ϕ25	~300	19.5	22	12	13	8	8	34	5.5	M10×1.25	15	30	13	M26×1.5	1/8	62
ϕ30	~300	19.5	22	12	13	8	8	38	5.5	M10×1.25	15	32	13	M26×1.5	1/8	64
ϕ40	~300	21.0	24	16	16	11	11	50	7.5	M14×1.5	21	46	19	M32×2.0	1/4	88

Bore size (mm)	Without Rod Boot		With Rod Boot				
	H	LT	ϕe	f	h	l	LT
ϕ20	41	116	36	14	56	0.3 Stroke+3	131
ϕ25	45	120	36	14	60		135
ϕ30	45	122	36	14	60		137
ϕ40	50	154	40	16	67	0.25 Stroke+3	171

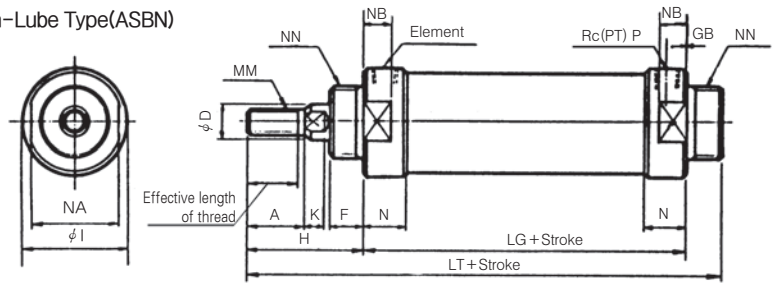
With Rubber Cushion

Without Rod Boot		With Rod Boot
LG	LT	LT
68	122	137
68	126	141
70	128	143
94	160	177

※ Minimum stroke with : 20㎜ or more

Single Acting/Basic Type

Lube Type(ASB), Non-Lube Type(ASBN)



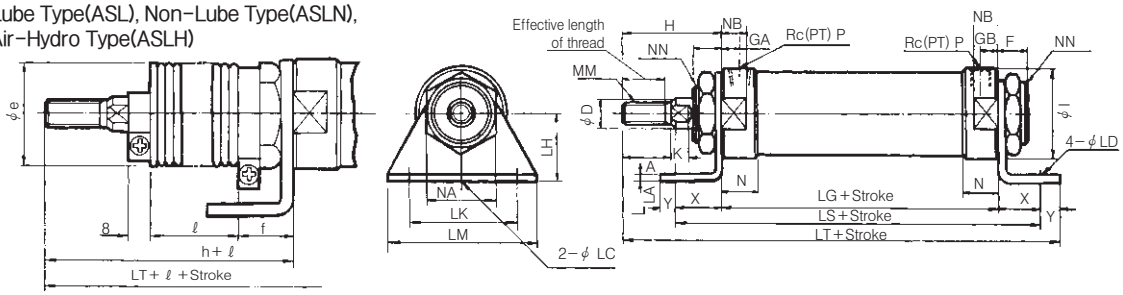
(mm)

Bore size (mm)	Stroke range (mm)	Effective length thread	A	φD	F	GB	I	K	MM	N	NA	NB	NN	P	H
φ20	~150	15.5	18	10	13	8	28	5	M8×1.25	15	24	13	M20×1.5	1/8	41
φ25	~150	19.5	22	12	13	8	34	5.5	M10×1.25	15	30	13	M26×1.5	1/8	45
φ30	~200	19.5	22	12	13	8	38	5.5	M10×1.25	15	32	13	M26×1.5	1/8	45
φ40	~250	21.0	24	16	16	11	50	7.5	M14×1.5	21	46	19	M32×2.0	1/4	50

Bore size (mm)	1~25ST		26~50ST		51~75ST		76~100ST		101~125ST		126~150ST		151~200ST		201~250ST	
	LG	LT	LG	LT	LG	LT	LG	LT	LG	LT	LG	LT	LG	LT	LG	LT
φ20	84	138	102	156	126	180	144	198	169	223	194	248	–	–	–	–
φ25	82	140	97	155	119	177	134	192	144	202	159	217	–	–	–	–
φ30	87	145	104	162	124	182	150	208	167	225	187	245	227	285	–	–
φ40	123	189	123	189	136	202	153	219	174	240	191	257	221	287	246	312

Double Acting (Foot/ASL○)

Lube Type(ASL), Non-Lube Type(ASLN),
Air-Hydro Type(ASLH)



(mm)

Bore size (mm)	*Stroke range (mm)	Effective length thread	A	φD	F	GA	GB	φI	K	MM	N	NA	NB	NN	P	LG
φ20	~400	15.5	18	10	13	8	8	28	5.0	M8×1.25	15	24	13	M20×1.5	1/8	62
φ25	~450	19.5	22	12	13	8	8	34	5.5	M10×1.25	15	30	13	M26×1.5	1/8	62
φ30	~450	19.5	22	12	13	8	8	38	5.5	M10×1.25	15	32	13	M26×1.5	1/8	64
φ40	~500	21.0	24	16	16	11	11	50	7.5	M14×1.5	21	46	19	M32×2.0	1/4	88

※ Minimum stroke with Rod Boot : 20㎜ or more.

Bore size (mm)	X	Y	LC	LD	LH	LS	LA	LK	LM	Without Rod Boot		With Rod Boot				
										H	LT	φe	f	h	ℓ	LT
φ20	20	8	4	6.8	25	102	3.2	40	55	41	131	36	17.2	56	0.3Stroke+3	146
φ25	20	8	4	6.8	28	102	3.2	40	55	45	135	36	17.2	60		150
φ30	20	8	4	6.8	28	104	3.2	40	55	45	137	36	17.2	60		152
φ40	23	12	4	7.0	30	134	3.2	55	75	50	173	40	19.2	67	0.25 Stroke+3	190

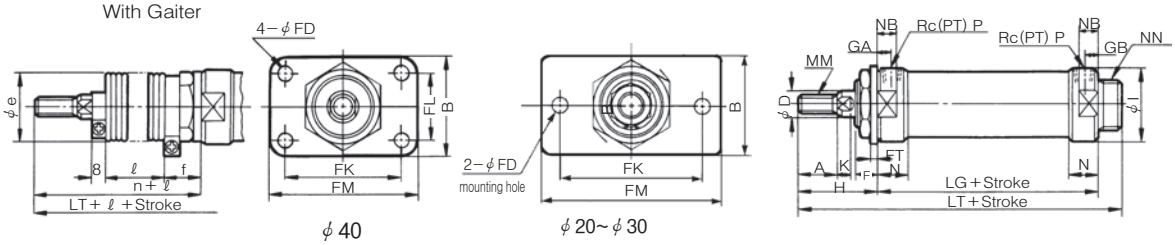
With Rubber Cushion

Without Rod Boot			With Rod Boot
LG	LS	LT	LT
68	108	137	152
68	108	141	156
70	110	143	158
94	140	179	190

Double Acting (Front Flange Type/ASF○)

Lube Type(ASF), Non-Lube Type(ASFN), Air-Hydro Type(ASFH)

With Gaiter



φ40 φ20~φ30

(mm)

Bore size (mm)	*Stroke range (mm)	Effective length thread	A	B	φD	F	GA	GB	φI	K	MM	N	NA	NB	NN	P	LG
φ20	~400	15.5	18	40	10	13	8	8	28	5.0	M8×1.25	15	24	13	M20×1.5	1/8	62
φ25	~450	19.5	22	42	12	13	8	8	34	5.5	M10×1.25	15	30	13	M26×1.5	1/8	62
φ30	~450	19.5	22	42	12	13	8	8	38	5.5	M10×1.25	15	32	13	M26×1.5	1/8	64
φ40	~500	21.0	24	52	16	16	11	11	50	7.5	M14×1.5	21	46	19	M32×2.0	1/4	88

Bore size (mm)	φFD	FT	FK	FL	FM	Without Rod Boot		With Rod Boot				
						H	LT	φe	f	h	ℓ	LT
φ20	7	3.2	60	–	75	41	116	36	17.2	56	0.3 Stroke+3	131
φ25	7	4.5	60	–	75	45	120	36	18.5	60		135
φ30	7	4.5	60	–	75	45	122	36	18.5	60		137
φ40	7	4.5	66	36	82	50	154	40	20.5	67	0.25 Stroke+3	171

※ Minimum stroke with Rod Boot : 20㎜ or more.

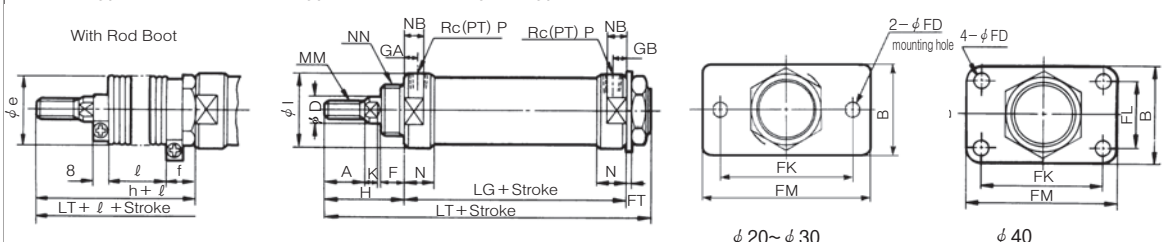
With Rubber Cushion

Without Rod Boot		With Rod Boot
LG	LT	LT
68	122	137
68	126	141
70	128	143
94	160	177

Double Acting(Rear Flange Type/ASG○)

Lube Type(ASG), Non-Lube Type(ASGN), Air - Hydro Type(ASGH)

With Rod Boot



φ20~φ30 φ40

(mm)

Bore Size (mm)	Stroke range (mm)	Effective length thread	A	B	φD	F	GA	GB	φI	K	MM	N	NA	NB	NN	P	LG
φ20	~300	15.5	18	40	10	13	8	8	28	5.0	M8×1.25	15	24	13	M20×1.5	1/8	62
φ25	~300	19.5	22	42	12	13	8	8	34	5.5	M10×1.25	15	30	13	M26×1.5	1/8	62
φ30	~300	19.5	22	42	12	13	8	8	38	5.5	M10×1.25	15	32	13	M26×1.5	1/8	64
φ40	~300	21.0	24	52	16	16	11	11	50	7.5	M14×1.5	21	46	19	M32×2.0	1/4	88

Bore size (mm)	φFD	FT	FK	FL	FM	Without Rod Boot		With Rod Boot				
						H	LT	φe	f	h	ℓ	LT
φ20	7	3.2	60	–	75	41	116	36	14	56	0.3 Stroke+3	131
φ25	7	4.5	60	–	75	45	120	36	14	60		135
φ30	7	4.5	60	–	75	45	122	36	14	60		137
φ40	7	4.5	66	36	82	50	154	40	16	67	0.25 Stroke+3	171

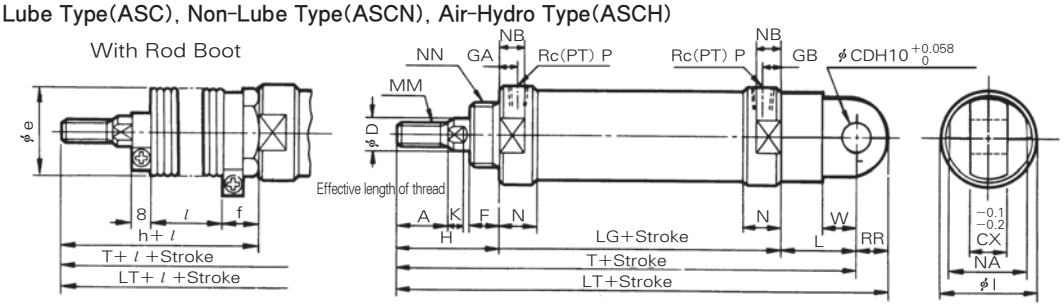
With Rubber Cushion

Without Rod Boot		With Rod Boot
LG	LT	LT
68	122	137
68	126	141
70	128	143
94	160	177

Double Acting (Single Clevis Type/ASC○)

Lube Type(ASC), Non-Lube Type(ASCN), Air-Hydro Type(ASCH)

With Rod Boot



(mm)

Bore size (mm)	Stroke range (mm)	Effective length of thread	A	φD	F	GA	GB	φI	K	L	MM	N	NA	NB	NN	P	LG
φ20	~300	15.5	18	10	13	8	8	28	5.0	30	M8×1.25	15	24	13	M20×1.5	1/8	62
φ25	~300	19.5	22	12	13	8	8	34	5.5	30	M10×1.25	15	30	13	M26×1.5	1/8	62
φ30	~300	19.5	22	12	13	8	8	38	5.5	30	M10×1.25	15	32	13	M26×1.5	1/8	64
φ40	~300	21.0	24	16	16	11	11	50	7.5	39	M14×1.5	21	46	19	M32×2.0	1/4	88

With Rubber Cushion

Bore size (mm)	W	φCD	CX	RR	Without Rod Boot			With Rod Boot					
					H	T	LT	φe	f	h	l	T	LT
φ20	14	9	10	9	41	133	142	36	14	56	0.3 Stroke+3	148	157
φ25	14	9	10	9	45	137	146	36	14	60		152	161
φ30	14	9	10	9	45	139	148	36	14	60		154	163
φ40	18	10	15	11	50	177	188	40	16	67	0.25Stroke+3	194	205

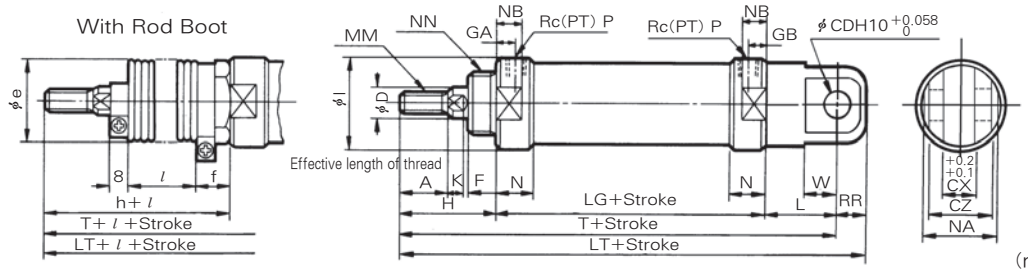
Without Rod Boot			With Rod Boot	
LG	T	LT	T	LT
68	139	148	154	163
68	143	152	158	167
70	145	154	160	169
94	183	194	200	211

※ Minimum stroke with Rod Boot : 20㎜ or more.

Double Acting(Double Clevis Type/ASD○)

Lube Type(ASD), Non-Lube Type(ASDN), Air-Hydro Type(ASDH)

With Rod Boot



(mm)

Bore size (mm)	Stroke range (mm)	Effective length of thread	A	φD	F	GA	GB	φI	K	L	MM	N	NA	NB	NN	P	LG
φ20	~300	15.5	18	10	13	8	8	28	5.0	30	M8×1.25	15	24	13	M20×1.5	1/8	62
φ25	~300	19.5	22	12	13	8	8	34	5.5	30	M10×1.25	15	30	13	M26×1.5	1/8	62
φ30	~300	19.5	22	12	13	8	8	38	5.5	30	M10×1.25	15	32	13	M26×1.5	1/8	64
φ40	~300	21.0	24	16	16	11	11	50	7.5	39	M14×1.5	21	46	19	M32×2.0	1/4	88

※ ※ Minimum stroke with Rod Boot : 20㎜ or more.

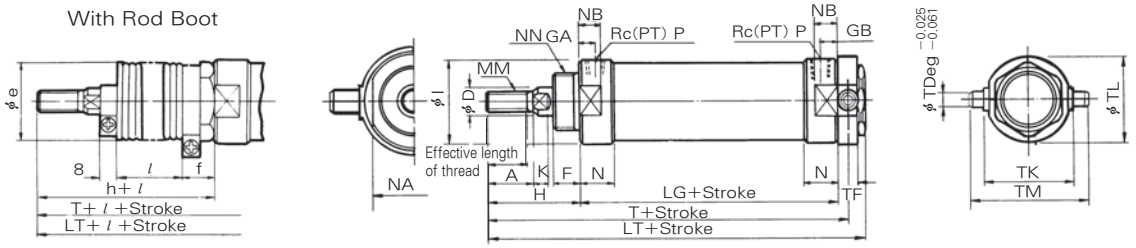
With Rubber Cushion

Bore size (mm)	W	φCD	CX	CZ	RR	Without Rod Boot			With Rod Boot					
						H	T	LT	φe	f	h	l	T	LT
φ20	14	9	10	19	9	41	133	142	36	14	56	0.3 Stroke+3	148	157
φ25	14	9	10	19	9	45	137	146	36	14	60		152	161
φ30	14	9	10	19	9	45	139	148	36	14	60		154	163
φ40	18	10	15	30	11	50	177	188	40	16	67	0.25 Stroke+3	194	205

Without Rod Boot			With Rod Boot	
LG	T	LT	T	LT
68	139	148	154	163
68	143	152	158	167
70	145	154	160	169
94	183	194	200	211

Double Acting (Rear Trunnion/AST○)

Lube Type(AST), Non-Lube Type(ASTN), Air-Hydro Type(ASTH)



(mm)

Bore size (mm)	Stroke range (mm)	Effective length of thread	A	φD	F	GA	GB	φI	K	MM	N	NA	NB	NN	P	LG
φ20	~300	15.5	18	10	13	8	8	28	5.0	M8×1.25	15	24	13	M20×1.5	1/8	62
φ25	~300	19.5	22	12	13	8	8	34	5.5	M10×1.25	15	30	13	M26×1.5	1/8	62
φ30	~300	19.5	22	12	13	8	8	38	5.5	M10×1.25	15	32	13	M26×1.5	1/8	64
φ40	~300	21.0	24	16	16	11	11	50	7.5	M14×1.5	21	46	19	M32×2.0	1/4	88

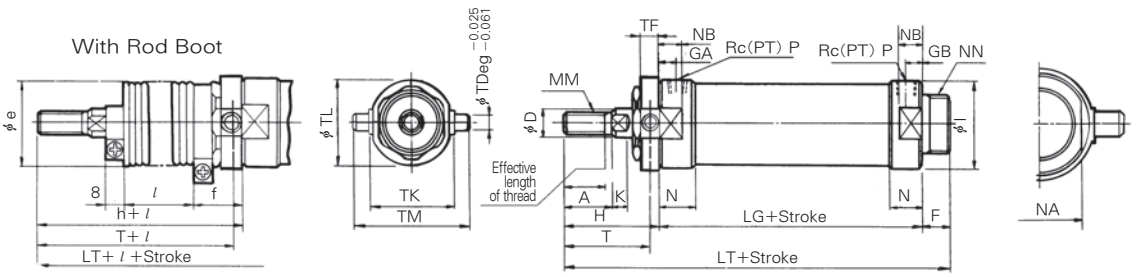
Bore size (mm)	φTD	TF	TK	φTL	TM	Without Rod Boot			With Rod Boot					
						H	T	LT	φe	f	h	l	T	LT
φ20	8	10	32	32	52	41	108.0	118	36	14	56	0.3 Stroke+3	123.0	133
φ25	9	10	40	40	60	45	112.0	122	36	14	60		127.0	137
φ30	9	10	40	40	60	45	114.0	124	36	14	60		129.0	139
φ40	10	11	53	53	77	50	143.5	154	40	16	67	0.25Stroke+3	160.5	171

With Rubber Cushion

LG	T	LT
68	114	124
68	118	128
70	120	130
94	169.5	160

Double Acting (Front Trunnion/ASU○)

Lube Type(ASU), Non-Lube Type(ASUN), Air-Hydro Type(ASUH)



(mm)

Bore size (mm)	Stroke range (mm)	Effective length of thread	A	φD	F	GA	GB	φI	K	MM	N	NA	NB	NN	P	LG
φ20	~300	15.5	18	10	13	8	8	28	5.0	M8×1.25	15	24	13	M20×1.5	1/8	62
φ25	~300	19.5	22	12	13	8	8	34	5.5	M10×1.25	15	30	13	M26×1.5	1/8	62
φ30	~300	19.5	22	12	13	8	8	38	5.5	M10×1.25	15	32	13	M26×1.5	1/8	64
φ40	~300	21.0	24	16	16	11	11	50	7.5	M14×1.5	21	46	19	M32×2.0	1/4	88

Bore size (mm)	φTD	TF	TK	φTL	TM	Without Rod Boot			With Rod Boot					
						H	T	LT	φe	f	h	l	T	LT
φ20	8	10	32	32	52	41	36	116	36	21	56	0.3 Stroke+3	51.0	131
φ25	9	10	40	40	60	45	40	120	36	21	60		55.0	135
φ30	9	10	40	40	60	45	40	122	36	21	60		55.0	137
φ40	10	11	53	53	77	50	44.5	154	40	24	67	0.25Stroke+3	61.5	171

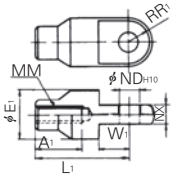
With Rubber Cushion

LG	T	LT
68	36	122
68	40	126
70	40	128
94	44.5	160

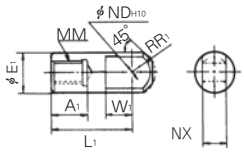
(mm)

I Type Single Knuckle Joint

TI-02 · TI-03
Material : Rolled steel sheet



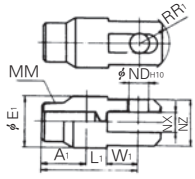
TI-04
Material : Free cutting sulfur steel



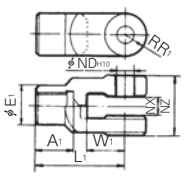
Parts No.	Applicable bore size(㎜)	A1	E1	L1	MM	R1	W1	φND H10	NX
TI-020B	20	16	20	36	M8×1.25	10	14	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$
TI-032B	25 · 32	18	20	38	M10×1.25	10	14	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$
TI-040B	40	22	24	55	M14×1.5	15.5	20	$12^{+0.070}_{0}$	$16^{-0.1}_{-0.3}$

Y Type Double Knuckle Joint

TY-020B, TY-032B
Material : Rolled steel sheet



TY-040B
Material : Cast Iron

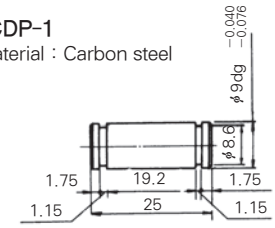


Parts No.	Applicable bore size(㎜)	A1	E1	L1	MM	R1	W1	φND H10	NX	NZ
TY-020B	20	16	20	36	M8×1.25	12	14	$9^{+0.058}_{0}$	$9^{+0.2}_{+0.1}$	18
TY-032B	25 · 32	18	20	38	M10×1.25	12	14	$9^{+0.058}_{0}$	$9^{+0.2}_{+0.1}$	18
TY-040B	40	22	24	55	M14×1.5	13	25	$12^{+0.070}_{0}$	$16^{+0.3}_{+0.1}$	38

Pin For Clevis-Pin For Knuckle

Applicable : φ20, φ25, φ30

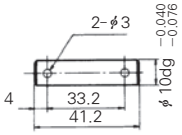
TCDP-1
Material : Carbon steel



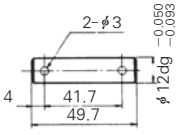
Retaining ring : C-9 type for pivot

Applicable : φ40(1.58)

TCDP-2
(for Clevis)
Material : Carbon steel

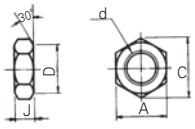


TCDP-3
(for Knuckle)
Material : Carbon steel



Applicable split pin : φ3×18 *l*

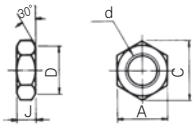
Mounting Nut(trunnion type only)



Material : rolled steel

Part No.	Applicable bore size(㎜)	d	J	A	C	D
TN-020B	20	M20×1.5	10	26	28	25.5
TN-032B	25 · 30	M26×1.5	10	32	34	31.5
TN-040B	40	M32×2.0	10	41	45	40.5

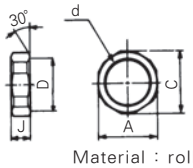
Mounting Nut



Material : Carbon steel

Part No.	Applicable bore size(㎜)	d	J	A	C	D
TSN-020B	20	M20×1.5	8	26	30	25.5
TSN-032B	25 · 30	M26×1.5	8	32	37	31.5
TSN-040B	40	M32×2.0	10	41	47.3	40.5

Rod End Nut



Material : rolled steel

Part No.	Applicable bore size(㎜)	d	J	A	C	D
TN-02	20	M8×1.25	5	13	15.0	12.5
TN-03	25 · 30	M10×1.25	6	17	19.6	16.5
TN-04	40	M14×1.5	8	22	25.4	21.0

Series ASW

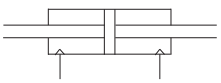
Double Rod Type / Double Acting

Bore Size(mm) : Ø20, Ø25, Ø30, Ø40

- LONG CYCLE LIFE
- AUTO SWITCH CAN BE MOUNTED TO MONITOR STROKE POSITION
- COMPACT/AFFORDABLE DESIGN
- REPAIRABLE

Symbol

Double acting/Double rod



How to Order

AS	W	L	N	25	100	JJ	W5	
1	2	3	4	5	6	7	8	9

1 Air Cylinder Standard
(Built-in magnet)

2 Double Rod End Cylinder

3 Mounting
B : Basic
L : Foot
F : Flange
T : Rear Trunnion
U : Front Trunnion

4 Type
Blank : Lube
N : Non-Lube
H : Air-Hydro

5 Bore Size
20 : ϕ20
25 : ϕ25
30 : ϕ30
40 : ϕ40

6 Stroke(mm)
20,25,30,40:25,50,75
100,125,150,200,250,300

7 Suffix Symbol for Cylinder
C : Rubber Cushion
※ "LG", "LT" Size : Rubber Cushion type is longer than standard type(6mm more).
〈Rod Boot〉
J : Nylon Boot
K : Neoprene Cloth
〈Double〉
JJ : Nylon Boot
KK : Neoprene Cloth

8 Auto Switch
W5 : Reed switch, 0.5m Lead wire
W5L : Reed switch, 3m Lead wire

9 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

Weight

kgf(lbf)

Bore size		ϕ20	ϕ25	ϕ30	ϕ40
Basic weight	Basic	0.20(0.49)	0.31(0.66)	0.34(0.75)	0.80(1.76)
	Foot	0.32(0.71)	0.41(0.90)	0.45(0.99)	0.99(2.18)
	Flange	0.23(0.51)	0.33(0.73)	0.37(0.82)	0.84(1.85)
	Trunnion	0.22(0.49)	0.34(0.75)	0.38(0.84)	0.84(1.85)
Additional weight for each 2 of stroke		0.09(0.20)	0.14(0.29)	0.14(0.29)	0.24(0.53)
Metal accessories	Single knuckle joint	0.06(0.13)	0.06(0.13)	0.06(0.13)	0.23(0.73)
	Double knuckle joint(with pin)	0.07(0.15)	0.07(0.15)	0.07(0.15)	0.21(0.44)

Example

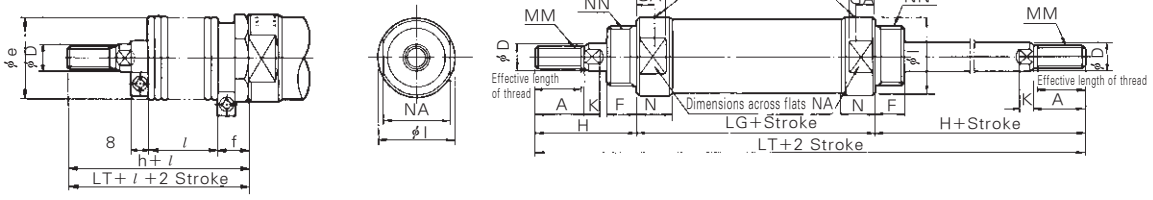
ASWL30-100
- Basic Weight ····· 0.45(Foot Type · ϕ30)
- Additional Weight ····· 0.14/50st
- Stroke ····· 100st

0.45+0.14×100/50=0.72kg

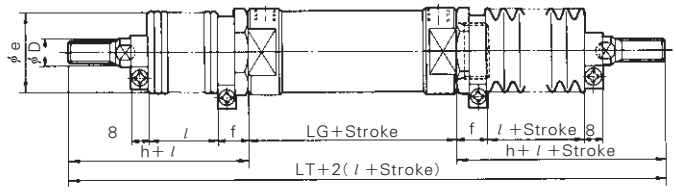
Basic Type/ASWB

Lube Type(ASWB), Non-Lube Type(ASWBN), Air-Hydro Type(ASWBH)

With Single Rod Boot



With Double Gaiter



(mm)

Bore size (mm)	Stroke range(mm)		Effective length of thread	A	φD	F	GA	φI	K	MM	N	NA	NB	NN	P	LG
	Without Rod Boot	With Rod Boot														
φ20	~300	20~300	15.5	18	10	13	8	28	5	M8×1.25	15	24	13	M20×1.5	1/8	62
φ25	~300	20~300	19.5	22	12	13	8	34	5.5	M10×1.25	15	30	13	M26×1.5	1/8	62
φ30	~300	20~300	19.5	22	12	13	8	38	5.5	M10×1.25	15	32	13	M26×1.5	1/8	64
φ40	~300	20~300	21.0	24	16	16	11	50	7.5	M14×1.5	21	46	19	M32×2.0	1/4	88

Bore size (mm)	Without Rod Boot	With single Rod Boot					With double Rod Boot
	H	LT	e	f	h	l	LT	LT
φ20	41	144	36	14	56	0.3Stroke+3	159	174
φ25	45	152	36	14	60		167	182
φ30	45	154	36	14	60		169	184
φ40	50	188	40	16	67	0.25Stroke+3	205	222

With Rubber Cushion

LG	LT		
	Without Rod Boot	With single Rod Boot	With Double Rod Boot
68	150	165	180
68	158	173	188
70	160	175	190
94	194	211	228

Series ASK

Non-rotating Rod Type/Double Acting, Single Acting

Bore Size(mm) : Ø20, Ø25, Ø30, Ø40

- AVAILABLE IN SERIES RANGING FROM ϕ20 THROUGH ϕ40
- HIGH NON-ROTATING ACCURACY
  ϕ20, ϕ25, ϕ30:±0.8°
  ϕ40:±0.5°
- LONG LIFE, HIGH SPEED OPERATION POSSIBLE
  Piston speed, 50~500 m/s, is same as standard type.
- AUTO SWITCH CAPABLE

Symbol

Double Acting　　Single Acting(Spring Return)

How to Order

AS K L 25 — 100 J — W5 [ ]

1 2 3 4 5 6 7 8

1 Air Cylinder
Built-in magnet, Non-Lube Standard

2 Non-Rotating Rod Type

3 Mounting
B : Basic
L : Foot Mount
F : Front Flange
G : Rear Flange
C : Single Clevis
D : Double Clevis
T : Rear Trunnion
U : Front Trunnion

4 Bore Size
20 : ϕ20
25 : ϕ25
30 : ϕ30
40 : ϕ40

5 Stroke/(mm)

Standard Stroke

Type	Bore Size (mm)	Standard Stroke (mm)
Double Acting	20, 25	25, 50, 75, 100, 125
	30, 40	150, 200, 250, 300
Single Acting	20, 25	25, 50, 75, 100, 125, 150
	30	25, 50, 75, 100, 125, 150, 200
	40	50, 75, 100, 125, 150, 200, 250

6 Suffix Symbol for Cylinder
(Rod Boot)
J : Nylon Tarpaulin
K : Neoprene Cloth

(Action)
Blank : Double Acting
S : Single Acting
※ Single Acting Spring extended type is not available.

7 Auto Switch
Blank : None
W5 : Reed Switch, 0.5m Lead wire
W5L : Reed Switch, 3m Lead wire

8 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

Specifications

Action	Double Acting	Single Acting(Spring Return)
Medium	Air	
Proof Pressure	1.5MPa(21psi)	
Max. Operating Pressure	1.0MPa(14psi)	
Min. Operating Pressure	0.05MPa(7psi)	0.18MPa(25psi)
Ambient and Fluid Temperature	5~60℃(41~140°F)	
Piston Speed	50~500 ㎜/s	
Cushion	None / Rubber	
Stroke Tolerance	~250st : $^{+1.0}_{0}$, 251~300st : $^{+1.4}_{0}$	
Non-Rotating Accuracy	φ20~φ30 : ±0.8°, φ40 : ±0.5°	
Mounting	Basic, Foot, Front Flange, Rear Flange, Single Clevis, Double Clevis, Rear Trunnion, Front Trunnion	

Cautions

〈Installation〉

- Avoid applying rotational torque to piston rod in order to prevent deformation of the non-rotation guide.

Allowable rotating torque range for piston rod or less (kgf · cm)	φ20	φ25	φ30	φ40
	2.0	2.5	2.5	4.5

- Load of piston rod should always be aligned parallel, with the cylinder axis.
- Avoid loading the single acting cylinder rod during retraction.
- Lubrication is not required, however, use non-additive turbine oil ISO VG 32 if lubrication is supplied.

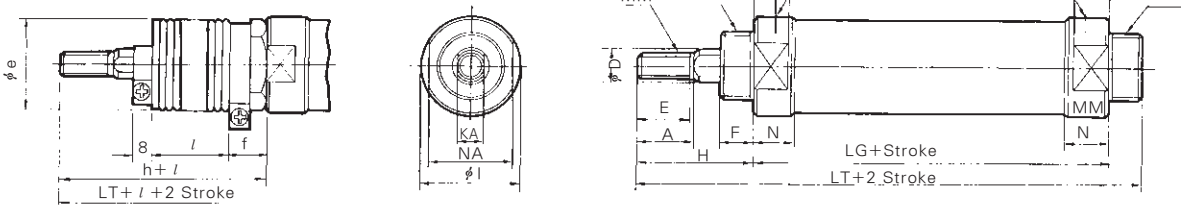
〈Installation piping〉

- Retract the rod fully before applying any kind of tightening torque on the end nut, Prevent torque being transmitted to the guide bushing by holding the rod stationary with a spanner on the flats.
- Flush tubing and fittings completely with clean air before use.
- When disassembling, hold one head cover on the flats with a vise while gripping the opposite cover on the flats with a spanner and turning counterclockwise.
  When re-assembling, tighten by giving an additional turn of 3°~5° from the point where dissembled.

Basic Type/ASKB

Lube Type(ASKB), Non-lube Type(ASKBN), Air-hydro Type(ASKBH)

With Single Rod Boot



Double Acting

(mm)

Bore size (mm)	Stroke range(mm)		Effective length of thread E	A	ϕD	F	GA	ϕI	KA	MM	N	NA	NB	NN	P	LG
	Without Rod Boot	With Rod Boot														
20	~300	20~300	15.5	18	10	13	8	28	8	M8×1.25	15	24	13	M20×1.5	1/8	62
25	~300	20~300	19.5	22	12	13	8	34	10	M10×1.25	15	30	13	M26×1.5	1/8	62
30	~300	20~300	19.5	22	12	13	8	38	10	M10×1.25	15	32	13	M26×1.5	1/8	64
40	~300	20~300	21.0	24	16	16	11	50	14	M14×1.5	21	46	19	M32×2.0	1/4	88

With Rubber Cushion

Bore size (mm)	Without Rod Boot		With single Rod Boot				
	H	LT	ϕe	f	h	l	LT
20	41	116	36	14	56	0.3Stroke+3	131
25	45	120	36	14	60		135
30	45	122	36	14	60		137
40	50	154	40	16	67	0.25Stroke+3	171

Without Rod Boot		With Rod Boot
LG	LT	LT
68	122	137
68	126	141
70	128	143
94	160	177

Single Acting

Bore size (mm)	Stroke Range (mm)	A	ϕD	F	GB	ϕI	KA	MM	N	NA	NB	NN	P	H
20	~150	18	10	13	8	28	8	M8×1.25	15	24	13	M20×1.5	1/8	41
25	~150	22	12	13	8	34	10	M10×1.25	15	30	13	M26×1.5	1/8	45
30	~200	22	12	13	8	38	10	M10×1.25	15	32	13	M26×1.5	1/8	45
40	~250	24	16	16	11	50	14	M14×1.5	21	46	19	M32×2.0	1/4	50

Bore size (mm)	25st		50st		75st		100st		125st		150st		200st		250st	
	LG	LT	LG	LT	LG	LT	LG	LT	LG	LT	LG	LT	LG	LT	LG	LT
20	84	138	102	156	126	180	144	198	169	223	194	248	-	-	-	-
25	82	140	97	155	119	177	134	192	144	202	159	217	-	-	-	-
30	87	145	104	162	124	182	150	208	167	225	187	245	227	285	-	-
40	123	189	123	189	136	202	153	219	174	240	191	257	221	287	246	312

Adjustable Stroke Cylinder/Extension Adjustable Type

AS | Mounting | Type | Bore size | - | Stroke | Additional symbol | Stroke adjusting symbol | - XC8

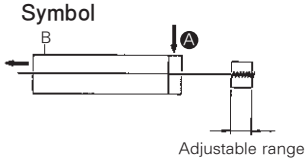
Additional symbol
- Blank — Without Rod Boot
- J — With Rod Boot(Nylon tarpaulin)
- K — With Rod Boot(Neoprene cloth)

Stroke adjusting symbol
- A — Stroke adjusting range 0~-25mm
- B — Stroke adjusting range 0~-50mm

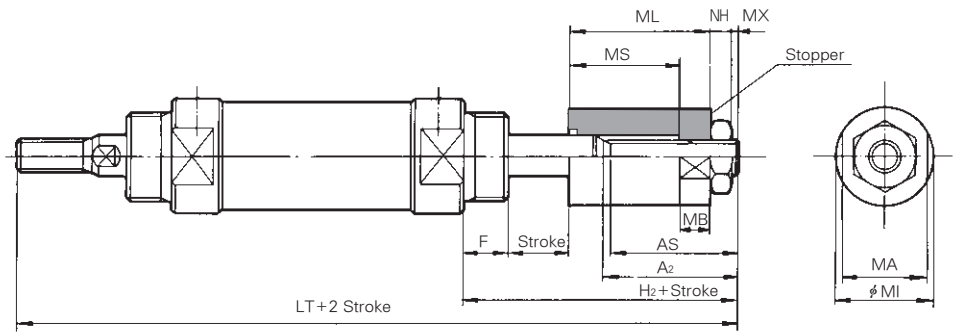
The Stroke at extend of the cylinder can be adjusted by the stopper in the head side from full stroke(0~-25mm) or (0~-50mm).

The cylinder stroke can be variably adjusted.
The stroke adjustment device is fixed at the head side, and the cylinder stroke is adjusted by the stroke on the outlet side.

Symbol



Construction, Dimensions/Basic Type



(mm)

Bore size(mm)	A_2	AS	ML	MA	MB	MS	φMI	NH	MX	H_2	LT	stroke range
φ20	44(69)	41.5(66.5)	40(65)	14	9	32(57)	17	5	3	61(86)	164(189)	~300
φ25	45(70)	42.5(67.5)	40(65)	19	11	32(57)	24	6	3	62(87)	169(194)	~300
φ30	45(70)	42.5(67.5)	40(65)	19	11	32(57)	24	6	3	62(87)	171(196)	~300
φ40	51(77)	48(74)	44(70)	27	13	33(58)	30	8	3	71(97)	209(235)	~300

( ) : Stroke Adjusting range!50mm

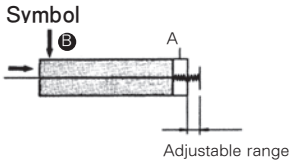
Adjustable Stroke Cylinder/Retraction Adjustable Type

AS (Mounting) (Type) (Bore size) - (Stroke) (Additional symbol) (Stroke adjusting symbol) - XC9

Additional symbol
- Blank — Without Rod Boot
- J — With Rod Boot(Nylon tarpaulin)
- K — With Rod Boot(Neoprene cloth)
- C — Rubber Cushion

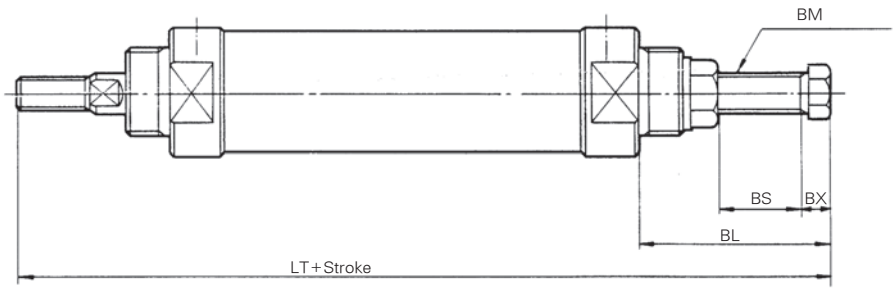
Stroke adjusting symbol
- A — Stroke adjusting range 0~-25㎜
- B — Stroke adjusting range 0~-50㎜

The Stroke at retraction of the cylinder can be adjusted from (0~-25㎜) or (0~50 ㎜) by the adjusting bolt.



※ For Adjustable stroke Cylirder (Retraction Adjustable Type), inquire separately.

Construction, Dimensions/Basic Type



(mm)

Bore size(㎜)	BS	BM	BX	BL	LT
ϕ20	29	M8×1.25	11	61	164
ϕ25	33	M8×1.25	11	65	172
ϕ30	31	M8×1.25	11	63	172
ϕ40	28	M12×1.75	15	71	209

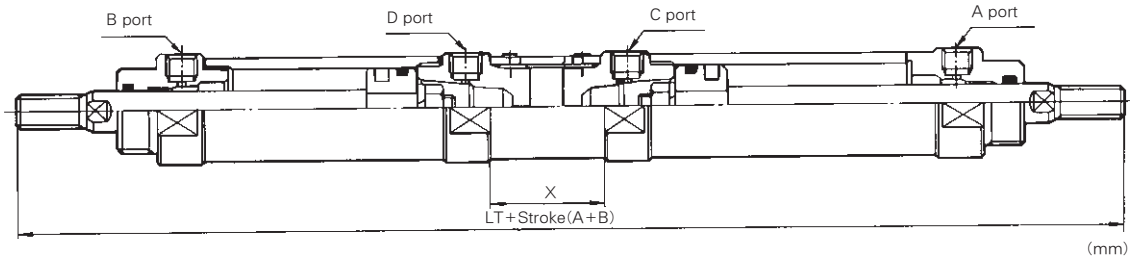
Dual Stroke Cylinder/Double Rod Type

AS Mounting Type Bore size - Stroke A Additional symbol + Stroke B Adjusting symbol - XC10

Additional symbol ●
- Blank — Without Rod Boot
- J — With Rod Boot(Nylon tarpaulin)
- K — With Rod Boot(Neoprene cloth)

Two cylinders are constructed as one cylinder in a back-to back configuration allowing the cylinder stroke to be controlled in three steps.

Construction, Dimensions/Basic Type



(mm)

Bore size(mm)	X	LT
ϕ20	28	234
ϕ25	28	242
ϕ30	28	246
ϕ40	34	310

※ Other dimensions are the same for standard type.

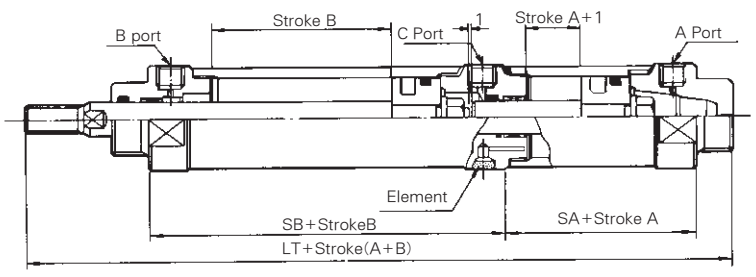
Dual Stroke Cylinder/Single Rod Type

AS Mounting Type Bore size - Stroke A + Stroke B-A Adjusting symbol - XC11

Additional symbol ●
- Blank — Without Rod Boot
- J — With Rod Boot(Nylon tarpaulin)
- K — With Rod Boot(Neoprene cloth)

This cylinder is produced with two air cylinders in line allowing double the output force.

Construction, Dimensions/Basic Type



(mm)

Bore size(mm)	SB	SA	LT
ϕ20	62	48	164
ϕ25	62	48	168
ϕ30	64	50	172
ϕ40	88	50	222

※ Other dimensions are the same for standard type.

Order Made Option

Single Acting Spring Extended

AS Mounting Type Bore size - Stroke - T

Specifications

Lube	Lube, Non-lube
Bore size	ϕ20, ϕ25, ϕ30, ϕ40
Max. operating pressure	1.0MPa(140psi)
Min. operating pressure	0.23MPa(32psi)
Cushion	None
Action	Spring extended
Mounting	basic type, Axial foot type, Head side, flange type, Single clevis type, Double clevis type, Head side trunnion, Rod side trunnion

High Temperature Cylinder

AS Mounting - Bore size - Stroke - XB6

Use at high temperature up to 150℃

※ Dimensions are the same as for standard type.

Boss Cut

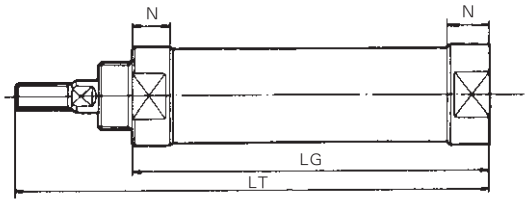
AS Mounting Type Bore size - Stroke Suffix - XC1

Boss for the head cover bracket is eliminated and the total length of cylinder is shortened.

Specifications

Type	Lube, Non-lube, Air-hydro
Bore size	ϕ20, ϕ25, ϕ30, ϕ40
Acting	Double, single
Mounting	Basic, Rod side flange, Rod side trunnion

Dimensions



Bore size(mm)	20	25	30	40
LT	102	106	108	137
LG	61	61	63	87
N	14	14	14	20

※ Other dimensions are the same as for standard type

End Lock Cylinder

AS Mounting Type Bore size - Stroke Suffix - X105

Specifications

Type	Lube, non-lube
Bore size	ϕ25, ϕ30, ϕ40
Cushion	None
Action	Double Acting
Retaining force	Max. 20kgf
Lock start pressure	0.05MPa(7psi)
Lock release pressure	0.2MPa(28psi)
Max. operating pressure	1.0MPa(140psi)

Stainless Steel Rod

AS Mounting Type Bore size - Stroke Suffix - XC6

Stainless steel piston rod is used to protect in harsh or wet environment.

Auto-switch mounting available.

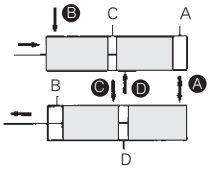
Specifications

Type	Lube, Non-lube, Air-hydro
Bore size	ϕ20, ϕ25, ϕ30, ϕ40
Piston rod nut material	Stainless steel

Tandem Air Cylinder

AS Mounting Type Bore size - Stroke Suffix - XC12

This cylinder is produced with two air cylinders in line allowing double the output force.



When air pressure is supplied to ports Ⓑ and Ⓓ, the output force is double in the return stroke.
When air pressure is supplied to ports Ⓐ and Ⓒ the output force is double in the return stroke.

Specifications

Lube	Lube, Non-lube
Bore size	ϕ20, ϕ25, ϕ30, ϕ40
Max. operating pressure	0.1MPa(14psi)
Min. operating pressure	0.08MPa(11psi)
Cushion	Air Cushion
operouting Type	Double acting
Mounting	Basic type, Axial foot type, Bod side, flange type, Single clevis type, Double clevis type, Head side flange type.

Series AX

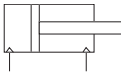
Standard Type/Double Acting : Single Rod

Bore Size(mm) : Ø20, Ø25, Ø32, Ø40

- STAINLESS STEEL BODY
- HIGH CYCLE LIFE
- LOW BREAKAWAY
- NUMEROUS MOUNTING OPTIONS
- MAGNET STANDARD FOR AUTO SWITCH
- BUMPERS STANDARD (AIR CUSHION OPTIONAL)
- DESIGNED FOR NON-LUBRICATED SERVICE
- COMPACT LIGHT DESIGN
- REPLACEABLE ROD GLAND

Symbol

Double acting/Single rod



How to Order

AX L 40 – 150 A J – ○ – W5 ○

1 2 3 4 5 6 7 8 9

1 Air Cylinder
※ Built-in Magnet standard

2 Mounting
B : Basic type
L : Axial foot type
F : Rod side flange type
G : Head side flange type
C : Single clevis type
D : Double clevis type
T : Head side trunnion type
U : Rod side trunnion type
E : Integrated clevis type
BZ: Boss-cut basic type
FZ: Boss-cut flange type
UZ: Boss-cut trunnion type

3 Bore Size(mm)
20 : φ20
25 : φ25
32 : φ32
40 : φ40

4 Stroke(mm)
φ20 : 25, 50, 75, 100, 125, 150, 200, 250, 300
φ25 : 25, 50, 75, 100, 125, 150, 200, 250, 300
φ32 : 25, 50, 75, 100, 125, 150, 200, 250, 300
φ40 : 25, 50, 75, 100, 125, 150, 200, 250, 300

5 Cushion
Blank : Rubber Cushion
A : Air Cushion
※Compact Type : Only Rubber Cushion

6 Rod Boot Option
Blank : None
J : Nylon Tarpaulin
K : Neoprene Cloth

Max. Ambient Temperature	
J	60℃(140°F)
K	※ 110℃(230°F)

※ The Max. Ambient Temperature of Gaiters Only
※ When knuckles are ordered
I : Single knuckle are ordered
Y : Double knuckle attached

7 Special Option
Blank : Standard Type
XC16 : Copper-Free

8 Auto Switch
(Band mounted type)
Blank : None
W5 : Reed Switch(Lead wire of 0.5m)
W5L : Reed Switch(Lead wire of 3m)

9 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

PART No. of Mounting Bracket

Bore Size(mm)	φ20	φ25	φ32	φ40
※Axial foot	TCM-L020B	TCM-L032B		TCM-L040B
Flange	TCM-F020B	TCM-F032B		TCM-F040B
Single Clevis	TCM-C020B	TCM-C032B		TCM-C040B
Double Clevis	TCM-D020B	TCM-D032B		TCM-D040B
Trunnion(With nut)	TCM-T020B	TCM-T032B		TCM-T040B

※ 2 pcs. Required Per Cylinder

PART No. of Auto Switch Mounting Band

Auto Switch Model	Bore Size(mm)			
	φ20	φ25	φ32	φ40
W5	TBM2-020	TBM2-025	TBM2-032	TBM2-040

※ Refer to P.598 for information on Rod end form change.

Model

Bore Size (mm)	ϕ20	ϕ25	ϕ32	ϕ40
Type	Air Cylinder			
Cushion	Rubber Cushion, Air Cushion			
Piping Method	1/8 Rc(PT)	1/8 Rc(PT)	1/8 Rc(PT)	1/4 Rc(PT)
Magnet	Buit Magnet standard			
Auto switch (Band Mounting Type)	Reed Auto Switch / W5			
Rod Boot	Non, Nylone Tarpaulin : 60℃(140˚F) Neopren Cloth : 110℃(230˚F)			

Specifications

Action	Double Acting Single Rod
Fluid	Air
Proof Pressure	1.5MPa (213psi)
Max. Operating Pressure	1.0MPa (140psi)
Min. Operating Pressure	0.05MPa (7psi)
Ambient and Fluid Temperature	-10~+70 ° C (14~158 ° F)
Lubrication	None (Non-Lube)
Thread Tolerance	KS 2 Class
Stroke Tolerance	$^{+1.4}_{0}$ mm

Piston Speed (Rubber Cushion)

Bore Size (mm)	ϕ20	ϕ25	ϕ32	ϕ40
Piston Speed	50~750 mm/sec			
Allowable Kinetic Energy(kgf-cm)	2.7	4	6.5	12

Auto Switch Specifications

Mounting	Lead Wire Entry	Reed Switch
Band Mounting Type	Grommet	W5

Material of Boot

Material of Boot	Max. Ambient Temperature
Nylon Tarpaulin	60℃(140˚F)
Neoprene Cloth	110℃(230˚F)

Boss-Cut Type

Boss for the head cover bracket is eliminated and the total length of the cylinder is shortened.

Compared to The Total Length of Cylinder

(Compared to The Basic Type)

ϕ20	ϕ25	ϕ32	ϕ40
▼13	▼13	▼13	▼16

Mounting

- Boss-Cut Basic Type(BZ)
- Boss-Cut Flange Type(FZ)
- Boss-Cut Trunnion Type(UZ)

Mounting and Accessovies

Mounting \ Accessories	Standard			Option		
	Mounting Nut	Rod End Nut	Clevis Pin	Single Knuckle Joint	Double Knuckle Joint	Boot
Basic Type	○(1pc.)	○	–	○	○	○
Axial Foot Type	○(2)	○	–	○	○	○
Rod Side Flange Type	○(1)	○	–	○	○	○
Head Side Flange Type	○(1)	○	–	○	○	○
Integrated Clevis Type	–	○	–	○	○	○
Single Clevis Type	–	○	–	○	○	○
Double Clevis Type	–	○	○	○	○	○
Head Side Trunnion Type	○(1)	○	–	○	○	○
Rod Side Trunnion Type	○(1)	○	–	○	○	○
Boss-Cut Basic Type	○(1)	○	–	○	○	○
Boss-Cut Flange Type	○(1)	○	–	○	○	○
Boss-Cut Trunnion Type	○(1)	○	–	○	○	○
Note					With pin	

Weight Table

kgf(lbsf)

Bore Size(mm)		ϕ20	ϕ25	ϕ32	ϕ40
Basic Weight	Basic Type	0.14(0.31)	0.21(0.46)	0.28(0.62)	0.56(1.23)
	Axial Foot Type	0.29(0.64)	0.37(0.82)	0.45(0.97)	0.83(1.83)
	Flange Type	0.20(0.44)	0.31(0.66)	0.37(0.82)	0.68(1.5)
	Integrated Clevis Type	0.12(0.26)	0.19(0.42)	0.27(0.6)	0.52(1.15)
	Single Clevis Type	0.18(0.4)	0.25(0.55)	0.32(0.71)	0.65(1.43)
	Double Clevis Type	0.19(0.42)	0.26(0.6)	0.33(0.73)	0.68(1.52)
	Trunnion Type	0.18(0.4)	0.28(0.62)	0.34(0.75)	0.66(1.46)
	Boss-Cut basic Type	0.13(0.29)	0.19(0.42)	0.26(0.57)	0.53(1.17)
	Boss-Cut flange Type	0.19(0.42)	0.28(0.62)	0.35(0.77)	0.65(1.43)
	Boss-Cut trunnion Type	0.17(0.37)	0.27(0.57)	0.32(0.71)	0.63(1.39)
Additional weight for each 50 of stroke		0.04(0.09)	0.06(0.13)	0.08(0.18)	0.13(0.29)
Mounting bracket	Single Knuckle Joint	0.06(0.13)	0.06(0.13)	0.07(0.13)	0.23(0.51)
	Double Knuckle Joint	0.07(0.15)	0.07(0.15)	0.07(0.15)	0.21(0.44)

Calculation Example: AXL32-100

- Basic weight : 0.44 (Foot type, ϕ32)
- Additional weight : 0.08/50 stroke
- Cylinder stroke: 100 stroke

0.44+0.08×100/50=0.06kgf

Boss - Cut Type

AX ◯ Z (Bore Size) — (Stroke) (Boot)

Specifications

Action	Double Acting Single Rod
Bore Size (mm)	ϕ20, ϕ25, ϕ32, ϕ40
Max. Operating Pressure	1.0MPa (140psi)
Min. Operating Pressure	0.18MPa (25psi)
Piping Method	0.5~300 mm/sec
Cushion	Rubber cushion (standard)
Piping Method	Screwed type
Mounting	Basic Type, Rod Side Flange Type, Head Side Flange Type, Rod Side Trunnion Type.

※ Auto Switch Available.

With Air Cushion

AX (Mounting) (Bore Size) — (Stroke) A (Boot)

With Air Cushion

Specifications

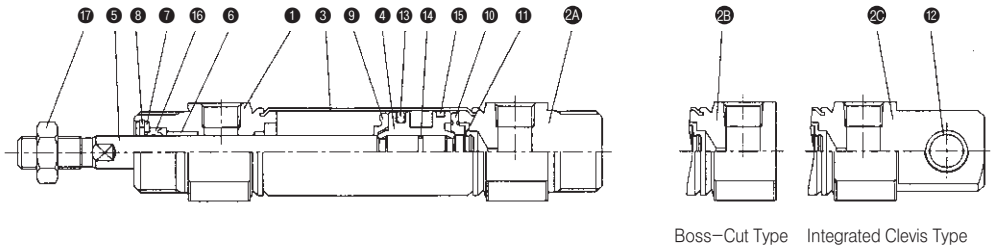
Action	Double Acting Single Rod
Bore Size(mm)	ϕ20, ϕ25, ϕ32, ϕ40
Max. Operating Pressure	1.0MPa (140psi)
Min. Operating Pressure	0.05MPa (7psi)
Cushion	Air Cushion
Piping Method	Screwed Type
Piston Speed	50~1,000 mm/sec
Mounting	Basic Type, Axial Foot Type, Rod Side Flange Type, Head Side Flange Type, Single Clevis Type, Double Clevis Type, Head Side Trunnion Type, Rod Side Trunnion Type, Integrated Clevis Type, Boss-Cut Type.

※ Auto Switch Available.

Cushion Mechanism

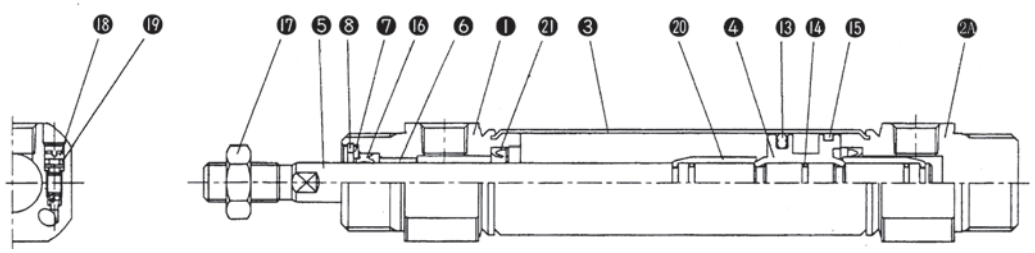
Bore size (mm)	Effective Cushion Length(mm)	Cushion Effective Oriffice(cm^2)	Allowable Kinetic Energy(kgf-cm)
ϕ20	11.0	2.09	5.5
ϕ25	11.0	3.30	8.0
ϕ32	11.0	5.86	13
ϕ40	11.8	9.08	24

Construction/Parts List



Boss-Cut Type Integrated Clevis Type

With Air Cushion



Parts List

No.	Descripion	Material	Note
❶	Rod Cover	Aluminum Alloy	White Alumite
2A	Head Cover A	Aluminum Alloy	White Alumite (Standard type)
2B	Head Cover B	Aluminum Alloy	White Alumite (Boss-cut type)
2C	Head Cover C	Aluminum Alloy	White Alumite (Integrated clevis type)
❸	Cylinder Tube	Stainless Steel	
❹	Piston	Aluminum Alloy	Chromate
❺	Piston Rod	Carbon Steel	Hard Chrome Plated
❻	Bush	Lead Bronze Casting	
❼	Packing Retainer	Rolled Steel	Nickel Plated
❽	Retaining Pin	Carbon Steel	Nickel Plated
❾	Damper A	Urethane	
❿	Damper B	Urethane	
⓫	Stopper Ring	Carbon Steel	

No.	Descripion	Material	Note
⓬	Clevis Bush	Lead Bronze Casting	
⓭	Piston Packing	NBR	
⓮	Piston Gasket	NBR	
⓯	Wearing	Resin	
⓱	Rod Nut	Nickel Plated	
⓲	Cushion Value Gasket	NBR	
⓳	Cushion Ring		
⓴	Cushion Packing	NBR	

Spare Parts/Packing List

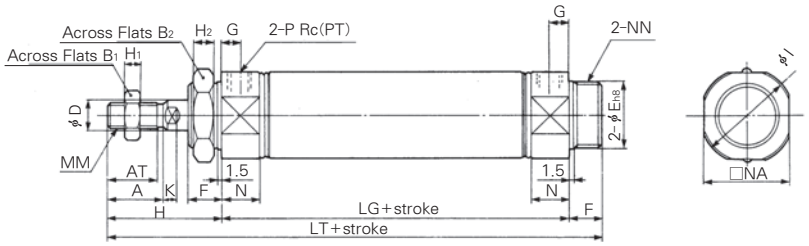
Rubber Cushion / Air Cushion

No.	Decription	Material	Type	Bore Size			
				20	25	32	40
⓰	Rod Packing	NBR	Rubber Cushion	PDU-8LZ	PDU-10LZ	PDU-12LZ	PDU-14LZ
			Air Cushion	PDU-8Z	PDU-10Z	PDU-12Z	PDU-14Z

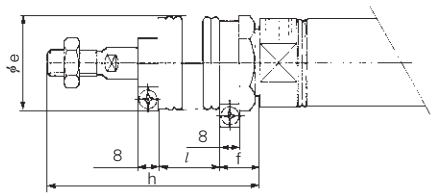
Basic Type (B)

AXB (Bore Size) — (Stroke) ( )

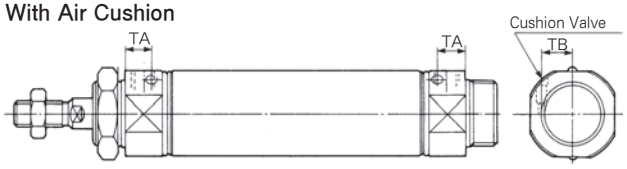
Standard Type



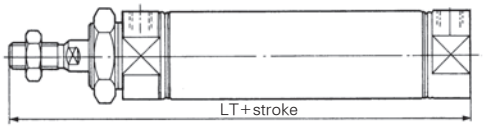
Rod Boot



With Air Cushion



Boss-Cut Type



(Unit : mm)

Bore Size	Stroke Range	A	AT	B_1	B_2	D	E	F	G	H	H_1	H_2	I	K	MM	N	NA	NN	P	LG	LT
φ20	~300	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	8	41	5	8	27	5	M8×1.25	15	24	M20×1.5	1/8	62	116
φ25	~300	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	8	45	6	8	33	5.5	M8×1.25	15	30	M26×1.5	1/8	62	120
φ32	~300	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	8	45	6	8	37.5	5.5	M10×1.25	15	34.5	M26×1.5	1/8	64	122
φ40	~300	24	21	22	41	14	$32^{0}_{-0.039}$	16	11	50	8	10	46.5	7	M14×1.5	21.5	42.5	M32×2	1/4	88	154

With Boot

(Unit : mm)

Bore Size	e	f	h							l						
			1~50	51~100	101~150	151~200	201~300	301~400	401~500	1~50	51~100	101~150	151~200	201~300	301~400	401~500
φ20	30	16	68	81	93	106	131	156	–	12.5	25	37.5	50	75	100	–
φ25	30	16	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125
φ32	30	16	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125
φ40	40	18	77	90	102	115	140	165	190	12.5	25	37.5	50	75	100	125

Boss-Cut Type

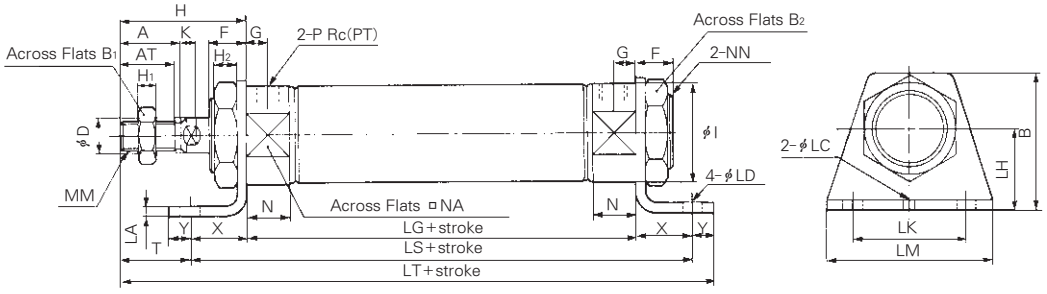
Bore Size	LT
φ20	103
φ25	107
φ32	109
φ40	138

With Air Cushion

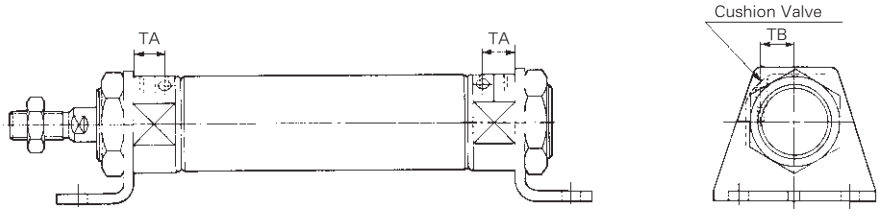
Bore Size	TA	TB
φ20	11.5	8.5
φ25	11.5	10
φ32	11.5	11.5
φ40	14.5	15

Axial Foot Type(L)

AXL Bore Size — Stroke



With Air Cushion



(Unit : mm)

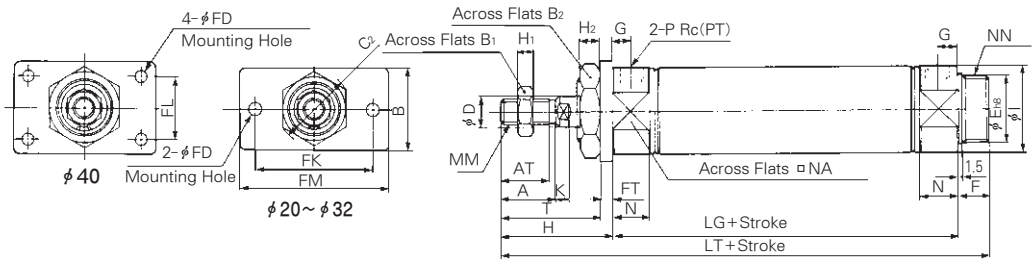
Bore Size	Stroke Range	A	AT	B	B1	B2	D	F	G	H	H1	H2	I	K	LC	LD	LH	LS	LA	LK	LM	MM	N	NA	NN	P	LG	X	Y	T	LT
φ20	~400	18	15.5	40	13	26	8	13	8	41	5	8	27	5	4	6.8	25	102	3.2	40	55	M8×1.25	15	24	M20×1.5	1/8	62	20	8	21	131
φ25	~450	22	19.5	47	17	32	10	13	8	45	6	8	33	5.5	4	6.8	28	102	3.2	40	55	M8×1.25	15	30	M26×1.5	1/8	62	20	8	25	135
φ32	~450	22	19.5	47	17	32	12	13	8	45	6	8	37.5	5.5	4	6.8	28	104	3.2	40	55	M10×1.25	15	34.5	M26×1.5	1/8	64	20	8	25	137
φ40	~500	24	21	54	22	41	14	16	11	50	8	10	46.5	7	4	7	30	134	3.2	55	75	M14×1.5	21.5	42.5	M32×2	1/4	88	23	10	27	171

With Air Cushion

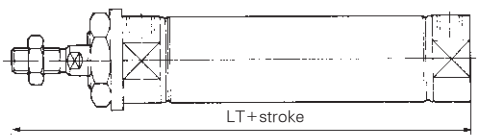
Bore Size	TA	TB
φ20	11.5	8.5
φ25	11.5	10
φ32	11.5	11.5
φ40	14.5	15

Rod Side Flange Type (F)

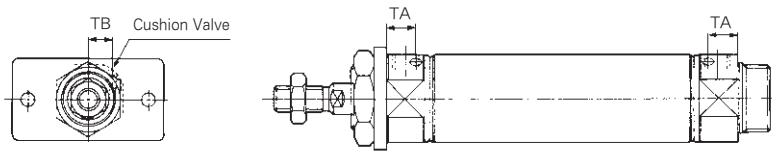
AXF (Bore Size) — (Stroke) ◯



Boss-Cut Type



With Air Cushion



(Unit : mm)

Bore Size	Stroke Range	A	AT	B	B_1	B_2	C_2	D	E	F	FD	FT	FK	FL	FM	G	H	H_1	H_2	I	K	MM
φ20	~400	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	7	4	60	–	75	8	41	5	8	27	5	M8×1.25
φ25	~450	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	7	4	60	–	75	8	45	6	8	33	5.5	M8×1.25
φ32	~450	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	7	4	60	–	75	8	45	6	8	37.5	5.5	M10×1.25
φ40	~500	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	7	5	66	36	82	11	50	8	10	46.5	7	M14×1.5

(Unit : mm)

Bore Size	N	NA	NN	P	LG	T	LT
φ20	15	24	M20×1.5	1/8	62	37	116
φ25	15	30	M26×1.5	1/8	62	41	120
φ32	15	34.5	M26×1.5	1/8	64	41	122
φ40	21.5	42.5	M32×2	1/4	88	45	154

Boss-Cut Type

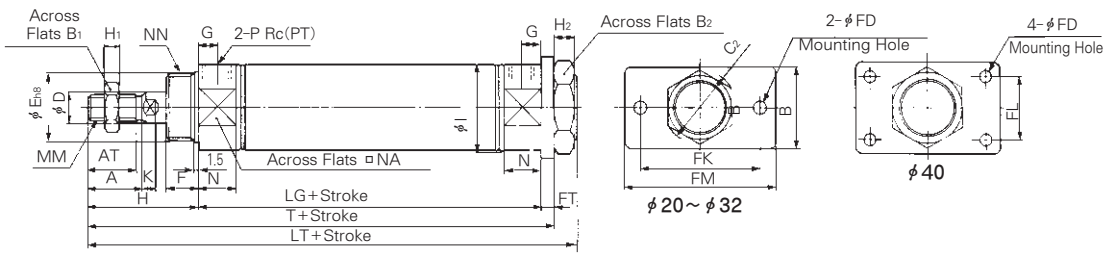
Bore Size	LT
φ20	103
φ25	107
φ32	109
φ40	138

With Air Cushion

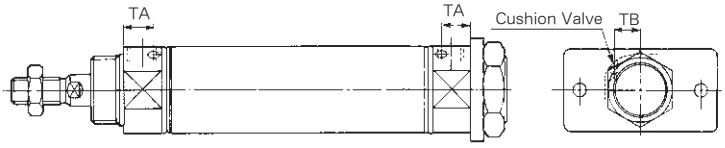
Bore Size	TA	TB
φ20	11.5	8.5
φ25	11.5	10
φ32	11.5	11.5
φ40	14	15

Head Side Flange Type (G)

AXG (Bore Size) — (Stroke) ○



With Air Cushion



(Unit : mm)

Bore Size	Stroke Range	A	AT	B	B1	B2	C2	D	E	F	FD	FT	FK	FL	FM	G	H	H1	H2	I
φ20	~300	18	15.5	34	13	26	30	8	20 $^{0}_{-0.033}$	13	7	4	60	—	75	8	41	5	8	27
φ25	~300	22	19.5	40	17	32	37	10	26 $^{0}_{-0.033}$	13	7	4	60	—	75	8	45	6	8	33
φ32	~300	22	19.5	40	17	32	37	12	26 $^{0}_{-0.033}$	13	7	4	60	—	75	8	45	6	8	37.5
φ40	~300	24	21	52	22	41	47.3	14	32 $^{0}_{-0.039}$	16	7	5	66	36	82	11	50	8	10	46.5

(Unit : mm)

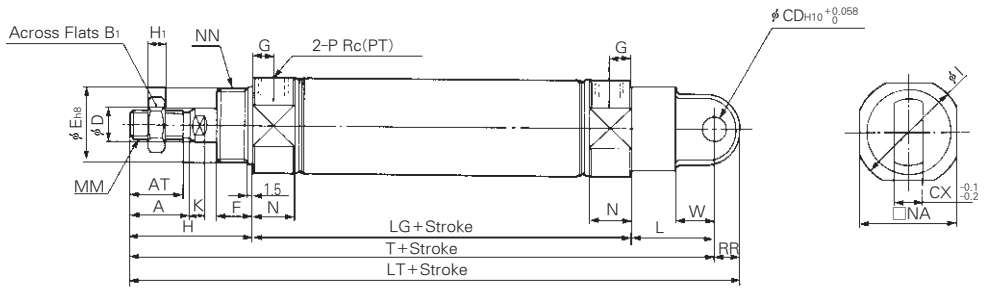
Bore Size	K	MM	N	NA	NN	P	LG	T	LT
φ20	5	M8×1.25	15	24	M20×1.5	1/8	62	107	116
φ25	5.5	M8×1.25	15	30	M26×1.5	1/8	62	111	120
φ32	5.5	M10×1.25	15	34.5	M26×1.5	1/8	64	113	122
φ40	7	M14×1.5	21.5	42.5	M32×2	1/4	88	143	154

With Air Cushion

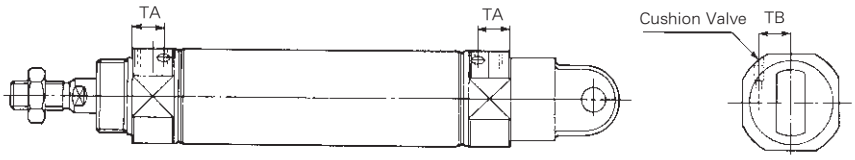
Bore Size	TA	TB
φ20	11.5	8.5
φ25	11.5	10
φ32	11.5	11.5
φ40	14.5	15

Single Clevis Type (C)

AXC (Bore Size) — (Stroke) ◯



With Air Cushion



(Unit : mm)

Bore Size	Stroke Range	A	AT	B1	CD	CX	D	E	F	G	H	H1	I	K	L	MM
φ20	~300	18	15.5	13	9	10	8	20 0 -0.033	13	8	41	5	27	5	30	M8×1.25
φ25	~300	22	19.5	17	9	10	10	26 0 -0.033	13	8	45	6	33	5.5	30	M8×1.25
φ32	~300	22	19.5	17	9	10	12	26 0 -0.033	13	8	45	6	37.5	5.5	30	M10×1.25
φ40	~300	24	21	22	10	15	14	32 0 -0.039	16	11	50	8	46.5	7	39	M14×1.5

(Unit : mm)

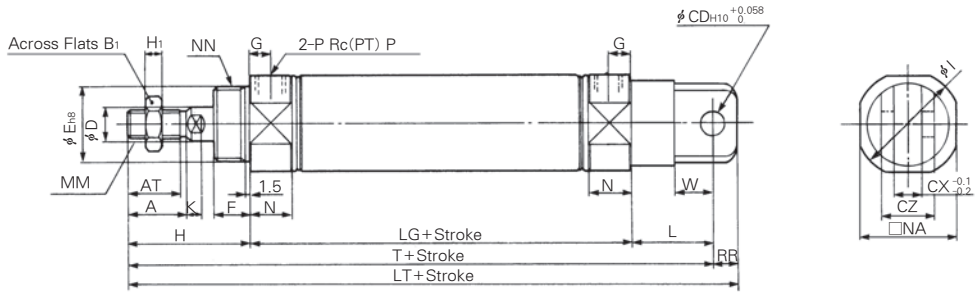
Bore Size	N	NA	NN	P	RR	LG	W	T	LT
φ20	15	24	M20×1.5	1/8	9	62	14	133	142
φ25	15	30	M26×1.5	1/8	9	62	14	137	146
φ32	15	34.5	M26×1.5	1/8	9	64	14	139	148
φ40	21.5	42.5	M32×2	1/4	11	88	18	177	188

With Air Cushion

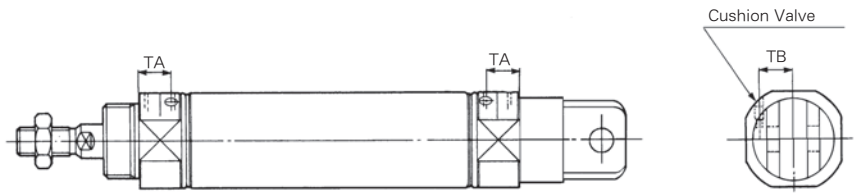
Bore Size	TA	TB
φ20	11.5	8.5
φ25	11.5	10
φ32	11.5	11.5
φ40	14.5	15

Double Clevis Type (D)

AXD (Bore Size) — (Stroke) ◯



With Air Cushion



(Unit : mm)

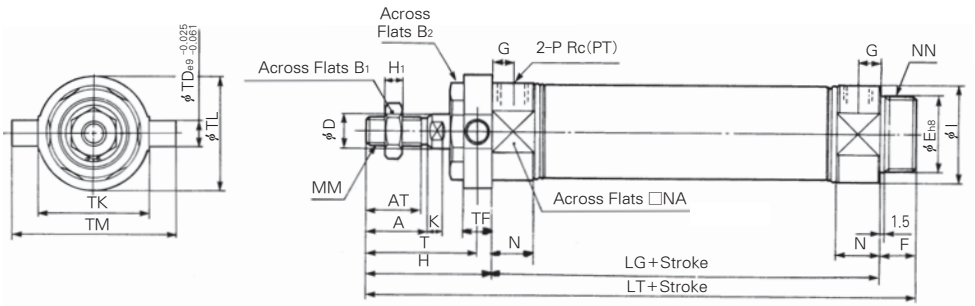
Bore Size	Stroke Range	A	AT	B1	CD	CX	CZ	D	E	F	G	H	H1	I	K	L	MM	N	NA	NN	P	RR	LG	W	T	LT
φ20	~300	18	15.5	13	9	10	19	8	20 0 -0.033	13	8	41	5	27	5	30	M8×1.25	15	24	M20×1.5	1/8	9	62	14	133	142
φ25	~300	22	19.5	17	9	10	19	10	26 0 -0.033	13	8	45	6	33	5.5	30	M8×1.25	15	30	M26×1.5	1/8	9	62	14	137	146
φ32	~300	22	19.5	17	9	10	19	12	26 0 -0.033	13	8	45	6	37.5	5.5	30	M10×1.25	15	34.5	M26×1.5	1/8	9	64	14	139	148
φ40	~300	24	21	22	10	15	30	14	32 0 -0.039	16	11	50	8	46.5	7	39	M14×1.5	21.5	42.5	M32×2	1/4	11	88	18	177	188

With Air Cushion

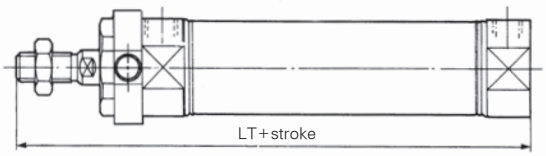
Bore Size	TA	TB
φ20	11.5	8.5
φ25	11.5	10
φ32	11.5	11.5
φ40	14.5	15

Rod Side Trunnion Type (U)

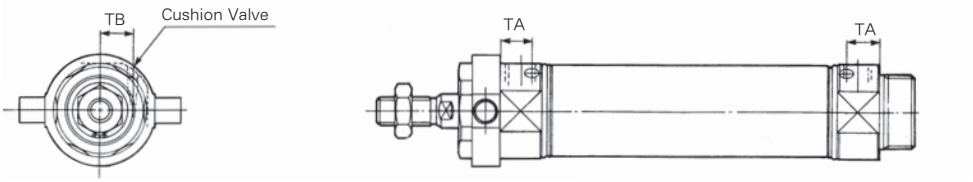
AXU (Bore Size) — (Stroke) ◯



Boss-Cut Type



With Air Cushion



(Unit : mm)

Bore Size	Stroke Range	A	AT	B1	B2	D	E	F	G	H	H1	I	K	MM	N	NA	NN	P
φ20	~300	18	15.5	13	26	8	20 $^{0}_{-0.033}$	13	8	41	5	27	5	M8×1.25	15	24	M20×1.5	1/8
φ25	~300	22	19.5	17	32	10	26 $^{0}_{-0.033}$	13	8	45	6	33	5.5	M8×1.25	15	30	M26×1.5	1/8
φ32	~300	22	19.5	17	32	12	26 $^{0}_{-0.033}$	13	8	45	6	37.5	5.5	M10×1.25	15	34.5	M26×1.5	1/8
φ40	~300	24	21	22	41	14	32 $^{0}_{-0.039}$	16	11	50	8	46.5	7	M14×1.5	21.5	42.5	M32×2	1/4

(Unit : mm)

Bore Size	LG	TD	TF	TK	TL	TM	T	LT
φ20	62	8	10	32	32	52	36	116
φ25	62	9	10	40	40	60	40	120
φ32	64	9	10	40	40	60	40	122
φ40	88	10	11	53	53	77	44.5	154

Boss-Cut Type

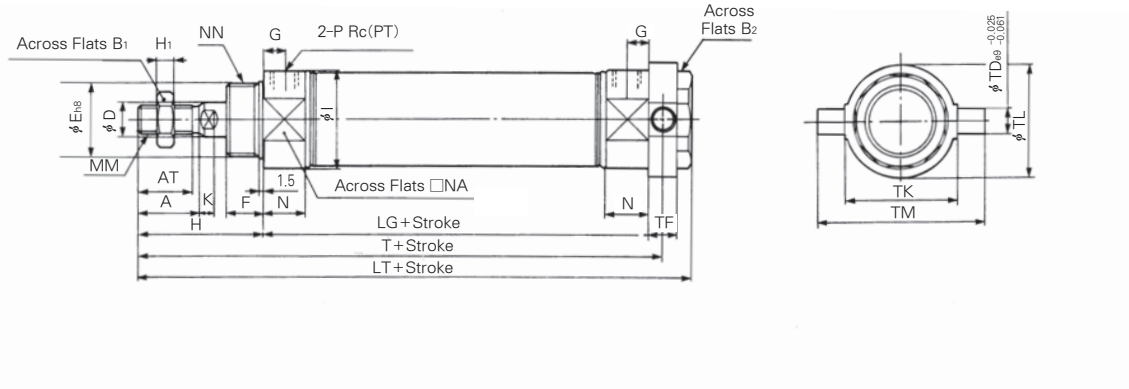
Bore Size	LT
φ20	103
φ25	107
φ32	109
φ40	138

With Air Cushion

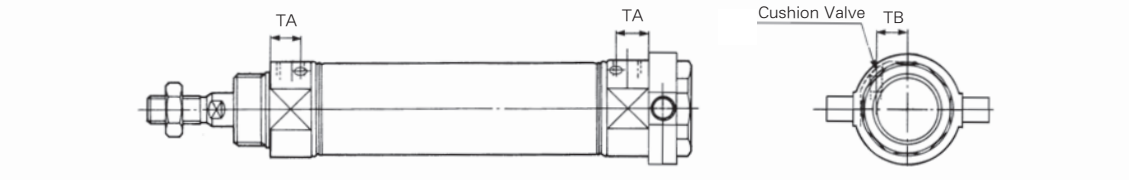
Bore Size	TA	TB
φ20	11.5	8.5
φ25	11.5	10
φ32	11.5	11.5
φ40	14.5	15

Head Side Trunnion Type (T)

AXT (Bore Size) — (Stroke) ◯



With Air Cushion



(Unit : mm)

Bore Size	Stroke Range	A	AT	B1	B2	D	E	F	G	H	H1	I	K	MM	N	NA	NN	P
φ20	~300	18	15.5	13	26	8	20 $^{0}_{-0.033}$	13	8	41	5	27	5	M8×1.25	15	24	M20×1.5	1/8
φ25	~300	22	19.5	17	32	10	26 $^{0}_{-0.033}$	13	8	45	6	33	5.5	M8×1.25	15	30	M26×1.5	1/8
φ32	~300	22	19.5	17	32	12	26 $^{0}_{-0.033}$	13	8	45	6	37.5	5.5	M10×1.25	15	34.5	M26×1.5	1/8
φ40	~300	24	21	22	41	14	32 $^{0}_{-0.039}$	16	11	50	8	46.5	7	M14×1.5	21.5	42.5	M32×2	1/4

(Unit : mm)

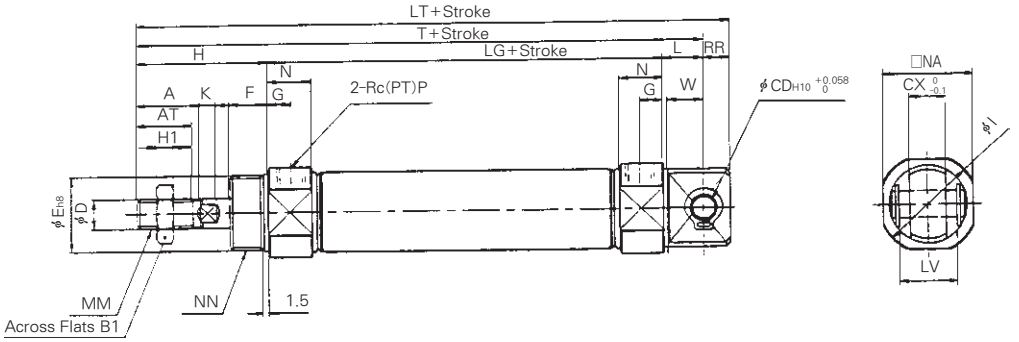
Bore Size	LG	TD	TF	TK	TL	TM	T	LT
φ20	62	8	10	32	32	52	108	118
φ25	62	9	10	40	40	60	112	122
φ32	64	9	10	40	40	60	114	124
φ40	88	10	11	53	53	77	143.5	154

With Air Cushion

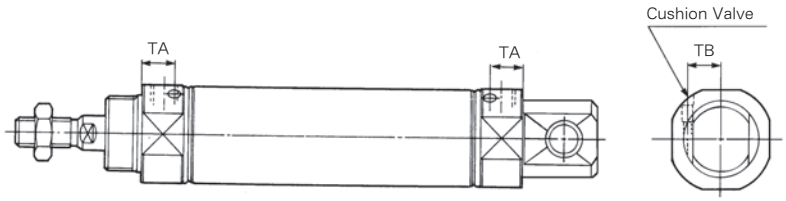
Bore Size	TA	TB
φ20	11.5	8.5
φ25	11.5	10
φ32	11.5	11.5
φ40	14.5	15

Integrated Clevis Type (E)

AXE (Bore Size) — (Stroke) ( )



With Air Cushion



(Unit : mm)

Bore Size	Stroke Range	A	AT	B_1	CD	CX	D	E	F	G	H	H_1	I	K	L	MM	N	NA	NN
φ20	~300	18	15.5	13	8	12	8	$20^{0}_{-0.033}$	13	8	41	5	27	5	12	M8×1.25	15	24	M20×1.5
φ25	~300	22	19.5	17	8	12	10	$26^{0}_{-0.033}$	13	8	45	6	33	5.5	12	M8×1.25	15	30	M26×1.5
φ32	~300	22	19.5	17	10	20	12	$26^{0}_{-0.033}$	13	8	45	6	37.5	5.5	15	M10×1.25	15	34.5	M26×1.5
φ40	~300	24	21	22	10	20	14	$32^{0}_{-0.039}$	16	11	50	8	46.5	7	15	M14×1.5	21.5	42.5	M32×2

(Unit : mm)

Bore Size	P	RR	LG	W	T	LT	LV
φ20	1/8	9	62	11.5	115	124	18.4
φ25	1/8	9	62	11.5	119	128	18.4
φ32	1/8	12	64	14.5	124	136	28
φ40	1/4	12	88	14.5	153	165	28

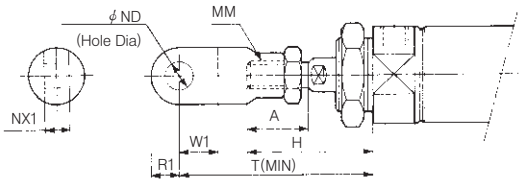
With Air Cushion

Bore Size	TA	TB
φ20	11.5	8.5
φ25	11.5	10
φ32	11.5	11.5
φ40	14.5	15

Accessories/Dimensions

mm

Single Knuckle Joint (mm)

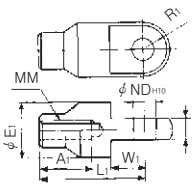


Bore Size	A	H	MM	ϕND^{H10}	NX$_1$	W$_1$	R$_1$	T
ϕ20	18	41	M8×1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	14	10	66
ϕ25	22	45	M10×1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	14	10	69
ϕ32	22	45	M10×1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	14	10	69
ϕ40	24	50	M14×1.5	$12^{+0.070}_{0}$	$16^{-0.1}_{-0.3}$	20	15.5	92

Single Knuckle Joint (mm)

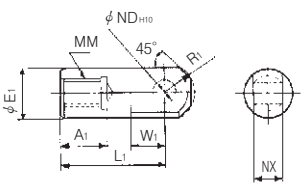
TI-020B, 032B

Material : Rolled Steel



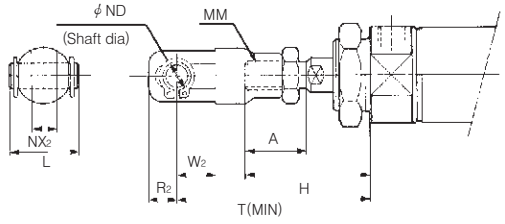
TI-040B

Material : Free Cutting Sulfur Steel



Part No.	Applicable Bore size	A$_1$	E$_1$	L$_1$	MM	ND^{H10}	NX	R$_1$	W$_1$
TI-020B	ϕ20	16	20	36	M8×1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	10	14
TI-032B	ϕ25	18	20	38	M10×1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	10	14
TI-032B	ϕ32	18	20	38	M10×1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	10	14
TI-040B	ϕ40	22	24	55	M14×1.5	$12^{+0.070}_{0}$	$16^{-0.1}_{-0.3}$	15.5	20

Double Knuckle Joint (mm)

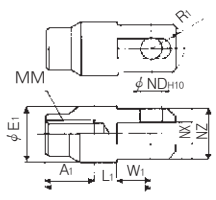


Bore Size	A	H	L	MM	ϕNDd$_9$	NX$_2$	R$_2$	W$_2$	T
ϕ20	18	41	25	M8×1.25	$9^{-0.040}_{-0.076}$	$9^{+0.2}_{+0.1}$	10	14	66
ϕ25 · ϕ32	22	45	25	M10×1.25	$9^{-0.040}_{-0.076}$	$9^{+0.2}_{+0.1}$	10	14	69
ϕ40	24	50	49.7	M14×1.5	$12^{-0.050}_{-0.093}$	$16^{+0.3}_{+0.1}$	13	25	92

Double Knuckle Joint (mm)

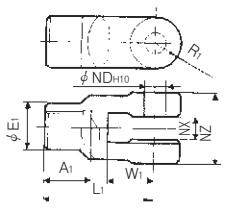
TY-020B, 032B

Material : Rolled steel



TY-040B

Material : Cast iron



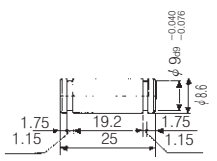
Part No.	Applicable Bore size	A$_1$	E$_1$	L$_1$	MM	ND^{H10}	NX	NZ	R$_1$	W$_1$	Applicable pin part NO.
TY-020B	ϕ20	16	20	36	M8×1.25	$9^{+0.058}_{0}$	$9^{+0.2}_{+0.1}$	18	12	14	TCDP-1
TY-032B	ϕ25 · ϕ32	18	20	38	M10×1.25	$9^{+0.058}_{0}$	$9^{+0.2}_{+0.1}$	18	12	14	TCDP-1
TY-040B	ϕ40	22	24	55	M14×1.5	$12^{+0.070}_{0}$	$16^{+0.3}_{+0.1}$	38	13	25	TCDP-3

Clevis Pin, Knuckle Pin (mm)

Applicable Bore Size : ϕ20, ϕ25, ϕ32

TCDP-1

Material:Carbon Steel



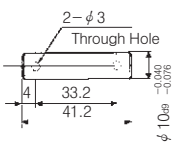
Retaining Pin:C9 Type For Pivot

Clevis Pin, Knuckle Pin (mm)

Applicable Bore Size : ϕ40

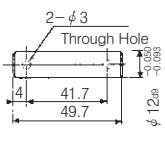
TCDP-2

Material:Carbon Steel



TCDP-3

Material:Carbon Steel

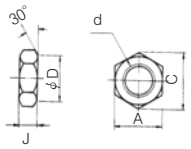


Applicable Split Pin : ϕ3×18ℓ

Accessories/Dimensions

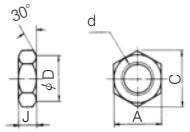
Rod End Nut

Material : Carbon Steel



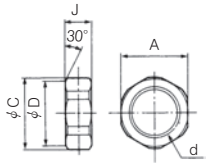
Mounting Nut

Material : Carbon Steel



Trunnion Nut

Material : Carbon Steel



(Unit : mm)

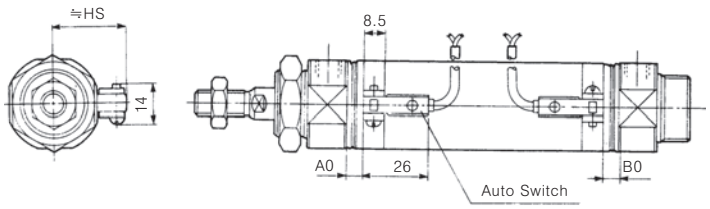
Part No.	Applicable bore size	A	C	D	d	J
TNT-02	φ 20	13	15.5	12.5	M8×1.25	5
TNT-03	φ 25	17	19.6	16.5	M10×1.25	6
TNT-03	φ 32	17	19.6	16.5	M10×1.25	6
TNT-04	φ 40	22	25.4	21.0	M14×1.5	8

Part No.	Applicable bore size	A	C	D	d	J
TSN-020B	φ 20	26	30	25.5	M20×1.5	8
TSN-032B	φ 25	32	37	31.5	M26×1.25	8
TSN-032B	φ 32	32	37	31.5	M26×1.5	8
TSN-040B	φ 40	41	47.3	40.5	M32×2.0	10

Part No.	Applicable bore size	A	C	D	d	J
TN-020B	φ 20	26	28	25.5	M20×1.5	10
TN-032B	φ 25	32	34	31.5	M26×1.25	10
TN-032B	φ 32	32	34	31.5	M26×1.25	10
TN-040B	φ 40	41	45	40.5	M32×2	10

Reed Switch Setting Position (Stroke End)

W5



Bore Size

Bore Size	W5		
	A0	B0	HS
φ 20	7	6	22.5
φ 25	7	6	25
φ 32	8	7	28.5
φ 40	13	12	32.5

Auto Switch Mounting, Minimum Possible Cylinder Strokes (mm)

Auto Switch Type	No. of Auto Switch				1pc.
	2pcs.		n pcs.		
	Different Surface	Same Surface	Different Orientation	Same Orientation	
W5	15	50	$15+45(\frac{n-2}{2})$ (n=2, 4, 6, 8…)	50+45(n−2)	10

① Adjustable Stroke Cylinder/Extension Adjustable Type

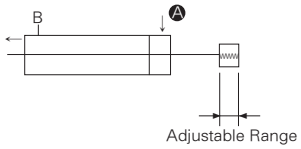
AX — Mounting — Type — Bore Size — Stroke — Additional Symbol — Stroke Adjusting Symbol — XC8

Additional Symbol
Blank-With Boot
J-With Boot(Nylon Tarpaulin)
K-With Boot(Neoprene Cloth)

Stroke Adjusting Symbol
A-Stroke Adjusting Range 0~25mm
B-Stroke Adjusting Range 0~50mm

The Extended Stroke of the cylinder can be adjusted by the stopper in the head side.

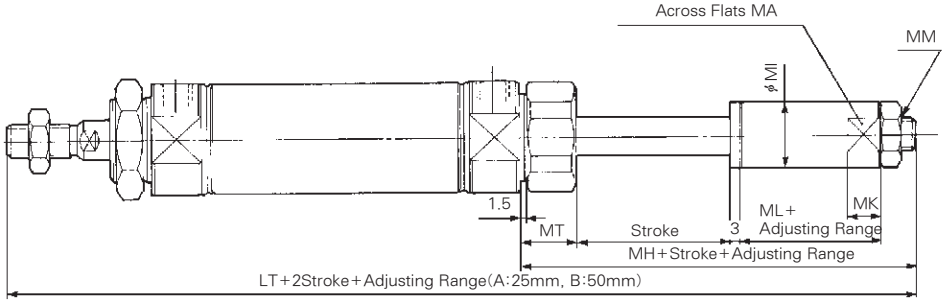
Symbol



Specifications

Fluid	Air
Proof Pressure	1.5MPa (213psi)
Max. Operating Pressure	1.0MPa (140psi)
Min. Operating Pressure	0.05MPa (7psi)
Piston Speed	50~750 mm/sec
Cushion	Rubber Cushion(Standard)
Stroke Adjusting System	Adjusting Stopper
Stroke Adjusting Range	A : 0~25mm, B : 0~50mm
Mounting	Basic Type, Axial Foot Type, Rod Side Flange Type, Head Side Flange Type, Rod Side Trunnion Type
Applicable Bore Size(mm)	ϕ20, ϕ25, ϕ32, ϕ40

Construction, Dimensions/Basic Type



(Unit: mm)

Bore Size	MA	MK	MI	MM	MT	MH	ML	LT
ϕ20	12	8	15	M8×1.25	16.5	47	18	150
ϕ25	17	10	20	M8×1.25	17.5	49	18	156
ϕ32	17	10	20	M10×1.25	17.5	49	18	158
ϕ40	22	12	25	M14×1.5	21.5	60	22	198

※ Other dimensions are the same for standard type.

② Adjustable Stroke Cylinder/Retraction Adjustable Type

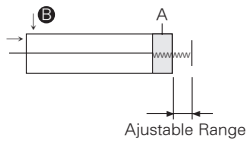
AX | Mounting | Type | Bore Size | Stroke | Additional Symbol | Stroke Adjusting Symbol — XC9

Additional symbol
Blank-Without Boot
J-With Boot(Nylon tarpaulin)
K-With Boot(Neoprene cloth)

Stroke Adjusting Symbol
A-Stroke Adjusting Range 0~25mm
B-Stroke Adjusting Range 0~50mm

The Retracted Stroke of the cylinder can be adjusted from (0~25)mm or (0~50)mm by the adjusting bolt

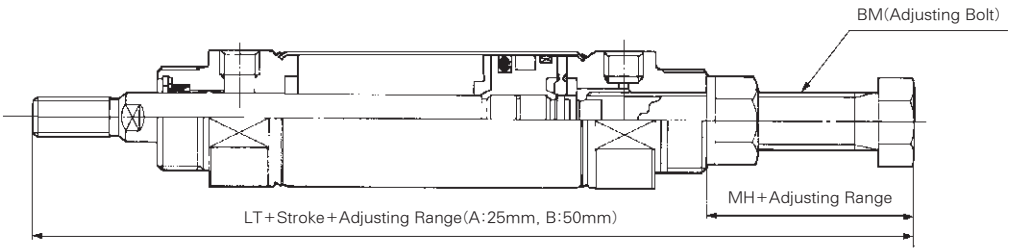
Symbol



Specifications

Fluid	Air
Proof Pressure	1.5MPa (213psi)
Max. Operating Pressure	1.0MPa (140psi)
Min. Operating Pressure	0.05MPa (7psi)
Piston Speed	50~750mm/sec
Cushion	Rubber cushion(Standard)
Stroke Adjusting System	Stopper adjustment
Stroke Adjusting Range	A : 0~25mm, B : 0~50mm
Mounting	Basic Type, Axial Foot Type, Rod Side Flange Type, Head Side Flange Type, Rod Side Trunnion Type, Head Side Trunnion Type
Applicable Bore Size(mm)	ϕ20, ϕ25, ϕ32, ϕ40
Stroke Range	~300 mm

Construction, Dimensions/Basic Type



(Unit : mm)

Bore Size	BM	MH	LT
ϕ20	M8×1.25	20	136
ϕ25	M8×1.25	20	140
ϕ32	M8×1.25	20	142
ϕ40	M12×1.75	24	178

※ Other dimensions are the same for standard type.

③ Dual Stroke Cylinder/Double Rod Type

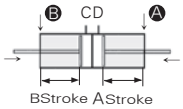
AX — Mounting — Type — Bore Size — Stroke A — Additional Symbol + Stroke B — Additional Symbol — XC10

Additional symbol
Blank-With Boot
J-With Boot(Nylon tarpaulin)
K-With Boot(Neoprene cloth)

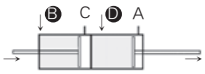
Two cylinders are constructed as one cylinder in a back-to-back configuraton allowing the cylinder stroke to be controlled in three steps.

Symbol

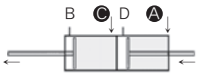
Function



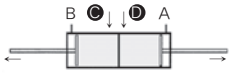
When air pressure is supplied to ports Ⓐ and Ⓑ, both A and B strokes retract.



When air pressure is supplied to ports Ⓑ and Ⓓ, A stroke extends.



When air pressure is supplied to ports Ⓐ and ⓒ, B stroke extends.

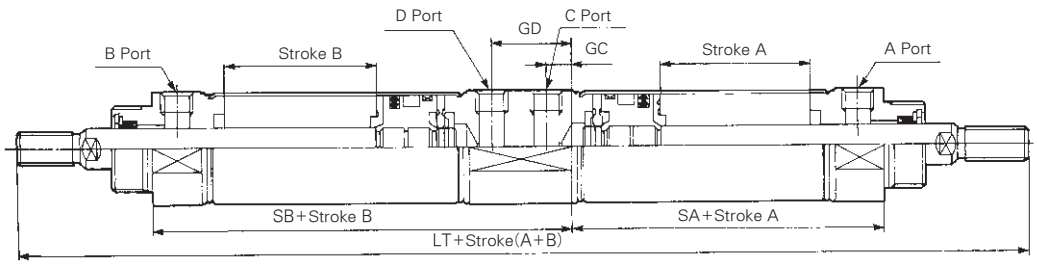


When air pressure is supplied to ports ⓒ and Ⓓ, both strokes A and B out strokes.

Specifications

Type	Non-lube
Fluid	Air
Proof Pressure	1.5MPa (213psi)
Max. Operating Pressure	1.0MPa (140psi)
Min. Operating Pressure	0.05MPa (7psi)
Piston Speed	50~750 mm/sec
Cushion	Rubber cushion(Standard)
Mounting	Basic type, Foot type, Flange type
Applicable Bore Size(mm)	ϕ20, ϕ25, ϕ32, ϕ40
Stroke A, B	~300 mm

Construction, Dimensions/Basic Type



(Unit : mm)

Bore Size	GC	GD	SA	SB	LT
ϕ20	7	24	47	78	207
ϕ25	7	24	47	78	215
ϕ32	7	24	49	80	219
ϕ40	10.5	33.5	66.5	110.5	277

※ Other dimensions are the same for standard type.

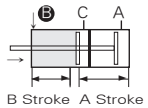
④ Dual Stroke Cylinder/Single Rod Type

AX (Mounting) (Type) (Bore Size) — (Stroke A) + (Stroke B - A) (Additional Symbol) — XC11

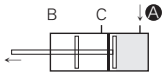
Additional Symbol ●
Blank-With Boot
J-With Boot(Nylon tarpaulin)
K-With Boot(Neoprene cloth)

Symbol

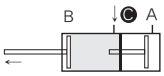
Function



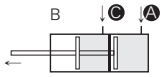
When air pressure is supplied to the Ⓑ port, both A and B strokes retract.



When air pressure is supplied to the Ⓐ port, the rod extends by A Stroke.



When air pressure is supplied to the ⓒ port, the rod extends.

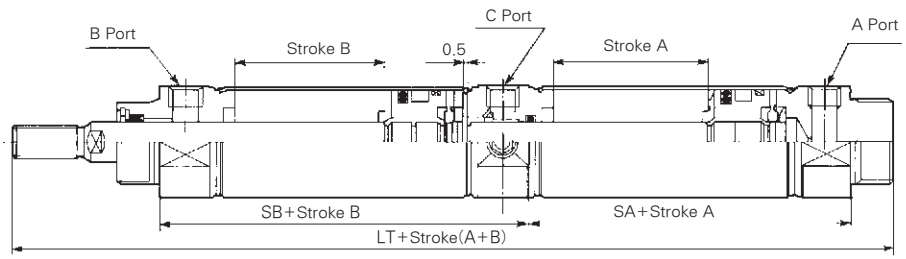


When air pressure is supplied to both ports Ⓐ and ⓒ double output force is obtainable in the range of the A stroke length.

Specifications

Fluid	Air
Proof Pressure	1.5MPa (213psi)
Max. Operating Pressure	1.0MPa (140psi)
Min. Operating Pressure	0.05MPa (7psi)
Piston Speed	50~750 mm/sec
Cushion	Rubber Cushion (Standard)
Mounting	Basic Type, Foot Type, Rod Side Flange Type Head Side Flange type Single Clevis Type, Double Clevis Type.
Applicable Bore Size(mm)	ϕ20, ϕ25, ϕ32, ϕ40
Stroke	~300 mm

Construction, Dimensions/Basic Type



(Unit : mm)

Bore Size	SA	SB	LT
ϕ20	48	62	164
ϕ25	48	62	168
ϕ32	50	64	172
ϕ40	67.5	88.5	222

※ Other dimensions are the same for standard type.

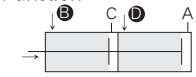
⑤ Tandem Type Air Cylinder

AX (Mounting)(Type)(Bore Size)—(Stroke)—XC12

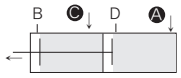
This is a cylinder produced with two air cylinders in line allowing double the output force.

Symbol

Function



When air pressure is supplied to ports Ⓑ and Ⓓ, the output force is doubled in the retract stroke.

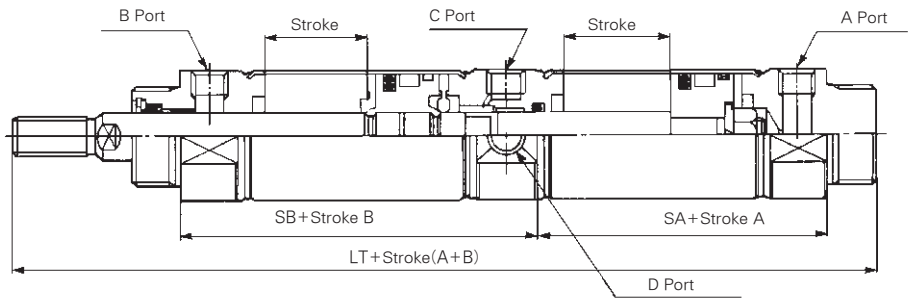


When air pressure is supplied to ports Ⓐ and ⓒ, the output force is doubled in the extend stroke.

Specifications

Type	Air cylinder
Applicable Bore Size	ϕ20, ϕ25, ϕ32, ϕ40
Max. Operating Pressure	1.0 MPa (140psi)
Min. Operating Pressure	0.08 MPa (11psi)
Cushion	Rubber Cushion (Standard)
Action	Double Acting
Mounting	Basic Type, Axial Foot Type, Rod Side Flange Type, Head Side Flange Type, Single Clevis Type, Double Clevis Type

Construction Dimension



(Unit : mm)

Bore Size	SA	SB	LT
ϕ20	48	62	164
ϕ25	48	62	168
ϕ32	50	64	172
ϕ40	67.5	88.5	222

※ Other dimensions are the same for standard type.

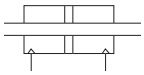
Series AXW

Standard Type/Double Acting : Double Rod

Bore Size(mm) : Ø20, Ø25, Ø32, Ø40

- STAINLESS STEEL BODY
- HIGH CYCLE LIFE
- LOW BREAKAWAY
- NUMEROUS MOUNTING OPTION
- MAGNET STANDARD FOR AUTO SWITCH
- BUMPERS STANDARD (AIR CUSHION OPTIONAL)
- DESIGNED FOR NON-LUBRICATED SERVICE
- COMPACT LIGHT DESIGN
- REPLACEABLE ROD GLAND

Symbol — Double Acting/Double Rod



How to Order

AXW [1] [2] 40 [3] 75 [4] A [5] J [6] – [7] – W5 [8] [9]

[1] Double Rod Type
(Built-in Magnet Standard)

[2] Mounting
B : Basic Type
L : Foot Type
F : Flange Type
U : Trunnion Type

[3] Bore Size(mm)
20 : φ20
25 : φ25
32 : φ32
40 : φ40

[4] Stroke(mm)
φ20 : 25, 50, 75, 100, 125, 150, 200, 250, 300
φ25 : 25, 50, 75, 100, 125, 150, 200, 250, 300
φ32 : 25, 50, 75, 100, 125, 150, 200, 250, 300
φ40 : 25, 50, 75, 100, 125, 150, 200, 250, 300

[5] Cushion
Blank : Rubber Cushion
A : Air Cushion

[6] Rod Boot Option
Blank : None
J : Nylon Tarpaulin(Single side)
JJ : Nylon Tarpaulin(Both side)
K : Neoprene Cloth(Single side)
KK : Neoprene Cloth(Both side)

[7] Special Option
Blank : Standard type
XC16 : Copper-free

[8] Auto Switch
(Band mounted type)
[Grommet]
Blank : None
W5 : W5
W5L : Reed Switch, 3m Lead wire

[9] Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

PART No. of Mounting Bracket

Bore Size(mm)	φ20	φ25	φ32	φ40
※Axial foot	TCM-L020B	TCM-L032B		TCM-L040B
Flange	TCM-F020B	TCM-F032B		TCM-F040B
Trunnion(With Nut)	TCM-T020B	TCM-T032B		TCM-T040B

※ 2pcs. Required Per Cylinder

PART No. of Auto Mounting Band

Auto Switch Model	Bore Size(mm)			
	φ20	φ25	φ32	φ40
W5	TBM2-020	TBM2-025	TBM2-032	TBM2-040

Model

Bore size(mm)	ϕ20	ϕ25	ϕ32	ϕ40
Type	Air Cylinder			
Cushion	Rubber Cushion, Air Cushion			
Piping Method	1/8 Rc(PT)	1/8 Rc(PT)	1/8 Rc(PT)	1/4 Rc(PT)
Magnet	Built-in Magnet Standard			
Auto Switch (Band Mounted Type)	Reed Auto Switch /w5			
Boot	• None • Nylon Tarpanlin(60℃) • Neoprene cloth			

Standard Stroke List

Action	Double Acting Double Rod
Fluid	Air
Proof Pressure	1.5 MPa (213psi)
Max. Operating Pressure	1.0 MPa (140psi)
Min. Operating Pressure	0.05 MPa (7psi)
Ambient and Fluid Temperature	-10~+70℃ (14~158°F)
Lubrication	None (Non-Lube)
Thread Tolerance	KS 2 Class
Storke Tolerance	$^{+1.4}_{0}$ mm

Piston Speed

Bore Size(mm)	ϕ20	ϕ25	ϕ32	ϕ40
Piston Speed(mm/sec)	50~750			
Allowable Kinetic Energy(kgf/cm)	2.7	4	6.5	12

Auto Switch Specifications

Mounting	Lead Wire Entry	Reed Switch
Band Mounted Type	Grommet	W5

※ A long stroke applies to the foot type and the flange type. For other mountings and case exceeding the Standard stroke limit, the max.

Mounting and Accessories

Accessories / Mounting	Standard		Option		
	Mounting Nut	Rod end Nut	Single Knuckle Joint	Double Knuckle Joint	Rod Boot
Basic Type	○(2pcs)	○(2pcs)	○	○	○
Foot Type	○(2pcs)	○(2pcs)	○	○	○
Flange Type	○(1pc)	○(2pcs)	○	○	○
Trunnion Type	○(1pc)	○(2pcs)	○	○	○
Note				With pin	Single, Both side

Material of Gaiter

Symbol		Material of Boot	Max. Ambient Temperature
Single Side	Both Side		
J	JJ	Nylon tarpaulin	140°F(60°C)
K	KK	Neoprene cloth	※230°F(110°C)

※ The max. ambient temperature of Boot only.

Weight Table

kgf(lbf)

Bore Size(mm)		ϕ20	ϕ25	ϕ32	ϕ40
Basic Weight	Basic Type	0.16(0.35)	0.25(0.55)	0.33(0.71)	0.65(1.43)
	Foot Type	0.31(0.68)	0.42(0.90)	0.48(1.06)	0.92(1.06)
	Flange Type	0.22(0.49)	0.34(0.75)	0.41(0.90)	0.77(1.70)
	Trunnion Type	0.20(0.44)	0.33(0.71)	0.38(0.84)	0.75(1.65)
Additional weight for each 50 of stroke		0.06(0.43)	0.09(0.20)	0.13(0.27)	0.19(0.42)
Mounting Bracket	Single Knuckle Joint	0.06(0.13)	0.07(0.13)	0.06(0.13)	0.23(0.51)
	Double Knuckle Joint(with pin)	0.07(0.15)	0.07(0.15)	0.07(0.15)	0.21(0.44)

Calculation (Example) **AXWL32-100**

- Basic weight-1.06(Foot type, ϕ32)
- Additional weight-0.29/50 stroke
- Cylinder stroke -100 stroke
- 1.06+0.29x100/50=1.64lbf

With Air Cushion

AXW [Mounting] [Bore Size] [Piping Method] — [Stroke] [A] [Boot]

A: With Air Cushion

With covers on both sides equipped with the cushion function, the cylinder absorbs the impact during high-speed operation without vibrating the section around it, and the cylinder provides longer life.

Specifications

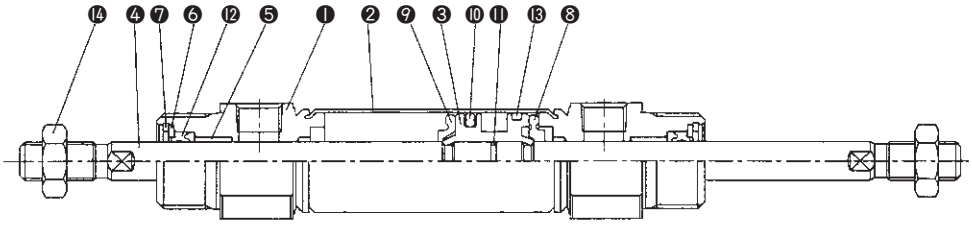
Action	Double acting double rod
Bore Size	ϕ20, ϕ25, ϕ32, ϕ40
Max. Operating Pressure	1.0MPa(140Psi)
Min. Operating Pressure	0.05MPa(7.1Psi)
Cushion	Air Cushion
Piping Method	Screwed Type
Piston Speed	50~1,000mm/sec
Mounting	Basic Type, Foot Type, Flange Type, Trunnion Type

※Auto switch Available

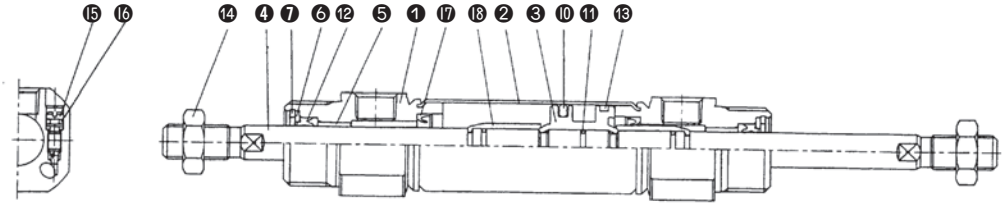
Cushion Mechanism

Bore Size (mm)	Effective Cushion Length mm(inch)	Cushion Effective oriffice $cm^2(in^2)$	Allowable Kinetic Energy kgf-cm(lbs-in)
ϕ20	11.0(0.433)	2.09(0.324)	5.5(4.774)
ϕ25	11.0(0.433)	3.30(0.512)	8.0(6.944)
ϕ32	11.0(0.433)	5.86(0.908)	13(11.287)
ϕ40	11.8(0.465)	9.08(1.407)	24(20.832)

Construction/Parts List



With Air Cushion



Parts List

No.	Description	Material	Note
❶	Rod Cover	Aluminum Alloy	White Alumite
❷	Cylinder Tube	Stainless Steel	
❸	Piston	Aluminum Alloy	Chromate
❹	Piston Rod	Carbon Steel	Hard Chrome Plated
❺	Bush	Sintered Metal	
❻	Packing Retainer	Rolled Steel	Nickel Plated
❼	Stopper Ring	Carbon Steel	Nickel Plated
❽	Damper A	Urethane	
❾	Damper B	Urethane	
❿	Piston Packing	NBR	
⓫	Piston Gasket	NBR	
⓭	Wear Ring	-	

No.	Descripion	Material	Note
⓮	Rod End Nut	-	Nickel Plated
⓯	Cushion Valve	-	Nickel Plated
⓰	Cushion Valve Gasket	NBR	
⓱	Cushion Packing	NBR	
⓲	Cushion Ring	-	

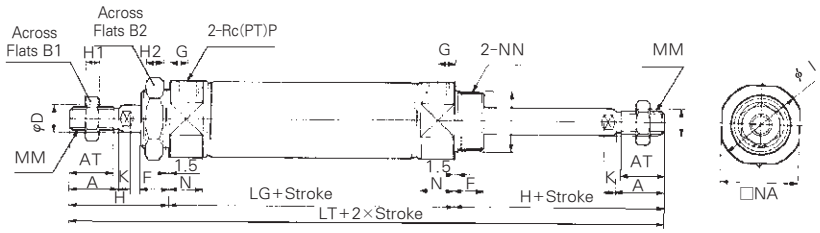
Spare Parts/Packing List

Rubber Cushion / Air Cushion

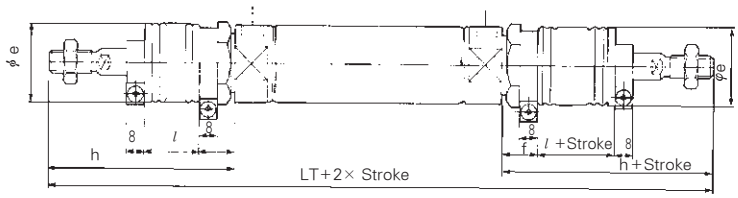
No.	Decription	Material	Type	Bore Size			
				20	25	32	40
⓬	Rod Packing	NBR	Rubber Cushion	PDU-8LZ	PDU-10LZ	PDU-12LZ	PDU-14LZ
			Air Cushion	PDU-8Z	PDU-10Z	PDU-12Z	PDU-14Z

Basic Type(B)

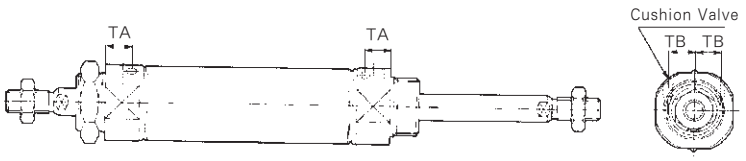
AXWB Bore Size — Stoke



With Rod Boot(Both side)



With Air Cushion



※ 301mm Stroke or more : Long Stroke

(Unit : mm)

Bore Size	Stroke Range	A	AT	B_1	B_2	D	E	F	G	H	H_1	H_2	I	K	MM	N	NA	NN	P	LG	LT
φ20	~300	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	8	41	5	8	27	5	M8×1.25	15	24	M20×1.5	1/8	62	144
φ25	~300	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	8	45	6	8	33	5.5	M8×1.25	15	30	M26×1.5	1/8	62	152
φ32	~300	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	8	45	6	8	37.5	5.5	M10×1.25	15	34.5	M26×1.5	1/8	64	154
φ40	~300	24	21	22	41	14	$32^{0}_{-0.039}$	16	11	50	8	10	46.5	7	M14×1.5	21.5	42.5	M32×2	1/4	88	188

With Gaiter

Bore Size	e	f	h							l							LT						
			1~50	51~100	101~150	151~200	201~300	301~400	401~500	1~50	51~100	101~150	151~200	201~300	301~400	401~500	1~50	51~100	101~150	151~200	201~300	301~400	401~500
φ20	30	16	68	81	93	106	131	156	—	12.5	25	37.5	50	75	100	—	198	224	248	274	324	374	—
φ25	30	16	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125	206	232	256	282	332	382	432
φ32	30	16	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125	208	234	258	284	334	384	434
φ40	40	18	77	90	102	115	140	165	190	12.5	25	37.5	50	75	100	125	242	268	292	318	368	418	468

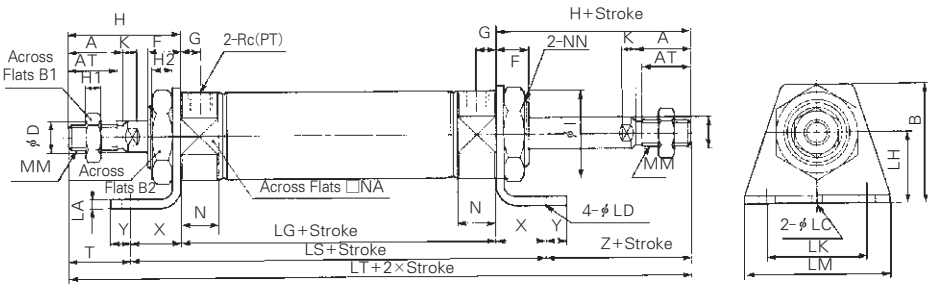
With Air Cushion

Bore size	TA	TB
φ20	11.5	8.5
φ25	11.5	10
φ32	11.5	11.5
φ40	14.5	15

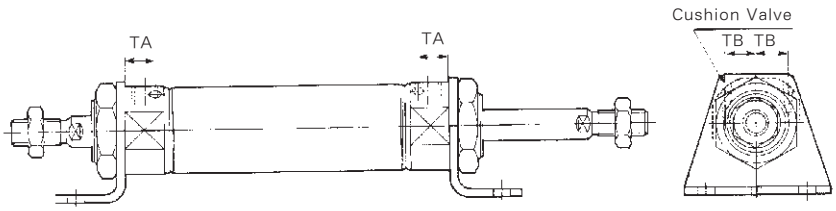
Axial Foot Type(L)

AXWL Bore Size — Stroke

Standard



With Air Cushion



(Unit : mm)

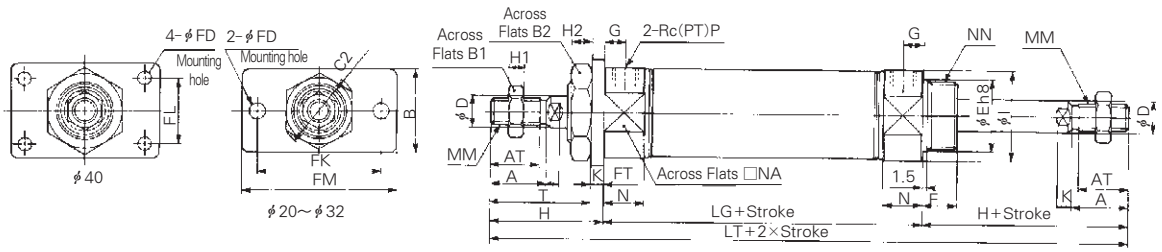
Bore Size	Stroke Range	A	AT	B	B_1	B_2	D	F	G	H	H_1	H2	I	K	LC	LD	LH	LS	LA	LK	LM	MM	N	NA	NN	P	LG	X	Y	T	LT
φ20	~400	18	15.5	40	13	26	8	13	8	41	5	8	27	5	4	6.8	25	102	3.2	40	55	M8×1.25	15	24	M20×1.5	1/8	62	20	8	21	144
φ25	~450	22	19.5	47	17	32	10	13	8	45	6	8	33	5.5	4	6.8	28	102	3.2	40	55	M8×1.25	15	30	M26×1.5	1/8	62	20	8	25	152
φ32	~450	22	19.5	47	17	32	12	13	8	45	6	8	37.5	5.5	4	6.8	28	104	3.2	40	55	M10×1.25	15	34.5	M26×1.5	1/8	64	20	8	25	154
φ40	~500	24	21	54	22	41	14	16	11	50	8	10	46.5	7	4	7	30	134	3.2	55	75	M14×1.5	21.5	42.5	M32×2	1/4	88	23	10	27	188

With Air Cushion

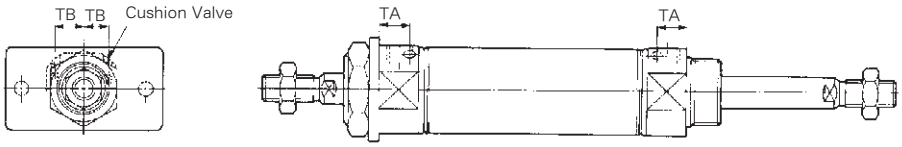
Bore size	TA	TB
φ20	11.5	8.5
φ25	11.5	10
φ32	11.5	11.5
φ40	14.5	15

Flange Type(F)

AXWF (Bore Size) — (Stroke) ( )



With Air Cushion



(Unit : mm)

Bore Size	Stroke Range	A	AT	B	B_1	B_2	C_2	D	E	F	FD	FT	FK	FL	FM	G	H	H_1	H_2	I	K	MM
φ20	~300	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	7	4	60	–	75	8	41	5	8	27	5	M8×1.25
φ25	~300	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	7	4	60	–	75	8	45	6	8	33	5.5	M8×1.25
φ32	~300	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	7	4	60	–	75	8	45	6	8	37.5	5.5	M10×1.25
φ40	~300	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	7	5	66	36	82	11	50	8	10	46.5	7	M14×1.5

(Unit : mm)

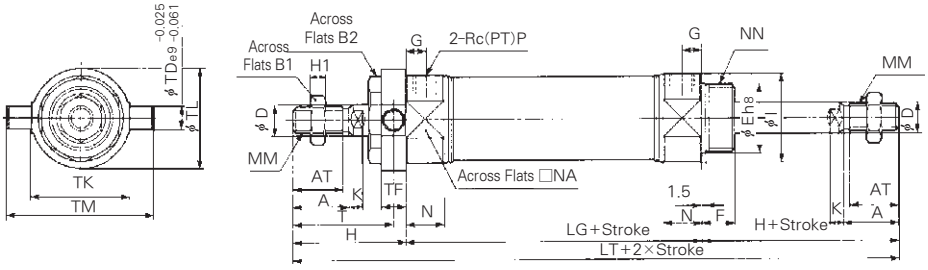
Bore Size	N	NA	NN	P	LG	T	LT
φ20	15	24	M20×1.5	1/8	62	37	144
φ25	15	30	M26×1.5	1/8	62	41	152
φ32	15	34.5	M26×1.5	1/8	64	41	154
φ40	21.5	42.5	M32×2	1/4	88	45	188

With Air Cushion

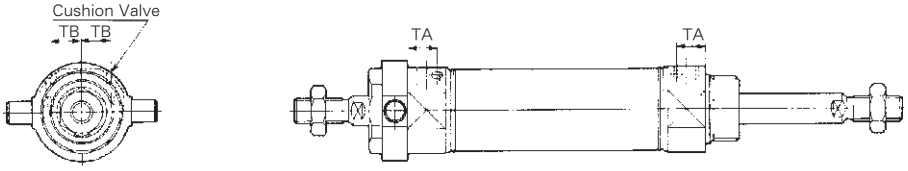
Bore size	TA	TB
φ20	11.5	8.5
φ25	11.5	10
φ32	11.5	11.5
φ40	14.5	15

Trunnion Type(U)

AXWU Bore Size — Stroke



With Air Cushion



(Unit : mm)

Bore Size	Stroke Range	A	AT	B_1	B_2	D	E	F	G	H	H_1	I	K	MM	N	NA	NN	P	LG
φ20	~300	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	8	41	5	27	5	M8×1.25	15	24	M20×1.5	1/8	62
φ25	~300	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	8	45	6	33	5.5	M8×1.25	15	30	M26×1.5	1/8	62
φ32	~300	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	8	45	6	37.5	5.5	M10×1.25	15	34.5	M26×1.5	1/8	64
φ40	~300	24	21	22	41	14	$32^{0}_{-0.039}$	16	11	50	8	46.5	7	M14×1.5	21.5	42.5	M32×2	1/4	88

(Unit : mm)

Bore Size	TD	TF	TK	TL	TM	T	LT
φ20	8	10	32	32	52	36	144
φ25	9	10	40	40	60	40	152
φ32	9	10	40	40	60	40	154
φ40	10	11	53	53	77	44.5	188

With Air Cushion

Bore Size	TA	TB
φ20	11.5	8.5
φ25	11.5	10
φ32	11.5	11.5
φ40	14.5	15

Series AXS

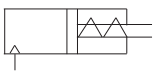
Standard Type/Single Acting:Spring Return, Spring Extended

Bore Size(mm) : Ø20, Ø25, Ø30, Ø40

- STAINLESS STEEL BODY
- HIGH CYCLE LIFE
- LOW BREAKAWAY
- NUMEROUS MOUNTING OPTION
- MAGNET STANDARD FOR AUTO SWITCH
- BUMPERS STANDARD
- DESIGNED FOR NON-LUBRICATED SERVICE
- COMPACT LIGHT DESIGN
- REPLACEABLE ROD GLAND

Symbol

Single acting spring return



Single acting spring Extended

How to Order

AXS L 32 — 40 S — ○ — W5 □

1 2 3 4 5 6 7 8

1 Type:Single Acting
※ (Built-in Magnet Standard)

2 Mounting
- B : Basic Type
- L : Axial Foot Type
- F : Rod Side Flange Type
- G : Head Side Flange Type
- C : Single Clevis Type
- D : Double Clevis Type
- T : Head Side Trunnion Type
- U : Rod Side Trunnion Type
- E : Integrated Clevis Type
- BZ : Boss-Cut Basic Type
- FZ : Boss-Cut Flange Type
- UZ : Boss-Cut Trunnion Type

3 Bore Size(mm)
- 20 : ϕ20
- 25 : ϕ25
- 32 : ϕ32
- 40 : ϕ40

4 Stroke
- ϕ20 : 25, 50, 75, 100, 125, 150
- ϕ25 : 25, 50, 75, 100, 125, 150
- ϕ32 : 25, 50, 75, 100, 125, 150, 200
- ϕ40 : 25, 50, 75, 100, 125, 150, 200, 250

5 Action
- S : Single Acting Spring Return
- T : Single Acting Spring Extended

6 Special Option
- Blank : Standard type
- XC16 : Copper-free

7 Auto Switch
- Blank : None
- W5 : Reed Switch, 0.5m Lead Wire
- W5L : Reed Switch, 3m Lead wire

8 Number of Auto Switches
- Blank : 2 pcs
- S : 1 pc
- N : N pcs

PART No. of Mounting Bracket

Bore Size(mm)	ϕ20	ϕ25	ϕ32	ϕ40
※Axial foot	TCM-L020B	TCM-L032B		TCM-L040B
Flange	TCM-F020B	TCM-F032B		TCM-F040B
Single Clevis	TCM-C020B	TCM-C032B		TCM-C040B
Double Clevis	TCM-D020B	TCM-D032B		TCM-D040B
Trunnion(With Nut)	TCM-T020B	TCM-T032B		TCM-T040B

※ 2pcs. Required Per Cylinder

PART No. of Auto Switch Mounting Band

Auto Switch Model	Bore Size(mm)			
	ϕ20	ϕ25	ϕ32	ϕ40
W5	TBM2-020	TBM2-025	TBM2-032	TBM2-040

Model

Bore Size(mm)	ϕ20	ϕ25	ϕ32	ϕ40
Type	Air Cylinder			
Cushion	Rubber Cushion			
Piping Method	Rc(PT)1/8	Rc(PT)1/8	Rc(PT)1/8	Rc(PT)1/4
Magnet	Built-in Magnet Standard			
Auto Switch(Band Mounted Type)	Reed Auto Switch/W5			

Specifications

Action	Spring Return	Spring Extended
Fluid	Air	
Proof Pressure	1.5MPa (213psi)	
Max. Operating Pressure	1.0MPa	
Min. Operating Pressure	0.18 MPa(25psi)	0.23 MPa(32psi)
Ambient and Fluid Temperature	-10~+70°C (14~158°F)	
Lubrication	Non-lube	
Thread Tolerance	KS 2 class	
Stroke Tolerance	$^{+1.4}_{0}$ mm	

Piston Speed

Bore Size(mm)	ϕ20	ϕ25	ϕ32	ϕ40
Piston speed(mm/sec)	50~750			
Allowable kinetic energy(kgf-cm)	2.7	4	6.5	12

Auto Switch Specification

Mounting	Lead Wire Entry	Reed Switch
Band Mounting Type	Grommet	W5

Boss-Cut Type

Boss for the head cover bracket is eliminated and the total length of the cylinder is shortened.

Compared to the Total Length of Cylinder

(Compared to the Basic Type)

ϕ20	ϕ25	ϕ32	ϕ40
▼13	▼13	▼13	▼16

Mounting

- Boss-Cut Basic Type(BZ)
- Boss-Cut Flange Type(FZ)
- Boss-Cut Trunnion Type(UZ)

Mounting and Accessories

Mounting \ Accessories	Standard			Option	
	Mounting Nut	Rod end Nut	Clevis Pin	Single Knuckle Joint	Double Knuckle Joint
Basic Type	○1pc.	○	–	○	○
Axial Foot Type	○2pcs.	○	–	○	○
Rod Side Flange Type	○1pc.	○	–	○	○
Head Side Flange Type	○1pc.	○	–	○	○
Integrated Clevis Type	–	○	–	○	○
Single Clevis Type	–	○	–	○	○
Double Clevis Type	–	○	○	○	○
Head Side Trunnion Type	○1pc.	○	–	○	○
Rod Side Trunnion Type	○1pc.	○	–	○	○
Boss-Cut Basic Type	○1pc.	○	–	○	○
Boss-Cut Flange Type	○1pc.	○	–	○	○
Boss-Cut Trunnion Type	○1pc.	○	–	○	○
Note					With Pin

Weight Table

Spring Return

kgf(lbf)

	Bore Size (mm)	ϕ20	ϕ25	ϕ32	ϕ40
Basic weight	25 stroke	0.20(0.44)	0.31(0.66)	0.42(0.93)	0.77(1.70)
	50 stroke	0.22(0.49)	0.33(0.73)	0.46(1.01)	0.84(1.85)
	75 stroke	0.27(0.60)	0.42(0.93)	0.58(1.28)	1.03(2.27)
	100 stroke	0.29(0.64)	0.45(0.99)	0.63(1.39)	1.09(2.40)
	125 stroke	0.35(0.77)	0.55(1.19)	0.76(1.08)	1.29(2.84)
	150 stroke	0.37(0.81)	0.57(1.26)	0.81(1.76)	1.36(3.0)
	200 stroke	–	–	0.97(2.14)	1.61(3.55)
	250 stroke	–	–	–	1.87(4.12)
Mounting Bracket Weight	Foot Type	0.15(0.33)	0.16(0.35)	0.16(0.35)	0.27(0.60)
	Flange Type	0.06(0.13)	0.09(0.20)	0.09(0.20)	0.12(0.26)
	Single Clevis Type	0.05(0.09)	0.05(0.09)	0.05(0.09)	0.09(0.20)
	Double Clevis Type	0.05(0.11)	0.06(0.13)	0.06(0.13)	0.13(0.28)
	Trunnion Type	0.04(0.09)	0.07(0.15)	0.07(0.15)	0.10(0.22)
	Integrated Clevis Type	-0.02(-0.04)	-0.02(-0.04)	-0.01(-0.02)	-0.04(-0.09)
	Boss-Cut Basic Type	-0.01(-0.02)	-0.02(-0.04)	-0.02(-0.04)	-0.03(0.07)
	Boss-Cut Flange Type	0.05(0.11)	0.08(0.15)	0.08(0.15)	0.09(0.20)
	Boss-Cut Trunnion Type	0.03(0.07)	0.05(0.11)	0.05(0.11)	0.07(0.15)
Acces-sories	Single Knuckle Joint	0.06(0.13)	0.06(0.13)	0.06(0.13)	0.23(0.51)
	Double Knuckle Joint(with pin)	0.08(0.15)	0.08(0.15)	0.08(0.15)	0.20(0.44)

Spring Extended

kgf(lbf)

	Bore Size(mm) ϕ20	ϕ25	ϕ32	ϕ40	
Basic weight	25 stroke	0.19(0.42)	0.29(0.64)	0.40(0.88)	0.74(1.63)
	50 stroke	0.21(0.46)	0.32(0.71)	0.44(0.97)	0.81(1.76)
	75 stroke	0.26(0.55)	0.39(0.86)	0.54(1.19)	0.97(2.14)
	100 stroke	0.27(0.60)	0.42(0.93)	0.58(1.28)	1.03(2.27)
	125 stroke	0.32(0.71)	0.49(1.08)	0.70(1.52)	1.20(2.65)
	150 stroke	0.34(0.75)	0.52(1.15)	0.73(1.61)	1.27(2.80)
	200 stroke	–	–	0.88(1.94)	1.49(3.28)
	250 stroke	–	–	–	1.72(3.79)
Mounting Bracket Weight	Foot Type	0.15(0.33)	0.16(0.35)	0.16(0.35)	0.27(0.60)
	Flange Type	0.06(0.13)	0.1(0.20)	0.1(0.20)	0.12(0.26)
	Single Clevis Type	0.04(0.09)	0.04(0.09)	0.04(0.09)	0.09(0.20)
	Double Clevis Type	0.05(0.09)	0.07(0.13)	0.07(0.13)	0.13(0.29)
	Trunnion Type	0.04(0.09)	0.07(0.15)	0.07(0.15)	0.10(0.22)
	Integrated Clevis Type	-0.02(-0.04)	-0.03(-0.04)	-0.01(-0.02)	-0.04(-0.09)
	Boss-Cut Basic Type	-0.01(-0.02)	-0.03(-0.04)	-0.02(-0.04)	-0.03(-0.07)
	Boss-Cut Flange Type	0.05(0.11)	0.08(0.15)	0.08(0.15)	0.09(0.20)
	Boss-Cut Trunnion Type	0.03(0.07)	0.05(0.11)	0.05(0.11)	0.07(0.15)
Acces-sories	Single Knuckle Joint	0.07(0.13)	0.07(0.13)	0.07(0.13)	0.23(0.51)
	Double Knuckle Joint(with pin)	0.07(0.15)	0.07(0.15)	0.07(0.15)	0.20(0.44)

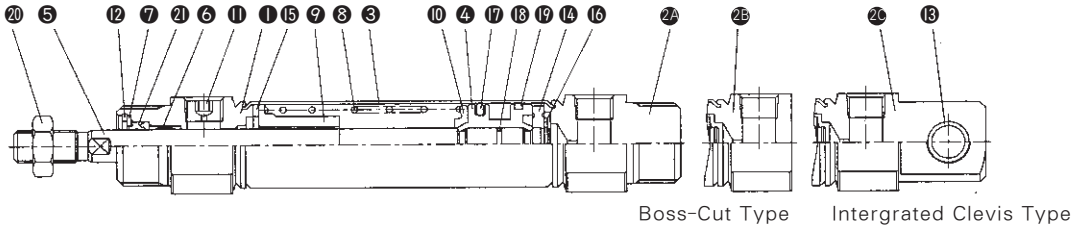
Calculation Example : AXL32-100S

Basic weight ···1.39lbf(Foot type ϕ32)

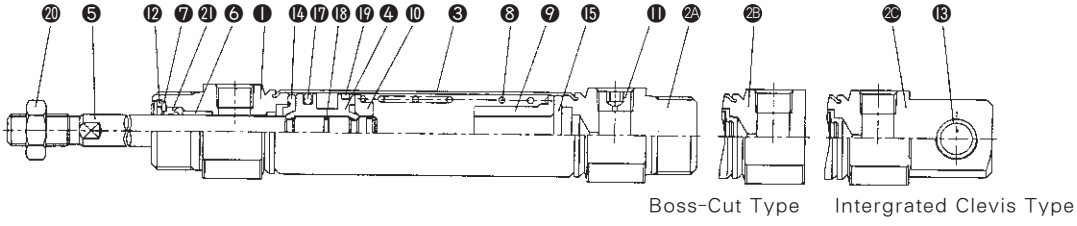
Cylinder stroke ···100 stroke

1.39+0.35=1.74lbf

Construction/Parts List



Boss-Cut Type　　Intergrated Clevis Type



Boss-Cut Type　　Intergrated Clevis Type

Part List

No.	Description	Material	Remarks
❶	Rod Cover	Aluminum Alloy	White Alumite
2A	Head Cover-A	Aluminum Alloy	White Alumite
2B	Head Cover-B	Aluminum Alloy	White Alumite
2C	Head Cover-C	Aluminum Alloy	White Alumite
❸	Cylinder Tube	Stainless Steel	-
❹	Piston	Aluminum Alloy	Chromate
❺	Piston Rod	Carbon Steel	Hard Chrome Plated
❻	Guide Bush	Sintered Metal	
❼	Retaining Ring	Rolled steel	Nickel Plated
❽	Spring	Steel Wire	Zinc chromate
❾	Spring Guide	Aluminum Alloy	Chromate
❿	Spring Supporter	Aluminum Alloy	〃
⓫	Plug	Alloy Steel	Black Chromate
⓬	Stopper Ring	Carbon Tool Steel	Nickel Plated
⓭	Bushing	Sintered Metal	

No.	Description	Material	Remarks
⓮	Damper A	Urethane	
⓯	Damper B	Urethane	
⓰	Retaining Ring	Carbon Tool Steel	
⓱	Piston Packing	NBR	
⓲	Piston Gasket	NBR	
⓳	Wear Ring	Resin	
⓴	Rod End Nut	Carbon Steel	Nickel Plated

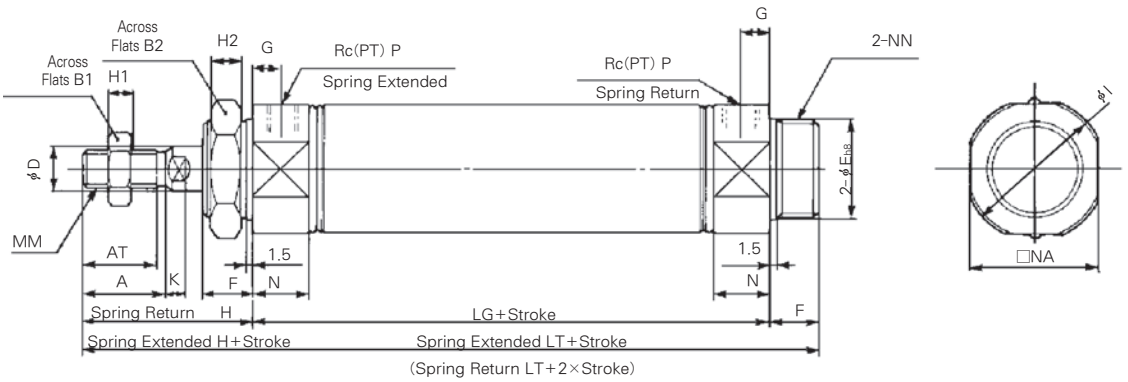
Packing List

Rubber Cushion / Air Cushion

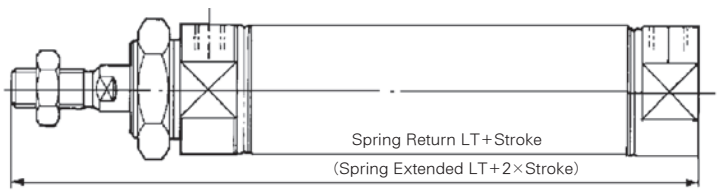
No.	Decription	Material	Type	Bore Size			
				20	25	32	40
㉑	Rod Packing	NBR	Rubber Cushion	PDU-8LZ	PDU-10LZ	PDU-12LZ	PDU-14LZ
			Air Cushion	PDU-8Z	PDU-10Z	PDU-12Z	PDU-14Z

Basic(B)

AXB (Bore Size)—(Stroke) S



Boss-Cut Type



※ This Drawing is Spring Extended.

(Unit : mm)

Bore Size	A	AT	B_1	B_2	D	E	F	G	H	H_1	H_2	I	K	MM	N	NA	NN	P
φ20	18	15.5	13	26	8 $^{-0.01}_{-0.05}$	20 $^{0}_{-0.033}$	13	8	41	5	8	27	5	M8×1.25	15	24	M20×1.5	1/8
φ25	22	19.5	17	32	10 $^{-0.01}_{-0.05}$	26 $^{0}_{-0.033}$	13	8	45	6	8	33	5.5	M8×1.25	15	30	M26×1.5	1/8
φ32	22	19.5	17	32	12 $^{-0.01}_{-0.05}$	26 $^{0}_{-0.033}$	13	8	45	6	8	37.5	5.5	M10×1.25	15	34.5	M26×1.5	1/8
φ40	24	21	22	41	14 $^{-0.01}_{-0.05}$	32 $^{0}_{-0.039}$	16	11	50	8	10	46.5	7	M14×1.5	21.5	42.5	M32×2	1/4

Stroke Dimension Adder

(Unit : mm)

Bore Size \ Stroke / Symbol	1~50		51~100		101~150		151~200		201~250	
	LG	LT	LG	LT	LG	LT	LG	LT	LG	LT
φ20	87	141	112	166	137	191	–	–	–	–
φ25	87	145	112	170	137	195	–	–	–	–
φ32	89	147	114	172	139	197	164	222	–	–
φ40	113	179	138	204	163	229	188	254	213	279

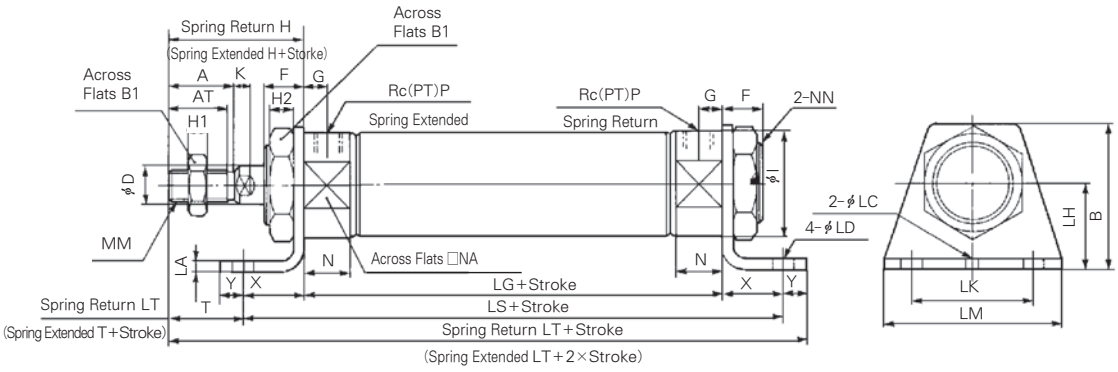
Boss-Cut Type

(Unit : mm)

Bore Size \ Stroke / Symbol	1~50	51~100	101~150	151~200	201~250
	LT	LT	LT	LT	LT
φ20	128	153	178	–	–
φ25	132	157	182	–	–
φ32	134	159	184	209	–
φ40	163	188	213	238	263

Axial Foot Type (L)

AXL Bore Size — Stroke S T



※ This Drawing is Spring Extended

(Unit : mm)

Bore Size	A	AT	B	B^1	B^2	D	F	G	H	H^1	H^2	I	K	LC	LD	LH	LA	LK	LM	MM	N	NA	NN	P	X	Y	T
φ20	18	15.5	40	13	26	8	13	8	41	5	8	27	5	4	6.8	25	3.2	40	55	M8×1.25	15	24	M20×1.5	1/8	20	8	21
φ25	22	19.5	47	17	32	10	13	8	45	6	8	33	5.5	4	6.8	28	3.2	40	55	M8×1.25	15	30	M26×1.5	1/8	20	8	25
φ32	22	19.5	47	17	32	12	13	8	45	6	8	37.5	5.5	4	6.8	28	3.2	40	55	M10×1.25	15	34.5	M26×1.5	1/8	20	8	25
φ40	24	21	54	22	41	14	16	11	50	8	10	46.5	7	4	7	30	3.2	55	75	M14×1.25	21.5	42.5	M32×2	1/4	23	10	27

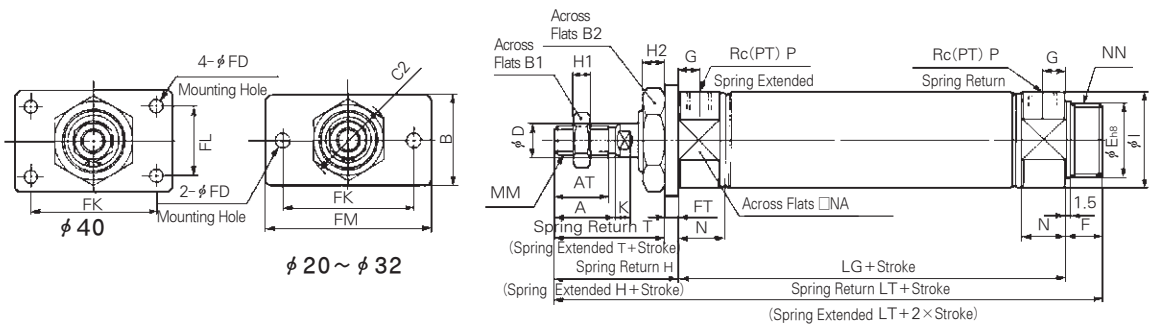
Stroke Dimension Adder

(Unit : mm)

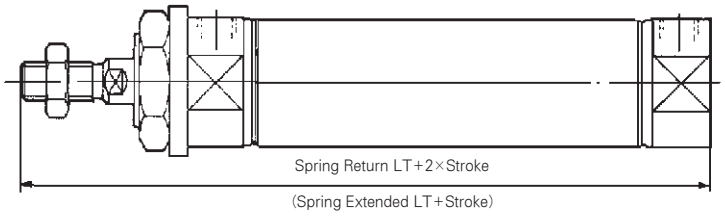
Bore size \ Stroke Symbol	1~50			51~100			101~150			151~200			201~250		
	LG	LS	LT	LG	LS	LT	LG	LS	LT	LG	LS	LT	LG	LS	LT
φ20	87	127	156	112	152	181	137	177	206	–	–	–	–	–	–
φ25	87	127	160	112	152	185	137	177	210	–	–	–	–	–	–
φ32	89	129	162	114	154	187	139	179	212	164	204	237	–	–	–
φ40	113	159	196	138	184	221	163	209	246	188	234	271	213	259	296

Rod Side Flange Type(F)

AXF (Bore Size)—(Stroke) S/T



Boss-Cut Type



※ This drawing is spring extended

(Unit : mm)

Bore Size	A	AT	B	B_1	B_2	C_2	D	E	F	FD	FT	FK	FL	FM	G	H	H_1	H_2	I	K	MM	N	NA	NN	P	T
φ20	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	7	4	60	–	75	8	41	5	8	27	5	M8×1.25	15	24	M20×1.5	1/8	37
φ25	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	7	4	60	–	75	8	45	6	8	33	5.5	M8×1.25	15	30	M26×1.5	1/8	41
φ32	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	7	4	60	–	75	8	45	6	8	37.5	5.5	M10×1.25	15	34.5	M26×1.5	1/8	41
φ40	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	7	5	66	36	82	11	50	8	10	46.5	7	M14×1.5	21.5	42.5	M32×2	1/4	45

Stroke Dimension Adder

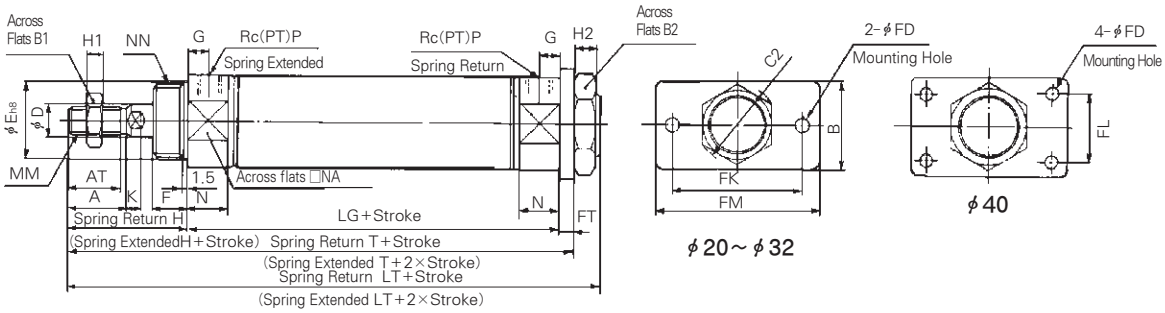
Bore size \ Stroke / Symbol	1~50		51~100		101~150		151~200		201~250	
	LG	LT	LG	LT	LG	LT	LG	LT	LG	LT
φ20	87	141	112	166	137	191	–	–	–	–
φ25	87	145	112	170	137	195	–		–	–
φ32	89	147	114	172	139	197	164	222	–	–
φ40	113	179	138	204	163	229	188	254	213	279

Boss-Cut Type

Bore size \ Stroke / Symbol	1~50	51~100	101~150	151~200	201~250
	LT	LT	LT	LT	LT
φ20	128	153	178	–	–
φ25	132	157	182	–	–
φ32	134	159	184	209	–
φ40	163	188	213	238	263

Head Side Flange Type(G)

AXG (Bore Size) — (Stroke) S T



※This Drawing is Spring Extended. (Unit : mm)

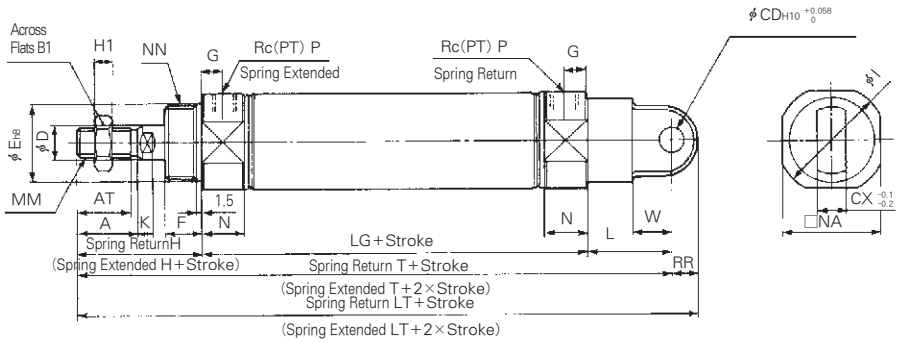
Bore Size	A	AT	B	B_1	B_2	C	D	E	F	FD	FT	FK	FL	FM	G	H	H_1	H_2	I	K	MM	N	NA	NN	P
φ20	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	7	4	60	–	75	8	41	5	8	27	5	M8×1.25	15	24	M20×1.5	1/8
φ25	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	7	4	60	–	75	8	45	6	8	33	5.5	M8×1.25	15	30	M26×1.5	1/8
φ32	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	7	4	60	–	75	8	45	6	8	37.5	5.5	M10×1.25	15	34.5	M26×1.5	1/8
φ40	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	7	5	66	36	82	11	50	8	10	46.5	7	M14×1.5	21.5	42.5	M30×2	1/4

Stroke Dimension Adder (Unit : mm)

Bore size \ Stroke Symbol	1~50			51~100			101~150			151~200			201~250		
	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT
φ20	87	132	141	112	157	166	137	182	191	–	–	–	–	–	–
φ25	87	136	145	112	161	170	137	186	195	–	–	–	–	–	–
φ32	89	138	147	114	163	172	139	188	197	164	213	222	–	–	–
φ40	113	168	179	138	193	204	163	218	229	188	243	254	213	268	279

Single Clevis Type(C)

AXC Bore Size — Stroke S/T



※ This Drawing is Spring Extended

(Unit : mm)

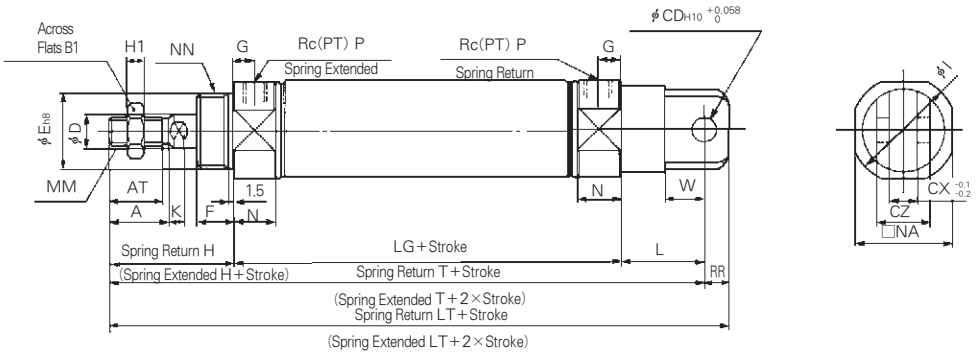
Bore Size	A	AT	B1	CD	CX	D	E	F	G	H	H1	I	K	L	MM	N	NA	NN	P	RR	W
φ20	18	15.5	13	9	10	8	20 0 -0.033	13	8	41	5	27	5	30	M8×1.25	15	24	M20×1.5	1/8	9	14
φ25	22	19.5	17	9	10	10	26 0 -0.033	13	8	45	6	33	5.5	30	M8×1.25	15	30	M26×1.5	1/8	9	14
φ32	22	19.5	17	9	10	12	26 0 -0.033	13	8	45	6	37.5	5.5	30	M10×1.25	15	34.5	M26×1.5	1/8	9	14
φ40	24	21	22	10	15	14	32 0 -0.039	16	11	50	8	46.5	7	39	M14×1.5	21.5	42.5	M32×2	1/4	11	18

Stroke Dimension Adder

Bore size \ Stroke / Symbol	1~50			51~100			101~150			151~200			201~250		
	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT
φ20	87	158	167	112	183	192	137	208	217	–	–	–	–	–	–
φ25	87	162	171	112	187	196	137	212	221	–	–	–	–	–	–
φ32	89	164	173	114	189	198	139	214	223	164	239	248	–	–	–
φ40	113	202	213	138	227	238	163	252	263	188	277	288	213	302	313

Double Clevis Type(D)

AXD — Bore Size — Stroke — S / T



※ This drawing is spring extended

(Unit : mm)

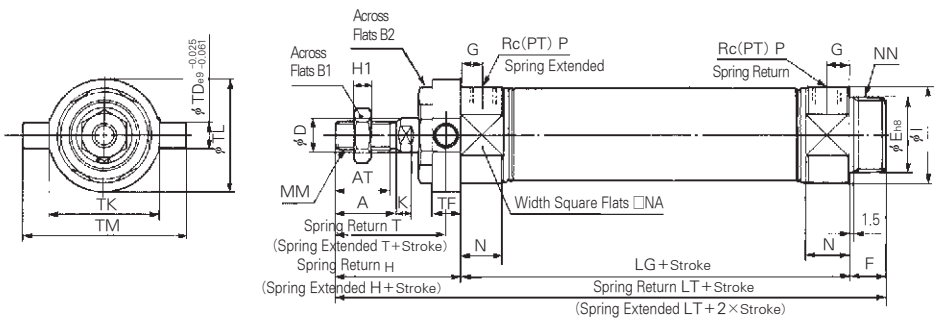
Bore Size	A	AT	B1	CD	CX	CZ	D	E	F	G	H	H1	I	K	L	MM	N	NA	NN	P	RR	W
φ20	18	15.5	13	9	10	19	8	20 0 -0.033	13	8	41	5	27	5	30	M8×1.25	15	24	M20×1.5	1/8	9	14
φ25	22	19.5	17	9	10	19	10	26 0 -0.033	13	8	45	6	33	5.5	30	M8×1.25	15	30	M26×1.5	1/8	9	14
φ32	22	19.5	17	9	10	19	12	26 0 -0.033	13	8	45	6	37.5	5.5	30	M10×1.25	15	34.5	M25×1.5	1/8	9	14
φ40	24	21	22	10	15	30	14	32 0 -0.039	16	11	50	8	46.5	7	39	M14×1.5	21.5	42.5	M32×2	1/4	11	18

Stroke Dimension Adder

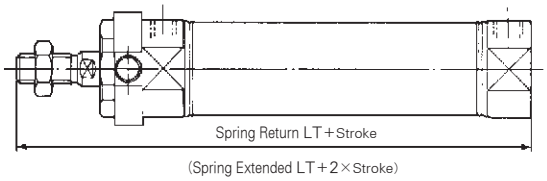
Bore size \ Stroke / Symbol	1~50			51~100			101~150			151~200			201~250		
	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT
φ20	87	158	167	112	183	192	137	208	217	–	–	–	–	–	–
φ25	87	162	171	112	187	196	137	212	221	–	–	–	–	–	–
φ32	89	164	173	114	189	198	139	214	223	164	239	248	–	–	–
φ40	113	202	213	138	227	238	163	252	263	188	277	288	213	302	313

Rod Side Trunnion Type(U)

AXU Bore Size — Stroke S T



Boss-Cut Type



※ This drawing is spring extended (Unit : mm)

Bore size	A	AT	B_1	B_2	D	E	F	G	H	H_1	I	K	MM	N	NA	NN	P	TD	TF	TK	TL	TM	T
φ20	18	15.5	13	26	8	20 $^{0}_{-0.033}$	13	8	41	5	27	5	M8×1.25	15	24	M20×1.5	1/8	8	10	32	32	52	36
φ25	22	19.5	17	32	10	26 $^{0}_{-0.033}$	13	8	45	6	33	5.5	M8×1.25	15	30	M26×1.5	1/8	9	10	40	40	60	40
φ32	22	19.5	17	32	12	26 $^{0}_{-0.033}$	13	8	45	6	37.5	5.5	M10×1.25	15	34.5	M26×1.5	1/8	9	10	40	40	60	40
φ40	24	21	22	41	14	32 $^{0}_{-0.039}$	16	11	50	8	46.5	7	M14×1.5	21.5	42.5	M32×2	1/4	10	11	53	53	77	44.5

Stroke Dimension Adder

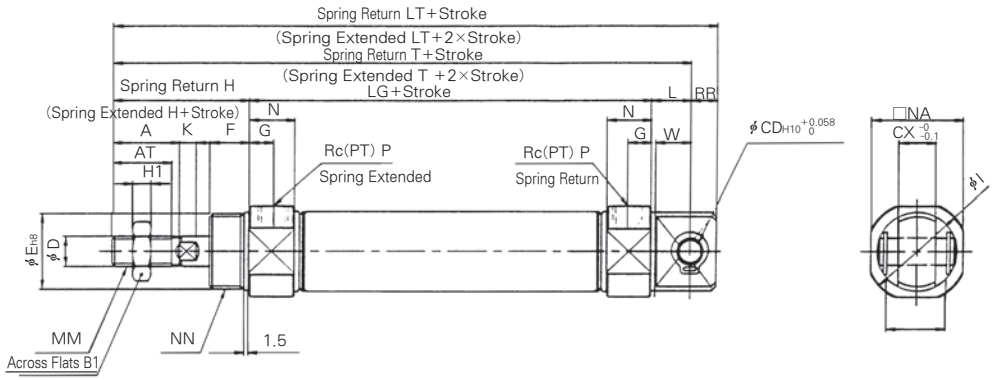
Bore size \ Stroke / Symbol	1~50		51~100		101~200		151~200		201~250	
	LG	LT	LG	LT	LG	LT	LG	LT	LG	LT
φ20	87	141	112	166	137	191	–	–	–	–
φ25	87	145	112	170	137	195	–		–	–
φ32	89	147	114	172	139	197	164	222	–	–
φ40	113	179	138	204	163	229	188	254	213	279

Boss-Cut Type

Bore size \ Stroke / Symbol	1~50	51~100	101~150	151~200	201~250
	LT	LT	LT	LT	LT
φ20	128	153	178	–	–
φ25	132	157	182	–	–
φ32	134	159	184	209	–
φ40	163	188	213	238	263

Integrated Clevis Type(E)

AXE Bore Size — Stroke ST



※ This drawing is spring extended.

(Unit : mm)

Bore Size	A	AT	B_1	CD	CX	D	E	F	G	H	H_1	I	K	L	LV	MM	N	NA	NN	P	RR	W
φ20	18	15.5	13	8	12	8	20 $^{0}_{-0.033}$	13	8	41	5	27	5	12	18.4	M8×1.25	15	24	M20×1.5	1/8	9	11.5
φ25	22	19.5	17	8	12	10	26 $^{0}_{-0.033}$	13	8	45	6	33	5.5	12	18.4	M8×1.25	15	30	M26×1.5	1/8	9	11.5
φ32	22	19.5	17	10	20	12	26 $^{0}_{-0.033}$	13	8	45	6	37.5	5.5	15	28	M10×1.25	15	34.5	M26×1.5	1/8	12	14.5
φ40	24	21	22	10	20	14	32 $^{0}_{-0.039}$	16	11	50	8	46.5	7	15	28	M14×1.5	21.5	42.5	M32×2	1/4	12	14.5

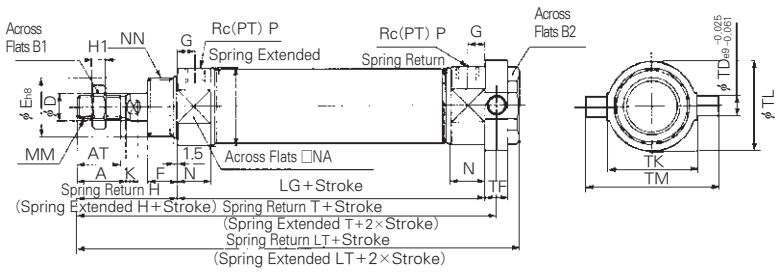
Stroke Dimension Adder

(Unit : mm)

Bore size \ Stroke / Symbol	1~50			51~100			101~150			151~200			201~250		
	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT
φ20	87	140	149	112	165	174	137	190	199	–	–	–	–	–	–
φ25	87	144	153	112	169	178	137	194	203	–	–	–	–	–	–
φ32	89	149	161	114	174	186	139	199	211	164	224	236	–	–	–
φ40	113	178	190	138	203	215	163	228	240	188	253	265	213	278	290

Head Side Trunnion Type(T)

AXT (Bore Size) — (Stroke) ST



(Unit : mm)

※ This drawing is spring extended

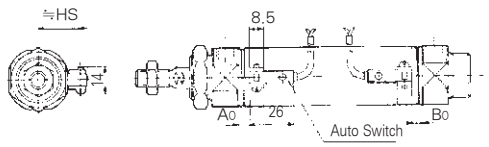
Bore Size	A	AT	B1	B2	D	E h8	F	G	H	H1	I	K	MM	N	NA	NN	P	TD	TF	TK	TL	TM
φ20	18	15.5	13	26	8	20 $^{0}_{-0.033}$	13	8	41	5	27	5	M8×1.25	15	24	M20×1.5	1/8	8	10	32	32	52
φ25	22	19.5	17	32	10	26 $^{0}_{-0.033}$	13	8	45	6	33	5.5	M8×1.25	15	30	M26×1.5	1/8	9	10	40	40	60
φ32	22	19.5	17	32	12	26 $^{0}_{-0.033}$	13	8	45	6	37.5	5.5	M10×1.25	15	34.5	M26×1.5	1/8	9	10	40	40	60
φ40	24	21	22	41	14	32 $^{0}_{-0.039}$	16	11	50	8	46.5	7	M14×1.5	21.5	42.5	M32×2	1/4	10	11	53	53	77

Stroke / Symbol / Bore size	1~50			51~100			101~150			151~200			201~250		
	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT
φ20	87	133	143	112	158	168	137	183	193	–	–	–	–	–	–
φ25	87	137	147	112	162	172	137	187	197	–	–	–	–	–	–
φ32	89	139	149	114	164	174	139	189	199	164	214	224	–	–	–
φ40	113	168.5	179	138	193.5	204	163	218.5	229	188	243.5	254	213	268.5	279

Reed Switch Setting Position (Stroke End)

W5

(Unit : mm)



Auto Switch Mounting, Minimum Possible Cylinder Stroke

Auto Switch Type	No. of auto switch				1pc
	2pcs.		npcs.		
	Different Surface	Same Surface	Different Surface	Same Surface	
W5	15	50	$15+45(\frac{n-2}{2})$ (n=2,4,6,8…)	50+45(n-2)	10

Auto Switch Setting Position(Stroke End)

(Unit : mm)

Auto Switch Type	Bore Size	Spring Return						Spring Extended						HS
		AO					BO	AO	BO					
		~50ST	51~100ST	101~150ST	151~200ST	201 ~250ST			~50ST	51~100ST	101~150ST	151~200ST	201 ~250ST	
W5	φ20	32	57	82	107	132	6	7	31	56	81	106	131	22.5
	φ25	32	57	82	107	132	6	7	31	56	81	106	131	25
	φ32	33	58	83	108	133	7	8	32	57	82	107	132	28.5
	φ40	38	63	88	113	138	12	13	37	62	87	112	137	32.5

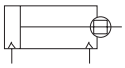
Series AXK

Non-Rotating Piston Rod Type/Double Acting:Single Rod

Bore Size(mm) : Ø20, Ø25, Ø32, Ø40

- NUMEROUS MOUNTING OPTIONS
- MAGNET STANDARD FOR AUTO SWITCH
- BUMPERS STANDARD
- DESIGNED FOR NON-LUBRICATED SERVICE
- COMPACT LIGHT DESIGN
- REPLACEABLE ROD GLAND
- CUSTOM DESIGNED PISTON ROD FOR NON-ROTATION

Double Acting/Single Rod



How to Order

AXK | L | 40 | 150 | J | ○ | W5 | ○

1 | 2 | 3 | 4 | 5 | 6 | 7 | 8

1 Non-Rotating Piston Rod Type
※ Built-in Magnet Standard

2 Mounting
- B : Basic Type
- L : Axial Foot Type
- F : Rod Side Flange Type
- G : Head Side Flange Type
- C : Single Clevis Type
- D : Double Clevis Type
- T : Head Side Trunnion Type
- U : Rod Side Trunnion Type
- E : Integrated Clevis Type
- BZ : Boss-Cut Basic Type
- FZ : Boss-Cut Flange Type
- UZ : Boss-Cut Trunnion Type

3 Bore size(mm)
- 20 : φ20
- 25 : φ25
- 32 : φ32
- 40 : φ40

4 Stroke (mm)
- φ20 : 25, 50, 75, 100, 125, 150, 200, 250, 300
- φ25 : 25, 50, 75, 100, 125, 150, 200, 250, 300
- φ32 : 25, 50, 75, 100, 125, 150, 200, 250, 300
- φ40 : 25, 50, 75, 100, 125, 150, 200, 250, 300

5 Rod Boot Option
- Blank : None
- J : Nylon Tarpaulin
- K : Neoprene Cloth

6 Special Option
- Blank : Standard type
- XC16 : Copper-free

7 Auto Switch
(Band mounted type)
(Grommet)
- Blank : None
- W5 : Reed Switch, 0.5m Lead Wire
- W5L : Reed Switch, 3m Lead Wire

8 Number of Auto Switches
- Blank : 2 pcs
- S : 1 pc
- N : N pcs

PART No. of Mounting Bracket

Bore size(mm)	φ20	φ25	φ32	φ40
※Axial foot	TCM-L020B	TCM-L032B		TCM-L040B
Flange	TCM-F020B	TCM-F032B		TCM-F040B
Single clevis	TCM-C020B	TCM-C032B		TCM-C040B
Double clevis	TCM-D020B	TCM-D032B		TCM-D040B
Trunnion(With nut)	TCM-T020B	TCM-T032B		TCM-T040B

※ 2 pcs. Required Per Cylinder

PART No. of Auto Switch Mounting Band

Auto Switch Model	Bore size(mm)			
	φ20	φ25	φ32	φ40
W5	TBM2-020	TBM2-025	TBM2-032	TBM2-040

Model

Bore Size(mm)	ϕ20	ϕ25	ϕ32	ϕ40
Action	Double Acting Single Rod			
Cushion	Rubber Cushion (Standard)			
Piping Method	Rc(PT) 1/8	Rc(PT) 1/8	Rc(PT) 1/8	Rc(PT) 1/4

Specifications

Action		Double Acting Single Rod
Fluid		Air
Proof pressure		1.5 MPa (213psi)
Max. Operating Pressure		1.0 MPa (140psi)
Min. Operating Pressure		0.05 MPa (7psi)
Ambient and Fluid Temperature		-10℃~+70℃ (14~ 158°F)
Lubrication		None (Non-Lube)
Stroke Tolerance		$^{+1.4}_{0}$ mm
Mounting		Basic Type, Axial Foot Type, Rod Side Flange Type, Head Side Flange Type, Single Clevis Type, Head Side Trunnion Type, Rod Side Trunnion Type, Integrated Clevis, Type Boss-Cut Type
Non-Rotating Accuracy	ϕ20, ϕ25	±0.8°
	ϕ32, ϕ40	±0.5°

Piston Speed

Bore Size(mm)	ϕ20	ϕ25	ϕ32	ϕ40
Piston Speed(mm/sec)	50 ~ 500			
Allowable Kinetic Energy(kgf/cm)	2.7	4	6.5	12

Auto Switch Specifications

Mounting	Lead Wire Entry	Reed Switch
Band Mounting Type	Grommet	W5

Material of Boot

Symbol	Material of Boot	Max. Ambient Temperature
J	Nylon Tarpaulin	60℃ (140°F)
K	Neoprene Cloth	※110℃ (230°F)

※ The max. ambient temperature of gaiters only.

Boss-Cut Type

Boss for the head cover bracket is eliminated and the total length of the cylinder is shortened.

Compared to the total length of cylinder (mm)

ϕ20	ϕ25	ϕ32	ϕ40
▼13	▼13	▼13	▼16

Mounting : ●Boss-Cut Basic Type(BZ) ●Boss-Cut Flange Type(FZ) ●Boss-Cut Trunnion Type(UZ)

Mounting and Accessories

Mounting \ Accessories	Standard			Option		
	Mounting Nut	Rod End Nut	Clevis Pin	Knuckle Joint	Double Knuckle Joint	Boot
Basic Type	○(1pc.)	○	—	○	○	○
Axial Foot Type	○(2)	○	—	○	○	○
Rod Side Flange Type	○(1)	○	—	○	○	○
Head Side Flange Type	○(1)	○	—	○	○	○
Intergrated Clevis Type	—	○	—	○	○	○
Single Clevis Type	—	○	—	○	○	○
Double Clevis Type	—	○	○	○	○	○
Head Side Trunnion Type	○(1)	○	—	○	○	○
Rod Side Trunnion Type	○(1)	○	—	○	○	○
Boss-Cut Basic Type	○(1)	○	—	○	○	○
Boss-Cut Flange Type	○(1)	○	—	○	○	○
Boss-Cut Trunnion Type	○(1)	○	—	○	○	○
Note					With pin	

Weight Table

kgf(lbf)

Bore Size(mm)		ϕ20	ϕ25	ϕ32	ϕ40
Basic weight	Basic Type	0.14(0.31)	0.21(0.46)	0.28(0.62)	0.58(1.26)
Mornting Bracket Weight	Axial Foot Type	0.29(0.64)	0.38(0.82)	0.44(0.97)	0.84(1.85)
	Flange Type	0.20(0.44)	0.30(0.66)	0.37(0.82)	0.69(1.52)
	Integrated Clevis Type	0.12(0.26)	0.19(0.42)	0.27(0.60)	0.53(1.17)
	Single Clevis Type	0.18(0.40)	0.26(0.55)	0.32(0.71)	0.66(1.46)
	Double Clevis Type	0.19(0.42)	0.27(0.60)	0.33(0.73)	0.70(1.54)
	Trunnion Type	0.18(0.40)	0.28(0.62)	0.34(0.75)	0.67(1.48)
	Boss-Cut Basic Type	0.13(0.29)	0.19(0.42)	0.26(0.57)	0.54(1.19)
	Boss-Cut Flange Type	0.19(0.42)	0.29(0.62)	0.35(0.77)	0.66(1.46)
	Boss-Cut Trunnion Type	0.17(0.37)	0.26(0.57)	0.32(0.71)	0.64(1.41)
Additional weight for each 50 mm of stroke		0.04(0.09)	0.08(0.15)	0.09(0.20)	0.14(0.31)
Accessories Weight	Single Knuckle joint	0.06(0.13)	0.06(0.13)	0.06(0.13)	0.23(0.51)
	Double Knuckle Joint (with pin)	0.08(0.15)	0.08(0.15)	0.08(0.15)	0.20(0.44)

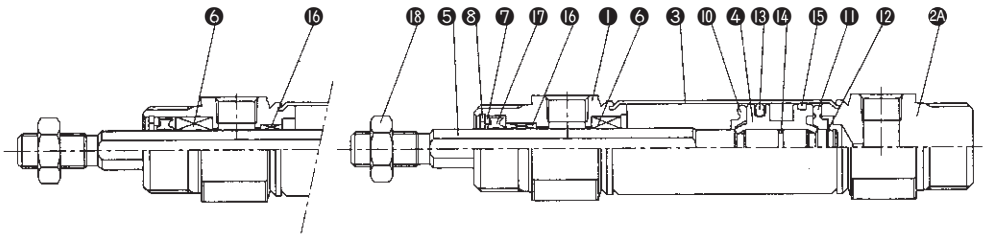
Calculation Example

AXKL 32-100

- Basic weight : 0.44(Foot type ϕ32)
- Additional weight : 0.09/50 stroke
- Cylinder stroke : 100 stroke

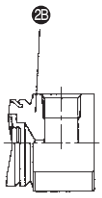
0.44+0.09×100/50=0.62kgf

Construction / Parts List

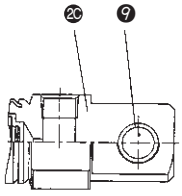


ϕ20 ϕ25~ϕ40

Boss-Cut Type



Integrated Clevis Type



Parts

No	Description	Material	Remarks
❶	Rod Cover	Alluminum Alloy	White Alumite
2A	Head Cover-A	〃	〃
2B	Head Cover-B	〃	〃
2C	Head Cover-C	〃	〃
❸	Cylinder Tube	stainless steel	-
❹	Piston	Alluminum Alloy	Chromate
❺	Pistan Rod	Stainless steel	
❻	Guide Bush	Sintered Metal	
❼	Retaining Ring	Rolled steel	Nickel Plated
❽	Stopper Ring	Carbon Tool steel	〃
❾	Guide Bush	Sintered Metal	
❿	DAMPER A	Urethane	
⓫	DAMPER B	〃	

No	Description	Material	Remarks
⓬	Stopper Ring	Carbon Tool steel	
⓭	Piston Packing	NBR	
⓮	Piston Gasket	NBR	
⓯	Wear Ring	Resin	
⓰	Bush	Brass	
⓲	Rod End Nut		Nickel Plated

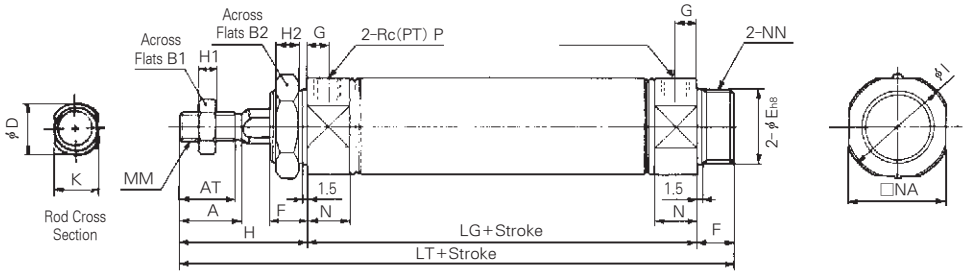
Packing List

No	Description	Material	Bore Size (mm)			
			20	25	32	40
⓱	Rod Packing	NBR	SORA-10	SORA-10	SORA-12	SORA-16

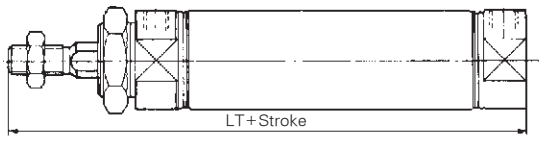
Basic Type(B)

AXKB (Bore Size) — (Stroke) ○

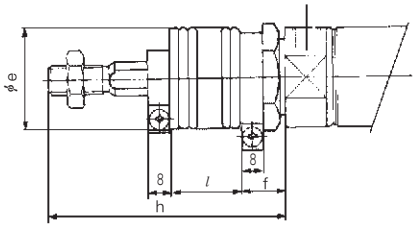
Standard Type



Boss-cut type



With Rod Boot



(mm)

Bore Size	A	AT	B_1	B_2	D	E	F	G	H	H_1	H_2	I	K	MM	N	NA	NN	P	LG	LT
φ20	18	15.5	13	26	$10^{-0.01}_{-0.05}$	$20^{0}_{-0.033}$	13	8	41	5	8	27	$8^{-0.01}_{-0.05}$	M8×1.25	15	24	M20×1.5	1/8	62	116
φ25	22	19.5	17	32	$10^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	8	33	$8^{-0.01}_{-0.05}$	M8×1.25	15	30	M26×1.5	1/8	62	120
φ32	22	19.5	17	32	$12^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	8	37.5	$10^{-0.01}_{-0.05}$	M10×1.25	15	34.5	M26×1.5	1/8	64	122
φ40	24	21	22	41	$16^{-0.01}_{-0.05}$	$32^{0}_{-0.039}$	16	11	50	8	10	46.5	$14^{-0.01}_{-0.05}$	M14×1.5	21.5	42.5	M32×2	1/4	88	154

With Rod Boot

(mm)

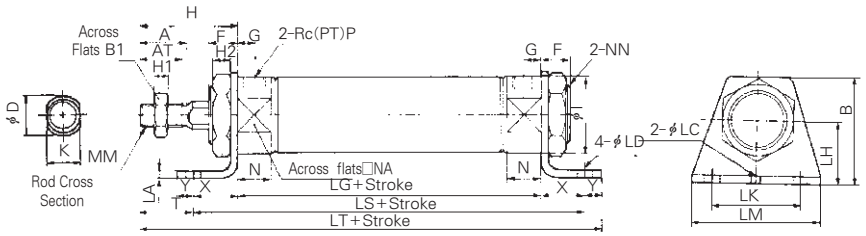
Bore Size	e	f	h					l				
			1~50ᵉ	51~100ᵉ	101~150ᵉ	151~200ᵉ	201~300ᵉ	1~50ᵉ	51~100ᵉ	101~150ᵉ	151~200ᵉ	201~300ᵉ
φ20	30	16	68	81	93	106	131	12.5	25	37.5	50	75
φ25	30	16	72	85	97	110	135	12.5	25	37.5	50	75
φ32	30	16	72	85	97	110	135	12.5	25	37.5	50	75
φ40	40	18	77	90	102	115	140	12.5	25	37.5	50	75

Boss-Cut Type

Bore Size	LT
φ20	103
φ25	107
φ32	109
φ40	138

Axial Foot Type(L)

AXKL Bore Size — Stroke

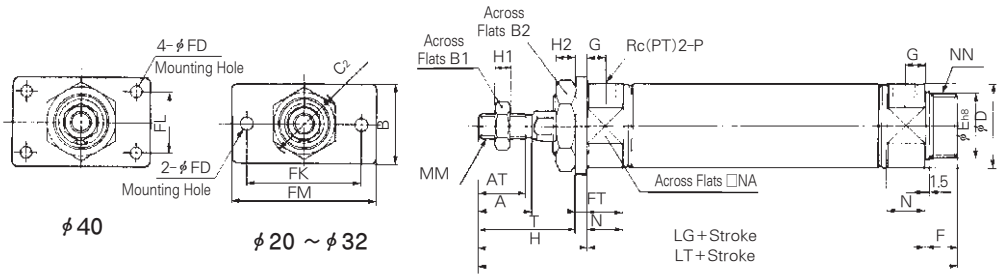


(mm)

Bore Size	A	AT	B	B_1	B_2	D	F	G	H	H_1	H_2	I	K	LC	LD	LH	LS	LA	LK	LM	MM	N	NA	NN	P	LG	X	Y	T	LT
φ20	18	15.5	40	13	26	$10^{-0.01}_{-0.05}$	13	8	41	5	8	27	$8^{-0.01}_{-0.05}$	4	6.8	25	102	3.2	40	55	M8×1.25	15	24	M20×1.5	1/8	62	20	8	21	131
φ25	22	19.5	47	17	32	$10^{-0.01}_{-0.05}$	13	8	45	6	8	33	$8^{-0.01}_{-0.05}$	4	6.8	28	102	3.2	40	55	M8×1.25	15	30	M26×1.5	1/8	62	20	8	25	135
φ32	22	19.5	47	17	32	$12^{-0.01}_{-0.05}$	13	8	45	6	8	37.5	$10^{-0.01}_{-0.05}$	4	6.8	28	104	3.2	40	55	M10×1.25	15	34.5	M26×1.5	1/8	64	20	8	25	137
φ40	24	21	54	22	41	$16^{-0.01}_{-0.05}$	16	11	50	8	10	46.5	$14^{-0.01}_{-0.05}$	4	7	30	134	3.2	55	75	M14×1.5	21.5	42.5	M32×2	1/4	88	23	10	27	171

Rod Side Flange Type(F)

AXKF Bore Size — Stroke



(mm)

Bore Size	A	AT	B	B_1	B_2	C_2	D	E	F	FD	FT	FK	FL	FM	G	H	H_1	H_2	I	K	MM
φ20	18	15.5	34	13	26	30	$10^{-0.01}_{-0.05}$	$20^{0}_{-0.033}$	13	7	4	60	–	75	8	41	5	8	27	$8^{-0.01}_{-0.05}$	M8×1.25
φ25	22	19.5	40	17	32	37	$10^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	7	4	60	–	75	8	45	6	8	33	$8^{-0.01}_{-0.05}$	M8×1.25
φ32	22	19.5	40	17	32	37	$12^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	7	4	60	–	75	8	45	6	8	37.5	$10^{-0.01}_{-0.05}$	M10×1.25
φ40	24	21	52	22	41	47.3	$16^{-0.01}_{-0.05}$	$32^{0}_{-0.039}$	16	7	5	66	36	82	11	50	8	10	46.5	$14^{-0.01}_{-0.05}$	M14×1.5

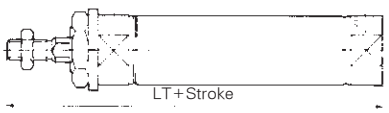
(mm)

Bore Size	N	NA	NN	P	LG	T	LT
φ20	15	24	M20×1.5	1/8	62	37	116
φ25	15	30	M26×1.5	1/8	62	41	120
φ32	15	34.5	M26×1.5	1/8	64	41	122
φ40	21.5	42.5	M32×2	1/4	88	45	154

Boss-Cut Type

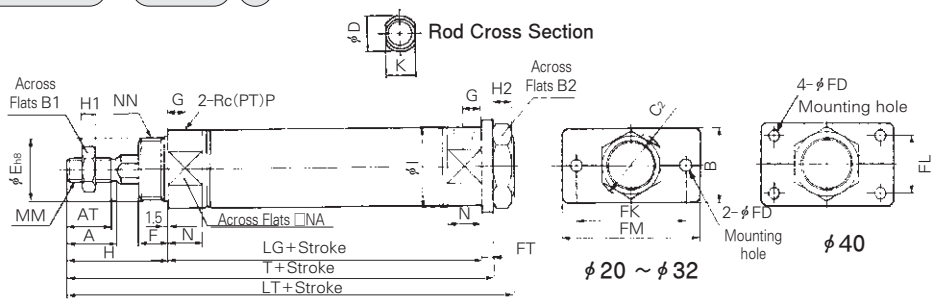
Bore Size	LT
φ20	103
φ25	107
φ32	109
φ40	138

Boss-cut type



Head Side Flange Type(G)

AXKG Bore Size — Stroke



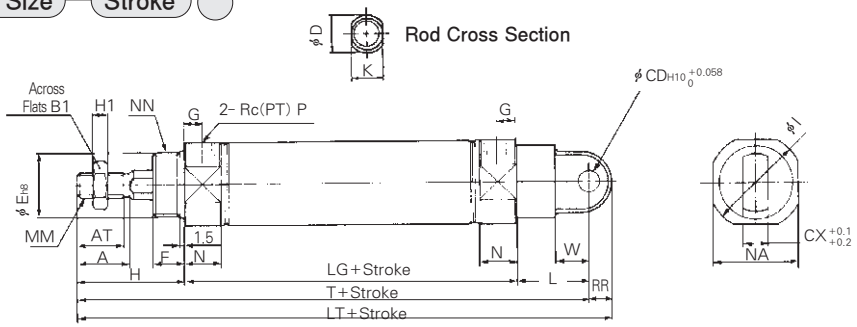
(mm)

Bore Size	A	AT	B	B_1	B_2	C_2	D	E	F	FD	FT	FK	FL	FM	G	H	H_1	H_2	I	K	MM
φ20	18	15.5	34	13	26	30	$10^{-0.01}_{-0.05}$	$20^{0}_{-0.033}$	13	7	4	60	–	75	8	41	5	8	27	$8^{-0.01}_{-0.05}$	M8×1.25
φ25	22	19.5	40	17	32	37	$10^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	7	4	60	–	75	8	45	6	8	33	$8^{-0.01}_{-0.05}$	M8×1.25
φ32	22	19.5	40	17	32	37	$12^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	7	4	60	–	75	8	45	6	8	37.5	$10^{-0.01}_{-0.05}$	M10×1.25
φ40	24	21	52	22	41	47.3	$16^{-0.01}_{-0.05}$	$32^{0}_{-0.039}$	16	7	5	66	36	82	10	50	8	10	46.5	$14^{-0.01}_{-0.05}$	M14×1.5

Bore Size	N	NA	NN	P	LG	T	LT
φ20	15	24	M20×1.5	1/8	62	107	116
φ25	15	30	M26×1.5	1/8	62	111	120
φ32	15	34.5	M26×1.5	1/8	64	113	122
φ40	21.5	42.5	M32×2	1/4	88	143	154

Single Clevis Type (C)

AXKC Bore Size — Stroke



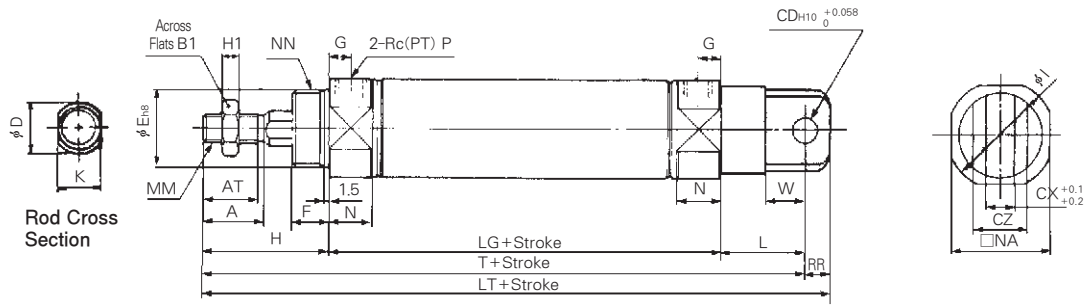
(mm)

Bore Size	A	AT	B_1	CD	CX	D	E	F	G	H	H_1	I	K	L	MM	N	NA	NN	P	RR
φ20	18	15.5	13	9	10	$10^{-0.01}_{-0.05}$	$20^{0}_{-0.033}$	13	8	41	5	27	$8^{-0.01}_{-0.05}$	30	M8×1.25	15	24	M20×1.5	1/8	9
φ25	22	19.5	17	9	10	$10^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	33	$8^{-0.01}_{-0.05}$	30	M8×1.25	15	30	M26×1.5	1/8	9
φ32	22	19.5	17	9	10	$12^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	37.5	$10^{-0.01}_{-0.05}$	30	M10×1.25	15	34.5	M26×1.5	1/8	9
φ40	24	21	22	10	15	$16^{-0.01}_{-0.05}$	$32^{0}_{-0.039}$	16	11	50	8	46.5	$14^{-0.01}_{-0.05}$	39	M14×1.5	21.5	42.5	M32×2	1/4	11

Bore Size	LG	W	T	LT
φ20	62	14	133	142
φ25	62	14	137	146
φ32	64	14	139	148
φ40	88	18	177	188

Double Clevis Type(D)

AXKD Bore Size — Stroke

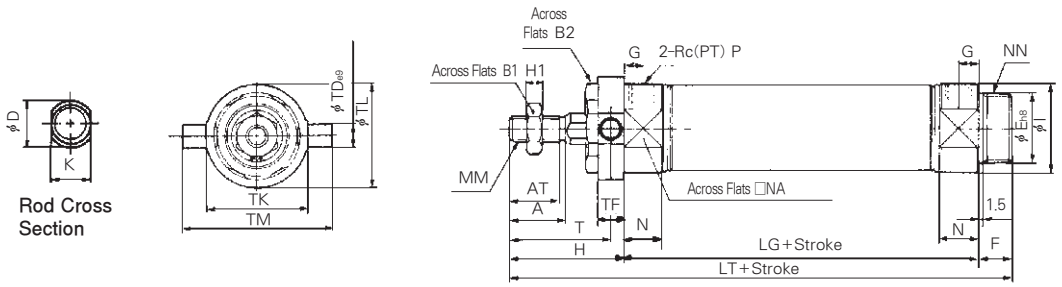


(mm)

Bore Size	A	AT	B1	CD	CX	CZ	D	E	F	G	H	H1	I	K	L	MM	N	NA	NN	P	RR	LG	W	T	LT
φ20	18	15.5	13	9	10	19	$10^{-0.01}_{-0.05}$	$20^{0}_{-0.033}$	13	8	41	5	27	$8^{-0.01}_{-0.05}$	30	M8×1.25	15	24	M20×1.5	1/8	9	62	14	133	142
φ25	22	19.5	17	9	10	19	$10^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	33	$8^{-0.01}_{-0.05}$	30	M8×1.25	15	30	M26×1.5	1/8	9	62	14	137	146
φ32	22	19.5	17	9	10	19	$12^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	37.5	$10^{-0.01}_{-0.05}$	30	M10×1.25	15	34.5	M26×1.5	1/8	9	64	14	139	148
φ40	24	21	22	10	15	30	$16^{-0.01}_{-0.05}$	$32^{0}_{-0.039}$	16	11	50	8	46.5	$14^{-0.01}_{-0.05}$	39	M14×1.5	21.5	42.5	M32×2	1/4	11	88	18	177	188

Rod Side Trunnion Type(U)

AXKU Bore Size — Stroke



(mm)

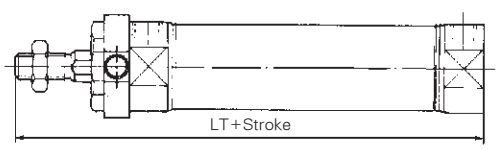
Bore Size	A	AT	B1	B2	D	E	F	G	H	H1	I	K	MM	N	NA	NN	P	LG	TD	TF
φ20	18	15.5	13	26	$10^{-0.01}_{-0.05}$	$20^{0}_{-0.033}$	13	8	41	5	27	$8^{-0.01}_{-0.05}$	M8×1.25	15	24	M20×1.5	1/8	62	8	10
φ25	22	19.5	17	32	$10^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	33	$8^{-0.01}_{-0.05}$	M8×1.25	15	30	M26×1.5	1/8	62	9	10
φ32	22	19.5	17	32	$12^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	37.5	$10^{-0.01}_{-0.05}$	M10×1.25	15	34.5	M26×1.5	1/8	64	9	10
φ40	24	21	22	41	$16^{-0.01}_{-0.05}$	$32^{0}_{-0.039}$	16	11	50	8	46.5	$14^{-0.01}_{-0.05}$	M14×1.5	21.5	42.5	M32×2	1/4	88	10	11

Bore Size	TK	TL	TM	T	LT
φ20	32	32	52	36	116
φ25	40	40	60	40	120
φ32	40	40	60	40	122
φ40	53	53	77	44.5	154

Boss-Cut Type

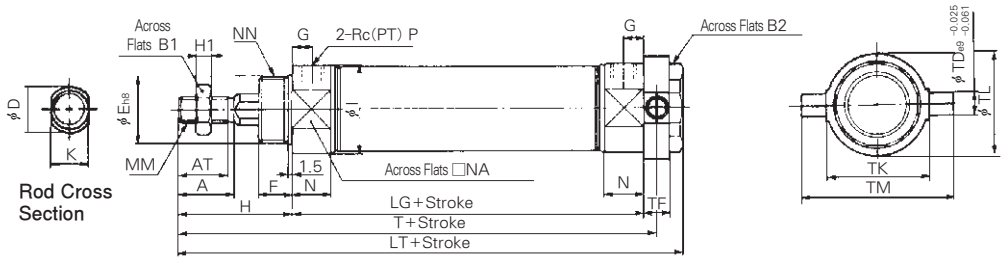
Bore Size	LT
φ20	103
φ25	107
φ32	109
φ40	138

Boss-Cut Type



Head Side Trunnion Type(T)

AXKT Bore size — Stroke



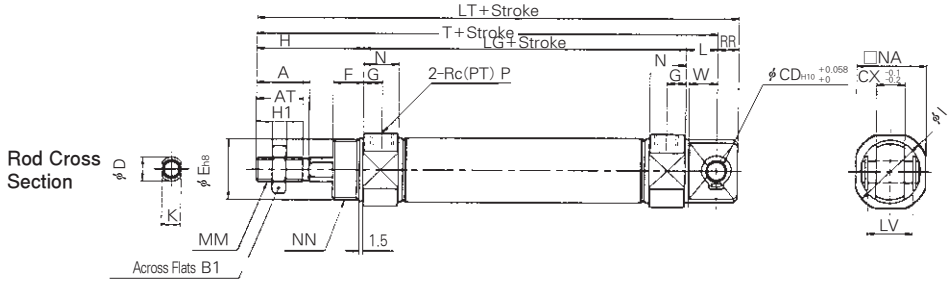
(mm)

Bore Size	A	AT	B_1	B_2	D	E	F	G	H	H_1	I	K	MM	N	NA	NN	P	LG	TD	TF
φ20	18	15.5	13	26	$10^{-0.01}_{-0.05}$	$20^{0}_{-0.033}$	13	8	41	5	27	$8^{-0.01}_{-0.05}$	M8×1.25	15	24	M20×1.5	1/8	62	8	10
φ25	22	19.5	17	32	$10^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	33	$8^{-0.01}_{-0.05}$	M8×1.25	15	30	M26×1.5	1/8	62	9	10
φ32	22	19.5	17	32	$12^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	37.5	$10^{-0.01}_{-0.05}$	M10×1.25	15	34.5	M26×1.5	1/8	64	9	10
φ40	24	21	22	41	$16^{-0.01}_{-0.05}$	$32^{0}_{-0.039}$	16	11	50	8	46.5	$14^{-0.01}_{-0.05}$	M14×1.5	21.5	42.5	M32×2	1/4	88	10	11

Bore Size	TK	TL	TM	T	LT
φ20	32	32	52	108	118
φ25	40	40	60	112	122
φ32	40	40	60	114	124
φ40	53	53	77	143.5	154

Integrated Clevis Type(E)

AXKE Bore Size — Stroke



(mm)

Bore Size	A	AT	B_1	CD	CX	D	E	F	G	H	H_1	I	K	L	MM	N	NA	NN	P	RR
φ20	18	15.5	13	8	12	$10^{-0.01}_{-0.05}$	$20^{0}_{-0.033}$	13	8	41	5	27	$8^{-0.01}_{-0.05}$	12	M8×1.25	15	24	M20×1.5	1/8	9
φ25	22	19.5	17	8	12	$10^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	33	$8^{-0.01}_{-0.05}$	12	M8×1.25	15	30	M26×1.5	1/8	9
φ32	22	19.5	17	10	20	$12^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	37.5	$10^{-0.01}_{-0.05}$	15	M10×1.25	15	34.5	M26×1.5	1/8	12
φ40	24	21	22	10	20	$16^{-0.01}_{-0.05}$	$32^{0}_{-0.039}$	16	11	50	8	46.5	$14^{-0.01}_{-0.05}$	15	M14×1.5	21.5	42.5	M32×2	1/4	12

Bore Size	LG	W	T	LT	LV
φ20	62	11.5	115	124	18.4
φ25	62	11.5	119	128	18.4
φ32	64	14.5	124	136	28
φ40	88	14.5	153	165	28

Series AXKS(T)

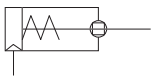
Non-Rotating Piston Rod Type/Single Acting:Spring Return, Spring Extended

Bore Size(mm) : Ø20, Ø25, Ø32, Ø40

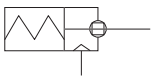
- NUMEROUS MOUNTING OPTIONS
- MAGNET STANDARD FOR AUTO SWITCH
- BUMPERS STANDARD
- DESIGNED FOR NON-LUBRICATED SERVICE
- COMPACT LIGHT DESIGN
- REPLACEABLE ROD GLAND
- CUSTOM DESIGNED PISTON ROD FOR NON-ROTATION AND LONG ROD SEAL LIFE

Symbol

Single Acting Spring Return



Single Acting Spring Extended



How to Order

AXK | L | 32 | 50 | S | | W5 | |

1 | 2 | 3 | 4 | 5 | 6 | 7 | 8

1 Non-Rotating Piston Rod Type
※ Built-in Magnet Standard

2 Mounting
- B : Basic Type
- L : Axial Foot Type
- F : Rod Side Flange Type
- G : Head Side Flange Type
- C : Single Clevis Type
- D : Double Clevis Type
- T : Head Side Trunnion Type
- U : Rod Side Trunnion Type
- E : Integrated Clevis Type
- BZ : Boss-Cut Basic Type
- FZ : Boss-Cut Flange Type
- UZ : Boss-Cut Trunnion Type

3 Bore Size(mm)
- 20: ϕ20
- 25: ϕ25
- 32: ϕ32
- 40: ϕ40

4 Stroke/mm
- ϕ20 : 25, 50, 75, 100, 125, 150
- ϕ25 : 25, 50, 75, 100, 125, 150
- 32 : 25, 50, 75, 100, 125, 150, 200
- 40 : 25, 50, 75, 100, 125, 150, 200, 250

5 Action
- S : Single Acting Spring Return
- T : Single Acting Spring Extend

6 Special Option
- Blank : Standard Type
- XC16 : Copper-Free

7 Auto Switch
(Band mounted type)
(Grommet)
- Blank : None
- W5 : Reed Switch, 0.5m Lead Wire
- W5L : Reed Switch, 3m Lead Wire

8 Number of Auto Switches
- Blank : 2 pcs
- S : 1 pc
- N : N pcs

PART No. of Mounting Bracket

Bore Size(mm)	20	25, 32	40
※Axial foot	TCM-L020B	TCM-L032B	TCM-L040B
Flange	TCM-F020B	TCM-F032B	TCM-F040B
Single Clevis	TCM-C020B	TCM-C032B	TCM-C040B
Double Clevis	TCM-D020B	TCM-D032B	TCM-D040B
Trunnion (With nut)	TCM-T020B	TCM-T032B	TCM-T040B

2pcs. Required per one cylinder.

PART No. of Auto swich Mounting Band

Auto Switch Model	Bore Size(mm)			
	20	25	32	40
W5	TBM2-020	TBM2-025	TBM2-032	TBM2-040

Model

Bore Size(mm)		φ20	φ25	φ32	φ40
Type		Air Cylinder			
Cushion		Rubber Cushion (Standard)			
Piping Method	Screwed Type	Rc(PT)1/8	Rc(PT)1/8	Rc(PT)1/8	Rc(PT)1/4
Auto Switch (Band Mounted Type)		Reed Auto Switch /W5			

Specifications

Action		Spring Return	Spring Extended
Fluid		Air	
Proof Pressure		1.5 MPa (213psi)	
Max. Operating Pressure		1.0 MPa (140psi)	
Min. Operating Pressure		0.18Mpa (25psi)	0.23Mpa (32psi)
Ambient and Fluid Temperature		-10~+70℃ (14~158℉)	
Lubrication		None (Non-Lube)	
Thread Tolerance		KS 2 Class	
Stroke Tolerance		$^{+1.4}_{0}$ mm	
Mounting		Basic Type, Axial Foot Type, Rod Side Flange Type, Head Side Flange Type, Single Clevis Type, Double Clevis Type, Rod Side Trunnion Type, Head Side Trunnion Type, Integrated Clevis Type, Boss-Cut Type.	
Non-Rotating Accuracy	φ20, φ25	±0.8°	
	φ32, φ40	±0.5°	

Piston Speed

Bore Size (mm)	φ20	φ25	φ32	φ40
Piston Speed (mm/sec)	50~500			
Allowable Kinetic Energy (kgf-cm)	2.7	4	6.5	12

Auto Switch Specifications

Mounting	Lead Wire Entry	Reed Switch
Band Mounting Type	Grommet	W5

Boss-Cut Type

Boss for the head cover bracket is eliminated and the total length of the cylinder is shortened.

Compared to the Total Length of Cylinder

(Compared to the basic type) (mm)

ϕ20	ϕ25	ϕ32	ϕ40
▼13	▼13	▼13	▼16

Mounting

- Boss-Cut Basic Type(BZ)
- Boss-Cut Flange Type(FZ)
- Boss-Cut Trunnion Type(UZ)

※ Spring return/( ):spring exlended

Mounting and Accessories

Accessories / Mounting	Standard			Option	
	Mounting Nut	Rod End Nut	Clevis Pin	Single Knuckle Joint	Double Knuckle Joint
Basic Type	O(1pc.)	O	-	O	O
Axial Foot Type	O(2)	O	-	O	O
Rod Side Flange Type	O(1)	O	-	O	O
Head Side Flange Type	O(1)	O	-	O	O
Integrated Clevis Type	-	O	-	O	O
Single Clevis Type	-	O	-	O	O
Double Clevis Type	-	O	O	O	O
Head Side Trunnion Type	O(1)	O	-	O	O
Rod Side Trunnion Type	O(1)	O	-	O	O
Boss-Cut Basic Type	O(1)	O	-	O	O
Boss-Cut Flange Type	O(1)	O	-	O	O
Boss-Cut Trunnion Type	O(1)	O	-	O	O
Note					With pin

Single Acting Spring Return(Spring Extended)

kgf

Bore Size(mm)		ϕ20	ϕ25	ϕ32	ϕ40
Basic Weight	25 Stroke	0.21(0.20)	0.31(0.30)	0.43(0.41)	0.78(0.75)
	50 Stroke	0.23(0.21)	0.34(0.33)	0.48(0.45)	0.86(0.83)
	75 Stroke	0.29(0.25)	0.43(0.41)	0.61(0.56)	1.08(0.99)
	100 Stroke	0.31(0.27)	0.47(0.44)	0.66(0.60)	1.14(1.06)
	125 Stroke	0.38(0.33)	0.56(0.52)	0.81(0.73)	1.34(1.23)
	150 Stroke	0.39(0.34)	0.59(0.55)	0.85(0.76)	1.39(1.31)
	175 Stroke	-(-)	-(-)	1.04(0.93)	1.71(1.54)
	200 Stroke	-(-)	-(-)	-(-)	2.00(1.78)
Mounting Bracket Weight	Foot type	0.15(0.15)	0.16(0.16)	0.16(0.16)	0.27(0.28)
	Flange type	0.06(0.06)	0.09(0.09)	0.09(0.09)	0.12(0.12)
	Single clevis type	0.04(0.04)	0.04(0.04)	0.04(0.04)	0.09(0.09)
	Double Knuckle Joint(with PIN) type	0.05(0.05)	0.06(0.06)	0.06(0.06)	0.13(0.13)
	Double clevis type	0.04(0.05)	0.07(0.07)	0.07(0.07)	0.10(0.11)
	Trunnion type	-0.02(-0.02)	-0.02(-0.02)	-0.01(-0.01)	-0.04(-0.04)
	Intergrated clevis type	-0.01(-0.01)	-0.02(-0.02)	-0.02(-0.02)	-0.03(-0.03)
	Boss-cut basic type	0.05(0.05)	0.07(0.07)	0.07(0.07)	0.09(0.09)
	Boss-cut flange type	0.03(0.03)	0.05(0.05)	0.05(0.05)	0.07(0.07)
Accessories	Boss-cut trunnion type	0.06(0.06)	0.06(0.06)	0.06(0.06)	0.23(0.23)
	Single knuckle joint type	0.07(0.07)	0.07(0.07)	0.07(0.07)	0.20(0.21)

Calculation
Example:AXKL32-100S(Bore size ϕ32, Foot type, 100st)
Basic weight…0.66+(Mounting bracket weight)0.16=0.82kgf

Precautions

Be sure to read before handling. Refer to P A-2 for safety instructions and common precautions.

Handling

- Avoid using the air cylinder in such a way that rotaional torque would be applied to the piston rod.
  If rotational torque is applied, the non-rotation guide will become deformed, thus affecting the non-roating accuracy.
  Refer to table bellow for the approximate values of the allowable range of rotational forque.

Allowable rotational torque	ϕ20	ϕ25	ϕ32	ϕ40
kg · f · cm	2.0	2.5	2.5	4.5

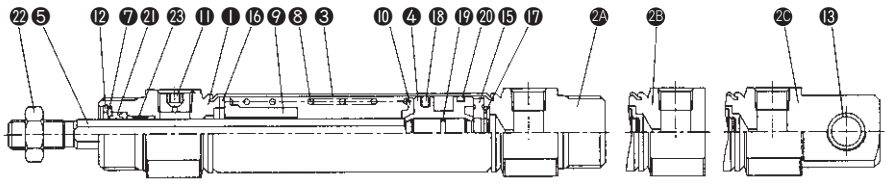
- The cyilnder has been lubricated for life at the factory and can be used without any further lubrication.
- Howerer, in the event that it will be lubricated, use class 1 turbine oil (with no additives) ISO VG32.

Mounting/Piping

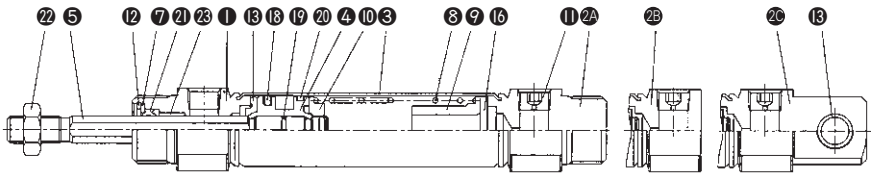
- To screw a bracket or a nut onto the threaded portion at the tip of the piston rod, make sure to retract the pistion rod entirely, and place a wrench over the flat portion of the rod that protrades. To tighten, take precautions to prevent the tightening torque from being applied to the non-roating guide.
- Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove cutting chips, cutting oil and other debris from inside the pipe.

Construction / Parts List

Spring Return Type



Spring Extended Type



Parts List

No.	Description	Material	Remarks
1	Rod Cover	Alluminum Alloy	White Alumite
2A	Head Cover-A	Alluminum Alloy	White Alumite
2B	Head Cover-B	Alluminum Alloy	White Alumite
2C	Head Cover-C	Alluminum Alloy	White Alumite
3	Cylinder Tube	Stainless Steel	
4	Piston	Alluminum Alloy	Chromate
5	Piston Rod	Stainless Steel	
6	Guide Bush	Lead Bronze Casting	
7	Retaining Ring	Rolled Steel	Nickel Plated
8	Spring return	Steel Wire	Zinc Chromate
9	Spring Guide	Alluminum Alloy	Chromate
10	Spring maintenance	Alluminum Alloy	Chromate
11	Fixed orifice mounted plug	Alloy Steel	Black Zinc Chromate
12	Stopper ring	Carbon Tool Steel	Nickel Plated
13	Bush for clevis	Lead Bronze Casting	

No.	Description	Material	Remarks
15	DAMPER A	Urethome	
16	DAMPER B	Urethome	
17	Stopper ring	Carbon Tool steel	
18	Piston Paeking	NBR	
19	Piston Gasket	NBR	
20	Wear ring	Resin	
22	Rod End Nut	Carbon steel	Nickel Plated
23	Bush		

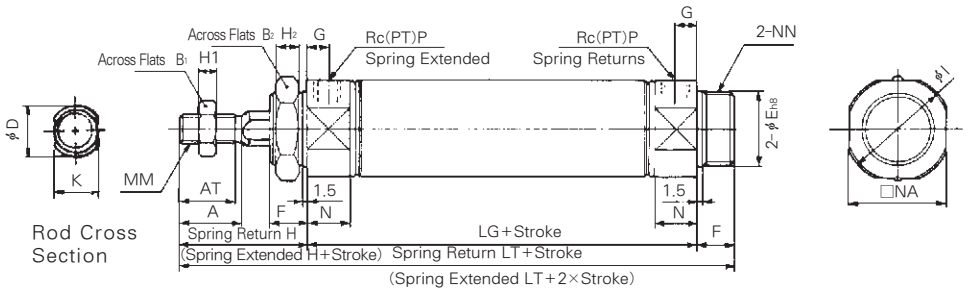
SPARE Parts

No.	Description	Material	Bore Size(mm)			
			20	25	32	40
21	Rod Packing	NBR	SORA-10	SORA-10	SORA-12	SORA-16

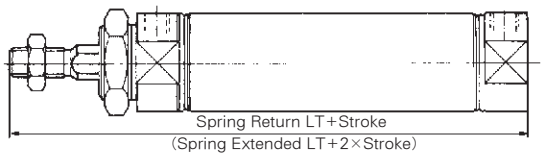
Basic Type (B)

AXKB (Bore Size)—(Stroke) S / T

Basic Type



Boss-Cut Type



※ This drawing is spring extended

(mm)

Bore Size	A	AT	B_1	B_2	D	E	F	G	H	H_1	H_2	I	K	MM	N	NA	NN	P
φ20	18	15.5	13	26	$10^{-0.01}_{-0.05}$	$20^{0}_{-0.033}$	13	8	41	5	8	27	$8^{-0.01}_{-0.05}$	M8×1.25	15	24	M20×1.5	1/8
φ25	18	15.5	17	32	$10^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	8	33	$8^{-0.01}_{-0.05}$	M8×1.25	15	30	M26×1.5	1/8
φ32	22	19.5	17	32	$12^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	8	37.5	$10^{-0.01}_{-0.05}$	M10×1.25	15	34.5	M26×1.5	1/8
φ40	24	21	22	41	$16^{-0.01}_{-0.05}$	$32^{0}_{-0.039}$	16	11	50	8	10	46.5	$14^{-0.01}_{-0.05}$	M14×1.5	21.5	42.5	M32×2	1/4

Stroke Dimension Adder (mm)

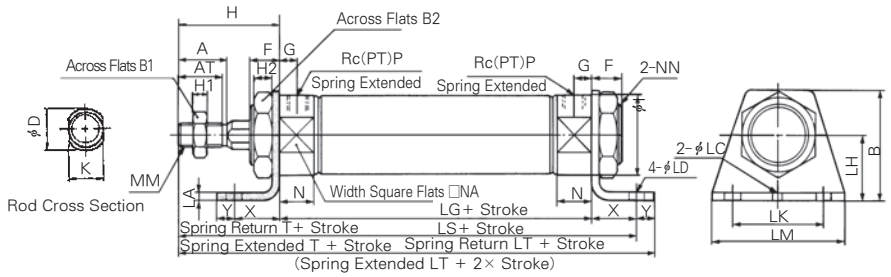
Bore Size \ Stroke Symbol	1~50		51~100		101~150		151~200		201~250	
	LG	LT	LG	LT	LG	LT	LG	LT	LG	LT
φ20	87	141	112	166	137	191	–	–	–	–
φ25	87	145	112	170	137	195	–		–	–
φ32	89	147	114	172	139	197	164	222	–	–
φ40	113	179	138	204	163	229	188	254	213	279

Boss-Cut Type (mm)

Bore Size \ Stroke Symbol	1~50	51~100	101~150	151~200	201~250
	LT	LT	LT	LT	LT
φ20	128	153	178	–	–
φ25	132	157	182	–	–
φ32	134	159	184	209	–
φ40	163	188	213	238	263

Foot Type(L)

AXKL (Bore Size)–(Stroke) S T



※ This drawing is spring extended

(mm)

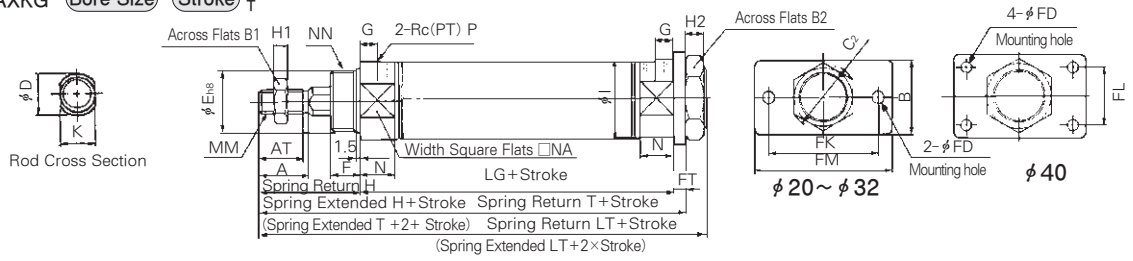
Bore Size	A	AT	B	B_1	B_2	D	F	G	H	H_1	H_2	I	K	LC	LD	LH	LA	LK	LM	MM	N	NA	NN	P	X	Y	T
φ20	18	15.5	40	13	26	$10^{-0.01}_{-0.05}$	13	8	41	5	8	27	$8^{-0.01}_{-0.05}$	4	6.8	25	3.2	40	55	M8×1.25	15	24	M20×1.5	1/8	20	8	21
φ25	22	19.5	47	17	32	$10^{-0.01}_{-0.05}$	13	8	45	6	8	33	$8^{-0.01}_{-0.05}$	4	6.8	28	3.2	40	55	M8×1.25	15	30	M26×1.5	1/8	20	8	25
φ32	22	19.5	47	17	32	$12^{-0.01}_{-0.05}$	13	8	45	6	8	37.5	$10^{-0.01}_{-0.05}$	4	6.8	28	3.2	40	55	M10×1.25	15	34.5	M26×1.5	1/8	20	8	25
φ40	24	21	54	22	41	$16^{-0.01}_{-0.05}$	16	11	50	8	10	46.5	$14^{-0.01}_{-0.05}$	4	7	30	3.2	55	75	M14×1.5	21.5	42.5	M32×2	1/4	23	10	27

Stroke Dimension Adder

Bore Size \ Stroke Symbol	1~50			51~100			101~150			151~200			201~250		
	LG	LS	LT	LG	LS	LT	LG	LS	LT	LG	LS	LT	LG	LS	LT
φ20	87	127	156	112	152	181	137	177	206	–	–	–	–	–	–
φ25	87	127	160	112	152	185	137	177	210	–	–	–	–	–	–
φ32	89	129	162	114	154	187	139	179	212	164	204	237	–	–	–
φ40	113	159	196	138	184	221	163	209	246	188	234	271	213	259	296

Head Side Flange Type(G)

AXKG (Bore Size)–(Stroke) S T



※ This drawing is spring extended

(mm)

Bore Size	A	AT	B	B_1	B_2	C_2	D	E	F	FD	FT	FK	FL	FM	G	H	H_1	H_2	I	K	MM	N	NA	NN	P	T
φ20	18	15.5	34	13	26	30	$10^{-0.01}_{-0.05}$	$20^{0}_{-0.033}$	13	7	4	60	–	75	8	41	5	8	27	$8^{-0.01}_{-0.05}$	M8×1.25	15	24	M20×1.5	1/8	37
φ25	22	19.5	40	17	32	37	$10^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	7	4	60	–	75	8	45	6	8	33	$8^{-0.01}_{-0.05}$	M8×1.25	15	30	M26×1.5	1/8	41
φ32	22	19.5	40	17	32	37	$12^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	7	4	60	–	75	8	45	6	8	37.5	$10^{-0.01}_{-0.05}$	M10×1.25	15	34.5	M26×1.5	1/8	41
φ40	24	21	52	22	41	47.3	$16^{-0.01}_{-0.05}$	$32^{0}_{-0.039}$	16	7	5	66	36	82	11	50	8	11	46.5	$14^{-0.01}_{-0.05}$	M14×1.5	21.5	42.5	M30×2	1/4	45

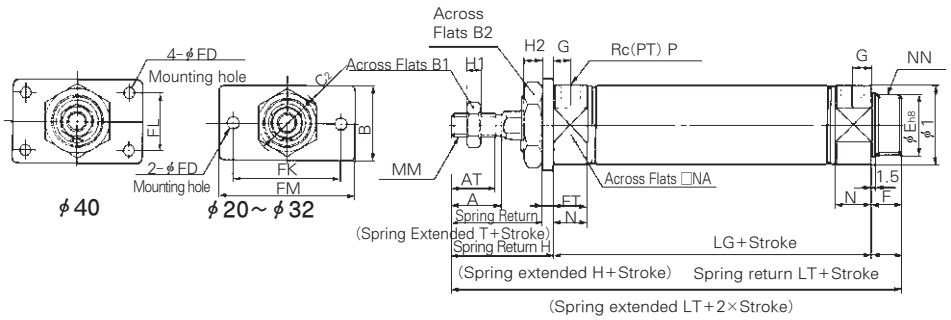
Stroke Dimension Adder

(Unit : mm)

Bore Size \ Stroke Symbol	1~50			51~100			101~150			151~200			201~250		
	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT
φ20	87	132	141	112	157	166	137	182	191	–	–	–	–	–	–
φ25	87	136	145	112	161	170	137	186	195	–	–	–	–	–	–
φ32	89	138	147	114	163	172	139	188	197	164	213	222	–	–	–
φ40	113	168	179	138	193	204	163	218	229	188	243	254	213	268	279

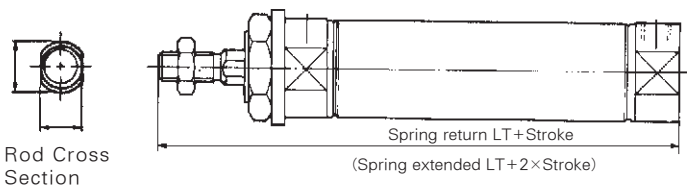
Rod Side Flange Type(F)

AXKF (Bore Size)–(Stroke) S / T



φ40

Boss-Cut type



※ This drawing is spring extended

(mm)

Bore Size	A	AT	B	B_1	B_2	C_2	D	E	F	FD	FT	FK	FL	FM	G	H	H_1	H_2	I	K	MM	N	NA	NN	P	T
φ20	18	15.5	34	13	26	30	$10^{-0.01}_{-0.05}$	$20^{0}_{-0.033}$	13	7	4	60	–	75	8	41	5	8	27	$8^{-0.01}_{-0.05}$	M8×1.25	15	24	M20×1.5	1/8	37
φ25	22	19.5	40	17	32	37	$10^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	7	4	60	–	75	8	45	6	8	33	$8^{-0.01}_{-0.05}$	M8×1.25	15	30	M26×1.5	1/8	41
φ32	22	19.5	40	17	32	37	$12^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	7	4	60	–	75	8	45	6	8	37.5	$10^{-0.01}_{-0.05}$	M10×1.25	15	34.5	M26×1.5	1/8	41
φ40	24	21	52	22	41	47.3	$16^{-0.01}_{-0.05}$	$32^{0}_{-0.039}$	16	7	5	66	36	82	11	50	8	10	46.5	$14^{-0.01}_{-0.05}$	M14×1.5	21.5	42.5	M32×2	1/4	45

Stroke Dimension Adder

(mm)

Bore Size \ Stroke / Symbol	1~50		51~100		101~150		151~200		201~250	
	LG	LT	LG	LT	LG	LT	LG	LT	LG	LT
φ20	87	141	112	166	137	191	–	–	–	–
φ25	87	145	112	170	137	195	–		–	–
φ32	89	147	114	172	139	197	164	222	–	–
φ40	113	179	138	204	163	229	188	254	213	279

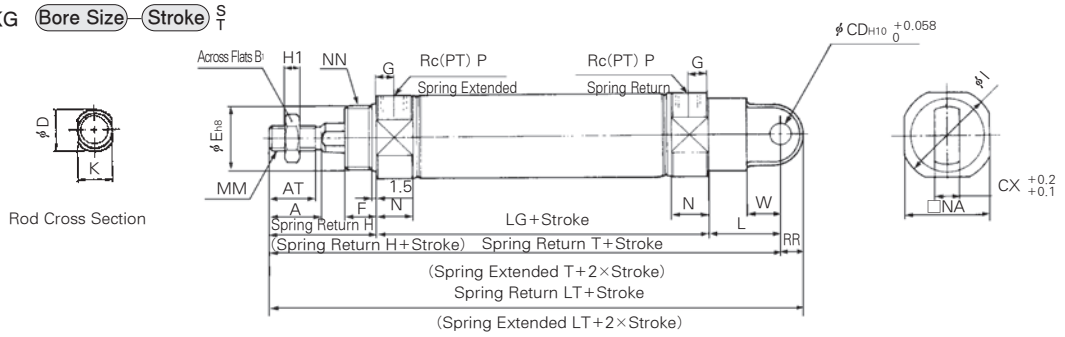
Boss-Cut Type/Distinction of Stroke

(mm)

Bore Size \ Stroke / Symbol	1~50	51~100	101~150	151~200	201~250
	LT	LT	LT	LT	LT
φ20	128	153	178	–	–
φ25	132	157	182	–	–
φ32	134	159	184	209	–
φ40	163	188	213	238	263

Single Clevis Type (C)

AXKG Bore Size — Stroke $^{S}_{T}$



※ This drawing is spring extended

(mm)

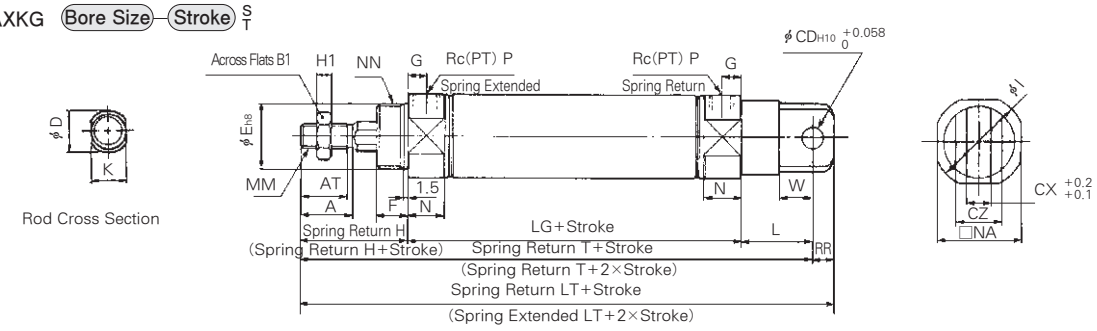
Bore Size	A	AT	B_1	CD	CX	D	E	F	G	H	H_1	I	K	L	MM	N	NA	NN	P	RR	W
φ20	18	15.5	13	9	10	10 $^{-0.01}_{-0.05}$	20 $^{0}_{-0.033}$	13	8	41	5	27	8 $^{-0.01}_{-0.05}$	30	M8×1.25	15	24	M20×1.5	1/8	9	14
φ25	22	19.5	17	9	10	10 $^{-0.01}_{-0.05}$	26 $^{0}_{-0.033}$	13	8	45	6	33	8 $^{-0.01}_{-0.05}$	30	M8×1.25	15	30	M26×1.5	1/8	9	14
φ32	22	19.5	17	9	10	12 $^{-0.01}_{-0.05}$	26 $^{0}_{-0.033}$	13	8	45	6	37.5	10 $^{-0.01}_{-0.05}$	30	M10×1.25	15	34.5	M26×1.5	1/8	9	14
φ40	24	21	22	10	15	16 $^{-0.01}_{-0.05}$	32 $^{0}_{-0.039}$	16	11	50	8	46.5	14 $^{-0.01}_{-0.05}$	39	M14×1.5	21.5	42.5	M32×2	1/4	11	18

Stroke Dimension Adder

Bore Size \ Stroke Symbol	1~50			51~100			101~150			151~200			201~250		
	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT
φ20	87	158	167	112	183	192	137	208	217	–	–	–	–	–	–
φ25	87	162	171	112	187	196	137	212	221	–	–	–	–	–	–
φ32	89	164	173	114	189	198	139	214	223	164	239	248	–	–	–
φ40	113	202	213	138	227	238	163	252	263	188	277	288	213	302	313

Double Clevis Type (D)

AXKG Bore Size — Stroke $^{S}_{T}$



※ This drawing is spring extended

(mm)

Bore Size	A	AT	B_1	CD	CX	CZ	D	E	F	G	H	H_1	I	K	L	MM	N	NA	NN	P	RR	W
φ20	18	15.5	13	9	10	19	10 $^{-0.01}_{-0.05}$	20 $^{0}_{-0.033}$	13	8	41	5	27	8 $^{-0.01}_{-0.05}$	30	M8×1.25	15	24	M20×1.5	1/8	9	14
φ25	22	19.5	17	9	10	19	10 $^{-0.01}_{-0.05}$	26 $^{0}_{-0.033}$	13	8	45	6	33	8 $^{-0.01}_{-0.05}$	30	M8×1.25	15	30	M26×1.5	1/8	9	14
φ32	22	19.5	17	9	10	19	12 $^{-0.01}_{-0.05}$	26 $^{0}_{-0.033}$	13	8	45	6	37.5	10 $^{-0.01}_{-0.05}$	30	M10×1.25	15	34.5	M26×1.5	1/8	9	14
φ40	24	21	22	10	15	30	16 $^{-0.01}_{-0.05}$	32 $^{0}_{-0.039}$	16	11	50	8	46.5	14 $^{-0.01}_{-0.05}$	39	M14×1.5	21.5	42.5	M32×2	1/4	11	18

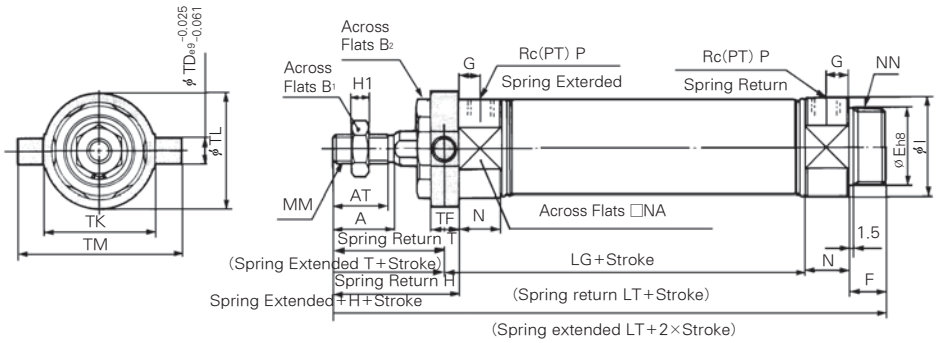
Stroke Dimension Adder

(Unit : mm)

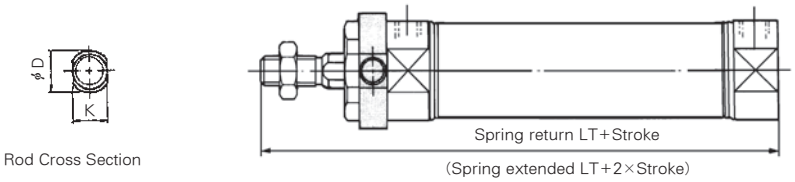
Bore Size \ Stroke Symbol	1~50			51~100			101~150			151~200			201~250		
	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT
φ20	87	158	167	112	183	192	137	208	217	–	–	–	–	–	–
φ25	87	162	171	112	187	196	137	212	221	–	–	–	–	–	–
φ32	89	164	173	114	189	198	139	214	223	164	239	248	–	–	–
φ40	113	202	213	138	227	238	163	252	263	188	277	288	213	302	313

Rod Side Trunnion Type(U)

AXKU Bore Size — Stroke S T



Boss-cut type



※ This drawing is spring extended

(mm)

Bore Size	A	AT	B_1	B_2	D	E	F	G	H	H_1	I	K	MM	N	NA	NN	P	TD	TF	TK	TL	TM	T
ϕ20	18	15.5	13	26	$10^{-0.01}_{-0.05}$	$20^{0}_{-0.033}$	13	8	41	5	27	$8^{-0.01}_{-0.05}$	M8×1.25	15	24	M20×1.5	1/8	8	10	32	32	52	36
ϕ25	22	19.5	17	32	$10^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	33	$8^{-0.01}_{-0.05}$	M8×1.25	15	30	M26×1.5	1/8	9	10	40	40	60	40
ϕ32	22	19.5	17	32	$12^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	37.5	$10^{-0.01}_{-0.05}$	M10×1.25	15	34.5	M26×1.5	1/8	9	10	40	40	60	40
ϕ40	24	21	22	41	$16^{-0.01}_{-0.05}$	$32^{0}_{-0.039}$	16	11	50	8	46.5	$14^{-0.01}_{-0.05}$	M14×1.5	21.5	42.5	M32×2	1/4	10	11	53	53	77	44.5

Stroke Dimension Adder (mm)

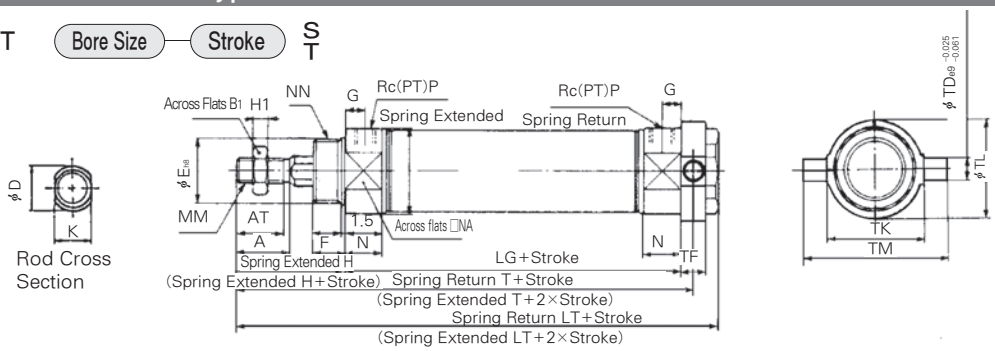
Bore Size \ Stroke Symbol	1~50		51~100		101~150		151~200		201~250	
	LG	LT	LG	LT	LG	LT	LG	LT	LG	LT
ϕ20	87	141	112	166	137	191	–	–	–	–
ϕ25	87	145	112	170	137	195	–		–	–
ϕ32	89	147	114	172	139	197	164	222	–	–
ϕ40	113	179	138	204	163	229	188	254	213	279

Boss-Cut Type (mm)

Bore Size \ Stroke Symbol	1~50	51~100	101~150	151~200	201~250
	LT	LT	LT	LT	LT
ϕ20	128	153	178	–	–
ϕ25	132	157	182	–	–
ϕ32	134	159	184	209	–
ϕ40	163	188	213	238	263

Head Side Trunnion Type (T)

AXKT Bore Size — Stroke S T



(mm)

Bore Size	A	AT	B_1	B_2	D	E	F	G	H	H_1	I	K	MM	N	NA	NN	P	TD	TF	TK	TL	TM
φ20	18	15.5	13	26	$10^{-0.01}_{-0.05}$	$20^{0}_{-0.033}$	13	8	41	5	27	$8^{-0.01}_{-0.05}$	M8×1.25	15	24	M20×1.5	1/8	8	10	32	32	52
φ25	22	19.5	17	32	$10^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	33	$8^{-0.01}_{-0.05}$	M8×1.25	15	30	M26×1.5	1/8	9	10	40	40	60
φ32	22	19.5	17	32	$12^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	37.5	$10^{-0.01}_{-0.05}$	M10×1.25	15	34.5	M26×1.5	1/8	9	10	40	40	60
φ40	24	21	22	41	$16^{-0.01}_{-0.05}$	$32^{0}_{-0.039}$	16	11	50	8	46.5	$14^{-0.01}_{-0.05}$	M14×1.5	21.5	42.5	M32×2	1/4	10	11	53	53	77

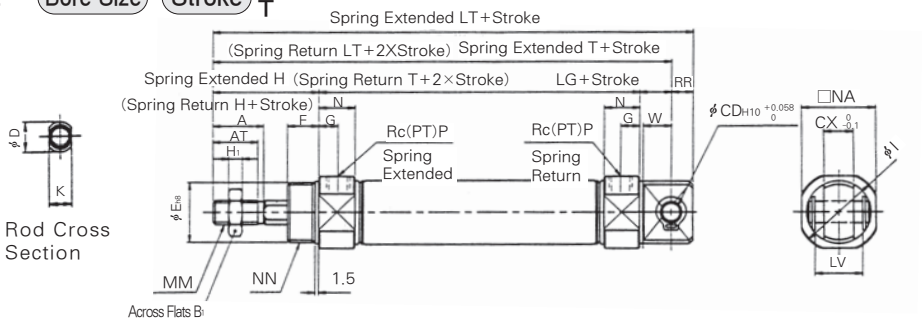
Stroke Dimension Adder

(mm)

Bore Size \ Stroke Symbol	1~50			51~100			101~150			151~200			201~250		
	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT
φ20	87	133	143	112	158	168	137	183	193	–	–	–	–	–	–
φ25	87	137	147	112	162	172	137	187	197	–	–	–	–	–	–
φ32	89	139	149	114	164	174	139	189	199	164	214	224	–	–	–
φ40	113	168.5	179	138	193.5	204	163	218.5	229	188	243.5	254	213	268.5	279

Single Clevis Type(E)

AXKE Bore Size — Stroke S T



(mm)

Bore Size	A	AT	B_1	CD	CX	D	E	F	G	H	H_1	I	K	L	LV	MM	N	NA	NN	P	RR	W
φ20	18	15.5	13	8	12	$10^{-0.01}_{-0.05}$	$20^{0}_{-0.033}$	13	8	41	5	27	$8^{-0.01}_{-0.05}$	12	18.4	M8×1.25	15	24	M20×1.5	1/8	9	11.5
φ25	22	19.5	17	8	12	$10^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	33	$8^{-0.01}_{-0.05}$	12	18.4	M8×1.25	15	30	M26×1.5	1/8	9	11.5
φ32	22	19.5	17	10	20	$12^{-0.01}_{-0.05}$	$26^{0}_{-0.033}$	13	8	45	6	37.5	$10^{-0.01}_{-0.05}$	15	28	M10×1.25	15	34.5	M26×1.5	1/8	12	14.5
φ40	24	21	22	10	20	$16^{-0.01}_{-0.05}$	$32^{0}_{-0.039}$	16	11	50	8	46.5	$14^{-0.01}_{-0.05}$	15	28	M14×1.5	21.5	42.5	M32×2	1/4	12	14.5

Stroke Dimension Adder

(mm)

Bore Size \ Stroke Symbol	1~50			51~100			101~150			151~200			201~250		
	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT	LG	T	LT
φ20	87	140	149	112	165	174	137	190	199	–	–	–	–	–	–
φ25	87	144	153	112	169	178	137	194	203	–	–	–	–	–	–
φ32	89	149	161	114	174	186	139	199	211	164	224	236	–	–	–
φ40	113	178	190	138	203	215	163	228	240	188	253	265	213	278	290

Series AXR

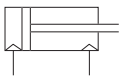
Direct Mounting Cylinder/Double Acting Single Rod

Bore Size(mm) : Ø20, Ø25, Ø32, Ø40

- STAINLESS STEEL BODY
- HIGH CYCLE LIFE
- LOW BREAKAWAY
- MAGNET STANDARD FOR AUTO SWITCH
- BUMPERS STANDARD
- DESIGNED FOR NON-LUBRICATED SERVICE
- COMPACT LIGHT DESIGN
- ADJUSTABLE STROKE AVAILABLE
- REPLACEABLE ROD GLAND

Symbol

Double Acting / Single Rod



How to Order

AXR — A — 20 — 25 — ○ — W5 — □

1 2 3 4 5 6 7

1 Direct Mount

2 Mounting
A : Rear Pivot Mounting
B : Front Face Mounting

3 Bore Size(mm)
20 : ϕ20
25 : ϕ25
32 : ϕ32
40 : ϕ40

4 Stroke/mm
ϕ20 : 25, 50, 75, 100, 125, 150
ϕ25 : 25, 50, 75, 100, 125, 150, 200
ϕ32 : 25, 50, 75, 100, 125, 150, 200
ϕ40 : 25, 50, 75, 100, 125, 150, 200, 250, 300

5 Series
Blank : Standard type
XC16 : Copper-free

6 Auto Switch
(Band Mounted Type)
〈Grommet〉
Blank : None
W5 : Reed Switch, 0.5m Lead Wire
W5L : Reed Switch, 3m Lead Wire

7 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

PART No. of Auto Switch Mounting Band

Auto Switch Model	Bore size (mm)			
	ϕ20	ϕ25	ϕ32	ϕ40
W5	TBM2-020	TBM2-025	TBM2-032	TBM2-040

- **Using the square rod cover, it is preferred to install the AXR Series direct mounting cylinder.**
- **Configuration with space saving**
  Its overall length is shorter, and its installation pitch can be made smaller since a directly mounted style can be possible without using brackets, so that the space needed for installation is significantly reduced.
- **Installstion with enhanced accuracy and strength**
  The installation accuracy can be improved using a centering boss since it is the directly mounted style, and the strength has been increased.
- **Two different styles in installation**
  The installation may be provided with two styles and may be selected based on the purpose : Thus, the front mounting style or the bottom mounting style.

Specifications

Action	Double Acting Single Rod
Fluid	Air
Proof Pressure	1.5MPa (213psi)
Max. Operating Pressure	1.0MPa (140psi)
Min. Operating Pressure	0.05MPa (7psi)
Ambient and Fluid Temperature	-50~158°F (-10°C~+70°C)
Lubricant	None(Non-Lube)
Stroke Tolerance	$^{+1.4}_{0}$mm
Mounting	Flush Mounting, Front Face Mounting

Piston Speed

Bore Size(mm)	ϕ20	ϕ25	ϕ32	ϕ40
Piston Speed(mm/sec)	50~750			
Allowable Kinetic Energy(kgf-cm)	2.7	4	6.5	12

Auto Switch Specifications

Mounting	Lead Wire Entry	Reed Switch
Band Mounting Type	Grommet	W5

Mounting and Accessories

Accessories / Mounting	Standard	Option	
	Rod End Nut	Single Knuckle Joint	Double Knuckle Joint
Rear Pivot Mounting	○	○	○
Front Face Mounting	○	○	○

Weight Table

kgf(lb)

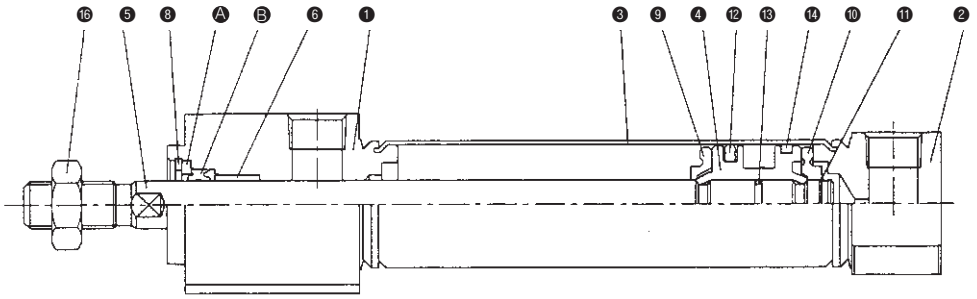
Bore size(mm)		ϕ20	ϕ25	ϕ32	ϕ40
Basic Weight	Rear Pivot Mounting	0.14 (0.31)	0.24 (0.51)	0.33 (0.7)	0.62 (1.36)
	Front Face Mounting	0.14 (0.31)	0.22 (0.48)	0.33 (0.7)	0.61 (1.34)
Additional Weight For Each 50 mm of Stroke		0.04 (0.09)	0.06 (0.13)	0.08 (0.17)	0.14 (0.28)

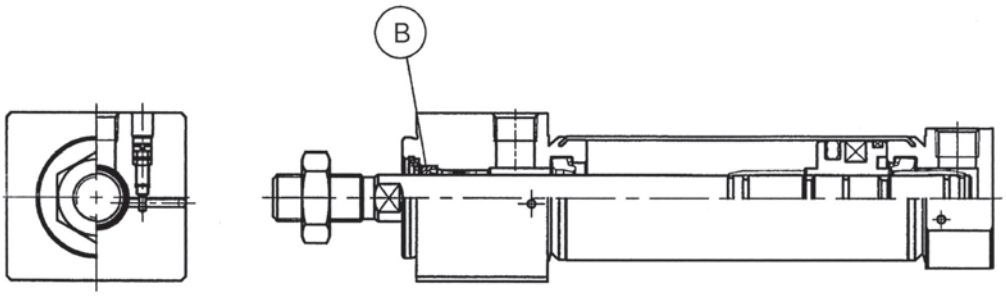
Calculation Example : AXRA 32-100

• Basic weight ··· 0.32kgf • Additional weight ··· 0.08/50 stroke • Cylinder stroke ··· 100 stroke

0.32+0.08×100/50=0.48 kgf

Construction/Parts List





Parts List

No.	Description	Material	Remarks
❶	Rod Cover	Aluminum Alloy	White Alumite
❷	Head Cover	Aluminum Alloy	White Alumite
❸	Cylinder Tube	Stainless Steel	
❹	Piston	Aluminum Alloy	Chromate
❺	Piston Rod	Carbon Steel	Hard Chrome Plated
❻	Bushing	Sintered BR	
Ⓐ	Packing	NBR	Nickel Plated
❽	Retaining Ring	Carbon Steel	Nickel Plated
❾	Bumper A	Urethane	
❿	Bumper B	Urethane	
⓫	Retaining Ring	Carbon Tool Steel	
⓬	Piston Packing	NBR	
⓭	Piston Packing	NBR	
⓮	Wear Ring		
⓰	Rod End Nut	Carbon Steel	Nickel Plated

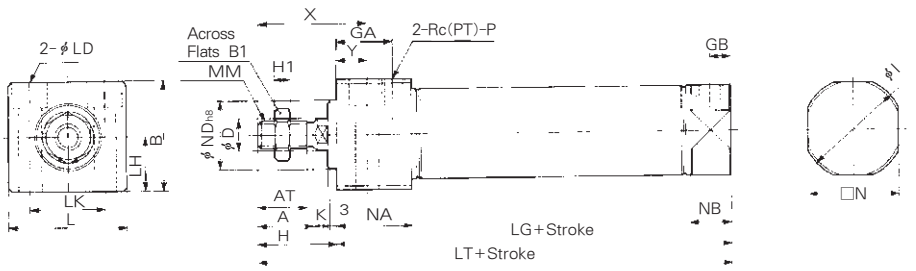
Packing List

Rubber Cushion / Air Cushion

No.	Decription	Material	Type	Bore Size			
				20	25	32	40
Ⓑ	Rod Packing	NBR	Rubber Cushion	PDU-8LZ	PDU-10LZ	PDU-12LZ	PDU-14LZ
			Air Cushion	PDU-8Z	PDU-10Z	PDU-12Z	PDU-14Z

Rear Pilot Mounting

AXRA (Bore Size) — (Stroke)



(Unit:mm)

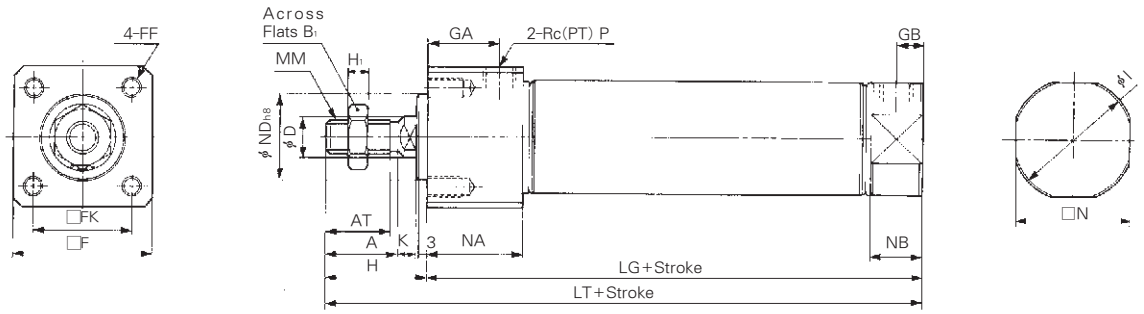
Bore size	Stroke range
φ20	~150
φ25	~200
φ32	~200
φ40	~300

(Unit:mm)

Bore Size	A	AT	B	B_1	D	GA	GB	H	H_1	I	K	L	LD	LH	LK	MM	N	NA	NB	ND	P	LG	X	Y	LT
φ20	18	15.5	30.3	13	8	22	8	27	5	27	5	33.5	φ5.5, φ9.5C-BORE Dp6.5	15	21	M8×1.25	24	29	15	$20^{0}_{-0.033}$	1/8	76	39	12	103
φ25	18	19.5	36.3	17	10	22	8	31	6	33	5.5	39	φ6.6, φ11C-BORE Dp7.5	18	25	M8×1.25	30	29	15	$26^{0}_{-0.033}$	1/8	76	43	12	107
φ32	22	19.5	42.3	17	12	22	8	31	6	37.5	5.5	47	φ9, φ14C-BORE Dp10	21	30	M10×1.25	34.5	29	15	$26^{0}_{-0.033}$	1/8	78	43	12	109
φ40	24	21	52.3	22	14	27	11	34	8	46.5	7	58.5	φ11, φ17.5C-BORE Dp12.5	26	38	M14×1.5	42.5	37.5	21.5	$32^{0}_{-0.039}$	1/4	104	49	15	138

Front Side Mounting

AXRB (Bore Size) — (Stroke)



(Unit : mm)

Bore Size	A	AT	B_1	D	F	FF	FK	GA	GB	H	H_1	I	K	MM	N	NA	NB	ND	P	LG	LT	Stroke
φ20	18	15.5	13	8	30.4	M5×0.8Depth9	22	22	8	27	5	27	5	M8×1.25	24	29	15	$20^{0}_{-0.033}$	1/8	76	103	~150
φ25	22	19.5	17	10	36.4	M6×1Depth11	26	22	8	31	6	33	5.5	M8×1.25	30	29	15	$26^{0}_{-0.033}$	1/8	76	107	~200
φ32	22	19.5	17	12	42.4	M6×1Depth11	30	22	8	31	6	37.5	5.5	M10×1.25	34.5	29	15	$26^{0}_{-0.033}$	1/8	78	109	~200
φ40	24	21	22	14	52.4	M8×1.25Depth14	36	27	11	34	8	46.5	7	M14×1.5	42.5	37.5	21.5	$32^{0}_{-0.039}$	1/4	104	138	~300

① Adjustable Stroke Cylinder/Extension Adjustable Type

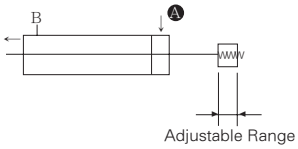
AXR (Mounting) (Bore Size) — (Stroke) (Stroke Adjusting Symbol) — XC8

Stroke adjusting symbol

A-Stroke Adjusting Range 0~25 mm
B-Stroke Adjusting Range 0~50 mm

The extended stroke of the cylinder can be adjusted by the stopper on the head side from full stroke (0~25) mm or (0~50) mm.

Symbol

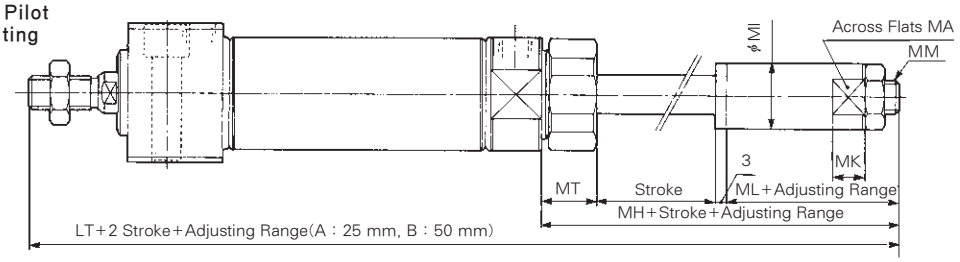


Specifications

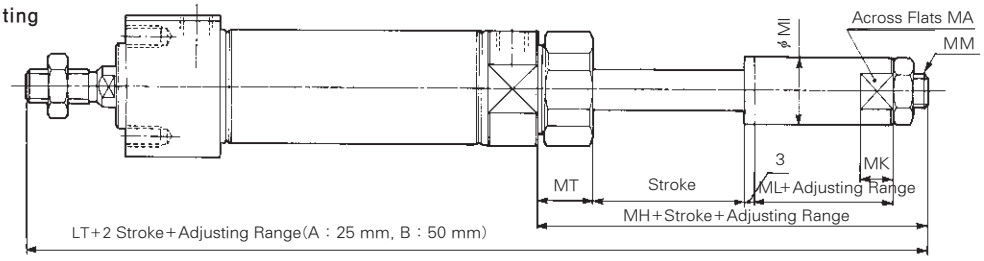
Type	Air Cylinder
Applicable Bore Size	ϕ20, ϕ25, ϕ32, ϕ40
Action	Double Acting Single Rod
Piston Speed(mm/sec)	50~750
Cushion	Rubber Cushion(Standard)
Stroke Adjusting System	Stopper Adjustment
Stroke Adjusting Range	A:0~25 mm, B : 0~50 mm
Mounting	Rear Pivot Mounting, Front Nose Mounting

Dimensions

Rear Pilot Mounting



Front Face Mounting



(mm)

Bore Size	MA	MH	MI	MK	ML	MM	MT	LT
ϕ20	12	47	15	8	18	M8×1.25	16.5	150
ϕ25	17	49	20	10	18	M8×1.25	17.5	156
ϕ32	17	49	20	10	18	M10×1.25	17.5	158
ϕ40	22	60	25	12	22	M14×1.5	21.5	198

※ Other dimensions are the same as for standard type.

② Adjustable Stroke Cylinder/Retraction Adjustable Type

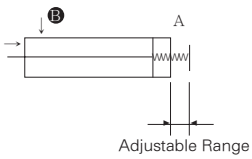
AXR (Mounting) (Bore Size) — (Stroke) (Stroke Adjusting Symbol) — XC9

Stroke Adjusting Symbol

A-Stroke Adjusting Range 0~25 mm
B-Stroke Adjusting Range 0~50 mm

The retracted stroke of the cylinder can be adjusted from (0~25) mm or (0~50) mm by the adjusting bolt.

Symbol

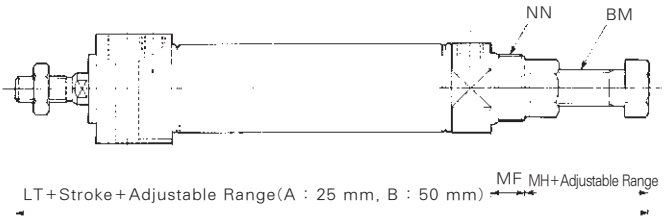


Specifications

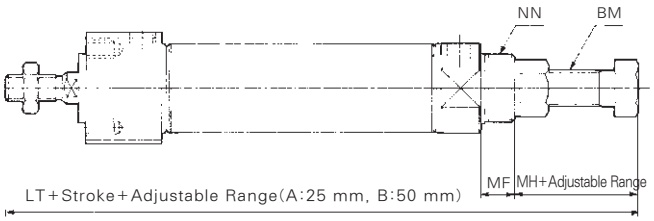
Type	Air Cylinder
Applicable Bore Size	ϕ20, ϕ25, ϕ32, ϕ40
Action	Double Acting Single Rod
Piston Speed(mm/sec)	50~750
Cushion	Rubber Cushion(Standard)
Stroke Adjusting System	Stopper Adjustment
Stroke Adjusting Range	A:0~25 mm, B : 0~50 mm
Mounting	Rear Pivot Mounting, Front Nose Mounting

Dimensions

Rear Pilot Mounting



Front Face Mounting



(Unit : mm)

Bore Size	BM	MF	MH	NN	LT
ϕ20	M8×1.25	13	20	M20×1.5	136
ϕ25	M8×1.25	13	20	M26×1.5	140
ϕ32	M10×1.25	13	20	M26×1.5	142
ϕ40	M12×1.75	16	24	M30×2	178

※ Other dimensions are the same for standard type.

Series AXRK

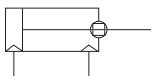
Non-Rotating Piston Rod Direct Mounting type

Bore Size(mm) : Ø20, Ø25, Ø32, Ø40

- DIRECT MOUNT CYLINDER
- HIGH ANTI-ROTATING ACCURACY
- SPACE SAVING CYLINDER
- SQUARE ROD COVER MAKES DIRECT MOUNTING POSSIBLE

Symbol

Double acting/Single rod
Non-rotating Piston rod



How to Order

AXRK — A — 20 — 50 — ( ) — W5 — ( )

1 2 3 4 5 6 7

1 Type
Non-Rotating/
Direct Pivot

2 Mounting
A : Rear Pilot mounting
B : Front side mounting

3 Bore Size(mm)
20 : ϕ20
25 : ϕ25
32 : ϕ32
40 : ϕ40

4 Stroke(mm)
ϕ20 : 25, 50, 75, 100, 125, 150
ϕ25 : 25, 50, 75, 100, 125, 150, 200
ϕ32 : 25, 50, 75, 100, 125, 150, 200
ϕ40 : 25, 50, 75, 100, 125, 150, 200, 250, 300

5 Special Options
Blank : Standard type
XC16 : Copper-free

6 Auto Switch
(Band mounted type)
〈Grommet〉
Blank : None
W5 : Reed Switch, 0.5m Lead wire
W5L : Reed Switch, 3m Lead wire

7 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

PART No. of Auto Switch Mounting Band

Auto Switch Model	Bore size(mm)			
	20	25	32	40
W5	TBM2-020	TBM2-025	TBM2-032	TBM2-040

- AXRK Series
- The Driect mounting of AXRK Series
  ϕ20, ϕ25 – ±0.8°
  ϕ32, ϕ40 – ±0.5°
- Accuracy with high non-rotation
  f20, f25 – ±0.8°
  f32, f40 – ±0.5°
- Configuration featuring space saving advantage
  Since a directly mounted style is adapted with no use of brackets, its entire length is shorter, and its installation pitch may be set smaller. So, the space required for installation is significanfly reduced.
- Enhanced accuracy and strength for installatin
  The installation accuracy is enhanced using a centering boss based on its directly mounted style, and the strength has also been enhanced.
- Two different installation available
  Two different installations are available and selectable based on their purpose of use : the front mounting method or the bottom mounting method.

Specifications

• Mounting Autoswitch : Existing Plug point

Front Face Mounting

Rear Pivot Mounting

• Calculation Example : AXRKA 32-100
• Basic Weigut ··· 0.32kgf
• Additional Weight ··· 0.09kgf
• Cylmder stroke ··· 100mm
0.32+0.09×100/50=0.50kgf

Specifications

Action	Double acting single rod
Fluid	Air
Proof Pressure	1.5MPa (213psi)
Max. Operating Pressure	1.0MPa (140psi)
Min. Operating Pressure	0.05MPa 7psi)
Ambient and Fluid Temperature	-10℃~+70°C (-50~153°F)
Cushion	Rubber Cushion (Standard)
Stroke Tolerance	$^{+1.4}_{0}$ mm
Non-Rotating Accuracy	ϕ20, ϕ25:±0.8°, ϕ32, ϕ40:±5°
Mounting	Rear Pivot Mounting, Front Face mounting

Piston Speed

Bore Size(mm)	ϕ20	ϕ25	ϕ32	ϕ40
Piston Speed	50~500 mm/sec			
Allowable Kinetic Energy(kgf/cm)	2.7	4	6.5	12

Auto Switch Specifications

Mounting	Lead Wire Entry	Reed Switch
Band Mounting Type	Grommet	W5

Mounting and Accessaries

Accessaries / Mounting	Standard	Option	
	Rod End Nut	Single Knuckel Joint	Double Knuckel Joint
Rear Pivot Mounting	O	O	O
Front Face Mounting	O	O	O

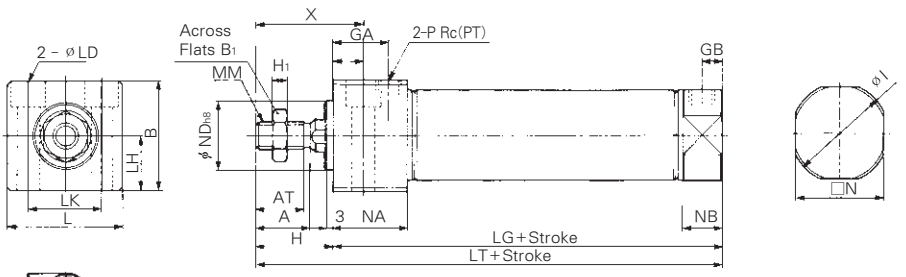
Weight Table

kgf(lbf)

Bore Size(mm)		ϕ20	ϕ25	ϕ32	ϕ40
Basic Weight	Rear Pivot Mounting	0.14	0.24	0.33	0.63
	Front Face Mounting	0.14	0.23	0.32	0.62
Additional weight for each 50 of stroke		0.04	0.07	0.09	0.15

Rear Pirot Mounting

AXRKA (Bore Size)—(Stroke)



Rod Cross Section

(mm)

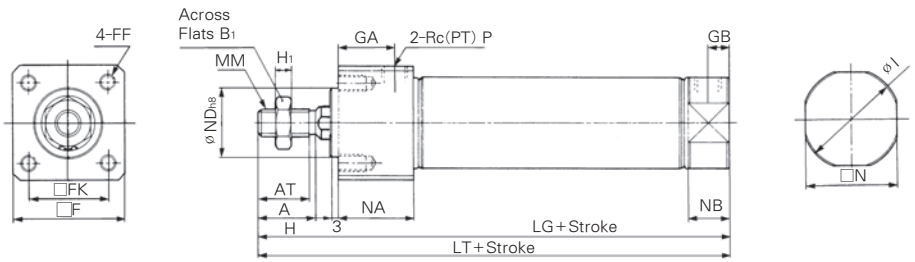
Bore size	D	K	Stroke range
ϕ20	10 $^{-0.01}_{-0.05}$	8 $^{-0.01}_{-0.05}$	~150
ϕ25	10 $^{-0.01}_{-0.05}$	8 $^{-0.01}_{-0.05}$	~200
ϕ32	12 $^{-0.01}_{-0.05}$	10 $^{-0.01}_{-0.05}$	~200
ϕ40	16 $^{-0.01}_{-0.05}$	14 $^{-0.01}_{-0.05}$	~300

(mm)

Bore size	A	AT	B	B1	GA	GB	H	H1	I	L	LD	LH	LK	MM	N	NA	NB	ND	P	LG	X	Y	LT
ϕ20	18	15.5	30.3	13	22	8	27	5	27	33.5	ϕ5.5, ϕ9.5C-BORE Dp6.5	15	21	M8×1.25	24	29	15	20 $^{0}_{-0.033}$	1/8	76	39	12	103
ϕ25	22	19.5	36.3	17	22	8	31	6	33	39	ϕ6.6, ϕ11C-BORE Dp7.5	18	25	M8×1.25	30	29	15	26 $^{0}_{-0.033}$	1/8	76	43	12	107
ϕ32	22	19.5	42.3	17	22	8	31	6	37.5	47	ϕ9, ϕ14C-BORE Dp10	21	30	M10×1.25	34.5	29	15	26 $^{0}_{-0.033}$	1/8	78	43	12	109
ϕ40	24	21	52.3	22	27	11	34	8	46.5	58.5	ϕ11, ϕ17.5C-BORE Dp12.5	26	38	M14×1.5	42.5	37.5	21.5	32 $^{0}_{-0.039}$	1/4	104	49	15	138

Front Face Mounting

AXRKB (Bore Size)—(Stroke)



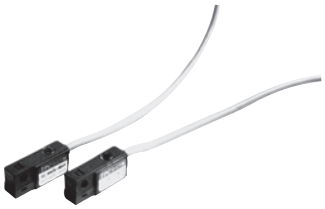
Rod Cross Section

(mm)

Bore size	D	K	Stroke range
ϕ20	10 $^{-0.01}_{-0.05}$	8 $^{-0.01}_{-0.05}$	~150
ϕ25	10 $^{-0.01}_{-0.05}$	8 $^{-0.01}_{-0.05}$	~200
ϕ32	12 $^{-0.01}_{-0.05}$	10 $^{-0.01}_{-0.05}$	~200
ϕ40	16 $^{-0.01}_{-0.05}$	14 $^{-0.01}_{-0.05}$	~300

(mm)

Bore size	A	AT	B1	F	FF	FK	GA	GB	H	H1	I	MM	N	NA	NB	ND	P	LG	LT
ϕ20	18	15.5	13	30.4	M5×0.8Dp9	22	22	8	27	5	27	M8×1.25	24	29	15	20 $^{0}_{-0.033}$	1/8	76	103
ϕ25	22	19.5	17	36.4	M6×1Dp11	26	22	8	31	6	33	M8×1.25	30	29	15	26 $^{0}_{-0.033}$	1/8	76	107
ϕ32	22	19.5	17	42.4	M6×1Dp11	30	22	8	31	6	37.5	M10×1.25	34.5	29	15	26 $^{0}_{-0.033}$	1/8	78	109
ϕ40	24	21	22	52.4	M8×1.25Dp14	36	27	11	34	8	46.5	M14×1.5	42.5	37.5	21.5	32 $^{0}_{-0.039}$	1/4	104	138



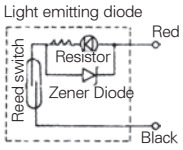
Specifications W5 (With indicator lamp)

Auto Switch Model	W5	
Application	Relay, Sequence Control	
Load Voltage	DC24V	AC100V
Max. Load Current/Range of Load Current	5~40mA	5~20mA
Protection Circuit for Contact Breaker Point	None	
Internal Voltage Drop	2.4V or less	
Indicator Lamp	ON:Red light emitting diode	

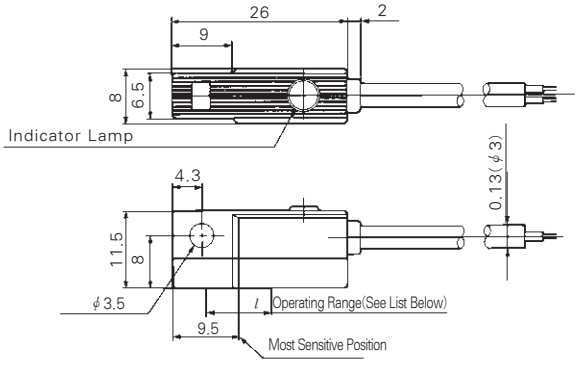
- Leakage Current – None
- Response Time – 1.2ms
- Lead Wire – Oil proof vinyl, ϕ3.4 0.2㎟, 2 Wire(red, black), 0.5m(18in)
- Impact Resistance– 30G
- Insulation Resistance – 50MΩ or more under the test voltage DC500V (Between case and cable)
- Withstand Voltage – AC1500V 1min (between case and cable)
- Ambient Temperature – 14~140°F (-10~60℃)
- Protection Structure – IEC spec IP67, Water-proof(JISCO920), oil-proof.

※ If 3m lead wire is required, L is put at the end of numbers.
Example : W5L

Auto Switch/Internal Circuit



Auto Switch Dimensions (mm)



Operating Range(l Dimension) (mm)

Series	Bore size			
	ϕ20	ϕ25	ϕ32	ϕ40
AX	7	8	8	8

Series AM2

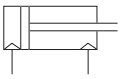
Air Cylinder

Bore Size(mm) : Ø40, Ø50, Ø63, Ø80, Ø100

- Improved energy absorption capacity
- Cylinder with high tech appearance
- Improved cushion capacity
- Compact and lightweight design
- Increase kinetic energy absorption

Symbol

Double Acting



How to Order

AM D 2 B N 50 – 150 N – XC16 – W3 S

1 2 3 4 5 6 7 8 9

1 Magnet
- Blank : None
- D : Built-in Magnet

2 Mounting
- B : Basic
- L : Foot
- F : Rod Side Flange
- G : Head Side Flange
- C : Single Rear Clevis
- D : Double Rear Clevis
- T : Center Trunnion

3 Type
- N : Non-lube
- F : Iron tube

4 Bore Size
- 40 : 40mm
- 50 : 50mm
- 63 : 63mm
- 80 : 80mm
- 100 : 100mm

5 Stroke (mm)
- Ø40 : 25,50,75,100,125,150,175, 200,250,300,350
- Ø50,63 : 25,50,75,100,125,150,175,200, 250,300,350,400, 450,500,600
- Ø80,100 : 50,75,100,125,150,175,200,250, 300,350,400,450,500,600,700

6 Suffix Symbol for Cylinder
- Bellows J : Non-lube
- K : Neoprene cloth
- Cushion N : None
- R : Rod end
- H : Head end
- Blank : Both end

7 Series
- Blank : Standard Type
- XC16 : Copper-Free

8 Auto Switches
- Blank : None
- W3 : Existing plug point Auto Switch
- W2PL : Intense-Magnetism-Resistant type

9 Number of Auto Switches
- Blank : 2 pcs
- S : 1 pc
- N : N pcs

Parts No. Of Mounting Bracket

Bore size	ø40	ø50	ø63	ø80	ø100
※ Foot	TCA2L40	TCA2L50	TCA2L63	TCA2L80	TCA2L100
Flange	TCA2F40	TCA2F50	TCA2F63	TCA2F80	TCA2F100
Single clevis	TCA2C40	TCA2C50	TCA2C63	TCA2C80	TCA2C100
Double clevis	TCA2D40	TCA2D50	TCA2D63	TCA2D80	TCA2D100

※ 2 pcs min for order of only one cylinder.

Specifications

Type	Non-lube	Air-hydro
Fluid	Air	L.P.Oil
Proof pressure	1.5MPa(213psi)	
Max. operating pressure	1.0MPa(14psi)	
Min. operating pressure	0.05MPa(7psi)	0.1MPa(14psi)
Ambient and fluid temperature	5~60°C(41~140°F)	
Piston speed	50~500mm/s	0.5~300mm/s
Cushion	Air Cushion	Not Available
Stroke tolerance	~250st : $^{+1.0}_{0}$,251~1,000st : $^{+1.4}_{0}$, 1,001~1,500st : $^{+1.8}_{0}$	
Mounting	Basic, Foot, Front flange, Rear flange, Single clevis, Double clevis, Center trunnion	

Weight/Aluminum Tube(Iron Tube)

kgf

Bore size		ø40	ø50	ø63	ø80	ø100
Basic Weight	Basic	0.94 (0.94)	1.29 (1.40)	2.19 (2.04)	3.50 (3.63)	4.58 (5.07)
	Foot	1.13 (1.13)	1.51 (1.62)	2.23 (2.38)	4.17 (4.30)	5.84 (6.06)
	Flange	1.31 (1.30)	1.75 (1.86)	3.64 (2.84)	4.96 (5.08)	6.72 (6.99)
	Single clevis	1.17 (1.17)	1.49 (1.74)	2.83 (2.67)	4.62 (4.74)	6.63 (6.68)
	Double clevis	1.21 (1.21)	1.47 (1.83)	2.78 (2.83)	4.90 (5.03)	7.15 (7.38)
	Trunnion	1.25 (1.35)	1.84 (1.94)	2.80 (3.00)	5.03 (5.32)	7.15 (7.54)
Additional weight per 2〃 stroke	All mounting bracket (except trunnion iron tube)	0.22 (0.28)	0.28 (0.35)	0.37 (0.43)	0.52 (0.70)	0.65 (0.87)
	Trunnion of iron tube	(0.36)	(0.46)	(0.65)	(0.86)	(1.07)
Accessories	Single knuckle	0.23	0.26	0.26	0.60	0.83
	Double knuckle(with pin)	0.37	0.43	0.43	0.87	1.27

※ In parenthese are for Iron tube type.

Example

AM2L40-100(Foot, ø40, 100st)
- Basic weight ····· 1.13kgf
- Additional weight ····· 0.22/50st
- Cylinder stroke ····· 100st

1.13+0.22×100/50=1.57kgf

Accessories

Description \ Mounting		Basic	Foot	Front flange	Rear flange	Single clevis	Double clevis	Center trunnion
Standard	Rod end nut	O	O	O	O	O	O	O
	Clevis pin	–	–	–	–	–	O	–
Option	Single knuckle joint	O	O	O	O	O	O	O
	Double knuckle joint(with pin)	O	O	O	O	O	O	O
	Gaiter	O	O	O	O	O	O	O

Parts No. Of Auto Switch Mounting Band

Switch model	Parts No.	Applicable bore size(mm)
W3	TBT-04	ø 40
	TBT-04	ø 50
	TBT-06	ø 63
	TBT-08	ø 80
	TBT-08	ø 100

Base Material And Surface Treatment

Description	Material	Note	
Cover		Aluminum alloy	Silver paint
Cylinder tube		Aluminum alloy	Hard alumite
		Carbon steel tube	Inside/Hard chrome plated
			Outside/Platinum silver
Seals area	Non-lube	NBR	PDU, NLP, OPA
	Air-hydro	NBR	SCB, SKY, SDA
Piston rod		Carbon steel	-
Piston		Aluminum alloy	Chromate

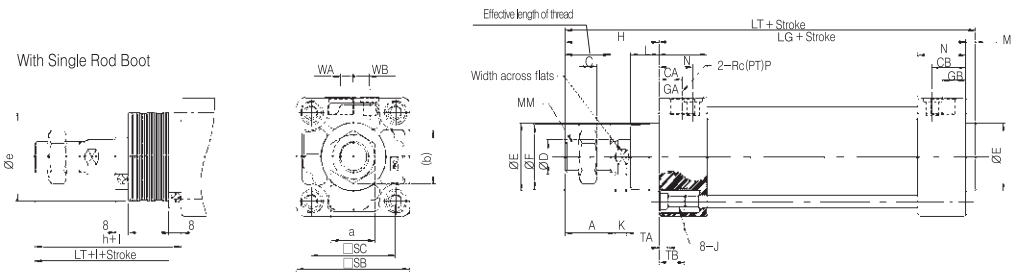
Rod boot Material

Symbol	Material	Max.ambient temperature
J	Nylon tarpaulin	60℃(140°F)
K	Neoprene cloth	※110℃(230°F)

※ Max. ambient temperature for the rod boot itself.

Basic Type/(B)

Non-Lube Type(AM2BN), Air-Hydro Type(AM2BH)



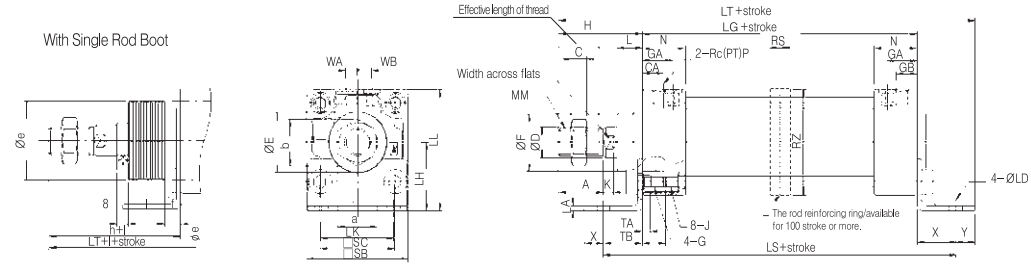
(mm)

Bore size (mm)	Stroke range(mm) Without gaiter	Stroke range(mm) With gaiter	Effective length of thread	Width across flats	A	□SB	□SC	CA	CB	ØD	ØE	ØF	GA	GB	M	N	P	LG	MM	J	K	L	WA	WB	a	b	c	TA	TB	Without Rod Boot H	Without Rod Boot LT	With Rod Boot Øe	With Rod Boot h	With Rod Boot l	With Rod Boot LT
40	~500	20~500	25	14	28	60	44	18	18	16	32	30	13	13	5	26.7	1/4	84	M14×1.5	M6×1.0	6	15	5	10.5	22	25.4	8	4.5	16	51	140	43	59	1/4 Stroke	148
50	~600	20~600	28	18	31	70	52	21	21	20	40	38	14.5	14.5	6	29.7	3/8	90	M18×1.5	M8×1.25	7	17.7	8	9.9	27	31.2	11	5.5	16	58	154	52	66		162
63	~600	20~600	28	18	31	85	64	21	21	20	40	38	15	15	6	30.7	3/8	98	M18×1.5	M8×1.25	7	17.4	9	11.5	27	31.2	11	5.5	16	58	162	52	66		170
80	~750	20~750	33	22	36	102	78	26	26	25	52	50	21	21	7	36.7	1/2	116	M22×1.5	M10×1.25	10	22.5	11	13	32	37	13	5.5	17	71	194	65	80		203
100	~750	20~750	37	26	40	116	92	28	28	30	52	50	21	21	8	39.7	1/2	126	M26×1.5	M10×1.25	10	19	13	14	41	47.3	16	5.5	17	72	206	65	81		215

※ For non standard Stroke, inquire separatly

Foot Type/(L)

Non-Lube Type(AM2LN), Air-Hydro Type(AM2LH)



(mm)

Bore size (mm)	Stroke range(mm) Without Rod Boot	Stroke range(mm) With Rod Boot	Effective length of thread	Width across flat	A	□SB	□SC	CA	CB	ØD	ØE	ØF	GA	GB	L	N	P	LG	MM	J	K
40	~500	20~500	25	14	28	60	44	18	18	16	32	30	13	13	15	26.7	1/4	84	M14×1.5	M6×1.0	6
50	~600	20~600	28	18	31	70	52	21	21	20	40	38	14.5	14.5	17.7	29.7	3/8	90	M18×1.5	M8×1.25	7
63	~600	20~600	28	18	31	85	64	21	21	20	40	38	15	15	17.4	30.7	3/8	98	M18×1.5	M8×1.25	7
80	~750	20~750	33	22	36	102	78	26	26	25	52	50	21	21	22.5	36.7	1/2	116	M22×1.5	M10×1.25	10
100	~750	20~750	37	26	40	116	92	28	28	30	52	50	21	21	19	39.7	1/2	126	M26×1.5	M10×1.25	10

Long Stroke Type

G	WA	WB	a	b	c	TA	TB	X	Y	ØLD	LH	LS	LA	LK	LL	Without Rod Boot H	Without Rod Boot LT	With Rod Boot Øe	With Rod Boot f	With Rod Boot h	With Rod Boot l	With Rod Boot LT
M6×1.0DP18	5	10.5	22	25.4	8	4.5	16	27	13	9	40	138	3.2	42	70	51	175	43	11.2	59	1/4 Stroke	183
M8×	8	9.9	27	31.2	11	5.5	16	27	13	9	45	144	3.2	50	80	58	188	52	11.2	66		196
1.25DP18	9	11.5	27	31.2	11	5.5	16	34	16	11.5	50	166	3.2	59	93	58	206	52	11.2	66		214
M8×	11	13	32	37	13	5.5	17	44	16	13.5	65	204	4.5	76	116	71	247	65	12.5	80		256
1.25DP18	13	14	41	47.3	16	5.5	17	43	17	13.5	75	212	6	92	133	72	258	65	14	81		267

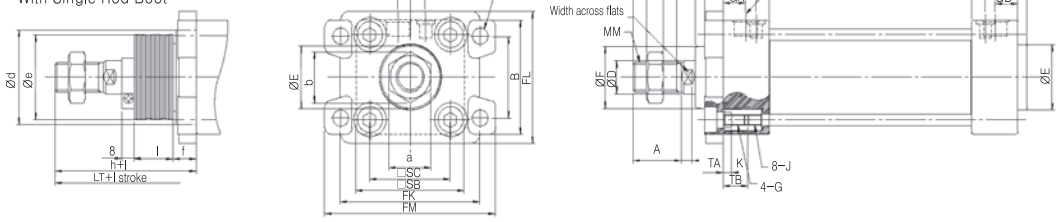
※ For non standard stroke, inquire separately

Bore size (mm)	Stroke range (mm)	RS	RZ
40	501~800	–	–
50	601~1200	30	76
63	601~1200	40	92
80	751~1400	45	112
100	751~1400	50	136

Front Flange/(F)

Non-Lube Type(AM2FN), Air-Hydro Type(AM2FH)

With Single Rod Boot



(mm)

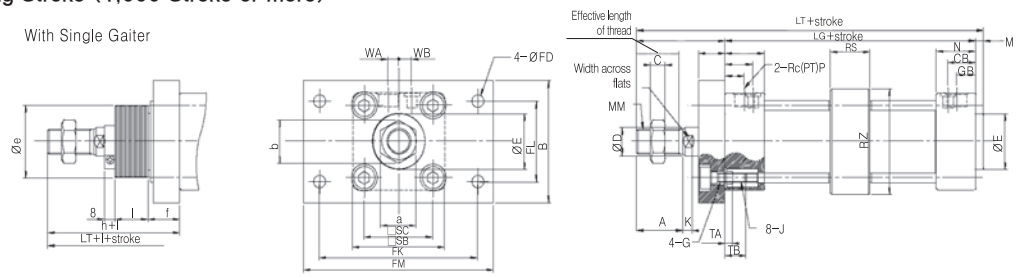
Bore size (mm)	Stroke range(mm)		Effective length of thread	Width across flats	A	B	□SB	□SC	CA	CB	ØD	ØE	ØF	GA	GB	LG	MM	G	J	K	L
	Without Rod Boot	With Rod Boot																			
40	~800	20~800	25	14	28	71	60	44	18	18	16	32	30	13	13	84	M14×1.5	M6×1.0 DP 18	M6×1.0	6	15
50	~1000	20~1000	28	18	31	81	70	52	21	21	20	40	38	14.5	14.5	90	M18×1.5	M8×1.25 DP 18	M8×1.25	7	17.7
63	~1000	20~1000	28	18	31	101	85	64	21	21	20	40	38	15	15	98	M18×1.5	M8×1.25 DP 22	M8×1.25	7	17.4
80	~1000	20~1000	33	22	36	119	102	78	26	26	25	52	50	21	21	116	M22×1.5	M10×1.25 DP 24	M10×1.25	10	22.5
100	~1000	20~1000	37	26	40	133	116	92	28	28	30	52	50	21	21	126	M26×1.5	M10×1.25 DP 24	M10×1.25	10	19

M	N	P	WA	WB	a	b	c	TA	TB	FV	ØFD	FT	FK	FL	FM	Without Rod Boot	With Rod Boot						
																H	LT	*Ød	Øe	f	h	l	LT
5	26.7	1/4	5	10.5	22	25.4	8	4.5	16	60	9	12	80	42	100	51	140	52	43	15	59	1/4 Stroke	148
6	29.7	3/8	8	9.9	27	31.2	11	5.5	16	70	9	12	90	50	110	58	154	58	52	15	66		162
6	30.7	3/8	9	11.5	27	31.2	11	5.5	16	86	11.5	15	105	59	130	58	162	58	52	17.5	66		170
7	36.7	1/2	11	13	32	37	13	5.5	17	102	13.5	18	130	76	160	71	194	80	65	21.5	80		203
8	39.7	1/2	13	14	41	47.3	16	5.5	17	116	13.5	18	150	92	180	72	206	80	65	21.5	81		215

★ Hole diameter of Rod Boot to mount Air-cylinder should be larger than the outside diameter of gaiter mounting bracket Ød.

Long Stroke (1,000 Stroke or more)

With Single Gaiter



※ It's for steel Flange.

(mm)

Bore size (mm)	Stroke range (mm)	Effective length of thread	Width across flats	A	B	□SB	□SC	CA	CB	ØD	ØE	GA	GB	P	LG	MM	G	J	K	M	N
50	1001~1200	28	18	35	88	70	52	21	21	20	40	14.5	14.5	3/8	90	M18×1.5	M8×1.25 DP 26	M8×1.25	7	6	29.7
63	1001~1200	28	18	35	105	85	64	21	21	20	40	15	15	3/8	98	M18×1.5	M8×1.25 DP 27	M8×1.25	7	6	30.7
80	1001~1400	33	22	40	124	102	78	26	26	25	52	21	21	1/2	116	M22×1.5	M10×1.25 DP 32	M10×1.25	11	7	36.7
100	1001~1500	37	26	40	140	116	92	28	28	30	52	21	21	1/2	126	M26×1.5	M10×1.25 DP 32	M10×1 25	11	8	39.7

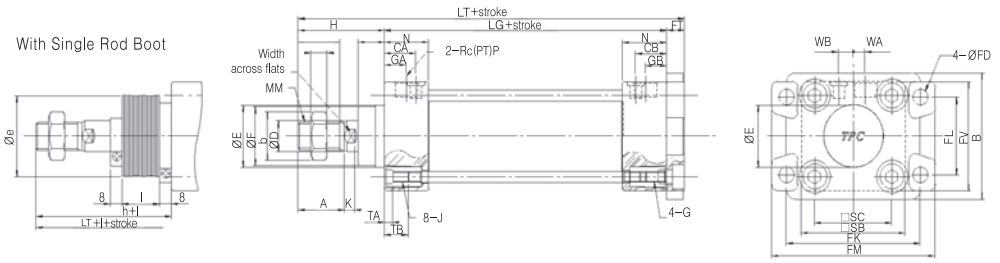
WA	WB	a	b	c	TA	TB	ØFD	FT	FK	FL	FM	RS	RZ	Without Rod Boot	With Rod Boot					
														H	LT	*Ød	f	h	l	LT
8	9.9	27	31.2	11	5.5	17	9	20	120	58	144	30	76	67	163	52	24	75	1/4 Stroke	171
9	11.5	27	31.2	11	5.5	17	11.5	23	140	64	170	40	92	71	175	52	27	79		183
11	13	32	37	13	5.5	18	13.5	28	164	84	198	45	112	87	210	65	32.5	96		219
13	14	41	47.3	16	5.5	18	13.5	29	180	100	220	50	136	89	223	65	33.5	98		232

★ Hole diameter of Rod Boot to mount Air-cylinder should be larger than the outside diameter of gaiter mounting bracket Øe.

Rear Flange/(G)

Non-Lube Type(AM2GN), Air-Hydro Type(AM2GH)

With Single Rod Boot



(mm)

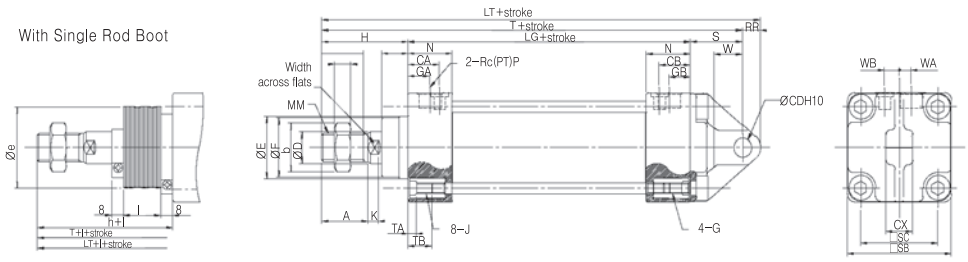
Bore size (mm)	Stroke range		Effective length of thread	Width across flats	A	B	□SB	□SC	CA	CB	ØD	ØE	ØF	GA	GB	LG	MM	G	J	K	L
	Without Rod Boot	With Rod Boot																			
40	~500	20~500	25	14	28	71	60	44	18	18	16	32	30	13	13	84	M14×1.5	M6×1.0 DP 18	M6×1.0	6	15
50	~600	20~600	28	18	31	81	70	52	21	21	20	40	38	14.5	14.5	90	M18×1.5	M8×1.25 DP 18	M8×1.25	7	17.7
63	~600	20~600	28	18	31	101	85	64	21	21	20	40	38	15	15	98	M18×1.5	M8×1.25 DP 22	M8×1.25	7	17.4
80	~750	20~750	33	22	36	119	102	78	26	26	25	52	50	21	21	116	M22×1.5	M10×1.25 DP 24	M10×1.25	10	22.5
100	~750	20~750	37	26	40	133	116	92	28	28	30	52	50	21	21	126	M26×1.5	M10×1.25 DP 24	M10×1 25	10	19

N	P	WA	WB	b	c	TA	TB	FV	ØFD	FT	FK	FL	FM	Without Rod Boot		With Rod Boot			
														H	LT	Øe	h	l	LT
26.7	1/4	5	10.5	25.4	8	4.5	16	60	9	12	80	42	100	51	147	43	59	1/4 Stroke	155
29.7	3/8	8	9.9	31.2	11	5.5	16	70	9	12	90	50	110	58	160	52	66		168
30.7	3/8	9	11.5	31.2	11	5.5	16	86	11.5	15	105	59	130	58	171	52	66		179
36.7	1/2	11	13	37	13	5.5	17	102	13.5	18	130	76	160	71	205	65	80		214
39.7	1/2	13	14	47.3	16	5.5	17	116	13.5	18	150	92	180	72	216	65	81		225

Single Clevis/(C)

Non-Lube Type(AM2CN), Air-Hydro Type(AM2CH)

With Single Rod Boot



(mm)

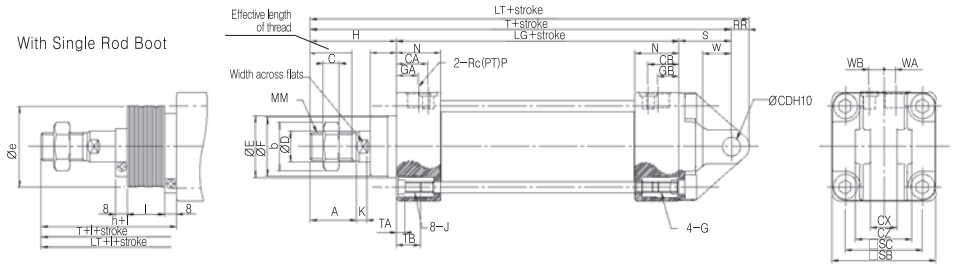
Bore size (mm)	Stroke range		Effective length of thread	Width across flats	A	□SB	□SC	CA	CB	ØD	ØE	ØF	GA	GB	LG	MM	G	J	K
	Without Rod Boot	With Rod Boot																	
40	~500	20~500	25	14	28	60	44	18	18	16	32	30	13	13	84	M14×1.5	M6×1.0 DP 18	M6×1.0	6
50	~600	20~600	28	18	31	70	52	21	21	20	40	38	14.5	14.5	90	M18×1.5	M8×1.25 DP 18	M8×1.25	7
63	~600	20~600	28	18	31	85	64	21	21	20	40	38	15	15	98	M18×1.5	M8×1.25 DP 20	M8×1.25	7
80	~750	20~750	33	22	36	102	78	26	26	25	52	50	21	21	116	M22×1.5	M10×1.25 DP 20	M10×1.25	10
100	~750	20~750	37	26	40	116	92	28	28	30	52	50	21	21	126	M26×1.5	M10×1.25 DP 20	M10×1.25	10

L	N	P	S	WA	WB	b	c	TA	TB	RR	W	ØCD H10		CX		Without Rod Boot			With Rod Boot				
																H	T	LT	Øe	h	l	T	LT
15	26.7	1/4	30	5	10.5	25.4	8	4.5	16	10	16	10	+0.058 0	15	−0.1 −0.3	51	165	175	43	59	1/4 Stroke	173	183
17.7	29.7	3/8	35	8	9.9	31.2	11	5.5	16	12	19	12	+0.070 0	18	−0.1 −0.3	58	183	195	52	66		191	203
17.4	30.7	3/8	40	9	11.5	31.2	11	5.5	16	16	23	16	+0.070 0	25	−0.1 −0.3	58	196	212	52	66		204	220
22.5	36.7	1/2	48	11	13	37	13	5.5	17	20	28	20	+0.084 0	31.5	−0.1 −0.3	71	235	255	65	80		244	264
19	39.7	1/2	58	13	14	47.3	16	5.5	17	25	36	25	+0.084 0	35.5	−0.1 −0.3	72	256	281	65	81		265	290

Double Clevis Type/(D)

Non-Lube Type(AM2DN), Air-Hydro Type(AM2DH)

With Single Rod Boot



(mm)

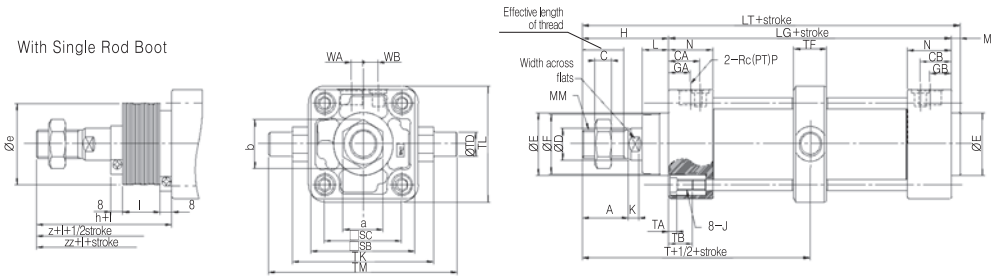
Bore size (mm)	Stroke range(mm)		Effective length of thread	Width across flats	A	□SB	□SC	CA	CB	ØD	ØE	ØF	GA	GB	LG	MM	G	J	K
	Without Rod Boot	With Rod Boot																	
40	~500	20~500	25	14	28	60	44	18	18	16	32	30	13	13	84	M14×1.5	M6×1.0 DP 18	M6×1.0	6
50	~600	20~600	28	18	31	70	52	21	21	20	40	38	14.5	14.5	90	M18×1.5	M8×1.25 DP 18	M8×1.25	7
63	~600	20~600	28	18	31	85	64	21	21	20	40	38	15	15	98	M18×1.5	M8×1.25 DP 18	M8×1.25	7
80	~750	20~750	33	22	36	102	78	26	26	25	52	50	21	21	116	M22×1.5	M10×1.25 DP 20	M10×1.25	10
100	~750	20~750	37	26	40	116	92	28	28	30	52	50	21	21	126	M26×1.5	M10×1.25 DP 20	M10×1.25	10

L	N	P	S	WA	WB	b	c	TA	TB	RR	W	ØCD H10		CX		CZ	Without Rod Boot			With Rod Boot				
																	H	T	LT	Øe	h	l	T	LT
15	26.7	1/4	30	5	10.5	25.4	8	4.5	16	10	16	10	+0.058 0	15	+0.3 +0.1	29.5	51	165	175	43	59	1/4 Stroke	173	183
17.7	29.7	3/8	35	8	9.9	31.2	11	5.5	16	12	19	12	+0.070 0	18	+0.3 +0.1	38	58	183	195	52	66		191	203
17.4	30.7	3/8	40	9	11.5	31.2	11	5.5	16	16	23	16	+0.070 0	25	+0.3 +0.1	49	58	196	212	52	66		204	220
22.5	36.7	1/2	48	11	13	37	13	5.5	17	20	28	20	+0.084 0	31.5	+0.3 +0.1	61	71	235	255	65	80		244	264
19	39.7	1/2	58	13	14	47.3	16	5.5	17	25	36	25	+0.084 0	35.5	+0.3 +0.1	64	72	256	281	65	81		265	290

Center Trunnion Type/(T)

Non-lube Type(AM2TN), Air-hydro type(AM2TH)

With Single Rod Boot

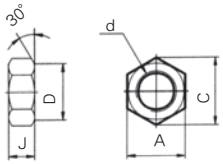


(mm)

Bore size (mm)	Stroke range(mm)		Effective length of thread	Width across flats	A	□SB	□SC	CA	CB	ØD	ØE	ØF	GA	GB	L	M	N	LG	MM	G	K
	Without Rod Boot	With Rod Boot																			
40	~500	20~500	25	14	28	60	44	18	18	16	32	30	13	13	15	5	26.7	84	M14×1.5	M6×1.0	6
50	~600	20~600	28	18	31	70	52	21	21	20	40	38	14.5	14.5	17.7	6	29.7	90	M18×1.5	M8×1.25	7
63	~600	20~600	28	18	31	85	64	21	21	20	40	38	15	15	17.4	6	30.7	98	M18×1.5	M8×1.25	7
80	~750	20~750	33	22	36	102	78	26	26	25	52	50	21	21	22.5	7	36.7	116	M22×1.5	M10×1.25	10
100	~750	20~750	37	26	40	116	92	28	28	30	52	50	21	21	19	8	39.7	126	M26×1.5	M10×1.25	10

P	WA	WB	a	b	c	TA	TB	ØTD e8		TF	TK	TL	TM	Without Rod Boot			With Rod Boot				
														H	T	LT	Øe	h	l	T	LT
1/4	5	10.5	22	25.4	8	4.5	17	15	−0.032 −0.059	22	85	62	117	51	93	140	43	59	1/4 Stroke	101	148
3/8	8	9.9	27	31.2	11	5.5	17	15	−0.032 −0.059	22	95	74	127	58	103	154	52	66		111	162
3/8	9	11.5	27	31.2	11	5.5	17	18	−0.032 −0.059	28	110	90	148	58	107	162	52	66		115	170
1/2	11	13	32	37	13	5.5	18	25	−0.040 −0.073	34	140	110	192	71	129	194	65	80		138	203
1/2	13	14	41	47.3	16	5.5	18	25	−0.040 −0.073	40	162	130	214	72	135	206	65	81		144	215

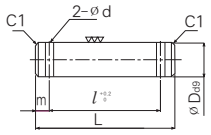
Rod End Nut(Standard accessaries) (mm)



Material : Rolled steel

Part No.	Applicable bore	d	J	A	C	D
TNT-04	ø40	M14×1.5	8	22	25.4	21
TNT-05	ø50 · ø60	M18×1.5	11	27	31.2	26
TNT-08	ø80	M22×1.5	13	32	37.0	31
TNT-10	ø100	M26×1.5	16	41	47.3	39

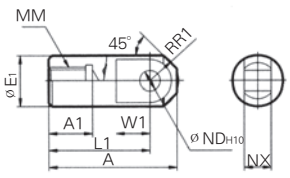
Knuckle Joint Pin/Clevis Pin (mm)



Material : Carbon steel

Part No	Bore Size		ø Dd9	L	l	m	ø d	Applicable split pin
	CLEVIS	KNUCKLE						
TCDP-2	ø40	—	$10^{-0.040}_{-0.076}$	45.2	37.2	4	ø3	ø3×18l
TCDP-3	ø50	ø40·50·60	$12^{-0.050}_{-0.093}$	54.3	46.3	4	ø3	ø3×18l
TCDP-4	ø63	—	$16^{-0.050}_{-0.093}$	70	60	5	ø4	ø4×24 l
TCDP-5	—	ø80	$18^{-0.040}_{-0.076}$	76	66	5	ø4	ø4×25l
TCDP-6	ø80	ø100	$20^{-0.065}_{-0.117}$	82	72	5	ø4	ø4×36 l
TCDP-7	ø100	—	$25^{-0.065}_{-0.117}$	87.5	77.5	5	ø4	ø4×36 l

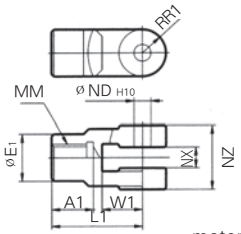
I Type Single Knuckle Joint (mm)



Material : Free cutting sulfur steel

Part No.	Applicable bore	A	A1	ø E1	L1	MM	R1	W1	ø NDH10	NX
TI-04	ø40	69	22	24	55	M14×1.5	15.5	20	$12^{+0.070}_{0}$	$16^{-0.1}_{-0.3}$
TI-05	ø50 · ø63	74	27	28	60	M18×1.5	15.5	20	$12^{+0.070}_{0}$	$16^{-0.1}_{-0.3}$
TI-08	ø80	91	37	36	71	M22×1.5	22.5	26	$18^{+0.070}_{0}$	$28^{-0.1}_{-0.3}$
TI-10	ø100	105	37	40	83	M26×1.5	24.5	28	$20^{+0.084}_{0}$	$30^{-0.1}_{-0.3}$

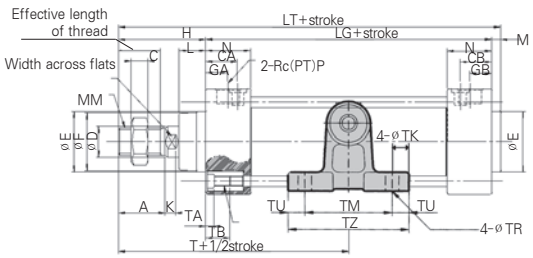
Y Type Double Knuckle Joint (mm)

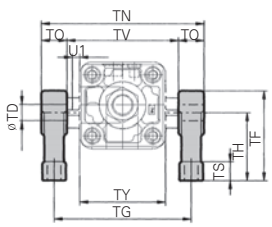


material : Cast iron

Part No.	Applicable bore	A1	ø E1	L1	MM	R1	W1	ø NDH10	NX	NZ
TY-04A	ø40	22	24	55	M14×1.5	13	25	$12^{+0.070}_{0}$	$16^{+0.3}_{+0.1}$	38
TY-05A	ø50 · ø63	27	28	60	M18×1.5	15	27	$12^{+0.070}_{0}$	$16^{+0.3}_{+0.1}$	38
TY-08A	ø80	37	36	71	M22×1.5	19	28	$18^{+0.070}_{0}$	$28^{+0.3}_{+0.1}$	55
TY-10A	ø100	37	40	83	M26×1.5	21	38	$20^{+0.084}_{0}$	$30^{+0.3}_{+0.1}$	61

Trunnion Bracket

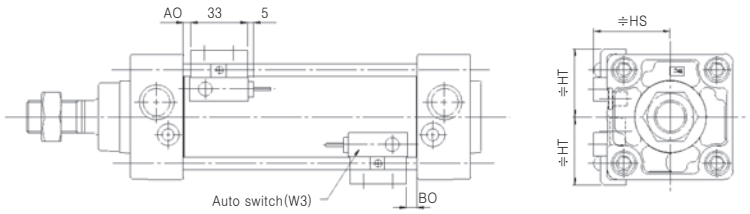




(mm)

Part No.	Applicable bore	TZ	TM	TU	TG	TV	TN	TO	ϕ TR	ϕ TK	TS	TH	TF	TY	U1	T	ϕ TD-H10
TCA1-S04	ϕ40	80	60	10	102	85	119	17	9	17	12	45	60	62	10	93	$15^{+0.070}_{0}$
	ϕ50	80	60	10	112	95	129	17	9	17	12	45	60	74	10	103	$15^{+0.070}_{0}$
TCA1-S06	ϕ63	100	70	15	130	110	150	20	11	22	14	55	73	90	10	107	$18^{+0.070}_{0}$
TCA1-S08	ϕ80	120	90	15	166	140	192	26	13.5	24	17	75	100	110	12	129	$25^{+0.084}_{0}$
	ϕ100	120	90	15	188	162	214	26	13.5	24	17	75	100	130	12	135	$25^{+0.084}_{0}$

With Auto Switch



(mm)

Part No. of Auto switch	Mounting position of Auto switch	Position				
		Ø40	Ø50	Ø63	Ø80	Ø100
W3	AO	0(0)	0(0)	0(2.5)	2(6)	4(7.5)
	BO	1(0)	1(0)	5(1.5)	8(4)	10(6.5)
	HS	37	41	46	53	61
	HT	31	35	42	50	57

※ ( ) is for long stroke, Non-Lube and Low Pressure Hydro.
Mounting possible for Foot & Front Flange.

Minimum Stroke of Attaching Auto Switch

n:Number of Auto Switch

Part No. of Auto switch	Number of Auto switch	Mounting Bracket for Auto switch	Center Trunnion Type			
			Ø40, Ø50	Ø63	Ø80	Ø100
W3	2 pcs(same,across flats) 1 pcs	15	90	100	110	120
	n pcs(same flats)	15+55 $\left(\frac{n-2}{2}\right)$ n=1, 2, 3, 4,…	90+100 $\left(\frac{n-4}{2}\right)$ n=4, 8, 12, 16, …	100+55 $\left(\frac{n-4}{2}\right)$ n=4, 8, 12, 16, …	110+55 $\left(\frac{n-4}{2}\right)$ n=4, 8, 12, 16, …	120+55 $\left(\frac{n-4}{2}\right)$ n=4, 8, 12, 16, …

Possible to order

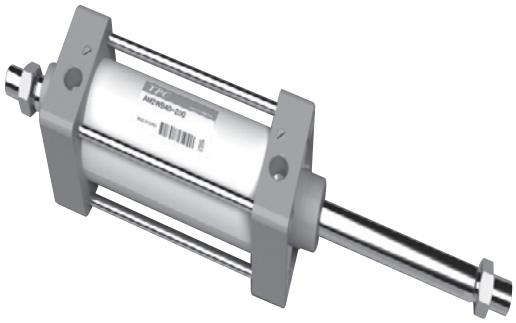
	1	2	3	4	5	6	7	8	9	10	11
Type	Non-Lube	Low pressure hydro	Steel Tube	Non-Rotating	Double Rod	Adjustable Stroke/ Extension Adjustable type	Adjustable Stroke/ Retraction Adjustable type	Dual/ Single Rod	Dual/ Double Rod	Powerful Scraper	Powerful Rod
Symbol	N	H	F	K	W	XC8	XC9	XC11	XC10	XC4	XB5
AM2	◆	–	◆	–	◆	◆	◆	–	◆	–	–

12	13	14	15	16	17	18	19
End Lock	Tandum	High Temperature	Rod Stainless	Coil Scraper	Front Flange	Intense-Magnetism-Resistance type	Copper-free
X105	XC12	XB6	XC6	X104	H	P	XC16
◆	–	◆	◆	–	◆	–	◆

◆ : Possible to produce

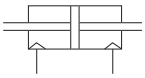
Series AM2W

Double Rod Type



- Double rod type cylinder.
- Long life, High speed operation possible
- Can operate without lubrication
- Auto switch capable (Tie rod Type)

Symbal



How to order

A M D 2 W L N 40 — 200 JJ — ○ S

1 2 3 4 5 6 7 8 9

1 Magnet
- Blank : None
- D : Built-in Magnet

2 Double rod Type Cylinder

3 Mounting
- B : Basic
- L : Foot
- F : Rod side Flange
- G : Head side Flange
- C : single Rear Clevis
- D : Double Rear Clevis
- T : Center Trunniom

※ Other how to order same as that of series AM2
How to order (Refer to page 172)

4 Type
- H : Air hydro
- N : Non-lube(Standard)

5 Bore Size
- 40 : 40mm
- 50 : 50mm
- 63 : 63mm
- 80 : 80mm
- 100 : 100mm

6 Stroke(mm)
- 40 : 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
- 50 : 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
- 63 : 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
- 80 : 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
- 100 : 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500

7 Suffix Symbol for Cylinder
- Blank : None
- J : Nylon tarpaulin (single Side)
- JJ : Nylon tarpaulin (Both Side)
- K : Neoprene cloth (single Side)
- KK : Neoprene cloth (Both Side)

8 Auto Switches
- Blank : None
- W3 : Existing plug point Aout Switch
- W2PL : Intense-Magnetism-Pesiatout

9 Number of Auto Switches
- Blank : 2 pcs
- S : 1 pc
- N : N pcs

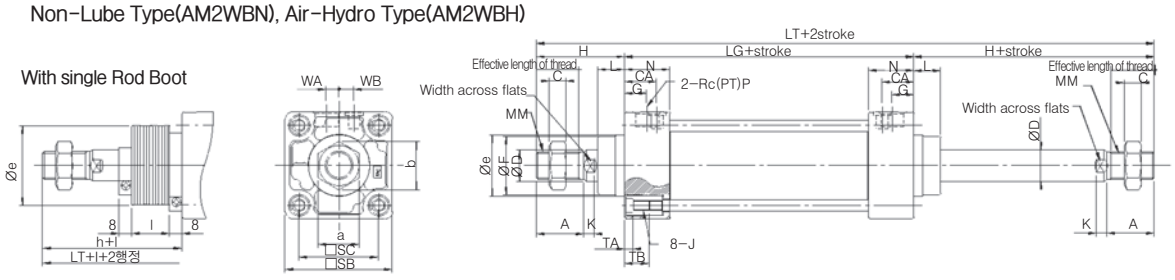
Specifications

Type	Non-lube	Air-hydro
Fluid	Air	L.P. oil
Proof Pressure	1.5MPa(213psi)	
Max. Operating pressure	1.0MPa(140psi)	
Min. Operating pressure	0.8MPa(113psi)	0.16MPa(22psi)
Piston speed	50~500mm/s	0.5~300mm/s
Ambient and fluid temperature	5~60℃(41~140°F)	
Cushion	Air Cushion	Not Available
Thread tolerance	KS class 2	
Stroke tolerance	~250st : $^{+1.0}_{0}$, 251~ 750st : $^{+1.4}_{0}$	
Mounting	Basic, Foot, Front flange, Center trunnion	

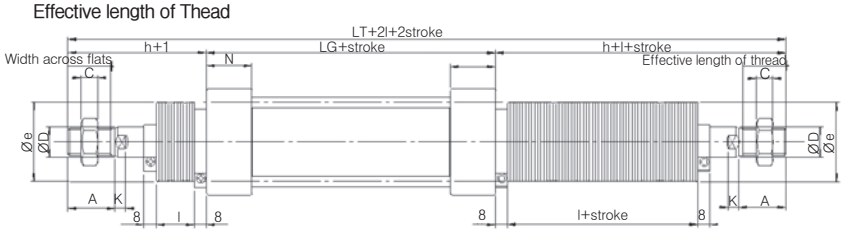
Basic Type/(B)

Non-Lube Type(AM2WBN), Air-Hydro Type(AM2WBH)

With single Rod Boot



With Double Rod Boot
Effective length of Thead

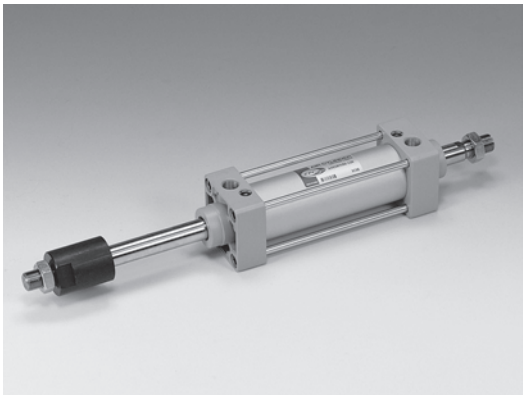


※ Dimensions by mounting Types are the same as for AM2 standard Type. (unit : mm)

Bore size (mm)	Stroke range(mm)		Effecter length of thread	Width across flat	A	□SB	□SC	CA	ØD	ØE	ØF	G	L	N	LG	MM	J
	Without Rod Boot	With Rod Boot															
40	~500	20~500	25	14	28	60	44	18	16	32	30	13	15	26.7	84	M14×1.5	M6×1.0
50	~600	20~600	28	18	31	70	52	21	20	40	38	14.5	17.7	29.7	90	M18×1.5	M8×1.25
63	~600	20~600	28	18	31	85	64	21	20	40	38	15	17.4	30.7	98	M18×1.5	M8×1.25
80	~750	20~750	33	22	36	102	78	26	25	52	50	21	22.5	36.7	116	M22×1.5	M10×1.25
100	~750	20~750	37	26	40	116	92	28	30	52	50	21	19	39.7	126	M26×1.5	M10×1.25

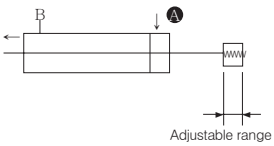
K	WA	WB	WB	b	c	P	TA	TB	Without Rod Boot		With Single(Double) Rod Boot				
									H	LT	Øe	h	l	LT	(LT)
6	5	10.5	22	25.4	8	1/4	4.5	16	51	186	43	59	1/4 stroke	194	202
7	8	9.9	27	31.2	11	3/8	5.5	16	58	206	52	66		214	222
7	9	11.5	27	31.2	11	3/8	5.5	16	58	214	52	66		222	230
10	11	13	32	37	13	1/2	5.5	17	71	258	65	80		267	276
10	13	14	41	47.3	16	1/2	5.5	17	72	270	65	81		279	288

Adjustable Stroke Cylinder / Extension Adjustable Type



The Stroke at extend of the cylinder can be adjusted by the stopper in the head side from full stroke(0~25mm) or (0~50mm).
※If you want lubrication types, inquire with us.

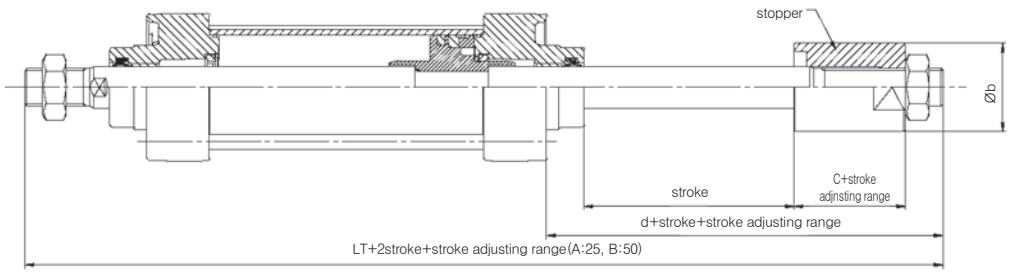
Symbol



AM2 (Mounting) (Type) (Bore Size) — (Stroke) (Additional symbol) (Stroke adjusting symbol) XC8

●Stroke adjusting symbol
A – Stroke adjusting range 0~25mm
B – Stroke adjusting range 0~50mm

Construction, Dimensions



※ other dimensions are the same for AM2 standard Type (unit : mm)

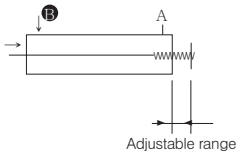
Bore size(mm)	Øb	c	d	LT
40	Ø32	22	51	186
50	Ø42	28	63.5	211.5
63		28	63.5	219.5
80	Ø55	35	78.5	265.5
100		35	75	273

Adjustable Stroke Cylinder / Retraction Adjustable Type

AM2 (Mounting) (Type) (Bore Size) — (Stroke) (Additional Symbal) (Stroke adjusting symbol) — XC9

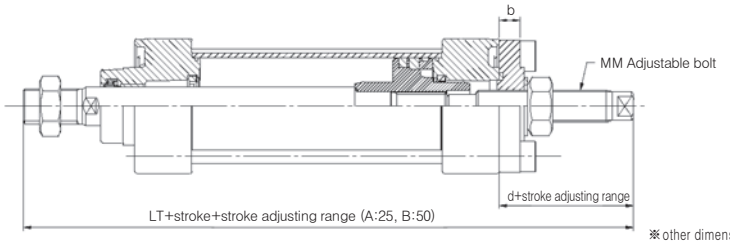
● Stroke adjusting Symbol
A – Stroke adjusting range 0~25mm
B – Stroke adjusting range 0~50mm

Symbol



The Stroke at retraction of the cylinder can be adjusted from (0~25mm) or (0~50mm) by the adjusting bolt.

Construction / Dimensions



※other dimensions are the same for AM2 standard Type (unit : mm)

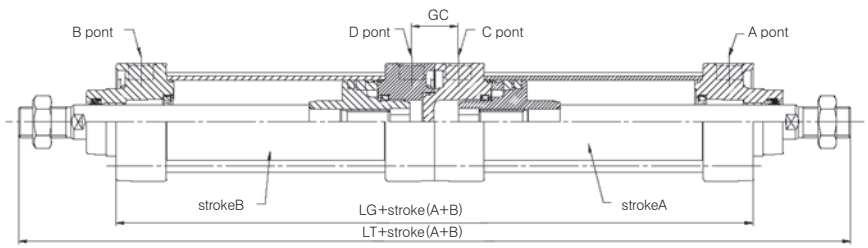
Bore size(mm)	MM	b	d	LT
40	M16×1.5	9	43	178
50	M16×1.5	11	45	193
63	M20×1.5	11	49.5	205.5
80	M24×1.5	15	58	245
100	M24×1.5	15	58	256

Dual Stroke cylinder / Double Rod Type

AM2 (Mounting) (Type) (Bore size) — (Stroke A) (Additional symbol) + (Stroke B) (Adjusting symbol) — XC10

Two cylinders are constructed as one cylinder in a back–to back configuration allowing the cylinder stroke to be controlled in three steps.
※If you want lubrication types, inquire with us.

Construction / Dimensions

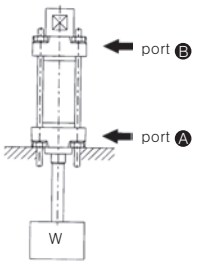


※other dimensions are the same for AM2 standard Type (unit : mm)

Bore Size(mm)	GC	LG	LT
40	25	167	269
50	28	179	295
63	29	195	311
80	41	231	373
100	41	251	395

END LOCK Cylinder

AM2 (Mounting) (Type) (Bore Size) – (Stroke) (Suffix) —X105



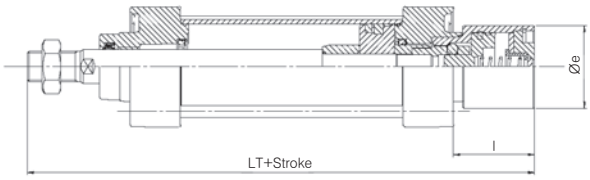
When the port B is the status of evacuation, the lock will be unlocked automatically if the pistion rod reach the end of the head side stroke.
Moreover the lock will be unlocked automatically if the air go into the port B.

Specification

Type	Non-lubrication
Bore Size	Ø40, Ø50, Ø63, Ø80, Ø100
Cushion	Air Cushion
Oparating type	Double Acting
Retatning force	Ø40:20kgf, Ø50~Ø100:150kgf
LOCK Start Pressure	0.05MP(7Psi)
LOCK Release Pressure	0.2MP(28Psi)
Mamting	Basic type, Axial foot type, Rod side flange type, Center trunnion

※If you want lubrication types, inquire with us.

Construction / Dimensions



(unit : mm)

Bore Size(mm)	Øe	l	LT
40	34	31	166
50	48	47.5	197.6
63	48	47.5	204.8
80	50	47	234
100	50	49	247

High Temperature Cylinder

AM2 (Mounting) (Type) (Bore Size) – (Stroke) (Suffix) — XB6

Use at high temperature up to 150℃

Specifications

Type	Non-Lubrication
Bore size	Ø40, Ø50, Ø63, Ø80, Ø100
Ambient and Fluid Temperature	-20~+150℃
Material of seal	FPM(Fluorme Rubber)

※ Non-auto switch

Stainless Steel Rod

AM2 (Mounting) (Type) (Bore Size) – (Stroke) (Suffix) — XC6

Suffix ●
Blank – Moumting Both side Cushion
R – Moumting Rod side cushion
H – Moumting Head side cushion
N – Nan-Cushion

It is used in case there is the risk of rust or corrosion, such as when the end of the pistion rod becomes immesed in water as it moves forward.

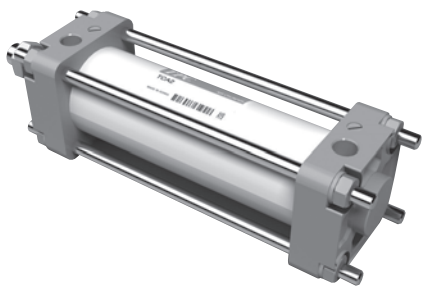
Specification

Type	Non-lube, Air-hydro
Bore size	Ø40, Ø50, Ø63, Ø80, Ø100
Piston rod material	Stainless steel (SUS304)

Series AM

Air Cylinder/Double Acting

Non-lube · Air-hydro Type(mm) : Ø40, Ø50, Ø63, Ø80, Ø100



- BUILT-IN AIR CUSHION
- DESIGNED FOR LONG LIFE & HIGH SPEED
- AVAILABLE IN WIDE STROKE & BORE SIZES

Symbol

Double acting

How To Order

AM | L | N | 50 – 150 | ○ | ○ — ○ — W3 | □

1 2 3 4 5 6 7 8 9 10

1 Air Cylinder
Standard
(Built-in magnet)

2 Mounting
B : Standard
L : Foot
F : Front flange
G : Rear flange
C : Single clevis
D : Double clevis
T : Center trunnion

3 Type
N : Non-lube
H : Air-hydro
F : Iron tube
(W/O Magnet)

4 Bore Size(mm)
40 : ϕ40
50 : ϕ50
63 : ϕ63
80 : ϕ80
100 : ϕ100

5 Stroke/(mm)
Bore Size : standard stroke
40 : 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
50 : 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600
63 : 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600
80 : 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700
100 : 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700

6 Rod Boot
Blank : None
J : Nylon tarpaulin
K : Neoprene cloth

7 Cushion
Blank : Both end
N : None
H : Head end
R : Rod end

※ When knuckles are ordered,
I : Single knuckle attached
Y : Double knuckle attached

8 Special Option
Blank : Standard type
XC16 : Copper-free

9 Auto Switch
Blank : None
W3 : Reed switch type, W3(AC100,200V,DC 24V)
Standard Auto Switch lead wire length is 0.5m.

※ Please suffix L at the end for lead wire of 3m(Option)
(Example) W3 - W3L

10 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

Model

Model	Type	Action	Seal
AM○N	Non-lube	Double	Special
AM○H	Air-hydro		Special

Parts No. Of Mounting Bracket

Bore size	ϕ40	ϕ50	ϕ63	ϕ80	ϕ100
※ Foot	TCA2L40	TCA2L50	TCA2L63	TCA2L80	TCA2L100
Flange	TCA2F40	TCA2F50	TCA2F63	TCA2F80	TCA2F100
Single clevis	TCA2C40	TCA2C50	TCA2C63	TCA2C80	TCA2C100
Double clevis	TCA2D40	TCA2D50	TCA2D63	TCA2D80	TCA2D100

Specifications

Type	Non-lube	Air-hydro
Fluid	Air	L.P.Oil
Proof pressure	1.5MPa(213psi)	
Max. operating pressure	1.0MPa(140psi)	
Min. operating pressure	0.05MPa(7psi)	0.1MPa(14psi)
Ambient and fluid temperature	5~60°C(41~140°F)	
Piston speed	50~500mm/s	0.5~300mm/s
Cushion	Air Cushion	Not Available
Stroke tolerance	~250st : $^{+1.0}_{0}$,251~1,000st : $^{+1.4}_{0}$, 1,001~1,500st : $^{+1.8}_{0}$	
Mounting	Basic, Foot, Front flange, Rear flange, Single clevis, Double clevis, Center trunnion	

Weight/Aluminum Tube(Iron Tube) (kgf)

Bore size		ϕ40	ϕ50	ϕ63	ϕ80	ϕ100
Basic Weight	Basic	0.89 (0.94)	1.37 (1.40)	2.01 (2.04)	3.48 (3.63)	4.87 (5.07)
	Foot	1.08 (1.13)	1.58 (1.62)	2.34 (2.38)	4.15 (4.30)	5.86 (6.06)
	Flange	1.26 (1.30)	1.81 (1.86)	2.79 (2.84)	4.93 (5.08)	6.79 (6.99)
	Single clevis	1.12 (1.17)	1.71 (1.74)	2.63 (2.67)	4.59 (4.74)	6.65 (6.68)
	Double clevis	1.16 (1.21)	1.79 (1.83)	2.79 (2.83)	4.88 (5.03)	7.18 (7.38)
	Trunnion	1.25 (1.35)	1.85 (1.94)	2.80 (3.00)	5.03 (5.32)	7.15 (7.54)
Additional weight per 2〃 stroke	All mounting bracket (except trunnion iron tube)	0.22 (0.28)	0.28 (0.35)	0.37 (0.43)	0.52 (0.70)	0.65 (0.87)
	Trunnion of iron tube	(0.36)	(0.46)	(0.65)	(0.86)	(1.07)
Accessories	Single knuckle	0.23	0.27	0.27	0.60	0.83
	Double knuckle(with pin)	0.37	0.43	0.43	0.87	1.27

※ In parentheses are for Iron tube type.

Example

AML 40-100(Foot, ϕ40, 100st)
- Basic weight ····· 1.08kgf
- Additional weight ····· 0.22/50st
- Cylinder stroke ····· 100st

1.08+0.22×100/50=1.52kgf

Accessaries

Description \ Mounting		Basic	Foot	Front Flange	Rear Flange	Single Clevis	Double Clevis	Center Trunnion
Standard	Rod End Nut	○	○	○	○	○	○	○
	Clevis Pin	—	—	—	—	—	○	—
Option	Single Knuckle Joint	○	○	○	○	○	○	○
	Double Knuckle Joint(With Pin)	○	○	○	○	○	○	○
	Gaiter	○	○	○	○	○	○	○

Parts No. Of Auto Switch Mounting Band

Switch Model	Parts No.	Applicable Bore Size(mm)
W3	TBT-04	ϕ40
	TBT-04	ϕ50
	TBT-06	ϕ63
	TBT-08	ϕ80
	TBT-08	ϕ100

Base Material And Surface Treatment

Description		Material	Note
Cover		Aluminum Alloy	Silver Paint
Cylinder Tube		Aluminum Alloy	Hard Alumite
		Carbon Steel Tube	Inside/Hard Chrome Plated
			Outside/Platinum Silver
Seals areal	Non-lube	NBR	PDU, NLP, OPA
	Air-hydro	NBR	SCB, SKY, SDA
Piston Rod		Carbon Steel	Hard Chrome Plated
Piston		Aluminum Alloy	Chromate

Gaiter/Material

Symbol	Material	Max.Ambient Temperature
J	Nylon Tarpaulin	60℃(140°F)
K	Neoprene Cloth	※110℃(230°F)

※ For gaiter itself

Precautions

① When mounting, completely flush the piping and be careful that dust and chips do not enter the cylinder.

② Load of piston rod should always be aligned parallel with the cylinder axis.

③ Avoid damaging(scratches, nicks) on the piston rod, which would lead to damage of rod seal, resulting in air leakage.

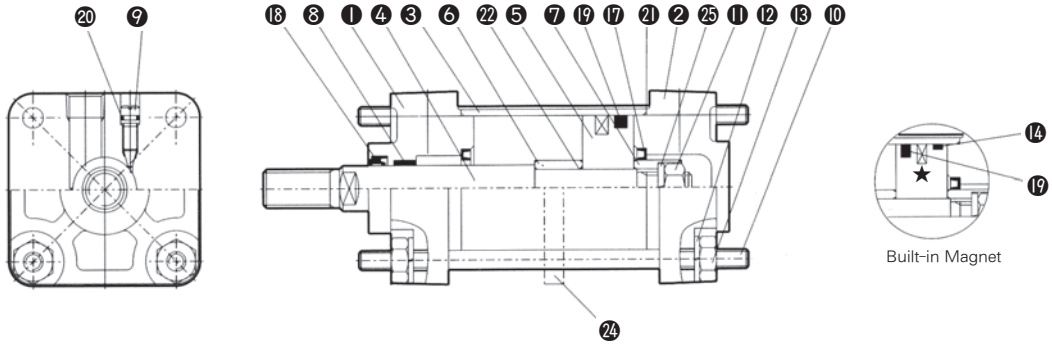
④〈Lubrication〉
Use non-additive turbine oil ISO-VG32.
Never use machine oil or spindle oil.

⑤〈L. P. Oil〉
Use ISO VG-22-46 or equivalent L. P. oil.
Never use machine oil or spindle oil.

⑥ Open air exhaust valve and completely let the inside air out before use.

⑦ In case you need cushion only on the air side, you don't have to specify the above. All you have to do is suffix R or H, and for others, follow "How to Order."

Construction



Parts List

NO.	Description	Material	Note
❶	Rod cover	Aluminum alloy	Silver paint
❷	Head cover	Aluminum alloy	Silver paint
❸	※Cylinder tube	Aluminum alloy	Hard alumite
❹	Piston rod	Carbon steel	Hard chrome plated
❺	Piston	Aluminum alloy	Chromate
❻	Cushion ring A	Aluminum	Chromate
❼	Cushion ring B	Aluminum	Chromate
❽	Bush	Lead bronze casting	–
❾	Cushion Valve	Rolled steel	Chromate
❿	Tie rod	Carbon steel	Zinc chromate
⓫	Piston nut	Rolled steel	Chromate
⓬	Spring washer	Steel wire	Black Zinc chromate
⓭	Tie rod nut	Rolled steel	Black Zinc chromate
⓮	Wearing	Resin	–
㉔	※Tie rod reinforcing ring	Cast iron	–
㉕	Spring washer	Steel wire	Zinc chromate

※ ㉔ Tie rod reinforcing ring : Available only for 1,000 stroke or more.
※ ③ In the case of Iron tube cylinder : Carbon steel tube, inside hard chrome plated.

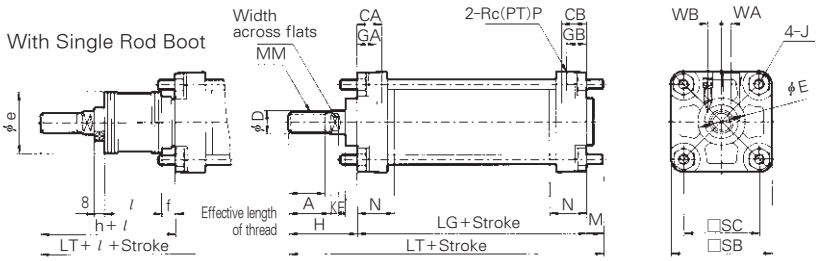
Seals List

NO.	Description	Material	Parts. No.				
			40	50	63	80	100
Non-lube Type							
⓱	Cushion seal	NBR	DSM-20	DSM-25	DSM-25	DSM-30	DSM-35
⓲	Rod seal		PDU-16Z	PDU-20Z	PDU-20Z	PDU-25Z	PDU-30Z
⓳	Piston seal		TPSA-40A	TPSA-50A	TPSA-63A	TPSA-80A	TPSA-100A
			P34	P44	P53	P70	P90
⓴	Cushion Valve seal		TC2A040-16A1486-PL		TC2A063-16A1488-PL		
㉑	Cylinder tube gasket		TC2A040-16-1486	TC2A050-16-1487	TC2A063-16-1488	TC2A080-16-1489	TC2A100-16-1490
㉒	Piston gasket		CA40-1608k-PL	CA63-1608k-PL	CA63-1608k-PL	CA80-1609k-PL	CA100-1610k-PL
Air-hydro Type			Same as lube type except⓲,⓳ and㉓				
⓲	Rod seal	NBR	SKY-16	SKY-20	SKY-20	SKY-25	SKY-30
⓳	Piston seal		SDA-40	SDA-50	SDA-63	SDA-80	SDA-100
㉓	Scraper		SCB-16	SCB-20	SCB-20	SCB-25	SCB-30

★ Magnet (Built-in Magnet)

Basic Type/(B)

Non-Lube Type(AMBN), Air-Hydro Type(AMBH)

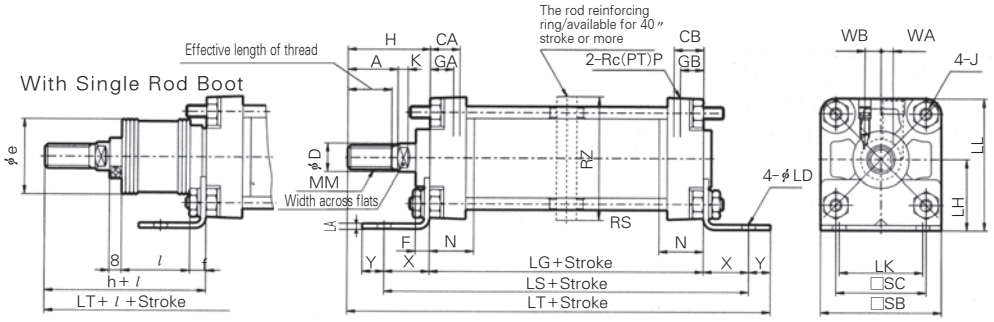


(unit:mm)

Bore size (mm)	Stroke range(mm)		Effective length of thread	Width across flats	A	□SB	□SC	CA	CB	φD	φE	F	GA	GB	J	K	M	MM	N	P	LG	WA	WB	Without Rod Boot		With Rod Boot				
	Without gaiter	With gaiter																						H	LT	φe	f	h	l	LT
φ40	~500	20~500	27	14	30	60	44	18	18	16	32	10	15	15	M8×1.25	6	11	M14×1.5	27	1/4	84	5	10.5	51	146	43	11.2	59	1/4 Stroke	154
φ50	~600	20~600	32	18	35	70	52	21	21	20	40	10	17	17	M8×1.25	7	11	M18×1.5	30	3/8	90	8	9.9	58	159	52	11.2	66		167
φ63	~600	20~600	32	18	35	85	64	21	21	20	40	10	17	17	M10×1.25	7	14	M18×1.5	31	3/8	98	9	11.5	58	170	52	11.2	66		178
φ80	~750	20~750	37	22	40	102	78	26	26	25	52	14	21	21	M12×1.75	11	17	M22×1.5	37	1/2	116	11	13	71	204	65	12.5	80		213
φ100	~750	20~750	37	26	40	116	92	28	28	30	52	14	21	21	M12×1.75	11	17	M26×1.5	40	1/2	126	13	14	72	215	65	14	81		224

Foot Type/(L)

Non-Lube Type(AMLN), Air-Hydro type(AMLH)



(unit:mm)

Bore size (mm)	Stroke range(mm)		Effective length of thread	A	□SB	□SC	CA	CB	φD	φE	F	GA	GB	J	K	MM	N	P	LG	WA	WB
	Without Rod Boot	With Rod Boot																			
φ40	~500	20~500	27	30	60	44	18	18	16	32	10	15	15	M8×1.25	6	M14×1.5	27	1/4	84	5	10.5
φ50	~600	20~600	32	35	70	52	21	21	20	40	10	17	17	M8×1.25	7	M18×1.5	30	3/8	90	8	9.9
φ63	~600	20~600	32	35	85	64	21	21	20	40	10	17	17	M10×1.25	7	M18×1.5	31	3/8	98	9	11.5
φ80	~750	20~750	37	40	102	78	26	26	25	52	14	21	21	M12×1.75	11	M22×1.5	37	1/2	116	11	13
φ100	~750	20~750	37	40	116	92	28	28	30	52	14	21	21	M12×1.75	11	M26×1.5	40	1/2	126	13	14

Bore size (mm)	X	Y	φLD	LH	LS	LA	LK	LL	Without Rod Boot		With Rod Boot				
									H	LT	φe	f	h	l	LT
φ40	27	13	9.0	40	138	3.2	42	70	51	175	43	11.2	59	1/4 Stroke	183
φ50	27	13	9.0	45	144	3.2	50	80	58	188	52	11.2	66		196
φ63	34	16	11.5	50	166	3.2	59	93	58	206	52	11.2	66		214
φ80	44	16	13.5	65	204	4.5	76	116	71	247	65	12.5	80		256
φ100	43	17	13.5	75	212	6.0	92	133	72	258	65	14.0	81		267

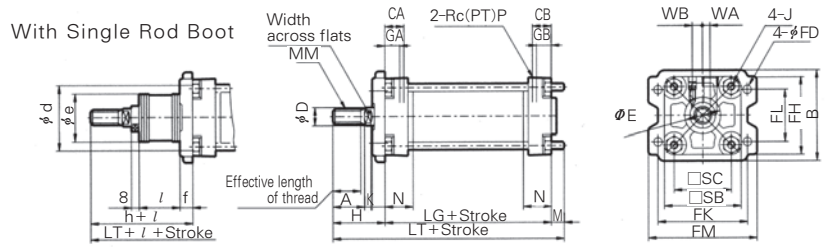
Long Stroke Type

Bore size (mm)	Stroke range (mm)	RS	RZ
φ40	501~800	–	–
φ50	601~1200	30	76
φ63	601~1200	40	92
φ80	751~1400	45	112
φ100	751~1500	50	136

Front Flange/(F)

Non-Lube Type(AMFN), Air-Hydro Type(AMFH)

With Single Rod Boot



(unit:mm)

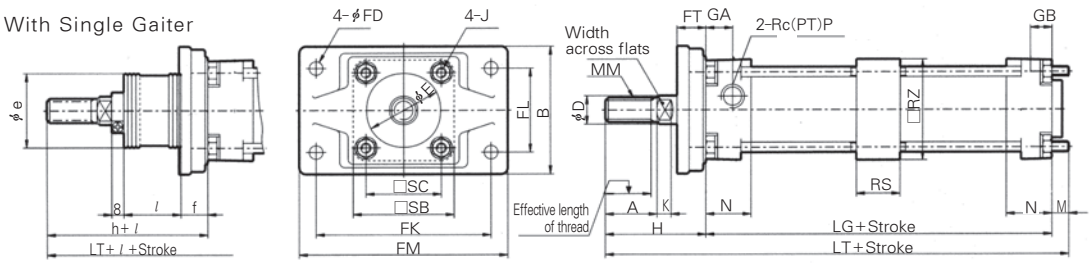
Bore size (mm)	Stroke range(mm) Without Rod Boot	With Rod Boot	Effective length of thread	A	B	□SB	□SC	CA	CB	φD	φE	GA	GB	J	K	M	MM	N	P	LG	WA	WB
φ40	~800	20~800	27	30	71	60	44	18	18	16	32	15	15	M8×1.25	6	11	M14×1.5	27	1/4	84	5	10.5
φ50	~1,000	20~1,000	32	35	81	70	52	21	21	20	40	17	17	M8×1.25	7	11	M18×1.5	30	3/8	90	8	9.9
φ63	~1,000	20~1,000	32	35	101	85	64	21	21	20	40	17	17	M10×1.25	7	14	M18×1.5	31	3/8	98	9	11.5
φ80	~1,000	20~1,000	37	40	119	102	78	26	26	25	52	21	21	M12×1.75	11	17	M22×1.5	37	1/2	116	11	13
φ100	~1,000	20~1,000	37	40	133	116	92	28	28	30	52	21	21	M12×1.75	11	17	M26×1.5	40	1/2	126	13	14

Bore size (mm)	FH	φFD	FT	FK	FL	FM	Without Rod Boot H	Without Rod Boot LT	With Rod Boot ★φd	φe	f	h	l	LT
φ40	60	9.0	12	80	42	100	51	146	52	43	15	59	1/4 Stroke	154
φ50	70	9.0	12	90	50	110	58	159	58	52	15	66		167
φ63	86	11.5	15	105	59	130	58	170	58	52	17.5	66		178
φ80	102	13.5	18	130	76	160	71	204	80	65	21.5	80		213
φ100	116	13.5	18	150	92	180	72	215	80	65	21.5	81		224

★ Hole diameter of Rod Boot to mount Air-cylinder should be larger than the outside diameter of gaiter mounting bracket φd.

Long Stroke(1001 Stroke or more)

With Single Gaiter



(unit:mm)

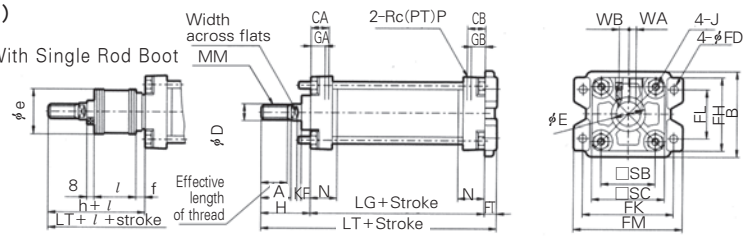
Bore size (mm)	Stroke range (mm)	Effective length of thread	A	B	□SB	□SC	φD	φE	GA	GB	J	K	M	MM	N	P	LG	WA	WB
φ50	1,001~1,200	32	35	88	70	52	20	40	17	17	M8×1.25	7	6	M18×1.5	30	3/8	90	8	9.9
φ63	1,001~1,200	32	35	105	85	64	20	40	17	17	M10×1.25	7	10	M18×1.5	31	3/8	98	9	11.5
φ80	1,001~1,400	37	40	124	102	78	25	52	21	21	M12×1.75	11	12	M22×1.5	37	1/2	116	11	13
φ100	1,001~1,500	37	40	140	116	92	30	52	21	21	M12×1.75	11	12	M26×1.5	40	1/2	126	13	14

Bore size (mm)	φFD	FT	FK	FL	FM	RS	RZ	Without Rod Boot H	Without Rod Boot LT	With Rod Boot ★φe	f	h	l	LT
φ50	9.0	20	120	58	144	30	76	67	163	52	19	66	1/4 Stroke	162
φ63	11.5	23	140	64	170	40	92	71	179	52	19	66		174
φ80	13.5	28	164	84	198	45	112	87	215	65	21	80		208
φ100	13.5	29	180	100	220	50	136	89	227	65	21	81		219

★ Hole diameter of rod boot to mount Air-cylinder should be larger than the outside diameter of rod boot mounting bracket φe.

Rear Flange/(G)

Non-Lube Type(AMGN),
Air-Hydro Type(AMGH)



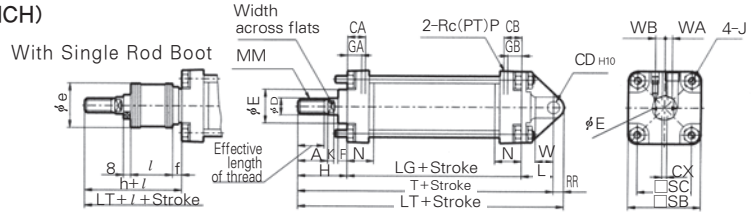
(unit:mm)

Bore size (mm)	Stroke range		Effective length of thread	A	B	□SB	□SC	CA	CB	φD	φE	F	GA	GB	J	K	MM	N	P	LG	WA	WB
	Without Rod Boot	With Rod Boot																				
φ40	~500	20~500	27	30	71	60	44	18	18	16	32	10	15	15	M8×1.25	6	M14×1.5	27	1/4	84	5	10.5
φ50	~600	20~600	32	35	81	70	52	21	21	20	40	10	17	17	M8×1.25	7	M18×1.5	30	3/8	90	8	9.9
φ63	~600	20~600	32	35	101	85	64	21	21	20	40	10	17	17	M10×1.25	7	M18×1.5	31	3/8	98	9	11.5
φ80	~750	20~750	37	40	119	102	78	26	26	25	52	14	21	21	M12×1.75	11	M22×1.5	37	1/2	116	11	13
φ100	~750	20~750	37	40	133	116	92	28	28	30	52	14	21	21	M12×1.75	11	M26×1.5	40	1/2	126	13	14

Bore size (mm)	FH	φFD	FT	FK	FL	FM	Without Rod Boot		With Rod Boot				
							H	LT	φe	f	h	l	LT
φ40	60	9.0	12	80	42	100	51	147	43	11.2	59	1/4 Stroke	155
φ50	70	9.0	12	90	50	110	58	160	52	11.2	66		168
φ63	86	11.5	15	105	59	130	58	171	52	11.2	66		179
φ80	102	13.5	18	130	76	160	71	205	65	12.5	80		214
φ100	116	13.5	18	150	92	180	72	216	65	14.0	81		225

Single Clevis/(C)

Non-Lube Type(AMCN),
Air-Hydro Type(AMCH)



(unit:mm)

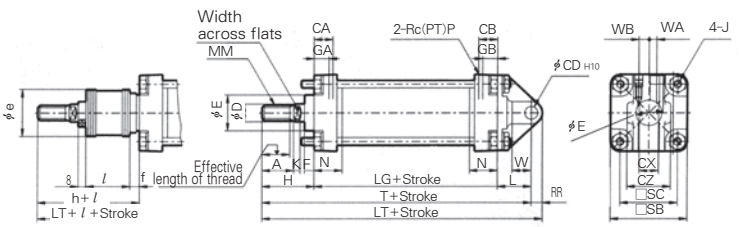
Bore size (mm)	Stroke range		Effective length of thread	A	□SB	□SC	CA	CB	φD	φE	F	GA	GB	J	K	L	MM	N	P	LG	WA	WB
	Without Rod Boot	With Rod Boot																				
φ40	~500	20~500	27	30	60	44	18	18	16	32	10	15	15	M8×1.25	6	30	M14×1.5	27	1/4	84	5	10.5
φ50	~600	20~600	32	35	70	52	21	21	20	40	10	17	17	M8×1.25	7	35	M18×1.5	30	3/8	90	8	9.9
φ63	~600	20~600	32	35	85	64	21	21	20	40	10	17	17	M10×1.25	7	40	M18×1.5	31	3/8	98	9	11.5
φ80	~750	20~750	37	40	102	78	26	26	25	52	14	21	21	M12×1.75	11	48	M22×1.5	37	1/2	116	11	13
φ100	~750	20~750	37	40	116	92	28	28	30	52	14	21	21	M12×1.75	11	58	M26×1.5	40	1/2	126	13	14

Bore size (mm)	RR	W	φCD H10	CX	Without Rod Boot			With Rod Boot					
					H	T	LT	φe	f	h	l	T	LT
φ40	10	16	10 +0.058 0	15.0 -0.1 -0.3	51	165	175	43	11.2	59	1/4 Stroke	173	183
φ50	12	19	12 +0.070 0	18.0 -0.1 -0.3	58	183	195	52	11.2	66		191	203
φ63	16	23	16 +0.070 0	25.0 -0.1 -0.3	58	196	212	52	11.2	66		204	220
φ80	20	28	20 +0.084 0	31.5 -0.1 -0.3	71	235	255	65	12.5	80		244	264
φ100	25	36	25 +0.084 0	35.5 -0.1 -0.3	72	256	281	65	14.0	81		265	290

Double Clevis Type/(D)

Non-Lube Type(AMDN),
Air-Hydro Type(AMDH)

With Single Rod Boot



(unit:mm)

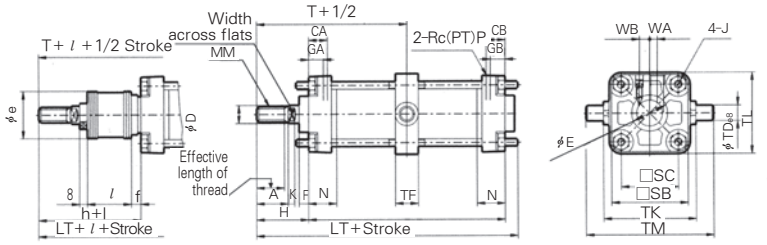
Bore size (mm)	Stroke range		Effective length of thread	A	□SB	□SC	CA	CB	φD	φE	F	GA	GB	J	K	L	MM	N	P	LG	WA	WB
	Without Rod Boot	With Rod Boot																					
φ40	~500	20~500	27	30	60	44	18	18	16	32	10	15	15	M8×1.25	6	30	M14×1.5	27	1/4	84	5	10.5
φ50	~600	20~600	32	35	70	52	21	21	20	40	10	17	17	M8×1.25	7	35	M18×1.5	30	3/8	90	8	9.9
φ63	~600	20~600	32	35	85	64	21	21	20	40	10	17	17	M10×1.25	7	40	M18×1.5	31	3/8	98	9	11.5
φ80	~750	20~750	37	40	102	78	26	26	25	52	14	21	21	M12×1.75	11	48	M22×1.5	37	1/2	116	11	13
φ100	~750	20~750	37	40	116	92	28	28	30	52	14	21	21	M12×1.75	11	58	M26×1.5	40	1/2	126	13	14

Bore size (mm)	RR	W	φCD H10	CX	CZ	Without Rod Boot			With Rod Boot					
						H	T	LT	φe	f	h	l	T	LT
φ40	10	16	10 +0.058 0	15.0 +0.3 +0.1	29.5	51	165	175	43	11.2	59	1/4 Stroke	173	183
φ50	12	19	12 +0.070 0	18.0 +0.3 +0.1	38	58	183	195	52	11.2	66		191	203
φ63	16	23	16 +0.070 0	25.0 +0.3 +0.1	49	58	196	212	52	11.2	66		204	220
φ80	20	28	20 +0.084 0	31.5 +0.3 +0.1	61	71	235	255	65	12.5	80		244	264
φ100	25	36	25 +0.084 0	35.5 +0.3 +0.1	64	72	256	281	65	14.0	81		265	290

Center Trunnion Type/(T)

Non-lube Type(AMTN),
Air-hydro type(AMTH)

With Single Rod Boot

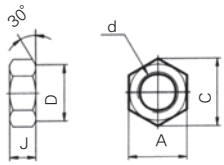


(unit:mm)

Bore size (mm)	Stroke range		Effective length of thread	A	□SB	□SC	CA	CB	φD	φE	F	GA	GB	J	K	MM	N	P	LG	WA	WB
	Without Rod Boot	With Rod Boot																				
φ40	~500	20~500	27	30	60	44	18	18	16	32	10	15	15	M8×1.25	6	M14×1.5	27	1/4	84	5	10.5
φ50	~600	20~600	32	35	70	52	21	21	20	40	10	17	17	M8×1.25	7	M18×1.5	30	3/8	90	8	9.9
φ63	~600	20~600	32	35	85	64	21	21	20	40	10	17	17	M10×1.25	7	M18×1.5	31	3/8	98	9	11.5
φ80	~750	20~750	37	40	102	78	26	26	25	52	14	21	21	M12×1.75	11	M22×1.5	37	1/2	116	11	13
φ100	~750	20~750	37	40	116	92	28	28	30	52	14	21	21	M12×1.75	11	M26×1.5	40	1/2	126	13	14

Bore size (mm)	φTDe8	TF	TK	TL	TM	Without Rod Boot			With Rod Boot					
						H	T	LT	φe	f	h	l	T	LT
φ40	15 -0.032 -0.059	22	85	62	117	51	93	140	43	11.2	59	1/4 Stroke	101	148
φ50	15 -0.032 -0.059	22	95	74	127	58	103	154	52	11.2	66		111	162
φ63	18 -0.032 -0.059	28	110	90	148	58	107	162	52	11.2	66		115	170
φ80	25 -0.040 -0.073	34	140	110	192	71	129	194	65	12.5	80		138	203
φ100	25 -0.040 -0.073	40	162	130	214	72	135	206	65	14.0	81		144	215

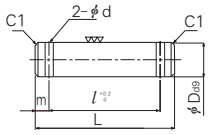
Rod End Nut(Standard Accessaries) (mm)



Material : Rolled steel

Part No.	Applicable bore	d	J	A	C	D
TNT-04	ϕ40	M14×1.5	8	22	25.4	21
TNT-05	ϕ50 · ϕ63	M18×1.5	11	27	31.2	26
TNT-08	ϕ80	M22×1.5	13	32	37.0	31
TNT-10	ϕ100	M26×1.5	16	41	47.3	39

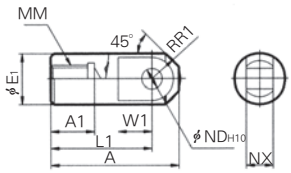
Knuckle Joint Pin/Clevis Pin (mm)



Material : Carbon steel

Part No	Bore Size		ϕDd9	L	l	m	ϕd	Applicable split pin ϕ × l
	CLEVIS	KNUCKLE						
TCDP-2	ϕ40	—	$10^{-0.040}_{-0.076}$	45.2	37.2	4	ϕ3	ϕ3×18l
TCDP-3	ϕ50	ϕ40·50·63	$12^{-0.050}_{-0.093}$	54.3	46.3	4	ϕ3	ϕ3×18l
TCDP-4	ϕ63	—	$16^{-0.050}_{-0.093}$	70	60	5	ϕ4	ϕ4×24 l
TCDP-5	—	ϕ80	$18^{-0.040}_{-0.076}$	76	66	5	ϕ4	ϕ4×25l
TCDP-6	ϕ80	ϕ100	$20^{-0.065}_{-0.117}$	82	72	5	ϕ4	ϕ4×36 l
TCDP-7	ϕ100	—	$25^{-0.065}_{-0.117}$	87.5	77.5	5	ϕ4	ϕ4×36l

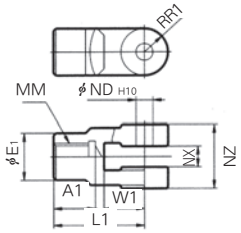
I Type Single Knuckle Joint (mm)



Material : Free cutting sulfur steel

Part No.	Applicable bore	A	A1	ϕE1	L1	MM	R1	W1	ϕNDH10	NX
TI-04	ϕ40	69	22	24	55	M14×1.5	15.5	20	$12^{-0.070}_{-0}$	$16^{-0.1}_{-0.3}$
TI-05	ϕ50 · ϕ63	74	27	28	60	M18×1.5	15.5	20	$12^{-0.070}_{-0}$	$16^{-0.1}_{-0.3}$
TI-08	ϕ80	91	37	36	71	M22×1.5	22.5	26	$18^{-0.070}_{-0}$	$28^{-0.1}_{-0.3}$
TI-10	ϕ100	105	37	40	83	M26×1.5	24.5	28	$20^{-0.084}_{-0}$	$30^{-0.1}_{-0.3}$

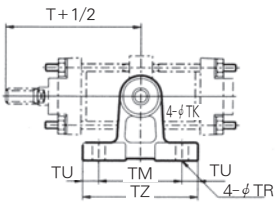
Y Type Double Knuckle Joint (mm)

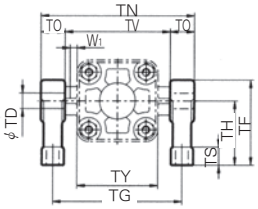


Cast iron

Part No.	Applicable bore	A1	ϕE1	L1	MM	R1	W1	ϕNDH10	NX	NZ
TY-04A	ϕ40	22	24	55	M14×1.5	13	25	$12^{+0.070}_{+0}$	$16^{+0.3}_{+0.1}$	38
TY-05A	ϕ50 · ϕ63	27	28	60	M18×1.5	15	27	$12^{+0.070}_{+0}$	$16^{+0.3}_{+0.1}$	38
TY-08A	ϕ80	37	36	71	M22×1.5	19	28	$18^{+0.070}_{+0}$	$28^{+0.3}_{+0.1}$	55
TY-10A	ϕ100	37	40	83	M26×1.5	21	38	$20^{+0.084}_{+0}$	$30^{+0.3}_{+0.1}$	61

Trunnion Bracket





※ The order makes special for trunnion type bracket.

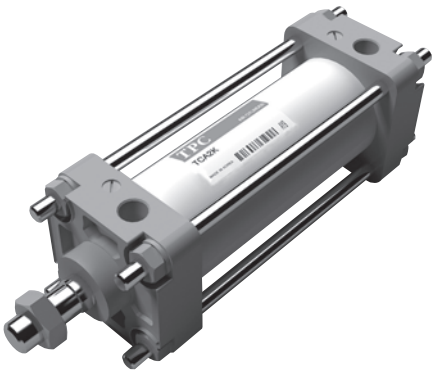
(mm)

Part No.	Applicable bore	TZ	TM	TU	TG	TV	TN	TO	ϕTR	ϕTK	TS	TH	TF	TY	W1	T	ϕTD-H10
TCA1-S04	ϕ40	80	60	10	102	85	119	17	9	17	12	45	60	62	10	93	$15^{+0.070}_{0}$
	ϕ50	80	60	10	112	95	129	17	9	17	12	45	60	74	10	103	$15^{+0.070}_{0}$
TCA1-S06	ϕ63	100	70	15	130	110	150	20	11	22	14	55	73	90	10	107	$18^{+0.070}_{0}$
TCA1-S08	ϕ80	120	90	15	166	140	192	26	13.5	24	17	75	100	110	12	129	$25^{+0.084}_{0}$
	ϕ100	120	90	15	188	162	214	26	13.5	24	17	75	100	130	12	135	$25^{+0.084}_{0}$

Series AMK

Non-Rotating Piston Rod Type

Non-lube Type : Ø40, Ø50, Ø63



- HIGH NON-ROTATING ACCURACY/±0.5°
- SAME MOUNTING DIMENSION AS OUR STANDARD TYPE
- AUTO SWITCH CAN BE MOUNTED (TIE ROD MOUNT TYPE)
- NON-LUBRICATED OPERATION POSSIBLE

Symbol

Piston Rod cross section

How to Order

AMK L 40 200 J ○ W3 □

1 2 3 4 5 6 7 8

1 Non-Rotating Piston-Rod Type Series (Built-in Magnet)

2 Mounting

3 Bore Size

4 Stroke

5 With Rod Boot

6 Order Made Option

7 Auto Switch

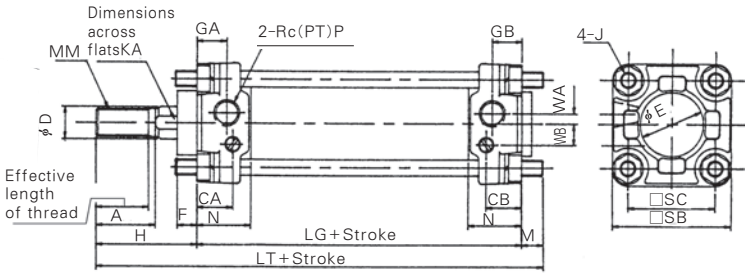
8 Number of Auto Switches

※ For details, please refer to page 186

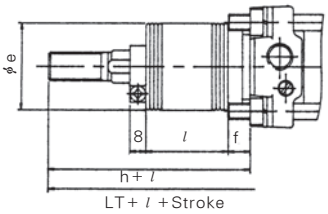
Specification

Fluid	Air
Proof pressure	1.5MPa(213psi)
Max.operating pressure	1.0MPa(140psi)
Min.operating pressure	0.5MPa(7psi)
Ambient and fluid temperature	5~60℃(41~140°F)
Piston speed	50~500mm/s
Cushion	Air Cushion
Stroke tolerance	φ40:25~500st:$^{+1.4}_{0}$, φ50, φ63:25~600st:
Allowable rotational torque	±0.5°
Lubication	Not required
Bore size(mm)	φ40, φ50, φ63,
Basic, Foot, front flange Mounting	Basic, Foot, Front flange, Rear flange, Single clevis, Double clevis, Center trunnion

Basic Type(B)



With Single Rod Boot



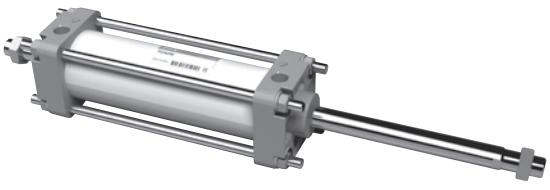
Bore size (mm)	Stroke range		Effective length of thread	A	□SB	□SC	CA	CB	φD	φE	F	GA	GB	J	KA	MM	N	P	LG	WA	WB
	Without Rod Boot	With Rod Boot																			
φ40	~500	20~500	27	30	60	44	18	18	16	32	10	15	15	M8×1.25	14	M14×1.5	27	1/4	84	5	10.5
φ50	~600	20~600	32	35	70	52	21	21	20	40	10	17	17	M8×1.25	18	M18×1.5	30	3/8	90	8	9.9
φ63	~600	20~600	32	35	85	64	21	21	20	40	10	17	17	M10×1.25	18	M18×1.5	31	3/8	98	9	11.5

Bore size (mm)	Without Rod Boot		With Rod Boot				
	H	LT	φe	f	h	l	LT
φ40	51	146	43	11.2	59	1/4 Stroke	154
φ50	58	159	52	11.2	66		167
φ63	58	170	52	11.2	66		178

Series AMW

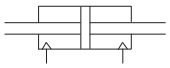
Double Rod End Type

Bore Size(mm) : Ø40, Ø50, Ø63, Ø80, Ø100



- DOUBLE ROD END TYPE CYLINDER
- LONG LIFE, HIGH SPEED OPERATION POSSIBLE
- NON-LUBRICATED OPERATION POSSIBLE
- AUTO SWITCH CAN BE MOUNTED (TIE ROD MOUNT TYPE)

Symbol



How to Order

AMW | L | N | 40 | 200 | JJ | | W3 | |

1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9

1 Double Rod End Cylinder Built-in Magnet

2 Mounting

3 Type
- N : Non-lube
- H : Air-hydro

4 Bore Size

5 Stroke
- φ40 : 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
- φ50 : 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
- φ63 : 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
- φ80 : 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
- φ100 : 25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500

6 Rod Boot
- J : Nylon tarpaulin(Single gaiter)
- JJ : Nylon tarpaulin(Double gaiter)
- K : Neoprene cloth(Single gaiter)
- KK : Neoprene cloth(Double gaiter)

7 Order Made Option

8 Auto Switch

9 Number of Auto Switches

※ For details, please refer to page 186

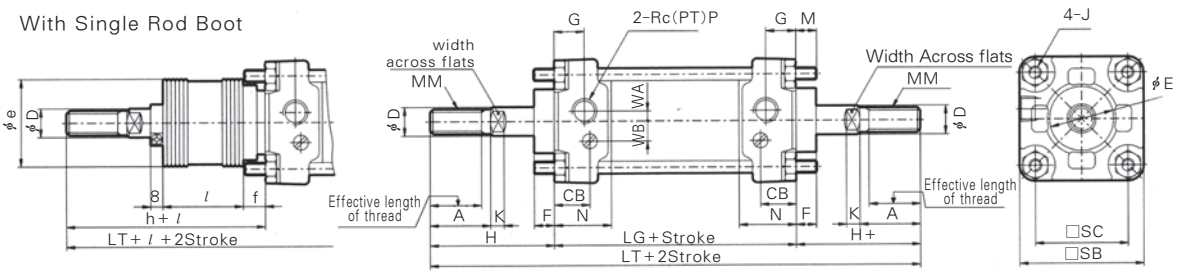
Specifications

Type	Non-lube	Air-hydro
Fluid	Air	L.P.Oil
Proof pressure	1.5Mpa(213psi)	
Max.operating pressure	1.0Mpa(140psi)	
Min.operating pressure	0.08MPa(1psi)	0.16MPa(22psi)
Piston speed	50~500mm/s	0.5~300mm/s
Ambient and fluid temperature	5~60℃(41~140°F)	
Cushion	Both side	None
Stroke tolerance	~250st : $^{+1.0}_{0}$, 251~750st : $^{+1.4}_{0}$	
Mounting	Basic, Foot, Flange, Center trunnion	

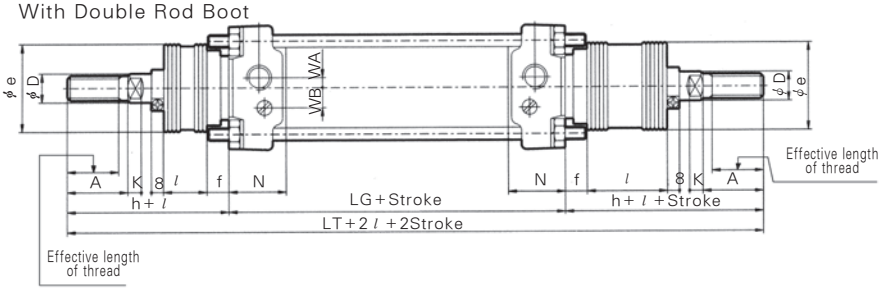
Basic Type/(B)

Non-Lube Type(AMWBN), Air-Hydro Type(AMWBH)

With Single Rod Boot



With Double Rod Boot



Bore size (mm)	Stroke range(mm) Without Rod Boot	Stroke range(mm) With Rod Boot	Effective length of thread	A	□SB	□SC	CA	CB	φD	φE	F	G	J	K	M	MM	N	P	LG	WA	WB
φ40	~500	20~500	27	30	60	44	18	18	16	32	10	15	M8×1.25	6	11	M14×1.5	27	1/4	84	5	10.5
φ50	~600	20~600	32	35	70	52	21	21	20	40	10	17	M8×1.25	7	11	M18×1.5	30	3/8	90	8	9.9
φ63	~600	20~600	32	35	85	64	21	21	20	40	10	17	M10×1.25	7	14	M18×1.5	31	3/8	98	9	11.5
φ80	~750	20~750	37	40	102	78	26	26	25	52	14	21	M12×1.75	11	17	M22×1.5	37	1/2	116	11	13
φ100	~750	20~750	37	40	116	92	28	28	30	52	14	21	M12×1.75	11	17	M26×1.5	40	1/2	126	13	14

Bore size (mm)	Without Rod Boot H	Without Rod Boot LT	With Rod Boot(Single) φe	f	h	l	LT	(Double) LT
φ40	51	186	43	11.2	59	1/4 Stroke	194	202
φ50	58	206	52	11.2	66		214	222
φ63	58	214	52	11.2	66		222	230
φ80	71	258	65	12.5	80		267	276
φ100	72	270	65	14.0	81		279	288

Adjustable Stroke Cylinder/Extension adjustable Type

AM | Mounting | Type | Bore size | Stroke | Rod Boot | Stroke Additional symbol — XC8

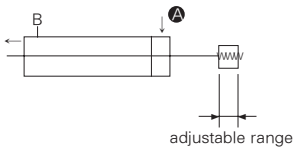
ROD BOOT●
Blank—Without Rod Boot
J —With Rod Boot(Nylon tarpaulin)
K —With Rod Boot(Neoprene cloth)

●Stroke Additionnal symbol
A—Stroke adjusting range 0~-25mm
B—Stroke adjusting range 0~-50mm

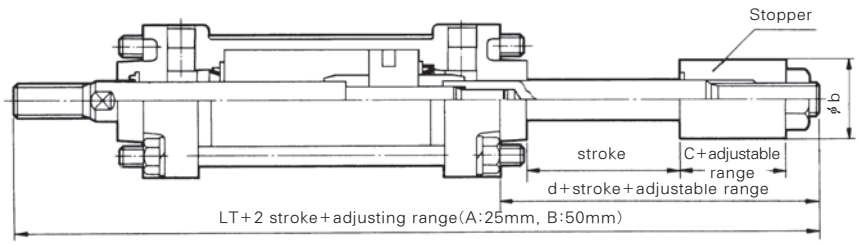
The stroke at the extended end of the cylinder can be adjusted by the stopper in the head side from full stroke 0~-25mm or 0~-50mm

※ If you want lubrication types, inquire with us.

Symbol



Construction/Dimensions



(mm)

Bore size	ϕb	c	d	LT
ϕ40	ϕ32	22	46	181
ϕ50	ϕ42	28	58.5	206.5
ϕ63		28	54	210
ϕ80	ϕ55	35	70	257
ϕ100		35	70	268

※ Other dimensions are the same for standard type

Adjustable Stroke Cylinder/Retraction adjustable Type

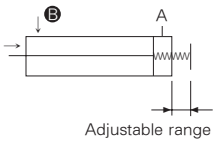
AM | Mounting | Type | Bore size | Stroke | Rod Boot | Stroke Additional symbol | XC9

Additional symbol
Blank—Without Rod Boot
J —With Rod Boot (Nylon tarpaulin)
K —With Rod Boot (Neoprene cloth)

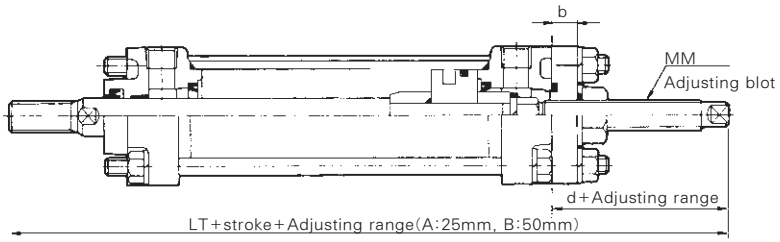
Stroke Additional symbol
A—Stroke adjusting range 0~-25mm
B—Stroke adjusting range 0~-50mm

The stroke at retraction of the cylinder can be adjusted from 0~-25mm or 0~-50mm by the adjusting bolt.

Symbol



Construction/Dimensions



※ Other dimensions are the same for standard type

(mm)

Bore Size	MM	b	d	LT
ϕ40	M16×1.5	9	43	178
ϕ50	M16×1.5	11	44	192
ϕ63	M20×1.5	11	48	204
ϕ80	M24×1.5	15	59	246
ϕ100	M24×1.5	15	57	255

Dual Stroke Cylinder/Double Rod Type

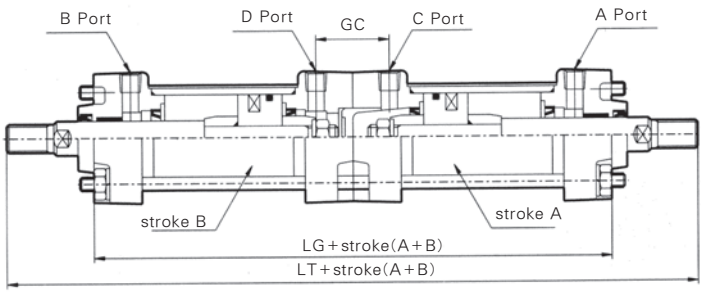
AM | Mounting | Type | Bore size | Stroke A | Rod Boot | + | Stroke B | Rod Boot | XC10

Additional symbol
Blank—Without Rod Boot
J—With Rod Boot (Nylon tarpaulin)
K—With Rod Boot (Neoprene cloth)

Two cylinders are constructed as one cylinder in a back-to-back configuration allowing the cylinder stroke to be controlled in three steps.

※ If you want lubrication types, inquire with us

Construction/Dimensions



※ Other dimensions are the same for standard type.

(mm)

Bore size	GC	LG	LT
ϕ40	29	167	269
ϕ50	33	179	295
ϕ63	33	195	311
ϕ80	41	231	373
ϕ100	41	251	395

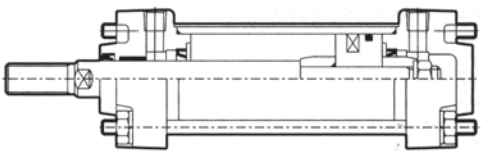
With Scraper

AM (Mounting) (Type) (Bore size) — (Stroke) — XC4

Specifications

Type	Lube, Non-Lube
Applicable cylinder bore size	ϕ40, ϕ50, ϕ63, ϕ80, ϕ100
Max.operating pressure	1.0MPa(140psi)
Min.operating pressure	0.05MPa(7psi)
Cushion	Air cushion(Standard)
Wiper ring	Material:SCB
Mounting	Basic type, Axial foot type, Rod side flange type, head side flange type, Single clevis type, Double clevis type, center trunnion

Construction



※ Dimensions are the same for standard type.

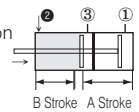
Dual Stroke Cylinder/Single Rod Type

AM (Mounting) (Type) (Bore Size) — (Stroke A) (Additional Symbol) + (Stroke B-A) (Additional Symbol) — XC11

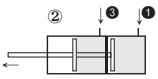
Two cylinders are unificated into one cylinder in series.
Cylinder stroke can be controlled not only back and forth, but also 2 steps.
Also, output can be two times.
ex) AMB50-50+50-XC11 : S_1=50mm, S_2=100mm

Symbol

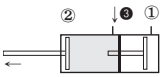
Function



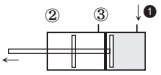
If air is supplied into ❷port, A stroke, and B stroke move backward.



If air is supplied into ❶port, and ❸ port, output can be two times in a range of A stroke.

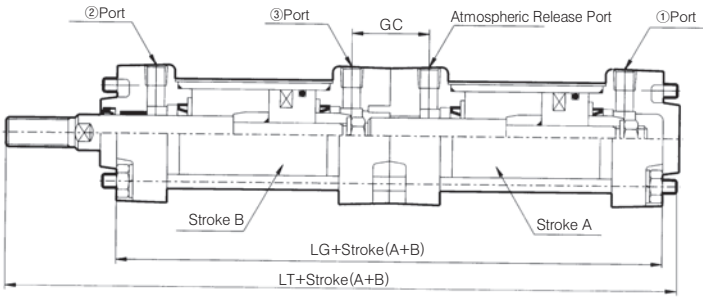


If air is supplied into ❸port, a rod and B stroke are operated.



If air is supplied into ❶port, a rod and A stroke are operated.

Construction/Dimensions



(Unit : mm)

Bore Size(mm)	GC	LG	LT
40	29	168	230
50	33	180	249
63	33	196	268
80	41	232	320
100	41	252	341

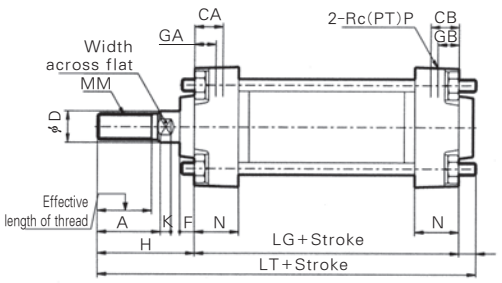
Over Sized Rod

AM (Mounting)(Type)(Bore size)–(Stroke)(Suffix)– XB5

The Piston Rod for the cylinder has larger diameter and increased intensity. In addition the stroke is long and this cylinder can be used in the cases of existing applications for bent Piston Rods.

Type	Lube, Non-lube				
Bore size(mm)	ϕ40	ϕ50	ϕ63	ϕ80	ϕ100
Piston rod diameter(mm)	ϕ20	ϕ25	ϕ25	ϕ30	ϕ36

Construcion/Dimensions



(mm)

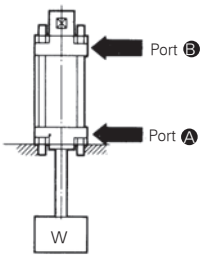
Bore size(mm)	A	ϕD	K	MM	P	H	LT
40	35	20	7	M18×1.5	1/4	58	153
50	40	25	11	M22×1.5	3/8	71	172
63	40	25	11	M22×1.5	3/8	71	183
80	40	30	11	M26×1.5	1/2	72	205
100	50	36	15	M30×1.5	1/2	85	228

※ Other dimensions are the same for Series AM standard type.

End Lock Cylinder

AM (Mounting)(Type)(Bore size)–(Stroke)(Suffix)– X105

※ If you want lubrication types, inquire with us

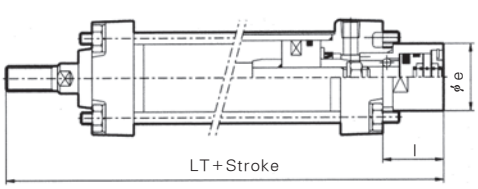


When the port B is the status of evacuation, the lock will be unlocked automatically if the piston rod reach the end of the head side stroke.
Moreover the lock will be unlocked automatically if the air goes into the port B.

Specifications

Type	Lube, Non-lube
Bore size	ϕ40, ϕ50, ϕ63, ϕ80, ϕ100
Cushion	Air Custion
Action	Double Acting
Retaining force	ϕ40:20kgf, ϕ50~ϕ100:150kgf
Lock start pressure	0.05MPa(7psi)
Lock release pressure	0.2MPa(28psi)
Mounting	Basic, Foot, Flange, Center trunnion

Construction/Dimensions



(mm)

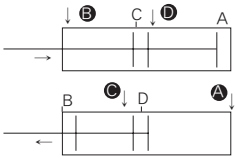
Bore size	ϕe	I	LT
ϕ40	34	31	166.0
ϕ50	48	47.5	195.5
ϕ63	48	47.5	203.5
ϕ80	50	47.0	234.0
ϕ100	50	49.0	247.0

Tandem Type Air Cylinder

AM (Mounting) (Type) (Bore size) – (Stroke) (Suffix) – XC12

This cylinder is produced with two air cylinders in line allowing double the output force.

Symbol



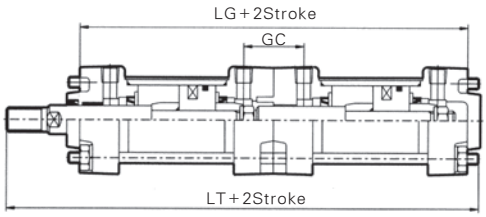
When air pressure is supplied to ports Ⓑ and Ⓓ,the output force is doubled in the return stroke.

When air pressure is supplied to ports Ⓐ and Ⓒ, the output force is doubled in the extend stroke.

Specifications

Type	Lube, Non-lube
Bore size	ϕ40, ϕ50, ϕ63, ϕ80, ϕ100
Max.operating pressure	1.0MPa(140psi)
Min.operating pressure	0.1MPa(14psi)
Cushion	Air cushion(Standard)
Action	Double Acting
Mounting	Basic type, Foot type, Rod side flange type, Head side flange type, Single clevis type, Double clevis type

Construction



(mm)

Bore size	GC	LG	LT
ϕ40	29	169	231
ϕ50	33	181	250
ϕ63	33	197	269
ϕ80	41	233	321
ϕ100	41	253	342

High Temperature Cylinder

AM (Mounting) N (Bore size) – (Stroke) (Suffix) – XB6

Can be used at high temperature up to 150°C

Specifications

Type	Non-lube
Bore size	ϕ40, ϕ50, ϕ63, ϕ80, ϕ100
Ambient and media temperature	-20~+150℃(-4~302°F)
Seal material	FPM

※ Auto-switch is not available

Stainless Steel Rod

AM (Mounting) (Type) (Bore size) – (Stroke) (Suffix) – XC6

Suffix-Cushion
Blank – Both End Cushion
R – Rod End Cushion
H – Rod Head Cushion
N – Non-Cushion

Stainless steel piston rod is used to protect in harsh or wet environment.
Auto-switch mounting available

Specifications

Type	Lube, Non-lube, Air-hydro
Bore size	ϕ40, ϕ50, ϕ63, ϕ80, ϕ100
Piston rod nut material	Stainless steel(SUS 304)

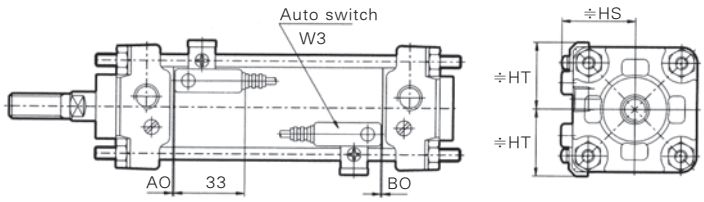
With Coil Scraper

AM (Mounting) (Type) (Bore size) – (Stroke) (Suffix) – X104

Cushion
Blank – Both End
R – Rod End
H – Head End
N – Without cushion

Auto Switch Mounting Position(At stroke End)

W3



Auto s/w model	Auto s/w mounting position	Auto s/w placement dimensions(mm)				
		ϕ40	ϕ50	ϕ63	ϕ80	ϕ100
W3	AO	0(0)	0(0)	0(2.5)	2(6)	4(7.5)
	BO	1(0)	1(0)	5(1.5)	8(4)	10(6.5)
	HS	40	43.5	49	55.5	63
	HT	31	35	42	50	57.5

※ ( ):in parenthesis are for long stroke, non-lube type and air-hydro type, but long stroke is available only for foot type and front flange type in the series AM

Minimum Auto Switch Mountable Stroke

Minimum auto switch mountable stroke is as follows.

n:No. of auto switch

Auto switch model	No. of Auto switch	Mounting bracket except trunnion	Center trunnion			
			ϕ40, ϕ50	ϕ63	ϕ80	ϕ100
W3	With 2 switch (different, same surface) with 1 switch	15	90	100	110	120
	With n switches (same surface)	$15+55\left(\frac{n-2}{2}\right)$ n=1, 2, 3, 4,…	$90+100\left(\frac{n-4}{2}\right)$ n=4, 8, 12, 16, …	$100+55\left(\frac{n-4}{2}\right)$ n=4, 8, 12, 16, …	$110+55\left(\frac{n-4}{2}\right)$ n=4, 8, 12, 16, …	$120+55\left(\frac{n-4}{2}\right)$ n=4, 8, 12, 16, …

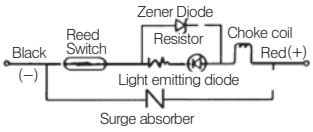
Auto Switch Specifications

Auto Swich Model	W3		
Application	Relay, Sequence Control		
Load Voltage	DC24V	AC100V	AC200V
Max. Load Current / Range of Load Current	5~50mA	5~25mA	5~12.5mA
Protection Circuit Contact Breaker Point	Built-in		
Internal Voltage Drop	2.4V		
Indicator Lamp	ON:Red Light Emitting Diode		

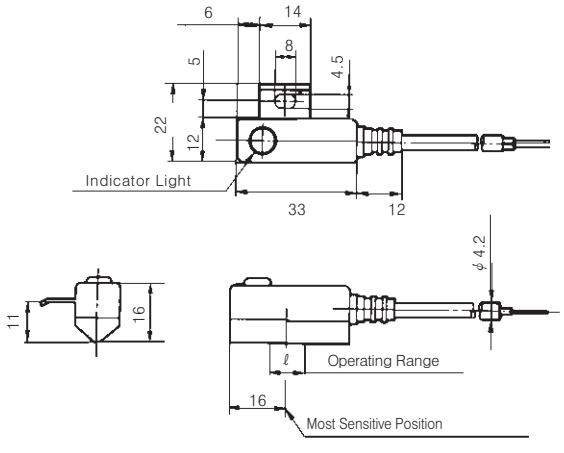
- Leakage current – None
- Response time – 1.2ms
- Lead Wire – Oil proof vinyl. ϕ4, (0.3)mm^2, 2 wire(red, black), 0.5m
- Impact Resistance – 30G
- Insulation Resistance – 50MΩ or more under the test voltage 500VDC (Between case and cable)
- Withstand Voltage – 1500VAC 1min(between case and cable)
- Ambient Temperature – -10~60℃
- Protection Structure – IEC spec IP67, Water-proof(JISCO920), oil-proof.

※ If 3m lead wire is required, L is put at end of model numbers.
(Example) W3L

Auto Switch/Internal Circuit



Auto Switch Dimensions (mm)



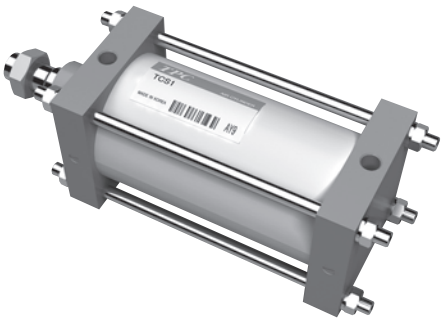
Operating Range (ℓ Dimensions) (mm)

Series	Bore Size(mm)				
	ϕ40	ϕ50	ϕ63	ϕ80	ϕ100
AM	9	10	11	11	11

Series AL/ALX

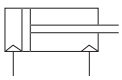
Air Cylinder

Bore size(mm) : Ø125, Ø140, Ø160, Ø180, Ø200, Ø250, Ø300



- WIDE BORE AND STROKE RANGE
- LONG LIFE AND HIGH SPEED OPERATION POSSIBLE
- BUILT-IN AIR CUSHION

Symbol



How to Order

AL	X	D	L		N	160	300	RJ		W3	
1	2	3	4	5	6	7	8	9	10	11	12

1 Air Cylinder

2 Model Series
- Blank : Ø125, Ø140, Ø160, Ø180, Ø200, Ø250, Ø300 : Nose Separator
- X : (Ø125, Ø140, Ø160 Only) : Nose Solid

3 Magnet
- Blank : None
- D : Built-in Magnet (ALX125,140,160 only)

4 Mounting
- B : Basic
- L : Foot
- F : Rod Side Flange
- G : Head Side Flange
- C : Single Rear Clevis
- D : Double Rear Clevis
- T : Center Trunnion

5 Tube Material
Ø125~Ø160
- Blank : Aluminum Tube
- F : Iron Tube

Ø180~Ø300
- Blank : Iron Tube(Standard)

※ Iron Tube:Not available Auto Switch

6 Type
- Blank : Lubricated
- N : Non-Lube
- H : Air-Hydro(Except Series ALX)

7 Bore Size
- 125 : 125mm
- 140 : 140mm
- 160 : 160mm
- 180 : 180mm
- 200 : 200mm
- 250 : 250mm
- 300 : 300mm

※ AL : 125~300(Standard Type)
※ ALX : 125, 140, 160 (Upgrade Type)
※ ALX Air-hydro type is available up to bore size Ø160
※ Air-hydro type is AL series type
※ Applicable bore size Ø125 to 160 is standard type for ALX

8 Stroke (mm)
- 125 : ~1,000
- 140 : ~1,000
- 160 : ~1,200
- 180~300 : ~2,000

※ Consult TPC for other stroke

9 Suffix Symbol for Cylinder
- Blank : Without Gaiter /Both End Air Cushion
- J : Nylan Tarpoulin
- K : Neoprene Cloth
- R : Rod end Air Custion
- H : Head end Air Custion
- N : Non-Cushion

10 Series
- Blank : Standard Type
- XC16 : Copper-Free

11 Auto switch
- Blank : None
- W3 : Reed Switch Type (AC110V, 220V, DC24V)

Standard auto switch lead wire length is 0.5m

12 Number of Auto Switches
- Blank : 2 pcs
- S : 1 pc
- N : N pcs

Specification

Type	Lube, Non-Lube	Air-Hydro
Fluid	Air	L.P.Oil
Proof Pressure	1.6MPa(227psi)	
Max.Operating Pressure	1.0MPa(140psi)	
Min.Operating Pressure	0.05MPa(7psi)	0.06MPa(8psi)
Ambient and Fluid Temperature	5~60℃(41~140°F)	
Piston Speed	50~500mm/s	0.5~200mm/s
Cushion	With Cushion	Non Cushion
Stroke Tolerance (mm)	~250$^{st\ ^{+1.0}_{0}}$, 251~1000$^{st\ ^{+1.4}_{0}}$, 1001~1500$^{st\ ^{+1.8}_{0}}$	
Mounting	Basic, Foot, Front flange, Rear flange, Single clevis, Double clevis, Center trunnion	

Parts No. of Mounting Bracket

Bore size	ϕ125	ϕ140	ϕ160	ϕ180	ϕ200	ϕ250	ϕ300
Foot	TCS1L125	TCS1L140	TCS1L160	TCS1L180	TCS1L200	TCS1L250	TCS1L300
Flange	TCS1F125	TCS1F140	TCS1F160	TCS1F180	TCS1F200	TCS1F250	TCS1F300
Single Clevis	TCS1C125	TCS1C140	TCS1C160	TCS1C180	TCS1C200	TCS1C250	TCS1C300
Double Clevis	TCS1D125	TCS1D140	TCS1D160	TCS1D180	TCS1D200	TCS1D250	TCS1D300

Model

Model	Type	Action	Seal	Bore size(mm)
AL	Lubricated	Double	O-ring	125, 140, 160, 180
ALN	Non-lube type	Double	Special	200, 250, 300
ALH	Air-hydro type	Double	Special	125, 140, 160

※ Series ALX : ϕ125, ϕ140, ϕ160

Weight/Aluminum Tube : Lubricated(Non-Lube, Air-Hydro) (kgf/lbf)

Bore Size(mm)		125	140	160
Standard Weight	Basic Type	14.85 (13.73)	17.98 (16.57)	24.78 (23.04)
	Foot Type	16.49 (15.37)	20.50 (19.09)	27.57 (25.83)
	Rod-Side Flange Type	17.53 (16.41)	22.99 (21.58)	31.16 (29.42)
	Head-Side Flange Type	17.54 (16.42)	22.98 (21.57)	31.16 (29.42)
	Single Rear Clevis Type	17.92 (16.80)	22.27 (20.86)	30.26 (28.52)
	Double Rear Clevis Type(With pin)	18.39 (17.26)	23.03 (21.62)	31.11 (29.37)
	Trunnion Type	18.98 (17.86)	23.71 (22.30)	32.17 (30.43)
Extra Weight per 100 Strokes		1.77	1.96	2.39
Accessory Fittings	Single Knuckle	0.91	1.16	1.56
	Double Knuckle(With pin)	1.37	1.81	2.48

※ ( ) : In parenthesis are for Non-Lubetype, Air-Hydro Type

Calculation Example : ALXL 160-500

- Basic Weight ···60.78lbf (Foot type, ϕ160)
- Additional Weight ···5.27/100 Stroke
- Cylinder Stroke···500stroke

60.78+5.27×500/100=87.13lbf

Weight/Iron Tube

(kgf)

Bore size(mm)		125	140	160	180	200	250	300
Standard Weight	Basic Type	15.20	18.38	25.24	34.16	42.66	79.78	115.94
	Foot Type	16.83	20.90	28.04	38.36	47.54	89.28	133.22
	Rod-side Flange Type	17.88	23.38	31.64	43.99	54.58	101.62	146.14
	Head-side Flange Type	17.88	23.38	31.64	43.99	54.58	101.62	146.14
	Single Rear Clevis Type	18.28	22.68	30.73	42.55	52.56	98.17	149.22
	Double rear Clevis Type(With pin)	18.73	23.42	31.58	44.23	54.59	101.37	154.96
	Trunnion Type	19.33	24.11	32.64	44.78	56.65	107.63	156.37
Extra Weight per 100 Stroke		2.66	3.02	3.58	4.95	5.75	9.08	12.15
Accessory Fittings	Single Knuckle	0.91	1.16	1.56	3.07	2.90	5.38	10.82
	Double Knuckle(With pin)	1.37	1.81	2.48	4.74	4.59	9.22	17.17

Rod boot Material

Symbol	Material	Max. ambient temperature
J	Nylon tarpaulin	60℃(140°F)
K	Neoprene cloth	※110℃(230°F)

※ Max. ambient temperature for the rod boot itself

Accessories

Description \ Mounting		Basic	Foot	Front Flange	Rear Flange	Single Clevis	Double Clevis	Center Trunnion
Standard	Clevis pin	–	–	–	–	–	O	–
Option	Rod Front Nut	O	O	O	O	O	O	O
	Single Knuckle joint	O	O	O	O	O	O	O
	Double knuckle joint(with pin)	O	O	O	O	O	O	O
	Gaiter	O	O	O	O	O	O	O

Cautions

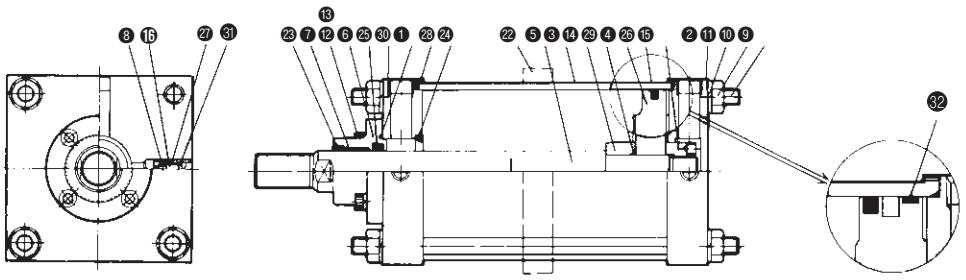
(1) When connecting piping,securely flush the piping to eliminate dust and chips from the cylinder
(2) During operation, load should be applied constantly to the piston rod in the axial direction.
(3) Don't scratch and hit the sliding section of the piston rod. The damage causes packing damage and can induce leakage.
(4) Use turbine oil No. 1(ISO VG32) for lubrication. Avoid machine oil and spindle oil.

Second Class Pressure Vessel

If the stroke is over below numbers, it becomes second class pressure vessel.

Bore Size(mm)	Stroke(mm)
160	1,986
180	1,569
200	998
250	813
300	564

Construction/Parts List (AL)



For Aluminum Tube

Main Parts

No.	Description		Material	Note
1	Rod Cover		#Rolled Steel	≒Black paint
2	Head Cover		#Rolled Steel	≒Black paint
3	Cylinder Tube	ϕ125~ϕ160	Aluminum Alloy	Hard alumite
		ϕ140~ϕ300	Carbon Steel	Hard chrome plated
4	Piston	ϕ125~ϕ160	Aluminum Alloy	
		ϕ180~	Cast Iron	
5	Piston Rod		Carbon Steel	Hard chrome plated
6	Nose		Cast Iron	Black Paint
7	Bush		Lead Bronze Casting	
8	Valve Guide		Brass	
9	Tie Rod		Carbon Steel	Uni-chromate
10	Tie Rod Nut		Rolled Steel	Black zinc chromate
11	Spring Washer		Steel Wire	Black zinc chromate
12	Nose Cap Screw		Chrome-Moly-bdeum Steel	Black zinc chromate
13	Spring Washer		Steel Wire	Black zinc chromate
14	Cushion Piece A		Rolled Steel	Kani-zen plated
15	Cushion Piece B		Rolled Steel	Kani-zen plated
16	Cushion Needle		Rolled Steel	Kani-zen plated
17	※ Space A		Rolled Steel	Zinc chromate
18	※ Space B		Rolled Steel	Zinc chromate
19	※Air Exhaust Valve A		Rolled Steel	Zinc chromate
20	※Air Exhaust Valve B		Chrome-molybdenum Steel	
21	※Check Ball		Chrome Bearing Steel	
22	Tie rod Reinforcing Ring		Rolled Steel	Black paint
32	Wear Ring		Resin	

#For AL series : Aluminum alloy
≒ For AL seeries : Silver paint
※ For Air-hydro type
★ Available only for long stroke

Seals

No.	Description	Material	Part No. 125	140	160	180	200	250	300
Lube Type									
23	Wiper Ring	NBR	SDR-36	SDR-36	SDR-36	SDR-36	SDR-36	SDR-36	SDR-36
24	Cushion Seal		DSM-50	DSM-50	DSM-50	DSM-60	SMS-36	DSM-75	PCS-85 PCS-75-PL
25	Rod Seal		PNY-36	PNY-36	PNY-40	PNY-45	PNY-50	PNY-60	PNY-70
26	Piston Seal		P-115	P-130	P-150	P-165	P-185	P-235	P-238
27	Cushion Valve Seal		P7	P7	P7	P7	P7	P7	P7
28	Tube Gasket		C120	C130	C155	C175	C195	CS160-168-G4	CS160-168
29	Piston Gasket		G25	G25	G25	G35	G35	G45	G45
30	Nose Gasket		G55	G55	G55	G65	G65	G80	G90
31	Guide Gasket		CA50-1607						

Non-Lube Type Same as lube type except 25 and 26

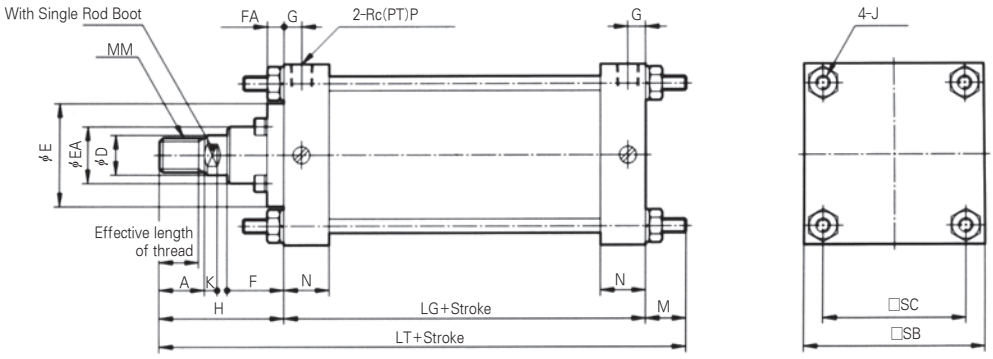
25	Rod Seal	NBR	PNY-36	PNY-36	PNY-40	PNY-45	PNY-50	PNY-60	PNY-70
26	Piston Seal		TPSA-125	TPSA-140	TPSA-160	TPSA-180	TPSA-200	TPSA-250	TPSA-300

Air-Hydro Type Same as lube type except 25 and 26

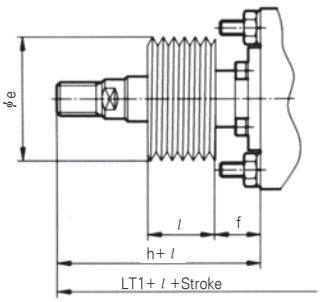
No.	Description	Material	Parts. No. 125	140	160
25	Rod Seal	NBR	SKY-36	SKY-36	SKY-40
26	Piston Seal		RPS-125	RPS-140	RPS-160

Basic Type/(ALB)

Lube Type(ALB), Non-Lube Type(ALBN), Air-Hydro Type(ALBH)



With Single Rod Boot



(mm)

Type	Bore size (mm)	※Stroke range (mm)	Effective length thread	A	□SB	□SC	φD	φE	φEA	F	FA	G	J	K	M	MM	N	P	LG
Lube	125	~1,000	47	50	145	115	36	90	59	43	14	16	M14×1.5	15	27	M30×1.5	35	1/2	98
Non-Lube	140	~1,000	47	50	161	128	36	90	59	43	14	16	M14×1.5	15	27	M30×1.5	35	1/2	98
Air-Hydro	160	~1,200	53	56	182	144	40	90	59	43	14	18.5	M16×1.5	17	30.5	M36×1.5	39	3/4	106
	180	~1,200	60	63	204	162	45	115	70	48	17	18.5	M18×1.5	20	35	M40×1.5	39	3/4	111
Lube	200	~1,200	60	63	226	182	50	115	74	48	17	18.5	M20×1.5	20	35	M45×1.5	39	3/4	111
Non-Lube	250	~1,200	67	71	277	225	60	140	86	60	20	23	M24×1.5	25	41.5	M56×2	49	1	141
	300	~1,200	76	80	330	270	70	140	96	60	20	23	M30×1.5	30	51.5	M64×2	49	1	146

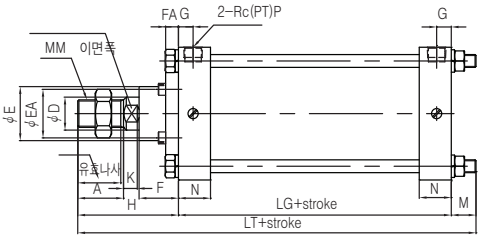
Type	Bore size (mm)	Without Rod Boot		With Rod Boot					With Actoss Flat
		H	LT	φe	f	h	ℓ	LT_1	
Lube	125	110	235	★75	40	133	0.2Stroke	258	31
Non-Llube	140	110	235	★75	40	133		258	31
Air-Hydro	160	120	256.5	★75	40	141		277.5	36
	180	135	281	85	45	153	0.2Stroke	299	41
Lube	200	135	281	90	45	153		299	46
Non-lube	250	160	342.5	105	55	176	0.17Stroke	358.5	56
	300	175	372.5	115	55	190		387.5	65

※ Minimum stroke with Rod Boot:30mm or more
★ Rod Boot material:neoprene cloth-80mm or more

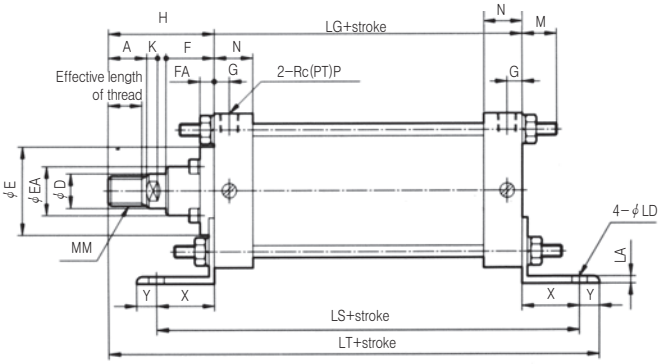
Foot Type/(ALL)

Lube Type(ALL), Non-Lube Type(ALLN), Air-Hydro Type(ALLH)

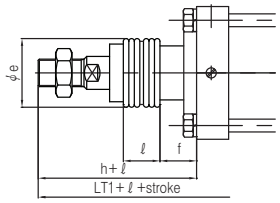
ϕ 125~ϕ 200



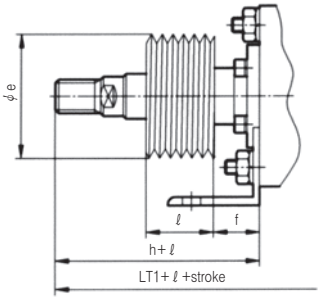
ϕ 250~ϕ 300

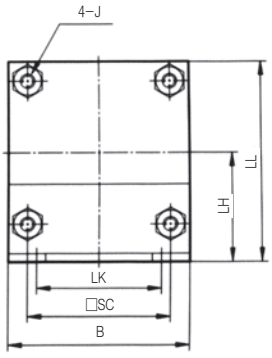


With Single Rod Boot (ϕ 125~ϕ 200)



With Single Rod Boot (ϕ 250~ϕ 300)





(mm)

Type	Bore size (mm)	※Stroke range (mm)	Effective length thread	A	B	□SC	φD	φE	φEA	F	FA	G	J	K	MM	N	P	LG
Lube	125	~1,400	47	50	145	115	36	90	59	43	14	16	M14×1.5	15	M30×1.5	35	1/2	98
Non-Lube	140	~1,400	47	50	161	128	36	90	59	43	14	16	M14×1.5	15	M30×1.5	35	1/2	98
Air-Hydro	160	~1,400	53	56	182	144	40	90	59	43	14	18.5	M16×1.5	17	M36×1.5	39	3/4	106
	180	~1,800	60	63	204	162	45	115	70	48	17	18.5	M18×1.5	20	M40×1.5	39	3/4	111
Lube	200	~1,800	60	63	226	182	50	115	74	48	17	18.5	M20×1.5	20	M45×1.5	39	3/4	111
Non-Lube	250	~2,000	67	71	277	225	60	140	86	60	20	23	M24×1.5	25	M56×2	49	1	141
	300	~2,000	76	80	330	270	70	140	96	60	20	23	M30×1.5	30	M64×2	49	1	146

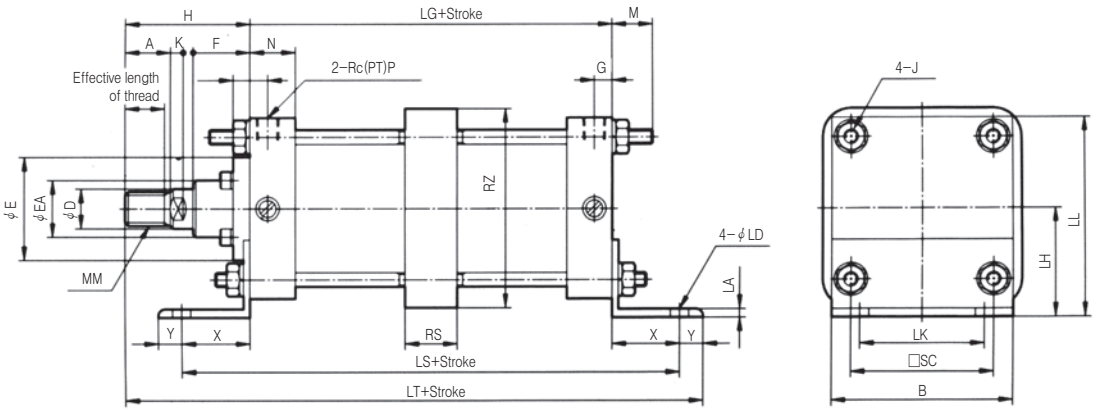
Type	Bore size (mm)	X	Y	φLD	LH	LS	LA	LK	LL	Without Rod Boot		With Rod Boot				
										H	LT	φe	f	h	ℓ	LT1
Lube	125	45	20	19	85	188	8	100	157.5	110	273	★75	40	133	0.2Stroke	296
Non-Lube	140	45	30	19	100	188	9	112	180.5	110	283	★75	40	133		306
Air-Hydro	160	50	25	19	106	206	9	118	197	120	301	★75	40	141		322
	180	60	30	24	125	231	10	132	227	135	336	85	45	153	0.2Stroke	354
Lube	200	60	30	24	132	231	10	150	245	135	336	90	45	153		354
Non-Lube	250	80	40	29	160	301	12	180	298.5	160	421	105	55	176	0.17Stroke	437
	300	90	40	33	200	326	15	212	365	175	451	115	55	190		466

※ Minimum with Rod Boot:30mm or more

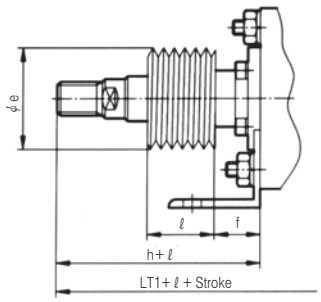
★ Rod Boot material:neoprene cloth-80mm

Long Stroke:Front Flange Type(ALL)

Lube(ALF), NON-Lube(ALFN)Air-Hydro(ALFH)



With Single Rod Boot



(mm)

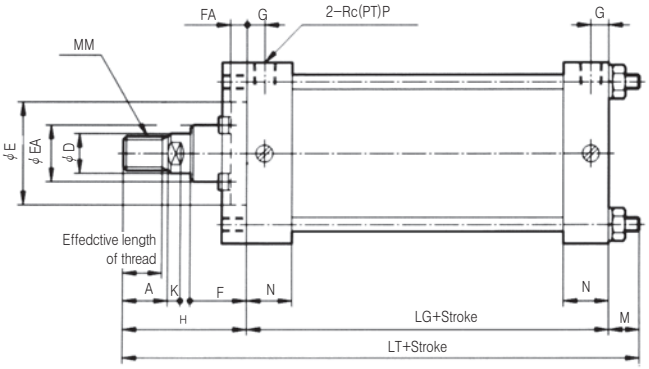
Type	Bore size (mm)	Stroke range	Effective length thread	A	B	□SC	φD	φE	φEA	F	FA	G	J	K	MM	N	P	LG
Lube	125	1,401~1,600	47	50	145	115	36	90	59	43	14	16	M14×1.5	15	M30×1.5	35	1/2	98
Non-Lube	140	1,401~1,600	47	50	161	128	36	90	59	43	14	16	M14×1.5	15	M30×1.5	35	1/2	98
Air-Hydro	160	1,401~1,600	53	56	182	144	40	90	59	43	14	18.5	M16×1.5	17	M36×1.5	39	3/4	106
	180	1,801~2,000	60	63	204	162	45	115	70	48	17	18.5	M18×1.5	20	M40×1.5	39	3/4	111
Lube	200	1,801~2,000	60	63	226	182	50	115	74	48	17	18.5	M20×1.5	20	M45×1.5	39	3/4	111
Non-Lube	250	2,001~2,400	67	71	277	225	60	140	86	60	20	23	M24×1.5	25	M56×2	49	1	141
	300	2,001~2,400	76	80	330	270	70	140	96	60	20	23	M30×1.5	30	M64×2	49	1	146

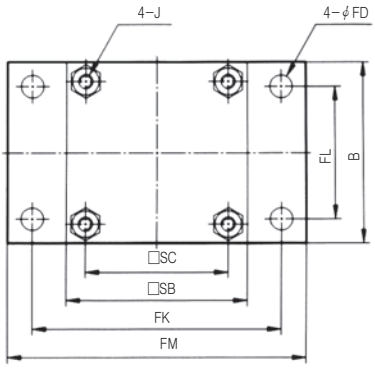
Type	Bore size (mm)	Stroke range	Y	φLD	LH	LS	LA	LK	LL	RS	RZ	Without Rod Boot		With Rod Boot				
												H	LT	φe	f	h	ℓ	LT1
Lube	125	45	20	19	85	188	8	100	157.5	50	164	110	273	★75	40	133		296
Non-Lube	140	45	30	19	100	188	9	112	180.5	55	184	110	283	★75	40	133	0.2Stroke	306
Air-Hydro	160	50	25	19	106	206	9	118	197	60	204	120	301	★75	40	141		322
	180	60	30	24	125	231	10	132	227	59	228	135	336	85	45	153	0.2Stroke	354
Lube	200	60	30	24	132	231	10	150	245	59	257	135	336	90	45	153		354
Non-Lube	250	80	40	29	160	301	12	180	298.5	69	325	160	421	105	55	176	0.17Stroke	437
	300	90	40	33	200	326	15	212	365	79	390	175	451	115	55	190		466

★ Rod Boot material:neoprene cloth-80mm

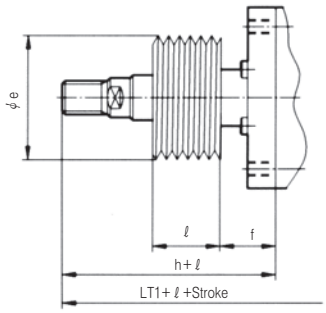
Rod Side Flange Type(ALF)

Lube Type(ALF), Non-Lube Type(ALFN), Air-Hydro Type(ALFH)





With Single Rod Boot



(mm)

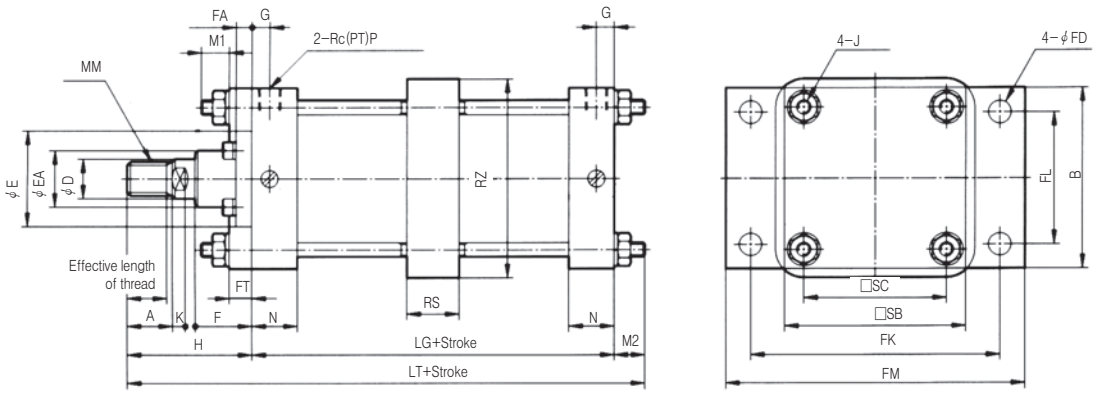
Type	Bore size (mm)	※Stroke range	Effective length thread	A	B	□SB	□SC	φD	φE	φEA	F	FA	G	J	K	M	MM	N	P	LG
Lube	125	~1,400	47	50	145	145	115	36	90	59	43	14	16	M14×1.5	15	30	M30×1.5	35	1/2	98
Non-Lube	140	~1,400	47	50	160	161	128	36	90	59	43	14	16	M14×1.5	15	24	M30×1.5	35	1/2	98
AirHydro	160	~1,400	53	56	180	182	144	40	90	59	43	14	18.5	M16×1.5	17	26	M36×1.5	39	3/4	106
	180	~1,800	60	63	200	204	162	45	115	70	48	17	18.5	M18×1.5	20	31	M40×1.5	39	3/4	111
Lube	200	~1,800	60	63	225	226	182	50	115	74	48	17	18.5	M20×1.5	20	31	M45×1.5	39	3/4	111
Non-Lube	250	~2,000	67	71	275	277	225	60	140	86	60	20	23	M24×1.5	25	35	M56×2	49	1	141
	300	~2,000	76	80	330	330	270	70	140	96	60	20	23	M30×1.5	30	48	M64×2	49	1	146

Type	Bore size (mm)	φFD	FT	FK	FL	FM	Without Rod Boot		With Rod Boot				
							H	LT	φe	f	h	ℓ	LT_1
Lube	125	19	14	190	100	230	110	238	★75	40	133	0.2Stroke	261
Non-Lube	140	19	20	212	112	255	110	232	★75	40	133		255
Air-Hydro	160	19	20	236	118	275	120	252	★75	40	141		273
	180	24	25	265	132	320	135	277	85	45	153	0.2Stroke	295
Lube	200	24	25	280	150	335	135	277	90	45	153		295
Non-Lube	250	29	30	355	180	420	160	336	105	55	176	0.17Stroke	352
	300	33	30	400	212	475	175	369	115	55	190		384

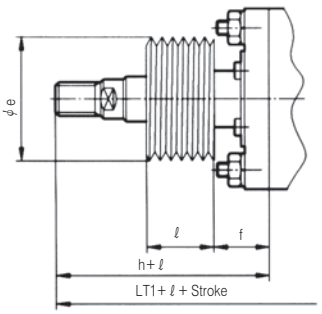
※ Minimum stroke with Rod Boot 30mm or more
★ Rod → Boot material : neoprene cloth-80mm

Long Stroke : Foot Flange Type(ALF)

Lube Type(ALF), Non-Lube Type(ALFN), Air-Hydro Type(ALFH)



With Single Rod Boot



(mm)

Type	Bore-size (mm)	※Stroke range (mm)	Effective length thread	A	B	□SB	□SC	φD	φE	φEA	F	FA	G	J	K	M_1	M_2	MM	N	P	LG
Lube	125	1,401~1,600	47	50	145	145	115	36	90	59	43	14	16	M14×1.5	15	22	22	M30×1.5	35	1/2	98
Non-Lube	140	1,401~1,600	47	50	160	161	128	36	90	59	43	14	16	M14×1.5	15	19	19	M30×1.5	35	1/2	98
Air-Hydro	160	1,401~1,600	53	56	180	182	144	40	90	59	43	14	18.5	M16×1.5	17	22	22	M36×1.5	39	3/4	106
	180	1,801~2,000	60	63	200	204	162	45	115	70	48	17	18.5	M18×1.5	20	26	26	M40×1.5	39	3/4	111
Lube	200	1,801~2,000	60	63	225	226	182	50	115	74	48	17	18.5	M20×1.5	20	26	26	M45×1.5	39	3/4	111
Non-Lube	250	2,001~2,400	67	71	275	277	225	60	140	86	60	20	23	M24×1.5	25	30	30	M56×2	49	1	141
	300	2,001~2,400	76	80	330	330	270	70	140	96	60	20	23	M30×1.5	30	36	36	M64×2	49	1	146

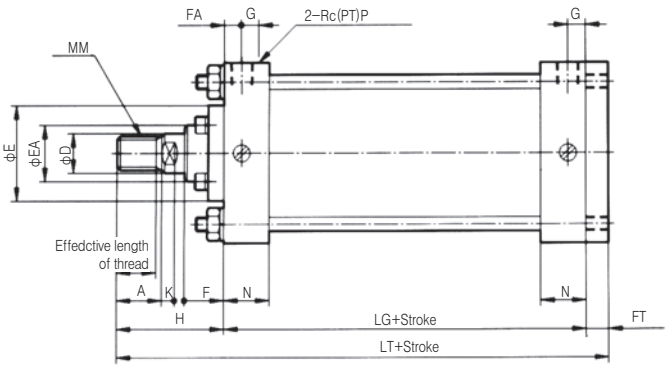
Type	Bore-size (mm)	φFD	FT	FK	FL	FM	RS	RZ	Without Rod Boot		With Rod Boot				
									H	LT	φe	f	h	ℓ	LT_1
Lube	125	19	14	190	100	230	50	164	110	230	★75	40	133	0.2Stroke	253
Non-Lube	140	19	20	212	112	255	55	184	110	227	★75	40	133		250
Air-Hydro	160	19	20	236	118	275	60	204	120	248	★75	40	141		269
	180	24	25	265	132	320	59	228	135	272	85	45	153	0.2Stroke	290
Lube	200	24	25	280	150	335	59	257	135	272	90	45	153		290
Non-Lube	250	29	30	355	180	420	69	325	160	331	105	55	176	0.17Stroke	347
	300	33	30	400	212	475	79	390	175	357	115	55	190		372

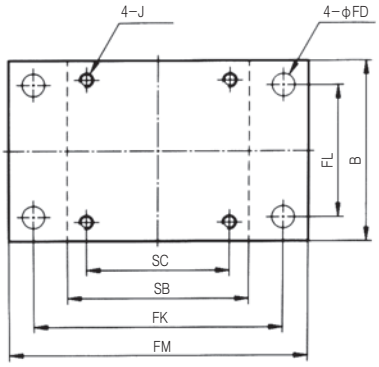
★ Rod Boot Material:neoprene cloth-80mm or more

※ Rod Boot Material :
neoprene cloth-80mm or more

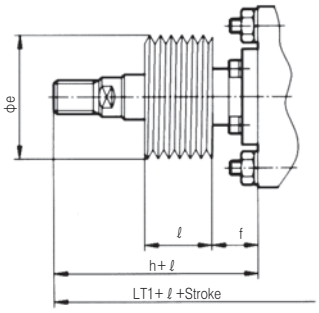
Head Side Flange Type(ALG/ALXG)

Lube Type(ALG), Non-LubeType(ALGN), Air-Hydro Type(ALGH)





With Single Rod Boot



(mm)

Type	Bore size (mm)	※Stroke range	Effective length thread	A	B	□SB	□SC	φD	φE	φEA	F	FA	G	J	K	MM	N	P	LG
Lube	125	~1000	47	50	145	145	115	36	90	59	43	14	16	M14×1.5	15	M30×1.5	35	1/2	98
Non-Lube	140	~1000	47	50	160	161	128	36	90	59	43	14	16	M14×1.5	15	M30×1.5	35	1/2	98
Air-Hydro	160	~1200	53	56	180	182	144	40	90	59	43	14	18.5	M16×1.5	17	M36×1.5	39	3/4	106
	180	~1200	60	63	200	204	162	45	115	70	48	17	18.5	M18×1.5	20	M40×1.5	39	3/4	111
Lube	200	~1200	60	63	225	226	182	50	115	74	48	17	18.5	M20×1.5	20	M45×1.5	39	3/4	111
Non-Lube	250	~1200	67	71	275	277	225	60	140	86	60	20	23	M24×1.5	25	M56×2	49	1	141
	300	~1200	76	80	330	330	270	70	140	96	60	20	23	M30×1.5	30	M64×2	49	1	146

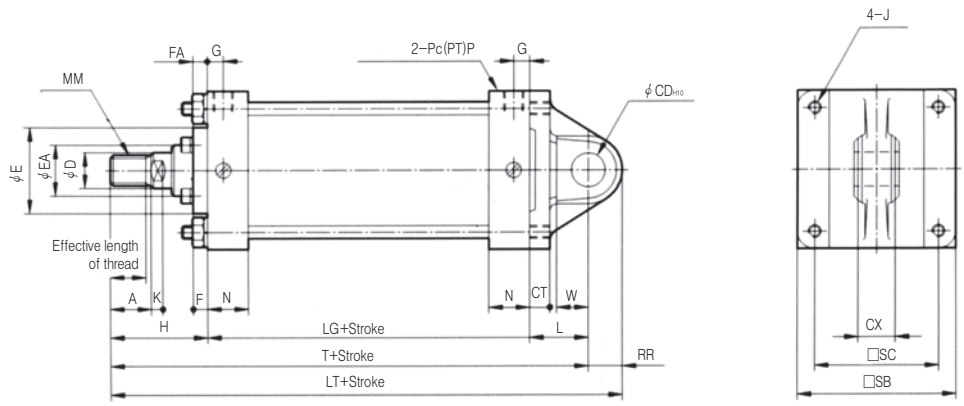
Type	Bore size (mm)	φFD	FT	FK	FL	FM	Without Rod Boot		With Rod Boot				
							H	LT	φe	f	h	ℓ	LT_1
Lube	125	19	14	190	100	230	110	222	★75	40	133		245
Non-Lube	140	19	20	212	112	255	110	228	★75	40	133	0.2Stroke	251
Air-Hydro	160	19	20	236	118	275	120	246	★75	40	141		267
	180	24	25	265	132	320	135	271	85	45	153	0.2Stroke	289
Lube	200	24	25	280	150	335	135	271	90	45	153		289
Non-Lube	250	29	30	355	180	420	160	331	105	55	176	0.17Stroke	347
	300	33	30	400	212	475	175	351	115	55	190		366

★ Rod Boot Material:neoprene cloth-80mm or more

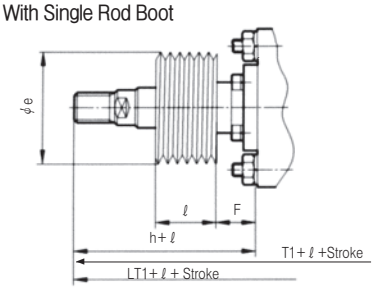
※ Rod Boot Material :
neoprene cloth-80mm or more

Single Clevis Type/(ALC)

Lube Type(ALC), Non-Lube Type(ALCN) Air-Hydro Type(ALCH)



With Single Rod Boot



(mm)

Type	Bore size (mm)	※Stroke range (mm)	Effective length thread	A	□SB	□SC	φ D	φ E	φ EA	F	FA	G	J	K	L	MM	N	P	RR	LG
Lube	125	~1,000	47	50	145	115	36	90	59	43	14	16	M14×1.5	15	65	M30×1.5	35	1/2	29	98
Non-Lube	140	~1,000	47	50	161	128	36	90	59	43	14	16	M14×1.5	15	75	M30×1.5	35	1/2	32	98
Air-Hydro	160	~1,200	53	56	182	144	40	90	59	43	14	18.5	M16×1.5	17	80	M36×1.5	39	3/4	36	106
	180	~1,200	60	63	204	162	45	115	70	48	17	18.5	M18×1.5	20	90	M40×1.5	39	3/4	44	111
Lube	200	~1,200	60	63	226	182	50	115	74	48	17	18.5	M20×1.5	20	90	M45×1.5	39	3/4	44	111
Non-Lube	250	~1,200	67	71	277	225	60	140	86	60	20	23	M24×1.5	25	110	M56×2	49	1	55	141
	300	~1,200	76	80	330	270	70	140	96	60	20	23	M30×1.5	30	130	M64×2	49	1	68	146

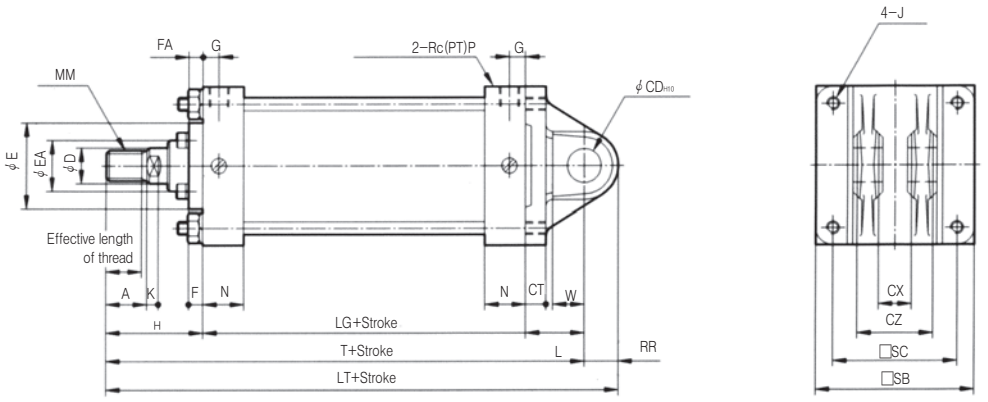
Type	Bore size (mm)	W	φ CD_{H10}	CT	CX	Without Rod Boot			With Rod Boot					
						H	T	LT	φ e	f	h	ℓ	T_1	LT_1
Lube	125	35	$25^{+0.084}_{0}$	17	$32^{-0.1}_{-0.3}$	110	273	302	★75	40	133	0.2Stroke	296	325
Non-Lube	140	40	$28^{+0.084}_{0}$	17	$36^{-0.1}_{-0.3}$	110	283	315	★75	40	133		306	338
Air-Hydro	160	45	$32^{+0.100}_{0}$	20	$40^{-0.1}_{-0.3}$	120	306	342	★75	40	141		327	363
	180	50	$40^{+0.100}_{0}$	23	$50^{-0.1}_{-0.3}$	135	336	380	85	45	153	0.2Stroke	354	398
Lube	200	50	$40^{+0.100}_{0}$	25	$50^{-0.1}_{-0.3}$	135	336	380	90	45	153		354	398
Non-Lube	250	65	$50^{+0.100}_{0}$	30	$63^{-0.1}_{-0.3}$	160	411	466	105	55	176	0.17Stroke	427	482
	300	80	$63^{+0.120}_{0}$	37	$80^{-0.1}_{-0.3}$	175	451	519	115	55	190		466	534

※ MInimum stroke with Rod Boot:30mm

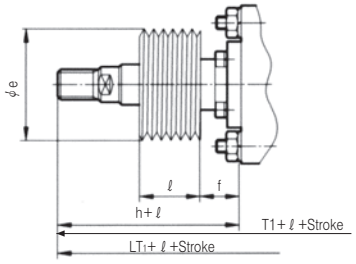
★ Rod Boot Material:neoprene cloth-80mm or more

Double Clevis Type/(ALD)

Lube Type(ALD), Non-Lube Type(ALDN), Air-Hydro Type(ALDH)



With Single Rod Boot



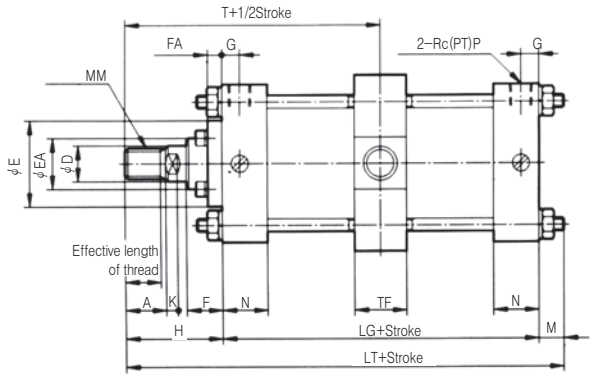
(mm)

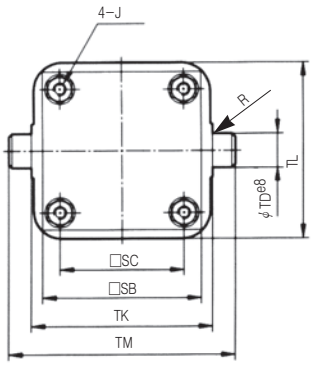
Type	Bore size (mm)	※Stroke range (mm)	Effective length thread	A	□SB	□SC	φD	φE	φEA	F	FA	G	J	K	L	MM	N	P	RR	LG
Lube	125	~1,000	47	50	145	115	36	90	59	43	14	16	M14×1.5	15	65	M30×1.5	35	1/2	29	98
Non-lube	140	~1,000	47	50	161	128	36	90	59	43	14	16	M14×1.5	15	75	M30×1.5	35	1/2	32	98
Air-hydro	160	~1,200	53	56	182	144	40	90	59	43	14	18.5	M16×1.5	17	80	M36×1.5	39	3/4	36	106
	180	~1,200	60	63	204	162	45	115	70	48	17	18.5	M18×1.5	20	90	M40×1.5	39	3/4	44	111
Lube	200	~1,200	60	63	226	182	50	115	74	48	17	18.5	M20×1.5	20	90	M45×1.5	39	3/4	44	111
Non-lube	250	~1,200	67	71	277	225	60	140	86	60	20	23	M24×1.5	25	110	M56×2	49	1	55	141
	300	~1,200	76	80	330	270	70	140	96	60	20	23	M30×1.5	30	130	M64×2	49	1	68	146

Type	Bore size (mm)	W	φ CDH10	CT	CX	CZ	Without Rod Boot			With Rod Boot					
							H	T	LT	φe	f	h	ℓ	T_1	LT_1
Lube	125	35	$25^{+0.084}_{0}$	17	$32^{+0.3}_{+0.1}$	$64^{0}_{-0.2}$	110	273	302	★75	40	133	0.2 Stroke	296	325
Non-lube	140	40	$28^{+0.084}_{0}$	17	$36^{+0.3}_{+0.1}$	$72^{0}_{-0.2}$	110	283	315	★75	40	133		306	338
Air-hydro	160	45	$32^{+0.100}_{0}$	20	$40^{+0.3}_{+0.1}$	$80^{0}_{-0.2}$	120	306	342	★75	40	141		327	363
	180	50	$40^{+0.100}_{0}$	23	$50^{+0.3}_{+0.1}$	$100^{-0.1}_{-0.3}$	135	336	380	85	45	153	0.2 Stroke	354	398
Lube	200	50	$40^{+0.100}_{0}$	25	$50^{+0.3}_{+0.1}$	$100^{-0.1}_{-0.3}$	135	336	380	90	45	153		354	398
Non-lube	250	65	$50^{+0.100}_{0}$	30	$63^{+0.3}_{+0.1}$	$126^{-0.1}_{-0.3}$	160	411	466	105	55	176	0.17Stroke	427	482
	300	80	$63^{+0.120}_{0}$	37	$80^{+0.3}_{+0.1}$	$160^{-0.1}_{-0.3}$	175	451	519	115	55	190		466	534

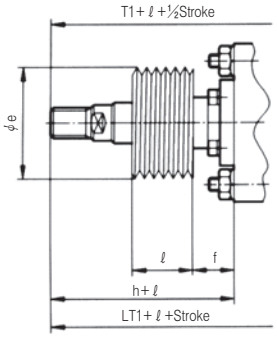
Center Trunnion Type/(ALT/ALXT)

Lube Type(ALT), Non-Lube Type(ALTN) Air-Hydro Type(ALTH)





With Single Rod Boot



(mm)

Type	Bore size (mm)	※Stroke range (mm)	Effective length thread	A	□SB	□SC	φD	φE	φEA	F	FA	G	J	K	M	MM	N	P	R	LG
Lube	125	25~1,000	47	50	145	115	36	90	59	43	14	16	M14×1.5	15	19	M30×1.5	35	1/2	1	98
Non-lube	140	30~1,000	47	50	161	128	36	90	59	43	14	16	M14×1.5	15	19	M30×1.5	35	1/2	1.5	98
Air-hydro	160	35~1,200	53	56	182	144	40	90	59	43	14	18.5	M16×1.5	17	22	M36×1.5	39	3/4	1.5	106
	180	30~1,200	60	63	204	162	45	115	70	48	17	18.5	M18×1.5	20	26	M40×1.5	39	3/4	2	111
Lube	200	30~1,200	60	63	226	182	50	115	74	48	17	18.5	M20×1.5	20	26	M45×1.5	39	3/4	2	111
Non-lube	250	30~1,200	67	71	277	225	60	140	86	60	20	23	M24×1.5	25	30	M56×2	49	1	3	141
	300	35~1,200	76	80	330	270	70	140	96	60	20	23	M30×1.5	30	36	M64×2	49	1	4	146

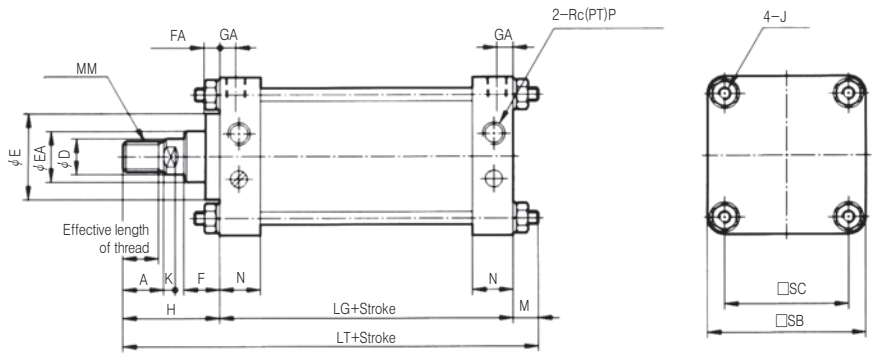
Type	Bore size (mm)	φ TDe8	TF	TK	TL	TM	Without Rod Boot			With Rod Boot					
							H	T	LT	φe	f	h	ℓ	T1	LT1
Lube	125	32 $^{-0.050}_{-0.089}$	50	170	164	234	110	159	227	★75	40	133	0.2 Stroke	182	250
Non-lube	140	36 $^{-0.050}_{-0.089}$	55	190	184	262	110	159	227	★75	40	133		182	250
Air-hydro	160	40 $^{-0.050}_{-0.089}$	60	212	204	292	120	173	248	★75	40	141		194	269
	180	45 $^{-0.050}_{-0.089}$	59	236	228	326	135	190.5	272	85	45	153	0.2 Stroke	208.5	290
Lube	200	45 $^{-0.050}_{-0.089}$	59	265	257	355	135	190.5	272	90	45	153		208.5	290
Non-lube	250	56 $^{-0.060}_{-0.106}$	69	335	325	447	160	230.5	331	105	55	176	0.17 Stroke	246.5	347
	300	67 $^{-0.060}_{-0.106}$	79	400	390	534	175	248	357	115	55	190		263	372

※ MInimum stroke with Rod Boot : 30mm

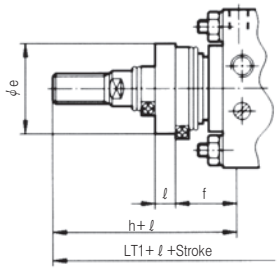
★ Rod Boot Material : neoprene cloth-80mm or more

Basic Type/(ALXB)

Lube Type(ALXB), Non-Lube Type(ALXBN) Air-Hydro Type(ALXBH)



With Single Rod Boot



(mm)

Type	Bore-size	※Stroke range	Effective length thread	A	□SB	□SC	φD	φE	φEA	F	FA	GA	GB	J	K	M	MM	N	P	LG
Lube Non-lube	125	~1,000	47	50	145	115	36	90	59	43	14	16	40	M14×1.5	15	27	M30×1.5	35	1/2	98
	140	~1,000	47	50	161	128	36	90	59	43	14	16	40	M14×1.5	15	27	M30×1.5	35	1/2	98
	160	~1,200	53	56	182	144	40	90	59	43	14	18.5	40	M16×1.5	17	30.5	M36×1.5	39	3/4	106
	180	~1,200	60	63	204	162	45	115	70	48	17	18.5	–	M18×1.5	20	35	M40×1.5	39	3/4	111
	200	~1,200	60	63	226	182	50	115	74	48	17	18.5	–	M20×1.5	20	35	M45×1.5	39	3/4	111
	250	~1,200	67	71	277	225	60	140	86	60	20	23	–	M24×1.5	25	41.5	M56×2	49	1	141
	300	~1,200	76	80	330	270	70	140	96	60	20	23	–	M30×1.5	30	51.5	M64×2	49	1	146

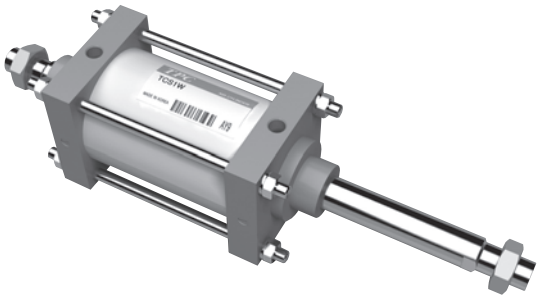
Type	Bore size	Without Rod Boot		With Rod Boot					With
		H	LT	φe	f	h	ℓ	LT_1	
Lube Non-Lube	125	110	235	★75	40	133	0.2Stroke	258	31
	140	110	235	★75	40	133		258	31
	160	120	256.5	★75	40	141		277.5	36
	180	135	281	85	45	153	0.2Stroke	299	41
	200	135	281	90	45	153		299	46
	250	160	342.5	105	55	176	0.17Stroke	358.5	56
	300	175	372.5	115	55	190		387.5	65

※ Minimum stroke with Rod Boot:30mm
★ Rod Boot Material:neoperne cloth-80mm

Series ALW/ALXW

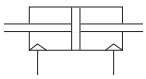
Double Rod End Type

Bore Size(mm) : Ø125, Ø140, Ø160, Ø180, Ø200, Ø250, Ø300



- DOUBLE ROD END CYLINDER
- ALUMINUM TUBE : ϕ 125~ ϕ 160
- IRON TUBE : ϕ 180~ ϕ 300

Symbol



How to Order

ALW / ALXW	D	L	N	125	100	J	W3		
1	2	3	4	5	6	7	8	9	10

1 Double Rod End Cylinder

2 Magnet
- Blank : None
- D : Built in Magnet (ϕ125, ϕ140, ϕ160 Only)

3 Mounting
- B : Basic Type
- L : Foot Type
- F : Front Flange
- T : Center Trunion

4 Type

5 Bore Size

6 Stroke

7 Suffix Symbol for Cylinder

8 Auto Switch

9 Number of Auto Switches

10 Series

※ For details, plese refer to page 206

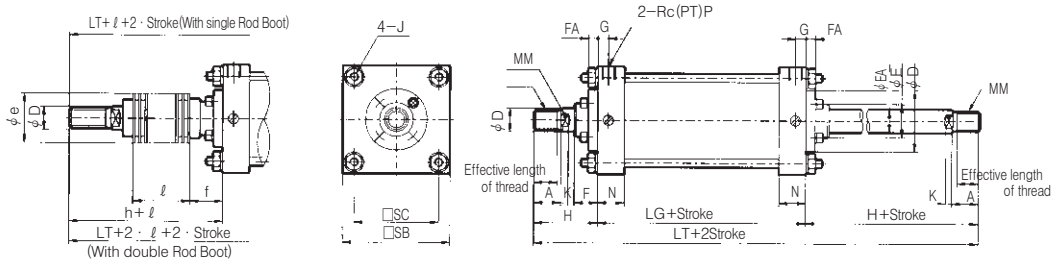
Specifications

Type	Lube, Non-lube	Air-hydro
Fluid	Air	L.P.Oil
Proof Pressure	1.6Mpa(22psi)	
Max. Operating Pressure	0.9Mpa(140psi)	
Min. Operating Pressure	50kPa(7psi)	60kPa(8psi)
Ambient and fluid temperature	5~60℃(41~140°F)	
Piston speed	50~500mm/s	0.5~200mm/s
Cushion	With Air Cushion	Without Cushion
Mounting	Basic, Foot, Flange, Center trunnion	

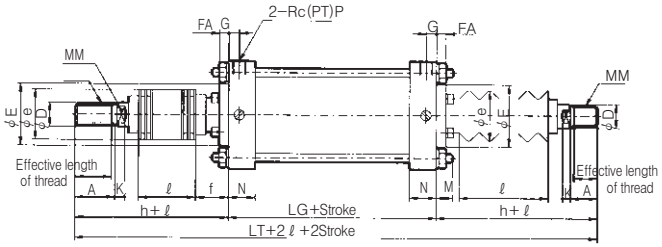
Basic Type (ALWB)

Lube Type (ALWB),
Non-Lube Type (ALWBN)
Air-Hydro Type (ALWBH)

With Single Rod Boot



With Double Rod Boot



Type	Bore Size (mm)	Stroke range		Effective length of thread	A	□SB	□SC	φD	φE	φEA	F	FA	G	J	K	M	MM	N	P	LG
		Without	With Root Boot																	
Lube	125	~1,000	30~1,000	47	50	145	115	36	90	59	43	14	16	M14×1.5	15	27	M30×1.5	35	1/21	98
Non-Lube	140	~1,000	30~1,000	47	50	161	128	36	90	59	43	14	16	M14×1.5	15	27	M30×1.5	35	/2	98
Air-Hydro	160	~1,200	30~1,200	53	56	182	144	40	90	59	43	14	18.5	M16×1.5	17	30.5	M36×1.5	39	3/4	106
Lub Non-Lube	180	~1,200	30~1,200	60	63	204	162	45	115	70	48	17	18.5	M18×1.5	20	35	M40×1.5	39	3/4	111
	200	~1,200	30~1,200	60	63	226	182	50	115	74	48	17	18.5	M20×1.5	20	35	M45×1.5	39	3/4	111
	250	~1,200	30~1,200	67	71	277	225	60	140	86	60	20	23	M24×1.5	25	41.5	M56×2	49	1	141
	300	~1,200	30~1,200	76	80	330	270	70	140	96	60	20	23	M30×1.5	30	51.5	M64×2	49	1	146

★ Rod Boot Material : Neoprene cloth-80mm or more

(mm)

Type	Bore size (mm)	Without Rod Boot		With Single Rod Boot					
		H	LT	φe	f	h	l	LT	LT
Lube	125	110	318	★75	40	133	0.2Stroke	341	364
Non-Lube	140	110	318	★75	40	133		341	364
Air-Hydro	160	120	346	★75	40	141		367	388
Lub Non-Lube	180	135	381	85	45	153	0.2Stroke	399	417
	200	135	381	90	45	153		399	417
	250	160	461	105	55	176	0.17Stroke	477	493
	300	175	496	115	55	190		511	526

Adjustable Stroke Cylinder/Extension Adjustable Type

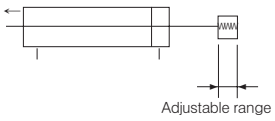
AX / ALX — Mounting — Tube material — Type — Bore size — Stroke — Additional symbol — Stroke adjusting symbol — XC8

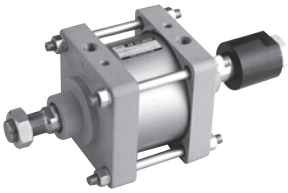
Additional symbol
Blank–With Rod
J–With Rod(Nylon tarpaulin)
K–With Rod(Neoprene cloth)

Stroke adjusting symbol
A–Stroke adjusting range 0~–25mm
B–Stroke adjusting range 0~–50mm

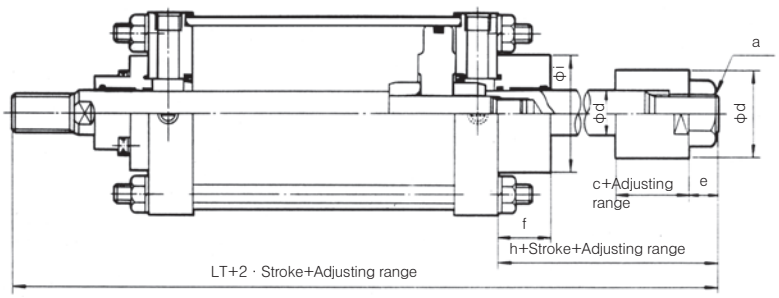
The stroke at extend of the cylinder can be adjusted by the stopper in the head side from full stroke 0~–25mm or 0~–50mm

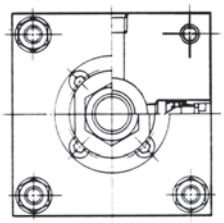
Symbol





Construction, Dimensions/Basic Type





※ Other dimensions are the same as standard type

(mm)

Tube Size(mm)	a	Øb	c	Ød	e	f	h	Øi	LT
125	M30×1.5	70	43	36	27	40	110	90	318
140	M30×1.5	70	43	36	27	40	110	90	318
160	M30×1.5	70	43	36	27	40	110	90	336
180	M42×1.5	80	50	45	37.5	45	132.5	115	378.5
200	M42×1.5	80	50	50	37.5	45	132.5	115	378.5
250	M56×2	110	70	60	50	55	175	140	476
300	M56×2	110	70	70	50	55	175	140	496

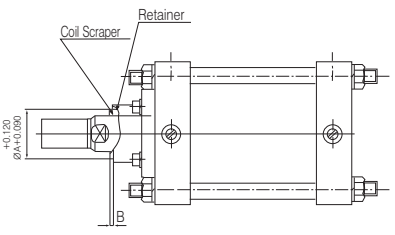
With Coil Scrapper

AX / ALX — Mounting — Tube Material — Type — Bore Size — Stroke — Suffix — X104

Suffix
Blank–basic — Both ends cushion
R — Rod end cushion
H — Head end cushion
N — non–cushion

Bore Size	ØA	B
125	Ø50	0.8
140	Ø50	0.8
160	Ø50	2.8
180	Ø60	1.8

Bore Size	ØA	B
200	Ø64	1.8
250	Ø78	0.5
300	Ø88	5



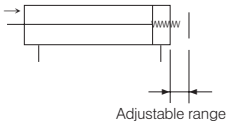
Adjustable Stroke Cylinder/Retraction Adjustable Type

AL
ALX — Mounting — Tube material — Type — Bore size — Stroke — Additional symbol — Stroke adjusting symbol — XC9

Stroke adjusting symbol
A–Stroke adjusting range 0~–25mm
B–Stroke adjusting range 0~–50mm

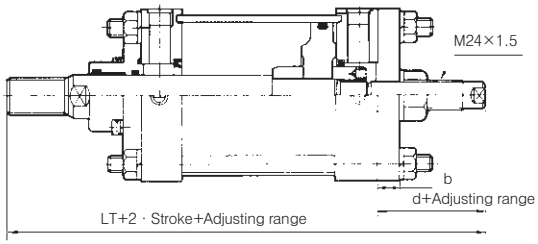
Symbol

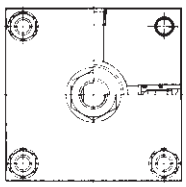
The stroke at retraction of the cylinder can be adjusted from 0~–25mm or 0~–50mm by the adjusting bolt.



A : 25m
B : 50m

Construction, Dimensions/Basic Type





(mm)

Bore size	b	d	LT
125	19	66	274
140	19	66	274
160	22	62	288

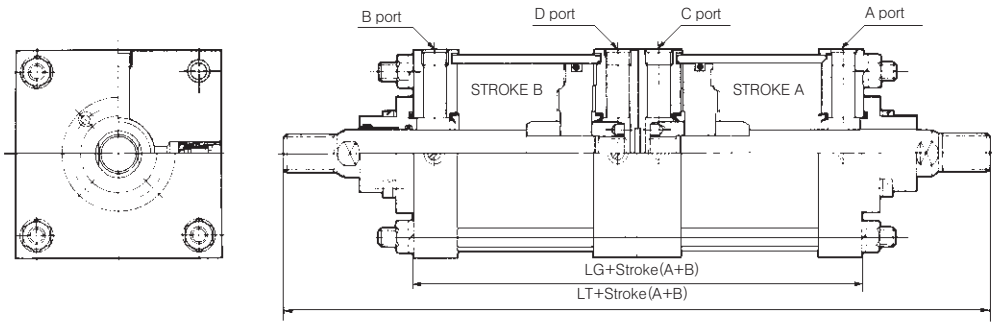
※ Other dimensions are the same as standard type

Dual Stroke Cylinder/Double Rod Type

AL / ALX — Mounting — Tube material — Type — Bore size — Stroke A — Additional symbol + Stroke B — Additional symbol — XC10

Two cylinders are constructed as one cylinder in a back-to-back configuraton allowing the cylinder stroke to be controlled in three steps.

Construction, Dimensions/Basic Type



Bore size(mm)	LG	LT
125	196	416
140	196	416
160	212	452
180	212	492
200	222	492
250	282	602
300	292	642

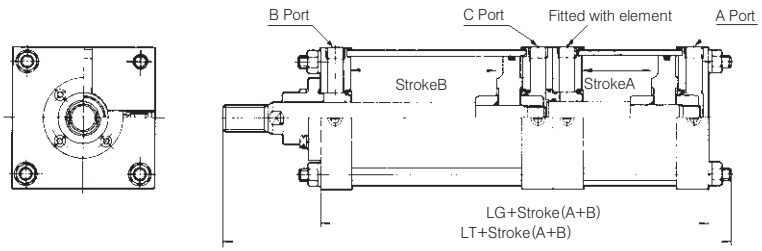
※ Other dimensions are the same as standard type

Dual Stroke Cylinder/Single Rod Type

AL / ALX — Mounting — Tube material — Type — Bore size — Stroke A — Additional symbol + Stroke B-A — Additional symbol — XC11

Additional Rod Boot
Blank–Without Rod Boot
J–With Rod Boot(Nylon tarpaulin)
K–With Rod Boot(Neoprene cloth)

Construction, Dimensions/Basic Type



(mm)

Bore size	LG	LT
125	197	334
140	197	334
160	213	363.5
180	223	393
200	223	393
250	283	484.5
300	293	519.5

※ Other dimensions are the same as standard type

High Temperature Cylinder

AL
ALX — Mounting — Tube material — Bore Size — Stroke — suffix — XB6

Suffix ●
Blank — Both sides Attached Air Cushion
R — Rod End Air Cushion
H — Head End Air Cushion
N — Non-cushion

Can be used at high temperature up to150℃ (302°F)

Specification

Type	Non-Lube
Bore Size	ϕ125, ϕ140, ϕ160, ϕ180, ϕ200
Ambient Temperature Condition	-20~+150℃ (-4~302°F)
Packing material	FPM(Fluorine)

Piston Rod Stainless

AL
ALX — Mounting — Tube material — Type — Bore Size — Stroke — suffix — XC6

Suffix ●
Blank — Both sides Attached Air Cushion
R — Rod End Air Cushion
H — Head End Air Cushion
N — Non-cushion

Stainless steel piston rod is used to protect in harsh or wet environment

Auto Switch Mounting Arailable

Type	Lube, Non-Lube, Air Hydro
Bore Size	ϕ125, ϕ140, ϕ160, ϕ180, ϕ200, ϕ250, ϕ300
Piston Material	Stainless steel (SUS304)

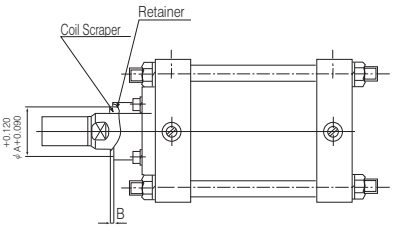
Bult in Coil Scraper

AL / ALX — Mounting — Tube material — Type — Bore size — Stroke — Suffix — X104

Suffix ●
Blank — Standard(Air Cushion)
R — Rod End Air Cushion
H — Head End Air Cushion
N — Non – Cushion

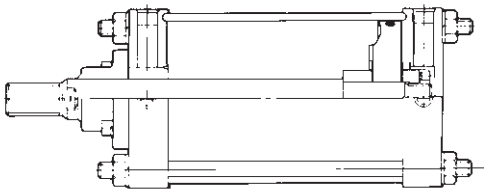
Bore Size	ϕA	B
125	ϕ50	0.8
140	ϕ50	0.8
160	ϕ50	2.8
180	ϕ60	1.8

Bore Size	ϕA	B
200	ϕ64	1.8
250	ϕ78	0.5
300	ϕ88	5



With Strong Scraper

AL / ALX — Mounting — Tube material — Type — Bore size — Stroke — Additional symbol — XC4

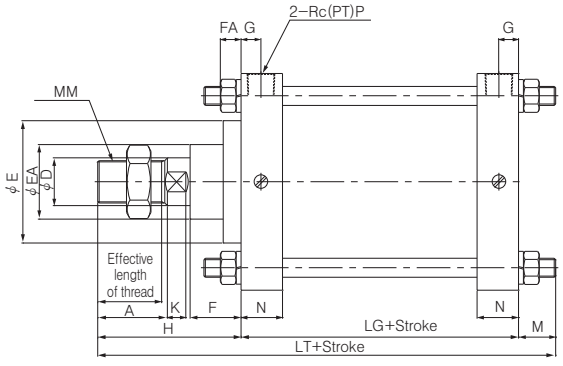


※ Dimensions are the same as standard type.

Oversized Rod Cylinder

AL / ALX — Mounting — Type — Bore size — Stroke — Suffix — XB5

Suffix ●
Blank — Both sides Attached Air Cushion
R — Rod End Air Cushion
H — Head End Air Cushion
N — Non – Cushion



Type	Lube, Non–lube				
Bore size(mm)	125	140	160	180	200
Piston rod diameter(mm)	50	60	60	70	70

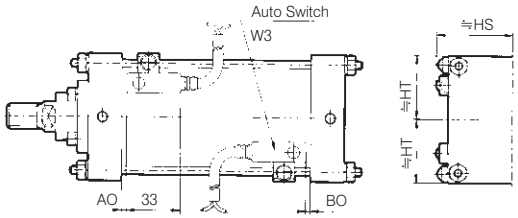
(mm)

Bore Size	A	ϕD	ϕE	ϕEA	F	K	MM	H	LT
125	63	50	115	74	48	20	M45×1.5	135	260
140	71	60	140	86	60	25	M56×2	160	285
160	71	60	140	86	60	25	M56×2	160	296.5
180	80	70	140	96	60	30	M64×2	175	321
200	80	70	140	96	60	30	M64×2	175	321

※ Dimensions are the same as Standard type.

Auto Switch Mounting Position (At stroke End)

W3



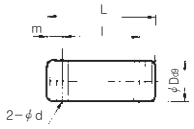
Auto s/w model	Auto s/w Mounting Position	Auto s/w placemant dimensions(mm) 125	140	160
W3	AO	0	0	0
	BO	0	0	0
	≒HS	75.5	82.0	90.0
	≒HT	70.0	76.5	87.0

Minimum Auto Switch Mountable Stroke

Auto switch model	No. of Auto Switch	Mounting bracket except trunnion	n:No. of Auto Switch φ125	φ140	φ160
W3	with 2 switches (different, same surface) with 1 switch	25	125	135	135
	with n switches (same surface bracket)	$125+55(\frac{n-2}{2})$	$125+55(\frac{n-4}{2})$ n=4,8,12,16,…	$135+55(\frac{n-4}{2})$ n=4,8,12,16,…	

Bracket

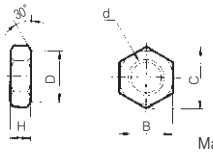
Knuckle Joint pin/Clevis Pin



Material:Carbon steel

Part No.	Applicable bore(mm)	φDd9	L	ℓ	m	φd	Applicable split pin
TIY-12	125	$25^{-0.065}_{-0.117}$	81.5	69.5	6	4	φ4×40
TIY-14	140	$28^{-0.065}_{-0.117}$	94.5	76.5	9	4	φ4×40
TIY-16	160	$32^{-0.080}_{-0.142}$	94.5	84.5	9	4	φ4×40
TIY-18	180 · 200	$40^{-0.080}_{-0.142}$	125	105	10	4	φ4×55
TIY-25	250	$50^{-0.080}_{-0.142}$	156	132	12	5	φ5×65
TIY-30	300	$63^{-0.100}_{-0.174}$	190	166	12	5	φ5×80

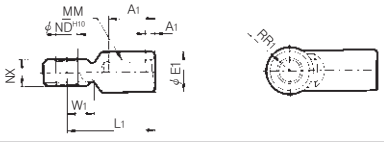
Rod End Nut



Material:Rolled steel

Part No.	Applicable bore(mm)	d	H	B	C	D
TNT-12	125 · 140	M30×1.5	18	46	53.1	44
TNT-16	160	M36×1.5	21	55	63.5	53
TNT-18	180	M40×1.5	23	60	69.3	57
TNT-20	200	M45×1.5	27	70	80.8	67
TNT-25	250	M56×2	34	85	98.1	82
TNT-30	300	M64×2	38	95	110.0	92

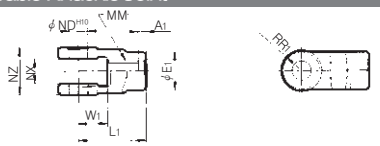
I type single knuckle Joint



Material:Cast iron

Part No.	Applicable bore(mm)	A1	A2	φE1	L1	MM	φND H10	NX	RR1	W1
TI-12	125	8	54	46	100	M30×1.5	$25^{+0.084}_{0}$	$32^{-0.1}_{-0.3}$	27	33
TI-14	140	8	54	48	105	M30×1.5	$28^{+0.084}_{0}$	$36^{-0.1}_{-0.3}$	30	39
TI-16	160	8	60	55	110	M36×1.5	$32^{+0.1}_{0}$	$40^{-0.1}_{-0.3}$	34	39
TI-18	180	8	67	70	125	M40×1.5	$40^{+0.1}_{0}$	$50^{-0.1}_{-0.3}$	42.5	44
TI-20	200	8	67	70	125	M45×1.5	$40^{+0.1}_{0}$	$50^{-0.1}_{-0.3}$	42.5	44
TI-25	250	9	75.5	86	160	M56×2	$50^{+0.1}_{0}$	$63^{-0.1}_{-0.3}$	53	66
TI-30	300	9	84.5	105	175	M64×2	$63^{+0.12}_{0}$	$80^{-0.1}_{-0.3}$	66	71

Y Type Double Knuckle Joint



Material:Cast iron

Part No.	Applicable bore(mm)	A1	φE1	L1	MM	φND H10	NX	NZRR1	W1	
TY-12A	125	8	46	100	M30×1.5	$25^{+0.084}_{0}$	$32^{+0.3}_{+0.1}$	$64^{-0.1}_{-0.3}$	27	42
TY-14A	140	8	48	105	M30×1.5	$28^{+0.084}_{0}$	$36^{+0.3}_{+0.1}$	$72^{-0.1}_{-0.3}$	30	47
TY-16A	160	8	55	110	M36×1.5	$32^{+0.1}_{0}$	$40^{+0.3}_{+0.1}$	$80^{-0.1}_{-0.3}$	34	46
TY-18A	180	8	70	125	M40×1.5	$40^{+0.1}_{0}$	$50^{+0.3}_{+0.1}$	$100^{-0.1}_{-0.3}$	42.5	54
TY-20A	200	8	70	125	M45×1.5	$40^{+0.1}_{0}$	$50^{+0.3}_{+0.1}$	$100^{-0.1}_{-0.3}$	42.5	54
TY-25A	250	9	86	160	M56×2	$50^{+0.1}_{0}$	$63^{+0.3}_{+0.1}$	$126^{-0.1}_{-0.3}$	53	81
TY-30A	300	9	105	175	M64×2	$63^{+0.12}_{0}$	$80^{+0.3}_{+0.1}$	$160^{-0.1}_{-0.3}$	66	87

Series AQ

Compact Cylinder : Standard Type/Double Action : Single Rod

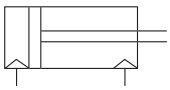
Bore Size(mm) : Ø12, Ø16, Ø20, Ø25

※ Ø32, Ø40, Ø50, Ø63, Ø80, Ø100 Applied AQ2 Series

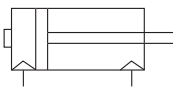
- ACHIEVEMENT OF COMPACT SIZE
- SPACE SAVING CYLINDER
- COMPACT EQUIPMENT DESIGN AVAILABLE

Symbol

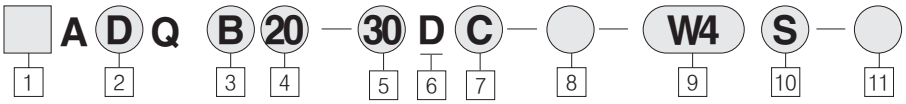
Double Acting : Single Rod



Rear Boss Mounting



How to Order



1 Series
Blank : Rc(PT)
U : NPT

2 Auto Switch Attachment
Blank : Standard type
D : Auto switch attached (Buit in magnet)

3 Attachment
B : Thru hole(standard type)
A : Both end tap(refor to p.231)
D : Double clevis(standard both-end type)
F : Front flange(standard both-end type)
G : Rear flange(standard both-end type)
L : Foot(standard both-end type)
※ Attachment fittings are delivered without assembly

4 Bore Size
12 : 12mm(½ Nom.)
16 : 16mm(⅝ Nom.)
20 : 20mm(¾ Nom.)
25 : 25mm(1 Nom.)

5 Cylinder Standard Stroke(mm)
Tube internal diameter standard stroke
12,16 : 5,10,15,20,25,30
20,25 : 5,10,15,20,25,30,35,40,45,50,75,100

6 Operation Method
D : Double action type

7 body Specification
Blank : Standard type(rod end female-thread)
C : Rubber cushion attached
M : Rod end male-thread
F : Rear boss mount
I : Single knuckle joint(rod end male-thread)
Y : Double knuckle joint(rod end male-thread)
※ Possible to combine body specification(CM, CF, CI, CFI, CFY, etc)
※ Except CF for Ø12 and Ø16 cases
※ I and Y are delivered without assembly

8 Series
Blank : Standard type
※ Ø12~ Ø40 : XC16 Type is standard

9 Types of Auto Switch
Blank : None
Reed Switch
W4 : W4(Reed Switch)
※ In case of 3m lead wire, L is additionally indicated at the end of item number
ex)W4L
※ In case of 5m lead track, please contact us

10 Auto Switch Additional Symbol
Blank : 2 pcs
S : 1 pc
N : N pcs

11 In Case of Producing Long Stroke
Refer to p.229 for production of long stroke

Notice

※Production of middle stroke
Minimum 3mm to 1mm middle stroke production is available by means of mounting spacer at standard stroke cylinder.
ex) AQB12-27D inserts 3mm wide spacer in standard cylinder AQB12-30D
ex) AQB12-29D inserts 21mm wide spacer in standard cylinder AQB12-50D

Notices for products

Please fully understand the notices prior to utilization, and refer to safety notice and common notice.

Warning

Assembly/Disassembly of Snap Ring

- Please use proper flyer (Attached tool of C-type snap ring) for assembly / disassembly.
- Please be cautious all the time that there is possible damage to human body or near-by equipments owing to projection of snap ring at the end of flyer (C-type snap ring) in spite of using proper flyer (Attached tool of C-type snap ring). Moreover, after checking full connection of snap ring during attachment, supply air.

Additional Component Number for Long Stroke Production

Bore Size	Long Stroke	Component Number
20	51st~	TC180
25		TC335

Item Number of Mountings

Bore Size(mm)	Foot	Flange	Double Clevis
12	QL-012	QF-012	QD-012
16	QL-016	QF-016	QD-016
20	QL-020	QF-020	QD-020
25	QL-025	QF-025	QD-025

※ In case of ordering foot type, please order 2EA foot per 1EA cylinder

Item Number of Mountings

Bore Size	Foot I-Knuckle	Flange Y-Knuckle	Double Clevis Joint Pin
12	QL-012	QF-012	QD-012
	QI-012	QY-012	QP-012
16	QL-016	QF-016	QD-016
	QI-016	QY-016	QP-012
20	QL-020	QF-020	QD-020
	QI-020	QY-020	QP-020
25	QL-025	QF-025	QD-025
	QI-025	QY-025	QP-025

Weight Sheet (Unit : g)

Bore Size (mm)	Cylinder Stroke(mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
12	40	47	54	61	68	75	–	–	–	–	–	–
16	61	72	83	94	105	116	–	–	–	–	–	–
20	91	112	132	152	173	193	213	234	254	274	–	–
25	118	139	160	181	203	224	245	266	287	309	–	–

Type

Bore Size(mm)			12	16	20	25
Air Pressure Type	Attachment	Penetration Hole (Standard)	○	○	○	○
		Both end Tap	○	○	○	○
	Built in Magnet		○	○	○	○
	Piping Method	Thread Type	M5× 0.8	M5× 0.8	M5× 0.8	M5× 0.8
	Rod end Male-Thread		○	○	○	○
	Rubber Cushion Attached		–	–	–	○
	Rear Boss Mount		○	○	○	○

Note1) In case of no auto switch, the thread for 5mm stroke is only M5×0.8

Standard Specifications

Type	Air Pressure (Non lube) Type
Applied Fluid	Air
Guaranteed Pressure Resistance	1.5MPa{15.3kgf/cm²}
Maximum Pressure Applied	1.0MPa{9.9kgf/cm²}
Ambient and Applied Fluid Temperature	5℃~60℃(No Frozen)
Rod end Thread Allowance	KS Level 2
Stroke Length Allowance	$^{+1.0}_{0}$
Running Piston Speed	50~500mm/s
Rubber Cushion	None
Rod end Thread	Female Thread
Attachment	Through Hole

Minimum Operation Pressure (Unit : MPa)

Bore Size(mm)	12	16	20	25
Air Pressure (Non lube) Type	0.07	0.07	0.05	0.05

Extra Weight Sheed (Unit : g)

Bore Size(mm)		12	16	20	25
Attachment Both end Tap Type		1	2	6	7
Rod end Male Thread	Male Thread Part	1.5	3	6	12
	Nut	1	2	4	8
Rear Boss Mount		0.7	1.3	2	3
Rubber Cushion Attached		1	2	5	4

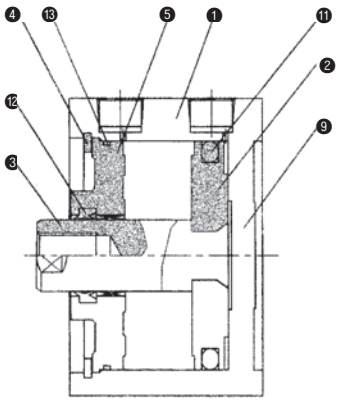
Calculation Method

ex) AQA20-20DCM

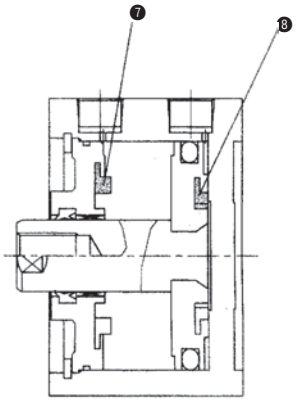
- Standard Weight : AQB20-20D ·····152g
- Extra Weight : Attachment both end tap type ·····6g
  Rod end male thread ·····10g
  Rubber cushion attached ·····5g

173g

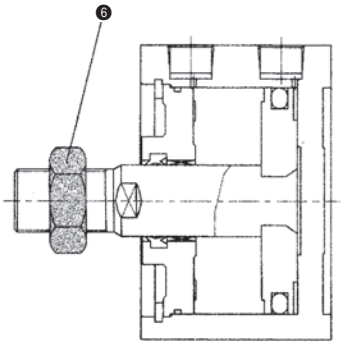
Structure Map/Component List



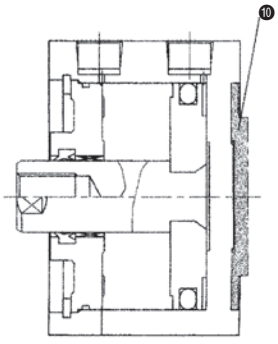
Standard Type



Rubber Cushion Attached

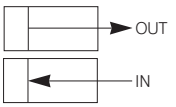


Rod end Male Thread Type



Rear Boss Mount

Theoretical Output Sheed (Unit : N)



Bore Size (mm)	Operation Direction	Applied Pressure(MPa)		
		0.3	0.5	0.7
12	IN	25	42	59
	OUT	34	57	79
16	IN	45	75	106
	OUT	60	101	141
20	IN	71	118	165
	OUT	94	157	220
25	IN	113	189	264
	OUT	147	245	344

1N≒0.102kgf
1MPa≒10.2kgf/cm^2

Component List

No.	Item Name	Material	Remark
❶	Cylinder Tube	Alumunum Alloy	Hard Alumite
❷	※ Piston	Alumunum Alloy	Chromite
❸	※ Piston Rod	Carbon Steel	Hard Chrome Plating
❹	Stop Ring	Carbon Tool Steel	Phosphate Coating
❺	Rod Cover	Alumunum Alloy	White Hard Alumite

No.	Item Name	Material	Remark
❻	Rod end Nut	Carbon Steel	Nickel Alloy
❼	Bumper A	Sintered Contained Alloy	
❽	Bumper B	Alloy Steel	Black Colored
❾	End Plate	Carbon Steel	Nickel Alloy
❿	Boss Mount Adapter	Aluminum Alloy	Hard Alumite

※ In case of Ø20 rubber cushion attachment, piston and piston rod (stainless steel) are equipped in one-body.

Packing List/Replacement Components/Air Pressure(no-fuel) Type

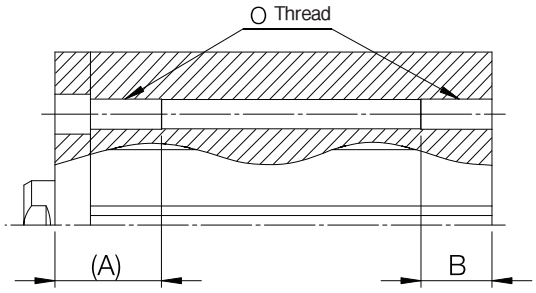
No.	Item Name	Material	Item No.			
			Ø12	Ø16	Ø20	Ø25
⓫	Piston Packing	NBR	TPSA-12	TPSA-16	TPSA-20	TPSA-25
⓬	Rod Packing	NBR	DYR-6	DYR-8	DYR-10SK-K	DYR-12
⓭	Gasket	NBR	C10	C14	C18	C22

Additional Reference ▶ In case of Both-end Tap

Unit :mm

Index	Bore Size	O	A	B
AQA	Ø12	M4×0.7	7	7
	Ø16	M4×0.7	7	7
	Ø20	M6×1.0	10(18)	10
	Ø25	M6×1.0	10(18)	10

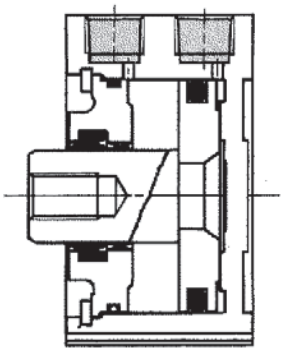
※ ( ) : Non-Rotation Type



Copper Free Type Cylinder

AQB Bore Size — Stroke D – XC16
Copper Free

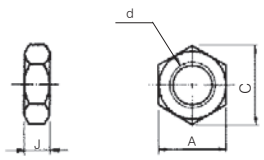
Structural Map



Specification

Acting Type	Double Action Single Rod
Bore Size	Ø12, Ø16, Ø20, Ø25
Proof Pressure	1.5MPa{15.3kgf/cm²}
Max Operating Pressure	1.0MPa{9.9kgf/cm²}
Running Piston Speed	50~500mm/s
Rubber Cushion	None
Piping Method	Insert Type
Attachment	Thru-Hole
Auto Switch	Available

Fittings Attached



Rod end Nut

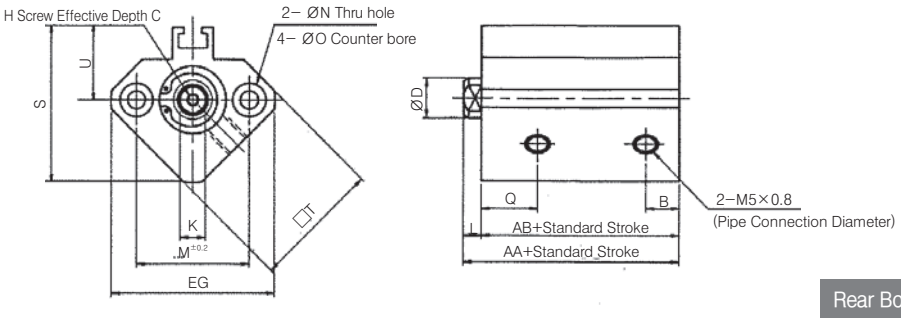
Material : Rolled Steel

Item No.	Applied Bore Size(mm)	d	J	A	C
M5×0.8-PL	12	M5×0.8	4	8	9.2
M6×1.0-PL	16	M6×1.0	5	10	11.5
TNT-02	20	M8×1.25	5	13	15.0
TNT-03	25	M10×1.25	6	17	19.6

Standard Type(Penetration Hole Type)/AQB

Bore Size
Ø12~ Ø25

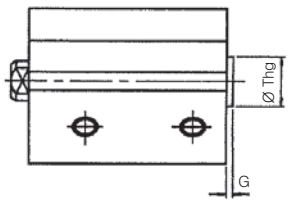
Refer to p.231 for both-end tap



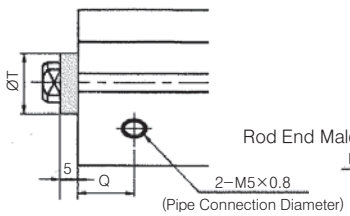
Rear Boss Mount (mm)

Bore Size (mm)	G	Thg
12	1.5	$15^{\ 0}_{-0.043}$
16	1.5	$20^{\ 0}_{-0.052}$
20	2	$13^{\ 0}_{-0.043}$
25	2	$15^{\ 0}_{-0.043}$

Rear Boss Mount

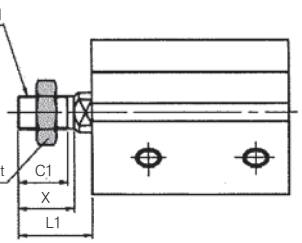


In Case of 75st



Bore Size (mm)	T
20	$15^{\ 0}_{-0.1}$
25	$16^{\ 0}_{-0.1}$

Rod End Male Thread



Rod end Male Thread (mm)

Bore Size (mm)	C1	X	H1	L1
12	9	10.5	M5×0.8	14
16	10	12	M6×1.0	15.5
20	12	14	M8×1.25	18.5
25	15	17.5	M10×1.25	22.5

※ 75 and 100 Stroke Range of Ø20 L1=28.5
※ 75 and 100 Stroke Range of Ø20 L1=32

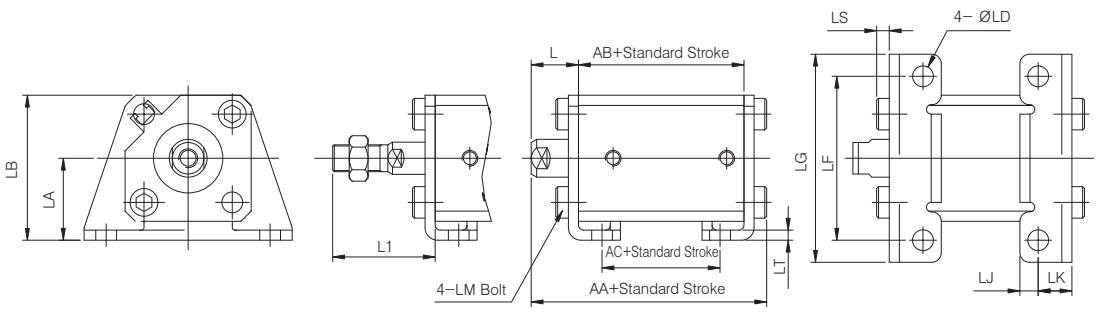
※ Please inquire separately for ordering over standard stroke since overall length is changed.

Standard Type (Unit : mm)

Bore Size (mm)	Stroke Range (mm)	AA	AB	C	D	EG	B	H	K	L	M	N	ØO	Q	□T	S	U
12	5~30	20.5	17	6	6	32	5	M3×0.5	5	3.5	22	3.5	6.5 Depth 3.5	7.5	25	35.5	19.5
16	5~30	22	18.5	8	8	38	5.5	M4×0.7	6	3.5	28	3.5	6.5 Depth 3.5	10	29	41.5	22.5
20	5~50	24	19.5	7	10	47	5.5	M5×0.8	8	4.5	36	5.5	9 Depth 7	10.5	36	48	24.5
	51~75, 76~100	55.5	41	12			10.5			14.5							
25	5~50	27.5	22.5	12	12	52	5.5	M6×1.0	10	5	40	5.5	9 Depth 7	11	40	53.5	27.5
	51~75, 76~100	58.5	44	15			11			14.5							

Note) The cylinder with rubber cushion has the same outer dimensions as standard type.

Foot Type/A(D)QL

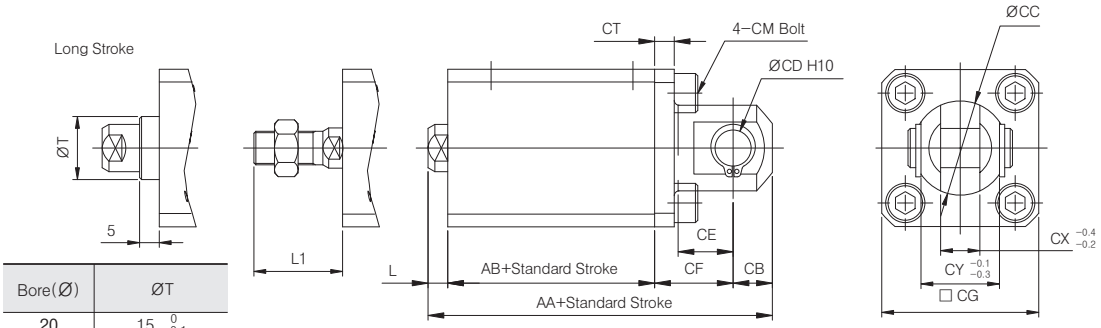


Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Standard Stroke Range	Standard Stroke						L	L1	LA	LB	LD	LF	LG	LJ	LM	LK	LS	LT
		No Auto Switch			Auto Switch Exists														
		AA	AB	AC	AA	AB	AC												
12	5~30	35.3	17	5	46.3	28	16	13.5	24	17	29.5	4.5	34	44	4.5	M4×0.7	8	2.8	2
16	5~30	36.8	18.5	6.5	48.8	30.5	18.5	13.5	25.5	19	33.5	4.5	38	48	5	M4×0.7	8	2.8	2
20	5~50	41.2	19.5	7.5	53.2	31.5	19.5	14.5	28.5	24	42	6.6	48	62	5.8	M6×1.0	9.2	4	3.2
	51~100	62.7	41	29	62.7	41	29	14.5	28.5										
25	5~50	44.7	22.5	7.5	54.7	32.5	17.5	15	32.5	26	46	6.6	52	66	5.8	M6×1.0	10.7	4	3.2
	51~100	65.7	44	29	65.7	44	29	14.5	32										

※ For mounting parts, A-type tube is basic.
※ Indication and dimension are same as dimension of standard cylinder.
※ Double clevis and cylinder are delivered without assembly.

Double Clevis Type/A(D)QD



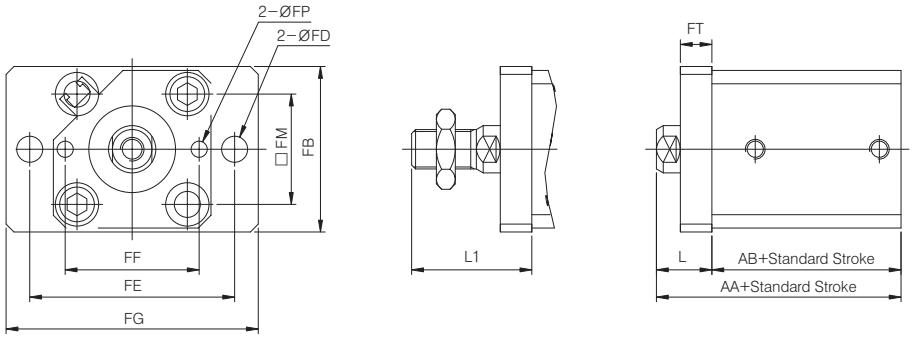
Bore(Ø)	ØT
20	15 0 -0.1
25	16 0 -0.1

Material : Ø12~Ø25-Carbon Steel (Unit : mm)

Bore Size (Ø)	Standard Stroke Range	Standard Stroke				L	L1	CB	CE	CF	CG	CM	CD	CT	CX	CY	CC (Ø)
		No Auto Switch		Auto Switch Exists													
		AA	AB	AA	AB												
12	5~30	40.5	17	51.5	28	3.5	14	6	7	14	25	M4×0.7	5 +0.05 0	4	5	10	12
16	5~30	43	18.5	55	30.5	3.5	15.5	6	10	15	29	M4×0.7	5 +0.05 0	4	6.5	12	14
20	5~50	51	19.5	63	31.5	4.5	18.5	9	12	18	36	M6×1.0	8 +0.06 0	5	8	16	20
	51~100	82.5	41	82.5	41	14.5	28.5										
25	5~50	57.5	22.5	67.5	32.5	5	22.5	10	14	20	40	M6×1.0	10 +0.06 0	5	10	20	24
	51~100	88.5	44	88.5	44	14.5	32										

※ For mounting parts, A-type tube is basic.
※ Indication and dimension are same as dimension of standard cylinder.
※ Double clevis and cylinder are delivered without assembly.

Rod Side Flange Type/A(D)QF

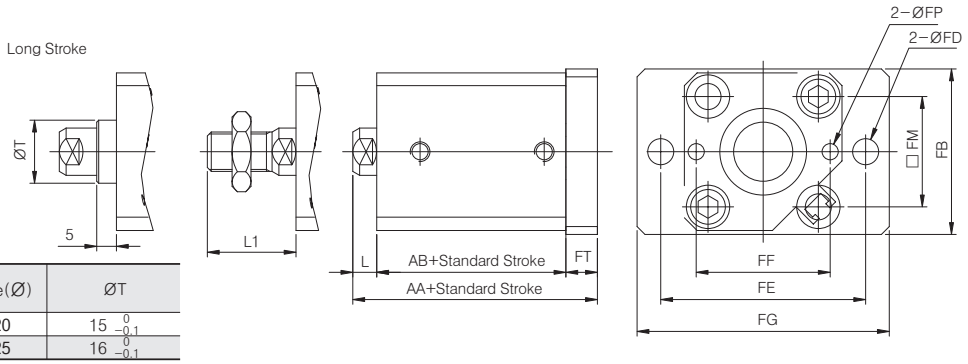


Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Standard Stroke Range	Standard Stroke				L	L1	FB	FD	FP	FE	FF	FG	FM	FT
		No Auto Switch		Auto Switch Exists											
		AA	AB	AA	AB										
12	5~30	30.5	17	41.5	28	13.5	24	25	4.5	3.1	45	23	55	15.5	5.5
16	5~30	32	18.5	44	30.5	13.5	25.5	30	4.5	3.1	45	24	55	20	5.5
20	5~50	34	19.5	46	31.5	14.5	28.5	39	6.6	3.1	48	28	60	25.5	8
	51~100	55.5	41	55.5	41										
25	5~50	37.5	22.5	47.5	32.5	15	32.5	42	6.6	4.1	52	34	64	28	8
	51~100	58.5	44	58.5	44	14.5	32								

※ For mounting parts, A-type tube is basic.
※ Indication and dimension are same as dimension of standard cylinder.
※ Double clevis and cylinder are delivered without assembly.

Head-Side Flange/A(D)QG



Bore(Ø)	ØT
20	$15\ ^{0}_{-0.1}$
25	$16\ ^{0}_{-0.1}$

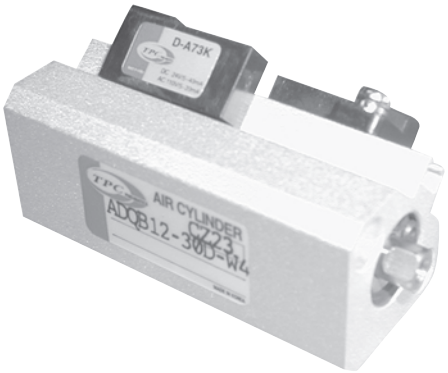
Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Standard Stroke Range	Standard Stroke				L	L1	FB	FD	FP	FE	FF	FG	FM	FT
		No Auto Switch		Auto Switch Exists											
		AA	AB	AA	AB										
12	5~30	26	17	37	28	3.5	14	25	4.5	3.1	45	23	55	15.5	5.5
16	5~30	27.5	18.5	39.5	30.5	3.5	15.5	30	4.5	3.1	45	24	55	20	5.5
20	5~50	32	19.5	44	31.5	4.5	18.5	39	6.6	3.1	48	28	60	25.5	8
	51~100	63.5	41	63.5	41	14.5	28.5								
25	5~50	35.5	22.5	45.5	32.5	5	22.5	42	6.6	4.1	52	34	64	28	8
	51~100	66.5	44	66.5	44	14.5	32								

※ For mounting parts, A-type tube is basic.
※ Indication and dimension are same as dimension of standard cylinder.
※ Double clevis and cylinder are delivered without assembly.

Series **ADQ** *Auto Switch Attachment*

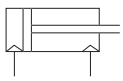
Standard Type/Double Acting : Single Rod



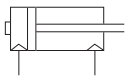
- AUTO SWITCH ATTACHED COMPACT CYLINDER
- SPACE SAVING CYLINDER
- COMPACT EQUIPMENT DESIGN AVAILABLE

Symbol

Double Action : Single Rod



Rear Boss Mount



Standard Specification

Type	Air Pressure(Non lube) Type
Applien Fluid	Air
Vicinity and Applied Fluid Temperature	5℃~60℃

Minimum Stroke for Auto Switch Attachment

Number of Auto Switch Attachment	Minimum Stroke
Attaching 1EA	5mm
Attaching 2EA	10mm

Order Form

Please refer to order form of standard type
for ordering auto switch attachment.

Auto Switch Type Applied

Auto Switch Type	Lead Track Extracting Method	Indicator and function existed (indicating 1 color)
W4 Type	Grommet	

Auto Switch Specification/Rail Attaching Type

Reed Auto Switch

Auto Switch Commponent Number	Voltage Loaded	Maximum Loading Current & Loading Current Range (mA)	Indicating Lamp (Turning ON)	Contact Point Protecting Circuit	Applied Purpose
W4	DC24V	5~40	○	None	Relay Sequence Controller
	AC100V	5~20			

• Length of Lead Track -0.5m(Standard), 3m

Notices for products

Please fully understand the notices prior to utilization, and refer to safety notice and common notice.

Warning

Assembly/Disassembly of Snap Ring

- Please use proper flyer (Attached tool of C-type snap ring) for assembly / disassembly.
- Please be cautious all the time that there is possible damage to human body or near-by equipments owing to projection of snap ring at the end of flyer (C-type snap ring) in spite of using proper flyer (Attached tool of C-type snap ring). Moreover, after checking full connection of snap ring during attachment, supply air.

Weight Sheet

(Unit : g)

Bore Size (mm)	Cylinder Stroke(mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
12	50	57	64	71	78	85	–	–	–	–	–	–
16	71	82	94	105	116	127	–	–	–	–	–	–
20	104	123	143	163	184	204	224	245	265	286	–	–
25	129	150	179	192	214	235	256	278	298	320	–	–

Extra Weight Sheet

(Unit : g)

Bore Size(mm)		12	16	20	25
Attachment Both end Tap Type		0.5	1	3	3.5
Rod end Male Thread	Male Thread Part	1.5	3	6	12
	Nut	1	2	4	8
Rear Boss Mount		0.7	1.3	2	3
Rubber Cushion Attached		1	2	5	4

Calculation Method

ex) ADQA20-20DCM

- Standard Weight : ADQB20-20D·····163g
- Extra Weight : Attachment both end tap type ·····3g
  Rod end male thread ·····10g
  Rubber cushion attached ·····5g

181g

Weight of Auto Switch

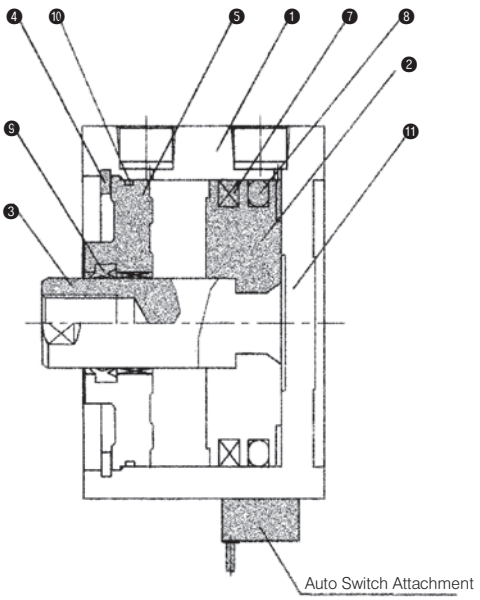
(Unit : g)

Type of Auto Switch	Auto Switch Type	Length of Lead Wire	
		0.5m	3m
Reed Auto Switch	W4	10	52

Weight of Mounting for Auto Switch

Item No.	Cylinder Internal Diameter Applied	Weight (g)
BQ-1	Ø12~ Ø25	1.5

Structure Map/Component List



Component List

No.	Name of Component	Material	Remark
❶	Cylinder	Aluminum Alloy	Hard Alumite
❷	Piston	Aluminum Alloy	Chromite
❸	Piston Rod	Stainless	Ø12~ Ø25
❹	Stop Ring	Carbon Tool Steel	Phosphate Coating
❺	Rod Cover	Aluminum Alloy	White Hard Alumite
❻	Magnetic	–	
❼	End Plate	Aluminum Alloy	Hard Alumite

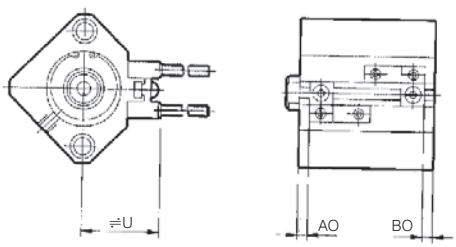
Packing List/Replacement Components/Air Pressure(Non lube) Type

No.	Item Name	Material	Item Number			
			Ø12	Ø16	Ø20	Ø25
❽	Piston Packing	NBR	PSD-12	PSD-16	PSD-20	PSD-25
❾	Rod Packing	NBR	DYR-6	DYR-8	DYR-10SK-K	DYR-12
❿	Gasket	NBR	C10	C14	C18	C22

Position of Auto Switch(Stroke End)

W4

Ø12~ Ø25



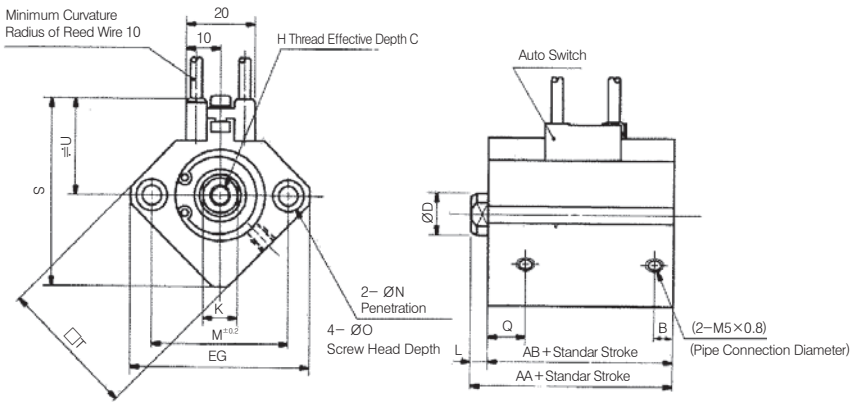
Position of Auto Switch

(Unit : mm)

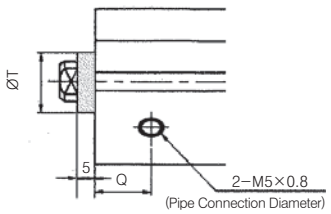
Bore Size (mm)	W4		
	AO	BO	U
12	5	6	19.5
16	8	5.5	22.5
20	8	7	24.5
25	8	7.5	27.5

Standard Type (Penetration Hole Type)/ADQB

Bore Size Ø12~Ø25

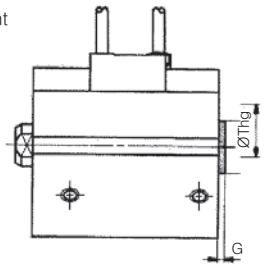


In Case of 75st



Bore Size (mm)	T
20	$15^{0}_{-0.1}$
25	$16^{0}_{-0.1}$

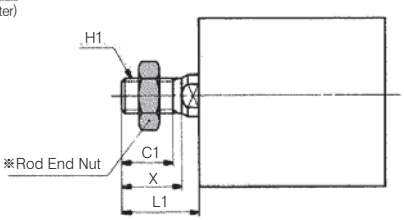
Rear Boss Mount



Rear Boss Mount (mm)

Bore Size (mm)	G	Thg
12	1.5	$15^{0}_{-0.043}$
16	1.5	$20^{0}_{-0.052}$
20	2	$13^{0}_{-0.043}$
25	2	$15^{0}_{-0.043}$

Rod End Male Thread



Rod End Male Thread Type (mm)

Bore Size (mm)	C1	X	H1	L1
12	9	10.5	M5×0.8	14
16	10	12	M6×1.0	15.5
20	12	14	M8×1.25	18.5
25	15	17.5	M10×1.25	22.5

※ 75 and 100 Stroke Range of Ø20 L_1=28.5
※ 75 and 100 Stroke Range of Ø20 L_1=32

※ A figure above is for the case of W4
※ Please inquire separately for ordering over standard stroke since overall length is changed.

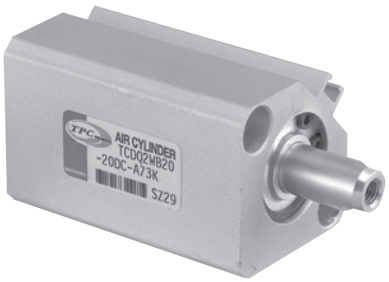
Bore Size (mm)	Stroke Range (mm)	AA	AB	C	D	EG	B	H	K	L	M	N	ØO	Q	S	U	□T
12	5~30	31.5	28	6	6	32	6.5	M3×0.5	5	3.5	22	3.5	6.5 Depth 3.5	11	35.5	19.5	25
16	5~30	34	30.5	8	8	38	5.5	M4×0.7	6	3.5	28	3.5	6.5 Depth 3.5	10	41.5	22.5	29
20	5~50	36	31.5	7	10	47	5.5	M5×0.8	8	4.5	36	5.5	9 Depth 7	10.5	48	24.5	36
	51~75, 76~100	55.5	41	12			10.5			14.5							
25	5~50	37.5	32.5	12	12	52	5.5	M6×1.0	10	5	40	5.5	9 Depth 7	11	53.5	27.5	40
	51~75, 76~100	58.5	44	15			11			14.5							

Note 1) Only 1EA auto switch is available for 5mm stroke.
Note 2) The cylinder with rubber cushion has the same outer dimensions as standard type.

Series AQW

Compact Cylinder : Standard Type/Double Action : Double Rod

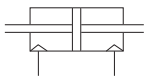
Bore Size(mm) : Ø20, Ø25



- DOUBLE ROD COMPACT CYLINDER
- SPACE SAVING CYLINDER
- COMPACT EQUIPMENT DESIGN AVAILABLE

Symbol

Double Action : Double Rod



How to Order

□ A D QW B 20 — 30 D C — ○ — W4 S

1 2 3 4 5 6 7 8 9 10

1 Series
Blank : Rc(PT)
U : NPT

2 Auto Switch Attachment
Blank : Standard type
D : Auto switch attached
(Buit in magnet)

3 Attachment
B : Thru hole(standard type)
A : Both end tap(refor to p.231)
F : Front flange
(Both end tap : standard)
L : Foot(Both end tap : standard)
※ Mountings are delivered without assembly

4 Bore Size
20 : 20mm(3/4 Nom.)
25 : 25mm(1 Nom.)

5 Cylinder Standard Stroke(mm)
Ø20, 25 : 5,10,15,20,25,30,35,40,45,50

6 Operation Method
D : Double action type

7 Body Specification
Blank : Standard type
(rod end female-thread)
C : Rubber cushion attached
M : Road end male-thread
I : Single knuckle joint
(rod end male-thread)
Y : Double knuckle joint
(rod end male-thread)
※ Possible to combine body specification
(CM, CF, CI, CFI, CFY, etc)
※ I and Y are delivered without assembly

8 Series
Blank : Standard type
XC16 : Copper Free Type
※ Ø20~25 : XC16 Type is standard

9 Types of Auto Switch
Blank : None
W4 : W4(Reed Switch)
※ In case of 3m lead wire, L should be added at the end of item number
ex)W4L
※ In case of 5m lead wire, please contact us

10 Auto Switch Additional Symbol
Blank : 2 pcs
S : 1 pc
N : N pcs

Item Number of Mountings

Bore Size (mm)	Foot	Flange	2-spin Clavis
20	QL-020	QF-020	QD-020
25	QL-025	QF-025	QD-025

※ In case of ordering foot mounting, please order 2EA foot mounting per 1EA Cylinder.

Mounting of Auto Switch/Component Number

Bore Size (mm)	Item Number	Remark	Switch Applied
20 · 25	BQ-1	• Switch Attaching Thread (M3×0.5×8ℓ) • Square Nut	W4

Notice

※Production of middle stroke
Minimum 3mm to 1mm middle stroke production is available by means of mounting spacer at standard stroke cylinder.
ex) AQWB12-27D inserts 3mm wide spacer in standard cylinder AQWB12-30D
ex) AQWB12-29D inserts 21mm wide spacer in standard cylinder AQWB12-50D

Notices for products

Please fully understand the notices prior to utilization, and refer to safety notice and common notice.

Warning

Assembly/Disassembly of Snap Ring

- Please use proper flyer (Attached tool of C-type snap ring) for assembly / disassembly.
- Please be cautious all the time that there is possible damage to human body or near-by equipments owing to projection of snap ring at the end of flyer (C-type snap ring) in spite of using proper flyer (Attached tool of C-type snap ring). Moreover, after checking full connection of snap ring during attachment, supply air.

Attachment

- Romove loading with fixing 2-face breadth part of loading-side piston rod.
- If loading-side piston rod is not firmly fixed, be cautious that connecting part (screw connecting part) of piston rod is possibly released.

Type

Bore Size(mm)			20 · 25
Air Pressure Type	Attachment	Thru Hole (Standard)	○
		Both end Tap	○
	Built in Magnet		○
	Piping Method	Thread Insert Type	M5× 0.8
	Rod end Male-Thread		○
	Rubber Cushion Attached		○

Standard Specification

Type	Air Pressure(Non lube) Type
Applied Fluid	Air
Proof Pressure	1.5MPa{15.3kgf/cm^2}
Max Operating Pressure	1.0MPa{9.9kgf/cm^2}
Vicinity and Applied Fluid Temperature	−10℃~+70℃(No Frozen)
Rod end Thread Allowance	KS Level 2
Stroke Length Allowable	$^{+1.0}_{0}$
Running Piston Speed	50~500mm/s
Rubber Cushion	None
Rod end Thread	Female Thread
Attachment	Thru Hole

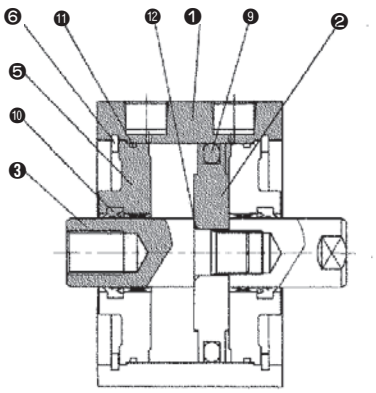
Minimum Operation Pressure

(Unit : MPa)

Bore Size(mm)	20	25
Air Pressure (Non lube) Type	0.05	0.05

Structure Map/Component List

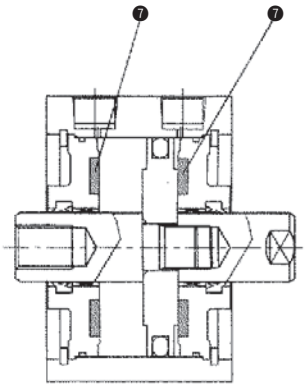
Standard Type



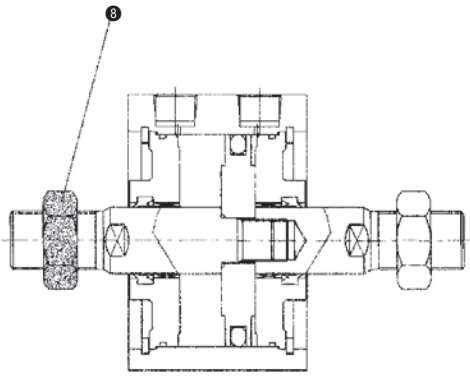
Component List

No.	Name of Component	Material	Remark
❶	Cylinder Tube	Aluminum Alloy	Hard Alumite
❷	Piston	Aluminum Alloy	Chromite
❸	Piston Rod A	Carbon Steel	Hard Chrome Plating
❹	Piston Rod B	Carbon Steel	Hard Chrome Plating
❺	Rod Cover	Aluminum Alloy	White Hard Alumite
❻	Stop Ring	Carbon Steel	Phosphate Coating
❼	Bumper	Polyurethane	
❽	Rod end Nut	Carbon Steel	Nickel Alloy

Rubber Cushion Attached



Rod end Male Thread



Seal Kits/Replacement Components/Air Pressure (non-lube) Type

No.	Component Name	Material	Component Number			
			Ø12	Ø16	Ø20	Ø25
❾	Piston Packing	NBR	PSD-12	PSD-16	PSD-20	PSD-25
❿	Rod Packing	NBR	DYR-6	DYR-8	DYR-10SK-K	DYR-12
⓫	Gasket	NBR	C10	C14	C18	C22
⓬	Piston Gasket		–	–	–	–

Theoretical Output Sheet (Unit : N)

Bore Size (mm)	Applied Pressure(MPa)		
	0.3	0.5	0.7
20	71	118	165
25	113	189	264

1N≒0.102kgf
1MPa≒10.2kgf/cm²

Weight Sheet (Unit : g)

Bore Size (mm)	Cylinder Stroke(mm)									
	5	10	15	20	25	30	35	40	45	50
20	88	104	119	134	149	164	179	195	209	224
25	119	136	153	171	187	204	221	238	255	272

Extra Weight Sheet (Unit : g)

Bore Size(mm)		20	25
Attachment Both end Tap Type		6	7
Rod end	Male Thread Part	10	22
Male Thread	Nut	8	16
Rubber Cushion Attached		−1	−2

Calculation Method

ex) AQWA20-20DCM

- Standard Weight : AQWB20-20D ·····134g
- Extra Weight : Attachment both end tap type ·····6g
  Rod end male thread ·····18g
  Rubber cushion attached·····1g

157g

Copper Free Air Cylinder

AQWB (Bore Size) — (Stroke) D − XC16

Copper Free

※ Copper free is basic type for Ø20~Ø25

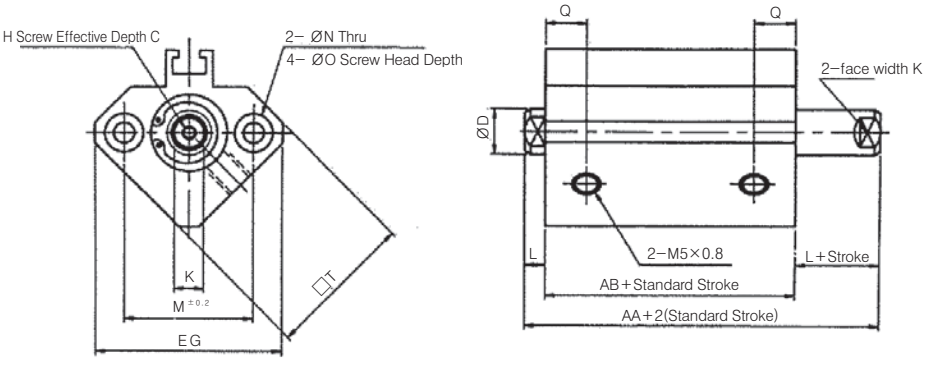
Specification

Acting Type	Double Action Single Rod
Bore Size	Ø20, Ø25
Proof Pressure	1.5MPa{15.3kgf/cm²}
Max Operating Pressure	1.0MPa{9.9kgf/cm²}
Running Piston Speed	50~500mm/s
Rubber Cushion	None
Piping Method	Insert Type
Attachment	Thru Hole
Auto Switch	Attachment Available

Standard Type (Thru Hole Type) AQWB

Bore Size Ø20, Ø25

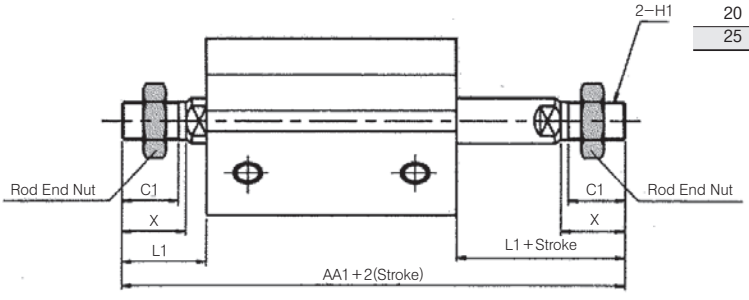
Refer to p. 231 for both-end tap



Rod end Male Thread Type (mm)

Bore Size (mm)	AA1	C1	H1	L1	X
20	63	12	M8×1.25	18.5	14
25	74	15	M10×1.25	22.5	17.5

Rod End Male Thread



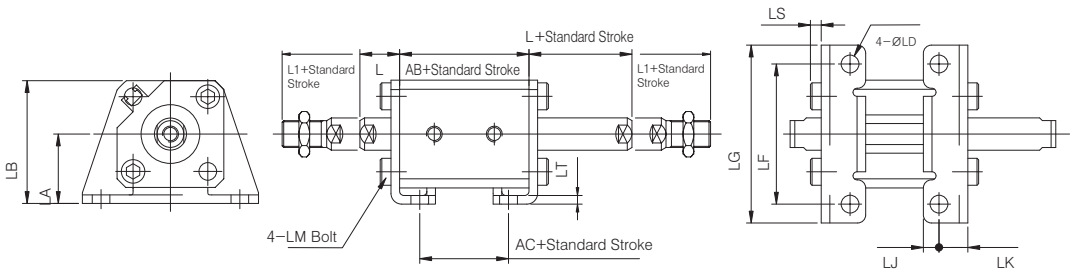
※ In case of longer stroke than standard, please contact us.

Standard Type (mm)

Bore Size (mm)	Stroke Range (mm)	AA	AB	C	D	EG	H	K	L	M	N	ØO	Q	□T
20	5~50	35	26	7	10	47	M5×0.8	8	4.5	36	5.5	9 Depth 7	9.5	36
25	5~50	39	29	12	12	52	M6×1.0	10	5	40	5.5	9 Depth 7	11	40

Note) The cylinder with rubber cushion has the same outer dimensions as standard type.

Foot Type/A(D)QWL

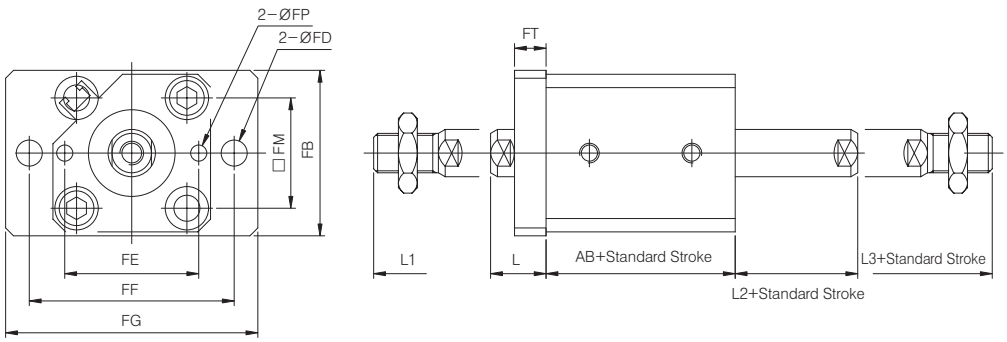


Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Standard Stroke Range	Standard Stroke				L	L1	LA	LB	LD	LF	LG	LJ	LM	LK	LS	LT
		No Auto Switch		Auto Switch Exists													
		AA	AB	AA	AB												
20	5~30	26	14	38	26	14.5	28.5	24	42	6.6	48	62	5.8	M6×1.0	9.2	4	3.2
25	5~30	29	14	39	24	15	32.5	26	46	6.6	52	66	5.8	M6×1.0	10.7	4	3.2

※ For mounting parts, A-type is basic.
※ Dimensions not indicated are same as standard cylinder dimensions.
※ Mounting parts are not assembled in delivery.

Flange Type/A(D)QWF



Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Standard Stroke Range	Standard Stroke		L	L1	L2	L3	FB	FD	FP	FE	FF	FG	FM	FT
		No Auto Switch	Auto Switch Exists												
		AA	AB												
20	5~30	26	38	14.5	28.5	4.5	18.5	39	6.6	3.1	28	48	60	25.5	8
25	5~30	29	39	15	32.5	5	22.5	42	6.6	4.1	34	52	64	28	8

※ For mounting parts, A-type is basic.
※ Dimensions not indicated are same as standard cylinder dimensions.
※ Mounting parts are not assembled in delivery.

Series ADQW Auto Switch Attachment

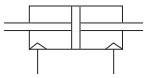
Standard Type/Double Acting : Double Rod

Bore Size(mm) : Ø20, Ø25

- AUTO SWITCH ATTACHED DOUBLE ROD COMPACT CYLINDER
- SPACE SAVING CYLINDER
- COMPACT EQUIPMENT DESIGN AVAILABLE

Symbol

Double Action : Double Rod



Standard Specification

Type	Air Pressure(non lube) Type
Applien Fluid	Air
Vicinity and Applied Fluid Temperature	−10℃~+60℃(No Frozen)

For detail, please refer to page. 229p

Order Form

Please refer to order form of standard type
for ordering auto switch attachment.

Minimum Stroke for Auto Switch Attachment

Number of Auto Switch Attachment	Minimum Stroke
Attaching 1EA	5mm
Attaching 2EA	10mm

Extra Weight Sheet (Unit : g)

Bore Size(mm)		20	25
Attachment Both end Tap Type		3	3.5
Rod end Male Screw	Male Thread Part	10	22
	Nut	8	16
Rubber Cushion Attached		−1	−2

Weight Sheet (Unit : g)

Bore Size (mm)	Cylinder Stroke(mm)									
	5	10	15	20	25	30	35	40	45	50
20	135	152	169	186	203	220	237	254	2,71	288
25	182	199	216	233	250	267	284	301	318	335

Calculation Method

ex) AQWA25−20DCM

- Standard Weight : ASQ2WB25−20D ·····233g
- Extra Weight : Attachment both end tap type ·····3.5g
  Rod end male thread ·····22g
  Rubber cushion attached ·····−2g

256.5g

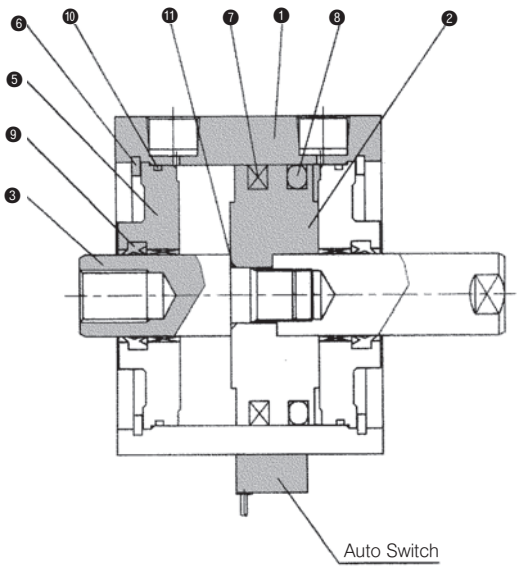
Weight of Auto Switch (g)

Type of Auto Switch	Auto Switch Type	Length of Lead Wire	
		0.5m	3m
Contact Point Existing Auto Switch	W4 Type	10	52

Mounting of Auto Switch

Item No.	Cylinder Internal Diameter Applied	Weight (g)
BQ−1	Ø20, Ø25	1.5

Structure Map/Component List



Component List

No.	Name of Component	Material	Remark
❶	Cylinder Tube	Aluminum Alloy	Hard Alumite
❷	Piston	Aluminum Alloy	Chromite
❸	Piston Rod	Carbon Steel	Hard Chrome Plating
❺	Collar	Aluminum Alloy	White Hard Alumite
❻	Stop Ring	Carbon Tool Steel	Phosphate Coating
❼	Magnet	NBR+Ba Ferrite	

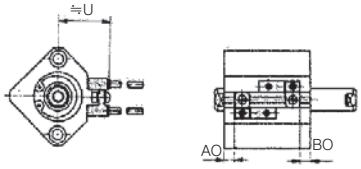
Seal Kits/Replacement Components/Air Pressure (Non-lube) Type

No.	Component Name	Material	Component Number			
			Ø12	Ø16	Ø20	Ø25
❽	Piston Packing	NBR	PSD-12	PSD-16	PSD-20	PSD-25
❾	Rod Packing	NBR	DYR-6	DYR-8	DYR-10SK-K	DYR-12
❿	Gasket	NBR	C10	C14	C18	C22
⓫	Piston Gasket	NBR	–	–	–	–

Position of Auto Switch (Stroke end)

W4

Ø20, Ø25



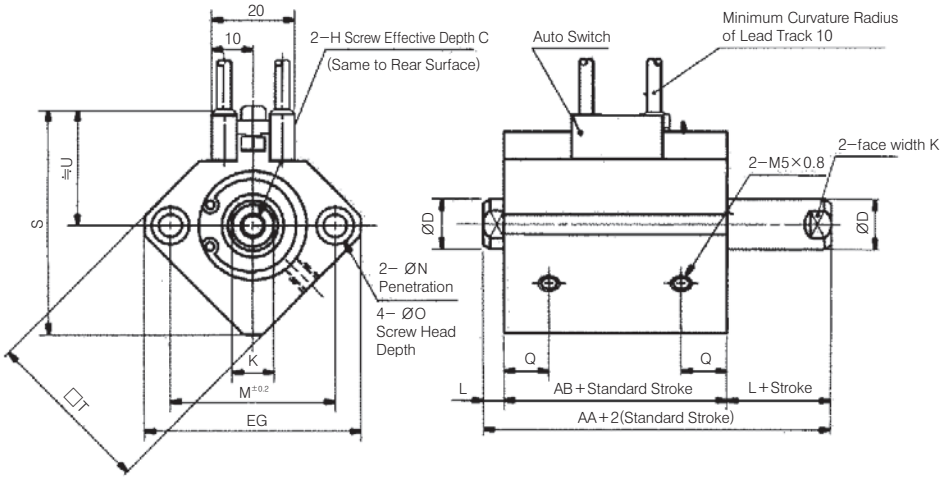
Position of Auto Switch (mm)

Bore Size (mm)	W4		
	AO	BO	U
20	8	13.5	24.5
25	8	13.5	27.5

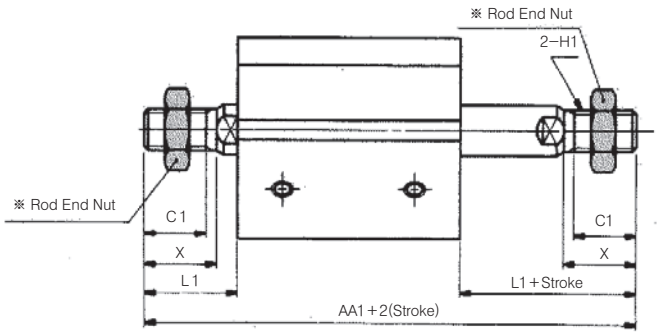
Standard Type (Thru Hole Type)/ADQWB

Bore Size Ø20, Ø25

Refer to p. 231 for both-end tap



Rod End Male Thread



※ The figure above is for auto switch W4

※ For longer stroke than standard, please contact us.

Rod end Male Thread Type (mm)

Bore Size (mm)	AA1	C1	H1	L1	X
20	75	12	M8×1.25	18.5	14
25	84	15	M10×1.25	22.5	17.5

Standard Type (mm)

Bore Size (mm)	Stroke Range (mm)	AA	AB	C	D	EG	H	K	L	M	N	ØO	Q	S	U	□T
20	5~50	47	38	7	10	47	M5×0.8	8	4.5	36	5.5	9 Depth 7	10.5	48	24.5	36
25	5~50	49	39	12	12	52	M6×1.0	10	5	40	5.5	9 Depth 7	11	53.5	27.5	40

Note 1) Only 1EA auto switch is availabe for 5mm stroke.

Note 2) The cylinder with rubber cushion has the same outer dimensions as standard type.

Series AQ

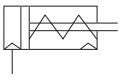
Standard Type/Single Acting : Single Rod

Bore Size(mm) : Ø20

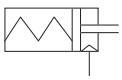
- SINGLE ACTING SINGLE ROD COMPACT CYLINDER
- SPACE SAVING CYLINDER
- COMPACT EQUIPMENT DESIGN AVAILABLE

Symbol

Single Acting Type/Spring Return Type



Single Acting Type/Spring Extended Type



How to Order

□ A D Q B 20 — 10 S M — ○ — W4 S

1 2 3 4 5 6 7 8 9 10

1 Series
Blank : Rc(PT)
U : NPT

2 Auto Switch Attachment
Blank : Standard type
D : Auto switch attached (Built in magnet)

3 Attachment
B : Thru hole(standard type)
A : Both end tap(refor to p.231)
D : Double clevis (standard both end type)
F : Front flange (standard both end type)
G : Rear flange (standard both end type)
L : Foot(standard both-end type)
※ Mountings are delivered without assembly

4 Bore Size
20 : 20mm(3/4 Nom.)

5 Cylinder Standard Stroke(mm)
Ø20 : 5, 10

6 Operation Method
S : Spring return type (Constant backward motion type)
T : Spring extended type (Constant backward motion type)

7 Body Specification
Blank : Standard type (rod end female thread)
M : Road end male thread
F : Rear boss mount
I : single knuckle joint (rod end male-thread)
Y : Double knuckle joint (rod end male-thread)
※ Possible to combine body specification (FM, FI, FY)
※ Except CF for Ø12 and Ø16 cases
※ I and Y are delivered without assembly

8 Series
Blank : Standard type
※ Ø12~Ø40 : XC16 Type is standard

9 Types of Auto Switch
Blank : None
W4 : W4(Reed Switch)
※ In case of 3m lead track, L should be added at the end of item number ex)W4L
※ In case of 5m lead track, please contact us

10 Auto Switch Additional Symbol
Blank : 2 pcs
S : 1 pc
N : N pcs

Mounting of Auto Switch/Component Number of Auto Switch

Bore Size (mm)	Item Number	Remark	Switch Applied
20	BQ-1	• Switch Attaching Thread (M3×0.5×8ℓ) • Square Nut	W4

Item Number of Mountings

Bore Size (mm)	Foot	Flange	2-spin Clavis
20	QL-020	QF-020	QD-020

※ In case of ordering foot mounting, please order 2EA per 1EA Cylinder.

Theoretical Output Sheet

Bore Size (mm)	Operation Method	Pressure Applied(MPa)			Spring Restore		Max. when rod-end allowable attaching load is horizontal
		0.3	0.5	0.7	Start	End	
20	Forward	78	141	204	16	6	6.6
	Backware Motion Type	217	378	539	24	15	

1N≒0.102kgf 1MPa≒10.2kgf/cm²

Notices for products

Please fully understand the notices prior to utilization, and refer to safety notice and common notice.

Warning

Assembly/Disassembly of Snap Ring

- Please use proper flyer (Attached tool of C-type snap ring) for assembly / disassembly.
- Please be cautious all the time that there is possible damage to human body or near-by equipments owing to projection of snap ring at the end of flyer (C-type snap ring) in spite of using proper flyer (Attached tool of C-type snap ring). Moreover, after checking full connection of snap ring during attachment, supply air.

Type

Bore Size(mm)			20	25
Air Pressure Type	Attachment	Thru Hole (Standard)	○	○
		Both end Tap	–	–
	Built in Magnet		○	○
	Piping Method	Thread Insert Type	M5×0.8	M5×0.8
	Rod end Male-Thread		○	○
	Rubber Cushion Attached		○	○

Standard Specification

Type	Air Pressure(no Fuel) Type
Applied Fluid	Air
Proof Pressure	1.5MPa{15.3kgf/cm²}
Max Operating Pressure	1.0MPa{9.9kgf/cm²}
Vicinity and Applied Fluid Temperature	−10℃~+70℃(No Frozen)
Rod end Thread Allowance	KS Level 2
Stroke Length Allowable	$^{+1.0}_{0}$
Running Piston Speed	50~500mm/s
Rubber Cushion	None
Rod end Thread	Female Thread
Attachment	Thru Hole

Extra Weight Sheet

(Unit:g)

Bore Size(mm)		20
Attachment Both end Tap Type		6
Rod end Male Thread	Male Screw Part	6
	Nut	4
Rear Boss Mount		2

Calculation Method

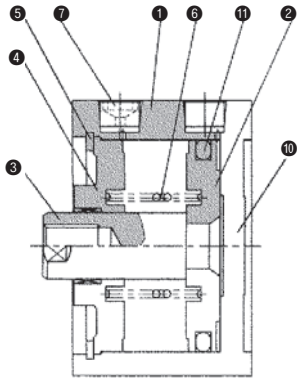
ex) AQA20-10SM

- Standard Weight : AQB20-10S ····· 112g
- Extra Weight : Attachment both end tap type ····· 6g
  Rod end male thread ····· 10g

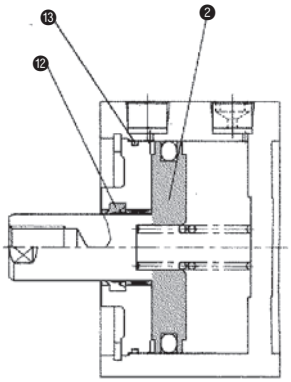
128g

Stucture Map/Componet List

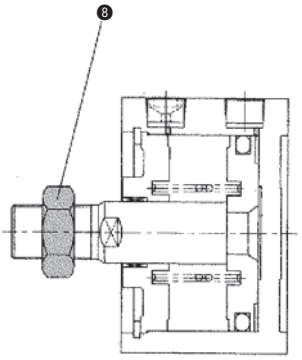
Spring Return Type



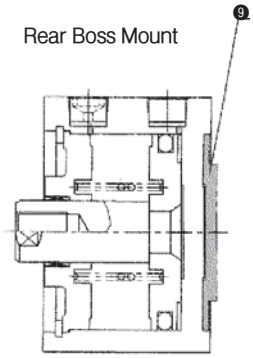
Spring Extended Type



Rod End Male Thread



Rear Boss Mount



Component List

No.	Component Name	Material	Remark
❶	Cylinder Tube	Aluminum Alloy	Hard Alumite
※ ❷	Piston	Aluminum Alloy	Chromite
❸	Piston Rod	Carbon Steel	Hard Chrome Plating
❹	Rod Cover	Aluminum Alloy	White Hard Alumite
❺	Stop Ring	Carbon Tool Steel	Phosphate Coating
❻	Restore Spring	Piano Wire	Galvanized Chromite
❼	Correction Throttle Attaching Plug	Alloy	Black Galvanized Chromite
❽	Rod end Nut	Carbon Steel	Nickel Plating
❾	Screw Ring	Aluminum Alloy	Ø20~ Ø25, Hard Alumite
❿	End Plate	–	–

Seal Kits/Replacement Components/Air Pressure (Non lube) Type

No.	Component Name	Material	Component Number
			Ø20
⓫	Piston Packing	NBR	PSD-20
⓬	Rod Packing	NBR	DYR-10SK-K
⓭	Gasket	NBR	C18

Copper Free Type Cylinder

AQWB (Bore Size) — (Stroke) $\frac{S}{T}$ – XC16

Copper Free Type

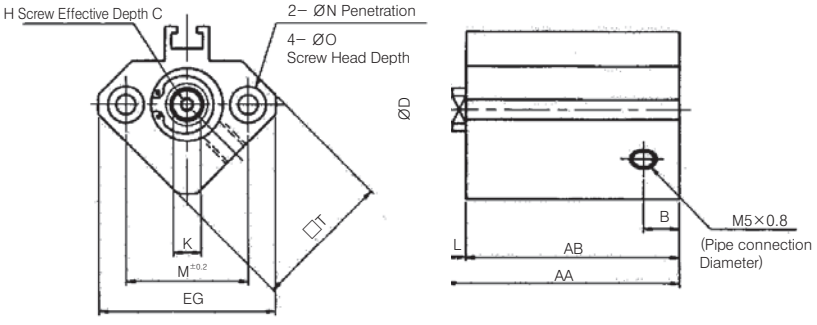
Specification

Acting Type	Double Action Single Rod
Bore	Ø20
Proof Pressure	1.5MPa{15.3kgf/cm^2}
Max Operating Pressure	1.0MPa{10.2kgf/cm^2}
Rubber Cushion	None
Piping Method	Screw Inserting Piping Type
Applied Piston Speed	50~500mm/s
Attachment	Penetration Hole
Auto Switch	Attachment Available

Standard Type (Thru Hole Type)/AQB

Bore Size Ø20
Spring Return Type

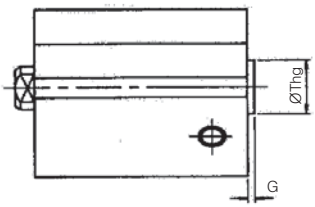
Refer to p. 231 for both-end tap



Rear Boss Mount Type (mm)

Bore Size (mm)	G	Thg
20	2	13 $^{0}_{-0.043}$

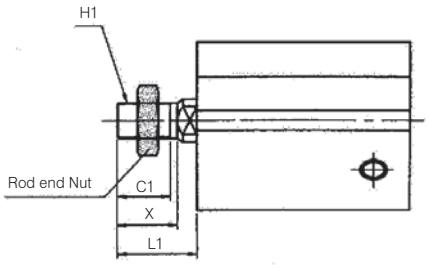
Rear Boss Mount



Rod end Male Thread Type (mm)

Bore Size (mm)	C1	X	H1	L1
20	12	14	M8×1.25	18.5

Rod End Male Thread



※ For longer stroke than standard, please contact us.

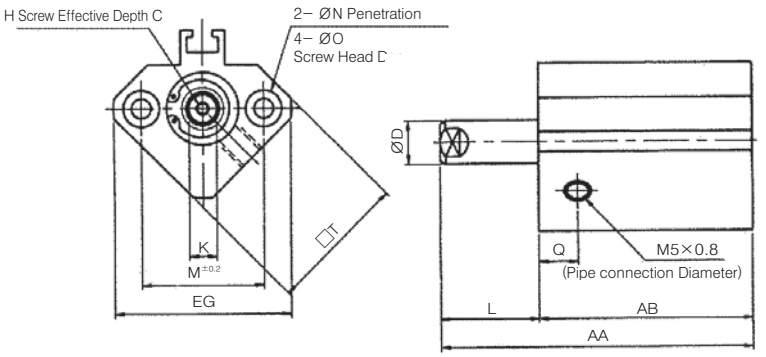
Standard Type (mm)

Bore Size (mm)	AA		AB		C	D	EG	B	H	K	L	M	N	ØO	□T
	5st	10st	5st	10st											
20	29	34	24.5	29.5	7	10	47	5.5	M5×0.8	8	4.5	36	5.5	9 Depth 7	36

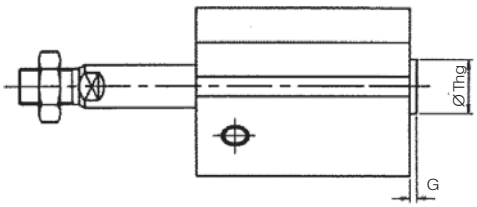
Standard Type (Thru Hole Type)/AQB

Bore Size Ø20
Spring Extended Type

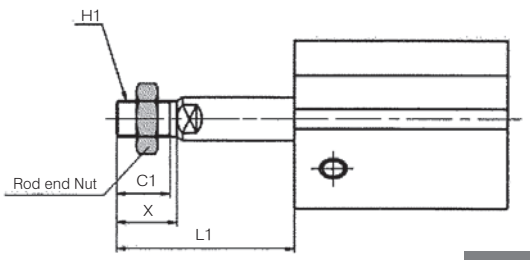
Refer to p. 231 for both-end tap



Rear boss Mounting



Rod End Male Thread



Rear boss Mounting Type (mm)

Bore Size (mm)	G	Thg
20	2	13 $^{0}_{-0.043}$

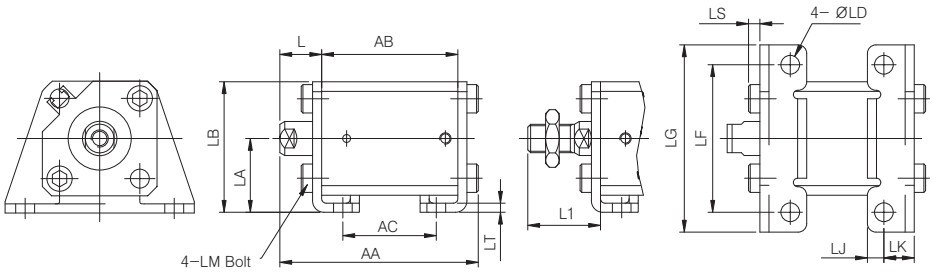
Rod end Male Thread Type (mm)

Bore Size (mm)	C1	X	H1	L1	
				5st	10st
20	12	14	M8×1.25	23.5	28.5

Standard Type (mm)

Bore Size (mm)	AA		AB		C	D	EG	H	K	L		M	N	ØO	Q	□T
	5st	10st	5st	10st						5st	10st					
20	34	44	24.5	29.5	7	10	47	M5×0.8	8	9.5	14.5	36	5.5	9 Depth 7	10.5	36

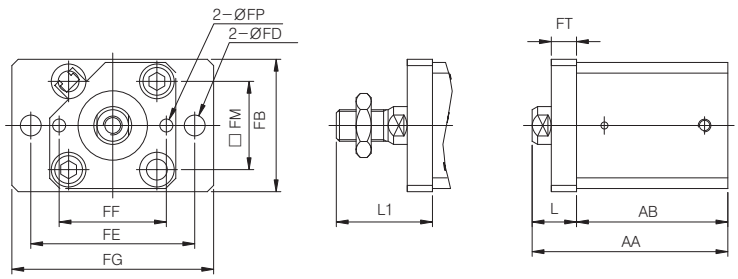
Foot Type/A(D)QL



Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Standard Stroke	No Auto Switch			With Auto Switch			L	L1	LA	LB	LD	LF	LG	LJ	LM	LK	LS	LT
		AA	AB	AC	AA	AB	AC												
20	5	46.2	24.5	12.5	58.2	36.5	24.5	14.5	28.5	24	42	6.6	48	62	5.8	M6×1.0	9.2	4	3.2
	10	51.2	29.5	17.5	63.2	41.5	29.5												

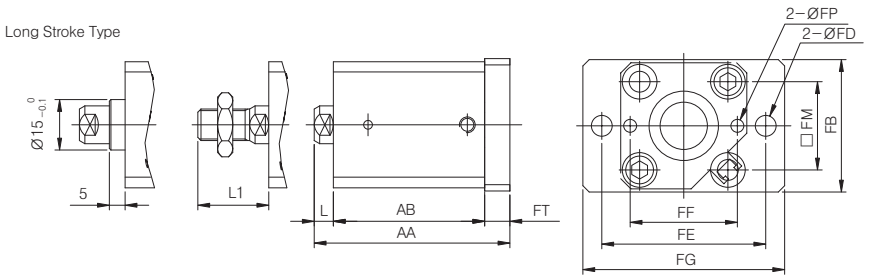
Flange Type/A(D)QF



Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Standard Stroke	No Auto Switch		With Auto Switch		L	L1	FB	FD	FP	FE	FF	FG	FM	FT
		AA	AB	AA	AB										
20	5	39	24.5	51	36.5	14.5	28.5	39	6.6	3.1	48	28	60	25.5	8
	10	44	29.5	56	41.5										

Head-side Flange Type/A(D)QG

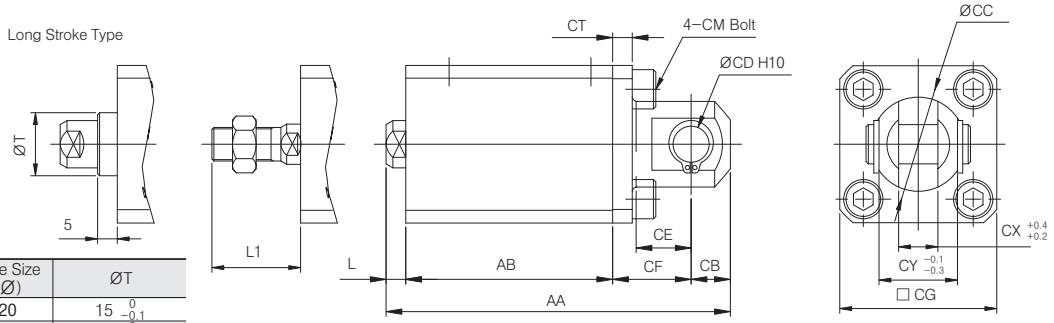


Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Standard Stroke	Without Auto Switch		With Auto Switch		L	L1	FB	FD	FP	FE	FF	FG	FM	FT
		AA	AB	AA	AB										
20	5	32.5	24.5	44.5	36.5	14.5	28.5	39	6.6	3.1	48	28	60	25.5	8
	10	37.5	29.5	49.5	41.5										

※ For mounting parts, A-type tube is basic.
※ Indication and dimension are same as dimension of standard cylinder.
※ Mounting are delivered without assembly.

Double Clevis Type/A(D)QD



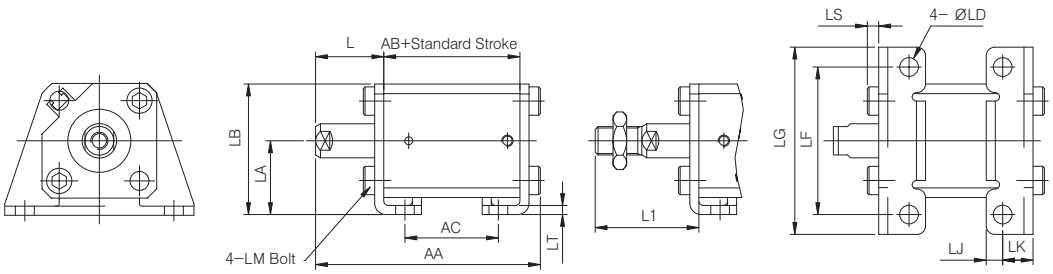
Bore Size (Ø)	ØT
20	15 0 -0.1
25	16 0 -0.1

Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Standard Stroke	Without Auto Switch		With Auto Switch		L	L1	FB	FD	FP	FE	FF	FG	FM	FT
		AA	AB	AA	AB										
20	5	39	24.5	51	36.5	14.5	28.5	39	6.6	3.1	48	28	60	25.5	8
	10	44	29.5	56	41.5										

※ For mounting parts, A-type tube is basic.
※ Indication and dimension are same as dimension of standard cylinder.
※ Mounting are delivered without assembly.

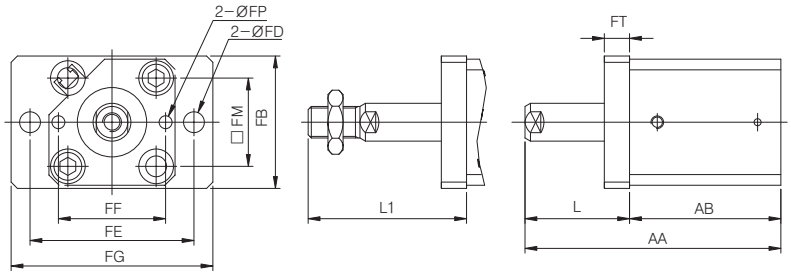
Foot Type/A(D)QL



Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Standard Stroke	Without Auto Switch			With Auto Switch			L	L1	LA	LB	LD	LF	LG	LJ	LM	LK	LS	LT
		AA	AB	AC	AA	AB	AC												
20	5	51.2	24.5	12.5	63.2	36.5	24.5	19.5	33.5	24	42	6.6	48	62	5.8	M6×1.0	9.2	4	3.2
	10	61.2	29.5	17.5	73.2	41.5	29.5	24.5	38.5										

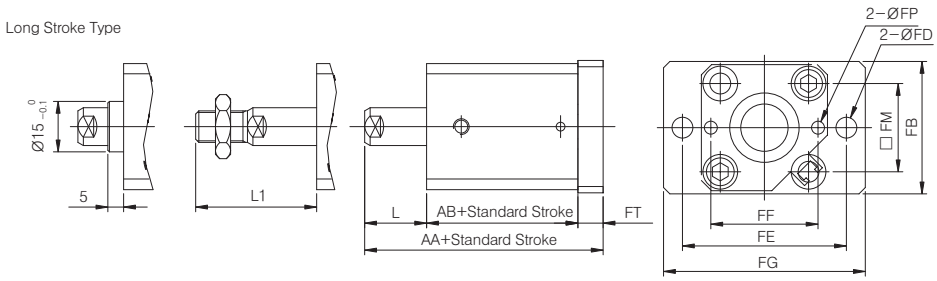
Front Flange Type/A(D)QF



Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Standard Stroke	Without Auto Switch		With Auto Switch		L	L1	FB	FD	FP	FE	FF	FG	FM	FT
		AA	AB	AA	AB										
20	5	44	24.5	56	36.5	19.5	33.5	39	6.6	3.1	48	28	60	25.5	8
	10	54	29.5	66	41.5	24.5	38.5								

Rear Flange Type/A(D)QG

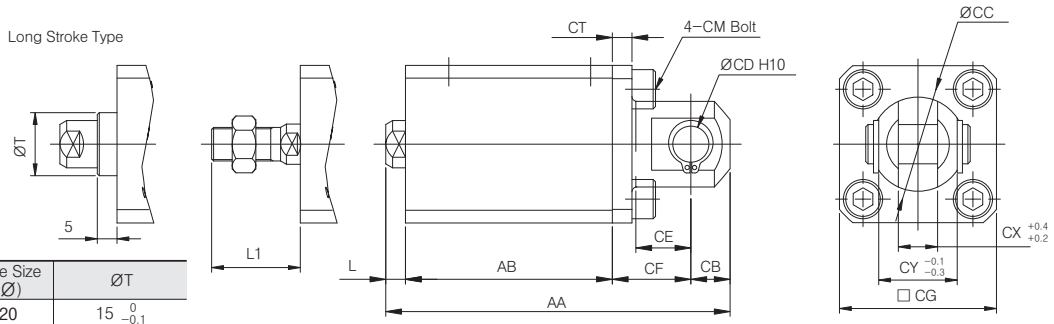


Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Standard Stroke	Without Auto Switch		With Auto Switch		L	L1	FB	FD	FP	FE	FF	FG	FM	FT
		AA	AB	AA	AB										
20	5	42	24.5	54	36.5	9.5	23.5	39	6.6	3.1	48	28	60	25.5	8
	10	52	29.5	64	41.5	14.5	28.5								

※ For mounting parts, A−type tube is basic.
※ Indication and dimension are same as dimension of standard cylinder.
※ Mounting are delivered without assembly.

Double Clevis Type/A(D)Q2D



Bore Size (Ø)	ØT
20	15 0 −0.1
25	16 0 −0.1

Material : Carbon Steel (Unit : mm)

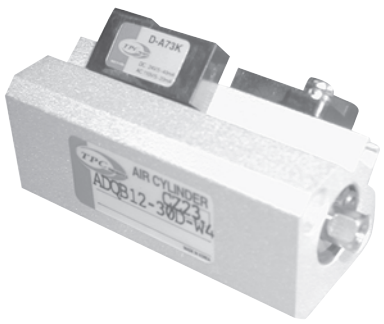
Bore Size (Ø)	Standard Stroke	Without Auto Switch		With Auto Switch		L	L1	CB	CE	CF	CG	CM	CD	CT	CX	CY	CC (Ø)
		AA	AB	AA	AB												
20	5~30	61	24.5	73	36.5	9.5	23.5	9	12	18	36	M6×1.0	8 +0.06 0	5	8	16	20
	5~30	71	29.5	83	41.5	14.5	28.5										

※ For mounting parts, A−type tube is basic.
※ Indication and dimension are same as dimension of standard cylinder.
※ Mounting are delivered without assembly.

Series **ADQ2** *Auto Switch Attachment*

Standard Type/Single Acting : Single Rod

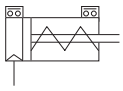
Bore Size(mm) : Ø20 (3/4Nom.)



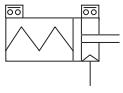
- SINGLE ACTING SINGLE-ROD AUTO SWITCH ATTACHED COMPACT CYLINDER
- SPACE SAVING CYLINDER
- COMPACT EQUIPMENT DESIGN AVAILABLE

Symbol

Single Acting/Spring Return



Single Acting/Spring Extended



Standard Specification

Type	Air Pressure(Non lube) Type
Applied Fluid	Air
Vicinity and Applied Fluid Temperature	−10℃~+60℃(No Frozen)

Minimum Stroke for Auto Switch Attachment

Number of Auto Switch Attachment	Minimum Stroke
Attaching 1EA	5mm
Attaching 2EA	10mm

Order Form

Please refer to order form of standard type
for ordering auto switch attachment.

Weight Sheet (Unit : g)

Workings	Bore Size (mm)	Cylinder Stroke (mm)			
		5	10	15	20
Spring Return	20	104	123	–	–
Spring Extended	20	109	127	–	–

Extra Weight Sheet (Unit : g)

Bore Size(mm)		20
Attachment Both end Tap Type		3
Rod end	Male Thread Part	6
Male Thread	Nut	4
Rubber Cushion Attached		2

Calculation Method

ex) AQA20-10SM

- Standard Weight : AQB20-10S·····123g
- Extra Weight : Attachment both end tap type ·····3g
  Rod end male thread ·····10g

136g

Weight of Auto Switch (Unit : g)

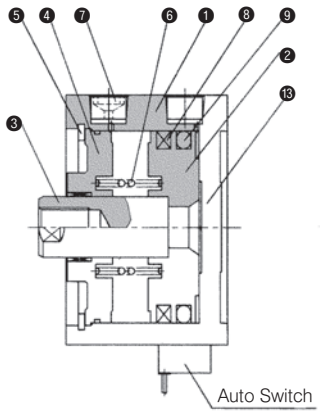
Type of Auto Switch	Auto Switch Type	Length of Lead Track	
		0.5m	3m
Reed Auto Switch	W4	10	52

Mounting of Auto Switch

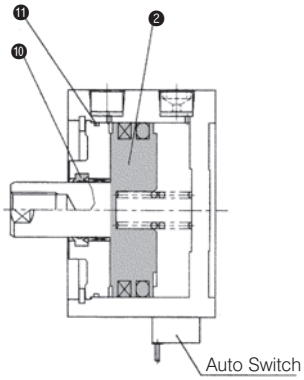
Item Number	Cylinder Internal Diameter Applied	Weight (g)
BQ-1	Ø20	1.5

Structure Map/Component List

Spring Return Type



Spring Extended Type



Component List

No.	Component Name	Material	Remark
❶	Cylinder Tube	Aluminum Alloy	Hard Alumite
❷	Piston	Aluminum Alloy	Chromite
❸	Piston Rod	Carbon Steel	Ø20
❹	Rod Cover	Aluminum Alloy	White Hard Alumite
❺	Stop Ring	Carbon Tool Steel	Phosphate Coating
❻	Restore Spring	Piano Wire	Galvanized Chromite

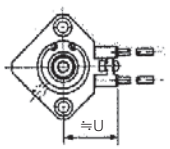
No.	Component Name	Material	Remark
❼	Correction Throttle Attaching Plug	Alloy	Black Galvanized Chromite
❽	Magnet	–	

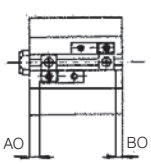
Seal Kit/Replacement Components/Air Pressure (non-lube) Type

No.	Component Name	Material	Component Number
			Ø20
❾	Piston Packing	NBR	PSD-20
❿	Rod Packing	NBR	DYR-10SK-K
⓫	Gasket	NBR	C18

Position of Auto Switch (Stroke end)

Ø20





Position of Auto Switch (Unit : mm)

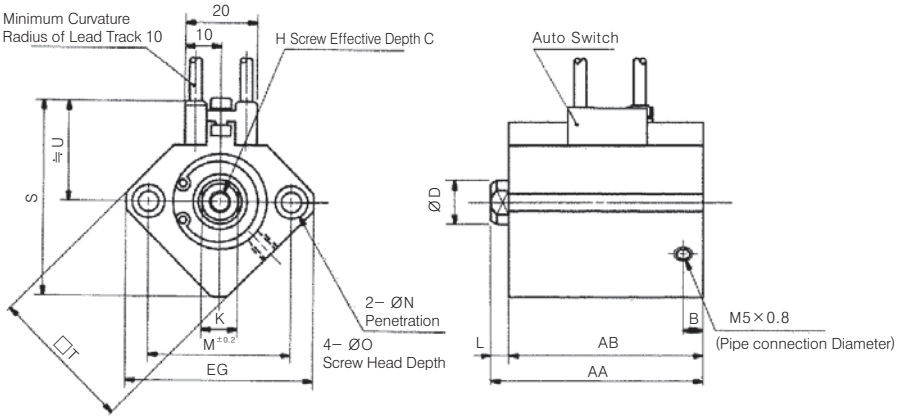
Bore Size (mm)	W4		
	AO	BO	U
20	8	7	24.5

※ Only Ø20 is available for spring extended type.

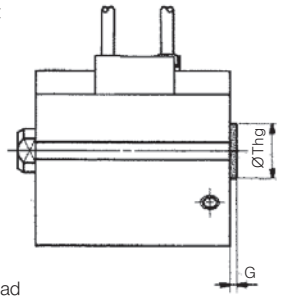
Standard Type (Thru Hole Type)/ADQB

Bore Size Ø20
Spring Return Type

Refer to p. 231 for both-end tap



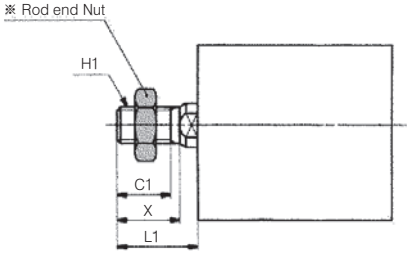
Rear Boss Mount



Rear Boss Mounting Type (mm)

Bore Size (mm)	G	Thg
20	2	$13\ ^{0}_{-0.043}$

Rod End Male Thread



Rod end Male Thread Type (mm)

Bore Size (mm)	C1	X	H1	L1
20	12	14	M8×1.25	18.5

※ The dimension above is for auto switch W4 type.
※ For longer stroke than standard, please contact us.

Standard Type

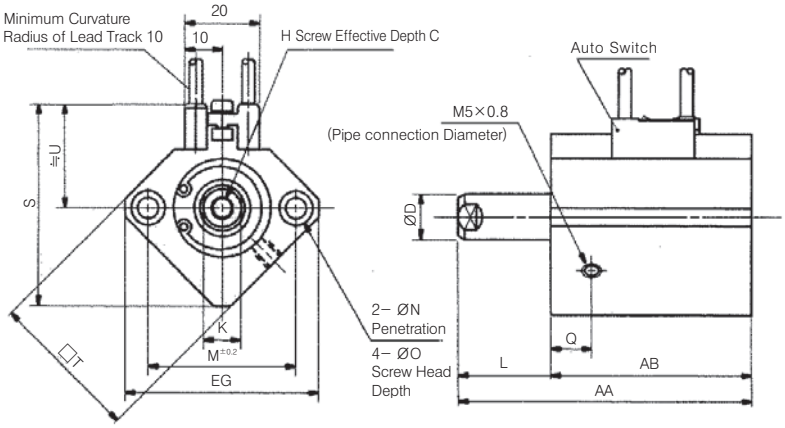
(mm)

Bore Size (mm)	AA		AB		C	D	EG	B	H	K	L	M	N	ØO	S	U	□T
	5st	10st	5st	10st													
20	41	46	36.5	41.5	7	10	47	5.5	M5×0.8	8	4.5	36	5.5	9 Depth 7	48	24.5	36

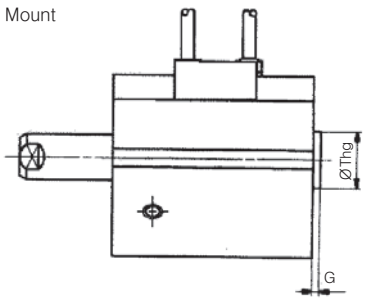
Standard Type (Thru Hole Type)/ADQ

Bore Size Ø20
Spring Extended Type

Refer to p. 231 for both-end tap



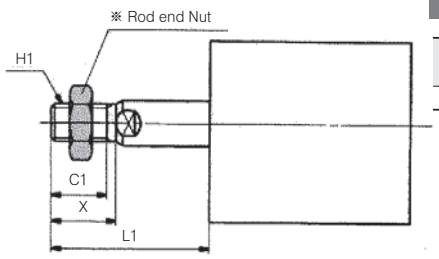
Rear boss Mount



Rear Boss Mounting Type (mm)

Bore Size (mm)	G	Thg
20	2	13 $^{0}_{-0.043}$

Rod End Male Thread



Rod end Male Thread Type (mm)

Bore Size (mm)	C1	X	H1	L1	
				5st	10st
20	12	14	M8×1.25	23.5	28.5

※ The dimension above is for auto switch W4 type.
※ For longer stroke than standard, please contact us.

Standard Type (mm)

Bore Size (mm)	AA		AB		C	D	EG	H	K	L		M	N	ØO	Q	S	U	□T
	5st	10st	5st	10st						5st	10st							
20	46	56	36.5	41.5	7	10	47	M5×0.8	8	9.5	14.5	36	5.5	9 Depth 7	10.5	48	24.5	36

Series AQK

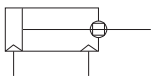
Non-Rod Rotation Type/Double Acting : Single Rod

Bore Size(mm) : Ø20, Ø25

- NON ROD ROTATION COMPACT CYLINDER
- SPACE SAVING CYLINDER
- COMPACT EQUIPMENT DESIGN AVAILABLE

Symbol

Non Rod Rotating Type



How to Order

□ A D QK B 20 — 30 D M — W4 S

1 2 3 4 5 6 7 8 9

1 Series
Blank : Rc(PT)
U : NPT

2 Auto Switch Attachment
Blank : Standard type
D : Auto switch attached (Built in magnet)

3 Attachment
B : Thru hole(standard type) Ø20
A : Both end tap

4 Bore Size
20 : 20mm(3/4 Nom.)
25 : 20mm(1 Nom.)

5 Cylinder Standard Stroke(mm)
Ø20, 25 : 5,10,15,20,25,30,35,40,45,50
• Tube internal diameter standard stroke
1mm middle stroke production in every 1mm is available by means of mounting spacer at standard stroke cylinder. (Possible minimum spacer : 3mm)
ex) AQKB25-37D inserts 3mm wide spacer in standard cylinder AQKB25-40D

6 Operation Method
D : Double action type

7 Body Specification
Blank : Standard type (rod end female-thread)
M : Road end female-thread
F : Rear boss mount
※ Possible to combine body specification (FM)

8 Types of Auto Switch
Blank : None
W4 : W4(Reed Switch)
※ In case of 3m lead track, L should be added at the end of item number
ex)W4L
(In case of 5m lead track, please contact us.)

9 Auto Switch Additional Symbol
Blank : 2 pcs
S : 1 pc
N : N pcs

Mounting of Auto Switch/Component for Auto Switch

Bore Size (mm)	Item Number	Remark	Switch Applied
20 · 25	BQ-1	• Switch Attaching Thread (M3×0.5×8ℓ) • Square Nut	W4

Notices for products

Please fully understand the notices prior to utilization, and refer to safety notice and common notice.

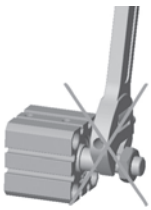
Warning

Assembly/Disassembly of Snap Ring

- Please use proper flyer (Attached tool of C-type snap ring) for assembly / disassembly.
- Please be cautious all the time that there is possible damage to human body or near-by equipments owing to projection of snap ring at the end of flyer (C-type snap ring) in spite of using proper flyer (Attached tool of C-type snap ring). Moreover, after checking full connection of snap ring during attachment, supply air.

Attachment

- Romove loading with fixing 2-face breadth part of loading-side piston rod.
- If loading-side piston rod is not firmly fixed, be cautious that connecting part (screw connecting part) of piston rod is possibly released.



- When using not rod rotating cylinder, be cautious not to apply rotation torque to piston rod, which makes non-rotation level bigger with deformation of rotation preventing guide.

Rotation Allowable Torque	20	25
kgf · cm or Less	2.0	2.5

• Use with loading on piston rod always in shaft direction.

Type

Bore Size(mm)			20	25
Air Pressure Type	Attachment	Thru Hole (Standard)	○	○
		Both end Tap	–	–
	Built in Magnet		○	○
	Piping Method	Thread Insert Type	M5×0.8	M5×0.8
	Rod end Male-Thread		○	○
	Rubber Cushion Attached		○	○

Note) In case of no auto switch, the thread for 5mm stroke is only M5×0.8

Standard Specification

Type	Air Pressure(no Fuel) Type
Applied Fluid	Air
Pressure Proof	1.5MPa{15.3kgf/cm²}
Max Operating Pressure	1.0MPa{9.9kgf/cm²}
Vicinity and Applied Fluid Temperature	−10℃~+70℃(No Frozen)
Rod end Thread Allowance	KS Level 2
Stroke Length Allowable	$^{+1.0}_{0}$
Running Piston Speed	50~500mm/s
Rubber Cushion	None
Rod end Thread	Female Thread
Attachment	Thru Hole

Minimum Operation Pressure

(Unit : MPa)

Bore Size(mm)	20	25
Air Pressure (non lube) Type	0.05	0.05

Rod Rotation Preventing Specification

Bore Size(mm)	20 · 25
Road Rotation Preventing Level	±1°

Theoretical Output Sheet

(Unit : N)

Bore Size (mm)	Operation Direction	Applied Pressure(MPa)		
		0.3	0.5	0.7
20	IN	71	118	165
	OUT	94	157	220
25	IN	113	189	264
	OUT	147	245	344

Weight Sheet

(Unit : g)

Bore Size (mm)	Cylinder Stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
20	104	117	132	145	159	173	188	202	215	229	–	–
25	137	152	167	182	197	212	227	242	257	272	–	–

Extra Weight Sheet

(Unit : g)

Bore Size (mm)		20	25
Attachment Both end Tap Type		–	–
Rod end Male Thread	Male Thread Part	6	12
	Nut	4	8
Rear Boss Mount		2	3

Calculation Method

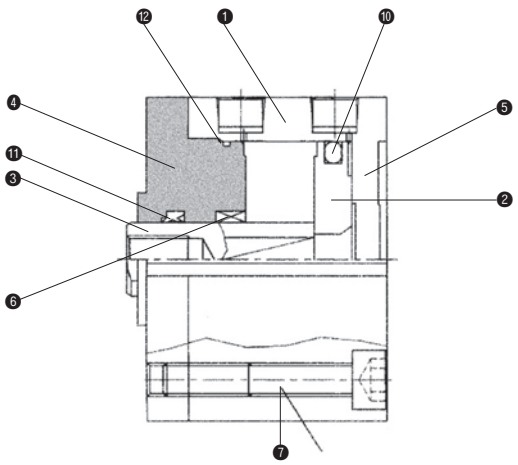
ex) AQKA20–20DM

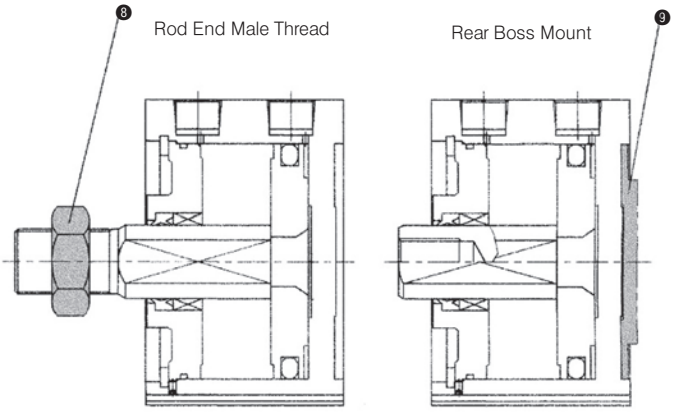
- Standard Weight : AQKB20–20D·····145g
- Extra Weight : Attachment both end tap type ·····0g
  Rod end male thread ·····10g

155g

Stucture Map/Components List

Standard Type (Bore Size Ø20, Ø25)





Component List

No.	Component Name	Material	Remark
❶	Cylinder Tube	Aluminum Alloy	Hard Alumite
❷	Piston	Aluminum Alloy	Chromite
❸	Piston Rod	Stainless Steel	Hard Chrome Plating
❹	Rod Cover	Aluminum Alloy	White Hard Alumite
❺	End Plate	Aluminum Alloy	White Hard Alumite
❻	Bush	Sintering Containing Alloy	
❼	Hexagonal Hole Attaching Bolt	Containing Alloy	Ø20, Ø25 Nickel Plating
❽	Rod end Nut	Carbon Steel	Nickel Plating

No.	Component Name	Material	Remark
❾	Nut Ring	Aluminum Alloy	Hard Alumite

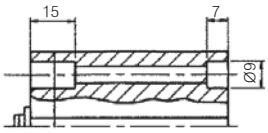
Seal Kits/Replacement Components/Air Pressure (non lube) Type

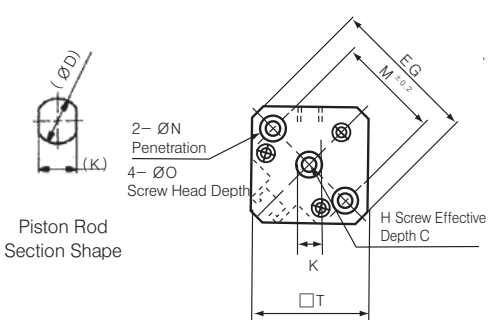
No.	Component Name	Material	Component Number	
			Ø20	Ø25
❿	Piston Packing	NBR	PSD-20	PSD-25
⓫	Rod Packing	NBR	SORA-10	SORA-12
⓬	Gasket	NBR	C18	C22

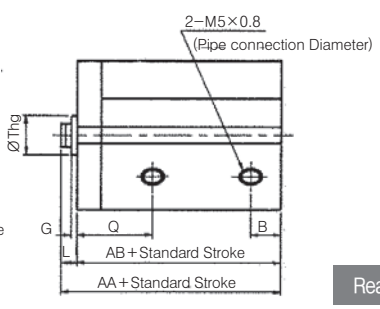
Standard Type (Thru Hole Type)/AQKB

Bore Size Ø20, Ø25

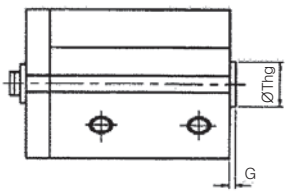
Both-end Tap Type







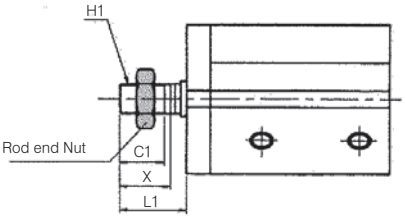
Rear Boss Mount



Rear Boss Mounting Type (mm)

Bore Size (mm)	G	Thg
20	2	$13\ ^{0}_{-0.043}$
25	2	$15\ ^{0}_{-0.043}$

Rod End Male Thread



Rod end Male Thread Type (mm)

Bore Size (mm)	C1	H1	L1	X
20	12	M8×1.25	18.5	14
25	15	M10×1.25	22.5	17.5

※ For longer stroke than standard, please contact us.

Standard Type (mm)

Bore Size (mm)	Stroke Range (mm)	AA	AB	C	D	EG	B	G	H	K	L	M	N	ØO	Q	□T
20	5~50	32	27.5	7	10	47	5.5	2	M5×0.8	8	4.5	36	5.5	9 Depth 7	17	36
25	5~50	35.5	30.5	12	12	52	5.5	2	M6×1.0	10	5	40	5.5	9 Depth 7	19	40

Series **ADQK** *Auto Switch Attachment*

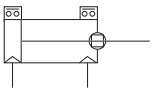
Non Rod Rotation Type/Double Acting : Single Rod

Bore Size(mm) : Ø20, Ø25

- NON ROD ROTATING PREVENTING COMPACT CYLINDER
- SPACE SAVING CYLINDER
- COMPACT EQUIPMENT DESIGN AVAILABLE

Symbol

Double Action : Single Rod



Standard Specification

Type	Air Pressure(no Fuel) Type
Applied Fluid	Air
Vicinity and Applied Fluid Temperature	−10℃~+60℃(No Frozen)

Minimum Stroke for Auto Switch Attachment

Number of Auto Switch Attachment	Minimum Stroke
Attaching 1EA	5mm
Attaching 2EA	10mm

Order Form

Please refer to order form of standard type
for ordering auto switch attachment.

Weight Sheet (Unit : g)

Bore Size (mm)	Cylinder Stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
20	138	152	166	180	194	208	222	236	250	264	–	–
25	178	194	210	226	242	258	274	290	306	322	–	–

Extra Weight Sheet (Unit : g)

Bore Size(mm)		20	25
Attachment Both end Tap Type		–	–
Rod end	Male Thread Part	6	12
Male Thread	Nut	4	8
Rubber Cushion Attached		2	3

Calculation Method

ex) ADQA20-10SM

- Standard Weight : ADQB20-10S ·····194g
- Extra Weight : Attachment both end tap type ·····0g
  Rod end male thread ·····10g

204g

Weight of Auto Switch (Unit : g)

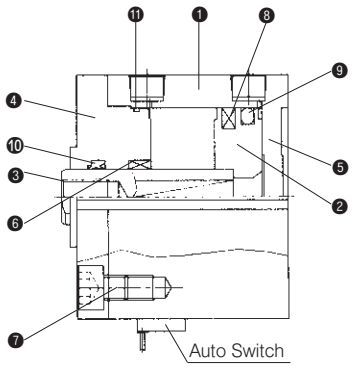
Type of Auto Switch	Auto Switch Type	Length of Lead Track	
		0.5m	3m
Reed Auto Switch	W4	10	52

Mounting of Auto Switch

Item Number	Cylinder Internal Diameter Applied	Weight (g)
BQ-1	Ø20, Ø25	1.5

Structure Map/Component List

Ø20, Ø25



Component List

No.	Component Name	Material	Remark
❶	Cylinder Tube	Aluminum Alloy	Hard Alumite
❷	Piston	Aluminum Alloy	Chromite
❸	Piston Rod	Stainless Steel	Hard Chrome Plating
❹	Rod Cover	Aluminum Alloy	White Hard Alumite
❺	End Plate		
❻	Bush	Sintering Containing Alloy	
❼	Hexagonal Hole Attaching Bolt	Alloy Steel	Ø20, Ø25 Black Zinc Chromite

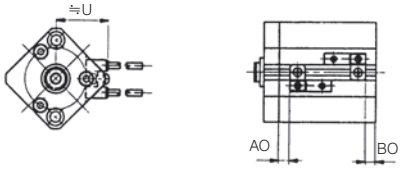
No.	Component Name	Material	Remark
❼	Magnet	–	

Seal Kits/Replacement Components/Air Pressure (non lube) Type

No.	Component Name	Material	Component Number	
			Ø20	Ø25
❾	Piston Packing	NBR	PSD–20	PSD–25
❿	Rod Packing	NBR	SORA–10	SORA–12
⓫	Gasket	NBR	C18	C22

Position of Auto Switch (Stroke end)

Ø20, Ø25

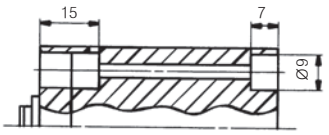


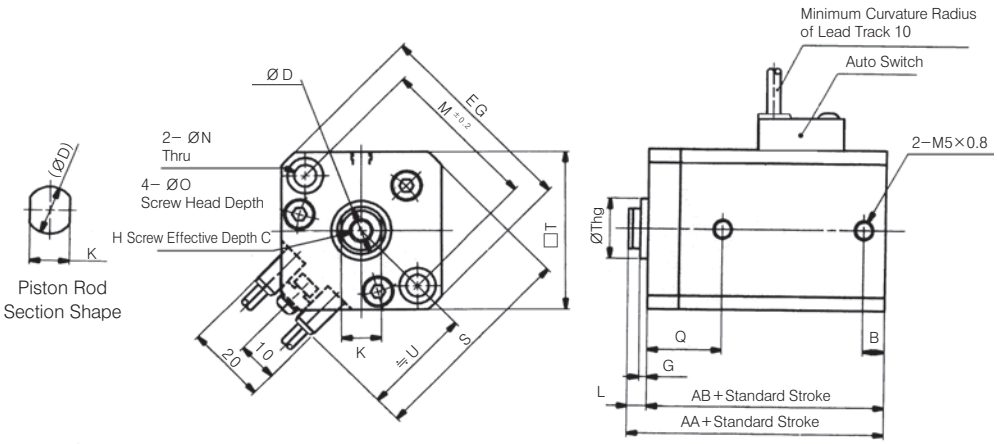
Position of Auto Switch (mm)

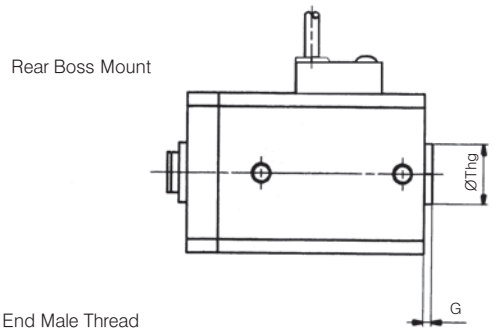
Bore Size (mm)	Position of Auto Switch		
	W4		
	AO	BO	U
20	8	7	24.5
25	8	7.5	27.5
32	9.5	6.5	31.5
40	13.5	9	35
50	11.5	12	41
63	14	15	47.5

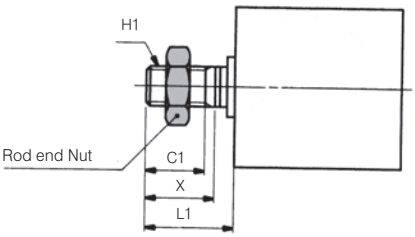
Standard Type (Thru Hole Type) ADQKB

Bore Size Ø20, Ø25









Rod end Male Thread Type (mm)

Bore Size (mm)	C1	H1	L1	X
20	12	M8×1.25	18.5	14
25	12	M10×1.25	22.5	17.5

※ The dimension above is for the case of W4 type.

※ For longer stroke than standard, please contact us.

Standard Type

(mm)

Bore Size (mm)	Stroke Range (mm)	AA	AB	C	D	EG	B	G	H	K	L	M	N	ØO	Q	S	Thg	U	□T
20	5~50	44	39.5	7	10	47	5.5	2	M5×0.8	8	4.5	36	5.5	9 Depth 7	18.5	48	13 $^{0}_{-0.043}$	24.5	36
25	5~50	45.5	40.5	12	12	52	5.5	2	M6×1.0	10	5	40	5.5	9 Depth 7	19	53.5	15 $^{0}_{-0.043}$	2.5	40

Series AQKW

Non Rod Rotating Type/Double Acting : Double Rod

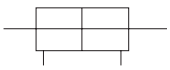
Bore Size(mm) : Ø20, Ø25

※ Refer to AQ2 Series for Ø32, Ø40, Ø50 and Ø63

- NON ROD ROTATING COMPACT CYLINDER
- SPACE SAVING CYLINDER
- COMPACT EQUIPMENT DESIGN AVAILABLE

Symbol

Non Rod Rotating Type



How to Order

□ A D QKW B 20 — 30 D M — W4 S

1 2 3 4 5 6 7 8 9

1 Series
Blank : Rc(PT)
U : NPT

2 Auto Switch Attachment
Blank : Standard type
D : Auto switch attached (Built in manet)

3 Attachment
B : Thru hole(standard type)
A : Both end tap

4 Bore Size
20 : 20mm(3/4 Nom.)
25 : 25mm(1 Nom.)

5 Cylinder Standard Stroke(mm)
Ø20, 25 : 5,10,15,20,25,30,35,40,45,50
• Tube internal diameter standard stroke
1mm middle stroke production in every 1mm is available by means of mounting spacer at standard stroke cylinder. (Possible minimum production spacer : 3mm)
ex) AQKWB20-47D inserts 3mm wide spacer in standard cylinder AQKWB20-50D

6 Operation Method
D : Double action type

7 Body Specification
Blank : Standard type (Rod end female-thread)
M : Rod end female-thread

8 Types of Auto Switch
Blank : None (Magnet equipped cylinder)
W4 : W4(Reed Switch)
※ In case of 3m lead wire, L should be added at the end of item number
ex)W4L
※ In case of 5m lead wire, please contact us.

9 Auto Switch Additional Symbol
Blank : 2 pcs
S : 1 pc
N : N pcs

Mounting for Auto Switch

Bore Size (mm)	Item Number	Remark	Switch Applied
			Reed Switch
20 · 25	BQ-1	• Switch Attaching Thread (M3×0.5×8ℓ) • Square Nut	W4

Type

Bore Size(mm)			20	25
Air Pressure Type	Attachment	Thru Hole (Standard)	○	○
		Both end Tap	–	–
	Built in Magnet		○	○
	Piping Method	Screw Insert Type	M5×0.8	M5×0.8
	Rod end Male-Thread		○	○

Note) In case of no auto switch, the thread for 5mm stroke is only M5×0.8

Standard Specification

Type	Air Pressure(Non lube) Type
Applied Fluid	Air
Pressure Proof	1.5MPa{15.3kgf/cm²}
Max Operating Pressure	1.0MPa{9.9kgf/cm²}
Vicinity and Applied Fluid Temperature	−10℃~+70℃(No Frozen)
Rod end Thread Allowance	KS Level 2
Stroke Length Allowable	$^{+1.0}_{0}$
Running Piston Speed	50~500mm/s
Rubber Cushion	None
Rod end Thread	Female Thread
Attachment	Thru Hole

Minimum Operation Pressure

(Unit : MPa)

Bore Size(mm)	20	25
Air Pressure (Non lube) Type	0.05	0.05

Rod Rotation Preventing Specification

Bore Size(mm)	20	25
Road Rotation Preventing Level	±1°	±0.8°

Notices for products

Please fully understand the notices prior to utilization, and refer to safety notice and common notice.

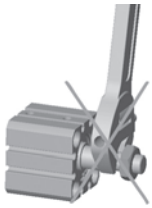
Warning

Assembly/Disassembly of Snap Ring

- Please use proper flyer (Attached tool of C-type snap ring) for assembly / disassembly.
- Please be cautious all the time that there is possible damage to human body or near-by equipments owing to projection of snap ring at the end of flyer (C-type snap ring) in spite of using proper flyer (Attached tool of C-type snap ring). Moreover, after checking full connection of snap ring during attachment, supply air.

Attachment

- Romove loading with fixing 2-face breadth part of loading-side piston rod.
- If loading-side piston rod is not firmly fixed, be cautious that connecting part (screw connecting part) of piston rod is possibly released.



- When using non rod rotating cylinder, be cautious not to apply rotation torque to piston rod, which makes non-rotation level bigger with deformation of rotation preventing guide.

Rotation Allowable Torque	20	25
kgf · cm or Less	2.0	2.5

- Use with loading on piston rod always in shaft direction.

Theoretical Output Sheet

(Unit : N)

Bore Size (mm)	Operation Direction	Applied Pressure(MPa)		
		0.3	0.5	0.7
20	IN	71	118	165
	OUT			
25	IN	113	189	264
	OUT			

Weight Sheet

(Unit : g)

Bore Size (mm)	Cylinder Stroke (mm)									
	5	10	15	20	25	30	35	40	45	50
20	102	116	132	146	162	176	–	–	–	–
25	138	155	172	189	206	223	240	257	274	291

Extra Weight Sheet

(Unit : g)

Bore Size (mm)		20	25
Attachment Both end Tap Type		–	–
Rod end Male Thread	Male Thread Part	10	22
	Nut	8	16

Calculation Method

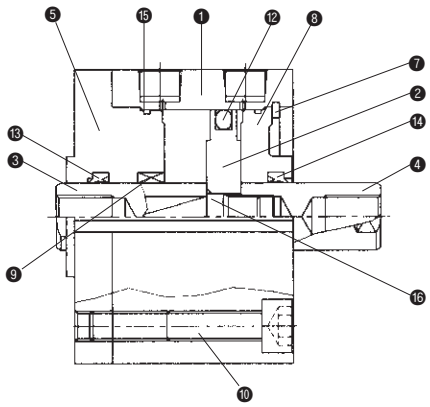
ex) AQKWA20-20DM

- Standard Weight : AQ2KWB20-20D ·····146g
- Extra Weight : Attachment both end tap type ·····0g
  Rod end male thread ·····18g

164g

Structure Map/Commponent List

Ø20, Ø25

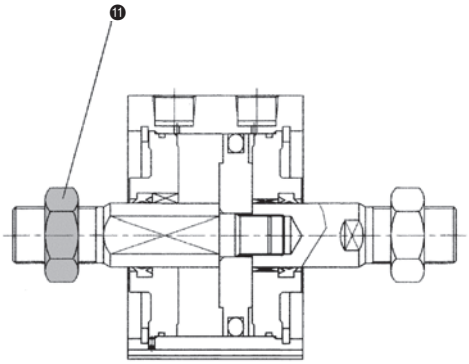


Component List

No.	Component Name	Material	Remark
❶	Cylinder Tube	Aluminum Alloy	Hard Alumite
❷	Piston	Aluminum Alloy	Chromite
❸	Piston Rod A	Stainless Steel	Hard Chrome Plating
❹	Piston Rod B	Carbon Steel	Hard Chrome Plating
❺	Rod Cover	Aluminum Alloy	Ø20, Ø25 Black Alumite
❻	Rotation Preventing Rod Cover	Aluminum Alloy	White Hard Alumite
❼	Stop Cover	Carbon Tool Steel	Phosphate Coating
❽	Rod Cover	Aluminum Alloy	White Hard Alumite
❾	Rotation Preventing Bush	Sintering Containing Alloy	Ø20~Ø25
❿	Hexagonal Hole Attaching Bolt	Alloy Steel	Ø20~Ø25, Nickel Plating

No.	Component Name	Material	Remark
⓫	Rod End Nut	Carbon Steel	Nickel Plating

Rod End Male Thread

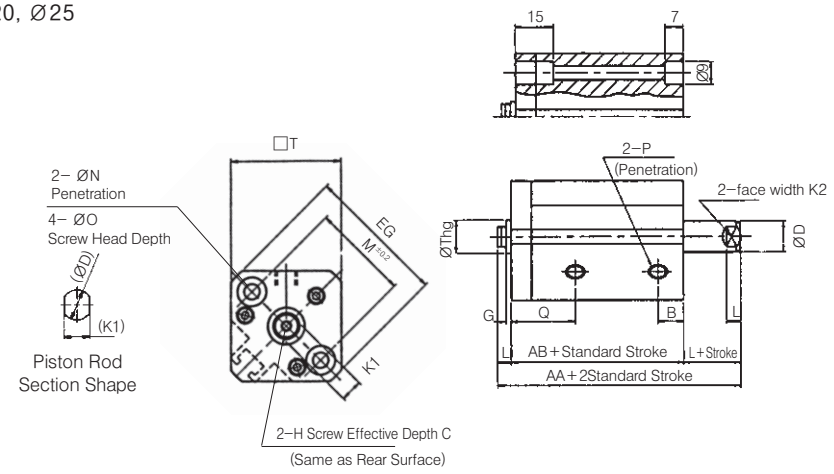


Seal Kit/Replacement Components/Air Pressure (Non lube) Type

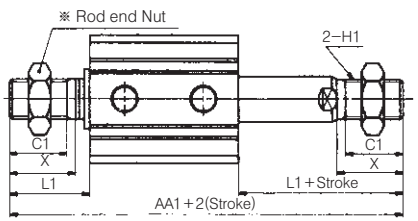
No.	Component Name	Material	Component Number	
			Ø20	Ø25
⓬	Piston Packing	NBR	PSD-20	PSD-25
⓭	Rotation Preventing Rod Packing	NBR	SORA-10	SORA-12
⓮	Rod Packing	NBR	DYR-10SK-K	DYR-12
⓯	Gasket	NBR	C18	C22
⓰	Piston gasket	NBR	–	–

Standard Type (Thru Hole Type) ADQKB

Bore Size Ø20, Ø25



Rod End Male Thread



Rod end Male Thread Type (mm)

Bore Size (mm)	AA1	C1	H1
20	71	12	M8×1.25
25	82	15	M10×1.25

Bore Size (mm)	L1	X
20	18.5	14
25	22.5	17.5

※ For longer stroke than standard, please contact us.

Standard Type (mm)

Bore Size (mm)	Sttoke Range (mm)	AA	AB	C	D	EG	B	G	H	I	J	K1	K2	L	M	N	P	Q	Thg	W	Z	□T
20	5~50	43	34	7	10	47	9.5	2	M5×0.8	–	–	8	8	4.5	36	5.5	M5×0.8	17.5	$13^{0}_{-0.043}$	–	–	36
25	5~50	47	37	12	12	52	11	2	M6×1.0	–	–	10	10	5	40	5.5	M5×0.8	19	$15^{0}_{-0.043}$	–	–	40

Series **ADQKW** *Auto Switch Attachment*

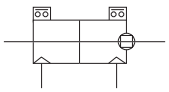
Non Rod Rotation Type/Double Acting : Double Rod

Bore Size(mm) : Ø20, Ø25

- AUTO SWITCH ATTACHED TO NON ROD ROTATION, DOUBLE ROD COMPACT CYLINDER
- SPACE SAVING CYLINDER
- COMPACT EQUIPMENT DESIGN AVAILABLE

Symbol

Non Rod Rotating Type



Standard Specification

Type	Air Pressure(Non lube) Type
Applied Fluid	Air
Vicinity and Applied Fluid Temperature	−10℃~+60℃(No Frozen)

Minimum Stroke for Auto Switch Attachment

Number of Auto Switch Attachment	Minimum Stroke
Attaching 1EA	5mm
Attaching 2EA	10mm

Extra Weight Sheet (Unit : g)

Bore Size(mm)		20	25
Attachment Both end Tap Type		–	–
Rod end	Male Thread Part	10	22
Male Thread	Nut	8	16

Calculation Method

ex) ADQKWA20-20DM

- Standard Weight : ADQKWB20-20D·····220g
- Extra Weight : Attachment both end tap type ·····0g
  Rod end male thread ·····18g

238g

Order Form

Please refer to order form of standard type
for ordering auto switch attachment.

Weight Sheet (Unit : g)

Bore Size (mm)	Cylinder Stroke (mm)									
	5	10	15	20	25	30	35	40	45	50
20	169	186	203	220	237	254	–	–	–	–
25	231	248	265	282	299	316	333	350	367	384

Weight of Auto Switch (Unit : g)

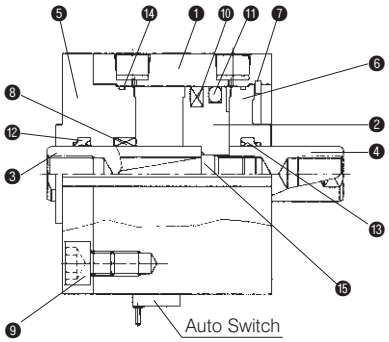
Type of Auto Switch	Auto Switch Type	Length of Lead Track	
		0.5m	3m
Reed Auto Switch	W4	10	52

Mounting for Auto Switch

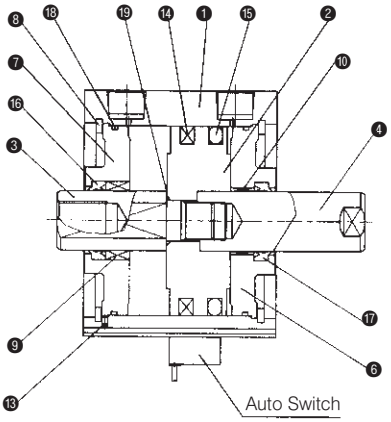
Item Number	Cylinder Internal Diameter Applied	Weight (g)
BQ-1	Ø20, Ø25	1.5

Structure Map/Component List

Ø20, Ø25



Ø32~Ø63



Component List

No.	Component Name	Material	Remark
❶	Cylinder Tube	Aluminum Alloy	Hard Alumite
❷	Piston	Aluminum Alloy	Chromite
❸	Piston Rod A	Stainless Steel	Hard Chrome Plating
❹	Piston Rod B	Stainless Steel	Ø20, Ø25
		Carbon Steel	Ø32~Ø63, Hard Chrome Plating
❺	Rod Cover	Aluminum Alloy	White Hard Alumite
❻	Rod Cover	Aluminum Alloy	White Hard Alumite
❼	Stop Ring	Carbon Tool Steel	Phosphate Coating
❽	Rotation Preventing Bush	Sintering Containing Alloy	Ø20~Ø63

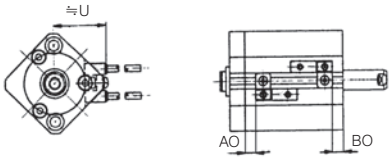
No.	Component Name	Material	Remark
❾	Hexagonal Hole Attaching Bolt	Alloy Steel	Black Zine Chromite
❿	Magnet	–	

Seal Kit/Replacement Components/Air Pressure (non lube) Type

No.	Component Name	Material	Component Number	
			Ø20	Ø25
❾	Piston Packing	NBR	PSD–20	PSD–25
❿	Rotation Preventing Rod Packing	NBR	SORA–10	SORA–12
⓫	Rod Packing	NBR	DYR–10SK–K	DYR–12
⓬	Gasket	NBR	C18	C22
⓭	Piston Gasket	NBR	–	–

Position of Auto Switch (Stroke end)

Ø20, Ø25



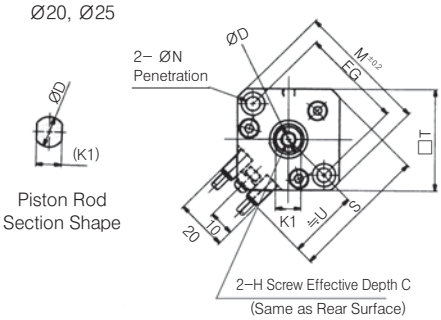
Position of Auto Switch

(Unit : mm)

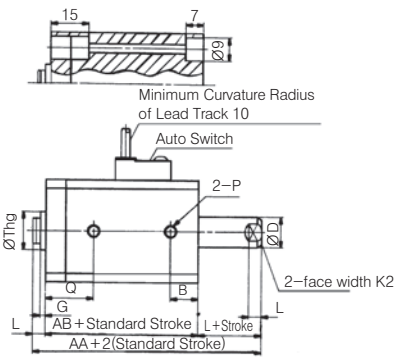
Bore Size (mm)	Position of Auto Switch		
	W4		
	AO	BO	U
20	8	13.5	24.5
25	8	13.5	27.5

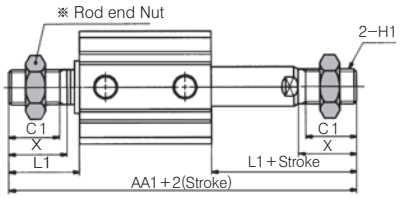
Standard Type (Thru Hole Type) ADQKWB

Bore Size Ø20~Ø32



Ø20, 25





Rod end Male Thread Type (mm)

Bore Size (mm)	AA1	C1	H1
20	83	12	M8×1.25
25	92	15	M10×1.25

Bore Size (mm)	L1	X
20	18.5	14
25	22.5	17.5

※ The dimension above is for the case of W4 type.

※ For longer stroke than standard, please contact us.

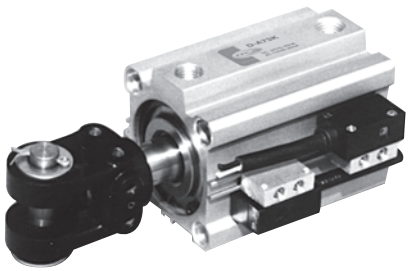
Standard Type

Bore Size (mm)	Stroke Range (mm)	AA	AB	C	D	EG	B	G	H	I	J	K1	K2	L	M	N	P	Q	S	Thg	U	□T	Z
20	5~50	55	46	7	10	47	10.5	2	M5×0.8	–	–	8	8	4.5	36	5.5	M5×0.8	18.5	48	$13^{0}_{-0.043}$	24.5	36	–
25	5~50	57	47	12	12	52	11	2	M6×1.0	–	–	10	10	5	40	5.5	M5×0.8	19	53.5	$15^{0}_{-0.043}$	27.5	40	–

Series ADQCP

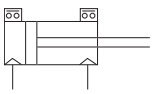
Compact Cylinder for Intense-Magnetism Resistant

Bore Size(mm) : Ø50, Ø63



- FOR WELDING MACHINE/INTENSE MAGNET FIELD
- SIZE/Ø50, Ø63

Symbol



How to Order

1 Series
Blank : Rc(PT)
U : NPT

2 Intense-Magnetism Resistant Auto Switch Attached Compact Cylinder Exclusively for Welding Machine, Coil Scrapper Equipped
※ CP : H Size M16×1.5
BP : H Size M18×1.5
Refer to H2 Size

3 Bore Size
50 : 50mm(2 Nom.)
63 : 63mm(2 ½ Nom.)

4 Standard Stroke(mm)
Ø50 : 25, 30, 35, 40, 45, 50
Ø63 : 25, 30, 35, 40, 45, 50

5 Double Action Type : DM

6 Rod End Option
Blank : None
Y : Double knuckle joint pin, plain washer, division pin attached(CP Type Only)

7 Series
Blank : Standard type
XC16 : Copper free

8 Types of Auto Switch
Blank : None
W6 : 120V AC, OFF Lighting
W7 : 24V DC, ON Lighting

9 Switch Lead Wire Length
L : 3m
Z : 5m

10 Auto Switch Additional Symbol
Blank : 2 pcs
S : 1 pc
N : N pcs

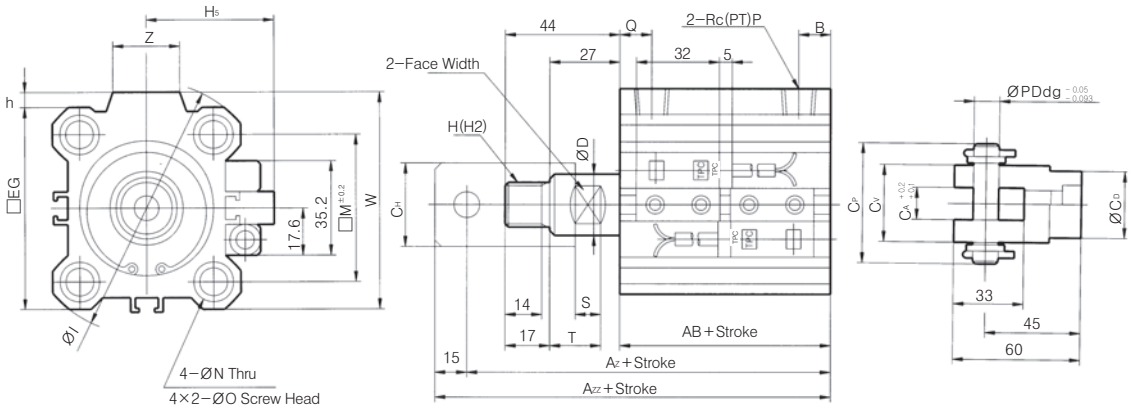
Components for Auto Switch

Switch Type	Component Number	
	Ø50	Ø63
W6, W7	BQP1T-050	

Standard Specification

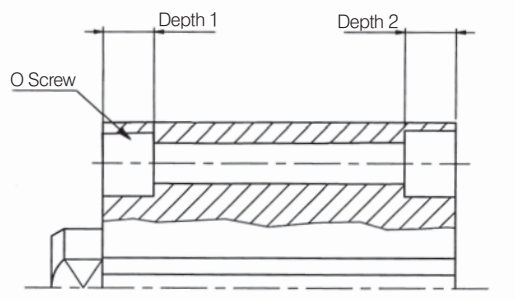
Type	ADQCP
Applied Fluid	Air
Bore Size	Ø50, Ø63
Stroke	Refer to Standard Stroke Table
Max. Operating Pressure	1.0MPa(9.9kgf/cm²)
Proofing Pressure	1.5MPa(15kgf/cm²)
Vicinity and Applied Fluid Temperature	5~60℃
Rod end Thread Allowance	KS Level 2
Stroke Length Allowable	$^{+1.0}_{0}$

Double Knuckle Joint



Bore Size (mm)	AA	A_Z	A_{ZZ}	AB	ØD	□EG	B	H(CP)	H2(BP)	ØI	J	K	M	ØN	ØO	P	Q	W	Z	T	S	Hs	Cp	Cv	C_A	PD	C_H	C_D
50	99.5	117.5	132.5	55.5	20	64	10.5	M16×1.5	M18×1.5	86	7	17	50	6.6	11Depth 8	1/4	10.5	71	22	20	10	49	55	36	16	12	30	30
63	105	123	138	61	20	77	10.5	M16×1.5	M18×1.5	103	7	17	60	9	14 Depth10.5	1/4	15	84	22	20	10	55.5	55	36	16	12	30	30

CP Type

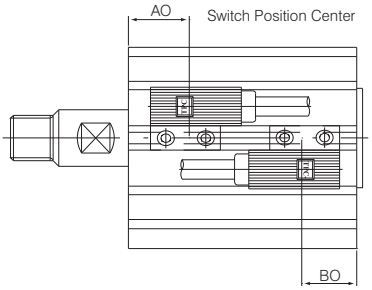


	Depth 1	Depth 2
Ø50	8	8
Ø63	10.5	11

Available Minimum Stroke For Intense-Magnetism Resistant Switch Attachment

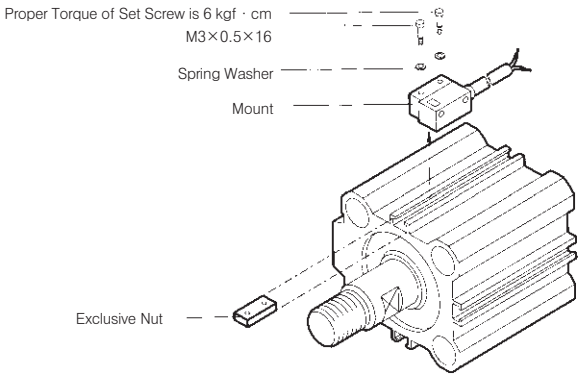
Switch Attaching Position / Bore Size	Attaching at the Same Surface	Attaching at the Same Surface	Attaching at Rear Surface	Attaching at Rear Surface
				
ADQCP Ø50, 63	25	30	25	

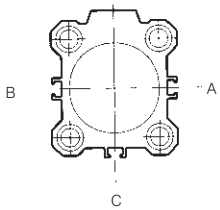
Proper Attaching Position of Auto Switch (End of Stroke)



Cylinder Type / Bore Size	50		63	
	AO	BO	AO	BO
ADQCP	33.5	22.5	37.5	24

How to Attach Auto Switch





It is possible to attach auto switch at 3 positions of A, B, C.

Specification ORDER MADE

Order Made of AQ Series Common Specification

Specification	Number	Symbol	Specification Contents
AQ	①	-XR0~XR38	Rod end Shape Changed
	②	-XC8	Variable Stroke Cylinder (Modified in Spring Return Motion)
	③	-XC9	Variable Stroke Cylinder (Modified in Spring Extended Motion)
	④	-XC10	Dual Stroke Cylinder/Double Rod Type
	⑤	-XC11	Dual Stroke Cylinder/Single Rod Type
	⑥	-X202	Overall Length is Same as Basic
	⑦	-X203	L Size of Rod Cover is Same as Basic
	⑧	-X163	Coil Scrapper Equipped (Tube Overall Length Increased)

Rod End Shape Changed (Refer to p.598 for separate rod end shape pattern) -XR0~XR38

Indicationg Rod End Shape Pattern Symbol

Patternized for rod end shape beside standard of AQ each series

Shape Change of Running Equipment and Applied Rod End (Range of Manufacturing)

Series		Cylinder Name (Operation Method)	Shape Change Symbol of Applied Rod End
Compact Cylinder AQ	AQ	Standard Type	-XR0~XR38
	AQ○-S	Standard Type Spring Retrun Type Only	

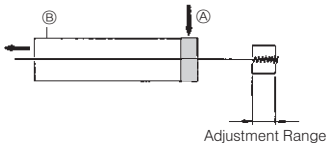
• Dimension, allowance and finishing not existed in drawings are followed by regulation of TPC Mechatronics Co., Ltd.

Dual Stroke Cylinder/Extension Adjustment Type

AQB Bore Size — Stroke D-XC8

The extended stroke of the cylinder can be adjusted by the stopper on the head side from full stroke(0~10mm).

Symbols

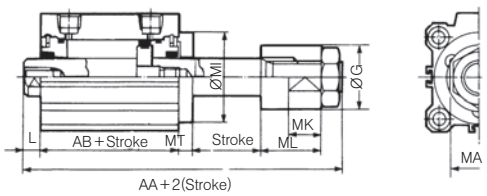


Specification

Type	Non lube
Tube Internal Diameter	Ø20
Operation Method	Double Action
Fluid Applied	Air
Stroke Adjustment Method	Stopper Adjustment
Stroke Adjustment Range	10mm
Attaching Type	Thru Hole
Minimum Prressure Applied	0.05MPa
Cushion	None

※ AQ2 Series is applied for Ø32, Ø40, Ø50, Ø63, Ø80 and Ø100

Structure/External Dimension Drawing



Bore Size (mm)	AA	AB	L	MT	MI	MA	MK	ØG	ML	Stroke Produced
20	67.5	26	4.5	8	Ø36	17	10	20	22.5	5~50

※ Dimension above is identical to AQ/standard type.

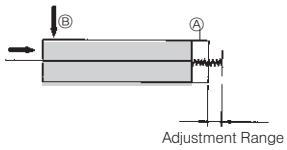
※ For longer stroke than basic, please contact us.

Dual Stroke Cylinder/Retraction Adjustment Type

AQ Attaching Bore Size — Stroke D(M)-XC9

The retracted stroke of the cylinder can be adjusted from(0~10mm) by the adjusting bolt.

Symbols

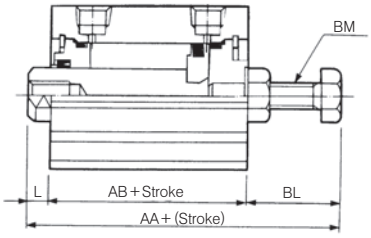


Specification

Type	Non lube
Tube Internal Diameter	Ø20
Operation Method	Double Action
Fluid Applied	Air
Stroke Adjustment Method	Adjustment Bolt Control
Stroke Adjustment Range	10mm
Attaching Type	Thru Hole(Standard), Both-end Tap
Minimum Prressure Applied	0.05MPa
Cushion	None

※ AQ2 Series is applied for Ø32, Ø40, Ø50, Ø63, Ø80 and Ø100

Structure/External Dimension Drawing



	AA	AB	L	BL	BM	
20	61(73)	26(38)	4.5	30.5	M8×1.25	5~50

※ Dimension above is identical to AQ/standard type.

※ Dimensions in ( ) are the case of auto switch attachment.

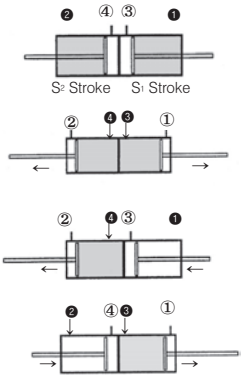
Dual Stroke Cylinder/Double Rod Type

AQB Bore — Stroke S_1 + Stroke S_2 D(C), (M)-XC10

Two cylinders are constructed as one cylinder in a back–to back configuration allowing the cylinder stroke to be controlled in the three steps.

Symbols

Function



When air pressure is supplied to ports ❶ and ❷, both S_1 and S_2 stroke retract.

When air pressure is supplied to ports ❸ and ❹, S_1 and S_2 strokes extend.

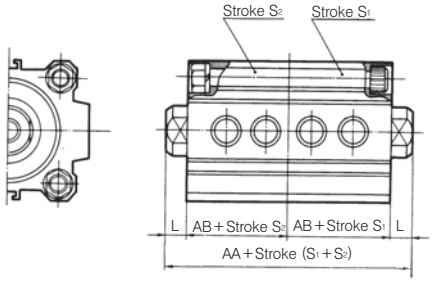
When air pressure is supplied to ports ❶ and ❹, S_2 stroke extends and S_1 retracts strokes.

When air pressure is supplied to ports ❷ and ❸, S_1 stroke extends and S_2 stroke retracts.

Specification

Type	Non lube
Bore Size	Ø12, Ø16, Ø20, Ø25, Ø32, Ø40, Ø50, Ø63, Ø80, Ø100
Operation Method	Double Action
Fluid Applied	Air
Attaching Type	Thru Hole

Structure/External Dimension Drawing



Bore Size (mm)	AA		AB		L	Produced Stroke S1 and S2 are Identical
	50st or Less	75, 100st	50st or Less	75, 100st		
12	41(63)	–	17(28)	–	3.5	5~30
16	44(68)	–	18.5(30.5)	–	3.5	
20	48(72)	–	19.5(31.5)	–	4.5	5~50
25	55(75)	–	22.5(32.5)	–	5	

※ Dimension in ( ) are the case of auto switch attachment.
※ Refer to Notices in p.228 for middles stroke production.
※ AQ2 Series is applied for Ø32, Ø40, Ø50, Ø63, Ø80 and Ø100

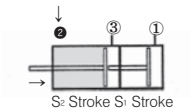
Dual Stroke Cylinder/Single Rod Type

AQB Bore — Stroke S_1 + Stroke S_2-S_1 D(M)-XC11

2 Cylinder head covers are direcity integrated, and it is available to control cylinder stroke in 2 level as well as return, and possible to achieve double cylinder output in case of A–stroke of output–force.

Symbols

Function



When air pressure is supplied to the ❷ port, both S_1 and S_2 stroke retract.

When air pressure is supplied to the ❶ port, the rod extends by the S_1 stroke length.

When air pressure is supplied to the ❸ port, the rod operates S_2–S_1.

When air pressure is supplied to ❶, rod moves S_1 stroke.

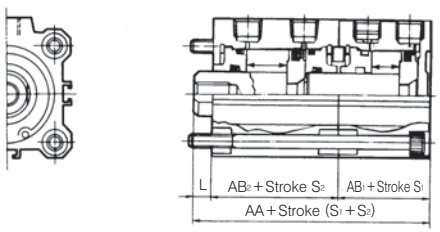
ex) • AQB50-50+50D-XC11 → S_1=50mm, S_2=100mm
• AQB50-50+10D-XC11 → S_1=50mm, S_2=60mm

Specification

Type	Non lube
Bore Size	Ø20, Ø32, Ø40, Ø50, Ø63, Ø80, Ø100
Operation Method	Double Action
Fluid Applied	Air
Attaching Type	Thru Hole
Piston Speed	50~500mm/s

※ AQ2 Series is applied for Ø32, Ø40, Ø50, Ø63, Ø80 and Ø100

Structure/External Dimension Drawing



Bore Size(mm)	AA	AB_1	AB_2	L
20	50(74)	19.5(31.5)	26(38)	4.5
25	56.5(76.5)	22.5(32.5)	29(39)	5

※ Dimension in ( ) are the case of auto switch attachment.
Noet1) Dimension over 75st is identical to auto switch case.

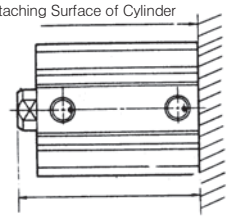
ORDER MADE AQ Series

Identical Dimension of Overall Dimension to Former Series

AOQ (Attachment) (Bore) — (Stroke) (Operation Method) (Specification) — XC202

Overall length A (head side section to rod side end) and rod end female thread size in single rod of AQ series are same as previons model.

Attaching Surface of Cylinder



Same Dimension as Previous Model

Specification is same as AQ Series basic type

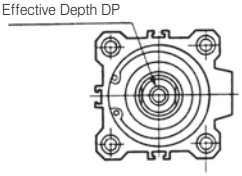
Standard Applied

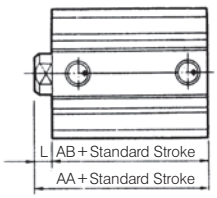
Single Rod	Double Action Type (Rubber Cushion)	Ø20 (AQ2 Series is applied for Ø32, Ø40, Ø50, Ø63, Ø80, Ø100)
	Single Action Type (Spring Return/Spring Extended Type)	Ø20(AQ2 Series is applied for Ø32, Ø40, Ø50)

External Dimension Drawing X202

Double Action/Single Rod

H Screw Effective Depth DP





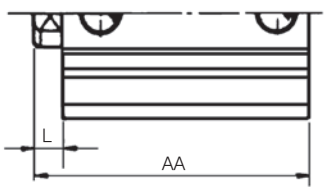
Symbol \ Bore	Ø12	Ø20	
Stroke mm	15,25	5, 10 20, 30 40, 50	15, 25 35, 45
AA	25.5	23(25)	28
AB	22	19.5	24.5
L	3.5	3.5 (5.5)	35
H	M3×0.5	M5×0.8	
DP	6	7	

Note) Dimension in ( ) is for 10-stroke case.

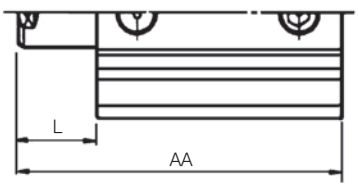
※ Different in H and C dimension to new model AQ series.

Single Acting

Spring Return

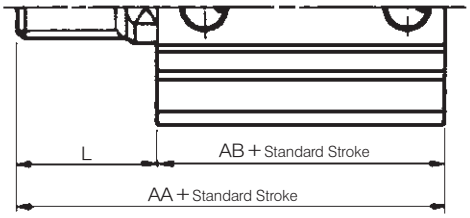


Spring Extended



Operation Method	Symbol	Ø20	
		5st	10st
Single Acting Spring Return	AA	28	35
	L	3.5	5.5
Single Acting Spring Extended	AA	33	45
	L	8.5	15.5

Double Action/Rod end Male Thread



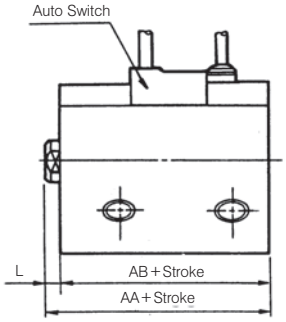
Bore / Stroke mm / Symbol	Ø12	Ø20	
	15, 25	10	15, 25 35, 45
AA	36	40	43
AB	22	19.5	24.5
L	14	20.5	18.5

Overall Dimension is Same as Previous Series/Auto Switch Attached

External Dimension Drawing

Double Action/Single Rod · Female Thread

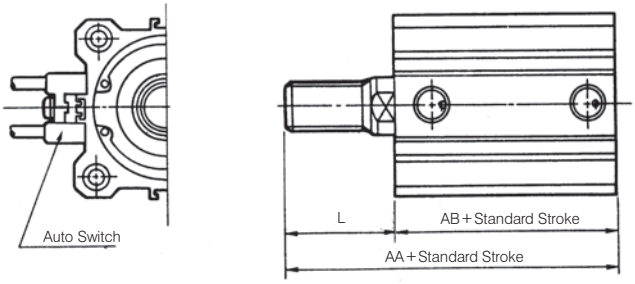
Ø12~Ø25



Bore / Stroke mm / Symbol	Ø12	Ø20	
	15,25	5, 10 20, 30 40, 50	15, 25 35, 45
AA	36.5	38.5	43.5
AB	33	31.5	36.5
L	3.5	7	7
H	M3×0.5	M5×0.8	
DP	6	7	

※ Different in H and C dimension of Ø32, Ø40 and Ø50 to new model AQ2 series.

Double Motion Type/Rod End Male Thread

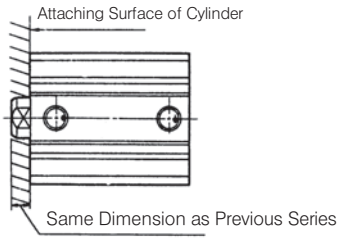


Bore / Stroke mm / Symbol	Ø12	Ø20	
	15, 25	5, 10 20, 30 40, 50	15, 25 35, 45
AA	47	53.5	58.5
AB	33	31.5	36.5
L	14	22	22

L Dimension at Rod Cover is Same as Previous Series X203

AOQ (Attachment) (Bore) – 10 (Operation Method) (Specification) –XC203

L Dimension (from rod section to rod end) and rod end female thread size in single rod of AQ series are same as previous series (old model).



Standard Applied

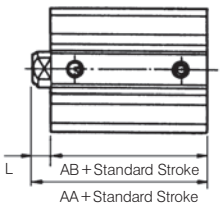
Single Rod	Femal Thread	Double Action Type (Rubber Cushion)	Ø20
		Single Motion Type (Spring Return/Extended)	Ø20
	Male Thread	AQ Series	

※ The bore size is the same as – X202.

Specification is same as AQ Series standard type

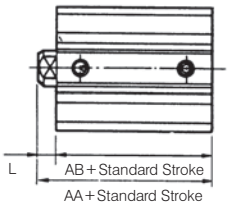
External Dimension Drawing/Just for 10mm Stroke

Double Action Type/Single Rod



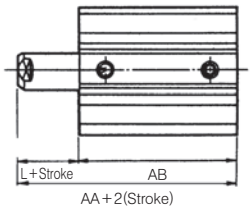
Symbol	Bore Size
	Ø20
AA	23
AB	19.5
L	3.5

Single Action Type/Forward



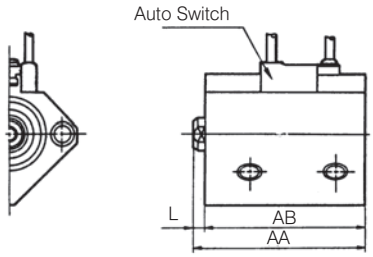
Symbol	Bore Size
	Ø20
AA	23
AB	19.5
L	3.5

Single Motion Type/Backward



Symbol	Bore Size
	Ø20
AA	23
AB	19.5
L	3.5

Auto Switch/External Dimension Drawing

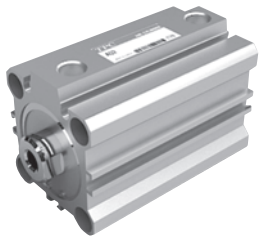


Symbol \ Bore	Ø20	
Stroke mm	5, 10, 20, 30, 40, 50	15, 25, 35, 45
AA	35	40
AB	31.5	36.5
L	3.5	3.5

Series AQ2, ADQ2

Compact Cylinder (a Square tube)/Double Acting, Single Rod Type

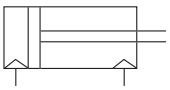
Bore Size(mm) : Ø12, Ø16, Ø20, Ø25, Ø32, Ø40, Ø50, Ø63, Ø80, Ø100, Ø125, Ø140 (refer to p.340)



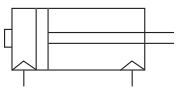
- SPACE SAVING CYLINDER
- COMPACT EQUIPMENT DESIGN AVAILABLE
- SMALL AUTO SWITCH EQUIPPED IN SQUARE TUBE

Symbol

Double Acting : Single Rod Type



Rear Boss Mount



How to Order

□ A D Q2 B 20 — 30 D C — ○ — W8H S

1 2 3 4 5 6 7 8 9 10

1 Magnet
Blank : Rc(PT)
U : NPT

2 Magnet
Blank : None
D : Built-in Magnet

3 Attaching Type
B : Through hole (standard type)
A : Both end tapped
D : Double rear clevis (standard both end tapped)
F : Rod side flange (standard both end tapped)
G : Head side flange (standard both end tapped)
L : Foot (standard both end tapped)
※ Mountings are delivered without assembly
※ D, F, L 25φ or less cannot be attached

4 Bore Size

12 : 12mm(1/2Nom.)	40 : 40mm(1 1/2Nom.)
16 : 16mm(5/8Nom.)	50 : 50mm(2Nom.)
20 : 20mm(3/4Nom.)	63 : 63mm(2 1/2Nom.)
25 : 25mm(1Nom.)	80 : 80mm(3 1/4Nom.)
32 : 32mm(1 1/4Nom.)	100 : 100mm(4Nom.)

5 Stroke(mm)
12,16 : 5,10,15,20,25,30
20,25 : 5,10,15,20,25,30,35,40,45,50
32,40 : 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100
50~100 : 10,15,20,25,30,35,40,45,50,75,100

6 Action
D : Double Acting Type

7 Body Specification
Blank : Standard type (rod end female thread)
C : Rubber Cushion Attached
M : Rod end male thread
F : Rear boss mount
I : Single knuckle joint (rod end male thread)
Y : Double Knuckle Joint (rod end male thread)
※ Possible to combine body specification (CM, CF, CI, CF, CFI, CFY, etc.)
※ F is not available for φ12, φ16
※ I and Y are delivered without assembly

8 Special Option
Blank : Standard type
XC16 : Copper-free
※ Ø12~Ø40 : XC16 is standard type

9 Auto Switch
Blank : None
Reed switch
W4 : W4 (Ø32~Ø100)
W8H(V) : Compact auto switch horizontal (vertical) type, 2 wire type
Non contact point existing auto switch
W9H(V) : Compact auto switch horizontal (vertical) type, 2 wire type
W9H(V)N : Compact auto switch horizontal (vertical) type, 3 wire type
W2P(L): Ø50~Ø100
※ In case of 3m lead wire, L should be added at the end of item number
ex) W4L or W2PL
※ In case of 5m lead wire, please contact us

10 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

Item Number of Mounting

Bore Size (mm)	Foot	Flange	Double Clevis
	I-Knuckle	Y-Knuckle	Joint Pin
12	AQL-012	AQF-012	AQD-012
	QI-012	QY-012	QP-012
16	AQL-016	AQF-016	AQD-016
	QI-016	QY-016	QP-012
20	AQL-020	AQF-020	AQD-020
	QI-020	QY-020	QP-020
25	AQL-025	AQF-025	AQD-025
	QI-025	QY-025	QP-025
32	QL-032	QF-032	QD-032
	QI-032	QY-032	QP-032
40	QL-040	QF-040	QD-040
	QI-032	QY-032	QP-032
50	QL-050	QF-050	QD-050
	QI-050	QY-050	QP-050
63	QL-063	QF-063	QD-063
	QI-050	QY-050	QP-050
80	QL-080	QF-080	QD-080
	QI-080	QY-080	QP-080
100	QL-0100	QF-100	QD-100
	QI-0100	QY-100	QP-100

※ In case of ordering foot mountings, please order 2EA foot mountings per 1EA cylinder

● Notice

※ Production of middle stroke
Minimum 3mm to 1mm middle stroke production is available by means of mountings spacer at standard stroke cylinder.
ex) AQ2B32-27D inserts 3mm wide spacer in standard cylinder AQ2B32-30D
ex) AQ2B32-29D inserts 21mm wide spacer in standard cylinder AQ2B32-50D

Notices for products

Please fully understand the notices prior to utilization, and refer to safety notice and common notice.

Warning

Assembly/Disassembly of Snap Ring

- Please use proper flyer (Attached tool of C-type snap ring) for assembly / disassembly.
- Please be cautious all the time that there is possible damage to human body or near-by equipments owing to projection of snap ring at the end of flyer (C-type snap ring) in spite of using proper flyer (Attached tool of C-type snap ring). Moreover, after checking full connection of snap ring during attachment, supply air.

Mounting

- Loading removing should be carried out with fixing load side piston rod 2 face width part.
- If load-side piston rod is not firmly fixed, connecting part (screw fixing part) of piston rod is possibly released.

Options

Bore Size(mm)			12	16	20	25	32	40	50	63	80	100
Air Pressure Type	Attachment	Through-hole	○	○	○	○	○	○	○	○	○	○
		Both ends Tap	○	○	○	○	○	○	○	○	○	○
	Built in Magnet		○	○	○	○	○	○	○	○	○	○
	Piping Method	Thread Type	M5×0.8				M5×0.8 Rc(PT)1/8	Rc(PT)1/8	Rc(PT)1/4		Rc(PT)3/8	
	Rod end Male Thread		○	○	○	○	○	○	○	○	○	○
	Rubber Cushion Mount		○	○	○	○	○	○	○	○	○	○
	Rear Boss Mount		–	–	○	○	○	○	○	○	○	○

(Note 1) When requring style without auto switch, M5×0.8 for 5mm stroke only.

Specifications

Description	Air Pressure (non-lubrication) Type
Fluid	Air
Guaranteed Pressure Resistance	1.5MPa{15.3kgf/cm²}
Maximum Pressure Applied	1.0MPa{9.9kgf/cm²}
Ambient and Applied Fluid Temperature	-5℃~70℃(No Frozen)
Rod end Thread Tolerance	KS Class 2
Stroke Tolerance	$^{+1.0}_{0}$
Piston Speed	50~500mm/s
Rubber Cushion	None
Rod end Thread	Female Thread
Mount	Through Hole

Minimum Operation Pressure

(Unit : MPa)

Bore Size(mm)	12	16	20	25	32	40	50	63	80	100
Air Pressure (non-lubrication) Type	0.07	0.07	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05

Weight Table

(Unit : g)

Bore Size (mm)	Cylinder Stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
12	40	47	54	61	68	75	–	–	–	–	–	–
16	61	72	83	94	105	116	–	–	–	–	–	–
20	91	112	132	152	173	193	213	234	254	274	–	–
25	118	139	160	181	203	224	245	266	287	309	–	–
32	157	180	202	225	248	270	292	316	339	362	522	636
40	272	294	316	338	360	382	404	426	448	470	623	733
50	–	401	439	476	514	551	589	626	663	701	958	1,102
63	–	647	687	727	767	807	847	987	927	967	1,257	1,464
80	–	1,443	1,534	1,624	1,714	1,804	1,894	1,985	2,076	2,166	2,830	3,296
100	–	2,208	2,314	2,420	2,526	2,632	2,738	2,844	2,950	3,056	3,801	4,318

※ Refer to p.327 for long stroke series

Option Weights

(Unit : g)

Bore Size(mm)		12	16	20	25	32	40	50	63	80	100
Attachment Both End Tap Type		1	2	6	7	7	6	7	17	31	43
Rod End Male Thread	Male Thread Part	1.5	3	6	12	26	27	53	53	120	175
	Nut	1	2	4	8	17	17	32	32	49	116
Rear Boss Mount		0.7	1.3	2	3	5	7	13	25	45	96
Rubber Cushion Attached		1	2	5	4	-3	-7	-9	-18	-31	-56

Calculation Method

ex) AQ2A20-20DCM

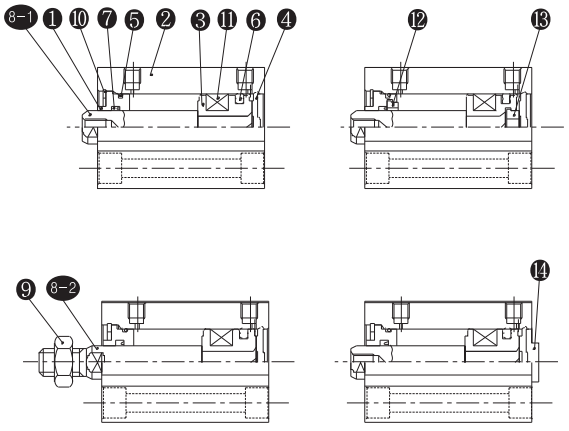
- Standard Weight : AQ2B20-20D ·····152g
- Extra Weight : Attachment both end tap type ·····6g
  Rod end male thread ·····10g
  Rubber cushion attached ·····5g

173g

Item Number of Auto Switch Band

Type of Auto Switch	Item Number of Band	Applied Tube Internal Diameter
W4	BQ-1	12~25
	BQ-2	32~125

Construction/Parts List



Parts List

No	Item Name	Quantity	Material	Remark
1	Rod Cover	1	Aluminum alloy	Hard Alumite
2	Cylinder Tube	1	Aluminum alloy	
3	Piston	1	Aluminum alloy	Chromite
4	End Plate	1	Aluminum alloy	Hard Alumite
5	Gasket	1	NBR	
6	Piston Packing	1	NBR	
7	Rod Packing	1	NBR	
8-1	Piston Rod	1	Stainless Steel	Female Thread Type
8-2	Piston Rod	1	Stainless Steel	Male Thread Type
9	Rod End Nut	1	Steel	Zinc White Galvanizing
10	Snap Ring	1	Carbon Tool Steel	Black Coloring
11	Magnet	1	NBR+Ba Ferrite	
12	Bumper "A"	1	Polyurethane	Rod Cover Side Equipped
13	Bumper "B"	1	Polyurethane	Piston Side Equipped
14	Nut Ring	1	Aluminum alloy	Hard Alumite

※ In case of Ø12 and Ø16, divided to piston and piston-B.
※ In case of Ø12 and Ø16, rear boss mount and end plate do not exist.
※ Copper free is basic.
Notice) Non automatic type carbon steel

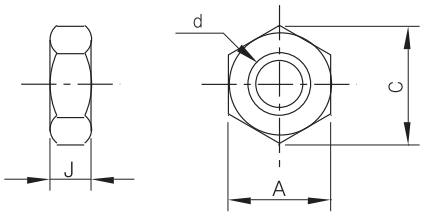
Theoretical Force

Bore Size (mm)	Operation Direction	Applied Pressure (MPa)		
		0.3	0.5	0.7
12	IN	25	42	59
	OUT	34	57	79
16	IN	45	75	106
	OUT	60	101	141
20	IN	71	118	165
	OUT	94	157	220
25	IN	113	189	264
	OUT	147	245	344
32	IN	181	302	422
	OUT	241	402	563
40	IN	317	528	739
	OUT	377	628	880
50	IN	495	825	1150
	OUT	589	982	1370
63	IN	841	1400	1960
	OUT	935	1560	2180
80	IN	1360	2270	3170
	OUT	1510	2510	3520
100	IN	2140	3570	5000
	OUT	2360	3930	5500

1N ≒ 0.102kgf
1MPa ≒ 10.2kgf/cm²

Rod End Nut

Material : Rolled Steel Materials

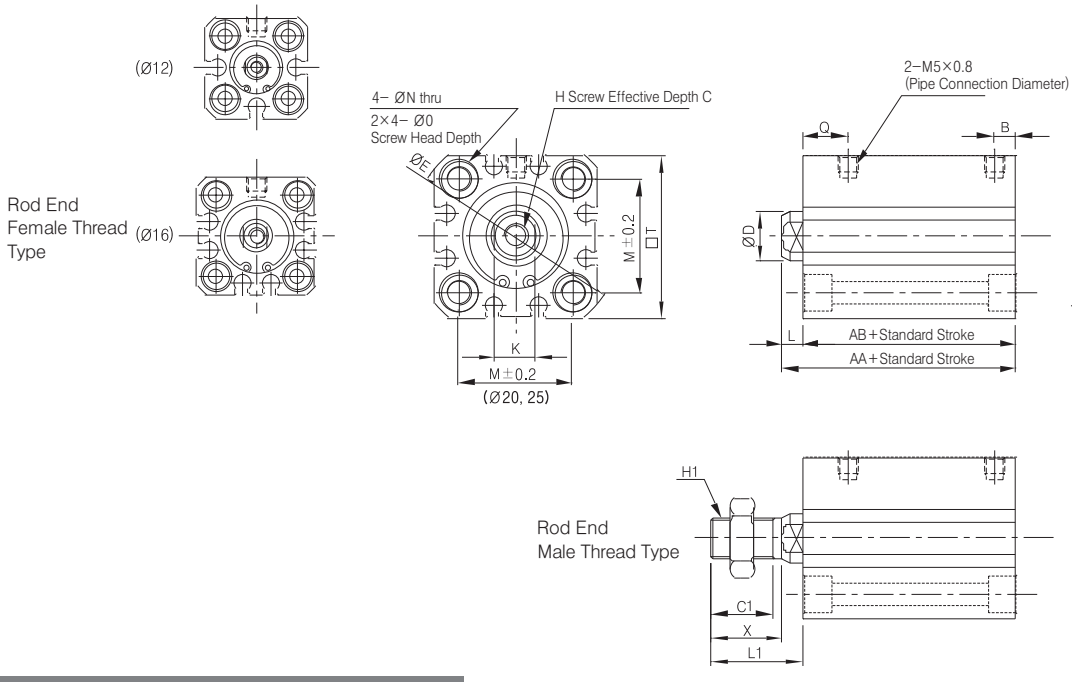


Item Number	Applied Bore Size (mm)	d	J	A	C
M5×0.8-PL	12	M5 × 0.8	4	8	9.2
M6×1.0-PL	16	M6 × 1	5	10	11.5
TNT-02	20	M8 × 1.25	5	13	15.0
TNT-03	25	M10 × 1.25	6	17	19.6
TNT-04	32, 40	M14×1.5	8	22	25.4
TNT-05	50, 63	M18×1.5	11	27	31.2
TNT-08	80	M22×1.5	13	32	37.0
TNT-10	100	M26×1.5	16	41	47.3

Seal Kit/Exchanging Parts/Air Pressure (no-lubrication) Type

NO	Item Number	Material	Ø12	Ø16	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
5	GASKET	NBR	C-10	C-14	C-18	C-22	C-29	C-36	C-46	C-60	C-75	C-95
6	PISTON PACKING	NBR	TPSA-12	TPSA-16	TPSA-20	TPSA-25	PPD-32	PPD-40	PPD-50	PPD-63	PPD-80	PPD-100
7	ROD PACKING	NBR	DYR-6K	DYR-8K	DYR-10SK	DYR-12	DYR-16	PDU-16Z	PDU-20Z	PDU-20Z	PDU-25Z	PDU-30Z

Standard Type (Through Hole Type)/AQ2B, ADQ2B



Rod End Male Thread Type (Unit : mm)

Bore Size	L1	C1	H1	X
12	14	9	M5×0.8	10.5
16	15.5	10	M6×1.0	12
20	18.5	12	M8×1.25	14
25	22.5	15	M10×1.25	17.5

Rear Boss Mount Type (Unit : mm)

Bore Size	G	ØThg
20	2	$13\ ^{0}_{-0.043}$
25	2	$15\ ^{0}_{-0.043}$

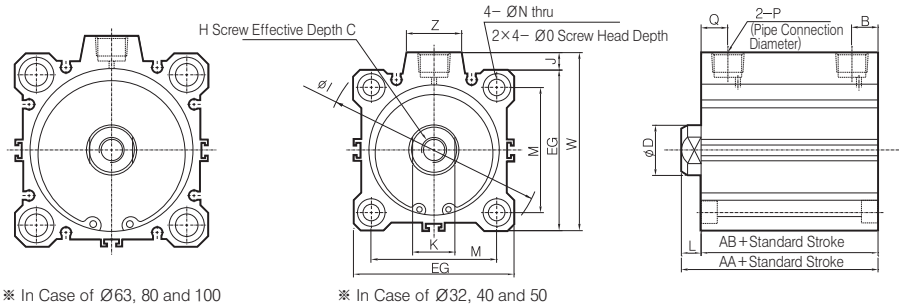
Standard Type (Unit : mm)

Bore Size	Range of Standard Stroke	Standard Type										Long Stroke	Long Stroke					D	N	K	E	M	□T
		No Auto Switch					Auto Switch Exists						No Auto Switch										
		AA	AB	L	Q	B	AA	AB	L	Q	B		AA	AB	L	Q	B						
12	5 ~ 30	20.5	17	3.5	7.5	5	31.5	28	3.5	11	6.5	35 ~ 50	45.5	32	13.5	7.5	7.5	6	3.5	5	32	15.5	25
16	5 ~ 30	22	18.5	3.5	8	5.5	34	30.5	3.5	11	5.5	35 ~ 50	45.5	32	13.5	7.5	7.5	8	3.5	6	38	20	29
20	5 ~ 50	24	19.5	4.5	10.5	5.5	36	31.5	4.5	10.5	5.5	~	–	–	–	–	–	10	5.5	8	47	25.5	36
25	5 ~ 50	27.5	22.5	5	11	5.5	37.5	32.5	5	11	5.5	~	–	–	–	–	–	12	5.5	10	52	28	40

Bore Size	H	C	O
12	M3×0.5	6	6.5 Depth 4
16	M4×0.7	8	6.5 Depth 4
20	M5×0.8	7	9 Depth 7
25	M6×1.0	12	9 Depth 7

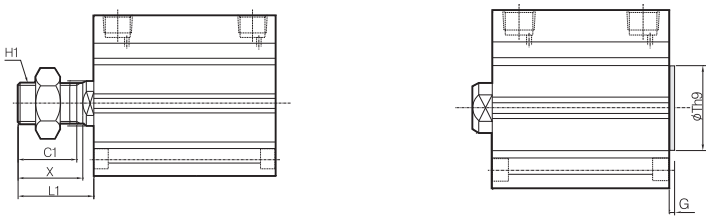
※ If auto switch does not exist, Ø12–5 stroke, Ø20/25–5/10 stroke has penetrated both ends for attachment bolt of tube.
※ In case of rubber cushion attachment, external dimension is same as standard type above.
※ Refer to p.333 for both–end tap.

Standard Type (Through Hole Type)/AQ2B, ADQ2B



※ In Case of Ø63, 80 and 100

※ In Case of Ø32, 40 and 50



Standard Type

(Unit : mm)

Bore Size	Range of Standard Stroke	Standard Stroke										C	D	EG	H	I	J	K	L	M	N	ØO	W	Z
		No Auto Switch					Auto Switch Exists																	
		AA	AB	B	P	Q	AA	AB	B	P	Q													
Ø32	5	30	23	5.5	M5×0.8	11.5	40	33	7.5	Rc(PT) 1/8	10.5	13	16	45	M8×1.25	60	4.5	14	7	34	5.5	9 Depth 7	49.5	14
	10~50			7.5	Rc(PT) 1/8	10.5					12.5													
	75, 100	40	33																					
Ø40	5~50	36.5	29.5	8	Rc(PT) 1/8	11	46.5	39.5	8	Rc(PT) 1/8	11	13	16	52	M8×1.25	69	5	14	7	40	5.5	9 Depth 7	57	14
	75, 100	46.5	39.5			14					14													
Ø50	10~50	38.5	30.5	10.5	Rc(PT) 1/4	10.5	48.5	40.5	10.5	Rc(PT) 1/4	10.5	15	20	64	M10×1.5	87	7	17	8	50	6.6	11 Depth 8	71	22
	75, 100	48.5	40.5			14					14													
Ø63	10~50	44	36	10.5	Rc(PT) 1/4	15	54	46	10.5	Rc(PT) 1/4	15	15	20	77	M10×1.5	103	7	17	8	60	9	14 Depth 10.5	84	22
	75, 100	54	46			16.5					16.5													
Ø80	10~50	53.5	43.5	12.5	Rc(PT) 3/8	16	63.5	53.5	12.5	Rc(PT) 3/8	16	21	25	98	M16×2.0	132	6	22	10	77	11	17.5 Depth 13.5	104	26
	75, 100	63.5	53.5			19					19													
Ø100	10~50	65	53	13	Rc(PT) 3/8	23	75	63	13	Rc(PT) 3/8	23	27	30	117	M20×2.5	156	6.5	27	12	94	11	17.5 Depth 13.5	123.5	26
	75, 100	75	63																					

※ In case of long stroke (101~3000ST), refer to p.327 (long stroke series)

Rod End Male Thread Type

(unit : mm)

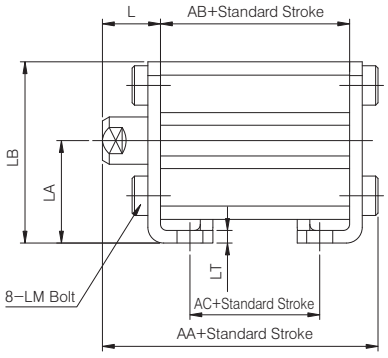
Bore Size	C1	H1	L1	X
Ø32	20.5	M14×1.5	28.5	23.5
Ø40	20.5	M14×1.5	28.5	23.5
Ø50	26	M18×1.5	33.5	28.5
Ø63	26	M18×1.5	33.5	28.5
Ø80	32.5	M22×1.5	43.5	35.5
Ø100	32.5	M26×1.5	43.5	35.5

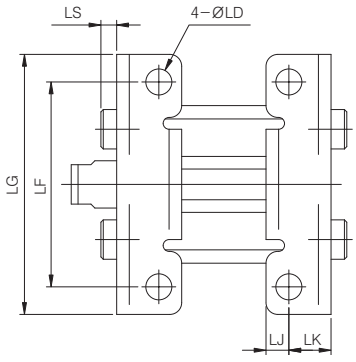
Rear Boss Mount Type

Bore Size	G	ØThg
Ø32	2	$21\ ^{0}_{-0.052}$
Ø40	2	$28\ ^{0}_{-0.052}$
Ø50	2	$35\ ^{0}_{-0.062}$
Ø63	2	$35\ ^{0}_{-0.062}$
Ø80	2	$43\ ^{0}_{-0.062}$
Ø100	2	$59\ ^{0}_{-0.074}$

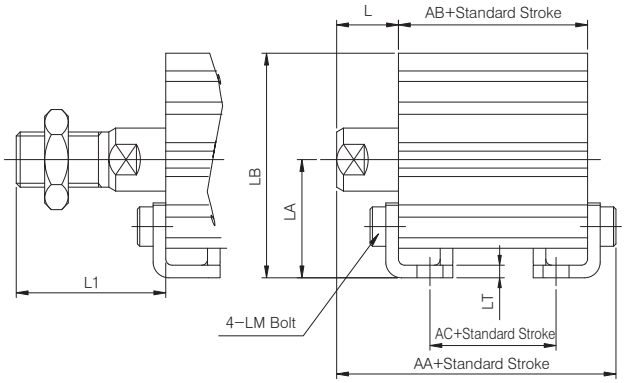
Foot Type/A(D)Q2L

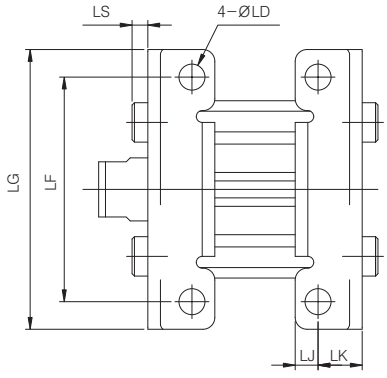
Ø12~Ø25





Ø32~Ø100





Material : Carbon Steel

(Unit : mm)

Bore Size (Ø)	Range of Standard Stroke	Range of Standard Stroke						L	L1	LA	LB	LD	LF	LG	LJ	LM	LK	LS	LT
		No Auto Switch			Auto Switch Exists														
		AA	AB	AC	AA	AB	AC												
12	5~30	35.3	17	5	46.3	28	16	13.5	24	17	29.5	4.5	34	44	4.5	M4×0.7	8	2.8	2
	35~50	48.3	32	20	55.5	32	20												
16	5~30	36.8	18.5	6.5	48.8	30.5	18.5	13.5	25.5	19	33.5	4.5	38	48	5	M4×0.7	8	2.8	2
	35~50	48.3	32	20	55.5	32	20												
20	5~50	41.2	19.5	7.5	53.2	31.5	19.5	14.5	28.5	24	42	6.6	48	62	5.8	M6×1.0	9.2	4	3.2
25	5~50	44.7	22.5	7.5	54.7	32.5	17.5	15	32.5	26	46	6.6	52	66	5.8	M6×1.0	10.7	4	3.2
32	5~50	47.2	23	7	57.2	33	17	17	28.5	30	57	6.6	57	71	5.8	M6×1.0	11.2	4	3.2
	75,100	57.2	33	17															
40	5~50	53.7	29.5	13.5	63.7	39.5	23.5	17	28.5	33	64	6.6	64	78	7	M6×1.0	11.2	4	3.2
	75,100	63.7	39.5	23.5															
50	10~50	56.7	30.5	7.5	66.7	40.5	17.5	18	33.5	39	78	9	79	95	8	M8×1.25	14.7	5	3.2
	75,100	66.7	40.5	17.5															
63	10~50	62.2	36	10	72.2	46	20	18	33.5	46	91.5	11	95	113	9	M10×1.5	16.2	5	3.2
	75,100	72.2	46	20															
80	10~50	75	43.5	13.5	85	53.5	23.5	20	43.5	59	114	13	118	140	11	M12×1.75	19.5	7	4.5
	75,100	85	53.5	23.5															
100	10~50	88	53	19	98	63	29	22	43.5	71	136	13	137	162	12.5	M12×1.75	23	7	6
	75,100	98	63	29															

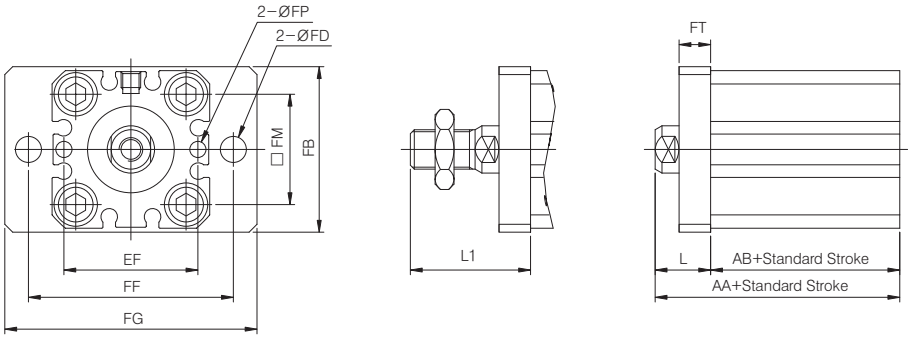
※ In case of mounting attached cylinder, A-type tube is standard.

※ Indication and dimension are same as dimension of standard cylinder.

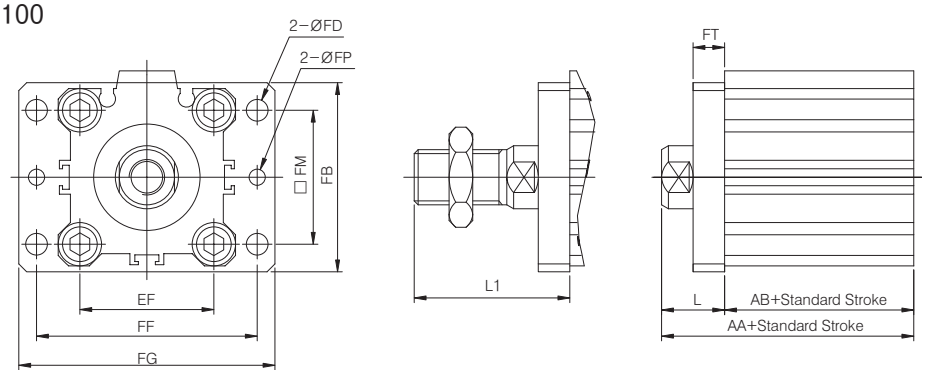
※ Cylinder and double clevis are delivered without assembly.

Rod Side Flange Type/A(D)Q2F

Ø12~Ø25



Ø32~Ø100



Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Range of Standard Stroke	Range of Standard Stroke				L	L1	FB	FD	FP	FE	FF	FG	FM	FN	FT
		No Auto Switch		Auto Switch Exists												
		AA	AB	AA	AB											
12	5~30	30.5	17	41.5	28	13.5	24	25	4.5	3.1	23	45	55	15.5	–	5.5
	35~50	55.5	32	55.5	32											
16	5~30	32	18.5	44	30.5	13.5	25.5	30	4.5	3.1	24	45	55	20	–	5.5
	35~50	55.5	32	55.5	32											
20	5~50	34	19.5	46	31.5	14.5	28.5	39	6.6	3.1	28	48	60	25.5	–	8
25	5~50	37.5	22.5	47.5	32.5	15	32.5	42	6.6	4.1	34	52	64	28	–	8
32	5~50	40	23	50	33	17	38.5	48	5.5	4.1	–	56	65	34	34	8
	75,100	50	33													
40	5~50	46.5	29.5	56.5	39.5	17	38.5	54	5.5	4.1	–	62	72	40	40	8
	75,100	58.5	39.5													
50	5~50	54	36	64	46	18	43.5	67	6.6	5.1	–	76	89	50	50	9
	75,100	58.5	40.5													
63	10~50	54	36	64	46	18	43.5	80	9	5.1	–	92	108	60	60	9
	75,100	64	46													
80	10~50	63.5	43.5	73.5	53.5	20	53.5	99	11	6.1	–	116	134	77	77	11
	75,100	73.5	53.5													
100	10~50	75	53	85	63	22	53.5	117	11	6.1	–	136	154	94	94	11
	75,100	85	63													

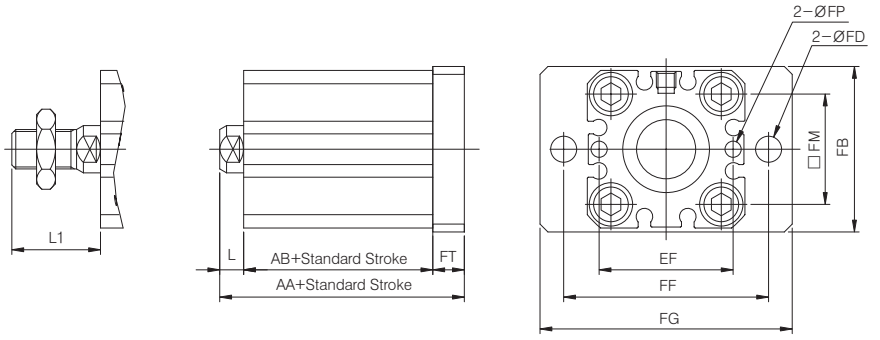
※ In case of mounting attached cylinder, A-type tube is standard.

※ Indication and dimension are same as dimension of standard cylinder.

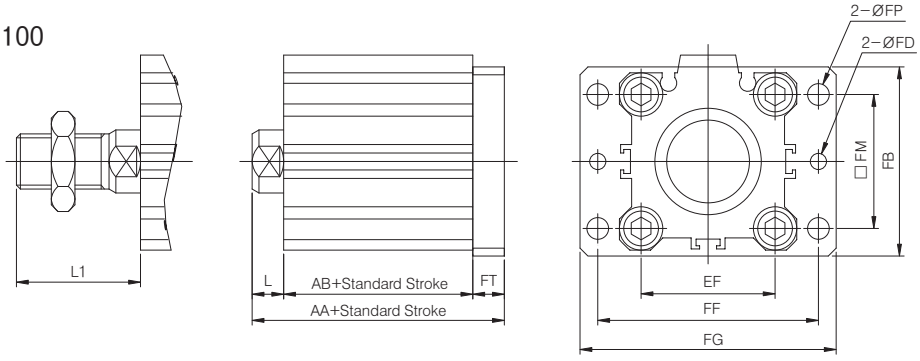
※ Cylinder and double clevis are delivered without assembly.

Head-Side flange Type/A(D)Q2G

Ø12~Ø25



Ø32~Ø100



Material : Carbon Steel

(Unit : mm)

Bore Size (Ø)	Range of Standard Stroke	Range of Standard Stroke				L	L1	FB	FD	FP	FE	FF	FG	FM	FN	FT
		No Auto Switch		Auto Switch Exists												
		AA	AB	AA	AB											
12	5~30	26	17	37	28	3.5	14	25	4.5	3.1	45	23	55	15.5	–	5.5
	35~50	51	32	51	32	13.5	24									
16	5~30	27.5	18.5	39.5	30.5	3.5	15.5	30	4.5	3.1	45	24	55	20	–	5.5
	35~50	51	32	51	32	13.5	25.5									
20	5~50	32	19.5	44	31.5	4.5	18.5	39	6.6	3.1	48	28	60	25.5	–	8
25	5~50	35.5	22.5	45.5	32.5	5	22.5	42	6.6	4.1	52	34	64	28	–	8
32	5~50	38	23	48	33	7	28.5	48	5.5	4.1	–	56	65	34	34	8
	75,100	48	33													
40	5~50	44.5	29.5	54.5	39.5	7	28.5	54	5.5	4.1	–	62	72	40	40	8
	75,100	54.5	39.5													
50	5~50	47.5	30.5	57.5	40.5	8	33.5	67	6.6	5.1	–	76	89	50	50	9
	75,100	57.5	40.5													
63	10~50	53	36	63	46	8	33.5	80	9	5.1	–	92	108	60	60	9
	75,100	63	46													
80	10~50	64.5	43.5	74.5	53.5	10	43.5	99	11	6.1	–	116	134	77	77	11
	75,100	74.5	53.5													
100	10~50	76	53	86	63	12	43.5	117	11	6.1	–	136	154	94	94	11
	75,100	86	63													

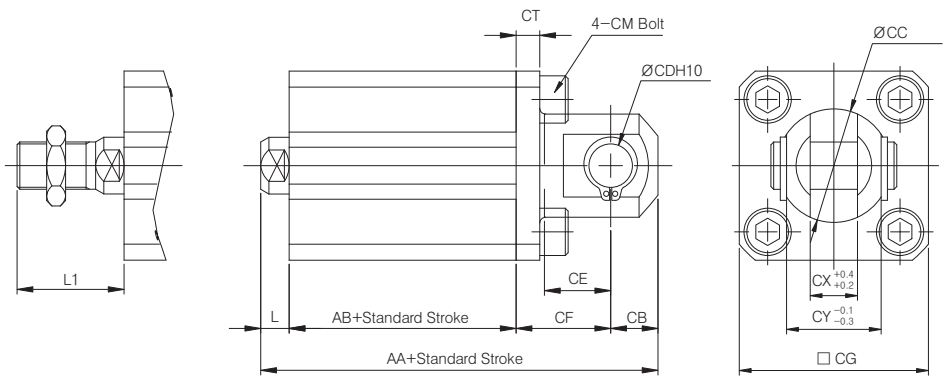
※ In case of mounting attached cylinder, A-type tube is standard.

※ Indication and dimension are same as dimension of standard cylinder.

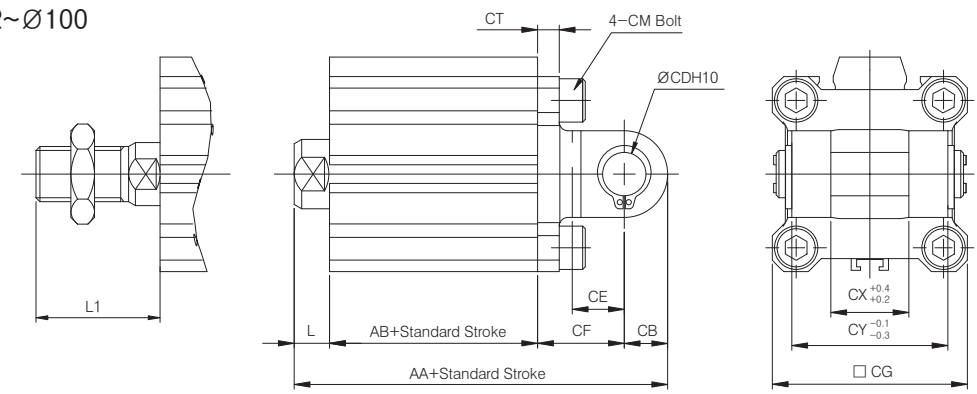
※ Cylinder and double clevis are delivered without assembly.

Double Rear Clevis/A(D)Q2D

Ø12~Ø25



Ø32~Ø100



Material: Ø12~Ø25−Carbon Steel, Ø32~Ø100−Cast Iron (Unit : mm)

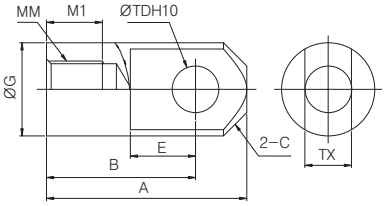
Bore Size (Ø)	Range of Standard Stroke	Range of Standard Stroke				L	L1	CB	CE	CF	CG	CM	CD	CT	CX	CY	CC (Ø)
		No Auto Switch		Auto Switch Exists													
		AA	AB	AA	AB												
12	5~30	40.5	17	51.5	28	3.5	14	6	7	14	25	M4×0.7	5 +0.05 0	4	5	10	12
	35~50	65.5	32	65.5	32	13.5	24										
16	5~30	43	18.5	55	30.5	3.5	15.5	6	10	15	29	M4×0.7	5 +0.05 0	4	6.5	12	14
	35~50	66.5	32	66.5	32	13.5	25.5										
20	5~50	51	19.5	63	31.5	4.5	18.5	9	12	18	36	M6×1.0	8 +0.06 0	5	8	16	20
25	5~50	57.5	22.5	67.5	32.5	5	22.5	10	14	20	40	M6×1.0	10 +0.06 0	5	10	20	24
32	5~50	60	23	70	33	7	28.5	10	14	20	45	M6×1.0	10 +0.06 0	5	18	36	–
	75,100	70	33														
40	5~50	68.5	29.5	78.5	39.5	7	28.5	10	14	22	52	M6×1.0	10 +0.06 0	6	18	36	–
	75,100	78.5	39.5														
50	10~50	80.5	30.5	90.5	40.5	8	33.5	14	20	28	64	M8×1.25	14 +0.07 0	7	22	44	–
	75,100	90.5	40.5														
63	10~50	88	36	98	46	8	33.5	14	20	30	77	M10×1.5	14 +0.07 0	8	22	44	–
	75,100	98	46														
80	10~50	109.5	43.5	119.5	53.5	10	43.5	18	27	38	98	M12×1.75	18 +0.07 0	10	28	56	–
	75,100	119.5	53.5														
100	10~50	132	53	142	63	12	43.5	22	31	45	117	M12×1.75	22 +0.084 0	10	32	56	–
	75,100	142	63														

※ In case of mounting attached cylinder, A−type tube is standard.

※ Indication and dimension are same as dimension of standard cylinder.

※ Cylinder and double clevis are delivered without assembly.

Single Knuckle Joint

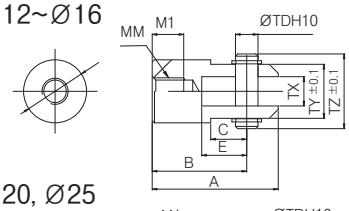


Material : Carbon Steel (Unit : mm)

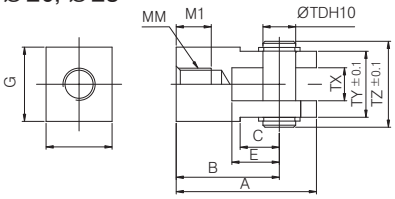
Item No.	Bore of Applied Cylinder (mm)	A	B	C	E	G (Ø)	MM	MI	ØTDH10	TX
QI-012	12	21.5	16	2.5	7	12	M5×0.8	6	5 $^{+0.048}_{0}$	5 $^{-0.2}_{-0.4}$
QI-016	16	32	25	3	14	14	M6×1.0	8	5 $^{+0.048}_{0}$	6.4 $^{-0.2}_{-0.4}$
QI-020	20	34	25	4	11.5	18	M8×1.25	8.5	8 $^{+0.058}_{0}$	8 $^{-0.2}_{-0.4}$
QI-025	25	41	30	5	14	23	M10×1.25	10.5	10 $^{+0.058}_{0}$	10 $^{-0.2}_{-0.4}$
QI-032	32,40	42	30	6	14	29	M14×1.5	14	10 $^{+0.058}_{0}$	18 $^{-0.3}_{-0.5}$
QI-050	50,63	56	40	6.5	20	36	M18×1.5	18	14 $^{+0.070}_{0}$	22 $^{-0.3}_{-0.5}$
QI-080	80	71	50	8	27	38	M22×1.5	21	18 $^{+0.070}_{0}$	28 $^{-0.3}_{-0.5}$
QI-100	100	79	55	10	31	44	M26×1.5	21	22 $^{+0.084}_{0}$	32 $^{-0.3}_{-0.5}$

Double Knuckle Joint

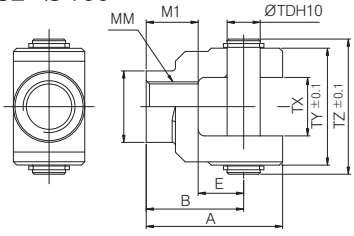
Ø12~Ø16



Ø20, Ø25



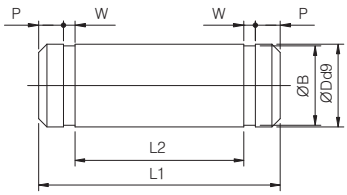
Ø32~Ø100



Material : Ø12~Ø25-Carbon Steel, Ø32~Ø100-Cast Iron (Unit : mm)

Item No.	Bore of Applied Cylinder (mm)	A	B	C	E	G	F	MM	MI	ØTDH10	TX	TY	TZ
QY-012	12	21.5	16	6	7	Ø12	–	M5×0.8	6	5 $^{+0.048}_{0}$	5 $^{-0.4}_{-0.2}$	10	14.6
QY-016	16	28	21	8	10	Ø14	–	M6×1.0	7	5 $^{+0.048}_{0}$	6.5 $^{-0.4}_{-0.2}$	12	16.6
QY-020	20	34	25	9.5	11.5	Ø18	16	M8×1.25	8.5	8 $^{+0.058}_{0}$	8 $^{-0.4}_{-0.2}$	16	21
QY-025	25	41	30	14	14	Ø22	20	M10×1.25	10.5	10 $^{+0.058}_{0}$	10 $^{-0.4}_{-0.2}$	20	25.6
QY-032	32,40	42	30	–	14	Ø22	–	M14×1.5	16	10 $^{+0.058}_{0}$	18 $^{-0.5}_{-0.3}$	36	41.6
QY-050	50,63	56	40	–	20	Ø28	–	M18×1.5	20	14 $^{+0.070}_{0}$	22 $^{-0.5}_{-0.3}$	44	50.6
QY-080	80	71	50	–	27	Ø38	–	M22×1.5	23	18 $^{+0.070}_{0}$	28 $^{-0.5}_{-0.3}$	56	64
QY-100	100	79	55	–	31	Ø44	–	M26×1.5	24	22 $^{+0.084}_{0}$	32 $^{-0.5}_{-0.3}$	64	72

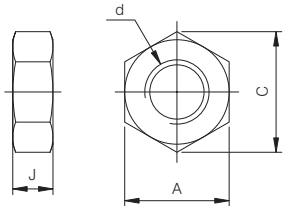
Double Knuckle Joint Pin/Double Clevis Pin



Material : Carbon Steel (Unit : mm)

Item No.	Bore of Applied Cylinder(mm)	ØDd9	L1	L2	P	W	B	Snapring
QP-012	12	5 $^{-0.03}_{-0.06}$	14.6	10.2	1.5	0.7	4.7	C Type for Shaft 5
QP-016	16	5 $^{-0.03}_{-0.06}$	16.6	12.2	1.5	0.7	4.7	C Type for Shaft 5
QP-020	20	8 $^{-0.04}_{-0.076}$	21	16.2	1.5	0.9	7.5	C Type for Shaft 5
QP-025	25	10 $^{-0.040}_{-0.076}$	25.6	20.2	1.55	1.15	9.4	C Type for Shaft 10
QP-032	32,40	10 $^{-0.040}_{-0.076}$	41.6	36.2	1.55	1.15	9.4	C Type for Shaft 10
QP-050	50,63	14 $^{-0.050}_{-0.076}$	50.6	44.2	2.05	1.15	13.1	C Type for Shaft 14
QP-080	80	18 $^{-0.050}_{-0.093}$	64	56.2	2.55	1.35	16.8	C Type for Shaft 18
QP-100	100	22 $^{-0.065}_{-0.117}$	72	64.2	2.55	1.35	20.8	C Type for Shaft 22

Rod End Nut



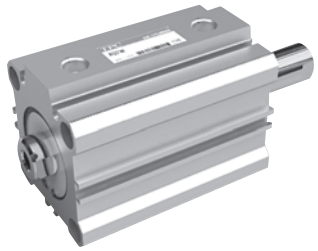
Material : Carbon Steel (Unit : mm)

Item No.	Bore of Applied Cylinder(mm)	d	J	A	C
M5×0.8-PL	12	M5×0.8	4	8	9.2
M5×0.8-PL	16	M6×1.0	5	10	11.5
TNT-02	20	M8×1.25	5	13	15
TNT-03	25	M10×1.25	6	17	19.6
TNT-04	32,40	M14×1.5	8	22	25.4
TNT-05	50,63	M18×1.5	11	27	31.2
TNT-08	80	M22×1.5	13	32	37.0
TNT-10	100	M26×1.5	16	41	47.3

Series AQ2W, ADQ2W

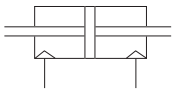
Compact Cylinder(Square Tybe) : Standard Type/Double Acting-Double Rod

Bore Size(mm) : Ø12, Ø16, Ø32, Ø40, Ø50, Ø63, Ø80, Ø100



- DOUBLE ROD COMPACT CYLINDER
- SPACE SAVING CYLINDER
- COMPACT EQUIPMENT DESIGN AVAILABLE
- SMALL AUTO SWITCH EQUIPPED IN SQUARE TUBE

Symbol Double Acting : Double Rod



How to Order

□ A D Q2 B 20 — 30 D C — ○ — W8H S

1 2 3 4 5 6 7 8 9 10

1 Magnet
Blank : Rc(PT)
U : NPT

2 Magnet
Blank : None
D : Built-in Magnet

3 Mounting
B : Through hole (standard type)
A : Both end tapped
F : Rod side flange (standard both end type)
L : Foot (standard both end type)
※ Mountings are delivered without assembly

4 Bore Size

12 : 12mm(½Nom.)	40 : 40mm(1½Nom.)
16 : 16mm(⅝Nom.)	50 : 50mm(2Nom.)
20 : 20mm(¾Nom.)	63 : 63mm(2½Nom.)
25 : 25mm(1Nom.)	80 : 80mm(3¼Nom.)
32 : 32mm(1¼Nom.)	100 : 100mm(4Nom.)

5 Stroke(mm)
Bore Size Standard Stroke
12, 16 : 5,10,15,20,25,30
32, 40 : 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100
50~100 : 10,15,20,25,30,35,40,45,50,75,100

6 Action
D : Double Acting Type

7 Body Option
Blank : Standard type (Rod end female thread)
C : Rubber Cushion Attached
M : Rod end male thread
F : Rear boss mount
I : Single knuckle joint (rod end male thread)
Y : Double Knuckle Joint (rod end male thread)
※ Possible to combine body specification (CM, CF, CI, CF, CFI, CFY, etc.)
※ ϕ12 and ϕ16 are not available for F
※ I and Y are delivered without assembly

8 Special Option
Blank : Standard type
XC16 : Copper-free
※ Ø12~Ø40 : XC16 is standard type

9 Auto switch
Blank : None
Reed switch
W4 : W4 (Ø32~Ø100)
W8H(V) : Subcompact auto switch horizontal (vertical) type, 2 wire type
Non contact auto switch
W9H(V) : Subcompact auto switch horizontal (vertical) type, 2 wire type
W9H(V)N: Subcompact auto switch horizontal (vertical) type, 3 wire type
W2P(L): Ø50~Ø100
※ In case of 3m lead line, L should be added at the end of item number
※ In case of 5m lead line, please contact us

10 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

Item Number of Mountings

Bore Size (mm)	Foot	Flange	Double Clevis
12	QL-012	QF-012	QD-012
16	QL-016	QF-016	QD-016
32	QL-032	QF-032	QD-032
40	QL-040	QF-040	QD-040
50	QL-050	QF-050	QD-050
63	QL-063	QF-063	QD-063
80	QL-080	QF-080	QD-080
100	QL-100	QF-100	QD-100

※ In case of ordering foot fittings, please order 2EA foot fittings per 1EA cylinder

● Notice

※ Production of middle stroke
Minimum 3mm to 1mm middle stroke production is available by means of mountings spacer at standard stroke cylinder.
ex) AQ2B32-27D inserts 3mm wide spacer in standard cylinder AQ2B32-30D
ex) AQ2B32-29D inserts 21mm wide spacer in standard cylinder AQ2B32-50D

Notices for products

Please fully understand the notices prior to utilization, and refer to safety notice and common notice.

Warning

Assembly/Disassembly of Snap Ring

- Please use proper flyer (Attached tool of C-type snap ring) for assembly / disassembly.
- Please be cautious all the time, there is possible damage to human body or vicinity equipments owing to projection of snap ring at the end of flyer (C-type snap ring) in spite of using proper flyer (Attached tool of C-type snap ring). Moreover, after checking full connection of snap ring during attachment, supply air.

Mounting

- Loading removing should be carried out with fixing load side piston rod 2 face width part.
- If load-side piston rod is not firmly fixed, connecting part (screw fixing part) of piston rod is possibly released.

Options

Bore Size(mm)			12	16	32	40	50	63	80	100
Air Pressure Type	Mounting	Through-hole	○	○	○	○	○	○	○	○
		Both ends Tap	○	○	○	○	○	○	○	○
	Built-In Magnet		○	○	○	○	○	○	○	○
	Piping Method	Thread Type	M5×0.8		M5×0.8 (Note1) / Rc(PT)1/8	Rc(PT)1/8	Rc(PT)1/4		Rc(PT)3/8	
	Rod end Male Thread		○	○	○	○	○	○	○	○
	Rubber Cushion Mount		○	○	○	○	○	○	○	○

(Note1) When requiring style without auto switch, M5×0.8 for 5mm stroke only.

Specification

Type	Air Pressure (non-lubrication) Type
Applied Fluid	Air
Guaranteed Pressure Resistance	1.5MPa{15.3kgf/cm²}
Maximum Pressure Applied	1.0MPa{9.9kgf/cm²}
Ambient and Applied Fluid Temperature	-10℃~70℃(No Frozen)
Rod end Thread	KS Class 2
Stroke Tolerance	$^{+1.0}_{0}$
Piston Speed	50~500mm/s
Rubber Cushion	None
Rod end Thread	Female Thread
Mounting	Through Hole

Minimum Operation Pressure

(Unit : MPa)

Bore Size(mm)	12	16	32	40	50	63	80	100
Air Pressure (no Fuel) Type	0.07	0.07	0.05	0.05	0.05	0.05	0.05	0.05

Weight Table

(Unit : g)

Bore Size (mm)	Cylinder Stroke (mm)					
	5	10	15	20	25	30
12	42	49	56	63	71	77
16	63	74	85	96	107	118
32	192	220	244	268	292	316
40	292	323	354	385	416	447
50	–	528	573	618	663	708
63	–	676	714	753	792	831
80	–	1241	1325	1409	1493	1577
100	–	2106	2225	2344	2463	2582

Option Weights

(Unit : g)

Bore Size(mm)		12	16	32	40	50	63	80	100
Attachment Both End Tap Type		1	2	7	6	7	17	31	43
Rod End	Male Thread Part	1.5	3	50	50	104	104	288	348
Male Thread	Nut	1	2	34	34	64	64	98	232
Rubber Cushion Attached		1	2	4	6	10	16	25	42

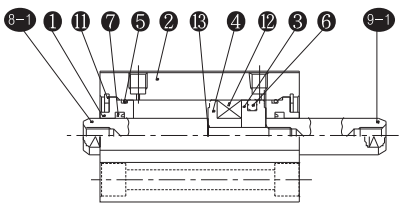
Calculation Method

ex) AQ2WA16-20DCM

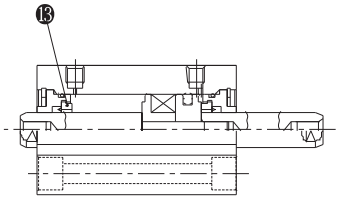
- Standard Weight : AQ2WB16-20D ·····96g
- Extra Weight : Attachment both end tap type ·····2g
  Rod end male thread ·····5g
  Rubber cushion attached ·····2g

105g

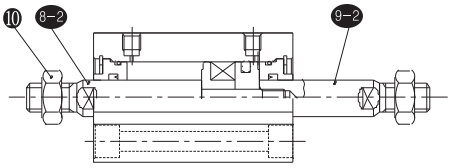
Construction/Parts List



Standard Type



Rubber Cushion Attached



Rod End Male Screw

Theoretical Force

(Unit : N)

Bore Size (mm)	Appliend Pressure (MPa)		
	0.3	0.5	0.7
12	25	42	59
16	45	75	106
32	181	302	422
40	317	528	739
50	495	825	1150
63	841	1400	1960
80	1360	2270	3170
100	2140	3570	5000

1N = 0.102kgf
1MPa = 10.2kgf/cm2

Parts List

No	Item Name	Quantity	Material	Remark
1	Rod Cover	2	Aluminum alloy	Hard Alumite
2	Cylinder Tube	1	Aluminum alloy	
3	Piston	1	Aluminum alloy	Chromite
4	Piston-B	1	Aluminum alloy	Chromite
5	Gasket	2	NBR	
6	Piston Packing	1	NBR	
7	Rod Packing	2	NBR	
8-1	Piston Rod-A	1	Stainless Steel	Female Thread Type
8-2	Piston Rod-A	1	Stainless Steel	Male Thread Type
9-1	Piston Rod-B	1	Stainless Steel	Female Thread Type
9-2	Piston Rod-B	1	Stainless Steel	Male Thread Type
10	Rod End Nut	2	Steel	Zinc White Galvanizing
11	Snap Ring	2	Carbon Tool Steel	Black Coloring
12	Magnet	1	NBR+Ba Ferrite	
13	Bumper "A"	2	Polyurethane	Rod Cover Side Equipped

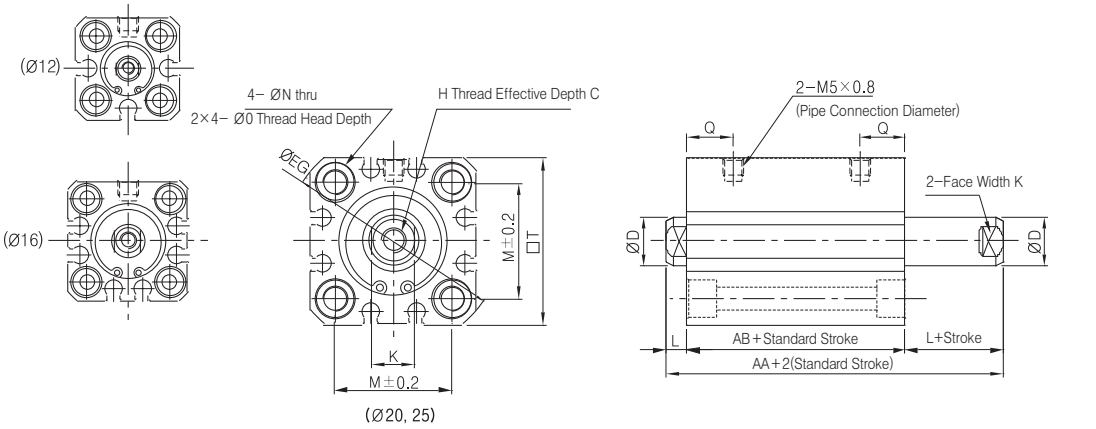
※ In case of Ø12 and Ø16, divided to piston and piston-B.
※ In case of Ø12 and Ø16, rear boss mount and end plate do not exist.
※ Copper free is basic.
Notice) Non automatic type carbon steel

Seal Kits/Exchanging Parts/Air Pressure (non-lubrication) Type

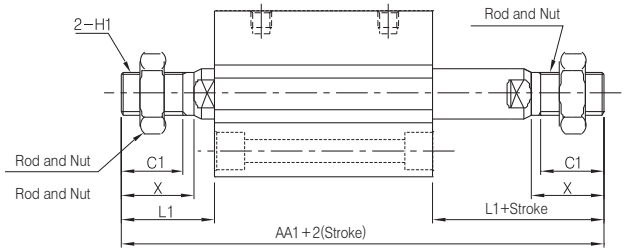
NO	Item Number	Material	Ø12	Ø16	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
5	GASKET	Rubber	C-10	C-14	C-29	C-36	C-46	C-60	C-75	C-95
6	PISTON PACKING	Rubber	TPSA-12	TPSA-16	PPD-32	PPD-40	PPD-50	PPD-63	PPD-80	PPD-100
7	ROD PACKING	Rubber	DYR-6K	DYR-8K	DYR-16	PDU-16Z	PDU-20Z	PDU-20Z	PDU-25Z	PDU-30Z

Standard Type (Through Hole type)/AQ2WB, ADQ2WB

Rod End
Female Thread Type



Rod End
Male Thread Type



Rod End Male Thread Type

(Unit : mm)

Bore Size	AA1		L1	C1	H1	X
	Non–Auto Switch	Mounting Auto Switch				
12	53.6	60	14	9	M5×0.8	12
16	57	60	15.5	10	M6×1.0	16

Standard Type

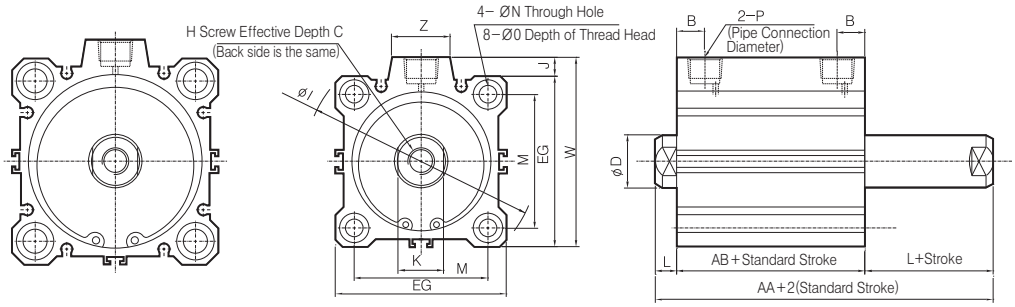
(Unit : mm)

Bore Size	Range of Standard Stroke	Non–Auto Switch				Mounting Auto Switch				D	N	K	ØEG	M	□T	H	C	O
		AA	AB	L	Q	AA	AB	L	Q									
12	5 ~ 30	32.6	25.6	3.5	9	39	32	3.5	10.5	6	3.5	5	32	15.5	25	M3×0.5	6	6.5 Depth 4
16	5 ~ 30	33	26	3.5	10	43	36	3.5	10	8	3.5	6	38	20	29	M4×0.7	8	6.5 Depth 4

※ In case of rubber cushion attachment, external dimension is same as standard type above.

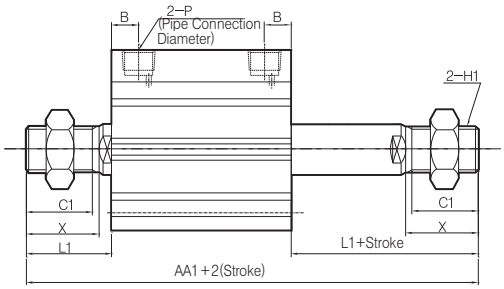
※ For both ends tap type, refer to p.333

Standard Type (Through Hole type)/AQ2WB, ADQ2WB



※ In case of Ø63, 80, 100

※ In case of Ø32, 40, 50



Rod End Male Thread Type

(Unit : mm)

Bore Size	AA1		C1	H1	L1	X
	No Auto Switch	Auto Switch Exists				
Ø32	87.5	97.5	20.5	M14×1.5	28.5	23.5
Ø40	97	107	20.5	M14×1.5	28.5	23.5
Ø50	107.5	117.5	26	M18×1.5	33.5	28.5
Ø63	109	119	26	M18×1.5	33.5	28.5
Ø80	138	148	32.5	M22×1.5	43.5	35.5
Ø100	147.5	157.5	32.5	M26×1.5	43.5	35.5

Standard Type

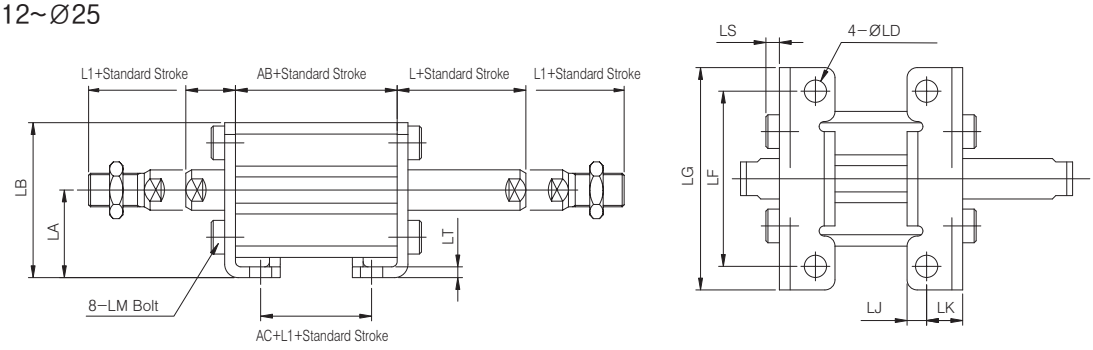
(Unit : mm)

Bore Size	Range of Standard Stroke	Standard Stroke						C	D	EG	B	H	I	J	K	L	M	N	ØO	W	Z
		No Auto Switch			Auto Switch Exists																
		AA	AB	P	AA	AB	P														
Ø32	5	44.5	30.5	M5 X 0.8	54.5	40.5	Rc(PT) 1/8	13	16	45	12.5	M8X1.25	60	4.5	14	7	34	5.5	9 Depth 7	49.5	14
	10~50	44.5	30.5	Rc(PT) 1/8																	
	75, 100	54.5	40.5																		
Ø40	5~50	54	40	Rc(PT) 1/8	64	50	Rc(PT) 1/8	13	16	52	14	M8X1.25	69	5	14	7	40	5.5	9 Depth 7	57	14
	75, 100	64	50																		
Ø50	10~50	56.5	40.5	Rc(PT) 1/4	66.5	50.5	Rc(PT) 1/4	15	20	64	14	M10X1.5	87	7	17	8	50	6.6	11 Depth 8	71	22
	75, 100	66.5	50.5																		
Ø63	10~50	58	42	Rc(PT) 1/4	68	52	Rc(PT) 1/4	15	20	77	15.5	M10X1.5	103	7	17	8	60	9	14 Depth 10.5	84	22
	75,100	68	52																		
Ø80	10~50	71	51	Rc(PT) 3/8	81	61	Rc(PT) 3/8	21	25	98	18	M16X2.0	132	6	22	10	77	11	17.5 Depth 13.5	104	26
	75, 100	81	61																		
Ø100	10~50	84.5	60.5	Rc(PT) 3/8	94.5	70.5	Rc(PT) 3/8	27	30	117	22	M20X2.5	156	6.5	27	12	94	11	17.5 Depth 13.5	123.5	26
	75, 100	94.5	70.5																		

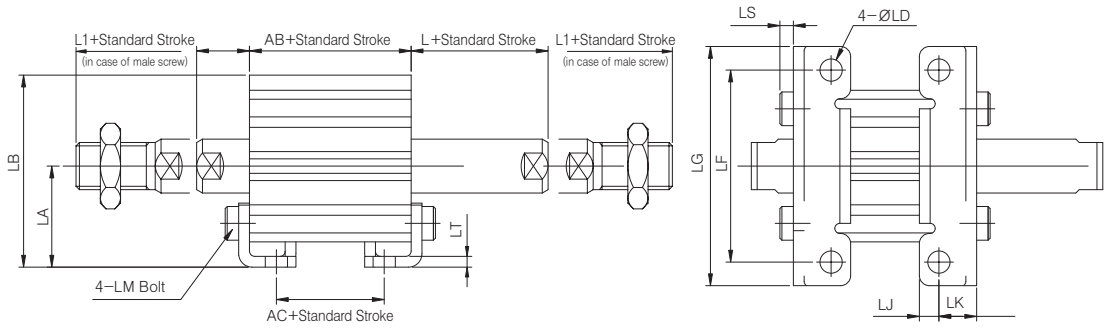
※ Please contact us for longer stroke than basic.

Foot Type/A(D)Q2WL

Ø12~Ø25



Ø32~Ø100



Material : Carbon Steel

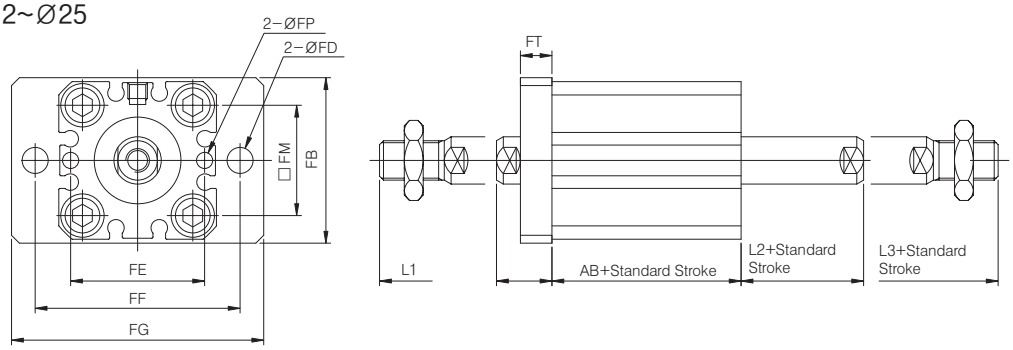
(Unit : mm)

Bore Size (Ø)	Range of Standard Stroke	Standard Stroke				L	L1	LA	LB	LD	LF	LG	LJ	LM	LK	LS	LT
		No Auto Switch		Auto Switch Exists													
		AB	AC	AB	AC												
12	5~30	25.6	13.6	32	20	13.5	24	17	29.5	4.5	34	44	4.5	M4×0.7	8	2.8	2
16	5~30	26	14	36	24	13.5	25.5	19	33.5	4.5	38	48	5	M4×0.7	8	2.8	2
32	5~50	30.5	14.5	40.5	24.5	17	38.5	30	57	6.6	57	71	5.8	M6×1.0	11.2	4	3.2
	75, 100	40.5	24.5														
40	5~50	40	24	50	34	17	38.5	33	64	6.6	64	78	7	M6×1.0	11.2	4	3.2
	75, 100	50	34														
50	10~50	40.5	17.5	50.5	27.5	18	43.5	39	78	9	79	95	8	M8×1.25	14.7	5	3.2
	75, 100	50.5	27.5														
63	10~50	42	16	52	26	18	43.5	46	91.5	11	95	113	9	M10×1.5	16.2	5	3.2
	75, 100	52	26														
80	10~50	51	21	61	31	20	53.5	59	114	13	118	140	11	M12×1.75	19.5	7	4.5
	75, 100	61	31														
100	10~50	60.5	26.5	70.5	36.5	22	53.5	71	136	13	137	162	12.5	M12×1.75	23	7	6
	75, 100	70.5	36.5														

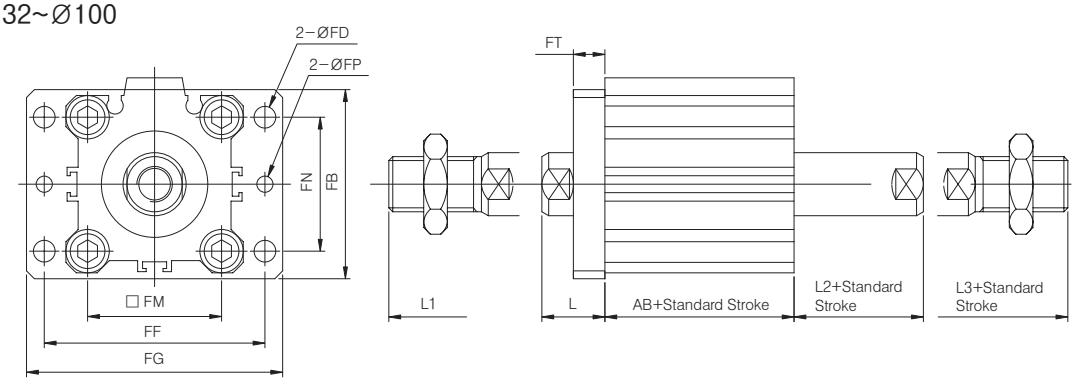
※ In case of mounting attached cylinder, A-type tube is standard.
※ Indication and dimension are same as dimension of standard cylinder.
※ Cylinder and fittings are delivered without assembly.
※ Please contact us for longer stroke than basic.

Flange Type/A(D)Q2WF

Ø12~Ø25



Ø32~Ø100



Material : Carbon Steel

(Unit : mm)

Bore Size (Ø)	Range of Standard Stroke	Standard Stroke		L	L1	L2	L3	FB	FD	FP	FE	FF	FG	FM	FN	FT
		No Auto Switch	Auto Switch Exist													
		AB	AB													
12	5~30	25.6	32	13.5	24	3.5	14	25	4.5	3.1	23	45	55	15.5	–	5.5
16	5~30	26	36	13.5	25.5	3.5	15.5	30	4.5	3.1	24	45	55	20	–	5.5
32	5~50	30.5	40.5	17	38.5	7	28.5	48	5.5	4.1	–	56	65	34	34	8
	75, 100	40.5														
40	5~50	40	50	17	38.5	7	28.5	54	5.5	4.1	–	62	72	40	40	8
	75, 100	50														
50	10~50	40.5	50.5	18	43.5	8	33.5	67	6.6	5.1	–	76	89	50	50	9
	75, 100	50.5														
63	10~50	42	52	18	43.5	8	33.5	80	9	5.1	–	92	108	60	60	9
	75, 100	52														
80	10~50	51	61	20	53.5	10	43.5	99	11	6.1	–	116	134	77	77	11
	75, 100	61														
100	10~50	60.5	70.5	22	53.5	12	43.5	117	11	6.1	–	136	154	94	94	11
	75, 100	70.5														

※ In case of mounting attached cylinder, A−type tube is standard.

※ Indication and dimension are same as dimension of standard cylinder.

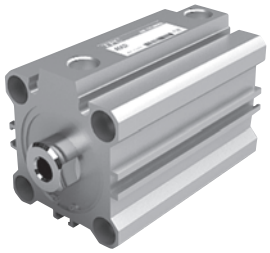
※ Cylinder and fittings are delivered without assembly.

※ Please contact us for longer stroke than basic.

Series AQ2, ADQ2

Compact Cylinder (Square Tube) : Standard Type/Single Acting - Single Rod

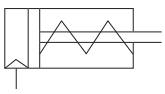
Bore Size(mm) : Ø12, Ø16, Ø25, Ø32, Ø40, Ø50



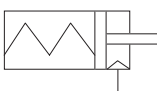
- SINGLE ACTION COMPACT TYPE CYLINDER
- SPACE SAVING CYLINDER
- COMPACT DEVICE DESION AVAILABLE
- SMALL AUTO SWITCH EQUIPPED IN SQUARE TUBE

Symbol

Single Action : Single Rod



Retraction type



How to Order

□ A D Q2 B 16 — 10 S M — ○ — W8H ○

1 2 3 4 5 6 7 8 9 10

1 Magnet
Blank : Rc(PT)
U : NPT

2 Magnet
Blank : None
D : Built-in magnet

3 Mounting
B : Through hole (standard type)
A : Both end tap (refer to p.323)
D : Double Clevis (standard both end type)
F : Rod side flange (standard both end type)
G : Head side flange (standard both end type)
L : Foot (standard both end type)
※ Mountings are delivered without assembly

4 Bore Size
12 : 12mm(½Nom.) 32 : 32mm(1¼Nom.)
16 : 16mm(⅝Nom.) 40 : 40mm(1½Nom.)
25 : 25mm(1Nom.) 50 : 50mm(2Nom.)

5 Stroke(mm)

Bore Size	Standard Stroke
Ø12, Ø16, Ø25	5, 10
Ø32, Ø40, Ø50	5, 10

6 Action
S : Single actiong extension type
T : Single acting retraction type
※ In case of Ø32, 40 and 50, T single acting retraction are not available.

7 Body option
Blank : Standard type (rod end female thread)
M : Rod end male thread
F : Rear boss mount
I : Single knuckle joint (rod end male thread)
Y : Double Knuckle Joint (rod end male thread)
※ Possible to combine body specification (FM, FI, FY)
※ Except F for ϕ12 and ϕ16 cases
※ I and Y are delivered without assembly

8 Series
Blank : Standard type
XC16 : Copper-free
※ Ø12~Ø40 : XC16 is standard type

9 Auto switch
Blank : None
Reed switch
W4 : W4 (Ø32~Ø100)
W8H(V) : Subcompact auto switch horizontal (vertical) type, 2 wire type
Non contact point existing auto switch
W9H(V) : Subcompact auto switch horizontal (vertical) type, 2 wire type
W9H(V)N : Subcompact auto switch horizontal (vertical) type, 3 wire type
W2P(L) : Ø50~Ø100
※ In case of 3m lead wire, L should be added at the end of item number
ex) W4L or W2PL
※ In case of 5m lead wire, please contact us

10 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

Item Number of Mounting

Bore Size (mm)	Foot	Flange	Double Clevis
12	QL-012	QF-012	QD-012
16	QL-016	QF-016	QD-016
32	QL-032	QF-032	QD-032
40	QL-040	QF-040	QD-040
50	QL-050	QF-050	QD-050

※ In case of ordering foot mountings, please order 2EA foot mounting per 1EA cylinder

● Notice

※ Production of middle stroke
Minimum 3mm to 1mm middle stroke production is available by means of mountings spacer at standard stroke cylinder.
ex) AQ2B12-27D inserts 3mm wide spacer in standard cylinder AQ2B12-30D
ex) AQ2B12-29D inserts 21mm wide spacer in standard cylinder AQ2B12-50D

Notices for products

Please fully understand the notices prior to utilization, and refer to safety notice and common notice.

Warning

Assembly/Disassembly of Snap Ring

- Please use proper flyer (Attached tool of C-type snap ring) for assembly / disassembly.
- Please be cautious all the time that there is a possible damage to human body or vicinity equipments owing to projection of snap ring at the end of wrench (C-type snap ring) in spite of using proper flyer (Attached tool of C-type snap ring). Moreover, after checking full connection of snap ring during attachment, supply air.

Mounting

- Loading removing should be carried out with fixing load side piston rod 2 face width part.
- If load-side piston rod is not firmly fixed, connecting part (screw fixing part) of piston rod is possibly released.

Options

Bore Size(mm)			12	16	25	32	40	50
Air Pressure Type	Attachment	Through Hole (Standard)	○	○	○	○	○	○
		Both end Tap	○	○	○	○	○	○
	Magnetic Built-In		○	○	○	○	○	○
	Piping Method	Thread Type	M5×0.8			M5×0.8 (Note1) / Rc(PT)1/8	Rc(PT)1/4	Rc(PT)1/4
	Rod end Male Thread		○	○	○	○	○	○
	Rubber Cushion Attached		○	○	○	○	○	○

(Note 1) When requiring style without auto switch, M5×0.8 for 5mm stroke only

Specifications

Type	Air Pressure (non-lubricationl) Type
Applied Fluid	Air
Guaranteed Pressure Resistance	1.5MPa{15.3kgf/cm²}
Maximum Pressure Applied	1.0MPa{9.9kgf/cm²}
Ambient and Applied Fluid Temperature	−10℃~70℃(No Frozen)
Rod end Thread Tolerance	KS Class 2
Stroke Tolerance	$^{+1.0}_{0}$
Piston Speed	50~500mm/s
Rubber Cushion	None
Rod end Thread	Female Thread
Mounting	Through Hole

Minimum Operation Pressure

(Unit : MPa)

Bore Size(mm)	12	16	25	32	40	50
Air Pressure (non-lubricationl) Type	0.07	0.07	0.15	0.17	0.15	0.13

Weight Table

(Unit : g)

Operation Method	Bore Size (mm)	Cylinder Stroke (mm)	
		5	10
Forward Type	12	40	47
	16	61	72
	25	118	139
	32	157	181
	40	276	298
	50	–	413
Backward Type	12	46	53
	16	66	78
	25	124	143

Option Weights

(Unit : g)

Bore Size(mm)		12	16	25	32	40	80
Attachment Both End Tap Type		1	2	7	7	6	7
Rod End Male Thread	Male Thread Part	1.5	3	12	26	27	53
	Nut	1	2	8	17	17	32
Rear Boss Mount		0.7	1.3	3	5	7	13
Rubber Cushion Attached		1	2	4	4	6	10

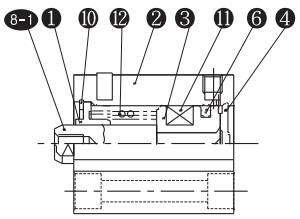
Calculation Method

ex) AQ2A25-10SM

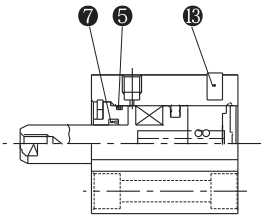
- Standard Weight : AQ2B25-10S ·····139g
- Extra Weight : Attachment both end tap type ·····7g
  Rod end male thread ·····20g
  Rubber cushion attached ·····4g

170g

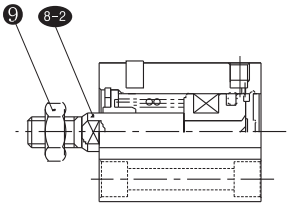
Constraction/Parts List



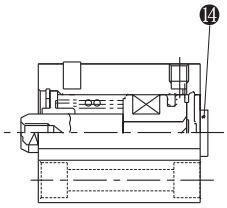
Forward Type



Backward Type



Rod End Male Screw



Rear Boss Mount

Parts List

No	Item Name	Quantity	Material	Remark
1	Rod Cover	1	Aluminum alloy	Hard Alumite
2	Cylinder Tube	1	Aluminum alloy	
3	Pistion	1	Aluminum alloy	Chromite
4	End Plate	1	Aluminum alloy	Hard Alumite
5	Gasket	1	NBR	
6	Piston Packing	1	NBR	
7	Rod Packing	1	NBR	
8–1	Piston Rod	1	Stainless Steel	Female Screw Type
8–2	Piston Rod	1	Stainless Steel	Male Screw Type
9	Rod End Nut	1	Steel	Zinc White Galvanizing
10	Snap Ring	1	Carbon Tool Steel	Black Coloring
11	Magnet	1	NBR+Ba Ferrite	
12	Return Spring	1	Spring Steel	
13	Air Exhaust bolt	1	Steel	Chromite
14	Nut Ring	1	Aluminum alloy	Hard Alumite

※ In case of Ø12 and Ø16, divided to piston and piston–B.
※ In case of Ø12 and Ø16, head side nut and end plate do not exist.
※ Copper free is basic.

Seal Kits/Exchanging Parts/Air Pressure (non-lubrication) Type

NO	Item Name	Material	Ø12	Ø16	Ø25	Ø32	Ø40	Ø50
5	GASKET	NBR	C10	C14	C22	C29	C36	C46
6	PISTON PACKING	NBR	PSD–12	PSD–16	PSD–25	PPD–32	PPD–40	PPD–50
7	ROD PACKING	NBR	DYR–6K	DYR–8K	DYR–12	DYR–16	PDU–16Z	PDU–20Z

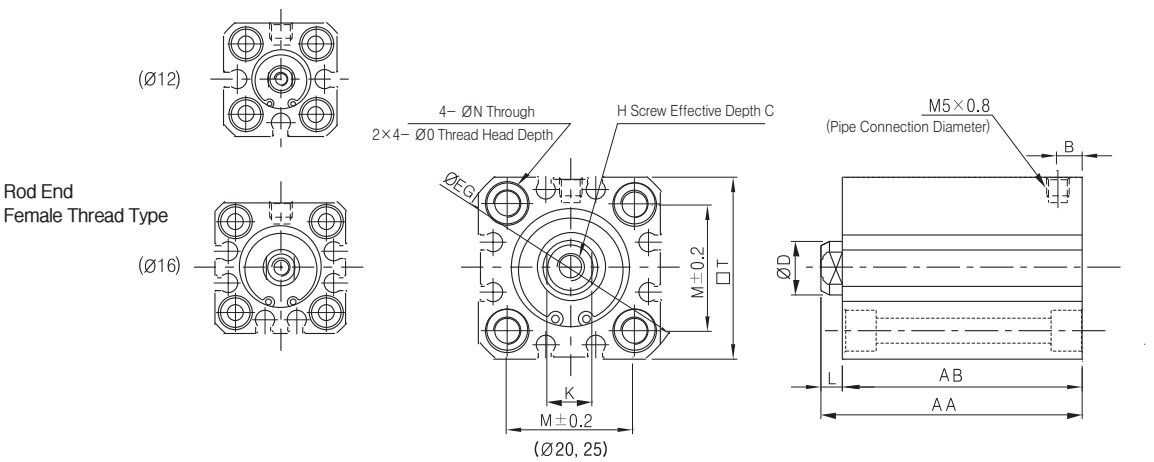
Theoretical Force

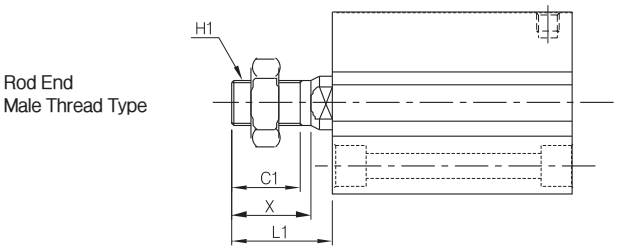
(Unit : N)

Operation Method	Bore Size (mm)	Applied Pressure(MPa) 0.3	0.5	0.7	Spring Restoration Start	End	Rod End Allowance Attached Max When Horizontal Load
Rorward Type	12	7	19	28	4	2	3.1
	16	26	57	79	10	4	3.3
	25	188	265	387	19	12	6.6
	32	217	378	593	24	15	17.4
	40	347	598	850	30	13	17.4
	50	535	928	1,316	54	25	30.4
Backward Type	12	5	11	15	10	2	3.1
	16	18	35	55	16	7	3.3
	25	121	187	289	27	9	6.6

1N = 0.102kgf
1MPa = 10.2kgf/cm2

Standard Type (Through Hole Type)/AQ2B, ADQ2B-Single Acting Extension Type



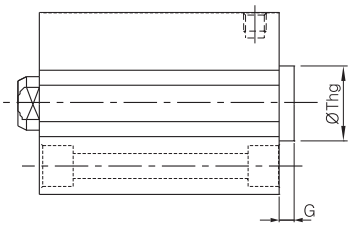


Rod End Male Thread Type (Unit : mm)

Bore Size	L1	C1	H1	X
12	14	9	M5×0.8	10.5
16	15.5	10	M6×1.0	12
25	22.5	15	M10×1.25	17.5

Rear Boss Mount Type (Unit : mm)

Bore Size	G	ØTh9
25	2	$15\ ^{0}_{-0.043}$



Standard Type (Unit : mm)

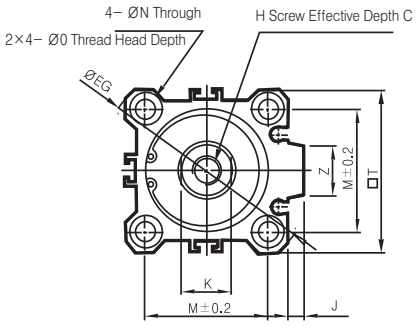
Bore Size	Range of Stroke	No Auto Switch					Auto Switch Exists					L	D	N	K	ØEG	M
		AA		AB		B	AA		AB		B						
		5 st	10 st	5 st	10 st		5 st	10 st	5 st	10 st							
12	5, 10	25.5	30.5	22	27	5	36.5	41.5	33	38	6.5	3.5	6	3.5	5	32	15.5
16		27	32	23.5	28.5	5.5	39	44	30.5	35.5	5.5	3.5	8	3.5	6	38	20
25		32.5	37.5	27.5	32.5	5.5	42.5	47.5	37.5	42.5	5.5	5	12	5.5	10	52	28

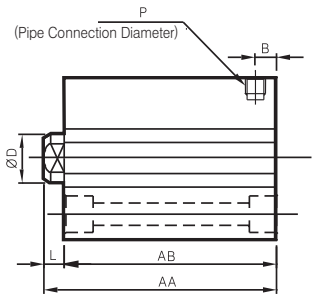
Bore Size	□T	H	C	O
12	25	M3×0.5	6	6.5 Depth 4
16	29	M4×0.7	8	6.5 Depth 4
25	40	M6×1.0	12	9 Depth 7

※ If auto switch does not exist, Ø12–5 stroke, Ø25–5/10 stroke has penetrated both ends for attachment bolt of tube.

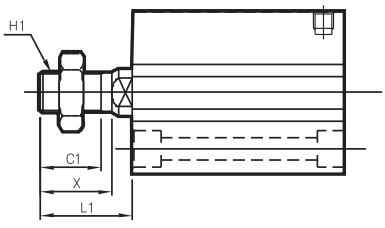
※ For both ends tap type, refer to p.333

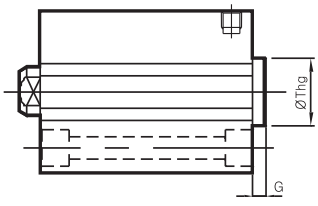
AQ2-Single Acting Extension Type(∅32~50)





Rod End
Male Thread Type





Rod End Male Thread Type (Unit : mm)

Bore Size	L1	C1	H1	X
32	28.5	20.5	M14×1.5	23.5
40	28.5	20.5	M14×1.5	23.5
50	33.5	26	M18×1.25	28.5

Rear Boss Mount Type (Unit : mm)

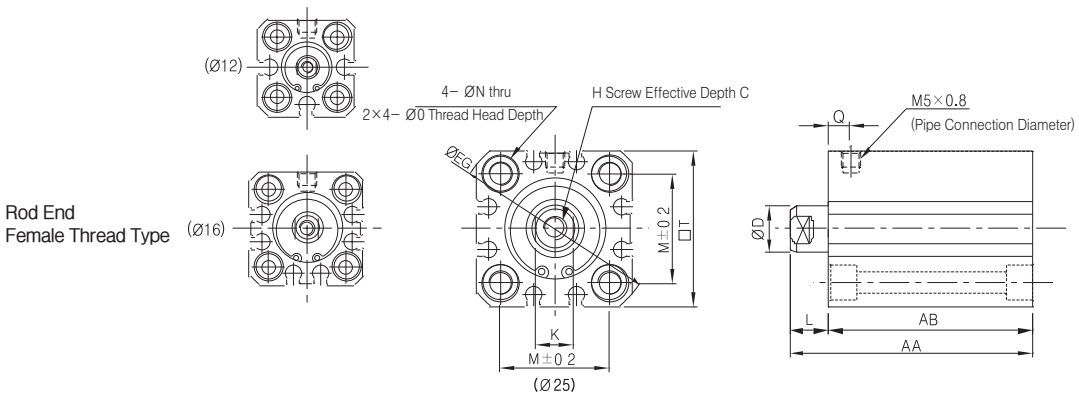
Bore Size	G	ØTh9
32	2	$21\ ^{0}_{-0.052}$
40	2	$28\ ^{0}_{-0.052}$
50	2	$35\ ^{0}_{-0.052}$

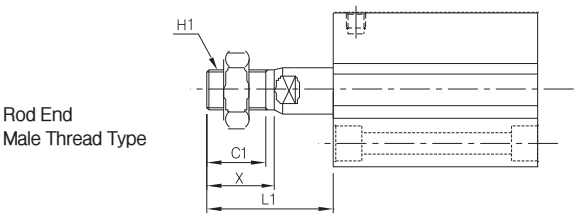
Standard Type (Unit : mm)

Bore Size	No Auto Switch					Auto Switch Exists					L	D	N	K	ØEG	M
	AA		AB		B	AA		AB		B						
	5 st	10 st	5 st	10 st		5 st	10 st	5 st	10 st							
32	35	40	28	33	7.5	45	50	38	43	7.5	7	16	5.5	14	60	34
40	41.5	46.5	34.5	39.5	8	51.5	56.5	44.5	49.5	8	7	16	5.5	14	69	40
50	–	48.5	–	40.5	10.5	–	58.5	–	50.5	10.5	8	20	6.6	17	86	50

Bore Size	□T	H	C	O	J	P	Z
32	45	M8×1.25	13	9 Depth 7	4.5	Rc 1/8	18
40	52	M8×1.25	13	9 Depth 7	5	Rc 1/8	18
50	64	M10×1.5	15	11 Depth 8	7	Rc 1/4	22

Standard Type (Through Hole Type)/AQ2B, ADQ2B – Single Acting Retraction Type

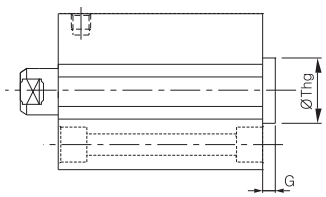




Rod End Male Thread Type

(Unit : mm)

Bore Size	L1		C1	H1	X
	5 st	10 st			
12	19	24	9	M5×0.8	10.5
16	20.5	25.5	10	M6×1.0	12
25	27.5	32.5	15	M10×1.25	17.5



Rear Boss Mount Type

(Unit : mm)

Bore Size	G	ØTh9
25	2	$15\ ^{0}_{-0.043}$

Standard Type

(Unit : mm)

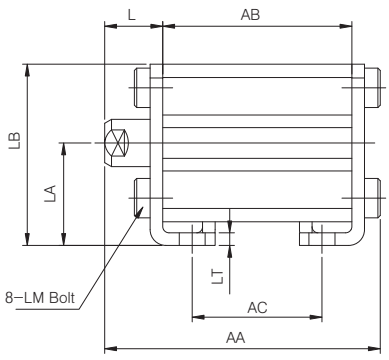
Bore Size	Range of Stroke	No Auto Switch					Auto Switch Exists					L		D	N	K	ØEG	M	□T	C	H	O
		AA		AB		Q	AA		AB		Q											
		5 st	10 st	5 st	10 st		5 st	10 st	5 st	10 st		5 st	10 st									
12	5, 10	30.5	40.5	22	27	7.5	41.5	51.5	33	38	11	8.5	13.5	6	3.5	5	32	15.5	25	6	M3×0.5	6.5 Depth 4
16		32	42	23.5	28.5	8	44	54	35.5	40.5	11	8.5	13.5	8	3.5	6	38	20	29	8	M4×0.7	6.5 Depth 4
25		37.5	47.5	27.5	32.5	11	47.5	57.5	37.5	42.5	11	10	15	12	5.5	10	52	28	40	12	M6×1.0	9 Depth 7

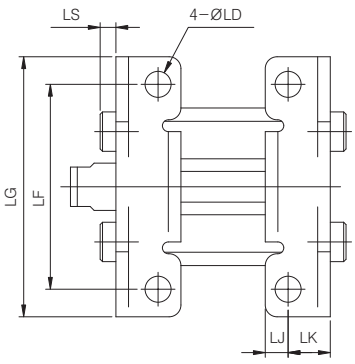
※ If auto switch does not exist, Ø12–5 stroke, Ø25–5/10 stroke has penetrated both ends for attachment bolt of tube.

※ For both ends tap type, refer to p.333

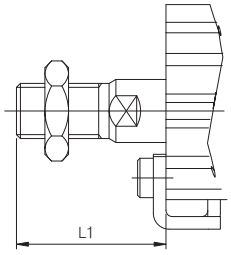
Foot Type/A(D)Q2L

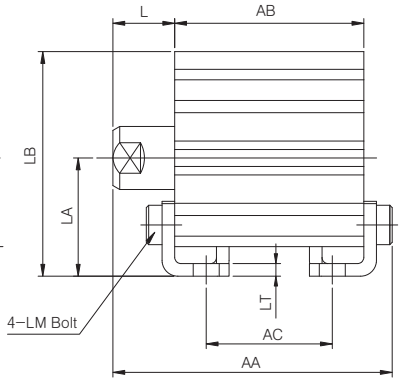
① Ø12~Ø16

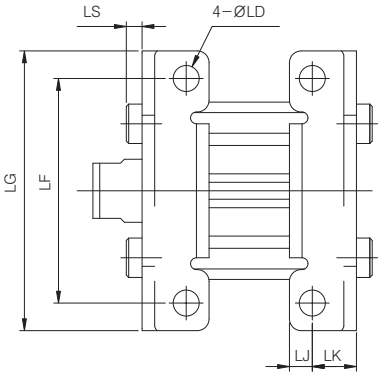




② Ø32, Ø40, Ø50







Material : Carbon Steel

(Unit : mm)

Bore Size (Ø)	Standard Stroke	No Auto Switch			Auto Switch Exists			L	L1	LA	LB	LD	LF	LG	LJ	LM	LK	LS	LT
		AA	AB	AC	AA	AB	AC												
12	5	40.3	22	10	51.3	33	21	13.5	24	17	29.5	4.5	34	44	4.5	M4×0.7	8	2.8	2
	10	45.3	27	15	56.3	38	26												
16	5	41.8	23.5	11.5	53.8	35.5	23.5	13.5	25.5	19	33.5	4.5	38	48	5	M4×0.7	8	2.8	2
	10	46.8	28.5	16.5	58.8	40.5	28.5												
25	5	49.7	27.5	12.5	59.7	37.5	22.5	15	32.5	26	46	6.6	52	66	5.8	M6×1.0	10.7	4	3.2
	10	54.7	32.5	17.5	64.7	42.5	27.5												
32	5	52.2	28	12	62.2	38	22	17	38.5	30	57	6.6	57	71	5.8	M6×1.0	11.2	4	3.2
	10	57.2	33	17	67.2	43	27												
40	5	58.7	34.5	18.5	68.7	44.5	28.5	17	38.5	33	64	6.6	64	78	7	M6×1.0	11.2	4	3.2
	10	63.7	39.5	23.5	73.7	49.5	33.5												
50	10	66.7	40.5	17.5	76.7	50.5	27.5	18	43.5	39	78	9	79	95	8	M8×1.25	14.7	5	3.2

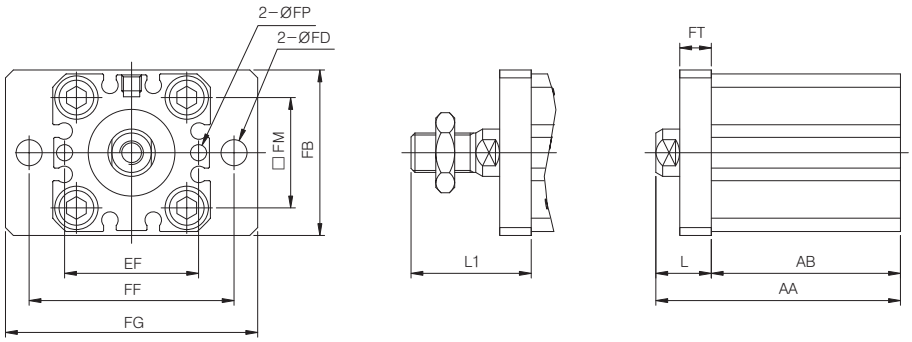
※ In case of mounting attached cylinder, A-type tube is standard.

※ Indication and dimension are same as dimension of standard cylinder.

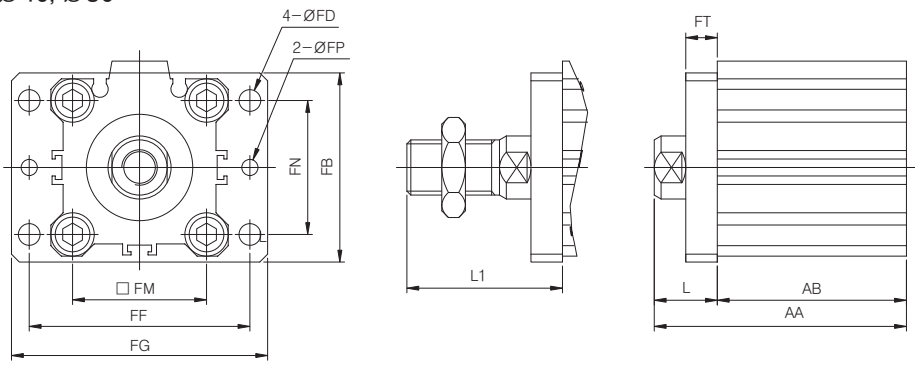
※ Cylinder and foot are delivered without assembly.

Rod Side Flange Type/A(D)Q2F

① Ø12, Ø16, Ø25



② Ø32, Ø40, Ø50



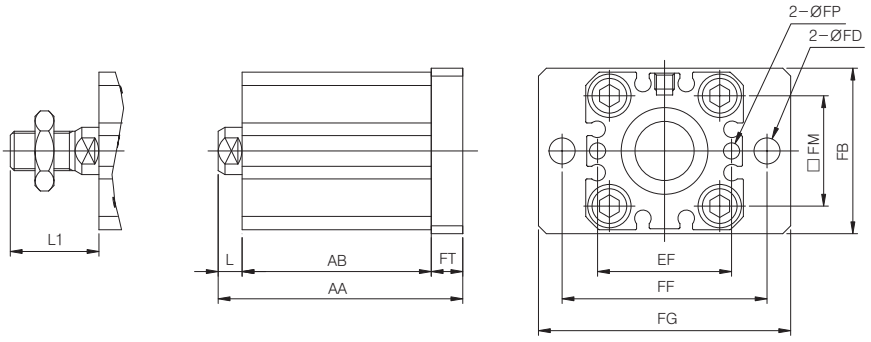
Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Standard Stroke	No Auto Switch		Auto Switch Exists		L	L1	FB	FD	FP	FE	FF	FG	FM	FN	FT
		AA	AB	AA	AB											
12	5	35.5	22	46.5	33	13.5	24	25	4.5	3.1	23	45	55	15.5	–	5.5
	10	40.5	27	51.5	38											
16	5	37	23.5	49	35.5	13.5	25.5	30	4.5	3.1	24	45	55	20	–	5.5
	10	42	28.5	54	40.5											
25	5	42.5	27.5	52.5	37.5	15	32.5	42	6.6	4.1	34	52	64	28	–	8
	10	47.5	32.5	57.5	42.5											
32	5	45	28	55	38	17	38.5	48	5.5	4.1	–	56	65	34	34	8
	10	50	33	60	43											
40	5	51.5	34.5	61.5	44.5	17	38.5	54	5.5	4.1	–	62	72	40	40	8
	10	56.5	39.5	66.5	49.5											
50	10	58.5	40.5	68.5	50.5	18	43.5	67	6.6	5.1	–	76	89	50	50	9

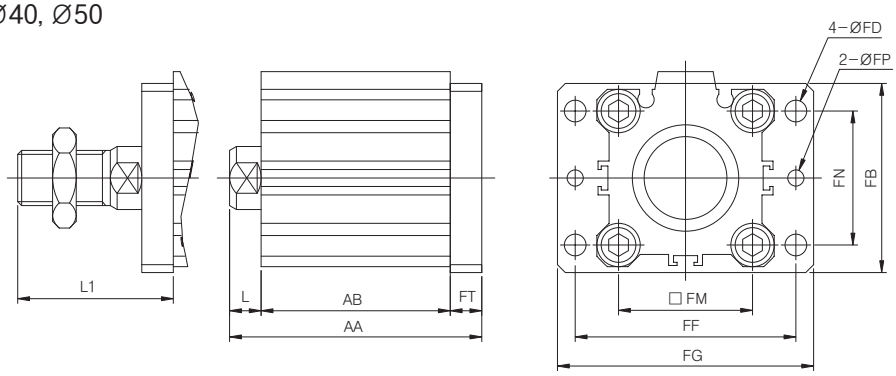
※ In case of mounting attached cylinder, A-type tube is standard.
※ Indication and dimension are same as dimension of standard cylinder.
※ Cylinder and foot are delivered without assembly.

Head Side Flange Type/A(D)Q2G

① Ø12, Ø16, Ø25



② Ø32, Ø40, Ø50



Material : Carbon Steel

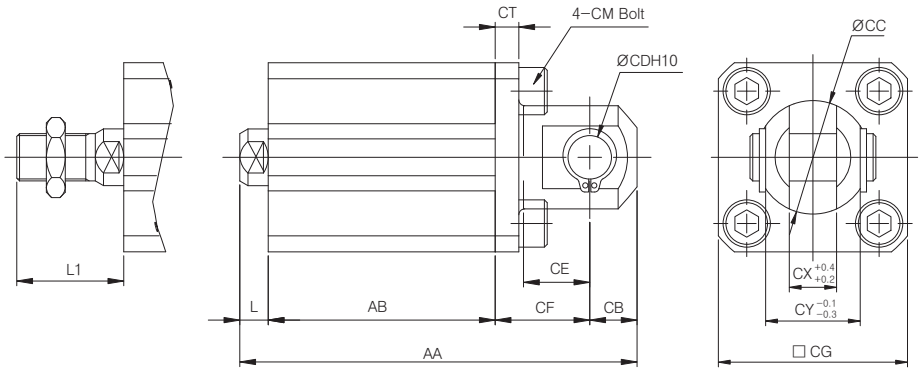
(Unit : mm)

Bore Size (Ø)	Standard Stroke	No Auto Switch		Auto Switch Exists		L	L1	FB	FD	FP	FE	FF	FG	FM	FN	FT
		AA	AB	AA	AB											
12	5	31	22	42	33	3.5	14	25	4.5	3.1	45	23	55	15.5	–	5.5
	10	36	27	47	38											
16	5	32.5	23.5	44.5	35.5	3.5	15.5	30	4.5	3.1	45	24	55	20	–	5.5
	10	37.5	28.5	49.5	40.5											
25	5	40.5	27.5	50.5	37.5	5	22.5	42	6.6	4.1	52	34	64	28	–	8
	10	45.5	32.5	55.5	42.5											
32	5	43	28	53	38	7	28.5	48	5.5	4.1	–	56	65	34	34	8
	10	48	33	58	43											
40	5	49.5	34.5	59.5	44.5	7	28.5	54	5.5	4.1	–	62	72	40	40	8
	10	54.5	39.5	64.5	49.5											
50	10	57.5	40.5	67.5	50.5	8	33.5	67	6.6	5.1	–	76	89	50	50	9

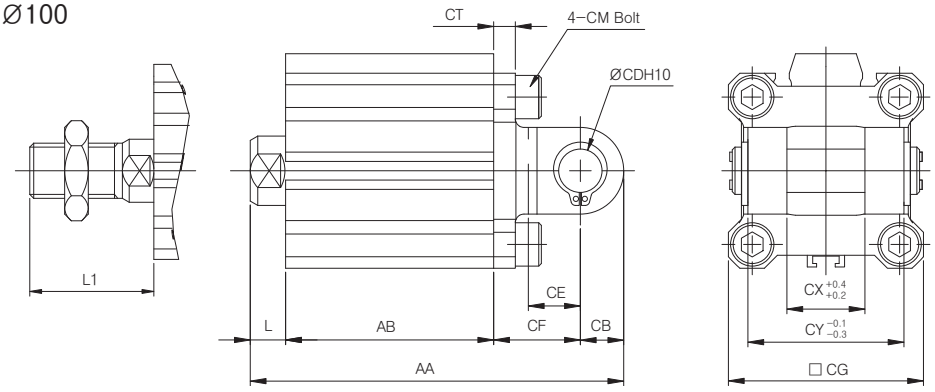
※ In case of mounting attached cylinder, A-type tube is standard.
※ Indication and dimension are same as dimension of standard cylinder.
※ Cylinder and foot are delivered without assembly.

Double Clevis Type/A(D)Q2D

Ø12~Ø25



Ø32~Ø100

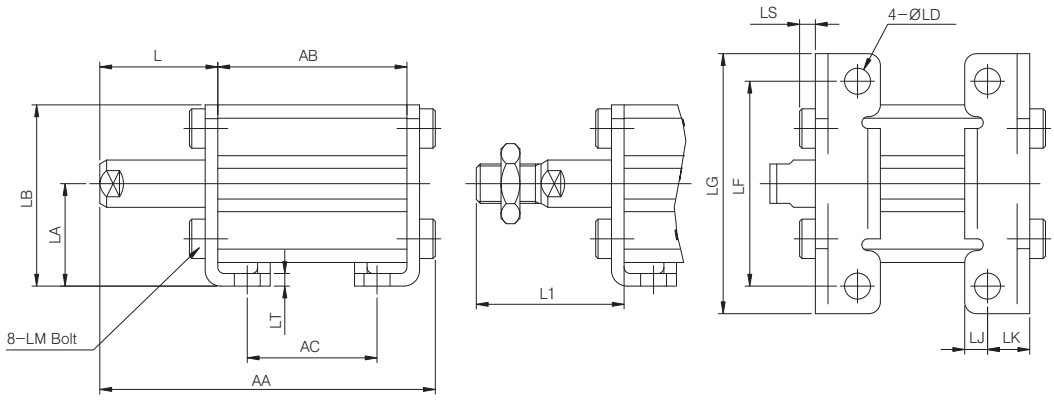


Materia l: Ø12~Ø16–Carbon Steel, Ø32~Ø50–Cast Iron (Unit : mm)

Bore Size (Ø)	Standard Stroke	No Auto Switch		Auto Switch Exists		L	L1	CB	CE	CF	CG	CM	CD	CT	CX	CY	CC (Ø)
		AA	AB	AA	AB												
12	5	45.5	22	56.5	33	3.5	14	6	7	14	25	M4×0.7	5 +0.05 0	4	5	10	12
	10	50.5	27	61.5	38												
16	5	48	23.5	60	35.5	3.5	15.5	6	10	15	29	M4×0.7	5 +0.05 0	4	6.5	12	14
	10	53	28.5	65	40.5												
25	5	62.5	27.5	72.5	37.5	5	22.5	10	14	20	40	M6×1.0	10 +0.06 0	5	10	20	–
	10	67.5	32.5	77.5	42.5												
32	5	65	28	75	38	7	28.5	10	14	20	45	M6×1.0	10 +0.06 0	5	18	36	–
	10	70	33	80	43												
40	5	73.5	34.5	83.5	44.5	7	28.5	10	14	22	52	M6×1.0	10 +0.06 0	6	18	36	–
	10	78.5	39.5	88.5	49.5												
50	10	90.5	40.5	100.5	50.5	8	33.5	14	20	28	64	M8×1.25	14 +0.07 0	7	22	44	–

※ In case of mounting attached cylinder, A-type tube is standard.
※ Indication and dimension are same as dimension of standard cylinder.
※ Cylinder and foot are delivered without assembly.

Foot Type/A(D)Q2L



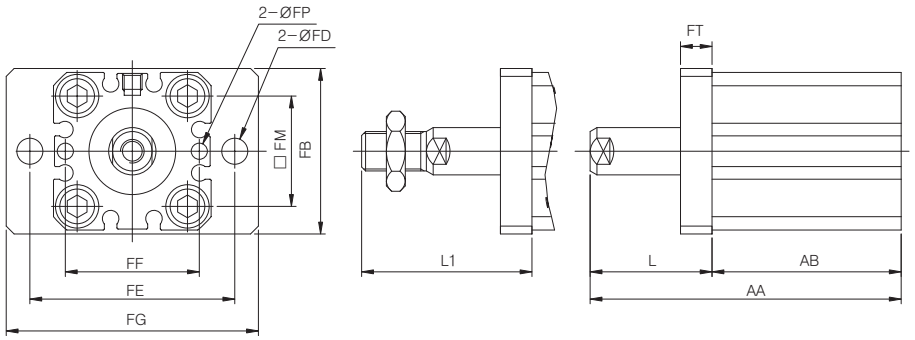
Material : Carbon Steel

(Unit : mm)

Bore Size (Ø)	Standard Stroke	No Auto Switch			Auto Switch Exists			L	L1	LA	LB	LD	LF	LG	LJ	LM	LK	LS	LT
		AA	AB	AC	AA	AB	AC												
12	5	45.3	22	10	56.3	33	21	18.5	29	17	29.5	4.5	34	44	4.5	M4×0.7	8	2.8	2
	10	55.3	27	15	66.3	38	26	23.5	34										
16	5	46.8	23.5	11.5	58.8	35.5	23.5	18.5	30.5	19	33.5	4.5	38	48	5	M4×0.7	8	2.8	2
	10	56.8	28.5	16.5	68.8	40.5	28.5	23.5	35.5										
25	5	54.7	27.5	12.5	64.7	37.5	22.5	20	37.5	26	46	6.6	52	66	5.8	M6×1.0	10.7	4	3.2
	10	64.7	32.5	17.5	74.7	42.5	27.5	25	42.5										

※ In case of mounting attached cylinder, A-type tube is standard.
※ Indication and dimension are same as dimension of standard cylinder.
※ Cylinder and foot are delivered without assembly.

Rod Side Flange Type/A(D)Q2F

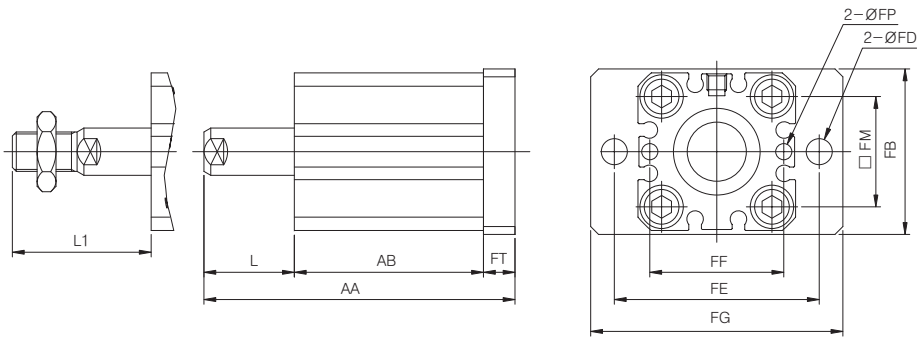


Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Standard Stroke	No Auto Switch		Auto Switch Exists		L	L1	FB	FD	FP	FE	FF	FG	FM	FT
		AA	AB	AA	AB										
12	5	40.5	22	51.5	33	18.5	29	25	4.5	3.1	45	23	55	15.5	5.5
	10	50.5	27	61.5	38	23.5	34								
16	5	42	23.5	54	35.5	18.5	30.5	30	4.5	3.1	45	24	55	20	5.5
	10	52	28.5	64	40.5	23.5	35.5								
25	5	47.5	27.5	57.5	37.5	20	37.5	42	6.6	4.1	52	34	64	28	8
	10	57.5	32.5	67.5	42.5	25	42.5								

※ In case of mounting attached cylinder, A-type tube is standard.
※ Indication and dimension are same as dimension of standard cylinder.
※ Cylinder and foot are delivered without assembly.

Head Side Flange Type/A(D)Q2G



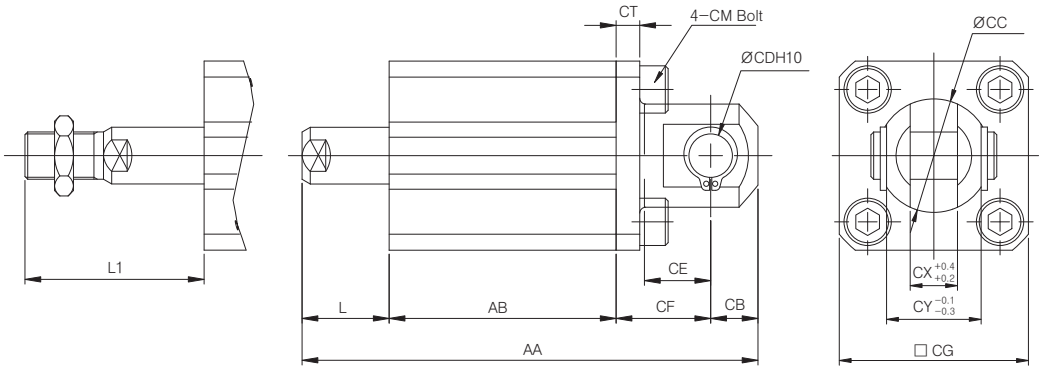
Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Standard Stroke	No Auto Switch		Auto Switch Exists		L	L1	FB	FD	FP	FE	FF	FG	FM	FT
		AA	AB	AA	AB										
12	5	36	22	47	33	8.5	19	25	4.5	3.1	45	23	55	15.5	5.5
	10	46	27	57	38	13.5	24								
16	5	37.5	23.5	49.5	35.5	8.5	20.5	30	4.5	3.1	45	24	55	20	5.5
	10	47.5	28.5	59.5	40.5	13.5	25.5								
25	5	45.5	27.5	55.5	37.5	10	27.5	42	6.6	4.1	52	34	64	28	8
	10	55.5	32.5	65.5	42.5	15	32.5								

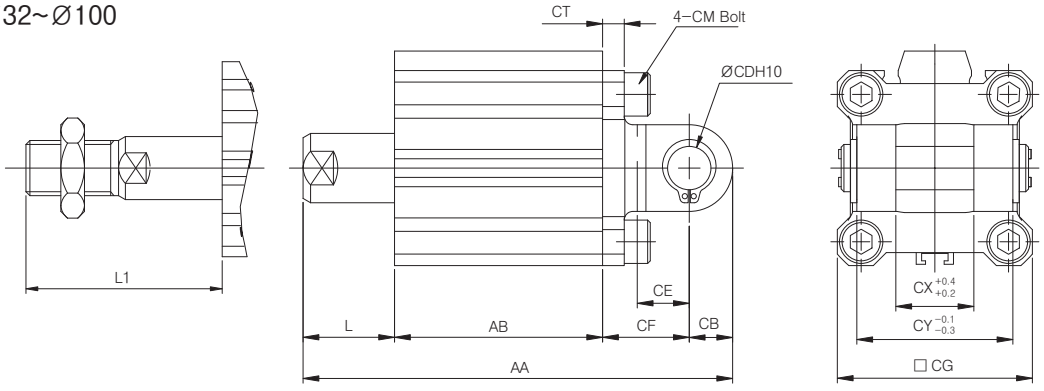
※ In case of mounting attached cylinder, A-type tube is standard.
※ Indication and dimension are same as dimension of standard cylinder.
※ Cylinder and foot are delivered without assembly.

Double Clevis Type/A(D)Q2D

Ø12~Ø25



Ø32~Ø100



Materia l: Ø12~Ø16-Carbon Steel, Ø32~Ø50-Cast Iron (Unit : mm)

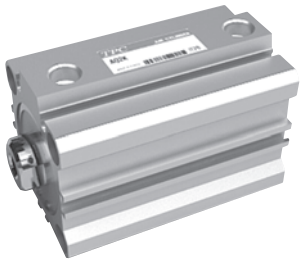
Bore Size (Ø)	Standard Stroke	No Auto Switch		Auto Switch Exists		L	L1	CB	CE	CF	CG	CM	CD	CT	CX	CY	CC (Ø)
		AA	AB	AA	AB												
12	5	50.5	22	61.5	33	8.5	19	6	7	14	25	M4×0.7	5 +0.05 0	4	5	10	12
	10	60.5	27	71.5	38	13.5	24										
16	5	53	23.5	65	35.5	8.5	20.5	6	10	15	29	M4×0.7	5 +0.05 0	4	6.5	12	14
	10	63	28.5	75	40.5	13.5	25.5										
25	5	67.5	27.5	77.5	37.5	10	27.5	10	14	20	40	M6×1.0	10 +0.06 0	5	10	20	24
	10	77.5	32.5	87.5	42.5	15	32.5										

※ In case of mounting attached cylinder, A-type tube is standard.
※ Indication and dimension are same as dimension of standard cylinder.
※ Cylinder and foot are delivered without assembly.

Series AQ2K, ADQ2K

Non-Rotation Rod Type/Double Acting : Single Rod

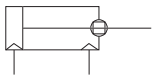
Bore Size(mm) : Ø32, Ø40, Ø50, Ø63



- NON ROD ROTATION COMPACT CYLINDER
- SPACE SAVING CYLINDER
- COMPACT EQUIPMENT DESIGN AVAILABLE

Symbol

Non Rod Rotation Type



How to Order

□ A D Q2K B 32 — 30 D M ○ — W8H S

1 2 3 4 5 6 7 8 9 10

1 Magnet
Blank : Rc(PT)
U : NPT

2 Magnet
Blank : None
D : Built-in magnet

3 Attachment
B : Through hole (standard type)
A : Both end tap
D : Double clevis (standard both end type)
F : Rod side flange (standard both end type)
G : Head side flange (standard both end type)
L : Foot (standard both end type)
※ Mountings are delivered without assembly

4 Bore Size
32 : 32mm(1¼Nom.)
40 : 40mm(1½Nom.)
50 : 50mm(2Nom.)
63 : 63mm(2½Nom.)

5 Stroke(mm)

Bore Size	Standard Stroke
Ø32, 40	5,10,15,20,25,30,35,40,45,50,75,100
Ø50, 63	10,15,20,25,30,35,40,45,50,75,100

6 Action
D : Double Acting Type

7 Body Option
Blank : Standard type (Rod end female thread)
M : Rod end male thread
F : Rear boss mount
I : Single knuckle joint (rod end male thread)
Y : Double Knuckle Joint (rod end male thread)
※ Possible to combine body specification (FM, FI, FY)
※ I and Y are delivered without assembly

8 Series
Blank : Standard type
XC16 : Copper-free
※ Ø32~Ø40 : XC16 is standard type

9 Auto Switch
Blank : None
Reed switch
W4 : W4 (Ø32~Ø100)
W8H(V) : Subcompact auto switch horizontal (vertical) type, 2 wire type
Non contact point existing auto switch
W9H(V) : Subcompact auto switch horizontal (vertical) type, 2 wire type
W9H(V)N : Subcompact auto switch horizontal (vertical) type, 3 wire type
W2P(L): Ø50~Ø100
※ In case of 3m lead wire, L should be added at the end of item number
ex) W4L or W2PL
※ In case of 5m lead wire, please contact us

10 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

Item Number of Mountings

Bore Size (mm)	Foot	Flange	Double Clevis
32	QL-032	QF-032	QD-032
40	QL-040	QF-040	QD-040
50	QL-050	QF-050	QD-050
63	QL-063	QF-063	QD-063

※ In case of ordering foot mounting, please order 2EA foot mountings per 1EA cylinder

● Notice

※ Production of middle stroke
Minimum 3mm to 1mm middle stroke production is available by means of mountings spacer at standard stroke cylinder.
ex) AQ2B12-27D inserts 3mm wide spacer in standard cylinder AQ2B12-30D
ex) AQ2B12-29D inserts 21mm wide spacer in standard cylinder AQ2B12-50D

Notices for products

Please fully understand the notices prior to utilization, and refer to safety notice and common notice.

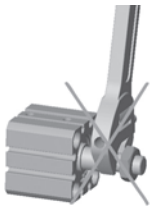
Warning

Assembly/Disassembly of Snap Ring

- Please use proper flyer (Attached tool of C-type snap ring) for assembly / disassembly.
- Please be cautious all the time that there is a possible damage to human body or vicinity equipments owing to projection of snap ring at the end of flyer (C-type snap ring) in spite of using proper flyer (Attached tool of C-type snap ring). Moreover, after checking full connection of snap ring during attachment, supply air.

Attachment

- Loading removing should be carried out with fixing load-side pistion rod 2 face width part.
- If load-side piston rod is not firmly fixed, connection part (screw fixing part) of piston rod is possibly released.



- Please be careful not to allow rotation torque to piston rod during utilization of rod rotation protecting cylinder, otherwise, which may amplify non-rotating level owing to deformation of rotation protecting guide. Allowance of rotating torque follows the table below.

Rotation Allowable Torque	32	40	50	63
kgf • cm or Less	4.5	4.5	4.5	4.5

- Please always use with shaft direction since load of piston rod is in shaft direction.

Options

Bore Size(mm)			32	40	50	63
Air Pressure Type	Attachment	Through Hole (Standard)	○	○	○	○
		Both ends Tap	–	○	○	○
	Magnetic Built-In		○	○	○	○
	Piping Method	Thread Type	Note1) M5×0.8 Rc(PT) 1/8	Rc(PT) 1/8	Rc(PT) 1/4	Rc(PT) 1/4
	Rod end Male-Thread		○	○	○	○
	Rear Boss Mount		○	○	○	○

(Note1) When requiring without auto switch, M5×0.8 for 5mm stroke only

Specifications

Type	Air Pressure (non-lubrication) Type
Applied Fluid	Air
Guaranteed Pressure Resistance	1.5MPa{15.3kgf/cm²}
Maximum Pressure Applied	1.0MPa{9.9kgf/cm²}
Ambient and Applied Fluid Temperature	−10℃~+70℃(No Frozen)
Rod end Thread Tolerance	KS Class 2
Stroke Tolerance	$^{+1.0}_{0}$
Piston Speed	50~500mm/s
Rubber Cushion	None
Rod end Screw	Female Thread
Mount	Through Hole

Minimum Operation Pressure

(Unit : MPa)

Bore Size(mm)	32	40	50	63
Air Pressure (non-lubrication) Type	0.05	0.05	0.05	0.05

Rod Rotation Preventing Specification

Bore Size(mm)	32	40	50	63
Rod Rotation Protecting Level	±0.8°			

Theoretical Output Sheet

(Unit : N)

Bore Size (mm)	Operation direction	Appliend Pressure (MPa)		
		0.3	0.5	0.7
32	IN	181	302	422
	OUT	241	402	563
40	IN	317	528	739
	OUT	377	628	880
50	IN	495	825	1,150
	OUT	589	982	1,370
63	IN	841	1,400	1,960
	OUT	935	1,560	2,180

Weight Sheet

(Unit : g)

Bore Size (mm)	Appliend Pressure (MPa)											
	5	10	15	20	25	30	35	40	45	50	75	100
32	203	223	243	263	283	303	323	343	363	383	403	–
40	215	238	261	284	307	330	353	376	399	422	445	468
50	–	381	418	455	492	529	566	603	640	677	714	751
63	–	550	592	634	676	718	760	802	844	886	928	970

Extra Weigth Sheet

(Unit : g)

Bore Size (mm)		20	25	32	40	50	63
Attachment Both End Tap Type		–	–	–	6	7	17
Rod End Male Thread	Male Thread Part	6	12	26	27	53	53
	Nut	4	8	17	17	32	32
Rear Boss Mount		2	3	5	7	13	25

Calculation Method

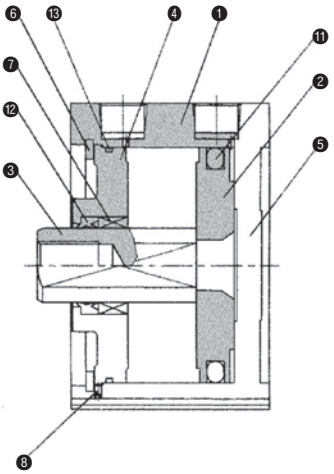
ex) ACQ2KA40-20DM

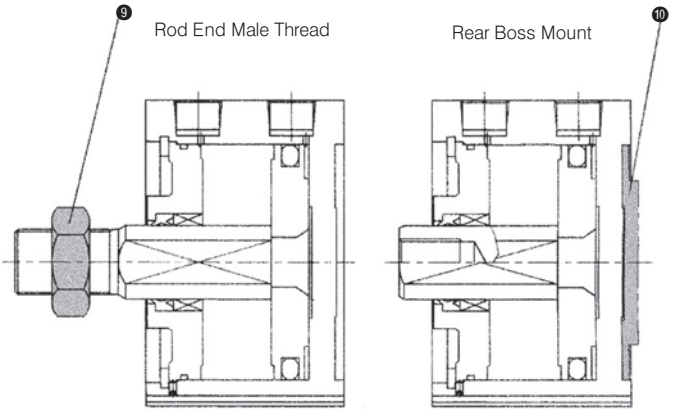
- Standard Weight : ACQ2KB40-20D ·····284g
- Extra Weight : Attachment both end tap type ·····6g
  Rod end male thread ·····44g

334g

Construction/Parts List

Standard Type (Bore Ø32~ Ø63)





Component List

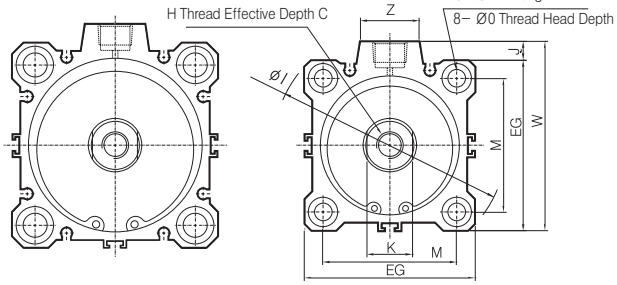
No.	Name of Component	Material	Remark
❶	Cylinder Tub	Aluminum Alloy	Hard alumite
❷	Piston	Aluminum Alloy	Chromite
❸	Piston Rod	Stainless	Ø32~Ø63, Hard Chrome Plated
❹	Rod Cover	Aluminum Alloy	White Hard Alumite
❺	End Plate	Aluminum Alloy	Hard Alumite
❻	Stop Ring	Carbon tool Steel	Phosphate Coating
❼	Bush	Sintered Contained Alloy	
❽	Hexagonal Hole Attached Stop Screw	Alloy Steel	Black Colored
❾	Rod End Nut	Carbon Steel	Nickel Alloy

No.	Name of Component	Material	Remark
❿	Nut Ring	Aluminum Alloy	Hard Alumite

Seal Kits/Exchanging Parts/Air Pressure (non-lubrication) Type

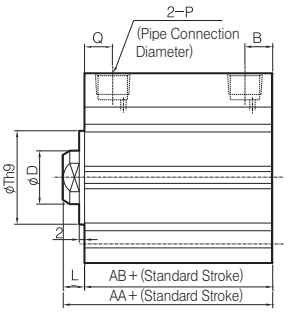
NO	Item Name	Material	Ø32	Ø40	Ø50	Ø63
⓫	Piston Packing	NBR	PPD-32	PPD-40	PPD-50	PPD-63
⓬	Rod Packing	NBR	SORA-16	SORA-16	SORA-20	SORA-20
⓭	Gasket	NBR	C-29	C-36	C-46	C-60

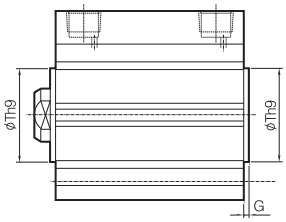
AQ2K/ADQ2K Standard Type (Through Hole Type) / AQ2KB, AQ2KB



※ In case of Ø63

※ In case of Ø32, 40, 50

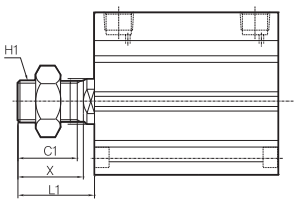




Rod End Male Thread Type

(Unit : mm)

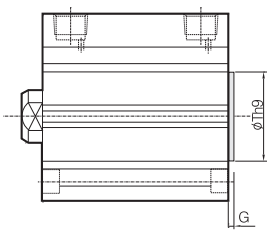
Bore Size(mm)	C1	H1	L1	X
Ø32	20.5	M14×1.5	28.5	23.5
Ø40	20.5	M14×1.5	28.5	23.5
Ø50	26	M18×1.5	33.5	28.5
Ø63	26	M18×1.5	33.5	28.5



Rear Boss Mount Type

(Unit : mm)

Bore Size(mm)	G	Th9
Ø32	2	$21\ ^{0}_{-0.052}$
Ø40	2	$28\ ^{0}_{-0.052}$
Ø50	2	$35\ ^{0}_{-0.062}$
Ø63	2	$35\ ^{0}_{-0.062}$

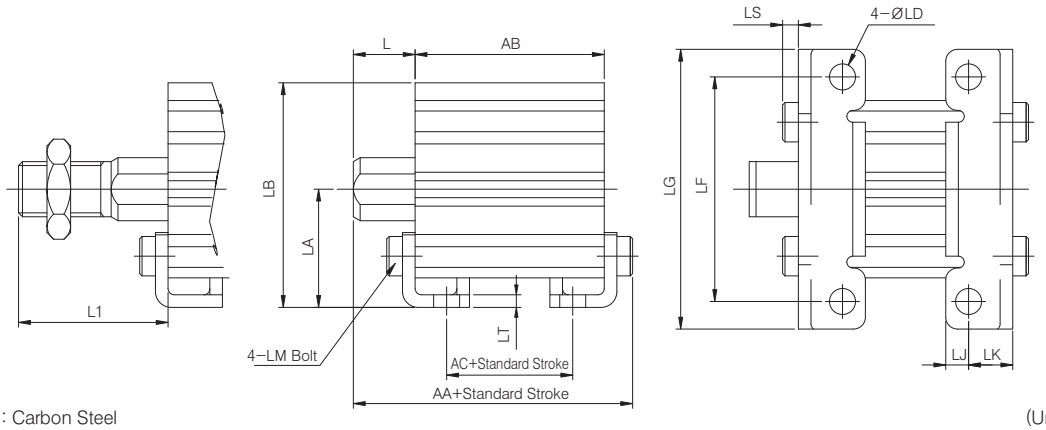


Standard Type

(Unit : mm)

Bore Size	Range of Standard Stroke	Standard Stroke												C	D	EG	H	I	J	K	M	N	ØO	W	Z	ØTh9
		No Auto Switch						Auto Switch Exists																		
		AA	AB	B	L	P	Q	AA	AB	B	L	P	Q													
Ø32	5	39	32	5.5	7	M5×0.8	20.5	49	42	5.5	7	M5×0.8	20.5	13	16	45	M8×1.25	60	4.5	14	34	5.5	9Depth7	49.5	14	$21\ ^{0}_{-0.052}$
	10~50			7.5		Rc(PT) 1/8	19.5			7.5		Rc(PT)1/8	19.5													
	75, 100	49	42																							
Ø40	5~50	37	30	8	7	Rc(PT) 1/8	11	46.5	39.5	8	7	Rc(PT)1/8	11	13	16	52	M8×1.25	69	5	14	40	5.5	9Depth7	57	14	$28\ ^{0}_{-0.052}$
	75, 100	46.5	39.5				14																			
Ø50	10~50	38.5	30.5	10.5	8	Rc(PT) 1/4	10.5	48.5	40.5	10.5	8	Rc(PT)1/4	10.5	15	20	64	M10×1.5	87	7	17	50	6.6	11Depth8	71	22	$35\ ^{0}_{-0.052}$
	75, 100	48.5	40.5				14																			
Ø63	10~50	44	36	10.5	8	Rc(PT) 1/4	15	54	46	10.5	8	Rc(PT)1/4	15	15	20	77	M10×1.5	103	7	17	60	9	14Depth 10.5	84	22	$35\ ^{0}_{-0.052}$
	75, 100	54	46				16.5																			

Foot Type/A(D)Q2KL

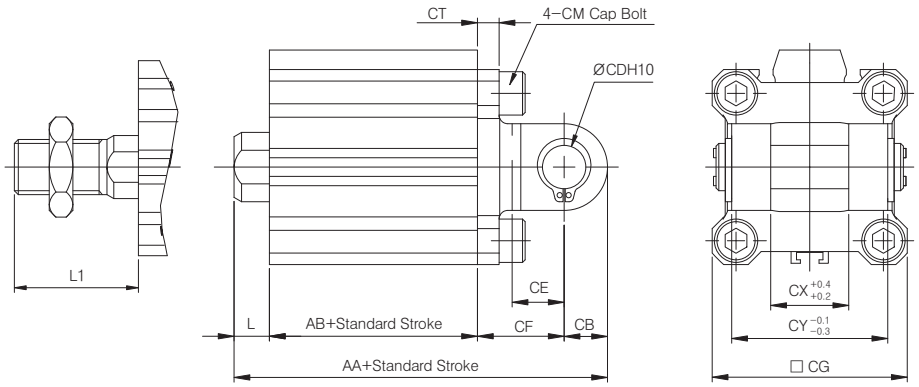


Materia l : Carbon Steel

(Unit : mm)

Bore Size (Ø)	Range of Standard Stroke	Standard Stroke						L	L1	LA	LB	LD	LF	LG	LJ	LM	LK	LS	LT
		No Auto Switch			Auto Switch Exists														
		AA	AB	AC	AA	AB	AC												
32	5~50	56.2	32	9.6	66.2	42	19.8	17	38.5	30	57	6.6	57	71	5.8	M6×1.0	11.2	4	3.2
	75,100	66.2	42	19.8															
40	5~50	54.2	30	13.5	63.7	39.5	23.5	17	38.5	33	64	6.6	64	78	7	M6×1.0	11.2	4	3.2
	75,100	63.7	39.5	23.5															
50	10~50	56.7	30.5	7.5	66.7	40.5	17.5	18	43.5	39	78	9	79	95	8	M8×1.25	14.7	5	3.2
	75,100	66.7	40.5	17.5															
63	5~50	62.2	36	10	72.2	46	20	18	43.5	46	91.5	11	95	113	9	M10×1.5	16.2	5	3.2
	75,100	72.2	46	20															

Double Clevis Type/A(D)Q2KD



Material: Ø12~Ø25–Carbon Steel, Ø32~Ø100–Cast Iron

(Unit : mm)

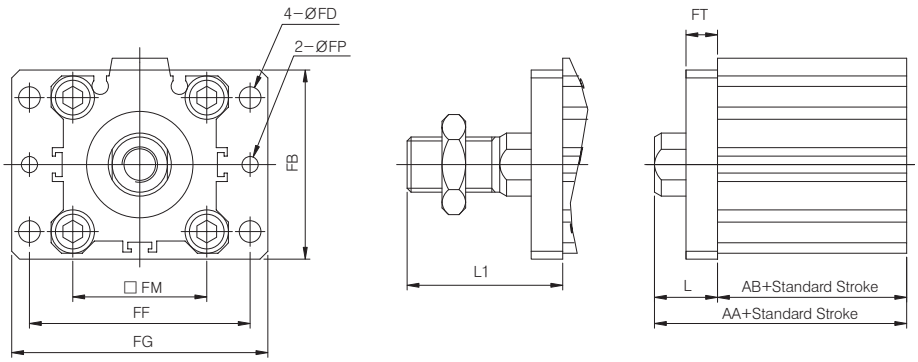
Bore Size (Ø)	Range of Standard Stroke	Standard Stroke				L	L1	CB	CE	CF	CG	CM	CD	CT	CX	CY
		No Auto Switch		Auto Switch Exists												
		AA	AB	AA	AB											
32	5~50	69	32	79	42	7	28.5	10	14	20	45	M6×1.0	10 +0.06 0	5	18	36
	75,100	79	42													
40	5~50	69	30	78.5	39.5	7	28.5	10	14	22	52	M6×1.0	10 +0.06 0	6	18	36
	75,100	78.5	39.5													
50	10~50	80.5	30.5	90.5	40.5	8	33.5	14	20	28	64	M8×1.25	14 +0.07 0	7	22	44
	75,100	90.5	40.5													
63	10~50	88	36	98	46	8	33.5	14	20	30	77	M10×1.5	14 +0.07 0	8	22	44
	75,100	98	46													

※ In case of mounting attached cylinder, A–type tube is standard.

※ Indication and dimension are same as dimension of standard cylinder.

※ Cylinder and foot are delivered without assembly.

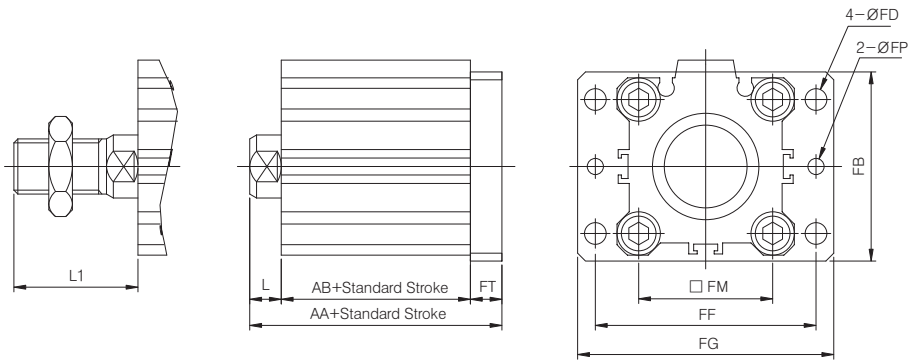
Rod Side Flange Type/A(D)Q2KF



Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Range of Standard Stroke	Standard Stroke				L	L1	FB	FD	FP	FF	FG	FM	FT
		No Auto Switch		Auto Switch Exists										
		AA	AB	AA	AB									
32	5~50	49	32	59	42	17	38.5	48	5.5	4.1	56	65	34	8
	75,100	59	42											
40	5~50	47	30	56.5	39.5	17	38.5	54	5.5	4.1	62	72	40	8
	75,100	56.5	39.5											
50	10~50	48.5	30.5	58.5	40.5	18	43.5	67	6.6	5.1	76	89	50	9
	75,100	58.5	40.5											
63	10~50	54	36	64	46	18	43.5	80	9	5.1	92	108	60	9
	75,100	64	46											

Head Side flange Type/A(D)Q2KG



Materia l : Carbon Steel (Unit : mm)

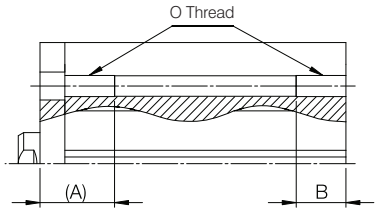
Bore Size (Ø)	Range of Standard Stroke	Standard Stroke				L	L1	FB	FD	FP	FF	FG	FM	FT
		No Auto Switch		Auto Switch Exists										
		AA	AB	AA	AB									
32	5~50	47	32	57	42	7	28.5	48	5.5	4.1	56	65	34	8
	75,100	57	42											
40	5~50	45	30	54.5	39.5	7	28.5	54	5.5	4.1	62	72	40	8
	75,100	54.5	39.5											
50	5~50	47.5	30.5	57.5	40.5	8	33.5	67	6.6	5.1	76	89	50	9
	75,100	57.5	40.5											
63	10~50	53	36	63	46	8	33.5	80	9	5.1	92	108	60	9
	75,100	63	46											

※ In case of mounting attached cylinder, A-type tube is standard.

※ Indication and dimension are same as dimension of standard cylinder.

※ Cylinder and foot are delivered without assembly.

Separated Reference ▶ In Case of Both Ends Tap



Standard Stroke (Unit : mm)

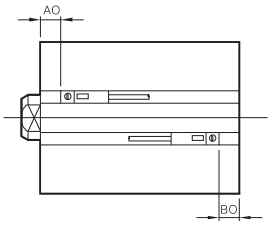
Classification	Bore Size	O	A	B
AQ2A	Ø32	M6×1.0	10	10
	Ø40	M6×1.0	10	10
	Ø50	M8×1.25	14	14
	Ø63	M10×1.5	18	18

※ ( ) : Rod Rotation prevention type

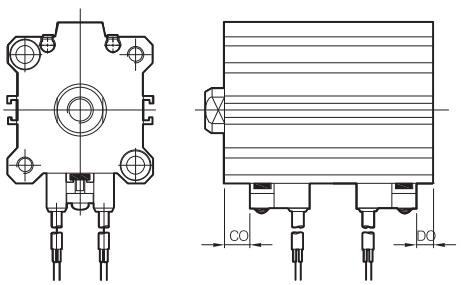
Auto Switch Specification

Items	Existing Contact Point (W8**)	Non Existing Contact Point (W9**)	Existing Contact Point (A73K)	Non Existing Contact Point (A73TN(P))
Size	External Diameter Ø4	External Diameter Ø4	–	
Loading Voltage	DC 24V, AC100V	DC 24V	DC24V, AC100	DC24V
Applied Current	5 ~ 40 mA (DC 24V) 5 ~ 20 mA (AC 110V)	5 ~ 30 mA	5 ~ 40 mA (DC 24V) 5 ~ 20 mA (AC 110V)	100 mA Less
Lead Track Direction	Vertical Type, Horizontal Type	Vertical Type, Horizontal Type	Vertical Type	
Lamp	Red LED ON When ON	Red LED ON When ON	Red LED ON When ON	
Wiring Method	2 Wire Type	2 Wire Type	2 Wire Type	3 Wire Type
Attachment Method	Screw Attached At Rail	Screw Attached At Ra	Rail Attachment type	
Operation Time	1.2ms or Less	1.2 ms or Less	1.2 ms or Less	
Internal Voltage Drop	2.4V or Less	4.5V or Less	2.4V or Less	1.5V or Less
Leakage Current	–	1.5mA or Less at DC 24V	–	

Auto Switch Mounting Position



W8**, W9** Type



W4 Type

Standard Type (Unit : mm)

Bore Size	Auto Swith Mounting Position						Remark
	W8**, W9**Type			W4 Type			
	AO	BO	Range of Operation	CO	DO	Range of Operation	
Ø12	7	7	8	–	–	–	
Ø16	12	7.5	10	–	–	–	General
	2.5	3	5.5	–	–	–	Single Motion Long Stroke Type
Ø20	11	9.5	9	–	–	–	
Ø25	2.5	2.5	9.5	–	–	–	
Ø32	12	9	5.5	9	6	12	
Ø40	16	11.5	5.5	13	8.5	11	
Ø50	14	14.5	5.5	11	11.5	10	
Ø63	16.5	17.5	6.5	13.5	14.5	12	
Ø80	20.5	21	5.5	17.5	18	12	
Ø100	24	27	6.5	21	24	13	

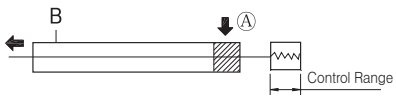
Note1) Only 1 auto switch is available for 5mm stroke.

Adjustable Stroke Cylinder/Extension Adjustable Type

AQ2B (Bore Size)—(Stroke) D− XC8

Thr extended stroke of the cylinder can be adjusted by the stopper on the head side from full stroke(0~10mm).

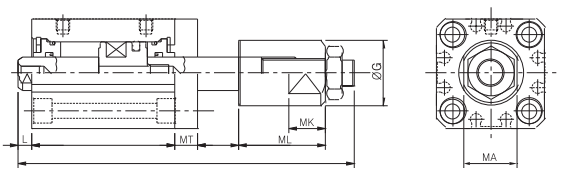
Indication Symbol



Specifications

Type	Air Pressure (non–Lubrication) Type
Tube Internal Diameter	32, 40, 50, 63, 80, 100
Operation Method	Double Motion
Applied Fluid	Air
Stroke Control Method	Stopper Control
Stroke Control Range	10mm
Attachment	Through Hole
Cushion	None
Minimum Applied Pressure	Ø12 : 0.07 MPa, Ø25 : 0.05 MPa

Contructions/Major Dimensions



Standard Type

(Unit : mm)

Bore Size	Range of Produced Stroke	No Auto Switch		Auto Switch Exists		L	MT	ML	MK	G	MA
		AA	AB	AA	AB						
12	5 ~ 30	57.7	25.6	64.9	32	3.5	5	19	8	14	11
25	5 ~ 50	71.1	29	81.3	39	5	8	22.5	10	20	17
32	5 ~ 50	78.5	30.5	88.5	40.5	7	6	26	14	27	24
40	5 ~ 50	88	40	98	50	7	6	26	14	27	24
50	5 ~ 50	100.5	40.5	110.5	50.5	8	8	30	16	35	30
63	5 ~ 50	102	42	112	52	8	10	30	16	35	30
80	5 ~ 50	125	51	135	61	10	12	38	20	48	41
100	5 ~ 50	138.5	60.5	148.5	70.5	12	14	38	20	48	41

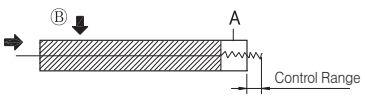
※ If auto switch does not exist, Ø25–5 stroke has penetrated both ends for attachment bolt of tube.
※ For both ends tap type, refer to p.333
※ Applied stroke has 5mm interval.
※ Ø20 apply as AQ Series (refer p.231)

Adjustable Stroke Cylinder/Retraction Adjustable Type

AQ2 (Attachment)(Bore Size)—(Stroke) − D(M) − XC9

The retracted stroke of the cylinder can be adjusted from(0~10mm) by the adjusting bolt.

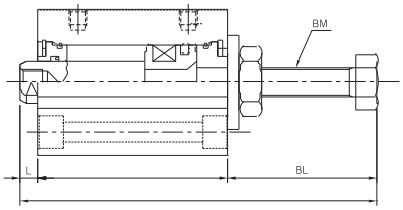
Indication Symbol



Specifications

Type	Air Pressure (non–Lubrication) Type
Tube Internal Diameter	32, 40, 50, 63, 80, 100
Operation Method	Double Motion
Applied Fluid	Air
Stroke Control Method	Contro Bolt Control
Stroke Control Range	10 mm
Attachment	Through Hole (Standard), Both Ends Tap
Cushion	None
Minimum Applied Pressure	0.05 MPa

Dimensions



Standard Type

(단위 : mm)

Bore Size	Range of Produced Stroke	No Auto Switch		Auto Switch Exists		L	BL	BM
		AA	AB	AA	AB			
12	5 ~ 30	52.6	25.6	59	32	3.5	23.5	M×0.8
16	5 ~ 30	53	26	63	36	3.5	23.5	M6×1.0
25	5 ~ 50	63.5	29	73.5	39	5	29.5	M8×1.25
32	5 ~ 50	65.5	30.5	75.5	40.5	7	28	M8×1.25
40	5 ~ 50	84	40	94	50	7	37	M12×1.5
50	10 ~ 50	84.5	40.5	94.5	50.5	8	36	M12×1.5
63	10 ~ 50	88.5	42	98.5	52	8	38.5	M16×1.5
80	10 ~ 50	109.5	51	119.5	61	10	49.5	M20×1.5
100	10 ~ 50	125	60.5	135	70.5	12	52.5	M20×1.5

※ If auto switch does not exist, Ø25–5 stroke has penetrated both ends for attachment bolt of tube.
※ For both ends tap type, refer to p.333
※ Applied stroke has 5mm interval.
※ Ø20 apply as AQ Series (refer p.231)

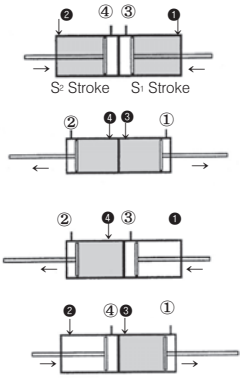
Dual Stroke Cylinder/Double rod Type

AQ2B Bore Size – Stroke S_1 + Stroke S_2 D(C) (M)-XC10

Two cylinders are constructed as one cylinder in a back–to back configuration allowing the cylinder stroke to be controlled in the three steps.

Symbols

Function



When air pressure is supplied to ports ❶ and ❷, both S_1 and S_2 stroke retract.

When air pressure is supplied to ports ❸ and ❹, both S_1 and S_2 stroke extend.

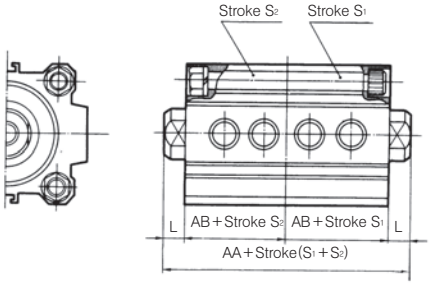
When air pressure is supplied to ports ❶ and ❹, S_2 stroke extends and S_1 retracts strokes.

When air pressure is supplied to ports ❷ and ❸, S_1 stroke extends and S_2 stroke retracts.

Specification

Type	Non lube
Bore Size	Ø32, Ø40, Ø50, Ø63, Ø80, Ø100
Operation Method	Double Acting
Applied Fluid	Air
Attachment	Through Hole

Structure/External Dimension Drawing



Bore Size (mm)	AA		AB		L	Produced Stroke S_1 and S_2 are Identical
	50st or Less	75, 100st or Less	50st or Less	75, 100st or Less		
32	60(80)	80(80)	23(33)	33(33)	7	5~100
40	73(93)	93(33)	29.5(39.5)	39.5(39.5)	7	
50	77(97)	97(97)	30.5(40.5)	40.5(40.5)	8	10~100
63	88(108)	108(108)	36(46)	46(46)	8	
80	107(127)	127(127)	43.5(53.5)	53.5(53.5)	10	
100	130(150)	150(150)	53(63)	63(63)	12	

※ Dimensions in ( ) are applied in auto switch attached case.
※ Refer to p.286(Notices) in case of middle stroke production.
※ In case of over 100st, refer to p.327 for AA and AB dimension.

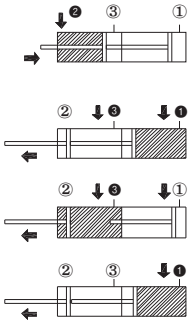
Dual Stroke Cylinder/single rod Type

AQ2B Bore Size – Stroke S_1 + Stroke $S_2 - S_1$ D(C)(M)-XC11

Two cylinders are constructed in serial as one cylinder. It is possible to control the cylinder stroke in two steps to obtain double the cylinder output force.

Symbols

Function



When air pressure is supplied to the ❷ port, both S_1 and S_2 stroke retract.

When air pressure is supplied to the ❶ port, the rod extends by the S_1 stroke length.

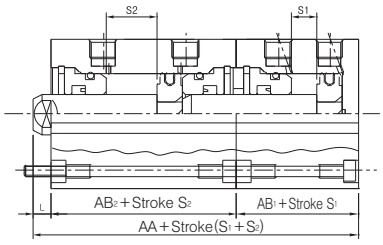
When air pressure is supplied to the ❸ port, the rod operates $S_2 - S_2$.

When air pressure is supplied to ❶, rod moves S_1 stroke.

Specification

Type	Non lube
Bore Size	32, 40, 50, 63, 80, 100
Operation Method	Double Acting
Applied Fluid	Air
Attachment	Through Hole
Piston Speed	50 ~ 500 mm/s

Structure/External Dimension Drawing



Standard Type

(Unit : mm)

Bore Size	Produced Stroke S1 and S2 are Identical	No Auto Switch			Auto Switch Exists			L
		AA	AB1	AB2	AA	AB1	AB2	
12	5 ~ 30	46.1	17	25.6	63.5	28	32	3.5
16	5 ~ 30	48	18.5	26	70	30.5	36	3.5
20	5 ~ 50	50	19.5	26	85	31.5	38	4.5
25	5 ~ 50	56.5	22.5	29	76.5	32.5	39	5
32	5 ~ 100	60.5	23	30.5	80.5	33	40.5	7
40	5 ~ 100	76.5	29.5	40	96.5	39.5	50	7
50	5 ~ 100	79	30.5	40.5	99	40.5	50.5	8
63	5 ~ 100	88	34	42	106	46	52	8
80	5 ~ 100	104.5	43.5	51	124.5	53.5	61	10
100	5 ~ 100	125.5	53	60.5	145.5	63	70.5	12

※Applied stroke has 5mm interval.

Specification ORDER MADE

Order Made for AQ2/TCQ2 Series Common Specification

Specification	Number	Symbol	Specification Contents
AQ2	①	-XR0~XR38	Rod end Shape Changed
	②	-XC8	Variable Stroke Cylinder (For Spring Return Motion)
	③	-XC9	Variable Stroke Cylinder (For Spring Extented Motion)
	④	-XC10	Dual Stroke Cylinder/Double Rod Type
	⑤	-XC11	Dual Stroke Cylinder/Single Rod Type
	⑥	-X202	Overall Length is Same as Basic
	⑦	-X203	L Size of Rod Cover is Same as Basic
	⑧	-X163	Coil Scraper Equipped (Tube Overall Length Increased)

Rod End Shape Changed (Refer to p.598) -XR0 ~ XR38

AQ — Type Indicating Method of Each Series — X — R1

Indicating Pattern Symbol of Rod End Shape

Patternized for rod end shape beside standard of AQ2 each series

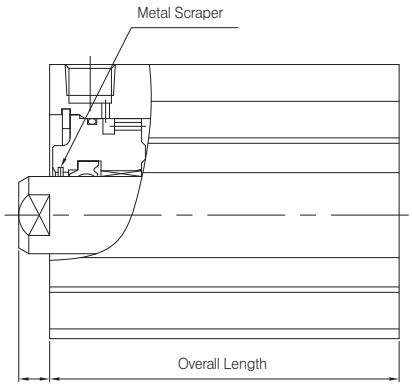
Shape Change of Operating Equipment and Applied Rod End

Series		Cylinder Name (Operating Method)	Rod End Shape Change Symbol
Compact Cylinder AQ	AQ	Standard Type	-XR0~XR38
	AQ○-S	Standard Type for Single Acting Spring Return Type	

Coil Scraper (Metal Scraper) Type -X163

A(D)Q2B(A) — Bore Size — Cylinder Stroke — Operation Method — Body Specification — Switch Specification — X163

Bore Size (mm)	Index	Stroke(mm) 10~50	55~65	70	75	80~90	100
Ø32	Non Auto	33+Stroke	108	133	118	133	150.5
	Auto	43+Stroke					
Ø40	Non Auto	39.5+Stroke	114.5	139.5	124.5	139.5	160
	Auto	49.5+Stroke					
Ø50	Non Auto	40.5+Stroke	115.5	140.5	125.5	140.5	160.5
	Auto	50.5+Stroke					
Ø63	Non Auto	46+Stroke	121	146	131	146	162
	Auto	56+Stroke					
Ø80	Non Auto	53.5+Stroke	128.5	153.5	138.5	153.5	171
	Auto	63.5+Stroke					
Ø100	Non Auto	63+Stroke	138	163	148	163	180.5
	Auto	73+Stroke					

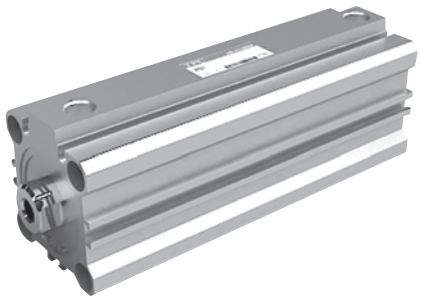


※ L is same as standard dimension.

Long Stroke Series AQ2, ADQ2

Compact Cylinder/Double Acting : Single Rod

Bore Size(mm) : Ø32, Ø40, Ø50, Ø63, Ø80, Ø100



- COMPACT EQUIPMENT DESIGN AVAILABLE
- SPACE SAVING CYLINDER

How to Order

□ A D Q2 A 32 — 200 D C △ — ○ — W4L ○

1 2 3 4 5 6 7 8 9 10 11

1 Series
Blank : RC(PT)
U : NPT

2 Magnet
Blank : None
D : Built-in magnet

3 Mounting
A : Both end tapped
※ Mounting
D : Double clevis
F : Rod side flange
G : Head side flange
L : Foot

4 Bore size
32 : 32mm
40 : 40mm
50 : 50mm
63 : 63mm
80 : 80mm
100 : 100mm

5 Stroke(mm)
Ø32~100 : 125, 150, 175, 200, 250, 300
※ Production of middle stroke
In accordance with installing spacer at cylinder of standard stroke, it is possible to produce middle stroke in every 1mm.
(Minimum production available spacer : 3mm)
ex) AQ2A50-148D installs 27mm wide spacer in AQ2A50-174D

6 Action
D : Double acting type

7 Cushion
C : Rubber cushion

8 Body Option
Blank : Standard type
(Rod end female thread)
M : Road end male thread
I : Single knuckle joint (Rod end male thread)
Y : Double Knuckle Joint (Rod end male thread)
※ I and Y are delivered without assembly

9 Series
Blank : Standard type (In case of Ø32~Ø40, Copper-free type is basic)
XC16 : Copper-free

10 Auto Switch
Blank : None
※ In case of magnetic equipped cylinder
Reed switch
W4 : W4
W8H : Subcompact auto switch (horizontal type, 2 wire type)
W9H : Subcompact auto switch (Vertical type, 2 wire type)
Contact point non existing auto switch
W8H : Subcompact auto switch (horizontal type, 2 wire type)
W9V : Subcompact auto switch (Vertical type, 2 wire type)
W8H : Subcompact auto switch (horizontal type, 2 wire type)
W8HN : Subcompact auto switch (horizontal type, 3 wire type)
W9VN : Subcompact auto switch (Vertical I type, 3 wire type)
W2P : Low magnetic non exisiting point switch (Ø50~Ø100)

11 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs
※ In case of 3m lead wire, L is should be added at the end of item number. (Standard 0.5m)

Options

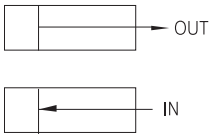
Bore Size(mm)		32	40	50	63	80	100
Air Pressure Type	Magnetic Built-in	○	○	○	○	○	○
	Piping Method(Screw Connecting Type)	Rc(PT)1/4		Rc(PT)1/4		Rc(PT)3/8	
	Rod End Male Screw	○	○	○	○	○	○
	Attachment Both end Tap	○	○	○	○	○	○
	Rubber Cushion Attached	○	○	○	○	○	○

Specifications

Type	Air Pressure (non-lubrication) Type
Applied Fluid	Air
Guaranteed Pressure Resistance	1.5MPa (15.3kgf/cm^2)
Maximum Pressure Applied	1.0MPa (9.9kgf/cm^2)
Minimum Pressure Applied	0.05MPa (0.5kgf/cm^2)
Ambient and Applied Fluid Temperature	Note 1)-5℃ ~ 70℃ (No Frozen)
Rod end Thread Tolerance	KS Class 2
Stroke Tolerance	0~+1.0mm
Piston Speed	50 ~ 500mm/s
Rubber Cushion	None
Rod Thread	Female Thread
Mounting	Through Hole

Note 1) Follow auto switch utilizing temperature in case of using auto switch

Theoretical Output Sheet (Unit : N)



Bore Size (mm)	Operating Direction	Pressure Applied (MPa) 0.3	0.5	0.7
32	IN	181	302	422
	OUT	241	402	563
40	IN	317	528	739
	OUT	377	628	880
50	IN	495	825	1150
	OUT	589	982	1370
63	IN	841	1400	1960
	OUT	935	1560	2180
80	IN	1360	2270	3170
	OUT	1510	2510	3520
100	IN	2140	3570	5000
	OUT	2360	3930	5500

1N ≒ 0.102kgf
1MPa ≒ 10.2kgf/cm^2

Weight Table

Non Auto Type Base (Unit : g)

Bore Size (mm)	Cylinder Stroke (mm) 125	150	175	200	250	300
32	750	853	956	1061	1267	1474
40	925	1040	1156	1271	1502	1733
50	1481	1663	1845	2028	2392	2757
63	1748	1951	2153	2357	2762	3168
80	3024	3355	3685	4017	4679	5340
100	4496	4945	5393	5842	6739	7637

Option Weight (Unit : g)

Bore Size (mm)		32	40	50	63	80	100
Rod End Male Thread	Male Thread Part	26	27	53	53	120	175
	Nut	17	17	32	32	49	116
Magnetic Equipped		12	13	15	24	25	37
Foot Type		106	116	188	279	563	883
Rod Side Flange Type		142	192	333	514	978	1268
Head Side Flange Type		142	192	333	514	978	1268
Double Clevis Type		157	207	393	539	1064	1835

※ 2EA (1set) weight for foot.
※ Bolt weight is included in attached mounting weight.

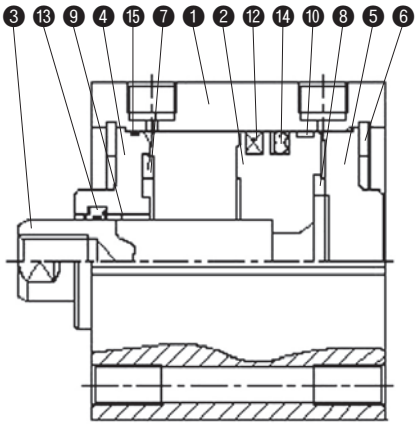
Calculation Method

ex) ADQ2F32-200DCM

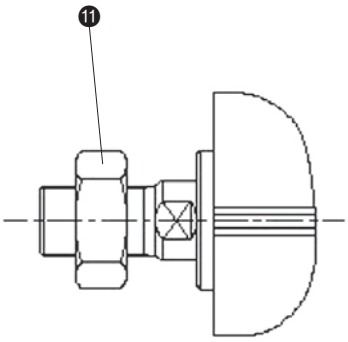
- Standard Weight : AQ2A32-200DC ·····1061g
- Extra Weight : Rod end male thread and nut ···26+17g
  Magnetic (equipped) ·····12g
  Rod side flange type·····142g

Sum 1258g

Structural Drawing



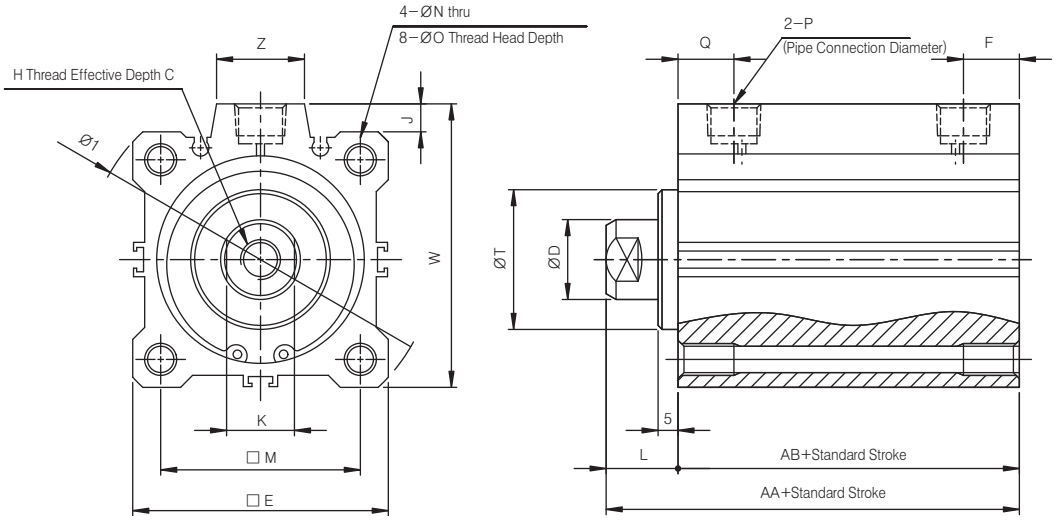
Standard Type (Rod End Female Thread)



Option(Rod End Male Thread)

No	Item Name	Material	Remark
1	Cylnder Tuve	Aluminum alloy	
2	Piston	Aluminum alloy	
3	Piston Rod	Carbon Steel	
4	Rod Cover	Aluminum alloy	
5	Head Cover	Aluminum alloy	
6	Snap Ring	Spring Steel	
7	Bumper "A"	Poly Urethane Rubber	Piston Side
8	Bumper "B"	Poly Urethane Rubber	Piston Side
9	Bush	Cooper Alloy	
10	Wear Ring	Resin	
11	Rod End Nut	Carbon Steel	
12	Magnet Ring	Baferrite+NBR	Option
13	Rod Packing	NBR	
14	Piston Gasdet	NBR	
15	Gasket	NBR	

Standard Type (Both Ends Tap Type)



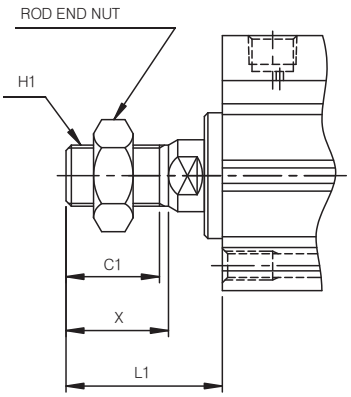
(Unit : mm)

Bore Size	Stroke	AA	AB	C	D	E	F	H	I	J	K	L	M	N	O	DE	P	Q	T	W	Z
Ø32	125,150	62.5	45.5	13	16	45	12.5	M8×1.25	60	4.5	14	17	34	5.5	M6×1.0	7	Rc(PT)1/8	12.5	22 $^{0}_{-0.052}$	49.5	14
Ø40		72	55	13	16	52	14	M8×1.25	69	5	14	17	40	5.5	M6×1.0	7	Rc(PT)1/8	14	28 $^{0}_{-0.052}$	57	14
Ø50	175,200	73.5	55.5	15	20	64	14	M10×1.5	87	7	17	18	50	6.6	M8×1.25	8	Rc(PT)1/4	14	35 $^{0}_{-0.062}$	71	22
Ø63		75	57	15	20	77	16.5	M10×1.5	103	7	17	18	60	9	M10×1.5	10.5	Rc(PT)1/4	16.5	35 $^{0}_{-0.062}$	84	22
Ø80	250,300	86	66	21	25	98	19	M16×2.0	132	6	22	20	77	11	M12×1.75	13.5	Rc(PT)3/8	19	43 $^{0}_{-0.062}$	104	26
Ø100		97.5	75.5	27	30	117	23	M20×2.5	156	6.5	27	22	94	11	M12×1.75	13.5	Rc(PT)3/8	22	59 $^{0}_{-0.074}$	123.5	26

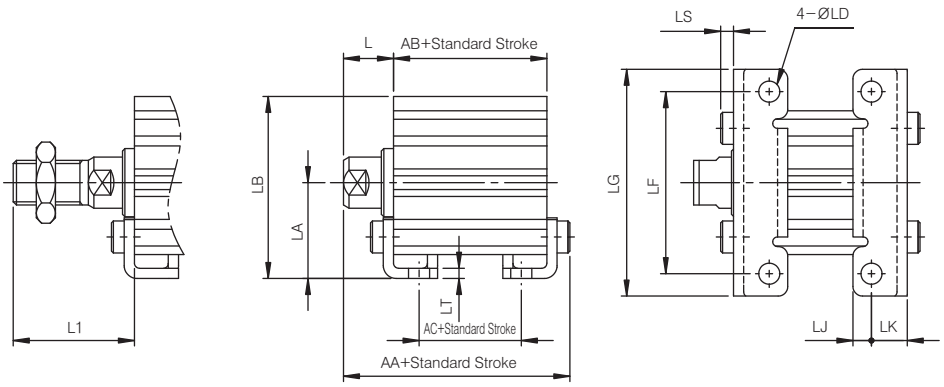
Rod End Male Thread Type

(Unit : mm)

Bore Size	C1	H1	L1	X
Ø32	20.5	M14×1.5	38.5	23.5
Ø40	20.5	M14×1.5	38.5	23.5
Ø50	26	M18×1.5	43.5	28.5
Ø63	26	M18×1.5	43.5	28.5
Ø80	32.5	M22×1.5	53.5	35.5
Ø100	32.5	M26×1.5	53.5	35.5



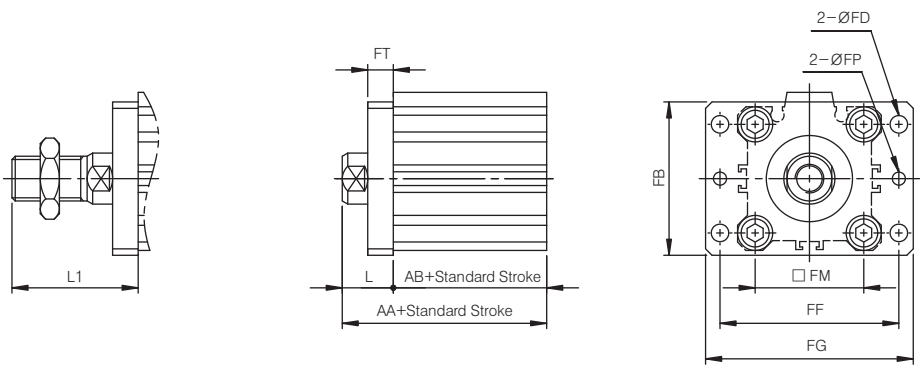
Foot Type/A(D)Q2L



Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Range of Standard Stroke	AA	AB	AC	L	L1	LA	LB	LD	LF	LG	LJ	LM	LK	LS	LT
32	125,150 175,200 250,300	69.7	45.5	29.5	17	38.5	30	57	6.6	57	71	5.8	M6×1.0	11.2	4	3.2
40		79.2	55	39	17	38.5	33	64	6.6	64	78	7	M6×1.0	11.2	4	3.2
50		81.7	55.5	32.5	18	43.5	39	78	9	79	95	8	M8×1.25	14.7	5	3.2
63		93.2	57	31	18	43.5	46	91.5	11	95	113	9	M10×1.5	16.2	5	3.2
80		97.5	66	36	20	53.5	59	114	13	118	140	11	M12×1.75	19.5	7	4.5
100		110.5	75.5	41.5	22	53.5	71	136	13	137	162	12.5	M12×1.75	23	7	6

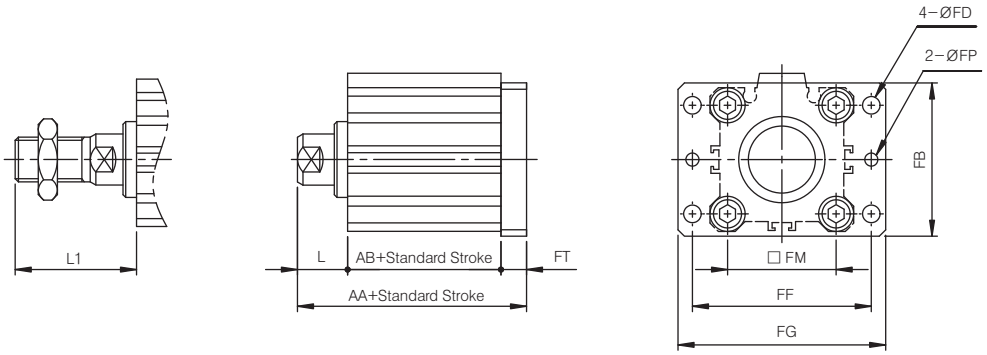
Rod Side Flange Type/A(D)Q2F



Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Range of Standard Stroke	AA	AB	L	L1	FB	FD	FP	FF	FG	FM	FT
32	125,150 175,200 250,300	62.5	45.5	17	38.5	48	5.5	4.1	56	65	34	8
40		77	55	17	38.5	54	5.5	4.1	62	72	40	8
50		73.5	55.5	18	43.5	67	6.6	5.1	76	89	50	9
63		75	57	18	43.5	80	9	5.1	92	108	60	9
80		86	66	20	53.5	99	11	6.1	116	134	77	11
100		97.5	75.5	22	53.5	117	11	6.1	136	154	94	11

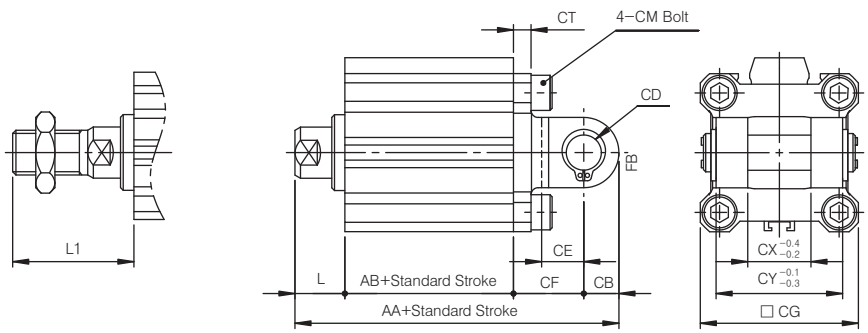
Head Side Flange Type/A(D)Q2G



Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Range of Standard Stroke	AA	AB	L	L1	FB	FD	FP	FF	FG	FM	FT
32	125,150 175,200 250,300	70.5	45.5	17	38.5	48	5.5	4.1	56	65	34	8
40		80	55	17	38.5	54	5.5	4.1	62	72	40	8
50		82.5	55.5	18	43.5	67	6.6	5.1	76	89	50	9
63		84	57	18	43.5	80	9	5.1	92	108	60	9
80		97	66	20	53.5	99	11	6.1	116	134	77	11
100		108.5	75.5	22	53.5	117	11	6.1	136	154	94	11

Double Clevis Type/A(D)Q2D



Material : Carbon Steel (Unit : mm)

Bore Size (Ø)	Range of Standard Stroke	AA	AB	L	L1	CB	CE	CF	CG	CM	CD	CT	CX	CY
32	125,150 175,200 250,300	92.5	45.5	17	38.5	10	14	20	45	M6×1.0	10 +0.06 0	5	18	36
40		104.0	55	17	38.5	10	14	22	52	M6×1.0	10 +0.06 0	6	18	36
50		115.5	55.5	18	43.5	14	20	28	64	M8×1.25	14 +0.07 0	7	22	44
63		119.0	57	18	43.5	14	20	30	77	M10×1.5	14 +0.07 0	8	22	44
80		142.0	66	20	53.5	18	27	38	98	M12×1.75	18 +0.07 0	10	28	56
100		164.5	75.5	22	53.5	22	31	45	117	M12×1.75	22 +0.084 0	13	32	64

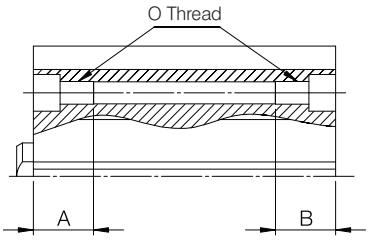
Additional Reference ▶ In Case Of Both Ends Tap

(mm)

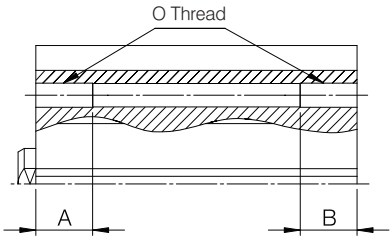
Classification	Bore Size (mm)	O	A	B
AQ2A	Ø12	M4×0.7	11	11
	Ø16	M4×0.7	11	11
	Ø20	M6×1.0	17	17
	Ø25	M6×1.0	17	17
	Ø32	M6×1.0	10	10
	Ø40	M6×1.0	10	10
	Ø50	M8×1.25	14	14
	Ø63	M10×1.5	18	18
	Ø80	M12×1.75	22	22
	Ø100	M12×1.75	22	22

※ Dimension of rotation protecting type (AQ2KA Ø32~Ø63) is same. But, AQ2A Ø80~Ø100 does not have rotation protecting type.

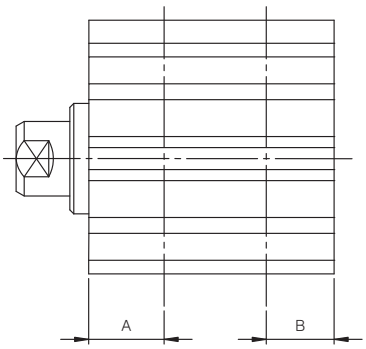
AQ2A (Ø12~Ø25)



AQ2A (Ø32~Ø100)



Auto Switch Setting Location



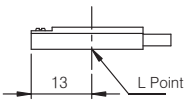
(Unit : mm)

Bore Size(mm)	A Point Location	B Point Location
32	17.8(18)	15.2(15.3)
40	22.1(22.6)	17.4(17.1)
50	20.8(20.2)	19.7(20.6)
63	22.5(22.9)	23.4(23.2)
80	25.4(26.4)	28.1(27.9)
100	29.5(29.6)	33.4(33.4)

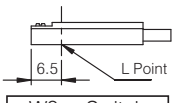
※ Use with coinciding L point of switch to A or B point of cylinder in case of switch attachment.

※ In case of attaching 2 auto switches, use minimum stroke over 10 stroke.
But, in case of W2P＊ switch attaching it is available to use over 15 stroke.

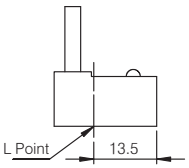
Note) Dimension in ( ) is Rubber specification.



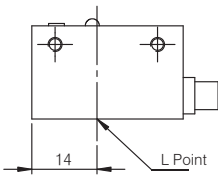
W8** Switch



W9** Switch



W4 Switch



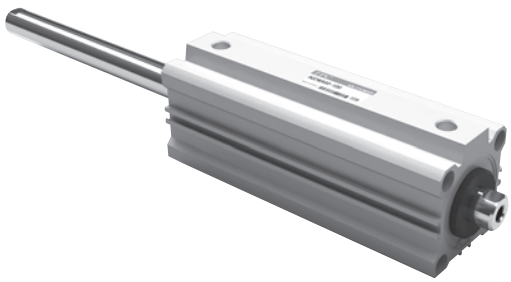
W2P* Switch

Long Stroke Series AQ2W, ADQ2W

Compact Cylinder/Double Acting Double Rod

Bore Size(mm) : Ø32, Ø40, Ø50, Ø63, Ø80, Ø100

- COMPACT EQUIPMENT DESIGN AVAILABLE
- SPACE SAVING CYLINDER



How to Order

	A	D	Q2	WA	32	–	200	D	C	△	–	○	–	W4L	○
1		2		3	4		5	6	7	8		9		10	11

1 Series
Blank : RC(PT)
U : NPT

2 Magnet
Blank : None
D : Built-in magnet

3 Mounting
WA : Dual rod both ends tap (standard type)
WF : Rod side flange
WG : Head side flange
WL : Foot
※ In case of dual rod, impossible to attach double clevis

4 Bore Size
32 : 32mm(1¼Nom.)
40 : 40mm(1½Nom.)
50 : 50mm(2Nom.)
63 : 63mm(2½Nom.)
80 : 80mm(3¼Nom.)
100 : 100mm(4Nom.)

5 Stroke(mm)
Ø32~100 : 125, 150, 175, 200, 250, 300
※ Production of middle stroke
In accordance with installing spacer at cylinder of standard stroke, it is possible to produce middle stroke in every 1mm.
(Minimum production available spacer : 3mm)
ex) AQ2A50-148D installs 27mm wide spacer in AQ2A50-175D

6 Action
D : Double acting type

7 Cushion
C : Rubber cushion

8 Body Option
M : Road end male thread
I : Single knuckle joint (Rod end male thread)
Y : Double knuckle joint (Rod end male thread)
※ I and Y are delivered without assembly

9 Series
Blank : Standard type (In case of Ø32~Ø40, copper free is standard)
XC16 : Copper-free

10 Auto switch
Blank : None
※ In case of magnetic equipped cylinder
Reed switch
W4 : W4
W8H : Subcompact auto switch (horizontal type, 2 wire type)
W9V : Subcompact auto switch (Vertical type, 2 wire type)
Non contact point existing auto switch
W8H : Subcompact auto switch (horizontal type, 2 wire type)
W9V : Subcompact auto switch (Vertical type, 2 wire type)
W8HN : Subcompact auto switch (horizontal type, 3 wire type)
W9VN : Subcompact auto switch (Vertical I type, 3 wire type)
W2P : Low magnetic non exisiting point switch (Ø50~Ø100)

11 Number of Auto switches
Blank : 2 pcs
S : 1 pc
N : N pcs
※ In case of 3m lead line, L is should be added at the end of item number. (Standard 0.5m)
ex) W4L

Options

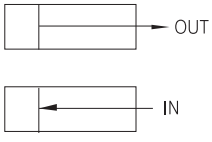
Bore Size(㎜)		32	40	50	63	80	100
Air Pressure Type	Built-in Magnet	○	○	○	○	○	○
	Piping Method(Screw Connecting Type)	Rc(PT)1/4		Rc(PT)1/4		Rc(PT)3/8	
	Rod End Male Thread	○	○	○	○	○	○
	Attachment Both end Tap	○	○	○	○	○	○
	Rubber Cushion Attached	○	○	○	○	○	○

Standard Specification

Type	Air Pressure (non-lubrication) Type
Applied Fluid	Air
Guaranteed Pressure Resistance	1.5MPa (15.3kgf/cm²)
Maximum Pressure Applied	1.0MPa (9.9kgf/cm²)
Minimum Pressure Applied	0.05MPa (0.5kgf/cm²)
Ambient and Applied Fluid Temperature	Note 1)-5℃ ~ 70℃ (No Frozen)
Rod end Thread Tolerance	KS Class 2
Stroke Tolerance	0~+1.0mm
Piston Speed	50 ~ 500mm/s
Rubber Cushion	None
Rod end Thread	Female Thread
Mounting	Both Ends Tap, Fittings

Note 1) Follow auto switch utilizing temperature in case of using auto switch

Theoretical Output Sheet (Unit : N)



Bore Size (mm)	Operating Direction	Pressure Applied (MPa) 0.3	0.5	0.7
32	IN	181	302	422
	OUT	241	402	563
40	IN	317	528	739
	OUT	377	628	880
50	IN	495	825	1150
	OUT	589	982	1370
63	IN	841	1400	1960
	OUT	935	1560	2180
80	IN	1360	2270	3170
	OUT	1510	2510	3520
100	IN	2140	3570	5000
	OUT	2360	3930	5500

Note 1) In case of dual rod specification, In & Out output is identical to in output

1N ≒ 0.102kgf
1MPa ≒ 10.2kgf/cm²

Weight Table

Dual Rod End Female Thread (DC) Base (Unit : g)

Bore Size (mm)	Cylinder Stroke (mm) 125	150	175	200	250	300
32	963	1109	1254	1402	1694	1986
40	1138	1296	1454	1612	1929	2245
50	1814	2063	2312	2561	3059	3557
63	2081	2351	2620	2890	3429	3968
80	3536	3980	4414	4851	5721	6591
100	5245	5845	6443	7043	8240	9438

Non Auto Type Base (Unit : g)

Bore Size (mm)	Cylinder Stroke (mm) 125	150	175	200	250	300
32	750	853	956	1061	1267	1474
40	925	1040	1156	1271	1502	1733
50	1481	1663	1845	2028	2392	2757
63	1748	1951	2153	2357	2762	3168
80	3024	3355	3685	4017	4679	5340
100	4496	4945	5393	5842	6739	7637

Option Weight (Unit : g)

Bore Size (mm)		32	40	50	63	80	100
Rod End	Male Thread Part	26	27	53	53	120	175
Male Thread	Nut	17	17	32	32	49	116
Magnetic Equipped		12	13	15	24	25	37
Foot Type		106	116	188	279	563	883
Rod Side Flange Type		142	192	333	514	978	1268
Head Side Flange Type		142	192	333	514	978	1268
2 spin Clevis Type		157	207	393	539	1064	1835

※ 2EA (1 set) weight for foot.
※ Bolt weight is included in attached mounting weight.
※ In case of dual rod, additional weight or rod male thread is double.

Calculation Method

ex) ADQ2WF32-200DC
- Standard Weight : AQ2A32-200DC·····1402g
- Extra Weight : Magnetic (equipped)·····12g
  Rod side flange type·····142g

Sum 1556g

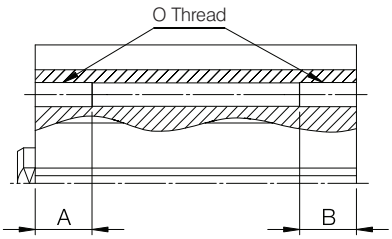
Additional Reference ▶ In Case Of Both Ends Tap

(mm)

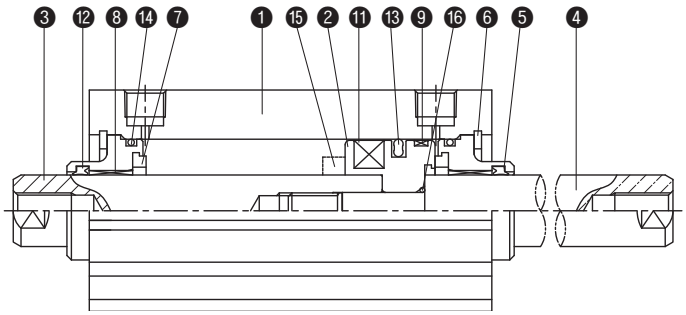
Classification	Bore Size (mm)	O	A	B
AQ2A	Ø32	M6×1.0	10	10
	Ø40	M6×1.0	10	10
	Ø50	M8×1.25	14	14
	Ø63	M10×1.5	18	18
	Ø80	M12×1.75	22	22
	Ø100	M12×1.75	22	22

※ Dimension of rotation protecting type (AQ2KA Ø32~Ø63) is same. But, AQ2A Ø80~Ø100 does not have rotation protecting type.

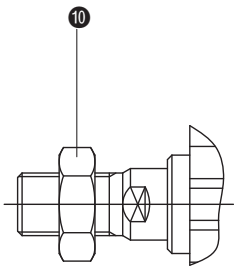
AQ2A (Ø32~Ø100)



Structural Drawing



In Case of Female Thread

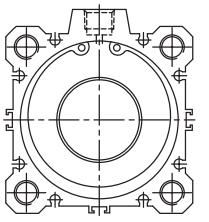


In Case of Male Thread

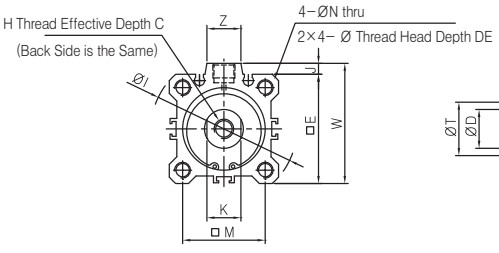
No	Item Name	Material	Remark
1	Cylnder Tube	Aluminum alloy	
2	Piston	Aluminum alloy	
3	Piston Rod-A	Carbon Steel	
4	Piston Rod-B	Carbon Steel	
5	Rod Cover	Aluminum alloy	
6	Snap Ring	Spring Steel	
7	Bumper	Poly Urethane Rubber	Rod Cover Side
8	Bush	Cooper Alloy	

No	Item Name	Material	Remark
1	Wear Ring	Resin	
2	Rod End Nut	Carbon Steel	(In Case of Non Standard Stroke)
3	Magnet	Ba+Ferrite+NBR	(Option)
4	Rod Packing	NBR	
5	Piston Packing	NBR	
6	Tube Gasket	NBR	
7	Spacer	Aluminum alloy	In Case of Non standard Stroke
8	Piston Gasket	NBR	(In Case of Dual Rod)

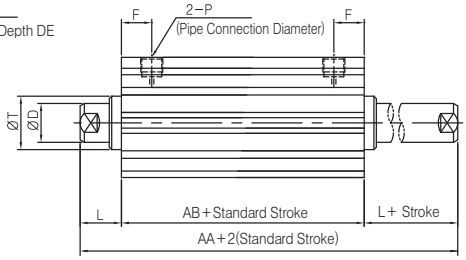
Standard Type (Both Ends Tap)/AQ2WA, ADQ2WA

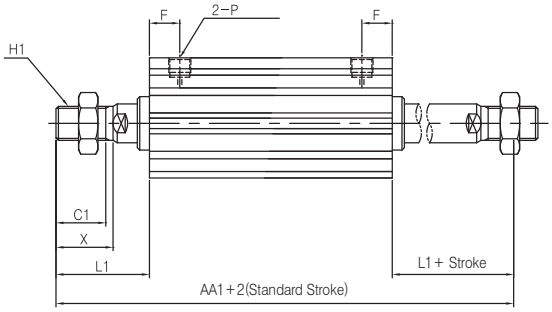


※ In Case of Ø63, 80 and 100



※ In Case of Ø32, 40 and 50





Rod End Male Thread Type

(Unit : mm)

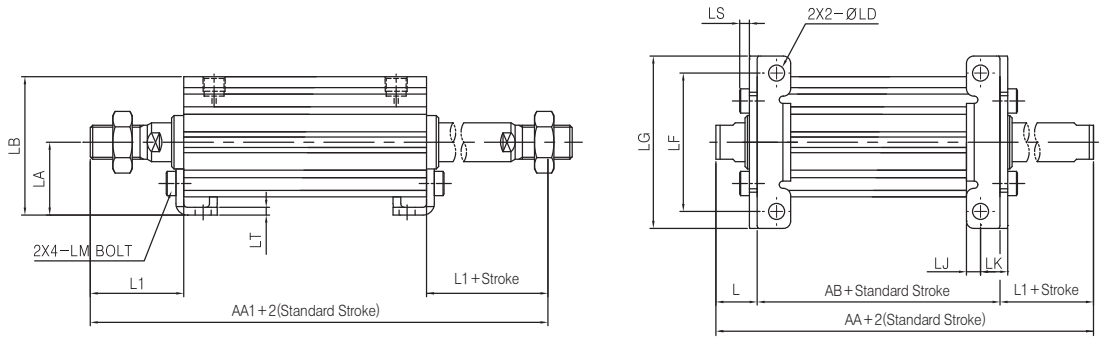
Bore Size	AA1	C1	H1	L1	X
Ø32	122.5	20.5	M14×1.5	38.5	23.5
Ø40	132	20.5	M14×1.5	38.5	23.5
Ø50	142.5	26	M18×1.5	43.5	23.5
Ø63	144	26	M18×1.5	43.5	23.5
Ø80	173	32.5	M22×1.5	53.5	23.5
Ø100	182.5	32.5	M26×1.5	53.5	23.5

Standard Type

(Unit : mm)

Bore Size	Stroke	AA	AB	C	D	E	F	H	I	J	K	L	M	N	O	DE	P	T	W	Z
Ø32	125, 150,	79.5	45.5	13	16	45	12.5	M8×1.25	60	4.5	14	17	34	5.5	M6×1.0	7	Rc(PT)1/8	22 $^{0}_{-0.052}$	49.5	14
Ø40		89	55	13	16	52	14	M8×1.25	69	5	14	17	40	5.5	M6×1.0	7	Rc(PT)1/8	28 $^{0}_{-0.052}$	57	14
Ø50	175, 200,	91.5	55.5	15	20	64	14	10×1.5	87	7	17	18	50	6.6	M8×1.25	8	Rc(PT)1/4	35 $^{0}_{-0.062}$	71	22
Ø63		95	57	15	20	77	16.5	10×1.5	103	7	17	18	60	9	M10×1.5	10.5	Rc(PT)1/8	35 $^{0}_{-0.062}$	84	22
Ø80	250, 300	106	66	21	25	98	19	M16×2.0	132	6	22	20	77	11	M12×1.75	13.5	Rc(PT)3/8	43 $^{0}_{-0.062}$	104	26
Ø100		119.5	75.5	21	30	117	23	M20×2.5	156	6.5	27	22	94	11	M12×1.75	22	Rc(PT)3/8	59 $^{0}_{-0.074}$	123.5	26

Foot Type/AQ2WL, ADQ2WL



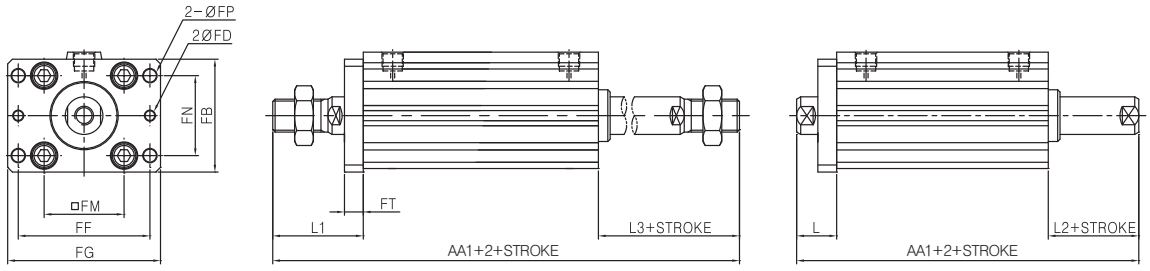
Material : Carbon Steel (Unit : mm)

Bore Size	Stroke	AA	AA1	AB	L	L1	LA	LB	LD	LF	LG	LJ	LM	LK	LS	LT
Ø32	125, 150,	79.5	122.5	45.5	17	38.5	30	57	6.6	57	71	5.8	M6×1.0	11.2	4	3.2
Ø40		89	132	55	17	38.5	33	64	6.6	64	78	7	M6×1.0	11.2	4	3.2
Ø50	175, 200,	91.5	142.5	55.5	18	43.5	39	79	9	78	95	8	M8×1.25	14.7	5	3.2
Ø63		95	144	57	18	43.5	45	91.5	11	91.5	113	9	M10×1.5	16.2	5	3.2
Ø80	250, 300	106	173	66	20	53.5	59	114	13	118	140	11	M12×1.75	19.5	7	4.5
Ø100		119.5	182.5	75.5	22	53.5	71	136	13	137	162	12.5	M12×1.75	23	7	6

※ Indication and dimension are same as dimension of standard cylinder.

※ Cylinder and mountings are delivered without assembly.

Rod Side Flange Type/AQ2WF, ADQ2WF

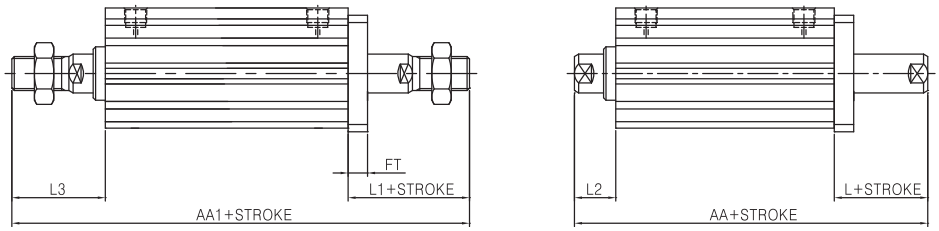


Material : Carbon Steel (Unit : mm)

Bore Size	Stroke	AA	AA1	AB	L	L1	L2	L3	FB	FP	FD	FF	FG	FM	FN	FT
Ø32	125, 150,	79.5	122.5	45.5	17	38.5	7	28.5	48	5.5	4.1	56	65	34	34	8
Ø40		89	132	55	17	38.5	7	28.5	54	5.5	4.1	62	72	40	40	8
Ø50	175, 200,	91.5	142.5	55.5	18	43.5	8	33.5	67	6.6	5.1	76	89	50	50	9
Ø63		95	144	57	18	43.5	8	33.5	80	9	5.1	92	108	60	60	9
Ø80	250, 300	106	173	66	20	53.5	10	43.5	99	11	6.1	116	134	77	77	11
Ø100		119.5	182.5	75.5	22	53.5	12	43.5	117	11	6.1	136	154	94	90	11

※ Indication and dimension are same as dimension of standard cylinder.
※ Cylinder and mountings are delivered without assembly.

Head Side Flange Type/AQ2WG, ADQ2WG

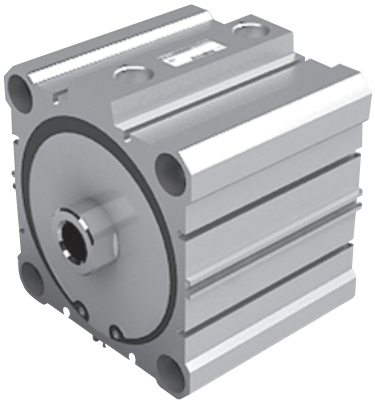


※ Indication and dimension are same as dimension of standard cylinder.
※ Indication dimension is identical to rod side flange type.
※ Cylinder and mountings are delivered without assembly.

Series AQ2

Large Diameter Compact Cylinder : Standard Type/Double Acting-single Rod, Double Rod

Bore Size(mm) : ϕ Ø125, Ø140



- COMPACT EQUIPMENT DESIGN AVAILABLE
- SMALL AUTO SWITCH EQUIPPED IN SQUARE TUBE

How to Order

□	A	D	Q2	B	125	—	30	D	C	□	—	W4	S
1		2		3	4		5	6	7	8		9	10

1 Series
Blank : RC(PT)
U : NPT

2 Magnet
Blank : None
D : Built-in magnet

3 Mounting
B : Standard type (Common to Through hole and both ends tap)
WB : In case of double rod

4 Bore Size
125 : Ø125mm
140 : Ø140mm

5 Stroke(mm)
Standard Stroke : 10, 20, 30, 40, 50, 75, 100, 125, 150, 200
※ Production of middle stroke
In accordance with installing spacer at cylinder of standard stroke, it is possible to produce middle stroke in every 5mm.
(Minimum production available spacer : 3mm)
ex) AQ2B125-35D installs 5mm wide spacer in standard stroke cylinder AQ2B125-40D

6 Action
D : Double acting type (Standard)

7 Cushion
C : Rubber cushion (Standard)

8 Body Option
Blank : Standard type (Rod end female thread)
M : Rod end male thread

9 Auto switch
Blank : None (Magnetic equipped cylinder)
Reed switch
W4 : W4
W8H : Subcompact auto switch (horizontal type, 2 wire type)
W8V : Subcompact auto switch (Vertical type, 2 wire type)
Non contact point existing auto switch
W9H : Subcompact auto switch (horizontal type, 2 wire type)
W9V : Subcompact auto switch (Vertical type, 2 wire type)
W9HN : Subcompact auto switch (horizontal type, 3 wire type)
W9VN : Subcompact auto switch (horizontal type, 3 wire type)
W2P : Low magnetic non exisiting point switch

10 Number of Auto switches
Blank : 2 pcs
S : 1pc
N : N pcs
※ Please contact us for special orders.

Option

Bore Size(㎜)			Ø125㎜	Ø140㎜
Air Pressure Type	Attachment	Penetration Hole	Standard Specification	
		Both End Tap	Standard Specification	
	Built-in Magnetic		Option Specification	
	Piping Method		Rc(PT)3/8 (Male Thread Connecting Type)	
	Rod End Male Thread		Option Specification	
	Rubber Cushion Attached		Standard Specification	

Specifications

Type	Air Pressure (Non lube) Type
Applied Fluid	Air
Guaranteed Pressure Resistance	1.5MPa (15kgf/cm^2)
Maximum Pressure Applied	1.0MPa (9.9kgf/cm^2)
Minimum Pressure Applied	0.05MPa (0.5kgf/cm^2)
Vicinity and Applied Fluid Temperature	5℃ ~ 60℃
Rubber Cushion	Standard
Rod end Thread	Male and Female Thread
Rod end Thread Allowance	KS Level 2
Stroke Length Allowable	0~+1.4(mm)
Attaching Method	Penetration Hole, Both ends Tap
Applied Piston Speed	50~500mm/s

Theoretical Force

(Unit : N)

Operating Direction		Pressure Applied (MPa)		
		0.3	0.5	0.7
Ø125	OUT	3,682	6,136	8,590
	IN	3,376	5,627	7,878
Ø140	OUT	4,618	7,697	10,776
	IN	4,313	7,188	10,063

1N ≒ 0.102kgf
1MPa ≒ 10.2kgf/cm^2

Weight Table

● Single Rod

(Unit : kg)

Bore Size	Type	Cylinder Stroke (mm)									
		10	20	30	40	50	75	100	125	150	200
Ø125	Standard	3.93	4.1	4.25	4.37	4.56	5.01	5.45	5.9	6.31	7.24
	Magnetic Equipped	3.94	4.11	4.26	4.38	4.57	5.02	5.46	5.91	6.32	7.25
Ø140	Standard	4.97	5.22	5.44	5.74	6.05	6.81	7.53	8.26	8.99	10.44
	Magnetic Equipped	4.99	5.24	5.46	5.76	6.07	6.83	7.55	8.28	9.01	10.46

※ It is the case for piston rod female thread specification(**-*DC).

● Dual Rod

(Unit : kg)

Bore Size	Type	Cylinder Stroke (mm)									
		10	20	30	40	50	75	100	125	150	200
Ø125	Standard	4.15	4.41	4.7	4.91	5.17	5.81	6.46	7.11	7.72	9.05
	Magnetic Equipped	4.16	4.42	4.71	4.92	5.18	5.82	6.47	7.12	7.73	9.06
Ø140	Standard	5.19	5.53	5.89	6.27	6.66	7.61	8.54	9.47	10.4	12.25
	Magnetic Equipped	5.21	5.55	5.91	6.29	6.68	7.63	8.56	9.49	10.42	12.27

※ It is the case for piston rod female thread specification(**-*DC).

Option Weight

(Unit : kg)

Rod End Male Thread	Male Thread Part	0.3
	Nut	0.15

※ In case of dual rod ×2

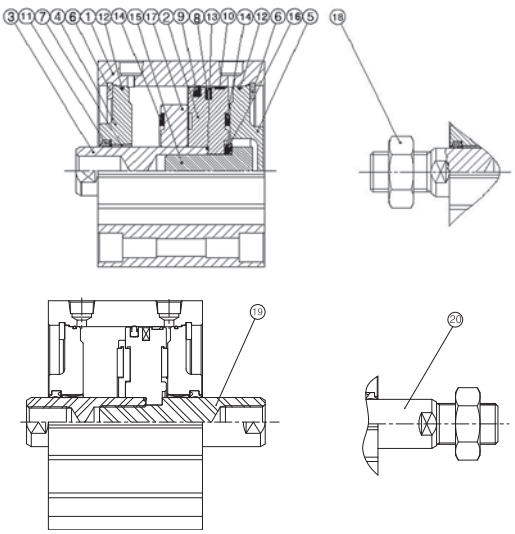
Calculation Method

ex) AQ2B125-30DCM

- Standard Weight : AQ2B125-30DC·····6g
- Extra Weight : Rod side flange type ·····0.45g

Sum 6.45g

Structural Drawing

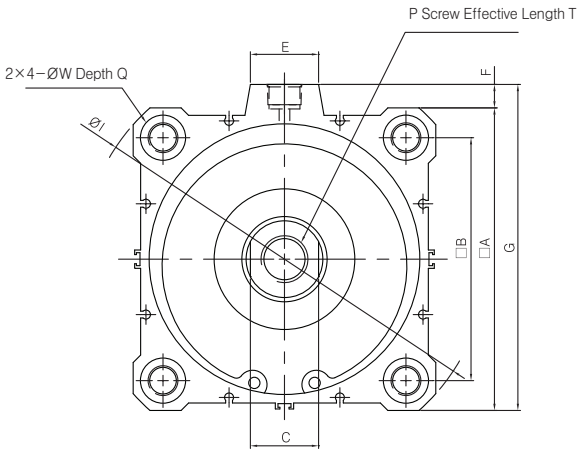


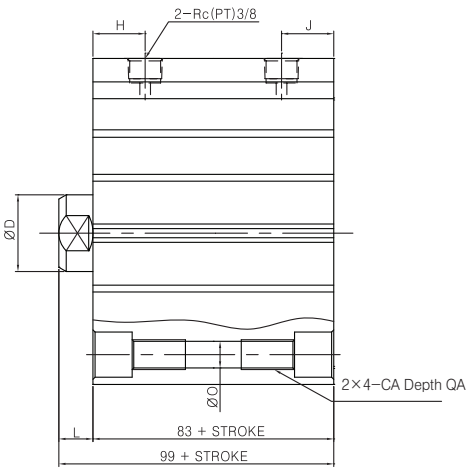
Dual Rod Type
(Rod End Female Thread)

Dual Rod Type
(Rod End male Thread)

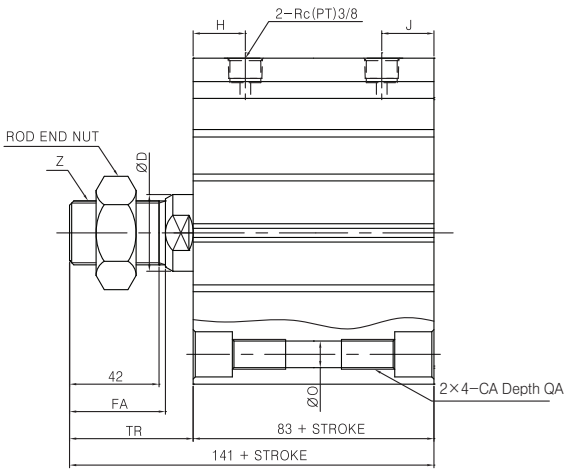
No	Item Name	Material	Remark
1	Cylinder Tube	Aluminum Alloy	
2	Piston	Aluminum Alloy	
3	Piston Rod	Carbon Steel	
4	Rod Cover	Aluminum Alloy	
5	Head Cover	Aluminum Alloy	
6	Snap Ring	Spring Steel	
7	Bush	Cooper Alloy	
8	Magnet Ring	Baferrite+NBR	Option
9	Piston Packing	NBR	
10	Wear Ring	Resin	
11	Rod Packing	NBR	
12	Gasket	NBR	
13	Piston Gasket	NBR	
14	Bumper	Poly Urethane Rubber	In Case Ø140, NBT
15	Hexagonal Bolt	Carbon Steel	
16	Spring Washer	Spring Steel	
17	Spacer	Aluminum Alloy	In Case Of Non Standard Stroke
18	Rod End Nut	Carbon Steel	
19	Piston Rod B	Carbon Steel	Dual Rod (Female Thread)
20	Piston Rod A	Carbon Steel	Dual Rod (male Thread)

Dimension Drawing/AQ2B, ADQ2B(Single Rod)





Standard (∗∗-∗DC)Type



Rod End Male Thread (∗∗-∗DCM)Type

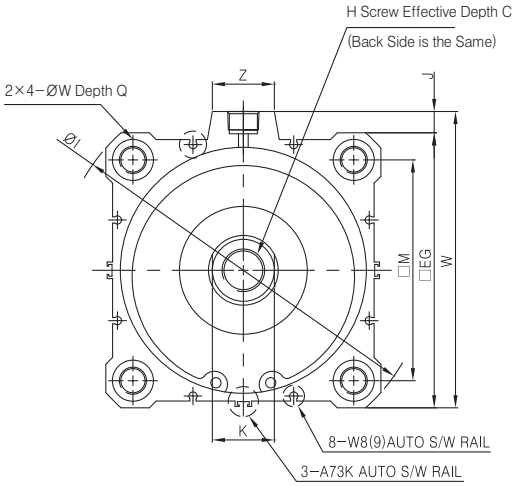
(Unit : mm)

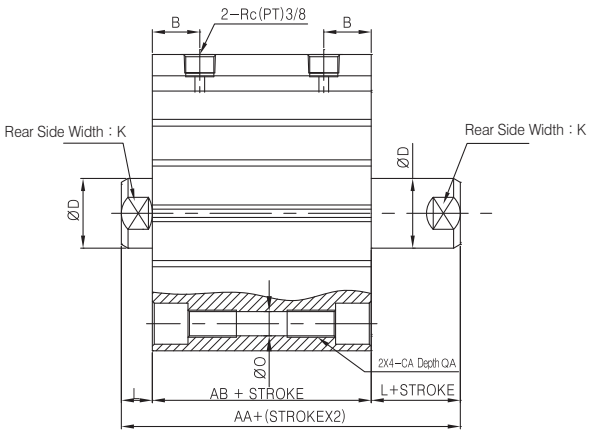
Bore Size	A	B	CA	C	D	E	F	FA	G	H	J
Ø125	142	114	M14×2	32	36	32	11	45	153	24.5	24.5
Ø140	158	128	M14×2	32	36	32	10	45	168	24.5	24.5

Bore Size	I	L	O	P	Q	QA	T	TR	W	Z
Ø125	190	16	12.5	M22×2.5	18.4	25	30	58	21.2	M30×1.5
Ø140	210	16	12.7	M22×2.5	18.4	25	30	58	21.2	M30×1.5

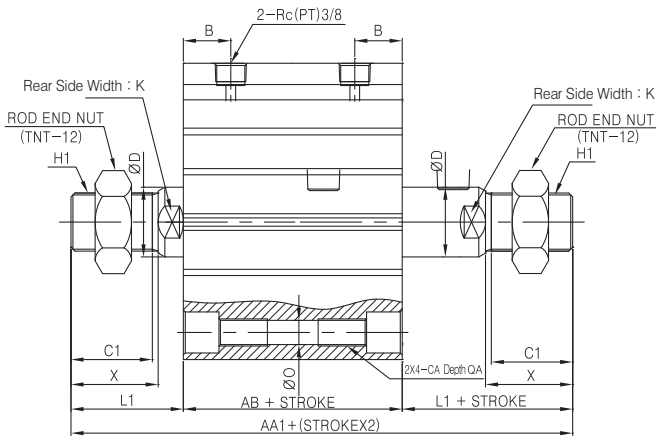
※ Refer to TNT−12 dimension of mounting of AL for Rod end nut.

Dimension Drawing/AQ2WB, ADQ2WB(Dual Rod)





Rod End Female Thread (∗WB∗-∗DC)Type



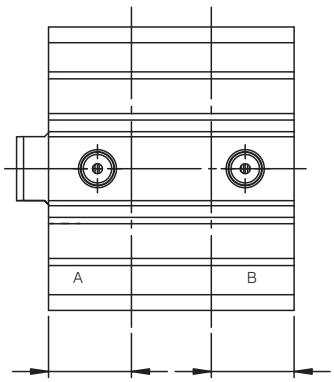
Rod End Male Thread (∗WB∗-∗DCM)Type

(Unit : mm)

Bore Size	AA	AB	L	H	C	W	EG	M	J	D	B	AA1
Ø125	115	83	16	M22×2.5	30	153	142	114	11	36	24.5	199
Ø140	115	83	16	M22×2.5	30	168	158	128	10	36	24.5	199

Bore Size	L1	X	C1	H1	I	Z	K	ØO	N	Q	CA	QA
Ø125	58	45	42	M30×1.5	190	32	32	12.5	21.2	18.4	M14×2	25
Ø140	58	45	42	M30×1.5	210	32	32	12.7	21.2	18.4	M14×2	25

Proper Attaching Position of Auto Switch (Condition for Forward/Backward Full Stroke Utilization)

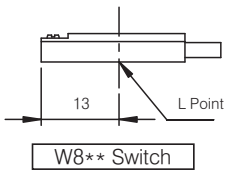


(Unit :mm)

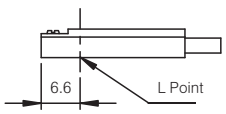
A Point Location	B Point Location
32	17.5

※ Use with coninciding L point of switch to A or B point of cylinder in case of switch attachment.

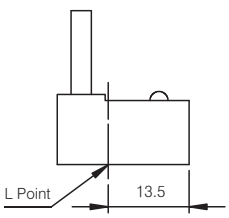
※ In case of attaching 2 auto switches, use minimum stroke over 10 stroke.
But, in case of W2P✻ switch attaching it is available to use over 15 stroke.



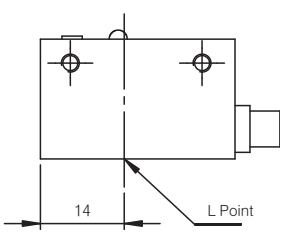
W8** Switch



W9** Switch



W4 Switch



W2P* Switch

Series AJ

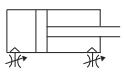
Clamp Cylinder/Double Acting

Bore Size(mm) : Ø50, Ø63

PAT

- TWO TYPES OF CLEVIS WIDTH ARE AVAILABLE(16.5mm, 19.5mm)
- THE PIPING ENTRY ORIENTATION CAN BE SELECTED
- EVEN MORE COMPACT AND LIGHT WEIGHT
- NON LUBE TYPE
- POSSIBLE TO DISASSEMBLE
- BUILT-IN SPEED CONTROLLER

Symbol



How to Order

AJ — G — A — 50 — 100 — Y — ( ) — W2 — ( )

1 2 3 4 5 6 7 8

1 Clamp Cylinder

2 Magnet
Blank : None
G : Built-in Magnet

3 Clevis Width
A : 16.5 $^{+3.0}_{-0.3}$mm
B : 19.5mm

4 Bore Size(mm)-Stroke(mm)
50 : ϕ50 : 50, 75, 100, 125, 150
63 : ϕ63 : 50, 75, 100, 125, 150

5 Accessories
Blank : None
Y : Double knuckle joint

6 Mount
B : Limit switch mount
N : Length of Rod end is different
D : Cam mount
19 : Foot mount

7 Auto Switch
Blank : None
Solid State Switch
W2 : 24VDC, For welding machine, intense magnetic field(except ϕ80)
Reed Switch
W3 : 24VDC, 100 · 200VAC
W2PZ : 5m Magnetic auto switch (DC24V Only)
*Refer to auto switch specification

8 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

Specifications

Clevis width	16.5mm	Series AJA
	19.5mm	Series AJB
Fluid		Air
Proof pressure		1.5MPa(213psi)
Max. operating pressure		1.0Mpa(140psi)
Min. operating pressure		0.05Mpa(7psi)
Ambient and fluid temperature. ˚C(˚F)		5~60℃(41˚F~140˚F)
Piston velocity		50~500 mm/sec
Cushion		Air-cushion (Both side)
Lubrication		Non-lube
Screw tolerance		KS 2 class
Stroke length tolerance		$^{+0.1}_{0}$
Speed controller		Built in (Standard)
Mounting style		Double clevis (Basic type only)

Accessories (Option)

Description	Series AJA	Series AJB
Double knuckle joint (With pin and split pin)	TCKA40-18-206A	TCKB40-18-207A
Limit switch mount	TCKAM040-48-16070A	
Cam	TCKAM040-42-16070	

※ ϕ32: Double Knuckle Joint - AC1K032-18-1887
Clevis Pin - AC1K032-23-1887

Weight table(The basic weight is for 0 stroke.) (kgf)

Bore Size		ϕ50	ϕ63
Cylinder	Basic weight	0.96	1.23
	Additional weight per 50 stroke	0.11	0.13
Double knuckle joint (With pin)		0.28	
Limit switch mount		0.22	
Cam		0.12	
Special bracket		2.2	

Calculation Method

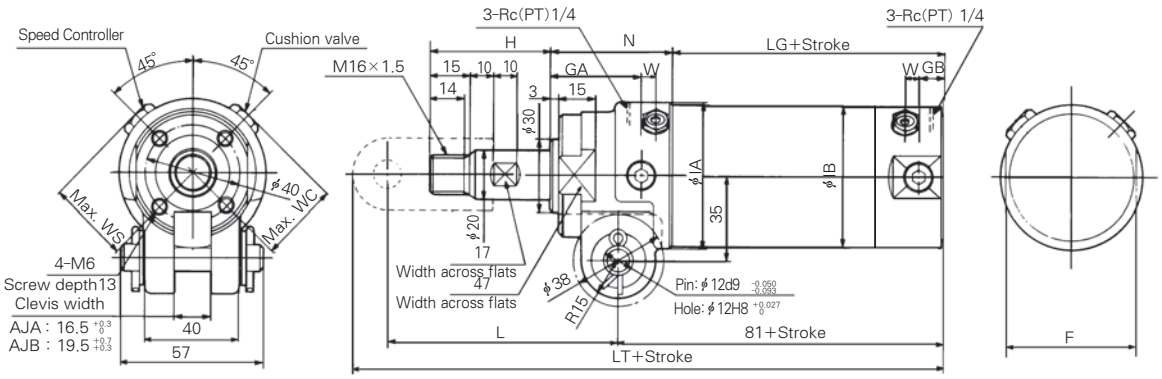
Example : AJ◯50-04Y
- Basic weight ··· 0.96(ϕ50)
- Additional weight ··· 0.01/25g stroke
- Cylinder stroke ··· 100mm stroke
- Double knuckle joint ··· 0.28(r)

0.96+0.10×100/250.28=1.64kgf

Dimensions/Series AJ

(Unit:mm)

AJ○50, AJ○63



(Unit:mm)

Bore Size(mm)	F	GA	GB	H	φIA	φIB	L	N	LG	W	WC	WS	LT
φ50	55	32	10	50	60	58	97	47	58	7	38	39	193
φ63	69	34	12	50	74	72	97	47	58	5.5	44	45	193

N

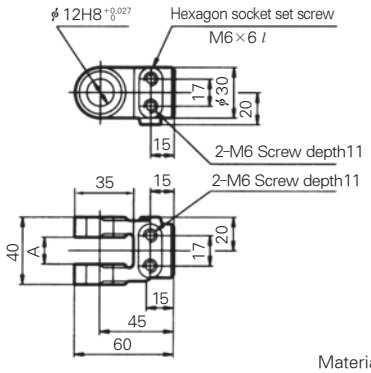
(Unit:mm)

Sign / Stroke / Bore Size(mm)	H					L					LT				
	50	75	100	125	150	50	75	100	125	150	50	75	100	125	150
φ50	52	62	70	83	83	97	107	115	128	128	194	204	212	225	225
φ63	52	62	70	83	83	97	107	115	128	128	194	204	212	225	225

Accessories

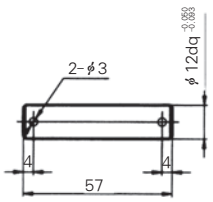
(Unit:mm)

Double knuckle joint



Material:Cast iron

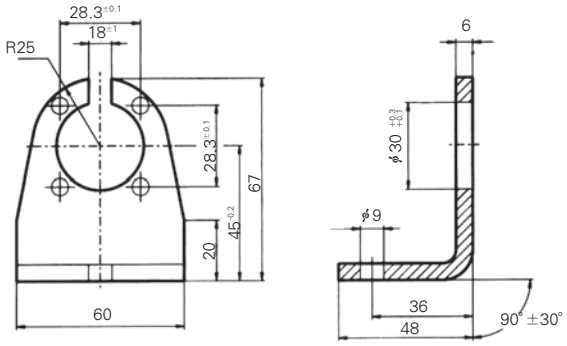
Pin : TC1K040-23-54806



Material:Carbon steel

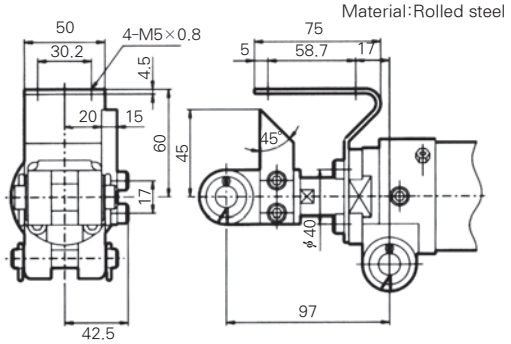
Part No.	A	Applicable clamp cylinder
TCKA40-18-206A	$16.5^{+0.2}_{0}$	Series AJA
TCKB40-18-207A	$19.5^{+0.7}_{+0.2}$	Series AJB

Foot Dimensions



Limit Switch Mount : Cam Mount

Material:Rolled steel



Note 1) The limit switch mount and the cam fitting are possible to change to optional positions by removing the hexagon socket head cap bolts.

Note 2) The cam fitting can be used when the mounting hole dimension is 97mm.

Series AJM

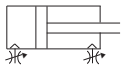
Clamp Cylinder / With intense-magnetism resistant auto switch

Bore Size(mm) : Ø50, Ø63

PAT

- TWO TYPES OF CLEVIS WIDTH ARE AVAILABLE(16.5mm, 19.5mm EXCEPT ϕ32)
- GAITER IS UNNECESSARY
  BECAUSE A HEAVY DUTY COIL SCRAPER IS PROVIDED AS A COUNTER MEASURE AGAINST SPATTER, ROD BOOT IS UNNECESSARY
- BUILT-IN MAGNET

Symbol



How to Order

AJM — A — 50 — 100 — Y — ( ) — W6 — ( )

1 2 3 4 5 6 7

1 Clamp Cylinder
With intense - magnetism resistant auto switch

2 Clevis Width
A : 16.5mm(ϕ50, ϕ63)
B : 19.5mm(ϕ50, ϕ63)

3 Bore Size / Stroke(mm)
50 : ϕ50 - 50, 75, 100, 125, 150
63 : ϕ63 - 50, 75, 100, 125, 150

4 Accessories
Blank : None
Y : Double knuckle joint

5 Mount
B : Limit switch mount
D : Cam mount
N : Rod end is different in length
19 : Foot mount

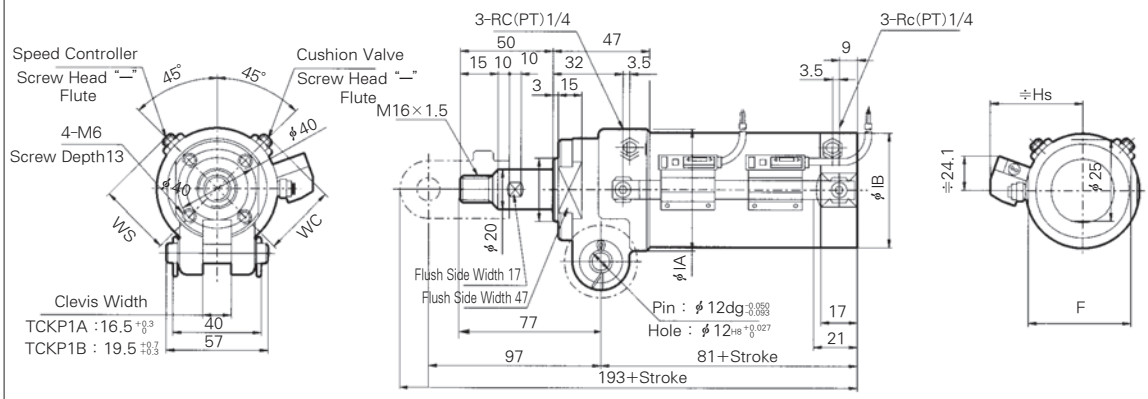
6 Auto Switch
W6 : 24VDC, OFF lighting
W7 : 24VDC, 100VAC, ON lighting
※ Refer to auto switch specification

7 Lead Wire Length
L : 3m
Z : 5m

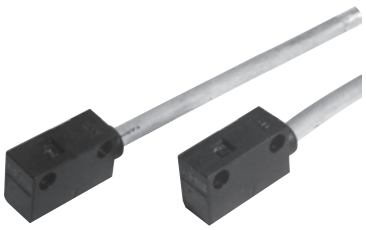
Dimensions/Series AJM

(Unit:mm)

AJM◯50, AJM◯63



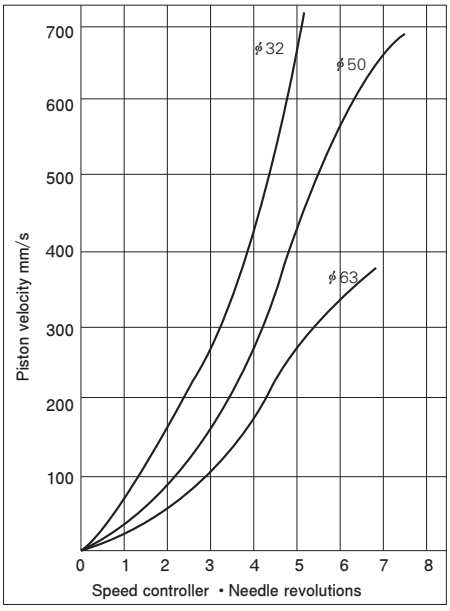
Bore	F	φIA	φIB	WC	WS	Hs
φ50	55	60	58	38	39	49
φ63	69	74	72	44	45	54.5



Auto Switch Specifications

Switch model NO.	W6(L), (Z)	W7(L), (Z)	
Switch type	Reed switch		
Operating voltage	AC100V	DC24V	AC100V
Operating Current circuit	20mA	5~40mA	5~20mA
Operating time	1.2mS		
Internal drop voltage	Nil	2.4V	
Leakge current Polarity	Max. 1.8mA	0	
Impact resistance	Operating	Present	
Pilot lamp	30G		
Type of lead wire	Oilproof, fire-resistant vinyl captype cord : 0.75㎟×2		
Lead wire length	0.5m, (3m), (5m)		
Ambient and fluid temperature	40°F~140°F		
Insulation resistance	50㏁ max. at DC 500V		
Protective construction	IEC : IP67 JIS CO920(Watertight)		
Application	Sequence controller relay		

Speed Controller Needle Revolutions And Corresponding Cylinder Speed

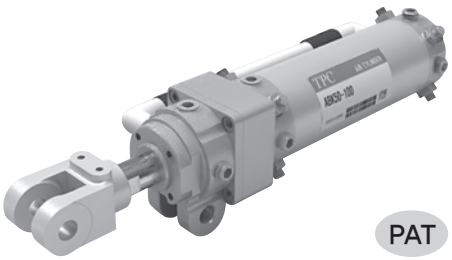


Conditions : OUT side supply pressure 5kgf/㎠, No-load

Series ABK

Taper (Forward Motion or Backward Motion) Clamp Cylinder

Bore Size(mm) : Ø50, Ø63



- LOW MAGNETIC RESISTANT AUTO SWITCH ATTACHING AVAILABLE
- AIR CUSHION BASICALLY BUILT-IN (ROD- SIDE, HEAD-SIDE)
- MAKING SERIES FOR CLEVIS WIDTH
- NO NEED OF BELLOWS IN APPLICATION STRONG COIL SCRAPPER
- POSSIBLE TO SELECT PIPING LOCATION

How to Order

ABK G A 50 — 100 Y ○ — B — ○ — □ □ □

1 2 3 4 5 6 7 8 9 10 11

1 Actuator Brake Clamp Cylinder

2 Magnet
- Blank : None
- G : Standard magnetic resistant type
- P : Intense magnetic resistant type

3 Clevis Width
- A : 16.5mm
- B : 19.5mm

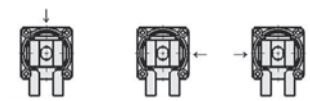
4 Bore Size(Ø)-Stroke(mm)
- Ø50 – 50,75,100,125,150
- Ø63 – 50,75,100,125,150
- ※ Possible to produce middle stroke beside standard stroke

5 End Bracket
- Blank : None
- Y : Double Knuckle Joint

6 Mount
- B : Limit switch mount
- D : Cam mount
- 19 : Foot

7 Locking Position
- B : Backward locking
- F : Forward locking

8 Port Position
- Blank : Upper
- R : Right
- L : Left
- ※ "R" & "L" type are only available when locking is performed forwardly(F)



9 Auto Switch
- Blank : None
- W3 : Standard magnetic resistant reed switch
- W2P : Standard magnetic resistant solid state switch
- P70R, P74R : Intense magnetic resistant reed switch

10 Number of Auto Switches
- Blank : 2 pcs
- S : 1 pc
- N : N pcs

11 Lengh of Lead Wire
- L : 3m
- Z : 5m

Notices for products

Please fully understand the notices prior to utilization, and refer to safety notice and common notice.

Specifications

	Bore Size	Ø50	Ø63
Cylinder	Operation Method	Double Motion Extension Rod	
	Applied Fluid	Air	
	Guaranteed Operating Pressure	1.5MPa	
	Maximum Operating Pressure	1.0MPa	
	Minimum Pressure Applied	0.2MPa	
	Ambient and Applied Fluid Temperature	5℃ ~ 60℃	
	Applied Piston Speed	50~500mm/s	
	Cushion	Both Side Air Cushion	
	Lubrication	Non-Lube	
	Stroke Length Tolerance	0/+1.0	
	Speed Controller	Built-in	
	Mounting	Double Clevis	
Lock	Lock Operating Method	Spring Lock	
	Note 1) Lock Releasing Pressure (for No Loading)	0.2Mpa More Than	
	Note 2) Lock Direction	Single Direction (Forward or Backward)	
	Note 3) Lock Keeping Strength N (Maximum Static Load)	1,519(155Kg) ± 3%	1,974(200Kg) ± 3%
	Lock Applied Purpose	Drop Prevention, Location Maintaining	

Note 1) For smooth lock release in case of load applied, recommended to use over 0.5MPa pressure.
Note 2) Regardless of lock direction (forward or backward), specification is the same.
Note 3) Lock keeping strength is maximum static load, and recommended to use less than 40% of maximum static load for safety.

Weight

(Unit : kg)

Bore Size		50	63
Cylinder	Basic Weight (0 st')	F:1.46, B:1.42	F:1.95, B:1.89
	Increased Weight Per 25 Stroke	0.11	0.13
2-Spin Knuckle Joint (Pin Inclusive)		0.36	
Limit Switch Attaching Board		0.22	
Cam Mount		0.15	
Foot		0.22	

※ Auto switch Attachment is exempted.

Foward Lock : F
Backward Lock : B

Calculation Method

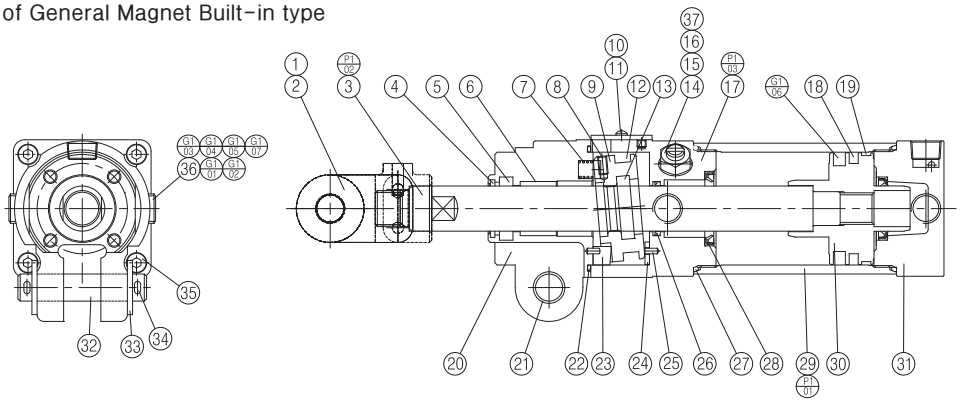
ex) ABKGA50-100Y-B

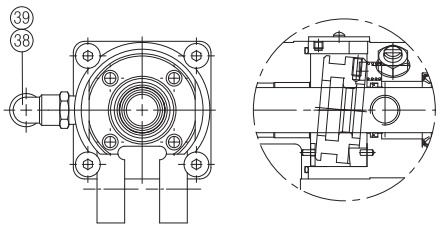
- Basic Weight(Ø50 Backward lock) : 1.42 Kg
- Additional Weight (per 25 st') : 0.11 * 4 = 0.44 Kg
- 2-Spin Knuckle Joint : 0.36 Kg

Total : 2.22 kg

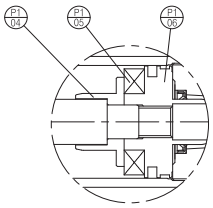
Structure Map

Backward Direction Lock Type(ABKG＊＊-＊＊＊＊-B)
In Case of General Magnet Built-in type





Backward Direction Lock Type TYPE
(ABK＊＊＊-＊＊＊＊-F)



In Case of Strong Magnet Built-in Type
(ABKP＊＊-＊＊＊＊-＊)

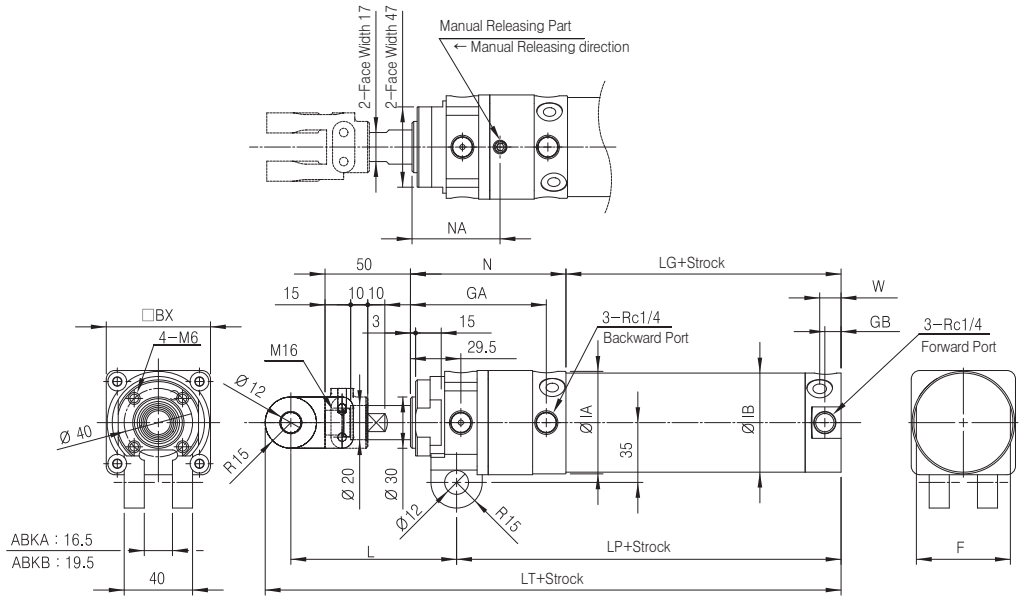
Major Component List

No	Component	Material Property	Quantity	Remark
❶	Y-Knuckle	Carbon Steel	1	
❷	Pin	Spring Steel	1	
❸	Piston Rod	Carbon Steel	1	Hard Chromite
❹	Coil Swrapper	Phosphor Bronze	1	
❺	Rod Packing	NBR	1	
❻	Bush	Copper Apply	1	
❼	Spring	Spring Steel	2	Zinc Chromite
❽	Bolt	Carbon Steel	1	
❾	Shoe	Carbon Steel	1	Silver Nitrate Coloring
❿	Manual Releasing Cover	Aluminum Alloy	1	
⓫	Bolt	SUS	2	
⓬	Shoe Piston Packing	NBR	1	
⓭	Shoe Rod Packing	NBR	1	
⓮	Nut	Carbon Steel	4	Zinc Chromite
⓯	Gasket	NBR	4	
⓰	Cushion Valve	Carbon Steel	2	Zinc Chromite
⓱	Middle Cover	Aluminum Alloy	1	White Alumite
⓲	Piston Packing	NBR	1	
⓳	Wearing	Resin	1	
⓴	Rod Cover	Alluminum Alloy	1	White Alumite
㉑	Bush	Copper Apply	2	
㉒	O Ring	NBR	1	Zinc Chromite
㉓	Hinge Pin	Carbon Steel	1	
㉔	Propping Plate	SUS	1	
㉕	Pin	Spring Steel	4	
㉖	Rod Packing	NBR	1	

번호	Component	Material Property	Quantity	Remark
㉗	Tube Gasket	NBR	2	
㉘	Cushion Packing	NBR	2	
㉙	Tube	Aluminum Alloy	1	
㉚	Piston	Aluminum Alloy	1	White Alumite
㉛	Head Cover	Aluminum Alloy	1	White Alumite
㉜	Pin	Carbon Steel	2	Zinc Chromite
㉝	Washer	Carbon Steel	4	Zine Chromite
㉞	Separate Pin	Steel Wire	4	
㉟	Bolt	Carbon Steel	4	
㊱	Plug	Carbon Steel	7(5)	Forward Direction 5EA
㊲	Speed Cone Valve	Carbon Steel	2	Zine Chromite
㊳	One Touch Fitting		2	Forward Direction Only
㊴	Tube		1	Forward Direction Only
G1-01	Plug	Copper Apply	2	
G1-02	Switch Rail	Carbon Steel	1	Zine Chromite
G1-03	Spring Washer	Spring Steel	2	Zine Chromite
G1-04	Bolt	Carbon Steel	2	Silver Nitrate Coloring
G1-05	Plug	Carbon Steel	2	
G1-06	Magnet	Magnetic Substance	1	
G1-07	Washer	Carbon Steel	2	Zine Chromite
P1-01	Tube	Aluminum Alloy	1	Hard Alumite
P1-02	Piston Rod	Carbon Steel	1	Hard Chrome Plating
P1-03	Middle Cover	Aluminum Alloy	1	White Alumite
P1-04	Piston A	Aluminum Alloy	1	White Alumite
P1-05	Magnet	Magnetic Substance	1	
P1-06	Piston B	Aluminum Alloy	1	White Alumite

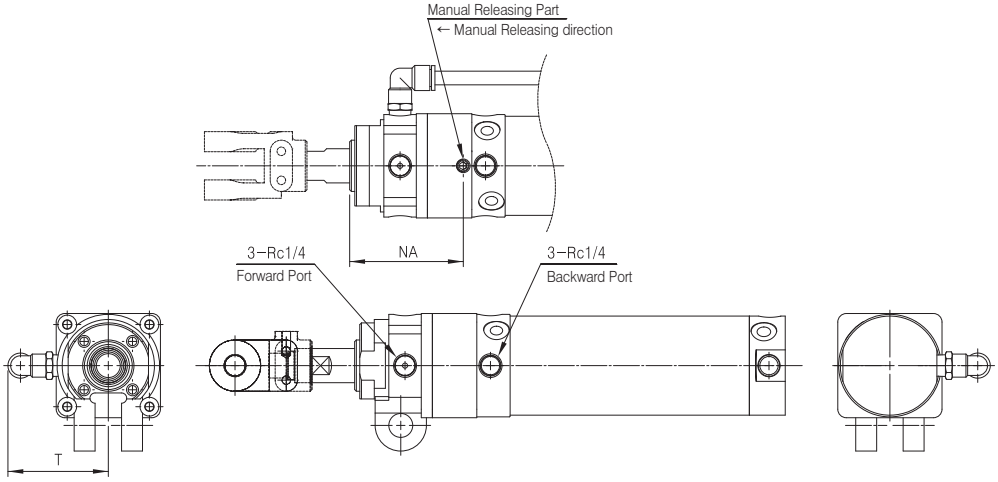
Fitting Dimension Drawing

Backward Lock Type (ABK＊＊＊-＊＊＊-B)



Bore Size	F	GA	GB	ØIA	ØIB	□BX	L	N	NA	W	LG	LP	LT	LG	LP	LT
														In Case of Strong Magnetic Resistant System		
Ø50	55	79.5	9.5	60	58	61	97	91	51.5	12.5	61	125	237	63	127	239
Ø63	69	79.5	9.5	74	72	75	97	91	50.8	12.5	61	125	237	63	127	239

Forward Lock Type (ABK＊＊＊-＊＊＊-F)



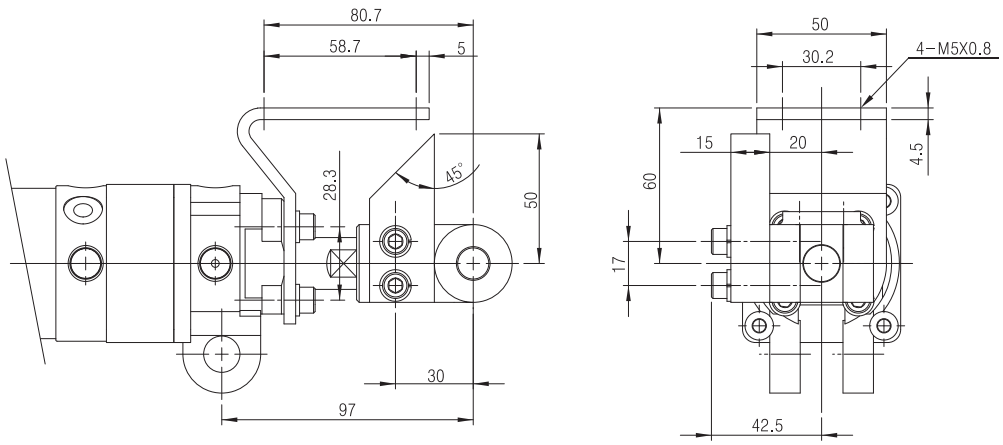
Bore Size	T	NA
Ø50	60	66.5
Ø63	66	67

※ Dimensions not indicated ard identical to forward lock type.

※ Limit switch attaching board, foot and cam mount are identical to TCK Ø50 and Ø63 specification.

Fitting Dimension Drawing

Limit Switch Attaching Board/Cam Mount

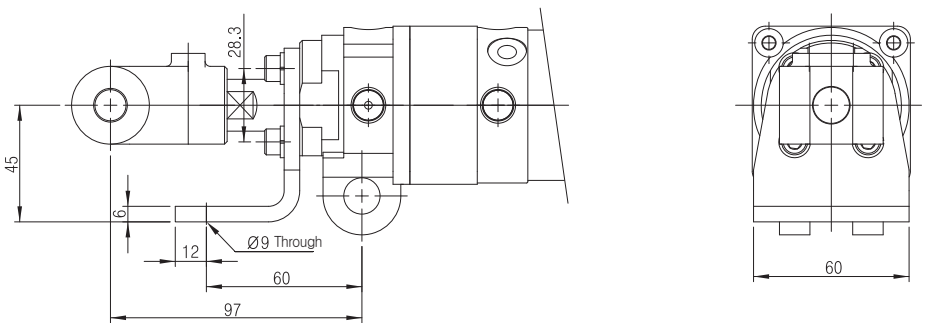


Name of Componet	ABKA	ABKB	Remark
Limit Switch Attaching Board	TCKM040-48-16070A		Both Available for Ø50 and Ø63
Cam Mount	TCKM040-42-16070		

※ Possible to attach limit switch attaching board and dog fittings at arbitrary location with removing hexagonal hole attaching bolt.

※ Application of cam mount is available for 97mm attaching hold size.

Foot



Name of Componet	ABKA	ABKB	Remark
Foot	TCKA-19		Both Available for Ø50 and Ø63

Notices for products

Please fully understand the notices prior to utilization, and refer to safety notice and common notice.

Warning

Features

❶ Since lock keeping strength indicates the capability maintaining maximum static load, it is recommended to use under 40% of keeping strength for safety and active operation in application of this product (for suing lock unit).

❷ This cylinder does not aim for interim stop but aims for locking in unexpected situation during stop situation, so that long term utilization of this cylinder in interim stop within running may cause damage or functional loss of lock unit.

❸ Do not refill fuel in lock releasing port. It may cause functional loss of lock unit.

❹ It is possible to cause maximum 1mm strlke shift to lock direction in case of long term application (with loading), which is caused by lock unit features.

❺ Do not disassemble / assemble lock unit. It may cause severe fault to lock operation.

Warning

Selection

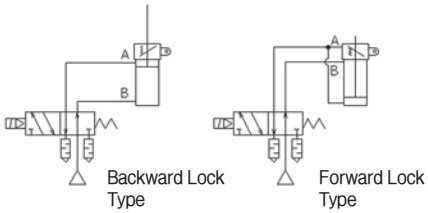
❶ During backward motion, lock type does not have binding force for forward motion of piston, and vice versa for backward motion. Therefore, be cautious to select a product for each direction.

Warning

Circuit

❶ Do not use close center valve for interim stop.

❷ Connect A port of solenoid valve to lock releasing port, B port to piston operating port. Lock releasing valve is not additionally needed, and common exhaust manifold may cause operation error by backpressure. Therefore, do not use common exhaust manifold.



Backward Lock Type

Forward Lock Type

Warning

Installation

❶ For easy installation of cylinder, carry out installation with mounting manual releasing bolt. It may prevent damage of safety and lock unit during installation.

Warning

Operation

❶ Since lock is released by manual releasing bolt for delivery, please use after removing a bolt. If supplying over 0.1MPa air to lock releasing port in unloaded condition, manual releasing bolt is easily removed. (Piston ord is possibly moving forward for forward lock type).

※ Plase carry out removal of manual releasing bolt as it is indicated in manual rreleasing cover.

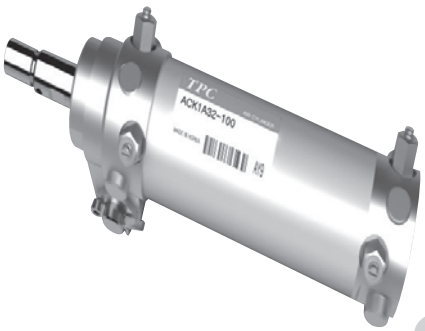
❷ Please restore B port air before restart from lock condition in unexpected situation. If lock is released in advance, it may cause unexpected accident.

❸ Please adjust air cushion and speed controller along user's configuration.

Series ACK1

Clamp Cylinder

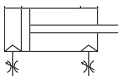
Bore Size(mm) : Ø32, Ø80



PAT

- POSSIBLE TO UTILIZE IN STRONG MAGNETIC SYSTEM CIRCUMSTANCES
- LIGHT AND COMPACT
- NON-FUEL TYPE AND DISASSEMBLY AVAILABLE
- SPEED CONTROLLER BUILT-IN
- OPTIONAL SELECTION OF PIPING DIRECTION AVAILABLE
- BELLOWS UNNECESSARY BY APPLICATION OF STRONG COIL SCRAPPER
- POSSIBLE TO MOUNT VARIOUS AUTO SWITCHES
  - Common Type (W5, W3)
  - Low Magnetic System type (W2P)
  - Strong Magnetic System

Symbol



How to Order

A	CKP1	A	32	—	100	Y	—	○	—	W2P	Z
1	2	3	4		5	6		7		8	9

1 Actuator

2 Magnet
Bore Size(mm) Ø32
Blank : Common magnet equipped (W2P, W5)
P : Strong magnet built-in type (for W2P)

Bore Size(mm) Ø80
Blank : Magnet equipped (W2P, W5)
P : Strong magnet built-in type (for W2P)
G : Common magnet equipped

3 Clevis Width

Bore Size	A	B	C
Ø32	$16.5^{+0.2}_{-0.2}$	–	–
Ø80	16.5	19.5	28

4 Bore Size(mm)
32 : 32mm, 80 : 80mm

5 Stroke(mm)
32 : 50,75,100,125,150,200,250,300
80 : 50,75,100,125,150,175,200,250,300

6 Rod End Fitting
Blank : None
Y : Double knuckle joint

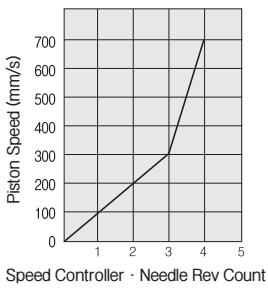
7 Additional Symbol
B : Limit switch fittings attached
D : Cam mount(Ø32 is not available)
19 : Foot

8 Auto Switch
Blank : None
W5 : Grommet
DC24V, AC100V, Light ON Lighting
W6 : AC100V OFF Lighting
W7 : DC24V, AC100V ON Lighting
W2P : DC24V ON Lighting
W3 : W3

9 Lead Wire Length
L : 3m(W5 included)
Z : 5m(W5 is not relevant)
※ 0.5mm is standard for W5.

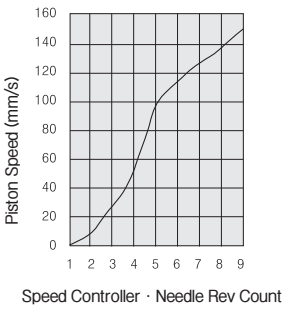
Speed Controller (Ø32)

Needle Rev Count and Cylinder Running Speed



Condition : Out-side, Pressure supplied 5kgf/㎠, for unloaded condition

Speed Controller (Ø80)



Specifications

Items	Content
Internal Diameter/Stroke	Ø32, Ø80 / 50 ~ 300mm
Applied Fluid	Air
Guaranted Pressure Resistance	1.5MPa(15kgf/cm²)
Maximum Pressure Applied	1.0MPa(9.9kgf/cm²)
Minimum Pressure Applied	0.05MPa(0.5kgf/cm²)
Ambient and Applied Fluid Temperature	5~60℃
Applied Piston Speed	50~500mm/s
Cushion	Both Side Air Cushion
Lubrication	Non-Lube
Stroke Tolerance	0 ~ 1.0mm
Speed Controller	Built-in
Attachment Supporting Type (Standard Type)	※Double Clevis (Pin and Separate Pin Attached)

Accessories (Option)

Name of component	Item Number
Limit Switch Attaching Board	ACKA080-48-001
Cam Mount	ACKA080-42-001
Foot	ACKA080-19-001

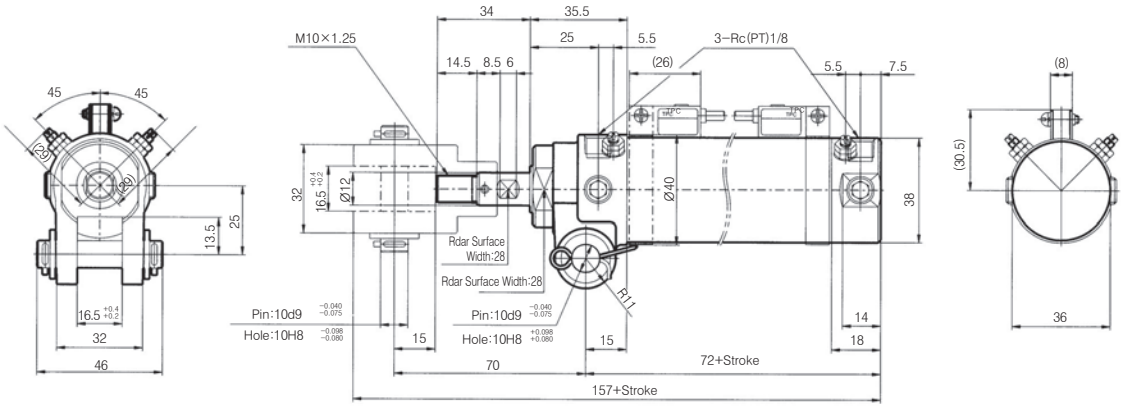
Weight Table

(Unit : kg)

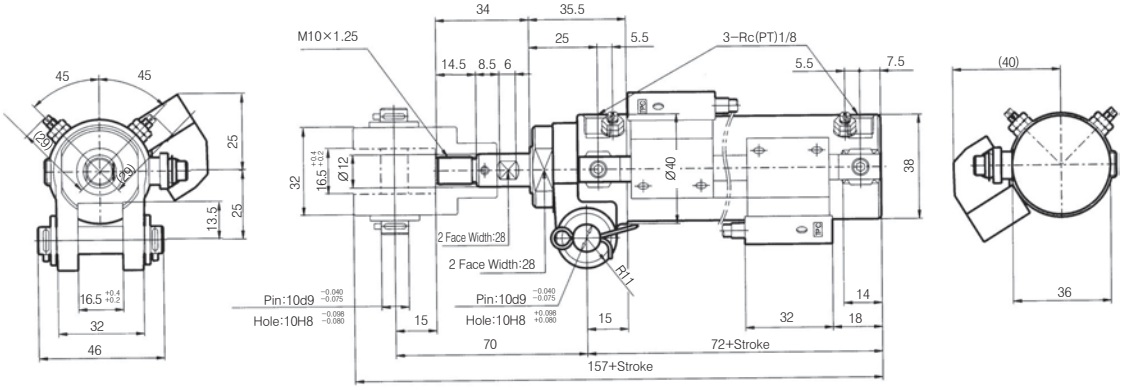
Bore Size		Ø32	Ø80
Cylinder	Basic Weight	0.42	3.86
	Increased Weight Per 25 Stroke	0.06	0.13
Double Knuckle Joint (Pin Inclusive)		0.21	0.6

Dimensions

Standard Type/ACK1 (Ø32)

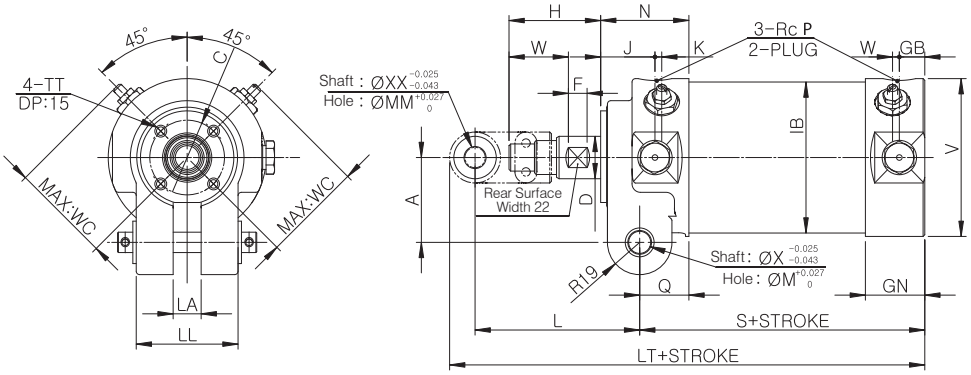


Auto Switch type
ACK P1 (Ø32)



Dimensions

ACK*1*80−** TYPE



(Unit : mm)

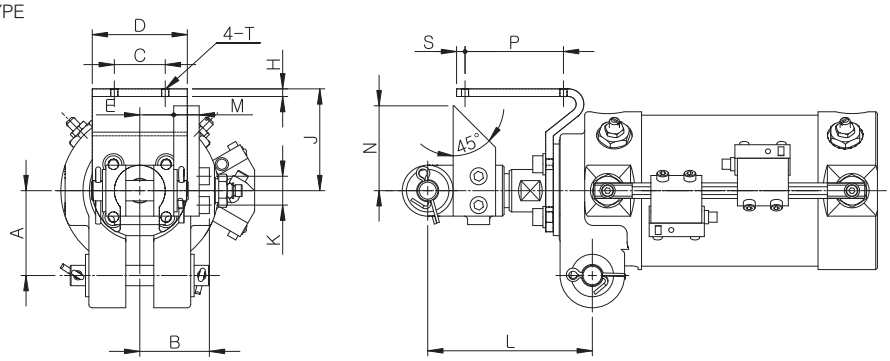
Bore Size	TYPE	A	H	C	D	WC	F	N	L	J	W	LA	LL	M	MM
Ø80	A	50	54	44	25	70	11	52	97	32	4	$16.5^{+0.3}_{0}$	60	12	12
	B	50	54	44	25	70	11	52	97	32	4	$19.5^{+0.7}_{+0.3}$	60	12	12
	C	50	48	44	25	70	11	52	110	32	4	28	60	18	18

(Unit : mm)

Bore Size	TYPE	GN	P	Q	IB	S	TT	X	XX	LT	GB
Ø80	A	35	3/8	29	89	118	M6×1.0	12	12	230	15
	B	35	3/8	29	89	118	M6×1.0	12	12	230	15
	C	35	3/8	29	89	118	M6×1.0	18	18	247.5	15

Limit S/W Mount : Cam Mount (∅80)

ACK*1*80−** TYPE



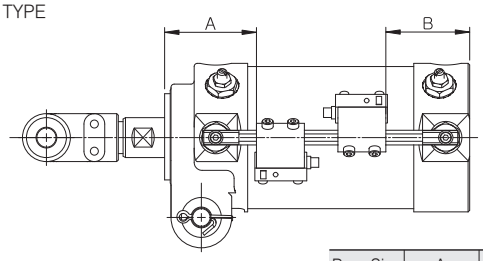
Parts Number	Parts Name	Remark
ACK1A080−48−001	Limit S/W Mount	A, B, C TYPE Common
ACK1A080−42−001	Cam Mount	C TYPE
TCKM040−42−16070		A, B TYPE

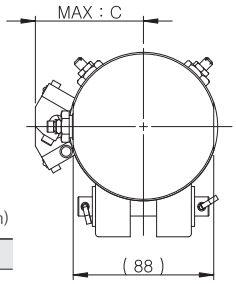
(Unit : mm)

Bore Size	TYPE	A	B	C	D	E	H	J	K	M	N	P	L	S	T
Ø80	A	50	41	30	56	20	4.5	60	17	15	50	58	97	5	M5×0.8
	B	50	41	30	56	20	4.5	60	17	15	45	58	97	5	M5×0.8
	C	48.5	41	30	56	27.5	4.5	60	17	15	45	58	110	5	M5×0.8

Auto Switch Attaching Location

ACK*1*80–** TYPE

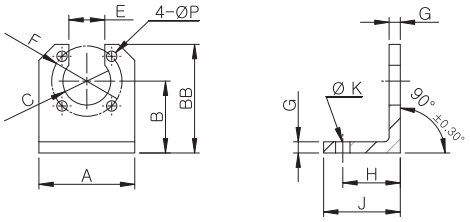




(Unit : mm)

Bore Size	A	B	C
Ø80	57.5	52.5	67

Foot

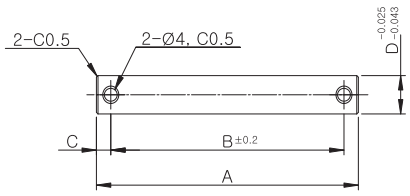


Parts Number	Name	Remark
ACK1A080–19–001	FOOT	A, B, C TYPE common

(Unit : mm)

Bore Size	A	B	BB	C	E	F	G	H	J	K	P
Ø80	60	$45^{0}_{-0.2}$	68	30	22.5 ± 0.1	44	7	36 ± 0.1	48	9	6.5

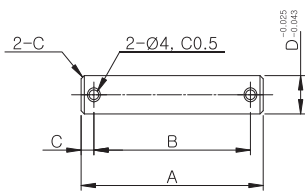
Clevis Pin



(Unit : mm)

Bore Size	TYPE	A	B	C	D
Ø80	A	82	73	4.5	12
	B	82	73	4.5	12
	C	82	73	4.5	18

Y Knuckle Pin



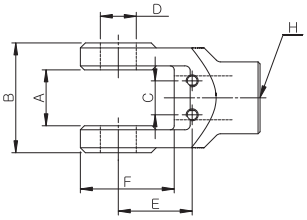
(Unit : mm)

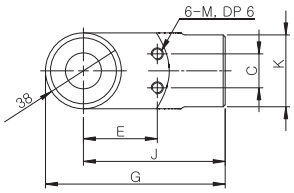
Bore Size	TYPE	A	B	C	D
Ø80	A	57	49	4	12
	B	57	49	4	12
	C	76.5	67.5	4.5	18

Parts Number	Name	Remark
ACK1A080–23–001	Clevis Pin	C TYPE
ACK1A080–23–003		A, B TYPE
ACK1A080–23–002	Y–Knuckle Pin	C TYPE
TC1K040–23–54806		A, B TYPE

Double Knuckle Joint

ACK*1*80–** TYPE





(Unit : mm)

Bore Size	A	B	C	D	E	F	G	H	J	K	M
Ø80	28	55	17 ± 0.1	$18^{+0.07}_{0}$	37	44	90	M22×1.5	71	36	M6×1.0

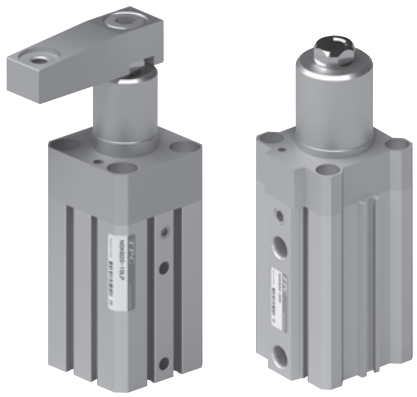
※ Y–Knuckle of ACK*1 $^{A}_{B}$ 80–** type is identical to Ø50 and Ø63.

Parts Number	Name	Remark
ACK1A080–19–001	FOOT	A, B, C TYPE common

Series **NSK**

Swing Clamp Cylinder

Bore Size(mm) : Ø20, Ø25, Ø32, Ø40, Ø50, Ø63



- POSSIBLE TO INSTALL AUTO SWITCH IN A TUBE
- MAXIMUM OPERTING PRESSURE : 1MPA
- COMPACT SIZE
- BUILT-IN COIL SCRAPPER (Ø40~Ø63)

How to Order

N (D) SK B 20 – 20 R P – W8* S

1 2 3 4 5 6 7 8 9

1 Swing Clamp Cylinder

2 Magnet
- Blank : None
- D : Built in Magnet

3 Mount
- B : Through hole/Both ends tapped common (Standard type)
- G: Head side flange type

4 Bore Size 5 Stroke (mm)
- 20 : Ø20 – 10 : 10mm, 20 : 20mm
- 25 : Ø25 – 10 : 10mm, 20 : 20mm
- 32 : Ø32 – 10 : 10mm, 20 : 20mm
- 40 : Ø40 – 10 : 10mm, 20 : 20mm
- 50 : Ø50 – 20 : 20mm, 50 : 50mm
- 63 : Ø63 – 20 : 20mm, 50 : 50mm

6 Rotation Direction
- R : Rotating in right hand direction
- L : Rotating in left hand direction
- ※ Rotary direction for unclamping (during backward)

7 Rotating Plate (ARM)
- Blank : None
- P : With rotation plate
- ※ Rotating plate is delivered without assembly

8 Auto Switch
- Blank : None (Magnetic equipped cylinder)

Contact point existing auto switch from below
- W4 : W4(P) (Contact point existed)
- W8H : Extremely small auto switch Horizontal (Vertical) type, 2 wire type

Contact point non existing auto switch from below
- W9H(V) : Extremely small auto switch Horiontal (Vertical) type, 2 wire type
- W9H(V)N : Extremely small auto switch horizontal (Vertical) type, 3 wire type
- W2P(L) : Contact point non existing (Available for over Ø40)

9 Number of Auto Switches
- Blank : 2 pcs
- S : 1 pc
- N : N pcs

Specifications

Index \ Items		Type (Tube Internal diameter)					
		Ø20	Ø25	Ø32	Ø40	Ø50	Ø63
Applied Fluid		Compressed Air					
Rod O.D		Ø12	Ø12	Ø16	Ø16	Ø20	Ø20
Cylinder Stroke (mm)	Rotate Section	9.5		15		19	
	Straight Section	10, 20		10, 20		20, 50	
	Total	19.5, 29.5		25, 35		39, 69	
	Tolerance	0~+1.4mm					
Rotation Angle & Tolerance		90±10 Degree					
Proof Pressure		15 Kgf/㎠					
Maximum Operating Pressure		9.9 Kgf/㎠					
Minimum Operating Pressure		1.0 Kgf/㎠					
Operating Method		Double Acting (Standard Type)					
Piston Utilizing Speed		50~200mm/sec.					
Cushion Equipped	Rod Side	Rubber (Rod End)					
	Head Side	None					
Ambient and Fluid Temperature Applied		−5~60℃					
Lubrication		No Necessary (Non−Lube)					
Pipe Contacting Hole		M5X0.8		Rc(PT)1/8		Rc(PT)1/4	
Applied Auto Switch		W8*, W9*, W4*(Over Ø32), W2P (4Over Ø40)					
Attaching Method		Bolt Penetration of Rod & Head side Cylinder Tube or Tap Attached and Flange Attached					

Theroretical Output Sheet

(Unit : kgf)

Bore Size (mm)	ROD Diameter (mm)	Operation Direction	Water Pressure Area	Applied Pressure(kgf/㎠)								
				2	3	4	5	6	7	8	9	10
20	12	CLAMP	2	4	6	8	10	12	14	16	18	20
		UNCLAMP	3	6	9	12	15	18	21	24	27	30
25		CLAMP	3.7	7.4	11.1	14.8	18.5	22.2	25.9	29.6	33.3	37
		UNCLAMP	4.9	9.8	14.7	19.6	24.5	29.4	34.3	39.2	44.1	49
32	16	CLAMP	6	12	18	24	30	36	42	48	54	60
		UNCLAMP	8	16	24	32	40	48	56	64	72	80
40		CLAMP	10.5	21	31.5	42	52.5	63	73.5	84	94.5	105
		UNCLAMP	12.5	25	37.5	50	62.5	75	87.5	100	112.5	125
50	20	CLAMP	16.4	32.8	49.2	65.6	82	98.4	114.8	131.2	147.6	164
		UNCLAMP	19.6	39.2	58.8	78.4	98	117.6	137.2	156.8	176.4	196
63		CLAMP	28	56	84	112	140	168	196	224	252	280
		UNCLAMP	31.1	62.2	93.3	124.4	155.5	186.6	217.7	248.8	279.9	311

Note) Theoretical output = Pressure X Water pressure area

Weight Sheet

(Unit : kg)

1. Cylinder

Stroke (mm)	Bore Size(mm)					
	20	25	32	40	50	63
10	0.26	0.32	0.5	0.55	—	
20	0.29	0.35	0.54	0.6	1.1	1.44
50	—	—	—	—	1.3	1.7

2. Mountings

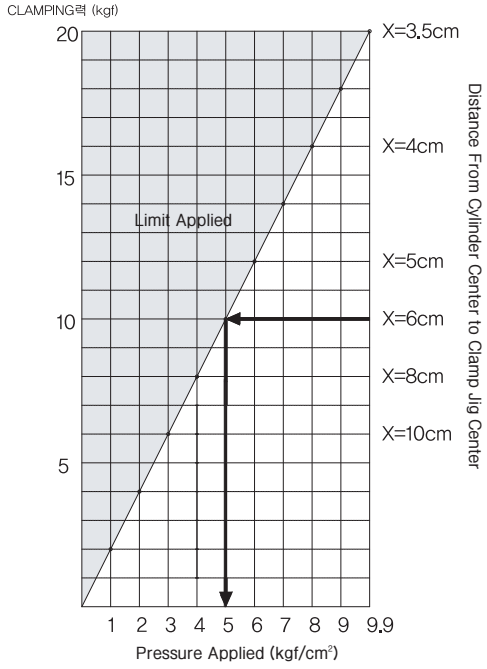
1) SWING PLATE

Item Number	Weight
NSK20−P	0.05
NSK32−P	0.14
NSK50−P	0.19

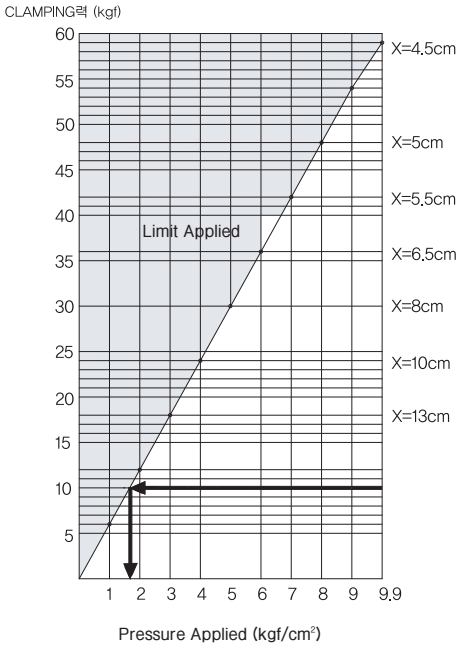
2) FLANGE

Item Number	Weight	Item Number	Weight
QF−020	0.14	QF−040	0.24
QF−025	0.17	QF−050	0.41
QF−032	0.19	QF−063	0.59

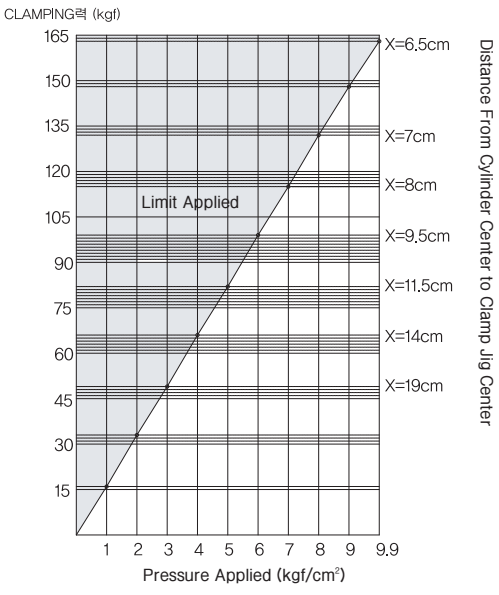
Bending Moment



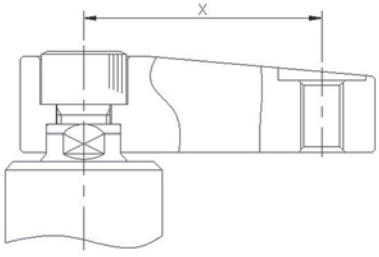
(Ø20, 25)



(Ø32, 40)



(Ø50, 63)



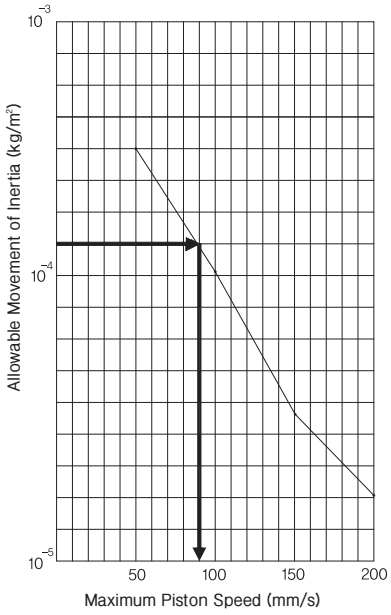
Graph Reading Method

In case designated clamp strength is 10kgf,

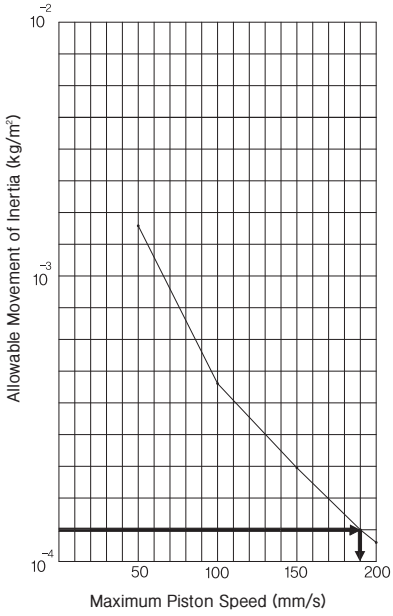
① Ø20, 25 type cases :
Possible to use with over 5kgf/cm² pressure applied and less than 6cm for maximum distance (x) from cylinder center to clamping installing jig center.

② Ø32, 40 type cases :
Possible to use with over 1.5kgf/cm² pressure applied and less than 13cm for maximum distance (x) from cylinder center to clamping installing jig center.

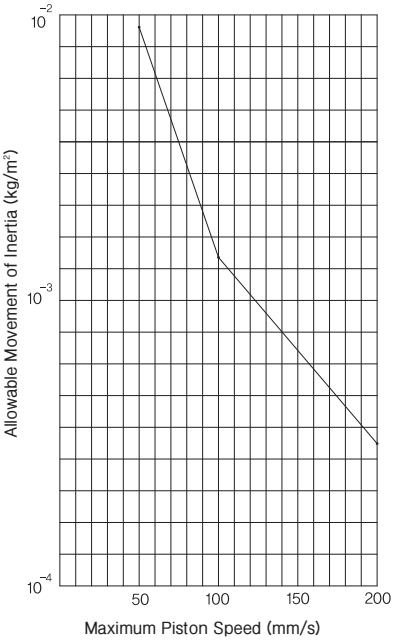
Allowable Moment of Inertia



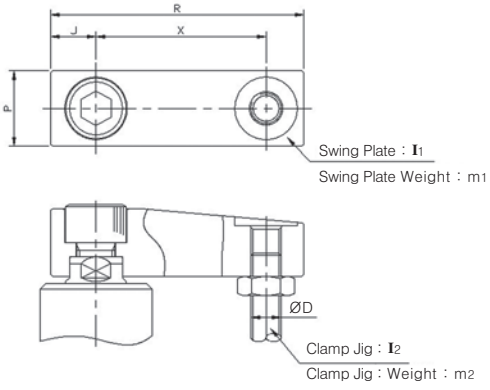
(Ø20, 25)



(Ø32, 40)



(Ø50, 63)



$I_1 : m_1 \cdot \frac{R^2+P^2}{12} + m_1 \cdot [\frac{R}{2} - J]^2$

$I_2 : m_2 \cdot \frac{D^2}{8} + m_2 \cdot X^2$

SWING PLATE : I_1+CLAMP JIG : I_2= I (TOTAL Moment of Inetia)

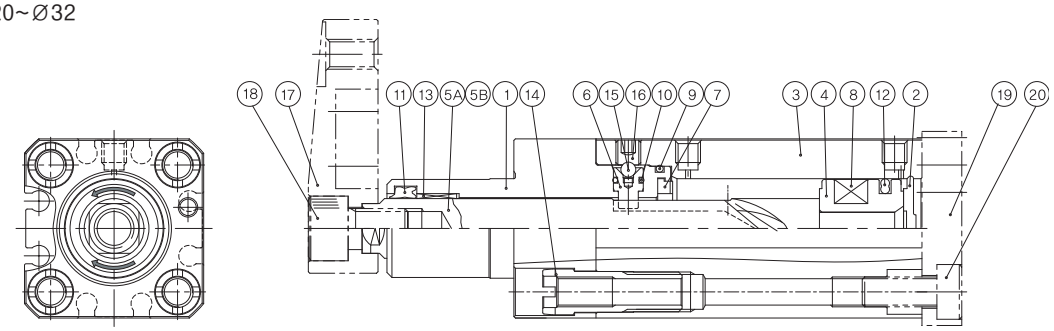
Graph Reading Method

In case total moment of inertia is calculated to $2x10^{-4}kg \cdot m^2$, maximum cylinder speed is,

① Less than 90mm/s for NSK*20 and 25 type,
② Less than 190mm/s for NSK*32 and 40 type,
③ Available to use within all range regardless of maximum piston speed (200m/s) for NSK*50 and 63 types.

Structural Drawing/Component List

Ø20~Ø32

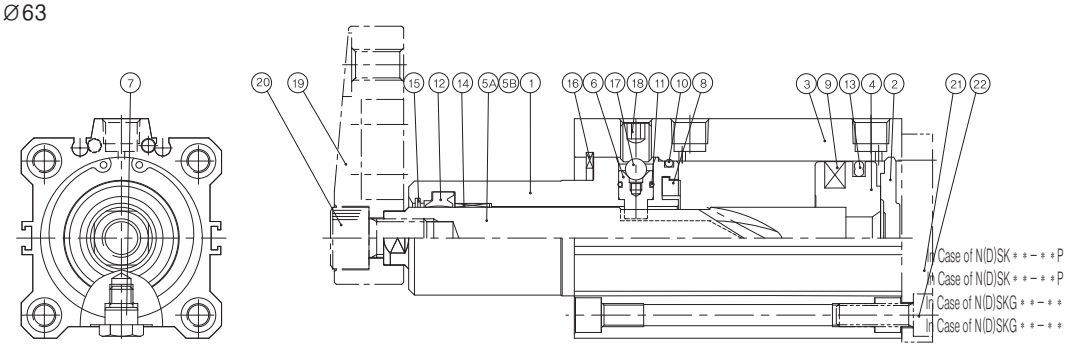


Component Name

NO	Component Name	Material	Remark
❶	Rod Cover	Aluminum Alloy	
❷	End Plate	Aluminum Alloy	
❸	Cylinder Tube	Aluminum Alloy	
❹	Piston	Aluminum Alloy	
❺	Piston Rod	High Carbon Chrome Bearing Steel	
❻	Guide Pin	High Carbon Chrome Bearing Steel	
❼	Bumper	Urethane	
❽	Magnet	NBR+Bagerrite	
❾	Tube Gasket	NBR	
❿	Guide Pin Gasket	NBR	

NO	Component Name	Material	Remark
⓫	Rod Packing	NBR	
⓬	Piston Packing	NBR	
⓭	Guide Bush	Cooper Alloy	
⓮	Socket Bolt	Carbon Steel	
⓯	Steel Ball	High Carbon Chrome Bearing Steel	
⓰	Set Screw	Chrome Molybdenum Steel	
⓱	Swing Plate	Rolled Steel Material	In Case of N(D)SK＊＊−＊＊P
⓲	6 Hexagonal Hole Bolt	Chrome Molybdenum Steel	In Case of N(D)SK＊＊−＊＊P
⓳	Flange	Rolled Steel Material	In Case of N(D)SKG＊＊−＊＊
⓴	6 Hexagonal Hole Bolt	Chrome Molybdenum Steel	In Case of N(D)SKG＊＊−＊＊

Ø40~Ø63



Component Name

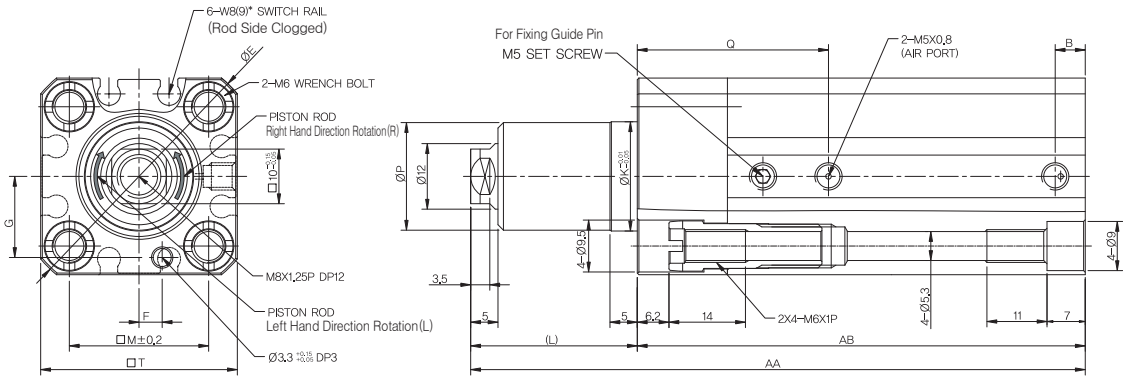
NO	Component Name	Material	Remark
❶	Rod Cover	Aluminum Alloy	
❷	End Plate	Aluminum Alloy	
❸	Cylinder Tube	Aluminum Alloy	
❹	Piston−A	Aluminum Alloy	
❺	Piston Rod	High Carbon Chrome Bearing Steel	
❻	Guide Pin	Bearing Steel	
❼	Guide Bolt	Rolled Steel Material	
❽	Bumper	Urethane	
❾	Magnet	NBR+Baferrite	
❿	Tube Gasket	NBR	
⓫	Guide Pin Gasket	NBR	

NO	Component Name	Material	Remark
⓬	Rod Packing	NBR	
⓭	Piston Packing	NBR	
⓮	Guide Bush	Cooper Alloy	
⓯	Metal Screper	Cooper Alloy	
⓰	Snap Ring	Carbon Steel	
⓱	Steel Ball	High Carbon Chrome Bearing Steel	
⓲	Set Scrrew	Chrome Molybdenum Steel	
⓳	Swing Plate	Rolled Steel Material	In Case of N(D)SK＊＊−＊＊P
⓴	6 Hexagonal Hole Bolt	Chrome Molybdenum Steel	In Case of N(D)SK＊＊−＊＊P
㉑	Flange	Rolled Steel Material	In Case of N(D)SKG＊＊−＊＊
㉒	6 Hexagonal Hole Bolt	Chrome Molybdenum Steel	In Case of N(D)SKG＊＊−＊＊

External Shape Dimension Drawing

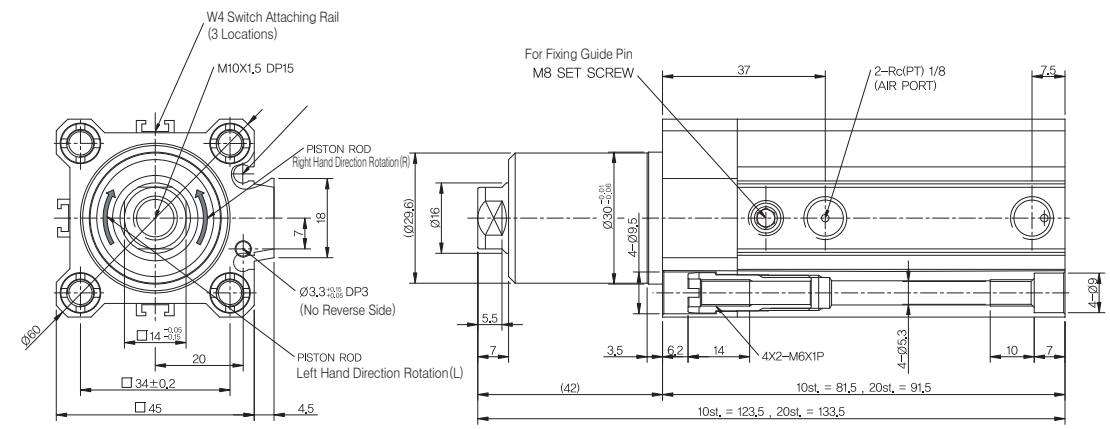
(Unit :mm)

Ø20~Ø25



Type	AA		AB		L	T	M	E	K	F	G	Q	B	P
	10st.	20st.	10st.	20st.										
Ø20	102.5	112.5	72	82	30.5	36	25.5	47	20	4.2	14.8	35	5.5	19.7
Ø25	103.5	113.5	73	83	30.5	40	28	52	23	5.7	17	32	5.6	22.5

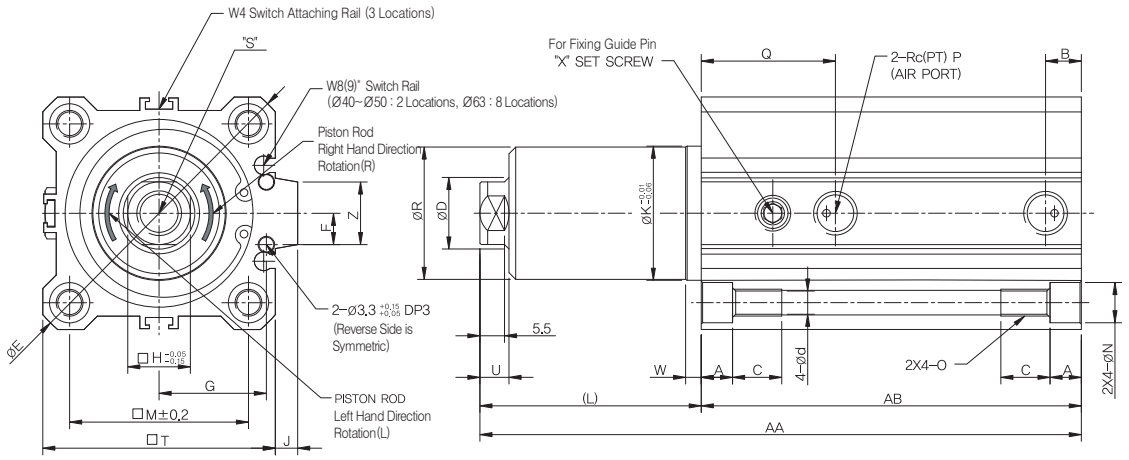
Ø32



External Shape Dimension Drawing

(Unit :mm)

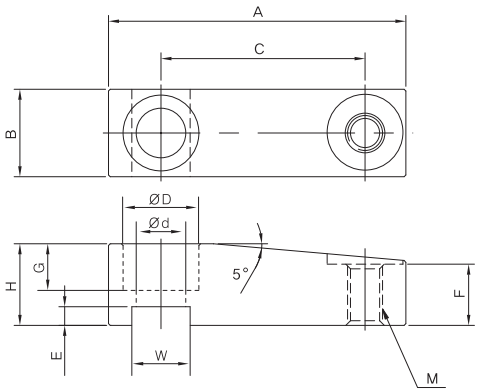
Ø40~Ø63



Type	AA			AB			L	T	M	E	K	F	G	Q	B	R	J	H	N
	10st.	20st.	50st.	10st.	20st.	50st.													
Ø40	124.5	134.5	–	75	85	–	49.5	52	40	69	30	7	24	30	8	29.6	5	14	9
Ø50	–	152	212	–	96.5	126.5	–	64	50	87	37	8	30	34	10.5	35.5	7	17	11
Ø63	–	155	215	–	100	130	–	77	60	103	48	9	35	35	10.5	47.4	7	17	14

Type	A	C	d	D	Z	P	O	X	U	W	S
Ø40	7	11	5.3	16	14	1/8	M6×1.0	M8	6.5	3.5	M10×1.5 DP:15
Ø50	8	14	6.6	20	22	1/4	M8×1.25	M8	7.5	4	M12×1.75 DP:16
Ø63	10.5	18	8.5	20	22	1/4	M10×1.5	M10	7.5	4.5	M12×1.75 DP:16

SWING PLATE



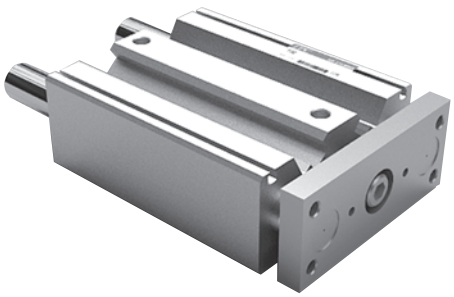
※ Surface Treatment : Nickel Chrome Plated

Item Number	Type	A	B	C	Ød	ØD	E	F	G	H	M	W
KP-20	Ø20, Ø25	51	15	35	Ø8.5	Ø13.5	3.2	10.5	8	14	M6×1 THRU	10
KP-32	Ø32, Ø40	67	20	45	Ø10.5	Ø16.5	5.2	13.5	9	18	M8×1.25 THRU	14
KP-50	Ø50, Ø63	89	22	65	Ø12.5	Ø19	5.2	15.5	11	22	M10×1.5 THRU	17

Series AG

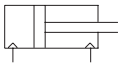
Compact Guide Cylinder

Bore size(mm) : Ø12(1/2 Nom), Ø16(5/8 Nom), Ø20(3/4 Nom), Ø25(1 Nom), Ø32(1 1/4 Nom), Ø40(1 1/2 Nom), Ø50(2 Nom), Ø63(2 1/2 Nom), Ø80(3 1/4 Nom), Ø100(4 Nom)



- ●COMPACT SLIM BODY GUIDE CYLINDER
- ●10 BORE SIZES
- ●MULTIPLE MOUNTING OPTIONS
- ●FLUSH MOUNTING-AUTO SWITCH
- ●AVAILABLE WITH BALL BEARING BUSHINGS
- ●LOW BREAKAWAY
- ●DESIGNED FOR NON-LUBE APPLICATIONS
- ●HIGH LOAD BEARING CHARACTERISTICS

Symbol



How to Order

U AG M 20 — 75 — ○ — W4 □

1 2 3 4 5 6 7

1 Port
- Blank : Rc(PT)
- U : NPT

2 Type of Bearing
- M : Slide bearing(Suitable for Stopper)
- L : Ball bush bearing (Suitable for Lifting/ Pushing)

3 Bore Size
- 12 : φ12mm(1/2 Nom.)
- 16 : φ16mm(5/8 Nom.)
- 20 : φ20mm(3/4 Nom.)
- 25 : φ25mm(1 Nom.)
- 32 : φ32mm(1 1/4 Nom.)
- 40 : φ40mm(1 1/2 Nom.)
- 50 : φ50mm(2 Nom.)
- 63 : φ63mm(2 1/2 Nom.)
- 80 : φ80mm(3 1/4 Nom.)
- 100 : φ100mm(4 Nom.)

4 Cylinder Stroke(mm)
Refer to Model/Standard Stroke Table.

Model/Standard Stroke Table

Bore Size(mm)	Standard Stroke(mm)
φ12, φ16	10, 20, 30, 40, 50, 75, 100
φ20, φ25	20, 30, 40, 50, 75, 100
φ32, φ40, φ50, φ63, φ80, φ100	25, 50, 75, 100, 125, 150

5 Option
- Blank : Standard (Copper-free type is basic for L type of φ12~φ40)
- XC16 : Copper-Free (Only L type can be in copper-free type)

• Intermediate stroke
As to Intermediate stroke(5, 10, 15, 20, 30, 35...), Spacer of 5, 10, 15, 20mm width will be used.
(Example)AGM50-10 is Produced by installing 15mm spacer in AGM 50-25.
Consult factory when the desired stroke is greater then the standard stroke.

6 Auto Switch
- Blank : None

Reed switch
- W4 : W4(2 wire DC24V, AC100V) (φ32 ~ φ100)
- W13 : W13(z wire, DC24V, AC110V) (φ12 ~ φ25)

Solid State Switch
- W1H : W1H(3 wire system, DC24V) (φ12 ~ φ25)

※ The standard, lead wire length is 0.5m "L" is added for 3m long lead wire (applicable to all models)
(Example) W4L
- W2 : (φ32 ~ φ63)

7 Number of Auto Switches
- Blank : 2 pcs
- S : 1 pc
- N : N pcs

Part No. of Auto Switch

Type	Mounting Parts	Bore Size
	BQ-4	32, 40
W4	BQ-4	50, 63
	BQ-2	80, 100
W2P	TGQ-32	32~63

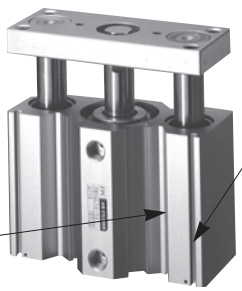
Specifications

Operation	Double Acting
Fluid	Air
Proof pressure	1.5MPa(217psi)
Max. operating pressure	1.0MPa(140psi)
Min. operating pressure	Ø12, 16 : 0.12MPa{1.2kgf/cm²}
	Ø25~100 : 0.1MPa{1.0kgf/cm²}
Ambient and fluid temperature	-10~+60℃(14°F~140°F)
Piston speed	50~500mm/s
Cushion	Rubber Cushion at Both Sides
Lubrication	Non-Lubrication
Stroke tolerance	$^{+1.5}_{0}$ mm

Packing List / Exchangeing Parts

Part Name	Material	Part Number									
		ϕ12	ϕ16	ϕ20	ϕ25	ϕ32	ϕ40	ϕ50	ϕ63	ϕ80	ϕ100
Piston Packing	NBR	TPSA-12	TPSA-16	TPSA-20	TPSA-25	TPSA-32	TPSA-40	TPSA-50	TPSA-63	TPSA-80	TPSA-100
Rod Packing	NBR	DRY-6	DRY-8	DRY-10SK-K	DRT-12	DRY-16	PDU-16Z	PDU-20Z	PDU-20Z	PDU-25Z	PDU-30Z
Gasket	NBR	C-10	C-14	C-18	C-23	C-29	C-36	C-46	C-60	C-75	C-95
Head Cover Gasket	NBR	-	-	-	-	TMGQM032-18-1586	TMGQM040-18-1587	TMGQM050-18-1588	TMGQM063-18-1589	TMGQM080-18-1794	TMGQM100-18-1796

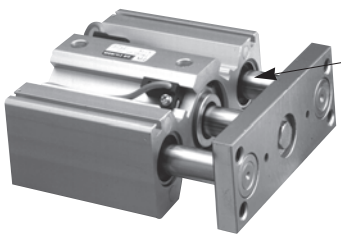
- Space saving cylinder. Provides Non-Rotating support for side loads. Suitable for conveyor lines where stopping and lifting are required.



- 2 kinds of bearing

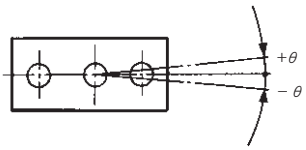
Slide Bearing -
Strength against side load is more than 2 times that of conventional stopper cylinders.

Ball Bushing Bearing -
Smooth operation suitable for pushing, lifting and applications where high precision is required.

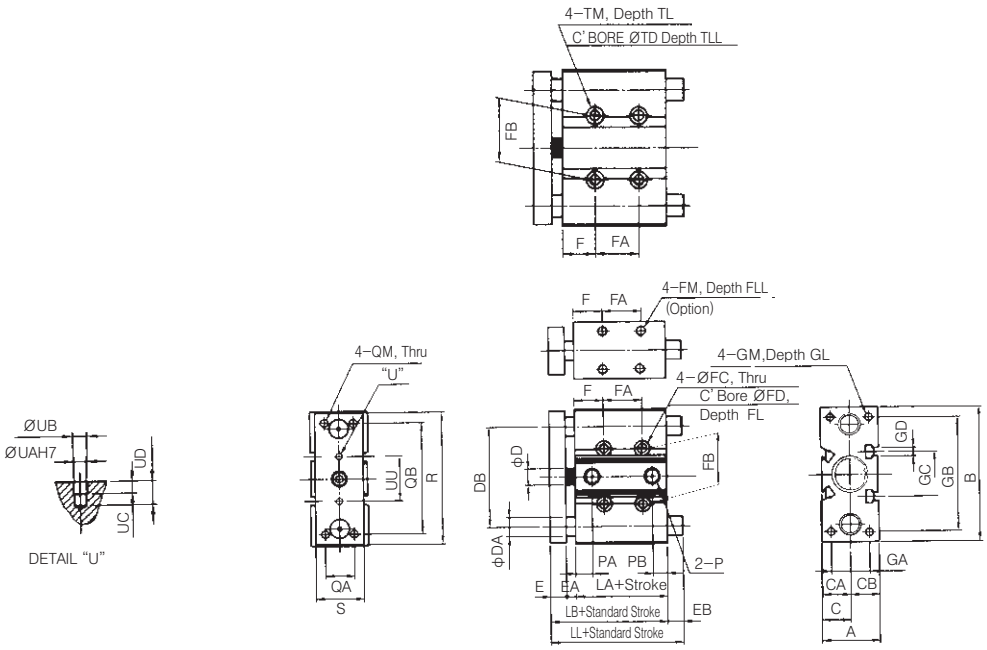


- High Non - Rotating Load Capability

Bore size	Non-Rotating Accuracy Θ	
	AGM	AGL
ϕ12	±0.07°	±0.10°
ϕ16		
ϕ20	±0.06°	±0.09°
ϕ25		
ϕ32	±0.06°	±0.08°
ϕ40		
ϕ50	±0.05°	±0.06°
ϕ63		
ϕ80	±0.04°	±0.05°
ϕ100		



Ø12~Ø25 / AGM · AGL



※ As to intermediate stroke, spacer will be used.

AGM · AGL Common Dimensions

(Units : mm)

Bore Size (mm)	A	B	C	CA	CB	D	DA		DB	E	EA	EB						F	FA		FB	FC	FD	FL	FH	FM	FLL	GA	GB	GC	GD	GM	GL	LA	LB
												AGM			AGL																				
							AGM	AGL				30st less	30~50st Between	50st Above	10st	20st	30st	40 · 50st	50st Above		30ST Less	30ST Above													
Ø12	26	60	13	12.5	13	6	8	6	46	8	5	0	5	34	3	13	13	23	28	7	20	40	25	4.3	8	13.5	18	M5×0.8	12	18	50	23	M3	M4×0.7	10	29	42
Ø16	30	67	15	14.5	15	8	10	8	50	8	5	0	5	34	5	20	20	30	35	7	24	44	27	4.3	8	12.5	22	M5×0.8	12	22	56	24	M3	M5×0.8	12	33	46
Ø20	36	85	18	17.5	18	10	12	10	58	10	6	3	5	47	–	12	25	35	42	18	24	44	31	5.5	9.5	13.5	24	M5×0.8	13	24	72	28	M5	M5×0.8	13	37	53
Ø25	42	95	21	20.5	21	12	16	13	68	10	6	3	5	47	–	18	18	37	48	18	24	44	35	5.5	9.5	14.5	30	M6×1.0	15	30	82	34	M5	M6×1.0	15	37.5	53.5

Bore Size (mm)	LL								P	PA	PB	QA	QB	QM	R	S	TM	TL	TD	TLL	UU	UA	UB	UC	UD
	AGM			AGL																					
	30st less	40st Between	50st Above	10st	20st	30st	40 · 50st	50st Above																	
Ø12	42	47	76	45	55	55	65	70	M5×0.8	11	8.5	14	48	M4×0.7	58	22	M5×0.8	Thru	6	4.3	23	3	3.5	3	6
Ø16	46	51	80	51	66	66	76	81	M5×0.8	11	8	16	54	M5×0.8	65	25	M5×0.8	10	6	4.3	24	3	3.5	3	6
Ø20	56	58	100	–	65	78	88	95	Rc1/8	10.5	9	18	70	M5×0.8	83	30	M6×1.0	12	7	8	28	3	3.5	3	6
Ø25	56.5	58.5	100.5	–	71.5	71.5	90.5	101.5	Rc1/8	11.5	9.5	26	78	M6×1.0	93	38	M6×1.0	12	7	8	34	4	4.5	3	6

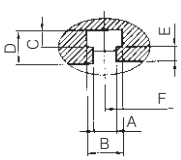
Grooves(Ø12, Ø16, Ø20, Ø25)

These grooves(W) can be used to firmly fix the terminal boards.,etc to the main body of the cylinder.

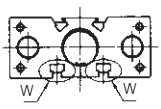
(Unit : mm)

Model	A	B	C	D	E	F	Applicable Bolt
AG□12	3.5	6	2	4.3	1.5	23	M3
AG□16	3.7	6.2	2	4.6	1.5	24	M3
AG□20	5.5	8.5	3.5	7.8	3	28	M5
AG□25	5.5	8.5	3.5	8	3	34	M5

AG▨12~25

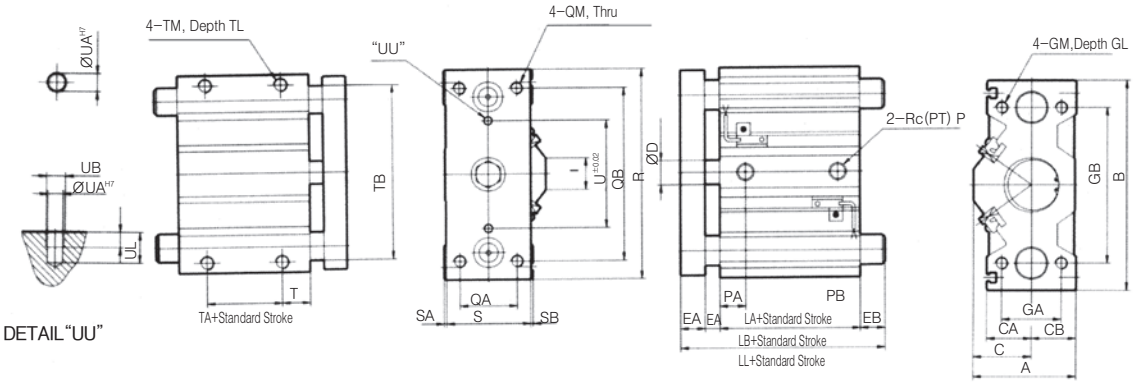


DETAIL"W"



AG●12
AG●16
AG●20
AG●25

∅32~∅63 / AGM · AGL



※ As to intermediate stroke, spacer will be used.

AGM · AGL Common Dimensions

(Unit : mm)

Bore Size (mm)	Standard Stroke (mm)	A	B	C	CA	CB	D	DA		E	EA	EB												GA	GB	GL	GM	I	LA	LB
								AGM	AGL			AGM						AGL												
												25ST	50ST	75ST	100ST	125ST	150ST	25ST	50ST	75ST	100ST	125ST	150ST							
Ø32	25, 50 75, 100 125, 150	53	114	27	25	26	16	20	16	12	10	23.2	41.2	46.2	46.2	51.2	51.2	4.4	41.4	46.4	46.4	66.4	66.4	38	80	20	M8×1.25	22	37.5	59.5
Ø40		57	124	31	25	26	16	20	16	12	10	16.7	34.7	39.7	39.7	44.7	44.7	0	34.9	39.9	39.9	59.9	59.9	38	90	20	M8×1.25	22	44	66
Ø50		69	140	39	29	30	20	25	20	16	12	27.7	39.7	49.7	49.7	54.7	54.7	2.9	44.9	49.9	49.9	69.9	69.9	44	100	25	M10×1.5	22	44	72
Ø63		82	150	45.5	29	36.5	20	25	20	16	12	22.7	34.7	44.7	44.7	49.7	49.7	0	39.9	44.9	44.9	64.9	64.9	44	110	25	M10×1.5	31	49	77

Bore Size (mm)	LL												P	PA	PB	QA	QB	QM	R	S	SA	SB	T	TA	TB	TL	TM	UU	UA	UB	UC	UL
	AGM						AGL																									
	25ST	50ST	75ST	100ST	125ST	150ST	25ST	50ST	75ST	100ST	125ST	150ST																			
Ø32	82.7	100.7	105.7	105.7	110.7	63.9	63.9	100.9	105.9	105.9	125.9	125.9	1/8	12.5	9	30	96	M8×1.25	112	48	2	1	16	5	100	11	M8×1.25	42	4	4.5	3	6
Ø40	82.7	100.7	105.7	105.7	110.7	110.7	63.9	100.9	105.9	105.9	125.9	125.9	1/8	14	10.5	30	106	M8×1.25	122	48	2	1	17	10	110	11	M8×1.25	50	4	4.5	3	6
Ø50	99.7	111.7	121.7	121.7	126.7	126.7	74.9	116.9	121.9	121.9	141.9	141.9	1/4	14	11	40	120	M10×1.5	138	56	2	1	17	10	124	12.5	M10×1.5	56	5	6	4	8
Ø63	99.7	111.7	121.7	121.7	126.7	126.7	74.9	116.9	121.9	121.9	141.9	141.9	1/4	16.5	13.5	50	130	M10×1.5	148	69	2	0	19	10	132	15	M10×1.5	66	5	6	4	8

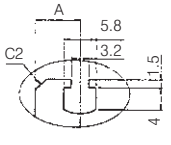
Grooves (∅32, ∅40, ∅50, ∅63, ∅80, ∅100)

These grooves can be used to firmly fix the bands of lead wires of the auto switch, and also terminal boards, etc, to the main body of the cylinder.

(Unit : mm)

Model	A
AG□32	8
AG□40	8
AG□50	8
AG□63	8
AG□80	10
AG□100	10

AG▩32~63



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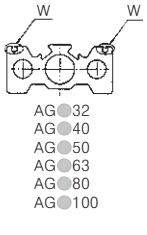
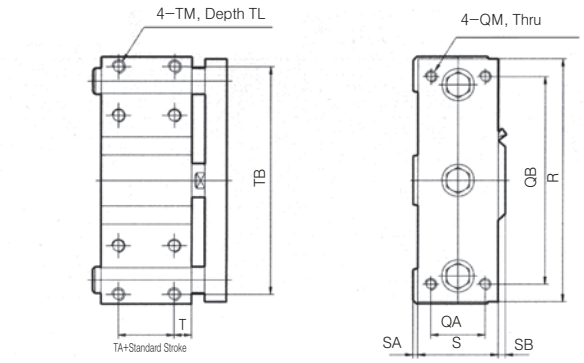
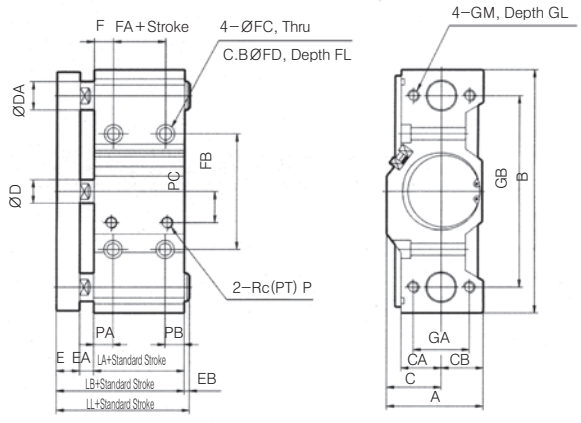


Ø80~Ø100 / AGM · AGL





※ As to intermediate stroke, spacer will be used.

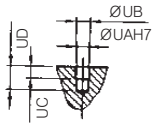
AGM · AGL Common Dimensions (Unit : mm)

Bore Size (mm)	Standard Stroke (mm)	A	B	C	CA	CB	D	DA		E	EA	EB						F	FA	FB	FC	FD	FL	GA	GB	GL
								AGM	AGL			AGM				AGL										
												25ST	50ST	75,100ST	125,150ST	25,50ST	75,100,125,150ST									
Ø80	25,50,75	96.5	204	50	38.5	46.5	25	30	25	22	18	23.3	25.3	53.3	58.3	8.5	72.5	20.5	15.5	100	11	17.5	11	56	155	30
Ø100	100,125,150	114.5	238	58	41	56.5	30	36	30	25	20	18.8	23.8	48.8	53.8	4.0	73.0	20.5	25	120	13	20	13	62	184	35

Bore Size (mm)	GM	LA	LB	LL						P	PA	PB	PC	QA	QB	QM	R	S	SA	SB	T	TA	TB	TL	TM
				AGM				AGL																		
				25ST	50ST	75,100ST	125,150ST	25,50ST	75,100,125,150ST																	
Ø80	M12×1.75	56.5	96.5	119.8	121.8	149.8	154.8	105	169	3/8	19	15.2	28	60	174	M12×1.75	198	80	6.5	10	20.5	15.5	182	18	M12×1.75
Ø100	M14×2	66	111	129.8	134.8	159.8	164.8	115	184	3/8	22.5	18.8	35	64	200	M14×2	231	95	9	10.5	20.5	25	211	21	M14×2

∅12(0.47)~∅25(0.98)/UAGM · UAGL

(inch)



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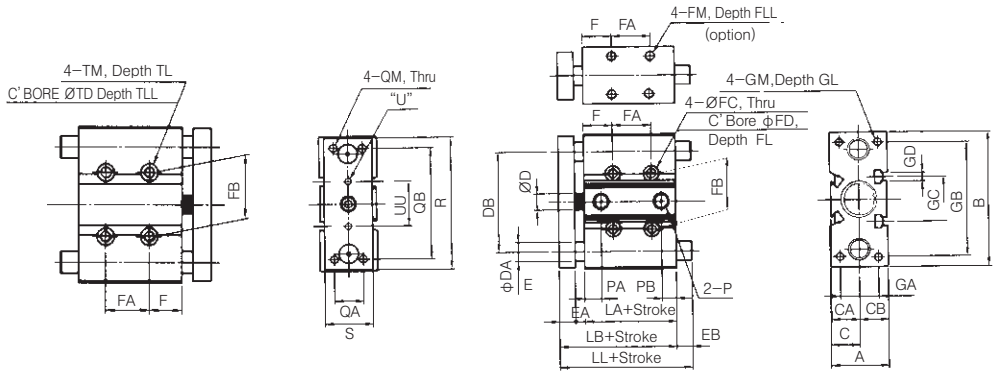


UAGM · UAGL Common Dimensions

※ As to intermediate stroke, spacer will be used.(inch)

Bore mm (inch)	A	B	C	CA	CB	D	DA		DB	E	EA	EB						F	FA		FB	FC	FD	FL	FH	FM	FLL	GA	GB	GC	GD	GM	GL	LA	LB
												UAGM		UAGL																						
							UAGM	UAGL				30ST Less	30~35ST Between	10ST	20ST	30ST	40~50ST	50ST Above		30ST Less	30ST Above															
Ø12(1/2 Nom.)	1.02	2.36	0.51	0.49	0.51	0.24	0.32	0.24	1.81	0.32	0.20	0	0.20	1.34	0.12	0.51	0.51	0.91	1.10	0.28	0.79	1.58	0.98	0.17	0.32	0.53	0.71	M5×0.8	0.47	0.71	1.97	0.91	M3	M4×0.7	0.39	1.14	1.65
Ø16(5/8 Nom.)	1.18	2.64	0.59	0.57	0.59	0.32	0.39	0.32	1.97	0.32	0.20	0	0.20	1.34	0.20	0.79	0.79	1.18	1.38	0.28	0.95	1.73	1.06	0.17	0.32	0.49	0.87	M5×0.8	0.47	0.87	2.21	0.95	M3	M5×0.8	0.47	1.30	1.81
Ø20(3/4 Nom.)	1.42	3.35	0.71	0.69	0.71	0.39	0.47	0.39	2.28	0.39	0.24	0.12	0.20	1.85	–	0.47	0.98	1.38	1.65	0.71	0.95	1.73	1.22	0.22	0.37	0.53	0.95	M5×0.8	0.51	0.95	2.84	1.10	M5	M5×0.8	0.51	1.46	2.09
Ø25(1 Nom.)	1.65	3.74	0.83	0.81	0.83	0.47	0.63	0.51	2.68	0.39	0.24	0.12	0.20	1.85	–	0.71	0.71	1.46	1.89	0.71	0.95	1.73	1.38	0.22	0.37	0.57	1.18	M6×1.0	0.59	1.18	3.23	1.34	M5	M6×1.0	0.59	1.48	2.11

Bore mm (inch)	LL								PA	PB	QA	QB	QM	R	S	TM	TL	TD	TLL	UU	UA	UB	UC	UD	P
	UAGM			UAGL																					
	30ST Less	40ST Between	50ST Above	10ST	20ST	30ST	40~50 ST	50ST																	
Ø12(1/2 Nom.)	1.65	1.85	2.99	1.77	2.17	2.17	2.56	2.76	0.43	0.33	0.55	1.89	M4×0.7	2.28	0.87	M5×0.8	Through	0.24	0.17	0.91	0.12	0.14	0.12	0.24	10–32UNF
Ø16(5/8 Nom.)	1.81	2.13	3.15	2.00	2.60	2.60	2.99	3.19	0.43	0.32	0.63	2.13	M5×0.8	2.56	0.98	M5×0.8	0.39	0.24	0.17	0.95	0.12	0.14	0.12	0.24	10–32UNF
Ø20(3/4 Nom.)	2.09	2.28	3.94	–	2.56	3.07	3.46	3.74	0.41	0.35	0.71	2.76	M5×0.8	3.27	1.18	M6×1.0	0.47	0.28	0.32	1.10	0.12	0.14	0.12	0.24	NPT1/8
Ø25(1 Nom.)	2.22	2.30	3.96	–	2.81	2.81	3.56	4.0	0.45	0.37	1.02	3.07	M6×1.0	3.66	1.50	M6×1.0	0.47	0.28	0.32	1.34	0.16	0.18	0.12	0.24	NPT 1/8

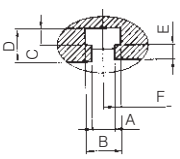
Grooves(Except for ∅12, ∅16, ∅20, ∅25)

These grooves can be used to frmly fix the lead wires of the auto switch, and also terminal boards, etc., to the main body of the cylinder.

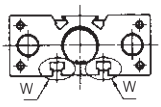
(inch)

Model	A	B	C	D	E	F	Applicable Bolt
UAG□12	0.14	0.24	0.08	0.17	0.06	0.91	M3
UAG□16	0.15	0.24	0.08	0.18	0.06	0.95	M3
UAG□20	0.22	0.33	0.14	0.31	0.12	1.10	M5
UAG□25	0.22	0.33	0.14	0.32	0.12	1.34	M5

UAG□12~25



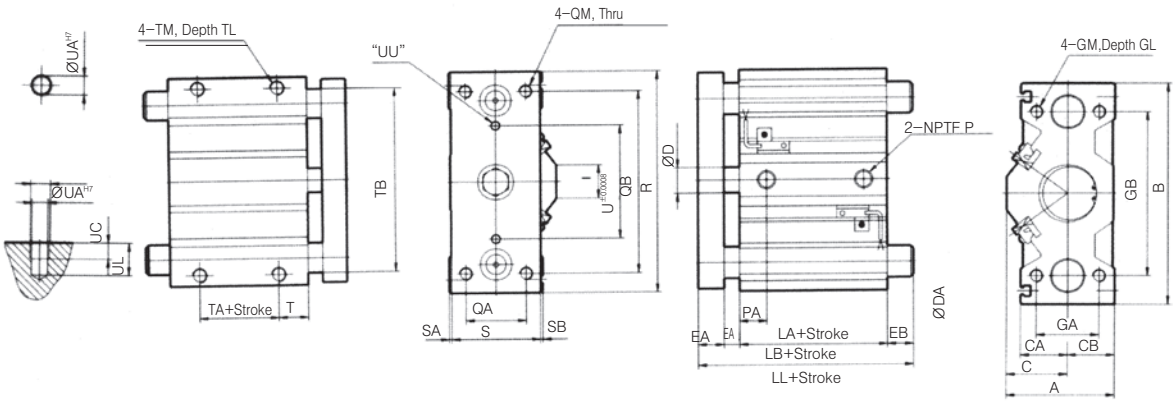
DETAIL"W"



UAG□12
UAG□16
UAG□20
UAG□25

Ø32(Nom. 1 1/4)~Ø63(Nom. 2 1/2")/UAGM · UAGL

(inch)



※ For intermediate strokes. Spacers will be used.

UAGM · UAGL Common Dimensions

(inch)

Bore Size mm (inch)	Standard Stroke (mm)	A	B	C	CA	CB	D	DA		E	EA	EB												GA	GB	GL	GM	I	LA	LB
								UAGM	UAGL			UAGM						UAGL												
												25ST	50ST	75ST	100ST	125ST	150ST	25ST	50ST	75ST	100ST	125ST	150ST							
Ø32(1 1/4 Nom.)	25, 50	2.09	4.49	1.06	0.98	1.02	0.63	0.79	0.63	0.47	0.39	0.91	1.62	1.82	1.82	2.02	2.02	0.17	1.63	1.83	1.83	2.61	2.61	1.50	3.15	0.79	M8×1.25	0.87	1.48	2.34
Ø40(1 1/2 Nom.)	75, 100	2.24	4.88	1.22	0.98	1.02	0.63	0.79	0.63	0.47	0.39	0.66	1.37	1.56	1.56	1.76	1.76	–	1.37	1.57	1.57	2.36	2.36	1.50	3.54	0.79	M8×1.25	0.87	1.73	2.60
Ø50(2 Nom.)	125, 150	2.72	5.51	1.54	1.14	1.18	0.79	0.98	0.79	0.63	0.47	1.09	1.56	1.96	1.96	2.15	2.15	0.11	1.77	1.96	1.96	2.75	2.75	1.73	3.94	0.98	M10×1.5	0.87	1.73	2.84
Ø63(2 1/2 Nom.)		3.23	5.91	1.79	1.14	1.44	0.79	0.98	0.79	0.63	0.47	0.89	1.37	1.76	1.76	1.96	1.96	–	1.57	1.77	1.77	2.56	2.56	1.73	4.33	0.98	M10×1.5	1.22	1.93	3.03

Bore Size mm (inch)	LL												P	PA	PB	QA	QB	QM	R	S	SA	SB	T	TA	TB	TL	TM	U	UA	UB	UC	UL
	UAGM						UAGL																									
	25ST	50ST	75ST	100ST	125ST	150ST	25ST	50ST	75ST	100ST	125ST	150ST																			
Ø32(1 1/4 Nom.)	3.26	3.96	4.16	4.16	4.36	4.36	2.52	3.97	4.17	4.17	4.96	4.96	NPT1/8	0.49	0.35	1.18	3.78	M8×1.25	4.41	1.89	0.08	0.04	0.63	0.20	3.94	0.43	M8×1.25	1.65	0.16	0.18	0.12	0.24
Ø40(1 1/2 Nom.)	3.26	3.96	4.16	4.16	4.36	4.36	2.52	3.97	4.17	4.17	4.96	4.96	NPT1/8	0.55	0.41	1.18	4.17	M8×1.25	4.80	1.89	0.08	0.04	0.67	0.39	4.33	0.43	M8×1.25	1.97	0.16	0.18	0.12	0.24
Ø50(2 Nom.)	3.93	4.40	4.79	4.79	4.99	4.99	2.95	4.60	4.80	4.80	5.59	5.59	NPT1/4	0.55	0.43	1.58	4.72	M10×1.5	5.43	2.21	0.08	0.04	0.67	0.39	4.88	0.49	M10×1.5	2.21	0.20	0.24	0.16	0.31
Ø63(2 1/2 Nom.)	3.93	4.40	4.79	4.79	4.99	4.99	2.95	4.60	4.80	4.80	5.59	5.59	NPT1/4	0.65	0.53	1.97	5.12	M10×1.5	5.83	2.72	0.08	–	0.75	0.39	5.20	0.59	M10×1.5	2.60	0.20	0.24	0.16	0.31

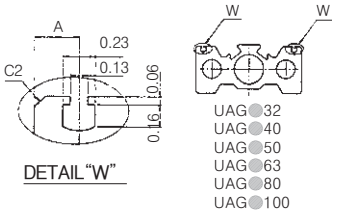
Grooves(Except for Ø32, Ø40, Ø50, Ø63)

These grooves can be used to firmly fix the lead wires of the auto switch, and terminal boards, etc., to the main body of the cylinder.

(inch)

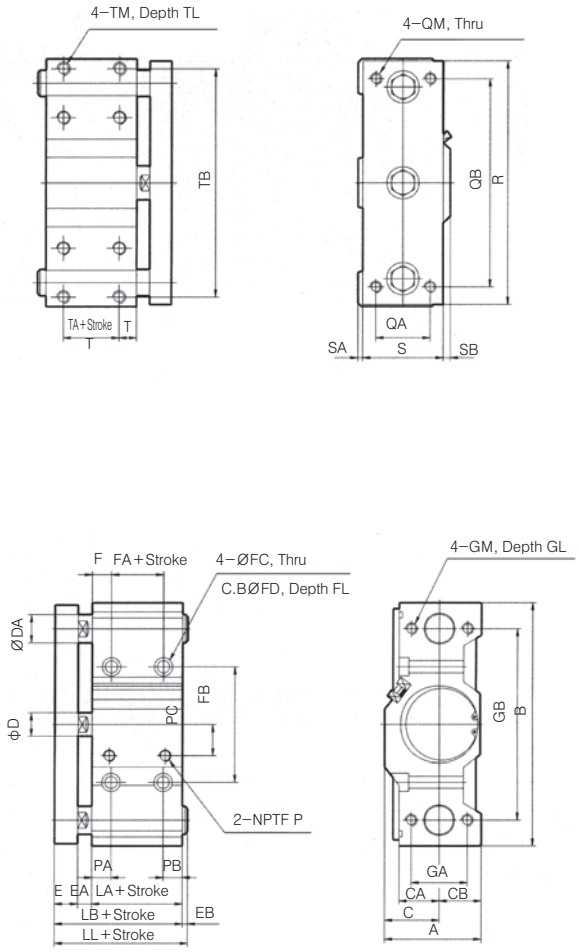
Model	A
UAG□32	0.32
UAG□40	0.32
UAG□50	0.32
UAG□63	0.32
UAG□80	0.39
UAG□100	0.39

UAG▩ ϕ32(Nom. 1 1/4)~ϕ63(Nom. 2 1/2")



∅80(3.15)~∅100(3.94)/UAGM · UAGL

(inch)



※ For intermediate strokes, spacers will be used.

UAGM · UAGL Common Dimensions

(inch)

Bore Size mm(inch)	Standard Stroke (mm)	A	B	C	CA	CB	D	DA		E	EA	EB						F	FA	FB	FC	FD	FL	GA	GB	GL
								UAGM	UAGL			UAGM				UAGL										
												25	50	75,100	125,150	25,50	75, 100, 125, 150									
Ø80(3¼ Nom.)	20, 50, 75, 100,	3.80	8.03	1.97	1.52	1.83	0.98	1.18	0.98	0.87	0.71	0.91	1.00	2.10	2.30	0.33	2.85	0.81	0.61	3.94	0.43	0.69	0.43	2.20	6.10	1.18
Ø100(4 Nom.)	125, 150	4.51	9.37	2.28	1.61	2.22	1.18	1.42	1.18	0.98	0.79	0.74	0.94	1.92	2.12	0.16	2.87	0.81	0.98	4.72	0.51	0.79	0.51	2.44	7.24	1.38

Bore Size mm(inch)	GM	LA	LB	LL						P	PA	PB	PC	QA	QB	QM	R	S	SA	SB	T	TA	TB	TL	TM
				UAGM				UAGL																		
				25	50	75, 100	125,150	25,50	75, 100, 125, 150																	
Ø80(3¼ Nom.)	M12×1.75	2.22	3.80	4.72	4.80	5.90	6.09	4.13	6.65	NPT3/8	0.75	0.60	1.10	2.36	6.85	M12×1.75	7.80	3.15	0.26	0.39	0.81	0.61	7.17	0.71	M12×1.75
Ø100(4 Nom.)	M14×2	2.60	4.37	5.11	5.31	6.29	6.49	4.53	7.24	NPT3/8	0.89	0.74	1.38	2.52	7.87	M14×2	9.09	3.74	0.35	0.41	0.81	0.98	8.31	0.83	M14×2

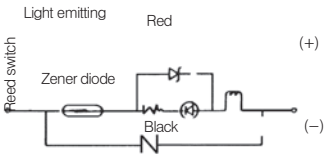
Auto Switch Specifications

Auto Switch Model	W4	
Application	Relay, Sequence Control	
Voltage	DC24V	AC110V
Range of Load Current	5~40mA	5~20mA
Protection Circuit for Contact Breaker Point	None	
Internal Voltage Drop	2.4V or less	
Indicator Lamp	ON:Red light emitting diode	

- Leakage current – None
- Response time – 1.2 ms
- Lead Wire – Oil proof vinyl Ø3.4, 0.2mm², 2 wire(red, black), 0.5 m
- Impact Resistance – 30G
- Insulation Resistance – 50MΩ or more under the test voltage 500VDC (Between case and cable)
- Breakdown Voltage – 1500VAC 1min(between case and cable)
- Ambient Temperature – 5~60℃
- Protection Structure – IEC spec IP67, Water-proof(JISC 0920), oil-proof.

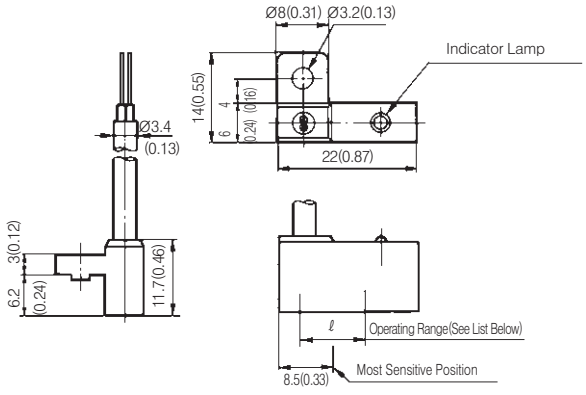
※ If 3m lead wire is required, L is put at end of model numbers.
(Example) W4L

Auto Switch/Internal Circuit



Auto Switch Dimensions

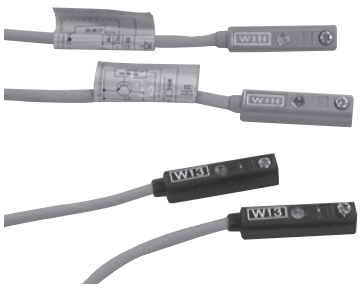
mm(inch)



Operating Range (ℓ Dimensions)

mm(inch)

Series	Bore Size inch(mm)					
	Ø32(4 1/4 Nom.)	Ø40(1 1/2 Nom.)	Ø50(2Nom.)	Ø63(2 1/2 Nom.)	Ø80(3 1/4 Nom.)	Ø100(4Nom.)
UAG	12 (0.47)	11 (0.43)	10 (0.39)	12 (0.47)	12 (0.47)	13 (0.51)



How to Order

W1 ✻ ✻ ✻

1 2 3 4

1 TPC Auto Switch Model

2 3 : Reed 2 wire AUTO S/W
H : Solid State 3 wire AUTO S/W

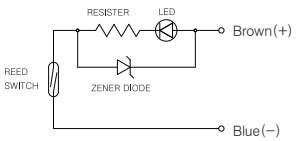
3 N : 3 wire(NPN)
P : 3 wire(PNP)

4 Blank : LEAD WIRE(0.5m)
M : LEAD WIRE(1m)
L : LEAD WIRE(3m)

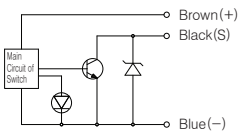
Specifications

Part No.	W13		W1HN(P)
Contact wiring	Contact 2 wire		Without contact 3 wire
Application	Relay, Sequence Control		
Voltage	DC24V	AC100V	DC24V
Current	5~40mA	5~20mA	≦40mA
Contact Protection Circuit	None		Built-in
Internal Voltage Drop	≦2.4V		≦1.5V
Indicator Lamp	ON : When Red LED		
Output	–		NPN(PNP)
Current Consumption	–		≦5mA
Current Leakage	None		≦100μA
Operation Time	≦1ms		≦2ms
Lead Wire	Oil Resistant Vinyl Code		
Shock Resistance	30G 100G		
Insulation Resistance	100MΩ or more (500DVC Mega) between lead wire and case		
Voltage Resistance	For 1 min.(in AC1500V/between a lead wire case)		
Temperature	−10 ~ 60℃		
Protection Structure	IEC Standard IP67, Water Proof, and(JISC0920),Oil Structure		

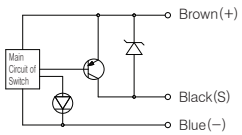
Internal Circuit



2 wire reed circuit

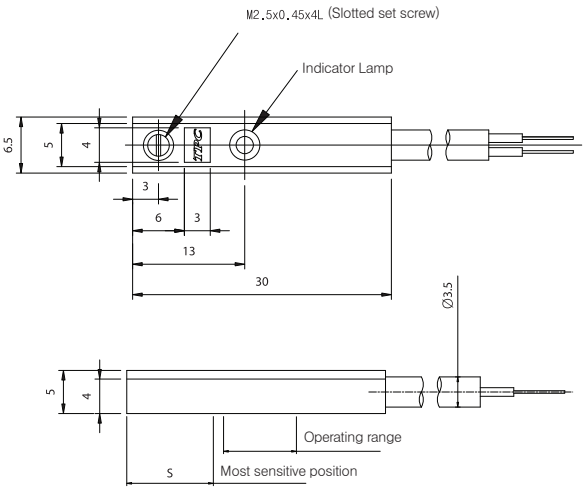


3 wire NPN solid state circuit



3 wire NPN solid state circuit

Protection Structure



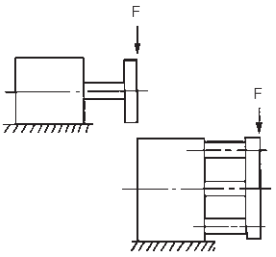
■ Caution

Plase read and understand the instructions before use. Refer to the auto switch precautions before using auto switches.

Operating Range

Section	W13	W1HN(P)
Most sensitive position(S)	10mm	1 ~ 2mm
Operation range(L)	6 ~ 12mm	4 ~ 10mm

Operating Conditions



Permissible Lateral Load (F)

Units : N

Bore Size	Model	Stroke(mm)						
		10	20	30	40	50	75	100
Ø12	AGM	26	20	18	18	17	29	25
	AGL	24	36	29	40	34	26	20
Ø16	AGM	42	34	30	28	26	39	34
	AGL	36	54	43	58	51	37	30
Ø20	AGM	–	53	47	45	42	88	76
	AGL	–	39	64	112	100	75	62
Ø25	AGM	–	70	61	60	54	116	100
	AGL	–	61	50	134	120	98	81

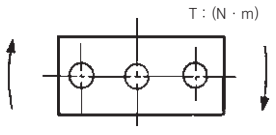
1N≒0.102kgf

Units : N

Bore Size	Model	Stroke(mm)					
		25	50	75	100	125	150
Ø32	AGM	196	167	137	108	91	76
	AGL	88	59	275	216	239	223
Ø40	AGM	196	167	137	108	91	76
	AGL	88	59	275	216	239	293
Ø50	AGM	294	255	215	176	151	130
	AGL	137	88	392	313	313	294
Ø63	AGM	294	255	215	176	151	130
	AGL	137	88	392	313	313	294
Ø80	AGM	353	304	255	206	–	–
	AGL	235	157	863	686	–	–
Ø100	AGM	539	470	412	343	–	–
	AGL	470	313	1370	1070	–	–

1N≒0.102kgf

Permissible Rotary Torque of Plate(T)



Units : N · m

Bore Size	Model	Stroke(mm)						
		10	20	30	40	50	75	100
Ø12	AGM	0.42	0.34	0.28	0.31	0.27	0.48	0.42
	AGL	0.51	0.88	0.75	1.06	0.96	0.78	0.64
Ø16	AGM	0.76	0.64	0.54	0.52	0.47	0.73	0.62
	AGL	0.82	1.43	1.23	1.64	1.52	1.23	1.06
Ø20	AGM	–	1.14	1.02	0.98	0.80	1.90	1.65
	AGL	–	1.14	2.03	3.40	3.19	2.65	2.32
Ø25	AGM	–	1.79	1.58	1.53	1.38	2.96	2.57
	AGL	–	2.10	1.86	4.74	4.46	4.01	3.53

1N · m≒10.2kgf.cm

Units : N · m

Bore Size	Model	Stroke(mm)					
		25	50	75	100	125	150
Ø32	AGM	3.92	2.94	2.45	1.96	1.47	1.03
	AGL	1.96	0.98	5.88	4.41	5.76	5.12
Ø40	AGM	4.41	3.43	2.94	2.45	1.84	1.35
	AGL	2.45	1.47	6.37	5.39	6.87	6.17
Ø50	AGM	7.35	5.88	4.90	4.41	3.31	2.41
	AGL	3.43	2.45	10.78	8.33	9.63	8.63
Ø63	AGM	7.84	6.37	5.39	4.90	3.60	2.59
	AGL	3.92	2.45	11.76	9.31	9.61	8.51
Ø80	AGM	11.76	9.80	7.84	6.86	–	–
	AGL	9.31	5.88	31.36	24.50	–	–
Ø100	AGM	22.54	19.60	16.66	14.70	–	–
	AGL	21.56	13.72	63.70	49.00	–	–

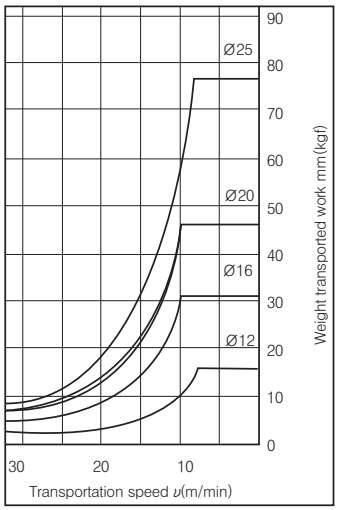
1N≒0.102kgf

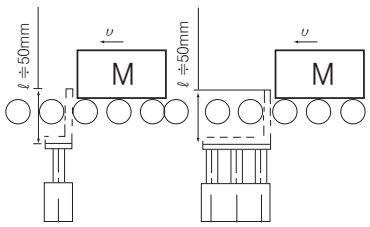
Operating Range When Used as Stopper

Bore Size	Non-Rotation Accuracy	
	AGM	AGL
Ø12	±0.07°	±0.10°
Ø16		
Ø20	±0.06°	±0.09°
Ø25		
Ø32	±0.06°	±0.08°
Ø40		
Ø50	±0.05°	±0.06°
Ø63		
Ø80	±0.04°	±0.05°
Ø100		

Bore Size Ø12~Ø25 / AGM12~25(Slide Bearing)

AGM12~25





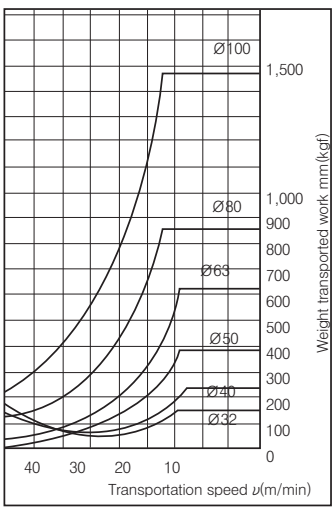
※ When selecting the machine type, if the dimension gets longer, select a certain cylinder having a sufficient bore.

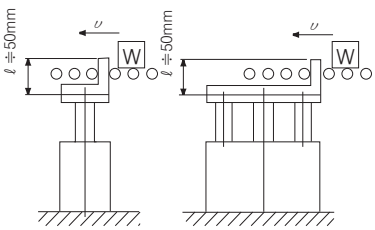
Note 1) When a stopper is used for the cylinder, use at 50 strokes or less.

Note 2) AGL(Ball bush bearing) should not be used as stopper.

Bore Size Ø32~Ø100 / AGM32~100(Slide Bearing)

AGM32~100



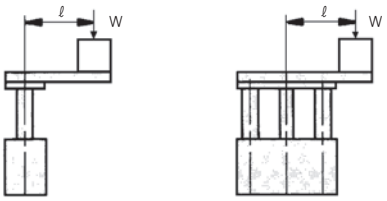


※ When selecting the machine type, if the dimension gets longer, select a certain cylinder having a sufficient bore.

Note 1) When a stopper is used for the cylinder, use at 50 strokes or less.

Note 2) AGL(Ball bush bearing) should not be used as stopper.

Operating Range When Used as Lifter

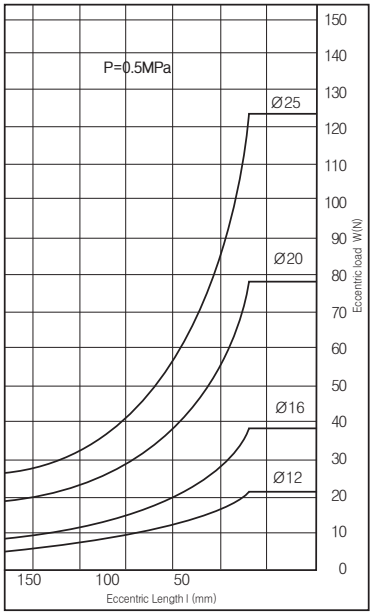


● Be sure to select a proper bore size so that the mass remains at or below the theoretical output (refer to the chart below)

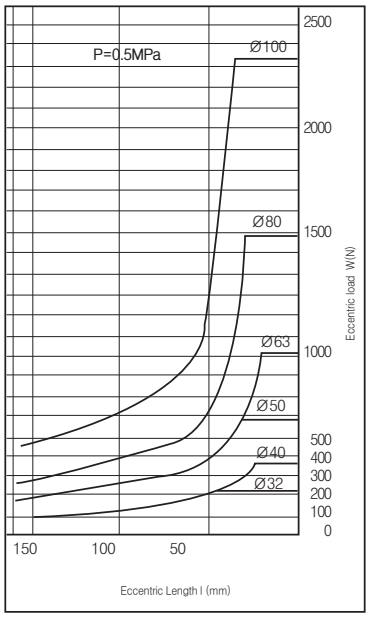
Bore Size	Theoretical Output
Ø12, Ø16	40% or Below
Ø20, Ø25	50% or Below
Ø32, Ø100	60% or Below

AGM/Slide Bearing

AGM Ø12~Ø25-□

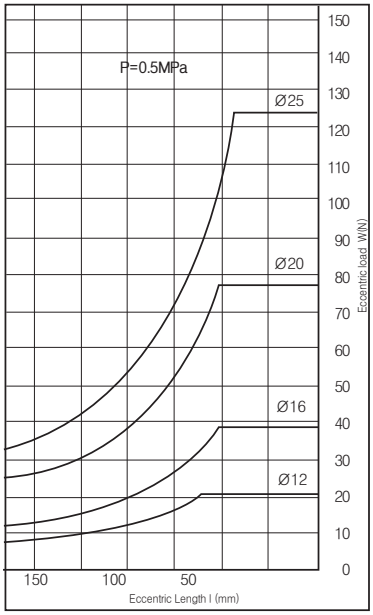


AGM Ø32~Ø100

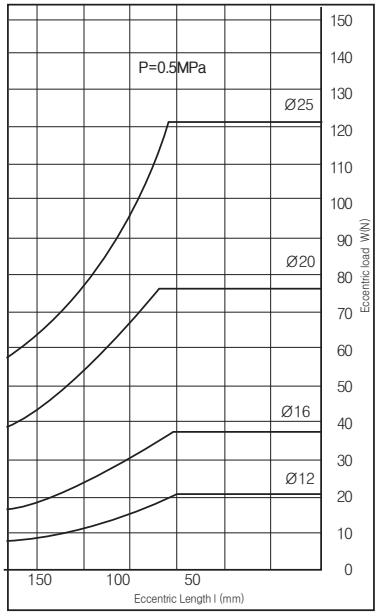


AGL/Ball Bush Bearing

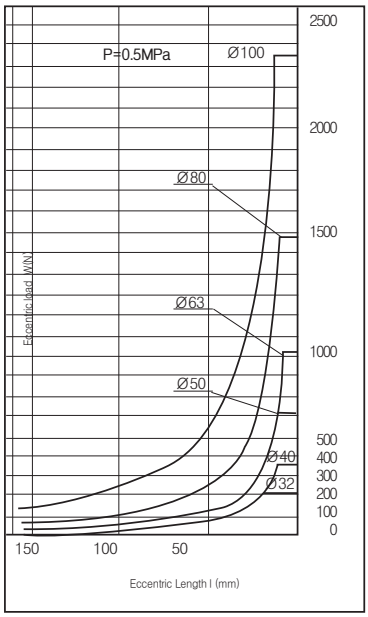
AGL Ø12~Ø25-$^{10}_{20}_{30}$



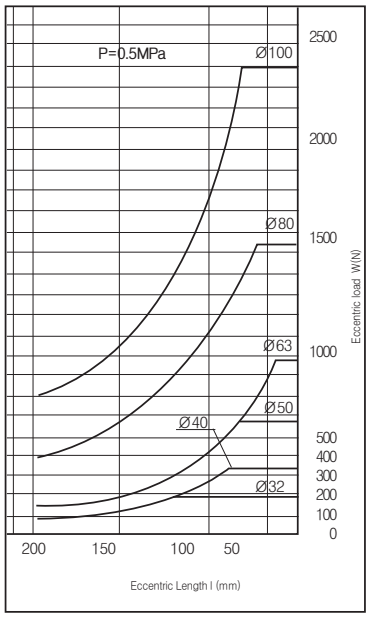
AGL Ø12~Ø25-30 more stroke



AGL Ø32~Ø100-$^{25}_{50}$



AGL Ø32~Ø105-$^{75}_{100}$



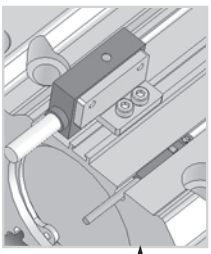
Guide Film Type Cylinder NGQ Series

▣ **Able to treat long stroke**

(Able to manufacture some models until Max. stroke of 300mm)

▣ **Improve plate's squareness and corrosion-resistance by improving process for guide connecting parts**

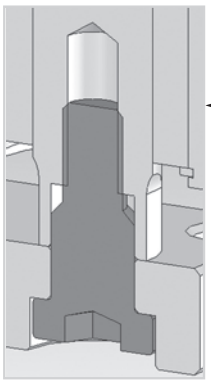
• Apply special high strength bolt

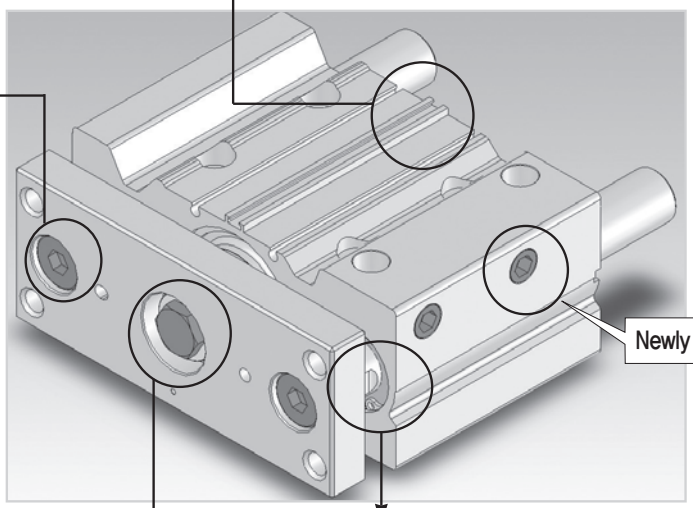


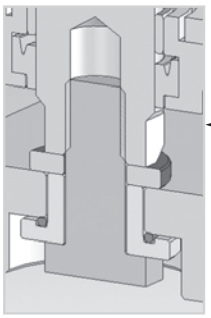
▣ **Diversify how to apply AUTO Switch**

• Apply auto switch of the general type, ø4 ultra-tiny type, strong magnetic field-resistant type

• Able to install top and bottom (some models) switches







▣ **Improve M TYPE's durability**

• Use special slide bearing

▣ **Excellent working performance (100% remove twisted and hung phenomenon during operation)**

• Exert smooth operability by endowed with oil gap to plate and piston rod parts

• Insert O-RING to prevent oil gap from making noise

▣ **Improve customer's convenience for attachment**

• Side attachment (OPTION)

• Add T-SLOT grooves on the bottom

• Extend penetration attachment specification

※ Refer to attachment related data

▣ **Improve TUBE's attachment precision**

• Size, bottom, and back process

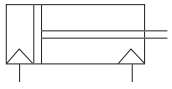
Series NGQ

Guide Attachment Compact Cylinder

Bore Size(mm) : Ø12, Ø16, Ø20, Ø25, Ø32, Ø40, Ø50, Ø63, Ø80, Ø100

- LATERAL LOAD-RESISTANT AND HIGH-PRECISION CYLINDER TO PREVENT ROTATION
- ABLE TO SELECT GUIDE ROAD BEARING OF 2 KINDS ACCORDING TO EACH USE-SLIDE BEARING AND BALL BEARING
- ENSURE EXCELLENT OPERATIONAL PERFORMANCE AND IMPROVE PRECISION
- APPLY AUTO SWITCH FOR DIVERSIFICATION
- BASICALLY INSTALL SIDE PORT
- IMPROVE CUSTOMER'S CONVENIENCE

Symbol



How to Order

NGQ M 20 – 50 □ – ○ ○ – □ □ □

1 2 3 4 5 6 7 8 9 10

1 NGQ = New Guide Compact Cylinder

2 Applied Bearing Type
- M : Slide bearing
- L : Ball bearing

3 Bore Size

Spec.	12	16	20	25	32
Bore(mm)	12	16	20	25	32
Spec.	40	50	63	80	100
Bore(mm)	40	50	63	80	100

4 Cylinder Stroke

Type	Bore Size	Standard Stroke (mm)
NGQM	Ø12, Ø16	10, 20, 30, 40, 50, 75, 100, 125, 150, 175, 200
	Ø20, Ø25	20, 30, 40, 50, 75, 100, 125, 150, 175, 200, 250, 300
NGQL	Ø32, Ø40, Ø50, Ø63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300
	Ø80, Ø100	25, 50, 75, 100, 125, 150, 175, 200

Note) Able to manufacture middle stroke in 5mm stroke by mounting spacer on standard stroke.
Ex) In the case of NGQM20-25ST, mount 5mm spacer on NGQM20-30ST, in which the whole product shape is the same as 30ST.

5 Port Type

Classification	Blank		US Type
Ø12, Ø16	M5 X 0.8		UNF
Classification	Blank	EU Type	US Type
Ø20~100	RC	G	NPT

※ Please inquiry for the product when you place an order the port of EU/US type.

6 Attachment Specification
- Blank : Non-side attachment hole
- H : Side attachment hole

7 Series
- Blank : Standard (Copper-free type is basic for L type of ϕ12 ~ ϕ40)
- XC16 : Copper-free type (Only L type can be in copper-free type)

8 Auto Switch
- Blank : None
- W4 : W4(2Wire DC 24V, AC100V)
- W2P : Strong magnetic field-resistant Auto S/W
  * The above S/W is applied to the ϕ32 ~ ϕ100
- W8V : Reed switch(Vertical type)
- W8H : Reed switch(Horizontal type)
- W9V : Solid state switch(Vertical type)
- W9H : Solid state switch(Horizontal type)
  * The above S/W is applied to the whole equipment.

9 Lead Wire Length
- Blank : 0.5 m
- L : 3 m

10 Number of Auto Switchs
- Blank : 2 pcs
- S : 1 pc
- N : N pcs

Standard Specification

Item		Specification	
Fluid		Compressed Air	
How to Operate		Double Acting	
Proof Pressure		1.5 Mpa (15kgf/㎠)	
Pressure Range Applied	Max. Pressure	1.0 Mpa (9.9kgf/㎠)	
	Min. Pressure	Ø12, Ø16	0.12 Mpa (1.2kgf/㎠)
		Ø20 ~ Ø100	0.1 Mpa (1.0kgf/㎠)
Surrounding and Used Fluid Temperature		-10℃ ~ +60℃	
Lubrication		Non Lubrication	
Cushion		Both Side Rubber Cushion (Basic)	
Piping		2 Direction Piping (Top and Bottom)	
Cylinder Attachment Type		Through Type Attachment (Top and Bottom), Side Attachment (Option)	
		T-Slot Attachment, Back Attachment	
AUTO S/W		Ultra-tiny AUTO S/W (W8*,W9*), W4	
		Able to Attach 3 Sets of Strong Magnetic Field-Resistant AUTO S/W (W2P)	
Applied Piston Speed		50 ~ 500 mm/S	
Stroke Tolerance		$^{+1.5}_{0}$mm	

Theory Output Table

(Unit : kgf)

Bore Size (㎜)	ROD Diameter (㎜)	Operation Direction	Water Pressure Area (㎠)	Pressure Applied(kgf/㎠)								
				2	3	4	5	6	7	8	9	10
12	6	OUT	1.1	2.3	3.4	4.5	5.7	6.8	7.9	9	10.2	11.3
		IN	0.9	1.7	2.5	3.4	4.2	5.1	5.9	6.8	7.6	8.5
16	8	OUT	2	4	6	8	10.1	12.1	14.1	16.1	18.1	20.1
		IN	1.5	3	4.5	6	7.5	9	10.6	12.1	13.6	15.1
20	10	OUT	3.1	6.3	9.4	12.6	15.7	18.8	22	25.1	28.3	31.4
		IN	2.4	4.7	7.1	9.4	11.8	14.1	16.5	18.8	21.2	23.6
25	12	OUT	4.9	9.8	14.7	19.6	24.5	29.4	34.3	39.3	44.2	49.1
		IN	3.8	7.6	11.3	15.1	18.9	22.7	26.4	30.2	34	37.8
32	16	OUT	8	16.1	24.1	32.2	40.2	48.2	56.3	64.3	72.4	80.4
		IN	6	12.1	18.1	24.1	30.1	36.2	42.2	48.2	54.3	60.3
40	16	OUT	12.6	25.1	37.7	50.2	62.8	75.4	87.9	100.5	113	125.6
		IN	10.6	21.1	31.7	42.2	52.8	63.3	73.9	84.4	95	105.5
50	20	OUT	19.6	39.3	58.9	78.5	98.1	117.8	137.4	157	176.6	196.3
		IN	16.5	33	49.5	65.9	82.4	98.9	115.4	131.9	148.4	164.9
63	20	OUT	31.2	62.3	93.5	124.6	155.8	186.9	218.1	249.3	280.4	311.6
		IN	28	56	84.1	112.1	140.1	168.1	196.1	224.1	252.2	280.2
80	25	OUT	50.2	100.5	150.7	201	251.2	301.4	351.7	401.9	452.2	502.4
		IN	45.3	90.7	136	181.3	226.7	272	317.3	362.7	408	453.3
100	30	OUT	78.5	157	235.5	314	392.5	471	549.5	628	706.5	785
		IN	71.4	142.9	214.3	285.7	357.2	428.6	500.1	571.5	642.9	714.4

Note) Theory output(kgf) = Pressure (kgf/㎠) X Piston water pressure area (㎠) 1kgf ≒ 9.8 N, 1kgf/㎠≒0.098Mpa

Weight Table (product weight)

(Unit : kg)

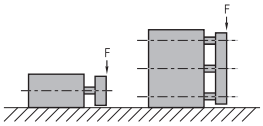
Bore Size	Type	Cylinder Stroke (mm)													
		10	20	25	30	40	50	75	100	125	150	175	200	250	300
Ø 12	M TYPE	0.2	0.3	—	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.0		
Ø 16		0.3	0.4	—	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.3	1.4		
Ø 20		—	0.7	—	0.8	0.8	0.9	1.2	1.4	1.6	1.8	2.0	2.2	2.7	3.1
Ø 25		—	1.0	—	1.1	1.2	1.3	1.7	1.9	2.2	2.5	2.8	3.0	3.6	4.1
Ø 32		—	—	1.7	—	—	2.2	2.5	2.8	3.2	3.6	4.0	4.3	5.3	6.0
Ø 40		—	—	1.8	—	—	2.5	2.8	3.3	3.8	4.2	4.8	5.2	6.4	6.9
Ø 50		—	—	3.1	—	—	3.8	4.5	5.2	5.8	6.5	7.3	7.9	8.8	9.4
Ø 63		—	—	3.7	—	—	4.8	5.4	6.2	6.8	7.6	8.4	9.1	10.1	10.8
Ø 80		—	—	6.6	—	—	7.5	8.8	9.7	10.7	11.6	12.8	13.7		
Ø 100		—	—	9.8	—	—	10.7	12.4	13.7	15.3	16.5	18.0	19.2		
Ø 12	L TYPE	0.2	0.3	—	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.9	0.9		
Ø 16		0.3	0.4	—	0.4	0.5	0.6	0.7	0.8	1.0	1.1	1.2	1.3		
Ø 20		—	0.7	—	0.8	0.9	0.9	1.1	1.3	1.5	1.7	1.9	2.1	2.5	2.9
Ø 25		—	1.0	—	1.1	1.3	1.3	1.6	1.8	2.1	2.3	2.6	2.8	3.3	3.7
Ø 32		—	—	1.5	—	—	2.0	2.3	2.6	2.9	3.3	3.6	3.9	4.6	5.2
Ø 40		—	—	1.7	—	—	2.2	2.7	3.1	3.5	3.9	4.4	4.8	5.6	6.0
Ø 50		—	—	2.8	—	—	3.5	4.2	4.8	5.4	6.0	6.7	7.3	7.8	10.2
Ø 63		—	—	3.5	—	—	4.5	5.1	5.8	6.5	7.1	7.8	8.5	9.2	9.8
Ø 80		—	—	6.3	—	—	7.5	8.8	9.6	10.5	11.2	12.4	13.1		
Ø 100		—	—	9.3	—	—	10.4	12.2	13.4	14.7	15.9	17.2	18.4		

Allowed Load

(Unit : N)

Bore Size	Type	Cylinder Stroke (mm)													
		10	20	25	30	40	50	75	100	125	150	175	200	250	300
Ø 12	M	20	16	—	13	15	13	19	16	14	12	11	10		
	L	20	37	—	31	36	31	14	8	5	3	2	2		
Ø 16	M	32	26	—	22	22	19	29	24	21	19	18	16		
	L	31	54	—	46	52	46	41	27	17	12	8	6		
Ø 20	M	—	52	—	44	43	38	67	58	51	45	40	36	28	19
	L	—	33	—	88	96	87	77	54	35	24	17	13	8	5
Ø 25	M	—	69	—	58	57	50	90	77	67	60	60	55	55	47
	L	—	49	—	39	102	92	91	77	79	70	52	40	25	17
Ø 32	M	—	—	146	—	—	160	143	122	115	102	117	107	92	80
	L	—	—	73	—	—	160	144	123	145	129	116	89	57	39
Ø 40	M	—	—	148	—	—	162	145	124	116	103	119	109	93	81
	L	—	—	73	—	—	160	144	123	144	129	116	89	56	38
Ø 50	M	—	—	238	—	—	236	221	192	179	160	176	161	138	121
	L	—	—	78	—	—	215	194	167	192	172	198	164	107	73
Ø 63	M	—	—	237	—	—	235	220	190	177	158	174	159	136	118
	L	—	—	74	—	—	215	194	165	191	171	198	160	102	69
Ø 80	M	—	—	298	—	—	245	297	258	241	216	226	207		
	L	—	—	100	—	—	69	274	239	212	190	205	188		
Ø 100	M	—	—	431	—	—	375	405	256	331	298	308	272		
	L	—	—	147	—	—	105	426	375	334	301	323	297		

1kgf ≒ 9.8 N, 1kgf/㎠≒0.098Mpa



Standard Stroke

Classification	Cylinder Stroke (mm)													
	10	20	25	30	40	50	75	100	125	150	175	200	250	300
Ø 12	●	●	–	●	●	●	●	●	●	●	●	●		
Ø 16	●	●	–	●	●	●	●	●	●	●	●	●		
Ø 20	–	●	–	●	●	●	●	●	●	●	●	●	●	●
Ø 25	–	●	–	●	●	●	●	●	●	●	●	●	●	●
Ø 32	–	–	●	–	–	●	●	●	●	●	●	●	●	●
Ø 40	–	–	●	–	–	●	●	●	●	●	●	●	●	●
Ø 50	–	–	●	–	–	●	●	●	●	●	●	●	●	●
Ø 63	–	–	●	–	–	●	●	●	●	●	●	●	●	●
Ø 80	–	–	●	–	–	●	●	●	●	●	●	●		
Ø100	–	–	●	–	–	●	●	●	●	●	●	●		

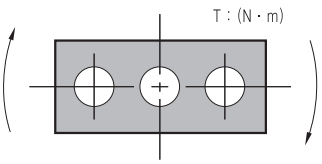
Note) In the case of middle stroke, able to manufacture it in 5 stroke units by mounting spacer (including '– ' mark part)

Allowed Rotation Torque (T)

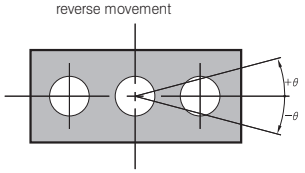
(Unit : N · m)

Bore Size	Type	Cylinder Stroke (mm)													
		10	20	25	30	40	50	75	100	125	150	175	200	250	300
Ø 12	M	0.4	0.4	—	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.2	—	—
	L	0.4	0.8	—	0.7	0.8	0.7	0.3	0.2	0.1	0.1	0.1	0.1	—	—
Ø 16	M	0.8	0.6	—	0.5	0.5	0.5	0.7	0.6	0.5	0.4	0.4	0.4	—	—
	L	0.7	1.3	—	1.1	1.2	1.1	1	0.6	0.4	0.3	0.2	0.2	—	—
Ø 20	M	—	1.4	—	1.2	1.2	1.1	1.9	1.6	1.4	1.3	1.1	1	0.8	0.5
	L	—	0.9	—	2.5	2.7	2.4	2.2	1.5	1	0.7	0.5	0.4	0.2	0.1
Ø 25	M	—	2.3	—	1.9	1.9	1.7	2.6	2.5	2.2	2	2	1.8	1.8	1.6
	L	—	1.6	—	1.3	3.4	3.1	3	2.6	2.6	2.3	1.7	1.3	0.8	0.5
Ø 32	M	—	—	5.9	—	—	6.4	5.7	4.9	4.6	4.1	4.7	4.3	3.7	3.2
	L	—	—	2.9	—	—	6.4	5.8	4.9	5.8	5.2	4.7	3.6	2.3	1.5
Ø 40	M	—	—	6.5	—	—	7.1	6.3	5.4	5.1	4.5	5.2	4.7	4	3.5
	L	—	—	3.2	—	—	6.9	6.3	5.3	6.3	5.6	5	3.9	2.5	1.7
Ø 50	M	—	—	13.1	—	—	13	12.2	10.5	9.8	8.8	9.7	8.9	7.6	6.6
	L	—	—	4.3	—	—	11.8	10.7	9.2	10.6	9.5	10.9	9	5.9	4
Ø 63	M	—	—	14.7	—	—	14.6	13.7	11.8	11	9.8	10.8	9.9	8.4	7.3
	L	—	—	4.6	—	—	13.3	12	10.3	11.9	10.6	12.3	9.9	6.3	4.3
Ø 80	M	—	—	23.1	—	—	19	23	20	18.7	16.7	17.5	16.1	—	—
	L	—	—	7.7	—	—	5.3	21.3	18.6	16.4	14.7	15.9	14.6	—	—
Ø 100	M	—	—	39.7	—	—	34.4	37.3	32.8	30.5	27.4	29.2	26.9	—	—
	L	—	—	13.6	—	—	9.7	39.2	34.5	30.8	27.7	29.7	27.3	—	—

1kgf ≒ 9.8 N, 1kgf/㎠≒0.098Mpa



Non-load: It is a theoretical rotational angle by guide rod and bearing's clearance in reverse movement



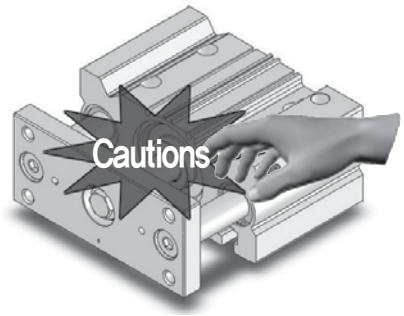
Maximum Rotation Angle

Bore Size	Maximum Rotation Angle(°)	
	NGQM	NGQL
Ø12, 16	±0.10 °	±0.07 °
Ø20, 25	±0.09 °	±0.06 °
Ø32, 40	±0.08 °	±0.06 °
Ø50, 63	±0.06 °	±0.05 °
Ø80, 100	±0.05 °	±0.04 °

Cautions

Please do not insert your hands or fingers between plate and body.

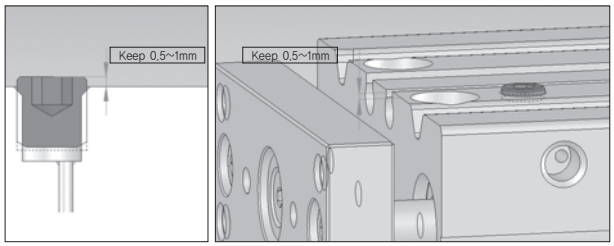
- Please be careful that your hands or fingers are not stuck between cylinder body and plate in air pressure.



In using side port

- When you use side port by attaching plug on top port hole, in the case of cylinder internal diameter of ø12,16, please assemble it in order to keep 0.5~1mm with top as below figure.

※Narrowed air orifice hole's diameter might cause cylinder operation problems.



Attachment

You can attach it by four methods such as back attachment, side attachment, penetration top attachment, and penetration bottom attachment.

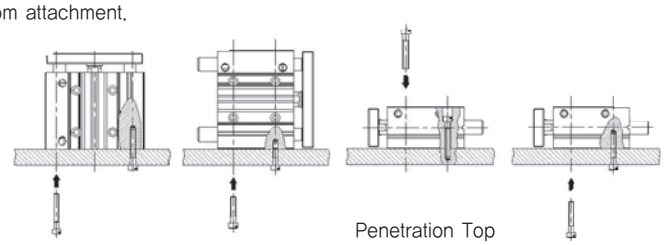


Table 1. T-SLOT Bolts

Bore Size	Applied Bolt	Bore Size	Applied Bolt
Ø12	M4	Ø40	M6
Ø16	M4	Ø50	M8
Ø20	M5	Ø63	M10
Ø25	M5	Ø80	M12
Ø32	M6	Ø100	M14

Note) Used bolt is based on hexagonal (rectangular) bolt.

① Caution in cylinder back attachment
In cylinder back attachment, please process entrance hole in order guide rod's end not to interfere attachment surface (bracket). But in back attachment, as for bolt depth, 1.5d is recommended (Refer to the Table 2. Back attachment area size and bolt size)

② In treating cylinder, please be careful of piston rod or guide rod's damage by impact or strange materials.
- Rod and cylinder damage may cause leakage and malfunction.

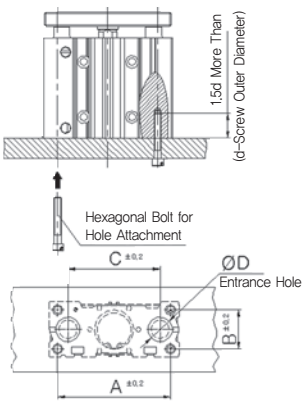
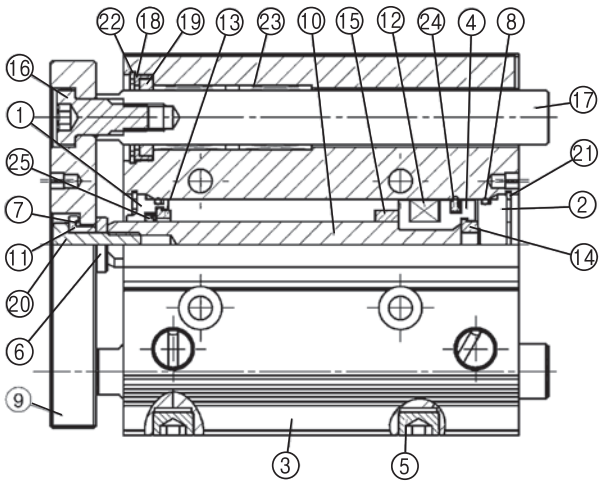


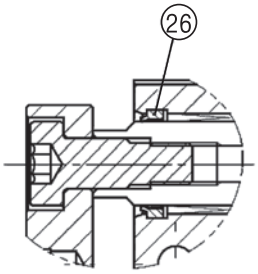
Table 2. Back Attachment Part's Size and Bolt Size

Bore Size	A (mm)	B (mm)	C (mm)	Ø D (mm) NGQM	Ø D (mm) NGQL	Hexagonal wrench bolt for attachment
Ø12	50	18	44	10	8	M4 X 0.7
Ø16	56	22	48	12	10	M5 X 0.8
Ø20	72	24	56	14	12	M5 X 0.8
Ø25	82	30	66	18	15	M5 X 0.8
Ø32	98	34	80	22	18	M8 X 1.25
Ø40	106	40	87	22	18	M8 X 1.25
Ø50	130	46	110	27	22	M10 X 1.5
Ø63	142	58	124	27	22	M10 X 1.5
Ø80	180	54	155	31	28	M12 X 1.75
Ø100	210	62	184	39	33	M14 X 2.0

Structural Drawing/Part List, Packing List

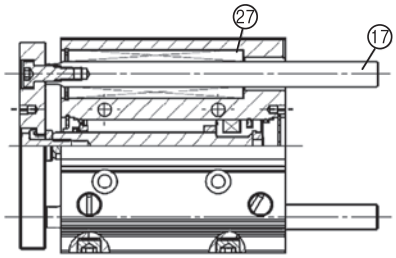
⊙ NGQM 12~25



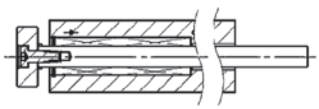


* Ø12, 16

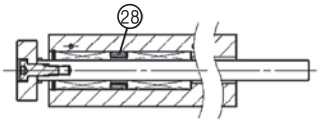
⊙ NGQL 12~25



* Ø12, 16 : More than 10ST
* Ø20 : More than 20ST
* Ø25 : More than 30ST



* Ø12, 16 : Between 10ST and 30ST
* Ø20 : Between 20ST and 30ST



* Ø12, 16, 20, 25 : More than 30ST

Part List

No.	Part Name	Material
1	ROD COVER	Aluminum Alloy
2	HEAD COVER	Aluminum Alloy
3	CYLINDER TUBE	Aluminum Alloy
4	PISTON	Aluminum Alloy
5	PORT PLUG	CarbonTool Steel
6	RETAINER WASHER	Stainless Steel
7	O-RING	NBR
8	GASKET	NBR
9	PLATE	Carbon Steel
10	PISTON ROD	Stainless Steel

No.	Part Name		Material
11	RETAINER		Carbon Steel
12	MAGNET		NBR
13	BUMPER-A		Urethane
14	BUMPER-B		Urethane
15	SPACER		Aluminum Alloy (Non-standard ST)
16	GUIDE ROD BOLT		CarbonTool Steel
17	GUIDE ROD	NGQM	Carbon Steel
		NGQL	High carbon chromium bearing steel
18	HOLDER		Carbon Steel

No.	Part Name	Material
19	FELT	Wool
20	PLATE ATTACHMENT BOLT	CarbonTool Steel
21	SNAP RING-A	CarbonTool Steel
22	SNAP RING-B	CarbonTool Steel
23	SLIDE BEARING	Copper Alloy
24	PISTON PACKING	NBR
25	ROD PACKING	NBR
26	SCRAPER	NBR
27	BALL BEARING	—
28	GUIDE SPACER	Aluminum Alloy

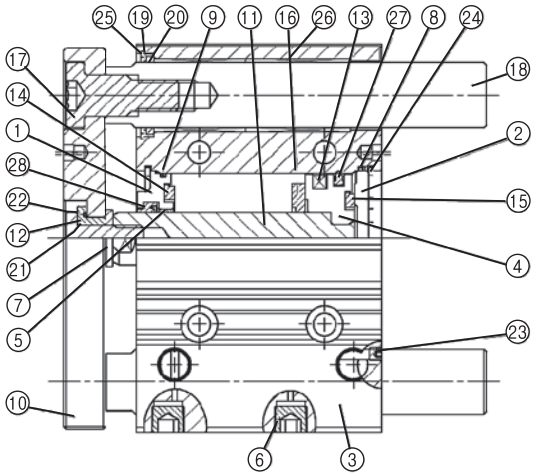
Packing List/Replacement Part

NO.	Part Name	Part Number			
		Ø12	Ø16	Ø20	Ø25
8	GASKET	C-10	C-14	C-18	C-23
24	PISTON PACKING	TPSA-12	TPSA-16	TPSA-20	TPSA-25
25	ROD PACKING	DYR-6	DYR-8	DYR-10SK-K	DYR-12
SEAL KIT		NGQ12-SK	NGQ16-SK	NGQ20-SK	NGQ25-SK

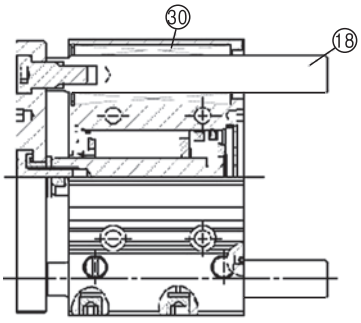
※ As for Seal KIT, 8, 9, 27, and 28 replacement parts are comprised in one type.

Structural Drawing/Part List, Packing List

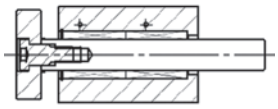
⊙ NGQM 32~63



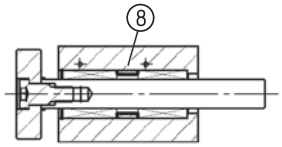
⊙ NGQL 32~63



∗Less than 25ST



∗Between 25ST and 50ST



∗More than 50ST

Part List

No.	Part Name	Material
1	ROD COVER	Aluminum Alloy
2	HEAD COVER	Aluminum Alloy
3	CYLINDER TUBE	Aluminum Alloy
4	PISTON	Aluminum Alloy
5	BUSH	Copper Alloy (Ø32and 40 are Excluded)
6	PORT PLUG	CarbonTool Steel
7	RETAINER WASHER	Carbon Steel
8	HEAD COVER GASKET	NBR
9	GASKET	NBR
10	PLATE	Carbon Steel

No.	Part Name		Material
11	PISTON ROD		Carbon Steel
12	RETAINER		Carbon Steel
13	MAGNET		NBR
14	BUMPER-A		Urethane
15	BUMPER-B		Urethane
16	SPACER		Aluminum Alloy (Non-standard ST)
17	GUIDE ROD BOLT		CarbonTool Steel
18	GUIDE ROD	NGQM	Carbon Steel
		NGQL	High carbon chromium bearing steel
19	HOLDER		Carbon Steel

No.	Part Name	Material
20	FELT	Wool
21	PLATE ATTACHMENT BOLT	CarbonTool Steel
22	O-RING	NBR
23	ACEPHALIA BOLT	CarbonTool Steel
24	SNAP RING-A	CarbonTool Steel
25	SNAP RING-B	CarbonTool Steel
26	SLIDE BUSH	Copper Alloy
27	PISTON PACKING	NBR
28	ROD PACKING	NBR
30	BALL BEARING	—
31	GUIDE SPACER	Aluminum Alloy

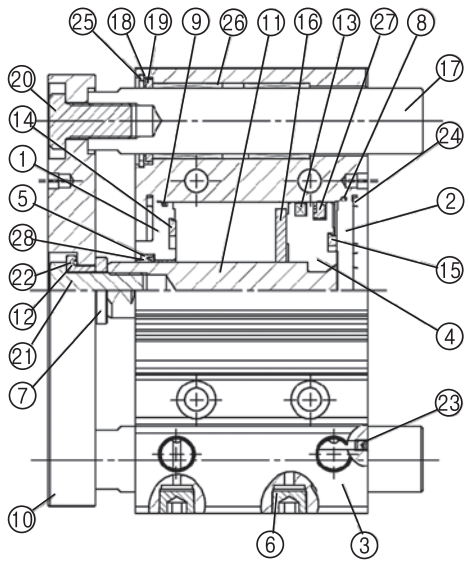
Packing List/Replacement Part

NO.	Part Name	Part Number			
		Ø32	Ø40	Ø50	Ø63
8	HEAD COVER GASKET	TGQM032-18-1586	TGQM040-18-1587	TGQM050-18-1588	TGQM063-18-1589
9	GASKET	C-29	C-36	C-46	C-60
27	PISTON PACKING	TPSA-32	TPSA-40	TPSA-50	TPSA-63
28	ROD PACKING	DYR-16	PDU-16Z	PDU-20Z	PDU-20Z
SEAL KIT		NGQ32-SK	NGQ40-SK	NGQ50-SK	NGQ63-SK

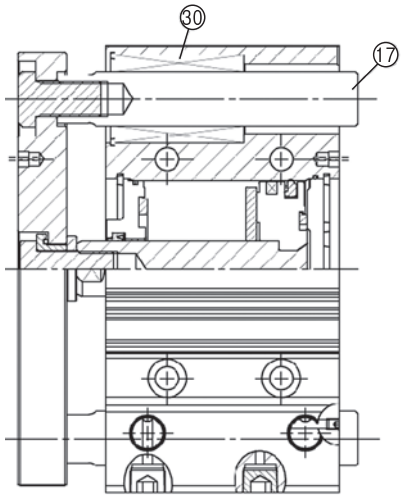
※ As for Seal KIT, 8, 9, 27, and 28 replacement parts are comprised in one type.

Structural Drawing/Part List, Packing List

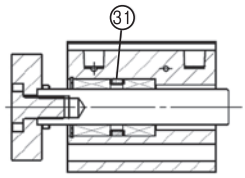
⊙ NGQM 80~100



⊙ NGQL 80~100



∗Less than 50ST



∗More than 50ST

Part List

No.	Part Name	Material
1	ROD COVER	Aluminum Alloy
2	HEAD COVER	Aluminum Alloy
3	CYLINDER TUBE	Aluminum Alloy
4	PISTON	Aluminum Alloy
5	BUSH	Copper Alloy
6	PORT PLUG	CarbonTool Steel
7	RETAINER WASHER	Carbon Steel
8	HEAD COVER GASKET	NBR
9	GASKET	NBR
10	PLATE	Carbon Steel
11	PISTON ROD	Carbon Steel

No.	Part Name		Material
12	RETAINER		Carbon Steel
13	MAGNET		NBR
14	BUMPER-A		Urethane
15	BUMPER-B		Urethane
16	SPACER		Aluminum Alloy (Non-standard ST)
17	GUIDE ROD	NGQM	Carbon Steel
		NGQL	High carbon chromium bearing steel
18	HOLDER		Carbon Steel
19	FELT		Wool
20	GUIDE ROD BOLT		CarbonTool Steel

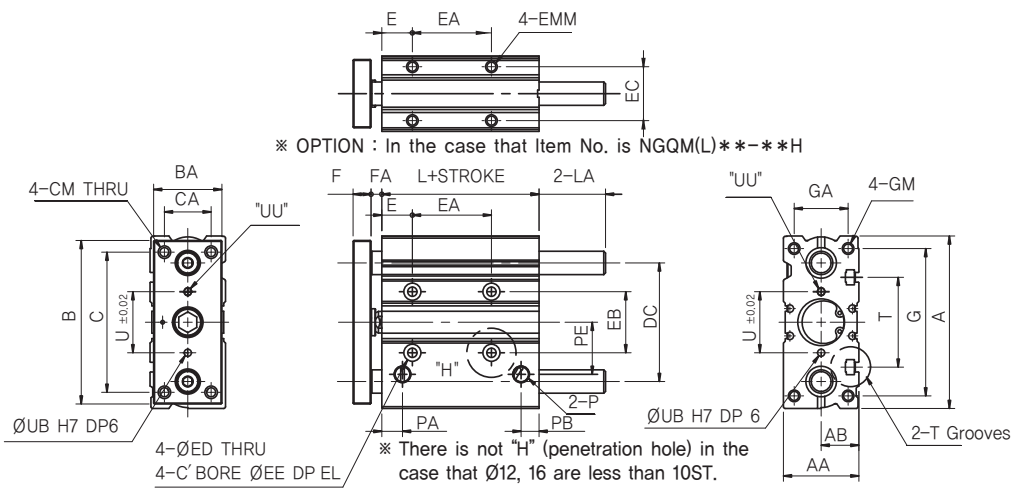
No.	Part Name	Material
21	PLATE ATTACHMENT BOLT	CarbonTool Steel
22	O-RING	NBR
23	ACEPHALIA BOLT	CarbonTool Steel
24	SNAP RING-A	CarbonTool Steel
25	SNAP RING-B	CarbonTool Steel
26	SLIDE BUSH	Copper Alloy
27	PISTON PACKING	NBR
28	ROD PACKING	NBR
30	BALL BEARING	—
31	GUIDE SPACER	Aluminum Alloy

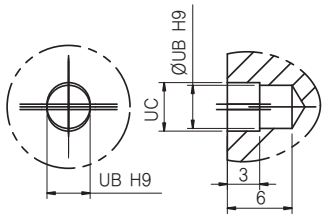
Packing List/Replacement Part

NO.	Part Name	Part Number	
		Ø80	Ø100
8	HEAD COVER GASKET	TGQM080-18-1794	TGQM100-18-1796
9	GASKET	C-75	C-95
27	PISTON PACKING	TPSA-80	TPSA-100
28	ROD PACKING	PDU-25Z	PDU-30Z
SEAL KIT		NGQ80-SK	NGQ100-SK

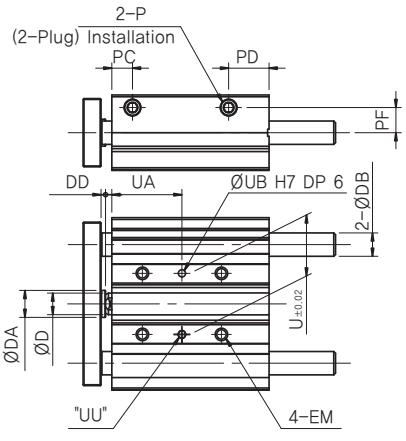
※ As for Seal KIT, 8, 9, 27, and 28 replacement parts are comprised in one type.

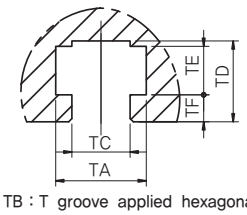
Size Drawing/NGQM, NGQL Ø12~25





DETAIL "UU"
(3 Positions)





TB : T groove applied hexagonal (rectangular) head bolt

T Groove Size
(2 Positions)

NGQM · NGQL Common Size Table(Ø12~25)

Bore Size (mm)	A	AA	AB	B	BA	C	CA	CM	D	DA	DB NGQ M	DB NGQ L	DC	DD	F	FA	G	GA	GM	P	PA	PB	PC	PD	PE	PF	T	TA	TB	TC	TD	TE	TF
12	61	26	13	56	22	48	14	M4×0.7	6	10	8	6	44	2	8	5	50	18	M4×0.7 DP 6	M5×0.8	14.5	12	14.5	12	10.5	8	37	7.4	M4	4.4	6.2	3.7	2
16	68	30	15	62	25	54	16	M5×0.8	8	11	10	8	48	2	8	5	56	22	M5×0.8 DP 8	M5×0.8	15	12	14.5	15	12	10	38	7.4	M4	4.4	6.7	3.7	2.5
20	84	36	18	81	30	70	18	M5×0.8	10	12	12	10	56	2.5	10	6	72	24	M5×0.8 DP 10	1/8	11	9.5	11	22	23	11	44	8.4	M5	5.4	7.5	4.5	2.5
25	96	42	21	91	38	78	26	M6×1.0	12	15	16	13	66	2.5	10	6	82	30	M6×1.0 DP 12	1/8	11.5	10	11.5	22.5	29	14	50	8.4	M5	5.4	7.5	4.5	2.5

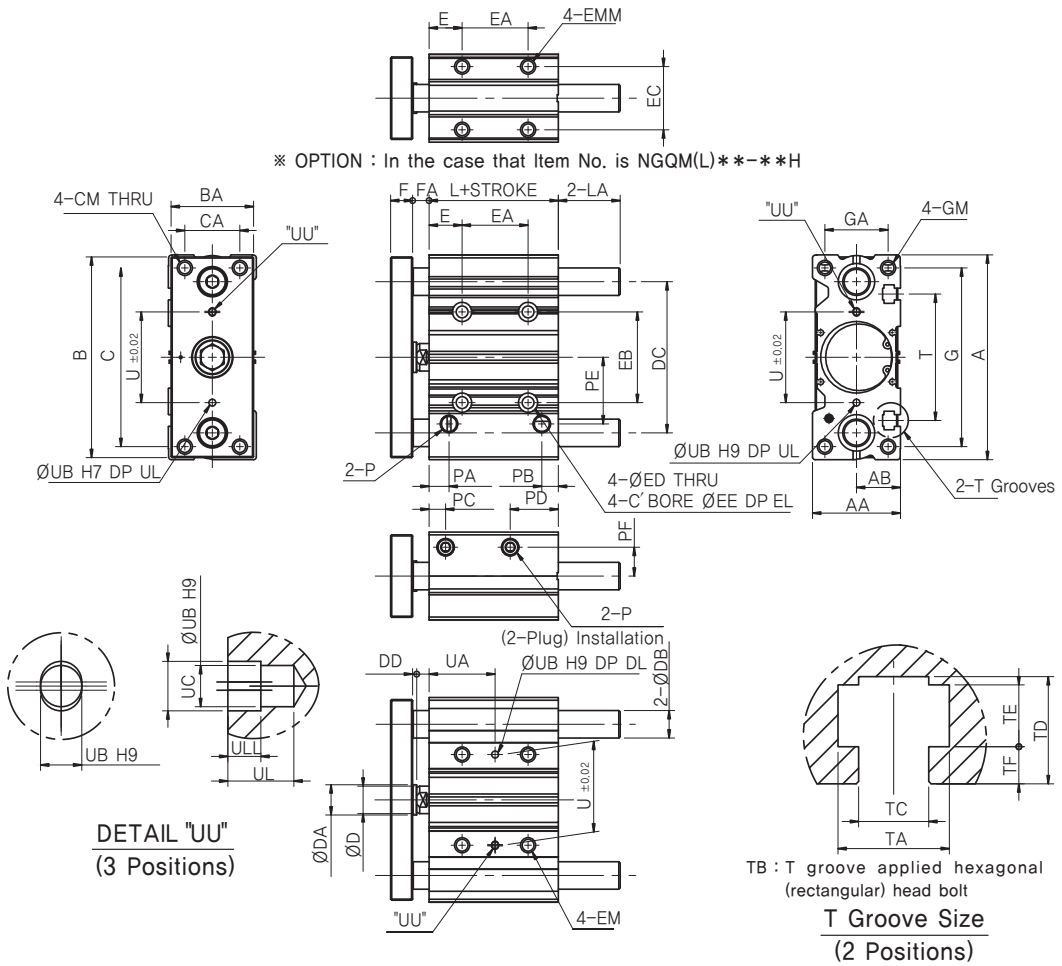
NGQM · NGQL Common Size Table(Ø12~16)

Bore Size (mm)	E	EA			EB	EC	ED	EE	EL	EM	EMM	L	LA												U	UA			UB	UC
													NGQM				NGQL													
		Less than 30	Between 30 and 100	Between 100 and 200									Less than 30	Between 30 and 50	Between 50 and 150	Between 150 and 200	Less than 10	Between 10 and 30	Between 30 and 50	Between 50 and 100	Between 100 and 150	Between 150 and 200			Less than 30	Between 30 and 100	Between 100 and 200		
12	5	20	40	110	23	18	4.3	8	4.5	M5×0.8 DP 10	M4×0.7 DP 6	29	3	9	37		0	14	24	29	34	39		23	15	25	60	3	3.5
16	5	24	44	110	24	22	4.3	8	4.5	M5×0.8 DP 10	M5×0.8 DP 8	33	5	9	38	43	0	20	30	35	45	55		24	17	27	60	3	3.5

NGQM · NGQL Common Size Table(Ø20~25)

Bore Size (mm)	E	EA				EB	EC	ED	EE	EL	EM	EMM	L	LA														U	UA				UB	UC
														NGQM					NGQL															
		Less than 30	Between 30 and 100	Between 100 and 200	Between 200 and 300									Less than 30	Between 30 and 50	Between 50 and 150	Between 150 and 200	Between 200 and 300	Less than 20	Between 20 and 30	Between 30and 50	Between 50and 100	Between 100 and 150	Between 150 and 200	Between 200 and 300				Less than 30	Between 30 and 100	Between 100 and 200	Between 200 and 300		
20	17	24	44	120	200	28	25	5.2	9.5	5.5	M6×1.0 DP 10	M5×0.8 DP 8	37	3.5	6.5	46.5			0	26	36	41	51	61	76	28		29	39	77	117	3	3.5
25	17	24	44	120	200	34	30	5.2	9.5	5.5	M6×1.0 DP 12	M6×1.0 DP 12	37.5	3	6	46	56	61	0		37	47	57	72	87	34		29	39	77	117	4	3.5

Size Drawing/NGQM, NGQL Ø32~63



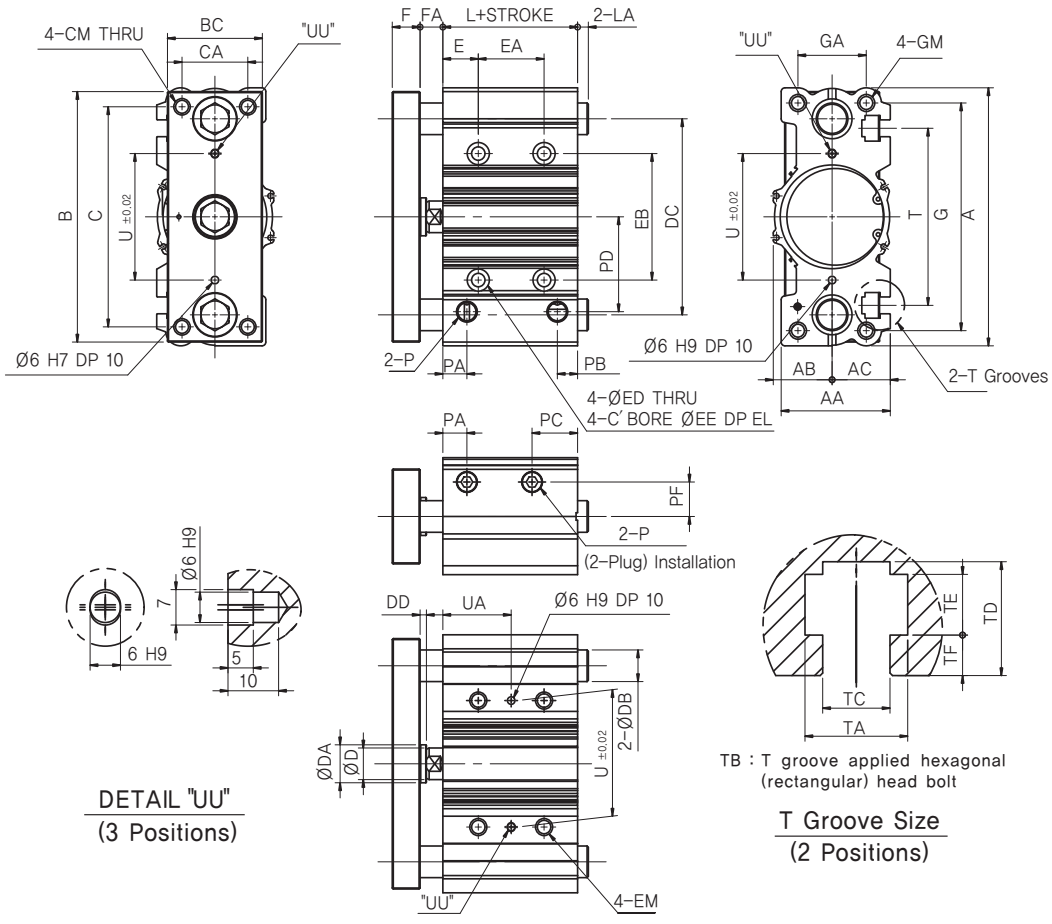
NGQM · NGQL Common Size Table(Ø32~63)

Bore Size (mm)	A	AA	AB	B	BA	C	CA	CM	D	DA	DB		DC	DD	F	FA	G	GA	GM	P	PA	PB	PC	PD	PE	PF
											NGQ M	NGQ L														
32	113	48	24	110	44	96	30	M8×1.25	16	18	20	16	80	3	12	10	98	34	M8×1.25 DP 16	1/8	12.5	9	12.5	28	36.5	16
40	121	54	27	118	44	104	30	M8×1.25	16	18	20	16	87	3	12	10	106	40	M8×1.25 DP 16	1/8	14	10.5	14	30	40.5	18
50	149	64	32	146	60	130	40	M10×1.5	20	22	25	20	110	3	16	12	130	46	M10×1.5 DP 20	1/4	14.5	11	12	35	48.5	21
63	162	77.5	39	158	70	130	50	M10×1.5	20	22	25	20	124	3	16	12	142	58	M10×1.5 DP 20	1/4	16.5	13.5	16.5	35	55	26.5

Bore Size (mm)	T	TA	TB	TC	TD	TE	TF	E	EA				EB	EC	ED	EE	EL	EM	EMM
									Less than 25	Between 25 and 100	Between 100 and 200	Between 200 and 100							
32	63	10.5	M6	6.5	9	5.5	3	21	24	48	124	200	42	36	6.6	11	7.5	M8×1.25 DP 16	M8×1.25 DP 12
40	72	10.5	M6	6.5	12	5.5	4	22	24	48	124	200	50	38	6.6	11	8.5	M8×1.25 DP 16	M8×1.25 DP 12
50	92	13.5	M8	8.5	13	7.5	4.5	24	24	48	124	200	66	46	8.6	14	12	M10×1.5 DP 20	M10×1.5 DP 12
63	110	17.8	M10	11	19	10	7.5	24	28	52	128	200	80	52	8.6	14	15	M10×1.5 DP 20	M10×1.5 DP 18

Bore Size (mm)	L	LA										U	UA				UB	UC	UL	ULL
		NGQM					NGQL						Less than 25	Between 25 and 100	Between 100 and 200	Between 200 and 100				
		Less than 25	Between 25 and 50	Between 50 and 100	Between 100 and 150	Between 150 and 300	Less than 25	Between 25 and 50	Between 50 and 100	Between 100 and 150	Between 150 and 300									
32	37.5	23.5	41.5	46.5	51.5	71.5	4.5	41.5	46.5	66.5	91.5	42	33	45	83	121	4	4.5	6	3
40	44	17	35	40	45	65	0	35	40	60	85	50	34	46	84	122	4	4.5	6	3
50	44	24	40	50	55	75	3	45	50	70	95	66	36	48	86	124	5	6	8	4
63	49	19	35	45	50	70	0	40	45	65	90	80	38	50	88	124	5	6	8	4

Size Drawing/NGQM, NGQL Ø80~100



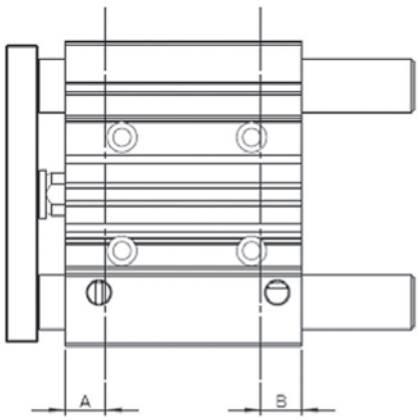
NGQM · NGQL Common Size Table(Ø80, 100)

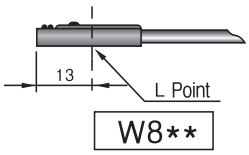
Bore Size (mm)	A	AA	AB	AC	B	BA	C	CA	CM	D	DA	DB		DC	DD	F	FA	G	GA	GM
												NGQM	NGQL							
80	204	86,25	46,5	46	198	75	174	52	M12×1,75	25	30	30	25	155	5	22	18	180	54	M12×1,75 DP 18
100	238	102,75	55,5	56	236	90	210	64	M14×2,0	30	35	36	30	184	5	25	25	210	62	M14×2,0 DP 25

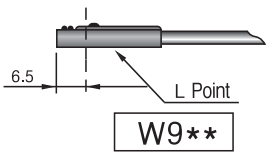
Bore Size (mm)	P	PA	PB	PC	PD	PE	T	TA	TB	TC	TD	TE	TF	E	EA			EB	ED	EE	EL	EM
															25	50 ~ 100	125 ~ 200					
80	3/8	19	15,5	36	75	27,25	140	20,3	M12	13,3	22,5	12	8	28	28	52	128	100	10,6	17,5	11	M12×1,75 DP 24
100	3/8	23	19	41	89	33,75	166	23,3	M14	15,3	26,5	13,5	10	11	48	72	148	124	12,5	20	11	M14×2,0 DP 28

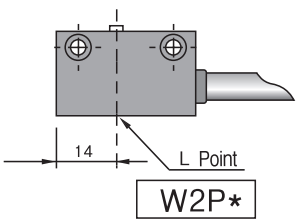
Bore Size (mm)	L	LA							U	UA		
		NGQM					NGQL			Less than 25	Between 25 and 100	Between 200 and 200
		Less than 25	Between 25 and 50	Between 50 and 100	Between 100 and 150	Between 150 and 200	Less than 50	Between 100 and 150	Between 150 and 200			
80	56,5	23,5	25,5	53,5	58,5	78,5	8,5	72,5	87,5	100	42	54	92
100	66	19	24	49	54	74	4	73	88	124	35	47	85

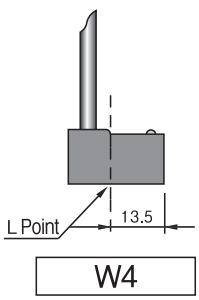
Auto Switch's Proper Attachment Position (Under Condition that Forward and Backward Full Stroke is Used)











(Unit : mm)

Bore Size	A Point Position	B Point Position
Ø12	14	15
Ø16	16.5	16.5
Ø20	16.5	21
Ø25	17.5	20
Ø32	18	20
Ø40	22.5	22
Ø50	20	24
Ø63	23	26.5
Ø80	26	31
Ø100	30	36

(Unit : mm)

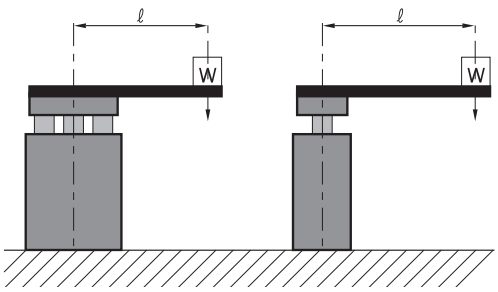
Switch Type	L Point Position (Detection Oosition)	Remarks
W8**	13	Able to use all the NGQ
W9**	6.5	
W4	13.5	Able to use internal diameter between Ø32 and Ø100
W2P*	14	

★ In attaching switch, please use it after matching cylinder's A point or B point with the switch's L point.

〈Cautions〉

In attaching two auto switches, Min. stroke should be operated more than 10 stroke. But in attaching W2P* switch, it can be operated more than 15 stroke.

In Vertical Attachment – NGQM / Slide Bearing



※ Using Condition

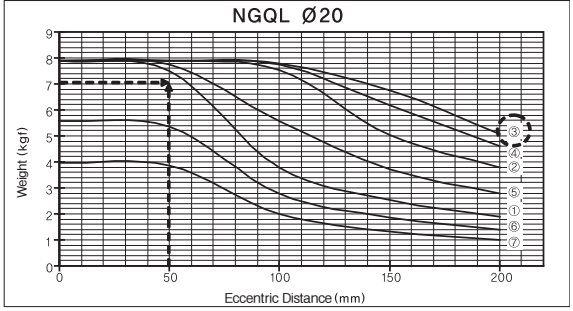
Pressure Applied P = 5 ~ 7 kgf/㎠
Cylinder Speed V ≒ 250mm/s (50 ~ 300 mm/s)
Eccentric Distance = ℓ (mm)
Applied Weight = W (kgf)

Note 1) Used pressure of 5 ~ 7 kgf/㎠ is recommended.
Note 2) When cylinder speed exceeds 30mm/s

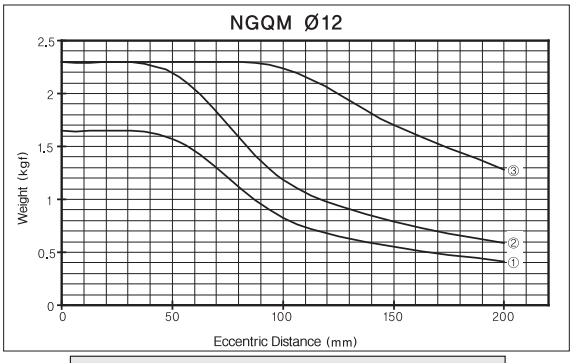
〈Selected Example〉
1. How to Attach : Vertical Attachment
2. Applied Bearing : Ball Bearing
3. Max. Cylinder Speed: 20mm/s
4. Applied Load : 7kgf
5. Applied Stroke : 50 Stroke
6. Eccentric Distance : 50mm

※Selection
1. Select ball bearing among vertical attached graphs.
2. Select a graph to endure load more than 7kgf
   → NGQL Ø20 ~ Ø100
3. Select a graph matched with 50 stroke and eccentric distance of 50mm and then, select device below the graph's line
   → Select NGQL Ø20 and apply eccentric distance of 50mm.
4. Selected device is NGQL Ø20-50ST

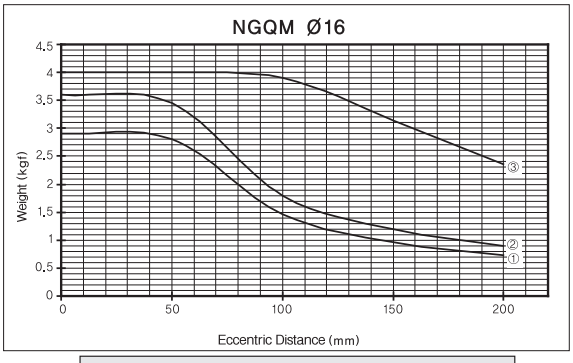
Table 3. Applied Load Ratio



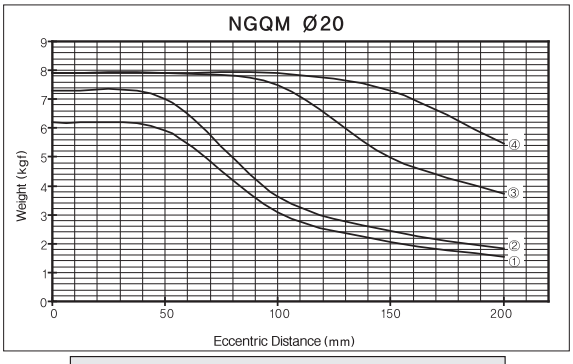
① Less than 20ST ② Between 30ST and 50ST
③ Between 30ST and 50ST ④ Between 50ST and 100ST
⑤ Between 100ST and 150ST ⑥ Between 150ST and 200ST
⑦ Between 200ST and 300ST



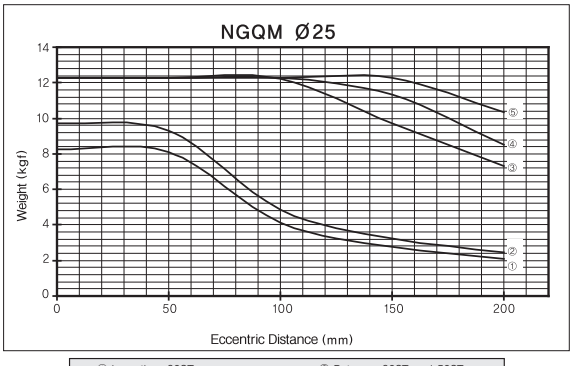
① Less than 30ST ② Between 30ST and 50ST
③ Between 50ST and 200ST



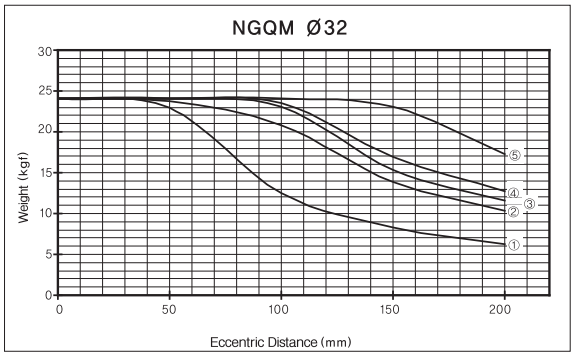
① Less than 30ST ② Between 30ST and 50ST
③ Between 50ST and 200ST



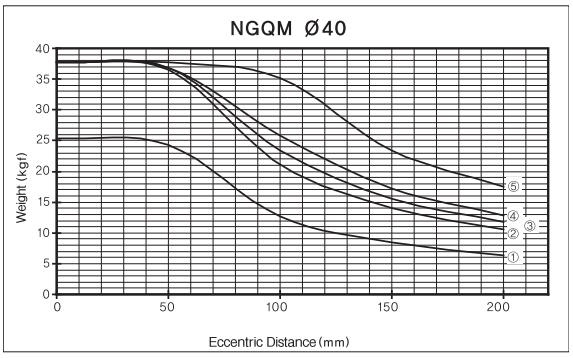
① Less than 30ST ② Between 30ST and 50ST
③ Between 50ST and 200ST ④ Between 200ST and 300ST



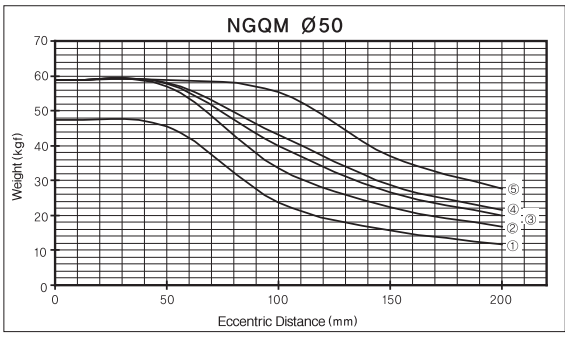
① Less than 30ST ② Between 30ST and 50ST
③ Between 50ST and 150ST ④ Between 150ST and 200ST
⑤ Between 200ST and 300ST



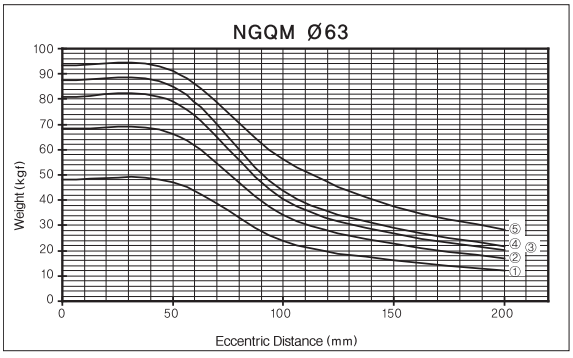
① Less than 25ST
② Between 25ST and 50ST
③ Between 50ST and 100ST
④ Between 100ST and 150ST
⑤ Between 150ST and 200ST



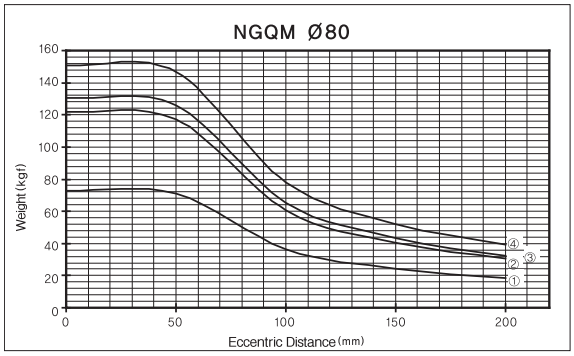
① Less than 25ST
② Between 25ST and 50ST
③ Between 50ST and 100ST
④ Between 100ST and 150ST
⑤ Between 150ST and 200ST



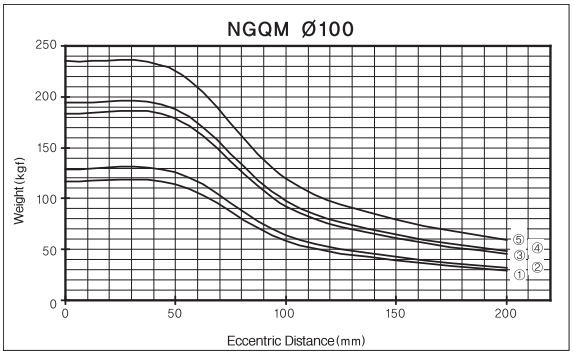
① Less than 25ST
② Between 25ST and 50ST
③ Between 50ST and 100ST
④ Between 100ST and 150ST
⑤ Between 150ST and 200ST



① Less than 25ST
② Between 25ST and 50ST
③ Between 50ST and 100ST
④ Between 100ST and 150ST
⑤ Between 150ST and 200ST

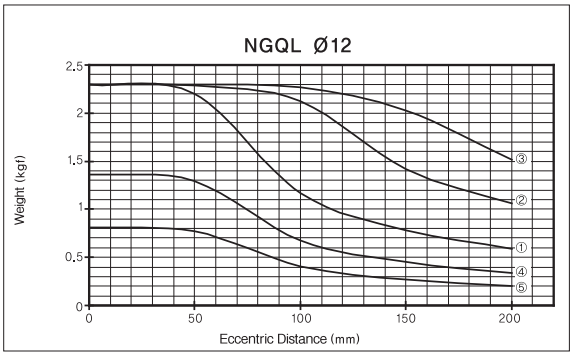


① Less than 50ST
② Between 50ST and 100ST
③ Between 100ST and 150ST
④ Between 150ST and 200ST

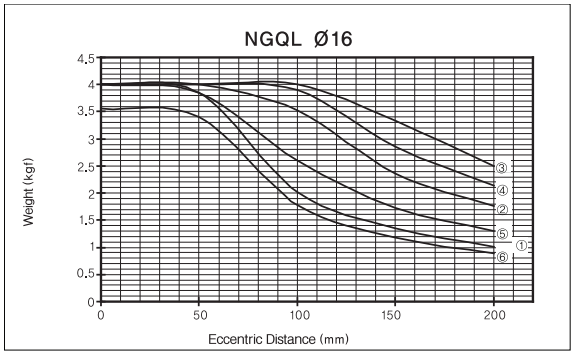


① Less than 25ST
② Between 25ST and 50ST
③ Between 50ST and 100ST
④ Between 100ST and 150ST
⑤ Between 150ST and 200ST

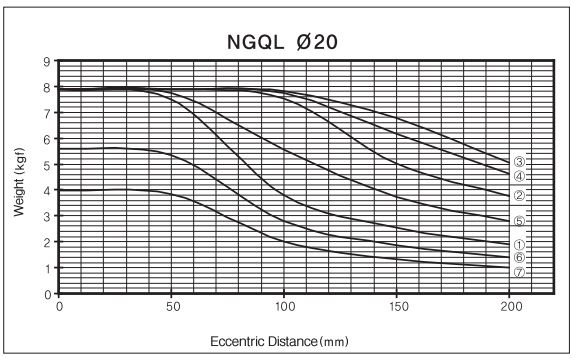
In Vertical Attachment – NGQL / Ball Bearing



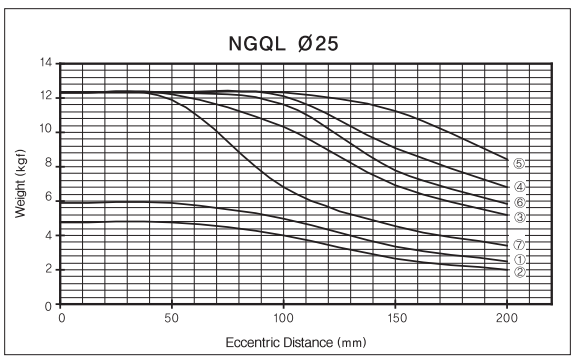
① Less than 10ST, Between 50ST and 100ST ② Between 10ST and 30ST
③ Between 30ST and 50ST ④ Between 100ST and 150ST
⑤ Between 150ST and 200ST



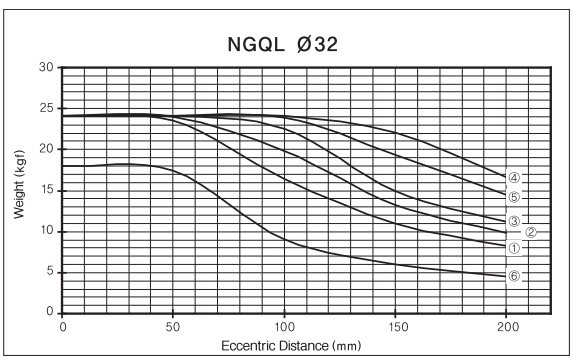
① Less than 10ST ② Between 10ST and 30ST
③ Between 30ST and 50ST ④ Between 50ST and 100ST
⑤ Between 100ST and 150ST ⑥ Between 150ST and 200ST



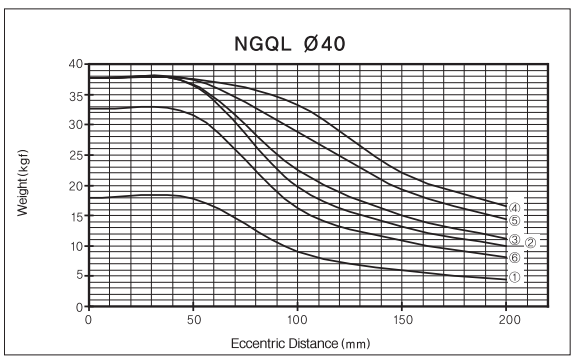
① Less than 20ST ② Between 20ST and 50ST
③ Between 30ST and 50ST ④ Between 50ST and 100ST
⑤ Between 100ST and 150ST ⑥ Between 150ST and 200ST
⑦ Between 200ST and 300ST



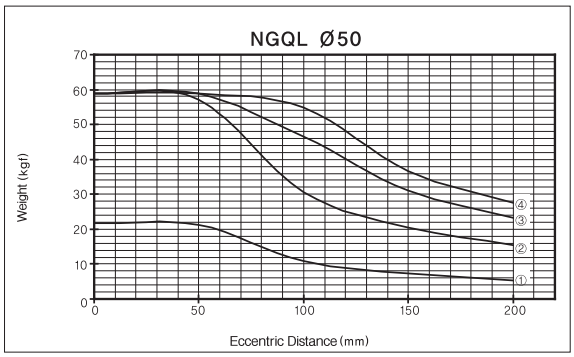
① Less than 20ST ② Between 20ST and 50ST
③ Between 30ST and 50ST ④ Between 50ST and 100ST
⑤ Between 100ST and 150ST ⑥ Between 150ST and 200ST
⑦ Between 200ST and 300ST



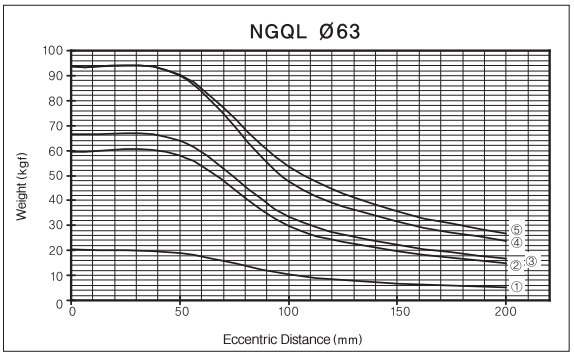
① Less than 25ST ② Between 25ST and 50ST
③ Between 50ST and 100ST ④ Between 100ST and 150ST
⑤ Between 150ST and 200ST ⑥ Between 200ST and 300ST



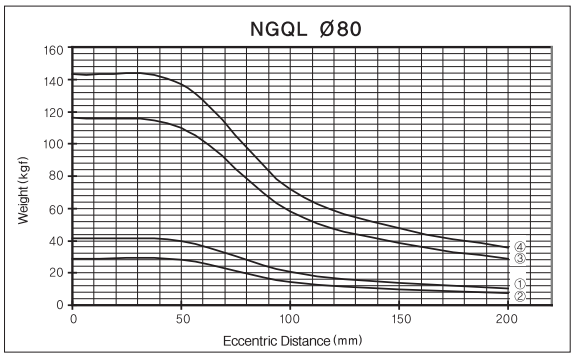
① Less than 25ST ② Between 25ST and 50ST
③ Between 50ST and 100ST ④ Between 100ST and 150ST
⑤ Between 150ST and 200ST ⑥ Between 200ST and 300ST



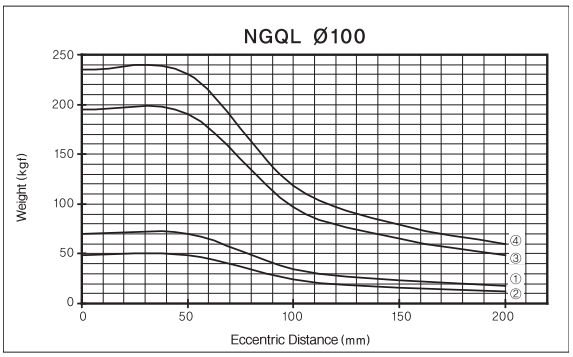
① Less than 25ST ② Between 25ST and 100ST, Between 200ST and 300ST
③ Between 100ST and 150ST ④ Between 150ST and 200ST



① Less than 20ST ② Between 25ST and 50ST, Between 200ST and 300ST
③ Between 50ST and 100ST ④ Between 100ST and 150ST
⑤ Between 150ST and 100ST

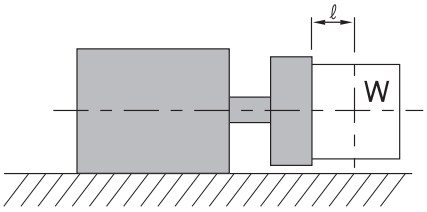


① Less than 25ST ② Between 25ST and 50ST
③ Between 50ST and 100ST ④ Between 100ST and 150ST



① Less than 25ST ② Between 25ST and 50ST
③ Between 50ST and 100ST ④ Between 100ST and 150ST

In Horizontal Attachment – NGQM / Slide Bearing



※ Using Condition

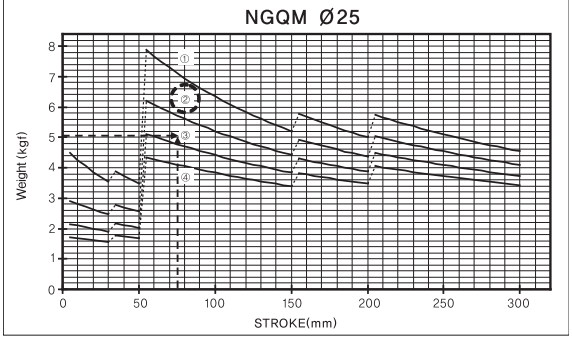
Pressure Applied P = 5 ~ 7 kgf/㎠
Cylinder Speed V ≒ 250mm/s (50 ~ 300 mm/s)
Eccentric Distance = ℓ (mm)
Applied Weight = W (kgf)

Note 1) Used pressure of 5 ~ 7 kgf/㎠ is recommended.
Note 2) When cylinder speed exceeds 30mm/s

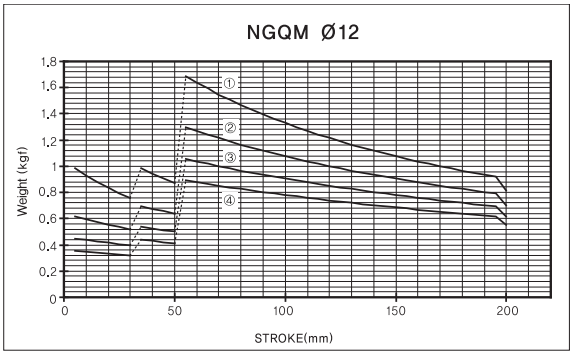
〈Selected Example〉
1. How to Attach : Horizontal Attachment
2. Applied Bearing : Ball Bearing
3. Max. Cylinder Speed : 250 mm/s
4. Applied Load : 5 kgf
5. Applied Stroke : 75 Stroke
6. Eccentric Distance : 100 mm

※Selection
1. Select Slide bearing among vertical attached graphs.
2. Select a graph to endure load more than 5kgf
   → NGQM Ø20 ~ Ø100
3. Select a graph matched with 75 stroke and eccentric distance of 100mm and then, select device below the graph's line
   → Select NGQM Ø25 ② and apply 75 stroke.
4. Selected device is NGQL Ø25-75ST

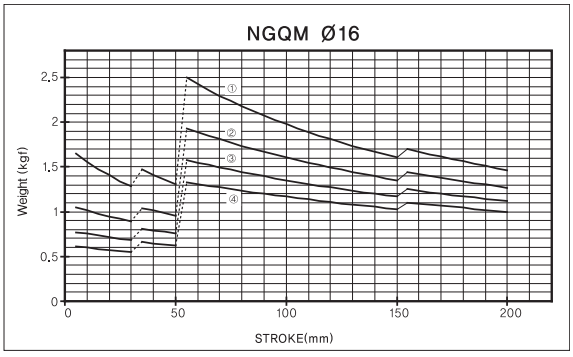
Table 3. Applied Load Ratio



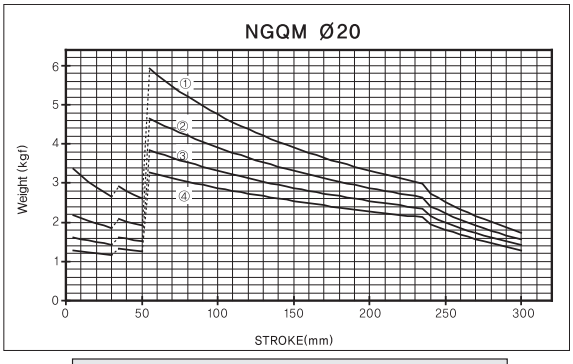
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



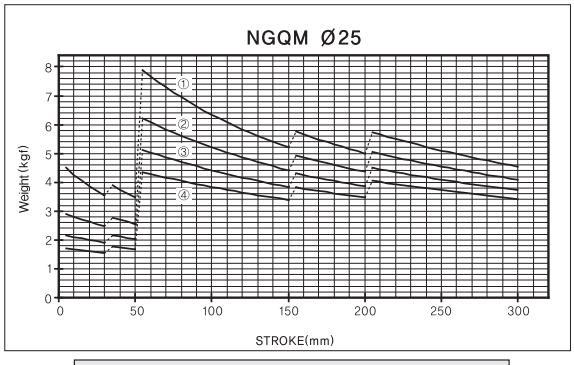
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



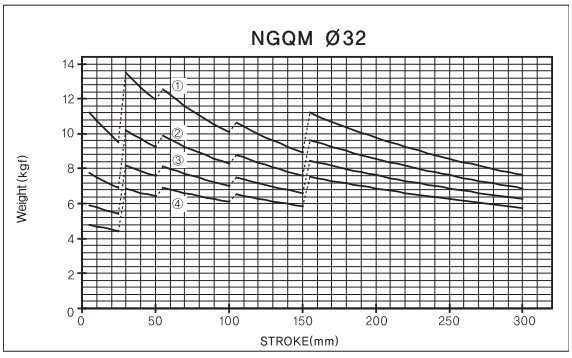
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



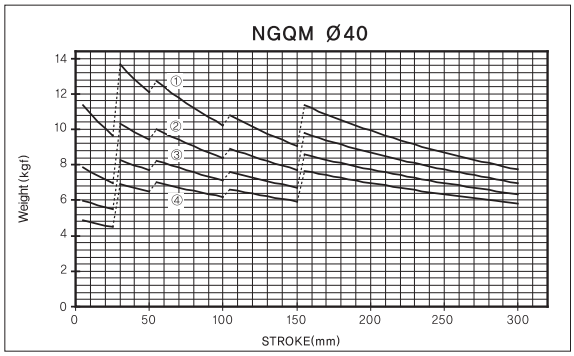
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



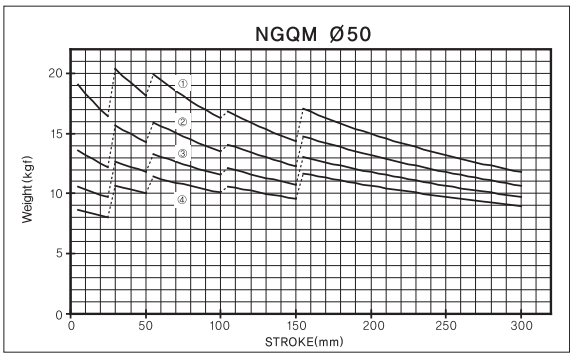
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



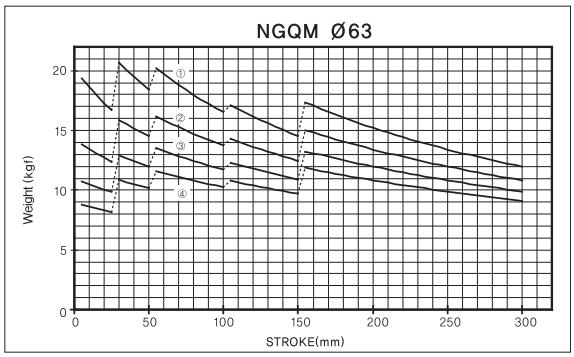
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



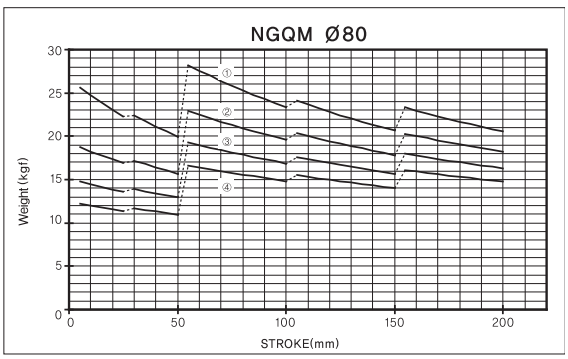
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



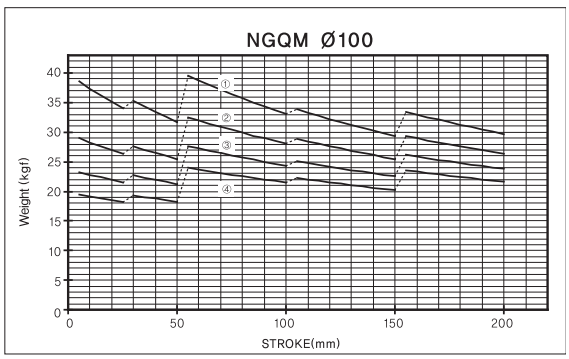
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm

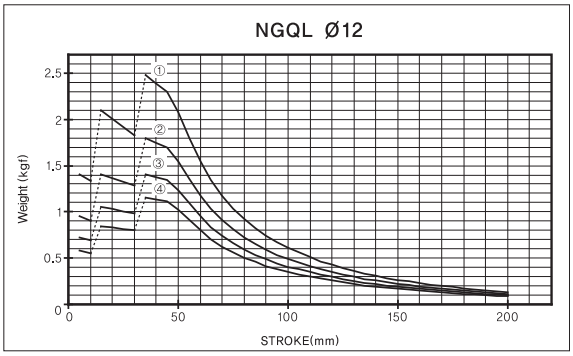


① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm

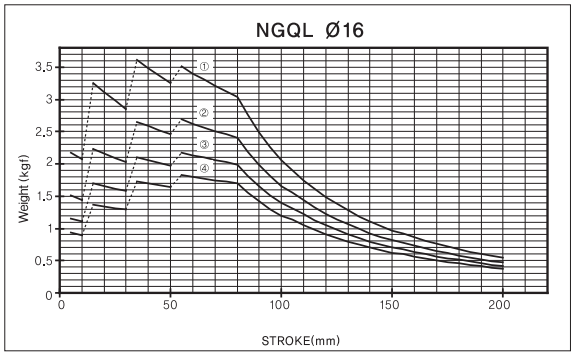


① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm

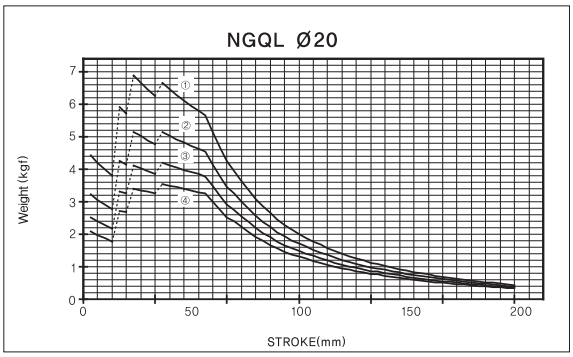
In Horizontal Attachment – NGQL / Ball Bearing



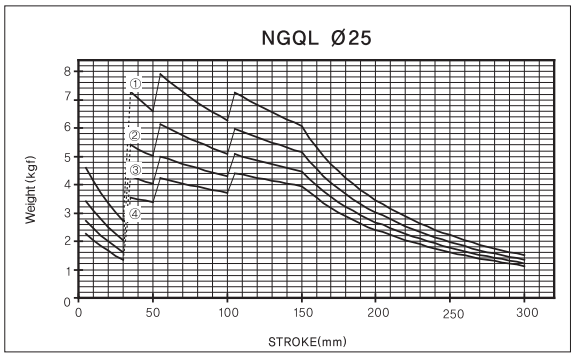
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



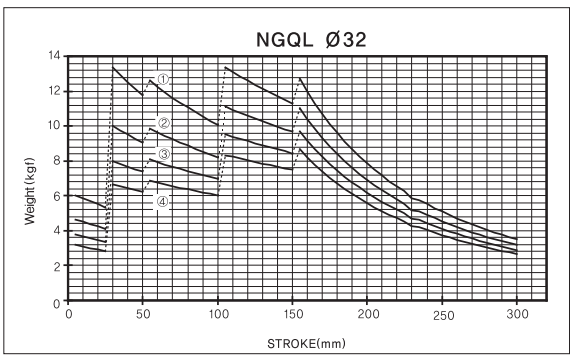
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



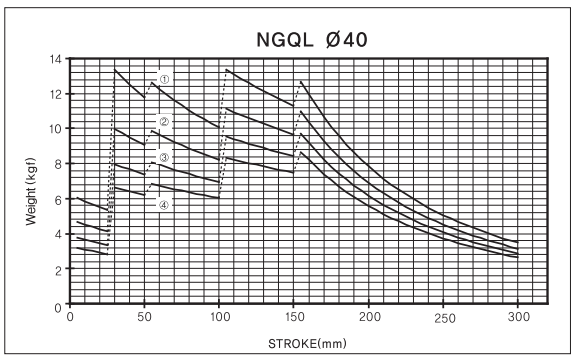
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



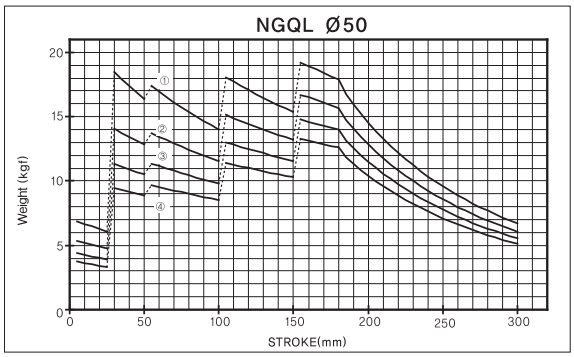
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



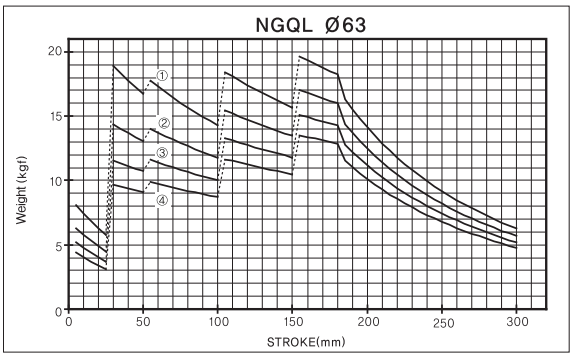
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



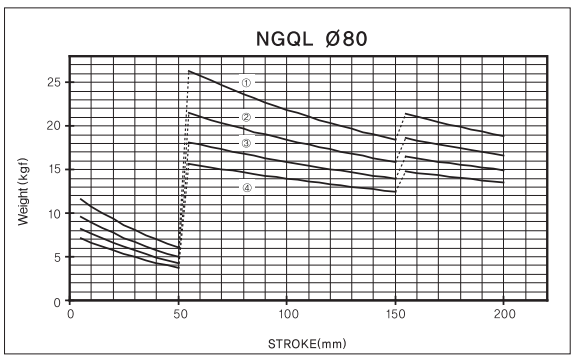
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



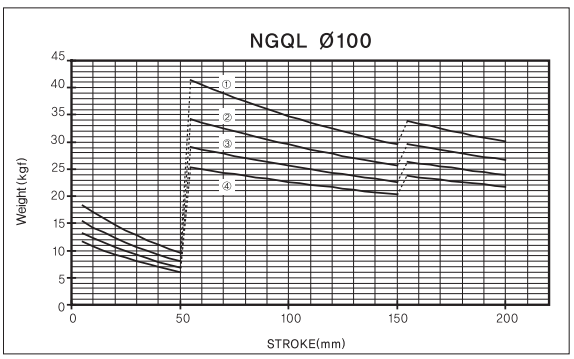
① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm



① Eccentric Distance(ℓ) : 50mm ② Eccentric Distance(ℓ) : 100mm
③ Eccentric Distance(ℓ) : 150mm ④ Eccentric Distance(ℓ) : 200mm

Applied Load Ratio

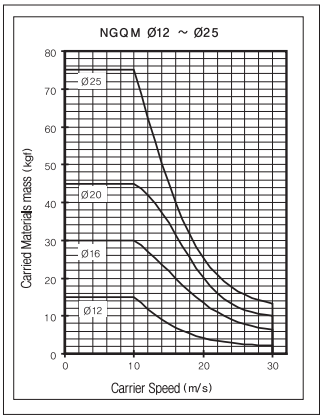
Table 3. Applied Load Ratio When Cylinder Speed is Faster Than 300mm/s

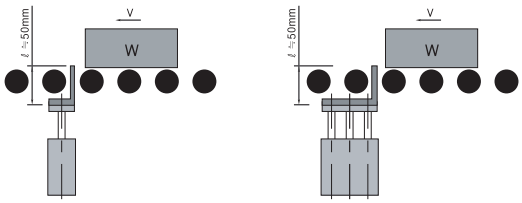
Bore Size	Applied Load Ratio			
	Vertical Attachment		Horizontal Attachment	
	NGQM	NGQL	NGQM	NGQL
Ø12	Lower than 15%	Lower than 20%	Lower than 25%	Lower than 40%
Ø16	Lower than 30%	Lower than 30%	Lower than 40%	Lower than 60%
Ø20	Lower than 20%	Lower than 25%	Lower than 25%	Lower than 50%
Ø25	Lower than 25%	Lower than 25%	Lower than 30%	Lower than 60%
Ø32	Lower than 20%	Lower than 25%	Lower than 30%	Lower than 50%
Ø40	Lower than 25%	Lower than 30%	Lower than 60%	Lower than 80%
Ø50	Lower than 30%	Lower than 30%	–	–
Ø63	Lower than 35%	Lower than 35%	–	–
Ø80	Lower than 30%	Lower than 35%	–	–
Ø100	Lower than 40%	Lower than 40%	–	–

※Recommend that the previous table's selected load is applied to the above table's ratio.

Load Range When it is Used for Stopper

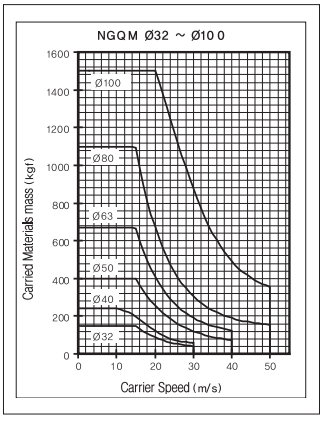
Bore Size Ø12~Ø25 / NGQM12~25(Slide Bearing)

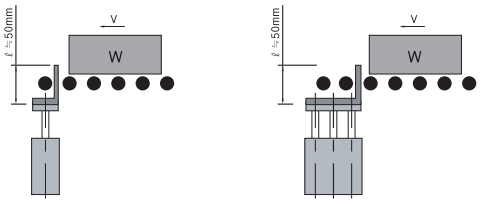




※ When L size is longer, please select right equipment having enough tube internal diameter.
Note 1) When it is used as stopper, please select 30 stroke and lower.
Note 2) NGQL (ball bearing) can be used as stopper.

Bore Size Ø32~Ø100 / NGQM32~100(Slide Bearing)



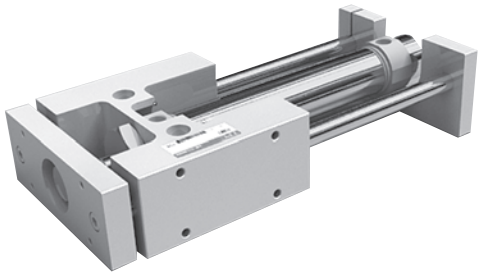


※ When L size is longer, please select right equipment having enough tube internal diameter.
Note 1) When it is used as stopper, please select 50 stroke and lower.
Note 2) NGQL (ball bearing) can be used as stopper.

Series AGX/GX

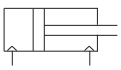
Guide Cylinder/Guide Unit

Bore Size(mm) : Ø20, Ø25, Ø32, Ø40



- COMPACT INTEGRATION OF AGX/GX SERIES CYLINDER WITH GUIDE RODS. THE LINEAR TRANSFER UNIT RESISTS LATERAL LOADING AND PROVIDES PRECISE, NON-ROTATING MOTION.
- THE AGX/GX SERIES IS EQUIPPED WITH A STANDARD MAGNET FOR AUTO SWITCH CAPABILITY
- 2 GUIDE RODS OFFER HIGH NON-ROTATING ACCURACY.

Symbols



How to Order

AGX [1] B [2] B [3] 40 [4] — 150 [5] A [6] — W5 [7] [8]

GX [1] B [2] B [3] 40 [4] — 150

Compact Guide Cylinder

[1] Type
Guide Cylinder
· Built-in magnet

[2] Type of Bearing
B : Bush Type

[3] Mounting
B : Standard

[4] Bore Size
20 : 20mm
25 : 25mm
32 : 32mm
40 : 40mm

[5] Stroke(mm)
ϕ20, ϕ25 : 25, 50, 75, 100,125, 150, 200, 250, 300
ϕ32 : 25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400
ϕ40 : 25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500

[6] Cushion
Blank : Rubber Cushion
A : Air Cushion

[7] Applicable Auto Switch Reed Switch
(Band Mounted Type)
〈Grommet〉
Blank : None
W5
※The standard lengh of lead is 0.5m, but a case of 3m(possible to take 3m to 3m to all type) is indicated as L.
(Example)W5L

[8] Number of Auto Switches
Blank : 2 pcs
S : 1pc
N : N pcs

Guide Unit

[1] Type of Bearing
B : Bush Type

[2] Mounting
B : Standard

[3] Bore Size
20 : 20mm
25 : 25mm
32 : 32mm
40 : 40mm

[4] Stroke(mm)
ϕ20, ϕ25 : 25, 50, 75, 100, 125, 150, 200, 250, 300
ϕ32 : 25, 50, 75, 100, 125,150, 200, 250, 300, 350, 400
ϕ40 : 25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500

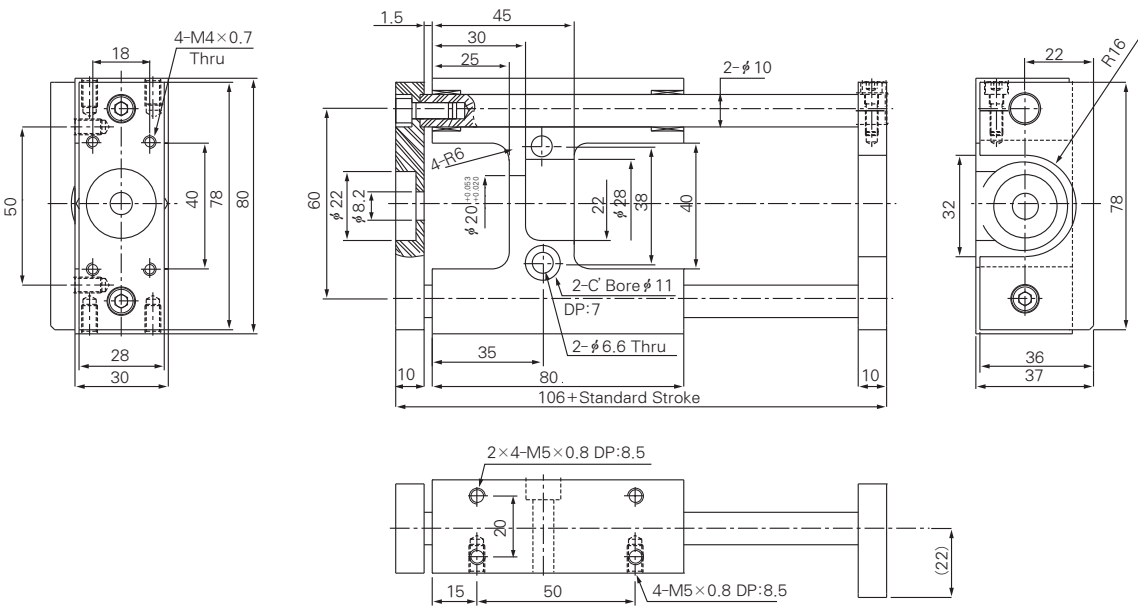
Specifications

Action	Double Acting
Fluid	Air
Proof Pressure	1.5MPa(213psi)
Max. Operating Pressure	0.99MPa(140psi)
Min. Operating Pressure	0.05MPa(7psi)
Ambient and Fluid Temperature	-10℃~+70℃(14°F~158°F)
Lubrication	Non-lube
Thread Tolerance	KS 2 class
Stroke Tolerance	$^{+1.4}_{0}$ mm

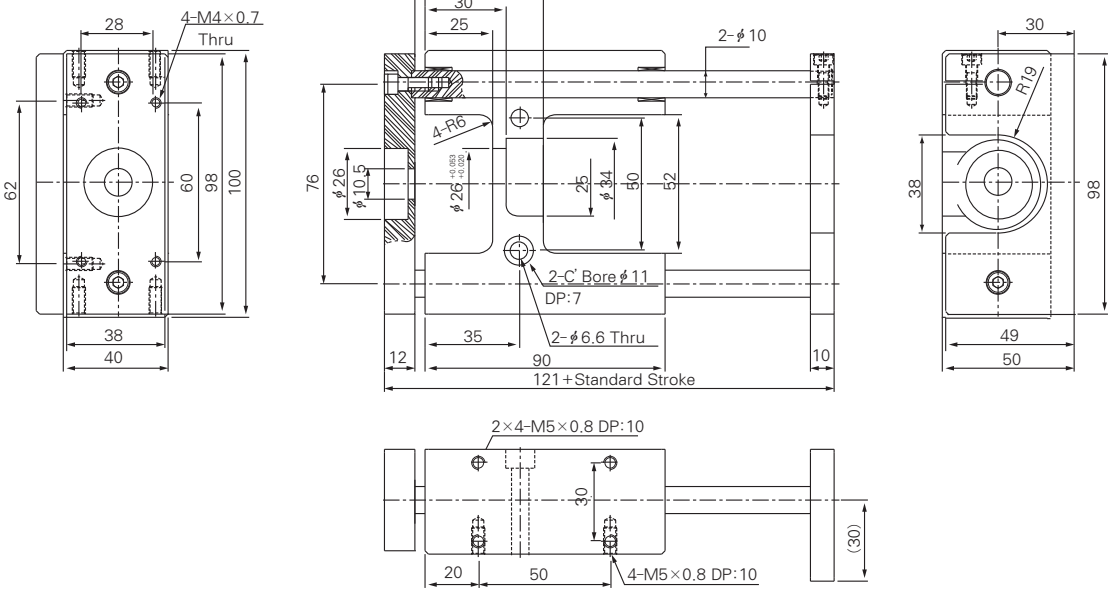
Guide Cylinder : Series AGX

Unit : mm

ϕ20(AGXBB20-＊＊)



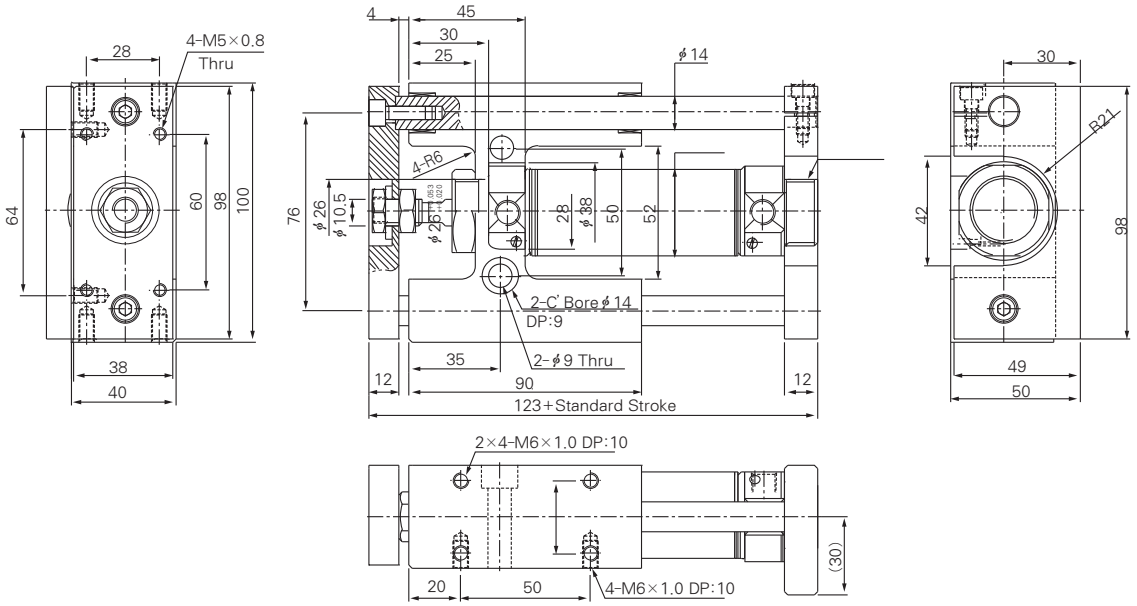
ϕ25(AGXBB25-＊＊)



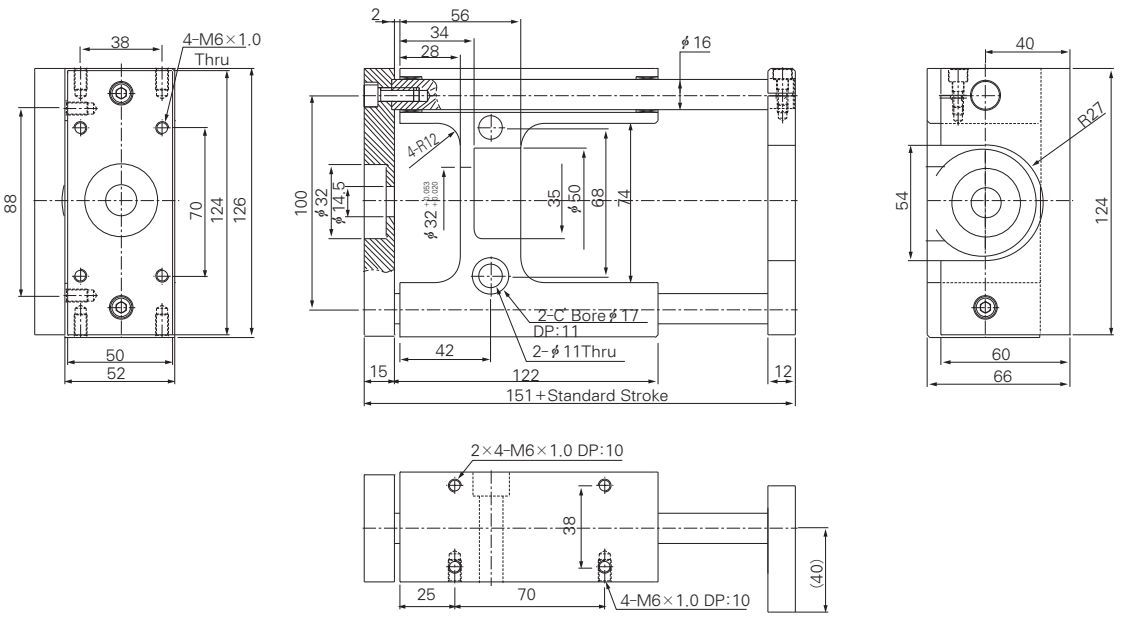
Guide Cylinder : Series AGX

Unit : mm

ϕ32(AGXBB32-＊＊)



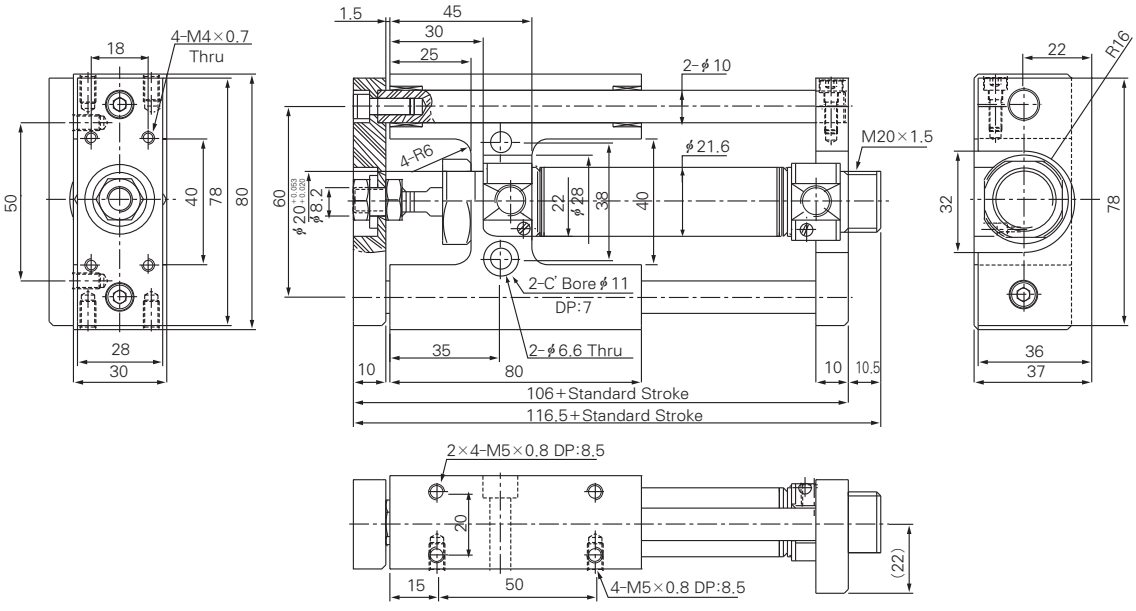
ϕ40(AGXBB40-＊＊)



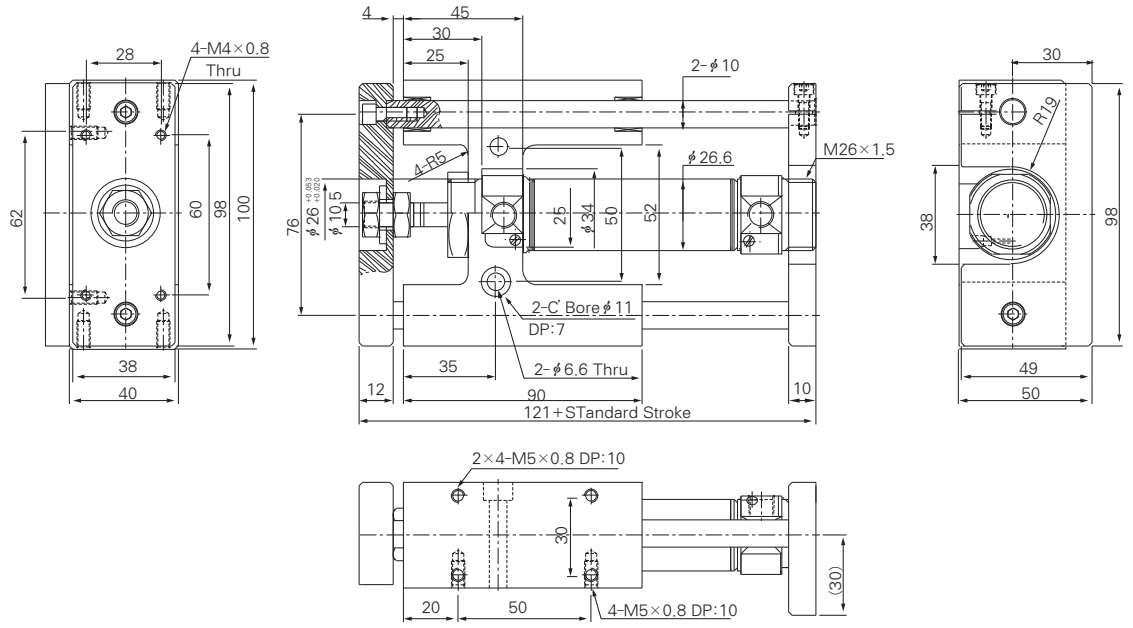
Guide Unit

Unit : mm

ϕ20(AGXBB20-＊＊)



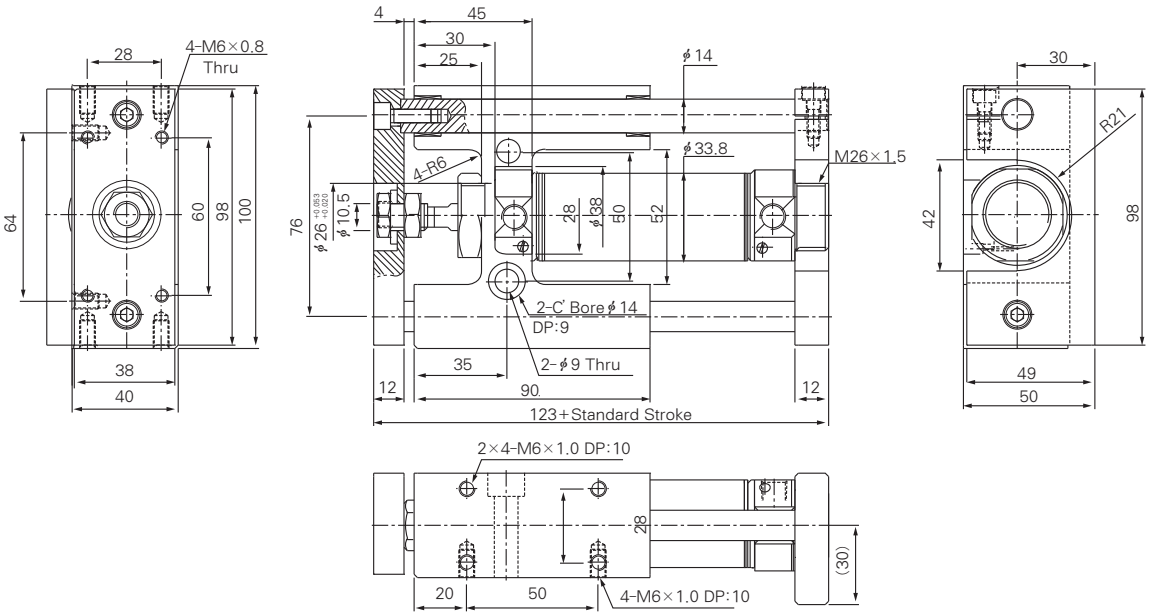
ϕ25(AGXBB25-＊＊)



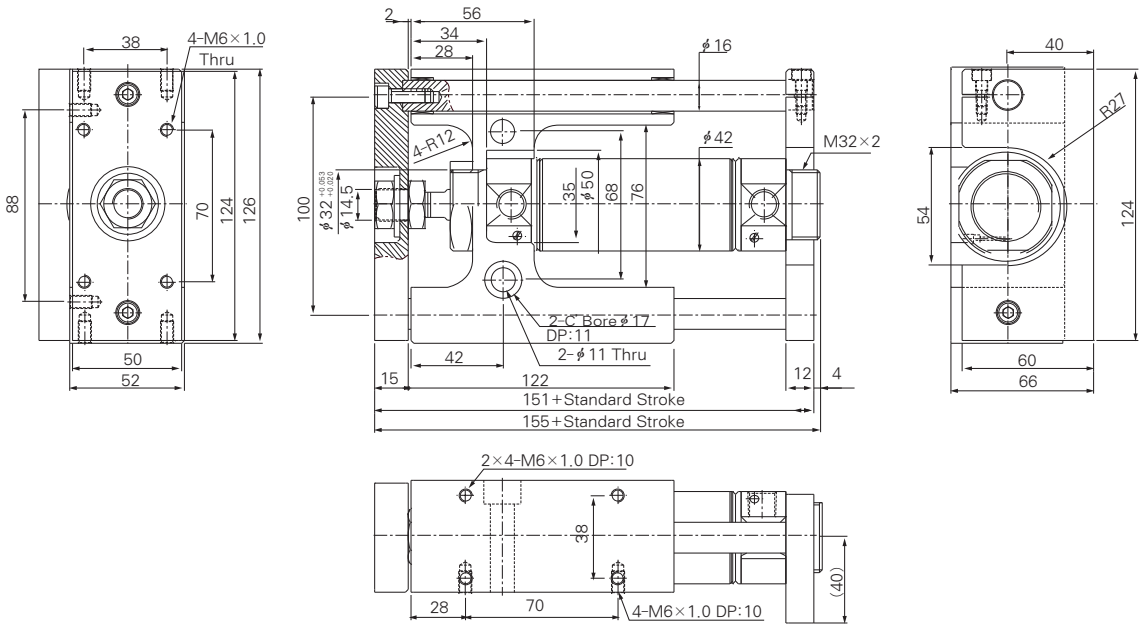
Guide Unit

Unit : mm

ϕ32(AGXBB32-＊＊)



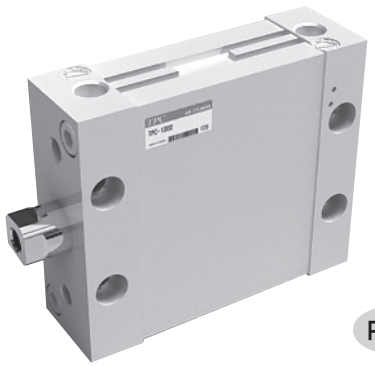
ϕ40(AGXBB40-＊＊)



Series NP

Plate Cylinder/Double Acting : Single Rod Non-Rotate

Bore Size(mm) : Ø50, Ø63



PAT

- COMPACT DESIGN
- INTERNAL ADJUSTABLE AIR CUSHIONS
- INTERNAL MULTIPLE MOUNTING LOCATIONS
- COIL SCRAPER AVAILABLE
- MICRO-SIZED AUTO SWITCHES
- ALLOWS MULTIPLE CYLINDERS TO BE MOUNTED SIDE BY SIDE

How to Order

NP	D	50-100	B	V	M	—	W2P			—	X104
1	2	3	4	5	6		7	8	9		10

1 New Plate Cylinder

2 Magnet
- Blank : None
- D : Built-in Magnet

3 Inner Diameter of Tube - Stroles
- 50 : 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100, 125, 150
- 63 : 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100, 125, 150, 200

4 Mounting
- Blank : None
- B : Y Knuckle (Rod's Bolt) + Head Cover Detachable Clevis
- C : Y Knuckle (Rod's Bolt)
- E : Detacable Clevis for Head Part
- HB : Y Knuckle(18mm Rod's Bolt) +Head Cover 2 Clevis

5 Mounting Locations
- V : Standard (Side)
- H : Axial (Back)

6 Rod-Top Types
- Blank : Rod-top Nut
- M : Rod-top Bolt

7 Auto Switch
- Blank : None
- W2P : Magnetic reed switch with 5 meter leads

8 Lead Wire
- Blank : 0.5m (only for micro switches)
- L : 3m
- Z : 5m (only for W2P switches)

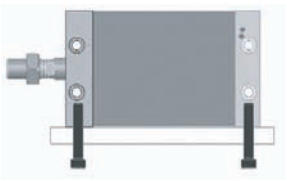
9 Number of Auto Switches
- Blank : 2 pcs
- S : 1 pc
- N : N pcs

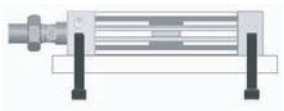
10 Coil Scraper
- Blank : None
- X104 : Coil Scraper Included

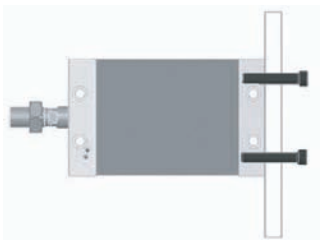
General Specifications

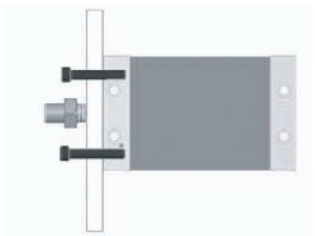
Operation Type		Double-Acting
Type		Pneumatic
Internal Pressure		1.05MPa(10.53kgf/cm²)
Range of Applicable Pressure		0.05MPa(0.53kgf/cm²)~1.02MPa(10.43kgf/cm²)
Temperature of Surroundings and Hydraulic Used		-5 ~ 60℃
Piston Velocity		50 ~ 500mm/sec
Lubrication		Non-lube
Cushion		Rubber Cushion
Stroke Tolerance		$^{+1.4}_{0}$
Inner diameter of Tube(mm)		Ø50
Rod-top Type		Rod-top Bolt, Rod-top Nut
AUTO S/W	W2P	Magnetic(Welding) Semi-conductors or Electronic
	W8, W9	Equipments

Multiple Mounting Options









Standard Strokes

Inter Diameter of Cylinder(mm)	Stroke(mm)
50	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100, 125, 150, 200
63	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100, 125, 150, 200

Theoretical Output

Bore Size	Diameter of Rod(mm)	Operational Direction	Piston's Hydraulic Pressure(mm²)	Pressure Used(NPa)					
				0.2	0.3	0.4	0.5	0.6	0.7
50	20	OUT	1960	392	588	784	980	1176	1372
		IN	1646	329	494	658	823	968	1152
63	20	OUT	3117	623	935	1247	1559	1870	2182
		IN	2803	561	841	1121	1402	1682	1962

Note) Theoretical Output (N) = Pressure * Piston's Hydraulic Pressure(mm²). 1N≒0.102kgf, 1MPa≒10.2kgf/cm²

Theoretical Output

Model	Remarks Strokes(mm)					
	50	75	100	125	150	Remarks
NP50	1,198	1,362	1,526	1,691	1,856	Standard Type
NP63	1,664	1,875	2,083	2,295	2,504	Standard Type

Theoretical Output

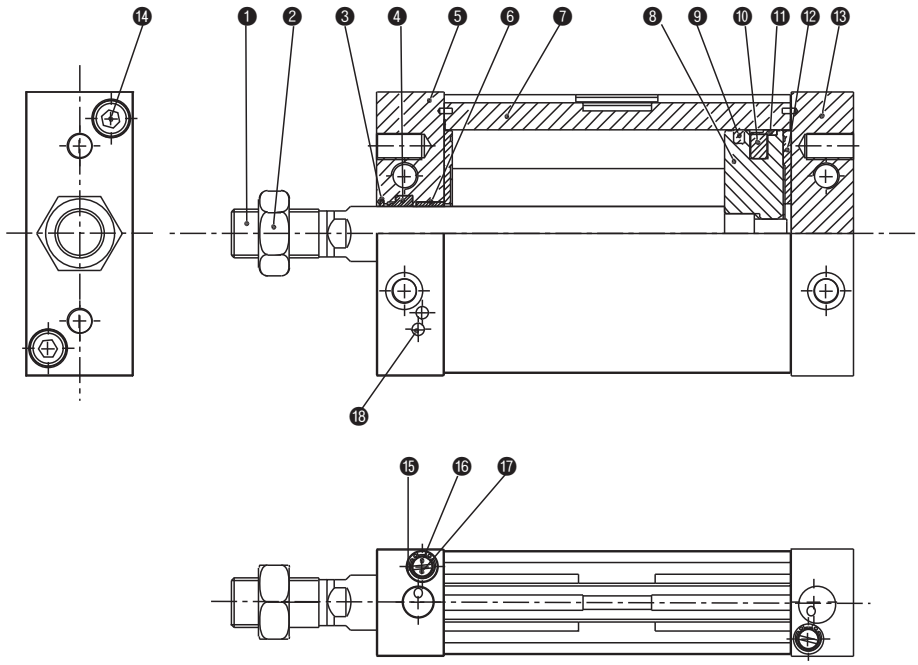
Type		Rod Type	Model No.	Masses(g)	Remarks
Y Kunckle	Detachable	For Nuts	Y-NP50	325 (Pin Attached)	Ø50, 63
		For Bolts	YMNP50	280 (Pin Attached)	Ø50, 63
Head Cover Clevis	Detachable	HYNP50, 63		485 (Pin Attached)	
Rod Cover Clevis	Detachable	RYNP50, 63		515 (Pin Attached)	

Note) 1. The types of metal parts include pins exclusively for clevises and separators and general washers. The metal parts for clevises are packaged with metal bolts for joints.

2. Y-NP50 and RYNP50 are not standard types and must be specially ordered.

3. The mass of detachable clevis? metal parts includes that of two metal bolts for joints.

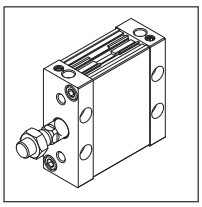
Structure

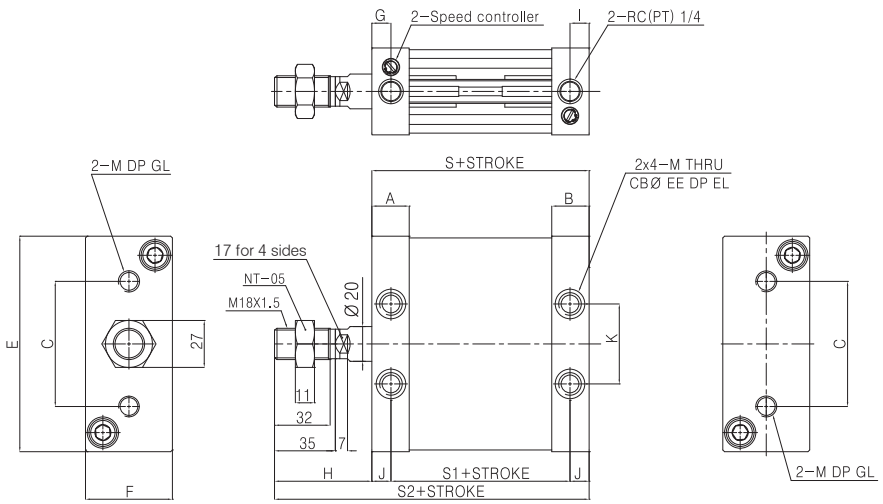


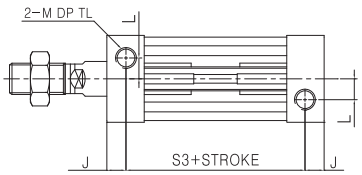
List of Parts

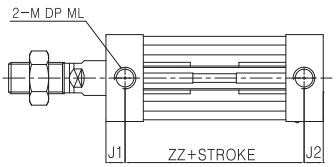
No.	Name of Part	Material	
1	PISTON ROD	Carbon Steel	
2	NUT	Stainless Steel	
3	METAL SCRAPER	Bronze Alloy	Option
4	ROD PACKING	NBR	
5	ROD COVER	Aluminum Alloy	
6	BUSH	Sintered Alloy	
7	TUBE	Aluminum Alloy	
8	PISTON	Aluminum Alloy	
9	PISTON PACKING	NBR	
10	MAGNET	Magnetic Circuit	Option
11	WEARING	Plastic Resin	
12	BUMPER	Urethane	
13	HEAD COVER	Aluminum Alloy	
14	Hexagonal Groove Bolt	Stainless Steel	
15	SNAP RING	Spring Steel	
16	SPEED CON'	Stainless Steel	
17	SPEED CON' PACKING	NBR	
18	STEEL BALL	Stainless Steel	

NP50 Dimensions (Bolts)









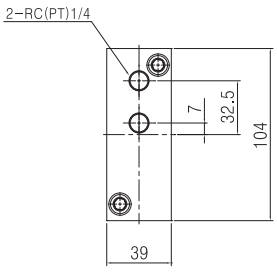
Model	A	B	S	S1	S2	S3	C	E	F	G
NP50	22.5	20.5	74	54	127	54	64	104	39	12.5
NP63	21.5	21.5	75	53	131	53	72	124	50	11

Model	I	H	J	K	L	M	GL	TL	EE	EL
NP50	11.5	53	10	42	9	M10X1.5	15	14.5	13.5	8.5
NP63	11	56	11	46	12	M12X1.75	15	16	17	10.5

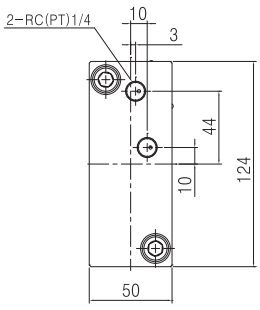
Model	ZZ	J1	J2	M	ML
NP50	48	14	12	M10X1.5	12.0
NP63	53	11	11	M12X1.75	16

Axis Direction

Port Dimensions

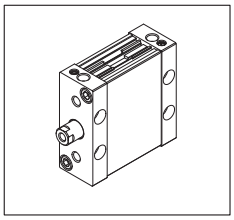


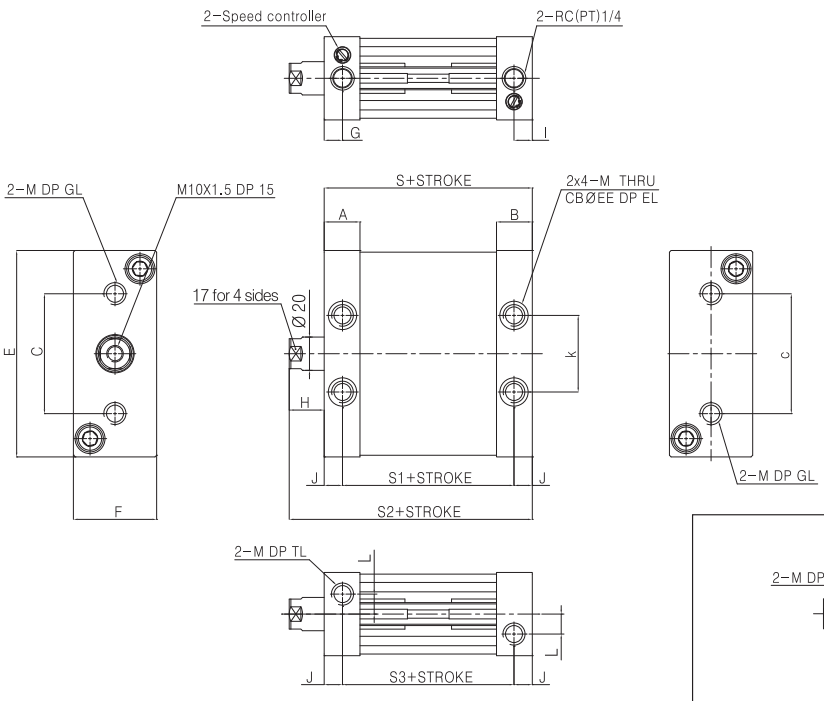
NP50

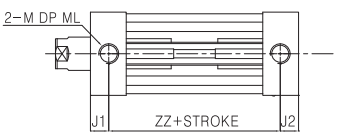


NP63

NP50 Dimensions (Nuts)







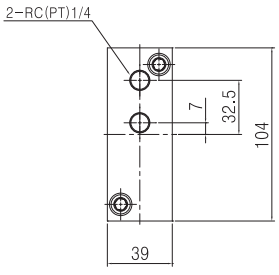
Model	A	B	S	S1	S2	S3	C	E	F	G
NP50	22.5	20.5	74	54	92	54	64	104	39	12.5
NP63	21.5	21.5	75	53	96	53	72	124	50	11

Model	I	H	J	K	L	M	GL	TL	EE	EL
NP50	11.5	18	10	42	9	M10X1.5	15	14.5	13.5	8.5
NP63	11	21	11	46	12	M12X1.75	15	16	17	10.5

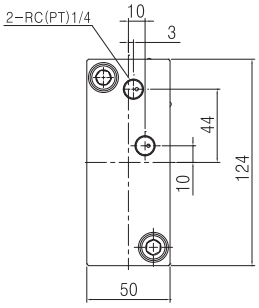
Model	ZZ	J1	J2	M	ML
NP50	48	14	12	M10X1.5	12
NP63	53	11	11	M12X1.75	16

Axis Direction

Port Dimensions

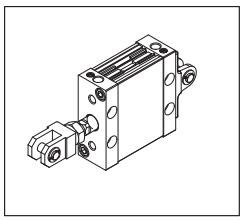


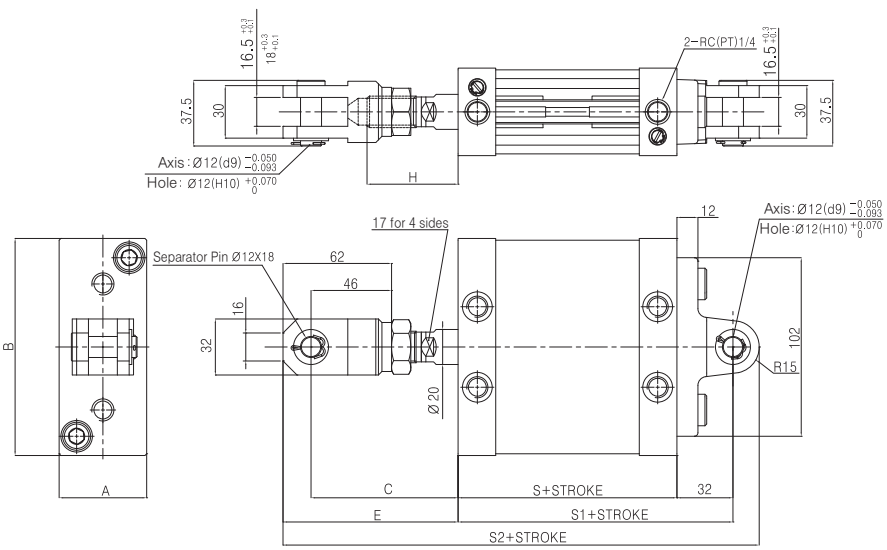
NP50



NP 63

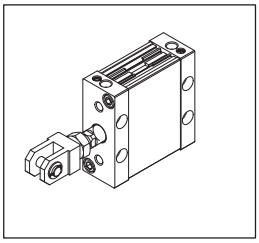
NP50 Dimensions (Detachable Clevis on Head)

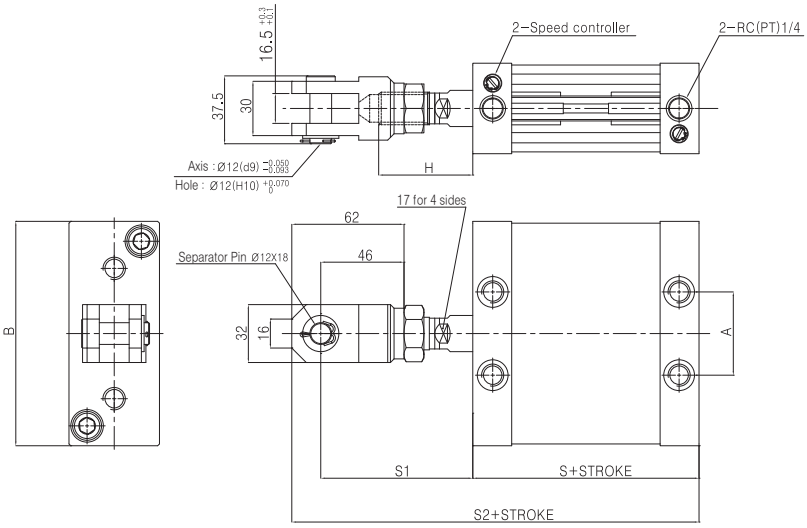




Model	S	S1	S2	A	B	C	E	H
NP50	74	106	218	39	104	81	97	53
NP63	75	107	222	50	124	84	100	56

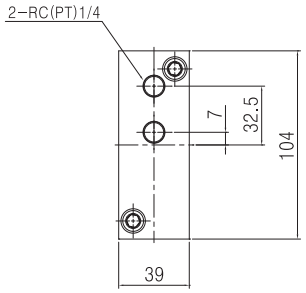
NP50 Dimensions (Standard Y-Knuckles)



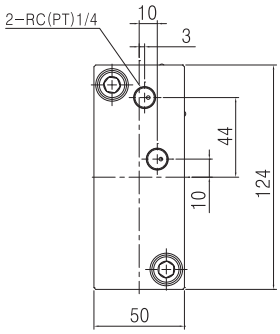


Model	S	S1	S2	A	B	H
NP50	74	81	171	42	104	53
NP63	75	84	175	46	124	56

Sectional Dimensions

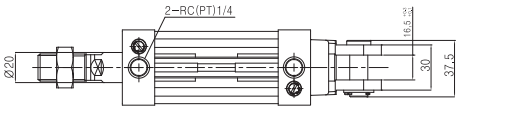


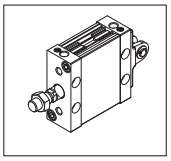
NP50

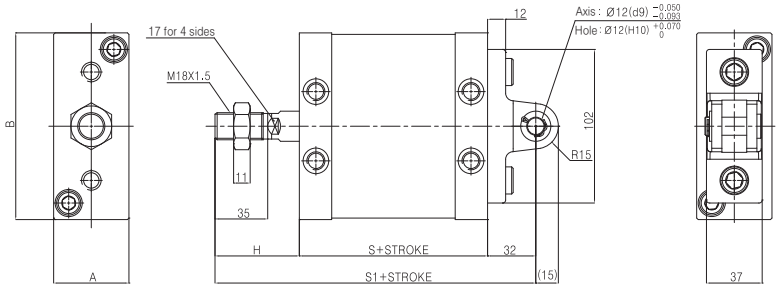


NP 63

NP50 Dimensions (Head Cover Detachable Clevis) (Metric Only)



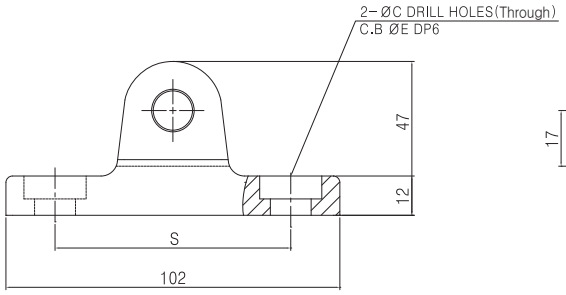


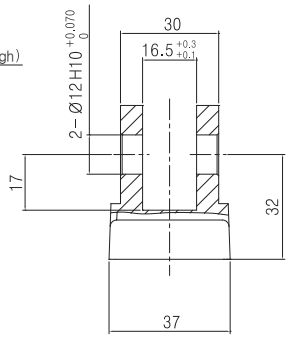


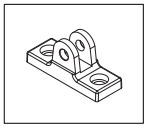
Model	S	S1	A	B	H
NP50	74	159	39	104	53
NP63	75	163	50	124	56

Size of Metal Parts

Detachable Clevis

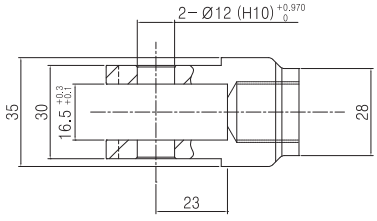


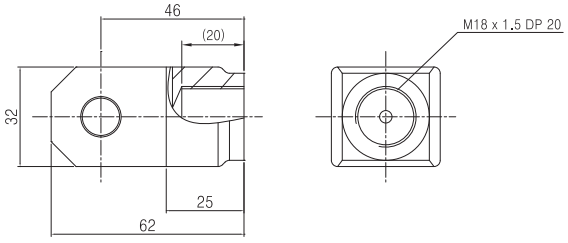




Model	S	C	E
NP50	64	11	17.5
NP63	72	12.5	19

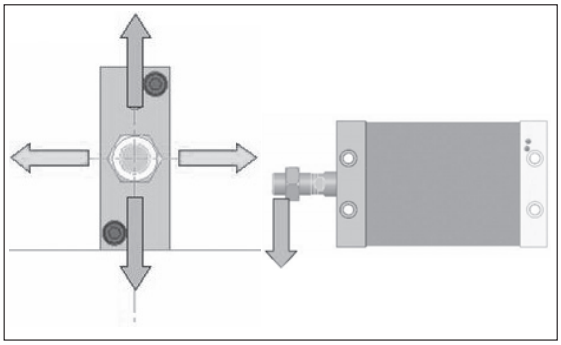
Sectional Dimesion Rod Series

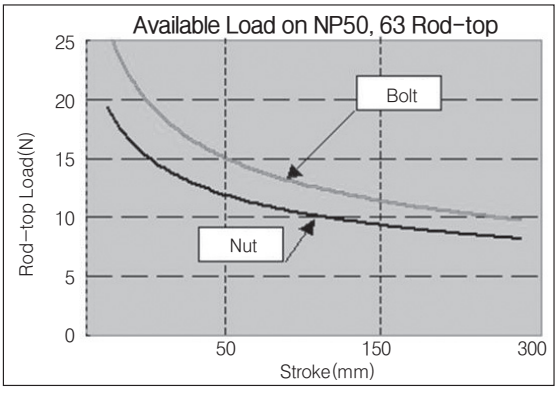




⚠ Safety Suggestions

1. As the piston rod does not rotate, push back the rod when jointing the operator on top of the piston rod and use the wrench hanger to connect the operator within the torque permitted.
   Torque permitted : 5.0 N.m
2. Load the piston rod on axial direction.
3. Please use caution as the speed cone attached in the inside of the cylinder's two covers (head cover, rod cover) is completely open and not included.
4. As shown in the illustration on the right, the plate cylinder has loads working to both X and Y directions. The loads are equivalent to the lateral load permitted. The lateral load permitted varies according to each stroke, so please refer to the table on the right for details.

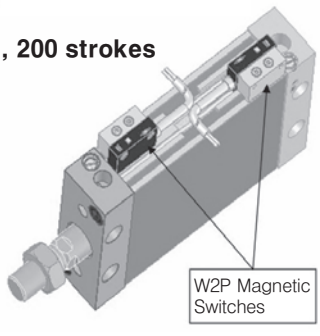




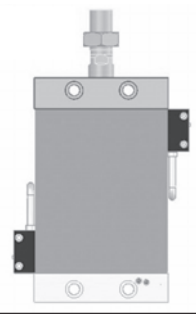
Application of Auto Switch

Two switches can be mounted on same side for stroke length of 75mm, 100mm, 125mm, 150mm, 200mm

75,100,125,150, 200 strokes



Use of switch on 50mm or less stroke mount switch on opposite side of cylinder

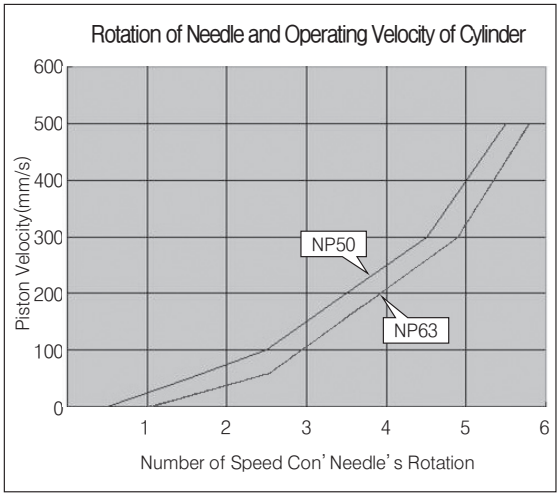


Available Rotationg Torque of Piston Rod (N.m)

Model	NP50	NP63
Available Rotating Torque of Rod	1.25	2.0

Non-rotation Tolerance of Rod

Model	NP50	NP63
Non-rotation Tolerance of Rod	±0.5°	±0.5°



Packing List (NP50)

Number	Model	Material	Part No.
1	PISTON PACKING	NBR	RHH-007710N713
2	ROD PACKING	NBR	PSA-20
3	BUMPER & GASKET	Urethane	NP050-34-7370

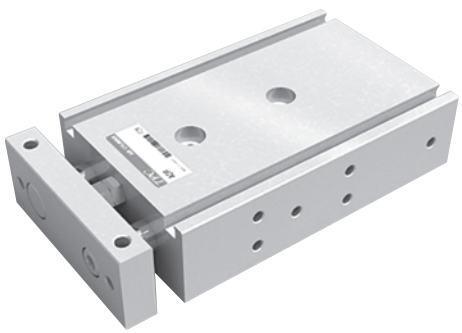
Packing List (NP63)

Number	Model	Material	Part No.
1	PISTON PACKING	NBR	NP063-45-7381
2	ROD PACKING	NBR	PSA-20
3	BUMPER & GASKET	Urethane	NP063-34-7381

Series ADR

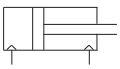
Double Rod Cylinder

Bore Size(mm) : Ø10, Ø16, Ø20, Ø25



- HIGH LATERAL LOAD CAPABILITY
- ADJUSTABLE STROKE IS AVAILABLE
- A THIN AND COMPACT DOUBLE ROD CYLINDER
- BALL BUSHING OPTION
- AUTO SWITCH READY
- NON-LUBE TYPE STANDARD

Symbol



How to Order

ADR M 10 — 30 — W1H S

1 2 3 4 5 6

1 Double Rod Cylinder
(Built-in magnet : standard)

2 Type of Bearing
M : Slide bearing type
L : Ball bushing bearing type

3 Bore Size
10 : 10mm
16 : 16mm
20 : 20mm
25 : 25mm

4 Stroke(mm)
ϕ10 : 10, 15, 20, 25, 30,40, 50
ϕ16 : 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100
ϕ20 : 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100
ϕ25 : 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 100

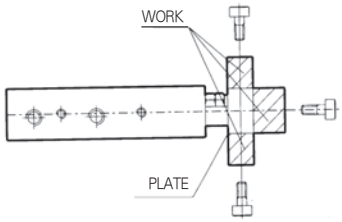
5 Auto Switch
Blank : None
W1H : Solid State Switch(DC24V)
W13 : Reed Switch(AC110V,DC24V)
※ Standard Auto Switch lead wire length is 1m, 3m leads available on all models by adding a "L" suffix to the part number.
Example W1H → W1HL

6 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

Specifications

Action	Double Acting Double Rod
Fluid	Air
Max. Operating Pressure	1.0Mpa{142psi}
Proof Pressure	0.7Mpa{99psi}
Min. Operating Pressure	0.1Mpa{14psi}
Amibient and Fluid Temperature	-10℃~+60℃(14~140°F)
Piston Speed	30~300 mm/s
Cushion	Rubber Cushion
Lube	None(Non-Lube)
Stroke Adjustment Range	0~-5mm
Bearing	Slide Bearing, Ball Bush Bearing (Same Dimensions)

Plate Can be Mounted From Three Faces



Standard Stroke

Model	Bearing	Bore Size	Standard Stroke
ADRM	Slide Bush Bearing	10	10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75
		16	10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100
		20	
		25	
ADRL	Ball Bush Bearing	10	10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75
		16	10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100
		20	
		25	

Theoretical Force

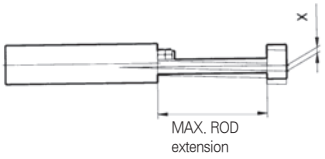
Unit:N

Model	Rod Dia (mm)	Operating Direction	Piston Area (mm²)	Operating Pressure (Mpa)						
				0.1	0.2	0.3	0.4	0.5	0.6	0.7
ADR M/L 10	6	OUT	157	15.7	31.4	47.1	62.8	78.5	94.2	110
		IN	100	10.0	20.0	30.0	40.0	50.0	60.0	70.0
ADR M/L 16	8	OUT	402	40.2	80.4	120.6	160.8	201	241.2	281.4
		IN	245	24.5	49.0	73.5	98.0	122.5	147	171.5
ADR M/L 20	10	OUT	628	62	125	188	251	314	376	439
		IN	471	47	94	141	188	235	282	329
ADR M/L 25	12	OUT	982	98.2	196	295	393	491	589	687
		IN	580	58.0	116	174	232	290	348	406

Operating Conditions

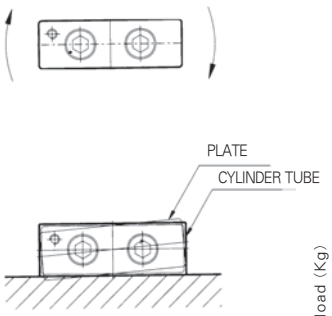
Inclination of plate end

The standard amount of inclination X of the plate end with no load applied is shown in the graph below.



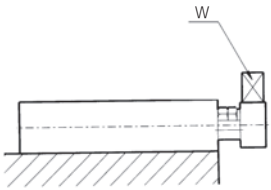
Non-rotating accuracy

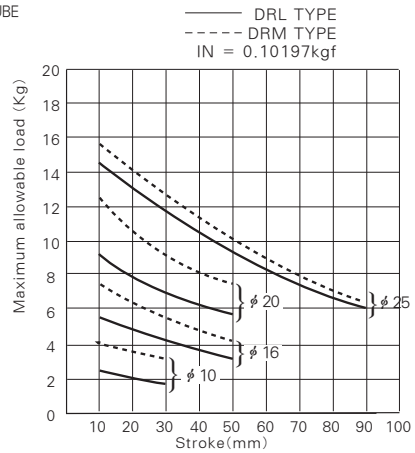
Standards of non-rotating accuracy θ° are values lower than those shown in the table below.



Maximum allowable load

The maximum allowable load will be lower than the values shown in the graph below when the cylinder is mounted as shown below.





Non-Rotating Accuracy

Cylinder Bore Size(mm)	ADRM (Slide bearing)	ADRL (Ball bush bearing)
φ 10	±0.15°	±0.15°
φ 16, φ 20	±0.15°	±0.15°
φ 25	±0.15°	±0.15°

Precautions

Mounting

① The Double rod cylinder can be mounted on three sides. However, the mating surface must be flat(Flatness : 0.05 (reference value) max.).
Otherwise desired piston rod operation and a malfunction may result.

② Mount the cylinder while the piston is retracted, Pay attention not to scratch or dent the slide part of the piston rod treatment Air leaks due to damaged packings may result in faulty operation.

③ Cylinder mounting face has hard alumite treatment but care should still be taken to avoid damaging it as this would result in loss of durability and faulty operation.

Piping

① The Double rod cylinder is provided with two supply ports in respective directions of operation. Change the plug position according changed, be sure to check that no air leaks from the plug. When a little amount of air still leaks, remove the plug and check the seat before reassembly.

② At the time of pipe-laying, thoroughly flush pipes and joints with air and then connect them.

③ Provide an air filter to supply sufficiently purified compressed air.

④ Cylinder tube can be used without oiling, but if you oil it, use turbine oil class-1(ISO VG32).
(Do not use machine oil or spindle oil.)

Adjustment of stroke

① The Double rod cylinder is provided with a bolt to adjust the stroke within the range of 0 to -5mm on the piston rod return side(IN).
Loosen the hexagon head bolt for adjustment.
After adjustment, completely tighten the hexagon head bolt and apply a stopper to it.

② Never use the cylinder without a damper bolt.

Ambient atmosphere

① Use the cylinder as little as possible in ambient atmospheres where the cylinder is exposed to water (hot water) or coolant.
When it is inevitable to use it in such atmospheres, protect the cylinder with a cover.

② Some atmospheres or fluids are harmful to the main body of the cylinder or packing.
Please contact us when special use is desired.

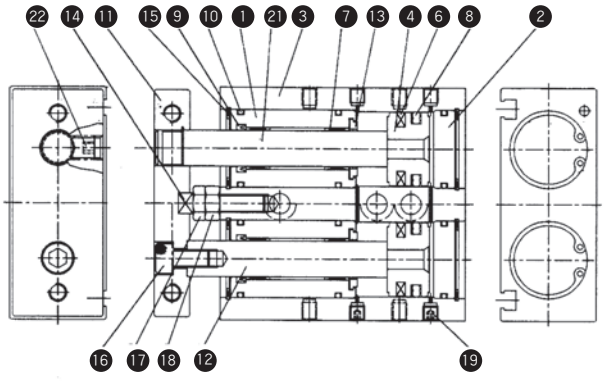
Disassembly and maintenance

① Remove the plate at the end for disassembling.
Disassembling is permitted only for replacement of packing or other necessary operations to prevent malfunction.

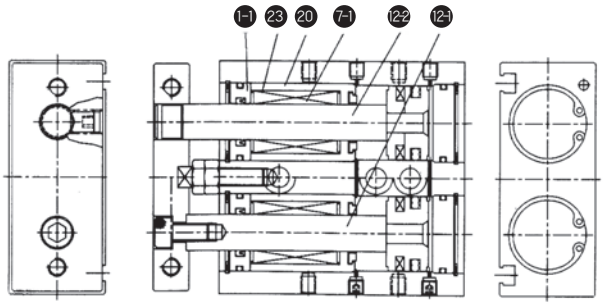
②. Please contact us for the method of dissembly or reassembly, or refer to the manual for disassembly.

Construction/Parts List, Packing List

ADRM(Slide Bearing)



ADRL(Ball Bush Bearing)



Slide Bush Type

No.	Description	Material	Note
❶	Rod Cover	Aluminum Alloy	Allumite
❷	Head Cover	〃	〃
❸	Cylinder Tube	〃	〃
❹	Piston	〃	Chromate
❻	Magnet	Ba-Ferrite+NBR	
❼	Slide Bush	Aluminum Alloy	White Allumite
❽	Piston Packing	NBR	
❾	Rod Packing	NBR	
❿	Tube Gasket	NBR	
⓫	Plate	Aluminum Alloy	White Allumite

No.	Description	Material	Note
⓬	Piston Rod	Stainless Steel	Hard Chrome Plated
⓭	Bumper-A	Urethane	
⓮	Bumper-B	Urethane	DRM010-34B1760
⓯	Snap Ring	Carbon Tool Steel	Nickel Plated
⓰	Plate Bolt	Chrome Steel	〃
⓱	Stroke Control Bolt	Carbon Steel	〃
⓲	Stroke Control Nut	〃	
⓳	Plug	〃	
㉑	Piston Rod-A	Bearing Steel	
㉒	Detent Screw	〃	

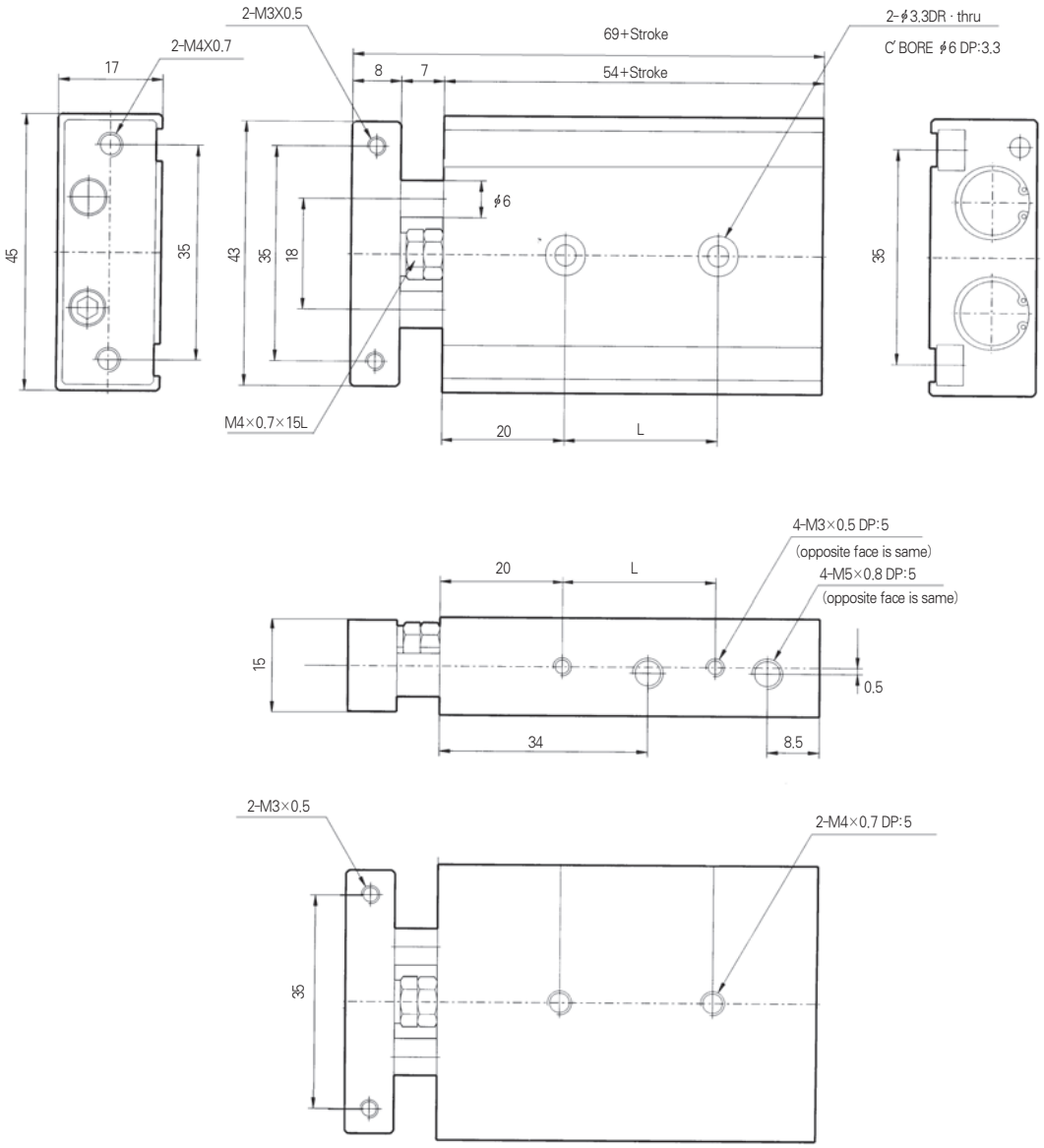
Ball Bush Type

No.	Description	Material
❶-1	Rod Cover	Aluminum
❼-1	Ball Bearing	–
⓬-1	Piston Rod	SUJ2

No.	Description	Material
⓬-2	Piston Rod-A	SUJ2
⓴	Bearing Stopper	Aluminum
㉓	Gasket	NBR

Dimensions

ADR ϕ10

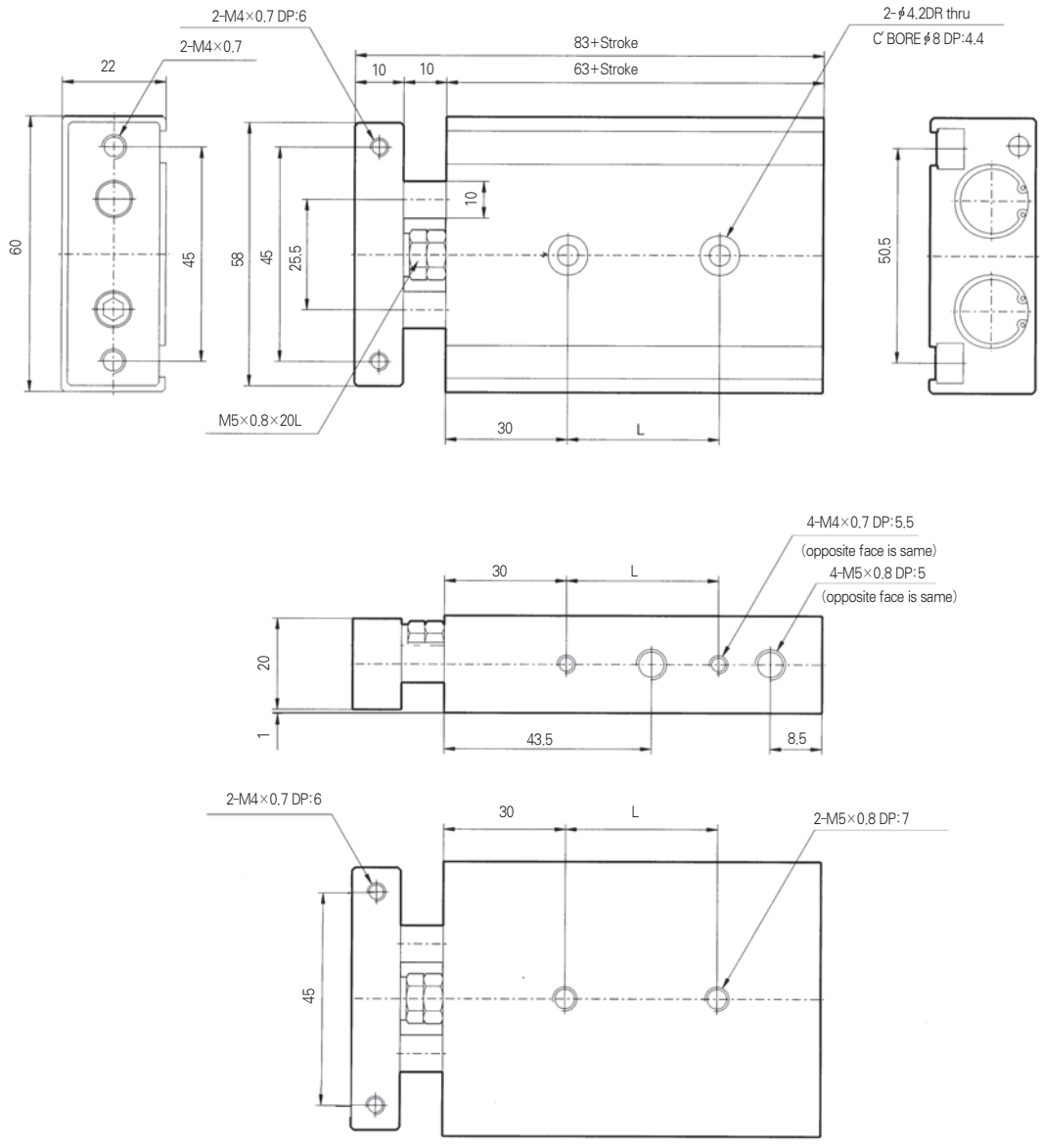


(mm)

Stroke (mm)	10	15	20	25	30	35	40	45	50	55	60	65	70	75
L	25	30	30	30	40	40	40	40	40	60	60	60	60	60

Dimensions

ADR ϕ16

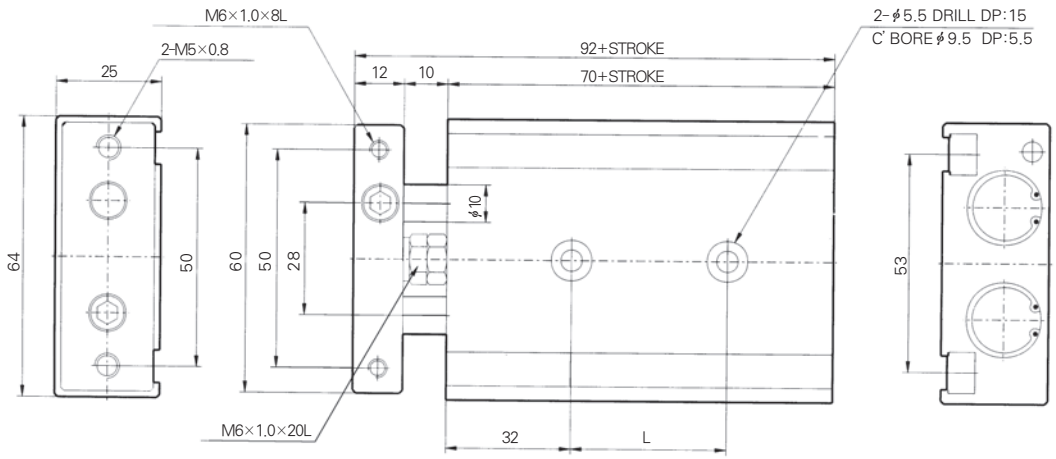


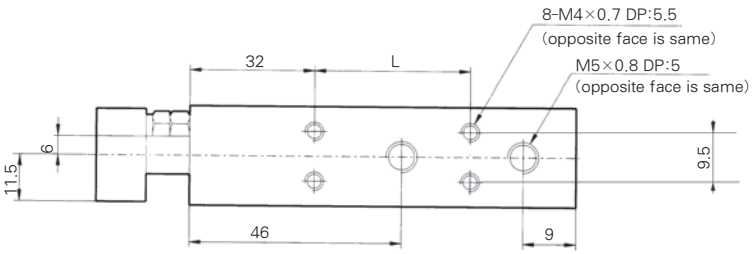
(mm)

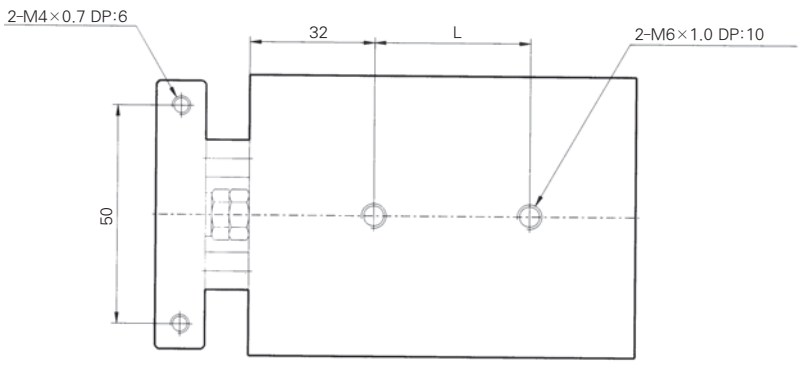
Stroke (mm)	10	15	20	25	30	35	40	45	50	60	70	80	90	100
L	25	25	25	25	40	40	40	40	40	60	60	80	80	80

Dimensions

ADR ϕ20





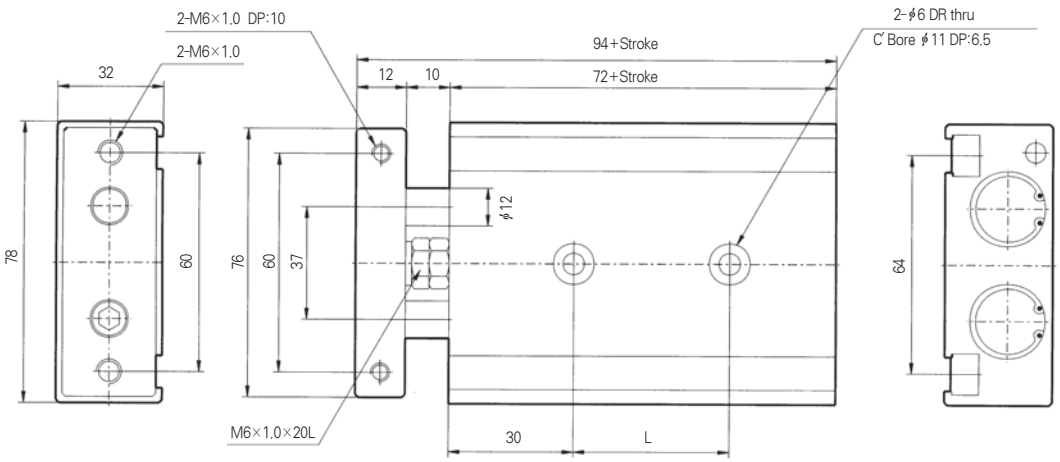


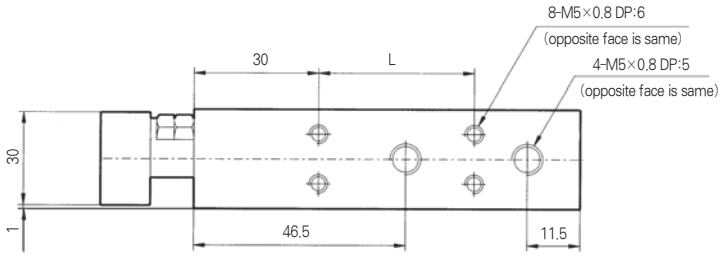
(mm)

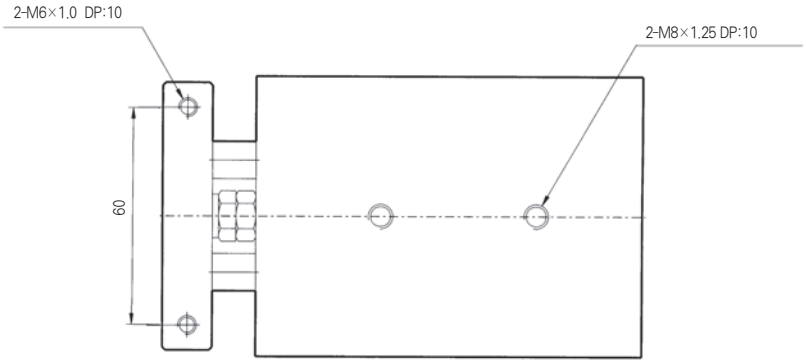
Stroke	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
L	30	30	30	30	40	40	40	40	40	60	60	60	60	60	80	80	80	80	80

Dimensions

ADR ϕ25

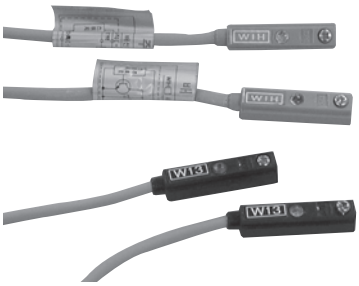






(mm)

Stroke (mm)	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	90	100
L	30	30	30	30	40	40	40	40	40	60	60	60	60	60	80	80	80



How to Order

W1 ✻ ✻ ✻

1 2 3 4

1 TPC Auto Switch Model

2 3 : Reed 2 wire AUTO S/W
H : Solid State 3 wire AUTO S/W

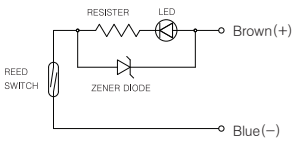
3 N : 3 wire(NPN)
P : 3 wire(PNP)

4 Blank : LEAD WIRE(0.5m)
M : LEAD WIRE(1m)
L : LEAD WIRE(3m)

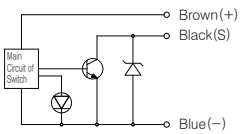
Specifications

Part No.	W13		W1HN(P)
Contact wiring	Reed Switch 2 wire		Solid State 3 wire
Application	Relay, Sequence Control		
Voltage	DC24V	AC100V	DC24V
Current	5~40mA	5~20mA	≦40mA
Contact Protection Circuit	None		Built-in
Internal Voltage Drop	Under 2.4V		≦1.5V
Indicator Lamp	ON : When Red LED		
Output	–		NPN(PNP)
Current Consumption	–		≦5mA
Current Leakage	None		≦100㎂
Operation Time	≦1ms		≦2ms
Lead Wire	Oil Resistant Vinyl Code		
Shock Resistance	30G 100G		
Insulation Resistance	100MΩ or more (500DVC Mega) between lead wire and case		
Voltage Resistance	For 1 min.(in AC1500V/between a lead wire case)		
Temperature	−10 ~ 60℃		
Protection Structure	IEC Standard IP67, Water Proof, and(JISC0920),Oil Structure		

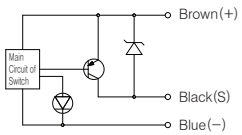
Internal Circuit



2 wire reed circuit

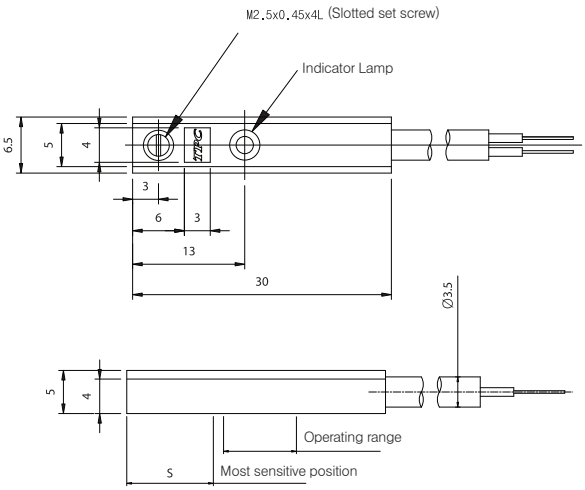


3 wire NPN solid state circuit



3 wire NPN solid state circuit

Protection Structure



■ Caution

Plase read and understand the instructions before use. Refer to the auto switch precautions before using auto switches.

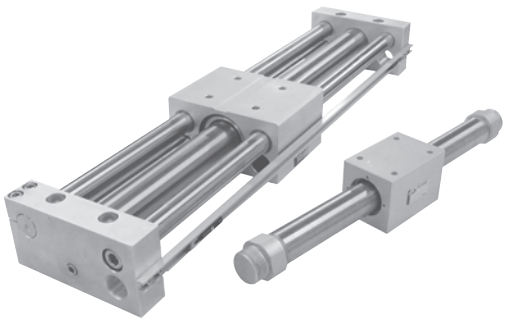
Operating Range

Section	W13	W1HN(P)
Most sensitive position(S)	10mm	1 ~ 2mm
Operation range(L)	6 ~ 12mm	4 ~ 10mm

Series AMR

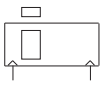
Magnet Type Rodless Cylinder

Bore Size(mm) : Ø10(0.39), Ø16(0.63), Ø20(0.79), Ø25(0.98), Ø32(1.26), Ø40(1.58)

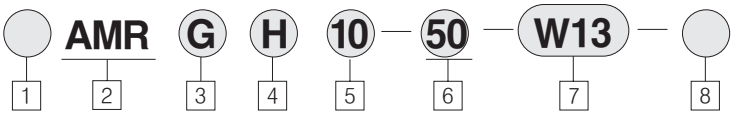


- PRECISION STAINLESS BODY FOR SMOOTH ACTUATION
- LIGHT WEIGHT
- COMPACT DESIGN
- LEAK FREE
- NON - LUBRICATION STANDARD
- POSITION SENSING CAPABLE

Symbol



How to Order



1 Series
Blank : Rc(PT)
U : NPT

2 Magnet Type Rodless Cylinder

3 Type of Bearing
B : Basic Type
G : With Guide Type(Auto Switch Capable Cylinder)

4 Magnet Holding Power(kgf)

Dia	H	L
ϕ10	5.5	–
ϕ16	12	–
ϕ20	24	15.7
ϕ25	37	22.5
ϕ32	60	36.5
ϕ40	94	58

5 Bore Size(mm) / (inch)
10 : ϕ10 (0.39)
16 : ϕ16 (0.63)
20 : ϕ20 (0.79)
25 : ϕ25 (0.98)
32 : ϕ32 (1.26)
40 : ϕ40 (1.58)

6 Stroke(mm) / (inch)

AMRB		AMRG	
ϕ10	50~300mm (0.5~12)	ϕ10	50~500mm (0.5~20)
ϕ16	50~300mm (0.5~12)	ϕ16	50~700mm (0.5~30)
ϕ20	100~1,500mm (0.5~60)	ϕ20	100~1,000mm (0.5~40)
ϕ25	100~1,500mm (0.9~60)	ϕ25	100~1,500mm (0.5~60)
ϕ32	100~2,000mm (0.5~78)	ϕ32	100~1,500mm (0.5~60)
ϕ40	100~2,000mm (0.5~78)	ϕ40	100~1,500mm (0.5~60)

7 Auto Switch
(AMRG only)
Blank : None
W13 : Reed Switch Type
(DC24V, AC110V)
W1H : Solid State Type(DC 24V)

Standard Auto Switch
• The length of lead wire for standard is 0.5m.
• The length of lead wire for 3m is added on "L"
ex) W13 : W13L, W1H : W1LH

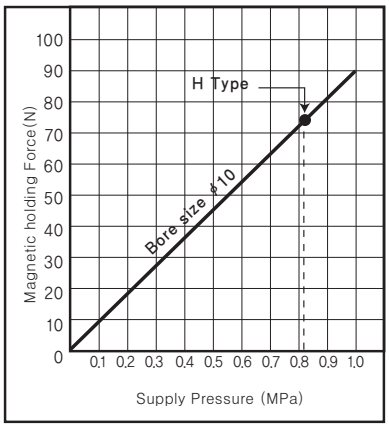
8 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

Specifications

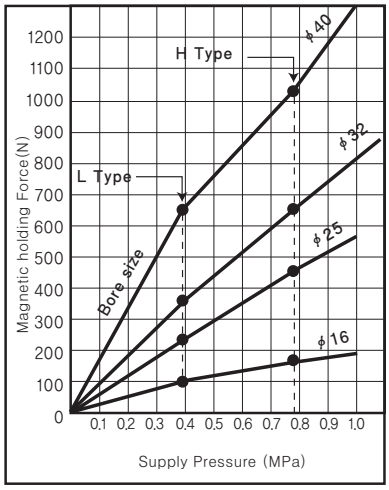
Fluid	Air	
Proof pressure	1.03MPa(149psi)	
Max. operating pressure	0.7MPa(9psi)	
Min. operating pressure	0.2MPa(28psi)	
Ambient and fluid temperature	5~60℃(41~140°F)	
Operating piston speed	50 ~ 400 mm/s	
Cushion	Rubber Cushion at Both Sides	
Lubrication	Non-lube	
Cushion	AMRB10, AMRB16	Rubber cushion
	AMRB20, AMRB25	Air cushion
	AMRB32, AMRB40	
	AMRG10, AMRG16, AMRG20	Rubber cushion
	AMRG25, AMRG32, AMRG40	

Cylinder Theoretical Output

ϕ10



ϕ16, ϕ20, ϕ25, ϕ32, ϕ40



Weight Table

kgf(lbs)

Number of magnets \ Bore size		ϕ10	ϕ16	ϕ20	ϕ25	ϕ32	ϕ40
Basic weight	AMROH	0.08(0.17)	0.30(0.62)	0.37	0.71(1.56)	1.34(2.95)	2.15(4.74)
	AMROL	-	-	0.26	0.62(2.62)	1.19(4.34)	1.97(6.83)
Additional weight per 50 stroke		0.014(0.03)	0.02(0.04)	0.04	0.05(0.11)	0.07(0.15)	0.08(0.17)

Calculation method/Example: AMRB32-0400

Basic weight ····· 1.34kg
Additional weight ··· 0.07/50s
Cylinder stroke ···· 500st

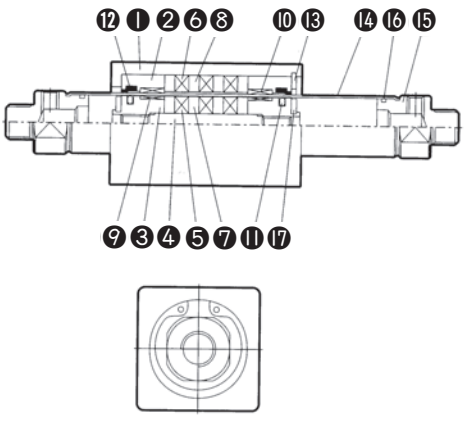
1.34+0.07×20÷2=2.04kg

Main Parts

Description	Material	Note
Head cover	Aluminium alloy	Colored hard alumite
Cylinder tube	Stainless steel	
Body	Aluminium alloy	Colored hard alumite
Magnet	Rare earth magnet	

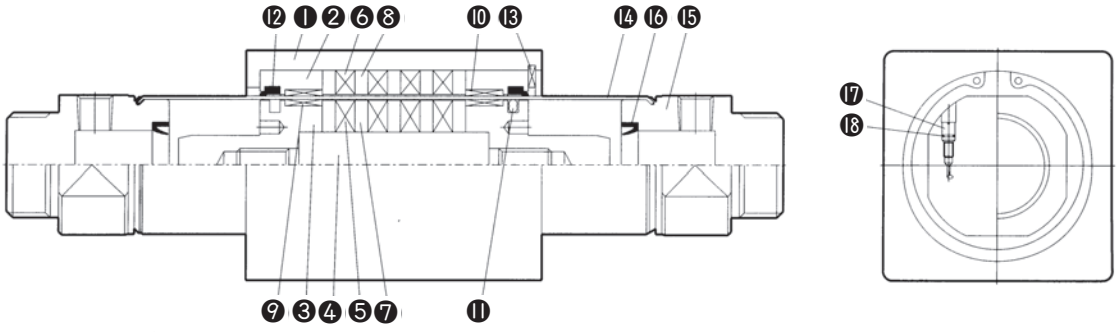
Basic Type:Construction/Parts List

AMRBH ϕ10, ϕ16



No.	Description	Material	Note
❶	Slider	Aluminum alloy	White Alumite
❷	Holder	Aluminum alloy	〃
❸	Piston	Aluminum alloy	Zinc Chromate
❹	Shaft	Stainless steel	
❺	Inner Magnet	-	Nickel Plated
❻	Outer Magnet	-	〃
❼	Inner Yoke	Carbon steel	
❽	Outer Yoke	Carbon steel	
❾	Inner Wear Ring	Resin	
❿	Outer Wear Ring	Resin	
⓫	Piston Packing	NBR	
⓬	Wiper Ring	NBR	
⓭	Snap Ring	Spring	
⓮	CylinderTube	Stainless steel	
⓯	End Cover	Aluminum alloy	
⓰	Tube Gasket	NBR	
⓱	Bumper	Urethane	

AMRBH ϕ20, ϕ25, ϕ32, ϕ40

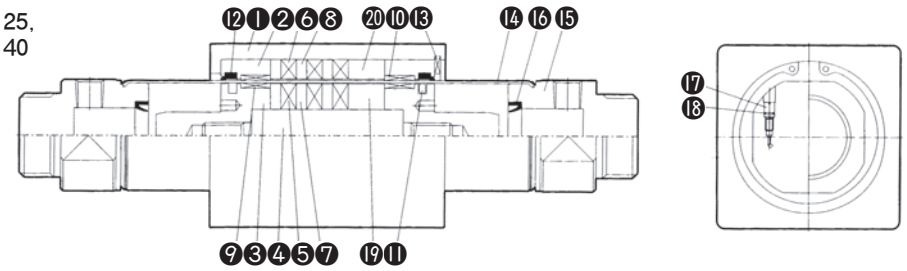


No.	Description	Material	Note
❶	Slider	Aluminum alloy	White Alumite
❷	Holder	Aluminum alloy	"
❸	Piston	Aluminum alloy	Zinc chromate
❹	Shaft	Stainless steel	
❺	Inner Magnet	-	Nicke Plated
❻	Outer Magnet	-	"
❼	Inner Yoke	Carbon steel	Zinc chromate
❽	Outer Yoke	Carbon steel	"
❾	Inner Wear Ring	Resin	
❿	Outer Wear Ring	Resin	
⓫	Piston Packing	NBR	
⓬	Wiper Ring	NBR	

No.	Description	Material	Note
⓭	Snap Ring	Spring steel	
⓮	CylinderTube	Stainless steel	
⓯	End Cover	Aluminum alloy	Hard Alumite
⓰	Cushion Packing	NBR	
⓱	Cushion Valve	Carbon steel	
⓲	Cushion Valve O-Ring	NBR	

Basic Type : Construction/Parts List

AMRBL ϕ20, ϕ25,
ϕ32, ϕ40

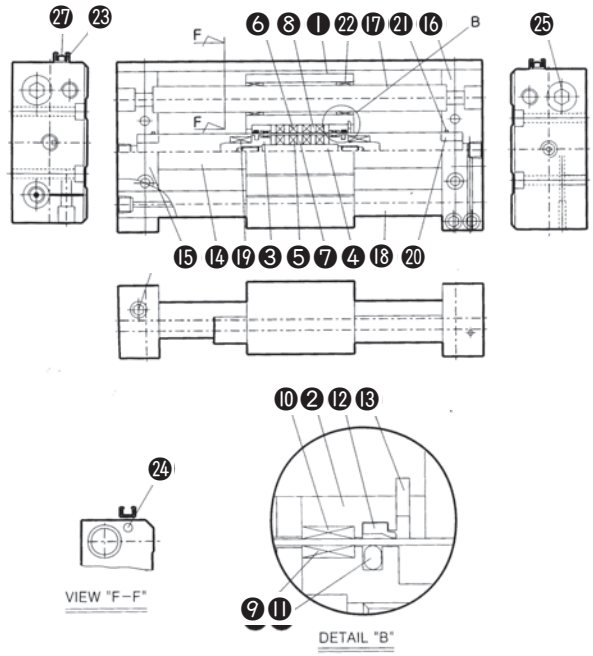


No.	Description	Material	Note
❶	Slider	Aluminum alloy	Hard Alumite
❷	Holder	Aluminum alloy	White Alwnite
❸	Piston	Aluminum alloy	Zink Chromate
❹	Shaft	Stainless steel	
❺	Inner Magnet	-	Nickel Plated
❻	Outer Magnet	-	"
❼	Inner Yoke	Carbon steel	Zinc Chromate
❽	Outer Yoke	Carbon steel	"
❾	Inner Wear Ring	Resin	
❿	Outer Wear Ring	Resin	
⓫	Piston Packing	NBR	
⓬	Wiper Ring	NBR	

No.	Description	Material	Note
⓭	Snap Ring	Spring steel	
⓮	CylinderTube	Stainless steel	
⓯	End Cover	Aluminum alloy	Hard Alumite
⓰	Cushion Packing	NBR	
⓱	Cushion Valve	Carbon steel	
⓲	Cushion Valve O-Ring	NBR	
⓳	Inner Spacer	Aluminum alloy	
⓴	Outer Spacer	Aluminum alloy	

Guide Type:Construction/Part List

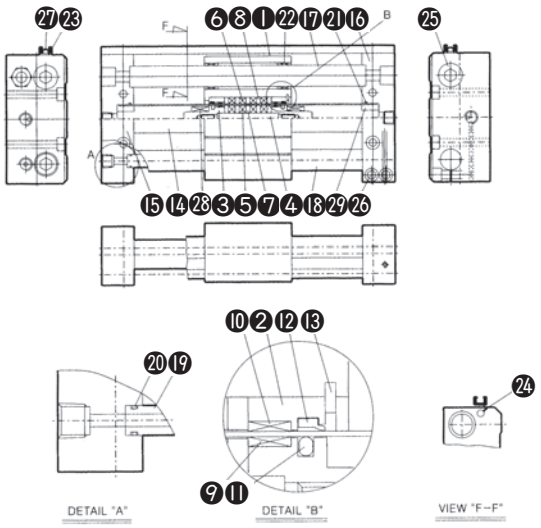
AMRGH ϕ10, ϕ16



No.	Description	Material	Note
❶	Slider	Aluminum alloy	Hard Alumite
❷	Holder	Aluminum alloy	White Alumite
❸	Piston	Aluminum alloy	Zinc Chromate
❹	Shaft	Stainless steel	
❺	Inner Magnet	-	Nickel Plated
❻	Outer Magnet	-	"
❼	Inner Yoke	Carbon Steel	Zomc Chromate
❽	Outer Yoke	Carbon Steel	"
❾	Inner Wear Ring	Resin	
❿	Outer Wear Ring	Resin	
⓫	Piston Packing	NBR	
⓬	Wiper Ring	NBR	
⓭	Snap Ring	Spring Steel	
⓮	CylinderTube	Stainless steel	
⓯	End Cover A	Aluminum alloy	Hard Alumite
⓰	End Cover B	Aluminum alloy	"
⓱	Guide Rod A	Carbon Steel	Hard Chrome Plated
⓲	Guide Rod B	Carbon Steel	"
⓳	Bumper	Urethane	
⓴	Cushion Stopper	Aluminum alloy	Zinc Chromate
㉑	Cyl' Tube Gasket	NBR	
㉒	Guide Bush	PBC3	
㉓	S/W Holder	Aluminum alloy	White Alumite
㉔	S/W Magnet	-	Nickel Plated
㉕	Guide Rod Bolt A	Carbon Steel	"
㉖	Guide Rod Bolt B	Carbon Steel	"
㉗	S/W Holder Bolt	Carbon Steel	"

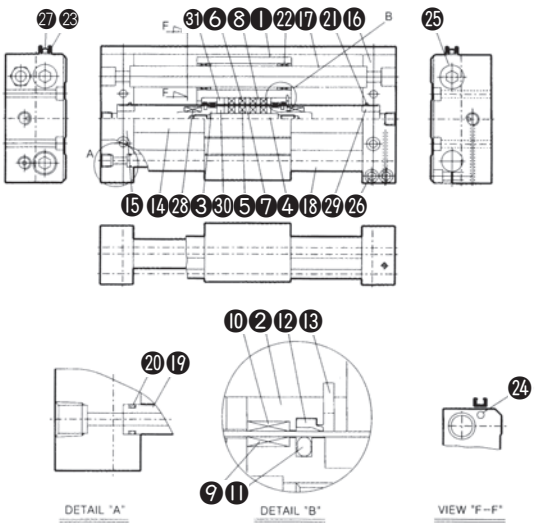
Construction/Guide Type

AMRGH ϕ20, ϕ25, ϕ32, ϕ40



No.	Description	Material	Note
❶	Slider	Aluminum alloy	Hard Alumite
❷	Holder	Aluminum alloy	"
❸	Piston	Aluminum alloy	Zinc Chromate
❹	Shaft	Stainless steel	
❺	Inner Magnet	-	Nickel Plated
❻	Outer Magnet	-	"
❼	Inner Yoke	Carbon Steel	Zinc Chromate
❽	Outer Yoke	Carbon Steel	"
❾	Inner Wear Ring	Resin	
❿	Outer Wear Ring	Resin	
⓫	Piston Packing	NBR	
⓬	Wiper Ring	NBR	
⓭	Snap Ring	Spring steel	
⓮	CylinderTube	Stainless steel	
⓯	End Cover A	Aluminum alloy	White Alumite
⓰	End Cover B	Aluminum alloy	"
⓱	Guide Rod A	Carbon Steel	Hard Chrome Plated
⓲	Guide Rod B	Carbon Steel	"
⓳	Air Pipe	Carbon Steel	
⓴	Air Pipe O-Ring	NBR	
㉑	Cyl' Tube O-Ring	NBR	
㉒	Guide Bush	PBC3	
㉓	S/W Holder	Aluminum alloy	White Alumite
㉔	S/W Magnet	-	Nickel Plated
㉕	Guide Rod Bolt A	Carbon Steel	"
㉖	Guide Rod Bolt B	Carbon Steel	"
㉗	S/W Holder Bolt	Carbon Steel	"
㉘	Bumper	Urethane	
㉙	Cushion Stopper	Aluminum alloy	Zinc Chromate

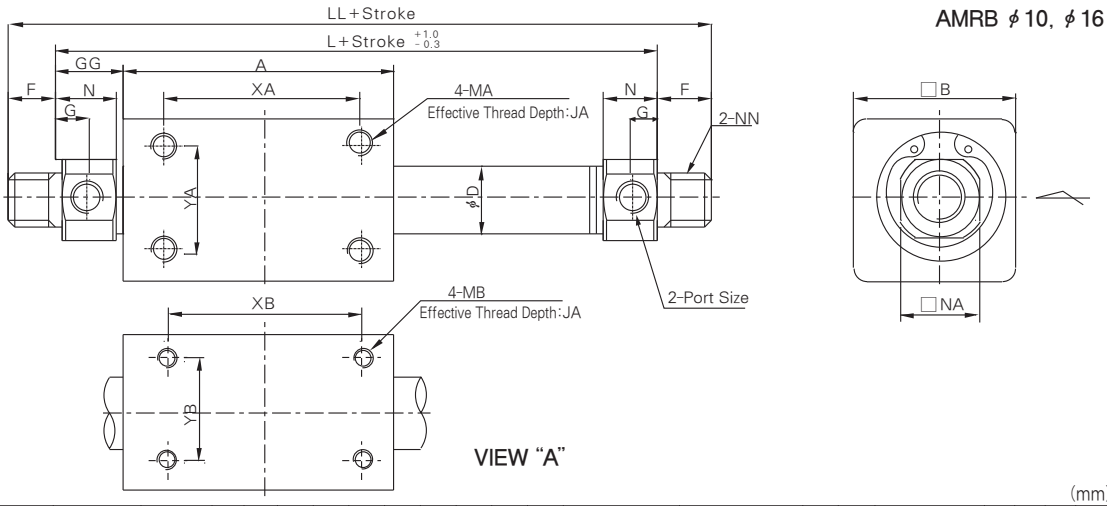
AMRGL ϕ20, ϕ25, ϕ32, ϕ40



No.	Description	Material	Note
❶	Slider	Aluminum alloy	Hand Alumite
❷	Holder	Aluminum alloy	"
❸	Piston	Aluminum alloy	Zinc Chromate
❹	Shaft	Stainless steel	
❺	Inner Magnet	-	Nickel Plated
❻	Outer Magnet	-	"
❼	Inner Yoke	Carbon Steel	Zinc chromate
❽	Outer Yoke	Carbon Steel	"
❾	Inner Wear Ring	Resin	
❿	Outer Wear Ring	Resin	
⓫	Piston Packing	NBR	
⓬	Wiper Ring	NBR	
⓭	Snap Ring	Spring Steel	
⓮	CylinderTube	Stainless steel	
⓯	End Cover A	Aluminum alloy	White Alumite
⓰	End Cover B	Aluminum alloy	"
⓱	Guide Rod A	Carbon Steel	Hard Chrome Plated
⓲	Guide Rod B	Carbon Steel	"
⓳	Air Pipe	Carbon Steel	
⓴	Air Pipe O-Ring	NBR	
㉑	Cyl' Tube Gasket	NBR	
㉒	Guide Bush	PBC3	
㉓	S/W Holder	Aluminum alloy	White Alumite
㉔	S/W Magnet	-	Nickel Plated
㉕	Guide Rod Bolt A	Carbon Steel	"
㉖	Guide Rod Bolt B	Carbon Steel	"
㉗	S/W Holder Bolt	Carbon Steel	"
㉘	Bumper	Urethane	
㉙	Cushion Stopper	Aluminum alloy	zinc Chromate
㉚	Inner Spacer	Aluminum alloy	White Alumite
㉛	Outer Spacer	Aluminum alloy	"

Dimensions / Basic Type

AMRB ϕ10, ϕ16



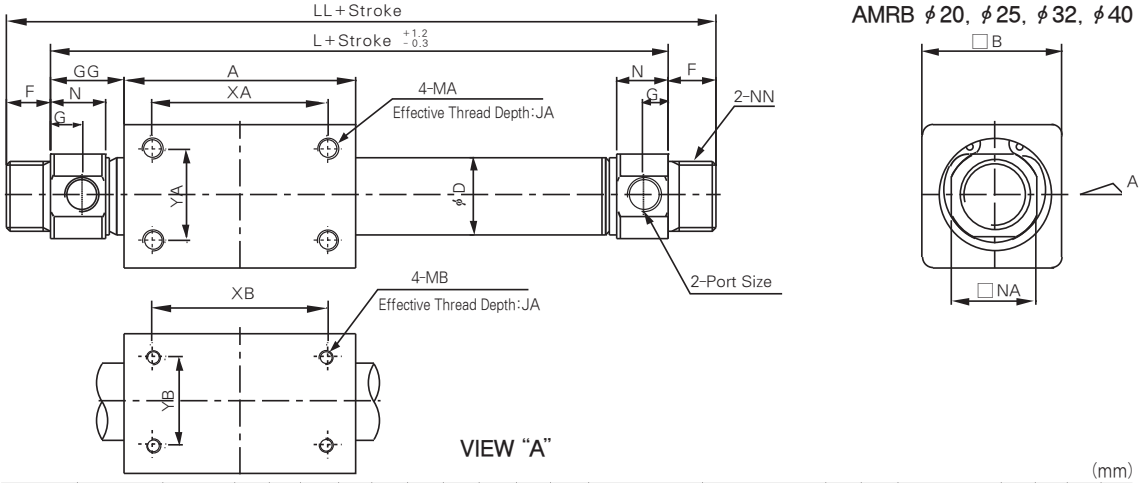
(mm)

Model	Stroke Range	Port Size	A	B	ϕD	F	G	GG	JA	JB	L	LL	MA	MB	N	NA	NN	XA	YA	XB	YB
AMRB*10	~300	M5×0.8	42	25	11	8	4.5	10.5	4.5	4.5	63	79	M4×0.7	M3×0.5	9	12	M8×1.0	30	16	30	16
AMRB*16	~300	M5×0.8	55	35	17.4	8	4.5	14	5.5	5.5	83	99	M5×0.8	M4×0.7	9	18	M10×1.0	35	20	35	19

(inch)

Model	Stroke range	Port size	A	B	ϕD	F	G	GG	JA	JB	L	LL	MA	MB	N	NA	NN	XA	YA	XB	YB
UAMRBH10	12inch	No.10-32UNF	1.65	0.98	0.43	0.31	0.18	0.41	0.18	0.18	2.48	3.11	8-32UNC	5-40UNC	0.35	0.47	5/16-24UNF	1.18	0.63	1.18	0.63
UAMRBH16	12inch	No.10-32UNF	2.17	1.38	0.69	0.31	0.18	0.55	0.22	0.22	3.27	3.90	10-32UNF	8-32UNC	0.35	0.71	3/8-24UNF	1.38	0.79	1.38	0.75

AMRB ϕ20, ϕ25, ϕ32, ϕ40



(mm)

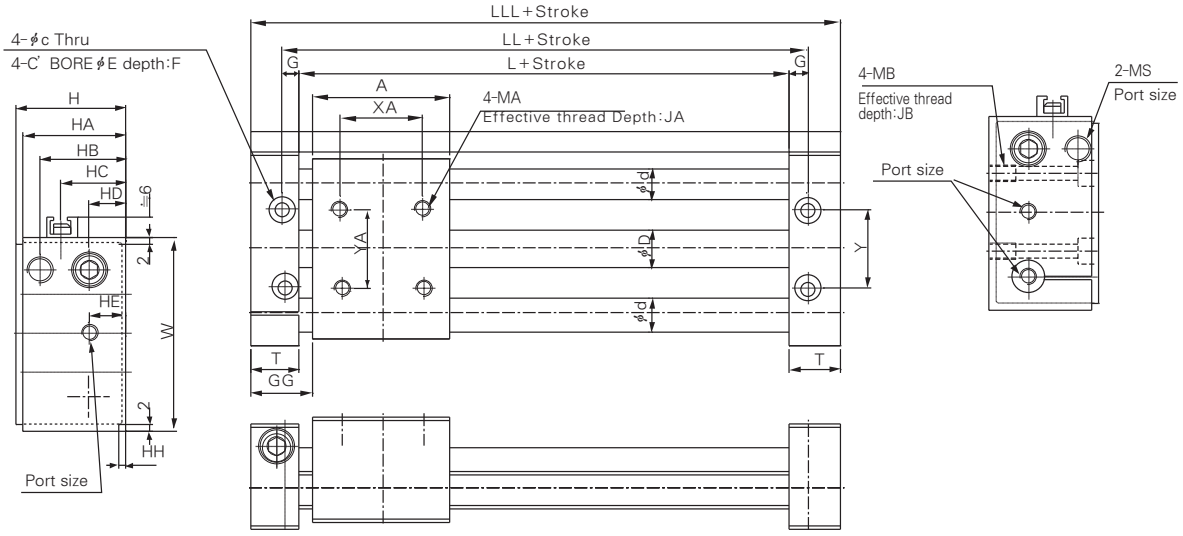
Model	Stroke Range	Port Size	A	B	ϕD	F	G	GG	JA	JB	L	LL	MA	MB	N	NA	NN	XA	YA	XB	YB
AMRB*20	~1,500	Rc 1/8	66	40	21.6	13	8	20	9	9	106	132	M6×1.0	M4×0.7	14.8	24	M20×1.5	50	26	50	25
AMRB*25	~1,500	Rc 1/8	75	50	26.6	13	8	18	9	9	111	137	M6×1.0	M5×0.8	14.8	30	M26×1.5	50	35	50	30
AMRB*32	~1,500	Rc 1/8	88	60	33.8	13	8	18	12	12	124	150	M8×1.25	M6×1.0	14.8	34.5	M26×1.5	60	40	50	40
AMRB*40	~1,500	Rc 1/4	91	70	42	16	11	29.5	11	11	150	182	M8×1.25	M6×1.0	21.3	42.5	M32×2.0	60	45	60	40

(inch)

Model	Stroke range	Port size	A	B	ϕD	F	G	GG	JA	JB	L	LL	MA	MB	N	NA	NN	XA	YA	XB	YB
UAMRB□20	0.5~60inch	NPT 1/8	2.60	1.57	0.85	0.51	0.31	0.64	0.35	0.35	4.17	5.20	1/4-28UNF	8-32UNC	0.58	0.94	3/4-16UNF	1.97	1.02	1.97	0.98
UAMRB□25	0.5~60inch	NPT 1/8	2.95	1.97	1.05	0.51	0.31	0.60	0.35	0.35	4.37	5.40	1/4-28UNF	10-32UNF	0.58	1.18	1-12UNF	1.97	1.38	1.97	1.18
UAMRB□32	0.5~60inch	NPT 1/8	3.46	2.36	1.33	0.51	0.31	0.61	0.47	0.47	4.88	5.90	5/16-24UNF	1/4-28UNF	0.58	1.36	1-12UNF	2.36	1.57	1.97	1.57
UAMRB□40	0.5~60inch	NPT 1/4	3.58	2.76	1.65	0.63	0.43	1.06	0.43	0.43	5.90	7.17	5/16-24UNF	1/4-28UNF	0.84	1.67	1 1/4-12UNF	2.36	1.77	2.36	1.57

Guide/ Slider Bearing Type

AMRG ϕ10, ϕ16



(mm)

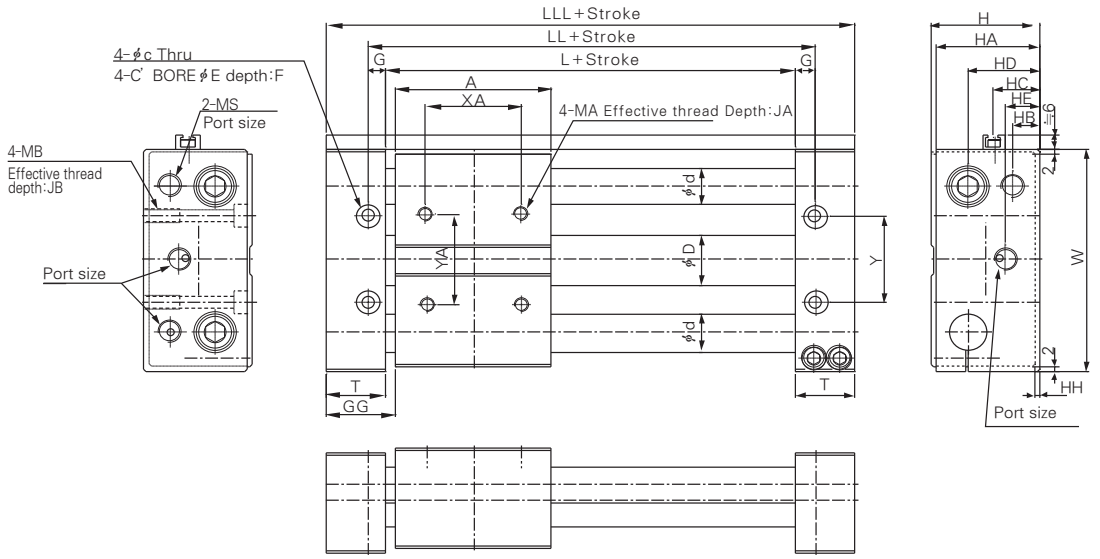
Model	Stroke Range	Port Size	A	ϕC	ϕD	ϕd	ϕE	F	GG	G	H	HA	HB	HC	HD	HE	HH	JA	JB	L	LL	LLL	MA	MB	MS	T	W	XA	Y	YA
AMRG*10	~500	M5×0.8	42	4.3	11	10	8	5	19	5	34	32	27	20	12	12	2	10	8	50	60	80	M5×0.8	M5×0.8	M8×1.0	15	60	25	24	25
AMRG*16	~700	M5×0.8	55	5.2	17.4	10	10	7	23	7	40	38	30	24	15	15	2	12	10	61	75	101	M5×0.8	M8×1.0	M8×1.0	20	75	30	30	30

(inch)

Model	Stroke range	Port size	A	ϕC	ϕD	ϕd	ϕE	F	GG	G	H	HA	HB	HC	HD	JA	JB	L	LL	LLL	MA	MB	MS	T	W	XA	Y	YA
UAMRGH10	0.5~20inch	10-32UNF	1.65	0.17	0.43	0.39	0.31	0.20	0.74	0.20	1.34	1.26	1.06	0.79	0.47	0.39	0.31	1.97	2.36	3.15	10-32UNF	10-32UNF	5/16-24UNF	0.59	2.36	0.98	0.94	0.98
UAMRGH16	0.5~20inch	10-32UNF	2.17	0.20	0.69	0.39	0.39	0.28	0.90	0.28	1.57	1.50	1.18	0.94	0.51	0.47	0.39	2.40	2.95	3.98	1/4-28UNF	1/4-28UNF	5/16-24UNF	0.79	2.95	1.18	1.18	1.18

Guide/ Slider Bearing Type

AMRG ϕ20, ϕ25, ϕ32, ϕ40

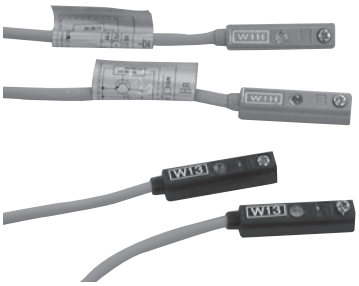


(mm)

Model	Stroke Range	Port Size	A	ϕC	ϕD	ϕd	ϕE	F	GG	G	H	HA	HB	HC	HD	HE	HH	JA	JB	L	LL	LLL	MA	MB	MS	T	W	XA	Y	YA
AMRG*20	~1,000	Rc 1/8	66	5.2	21.6	16	10	6	29	8	46	44	11	19	30	14.5	2	8	15	74	90	124	M6×1.0	M6×1.0	M10×1.0	25	98	40	38	40
AMRG*25	~1,500	Rc 1/8	74	6.8	26.6	16	11	7	25	8	54	52	15	23	34	18.5	2	8	16	74	90	124	M6×1.0	M8×1.25	M14×1.5	25	102	40	42	40
AMRG*32	~1,500	Rc 1/8	88	8.6	33.8	20	14	8.6	29	10	64	62	19.5	29.5	42.5	19	4	12	16	90	110	146	M8×1.25	M10×1.5	M20×1.5	28	122	50	50	50
AMRG*40	~1,500	Rc 1/4	91	8.6	42	25	14	8.6	34.5	10	74	72	20	34.5	47.5	20	4	12	14	100	120	160	M8×1.25	M10×1.5	M20×1.5	30	145	64	64	64

(inch)

Model	Stroke range	Port size	A	ϕC	ϕD	ϕd	ϕE	GG	F	G	H	HA	HB	HC	HD	JA	JB	L	LL	LLL	MA	MB	MS	T	W	XA	Y	YA
UAMRG□20	0.5~40inch	NPT 1/8	2.60	0.20	0.85	0.63	0.39	1.14	0.24	0.31	1.81	1.73	0.43	0.75	0.57	0.31	0.59	2.91	3.54	4.88	1/4-28UNF	1/4-28UNF	3/8-24UNF	0.98	3.86	1.57	1.50	1.57
UAMRG□25	0.5~60inch	NPT 1/8	2.91	0.27	1.05	0.63	0.43	0.98	0.28	0.31	2.12	2.05	1.59	0.91	0.73	0.31	0.63	2.91	3.54	4.88	1/4-28UNF	5/16-24UNF	9/16-18UNF	0.98	4.02	1.57	1.65	1.57
UAMRG□32	0.5~60inch	NPT 1/8	3.46	0.34	1.33	0.79	0.55	1.14	0.34	0.39	2.52	2.44	0.77	1.16	0.75	0.47	0.63	3.54	4.33	5.75	5/16-24UNF	3/8-24UNF	3/4-16UNF	1.10	4.80	1.97	1.97	1.97
UAMRG□40	0.5~60inch	NPT 1/4	3.58	0.34	1.65	0.98	0.55	1.36	0.34	0.39	2.91	2.83	0.79	1.36	0.79	0.47	0.55	3.94	4.72	6.30	5/16 24UNF	3/8-24UNF	3/4-16UNF	1.18	4.72	2.52	2.52	2.52



How to Order

W1 ✻ ✻ ✻

1 2 3 4

1 TPC Auto Switch Model

2 3 : Reed AUTO S/W
H : Solid State AUTO S/W

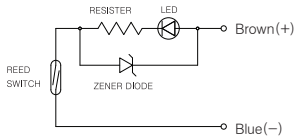
3 N : 3 wire(NPN)
P : 3 wire(PNP)

4 Blank : LEAD WIRE(0.5m)
M : LEAD WIRE(1m)
L : LEAD WIRE(3m)

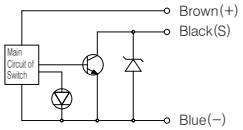
Specifications

Part No.	W13		W1HN(P)
Contact wiring	Reed Switch 2 wire		Solid Stage Switch 3 wire
Application	Relay, Sequence Control		
Voltage	DC24V	AC100V	DC24V
Current	5~40mA	5~20mA	≦40mA
Contact Protection Circuit	None		Built−in
Internal Voltage Drop	Under 2.4V		≦1.5V
Indicator Lamp	ON : When Red LED		
Output	−		NPN(PNP)
Current Consumption	−		≦5mA
Current Leakage	None		≦100㎂
Operation Time	≦1ms		≦2ms
Lead Wire	Oil Resistant Vinyl Code		
Shock Resistance	30G 100G		
Insulation Resistance	100㏁ or more (500DVC Mega) between lead wire and case		
Voltage Resistance	For 1 min.(in AC1500V/between a lead wire case)		
Temperature	−10 ~ 60℃		
Protection Structure	IEC Standard IP67, Water Proof, and(JISC0920),Oil Structure		

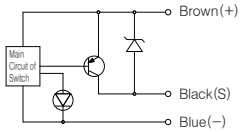
Internal Circuit



2 wire reed circuit

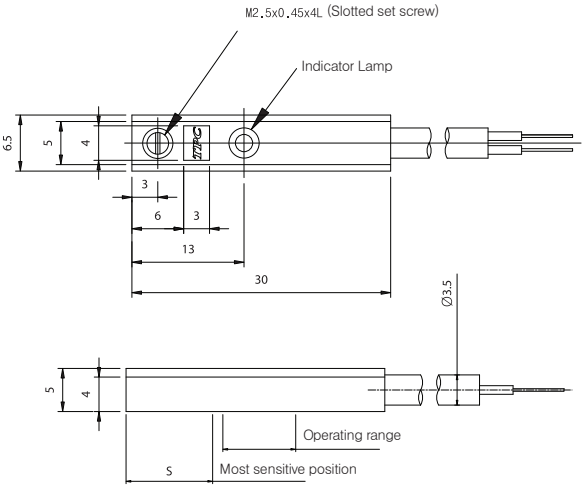


3 wire NPN solid state circuit



3 wire NPN solid state circuit

Protection Structure



■ Caution

Plase read and understand the instructions before use. Refer to the auto switch precautions before using auto switches.

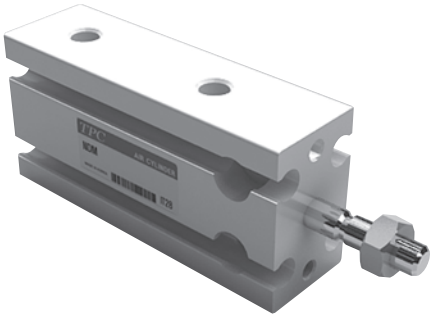
Operating Range

Section	W13	W1HN(P)
Most sensitive position(S)	10mm	1 ~ 2mm
Operation range(L)	6 ~ 12mm	4 ~ 10mm

Series **NDM**

Direct Mount Cylinder/Standard Type: Double Acting Single Rod

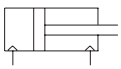
Bore Size(mm) : Ø10, Ø16, Ø20, Ø25



- COMPACT DESIGN SAVES SPACE
- MULTIPLE MOUNTING OPTIONS
- AUTO SWITCH TYPE AVAILABLE
- NON LUBRICATED SERVICE STANDARD

Symbol

Double acting



How to Order

NDM **D** **16** – **20** **D** – **W8H** ○

1 2 3 4 5 6 7

1 Direct Mount Cylinder
※ Standard type
Built–in Magnet & Rubber Cushion

2 Blank : Without Magnet
D : Built–in Magnet

3 Bore size(mm)
10 : ϕ 10
16 : ϕ 16
20 : ϕ 20
25 : ϕ 25

4 Stroke(mm)
ϕ 10, 16 : 5, 10, 15, 20, 25, 25, 30
ϕ 20, 25 : 5, 10, 15, 20, 25, 25, 30, 40, 50

5 Action
D : Double acting

6 Auto Switch
Blank : None
W8H(V) : Reed Switch – 2 wire
(DC24V, AC110V)
W9H(V) : Solid State Switch – 3 wire
(DC24V)
※ Standard Auto Switch lead wire length is 1m. 3m leads available on all models by adding a "L" suffix to the part number.
Example)W1H → W1HL

7 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

Minimum Operating Pressure Mpa(psi)

Type \ Bore size(mm)	10	16	20	25
Double acting (Single rod)	0.06 (8.5psi)	0.06 (8.5psi)	0.05 (7.1psi)	0.5 (7.1psi)

Standard Specifications

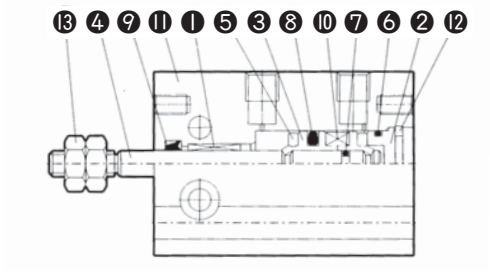
Fluid	Air
Proof pressure	1.05MPa(149psi)
Max. operating pressure	0.7Mpa(99psi)
Ambient and fluid temperature ℃(°F)	5 ~ 60℃(41~140°F)
Lubrication	Not required
Cushion	Both sides rubber cushion
Rod end thread	Male thread
Thread tolerance	KS 2 Class
Stroke allowance	$^{+1.0}_{0}$
Mounting	Basic type

Standard Stroke (mm)

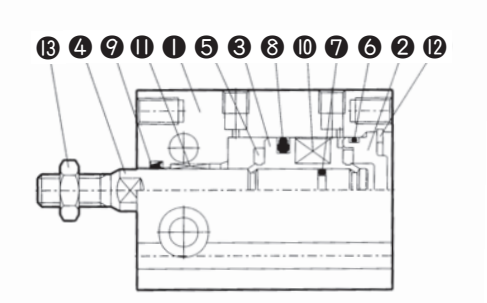
Bore size (mm)	Double acting							
	Stroke							
	5	10	15	20	25	30	40	50
10	○	○	○	○	○	○	–	–
16	○	○	○	○	○	○	–	–
20	○	○	○	○	○	○	○	○
25	○	○	○	○	○	○	○	○

Construction Parts List / Double Acting Single Rod

ϕ10, 16



ϕ20, ϕ25

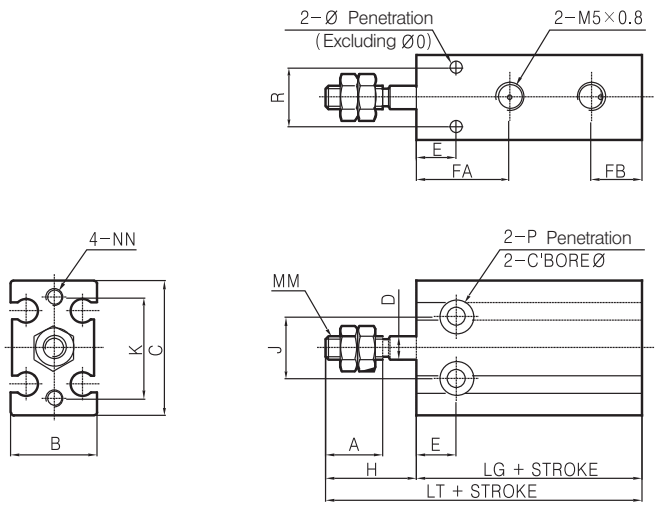


Parts List

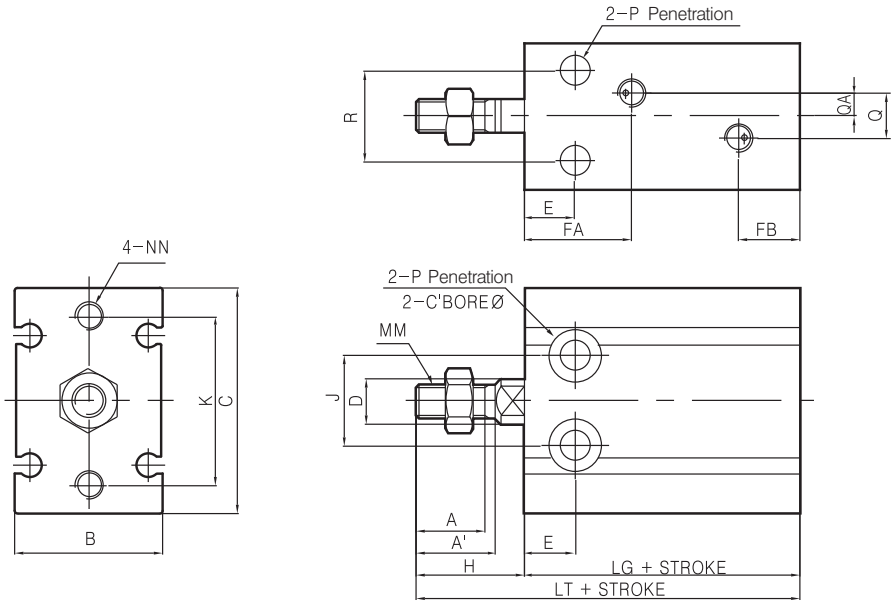
No.	Description	Material	Note
❶	Cylinder Tube	Aluminum alloy	Hard alumite
❷	Head cover	Aluminum alloy	Hard alumite
❸	Piston	Brass	
		Aluminum alloy	
❹	Piston rod	Stainless steel	
❺	Bumper	Urethane	
❻	Head Cover Gasket	NBR	
❼	Piston Gasket	NBR	
❽	Piston Packing	NBR	
❾	Rod Packing	NBR	
❿	Magnet	–	
⓫	Bush	Sintered oil bearing alloy	
⓬	Snap ring	Spring steel	Nickel plated
⓭	Rod End Nut	Carbon steel	

Dimensions Double Acting/Single Rod

Ø10, Ø16



Ø20,Ø25



Bore Size (mm)	A	A'	B	C	D	E	FA	FB	H	J	K	MM	NN	P	Q	QA	R	T	Auto Switch Does Not Exist		Auto Switch Exist	
																			LG	LT	LG	LT
10	10	–	15.2	24	4	7	16.5	9	16	11	18	M4×0.7	M3×0.5 DP:5	3.2	–	–	–	6 DP:5	35	51	35	51
16	11	12.5	20	32	6	7	16.5	11	16	14	25	M5×0.8	M4×0.7 DP:6	4.3	–	–	12	7.6 DP:6.5	31	47	40	56
20	12	14	26	40	8	9	19	11	19	16	30	M6×1.0	M5×0.8	5.3	8	4	16	9.3 DP:8	36	55	44	63
25	15.5	18	32	50	10	10	21.5	13	23	20	38	M8×1.25	M5×0.8 DP:8	5.3	9	4.5	20	9.3 DP:9	40	63	48	71

Series **NDMW**

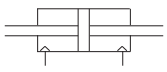
Direct Mount Cylinder/Double Acting Double Rod

Bore Size(mm) : Ø10, Ø16, Ø20, Ø25

- SPACE SAVING COMPACT DESIGN
- MULTIPLE MOUNTINGS
- NON-ROTATING ROD TYPE AVAILABLE
- NON LUBRICATED SERVICE STANDARD

Symbol

Double Rod



How to Order

NDM **D** **W** **16** – **30** **D** – **W8HL** ○

1 2 3 4 5 6 7 8

1 Direct Mount Cylinder

2 Blank : Non-Magnet
D : Built-in Magnet

3 Double Rod Type

4 Bore Size(mm)
10 : φ10
16 : φ16
20 : φ20
25 : φ25

5 Stroke(mm)
φ10, 16 : 5, 10, 15, 20, 25, 30
φ20, 25 : 5, 10, 15, 20, 25, 30, 40, 50

6 Action
D : Double Acting

7 Auto Switch
Blank : None
W9H(V) : Solid State Switch
(DC 24V)– 3wire
W8H(V) : Reed Switch
(DC 24V, DC 100V)
※ Standard Auto Switch lead wire length is 1m.
3m leads available on all models by adding a "L" suffix to the part number.
Example)W1H → W1HL

8 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

Standard Specifications

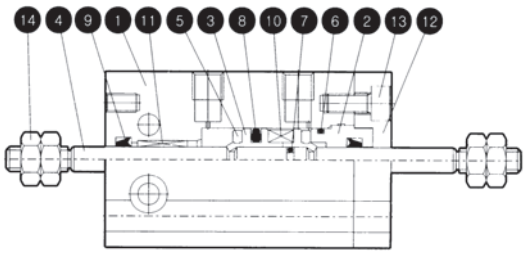
Fluid	Air
Proof pressure	1.05MPa{149psi}
Max. operating pressure	0.7MPa{99psi}
Ambient and fluid temperature	5~60℃
Lubrication	Not required
Cushion	Both Sides RUBBER Cushion
Rod end thread	Male thread
Thread tolerance	KS 2 Class
Stroke allowance	$^{+1.0}_{0}$
Mounting	Basic type

Theoretical Force

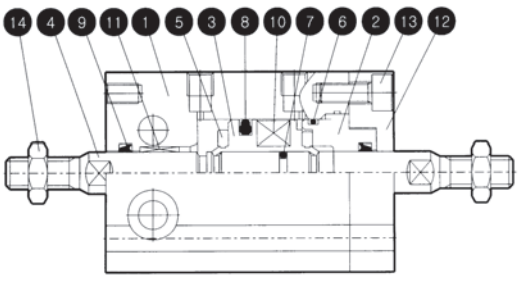
Bore size (mm)	Rod diameter (mm)	hydraulic area (mm)	Operating pressure (Mpa)		
			0.3	0.5	0.7
ø10	4	66.0	19.8	33.0	46.2
ø16	6	172	51.6	86.0	121
ø20	8	264	79.2	132	185
ø25	10	412	124	206	288

Construction/Parts List

NDMW ϕ10, ϕ16



NDMW ϕ20, ϕ25

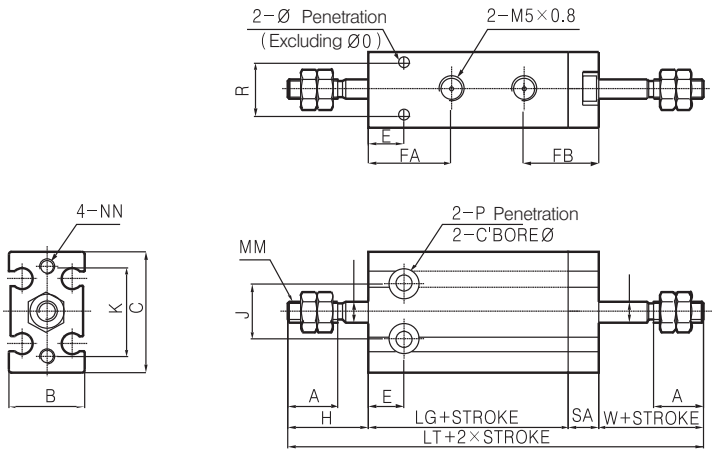


Parts List

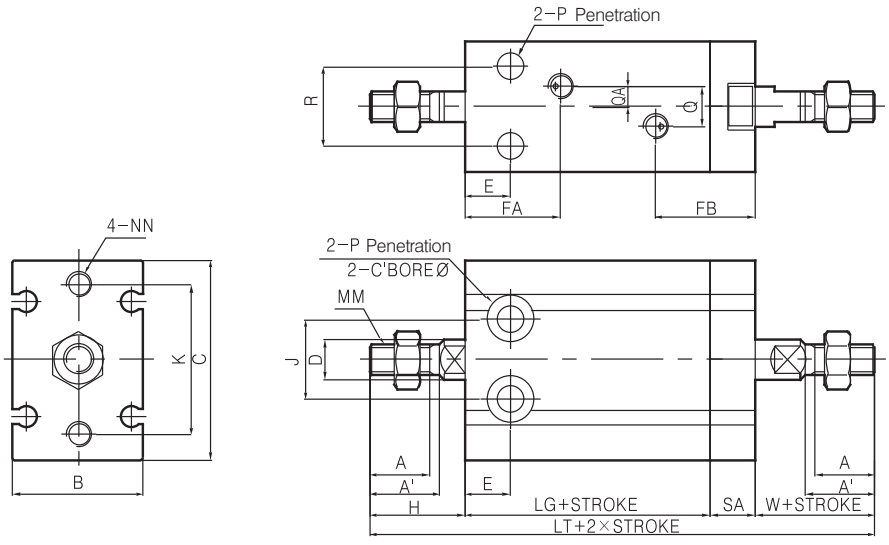
No.	Description	Material	Note
❶	Cylinder Tube	Aluminum alloy	Hard alumite
❷	Rod Cover	Aluminum alloy	Hard alumite
❸	Piston	Brass	ϕ10
		Aluminum alloy	ϕ16~ϕ25 Cromate
❹	Piston Rod	Stainless steel	
❺	Bumper	Urethane	
❻	Head Cover Gasket	NBR	
❼	Piston Gasket	NBR	
❽	Piston Packing	NBR	
❾	Rod Packing	NBR	
❿	Magnet	–	
⓫	Bush	Sintered oil bearing alloy	
⓬	Retainer	Aluminum alloy	Hard Allumite
⓭	Hexagonal Head Cap Screw	Carbon steel	Nickel plated
⓮	Rod End Nut	Carbon steel	

Double Acting/Double Rod Type(NDMW)

Ø10, Ø16



Ø20, Ø25

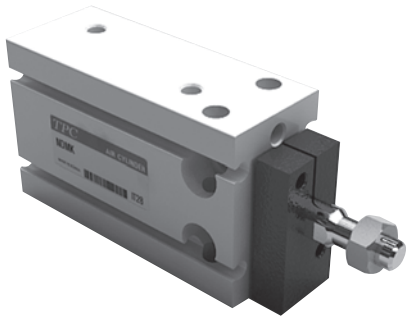


Bore Size (mm)	A	A'	B	C	D	E	FA	FB	H	J	K	MM	NN	P	Q	QA	R	SA	T	W	Auto Switch Does Not Exist		Auto Switch Exist	
																					LG	LT	LG	LT
10	10	–	15.2	24	4	7	16.5	15	16	11	18	M4×0.7	M3×0.5 DP:5	3.2	–	–	–	6	6 DP:5	16	35	73	35	73
16	11	12.5	20	32	6	7	16.5	17.5	16	14	25	M5×0.8	M4×0.7 DP:6	4.3	–	–	12	7.5	7.6 DP:6.5	16	31	70.5	40	79.5
20	12	14	26	40	8	9	19	20	19	16	30	M6×1.0	M5×0.8	5.3	8	4	16	9	9.3 DP:8	19	36	83	44	91
25	15.5	18	32	50	10	10	21.5	20	23	20	38	M8×1.25	M5×0.8 DP:8	5.3	9	4.5	20	9	9.3 DP:9	23	40	95	48	103

Series NDMK

Direct Mount Cylinder/Double Acting/Non-Rotating Rod/Single Rod

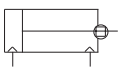
Bore Size(mm) : Ø10, Ø16, Ø20, Ø25



- SUPPORTING LATERAL LOAD WITH LONG BUSH
- A SPACE - SAVING
- EASY MOUNTING AND STRONG HOLD

Symbol

Non-Rotating Rod/Single Rod



How To Order

NDM D K 10 — 30 D — W8HL S

1 2 3 4 5 6 7 8

1 Direct Mount Cylinder

2 Blank : Non-Magnet
D : Built-in Magnet

3 Non-Rotating

4 Bore Size
10 : Ø10
16 : Ø16
20 : Ø20
25 : Ø25

5 Stroke (mm)
Ø10, 16 : 5, 10, 15, 20, 25, 30st
Ø20, 25 : 5, 10, 15, 20, 25, 30, 40, 50st

6 Acting
D : Double Acting

7 Auto Switch
Blank : None
W8H(V) : Reed Switch - 2 wire
(DC24V, AC110V)
W9H(V) : Solid State Switch - 3 wire
(DC24V)
※ Standard Auto Switch lead wire length is 1m.
3m leads available on all models by adding a "L" suffix to the part number.
Example)W1H → W1HL

8 Number of Auto Switchs
Blank : 2 pcs
S : 1 pc

■ Caution

Be sure to read before handling

Standard Specifications

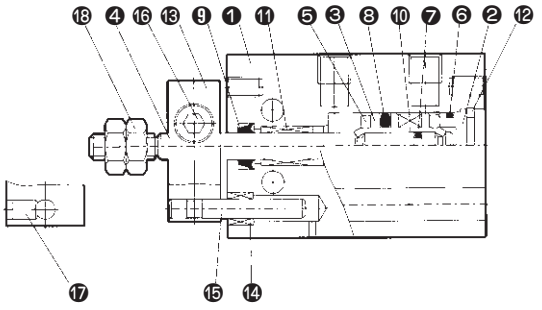
Acting	Double acting single rod
Fluid	Air
Proof pressure	1.05MPa(10.5kgf/cm^2)
Max. operating pressure	0.7MPa(7kgf/cm^2)
Min. operating pressure	0.05MPa(0.5kgf/cm^2)
Ambient and fluid temperature	5 ~ 60℃
Lubrication	Not required
Piston Speed	50 ~ 500mm/sec
Cushion	Both Side Rubber Cushion
Rod end thread	Male thread
Thread tolerance	KS 2 class
Stroke allowance	$^{+1.0}_{0}$
Mounting	Basic type

Non-Rotating Piston Rod Accuracy/Specification

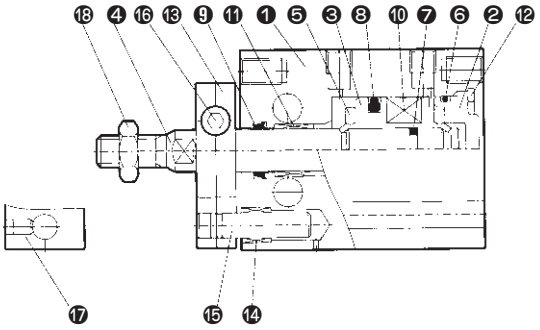
Bore Size	Ø10,Ø16	Ø20,Ø25
Non-Rotating Piston Rod Accuracy	±0.8°	±0.5°

Construction/Parts List/Non-Rotating Piston Single Rod Type

Ø10, Ø16



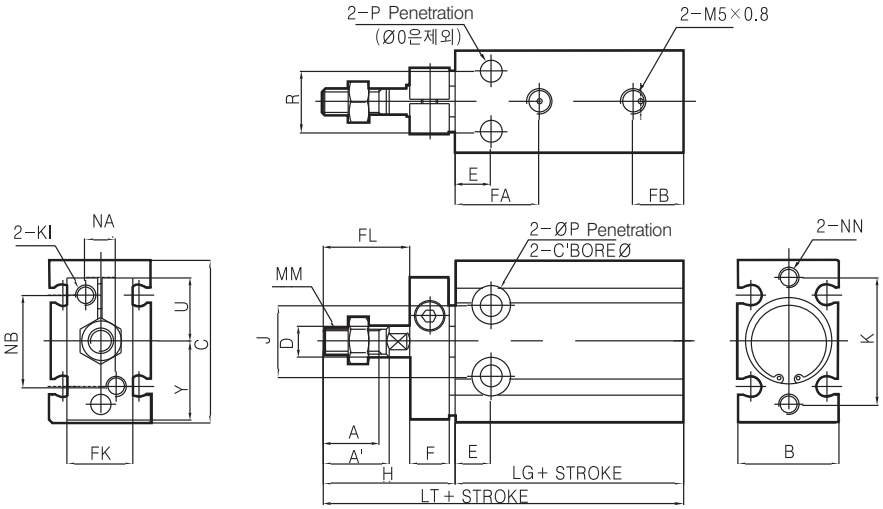
Ø20, Ø25



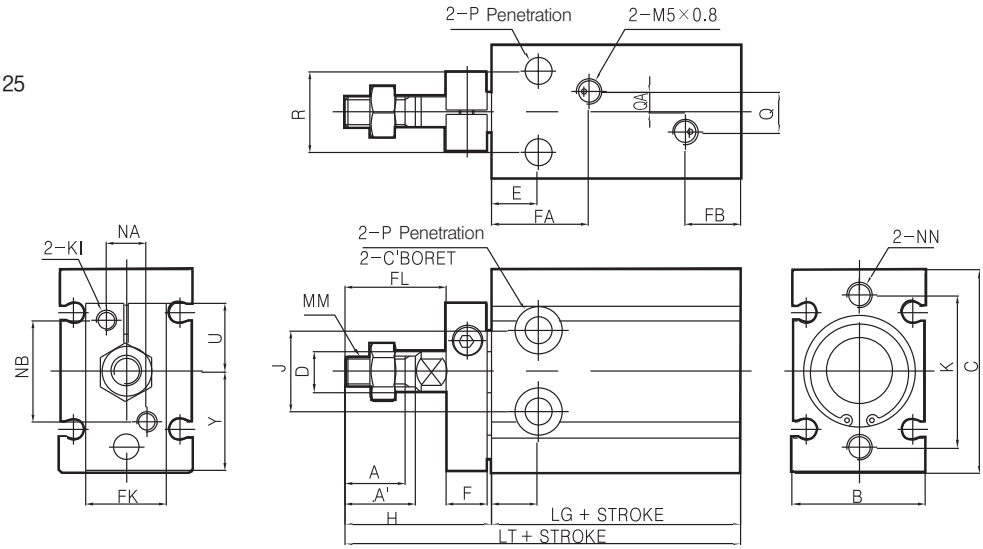
No.	Description	Material	Note
❶	Cylinder Tube	Alluminum alloy	Hard alumite
❷	Head Cover	Alluminum alloy	Alumite
❸	Piston	Brass	Ø6, Ø10
		Alluminum alloy	Ø6~Ø32 Chromate
❹	Piston Rod	Stainless steel	
❺	Bumper	Urethane rubber	
❻	Head Cover Gasket	NBR	
❼	Piston Gasket	NBR	
❽	Piston Packing	NBR	
❾	Rod Packing	NBR	
❿	Magnet	–	
⓫	Bush	Sintered oil bearing alloy	
⓬	Snap Ring	Spring Steel	Nickel Plated
⓭	Anti-rotating plate	Alluminum Alloy	Hard alumite
⓮	Guide Bush	Sintered oil bearing alloy	
⓯	Guide Rod	Stainless Steel	
⓰	Haxagonal head Cap screw	Carbon Steel	
⓱	Hexagon socket	Carbon Steel	
⓲	Rod End Nut	Carbon Steel	Nickel Plated

Double Acting/Non-Rotating Single Rod

Ø10, Ø16



Ø20, Ø25



Bore Size (mm)	A	A'	B	C	D	E	F	FL	FK	FA	FB	H	J	K	KI	MM	NA	NB	NN NN	P	Q	QA	R	T T	U	Y	Auto Switch Does Not Exist LG	Auto Switch Does Not Exist LT	Auto Switch Exist LG	Auto Switch Exist LT
10	10	–	15.2	24	4	7	8	12	12	16.5	9	21	11	18	M3×0.5	M4×0.7	7	15	M3×0.5 DP:5	3.2	–	–	–	6 DP:5	10.5	11.5	35	56	35	56
16	11	13	20	32	6	7	8	17	13	16.5	10	26	14	25	M3×0.5	M5×0.8	6	18	M4×0.7 DP:6	4.3	–	–	12	7.6 DP:6.5	12.5	15.5	31	57	40	66
20	12	14	26	40	8	9	8	20	16	19	13	29	16	30	M4×0.7	M6×1.0	8	20	M5×0.8	5.3	8	4	16	9.3 DP:8	13.5	19.5	36	65	44	73
25	15.5	18	32	50	10	10	10	22	20	21.5	13	33	20	38	M5×0.8	M8×1.25	10	28	M5×0.8 DP:8	5.3	9	4.5	20	9.3 DP:9	19	24.5	40	73	48	81

Series NDMKW

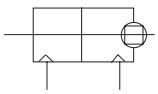
Direct Mount Cylinder/Double Acting/Non-Rotating Piston Double Rod

Bore Size(mm) : Ø10, Ø16, Ø20, Ø25

- SUPPORTING LATERAL LOAD WITH LONG BUSH
- A SPACE - SAVING
- EASY MOUNTING AND STRONG HOLD

Symbol

Non-Rotating Rod/Double Rod



How to Order

NDM D KW 10 — 30 D — W8HL S

1 2 3 4 5 6 7 8

1 Direct Mount Cylinder

2 Blank : Without Magnet
D : Built-in Magnet

3 Non-Rotating Piston Double Rod

4 Bore Size
10 : Ø10
16 : Ø16
20 : Ø20
25 : Ø25

5 Stroke (mm)
Ø10, 16 : 5, 10, 15, 20, 25, 30st
Ø20, 25 : 5, 10, 15, 20, 25, 30, 40, 50st

6 Acting
D : Double Acting

7 Auto Switch
Blank : None
W8H(V) : Reed Switch - 2 wire
(DC24V, AC110V)
W9H(V) : Solid State Switch - 3 wire
(DC24V)
※ Standard Auto Switch lead wire length is 1m.
3m leads available on all models by adding a "L" suffix to the part number.
Example)W1H → W1HL

8 Number of Auto Switchs
Blank : 2 pcs
S : 1 pc

■ Caution

Be sure to read before handling

Non-Rotating Rod Accuracy

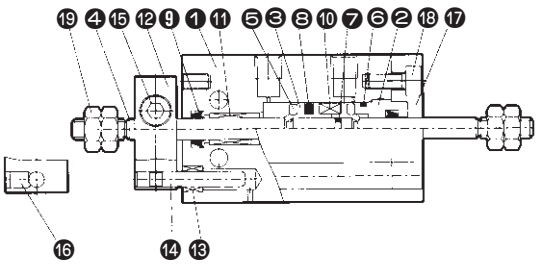
Bore Size	ϕ10, ϕ16	ϕ20, ϕ25
Non-Rotating Rod Accuracy	±0.8°	±0.5°

Standard Specification

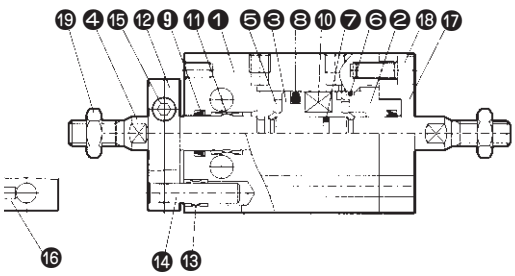
Operating Type	Double acting Single Rod
Fluid	Air
Proof Pressure	10.5MPa(149psi)
Max. Operating Pressure	0.7MPa(99psi)
Ambient Normal Fluid Temperature	5 ~ 60℃(41°F~140°F)
Lubricant	None(None-Lube)
Piston Speed	50 ~ 500mm/sec
Cushion	Rubber Cushion
Rod end thread	Male thread
Thread Tolelance	KS class 2
Stroke Tolerance	$^{+1.0}_{0}$
Mounting	Basic

Construction / Non-Rotating Piston / Double Rod Type

ϕ10, ϕ16



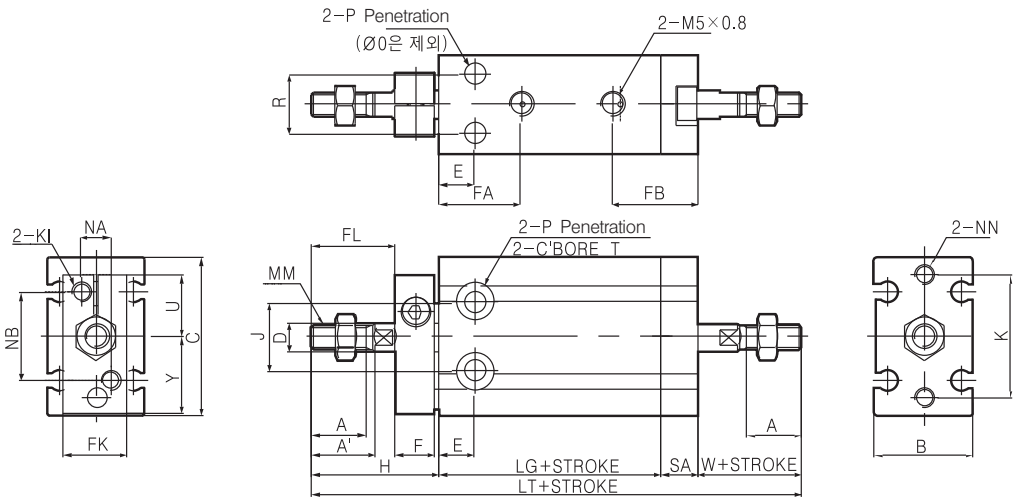
ϕ20, ϕ25



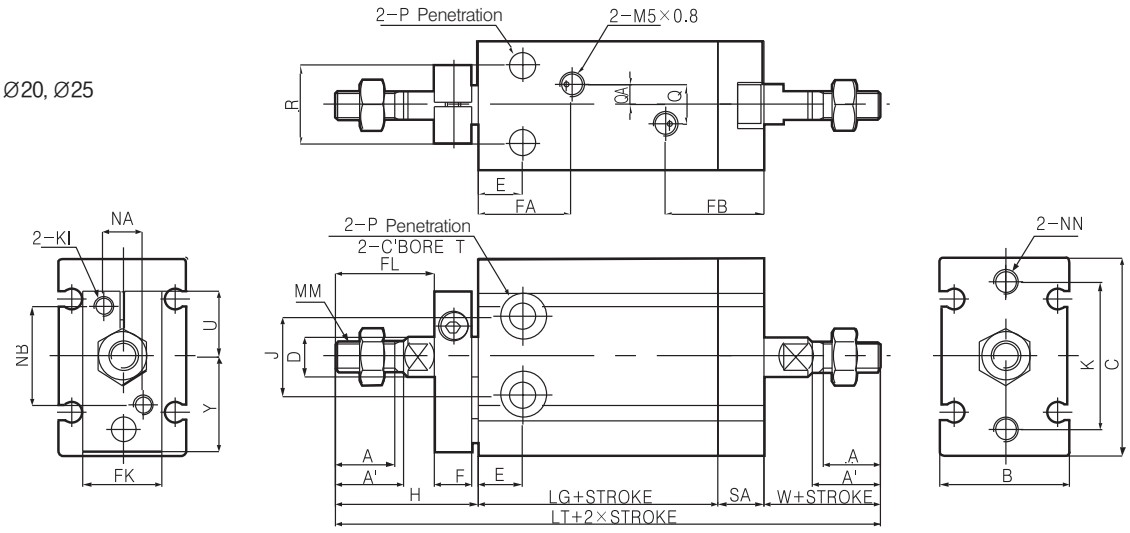
No.	Description	Material	Note
❶	Cylinder Tube	Alluminum Alloy	Hard Alumite
❷	Head Cover	Alluminum Alloy	Alumite
❸	Piston	Brass	ϕ6, ϕ10
		Alluminum Alloy	ϕ16~ϕ32Chromate
❹	Piston Rod	Stainless Steel	
❺	Bumper	Urethane Rubber	
❻	Head Cover Gasket	NBR	
❼	Piston Gasket	NBR	
❽	Piston Packing	NBR	
❾	Rod Packing	NBR	
❿	Magnet	–	
⓫	Bush	Sintered Oil Bearing Alloy	
⓬	Anti-rotating Plate	Alluminum Alloy	Hard Alumite
⓭	Guide Bush	Sintered Oil Bearing Alloy	
⓮	Guide Rod	Stainless Stee	
⓯	Haxagonal Head Cap Screw	Carbon Steel	
⓰	Hexagon Socket	Carbon Steel	
⓱	Retainer	Aluminum allog	Hard Alumite
⓲	Haxagonal Head Cap Screw	Carbon Steel	
⓳	Rod End Nut	Carbon Steel	Nickel Plated

Double Acting/Non-Rotating Piston Double Rod

Ø10, Ø16



Ø20, Ø25



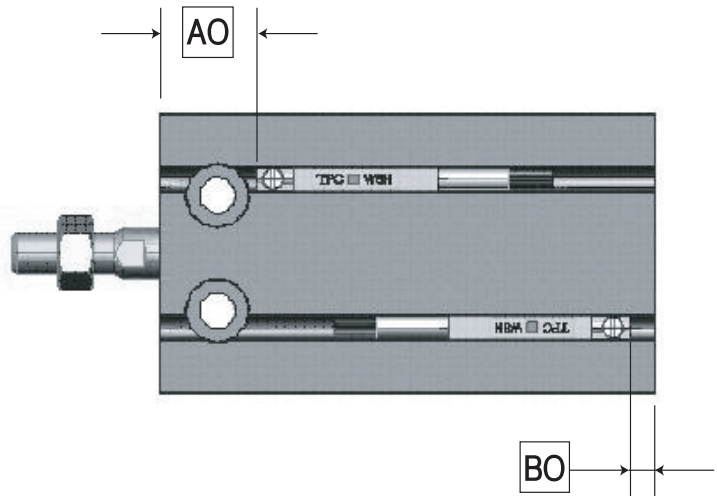
Bore Size (mm)	A	A'	B	C	D	E	F	FL	FK	FA	FB	H	J	K	KI	MM	NA	NB	NN	P	Q	QA	R	SA	T	U	Y	Auto Switch Does Not Exist		Auto Switch Exist	
																												LG	LT	LG	LT
10	10	–	15.2	24	4	7	8	12	12	16.5	15	21	11	18	M3×0.5	M4×0.7	7	15	M3×0.5 DP:5	3.2	–	–	–	6	6 DP:5	10.5	11.5	35	78	35	78
16	11	13	20	32	6	7	8	17	13	16.5	17.5	26	14	25	M3×0.5	M5×0.8	6	18	M4×0.7 DP:6	4.3	–	–	12	7.5	7.6 DP:6.5	12.5	15.5	31	80.5	40	89.5
20	12	14	26	40	8	9	8	20	16	19	20	29	16	30	M4×0.7	M6×1.0	8	20	M5×0.8	5.3	8	4	16	9	9.3 DP:8	13.5	19.5	36	93	44	101
25	15.5	18	32	50	10	10	10	22	20	21.5	22	33	20	38	M5×0.8	M8×1.25	10	28	M5×0.8 DP:8	5.3	8	4	20	9	9.3 DP:9	19	24.5	40	105	48	113

Checking Auto Switch

A. How to check : After assembling auto switch, check the working of auto switch moving piston
B. Conditions : W8(plug point) / W9(Non plug point)–Horizontal / Vertical switch
C. Mounting position : Refer to the drawing
D. Tolerance : 30%
E. Setting postion

Unit : mm

Cylinder	Symbol	Position of Auto Switch			
		Ø10	Ø16	Ø20	Ø25
NDMD	AO	17.0	18.0	20.0	24.0
	BO	2.0	6.0	7.0	8.0



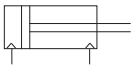
Series ARD

Round Cylinder

Bore Sizemm(inch) : Ø32(1¼), Ø40 (1½), Ø50(2), Ø63(2½)

- COMPACT DESIGN
- HIGH SPEED ACTUATOR
- STANDARD RUBBER BUMPER (AIR CUSHION OPTIONAL)
- LIGHTWEIGHT
- BUILT-IN MAGNET FOR AUTO SWITCH

Symbol



How To Order

□ ARD B A 40 — 100 — W5 □

1 2 3 4 5 6 7 8

1 Series
Blank : Rc(PT)
U : NPT

2 Round Cylinder
* (Built-in Magnet, Bumper, Non-lube standard)

3 Mounting
B : Basic type

4 Cushion
Blank : Rubber Cushion
A : Air Cushion

5 Bore Size(inch)
32 : 32mm(1¼)
40 : 40mm(1½)
50 : 50mm(2)
63 : 63mm(2½)

6 Stroke

Rubber Cushion Type	Stroke	Air Cushion Type	Stroke
ϕ32 (1¼)	25(0.984)~450(17.7)	ϕ32 (1¼)	25(0.984)~450(17.7)
ϕ40 (1½)	25(0.984)~800(31.5)	ϕ40 (1½)	25(0.984)~800(31.5)
ϕ50 (2)	25(0.984)~1200(47.2)	ϕ50 (2)	25(0.984)~1200(47.2)
ϕ63 (2½)	25(0.984)~1200(47.2)	ϕ63 (2½)	25(0.984)~1200(47.2)

7 Auto Switch
Blank : None
(Cylinder with built-in Magnet)
Reed Switch
W5(2wire DC24V, AC 100V)
Band mounted type
※ Standard Lead 1m
(upto 3m optional)

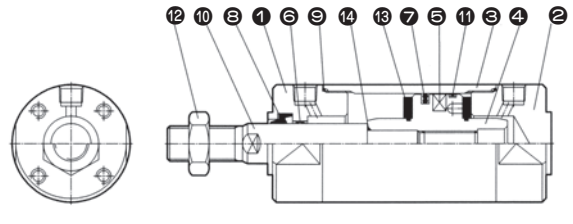
8 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

Specifications

Fluid	Air	
Proof Pressure	1.5MPa(220psi)	
Max. Operation Pressure	1.0MPa(150psi)	
Min. Operation Pressure	0.05MPa(8psi)	
Ambient and Fluid Temperature	5~ 60℃ (41~140℉)	
Lubrication	None(Non-Lube)	
Piston Speed	1.9~40inch/sec (50~1000 mm/sec)	
Stroke Tolerance (inch)	~40st: $^{+0.058}_{0}$ ~47st: $^{+0.071}_{0}$	
Thread Tolerance	KS 2 Class	
Cushion	Rubber Cushion	Air Cushion

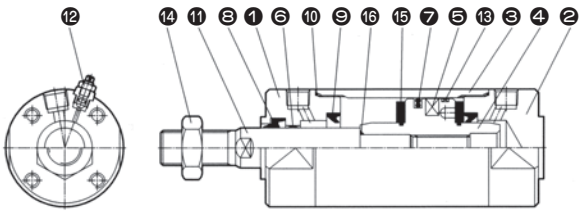
Construction/Parts List

ARD ϕ32~ϕ63(Rubber Cushion Type)



No.	Description	Material		Note
⑭	Piston Gasket	NBR		
⑬	Bumper	ø20, ø25	NBR	
		ø32~ø63	Urethane	
⑫	Rod End Nut	Rolled Steel		Zinc Plated
⑪	Wear Ring	-		
⑩	Piston Rod	Carbon Steel		Hard Chrome Plated
⑨	Tube Gasket	NBR		
⑧	Rod Packing	NBR		
⑦	Piston Packing	NBR		
⑥	Rod Bushing	Lead Bronze Casting		
⑤	Magnet	Ba Ferrite+NBR		
④	Piston	Al		Chromate
③	Cylinder Tube	Al		Hard alumite
②	Head Cover	Al		White alumite
①	Rod Cover	Al		〃

ARDA ϕ32~ϕ63(Air Cushion Type)

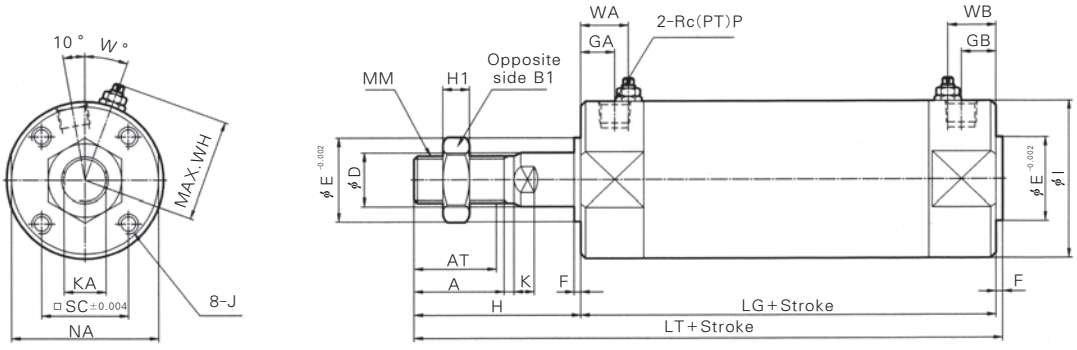


No.	Description	Material		Note
⑯	Piston Gasket	NBR		
⑮	Bumper	ø20, ø25	NBR	
		ø32~ø63	Urethane	
⑭	Rod End Nut	Rolled Steel		Zinc Plated
⑬	Wear Ring	-		
⑫	Cushion Valve Ass'y			
⑪	Piston Rod	Carbon Steel		Hard Chrome Plated
⑩	Tube Gasket	NBR		
⑨	Cushion Packing	NBR		
⑧	Rod Packing	NBR		
⑦	Piston Packing	NBR		
⑥	Rod Bushing	Lead Bronze Casting		
⑤	Magnet	Ba Ferrite+NBR		
④	Piston	Al		Chromate
③	Cylinder Tube	Al		Hard alumite
②	Head Cover	Al		White alumite
①	Rod Cover	Al		〃

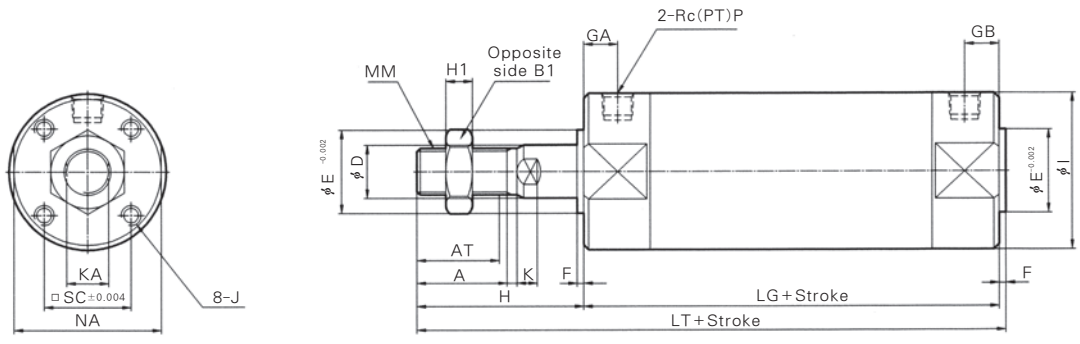
Dimensions

(inch)

Air Cushion Type



Rubber Cushion Type

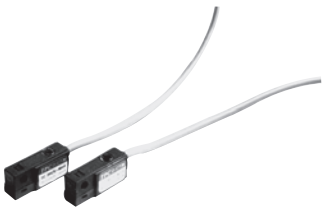


(mm)

Bore size (mm)	Standard stroke Range mm / Extended stroke Range mm	AT	A	□SC	φD	φE	F	GA	GB	φI	J	K	KA	MM	NA	P	LG	H	LT	WA	WB	WH	W	H1	B1
φ32	~300 / 301~450	19.5	22	20	12	18	2	12	12	38	M5×0.8 DP:8	5.5	10	M10×1.25	36	1/8	32	40	124	14	14	28.5	25	6	7
φ40	~300 / 301~800	27	30	26	16	25	2	13	13	47	M6×1 DP:12	6	14	M14×1.5	44	1/8	87	50	139	15	15	33	20	8	22
φ50	~300 / 301~1200	32	35	32	20	30	2	14	14	58	M8×1.25 DP:16	7	18	M18×1.5	55	1/4	102	58	162	16	16	38.5	20	11	27
φ63	~300 / 301~1200	32	35	38	20	32	2	14	14	72	M10×1.5 DP:16	7	18	M18×1.5	69	1/4	105	58	165	16	16	45.5	20	11	27

(inch)

Bore size (inch)	Standard stroke Range mm / Extended stroke Range mm	AT	A	□SC	φD	φE	F	GA	GB	φI	J	K	KA	MM	NA	P	LG	H	LT	WA	WB	WH	W	H1	B1
φ32(1 1/4)	~300(12) / 301~450(18)	0.77	0.87	0.79	0.48	0.71	0.08	0.48	0.48	0.67	10-32UNF	0.22	0.40	7/16-20UNF	1.42	1/8	3.23	1.57	4.88	0.48	0.48	1.12	0.98	0.24	0.67
φ40(1 1/2)	~300(12) / 301~800(32)	1.06	1.18	1.02	0.63	0.98	0.08	0.51	0.51	1.85	1/4-28UNF	0.24	0.24	7/16-20UNF	1.73	1/8	3.43	1.97	5.47	0.60	0.60	1.30	0.79	0.31	0.87
φ50(2)	~300(12) / 301~1200(48)	1.26	1.38	1.26	0.79	1.18	0.08	0.55	0.55	2.28	5/16-24UNF	0.28	0.71	1/2-20UNF	2.17	1/4	4.02	2.28	6.38	0.63	0.63	1.52	0.79	0.43	1.06
φ63(2 1/2)	~300(12) / 301~1200(48)	1.26	1.38	1.50	0.79	1.26	0.08	0.55	0.55	2.83	3/8-24UNF	0.28	0.71	1/2-20UNF	2.72	1/4	4.13	2.28	6.50	0.63	0.63	1.79	0.79	0.43	1.06



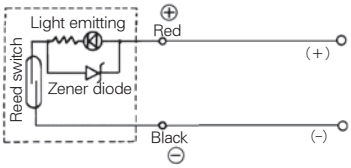
Auto Switch Specifications

Auto Switch Model	W5	
Application	Relay, Sequence Control	
Voltage	DC24V	AC110V
Range of Load Current	5~40mA	5~20mA
Protection Circuit for Contact Breaker Point	None	
Internal Voltage Drop	2.4V or less	
Indicator Lamp	ON:Red light emitting diode	

- Leakage current – None
- Response time – 1.2 ms
- Lead Wire – Oil proof vinyl. φ3.4, 0.2mm², 2 wire(red, black), 0.5 m(0.02inch)
- Impact Resistance – 30G
- Insulation Resistance – 50MΩ or more under the test voltage 500VDC (Between case and cable)
- Withstand Voltage – 1500VAC 1min(between case and cable)
- Ambient Temperature – 40~140°F (5~60℃)
- Protection Structure – IEC spec IP67, Water-proof(JISCO920), oil-proof.

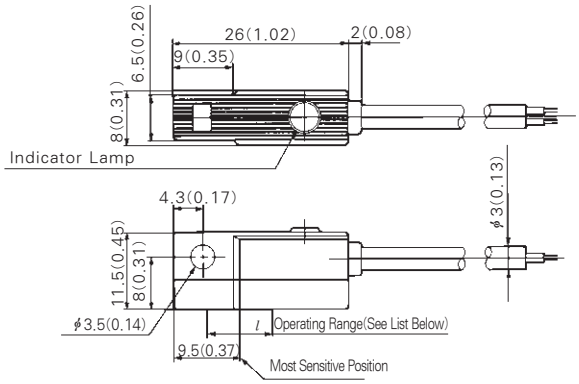
※ If 3m(118 in) lead wire is required, L is put at end of model numbers.
(Example) W5L

Auto Switch/Internal Circuit



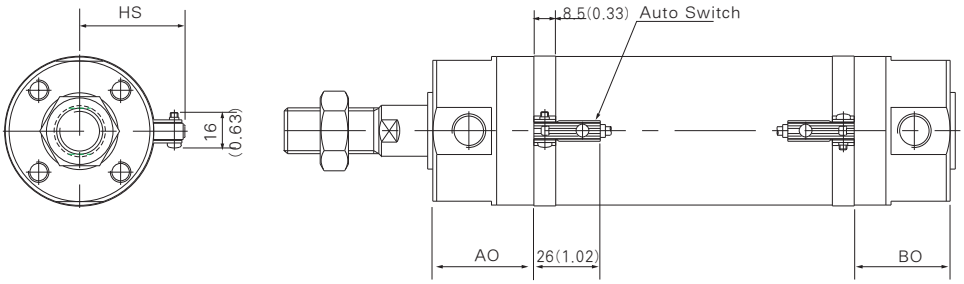
Auto Switch Dimensions

mm(inch)



Auto Switch Setting Position

mm(inch)



Auto Switch Mounting Position

mm(inch)

Bore size mm(inch)	W5		
	AO	BO	HS
φ32(1.26)	23(0.91)	33(1.30)	30.5(1.20)
φ40(1.57)	32(1.26)	29(1.14)	35(1.38)
φ50(1.97)	39.5(1.56)	37.5(1.48)	40.5(1.59)
φ63(2.48)	41(1.61)	38(1.50)	47.5(1.87)

Minimum Auto Switch Mountable Stroke

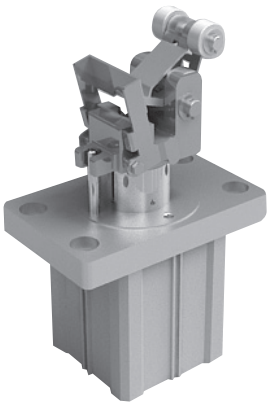
mm(inch)

Type of Auto Switch	Number of Switch		
	With 2pcs.		With 1pc.
	Different Orientation	Same Orientation	
W5	15(0.59)	50(1.97)	10(0.39)

Series NST

Stopper Cylinder

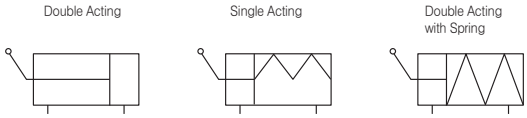
Bore Size(mm) : Ø50, Ø63, Ø80



PAT

- IT IS POSSIBLE TO CHANGE THE ROTATION OF THE ACTUATOR BY 360 DEGREES WITH STEPS OF 90°
- SHOCK ABSORBER PRE-INSTALLED FOR EASY SETUP
- AUTO SWITCH CAPABLE
- SINGLE ACTION, DOUBLE ACTION, DOUBLE ACTION WITH SPRING EXTEND AVAILABLE

Symbol



How to Order

NST	LA	50	—	30	D	M	—	P	V1	—	W4	S
1	2	3		4	5	6		7	8		9	10

1 NST: New Stopper Cylinder

2 LA : Lever / Stardard
LB : Lever / Rod Cover Slim Type(Only ϕ50 Available)
LC : Lever / Rod Cover Quadrable Type(Only ϕ50 Available)

3 Bore Size(mm)
50 : ϕ50
63 : ϕ63
80 : ϕ80

4 Stroke(mm)
ϕ50 : 25, 30, 40
ϕ63 : 30, 40
ϕ80 : 30, 40

5 Action
Blank : Single Acting
D : Double Acting
Z : Double Acting with Spring

6 Roller
Blank : MC Nylon
M : Rolled steel(SPA material)

7 Lever Lock
Blank : None
S : Pallet Stop
P : Pallet Pass
SP : Pallet Stop, Pass
R : Opposite Direction, Unlock Fuction
(Lever lock fuction, pass pin attached)
* Only ϕ80 available

8 Valve
Blank : None
V1 : AC 100V
V2 : AC 220V
V5 : DC 24V

9 Auto Switch
Blank : None
W4 : Reed Auto Switch
W8H/W8V : Reed auto switch (horizontal type/vertical type)

Caution :
1. According to the leading direction of the existing plug point or non plug point auto switch, it is separated into horizontal/vertical types.
2. When the lead line length is 3m add an L to the end number of the product.
ex) W8H:W8HL
3. W4, W8H(V):Multiple use of DC24V, AC110V/ Multiple use of W9H(V):DC24V

10 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

Specifications

Action	Double Acting, Single Acting, Double Acting with Spring
Fluid	Air
Proof pressure	1.5MPa(213psi)
Max. operating pressure	1MPa(142psi)
Min. operating pressure	Double Acting : MPa
	Single Acting : MPa
Ambient and fluid temperature	-5~70℃
Lubrication	Not Required
Cushion	Rubber Cushion
Stroke Length Tolerance	$^{+1.4}_{0}$
Mounting type	Thru hole (standard), Both endes tapped
Auto Switch	Attachable

Specifications

Bore Size	Standard Stroke(mm)
ϕ50	25, 30, 40
ϕ63, ϕ80	30, 40

Specifications

Tube Bore Size(mm)	ROD Size(mm)
ϕ50	32
ϕ63	40
ϕ80	50

Specifications

Pressure(Kgf/cm²) / Bore Size(mm)	1.2	2	3	4	5	6	7
ϕ50	5	30	40	70	95	120	150
ϕ63	15	40	75	120	150	180	225
ϕ80	20	60	110	160	200	240	280

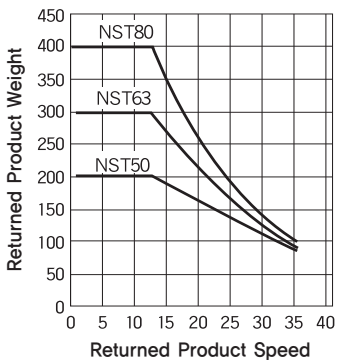
Weight

(Unit : g)

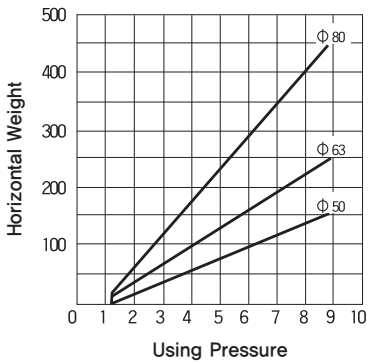
Bore Size(mm)	Stroke(mm)		
	25	30	40
50(Standard)	2,135	2,178	2,263
50(slim)	2,151	2,194	-
63	-	3,998	4,134
80	-	5,528	5,808

Stopper Cylinder Selection Process

LEVER Type(NST＊＊)



LEVER Type



Precaution

Please be fully aware before using
Please read the notice(Page 36) for safety.

Selection

- When lever is in standing up position, do not make collision with pallet.
- when lever is in standing up position in shock absorber's inner lever type, in case pallet collides with it, energy is absorbed to the cylinder body, therefore, don't make collision happen.
- Please make sure no not to scratch the Connection parts.
- piston rod is not hardened, so damage can be occurred if connection part of pallet is sharp. In case of this, do not use. It causes non-function.
- When stopping temporarily loay which is be absorbed to cylinder in Stopper cylinder.
- Within the range of usage of CAT. Just use when stopping the pallet.
  In case of stopping the stopper cylinder, if the cylinder impellent force becomes horizontally lowered, please contact us.

Mounting

- Do not give the rotation torque to cylinder rod.
- Contact area of cylinder should be parallel to contact area of pallet in order not to cause rotation torque on the cylinder rod.

Operation

- Do not make outside force after lever locking when attaching a lever type lock device.
- When adjusting conveyor, move after pull down the cylinder.
- Do not use the oil at the connection area of pistion rod.
- Oil causes non-function.
- Please be careful with hands and clothing during operation.

Repair and inspection

When replacing the shock absorber, please fix the shock absorber well with fixing bolt.

STOPPER CYLINDER Selection Process

1. From the crossing point of the maximum weight of the returned product and speed we select the size of the cylinder and damper model.
2. Through the friction calculation of the conveyor roller and pallet we bring out the constant horizontal weight.
   (Constant horizontal weight = Returned product weight × Friction calculation)
3. Set up the user pressure and select the cylinder size.

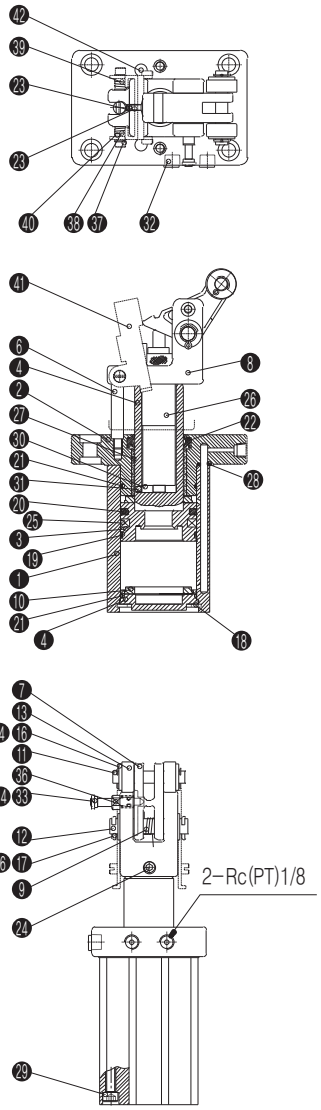
Application example

※ Condition used = Conveyor speed : 14m/min, Returned product total weight : 230kgf, Pressure used : 5kgf/cm^2, Friction calculation number : 0.1

※ Selection method
- Select the damper model and cylinder size
  LB(strong type) damper, 50 size cylinder
- Find the constant horizontal weight
  Returned product weight × Friction calculation number = 230kgf×0.1=23(kgf)
  The 50size cylinder is selected on the crossing point of the pressure used at 5kgf/cm^2, and at the constant horizontal weight of 23kgf

Basic Type : Construction/Parts List

AMRBL ϕ50, 63

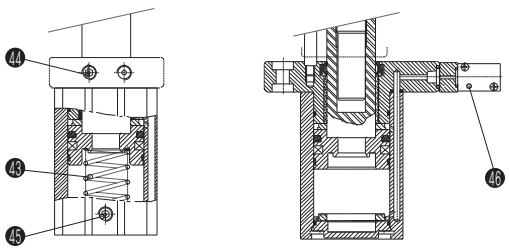


No.	Description	Material		Note
❶	Tube	Aluminum alloy	1	
❷	Rod Cover	Aluminum alloy	1	
❸	Piston	Aluminum alloy	1	
❹	Piston Rod	Carbon Steel	1	
❺	Head Cover	Aluminum alloy	1	
❻	Guide Rod	Carbon Steel	1	
❼	Lever	Carbon Steel	1	
❽	Holder	Carbon Steel	1	
❾	Lever Spring	Spring Steel	1	
❿	Bumper	NBR	2	Head, Rod
⓫	Roller Pin	Carbon Steel	1	
⓬	Lever Pin	Carbon Steel	1	
⓭	Roller	Mc Nylon	2	
⓮	Washer	Rolled Steel	2	
⓯	Washer	Rolled Steel	2	
⓰	Split pin	Wrought Steel	2	
⓱	Split pin	Wrought Steel	2	
⓲	C Snap Ring	Spring Steel	1	
⓳	Wearing	Resin	1	
⓴	Piston Packing	NBR	1	
㉑	Gasket	NBR	2	
㉒	Rod Packing	NBR	1	
㉓	Six angles hole stop Screw	Carbon Steel	2	
㉔	Six angles hole stop Screw	Carbon Steel	1	
㉕	Magnet Ring	NBR	1	
㉖	Shock Absorber	–	1	
㉗	Du Bush	Lead Bronce	1	
㉘	O-Ring	NBR	2	
㉙	Six Angles hole Bolt	Carbon Steel	4	
㉚	Damper	Carbon Steel	1	
㉛	Six Angles stop Screw	Carbon Steel	1	
㉜	Stopper Blook	Carbon Steel	1	
㉝	Six Angles hole Bolt	Carbon Steel	2	
㉞	Pass Ring	Carbon Steel	(1)	Option
㉟	O-Ring	NBR	(1)	Option
㊱	Look Bar	Carbon Steel	(1)	Option
㊲	Look Jig	Carbon Steel	(1)	Option
㊳	Fixing Bolt	Carbon Steel	(2)	Option
㊴	Look Spring(left)	Stcuinless Steel	(1)	Option
㊵	Look Spring(Rigot)	Stcuinless Steel	(1)	Option
㊶	Collar Spacer	Resin	(2)	Option
㊷	Look Bracket	Rolled Steel	(1)	Option
㊸	Stopper	Alloy steel	(2)	Option
㊹	Return Sprring	Swp-b	1	
㊺	Plug boff	Alloy Steel	1	Siage Acfing
㊻	Solenoid V/V	–	1	DS2000 Serles

■Single Acting : ※T

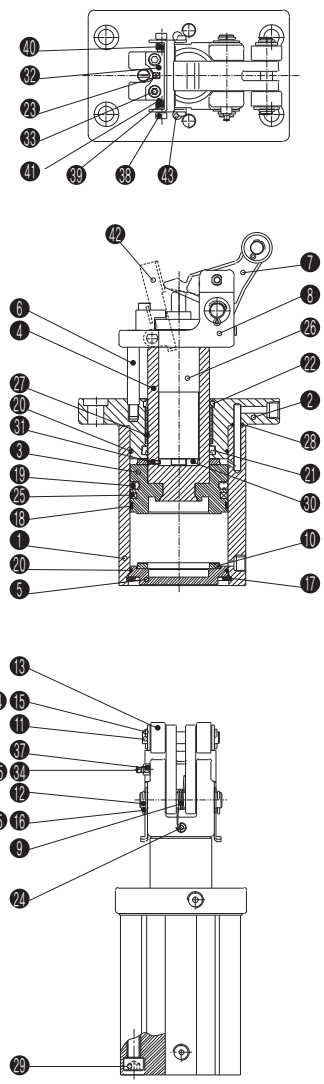
■Single Acting : ※Z
/Buitt-in spring

■V/V Type : ※Z-V※



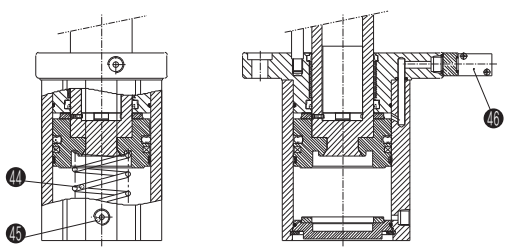
Construction / Part List

AMRBL ∮80



■Single Acting : ※T
■Double Spring : ※Z
/Built-in spring

■V/V Type : ※Z-V※

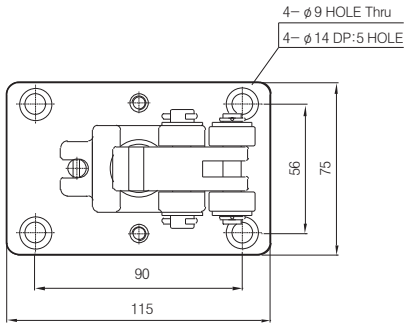


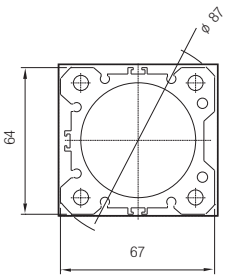
Part List

No.	Description	Material		Note
❶	Tube	Aluminum alloy	1	
❷	Rod Cover	Aluminum alloy	1	
❸	Piston	Aluminum alloy	1	
❹	Piston Rod	Carbon Steel	1	
❺	Head Cover	Aluminum alloy	1	
❻	Guide Rod	Carbon Steel	1	
❼	Lever	Carbon Steel	1	
❽	Holder	Carbon Steel	1	
❾	Lever Spring	Spring Steel	1	
❿	Bumper	NBR	2	Head, Rod
⓫	Roller Pin	Carbon Steel	1	
⓬	Lever Pin	Carbon Steel	1	
⓭	Roller	Mc Nylon	2	
⓮	Washer	Rolled Steel	2	
⓯	Washer	Rolled Steel	2	
⓰	Split pin	Wrought Steel	2	
⓱	Split pin	Wrought Steel	2	
⓲	C Snap Ring	Spring Steel	1	
⓳	Wearing	Resin	1	
⓴	Piston Packing	NBR	1	
㉑	Gasket	NBR	2	
㉒	Aod Packing	NBR	1	
㉓	Six angles hole stop Screw	Carbon Steel	2	
㉔	Six angles hole stop Screw	Carbon Steel	1	
㉕	Magnet Ring	NBR	1	
㉖	Shock Absorber	–	1	
㉗	Du Bush	Lead Bronce	1	
㉘	O-Ring	NBR	2	
㉙	Six angles hole Bolt	Carbon Steel	4	
㉚	Damper	Carbon Steel	1	
㉛	Six angles hole stop Screw	Carbon Steel	1	
㉜	Port Plug	Stoinless Steel	2	
㉝	Pass Ring	Carbon Steel	(1)	Option
㉞	O-Ring	NBR	(1)	Option
㉟	Look Bar	Carbon Steel	(1)	Option
㊱	Look Jig	Carbon Steel	(1)	Option
㊲	Fixing Bolt	Carbon Steel	(2)	Option
㊳	Look Spring(left)	Stcuinless Steel	(1)	Option
㊴	Look Spring(Rigot)	Stcuinless Steel	(1)	Option
㊵	Collar Spacer	Resin	(2)	Option
㊶	Look Bracket	Rolled Steel	(1)	Option
㊷	Stopper	Alloy steel	(2)	Option
㊸	Return Spring	Swp-b	1	
㊹	Plug boff	Alloy Steel	1	Siage Acfing
㊺	Plug boff	Alloy Steel	1	Siage Acfing
㊻	Solenoid V/V	–	1	DS2000 Serles

Dimensions

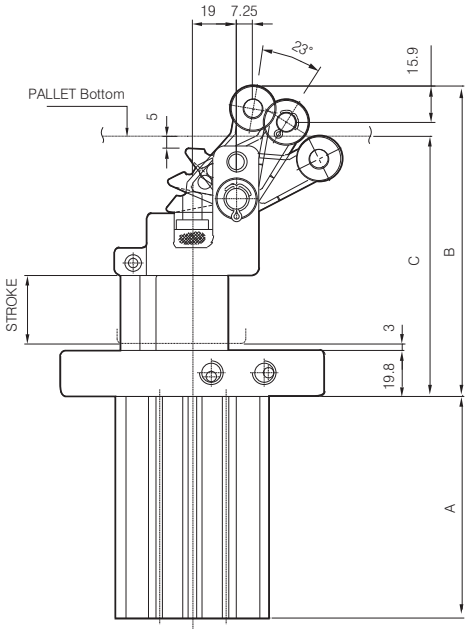
NSTLA50 (Standard)

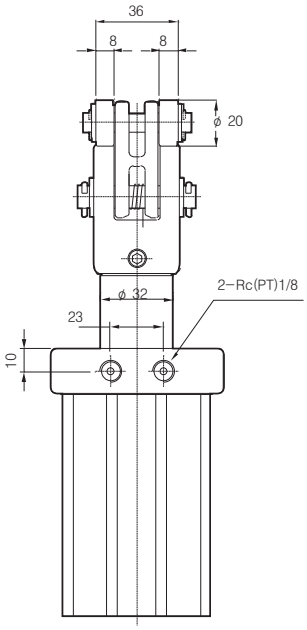




TUBE Cutting

Caution : Mounting □ 66×69



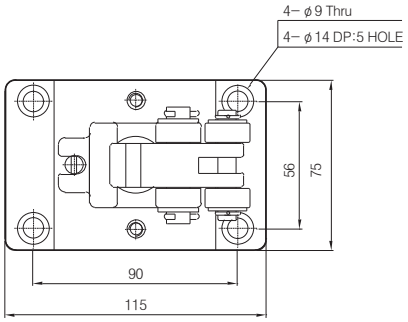


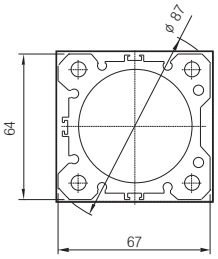
(Unit : mm)

St. \ Dim	A	B	C
25	91.7	130	108
30	96.7	135	113
40	106.7	145	123

Dimensions

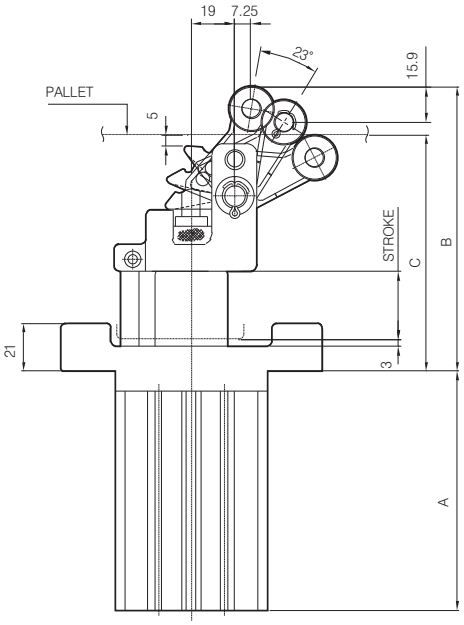
NSTLB50 (Rod Cover Slim Type)

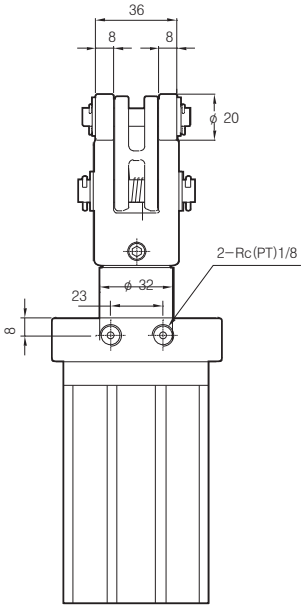




TUBE Cutting

Caution : Mounting □ 66×69



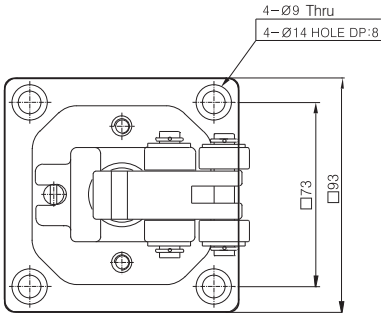


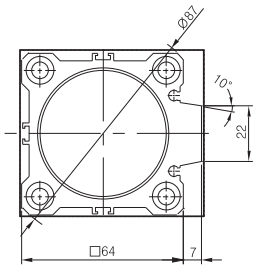
(Unit : mm)

St. \ Dim	A	B	C
25(Rod Cover Slim Type)	100.5	120	99
30(Rod Cover Slim Type)	105.5	125	104

Dimensions

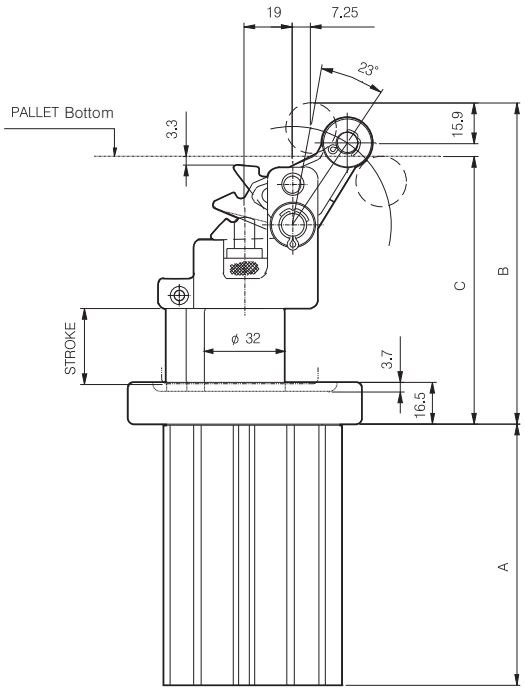
NSTLC50 (Square)

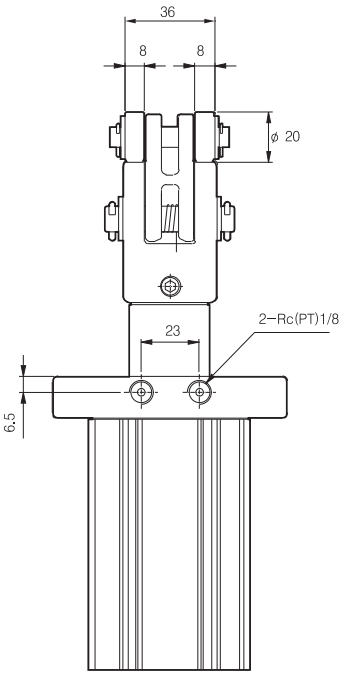




TUBE Cutting

Caution : Mounting □ 66×69



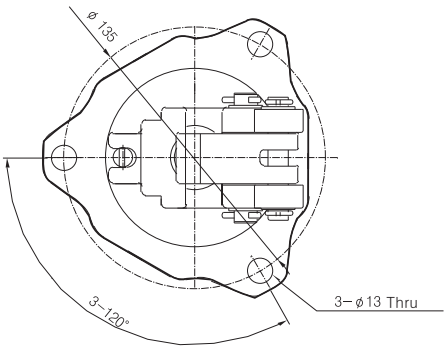


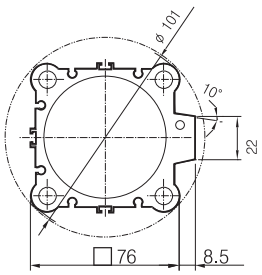
(Unit : mm)

St. \ Dim	A	B	C
30(Square)	103	127.2	106

Dimensions

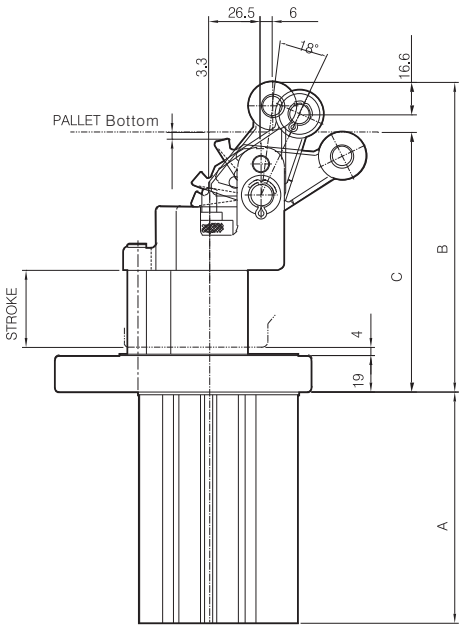
NSTLA63 (Standard)

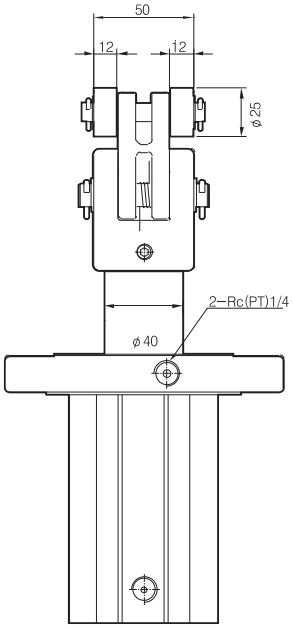




TUBE Cutting

Caution : Mounting Ø103



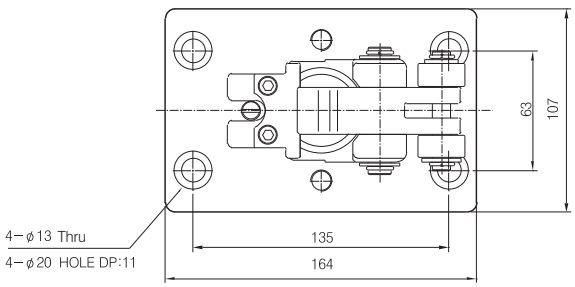


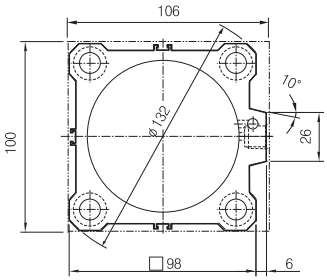
(Unit : mm)

St. \ Dim	A	B	C
30	109	150	124
40	119	160	134

Dimensions

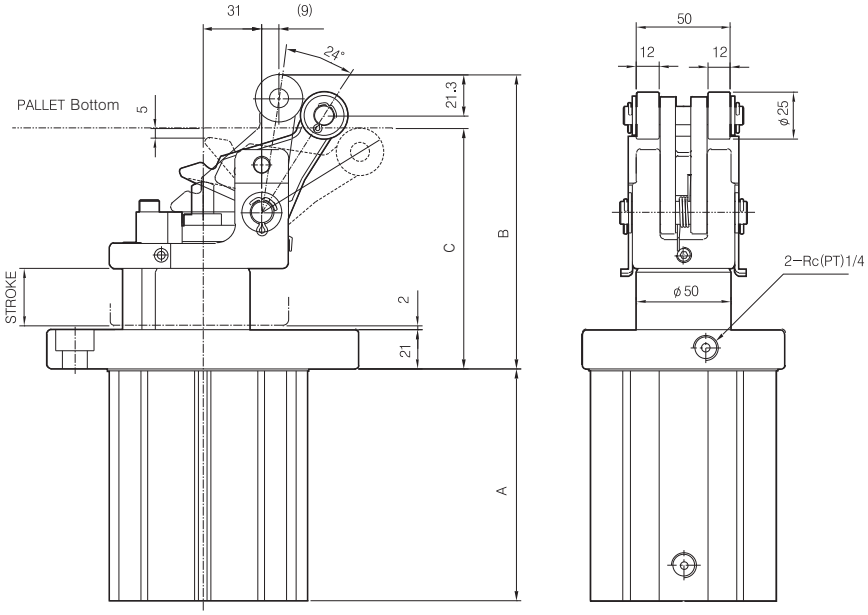
NSTLA80 (Standard)





TUBE Cutting

Caution : Mounting □ 100×106



(Unit : mm)

St. \ Dim	A	B	C
30	122	155	127
40	132	165	137

Series AST

Stopper Cylinder

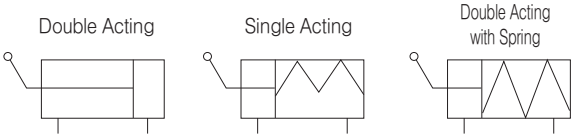
Bore Size(mm) : Ø50, Ø63, Ø80

DIRECT TYPE

ROLLER TYPE

- IT IS POSSIBLE TO CHANGE THE ROTATION OF THE ACTUATOR BY 360 DEGREES WITH STEPS OF 90°
- AUTO SWITCH CAPABLE
- SINGLE ACTION, DOUBLE ACTION, DOUBLE ACTION WITH SPRING EXTEND AVAILABLE

Symbol



How to Order

A	ST	R	50	—	30	D	M	—	V1	—	W4	S
1	2	3	4		5	6	7		8		9	10

1 Actuator

2 Stopper Cylinder

3 Model Type
Roller : R
Direct : D

4 Bore Type
50 : 50mm
63 : 63mm
80 : 80mm

5 Stroke
ϕ50 : 30
ϕ63 : 40
ϕ80 : 40

6 Action
Blank : Single Acting
D : Double Acting
Z : Double Acting with Spring

7 Roller
Blank : MC Nylon
M : Rolled steel(SPA material)

8 Valve
Blank : None
V1 : AC 110V
V2 : AC 220V
V5 : DC 24V

9 Auto Switch
Blank : None
W : Reed Auto Switch
W8H/W8V : Reed auto switch (horizontal type / vertical type)
W9H/W9V : Solid State auto switch (horizontal Type / vertical Type)

Caution :
1. According to the lead line direction of the existing plug point or non plug point auto switch, it is separated into horizontal/vertical types.
2. When the lead line length is 3m add an L to the end number of the product.
ex) W8H: W8HL
3. W4, W8H(V):Multiple use of DC24V, AC110V / Multiple use of W9H(V):DC24V

10 Number of Auto Switches
Blank : 2 pcs
S : 1 pc

DIRECT TYPE

Specifications

Action	Double Acting, Single Acting, Double Acting with Spring
Fluid	Air
Proof pressure	1.5MPa(213psi)
Max. Operating Pressure	1MPa(142psi)
Min. Operating Pressure	Double Acting:0.1MPa
	Single Acting:0.1MPa
Ambient and Fluid Temperature	-5℃ ~ 70℃
Lubrication	Not Required
Cushion	Rubber Cushion
Stroke Length Tolerance	$^{+1.4}_{0}$
Mounting type	Thru hole (standard), Both ends tapped
Auto Switch	Attachable
Type	Roller Type, Direct Type

Standard Stroke

Bore Size	Standard Stroke(mm)
ϕ50	30
ϕ63, ϕ80	40

Rod High Rigid

Tube Bore Size(mm)	ROD Size(mm)
ϕ50	32
ϕ63	40
ϕ80	50

ROLLER TYPE

Traverse Load and Operating Pressure

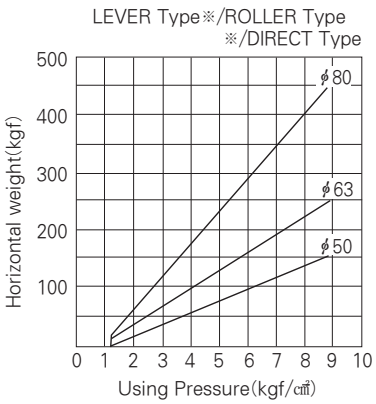
Pressure(kgf/cm²) / Bore Size((mm)	1.2	2	3	4	5	6	7
ϕ50	5	30	40	70	95	120	150
ϕ63	15	40	75	120	150	180	225
ϕ80	20	60	110	160	200	240	280

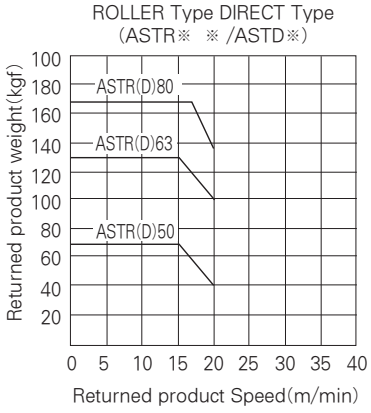
Weight

(unit : kgf)

Bore Size	Type	
	Roller Type	Direct Type
50-30st	2,170	2,200
63-40st	3,584	3,704
80-40st	5,656	5,792

Stopper Cylinder Selection Process





Precautions

Please be fully aware before using Please read the notice(Page 36) for safety.

Selection

Caution

- Do not scratch the connection area of piston.
  piston rod is not hardened, so damage can occur if connection part of pallet is sharp. In case of this, do not use. It causes non-function.
- When stopping temporarily load it is be absorbed to cylinder in Stopper cylinder.

Mounting

- Do not give the rotation torque to cylinder rod.
  Contact area of cylinder should be parallel to contact area of pallet in order not to occur rotation torque on the cylinder rod.

Operation

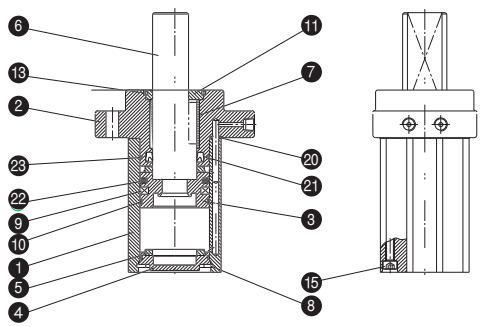
- Do not use the oil at the connection area of pistion rod.
  Oil causes non-function.

Repair and maintance

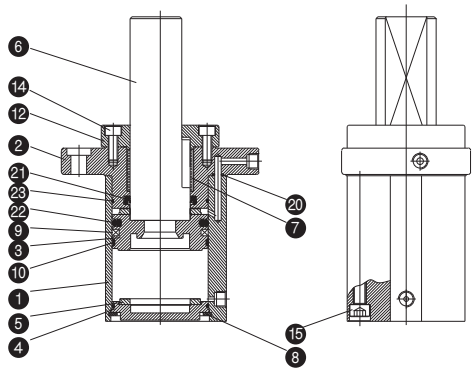
- When changing the direction for preventing rotation, release the two pieces of fixing bolt on the tube cover and rod cover and change the position and then tighten the bolts again.

Construction / Parts List

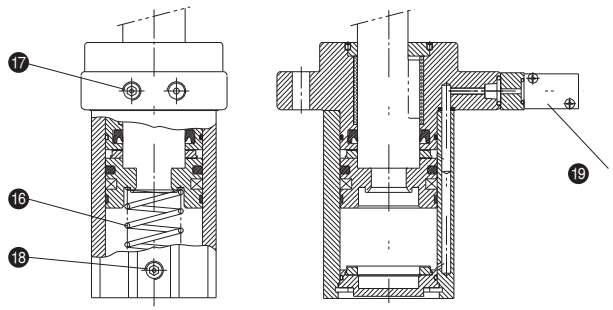
φ50(Double Acting: ※D)



φ63, φ80(Double Acting: ※D)



■ Single Acting: ※T
■ Double Acting: ※Z
Built-in Spring
■ V/V Type: ※Z-V※



Parts List

NO.	Description	Material	Qty	Note
❶	Tube	Aluminum alloy	1	Hard Alumite
❷	Rod Cover	Aluminum alloy	1	
❸	Piston	Aluminum alloy	1	Chromate
❹	Head Cover	Aluminum alloy	1	White Alumite
❺	Bumper	Urethane	2	HEAD, ROD
❻	Piston Rod	Carbon Steel	1	Hard Chrame Plated
❼	Bush	Lead bronze	1	
❽	C Snap ring	Spring Steel	1	
❾	Magnet Ring	NBR	1	
❿	Wear ring	Resin	1	
⓫	Guide		1	
⓬	Cover	Aluminum alloy	1	
⓭	Bolt	Alloy Steel	1	
⓮	Bolt	Chrome-molybdenum Steel	4	
⓯	Bolt	Chrome-molybdenum Steel	4	
⓰	Return Spring	Spring Steel	1	
⓱	Plug bolt	Alloy Steel	1	For single Acting φ50
⓲	Plug bolt	Alloy Steel	1	For single Acting φ63, 80
⓳	Solenoid V/V	–	1	DS2000 Series

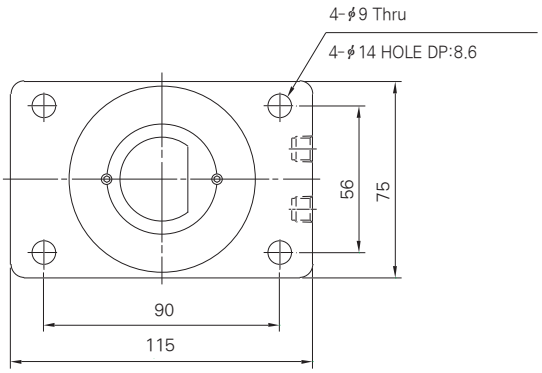
Packing List

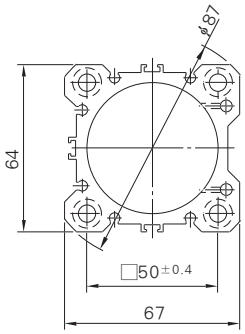
NO.	Description	Material	Qty	Bore Size			Note
				φ50	φ63	φ80	
⓴	O-ring	NBR	2	P5	P5	P6	
㉑	Rod Packing	NBR	1	PNY-32	PNY-40	PNY-50	
㉒	Piston Packing	NBR	1	PSD-50	PSD-63	PSD-80	
㉓	Gasket	NBR	2	C-46	C-60	C-75	ROD, HEAD

Dimensions / Direct Type

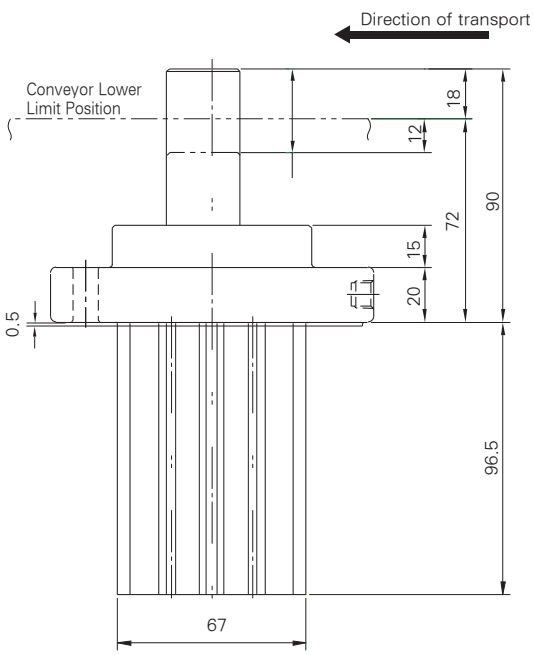
(Unit: mm)

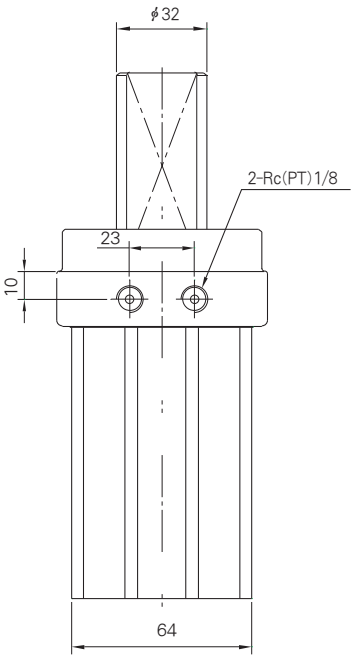
ASTD50-30D





Tube Cutting

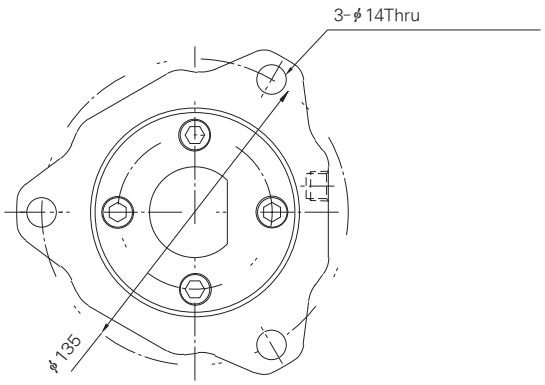


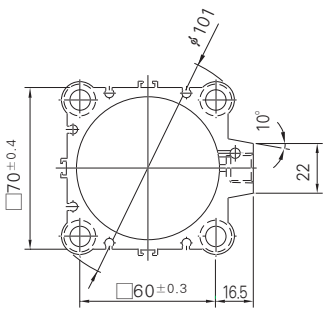


Dimensions / Direct Type

(Unit: mm)

ASTD63-40D





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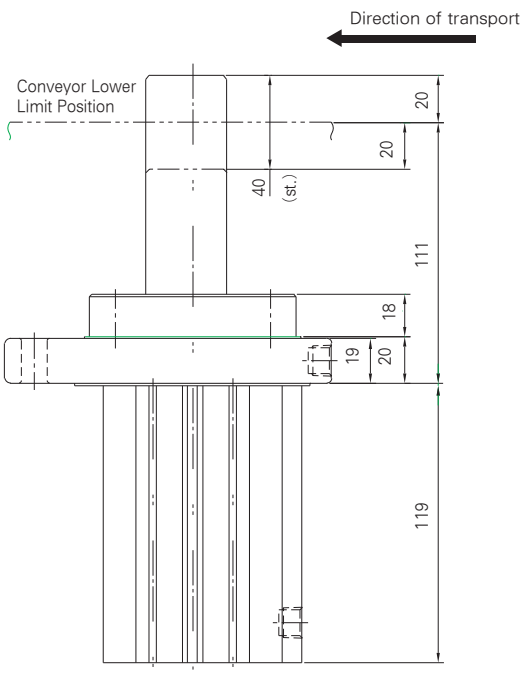
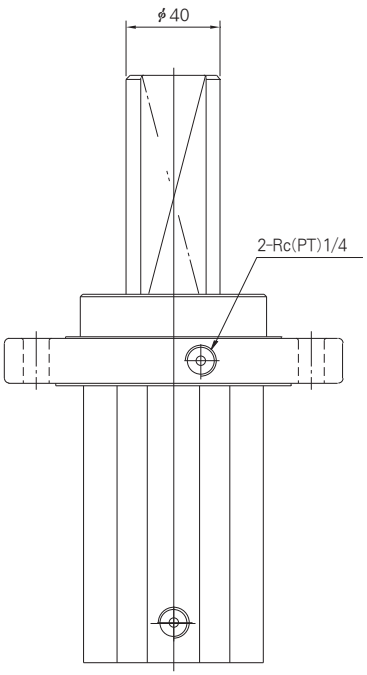
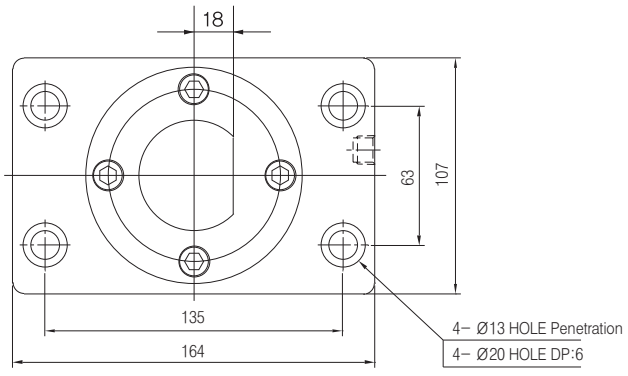


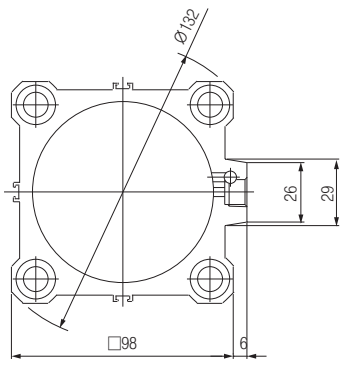


Dimensions / Direct Type

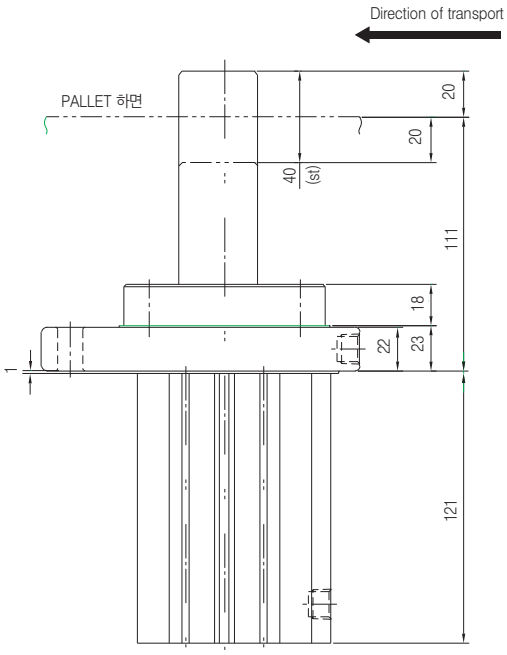
(Unit: mm)

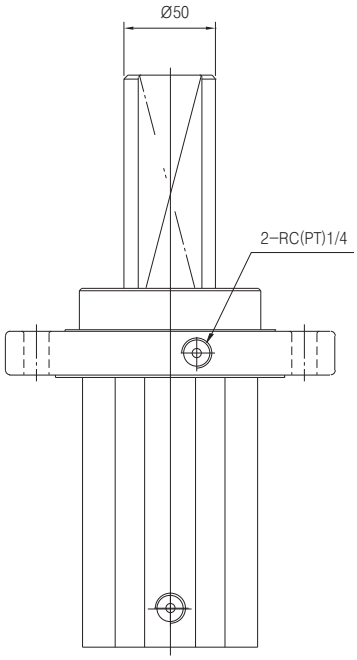
ASTD80-40D





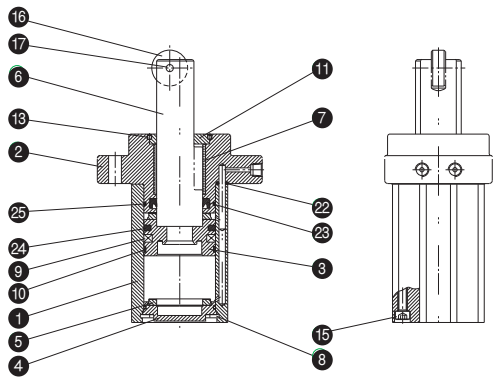
Tube Cutting



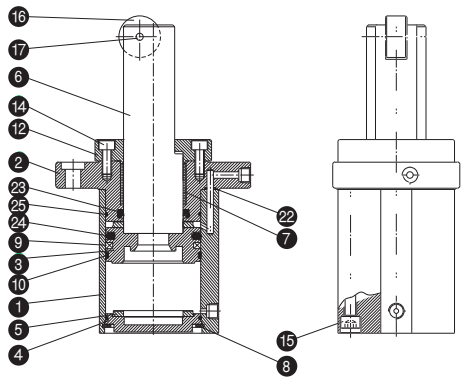


Dimensions / Direct Type

ϕ50(Double Acting: ※D)



ϕ63, ϕ80(Double Acting: ※D)



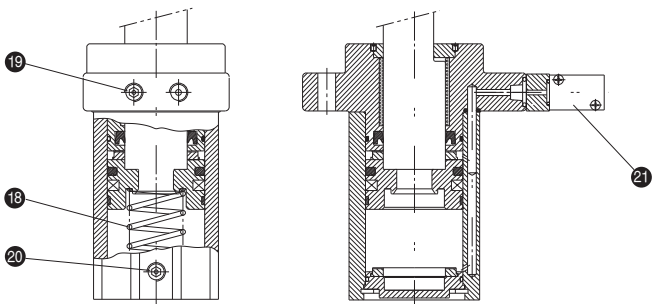
Parts List

NO.	Description	Material		Note
❶	Tube	Aluminum alloy	1	Hard Alumite
❷	Rod Cover	Aluminum alloy	1	
❸	Piston	Aluminum alloy	1	Chromate
❹	Head Cover	Aluminum alloy	1	White Alumite
❺	Bumper	Urethane	2	Head, Rod
❻	Piston Rod	Carbon steel	1	Hard Chrome Plated
❼	Bush	Lead bronze	1	
❽	C SNAPRING	Spring steel	1	
❾	Magnet Ring	NBR	1	
❿	Wear ring	Resin	1	
⓫	Guide		1	
⓬	Cover	Aluminum alloy	1	
⓭	Bolt	Alloy steel	4	
⓮	Bolt	Chrome-molybdenum steel	4	
⓯	Bolt	Chrome-molybdenum steel	1	
⓰	Roller	(MC-NYLON)	1	
⓱	Spring pin	Spring steel	1	
⓲	Return Spring	Spring steel	1	
⓳	plug bolt	Alloy steel	1	For single Acting ϕ50
⓴	plug bolt	Alloy steel	1	For single Acting ϕ63, 80
㉑	Solenoid V/V	-	1	DS2000 Series

Packing List

NO.	Description	Material	Qty	Bore Size(mm)			Note.
				ϕ50	ϕ63	ϕ80	
㉒	O-ring	NBR	2	P5	P5	P6	
㉓	Rod Packing	NBR	1	PNY-32	PNY-40	PNY-50	
㉔	Piston Packing	NBR	1	PSD-50	PSD-63	PSD-80	
㉕	Gasket	NBR	2	C-46	C-60	C-75C	ROD , HEAD

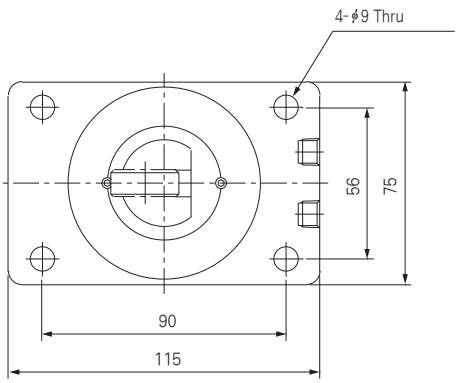
■ Single Acting: ※T
■ Double Acting: ※Z ■ V/V Type: ※Z-V※
Built-in spring

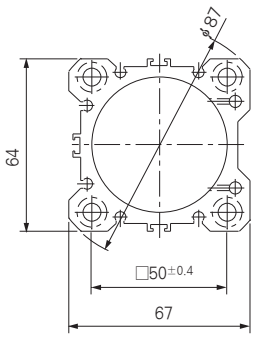


Dimensions / Roller Type

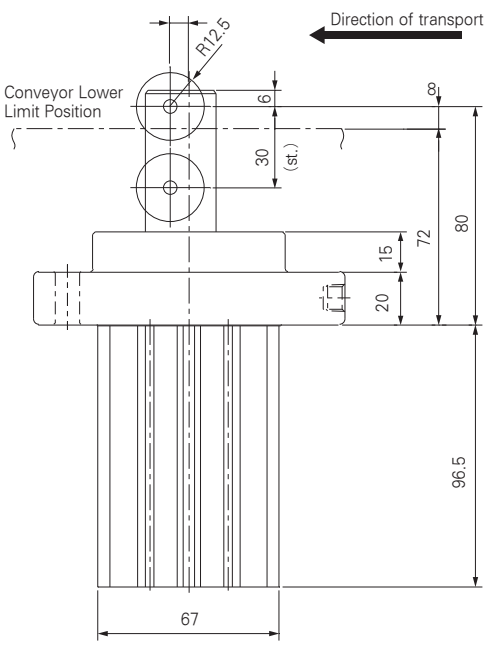
ASTR50-30D

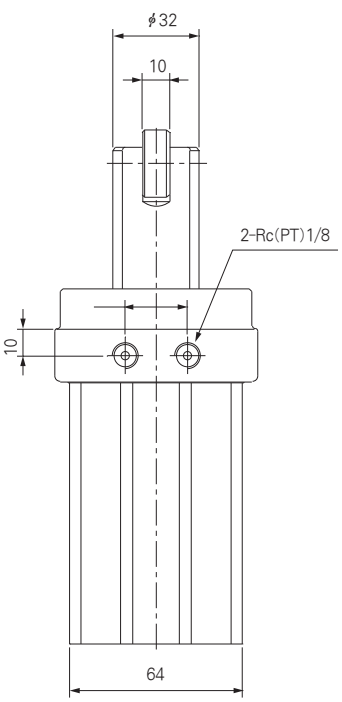
(Unit: mm)





Tube Cutting

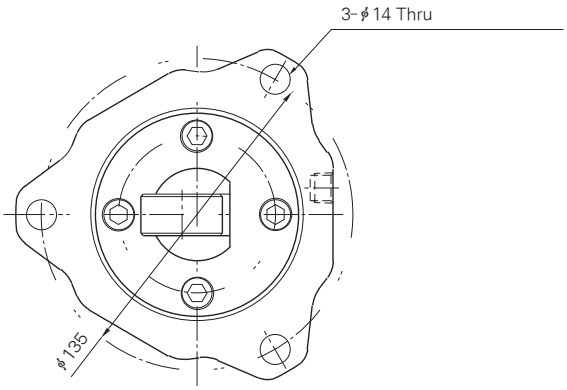


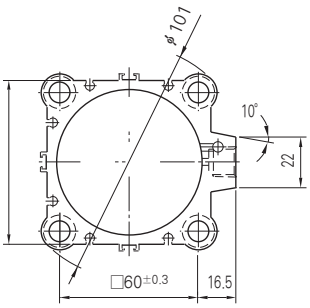


Dimensions / Roller Type

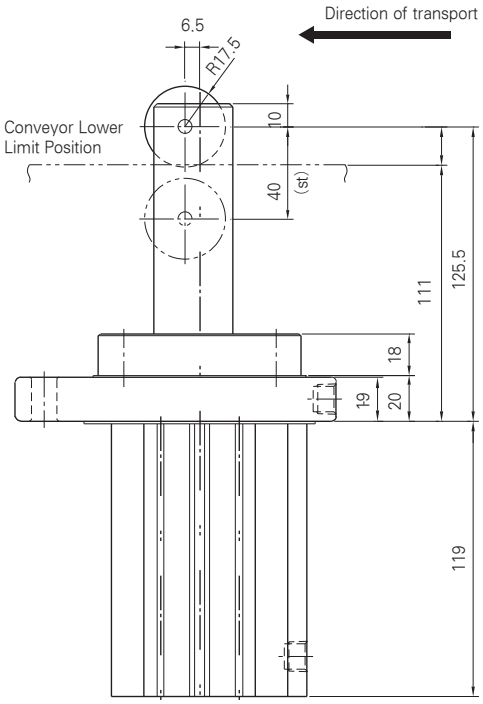
(Unit: mm)

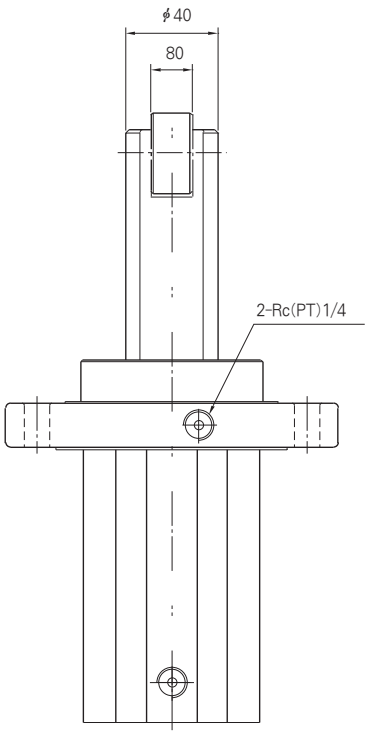
ASTR63-40D





Tube Cutting

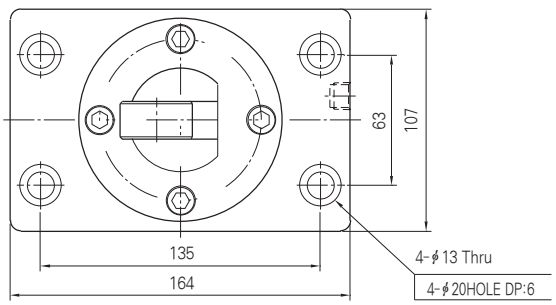


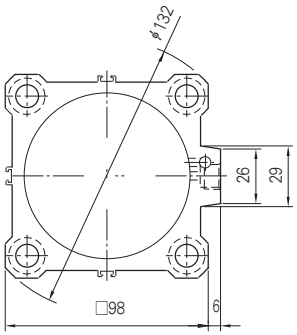


Dimensions / Roller Type

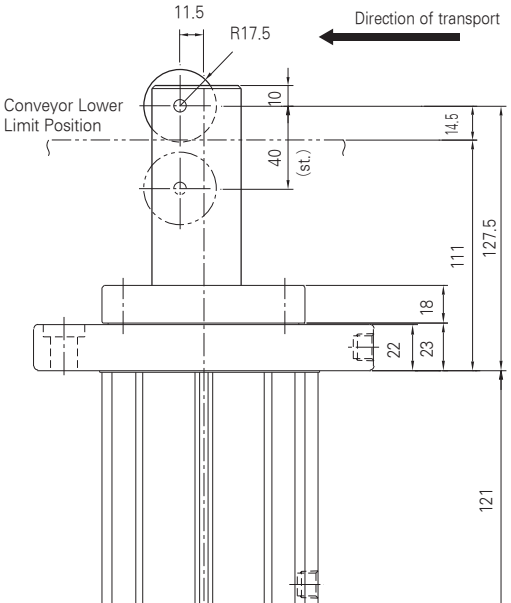
(Unit: mm)

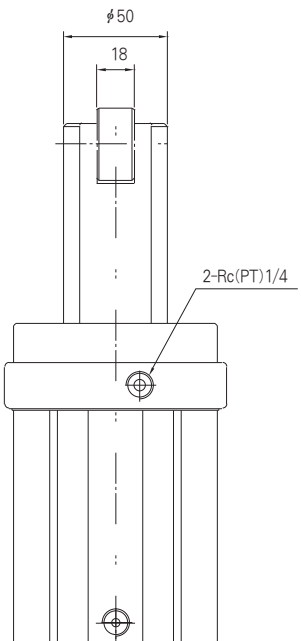
ASTR80-40D





Tube Cutting





Auto Switch

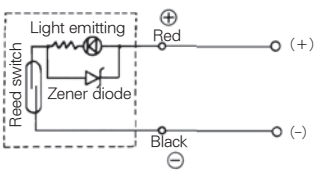
- Leakage current - None
- Response time - 1.2ms
- Lead Wire - Oil proof vinyl. ϕ3.4, 0.2mm², 2 wire(red, black), 0.5m
- Impact Resistance — 30G
- Insulation Resistance — 50MΩ or more under the test voltage DC500V (Between case and cable)
- Withstand Voltage — 1500VAC 1min (between case and cable)
- Ambient Temperature — 5~60℃
- Protection Structure — IEC spec IP67, Water-proof(JISCO920), oil-proof,

※ If 3m lead wire is required, L is put at end of model numbers.
(Example)W4L

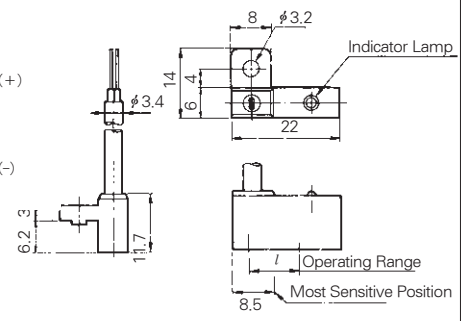
Auto Switch Specifications

W4 (With Indicator Lamp)		
Auto Switch Model	W4	
Application	Relay, Sequence Control	
Voltage	DC24V	AC110V
Range of Load Current	5~40mA	5~20mA
Protection Circuit for Contact Breaker point	None	
Internal Voltage Drop	2.4V or less	
Indicator Lamp	ON: Red light emitting diode	

Auto Switch/Internal Circuit



Auto Switch Dimensions



Precautions

Selection

1. When the lever is in a standing up position do not allow it to collide with the pallet.
   - When the lever is standing up and it collides with the pallet, power is absorbed to the cylinder body, so make sure no collision occurs.
2. Within the limits of the speed and weight of the product on the cat, only use when stopping the pallet.
   - When stopping the stopper cylinder from the connected cat, the cylinder driving force becomes horizontally lowered; if this occurs, please contact us.

Mounting

1. Make sure the rotation torque does not get tangled in the cylinder rod.
   - To make sure the rotation torque does not get tangled in the cylinder rod, mount it so that the cylinder rod contact area is parallel to the pallet contact area.
2. Be careful that the piston rod slide-way does not become damaged.
   - Packing damages may be the reason for operational errors and air leakages.

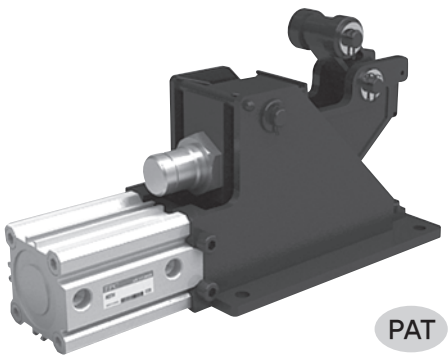
Operation

1. When attaching a lever type lock device, after lever locking, make sure outside force from the opposite direction does not get tangled.
   - When moving the conveyor or pallet, make sure to backup and pull down the cylinder.
2. When activating the pull up and pull down function of the cylinder, be careful of the narrow crack between the lever holder and the rod flange.
   - Make sure your hands or other instruments accidentally do not slip into the crack while operating.
3. Be careful that no cutting & grinding oil, water or dust wells up.
   - It will bring about damage to the shock-absorber.
4. Adjust the rod of the shock-absorber to its maximum level to collide with the returned product.
   - When the returned product energy is larger than the shock-absorber suction force during a collision, the lever holder will absorb the load.
   (When output is in the maximum force stage)

Series ASTH

Horizontal Stopper Cylinder

Bore Size : Ø32, Ø50



- AS THE LATERAL LOAD DOES NOT DIRECTLY APPLY ON THE CYLINDER, IT IS VERY RESISTANT TO LATERAL LOAD.
- AS THE JOINTING PLATE DOES NOT NEED HOLES TO INSERT CYLINDER TUBES, IT SAVES INSTALLATION COST.
- AS THE CYLINDER IS HORIZONTALLY LEVELED, IT IS SUITABLE FOR LOW CONVEYORS OR OTHER NARROW SPACES.
- IT SHOWS EXCELLENT PERFORMANCES COMPARED TO HORIZONTAL STOPPERS.
- ERGONOMIC STRUCTURE FOR CONVENIENCE AND DURABILITY

How to Order

A(D)ST	H	32	—	L	M	P	—	W4	S	—	BK	H
1	2	3		4	5	6		7	8		9	10

[1] Horizontal Type Stopper Cylinder
- * ADS if includes magnet (auto switch)
- D : With auto switch

[2] Attachment Type
- H : Horizontal

[3] Inner Diameter of Tube (Fixed Stroke)
- 32 : Ø32
- 50 : Ø50

[4] Cylinder Pipe Port Location
- Blank : Right
- L : Left
- * Refer to Dimension Drawing

[5] Stop Roller Material
- Blank : Resin (MC Nylon)
- M : Compressed Steel
- * Refer to Recommened Selection Table

[6] Installation of Pass Pin
- Blank : None
- P : Installed

[7] Lever Ascend & Descend Sensor
- Blank : None
- W4 : Angled Point Auto Switch
- W8H/W8V : Rounded Point Auto Switch
- W9H/W9V : Rounded No-Point Auto Switch
- W2P : Magnetic Auto Switch (Not applied to Model 32)
- BK : Adjacent Sensor Bracket (Only for 50, Refer to Dimension Drawing)

[8] Number of Auto Switches
- Blank : 2 pcs
- S : 1 pc
- N : N pcs

[9] Applicable Proximity Sensor
- BK : Basic
- BK1 : Up
- BK2 : Down
- BK3 : Up+Down

[10] Shock Absorber
- None for ϕ 32 : M20
- None for ϕ 50 : M36
- H for ϕ 50 : M42
- L for ϕ 50 : M25

Specifications

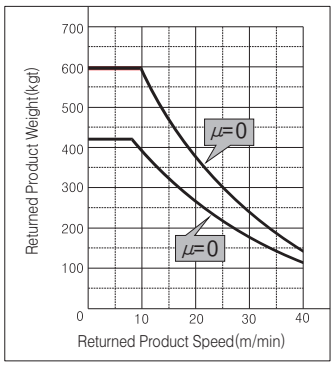
▼ **Specifications**

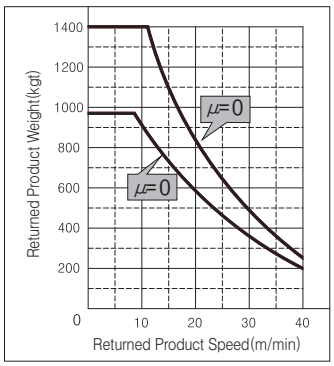
Items	Bore Size		Note
	Ø32	Ø50	
Fluid	Air		
Action	Double Acting		
Mounting	Horizontal(Bottom Frame) Mounting		
Proof Pressure	1.5MPa(15Kgf/㎠)		
Max. Operating Pressure	1.0MPa(10Kgf/㎠)		
Min. Operating Pressure	0.1MPa(1.0Kgf/㎠)		
Ambient and Fluid Temperaturre	−5~70℃(Without Freezing)		
Lubrication	Not Required		
Piston Speed	50~500mm/sec.		
Auto Switch	W4 W8H(V) W9H(V) AUTO Switch	W4 W8H(V) W9H(V) W2P	
Up & Down cylinder bore size X Stroke	Φ32X40mm	Φ50X40mm	Fixed Stroke
Allowable Load	5~600Kgf	10~1,400Kgf	Different regarding conveyor speed
Cushion	Rubber Cushion	Rubber Cushion	
Weight	2.5Kgf	9.5Kgf	Without Option Parts

▼ **Applying Shock Absorber Spec**

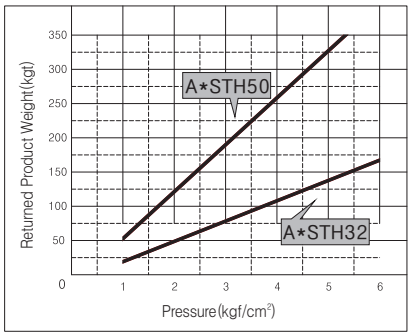
Part No.	SB2015-B	SB3625-B	Adjustable Type
Port Size	M20X1.5	M36×1.5	
Stroke	15mm	50×40mm	
Effective Weight	1.3~285N	17~2,450N	
Impact Force	1,160M	6,000M	
Return Force	8~15N	Rubber Cushion	
Weight	150g	680g	

Selection of Horizontal Stopper Cylinder and Applicable Pressure





Stop Capacity Graph for Pallet Return Force



Cylinder Pressure Graph for Lateral Load on Lever

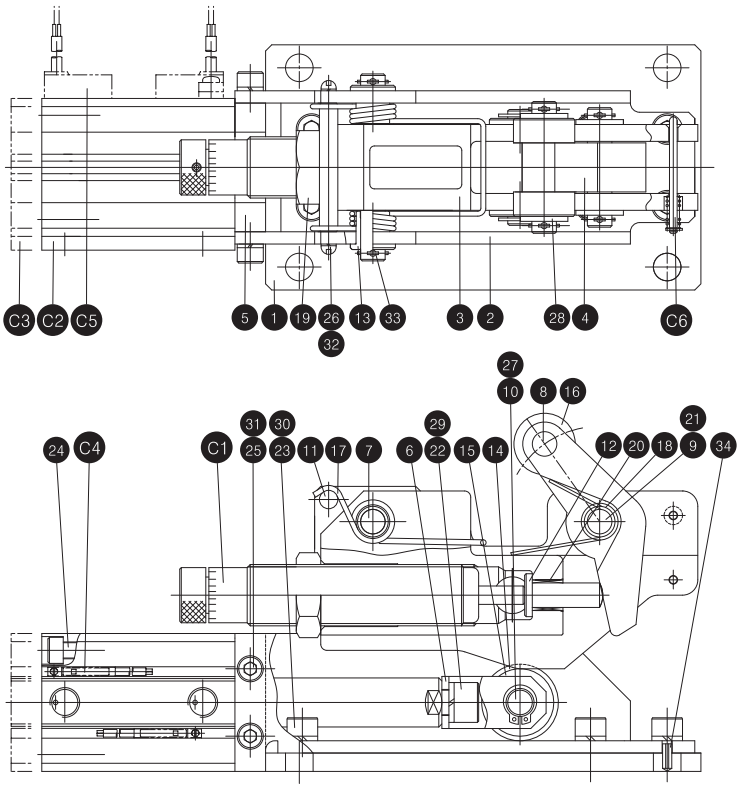
▶ Example Selection of Model and Pressure

- When stopping occurs when the pallet on a conveyor with 0.1 of friction force with cylinder is transported at 250kgf of weight and 20m/min speed and when two pallets are sometimes transported simultaneously
- ASTH50 model is selected based on Stop Capacity Graph for Pallet Return Force. As the actual lateral load on lever is about 50Kgf, refer to Cylinder Pressure Graph to select 1.5Kgf/㎠ or higher cylinder.

  * Lateral Load (50Kgf)=Pallets (2)*Friction Force (0.1)*Weight (250Kgf)

Structure/Parts LIST

A*STH32



Parts LIST

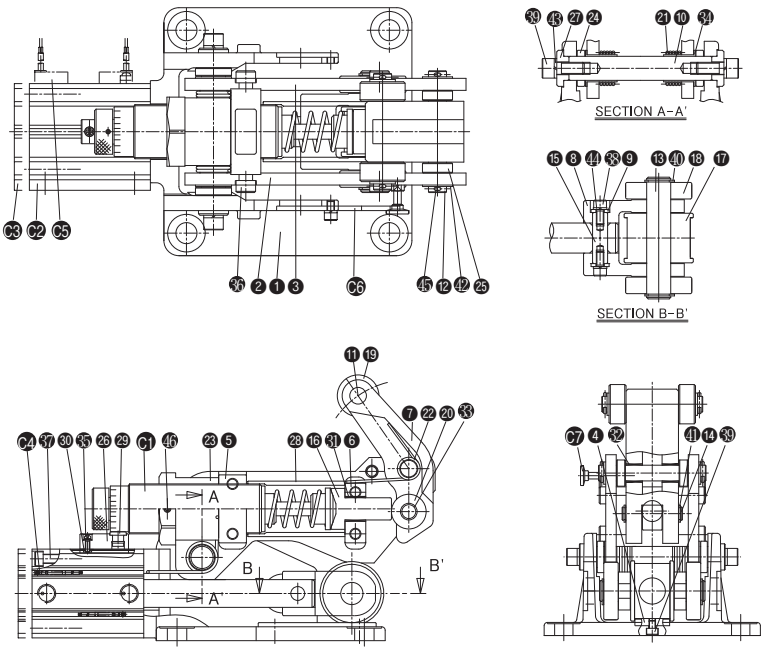
NO	Parts	Materials	Count	Remarks
❶	BASE PLATE	Compressed Steel	1	Silver Nitrate
❷	SIDE PLATE	Compressed Steel	1	Silver Nitrate
❸	HOUSING	Cast Steel	1	Silver Nitrate
❹	LEVER	Cast Steel	1	Chrome Plating
❺	CYLNDER PLATE	Compressed Steel	1	Silver Nitrate
❻	CYLINDER ROD JOINT	Compressed Steel	1	Silver Nitrate
❼	LEVER HINGEPIN	Chromium Molybdenum Steel	1	Nickel Plating
❽	STOP ROUER PIN	Chromium Molybdenum Steel	1	Nickel Plating
❾	LEVER PIN	Chromium Molybdenum Steel	1	Nickel Plating
❿	CYLNDER ROLLER PIN	Chromium Molybdenum Steel	1	Nickel Plating
⓫	SIDE SHAFT	Chromium Molybdenum Steel	1	Nickel Plating
⓬	SHOCK ABSORBER	Chromium Molybdenum Steel	1	Nickel Plating
⓭	BUSHING	Chromium Molybdenum Steel	2	Nickel Plating
⓮	CYLINDER ROLLER-A	Chromium Molybdenum Steel	1	Silver Nitrate
⓯	CYLINDER ROLLER-B	Chromium Molybdenum Steel	2	Silver Nitrate
⓰	STOP ROLLER	Chromium Molybdenum Steel / MC NYLON	2	(Refer to Model Selection Table)
⓱	HINGE SPRING	Spring Steel	1	Silver Nitrate
⓲	LEVER SPRING	Spring Steel	1	Silver Nitrate
⓳	LOCKNUT	Carbon Steel	1	Silver Nitrate
⓴	GUIDE BUSH	Cast Bronze	1	
㉑	GUIDE BUSH	Cast Bronze	2	
㉒	HEXAGONAL BOLT	Chromium Molybdenum Steel	1	Silver Nitrate
㉓	HEXAGONAL BOLT	Chromium Molybdenum Steel	6	Silver Nitrate
㉔	Hexagonal Bolt	Chromium Molybdenum Steel	4	Silver Nitral
㉕	Hexagonal Bolt	Chromium Molybdenum Steel	4	Silver Nitral
㉖	Small "+" Nail	Chromium Molybdenum Steel	2	Nickel Platir
㉗	C Stop Ring	Spring Steel	2	Silver Nitral
㉘	Flat Washer	Compressed Steel	4	Zinc Plating
㉙	Spring Washer	Spring Steel	1	Silver Nitral
㉚	Spring Washer	Spring Steel	6	Silver Nitral
㉛	Spring Washer	Spring Steel	4	Silver Nitral
㉜	Spring Washer	Spring Steel	2	Nickel Platir
㉝	Divide Pin	Flexible Steel	6	Zinc Plating
㉞	Spring Pin	Spring Steel	2	Silver Nitral

Packing LIST

NO	Model	Model No.	Count	Remarks
C6	PASS PIN ASS'Y	ASTH32-60A-A3455-1	1	Includes Spring, E Stop Ring. Flat Washer
C5	Auto Switch	D-A73K",D-173TN(P)"	1 (2)	(Refer to Model No. and Auto Switch Catalog)
C4		WB", WB""		
C3	AIR CYLINDER	ADD2832-40DC-AA3455-1	1	With Auto Switch
C2		AD2832-40DC-AA3455-1		Without Auto Switch
C1	SHOCKABSORBER	BB2015-B	1	1 Lock Nut

Structure/Parts List

A*STH50



Part LIST

NO	Parts	Materials	Count	Remarks
❶	BASE PLATE	Castiron	1	Silver Plating
❷	SIDE PLATE-R	Compressed Steel	1	Silver Nitrate
❸	SIDE PLATE-L	Compressed Steel	1	Silver Nitrate
❹	ROLLER GUIDE PLATE	Compressed Steel	1	Silver Nitrate
❺	SHOCK ABSORBER HOLDER	Compressed Steel	1	Silver Nitrate
❻	ADAPTER HOLDER	Compressed Steel	1	Silver Nitrate
❼	LEVER	Cast Steel	1	Black Plating
❽	CYLNDER ROD JOINT	Cast Steel	1	Black Plating
❾	JOING APACER	Carbon Steel	1	Silver Nitrate
❿	LEVER HINGE PIN	Chromium molybdenum Steel	1	Silver Nitrate
⓫	STOP ROLLER PIN	Chromium molybdenum Steel	1	Silver Nitrate
⓬	LEVER PIN	Chromium molybdenum Steel	1	Silver Nitrate
⓭	CYLNDER ROLLER PIN	Chromium molybdenum Steel	1	Silver Nitrate
⓮	LEVER ROLLER PIN	Chromium molybdenum Steel	1	Silver Nitrate
⓯	ROD JOINT PIN	Chromium molybdenum Steel	1	Silver Nitrate
⓰	SHOCK ABSORBER ADAPTEA	Chromium molybdenum Steel	1	Silver Nitrate
⓱	CYLNDER FOLLER-A	Chromium molybdenum Steel	1	Silver Nitrate
⓲	CYLNDER FOLLER-B	Chromium molybdenum Steel	2	Silver Nitrate
⓳	STOP ROLLER	Chromium molybdenum Steel / MC Nylon	2	Refer to Model & Selection Table)
⓴	LEVER ROLLER	Chromium molybdenum Steel	1	Silver Nitrate
㉑	HINGE SPRING	Spring Steel	1	Silver Nitrate
㉒	LEVER SPRING	Spring Steel	1	Silver Nitrate
㉓	LOCK HNT	Carbon Steel	1	Silver Nitrate
㉔	SIDE PLATE SPACER		2	
㉕	LEVER SPACER		2	
㉖	UPPER PLATE	Aluminum Alloy	1	Black Alumilite
㉗	T-WASHER	Carbon Steel	1	Silver Nitrate
㉘	SHOCK ABSORBER COVER	Acryl	1	
㉙	BUMPER	Urethane	1	
㉚	BUMPER PLATE MOUNTING HUT	Compressed Steel	1	Nickel Plating

NO	Parts	Materials	Count	Remarks
㉛	GUIDE BUSH	Cast Bronze	1	
㉜	GUIDE BUSH	Cast Bronze	2	
㉝	GUIDE BUSH	Cast Bronze	1	
㉞	FLANGE BUSH	Cast Bronze	2	
㉟	SCREN ASS'Y	Carbon Steel	1	Nickel Platir
㊱	HEXAGONAL BOLT	Chromium molybdenum Steel	2	Silver Nitral
㊲	HEXAGONAL BOLT	Chromium molybdenum Steel	3	Silver Nitral
㊳	HEXAGONAL BOLT	Chromium molybdenum Steel	4	Silver Nitral
㊴	HEXAGONAL BOLT	Chromium molybdenum Steel	2	Nickel Platir
㊵	C Stop Ring	Spring Steel	2	Silver Nitral
㊶	C Stop Ring	Spring Steel	2	Silver Nitral
㊷	FLAT WASHER	Compressed Steel	4	Zinc Plating
㊸	SPRING WASHER	Spring Steel	2	Silver Nitral
㊹	SPRING WASHER	Spring Steel	2	Silver Nitral
㊺	DIVIDE PIN	Flexible Steel	4	Zinc Plating
㊻	SET SCREW	Chromium molybdenum Steel	2	Silver Nitral

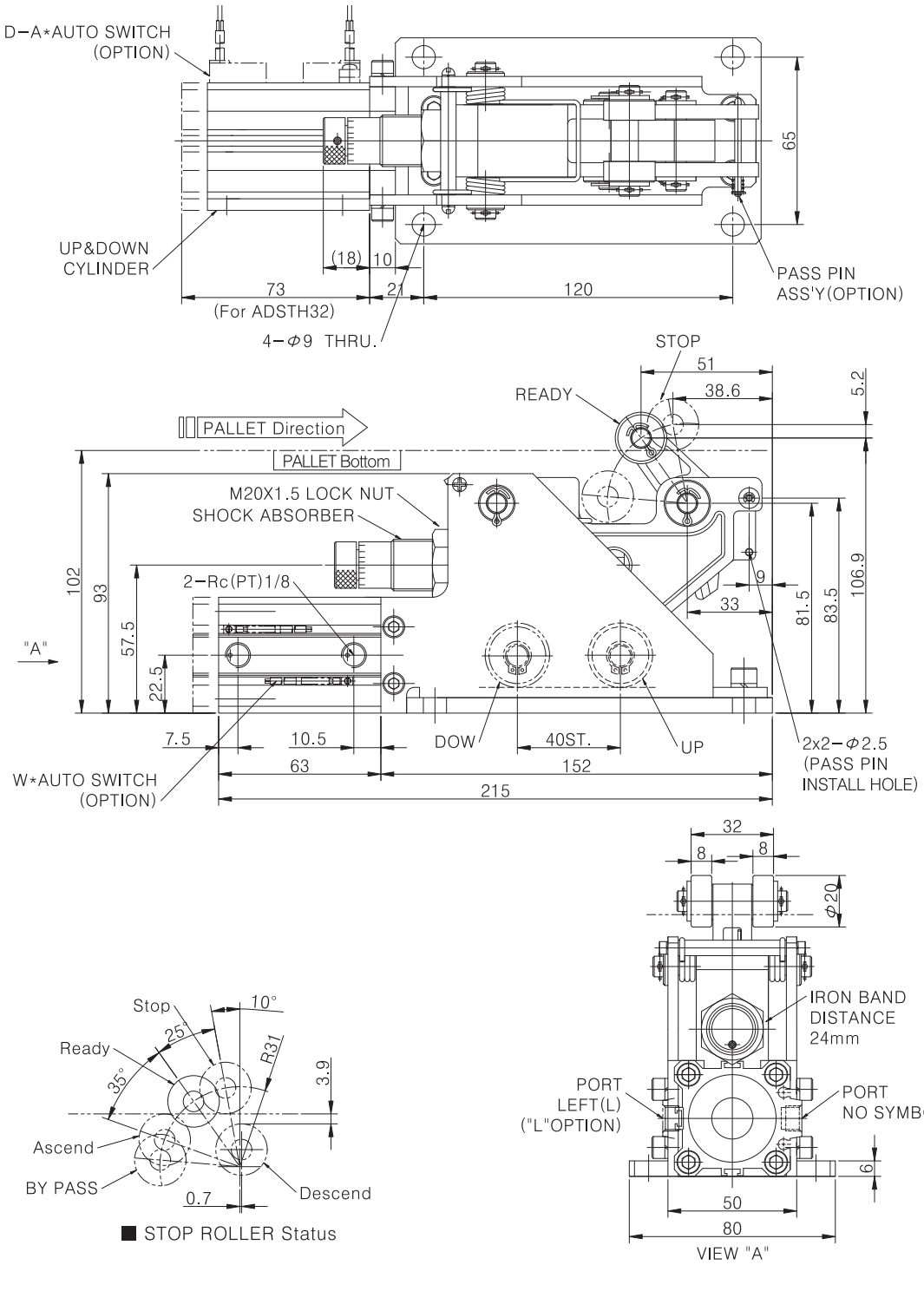
Packing LIST

NO	Model	Model No.	Count	Remarks
C7	PASS PIN ASS'Y	ASTH32-60A-A3455	1	
C6	SENSOR BRACKET ASS'Y	ASTH32-60A-A3455	1	(2 Bolts with M5)
C5	AUTO SWITCH	D-A73K",D-173TN(P)"	(2)	(Refer to Model No. and Auto Switch Catalog)
C4		WB", WB""		
C3	AIR CYLINDER	ADD2832-40DC-AA3455-1	1	With Auto Switch Without Auto Switch
C2		AD2832-40DC-AA3455-1		
C1	SHOCK ABSORBER	BB2015-B	1	

Outside Dimensions

(Unit: mm)

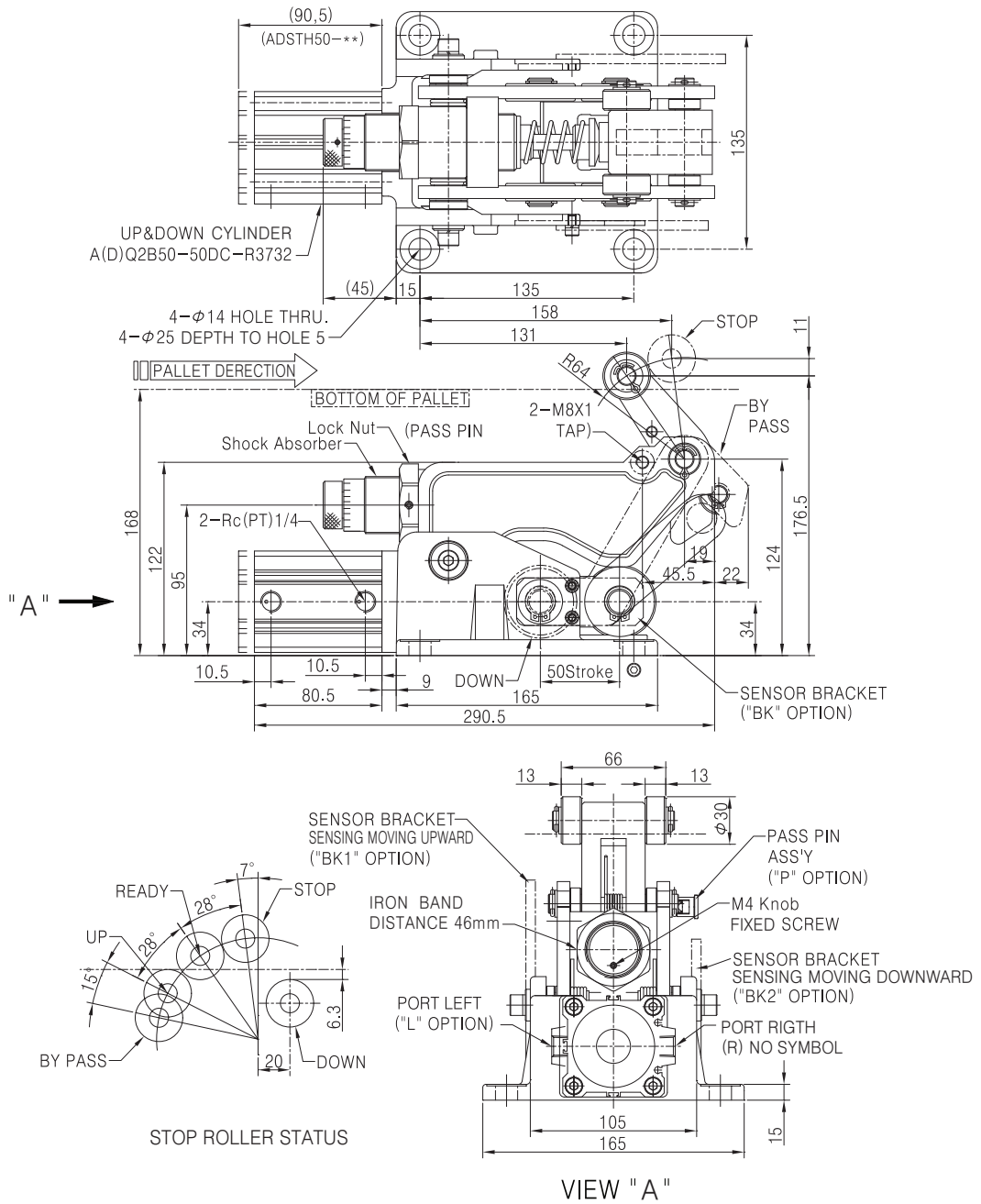
A*STH32



Outside Dimensions

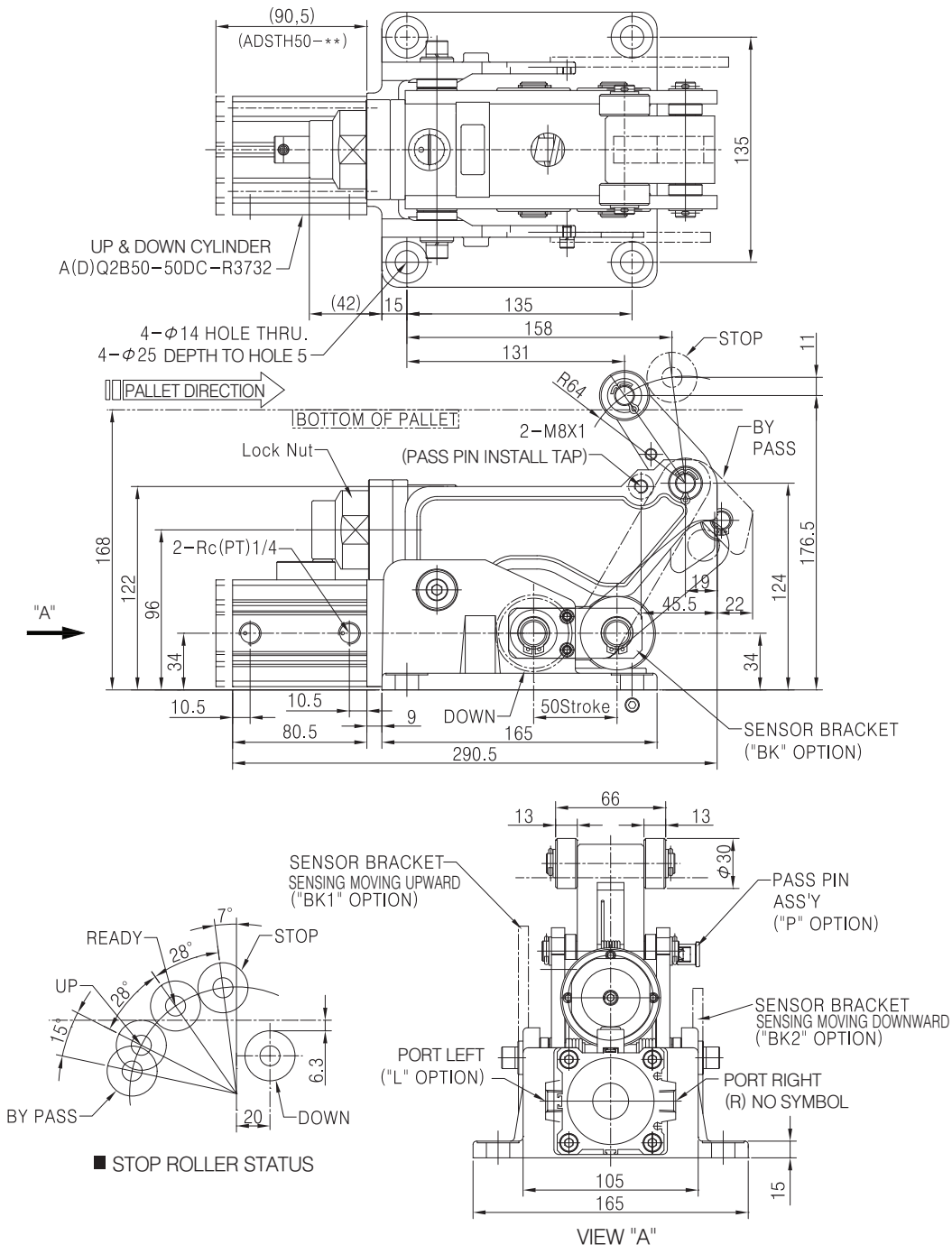
(Unit: mm)

A*STH50



Outside Dimensions

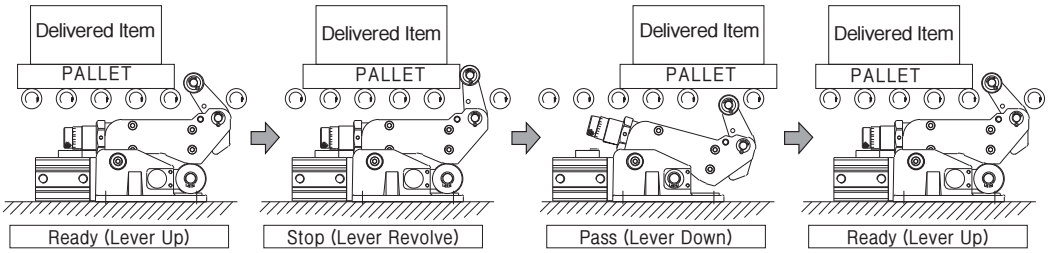
A*STH50-**-H



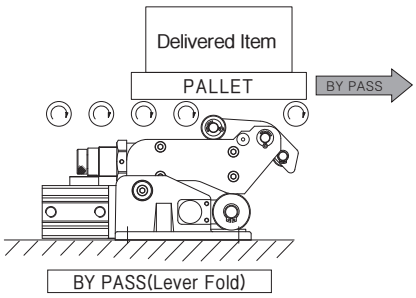
■ STOP ROLLER STATUS

Horizontal Stopper Cylinder Level Operation Status

▣ Horizontal Stopper Cylinder Pallet at Stop
Horizontal Stopper Cylinder's lever repetitively undergoes the following process to control pallet transportation.



▣ BY PASS Status
When lever does not control pallet transportation.
For further information, please refer to Manual.



How to Use Horizontal Stopper Cylinder

● Thoroughly read the following material:
– For other uses, please refer to TCQ2 Cylinder or Shock Absorber (SD**) Catalogs.

● Selecting Stop Roller Materials
– Refer to the following table to select stop roller materials.

▶ Recommended Stop Roller Material Selection

Delivered Item (Kg)	Weight Resin	PALLET Aluminum	Material Compressed Steel	Remarks
300 and below	N	N	N	
300 or above	M	M	M	

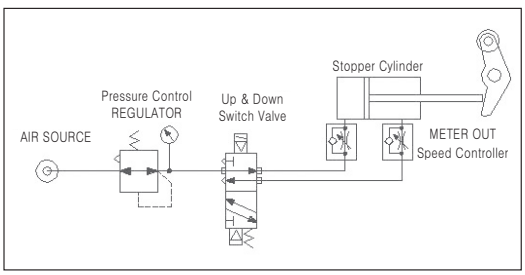
Abbrev) M=Compressed Steel, N=Nylon
Note) If you need other materials or need to change sizes, please contact the company.

● Recommended Air Pressure for Cylinder Indicated below:
– Install air pressure circuit for operation as indicated below:

▶ Speed : Control ascending/descending speed using a meter-out speed controller on the front and back of the cylinder.

▶ Pressure : Install a regulator before the switching valve to prevent excessive pressure on the cylinder.

▶ Switch Valve : Single valve is recommended so the lever does not ascend to pass pallets even when the valve is out.

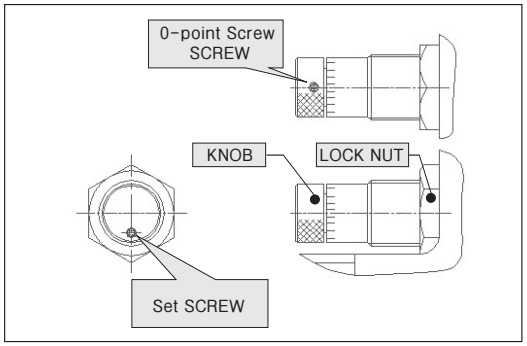


● Controlling Impact on Shock Absorber
– After installing the cylinder, rotate the knob on shock absorber in the picture to adjust the maximum shock absorption according to weight and speed of transportation
– How to Control
: Rotate the knob and the 0-point screw on top to increase the shock absorption calibration to reach the highest point. Drop the calibration one by one and fix it on the location where the pallet will lay on the stop roller.
When fixing is complete, fasten the set screw so that the knob does not rotate in vibration or impact.

▶ Size of Wrench Used to Fix Knob

Φ32	1.5mm
Φ50	2mm

How to use Horizontal Stopper Cylinder



● How to Replace Shock Absorber

- If a wrong shock absorber is selected or the shock absorber needs to be replaced, follow the steps below:
- How to replace
  : When replacing shock absorber, refer to the dimension and structure drawings.

▶ Use the correct size wrench to unfasten the lock nut that is fixing the shock absorber. Disassemble it by turning it counterclockwise.

❗ Caution: For the 50 Model, disassemble the set screw before turning the lock nut.

▶ Grab the knob and turn it clockwise to disassemble the shock absorber. The set screw must be fastened.

▶ Turn the new shock absorber clockwise to set it in place and fix it by fastening the lock nut.

Caution: After assembling the shock absorber, fasten the lever and secure additional strokes. Otherwise, it may cause a breakdown.

▶ Upon completing the replacement, pull the lever 2–3 times and check whether the adapter proceeds and recedes with no obstacles.

Caution: We do not guarantee the quality of shock absorbers of other brands.

● How to Change Cylinder Pipe Port Location

- To change the cylinder pipe port location, follow the steps below:
- How to change

▶ Turn the set screw on bumper block on top of the cylinder counterclockwise and take it off for ϕ50 only

▶ Completely unfasten four bolts counterclockwise, pull the cylinder about 2–5mm apart from the frame, and rotate it 180° so the port is placed on the opposite side.

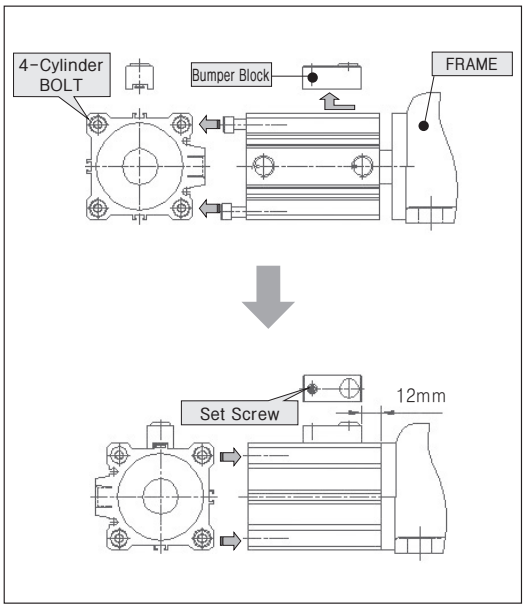
▶ Bolt Sizes

Model	No Switch	With Switch	Remarks
ϕ32	M5×65L	M5×65L	(4mm Wrench)
ϕ50	M6×80L	M6×90L	(5mm Wrench)

▶ Turn four bolts clockwise for temporary assembly and fix the bumper block (50 Model) as shown below.

▶ Operate the cylinder 2–3 times and completely fasten the four bolts.

Caution: If you omit the temporary assembly process, the cylinder might be stuck and not work well.



● How to Replace Cylinder

- To replace the cylinder, follow the steps below:
- How to Replace
  : Refer to the Structure Drawing.

▶ Unfasten the Rod Joint at the end of the cylinder rod.

▶ Disassemble the cylinder from frame as described under "How to Change Cylinder Pipe Port Location."

▶ Reverse the disassembly steps to reassemble.

Caution: We do not guarantee the quality of performance if you disassemble cylinder in a random manner.

● Pass Pin Feature

User's Manual and Installation Instruction

- Description
  : If you do not need the spare part or long-term stop function, push cylinder lever toward shock absorber and fix it for the pallet to pass without any stop.
- How to Use

▶ The 50 Model
: As shown in the drawing, push cylinder lever toward shock absorber and push the Pass Pin into the Pass Pin Hanging Pin Hole on the Lever.

How to use Horizontal Stopper Cylinder

To disassemble, slightly push the lever and pull the hook on the Pass Pin. Put the lever to ready to use.

Caution : When it is not set to By Pass, always pull the pin so it recedes. If pin is set to proceed, it might be damaged by the lever.

▶ The 32 Model

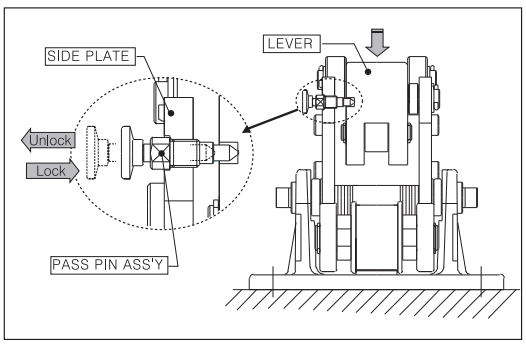
: As shown in the drawing, push the lever toward the shock absorber to set it to By Pass and push the pin to release it.

• How to Install (Left or Right)

▶ The 50 Model

: Use a wrench to fix the Pass Pin Assembly onto M8X1 Screw Thread on the side plate.

Caution: When assembling, cover the screw thread with lock tight fabric or seal tape to prevent unfastening in vibration.

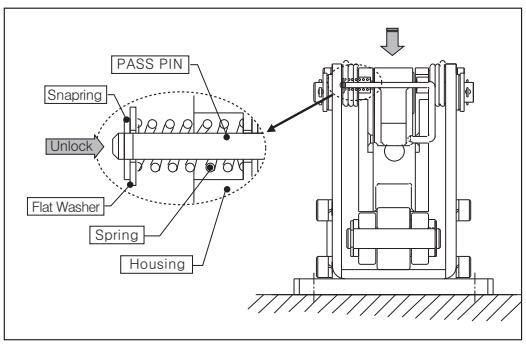


▲ Installation of the 50 Model

▶ The 32 Model

: Insert the "ㄷ"-shaped pass pin into the 2.5 hole on the housing and assemble spring-flat washer-and snap ring.

Caution : Reassembling the snap ring more than twice would cause it to lose elasticity and loosen in vibration. Therefore, replace loosened snap ring.



▲ Installation of the 32 Model

● How to Install Adjacent Sensor (only for 50 Model)

• Use the adjacent sensor to monitor whether the cylinder lever is up (ready/stop) or down (pass) using the location of Joint Pin at the end of the Cylinder Rod and whether the operation is on or off.

Caution: Lever rotation and By Pass cannot be monitored.

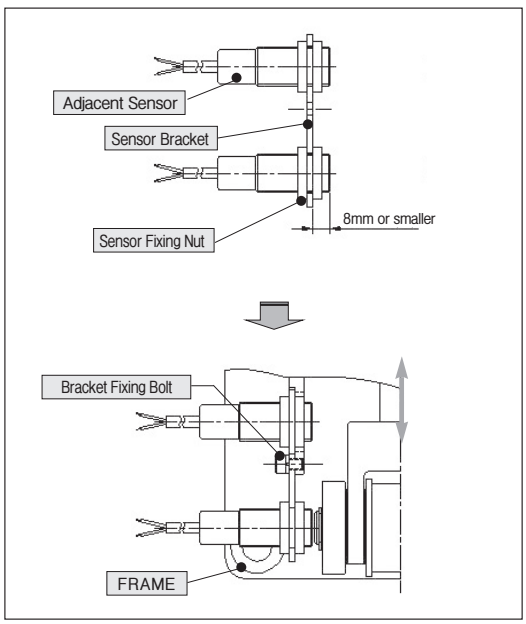
• How to Install

▶ As shown below, use two nuts to fix the adjacent sensor onto the sensor bracket and insert it to the fixing hole on the frame, and use two fixing bolts (M5X8L, including spring washer) to install it.

▶ Select an adjacent sensor (sold separately) that satisfies the following:

※ Adjacent Sensor

SIZE	Adjacent Distance
M18	5~10mm

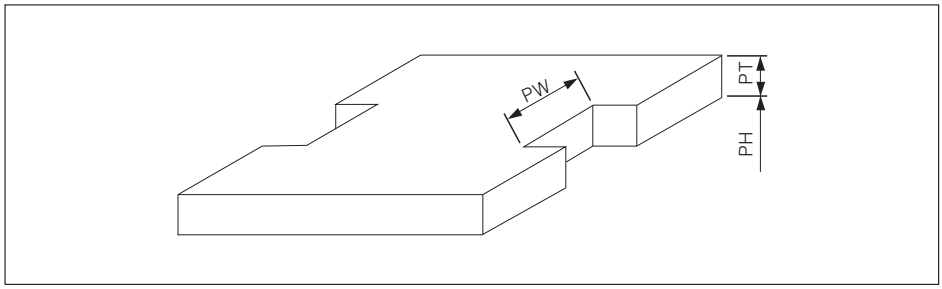


● Refer to our ADQ2** Cylinder Catalog for the installation and use of cylinder Auto Switch.

Safety Suggestions

- Thoroughly read the following before using the device.
  – For other safety suggestions, refer to the Vertical Stopper Cylinder (NST**)Catalog.
- For the convenient stopping of the cylinder lever, refer to the following dimensions for the height from cylinder plate to the bottom of pallet (PH), thickness of pallet (PT), and lever touch width (PW).
  – Recommended Dimensions

Model	Height of Bottom of Pallet(PH)		Minimum Thickness of Pallet(PT)	Minimum Width of Lever Touch(PW)
	Height	Error Allowance		
Φ32	102	±3	15	45
Φ50	168	±5	25	80



- Because horizontal stopper cylinder is longer towards the pallet direction, secure a certain width of space so the roller conveyor is free from obstacles when operating the cylinder.
- When using one cylinder, install accordingly so the two stop rollers meet each other and stop in the center of pallet. If the delivered item's center of load on the pallet is not set to maintain balance, place two cylinders symmetrically. If installing two cylinders is impossible, fasten the pallet to minimize vibration and move the cylinder to the center of delivered item.
  – If repeated stopping leaves excessive moment load onto the side of the lever's stop roller, it may damage surrounding parts.

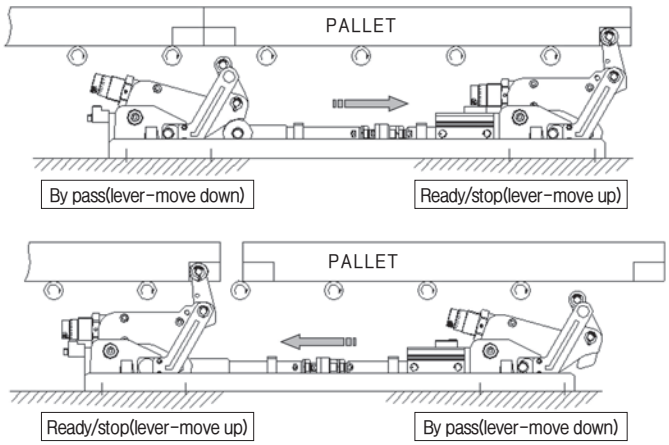
Series ASTH

Applications / Double Lever Type

Bore Size(mm) : Ø32, Ø50

▣ Stop postion of horizontal stopper cylinder with double lever

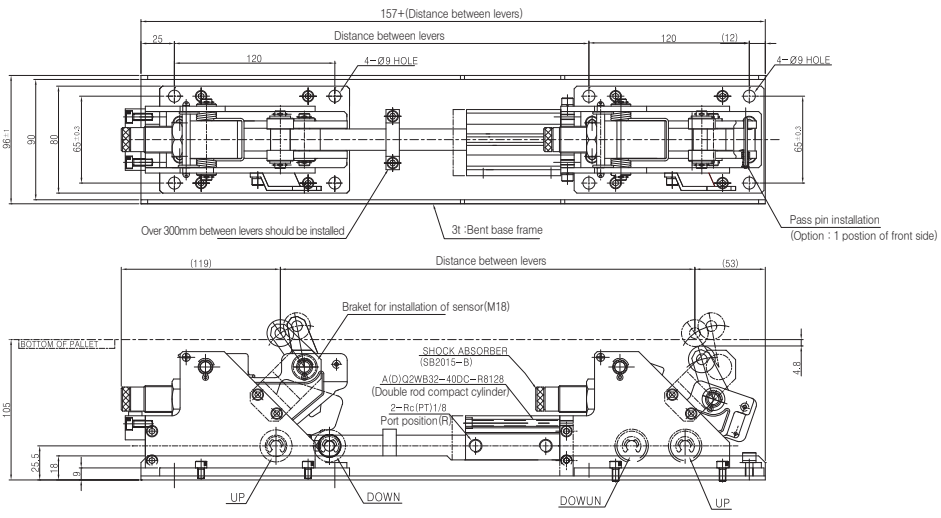
As seen in the below drawing, the cylinders cross-move up and down to control moving pallets.
The working status of lever such as ready or by pass is the same as basic type(single lever type).



▣ Working application of horizontal stopper cylinder with double lever

Structure

Ø32 Bore



- The size and options are the same as basic type(single lever type)
- The distance between levers 250~500mm is available for this base plate attached type.
  ※ The distance between levers is from the ready(stop) position of front lever to the ready(stop) postion of back lever.
- The horizontal stopper cylinder with double lever is an order made item, so please contact us for the lead time or any questions.

How to Order

AST32 - (Distance Between Levers) L M P - BK - R8128

① ② ③④⑤ ⑥ ⑦

NO.	Options	NO.	Options
1	Stopper Cylinder	5	Pass Pin
2	Distance Between Levers		Blank : None
3	Position of Port(L, R)		P : 1 Pin in Front Side
4	Material of Stopper Roller	6	Sensor Bracket
	Blank : Resin(MC Nylon)	7	Order made number
	M: Rolled Steel		

Series ASTH

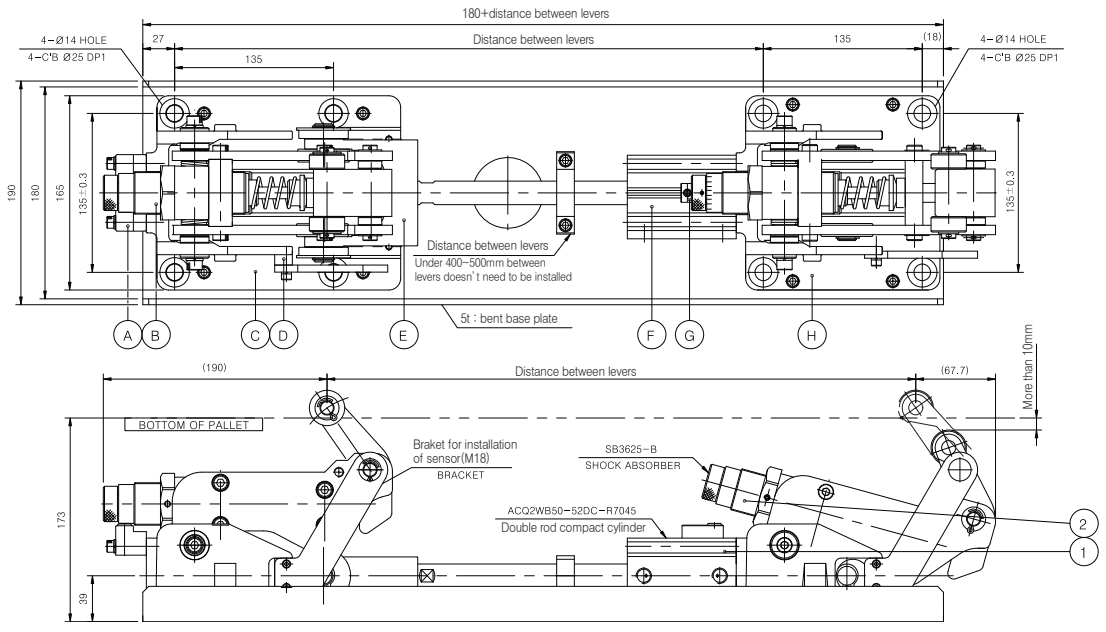
Applications / Double Lever Type

Bore Size(mm) : Ø32, Ø50

▣ Working application of horizontal stopper cylinder with double lever 1

Structure

Ø50 Bore



- The size and options are the same as basic type(single lever type).
- The distance between levers 400~599mm is available for this base attached type.
  ※ The distance between levers is from the ready(stop) position of front lever to the ready(stop) postion of back lever)
- The horizontal stopper cylinder with double lever is an order made item, so please contact us for the lead time or any questions.
- Order number : AST50-500(distance between levers)LMP-R7045-3(silver nitrate tinted, sensor bracket included)
  ※ Please ask us for the change of metal finishing or M45 shock absober or limit switch etc.

Series ASTH

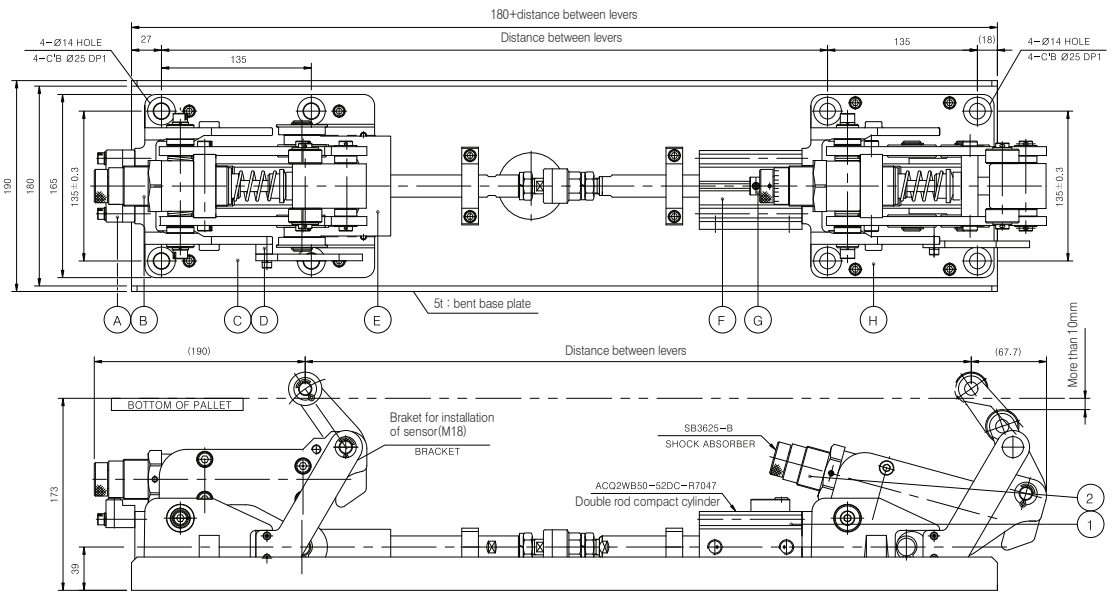
Applications / Double Lever Type

Bore Size(mm) : Ø32, Ø50

▣ Working application of horizontal stopper cylinder with double lever 2

Structure

Ø50 Bore with Connecting Shaft Type

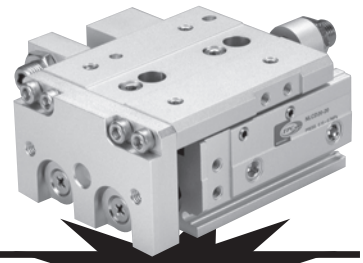


- The size and options are the same as basic type(single lever type)
- The distance between lever 600~2,000mm is available for this connecting shaft type.
  ※The distance between levers(P) is from the ready(stop) position of front lever to the ready(stop) postion of back lever.
- The horizontal stopper cylinder with double lever is an order made item, so please contact us for the lead time or any questions.
- Order number : AST50-1000(distance between levers)LMP-R7047-5(silver nitrate tinted, sensor bracket included)
  ※ Please ask us for the change of metal finishing or M45 shock absober or limit switch etc.

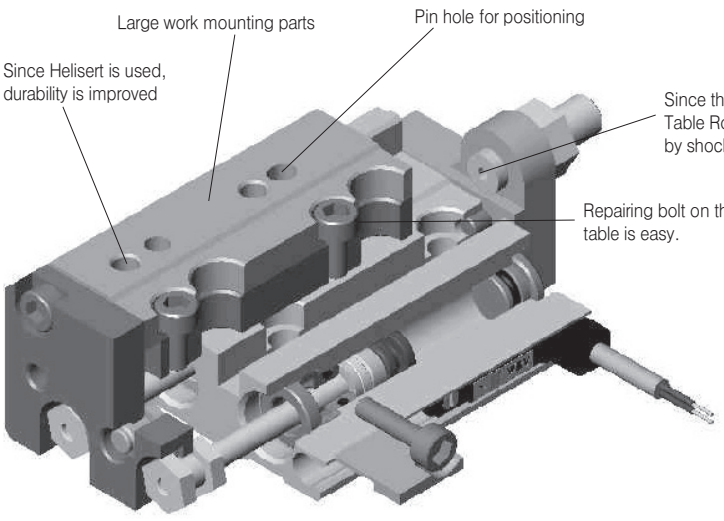
Series NLCD

Table Cylinder

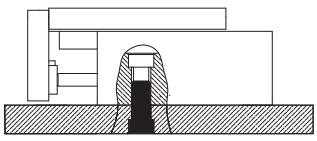
Bore Size(mm) : Ø6, Ø8, Ø12, Ø16, Ø20, Ø25, Ø32



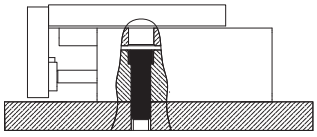
Patent No. 0380194



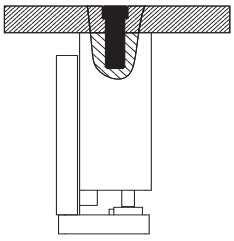
1.Side mounting(Body Tapped)

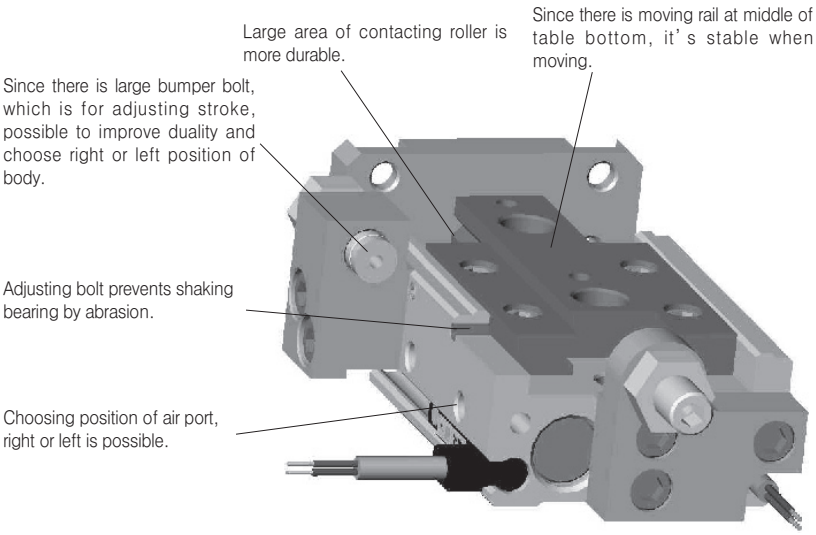


2.Side mounting(Body through hole)



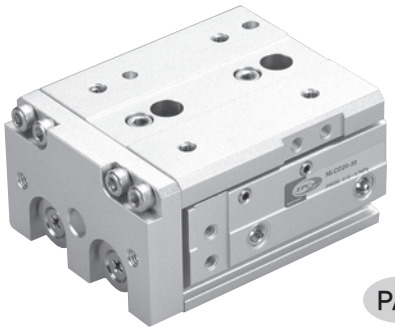
3.Axial mounting(Body tapped)





NLCD Variation

Model	Bore Size ø (㎜)	Standard Stroke(mm)									Adjuster Option	Auto Switch
		10	20	30	40	50	75	100	125	150	Stroke Adjuster	
NLCD6	6	■	■	■	■	■	–	–	–	–	Front side	Reed Switch [W8H] [W8V]
NLCD8	8	■	■	■	■	■	■	–	–	–		
NLCD12	12	■	■	■	■	■	■	■	–	–	Rear side	Solid State Switch [W9H] [W9V] [W9HN] [W9HP]
NLCD16	16	■	■	■	■	■	■	■	■	–		
NLCD20	20	■	■	■	■	■	■	■	■	■	Both side	
NLCD25	25	■	■	■	■	■	■	■	■	■		
NLCD32	32	–	–	■	–	–	■	■	–	–		



PAT

Specifications

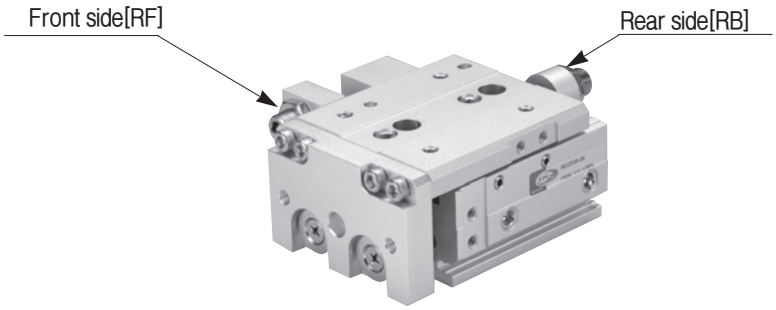
Bore Size(Ø㎜)	6, 8, 12, 16, 20, 25, 32
Fluid	Air
Action	Double Acting
Operating Pressure	0.15~0.7Mpa(21~99psi)
Proof Pressure	1.05Mpa(152psi)
Ambient and Fluid Temp ℃(°F)	−10~60℃(14~140°F)
Piston Speed	50~500㎜/s
Lubrication	Non Lubrication
Auto Switch	Reed Switch : DC(24V)/AC(110V) Solid State Switch : DC(24V)
Stroke Length Tolerance	0~+1㎜
Option(Stroke Adjust)	Bolt+Dmaper (Front side/Rear side/Both side)

Option

Stroke Adjuster

- Front side[RF]
- Rear side[RB]
- Both side[R]

※ Standard Adjustable Stroke Range 0 to 5㎜



Standard Stroke

Model	Standard Stroke(mm)								
	10	20	30	40	50	75	100	125	150
NLCD6	■	■	■	■	■	–	–	–	–
NLCD8	■	■	■	■	■	■	–	–	–
NLCD12	■	■	■	■	■	■	■	–	–
NLCD16	■	■	■	■	■	■	■	■	–
NLCD20	■	■	■	■	■	■	■	■	■
NLCD25	■	■	■	■	■	■	■	■	■
NLCD32	–	–	■	■	■	■	■	–	–

Weight Table

(Unit:g(lb))

Model	Standard Stroke(mm)								
	10	20	30	40	50	75	100	125	150
NLCD6	97(0.21)	120(0.26)	138(0.30)	186(0.41)	216(0.47)	–	–	–	–
NLCD8	165(0.36)	176(0.39)	209(0.46)	258(0.57)	313(0.69)	456(1.00)	–	–	–
NLCD12	336(0.74)	336(0.74)	336(0.74)	296(0.65)	496(1.09)	683(1.50)	920(2.03)	–	–
NLCD16	588(1.29)	588(1.29)	597(1.31)	656(1.44)	784(1.73)	1127(2.48)	1421(3.13)	1750(3.86)	–
NLCD20	950(2.09)	969(2.13)	997(2.19)	1092(2.41)	1235(2.72)	1615(3.56)	2137(4.71)	2650(5.84)	3141(6.92)
NLCD25	1599(3.52)	1618(3.57)	1627(3.58)	1767(3.89)	2008(4.42)	2557(5.64)	3162(6.97)	4150(9.15)	4800(10.58)
NLCD32	–	–	2416(5.32)	–	–	3168(6.98)	3960(8.73)	–	–

Theoretical Force

(Unit:N)

Model	Rod Diameter (㎜)	Operating Direction	Piston Area (㎟)	Operating Pressure · Mpa(psi)					
				0.2(29)	0.3(43)	0.4(58)	0.5(72)	0.6(87)	0.7(101)
NLCD6	3	Extention	57	11	17	23	29	34	40
		Retraction	42	8	13	17	21	25	29
NLCD8	4	Extention	101	20	30	40	51	61	71
		Retraction	75	15	23	30	38	45	53
NLCD12	6	Extention	226	45	68	90	113	136	158
		Retraction	170	34	51	68	85	102	119
NLCD16	8	Extention	402	80	121	161	201	241	281
		Retraction	302	60	91	121	151	181	211
NLCD20	10	Extention	628	126	188	251	314	377	440
		Retraction	471	94	141	188	236	283	330
NLCD25	12	Extention	982	196	295	393	491	589	687
		Retraction	756	151	227	302	378	454	529

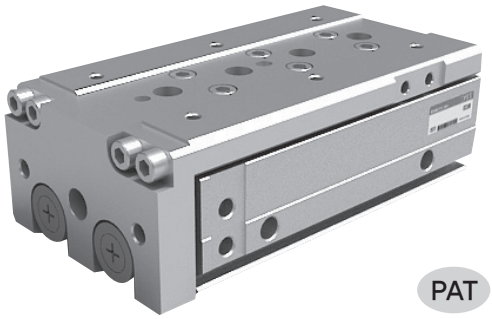
Note) Theoretical Force[N]=Pressure[Mpa]×Piston Area[㎟]

1N≒0.102kgf, 1Mpa≒10.2kgf/㎠

Series NLCD

Table Cylinder

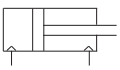
Bore Size : Ø6, Ø8, Ø12, Ø16, Ø20, Ø25, Ø32



PAT

- LARGE MOUNTING SURFACE
- LARGE ROLLER CONTACT AREA
- CHOOSING POSITION OF AIR PORT, RIGHT OR LEFT IS POSSIBLE
- MOUNTING POSSIBLE IN THREE DIRECTIONS
- ATTACHING FIXTURE IS EASY
- EASY REPAIRING IS POSSIBLE FROM THE REPAIRING BOLT ON THE SURFACE OF TABLE

Symbol



How to Order

NLCD — 12 — 50 — RF15 — R — W8H — S

1 2 3 4 5 6

1 Table Cylinder Double Rod(Built in Magnet)

2 Bore Size(Ø mm)
- 6 : Ø6mm
- 8 : Ø8mm
- 12 : Ø12mm
- 16 : Ø16mm
- 20 : Ø20mm
- 25 : Ø25mm
- 32 : Ø32mm

3 Stroke(mm)
- Ø6-10, 20, 30, 40, 50
- Ø8-10, 20, 30, 40, 50, 75
- Ø12-10, 20, 30, 40, 50, 75, 100
- Ø16-10, 20, 30, 40, 50, 75, 100, 125
- Ø20-10, 20, 30, 40, 50, 75, 100, 125, 150
- Ø25-10, 20, 30, 40, 50, 75, 100, 125, 150
- Ø32-30, 75, 100

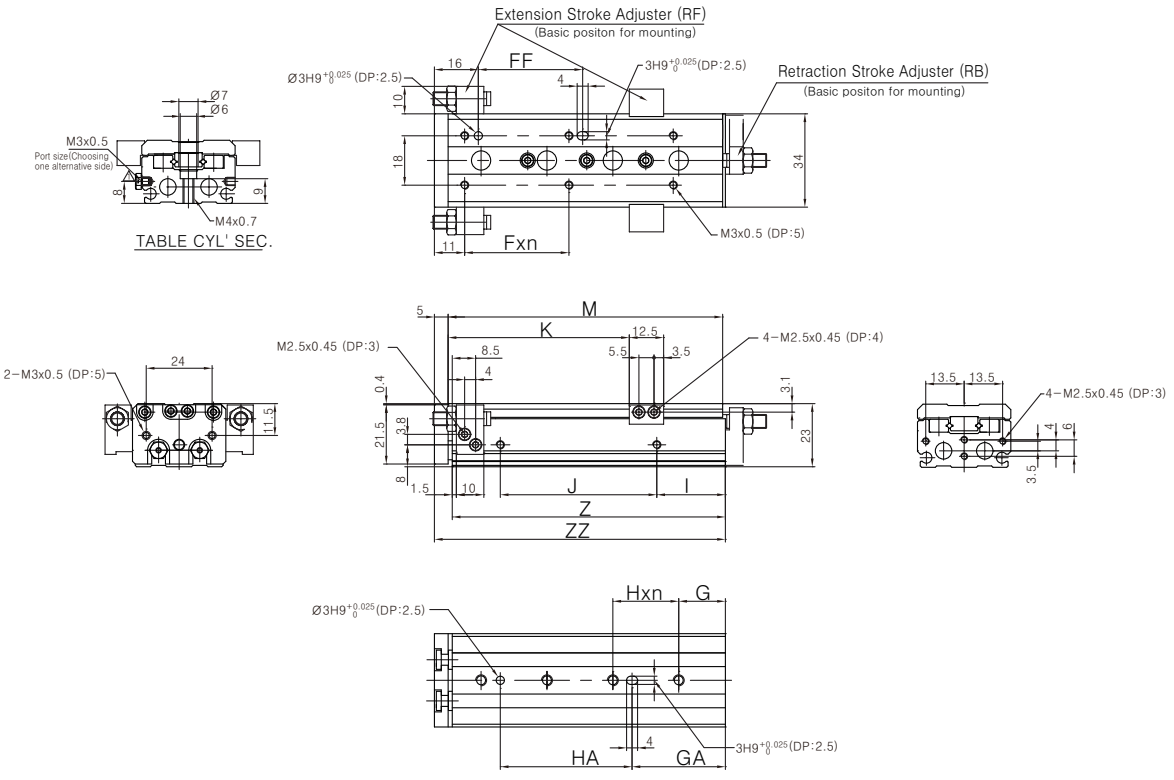
4 Adjuster Option
- – Rubber Damper
- RF : Fr ont side
- RB : Rear side
- R : Both side (RF+RB)
- ※ Adjustable Range : 5, 15, 25mm
- ※ Standard Adjustable Stroke Range 0 to 5mm
- ※ NLCD32 : Not Available Adjuster Option
- – Shock-Absorber
- SF : Front side
- SB : Rear side
- S : Both side (SF+SB)
- ※ NLCD6, NLCD32 : Not Available Shock Absorber Option

5 Auto Switch
- Blank : None
- W8V : Reed Switch(Vertical Type)
- W8H : Reed Switch(Horizontal Type)
- W9H : Solid State Switch(Horizontal Type)
- W9V : Solid State Switch(Vertical Type)
- W9HN : Solid State Switch(3 Wire, NPN)
- W9HP : Solid State Switch(3 Wire, PNP)
- ※ Standard auto switch lead wire length is 1m. 3m leads available on all models by adding a "L" suffix to the part number. (ex:W8HL, W9VL)

6 Number of Auto Switches
- Blank : 2 pcs
- S : 1 pc
- N : N pcs

Dimensions NLCD 6

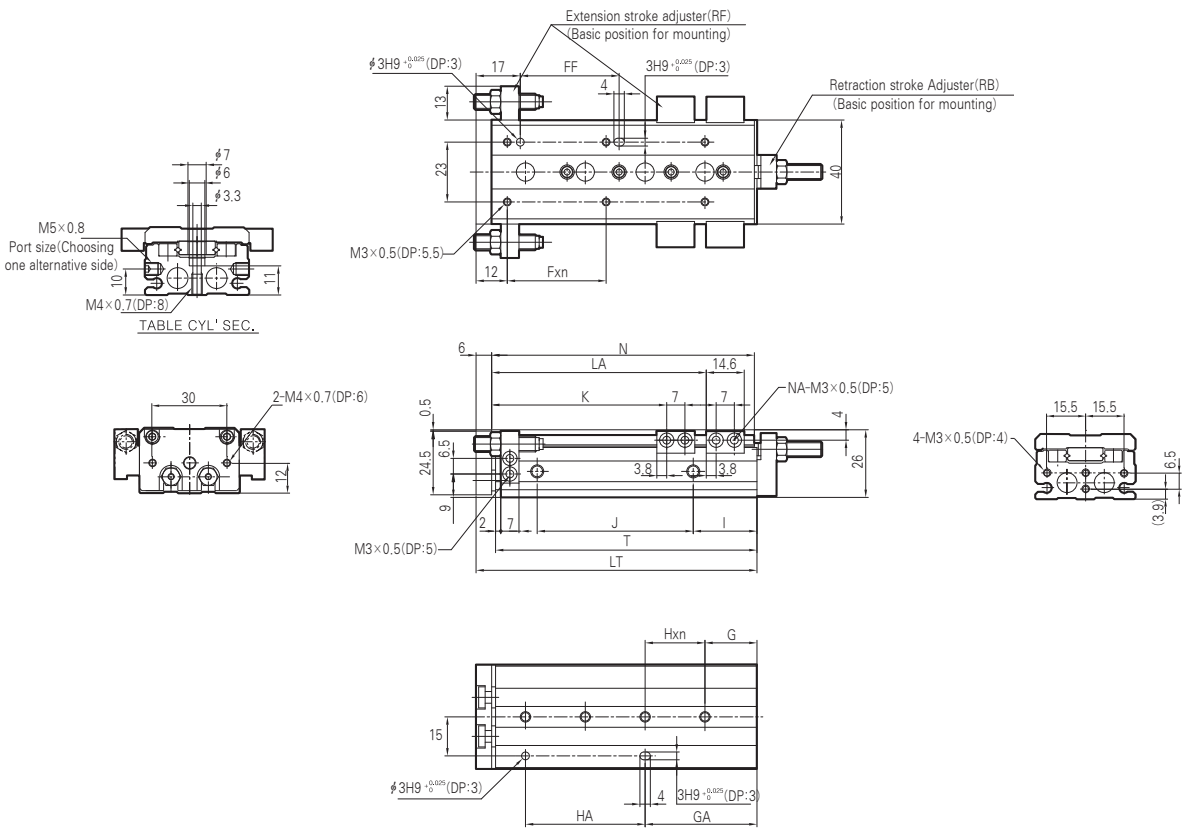
(Unit:mm)



Model	Fxn	FF	G	Hxn	GA	HA	I	J	L	N	T	LT
NLCD 06-10	20×1	20	6	25×1	12	25	10	17	26	42	41.5	48
NLCD 06-20	30×1	30	6	35×1	12	20	10	27	36	52	51.5	58
NLCD 06-30	20×2	20	11	20×2	22	20	7	40	46	62	61.5	68
NLCD 06-40	28×2	28	13	30×2	26	30	19	50	56	84	83.5	90
NLCD 06-50	38×2	38	17	24×3	34	48	25	60	66	100	99.5	106

Dimensions NLCD 8

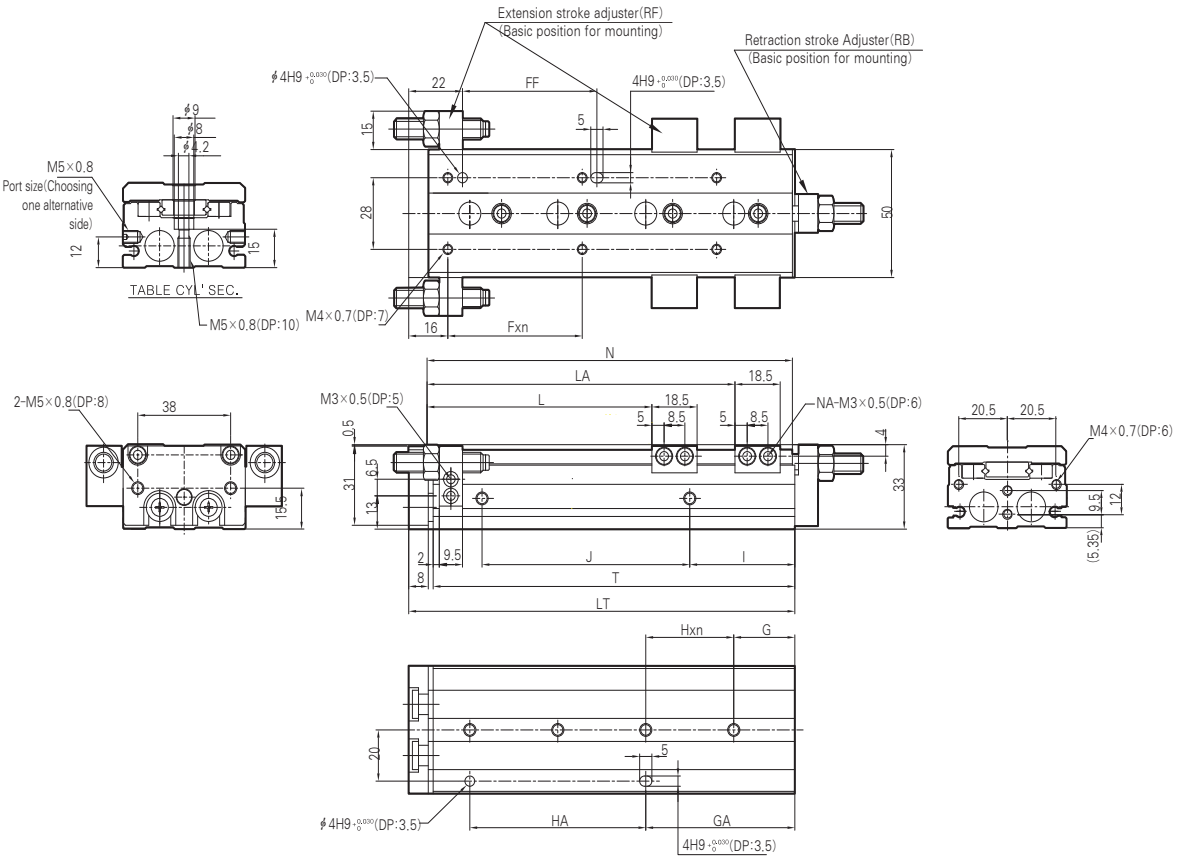
(Unit:mm)



Model	Fxn	FF	G	Hxn	GA	HA	I	J	K	LA	NA	N	T	LT
NLCD 08-10	25×1	25	9	28×1	17	20	13	19.5	23.5	-	4	49	48.5	56
NLCD 08-20	25×1	25	12	30×1	12	30	8.5	29	33.5	-	4	54	53.5	61
NLCD 08-30	40×1	40	13	20×2	33	20	9.5	39	43.5	-	4	65	64.5	72
NLCD 08-40	50×1	50	15	28×2	43	28	10.5	56	53.5	-	4	83	82.5	90
NLCD 08-50	38×2	38	20	23×3	43	46	24.5	60	63.5	82.5	8	101	100.5	108
NLCD 08-75	50×2	50	27	28×4	83	56	38.5	96	88.5	132.5	8	151	150.5	158

Dimensions NLCD 12

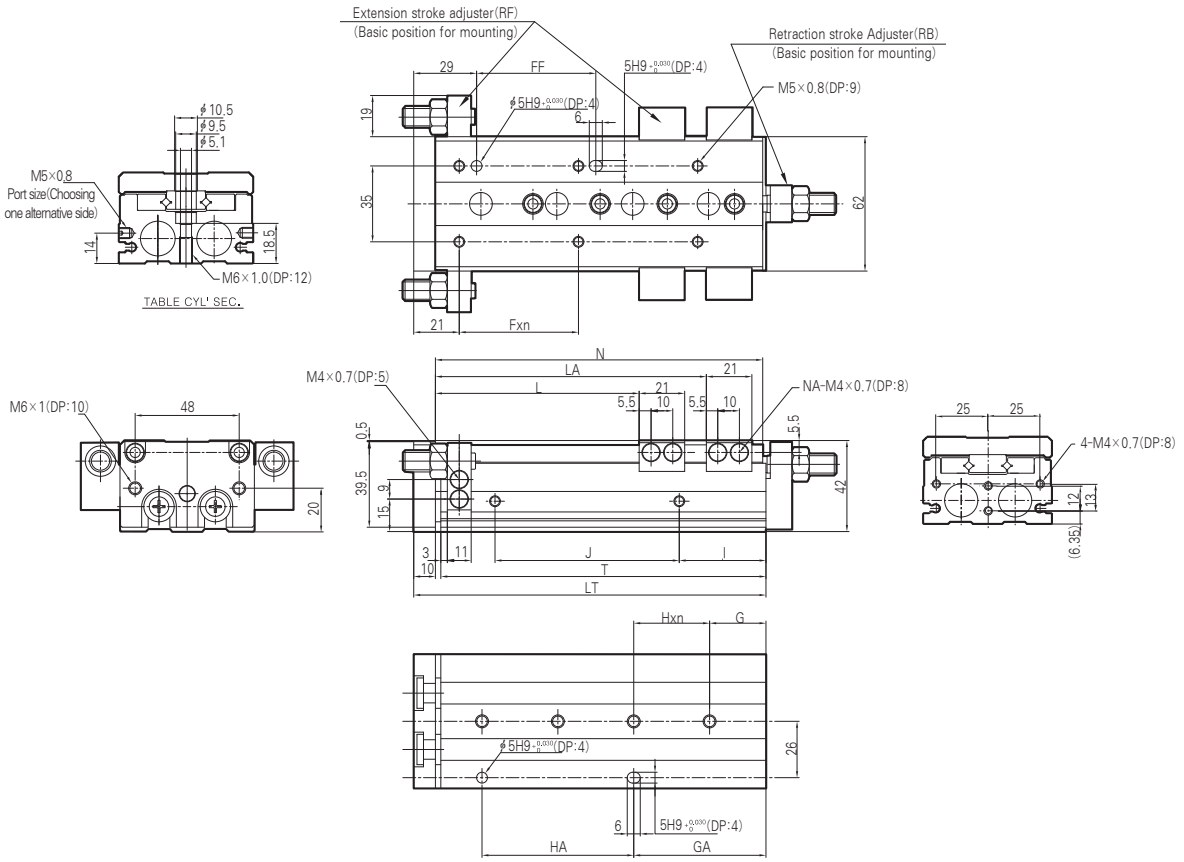
(Unit:mm)



Model	Fxn	FF	G	Hxn	GA	HA	I	J	L	LA	NA	N	T	LT
NLCD 12-10	35×1	35	15	40×1	15	40	10	40	26.5	-	4	71	70	80
NLCD 12-20	35×1	35	15	40×1	15	40	10	40	36.5	-	4	71	70	80
NLCD 12-30	35×1	35	15	40×1	15	40	10	40	46.5	-	4	71	70	80
NLCD 12-40	50×1	50	17	25×2	42	25	10	52	56.5	-	4	83	82	92
NLCD 12-50	35×2	35	15	36×2	51	36	22	60	66.5	-	4	103	102	112
NLCD 12-75	55×2	55	25	36×3	61	72	43	85	91.5	125.5	8	149	148	158
NLCD 12-100	65×2	65	35	38×4	111	76	52	130	116.5	179.5	8	203	202	212

Dimensions NLCD 16

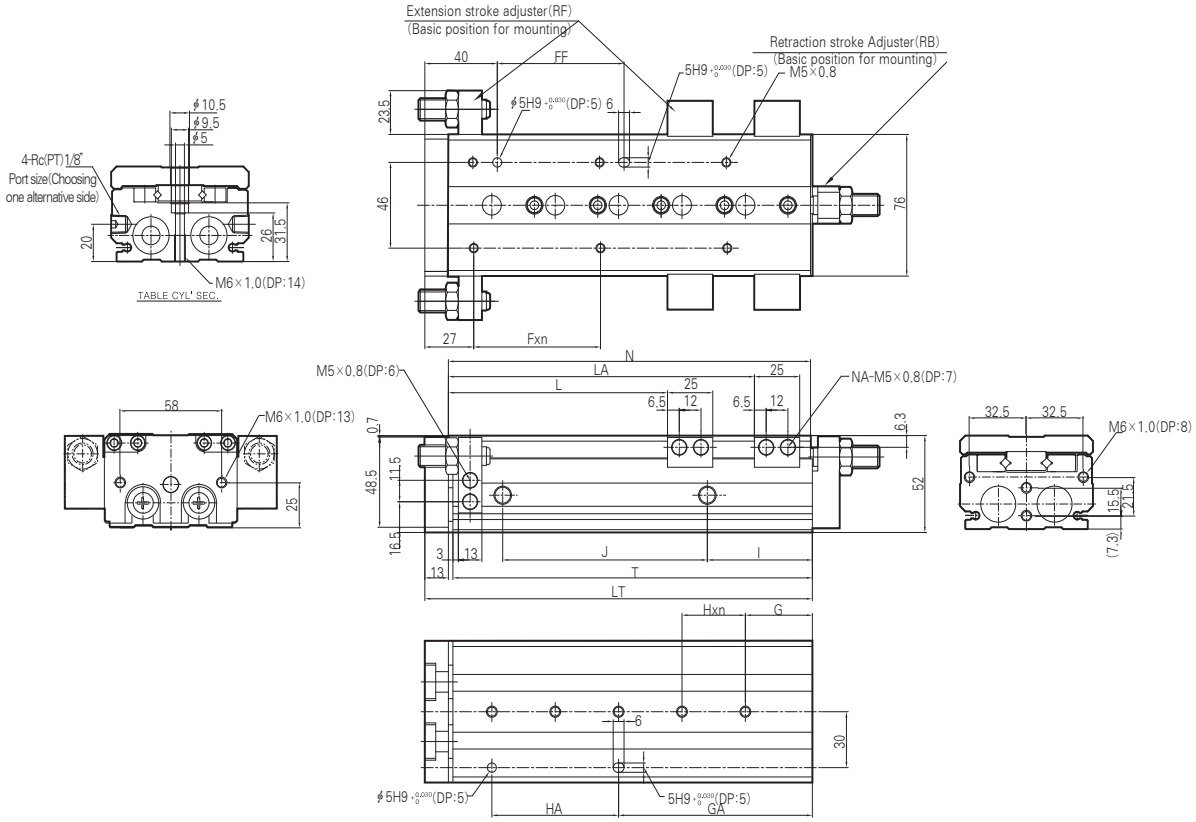
(Unit:mm)



Model	Fxn	FF	G	Hxn	GA	HA	I	J	L	LA	NA	N	T	LT
NLCD 16-10	35×1	35	16	40×1	16	40	10	40	29	-	4	76	75	87
NLCD 16-20	35×1	35	16	40×1	16	40	10	40	39	-	4	76	75	87
NLCD 16-30	35×1	35	16	40×1	16	40	10	40	49	-	4	76	75	87
NLCD 16-40	40×1	40	16	50×1	16	50	10	50	59	-	4	86	85	97
NLCD 16-50	30×2	30	21	30×2	51	30	15	60	69	-	4	101	100	112
NLCD 16-75	55×2	55	26	35×3	61	70	40	85	94	125	8	151	150	162
NLCD 16-100	65×2	65	39	35×4	109	70	55	118	119	173	8	199	198	210
NLCD 16-125	70×3	70	19	35×6	159	70	68	155	144	223	8	249	248	260

Dimensions NLCD 20

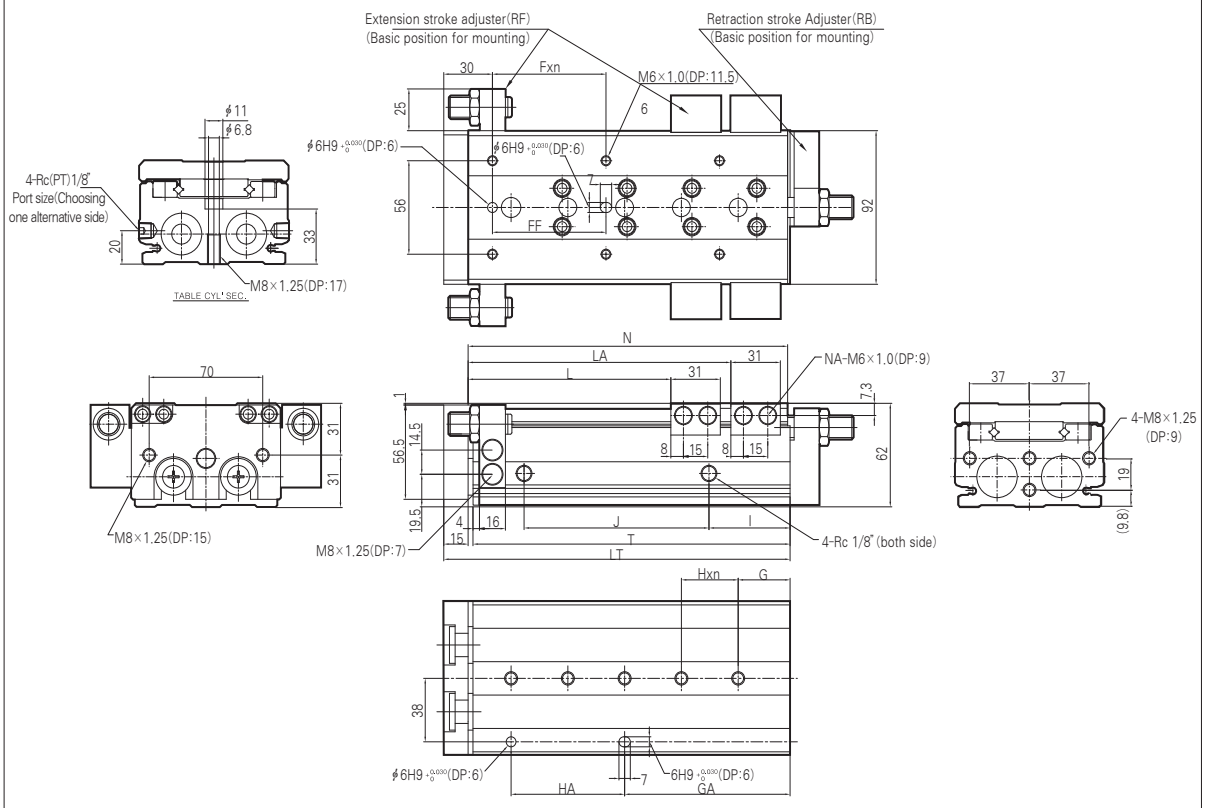
(Unit: mm)



Model	Fxn	FF	G	Hxn	GA	HA	I	J	L	LA	NA	N	T	LT
NLCD 20-10	50×1	50	15	45×1	25	35	10	44	31	-	4	83	81.5	97
NLCD 20-20	50×1	50	15	45×1	25	35	10	44	41	-	4	83	81.5	97
NLCD 20-30	50×1	50	15	45×1	25	35	10	44	51	-	4	83	81.5	97
NLCD 20-40	60×1	60	15	55×1	35	35	10	54	61	-	4	93	91.5	107
NLCD 20-50	35×2	35	15	35×2	50	35	10	69	71	-	4	108	106.5	122
NLCD 20-75	60×2	60	19	35×3	54	70	10	108	96	-	4	147	145.5	161
NLCD 20-100	70×2	70	37	35×4	107	70	58	113	121	169	8	200	198.5	214
NLCD 20-125	70×3	70	41	38×5	155	76	70	155	146	223	8	254	252.5	268
NLCD 20-150	80×3	80	19	44×6	195	88	87	190	171	275	8	306	304.5	320

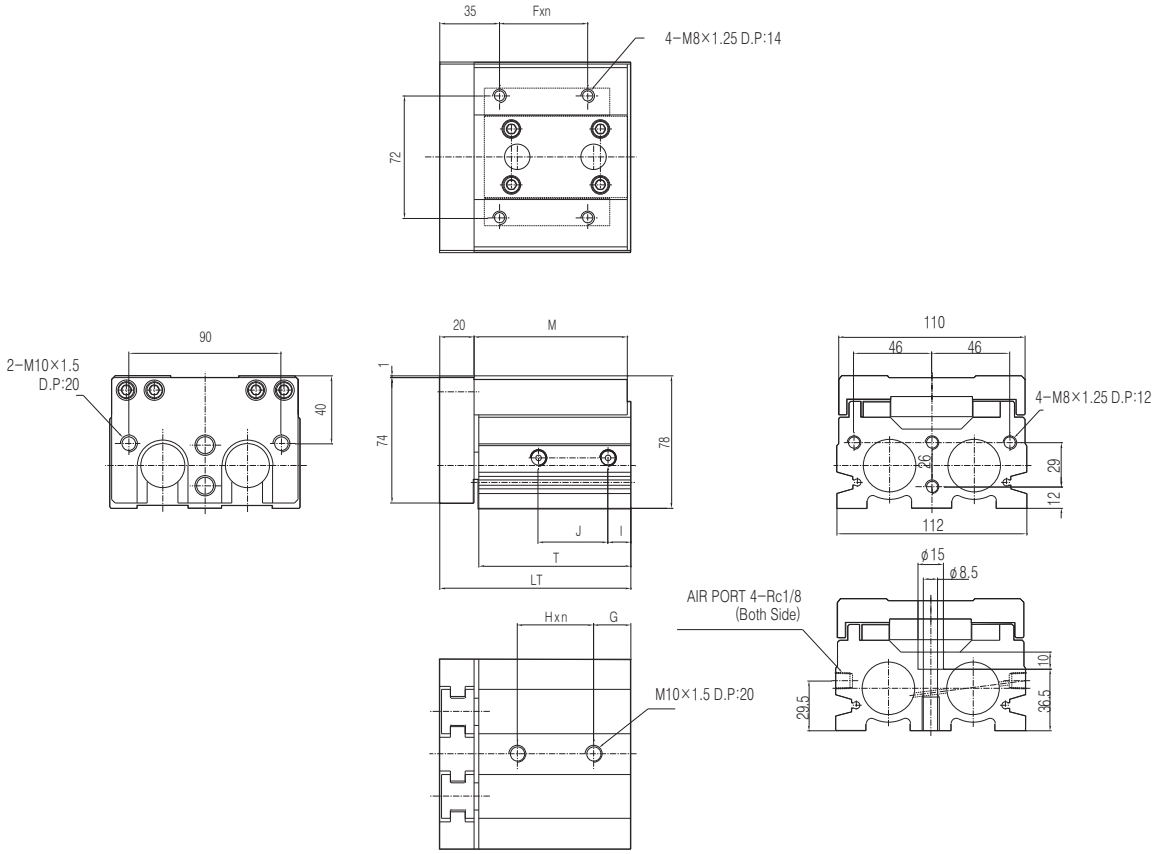
Dimensions NLCD 25

(Unit:mm)



Model	Fxn	FF	G	Hxn	GA	HA	I	J	L	LA	NA	N	T	LT
NLCD 25-10	50×1	40	22	45×1	22	45	12	47	35	-	4	92	90.5	108.5
NLCD 25-20	50×1	40	22	45×1	22	45	12	47	45	-	4	92	90.5	108.5
NLCD 25-30	50×1	40	22	45×1	22	45	12	47	55	-	4	92	90.5	108.5
NLCD 25-40	60×1	50	22	55×1	22	55	12	57	65	-	4	102	100.5	118.5
NLCD 25-50	35×2	35	20	35×2	55	35	12	70	75	-	4	115	113.5	131.5
NLCD 25-75	60×2	60	26	35×3	61	70	33	90	100	-	4	156	154.5	172.5
NLCD 25-100	70×2	70	32	35×4	102	70	50	114	125	162	8	197	195.5	213.5
NLCD 25-125	75×2	75	40	38×5	154	76	67	155	150	218	8	255	253.5	271.5
NLCD 25-150	80×3	80	30	40×6	190	80	82	180	175	258	8	295	293.5	311.5

Dimensions NLCD 32



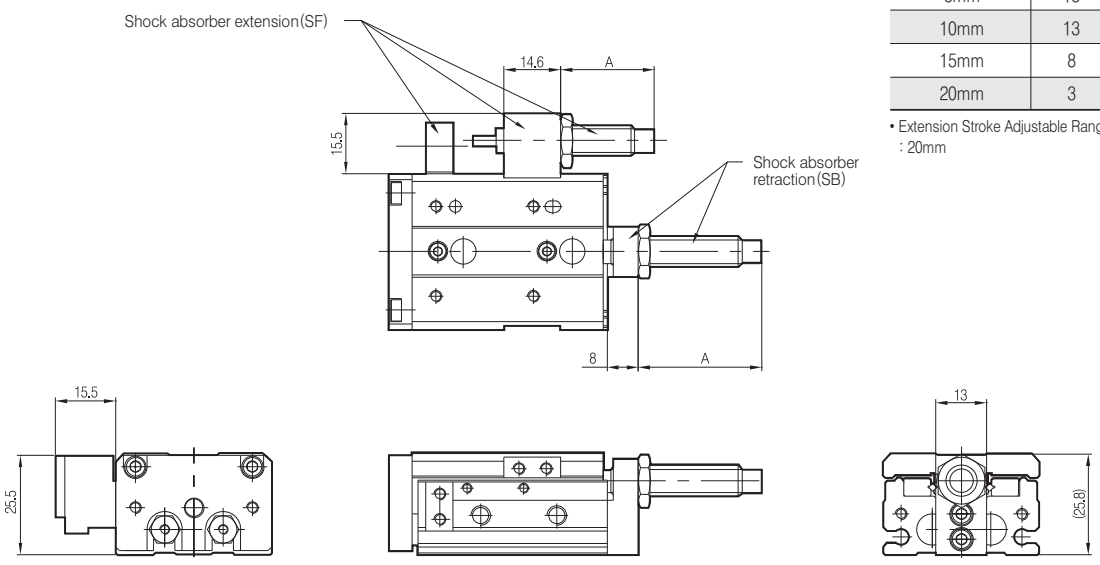
Type	Fxn	G	Hxn	I	J	M	T	LT
NLCD 32−30	52×1	22	45×1	13.5	41	90.5	89.5	112.5
NLCD 32−75	75×2	33	38×3	53	106	176	175	198
NLCD 32−100	64×2	42	50×3	73	131	221	220	243

Dimensions of Shock Absorber Option

NLCD8-**SF,SB,S

Stroke Adjustable Range	A
5mm	18
10mm	13
15mm	8
20mm	3

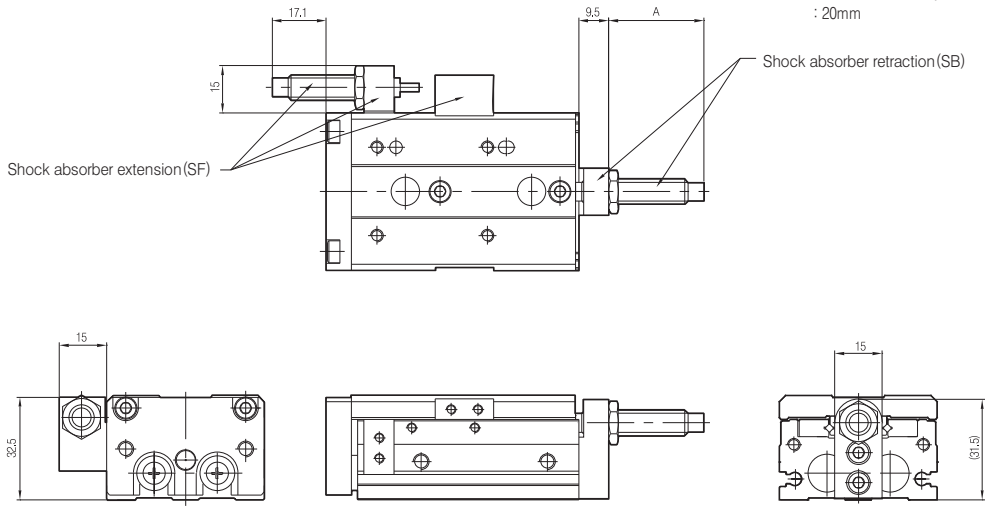
• Extension Stroke Adjustable Range : 20mm



NLCD12-**SF,SB,S

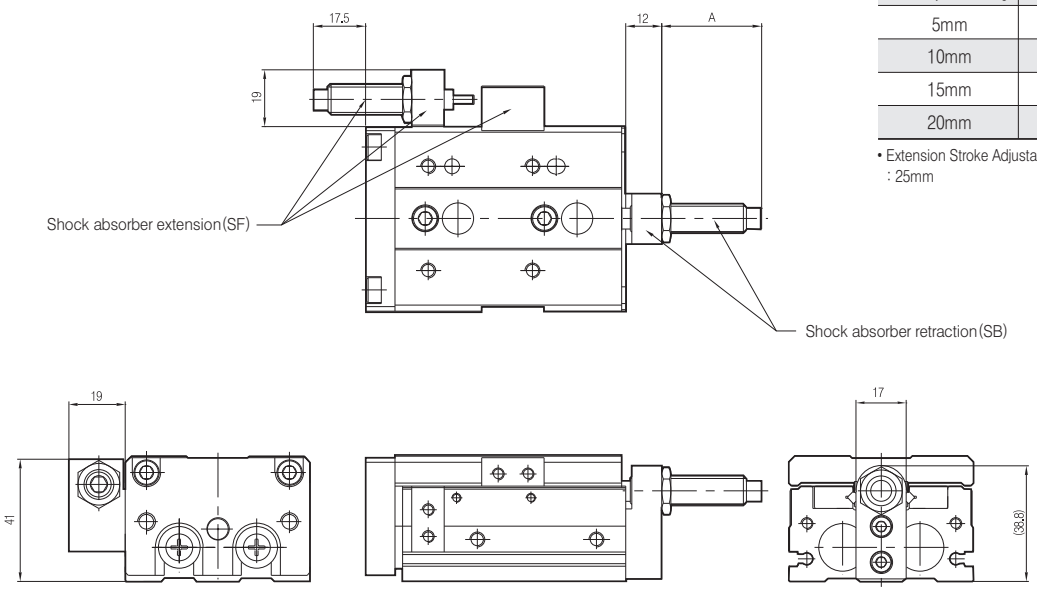
Stroke Adjustable Range	A
5mm	25
10mm	20
15mm	15
20mm	10

• Extension Stroke Adjustable Range : 20mm



Dimensions of Shock Absorber Option

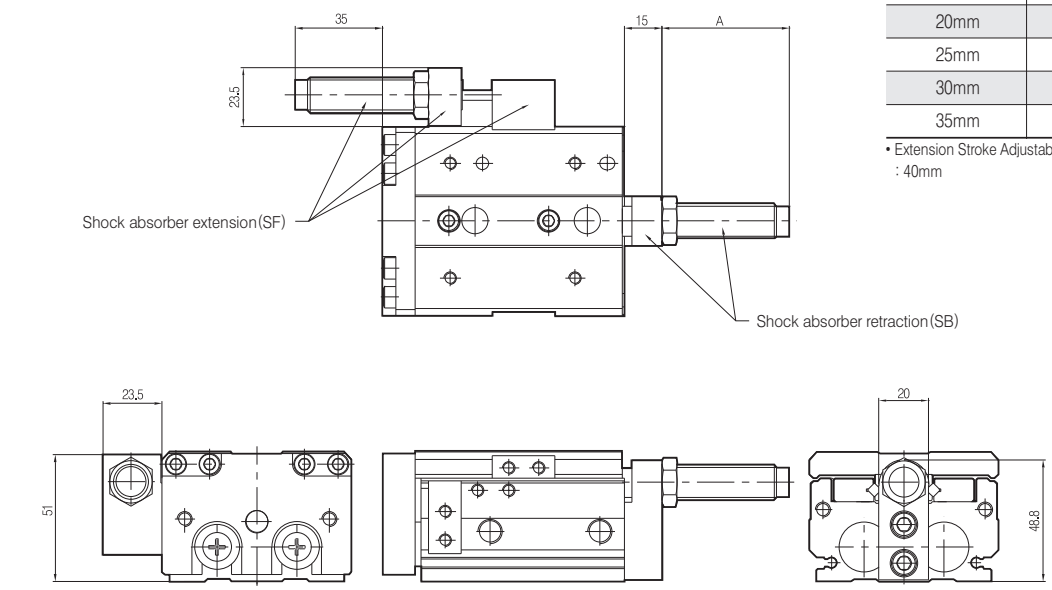
NLCD16-**SF,SB,S



Stroke Adjustable Range	A
5mm	28.5
10mm	23.5
15mm	18.5
20mm	13.5

• Extension Stroke Adjustable Range : 25mm

NLCD20-**SF,SB,S



Stroke Adjustable Range	A
5mm	46
10mm	41
15mm	38
20mm	33
25mm	28
30mm	23
35mm	18

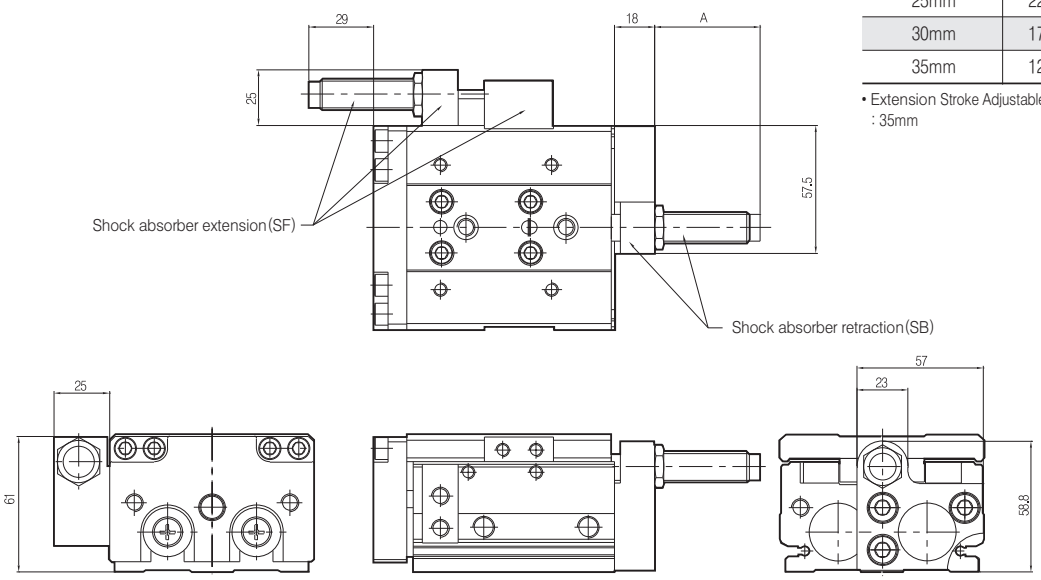
• Extension Stroke Adjustable Range : 40mm

Dimensions of Shock Absorber Option

NLCD25-**SF,SB,S

Stroke Adjustable Range	A
5mm	42.5
10mm	37.5
15mm	32.5
20mm	27.5
25mm	22.5
30mm	17.5
35mm	12.5

• Extension Stroke Adjustable Range : 35mm

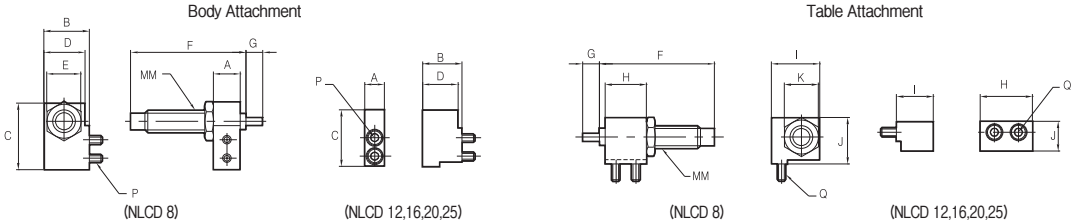


Shock absorber Option

Shock absorber Type	S0806	S1007	S1412
Applicable Table Cylinder	NLCD8 / NLCD12	NLCD16	NLCD20/NLCD25
Max. Absorbing Energy	3	6	20
Absorbing Stroke(mm)	6	7	12
Max.Collision Speed(m/s)	0.3~2.5	0.3~3.5	0.3~5
Max. Operating Freq.(Cycle/min)	117	207	550
Max. Acceptable Spring Force	58.8	117.6	392
Ambient and Auid Temperature(℃)	−10~+80		
Weight(g)	17	28	70

Dimensions of Shock Absorber Option

Dimension of Shock Absorber Extension Unit Option



(NLCD 8) (NLCD 12,16,20,25) (NLCD 8) (NLCD 12,16,20,25)

Size	Type	BODY Attachment							TABLE Attachment						
		A	B	C	D	E	F	G	H	I	J	K	P	Q	MM
NLCD08	NLCD 08-SF	7	14	20	12.5	–	40.6	6	14.6	17	16	11	M3×15	M3×20	M8×1
NLCD12	NLCD 12-SF	9.5	16	23.5	14.5	11	40.6	6	18.5	13	10.5	–	M3×15	M4×10	M8×1
NLCD16	NLCD 16-SF	11	20	31	18.5	12.7	47	7	21	15	13.5	–	M4×20	M4×15	M10×1
NLCD20	NLCD 20-SF	13	25	40.5	23.1	19	67	12	25	20	16	–	M5×25	M5×20	M14×1.5
NLCD25	NLCD 25-SF	16	28.5	49.5	24	19	67	12	33	22	18.5	–	M8×25	M6×25	M14×1.5

Dimension of Shock Absorber Retraction Unit Option

(NLCD8,12,16,20,25) (NLCD 25)

Size	Type	BODY Attachment									
		A	B	C	D	D1	E	F	G	P	MM
NLCD08	NLCD 08-SB	13	8	24.5	–	–	11	40.6	6	M3×8	M8×1
NLCD12	NLCD 12-SB	15	9.5	31.5	–	–	11	40.6	6	M4×10	M8×1
NLCD16	NLCD 16-SB	17	12	38	–	–	12.7	47	7	M4×15	M10×1
NLCD20	NLCD 20-SB	20	15	48	–	–	14	67	12	M6×15	M14×1.5
NLCD25	NLCD 25-SB	57	18	58	23	39	14	67	12	M8×15	M14×1.5

How to Order

NLCD ** — ** **

1 2 3

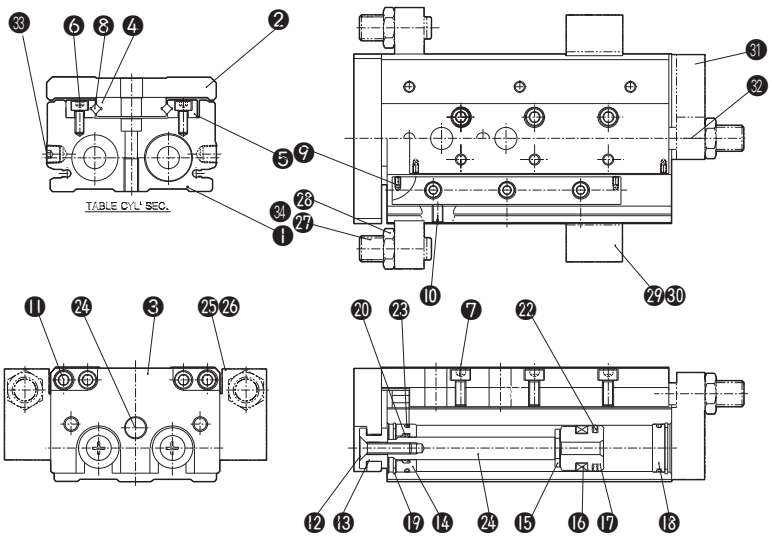
1 Bore Size(ϕ mm)
- 6 : ϕ6
- 8 : ϕ8
- 12 : ϕ12
- 16 : ϕ16
- 20 : ϕ20
- 25 : ϕ25

2 Stroke Adjuster
- Rubber Damper
  - RF: Front Side Adjuster
  - RB: Back Side Adjuster
- Shock absorber Attachment
  - SF: Front Side Shock absorber Attachment
  - SB: Back Side Shock absorber Attachment

3 Adjustable Range
- Blank : 5mm : Standard, 15 : 15mm, 25 : 25mm
- * NLCD6 : 25mm is not available.

Structure

(Unit:mm)



No.	Description	Material	Note
1	Body	Alluminum Ally	
2	Table	Alluminum Ally	
3	Plate	Alluminum Ally	
4	Center Rail	Bearing Steel	
5	Support Rail	Bearing Steel	
6	Blanking Plug	Stainless Steel	
7	Blanking Plug	Stainless Steel	
8	Roller & Spacer	Bearing Steel/MC Nylon	
9	Set Screw	Stainless Steel	
10	Set Screw	Stainless Steel	
11	Blanking Plug	Stainless Steel	
12	(+)Flush Bolt	Stainless Steel	
13	Retainer	Alluminum Ally	
14	Rod Cover	Alluminum Ally	
15	Bumper	Rubber	
16	Magnet	NBR	
17	Piston	Alluminum Ally	

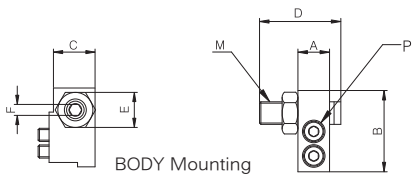
No.	Description	Material	Note
18	Head Cover	Alluminum Ally	
19	O-Ring	Spring Steel	
20	Rod Packing	NBR	
21	Piston Rod	Stainless Steel	
22	Piston Packing	NBR	
23	Gasket(O-Ring)	NBR	
24	Plate Bumper	Polyurethane	
25	Bumper Plate-1	Stainless Steel	Option
26	Blanking Plug	Stainless Steel	Option
27	Bumper Holder	Ally Steel	Option
28	Nut	Ally Steel	Option
29	Bumper Plate-2	Alluminum Ally	Option
30	Blanking Plug	Stainless Steel	Option
31	Bumper Plate-3	Alluminum Ally	Option
32	Blanking Plug	Stainless Steel	Option
33	Plug	Ally Steel	
34	Plate Bumper	Polyurethane	

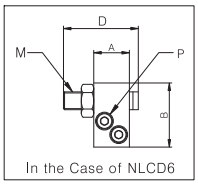
Spare Parts/Seal Kits

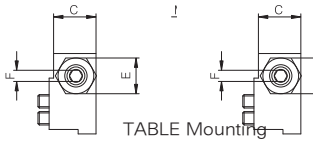
No.	Description	Material	Part No.						
			NLCD6	NLCD8	NLCD12	NLCD16	NLCD20	NLCD25	NLCD32
22	Piston Seal	NBR	OPA-6	PSD-8	PPD-12	PPD-16	PPD-20	PPD-25	PPD-32
20	Rod Seal	NBR	MYA-3	MYA-4	PPU-6	PPU-8	PPU-10	PPU-12	MYR-16
23	Tube Gasket	NBR	TC1P006-34A1693	TC2M020-16-1385	C-10	CA80-1609K	ADR020-16-1763	ø26.5×ø22.5×2T	C-29

Stroke Adjuster at Extension End(RF)

(Unit:mm)



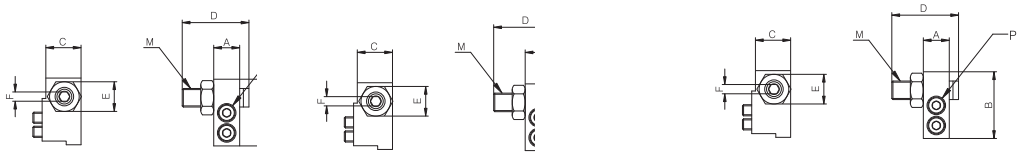




Model	Model No.	Stroke adjusting Range(㎜)	BODY Mounting								Table Mounting			
			A	B	C	D	E	F	M	P	H	I	J	Q
NLCD6	NLCD6-RF	5	10	18	10.5	21	8	2.5	M5×0.8	M2.5×10L	12.5	9	10	M2.5×10L
	NLCD6-RF15	15				31								
NLCD8	NLCD8-RF	5	7	20	14	16.5	10	3	M6×1.0	M3×15L	14.6	7.5	10	M3×12L
	NLCD8-RF15	15				26.5								
	NLCD8-RF25	25				36.5								
NLCD12	NLCD12-RF	5	9.5	23.5	16	20	12	4	M8×1.0	M3×15L	18.5	10.5	13	M3×15L
	NLCD12-RF15	15				30								
	NLCD12-RF25	25				40								
NLCD16	NLCD16-RF	5	11	31	20	24.5	14	5	M10×1.0	M4×20L	21	13.5	15	M4×15L
	NLCD16-RF15	15				34.5								
	NLCD16-RF25	25				44.5								
NLCD20	NLCD20-RF	5	13	40.5	25	27.5	17	6	M12×1.25	M5×25L	25	16	20	M5×20L
	NLCD20-RF15	15				37.5								
	NLCD20-RF25	25				47.5								
NLCD25	NLCD25-RF	5	16	49.5	26.5	32.5	19	6	M14×1.5	M8×25L	33	18.5	22	M6×25L
	NLCD25-RF15	15				42.5								
	NLCD25-RF25	25				52.5								

Stroke Adjuster at Retraction End(RB)

(Unit:mm)



Model	Model No.	Stroke adjusting Range(㎜)	BODY Mounting									
			A	B	C	D	E	F	G	H	J	K
NLCD6	NLCD6-RB	5	22	20.5	12.5	10	21	6.5	8	2.5	M2.5×6L	M5×0.8
	NLCD6-RB15	15					31					
NLCD8	NLCD8-RB	5	13	24.5	-	-	16.5	8	10	3	M3×8L	M6×1.0
	NLCD8-RB15	15					26.5					
	NLCD8-RB25	25					36.5					
NLCD12	NLCD12-RB	5	15	31.5	-	-	20	9.5	12	4	M4×10L	M8×1.0
	NLCD12-RB15	15					30					
	NLCD12-RB25	25					40					
NLCD16	NLCD16-RB	5	17	38	-	-	24.5	12	14	5	M4×15L	M10×1.0
	NLCD16-RB15	15					34.5					
	NLCD16-RB25	25					44.5					
NLCD20	NLCD20-RB	5	20	48	-	-	27.5	15	17	6	M6×15L	M12×1.25
	NLCD20-RB15	15					37.5					
	NLCD20-RB25	25					47.5					
NLCD25	NLCD25-RB	5	57	58	39	23	32.5	18	19	6	M8×15L	M14×1.5
	NLCD25-RB15	15					42.5					
	NLCD25-RB25	25					52.5					

How to Order

NLCD ✱✱ − ✱✱ ✱✱

1 2 3

1 Bore size
6-Ø6, 8-Ø8
12-Ø12, 16-Ø16
20-Ø20, 25-Ø25

2 Stroke Adjuster
-Rubber Damper
RF : Extension Stroke Adjuster
RB : Retraction Stroke Adjuster
-Shock Absorber
SF : Extension Stroke Adjuster
SB : Retraction Stroke Adjuster

3 Adjustable Range
Blank : 5㎜ Standard
15 : 15㎜, 25 : 25㎜
※ NLCD6 : 25㎜ is not available.

How to Select

1. The first] Operation conditions

Calculation	Selecting example
• Model used • Cushion Style • Work mounting position • Mounting position • Average velocity Va (mm/s) • Allowable load W (kg) • Over hang Ln (m) : Fig. 1 From product until work gravity center distance	• Cylinder : NLCD25-30 • Cushion : Rubber Cushion • Work : Table mounting • Mounting : Horizontal mounting • Average velocity : Va=300[mm/s] • Load mass : W=0.5[kg] • Qverhang : 0.035

2. Second] Kinetic energy

• Calculate kinetic energy : E(J) $E = 0.5 \times W \times (V/1000)^2$ Ez = γ× Emax Table 3 Coefficient of velocity γ: Table 1 Kinetic energy(E) ≤ Max. allowable kinetic energy • Kinetic energy of work does not exceed allowable kinetic energy	$E = 0.5 \times 0.5 \times (300 / 1000)^2 = 0.0225$ $Ez = 0.6 \times 0.25 = 0.15$ E = 0.0225 ≤ Ez = 0.15 Possible to use by Kinetic energy(Ea) : Table 2 Max. allowable kinetic energy(Emax) : Table 3

3. Third] Load factor of Load mass

1) Load factor calculation of load mass (1) Calculate allowable load mass Wa(kg) Wa = γ× Wmax : Table 3 (2) Calculate Load mass load factor X_1 = γ× W / Wa 2) Load factor of kinetic moment (1) Calculate kinetic moment Me(N.m) Me = 1/3 × le × 9.8 × Ln Shock mass le = $\delta \times W \times V$ δ: Dumper coeficient – With urethance bumper(Standard) = 0.04 – With Shock absorber = 0.01 (2) Calculate allowable kinetic moment Mea(N.m) Wm = γ× Mmax : Table 4 (3) Calculate load factor α of kinetic moment X_2 = Me / Vm Coefficient of velocity γ: Table 1	Me = 1/3 × 6 × 9.8 × 0.035 = 0.686 le = 0.04 × 0.5 × 300 = 6. Ln = 0.035 Wm = 0.6 × 27.54 = 16.524 X_2 = 0.686 / 16.524 = 0.041 γ = 0.6

4. Fourth] Sum of load factor

When sum of load factor does not execcd 1. it is possible to use.

$\Sigma x n = X_1 + X_2 \leq 1 = 0.08 + 0.041 = 0.121 \leq 1$ And it is possible to use.

Fig. 1 Overhang : Ln(mm), from product until Work center distance

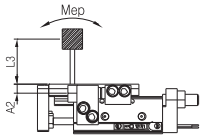
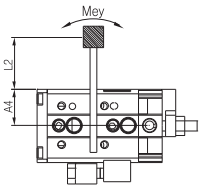
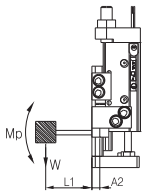
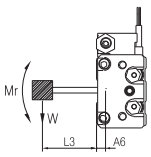
	Work mounting	
Hori zontal mounting		
Vertical mounting		

Table 2 Max. allowable kinetic energy : Emax

Model	Allowable kinetic energy	
	Rubber bumper	Shock absorber
NLCD 6	0.02	0.04
NLCD 8	0.038	0.076
NLCD12	0.075	0.15
NLCD16	0.125	0.25
NLCD20	0.175	0.35
NLCD25	0.25	0.5
NLCD32	0.325	0.65

Table 1 Coefficient of velocity : γ

Average speed (mm/s)	Application coefficient
50~200	1.0
200	0.6

Table 3 Max. allowable load mass : Wmax(kg)

Model	Max. allowable load mass
NLCD 6	0.8
NLCD 8	1.5
NLCD12	3
NLCD16	5
NLCD20	7
NLCD25	10
NLCD32	13

Table 4 Max. allowable moment : Mmax(N.m)

Model	Stroke (mm)								
	10	20	30	40	50	75	100	125	150
NLCD6	0.63	0.9	1.08	1.08	1.08	-	-	-	-
NLCD8	1.8	1.8	2.52	3.24	3.78	3.78	-	-	-
NLCD12	3.78	3.78	3.78	5.22	6.3	9	9	-	-
NLCD16	10.17	10.17	10.17	10.17	14.31	22.5	30.7	30.7	-
NLCD20	17.46	17.46	17.46	17.46	24.48	31.5	45.45	45.45	45.45
NLCD25	27.54	27.54	27.54	27.54	38.52	49.6	60.57	60.57	60.57
NLCD32	-	-	32.13	-	-	55.8	66.6	-	-

Symbol

Symbol	Definition	Symbol	Definition	Symbol	Definition	Symbol	Definition
An (n = 1~6)	Correction value ofr movement center distance(mm)	Ma (Map, May, Mar)	Allowable static movement(Pitch,Yaw,Roll)(N.m)	W	Static load(kg)	γ	Allowable movement coeficient
E	Kinetic energy(J)	Me (Mep, Mey)	Kinetic moment(Pitch,Yaw)(N.m)	Wa	Allowable static load(kg)	δ	Damper coeficient
Ea	Allowable kinetic energy(J)	Mea (Meap, Meay)	Allowable kinetic movement(Pitch,Yaw)(N.m)	We	Load equivalent to collision(kg)	k	Work mounting coeficient
Emax	Max. allowable kinetic energy(J)	Mmax (Mpmax, Mymax, Mmax)	Max. allowable kinetic movement(Pitch,Yaw,Roll)(N.m)	Wmax	Max. allowable static load(kg)		
Ln (n = 1~3)	Overhang (mm)	V	Collision speed(mm/s)	α	Load rate		
M (Mp, My, Mr)	Static movement(Pitch,Yaw,Roll)(N.m)	Va	Average speed(mm/s)	β	Allowable static load coeficient		

Series NLCD / Precautions

Selection

Caution

Do not apply a load over the operating limit range.

Mounting

Caution

Do not scratch and dent mounting side of body, table and end plate.

The damage will result in a decrease in parallelism, vibration of guide and an increase in moving part resistance.

Avoid contact with the air slide table during operation.

Adjuster option creates additional pinch points which can cause injury to operator when table is moving.

Preventative measures. e. g. installation of a cover, should be taken to avoid such accidents.

Precautions for Adjuster Option

Caution

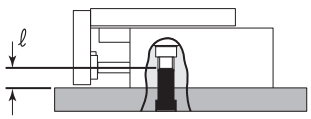
When stroke adjuster is adjusted, do not hit the table with wrench.

This can cause excessive play.

Mounting

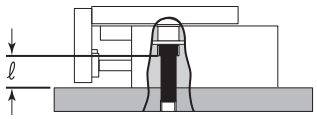
Caution

1. Lateral mounting (Body tapped)



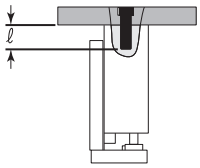
Model	Bolt	Max. Torque N.m(kg.cm)	Max. screw-in depth (ℓ mm)
NLCD06	M4×0.7	2.1(21.4)	8
NLCD08	M4×0.7	2.1(21.4)	8
NLCD12	M5×0.8	4.4(44.9)	10
NLCD16	M6×1	7.4(75.5)	12
NLCD20	M6×1	7.4(75.5)	14
NLCD25	M8×1.25	18(180)	17
NLCD32	M10×1.55	40(408)	20

2. Lateral mounting (Through)



Model	Bolt	Max. Torque N.m(kg.cm)	Max. screw-in depth (ℓ mm)
NLCD06	M3×0.5	1.2(12.2)	9
NLCD08	M3×0.5	1.2(12.2)	11
NLCD12	M4×0.7	2.8(28.6)	15
NLCD16	M5×0.8	5.7(58.1)	17.5
NLCD20	M5×0.8	5.7(58.1)	26
NLCD25	M6×1	10(100)	33
NLCD32	M8×1.25	18(80)	36.5

3. Axial mounting (Body tapped)

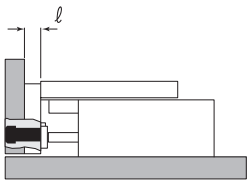


Model	Bolt	Max. Torque N.m(kg.cm)	Max. screw-in depth (ℓ mm)
NLCD06	M2.5×0.45	0.5(5.1)	5
NLCD08	M3×0.5	0.9(9.2)	5
NLCD12	M4×0.7	2.1(21.4)	9
NLCD16	M5×0.8	4.4(44.9)	9
NLCD20	M5×0.8	4.4(44.9)	9
NLCD25	M6×1	7.4(75.5)	9
NLCD32	0.8×1.25	18(100)	10

Mounting

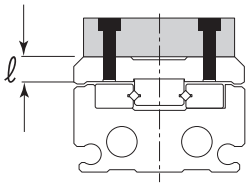
Caution

1. Front face mounting



Model	Bolt	Max. Torque N.m(kg.cm)	Max. screw-in depth (ℓ mm)
NLCD06	M3×0.5	0.9(9.2)	5
NLCD08	M4×0.7	2.1(21.4)	6
NLCD12	M5×0.8	4.4(44.9)	8
NLCD16	M6×1	7.4(75.5)	10
NLCD20	M6×1	7.4(75.5)	13
NLCD25	M8×1.25	18(180)	15
NLCD32	M10×1.5	40(408)	20

2. Top face mounting



Model	Bolt	Max. Torque N.m(kg.cm)	Max. screw-in depth (ℓ mm)
NLCD06	M3×0.5	0.9(9.2)	5
NLCD08	M3×0.5	0.9(9.2)	5.5
NLCD12	M4×0.7	2.1(21.4)	7
NLCD16	M5×0.8	4.4(44.9)	9
NLCD20	M5×0.8	4.4(44.9)	9.5
NLCD25	M6×1	7.4(75.5)	11.5
NLCD32	M8×1.25	18(180)	14

Precautions for Adjuster Option

Caution

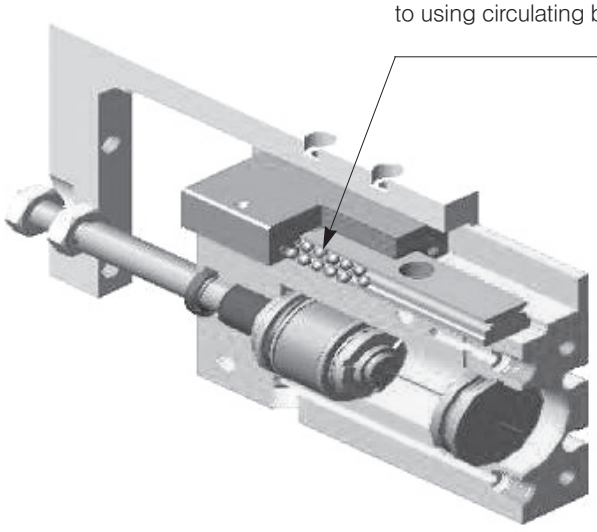
Model	Tightening Torque N.m(kg.cm)
NLCD06	3.0 (30.6)
NLCD08	5.0 (51.0)
NLCD12	12.5 (128)
NLCD16	25.0 (255)
NLCD20	43.0 (439)
NLCD25	69.0 (704)
NLCD32	-

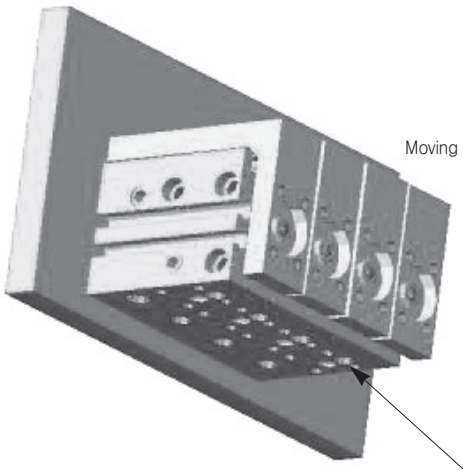
Series NLCS

Table Cylinder

Bore Size : Ø6, Ø10, Ø16

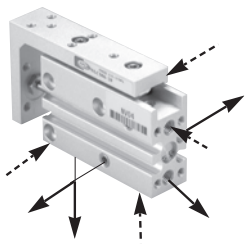
Guarantee of long life time due to using circulating bearing





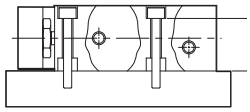
Moving forward

Moving backward

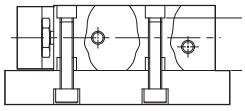


Various application due to adding air supply port on the bottom of table.

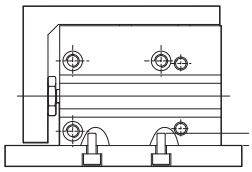
1. Side mounting(Body through hole)



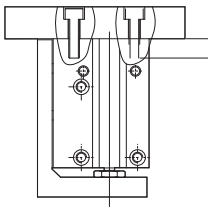
2. Side mounting(Body tapped)



3.Vertical mounting(Body tapped)



4.Axial mounting(Body tapped)



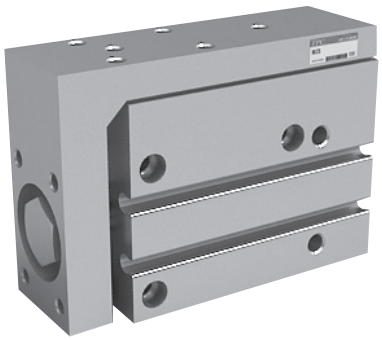
NLCD Variation

Model	Bore size (㎜)	Standard Stroke							Auto Switch
		5	10	15	20	25	30	40	
NLCD6	6	■	■	■	■	■	■	–	Reed Switch [W8H] [W8V]
NLCD10	10	■	■	■	■	■	■	■	Solid State Switch [W9H] [W9V] [W9HN] [W9HP]
NLCD16	16	■	■	■	■	■	■	–	

Series NLCS

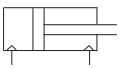
Table Cylinder

Bore Size : Ø6, Ø10, Ø16



- IMPROVEMENT OF DURABILITY DUE TO USE CIRCULATING BEARING
- USING PRECISE HEAVY WEIGHT BEARING BLOCK
- UNIVERSAL MOUNTING

Symbol



How to Order

NLCS **06** — **20** **W8H** **S**

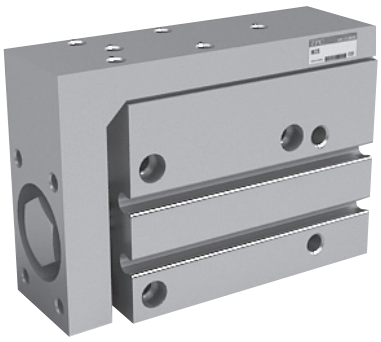
1 2 3 4

1 Table Cylinder Single Rod

2 Bore Size(Ø㎜)-Stroke(㎜)
6-5,10,15,20,25,30
10-5,10,15,20,25,30, 40
16-5,10,15,20,25,30

3 Auto Switch
Blank : None
W8V : Reed Switch(Vertical Type)
W8H : Reed Switch(Horizontal Type)
W9H : Solid State Switch(Horizontal Type)
W9V : Solid State Switch(Vertical Type)
W9HN : Solid State Switch(3 Wire, NPN)
W9HP : Solid State Switch(3 Wire, PNP)
※ Standard auto switch lead wire length is 1m.
3m leads available on all models by adding a "L" suffix to the part number. (ex:W8HL, W9VL)

4 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs



Specifications

Bore size(Ø㎜)	6, 10, 16
Fluid	Air
Action	Double Acting
Operating Pressure	0.15~0.7Mpa(21~99psi)
Proof Pressure	1.05Mpa(152psi)
Ambient and Fluid Temp ℃(°F)	−10~60℃(14~140°F)
Piston Speed	50~500㎜/s
Lubrication	Non Lube
Auto Switch(OPTION)	Reed Switch : DC(24V)/AC(110V) Solid State Switch : DC(24V)
Stroke Length Tolerance	0~+1㎜
Cushion	Rubber Damper(Both side)

Standard Stroke

Model	Standard Stroke						
	5	10	15	20	25	30	40
NLCS6	○	○	○	○	○	○	–
NLCS10	○	○	○	○	○	○	○
NLCS16	○	○	○	○	○	○	–

Weight Table

(Unit:g(ℓb))

Model	Standard Stroke						
	5	10	15	20	25	30	40
NLCS6	45	50	60	65	75	80	–
NLCS10	95	105	115	120	145	150	★
NLCS16	100	190	230	230	260	280	–

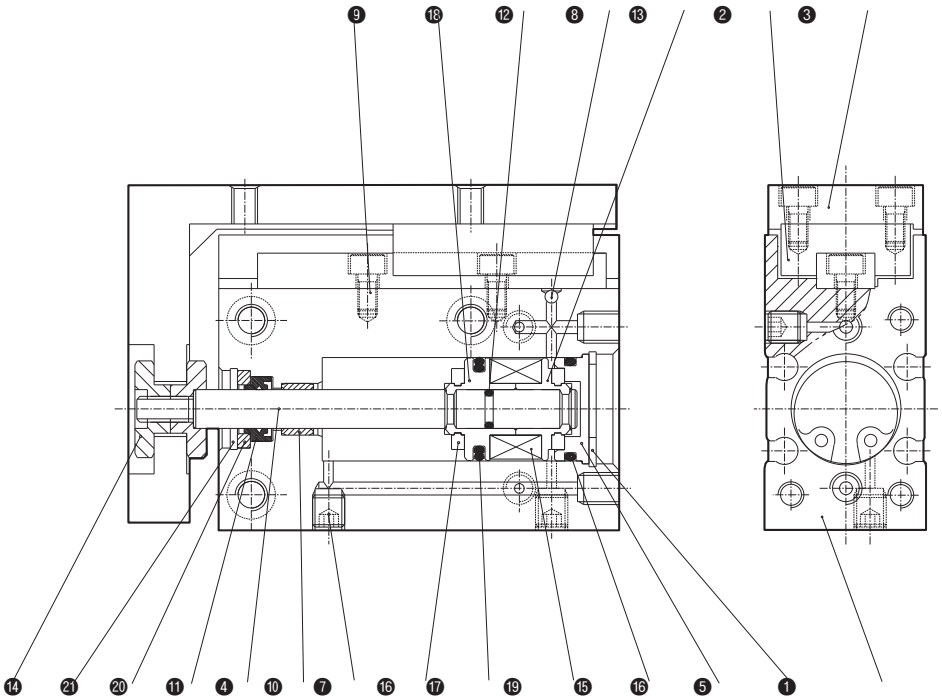
Theoretical Force

(Unit:N)

Model	Operating Direction	Operating Pressure(Mpa(psi))		
		0.3(43.5)	0.5(72.5)	0.7(101.5)
NLCS6	Extention	17	29	40
	Retraction	13	21	29
NLCS10	Extention	30	51	71
	Retraction	23	38	53
NLCS16	Extention	68	113	158
	Retraction	51	85	119

※ Theoretical Force[N]=Pressure[Mpa]×Piston Area[㎟]　　1N≒0.102kgf, 1Mpa≒10.2kgf/㎠

Structure



No.	Description	Material	Note
1	Body	Alluminum Ally	
2	Bearing Ass'y	Ally Steel	
3	Table	Alluminum Ally	
4	Piston Rod	Stainless Steel	
5	Snap Ring	Spring Steel	
6	Head Cover	Alluminum Ally	
7	Headless Wrench Bolt	Stainless Steel	
8	Ball(Ø)	Ally Steel	
9	Blanking Plug	Stainless Steel	
10	Bush	Ally Steel	

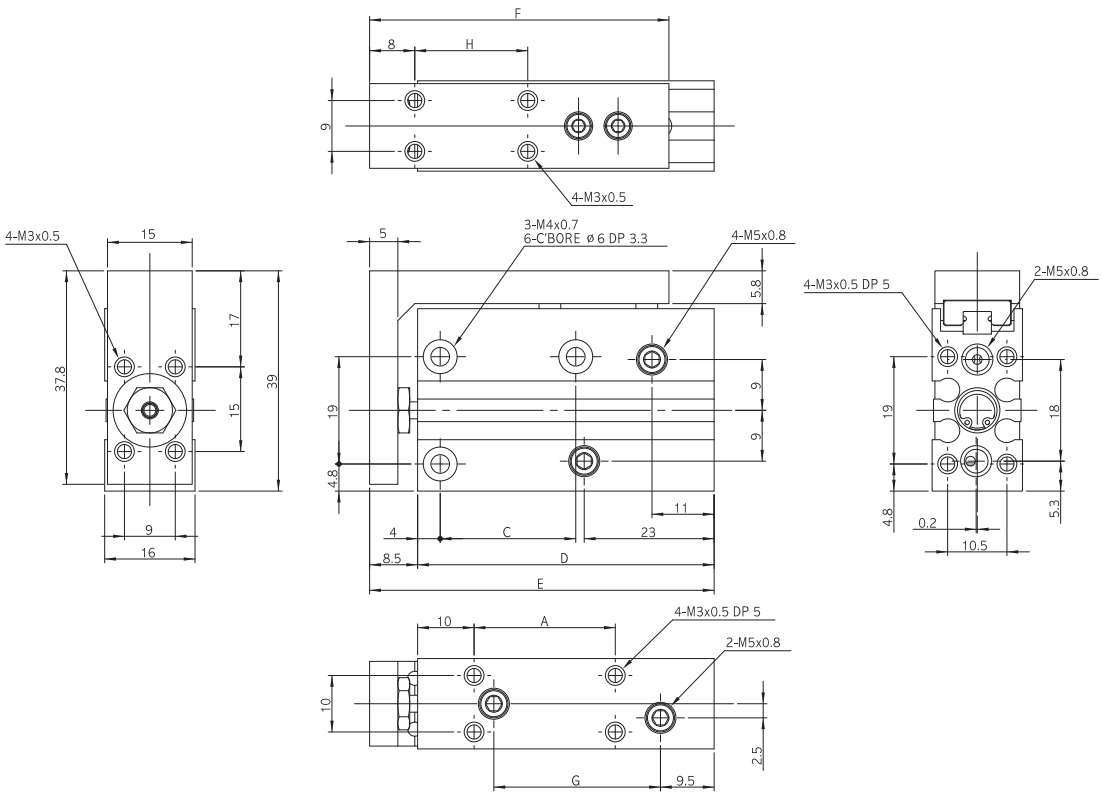
11	Rod Packing	NBR	
12	Piston Gasket	NBR	
13	Piston-B	Alluminum Ally	
14	Retainer	Brass	
15	Tube Gasket	NBR	
16	Bumper	Polyurethane	
17	Piston Packing	NBR	
18	Piston-A	Alluminum Ally	
19	Magnet	Alloy Steel	
20	Rod Cover	Brass	
21	Snap Ring	Ally Steel	

Spare Parts/Seal Kits

No.	Description	Material	Part. No		
			NLCS6	NLCS10	NLCS16
11	Rod Seal	NBR	KSYR-3	KSYR-4	ORA-6
15	Tube Gasket	NBR	TC1P006-16-1693	TC1P006-16A1694	TC1P006-15A-1695
17	Piston Seal	NBR	OPA-6	OPA-10	OPA-16

Dimensions NLCS 6

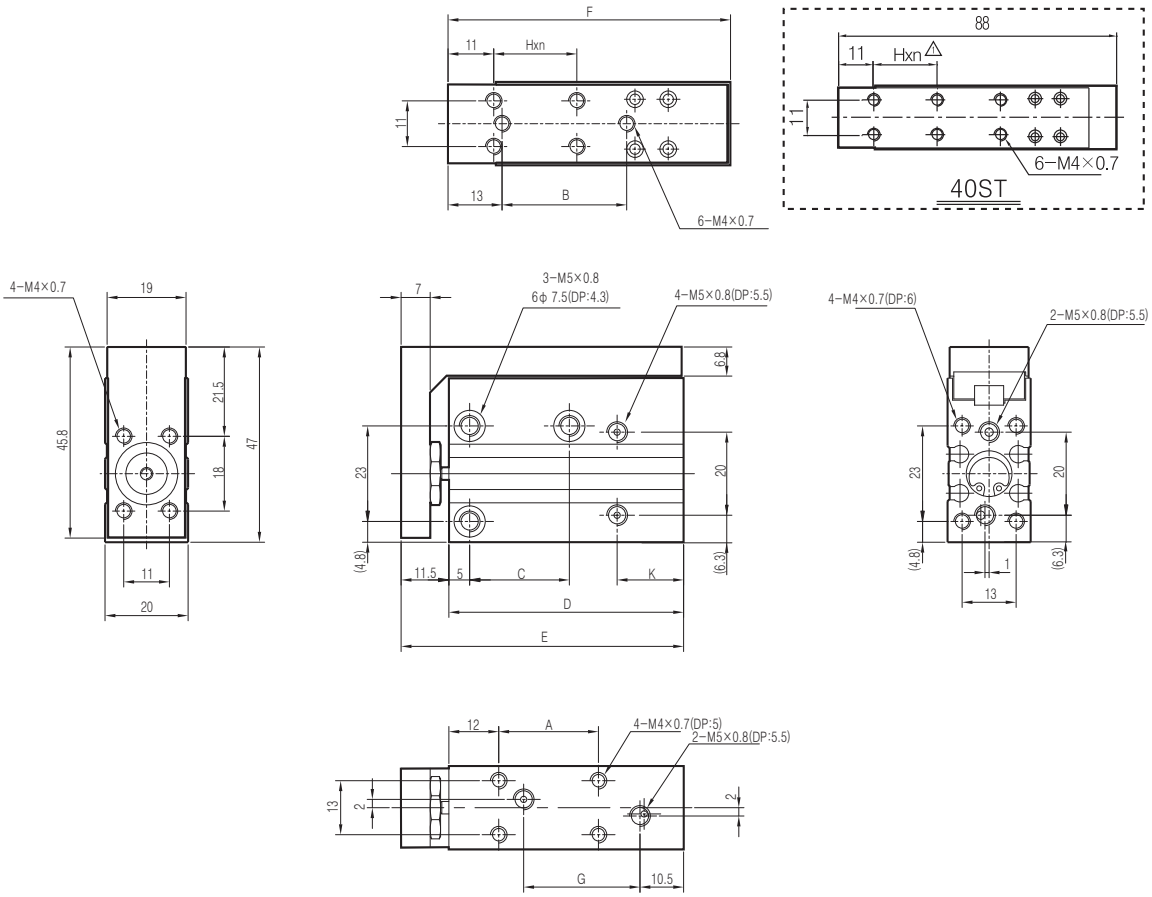
(Unit:mm)



No	Part. No	Stroke	A	C	D	E	F	G	H
1	NLCS6-5	5	10	14	37.5	46	38	14.5	10
2	NLCS6-10	10	15	14	42.5	51	43	19.5	10
3	NLCS6-15	15	20	24	47.5	56	48	24.5	20
4	NLCS6-20	20	25	24	52.5	61	53	29.5	20
5	NLCS6-25	25	30	34	57.5	66	58	34.5	30
6	NLCS6-30	30	35	34	62.5	71	63	39.5	30

Dimensions NLCS 10

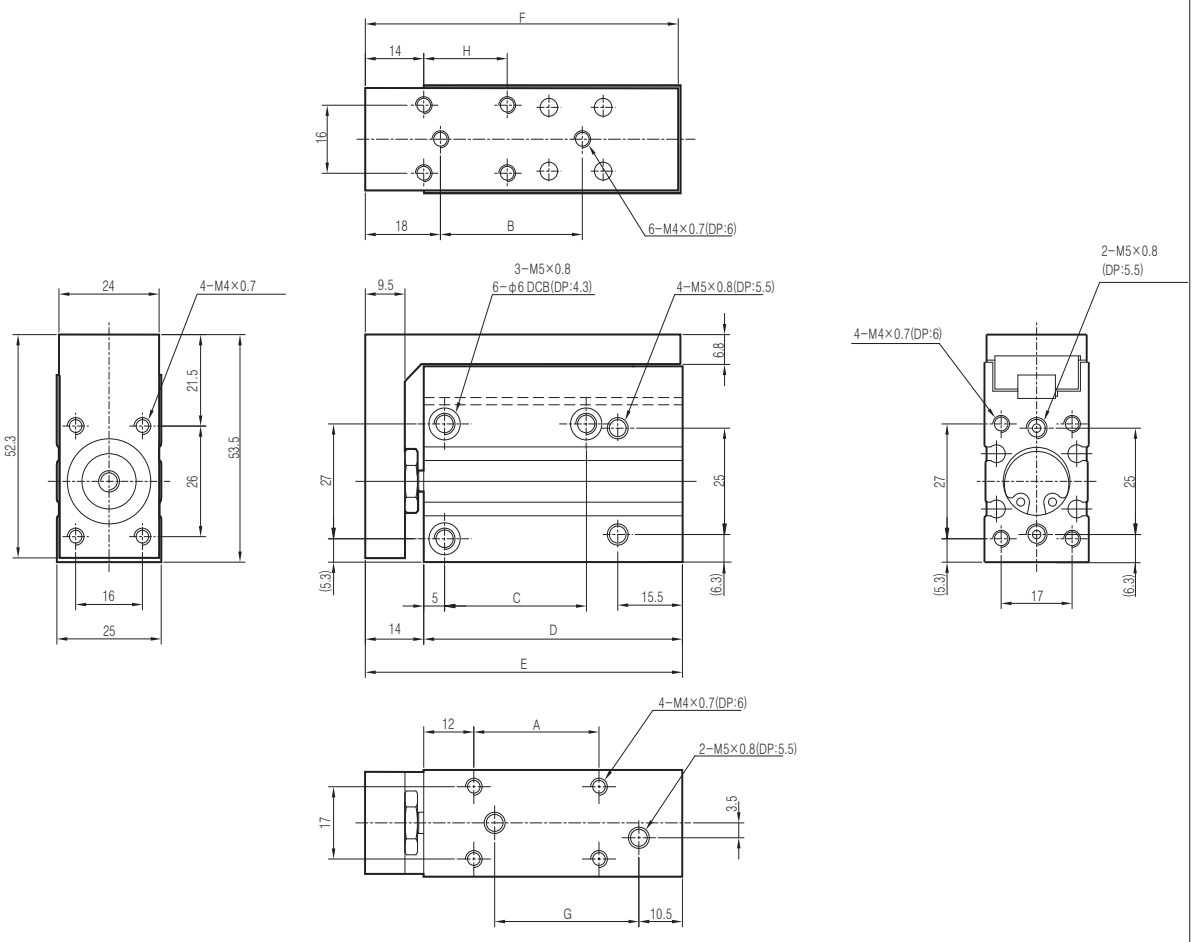
(Unit:mm)



No	Part. No	Stroke	A	B	C	D	E	F	G	Hxn	K
1	NLCS10-5	5	10	14	14	41.5	53	52.5	14.5	10×1	14.5
2	NLCS10-10	10	14	19	14	46.5	58	57.5	19.5	10×1	15
3	NLCS10-15	15	18	25	24	51.5	63	62.5	24.5	20×1	16
4	NLCS10-20	20	24	30	24	56.5	68	67.5	29.5	20×1	16
5	NLCS10-25	25	32	40	34	64.5	76	75.5	34.5	30×1	16
6	NLCS10-30	30	35	45	34	68.5	80	79.5	39.5	30×1	16
7	NLCS10-40	40	45	–	45	76.5	88	79	49.5	20×2	16

Dimensions NLCS 16

(Unit:mm)



No	Part. No	Stroke	A	B	C	D	E	F	G	H
1	NLCS16-5	5	20	24	24	52	66	65.5	19.5	10
2	NLCS16-10	10	20	24	24	52	66	65.5	24.5	10
3	NLCS16-15	15	30	35	34	62	76	75.5	29.5	20
4	NLCS16-20	20	30	35	34	62	76	75.5	34.5	20
5	NLCS16-25	25	40	45	40	72	86	85.5	39.5	30
6	NLCS16-30	30	45	50	40	77	91	90.5	44.5	30

Cautions for each product in NLCS Series

Be sure to understand these matters before using the products.

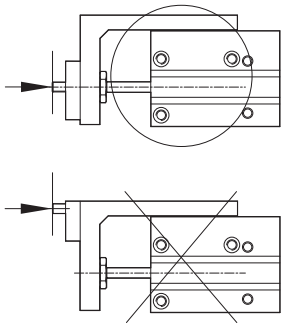
Allowable Movement

Type	Stroke	Allowable movement(N.M)			Distance adjustment value for moment position(㎜)	
		M1	M2	M3	Cp.Cy	Cr
NLCS6	5	0.046	0.040	0.049	28	7.5
	10	0.046	0.040	0.049	28	
	15	0.061	0.053	0.062	31	
	20	0.061	0.053	0.062	34	
	25	0.076	0.066	0.074	38	
	30	0.076	0.066	0.074	41	
NLCS10	5	1.1	1.1	1.82	30	9.5
	10	0.98	0.98	1.58	38	
	15	0.85	0.85	1.38	45	
	20	0.74	0.74	1.2	45	
	25	0.64	0.64	1.0	55	
	30	0.56	0.56	0.9	55	
	40	0.48	0.48	0.8	55	
NLCS16	5	2.17	2.17	3.21	42	12
	10	1.89	1.89	2.8	42	
	15	1.64	1.64	2.43	56	
	20	1.43	1.43	2.11	61	
	25	1.24	1.24	1.84	61	
	30	1.08	1.08	1.6	71	

Cautions for selection

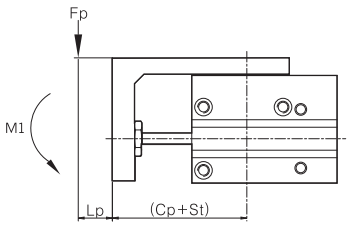
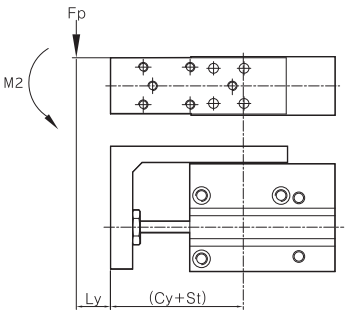
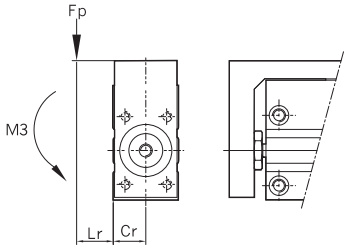
Cautions

- Never insert your finger in the gap between table and cylinder tube. When piston rod is moving in, finger can be jammed between table and cylinder tube. So never insert your finger. If finger is jammed, injury may be inevitable, because the power of cylinder is very strong.
- Loading mass and moment must not exceed maximum loading mass and allowable movement.
- In case that the output of table cylinder is directly applied to table, it must be applied on the line of rod axis.(Refer to the following figure)



- Be sure to connect speed controller in order to keep the speed below 50mm/s.

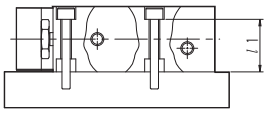
Formula for Calculaion of Allowable Static Load, Fp, Fy and Fr

When PITCH movement is added	When YAW movement is added	When ROLL movement is added
		
$Fp=\frac{M1\times1000}{Lp+Cp+St}(N)$	$Fy=\frac{M2\times1000}{Ly+Cy+St}(N)$	$Fr=\frac{M3\times1000}{Lr+Cr}(N)$
Lp : Distance from table to leading point(mm) Cp : Distance adjusting value for central position of movement(mm) St : Length of stroke (mm).	Ly : Distance from table to leading point(mm) Cy : Distance adjusting value for central position of movement(mm) St : Length of stroke (mm).	Lr : Distance from table to leading point(mm) Cr : Distance adjusting value for central position of movement(mm)

How to install compact slide

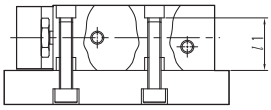
● Compact slide can be installed in 4 directions.
Select it in accordance with machine or Work.

Horizontal installation type(BODY penetration hole)



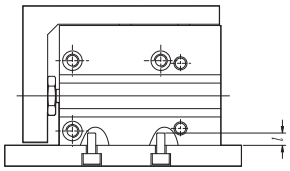
Model	Using Bolt	Maximum Fastening Torque Nm	ℓ
NLCS6	M3×0.5	1.1(11)	12.7
NLCS10	M4×0.7	2.5(25)	15.6
NLCS16	M4×0.7	5.1(25)	20.6

Horizontal installation type(BODY tap)



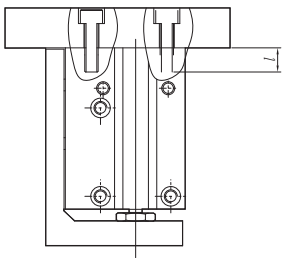
Model	Using Bolt	Maximum Fastening Torque Nm	ℓ
NLCS6	M3×0.5	2.5(25)	9.4
NLCS10	M5×0.8	5.1(52)	11.2
NLCS16	M5×0.8	5.1(52)	16.2

Vertical installation type(BODY tap)



Model	Using Bolt	Maximum Fastening Torque Nm	ℓ
NLCS6	M3×0.5	1.1(11)	4.8
NLCS10	M4×0.7	2.5(25)	6
NLCS16	M4×0.7	2.5(25)	6

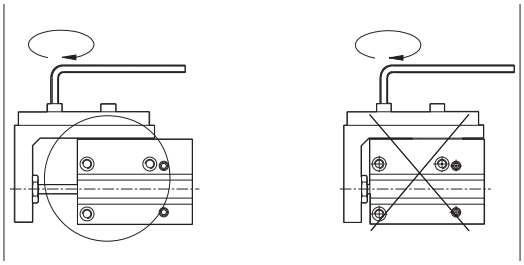
Axial direction installation type(BODY tap)



Model	Using Bolt	Maximum Fastening Torque Nm	ℓ
NLCS6	M3×0.5	1.1(11)	4.8
NLCS10	M4×0.7	2.5(25)	6
NLCS16	M4×0.7	2.5(25)	6

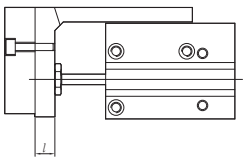
How to install Work

●It is possible to install work on the 2 surface of compact slide.
●As table is supported by miniature linear guide, avoid excessive shock or moment when installing work.
●Be sure to support table when fastening work to table by bolt, etc. If body is supported when fastening, guide will undergo excessive moment, thereby deteriorating precision.



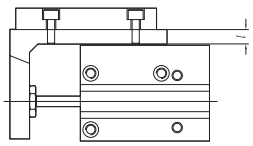
●When connecting to load with external tools of support or guide, be sure to select suitable connecting method and perform position deciding work as much as required.
●If the sliding part of piston rod is damaged or collided, malfunction or air leakage may be caused.

Front surface installation type



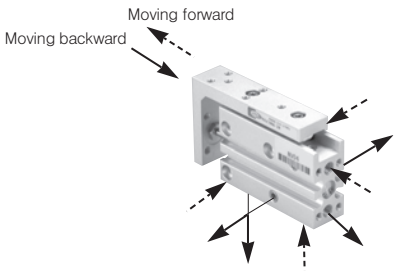
Model	Using Bolt	Maximum Fastening Torque Nm	ℓ
NLCS6	M3×0.5	1.1(11)	5
NLCS10	M4×0.7	2.5(25)	7
NLCS16	M4×0.7	2.5(25)	9.5

Lateral surface installation type

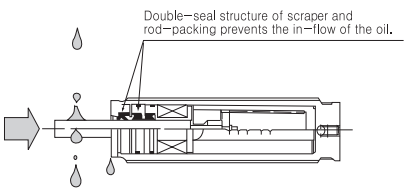


Model	Using Bolt	Maximum Fastening Torque Nm	ℓ
NLCS6	M3×0.5	1.1(11)	5
NLCS10	M4×0.7	2.5(25)	6
NLCS16	M4×0.7	2.5(25)	6

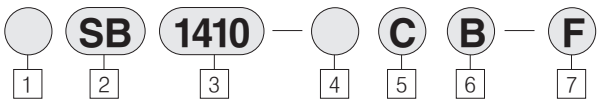
Moving direction of each pressurized port



Series SB
Shock Absorber



How to Order



1 Standard Thread
Blank : Rc(PT)
U : NPT

2 SHOCK ABSORBER

3 Type of Thread×STROKE
Adjustable
1410 : M14×P1.5×10
2015 : M20×P1.5×15
2525 : M25×P1.5×25
2725 : M27×P3.0×25
3625 : M36×P1.5×25
3650 : M36×P1.5×50
4225 : M42×P1.5×25
4250 : M42×P1.5×50
4275 : M42×P1.5×75
6450 : M64×P2.0×50
64100 : M64×P2.0×100
64150 : M64×P2.0×150

Compensative
1006 : M10×P1.0×6
1415 : M14×P1.0×15
1420 : M14×P1.0×20
2020 : M20×P1.5×20
2030 : M20×P1.5×30
2050 : M20×P1.5×50
2525 : M25×P2.0×25
2530 : M25×P2.0×30
2550 : M25×P2.0×50
2580 : M25×P2.0×80
3680 : M36×P1.5×80

4 Option
Blank : None
1 : Light weight(only applies to compensator M10~M36 Series)
2 : Standard(only applies to compensator M10~M36 Series)
3 : Reinforced (only applies to compensator M14~M36 Series)

5 CAPS
Blank : None
C : CAP

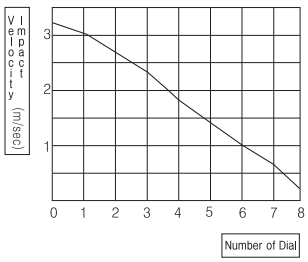
6 Control Dial
Blank : None
B : Control Dial

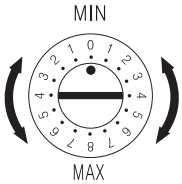
7 OPTION
Blank : Pair of Basic Lock and Nut
F : Square Flange (only applies to Adjustable M36~M64 Series)
S : Stop Collar (only applies to Adjustable M14~M64 Series)
U : Urethane Cap (only applies to Adjustable M36~M64 Series)
※ M10~M25 Series are basically equipeed with Urethane Caps.

Directions and Applications

Items	characteristics	Directions for use	Applications	Applicable temp Range
SB Series Standard (Miniature · Middle-Size)	1) Using the 360'-rotating damping control dial, the range of shock absorption can be adjusted by the user according to the impact velocity. 2) Prepares for another cycle by quickly retrieving the piston road with a specially designed spring. 3) Extends the life span of the product by preventing the corrosion with finishes on the outer cylinder and corroding the chrome plating on the piston road. 4) The thermal energy is established based on the atmospheric temperature of 20'C.	1) After adjusting the damping control dial, fasten it with a wrench. 2) Check if the effective weight is within the applicable range. 3) With the insertion of a poly pad in the end button of the road, the noise decreases 3~7dB. 4) It can be attached on any location.	1. Automation Lines 2. Automobile Equipments 3. Conveyor Equipments 4. Linear Movement of Oil Insertion 5. Wrappers 6. Textile Weavers 7. Press/adherers	-20'C ~ 60'C
SB Series (Heavy Duty)	1) Improves the productivity by increasing the acceleration of the equipment. 2) Reduces the manufacturing cost by extending the life span of the shock-absorbing equipments. 3) Improves the operational efficiency by reducing the noise inside the manufacturing facility. 4) Improves and maintains the quality by preventing damages of the products. 5) Maximum Impact Velocity: 0.05~3.3 m/sec 6) Range of Applicable Temperature: -20~60'C 7) When using Vitar seal and specialized oil, the range extends to -40~120'C.			
SB Series long-stroke type	1) With its innovative multiple-orifice structure, it definitely stops the Robot softly when extruding the materials. 2) Maximum Impact Velocity: Less than 3.5 m/sec Maximum Applicable Temperature: -20~60'C			

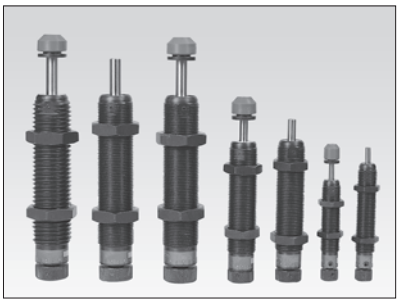
How to use Adjustable Dial

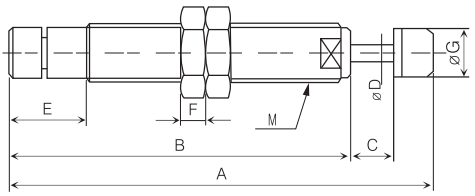


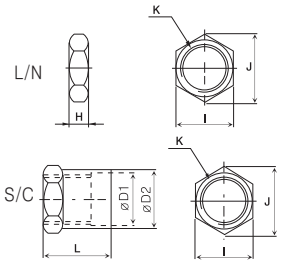


Comment) • The outer measurements are subject to change for improvements without notifications.

SB Series [Miniature]







Dimension & Capacity Chart

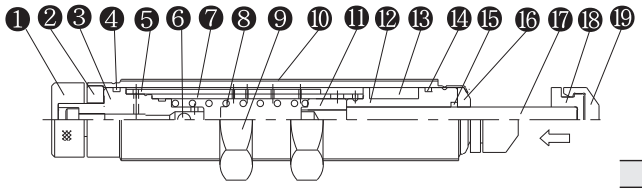
unit: mm

Model	Stroke	A	B	C	ØD	E	F	ØG	M
SB1410-CB	10	93	70.5	10	4	20	4	11	M14×P1.5
SB2015-CB	15	127	97.5	15	6	22	6	17	M20×P1.5
SB2525-CB	25	166	126.5	25	8	24	8	20	M25×P1.5
SB2725-CB	25	166	126.5	25	8	24	8	20	M27×P3.0

L/N, S/C, S/F	H	I	J	D1	D2	L	K
SB1410-CB	4	17	19.6	15	18	26	M14×P1.5
SB2015-CB	6	24	27.7	21	23	35	M20×P1.5
SB2525-CB	8	32	37	26	31	40	M25×P1.5
SB2725-CB	8	32	37	28	31	40	M27×P3.0

Model	S Stroke (mm)	E[C] Total Energy [MAX] (Nm)	E[D] Thermal Energy [MAX] (Nm/h)	W[E] Effective Weight [MIN] [MAX] (N)	F Impact Force (N)	Return Force [MIN] [MAX] (N)	Mass (g)
SB1410-CB	10	5	24.500	0.3~102	680	5~11	65
SB2015-CB	15	14	35.000	1.3~285	1160	8~15	150
SB2525-CB	25	75	70.000	9.8~1550	3800	15~45	340
SB2725-CB	25	75	70.000	9.8~1550	3800	15~45	390

Construction

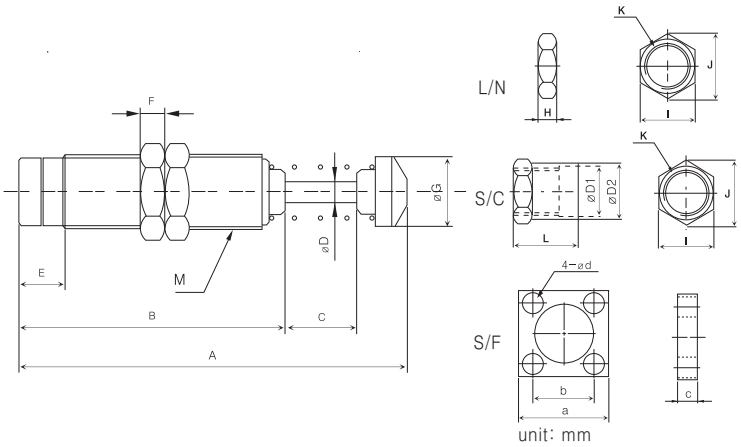


Parts List

No	Description	Material	Note
❶	Adjustable Dial	Carbon Steel	Black Coating
❷	Stopping Ring	Carbon Steel	Black Coating
❸	Adjustable Rod	Carbon Steel	Black Coating
❹	End Packing	NBR	
❺	Adjustable Tube	Special Steel	
❻	Steel Ball	Bearing Steel	
❼	Inner Tube	Special Steel	
❽	Return Spring	Spring Steel	Heat Treatment
❾	Lock Nut	Carbon Steel	Black Coating
❿	Housing	Rolling Steel	Black Coating
⓫	Piston	Copper Ally	
⓬	Packing Holder	Copper Ally	
⓭	Accumulator	NBR	Foaming Rubber
⓮	Top Packing	NBR	
⓯	Rod Packing	NBR	
⓰	Dust Cap	Al + Acetal	
⓱	Piston Rod	Special Steel	Hard Cr Plating
⓲	Button	Carbon Steel	Black Coating
⓳	Cap	Special Urethane	

Comment) • The outer measurements are subject to change for improvements without notifications.

SB Series (Middle Size)



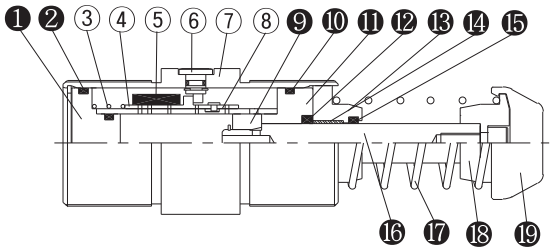
Dimension & Capacity Chart

Model	Stroke	A	B	C	ØD	E	F	ØG	M
SB3625-CB	25	182	133	25	10	26	10	34	M36×P1.5
SB3650-CB	50	232	158	50	10	26	10	34	M36×P1.5

L/N, S/C, S/F	H	I	J	D1	D2	L	a	b	c	d	K
SB3625-CB	10	46	53.1	37	45	60	45	32	9	6	M36×P1.5
SB3650-CB	10	46	53.1	37	45	60	45	32	9	6	M36×P1.5

Model	S Stroke (mm)	E^C Total Energy [MAX] (Nm)	E^D Thermal Energy [MAX] (Nm/h)	W^E Effective Weight [MIN] [MAX] (N)	F Impact Force (N)	Return Force [MIN] [MAX] (N)	Mass (g)
SB3625-CB	25	120	90.000	17~2450	6000	40~75	680
SB3650-CB	50	240	110.000	34~4900	6000	25~60	780

Construction



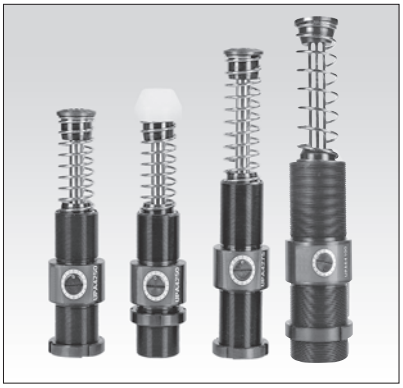
Parts List

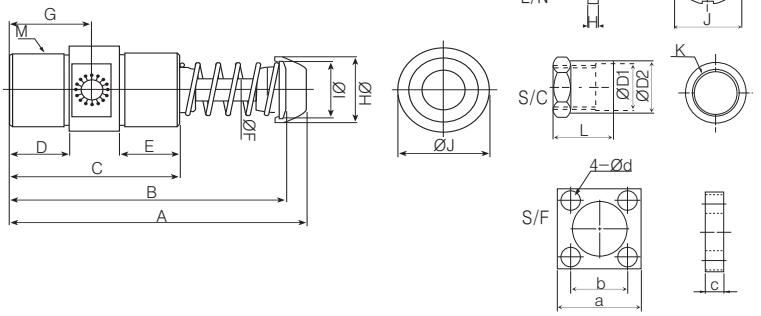
No	Description	Material	Note
❶	End Rod	Carbon Steel	Black Coating
❷	End Packing	NBR	
③	Adjustable Spring	Spring Steel	Heat Treatment
④	Inner Tube	Special Steel	
⑤	Accumulator	Special Rubber	Foaming Rubber
⑥	Adjustable Dial	Carbon Steel	Black Coating
⑦	Housing	Rolling Steel	Black Coating
⑧	Adjustable Tube	Special Steel	
❾	Piston	Copper Ally	
❿	Top Packing	NBR	

No	Description	Material	Note
⓫	Packing Holder	Copper Ally	
⓬	Rod Packing	Special Rubber	
⓭	Dust Cap	Al + Acetal	
⓮	Bearing	Standard	Black Coating
⓯	Dust Seal	NBR	
⓰	Piston Rod	Special Steel	
⓱	Return Spring	Spring Steel	Hard Cr Plating
⓲	Button	Carbon Steel	Hard Cr Plating
⓳	Cap	Special Urethane	Black Coating

Comment) • No ③~⑧ is for Adjustable dial of Heavy duty.
• The outer measurements are subject to change for improvements without notifications.

SB Series (Heavy Duty)





Dimension & Capacity Chart

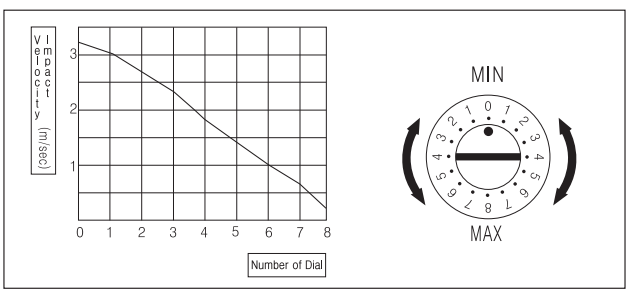
unit: mm

Model	Stroke	A	B	C	D	E	ØF	G	ØH	ØI	J	M
SB4225-CB	25	167	152	94	32	29	14	49	45	38	54	M42×P1.5
SB4250-CB	50	217	202	119	44	42	14	61.5	45	38	54	M42×P1.5
SB4275-CB	75	267	252	144	56	55	14	74	45	38	54	M42×P1.5
SB6450-CB	50	241	224	138	50	49	20	67.5	58	50	75	M64×P2.0
SB64100-CB	100	341	324	188	76	75	20	95	58	50	75	M64×P2.0
SB64150-CB	150	471	454	238	76	75	20	141	58	50	75	M64×P2.0

L/N, S/C, S/F	J	C	D_2	D_1	L	a	b	c	d	K
SB42**-CB	54	10	58	44	48	60	41.5	12	9	M42×P1.5
SB64**-CB	75	16	75	60	60	90	70	16	10	M64×P2.0

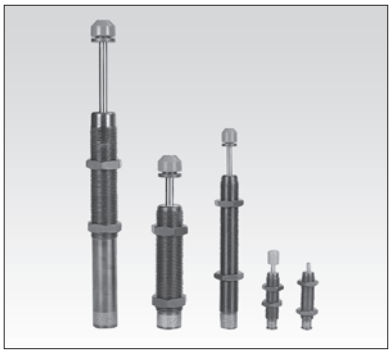
Model	S Stroke (mm)	E^C Total Energy [MAX] (Nm)	E^D Thermal Energy [MAX] (Nm/h)	W^E Effective Weight [MIN] [MAX] (N)	F Impact Force (N)	Return Force [MIN] [MAX] (N)	Mass (g)
SB4225-CB	25	250	130000	25 3600	24000	50 85	1000
SB4250-CB	50	500	157500	45 6100	24000	35 75	1300
SB4275-CB	75	750	195000	55 9100	24000	35 100	1600
SB6450-CB	50	1250	245000	70 13000	33000	80 165	3500
SB64100-CB	100	2550	335000	115 17500	33000	75 210	4700
SB64150-CB	150	3750	370000	130 23500	33000	95 360	6100

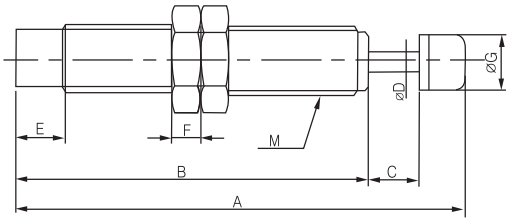
How to use adjustable dial



Comment) • The outer measurements are subject to change for improvements without notifications.

SB Series (Standard)





1. Self-compensating type, multi orifice these shock absorbers automatically adjust force and stroke.
2. MAX. impact speed : SB 1006 0.1~2.4m/sec SB 2020 0.5~4.0m/sec SB 2525 0.5~3.5m/sec
3. Allowable Temperture Range : -20~ 60℃

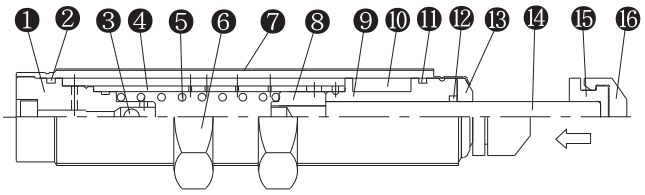
Dimension & Capacity Chart

unit: mm

Model	Stroke	A	B	C	ØD	E	F	ØG	M
SB1006	6	60	41	6	3	5	3	8	M10×P1.0
SB1415 SB1415-CB-A	15	101	73.5	15	4	11	4	11	M14×P1.0 M14×P1.5
SB1420	20	142	109.5	20	4	10	4	11	M14×P1.0
SB2020	20	123	88.5	20	6	13	6	17	M20×P1.5
SB2025	25	131	91.5	25	8	13	8	20	M25×P1.5

Model	S Stroke (mm)	E[C] Total Energy [MAX] (Nm)	E[D] Thermal Energy [MAX] (Nm/h)	W[E] Effective Weight [MIN] [MAX] (N)	F Impact Force (N)	Return Force [MIN] [MAX] (N)	Mass (g)
SB1006-1C SB1006-2C	6	3	20000	0.9~5.0 5.0~13	630	4 6	25
SB1415-1C SB1415-2C SB1415-3C	15	15	45000	0.9~8.0 8.0~70 65~140	1300	7 11	65
SB1420-1C SB1420-2C SB1420-3C	20	19	48000	1.5~10 10~80 70~180	1300	7 12	80
SB2020-1C SB2020-2C SB2020-3C	20	30	52500	2.0~20 20~200 170~800	1900	10 30	130
SB2525-1C SB2525-2C SB2525-3C	25	80	72000	10~120 110~1000 350~1600	4000	20 45	530

Construction

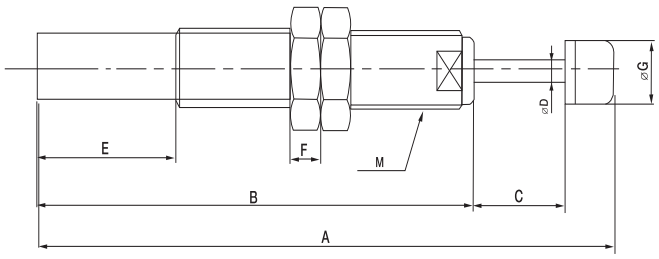


Internal Structure

No	Part	Material	Remark
❶	End Rod	Carbon Steel	Black Coating
❷	End Packing	NBR	
❸	Steel Ball	Bearing Steel	
❹	Inner Tube	Specialized Steel	
❺	Return Spring	Spring Steel	Heat-Treated
❻	Torque Nut	Carbon Steel	Black Coating
❼	Housing	Compressed Steel	Black Coating
❽	Piston	Copper Alloy	
❾	Packing Holder	Copper Alloy	
❿	Accumulator	Specialized Rubber	Foam Rubber
⓫	Top Packing	NBR	
⓬	Road Packing	Specialized Rubber	
⓭	Dust Cap	Al + Acetate	
⓮	Piston Road	Specialized Steel	Ironstone Cr Plated
⓯	Button	Carbon Steel	Black Coating
⓰	Cap	Specialized Urethane	SB1006 : M.C Nylon

Comment) • The outer measurements are subject to change for improvements without notifications.

SB Series (Long-Stroke)



Dimension & Capacity Chart

unit: mm

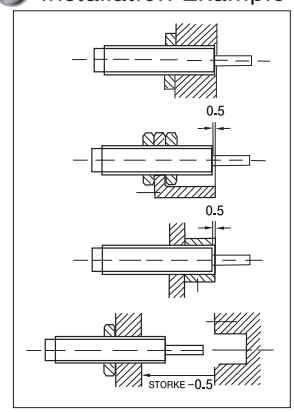
Model	Stroke	A	B	C	ØD	E	F	ØG	M
SB2030	30	148	103.5	30	6	13	6	17	M20×P1.5
SB2050	50	219	154.5	50	6	65	6	17	M20×P1.5
SB2530	30	160	115.5	30	8	13	8	20	M25×P2.0
SB2550	50	235	170.5	50	8	61	8	20	M25×P2.0
SB2580	80	330	235.5	80	8	126	8	20	M25×P2.0
SB3680	80	343	241	80	10	131	10	34	M36×P1.5

Model	S Stroke (mm)	E^C Total Energy [MAX] (Nm)	E^D Thermal Energy [MAX] (Nm/h)	W^E Effective Weight [MIN] [MAX] (N)	F Impact Force (N)	Return Force [MIN] [MAX] (N)	Mass (g)
SB2030-1C SB2030-2C SB2030-3C	30	45	33500	4~12 20~220 180~850	1900	20 40	230
SB2050-1C SB2050-2C SB2050-3C	50	75	33500	6.8~40 35~350 300~1200	1900	10 35	300
SB2530-1C SB2530-2C SB2530-3C	30	100	75000	13~140 130~1200 500~2000	4000	20 50	300
SB2550-1C SB2550-2C SB2550-3C	50	130	54000	17~160 150~1600 1200~2650	4000	20 45	410
SB2580-1C SB2580-2C SB2580-3C	80	210	86500	27~350 300~2000 1300~4300	4000	25 50	530
SB3680-1C SB3680-2C SB3680-3C	80	320	128000	35~450 400~2800 2500~5500	5000	10 30	800

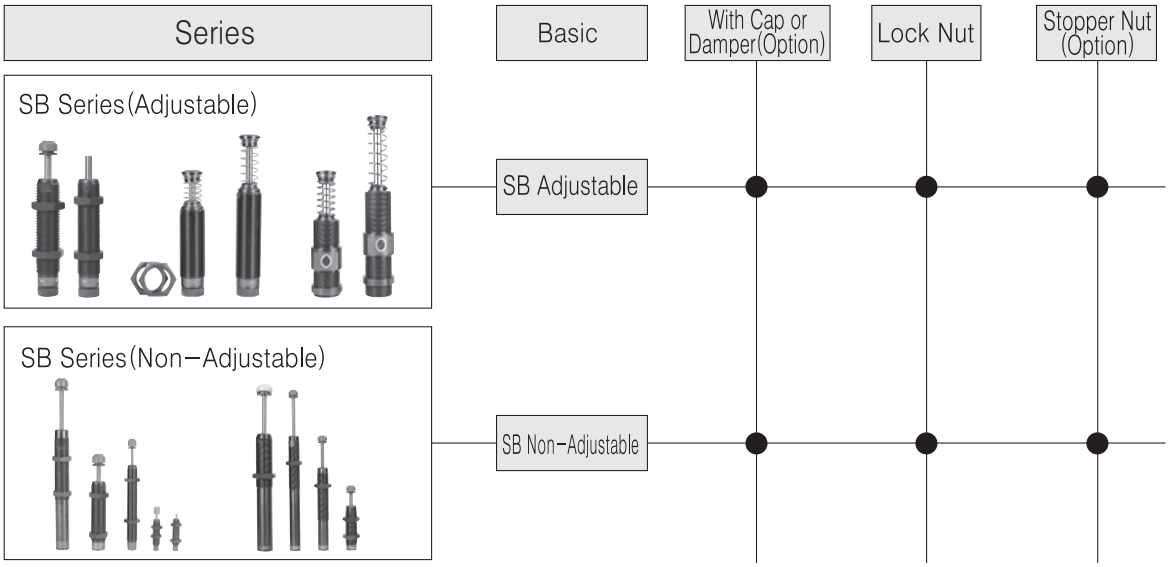
Suggestions for Usages

1. To prevent oil leakage, do not slant the unit more than 1°.
2. To prevent shaking during operations, fasten the lock nut tightly.
3. To prevent Full Load, install the pistol to stop 1~1.5mm short from the end of the stroke.
4. Run regular maintenance to check the unit is performing its full capacity.

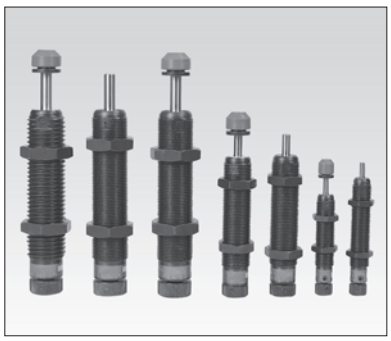
Installation Example



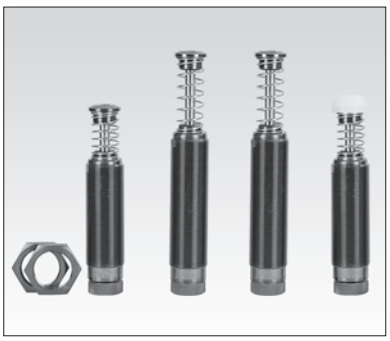
Comment) • The outer measurements are subject to change for improvements without notifications.



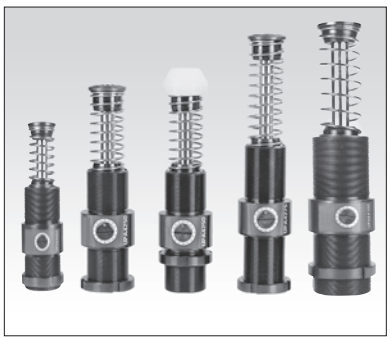
Shock Absorber



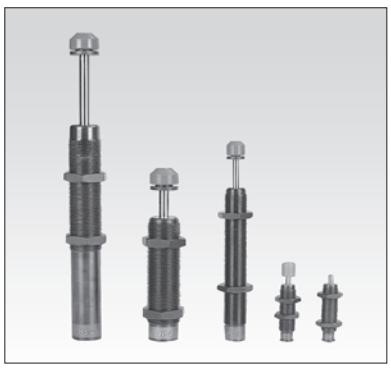
Adjustable SB (Miniature)
SB1410~2725 Series



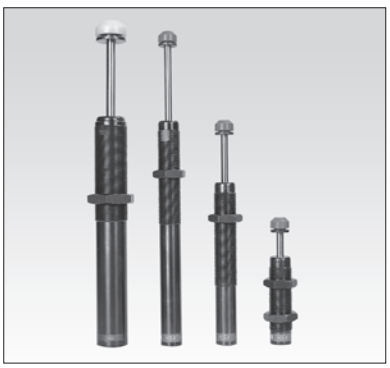
Adjustable SB (Mid size)
SB3625~3650 Series



Adjustable SB (Heavy Duty)
SB4225~64150 Series



Non-Adjustable SB (Standard)
SB1006~2525 Series

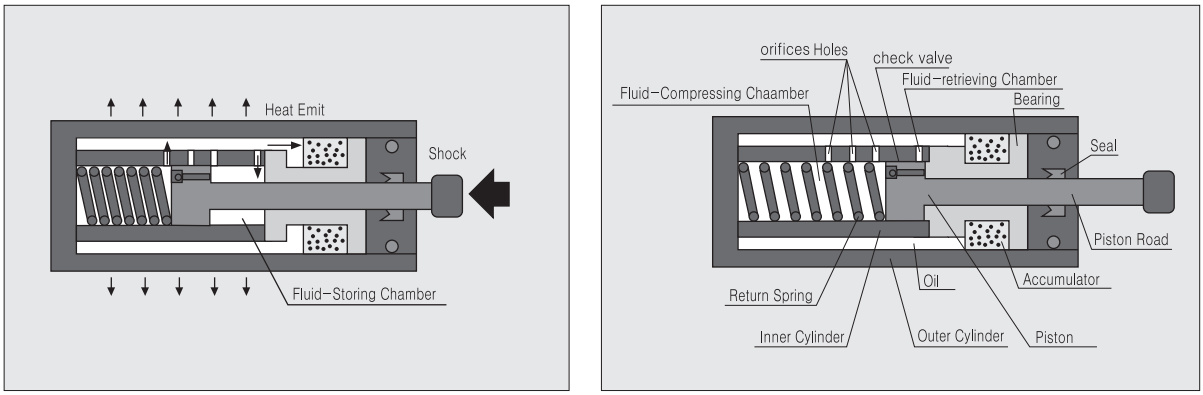


Non-Adjustable SB (Long-Stroke type)
SB2030~3680 Series

Note) • The size is subject to be changed for improve capacity without pre-notice.

Principles and Structures of the Shock Absorber

As a kinetic object with a certain mass collides to the piston, the piston backs up into the inner cylinder to gradually chain the orifice. Then the activating fluid inside the cylinder is pushed out through the orifice into the outer cylinder and flows into and stored in the top of the inner cylinder through the fluid–retrieving opening. The excessive activating fluid is temporarily stored in the accumulator.
When the object is removed, the piston quickly retrieves back by a return spring so that the activating fluid flows into the inner cylinder through the check valve.



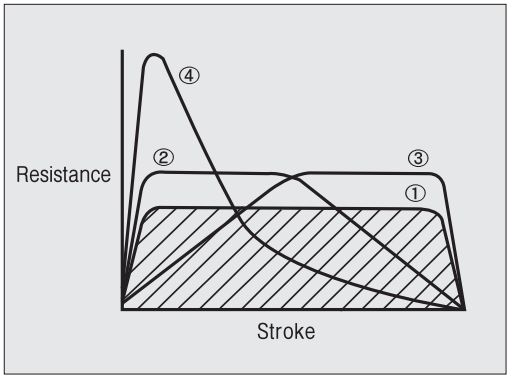
Adjustable Shock Absorber

Adjustable Shock Absorber

Applying the Multiple–Orifice principle, the SB Series is equipped with multiple orifices on the fixed inner tube and inserted with a long–grooved out tube so that the out tube can be screwed to adjust the total cross section.
It not only can be adjusted according to changes of the shock energy, but also indicates the size of the energy from 0 to 8 according to the degree of the openness.

Compensator Shock Absorber

It refers to the products with fixed orifices produced by unifying the advantages of the Hydro Shock and the Adjustable Shock Absorber. It not only absorbs a wider range of shock energy, but also emits the shock energy as heat energy more efficiently.
Also, this specially designed orifice that does not require adjustments maintains the pressure evenly throughout the changes of the shock energy to stop the kinetic object softly.



Graph
① shows the ideal deceleration while maintaining the lowest impact force,
② shows the low effective state of the self–compensator Shock Absorbers,
③ shows the high effective weight state of the self–compensator Shock Absorbers and
④ shows a dashpot.

Comment) • The outer measurements are subject to change for improvements without notifications.

The Importance of Effective Weight

The Importance of Effective Weight

The Effective Weight refers to the actual amount of shock energy absorbed by the Shock Absorber from the moment the kinetic object collides to the Shock Absorber until it stops. As shown in Illustration ⓐ, when the actual mass of the kinetic object is minor but the impact velocity is considerable (faster than 3m/sec), the resistance increases soon after the collision. Therefore, it is necessary to increase the cross section of the orifice.

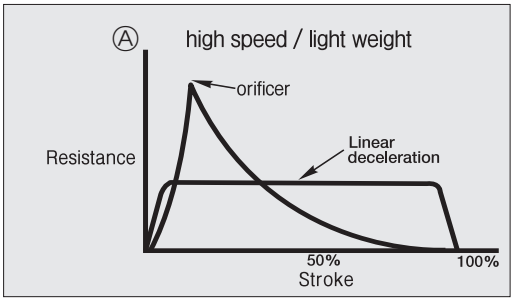
As shown in Illustration ⓑ, when the impact velocity is very slow (slower than 0.5m/sec) but the mass is considerably heavy or has an additional propelling force, the resistance increases at the end of the stroke. Therefore, it is necessary to decrease the cross section of the orifice.

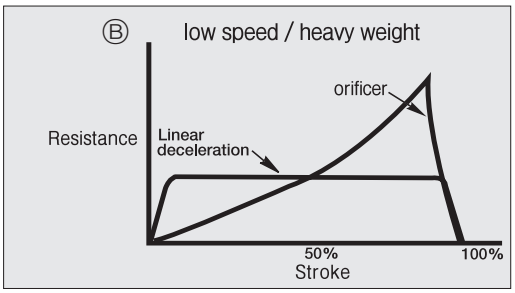
A) Light Mass and Fast Velocity

Resistance / Increase the cross section of the orifice / Stroke

B) Slow Velocity and Heavy Mass

Resistance / Decrease the cross section of the orifice / Stroke





Selected Examples

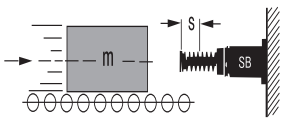
As shown in Illustrations ①, ②, ③ and ④, even though the kinetic objects have equal mass and velocity, the actual shock energy of the Shock Absorber changes significantly depending on the addition of the additional propelling force and on the location of the Shock Absorber.

First, when comparing examples ① and ②, it is shown that the shock energy of ② is 1.5 times that of ①, because ② has the addition of the additional propelling energy.

Also, when comparing examples ③ and ④, it is shown that the actual shock energy of ③ increases 16 times, because ③ is located differently although ③ and ④ has equal amount of kinetic energy.

As explained above, although the mass and the velocity are equal, the actual shock energy on the Shock Absorber can change significantly according to each situation. Therefore, not only the total energy but also the effective weight has to be considered when selecting a model.

1) Without Additional Propelling Force



Formula

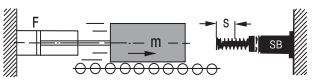
$W^E = m$

Example

m = 50 kg
v = 2 m/s
E^A = 50 Nm

$W^E = \frac{2 \times 200}{4} = 100$ kg

2) With Additional Propelling Force



Formula

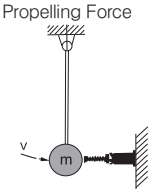
$W^E = \frac{2 \cdot E^C}{v^2}$

Example

m = 50 kg
F = 2000 N
v = 2 m/s
s = 0.1 m
E^A = 100 Nm
E^B = 200 Nm
E^C = 300 Nm

$W^E = \frac{2 \times 300}{4} = 150$ kg

3) Without Additional Propelling Force



Formula

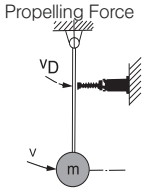
$W^E = m$

Example

m = 10 kg
v = 2 m/s
E^A = 20 Nm

$W^E = \frac{2 \times 20}{4} = 10$ kg

4) With Additional Propelling Force



Formula

$W^E = \frac{2 \cdot E^1}{vD^2}$

Example

m = 10 kg
v = 2 m/s
vD = 0.5 m/s
E^A = 20 Nm

$W^E = \frac{2 \times 20}{0.5^2} = 160$ kg

Comment) • The outer measurements are subject to change for improvements without notifications.

How to Select

Four Elements for Selecting Models

1	Weight	m (kg)
2	Impact velocity	V (m/sec)
3	Propelling force	F (N)
4	Cycle per hour	C (cycle/hour)

Calculation Formula

Step 1	Kinetic Energy	$E^A = m \cdot v^2/2$	Group 1 model assumption
Step 2	Work Energy	$E^B = F \cdot S$	
Step 3	Total Energy	$E^C = E^A + E^B$	
Step 4	Thalmal Energy	$E^D = (E^A + E^B)\ C$	Group 2 model assumption
Step 5	Effective Weight	$W^E = 2 \cdot E^C / V^2$	Final model selection

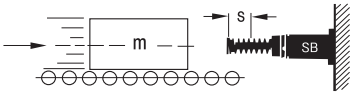
Details of Applications

E^A	Kinetic Energy : Kinetic Energy	(Nm)
E^B	Work Energy : Work Energy	(Nm)
E^C	Total Energy : Total Energy	(Nm)
E^D	Thermal Energy : Thamal Energy	(Nm/hr)
W^E	Effective Weight : Effective Weight	(Kg)
m	Weight : mass	(Kg)
v	Impact velocity : velocity	(m/s)
V^D	impact velocity	(m/s)
F	Propelling force : propelling force	(N)
C	Cycle per hour : cycle per hour	(cycle/hr)
P	motor power	(kw)

ST	Stall torque factor 1 to 2.5	(2.5)
M	Propelling troque	(Nm)
g	Acceleration of gravity	(m/s^2)
h	Actual drop height	(m)
L/R/r	Radius	(m)
Q	Reaction force	(N)
u	Friction coefficient	
t	deceleration time	(sec)
g"s	deceleration rate	(g"s)
s	stroke	(m)

1N = 0.102 kg, 1kg = 9.81 N
1Nm = 0.102kg.m 1kg.m = 9.81 Nm

1. Horizontal movement addition (without propelling force)



Calculation formulas

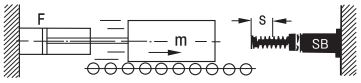
$E^A = 0.5 \cdot m \cdot v^2$
E^B = zero
$E^C = E^A + E^B$
$E^D = E^C \cdot C$
$W^E = \frac{2 \cdot E^C}{v^2} = m$

m= 150 kg
V = 2 m/s
C = 400 /hr

$E^A = 0.5 \times 150 \times 2^2 = 300Nm$
$E^B = 300 + 0 = 300Nm$
$E^D = 300 \times 400 = 120.000Nm$
$W^E = m = 150kg$

capacity chart model : SB4250-CB

2. Horizontal movement addition (with propelling force)



Calculation formulas

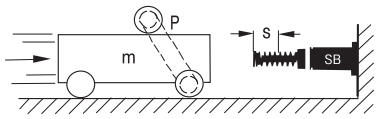
$E^A = 0.5 \cdot m \cdot v^2$
$E^B = F \cdot s$
$E^C = E^A + E^B$
$E^D = E^C \cdot C$
$W^E = \frac{2 \cdot E^C}{v^2}$

m= 250 kg
V = 1.5 m/s
F = 1000 N
C = 300 /hr
S = 0.05 m

$E^A = 0.5 \times 250 \times 1.5^2 = 281.25Nm$
$E^B = 1000 \times 0.05 = 50Nm$
$E^C = 281.25 + 50 = 331.25Nm$
$E^D = 331.25 \times 300 = 99.375Nm/hr$
$W^E = 2 \times 331.25 \div 1.5^2 = 294.4kg$

capacity chart model : SB3650-CB

3. Horizontal movement (when operating an electromotive motor)



Calculation formulas

$E^A = 0.5 \cdot m \cdot v^2$
$E^B = \frac{1000 \cdot P \cdot ST \cdot s}{V}$
$E^C = E^A + E^B$
$E^D = E^c \cdot C$
$W^E = \frac{2 \cdot E^C}{v^2}$

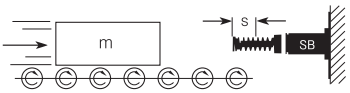
m= 700 kg
V = 1.5 m/s
ST= 2.5
P = 6 kw
C = 200 /hr
S = 0.1m

$E^A = 0.5 \times 700 \times 1.5^2 = 788Nm$
$E^B = 1000 \times 6 \times 2.5 \times 0.1 \div 1.5 = 1000Nm$
$E^C = 788 + 1000 = 1788Nm$
$E^D = 1788 \times 200 = 357.600Nm/hr$
$W^E = 2 \times 1788 \div 1.5^2 = 1589kg$

capacity chart model : SB64150-CB

Comment) • The outer measurements are subject to change for improvements without notifications.

4. Horizontal Movement (Power Roller Free)



Calculation formulas

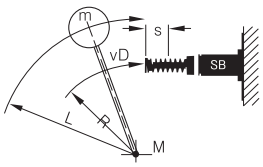
$E^A = 0.5 \cdot m \cdot v^2$
$E^B = u \cdot m \cdot g \cdot s$
$E^C = E^A + E^B$
$E^D = E^C \cdot C$
$W^E = \frac{2 \cdot E^C}{v^2}$

m= 100 kg
V = 1.5 m/s
C = 200 /hr
S = 0.1m
U = 0.2 (steel/steel)

$E^A = 0.5 \times 100 \times 1.5^2 = 113Nm$
$E^B = 0.2 \times 100 \times 9.81 \times 0.1 = 20Nm$
$E^C = 113+20 = 133Nm$
$E^D = 133 \times 200 = 26.600Nm/hr$
$W^E = 2 \times 133 \div 1.5^2 = 118kg$

capacity chart model : SB2525-CB

5. Horizontal Rotational Movement (With additional propelling force)



Calculation formulas

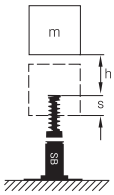
$E^A = 0.5 \cdot m \cdot v^2$
$E^B = \frac{M \cdot s}{R}$
$E^C = E^A + E^B$
$E^D = E^C \cdot C$
$V^D = \frac{V \cdot R}{L}$
$W^E = \frac{2 \cdot E^C}{v^{D2}}$

m= 50 kg
V = 1.5 m/s
R = 0.5 m
C = 200 /hr
L = 1 m
S = 0.03 m

$E^A = 0.5 \times 50 \times 1.5^2 = 56Nm$
$E^B = 100 \times 0.03 \div 0.5 = 6Nm$
$E^C = 56+6 = 62Nm$
$E^D = 62 \times 200 = 12.400Nm/hr$
$V^D = 1.5 \times 0.5 \div 1 = 0.75m/s$
$W^E = 2 \times 62 \div 0.75^2 = 220kg$

capacity chart model : SB2525-CB

6. Vertical Movement (Free Fall)



Calculation formulas

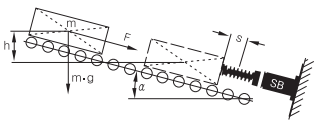
$E^A = m \cdot g \cdot h$
$E^B = m \cdot g \cdot s$
$E^C = E^A + E^B$
$E^D = E^C \cdot C$
$V^D = \sqrt{2 \cdot g \cdot h}$
$W^E = \frac{2 \cdot E^C}{v^{D2}}$

m= 100 kg
h = 0.5 m
M = 100 N/m
C = 50 /hr
S = 0.1m

$E^A = 100 \times 9.81 \times 0.5 = 490Nm$
$E^B = 100 \times 9.81 \times 0.1 = 98Nm$
$E^C = 490+98 = 588Nm$
$E^D = 588 \times 50 = 29.400Nm/hr$
$V^D = \sqrt{2 \times 9.81 \times 0.5} = 3.13m/s$
$W^E = 2 \times 588 \div 3.13^2 = 120kg$

capacity chart model : SB2525-2C

7. Free Fall on slopes



Calculation formulas

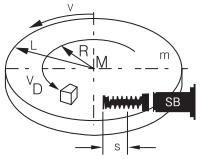
$E^A = m \cdot g \cdot h$
$E^B = m \cdot g \cdot \sin\alpha \cdot s$
$E^C = E^A + E^B$
$E^D = E^C \cdot C$
$V^D = \sqrt{2 \cdot g \cdot h}$
$W^E = \frac{2 \cdot E^C}{v^{D2}}$

m= 100 kg
h = 1 m
α = 30°
C = 100 /hr
S = 0.1m

$E^A = 100 \times 9.81 \times 1 = 981Nm$
$E^B = 100 \times 9.81 \times 0.5 \times 0.1 = 49Nm$
$E^C = 981+49 = 1030Nm$
$E^D = 1030 \times 100 = 103.000Nm/hr$
$V^D = \sqrt{2 \times 9.81 \times 1} = 4.5m/s$
$W^E = 2 \times 1030 \div 4.5^2 = 1.017kg$

capacity chart model : SB3625-CB

8. Index Table (When operating N)



Calculation formulas

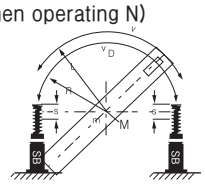
$E^A = 0.25 \cdot m \cdot v^2$
$E^B = \frac{M \cdot s}{R}$
$E^C = E^A + E^B$
$E^D = E^C \cdot C$
$v^D = \frac{V \cdot R}{L}$

m= 400 kg
V = 1.5 m/s
M = 2000 N/m
S = 0.05m
L = 1 m
R = 1 m
C = 150 /hr

$E^A = 0.25 \times 400 \times 1.5^2 = 225Nm$
$E^B = 2000 \times 0.05 \div 1 = 100Nm$
$E^C = 225+100 = 325Nm$
$E^D = 325 \times 150 = 32.500Nm/hr$
$V^D = 1.5 \times 1 \div 1.5 = 1m/s$
$W^E = 2 \times 325 \div 1^2 = 650kg$

capacity chart model : SB2525-CB/SB2525-2C

9. Horizontal Rotational Movement (When operating N)



Calculation formulas

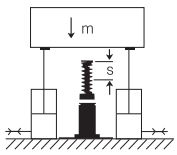
$E^A = 0.5 \cdot m \cdot (v \cdot 0.6)^2$
$E^B = \frac{M \cdot s}{R}$
$E^C = E^A + E^B$
$E^D = E^C \cdot C$
$v^D = \frac{V \cdot R}{L}$
$W^E = \frac{2 \cdot E^C}{V_D^2}$

m= 250 kg
V = 1.5 m/s
M = 2000 N/m
S = 0.03m
L = 1.5 m
R = 1.5 m
C = 1000 /hr

$E^A = 0.5 \times 250 \times (1.5 \times 0.6)^2 = 101Nm$
$E^B = 2000 \times 0.03 \div 1.5 = 40Nm$
$E^C = 101+40 = 141Nm$
$E^D = 141 \times 1000 = 141.000Nm/hr$
$V^D = 1.5 \times 1.5 \div 1.5 = 1.5m/s$
$W^E = 2 \times 141 \div 1.5^2 = 125kg$

capacity chart model : SB4250-CB

10. Vertical Movement (With propelling force)



Calculation formulas

$E^A = 0.5 \cdot m \cdot v^2$
$E^B = m \cdot g \cdot s$
$E^C = E^A + E^B$
$E^D = E^C \cdot C$
$W^E = \frac{2 \cdot E^C}{v^2}$

m= 800 kg
V = 1 m/s
S = 0.15m
C = 10 /hr

$E^A = 0.5 \times 800 \times 1^2 = 400Nm$
$E^B = 800 \times 9.81 \times 0.15 = 1177Nm$
$E^C = 400+1177 = 1577Nm/hr$
$E^D = 1577 \times 10 = 15.770Nm/hr$
$W^E = 2 \times 1577 \div 1^2 = 3154kg$

capacity chart model : SB4250-CB

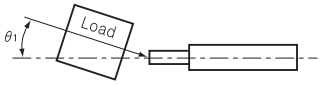
※ When a special safely Illustration is needed, add a compensator constant.

Precautions

Selection

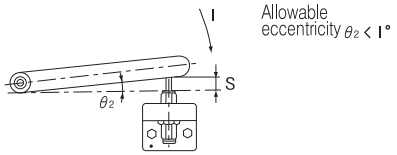
Warning

1. In the installation, the Impact body should be perpendicular to the shock absorber's axial center.
   An angle of deviation that exceeds will place an excessive load on the bearings, resulting in oil leaks within a short period of operation.



Allowable eccentricity θ_1 < 1°

2. When oscillating impacts are applied, the installation must be designed so that the direction in which the load is applied is perpendicular to the shock absorber's axial center.
   The allowable oscillating angle until the stroke end must be O_2 〈 1". Here, the minimum installation radius is shown in the table below. If the angle is in excess of 1", it may result in oil leakage.



(mm)

Model	S(Stroke)	θ_2(Allowable rotation angle)
SB1006	6	1°
SB1410-CB	10	
SB1415	15	
SB2015-CB	15	
SB1420	20	
SB2020	20	
SB2525-CB	25	
SB2725-CB	25	

3. It is needed to form a guide when the impact body involve in vibrations.
   When it is judged to be involved in vibrations and a force that is perpendicular to the axis is applied to the piston rod, be sure that a secure guide must be provided for the impact body.
4. It is needed to consider whether the rigidity of the mounting frame must be taken into consideration.
   If the mounting frame is not rigidly installed, vibrations may occur in the shock absorber an impact, resulting in bearing wear and damage. It is needed to apply the following formula to calculate the force that is applied to the mounting frame:

$$\text{Force applied to the mounting frame } N \fallingdotseq 2\,\frac{\text{E (absorption energy J)}}{\text{S (stroke m)}}$$

Caution

1. The maximum absorption energy indicated in the specifications for both Series RB and RBL cannot be brought into full play unless the entire stroke is used.
2. The contact surface of the impact body with which the piston rod comes in contact must be highly rigid.
   In the case whthout a cap, a high surface compression load is applied to the contact surface of the impact body with which the piston rod comes in contact. Therefore, the contact surface must be highly rigid(hardness of HRC35 or more).
3. Be aware of the return force of the impact body.
   If used in a conveyou drive, affer the shock absorber has absorbed energy, it could be pushed back by the spring that is built in. Refer to the column for the spring force in the specifications.

Environment

Warning

1. Exposing the shock absorber to machining oil, water, or dust should be avoided.
   Under the condition that fluids such as machining oil or water are present in atomized form or come in direct contact with the piston rod, or in which dust could adhere to the piston rod, the use of series RB should be avoided. Otherwise, malfunction may result.
2. Operating the shock absorber in an environment that poses the risk of corrosion.
   Be sure to see the respective structural drawing for the type of material used in the shock absorber.
3. The use of the shock absorber in a clean room should be avoided.
   Since the clean room may be contaminated thereby.

Mounting

Warning

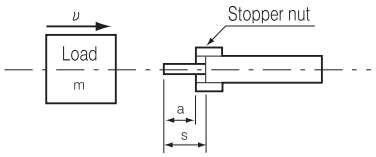
Be sure to check the power supply to the equipment and verify that the equipment has stopped prior to performing torque installation, removal, or stroke adjustment.

Caution

1. The torque of mounting nut should be tightened as follows.

Model	SB10□□	SB14□□	SB20□□	SB27□□
O.D.thread mm	M10×1.0	M14×1.5	M20×1.5	M27×3.0
Tightening torque N · m(kgf · m)	3.0(0.3)	10(1.0)	23(2.3)	63(6.3)

   In event that the tightening torque applied to the nut is in excess of the value given above, the shock absorber itself may be damaged.
2. Scratchingthe sliding portion of the piston rod or the outside should be avoided.
   If it is failed to check this precaution, the sliding potion of the piston rod, or damage the seals may be scratched or gouged, resulting in leakage and malfunction. Furthermore, damaging the outer side of threaded portion of the outer tube may prevent the shock absorber from being mounted onto the frame, or its informal components could deform, resulting ina malfunction.
3. Turning the screw on the bottom of the body should be avoided.
   It is not an adjustment screw, as this will cause oil leakage.



Maintenance

Caution

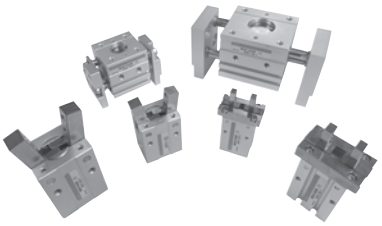
1. Be sure to check whether the retaining nut is loosed.
   If it is used in a loosed state, the shock absorber could become damaged.
2. Be sure to check any abnormal impact sounds or vibrations.
   In event that the impact sounds or vibrations are abnormally high, the shock absorber may have reached the end of its service life. In this case, it is preferred to replace the shock absorber. The continuation of this state may cause equipment damage.
3. Be sure to check the cap for any cracks or wear. In event that the shock absorber comes with a cap, the cap could wear first. So as to prevent the impact body from damage, it is preferred to replace the cap often.

Series NF

Air Chuck

Bore Size(mm) : NFH(L)2-Ø10, Ø16, Ø20, Ø25 / NFW2-Ø10, Ø12, Ø16, Ø20, Ø25, Ø30 / NFP2-Ø12, Ø16, Ø20, Ø25, Ø32, Ø40 / NFS-Ø10, Ø16, Ø20, Ø25

- COMFORTABLE ATTACHMENT
- COMPACT DESIGN
- GUARANTEE HIGH STRENGTH AND HIGH PRECISION
- SUPERB DURABILITY



How to Order

NFH2 — 20 D — W9H S

1 2 3 4 5

1 AIR CHUCK Series
New
Finger
Horizontal
2 : Number of fingers

2 Bore Size - Opening/Closing Stroke(mm)

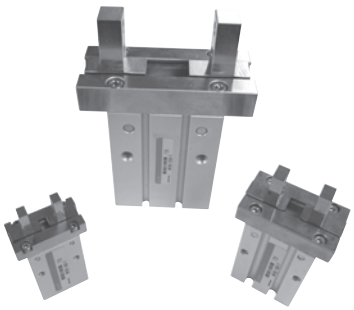
Title	Bore Size	Opeing/Closing Stroke
10	10	4
16	16	6
20	20	10
25	25	14

3 Action
D : Double Acting type
S : Single Acting type (contact)

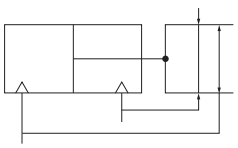
4 Auto Switch
Blank : None
W9H : Mini solid state auto switch (Horizontal type)
W9V : Mini solid state auto switch (Verticall type)

5 Number of Auto Switches
Blank: 2 pcs
S : 1 pc

NFH2 (Double Motion Type)



Symbol



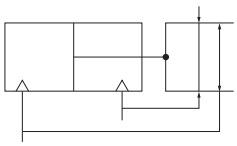
Specification Along Dimensions

Type		NFH2-10D	NFH2-16D	NFH2-20D	NFH2-25D
Bore Size (mm)		10	16	20	25
Opening/Closing Stroke (mm)	Closing Width	6	7	7	9
	Opening Width	10	13	17	23
	Stroke	4	6	10	14
Theoretical Gripping Force(kgf) Air Pressure Applied 5kgf/cm²	Closed	1.1	3.5	4.3	6.4
	Opened	1.7	4.1	6.7	10.6
Port Size		M3	M5	M5	M5
Main Body Weight(kgf)		0.05	0.14	0.25	0.48
Maximum Gripping Length L(mm)		30	35	60	80
Fluid		Air	Air	Air	Air
Operating Pressure		3 ~ 7	3 ~ 7	3 ~ 7	3 ~ 7
Lubricant Applied		Unnecessary	Unnecessary	Unnecessary	Unnecessary
Ambient and Fluid Temperature		5 ~ 60	5 ~ 60	5 ~ 60	5 ~ 60
Repeat Opening/Closing Location Distance(mm)	Initial Value	±0.01	±0.01	±0.01	±0.01
	After 1 million Times Operation	±0.1	±0.05	±0.05	±0.05
Critical Performance Times(C.P.M)		160	160	160	160
Auto Switch for Opening/Closing Checking		W9H,W9V	W9H,W9V	W9H,W9V	W9H,W9V

Note 1) Theoretical gripping force is the value at stroke center.

NFHL2

Symbol



How to Order

NFHL2 — 20 D — W9H S

1 2 3 4 5

1 AIR CHUCK Series
New
Finger
Horizontal
2 : Number of fingers

2 Bore Size -Opening/Closing Stroke(mm)

Title	Bore Size	Opeing/Closing Stroke
10	10	8
16	16	12
20	20	18
25	25	22

3 Action
D : Double Acting type
S : Single Acting type(contact)

4 Auto Switch
Blank : None(built-in Magnet)
W9H : Mini solid state auto switch (Horizontal type)
W9V : Mini solid state auto switch (Verticall type)

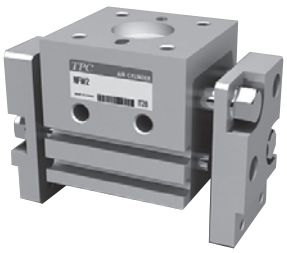
5 Number of Auto Switches
Blank : 2 pcs
S : 1 pc

Specification Along Dimensions

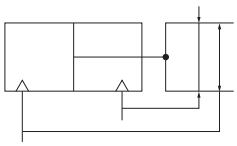
Type		NFHL2-10D	NFHL2-16D	NFHL2-20D	NFHL2-25D
Bore Size (mm)		10	16	20	25
Opening/Closing Stroke (mm)	Closing Width	11	15	16	19
	Opening Width	19	27	34	41
	Stroke	8	12	18	22
Theoretical Gripping Force(kgf) Air Pressure Applied 5kgf/cm²	Closed	1.2	3.2	4.8	6.6
	Opened	1.9	5.2	7.4	11.2
Port Size		M3	M5	M5	M5
Main Body Weight(kgf)		0.06	0.15	0.31	0.56
Maximum Gripping Length L(mm)		30	35	60	80
Fluid		Air	Air	Air	Air
Operating Pressure		3 ~ 7	3 ~ 7	3 ~ 7	3 ~ 7
Lubricant Applied		Unnecessary	Unnecessary	Unnecessary	Unnecessary
Ambient and Fluid Temperature		5 ~ 60	5 ~ 60	5 ~ 60	5 ~ 60
Repeat Opening/Closing Location Distance(mm)	Initial Value	±0.01	±0.01	±0.01	±0.01
	After 1 million Times Operation	±0.1	±0.05	±0.05	±0.05
Critical Performance Times(C.P.M)		120	120	120	120
Auto Switch for Opening/Closing Checking		W9H,W9V	W9H,W9V	W9H,W9V	W9H,W9V

Note 1) Theoretical gripping force is the value at stroke center.

NFW2



Symbol



How to Order

NFW2 — 20 A — W9H S

1 2 3 4 5

1 AIR CHUCK Series
New
Finger
Horizontal
2 : Number of fingers

2 Bore Size-Opening/Closing Stroke(mm)

Title	Bore Size	Opeing/Closing Stroke
10	10	10
12	12	20
16	16	30
20	20	40
25	25	50
30	30	60

3 Operating Method
A : Vertical Direction
B : Horizontal Direction

4 Auto Switch
Blank : None
W9H : Mini solid state auto switch (Horizontal type)
W9V : Mini solid state auto switch (Verticall type)

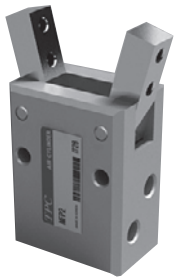
5 Number of Auto Switches
Blank : 2 pcs
S : 1 pc

Specification Along Dimensions

Type		NFW2-10	NFW2-12	NFW2-16	NFW2-20	NFW2-25	NFW2-30
Bore Size (mm)		10	12	16	20	25	30
Opening/Closing Stroke (mm)	Closing Width	36	44	54	76	90	110
	Opening Width	46	64	84	116	140	170
	Stroke	10	20	30	40	50	60
Theoretical Gripping Force(kgf) Air Pressure Applied 5kgf/cm²	Closed / Opened	2.5	3.7	7.5	11.8	18.9	25.3
Port Size		M5	M5	M5	M5	M5	M5
Main Body Weight(kgf)		0.18	0.30	0.45	1.0	1.75	2.7
Maximum Gripping Length L(mm)		30	45	75	100	120	150
Fluid		Air	Air	Air	Air	Air	Air
Operating Pressure		3 ~ 7	3 ~ 7	3 ~ 7	3 ~ 7	3 ~ 7	3 ~ 7
Lubricant Applied		Unnecessary	Unnecessary	Unnecessary	Unnecessary	Unnecessary	Unnecessary
Ambient and Fluid Temperature		5 ~ 60	5 ~ 60	5 ~ 60	5 ~ 60	5 ~ 60	5 ~ 60
Repeat Opening/Closing Location Distance(mm)	Initial Value	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1
	After 1 million Times Operation	±0.2	±0.2	±0.2	±0.2	±0.2	±0.2
Critical Performance Times(C.P.M)		60	60	60	60	60	60
Auto Switch for Opening/Closing Checking		W9H,W9V	W9H,W9V	W9H,W9V	W9H,W9V	W9H,W9V	W9H,W9V

Note 1) Theoretical gripping force is the value at stroke center.

NFP2



How to Order

NFP2 — 20 D — W9H S

1 2 3 4 5

1 AIR CHUCK Series
New
Finger
Horizontal
2 : Number of fingers

2 Bore Size-Opening/Closing Stroke(mm)

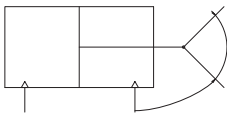
Name	Bore Size	Opeing/Closing Stroke
12	12	−5°~15°
16	16	
20	20	−5°~20°
25	25	
32	30	
40	40	

3 Action
D : Double Acting type

4 Auto Switch
Blank : None (built−in Magnet)
W9H : Mini solid state auto switch (Horizontal type)
W9V : Mini solid state auto switch (Verticall type)
Auto Switch attaching unavailable (NFP−12, NFP2−16)

5 Number of Auto Switches
Blank : 2 pcs
S : 1 pc

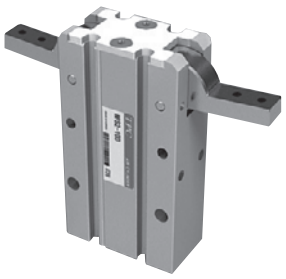
Symbol



Specification

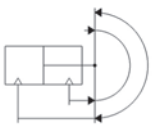
Type		NFP2-12D	NFP2-16D	NFP2-20D	NFP2-25D	NFP2-32D	NFP2-40D
Bore Size (mm)		12	16	20	25	32	40
Opening/Closing Range (°)		−5 ~ 15	−5 ~ 15	−5 ~ 20	−5 ~ 20	−5 ~ 20	−5 ~ 20
Theoretical Gripping Force(kgf)	Closed	1.1	1.7	2.4	4.2	7.1	11.8
Air Pressure Applied 5kgf/cm²	Opened	1.4	2.2	3.2	5.5	8.5	14.1
Port Size		M5	M5	M5	M5	PT1/8	PT1/8
Main Body Weight(kgf)		0.05	0.09	0.2	0.25	0.4	0.75
Soft Jaw Allowance Length L(mm)		45	60	70	75	85	120
Fluid		Air	Air	Air	Air	Air	Air
Operating Pressure		3 ~ 7	3 ~ 7	3 ~ 7	3 ~ 7	3 ~ 7	3 ~ 7
Lubricant Applied		Unnecessary	Unnecessary	Unnecessary	Unnecessary	Unnecessary	Unnecessary
Ambient and Fluid Temperature		5 ~ 60	5 ~ 60	5 ~ 60	5 ~ 60	5 ~ 60	5 ~ 60
Repeat Opening/Closing Location Distance(mm)	Initial Value	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1
	After 1 million Times Operation	±0.2	±0.2	±0.2	±0.2	±0.2	±0.2
Critical Performance Times(C.P.M)		60	60	60	60	60	60
Auto Switch for Opening/Closing Checking		–	–	W9H,W9V	W9H,W9V	W9H,W9V	W9H,W9V

Note 1) Theoretical gripping force is the value at stroke center.



- IMPROUED DESIG FOR PREVNTUG FROM A BREAKAWAY OF HINGE PIN EASY MAINTENANCE
- STAINLESS STEEL
- RESISTENCE IMPROVED BY USING ENGINEERING PLASTIC FLANGE BUSH
- DUST PROOF CONSTRUCTION

Symbol



How to Order

NFS 2 – 10 D – W9H S

1 2 3 4 5

1 Number of Fingers
2 : 2 Fingers

2 Bore Size
10 : ϕ10
16 : ϕ16
20 : ϕ20
25 : ϕ25

3 Action
D : Double Acting

4 Auto Switch
Blank : None
W9H : Mini Solid State Auto Switch(Horizontal)
W9V : Mini Solid State Auto Switch(Vertical)
W10H : Mini Solid State Auto Switch(Vertical)

5 Number of Auto Switches
Blank : 2 pcs
S : 1 pc

Specifications

Model	NFS2-10D	NFS2-16D	NFS2-20D	NFS2-25D
Bore Size(mm)	10	16	20	25
Opening Range(°)	-3 ~ 180			
Port Size	M5			
Weight(Kgf)	0.08	0.16	0.32	0.56
Fluid	Air			
Operating Pressure(Mpa)	0.2 ~ 0.6			
Lubrication	Not Required			
Temperature(℃)	5 ~ 60℃			
Auto Switch	W9H, W9V, W10V (Solid State)			

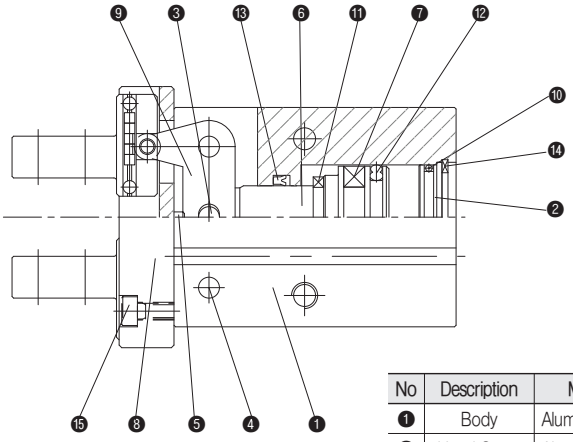
Performance

Model	*Gripping Moment Nm	Over Length (mm)	Repeatability	Max. Oprating Frequency (C.P.M)
NFS2-10D	0.14	45	±0.2	60
NFS2-16D	0.54	60		
NFS2-20D	1.12	74		
NFS2-25D	2.03	90		

*Gripping moment is based on pressure 0.5MPa.

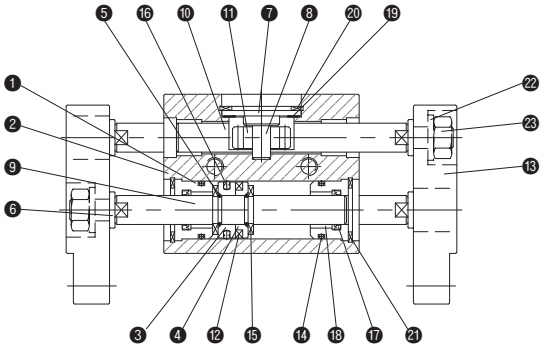
Construction

NFH(L)2



No	Description	Material	Note	No	Description	Material	Note
1	Body	Aluminum Alloy		9	Link	Carbon Steel	Nickel Plated
2	Head Cover	Aluminum Alloy		10	Tube Gasket	NBR	
3	Hinge Pin	Carbon Steel	Heat Treated	11	Bumper	Urethane Rubber	
4	Link Pin	Carbon Steel	Heat Treated	12	Piston Packing	NBR	
5	Dowel Pin	Carbon Steel	Heat Treated	13	Rod Packing	NBR	
6	Piston Rod	Aluminum Alloy		14	Snap Ring	Carbon Steel	
7	Magnet	Magnet		15	Socket Bolt	Carbon Steel	Nickel Plated
8	Finger Ass'y	Carbon Steel	Nickel Plated				

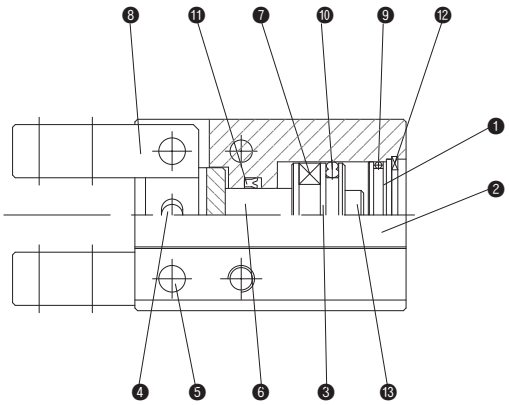
NFW2



No	Description	Material	Note	No	Description	Material	Note
1	Rod Cover	Aluminum Alloy		13	Finger	Aluminum Alloy	Nickel Plated
2	Body	Aluminum Alloy		14	Tube Gasket	NBR	
3	Piston	Aluminum Alloy		15	Bumper	Urethane Rubber	
4	Magnet Seat	Aluminum Alloy		16	Piston Packing	NBR	
5	Wire Ring	Spring Wire		17	Rod Packing	NBR	
6	Washer		Nickel Plated	18	Du Bush		
7	Cover		Nickel Plated	19	Washer	Carbon Steel	
8	Pinion Shaft	Carbon Steel	Chrome Plated	20	Snap Ring	Carbon Steel	
9	Piston Rod	Stainless		21	Snap Ring	Carbon Steel	
10	Rack Gear	Stainless		22	Plain Washer	Carbon Steel	
11	Pinion	Carbon Steel	Nitriding	23	Lock Nut	Carbon Steel	
12	Magnet	Magnet					

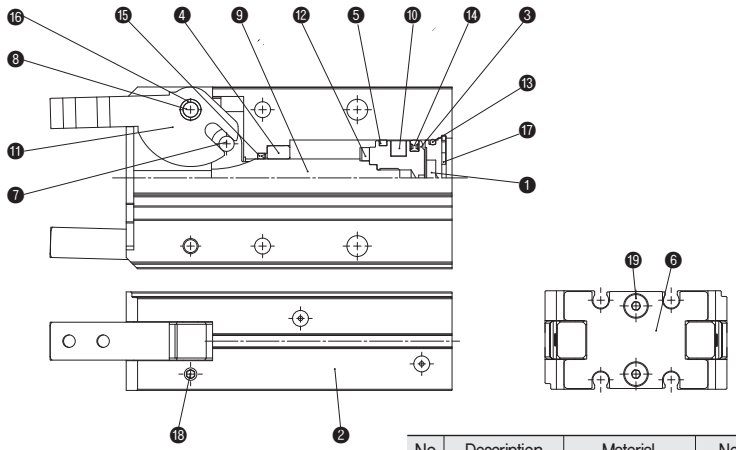
Construction

NFP2



No	Description	Material	Note	No	Description	Material	Note
❶	Head Cover	Aluminum Alloy		❽	Finger	Carbon Steel	Nickel Plated
❷	Body	Aluminum Alloy		❾	Tube Gasket	NBR	
❸	Piston	Aluminum Alloy		❿	Piston Packing	NBR	
❹	Hinge Pin	Carbon Steel	Heat Treated	⓫	Rod Packing	NBR	
❺	Link Pin	Carbon Steel	Heat Treated	⓬	Snap Ring	Carbon Steel	
❻	Piston Rod	Aluminum Alloy		⓭	Lock Nut	Carbon Steel	
❼	Magnet	Magnet					

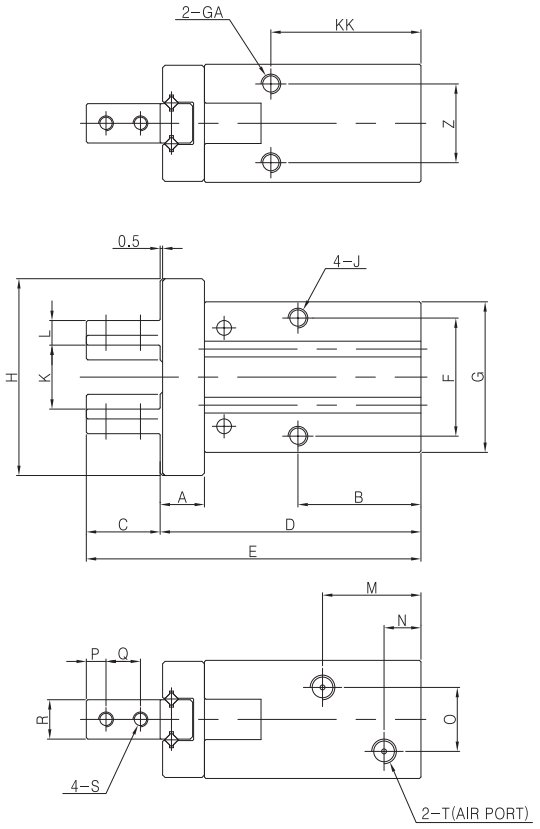
NFS2

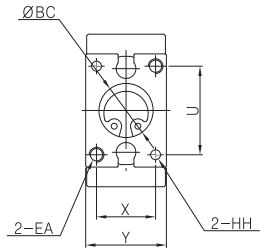


No	Description	Material	Note	No	Description	Material	Note
❶	Head Cover	Aluminum Alloy		⓫	Finger	Stainless Steel	
❷	Body	Aluminum Alloy		⓬	Bumper	Urethane	
❸	Piston	Aluminum Alloy		⓭	Tube Gasket	NBR	
❹	Bush	Copper		⓮	Piston Packing	NBR	
❺	Wear Ring	Resin		⓯	Rod Packing	NBR	
❻	Cover Plate	Stainless Steel		⓰	Bush	Resin	
❼	Hinge Pin	Carbon Steel		⓱	Snap Ring	Carbon Steel	
❽	Link Pin	Carbon Steel		⓲	Set Screw	Carbon Steel	
❾	Piston Rod	Stainless Steel		⓳	F-Head Cap HEX. Socket Bolt	Carbon Steel	
❿	Magnet	Magnet					

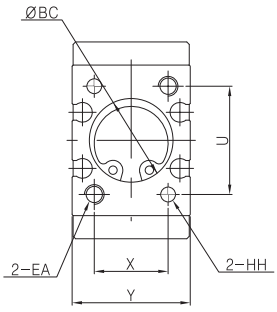
Air Chuck Horizontal Opening/Closing Type

NFH2 Ø10, Ø16, Ø20, Ø25, Ø32, Ø40





★(In case of Ø10)
※ Unable to attach penetration hole through "J", when switch attached(Ø10)



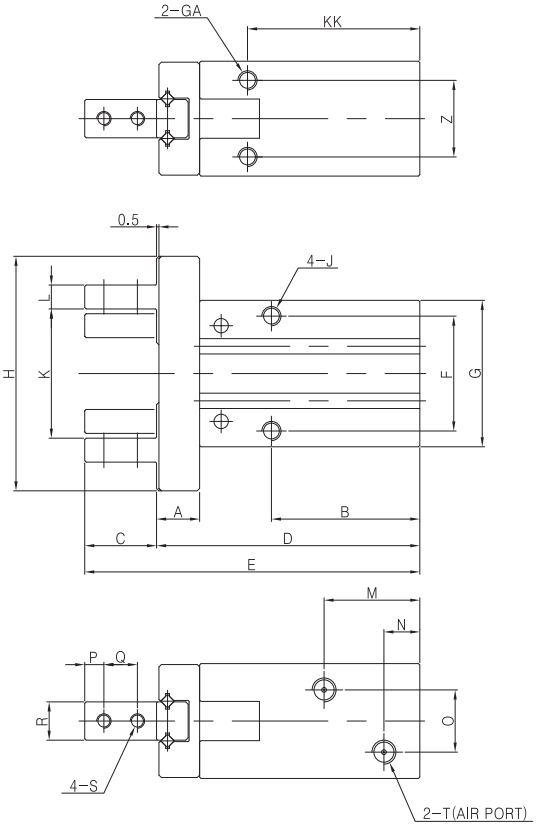
★(In case of Ø16~Ø20)

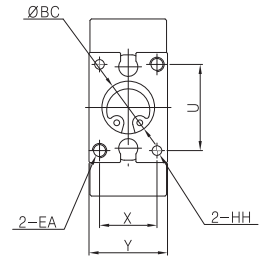
Bore Size (mm)	Range of Opening/Closing (mm)	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S
10	4	7	23	12	45	57	16	23	31	M3 DP5	OPEN = 10 CLOSE = 6	4	19	7	10	3	5.5	$5^{0}_{-0.05}$	M2.5 Through
16	6	9	25	15	53	68	24	30.6	40	M4 DP8	OPEN = 13 CLOSE = 7	5	19	7.5	13	4	7	$8^{0}_{-0.05}$	M3 Through
20	10	11	29	20	65	85	30	42	50	M5 DP10	OPEN = 17 CLOSE = 7	8	22.5	8	15	5	9	$10^{0}_{-0.05}$	M4 Through
25	14	14	30	25	78	103	36	52	64	M6 DP12	OPEN = 23 CLOSE = 9	10	23.5	8	20	6	12	$12^{0}_{-0.05}$	M5 Through

Bore Size (mm)	Range of Opening/Closing (mm)	T	U	X	Y	Z	ØBC	EA	KK	GA	HH
10	4	M3	18	12	16.4	11	11 DP1.3	M3 DP6	27	M3 DP6	Ø2 H9 DP3
16	6	M5	22	15	24	16	17 DP1.3	M4 DP8	30.5	M4 DP5.5	Ø3 H9 DP3
20	10	M5	32	18	28	19	21 DP1.5	M5 DP10	35	M5 DP8	Ø4 H9 DP4
25	14	M5	40	22	34	22	26 DP1.5	M6 DP12	36.5	M6 DP10	

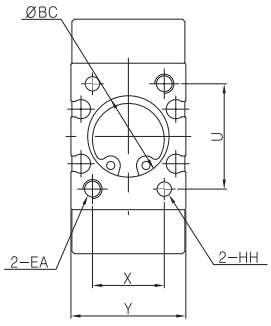
Air Chuck Horizontal Opening/Closing Type

NFHL Ø10, Ø16, Ø20, Ø25, Ø32, Ø40





★(In case of Ø10)
※ Unable to attach penetration hole through "J" , when switch attached(Ø10)



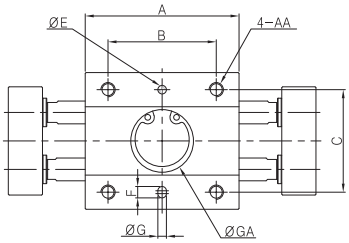
★(In case of Ø16~Ø20)

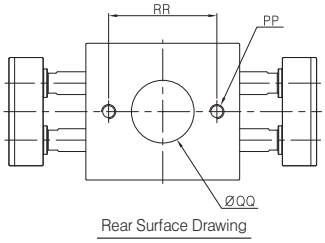
Bore Size (mm)	Range of Opening/Closing (mm)	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S
10	8	7	25	12	45	57	16	23	37	M3 DP5	OPEN = 19 CLOSE = 11	4	19	7	10	3	5.5	$5\ ^{0}_{-0.05}$	M2.5 Through
16	12	9	31	15	55	70	24	30.6	49	M4 DP8	OPEN = 27 CLOSE = 15	5	19	7.5	13	4	7	$8\ ^{0}_{-0.05}$	M3 Through
20	18	11	36	20	70	90	30	42	65	M5 DP10	OPEN = 34 CLOSE = 16	8	26	8	15	5	9	$10\ ^{0}_{-0.05}$	M4 Through
25	22	14	40	25	81	106	36	52	77	M6 DP12	OPEN = 41 CLOSE = 19	10	29.5	8	20	6	12	$12\ ^{0}_{-0.05}$	M5 Through

Bore Size (mm)	Range of Opening/Closing (mm)	T	U	X	Y	Z	ØBC	EA	KK	GA	HH
10	8	M3	18	12	16.4	11.4	11 DP1.3	M3 DP6	29	M3 DP6	Ø2 H9 DP3
16	12	M5	22	15	24	16	17 DP1.3	M4 DP8	36	M4 DP5.5	Ø3 H9 DP3
20	18	M5	32	18	28	18.6	21 DP1.5	M5 DP10	43	M5 DP8	Ø4 H9 DP4
25	22	M5	40	22	34	22	26 DP1.5	M6 DP12	48	M6 DP10	

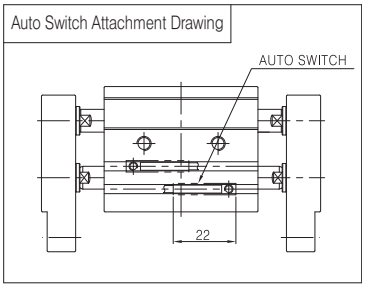
Air Chuck Double Width

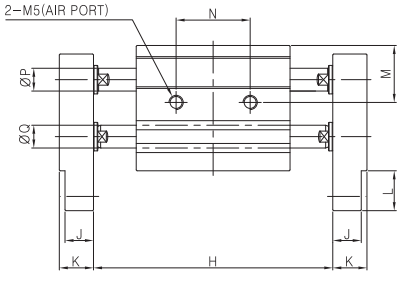
NFW2 Ø10, Ø12, Ø16, Ø20, Ø25, Ø30

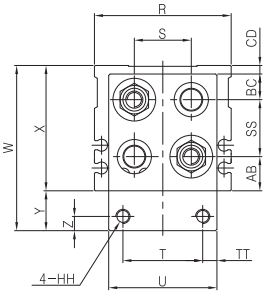




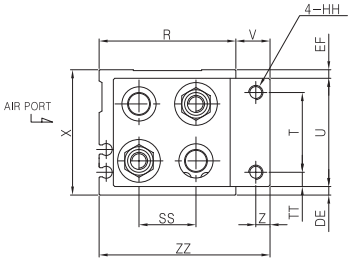
Rear Surface Drawing







A-Type (Vertical direction)



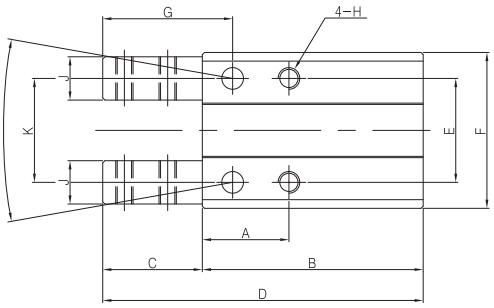
B-Type (Vertical direction)

Bore Size (mm)	Range of Opening/Closing (mm)	A	AA	B	C	ØE	F	ØG	ØGA	H	J	K	L	M	N	ØP	ØQ
10	10	36	M4 DP5	22	22	3H9 $^{+0.025}_{0}$ DP3	4	3H9 $^{+0.025}_{0}$ DP3	15 $^{+0.05}_{0}$ DP3	OPEN = 46 CLOSE = 36	6	8	10	16.5	16	6	6
12	20	44	M4 DP6	30	30	3H9 $^{+0.025}_{0}$ DP3	4	3H9 $^{+0.025}_{0}$ DP3	15 $^{+0.05}_{0}$ DP3	OPEN = 64 CLOSE = 44	8	10	10	19	19	8	7
16	30	54	M5 DP6	38	36	3H9 $^{+0.025}_{0}$ DP3	4	3H9 $^{+0.025}_{0}$ DP3	22 $^{+0.05}_{0}$ DP3	OPEN = 84 CLOSE = 54	10	12	14	20	26	8	8
20	40	76	M6 DP7	56	30	4H9 $^{+0.030}_{0}$ DP4	5	4H9 $^{+0.030}_{0}$ DP4	22 $^{+0.05}_{0}$ DP5	OPEN = 116 CLOSE = 76	10	15	16	31	36	12	10
25	50	90	M6 DP7	58	44	4H9 $^{+0.030}_{0}$ DP4	5	4H9 $^{+0.030}_{0}$ DP4	22 $^{+0.05}_{0}$ DP5	OPEN = 140 CLOSE = 90	12	20	18	34	43	14	12
30	60	110	M8 DP8	72	44	4H9 $^{+0.030}_{0}$ DP5	5	4H9 $^{+0.030}_{0}$ DP5	30 $^{+0.05}_{0}$ DP5	OPEN = 170 CLOSE = 110	15	24	24	36	48	16	16

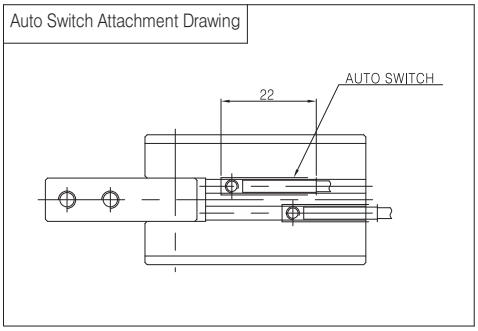
Bore Size (mm)	Range of Opening/Closing (mm)	R	S	T	U	V	W	X	Y	Z	AB	BC	CD	DE	EF	HH	PP	ØQQ	RR	SS	TT	ZZ
10	10	34	15	15	26	9.5	46	36	10	4	9	5.5	6.5	3.5	6.5	M3 Through	M4 DP5	15 $^{+0.05}_{0}$ DP2.5	26	15	5.5	43.5
12	20	42	18	18	32	8	50	40	10	4	10	7.5	4.5	3	5	M4 Through	M4 DP6	15 $^{+0.05}_{0}$ DP2.5	32	18	7	50
16	30	48	20	28	38	12	58	44	14	5	12	9	3	3	3	M5 Through	M5 DP6	22 $^{+0.05}_{0}$ DP2.5	38	20	5	60
20	40	58	26	30	48	14	76	60	16	8	14	11	9	3	9	M6 Through	M6 DP7	22 $^{+0.05}_{0}$ DP2.5	56	26	9	72
25	50	68	30	38	58	18	88	70	18	8	19	14	7	5	7	M6 Through	M8 DP8	22 $^{0.05}_{0}$ DP3	58	30	10	86
30	60	74	34	40	62	24.5	100	77	23	12	21.5	15.5	6	7.5	7.5	M8 Through	M8 DP8	30 $^{0.05}_{0}$ DP3	72	34	11	98.5

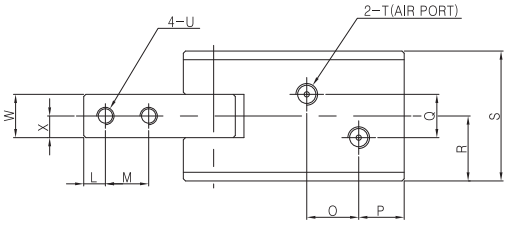
Air Chuck Point Opening/Closing

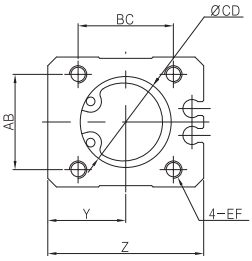
NFP2 Ø12, Ø16, Ø20, Ø25, Ø32, Ø40



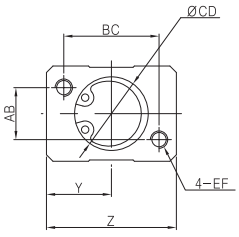
※ A 'H' tap drill is from Ø12~Ø25 which are available for penetration attachment.







★(In case of Ø50~Ø40)



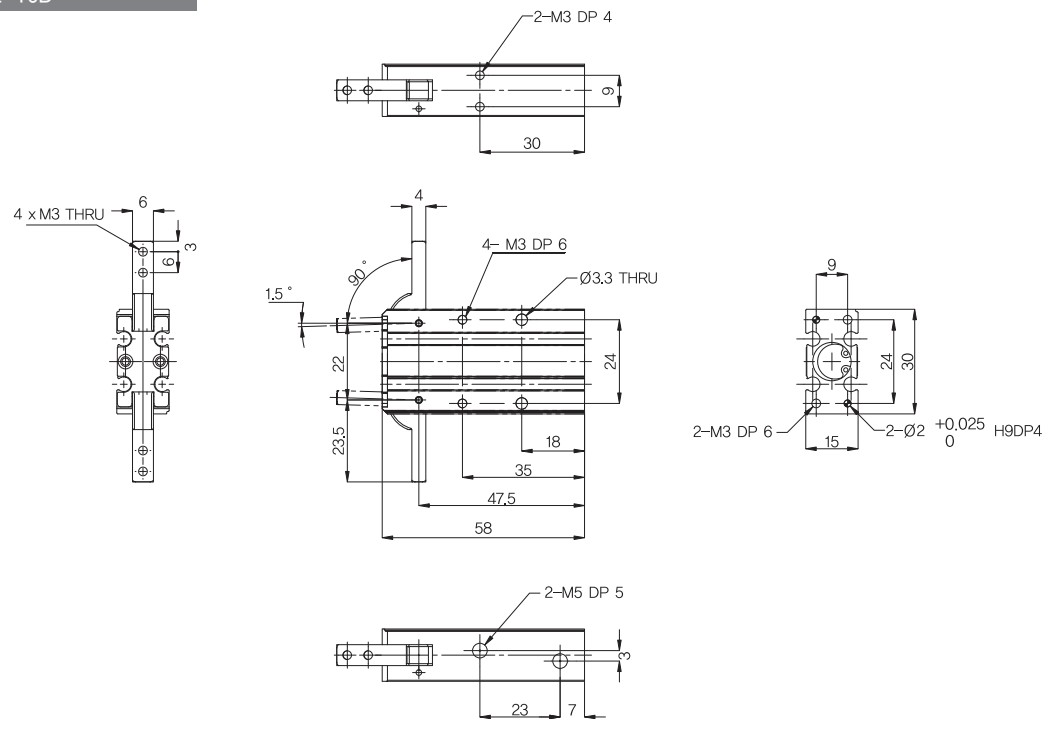
★(In case of Ø12~Ø16)
※ Auto switch attachment unavailable

Bore Size (mm)	Range of Opening/Closing (mm)	A	B	C	D	E	F	G	H	J	K	L	M	O	P	Q	R	S	T	U	W $^{0}_{-0.1}$
12	−5°~15°	14	35	13	48	18	26	18	M4 DP5	6	18	3	7	7.5	8	6	9	18	M5	M3 Through	7
16		16	39	17	56	20	30	23	M4 DP6	8	20	4	9	9	8	8	11	22	M5	M4 Through	8
20	−5°~20°	20	51	23	74	24	36	30	M5 DP6	10	24	5	10	12	10.5	10	15	30	M5	M4 Through	10
25		21	52	25	77	26	40	32	M5 DP8	10	28	5	12	11.5	10	13	18	36	M5	M5 Through	12
30		24	62	26	88	32	46	34	M5 DP10	12	32	5	12	15.5	13	12	20	40	R/C 1/8	M5 Through	14
40		27	72	32	104	40	56	41	M6 DP12	16	36	6	20	15.5	14	20	25	50	R/C 1/8	M6 Through	18

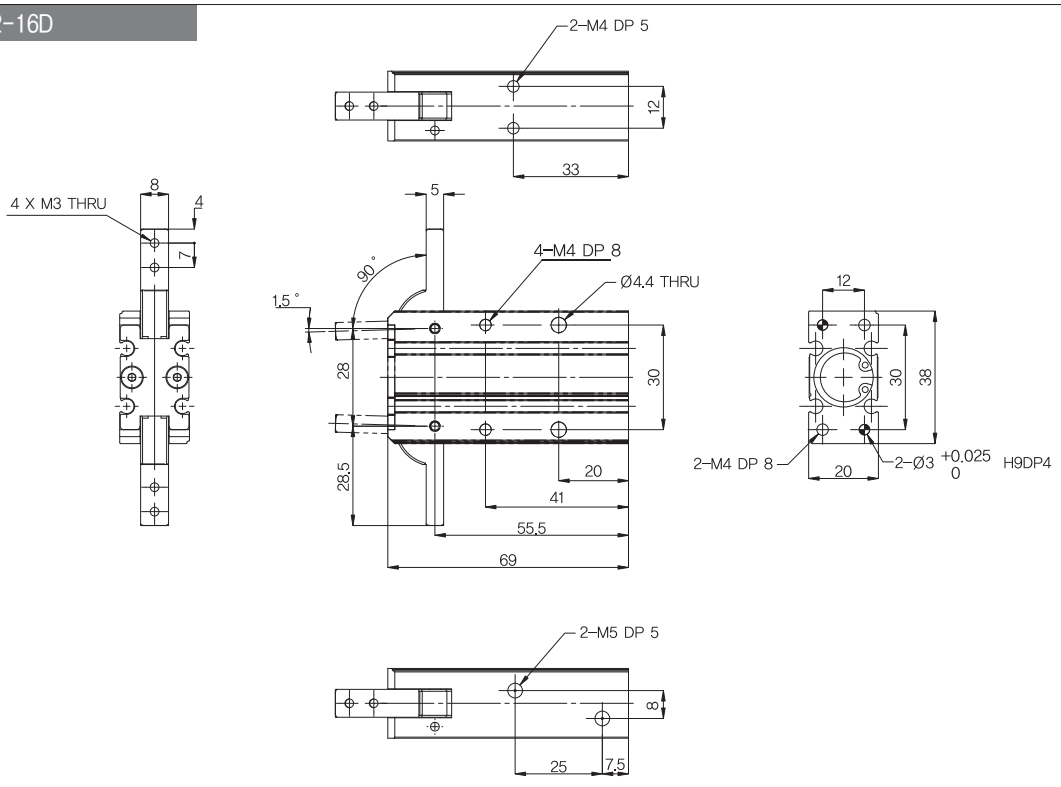
Bore Size (mm)	Range of Opening/Closing (mm)	X	Y	Z	AB	BC	CD	EF
12	−5°~15°	3.5	13	26	8	18	13 DP1.3	M3 DP6
16		4	15	30	12	22	17 DP1.3	M4 DP8
20	−5°~20°	5	18	36	22	22	21 DP1.5	M4 DP10
25		6	20	40	26	26	26 DP1.5	M5 DP12
30		7	23	46	28	28	32 DP1.5	M5 DP12
40		9	28	56	40	40	42 DP2	M6 DP15

Dimensions

NFS2-10D

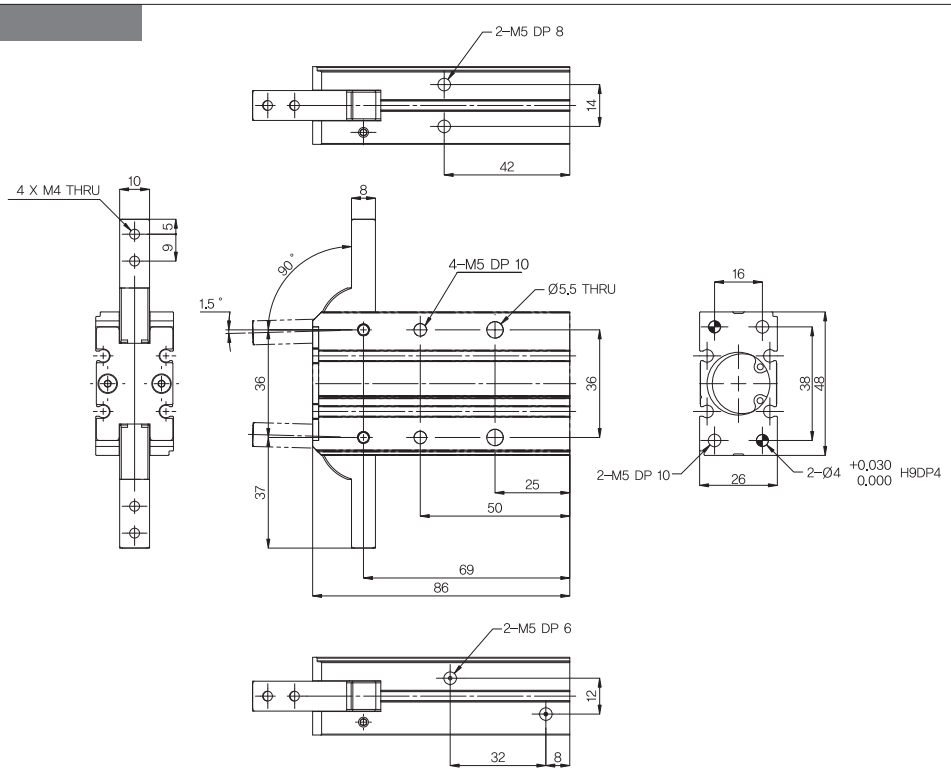


NFS2-16D

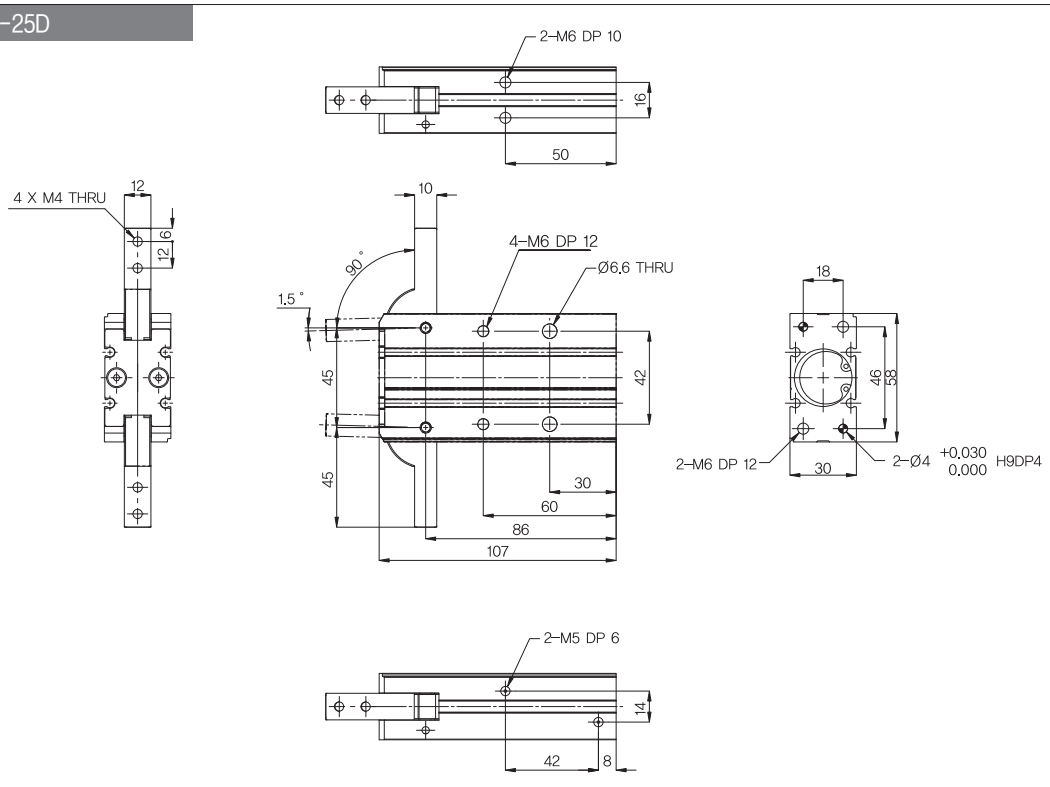


Dimensions

NFS2-20D



NFS2-25D



Notices on Design

Warning

❶ Suitable safety measure should be set for possibility of danger to human body from moving work or possibility of putting fingers into finger cylinder.

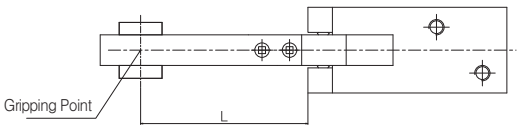
❷ If circuit pressure is lowered owing to air source problem or power failure, work is possibly decreased because of gripping capability reduction. Measures for preventing damage of human body or machinery such as prevention of drop should be reserved.

Notices for Selection

Warning

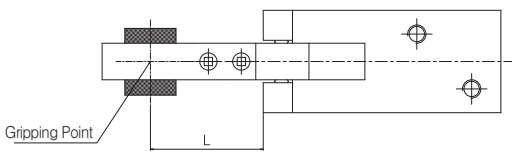
❶ Install attachment short and light.

A. Heavy or long appendage cause shaking of finger part or negative influence to life lifespan owing to enlarged inertia.



〈Too long for appendage and gripping point〉

B. It is recommended to have shorter and lighter gripping point within limit range.



〈Too long for appendage and gripping point〉

C. In case of large scale work or long work, upgrade the size or use multiple numbers.

❷ Select a machine type with marginal gripping force for work weight. If selecting impractical machine type, it may cause drop of work. Refer to machine type selection standard for theoretical gripping force and work weight of each series.

❸ Do not apply an operation causing excessive external force or impact, which causes failure of machine. If needed, contact a manufacturer.

❹ Select a machine margianl for opening/closing width for work.

〈In case of no margin〉

A. Deviation of air chuck opening/closing and work diameter may cause unstability of gripping.

B. Application of auto switch may cause detection failure. Refer to auto switch differential of each series to guarantee marginal stroke for difference.

Notices for Attachment

Warning

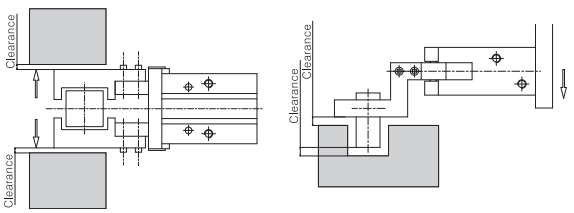
❶ Do not bring damage or impact by dropping air chuck when attaching. Slight deformation may cause fire or operation failure.

❷ Please suitably conduct connection of screw when attaching air chuck or appendage within limited torque value. Connection out of limited range may cause operation failufre, and lack of connection may cause inappropriate location or drop.

Notices

❶ In case of attaching appendage to finger, be cautious not to make finger twisted. It may cause shaking or fire.

❷ Adjust and check not to apply external force to finger. If repeated bending stress or excessive stress is applied to finger, it may cause shaking or damage to finger. Install clearance by moving stroke end of air chuck not to allow thouch of work or appendage.



❸ Be cautious not to allow excessive force for insertion of work with adjusting the center. Especially, check the safety not to make manual operation during test running, nor allow impact caused by low speed operation with lowering the pressurre of cylinder.

❹ Adjust controller not to allow excessive speed of finger opening/closing. In case of excessive speed of finger opening/closing which causes enlargement of impact, it may cause negative influence to work gripping repetition or lifespan.

Machine Type Selection Method

1 Condition Checking

① Weight (kg) of operating components
② Gripping method (external/internal diameter gripping)
③ Frictional coefficient (μ)
④ Marginal ratio (a)
⑤ Although frictional coefficient between appendage and work is different along the shape, please select machine type which allows morre than 10~20 times bigger gripping force than work weight.
⑥ Moreover, there should be a margin considered for high degree of acceleration or impact when returning the work.

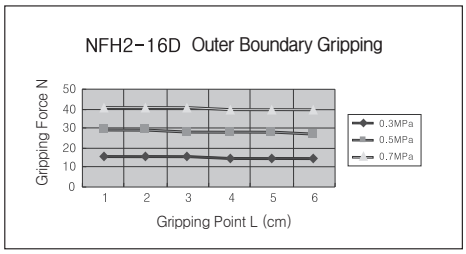
2 Calculation of Necessary Gripping Force

① Weight of operating component = 0.1(kg)
② Gripping method = Outer boundary grip
③ Frictional coefficient (μ)
④ Marginal ratio (a) = 4
⑤ Necessary gripping force (F)
F = mg/(2μ) * a
– g : Gravitational acceleration(9.8 m/s2)
⑥ Calculation 1
Gripping force is set to 10 times of work weight (μ= 0.2)
F = 0.1kg * 9.8 m/s2 * 10 = 9.8(N)
⑦ Calculation 2
Gripping force is set to 20 times of work weigh(μ= 0.1)
F = 0.1kg * 9.8 m/s2 * 20 = 19.6(N)

3 Machine Selection on gripping force graph

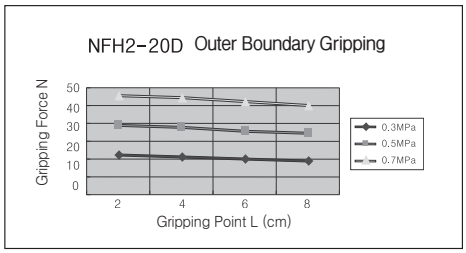
① Distance : L = 2cm
② Pressure : 0.3MPa
③ Conversion of gravity unit
1MPa ≒ 10.2kgf/cm^2
1N ≒ 0.102kgf

1kgf/cm^2 ≒ 0.098MPa
1kgf ≒ 9.8N



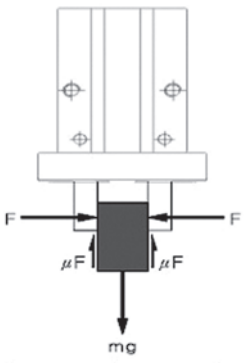
④ Machine selection for calculation 1
※ In case NFH2–16D is selected
Gripping force 15.7N is achieved at the intersection of gripping distance L=2cm and pressure 0.3MPa.
※ Gripping force is 16 times of work weight, and it satisfies over 10 times of gripping set value.

Note : Apply olading under the range or application limit.
It may cause deterioration of shaking, excessive unequal loading to guide part, negative effect to lifespan, etc, if applied over the range.



⑤ Machine selection for calculation 1
※ In case NFH2–20D is selected
Gripping force 22N is achieved at the intersection of gripping distance L=2cm and pressure 0.3MPa.
※ Gripping force is 22 times of work weight, and it satisfies over 20 times of gripping set value.

4 Machine Selection Diagram



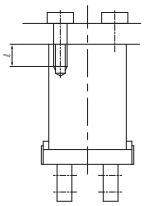
※ When work gripped as it is shown in the figure above,
F : Gripping force(N)
μ: Frictional xoefficient between appendage and work
m : Mass of work(kg)
g : Gravitational acceleration(= 9.8m/s2)
mg : Weight of work(N)

The condition which work is not dropped is,
F > mg / 2μalong 2 * μF > mg
If F is determined with margin ratio a,
F = mga / (2μ)

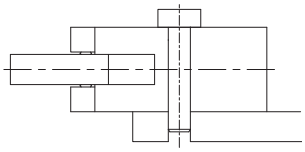
Note) In case of high degree of acceleration or impact, bigger margin should be considered for calculation.

Before to Apply Air Chuck

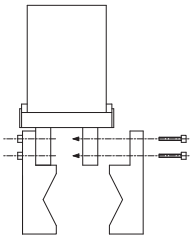
How to Attach of Air Chuck / NFH2 Series



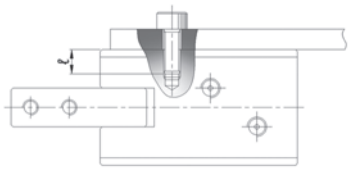
Machine Type	Bolt Applied	Maximum Connecting Torque N*m(kgf*cm)	Maximum Tightening Depth ℓ
NFH2-10D	M3×0.5	0.88(9)	6
NFH2-16D	M4×0.7	2.1(21)	8
NFH2-20D	M5×0.8	4.3(44)	10
NFH2-25D	M6×1	7.3(74)	12



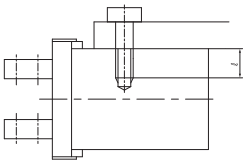
Machine Type	Bolt Applied	Maximum Connecting Torque N*m(kgf*cm)
NFH2-10D	M3×0.5	0.49(5)
NFH2-16D	M4×0.7	0.88(9)
NFH2-20D	M5×0.8	2.1(21)
NFH2-25D	M6×1	4.3(44)



Machine Type	Bolt Applied	Maximum Connecting Torque N*m(kgf*cm)
NFH2-10D	M2.5×0.45	0.31(3.2)
NFH2-16D	M3×0.5	0.59(6)
NFH2-20D	M4×0.7	1.4(14)
NFH2-25D	M5×0.8	2.8(29)

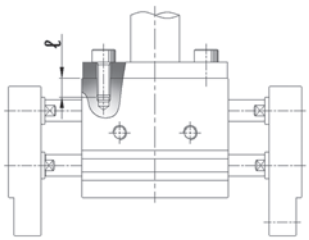


Machine Type	Bolt Applied	Maximum Connecting Torque N*m(kgf*cm)	Maximum Tightening Depth ℓ
NFH2-10D	M3×0.5	0.69(7)	5
NFH2-16D	M4×0.7	2.1(21)	8
NFH2-20D	M5×0.8	4.3(44)	10
NFH2-25D	M6×1	7.3(74)	12

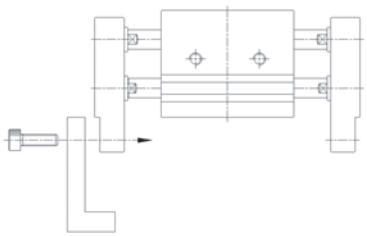


Machine Type	Bolt Applied	Maximum Connecting Torque N*m(kgf*cm)	Maximum Tightening Depth ℓ
NFH2-10D	M3×0.5	0.9(9)	6
NFH2-16D	M4×0.7	1.6(16)	6.5
NFH2-20D	M5×0.8	3.3(34)	8
NFH2-25D	M6×1	5.9(60)	10

How to Attach of Air Chuck / NFW2 Series

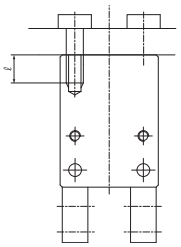


Machine Type	Bolt Applied	Maximum Connecting Torque N*m(kgf*cm)	Maximum Tightening Depth ℓ
NFW2-10A(B)	M4×0.7	1.6(16)	5
NFW2-12A(B)	M4×0.7	1.6(16)	6
NFW2-16A(B)	M5×0.8	3.3(34)	6
NFW2-20A(B)	M6×1	5.9(60)	7
NFW2-25A(B)	M6×1	5.9(60)	7
NFW2-30A(B)	M8×1.25	18(183)	8

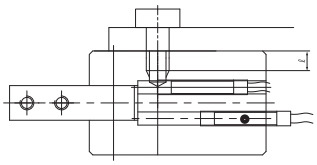


Machine Type	Bolt Applied	Maximum Connecting Torque N*m(kgf*cm)
NFW2-10A(B)	M3×0.5	0.59(6)
NFW2-12A(B)	M4×0.7	1.4(14)
NFW2-16A(B)	M5×0.8	2.8(29)
NFW2-20A(B)	M6×1	5.9(60)
NFW2-25A(B)	M6×1	5.9(60)
NFW2-30A(B)	M8×1.25	18(183)

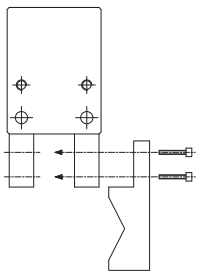
How to Attach Method of Air Chuck / NFP2 Series



Machine Type	Bolt Applied	Maximum Connecting Torque N*m(kgf*cm)	Maximum Tightening Depth ℓ
NFP2-12D	M3×0.5	0.88(9)	5
NFP2-16D	M4×0.7	2.1(21)	8
NFP2-20D	M4×0.7	2.1(21)	10
NFP2-25D	M5×0.8	4.3(44)	12
NFP2-32D	M5×0.8	4.3(44)	12
NFP2-40D	M5×0.8	4.3(44)	12



Machine Type	Bolt Applied	Maximum Connecting Torque N*m(kgf*cm)	Maximum Tightening Depth ℓ
NFP2-12D	M4×0.7	2.1(21)	5
NFP2-16D	M4×0.7	2.1(21)	6
NFP2-20D	M5×0.8	4.3(44)	6
NFP2-25D	M5×0.8	4.3(44)	8
NFP2-32D	M5×0.8	4.3(44)	10
NFP2-40D	M6×1	7.3(76)	12



Machine Type	Bolt Applied	Maximum Connecting Torque N*m(kgf*cm)
NFP2-12D	M3×0.5	0.88(9)
NFP2-16D	M4×0.7	2.1(21)
NFP2-20D	M4×0.7	2.1(21)
NFP2-25D	M5×0.8	4.3(44)
NFP2-32D	M5×0.8	4.3(44)
NFP2-40D	M6×1	7.3(76)

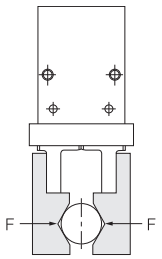
Machine Selection

Effective Gripping Force Checking

- A Method Showing Effective Gipping Force

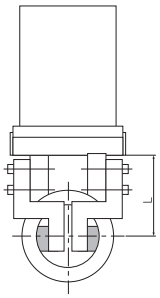
  Effective gripping force in the graph below is shown as 1 finger thrust F under the condition which 2 fingers and appendage are all connected to the work.

NFH2/Standard

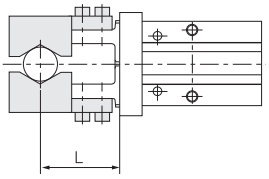


1N = 0.102kgf
1MPa = 10.2kgf/cm^2

Inner Boundary Gripping Condition



Outer Boundary Gripping Condition
NFH2/Standard

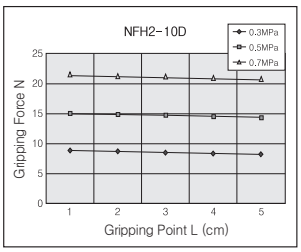


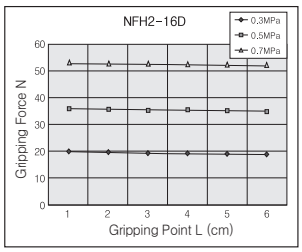
Machine Selection Basis For Work Mass

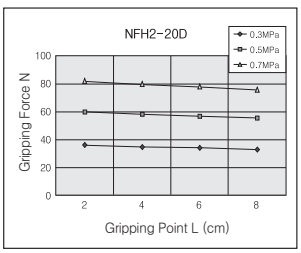
- Although frictional coefficient between appendage and work is different along the shape, please select machine type which allows more than 10~20 times bigger gripping force than work weight.
- There should be bigger margin considered for high degree of acceleration or impact when returning the work.

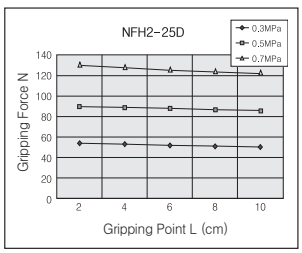
NFH2 Gripping Force Graph (Effective Gripping Force)

Outer Boundary Gripping Condition

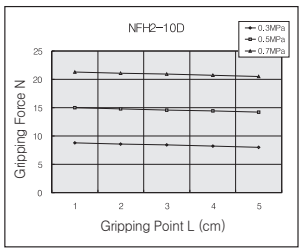


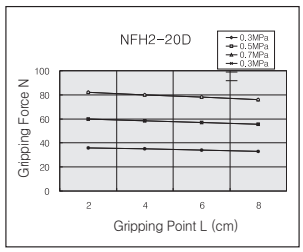


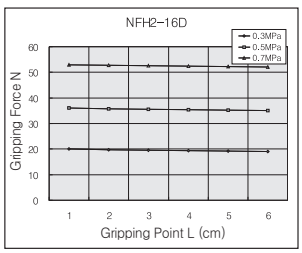


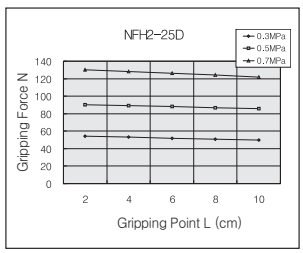


Inner Boundary Gripping Condition

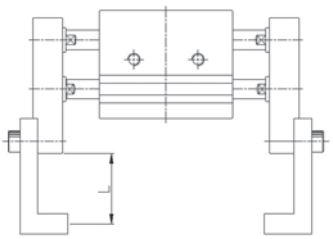








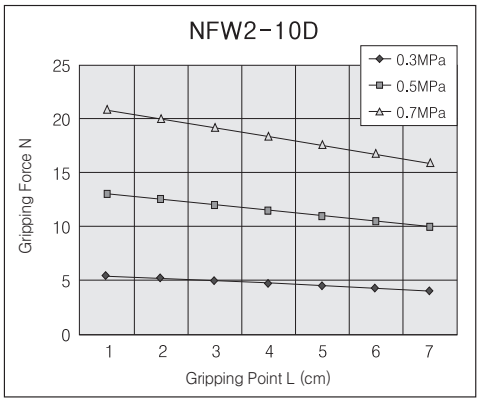
Machine Selection

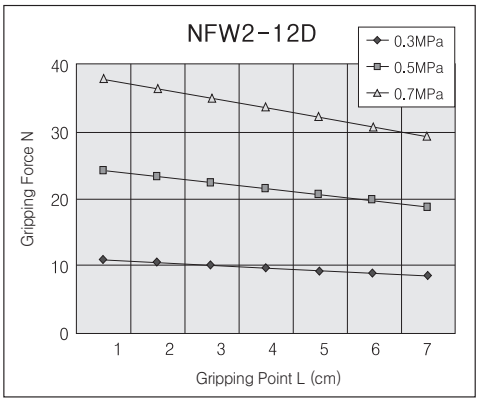


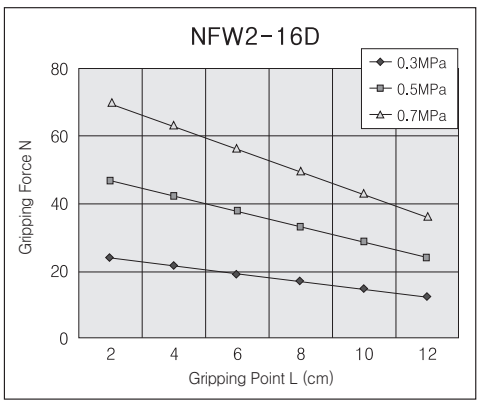
Machine Selection Basis For Work Mass

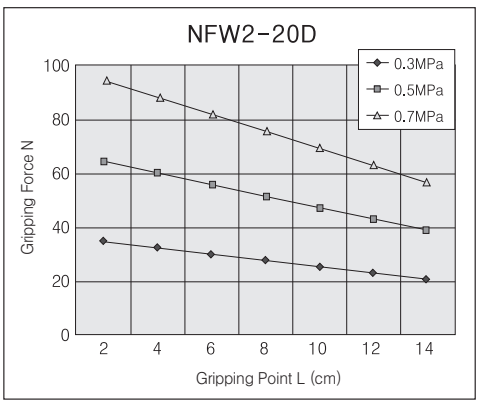
- Although frictional coefficient between appendage and work is different along the shape, please select machine type which allows nore than 10~20 times bigger gripping force than work weight.
- Moreover, there should be bigger margin considered for high degree of acceleration or impact when returning the work.

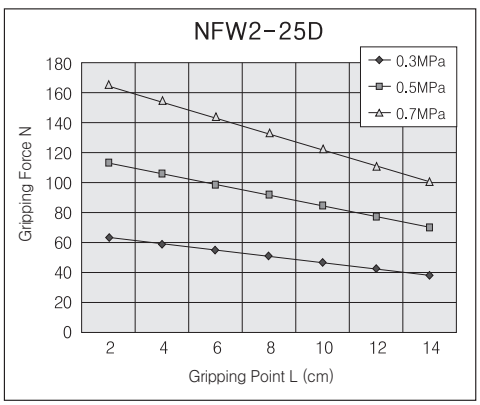
NFW2 Gripping Force Graph (Theoretical Gripping Force)

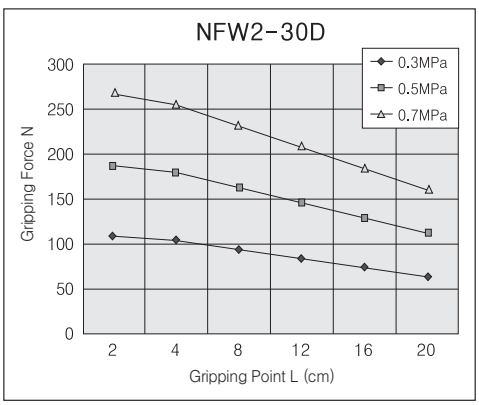








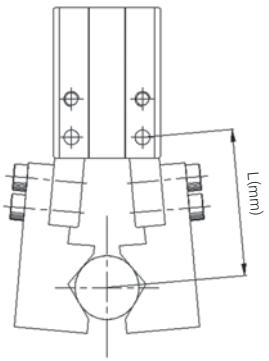




Machine Selection

Gripping Point

• Please apply gripping point of work within the range of theretical gripping force graph.



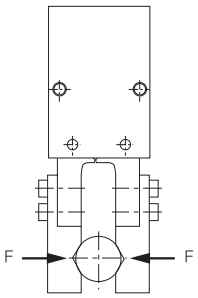
Machine Selection Basis For Work Mass

• Although frictional coefficient between appendage and work is different along the shape, please select machine type which allows more than 10~20 times bigger gripping force than work weight.

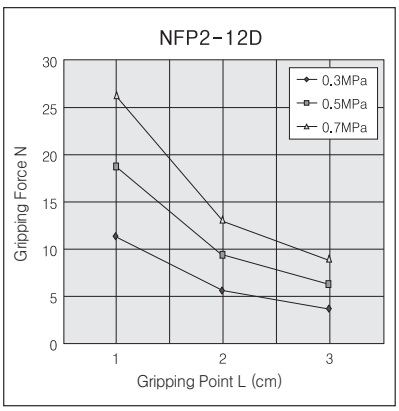
• Moreover, there should be bigger margin considered for high degree of acceleration or impact when returning the work.

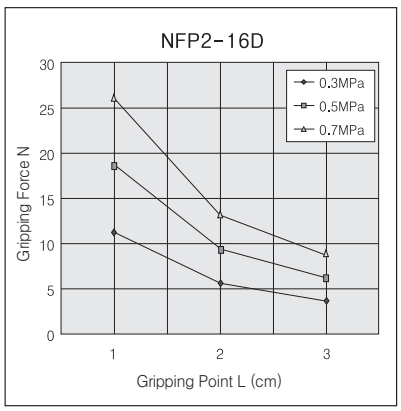
• Indicating method of theoretical gripping force

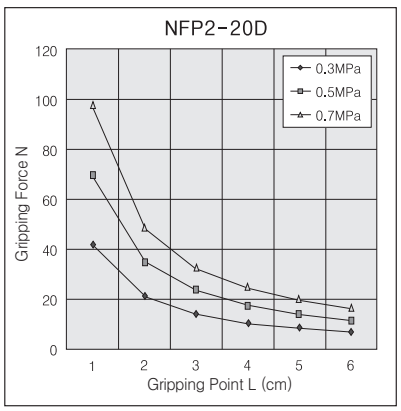
Theoretical gripping force in the graph below is shown as 1 finger thrust F under the condition which 2 fingers and appendage are all connected to the work.

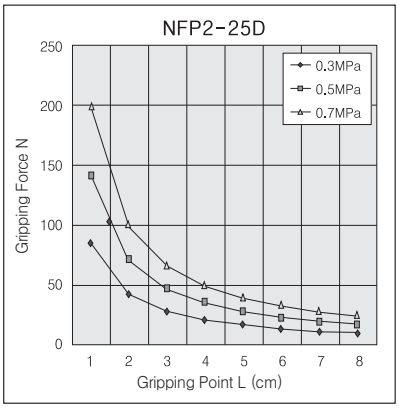


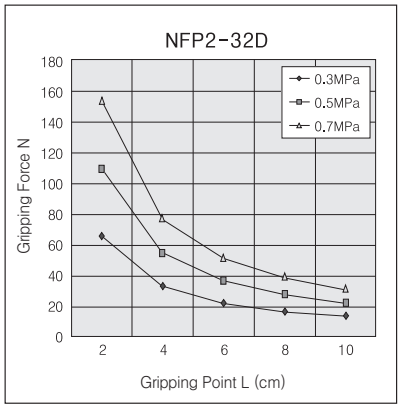
NFP2 Gripping Force Graph (Theoretical Gripping Force)

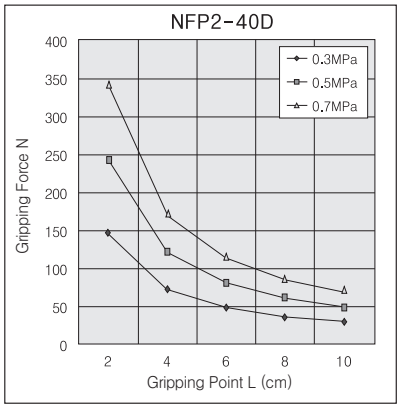








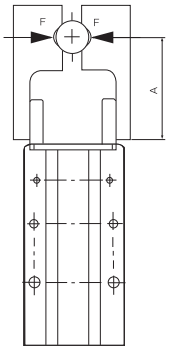




Actual Gripping Force

Gripping Point

• Please apply gripping point of work within the range of theretical gripping force graph.



Machine Selection Basis For Work Mass

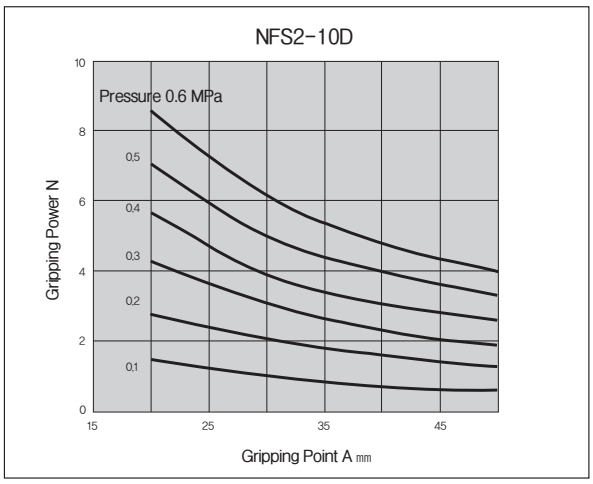
• Although frictional coefficient between appendage and work is different along the shape, please select machine type which allows more than 10~20 times bigger gripping force than work weight.

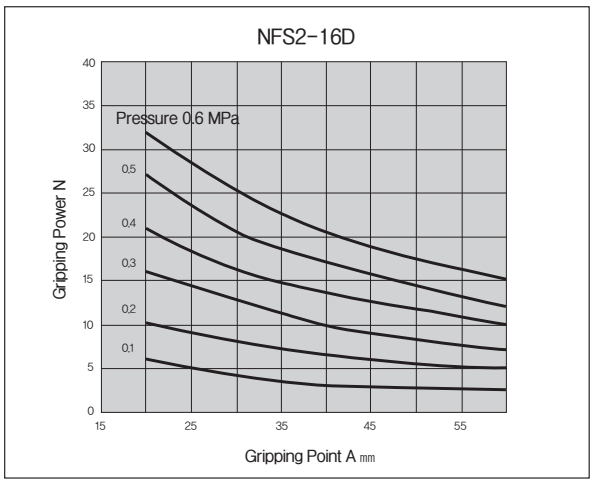
• Moreover, there should be bigger margin considered for high degree of acceleration or impact when returning the work.

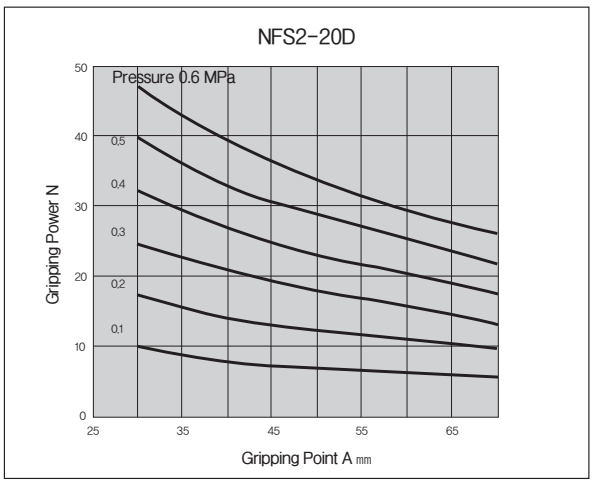
• Indicating method of theoretical gripping force

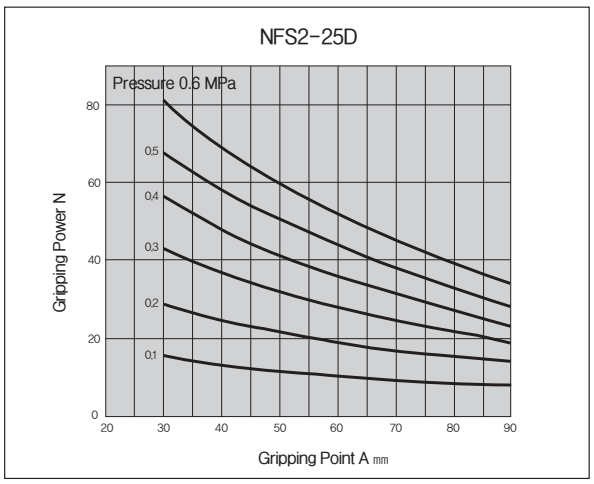
Theoretical gripping force in the graph below is shown as 1 finger thrust F under the condition which 2 fingers and appendage are all connected to the work.

Gripping Force Graph(Theoretical Gripping Force)





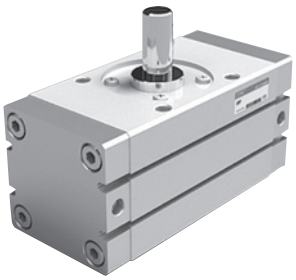




Series NR

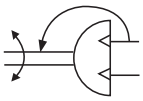
Rotary Cylinder

Rack & Pinion-NRP



- LONG DURABILITY IS GUARANTEED BY THE INSTALLATION OF WEAR RING AND USE OF LOW FRICTION PACKING.
- SHOCK ABSORBER CAN BE INSTALLED(LOW NOISE).
- EASY TO ADJUST ANGLE BY STOPPER.
- COMPACT DESIGN.

Symbol



How to order

NRP B S 50 – 90 □ W8H S

1 2 3 4 5 6 7 8

1 Rotary Cyl.
N : NEW
R : Rotary Cyl.
P : Rack Pinion

2 Mounting
B : Basic type
L : Foot type

3 Axis
Standard
S : Single axis
W : Double axes

4 Bore Size
50, 63, 80, 100

5 Rotation Angle

Standard	90°	90°
	180°	180°
Sub standard	100°	100°
	190°	190°

※ For non indicated angle please contact us.

6 Cushion
Blank : None
C : Air cushion

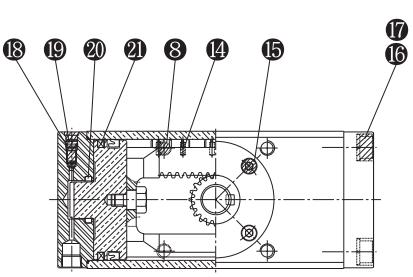
7 Auto Switch
Blank : None
W8H : Reed switch
W8V : Reed switch
W9H : Solid state switch
W9V : Solid state switch

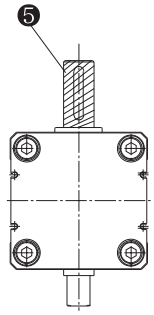
8 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

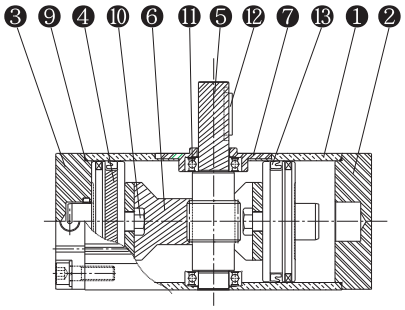
Specifications

Models		NRP 50	NRP 63	NRP 80	NRP 100
Bore Size(mm)		50	63	80	100
Rotation Angle (°)	standard	90^{+4}_{0}, 180^{+4}_{0}			
	substandard	100^{+4}_{0}, 190^{+4}_{0}			
Air Cushion	standard	×			
	option	○			
Theoretic Torque(kgf · cm) (based on 5 kgf/cm²)		98	187	377	785
Allowed Energy (kgf · cm)	without air cushion	0.475	1.14	1.52	5.225
	with air cushion	8.8	13.2	17.6	26.4
Port Size		Rc(PT)1/8	Rc(PT)1/8	Rc(PT)1/4	Rc(PT)3/8
Weight of Main Body(kgf)	90°	1.6	2.6	4.5	8.2
	180°	1.8	3.1	5.0	9.3
Maximum Radial Load (kgf)		20	30	40	60
Maximum Thrust Load (kgf)		50	60	90	100
Rotation Time(sec)	based on 90°	0.2 ~ 2	0.2 ~ 3	0.2 ~ 4	0.2 ~ 5
Fluid		Air(Non-lube)			
Pressure(kgf/cm²)		1.5~10.2			
Temperature · ℃(℉)		0 ~ 60℃(0~140℉)			
Action		Double operating			
Tolerance of rotation angle		0 ~ +4°			
Auto switch type		W8H,W8V			
		W9H, W9V			

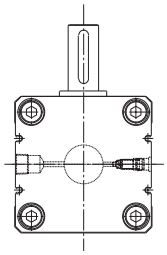
Construction/Parts List







Double shaft type

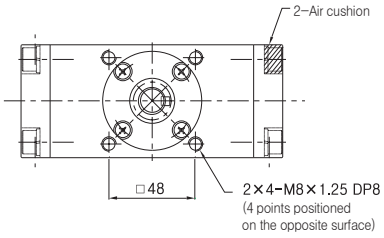


Parts List

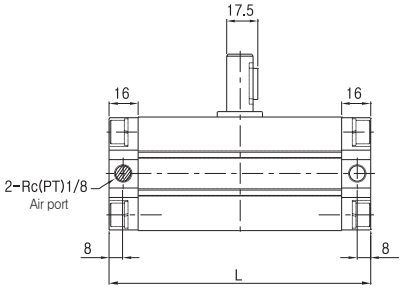
No.	Description	Material	Note
❶	Body	Aluminum alloy	
❷	Cover(right)	Aluminum alloy	
❸	Cover(left)	Aluminum alloy	
❹	Piston	Stainless steel	
	Piston(100˚, 190˚)	Stainless steel	Option
❺	Shaft	Aluminum alloy	
	Shaft(double)	Aluminum alloy	Option
❻	Rack	Carbon steel	
❼	Bearing retainer	Aluminum alloy	
❽	Slider	Resin	
❾	Tube gasket	Rubber	
❿	Connecring screw	Carbon steel	
⓫	Bearing	Bearing steel	
⓬	Parallel key	Carbon steel	
⓭	Piston packing	Rubber	
⓮	Spring pin	Steel wire	
⓯	Plush bolt	Carbon steel	
⓰	Bolt-hex socket	Steel wire	
⓱	Spring washer	Steel wire	
⓲	Cushion valve o-ring	Rubber	
⓳	Cushion valve	Rolled steel	
⓴	Cushion packing	Rubber	
㉑	Magnet	Magnet type	

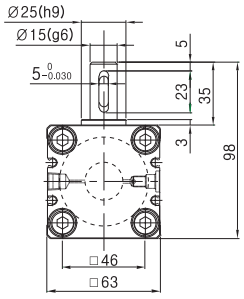
Ø 50

(mm)

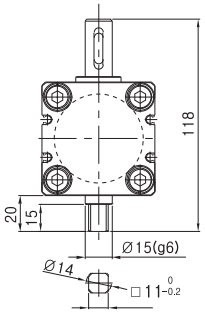


Rotation angle	90°	180°
L	157	190



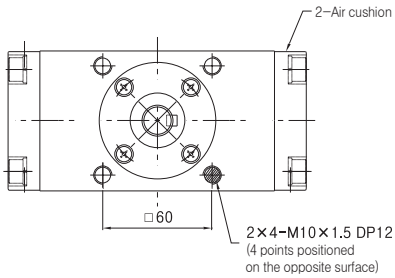


Double shaft type

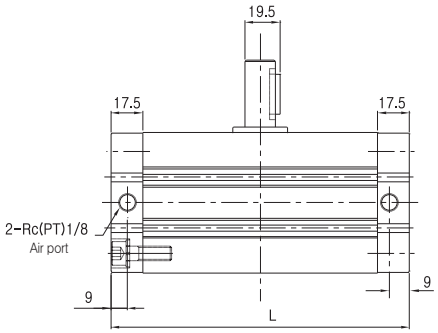


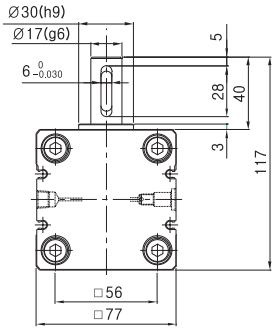
Ø 63

(mm)

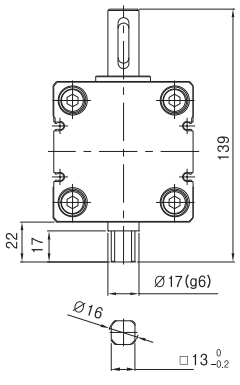


Rotation angle	90°	180°
L	176	224.5





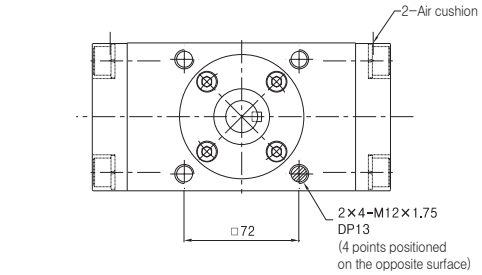
Double shaft type

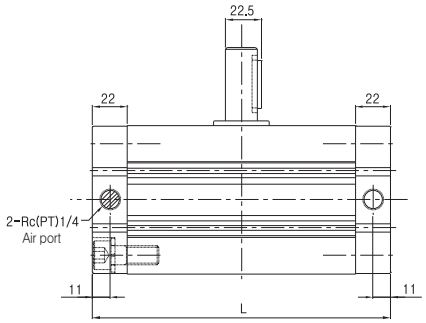


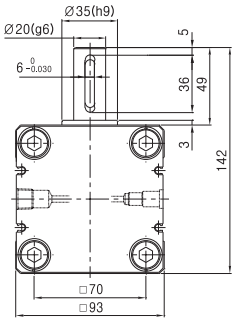
Ø 80

a

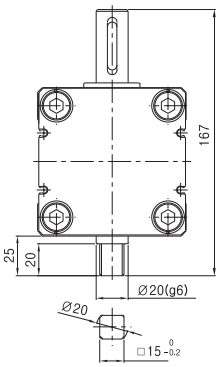
Rotation angle	90°	180°
L	202	244







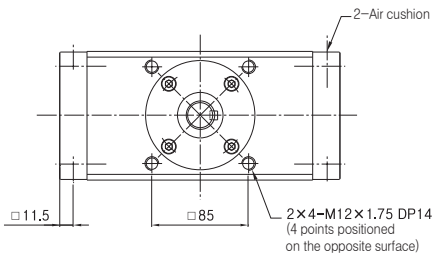
Double shaft type

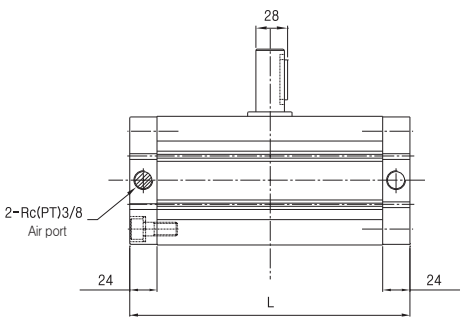


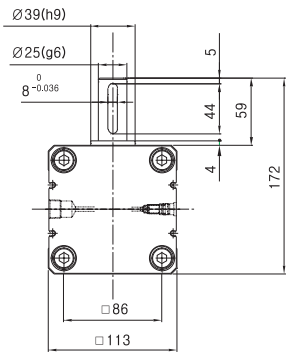
Ø 100

(mm)

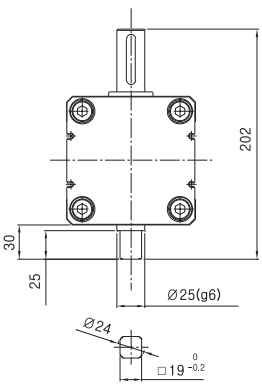
Rotation angle	90°	180°
L	260	326





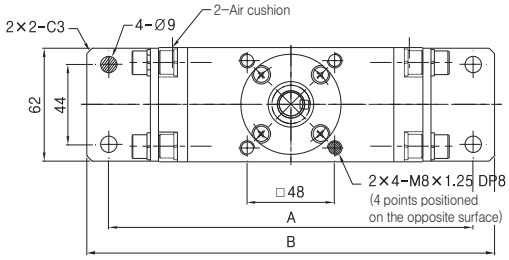


Double shaft type

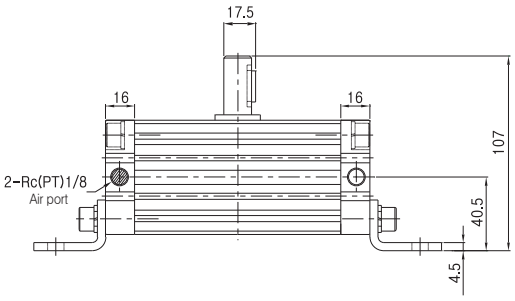


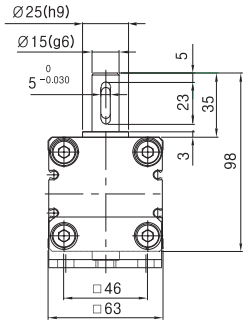
Ø 50

(mm)



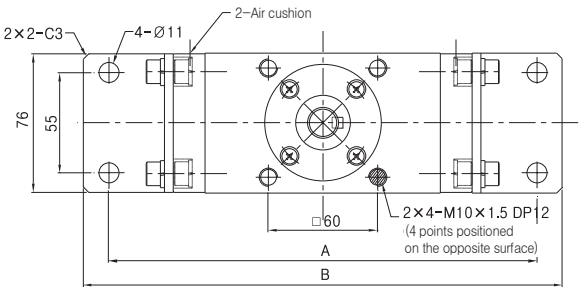
Rotation angle	90°	180°
A	212	245
B	236	269



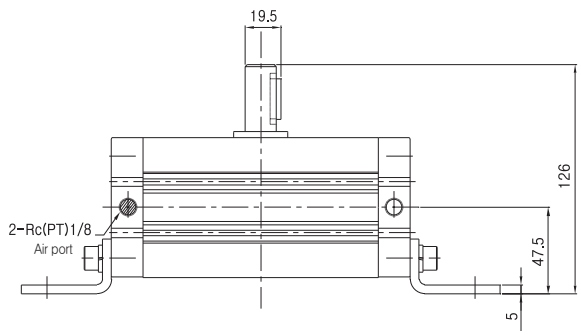


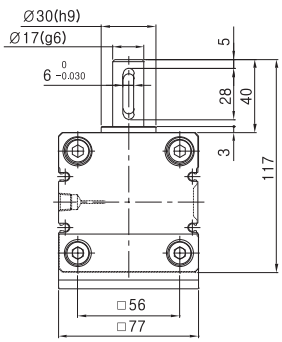
Ø 63

(mm)



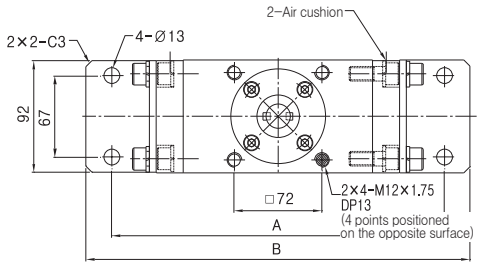
Rotation angle	90°	180°
A	247	295.5
B	275	323.5



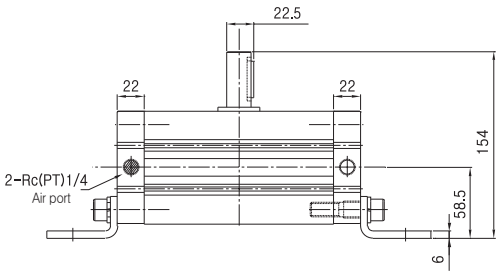


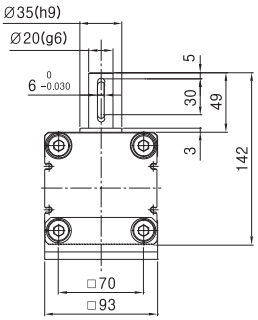
Ø 80

(mm)



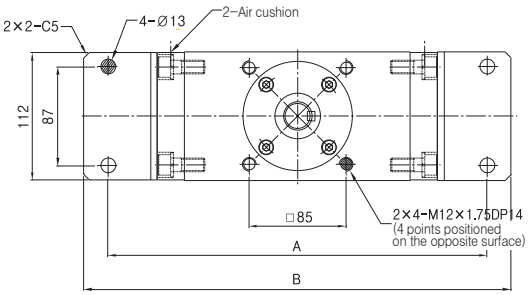
Rotation angle	90°	180°
A	274	318
B	316	360



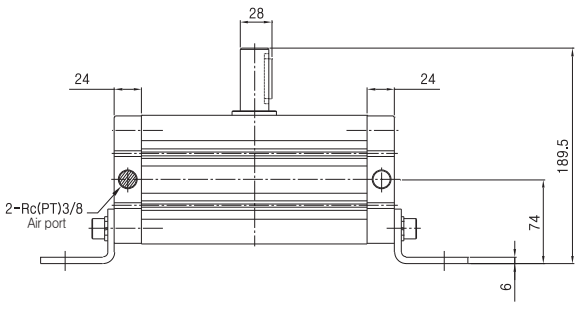


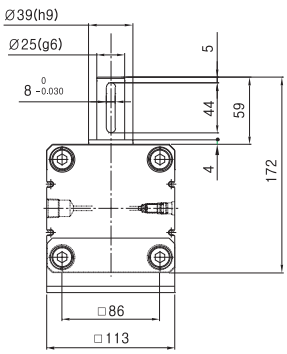
Ø 100

(mm)



Rotation angle	90°	180°
A	347	413
B	389	455

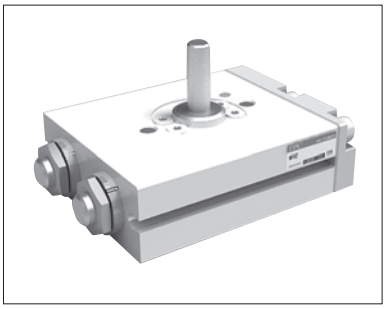




Series NR

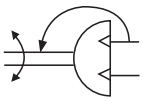
Rotary Cylinder

Rack & Pinion Compact type–NRC



- RACK AND PINION TYPE
- BACKLASH IS MINIMIZED TO DETERMINE THE POSITION, IN HIGH PRECISION BY USING DOUBLE RACK
- POSSIBLE TO CANTROL ANGLE AS WELL AS CUSHION STROKE
- AUTO SWITCH IS ATTACHABLE FOR DETECTING OPENING AND CLOSING

Symbol



How to order

NRC (1) W (2) 20 (3) — 90 (4) — W8H (5) ( ) (6)

1 Rotary cyl.
N : New
R : Rotary cyl.
C : Compact

2 Axis
Standard
S : Single axis
W : Double axes

3 Size
12, 15, 20, 30

4 Rotation Angle
90 : 90°
180 : 180°

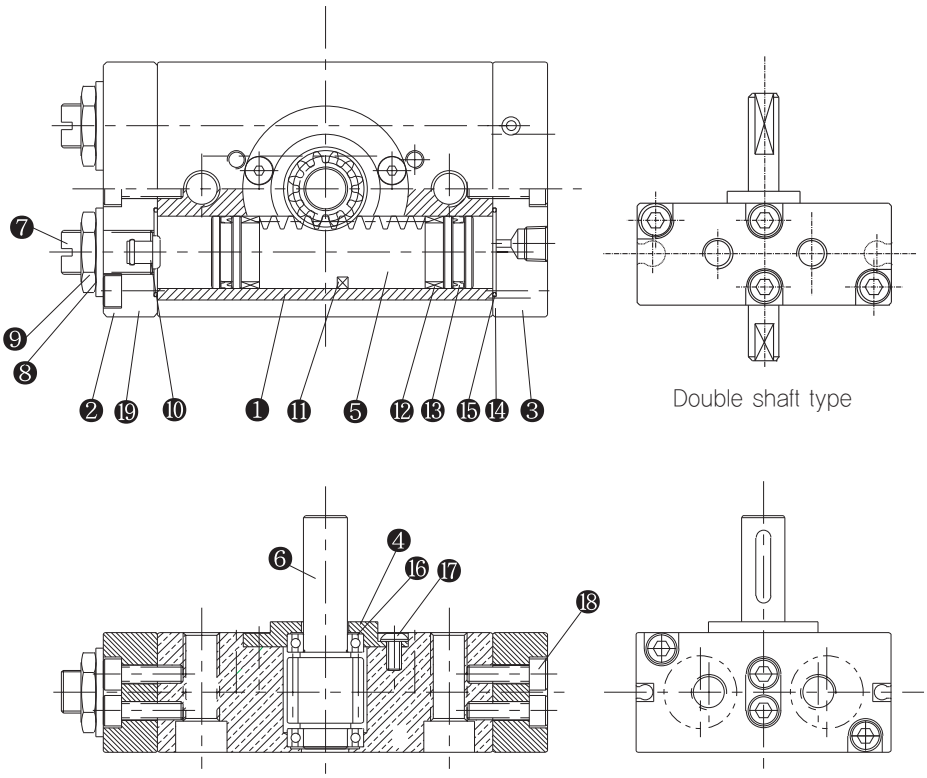
5 Auto Switch
Blank : None
W8H : Reed switch
W8V : Reed switch
W9H : Solid state auto switch
W9V : Solid state auto switch

6 Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

Specifications

Models		NRC 12	NRC 15	NRC 20	NRC 30
Bore Size(mm)		10	13	18	20
Rotation Angle and Regulating Range(°)		90±5 180±5			
Cushion	adjusting bolt attached	Urethane			
	shock absorber attached	Shock absorber			
Theortic Torque (kgf · cm) (based on P=5 Kgf/cm²)		3.53	7.96	20.35	28.26
Allowed Energy (kgf · cm)	without cushion	0.07	0.12	0.24	0.46
	shock absorber attached	0.7	1.2	2.5	3.8
Air Supply port size		M5	M5	PT 1/8	PT 1/8
Maximum Radial Load (kgf)		1.5	2	5	8
Maximum thrust Load (kgf)		1.6	2	5	10
Rotation Time (sec) based on 90°	adjusting bolt attached	0.2 ~ 0.7	0.2 ~ 0.7	0.2 ~ 1	0.2 ~ 1
	shock absorber attached	0.2 ~ 0.5	0.2 ~ 0.5	0.2 ~ 0.7	0.2 ~ 0.7
Fluid		air			
Pressure		1.5 ~ 7.1kgf/cm²(21~101psi)			
Lubrication		unnecessary			
Temperature · ℃(℉)		0 ~ 60℃(0~140℉)			
Action		Double operating			
Auto switch type		W8H,W9H			
		W8V, W9V			

Construction/Parts List

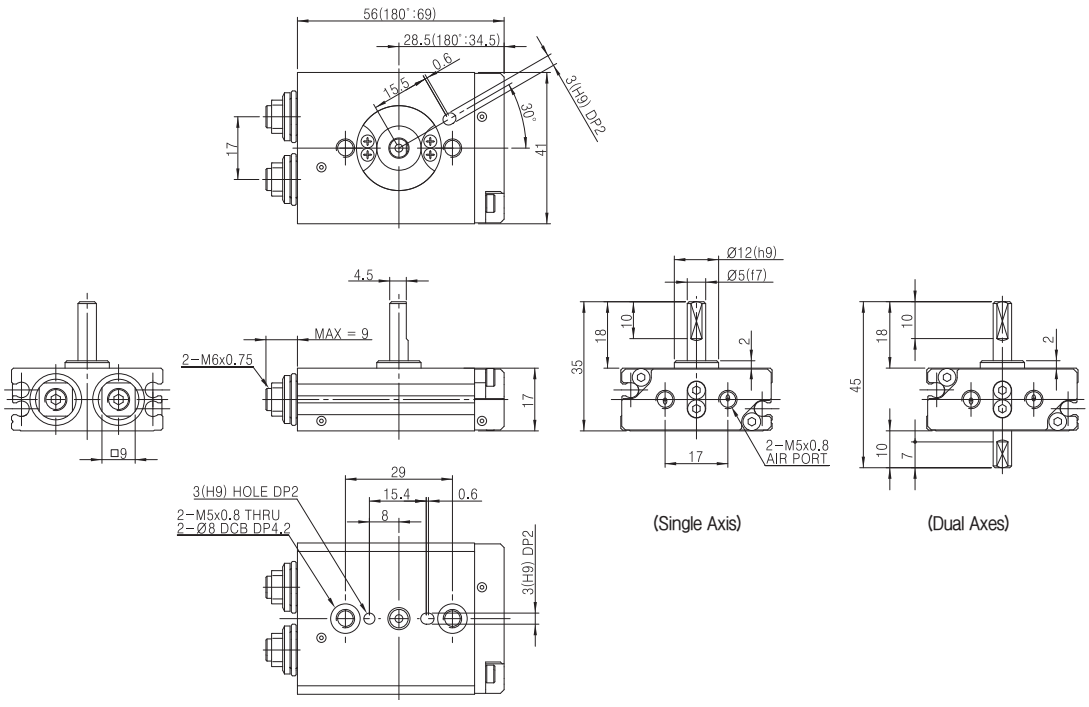


Parts List

No.	Description	Material	Note
❶	Body-rotary	Aluminum alloy	
❷	Cover-end	Aluminum alloy	
❸	Cover-port	Aluminum alloy	
❹	Cover-shaft	Aluminum alloy	
❺	Piston-rack	Stainless steel	
❻	Shaft-rotary	Carbon steel	
❼	Stopper-adjust	Stainless steel	
❽	Seal washer	NBR+carbon steel	
❾	Nut-seal	Carbon steel	
❿	Cushion	Urethane	
⓫	Magnet	Magnet type	
⓬	Wear ring	Resin	
⓭	Piston packing	NBR	
⓮	O-ring	NBR	
⓯	O-ring	NBR	
⓰	Bearing-ball	Bearing steel	
⓱	Hex socket bolt	Carbon steel	
⓲	Bolt-hex socket	Carbon steel	
⓳	Shock absorber	-	Option

Ø 12

(mm)

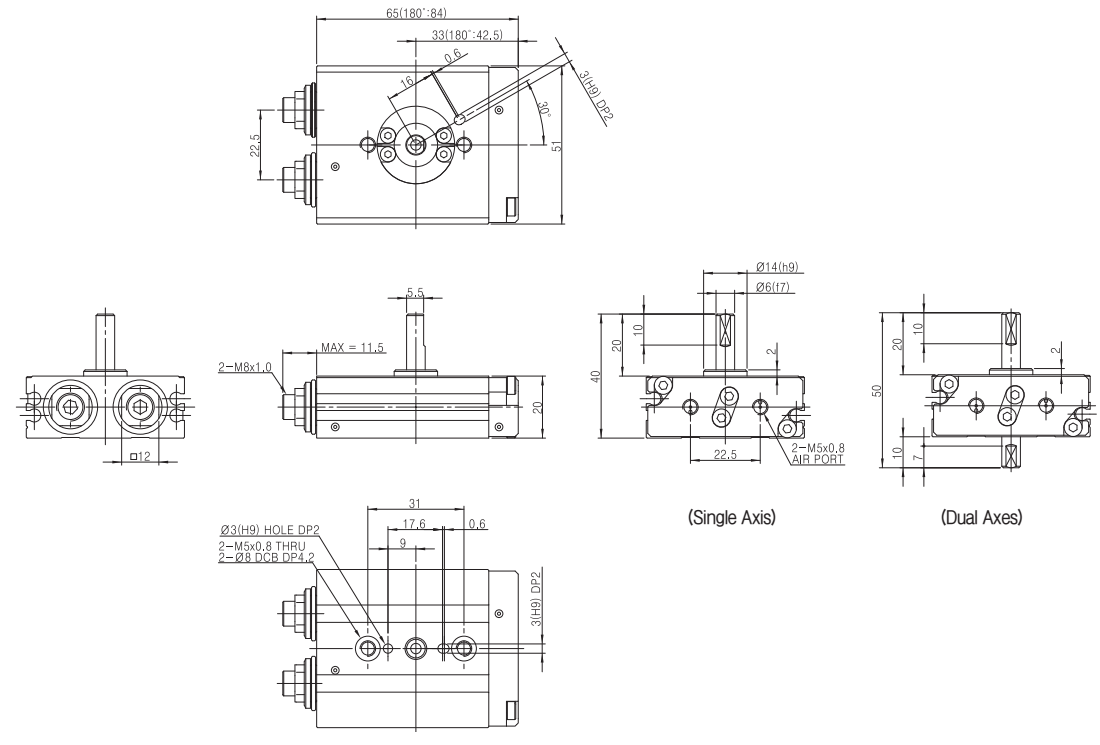


(Single Axis)

(Dual Axes)

Ø 15

(mm)

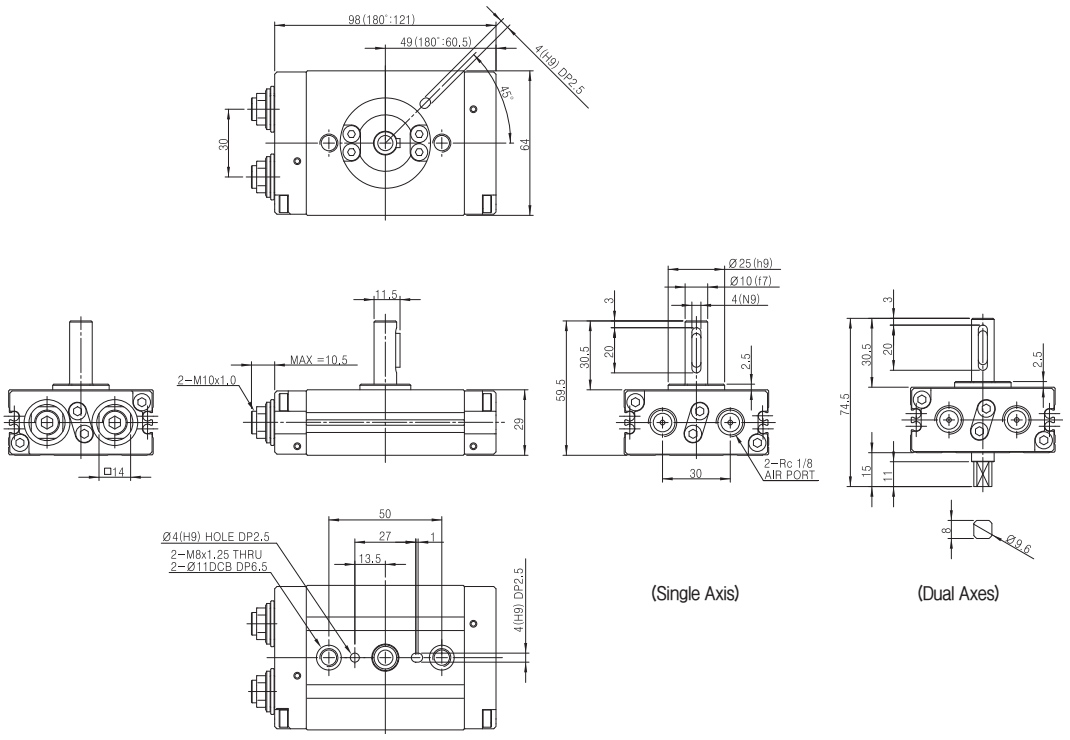


(Single Axis)

(Dual Axes)

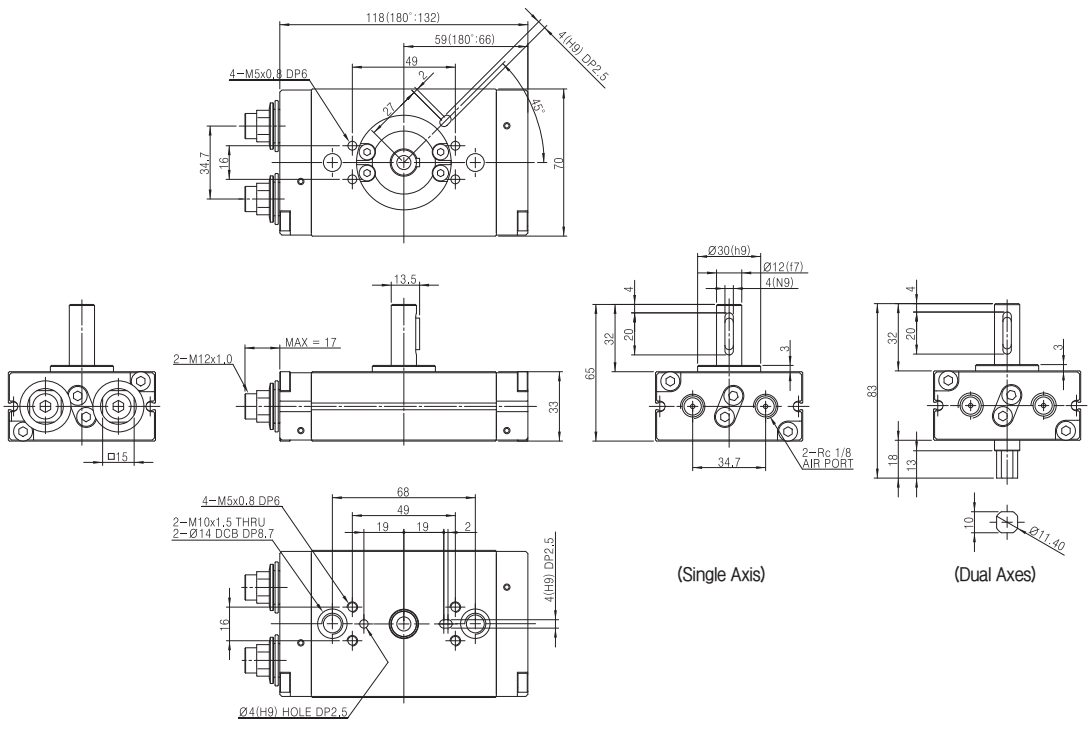
Ø 20

(mm)


98(180°:121)
49(180°:60.5)
4(H9) DP2.5
45°
30
64
11.5
MAX =10.5
2-M10x1.0
29
□14
Ø25(h9)
Ø10(f7)
4(N9)
3
30.5
20
2.5
59.5
30
2-Rc 1/8
AIR PORT
74.5
15
11
8
Ø9.6
50
27
1
13.5
Ø4(H9) HOLE DP2.5
2-M8x1.25 THRU
2-Ø11DCB DP6.5
4(H9) DP2.5
(Single Axis)
(Dual Axes)

Ø 30

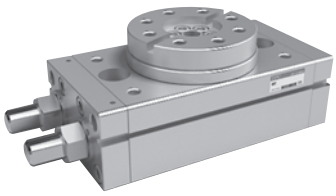
(mm)


118(180°:132)
59(180°:66)
4(H9) DP2.5
49
4-M5x0.8 DP6
27
3
45°
34.7
16
70
13.5
MAX = 17
2-M12x1.0
33
□15
Ø30(h9)
Ø12(f7)
4(N9)
4
20
32
3
65
34.7
2-Rc 1/8
AIR PORT
83
18
13
10
Ø11.40
68
49
19
19
2
4-M5x0.8 DP6
2-M10x1.5 THRU
2-Ø14 DCB DP8.7
4(H9) DP2.5
16
Ø4(H9) HOLE DP2.5
(Single Axis)
(Dual Axes)

Series NR

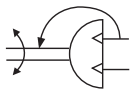
Rotary Cylinder

Rack & Pinion Table type–NRT



- REVOLVING ROTARY CYLINDER, DOUBLE PISTON TYPE(RACK AND PINION).
- SHOCK ABSORBER CAN BE INSTALLED.
- WIRING IS HANDLED IN SINGLE METHOD BY MIDDLE EMPTY AXIS.
- IT IS POSSIBLE TO REGULATE ANGLE AS WELL AS CUSHION STROKE.
- AN AUTO SWITCH CAN BE ATTACHED TO DETECT OPENING AND CLOSING.
- SMOOTH OPERATION AND HIGH POWER.
- HIGH PRECISION.
- A VARIETY OF MOUNTING OPTIONS.

Symbol



How to order

NRT (1) 30 (2) ○ (3) — W8H (4) S (5)

1 ROTARY CYL.
- N : NEW
- R : Rotary Cyl.
- T : Table

2 Size
30, 50, 70, 100

3 Shock Absorber
- Blank : Adjusting bolt
- S : Shock Absorber

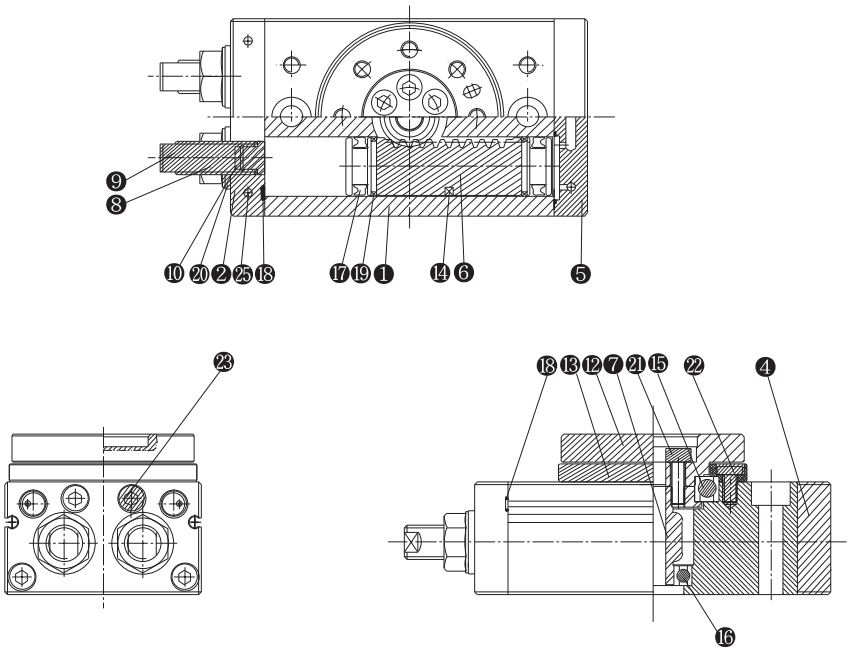
4 Auto Switch
- Blank : None
- W8H : Reed switch
- W8V : Reed switch
- W9H : Solid state switch
- W9V : Solid state switch

5 Number of Auto Switches
- Blank : 2 pcs
- S : 1 pc
- N : N pcs

Specifications

Models		NRT 30	NRT 50	NRT 70	NRT 100
Bore Size (mm)		2 × Ø22	2 × Ø25	2 × Ø28	2 × Ø32
Rotation Angle (°)		0 ~ 190°			
Cushion	adjusting bolt attached	Urethane			
	shock absorber attached	Shock absorber			
Theoretic Torque (kgf · cm)		31.3	51.5	75.4	102.5
Allowed Energy (kgf · cm)	without cushion	0.49	0.78	2.33	3.10
	shock absorber attached	1.041	2.639	9.68	14.08
Air Supply port size		PT1/8			
Weight (g)		1,310	2,030	3,110	4,300
Maximum Radial Load (kgf)		20	32	34	40
Maximum Thrust Load (kgf)		37	46	49	72
Rotation Time (sec) based on 90℃	adjusting bolt attached	0.2 ~ 1.0	0.2 ~ 1.0	0.2 ~ 1.5	0.2 ~ 2.0
	shock absorber attached	0.2 ~ 0.7	0.2 ~ 0.7	0.2 ~ 1.0	0.2 ~ 1.0
Fluid		Air			
Pressure		0.15~1.0MPa(21~145psi)			
Temperature · ℃(℉)		0 ~ 60℃(0~140℉)			
Action		Double operating			
Precision (mm)	Initial Value	±0.05			
	After operation in 1 million times	±0.07			
Auto switch type		W8H,W9V			
		W8H, W9V			

Structure/Parts List

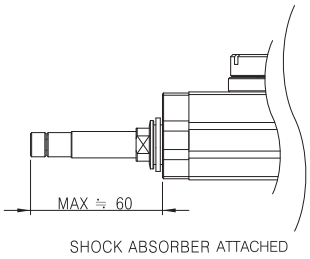


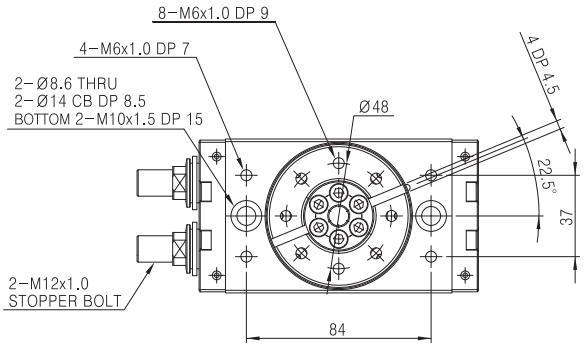
Parts list

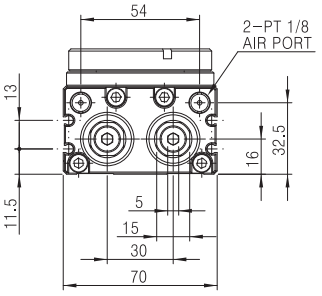
No.	Description	Material	Note
❶	Body	Aluminum alloy	
❷	Port cover	Aluminum alloy	
❹	Gasket	NBR	
❺	End cover	Aluminum alloy	
❻	Piston	Stainless steel	
❼	Pinion	Carbon steel	
❽	Flange nut	Carbon steel	
❾	Adjust bolt	Carbon steel	
❿	Cushion pad	Urethane	
⓬	Table	Aluminum alloy	
⓭	Bearing retainer	Aluminum alloy	
⓮	Magnet	Magnet type	
⓯	Ball bearing	Bearing steel	
⓰	Ball bearing	Bearing steel	
⓱	Piston packing	NBR	
⓲	Port o-ring	NBR	
⓳	Wearing	Resin	
⓴	Seal washer	NBRr+carbon steel	
㉑	Hex socket bolt	Carbon steel	
㉒	Hex socket bolt	Carbon steel	
㉓	Hex socket bolt	Carbon steel	
㉕	Steel ball	Carbon steel	
㉖	Shock absorber	Stainless steel	Option

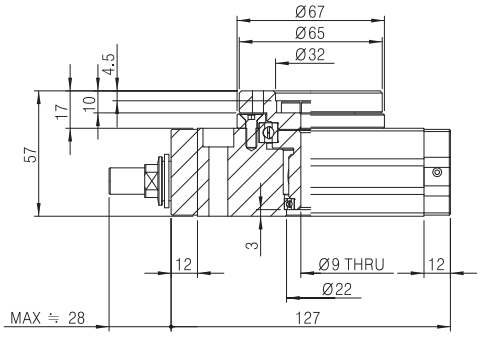
Ø 30

(mm)


MAX ≒ 60
SHOCK ABSORBER ATTACHED

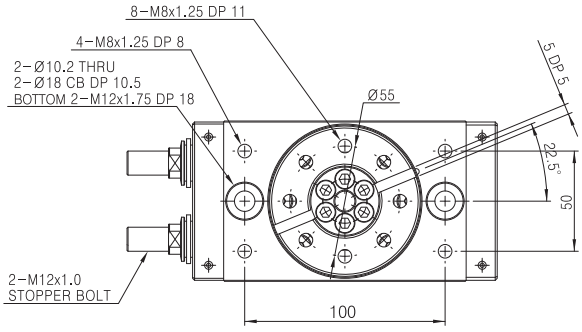

8-M6x1.0 DP 9
4-M6x1.0 DP 7
2-Ø8.6 THRU
2-Ø14 CB DP 8.5
BOTTOM 2-M10x1.5 DP 15
Ø48
4 DP 4.5
22.5°
37
2-M12x1.0
STOPPER BOLT
84

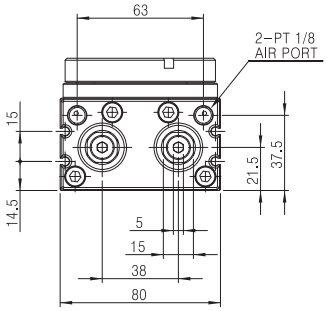

54
2-PT 1/8
AIR PORT
13
32.5
16
11.5
5
15
30
70

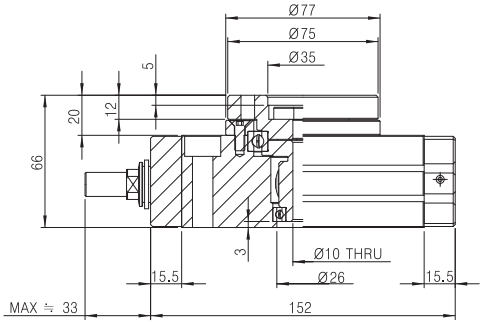

Ø67
Ø65
Ø32
4.5
10
17
57
3
12
Ø9 THRU
12
Ø22
MAX ≒ 28
127

Ø 50

(mm)

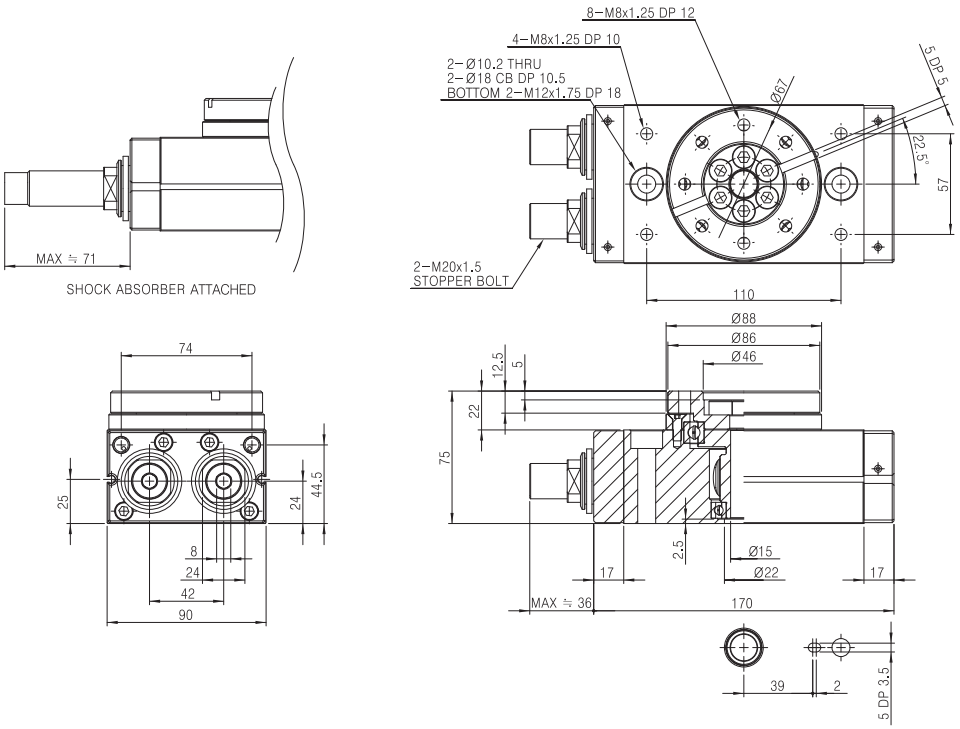

8-M8x1.25 DP 11
4-M8x1.25 DP 8
2-Ø10.2 THRU
2-Ø18 CB DP 10.5
BOTTOM 2-M12x1.75 DP 18
Ø55
5 DP 5
22.5°
50
2-M12x1.0
STOPPER BOLT
100


63
2-PT 1/8
AIR PORT
15
37.5
21.5
14.5
5
15
38
80


Ø77
Ø75
Ø35
5
20
12
66
3
Ø10 THRU
15.5
Ø26
15.5
MAX ≒ 33
152

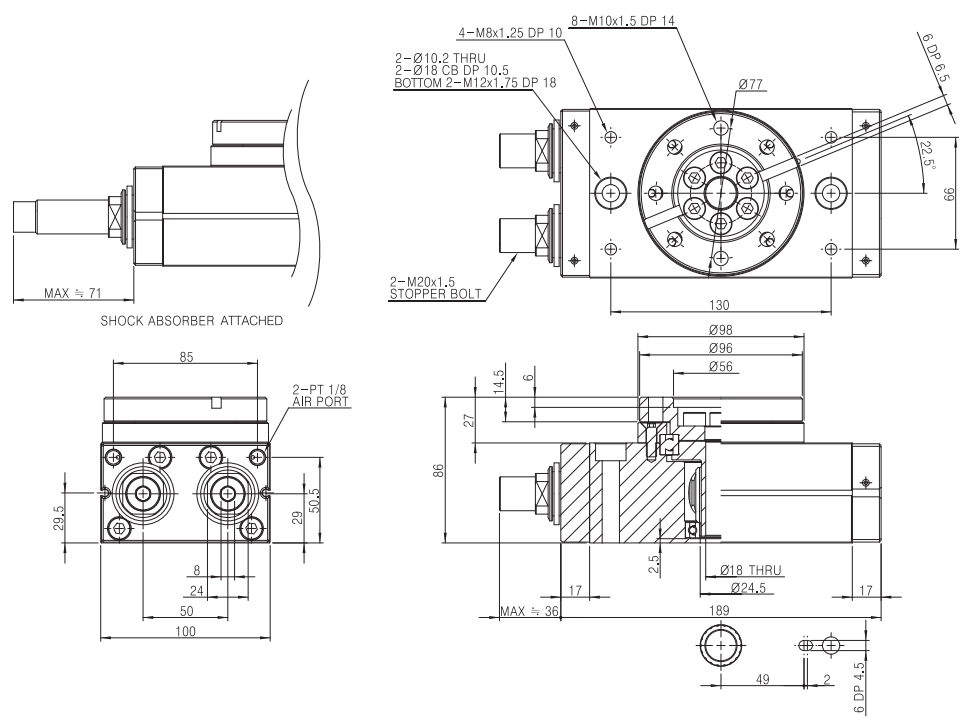
Ø 70

(mm)



Ø 100

(mm)



Common cautions for rotary cylinder series

Please make sure to read this prior to selecting and using our products and for detailed cautions of each series, see the details of the respective model.

Cautions for design

Warning

(1) It is needed to fasten firmly so as to prevent the fixing part or joint of rotary cylinder from being loose. Especially, it is preferred that rotary cylinder should be fastened by the surest way in place

(2) By attaching protective cover, it is possible to prevent any possible injury to the operation.

(3) It may be necessary to provide decelerating circuit or shock absorber.

(4) Rotary cylinder may be subject to the risk of malfunction if power changes due to distortion of sliding part of machine

(5) At the time when you design circuit, it is recommended to consider a prepare restart procedure for after an emergency stop.

Cautions for design

Danger

The use of product for the following purpose should be avoided.

1. For the use of medical use equipment designed to treat human body.
2. For the use of mechanical device or equipment designed to transport or move persons.
3. For the use of mechanical device that needs the maximum stability.

Warning

(1) Confirm the specification.

Be sure that the products in this catalog are designed to be used for industrial compressed air system only. When it is used for allowed energy of load, pressure or temperature beyond the range of specification, it may cause damage or malfunction.

(2) Vibration and shock.

The use of rotary cylinder should be avoided to absorb the vibration and shock of mechanical device.

(3) Concerning intermediary stop.

If at the middle of a direction control valve (3–position closed center type), the rotary cylinder piston stops,it cannot be precisely stopped at exact position like oil pressure because of compressed air. Furthermore, since it is impossible to guarantee prevention of air leakage using valve and rotary cylinder, the stopping position may not be maintained for long time, resulting in damage to human body or equipment.

(4) In event that the kinetic energy on the product exceeds tolerance, be sure to install buffer.

Over energy may break product, resulting in damage to human body, instrument or equipment.

Caution

(1) Confirm all specification.

Otherwise, durability may decrease and abnormal wearing or damaging of shaft/internal parts may occur.

(2) Over load external torque exceeding the specified power to the product should be avoided.

(3) Be sure to always increase the speed gradually by attaching speed controller when the rotary cylinder is running.

(4) The use of the product in the low speed area beyond the speed controlling range indicated in the product should be avoided.

Stick slip or stopping of operation may occur due to using low speeds.

(5) Sufficient tolerance is needed in torque

Be sure to select a model so that the required torque is less than 70% of theoretic torque (less than 50% in the case of variable load). If mass of load is large, andoperating speed is fast, the inertia load gets too large exceeding the allowed energy of rotary cylinder, so that the product may be broken resulting in fatal injury to the operation or damage to instruments or equipment. In this case, it is preferred to install shock absorber so as to prevent the inertia power from being directly applied to rotary cylinder.

(6) The use of the product using oil pressure (except NRP for low oil pressure) should be avoided.

The product can be seriously damaged if it is used with the oil pressure.

Cautions for selection

Danger

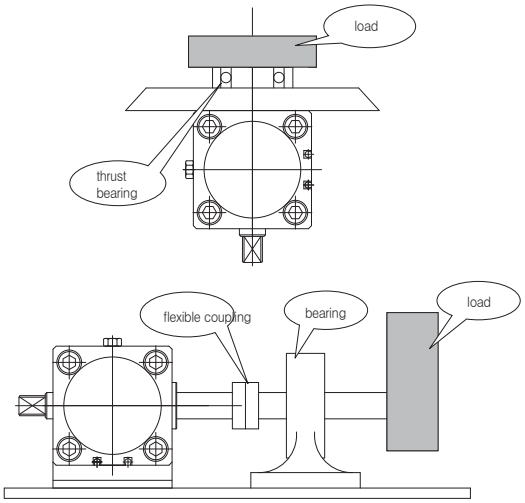
(1) Be sure to always check whether it is fixed in safety when attaching the product.

Dropping the product or irregular operation may result in injury.

(2) Water must be kept away from the product.
Sprinkling water to the product, washing it with water or using it in the water should be avoided, otherwise it may cause malfunction, resulting in injury, electric shock, fire, etc.
(3) Touching it should be avoided while the product is running.

Warning

(1) Space for maintenance and repair should be provided.
(2) Careful handling is needed with respect to cords such as lead wire of auto switch so as to prevent any possible damage.
(3) Putting auto switch in the external magnetic field is avoided while rotary cylinder is running.
(4) Installation of safety valve
So as to prevent the pressure from exceeding regular pressure, be sure to install safety valve when it is increasing because of external power applied to rotary cylinder. Over pressure may break the product.
(5) Modifying the product should be avoided.
(6) Fastening screw and observance of fastening torque are needed.
Fasten screw to the recommended torque while installing.
(7) Be sure to check that the revolving direction of rotary cylinder coincides with that of the load.
If the center of revolution does not coincide or moment weight is applied to the point of shaft, it is needed to put flexible coupling so that only the revolving power may be transmitted.
So as to achieve a running condition, be sure to let the load apply directly to shaft as described in the following diagram.



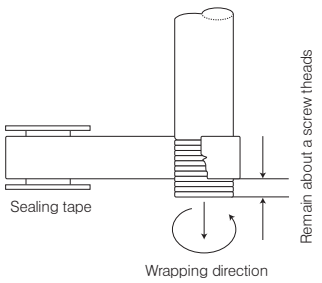
Cautions

(1) Applying load exceeding twisting or bending strength to the rotary cylinder shaft should be avoided.

Cautions for piping

Cautions

(1) Action prior to piping.
Make sure to clean piping in order to eliminate the chip, oil or dust in a pipe.
(2) Method of using seal pipe
In event that connecting piping or fitting is performed, it is needed to make sure to prevent the chip or sealing material of piping screw from entering into the inside of piping. Especially, wind it, leaving 1.5–2 threads of pipe untapped when using seal tape.



Cautions for adjusting the cushion

Cautions

(1) It is needed to adjust cushion valve again.
At the time of delivery, though cushion is adjusted, readjusting cushion valve installed on the cover based on the load and running speed used is needed. In the event that cushion valve is turned clockwise, the orifice hole becomes smaller and cushion becomes stronger. After adjusting, it is needed to fasten lock nut (if any) firmly.
(2) Using cushion valve should be avoided while it is completed closed.

Cautions for lubrication

Cautions

(1) No use of Lubrication
Be sure to use this product without lubrication. If needed, it may be used with lubrication; in this case stick slip will result.
So as to operate all in air hydro type, it is needed to lubricate turbine oil first class(without addition) ISO VG 32.
When other operating oil beyond designated model is used, failure results.
Using machine oil and spindle oil are avoided.

Cautions for air source

Cautions

(1) It is needed to attach air filter

The use of the product should be avoided in the place in which there are provided dust, salt, iron, powder, humidity, organic solvent, operating oil of phosphoric acid ester type sulfurous acid gas, chlorine gas, and the acids are contained. With the above conditions, operation delay, sudden deterioration of performance and reduction of durability may occur.

(2) The use of the product should be avoided in the place subjected to erosion.

For the equality of materials of rotary cylinder, it is needed to check each structure diagram.

(3) The use of the auto switch should be avoided in the strong magnetic field.

The use of the auto switch should be avoided in the place where there are provided high current or strong magnetism. Otherwise, it may cause malfunction. In particular, the use of the object which may be magnetized to the arranged bracket should be avoided.

Danger

(1) Hazardous substances such as flammables must be avoided.

Warning

(1) Do not use the product in the place where dust, salt, iron powder, humidity, organic solvent, operating oil of phosphoric acid ester type sulfurous acid gas, chlorine gas and the acids are contained. This condition may cause suspension of operation, sudden deterioration of performance and reduction of durability.

(2) Do not use the product in the place which is subject to erosion.

For the quality of materials of rotary cylinder, refer to each structure diagram.

(3) Auto switch must not be used in the strong magnetic field.

Do not use auto switch in the place with high current or strong magnetism, otherwise malfunction may occur. Especially, don't use object that can be magnetized to the installed bracket.

Cautions

(1) The use of the auto switch should be avoided together with this product.

Otherwise, malfunction or undesired operation could result.

It is needed to attach air filter to an upper stream provided near valve. It is preferred to set the filtering rate below 5um.

(2) It is needed to install following cooler, air dryer, drain catch etc. for preparation

Malfunction of valve or other air pressure equipment may be damaged due to compressed air with much drain.

(3) It is preferred to set the temperature of fluid and environment within the range of specification.

The circuit moisture could be frozen below 5C, resulting in damage and malfunction in packing. So, it is needed to prepare freezing phenomenon.

Cautions for environment for use

Danger

(1) The use of the product should be avoided in the place in which there are provided dust, salt, iron, powder, humidity, organic solvent, operating oil of phosphoric acid ester type sulfurous acid gas, chlorine gas, and the acids are contained. With the above conditions, operation delay, sudden deterioration of performance and reduction of durability may occur.

(2) The over force should be applied to the auto switch or rotary cylinder.

Cautions for repair

Danger

Person who uses pace maker should be kept away from the product within 1m.

Warning

The repair should be performed in the sequence of the manual. Otherwise, instrument or device may have malfunction or may be damaged.

Cautions

Inspection available on demand.

Even with high durability, air pressure apparatus could have deterioration of function. So as to prevent accident, it is needed to check that the needed function of system is normal with daily check.

How to select models

Caution: Load must not exceed the allowed limit. .

In the case of using rotary cylinder, most factors are studied in the context of inertia load. Erroneous selection for shape and weight of this inertia load, the internal parts may be broken by inertia power of load though the load required torque of rotary cylinder is not so large. For this reason, it is necessary to select right model.

1. Use Condition

Enumerate the use conditions in consideration of attaching direction and work shape.

- revolving angle : θ (rad) table 1
- rotation time : t (sec) table 1
- applied pressure : P (MPa)
- shape and weight of inertia load figure 1
- attaching direction: horizontal or vertical

1MPa ≒ 10.2kgf/cm^2

2. Calculating the required rotation time

For selecting models, it is desirable to keep the speed in a controllable range.

Given the use conditions, the rotation time of rotary cylinder is obtained by the following expression. table 1

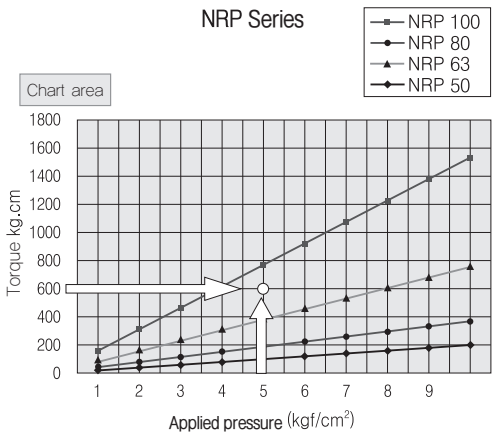
$$t \geq \sqrt{(2 \times I \times \theta^2 / E)}$$

E : allowed kinetic energy (J)
I : inertia moment (kgf · m^2)
θ : revolving angle (rad)
90° → 1.57 rad
180° → 3.14 rad
t : rotation time (s)

3. Selecting the quantity of torque (selecting model)

For selecting models, torque necessary for revolution must be obtained to meet the object.

NRP Series



Referring to the above graph of theoretic torque, if torque of 600kgf.cm is necessary with applied pressure of 5kgf/㎠, the supplying pressure is extended to horizontal axis and torque, to vertical axis respectively to get the intersection. Inner diameter (NRP 100) larger than this intersection is to be selected.

Item	Horizontal Rotation	Vertical Rotation	Remark
static torque calculation(T_S)	–	$T_S = 2m \times L$	m : weight(Kgf) L : distance between revolving axis and load center(m)
accelerating torque calculation(T_A)	$T_A = I \times \omega_A \times K$		I : inertia moment(Kgf · m^2) ω_A : each acceleration calculation(rad/s^2) ω_A : ($2\theta/t^2$) K : safety coefficient, over 5
required torque(T)	T_A	$T_A + T_S$	
rotary cylinder theoretic torque	T graph 1		

※ Effective torque: to be calculated within 70 % of T theoretic torque in consideration of safety rate.

1J = 0.10197kgf · m = 10.2kgf · cm
1kgf · m = 9.80665J
1N = 0.10197 kgf
1N · m = 0.10197kgf · m = 10.2kgf · cm

4. Calculating the load capacity

Referring to the table of shape, get the inertia moment I.

※ In the case of rectangle

$I = m \times (a^2 + b^2)/12$

I : inertia moment (kgf m2)
m : weight (kgf)
a : horizontal (m)
b : vertical (m)
calculation formula of inertia moment : figure 1

5. Calculating kinetic energy and checking allowed energy

Get the kinetic energy E(J) of loaded object.Get allowed energy Ea(J).
Check to prevent the kinetic energy E(J) of loaded object from exceeding the allowed energy Ea(J).

※ In the case of rectangle

$E = 1/2 \times I \times \omega^2$, $\omega = (2\theta / t)$

E : kinetic energy (J)
I : inertia moment ($kgf \cdot m^2$)
ω : velocity (rad/s)
θ : revolving angle (rad)
90° = 1,57 rad
180° = 3,14 rad
t : rotation time (s)
allowed energy Emax : table 1
kinetic energy(E)≤ allowed energy(Ea)

※ In the case of attaching shock absorber

weight m_1 : m_1 : (kgf)
$m_1 = I / R2$ I : ($kgf \cdot m^2$)
R : distance between the center line of revolution to the center of vertical hem shock(m) figure 4

weight m_2
$m_2 = (2 \times T \times L) / (R^3 \times \omega^2)$
$\omega = (2\theta / t)$ m_2 : weight (kgf)
T : effective torque(N · m)
L : stroke of shock absorber(m) figure 4

$m = m_1 + m_2$ ω : angular velocity (rad/s)
calculating the colliding velocity V : velocity(m/s)
$V = R \times \omega$
calculating kinetic energy $E = 1/2 \times m \times V^2$
kinetic energy(E)≤allowed energy(Ea)

6. Load Rate

6-1 load rate of thrust load
Get loadable mass Wr(kg). Get load rate $\alpha 1$ of load mass.

maximum loadable weight Wmax : figure 2
$\alpha_1 = W / W_{T\ MAX}$

6-2 load rate of radial load
Get loadable mass Wr(kg).
Get load rate $\alpha 2$ of load mass.

maximum loadable weight Wmax : figure 2
$\alpha_2 = W / W_{R\ MAX}$

6-3 load rate of bending moment
Get moment M(N.m).
Get allowed moment M_{MAX}(N.m).
Get load rate $\alpha 3$ of static moment.

maximum loadable weight Wmax : figure 2
$\alpha_3 = M / M_{MAX}$
(for NRT series only)

7. The whole sum of total load rate

If the whole sum of load rate does not exceed 1.

Usable depending on $\Sigma\alpha_n = \alpha_1 + \alpha_2 + \alpha_3 \leq 1$

Table 1 classifying system of rotary cylinder series

Type		Model	Cylinder diameter (mm)	Revolving angle (°)	Allowed energy (Kgf.cm)		Theoretic energy (Kgf.cm) (based on P=5Kgf/㎠)	Rotation time based on 90 ° (sec)		Maximum thrust load(Kgf)	Maximum radial load(Kgf)
Rotary Cylinder	Rack & Pinion type	NRP50	50	90	without air cushion	0.475	103	0.2 ~ 2		50	20
				180	with air cushion	8.8					
		NRP63	63	90	without air cushion	1.14	187	0.2 ~ 3		60	30
				180	with air cushion	13.2					
		NRP80	80	90	without air cushion	1.52	377	0.2 ~ 4		90	40
				180	with air cushion	17.6					
		NRP100	100	90	without air cushion	5.225	765	0.2 ~ 5		100	60
				180	with air cushion	26.4					
	Rack & Pinion Compact type	NRC12	10	90	without cushion	0.07	3.1	adjusting bolt attached	0.2~0.7	1.6	1.5
				180	shock absorber attached	0.7		shock absorber attached	0.2~0.5		
		NRC15	13	90	without cushion	0.12	8.0	adjusting bolt attached	0.2~0.7	2	2
				180	shock absorber attached	1.2		shock absorber attached	0.2~0.5		
		NRC20	18	90	without cushion	0.24	19.1	adjusting bolt attached	0.2~1.0	5	5
				180	shock absorber attached	2.5		shock absorber attached	0.2~0.7		
		NRC30	20	90	without cushion	0.46	28.3	adjusting bolt attached	0.2~1.0	10	8
				180	shock absorber attached	3.8		shock absorber attached	0.2~0.7		
	Table type	NRT30	2x∅22	190	adjusting bolt attached	0.49	31.3	adjusting bolt attached	0.2~1.0	37	20
					shock absorber attached	1.041		shock absorber attached	0.2~0.7		
		NRT50	2x∅25	190	adjusting bolt attached	0.78	51.5	adjusting bolt attached	0.2~1.0	46	32
					shock absorber attached	2.639		shock absorber attached	0.2~0.7		
		NRT70	2x∅28	190	adjusting bolt attached	2.33	75.4	adjusting bolt attached	0.2~1.5	49	34
					shock absorber attached	9.68		shock absorber attached	0.2~1.0		
		NRT100	2x∅32	190	adjusting bolt attached	3.10	102.5	adjusting bolt attached	0.2~2.0	72	40
					shock absorber attached	14.08		shock absorber attached	0.2~1.0		

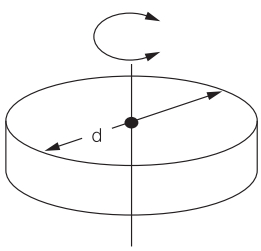
Figure 1 Formula to calculate inertia movement

Classification of Movement (inertia resistance)

Formula of inertia movement can be described by the following expression.

Depending on the shape of inertia movement object, apply the expressions as described in the following figures.

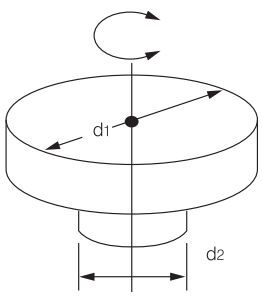
1. Shape of disk on the revolving central line



- diameter d(m)
- weight m(Kgf)

$I = md^2/8$

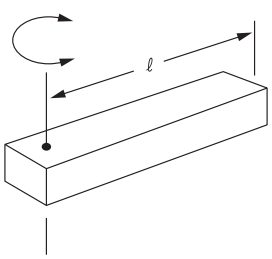
2. Disk of single dimension on the revolving central line



- diameter d_1(m)
  d_2(m)
- weight
  m_1 : d_1 partial weight (Kgf)
  m_2 : d_2 partial weight (Kgf)

$I = (m_1 d_1^2 + m_2 d_2^2)$

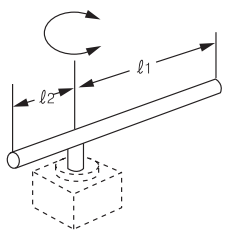
3. Stick



- stick length ℓ (m)
- weight m(Kgf)

$I = m\ell^2/3$

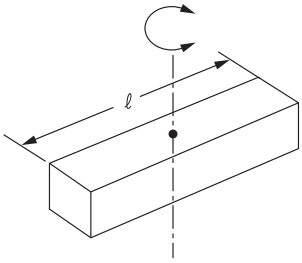
4. Slim Rod



- stick length ℓ_1(m)
  ℓ_2(m)
- weight
  m_1 : ℓ_1 partial weight (Kgf)
  m_2 : ℓ_2 partial weight (Kgf)

$I = (m_1 \ell_1^2 + m_2 \ell_2^2)$

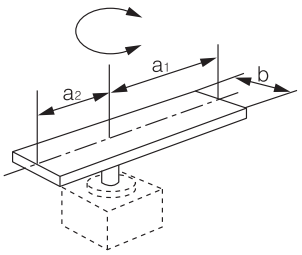
5. Stick on the revolving central line



- stick length ℓ (m)
- weight m(Kgf)

$I = m\ell^2/12$

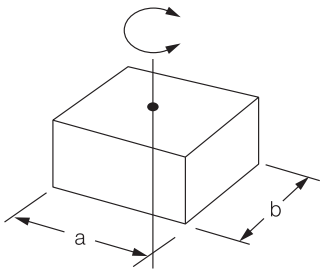
6. Displaced rectangle on the revolving central line



- horizontal a_1(m)
  a_2(m)
- weight
  m_1 : a1×b partial weight (Kgf)
  m_2 : a1×b partial weight (Kgf)

$I=m_1(4a_1^2+b_1^2)/12+m_2(4a_2^2+b_2^2)/12$

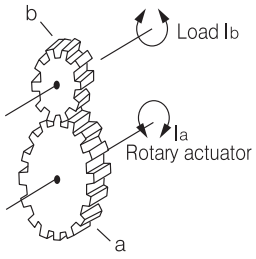
7. Rectangle on the revolving central line



- horizontal a(m)
  vertical b(m)
- weight m(Kgf)

$I = m(a^2 + b^2)/12$

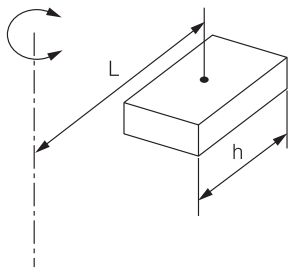
8. In case of toothed wheel combination



- number of toothed wheel : a
- number of toothed wheel : b
- Get the revolving inertia moment Ib on the load axis.
- If replace the revolving inertia moment on the driving axis by Ib to make Ia,

$L= (a/b)^2 * I_b$

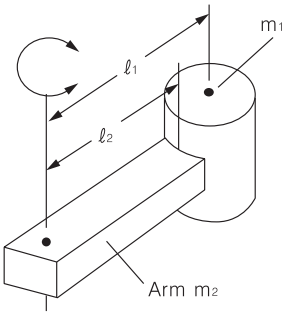
9. In case the revolving axis is at any point of load



- horizontal h(m)
- L : distance from the revolving axis to the center of load (m)
- weight m(Kgf)

$I = (mh^2/12)+mL^2$

10. In case that load is applied to the arm terminal



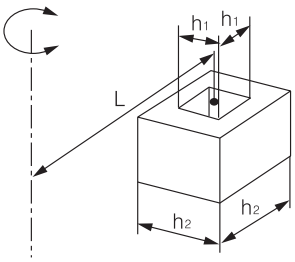
- I1 : inertia moment on the central line of load at vertical hem
- I2 : inertia moment on the revolving axis of Arm part

m1 : weight at the vertical hem(Kgf)
m2 : weight at the arm part(Kgf)
ℓ1 : distance between revolving axis and center of vertical hem load (m)
ℓ2 : distance between revolving axis and center of vertical hem load (m)

$I = m1k^2+m_2\ell_1^2+(m2\ell_2^2)/3$

k : If m_1 is in the shape of disk, $k=d^2/8$, referring to 1.

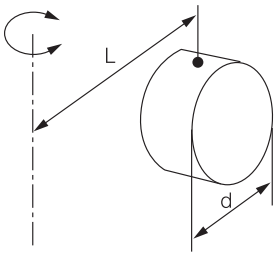
11. Empty Rectangle



- length h1(m)
  h2(m)
- L : distance from the revolving axis to the center of load (m)
- weight m(Kgf)

$I = m/12(h_2^2 + h_2^2) + mL^2$

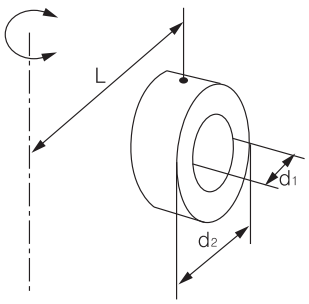
12. Slim Disk



- diameter d(m)
- L : distance from the revolving axis to the center of load (m)
- Weight m(Kgf)

$I = (md^2/16) + mL^2$

13. Slim Disk (empty in the middle)



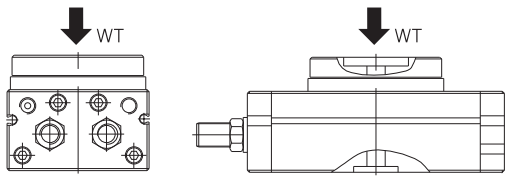
- diameter d1(m)
  d2(m)
- L : distance from the revolving axis to the center of load (m)
- weight m(Kgf)

$I = m/16(d_2^2 + d_1^2) + mL^2$

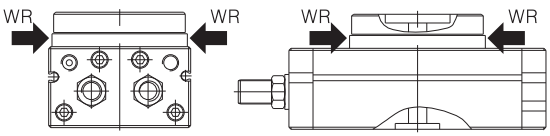
Figure 2 Allowed Axis Load

Model	Series	Type	Thrust Load (Kgf)	Radial Load (Kgf)	Bending Movement N.m(Kgf.cm)
Rack and Pinion Type	NRC Series (double rack)	NRC12	1.6	1.5	–
		NRC15	2	2	–
		NRC20	5	5	–
		NRC30	10	8	–
	NRP Series (single rack)	NRP50	50	20	–
		NRP63	60	30	–
		NRP80	90	40	–
		NRP100	100	60	–
	NRT Series (double rack)	NRT30	37	20	5.3 (54)
		NRT50	46	32	9.7 (99)
		NRT70	49	34	12.0 (122)
		NRT100	72	40	18.0 (184)

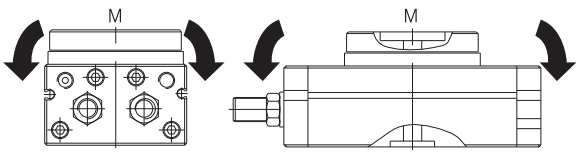
Thrust Load (NRT)



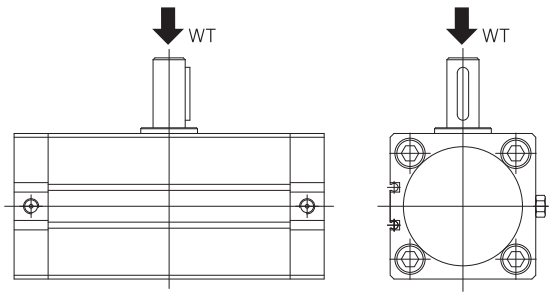
Radial Load (NRT)



Bending Movement Load (NRT)



Thrust Load (NRP, NRC)



Radial Load (NRP, NRC)

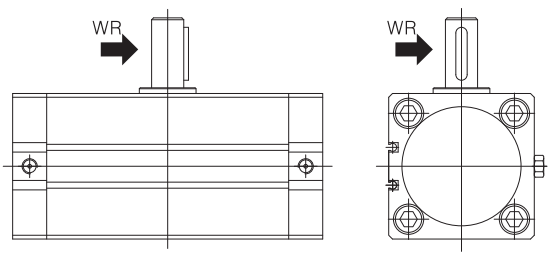
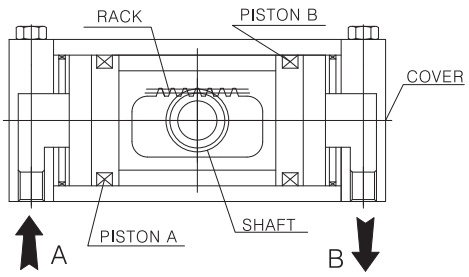
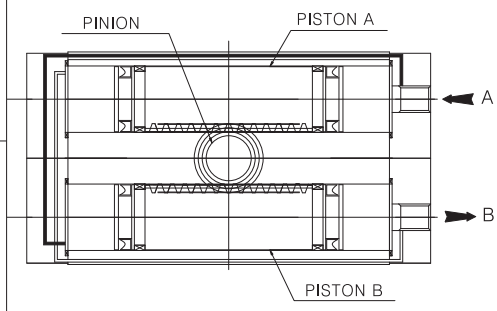
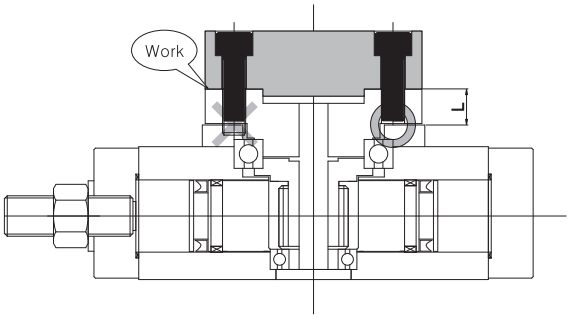


Figure 3 Operation Principle

Series		Operating Principle	Explanation
Rack & Pinion Type	NRP		1. This equipment is composed of two pistons which move inside the cylinder, contacting the cylinder and rack/shaft which is inserted into the piston. 2. If air is supplied through A port, piston A is pressed and torque generates at shaft through rack pinion. 3. Air in the draining chamber is drained through B port and revolves clockwise. 4. If piston B contacts cover and stops, shaft also stops. 5. If air is supplied through B port, it also revolves counterclockwise.
Rack & Pinion Compact Type	NRC		1. This equipment is composed of rack which moves inside two parallel cylinders, contacting them and 2 pistons and pinion in one body. 2. If air is supplied through A port, the right side of piston A is pressed and simultaneously the left side of piston B is also pressed through the air passage of main body. Then, torque in the quantity of 2 pistons generates at pinion. 3. Air in the draining chamber is drained through B port and revolves counterclockwise. 4. If piston B contacts adjusting bolt and stops, pinion also stops. 5. If air is supplied through B port, it also revolves clockwise.
Table Type	NRT		

How to mount rotary cylinder

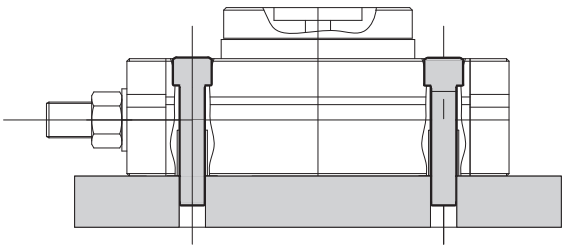
How to mount NRT series



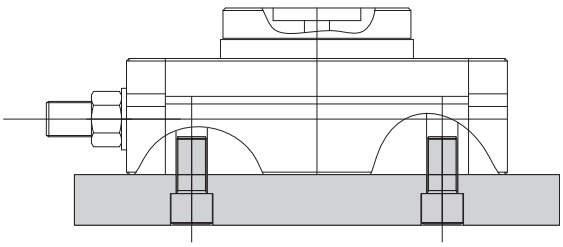
Model	Bolt	Maximum fastening torque M(Kgf*cm)	Maximum tightening depth L
NRT30	M6 × 1	7.4 (73)	10
NRT50	M8 × 1.25	17.3 (170)	12
NRT70	M8 × 1.25	17.3 (170)	12.5
NRT100	M10 × 1.5	35.7 (350)	14.5

There are 2 attaching methods for rotary cylinder NRT series as described in the following figures.
The tightening torque must comply with the following table.

※ fastening method through hole

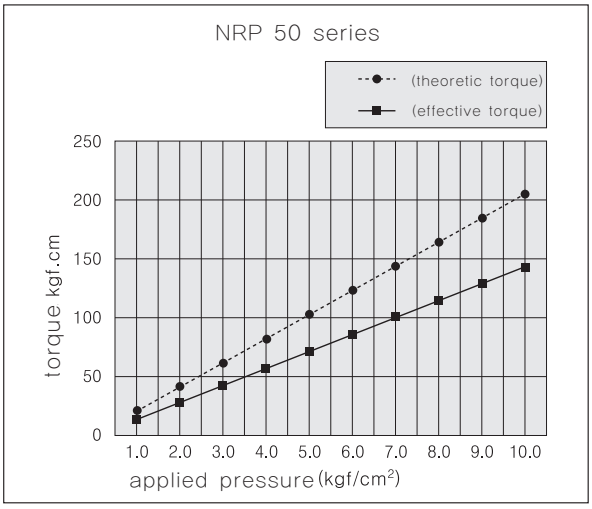


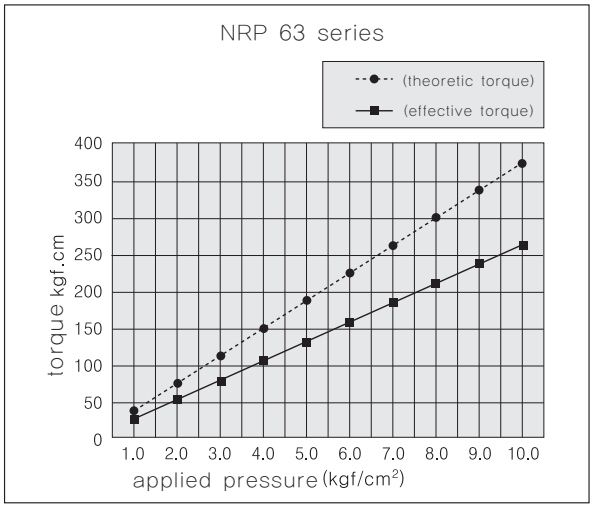
※ fastening method through TAP part (female screw)

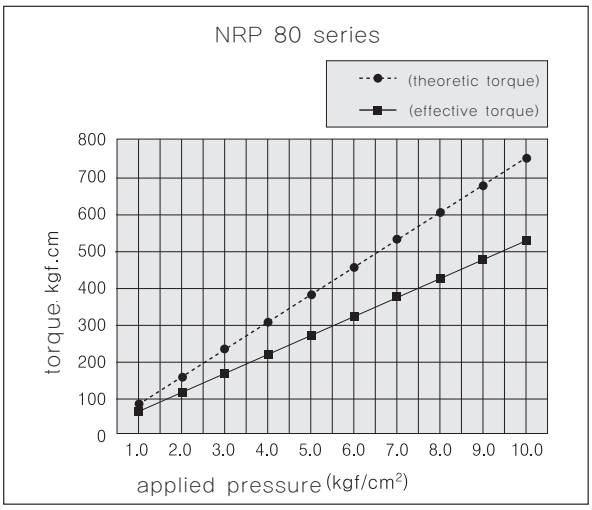


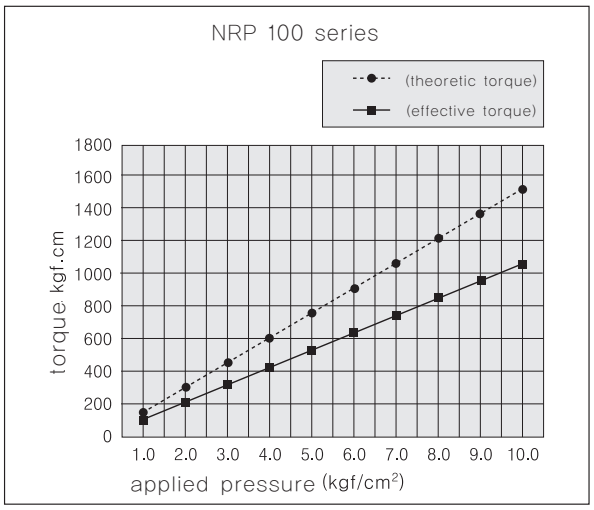
Model	Fastening method	Bolt	Maximum fastening torque N*m (Kgf*cm)
NRT30	through hole	M8 × 1.25	17.3 (170)
	female screw	M10 × 1.5	35.7 (350)
NRT50	through hole	M10 × 1.5	35.7 (350)
	female screw	M12 × 1.75	61.2 (600)
NRT70	through hole	M10 × 1.5	35.7 (350)
	female screw	M12 × 1.75	61.2 (600)
NRT100	through hole	M10 × 1.5	35.7 (350)
	female screw	M12 × 1.75	61.2 (600)

NRP Series

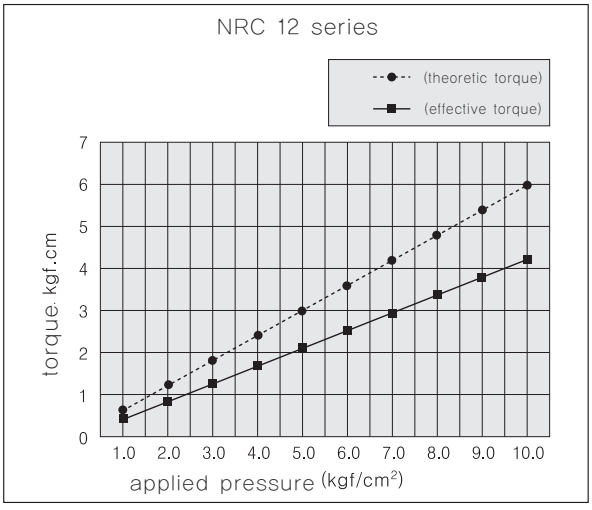


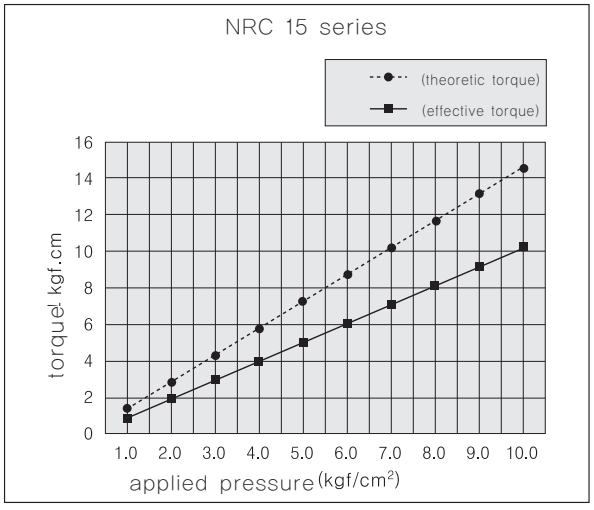




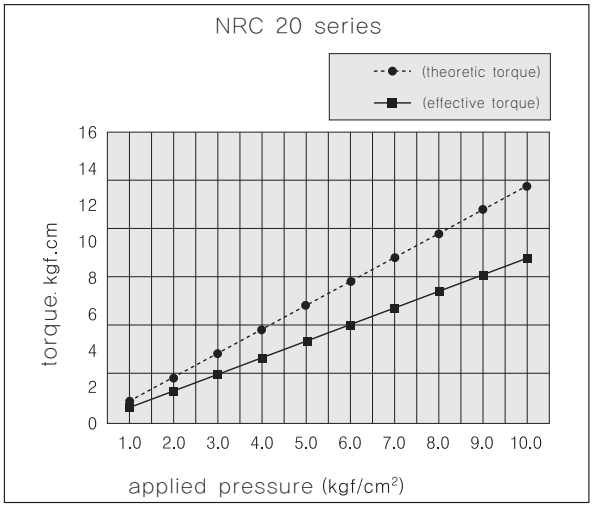


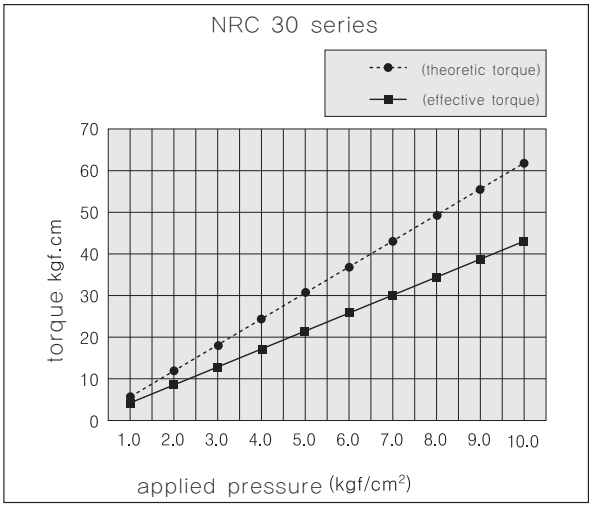
NRC Series



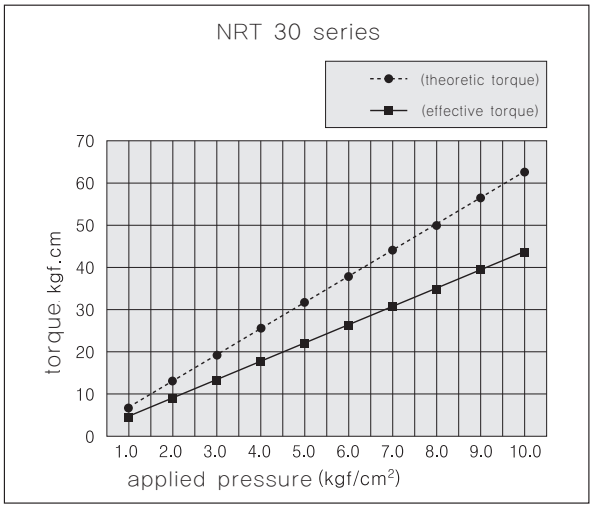


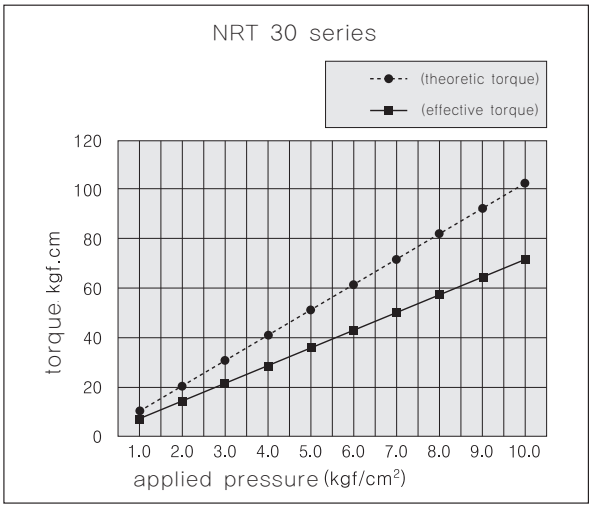
NRC Series

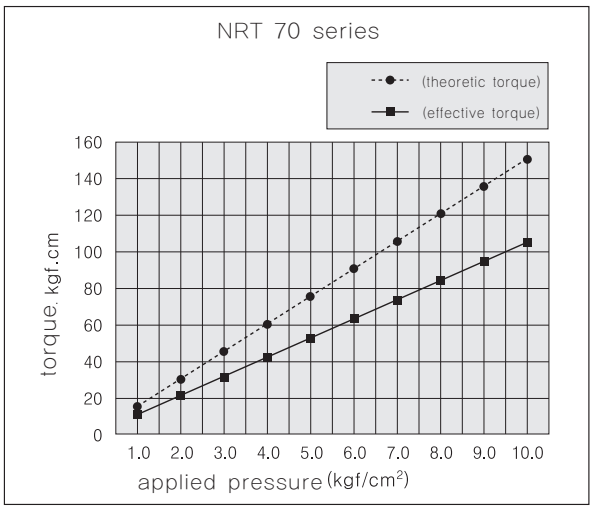




NRT Series







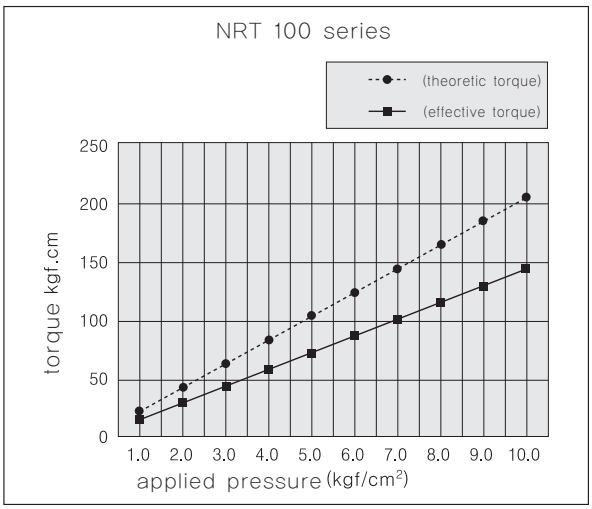
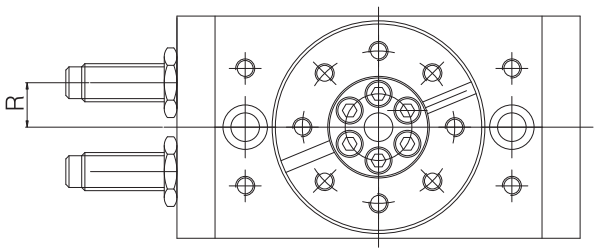


Figure 4

1. Shock absorber stroke and distance

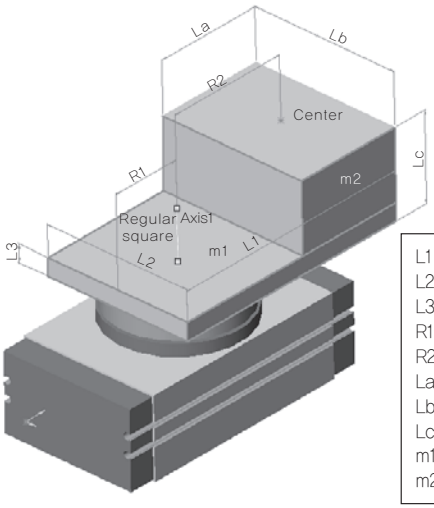


R : distance from the revolving central line to the shock center at vertical hem

Type		Model	R (m)	Shock absorber stroke(m)	Shock absorber spec
Rotary Cylinder	rack & pinion compact type	NRC12	0.01	0.005	M8 × 0.75
		NRC15	0.014	0.005	M8 × 0.75
		NRC20	0.016	0.006	M10 × 1.0
		NRC30	0.0195	0.006	M12 × 1.0
	table type	NRT30	0.014	0.006	M12 × 1.0
		NRT50	0.019	0.01	M14 × 1.5
		NRT70	0.021	0.015	M20 × 1.5
		NRT100	0.025	0.015	M20 × 1.5

Example (on the basis of NRT type)

In a case where a plate is attached to the revolving axis and assembled to the terminal plate in regular square type :



L1 : 0.12m
L2 : 0.05m
L3 : 0.01m
R1 : 0.025m
R2 : 0.07m
La : 0.05m
Lb : 0.05m
Lc : 0.05m
m1 : square plate
m2 : regular square

1. Applying Condition
   ① revolving angle : 90 °
   ② rotation time : 0.5 second
   ③ applied pressure : 0.5 (Mpa)
   ④ shape: Refer to the above figure.
   Quality of the material of plate : aluminum alloy
   (specific gravity=2.68 × 103 Kg/ m³)
   Quality of the material of regular square : steel for structure
   (specific gravity=7.85 × 103 Kg/ m³)
   ⑤ attaching direction : horizontal

2. Checking Rotation Time

Rotation time is 0.5 second.(on the basis of 90 °) Thus, as rotation time is between 0.2~1.0 second, it can be used without problem.

3. Selecting Torque

Calculating inertia moment :

Weight of plate

$m_1 = L2 \times (L1-R1) \times L3 \times 2.68 \times 10^3$
$= 0.05 \times (0.12-0.025) \times 0.01 \times 2.68 \times 10^3 = 0.127$ (kgf)
$m_2 = L2 \times R1 \times L3 \times 2.68 \times 10^3$
$= 0.05 \times 0.025 \times 0.01 \times 2.68 \times 10^3 = 0.034$ (kgf)
$I_1 = 0.127/12\{4 \times (0.12-0.025)^2 + 0.05^2\} + 0.034/12\{4 \times 0.025^2 + 0.05^2\}$
$= 0.42 \times 10^{-3}$ (kg.m²) ————①

Weight of regular square

$m_3 = La \times Lb \times Lc \times 2.68 \times 10^3$
$= 0.05 \times 0.05 \times 0.05 \times 2.68 \times 10^3 = 0.335$ (kgf)

$I_2 = (0.335 \times 0.05^2)/12 + (0.335 \times 0.07^2)$
$= 1.71 \times 10^{-3}$ (kg. m²) ————②

Get the actual inertia moment I.
$I = I_1 + I_2$
$= 0.42 \times 10^{-3} + 1.71 \times 10^{-3}$
$= 2.13 \times 10^{-3}$ (kg. m²)————③

According to the condition, θ=90 ° , t=0.5 second Thus, each acceleration wa is calculated by the following expression.

$\omega_A = (2 \times 1.57)/ 0.5^2 = 12.56$ (rad/s²) ————④

Substituting expression ③,④ limit coefficient: over 5 times is applied to accelerating torque.
Accelerating torque $TA = I \times \omega_A \times K = 5.43 \times 10^{-3} \times 12.56$ (rad/s²) × 5 = 0.134 (N.m) ——⑤

Referring to the table of theoretic torque
If torque of 0.134 N.m (1.37 Kgf.cm) is necessary when applied pressure is 0.5 MPa (5 Kg/cm²), the supplying pressure is extended to horizontal axis and torque, to vertical axis respectively to get the intersection. Inner diameter larger than this intersection is to be selected.

※ Rotary cylinder: For NRT30, theoretic torque is
T=31.3 Kgf.cm
Effective torque: to be calculated within 70 % of the theoretic torque.
T ≒ 21.9 Kgf.cm

4. Inspecting kinetic energy

When a urethane stopper is installed
According to the condition, θ=90 ° , t = 0.5 second
ω = (2 × 1.57)/ 0.5 = 6.28 (rad/s) ————①
From the expression ①, kinetic energy E is
E = 1/2 × 2.13 × 10 −3 × 6.282 = 0.042 (J) ——— ②
0.042 < 0.048 (0.49 Kgf.cm)it can be used with no problem in installation.
In case that allowed energy is exceeded, use buffer such as shock absorber, etc.

When shock absorber is installed

m1 = (2.13 × 10−3)/0.0142 = 10.87(Kgf) ————③
m2 = (2 × 0.134 × 0.006)/(0.0143 × 6.282)
= 14.86(Kgf) ————④

From expressions ③, ④
m = 10.87 + 14.86 = 25.73 (Kg) ————⑤
v = 0.014 × 6.28 = 0.088—— ————⑥
From expressions ⑤, ⑥ If the expression of kinetic energy is substituted from the expressions (5),(6) E = (25.73 × 0.0882)/ 2 = 0.0996 (J)
As 0.0996 < 0.106 (1.041 Kgf.cm), it can be used with no problem in installing shock absorber.

5. Inspecting load rate

Thrust load
Total weight : 0.127 + 0.034 + 0.335 = 0.496 (KG)
Thus, WT = 0.496 × 9.8 = 4.86 (N) ————①
Radial load
As there is no applied load WR = 0 (N) ————②
Moment
The movement of plate is,
M1 = (0.127 + 0.034) × 9.8 × { (0.12/2) − 0.025 } =
0.055 (N.m) ——③

The movement of regular square is
M2 = 0.335 × 9.8 × 0.07 = 0.23 (N.m) ——④
From the expressions ③, ④ the total moment value is,
M = 0.055 + 0.23 = 0.285 (N.m)————⑤

From expressions ①, ②, and ⑤ the value of total load rate is,

(WT / WT MAX)+(WS / WS MAX)+(M / M MAX)=4.86/363+ 0/197+0.285/5.3 = 0.0672 < 1.0

If the total of load rate does not exceed 1, it can be used.

6. Selection

NRT 30 can be used, because it is within the requirement of kinetic energy and load rate.

Air consumption of rotary cylinder

ℓ /min(ANR)

Model		Cylinder diameter · cm(in)	PCD · cm(in)	Cylinder stroke · cm(in)	Internal volume	Pressure · Kgf/cm²(psi)									
						1	2	3	4	5	6	7	8	9	10
NRC series (double rack)	NRC12-90°	1(0.39)	1.05(0.41)	0.82(0.32)	0.65	0.01(0.14)	0.03(0.42)	0.04(0.57)	0.05(0.71)	0.07(0.99)	0.08(1.13)	0.09(1.28)	–	–	–
	NRC12-180°	1(0.39)	1.05(0.41)	1.65(0.65)	1.29	0.03(0.42)	0.05(0.71)	0.08(1.13)	0.10(1.42)	0.13(1.85)	0.16(2.27)	0.18(2.56)	–	–	–
	NRC15-90°	1.3(0.51)	1.65(0.65)	1.30(0.51)	1.72	0.04(0.57)	0.07(0.99)	0.11(1.56)	0.14(1.99)	0.17(2.41)	0.21(2.98)	0.24(3.41)	–	–	–
	NRC15-180°	1.3(0.51)	1.65(0.65)	2.59(1.02)	3.44	0.07(0.99)	0.14(1.89)	0.21(2.98)	0.28(3.98)	0.35(4.98)	0.41(5.83)	0.48(6.82)	–	–	–
	NRC20-90°	1.8(0.71)	1.55(0.61)	1.22(0.48)	3.09	0.07(0.99)	0.13(1.99)	0.19(2.70)	0.25(3.55)	0.31(4.41)	0.37(5.26)	0.43(6.11)	–	–	–
	NRC20-180°	1.8(0.71)	1.55(0.61)	2.43(0.95)	6.19	0.13(1.85)	0.26(1.85)	0.38(5.40)	0.50(7.11)	0.62(8.81)	0.75(10.66)	0.87(12.37)	–	–	–
	NRC30-90°	2(0.79)	1.75(0.69)	1.37(0.54)	4.31	0.09(1.28)	0.18(3.70)	0.26(3.70)	0.35(4.98)	0.43(6.11)	0.52(7.39)	0.60(8.53)	–	–	–
	NRC30-180°	2(0.79)	1.75(0.69)	2.75(1.08)	8.63	0.19(2.70)	0.36(2.56)	0.53(7.54)	0.70(9.95)	0.87(12.37)	1.04(14.79)	1.21(17.21)	–	–	–
NRP series (single rack)	NRP50-90°	5(1.97)	2.1(0.82)	1.65(0.65)	32.35	0.70(1.95)	1.34(5.12)	1.98(28.16)	2.62(37.26)	3.26(51.5)	3.90(55.4)	4.54(64.5)	5.17(73.5)	5.81(82.6)	6.45(91.7)
	NRP50-100°	5(1.97)	2.1(0.82)	1.83(0.72)	35.95	0.78(11.09)	1.49(19.06)	2.20(31.3)	2.91(141.4)	3.62(92.7)	4.33(61.6)	5.04(71.7)	5.75(81.8)	6.46(91.9)	7.17(102)
	NRP50-180°	5(1.97)	2.1(0.82)	3.30(1.30)	64.70	1.4(20.0)	2.68(21.19)	3.96(56.3)	5.24(74.5)	6.52(92.7)	7.79(110)	9.07(129)	10.35(147)	11.63(165)	12.90(183)
	NRP50-190°	5(1.97)	2.1(0.82)	3.48(1.37)	68.30	1.49(21.2)	2.83(40.2)	4.18(59.4)	5.53(78.6)	6.88(97.8)	8.23(117)	9.58(136)	10.92(155)	12.27(174)	13.62(193)
	NRP63-90°	6.3(2.48)	2.4(0.94)	1.88(0.74)	58.70	1.28(18.2)	2.44(34.7)	3.59(51.0)	4.75(67.5)	5.91(84.0)	7.07(100)	8.23(117)	9.39(133)	10.55(150)	11.71(166)
	NRP63-100°	6.3(2.48)	2.4(0.94)	2.09(0.82)	65.22	1.42(20.2)	2.71(38.5)	3.99(56.7)	5.28(75.1)	6.57(93.4)	7.86(111)	9.14(130)	10.43(148)	11.72(166)	13.01(185)
	NRP63-180°	6.3(2.48)	2.4(0.94)	3.77(1.48)	117.40	2.55(30.2)	4.87(69.2)	7.19(102)	9.51(135)	11.82(168)	14.14(201)	16.46(234)	18.78(267)	21.10(300)	23.41(333)
	NRP63-190°	6.3(2.48)	2.4(0.94)	3.98(1.56)	123.92	2.69(38.2)	5.14(77.5)	7.59(108)	10.03(142)	12.48(177)	14.93(212)	17.37(247)	19.82(282)	22.27(316)	24.71(351)
	NRP80-90°	8(3.15)	3(1.18)	2.36(0.93)	118.32	2.57(36.2)	4.91(69.8)	7.24(103)	9.58(136)	11.92(169)	14.25(202)	16.59(236)	18.92(269)	21.26(302)	23.60(335)
	NRP80-100°	8(3.15)	3(1.18)	2.62(1.03)	131.46	2.86(40.6)	5.45(73.1)	8.05(114)	10.64(151)	13.24(188)	15.84(225)	18.43(262)	21.03(299)	23.62(336)	26.22(373)
	NRP80-180°	8(3.15)	3(1.18)	4.71(1.85)	236.63	5.15(73.2)	9.82(69.8)	14.49(206)	19.16(272)	23.83(339)	28.50(405)	33.18(472)	37.85(538)	42.52(604)	47.19(671)
	NRP80-190°	8(3.15)	3(1.18)	4.97(1.95)	249.78	5.43(77.2)	10.36(77.5)	15.29(217)	20.23(287)	25.16(358)	30.09(428)	35.02(498)	39.95(568)	44.88(638)	49.81(708)
	NRP100-90°	10(3.94)	3.9(1.53)	3.06(1.20)	240.33	5.23(74.3)	9.97(139)	14.72(209)	19.46(276)	24.21(344)	28.95(411)	33.69(479)	38.44(564)	43.18(614)	47.93(681)
	NRP100-100°	10(3.94)	3.9(1.53)	3.40(1.34)	267.03	5.81(82.6)	11.08(147)	16.35(232)	21.62(307)	26.89(382)	32.17(457)	37.44(532)	42.71(607)	47.98(682)	53.25(757)
	NRP100-180°	10(3.94)	3.9(1.53)	6.12(2.41)	480.66	10.45(148)	19.94(142)	29.43(418)	38.92(553)	48.41(688)	57.90(823)	67.39(958)	76.88(1093)	86.37(1228)	95.86(1363)
	NRP100-190°	10(3.94)	3.9(1.53)	6.46(2.54)	507.36	11.03(156)	21.05(157)	31.07(442)	41.08(584)	51.10(727)	61.12(869)	71.13(1011)	81.15(1154)	91.17(1296)	101.18(1439)
NRT series (double rack)	NRT30-190°	2.2(0.86)	1.65(0.65)	2.73(1.07)	20.78	0.90(12.8)	1.72(24.4)	2.54(36.1)	3.36(47.8)	4.19(59.6)	5.01(71.2)	5.83(82.9)	6.65(94.6)	7.47(106)	8.29(118)
	NRT50-190°	2.5(0.98)	2.1(0.82)	3.48(1.37)	34.15	1.49(21.2)	2.83(40.2)	4.18(59.4)	5.53(78.6)	6.88(97.8)	8.23(117)	9.58(136)	10.92(155)	12.27(174)	13.62(193)
	NRT70-190°	2.8(1.10)	2.45(0.96)	4.06(1.60)	49.98	2.17(30.8)	4.15(59)	6.12(87)	8.09(115)	10.07(143)	12.04(171)	14.01(199)	15.99(227)	17.96(259)	19.93(283)
	NRT100-190°	3.2(1.26)	2.55(1.0)	4.23(1.66)	67.94	2.95(41.9)	5.64(80.2)	8.32(118)	11.00(156)	13.69(194)	16.37(233)	19.05(271)	21.73(309)	24.42(347)	27.10(385)

Calculation of air fluid quantity and air consumption

Air consumption (Q) for one cycle of each rotary cylinder is indicated in table 1-6, which will be helpful for your calculation. The air fluid quantity and air consumption is calculated by the following expression.

● To get air fluid quantity (in the case of F.R.L , etc. are selected)

Q1=(3.14D^2/4)*L*60/t*(P+1.013)/1.013*10^-3

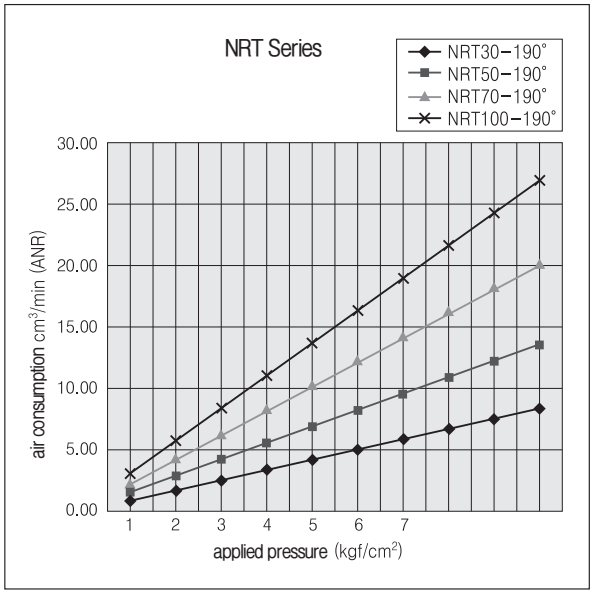
or Q1=q*60/t*(P+1.013)/1.013*10^-3

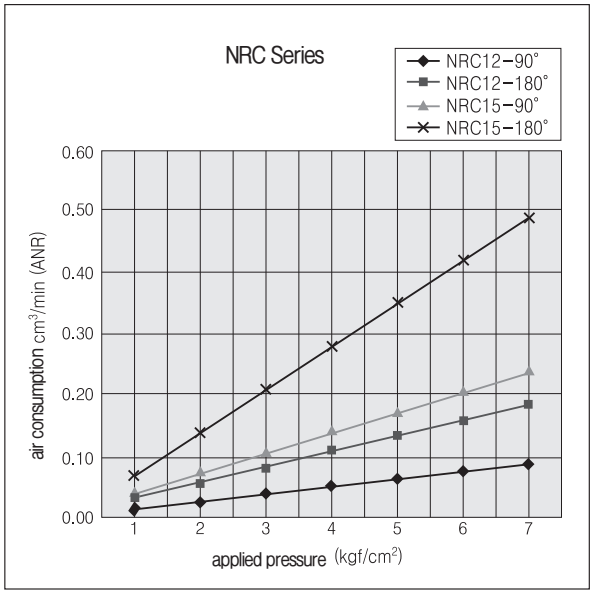
● To get air consumption

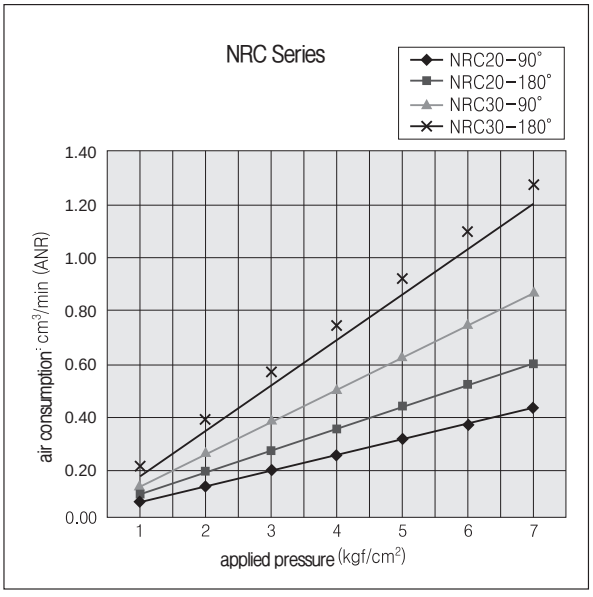
Q2=(3.14D^2/4)*L*2*n*(P+1.013)/1.013*10^-3

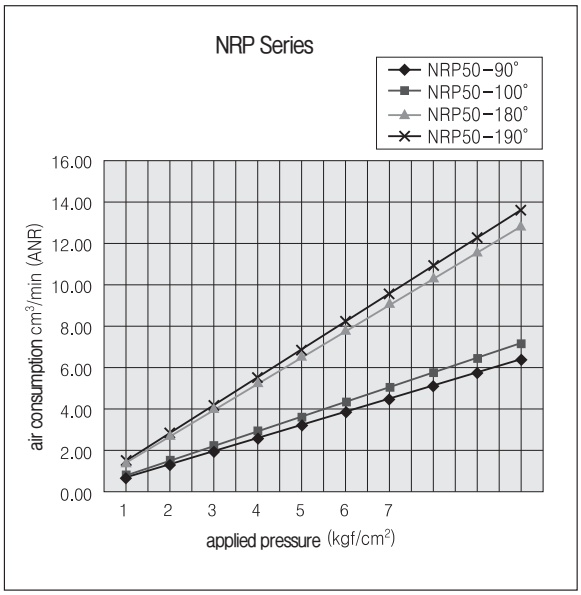
or Q2=q*2*n*(P+1.013)/1.013*10^-3

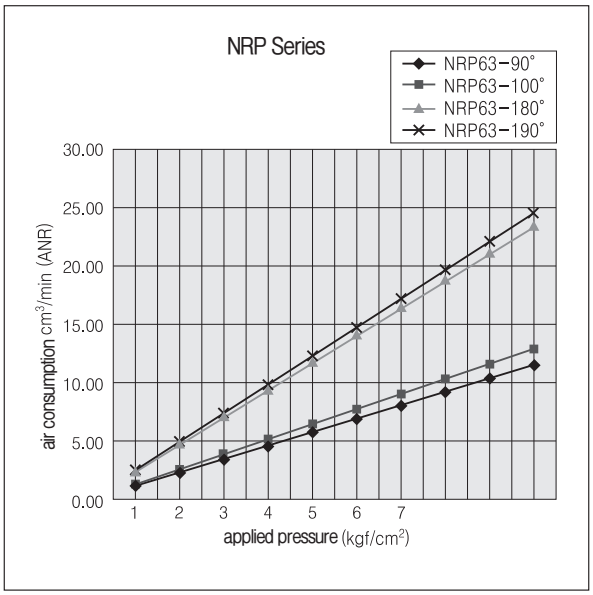
Q1 : air fluid quantity ℓ /min (ANR)
Q2 : air fluid consumption ℓ /min (ANR)
D : inner diameter of cylinder tube cm
L : cylinder stroke cm
q : inner volume of cylinder (one cylinder only) : cm^3
t :time required for one going and returning of cylinder S
n : number of shaking per minute times/min
P : applied pressure Kgf/cm^2

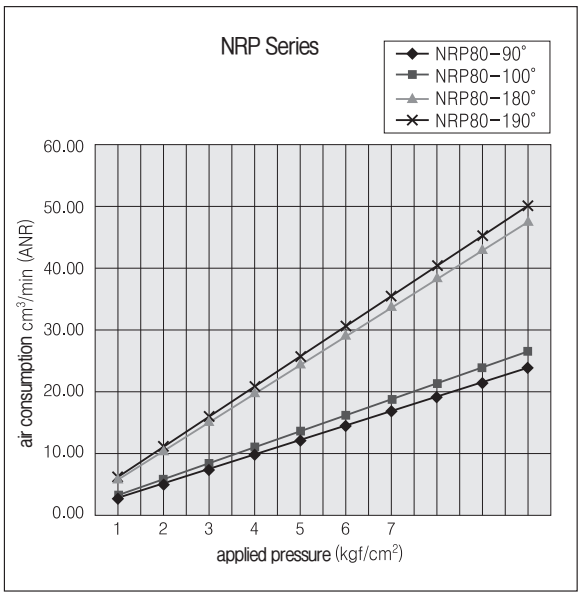


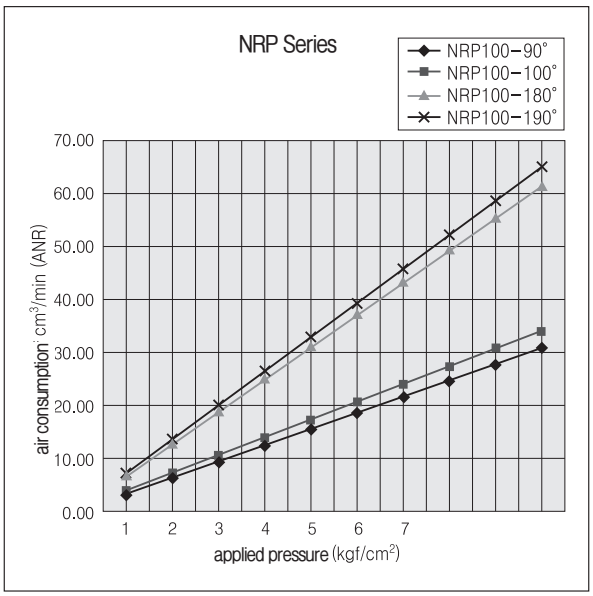





NRP Series
NRP50-90°
NRP50-100°
NRP50-180°
NRP50-190°
air consumption cm³/min (ANR)
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
1 2 3 4 5 6 7
applied pressure (kgf/cm²)

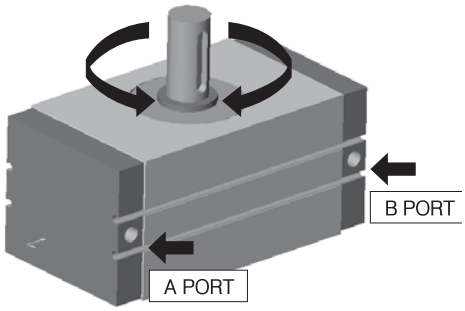

NRP Series
NRP63-90°
NRP63-100°
NRP63-180°
NRP63-190°
air consumption cm³/min (ANR)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
1 2 3 4 5 6 7
applied pressure (kgf/cm²)


NRP Series
NRP80-90°
NRP80-100°
NRP80-180°
NRP80-190°
air consumption cm³/min (ANR)
60.00
50.00
40.00
30.00
20.00
10.00
0.00
1 2 3 4 5 6 7
applied pressure (kgf/cm²)

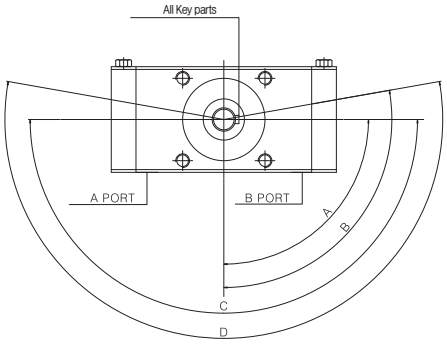

NRP Series
NRP100-90°
NRP100-100°
NRP100-180°
NRP100-190°
air consumption cm³/min (ANR)
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
1 2 3 4 5 6 7
applied pressure (kgf/cm²)

Rotating direction and angle range

1.1 Rotating direction of NRP series: If pressed at A port, the axis revolves clockwise and if pressed at B port, counterclockwise.



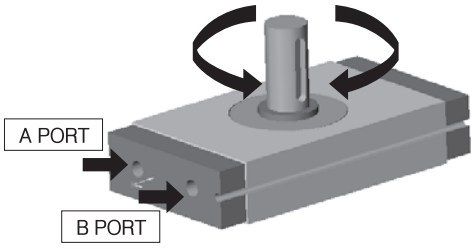
1.2 Angle range of NRP series



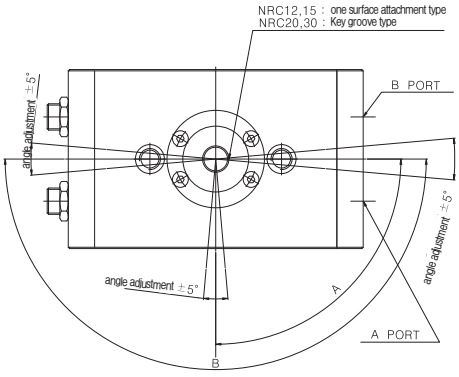
A : I revolving angle of Key groove 90° $^{+4}_{0}$
B : I revolving angle of Key groove 100° $^{+4}_{0}$
C : I revolving angle of Key groove 180° $^{+4}_{0}$
D : I revolving angle of Key groove 190° $^{+4}_{0}$

※ 90°, 180° : standard specification, 100°, 190° : substandard specification.

1.3 Rotating direction of NRC series : If pressed at A port, the axis revolves clockwise and if pressed at B port, counterclockwise.



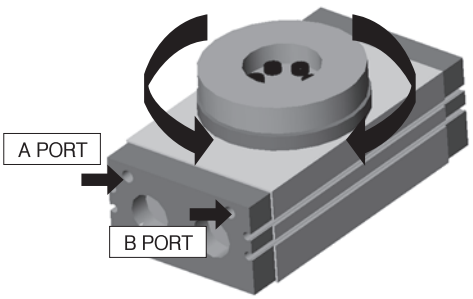
1.4 Angle range of NRC series



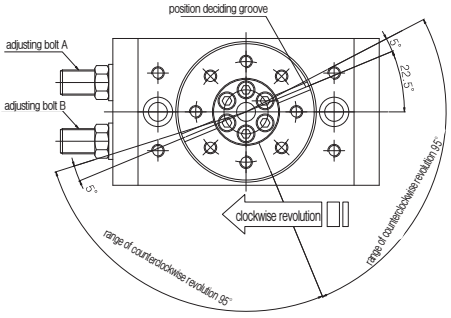
A : shaking angle of Key groove 80° ~100°
B : shaking angle of Key groove 170° ~190°

※ The range of angle adjustment is ±5°.

1.5 Rotating direction of NRT series : If pressed at A port, the axis revolves clockwise and if pressed at B port, counterclockwise.



1.6 Angle range of NRT series



※ The maximum rotation range is 190°. Using shock absorber at angle adjusting part, shock absorber attaching type can receive kinetic energy of 2~5 times to that of adjusting bolt attachment.

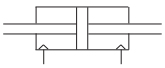
Series ASL

Slide Cylinder

Bore Size(mm) : Ø12, Ø16, Ø20, Ø25, Ø32

- ENSURE HIGH POSITIONAL ACCURACY
- AUTO SWITCH CAN BE INSTALLED
- COMPACT TYPE
- SMOOTH OPERATION AND HIGH THRUST
- MOUNTABLE BY THE HOUSING OR THE PLATE

Symbol



How to order

ASL [1] T [2] 12 [3] — 50 [4] B [5] — W8H [6] [7]

[1] Slide Cylinder
(Built in Magnet)

[2] Mounting
T : TUBE mounting
P : PLATE mounting

[3] Bore Size
12 : 12mm
16 : 16mm
20 : 20mm
25 : 25mm
32 : 32mm

[4] Stroke
Ø12 : 25, 50, 75
Ø16 : 25, 50, 75, 100
Ø20 : 25, 50, 75, 100
Ø25 : 25, 50, 75, 100, 125
Ø32 : 25, 50, 75, 100, 125, 150

[5] Cushion
Blank : Stopper 2EA
B : Shock Absorber 2EA
BS : Shock Absorber 1EA(Built in magnet)

[6] Auto Switch
Blank : None
W8H : Reed Auto Switch(Horizontal)
W9H : Solid State Auto Switch(Horizontal)
W8V : Reed Auto Switch(Vertical)
W9V : Solid State Auto Switch(Vertical)

[7] Number of Auto Switches
Blank : 2 pcs
S : 1 pc
N : N pcs

Specifications

Model		ASL12	ASL16	ASL20	ASL25	ASL32
Cylinder (mm)		2×12	2×16	2×20	2×25	2×32
Rod (mm)		6	10	12	14	16
Standard Stoke (mm)		25, 50, 75	25, 50, 75, 100	25, 50, 75, 100	25, 50, 75, 100, 125	25, 50, 75, 100, 125, 150
Theoretical Force (kgf)		1.69×P	3.02×P	4.71×P	7.56×P	18.84×P
Port Size		M5	M5	M5	PT 1/8	PT 1/8
Weight (kgf)		0.14 + 0.002×S.T	0.23 + 0.0035×S.T	0.5 + 0.0045×S.T	0.7 + 0.007×S.T	1.24 + 0.01×S.T
Max. Holing Force(kgf)	TUBE	0.2 ~ 0.9	0.3 ~ 2.5	0.4 ~ 4.5	0.4 ~ 6.6	0.8 ~ 11.2
	PLATE	0.1 ~ 0.5	0.1 ~ 0.8	0.2 ~ 1.4	0.2 ~ 1.8	0.3 ~ 4.1
Fluid		Air				
Operating Pressure		0.15 ~ 1.0MPa(21~145psi)				
Lubrication		None(Non-Lube)				
Temperature · ℃(˚F)		5 ~ 60(41~140)				
Speed (mm/sec)		50 ~ 300				
Action		Double Acting				
Switch AUTO Switch		W8H, W9H W8V, W9V				

Max. Movable Weight / Non-rotating Accurancy

Model	ASL12	ASL16	ASL20	ASL25	ASL32
Max. Movable Weight	1kg	4kg	5kg	6kg	10kg
Non-rotating accurancy	±0.1˚	±0.04˚	±0.04˚	±0.02˚	±0.01˚

※ Place the center of gravity of the load and center of the slide unit close during operation.

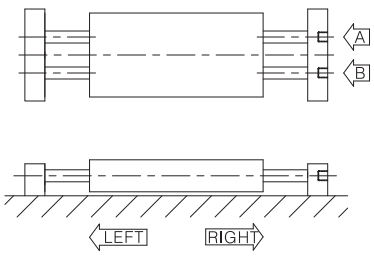
Weight

(kg)

Model	Stroke (mm)							
	25	50	75	100	125	150	175	200
ASL12	0.19	0.24	0.29		-	-	-	-
ASL16	0.32	0.41	0.49	0.58				
ASL20	0.61	0.73	0.85	0.95				
ASL25	0.89	1.10	1.23	1.41	1.58			
ASL32	1.49	1.75	1.99	2.24	2.49	2.74		

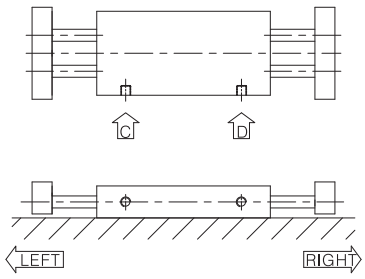
Operating direction per pressurized port

When the plate is fixed, operating direction of the housing.



Pressurized Port	A	B
Operating direction	Left	Right

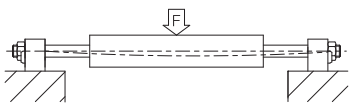
When the housing is fixed, operating direction of the plate.



Pressurized Port	C	D
Operating direction	Left	Right

Deflection of the piston rod by center loading

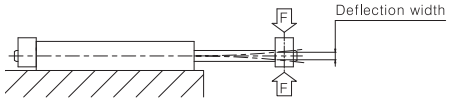
In event that the middle of the housing is provided with center loading.



(mm)

Model	Stroke / Load(N)	100	150
ASL12	9.8	0.07	-
ASL16	39.1	0.05	0.20
ASL20	49	0.03	0.14
ASL25	58	0.02	0.08
ASL32	98	0.02	0.07

In event that the middle of the place is provided with center loading.



(mm)

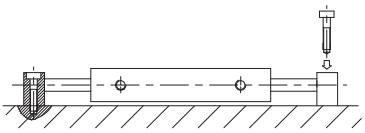
Model	Stroke / Load(N)	50	100	125	150
ASL12	2.9	0.06	0.30	-	-
ASL16	4.9	0.03	0.10	-	-
ASL20	7.8	0.03	0.09	-	-
ASL25	9.8	0.03	0.09	0.16	-
ASL32	29.3	0.02	0.05	0.10	0.15

Note) Here, the factors represent the total deflection widths in the vertical direction.

Mounting Method

Plate Mounting

Bottom side is fixed

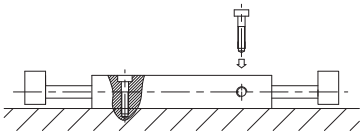


Topside is fixed

Model	Mounting Method	Thread	Max. mounting Torque N*m(kgf*cm)
ASLP12	Bottom side is fixed	M4×0.7	2.1 (21)
	Topside is fixed	M3×0.5	0.88 (9)
ASLP16	Bottom side is fixed	M5×0.8	4.3 (44)
	Topside is fixed	M4×0.7	2.1 (21)
ASLP20	Bottom side is fixed	M6×1.0	5.9 (60)
	Topside is fixed	M5×0.8	4.3 (44)
ASLP25	Bottom side is fixed	M8×1.25	18 (183)
	Topside is fixed	M6×1.0	5.9 (60)
ASLP32	Bottom side is fixed	M8×1.25	18 (183)
	Topside is fixed	M6×1.0	5.9 (60)

Housing Mounting

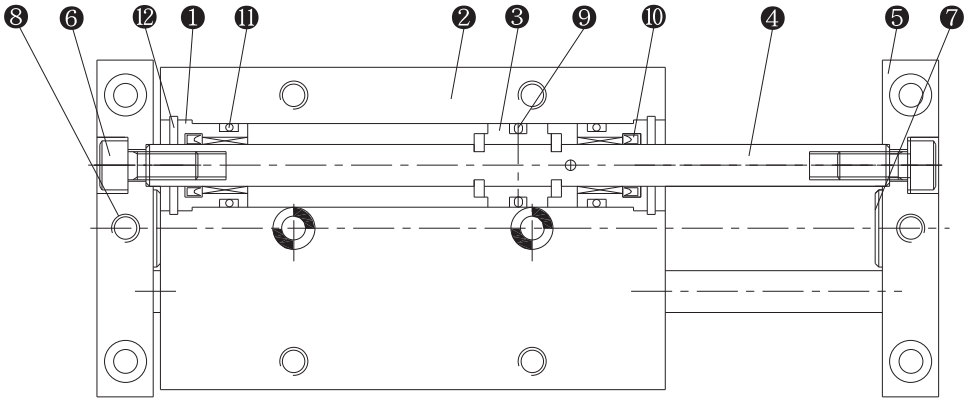
Bottom side is fixed



Upside is fixed

Model	Mounting Method	Thread	Max. mounting Torque N*m(kgf*cm)
ASLT12	Bottom side is fixed	M4×0.7	2.1 (21)
	Topside is fixed	M3×0.5	0.88 (9)
ASLT16	Bottom side is fixed	M5×0.8	4.3 (44)
	Topside is fixed	M4×0.7	2.1 (21)
ASLT20	Bottom side is fixed	M6×1.0	5.9 (60)
	Topside is fixed	M5×0.8	4.3 (44)
ASLT25	Bottom side is fixed	M8×1.25	18 (183)
	Topside is fixed	M6×1.0	5.9 (60)
ASLT32	Bottom side is fixed	M8×1.25	18 (183)
	Topside is fixed	M6×1.0	5.9 (60)

Construction / Parts List



Parts List

No	Descriptin	Material	Note
❶	Rod Cover	Aluminum alloy	Alumate
❷	Cyl. Tube	Aluminum alloy	Alumate
❸	Piston	Aluminum alloy	
❹	Piston Rod	Carbon Steel piping for machine constructions	Hard Chrome
❺	Plate	Aluminum alloy	Hard Alumate
❻	Bolt	Steel	

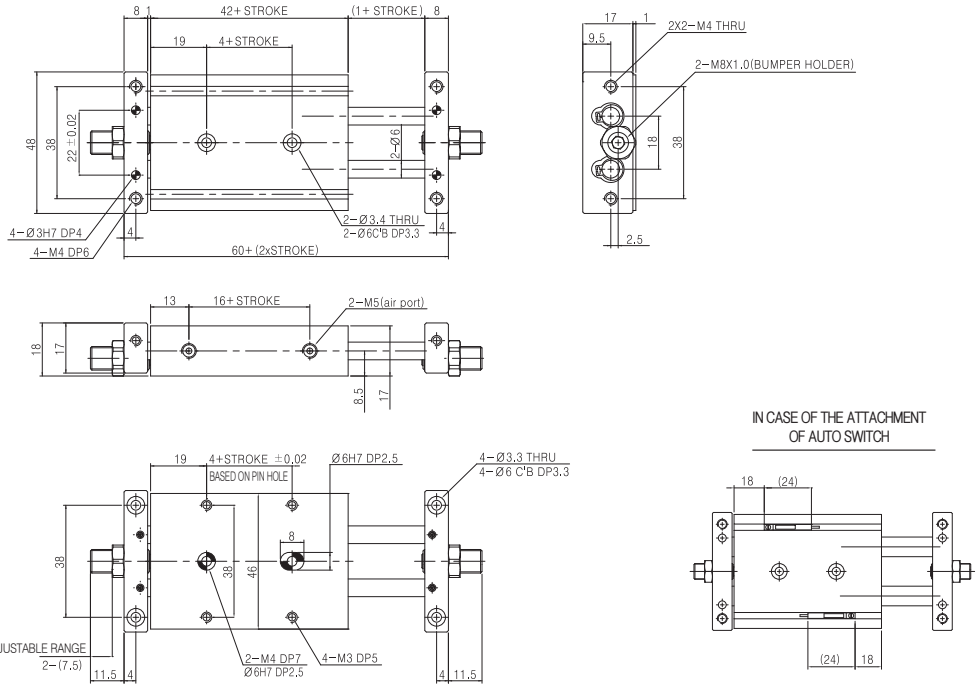
No	Description	Material	Note
❼	Stopper	Urethane	
❽	Adjusting Bolt	Chrome Steel	
❾	Piston Packing	NBR	DYP Series
❿	Rod Packing	NBR	DYP Series
⓫	Tube Gasket	NBR	
⓬	C Type Ring for Stoping	Spring Steel	

Replacement Parts : Seal kits & Shock Absorber

Model	Seal kit Model No.	Contents
ASLT / ASLP12	ASL12-SK	❾, ❿, ⓫ are included in one set.
ASLT / ASLP16	ASL16-SK	
ASLT / ASLP20	ASL20-SK	
ASLT / ASLP25	ASL25-SK	
ASLT / ASLP32	ASL32-SK	

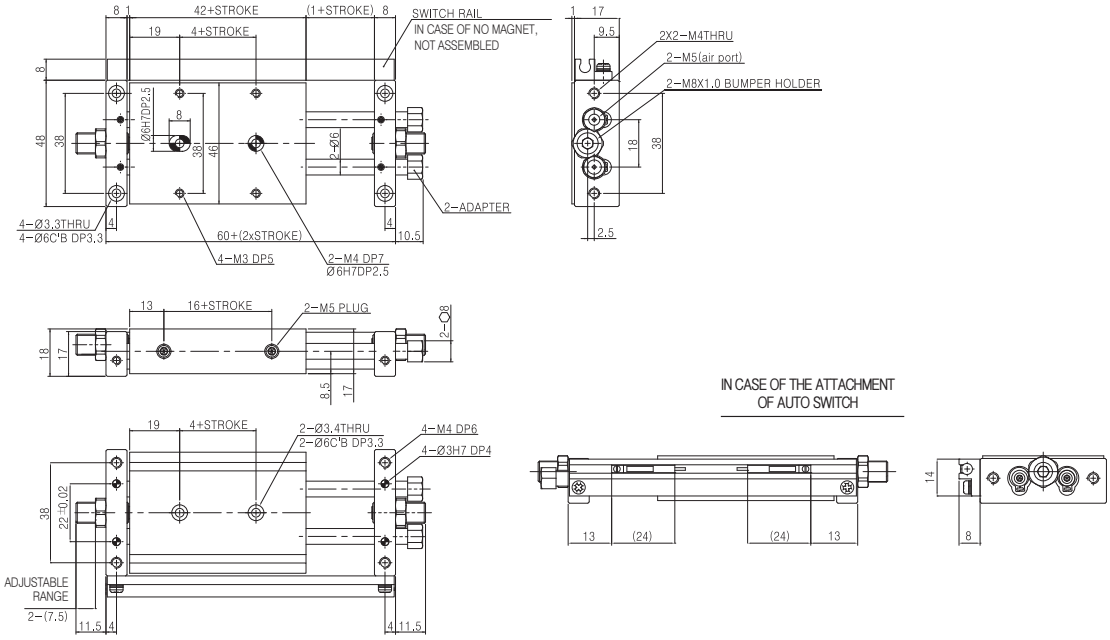
Fixed Tube Type Ø12

(mm)



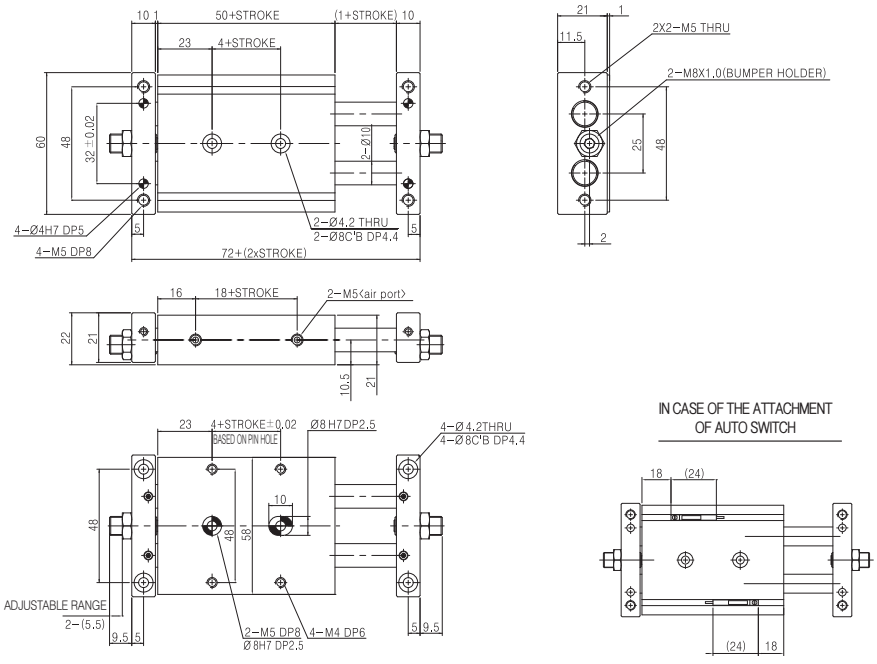
Fixed Plate Type Ø12

(mm)



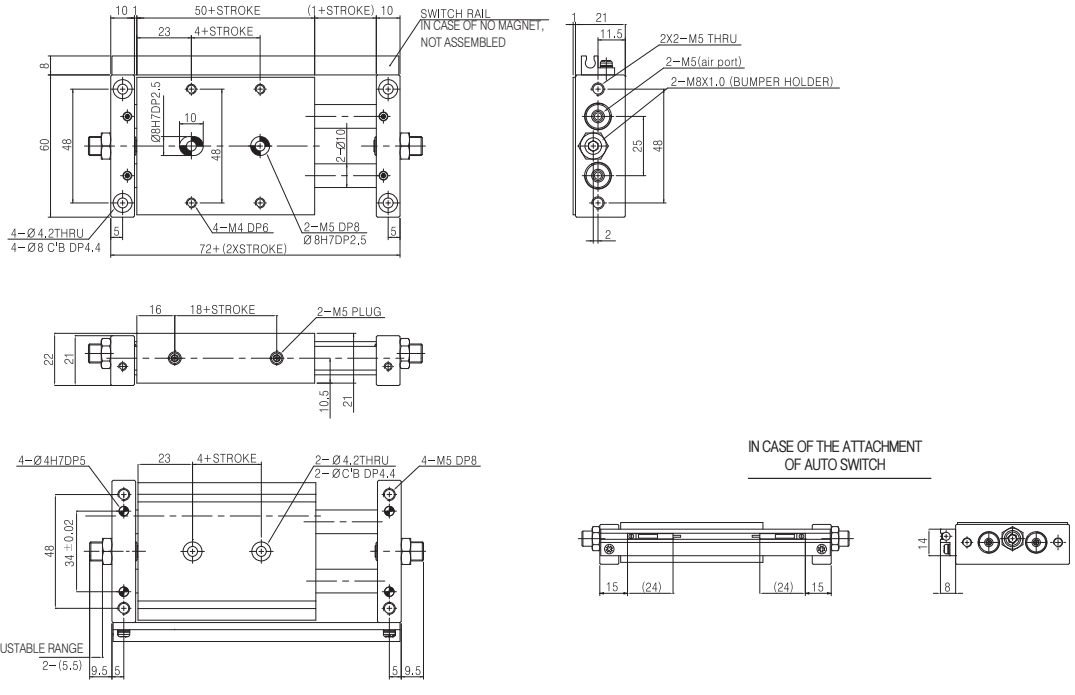
Fixed Tube Type Ø16

(mm)



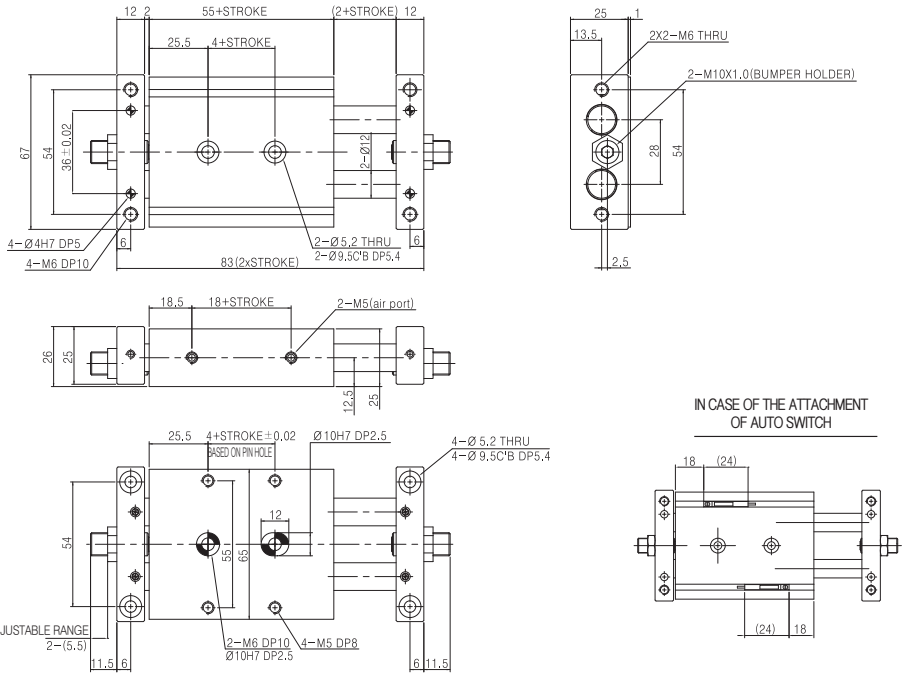
Fixed Plate Type Ø16

(mm)



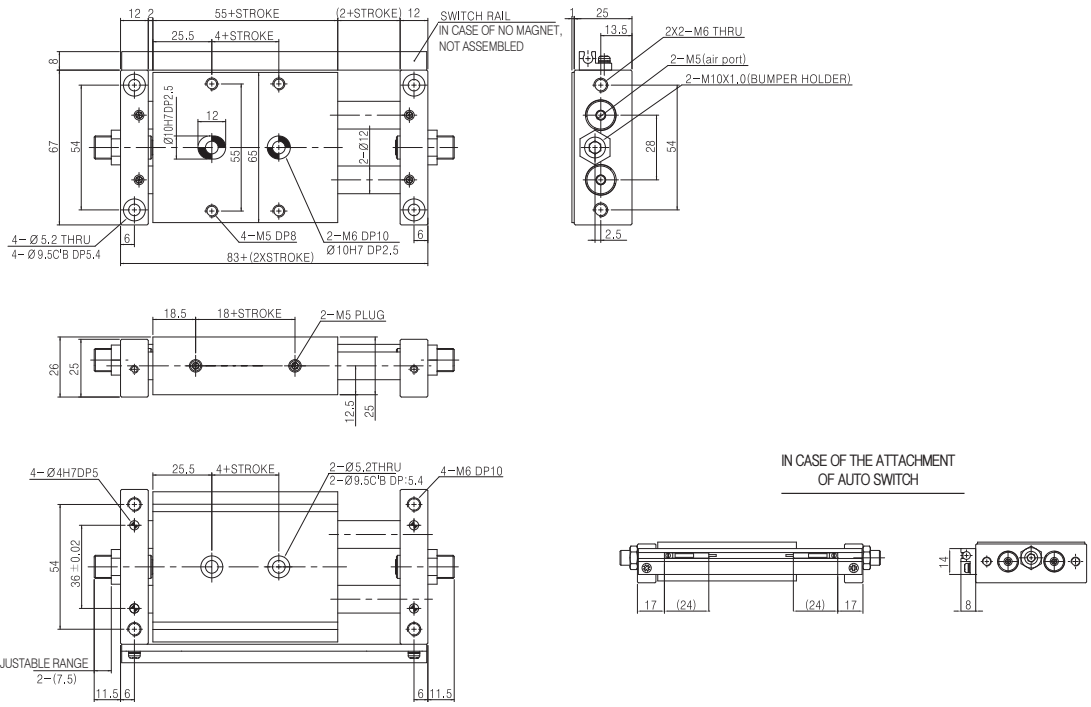
Fixed Tube Type Ø20

(mm)



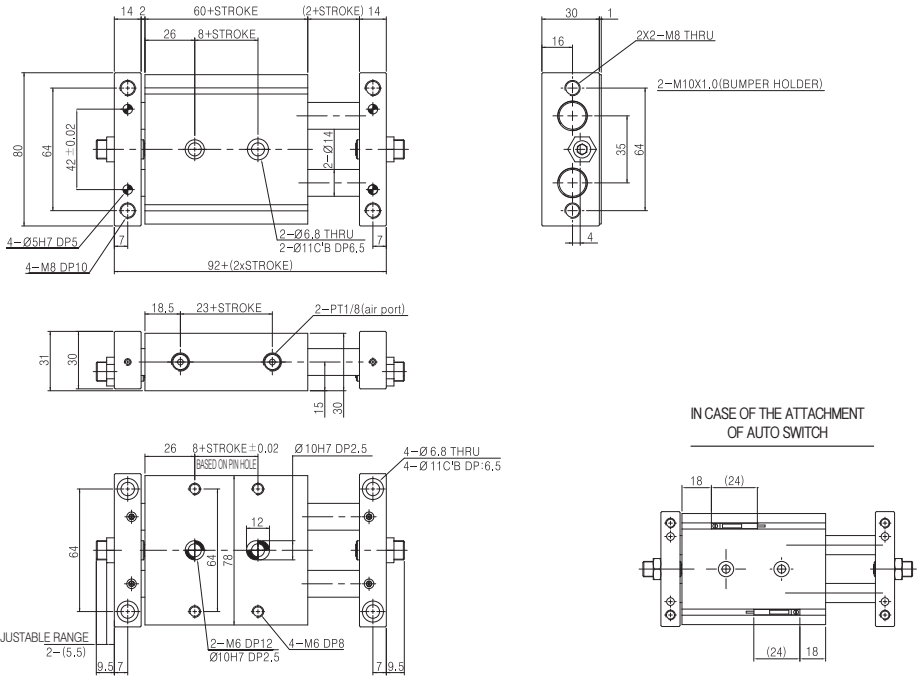
Fixed Plate Type Ø20

(mm)



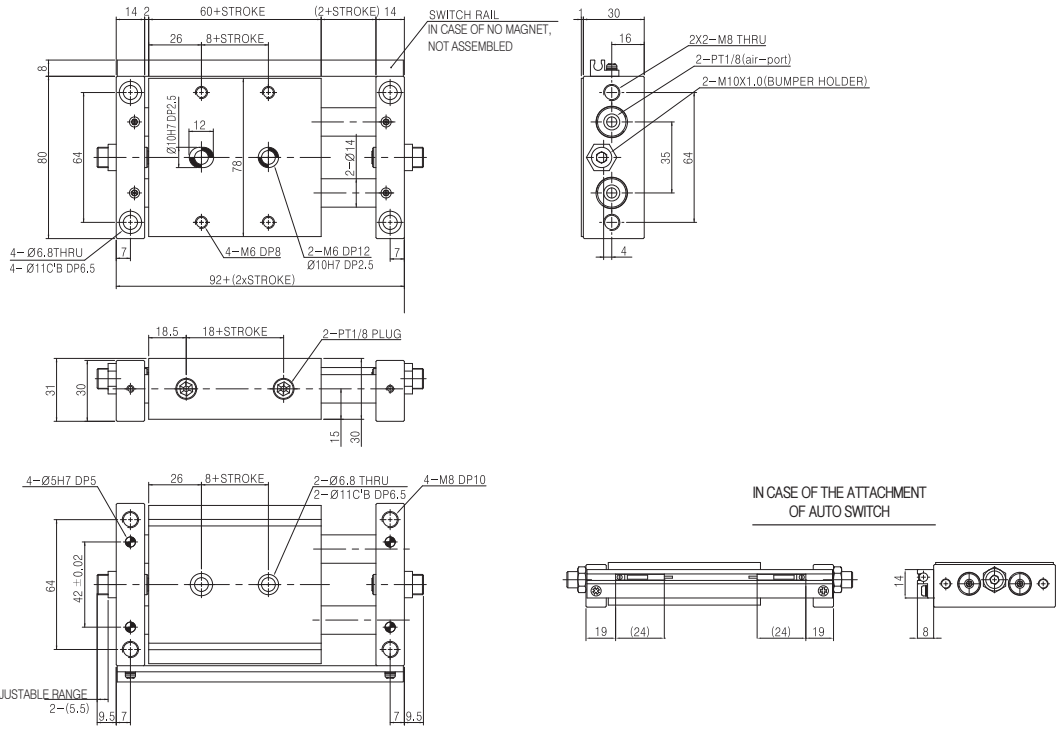
Fixed Tube Type Ø25

(mm)



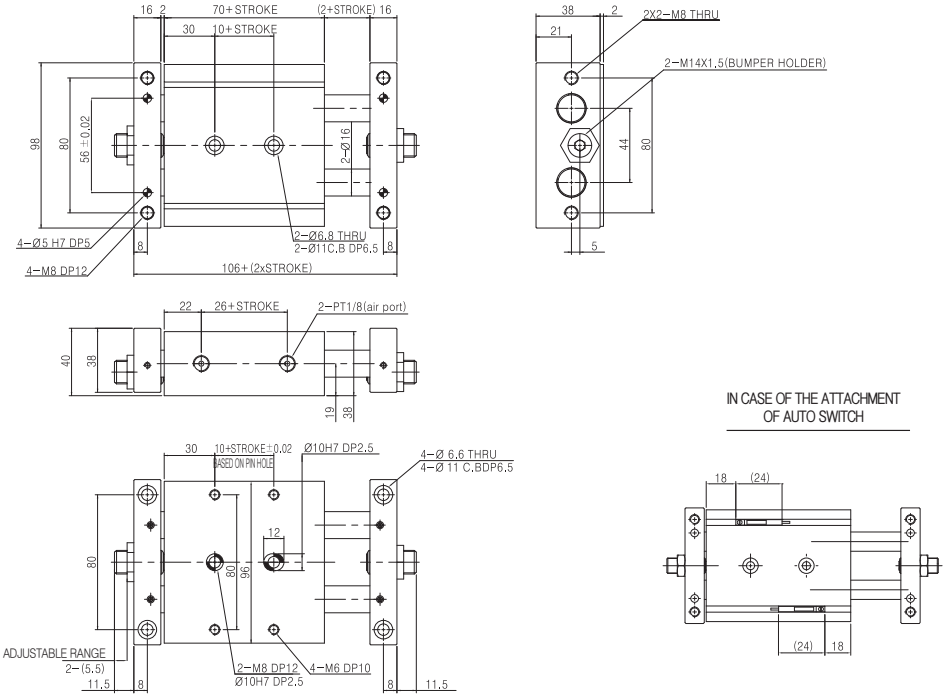
Fixed Plate Type Ø25

(mm)



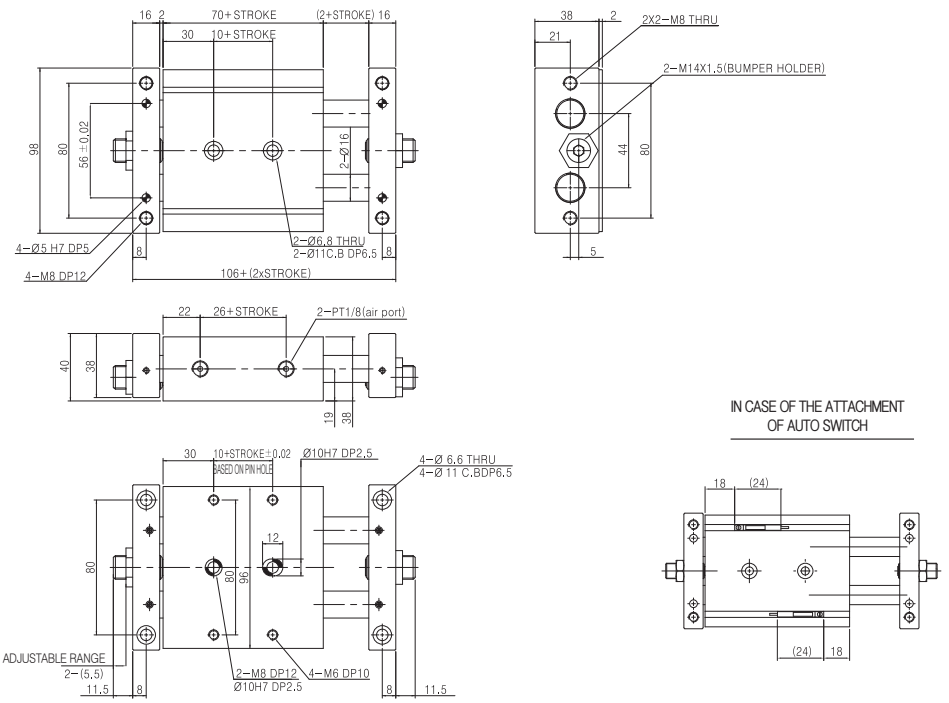
Fixed Tube Type Ø32

(mm)



Fixed Plate Type Ø32

(mm)



General Suggestions for Slide Cylinder Series

Please read all instructions before selecting and using our products. Refer to the directions for each model for details. Relating to euch products charactieristics.

Installation Suggestions

Warning

1) Tightly fasten each joint and connection of the Slide Cylinders.

When operating the Slide Cylinder frequently or under heavy vibration, fasten the connections*, according to manufacturers specifications. Leak test before applying full pressure.

Selection Suggestions

Warning

1) Carefully read the Properties.

The products introduced in this catalog are designed for industrial compressed-air systems only. Overloaded energy, pressure or temperature cause damage or mal-operation and, therefore, do not exceed the range of the properties.

2) Vibration and Impact

Do not use the Slide Cylinder to absorb vibration and impact of machineries.

Warning

1) Establishing space for storage and maintenance

When installing the product, establish adequate operation space around it. When not established, it may cause difficulty with daily inspections and maintenance and repair works and eventually cause operational defects and damages.

2) Avoid cuts on the wire cords such as the Auto Switch lead wires.

Cutting, excessive bending, putting, rolling, loading with heaving object and putting between two objects may cause fire, electrical shocks or abnormal operations due to electricity leakage or connection defects.

3) During the the operation of the Slide Cylinder, do not place the auto switch on an outer magnetic field.

It may move unexpectedly and cause damages.

4) Install a safety valve.

Install a device such as a safety valve to keep the pressure below the regular pressure when the pressure increases due to outer forces applied onto the Slide Cylinder.

It may break due to excessive pressure.

5) Do not deform the product.

It may cause physical injury, electrical shocks or fire due to abnormal operations.

6) Test the unit before operations.

If the unit was not used over 48 hours or stored as stock for a long time, the connections may have adhered to each other and delay the operation.

In this case, test the unit before normal operations.

7) Strictly observe the connecting screws for torque.

Upon installation, fasten the screws with the recommended torque.

8) Before operations

Always inspect safety details of the operational space in prior to operating the device by supplying electricity and air.

9) After operations

Do not touch where electricity is exposed, such as terminals, during the electricity supply.

It may cause electrical shocks or abnormal operations.

10) Be cautious when handling objects with mass.

When transporting or adjoining heavy objects, establish safe surroundings for the operators and handle with caution by completely supporting them with lifts or supports.

11) High-pressure Gas Safety Supervision Regulations and its Enforcement Ordinances apply.

Follow all published regulations by all pertinent regulation agencies.

Warning

1) Do not overload the shaft of the Slide Cylinder which may cause distortion or bending.

It may cause a decrease in life span and abrasion and damage of shaft or inner parts.

2) Avoid denting or cutting the operating part of the shaft of the Slide Cylinder.

The inner tube is manufactured by precise tolerance and may cause operational defects even with a little distortion.

Also, dents or cuts on the operating part of the shaft may cause air leakage due to damages on the packings.

3) When installing

When installing the wires and pipes of the products, always refer to the catalog and other references.

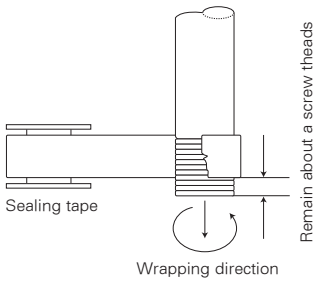
4) Safety
Always wear protecting gloves, glasses and boots for safety purposes.

5) Reference to handling manual
Carefully read and understand the handling manual before adjoining and using the products.

Caution

1) Management before piping
Before piping, remove chips, oil residue or dust.

2) Method of adhering seal tape
When connecting pipes or fitting parts, keep the chips of piping screws or other wastes, away from the inside of the pipes. Also, when using the seal tape, leave 1.5~2 threader uncovered.



Fueling Suggestions

Caution

1) Non lube type Slide Cylinder
This product is a non-fueling type.
Do not use machine-oil or spindle-oil.

Air Source Related Suggestions

Warning

1) Use clean air.
When the compressed air contains chemicals, compound oil with organic liquid, salt content or corrosive gas, it may cause damage or operational defects.

Caution

1) Use an air filter.

2) Install After-Cooler, Air Dryer, Drain Catch and etc as counterplans.

3) Maintain the oil temperature and surrounding temperature within the allowance range.
When the temperature drops below 5℃, the moisture content of the circuit may freeze and cause damages or mal-operations of the packing. Therefore, prevent freezing.

Operation Environment Related Suggestions

Danger

1) Do not use around hazardous materials such as flammables.

Warning

1) Do not use where there is an exceeding amount of dust, salt content, steel powder or moisture content and where the surrounding atmosphere with organic solvent also contains phosphoric-acid ester-class activating oil, sulfurous acid gas, chlorine gas and other acidic materials. These conditions may cause operation interruption, sudden capacity declination or shortened life span. .

2) When using the auto switch, do not use around ferromagnetism.
Do not use the auto switch around high electric current or a strong magnetic field.

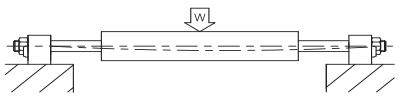
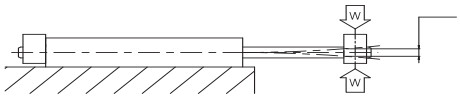
Warning

1) Do not use the auto switches of other companies.
Only use TPC switches.

How to Select

Maximum deflection (&) should be less than 0.3mm

How to calculate defelction

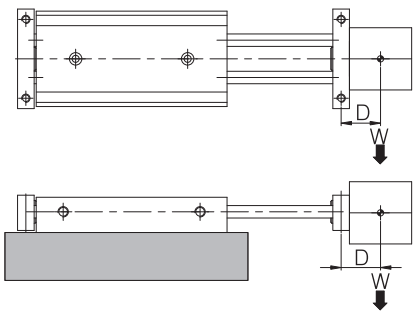
In case of ASLP (Plate Mounting Type)	In case of ASLT (Housing Mounting Type)
	

A(mm) : Distance between plate and center of support point
Wt(Kgf) : Weight of the slide table (including Bush)
L(mm) : Distance between center of load and center of shaft
D(mm) : Distance between center of the load and plate
E(mm) : Stroke + Length of piston rod
M(gf/mm³) : Weight of shaft
C(mm) : Distance between center of the shafts
Fs(Kgf) : Static Movement
T : Constant Factor
P(mm) : Center between support point of bush
Wp(Kgf) : Plate Weight
W(Kgf) : Load weight
S(mm) : Stroke

Model	A	C	E	Wp(gf)	Wt(gf)	T	P	M
ASL12	15	18	S+44	17	99+1.62ST	4.01×10^{6}	ST+22	0.44
ASL16	16	25	S+52	31	190+2.36ST	1.27×10^{7}	ST+30	0.78
ASL20	17	28	S+59	50	295+3.07ST	3.04×10^{7}	ST+37	1.22
ASL25	23	35	S+64	79	459+4.09ST	6.41×10^{7}	ST+32	1.76
ASL32	23	44	S+74	125	724+5.71ST	2.03×10^{7}	ST+44	3.14

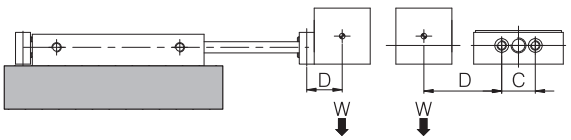
5. The static load transferred to the shaft depending an position and direction of the lead.

1



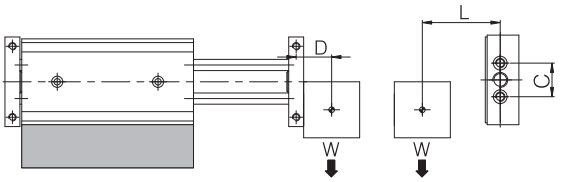
Fs = (W + Wp)/2+(S*M)

2



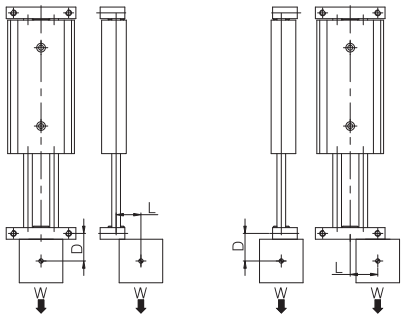
Fs = W(L/C+1)+W+Wp/2+(S*M)

#3



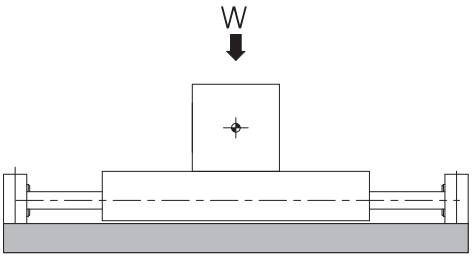
$$Fs = \sqrt{[(W+Wp)/2+)S*M)]^2+(W+L)^2/C}$$

#4

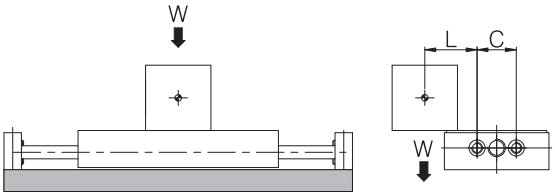


$$Fs = (W*L)/[2(A+D+S)]$$

#5

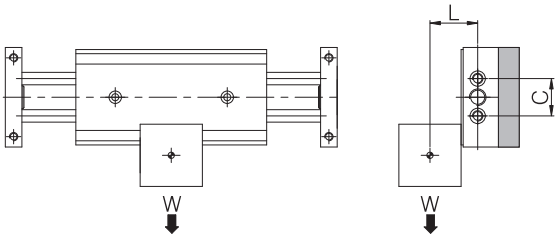


#6



#7

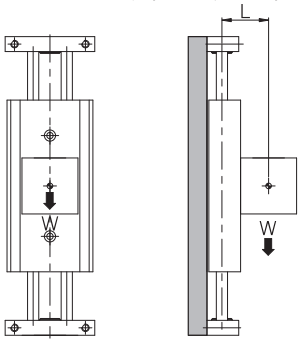
$$Fs = (W+Wt)/2$$



$$Fs = \sqrt{[(W+Wt)/2]^2+[(W+L)/C]^2}$$

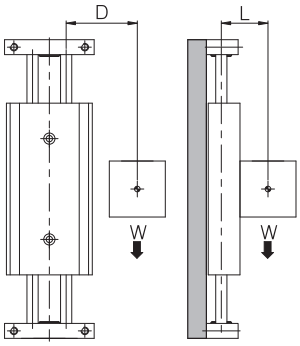
#8

$$Fs = W+W(L/C+1)+Wt/2$$



$$Fs = (W*L)/P$$

#9



$$Fs = (W\sqrt{D^2+L^2})/P$$

Mini Auto Switch

- ENLARGEMENT OF STANDARD LEAD WIRE
- OIL PROOF AND INTERNAL COMBUSION IS EXCELLENT
- COMPACT DESIGN
- EASY TO CHECK EXISTING / NON PLUG

How to Order

W ✻ ✻ ✻
1 2 3 4

1 TPC Auto Switch Model

2 7 : Mini existing plug point AUTO SWITCH
8 : Mini existing plug point AUTO SWITCH
9 : Mini non plug point round AUTO SWITCH
10 : Mini non plug point round AUTO SWITCH(10mm)

3 H : LEAD WIRE HORIZONTAL TYPE
(W7 : Horizontal only)
V : LEAD WIRE VERTICAL TYPE
(W10 : Vertical only)

4 Blank : Wiring Method(2 wires), LEAD WIRE Length(1m)
L : LEAD WIRE(3m)
N : Wiring Method(3 wires, NPN), LEAD WIRE Length(1m)
P : Wiring Method(3 wires, PNP), LEAD WIRE Length(1m)
NL : Wiring Method(3 wires, NPN), LEAD WIRE (3m)
PL : Wiring Method(3 wires, PNP), LEAD WIRE (3m)
(Note1) "N", "P", "NL" and "PL" are only for solid state switch W9✻ type.
(Note2) W10 : Lead wire 0.5mm, 2wires, "N" type only.

Specification

Item	W7	Contact (W8)	Non-Contact (W9)	W10 ✻ ✻	
Size	Outer Diameter of 4mm		Outer Diameter of 4mm	Solid State Switch 2 wire	Solid State Switch 3 wire(NPN)
Loaded Voltage	AC220V	DC24V, AC100V	DC24V	DC24V	
Working electric Current	5~15mA	5~40mA (DC24V) 5~20mA(AC110V)	5~30mA	5~40mA	Less than 100mA
				None	
Direction of Lead Wire	Vertical, Horizontal		Vertical, Horizontal	Vertical(V)	
Lamp	Red LED lights when ON		Green LED lights when ON	Green LED lights when ON	
Wiring	Double wiring		Double wiring (Triple wiring)		
Output	–		NPN, PNP		
Attachment	Screw-attachment on		Screw-attachment on Rail		
Operation Time	Less than 1.2ms		Less than 1.2ms	Less than 4.5V	Less than 1.5V
Inner Voltage Epression	Less than 2.4V		Less than 4.5V	Less than 0.9mA	Less than 100μA
Minimum Gauss Required	Higher than 65G		Higher Than 35G	–	Less than 12mA
Maximum Gauss Limited	Lower than 450G				
Lifespan of Swich	1×10^7 when loaded 5V, 5mV 1×10^7 when loaded 12V, 5mV 1×10^7 when loaded 24V, 5mV		–		
Electric Current Leakage	–		Less than 15mA under DC24V		

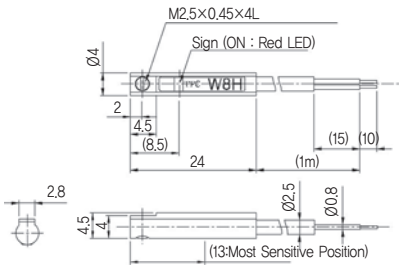
Remote Range of the Switch

Classification	W7 ✻ ✻, W8 ✻ ✻	W9 ✻ ✻	W10 ✻ ✻
L(Maximum Remote Range)	13	6.5	7
Remote Range of the Switch	7~12	4.3~4.7	4~7

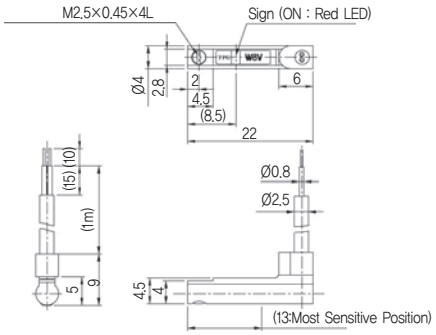
✻ Waming : When the amount of motion electric current loaded on the controllers such as PLC, is lower than that of current leakage, it is called non-operative state (ON) and results in miss-operation.
When the number of parallel connection is n, the amount of current leakage multiplies n times.

Measurement Illustration

W8*

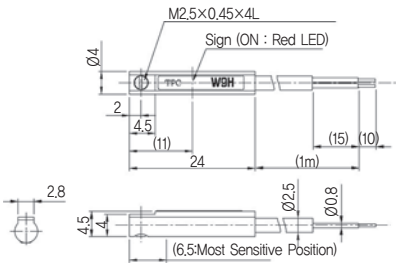


W8H (Horizontal)

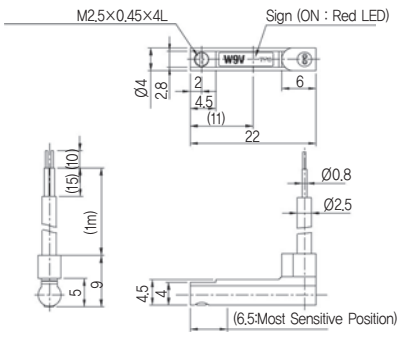


W8V (Vertical)

W9*

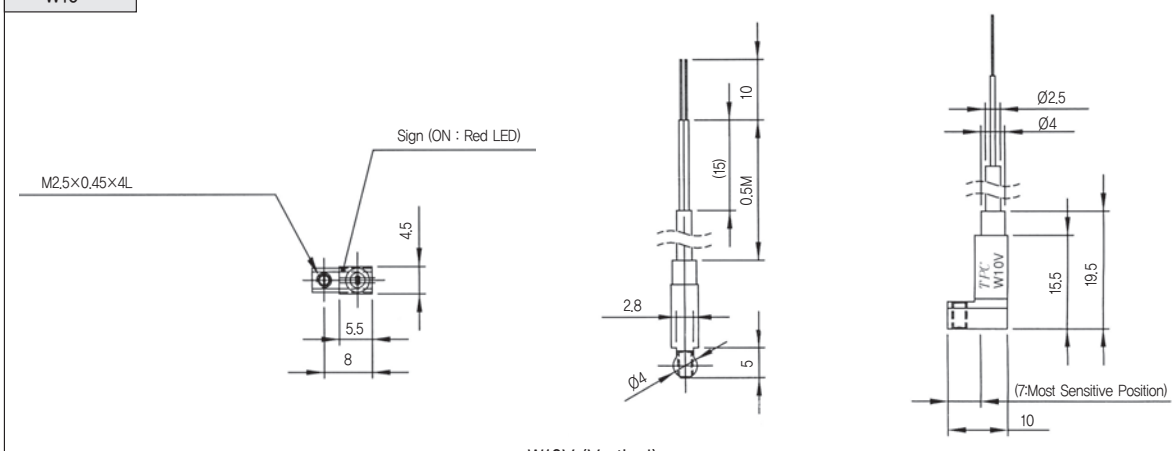


W9H (Horizontal)



W9V (Vertical)

W10*



W10V (Vertical)

Low Speed Cylinder

● A cylinder with special specification which smoothly operates without stick slip under the condition lower than minimum operating speed of standard product

How to Order

Standard Product Order Specification — XLS

1 2

1 Type
: Applied cylinder number
Ex) AQ2B32-50D-XLS

2 XLS
: Low speed cylinder
Applied piston speed : 5~50mm/sec
※ Other dimensions and specification are identical to standard product

Applied Cylinder Series

Index	Applied Tube Diameter
ACP	Ø6~Ø16
NLCD(S)	Ø6~Ø32
ADR	Ø10~Ø25
NDM	Ø10~Ø25
AS	Ø20~Ø40
AM	Ø20~Ø40
AGX	Ø20~Ø40
ARD	Ø20~Ø63
AQ2	Ø12~Ø125
AQ	Ø12~Ø25
TGQ, NGQ	Ø12~Ø100
AM2	Ø40~Ø100
AM	Ø40~Ø100
AL/ALX	Ø125~Ø200

Note1) Contact a manufacturer for application of cylinder beside the lists above.
Note2) Air cushion is not necessary for low speed operation, so that make an order without cushion for AM, AM2, AL/ALX (2) and ARD cylinders.
Ex) AM50-150N-XLS
ARDB40-150-XLS

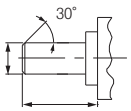
Notices

● Operation beyond specified operation piston speed degrades cylinder durability.
● Since special lubricant is used, refueling may consume lubricant, which possibly causes degradation of performance.

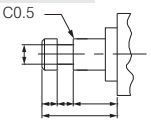
Change of Rod End Shape

Symbol : R0 The shape of rod end is same to that of standard type.
Be sure to indicate H size if it is different from standard size.

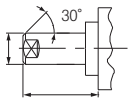
Symbol : R1



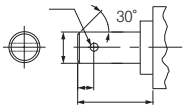
Symbol : R2



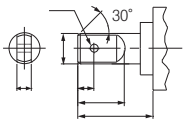
Symbol : R3



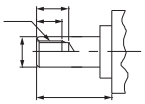
Symbol : R4



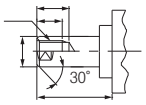
Symbol : R5



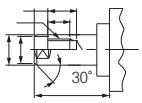
Symbol : R6



Symbol : R7



Symbol : R8



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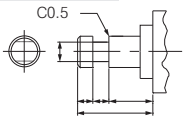

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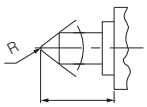

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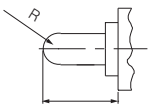

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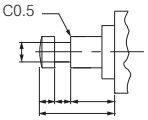

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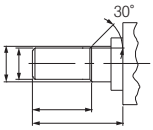

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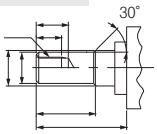

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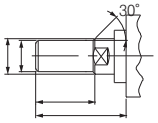

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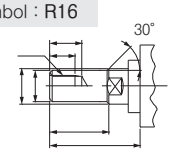

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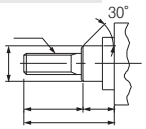

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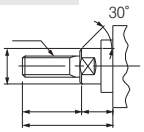

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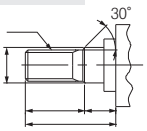

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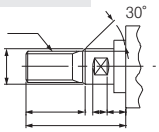

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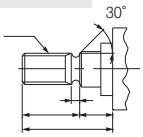

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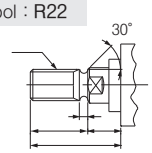

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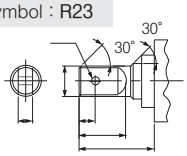

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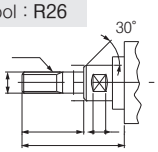

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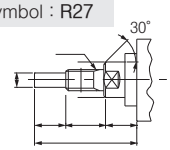
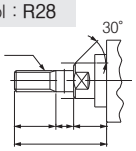


Symbol : R28



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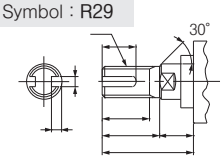

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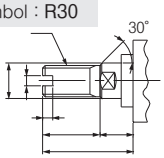

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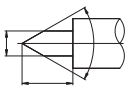

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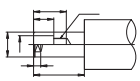

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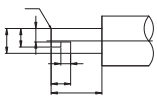

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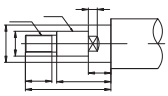

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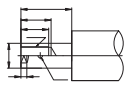

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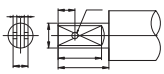

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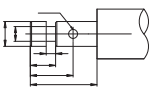
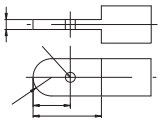
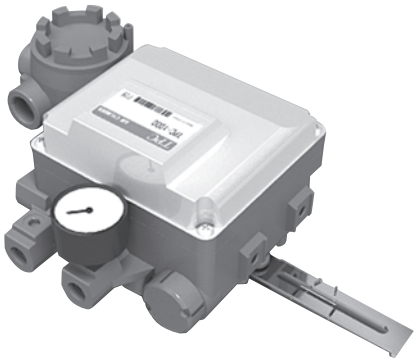


Symbol : R38



Series TPC-1000

Electric Pneumatic Positioner



- NO RESONANCE IN WAVE RANGE OF 5~20Hz
- POSSIBLE FOR 1/2 SPLIT RANGE CONTROL WITH SIMPLE CONTROL WITHOUT COMPONENT REPLACEMENT
- VERY COMFORTABLE ZERO AND SPAN ADJUSTMENT
- VERY SIMPLE CONVERSION BETWEEN OPERATION TYPE AND REVERSE-OPERATION TYPE
- VERY SIMPLE FEEDBACK CONNECTION
- QUICK AND ACCURATE REACTION SPEED
- ECONOMIC AIR CONSUMPTION
- SIMPLE PREVENTION OF HUNTING PHENOMENON IN SMALL ACTUATOR IN APPLICATION OF ORIFICE
- FREE SETTING OF PIPING DIRECTION BY MILTI-PORT DESIGN
- SIMPLE MAINTENANCE BY BLOCK BUILD STRUCTURRE

How to Order

TPC-1000 ① ② ③ ④ ⑤

① Motion Method
- L : Linear
- R : Rotary

② Operating Method
- S : Single
- D : Double

③ Explosion proof Level Type
- N : Non-ewplosion proof

④ Lever Type
- LINEAR 1 : 10~40
- 2 : 40~70
- 3 : 70~100
- 4 : 100~130
- 5 : 130~150
- ROTARY 1 : M6×32L
- 2 : M6×63L
- 3 : M8×40L
- 4 : M8×63L

⑤ Orifice Types
Cylinder Inside Volume
- 1 : 90cm³ or less
- 2 : 90~180cm³
- 3 : 180cm³ or more

＊Note
1) Based on the condition of 20℃ for atmospheric temperature, 760mmHg for absolute pressure and 65% for relative humidity.
2) Pressure-resistant molding explosion proof (Exdm II BT6) and container protection level IP66 are applied for basic specification of product.
3) Single acting as initial setting
4) Possible to control 1/2 split range control in standard product with adjusting span.
5) Please contact for the products beside standard products.

Specifications

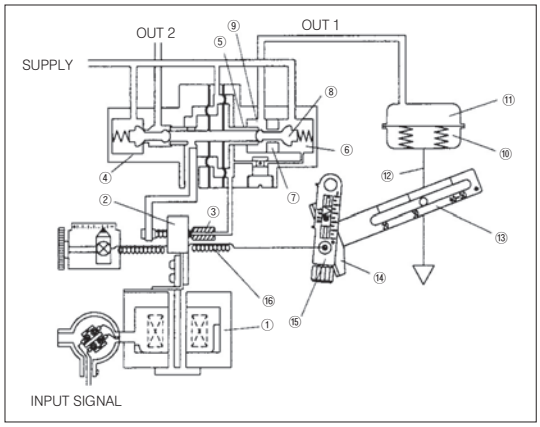
Items \ Type	TPC-1000L (Linear)		TPC-1000R (Rotary)	
	Single	Double	Single	Double
Input Signal	Less than 4~20 mA DC 24V (Possible for 1/2 Split Range Control)			
Internal Resistance	250±15Ω			
Pressure Supplied	0.14 ~ 0.7 MPa (1.4~7kgf/cm²)			
Stroke	10~150mm		0 ~ 90°	
Pipe Connecting Part	PT (NPT) 1/4			
Pressure Gauge Connecting Part	PT (NPT) 1/8			
Electric Cable Connecting Part	PF ½			
Explosion-proof Specification	ExiaIIBT6, ExdmIIBT6, ExdmIICT6			
Container Protection Level	IP 66			
Vicinity Temperature Range	-20℃ ~ 70℃ (-4°F ~ 158°F) High Temp : Please Contact us			
Linearity	±2% F.S.			
Hysteresis	1% F.S.			
Sensitivity	±0.5% F.S.			
Repeatability	±0.5% F.S.			
Air Consumption	5 LPM (Pressure Supplied=0.14 MPa)			
Capacity Supplied	80 LPM (Pressure Supplied=0.14 MPa)			
Material Property	Aluminum Die Casting			
Weight	Around 2.8 kg			

Performance Property

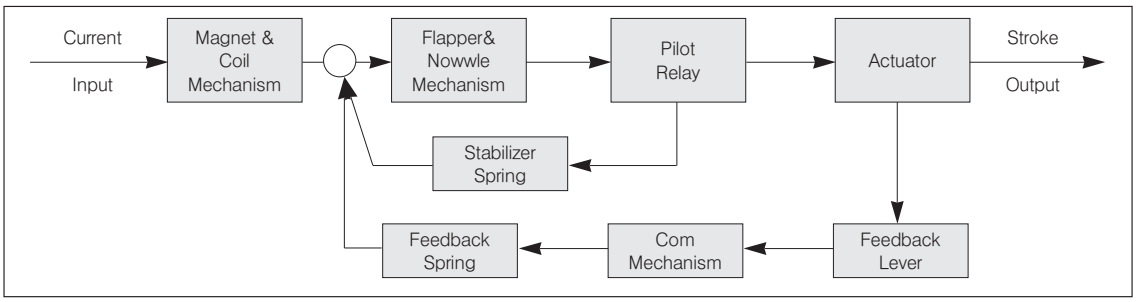
TPC-1000L

Increase input current to change stroke location of valve. Force is generated at ① Torque motor, extend distance between ② Flapper and ③ Nozzle, and dramatically decrease nozzle back-pressure. Thus, ⑤Spool is lifted, and ⑦ Seat is opened at the same time to send pneumatic pressure in OUT 1 pipe to ⑩ Actuator. ⑪ Actuator stem is pulled down.

As ⑫ Actuator stem is pulled down, ⓐ Feedback Spring is pulled by feedback connecting part, and ⑫ Actuator stem is to be stopped at where the force generated by spring force and input current becomes balanced.



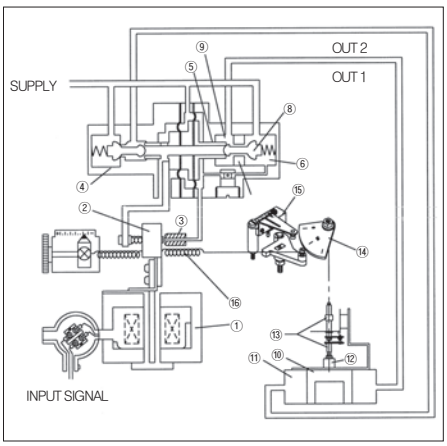
Operating Diagram of TPC-1000L



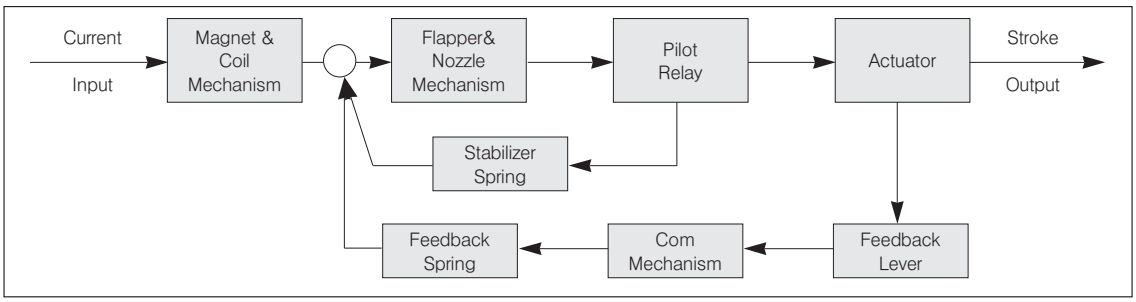
TPC-1000R

Increase input current to change stroke location of valve. Force is generated at ① Torque motor, extend distance between ② Flapper and ③ Nozzle, and dramatically decrease nozzle back-pressure. Thus, ⑤Spool is lifted, and ⑦ Seat is opened at the same time to send pneumatic pressure in OUT 1 pipe to ⑩ Actuator. As pressure in actuator is increased, ⑫ Actuator stem begins rotating.

As ⑫ Actuator stem is rotated, feedback spring is pulled by feedback connecting part, and ⑫ Actuator stem is to be stopped at where the force generated by spring force and input current becomes balanced.

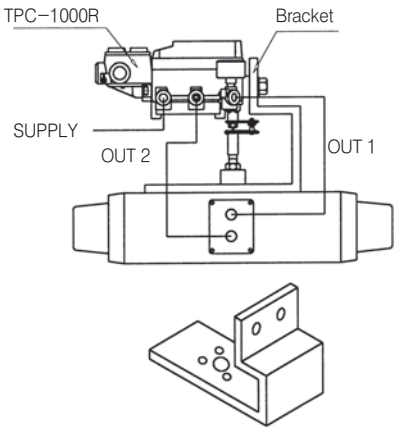


Operating Diagram of TPC-1000R

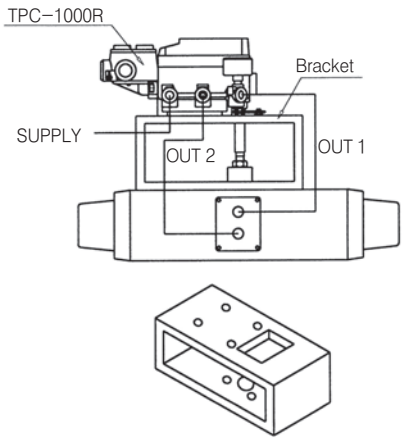


Installation

Mount Method to Actuator



Ex1) Using scrrew hole (M8) located next to positioner

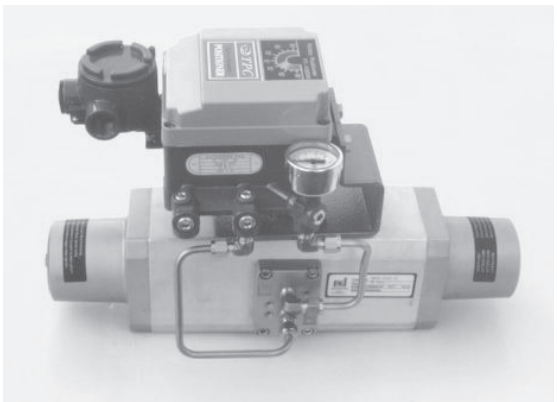


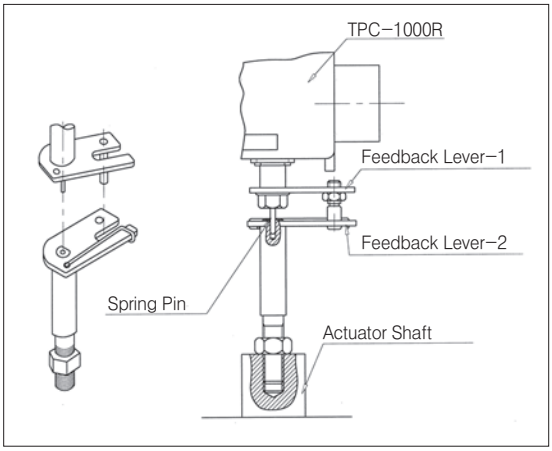
Ex2) Using scrrew hole (M8) located below positioner

Feedback Lever Connection

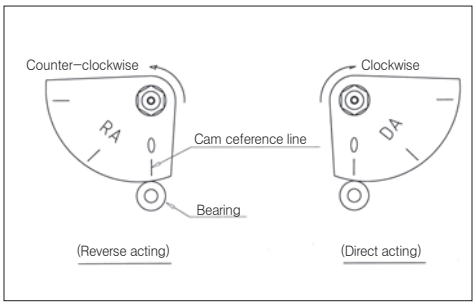
Mount positioner on mounting bracket to make feedback level shaft of positioner and stem shaft of rotary actuator almost concentricity. Concentric range should have the size which spring pin located under feedback lever 1 comes into a small hole located upper side of feedback lever 2.

Note) If concentric is not made when mounting positioner on mounting bracket, it may cause problems in normal operation of positioner, and excessive force on feedback shaft of positioner may cause damage of some components.



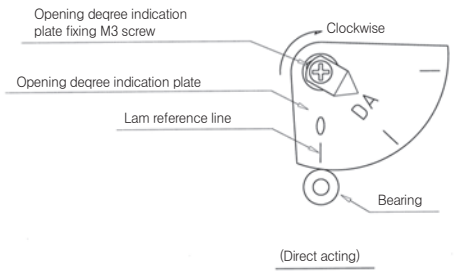


Cam Mounting Method



(1) If actuator shaft is rotated in clockwise direction to increase input signal, a cam should be mounted with DA (Direction Action) marked surface facing upward.
(2) On the contrary, if actuator shaft is rotated in counter-clockwise direction to increase input signal, a cam should be mounted with RA (Reverse Action) marked surface facing upward.
(3) First of all, checking should be conducted if angle location of actuator is located at the initial point. If yes, release hexagonal flange but which fastened a cam, and adjust a com to make bearing contact surface is coincident to zero indicating line marked on cam.
(4) Supplied pressure should be cut when mounting a com. If not, finger or hand possibly gets jammed, which causes injury.
(5) A cam is mounted in RA status for delivery. Hexagonal flange nut should be used with proper torque for replacement or adjustment of cam. (Regulated fastening torque is 2.0~2.5Nm)

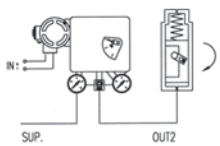
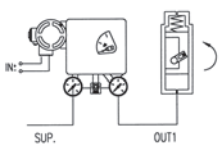
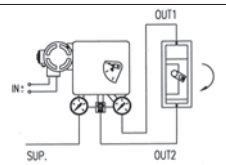
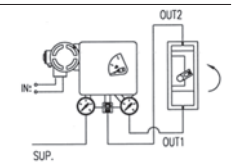
Attaching Scale Indicating Panel



(1) Attach scale indicating panel after mounting a cam. Use M3 screw for attaching scale indicating panel. Insert scle indicating panel at upper side of positioner shaft, and properly connect with a screwdriver.
(2) Look external indicating window with closing main body cover of positioner, and check if scale of scale indicating panel is indicating zero in external indicating window.
(3) After adjusting the location of scale indicating panel, firmly fasten M3 scrrew using a screw driver.

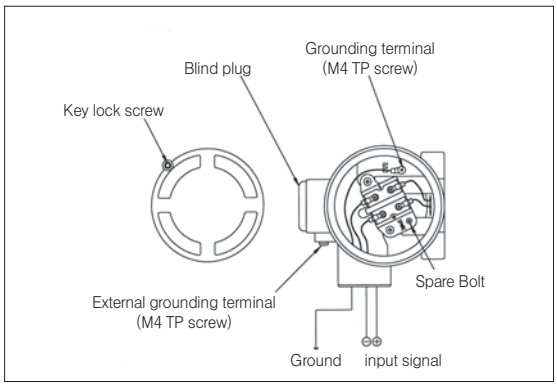
Piping

1 Pipe should be used after full cleaning foreign materials.
2 Air should be supplied after full cleaning moisture or dust.
3 If using double action to single action, Close OUT2 pipe using blind plug, and use OUT1 pipe.

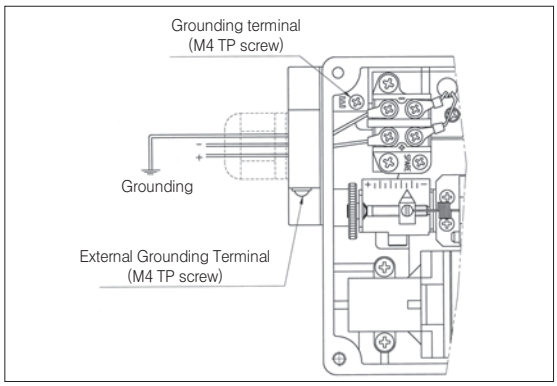
Direct Action Type		Reverse Action Type	
If input current is increased, actuator stem is rotated in clockwise direction.		If input current is increased, actuator stem is rotated in clockwise direction.	
If input current is increased, actuator stem is rotated in counter-clockwise direction.		If input current is increased, actuator stem is rotated in counter-clockwise direction.	

Electric Wiring

1 Connect (+) and (−) in external terminal board of positioner to (+) and (−) from external input wire respectively.
2 Pressure−resistant incoming method and metal conduit incoming method are available.
① Cable grand is applied for pressure−resistant incoming method.(Cable outer diameter 9.0~ 11)
② PF ½ size is applied for metal conduit incoming method.
3 Close terminal panel cover, and firmly fasten using key lock screw.
4 Additional terminal connecting screws are mounted on terminal board.



Exdm II BT6



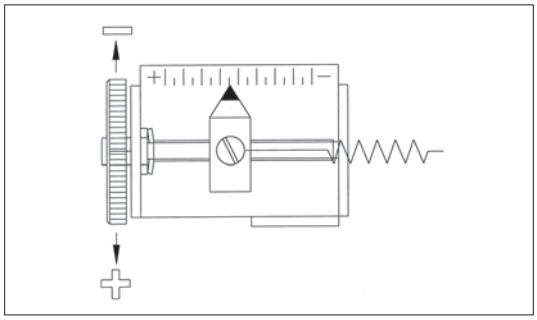
Exia II BT6

Opening Range Adjustment

Prior to opening range adjustment, check following items.
1 Check if wiring between OUT1 and OUT2 piping part of positioner and actuator is correctly done.
2 Check if (+) and (−) terminal of positioner and external power is correctly connected, and check if grounding wire is correctly connected.
3 Check if positioner is firmly mounted on actuator.
4 Check if auto/manual switch of pilot valve is closed, which is supposed to be firmly fastened in clockwise direction.
5 Check if cam mount is correctly made along operating method. (Direct action/Reverse action)

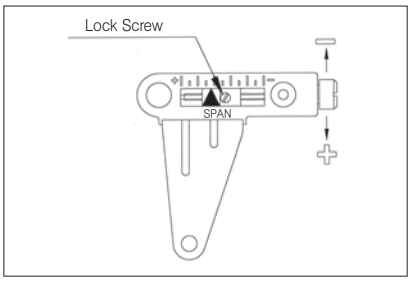
Zero Adjustment

1 Adjust zero point of actuator rotating angle with rotating zero controller in counter−clockwise or clockwise direction after adjusting initial input signal to 4mA.
2 In case of single action actuator using spring, it is recommended to check if assigned standard pressure is shown in positioner pressure gauge at zero point of rotating angle.



Span Adjustment

1. Allow input current from 0% to 100% (4~20mA, 4~12mA, 12~20mA, etc) to check rotating angle of actuator stem.
2. If current rotating angle is smaller than assigned angle, adjust rotating angle with span controller in counter-clockwise direction, and clockwise direction in opposite case.
3. Zero point is changed with adjustment of span, repeat zero adjustment form 1~11 phrases.
4. If span adjustment is completed, use lock screw.

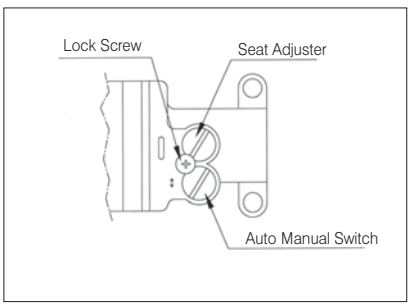


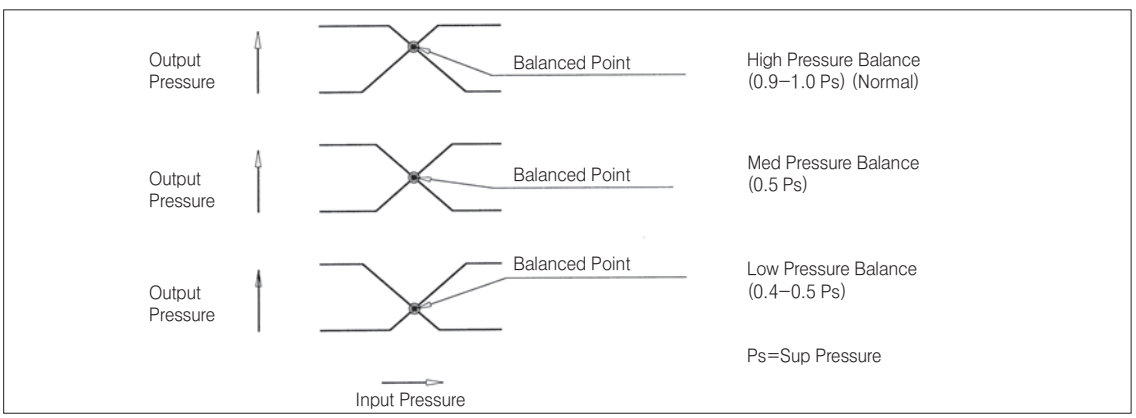
Auto/Manual Switch

1. This switch is applied for temporary stop of positioner operation.
2. It is set to "Auto" for delivery. If rotating switch in counter-clockwise direction, operation is stopped and actuator is changed to "Manual".
3. If switch is set to "Manual", pressure of reducing valve is directly delivered to actuator without passing positioner, and rotating angle is adjusted by control of pressure in pneumatic reducing valve. If turning back to normal operation of positioner, rotate switch in clockwise direction.
4. In case of using OUT2 pipe in single action type an double action type, this switch is not available.

Seat Adjuster

1. No need of using seat adjuster at workplace since balanced pressure point of output pressure is optimized for delivery.
2. Seat adjuster is applied only for double action type, which change in balanced pressure point of output pressure is needed.
3. Rotate seat adjuster in clockwise direction for lack of sensitivity or high degree of hysteresis owing to external condition such as loading on valve or actuator. If hunting is occurred, rotate seat adjuster in counter-clockwise direction. (Degree of rotating seat adjuster is different along actuator. Stopper screw should not be pulled out.)
4. If hunting is occurred owing to small internal capacity of actuator, please refer to additional options.





Maintenance and Inspection

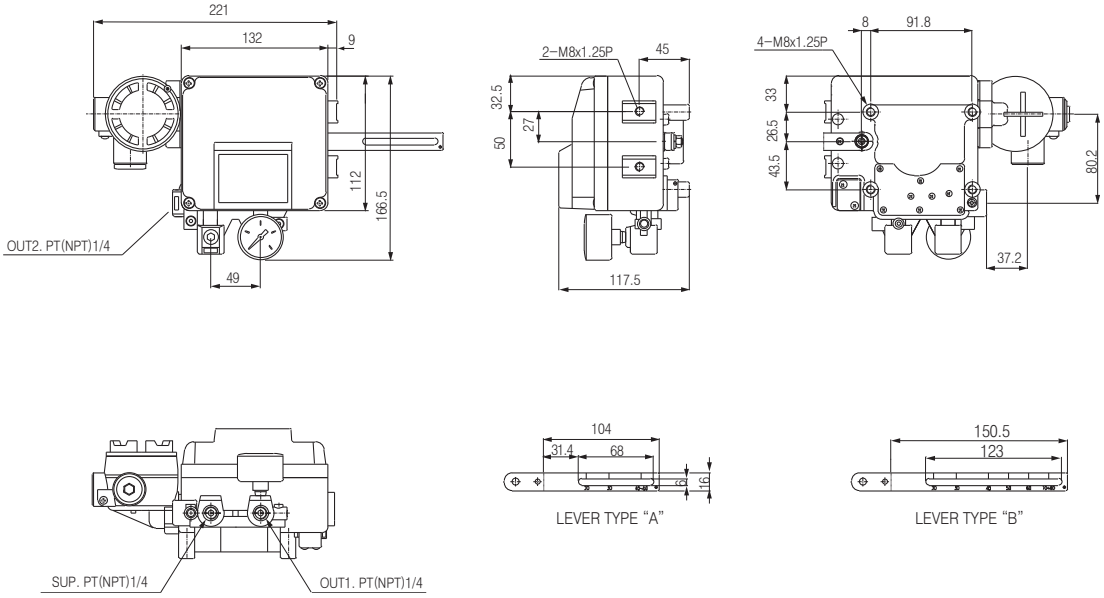
1. If pressure supplied is not constant, it may cause abnormal operation of positioner. Check if periodic air supply is fully cleaned, or problem is detected in cleaning system.
2. In case of removing pilot valve, be cautious not to remove O-ring or stabilizer spring in attaching face of pilot valve.
3. If carbon or other sediments are clogged in fixed orifice (located in Auto/Manual Switch), remove pilot valve and blow out sediment with applying high pressure air into opposite hole af Auto/Manual Switch. If still clogged, put 0.2 drill or steel wire into orifice. In case inevitably releasing stopper screw for removing Auto/Manual Switch, stopper screw must be re-installed after finishing thw work.
4. It is recommended to check if there is a damage on positioner once a year. If damaged component is found, it should be replaced to a new component.

Notices for Handling

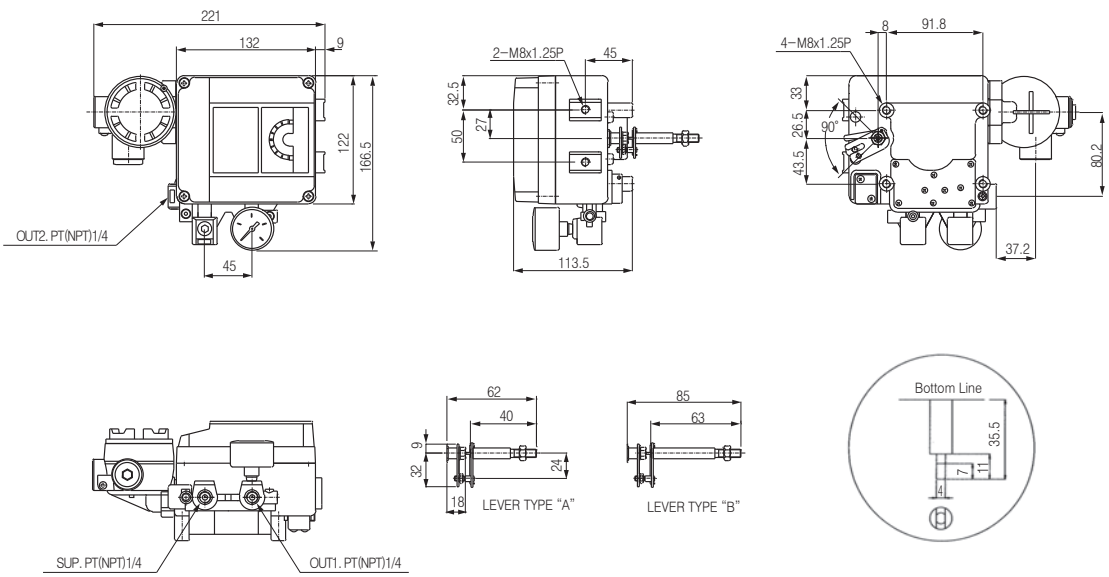
1. Excessive impact or vibration may cause failure of positioner. Positioner is sensitive equipment, which requires careful handling during operation.
2. Application of positioner beside assigned condition (input currrent, voltage, pneumatic pressure, vicinity temperature, etc) may cause quick abrasion or sealing components or damage of coil, which eventually causes abnormal operation of positioned.
3. In case of opening terminal board cover in dangerous location, input current must be cut in advance.
4. Terminal board cover and main body cover must be closed during normal operation of positioned.
5. In case of leaving positioned in exterior space without using for a long period, terminal board cover and main body cover must be closed. Moreover, special caution is needed not to stagnate condensed water within high temperature and humidity environment.

External Dimension Drawing

TPC-1000L
(Dimensions)



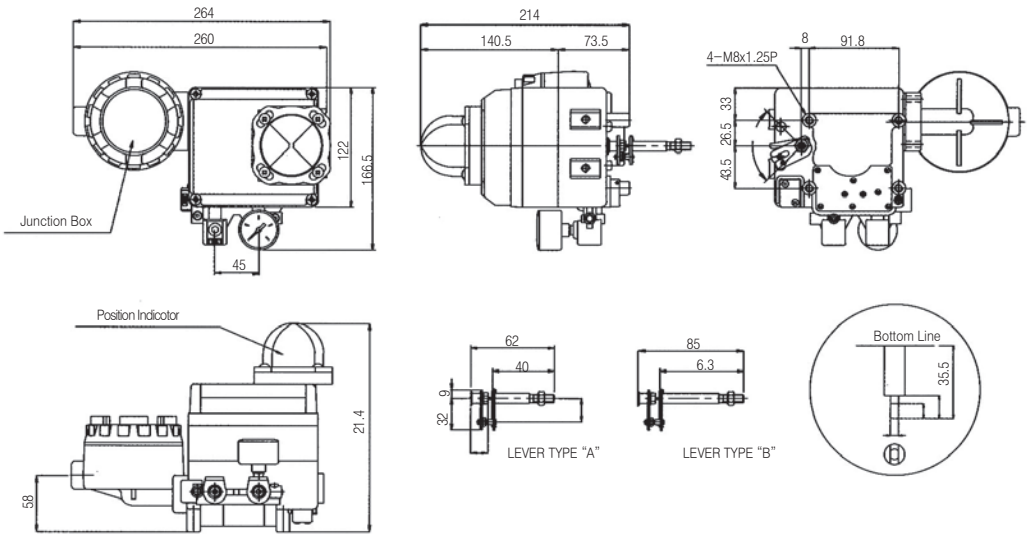
TPC-1000R (Standard Type)
(Standard Type Dimensions)



External Dimension Drawing

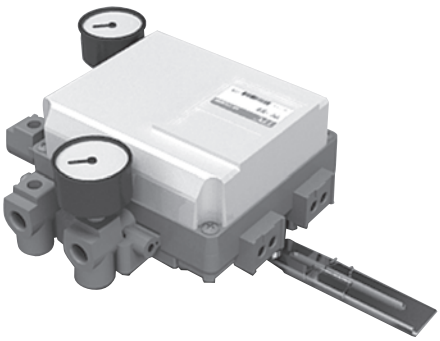
TPC-1000R

(Dimensions-Included Position Transmitter & Limit Switch Type)



Series TPC-1200

Electric Pneumatic Positioner



- VIBRATION-RESISTANT REINFORCED STRUCTURE DESIGNED, NO FAILURE IN SPITE OF HIGH VIBRATION OF PLANT
- CREDIBILITY OF PRODUCT SECURED THROUGH OVER 500,000 TIMES REPEAT TEST AND VIBRATION TEST
- POSSIBLE FOR PIPING IN ANY DIRECTION WITH MULTI PLUG TYPE DESIGN FOR COMFORTABLE PIPING
- QUICK AND PRECISE REACTION SPEED
- UTILIZATION AVAILABLE FOR 1/2 SPLIT RANGE WITH SIMPLE MANIPULATION WITHOUT REPLACEMENT OF COMPONENTS
- SIMPLE MAINTENANCE WITH BLOCK BUILT STRUCTURE DESIGN
- VERY SIMPLE CONVERSION BETWEEN REVERSE ACTION AND DIRECT ACTION
- EASY START-UP WITH SIMPLE ZERO AND SPAN ADJUSTMENT
- SIMPLE FEEDBACK CONNECTION

How to Order

TPC-1200 ○ ○ ○ ○ ○ ○

1 2 3 4 5 6

1 Actuator Running Method
- L : Linear type
- R : Rotary type

2 Operating Method
- S : Single
- D : Double

3 Lever type

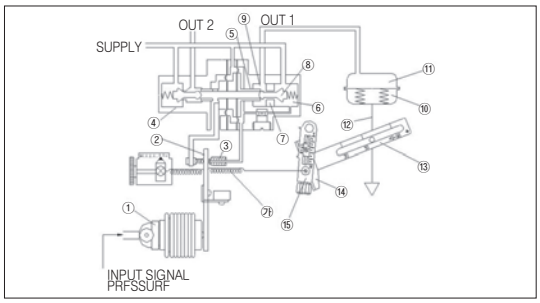
LINEAR	1	Below 40mm
	2	40 ~ 70mm
	3	70 ~ 100mm
	4	100 ~ 130mm
	5	130 ~ 150mm
ROTARY	1	M6 x 40L
	2	M6 x 63L
	3	M8 x 40L
	4	M8 x 63L
	5	NAMUR

4 Orifice Type
- 1 : Below 90cm^3
- 2 : 90 ~ 180cm^3
- 3 : Over 180cm^3

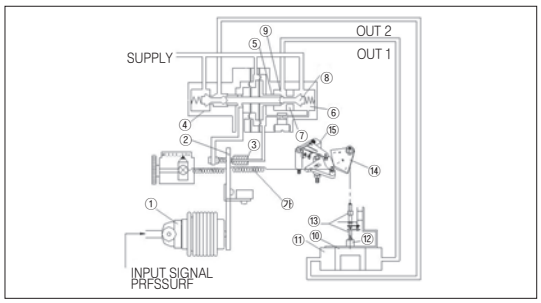
Product specifications

Items \ Type	TPC 1200L		TPC 1200R	
	Linear		Rotary	
	Single	Double	Single	Double
Input Signal	0.2 ~ 1kgf/cm^2 (3~15 psi)			
Pressure Supplied	1.4 ~ 7kgf/cm^2 (20~100 psi)			
Stroke	10~150mm		0~90°	
Pipe Connecting Part	PT (NPT) 1/4			
Pressure Gauge Connecting Part	PT (NPT) 1/8			
Container Protection Level	IP66			
Vicinity Temperature Range	−20℃ ~ 70℃ (−4~158°F)			
Linearity	±1% F.S.	±2% F.S.		
Hysteresis	1% F.S.			
Sensitivity	±0.2% F.S.	±0.5% F.S.		
Repeatability	±0.5% F.S.			
Air Consumption	3LPM(Sup.=1.4kgf/cm^2, 20 psi)			
Capacity Supplied	80LPM(Sup.=1.4kgf/cm^2, 20 psi)			
Material Property	Aluminum Die Casting			
Weight	1.7 kg (3.7 lb)			

Performance property



〈 TPC-1200L 〉

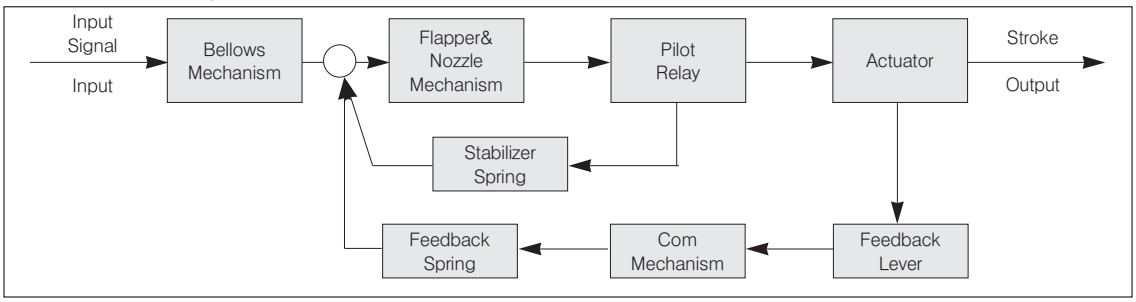


〈 TPC-1200R 〉

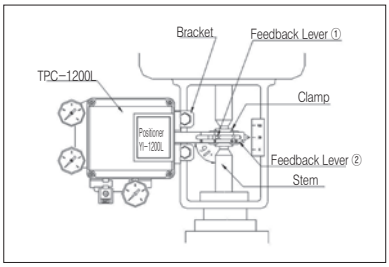
Increase input pressure to open a valve. As force is generated from ① Torque motor, and push ② Flapper to opposite direction of Nozzle. As distance between ③ Nozzle and ② Flapper is departed, ⑥ air filled in upper part of ⑤ Spool in ④ Pilot is exhausted, which makes 5) Spool elevated. Meanwhile, it pushes ⑧ Poppet blocking ⑦ Seat, and supply air is coming into ⑫ Actuator Stem through ⑦ Seat. As pressure of ⑪ Actuator Chamber is increased, ⑫ Actuator stem is falling down, so that motion of ⑫ Actuator Stem is received to TPC1100 ⑫ Cam through ⑬ Feedback Lever. This motion is transferred to ⑮ Span Lever, and pulls Span Spring.

Span spring is balanced with force from Bellows, and moves flapper to original location, which reduces distance from Nozzle. Air discharged through Nozzle is reduced, which derives pressure at upper part of Spool elevated. Therefore, Spool is falling down to original location with blocking seat by Poppet, so that air inflow to ⑩ Actuator from supply is stopped. As motion of ⑩ Actuator is stopped, TPC-1200 is restored to normal state.

TPC-1200 Block Diagram



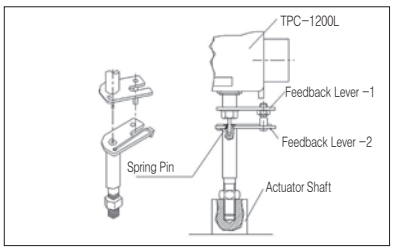
Installation

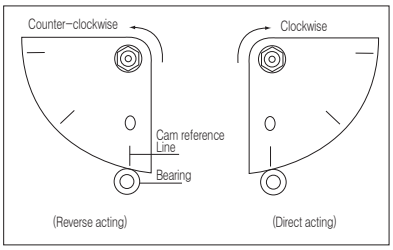


<TPC-1200L>

Produce Mounting Bracket available for contact of TPC-1200L and Actuator. As it is shown in a right figure, after temporarily fixing clamp and feedback lever on actuator stem, connect air piping to supply of TPC-1200L through TPC-200. After adjusting output pneumatic pressure to 50% of signal, and adjust actuator stem located in the middle of rated stroke.

Move clamp and bracket up and down to make perpendicular angle between feedback lever and actuator stem at this condition. After adjustment, firmly fix clamp at actuator stem.





<TPC-1200R>

1) Feedback Lever Connection

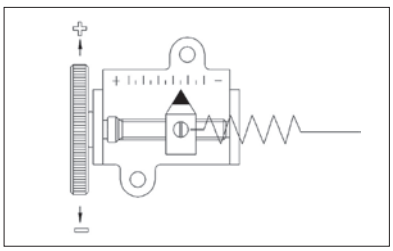
Adjust the positioner to make feedback lever shaft of positioner and rotary actuator stem shaft almost concentric, and mount on mounting bracket. Concentric range is accepted if spring pin under feedback lever 1 is inserted to a small hole at upper side of feedback lever 2.

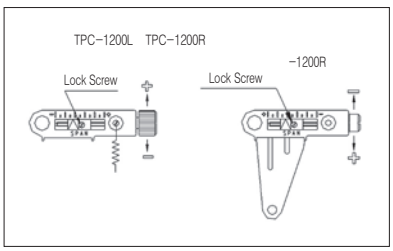
Note) If it is not concentric in positioner mounting at mounting bracket, it may cause abnormal operation of positioner. Moreover, it may bring excessive force on feedback shaft of positioner, which causes damage of some components.

2) Cam mounting method

In case actuator shaft is rotated in clockwise direction when increasing input signal, mount a cam with showing DA marked face showing upward. Check if angle location of actuator is heading for initial point. If yes, release cam fastening hexagonal flange nut, and adjust a cam to make bearing contact face precisely to zero indicating line. A cam is mounted in RA condition for delivery.

Adjustment Sequence





1 Zero Adjustment

< TPC-1200L,R >

Adjust indicator location with rotating zero adjuster in clockwise or counter-clockwise direction to make actuator indicator located in initial point of stroke scale board under input signal 0.2kgf/cm^2.

As for spring actuator, check whether it is set to standard pressure at zero point. If not, rotate zero adjuster for setting.

2 Span Adjustment

< TPC-1200L,R >

① After adjustment of zero point, conduct adjustment to make indicator reached to the final stroke point for final input signal with rotating span adjustment screw.

② Zero point is possibly changed at this stage, double check zero point after span adjustment. If zero point is changed, repeat zero point and span adjustment.

③ Application of 1/2 split range function is available with simple adjustment of zero and span without complex procedure.

④ After setting finished, close with fastening lock screw at span adjustment part.

3 A/M Switch (Auto/Manual Switch)

① A/M Switch allows auto/manual operation conversion of valve.

② It is set to “A” for delivery, and if manual control needed, rotate A/M switch to counter-clockwise direction.

③ If changed to manual control, supply pressure from TPC-200 regulator installed in front of TPC-1100 is directly connected to actuator. After using, restore a switch to “A”.

④ f OUT2 is applied in single action type, or double action type is applied, A/M switch is not available.

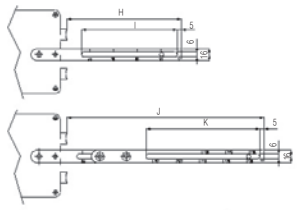
4 Seat Adjuster

① No need of use since it is fully adjusted for delivery for customer purpose. Do not regulate seat adjuster or release lock screw.

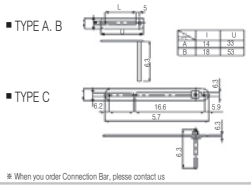
② Seat adjuster is utilized only in double action type. In case pressure balance point is necessarily changed, seat adjuster is used, however, it influences to performance of positioner, so that it is recommended to be kept in delivery condition if possible.

Lever Type Selection

◎ Linerar Lever Type
■ Feedback Lever

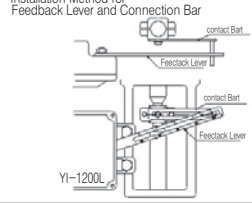


■ Connection Bar (option)

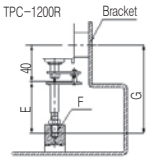


※ When you order Connection Bar, please contact us

■ Installation Method for Feedback Lever and Connection Bar



◎ Rotart Lever Type



TPC-1200L Lever Type

Type \ Dimension / Stroke		H	I	J	K
A	10-40mm	95	84		
B	40-70mm	150.5	123		
C	40-100mm	276.5	201		
D	70-130mm			361	201
E	130-150mm			416	201

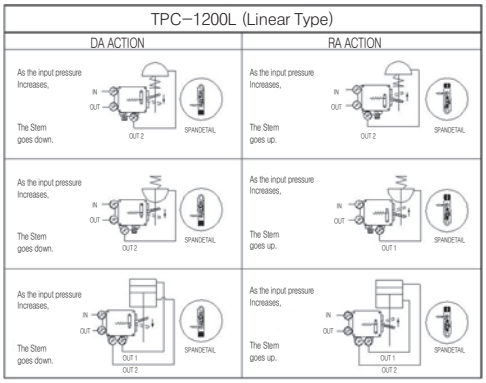
※ Lever Type AB or standard C.D.E or option

TPC-1200R Lever Type

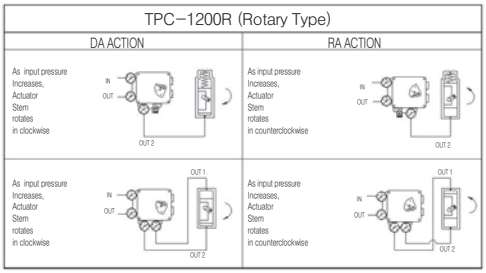
Type \ Dim.	E	F	G
A	40	M6	80
B	63	M6	103
C	40	M8	80
D	63	M8	103

Piping Diagram

TPC-1200L (Linear Type)



TPC-1200R (Rotary Type)



7. Air Piping Conditions

1. Supply air should be used after full cleaning of moisture and dust through filter. If not, it may cause abnormal operation of positioner.
2. Dust in a pipe should be fully cleaned before use.
3. It is recommended to use TPC-200 regulator to keep constant pressure in air supply.
4. In case of using double action type to single action type, one of OUT1 or OUT2 pipe is blocked, and use PT1/8 plug for pressure gauge location, and PT1/4 plug for pipe location.

8. Maintenance and Inspection

1. If supply pressure is not constant, it may cause abnormal operation of positioner. Regular check is needed whether air is cleaned, or cleaning system is correctly operated.
2. If disassembly of pilot valve is needed, be cautious not to remove O-ring or stabilizing spring from pilot valve.
3. If carbon or other sediments are clogged in fixed orifice (located in Auto/Manual Switch), remove pilot valve and blow out sediment with applying high pressure air into opposite hole of Auto/Manual Switch. If still clogged, put 0.2 drill or steel wire into orifice. In case inevitably releasing stopper screw for removing Auto/Manual Switch, stopper screw must be re-installed after finishing the work.
4. It is recommended to check if there is damage on positioner once a year. If damaged component is found, it should be replaced to a new component.

9. Causion

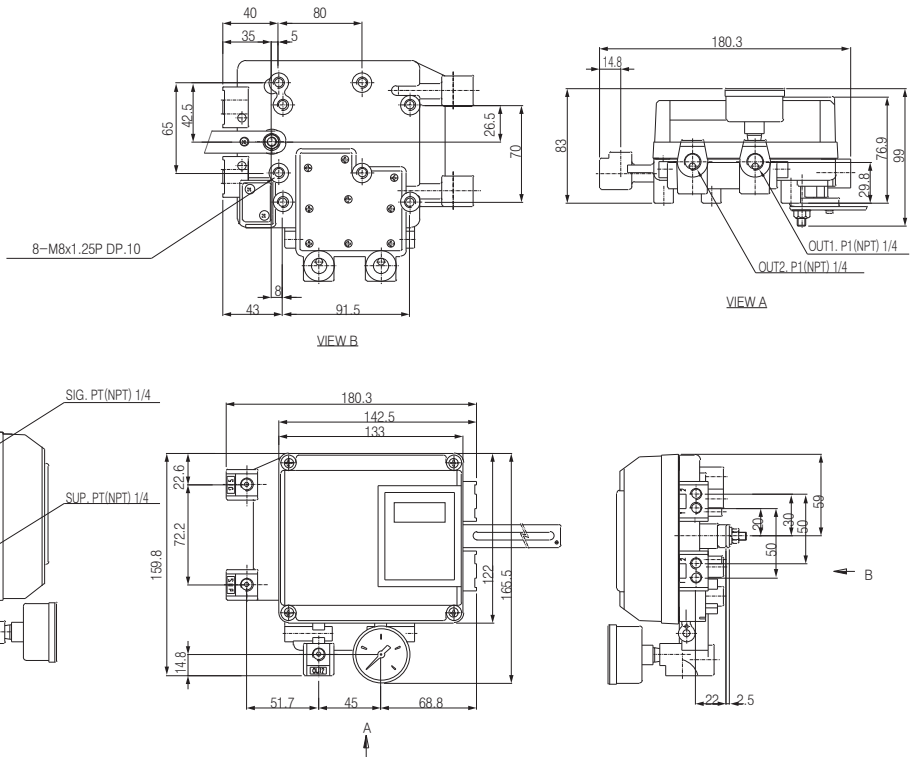
1. Excessive impact or vibration may cause failure of positioner during transportation or handling.
2. If using over the limit of specified temperature range, it may cause failure.
3. Pipe connecting holes which are not used for a long period should be covered by blind plug.
4. In case of leaving positioned in exterior space without using for a long period, terminal board cover and main body cover must be closed. Moreover, special caution is needed not to stagnate condensed water within high temperature and humidity environment.

10. A/S and Repair

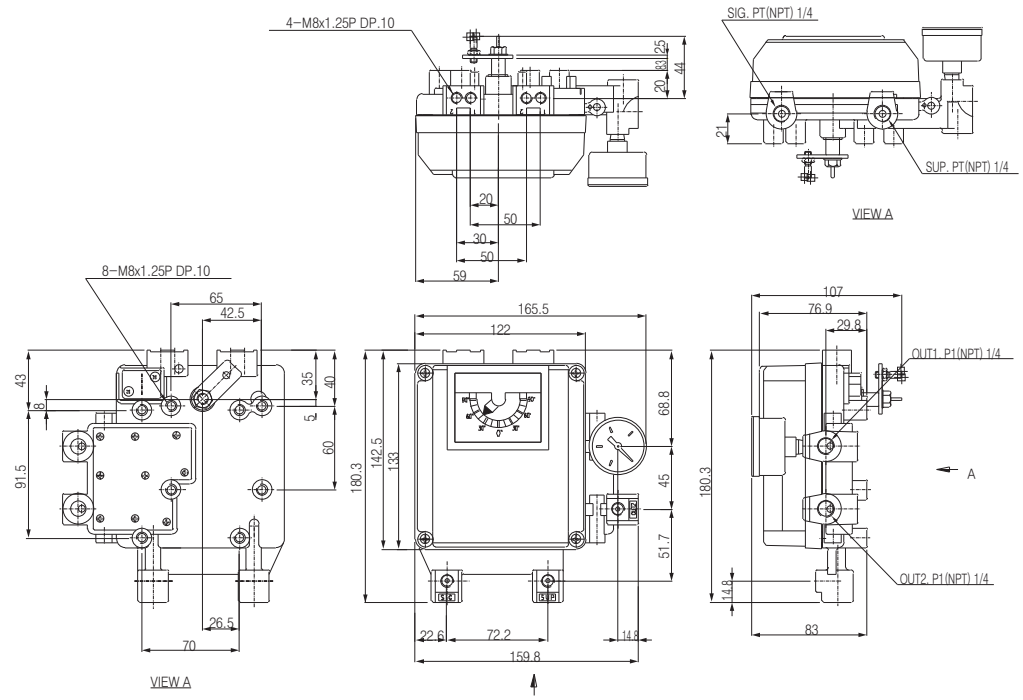
1. The most skilled engineer with state-of-art skill is in charge of A/S of positioner.
2. For any inquiries or problem of product, please contact the manufacturer.

External Dimension Drawing

TPC-1200L



TPC-1200R



Series SAH

Air Hydro Converter

Bore Size(mm) : Ø63, Ø100, Ø160

How to Order

SAH 1 — 100 2 — 100 3

1 Air Hydro Converter
2 Bore Size
3 Effective Oil Level Stroke(㎜)

Caution

1) Install the converter vertically.
2) It is preferred to check that available effective capability must be 1.25 times greater than capability of the actuator.
3) It is preferred to check that oil level speed will be 20mm/s or less with calculating operating velocity.
4) It is preferred to check that compressed air must not be intermixed with the operating oil.
5) It is preferred to check that the bore of the pipes must be large without loss of the pressure.
6) It is preferred to check that the converter must be located higher than the cylinder in order to fill it with oil.
7) It is preferred to make sure that there are no extreme differences in the bore size of the pipes used for preventing air bubbles from forming.
8) It is preferred to prevent sludge from inter mixing with oil, liquid steel is recommended over tape.
9) It is preferred to check that all pipes should be checked for leakage prior to operation.
10) It is preferred to check that use of operating oil is recommended.
11) It is preferred to check that prior to operation please release compressed air and check fluid(oil) levels.

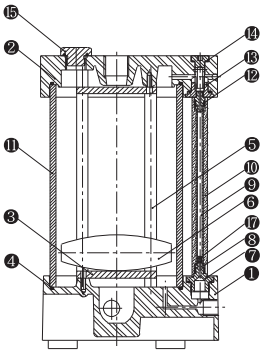
Bore Size (mm)	Effective oil level Stroke											Limited Flow
	50	100	150	200	250	300	400	500	600	700	800	(l/min)
ø 63	150	300	450	600	740	890	1190	1480	1780	-	-	36
ø 100	370	750	1120	1510	1870	2260	3010	3770	4520	-	-	88
ø 160	-	1830	-	3660	-	5490	7320	9150	10980	12810	14640	217

Specifications

Bore Size(mm)		63	100	160
Operating Pressure(MPa)		0 ~ 0.7MPa(0~99psi)		
Max. Operating Pressure		1.0MPa(142psi)		
Ambient and Fluid Temperature(℃)		5 ~ 50		
Fluid		Turbine Oil (40 ~ 100 cSt)		ISO VG 32
Thread (Rc) PT	AIR	3/8	1/2	3/4
	OIL	3/4		

※ Limited Flow : It shows the limit of converter oil level speed(0.2m/s) which can maintain stability of converter oil level.

Construction



No	Description	Port	Note
1	BODY (1)		
2	BODY (2)		
3	COVER		
4	O-RING	G port	
5	LOCK BOLT		
6	FLOATER		
7	FITTING		
8	CAP		
9	Oil gauge HOSE		
10	TUBE		acrylic
11	TUBE		
12	FITTING		
13	FLARE NUT		
14	Oil gauge BOLT		
15	CAP NUT		
16	OIL CAP		
17	Oil level gauge		

Bore Size : ø63, ø100, ø160

(Unit:mm)

Symbol

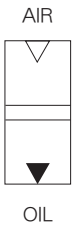


Figure 1) Symbol

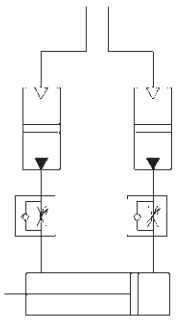


Figure 2) Application example

- Available Fluid

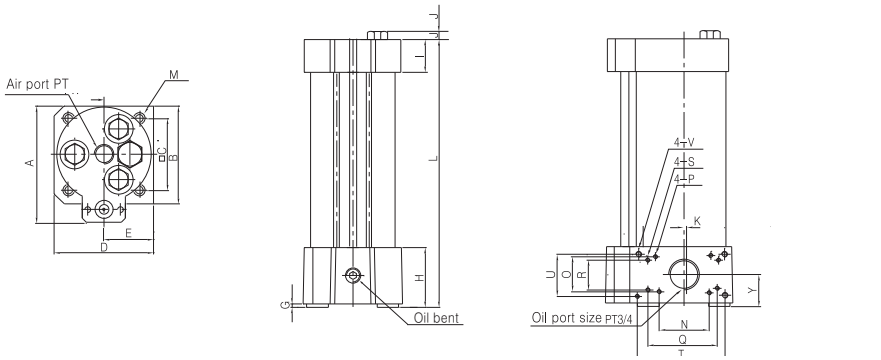
  Use petroleum based turbine hydraulic oil or turbine oil ISO VG32.

Model \ Size	Air Port	Oil Port	A	B	C	4-øM	D	E	G	H	I
ø 63	PT3/8	PT3/4	105	87	64	8.5	88	45	3	53	30
ø 100	PT1/2	PT3/4	152	127	95.5	13	136	72	7	63	36

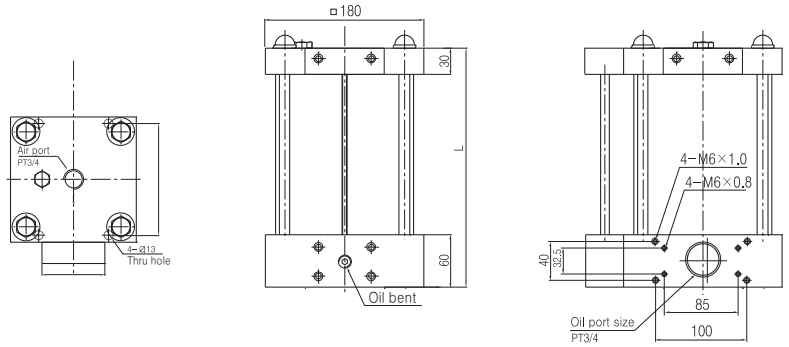
Model \ port	J	K	N	O	4-P	Q	R	4-S	T	U	4-V	Y
ø 63	7	2	72	36	M5×0.8	-	-	-	-	-	-	28
ø 100	7	8	72	36	M5×0.8	85	32.5	M5×0.8	100	40	M6×1.0	35

L \ ST	50	100	150	200	250	300	400	500	600	700	800
ø 63	245	295	345	395	445	495	595	695	795	-	-
ø 100	255	305	355	405	455	505	605	705	805	-	-
ø 160	-	272	-	412	-	552	662	802	922	1042	1152

SAH-63, 100



SAH-160



Series NBU

B – Unit

PAT

- HIGH SPEED AIR SPRAY THROUGH NOZZLE GENERATES DIFFERENTIAL PRESSURE AT GLASS SURFACE, WHICH INDUCES SUCTION PHENOMENON AT GLASS SURFACE, SO THAT INDUCES STABLE ELEVATION.
- COMFORTABLE LEVELING WITH APPLICATION OF FLEXIBLE PAD, AND UPGRADED ELEVATION WITH EXCELLENT ADHESION TO WORK SURFACE OWING TO TILT (2") FUNCTION
- ADVANTAGEOUS FOR ELEVATION OF HEAVY MATERIALS OWING TO HIGH RESOLUTION ARRANGEMENT WITH PARALLEL SECTION SHAPE AT EXTERNAL MOUNTING PART

How to Order

NBU 10 B – 30

1 2 3 4

1 NBU = Air Blow Unit

2 Nozzle Diameter
10 : Ø1(mm)
25 : Ø2.5 (mm)

3 PAD
B : Blow Type Pad
V : Vacuum Type Pad

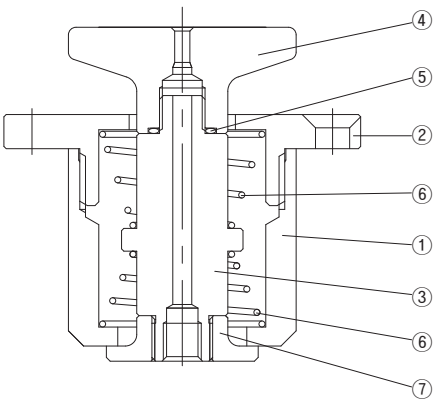
4 PAD External Diameter
30 : Ø30 (mm)

Product Specifications

Cylinder specification

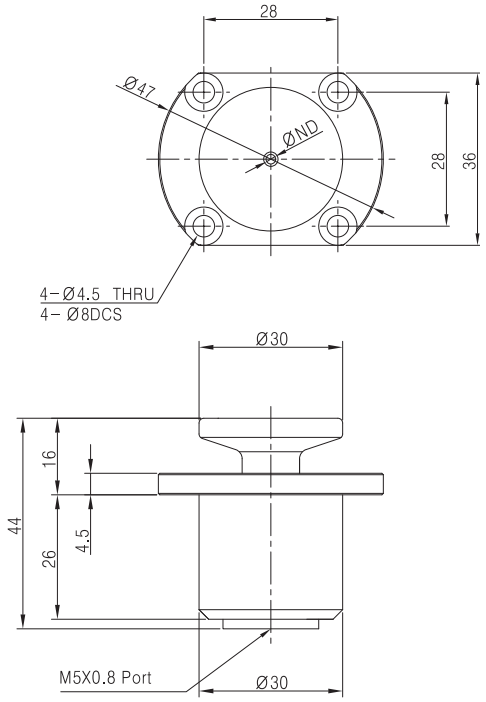
Item	Dimension		Remark
	NBU 10	NBU 25	
Fluid	Air		
Elevation Weight	0.3 kgf/1EA		
Maximum Pressure	0.1~0.5 Mpa (1~5 kgf/㎠)		
Flux Consumption	45 ℓ/min	33 ℓ/min	
Elevation Height	0.3~0.5mm		

Construction/Parts List



No.	Item number	Material	Quantity	Remark
1	Body	Aluminum Alloy	1	
2	Cover	Aluminum Slloy	1	
3	Shaft	Stainless Steel	1	
4	PAD	Engineering Plastic (V–Type)	1	
5	Gasket	Rubber	1	
6	Spring	Spring Steel	2	
7	End Plate	Aluminum Alloy	1	

External Dimension Drawing



Nozzle Diameter	10	25
ØND	Ø1	Ø2.5

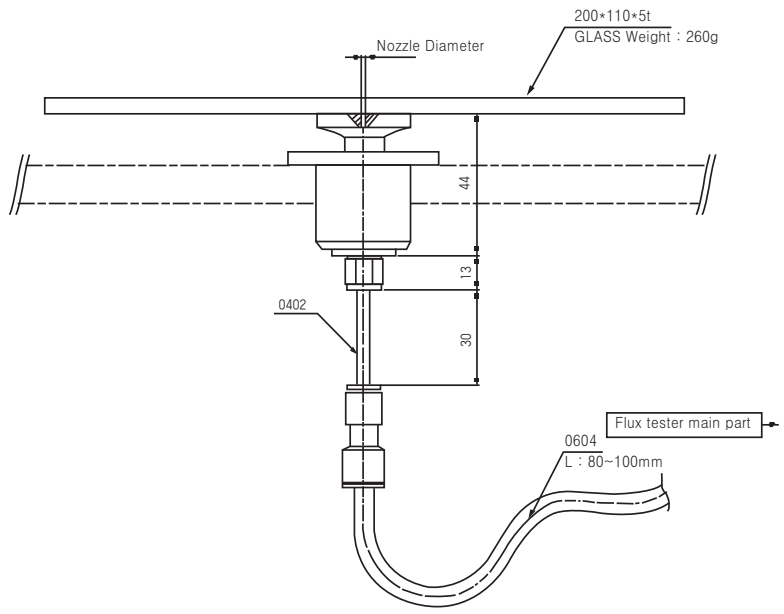
Air Consumption Estimation Sheet

Air Consumption Along Pressure Supplied: Nozzle Diameter Ø1.0

Pressure(kgf/cm²)		1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5
Air Consumption (ℓ/min)	Non-Loading Condition	19	23	27	31	35	40	44	48	52
	When Glass Loading	18	21	25	29	33	37	42	45	49

Air Consumption Along Pressure Supplied: Nozzle Diameter Ø2.5

Pressure(kgf/cm²)		1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5
Air Consumption (ℓ/min)	Non-Loading Condition	49	60	71	82	93	104	116	128	139
	When Glass Loading	11	14	17	20	23	26	29	33	38



<Test Map>

※ In case tube length and test conditions are different to test map above, the result may differ.

Series ACU

Centering Unit

Ø65 , Ø100, Ø130

PAT

- MAXIMIZED SHAFT EXTERNAL DIAMETER, INCREASED TRANSVERSE LOADING-RESISTANCE IN CASE OF TABLE LOCKING
- SINCE IT IS LOCKED AS PISTON IS DESCENDING, NO SHAKING OF TABLE
- RESTRAIN VACUUM GENERATION AT CLUTCH PART DURING LOCKING RELEASING, ENHANCED ORIGINAL POINT RESTORATION
- UPGRADED ASSEMBLY PERFORMANCE AND COMPACT EXTERIOR BY CYLINDER-TUBE INTEGRATED STRUCTURE
- POSSIBLE TO SELECT MATERIALS FOR UPPER TABLE
- SUCTION PORT RESERVED TO FORCIBLY EXHAUST PARTICLE GENERATED INSIDE
- USER CONVENIENCE AND SOLIDITY ORIENTED MECHANICAL STRUCTURE

How to Order

ACU 65 — L A S — (30)

1 2 3 4 5 6

1 Centering (Floating) Unit

2 Internal Diameter and Table Maximum Eccentricity
- 65 : Ø65 (15 mm)
- 100 : Ø100 (20 mm)
- 130 : Ø130 (30 mm)

3 Operating Method
- Blank : Double action standard type (Whole types)
- L : Lock & Lift Type (Only for Ø100 and Ø130)
- ※ For lock constant releasing type, please contact us.(single specitication)

4 Connection specification
- Blank : Flange attached (Standard type)
- A : Height adjusting type(Only fo Ø65 Type)

5 Table Material Specification
- Blank : Engineering Plastic
- S : Stainless steel

6 Spacer mount specification (Ø65 height adjusting type is not pertinent)
- Blank : Spacer not mounted
- (30) : Spacer height 30
- Standard : 5~100
- ※ For over 100mm, please contact us.

Product Specifications

Cylinder specifications

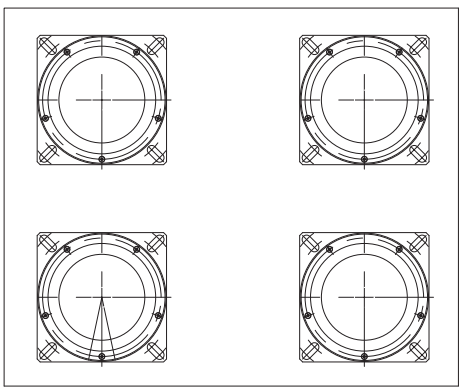
Item	Type			Remark
	Ø65	Ø100	Ø130	
Fluid	Air			
Action	Double/Single Action			Refer to Order Form
Cylinder Tube/Piston Rod Diameter	Ø65 / Ø50	Ø100 / Ø90	Ø130 / Ø120	
Cylinder Stroke	Less than 1mm			
Table Horizontal Stroke (Eccentricity)	15mm	20 mm	30 mm	
Table Max. Portable Load	300 kgf	400 kgf	500 kgf	
Locking Force	About 68 kgf	About 75 kgf	About 98kgf	
Proof Pressure	1.3 Mpa (12.8 kgf/㎠)			
Maximum Operating Pressure	0.87 Mpa (8.5 kgf/㎠)			
Minimum Operating Pressure	0.2 Mpa (2.0 kgf/㎠)			
Ambient and Fluid Temperature	5~60℃			
Stroke Length Tolerance	0 ~ +0.3mm			
Centering Restoration Location (after operating 1 million times)	Diameter ±0.5 in Less			
Lubrication	Non-Lube			
Applied Piston Speed	50~500 mm/sec			

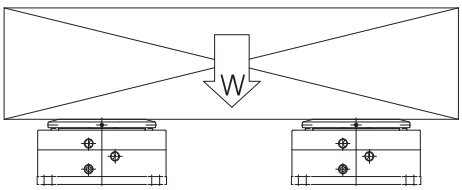
C-Unit Specification Selecting Method

1. Cassette Weight Checking

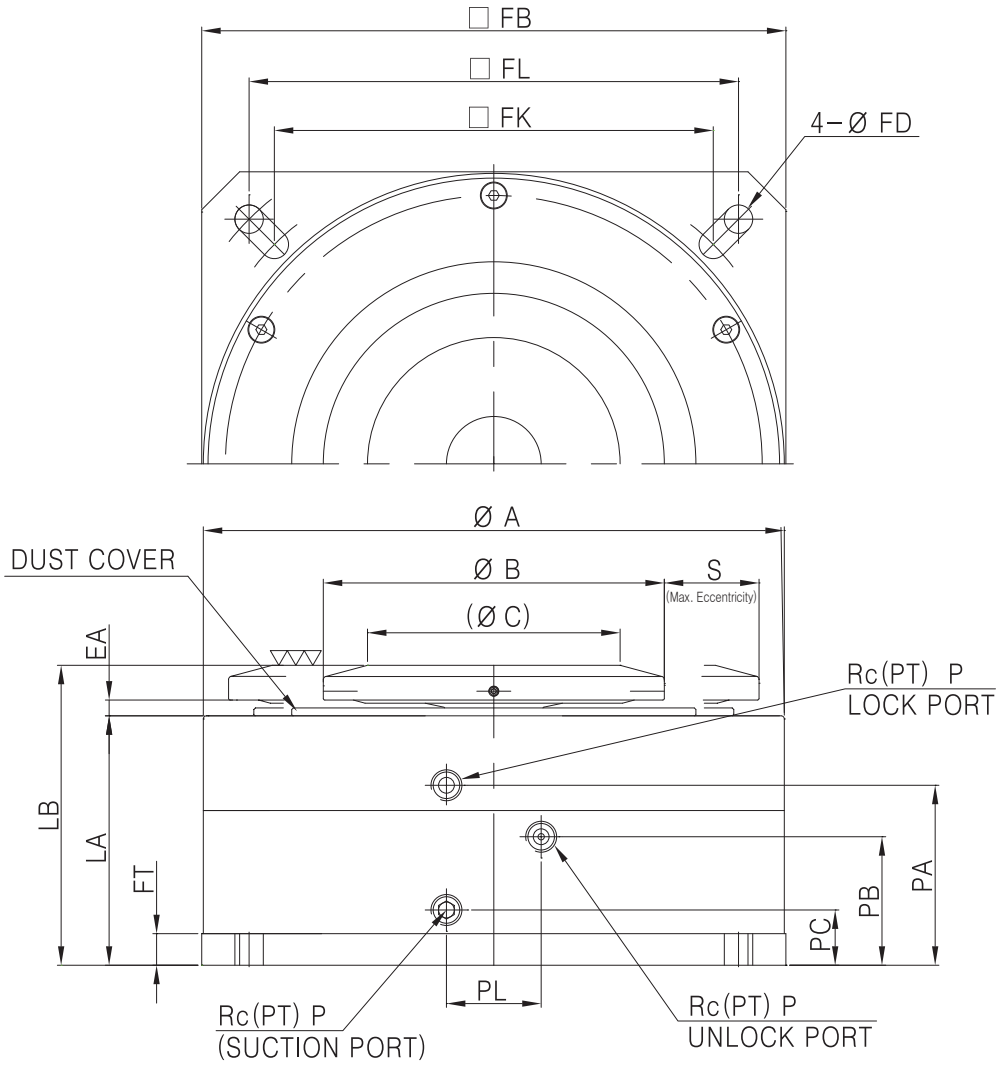
2. C-Unit installation Quantity Checking
   ※ Quantity and interference checking
   ※ Less than 60% of loading rate for total portable load is applied
   Quantity = {Work (glass, etc) included max weight / (Max portable load x 0.6)}

3. C-Unit Selection
   ※ Type selection in consideration of frame deformation in accordance with estimated quantity and distance between C-Units along each machine type.





External Dimension Drawing



Machine Type	S	A	B	C	LA	LB	EA	FT	FK	FL	FB	FD	P	PA	PB	PC	PL
Ø 65	15	99	109	80	56.5	63	0.5	6	–	80	102	7	1/8	38	19.5	–	(25.5)
Ø 100	20	130	109	76	65	66	2.5	8	101	117	131	9	1/8	41.5	28.5	15.5	(27)
Ø 130	30	184	108	80	79	95	5	10	–	155	185	9	1/8	57	40.7	17.5	(30)

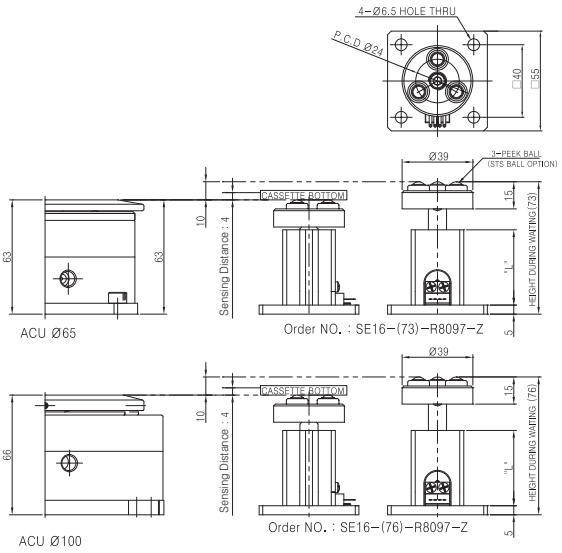
Series SE(Sensing Unit)

Standard Type/Double Acting : Single Rod

Ø16 Y, Z Type

- COMPACT SIZED WITH ACTUALIZATION OF THE SAME HEIGHT TO C-UNIT
- POSSIBLE TO APPLY ALONG C-UNIT HEIGHTS, NO NEED OF ADDITIONAL HEIGHT ADJUSTING SPACER
- IN APPLICATION OF BALL TRANSFER AT UPPER PLATE, UPGRADED WEARING-RESISTANCE AND POSSIBLE TO SELECT BALL MATERIALS ALONG THE PURPOSES

ACY 65 and ACU 100 Applied



Order Form

SE16 - 73 (S) - R8097 - Z

- Type No.
- BALL Material-Blank : PEEK, S : STS
- Height During Waiting(73mm)
- Model Name

Product Specification

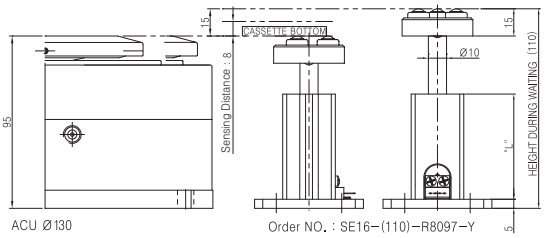
Action	Single Acting(Spring Return)	Stroke	10mm
Sensor	EE-SX673A (OMRON)	SensingStroke	6~10mm (4mm Region)
Height Range (Waiting height)	73~95 mm		

※ Height for order during waiting is selected in dimensions within regulation.

"L" Part Dimension Condition Table

Waiting height	73~82	83~92	93~102
"L"	41.5	48	58

ACU 130 Applied



How to Order

SE16 - 110 (S) - R8097 - Y

- Type No.
- BALL Material-Blank : PEEK, S : STS
- Height During Waiting(110mm)
- Model Name

Specifications

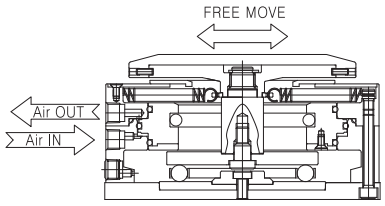
Action	Single Acting(Spring Return)	Stroke	15mm
Sensor	EE-SX673A (OMRON)	Sensing Stroke	8~15mm (7mm Region)
Height Range (Waiting height)	98~147 mm		

※ Height for order during waiting is selected in dimensions within regulation.

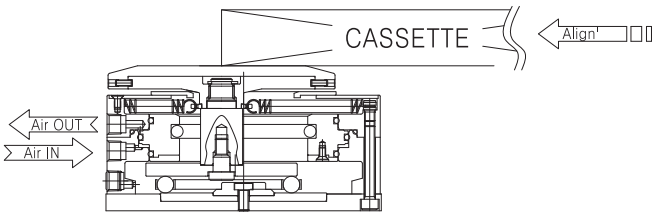
"L" Part Dimension Condition Table

Waiting height	98~107	108~117	118~127	128~137	138~147
"L"	58	68	78	88	98

C-Unit Motion Condition



Waiting Condition



Cassette Centering

1. Waiting Condition
   ▶ Located at upper floating table center, and possible to freely move by external force

2. Work (Cassette) Loading
   ▶ After cassette loading, centering by alignment cylinder

3. Work Fix After Centering Completed
   ▶ Work fixed by air supply floating table fix at lock port

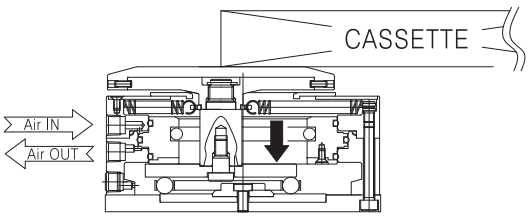
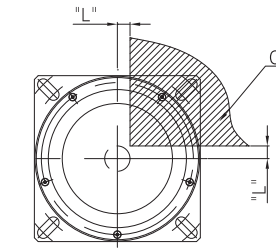


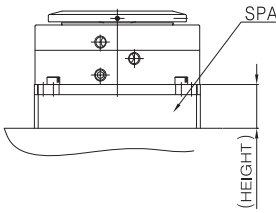
Table LOCK
(Cassette Fix)

Notices for C-Unit and S-Unit Installation

1. It should be careful that cassette is possibly off regulated value from the center. In case cassette is off from regulated value, one-side loading is applied, which causes problem in floating table connecting shaft.
2. In case of using over one-side maximum eccentricity of cylinder, it possibly generates early wearing or floating table or damage of floating table connecting shaft. It is recommended to install stopper at the side not to generate eccentricity.
3. In case of install a spacer to adjust the height during C-Unit installation, load is concentrated at the middle of C-Unit, so that special caution is needed for the center of spacer inside.
   * It is possible to deal with exclusive spacers along each item produced by manufacturer, it is recommended to order with cylinder.
4. Be cautious for selection of R8097-Z and Y types since its sensing distance and stroke are different.
5. It is recommended to install the height of C-Unit within applied stroke of sensing unit. If lower, it may cause damage of sensing unit owing to direct load from cassette.
6. This product is made for axial loading only, which transverse loading structure is not allowed, and please keep sufficient loading height not to bring impact during cassette loading.
7. Please contact our customer center (1588-5982) if there is a problem occurred or any inquiries.



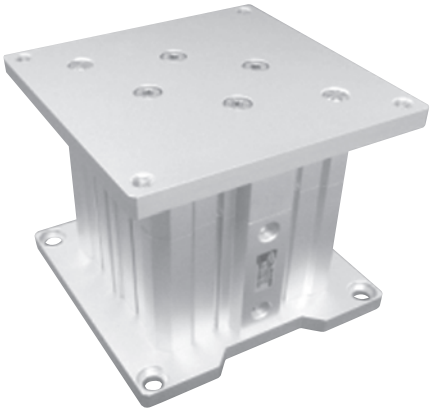
NO.	"L"
ACU Ø65	6mm
ACU Ø100	11mm
ACU Ø130	17mm



※ SPACER (If Orderd Separately)

NO.	ORDER NO	Remark
ACU Ø65	AQ2B65-36-(Height)-R3804-3M-3	Excluding Height Adjustable Type
ACU Ø100	AQ2B100-36-(Height)-R3804K	
ACU Ø130	AQ2B130-36-(Height)-R3804G	

Series ARM CYLINDER



- OWING TO DRAMATICALLY BIGGER PISTON ROD DIAMETER THAN OTHER COMMON CYLINDERS, SHOWING STRONG ROD-SIDE TRANSVERSE LOADING RESISTANCE FOR FORWARD MOTION AND POSSIBLE FOR FORWARD MOTION WITHOUT PISTON PACKING
- LESS BACKWARD MOTION-SIDE VOLUME, CONTRIBUTING TO REDUCE AIR CONSUMPTION
- NO NEED OF ADDITIONAL GUIDE INSTALLATION, INSTALLATION COST SAVING
- MAINLY APPLIED FOR LIFT

How to Order

ARM (K) 125 — 50 S — W8* S

1 2 3 4 5 6 7

1 Actuator Ram Cylinder

2 Piston Rod Rotation
- Blank : None(Without non-rotation function standard type)
- K : Non-rotation type

3 Cylinder Internal Diameter
- Ø63 : 63mm
- Ø80 : 80mm
- Ø100 : 100mm
- Ø125 : 125mm

4 Stroke
- 30 : 30mm
- 50 : 50mm
- 75 : 75mm
- 100 : 100mm
- ※ Spacer installed in every 5mm, possible to produce middle stroke beside standard stroke. Please contact for other stroke cases.

5 Action
- Blank : Double action (standard type)
- S : Single action forward motion (Spring not installed)

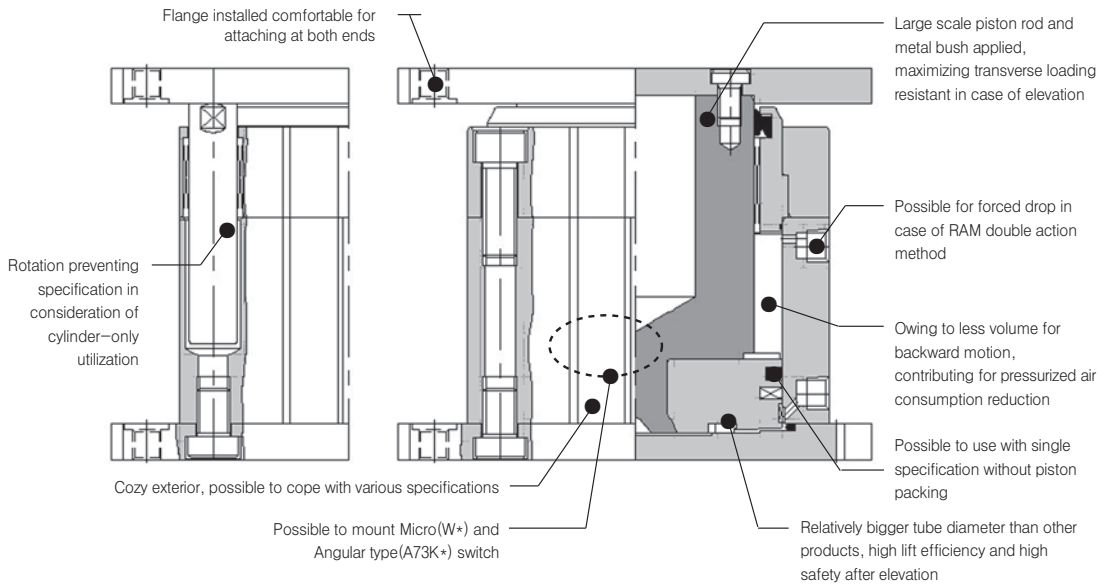
6 Auto Switch
- Blank : None(Built in magnet)
- B : Without magnet

Reed Switch
- W4 : Reed switch
- W8H(V) : Micro auto switch, horizontal (vertical) type, 2 wire

Solid State Switch
- W9H(V) : Micro auto switch, horizontal (vertical) type, 2 wire
- W9H(V)N : Micro auto switch, horizontal (vertical) type, 3 wire
- W2P : Built in magnet auto switch(solide state switch)

7 Number of Auto Switches
- Blank : 2 pcs
- S : 1 pc
- N : N pcs

Product Features



Product Specifications

Item	Type (Tube Internal Diameter)			
	Ø63	Ø80	Ø100	Ø125
Fluid	Air			
Tube Internal Diameter/Rod External Diameter	Ø63 / Ø50	Ø80 / Ø60	Ø100 / Ø80	Ø125 / Ø100
Cylinder Standard Stroke	30, 50, 75, 100mm(possible to cope with 5mm unit spacer mount in case of middle stroke)			
Stroke Length Tolerance	0 ~ +1.0mm			
Proof Pressure	12.8 Kgf/㎠			
Maximum Operating Pressure	8.5 Kgf/㎠			
Minimum Operating Pressure	0.5 Kgf/㎠			
Action	Double Action (Standard), Single Action (Lift and Forward Motion Only)			
Piston Speed Applied	20~200mm/sec			
Cushion	Rubber (End of Elevation and Drop) Cushion			
Vicinity and Applied Fluid Temperature	–5~60℃			
Refueling	No refuel			
Port Size	Rc (PT)1/8		Rc (PT)1/4	
Auto Switch	W8*, W9*, D–A73K*, W2P (Refer to type indicating method for details)			
Attaching Method	Bolt Penetration Hole of Rod & Head Side Flange or Tap Attached			

Theoretical Output Sheet

Bore Size (mm)	Rod external Diameter (mm)	Operation Category	Hydraulic Pressure Area (cm^2)	Operating Pressure (Kgf/cm^2)								
				1	2	3	4	5	6	7	8	8.5
Ø63	Ø50	For Forward Motion	31	31	62	93	124	155	186	217	248	264
		For Backward Motion	11.5	12	23	35	46	58	69	81	92	98
Ø80	Ø60	For Forward Motion	50	50	100	150	200	250	300	350	400	425
		For Backward Motion	22	22	44	66	88	110	132	154	176	187
Ø100	Ø80	For Forward Motion	78.5	79	157	236	314	393	471	550	628	667
		For Backward Motion	28.2	28	56	85	113	141	169	197	226	240
Ø125	Ø100	For Forward Motion	122.5	123	245	368	490	613	735	858	980	1,041
		For Backward Motion	44	44	88	132	176	220	264	308	352	374

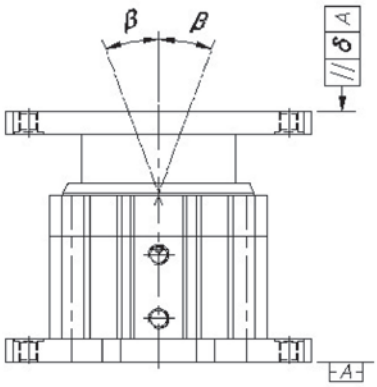
In case of single acting for lifting, output of forwarding and output of backwarding are same.
During backwarding, it can be dropped because of weight.

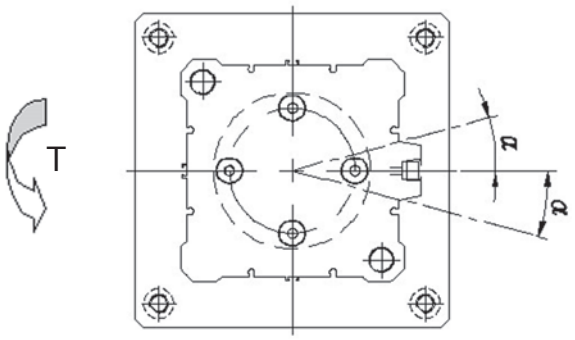
Product Weight List

(Unit : kgf)

Bore Size(mm)	Type	Standard Stroke (mm)			
		30	50	75	100
Ø63	Standard Type	2.1	2.7	3.2	3.7
	Rotation Preventing Type	2.2	2.8	3.3	3.8
Ø80	Standard Type	3.7	4.6	5.3	6.0
	Rotation Preventing Type	3.8	4.7	5.4	6.1
Ø100	Standard Type	7.3	8.5	9.5	10.5
	Rotation Preventing Type	7.7	9.0	10.1	11.2
Ø125	Standard Type	12.2	14.0	15.5	17.0
	Rotation Preventing Type	13.2	15.3	17.0	18.7

Degree of Table Horizontal Level & Shaking





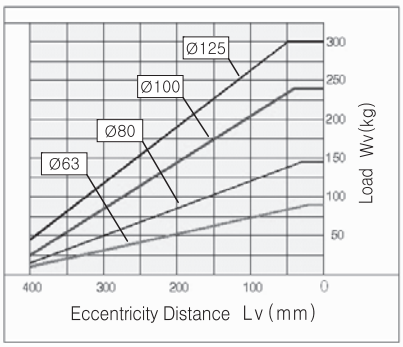
Type	Degree of Upper/Lower Table horizontal Level(δ)	Degree of Shaking During Elevation(β)	Degree of Table Rotating Prevention(α)	Table Rotating Torque Allowance(T, N · m)			
				30 Stroke	50 Stroke	75 Stroke	100 Stroke
Ø63	Less than ±0.2	0.15° or Less	0.08° or Less	2	1.6	1.5	1
Ø80				3.1	2.7	2.2	1.8
Ø100		0.1° or Less	0.05° or Less	6.7	5.8	4.6	3.5
Ø125				11.7	10.4	9	7.6

Note1) Mean value during forward/backward motion at 5kgf/cm^{2}pressure applied

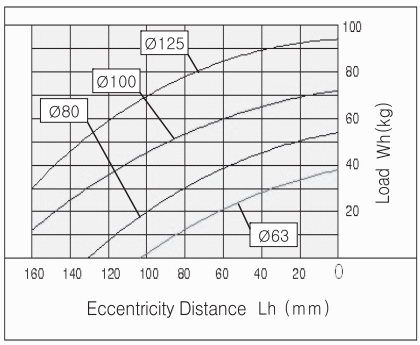
Note2) Degree of table rotating prevention and torque allowable is data for the case of rotation preventing specification.

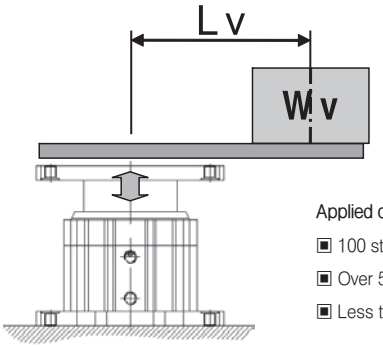
Allowable Bending and Loading Sheet

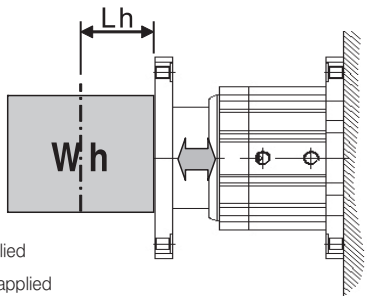
▽ VERTICAL



▽ HORIZONTAL







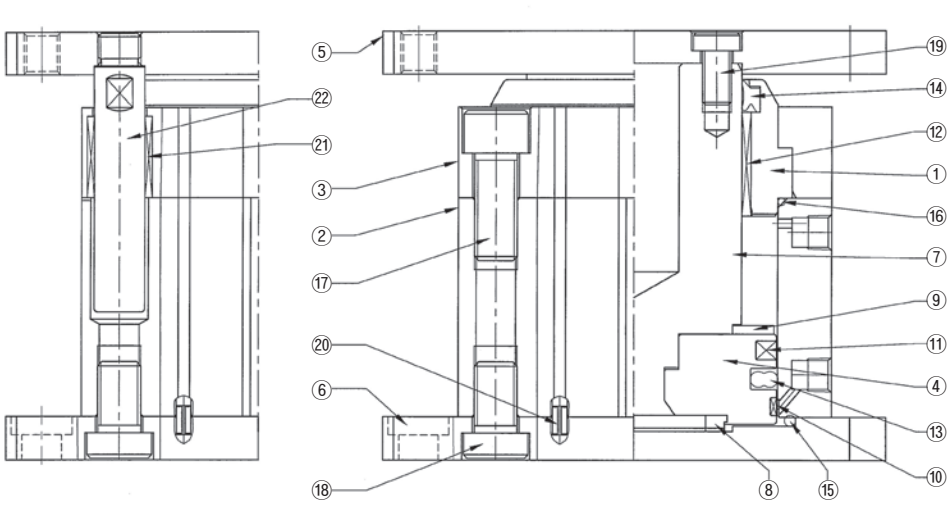
Applied condition

- ▣ 100 stroke base
- ▣ Over 5kgf/cm^2 for pressure applied
- ▣ Less than 200mm/s for speed applied

Product Structure Map

Rotation Preventing Type

Standard Type

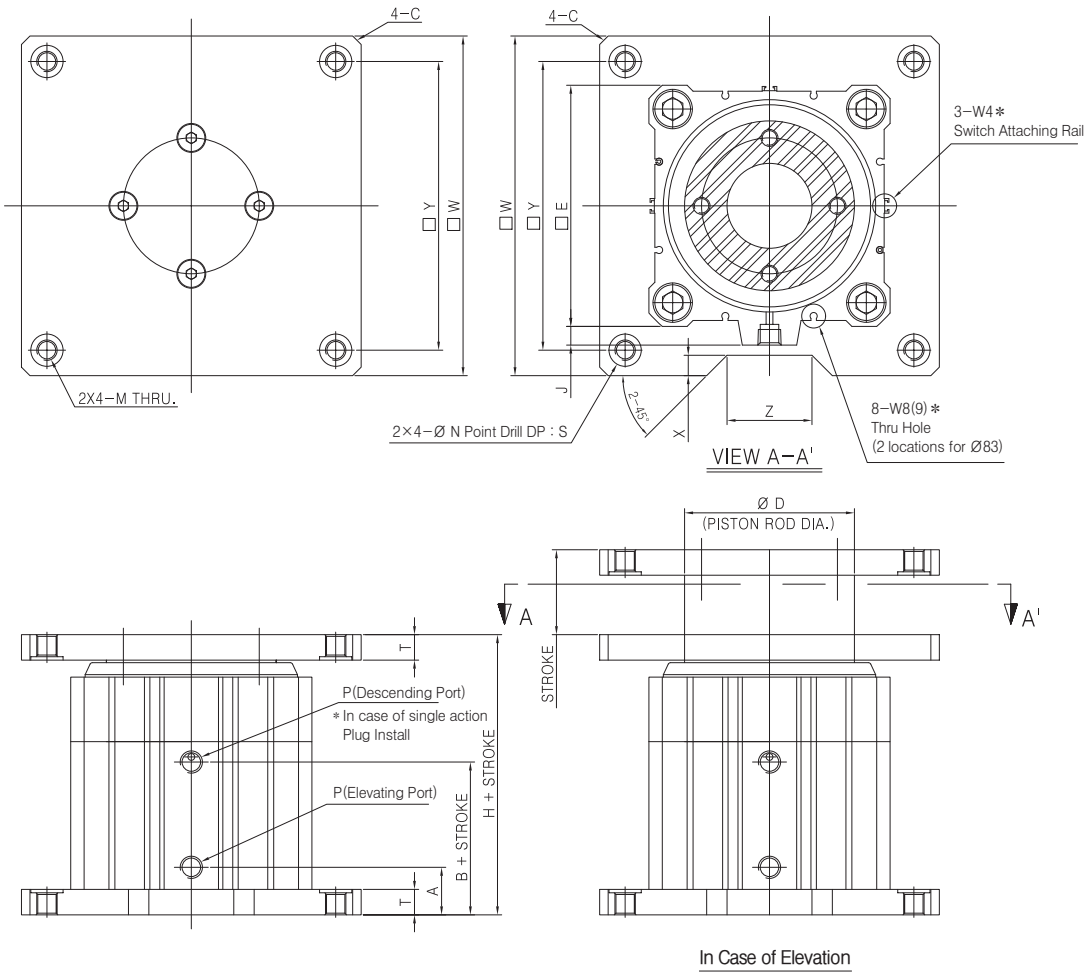


No.	Item Number	Quantity	Material	Remark
1	Rod Cover	1	Aluminum Alloy	
2	Cylinder Tube A	1	Aluminum Alloy	
3	Cylinder Tube B	1	Aluminum Alloy	
4	Piston	1	Aluminum Alloy	
5	Flange A	1	Aluminum Alloy	
6	Flange B	1	Aluminum Alloy	
7	Piston Rod	1	Carbon Steel	
8	Bumper A	1	Urethane	
9	Bumper B	1	Urethane	
10	Wear Ring	1	Resin	
11	Magnet Ring	1	Magnet	

No.	Item Number	Quantity	Material	Remark
12	Bush	1	Mile bronze casting	
13	Piston Packing	1	NBR	
14	Rod Packing	1	NBR	
15	Tube gasket A	1	NBR	
16	Tube gasket B	1	NBR	
17	Wrench Bolt	4(2)	Chrome Molybdenum Steel	
18	Wrench Bolt	4	Chrome Molybdenum Steel	
19	Wrench Bolt	4	Chrome Molybdenum Steel	
20	Spring Pin	2	Carbon tool steel	
21	Guide Bush	(2)	Resin	
22	Guide Rod	(2)	Stainless steel	

Note1) Quantity in ( ) in item number 17, 21 and 22 is for rotation preventing specification case.

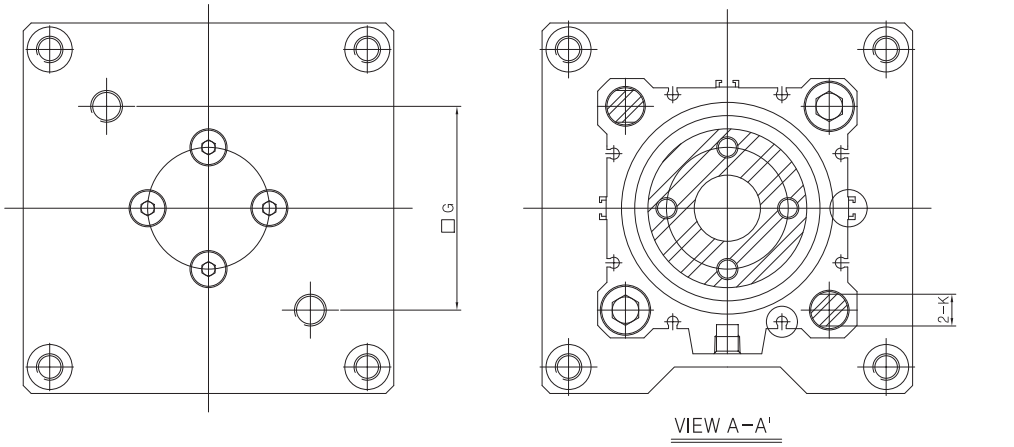
Dimension Drawing - Standard Type Ø63, 80, 100, 125

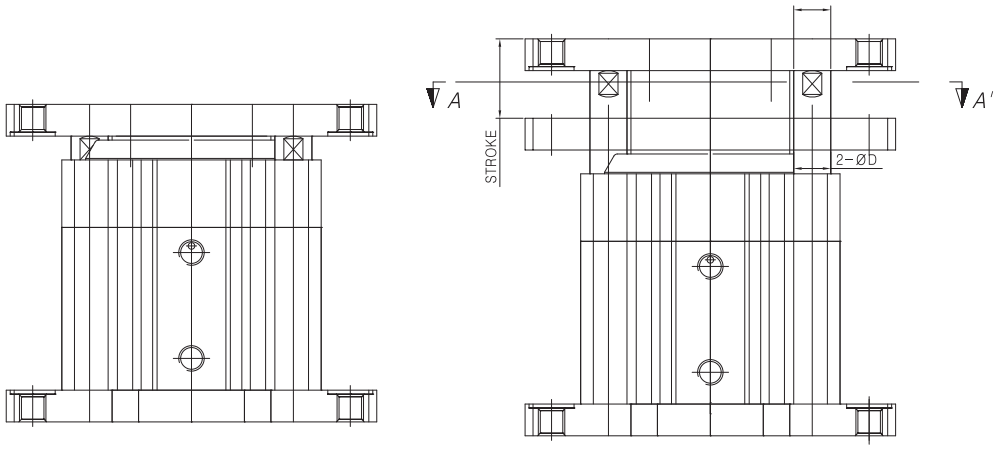


In Case of Elevation

Bore Size	DEMENTIONS															
	H	W	Y	P	A	B	C	D	E	J	M	N	S	T	X	Z
Ø63	80	120	100	Rc(PT) 1/8	24	30	3	50	77	7	M8×1.25	14	1.3	10	10	40
Ø80	90	140	120		24	34	3	60	98	6	M10×1.25	17	1.5	12	10	40
Ø100	100	160	140	Rc(PT) 1/4	26	37	3	80	117	6.5		17	1.5	12	10	50
Ø125	115	200	170		28	40	5	100	142	11	M12×1.75	19	2	15	12	50

Dimension Drawing - Rotation Preventing type Ø63, 80, 100, 125





Bore Size	DEMENTIONS		
	G	D	K
Ø63	60	12	10
Ø80	77	14	12
Ø100	94	16	14
Ø125	114	20	18

Note) Dimensions without indication are identical to standard type.

Product Manual

▣ In case of single installation and utilization of cylinder, please use with selecting rotation preventing option if additional rotation preventing option does not exist.

▣ In case center distance of applied load is over 400mm or rotating torque is over the regulation, use more than 2 standard cylinders as it is shown in Figure 1.

- But, there should be no deflection and shaking at connecting bracket to installed cylinder, and return speed should be adjusted to the same.

▣ Please apply loading of cylinder within the range of allowable transverse loading.

- In case of using for vertical lift purpose, operation performance is better as margin rate of output against allowable transverse load is bigger, and safety is enhanced.

▣ As RAM type cylinder, it is possible to install 1 air pipe for lift (Single spec without spring).

- But, elevation output becomes identical to piston rod (hydraulic section X pressure), however, forcible descending is not available for non–loading condition owing to descending caused by gravity although speed control is comfortable owing to increased cylinder internal volume. It is applied for safety problem free area or rod for descending with light loading, or if head–side pipe interference or installation is unavailable. (Refer to double action for spring controller instruction. Use double solenoid valve for safety matters)

▣ In case of using double action type RAM cylinder with heavy loading for lift, please carry out piping as it is shown in Figure 3 for safety.

- Combine/install meter in and meter out speed controller at forward motion (head–side) side, and use after adjustment of speed. Speed control of backward side is not easy owing to insufficient volume.
- Use after installation of pilot check valve or descending preventing valve at pipe line to prevent accident. The closer to the cylinder, the better.
- Use double solenoid option for elevation/descending operation switching valve of cylinder. Single solenoid valve may cause accident owing to sudden movement in case of power OFF.

▣ Please contact manufacturer for other inquiries or additional production specification.

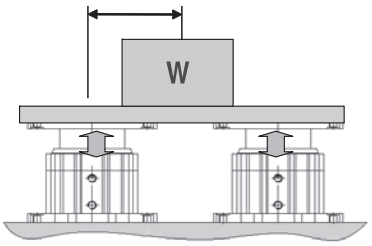


Fig. 1 Cylinder Connection Installation Figure

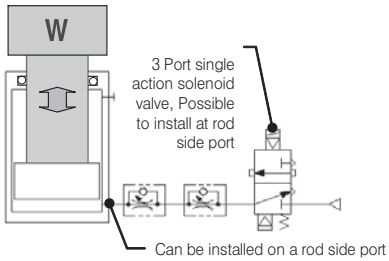


Fig. 2 Single Action Piping

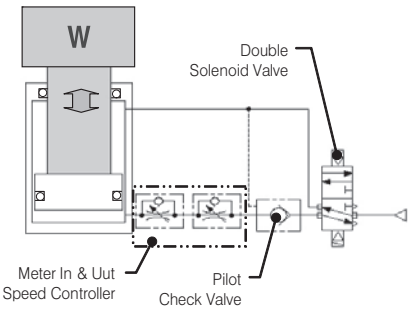


Fig. 3 Double Action Piping

Notice for Use

Notice

- Do not approach fingers to lower side of table during cylinder operation, it possibly gets between flange and cylinder tube. Please install safety cover if it is installed near workers.
- The heavier installation load, the slower operation speed, and high speed exhaust valve should not be utilized. If may cause accident owing to acceleration of descending speed.
- If height adjustment is carried out by installation of spacer as it is shown in right figure, do not make any space under cylinder center part. If cylinder is moved backward, loading is concentrated to the center, which causes deflection of flange.
- Cylinder pipe contact screw and orifice diameter are adjusted to cylinder speed. Arbitrary extension processing may cause acceleration of speed.
- Please comply safety notice, and hope this machine will help your business.