Air Cylinder Short Type

New

RoHS

Fully Functional
Compact Design

Space saving design for shorter total length.

contributes to downsizing of equipment.

Up to **21%** lighter

Up to **66** mm shorter

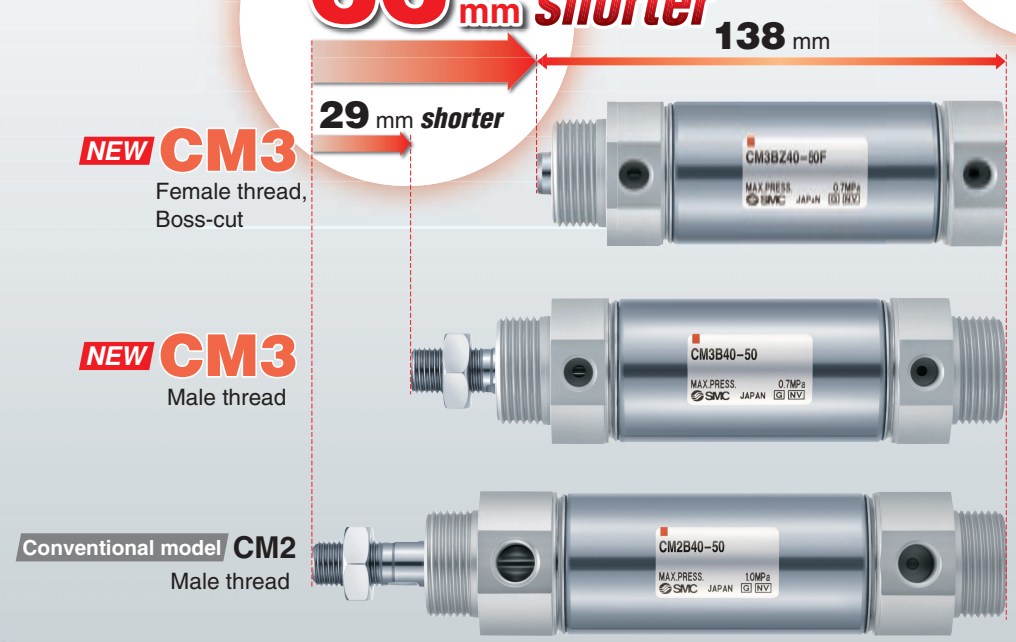
29 mm shorter

138 mm

NEW **CM3**
Female thread,
Boss-cut

NEW **CM3**
Male thread

Conventional model **CM2**
Male thread



CM3B40-50□ stroke

Series ***CM3***

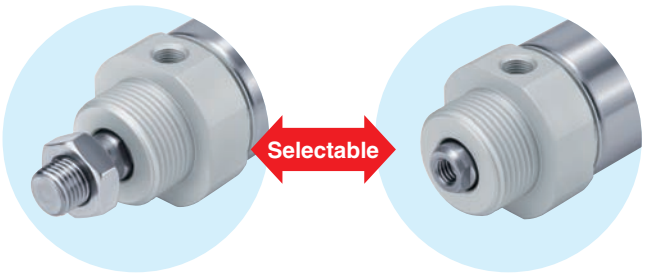
SMC

CAT.NAS20-212A

Series CM3

Female rod end available as standard

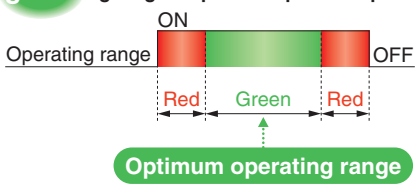
Applications expanded by making it possible to select either male or female thread within the standard model.



2-color indication solid state auto switch mountable

Possible to confirm whether the position is appropriate at a glance.
Shortens adjustment time.

A green light lights up at the optimum operating range.



Shorter total length than CM2 series

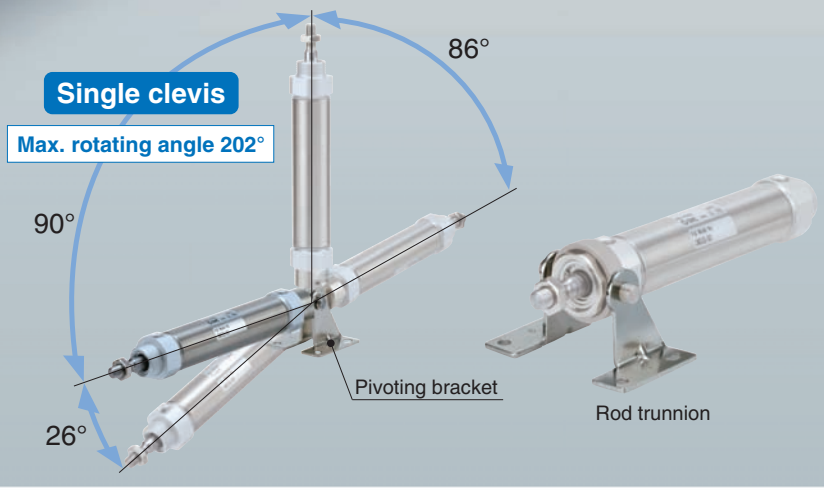
Bore size (mm)	Shortened by
20	17 mm
25	17 mm
32	13 mm
40	29 mm

∗ Compared with the basic type with male thread

Tube is resistant to external impact.
Prevents deformation and damage from external impact.

Small auto switches are mountable.

Pivoting single clevis and trunnion bracket are mountable.
Rotation: Max. 202° (CM3C40)



Series Variations

Series	Bore size (mm)	Standard stroke (mm)	Action	Rod	Mounting	Built-in magnet for auto switch	Rubber bumper	Auto switch
CM3	20, 25, 32, 40	25 to 300	Double acting	Single rod	Basic, Foot, Flange, Clevis, Trunnion	●	●	D-M9□(W), D-A90

Air Cylinder Short Type
Standard: Double Acting, Single Rod
Series CM3
ø20, ø25, ø32, ø40

RoHS

How to Order

CM3 L 40 – 150 □

With auto switch **CDM3 L 40 – 150 □ – M9BW □**

With auto switch
(Built-in magnet)

Mounting

B	Basic
L	Foot
F	Rod flange
G	Head flange
C	Single clevis
D	Double clevis
U	Rod trunnion

T	Head trunnion
E	Integral clevis
BZ	Boss-cut/Basic
FZ	Boss-cut/Rod flange
UZ	Boss-cut/Rod trunnion

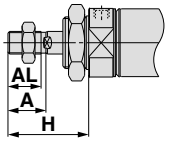
Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm

Rod end thread

Nil	Male thread
F	Female thread
G	Long male rod end*

∗ G: Same rod end dimensions (A, AL, H) as CM2 series.



Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

Nil	Without auto switch

∗ For applicable auto switches, refer to the below table.

Cylinder stroke (mm)
Refer to the next page for standard strokes.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDM3F32-100

Applicable Auto Switches/Refer to pages 1263 to 1371 in Best Pneumatics No. 2 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model	Lead wire length (m) 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
Solid state auto switch	——	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)				M9P	●	●	●	○	—	○		
				2-wire		12 V		M9B	●	●	●	○	—	○	—	
		Connector						H7C	●	—	●	●	●	—		
		Terminal conduit		3-wire (NPN)		5 V, 12 V		G39A	—	—	—	—	●	—	IC circuit	
				2-wire		12 V		K39A	—	—	—	—	●	—	—	
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		M9NW	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)				M9PW	●	●	●	○	—	○		
				2-wire		12 V		M9BW	●	●	●	○	—	○	—	
	Water resistant (2-color indication)							H7BA	—	—	●	○	—	○		
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		H7NF	●	—	●	○	—	○	IC circuit	
Reed auto switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96	●	—	●	—	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	A93	●	—	●	●	—	—	—	Relay, PLC
			No				100 V or less	A90	●	—	●	—	—	—	IC circuit	
			Yes				100 V, 200 V	B54	●	—	●	●	—	—	—	
			No				200 V or less	B64	●	—	●	—	—	—		
		Connector	Yes				—	C73C	●	—	●	●	●	—		
			No				24 V or less	C80C	●	—	●	●	●	—	IC circuit	
		Terminal conduit	Yes				—	A33A	—	—	—	—	●	—	—	PLC
							100 V, 200 V	A34A	—	—	—	—	●	—		Relay, PLC
		DIN terminal						A44A	—	—	—	—	●	—		
	Diagnostic indication (2-color indication)	Grommet				—	—	B59W	●	—	●	—	—	—		

∗ Lead wire length symbols: 0.5 m ·····Nil (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ
None ····· N (Example) H7CN

∗ Solid state auto switches marked with "○" are produced upon receipt of order.
∗ Do not indicate suffix "N" for no lead wire on the D-A3□A/A44A/G39A/K39A types.
∗ The D-G39A/K39A cannot be mounted on the bore size ø20.
∗ The D-A9□V/M9□V/M9□WV types and the D-M9□A(V)L type cannot be mounted.

∗ Since there are other applicable auto switches than listed above, refer to Best Pneumatics .
∗ For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.
∗ The D-A9□/M9□/M9□W type auto switches are shipped together, (but not assembled). (However, auto switch mounting brackets are assembled when being shipped.)
∗ Water resistant type auto switch can be mounted to the models with the above mentioned part numbers, but this does not guarantee the water resistance of the cylinder. A water resistant type cylinder is recommended for use in an environment which requires water resistance.
∗ For other applicable auto switches, please contact SMC.

Specifications

Bore size (mm)		20	25	32	40
Type		Pneumatic			
Action		Double acting, Single rod			
Fluid		Air			
Proof pressure		145 psi (1.0 MPa)			
Maximum operating pressure		102 psi (0.7 MPa)			
Minimum operating pressure		7 psi (0.05 MPa)			
Ambient and fluid temperature		Without auto switch: 14 to 158°F (–10 to 70°C) (No freezing) With auto switch: 14 to 140°F (–10 to 60°C) (No freezing)			
Lubrication		Not required (Non-lube)			
Stroke length tolerance		$^{+1.4}_{0}$ mm			
Piston speed		50 to 750 mm/s			
Cushion		Rubber bumper			
Allowable kinetic energy	**Male rod end**	0.2 J	0.29 J	0.46 J	0.84 J
	Female rod end	0.11 J	0.18 J	0.29 J	0.52 J

∗ Operate the cylinder within the allowable kinetic energy. Refer to page 4 for details.

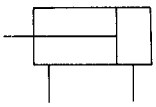
Standard Strokes

Bore size (mm)	Standard stroke (mm) Note)
20	25, 50, 75, 100, 125, 150, 200, 250, 300
25	
32	
40	

∗ Other intermediate strokes can be manufactured upon receipt of order.
Manufacture of intermediate strokes in 1 mm intervals is possible. (Spacers are not used.)

JIS Symbol

Double acting, Single rod



Refer to pages 13 to 16 for cylinders with auto switches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

Boss-cut

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

Comparison of the Full Length Dimension (Versus CM3□-□ type)

(mm)

ø20	ø25	ø32	ø40
–13	–13	–13	–16

Mounting

■ Boss-cut/Basic (BZ) ■ Boss-cut/Rod flange (FZ)
■ Boss-cut/Rod trunnion (UZ)

Mounting Brackets/Part No.

Mounting bracket	Min. order qty.	Bore size (mm)				Contents (for minimum order quantity)
		20	25	32	40	
Foot ∗	2	CM-L020B	CM-L032B		CM-L040B	2 foots, 1 mounting nut
Flange	1	CM-F020B	CM-F032B		CM-F040B	1 flange
Single clevis ∗∗	1	CM-C020B	CM-C032B		CM-C040B	1 single clevis, 3 liners
Double clevis ∗∗ ∗∗∗ (with pin)	1	CM-D020B	CM-D032B		CM-D040B	1 double clevis, 3 liners, 1 clevis pin, 2 retaining rings
Trunnion (with nut)	1	CM3-T020B	CM3-T032B		CM3-T040B	1 trunnion, 1 trunnion nut

∗ Order 2 foots per cylinder.
∗∗ 3 liners are included with a clevis bracket for adjusting the mounting angle.
∗∗∗ A clevis pin and retaining rings (split pins for ø40) are included.

⚠Warning

1. **Operate the cylinder within the specified cylinder speed, kinetic energy and lateral load at the rod end.**
2. **The allowable kinetic energy is different between the cylinders with male rod end and with female rod end due to the different thread sizes. Refer to page 4.**
3. **When female rod end is used, use a washer, etc. to prevent the contact part at the rod end from being deformed depending on the material of the work piece.**

⚠Caution

1. **Use a thin wrench when tightening the piston rod.**

Mounting and Accessories

Mounting \ Accessories	Standard			Option		
	Mounting nut	Rod end nut (male thread)	Clevis pin	Single knuckle joint	Double knuckle joint Note 3)	Pivoting clevis bracket Note 4)
Basic	●(1 pc.)	●	—	●	●	—
Foot	●(2)	●	—	●	●	—
Rod flange	●(1)	●	—	●	●	—
Head flange	●(1)	●	—	●	●	—
Integral clevis	— Note 1)	●	—	●	●	●
Single clevis	— Note 1)	●	—	●	●	—
Double clevis Note 3)	— Note 1)	●	● Note 5)	●	●	—
Rod trunnion	●(1) Note 2)	●	—	●	●	—
Head trunnion	●(1) Note 2)	●	—	●	●	—
Boss-cut/Basic	●(1)	●	—	●	●	—
Boss-cut/Rod flange	●(1)	●	—	●	●	—
Boss-cut/Rod trunnion	●(1)	●	—	●	●	—

Note 1) Mounting nuts are not attached to the integral clevis, single clevis and double clevis types.
Note 2) Trunnion nuts are attached to the rod trunnion and head trunnion types.
Note 3) A pin and retaining rings (split pins for ø40) are included with the double clevis and double knuckle joint.
Note 4) A pivoting clevis bracket pin and retaining rings are included with the pivoting clevis bracket.
Note 5) Retaining rings (split pins for ø40) are included with the clevis pin.

Mounting Brackets, Accessories/Material, Surface Treatment

Segment	Description	Material	Surface treatment
Mounting brackets	Foot	Iron	Nickel plated
	Flange	Iron	Nickel plated
	Single clevis	Iron	Nickel plated
	Double clevis	Iron	Nickel plated
	Trunnion	Iron	Electroless nickel plated
Accessories	Rod end nut (male thread)	Iron	Nickel plated
	Mounting nut	Iron	Nickel plated
	Trunnion nut	Iron	Nickel plated
	Pivoting clevis bracket	Iron	Nickel plated
	Pivoting clevis bracket pin	Iron	(None)
	Single knuckle joint	Iron	Electroless nickel plated
	Double knuckle joint	Iron	Electroless nickel plated Metallic bronze color painted for ø40
	Double clevis pin	Iron	(None)
	Double knuckle joint pin	Iron	(None)

⚠ Warning

1. Do not rotate the cover.
If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.

⚠ Caution

1. Do not touch the cylinder during operation at a high speed and a high frequency.
Use caution when handling a cylinder, which is running at a high speed and a high frequency, because the surface of a cylinder tube could get so hot enough as to cause you get burned.

2. Do not use the air cylinder as an air-hydro cylinder.
If it uses turbine oil in place of operating fluids for cylinder, it will result in oil leakage and damage the product.

Weights

(kg)

Bore size (mm)		20	25	32	40
Basic weight	Basic	0.12	0.18	0.25	0.45
	Long male rod end (G)	0.13	0.20	0.27	0.48
	Female rod end (F)	0.11	0.17	0.23	0.41
	Boss-cut/Basic	0.11	0.17	0.23	0.42
	Boss-cut/Long male rod end	0.12	0.18	0.25	0.45
	Boss-cut/Female rod end	0.10	0.15	0.22	0.38
	Integral clevis	0.12	0.18	0.26	0.46
	Integral clevis/Long male rod end	0.13	0.19	0.28	0.48
	Integral clevis/Female rod end	0.11	0.16	0.25	0.41
Additional weight for bracket	Foot	0.15	0.16	0.16	0.27
	Flange	0.06	0.09	0.09	0.12
	Single clevis	0.04	0.04	0.04	0.09
	Double clevis	0.05	0.06	0.06	0.13
	Trunnion	0.04	0.07	0.07	0.10
Pivoting bracket		0.08	0.09	0.17	0.25
Single knuckle joint		0.05	0.09	0.09	0.10
Double knuckle joint (with pin)		0.05	0.09	0.09	0.13
Additional weight per 50 mm of stroke		0.04	0.06	0.08	0.11
Additional weight for switch magnet		0.01	0.01	0.01	0.01

Calculation: (Example) **CDM3F20-100G**
(Flange type, ø20, 100 mm stroke)
- Basic weight ····· 0.12 (Basic type G, ø20)
- Additional weight for bracket ···· 0.06 (Flange)
- Additional weight for stroke ····· 0.04/50 mm
- Air cylinder stroke ····· 100 mm
- Additional weight for switch magnet ···· 0.01

0.12 + 0.06 + 0.04 x (100/50) + 0.01 = 0.27 kg

Allowable Kinetic Energy

Table (1) Max. Allowable Kinetic Energy [J]

Bore size (mm)	20	25	32	40
Male rod end	0.2	0.29	0.46	0.84
Female rod end	0.11	0.18	0.29	0.52

Kinetic energy E (J) $= \dfrac{(m_1 + m_2)\,V^2}{2}$

m_1: Mass of cylinder movable parts kg
m_2: Load mass kg
V : Piston speed at the end m/s

Table (2) Mass of Cylinder Movable Parts: At Each Rod End/Without Built-in Magnet/0 Stroke [g]

Bore size (mm)	20	25	32	40
Basic	31.2	55.8	82.5	147.3
Long male rod end (G)	39.4	69.4	102.0	172.7
Female rod end (F)	22.4	38.5	66.5	102.3

∗ Mass of the rod end nut is included for the basic type and the long male rod end type (G).

Table (3) Additional Mass [g]

Bore size (mm)	20	25	32	40
Additional mass per 50 mm of stroke	19.6	30.6	44.1	60.6
Switch magnet	3.5	4.0	5.0	6.0

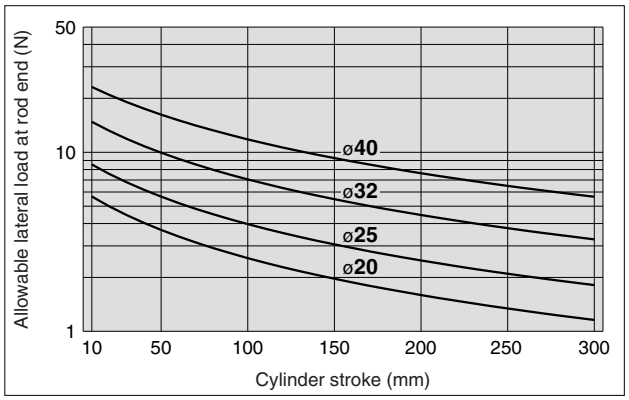
∗ Do not apply a lateral load over the allowable range to the rod end when it is mounted horizontally.

Calculation: (Example) **CDM3B40-175**

- Basic mass of movable parts: Table (2) Rod end [Basic], Bore size [40] ····· 147.3 g
- Additional mass: Additional mass of stroke 60.6 x 175/50 = 212.1 g ···· 212.1 g
  Switch magnet ····· 6.0 g

Total 365.4 g

Allowable Lateral Load at Rod End



Theoretical Output

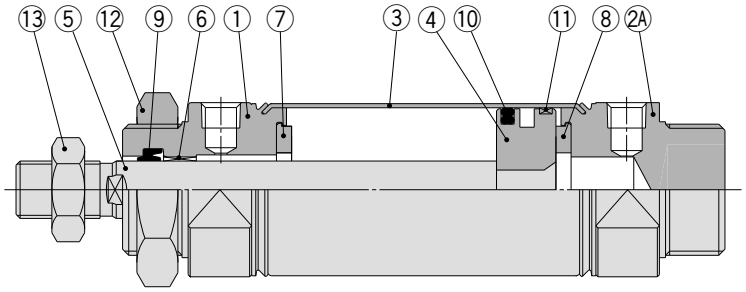
Unit: N

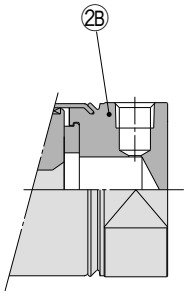
Bore size D (mm)	Rod size d (mm)	Operating direction	Piston area (mm²)	Operating pressure (MPa) 0.2	0.3	0.4	0.5	0.6	0.7
20	8	OUT	314	62.8	94.2	125.6	157	188.4	219.8
		IN	264	52.8	79.2	105.6	132	158.4	184.8
25	10	OUT	491	98.2	147.3	196.4	245.5	294.6	343.7
		IN	412	82.4	123.6	164.8	206	247.2	288.4
32	12	OUT	804	160.8	241.2	321.6	402	482.4	562.8
		IN	691	138.2	207.3	276.4	345.5	414.6	483.7
40	14	OUT	1257	251.4	377.1	502.8	628.5	754.2	879.9
		IN	1103	220.6	330.9	441.2	551.5	661.8	772.1

∗ Theoretical outpt (N) = Pressure (MPa) x Piston area (mm²)

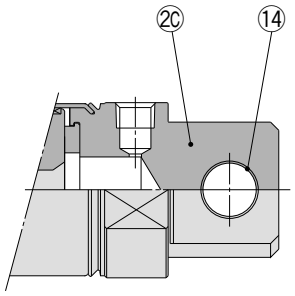
Construction

With rubber bumper





Boss-cut



Clevis integrated

Component Parts

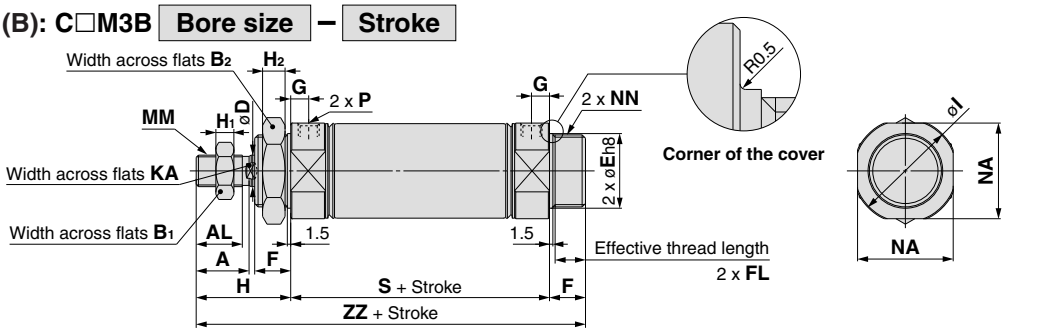
No.	Description	Material	Note
1	**Rod cover**	Aluminum alloy	Anodized
2A	**Head cover A**	Aluminum alloy	Anodized
2B	**Head cover B**	Aluminum alloy	Anodized
2C	**Head cover C**	Aluminum alloy	Anodized
3	**Cylinder tube**	Stainless steel	
4	**Piston**	Aluminum alloy	Chromated
5	**Piston rod**	Iron	Hard chrome plated
6	**Bushing**	Copper alloy	
7	**Bumper A**	Urethane	
8	**Bumper B**	Urethane	
9	**Rod seal**	NBR	
10	**Piston seal**	NBR	
11	**Wear ring**	Resin	
12	**Mounting nut**	Iron	Nickel plated
13	**Rod end nut**	Iron	Nickel plated
14	**Bushing for clevis**	Copper alloy	

⚠ Caution

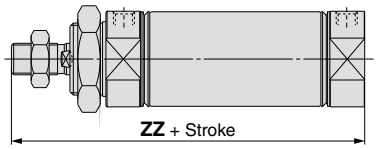
1. Not able to disassemble.
Cover and cylinder tube are connected to each other by crimping method, thus making it impossible to disassemble.

Dimensions

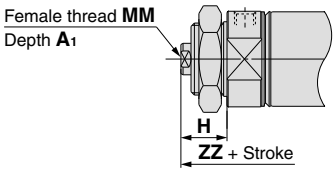
Basic (B): C□M3B Bore size – Stroke



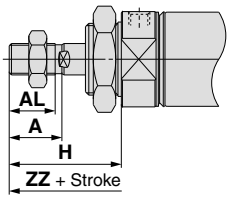
Boss-cut



Female rod end



Long male rod end *2



Basic (B)

(mm)

Bore size	A	AL	B1	B2	D	E	F	FL	G	H	H1	H2	I	KA	MM	NA	NN
20	14.5	12	13	26	8	$20^{0}_{-0.033}$	13	10.5	6	31	5	8	27.9	Width across flats 6 length 3.5	M8 x 1.25	24	M20 x 1.5
25	17.5	15	17	32	10	$26^{0}_{-0.033}$	13	10.5	6	34	6	8	33.4	Width across flats 8 length 3.5	M10 x 1.25	30	M26 x 1.5
32	17.5	15	17	32	12	$26^{0}_{-0.033}$	13	10.5	8	34	6	8	37.4	Width across flats 10 length 3.5	M10 x 1.25	34.5	M26 x 1.5
40	23.5	20.5	22	41	14	$32^{0}_{-0.039}$	16	13.5	8	42	8	10	46.4	Width across flats 12 length 3.5	M14 x 1.5	42.5	M32 x 2

Bore size	P	S	ZZ
20	M5 x 0.8	55	99
25	M5 x 0.8	56	103
32	Rc1/8	62	109
40	Rc1/8	67	125

Boss-cut (mm)

Bore size	ZZ
20	86
25	90
32	96
40	109

Female Rod End (mm)

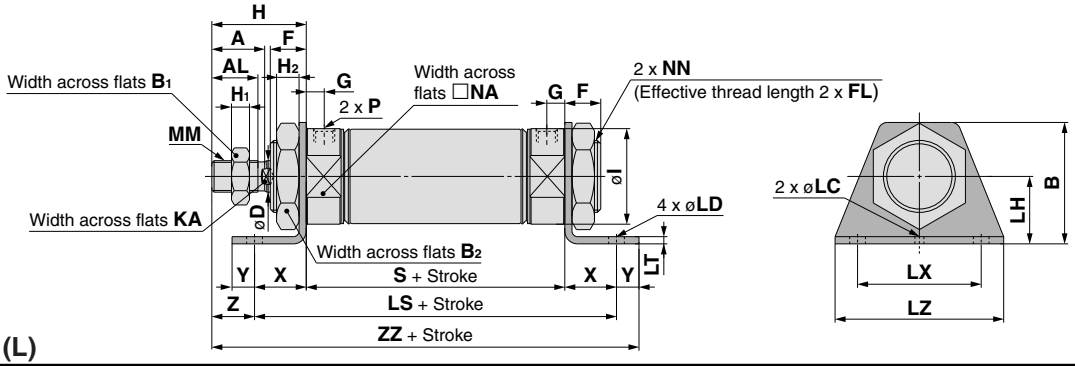
Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	88
25	8	20	M5 x 0.8	89
32	12	20	M6 x 1	95
40	13	21	M8 x 1.25	104

Long Male Rod End (mm)

Bore size	A	AL	H	ZZ
20	18	15.5	41	109
25	22	19.5	45	114
32	22	19.5	45	120
40	24	21	50	133

*1 Use a thin wrench when tightening the piston rod.
*2 The dimension from the rod cover to the male rod end of the long male rod end type is the same as the CM2 series.
*3 When female thread is used, use a washer, etc. to prevent the contact part at the rod end from being deformed depending on the material of the work piece.

Foot (L): C□M3L Bore size – Stroke



Foot (L)

(mm)

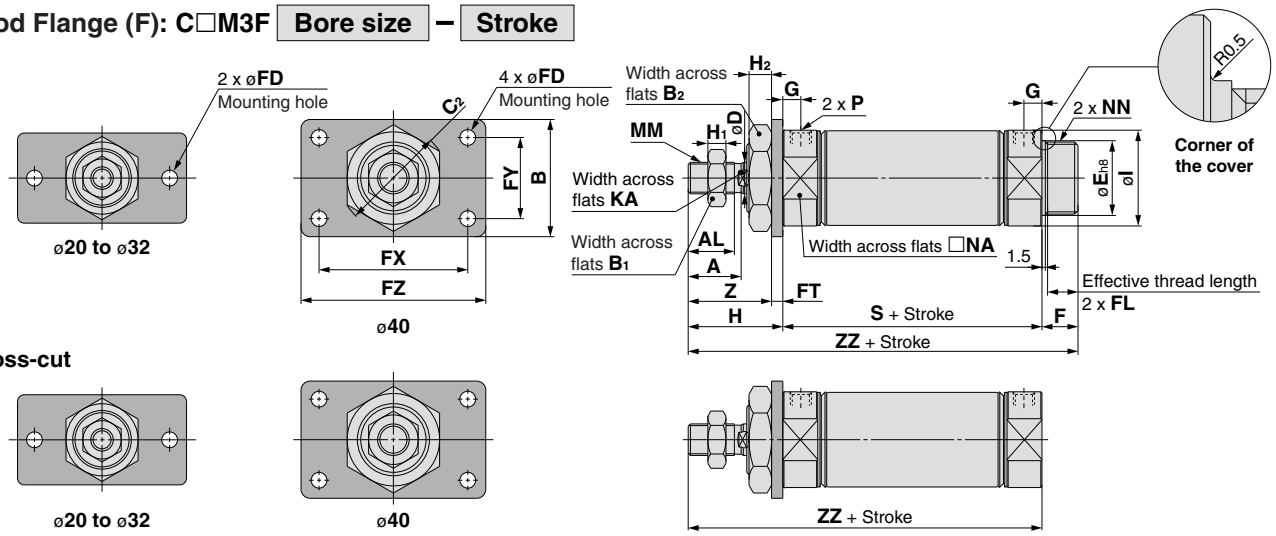
Bore size	A	AL	B	B1	B2	D	F	FL	G	H	H1	H2	I	KA	LC	LD	LH	LS
20	14.5	12	40	13	26	8	13	10.5	6	31	5	8	27.9	Width across flats 6 length 3.5	4	6.8	25	95
25	17.5	15	47	17	32	10	13	10.5	6	34	6	8	33.4	Width across flats 8 length 3.5	4	6.8	28	96
32	17.5	15	47	17	32	12	13	10.5	8	34	6	8	37.4	Width across flats 10 length 3.5	4	6.8	28	102
40	23.5	20.5	54	22	41	14	16	13.5	8	42	8	10	46.4	Width across flats 12 length 3.5	4	7	30	113

Bore size	LT	LX	LZ	MM	NA	NN	P	S	X	Y	Z	ZZ
20	3.2	40	55	M8 x 1.25	24	M20 x 1.5	M5 x 0.8	55	20	8	11	114
25	3.2	40	55	M10 x 1.25	30	M26 x 1.5	M5 x 0.8	56	20	8	14	118
32	3.2	40	55	M10 x 1.25	34.5	M26 x 1.5	Rc1/8	62	20	8	14	124
40	3.2	55	75	M14 x 1.5	42.5	M32 x 2	Rc1/8	67	23	10	19	142

* Use a thin wrench when tightening the piston rod.
* Refer to the dimensions of the basic type for the female rod end type and the long male rod end type.

Dimensions

Rod Flange (F): C□M3F Bore size – Stroke



Boss-cut

Rod Flange (F)

(mm)

Bore size	A	AL	B	B_1	B_2	C_2	D	E	F	FD	FL	FT	FX	FY	FZ	G	H	H_1	H_2
20	14.5	12	34	13	26	30	8	$20^{0}_{-0.033}$	13	7	10.5	4	60	—	75	6	31	5	8
25	17.5	15	40	17	32	37	10	$26^{0}_{-0.033}$	13	7	10.5	4	60	—	75	6	34	6	8
32	17.5	15	40	17	32	37	12	$26^{0}_{-0.033}$	13	7	10.5	4	60	—	75	8	34	6	8
40	23.5	20.5	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	7	13.5	5	66	36	82	8	42	8	10

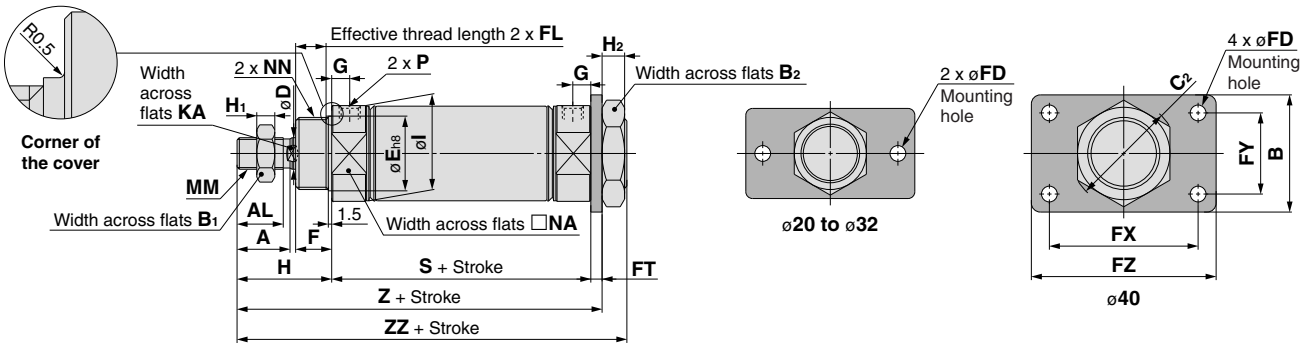
Bore size	I	KA	MM	NA	NN	P	S	Z	ZZ
20	27.9	Width across flats 6 length 3.5	M8 x 1.25	24	M20 x 1.5	M5 x 0.8	55	27	99
25	33.4	Width across flats 8 length 3.5	M10 x 1.25	30	M26 x 1.5	M5 x 0.8	56	30	103
32	37.4	Width across flats 10 length 3.5	M10 x 1.25	34.5	M26 x 1.5	Rc1/8	62	30	109
40	46.4	Width across flats 12 length 3.5	M14 x 1.5	42.5	M32 x 2	Rc1/8	67	37	125

Boss-cut (mm)

Bore size	ZZ
20	86
25	90
32	96
40	109

∗ Use a thin wrench when tightening the piston rod.
∗ Refer to the dimensions of the basic type for the female rod end type and the long male rod end type.

Head Flange (G): C□M3G Bore size – Stroke



Head Flange (G)

(mm)

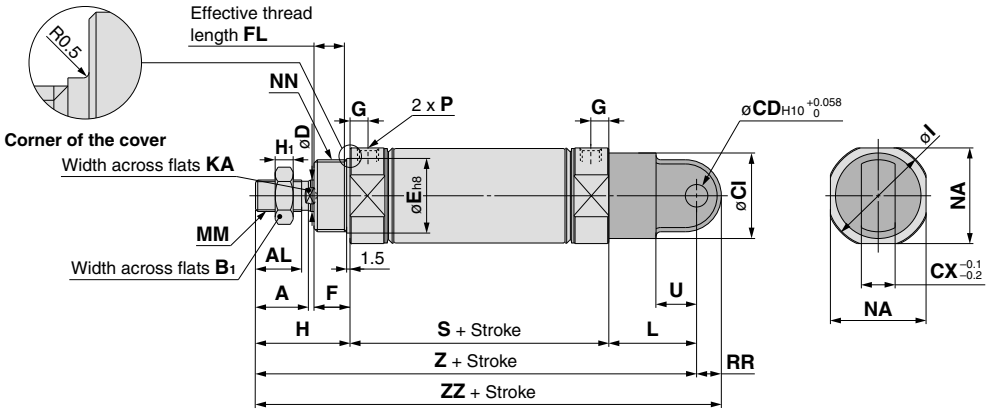
Bore size	A	AL	B	B_1	B_2	C_2	D	E	F	FD	FL	FT	FX	FY	FZ	G	H	H_1	H_2
20	14.5	12	34	13	26	30	8	$20^{0}_{-0.033}$	13	7	10.5	4	60	—	75	6	31	5	8
25	17.5	15	40	17	32	37	10	$26^{0}_{-0.033}$	13	7	10.5	4	60	—	75	6	34	6	8
32	17.5	15	40	17	32	37	12	$26^{0}_{-0.033}$	13	7	10.5	4	60	—	75	8	34	6	8
40	23.5	20.5	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	7	13.5	5	66	36	82	8	42	8	10

Bore size	I	KA	MM	NA	NN	P	S	Z	ZZ
20	27.9	Width across flats 6 length 3.5	M8 x 1.25	24	M20 x 1.5	M5 x 0.8	55	90	99
25	33.4	Width across flats 8 length 3.5	M10 x 1.25	30	M26 x 1.5	M5 x 0.8	56	94	103
32	37.4	Width across flats 10 length 3.5	M10 x 1.25	34.5	M26 x 1.5	Rc1/8	62	100	109
40	46.4	Width across flats 12 length 3.5	M14 x 1.5	42.5	M32 x 2	Rc1/8	67	114	125

∗ Use a thin wrench when tightening the piston rod.
∗ Refer to the dimensions of the basic type for the female rod end type and the long male rod end type.

Dimensions

Single Clevis (C): C□M3C Bore size – Stroke



Single Clevis (C)

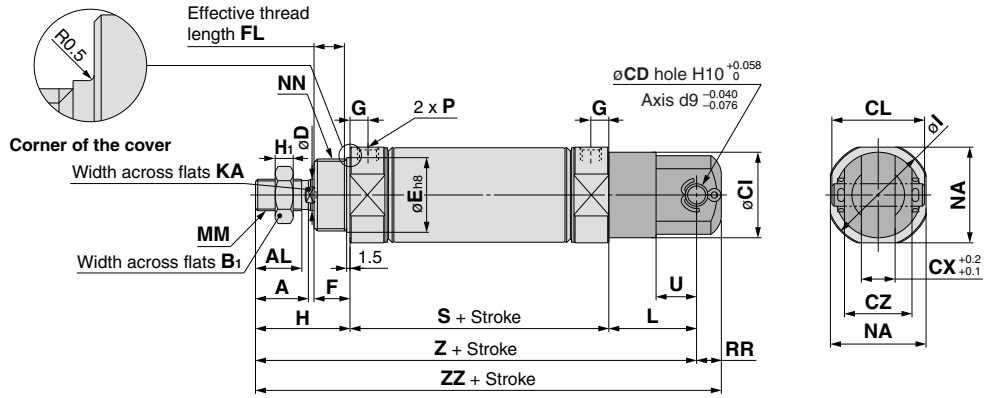
(mm)

Bore size	A	AL	B1	CD	CI	CX	D	E	F	FL	G	H	H1	I	KA	L
20	14.5	12	13	9	24	10	8	$20^{0}_{-0.033}$	13	10.5	6	31	5	27.9	Width across flats 6 length 3.5	30
25	17.5	15	17	9	30	10	10	$26^{0}_{-0.033}$	13	10.5	6	34	6	33.4	Width across flats 8 length 3.5	30
32	17.5	15	17	9	30	10	12	$26^{0}_{-0.033}$	13	10.5	8	34	6	37.4	Width across flats 10 length 3.5	30
40	23.5	20.5	22	10	38	15	14	$32^{0}_{-0.039}$	16	13.5	8	42	8	46.4	Width across flats 12 length 3.5	39

Bore size	MM	NA	NN	P	RR	S	U	Z	ZZ
20	M8 x 1.25	24	M20 x 1.5	M5 x 0.8	9	55	14	116	125
25	M10 x 1.25	30	M26 x 1.5	M5 x 0.8	9	56	14	120	129
32	M10 x 1.25	34.5	M26 x 1.5	Rc1/8	9	62	14	126	135
40	M14 x 1.5	42.5	M32 x 2	Rc1/8	11	67	18	148	159

∗ Use a thin wrench when tightening the piston rod.
∗ Refer to the dimensions of the basic type for the female rod end type and the long male rod end type.

Double Clevis (D): C□M3D Bore size – Stroke



Double Clevis (D)

(mm)

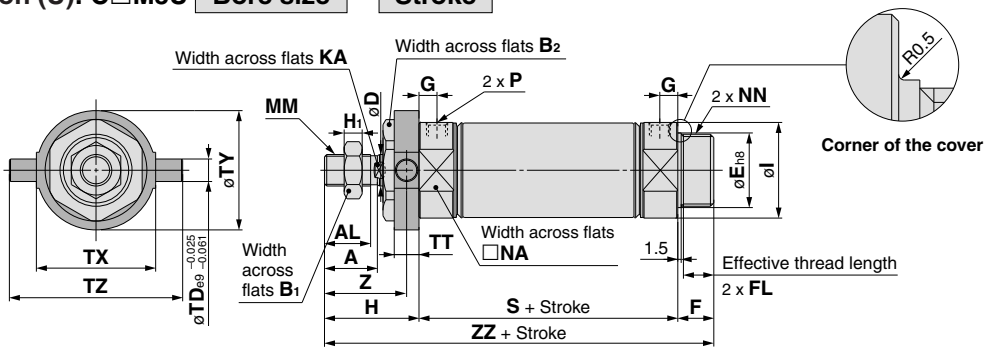
Bore size	A	AL	B1	CD	CI	CL	CX	CZ	D	E	F	FL	G	H	H1	I	KA
20	14.5	12	13	9	24	25	10	19	8	$20^{0}_{-0.033}$	13	10.5	6	31	5	27.9	Width across flats 6 length 3.5
25	17.5	15	17	9	30	25	10	19	10	$26^{0}_{-0.033}$	13	10.5	6	34	6	33.4	Width across flats 8 length 3.5
32	17.5	15	17	9	30	25	10	19	12	$26^{0}_{-0.033}$	13	10.5	8	34	6	37.4	Width across flats 10 length 3.5
40	23.5	20.5	22	10	38	41.2	15	30	14	$32^{0}_{-0.039}$	16	13.5	8	42	8	46.4	Width across flats 12 length 3.5

Bore size	L	MM	NA	NN	P	RR	S	U	Z	ZZ
20	30	M8 x 1.25	24	M20 x 1.5	M5 x 0.8	9	55	14	116	125
25	30	M10 x 1.25	30	M26 x 1.5	M5 x 0.8	9	56	14	120	129
32	30	M10 x 1.25	34.5	M26 x 1.5	Rc1/8	9	62	14	126	135
40	39	M14 x 1.5	42.5	M32 x 2	Rc1/8	11	67	18	148	159

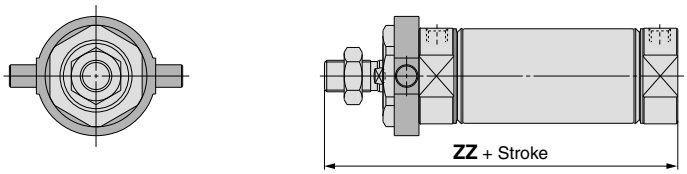
∗ A clevis pin and retaining rings (split pins for ø40) are shipped together.
∗ Use a thin wrench when tightening the piston rod.
∗ Refer to the dimensions of the basic type for the female rod end type and the long male rod end type.

Dimensions

Rod Trunnion (U): C□M3U Bore size – Stroke



Boss-cut



Rod Trunnion (U)

(mm)

Bore size	A	AL	B1	B2	D	E	F	FL	G	H	H1	I	KA	MM	NA
20	14.5	12	13	26	8	$20^{0}_{-0.033}$	13	10.5	6	31	5	27.9	Width across flats 6 length 3.5	M8 x 1.25	24
25	17.5	15	17	32	10	$26^{0}_{-0.033}$	13	10.5	6	34	6	33.4	Width across flats 8 length 3.5	M10 x 1.25	30
32	17.5	15	17	32	12	$26^{0}_{-0.033}$	13	10.5	8	34	6	37.4	Width across flats 10 length 3.5	M10 x 1.25	34.5
40	23.5	20.5	22	41	14	$32^{0}_{-0.039}$	16	13.5	8	42	8	46.4	Width across flats 12 length 3.5	M14 x 1.5	42.5

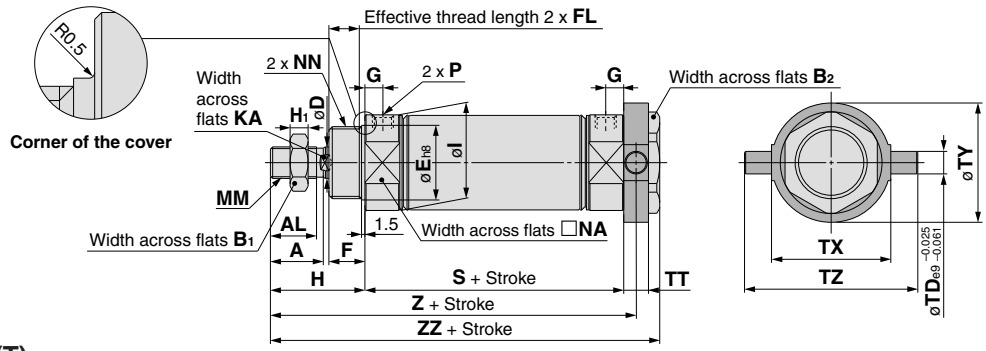
Bore size	NN	P	S	TD	TT	TX	TY	TZ	Z	ZZ
20	M20 x 1.5	M5 x 0.8	55	8	10	32	32	52	26	99
25	M26 x 1.5	M5 x 0.8	56	9	10	40	40	60	29	103
32	M26 x 1.5	Rc1/8	62	9	10	40	40	60	29	109
40	M32 x 2	Rc1/8	67	10	11	53	53	77	36.5	125

Boss-cut (mm)

Bore size	ZZ
20	86
25	90
32	96
40	109

∗ Use a thin wrench when tightening the piston rod.
∗ Refer to the dimensions of the basic type for the female rod end type and the long male rod end type.

Head Trunnion (T): C□M3T Bore size – Stroke



Head Trunnion (T)

(mm)

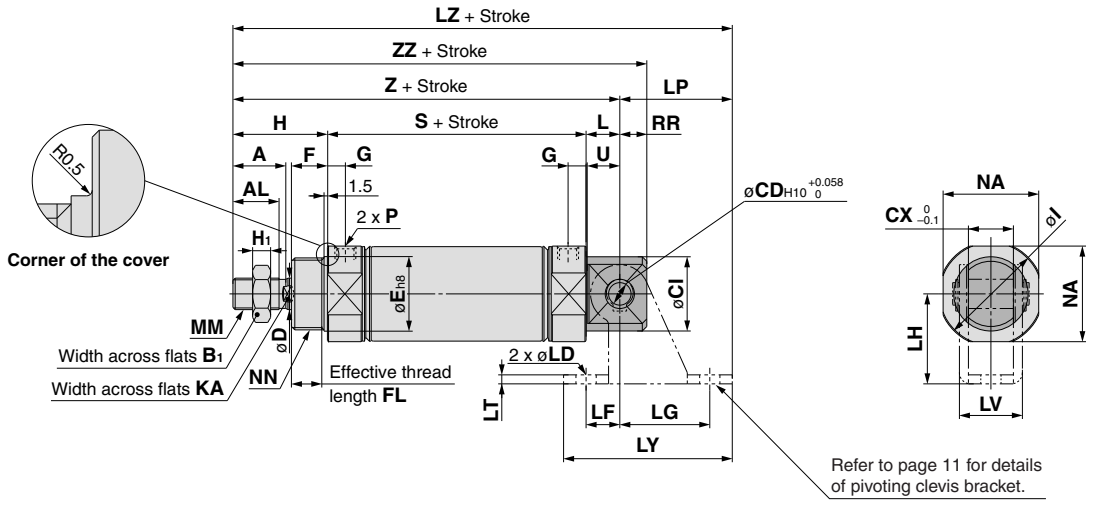
Bore size	A	AL	B1	B2	D	E	F	FL	G	H	H1	I	KA	MM	NA
20	14.5	12	13	26	8	$20^{0}_{-0.033}$	13	10.5	6	31	5	27.9	Width across flats 6 length 3.5	M8 x 1.25	24
25	17.5	15	17	32	10	$26^{0}_{-0.033}$	13	10.5	6	34	6	33.4	Width across flats 8 length 3.5	M10 x 1.25	30
32	17.5	15	17	32	12	$26^{0}_{-0.033}$	13	10.5	8	34	6	37.4	Width across flats 10 length 3.5	M10 x 1.25	34.5
40	23.5	20.5	22	41	14	$32^{0}_{-0.039}$	16	13.5	8	42	8	46.4	Width across flats 12 length 3.5	M14 x 1.5	42.5

Bore size	NN	P	S	TD	TT	TX	TY	TZ	Z	ZZ
20	M20 x 1.5	M5 x 0.8	55	8	10	32	32	52	91	101
25	M26 x 1.5	M5 x 0.8	56	9	10	40	40	60	95	105
32	M26 x 1.5	Rc1/8	62	9	10	40	40	60	101	111
40	M32 x 2	Rc1/8	67	10	11	53	53	77	114.5	125

∗ Use a thin wrench when tightening the piston rod.
∗ Refer to the dimensions of the basic type for the female rod end type and the long male rod end type.

Dimensions

Integral Clevis (E): C□M3E Bore size – Stroke



Integral Clevis (E)

(mm)

Bore size	A	AL	B_1	CD	CI	CX	D	E	F	FL	G	H	H_1	I	KA	L
20	14.5	12	13	8	20	12	8	$20^{0}_{-0.033}$	13	10.5	6	31	5	27.9	Width across flats 6 length 3.5	12
25	17.5	15	17	8	22	12	10	$26^{0}_{-0.033}$	13	10.5	6	34	6	33.4	Width across flats 8 length 3.5	12
32	17.5	15	17	10	27	20	12	$26^{0}_{-0.033}$	13	10.5	8	34	6	37.4	Width across flats 10 length 3.5	15
40	23.5	20.5	22	10	33	20	14	$32^{0}_{-0.039}$	16	13.5	8	42	8	46.4	Width across flats 12 length 3.5	15

Bore size	MM	NA	NN	P	RR	S	U	Z	ZZ
20	M8 x 1.25	24	M20 x 1.5	M5 x 0.8	9	55	11.5	98	107
25	M10 x 1.25	30	M26 x 1.5	M5 x 0.8	9	56	11.5	102	111
32	M10 x 1.25	34.5	M26 x 1.5	Rc1/8	12	62	14.5	111	123
40	M14 x 1.5	42.5	M32 x 2	Rc1/8	12	67	14.5	124	136

Pivoting Clevis Bracket

(mm)

Bore size	LD	LF	LG	LH	LP	LT	LV	LY	LZ
20	6.8	15	30	30	37	3.2	18.4	59	135
25	6.8	15	30	30	37	3.2	18.4	59	139
32	9	15	40	40	50	4	28	75	161
40	9	15	40	40	50	4	28	75	174

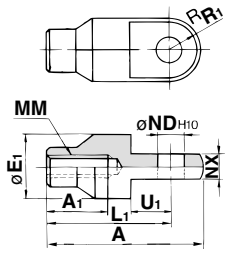
∗ Use a thin wrench when tightening the piston rod.
∗ Refer to the dimensions of the basic type for the female rod end type and the long male rod end type.

Dimensions of Accessories 1

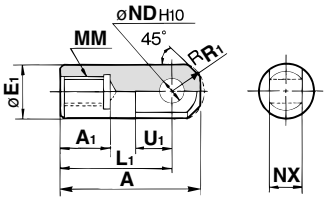
Single Knuckle Joint

(mm)

I-020B, I-032B Material: Iron



I-040B Material: Iron



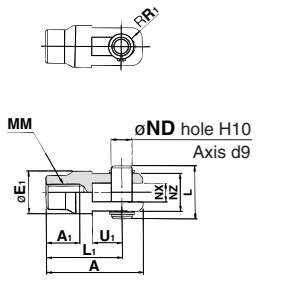
Part no.	Applicable bore size	A	A1	E1	L1	MM	ND H10	NX	R1	U1
I-020B	**20**	46	16	20	36	M8 x 1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	10	14
I-032B	**25, 32**	48	18	20	38	M10 x 1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	10	14
I-040B	**40**	69	22	24	55	M14 x 1.5	$12^{+0.070}_{0}$	$16^{-0.1}_{-0.3}$	15.5	20

∗ Use a thin wrench when tightening the piston rod.

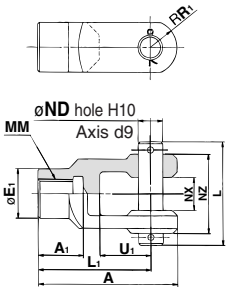
Double Knuckle Joint

(mm)

Y-020B, Y-032B Material: Iron



Y-040B Material: Cast iron



Part no.	Applicable bore size	A	A1	E1	L	L1	MM	ND	NX	NZ	R1	U1	Included pin part no.	Retaining ring Split pin size
Y-020B	**20**	46	16	20	25	36	M8 x 1.25	9	$9^{+0.2}_{+0.1}$	18	5	14	CDP-1	Type C9 for axis
Y-032B	**25, 32**	48	18	20	25	38	M10 x 1.25	9	$9^{+0.2}_{+0.1}$	18	5	14	CDP-1	Type C9 for axis
Y-040B	**40**	68	22	24	49.7	55	M14 x 1.5	12	$16^{+0.3}_{+0.1}$	38	13	25	CDP-3	ø3 x 18ℓ

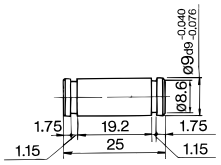
∗ A knuckle pin and retaining rings (split pins for ø40) are included.

Double Clevis Pin

(mm)

Bore size/ø20, ø25, ø32

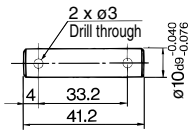
CDP-1 Material: Iron



Retaining ring: Type C9 for axis

Bore size/ø40

CDP-2 Material: Iron



Split pin: ø3 x 18ℓ

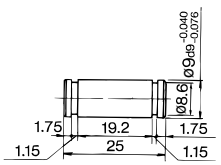
∗ Retaining rings (split pins for ø40) are included.

Double Knuckle Joint Pin

(mm)

Bore size/ø20, ø25, ø32

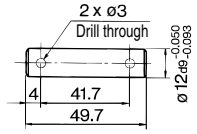
CDP-1 Material: Iron



Retaining ring: Type C9 for axis

Bore size/ø40

CDP-3 Material: Iron

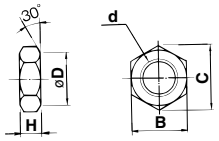


Split pin: ø3 x 18ℓ

∗ Retaining rings (split pins for ø40) are included.

Rod End Nut (mm)

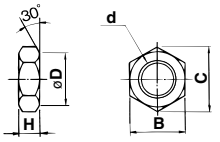
Material: Iron



Part no.	Applicable bore size	B	C	D	d	H
NT-02	**20**	13	15.0	12.5	M8 x 1.25	5
NT-03	**25, 32**	17	19.6	16.5	M10 x 1.25	6
NT-04	**40**	22	25.4	21.0	M14 x 1.5	8

Mounting Nut (mm)

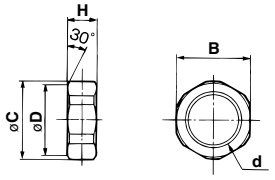
Material: Iron



Part no.	Applicable bore size	B	C	D	d	H
SN-020B	**20**	26	30	25.5	M20 x 1.5	8
SN-032B	**25, 32**	32	37	31.5	M26 x 1.5	8
SN-040B	**40**	41	47.3	40.5	M32 x 2.0	10

Trunnion Nut (mm)

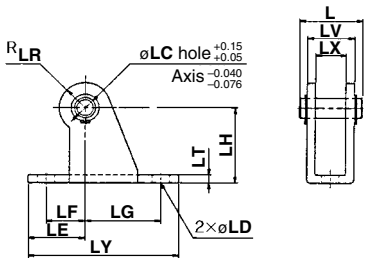
Material: Iron



Part no.	Applicable bore size	B	C	D	d	H
TN-020B	**20**	26	28	25.5	M20 x 1.5	10
TN-032B	**25, 32**	32	34	31.5	M26 x 1.5	10
TN-040B	**40**	41	45	40.5	M32 x 2	10

Pivoting Clevis Bracket (For CM3E) (mm)

Material: Iron



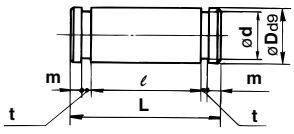
Part no.	Applicable bore size	L	LC	LD	LE	LF	LG	LH	LR
CM-E020B	**20, 25**	24.5	8	6.8	22	15	30	30	10
CM-E032B	**32, 40**	34	10	9	25	15	40	40	13

Part no.	Applicable bore size	LT	LX	LY	LV	Included pin part no.
CM-E020B	**20, 25**	3.2	12	59	18.4	CD-S02
CM-E032B	**32, 40**	4	20	75	28	CD-S03

Note 1) A pivoting clevis bracket pin and retaining rings are included.
Note 2) It cannot be used for the single clevis (CM3C) and double clevis (CM3D) types.

Pivoting Clevis Bracket Pin (For CM3E) (mm)

Material: Iron



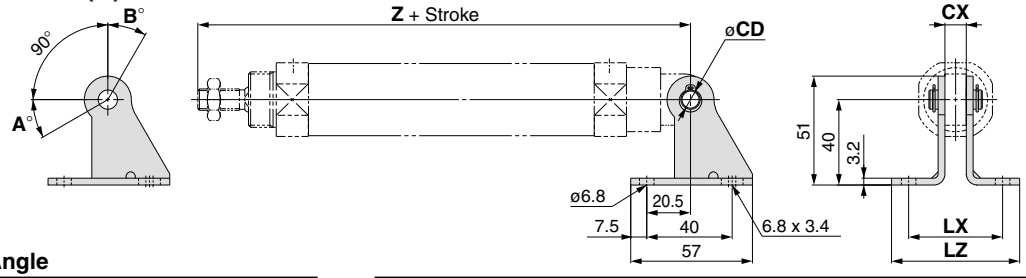
Part no.	Applicable bore size	D_{d9}	d	L	ℓ	m	t	Included retaining ring
CD-S02	**20, 25**	$8^{-0.040}_{-0.076}$	7.6	24.5	19.5	1.6	0.9	Type C8 for axis
CD-S03	**32, 40**	$10^{-0.040}_{-0.076}$	9.6	34	29	1.35	1.15	Type C10 for axis

Note) Retaining rings are included.

Dimensions of Accessories 2

Dimensions

■Single Clevis (C)



Rotating Angle

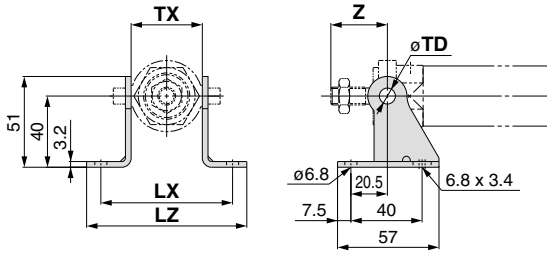
Bore size (mm)	A°	B°	A° + B° + 90°
20	25	85	200
25, 32	21	81	192
40	26	86	202

(mm)

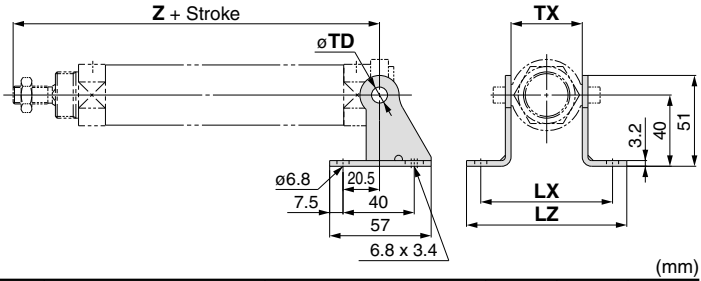
Mounting	Part no.	Applicable bore size	CX	Z + Stroke	CD	LX	LZ
CM3C (Single clevis)	**CM-B032**	**20**	10	116	9	44	60
		25		120			
		32		126			
	CM-B040	**40**	15	148	10	49	65

Note 1) A pivoting bracket pin and retaining rings are not included with the pivoting bracket.
Note 2) The above dimensions are for the male rod end type.

■Rod Trunnion (U)



■Head Trunnion (T)



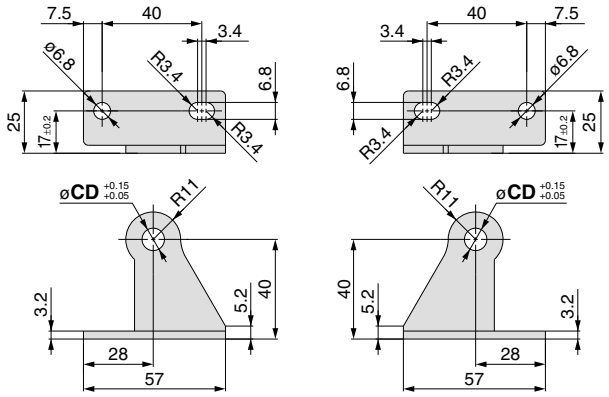
(mm)

Mounting	Part no.	Applicable bore size	TX	Rod trunnion Z	Head trunnion Z + Stroke	TD	LX	LZ
CM3U, CM3T (Rod trunnion, Head trunnion)	**CM-B020**	**20**	32	26	91	8	66	82
	CM-B032	**25**	40	29	95	9	74	90
		32			101			
	CM-B040	**40**	53	36.5	114.5	10	87	103

Note 1) A pivoting bracket pin and retaining rings are not included with the pivoting bracket.
Note 2) The above dimensions are for the male rod end type.

Pivoting Bracket

∗ Pivoting brackets consist of a set of two brackets.

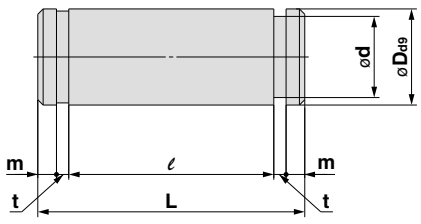


(mm)

Part no.	CD
CM-B020	8
CM-B032	9
CM-B040	10

Note) A pivoting bracket pin and retaining rings are not included with the pivoting bracket.

Pivoting Bracket Pin



(mm)

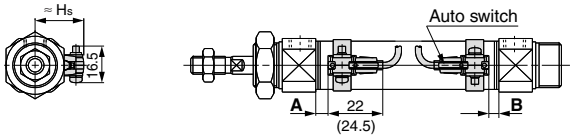
Applicable bore size	Part no.	Dd9	d	L	ℓ	m	t	Included retaining ring
20, 25, 32	**CDP-1**	$9^{-0.040}_{-0.076}$	8.6	25	19.2	1.75	1.15	Type C9 for axis
40	**CD-S03**	$10^{-0.040}_{-0.076}$	9.6	34	29	1.35	1.15	Type C10 for axis

Note) Retaining rings are included with the pivoting bracket pin.

Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

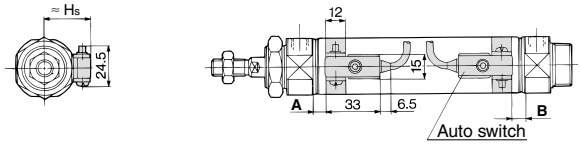
Reed auto switch

D-A9□

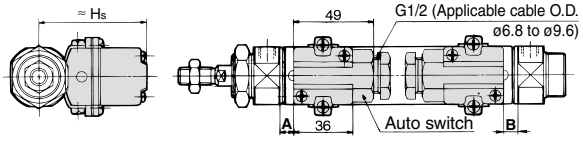


( ): Dimensions of D-A93 type

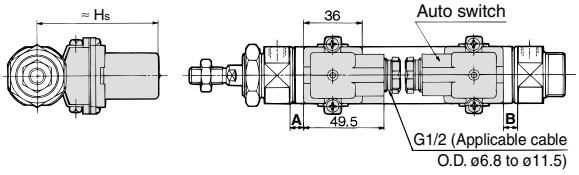
D-B54/B64/B59W



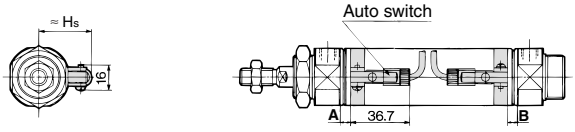
D-A33A/A34A



D-A44A

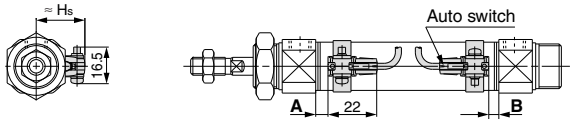


D-C73C/C80C

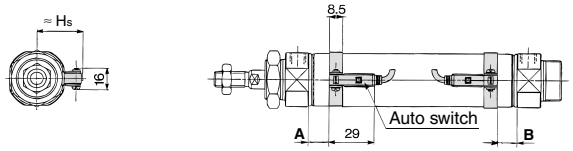


Solid state auto switch

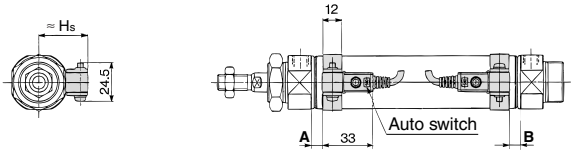
D-M9□
D-M9□W



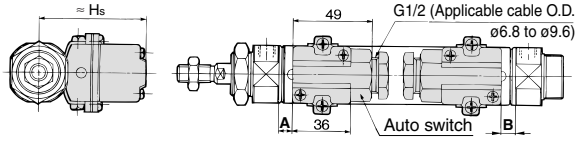
D-H7NF/H7BAL



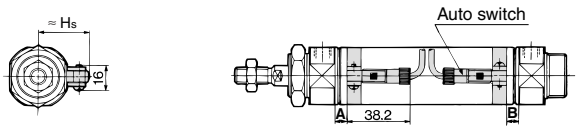
D-G5NTL



D-G39A/K39A



D-H7C



Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size	D-M9□ D-M9□W		D-A9□		D-B54 D-B64		D-C73C D-C80C		D-B59W		D-A3□A D-A44A D-G39A Note 2) D-K39A Note 2)		D-H7C D-H7BAL D-H7NF		D-G5NTL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	10	9	6	5	0.5	0	6.5	5.5	3.5	2.5	0	0	5.5	4.5	2	1
25	10	10	6	6	0.5	0.5	6.5	6.5	3.5	3.5	0	0	5.5	5.5	2	2
32	10	10	6	6	0.5	0.5	6.5	6.5	3.5	3.5	0	0	5.5	5.5	2	2
40	12	12	8	8	2.5	2.5	8.5	8.5	5.5	5.5	2	2	7.5	7.5	4	4

Note 1) Adjust the auto switch after confirming the operating condition in the actual setting.
Note 2) The D-G39A/K39A cannot be mounted on the bore size ø20.
Note 3) For the combination of the following auto switches, bore sizes and mounting positions, the auto switch cannot be mounted to the port side.
- D-G5□ type: On the head side and the rod side of the bore size ø32
- D-B5□/B64 types (except B59W) ··· On the head side of the bore size ø20, ø32, On the rod side of the bore size ø32

Auto Switch Mounting Height

(mm)

Auto switch model / Bore size	D-M9□ D-M9□W D-A9□	D-B54 D-B64 D-B59W D-G5NTL D-H7C	D-H7BAL D-H7NF	D-C73C D-C80C	D-A3□A D-G39A Note) D-K39A Note)	D-A44A
	Hs	Hs	Hs	Hs	Hs	Hs
20	22	25.5	22.5	25	60	69.5
25	24.5	28	25	27.5	62.5	72
32	28	31.5	28.5	31	66	75.5
40	32	35.5	32.5	35	70	79.5

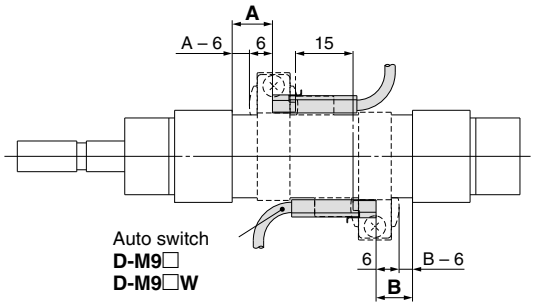
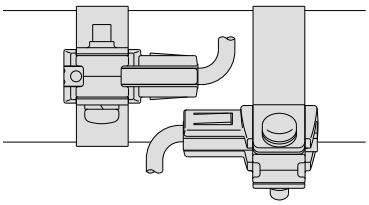
Note) The D-G39A/K39A cannot be mounted on the bore size ø20.

Minimum Stroke for Auto Switch Mounting

n: Number of auto switches (mm)

Auto switch model	Number of auto switches				
	With 1 pc.	With 2 pcs.		With n pcs.	
		Different surfaces	Same surface	Different surfaces	Same surface
D-M9□/M9□W **D-A9□**	10	15 Note 1)	45 Note 1)	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6···)	45 + 45 (n – 2)
D-H7BAL/H7NF	10	15	60	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6···)	60 + 45 (n – 2)
D-C73C/C80C **D-H7C**	10	15	65	$15 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···)	65 + 50 (n – 2)
D-B54/B64 **D-G5NTL**	10	15	75	$15 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···)	75 + 55 (n – 2)
D-B59W	15	20	75	$20 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···)	75 + 55 (n – 2)
D-A3□A/A44A **D-G39A** **D-K39A**	10	35	100	35 + 30 (n – 2)	100 + 100 (n – 2)

Note 1) Auto switch mounting

Auto switch model	With 2 auto switches	
	Different surfaces Note 1)	Same surface Note 1)
	 The auto switch proper mounting position is 6 mm inward from the switch holder edge.	 The auto switch is mounted by slightly displacing it in a direction (cylinder tube circumferential exterior) so that the auto switch and lead wire do not interfere with each other.
D-M9□ **D-M9□W**	Less than 20 mm stroke Note 2)	Less than 55 mm stroke Note 2)
D-A93	—	Less than 50 mm stroke Note 2)

Note 2) Minimum stroke for auto switch mounting in styles other than those mentioned in Note 1

Operating Range

(mm)

Auto switch model	Bore size			
	20	**25**	**32**	**40**
D-M9□ **D-M9□W**	3	3	4	3.5
D-A9□	6	6	6	6
D-C73C/C80C	7	8	8	8
D-B54/B64 **D-A3□A/A44A**	8	8	9	9
D-B59W	12	12	13	13
D-H7BAL **D-G5NTL/H7NF**	4	4	4.5	5
D-H7C	7	8.5	9	10
D-G39A/K39A	—	9	9	9

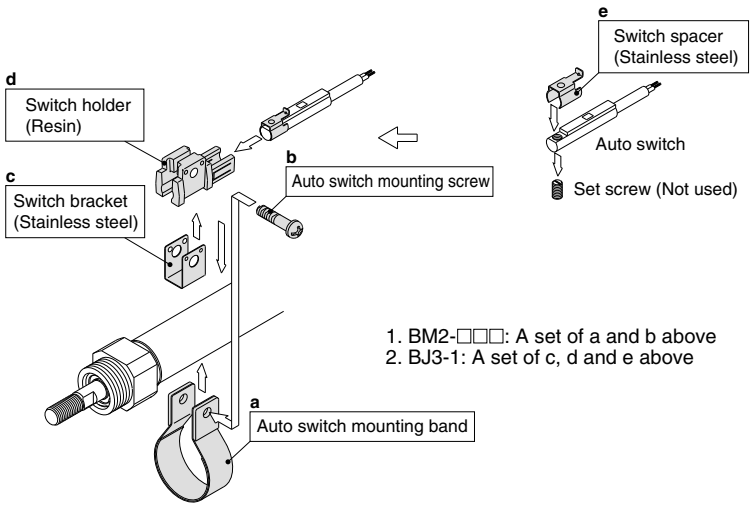
∗ Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

Auto Switch Mounting Brackets/Part No.

Auto switch model	Bore size (mm)			
	ø20	ø25	ø32	ø40
D-M9□ D-M9□W D-A9□	Note 1) ①BM2-020 ②BJ3-1	Note 1) ①BM2-025 ②BJ3-1	Note 1) ①BM2-032 ②BJ3-1	Note 1) ①BM2-040 ②BJ3-1
D-C73C/C80C D-H7BAL D-H7NF	BM2-020	BM2-025	BM2-032	BM2-040
D-B54/B64 D-B59W D-G5NTL D-G5NBL	BA2-020	BA2-025	BA2-032	BA2-040
D-A3□A/A44A D-G39A/K39A	BM3-020 Note 2)	BM3-025	BM3-032	BM3-040

Note 1) Two kinds of auto switch mounting brackets are used as a set.
Note 2) The D-G39A/K39A cannot be mounted on the bore size ø20.

[Stainless Steel Mounting Screw]
The following stainless steel mounting screw is available. Use it in accordance with the operating environment. (Since auto switch mounting bracket is not included, order it separately.)
BBA4: For D-C7/C8/H7 types
Note 3) Refer to page 1358 in Best Pneumatics No. 2 for details of BBA4 screws.
The above stainless steel screws are used when a cylinder is shipped with the D-H7BAL auto switches. When only an auto switch is shipped independently, the BBA4 screw is attached.



1. BM2-□□□: A set of a and b above
2. BJ3-1: A set of c, d and e above

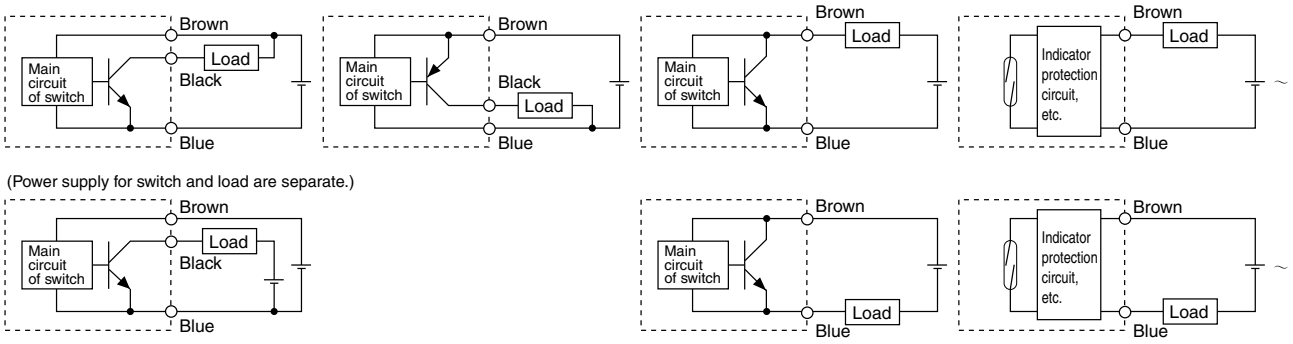
Other than the applicable auto switches listed in “How to Order,” the following auto switches are mountable. Refer to pages 1263 to 1371 in Best Pneumatics No. 2 for detailed specifications.

* With pre-wired connector is also available for solid state auto switches. For details, refer to pages 1328 and 1329 in Best Pneumatics No. 2.
* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to page 1290 in Best Pneumatics No. 2.
* Solid state auto switch with timer (D-G5NTL) is also available. For details, refer to page 1313 in Best Pneumatics No. 2.
* Wide range detection type, solid state auto switch (D-G5NBL) is also available. For details, refer to page 1320 in Best Pneumatics No. 2.

Prior to Use
Auto Switch Connection and Example

Basic Wiring

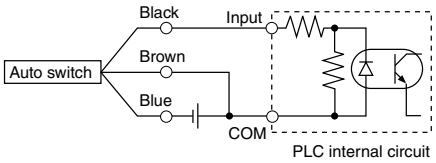
Solid state 3-wire, NPN **Solid state 3-wire, PNP** **2-wire (Solid state)** **2-wire (Reed)**



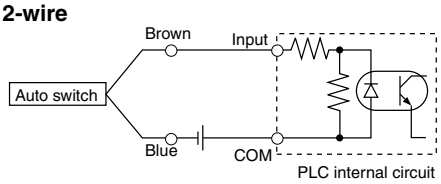
(Power supply for switch and load are separate.)

Example of Connection with PLC (Programmable Logic Controller)

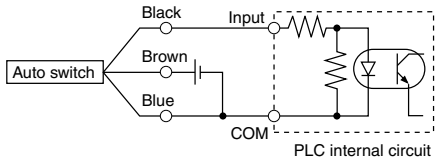
- **Sink input specifications**
  3-wire, NPN



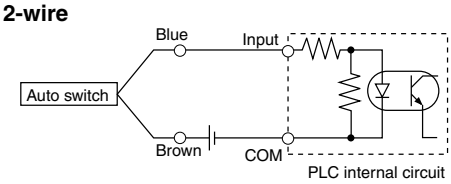
2-wire



- **Source input specifications**
  3-wire, PNP



2-wire

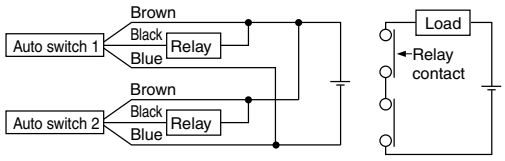


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

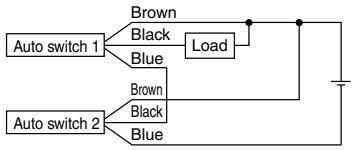
Example of AND (Series) and OR (Parallel) Connection

- **3-wire**

AND connection for NPN output (Using relays)

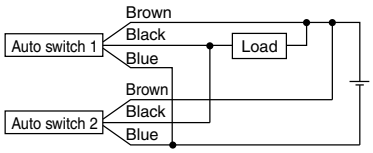


AND connection for NPN output (Performed with auto switches only)



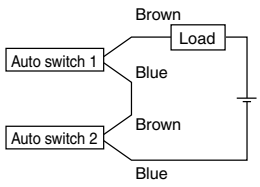
The indicator lights will light up when both of the auto switches are in the ON state.

OR connection for NPN output



- **2-wire**

2-wire with 2-switch AND connection

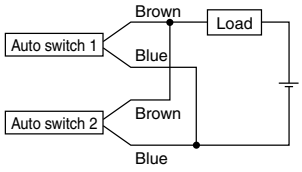


When two auto switches are connected in series, malfunction may occur because the load voltage will decrease in the ON state. The indicator lights will light up when both of the auto switches are in the ON state.

Load voltage at ON = Power supply voltage – Residual voltage x 2 pcs.
= 24 V – 4 V x 2 pcs.
= 16 V

Example: Power supply voltage 24 VDC
Auto switch internal voltage drop 4 V

2-wire with 2-switch OR connection



(Solid state)
When two auto switches are connected in parallel, malfunction may occur because the load voltage will increase in the OFF state.

Load voltage at OFF = Leakage current x 2 pcs. x Load impedance
= 1 mA x 2 pcs. x 3 kΩ
= 6 V

Example: Load impedance 3 kΩ
Auto switch leakage current 1 mA

(Reed)
Because there is no leakage current, the load voltage will not increase in the OFF state. However, depending on the number of auto switches in the ON state, the indicator lights may sometimes grow dim or not light up, due to the dispersion and reduction of the current flowing to the auto switches.

⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC), American National Standards Institute (ANSI)*1) and other safety regulations.

⚠ Caution: **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

⚠ Warning: **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

⚠ Danger : **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots - Safety.
ANSI / (NFPA) T2.25.1 R2: Pneumatic fluid power - Systems standard for industrial machinery.
NF PA (Fluid) T2.24.1 R1: Hydraulic fluid power - Systems standard for stationary industrial machinery.
NFPA 79: Electrical Standard for Industrial Machinery.
ANSI / RIA / ISO 10218 -1: Robots for Industrial Environment - Safety Requirements - Part 1 - Robot.
etc.

⚠ Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.
Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.
1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.
1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠ Caution

1. The product is provided for use in manufacturing industries.
The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements". Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

***2) Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

⚠ Safety Instructions | Be sure to read "Handling Precautions for SMC Products" (M-E03-3) before using.

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