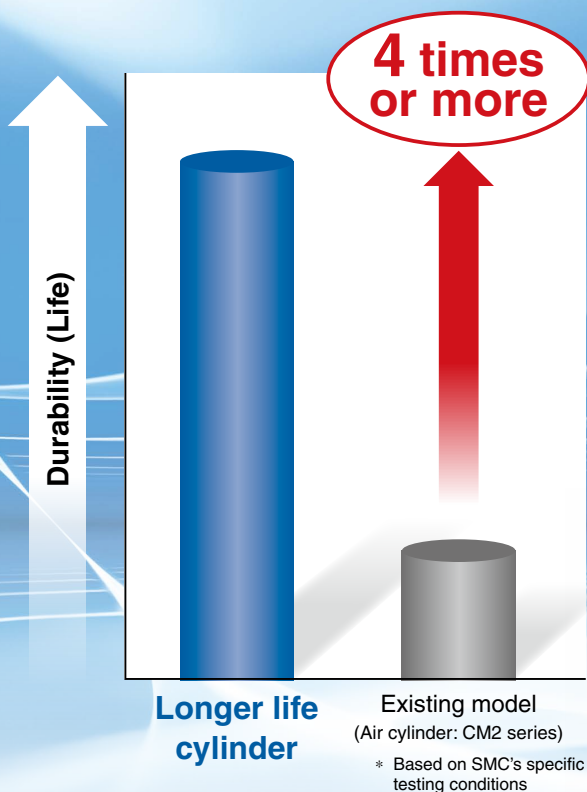


High Durability Series

Longer Life Cylinder

New
RoHS

*New technology offers at least
4 times better durability*



- The maintenance intervals will be extended



- Employs the same specification and dimensions as the existing models, CM2 Air Cylinder series

High Durability Series

High Durability Series is the series name for the "special specification" that offers superior durability and environmental resistance compared to standard products.

Series Variations

Series	Action	Model	Bore size				Cushion	Standard stroke
			20	25	32	40		
Air cylinder CM2 series 	Double acting, Single rod	CM2-XB24	•	•	•	•	Rubber bumper	25 to 300

CM2-XB24


CAT.ES20-286A

High Durability Series

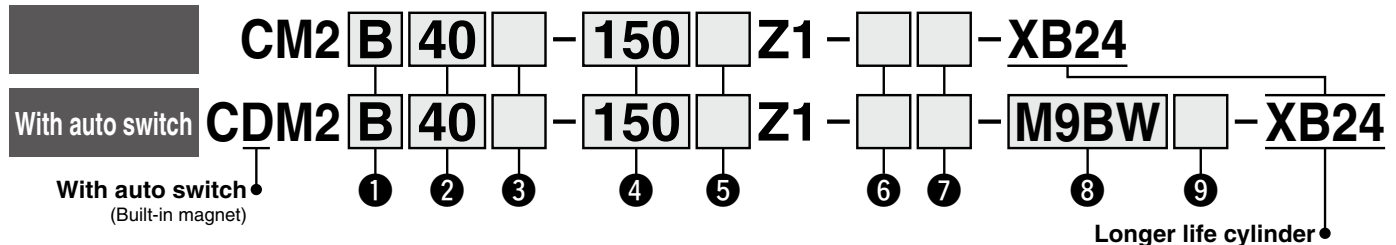
Longer Life Cylinder: Double Acting, Single Rod

CM2-XB24

ø20, ø25, ø32, ø40

RoHS

How to Order



1 Mounting

B	Basic (Double-side bossed)
L	Axial foot bracket
F	Rod flange
G	Head flange
C	Single clevis
D	Double clevis
U	Rod trunnion
T	Head trunnion
E	Integrated clevis
V	Integrated clevis (90°)
BZ	Boss-cut/Basic
FZ	Boss-cut/Rod flange
UZ	Boss-cut/Rod trunnion

2 Bore size

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

3 Port thread type

Nil	Rc
TN	NPT
TF	G

4 Cylinder stroke [mm]

Refer to page 2 for standard strokes.

5 Rod end thread

Nil	Male rod end
F	Female rod end

6 Pivot bracket

Nil	No bracket
N	Pivot bracket

* Only for "C", "T", "U", "E", "V", and "UZ" mounting types

* The pivot bracket is shipped together with the product but does not come assembled.

7 Rod end bracket

Nil	No bracket	W	Double knuckle joint
V	Single knuckle joint	Q	Rod end

* No bracket is provided with the female rod end.

* A knuckle joint pin is not provided with the single knuckle joint.

* The rod end bracket is shipped together with the product but does not come assembled.

8 Auto switch

Nil	Without auto switch
------------	---------------------

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

9 Number of auto switches

Nil	2
S	1
n	n

* Refer to page 2 for the ordering example of cylinder assembly.

Applicable Auto Switches/Refer to the Web Catalog for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length [m]					Pre-wired connector	Applicable load							
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)									
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC						
		3-wire (PNP)		M9PV			M9P	●	●	●	○	—	○									
		Connector		2-wire			12 V	M9BV	M9B	●	●	●	○	—	○		—					
		Terminal conduit		3-wire (NPN)			5 V, 12 V	—	G39A	—	—	—	●	—	IC circuit							
	Diagnostic indication (2-color indicator)	Grommet		2-wire	12 V		—	K39A	—	—	—	—	●	—	—		—					
				3-wire (NPN)	5 V, 12 V		M9NWV	M9NW	●	●	●	○	—	○	IC circuit							
				3-wire (PNP)	5 V, 12 V		M9PWV	M9PW	●	●	●	○	—	○			IC circuit					
				2-wire	12 V		M9BWV	M9BW	●	●	●	○	—	○	—							
	Water resistant (2-color indicator)	Grommet		3-wire (NPN)	5 V, 12 V		M9NAV*1	M9NA*1	○	○	●	○	—	○	IC circuit							
				3-wire (PNP)	5 V, 12 V		M9PAV*1	M9PA*1	○	○	●	○	—	○			—					
	2-wire			12 V	M9BAV*1		M9BA*1	○	○	●	○	—	○	IC circuit								
	With diagnostic output (2-color indicator)			4-wire (NPN)	5 V, 12 V		—	H7NF	●	—	●	○	—		○		IC circuit					
	Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	●	●	●	—	○	IC circuit	—				
Connector					2-wire				24 V	12 V	100 V	A93V	A93	●	●	●	●		—	○*2	—	Relay, PLC
											100 V or less	A90V	A90	●	●	●	●		—	○*2	IC circuit	
											100 V, 200 V	—	B54	●	—	●	●		—	—	—	
			200 V or less	—		B64	●	—			●	—	—	IC circuit								
Terminal conduit			Yes	—	—	—	C73C	●	—	●	●	●	—		—	Relay, PLC						
				24 V or less	—	C80C	●	—	●	●	●	—	IC circuit									
				—	—	A33A	—	—	—	—	●	—		—			PLC					
				100 V, 200 V	—	A34A	—	—	—	—	●	—	—					Relay, PLC				
DIN terminal			—	—	A44A	—	—	—	—	●	—	—		Relay, PLC								
Grommet			—	—	B59W	●	—	●	—	—	—		—		Relay, PLC							
Diagnostic indication (2-color indicator)			—	—	—	—	—	—	—	—	—	—		Relay, PLC								

*1 Water-resistant type auto switches can be mounted on the above models, but SMC cannot guarantee water resistance.

A water-resistant type cylinder is recommended for use in an environment which requires water resistance.

*2 The load voltage used is 24 VDC.

* Lead wire length symbols: 0.5 m Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NLW
5 m Z (Example) M9NZW
None N (Example) H7CN

* Auto switches marked with a "○" are produced upon receipt of order.

* Do not indicate suffix "N" for no lead wire on the D-A3□□A/A44A/G39A/K39A models.

* Since there are applicable auto switches other than those listed above, refer to the Web Catalog for details.

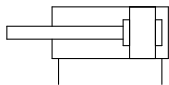
* For details on auto switches with pre-wired connectors, refer to the Web Catalog.

* The D-A9□□/M9□□□ auto switches are shipped together with the product but do not come assembled. (Only the auto switch mounting brackets are assembled before shipment.)



Symbol

Double acting, Single rod



The mounting pitch and shape of this product with auto switch are the same as those of the CM2 series with auto switch. For details, refer to the **Web Catalog**.

- Auto Switch Proper Mounting Position (Detection at stroke end) and Mounting Height
- Min. Stroke for Auto Switch Mounting
- Operating Range
- Auto Switch Mounting Brackets/Part Nos.

Specifications

Bore size [mm]			20	25	32	40
Type			Pneumatic			
Action			Double acting, Single rod			
Fluid			Air			
Proof pressure			1.5 MPa			
Max. operating pressure			1.0 MPa			
Min. operating pressure			0.05 MPa			
Ambient and fluid temperatures			Without auto switch: -10°C to 70°C With auto switch: -10°C to 60°C (No freezing)			
Lubrication			Not required (Non-lube)			
Stroke length tolerance*1			+1.4 0 mm			
Piston speed			50 to 750 mm/s			
Cushion			Rubber bumper			
Allowable kinetic energy	Rubber bumper	Male thread	0.27 J	0.4 J	0.65 J	1.2 J
		Female thread	0.11 J	0.18 J	0.29 J	0.52 J

*1 Does not include the amount of bumper change

* Operate the cylinder within the allowable kinetic energy.

* For the allowable rod end lateral load, refer to the "Air Cylinders Model Selection" in the **Web Catalog**.

Standard Strokes

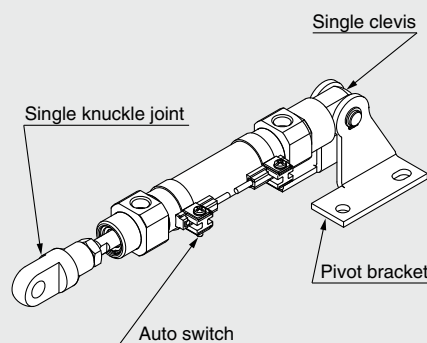
Bore size [mm]	Standard stroke [mm]*1	Max. manufacturable stroke [mm]
20	25, 50, 75, 100, 125, 150, 200, 250, 300	1000
25		
32		
40		

*1 Intermediate strokes not listed above are produced upon receipt of order. The manufacturing of intermediate strokes in 1 mm increments is possible. (Spacers are not used.)

* Applicable strokes should be confirmed according to the usage. For details, refer to the "Air Cylinders Model Selection" in the **Web Catalog**. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to deflection, etc.

Option: Ordering Example of Cylinder Assembly

Cylinder model: CDM2C20-50Z1-NV-M9BW-XB24



Mounting C: Single clevis
Pivot bracket N: Yes
Rod end bracket V: Single knuckle joint
Auto switch D-M9BW: 2 pcs.

* Pivot bracket, single knuckle joint and auto switch are shipped together with the product but do not come assembled.

* Pivot bracket is only available for "C", "T", "U", "E", "V", and "UZ" mounting types.

* No bracket is provided with the female rod end.



Precautions

Refer to page 13 before handling the products.

The allowable kinetic energy, allowable loads at the rod end, theoretical output, and weight are equivalent to those of the Air Cylinder CM2 series. For details, refer to the **Web Catalog**.

Mounting and Accessories

Accessories		Body	Standard (mounted to the body)					Standard (shipped together but does not come assembled)								Option			
			Mounting nut	*1 Rod end nut (Male thread)	Single clevis	Double clevis	*7 Liner	Mounting nut	Foot bracket	Flange	Pivot bracket	*5 Pivot bracket pin	*5 Double clevis pin	Trunnion	Mounting nut (For trunnion)	Clevis pivot bracket (CM2E/CM2V)	Clevis pivot *5 bracket pin (CM2E/CM2V)	Single knuckle joint (Male thread only)	*6 Double knuckle joint (Male thread only)
Mounting																			
B	Basic (Double-side bossed)	●(1 pc.)	●(1 pc.)	●(1 pc.)	—	—	—	—	—	—	—	—	—	—	—	—	●	●	●
L	Axial foot bracket	●(1 pc.)	●(1 pc.) ^{1/2}	●(1 pc.)	—	—	—	●(1 pc.) ^{1/2}	●(2 pcs.)	—	—	—	—	—	—	—	●	●	●
F	Rod flange	●(1 pc.)	●(1 pc.)	●(1 pc.)	—	—	—	—	—	●(1 pc.)	—	—	—	—	—	—	●	●	●
G	Head flange	●(1 pc.)	●(1 pc.)	●(1 pc.)	—	—	—	—	—	●(1 pc.)	—	—	—	—	—	—	●	●	●
C	Single clevis	●(1 pc.)	—*3	●(1 pc.)	●(1 pc.)	—	●(Max. 3 pcs.)	—*3	—	—	—	—	—	—	—	—	●	●	●
D	Double clevis	●(1 pc.)	—*3	●(1 pc.)	—	●(1 pc.)	●(Max. 3 pcs.)	—*3	—	—	—	—	●(1 pc.)	—	—	—	●	●	●
U	Rod trunnion	●(1 pc.)	—*4	●(1 pc.)	—	—	—	—	—	—	—	—	—	●(1 pc.)	●(1 pc.)	—	●	●	●
T	Head trunnion	●(1 pc.)	—*4	●(1 pc.)	—	—	—	—	—	—	—	—	—	●(1 pc.)	●(1 pc.)	—	●	●	●
E	Integrated clevis	●(1 pc.)	—*3	●(1 pc.)	—	—	—	—*3	—	—	—	—	—	—	—	—	●	●	●
V	Integrated clevis (90°)	●(1 pc.)	—*3	●(1 pc.)	—	—	—	—*3	—	—	—	—	—	—	—	—	●	●	●
BZ	Boss-cut/Basic	●(1 pc.)	●(1 pc.)	●(1 pc.)	—	—	—	—	—	—	—	—	—	—	—	—	●	●	●
FZ	Boss-cut/ Rod flange	●(1 pc.)	●(1 pc.)	●(1 pc.)	—	—	—	—	—	●(1 pc.)	—	—	—	—	—	—	●	●	●
UZ	Boss-cut/ Rod trunnion	●(1 pc.)	—*4	●(1 pc.)	—	—	—	—	—	—	—	—	—	●(1 pc.)	●(1 pc.)	—	●	●	●

Mounting: C Pivot bracket symbol: N Single clevis + Pivot bracket + Pin	Standard (mounted to the body)						Option												
	● (1 pc.)	— ^{*3}	● (1 pc.)	● (1 pc.)	—	● (Max. 3 pcs.)	— ^{*3}	—	—	● (2 pcs.)	● (1 pc.)	—	—	—	—	—	●	●	●
Mounting: T, U, UZ Pivot bracket symbol: N Trunnion + Pivot bracket	● (1 pc.)	— ^{*4}	● (1 pc.)	—	—	—	— ^{*3}	—	—	● (2 pcs.)	—	—	● (1 pc.)	● (1 pc.)	—	—	●	●	●
Mounting: E Pivot bracket symbol: N Integrated clevis + Pivot bracket + Pin	● (1 pc.)	— ^{*3}	● (1 pc.)	—	—	—	— ^{*3}	—	—	—	—	—	—	—	● (1 pc.)	● (1 pc.)	●	●	●
Mounting: V Pivot bracket symbol: N Integrated clevis (90°) + Pivot bracket + Pin	● (1 pc.)	— ^{*3}	● (1 pc.)	—	—	—	— ^{*3}	—	—	—	—	—	—	—	● (1 pc.)	● (1 pc.)	●	●	●

*1 A rod end nut is not provided with the female rod end.

*2 Two mounting nuts are included.

*3 A mounting nut is not included with the clevis.

*4 A trunnion is included with "T", "U", and "UZ" mounting types.

*5 Retaining rings are included.

*6 A pin and retaining rings (split pins for ø40) are included.

*7 This is the part(s) used to adjust the clevis angle. Mounting quantity can vary.

* Stainless steel mounting brackets and accessories are also available.

Refer to the **Web Catalog** for details.

Mounting Brackets/Part Nos.

Mounting bracket	Min. order quantity	Bore size [mm]				Contents (for Min. order quantity)
		20	25	32	40	
Foot bracket ^{*1}	2	CM-L020B	CM-L032B	CM-L040B	CM-L040B	2 foot brackets, 1 mounting nut
Foot bracket ^{*2}	1	CMZ1-L020B	CMZ1-L032B	CMZ1-L040B	CMZ1-L040B	1 foot bracket
Flange	1	CM-F020B	CM-F032B	CM-F040B	CM-F040B	1 flange
Single clevis ^{*3}	1	CM-C020B	CM-C032B	CM-C040B	CM-C040B	1 single clevis, 3 liners
Double clevis (with pin) ^{*3, *4}	1	CM-D020B	CM-D032B	CM-D040B	CM-D040B	1 double clevis, 3 liners, 1 clevis pin, 2 retaining rings
Double clevis pin	1	CDP-1			CDP-2	1 clevis pin, 2 retaining rings (split pins)
Trunnion (with nut)	1	CM-T020B	CM-T032B	CM-T040B	CM-T040B	1 trunnion, 1 trunnion nut
Rod end nut	1	NT-02	NT-03	NT-04	NT-04	1 rod end nut
Mounting nut	1	SN-020B	SN-032B	SN-040B	SN-040B	1 mounting nut
Trunnion nut	1	TN-020B	TN-032B	TN-040B	TN-040B	1 trunnion nut
Single knuckle joint	1	I-020B	I-032B	I-040B	I-040B	1 single knuckle joint
Double knuckle joint	1	Y-020B	Y-032B	Y-040B	Y-040B	1 double knuckle joint, 1 knuckle pin, 2 retaining rings
Rod end	1	KJ8D	KJ10D	KJ14D	KJ14D	1 rod end
Double knuckle joint pin	1	CDP-1			CDP-3	1 knuckle pin, 2 retaining rings (split pins)
Clevis pivot bracket pin (For CM2E/CM2V)	1	CD-S02		CD-S03		1 clevis pin, 2 retaining rings
Clevis pivot bracket (For CM2E/CM2V)	1	CM-E020B		CM-E032B		1 clevis pivot bracket, 1 clevis pin, 2 retaining rings
Pivot bracket (For CM2C)	1	CM-B032			CM-B040	2 pivot brackets (1 of each type)
Pivot bracket pin (For CM2C)	1	CDP-1			CD-S03	1 pin, 2 retaining rings
Pivot bracket (For CM2T/CM2U)	1	CM-B020	CM-B032		CM-B040	2 pivot brackets (1 of each type)

*1 Order two foot brackets per cylinder.

*2 A single foot bracket is available.

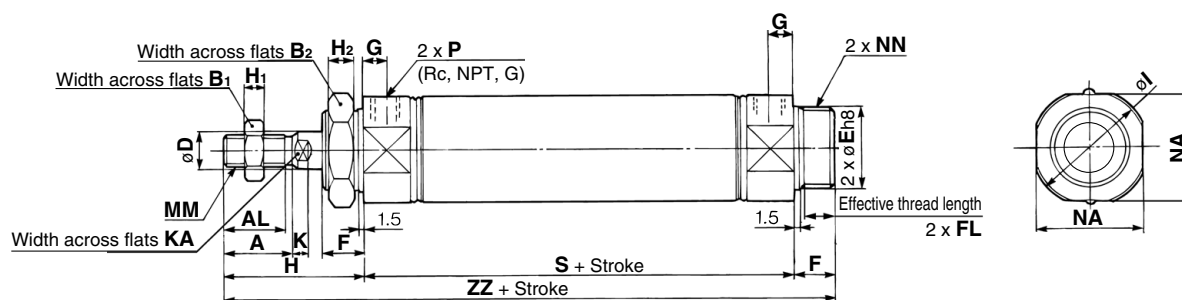
*3 3 liners are included with a clevis bracket for adjusting the mounting angle.

*4 A clevis pin and retaining rings (split pins for ø40) are included.

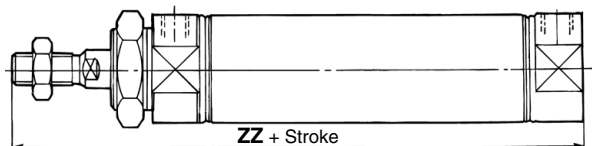
For dimensions of accessories (options), refer to the **Web Catalog**.

Basic (Double-side Bossed) (B)

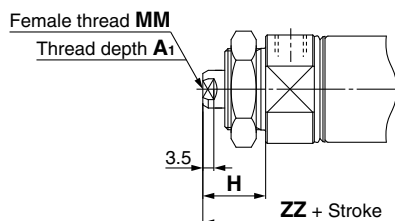
CM2B **Bore size** — **Stroke** **Z1-XB24**



Boss-cut



Female rod end



[mm]																					
Bore size	A	AL	B ₁	B ₂	D	E	F	FL	G	H	H ₁	H ₂	I	K	KA	MM	NA	NN	P	S	ZZ
20	18	15.5	13	26	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	62	116
25	22	19.5	17	32	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	62	120
32	22	19.5	17	32	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	8	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	64	122
40	24	21	22	41	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	88	154

Boss-cut [mm]	
Bore size	ZZ
20	103
25	107
32	109
40	138

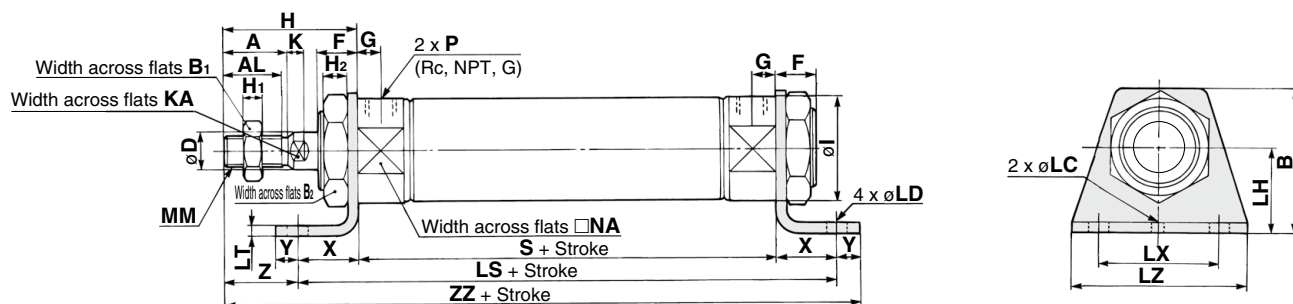
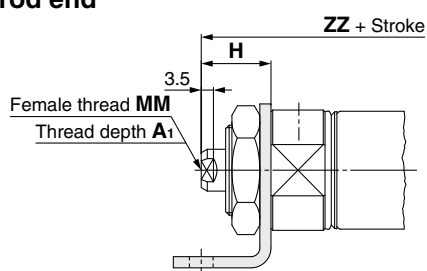
Female Rod End				[mm]
Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	95
25	8	20	M5 x 0.8	95
32	12	20	M6 x 1	97
40	13	21	M8 x 1.25	125

* When a female thread is used, use a thin wrench when tightening the piston rod.

- * When a female thread is used, depending on the material of the workpiece, use a washer etc., to prevent the contact part at the rod end from being deformed.

Axial Foot Bracket (L)

CM2L Bore size — Stroke Z1-XB24

**Female rod end**

[mm]

Bore size	A	AL	B	B ₁	B ₂	D	F	G	H	H ₁	H ₂	I	K	KA	LC	LD	LH	LS	LT	LX	LZ	MM	NA	P	S	X	Y	Z	ZZ
20	18	15.5	40	13	26	8	13	8	41	5	8	28	5	6	4	6.8	25	102	3.2	40	55	M8 x 1.25	24	1/8	62	20	8	21	131
25	22	19.5	47	17	32	10	13	8	45	6	8	33.5	5.5	8	4	6.8	28	102	3.2	40	55	M10 x 1.25	30	1/8	62	20	8	25	135
32	22	19.5	47	17	32	12	13	8	45	6	8	37.5	5.5	10	4	6.8	28	104	3.2	40	55	M10 x 1.25	34.5	1/8	64	20	8	25	137
40	24	21	54	22	41	14	16	11	50	8	10	46.5	7	12	4	7	30	134	3.2	55	75	M14 x 1.5	42.5	1/4	88	23	10	27	171

Female Rod End [mm]

Bore size	A ₁	H	MM	ZZ
20	8	20	M4 x 0.7	110
25	8	20	M5 x 0.8	110
32	12	20	M6 x 1	112
40	13	21	M8 x 1.25	142

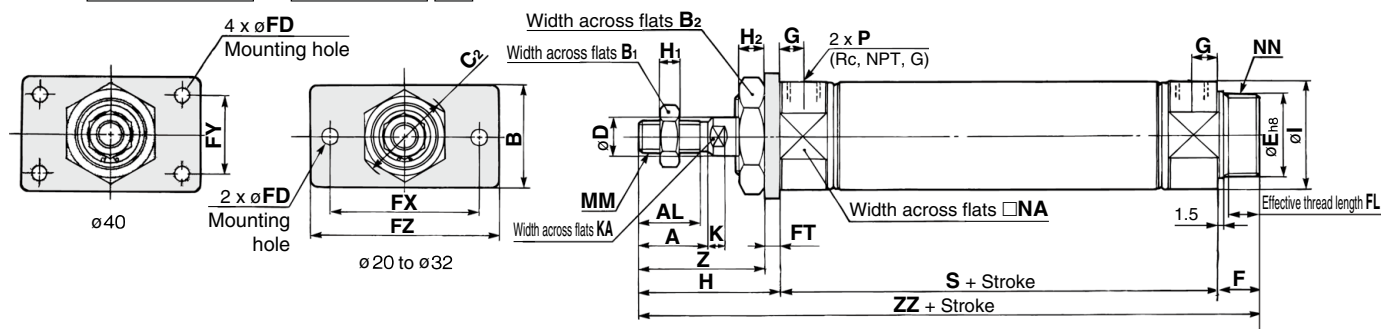
* When a female thread is used, use a thin wrench when tightening the piston rod.

* When a female thread is used, depending on the material of the workpiece, use a washer etc., to prevent the contact part at the rod end from being deformed.

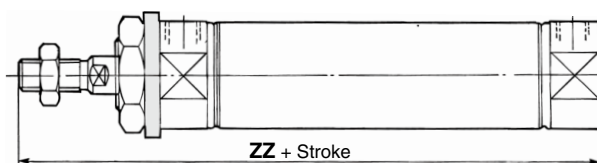
* The bracket is shipped together with the product.

Rod Flange (F)

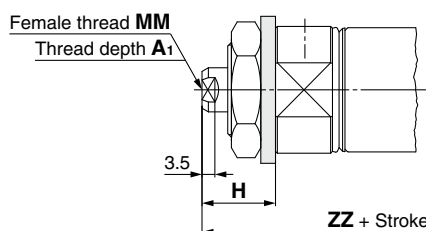
CM2F **Bore size** — **Stroke** **Z1-XB24**



Boss-cut



Female rod end



[mm]																													
Bore size	A	AL	B	B ₁	B ₂	C ₂	D	E	F	FL	FD	FT	FX	FY	FZ	G	H	H ₁	H ₂	I	K	KA	MM	NA	NN	P	S	Z	ZZ
20	18	15.5	34	13	26	30	8	20 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	62	37	116
25	22	19.5	40	17	32	37	10	26 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	62	41	120
32	22	19.5	40	17	32	37	12	26 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	45	6	8	37.5	5.5	10	M10 x 1.25	30.5	M26 x 1.5	1/8	64	41	122
40	24	21	52	22	41	47.3	14	32 ⁰ _{-0.039}	16	13.5	7	5	66	36	82	11	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	88	45	154

Boss-cut [mm]	
Bore size	ZZ
20	103
25	107
32	109
40	138

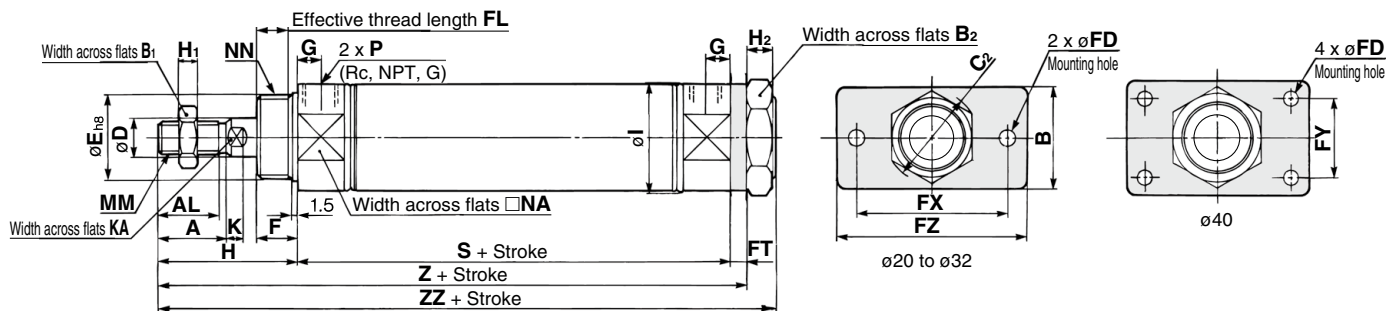
Female Rod End [mm]				
Bore size	A ₁	H	MM	ZZ
20	8	20	M4 x 0.7	95
25	8	20	M5 x 0.8	95
32	12	20	M6 x 1	97
40	13	21	M8 x 1.25	125

- * When a female thread is used, use a thin wrench when tightening the piston rod.
- * When a female thread is used, depending on the material of the workpiece, use a washer etc., to prevent the contact part at the rod end from being deformed.

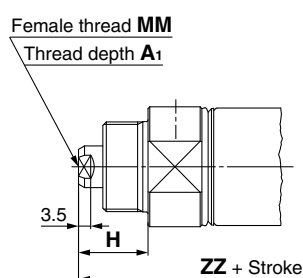
* The bracket is shipped together with the product.

Head Flange (G)

CM2G Bore size — Stroke Z1-XB24



Female rod end



Bore size	A	AL	B	B ₁	B ₂	C ₂	D	E	F	FL	FD	FT	FX	FY	FZ	G	H	H ₁	H ₂	I
20	18	15.5	34	13	26	30	8	20 ⁰ _{0.033}	13	10.5	7	4	60	—	75	8	41	5	8	28
25	22	19.5	40	17	32	37	10	26 ⁰ _{0.033}	13	10.5	7	4	60	—	75	8	45	6	8	33.5
32	22	19.5	40	17	32	37	12	26 ⁰ _{0.033}	13	10.5	7	4	60	—	75	8	45	6	8	37.5
40	24	21	52	22	41	47.3	14	32 ⁰ _{0.039}	16	13.5	7	5	66	36	82	11	50	8	10	46.5

Bore size	K	KA	MM	NA	NN	P	S	Z	ZZ
20	5	6	M8 x 1.25	24	M20 x 1.5	1/8	62	107	116
25	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	62	111	120
32	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	64	113	122
40	7	12	M14 x 1.5	42.5	M32 x 2	1/4	88	143	154

Female Rod End [mm]

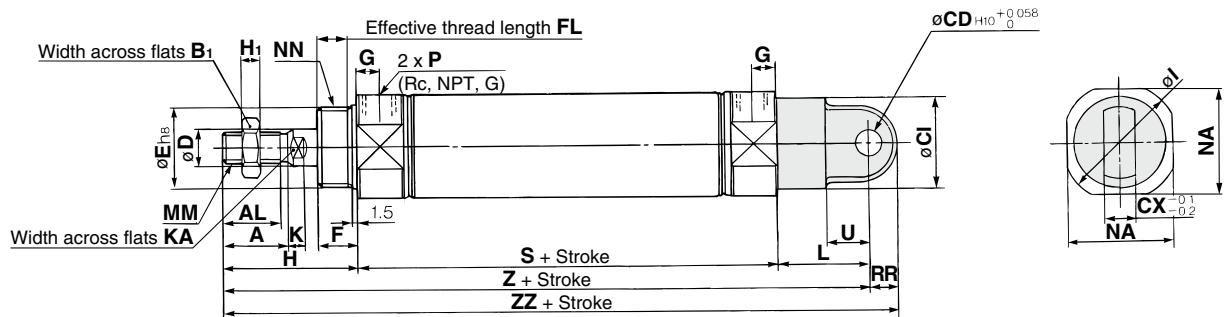
Bore size	A ₁	H	MM	ZZ
20	8	20	M4 x 0.7	95
25	8	20	M5 x 0.8	95
32	12	20	M6 x 1	97
40	13	21	M8 x 1.25	125

- * When a female thread is used, use a thin wrench when tightening the piston rod.
- * When a female thread is used, depending on the material of the workpiece, use a washer etc., to prevent the contact part at the rod end from being deformed.

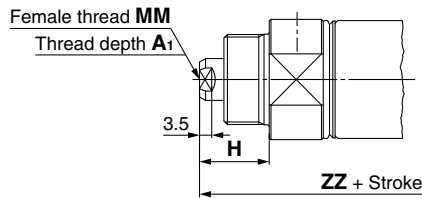
- * The bracket is shipped together with the product.

Single Clevis (C)

CM2C Bore size — Stroke Z1-XB24



Female rod end



Bore size	A	AL	B1	CI	CD	CX	D	E	F	FL	G	H	H1	I	K	KA	L	MM	NA	NN	P	RR	S	U	Z	ZZ
20	18	15.5	13	24	9	10	8	20 ^{+0.033} ₀	13	10.5	8	41	5	28	5	6	30	M8 x 1.25	24	M20 x 1.5	1/8	9	62	14	133	142
25	22	19.5	17	30	9	10	10	26 ^{+0.033} ₀	13	10.5	8	45	6	33.5	5.5	8	30	M10 x 1.25	30	M26 x 1.5	1/8	9	62	14	137	146
32	22	19.5	17	30	9	10	12	26 ^{+0.033} ₀	13	10.5	8	45	6	37.5	5.5	10	30	M10 x 1.25	34.5	M26 x 1.5	1/8	9	64	14	139	148
40	24	21	22	38	10	15	14	32 ^{+0.039} ₀	16	13.5	11	50	8	46.5	7	12	39	M14 x 1.5	42.5	M32 x 2	1/4	11	88	18	177	188

Female Rod End [mm]

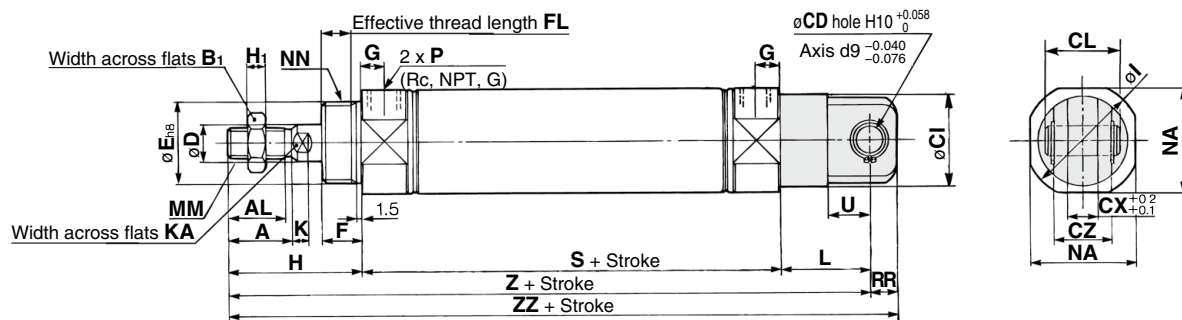
Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	121
25	8	20	M5 x 0.8	121
32	12	20	M6 x 1	123
40	13	21	M8 x 1.25	159

* When a female thread is used, use a thin wrench when tightening the piston rod.

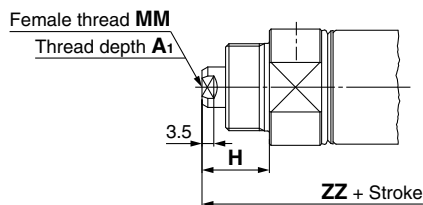
* When a female thread is used, depending on the material of the workpiece, use a washer etc., to prevent the contact part at the rod end from being deformed.

Double Clevis (D)

CM2D Bore size — Stroke Z1-XB24



Female rod end



Bore size	A	AL	B ₁	CD	CI	CL	CX	CZ	D	E	F	FL	G	H	H ₁	I	K	KA	L	MM	NA	NN	P	RR	S	U	Z	ZZ
20	18	15.5	13	9	24	25	10	19	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	28	5	6	30	M8 x 1.25	24	M20 x 1.5	1/8	9	62	14	133	142
25	22	19.5	17	9	30	25	10	19	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	33.5	5.5	8	30	M10 x 1.25	30	M26 x 1.5	1/8	9	62	14	137	146
32	22	19.5	17	9	30	25	10	19	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	37.5	5.5	10	30	M10 x 1.25	34.5	M26 x 1.5	1/8	9	64	14	139	148
40	24	21	22	10	38	41.2	15	30	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	46.5	7	12	39	M14 x 1.5	42.5	M32 x 2	1/4	11	88	18	177	188

* A clevis pin and retaining rings (split pins for ø40) are shipped together with the product.

Female Rod End [mm]

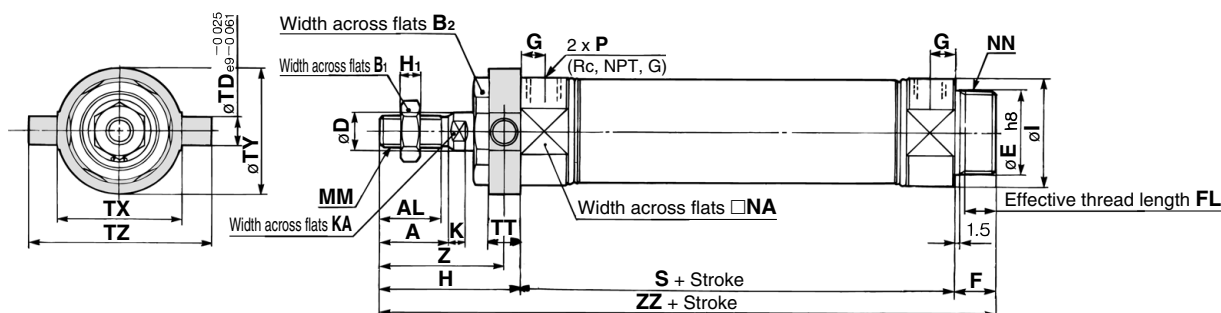
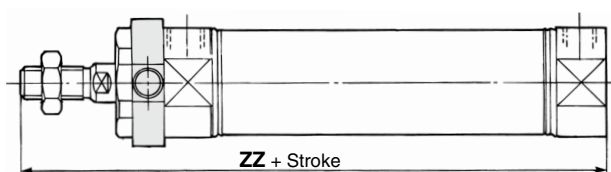
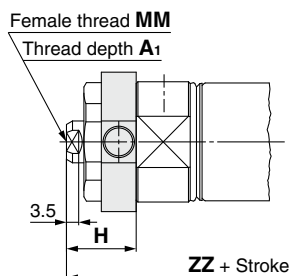
Bore size	A ₁	H	MM	ZZ
20	8	20	M4 x 0.7	121
25	8	20	M5 x 0.8	121
32	12	20	M6 x 1	123
40	13	21	M8 x 1.25	159

* When a female thread is used, use a thin wrench when tightening the piston rod.

* When a female thread is used, depending on the material of the workpiece, use a washer etc., to prevent the contact part at the rod end from being deformed.

Rod Trunnion (U)

CM2U Bore size — Stroke Z1-XB24

**Boss-cut****Female rod end**

Bore size	A	AL	B ₁	B ₂	D	E	F	FL	G	H	H ₁	I	K	KA	MM	NA	NN	P
20	18	15.5	13	26	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8
25	22	19.5	17	32	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8
32	22	19.5	17	32	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8
40	24	21	22	41	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4

Bore size	S	TD	TT	TX	TY	TZ	Z	ZZ
20	62	8	10	32	32	52	36	116
25	62	9	10	40	40	60	40	120
32	64	9	10	40	40	60	40	122
40	88	10	11	53	53	77	44.5	154

Boss-cut [mm]

Bore size	ZZ
20	103
25	107
32	109
40	138

Female Rod End [mm]

Bore size	A ₁	H	MM	ZZ
20	8	20	M4 x 0.7	95
25	8	20	M5 x 0.8	95
32	12	20	M6 x 1	97
40	13	21	M8 x 1.25	125

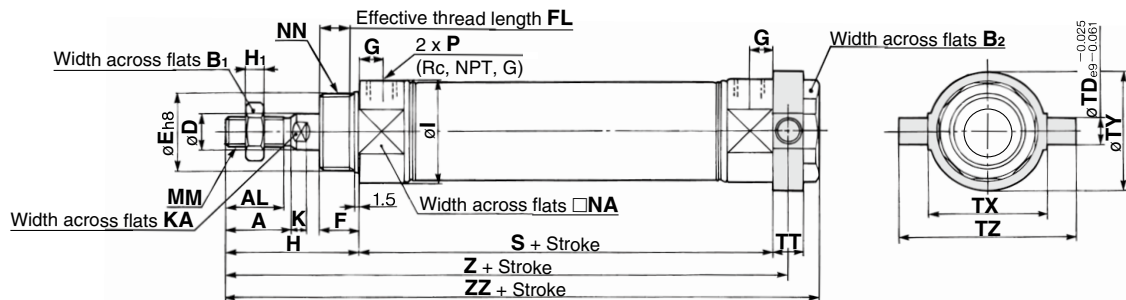
* When a female thread is used, use a thin wrench when tightening the piston rod.

* When a female thread is used, depending on the material of the workpiece, use a washer etc., to prevent the contact part at the rod end from being deformed.

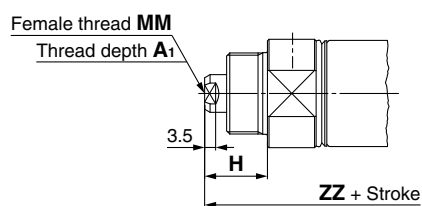
* The bracket is shipped together with the product.

Head Trunnion (T)

CM2T Bore size — Stroke Z1-XB24



Female rod end



Bore size	A	AL	B ₁	B ₂	D	E	F	FL	G	H	H ₁	I	K	KA	MM	NA	NN	P
20	18	15.5	13	26	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8
25	22	19.5	17	32	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8
32	22	19.5	17	32	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8
40	24	21	22	41	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4

Bore size	S	TD	TT	TX	TY	TZ	Z	ZZ
20	62	8	10	32	32	52	108	118
25	62	9	10	40	40	60	112	122
32	64	9	10	40	40	60	114	124
40	88	10	11	53	53	77	143.5	154

* The bracket is shipped together with the product.

Female Rod End [mm]

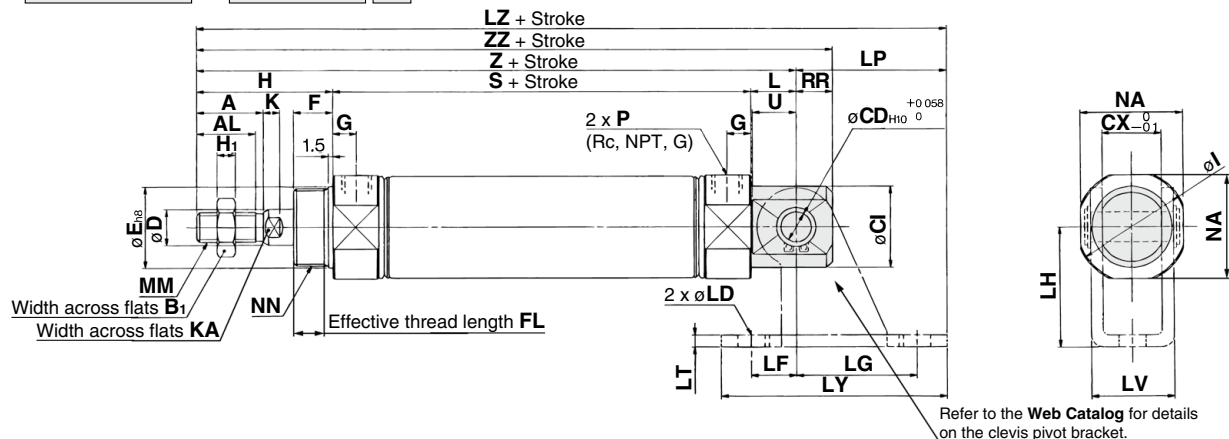
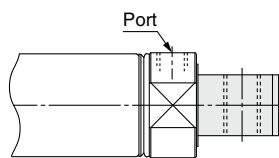
Bore size	A ₁	H	MM	ZZ
20	8	20	M4 x 0.7	97
25	8	20	M5 x 0.8	97
32	12	20	M6 x 1	99
40	13	21	M8 x 1.25	125

* When a female thread is used, use a thin wrench when tightening the piston rod.

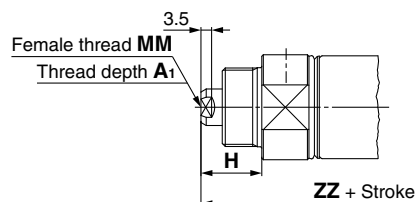
* When a female thread is used, depending on the material of the workpiece, use a washer etc., to prevent the contact part at the rod end from being deformed.

Integrated Clevis (E)

CM2E Bore size — Stroke Z1-XB24

**Integrated clevis (90°)(V)**

* The dimensions are the same as those for the integrated clevis (E).

Female rod end

[mm]

Bore size	A	AL	B ₁	CD	CI	CX	D	E	F	FL	G	H	H ₁	I	K	KA	L	MM	NA	NN
20	18	15.5	13	8	20	12	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	28	5	6	12	M8 x 1.25	24	M20 x 1.5
25	22	19.5	17	8	22	12	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	33.5	5.5	8	12	M10 x 1.25	30	M26 x 1.5
32	22	19.5	17	10	27	20	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	37.5	5.5	10	15	M10 x 1.25	34.5	M26 x 1.5
40	24	21	22	10	33	20	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	46.5	7	12	15	M14 x 1.5	42.5	M32 x 2

[mm]

Bore size	P	RR	S	U	Z	ZZ
20	1/8	9	62	11.5	115	124
25	1/8	9	62	11.5	119	128
32	1/8	12	64	14.5	124	136
40	1/4	12	88	14.5	153	165

Female Rod End [mm]

Bore size	A ₁	H	MM	ZZ
20	8	20	M4 x 0.7	103
25	8	20	M5 x 0.8	103
32	12	20	M6 x 1	111
40	13	21	M8 x 1.25	136

Clevis Pivot 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	152
25	6.8	15	30	30	37	3.2	18.4	59	156
32	9	15	40	40	50	4	28	75	174
40	9	15	40	40	50	4	28	75	203

* When a female thread is used, use a thin wrench when tightening the piston rod.

* When a female thread is used, depending on the material of the workpiece, use a washer etc., to prevent the contact part at the rod end from being deformed.



Specific Product Precautions

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For actuator and auto switch precautions, refer to “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smcworld.com>

Handling

⚠ 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 joint of the cover.

2. Operate the cylinder within the specified cylinder speed, kinetic energy, and lateral load at the rod end.

3. The allowable kinetic energy is different between the cylinders with male rod ends and with female rod ends due to the different thread sizes.

4. When a female rod end is used, depending on the material of the workpiece, use a washer etc., to prevent the contact part at the rod end from being deformed.

5. Do not apply excessive lateral load to the piston rod.

Easy checking method

Min. operating pressure after the cylinder is mounted to the equipment (MPa) = Min. operating pressure of cylinder (MPa) + {Load mass (kg) x Friction coefficient of guide/Sectional area of cylinder (mm²)}

If smooth operation is confirmed within the above value, the load on the cylinder is the resistance of the thrust only and it can be judged as having no lateral load.

⚠ Caution

1. Cannot be disassembled

Cover and cylinder tube are connected to each other by caulking method, thus making it impossible to disassemble. Parts inside the cylinder, such as the rod seal, can never be replaced.

2. Do not touch the cylinder during operation.

Use caution when handling a cylinder, which is running at a high speed and a high frequency, because the surface of the cylinder tube could get hot enough to burn you.

3. Do not use the air cylinder as an air-hydro cylinder.

The use of turbine oil as a fluid for an air cylinder may result in oil leakage.

4. The oil stuck to the cylinder is grease.

5. The base oil of the grease may seep out.

The base oil of the grease in the cylinder may seep out of the tube, cover, crimped part, or rod bushing depending on the operating conditions (ambient temperature 40°C or more, pressurized condition, low frequency operation).

6. When a rod end female thread is used, use a thin wrench when tightening the piston rod.

7. When using a rod end bracket and/or pivot bracket, make sure they do not interfere with other brackets, workpieces, rod section, etc.

8. Do not lubricate the cylinder.

Lubrication of the cylinder, using a lubricator, may cause malfunction.

9. Do not wipe out the grease in the sliding part.

If grease applied to the sliding surface is removed, this can cause malfunction and reduce the life of the cylinder.

Durability of The Cylinder

The durability of a longer life cylinder has been evaluated by comparison with the existing cylinders under SMC's test conditions.

The durability of a cylinder depends on the customer's operating conditions and operating environment.

Therefore, durability of four times or longer will not be guaranteed under all conditions.

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)*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.
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, whichever is first.*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.

Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

Safety Instructions

Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.