Stainless Steel Cylinder

New

Compact / Improved Water-resistant Type

RoHS

Ø 20, Ø 25, Ø 32, Ø 40

External parts made of stainless steel

CO_2e 49 % reduction

5.96 kg-CO_2e ➡ **3.07 kg**-CO_2e

When compared with the existing CG5 series during manufacturing

Compact and lightweight

Compact Type

Overall length reduced by **21 %** 175 mm➡139 mm

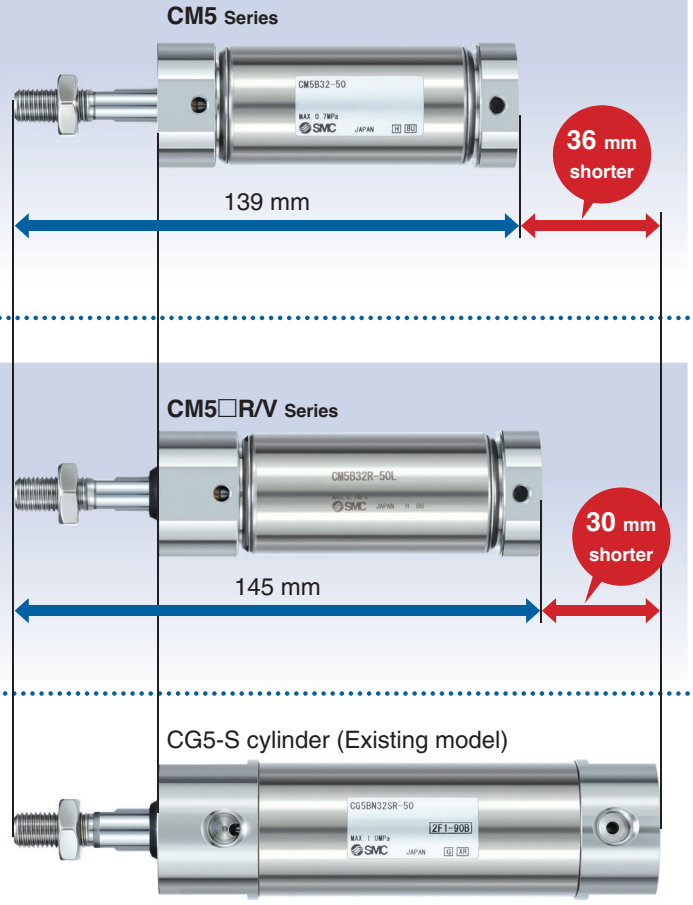
Weight: Max. **50 %** reduction 0.75 kg➡0.38 kg

* Compared with the existing CG5-S series at 32 mm bore and 50 mm stroke

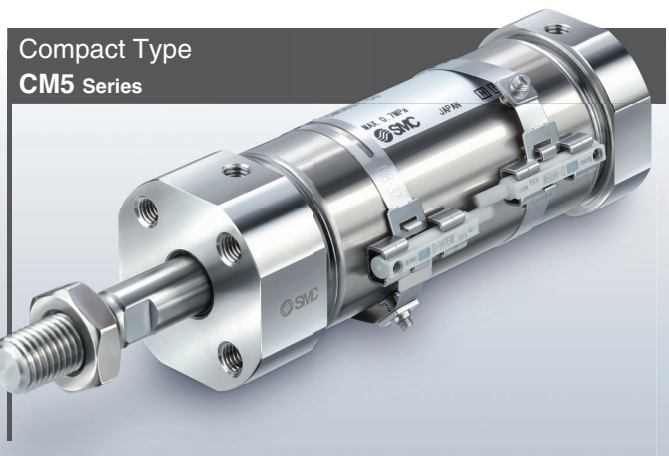
4 times or more life expectancy under the water droplet scattering environment

Improved Water-resistant Type

* Compared to the standard CM2 product series



* Compared at 32 mm bore and 50 mm stroke



CM5□ Series

SMC

CAT.EUS20-300A-UK

Featuring a special scraper for 4 times the durability (Improved water-resistant type)

■ Grease for use in food machinery: NSF-H1 certified greases are available.

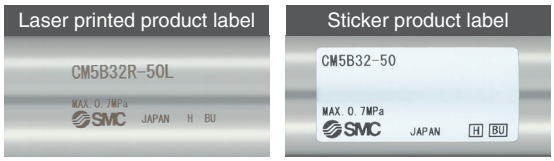
⚠ Caution

Avoid installing and using a cylinder inside a food zone.
Refer to the operation manual for details.

Seal material: FKM or NBR are available.

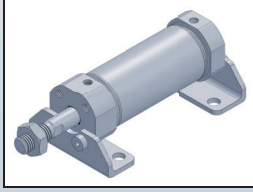
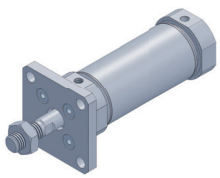
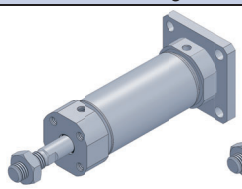
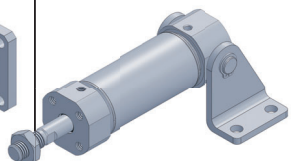
Special scraper, rod seal, and tube gasket
∗ Only NBR is available for the piston seal.

Laser printing of the product label is an available option.



Water-resistant solid state auto switch D-M9□A

Mounting Brackets

L: Axial foot bracket	F: Rod flange	G: Head flange	E: Integrated clevis
			

External parts made of stainless steel

Stainless steel is used for the cylinder body, mounting bracket, mounting bolt, and accessories.
For details, refer to page 4.

Series Variations

Series		Seal material	Grease	Action	Bore size [mm]				Applicable auto switch	Cushion	Mounting bracket	Label
					20	25	32	40				
Compact type	**CM5 Series** 	NBR	General purpose grease for industrial use	Double Acting Single Rod	●	●	●	●	D-M9□A(V)	Rubber	Axial foot bracket Rod flange Head flange Integrated clevis	Sticker product label, Laser printed product label
Improved water-resistant type	**CM5□R/V Series** 	NBR, FKM	Grease for use in food-safe machinery: NSF-H1 certified greases are available.	Double Acting Single Rod	●	●	●	●				

This product cannot be used in the food zone. Refer to the **Web Catalogue** for details.

CONTENTS

Stainless Steel Cylinder ***CM5□ Series***

Compact Type CM5 Series

Improved Water-resistant Type CM5□R/V Series

⚠ CM5□ Series/Specific Product Precautions

Be sure to read this before handling the products. For safety instructions as well as actuator and auto switch precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" of each product on the SMC website: https://www.smc.eu

Stainless Steel Cylinder / Compact Type
Double Acting, Single Rod

CM5 Series
Ø 20, Ø 25, Ø 32, Ø 40

RoHS

How to Order

Without magnet C M5 B 20 – 50 ☐

With auto switch C D M5 B 20 – 50 ☐ – M9BA ☐

With auto switch (Built-in magnet)

Mounting, Bracket

B	Basic (Female thread on both covers)
BZ	Basic (Female thread on rod cover)
L	Axial foot bracket
F	Rod flange
G	Head flange
E	Integrated clevis

Bore size

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

Cylinder stroke [mm]
Refer to page 4 for applicable strokes.

Label

—	Sticker product label
L	Laser printed product label

Auto switch

—	Without auto switch

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

Number of auto switches

—	2
S	1
n	n

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

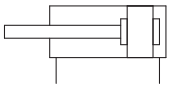
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length [m]				Pre-wired connector				Applicable load	
													M8 3-pin		M12 4-pin			
					DC		Perpendicular	In-line	0.5	1	3	5	0.5	1	0.5	1		
									—	M	L	Z	SAPC	MAPC	SDPC	MDPC		
Solid state auto switch	Water resistant (2-colour indicator)	Grommet	Yes	3-wire (NPN)	24 V	5V, 12 V	**M9NAV**∗1, ∗2	**M9NA**∗1, ∗2	○	○	●	○	○	○	○	○	IC circuit	Relay, PLC
				3-wire (PNP)			**M9PAV**∗1, ∗2	**M9PA**∗1, ∗2	○	○	●	○	○	○	○	○		
				2-wire		12 V	**M9BAV**∗1, ∗2	**M9BA**∗1, ∗2	○	○	●	○	○	○	○	○	—	

∗1 Water-resistant type auto switches can be mounted on the above models, but SMC cannot guarantee water resistance.
∗2 For the type with a pre-wired connector, brass is used for some of the connector parts.

1) Lead wire length symbols: 0.5 m····· — (Example) M9NA
1 m····· M (Example) M9NAM
3 m····· L (Example) M9NAL
5 m····· Z (Example) M9NAZ
2) Since there are applicable auto switches other than those listed above, refer to page 14 for details.
3) Solid state auto switches marked with a "○" are produced upon receipt of order.
4) For details on applicable auto switches/auto switches with pre-wired connectors, refer to the **Web Catalogue**.
5) 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



Refer to pages 13 and 14 for cylinders with auto switches.

· Auto Switch Proper Mounting Position (Detection at stroke end) and Mounting Height
· Min. Stroke for Auto Switch Mounting
· Precautions for Mounting Two D-M9 In-line Entry Type Auto Switches on the Same Surface
· 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	1.0 MPa*1			
Max. operating pressure	0.7 MPa*1			
Min. operating pressure	0.05 MPa			
Ambient and fluid temperatures	5 to 60 °C (No freezing)			
Lubrication	Not required (Non-lube)			
Stroke length tolerance	$^{+2.0}_{0}$ mm			
Piston speed	50 to 500 mm/s*1, *2			
Cushion	Rubber bumper			
Allowable kinetic energy [J]	0.11	0.18	0.29	0.52
Grease	General purpose grease for industrial use (GR-S)			

*1 The proof pressure, maximum operating pressure and operating piston speed all differ from the existing CG5-S product series.
*2 Depending on the system configuration selected, the specified speed may not be satisfied.
* Operate the cylinder within the allowable kinetic energy.
* Due to the initial wear, etc., of the sliding parts, the piston rod surface may start to appear black.

Applicable Strokes

Bore size [mm]	Applicable stroke [mm]*1
20	25, 50, 75, 100, 125, 150, 200, 250, 300
25	
32	
40	

*1 Intermediate strokes not listed above are produced upon receipt of order.
Minimum manufacturable stroke length is 25 mm. Maximum manufacturable stroke length is 300 mm.

Mounting Brackets/Part Nos.

Mounting bracket		Min. order quantity	Bore size [mm]				Material	Contents
			20	25	32	40		
Rod end nut		1	NT-02SUS	NT-03SUS		NT-G04SUS	Stainless steel*3	1 rod end nut
Bracket mounting bolt*1	For foot bracket	1	CM5-H020	CM5-H025		CM5-040-L	Stainless steel*3	4 mounting bolts
	For flange					CM5-040-F	Stainless steel*3	4 mounting bolts
Foot bracket*2		1	CM5-L020	CM5-L025	CM5-L032	CM5-L040	Stainless steel*3	2 mounting bolts, 1 foot bracket
Flange bracket		1	CM5-F020	CM5-F025	CM5-F032	CM5-F040	Stainless steel*3	4 mounting bolts, 1 flange
Clevis pin		1	CM5-CD-E020	CM5-CD-E025	CM5-CD-E032	CM5-CD-E040	Stainless steel*4	2 retaining rings, 1 clevis pin
Pivot bracket		1	CM5-E020SUS	CM5-E025SUS	CM5-E032SUS	CM5-E040SUS	*3, *4 Stainless steel	1 clevis pin, 2 retaining rings, A pair of pivot brackets

*1 The mounting bolt differs from the one used in the existing CG5-S product series.
*2 Order 2 foot brackets for each cylinder unit.
*3 Austenite stainless steel
*4 Martensitic stainless steel (Clevis pin)
* Refer to page 12 for dimensions.

Weight

[kg]

Bore size [mm]		20	25	32	40
Basic weight (Without magnet)	CM5B□-□ Basic (Female thread on both covers)	0.15	0.24	0.32	0.60
	CM5BZ□-□ Basic (Female thread on rod cover)	0.15	0.25	0.33	0.60
	CM5L□-□ Axial foot bracket	0.24	0.35	0.43	0.75
	CM5F□-□ Rod flange	0.36	0.45	0.52	0.88
	CM5G□-□ Head flange	0.36	0.45	0.52	0.88
	CM5E□-□ Integrated clevis	0.18	0.29	0.40	0.70
Additional weight per 50 mm of stroke		0.04	0.05	0.06	0.10
Pivot bracket*1		0.08	0.08	0.18	0.18
Additional weight with magnet		0.01	0.02	0.02	0.03

*1 Including clevis pin and retaining ring

Calculation (Example): **CDM5L32-150**

- Basic weight..... 0.43 kg (Axial foot bracket, Ø 32)
- Additional weight..... 0.06 kg/50 mm stroke
- Cylinder stroke ..... 150 mm
- Additional weight with magnet..... 0.02 kg

0.43 + 0.06 x 150/50 + 0.02 = **0.63 kg**

Allowable Kinetic Energy

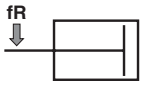
Table (1) Max. Allowable Kinetic Energy [J]

Bore size [mm]	20	25	32	40
CM5	0.11	0.18	0.29	0.52
CM5□R/V	0.11	0.18	0.29	0.52

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

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

Allowable Lateral Load at Rod End



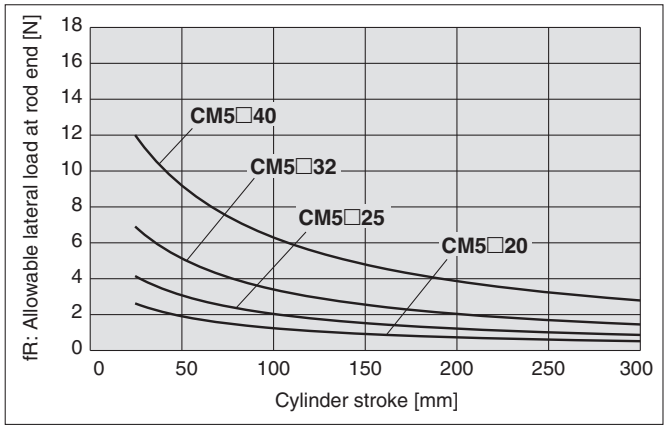


Table (2) Mass of Cylinder Moving Parts Without Built-in Magnet/0 Stroke [kg]

Bore size [mm]	20	25	32	40
CM5	0.03	0.05	0.05	0.11
CM5□R/V	0.03	0.05	0.06	0.12

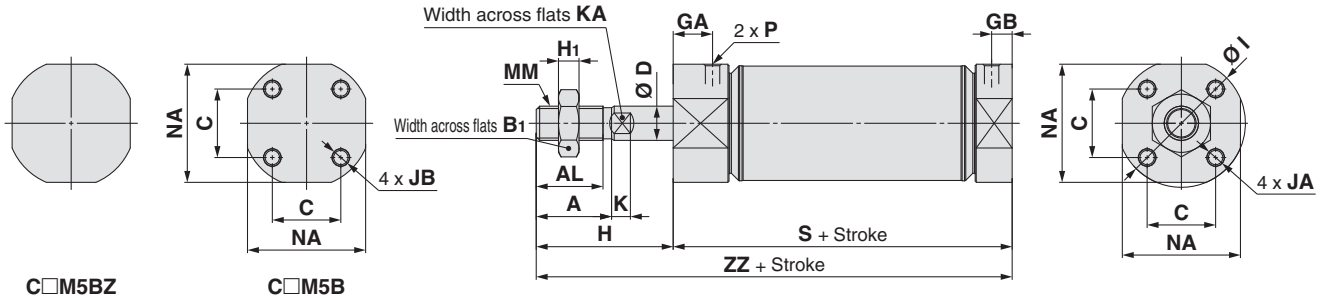
Table (3) Mass of Cylinder Moving Parts/Additional Weight [kg]

Bore size [mm]	20	25	32	40
Additional weight per 50 mm of stroke	0.02	0.03	0.03	0.06

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

Dimensions

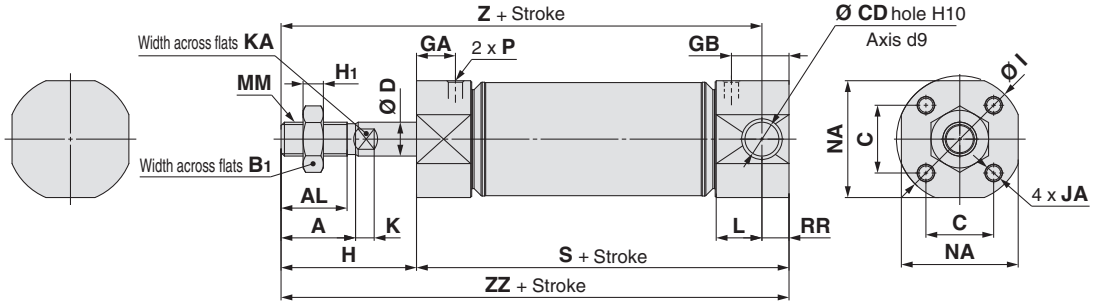
Basic (Female thread on both covers:B), (Female thread on rod cover: BZ)



[mm]

Bore size	A	AL	B1	C	D	GA	GB	H	H1	I	JA	JB	K	KA	MM	NA	P	Without magnet		Built-in magnet	
																		S	ZZ	S	ZZ
20	18	15.5	13	16.5	8	9.5	6	35	5	30	M4 x 0.7 depth7	M4 x 0.7 depth 6.5	5	6	M8 x 1.25	24	M5 x 0.8	46	81	52	87
25	22	19.5	17	18.5	10	11	6	40	6	33.5	M5 x 0.8 depth8	M5 x 0.8 depth 6.5	5.5	8	M10 x 1.25	30	M5 x 0.8	49	89	54.5	94.5
32	22	19.5	17	20	10	11.5	6	40	6	37.5	M5 x 0.8 depth8	M5 x 0.8 depth 7	5.5	8	M10 x 1.25	34.5	M5 x 0.8	49	89	55	95
40	30	27	19	26	14	13	7	50	8	46.5	M6 x 1 depth 12	M6 x 1 depth 8	6	12	M14 x 1.5	42.5	M5 x 0.8	57	107	63.5	113.5

Integrated clevis (E)



[mm]

Bore size	A	AL	B1	C	CD		D	GA	GB	H	H1	I	JA	K	KA	L	MM	NA	P	RR
					Hole	Axis														
20	18	15.5	13	16.5	$8^{+0.058}_{0}$	$8^{-0.040}_{-0.076}$	8	9.5	15	35	5	30	M4 x 0.7 depth 7	5	6	12.5	M8 x 1.25	24	M5 x 0.8	7
25	22	19.5	17	18.5	$8^{+0.058}_{0}$	$8^{-0.040}_{-0.076}$	10	11	15	40	6	33.5	M5 x 0.8 depth 8	5.5	8	12.5	M10 x 1.25	30	M5 x 0.8	7
32	22	19.5	17	20	$10^{+0.058}_{0}$	$10^{-0.040}_{-0.076}$	10	11.5	17	40	6	37.5	M5 x 0.8 depth 8	5.5	8	13.5	M10 x 1.25	34.5	M5 x 0.8	8
40	30	27	19	26	$10^{+0.058}_{0}$	$10^{-0.040}_{-0.076}$	14	13	17	50	8	46.5	M6 x 1 depth 12	6	12	13.5	M14 x 1.5	42.5	M5 x 0.8	8

Bore size	Without magnet			Built-in magnet		
	S	Z	ZZ	S	Z	ZZ
20	55	83	90	61	89	96
25	57	90	97	63	96	103
32	60	92	100	66	98	106
40	67	109	117	73.5	115.5	123.5

∗ For details about the mounting bracket and accessories, please refer to page 10 through to 12.

Stainless Steel Cylinder / Improved Water-resistant Type
Double Acting, Single Rod
CM5□R/V Series
Ø 20, Ø 25, Ø 32, Ø 40

RoHS

How to Order

Without magnet C M5 **B** **20** **R** – **50** □

With auto switch C **D** M5 **B** **20** **R** – **50** □ – **M9BA** □

With auto switch (Built-in magnet)

Mounting, Bracket

B	Basic (Female thread on both covers)
BZ	Basic (Female thread on rod cover)
L	Axial foot bracket
F	Rod flange
G	Head flange
E	Integrated clevis

Bore size

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

Special scraper/ Seal material

R	NBR
V	FKM*1

*1 Only external facing seals are available in FKM (special scrapers, rod seal and tube gasket)

Cylinder stroke [mm]
Refer to page 8 for applicable strokes.

Label

—	Sticker product label
L	Laser printed product label

Auto switch

—	Without auto switch

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

Number of auto switches

—	2
S	1
n	n

Applicable Auto Switches / Refer to the **Web Catalogue** 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	
													M8 3-pin		M12 4-pin			
					DC		Perpendicular	In-line	0.5	1	3	5	0.5	1	0.5	1		
									—	M	L	Z	SAPC	MAPC	SDPC	MDPC		
Solid state auto switch	Water resistant (2-colour indicator)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	**M9NAV***1	**M9NA***1	○	○	●	○	○	○	○	○	IC circuit	Relay, PLC
				3-wire (PNP)			**M9PAV***1	**M9PA***1	○	○	●	○	○	○	○	○		
				2-wire		12 V	**M9BAV***1	**M9BA***1	○	○	●	○	○	○	○	○	—	

*1 For the type with a pre-wired connector, brass is used for some of the connector parts.

1) Lead wire length symbols: 0.5 m····· — (Example) M9NA
1 m····· M (Example) M9NAM
3 m····· L (Example) M9NAL
5 m····· Z (Example) M9NAZ

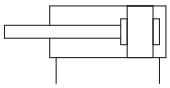
2) Solid state auto switches marked with a "○" are produced upon receipt of order.

3) For details on applicable auto switches/auto switches with pre-wired connectors, refer to the **Web Catalogue**.

4) 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



Refer to pages 13 and 14 for cylinders with auto switches.

- Auto Switch Proper Mounting Position (Detection at stroke end) and Mounting Height
- Min. Stroke for Auto Switch Mounting
- Precautions for Mounting Two D-M9 In-line Entry Type Auto Switches on the Same Surface
- 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	1.0 MPa*1			
Max. operating pressure	0.7 MPa*1			
Min. operating pressure	0.08 MPa		0.05 MPa	
Ambient and fluid temperatures	5 to 60 °C (No freezing)			
Lubrication	Not required (Non-lube)			
Stroke length tolerance	$^{+2.0}_{0}$ mm			
Piston speed	50 to 500 mm/s*1, *2			
Cushion	Rubber bumper			
Allowable kinetic energy [J]	0.11	0.18	0.29	0.52
Grease	Grease for food processing machines (NSF-H1) (GR-H)			

*1 The proof pressure, maximum operating pressure and operating piston speed all differ from the existing CG5-S product series.
*2 Depending on the system configuration selected, the specified speed may not be satisfied.
* Operate the cylinder within the allowable kinetic energy.
* Due to the initial wear, etc., of the sliding parts, the piston rod surface may start to appear black.

Applicable Strokes

Bore size [mm]	Applicable stroke [mm]*1
20	25, 50, 75, 100, 125, 150, 200, 250, 300
25	
32	
40	

*1 Intermediate strokes not listed above are produced upon receipt of order.
Minimum manufacturable stroke length is 25 mm. Maximum manufacturable stroke length is 300 mm.

For details on mounting brackets and part numbers, refer to page 4.

Weight

[kg]

Bore size [mm]		20	25	32	40
Basic weight (Without magnet)	CM5B□R/V-□ Basic (Female thread on both covers)	0.17	0.27	0.37	0.66
	CM5BZ□R/V-□ Basic (Female thread on rod cover)	0.17	0.27	0.37	0.67
	CM5L□R/V-□ Axial foot bracket	0.25	0.38	0.47	0.81
	CM5F□R/V-□ Rod flange	0.38	0.47	0.56	0.94
	CM5G□R/V-□ Head flange	0.38	0.47	0.56	0.94
	CM5E□R/V-□ Integrated clevis	0.20	0.32	0.44	0.77
Additional weight per 50 mm of stroke		0.04	0.05	0.06	0.10
Pivot bracket*1		0.08	0.08	0.18	0.18
Additional weight with magnet		0.01	0.02	0.02	0.03

*1 Including clevis pin and retaining ring

Calculation (Example): **CDM5L32R-150**

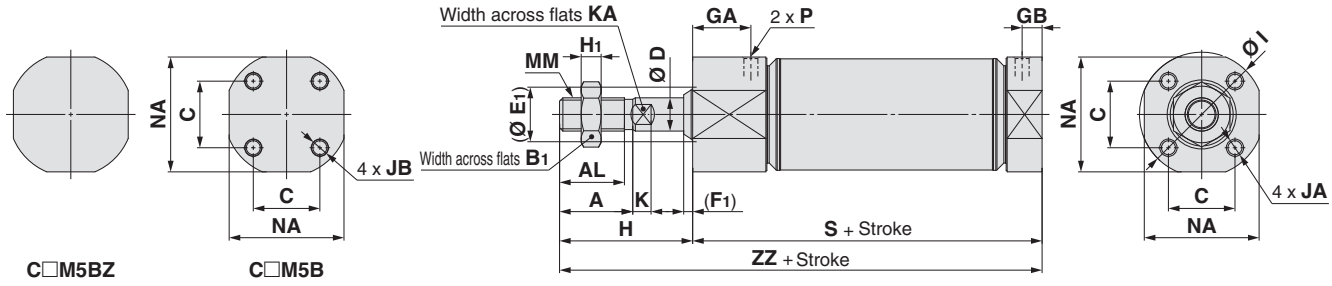
- Basic weight..... 0.47 kg (Axial foot bracket, Ø 32)
- Additional weight..... 0.06 kg/50 mm stroke
- Cylinder stroke ..... 150 mm
- Additional weight with magnet..... 0.02 kg

0.47 + 0.06 × 150/50 + 0.02 = **0.67 kg**

For details on allowable kinetic energy, allowable lateral load at the rod end, please refer to the standard type on page 5.

Dimensions

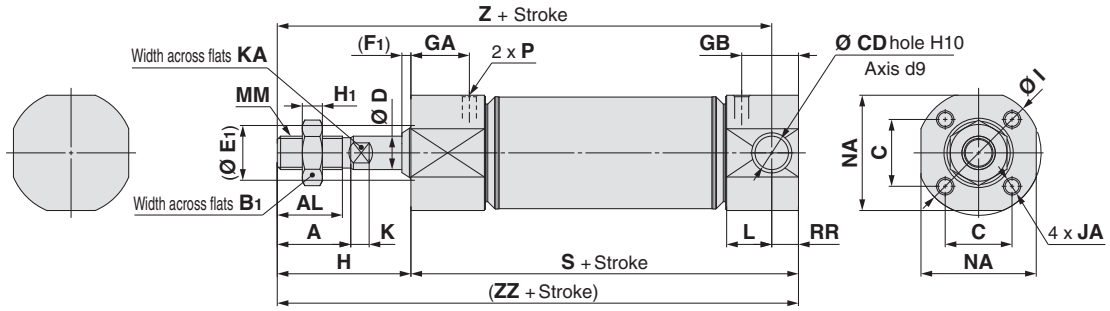
Basic (Female thread on both covers:B), (Female thread on rod cover: BZ)



[mm]

Bore size	A	AL	B1	C	D	E1	F1	GA	GB	H	H1	I	JA	JB	K	KA	MM	NA	P	Without magnet		Built-in magnet	
																				S	ZZ	S	ZZ
20	18	15.5	13	16.5	8	15	3	14.5	6	35	5	30	M4 x 0.7 depth 7	M4 x 0.7 depth 6.5	5	6	M8 x 1.25	24	M5 x 0.8	51	86	57	92
25	22	19.5	17	18.5	10	17	3	16	6	40	6	33.5	M5 x 0.8 depth 8	M5 x 0.8 depth 6.5	5.5	8	M10 x 1.25	30	M5 x 0.8	54	94	59.5	99.5
32	22	19.5	17	20	10	17	3	17.5	6	40	6	37.5	M5 x 0.8 depth 8	M5 x 0.8 depth 7	5.5	8	M10 x 1.25	34.5	M5 x 0.8	55	95	61	101
40	30	27	19	26	14	21	3	19	7	50	8	46.5	M6 x 1 depth 12	M6 x 1 depth 8	6	12	M14 x 1.5	42.5	M5 x 0.8	63	113	69.5	119.5

Integrated clevis (E)



[mm]

Bore size	A	AL	B1	C	CD		D	E1	F1	GA	GB	H	H1	I	JA	K	KA	L	MM	NA	P
					Hole	Axis															
20	18	15.5	13	16.5	$8^{+0.058}_{0}$	$8^{-0.040}_{-0.076}$	8	15	3	14.5	15	35	5	30	M4 x 0.7 depth 7	5	6	12.5	M8 x 1.25	24	M5 x 0.8
25	22	19.5	17	18.5	$8^{+0.058}_{0}$	$8^{-0.040}_{-0.076}$	10	17	3	16	15	40	6	33.5	M5 x 0.8 depth 8	5.5	8	12.5	M10 x 1.25	30	M5 x 0.8
32	22	19.5	17	20	$10^{+0.058}_{0}$	$10^{-0.040}_{-0.076}$	10	17	3	17.5	17	40	6	37.5	M5 x 0.8 depth 8	5.5	8	13.5	M10 x 1.25	34.5	M5 x 0.8
40	30	27	19	26	$10^{+0.058}_{0}$	$10^{-0.040}_{-0.076}$	14	21	3	19	17	50	8	46.5	M6 x 1 depth 12	6	12	13.5	M14 x 1.5	42.5	M5 x 0.8

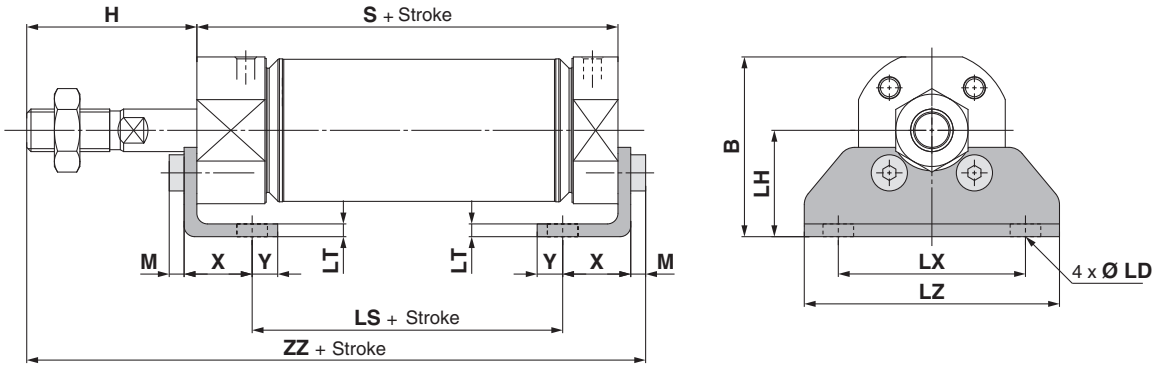
Bore size	RR	Without magnet			Built-in magnet		
		S	Z	ZZ	S	Z	ZZ
20	7	60	88	95	66	94	101
25	7	62	95	102	68	101	108
32	8	66	98	106	72	104	112
40	8	73	115	123	79.5	121.5	129.5

CM5□ Series
Mounting Bracket Dimensions

Dimensions

∗ Mounting bracket is shipped together with the product, but not assembled

Axial foot bracket (L)



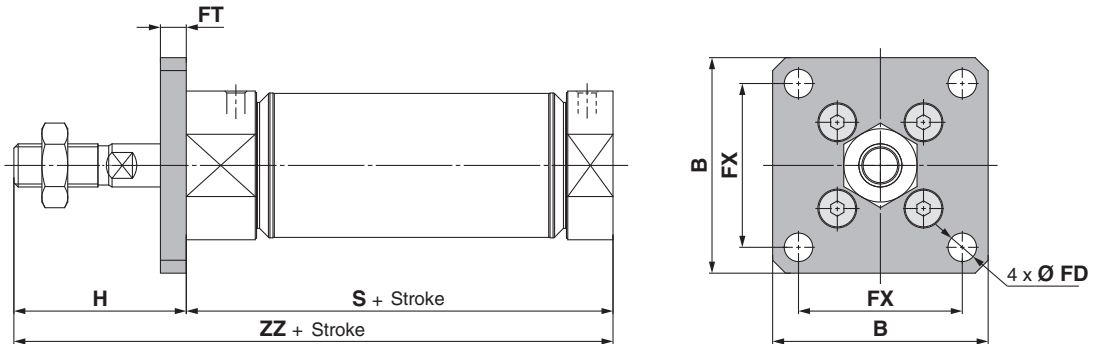
CM5 Series [mm]

Bore size	B	H	LD	LH	LT	LX	LZ	M	X	Y	Without magnet			Built-in magnet		
											LS	S	ZZ	LS	S	ZZ
20	34	35	6	22	3	40	50	3	15	7	22	46	87	28	52	93
25	40	40	6	25	3	44	60	3.5	15	7	25	49	95.5	30.5	54.5	101
32	42.5	40	7.2	25	3	44	60	3.5	16	6	23	49	95.5	29	55	101.5
40	51.5	50	7.2	30	3	54	75	4	16.5	6.5	30	57	114	36.5	63.5	120.5

CM5□R/V Series [mm]

Bore size	Without magnet			Built-in magnet		
	LS	S	ZZ	LS	S	ZZ
20	27	51	92	33	57	98
25	30	54	100.5	35.5	59.5	106
32	29	55	101.5	35	61	107.5
40	36	63	120	42.5	69.5	126.5

Rod flange (F)



CM5 Series [mm]

Bore size	B	FD	FT	FX	H	Without magnet		Built-in magnet	
						S	ZZ	S	ZZ
20	50	5.5	6	36	35	46	81	52	87
25	50	5.5	6	36	40	49	89	54.5	94.5
32	50	6.6	6	38	40	49	89	55	95
40	60	6.6	6	46	50	57	107	63.5	114

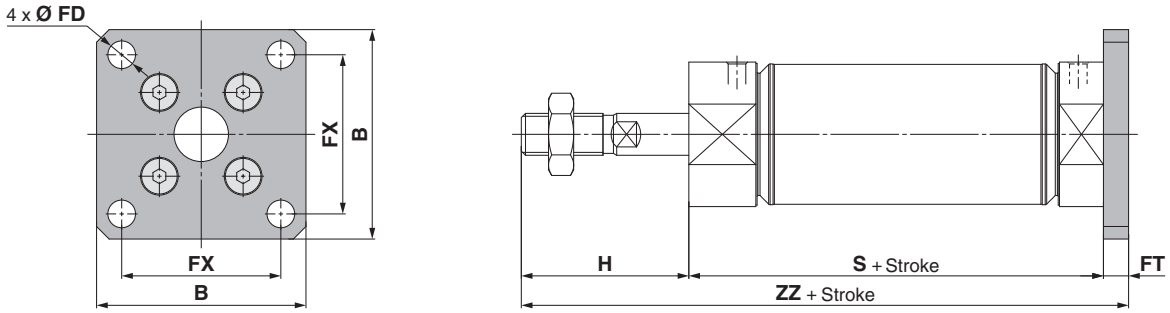
CM5□R/V Series [mm]

Bore size	Without magnet		Built-in magnet	
	S	ZZ	S	ZZ
20	51	86	57	92
25	54	94	59.5	99.5
32	55	95	61	101
40	63	113	69.5	120

Dimensions

* Mounting bracket is shipped together with the product, but not assembled

Head flange (G)



CM5 Series [mm]

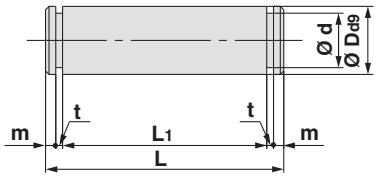
Bore size	B	FD	FT	FX	H	Without magnet		Built-in magnet	
						S	ZZ	S	ZZ
20	50	5.5	6	36	35	46	87	52	93
25	50	5.5	6	36	40	49	95	54.5	100.5
32	50	6.6	6	38	40	49	95	55	101
40	60	6.6	6	46	50	57	113	63.5	119.5

CM5□R/V Series [mm]

Bore size	Without magnet		Built-in magnet	
	S	ZZ	S	ZZ
20	51	92	57	98
25	54	100	59.5	105.5
32	55	101	61	107
40	63	119	69.5	125.5

CM5□ Series
Dimensions of Accessories

Clevis Pin

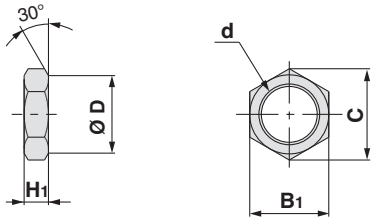


Material: Stainless steel 440 (Pin)
Stainless steel 304
(Retaining ring)

[mm]

Applicable bore size	Part no.	D_{d9}	d	L	L_1	m	t	Included retaining ring
20	**CM5-CD-E020**	$8^{-0.040}_{-0.076}$	7.6	35.6	30.8	1.5	0.9	Type C 8 for axis
25	**CM5-CD-E025**	$8^{-0.040}_{-0.076}$	7.6	41.6	36.8	1.5	0.9	Type C 8 for axis
32	**CM5-CD-E032**	$10^{-0.040}_{-0.076}$	9.6	49	43.6	1.55	1.15	Type C 10 for axis
40	**CM5-CD-E040**	$10^{-0.040}_{-0.076}$	9.6	57	51.6	1.55	1.15	Type C 10 for axis

Rod End Nut

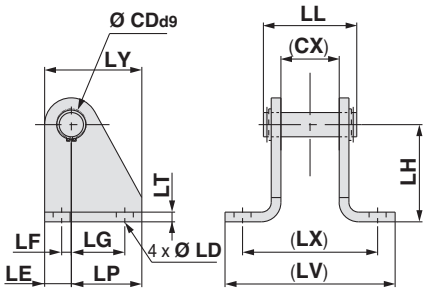


Material: Stainless steel 304

[mm]

Applicable bore size	Part no.	B_1	C	D	d	H_1
20	**NT-02SUS**	13	(15)	12.5	M8 x 1.25	5
25, 32	**NT-03SUS**	17	(19.6)	16.5	M10 x 1.25	6
40	**NT-G04SUS**	19	(21.9)	18	M14 x 1.5	8

Pivot Bracket

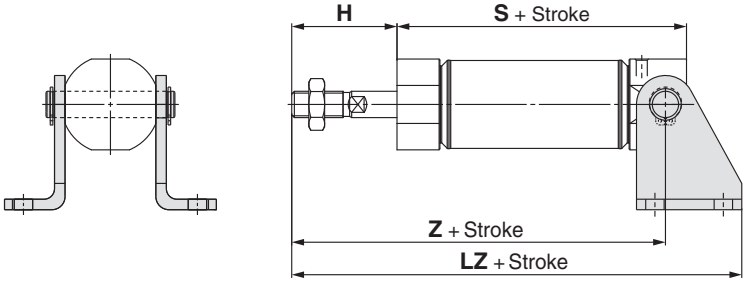


Material: Stainless steel 440 (Pin)
Stainless steel 304 (Bracket, Retaining ring)

[mm]

Applicable bore size	Part no.	**CD** (Shaft)	**CX**	**LD**	**LE**	**LF**	**LG**	**LH**	**LL**	**LP**	**LT**	**LV**	**LX**	**LY**	Clevis pin to be used
20	**CM5-E020SUS**	$8^{-0.040}_{-0.076}$	24	7	9	2	14	30	35.6	21	3	64.5	50	30	CM5-CD-E020
25	**CM5-E025SUS**	$8^{-0.040}_{-0.076}$	30	7	9	2	14	30	41.6	21	3	70.5	56	30	CM5-CD-E025
32	**CM5-E032SUS**	$10^{-0.040}_{-0.076}$	34.5	7	11	4	22	40	49	29	4	81	66.5	40	CM5-CD-E032
40	**CM5-E040SUS**	$10^{-0.040}_{-0.076}$	42.5	7	11	4	22	40	57	29	4	89	74.5	40	CM5-CD-E040

Mounting a Pivot Bracket to the Cylinder



CM5 Series

[mm]

Bore size	H	Without magnet		Built-in magnet		LZ	
		S	Z	S	Z	Without magnet	Built-in magnet
20	35	55	83	61	89	104	110
25	40	57	90	63	96	111	117
32	40	60	92	66	98	121	127
40	50	67	109	73.5	115.5	138	144.5

CM5□R/V Series

[mm]

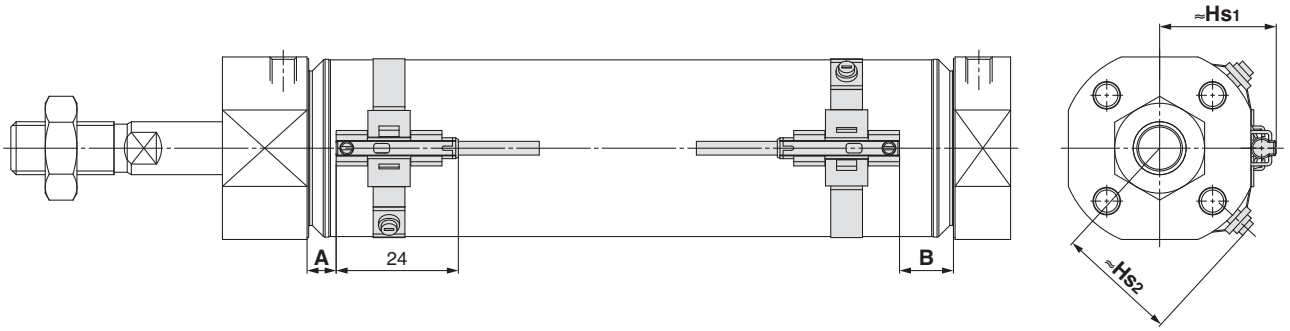
Bore size	Without magnet			Built-in magnet		
	LZ	S	Z	LZ	S	Z
20	109	60	88	115	66	94
25	116	62	95	122	68	101
32	127	66	98	133	72	104
40	144	73	115	150.5	79.5	121.5

Auto Switch Mounting

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

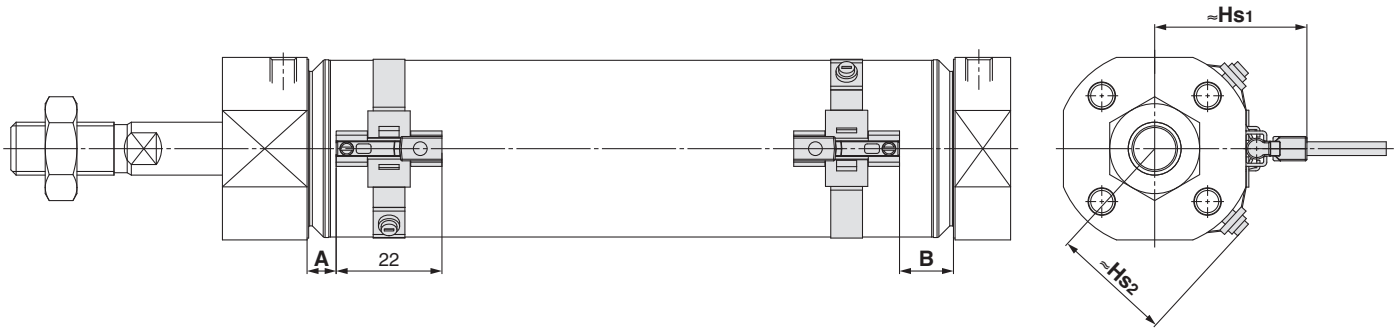
Solid state auto switch

D-M9□A



A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-M9□AV



A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

When the cylinder is shipped from the factory, the set screw of the auto switch mounting band is sometimes mounted facing 180° in the opposite direction of the figure above.

Auto Switch Proper Mounting Position [mm]

Auto switch model / Bore size	D-M9□A(V)	
	A	B
20	5	10
25	5.5	10
32	5.5	10.5
40	8.5	13.5

∗ Adjust the auto switch after confirming the operating condition in the actual setting.

Auto Switch Mounting Height [mm]

Auto switch model / Bore size	D-M9□A	D-M9□AV	
	Hs1, Hs2	Hs1	Hs2
20	17	23	17
25	19.5	25.5	19.5
32	23	29	23
40	27	32.5	27

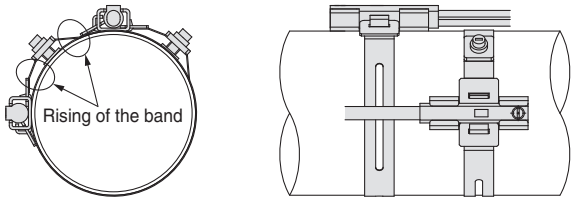
Min. Stroke for Auto Switch Mounting

n: Number of auto switches [mm]

Auto switch model	Number of auto switches				
	1	2		n	
		Different surfaces	Same surface	Different surfaces	Same surface
D-M9□A	25	25	40	$25 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6⋯)∗1	60 + 35 (n - 2) (n = 2, 3, 4, 5⋯)
D-M9□AV	25	25	35	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6⋯)∗1	35 + 35 (n - 2) (n = 2, 3, 4, 5⋯)

∗1 When “n” is an odd number, an even number that is one larger than the odd number is to be used for the calculation.

Precautions for Mounting Two D-M9 In-line Entry Type Auto Switches on the Same Surface

Auto switch model	Applicable strokes	When mounting two auto switches on the same surface at the stroke indicated to the left
D-M9□A	40 to 59	 · The location where the M 3 set screw for securing the auto switch mounting band is mounted (nut part) is raised, so it is necessary to adjust the mounting position in the circumferential direction of the cylinder tube to prevent interference with the D-M9 and the lead wires.

Operating Range

[mm]

Auto switch model	Bore size			
	20	**25**	**32**	**40**
D-M9□A(V)	2.5	2.5	3	3

∗ 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.
∗ When an auto switch is used, mount it at the center of the operating range.

Auto Switch Mounting Brackets/Part Nos.

Auto switch model	Bore size [mm]			
	Ø 20	**Ø 25**	**Ø 32**	**Ø 40**
D-M9□A(V)	BM8-020S	BM8-025S	BM8-032S	BM8-040S

Other than the applicable auto switches listed in “How to Order,” the following auto switches are also mountable.
Refer to the **Web Catalogue** for the detailed specifications.

Type	Model	Electrical entry	Features
Solid state	**D-M9N, M9P, M9B**	Grommet (In-line)	—
	D-M9NW, M9PW, M9BW		Diagnostic indication (2-colour indicator)
	D-M9NV, M9PV, M9BV	Grommet (Perpendicular)	—
	D-M9NWV, M9PWV, M9BWV		Diagnostic indication (2-colour indicator)

∗ The set screws used are made of steel.
∗ Does not apply to the CM5□R/V series (improved water-resistant type)
∗ The cylinder mounting procedure is the same as that for the D-M9□A and M9□AV types.
∗ A type with a pre-wired connector is also available. For details, refer to the **Web Catalogue**.
∗ For the type with a pre-wired connector, brass is used for some of the connector parts.

Technical Data:
Chemical Resistance Table

◎ : No influence or almost no influence
○ : Some influence, but operational depending on conditions
△ : Avoid use if possible
× : Substantial influence, not suitable for use
— : Not tested

Chemical Resistance Table

Parts			Body		Seal	
Material			Stainless steel	Aluminum*1	Nitrile rubber	Fluororubber
Chemical name (Concentration weight %, Temperature °C) / Symbol			Stainless steel 304	Al	NBR (−10 to 60 °C)	FKM (−40 to 150 °C)
Inorganic salt	1	Hydrochloric acid (20 %, Room temperature)	×	×	○	◎
	2	Chromic acid (25 %, 70 °C)	○	×	×	◎
	3	Boric acid	○	×	◎	◎
	4	Sulfuric acid (30 %, Room temperature)	×	×	◎	◎
	5	Phosphoric acid (50 %, Room temperature)	○	×	◎	◎
Inorganic alkali	6	Ammonium hydroxide (28 %)	○	○	○	×
	7	Sodium hydroxide (30 %, Room temperature)	◎	×	◎	△
	8	Calcium hydroxide	△	×	◎	◎
	9	Magnesium hydroxide	○	○	◎	◎
Organic solvent	10	Acetylene	◎	◎	◎	◎
	11	Formic acid (25 %, Room temperature)	○	△	×	△
	12	Citric acid	△	×	◎	◎
	13	Acetic acid (10 %, Room temperature)	◎	△	△	○
	14	Lactic acid (5 %, 20 °C)	○	×	◎	◎
Others (oil, gas, etc.)	15	Linseed oil	◎	○	◎	◎
	16	Potassium chloride	○	△	◎	◎
	17	Calcium chloride	○	◎	◎	◎
	18	Mineral oil	◎	◎	◎	◎
	19	Sodium hypochlorite (2 %, Room temperature)	○	×	×	◎
	20	Sodium chloride (Industrial salt)	○	—	◎	◎
	21	Carbon dioxide gas (Liquid carbon)	◎	◎	◎	◎
	22	Natural gas	◎	◎	◎	◎
	23	Boric acid (Sodium borate)	○	×	◎	◎

* Unless noted otherwise, the solution concentration is in a saturated state.
* Chemical resistance is a guide that applies only to the stainless steel cylinder parts, and does not guarantee the performance of air cylinders (auto switches). Be sure to perform a verification test before operating.

*1 Reference data

⚠ 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.

⚠ **Danger:**	**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
⚠ **Warning:**	**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
⚠ **Caution:**	**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

1) ISO 4414: Pneumatic fluid power – General rules and safety requirements for systems and their components.
ISO 4413: Hydraulic fluid power – General rules and safety requirements for systems and their components.
IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.
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 catalogue 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. Our products cannot be used beyond their specifications.
Our products are not developed, designed, and manufactured to be used under the following conditions or environments.
Use under such conditions or environments is not covered.
1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogues and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

⚠ Caution

We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.
Use in non-manufacturing industries is not covered.
Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.
The new Measurement Act prohibits use of any unit other than SI units in Japan.

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 catalogue 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.

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Spain	+34 945184100	www.smc.eu	post.es@smc.com
Sweden	+46 (0)86031240	www.smc.nu	order.se@smc.com
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