

Dual Rod Cylinder

ø6, ø10, ø16, ø20, ø25, ø32

New

RoHS

Allowable kinetic energy

0.016 J

7
times

New CXS2

0.016

Existing product
CXS

0.0023

Allowable kinetic energy [J] * Compared at a ø6

Max. piston speed

800 mm/s

2.6
times

New CXS2

800

Existing product
CXS

300

Piston speed [mm/s] * Compared at a ø6

Max.
standard
stroke
increased

ø6

50 mm ▶ **100 mm**

ø10

75 mm ▶ **150 mm**

ø16 to ø32

100 mm ▶ **200 mm**

Mounting dimensions are compatible with the existing CXS series products.



CXS2 Series

SMC

CAT.ES20-275A

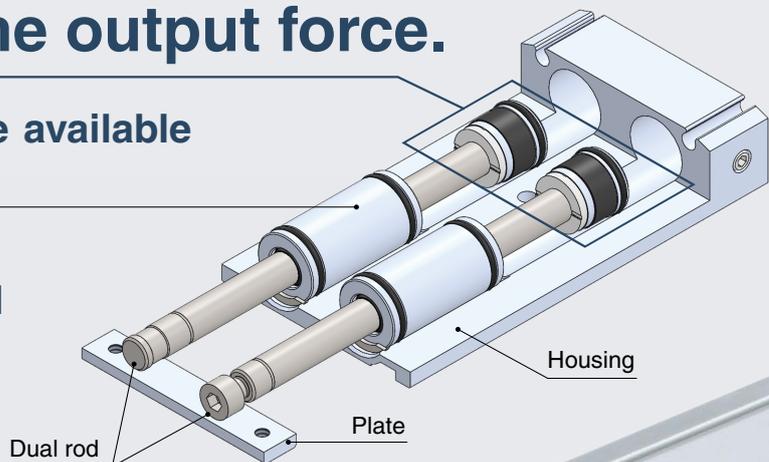
Double piston construction provides twice the output force.

Two types of bearings are available as standard.

- Ball bushing bearing
- Slide bearing

Piston diameter increased up to 16 mm

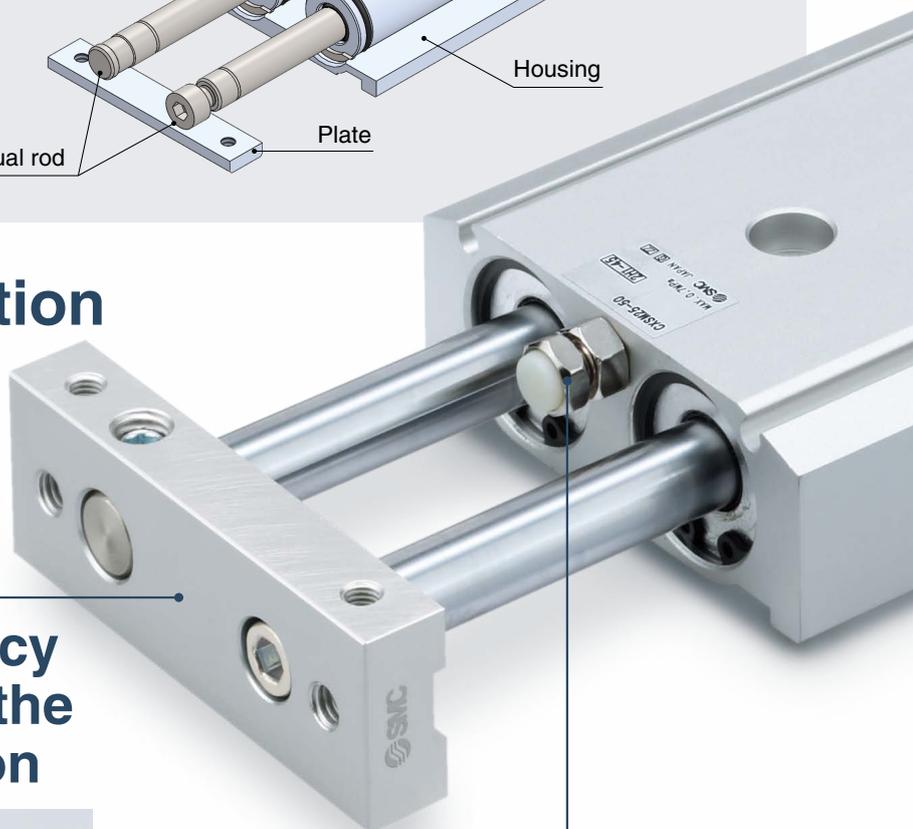
Same external dimensions as the 15 mm bore size version but the output force increased by approx. 14%



Weight: 7% reduction

0.15 kg → 0.14 kg

(Compared with the CXS□ series, ø10, 10 mm stroke)



Non-rotating accuracy of $\pm 0.1^\circ$ because of the dual rod construction

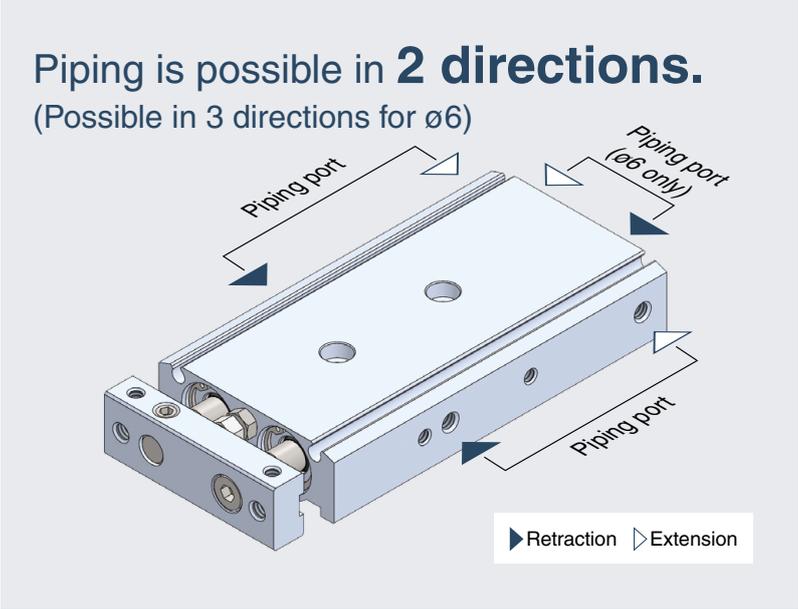


Stroke is adjustable up to **-5 mm**.

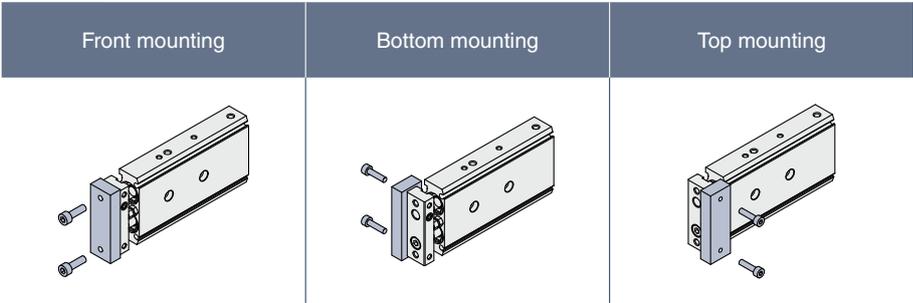
Compact auto switches are mountable.
(D-M9□, D-A9□)



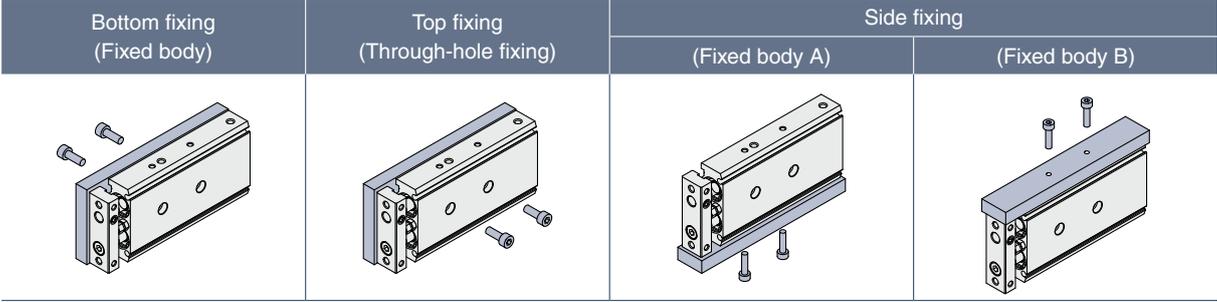
Piping is possible in **2 directions**.
(Possible in 3 directions for $\phi 6$)



Workpiece can be mounted from **3 directions**.



Body can be mounted from **4 directions**.



Series Variations

Series/Model	Bearing type	Bore size [mm]											Standard stroke [mm]	Axial piping	Clean series (10-series)	Cylinder with stable lubrication function (Lube-retainer)	Page	
		6	10	12	16 /15	20	25	32	40	50	63	80						100
 <p>New Basic type/ CXS2</p>	Slide bearing													ø6: 10 to 100 ø10: 10 to 150 ø16 to ø32: 10 to 200	 (ø6)	—	—	p. 11
	Ball bushing bearing	●	●	—	●	●	●	●	—	—	—	—	—					
 <p>Compact type/ CXSJ</p>		●	●	—	●	●	●	●	—	—	—	—	—	ø6: 10 to 50 ø10: 10 to 75 ø16 to ø32: 10 to 100	 (ø6, ø10)	—	—	Web Catalog
 <p>Basic type/ CXS</p>		●	●	—	●	●	●	—	—	—	—	—	ø6: 10 to 50 ø10: 10 to 75 ø15 to ø32: 10 to 100	 (ø6)	●	●		
 <p>With air cushion/ CXS-A</p>	Slide bearing													ø20 to ø32: 10 to 100	—	—	—	
	Ball bushing bearing	—	—	—	—	●	●	●	—	—	—	—	—					
 <p>With end lock for retraction side/ CXS-R</p>		●	●	—	●	●	●	—	—	—	—	—	ø6 to ø15: 10 to 50 ø20 to ø32: 10 to 100	 (ø6)	—	—		
 <p>Double rod type/ CXSW</p>		●	●	—	●	●	●	—	—	—	—	—	ø6 to ø15: 10 to 50 ø20 to ø32: 10 to 100	—	—	—		
 <p>Basic type/ JMGP</p>	Slide bearing	—	—	●	●	●	●	●	●	●	●	●	ø12, ø16: 10 to 100 ø20, ø25: 20 to 150 ø32 to ø100: 20 to 200	—	—	—		

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Dual Rod Cylinder *CXS2 Series*



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CXS2 Series

Model Selection: Basic Type

⚠ Caution Confirmation of theoretical output is required separately. Refer to the "Theoretical Output" on page 12.

Basic Type: CXS2

Vertical Mounting

Mounting orientation									
Max. speed [mm/s]		Up to 200		Up to 400		Up to 600		Over 600	
Stroke [mm]		All strokes							
Selection graph	ø6	1		2		3		4	
	ø10	5		6		7		8	
	ø16	5		6		7		8	
	ø20	5		6		7		8	
	ø25	5		6		7		8	
	ø32	5		6		7		8	

* Max. speeds are: ø6/ø10: 800 mm/s, ø16/ø20: 700 mm/s, and ø25/ø32: 600 mm/s.

Horizontal Mounting

Mounting orientation						* Refer to the precaution below.					
Stroke [mm]		Up to 10		Up to 30		Up to 50		Up to 75		Up to 100	
Max. speed [mm/s]		Up to 400	Over 400	Up to 400	Over 400	Up to 400	Over 400	Up to 400	Over 400	Up to 400	Over 400
Selection graph	ø6	9		10		11		12		13	
	ø10	14		15		16		17		18	
	ø16	14		15		16		17		18	
	ø20	14		15		16		17		18	
	ø25	14		15		16		17		18	
	ø32	14		15		16		17		18	

* Max. speeds are: ø6/ø10: 800 mm/s, ø16/ø20: 700 mm/s, and ø25/ø32: 600 mm/s.

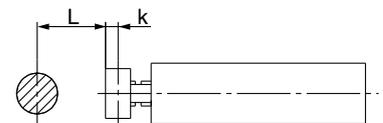
⚠ Caution

If the cylinder is horizontally mounted and the plate end does not reach the load's center of gravity, use the formula below to calculate the imaginary stroke L' that includes the distance between the load's center of gravity and the plate end. Select the graph that corresponds to the imaginary stroke L'.

$$\text{Imaginary stroke } L' = (\text{Stroke}) + k + L$$

k: Distance between the center and end of the plate

ø6	2.75 mm
ø10	4 mm
ø16	5 mm
ø20	6 mm
ø25	6 mm
ø32	8 mm



(Example)

When using CXS2M6-10 and L = 15 mm:

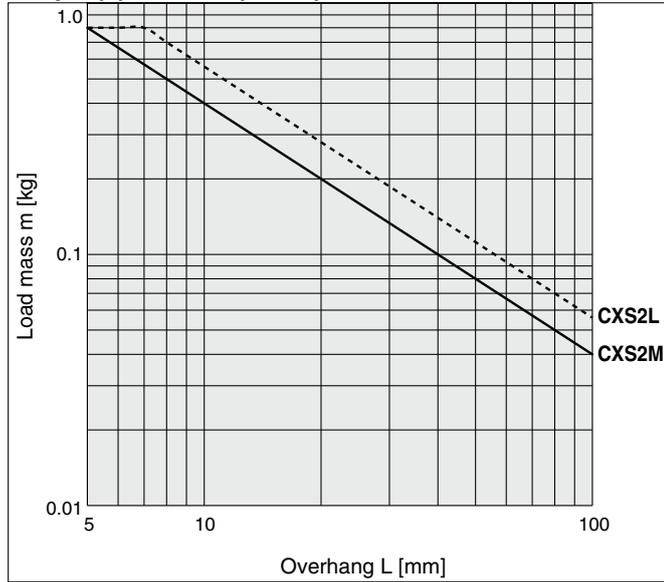
$$\text{Imaginary stroke } L' = 10 + 2.75 + 15 = 27.75$$

Therefore, the graph used for your model selection should be the one for CXS2M6-30.

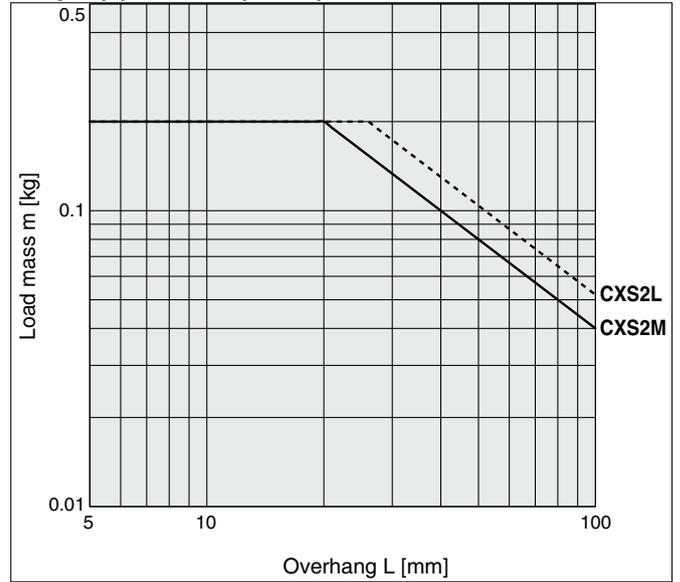
Vertical Mounting

∅6

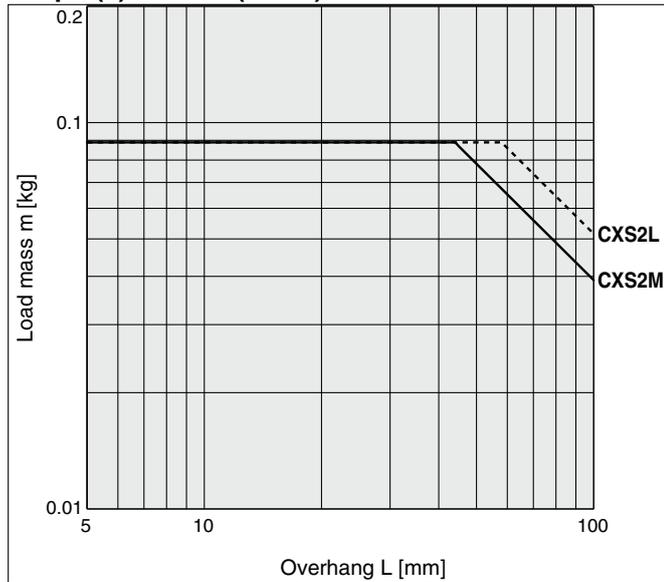
Graph (1) V = 200 (mm/s)



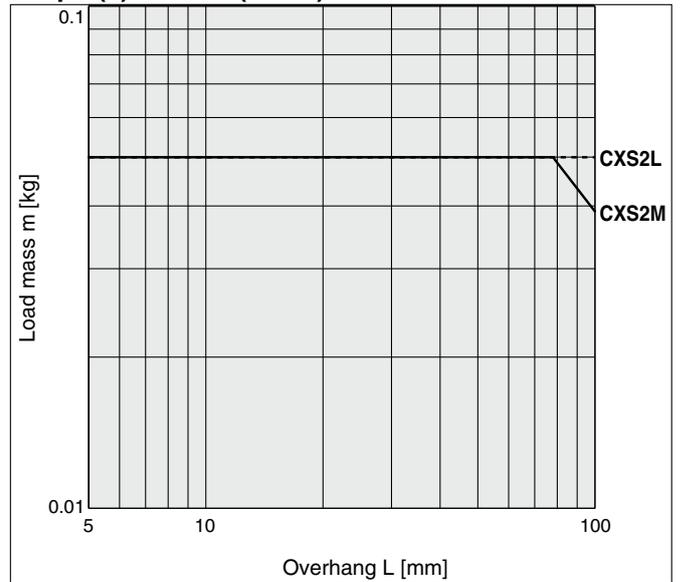
Graph (2) V = 400 (mm/s)



Graph (3) V = 600 (mm/s)



Graph (4) V = 800 (mm/s)

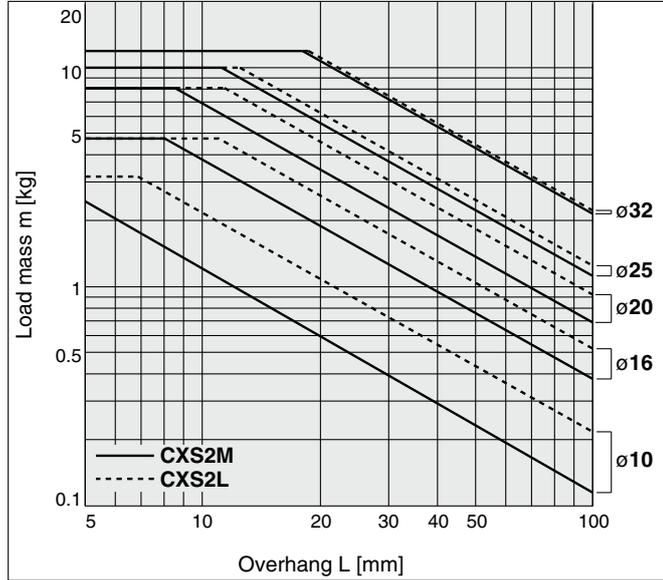


CXS2 Series

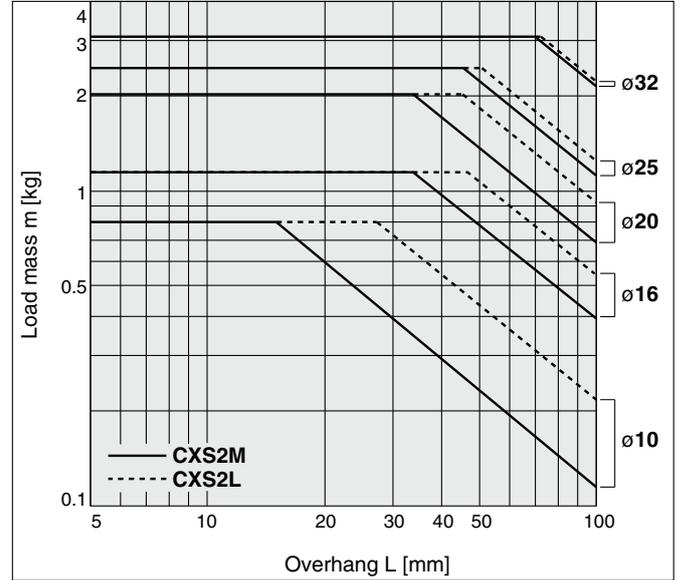
Vertical Mounting

ø10 to ø32

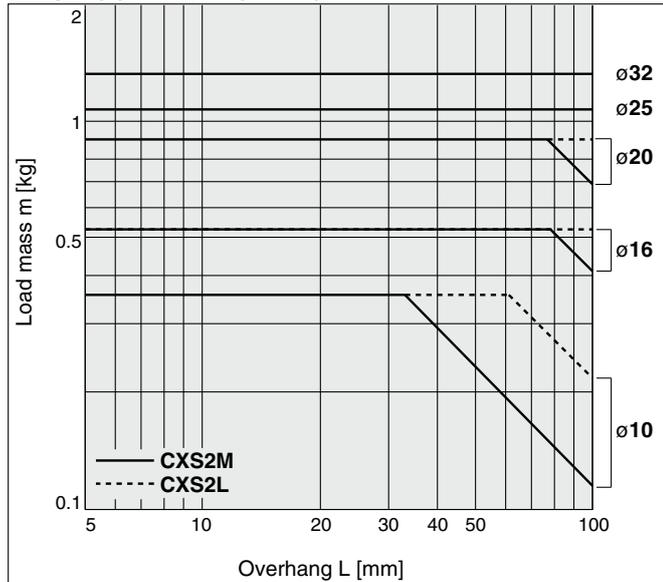
Graph (5) V = 200 (mm/s)



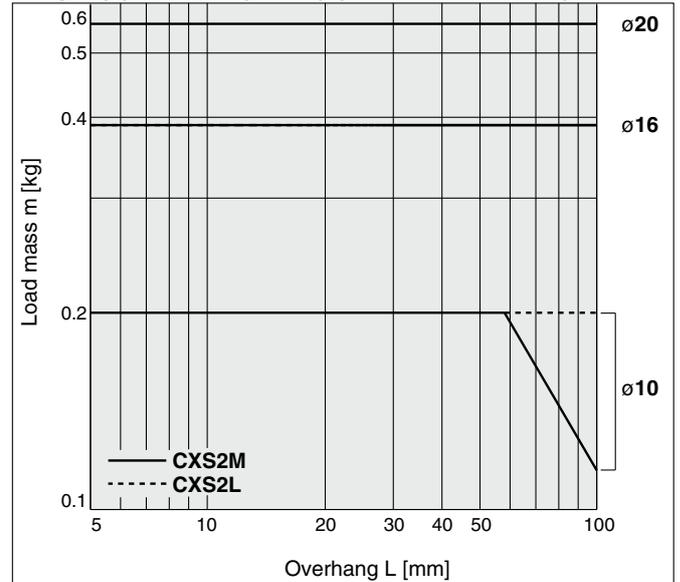
Graph (6) V = 400 (mm/s)



Graph (7) V = 600 (mm/s)



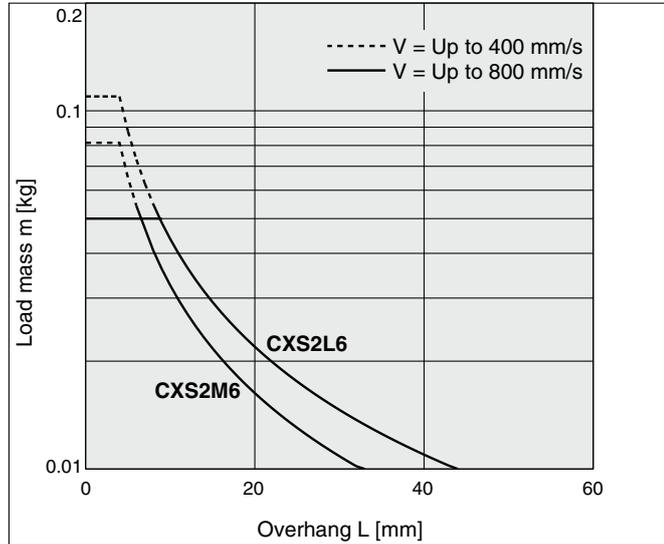
Graph (8) V = 700 (mm/s) (800 mm/s for ø10)



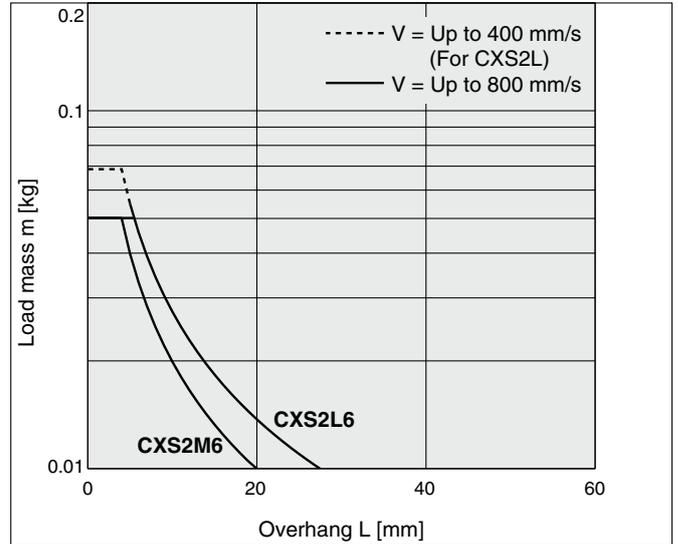
Horizontal Mounting

∅6

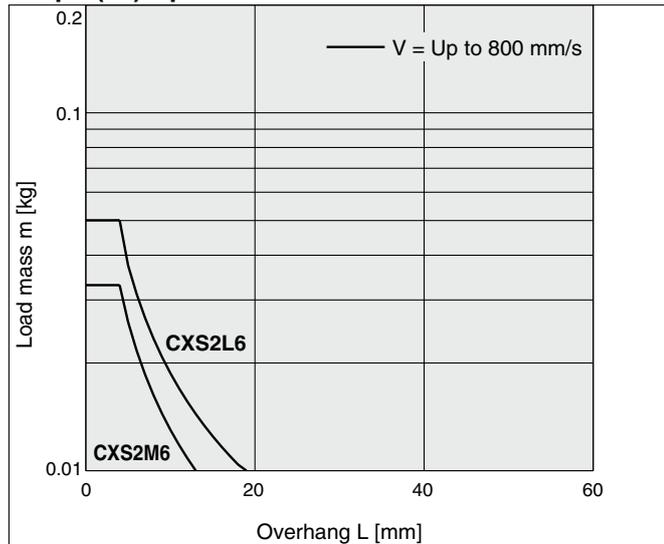
Graph (9) Up to 10 stroke



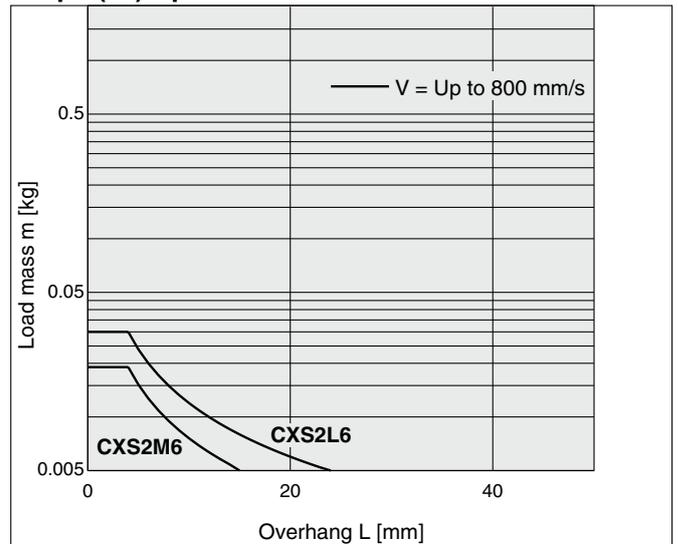
Graph (10) Up to 30 stroke



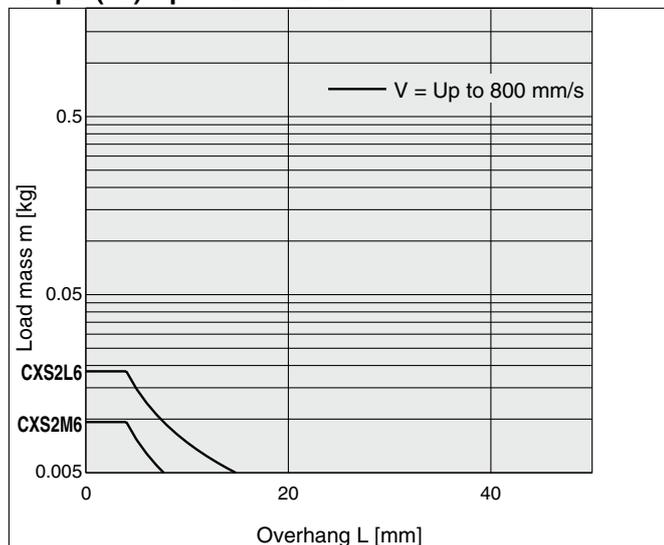
Graph (11) Up to 50 stroke



Graph (12) Up to 75 stroke



Graph (13) Up to 100 stroke

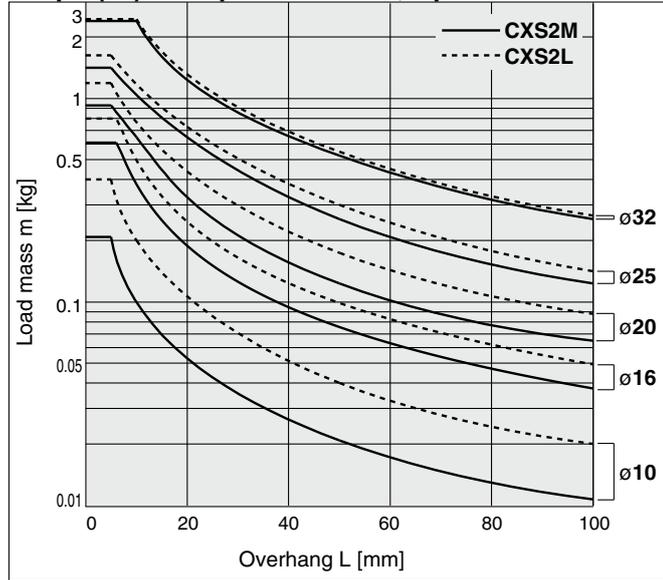


CXS2 Series

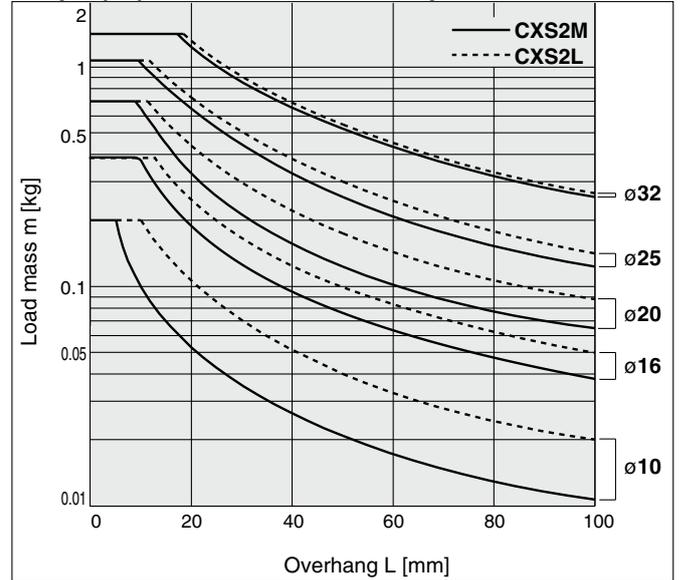
Horizontal Mounting

ø10 to ø32

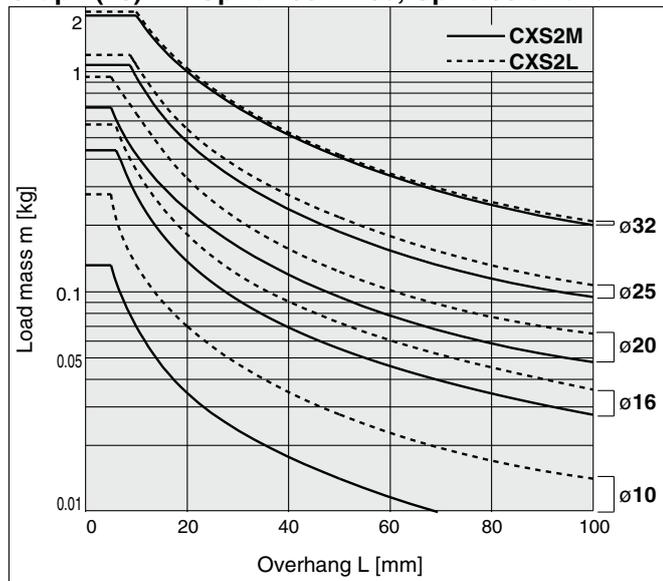
Graph (14) V = Up to 400 mm/s; Up to 10 stroke



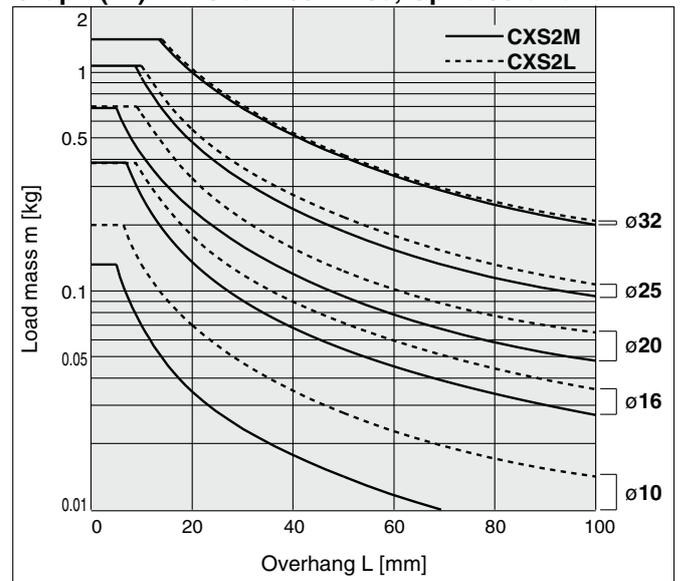
Graph (15) V = Over 400 mm/s; Up to 10 stroke



Graph (16) V = Up to 400 mm/s; Up to 30 stroke



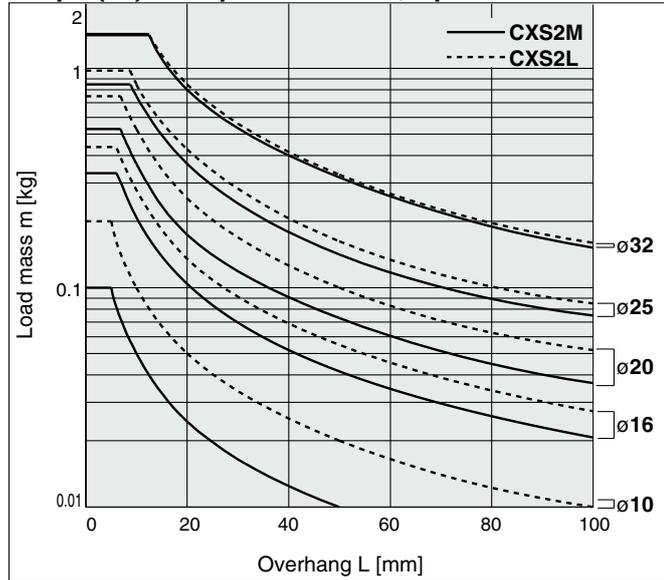
Graph (17) V = Over 400 mm/s; Up to 30 stroke



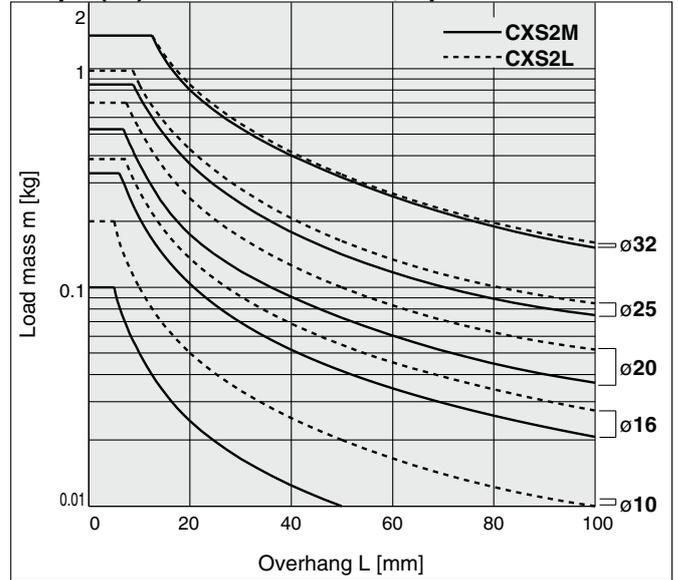
Horizontal Mounting

ø10 to ø32

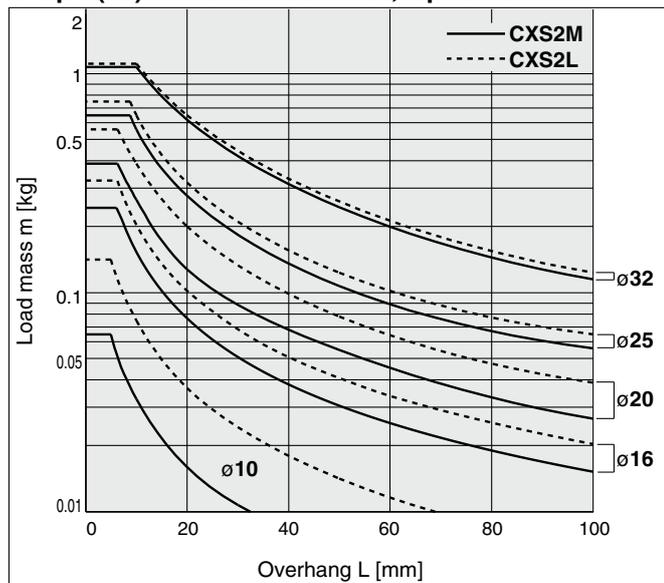
Graph (18) V = Up to 400 mm/s; Up to 50 stroke



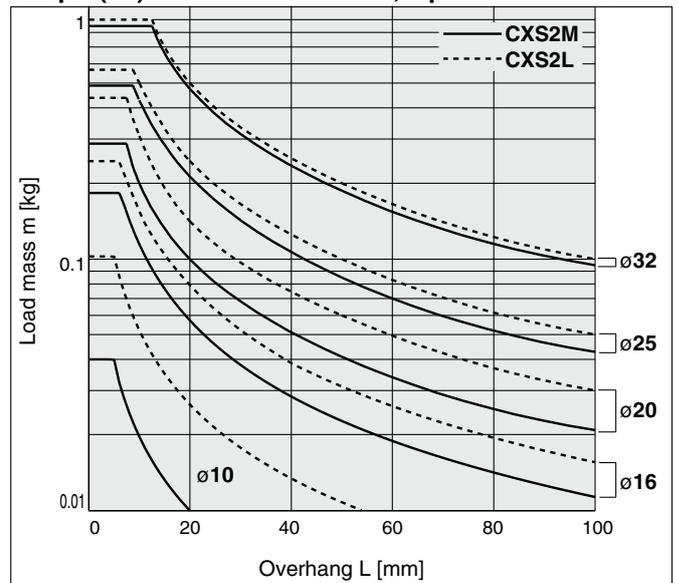
Graph (19) V = Over 400 mm/s; Up to 50 stroke



Graph (20) V = Over 400 mm/s; Up to 75 stroke



Graph (21) V = Over 400 mm/s; Up to 100 stroke



Dual Rod Cylinder Basic Type **CXS2 Series** ø6, ø10, ø16, ø20, ø25, ø32

How to Order

CXS2 **M** **20** **□** - **100** - **M9BW** **□**

Bearing type

M	Slide bearing
L	Ball bushing bearing

Bore size

6	6 mm
10	10 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm

Thread type

Symbol	Type	Bore size
Nil	M thread	ø6 to ø20
	Rc1/8	
TN	NPT1/8	ø25, ø32
TF	G1/8	

Number of auto switches

Nil	2
S	1
n	n

Auto switch

Nil	Without auto switch (Built-in magnet)
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* For applicable auto switches, refer to the table below.

Cylinder stroke [mm]

* Refer to page 12 for standard strokes.

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] ^{*3}				Pre-wired connector	Applicable load				
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)						
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit				
				3-wire (PNP)			M9PV	M9P	●	●	●	○	○					
				2-wire			M9BV	M9B	●	●	●	○	○					
	Diagnostic indication (2-color indicator)			3-wire (NPN)	24 V		5 V, 12 V	M9N WV	M9N W	●	●	●	○	○	IC circuit	Relay, PLC		
				3-wire (PNP)			5 V, 12 V	M9P WV	M9P W	●	●	●	○	○				
				2-wire			12 V	M9B WV	M9B W	●	●	●	○	○				
	Water resistant (2-color indicator)			3-wire (NPN)	5 V, 12 V		—	M9NAV^{*1}	M9NA^{*1}	○	○	●	○	○	IC circuit			
				3-wire (PNP)				M9PAV^{*1}	M9PA^{*1}	○	○	●	○	○				
				2-wire				12 V	M9BAV^{*1}	M9BA^{*1}	○	○	●	○		○		
Reed auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V	—	A96V	A96	●	●	●	●	○	IC circuit	—		
				2-wire				12 V	100 V	A93V	A93	●	●	●	●		○ ^{*2}	—
				2-wire				5 V, 12 V	100 V or less	A90V	A90	●	●	●	●		○ ^{*2}	

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

Please contact SMC regarding water-resistant types with the above model numbers.

*2 The load voltage used is 24 VDC.

*3 Lead wire length symbols: 0.5 m Nil (Example) M9NW

1 m M M9NWM

3 m L M9NWL

5 m Z M9NWZ

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

• Since there are applicable auto switches other than those listed above, refer to page 19 for details.

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

* Auto switches are shipped together with the product but do not come assembled.



Specifications

Bore size [mm]	6	10	16	20	25	32
Fluid	Air (Non-lube)					
Proof pressure	1.05 MPa					
Max. operating pressure	0.7 MPa					
Min. operating pressure	0.15 MPa	0.1 MPa			0.05 MPa	
Ambient and fluid temperatures	-10 to 60°C (No freezing)					
Piston speed	30 to 800 mm/s		30 to 700 mm/s		30 to 600 mm/s	
Cushion	Rubber bumper					
Stroke adjustable range	0 to -5 mm compared to the standard stroke					
Port size	M5 x 0.8				Rc (NPT, G) 1/8	
Bearing type	Slide bearing, Ball bushing bearing (Same dimensions for both)					
Allowable kinetic energy	0.016 J	0.064 J	0.095 J	0.17 J	0.27 J	0.32 J

Standard Stroke Range

Model	Stroke range	Standard stroke
CXS2□6	1 to 100	10, 20, 30, 40, 50, 60, 70, 75, 80, 90, 100
CXS2□10	1 to 150	10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 75, 80, 90, 100, 110, 120, 125, 150
CXS2□16	1 to 200	10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 75, 80, 90, 100, 110, 120, 125, 150, 175, 200
CXS2□20		10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 75, 80, 90, 100, 110, 120, 125, 150, 175, 200
CXS2□25		10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 75, 80, 90, 100, 110, 120, 125, 150, 175, 200
CXS2□32		10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 75, 80, 90, 100, 110, 120, 125, 150, 175, 200

* Intermediate strokes are available as special orders.

Refer to page 19 for cylinders with auto switches.

- Auto Switch Proper Mounting Position (Detection at stroke end)
- Operating Range
- Auto Switch Mounting Dimensions
- Auto Switch Mounting

Moisture Control Tube IDK Series



When operating an actuator with a small bore size and a short stroke at a high frequency, dew condensation (water droplets) may occur inside the piping depending on the conditions. Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the **Web Catalog**.

Theoretical Output

Model	Rod size [mm]	Operating direction	Piston area [mm ²]	Operating pressure [MPa]							
				0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
CXS2□6	4	OUT	56	—	8.4	11.2	16.8	22.4	28.0	33.6	39.2
		IN	31	—	4.6	6.2	9.3	12.4	15.5	18.6	21.7
CXS2□10	6	OUT	157	15.7	—	31.4	47.1	62.8	78.5	94.2	110
		IN	100	10.0	—	20.0	30.0	40.0	50.0	60.0	70.0
CXS2□16	8	OUT	402	40.2	—	80.4	121	161	201	241	281
		IN	301	30.1	—	60.2	90.3	120	151	181	211
CXS2□20	10	OUT	628	62.8	—	126	188	251	314	377	440
		IN	471	47.1	—	94.2	141	188	236	283	330
CXS2□25	12	OUT	982	98.2	—	196	295	393	491	589	687
		IN	756	75.6	—	151	227	302	378	454	529
CXS2□32	16	OUT	1608	161	—	322	482	643	804	965	1126
		IN	1206	121	—	241	362	482	603	724	844

* Theoretical output [N] = Pressure [MPa] x Piston area [mm²]

Weight

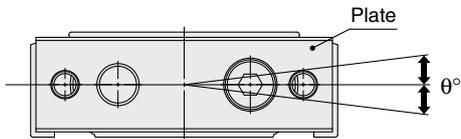
Model	Stroke range [mm]																				
	10	15	20	25	30	35	40	45	50	60	70	75	80	90	100	110	120	125	150	175	200
CXS2M6	0.08	—	0.10	—	0.11	—	0.12	—	0.14	0.15	0.17	0.17	0.18	0.19	0.21	—	—	—	—	—	—
CXS2L6	0.08	—	0.10	—	0.11	—	0.12	—	0.14	0.15	0.17	0.17	0.18	0.19	0.21	—	—	—	—	—	—
CXS2M10	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.21	0.22	0.24	0.26	0.27	0.28	0.30	0.32	0.34	0.36	0.37	0.42	—	—
CXS2L10	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.21	0.22	0.24	0.26	0.27	0.28	0.30	0.32	0.34	0.36	0.37	0.42	—	—
CXS2M16	0.24	0.26	0.27	0.28	0.30	0.31	0.32	0.34	0.35	0.38	0.40	0.42	0.43	0.45	0.48	0.51	0.53	0.55	0.61	0.68	0.75
CXS2L16	0.26	0.27	0.29	0.30	0.31	0.33	0.34	0.35	0.37	0.39	0.42	0.43	0.45	0.47	0.50	0.53	0.55	0.57	0.63	0.70	0.77
CXS2M20	0.40	0.41	0.43	0.45	0.47	0.49	0.50	0.52	0.54	0.58	0.61	0.63	0.65	0.69	0.72	0.76	0.79	0.81	0.90	0.99	1.09
CXS2L20	0.41	0.42	0.44	0.46	0.48	0.50	0.51	0.53	0.55	0.59	0.62	0.64	0.66	0.70	0.73	0.77	0.80	0.82	0.91	1.00	1.10
CXS2M25	0.59	0.62	0.65	0.67	0.70	0.72	0.75	0.78	0.80	0.86	0.91	0.94	0.96	1.02	1.07	1.12	1.17	1.20	1.33	1.47	1.60
CXS2L25	0.60	0.63	0.66	0.68	0.71	0.73	0.76	0.79	0.81	0.87	0.92	0.95	0.97	1.03	1.08	1.13	1.18	1.21	1.34	1.48	1.61
CXS2M32	1.09	1.13	1.18	1.22	1.26	1.30	1.34	1.38	1.43	1.51	1.59	1.64	1.68	1.76	1.84	1.93	2.01	2.05	2.26	2.47	2.68
CXS2L32	1.11	1.15	1.19	1.23	1.28	1.32	1.36	1.40	1.44	1.53	1.61	1.65	1.69	1.78	1.86	1.94	2.03	2.07	2.28	2.49	2.69

CXS2 Series

Operating Conditions

Non-rotating Accuracy

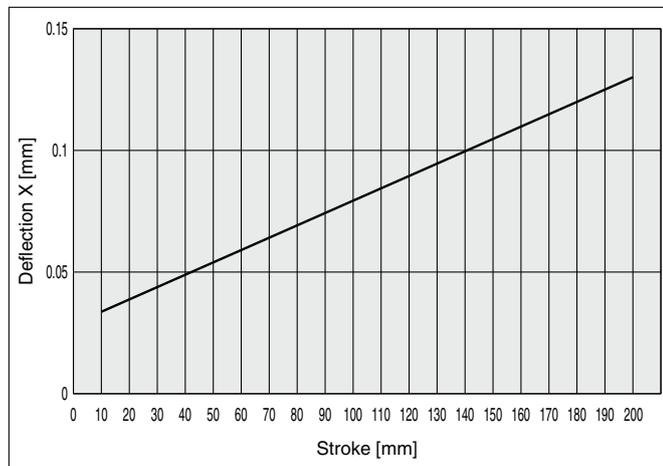
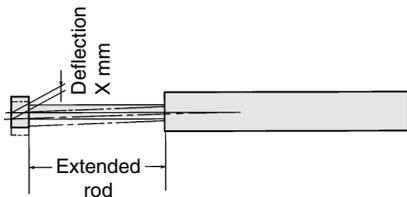
Non-rotating accuracy θ° at the retracted end and without a load should be less than or equal to the value provided in the table below as a guide.



Bore size [mm]	$\phi 6$ to $\phi 32$
CXS2M (Slide bearing)	$\pm 0.1^\circ$
CXS2L (Ball bushing bearing)	

CXS2 $\phi 6$ to 32 Deflection at the Plate End

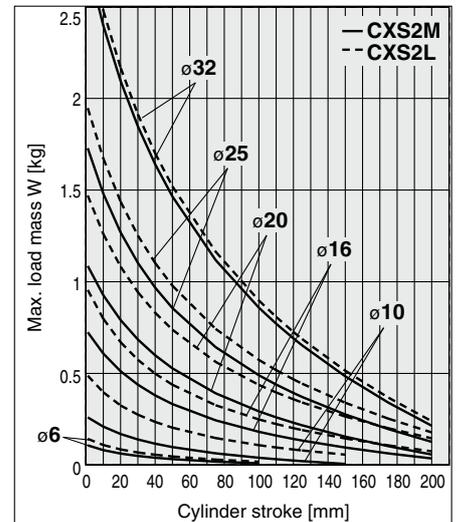
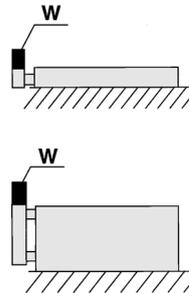
An approximate plate-end deflection X without a load is shown in the graph below.



As a guide, $\phi 6$ is up to 100 mm strokes, $\phi 10$ is up to 150 mm strokes, and $\phi 16$ to $\phi 32$ are up to 200 mm strokes.

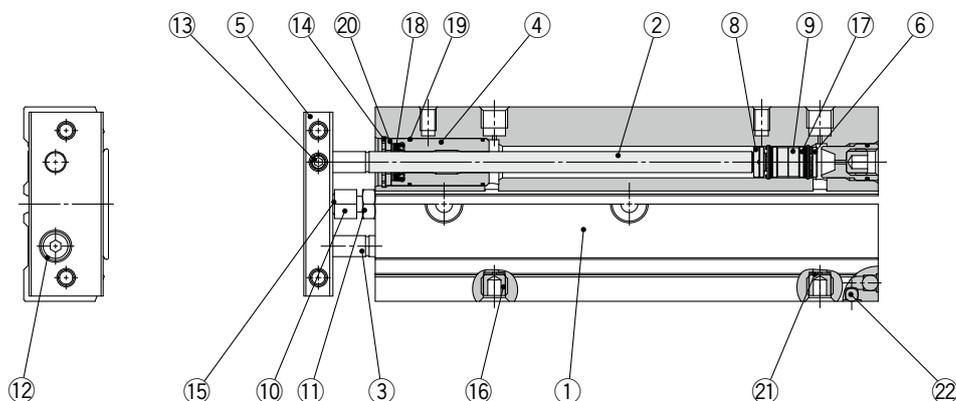
Max. Load Mass

When the cylinder is mounted as shown in the diagrams below, the max. load mass W should not exceed the values illustrated in the graph.

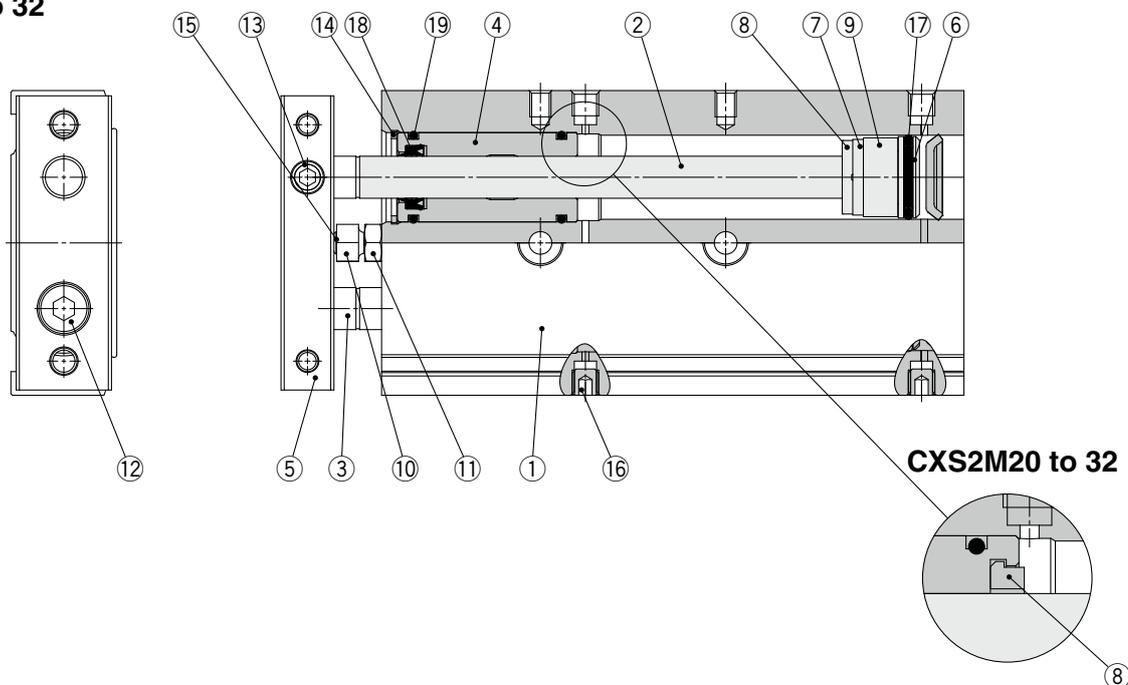


Construction: Slide Bearing

CXS2M6



CXS2M10 to 32



Component Parts

No.	Description	Material	Note
1	Housing	Aluminum alloy	Hard anodized
2	Piston rod A	Carbon steel*1	Hard chrome plating
3	Piston rod B	Carbon steel*1	Hard chrome plating
4	Rod cover	Aluminum bearing alloy	
5	Plate	Aluminum alloy	Anodized
6	Piston A	Aluminum alloy	
7	Piston B	Aluminum alloy	
8	Bumper	Urethane	
9	Magnet	—	
10	Bumper bolt	Carbon steel	Zinc chromated
11	Hexagon nut	Carbon steel	Zinc chromated
12	Hexagon socket head cap screw	Chromium steel	Zinc chromated
13	Hexagon socket head set screw	Chromium steel	Zinc chromated
14	Retaining ring	Special steel	Phosphate coating

*1 Stainless steel for CXSM6

Component Parts

No.	Description	Material	Note
15	Bumper	Urethane	
16	Plug	Chromium steel	Zinc chromated
17	Piston seal	NBR	
18	Rod seal	NBR	
19	O-ring	NBR	
20	Seal retainer	Aluminum alloy	
21	Port spacer	Aluminum alloy	
22	Steel ball	Special steel	Hard chrome plating

Replacement Parts: Seal Kit

Bore size [mm]	Part no.	Contents
6	CXS2M6-PS	Set of nos. above (17, 18 and 19)
10	CXS2M10APS	
16	CXS2M16-PS	
20	CXS2M20-PS	
25	CXS2M25-PS	
32	CXS2M32-PS	

* Seal kit includes (17), (18) and (19). Order the seal kit, based on each bore size.

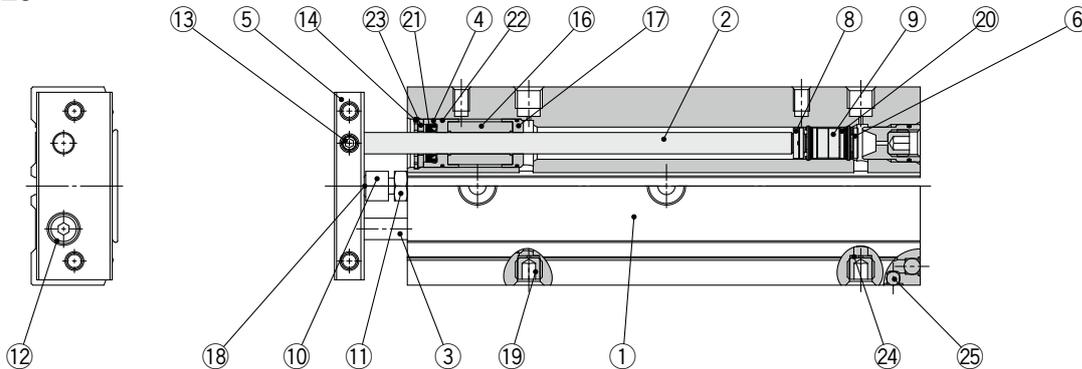
* Since the seal kit does not include a grease pack, order it separately.

Grease pack part no.: GR-S-010 (10 g)

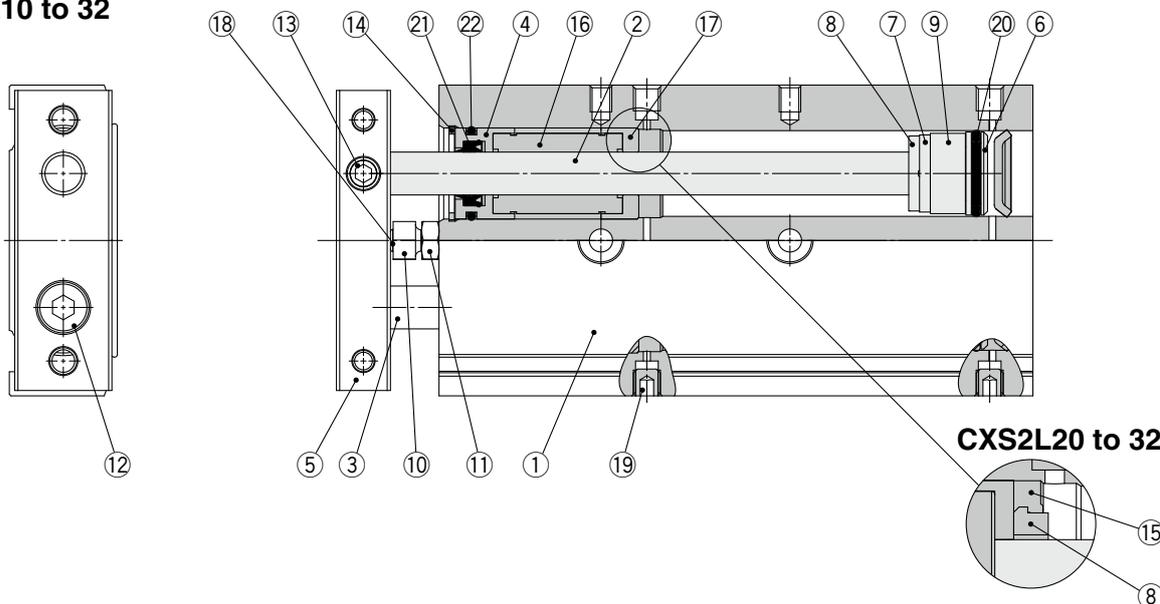
CXS2 Series

Construction: Ball Bushing Bearing

CXS2L6



CXS2L10 to 32



Component Parts: Standard Piping

No.	Description	Material	Note
1	Housing	Aluminum alloy	Hard anodized
2	Piston rod A	Special steel	Hard chrome plating
3	Piston rod B	Special steel	Hard chrome plating
4	Rod cover	Aluminum bearing alloy	
5	Plate	Aluminum alloy	Anodized
6	Piston A	Aluminum alloy	
7	Piston B	Aluminum alloy	
8	Bumper	Urethane	
9	Magnet	—	
10	Bumper bolt	Carbon steel	Zinc chromated
11	Hexagon nut	Carbon steel	Zinc chromated
12	Hexagon socket head cap screw	Chromium steel	Zinc chromated
13	Hexagon socket head set screw	Chromium steel	Zinc chromated
14	Retaining ring	Special steel	Phosphate coating
15	Bumper holder	ø20 to ø32: Synthetic resin	
16	Ball bushing	—	

Component Parts

No.	Description	Material	Note
17	Bearing spacer	ø10: Synthetic resin ø6, ø16: Aluminum bearing alloy	
18	Bumper	Urethane	
19	Plug	Chromium steel	Zinc chromated
20	Piston seal	NBR	
21	Rod seal	NBR	
22	O-ring	NBR	
23	Seal retainer	Aluminum alloy	
24	Port spacer	Aluminum alloy	
25	Steel ball	Special steel	Hard chrome plating

Replacement Parts: Seal Kit

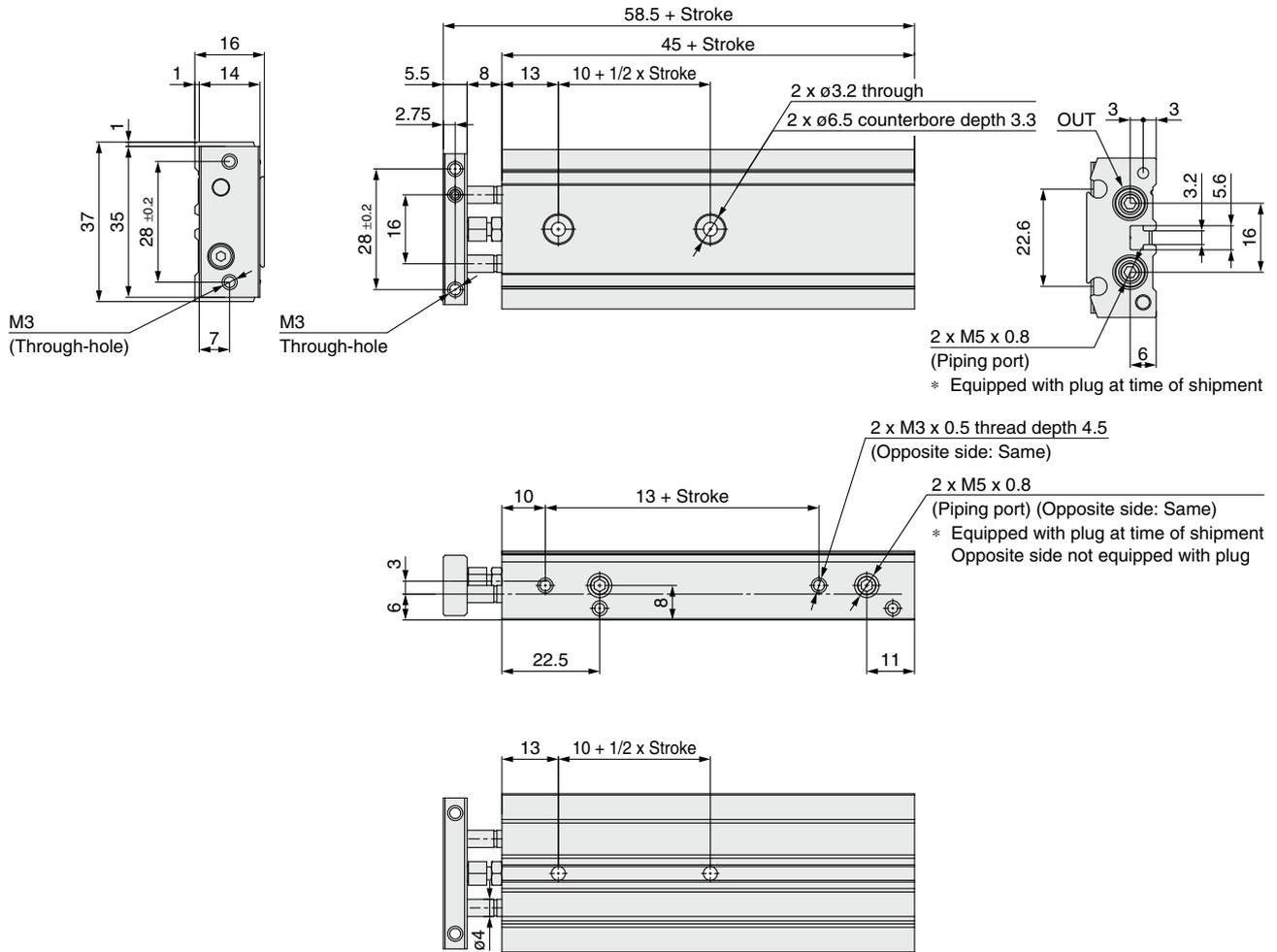
Bore size [mm]	Part no.	Contents
6	CXS2L6-PS	Set of nos. above ⑳, ㉑ and ㉒
10	CXS2L10BPS	
16	CXS2L16-PS	
20	CXS2L20-PS	
25	CXS2L25-PS	
32	CXS2L32-PS	

* Seal kit includes ㉑, ㉑ and ㉒. Order the seal kit, based on each bore size.

* Since the seal kit does not include a grease pack, order it separately.

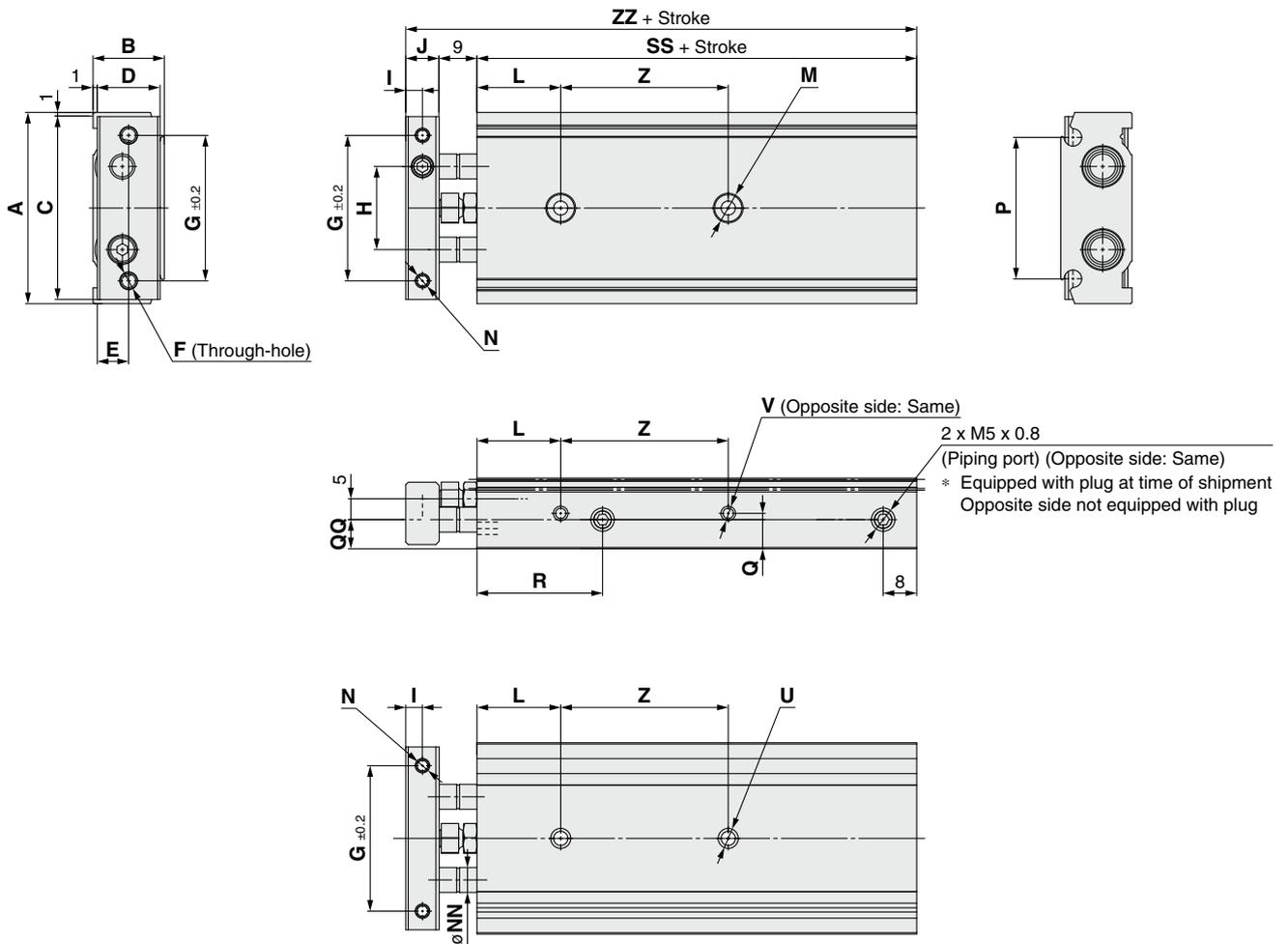
Grease pack part no.: GR-S-010 (10 g)

Dimensions: $\phi 6$



CXS2 Series

Dimensions: $\phi 10$, $\phi 16$

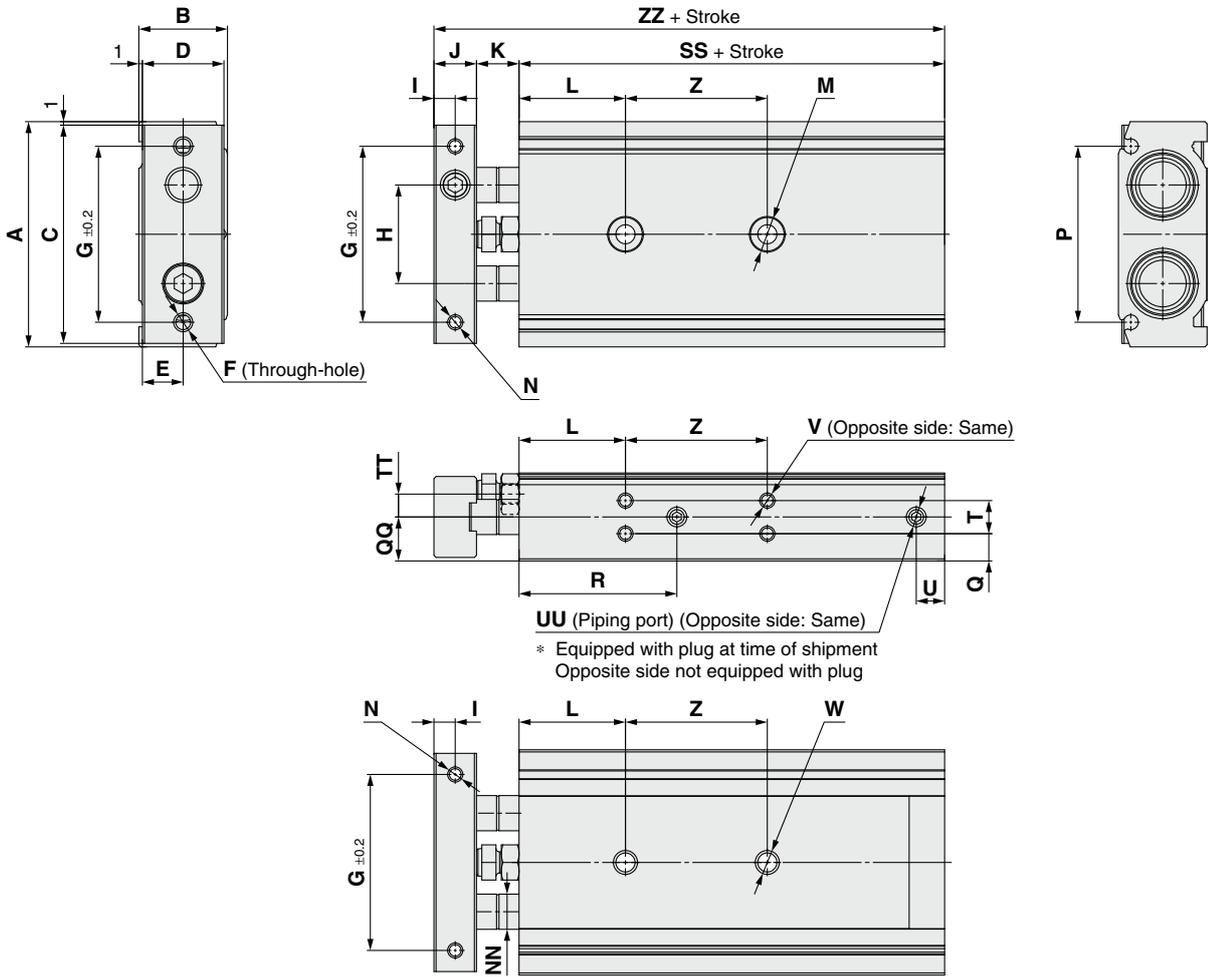


Model	A	B	C	D	E	F	G	H	I	J	L	M	N	NN	P	Q	QQ	R	U	V
CXS2□10	46	17	44	15	7.5	2 x M4 x 0.7	35	20	4	8	20	2 x $\phi 3.4$ through 2 x $\phi 6.5$ counterbore depth 3.3	2 x M3 x 0.5 thread depth 5	$\phi 6$	34	8.5	7	30	2 x M4 x 0.7 thread depth 7	4 x M3 x 0.5 thread depth 4.5
CXS2□16	58	20	56	18	9	2 x M5 x 0.8	45	25	5	10	30	2 x $\phi 4.3$ through 2 x $\phi 8$ counterbore depth 4.4	2 x M4 x 0.7 thread depth 6	$\phi 8$	45	10	10	38.5	2 x M5 x 0.8 thread depth 8	4 x M4 x 0.7 thread depth 5

Dimensions by Stroke

Model	Symbol Stroke	SS	Z							ZZ
			10, 15, 20, 25	30, 35, 40, 45, 50	60, 70, 75, 80	90, 100	110, 120, 125	150	175, 200	
CXS2□10		55	30	40	50	60	70	80	—	72
CXS2□16		60	25	35	45	55	65	75	145	79

Dimensions: $\phi 20$, $\phi 25$, $\phi 32$



[mm]

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	NN	P
CXS2□20	64	25	62	23	11.5	2 x M5 x 0.8	50	28	6	12	12	30	2 x $\phi 5.5$ through 2 x $\phi 9.5$ counterbore depth 5.3	2 x M4 x 0.7 thread depth 6	$\phi 10$	50
CXS2□25	80	30	78	28	14	2 x M6 x 1.0	60	35	6	12	12	30	2 x $\phi 6.9$ through 2 x $\phi 11$ counterbore depth 6.3	2 x M5 x 0.8 thread depth 7.5	$\phi 12$	59.6
CXS2□32	98	38	96	36	18	2 x M6 x 1.0	75	44	8	16	14	30	2 x $\phi 6.9$ through 2 x $\phi 11$ counterbore depth 6.3	2 x M5 x 0.8 thread depth 8	$\phi 16$	75

Model	Q	QQ	R	T	TT	U	UU			V	W
							Nil	TN	TF		
CXS2□20	7.75	12.5	45	9.5	6.5	8	4 x M5 x 0.8	—	—	8 x M4 x 0.7 thread depth 5.5	2 x M6 x 1.0 thread depth 10
CXS2□25	8.5	15	46	13	9	9	4 x Rc1/8	4 x NPT1/8	4 x G1/8	8 x M5 x 0.8 thread depth 7.5	2 x M8 x 1.25 thread depth 12
CXS2□32	9	19	56	20	11.5	10				8 x M5 x 0.8 thread depth 7.5	2 x M8 x 1.25 thread depth 12

Dimensions by Stroke

Model	Symbol Stroke	SS	Z				ZZ
			10, 15, 20, 25	30, 35, 40, 45, 50	60, 70, 75, 80, 90, 100	110, 120, 125, 150	
CXS2□20		70	30	40	60	80	94
CXS2□25		72	30	40	60	80	96
CXS2□32		82	40	50	70	90	112

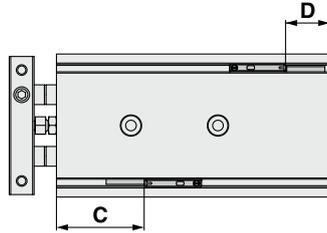
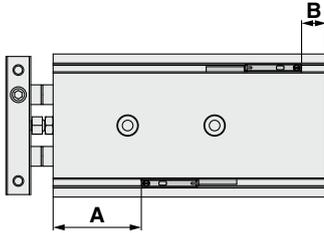
CXS2 Series

Auto Switch Mounting

Auto Switch Proper Mounting Position (Detection at Stroke End)

Electrical entry direction: Inward

Electrical entry direction: Outward



Operating Range

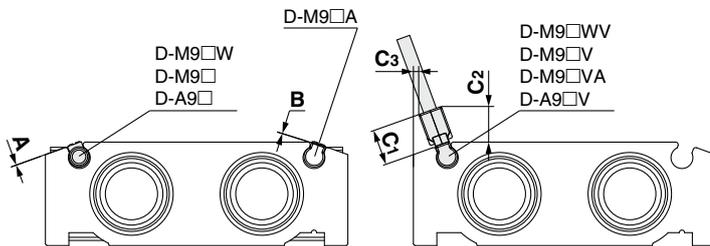
Auto switch model	Bore size [mm]					
	6	10	16	20	25	32
D-A9□, D-A9□V	6.5	5.5	5.5	7	7.5	9
D-M9□, D-M9□V D-M9□A, D-M9□AV D-M9□W, D-M9□WV	2.5	3	3.5	4.5	4.5	5

* Since this is a guideline including hysteresis, not meant to be guaranteed (assuming approx. ±30% dispersion). There may be the case it will vary substantially depending on an ambient environment.

Bore size [mm]	D-A9□				D-A9□V				D-M9□(E), D-M9□W D-M9□AV				D-M9□(E)V, D-M9□WV				D-M9□A			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
6	17	8	12.5	3.5	17	8	15	6	21	12	11	2	21	12	13	4	21	12	9	0
10	25	10	20.5	5.5	25	10	23	8	29	14	19	4	29	14	21	6	29	14	17	2
16	34	5.5	29.5	1	34	5.5	32	3.5	38	9.5	28	-0.5	38	9.5	30	1.5	38	9.5	26	-2.5
20	40	10	35.5	5.5	40	10	38	8	44	14	34	4	44	14	36	6	44	14	32	2
25	41	11	36.5	6.5	41	11	39	9	45	15	35	5	45	15	37	7	45	15	33	3
32	50	11.5	45.5	7	50	11.5	48	9.5	54	15.5	44	5.5	54	15.5	46	7.5	54	15.5	42	3.5

* Negative figures in the column D indicate how much the load wires protrude from the cylinder body.
* Adjust the auto switch after confirming the operating conditions in the actual setting.

Dimensions for Auto Switch Mounting



A Dimension

Symbol	Bore size [mm]					
	6	10	16	20	25	32
D-M9□, D-M9□W D-A9□	A	0.5	0.5	0.5	0.5	0.5
D-M9□A	B	1	1	1	1	1
D-M9□V, D-M9□WV	C1	7.5	7	7.5	7.5	7.5
D-M9□AV	C2	7.5	6	7.5	7.5	6.5
D-A9□V	C3	—	2.5	—	—	—

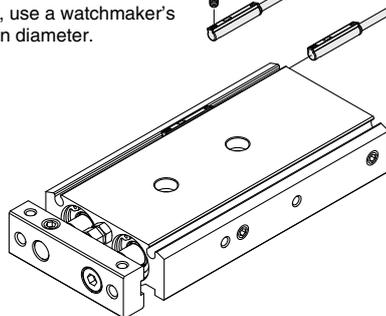
How to Mount Auto Switches

When mounting and securing auto switches, they should be inserted into the cylinder's auto switch mounting rail from the direction shown in the drawing below.

After setting in the mounting position, use a flat head watchmaker's screwdriver to tighten the auto switch mounting screw that is included.

* When tightening an auto switch mounting screw, use a watchmaker's screwdriver with a handle of approx. 5 to 6 mm in diameter.

Auto switch mounting screw
M2.5 x 4L
(Included with auto switch)



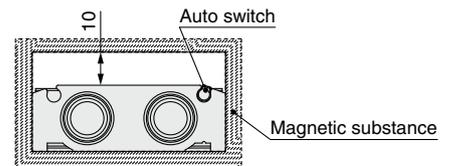
Tightening Torque for Auto Switch Mounting Screw [N·m]

Auto switch model	Tightening torque
D-M9□(V) D-M9□W(V) D-A9□(V)	0.05 to 0.15
D-M9□A(V)	0.05 to 0.10

Caution

1. Avoid proximity to magnetic objects

When the body of the cylinder fitted with auto switches is adjacent to a magnetic substance such as a ferrous metal plate, it is necessary to ensure that there is at least 10 mm between the cylinder's upper surface and the magnetic substance as shown in the figure below. Failure to provide adequate clearance may cause the auto switch to malfunction (switch does not turn on).



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

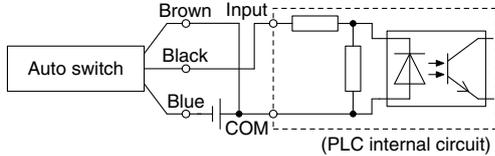
* Normally closed (NC = b contact) solid state auto switches (D-M9□E(V)) are also available. For details, refer to the **Web Catalog**.

Prior to Use

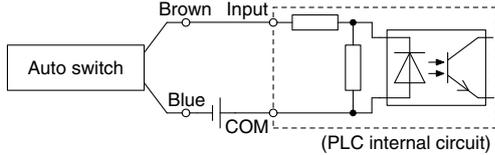
Auto Switch Connections and Examples

Sink Input Specifications

3-wire, NPN

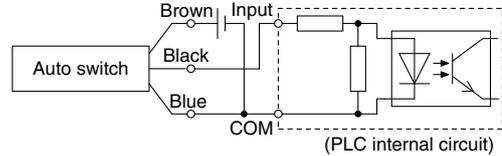


2-wire

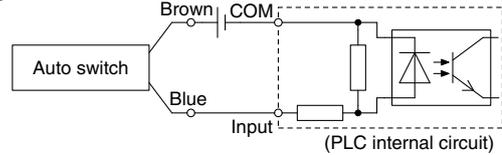


Source Input Specifications

3-wire, PNP



2-wire

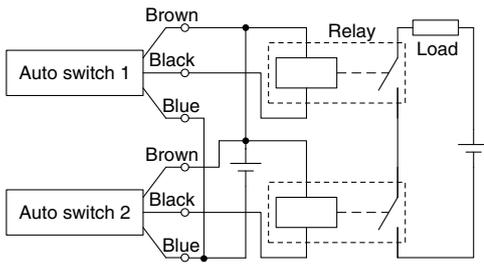


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

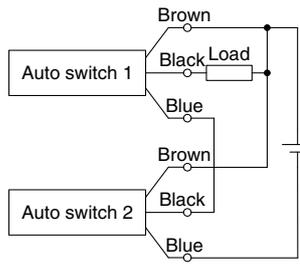
Examples of AND (Series) and OR (Parallel) Connections

* When using solid state auto switches, ensure the application is set up so the signals for the first 50 ms are invalid. Depending on the operating environment, the product may not operate properly.

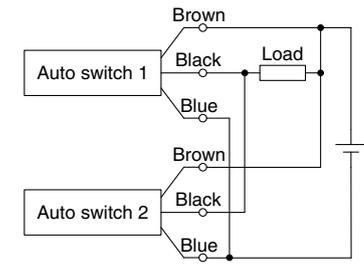
3-wire AND connection for NPN output (Using relays)



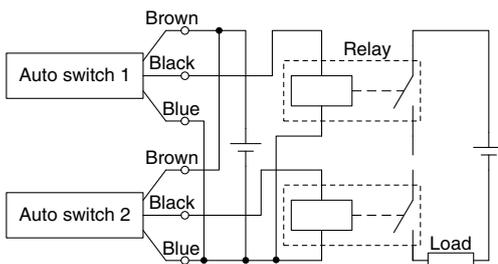
(Performed with auto switches only)



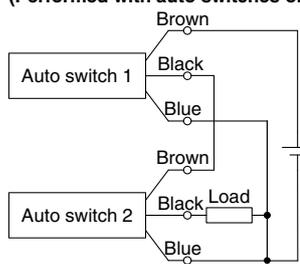
3-wire OR connection for NPN output



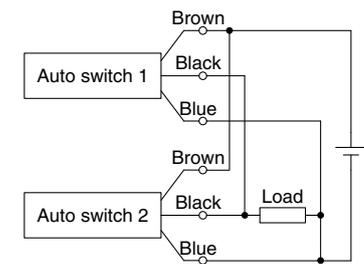
3-wire AND connection for PNP output (Using relays)



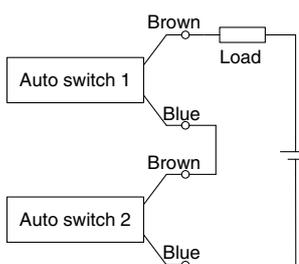
(Performed with auto switches only)



3-wire OR connection for PNP output



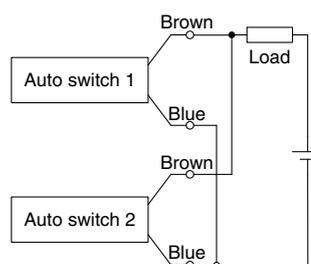
2-wire AND connection



When two auto switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state. The indicator lights will light up when both of the auto switches are in the ON state. Auto switches with a load voltage less than 20 V cannot be used. Please contact SMC if using AND connection for a heat-resistant solid state auto switch or a trimmer switch.

Example) Load voltage at ON
 Power supply voltage: 24 VDC
 Internal voltage drop: 4 V
 Load voltage at ON = Power supply voltage –
 Internal voltage drop x 2 pcs.
 = 24 V – 4 V x 2 pcs.
 = 16 V

2-wire OR connection



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

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

(Reed)
 Because there is no current leakage, the load voltage will not increase when turned OFF. 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)*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.

SMC Corporation

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Specifications are subject to change without prior notice
and any obligation on the part of the manufacturer.

D-G