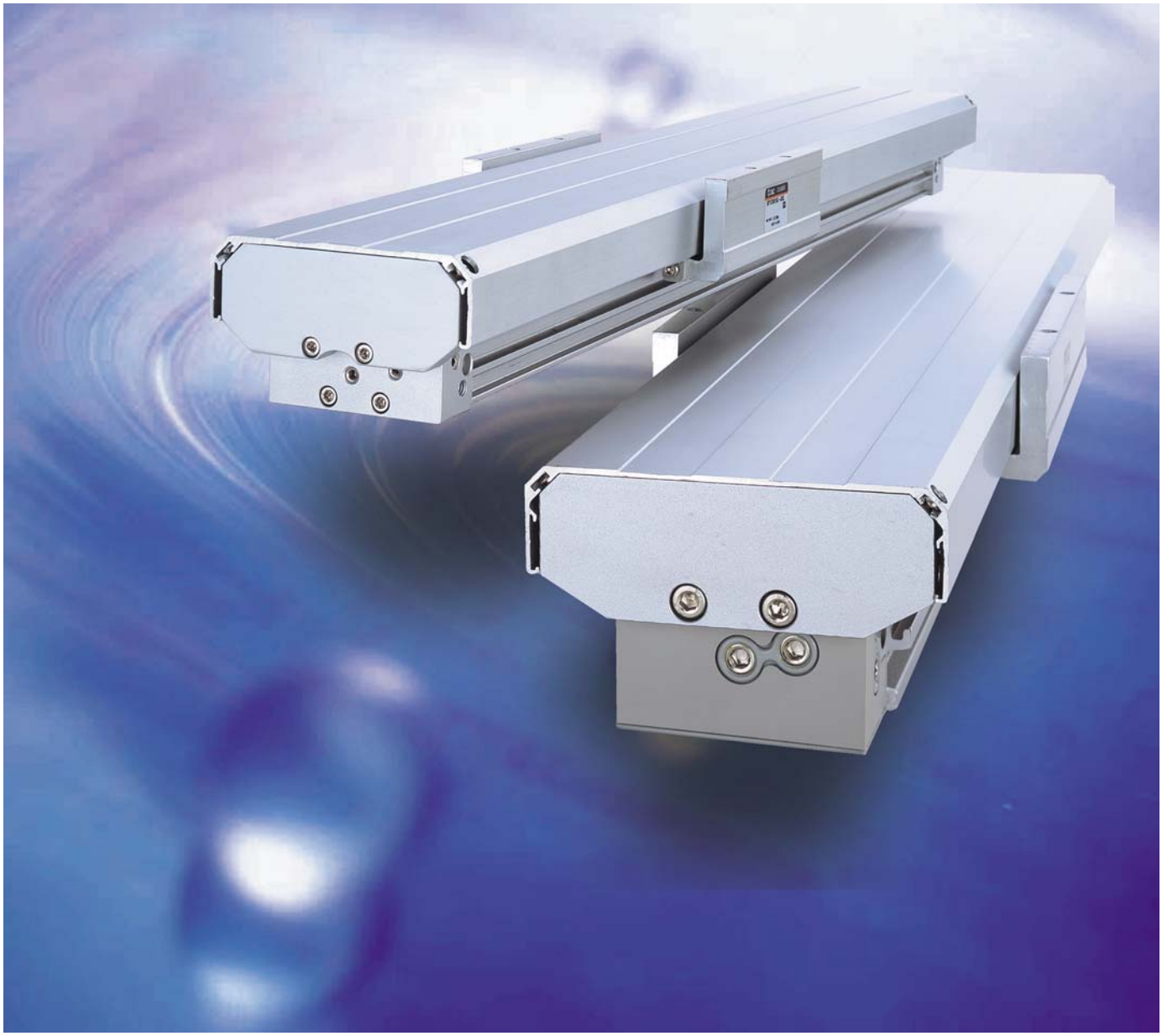
CAT.ES20-161 A -UK

SMC

Mechanically Jointed Rodless Cylinder with Protective Cover

Series MY1□W

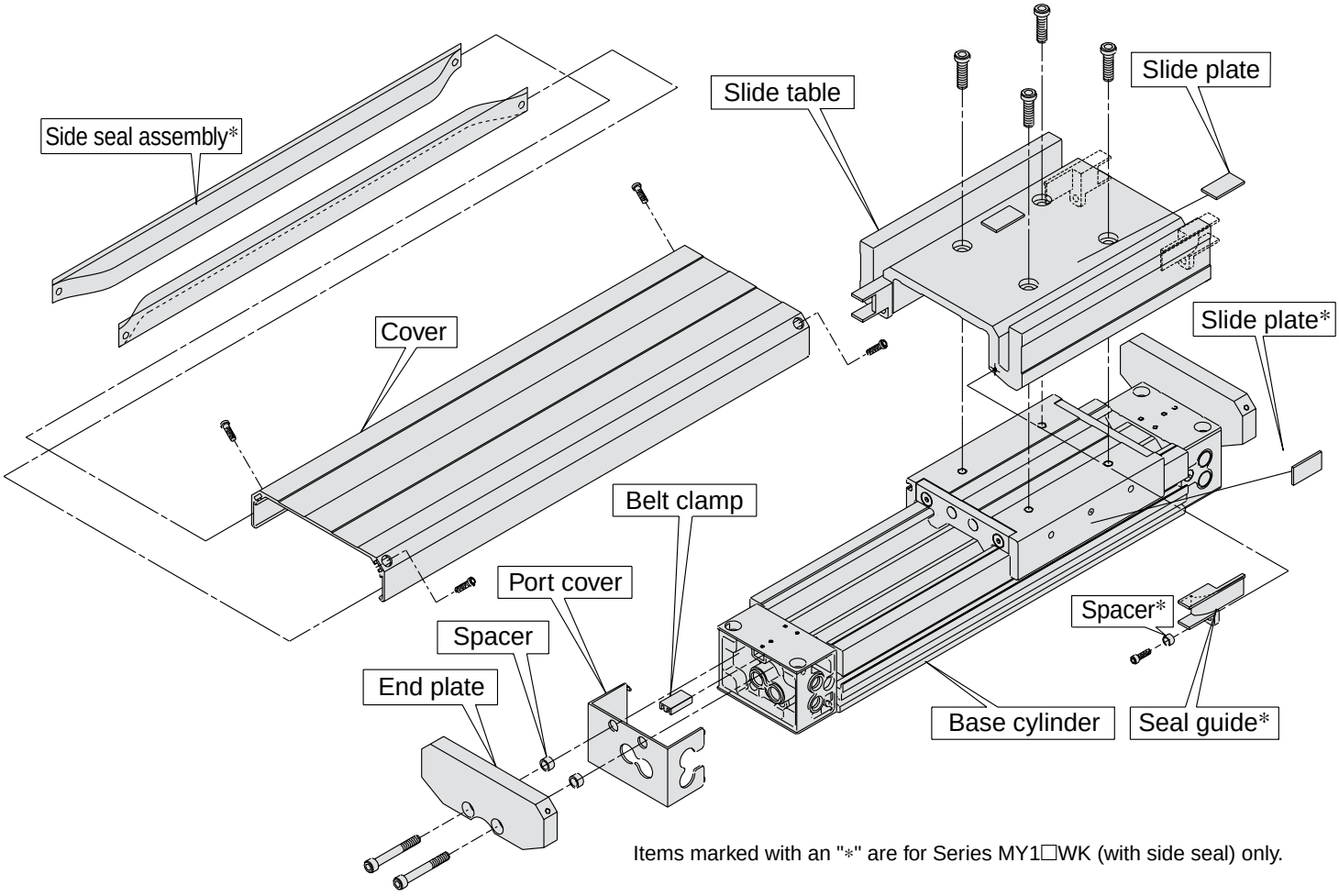
ø16, ø20, ø25, ø32, ø40, ø50, ø63



Introducing our mechanically jointed rodless cylinder with a superior dustproof, water-resistant protective cover.

Series MY1MW/MY1CW

Mechanically Jointed Rodless Cylinder with Protective Cover



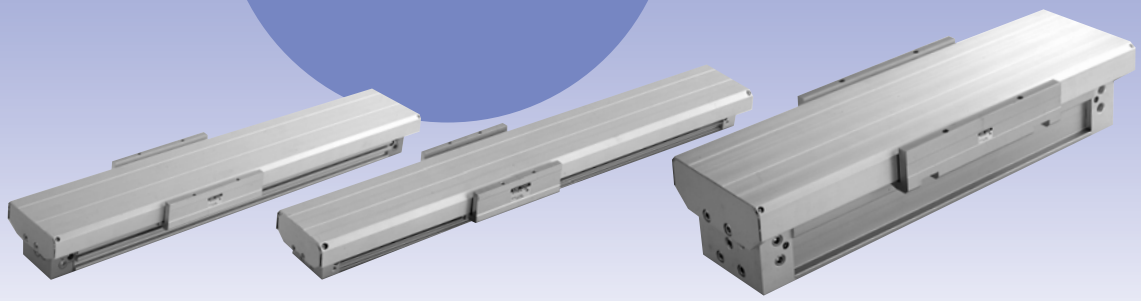
Items marked with an "*" are for Series MY1□WK (with side seal) only.

Variations

Series	Guide type	Cover	Bore sizes (mm)							Options
			16	20	25	32	40	50	63	
MY1MW	Slide bearing	With protective cover	●	●	●	●	●	●	●	• Centralised piping • Stroke adjusting unit • Side support
MY1MWK		With protective cover + side seal	●	●	●	●	●			
MY1CW	Cam follower guide	With protective cover	●	●	●	●	●	●	●	
MY1CWK		With protective cover + side seal	●	●	●	●	●			

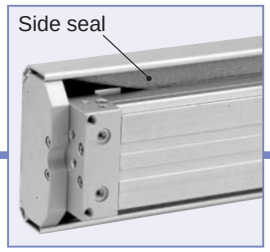
Protective cover

Offers excellent dust and water resistance



1 In environments where the cylinder is exposed to dust particles and water spray or splash, its dustproof, water-resistant cover offers superior protection.

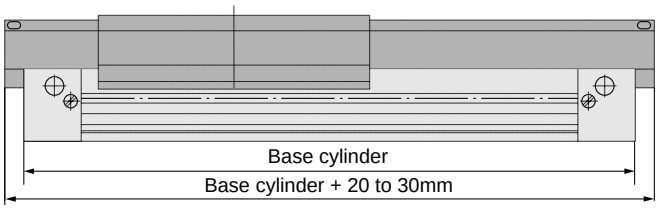
2 Side seals provide greater lateral dustproofing and water resistance.



3 The cover in no way interferes with the installation of base cylinder options.

4 Cover units and Side seal units can be installed on the already existing Series MY1M/MY1C. Which have thenew type end caps with pre-tapped holes.

5 Protective cover only minimally adds to overall length.



6 Water-resistant solid state switches can be mounted onto the ø25 to ø40 models.

▶ Stroke availability

Strokes may be selected in increments of 1mm.

▶ Stroke adjusting unit

Strokes can be adjusted either at one end or both ends.

- With adjusting bolts
- With low load shock absorber + Adjusting bolts (L unit)

▶ Centralized piping

Piping ports are concentrated on one side.

▶ Side supports

Side supports prevent cylinder tube from sagging in long stroke applications.

▶ Interchangeable mounting

Cylinder and work piece mounting interchangeability is possible between Series MY1MW and MY1CW.

Mechanically Jointed Rodless Cylinder with Protective Cover

Series MY1□W

Slide Bearing Guide Type/Cam Follower Guide Type

ø16, ø20, ø25, ø32, ø40, ø50, ø63

How to Order

E MY1M W K 25 □ — 300 □ □ — Y7BW □

Guide type

M	Slide bearing guide
C	Cam follower guide

With protective cover

Side seal Note)

Nil	Without side seal
K	With side seal

Note) Cylinders with side seal are available for ø16 to ø40.

Cylinder bore size

16	16mm
20	20mm
25	25mm
32	32mm
40	40mm
50	50mm
63	63mm

Thread Port (ø25 to ø63)

—	Rc(PT)
E	G(PF)

Stroke

Refer to the standard stroke table on page 2.

Piping

Nil	Standard
G	Centralised piping

Auto switch type

Nil	Without auto switch

∗ Refer to the table below for auto switch types.

Number of auto switches

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

Number of stroke adjusting units Note)

Nil	Both ends
S	One end

Note) "S" is available when stroke adjusting units are A and L.

Stroke adjusting unit

Nil	Without adjusting unit
A	With adjusting bolt
L	With low load shock absorber + Adjusting bolt
AL	With one A unit and one L unit

Applicable auto switches: Refer to pages 12 through 20 for detailed auto switch specifications.

For ø16, ø20

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC	Load voltage AC	Auto switch type: Electrical entry direction: Perpendicular	Auto switch type: Electrical entry direction: In-line	Lead wire length (m)∗: 0.5 (Nil)	3 (L)	5 (Z)	Applicable loads	
Reed switch	—	Grommet	No	2-wire	24V 5V 12V	100V or less	**A90V**	**A90**	●	●	—	IC circuit	Relay PLC
			Yes	2-wire	12V	100V	**A93V**	**A93**	●	●	—	—	
				3-wire (NPN)	— 5V	—	**A96V**	**A96**	●	●	—	IC circuit	—
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24V 5V 12V	—	**M9NV**	**M9N**	●	●	○	IC circuit	Relay PLC
				3-wire (PNP)			**M9PV**	**M9P**	●	●	○		
				2-wire			**M9BV**	**M9B**	●	●	○	—	
	Diagnostic indication (2-colour display)			3-wire (NPN)			**M9NWV**	**M9NW**	●	●	○	IC circuit	
				3-wire (PNP)			**M9PWV**	**M9PW**	●	●	○		
				2-wire			**M9BWV**	**M9BW**	●	●	○	—	

∗ Lead wire length symbols: 0.5m ..... Nil (Example) M9NW
3m ..... L M9NWL
5m ..... Z M9NWZ

∗∗ Solid state switches marked "○" are produced upon receipt of order.

For ø25, ø32, ø40, ø50, ø63

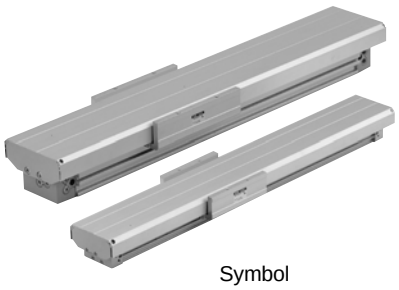
Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC	Load voltage AC	Auto switch type: Electrical entry direction: Perpendicular (Note 1)	Auto switch type: Electrical entry direction: In-line	Lead wire length (m)∗: 0.5 (Nil)	3 (L)	5 (Z)	Applicable loads	
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	— 5V	—	—	**Z76**	●	●	—	IC circuit	—
				2-wire	24V 12V	100V	—	**Z73**	●	●	●	—	Relay PLC
			No		5V 12V	100V or less	—	**Z80**	●	●	—	IC circuit	
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24V 5V 12V	—	**Y69A**	**Y59A**	●	●	○	IC circuit	Relay PLC
				3-wire (PNP)			**Y7PV**	**Y7P**	●	●	○		
				2-wire	12V		**Y69B**	**Y59B**	●	●	○	—	
	Diagnostic indication (2-color display)			3-wire (NPN)	5V 12V		**Y7NWV**	**Y7NW**	●	●	○	IC circuit	
				3-wire (PNP)			**Y7PWV**	**Y7PW**	●	●	○		
				2-wire	12V		**Y7BWV**	**Y7BW**	●	●	○	—	
	Water-resistant (2-colour display)			2-wire	12V		—	Note 2) **Y7BAL**	●	●	○	—	

∗ Lead wire length symbols: 0.5m ..... Nil (Example) Y59A
3m ..... L Y59AL
5m ..... Z Y59AZ

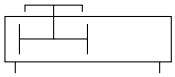
∗∗ Solid state switches marked "○" are produced upon receipt of order.
Note 1) Perpendicular electrical entry is not available for ø50 and ø63.
Note 2) Water-resistant switches are not available for ø50 and ø63.

Shock absorbers part numbers for L unit

Bore size (mm) / Unit	16	20	25	32	40	50	63
L unit	RB0806		RB1007	RB1412		RB2015	



Symbol



Specifications

Bore size (mm)		16	20	25	32	40	50	63
Fluid		Air						
Action		Double acting						
Operating pressure range		MY1MW: 0.15 to 0.8MPa; MY1CW: 0.1 to 0.8MPa						
Proof pressure		1.2MPa						
Ambient and fluid temperature		5° to 60°C						
Cushion		Air cushion						
Lubrication		Non-lube						
Stroke length tolerance		1000 or less $^{+1.8}_{0}$ 1001 to 3000 $^{+2.8}_{0}$	2700 or less $^{+1.8}_{0}$; 2701 to 5000 $^{+2.8}_{0}$					
Port size	**Front/Side ports**	M5		1/8		1/4	3/8	
	Bottom ports (centralised piping type only)	ø4		ø5	ø6	ø8	ø10	ø11

Stroke Adjusting Unit Specifications

Bore size (mm)	16		20		25		32		40		50		63	
Unit symbol	**A**	**L**	**A**	**L**	**A**	**L**	**A**	**L**	**A**	**L**	**A**	**L**	**A**	**L**
Configuration and shock absorber	With adjusting bolt	RB 0806 with adjusting bolt	With adjusting bolt	RB 0806 with adjusting bolt	With adjusting bolt	RB 1007 with adjusting bolt	With adjusting bolt	RB 1412 with adjusting bolt	With adjusting bolt	RB 1412 with adjusting bolt	With adjusting bolt	RB 2015 with adjusting bolt	With adjusting bolt	RB 2015 with adjusting bolt
Fine stroke adjustment range (mm)	0 to –5.6		0 to –6		0 to –11.5		0 to –12		0 to –16		0 to –20		0 to –25	
Stroke adjustment range	When exceeding the fine stroke adjustment range: Use Made to Order specifications "-X416" and "-X417". (Refer to page 21 for details.)													

Shock Absorber Specifications

Model		RB 0806	RB 1007	RB 1412	RB 2015
Max. energy absorption (J)		2.9	5.9	19.6	58.8
Stroke absorption (mm)		6	7	12	15
Max. impact speed (mm/s)		1500			
Max. operating frequency (cycle/min)		80	70	45	25
Spring force (N)	**Extended**	1.96	4.22	6.86	8.34
	Retracted	4.22	6.86	15.98	20.50
Operating temperature range (°C)		5 to 60			

Piston Speed

Bore sizes (mm)		16 to 63
Without stroke adjusting unit		100 to 1000mm/s
Stroke adjusting unit	**A unit**	100 to 1000mm/s Note 1)
	L unit	100 to 1500mm/s Note 2)

Note 1) The air cushion capacity will be reduced when the stroke adjustment range is increased by the adjusting bolt. When exceeding the air cushion stroke ranges shown on page 28, the **piston speed** should be **100 to 200mm/s.**

Note 2) The piston speed is 100 to 1000mm/s for centralised piping.

Note 3) Cylinders should be operated at a speed within the absorption capacity range. Please refer to page 28.

Standard Strokes

Bore sizes (mm)	Standard strokes (mm)*	Max. manufacturable stroke (mm)
16	100, 200, 300, 400, 500, 600, 700 800, 900, 1000, 1200, 1400, 1600 1800, 2000	3000
20, 25, 32, 40, 50, 63		

* Strokes can be manufactured in 1mm increments, up to the maximum stroke. If the required stroke length exceeds 2000mm, please indicate "-XB11" at the end of the ordering number. Refer to the Made to Order specifications on page 21 for details.

Theoretical Output

Unit: N

Bore size (mm)	Piston area (mm²)	Operating pressure (MPa)						
		0.2	0.3	0.4	0.5	0.6	0.7	0.8
16	200	40	60	80	100	120	140	160
20	314	62	94	125	157	188	219	251
25	490	98	147	196	245	294	343	392
32	804	161	241	322	402	483	563	643
40	1256	251	377	502	628	754	879	1005
50	1962	392	588	784	981	1177	1373	1569
63	3115	623	934	1246	1557	1869	2180	2492

Weights

Unit: kg

Bore size (mm)	MY1MW		MY1CW		Side support weight (per set)	Stroke adjusting unit weight (per unit)	
	Basic weight	Additional weight per 50mm of stroke	Basic weight	Additional weight per 50mm of stroke	Type A and B	A unit	L unit
16	1.25	0.16	1.25	0.16	0.01	0.03	0.04
20	1.90	0.19	1.85	0.18	0.02	0.04	0.05
25	2.56	0.28	2.50	0.28	0.02	0.07	0.11
32	4.75	0.43	4.62	0.42	0.04	0.14	0.23
40	7.79	0.61	7.51	0.57	0.08	0.25	0.34
50	13.53	0.83	13.61	0.82	0.08	0.36	0.51
63	21.84	1.18	21.94	1.17	0.17	0.68	0.83

Calculation method — Example: **MY1MW25-300A**

Basic weight 2.56kg
Additional weight ..... 0.28kg per 50mm of stroke
Weight of A unit 0.07kg

Cylinder stroke 300mm
2.56 + 0.28 x 300 ÷ 50 + 0.07 x 2 = Approx. 4.38kg

Options

Stroke adjusting unit model numbers

Bore size (mm) / Unit type	16	20	25	32	40	50	63
A unit	MYM-A16A	MYM-A20A	MYM-A25A	MYM-A32A	MYM-A40A	MYM-A50A	MYM-A63A
L unit	MYM-A16L	MYM-A20L	MYM-A25L	MYM-A32L	MYM-A40L	MYM-A50L	MYM-A63L

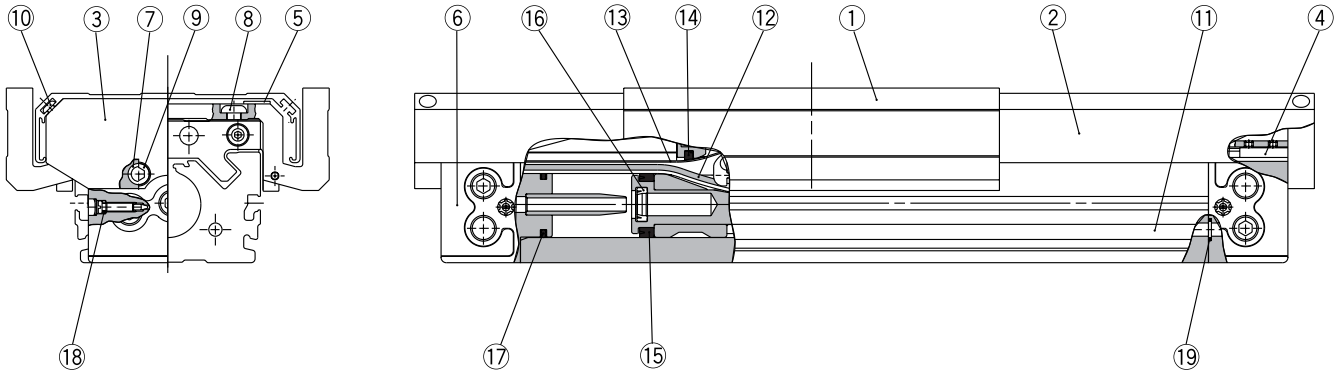
Side support model numbers

Bore size (mm) / Type	16	20	25	32	40	50	63
Side support A	MY-S16A	MY-S20A	MY-S25A	MY-S32A	MY-S40A		MY-S63A
Side support B	MY-S16B	MY-S20B	MY-S25B	MY-S32B	MY-S40B		MY-S63B

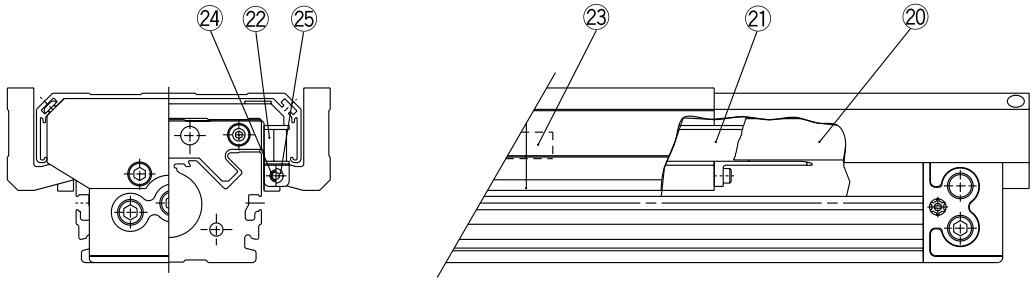
Refer to page 9 for detailed information on dimensions.

Construction

MY1□W



MY1□WK with side seal



Parts list

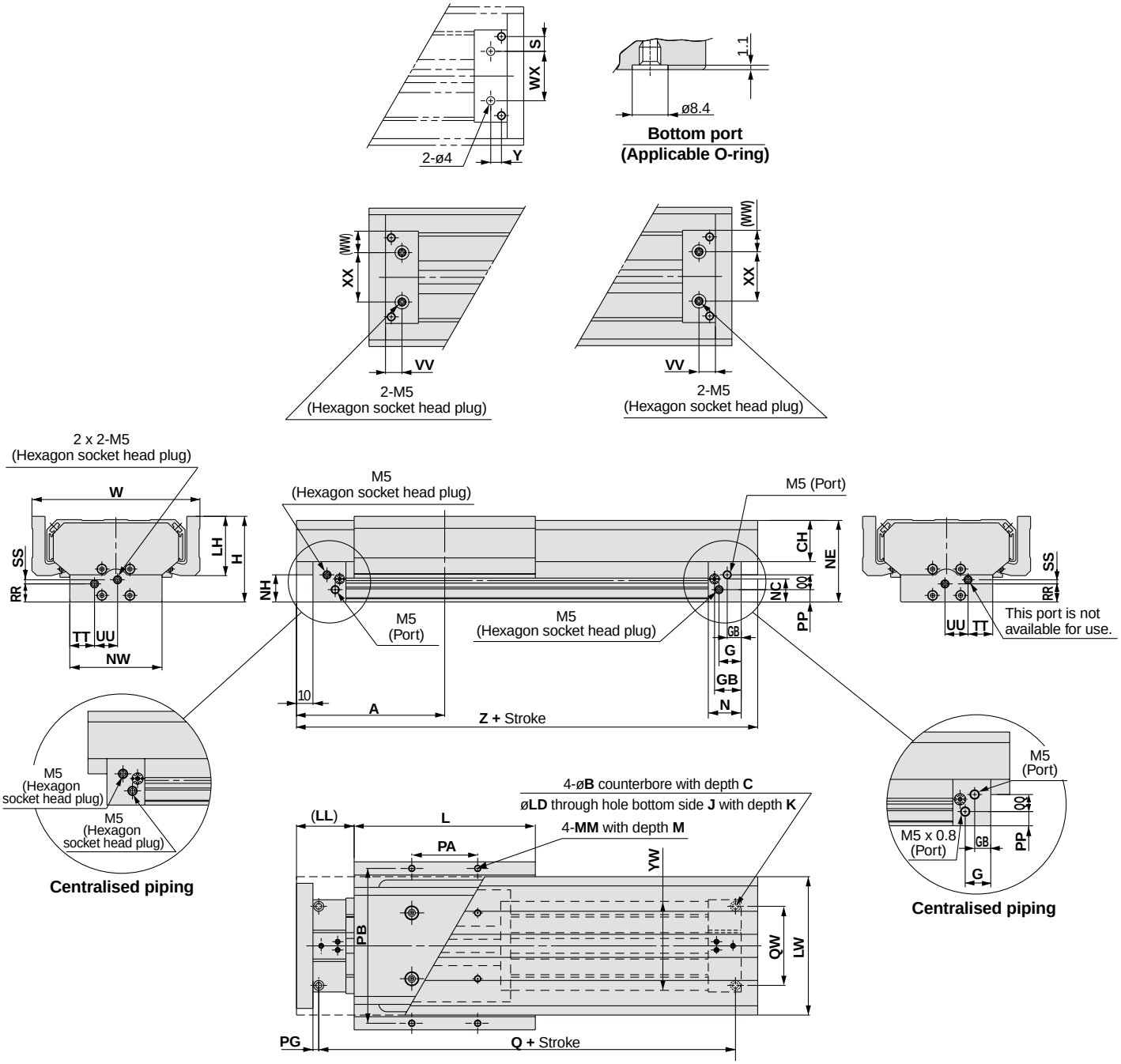
No.	Description		Material	Note	ø16	ø20	ø25	ø32	ø40	ø50	ø63
1	Cover unit	Slide table	Aluminum alloy	Hard anodized	MYMW-16-stroke	MYMW-20-stroke	MYMW-25-stroke	MYMW-32-stroke	MYMW-40-stroke	MYMW-50-stroke	MYMW-63-stroke
2		Cover	Aluminum alloy	Hard anodized							
3		End plate	Aluminum alloy	Hard anodized							
4		Belt clamp	Special resin								
5		Slide plate	Special resin								
6		Port cover	Special resin	(ø25 to ø40)							
7		Spacer	Stainless steel	(ø25 to ø40)							
8		Hexagon socket button head screw	Chromium molybdenum steel	Nickel plated							
9		Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated							
10		Hexagon socket button head screw	Chromium molybdenum steel	Nickel plated							
11	Rodless cylinder		—	MY1M/MY1C	—	—	—	—	—	—	—
21	Side seal unit	Seal guide A	Special resin		MYMK-16-A	MYMK-16-A	MYMK-25-A	MYMK-25-A	MYMK-25-A	—	—
22		Seal guide B	Special resin								
23		Slide plate	Special resin								
24		Spacer	Stainless steel								
25		Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated							

Seal list

No.	Description	Material	Qty.	ø16	ø20	ø25	ø32	ø40	ø50	ø63
12	Seal belt	Special resin	1	MY16-16A-Stroke	MY20-16A-Stroke	MY25-16A-Stroke	MY32-16A-Stroke	MY40-16A-Stroke	MY50-16A-Stroke	MY63-16A-Stroke
13	Dust seal band	Stainless steel	1	MY16-16B-Stroke	MY20-16B-Stroke	MY25-16B-Stroke	MY32-16B-Stroke	MY40-16B-Stroke	MY50-16B-Stroke	MY63-16B-Stroke
14	Scraper	NBR	2	MYM16-15AK0500	MYM20-15AK0501	MYM25-15AA5903	MYM32-15AA5904	MYM40-15AA5905	MYM50-15AK0502	MYM63-15AK0503
15	Piston seal	NBR	2	GMY16	GMY20	GMY25	GMY32	GMY40	GMY50	GMY63
16	Cushion seal	NBR	2	MYB16-15-A7163	MYB20-15-A7164	RCS-8	RCS-10	RCS-12	MC-16	MC-20
17	Tube gasket	NBR	2	P12	P16	TMY-25	TMY-32	TMY-40	P44	P53
18	O-ring	NBR	2	ø4 x ø1.8 x ø1.1	ø5.1 x ø3 x ø1.05	ø7.15 x ø3.75 x ø1.7	ø8.3 x ø4.5 x ø1.9	C-4	C-4	C-4
19	O-ring	NBR	4	ø7 x ø4 x ø1.5	ø7 x ø4 x ø1.5	C-6	C-7	C-9	C-11.2	C-14
20	Side seal assembly	Polyurethane	2	MYMK-16-stroke	MYMK-20-stroke	MYMK-25-stroke	MYMK-32-stroke	MYMK-40-stroke	—	—

Note) Two types of dust seal band are available. Verify which type to use for ordering since the part number differs depending on the treatment of the hexagon socket head set screw.
(A) Black zinc chromated → MY□□-16B-stroke (B) Nickel plated → MY□□-16BW-stroke

Dimensions: ø16, ø20



Bore size (mm)	A	B	C	CH	G	GA	GB	H	J	K	L	LD	LH	LL	LW	M	MM	N	NC	NE	NH	NW
16	90	6	3.5	25	13.5	8.5	16.2	52	M5	10	110	3.6	38	35	84	6	M4	20	14	49.5	16.5	56
20	110	7.5	4.5	26	12.5	—	20	58	M6	12	130	4.8	39	45	88	7.5	M5	25	17	55.5	21.7	60

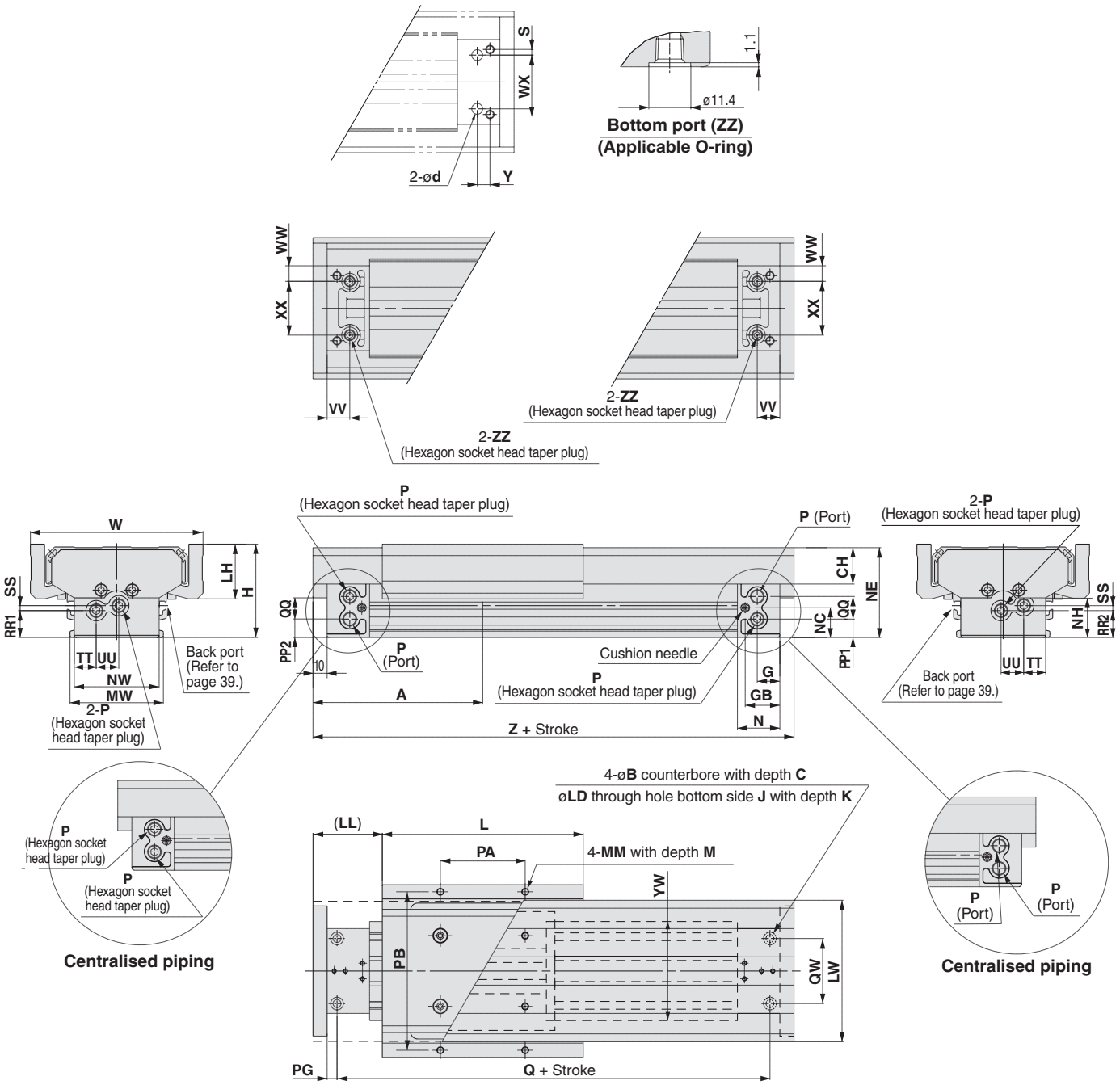
Bore size (mm)	PA	PB	PG	PP	Q	QQ	QW	RR	SS	TT	UU	VV	W	WW	YW	Z
16	40	94	3.5	7.5	153	9	48	11	2.5	15	14	10	102	13	54	180
20	50	100	4.5	11.5	191	10	45	14.5	5	18	12	12.5	110	14	58	220

Hole sizes for centralised piping on the bottom

Bore size (mm)	S	WX	Y	Applicable O-ring
16	9	30	6.5	C6
20	6.5	32	8	C6

(Mounting side should be machined to these dimensions.)

Dimensions: ø25, ø32, ø40



Bore size (mm)	A	B	C	CH	G	GB	H	J	K	L	LD	LH	LL	LW	M	MM	MW	N	NC	NE	NH	NW
25	120	9	5.5	25.7	17	24.5	66	M6	9.5	142	5.6	38.7	49	100	10	M5	66	30	21	64	28	60
32	150	11	6.5	31.5	19	30	82	M8	16	172	6.8	44.2	64	122	13	M6	80	37	26	80	37	74
40	180	14	8.5	34.8	23	36.5	98	M10	15	202	8.6	47.2	79	138	13	M6	96	45	32	96	48	94

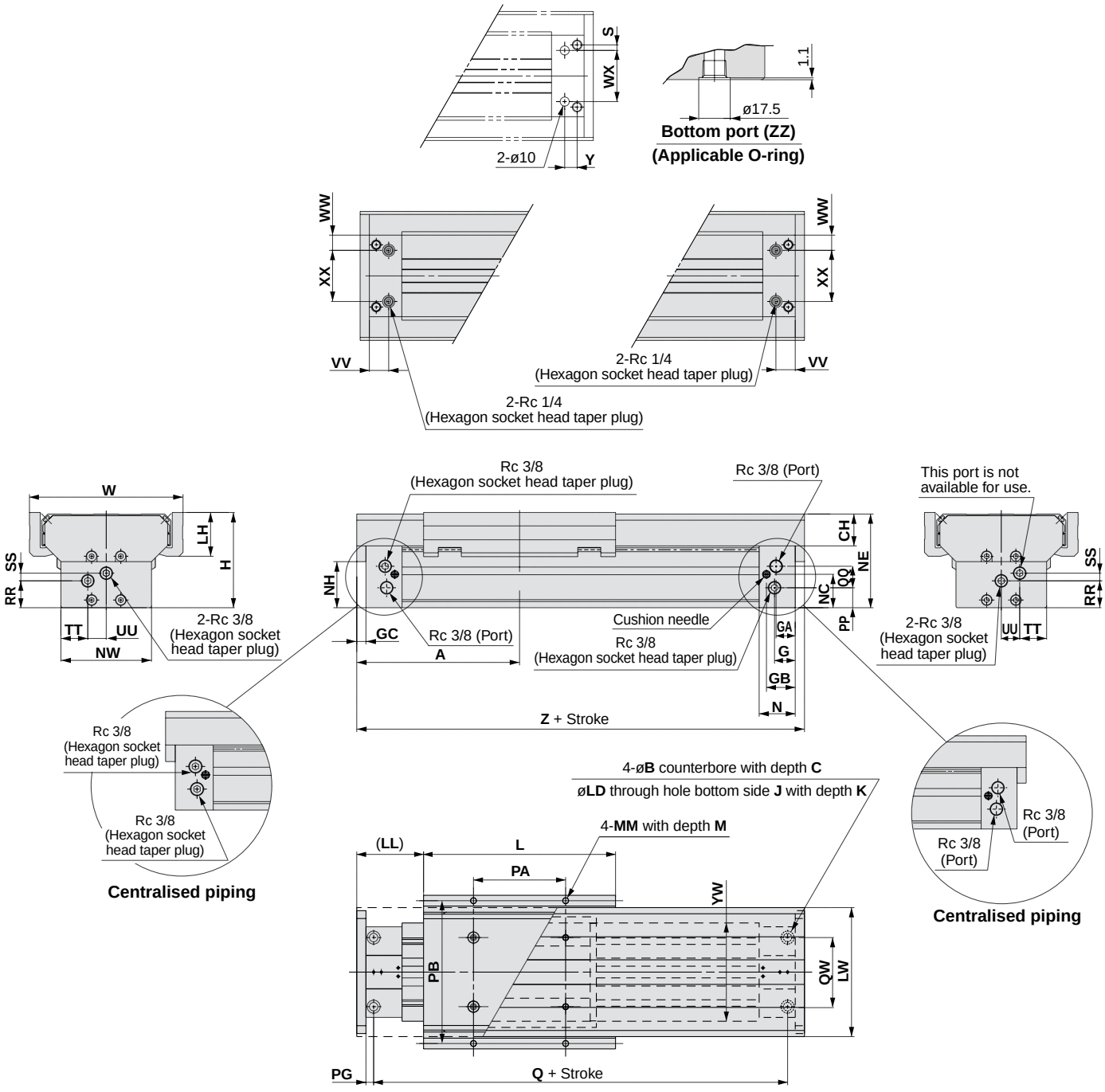
Bore size (mm)	P	PA	PB	PG	PP1	PP2	Q	QQ	QW	RR1	RR2	SS	TT	UU	VV	W	WW	YW	Z
25	Rc 1/8	60	112	7	12.7	12.7	206	15.5	46	18.9	17.9	5.1	15.5	16	16	122	11	70	240
32	Rc 1/8	80	134	8	15.5	18.5	264	16	60	22	24	4	21	16	19	144	13	88	300
40	Rc 1/4	100	150	9	17.5	20	322	26	72	25.5	29	9	26	21	23	160	20	104	360

Hole sizes for centralised piping on the bottom

Bore size (mm)	D	d	WX	Y	S	Applicable O-ring
25	11.4	6	38	9	4	C9
32	11.4	6	48	11	6	C9
40	13.4	8	54	14	9	C11.2

(Mounting side should be machined to these dimensions.)

Dimensions: ø50, ø63



Bore size (mm)	A	B	C	CH	G	GA	GB	GC	H	J	K	L	LD	LH	LL	LW	M	MM	N	NC	NE	NH
50	212	17	10.5	41.5	27	25	37.5	12	124	M14	28	250	11	57	87	168	15	M8	47	44	122	60
63	245	19	12.5	47	29.5	27.5	39.5	15	149	M16	32	290	14	65	100	200	16	M10 x 1.25	50	60	147	70

Bore size (mm)	NW	PA	PB	PG	PP	Q	QQ	QW	RR	SS	TT	UU	VV	W	WW	YW	Z
50	118	120	186	10	26	380	28	90	35	10	35	24	28	200	22	128	424
63	142	140	220	12	42	436	30	110	49	13	43	28	30	236	25	152	490

Hole sizes for centralised piping on the bottom

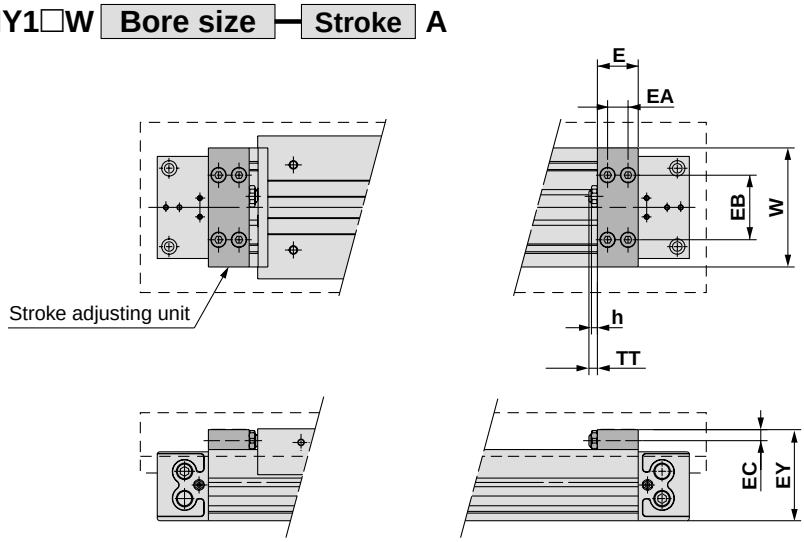
Bore size (mm)	S	WX	Y	Applicable O-ring
50	8	74	18	C15
63	9	92	18	C15

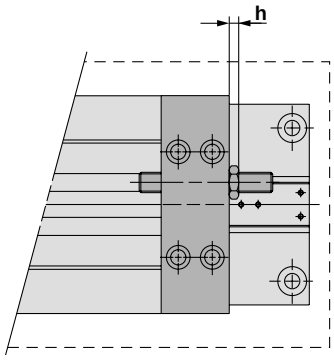
(Mounting side should be machined to these dimensions.)

Stroke Adjusting Unit

With adjusting bolt

MY1□W Bore size — Stroke A



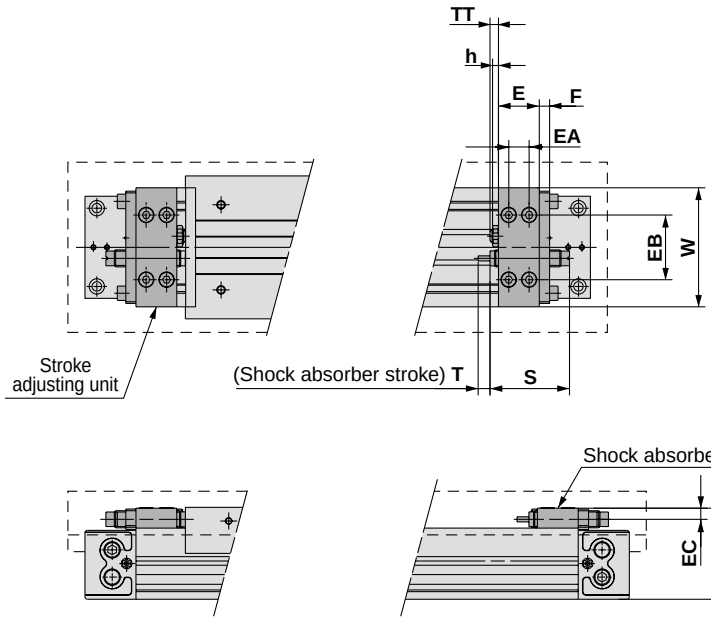


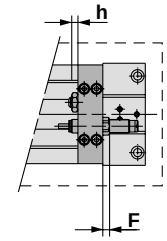
MY1□W50, 63

Model	E	EA	EB	EC	EY	h	TT	W
MY1□W16	14.6	7	30	5.8	39.5	3.6	5.4 (Max. 11)	58
MY1□W20	20	10	32	5.8	45.5	3.6	5 (Max. 11)	58
MY1□W25	24	12	38	6.5	53.5	3.5	5 (Max. 16.5)	70
MY1□W32	29	14	50	8.5	67	4.5	8 (Max. 20)	88
MY1□W40	35	17	57	10	83	4.5	9 (Max. 25)	104
MY1□W50	40	20	66	14	106	5.5	13 (Max. 33)	128
MY1□W63	52	26	77	14	129	5.5	13 (Max. 38)	152

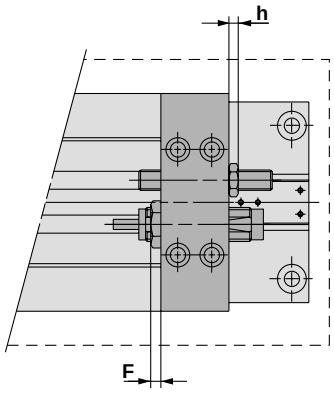
With low load shock absorber + Adjusting bolts

MY1□W Bore size — Stroke L





MY1□W16, 20

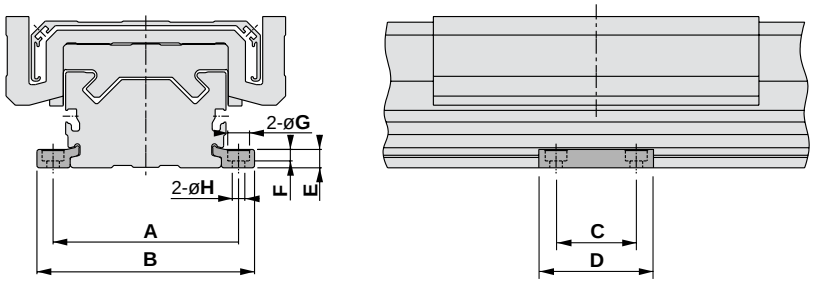


MY1□W50, 63

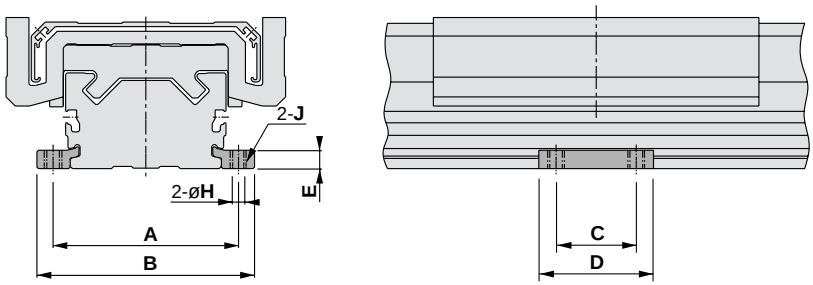
Model	E	EA	EB	EC	EY	F	h	S	T	TT	W	Shock absorber unit model
MY1□W16	14.6	7	30	5.8	39.5	4	3.6	40.8	6	5.4 (Max. 11)	58	RB0806
MY1□W20	20	10	32	5.8	45.5	4	3.6	40.8	6	5 (Max. 11)	58	RB0806
MY1□W25	24	12	38	6.5	53.5	6	3.5	46.7	7	5 (Max. 16.5)	70	RB1007
MY1□W32	29	14	50	8.5	67	6	4.5	67.3	12	8 (Max. 20)	88	RB1412
MY1□W40	35	17	57	10	83	6	4.5	67.3	12	9 (Max. 25)	104	RB1412
MY1□W50	40	20	66	14	106	6	5.5	73.2	15	13 (Max. 33)	128	RB2015
MY1□W63	52	26	77	14	129	6	5.5	73.2	15	13 (Max. 38)	152	RB2015

Side Supports

Side support A
MY-S□A



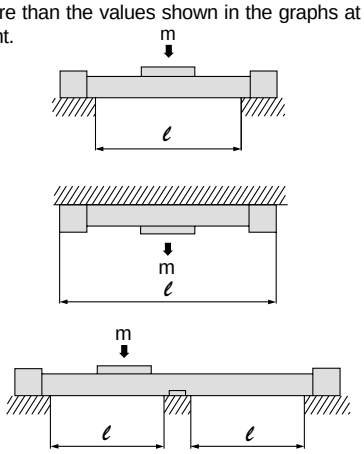
Side support B
MY-S□B



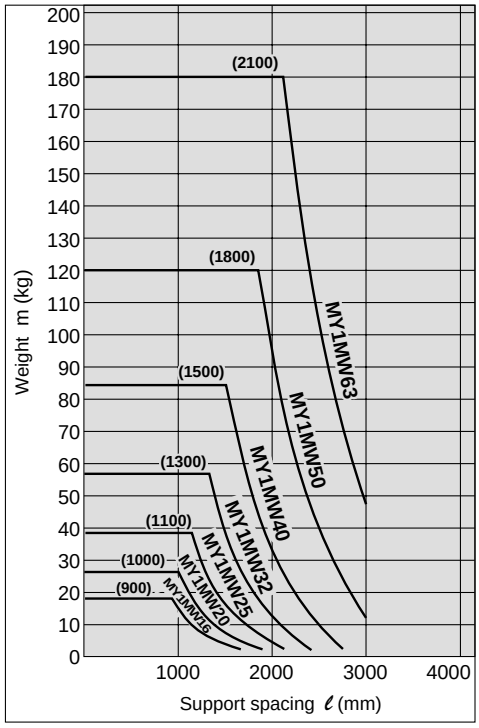
Model	Applicable cylinder	A	B	C	D	E	F	G	H	J
MY-S16$^{A}_{B}$	MY1□W16	61	71.6	15	26	4.9	3	6.5	3.4	M4
MY-S20$^{A}_{B}$	MY1□W20	67	79.6	25	38	6.4	4	8	4.5	M5
MY-S25$^{A}_{B}$	MY1□W25	81	95	35	50	8	5	9.5	5.5	M6
MY-S32$^{A}_{B}$	MY1□W32	100	118	45	64	11.7	6	11	6.6	M8
MY-S40$^{A}_{B}$	MY1□W40	120	142	55	80	14.8	8.5	14	9	M10
	MY1□W50	142	164							
MY-S63$^{A}_{B}$	MY1□W63	172	202	70	100	18.3	10.5	17.5	11.5	M12

Guide for Side Support Application

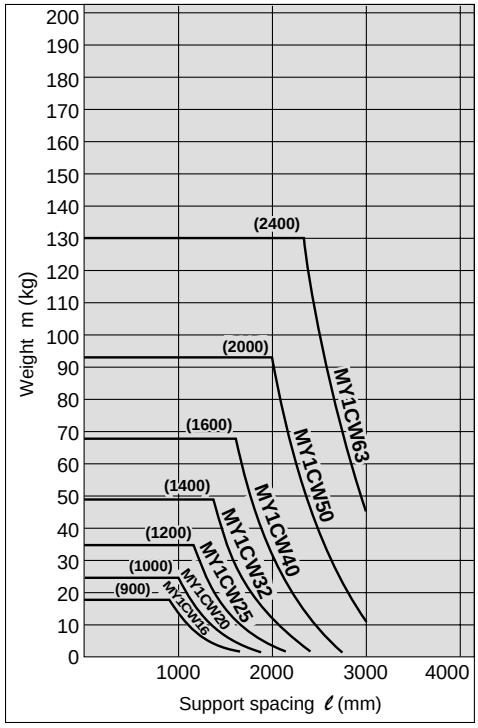
During long stroke operation, the cylinder tube may deflect due to its own weight and/or load weight. In such cases, install a side support at the intermediate stroke position. The spacing of the side support must be no more than the values shown in the graphs at right.



MY1MW



MY1CW



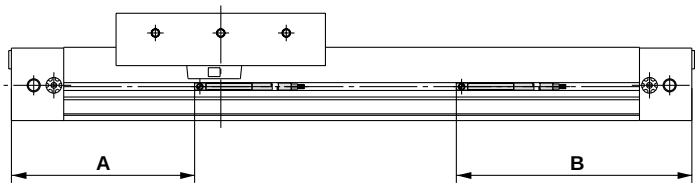
⚠Caution

1. If the cylinder mounting surfaces are not measured accurately, using a side support may cause poor operation. Make sure to level the cylinder tube when mounting the cylinder. For long stroke operation involving vibration and impact, the use of side supports is recommended even if the spacing value is within the allowable limits shown in the graphs.
2. Support brackets are not for mounting. They should be used only to provide support.

Auto Switch Proper Mounting Position for Stroke End Detection

Note) The operating range is a guide that includes hysteresis, and therefore, is not guaranteed. The range may vary greatly (as much as ±30%) depending on the operating environment.

MY1CW 16, 20
MY1MW 16, 20



Reed switch
D-A90(V), D-A93(V), D-A96(V)

Mounting position	ø16	ø20
A	70	90
B	90	110
Operating range Note)	11	7.5

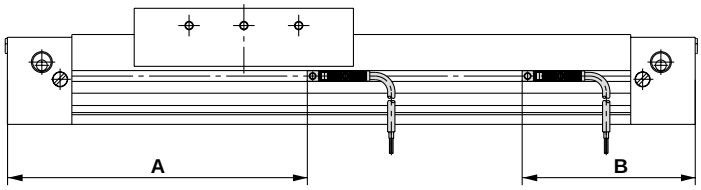
Solid state switch
D-M9N(V), D-M9P(V), D-M9B(V)

Mounting position	ø16	ø20
A	74	94
B	86	106
Operating range Note)	8.5	6.5

D-M9NW(V), D-M9PW(V), D-M9BW(V)

Mounting position	ø16	ø20
A	73	93
B	87	107
Operating range Note)	8.5	6.5

MY1MW 25, 32, 40, 50, 63



Reed switch
D-Z73, D-Z76, D-Z80

Mounting position	ø25	ø32	ø40	ø50	ø63
A	139.5	184.5	229.5	278.5	323.5
B	80.5	95.5	110.5	121.5	136.5
Operating range Note)	12	12	12	11.5	11.5

Solid state switch
D-Y59 $^{A}_{B}$, D-Y69 $^{A}_{B}$, D-Y7P(V)
D-Y7NW(V), D-Y7PW(V), D-Y7BW(V)

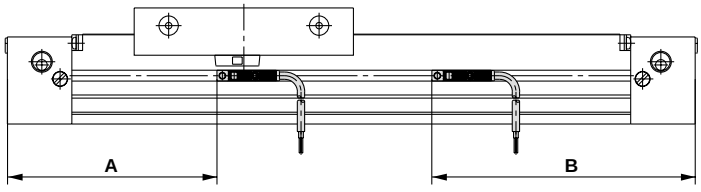
Mounting position	ø25	ø32	ø40	ø50	ø63
A	139.5	184.5	229.5	278.5	323.5
B	80.5	95.5	110.5	121.5	136.5
Operating range Note)	5	5	5	5.5	5.5

D-Y7BAL

Mounting position	ø25	ø32	ø40
A	139.5	184.5	229.5
B	80.5	95.5	110.5
Operating range Note)	8	8	8

Perpendicular electrical entry is not available for ø50 and ø63.
(D-Y69A, D-Y69B, D-Y7PV D-Y7NWV, D-Y7PWV, D-Y7BWV)

MY1CW 25, 32, 40, 50, 63



Reed switch
D-Z73, D-Z76, D-Z80

Mounting position	ø25	ø32	ø40	ø50	ø63
A	97.5	127.5	157.5	278.5	323.5
B	122.5	152.5	182.5	121.5	136.5
Operating range Note)	12	12	12	11.5	11.5

Solid state switch
D-Y59 $^{A}_{B}$, D-Y69 $^{A}_{B}$, D-Y7P(V)
D-Y7NW(V), D-Y7PW(V), D-Y7BW(V)

Mounting position	ø25	ø32	ø40	ø50	ø63
A	97.5	127.5	157.5	278.5	323.5
B	122.5	152.5	182.5	121.5	136.5
Operating range Note)	5	5	5	5.5	5.5

D-Y7BAL

Mounting position	ø25	ø32	ø40
A	97.5	127.5	157.5
B	122.5	152.5	182.5
Operating range Note)	8	8	8

Perpendicular electrical entry is not available for ø50 and ø63.
(D-Y69A, D-Y69B, D-Y7PV D-Y7NWV, D-Y7PWV, D-Y7BWV)

Auto Switch Mounting & Installation of Lead Wire Cover (ø50, ø63)

⚠Caution

Be sure to install a lead wire cover on the auto switches for size ø50 and ø63 cylinders.

Install a lead wire cover following the instructions provided below to prevent the lead wire from interfering with the slider.

Lead wire cover is packaged together with size ø50 and ø63 cylinders equipped with auto switches.

For ordering the lead wire cover separately, use the following part number:

MYM63GAR6386-1640 (Length: 2m)

1. Auto switch mounting position

Up to 4 auto switches can be mounted on one side of the cylinder (total of 8 switches on both sides).

When multiple auto switches are used, be sure to use the lead wire groove and pull the lead wires out from the edge of the cylinder. (Bold lines in Figure 1 indicate lead wires.)

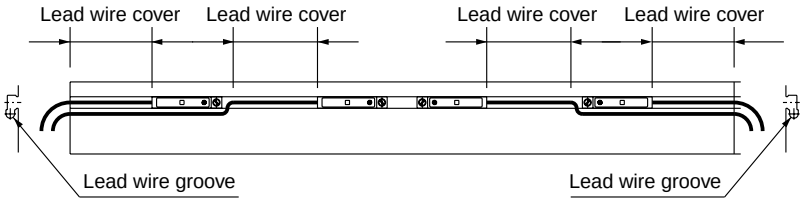


Figure 1. Auto switch mounting position

2. How to mount auto switch/install lead wire cover

1. Insert and slide in the auto switch from the side of the cylinder and secure it with the screw provided. (Refer to Figure 2.)

2. Cut the lead wire cover to the desired length using a cutter or tube cutter. (Refer to Figure 1.)

3. First place the lead wires into the lead wire cover. Then, install a lead wire cover onto a cylinder body. (Refer to Figure 3.)

4. Make sure that the lead wires do not interfere with the slide table at any stroke range.

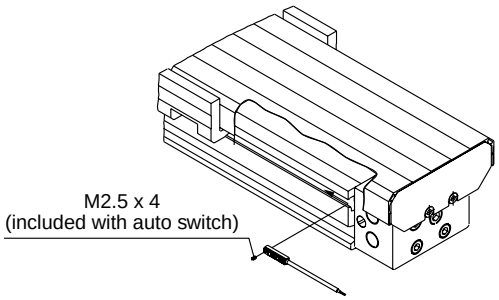


Figure 2. Auto switch mounting

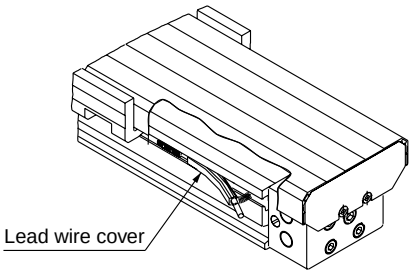


Figure 3. Installation of lead wire cover

Series MY1□W

Auto Switch Specifications

Auto Switch Common Specifications

Type	Reed switch	Solid state switch
Leakage current	None	3-wire: 100μA or less; 2-wire: 0.8mA or less
Operating time	1.2ms	1ms or less
Impact resistance	300m/s²	1000m/s²
Insulation resistance	50MΩ or more at 500VDC (between lead wire and case)	
Withstand voltage	1500VAC for 1 min. (between lead wire and case)	1000VAC for 1 min. (between lead wire and case)
Ambient temperature	–10° to 60°C	
Enclosure	IEC529 standard IP67, JIS C0920: Watertight construction	

Lead Wire Lengths

Lead wire length indication

(Example) **D-M9P L**

Lead wire length

Nil	0.5m
L	3m
Z	5m

Notes) • Lead wire length Z (5m) applicable auto switches
Reed switch: D-Z73
Solid state switch: All types are produced upon receipt of order.
• For D-Y5, D-Y6, and D-Y7, flexible wire specification is standard.
• To designate flexible wire specification for the D-M9 type, add "-61" after the lead wire length.

(Example) D-M9PL-61

Flexible specification

Contact Protection Box: CD-P11, CD-P12

<Applicable switch type>

Reed switches do not have built-in contact protection circuits.
A contact protection box should be used in any of the following conditions, otherwise, the life of the contacts may be reduced (they may stay on continuously).

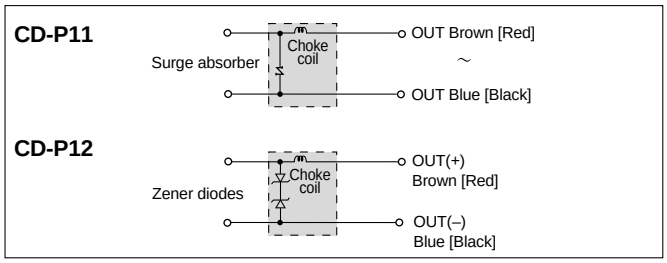
1. Operated load is an induction load.
2. The length of wiring to the load is 5m or more.
3. The load voltage is 100VAC or 200VAC.

Specifications

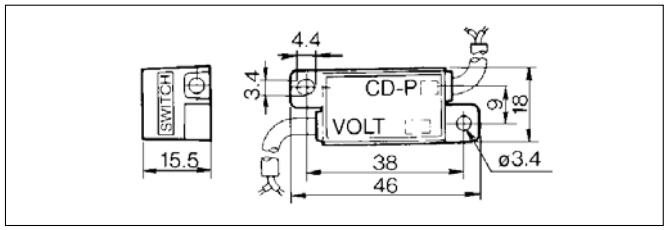
Part no.	CD-P11		CD-P12
Load voltage	100VAC	200VAC	24VDC
Max. load current	25mA	12.5mA	50mA

∗ Lead wire length — Switch connection side: 0.5m
Load connection side: 0.5m

Internal circuits



Dimensions



Connection for Contact Protection Box

To connect a switch unit to a contact protection box, connect the lead wire from the side of the contact protection box marked SWITCH to the lead wire coming out of the switch unit.
The switch unit should be kept as close as possible to the contact protection box with a lead wire that is no more than 1 meter in length.

Reed Switches: Direct Mounting Type
D-A90(V), D-A93(V), D-A96(V)

Specifications

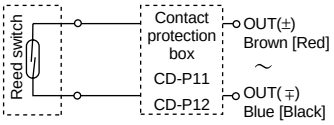
Auto switch part no.	D-A90	D-A90V	D-A93	D-A93V	D-A96	D-A96V
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	2-wire				3-wire	
Applicable load	IC circuit, Relay, PLC		Relay, PLC		IC circuit	
Load voltage / Load current range and Max. load current	24V AC/DC or less/50mA 48V AC/DC or less/40mA 100V AC/DC or less/20mA		24VDC/5 to 40mA 100VAC/5 to 20mA		4 to 8VDC/20mA	
Contact protection circuit	Not available					
Internal resistance/ Internal voltage drop	1Ω or less (includes 3m lead wire length)		2.4V or less (to 20mA) 3V or less (to 40mA)	2.7V or less	0.8V or less	
Indicator light	None		Red LED lights when ON			

- **Lead wire** ..... Oilproof heavy duty vinyl cord: ø2.7, 0.5m
  D-A90(V), D-A93(V): 0.18mm² x 2 cores (Brown, Blue [Red, Black])
  D-A96(V): 0.15mm² x 3 cores (Brown, Black, Blue [Red, Black, White])
- **Insulation resistance** ..... 50MΩ or more at 500VDC (between lead wire and case)
- **Withstand voltage** ..... 1000VAC for 1 min. (between lead wire and case)
- **Operating time** 1.2ms
- **Ambient temperature** ..... –10° to 60°C
- **Impact resistance** 300m/s²
- **Leakage current** 0
- **Enclosure** ..... IEC529 standard IP67 (JISC0920) watertight

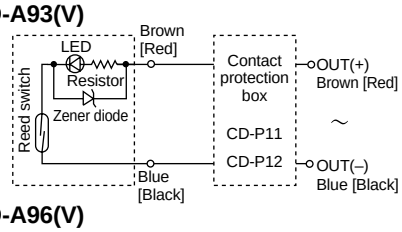
Note) Refer to page 12 for lead wire lengths.

Internal circuits

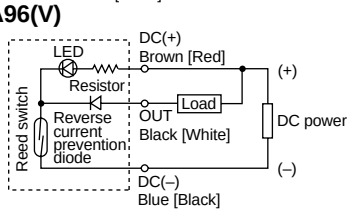
D-A90(V)



D-A93(V)



D-A96(V)



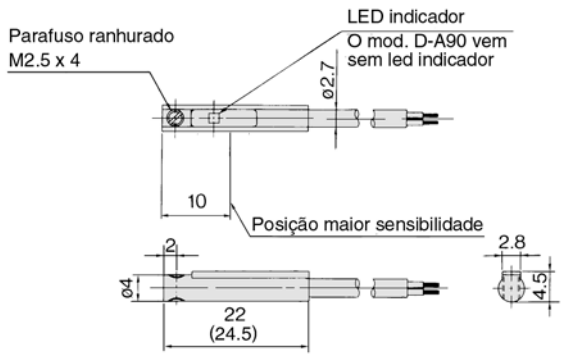
Weights

(g)

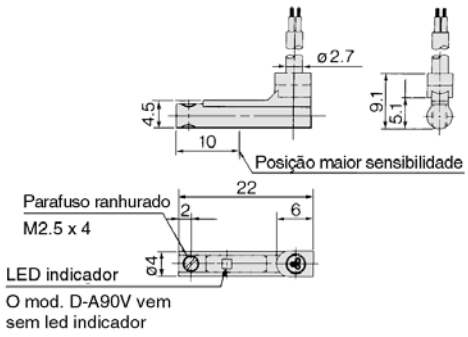
Auto switch part no.	D-A90	D-A90V	D-A93	D-A93V	D-A96	D-A96V
Lead wire length: 0.5m	7	7	6	7	8	8
Lead wire length: 3m	35	35	30	35	41	41

Dimensions

D-A90, D-A93, D-A96



D-A90V, D-A93V, D-A96V



The dimension inside ( ) is for D-A93.

Reed Switches: Direct Mounting Type
D-Z73, D-Z76, D-Z80

Specifications

With indicator light

Auto switch part no.	D-Z73		D-Z76
Electrical entry direction	In-line		
Wiring type	2-wire		3-wire
Applicable load	Relay, PLC		IC circuit
Load voltage	24VDC	100VAC	4 to 8VDC
Maximum load current Load current range	5 to 40mA	5 to 20mA	20mA
Contact protection circuit	Not available		
Internal voltage drop	2.4V or less (up to 20mA), 3V or less (up to 40mA)		0.8V or less
Indicator light	Red LED lights when ON		

Without indicator light

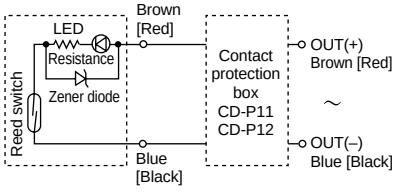
Auto switch part no.	D-Z80		
Electrical entry direction	In-line		
Wiring type	2-wire		
Applicable load	Relay, PLC, IC circuit		
Load voltage	24V AC/DC or less	48V AC/DC or less	100V AC/DC or less
Maximum load current	50mA	40mA	20mA
Contact protection circuit	Not available		
Internal resistance	1Ω or less (includes 3m lead wire length)		

- **Lead wire** ..... Oilproof heavy duty vinyl cord:
  D-Z73: ø2.7, 0.18mm² x 2 cores (Brown, Blue [Red, Black])
  D-Z76: ø3.4, 0.2mm² x 3 cores (Brown, Black, Blue [Red, White, Black])
  D-Z80: ø3.4, 0.2mm² x 2 cores (Brown, Blue [Red, Black])
- **Insulation resistance** ..... 50MΩ or more at 500VDC (between lead wire and case)
- **Withstand voltage** ..... 1000VAC for 1 min. (between lead wire and case)
- **Operating time** 1.2ms
- **Ambient temperature** ..... –10° to 60°C
- **Impact resistance** 300m/s²
- **Leakage current** 0
- **Enclosure** ..... IEC529 standard IP67 (JISC0920) watertight

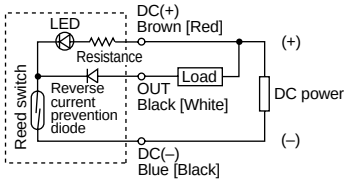
Note) Refer to page 12 for lead wire lengths.

Internal circuits

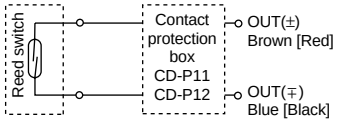
D-Z73



D-Z76



D-Z80



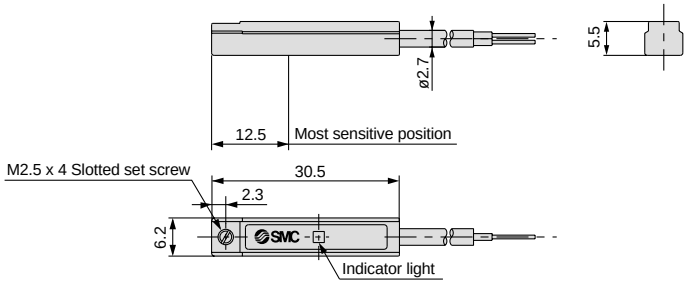
Weights

(g)

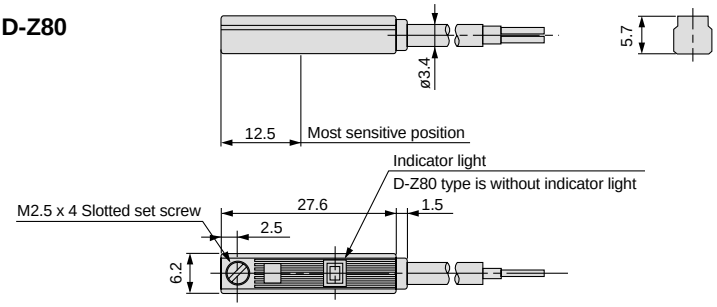
Auto switch part no.	Lead wire length: 0.5m	Lead wire length: 3m
D-Z73	6	31
D-Z76	10	55
D-Z80	9	49

Dimensions

D-Z73



D-Z76, D-Z80



Solid State Switches: Direct Mounting Type
D-M9N(V), D-M9P(V), D-M9B(V)

Grommet

Specifications

D-M9□, D-M9□V (with indicator light)						
Auto switch part no.	D-M9N	D-M9NV	D-M9P	D-M9PV	D-M9B	D-M9BV
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay, PLC				24VDC relay, PLC	
Power supply voltage	5, 12, 24VDC (4.5 to 28VDC)				—	
Current consumption	10mA or less				—	
Load voltage	28VDC or less		—		24VDC (10 to 28VDC)	
Load current	40mA or less		80mA or less		5 to 40mA	
Internal voltage drop	1.5V or less (0.8V or less at 10mA load current)		0.8V or less		4V or less	
Leakage current	100μA or less at 24VDC				0.8mA or less	
Indicator light	Red LED lights when ON					

• **Lead wire** ..... Oilproof heavy duty vinyl cord: ø2.7, 0.5m
D-M9N(V), D-M9P(V): 0.15mm² x 3 cores (Brown, Black, Blue [Red, White, Black])
D-M9B(V): 0.18mm² x 2 cores (Brown, Blue [Red, Black])

Note) Refer to page 12 for auto switch common specifications and lead wire lengths.

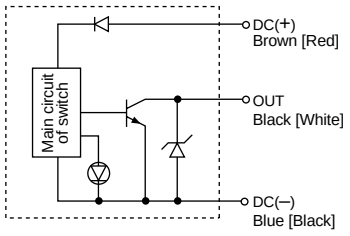
Weights

(g)

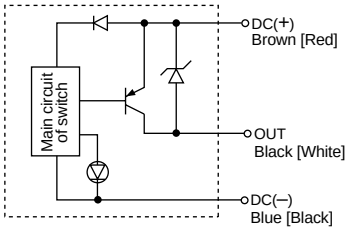
Auto switch part no.	D-M9N	D-M9P	D-M9B	D-M9NV	D-M9PV	D-M9BV
Lead wire length: 0.5m	7	7	6	7	7	6
Lead wire length: 3m	37	37	31	37	37	31

Internal circuits

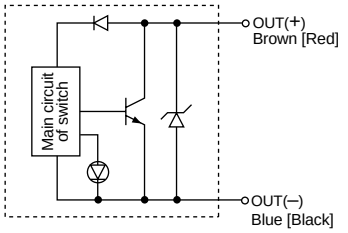
D-M9N(V)



D-M9P(V)

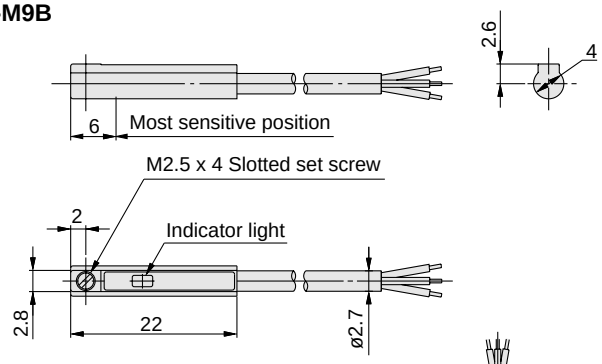


D-M9B(V)

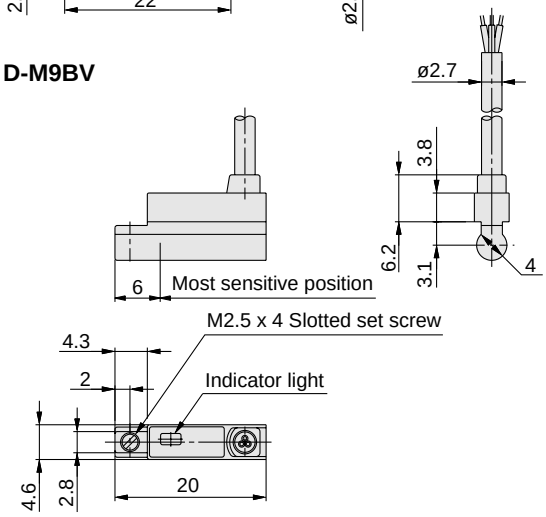


Dimensions

D-M9N, D-M9P, D-M9B



D-M9NV, D-M9PV, D-M9BV



SMC

Solid State Switches with 2-Colour Display:
Direct Mounting Type
D-M9NW(V), D-M9PW(V), D-M9BW(V)

Grommet

Specifications

D-M9□W, D-M9□WV (with indicator light)						
Auto switch part no.	D-M9NW	D-M9NWV	D-M9PW	D-M9PWV	D-M9BW	D-M9BWV
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay, PLC				24VDC relay, PLC	
Power supply voltage	5, 12, 24VDC (4.5 to 28VDC)				—	
Current consumption	10mA or less				—	
Load voltage	28VDC or less		—		24VDC (10 to 28VDC)	
Load current	40mA or less		80mA or less		5 to 40mA	
Internal voltage drop	1.5V or less (0.8V or less at 10mA load current)		0.8V or less		4V or less	
Leakage current	100μA or less at 24VDC				0.8mA or less	
Indicator light	Operating position ..... Red LED lights up Optimum operating position … Green LED lights up					

• **Lead wire** ..... Oilproof heavy duty vinyl cord: ø2.7, 0.5m
D-M9NW(V), D-M9PW(V): 0.15mm² x 3 cores (Brown, Black, Blue [Red, White, Black])
D-M9BW(V): 0.18mm² x 2 cores (Brown, Blue [Red, Black])

Note) Refer to page 12 for auto switch common specifications and lead wire lengths.

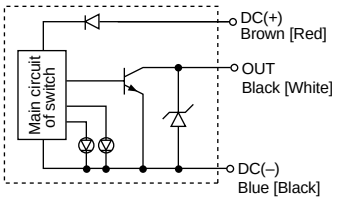
Weights

(g)

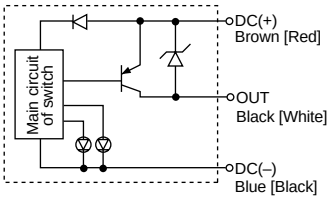
Auto switch part no.	D-M9NW	D-M9NWV	D-M9PW	D-M9PWV	D-M9BW	D-M9BWV
Lead wire length: 0.5m	7	7	7	7	7	7
Lead wire length: 3m	34	34	34	34	32	32

Internal circuits

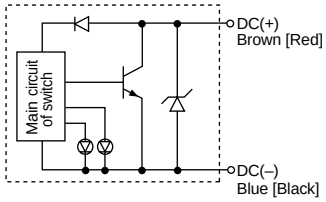
D-M9NW(V)



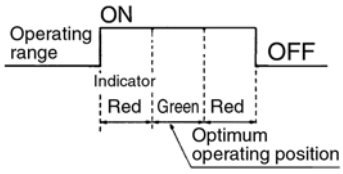
D-M9PW(V)



D-M9BW(V)

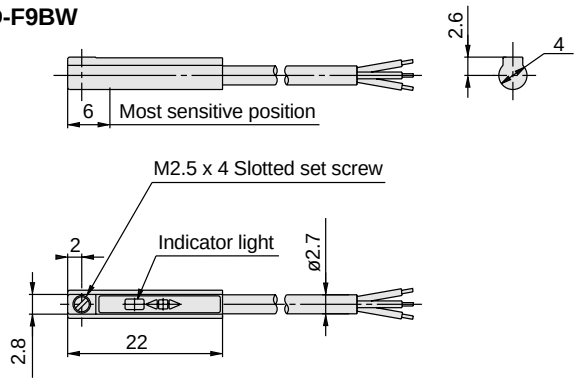


Indicator light

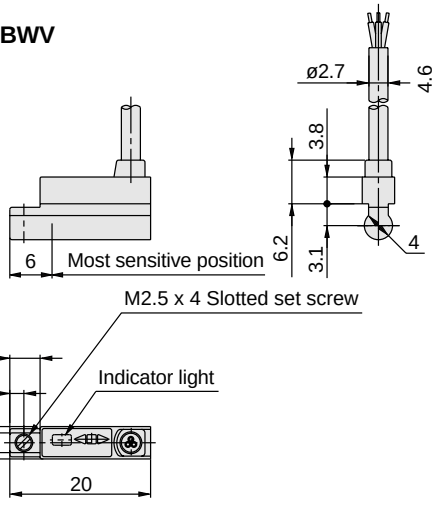


Dimensions

D-F9NW, D-F9PW, D-F9BW



D-F9NWV, D-F9PWV, D-F9BWV



Solid State Switches: Direct Mounting Type
D-Y59$^{A}_{B}$, D-Y69$^{A}_{B}$, D-Y7P(V)

Grommet

Specifications

D-Y5, D-Y6, D-Y7P, D-Y7PV (with indicator light)						
Auto switch part no.	D-Y59A	D-Y69A	D-Y7P	D-Y7PV	D-Y59B	D-Y69B
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay, PLC				24VDC relay, PLC	
Power supply voltage	5, 12, 24VDC (4.5 to 28VDC)				—	
Current consumption	10mA or less				—	
Load voltage	28VDC or less		—		24VDC (10 to 28VDC)	
Load current	40mA or less		80mA or less		5 to 40mA	
Internal voltage drop	1.5V or less (0.8V or less at 10mA load current)		0.8V or less		4V or less	
Leakage current	100μA or less at 24VDC				0.8mA or less at 24VDC	
Indicator light	Red LED lights when ON					

• **Lead wires** ... Oilproof heavy-duty flexible vinyl cord, ø3.4, 0.5m,
D-Y59A, D-Y69A, D-Y7P(V):0.15mm² x 3 cores (Brown, Black, Blue [Red, White, Black]),
D-Y59B, D-Y69(B): 0.15mm² x 2 cores (Brown, Blue [Red, Black])

Note) Refer to page 12 for solid state auto switch common specifications and lead wire lengths.

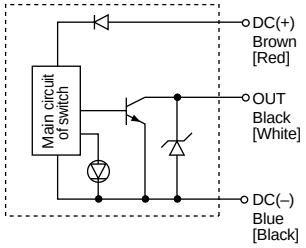
Weights

(g)

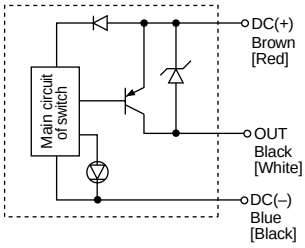
Auto switch part no.	D-Y59A, D-Y69A	D-Y59B, D-Y69B	D-Y7P, D-Y7PV
Lead wire length 0.5m	10	9	10
Lead wire length 3m	53	50	53

Internal circuits

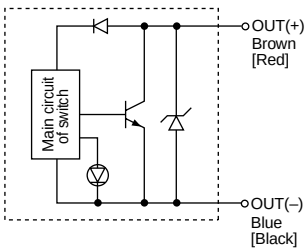
D-Y59A, D-Y69A



D-Y7P(V)

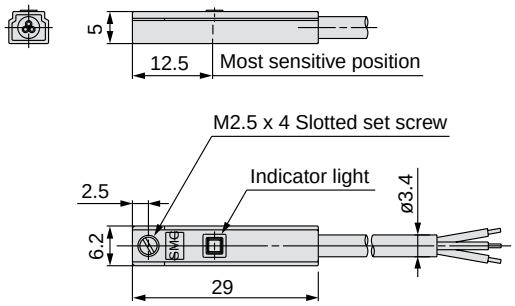


D-Y59B, D-Y69B

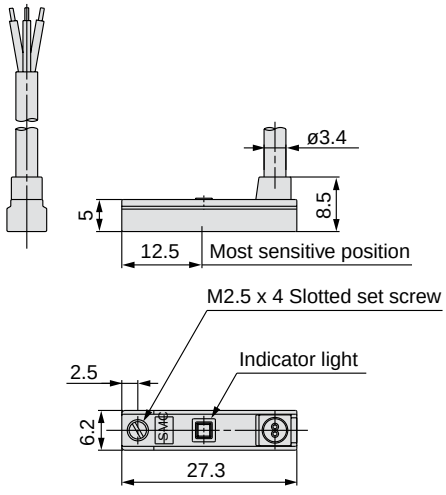


Dimensions

D-Y59A, D-Y7P, D-Y59B



D-Y69A, D-Y7PV, D-Y69B



Solid State Switches with 2-Colour Display:
Direct Mounting Type
D-Y7NW(V), D-Y7PW(V), D-Y7BW(V)

Grommet

The optimum operating position can be determined by the colour of the light.
(Red→Green←Red)

Specifications

D-Y7□W, D-Y7□WV (with indicator light)						
Auto switch part no.	D-Y7NW	D-Y7NWV	D-Y7PW	D-Y7PWV	D-Y7BW	D-Y7BWV
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay, PLC				24VDC relay, PLC	
Power supply voltage	5, 12, 24VDC (4.5 to 28VDC)				—	
Current consumption	10mA or less				—	
Load voltage	28VDC or less		—		24VDC (10 to 28VDC)	
Load current	40mA or less		80mA or less		5 to 40mA	
Internal voltage drop	1.5V or less (0.8V or less at 10mA load current)		0.8V or less		4V or less	
Leakage current	100μA or less at 24VDC				0.8mA or less at 24VDC	
Indicator light	Operating position ..... Red LED lights up Optimum operating position ..... Green LED lights up					

• **Lead wires** ... Heavy duty oil resistant flexible vinyl cord, ø3.4, 0.5m,
D-Y7NW(V), D-Y7PW(V): 0.15mm² x 3 cores (Brown, Black, Blue [Red, White, Black]),
D-Y7BW(V): 0.15mm² x 2 cores (Brown, Blue [Red, Black])

Note) Refer to page 12 for solid state switch common specifications and lead wire lengths.

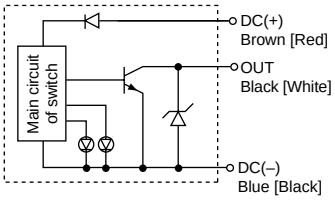
Weights

(g)

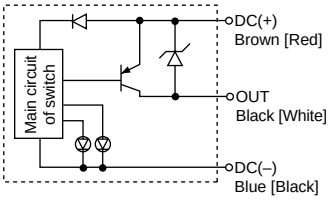
Auto switch part no.	D-Y7NW	D-Y7PW	D-Y7BW
Lead wire length: 0.5m	11	11	11
Lead wire length: 3m	54	54	54

Internal circuits

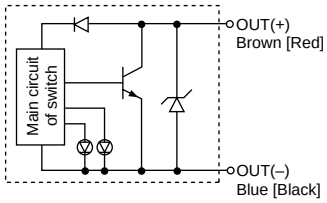
D-Y7NW(V)



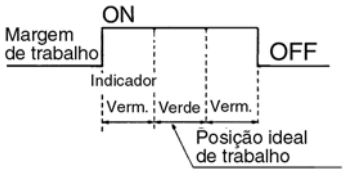
D-Y7PW(V)



D-Y7BW(V)

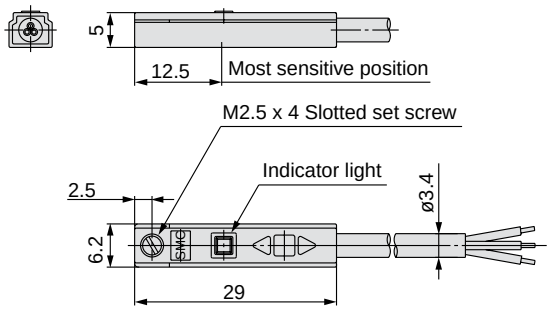


Indicator light

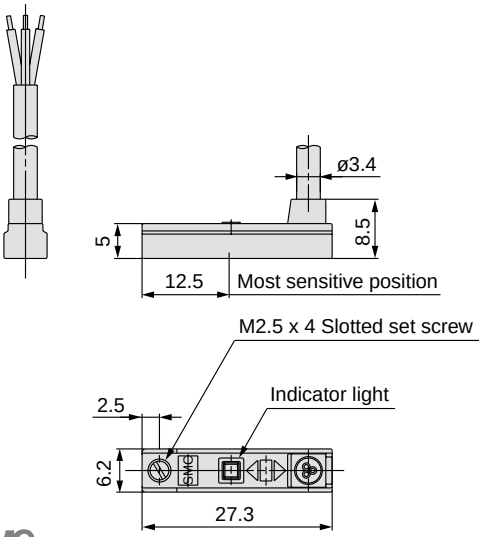


Dimensions

D-Y7□W



D-Y7□WV



Water-Resistant
Solid State Switches with 2-Colour Display
D-Y7BAL 2-Wire Type

Grommet

Improved water-resistant type (for coolant also)

Specifications

Auto switch part no.	**D-Y7BAL**
Wiring type	2-wire
Applicable load	24VDC relay, PLC
Load voltage	24VDC (10 to 28VDC)
Load current	5 to 40mA
Internal voltage drop	4V or less
Leakage current	0.8mA or less at 24VDC
Indicator light	Operating position ..... Red LED lights up Optimum operating position ..... Green LED lights up

- **Operating time** ..... 1ms or less
- **Lead wires** ..... Oilproof heavy-duty flexible vinyl cable, ø3.4, 0.15mm², 2 cores (Brown, Blue [Red, Black]), 3m
- **Impact resistance** 1000m/s²
- **Insulation resistance** ... 50MΩ or more at 500VDC (between lead wire and case)
- **Withstand voltage** ..... 1000VAC for 1 min. (between lead wire and case)
- **Ambient temperature** ... –10° to 60°C
- **Enclosure** ..... IEC529 standard IP67 (JISC0920) watertight

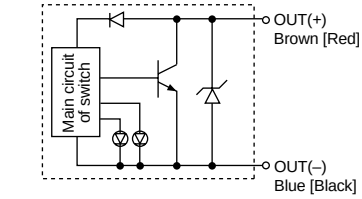
Weights

(g)

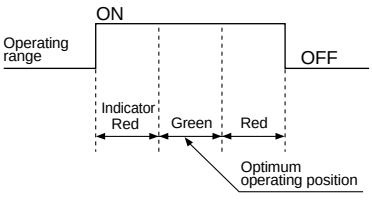
Auto switch part no.	**D-Y7BAL**
Lead wire length 3m	54

Internal circuits

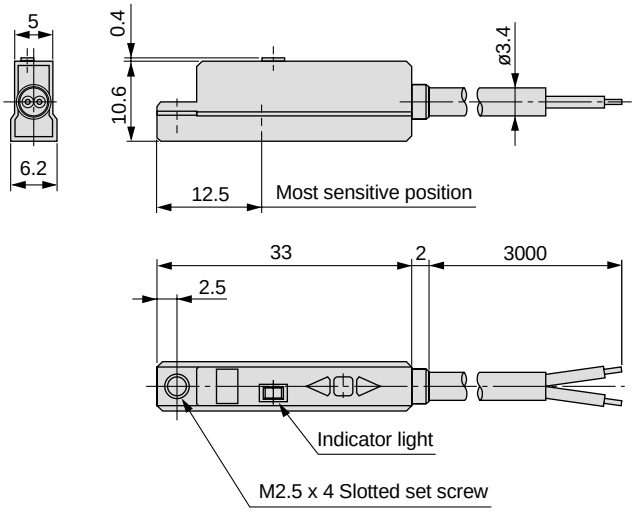
D-Y7BAL



Indicator light



Dimensions

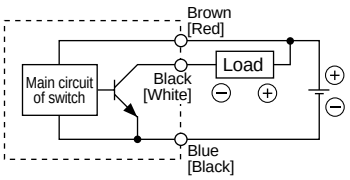


SMC

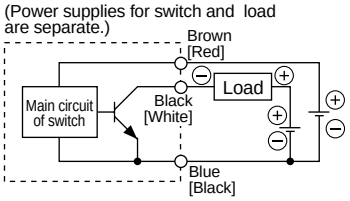
Auto Switch Connections and Examples

Basic Wiring

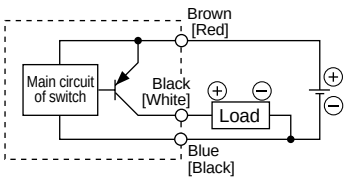
Solid state 3-wire, NPN



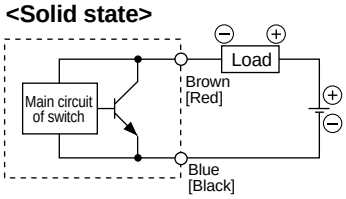
(Power supplies for switch and load are separate.)

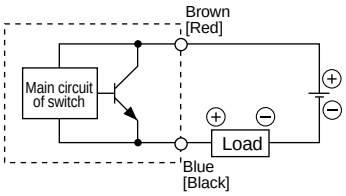


Solid state 3-wire, PNP

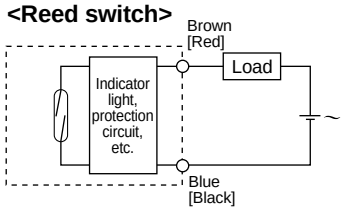


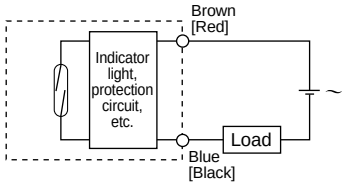
2-wire <Solid state>





2-wire <Reed switch>

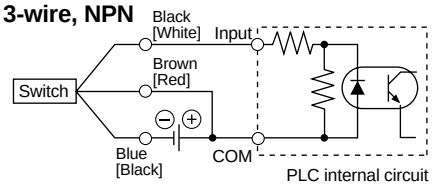




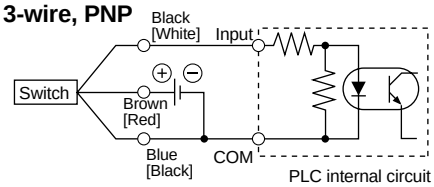
Examples of Connection to PLC

Sink input specifications

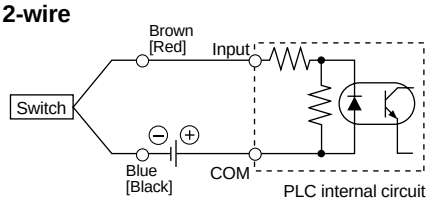
3-wire, NPN



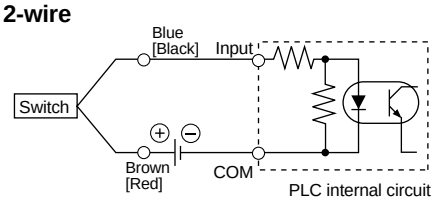
3-wire, PNP



2-wire



2-wire

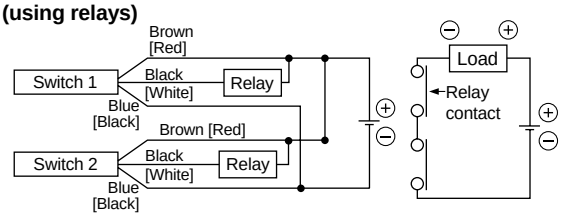


The connection method will vary depending on the applicable PLC input specifications.

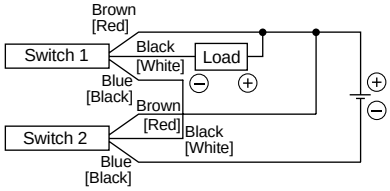
Connection Examples for AND (Series) and OR (Parallel)

3-wire

AND connection for NPN output (using relays)

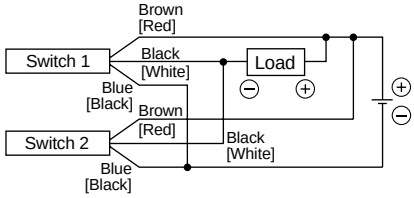


AND connection for NPN output (performed with switches only)

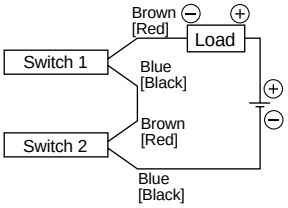


The indicator lights will light up when both switches are turned ON.

OR connection for NPN output



2-wire with 2-switch AND connection



When two 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 if both of the switches are in the ON state.

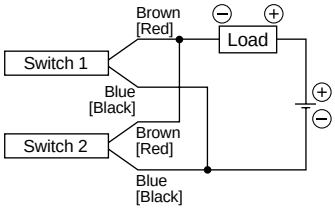
$$\text{Load voltage at ON} = \left(\text{Power supply voltage} - \text{Internal voltage drop}\right) \times 2 \text{ pcs.}$$

$$= 24\text{V} - 4\text{V} \times 2 \text{ pcs.}$$

$$= 16\text{V}$$

Example: Power supply is 24VDC.
Internal voltage drop in switch is 4V.

2-wire with 2-switch OR connection



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

<Reed switch>
Because there is no current leakage, the load voltage will not increase when turned OFF. However, depending on the number of switches in the ON state, the indicator lights may sometimes grow dim or not light up because of the dispersion and reduction of the current flowing to the switches.

$$\text{Load voltage at OFF} = \text{Leakage current} \times 2 \text{ pcs.} \times \text{Load impedance}$$

$$= 1\text{mA} \times 2 \text{ pcs.} \times 3\text{k}\Omega$$

$$= 6\text{V}$$

Example: Load impedance is 3kΩ.
Leakage current from switch is 1mA.

Series MY1□W

Made to Order Specifications

Made to Order

Contact SMC for detailed dimensions, specifications, and lead times.

1 Long stroke -XB11

Available with long strokes exceeding standard stroke range. The stroke can be set in 1mm increments.

■ **Stroke range: 2001 to 3000mm**

MY1 [M] W [Bore size] – [Stroke] – [Auto switch type] [No. of auto switches] – XB11

Series: Bore size

		10	16	20	25	32	40	50	63	80	100
M	Slide bearing guide type	●	●	●	●	●	●	●	●		
C	Cam follower guide type		●	●	●	●	●	●	●		

Example) MY1MW40G-2999L-Z73-XB11

2 Dust seal band NBR lining specification -XC67

The standard vinyl chloride lining specification is changed to NBR lining for improved oil resistance and peeling resistance.

Note) Consult with SMC for specific details on oil resistance.

MY1 [M] W [Bore size] – [Stroke] – [Auto switch type] [No. of auto switches] – XC67

Series: Bore size

		10	16	20	25	32	40	50	63	80	100
M	Slide bearing guide type	●	●	●	●	●	●	●	●		
C	Cam follower guide type		△	●	●	●	●	●	●		

Contact SMC for △ marked items.

Example) MY1MW40G-300L-Z73-XC67

For ordering dust seal band (NBR lining) only

MY [Bore size] – 16 B N [ ] – [Stroke]

Dust seal band NBR lining

Dust seal band hexagon socket head set screw thread

Nil	Black zinc chromated
W	Nickel plated

Refer to "Dust seal band" under the seal parts on the construction page of each series for details.

Example) MY25-16BNW-300

3 Holder mounting bracket ..... ①, ② -X416, X417

Holder mounting brackets are used to fix the stroke adjusting unit at an intermediate stroke position.

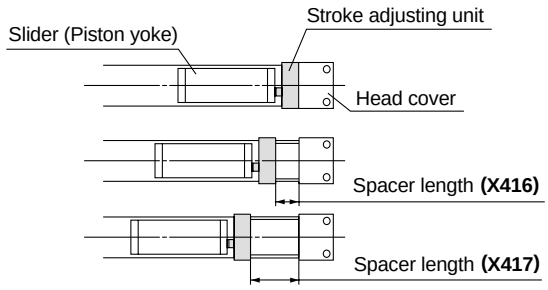
Holder mounting bracket ① ..... **-X416** Holder mounting bracket ② ..... **-X417**

Fine stroke adjustment range

(mm)

Bore size (mm)	-X416 (one side)			-X417 (one side)		
	Spacer lengths	Adjustment range		Spacer length	Adjustment range	
		MY1MW	MY1CW		MY1MW	MY1CW
16	5.6	–5.6 to –11.2		11.2	–11.2 to –16.8	
20	6	–6 to –12		12	–12 to –18	
25	11.5	–11.5 to –23		23	–23 to –34.5	
32	12	–12 to –24		24	–24 to –36	
40	16	–16 to –32		32	–32 to –48	
50	20	–20 to –40		40	–40 to –60	
63	25	–25 to –50		50	–50 to –75	

(Any fine strokes outside the parameters in the adjustment ranges above are considered to be a special order and processed accordingly.)



MY1 [M] W [Bore size] – 300 [L] – [X416] [ ]

Combination symbol
Refer to the table below for applicable symbols.

Holder mounting bracket
Refer to the table below for applicable symbols.

Stroke adjusting unit
Refer to the table below for applicable symbols.

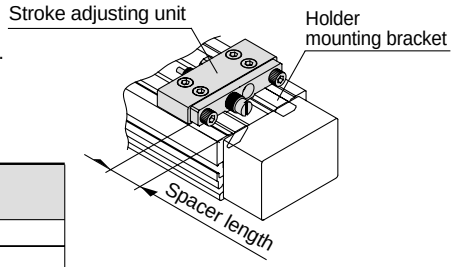
Stroke
Note) Indicates the stroke prior to mounting the stroke adjusting unit.

Series: Bore size

		10	16	20	25	32	40	50	63	80	100
M	Slide bearing guide type	●	●	●	●	●	●	●	●		
C	Cam follower guide type		●	●	●	●	●	●	●		

Holder mounting bracket illustration

MY1MW/MY1CW



Stroke adjusting unit	Holder mounting bracket	Combination Symbol	Mounting pcs. X416	Mounting pcs. X417	Combination description
A, L, AS, LS	X416	Nil	1		X416 on one side
A, L		W	2		X416 on both sides
		Z	1	1	X416 on one side, X417 on the other side
AL		A	1		X416 on A unit side
AL		L	1		X416 on L unit side
AL		AZ	1	1	X416 on A unit side, X417 on the other side
AL		LZ	1	1	X416 on L unit side, X417 on the other side
A, L, AS, LS	X417	Nil		1	X417 on one side
A, L		W		2	X417 on both sides
AL		A		1	X417 on A unit side
AL		L		1	X417 on L unit side

Note) For AS and LS, stroke adjusting unit is mounted on one side only.

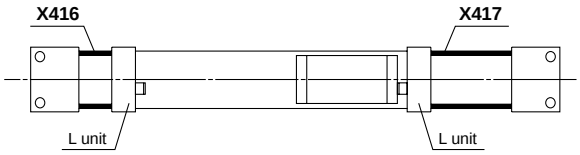
SMC

3 Holder mounting bracket (Continued) ..... ①, ② -X416, X417

Example

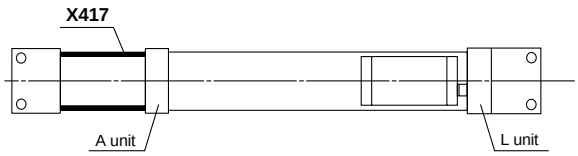
• For L units with one each of X416 and X417

MY1□W25G-300L-X416Z



• For A and L units, where X417 is mounted on the A unit side only and nothing is mounted on the L unit side.

MY1□W25G-300AH-X417A



How to order stroke adjusting unit or holder mounting bracket by itself:

MYM-A16A – X417 □

Combination symbol

Nil	Stroke adjusting unit + Holder mounting bracket
N	Holder mounting bracket only

Holder mounting bracket

X416	Holder mounting bracket ①
X417	Holder mounting bracket ②

Stroke adjusting unit model

Note) Refer to "Option" on page 3.

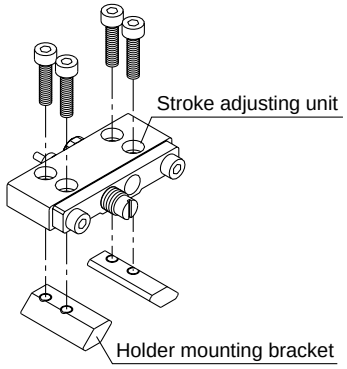
Example

• Stroke adjusting unit with holder mounting bracket

MYM-A25L-X416 (L unit for MY1□W25 and X416 bracket)

• Holder mounting bracket only

MYM-A25L-X416N (MY1□W25 and X416 bracket for L unit)



4 Copper-free specification 20-

Copper-free compatible.

Note) Not available for cylinders with side seal (MY1□WK).

20 – MY1 M W Bore size – Stroke – Auto switch type No. of auto switches

Series: Bore size

		10	16	20	25	32	40	50	63	80	100
M	Slide bearing guide type		●	●	●	●	●	●	●		
C	Cam follower guide type		●	●	●	●	●	●	●		

Series MY1□W

Model Selection 1

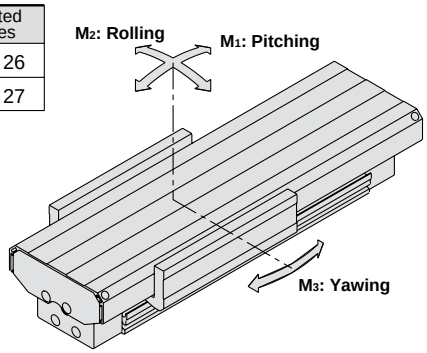
This section illustrates the standard model selection procedure to help you choose the most suitable cylinders from Series MY1MW/MY1CW for your application needs.

Standards for Tentative Model Selection

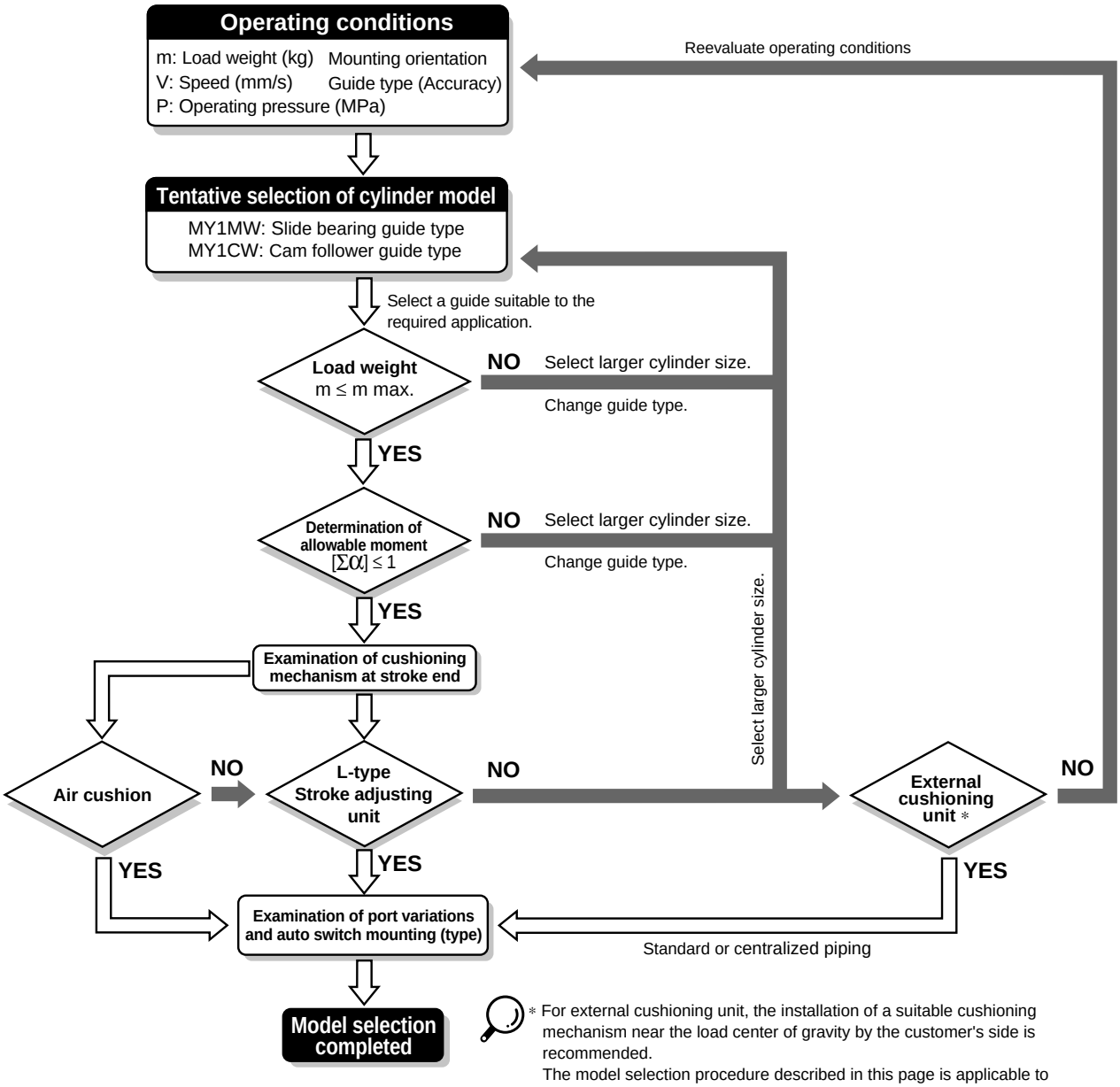
Cylinder model	Guide type	Standards for guide selection	Graphs for related allowable values
MY1MW	**Slide bearing guide**	Slide table accuracy approx. ±0.12mm Note)	Refer to page 26
MY1CW	**Cam follower guide**	Slide table accuracy approx. ±0.05mm Note)	Refer to page 27

∗ These accuracy values for each guide should be used only as a guide during selection. Contact SMC when guaranteed accuracy for MY1CW is required.

Note) "Accuracy" here means displacement of the slide table (at stroke end) when 50% of the allowable moment shown in the catalog is applied (reference value).



Selection Flow Chart

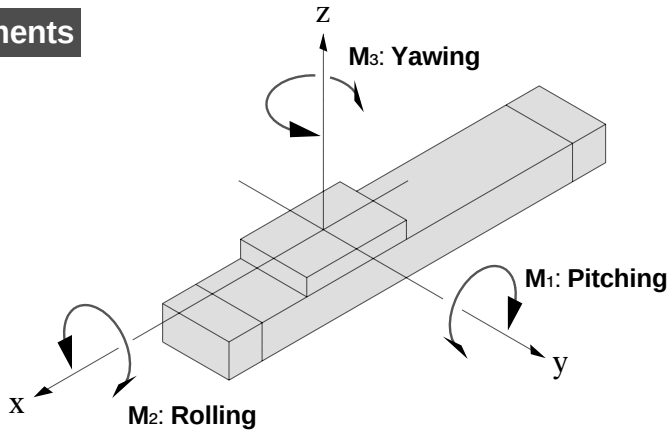


∗ For external cushioning unit, the installation of a suitable cushioning mechanism near the load center of gravity by the customer's side is recommended.
The model selection procedure described in this page is applicable to all mechanically jointed rodless cylinders.
Refer to the separate instruction manual for further details. If you have any questions, please contact SMC.

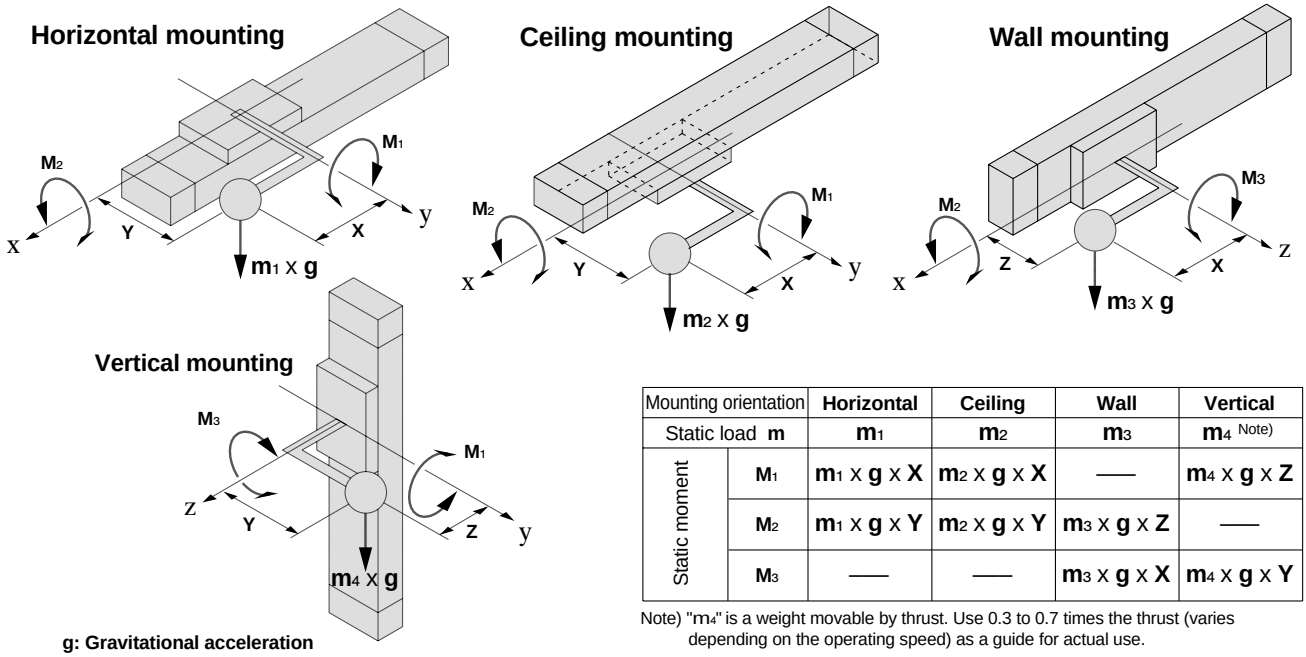
Types of Moment Applied to Rodless Cylinders

Multiple moments may be generated depending on the mounting orientation, load, and position of the center of gravity.

Coordinates and moments



Static moment

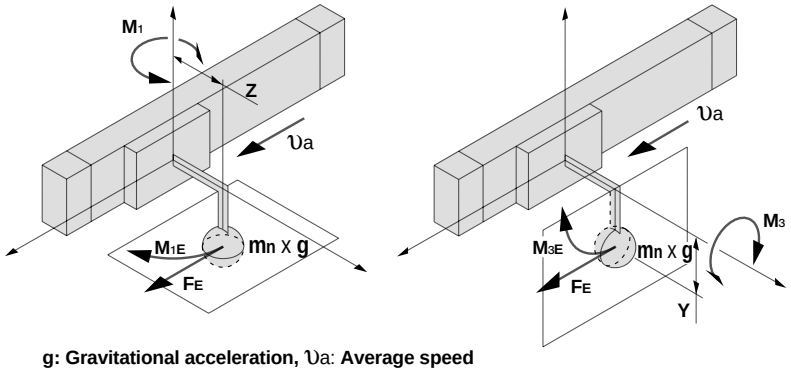


Mounting orientation		Horizontal	Ceiling	Wall	Vertical
Static load **m**		m_1	m_2	m_3	m_4 Note)
Static moment	M_1	$m_1 \times g \times X$	$m_2 \times g \times X$	—	$m_4 \times g \times Z$
	M_2	$m_1 \times g \times Y$	$m_2 \times g \times Y$	$m_3 \times g \times Z$	—
	M_3	—	—	$m_3 \times g \times X$	$m_4 \times g \times Y$

Note) "m_4" is a weight movable by thrust. Use 0.3 to 0.7 times the thrust (varies depending on the operating speed) as a guide for actual use.

g: Gravitational acceleration

Dynamic moment



Mounting orientation		Horizontal	Ceiling	Wall	Vertical
Dynamic load F_E		$\frac{1.4}{100} \times \upsilon a \times m_n \times g$			
Dynamic moment	M_{1E}	$\frac{1}{3} \times F_E \times Z$			
	M_{2E}	**Dynamic moment M_{2E} is not generated.**			
	M_{3E}	$\frac{1}{3} \times F_E \times Y$			

Note) Regardless of the mounting orientation, dynamic moment is calculated using the formulas above.

g: Gravitational acceleration, υa: Average speed

Maximum Allowable Moment/Maximum Load Weight

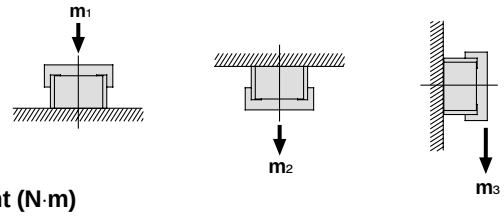
Model	Bore size (mm)	Maximum allowable moment (N·m)			Maximum load weight (kg)		
		M_1	M_2	M_3	m_1	m_2	m_3
MY1MW	**16**	6.0	3.0	1.0	18	7	2.1
	20	10	5.2	1.7	26	10.4	3
	25	15	9.0	2.4	38	15	4.5
	32	30	15	5.0	57	23	6.6
	40	59	24	8.0	84	33	10
	50	115	38	15	120	48	14
	63	140	60	19	180	72	21
MY1CW	**16**	6.0	3.0	2.0	18	7	2.1
	20	10	5.0	3.0	25	10	3
	25	15	8.5	5.0	35	14	4.2
	32	30	14	10	49	21	6
	40	60	23	20	68	30	8.2
	50	115	35	35	93	42	11.5
	63	150	50	50	130	60	16

The above values are the maximum allowable values for moment and load. Refer to each graph on pages 26 and 27 regarding the maximum allowable moment and maximum load weight for a particular piston speed.

Maximum allowable moment

Select the moment from within the range of operating limits shown in the graphs. Note that the maximum load weight value may sometimes exceed even the operating limits shown in the graphs. Therefore, check the allowable load for the selected conditions.

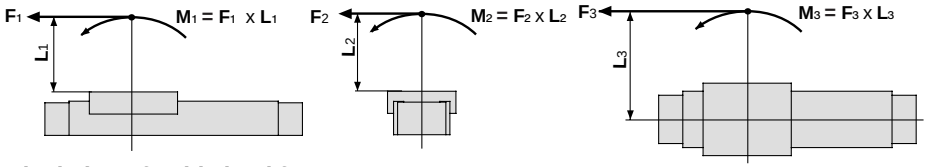
Load weight (kg)



⚠Caution

- The cylinder should be mounted in m_1 orientation if maximum dustproofing is required.

Moment (N·m)



Maximum load weight

Select the load weight from within the range of limits shown in the graphs. Note that the maximum allowable moment value may sometimes exceed even the operating limits shown in the graphs. Therefore, also check the allowable moment for the selected conditions.

<Calculation of guide load factor>

1. Three factors must be considered when computing calculations for selection:
   a) Maximum load weight
   b) Static moment
   c) Dynamic moment (at the time of impact with stopper)

To evaluate, use υa (average speed) for **a** and **b**, and υ (impact speed $\upsilon = 1.4\upsilon a$) for **c**.
Calculate m max for (1) from the maximum allowable load graph (m_1, m_2, and m_3), and Mmax for (2) and (3) from the maximum allowable moment graph (M_1, M_2, and M_3).

Total sum of guide load factors

$$\Sigma\alpha = \frac{\text{Load mass [m]}}{\text{Maximum allowable load [m max]}} + \frac{\text{Static moment [M]}^{\text{Note 1)}}}{\text{Allowable static moment [Mmax]}} + \frac{\text{Dynamic moment [M}_E\text{]}^{\text{Note 2)}}}{\text{Allowable dynamic moment [M}_E\text{max]}} \leq 1$$

Note 1) Moment caused by the load with a cylinder in resting condition.

Note 2) Moment caused by the load equivalent to impact at the stroke end (at the time of impact with stopper).

Note 3) Depending on the shape of the work piece, multiple moments may be generated. In such cases, the total sum of the load factors ($\Sigma\alpha$) is the total of all such moments.

2. Reference formulas [Dynamic moment at impact]
   Use the following formulas to calculate dynamic moment when taking stopper impact into consideration.

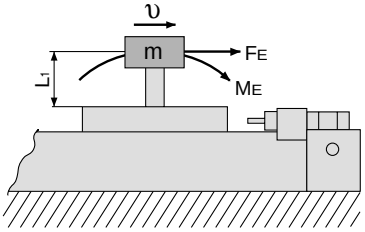
m : Load mass (kg)	υ : Impact speed (mm/s)
F : Load (N)	L_1 : Distance to the load center of gravity (m)
F_E : Load equivalent to impact (impact with stopper)	M_E: Dynamic moment (N·m)
υa : Average speed (mm/s)	g : Gravitational acceleration (9.8m/s²)
M : Static moment (N·m)	

$$\upsilon = 1.4\upsilon a \text{ (mm/s)} \qquad F_E = \frac{1.4}{100}\upsilon a \cdot g \cdot m \quad \text{Note 4)}$$

$$\therefore M_E = \frac{1}{3} \cdot F_E \cdot L_1 = 0.05\upsilon a\, m\, L_1 \text{ (N·m)} \quad \text{Note 5)}$$

Note 4) $\frac{1.4}{100}\upsilon a$ is a dimensionless coefficient for calculating impact force.

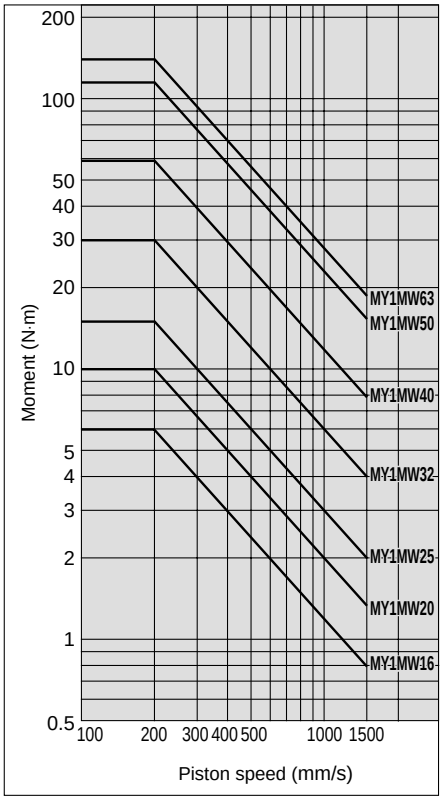
Note 5) Average load coefficient ($= \frac{1}{3}$):
This coefficient is for averaging the maximum load moment at the time of stopper impact in order to calculate the cylinder's service life.



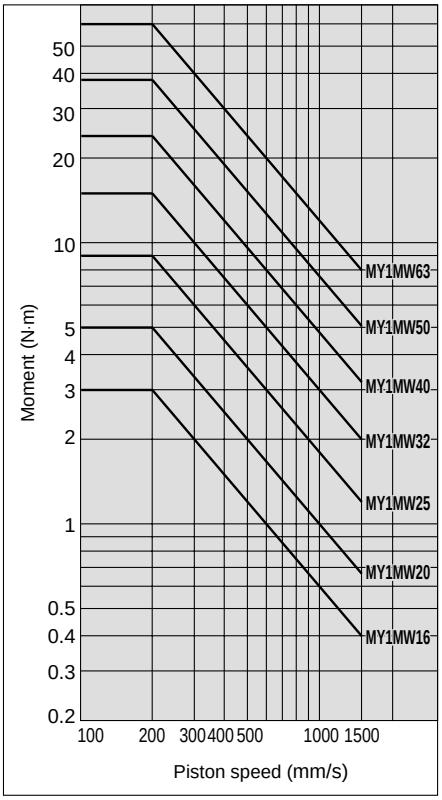
3. Refer to pages 30 and 31 for detailed selection procedures.

Maximum Allowable Moment: MY1MW

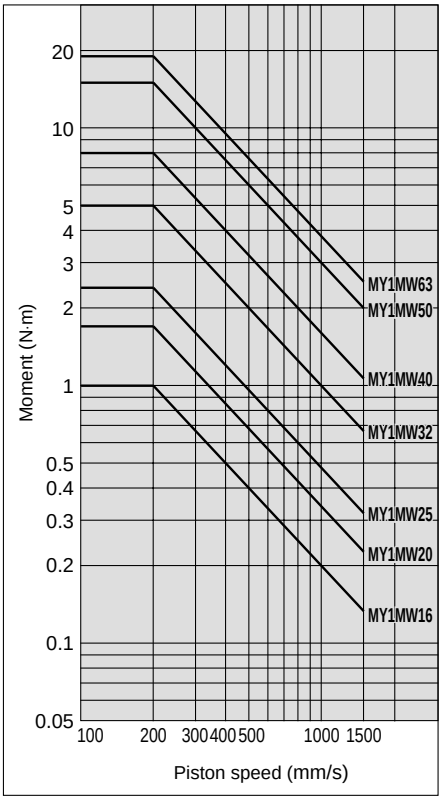
MY1MW: M_1



MY1MW: M_2

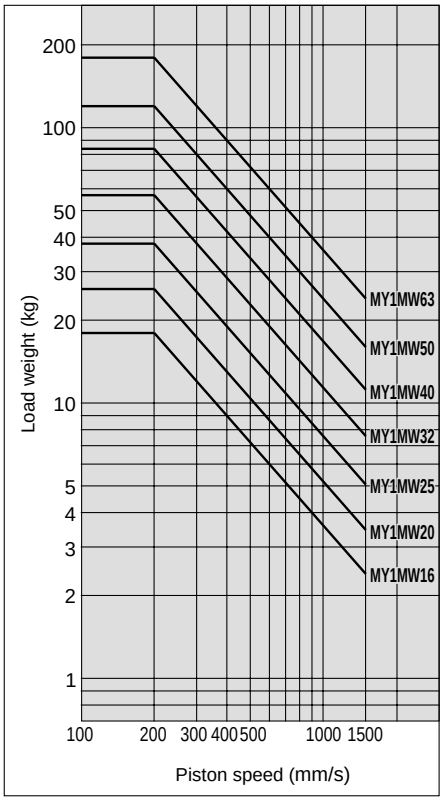


MY1MW: M_3

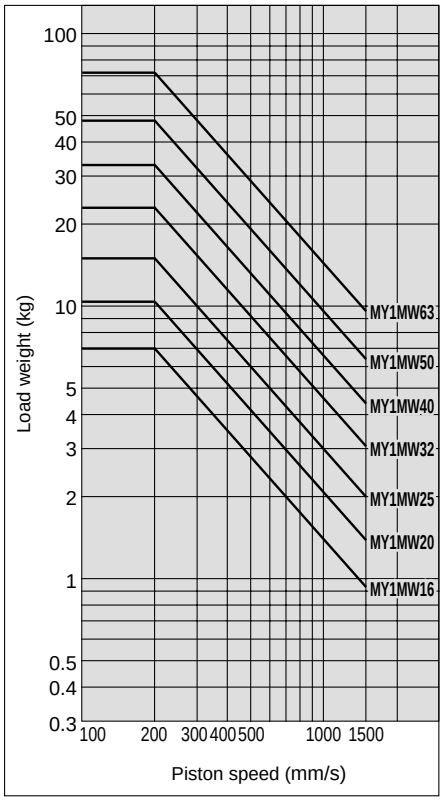


Maximum Load Weight: MY1MW

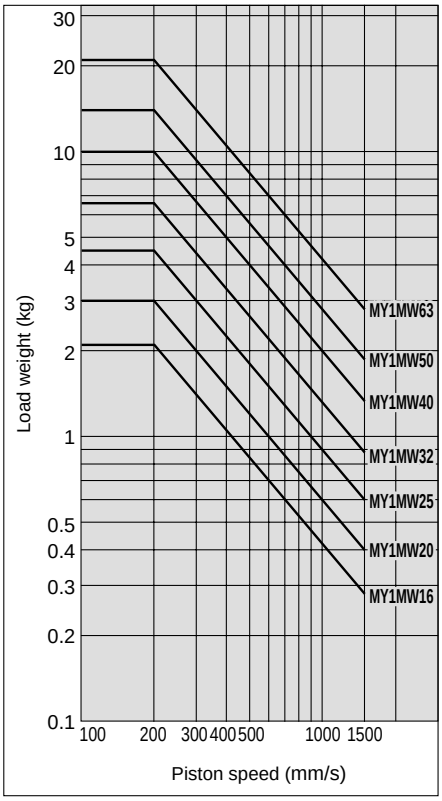
MY1MW: m_1



MY1MW: m_2



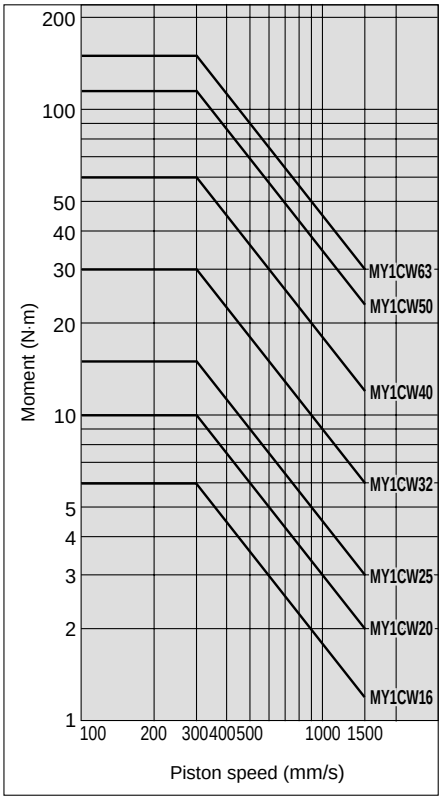
MY1MW: m_3



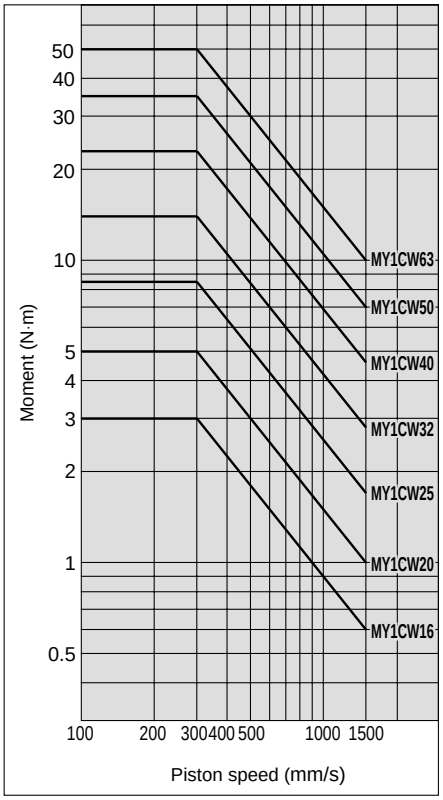
Maximum Allowable Moment/Maximum Load Weight

Maximum Allowable Moment: MY1CW

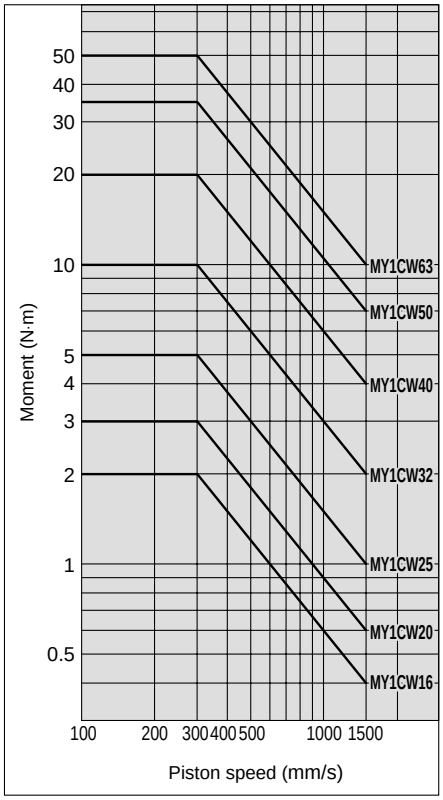
MY1CW: M_1



MY1CW: M_2

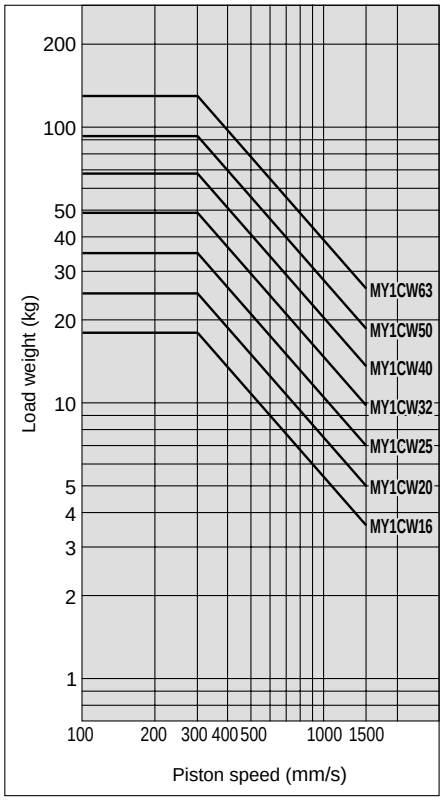


MY1CW: M_3

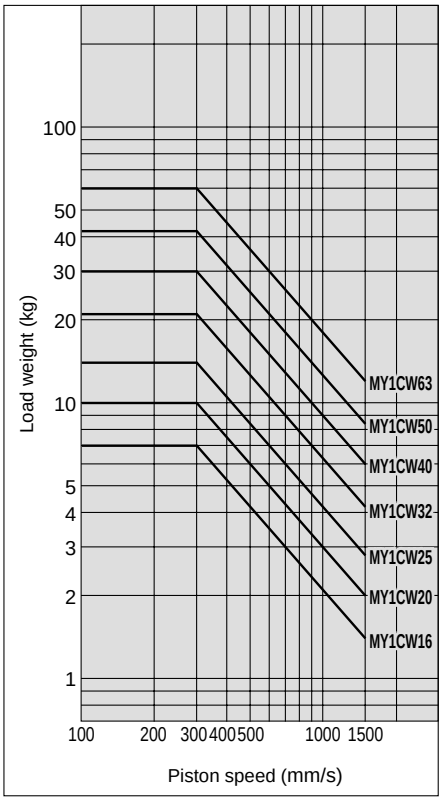


Maximum Load Weight: MY1CW

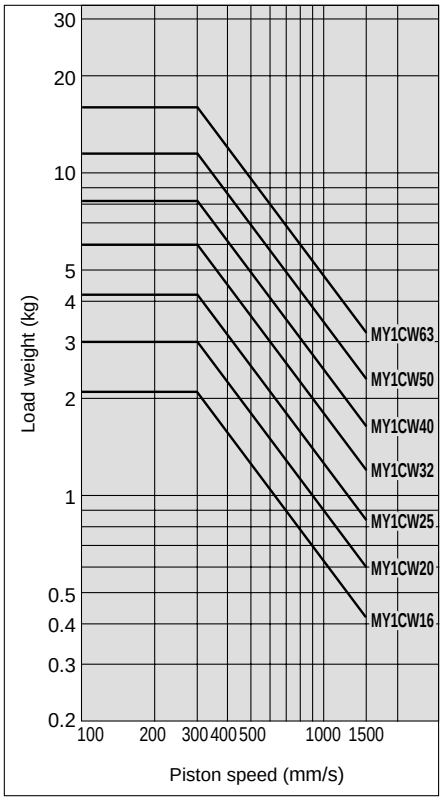
MY1CW: m_1



MY1CW: m_2



MY1CW: m_3



Cushion Capacity

Cushion selection

<Air cushion>
Air cushions are a standard feature for mechanically jointed rodless cylinders.
The air cushion mechanism is incorporated to prevent excessive impact of the piston at the stroke end during high speed operation. The purpose of air cushion, thus, is not to decelerate the piston near the stroke end.
The ranges of load and speed that air cushions can absorb are within the air cushion limit lines shown in the graphs.

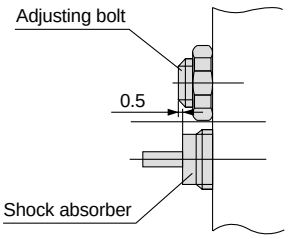
<Stroke adjusting unit with shock absorber>
Use this unit when operating with a load or speed exceeding the air cushion limit line, or when cushioning is required outside of the effective air cushion stroke range due to stroke adjustment.

L unit
Use this unit when the cylinder stroke is outside of the effective air cushion range even if the load and speed are within the air cushion limit line, or when the cylinder is operated in a load and speed range above the air cushion limit line or below the L-unit limit line.

⚠Caution

1. Perform stroke adjustment using the adjusting bolt as shown in the picture below.

When the effective stroke of the shock absorber decreases due to stroke adjustment, the absorption capacity decreases dramatically. Adjust the adjusting bolt so that it is secure at a position where it protrudes approximately 0.5mm beyond the shock absorber.



2. Do not use a shock absorber and air cushion together.

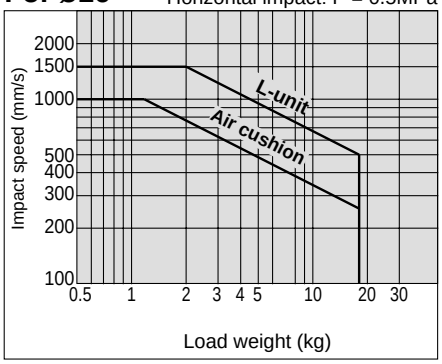
Air cushion stroke

Unit: mm

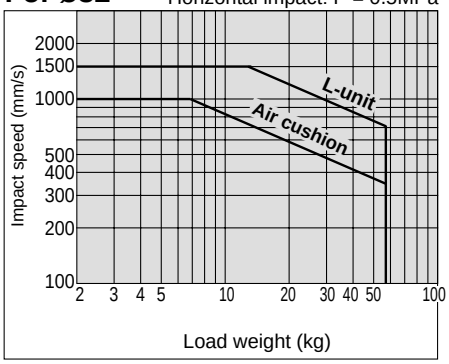
Bore size (mm)	Cushion stroke
16	12
20	15
25	15
32	19
40	24
50	30
63	37

Absorption capacity of air cushion and stroke adjusting units

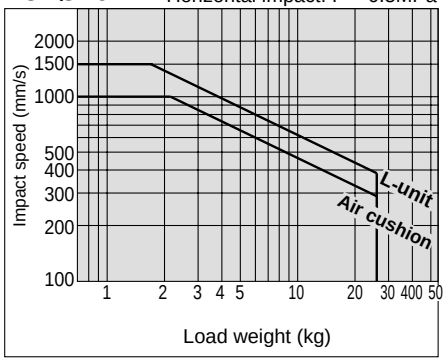
For ø16 Horizontal impact: P = 0.5MPa



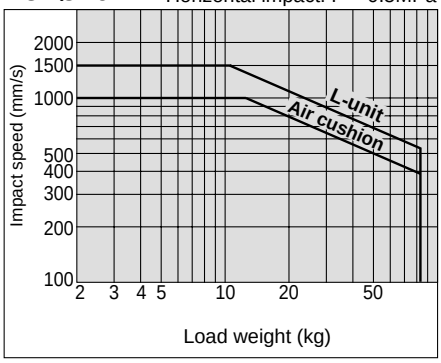
For ø32 Horizontal impact: P = 0.5MPa



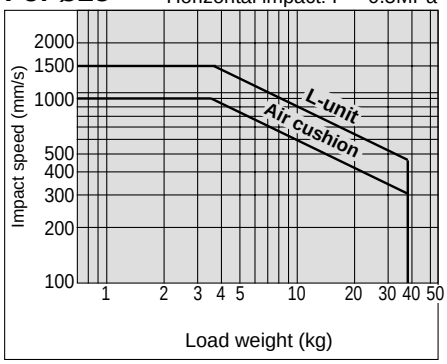
For ø20 Horizontal impact: P = 0.5MPa



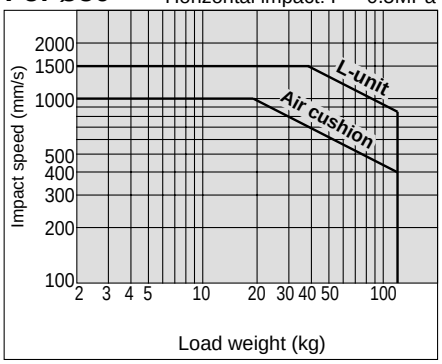
For ø40 Horizontal impact: P = 0.5MPa



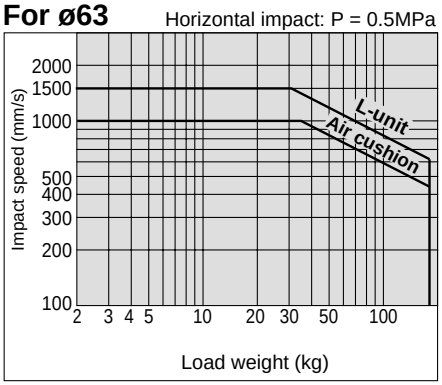
For ø25 Horizontal impact: P = 0.5MPa



For ø50 Horizontal impact: P = 0.5MPa



For ø63 Horizontal impact: P = 0.5MPa



Cushion Capacity

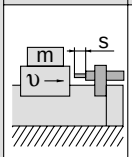
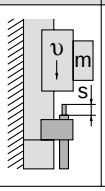
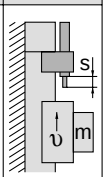
Tightening torque for stroke adjusting unit holding bolts (N·m)

Bore size (mm)	Unit	Tightening torque
16	A	0.6
	L	
20	A	1.5
	L	
25	A	3.0
	L	
32	A	5.0
	L	
40	A	12
	L	
50	A	12
	L	
63	A	24
	L	

Tightening torque for stroke adjusting unit lock plate holding bolts (N·m)

Bore size (mm)	Unit	Tightening torque
25	L	1.2
32	L	3.3
40	L	3.3

Calculation of absorbed energy for stroke adjusting unit with shock absorber (N·m)

	Horizontal	Vertical (downward)	Vertical (upward)
Type of impact			
Kinetic energy E_1	$\frac{1}{2}m\cdot\upsilon^2$		
Thrust energy E_2	F·s	F·s + m·g·s	F·s – m·g·s
Absorbed energy E	$E_1 + E_2$		

Symbols

υ: Speed of impacting object (m/s)

m: Weight of impacting object (kg)

F: Cylinder thrust (N)

g: Gravitational acceleration (9.8m/s²)

s: Shock absorber stroke (m)

Note) The speed of the impacting object is measured at the moment of impact with the shock absorber.

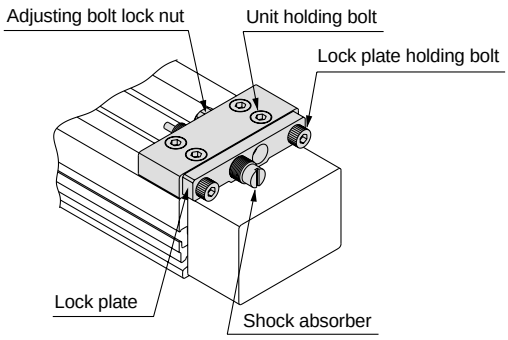
⚠ Specific Product Precautions

Be sure to read before handling.
Refer to pages 32 through 38 for Safety Instructions and Auto Switch Precautions.

⚠ Caution

Take precautions to avoid getting your hands caught in the unit during adjustment.

When using a product with stroke adjusting unit, the space between the slide table (slider) and the stroke adjusting unit is very narrow. Care should be taken to avoid the danger of hands getting caught in this small space.



<Fastening of unit>

The unit can be secured by evenly tightening the four unit holding bolts.

⚠ Caution

Do not operate with the stroke adjusting unit fixed in an intermediate position.

When the stroke adjusting unit is fixed in an intermediate position, slippage can occur depending on the amount of energy released at the moment of an impact. In such cases, the use of adjusting bolt mounting brackets, available per Made to Order specifications – X 416 and – X 417, is recommended.

Consult with SMC for other lengths. (Refer to "Tightening torque for stroke adjusting unit holding bolts" values in the chart at the upper left corner of this page.)

<Stroke adjustment with adjusting bolt>

Loosen the adjusting bolt lock nut, and adjust the stroke from the lock plate side using a hexagon wrench. Retighten the lock nut.

<Stroke adjustment with shock absorber>

Loosen the two lock plate holding bolts and adjust the stroke by turning the shock absorber. Then, evenly tighten the lock plate holding bolts to secure the shock absorber.

Avoid excessive tightening of the holding bolts (except for ø16, ø20, ø50, and ø63). (Refer to "Tightening torque for stroke adjusting unit lock plate holding bolts" above left.)

Note) Although the lock plate may slightly bend due to tightening of the lock plate holding bolt, this does not a affect the shock absorber and locking function.

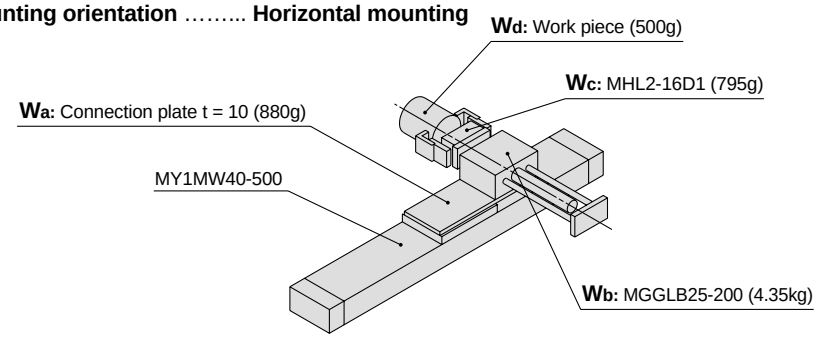
Model Selection 2

This section illustrates the standard model selection procedure using the actual operating conditions as one of the examples.

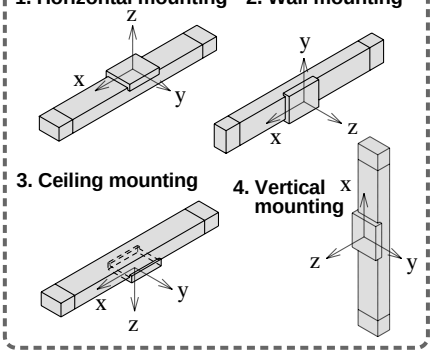
Calculation of Guide Load Factor

1 Operating conditions

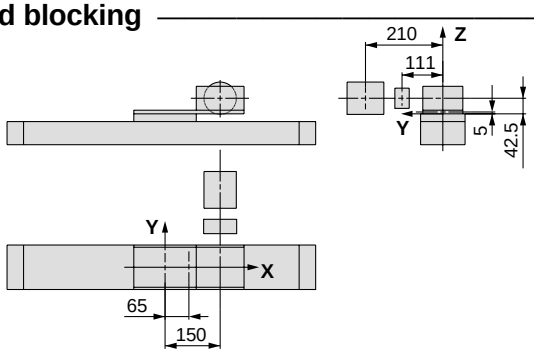
Cylinder …… **MY1MW40-500**
Average operating speed υ**a** …. **200mm/s**
Mounting orientation …….. **Horizontal mounting**



Mounting orientation



2 Load blocking



Weight and centre of gravity for each work piece

Work piece no.	Mass mn	Center of gravity		
		X-axis Xn	Y-axis Yn	Z-axis Zn
Wa	0.88kg	65mm	0mm	5mm
Wb	4.35kg	150mm	0mm	42.5mm
Wc	0.795kg	150mm	111mm	42.5mm
Wd	0.5kg	150mm	210mm	42.5mm

n = a, b, c, d

3 Composite center of gravity calculation

$m_1 = \Sigma m_n$
$= 0.88 + 4.35 + 0.795 + 0.5 =$ **6.525kg**

$X = \frac{1}{m_1} \times \Sigma (m_n \times X_n)$
$= \frac{1}{6.525} (0.88 \times 65 + 4.35 \times 150 + 0.795 \times 150 + 0.5 \times 150) =$ **138.5mm**

$Y = \frac{1}{m_1} \times \Sigma (m_n \times Y_n)$
$= \frac{1}{6.525} (0.88 \times 0 + 4.35 \times 0 + 0.795 \times 111 + 0.5 \times 210) =$ **29.6mm**

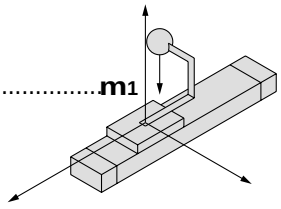
$Z = \frac{1}{m_1} \times \Sigma (m_n \times Z_n)$
$= \frac{1}{6.525} (0.88 \times 5 + 4.35 \times 42.5 + 0.795 \times 42.5 + 0.5 \times 42.5) =$ **37.4mm**

4 Calculation of load factor for static load

m_1: Weight

m_1 max (from ① of graph MY1MW: m_1 on page 31) = 84 (kg) ..... **m_1**

Load factor $\alpha_1 = m_1/m_1$ max = 6.525/84 = **0.08**

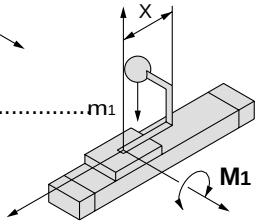


M_1: Moment

M_1 max (from ② of graph MY1MW: M_1 on page 31) = 59 (N·m) ..... m_1

$M_1 = m_1 \times g \times X = 6.525 \times 9.8 \times 138.5 \times 10^{-3} = 8.86$ (N·m)

Load factor $\alpha_2 = M_1/M_1$ max = 8.86/59 = **0.15**



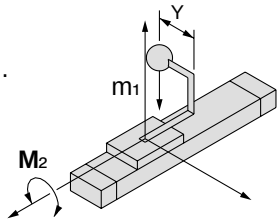
Calculation of Guide Load Factor

M_2: Moment

M_2 max (from ③ of graph MY1MW: M_2) = 24 (N·m) ……

$M_3 = m_1 \times g \times Y = 6.525 \times 9.8 \times 29.6 \times 10^{-3} = 1.89$ (N·m)

Load factor $\alpha_3 = M_2/M_2$ max = 1.89/24 = **0.08**



5 Calculation of load factor for dynamic moment

Equivalent load F_E at impact

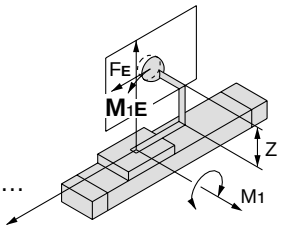
$$F_E = \frac{1.4}{100} \times \upsilon a \times g \times m = \frac{1.4}{100} \times 200 \times 9.8 \times 6.525 = 179.1 \text{ (N)}$$

M_{1E}: Moment

M_{1E} max (from ④ of graph MY1MW: M_1 where 1.4υa = 280mm/s) = 42.1 (N·m) ……

$$M_{1E} = \frac{1}{3} \times F_E \times Z = \frac{1}{3} \times 179.1 \times 37.4 \times 10^{-3} = 2.23 \text{ (N·m)}$$

Load factor $\alpha_4 = M_{1E}/M_{1E}$ max = 2.23/42.1 = **0.05**

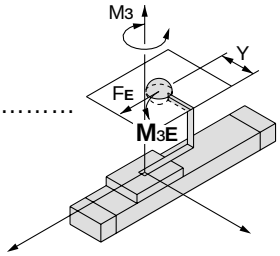


M_{3E}: Moment

M_{3E} max (from ⑤ of graph MY1MW: M_3 where 1.4υa = 280mm/s) = 5.7 (N·m) ……

$$M_{3E} = \frac{1}{3} \times F_E \times Y = \frac{1}{3} \times 179.1 \times 29.6 \times 10^{-3} = 1.77 \text{ (N·m)}$$

Load factor $\alpha_5 = M_{3E}/M_{3E}$ max = 1.77/5.7 = **0.31**



6 Sum and examination of guide load factors

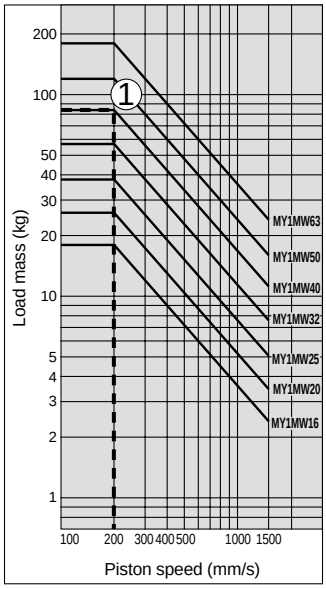
$\Sigma\alpha = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 = \mathbf{0.67} \leq \mathbf{1}$

The above calculation is within the allowable value, and therefore the selected model can be used.
Select a shock absorber separately.
In an actual calculation, when the total sum of guide load factors $\Sigma\alpha$ in the formula above is more than 1, consider either decreasing the speed, increasing the bore size, or changing the product series. This calculation can be easily made using the "SMC Pneumatics CAD System".

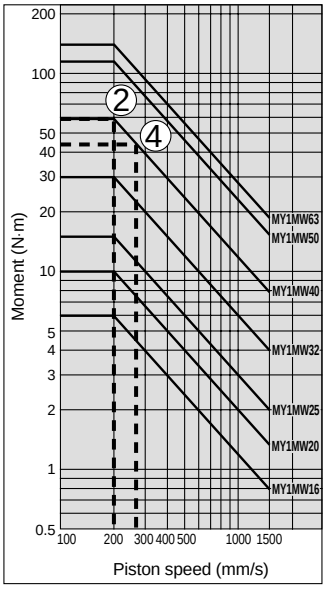
Load weight

Allowable moment

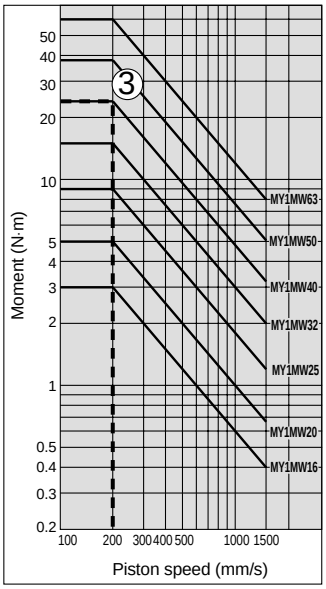
MY1MW: m_1



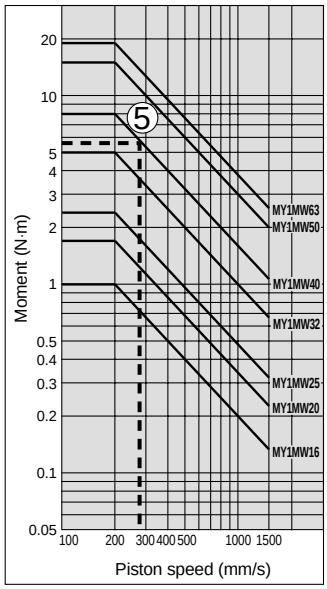
MY1MW: M_1



MY1MW: M_2



MY1MW: M_3



Series MY1□W

Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by a label of **"Caution"**, **"Warning"**, or **"Danger"**. To ensure safety, be sure to observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

⚠ Caution : Operator error could result in injury or equipment damage.

⚠ Warning : Operator error could result in serious injury or loss of life.

⚠ Danger : In extreme conditions, there is a possible result of serious injury or loss of life.

Note 1) ISO 4414: Pneumatic fluid power − Recommendations for the application of equipment to transmission and control systems

Note 2) JIS B 8370: General Rules for Pneumatic Equipment

⚠Warning

1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.

Since the products specified here are used in various operating conditions, their compatibility with the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements.

2. Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if handled incorrectly. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.

1. Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc. (Bleed air into the system gradually to create back pressure.)

4. Contact SMC if the product is to be used in any of the following conditions:

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.

Series MY1□W
Actuator Precautions 1

Be sure to read before handling.

Design

⚠Warning

1. There is a danger of sudden or erratic action by cylinders if sliding parts of machinery are twisted and changes in forces occur.

In such cases, bodily injury may occur, e.g., by catching hands or feet in the machinery, or damage to the machinery itself may occur. Therefore, the machinery should be adjusted to operate smoothly and designed to prevent such dangers.

2. Securely tighten all stationary parts and connected parts so that they will not become loose.

Especially when a cylinder operates with high frequency or is installed where there is a lot of vibration, ensure that all parts remain secure.

3. A deceleration circuit or shock absorber may be required.

When a driven object is operated at high speed or the load is heavy, a cylinder's cushion will not be sufficient to absorb impact. Install a deceleration circuit to reduce the speed before cushioning, or install an external shock absorber to relieve impact. In this case, the rigidity of the machinery should also be examined.

4. Take into account a possible drop in operating pressure due to a power outage.

When a cylinder is used as a clamping mechanism, there is a danger of work pieces dropping if there is a decrease in clamping force due to a drop in circuit pressure caused by a power outage. Therefore, safety equipment should be installed to prevent damage to machinery and bodily injury. Suspension mechanisms and lifting devices also require drop prevention measures.

5. Take into account a possible loss of power source.

Measures should be taken to protect against bodily injury and equipment damage in the event that there is a loss of power to equipment controlled by air pressure, electricity, or hydraulics.

6. Design circuitry to prevent sudden lurching of driven objects.

Take special care when a cylinder is operated by an exhaust centre type directional control valve or when it is starting up after residual pressure is exhausted from the circuit. The piston and its driven object will lurch at high speed if pressure is applied to one side of the cylinder because of the absence of air pressure inside the cylinder. Therefore, equipment should be selected and circuits designed to prevent sudden lurching because when this occurs, there is a danger of bodily injury, particularly to limbs, and/or damage to equipment.

7. Take into account emergency stops.

Design the system so that bodily injury and/or damage to machinery and equipment will not occur when machinery is stopped by a manual emergency stop or a safety device triggered by abnormal conditions.

8. Consider a system's action when operation is restarted after an emergency stop or an abnormal stop.

Design machinery so that bodily injury or equipment damage will not occur upon restart of operation.

When the cylinder has to be reset at the starting position, install safe manual control equipment.

Selection

⚠Warning

1. Confirm the specifications.

The products featured in this catalog are designed for use in industrial compressed air systems. If the products are used in conditions where pressure and/or temperature are outside the range of specifications, damage and/or malfunction, may occur. Do not use in these conditions. (Refer to specifications.)

Consult with SMC if fluid other than compressed air is to be used.

2. Intermediate stops

When intermediate stopping of a cylinder piston is performed with a 3-position closed centre type directional control valve, it is difficult to achieve stopping positions as accurately and precisely as with hydraulic pressure due to the compressibility of air.

Furthermore, since valves and cylinders are not guaranteed for zero air leakage, it may not be possible to hold a stopped position for an extended period of time. Contact SMC if it is necessary to hold a stopped position for an extended period.

⚠Caution

1. Operate within the limits of the maximum usable stroke.

Refer to the cylinder model selection procedure for the maximum usable stroke.

2. Operate the piston in such a way that collision damage will not occur at the stroke end.

Operate within such a range that will prevent damage from occurring when a piston, having inertial force, stops by striking the cover at the stroke end. Refer to the cylinder model selection procedure for the maximum usable stroke.

3. Use a speed controller to adjust the cylinder drive speed, gradually increasing from a low speed to the desired speed setting.

4. Provide intermediate supports for long stroke cylinders.

Provide intermediate supports for cylinders with long strokes to prevent the rod from sagging due to deflection of the tube, vibration, and external loads.

Series MY1□W
Actuator Precautions 2

Be sure to read before handling.

Handling

⚠Caution

1. Do not inadvertently move the guide adjusting unit.

The guide is preadjusted at the factory so that readjustment is not required under normal operating conditions. Do not inadvertently move the the guide adjusting unit and change the setting.

2. Avoid operation that causes negative pressure inside the cylinder.

Take precautions under operating conditions in which negative pressure is created inside the cylinder by external forces or inertial forces. Air leakage may occur due to separation of the seal belt.

3. Take precautions to avoid getting your hands caught in the unit.

When using a cylinder with stroke adjusting unit, the space between the slide table and the stroke adjusting unit is very narrow. Care should be taken to avoid the danger of hands getting caught in this small space.

4. Do not operate while the stroke adjusting unit is fixed in an intermediate position.

When the stroke adjusting unit is fixed in an intermediate position, slippage can occur depending on the amount of energy released at the time of an impact. In such cases, the use of the adjusting bolt mounting brackets, available per Made to Order specifications – X 416 and – X 417, is recommended.

Consult with SMC for other lengths.

Mounting

⚠Caution

1. Do not apply strong impacts or excessive moment to the slide table (slider).

Since the slide table (slider) is supported by either precision bearings (MY1CW) or resin bearings (MY1MW), do not apply strong impacts or excessive moment when mounting work pieces.

2. Align carefully when connecting to a load having an external guide mechanism.

A mechanically jointed rodless cylinder can be used with a direct load within the allowable range for each guide type, however, careful alignment is required when connecting to a load having an external guide mechanism.

As the stroke becomes longer, decentering of the axis center becomes larger. Before operation, consider a proper connecting method (such as floating mechanism) to absorb decentering.

3. Do not scratch or gouge the cylinder tube by striking or grasping it with other objects.

Cylinder shape is manufactured to precise tolerances, so that even a slight deformation can cause faulty operation.

4. Do not use until you can verify that equipment can operate properly.

Following mounting, repair, or conversions, verify correct mounting by conducting suitable function and leakage tests after piping and power connections have been made.

5. Instruction manual

The product should be mounted and operated after thoroughly reading the manual and understanding its contents.

Keep the instruction manual where it can be easily referred to as needed.

Piping

⚠Caution

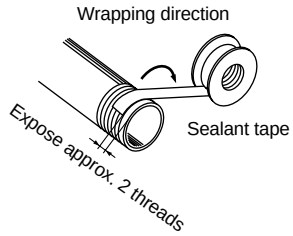
1. Preparation before piping

Before piping is connected, it should be thoroughly flushed out with air or water to remove chips, cutting oil, and other debris.

2. Wrapping of sealant tape

When screwing together pipes and fittings, be certain that chips from the pipe threads and sealing material do not get inside the piping.

Also, when sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.



Cushion

⚠Caution

1. Readjust using the cushion needle.

Cushion needles are adjusted at the time of shipment. When the cylinder is put into service, the cushion needles should be readjusted based on factors such as the size of the load and the operating speed. When the cushion needles are turned clockwise, restriction of the air flow becomes greater and thus the cushioning effect also increases.

2. Do not operate with the cushion needles fully closed.

Seals may be damaged.

Lubrication

⚠Caution

1. Lubrication of non-lube type cylinder

The cylinder is lubricated for life at the factory and can be used without any further lubrication.

However, in the event that additional cylinder lubrication is required, be sure to use ISO VG32 Class 1 turbine oil (with no additives).

Stopping lubrication later may lead to malfunctions because the new lubricant will cancel out the original lubricant. Therefore, additional lubrication must be continued once it has been started.

Series MY1□W
Actuator Precautions 3

Be sure to read before handling.

Air Supply

⚠Warning

1. Use clean air.

Do not use compressed air containing chemicals, synthetic oils containing organic solvents, salt, or corrosive gases, as this can cause damage or malfunctions.

⚠Caution

1. Install air filters.

Install air filters immediately upstream of valves. The filtration degree should be 5μm or finer.

2. Install an after-cooler, air dryer, or water separator (Drain Catch).

Air that includes excessive drainage or condensate may cause malfunction of valves and other pneumatic equipment. To prevent this, install an after-cooler, air dryer, or water separator (Drain Catch).

3. Use the product within the specified range of fluid and ambient temperature.

Take measures to prevent freezing when below 5°C, since moisture in circuits can freeze and cause damage to seals and lead to malfunctions.

Refer to SMC's "Air Preparation System" catalog for further details on compressed air quality.

Operating Environment

⚠Warning

1. Do not use in environments where there is a danger of corrosion.

Refer to the construction drawings to verify cylinder materials.

Maintenance

⚠Warning

1. Perform maintenance inspection and service according to the procedures indicated in the instruction manual.

Improper handling and maintenance may cause malfunctioning and damage of machinery or equipment to occur.

2. Removal of components, and supply/exhaust of compressed air

Before any machinery or equipment is removed, first ensure that the appropriate measures are in place to prevent the fall or erratic movement of driven objects and equipment, then cut off the electric power and reduce the pressure in the system to zero. Only then should you proceed with the removal of any machinery and equipment.

When machinery is restarted, proceed with caution after confirming that appropriate measures are in place to prevent cylinders from lurching.

⚠Caution

1. Filter drainage

Drain out condensate from air filters regularly.

Series MY1□W
Auto Switch Precautions 1

Be sure to read before handling.

Design and Selection

⚠Warning

1. Confirm the specifications.

Read the specifications carefully and use the product appropriately. The product may be damaged or malfunction if it is used outside the range of specifications for load current, voltage, temperature, or impact.

2. Take precautions when multiple cylinders are used close together.

When two or more auto switch cylinders are lined up in close proximity to each other, magnetic field interference may cause the switches to malfunction. Maintain a minimum cylinder separation of 40mm. (When the allowable interval is specified for each cylinder series, use the indicated value.)

3. Monitor the length of time that a switch is ON at an intermediate stroke position.

When an auto switch is placed at an intermediate position of the stroke and a load is driven at the time the piston passes, the auto switch will operate, but if the speed is too great the operating time will be shortened and the load may not operate properly. The maximum detectable piston speed is:

$$V(mm/s) = \frac{\text{Auto switch operating range (mm)}}{\text{Load operating time (ms)}} \times 1000$$

4. Keep wiring as short as possible.

<Reed switches>

As the length of the wiring to a load gets longer, the rush current at switching ON becomes greater, and this may shorten the product's life. (The switch will stay ON all the time.)

Use a contact protection box when the wire length is 5m or longer.

<Solid state switches>

Although wire length should not affect switch function, use a wire that is 100m or shorter.

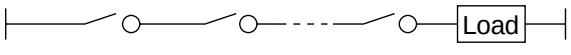
5. Monitor the internal voltage drop of the switch.

<Reed switches>

1) Switches with an indicator light (except D-A96, D-A96V, D-Z76)
   - If auto switches are connected in series as shown below, take note that there will be a large voltage drop because of internal resistance in the light emitting diodes. (Refer to internal voltage drop in the auto switch specifications.)

     [The voltage drop will be "n" times larger when "n" auto switches are connected.]

     Even though an auto switch operates normally, the load may not operate.



   - Similarly, when operating below a specified voltage, it is possible that the load may be ineffective even though the auto switch function is normal. Therefore, the formula below should be satisfied after confirming the minimum operating voltage of the load.

$$\text{Supply voltage} - \text{Internal voltage drop of switch} > \text{Minimum operating voltage of load}$$

2) If the internal resistance of a light emitting diode causes a problem, select a switch without an indicator light (D-A90, D-A90V, D-Z80).

<Solid state switches>

3) Generally, the internal voltage drop will be greater with a 2-wire solid state auto switch than with a reed switch. Take the same precautions as in 1) above.

Also note that a 12VDC relay is not applicable.

6. Monitor leakage current.

<Solid state switches>

With a 2-wire solid state auto switch, current (leakage current) flows to the load to operate the internal circuit even when in the OFF state.

If the condition given in the below formula is not met, the switch will not reset correctly (it stays ON).

Current to operate load (OFF condition) > Leakage current

Use a 3-wire switch if this condition cannot be satisfied. Moreover, leakage current flow to the load will be "n" times larger when "n" auto switches are connected in parallel.

7. Do not use a load that generates surge voltage.

<Reed switches>

If driving a load that generates surge voltage, such as a relay, use a switch with a built-in contact protection circuit or a contact protection box.

<Solid state switches>

Although a zener diode for surge protection is connected at the output side of a solid state auto switch, damage may still occur if a surge is applied repeatedly. When directly driving a load that generates surge, such as a relay or solenoid valve, use a switch with a built-in surge absorbing element.

8. Cautions for use in an interlock circuit

When an auto switch is used for an interlock signal requiring high reliability, devise a double interlock system to safeguard against malfunctions by providing a mechanical protection function, or by also using another switch (sensor) together with the auto switch.

Also perform periodic maintenance inspections and confirm proper operation.

9. Ensure sufficient clearance for maintenance activities.

When designing an application, be sure to allow sufficient clearance for maintenance and inspections.

Series MY1□W
Auto Switch Precautions 2

Be sure to read before handling.

Mounting and Adjustment

⚠Warning

1. Do not drop or bump.

Do not drop, bump, or apply excessive impacts (300m/s² or more for reed switches and 1000m/s² or more for solid state switches) while handling. Although the body of the switch may not be damaged, the inside of the switch could be damaged and cause a malfunction.

2. Do not carry a cylinder by the auto switch lead wires.

Never carry a cylinder by its lead wires. This may not only cause broken lead wires, but it may cause internal elements of the switch to be damaged by the stress.

3. Mount switches using the proper tightening torque.

When a switch is tightened beyond the range of tightening torque, the mounting screws, mounting bracket, or switch may be damaged.

On the other hand, tightening below the range of tightening torque may allow the switch to slip out of position.

4. Mount a switch at the center of the operating range.

Adjust the mounting position of an auto switch so that the piston stops at the center of the operating range (the range in which a switch is ON). (The mounting positions shown in the catalog indicate the optimum position at the stroke end.) If mounted at the end of the operating range (around the borderline of ON and OFF), the operation will be unstable.

Wiring

⚠Warning

1. Avoid repeatedly bending or stretching lead wires.

Broken lead wires will result from repeatedly applying bending stress or stretching force to the lead wires.

2. Be sure to connect the load before power is applied.

<2-wire type>

If the power is turned on when an auto switch is not connected to a load, the switch will be instantly damaged because of excess current.

3. Confirm proper insulation of wiring.

Be certain that there is no faulty wiring insulation (such as contact with other circuits, ground fault, improper insulation between terminals, etc.). Damage may occur due to excess current flow into a switch.

4. Do not wire in conjunction with power lines or high voltage lines.

Wire separately from power lines or high voltage lines, avoiding parallel wiring or wiring in the same conduit with these lines. Control circuits containing auto switches may malfunction due to noise from these other lines.

Wiring

⚠Warning

5. Do not allow short circuiting of loads.

<Reed switches>

If the power is turned on with a load in a short circuited condition, the switch will be instantly damaged because of excess current flow into the switch.

<Solid state switches>

PNP output type switches do not have built-in short circuit protection circuits. If loads are short circuited, the switches will be instantly damaged, as in the case of reed switches.

* Take special care to avoid reverse wiring with the brown [red] power supply line and the black [white] output line on 3-wire type switches.

6. Avoid incorrect wiring.

<Reed switches>

A 24VDC switch with indicator light has polarity. The brown [red] lead wire is (+), and the blue [black] lead wire is (–).

1) If connections are reversed, the switch will still operate, but the light emitting diode will not light up.

   Also note that a current greater than the maximum specified one will damage a light emitting diode and make it inoperable.

   Applicable models: D-A93, D-A93V, D-Z73

<Solid state switches>

1) Even if connections are reversed on a 2-wire type switch, the switch will not be damaged because it is protected by a protection circuit, but it will remain in a normally on state. However, it is still necessary to avoid reversed connections since the switch will be damaged if a load short circuits in this condition.

* 2) Even if (+) and (–) power supply line connections are reversed on a 3-wire type switch, the switch will still be protected by a protection circuit. However, if the (+) power supply line is connected to the blue [black] wire and the (–) power supply line is connected to the black [white] wire, the switch will be damaged.

* Lead wire colour changes

Lead wire colours of SMC switches have been changed in order to meet NECA Standard 0402 for production beginning September, 1996 and thereafter. Please refer to the tables provided.
Special care should be taken regarding wire polarity during the time that the old colours still coexist with the new colours.

2-wire

	Old	New
Output (+)	Red	Brown
Output (–)	Black	Blue

3-wire

	Old	New
Power supply (+)	Red	Brown
Power supply GND	Black	Blue
Output	White	Black

Solid state with diagnostic output

	Old	New
Power supply (+)	Red	Brown
Power supply GND	Black	Blue
Output	White	Black
Diagnostic output	Yellow	Orange

Solid state with latch type diagnostic output

	Old	New
Power supply (+)	Red	Brown
Power supply GND	Black	Blue
Output	White	Black
Latch type diagnostic output	Yellow	Orange

Series MY1□W
Auto Switch Precautions 3

Be sure to read before handling.

Operating Environment

⚠Warning

1. Never use in the presence of explosive gases.

The construction of our auto switches does not make them explosion proof. Never use them in the presence of an explosive gas, as this may cause a serious explosion

2. Do not use in an area where a magnetic field is generated.

Auto switches will malfunction or magnets inside cylinders will become demagnetized if used in such an environment. (Consult with SMC regarding the availability of magnetic field resistant auto switches.)

3. Do not use in an environment where the auto switch will be continually exposed to water.

Switches satisfy IEC standard IP67 construction (JIS C0920: watertight construction). Nevertheless, they should not be used in applications where they are continually exposed to water splash or spray. This may cause deterioration of the insulation or swelling of the potting resin inside switches and may lead to a malfunction.

4. Do not use in an environment laden with oil or chemicals.

Consult with SMC if auto switches will be used in an environment laden with coolants, cleaning solvents, various oils, or chemicals. If auto switches are used under these conditions for even a short time, they may be adversely affected by a deterioration of the insulation, a malfunction due to swelling of the potting resin, or hardening of the lead wires.

5. Do not use in an environment with temperature cycles.

Consult with SMC if switches are to be used where there are temperature cycles other than normal temperature changes, as they may be adversely affected internally.

6. Do not use in an environment where there is excessive impact shock.

<Reed switches>

When excessive impact (300m/s² or more) is applied to a reed switch during operation, the contact point may malfunction and generate or cut off a signal momentarily (1ms or less). Consult with SMC regarding the need to use a solid state switch depending on the environment.

7. Do not use in an area where surges are generated.

<Solid state switch>

When there are units (such as solenoid type lifters, high frequency induction furnaces, motors) that generate a large amount of surge in the area around cylinders with solid state auto switches, their proximity may cause deterioration or damage to the internal circuit elements of the switches. Avoid and protect against sources of surge generation and crossed lines.

8. Avoid close contact with accumulated iron waste or magnetic substances.

When a large accumulated amount of ferrous waste such as machining chips or welding spatter, or a magnetic substance (something attracted by a magnet) is brought into close proximity to an cylinder with auto switches, this may cause the auto switches to malfunction due to a loss of the magnetic force inside the cylinder.

Maintenance

⚠Warning

1. Perform the following maintenance inspection and services periodically in order to prevent possible danger due to unexpected auto switch malfunction.

1) Securely tighten switch mounting screws.
If screws become loose or the mounting position is dislocated, retighten screws securely after readjusting the mounting position.

2) Confirm that there is no damage to lead wires.
To prevent faulty insulation, replace switches or repair lead wires if damage is discovered.

3) Confirm that the green light on the 2-color indicator type switch lights up.

Confirm that the Green LED is ON when stopped at the set position. If the Red LED is ON when stopped at the set position, the mounting position is not appropriate. Readjust the mounting position until the Green LED lights up.

Other

⚠Warning

1. Consult with SMC concerning water resistance, elasticity of lead wires, and usage at welding sites.

Series MY1□W
Specific Product Precautions 1

Be sure to read before handling.
Refer to pages 32 through 38 for Safety Instructions, Actuator Precautions, and Auto Switch Precautions.

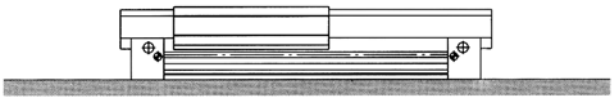
Mounting

⚠Caution

1. To obtain the best results from the cover, horizontal mounting is recommended.

- With horizontal mounting (shown below), the entry of dirt and dust from the bottom of the cover is much less compared to other mounting orientations, making it much more efficient.

Horizontal mounting



2. When the cylinder is mounted from the top side or when strokes are to be adjusted by installing a stroke adjusting unit, the protective cover must be removed for these purposes.

- Refer to page 40 for detailed assembly procedure.

Operating Environment

⚠Caution

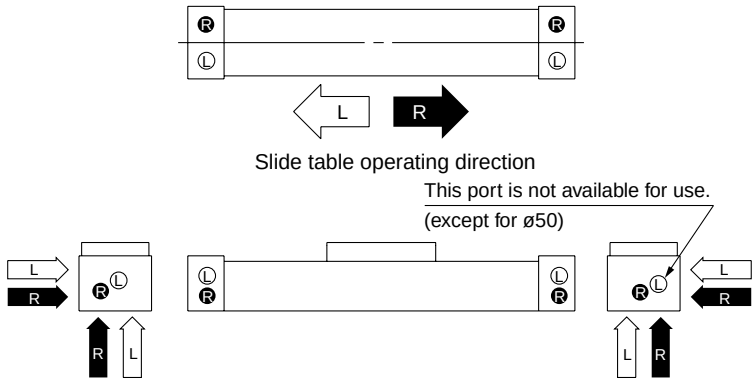
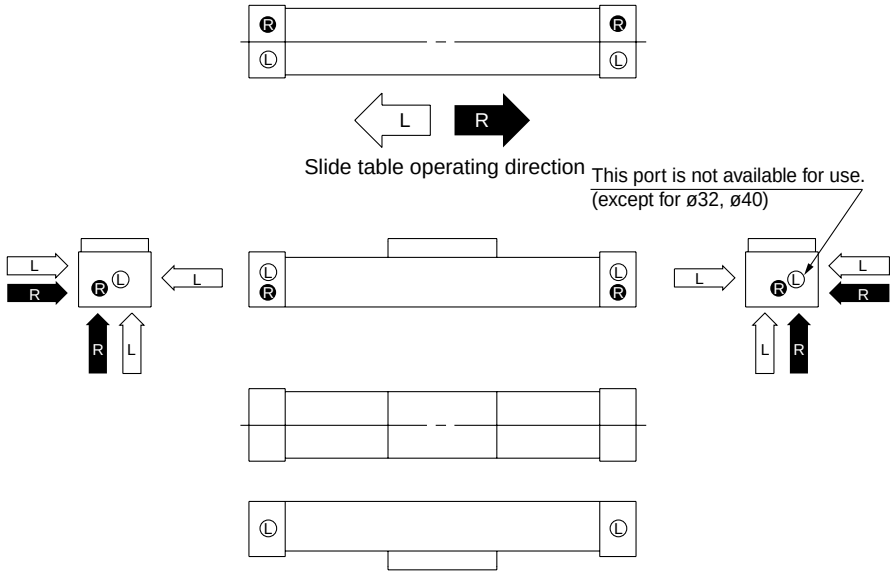
1. Because of floating particles such as paper dust and coolant mist that may enter the inside of the cover.

- Since there is a gap between the bottom of the cover and cylinder tube, take precautions when operating cylinders in environments where there is exposure to excessive amount of floating particles, water/oil splash, or chip spattering. If they enter inside the cover, malfunction may occur.

⚠Caution

Centralised Piping Port Variations

- Head cover piping connection can be freely selected to best suit different piping conditions.

Applicable cylinders	Port variations
MY1MW16, 20, 50, 63 **MY1CW16, 20, 50, 63**	
MY1MW25, 32, 40 **MY1CW25, 32, 40**	

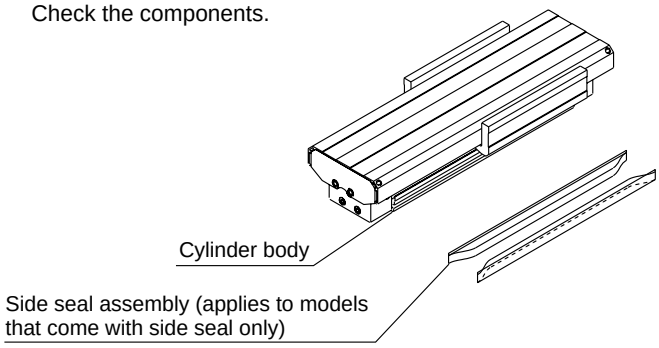
Series MY1□W
Specific Product Precautions 2

Be sure to read before handling.
Refer to pages 32 through 38 for Safety Instructions, Actuator Precautions, and Auto Switch Precautions.

Assembly Procedure

1. Component check

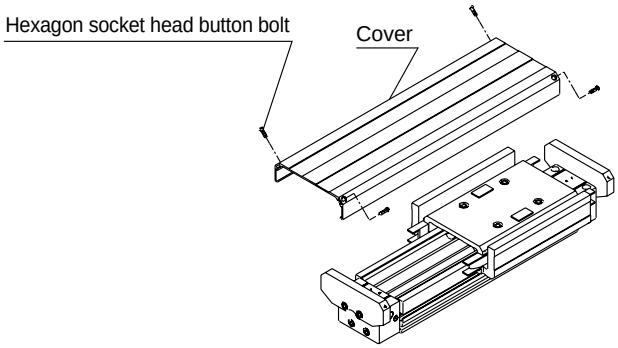
Check the components.



Note) When auto switches are included with a cylinder order, they are packaged together with the cylinder.

2. Removal of cover

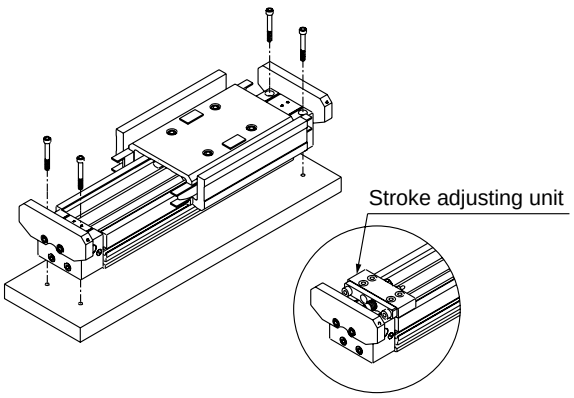
Remove the hexagon socket head button bolts and cover.



3. Body mounting/adjustment

Mount the cylinder body.

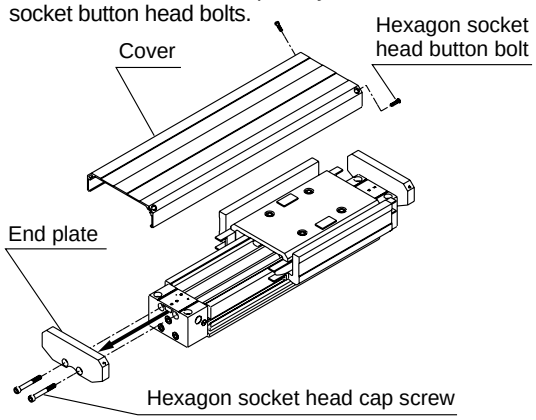
For cylinders with protective cover only (i.e., without side seal), reinstall the cover after the cylinder is mounted and adjusted. (Refer to Step 6 "Cover installation".)



Note) The adjustment of the stroke adjusting unit (optional) should also be done at this time.

4. Temporary cover installation

1) Remove the hexagon socket head cap screws and one of the end plates.
2) Place the cover and temporarily secure it with the hexagon socket button head bolts.

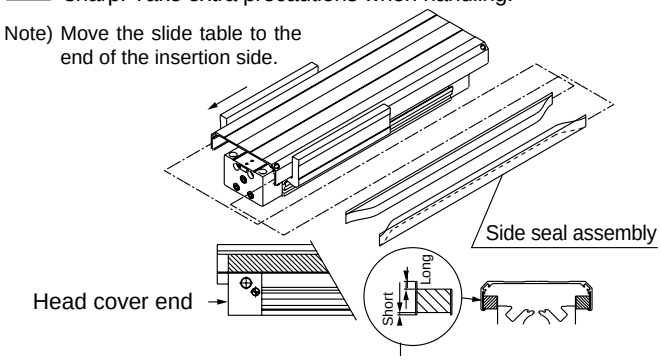


5. Side seal installation

Slide the side seal assembly into the place from one end of the cylinder.

⚠ Stainless steel portions of the side seal assembly are very sharp. Take extra precautions when handling.

Note) Move the slide table to the end of the insertion side.



Note) Slide the side seal all the way to the end of the head cover.

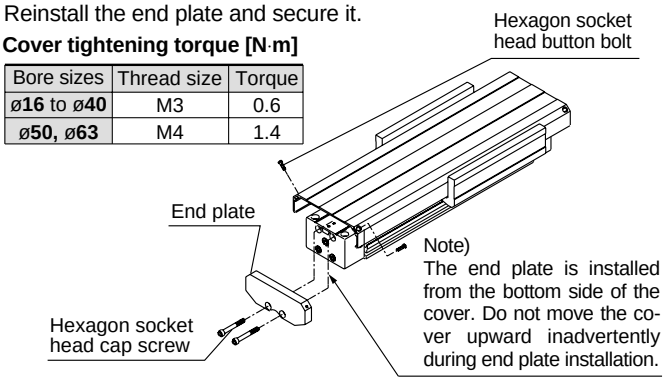
Note) Make sure the side seal assembly is facing in the right direction.

6. Cover installation

Reinstall the end plate and secure it.

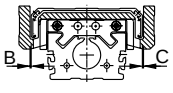
Cover tightening torque [N·m]

Bore sizes	Thread size	Torque
ø16 to **ø40**	M3	0.6
ø50, ø63	M4	1.4



End plate tightening torque [N·m]

Bore size	Thread size	Torque
ø16	M3	0.6
ø20	M4	1.4
ø25	M5	2.8
ø32	M6	4.8
ø40	M6	4.8
ø50	M8	12
ø63	M10	24



Note) If there is no gap (clearance) between the slide table and cover (B, C in the drawing above) throughout the stroke range, loosen the hexagon socket head cap screw to readjust the cover, then retighten it.

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