Magnetically Coupled Rodless Cylinder
Direct Mount Type

New

RoHS

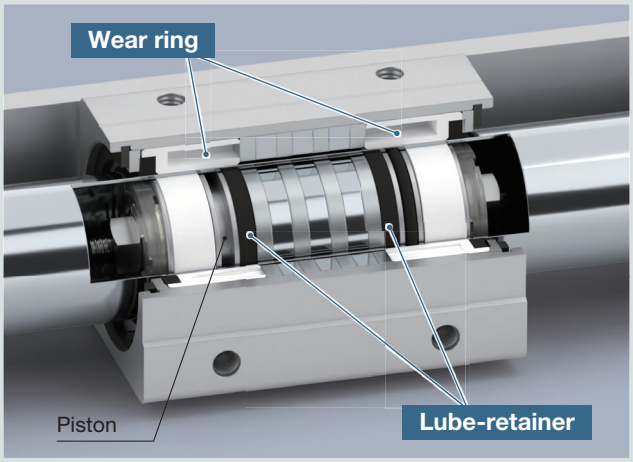
Ø 6, Ø 10, Ø 15, Ø 20, Ø 25, Ø 32, Ø 40, Ø 50, Ø 63

Improved lubrication

A **Lube-retainer** is installed to support lubrication retention on the piston and to ensure a lubrication film.
(Bore size: Ø 15 to Ø 63)

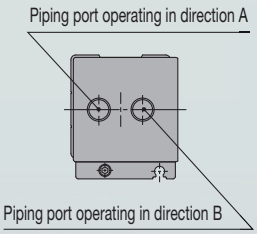
Stable operation

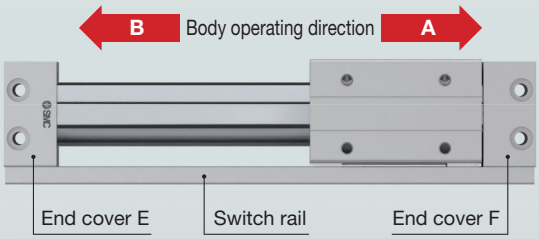
Lengthening of the **wear ring** on the body side by, 30 % at maximum, helps to achieve smooth movement.



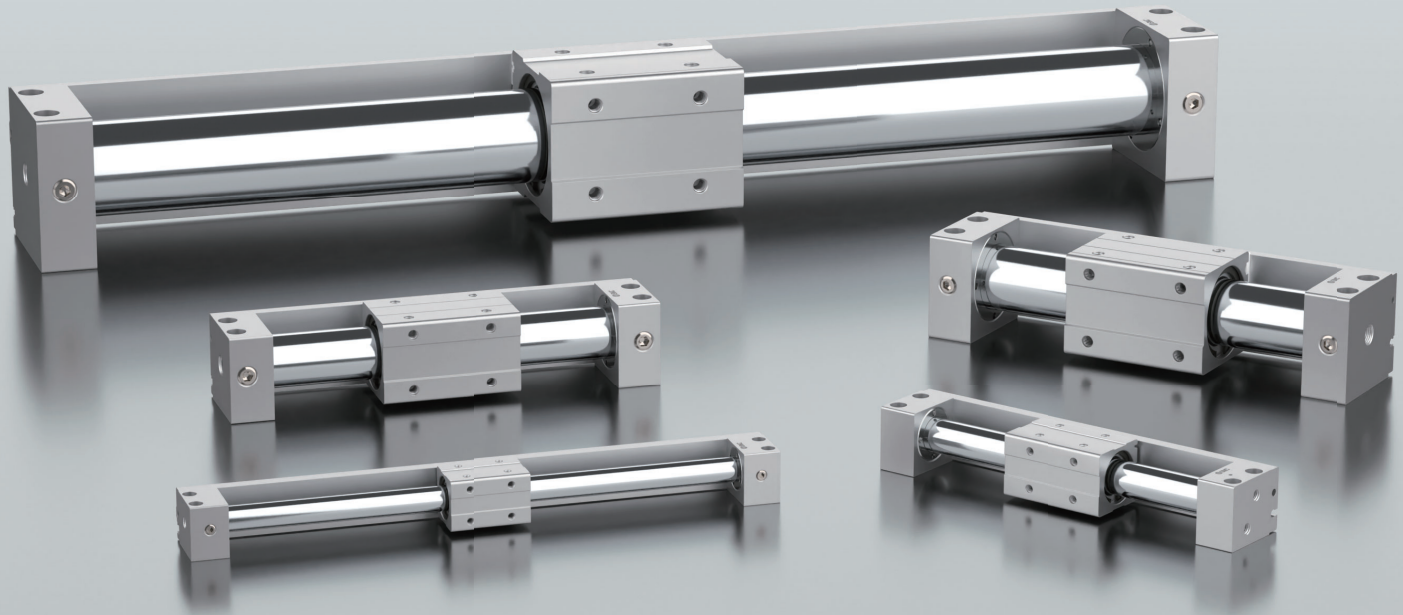
Improved piping flexibility

Improved piping flexibility with the addition of a **right side centralised piping type**





■ The specifications, magnet holding force, and mounting dimensions are the same as those of the existing CY3R series model.

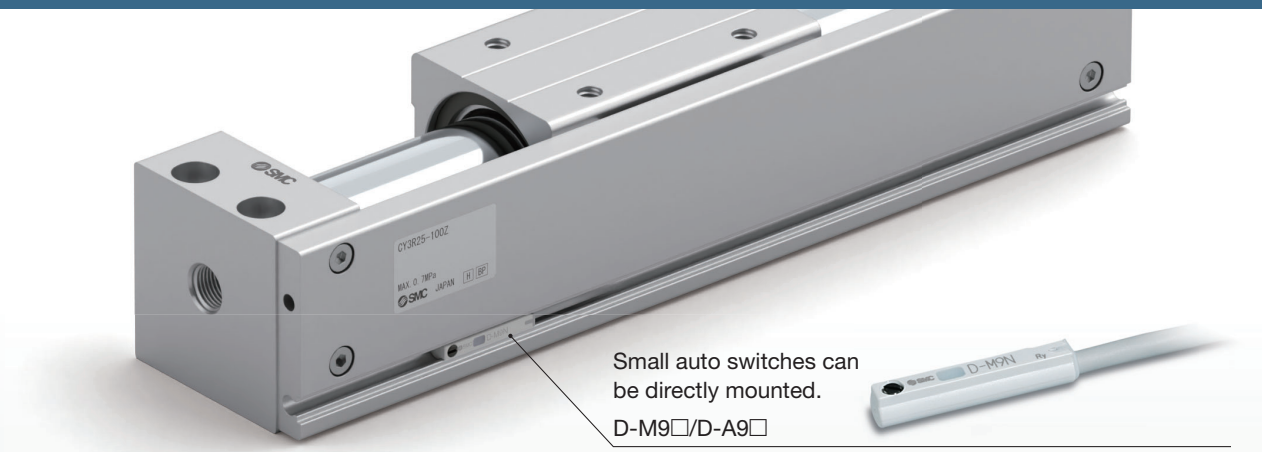


CY3R Series

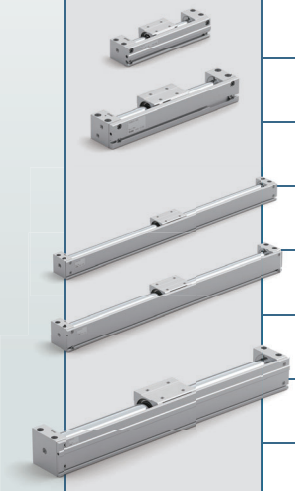
SMC

CAT.EUS20-318A-UK

Small auto switches can be directly mounted. (All sizes)



Series Variations

Series	Bore size [mm]	Standard stroke [mm]	Piston speed	Cushion	Mounting orientation	Magnet holding force
		50 100 150 200 250 300 350 400 450 500 600 700 800 900 1000				
Direct mount type 	6	● ● ● ●	50 to 500 mm/s	Rubber bumper	Horizontal Inclined Vertical	19.6 N
	10	● ● ● ● ● ●				53.9 N
	15	● ● ● ● ● ● ● ● ● ● ●				137 N
	20	● ● ● ● ● ● ● ● ● ● ● ● ● ●				231 N
	25	● ● ● ● ● ● ● ● ● ● ● ● ● ●				363 N
	32	● ● ● ● ● ● ● ● ● ● ● ● ● ●				588 N
	40	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●				922 N
	50	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●				1471 N
	63	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●				2256 N

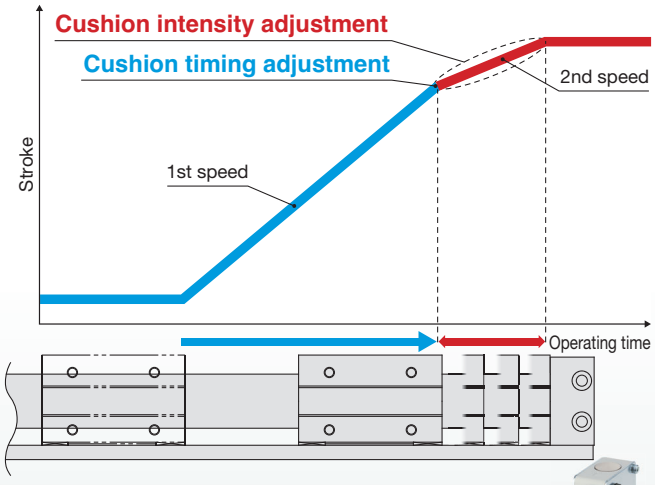
CONTENTS

Related Products

Deceleration Controller DAS Series

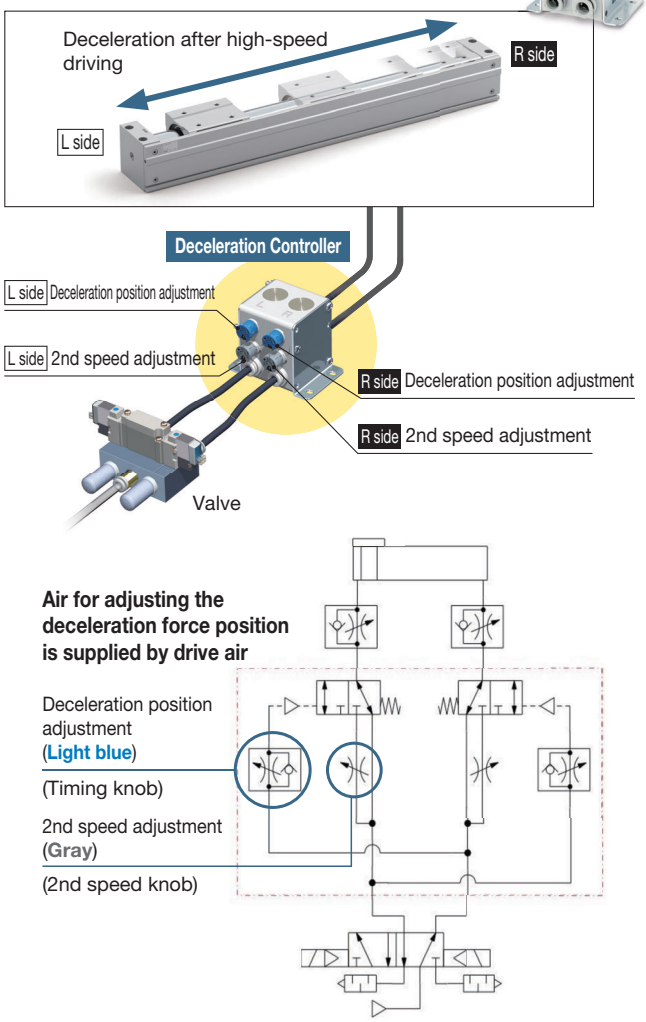
2-speed control reduces cycle time Allows for the impact relaxation of the stroke end

Allows for the 2-speed control of cylinders The deceleration position (cushion timing) and 2nd speed (cushion intensity) can be adjusted.



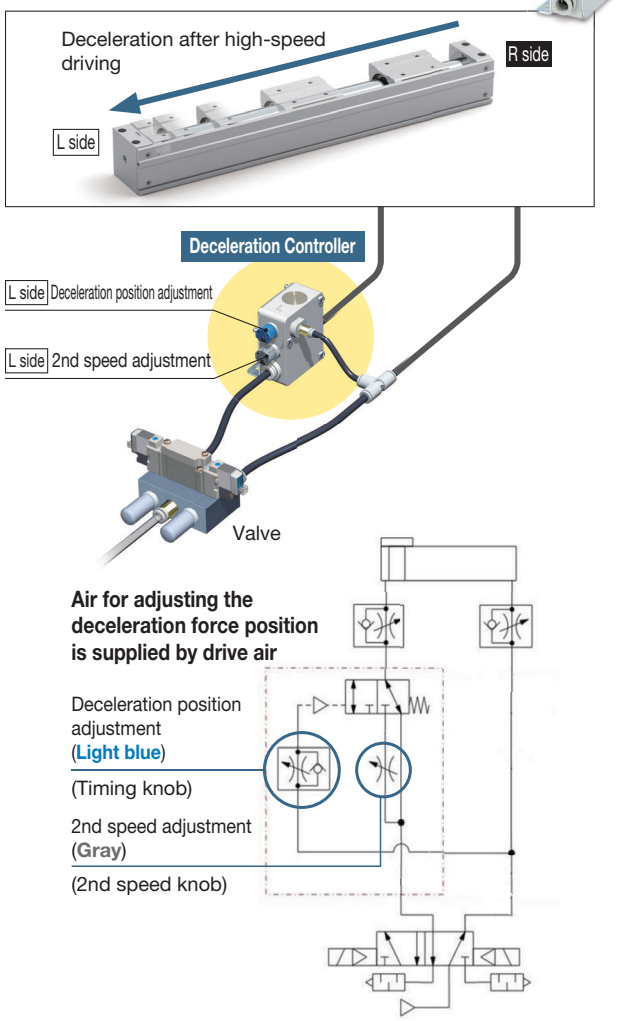
Piping Example

For double-end



Air for adjusting the deceleration force position is supplied by drive air

For single-end



Air for adjusting the deceleration force position is supplied by drive air

Variations

Mounting	Body size	Applicable tubing O.D.										Bore size
		Metric size					Inch size					
		4	6	8	10	12	5/32"	1/4"	5/16"	3/8"	1/2"	
	5	●	●	●	●	●	●	●	●	●	●	Ø 10 to Ø 40
	7			●	●	●			●	●	●	Up to Ø 100

CY3R Series
Model Selection

E: Kinetic energy of load [J]

$$E = \frac{(W + W_B)}{2} \times \left(\frac{V}{1000}\right)^2$$

Es: Allowable kinetic energy for intermediate stop using an air pressure circuit [J]
Fn: Allowable driving force [N]
MD: Max. allowable moment when a connection bracket, etc., is carried directly [N·m]
Ps: Operating pressure limit for intermediate stop using an external stopper, etc. [MPa]
Pv: Max. operating pressure for vertical operation [MPa]
WBmax: Max. load mass when loaded directly on the body [kg]
Wv: Allowable load mass for vertical operation [kg]

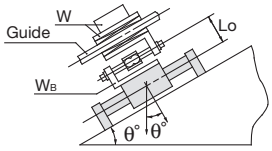
Operating Conditions

- **W:** Load mass [kg]
- **WB:** Connection bracket weight [kg]
- **μ:** Guide's coefficient of friction
- **Lo:** Distance from cylinder shaft center to workpiece point of application [cm]
- **L1:** Distance from cylinder shaft center to connection fitting, etc. [mm]
- **Switches**
- **P:** Operating pressure [MPa]
- **V:** Speed [mm/s]
- **Stroke [mm]**
- **Mode of operation (horizontal, inclined, vertical)**

Mode of operation

Horizontal operation | Inclined operation | Vertical operation *1

Review of load mass and operating pressure



Inclined operation

First tentative bore size determination $\text{Ø } D \geq 1.6 \times \sqrt{\frac{F_1}{P}}$

First tentative bore size determination $\text{Ø } D \geq 1.6 \times \sqrt{\frac{F_2}{P}}$

First tentative bore size determination $\text{Ø } D \geq 1.6 \times \sqrt{\frac{F_3}{P}}$

Allowable Driving Force Table (Fn) (n = 1, 2, 3)

Horizontal	$F_1 = \mu \times (W + W_B) \times 9.8$
Inclined	$F_2 = (W + W_B) \times 9.8 \times (\mu\cos\theta + \sin\theta)$
Vertical	$F_3 = (W + W_B) \times 9.8 \times (\mu + 1)$

Refer to the allowable driving force table for the (Fn) of data Ⓐ.

$W + W_B \leq W_v$, $P \leq P_v$ | $W + W_B > W_v$, $P > P_v$

Determination of allowable load mass & pressure

(Refer to page 4 for vertical operation.)

(Refer to page 4 for the connection bracket weight.)

$W_B > W_{Bmax}$

Determination of connection bracket weight (W_B)

Review of connection bracket

$W_B \leq W_{Bmax}$

(Refer to standard stroke table on page 8.)

Review of switch use and stroke

Equipped with switch rail? — Yes

Equipped with switches? — Yes

Determination of stroke with switch — NG / OK

No

Second tentative determination of bore size using the graph of allowable driving force (Fn) and distance from cylinder shaft center (Lo)

Equipped with external guide system? — Yes

No

Intermediate stop? *1 — Yes

No

*2 $W_B \times L_1 > M_D$

Determination of rotating moment

(Refer to page 6 for body non-rotating accuracy and maximum allowable moment.)

$W_B \times L_1 \leq M_D$

*2 NG

Determination of allowable stroke

(Refer to page 6 for body non-rotating accuracy and maximum allowable moment.)

OK

Intermediate stopping method

Stop with external stopper

Stop with air pressure circuit

(Refer to page 6 for intermediate stops.)

Determination of load's kinetic energy (E)

$E \leq Es$

$E > Es$

$E = \frac{(W + W_B)}{2} \times \left(\frac{V}{1000}\right)^2$

Bore size determination

Determination of pressure (P) when making intermediate stop

$P \leq Ps$

(Refer to page 6 for intermediate stops.)

$P > Ps$

Review of larger bore size

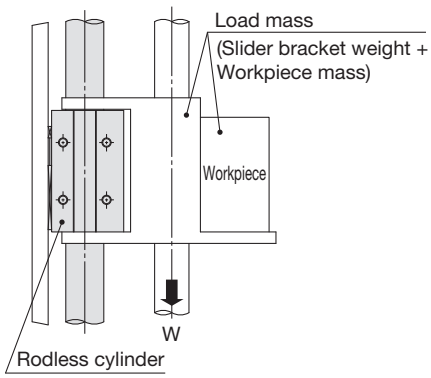
Review of larger bore size

Model determination

*1 This cylinder cannot perform an intermediate stop using an air pressure circuit in vertical operation. In this case, an intermediate stop can be performed only by using an external stopper, etc.
*2 An external guide system should be installed when over specifications.

1 Vertical Operation

It is recommended that the load is guided by a ball type bearing (linear guide, etc.). If a slide bearing is used, sliding resistance increases due to the load mass and moment, which may cause malfunctions.
When the cylinder is mounted vertically or on an angle, be sure to use an external stopper, etc., for positioning.
In addition, as the slider may move downward toward the stroke end due to its self-weight or the mass of the workpiece, use an external stopper, etc., for positioning if accurate positioning is required.

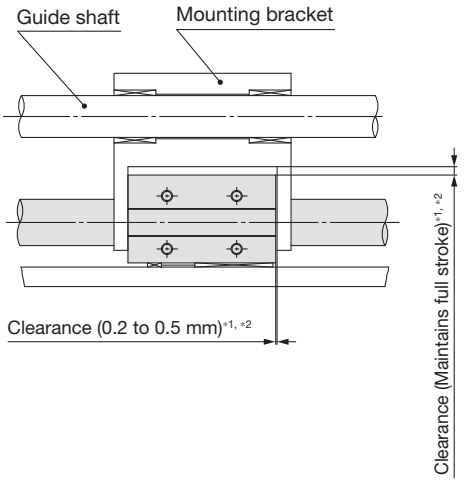


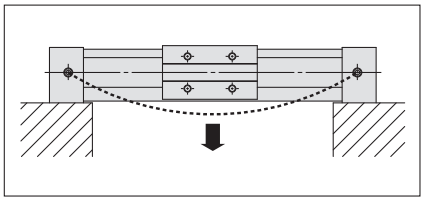
Bore size [mm]	Model	Allowable load mass (Wv) [kg]	Max. operating pressure (Pv) [MPa]
6	**CY3R6**	1.0	0.55
10	**CY3R10**	2.7	0.55
15	**CY3R15**	7.0	0.65
20	**CY3R20**	11.0	0.65
25	**CY3R25**	18.5	0.65
32	**CY3R32**	30.0	0.65
40	**CY3R40**	47.0	0.65
50	**CY3R50**	75.0	0.65
63	**CY3R63**	115.0	0.65

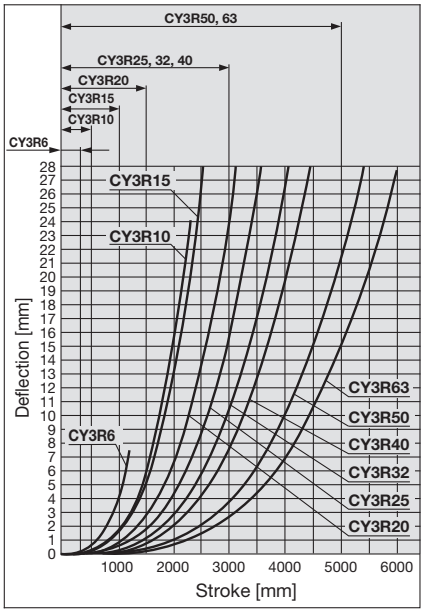
∗ Use caution, as there is a danger of breaking the magnetic coupling if operated above the max. operating pressure.

Cylinder Self-Weight Deflection

When the cylinder is mounted horizontally, deflection appears due to its self-weight as shown in the data, and the longer the stroke is, the greater the amount of variation in the shaft centre. Therefore, a connection method should be considered which can assimilate this deflection.







∗ The above deflection data represent values at the time when the external sliding part moves to the middle of the stroke.

∗1 **According to the self-weight deflection in the figure on the right, provide clearance so that the cylinder does not touch the mounting surface or the load, etc., and is able to operate smoothly within the min. operating pressure range for a full stroke.** For more information, refer to the Operation Manual.
∗2 The amount of deflection differs from the CY1R. Adjust the clearance value by referring to the self-weight deflection as shown in the table on the right.

When the CY1R is replaced with the CY3R, install a cylinder after confirming a full stroke and clearance are allowed.

2 Max. Weight of Connection Bracket to the Body

The CY3R series is guided by an external axis (such as a linear guide) without directly mounting the load. When designing a metal bracket to connect the load, make sure that its weight will not exceed the value in the table on the right.
(For connection methods, refer to the Operation Manual.)

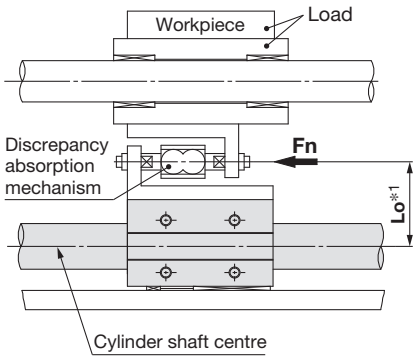
Max. Connection Bracket Weight

Model	Max. connection bracket weight (WBmax) [kg]
CY3R6	0.2
CY3R10	0.4
CY3R15	1.0
CY3R20	1.1
CY3R25	1.2
CY3R32	1.5
CY3R40	2.0
CY3R50	2.5
CY3R63	3.0

3 Allowable Driving Force

Selection procedure

1. Find the drive resisting force **Fn** [N] when moving the load horizontally.
2. Find the distance **Lo** [cm] from the point of the load where driving force is applied, to the centre of the cylinder shaft.
3. Select the bore size from **Lo** and **Fn**, based on data Ⓐ.



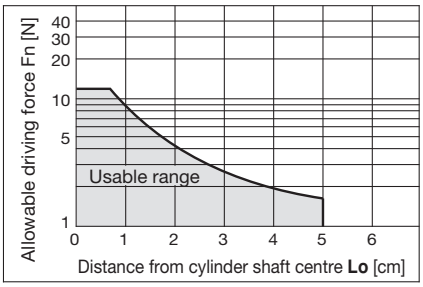
Selection example

Given a load drive resisting force of **Fn** = 100 [N] and a distance from the cylinder shaft centre to the load application point of **Lo** = 8 cm, find the intersection point by extending upward from the horizontal axis of data Ⓐ where the distance from the shaft centre is 8 cm, and then extending to the side, find the allowable driving force on the vertical axis. Models suitable in satisfying the requirement of 100 [N] are the **CY3R32** or **CY3R40**.

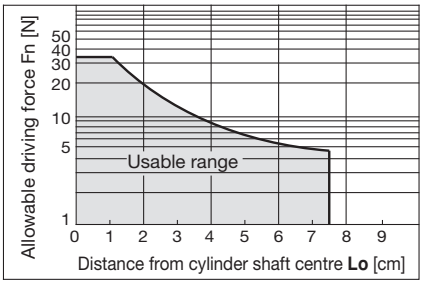
*1 The Lo point from the cylinder shaft centre is the moment working point between the cylinder and the load section.

<Data Ⓐ : Distance from cylinder shaft centre —— Allowable driving force>

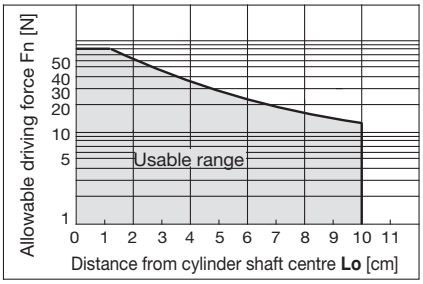
CY3R6



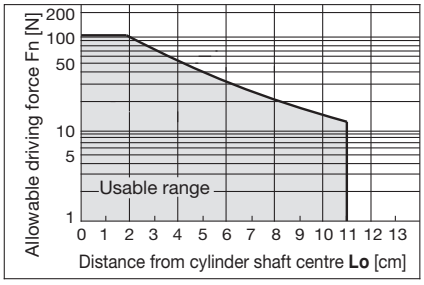
CY3R10



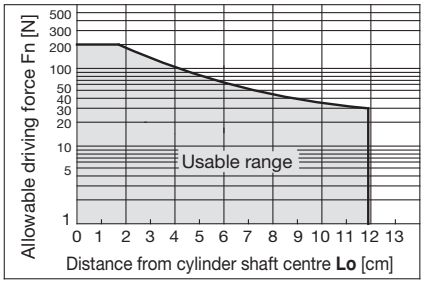
CY3R15



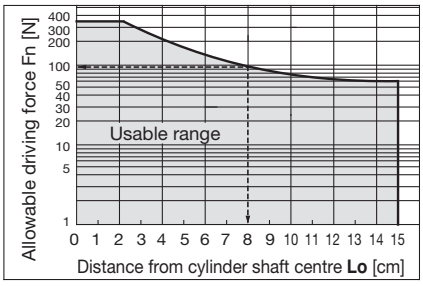
CY3R20



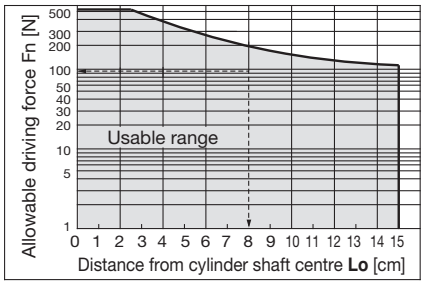
CY3R25



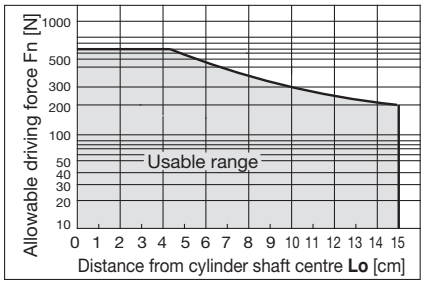
CY3R32



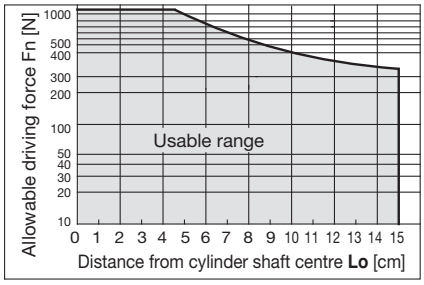
CY3R40



CY3R50



CY3R63



Intermediate Stop

4 Stop with Air Pressure Circuit

When performing an intermediate stop of a load using an air pressure circuit, operate at or below the kinetic energy shown in the table on the right. Use caution, as operation when exceeding the allowable value can result in breaking of the magnetic coupling.
When an intermediate stop is performed by means of an air pressure circuit, the body stopping accuracy is not high. If a high stopping accuracy is required, consider positioning with an external stopper.
For vertical actuation, intermediate stop with a pneumatic circuit is not possible. In this case as well, consider the intermediate stop method using an external stopper.

(Reference values)

Bore size [mm]	Model	Allowable kinetic energy for intermediate stop (Es) [J]
6	**CY3R6**	0.007
10	**CY3R10**	0.03
15	**CY3R15**	0.13
20	**CY3R20**	0.24
25	**CY3R25**	0.45
32	**CY3R32**	0.88
40	**CY3R40**	1.53
50	**CY3R50**	3.12
63	**CY3R63**	5.07

5 Stop with External Stopper

When stopping a load in mid-stroke using an external stopper, etc., operate within the operating pressure limits shown in the table on the right. Use caution, as operation at a pressure exceeding these limits can result in breaking of the magnetic coupling.

Bore size [mm]	Model	Operating pressure limit for intermediate stop (Ps) [MPa]
6	**CY3R6**	0.55
10	**CY3R10**	0.55
15	**CY3R15**	0.65
20	**CY3R20**	0.65
25	**CY3R25**	0.65
32	**CY3R32**	0.65
40	**CY3R40**	0.65
50	**CY3R50**	0.65
63	**CY3R63**	0.65

Precautions on Design

Stroke End Stopping Method

When stopping a load having a large inertial force at the stroke end, tilting of the body and damage to the bearings and cylinder tube may occur. (Refer to Fig. 1.)
As shown in Fig. 2, a shock absorber should be used together with the stopper, and thrust should also be transmitted from the centre of the body so that tilting will not occur.

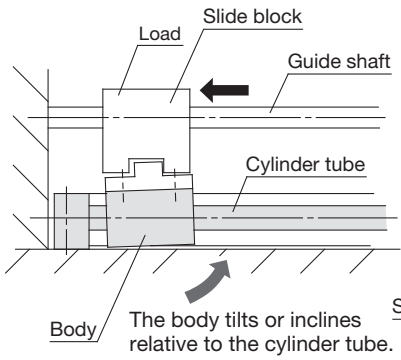


Fig. 1

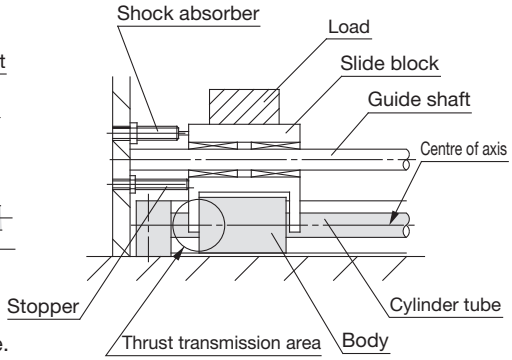


Fig. 2

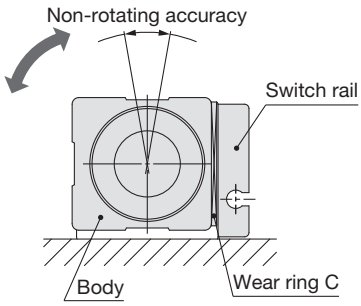
Body Non-rotating Accuracy and Maximum Allowable Moment (With Switch Rail)

(Reference values)

Reference values for non-rotating accuracy and maximum allowable moment at stroke end are indicated below.

Bore size [mm]	Non-rotating accuracy [°]	Max. allowable moment (M_D) [N·m]	Allowable stroke*1 [mm]
6	7.3	0.02	100
10	6.0	0.05	100
15	4.5	0.15	200
20	3.7	0.20	300
25	3.7	0.25	300
32	3.1	0.40	400
40	2.8	0.62	400
50	2.4	1.00	500
63	2.2	1.37	500

*1 The above reference values will be satisfied within the allowable stroke ranges, but caution is necessary, because as the stroke becomes longer, the inclination (rotation angle) within the stroke can be expected to increase.
* Avoid operations where rotational torque (moment) is applied. In such a case, the use of an external guide is recommended.
* When a load is applied directly to the body, the loaded weight should be no greater than the allowable load weight on page 4.



Magnetically Coupled Rodless Cylinder
Direct Mount Type
CY3R Series

RoHS

Ø 6, Ø 10, Ø 15, Ø 20, Ø 25, Ø 32, Ø 40, Ø 50, Ø 63

How to Order

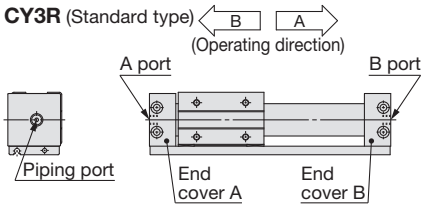
CY3R ☐ **25** ☐ – **300** ☐ **Z** – **M9BW** ☐

Direct mount type ● ❶ ❷ ❸ ❹ ❺ ❻ ❼

❶ Piping type

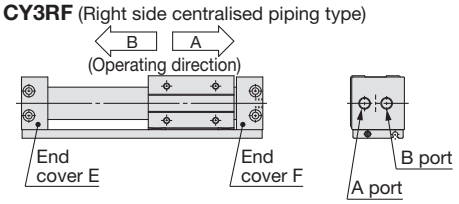
—

CY3R (Standard type)



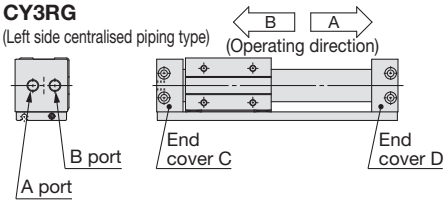
F

CY3RF (Right side centralised piping type)



G

CY3RG
(Left side centralised piping type)



∗ Ø 6 is only available for the standard type (no centralised piping type available).
∗ The piping direction where both ports are provided from one side is shown with the switch rail positioned at the front.

❷ Bore size

6	6 mm	**32**	32 mm
10	10 mm	**40**	40 mm
15	15 mm	**50**	50 mm
20	20 mm	**63**	63 mm
25	25 mm		

❸ Port thread type

Symbol	Type	Bore size
—	M thread	6, 10, 15
	Rc	20, 25, 32, 40, 50, 63
TN	NPT	
TF	G	

❹ Standard stroke

Refer to page 8 for standard strokes.

❺ Switch rail

—	With switch rail
N	Without switch rail

∗ A type with switch rail has built-in auto switch magnets.
∗ Ø 15 has built-in auto switch magnets even without switch rail.
∗ Centralised piping type (F/G) is not available without switch rail (N).

❻ Auto switch

—	Without auto switch

∗ When the switch rail symbol is — (with switch rail)
∗ For applicable auto switches, refer to the table below.

❼ Number of auto switches

—	2
S	1
n	n

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

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model: Perpendicular	Auto switch model: In-line	Lead wire length [m]: 0.5 (—)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9NV**	**M9N**	●	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	●	○	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	●	○	○	—	
	Diagnostic indication (2-colour indicator)			3-wire (NPN)		5 V, 12 V		**M9NWV**	**M9NW**	●	●	●	○	○	IC circuit	
				3-wire (PNP)				**M9PWV**	**M9PW**	●	●	●	○	○		
				2-wire		12 V		**M9BWV**	**M9BW**	●	●	●	○	○	—	
	Water resistant (2-colour indicator)			3-wire (NPN)		5 V,12 V		**M9NAV**∗1	**M9NA**∗1	○	○	●	○	○	IC circuit	
				3-wire (PNP)				**M9PAV**∗1	**M9PA**∗1	○	○	●	○	○		
				2-wire		12 V		**M9BAV**∗1	**M9BA**∗1	○	○	●	○	○	—	
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96V**	**A96**	●	●	●	●	○	IC circuit	—
			No	2-wire	24 V	12 V	100 V	**A93V**∗2	**A93**	●	●	●	●	○∗2	—	Relay, PLC
							100 V or less	**A90V**	**A90**	●	●	●	●	○∗2	IC circuit	

∗1 Water-resistant type auto switches can be mounted on the above models, but SMC cannot guarantee water resistance.
∗2 The load voltage used is 24 VDC.

∗ Lead wire length symbols: 0.5 m..... — (Example) M9NW
1 m..... M (Example) M9NWM
3 m..... L (Example) M9NWL
5 m..... Z (Example) M9NWZ

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

∗ For details on auto switches with pre-wired connectors, refer to the **Web Catalogue**.
∗ Auto switches are shipped together with the product but do not come assembled.

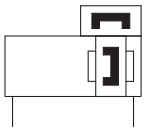
Specifications

Bore size [mm]	6	10	15	20	25	32	40	50	63
Fluid	Air								
Proof pressure	1.05 MPa								
Max. operating pressure∗2	0.7 MPa								
Min. operating pressure	0.16	0.16	0.16	0.16	0.15	0.14	0.12	0.12	0.12
Ambient and fluid temperatures	–10 to 60°C (No freezing)								
Piston speed∗1	50 to 500 mm/s								
Cushion	Rubber bumper								
Lubrication	Not required (Non-lube)								
Stroke length tolerance [mm]	0 to 250 st: $^{+1.0}_{0}$, 251 to 1000 st: $^{+1.4}_{0}$, 1001 st or more: $^{+1.4}_{8}$								
Mounting	Direct mount type								
Mounting orientation	Horizontal, Inclined, Vertical								
Magnet holding force [N]	19.6	53.9	137	231	363	588	922	1471	2256

∗1 When an auto switch is installed at an intermediate position of a type with auto switch, keep the maximum piston speed at 300 mm/s or below to ensure operation of relays or other devices.
∗2 Note that to perform an intermediate stop with an external stopper, the required operating pressure limit is the pressure explained in "Stop with External Stopper" on page 6.

Symbol

Rubber bumper (Magnet type)



Standard Strokes

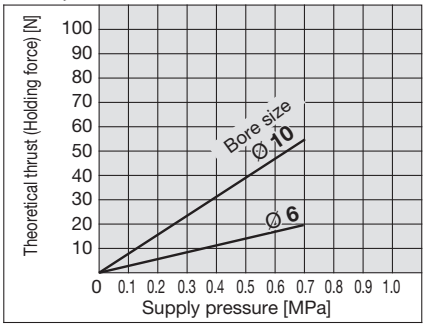
Bore size [mm]	Standard stroke [mm]	Manufacturable stroke [mm]
6	50, 100, 150, 200	20 to 300
10	50, 100, 150, 200, 250, 300	20 to 500
15	50, 100, 150, 200, 250, 300, 350, 400, 450, 500	20 to 1000
20	100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	25 to 1500
25		
32		25 to 2000
40	100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, 1000	
50		40 to 2000
63		

∗ The longer the stroke, the larger the amount of deflection in a cylinder tube. Pay attention to the mounting bracket and clearance value.
∗ Intermediate strokes are available in 1 mm increments.
∗ Installing an auto switch at the midpoint on a long stroke may reduce auto switch responsiveness due to switch rail deflection. If this happens, place a block or similar object on the switch rail to prevent switch rail deflection.

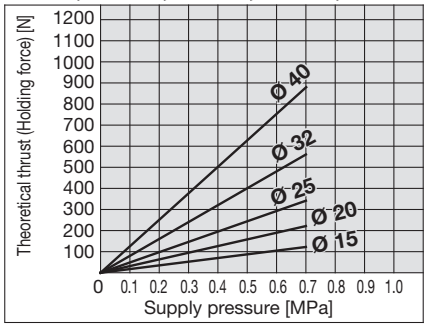
Theoretical Cylinder Thrust

⚠Caution When calculating the actual thrust, design should consider the min. operating pressure.

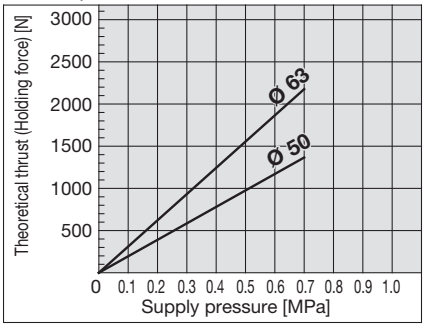
Ø 6, Ø 10



Ø 15, Ø 20, Ø 25, Ø 32, Ø 40



Ø 50, Ø 63



Weight

[kg]

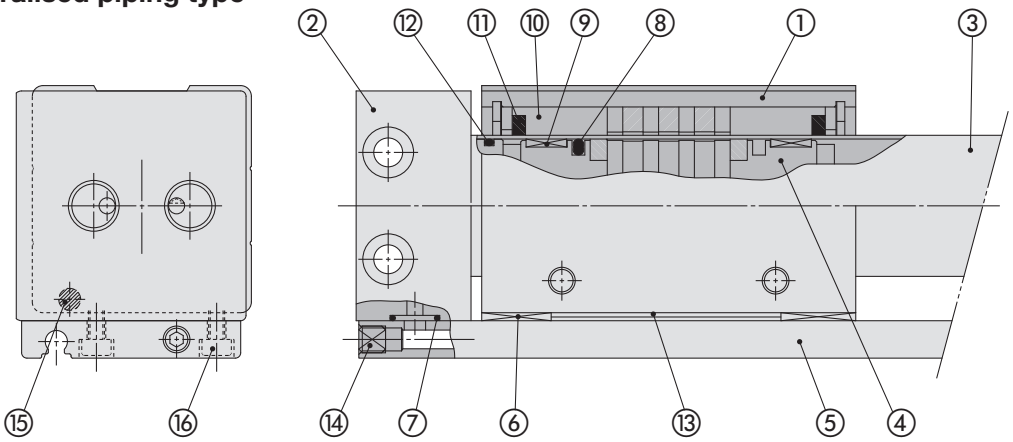
Bore size [mm]		6	10	15	20	25	32	40	50	63
Basic weight (at 0 st)	With switch rail	0.084	0.172	0.314	0.512	0.710	1.211	1.974	3.923	5.741
	Without switch rail	0.067	0.139	0.262	0.441	0.621	1.078	1.791	3.594	5.345
Additional weight per 50 mm of stroke	With switch rail	0.018	0.033	0.040	0.050	0.057	0.076	0.094	0.158	0.188
	Without switch rail	0.007	0.013	0.015	0.020	0.022	0.032	0.040	0.075	0.094

Calculation method/Example: **CY3R25-500Z** (With switch rail)
- Basic weight·····0.710 (Ø 25)
- Additional weight·····0.057/50 mm stroke
- Cylinder stroke·····500 mm stroke

0.710 + 0.057 × 500 ÷ 50 = **1.280 kg**

Construction

Left side centralised piping type



Component Parts

No.	Description
1	**Body**
2	**End cover**
3	**Cylinder tube**
4	**Piston**
5	**Switch rail**
6	**Wear ring C**
7	**Switch rail gasket**
8	**Piston seal**
9	**Wear ring A**
10	**Wear ring B**
11	**Lube-retainer B**
12	**Cylinder tube gasket**
13	**Magnetic shielding plate**
14	**Plug**
15	**Switch magnet**
16	**Hexagon socket head cap screw**

Replacement Parts/Seal Kit

Bore size [mm]	Kit no.	Contents
6	CY3R6-Z-PS	Nos. ⑥, ⑧, ⑨, ⑩, ⑫ above
10	CY3R10-Z-PS	Nos. ⑥, ⑦, ⑧, ⑩, ⑪, ⑫ above
15	CY3R15-Z-PS	Nos. ⑥, ⑦, ⑧, ⑨, ⑩, ⑪, ⑫ above
20	CY3R20-Z-PS	
25	CY3R25-Z-PS	
32	CY3R32-Z-PS	
40	CY3R40-Z-PS	

* Seal kits are the same for both the both sides piping type and the centralised piping type.
* As sizes Ø 50 and Ø 63 cannot be disassembled, the seal kit cannot be replaced.
* The seal kit includes a grease pack (10 g).
  Order with the following part number when only the grease pack is required.
  Grease pack part number: GR-S-010
* When replacing wear ring A for the Ø 10, repairs are handled at our factory.

Switch Rail Accessory Kit Nos.

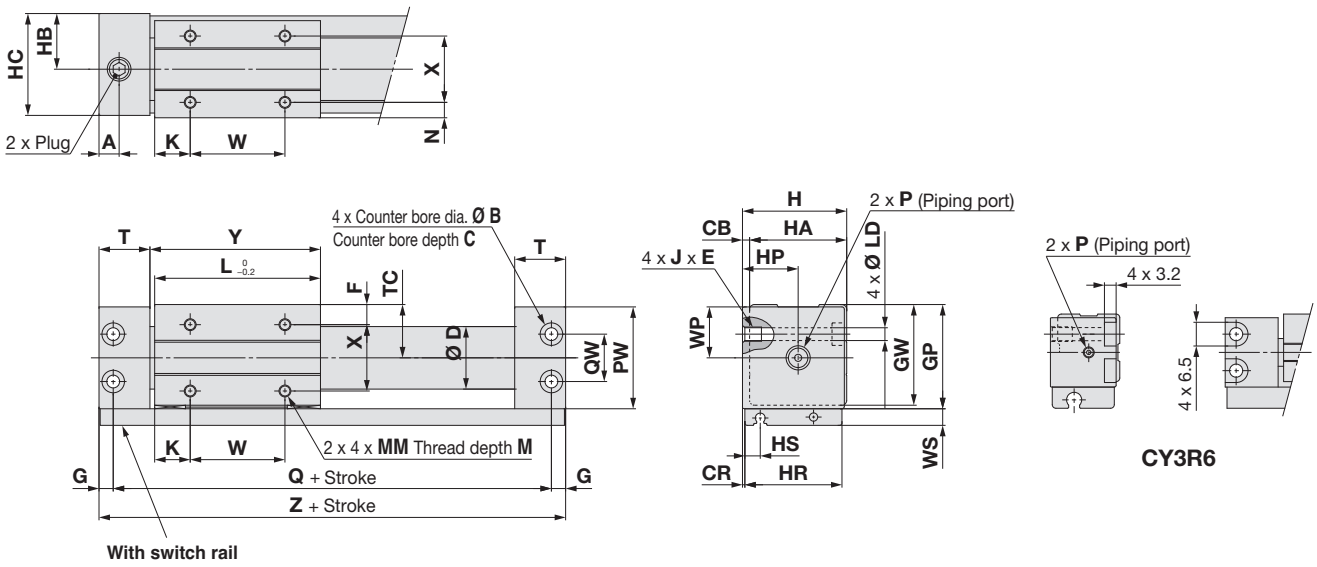
Bore size [mm]	Standard type	Right side centralised piping type	Left side centralised piping type	Contents
	CY3R	**CY3RF**	**CY3RG**	
6	CYR6E-□Z	—	—	Nos. ⑤, ⑥, ⑬, ⑮, ⑯ above
10	CYR10E-□Z	CYR10EF-□Z	CYR10EG-□Z	Nos. ⑤, ⑥, ⑦, ⑭, ⑮, ⑯ above
15	CYR15E-□Z	CYR15EF-□Z		Nos. ⑤, ⑥, ⑦, ⑬, ⑭, ⑯ above
20	CYR20E-□Z	CYR20EF-□Z		Nos. ⑤, ⑥, ⑦, ⑬, ⑭, ⑮, ⑯ above
25	CYR25E-□Z	CYR25EF-□Z		
32	CYR32E-□Z	CYR32EF-□Z		
40	CYR40E-□Z	CYR40EF-□Z		
50	CYR50E-□Z	CYR50EF-□Z		
63	CYR63E-□Z	CYR63EF-□Z		

* □ indicates the stroke.
* A magnet is already built in for Ø 15.
* A plug is installed in the centralised piping type switch rail.
* The quantity of each component is for a single cylinder.
* The switch rail accessory kit does not come with a grease pack.

Dimensions: Standard Type

∅ 6 to ∅ 63

∗ This figure shows types with switch rail (—).



[mm]

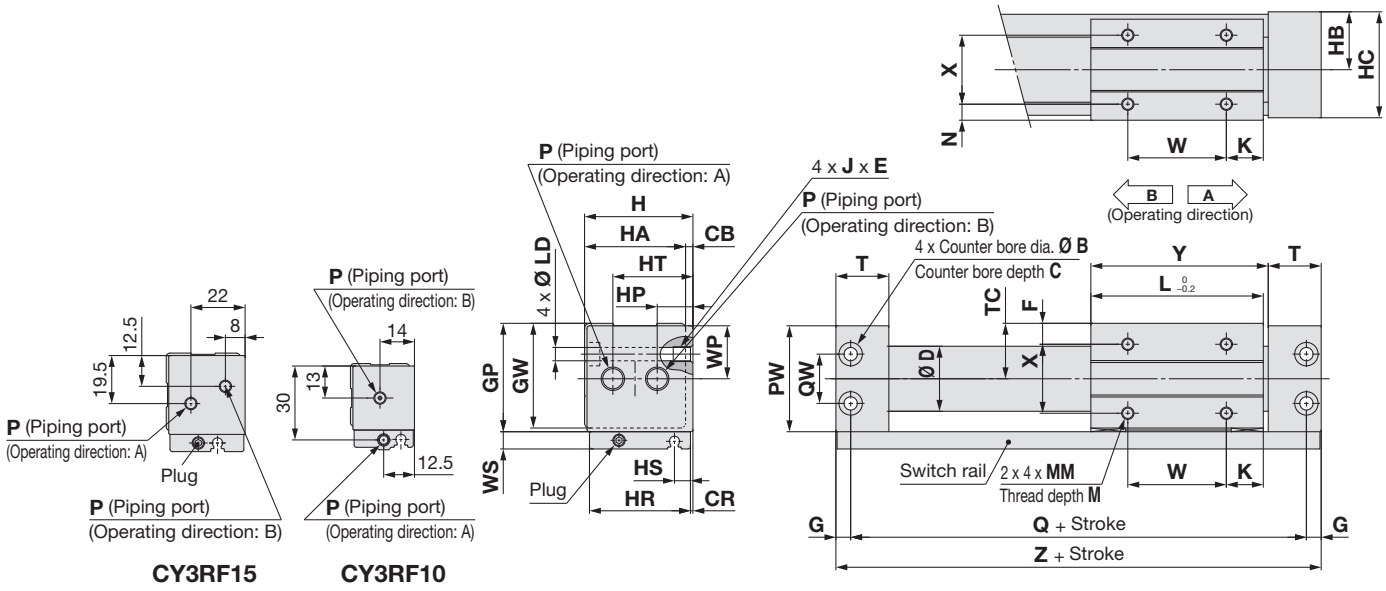
Model	A	B	C	CB	CR	D	F	G	GP	GW	H	HA	HB	HC	HP	HR	HS	J x E	K
CY3R6	7	—	—	2	0.5	7.6	5.5	3	20	18.5	19	17	10.5	18	10.5	17	6	M4 x 0.7 x 6	7
CY3R10	9	6.5	3.2	2	0.5	12	6.5	4	27	25.5	26	24	14	25	14	24	5	M4 x 0.7 x 6	9
CY3R15	10.5	8	4.2	2	0.5	16.6	8	5	33	31.5	32	30	17	31	17	30	10.7	M5 x 0.8 x 7	14
CY3R20	9	9.5	5.2	3	1	21.6	9	6	39	37.5	39	36	21	38	21	36	7.5	M6 x 1 x 8	11
CY3R25	8.5	9.5	5.2	3	1	26.4	8.5	6	44	42.5	44	41	23.5	43	23.5	41	6.5	M6 x 1 x 8	15
CY3R32	10.5	11	6.5	3	1.5	33.6	10.5	7	55	53.5	55	52	29	54	29	51	15.7	M8 x 1.25 x 10	13
CY3R40	10	11	6.5	5	2	41.6	13	7	65	63.5	67	62	36	66	36	62	17.6	M8 x 1.25 x 10	15
CY3R50	14	14	8.2	5	2	52.4	17	8.5	83	81.5	85	80	45	84	45	80	9	M10 x 1.5 x 15	25
CY3R63	15	14	8.2	5	3	65.4	18	8.5	95	93.5	97	92	51	96	51	90	9.5	M10 x 1.5 x 15	24

Model	L	LD	M	MM	N	PW	Q	QW	T	TC	W	WP	WS	X	Y	Z
CY3R6	34	3.6	3.5	M3 x 0.5	3.5	19	60	10	14.5	10.5	20	9.5	5.8	10	35.5	66
CY3R10	38	3.6	4	M3 x 0.5	4.5	26	68	14	17.5	14	20	13	8	15	39.5	76
CY3R15	53	4.3	5	M4 x 0.7	6	32	84	18	19	17	25	16	7	18	54.5	94
CY3R20	62	5.4	5	M4 x 0.7	7	38	95	17	20.5	20	40	19	7	22	64	107
CY3R25	70	5.4	6	M5 x 0.8	6.5	43	105	20	21.5	22.5	40	21.5	7	28	72	117
CY3R32	76	7	7	M6 x 1	8.5	54	116	26	24	28	50	27	7	35	79	130
CY3R40	90	7	8	M6 x 1	11	64	134	34	26	33	60	32	7	40	93	148
CY3R50	110	8.6	10	M8 x 1.25	15	82	159	48	30	42	60	41	10	50	113	176
CY3R63	118	8.6	10	M8 x 1.25	16	94	171	60	32	48	70	47	10	60	121	188

Model	**P** (Piping port)		
	—	**TN**	**TF**
CY3R6	M3 x 0.5	—	—
CY3R10	M5 x 0.8	—	—
CY3R15	M5 x 0.8	—	—
CY3R20	Rc1/8	NPT1/8	G1/8
CY3R25	Rc1/8	NPT1/8	G1/8
CY3R32	Rc1/8	NPT1/8	G1/8
CY3R40	Rc1/4	NPT1/4	G1/4
CY3R50	Rc1/4	NPT1/4	G1/4
CY3R63	Rc1/4	NPT1/4	G1/4

Dimensions: Right Side Centralised Piping Type

Ø 10 to Ø 63



[mm]

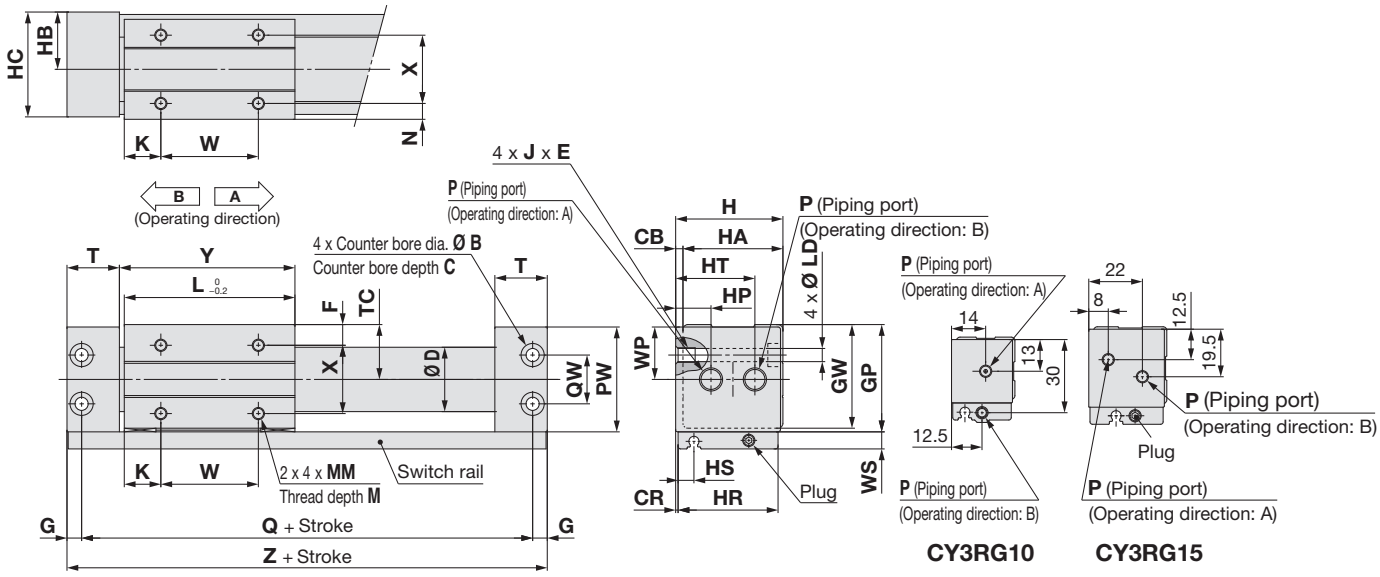
Model	B	C	CB	CR	D	F	G	GP	GW	H	HA	HB	HC	HP	HR	HS	HT	J x E	K
CY3RF10	6.5	3.2	2	0.5	12	6.5	4	27	25.5	26	24	14	25	—	24	5	—	M4 x 0.7 x 6	9
CY3RF15	8	4.2	2	0.5	16.6	8	5	33	31.5	32	30	17	31	—	30	10.7	—	M5 x 0.8 x 7	14
CY3RF20	9.5	5.2	3	1	21.6	9	6	39	37.5	39	36	21	38	12	36	7.5	28	M6 x 1 x 8	11
CY3RF25	9.5	5.2	3	1	26.4	8.5	6	44	42.5	44	41	23.5	43	14.5	41	6.5	32.5	M6 x 1 x 8	15
CY3RF32	11	6.5	3	1.5	33.6	10.5	7	55	53.5	55	52	29	54	20	51	15.7	41.5	M8 x 1.25 x 10	13
CY3RF40	11	6.5	5	2	41.6	13	7	65	63.5	67	62	36	66	25	62	17.6	50	M8 x 1.25 x 10	15
CY3RF50	14	8.2	5	2	52.4	17	8.5	83	81.5	85	80	45	84	32	80	9	58.5	M10 x 1.5 x 15	25
CY3RF63	14	8.2	5	3	65.4	18	8.5	95	93.5	97	92	51	96	38	90	9.5	63.5	M10 x 1.5 x 15	24

Model	L	LD	M	MM	N	PW	Q	QW	T	TC	W	WP	WS	X	Y	Z
CY3RF10	38	3.6	4	M3 x 0.5	4.5	26	68	14	17.5	14	20	13	8	15	39.5	76
CY3RF15	53	4.3	5	M4 x 0.7	6	32	84	18	19	17	25	16	7	18	54.5	94
CY3RF20	62	5.4	5	M4 x 0.7	7	38	95	17	20.5	20	40	19	7	22	64	107
CY3RF25	70	5.4	6	M5 x 0.8	6.5	43	105	20	21.5	22.5	40	21.5	7	28	72	117
CY3RF32	76	7	7	M6 x 1	8.5	54	116	26	24	28	50	27	7	35	79	130
CY3RF40	90	7	8	M6 x 1	11	64	134	34	26	33	60	32	7	40	93	148
CY3RF50	110	8.6	10	M8 x 1.25	15	82	159	48	30	42	60	41	10	50	113	176
CY3RF63	118	8.6	10	M8 x 1.25	16	94	171	60	32	48	70	47	10	60	121	188

Model	P (Piping port)		
	—	TN	TF
CY3RF10	M5 x 0.8	—	—
CY3RF15	M5 x 0.8	—	—
CY3RF20	Rc1/8	NPT1/8	G1/8
CY3RF25	Rc1/8	NPT1/8	G1/8
CY3RF32	Rc1/8	NPT1/8	G1/8
CY3RF40	Rc1/4	NPT1/4	G1/4
CY3RF50	Rc1/4	NPT1/4	G1/4
CY3RF63	Rc1/4	NPT1/4	G1/4

Dimensions: Left Side Centralised Piping Type

Ø 10 to Ø 63



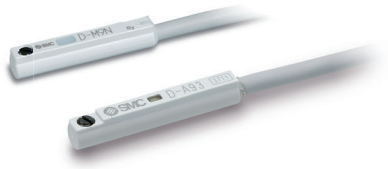
[mm]

Model	B	C	CB	CR	D	F	G	GP	GW	H	HA	HB	HC	HP	HR	HS	HT	J x E	K
CY3RG10	6.5	3.2	2	0.5	12	6.5	4	27	25.5	26	24	14	25	—	24	5	—	M4 x 0.7 x 6	9
CY3RG15	8	4.2	2	0.5	16.6	8	5	33	31.5	32	30	17	31	—	30	10.7	—	M5 x 0.8 x 7	14
CY3RG20	9.5	5.2	3	1	21.6	9	6	39	37.5	39	36	21	38	12	36	7.5	28	M6 x 1 x 8	11
CY3RG25	9.5	5.2	3	1	26.4	8.5	6	44	42.5	44	41	23.5	43	14.5	41	6.5	32.5	M6 x 1 x 8	15
CY3RG32	11	6.5	3	1.5	33.6	10.5	7	55	53.5	55	52	29	54	20	51	15.7	41.5	M8 x 1.25 x 10	13
CY3RG40	11	6.5	5	2	41.6	13	7	65	63.5	67	62	36	66	25	62	17.6	50	M8 x 1.25 x 10	15
CY3RG50	14	8.2	5	2	52.4	17	8.5	83	81.5	85	80	45	84	32	80	9	58.5	M10 x 1.5 x 15	25
CY3RG63	14	8.2	5	3	65.4	18	8.5	95	93.5	97	92	51	96	38	90	9.5	63.5	M10 x 1.5 x 15	24

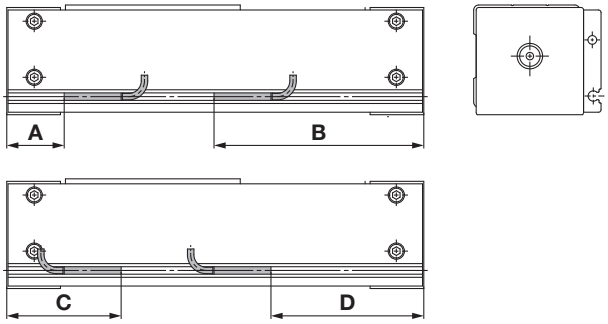
Model	L	LD	M	MM	N	PW	Q	QW	T	TC	W	WP	WS	X	Y	Z
CY3RG10	38	3.6	4	M3 x 0.5	4.5	26	68	14	17.5	14	20	13	8	15	39.5	76
CY3RG15	53	4.3	5	M4 x 0.7	6	32	84	18	19	17	25	16	7	18	54.5	94
CY3RG20	62	5.4	5	M4 x 0.7	7	38	95	17	20.5	20	40	19	7	22	64	107
CY3RG25	70	5.4	6	M5 x 0.8	6.5	43	105	20	21.5	22.5	40	21.5	7	28	72	117
CY3RG32	76	7	7	M6 x 1	8.5	54	116	26	24	28	50	27	7	35	79	130
CY3RG40	90	7	8	M6 x 1	11	64	134	34	26	33	60	32	7	40	93	148
CY3RG50	110	8.6	10	M8 x 1.25	15	82	159	48	30	42	60	41	10	50	113	176
CY3RG63	118	8.6	10	M8 x 1.25	16	94	171	60	32	48	70	47	10	60	121	188

Model	**P** (Piping port)		
	—	**TN**	**TF**
CY3RG10	M5 x 0.8	—	—
CY3RG15	M5 x 0.8	—	—
CY3RG20	Rc1/8	NPT1/8	G1/8
CY3RG25	Rc1/8	NPT1/8	G1/8
CY3RG32	Rc1/8	NPT1/8	G1/8
CY3RG40	Rc1/4	NPT1/4	G1/4
CY3RG50	Rc1/4	NPT1/4	G1/4
CY3RG63	Rc1/4	NPT1/4	G1/4

CY3R Series
D-M9 D-A9
Auto Switch Mounting



Auto Switch Proper Mounting Position (Detection at stroke end)



Auto Switch Proper Mounting Position

[mm]

Auto switch model / Bore size	A		B		C		D	
	D-A9□	D-M9□ D-M9□W D-M9□A	D-A9□	D-M9□ D-M9□W D-M9□A	D-A9□	D-M9□ D-M9□W D-M9□A	D-A9□	D-M9□ D-M9□W D-M9□A
6	10.5	14.5	55.5	51.5	30.5	26.5	35.5	39.5
10	29	33	47	43	49	45	—	31
15	17.5	21.5	76.5	72.5	37.5	33.5	56.5	60.5
20	19.5	23.5	87.5	83.5	39.5	35.5	67.5	71.5
25	20.5	24.5	97.5	93.5	40.5	36.5	77.5	81.5
32	24	28	106	102	44	40	86	90
40	26	30	122	118	46	42	102	106
50	30	34	146	142	50	46	126	130
63	32	36	156	152	52	48	136	140

∗ D-A9□ type cannot be mounted on the section D of Ø 10.
∗ The values in the table above are to be used as a reference when mounting auto switches for stroke end detection. Adjust the auto switch after confirming the operating conditions in the actual setting.
∗ 50 mm is the minimum stroke available with 2 auto switches mounted.

Operating Range

[mm]

Auto switch model	Bore size								
	6	**10**	**15**	**20**	**25**	**32**	**40**	**50**	**63**
D-A9□	6.5	13.5	5.5	6	7	7.5	8	9.5	10
D-M9□ **D-M9□W** **D-M9□A**	3.5	6	3.5	3.5	3.5	4	5	5.5	6

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

CY3R Series
Specific Product Precautions

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

Handling

⚠ Warning

1. Pay attention to the space between the head cover and the body.

Take sufficient care to avoid getting your hands or fingers caught when the cylinder is operated.

Mounting

⚠ Caution

1. Take care to avoid nicks or other damage on the outside surface of the cylinder tube.

This can lead to damage of the wear ring and Lube-retainer, which in turn can cause malfunctions.

2. Pay attention to any connections with any other axis.

As the external slider rotates, pay attention not to obstruct the floating at the time of connection with another axis.

3. Do not operate with the magnetic coupling out of position.

In case the magnetic coupling is out of position, push the external slider back into the correct position by hand at the end of the stroke (or correct the piston slider with air pressure).

4. Careful alignment is necessary when connecting to a load having an external guide mechanism.

As the stroke becomes longer, variations in the centre axis become larger. Consider using a connection method (floating mechanism) that is able to absorb these variations.

Disassembly and Maintenance

⚠ Warning

1. When disassembling the cylinder, be sure to carefully handle it. The adsorption force of the magnet is very strong.

Handle with caution when removing the external slider and piston slider from the cylinder tube for maintenance, etc. For details, refer to the Operation Manual.

⚠ Safety Instructions

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

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

1) ISO 4414: Pneumatic fluid power – General rules and safety requirements for systems and their components.
ISO 4413: Hydraulic fluid power – General rules and safety requirements for systems and their components.
IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.
etc.

⚠ Warning

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

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

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

4. Our products cannot be used beyond their specifications.
Our products are not developed, designed, and manufactured to be used under the following conditions or environments.
Use under such conditions or environments is not covered.
1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogues and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

⚠ Caution

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

Limited warranty and Disclaimer/Compliance Requirements

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

Limited warranty and Disclaimer

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

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

Compliance Requirements

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

SMC Corporation (Europe)

Austria	+43 (0)2262622800	www.smc.at	office.at@smc.com
Belgium	+32 (0)33551464	www.smc.be	info@smc.be
Bulgaria	+359 (0)2807670	www.smc.bg	sales.bg@smc.com
Croatia	+385 (0)13707288	www.smc.hr	sales.hr@smc.com
Czech Republic	+420 541424611	www.smc.cz	office.at@smc.com
Denmark	+45 70252900	www.smcdk.com	smc.dk@smc.com
Estonia	+372 651 0370	www.smcee.ee	info.ee@smc.com
Finland	+358 207513513	www.smc.fi	smc.fi@smc.com
France	+33 (0)164761000	www.smc-france.fr	supportclient.fr@smc.com
Germany	+49 (0)61034020	www.smc.de	info.de@smc.com
Greece	+30 210 2717265	www.smchellas.gr	sales@smchellas.gr
Hungary	+36 23513000	www.smc.hu	office.hu@smc.com
Ireland	+353 (0)14039000	www.smcautomation.ie	technical.ie@smc.com
Italy	+39 03990691	www.smcitalia.it	mailbox.it@smc.com
Latvia	+371 67817700	www.smc.lv	info.lv@smc.com
Lithuania	+370 5 2308118	www.smclt.lt	info.lt@smc.com
Netherlands	+31 (0)205318888	www.smc.nl	info@smc.nl
Norway	+47 67129020	www.smc-norge.no	post.no@smc.com
Poland	+48 22 344 40 00	www.smc.pl	office.pl@smc.com
Portugal	+351 214724500	www.smc.eu	apoiocliente.pt@smc.com
Romania	+40 213205111	www.smcromania.ro	office.ro@smc.com
Russia	+7 (812)3036600	www.smc.eu	sales@smcru.com
Slovakia	+421 (0)413213212	www.smc.sk	sales.sk@smc.com
Slovenia	+386 (0)73885412	www.smc.si	office.si@smc.com
Spain	+34 945184100	www.smc.eu	post.es@smc.com
Sweden	+46 (0)86031240	www.smc.nu	order.se@smc.com
Switzerland	+41 (0)523963131	www.smc.ch	helpcenter.ch@smc.com
Turkey	+90 212 489 0 440	www.smcturkey.com.tr	satis.tr@smc.com
UK	+44 (0)845 121 5122	www.smc.uk	sales.gb@smc.com
South Africa	+27 10 900 1233	www.smcza.co.za	Sales.za@smc.com

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