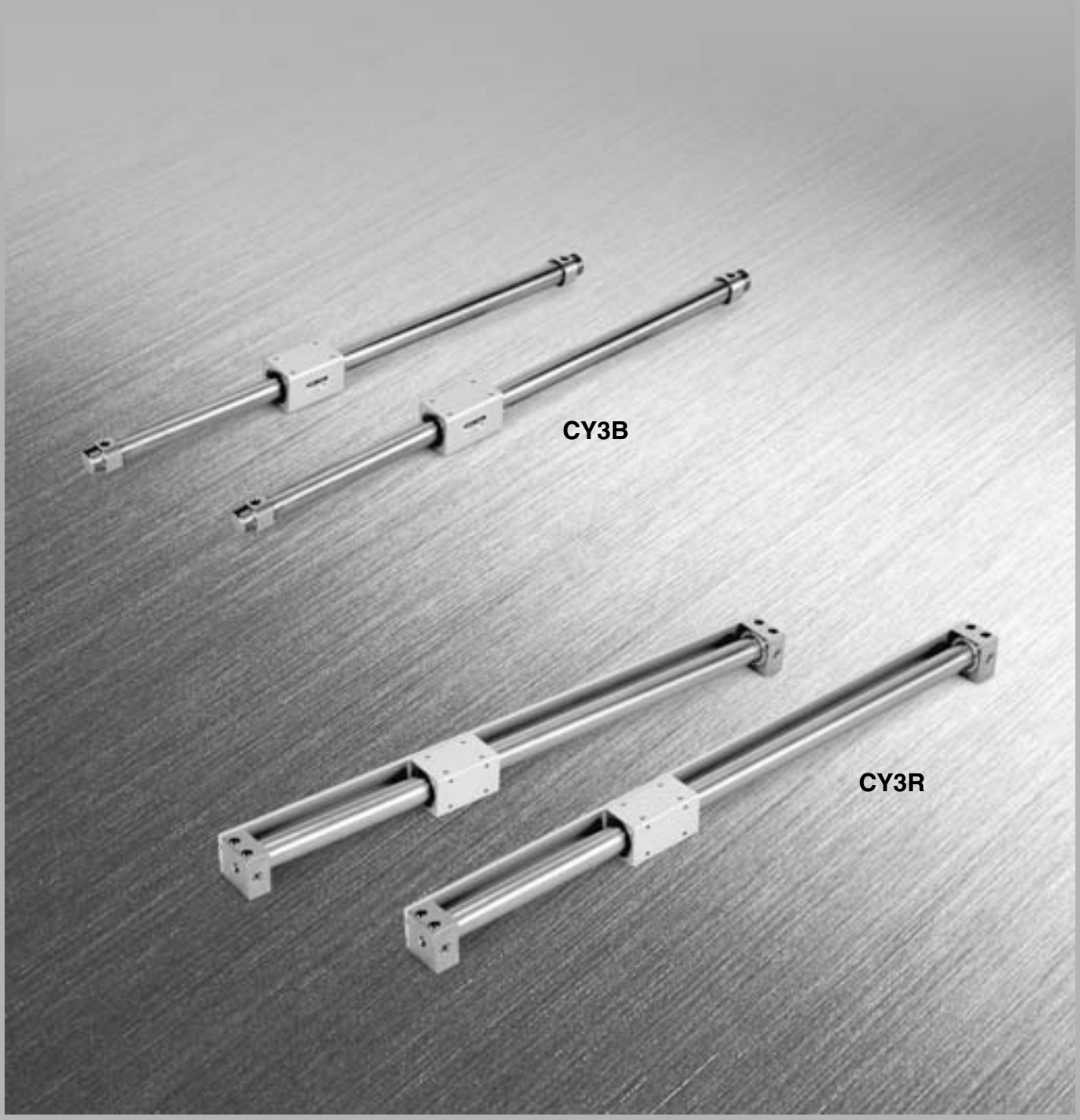
Basic type / Direct mount type

Series CY3B/CY3R

ø6, ø10, ø15, ø20, ø25, ø32, ø40, ø50, ø63



Series CY3B/CY3R

Basic type Direct mount type

Upgraded version of space saving magnetically rodless cylinder!

Improved durability

Improved bearing performance
A 70% longer wear ring length achieving an improvement in bearing performance compared to the CY1B.

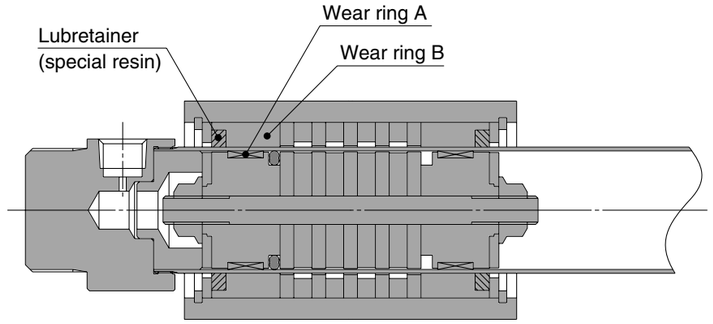
Improved lubrication by using a lubretainer
A special resin lubretainer is installed on the dust seal to achieve ideal lubrication on the external surface of the cylinder tube.

Reduction of sliding resistance

Minimum operating pressure reduced by 30%
By using a lubretainer, the minimum operating pressure is reduced by 30%.
(CY3B40 compared with CY1B40)

Direct mount type *Series* ***CY3R***

Basic type *Series* ***CY3B***



Series CY3B

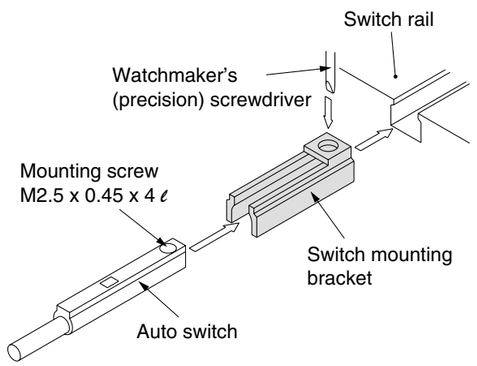
Series Variations

Series	Bore size	Standard stroke (mm)										
		50	100	150	200	250	300	350	400	450	500	600	700	800	900	1000
CY3B	ø6	●		●												
	ø10	●		●												
	ø15	●		●												
	ø20	●		●	●	●	●	●	●	●	●	●	●	●	●	●
	ø25	●		●	●	●	●	●	●	●	●	●	●	●	●	●
	ø32	●		●	●	●	●	●	●	●	●	●	●	●	●	●
	ø40	●		●	●	●	●	●	●	●	●	●	●	●	●	●
	ø50	●		●	●	●	●	●	●	●	●	●	●	●	●	●
	ø63	●		●	●	●	●	●	●	●	●	●	●	●	●	●
CY3R	ø6	●		●												
	ø10	●		●												
	ø15	●		●												
	ø20	●		●	●	●	●	●	●	●	●	●	●	●	●	●
	ø25	●		●	●	●	●	●	●	●	●	●	●	●	●	●
	ø32	●		●	●	●	●	●	●	●	●	●	●	●	●	●
	ø40	●		●	●	●	●	●	●	●	●	●	●	●	●	●
	ø50	●		●	●	●	●	●	●	●	●	●	●	●	●	●
	ø63	●		●	●	●	●	●	●	●	●	●	●	●	●	●

Note) The ● mark indicates the available combination of bore size and standard stroke.

Individual made-to-order products	
Heat resistant specifications	(XB6)
Low speed specifications (15 to 50 mm/s)	(XB9)
Long stroke	(XB11)
Low speed specifications (7 to 50 mm/s)	(XB13)
Hydro specifications	(X116)
Axial ports	(X132)
High speed specifications	(X160)
Helical insert thread specifications	(X168)
Added mounting tap positions for slider	(X206)
Oil-free exterior specifications	(X210)
Outside of cylinder tube with hard chrome plating	(X322)
Oil-free exterior specifications (with dust seal)	(X324)
Interchangeable specification with CY1□6	(X1468)
With magnetic shielding plate	(XC24)
With floating joint	(XC57)

Availability of made to order products varies with the series and the bore size. For more information, please refer to pages 1395 to 1565.



Small auto switches are mountable.
Small auto switches can be mounted on the current auto switch mounting groove of the CY3R25 to 63. So, they can be mounted to all of the cylinder sizes in the CY3R series, making inventory control of the product easy.

Lightweight
The body weight has been reduced by approximately 10% by eliminating unnecessary body weight and by reducing the outer diameter of the cylinder tube. (Compared with previous ø50 and ø60 models)

Бесштоковый магнитный пневмоцилиндр
Серия CY3B / CY3R

Усовершенствованная конструкция бесштокового магнитного пневмоцилиндра!

Увеличенный срок службы

Улучшенные характеристики подшипников

Увеличение осевой длины направляющего кольца на 70% в сравнении с серией CY1 позволило улучшить эксплуатационные характеристики подшипников.

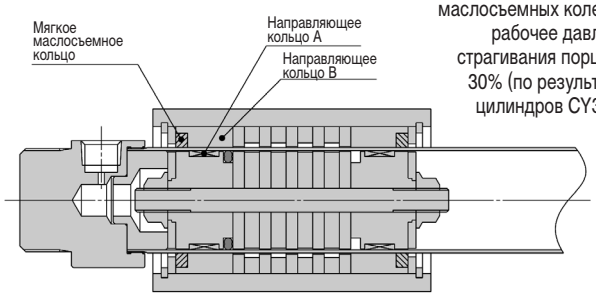
Улучшенная смазка

Мягкие маслосъемные кольца, выполненные из специального полимерного материала, позволяют обеспечить идеальные условия для смазки наружной поверхности гильзы цилиндра.

Снижение трения скольжения

Минимальное рабочее давление снижено на 30%

Благодаря использованию мягких маслосъемных колец минимальное рабочее давление (давление страгивания поршня) снижено на 30% (по результатам сравнения цилиндров CY3B40 и CY1B40).



CY3B

С направляющей пластиной – CY3R

Базовое исполнение – CY3B

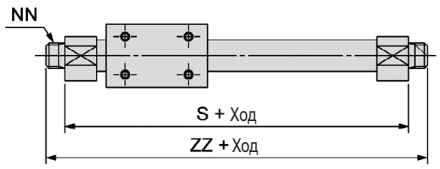
Исполнения с разными типами резьб

Цилиндры диаметром 20 мм и более исполняются с присоединительными резьбами двух типов.

Диаметр (мм)	Тип резьбы
6, 10, 15	M
20, 25, 32, 40	Rc
50, 63	G

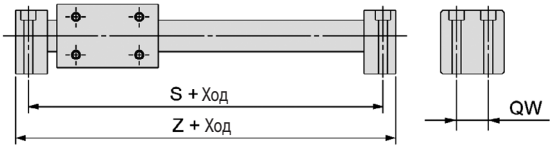
Присоединительные размеры идентичны серии CY1

CY3B



Присоединительные размеры (см.рисунок слева) идентичны размерам серий CY1B/CY1R. Благодаря этому цилиндры серий CY1 и CY3 являются взаимозаменяемыми.

CY3R



Специальные исполнения

Возможность заказа специальных исполнений зависит от серии (CY3B/R) и от диаметра цилиндра.

Информацию можно получить по запросу.

Model Selection 1

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)
M_D: Maximum allowable moment (N·m) when a connection bracket, etc. is carried directly
Ps: Operating pressure limit for intermediate stop using an external stopper, etc. (MPa)
Pv: Maximum operating pressure for vertical operation (MPa)
W_{Bmax}: Maximum load mass (kg) when loaded directly on the body
Wv: Allowable load mass for vertical operation (kg)

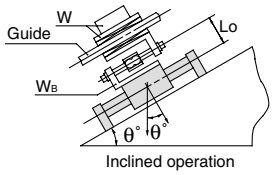
Operating Conditions

- **W**: Load mass (kg)
- **W_B**: Connection bracket mass (kg)
- **μ**: Guide's coefficient of friction
- **L_O**: Distance from cylinder shaft center to workpiece point of application (cm)
- **L_1**: 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 (Note 1)

Review of load mass and operating pressure



Inclined operation

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

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

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

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 Ⓐ.

Determination of allowable load mass & pressure
- $W + W_B \leq W_V$, $P \leq P_V$
- $W + W_B > W_V$, $P > P_V$ (Refer to page 1172 for vertical operation.)

Determination of connection bracket mass (W_B) (Refer to page 1172 for the maximum load mass when loaded directly on the body and connection bracket.)
- $W_B > W_{Bmax}$ → Review of connection bracket
- $W_B \leq W_{Bmax}$

CY3B | CY3R

Review of switch use and stroke (Refer to standard stroke table on page 1179.)

Equipped with switch rail? Yes / No

Equipped with switches? Yes / No

Determination of stroke with switch NG / OK

(Refer to data Ⓐ on pages 1170 and 1171.)

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? Yes / No (Note 1)

Intermediate stopping method
- Stop with external stopper
- Stop with air pressure circuit (Refer to page 1173 for intermediate stops.)

Determination of load's kinetic energy (E)
- $E \leq Es$
- $E > Es$, $E = \frac{(W + W_B)}{2} \times \left(\frac{V}{1000}\right)^2$

Determination of pressure (P) when making intermediate stop
- $P \leq Ps$
- $P > Ps$ → Review of larger bore size

(Refer to page 1173 for intermediate stops.)

Review of larger bore size

Bore size determination

Note 3) $W_B \times L_1 > M_D$

Determination of rotating moment (Refer to page 1173 for body non-rotating accuracy and maximum allowable moment.)

$W_B \times L_1 \leq M_D$

Determination of allowable stroke NG / OK (Note 3) (Refer to page 1173 for body non-rotating accuracy and maximum allowable moment.)

Review of order made products based on operating conditions (Note 2)

(Refer to pages 1175 through 1179.)

Model determination

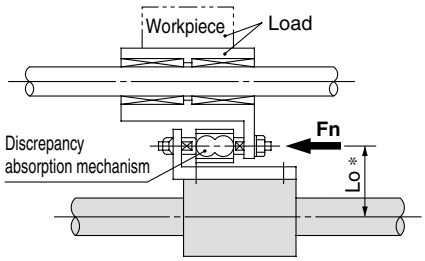
Note 1) This cylinder cannot perform an intermediate stop using an air pressure circuit in vertical operation. In this case, an intermediate stop can be performed only by using an external stopper, etc.
Note 2) Depending on the operating environment, etc., order made products should also be reviewed.
Note 3) An external guide system should be installed when over specifications.

Model Selection 2

Selection Procedure

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 center of the cylinder shaft.
3. Select the bore size from **Lo** and **Fn**, based on data Ⓐ.



Selection example

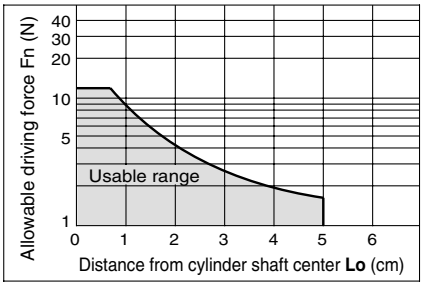
Given a load drive resisting force of **Fn** = 100 (N) and a distance from the cylinder shaft center to the load application point of **Lo** = 8 cm, find the intersection point by extending upward from the horizontal axis of data Ⓐ where the distance from the shaft center is 8 cm, and then extending to the side, find the allowable driving force on the vertical axis.

Models suitable in satisfying the requirement of 100 (N) are **CY3□32** or **CY3□40**.

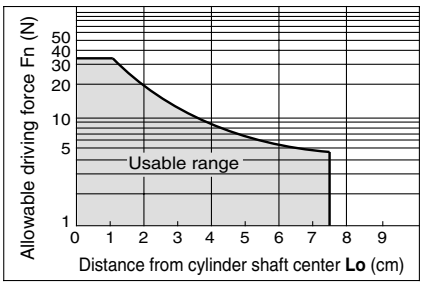
* The Lo point from the cylinder shaft center is the moment working point between the cylinder and the load section.

<Data Ⓐ: Distance from cylinder shaft center —— Allowable driving capacity>

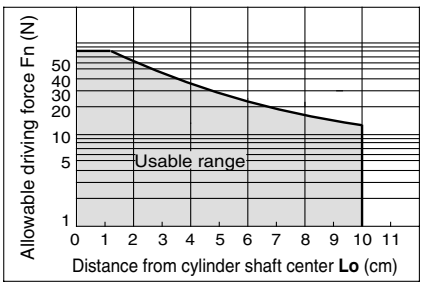
CY3B6



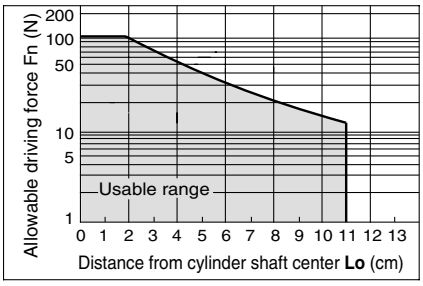
CY3B10



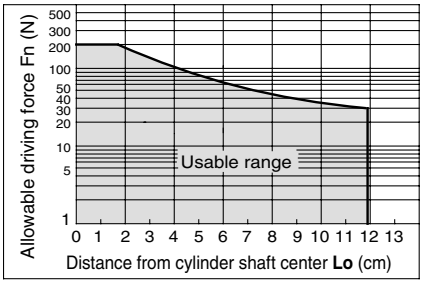
CY3B15



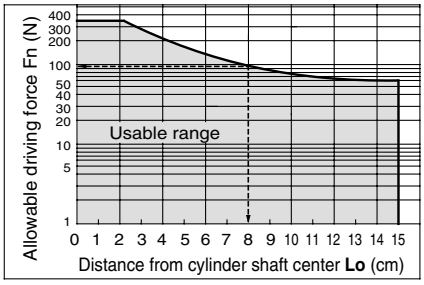
CY3B20



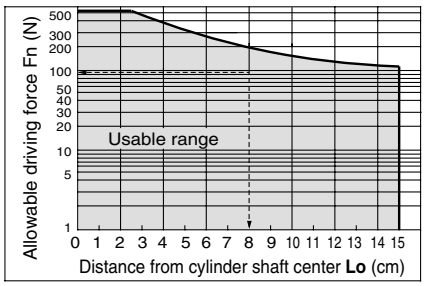
CY3B25



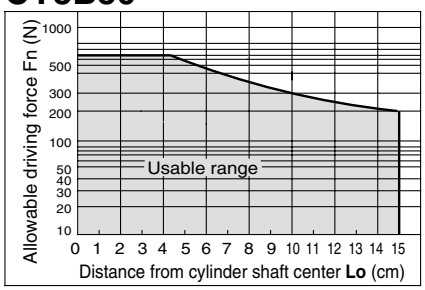
CY3B32



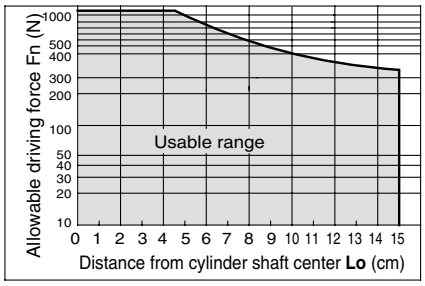
CY3B40



CY3B50



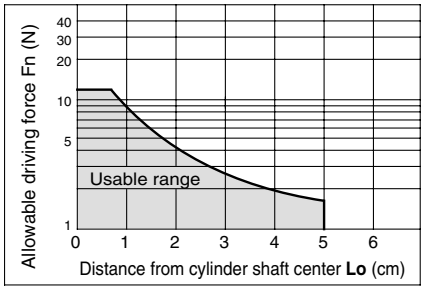
CY3B63



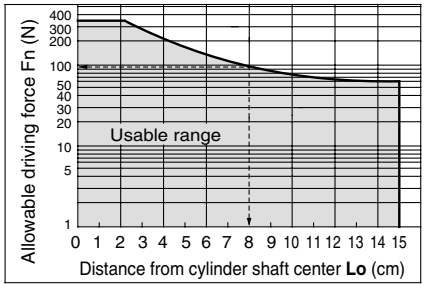
Precautions on Design 1

<Data Ⓐ: Distance from cylinder shaft center —— Allowable driving capacity>

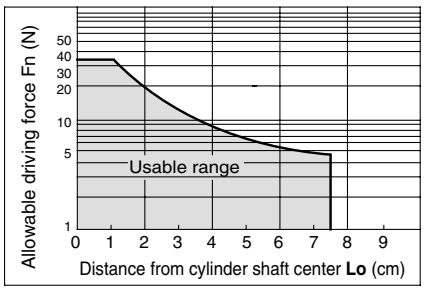
CY3R6



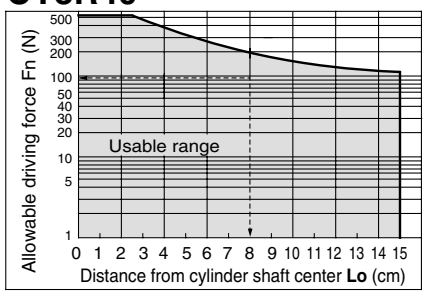
CY3R32



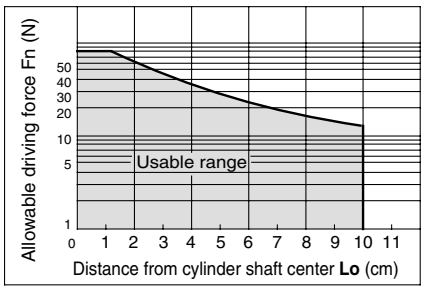
CY3R10



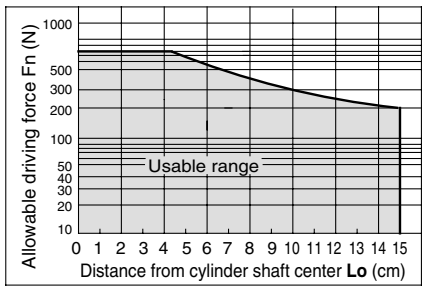
CY3R40



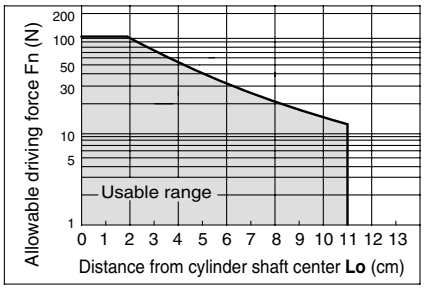
CY3R15



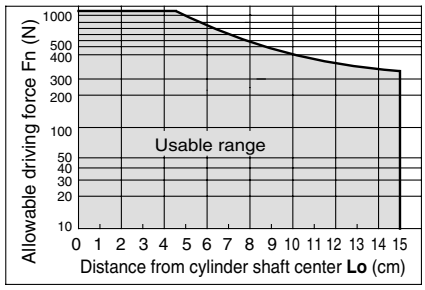
CY3R50



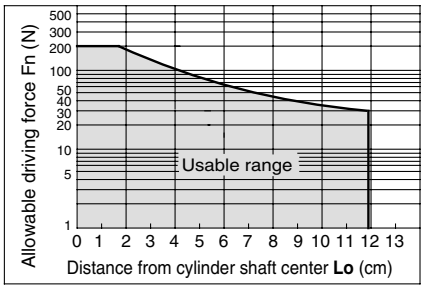
CY3R20



CY3R63



CY3R25

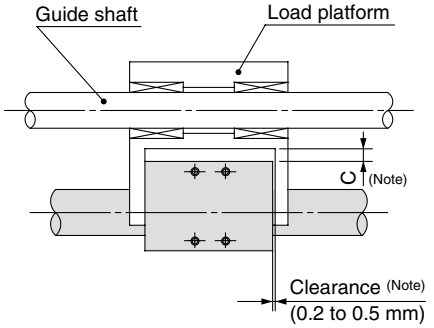


Model Selection 3

Precautions on Design 2

Cylinder Dead Weight Deflection

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



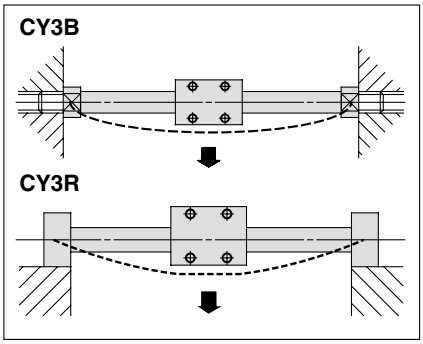
The above clearance amount is a reference value.

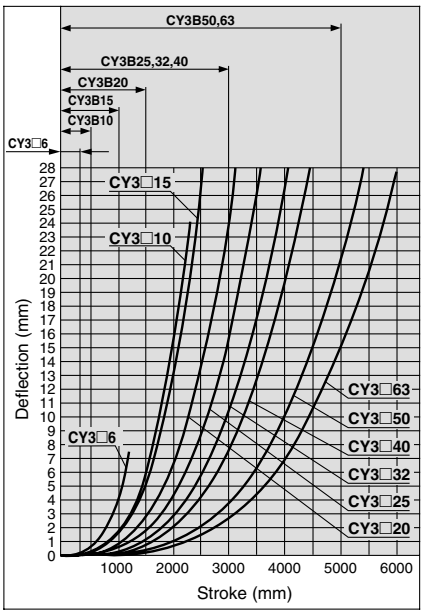
Note 1) According to the dead weight deflection in the figure on the right, provide clearance so that the cylinder does not touch the mounting surface or the load, etc., and is able to operate smoothly within the minimum operating pressure range for a full stroke. For more information, refer to instruction manual.

Note 2) In case of the CY3R, install a shim, etc. to eliminate clearance between the body and the switch rail. For more information, refer to the CY3R instruction manual.

Note 3) The amount of deflection differs from the CY1B/CY1R. Adjust the clearance value by referring to the dead weight deflection as shown in the table on the right.

When CY1B/CY1R are replaced with CY3B/CY3R, install a cylinder after confirming a full stroke and clearance are allowed.



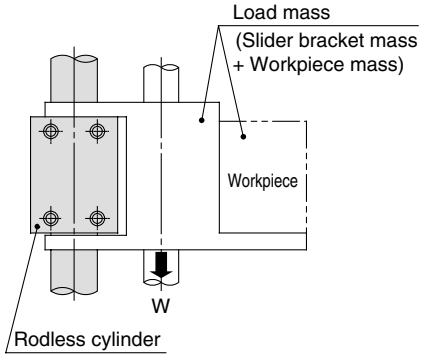


∗ The above deflection data represent values at the time when the external sliding part moves to the middle of the stroke.

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 sidelong, a slider may move downwards due to the self-weight or workpiece mass. If an accurate stopping position is required at the stroke end or mid-stroke, use an external stopper to secure accurate positioning.



Bore size (mm)	Model	Allowable load mass (Wv) (kg)	Max. operating pressure (Pv) (MPa)
6	CY3□6	1.0	0.55
10	CY3□10	2.7	0.55
15	CY3□15	7.0	0.65
20	CY3□20	11.0	0.65
25	CY3□25	18.5	0.65
32	CY3□32	30.0	0.65
40	CY3□40	47.0	0.65
50	CY3□50	75.0	0.65
63	CY3□63	115.0	0.65

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

Maximum Mass of Connection Bracket to the Body

Series CY3B 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 below. Basically, guide the CY3R direct mounting type also with an external axis. (For connection methods, refer to the Instruction Manual.)

Max. Connection Bracket Mass

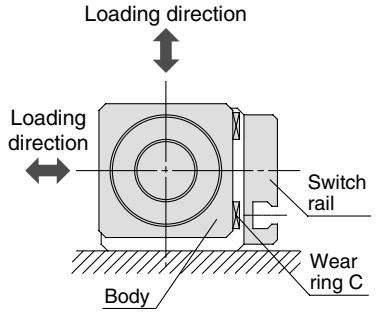
Model	Max. connection bracket mass (WBmax) (kg)
CY3□6	0.2
CY3□10	0.4
CY3□15	1.0
CY3□20	1.1
CY3□25	1.2
CY3□32	1.5
CY3□40	2.0
CY3□50	2.5
CY3□63	3.0

Consult with SMC in case a bracket with mass exceeding the above value is to be mounted.

<CY3R> Maximum Load Mass when Loaded Directly on Body

When the load is applied directly to the body, it should be no greater than the maximum values shown in the table below.

Model	Max. load 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



Precautions on Design 3

Intermediate Stop

(1) Intermediate stopping of load with an external stopper, etc.

When stopping a load in mid-stroke using an external stopper, etc., operate within the operating pressure limits shown in the table below. 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	**CY3□6**	0.55
10	**CY3□10**	0.55
15	**CY3□15**	0.65
20	**CY3□20**	0.65
25	**CY3□25**	0.65
32	**CY3□32**	0.65
40	**CY3□40**	0.65
50	**CY3□50**	0.65
63	**CY3□63**	0.65

(2) Intermediate stopping of load with an air pressure circuit

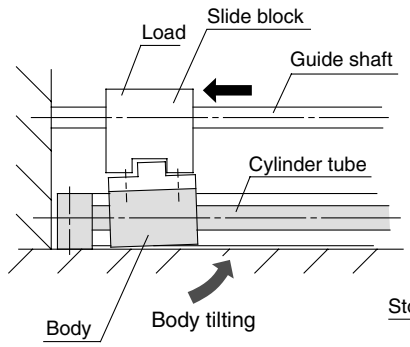
When performing an intermediate stop of a load using an air pressure circuit, operate at or below the kinetic energy shown in the table below. Use caution, as operation when exceeding the allowable value can result in breaking of the magnetic coupling.

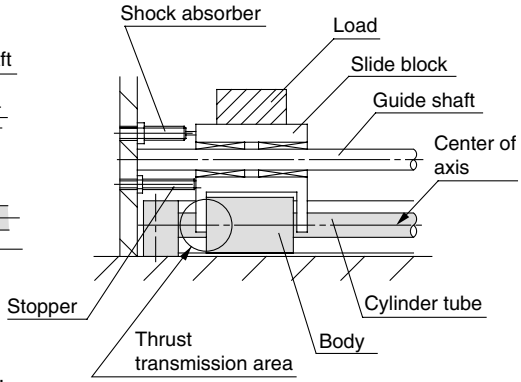
(Reference values)

Bore size (mm)	Model	Allowable kinetic energy for intermediate stop (Es) (J)
6	**CY3□6**	0.007
10	**CY3□10**	0.03
15	**CY3□15**	0.13
20	**CY3□20**	0.24
25	**CY3□25**	0.45
32	**CY3□32**	0.88
40	**CY3□40**	1.53
50	**CY3□50**	3.12
63	**CY3□63**	5.07

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 the left hand drawing below.)
As shown in the right hand drawing below, a shock absorber should be used together with the stopper, and thrust should also be transmitted from the center of the body so that tilting will not occur.





Note) The drawing shows the CY3R series.

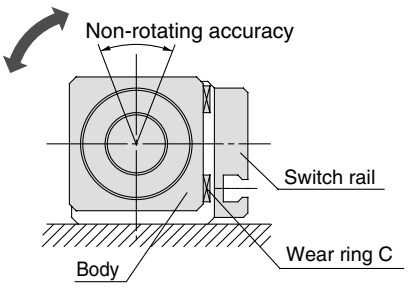
<CY3R>

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 (mm) Note 2)
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



Note 1) Avoid operations where rotational torque (moment) is applied. In such a case, the use of an external guide is recommended.
Note 2) 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.
Note 3) When a load is applied directly to the body, the loaded weight should be no greater than the allowable load mass on page 1172.

Magnetically Coupled Rodless Cylinder/ Basic Type

Series CY3B

ø6, ø10, ø15, ø20, ø25, ø32, ø40, ø50, ø63

How to Order

Basic type **CY3B** **25** **□** – **300** – **□**

Basic type

Bore size

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

Port thread type

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

Standard stroke
Refer to the standard stroke table shown below.

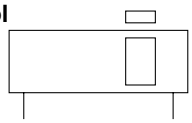
Made to Order
Refer to page 1175 for details.

Standard Stroke

Bore size (mm)	Standard stroke (mm)	Maximum available stroke (mm)
6	50, 100, 150, 200	300
10	50, 100, 150, 200, 250, 300	500
15	50, 100, 150, 200, 250, 300, 350, 400, 450, 500	1000
20	100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	1500
25		3000
32		
40	100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, 1000	3000
50		5000
63		

Note 1) Long stroke specification (XB11) applies to the strokes exceeding 2000 mm. (Refer to page 1405.)
Note 2) The longer the stroke, the larger the amount of deflection in a cylinder tube. Pay attention to the mounting bracket and clearance value.
Note 3) Intermediate stroke is available by the 1 mm interval.

JIS Symbol



Made to Order
(Refer to pages 1395 to 1565 for details.)

Symbol	Specifications
–XB6	Head resistant cylinder (–10 to 150°C)
–XB9	Low-speed cylinder (15 to 50mm/s)
–XB11	Long stroke type
–XB13	Low-speed cylinder (7 to 50mm/s)
–XC24	With magnetic shielding plate
–XC57	With floating joint
–X116	Hydro specifications
–X132	Axial ports
–X160	High speed specifications
–X168	Helical insert thread specifications
–X206	Added mounting tap positions for slider
–X210	Non-lubricated exterior specifications
–X322	Outside of cylinder tube with hard chrome plating
–X324	Non-lubricated exterior specifications (with dust seal)
–X1468	Interchangeable specification with CY1□6

Specifications

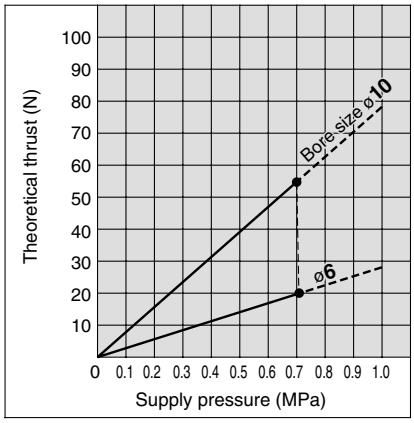
Bore size (mm)	6	10	15	20	25	32	40	50	63
Fluid	Air								
Proof pressure	1.05 MPa								
Max. operating pressure	0.7 MPa								
Min. operating pressure	0.16	0.16	0.16	0.16	0.15	0.14	0.12	0.12	0.12
Ambient and fluid temperature	–10 to 60°C								
Piston speed	50 to 500 mm/s								
Cushion	Rubber bumper								
Lubrication	Not required (Non-lube)								
Stroke length tolerance	0 to 250 st: $^{+1.0}_{0}$, 251 to 1000 st: $^{+1.4}_{0}$, 1001 st to: $^{+1.8}_{0}$								
Mounting orientation	Horizontal, Inclined, Vertical Note)								
Mounting nut (2 pcs.)	Standard equipment (accessory)								
Magnet holding force (N)	19.6	53.9	137	231	363	588	922	1471	2256

Note) When vertically mounting, it is impossible to perform an intermediate stop by means of a pneumatic circuit.

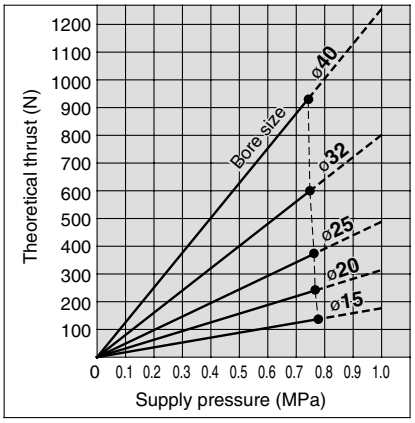
Theoretical Cylinder Thrust

⚠Caution **When calculating the actual thrust, design should consider the minimum actuating pressure.**

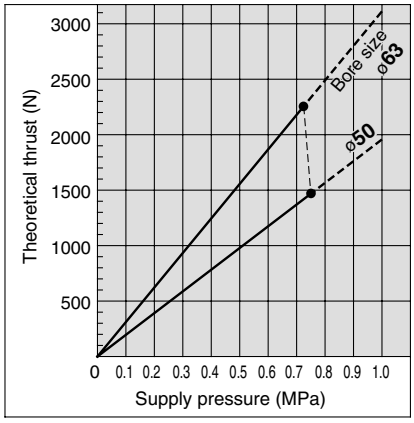
ø6, ø10



ø15, ø20, ø25, ø32, ø40



ø50, ø63



Mass

Unit: kg

Bore size (mm)	6	10	15	20	25	32	40	50	63
Basic mass (at 0 st)	0.052	0.08	0.275	0.351	0.672	1.287	2.07	3.2	5.3
Additional mass per 50 mm of stroke	0.004	0.014	0.015	0.02	0.023	0.033	0.04	0.077	0.096

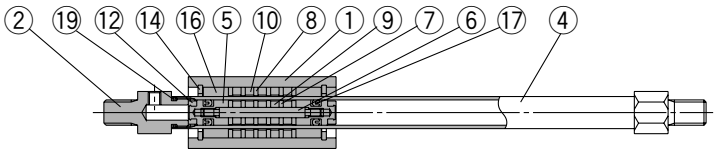
Calculation method/Example: **CY3B32-500**

Basic mass.....1.287 kg
Additional mass .....0.033/50 st
Cylinder stroke.....500 st
} 1.287 + 0.033 x 500 ÷ 50 = 1.617 kg

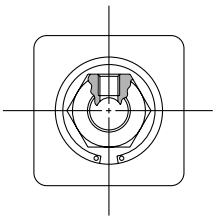
Construction

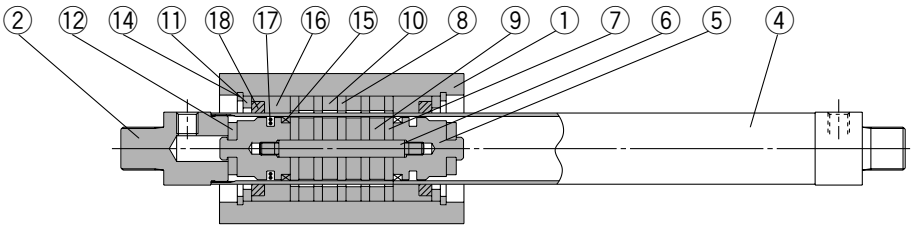
Basic type

CY3B6



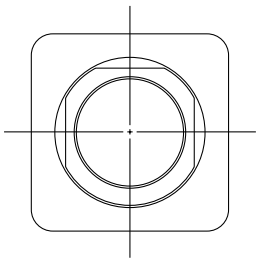
CY3B10, 15

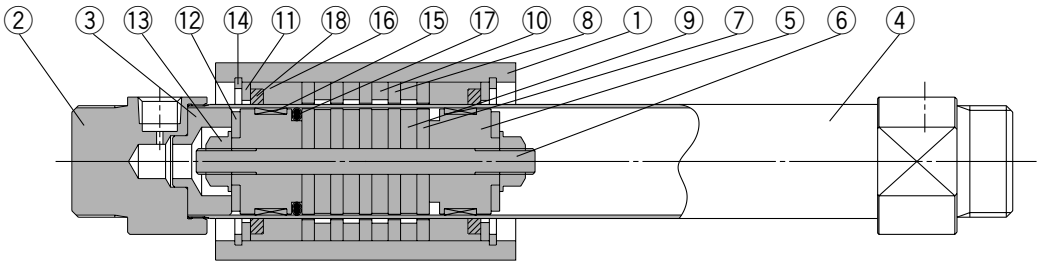




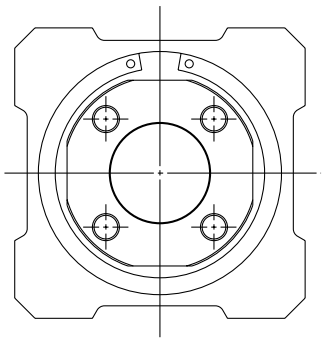
∗ The above drawing is ø15. (3 magnets are used in ø10.)

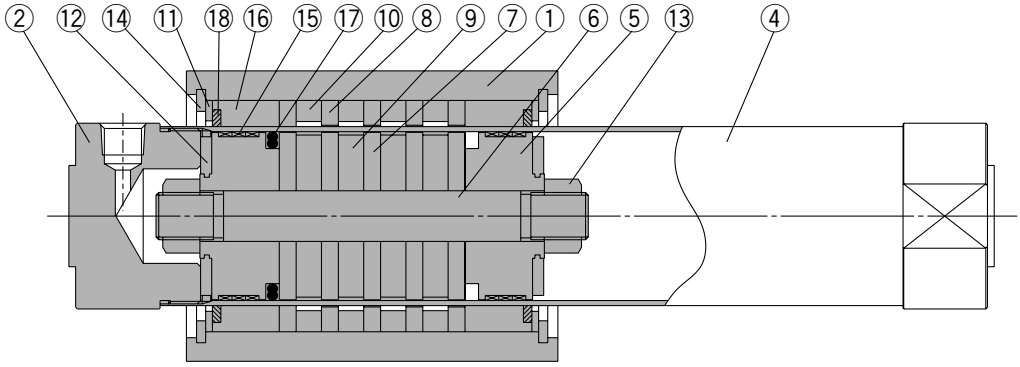
CY3B20 to 40





CY3B50, 63





Component Parts

No.	Description	Material		Note	
1	**Body**	Aluminum alloy		Hard anodized	
2	**Head cover**	ø6, ø10	Brass		
		ø15 to ø63	Aluminum alloy		
3	**End collar**	Aluminum alloy		ø20 to ø40 only	
4	**Cylinder tube**	Stainless steel			
5	**Piston**	ø6	Brass	ø6	Electroless Ni plated
		ø10 to ø63	Aluminum alloy	ø10 to ø63	Chromated
6	**Shaft**	Stainless steel			
7	**Piston side yoke**	Rolled steel		Zinc chromated	
8	**External slider side yoke**	Rolled steel		Zinc chromated	
9	**Magnet A**	—			
10	**Magnet B**	—			
11	**Spacer**	Aluminum alloy		ø6: not available	
12	**Bumper**	Urethane rubber			
13	**Piston nut**	Carbon steel		ø6 to ø15: not available	
14	**C type retaining ring for hole**	Carbon tool steel		Phosphate coated	
15	**Wear ring A**	Special resin			
16	**Wear ring B**	Special resin			
17	**Piston seal**	NBR			
18	**Lubretainer**	Special resin		ø6: not available	
19	**Cylinder tube gasket**	NBR		ø6, ø10 only	

Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
6	CY3B6-PS	Set of nos. above ⑮, ⑯, ⑰, ⑲
10	CY3B10-PS	Set of nos. above ⑮, ⑯, ⑰, ⑱, ⑲
15	CY3B15-PS	Set of nos. above ⑮, ⑯, ⑰, ⑱
20	CY3B20-PS	
25	CY3B25-PS	
32	CY3B32-PS	
40	CY3B40-PS	
50	CY3B50-PS	
63	CY3B63-PS	

Note 1) Seal kits are sets consisting of numbers 15 through 19. Order using the kit number corresponding to each bore size.

Note 2) Adhesive glue is applied to the thread fixed section of the head cover and cylinder tube. Contact SMC if the head cover removal is difficult.

∗ Seal kit includes a grease pack (ø6, ø10: 5 and 10 g, ø15 to ø63: 10 g). Order with the following part number when only the grease pack is needed.

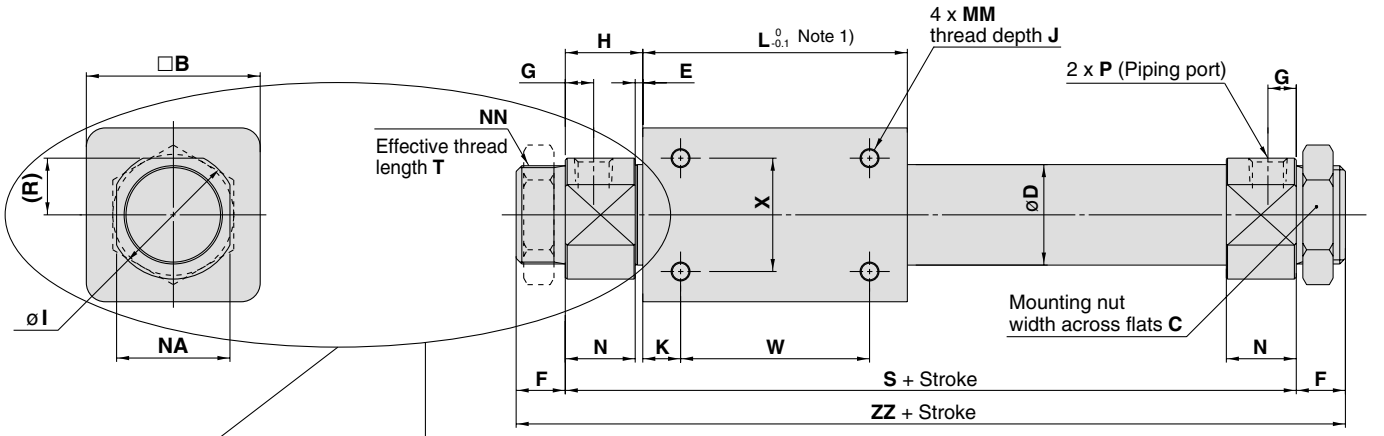
Grease pack part number for ø6, ø10: GR-F-005 (5 g) For external sliding sections
GR-S-010 (10 g) For tubing interior

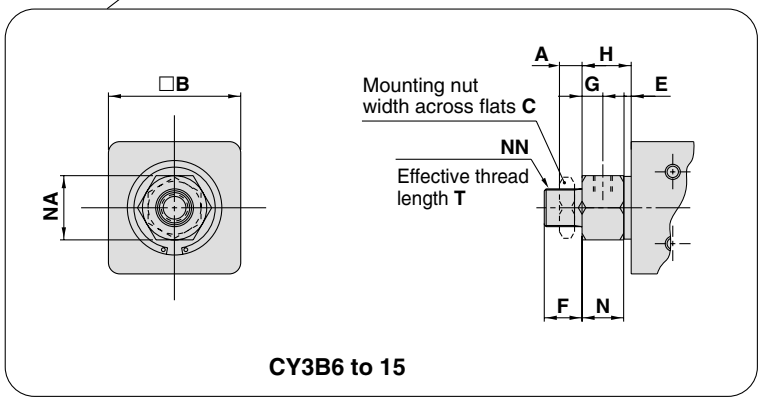
Grease pack part number for ø15 to ø63: GR-S-010 (10 g)

Dimensions

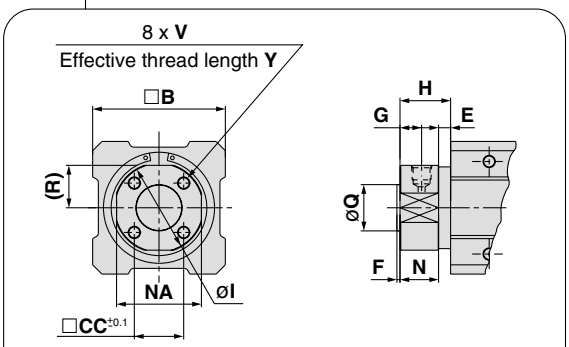
Basic type

CY3B6 to 63





CY3B6 to 15



CY3B50, 63

(mm)

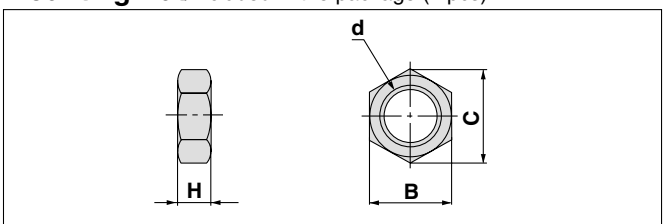
Model	A	B	C	CC	D	E	F	G	H	I	J	K	L	MM	N	NA	NN	Q	R	S	T	V
CY3B6	4	17	8*	—	7.6	4	8*	5	13.5*	—	4.5	5	35	M3 x 0.5	9.5*	10*	M6 x 1*	—	—	62*	6.5	—
CY3B10	4	25	14	—	12	1.5	9	5	12.5	—	4.5	4	38	M3 x 0.5	11	14	M10 x 1	—	—	63	7.5	—
CY3B15	4	35	14	—	16.6*	2	10	5.5	13	—	6	11	57	M4 x 0.7	11	17	M10 x 1	—	—	83	8	—
CY3B20	8	36	26	—	21.6*	2*	13	7.5*	20	28	6	8	66	M4 x 0.7	18*	24	M20 x 1.5	—	12*	106	10	—
CY3B25	8	46	32	—	26.4*	2*	13	7.5*	20.5	34	8	10	70	M5 x 0.8	18.5*	30	M26 x 1.5	—	15*	111	10	—
CY3B32	8	60	32	—	33.6*	2*	16	8*	22	40	8	15	80	M6 x 1	20*	36	M26 x 1.5	—	18*	124	13	—
CY3B40	10	70	41	—	41.6*	3*	16	11	29	50	10	16	92	M6 x 1	26*	46	M32 x 2	—	23*	150	13	—
CY3B50	—	86	—	32	52.4*	8	2	14	33	58*	12	25	110	M8 x 1.25	25	55	—	30 −0.007 −0.037	27.5*	176	—	M8 x 1.25
CY3B63	—	100	—	38	65.4*	8	2	14	33	72*	12	26	122	M8 x 1.25	25	69	—	32 −0.007 −0.043	34.5*	188	—	M10 x 1.5

Model	W	X	Y	ZZ	P (Piping port)		
					Nil	TN*	TF*
CY3B6	25	10	—	78*	M3 x 0.5*	—	—
CY3B10	30	16	—	81	M5 x 0.8	—	—
CY3B15	35	19	—	103	M5 x 0.8	—	—
CY3B20	50	25	—	132	Rc 1/8	NPT 1/8	G 1/8
CY3B25	50	30	—	137	Rc 1/8	NPT 1/8	G 1/8
CY3B32	50	40	—	156	Rc 1/8	NPT 1/8	G 1/8
CY3B40	60	40	—	182	Rc 1/4	NPT 1/4	G 1/4
CY3B50	60	60	16	180	Rc 1/4	NPT 1/4	G 1/4
CY3B63	70	70	16	192	Rc 1/4	NPT 1/4	G 1/4

Note 2) The astrisk denotes the dimensions which are different from the CY1B series.

Note 3) Mounting nuts can be screwed on only for the effective thread length of the head cover (T dimension). When mounting a cylinder, consider the thickness of flange, etc.

Mounting Nut/Included in the package (2 pcs).



Part no.	Applicable bore size (mm)	d	H	B	C
SNJ-006B	**6**	M6 x 1.0	4	8	9.2
SNJ-016B	**10, 15**	M10 x 1.0	4	14	16.2
SN-020B	**20**	M20 x 1.5	8	26	30
SN-032B	**25, 32**	M26 x 1.5	8	32	37
SN-040B	**40**	M32 x 2.0	10	41	47.3

Note) Mounting nuts are not available for ø50 and ø63.

Magnetically Coupled Rodless Cylinder/ Direct Mount Type

Series CY3R

ø6, ø10, ø15, ø20, ø25, ø32, ø40, ø50, ø63

How to Order

CY3R □ 25 □ – 300 □ – M9BW □ – □

Direct mount type

Piping type

Nil	Standard type
G	Centralized piping type

∗ Type G (centralized piping) is not available for ø6.

Bore size

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

Port thread type

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

Cylinder stroke (mm)
Refer to page 1179 for standard stroke.

Switch rail

Nil	With switch rail
N	Without switch rail

Note 1) A type with switch rail has built-in auto switch magnets.
Note 2) ø15 has built-in auto switch magnets even without switch rail.

Auto switch type

Nil	Without auto switch (Built-in magnet)

Note) In case of ø20 with switch rail but without auto switch, the cylinder construction is for reed auto switch. Mounting a solid state auto switch causes malfunctions.

∗ Refer to the table below for auto switch model numbers.

Number of auto switches

Nil	2 pcs.
S	1 ps,
n	"n" pcs.

Made to Order
Refer to page 1179 for details.

Applicable Auto Switches / Refer to pages 1263 to 1371 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC		Load voltage AC	Auto switch model	Lead wire length (m) 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24V	5V,12V	—	**M9N**	●	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9P**	●	●	●	○	○		
				2-wire		12V		**M9B**	●	●	●	○	○	—	
	Diagnostic indication (2-color display)			3-wire (NPN)		5V,12V		**M9NW**	●	●	●	○	○	IC circuit	
				3-wire (PNP)				**M9PW**	●	●	●	○	○		
				2-wire		12V		**M9BW**	●	●	●	○	○	—	
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5V	—	**A96**	●	—	●	—	—	IC circuit	—
			No	2-wire	24V	5V,12V	100V	**A93**	●	—	●	—	—	—	Relay, PLC
							100V or less	**A90**	●	—	●	—	—	IC circuit	

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

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

∗ Other than the applicable auto switches listed in "How to Order", the other auto switches can be mounted. For detailed specifications, refer to page 1185.
∗ With pre-wired connector is also available in solid state auto switches. For specifications, refer to pages 1328 to 1329.
∗ The auto switch is shipped together, but not assembled.

Specifications

Bore size (mm)	6	10	15	20	25	32	40	50	63
Fluid	Air								
Proof pressure	1.05 MPa								
Max. operating pressure	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 temperature	–10 to 60°C								
Piston speed	50 to 500 mm/s								
Cushion	Rubber bumper								
Lubrication	Not required (Non-lube)								
Stroke length tolerance	0 to 250 st: $^{+1.0}_{0}$, 251 to 1000 st: $^{+1.4}_{0}$, 1001 st to: $^{+1.8}_{0}$								
Mounting	Direct mount type								
Mounting orientation	Horizontal, Inclined, Vertical Note 2)								
Magnet holding force (N)	19.6	53.9	137	231	363	588	922	1471	2256

Note 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.
Note 2) When vertically mounting, it is impossible to perform an intermediate stop by means of a pneumatic circuit.

Made to Order
(Refer to pages 1395 to 1565 for details.)

Symbol	Specifications
–X116	**Hydro specifications**
–X160	**High speed specifications**
–X322	**Outside of cylinder tube with hard chrome plating**
–X1468	**Interchangeable specification with CY1□6**
–XC57	**With floating joint**

Standard Stroke

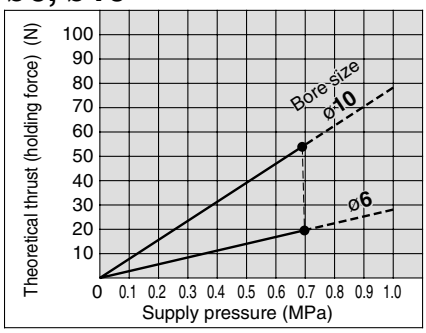
Bore size (mm)	Standard stroke (mm)	Max. stroke without switch (mm)	Max. stroke with switch (mm)
6	50, 100, 150, 200	300	300
10	50, 100, 150, 200, 250, 300	500	500
15	50, 100, 150, 200, 250, 300 350, 400, 450, 500	1000	750
20	100, 150, 200, 250, 300, 350 400, 450, 500, 600, 700, 800	1500	1000
25			1200
32		2000	1500
40	100, 150, 200, 250, 300, 350 400, 450, 500, 600, 700, 800 900, 1000		
50			
63			

Note 1) The longer the stroke, the larger the amount of deflection in a cylinder tube. Pay attention to the mounting bracket and clearance value.
Note 2) Intermediate stroke is available by the 1 mm interval.

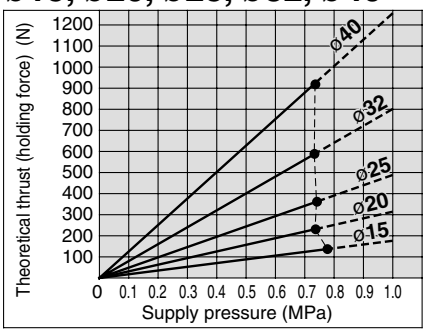
Theoretical Cylinder Thrust

⚠ Caution **When calculating the actual thrust, design should consider the minimum actuating pressure.**

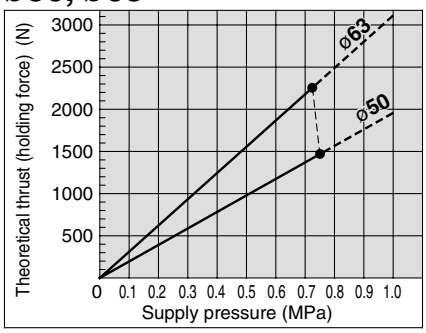
ø6, ø10



ø15, ø20, ø25, ø32, ø40



ø50, ø63



Mass

Unit: kg

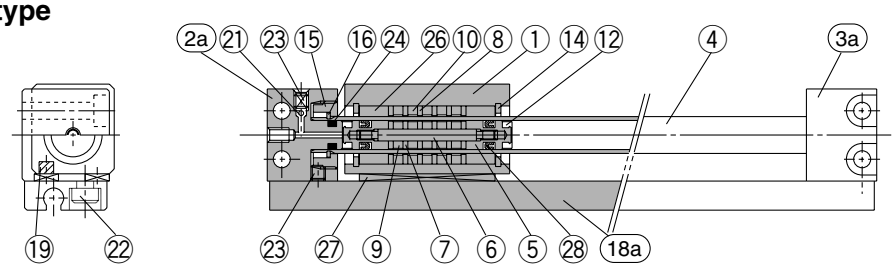
Bore size (mm)		6	10	15	20	25	32	40	50	63
Basic mass (at 0 st)	With switch rail	0.086	0.111	0.272	0.421	0.622	1.217	1.98	3.54	5.38
	Without switch rail	0.069	0.08	0.225	0.351	0.542	1.097	1.82	3.25	5.03
Additional mass per 50 mm of stroke	With switch rail	0.016	0.034	0.040	0.051	0.056	0.076	0.093	0.159	0.188
	Without switch rail	0.004	0.014	0.015	0.020	0.023	0.033	0.040	0.077	0.096

Calculation method/Example: **CY3R25-500** (with switch rail) Basic mass…0.622 (kg), Additional mass…0.056 (kg/50 st), Cylinder stroke…500 (st)
0.622 + 0.056 x 500 ÷ 50 = 1.182 (kg)

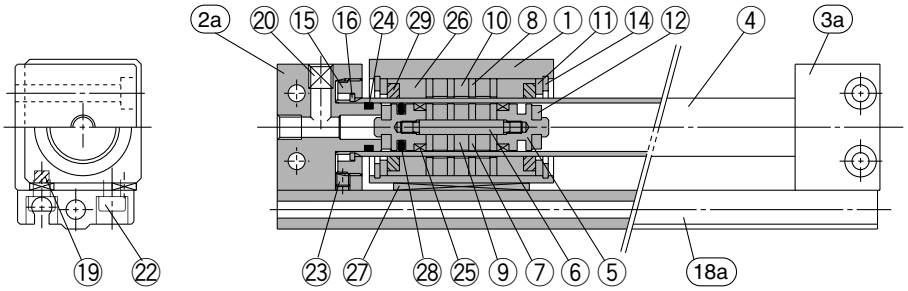
Construction

Both sides piping type

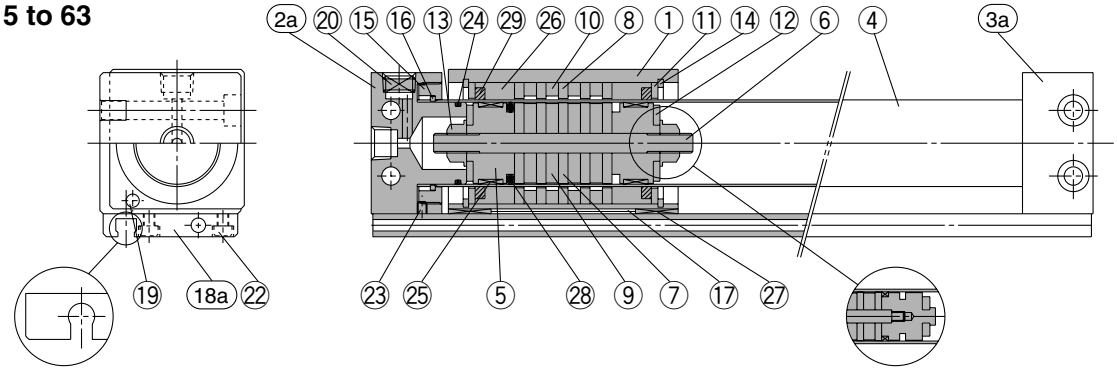
CY3R6



CY3R10



CY3R15 to 63



CY3R15, 20 **CY3R15**

Component Parts

No.	Description	Material		Note	
1	Body	Aluminum alloy		Hard anodized	
2a	End cover A	Aluminum alloy			
2b	End cover C	Aluminum alloy			
3a	End cover B	Aluminum alloy			
3b	End cover D	Aluminum alloy			
4	Cylinder tube	Stainless steel			
5	Piston	ø6	Brass	ø6	Electroless nickel plated
		ø10 to ø63	Aluminum alloy	ø10 to ø63	Chromate
6	Shaft	Stainless steel			
7	Piston side yoke	Rolled steel plate		Zinc chromated	
8	External slider side yoke	Rolled steel plate		Zinc chromated	
9	Magnet A	—			
10	Magnet B	—			
11	Spacer	Aluminum alloy		ø6: not available	
12	Bumper	Urethane rubber			
13	Piston nut	Carbon steel		Zinc chromate (ø6 to ø15: not available)	
14	Type C retaining ring for hole	Carbon tool steel		Phosphate coated	
15	Attachment ring	Aluminum alloy		Chromate	
16	Type C retaining ring for shaft	Hard steel wire			
17	Magnetic shielding plate	Rolled steel plate		Chromated (ø6, ø10: not available)	
18a	Switch rail (both sides piping)	Aluminum alloy		White anodized	
18b	Switch rail (centralized piping)	Aluminum alloy		White anodized	
19	Magnet	—			
20	Hexagon socket head plug	Chromium steel		Nickel plated	
21	Steel balls	Chromium steel		ø40	Hexagon socket head plug
				ø20, ø50, ø63	None
22	Hexagon socket head screw	Chromium steel		Nickel plated	
23	Hexagon socket head set screw	Chromium steel		Nickel plated	

No.	Description	Material	Note
24 Note 2)	Cylinder tube Gasket	NBR	
25 Note 2)	Wear ring A	Special resin	ø6: not available
26 Note 2)	Wear ring B	Special resin	
27 Note 2)	Wear ring C	Special resin	
28 Note 2)	Piston seal	NBR	
29 Note 2)	Lubretainer	Special resin	ø6: not available
30 Note 2)	Switch rail gasket	NBR	Both sides piping type: None

Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
6	CY3R6-PS	Set of nos. above ㉔, ㉖, ㉗, ㉘
10	CY3R10-PS	Set of nos. above ㉔, ㉕, ㉖, ㉗, ㉘, ㉙, ㉚
15	CY3R15-PS	
20	CY3R20-PS	
25	CY3R25-PS	
32	CY3R32-PS	
40	CY3R40-PS	
50	CY3R50-PS	
63	CY3R63-PS	

Note1) Seal kits are the same for both the both sides piping type and the centralized piping type.

Note2) Seal kits are sets consisting of numbers 24 through 30. Order using the kit number corresponding to each bore size.

∗ Seal kit includes a grease pack (ø6, ø10: 5 and 10 g, ø15 to ø63: 10 g). Order with the following part number when only the grease pack is needed.

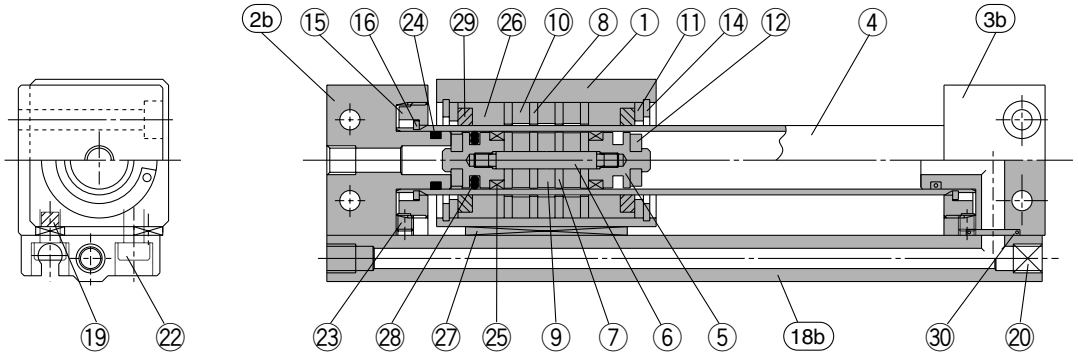
Grease pack part number for ø6, ø10: GR-F-005 (5 g) For external sliding sections
GR-S-010 (10 g) For tubing interior

Grease pack part number for ø15 to ø63: GR-S-010 (10 g)

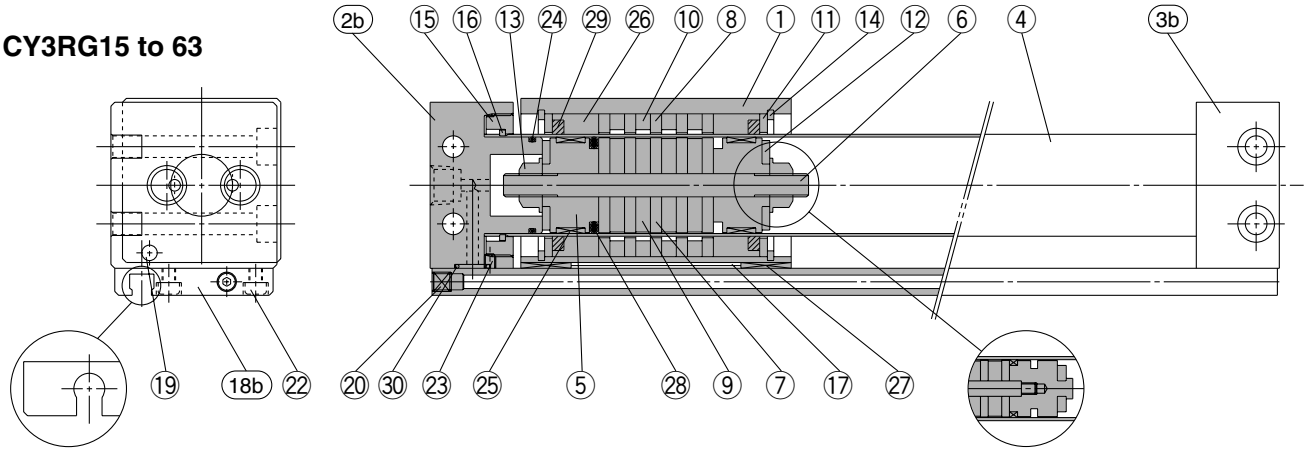
Construction

Centralized piping type

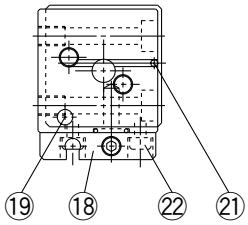
CY3RG10



CY3RG15 to 63



CY3RG15, 20 **CY3RG15**



CY3RG15

Switch Rail Accessory

CYR 15 E B (N) – 100

Bore size

Cylinder piping type

Nil	Centralized piping (CY3RG)
B	Both sides piping (CY3R)

Note) Only "B" for ø6.

Auto switch type (ø20 only)

Nil	For reed switch
N	For solid state switch

Stroke

Switch Rail Accessory Kit

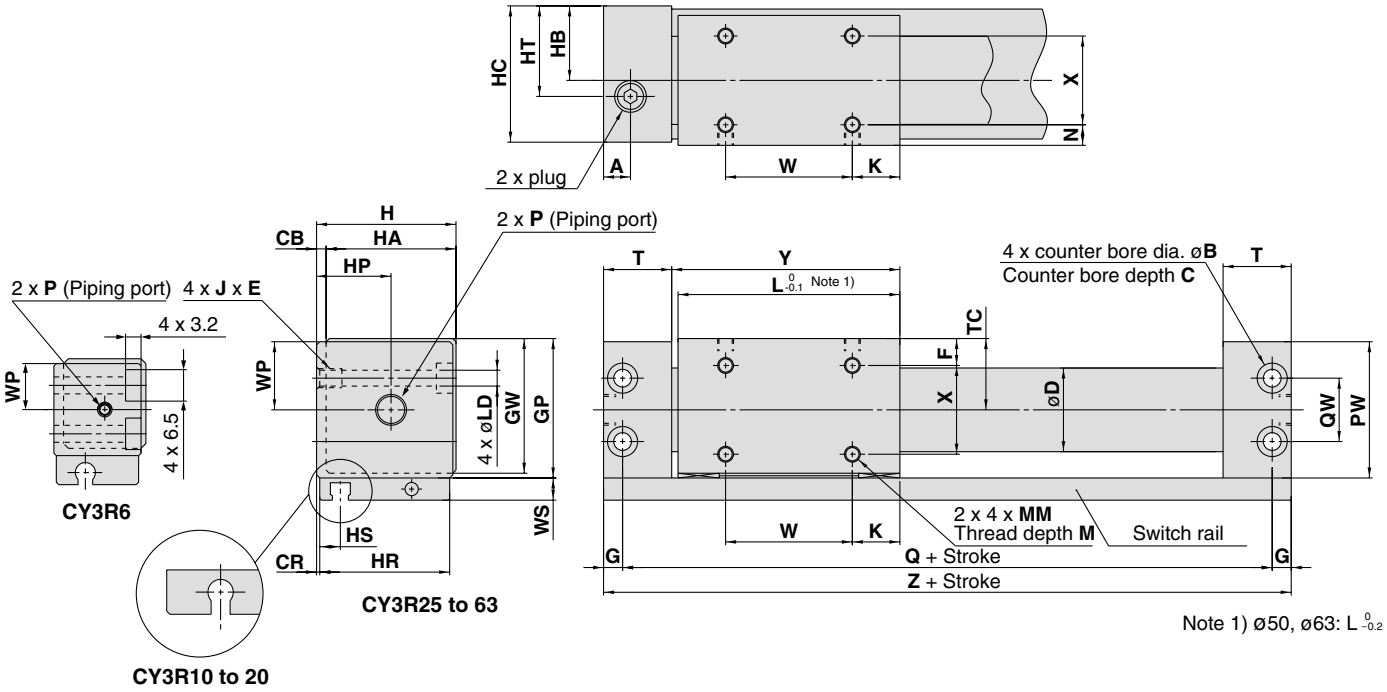
Bore size (mm)		Kit no.		Contents
		Both sides piping	Centralized piping	
6		CYR6EB-☐	—	Numbers (18a), (18b), ⑲, ㉒, ㉗ above
10		CYR10EB-☐	CYR10E-☐	Numbers (18a), (18b), ⑲, ⑳, ㉒, ㉗ above
15		CYR15EB-☐	CYR15E-☐	Numbers ⑰, (18a), (18b), ⑳, ㉒, ㉗ above Note 2)
20	For reed switch	CYR20EB-☐	CYR20E-☐	Numbers ⑰, (18a), (18b), ⑳, ㉒, ㉗ above
	For solid state switch	CYR20EBN-☐	CYR20EN-☐	
25		CYR25EB-☐	CYR25E-☐	
32		CYR32EB-☐	CYR32E-☐	
40		CYR40EB-☐	CYR40E-☐	
50		CYR50EB-☐	CYR50E-☐	
63		CYR63EB-☐	CYR63E-☐	

Note 1) ☐ indicates the stroke.
Note 2) A magnet is already built in for ø15.
Note 3) (18a) is attached on both sides piping.
Note 4) (18b) and ⑳ are attached on centralized piping.

Dimensions

Both sides piping type: ø6 to ø63

Note) This figure shows types with switch rail (Nil).



Note 1) ø50, ø63: L $^{0}_{-0.2}$

(mm)

Model	A	B	C	CB	CR	D	F	G	GP	GW	H	HA	HB	HC	HP	HR	HS	HT	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	10.5*	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	14	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	8.5	17	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	24	36	7.5	24	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	23.5	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	7	29	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	8	36	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	45	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	51	M10 x 1.5 x 15	24

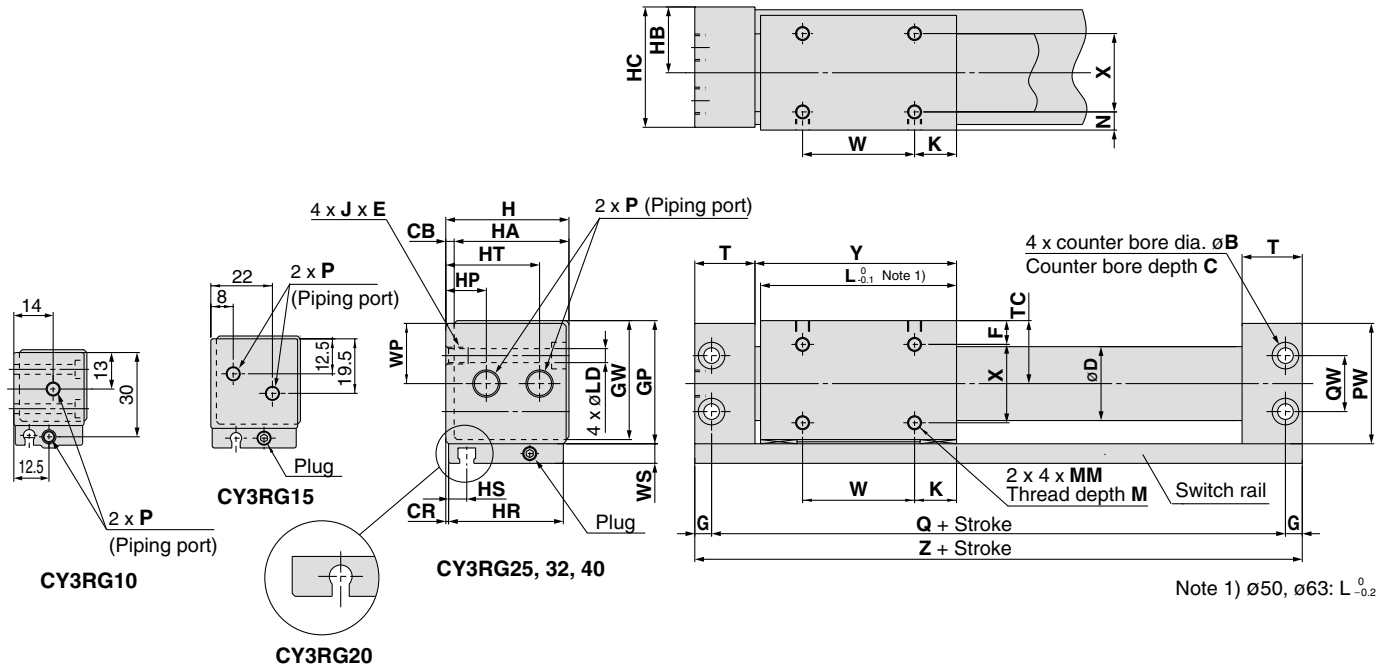
Model	L	LD	M	MM	N	PW	Q	QW	T	TC	W	WP	WS	X	Y	Z
CY3R6	34	3.5	3.5	M3 x 0.5	3.5	19	60*	10	14.5*	10.5	20	9.5	6	10	35.5	66*
CY3R10	38	3.5	4	M3 x 0.5	4.5	26	68	14	17.5	14	20	13	8	15	39.5	76
CY3R15	53	4.3	5	M4 x 0.7	6	32	84	18	19	17	25	16	7	18	54.5	94
CY3R20	62	5.4	5	M4 x 0.7	7	38	95	17	20.5	20	40	19	7	22	64	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)		
	Nil	TN*	TF*
CY3R6	M3 x 0.5*	—	—
CY3R10	M5 x 0.8	—	—
CY3R15	M5 x 0.8	—	—
CY3R20	Rc 1/8	NPT 1/8	G 1/8
CY3R25	Rc 1/8	NPT 1/8	G 1/8
CY3R32	Rc 1/8	NPT 1/8	G 1/8
CY3R40	Rc 1/4	NPT 1/4	G 1/4
CY3R50	Rc 1/4	NPT 1/4	G 1/4
CY3R63	Rc 1/4	NPT 1/4	G 1/4

Note 2) The astrisk denotes the dimensions which are different from the CY1R series.

Dimensions

Centralized piping type: ø10 to ø63



Note 1) ø50, ø63: L $^{0}_{-0.2}$

(mm)

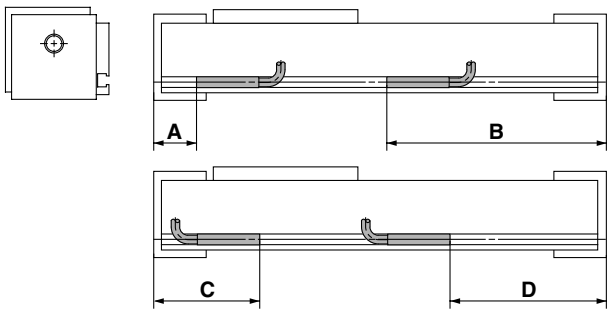
Model	B	C	CB	CR	D	F	G	GP	GW	H	HA	HB	HC	HP	HR	HS	HT	J x E	K	L
CY3RG10	6.5	3.2	2	0.5	12	6.5	4	27	25.5	26	24	14	25	—	24	5	—	M4 x 0.7 x 6	9	38
CY3RG15	8	4.2	2	0.5	16.6*	8	5	33	31.5	32	30	17	31	—	30	8.5	—	M5 x 0.8 x 7	14	53
CY3RG20	9.5	5.2	3	1	21.6*	9	6	39	37.5	39	36	21	38	11	36	7.5	28	M6 x 1 x 8	11	62
CY3RG25	9.5	5.2	3	1	26.4*	8.5	6	44	42.5	44	41	23.5	43	14.5	41	6.5	33.5	M6 x 1 x 8	15	70
CY3RG32	11	6.5	3	1.5	33.6*	10.5	7	55	53.5	55	52	29	54	20	51	7	41	M8 x 1.25 x 10	13	76
CY3RG40	11	6.5	5	2	41.6*	13	7	65	63.5	67	62	36	66	25	62	8	50	M8 x 1.25 x 10	15	90
CY3RG50	14	8.2	5	2	52.4*	17	8.5	83	81.5	85	80	45	84	32	80	9	56	M10 x 1.5 x 15	25	110
CY3RG63	14	8.2	5	3	65.4*	18	8.5	95	93.5	97	92	51	96	35	90	9.5	63.5	M10 x 1.5 x 15	24	118

Model	LD	M	MM	N	PW	Q	QW	T	TC	W	WP	WS	X	Y	Z
CY3RG10	3.5	4	M3 x 0.5	4.5	26	68	14	17.5	14	20	13	8	15	39.5	76
CY3RG15	4.3	5	M4 x 0.7	6	32	84	18	19	17	25	16	7	18	54.5	94
CY3RG20	5.4	5	M4 x 0.7	7	38	95	17	20.5	20	40	19	7	22	64	107
CY3RG25	5.4	6	M5 x 0.8	6.5	43	105	20	21.5	22.5	40	21.5	7	28	72	117
CY3RG32	7	7	M6 x 1	8.5	54	116	26	24	28	50	27	7	35	79	130
CY3RG40	7	8	M6 x 1	11	64	134	34	26	33	60	32	7	40	93	148
CY3RG50	8.6	10	M8 x 1.25	15	82	159	48	30	42	60	41	10	50	113	176
CY3RG63	8.6	10	M8 x 1.25	16	94	171	60	32	48	70	47	10	60	121	188

Model	**P** (Piping port)		
	Nil	**TN***	**TF***
CY3RG10	M5 x 0.8	—	—
CY3RG15	M5 x 0.8	—	—
CY3RG20	Rc 1/8	NPT 1/8	G 1/8
CY3RG25	Rc 1/8	NPT 1/8	G 1/8
CY3RG32	Rc 1/8	NPT 1/8	G 1/8
CY3RG40	Rc 1/4	NPT 1/4	G 1/4
CY3RG50	Rc 1/4	NPT 1/4	G 1/4
CY3RG63	Rc 1/4	NPT 1/4	G 1/4

Note 2) The astrisk denotes the dimensions which are different from the CY1RG series.

Auto Switch Proper Mounting Position for Stroke End Detection



(Reference dimension)

Auto Switch Proper Mounting Position
ø6 to ø20

(mm)

Bore size (mm) \ Auto switch model	A		B		C		D	
	D-A9□	D-M9□ D-M9□W	D-A9□	D-M9□ D-M9□W	D-A9□	D-M9□ D-M9□W	D-A9□	D-M9□ D-M9□W
6	26	30	46	42	46	42	26	30
10	28	32	48	44	48	44	—	32
15	17.5	21.5	76.5	72.5	—	—	56.5	60.5
20	19.5	23.5	87.5	83.5	39.5	35.5	67.5	71.5

Note 1) Auto switches cannot be installed in Area C in the case of ø15.
Note 2) D-A9□ type cannot be mounted on the section D of ø10.
Note 3) The above values are a guideline of the auto switch mounting position when detected at the stroke end. Adjust the auto switch after confirming the operating conditions in the actual setting.
Note 4) D-Z7□ and D-Y□ types cannot be mounted.

ø25 to ø63

(mm)

Bore size (mm) \ Auto switch model	A			B			C			D		
	D-A9□	D-M9□ D-M9□W	D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W	D-A9□	D-M9□ D-M9□W	D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W	D-A9□	D-M9□ D-M9□W	D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W	D-A9□	D-M9□ D-M9□W	D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W
25	19	23	18	98	94	99	42	38	43	75	79	74
32	22.5	26.5	21.5	107.5	103.5	108.5	45.5	41.5	46.5	84.5	88.5	83.5
40	24.5	28.5	23.5	123.5	119.5	124.5	47.5	43.5	48.5	100.5	104.5	99.5
50	28.5	32.5	27.5	147.5	143.5	148.5	51.5	47.5	52.5	124.5	128.5	123.5
63	30.5	34.5	29.5	157.5	153.5	158.5	53.5	49.5	54.5	134.5	138.5	133.5

Note 1) 50 mm is the minimum stroke available with 2 auto switches mounted.
Note 2) Figures in the table above are used as a reference when mounting the auto switches for stroke end detection. In the case of actually setting the auto switches, adjust them after confirming their operation.
Note 3) Auto switch brackets are required when ordering D-A9□/M9□/M9□W types and cylinders separately. (Refer to the auto switch mounting bracket: part no. on page 1185.)

Auto Switch Operation Range

(mm)

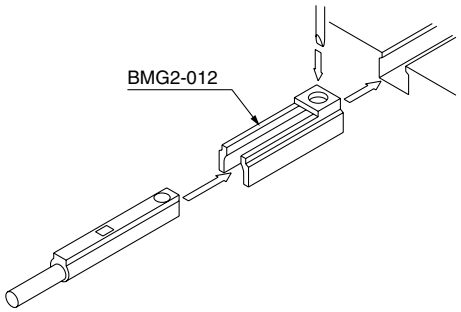
Auto switch model	Bore size (mm)								
	6	**10**	**15**	**20**	**25**	**32**	**40**	**50**	**63**
D-A9□	8	11	8	6	6	7	9	8	8
D-M9□ **D-M9□W**	4.5	6.5	6.5	4	5	5.5	5.5	6.5	7
D-Z7□/Z80	—	—	—	—	9	9	11	9	10
D-Y59□/Y7P/Y7□W	—	—	—	—	5	5	6	6	6

∗ The auto switches cannot be mounted in some cases.
∗ Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approximately ±30% dispersion). It may vary substantially depending on an ambient environment.

Auto Switch Mounting Bracket/Part No.

Auto switch model	Bore size (mm)
	ø25 to ø63
D-A9□ **D-M9□** **D-M9□W**	BMG2-012

D-A9□/M9□/M9□W



Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted.
For detailed specifications, refer to pages 1263 to 1371.

Type	Model	Electrical entry	Features	Applicable bore size
Reed auto switch	D-Z73, Z76	Grommet (In-line)	—	ø25 to ø63
	D-Z80		Without indicator light	
Solid state auto switch	D-Y59A, Y59B, Y7P	Grommet (In-line)	—	
	D-Y7NW, Y7PW, Y7BW		Diagnostic indication (2-color display)	

∗ With pre-wired connector is also available in solid state auto switches. For specifications, refer to pages 1328 and 1329.
∗ Normally closed (NC = b contact), solid state switch (D-F9G/F9H/Y7G/Y7H type) are also available. For details, refer to pages 1290 and 1292.
∗ Applicable bore sizes are ø25 to ø63.

Series CY3B/CY3R
Specific Product Precautions 1

Be sure to read before handling.
Refer to front matters 54 and 55 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

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.

2. Do not apply a load to a cylinder which is greater than the allowable value stated in the Model Selection.

Applying an improper load may cause malfunctions.

3. When the cylinder is used in a place where water or cutting oil may splash it or the lubrication on its sliding parts could be deteriorate, please consult with SMC.

4. When applying grease to the cylinder, use the grease that has already been applied to the product. Contact SMC for available grease packs.

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 lubretainer, which in turn can cause malfunction.

2. Take care regarding rotation of the external slider.

Rotation should be controlled by connecting it to another shaft (linear guide, etc.).

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. The cylinder is mounted with bolts through the mounting holes in the end covers. Be sure they are tightened securely. (CY3R)

5. If gaps occur between the mounting surface and the end covers when mounting with bolts, perform shim adjustment using spacers, etc. so that there is no unreasonable stress. (CY3R)

6. Be sure that both end covers are secured to the mounting surface before operating the cylinder.

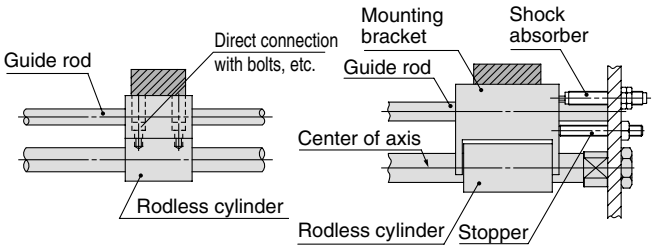
Avoid operation with the external slider secured to the surface.

Mounting

⚠ Caution

7. Do not apply a lateral load to the external slider.

When a load is mounted directly to the cylinder, variations in the alignment of each shaft center cannot be assimilated, which results in the generation of a lateral load that can cause malfunction. (Figure 1) The cylinder should be operated using a connection method which allows for assimilation of shaft alignment variations and deflection due to the cylinder's own mass. A drawing of a recommended mounting is shown in Figure 2.



Variations in the load and cylinder shaft alignment cannot be assimilated, resulting in malfunction.

Figure 1. Incorrect mounting

Note) The drawing shows the CY3B series.

Shaft alignment variations are assimilated by providing clearance for the mounting bracket and cylinder. Moreover, the mounting bracket is extended above the cylinder shaft center, so that the cylinder is not subjected to moment.

Figure 2. Recommended mounting

8. Use caution regarding the allowable load mass when operating in a vertical direction.

The allowable load mass when operating in a vertical direction (reference values on page 1172) is determined by the model selection method, however, if a load greater than the allowable value is applied, the magnetic coupling may break and there is a possibility of dropping the load. When using this type of application, contact SMC regarding the operating conditions (pressure, load, speed, stroke, frequency, etc.).

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

As the stroke becomes longer, variations in the center axis become larger. Consider using a connection method (floating mechamism) that is able to absorb these variations. Furthermore, use the special floating brackets (XC57) which have been provided for the CY3B and CY3R series (page 1483).

Series CY3B/CY3R
Specific Product Precautions 2

Be sure to read before handling.
Refer to front matters 54 and 55 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

Disassembly & Maintenance

⚠ Warning

1. Use caution as the attractive power of the magnets is very strong.

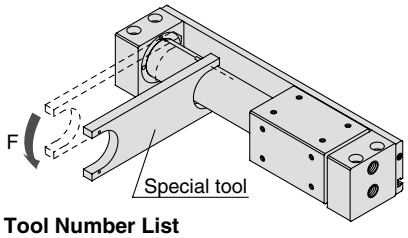
When removing the external slider and piston slider from the cylinder tube for maintenance, etc., handle with caution, since the magnets installed in each slider have very strong attractive power.

⚠ Caution

1. When reattaching the head covers after disassembly, confirm that they are tightened securely. (CY3B)

When disassembling, hold the wrench flat section of one head cover with a vise, and remove the other cover using a spanner or adjustable angle wrench on its wrench flat section. When retightening, first coat with Locktight (No. 542 red), and retighten 3 to 5° past the original position prior to removal.

2. Special tools are necessary for disassembly. (CY3R)



Special Tool Number List

Part no.	Applicable bore size (mm)
CYRZ-V	6, 10, 15, 20
CYRZ-W	25, 32, 40
CYRZ-X	50
CYRZ-Y	63

3. Use caution when taking off the external slider, as the piston slider will be directly attracted to it.

When removing the external slider or piston slider from the cylinder tube, first force the sliders out of their magnetically coupled positions and then remove them individually while there is no longer any holding force. If they are removed when still magnetically coupled, they will be directly attracted to one another and will not come apart.

4. Do not disassemble the magnetic components (piston slider, external slider).

This can cause a loss of holding force and malfunction.

5. When disassembling to replace the seals and wear ring, refer to the separate disassembly instructions.

Disassembly & Maintenance

⚠ Caution

6. Note the direction of the external slider and piston slider.

Since the external slider and piston slider are directional for ø6 and ø10, refer to the figures below when performing disassembly or maintenance. Put the external slider and piston slider together, and insert the piston slider into the cylinder tube so that they will have the correct positional relationship as shown in Figure 3. If they align as shown in Figure 4, insert the piston slider after turning it around 180°. If the direction is not correct, it will be impossible to obtain the specified holding force.

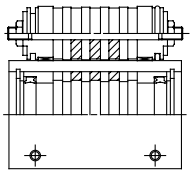


Figure 3. Correct position

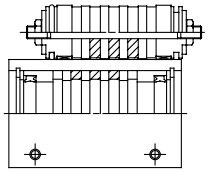


Figure 4. Incorrect position

For ø6 and ø10