

Magnetically Coupled Rodless Cylinder/ Basic Type

CY3B Series

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

• **Standard stroke**
Refer to the standard stroke table shown below.

• **Made to Order**
Refer to page 1469 for details.

• **Port thread type**

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

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 type (XB11) applies to the strokes exceeding 2000 mm. (Refer to page 1739.)

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 in 1 mm increments.

Specifications

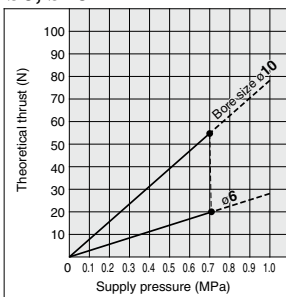
Bore size (mm)	6	10	15	20	25	32	40	50	63
Fluid	Air								
Proof pressure	1.05 MPa								
Max. operating pressure	0.7 MPa								
Min. operating pressure	0.16	0.16	0.16	0.16	0.15	0.14	0.12	0.12	0.12
Ambient and fluid temperature	-10 to 60°C (No freezing)								
Piston speed	50 to 500 mm/s								
Cushion	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 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.

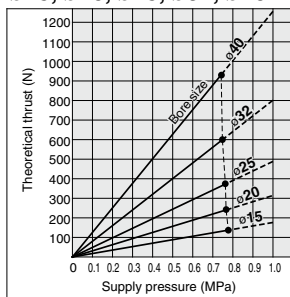
⚠ Caution When calculating the actual thrust, design should consider the minimum actuating pressure.

Theoretical Cylinder Thrust

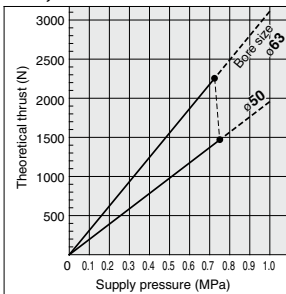
ø6, ø10



ø15, ø20, ø25, ø32, ø40



ø50, ø63



Weight

Bore size (mm)	6	10	15	20	25	32	40	50	63
Basic weight (at 0 st)	0.052	0.08	0.275	0.351	0.672	1.287	2.07	3.2	5.3
Additional weight 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**

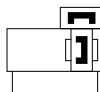
Basic weight.....1.287 kg
 Additional weight.....0.033/50 st } 1.287 + 0.033 x 500 ÷ 50 = 1.617 kg
 Cylinder stroke.....500 st }

Unit: kg



Symbol

Rubber bumper (Magnet type)



Made to Order: Individual Specifications
(For details, refer to pages 1480 to 1482.)

Symbol	Specifications
-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

Made to Order

[Click here 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

For clean specifications, refer to "Pneumatic Clean Series" catalog (CAT.E02-23).

CY3B
CY3R

CY1S

CY1L

CY1H

CY1F

CYP

D-□

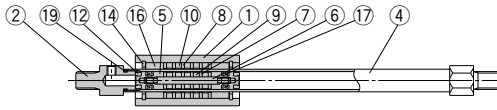
-X□

Technical
Data

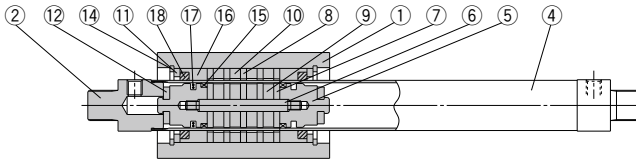
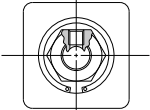
CY3B Series

Construction

Basic type CY3B6

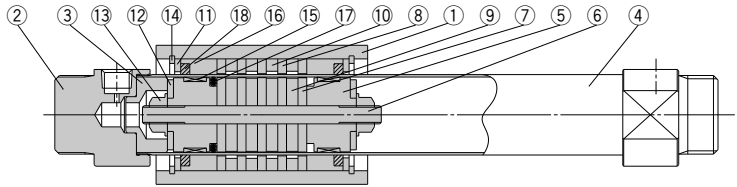
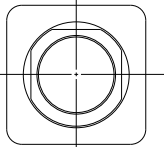


CY3B10, 15

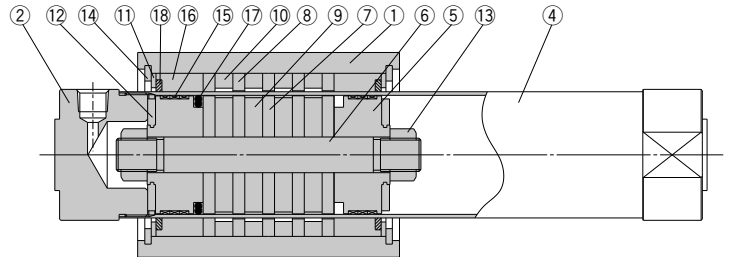
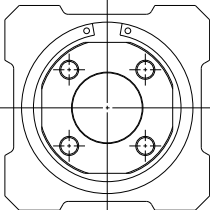


* The above drawing is $\phi 15$. (3 magnets are used in $\phi 10$.)

CY3B20 to 40



CY3B50, 63



Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Head cover	$\phi 6, \phi 10$ Brass $\phi 15$ to $\phi 63$ Aluminum alloy	
3	End collar	Aluminum alloy	$\phi 20$ to $\phi 40$ only
4	Cylinder tube	Stainless steel	
5	Piston	$\phi 6$ Brass $\phi 10$ to $\phi 63$ Aluminum alloy	$\phi 6$ Electroless Ni plated $\phi 10$ to $\phi 63$ Chromated
6	Shaft	Stainless steel	Chromated
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	$\phi 6$: not available
12	Bumper	Urethane rubber	
13	Piston nut	Carbon steel	$\phi 6$ to $\phi 15$: 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	Lube-retainer	Special resin	$\phi 6$: not available
19	Cylinder tube gasket	NBR	$\phi 6, \phi 10$ only

Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
6	CY3B6-PS	Set of nos. above 16, 17, 19
10	CY3B10-PS	Set of nos. above 16, 17, 18, 19
15	CY3B15-PS	
20	CY3B20-PS	
25	CY3B25-PS	Set of nos. above 15, 16, 17, 18
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.

Note 3) For replacement of the $\phi 10$ wear ring A, contact SMC or your nearest sales representative.

* Seal kit includes a grease pack ($\phi 6, \phi 10$: 5 and 10 g, $\phi 15$ to $\phi 63$: 10 g). Order with the following part number when only the grease pack is needed.

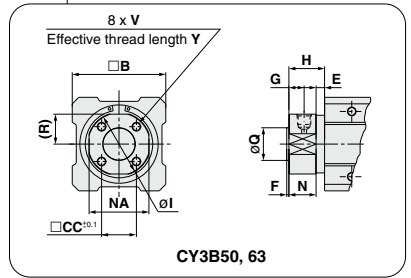
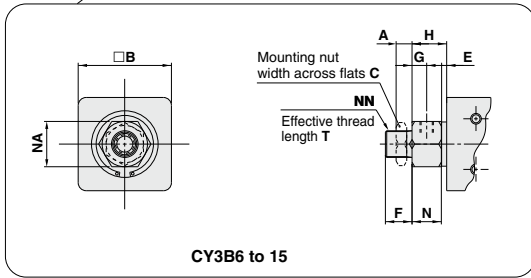
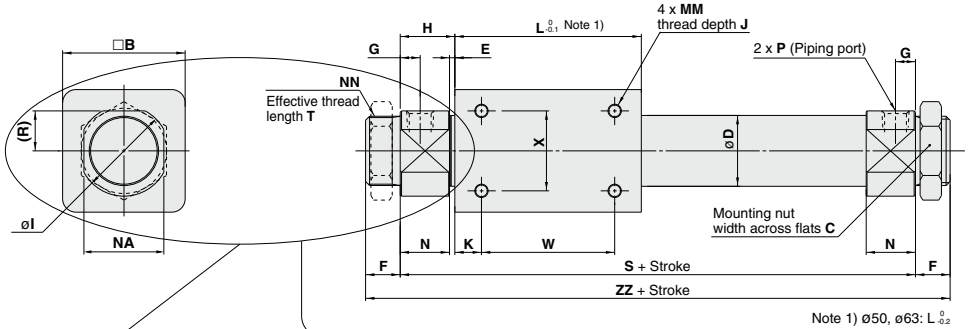
Grease pack part number for $\phi 6, \phi 10$: GR-F-005 (5 g) For external sliding sections
GR-S-010 (10 g) For tubing interior

Grease pack part number for $\phi 15$ to $\phi 63$: GR-S-010 (10 g)

Dimensions

Basic type

CY3B6 to 63

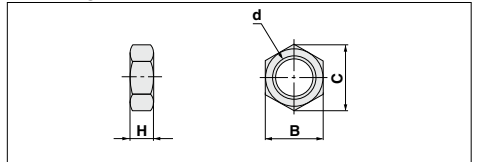


Model	A	B	C	CC	D	E	F	G	H	I	J	K	L	MM	N	NA	NN	Q	R	S	T	V
CY3B6	4	17	8*	—	7.6	4	8*	5	13.5*	—	4.5	5	35	M3 x 0.5	9.5*	10*	M6 x 1*	—	—	62*	6.5	—
CY3B10	4	25	14	—	12	1.5	9	5	12.5	—	4.5	4	38	M3 x 0.5	11	14	M10 x 1	—	—	63	7.5	—
CY3B15	4	35	14	—	16.6*	2*	10	5.5	13	—	6	11	57	M4 x 0.7	11	17	M10 x 1	—	—	83	8	—
CY3B20	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/-0.007}	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/-0.007}	34.5*	188	—	M10 x 1.5

Model	W	X	Y	ZZ	P (Piping port)		
					NH	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 asterisk 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

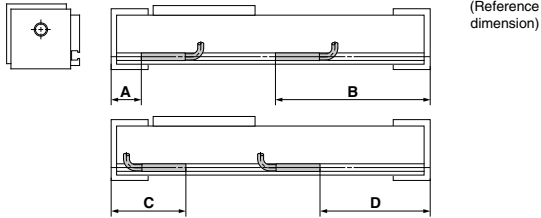
Note) Mounting nuts are not available for ø50 and ø63.

CY3B
CY3R
CY1S
CY1L
CY1H
CY1F
CYP

D-□
-X□
Technical Data

CY3B/CY3R Series Auto Switch Mounting

Auto Switch Proper Mounting Position for Stroke End Detection



Auto Switch Proper Mounting Position

ø6 to ø20

(mm)

Auto switch model Bore size (mm)	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	D-A9□	D-M9□ D-M9□W D-M9□A		
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)

Auto switch model Bore size (mm)	A				B				C				D			
	D-A9□	D-M9□ D-M9□W D-M9□A	D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W D-Y7BA	D-A9□	D-M9□ D-M9□W D-M9□A	D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W D-Y7BA	D-A9□	D-M9□ D-M9□W D-M9□A	D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W D-Y7BA	D-A9□	D-M9□ D-M9□W D-M9□A	D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W D-Y7BA	D-A9□	D-M9□ D-M9□W D-M9□A	D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W D-Y7BA	
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/M9□A types and cylinders separately. (Refer to the auto switch mounting bracket: part no. on page 1479.)

Auto Switch Operation Range

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 D-M9□A	4.5	6.5	4.5	5	5	5.5	5.5	6.5	7
D-Z7□/Z80	—	—	—	—	9	9	11	9	10
D-Y59□/Y7P/Y7□W/Y7BA	—	—	—	—	5	5	6	6	6

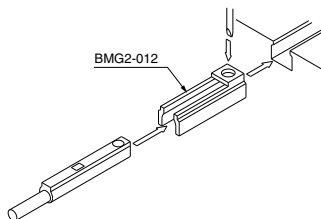
* The auto switches cannot be mounted in some cases.

* 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)
	D-A9□ D-M9□ D-M9□W D-M9□A
	BMG2-012

D-A9□/M9□/M9□W/M9□A



Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted. For detailed specifications, refer to pages 1575 to 1701.

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)	
	D-Y7BA		Water resistant (2-color display)	

* With pre-wired connector is also available in solid state auto switches. For specifications, refer to pages 1648 and 1649.

* Normally closed (NC = b contact) solid state switches (D-M9□E(V)/Y7G/Y7H) are also available. For details, refer to pages 1592-1 and 1595.

* Applicable bore sizes are ø25 to ø63.

CY3B
CY3R

CY1S

CY1L

CY1H

CY1F

CYP

D-□

-X□

Technical
Data

CY3B/CY3R Series

Made to Order: Individual Specifications 1

Please contact SMC for detailed dimensions, specifications and lead times.



Applicable Series

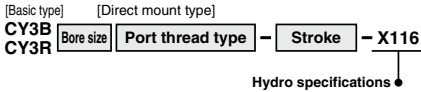
No.	Symbol	Specifications/Description	Basic type CY3B	Direct mount type CY3R
1	-X116	Hydro specifications	●(ø25 to ø63)	●(ø25 to ø63)
2	-X132	Air supply port relocated in axial direction	●(ø6 to ø63)	—
3	-X160	High speed specifications	●(ø20 to ø63)	●(ø20 to ø63)
4	-X168	Helical insert thread specifications	●(ø20 to ø63)	—
5	-X206	Added mounting tap positions for slider	●(ø6 to ø63)	—
6	-X210	Non-lubricated exterior specifications	●(ø6 to ø63)	—
7	-X322	Outside of cylinder tube with hard chrome plated	●(ø15 to ø63)	●(ø15 to ø63)
8	-X324	Non-lubricated exterior specifications (with dust seal)	●(ø10 to ø63)	—
9	-X1468	Interchangeable with CY1□6	●(ø6)	●(ø6)

1 Hydro Specifications

Symbol

-X116

This type is applicable for precision constant speed feed, intermediate stop and skip feed.



Specifications

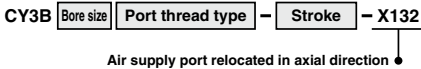
Type	Basic type, Direct mount type
Bore size	Basic type CY3B25 to 63, CY3R25 to 63
Fluid	Turbine oil
Piston speed	15 to 300mm/s

Note) Piping is from each plate on both sides.

2 Air Supply Port Relocated in Axial Direction

Symbol

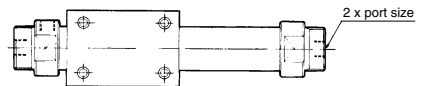
-X132



The air supply port has been changed to an axial position on the head cover.

Specifications

Applicable series	CY3B
Bore size	ø6 to ø63



The port size is the same as the standard type.

3 High Speed Specifications Symbol
-X160

CY3B Bore size Port thread type - Stroke - **X160**

High speed specifications ●

This makes a high speed piston drive of 1,500 mm/s possible (basic type, without load), but it is not applicable for all conditions. Consult with SMC for the operating conditions, etc.

Specifications

Applicable series	CY3B/CY3R
Bore size	ø20 to ø63
Piston speed (no load)	1500 mm/s (MAX)

- Note 1) When operating this cylinder at high speed, a shock absorber must be provided.
 Note 2) For the CY3R, only the piping on both sides can be made.
 Note 3) The piston speed may vary depending on the operating conditions. For details, contact SMC or your nearest sales representative.
 Note 4) Speed tends to decrease over a period of time depending on the operating conditions. Apply grease periodically if necessary.

5 Added Mounting Tap Positions for Slider Symbol
-X206

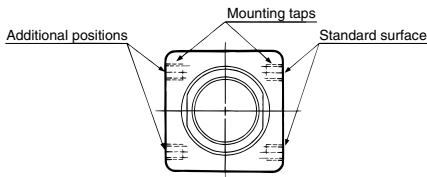
CY3B Bore size Port thread type - Stroke - **X206**

Added mounting tap positions for slider ●

Mounting taps have been added on the surface opposite the standard positions.

Specifications

Applicable series	CY3B
Bore size	ø6 to ø63



* Dimensions are the same as the standard product.

4 Helical Insert Thread Specifications Symbol
-X168

CY3B Bore size Port thread type - Stroke - **X168**

Helical insert thread specifications ●

Helical insert thread is used for standard mounting thread.

Specifications

Applicable series	CY3B
Bore size	CY3B: ø20 to ø63

6 Non-lubricated Exterior Specifications Symbol
-X210

CY3B Bore size Port thread type - Stroke - **X210**

Non-lubricated exterior specifications ●

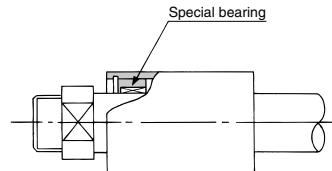
Suitable for environments where oil is not tolerated. A scraper is not installed. A separate version -X324 (with a felt dust seal) is available in cases in which dust, etc. is dispersed throughout the environment.

Specifications

Applicable series	CY3B
Bore size	ø6 to ø63

Construction

CY3B (Basic type)



CY3B
CY3R

CY1S

CY1L

CY1H

CY1F

CYP

D-□

-X□

Technical
Data

CY3B/CY3R Series

Made to Order: Individual Specifications 2

Please contact SMC for detailed dimensions, specifications and lead times.



7 Outside of Cylinder Tube with Hard Chrome Plated Symbol **-X322**

CY3B Bore size Port thread type — Stroke — X322

Outside of cylinder tube with hard chrome plated

The cylinder tube outer circumference is plated with hard chrome, which further reduces bearing abrasion.

* Be sure to install a shock absorber to the stroke end.

Note 1) The maximum stroke is 3,500 st, or the maximum stroke for the standard type.

CY3R is compatible with the maximum stroke for the standard type.

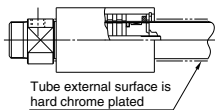
Note 2) When exceeding 2,000 strokes, contact SMC separately.

Specifications

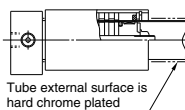
Applicable series	Bore size (mm)
*CY3B-3R	ø15 to ø63

Construction/Dimensions

CY3B



CY3R



8 Non-lubricated Exterior Specifications (with Dust Seal) Symbol **-X324**

CY3B Bore size Port thread type — Stroke — X324

Non-lubricated exterior specifications (with dust seal)

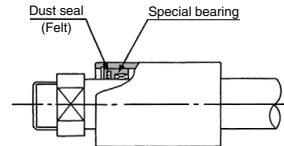
Non-lubricated exterior type with a felt dust seal on the cylinder body.

Specifications

Applicable series	Bore size (mm)
CY3B	ø10 to ø63

Construction

CY3B (Basic type)



9 Interchangeable with CY1□6 Symbol **-X1468**

CY3B Bore size Port thread type — Stroke — X1468

Interchangeable with CY1□6

Can be interchanged with CY1□6.