

STR2

Twin Rod Cylinder

ø6, ø10, ø16, ø20, ø25, ø32

Guided



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STM

STG

STS/
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STR2

UCA2

Cylinder
Switch

Ending

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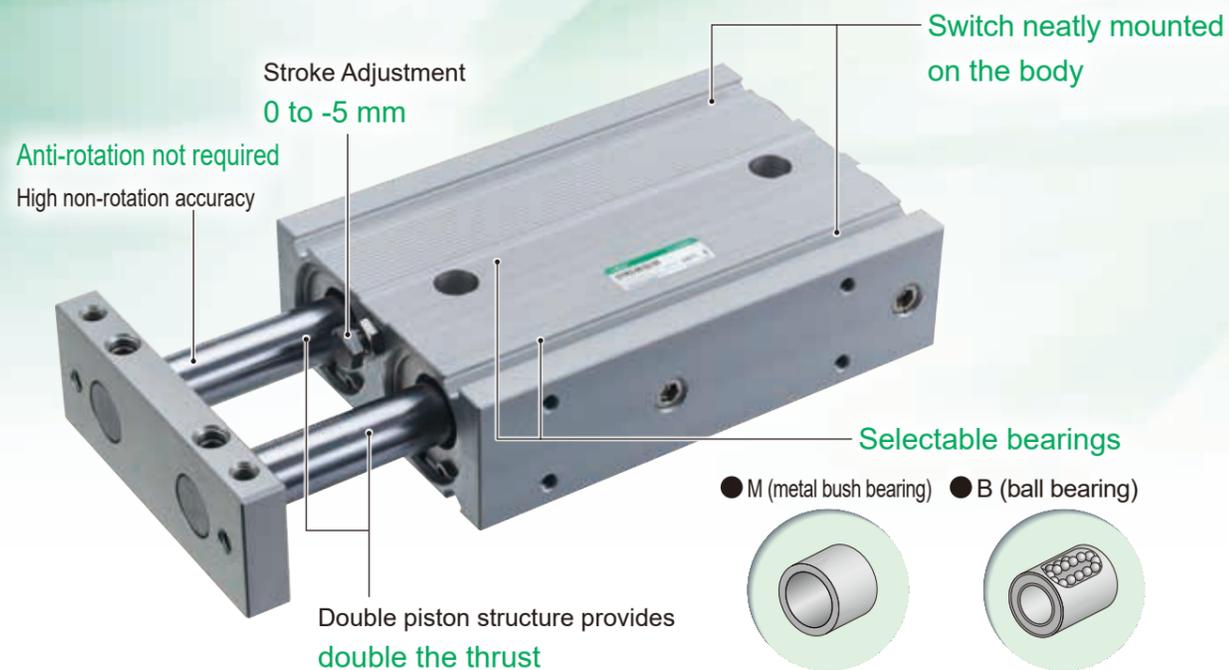
STR2

UCA2

Cylinder
Switch

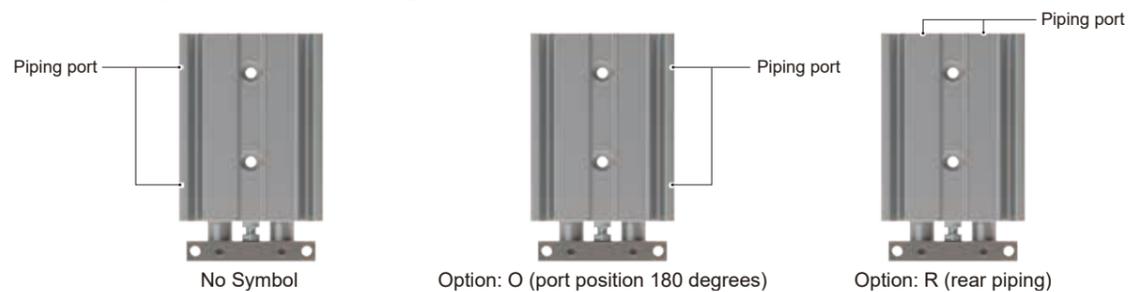
Ending

Twin rod / Double piston structure Achieves high non-rotation accuracy and double the thrust



Selectable piping port position

Select piping position according to equipment

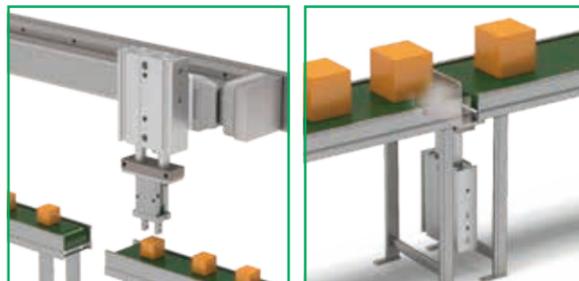


Application Example

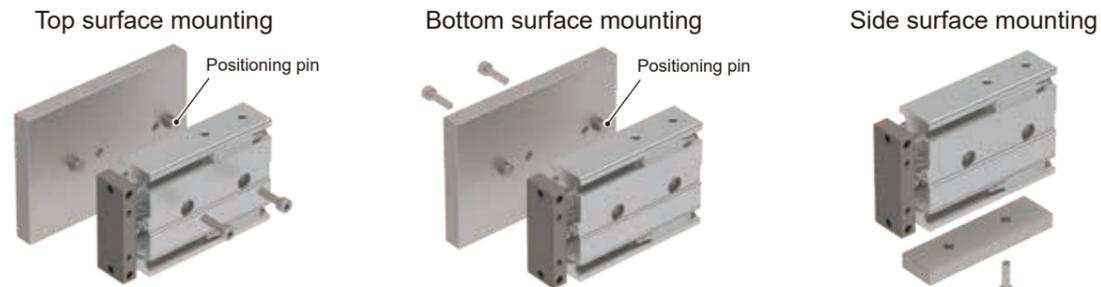
Simple lifter / Pusher



Pick & Place / Stopper

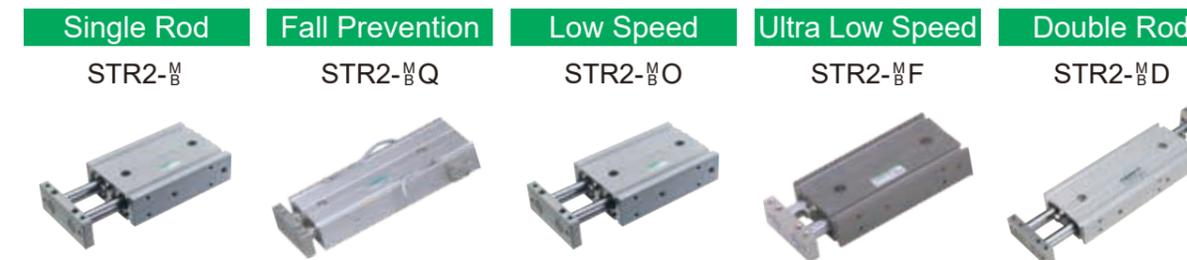


Main body mounting surface has 3 surfaces



* Locating pin holes are not provided for side mounting.
* Option: When O is selected, side mounting is not possible.

Workpiece mounting surface has 3 surfaces



STR2 Series product system

Model variations	Bearing		Bore size (mm)					
	Metal bush bearing M	Ball bearing B	ø6	ø10	ø16	ø20	ø25	ø32
Double acting / Standard STR2- $\frac{M}{B}$	●	●	●	●	●	●	●	●
Double acting / Position locking STR2- $\frac{M}{B}Q$	●	●		●	●	●	●	●
Double acting / Low speed STR2- $\frac{M}{B}O$	●	●	●	●	●	●	●	●
Double acting / Ultra low speed STR2- $\frac{M}{B}F$	●	●		●	●	●	●	●
Double acting / Double rod STR2- $\frac{M}{B}D$	●	●	●	●	●	●	●	●

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Ending

●: Standard, ◎: Option, ○: Custom Products ■: Not manufacturable

Variation	Model No. Circuit Diagram Symbol	Bore size (mm)	Standard Stroke (mm)											Stroke (mm)	Min. Stroke (mm)	Max. Stroke (mm)	Intermediate stroke (mm) increments	Producible Stroke (mm)	Bearing type		Option			Switch	Page
			10	20	30	40	50	60	70	80	90	100	Plain bearing						Rolling bearing	End plate material Steel	Piping port position 180° change	Rear piping type			
			M	B	F	O	R																		
Double acting / Standard type	STR2- ^M _B 	ø6, ø10	●	●	●	●	●	■	■	■	■	■	■	5	50	1	100	●	●	◎	◎	◎	◎	668	
		ø16, ø20, ø25, ø32	●	●	●	●	●	●	●	●	●	●	●	●	100		200	●	●	◎	◎	◎	◎		
Double Acting / Drop Prevention Type	STR2- ^M _B Q 	ø16, ø20, ø25, ø32	●	●	●	●	●	●	●	●	●	●	●	5	100	-	-	●	●	◎	◎	■	◎	676	
Double Acting / Low Speed Type	STR2- ^M _B O 	ø6, ø10	●	●	●	●	●	■	■	■	■	■	■	5	50	1	100	●	●	◎	◎	○	◎	684	
		ø16, ø20, ø25, ø32	●	●	●	●	●	●	●	●	●	●	●	●	100		200	●	●	◎	◎	○	◎		
Double Acting / Ultra Low Speed Type	STR2- ^M _B F 	ø10	●	●	●	●	●	■	■	■	■	■	■	5	50	1	100	●	●	◎	○	◎	◎	690	
		ø16, ø20, ø25, ø32	●	●	●	●	●	●	●	●	●	●	●	●	100		200	●	●	◎	○	◎	◎		
Double Acting / Double Rod Type	STR2- ^M _B D 	ø6, ø10	●	●	●	●	●	■	■	■	■	■	■	5	50	-	-	●	●	◎	◎	■	◎	694	
		ø16, ø20, ø25, ø32	●	●	●	●	●	●	●	●	●	●	●	●	100			●	●	◎	◎	■	◎		

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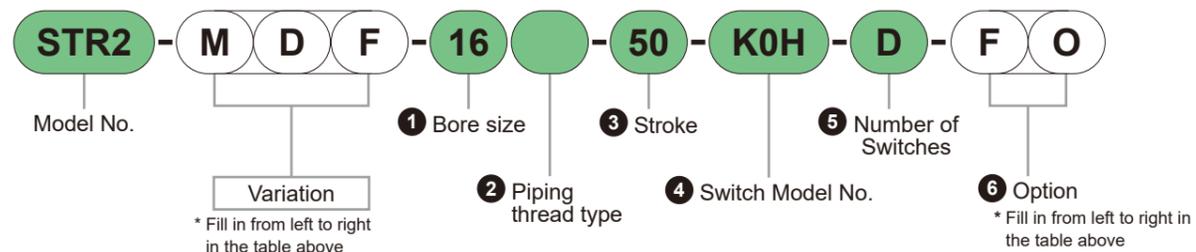
STR2-M (Plain bearing) Series

Combinability table of variations and option items (Plain bearing)

- Symbol: Standard
- ◎ Symbol: Option
- Symbol: Custom Products
- △ Symbol: Manufacturable depending on conditions (Please consult)
- x Symbol: Not manufacturable

Category	Code	Variation					Piping thread		Option		
		M	D	Q	O	F	NN	GN	F	O	R
Variation	Double acting basic type (Plain bearing)	M	◎	◎	◎	◎	○	○	◎	◎	◎
	Double rod type	D		○	○	○	○	○	◎	◎	x
	Drop prevention type	Q			x	x	○	○	◎	◎	x
	Low speed type	O				x	○	○	◎	◎	○
	Ultra low speed type	F					○	○	◎	◎	◎
Piping thread	NPT	NN					x	○	○	○	○
	G	GN						○	○	○	○
Option	End plate material Steel	F							○	○	○
	Piping port position 180° change	O								x	
	Rear piping type	R									
Accessories	Cylinder Switch	Separately Shown	◎	◎	◎	◎	○	○	◎	◎	◎

[Model No. Notation Example]



- Model No. : Twin Rod Cylinder
- Variation : Plain Bearing, Double Rod Type, Ultra Low Speed Type
- 1 Bore size : ø16mm
- 2 Port thread : Rc Thread
- 3 Stroke : 50 mm
- 4 Switch model No. : Solid State TOH Switch, Lead Wire 1 m
- 5 Number of Switches : With 2 pcs.
- 6 Option : End plate material (Steel), Piping port position 180° change

STR2-B (Rolling bearing) Series

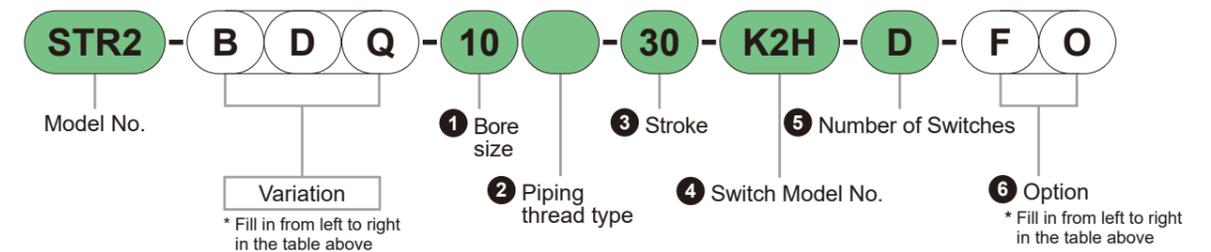
Variation / Option combinability table

Combinability table of variations and option items (Rolling bearing)

- Symbol: Standard
- ◎ Symbol: Option
- Symbol: Custom Products
- △ Symbol: Manufacturable depending on conditions (Please consult)
- x Symbol: Not manufacturable

Category	Code	Variation					Piping thread		Option		
		B	D	Q	O	F	NN	GN	F	O	R
Variation	Double acting basic type (Rolling bearing)	B	◎	◎	◎	◎	○	○	◎	◎	◎
	Double rod type	D		○	○	○	○	○	◎	◎	x
	Drop prevention type	Q			x	x	○	○	◎	◎	x
	Low speed type	O				x	○	○	◎	◎	○
	Ultra low speed type	F					○	○	◎	◎	◎
Piping thread	NPT	NN					x	○	○	○	○
	G	GN						○	○	○	○
Option	End plate material Steel	F							○	○	○
	Piping port position 180° change	O								x	
	Rear piping type	R									
Accessories	Cylinder Switch	Separately Shown	◎	◎	◎	◎	○	○	◎	◎	◎

[Model No. Notation Example]



- Model No. : Twin Rod Cylinder
- Variation : Rolling bearing, Double rod type, Drop prevention type
- 1 Bore size : ø10 mm
- 2 Port thread : Rc Thread
- 3 Stroke : 30 mm
- 4 Switch model No. : Solid State, K2H Switch, Lead Wire 1 m
- 5 Number of Switches : With 2 pcs.
- 6 Options : End plate material (Steel), Piping port position 180° change



Twin Rod Cylinder Double acting / Standard type

STR2-M Series

● Bore size: ø6, ø10, ø16, ø20, ø25, ø32

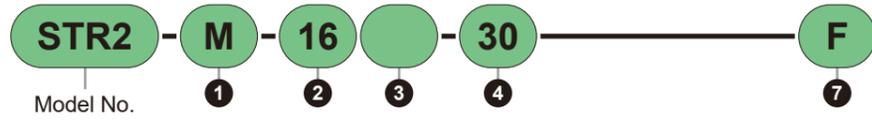
Circuit Diagram Symbol



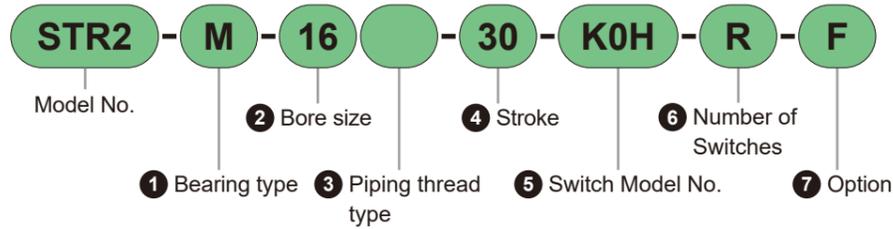
STR2-M Series Model No. Notation Method

Model No. Notation Method

Without Switch
(Built-in magnet for switch)



With Switch
(Built-in magnet for switch)



1 Bearing type

Code	Content
M	Plain bearing
B	Rolling bearing

2 Bore Size (mm)

Code	Content
6	ø6
10	ø10
16	ø16
20	ø20
25	ø25
32	ø32

3 Piping thread type

Code	Content
Blank	M5 (ø6 to ø25) Rc thread (ø32)
NN	NPT thread (Custom Product) (ø32)
GN	G thread (Custom Product) (ø32)

*1: For G thread, opposite side (7 Option "O") is not available. There is no port itself, not a plug seal.
(7 If option "O" is selected, there is no standard port.)

4 Stroke (mm)

Bore size	Stroke	Intermediate Stroke
ø6, ø10	5 to 50	Every 1 mm *2
*1 ø16 to ø32	5 to 100	

*1: (7 The maximum stroke of option rear piping type "R" is

- ø16 : 70 mm
- ø20 / 25 : 60 mm
- ø32 : 50 mm

*2: The overall length dimension is the same as the dimension of the longer standard stroke.

*3: For standard stroke, please refer to P. 670.

5 Switch Model No.

For switch details, please refer to P. 753.
Switches are included to the product and shipped.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead wire *1		
			AC	DC	AC	DC	Straight	L-shape	
Solid State	1-Color	2-wire	-	10 to 30	-	5 to 20 *2	K2H□	K2V□	
		3-wire (NPN)	-	30 or less	-	50 or less	K3H□	K3V□	
		3-wire (PNP)	-	-	-	-	K3PH□	K3PV□	
	2-Color	2-wire	-	10 to 30	-	5 to 20	K2YH□	K2YV□	
		3-wire (NPN)	-	30 or less	-	50 or less	K3YH□	K3YV□	
		3-wire (PNP)	-	-	-	-	K3YH□	K3YV□	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	K0H□	K0V□	
	No Indicator LED			5/12/24	20 or less	50 or less	K5H□	K5V□	

1: For "□" in the switch model No., enter the code selected from the "" Lead wire length" table.

*2: Maximum load current value above: 20 mA, is at 25°C. If the switch operating ambient temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)

*3: Reed switches cannot be used with STR2-B-6 / 10.

*4: Switches other than the model Nos. listed above are also available. (Custom order) For details, refer to P. 753.

* Lead wire length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length 1 m KOH
3 m KOH [3]
5 m KOH [5]

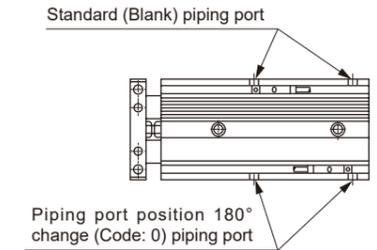
6 Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

7 Option

Code	Content
F	End plate material: Steel
O	Piping port position 180° change
R	Rear piping type

*The piping port position in the case of "O" is as shown in the diagram below.



For combinations of variations and options, please refer to P. 666 (Plain bearing) and P.667 (Rolling bearing).

Clean Specification

(Catalog No. CB-033SA)

- Dust prevention structure usable in cleanrooms

STR2-B-.....-P7□

STR2-B-.....-P5□

Rechargeable Battery Compatible Specification

(Catalog No. CC-1226AA)

- Design compatible with rechargeable battery manufacturing process

STR2-M-.....-P4□

* Please contact us for details.

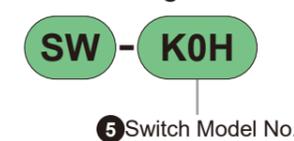
High Durability Components HP Series

(Catalog No. CC-1421AA)

- Long-life actuator that contributes to productivity improvement with stable operation

STR2-M-.....-HP□

Switch Single Unit Model No. Notation Method



Specifications

Item	STR2-M (Plain bearing) STR2-B (Rolling bearing)						
	mm	ø6	ø10	ø16	ø20	ø25	ø32
Bore size	mm	ø6	ø10	ø16	ø20	ø25	ø32
Actuation method	Double Acting Type						
Operating Fluid	Compressed Air						
Max. Working Pressure	MPa	0.7					
Min. Operating Pressure	MPa	0.2	0.15				0.1
Proof Pressure	MPa	1.05					
Ambient Temperature	°C	-10 to 60 (However, no freezing)					
Port Size		M5				Rc1/8	
Stroke tolerance	mm	+2.0 0					
Stroke adjustment range	mm	-5 to 0					
Operating Piston Speed	mm/s	50 to 500					
Non-rotation accuracy (Reference value)	STR2-M	±0.4°	±0.3°			±0.2°	
	STR2-B	±0.2°	±0.1°			±0.3°	
Cushion	Rubber Cushion						
Lubrication	Not required (When lubricating, use turbine oil Class 1 ISO VG32)						
Allowable Absorption Energy	PUSH	0.008	0.061	0.181	0.303	0.68	1.3
	PULL	0.059	0.083	0.083	0.127	0.237	0.311

Cylinder Weight

Bore size	Product Weight at Stroke 0 mm		S= Per 10 mm Added Weight
	STR2-M	STR2-B	
ø6	60	64	10
ø10	140	155	14
ø16	240	300	20
ø20	340	405	40
ø25	580	610	52
ø32	1300	1150	83

(Example) Product Weight
STR2-M-6-10-K2H-D

- Product Weight at stroke=0 mm 60 g
- Added weight at stroke 10 mm 10 g x 1=10 g
- Weight of cylinder switch (2 pieces) 18 g x 2=36 g
- Product Weight 60 g + 10 g + 36 g = 106 g

Stroke

Bore size	Standard Stroke (mm)	Max. Stroke (mm)	Min. Stroke (mm)	Producible stroke (mm)	Min. stroke with switch (mm)
ø6	10, 20, 30, 40, 50	50	5	100	10
ø10				200	
ø16	10, 20, 30, 40, 50 60, 70, 80, 90, 100	100	*1	200	10
ø20					
ø25					
ø32					

*1: In case of rear piping type
 ● ø16 : 70 mm
 ● ø20, ø25 : 60 mm
 ● ø32 : 50 mm

*2: Intermediate strokes can be manufactured every 1 mm. However, the overall length dimension is the same as the dimension of the longer standard stroke.

Theoretical Thrust Table

(Unit: N)

Bore size (mm)	Operating Direction	Operating Pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø6	Push	-	-	11.3	17.0	22.6	28.3	33.9	39.6
	Pull	-	-	6.28	9.42	12.6	15.7	18.8	22.0
ø10	Push	-	23.6	31.4	47.1	62.8	78.5	94.2	1.10 x 10 ²
	Pull	-	15.1	20.1	30.2	40.2	50.3	60.3	70.4
ø16	Push	40.2	60.3	80.4	1.21 x 10 ²	1.61 x 10 ²	2.01 x 10 ²	2.41 x 10 ²	2.81x10 ²
	Pull	24.5	36.8	49.0	73.5	98.0	1.23x10 ²	1.47 x 10 ²	1.72x10 ²
ø20	Push	62.8	94.2	1.26 x 10 ²	1.88 x 10 ²	2.51 x 10 ²	3.14 x 10 ²	3.77 x 10 ²	4.40x10 ²
	Pull	40.2	60.3	80.4	1.21 x 10 ²	1.61 x 10 ²	2.01 x 10 ²	2.41 x 10 ²	2.81x10 ²
ø25	Push	98.2	1.47 x 10 ²	1.96 x 10 ²	2.95 x 10 ²	3.93 x 10 ²	4.91 x 10 ²	5.89 x 10 ²	6.87x10 ²
	Pull	67.4	1.01 x 10 ²	1.35x10 ²	2.02x10 ²	2.70x10 ²	3.37x10 ²	4.04x10 ²	4.72x10 ²
ø32	Push	1.61 x 10 ²	2.41 x 10 ²	3.22 x 10 ²	4.83 x 10 ²	6.43 x 10 ²	8.04 x 10 ²	9.65x10 ²	1.13 x 10 ³
	Pull	1.21 x 10 ²	1.81 x 10 ²	2.41 x 10 ²	3.62x10 ²	4.83 x 10 ²	6.03x10 ²	7.24 x 10 ²	8.44 x 10 ²

Cylinder Switch

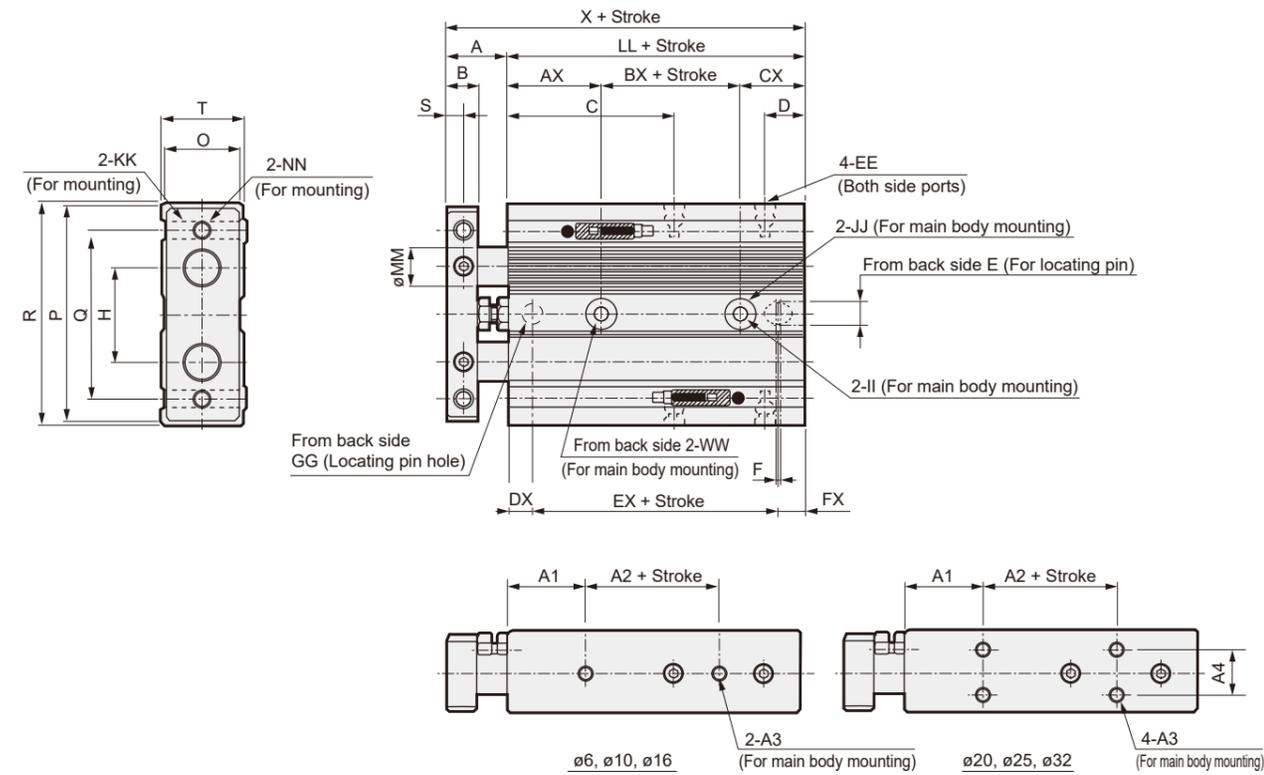
Cylinder Switch

Ending

Ending

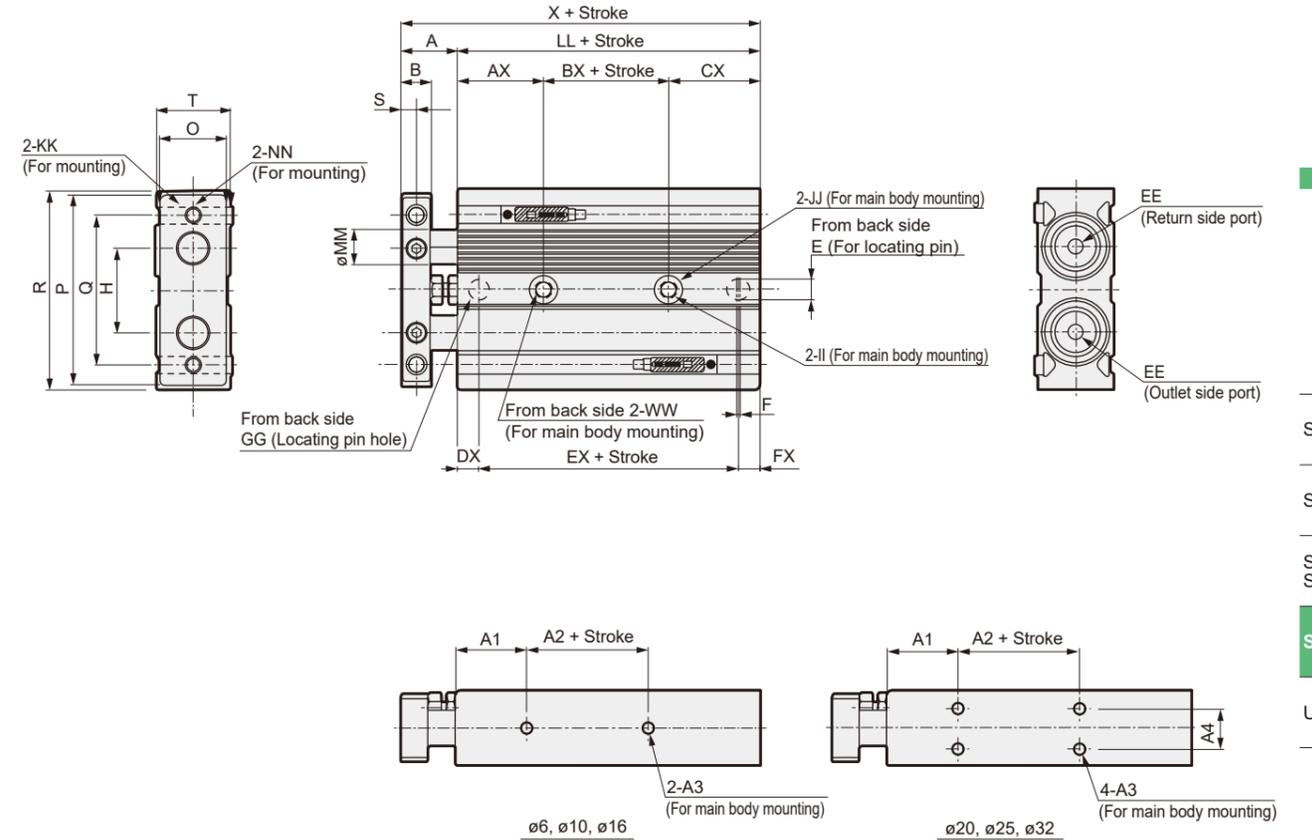
External dimensions diagram (Bore size: ø6 to ø32)

● Standard type, end plate material: Steel (F) , Piping port position 180° change (O)



External dimensions diagram (Bore size: ø6 to ø32)

● Rear piping (R)



Code	Basic type, O, F Basic dimensions																		
Bore size (mm)	A	B	C	D	E	EE	F	GG	H	II	JJ	KK	LL ^{*1}	MM					
ø6	12	6	24.5	7.5	4 ^{+0.07/-0.02} depth 4	M5	1	4 ^{+0.07/-0.02} depth 4	14	3.4	6.5 Counterbore depth 3.3	M3 Through	44	4					
ø10	14	6	35	7	4 ^{+0.07/-0.02} depth 4	M5	1	4 ^{+0.07/-0.02} depth 4	20	4.3	8 Counterbore depth 4.4	M4 Through	55	6					
ø16	16	8	43	9.5	6 ^{+0.07/-0.02} depth 6	M5	1	6 ^{+0.07/-0.02} depth 6	25	4.3	8 Counterbore depth 4.4	M5 Through	66	10					
ø20	20	10	46	9.5	6 ^{+0.07/-0.02} depth 6	M5	1	6 ^{+0.07/-0.02} depth 6	28	5.2	9.5 Counterbore Depth 5.4	M5 Through	75	12					
ø25	22	12	44	10.5	6 ^{+0.07/-0.02} depth 6	M5	1	6 ^{+0.07/-0.02} depth 6	34	6.3	11 Counterbore Depth 6.5	M6 Through	75	14					
ø32	22	12	56	11	6 ^{+0.07/-0.02} depth 6	Rc 1/8	1	6 ^{+0.07/-0.02} depth 6	44	6.3	11 Counterbore Depth 6.5	M6 Through	91	16					
Code																			
Bore size (mm)	NN	O	P	Q	R	S	T	WW	X ^{*1}	AX	BX ^{*1}	CX	DX	EX ^{*1}	FX	A1	A2 ^{*1}	A3	A4
ø6	M3 Through	11	34	29	36	3	13	M4 Depth 5	56	20	10	14	7	30	7	15	10	M3 Depth 4	-
ø10	M4 Through	13	42	36	44	3	15	M5 Depth 6	69	24	14	17	8	38	9	15	20	M3 Depth 3.5	-
ø16	M5 Through	19	52	45	58	4	21	M5 Depth 6	82	24	26	16	8	50	8	20	25	M4 Depth 4	-
ø20	M5 Through	24	60	50	62	5	27	M6 Depth 8	95	24	33	18	9	57	9	20	30	M4 Depth 4	13
ø25	M6 Through	30	70	60	72	6	33	M8 Depth 8	97	24	33	18	9	57	9	20	30	M5 Depth 6	18
ø32	M6 Through	36	94	75	96	6	38	M8 Depth 8	113	24	47	20	9	73	9	20	40	M5 Depth 8	24

*1: For intermediate strokes, the overall length dimension is the same as the dimension of the longer standard stroke.
 *2: If the surface with the counterbore (JJ) is used as the mounting surface for this cylinder, the cylinder may tilt due to the step. In such cases, use the port position change or port position 180° change option (O) so that the surface with the counterbore is not the mounting surface.
 *3: For dimensions with each switch, refer to P. 700, 701.

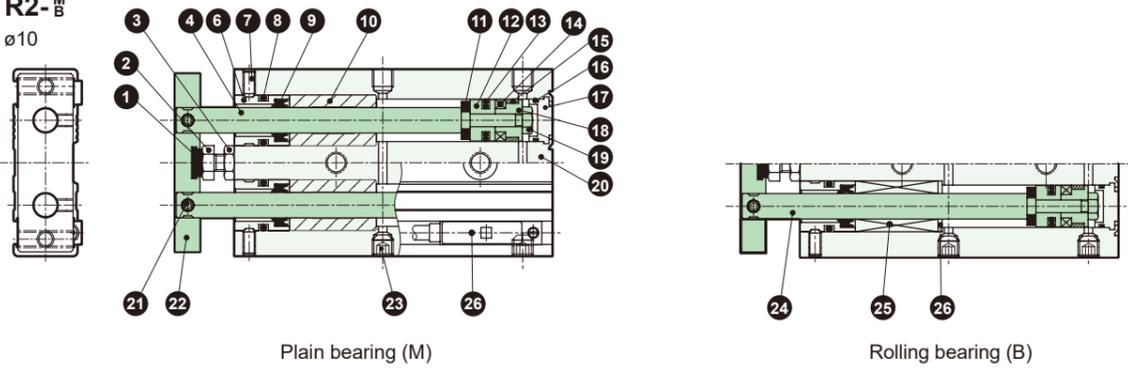
Code	R Basic dimensions																
Bore size (mm)	A	B	E	EE	F	GG	H	II	JJ	KK	LL ^{*1}	MM	NN	O			
ø6	12	6	4 ^{+0.07/-0.02} depth 4	M5	1	4 ^{+0.07/-0.02} depth 4	14	3.4	6.5 Counterbore depth 3.3	M3 Through	54	4	M3 Through	11			
ø10	14	6	4 ^{+0.07/-0.02} depth 4	M5	1	4 ^{+0.07/-0.02} depth 4	20	4.3	8 Counterbore depth 4.4	M4 Through	65	6	M4 Through	13			
ø16	16	8	6 ^{+0.07/-0.02} depth 6	M5	1	6 ^{+0.07/-0.02} depth 6	25	4.3	8 Counterbore depth 4.4	M5 Through	76	10	M5 Through	19			
ø20	20	10	6 ^{+0.07/-0.02} depth 6	M5	1	6 ^{+0.07/-0.02} depth 6	28	5.2	9.5 Counterbore Depth 5.4	M5 Through	85	12	M5 Through	24			
ø25	22	12	6 ^{+0.07/-0.02} depth 6	M5	1	6 ^{+0.07/-0.02} depth 6	34	6.3	11 Counterbore Depth 6.5	M6 Through	85	14	M6 Through	30			
ø32	22	12	6 ^{+0.07/-0.02} depth 6	Rc 1/8	1	6 ^{+0.07/-0.02} depth 6	44	6.3	11 Counterbore Depth 6.5	M6 Through	101	16	M6 Through	36			
Code																	
Bore size (mm)	P	Q	R	S	T	WW	X ^{*1}	AX	BX ^{*1}	CX	DX	EX ^{*1}	FX	A1	A2 ^{*1}	A3	A4
ø6	34	29	36	3	13	M4 Depth 5	66	20	10	24	7	40	7	15	10	M3 Depth 4	-
ø10	42	36	44	3	15	M5 Depth 6	79	24	14	27	8	48	9	15	20	M3 Depth 3.5	-
ø16	52	45	58	4	21	M5 Depth 6	92	24	26	26	8	60	8	20	25	M4 Depth 4	-
ø20	60	50	62	5	27	M6 Depth 8	105	24	33	28	9	67	9	20	30	M4 Depth 4	13
ø25	70	60	72	6	33	M8 Depth 8	107	24	33	28	9	67	9	20	30	M5 Depth 6	18
ø32	94	75	96	6	38	M8 Depth 8	123	24	47	30	9	83	9	20	40	M5 Depth 8	24

*1: For intermediate strokes, the overall length dimension is the same as the dimension of the longer standard stroke.
 *2: If the surface with the counterbore (JJ) is used as the mounting surface for this cylinder, the cylinder may tilt due to the step. In such cases, use the port position change or port position 180° change option (O) so that the surface with the counterbore is not the mounting surface.
 *3: For dimensions with each switch, refer to P. 700, 701.

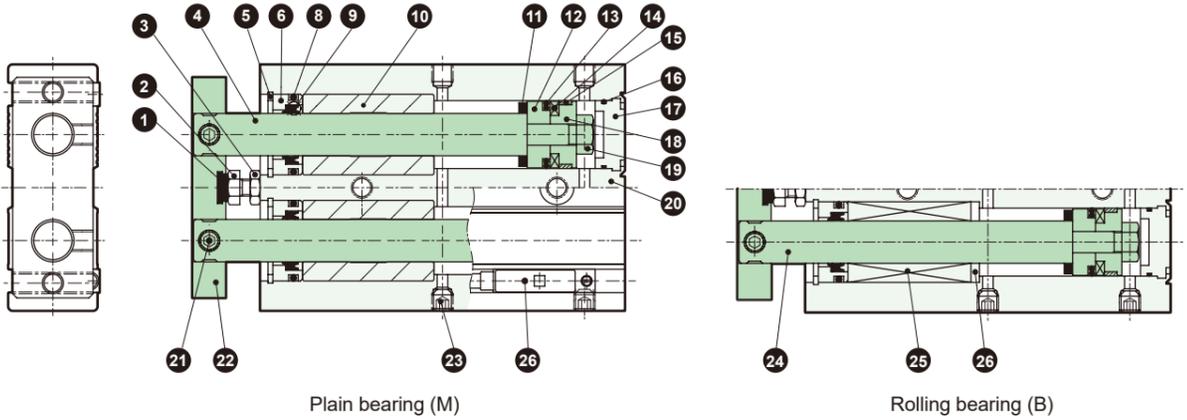
Internal Structure Diagram / Material

● Standard type

STR2-M
ø6, ø10



ø16 to ø32



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Cushion rubber (H)	Urethane Rubber		14	Magnet	Plastic	
2	Hexagon bolt	Stainless Steel		15	Wear Ring	Polyacetal	
3	Hexagon Nut	Stainless Steel		16	O-ring	Nitrile Rubber	
4	Piston rod (1)	ø6 to ø20: Stainless steel ø25, ø32: Steel	ø16 to ø32: Industrial chrome plating	17	Cap	Aluminum Alloy	Chromate
5	C-ring for hole	Stainless Steel	ø16 to ø32 only	18	Magnet spacer	Aluminum Alloy	Chromate
6	Housing	ø6, ø10: Stainless steel ø16 to ø32: Aluminum alloy	ø16 to ø32: Chromate	19	Hexagon Nut	Steel	Zinc Chromate
7	Hexagon socket set screw	Stainless Steel	ø6, ø10 only	20	Cylinder Body	Aluminum Alloy	Hard Anodized
8	O-ring	Nitrile Rubber		21	Hexagon socket set screw	Stainless Steel	
9	Rod Packing	Nitrile Rubber		22	End plate *1	Aluminum Alloy	Alumite
10	Bushing	Aluminum Alloy		23	Hexagon socket set screw	Stainless Steel	
11	Cushion rubber (R)	Urethane Rubber		24	Piston rod (2)	Steel	Industrial Hard Chrome Plating
12	Piston	Aluminum Alloy	Chromate	25	Bearing	Aluminum alloy	
13	Piston Packing	Nitrile Rubber		26	Spacer	Aluminum alloy	Chromate
				27	Switch		

*1: Option (F): In the case of end plate material steel, the material is steel and the treatment is zinc chromate.

Consumable Parts List

STR2-M, STR2-B

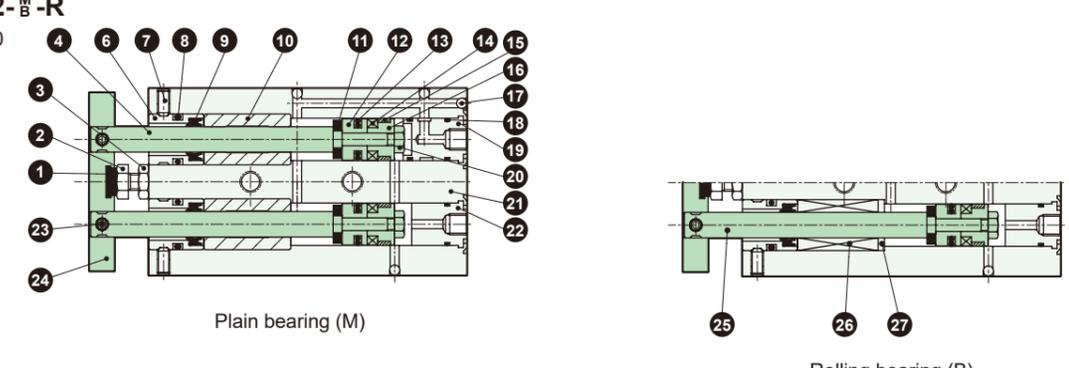
Bore size (mm)	Kit Number	Consumable Part No.
ø6	STR2-6K	
ø10	STR2-10K	
ø16	STR2-16K	1 8 9 11 13 15
ø20	STR2-20K	
ø25	STR2-25K	
ø32	STR2-32K	

*Please specify the kit number when ordering.

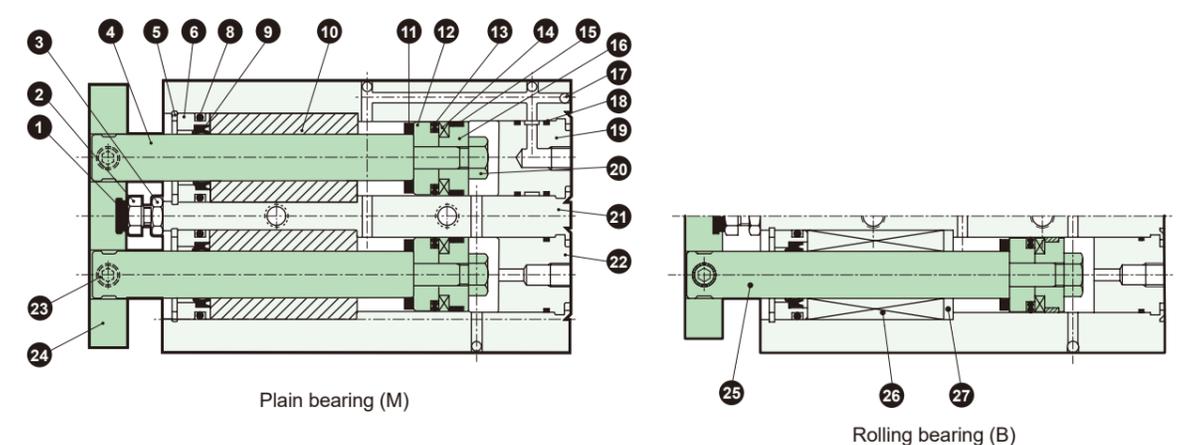
Internal Structure Diagram/Material

● Rear piping (R)

STR2-M-R
ø6, ø10



ø16 to ø32



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Cushion rubber (H)	Urethane Rubber		14	Magnet	Plastic	
2	Hexagon bolt	Stainless Steel		15	Wear Ring	Polyacetal Resin	
3	Hexagon Nut	Stainless Steel		16	Magnet spacer	Aluminum Alloy	Chromate
4	Piston rod (1)	ø6 to ø20: Stainless steel ø25, ø32: Steel	ø16 to ø32: Industrial chrome plating	17	Steel ball	Steel	
5	C-ring for hole	Stainless Steel	ø16 to ø32 only	18	O-ring	Nitrile Rubber	
6	Housing	ø6, ø10: Stainless steel ø16 to ø32: Aluminum alloy	ø16 to ø32: Chromate	19	Cap (A)	Aluminum Alloy	Chromate
7	Hexagon socket set screw	Stainless Steel	ø6, ø10 only	20	Hexagon Nut	Steel	Zinc Chromate
8	O-ring	Nitrile Rubber		21	Cylinder Body	Aluminum Alloy	Hard Anodized
9	Rod Packing	Nitrile Rubber		22	Cap (B)	Aluminum Alloy	Chromate
10	Bushing	Aluminum Alloy		23	Hexagon socket head set screw	Stainless Steel	
11	Cushion rubber (R)	Urethane Rubber		24	End plate	Aluminum Alloy	Alumite
12	Piston	Aluminum Alloy	Chromate	25	Piston rod (2)	Steel	Industrial Hard Chrome Plating
13	Piston Packing	Nitrile Rubber		26	Bearing		
				27	Spacer	Aluminum alloy	Chromate

Consumable Parts List

STR2-M-R (Rear piping), STR2-B-R (Rear piping)

Bore size (mm)	Kit Number	Consumable Part No.
ø6	STR2-6K	
ø10	STR2-10K	
ø16	STR2-16K	1 8 9
ø20	STR2-20K	11 13 15
ø25	STR2-25K	
ø32	STR2-32K	

*Please specify the kit number when ordering.

Guided

Guided

STM

STM

STG

STG

STS/
STL

STS/
STL

STR2

STR2

UCA2

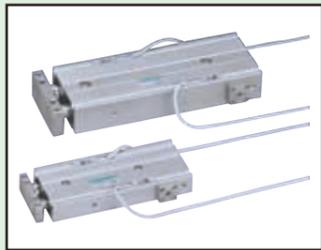
UCA2

Cylinder
Switch

Cylinder
Switch

Ending

Ending



Twin Rod Cylinder Double acting / Drop prevention type

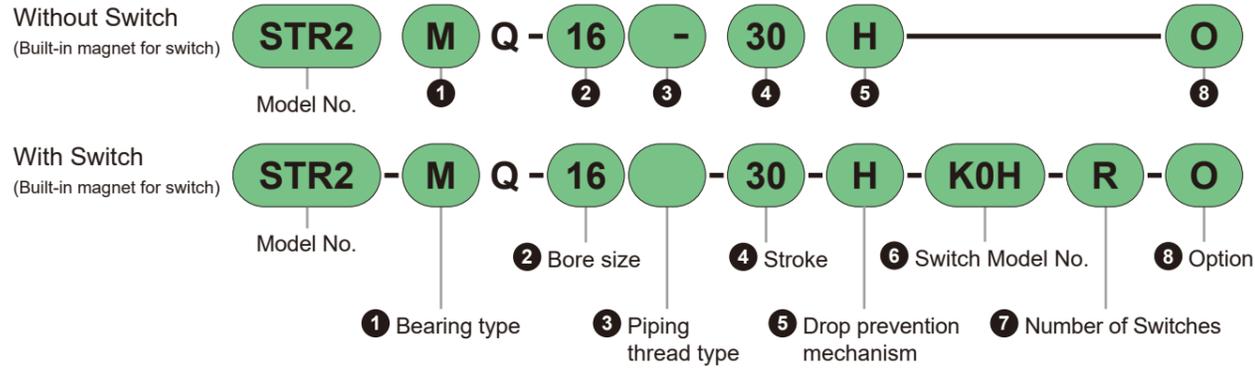
STR2-MBQ Series

● Bore size: $\phi 16$, $\phi 20$, $\phi 25$, $\phi 32$

Circuit
Diagram
Symbol



Model No. Notation Method



1 Bearing type

Code	Content
M	Plain bearing
B	Rolling bearing

2 Bore Size (mm)

Code	Content
16	$\phi 16$
20	$\phi 20$
25	$\phi 25$
32	$\phi 32$

3 Piping thread type

Code	Content
Blank	M5 ($\phi 16$ to $\phi 25$) Rc thread ($\phi 32$)
NN	NPT thread (Custom Product) ($\phi 32$)
GN	G thread (Custom Product) ($\phi 32$)

*In the case of G thread, there is no port on the opposite side (8 option "O"). There is no port itself, not a plug seal.
* If option "O" is selected, there is no standard port.

4 Stroke (mm)

Bore size	Stroke
$\phi 16$ to $\phi 32$	10 to 100

*For standard stroke, please refer to P. 678.

5 Drop prevention mechanism

Code	Content
H	With head side fall prevention
R	With rod side fall prevention

6 Switch Model No.

For switch details, please refer to P. 753.
Switches are included to the product and shipped.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead wire *1		
			AC	DC	AC	DC	Straight	L-shape	
Solid State	1-Color	2-wire	-	10 to 30	-	5 to 20 *2	K2H□	K2V□	
		3-wire (NPN)	-	30 or less	-	50 or less	K3H□	K3V□	
		3-wire (PNP)	-	-	-	-	K3PH□	K3PV□	
Solid State	2-Color	2-wire	-	10 to 30	-	5 to 20	K2YH□	K2YV□	
		3-wire (NPN)	-	30 or less	-	50 or less	K3YH□	K3YV□	
Reed	1-Color No Indicator LED	2-wire	110	12 / 24	7 to 20	5 to 50	K0H□	K0V□	
				5 / 12 / 24	20 or less	50 or less	K5H□	K5V□	

*1: For "□" in the switch model No., enter the code selected from the "Lead wire length" table.

*2: Maximum load current value above: 20 mA, is at 25°C. If the switch operating ambient temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)

*3: Switches other than the model Nos. listed above are also available. (Custom order)
For details, refer to P. 753.

* Lead wire length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length 1 m KOH
3 m KOH [3]
5 m KOH [5]

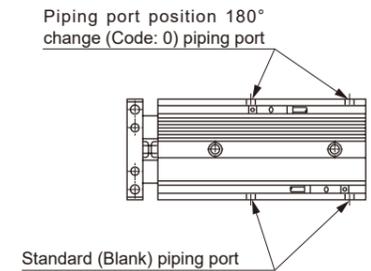
7 Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

8 Option

Code	Content
F	End plate material: Steel
O	Piping port position 180° change

*The piping port position in the case of "O" is as shown in the diagram below.



For combinations of variations and options, please refer to P. 666 (Plain bearing) and 667 (Rolling bearing).

Rechargeable Battery Compatible Specification

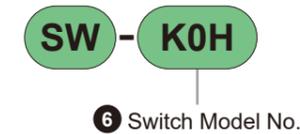
(Catalog No. CC-1226AA)

- Structure usable in rechargeable battery manufacturing processes

STR2-MBQ - P4□

* Please contact us for details.

Switch Single Unit Model No. Notation Method



Specifications

Item	STR2-MQ (Plain bearing)		STR2-BQ (Rolling bearing)		
	mm	mm	mm	mm	
Bore size	mm	ø16	ø20	ø25	ø32
Actuation method	Double Acting, Drop Prevention Type				
Operating Fluid	Compressed Air				
Max. Working Pressure	MPa	0.7			
Min. Operating Pressure	MPa	0.15			
Proof Pressure	MPa	1.05			
Ambient Temperature	°C	-10 to 60 (However, no freezing)			
Port Size		M5		Rc1/8	
Stroke tolerance	mm	+2.0			
Stroke adjustment range	mm	Not adjustable (With head side fall prevention) / -5 to 0 (With rod side fall prevention)			
Operating Piston Speed	mm/s	50 to 500			
Non-rotation accuracy (Reference value)	STR2-M	±0.3°		±0.2°	
	STR2-B	±0.1°		±0.3°	
Cushion	Rubber Cushion				
Lubrication	Not required (When lubricating, use turbine oil Class 1 ISO VG32)				
Fall prevention mechanism	Rod side or head side				
Holding Force	N	Max. Thrust x 0.7			
Allowable Absorption Energy	PUSH	0.181	0.303	0.68	1.3
	PULL	0.083	0.127	0.237	0.311

Cylinder Weight

Unit: g

Bore size	Product Weight at Stroke 0 mm		Added Weight per S = 10 mm
	STR2-M	STR2-B	
ø16	390	405	31
ø20	605	605	43
ø25	910	890	59
ø32	1430	1480	84

(Example) Product Weight
STR2-MQ-16-10-H-K2H-D

- Product Weight at stroke=0 mm 390 g
- Added weight at stroke 10 mm 31 g x 1=31 g
- Weight of cylinder switch (2 pieces) ... 18 g x 2=36 g
- Product Weight 390 g + 31 g + 36 g = 457 g

 Be sure to read "Precautions for Use" (Drop prevention type STR2-Q) P. 712, 715 before use.

Stroke

Bore size	Standard Stroke (mm)	Max. Stroke (mm)	Min. Stroke (mm)	Min. stroke with switch (mm)
ø16	10, 20, 30, 40, 50 60, 70, 80, 90, 100	100	5	10
ø20				
ø25				
ø32				

*Intermediate strokes are custom products.

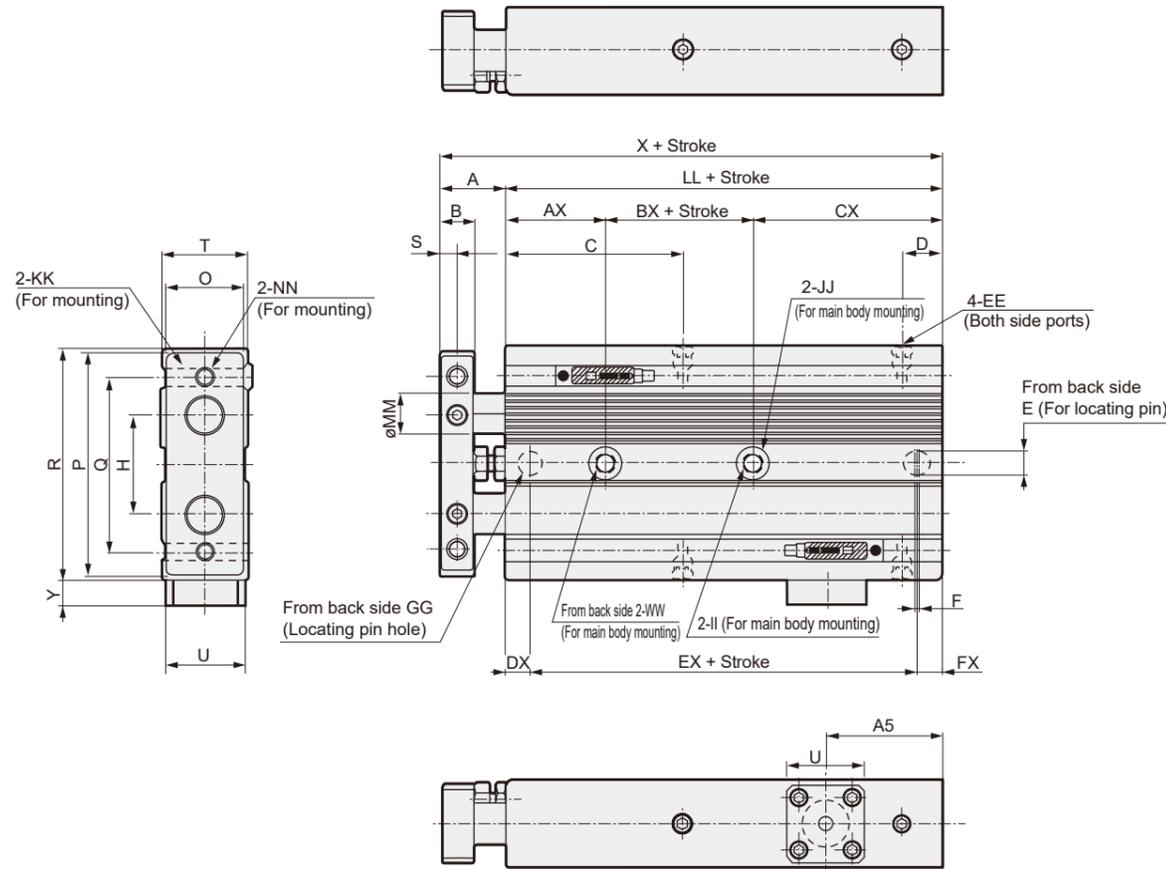
Theoretical Thrust Table

(Unit: N)

Bore size (mm)	Operating Direction	Operating Pressure MPa						
		0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø16	Push	60.3	80.4	1.21 x 10 ²	1.61 x 10 ²	2.01 x 10 ²	2.41 x 10 ²	2.81x10 ²
	Pull	36.8	49.0	73.5	98.0	1.23x10 ²	1.47 x 10 ²	1.72x10 ²
ø20	Push	94.2	1.26 x 10 ²	1.88 x 10 ²	2.51 x 10 ²	3.14 x 10 ²	3.77 x 10 ²	4.40x10 ²
	Pull	60.3	80.4	1.21 x 10 ²	1.61 x 10 ²	2.01 x 10 ²	2.41 x 10 ²	2.81x10 ²
ø25	Push	1.47 x 10 ²	1.96 x 10 ²	2.95 x 10 ²	3.93 x 10 ²	4.91 x 10 ²	5.89 x 10 ²	6.87x10 ²
	Pull	1.01 x 10 ²	1.35x10 ²	2.02x10 ²	2.70x10 ²	3.37x10 ²	4.04x10 ²	4.72x10 ²
ø32	Push	2.41 x 10 ²	3.22 x 10 ²	4.83 x 10 ²	6.43 x 10 ²	8.04 x 10 ²	9.65x10 ²	1.13 x 10 ³
	Pull	1.81 x 10 ²	2.41 x 10 ²	3.62x10 ²	4.83 x 10 ²	6.03x10 ²	7.24 x 10 ²	8.44 x 10 ²

External dimensions diagram (Bore size: ø16 to ø32)

● Drop prevention type (Q) With head side fall prevention (H), Piping port position 180° change (O)



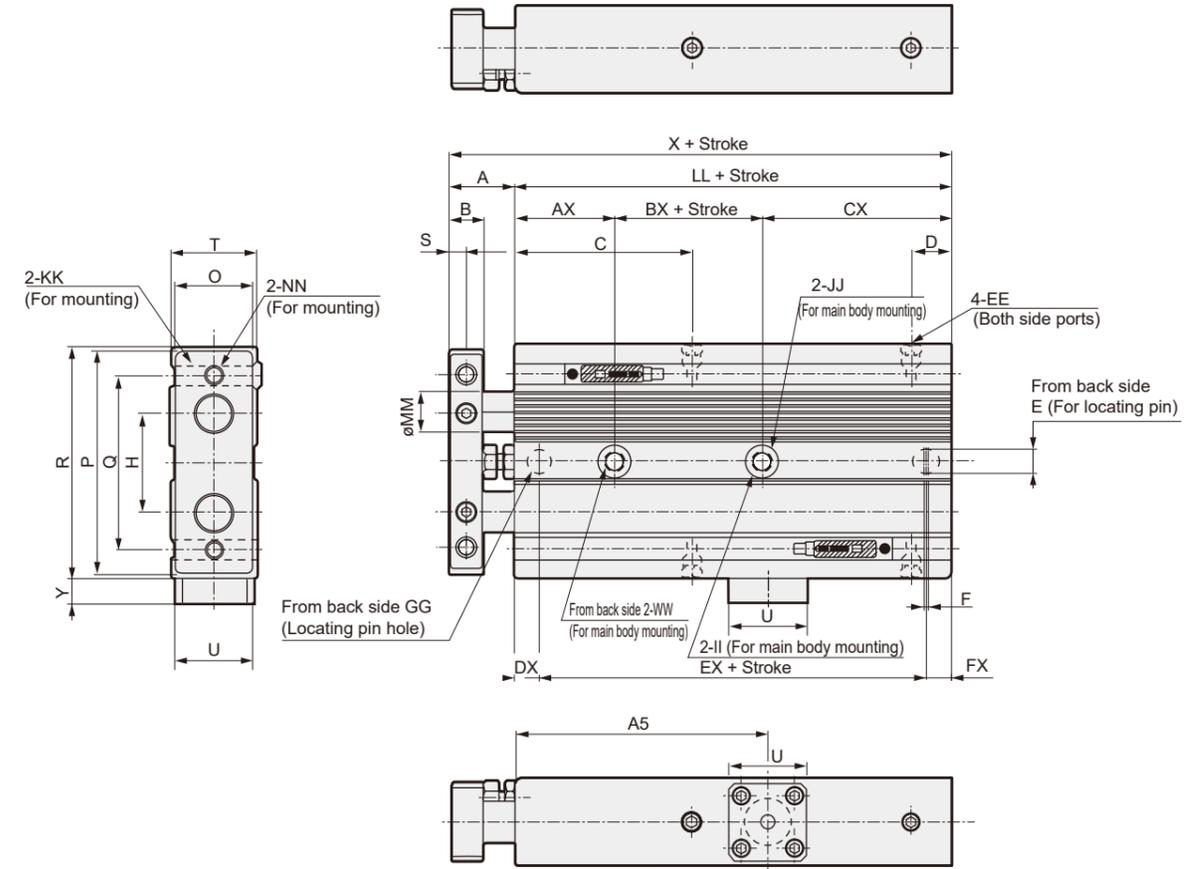
Code	Q-H Basic dimensions															
Bore size (mm)	A	B	C	D	E	EE	F	GG	H	II	JJ	KK	LL	MM	NN	O
ø16	16	8	43	9.5	6 ^{+0.07} _{-0.02} Depth 6	M5	1	6 ^{+0.07} _{-0.02} Depth 6	25	4.3	8 Counterbore depth 4.4	M5 Through	96	10	M5 Through	19
ø20	20	10	46	9.5	6 ^{+0.07} _{-0.02} Depth 6	M5	1	6 ^{+0.07} _{-0.02} Depth 6	28	5.2	9.5 Counterbore Depth 5.4	M5 Through	105	12	M5 Through	24
ø25	22	12	44	10.5	6 ^{+0.07} _{-0.02} Depth 6	M5	1	6 ^{+0.07} _{-0.02} Depth 6	34	6.3	11 Counterbore Depth 6.5	M6 Through	105	14	M6 Through	30
ø32	22	12	56	11	6 ^{+0.07} _{-0.02} Depth 6	Rc 1/8	1	6 ^{+0.07} _{-0.02} Depth 6	44	6.3	11 Counterbore Depth 6.5	M6 Through	121	16	M6 Through	36

Code	Q-H Basic dimensions															
Bore size (mm)	P	Q	R	S	T	U	WW	X	Y	AX	BX	CX	DX	EX	FX	A5
ø16	52	45	58	4	21	19	M5 Depth 6	112	6	24	26	46	8	80	8	28
ø20	60	50	62	5	27	23	M6 Depth 8	125	7.5	24	33	48	9	87	9	25
ø25	70	60	72	6	33	23	M8 Depth 8	127	7.5	24	33	48	9	87	9	28
ø32	94	75	96	6	38	23	M8 Depth 8	143	7.5	24	47	50	9	103	9	27.5

*1: If the surface with the counterbore (JJ) is used as the mounting surface for this cylinder, the cylinder may tilt due to the step. In such cases, use the port position change or port position 180° change option (O) so that the surface with the counterbore is not the mounting surface.
*2: For dimensions with each switch, refer to P. 700, 701.

External dimensions diagram (Bore size: ø16 to ø32)

● Drop prevention type (Q) With rod side fall prevention (R), Piping port position 180° change (O)



Code	Q-R Basic dimensions															
Bore size (mm)	A	B	C	D	E	EE	F	GG	H	II	JJ	KK	LL	MM	NN	O
ø16	16	8	43	9.5	6 ^{+0.07} _{-0.02} Depth 6	M5	1	6 ^{+0.07} _{-0.02} Depth 6	25	4.3	8 Counterbore depth 4.4	M5 Through	96	10	M5 Through	19
ø20	20	10	46	9.5	6 ^{+0.07} _{-0.02} Depth 6	M5	1	6 ^{+0.07} _{-0.02} Depth 6	28	5.2	9.5 Counterbore Depth 5.4	M5 Through	105	12	M5 Through	24
ø25	22	12	44	10.5	6 ^{+0.07} _{-0.02} Depth 6	M5	1	6 ^{+0.07} _{-0.02} Depth 6	34	6.3	11 Counterbore Depth 6.5	M6 Through	105	14	M6 Through	30
ø32	22	12	56	11	6 ^{+0.07} _{-0.02} Depth 6	Rc 1/8	1	6 ^{+0.07} _{-0.02} Depth 6	44	6.3	11 Counterbore Depth 6.5	M6 Through	121	16	M6 Through	36

Code	Q-R Basic dimensions															
Bore size (mm)	P	Q	R	S	T	U	WW	X	Y	AX	BX	CX	DX	EX	FX	A5
ø16	52	45	58	4	21	19	M5 Depth 6	112	6	24	26	46	8	80	8	61.5
ø20	60	50	62	5	27	23	M6 Depth 8	125	7.5	24	33	48	9	87	9	61.5
ø25	70	60	72	6	33	23	M8 Depth 8	127	7.5	24	33	48	9	87	9	61.5
ø32	94	75	96	6	38	23	M8 Depth 8	143	7.5	24	47	50	9	103	9	72.5

*1: If the surface with the counterbore (JJ) is used as the mounting surface for this cylinder, the cylinder may tilt due to the step. In such cases, use the port position change or port position 180° change option (O) so that the surface with the counterbore is not the mounting surface.
*2: For dimensions with each switch, refer to P. 700, 701.

Guided

STM

STG

STS/
STL

STR2

UCA2

Guided

STM

STG

STS/
STL

STR2

UCA2

Cylinder
Switch

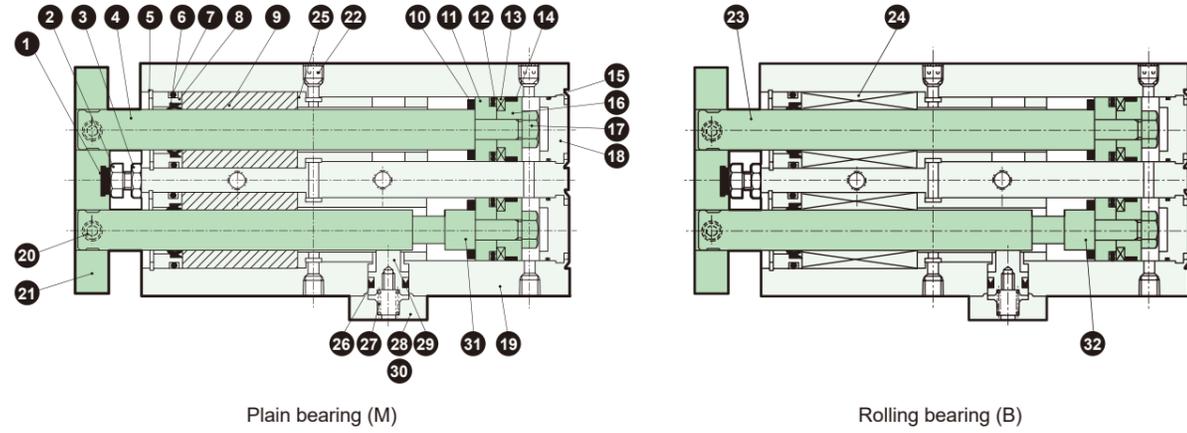
Ending

Cylinder
Switch

Ending

Internal Structure Diagram / Material

- Drop prevention type
(With rod side fall prevention)
STR2-^M/_BQ-R



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Cushion rubber (H)	Urethane Rubber		17	Hexagon Nut	Steel	Zinc Chromate
2	Hexagon bolt	Stainless Steel		18	Cap	Aluminum Alloy	Chromate
3	Hexagon Nut	Stainless Steel		19	Cylinder Body	Aluminum Alloy	Hard Anodized
4	Piston rod (1)	ø16, ø20: Stainless steel ø25, ø32: Steel	Industrial Hard Chrome Plating	20	Hexagon socket head set screw	Stainless Steel	
5	C-ring for hole	Stainless Steel		21	End plate	Aluminum Alloy	Alumite
6	Rod Packing	Nitrile Rubber		22	Hexagon socket head set screw	Stainless Steel	
7	O-ring	Nitrile Rubber		23	Piston rod (1)	Steel	Industrial Hard Chrome Plating
8	Housing	Aluminum Alloy	Chromate	24	Bearing		
9	Bushing	Aluminum Alloy		25	Adapter	Aluminum Alloy	Chromate
10	Cushion rubber (R)	Urethane Rubber		26	Stopper packing	Nitrile Rubber	
11	Piston	Aluminum Alloy	Chromate	27	Coil Spring	Piano Wire	Electrodeposition Coating
12	Piston Packing	Nitrile Rubber		28	Stopper Cover	Aluminum Alloy	Alumite
13	Magnet	Plastic		29	Stopper Piston	Stainless Steel	
14	Wear Ring	Polyacetal		30	Hexagon Socket Head Cap Screw	Stainless Steel	
15	O-ring	Nitrile rubber		31	Piston rod (2)	ø16, ø20: Stainless steel ø25, ø32: Steel	Industrial Hard Chrome Plating
16	Spacer	Aluminum alloy	Chromate	32	Piston rod (2)	Steel	Industrial Hard Chrome Plating

Consumable Parts List

STR2-^M/_BQ-R

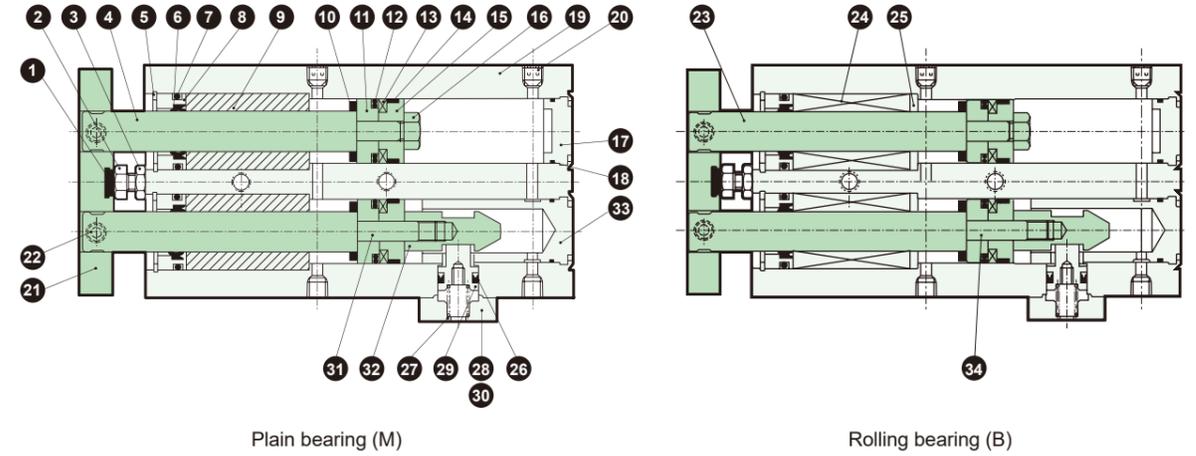
Bore size (mm)	Kit Number	Consumable Part No.
ø16	STR2-Q-16K	
ø20	STR2-Q-20K	1 6 7 26
ø25	STR2-Q-25K	10 12 14
ø32	STR2-Q-32K	

*Please specify the kit number when ordering.

Internal Structure Diagram / Material

Internal Structure Diagram / Material

- Drop prevention type
With head side fall prevention
STR2-^M/_BQ-H



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Cushion rubber (H)	Urethane Rubber		18	O-ring	Nitrile Rubber	
2	Hexagon bolt	Stainless Steel		19	Cylinder Body	Aluminum Alloy	Hard Anodized
3	Hexagon Nut	Stainless Steel		20	Hexagon socket head set screw	Stainless Steel	
4	Piston rod (1)	ø16, ø20: Stainless steel ø25, ø32: Steel	Industrial Hard Chrome Plating	21	End plate	Aluminum Alloy	Alumite
5	C-ring for hole	Stainless Steel		22	Hexagon socket head set screw	Stainless Steel	
6	Rod Packing	Nitrile Rubber		23	Piston rod (1)	Steel	Industrial Hard Chrome Plating
7	O-ring	Nitrile Rubber		24	Bearing		
8	Housing	Aluminum Alloy	Chromate	25	Spacer	Aluminum alloy	Chromate
9	Bushing	Aluminum Alloy		26	Stopper packing	Nitrile Rubber	
10	Cushion rubber (R)	Urethane Rubber		27	Coil Spring	Piano Wire	Electrodeposition Coating
11	Piston	Aluminum Alloy	Chromate	28	Stopper Cover	Aluminum Alloy	Alumite
12	Piston Packing	Nitrile Rubber		29	Stopper Piston	Stainless Steel	
13	Magnet	Plastic		30	Hexagon Socket Head Cap Screw	Stainless Steel	
14	Wear Ring	Polyacetal		31	Piston rod (2)	ø16, ø20: Stainless steel ø25, ø32: Steel	Industrial Hard Chrome Plating
15	Spacer	Aluminum alloy	Chromate	32	Sleeve	Stainless Steel	
16	Hexagon Nut	Steel	Zinc Chromate	33	Head Cover	Aluminum Alloy	Chromate
17	Cap	Aluminum Alloy	Chromate	34	Piston rod (2)	Steel	Industrial Hard Chrome Plating

Consumable Parts List

STR2-^M/_BQ-H

Bore size (mm)	Kit Number	Consumable Part No.
ø16	STR2-Q-16K	
ø20	STR2-Q-20K	1 6 7 26
ø25	STR2-Q-25K	10 12 14
ø32	STR2-Q-32K	

*Please specify the kit number when ordering.



Twin Rod Cylinder Double acting / Low speed type

STR2-MBO Series

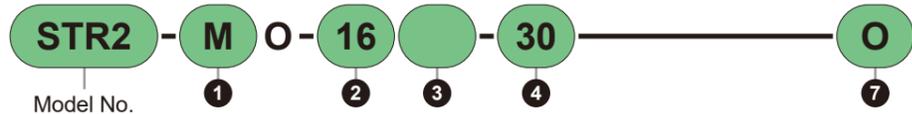
● Bore size: $\phi 6$, $\phi 10$, $\phi 16$, $\phi 20$, $\phi 25$, $\phi 32$

Circuit Diagram Symbol

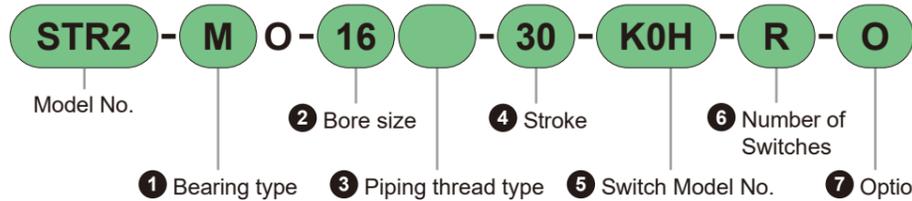


Model No. Notation Method

Without Switch
(Built-in magnet for switch)



With Switch
(Built-in magnet for switch)



1 Bearing type

Code	Content
M	Plain bearing
B	Rolling bearing

2 Bore size (mm)

Code	Content
6	$\phi 6$
10	$\phi 10$
16	$\phi 16$
20	$\phi 20$
25	$\phi 25$
32	$\phi 32$

3 Piping thread type

Code	Content
Blank	M5 ($\phi 6$ to $\phi 25$) Rc thread ($\phi 32$)
NN	NPT thread (Custom Product) ($\phi 32$)
GN	G thread (Custom Product) ($\phi 32$)

*In the case of G thread, there is no port on the opposite side (option "O"). There is no port itself, not a plug seal. (If option "O" is selected, there is no standard port.)

4 Stroke (mm)

Bore size	Stroke	Intermediate Stroke
$\phi 6$, $\phi 10$	5 to 50	Every 1 mm
$\phi 16$ to $\phi 32$	5 to 100	

*1: The overall length dimension is the same as the longer standard stroke.
*2: For standard stroke, please refer to P. 686.

5 Switch Model No.

For switch details, please refer to P. 753.
Switches are included to the product and shipped.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead wire *1		
			AC	DC	AC	DC	Straight	L-shape	
Solid State	1-Color	2-wire	-	10 to 30	-	5 to 20 *2	K2H□	K2V□	
		3-wire (NPN)	-	30 or less	-	50 or less	K3H□	K3V□	
		3-wire (PNP)	-	-	-	-	K3PH□	K3PV□	
Solid State	2-Color	2-wire	-	10 to 30	-	5 to 20	K2YH□	K2YV□	
		3-wire (NPN)	-	30 or less	-	50 or less	K3YH□	K3YV□	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	K0H□	K0V□	
	No Indicator LED			5/12/24	20 or less	50 or less	K5H□	K5V□	

*1: For "□" in the switch model No., enter the code selected from the "Lead wire length" table.
*2: Maximum load current value above: 20 mA, is at 25°C. If the switch operating ambient temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: Reed switches cannot be used with STR2-B-6 / 10.
*4: Switches other than the model Nos. listed above are also available. (Custom order) For details, refer to P. 753.

* Lead wire length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length 1 m KOH
3 m KOH [3]
5 m KOH [5]

6 Number of Switches

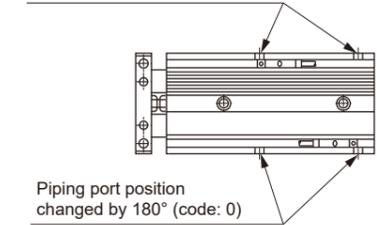
Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

7 Option

Code	Content
F	End plate material: Steel
O	Piping port position 180° change

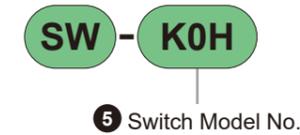
*The piping port position in the case of "O" is as shown in the diagram below.

Piping port positions for standard (blank)



For combinations of variations and options, please refer to P. 666 (Plain bearing) and 667 (Rolling bearing).

Switch Single Unit Model No. Notation Method



5 Switch Model No.

Specifications

Item	STR2-MO (Plain bearing) STR2-BO (Rolling bearing)							
Bore size	mm	ø6	ø10	ø16	ø20	ø25	ø32	
Actuation method	Double Acting/Low Speed Type							
Operating Fluid	Compressed Air							
Max. Working Pressure	MPa	0.7						
Min. Operating Pressure	MPa	0.2	0.15	0.1				
Proof Pressure	MPa	1.05						
Ambient Temperature	°C	-10 to 60 (However, no freezing)						
Port Size		M5				Rc1/8		
Stroke tolerance	mm	+2.0 0						
Stroke adjustment range	mm	-5 to 0						
Operating Piston Speed	mm/s	10 to 200						
Non-rotation accuracy (Reference value)	STR2-M	±0.4°	±0.3°			±0.2°		
	STR2-B	±0.2°	±0.1°			±0.3°		
Cushion	Rubber Cushion							
Lubrication	Not Available							
Allowable Absorption Energy	PUSH	0.008	0.061	0.181	0.303	0.68	1.3	
	PULL	0.059	0.083	0.083	0.127	0.237	0.311	

Cylinder Weight

Unit: g

Bore size	Product Weight at Stroke 0 mm		Added Weight per S = 10 mm
	STR2-M	STR2-B	
ø6	60	64	10
ø10	140	155	14
ø16	240	300	20
ø20	340	405	40
ø25	580	610	52
ø32	1300	1150	83

(Example) Product Weight
STR2-M-6-10-K2H-D

- Product Weight at stroke=0 mm 60 g
- Added weight at stroke 10 mm 10 g x 1=10 g
- Weight of cylinder switch (2 pieces) ··· 18 g x 2=36 g
- Product Weight 60 g + 10 g + 36 g = 106 g

Stroke

Bore size	Standard Stroke (mm)	Max. Stroke (mm)	Min. Stroke (mm)	Producibile stroke (mm)	Min. stroke with switch (mm)
ø6	10, 20, 30, 40, 50	50	5	100	10
ø10					
ø16					
ø20	10, 20, 30, 40, 50	100	5	200	10
ø25					
ø32					

*The custom stroke is available in 1 mm increments.
However, the overall length dimension is the same as the dimension of the longer standard stroke.

Outline Dimension Drawing

Double Acting, Standard Type Same as the STR2-M^BO Series. See P. 672.

Theoretical Thrust Table

(Unit: N)

Bore size (mm)	Operating Direction	Operating Pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø6	Push	-	-	11.3	17.0	22.6	28.3	33.9	39.6
	Pull	-	-	6.28	9.42	12.6	15.7	18.8	22.0
ø10	Push	-	23.6	31.4	47.1	62.8	78.5	94.2	1.10 x 10 ²
	Pull	-	15.1	20.1	30.2	40.2	50.3	60.3	70.4
ø16	Push	40.2	60.3	80.4	1.21 x 10 ²	1.61 x 10 ²	2.01 x 10 ²	2.41 x 10 ²	2.81x10 ²
	Pull	24.5	36.8	49.0	73.5	98.0	1.23x10 ²	1.47 x 10 ²	1.72x10 ²
ø20	Push	62.8	94.2	1.26 x 10 ²	1.88 x 10 ²	2.51 x 10 ²	3.14 x 10 ²	3.77 x 10 ²	4.40x10 ²
	Pull	40.2	60.3	80.4	1.21 x 10 ²	1.61 x 10 ²	2.01 x 10 ²	2.41 x 10 ²	2.81x10 ²
ø25	Push	98.2	1.47 x 10 ²	1.96 x 10 ²	2.95 x 10 ²	3.93 x 10 ²	4.91 x 10 ²	5.89 x 10 ²	6.87x10 ²
	Pull	67.4	1.01 x 10 ²	1.35x10 ²	2.02x10 ²	2.70x10 ²	3.37x10 ²	4.04x10 ²	4.72x10 ²
ø32	Push	1.61 x 10 ²	2.41 x 10 ²	3.22 x 10 ²	4.83 x 10 ²	6.43 x 10 ²	8.04 x 10 ²	9.65x10 ²	1.13 x 10 ³
	Pull	1.21 x 10 ²	1.81 x 10 ²	2.41 x 10 ²	3.62x10 ²	4.83 x 10 ²	6.03x10 ²	7.24 x 10 ²	8.44 x 10 ²

Cylinder Switch

Cylinder Switch

Ending

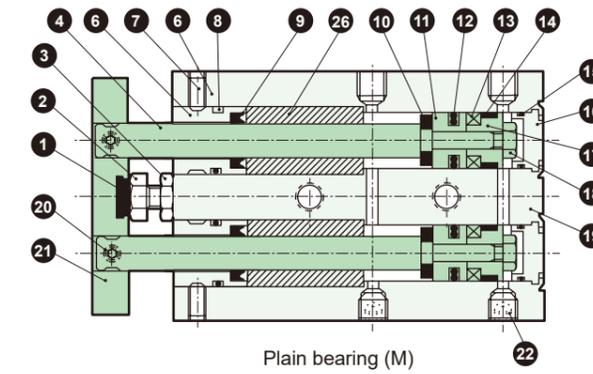
Ending

Internal Structure Diagram/Material

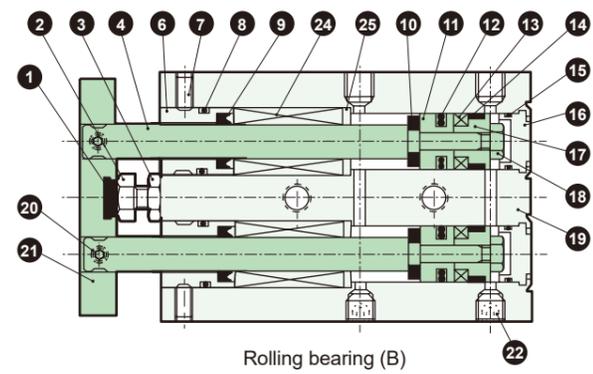
● Low Speed Type

STR2-M_BO

ø6, ø10

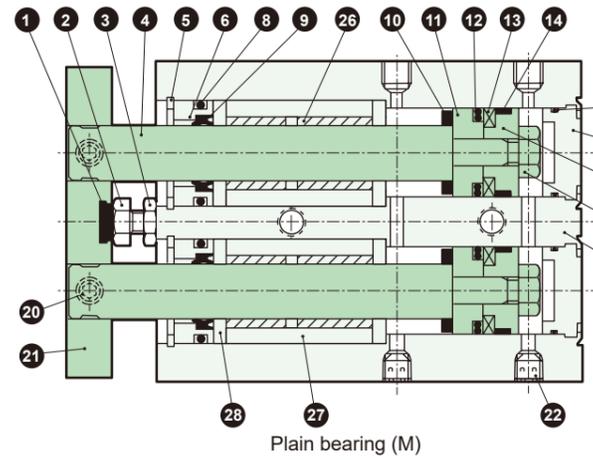


Plain bearing (M)

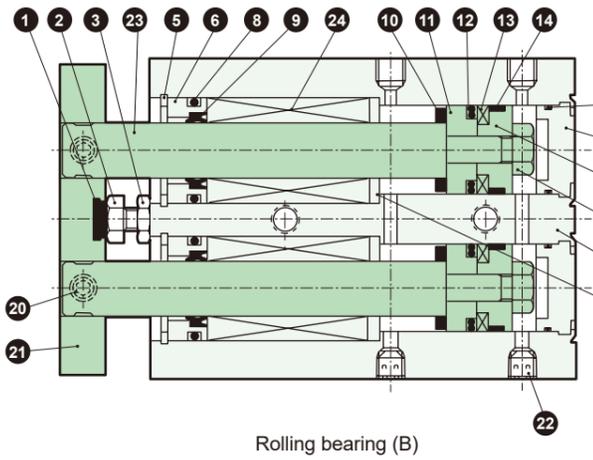


Rolling bearing (B)

ø16 to ø32



Plain bearing (M)



Rolling bearing (B)

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Cushion rubber (H)	Urethane Rubber		14	Wear Ring	Polyacetal	
2	Hexagon bolt	Stainless Steel		15	O-ring	Nitrile rubber	
3	Hexagon Nut	Stainless Steel		16	Cap	Aluminum Alloy	Chromate
4	Piston rod (1)	ø6 to ø20: Stainless steel ø25, ø32: Steel	ø16 to ø32: Industrial chrome plating	17	Magnet spacer	Aluminum Alloy	Chromate
5	C-ring for hole	Stainless Steel	ø16 to ø32 only	18	Hexagon Nut	Steel	Zinc Chromate
6	Housing	ø6, ø10: Stainless steel ø16 to ø32: Aluminum alloy	ø 16 to ø 32: Chromate	19	Cylinder Body	Aluminum Alloy	Hard Anodized
7	Hexagon socket set screw	Stainless Steel	ø6, ø10 only	20	Hexagon socket set screw	Stainless Steel	
8	O-ring	Nitrile Rubber		21	End plate *1	Aluminum Alloy	Alumite
9	Rod Packing	Nitrile Rubber		22	Hexagon socket set screw	Stainless Steel	
10	Cushion rubber (R)	Urethane Rubber		23	Piston rod (2)	Steel	Industrial Hard Chrome Plating
11	Piston	Aluminum Alloy	Chromate	24	Bearing		
12	Piston Packing	Nitrile Rubber		25	Spacer	Aluminum alloy	Chromate
13	Magnet	Plastic		26	Bushing	Oil-impregnated Bearing Alloy	
				27	Aluminum housing	Aluminum Alloy	Chromate
				28	Spacer	Aluminum alloy	Chromate

*1: Option (F): In the case of end plate material steel, the material is steel and the treatment is zinc chromate.

Consumable Parts List

STR2-M_BO (Low speed type) * All consumable parts other than piston packing are the same as standard.

Bore size (mm)	Kit Number	Consumable Part No.
ø6	STR2-O-6K	
ø10	STR2-O-10K	
ø16	STR2-O-16K	1 8 9 10 12 14
ø20	STR2-O-20K	
ø25	STR2-O-25K	
ø32	STR2-O-32K	

*Please specify the kit number when ordering.

MEMO

Guided

Guided

STM

STM

STG

STG

STS/
STL

STS/
STL

STR2

STR2

UCA2

UCA2

Cylinder
Switch

Cylinder
Switch

Ending

Ending



Twin Rod Cylinder Double acting / Ultra low speed type

STR2-BF Series

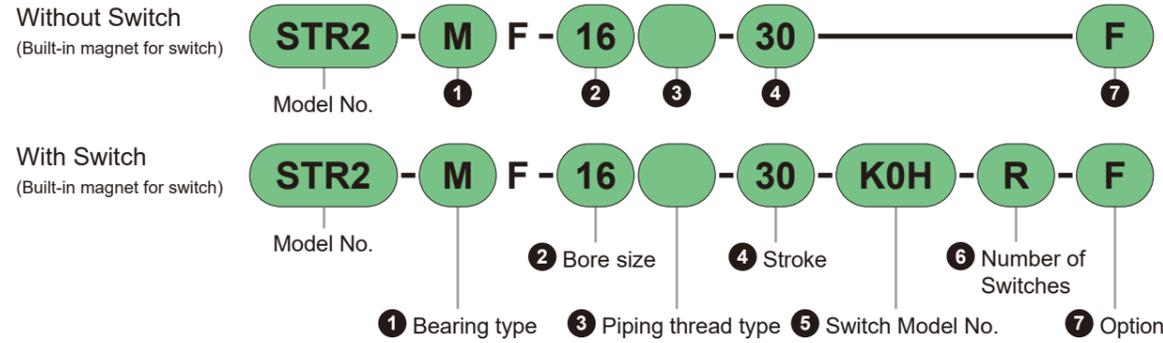
● Bore size: $\phi 10$, $\phi 16$, $\phi 20$, $\phi 25$, $\phi 32$

Circuit Diagram Symbol



STR2-BF Series
Model No. Notation Method

Model No. Notation Method



1 Bearing type

Code	Content
M	Plain bearing
B	Rolling bearing

2 Bore size (mm)

Code	Content
10	$\phi 10$
16	$\phi 16$
20	$\phi 20$
25	$\phi 25$
32	$\phi 32$

Piping thread type

Code	Content
Blank	M5 ($\phi 10$ to $\phi 25$) Rc thread ($\phi 32$)
NN	NPT thread (Custom Product) ($\phi 32$)
GN	G thread (Custom Product) ($\phi 32$)

*In the case of G thread, there is no port on the opposite side (option "O"). There is no port itself, not a plug seal.
⑦ If option "O" is selected, there is no standard port.)

4 Stroke (mm)

Bore size	Stroke	Intermediate Stroke
$\phi 10$	5 to 50	Every 1 mm
$\phi 16$ to $\phi 32$	5 to 100	

*1: ⑦ The maximum stroke of option rear piping type "R" is
 • $\phi 16$: 70 mm
 • $\phi 20, \phi 25$: 60 mm
 • $\phi 32$: 50 mm.

*2: The overall length dimension is the same as the longer standard stroke.
 *3: For standard stroke, please refer to P. 692.

5 Switch Model No.

For switch details, please refer to P. 753.
Switches are included to the product and shipped.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead wire *1		
			AC	DC	AC	DC	Straight	L-shape	
Solid State	1-Color	2-wire	-	10 to 30	-	5 to 20 *2	K2H□	K2V□	
		3-wire (NPN)	-	30 or less	-	50 or less	K3H□	K3V□	
		3-wire (PNP)	-	-	-	-	K3PH□	K3PV□	
	2-Color	2-wire	-	10 to 30	-	5 to 20	K2YH□	K2YV□	
		3-wire (NPN)	-	30 or less	-	50 or less	K3YH□	K3YV□	
		3-wire (PNP)	-	-	-	-	K3YH□	K3YV□	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	K0H□	K0V□	
	No Indicator LED			5/12/24	20 or less	50 or less	K5H□	K5V□	

*Lead wire length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length 1 m KOH
 3 m KOH ③
 5 m KOH ⑤

*1: For "□" in the switch model No., enter the code selected from the "Lead wire length" table.
 *2: Maximum load current value above: 20 mA, is at 25°C. If the switch operating ambient temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
 *3: Reed switches cannot be used with STR2-BF-10.
 *4: Switches other than the model Nos. listed above are also available. (Custom order)
 For details, refer to P. 753.

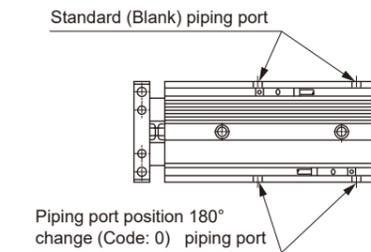
6 Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

7 Option

Code	Content
F	End plate material: Steel
O	Piping port position 180° change
R	Rear piping type

*The piping port position in the case of "O" is as shown in the diagram below.



For combinations of variations and options, please refer to P. 666 (Plain bearing) and 667 (Rolling bearing).

Clean Specification

(Catalog No. CB-033SA)

● Dust prevention structure usable in cleanrooms

STR2-BF - P7□

Switch Single Unit Model No. Notation Method

● Switch body only

SW - K0H

5 Switch Model No.

Specifications

Item	STR2-MF (Plain bearing), STR2-BF (Rolling bearing)				
Bore size mm	ø10	ø16	ø20	ø25	ø32
Actuation method	Double Acting Type				
Operating Fluid	Compressed Air				
Max. Working Pressure MPa	0.70				
Min. Operating Pressure MPa	0.15	0.1			
Ambient Temperature °C	5 to 60				
Port Size	M5			Rc1/8	
Stroke tolerance mm	-5 to 0				
Operating Piston Speed mm/s	1 to 200				
Non-rotation accuracy (Reference value)	STR2-MF	±0.3°			±0.2°
	STR2-BF	±0.1°			±0.3°
Cushion	Rubber Cushion				
Lubrication	Lubrication Not Possible				
Allowable Absorbed Energy J	0.061	0.181	0.303	0.68	1.3

*For ø6, low speed type (STR2-0) is recommended.

Stroke

Bore size	Standard Stroke (mm)	Max. Stroke (mm)	Min. Stroke (mm)	Minimum Stroke with Switch (mm)
ø10	10, 20, 30, 40, 50	50	5	10
ø16	10, 20, 30, 40, 50 60, 70, 80, 90, 100	100		
ø20				
ø25				
ø32				

*About Intermediate Stroke: Manufacturable every 1 mm. However, the overall length dimension is the same as the dimension of the longer standard stroke.

Theoretical Thrust Table

(Unit: N)

Bore size (mm)	Operating Direction	Operating Pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø10	Push	-	23.6	31.4	47.1	62.8	78.5	94.2	1.10 x 10 ²
	Pull	-	15.1	20.1	30.2	40.2	50.3	60.3	70.4
ø16	Push	40.2	60.3	80.4	1.21 x 10 ²	1.61 x 10 ²	2.01 x 10 ²	2.41 x 10 ²	2.81x10 ²
	Pull	24.5	36.8	49.0	73.5	98.0	1.23x10 ²	1.47 x 10 ²	1.72x10 ²
ø20	Push	62.8	94.2	1.26 x 10 ²	1.88 x 10 ²	2.51 x 10 ²	3.14 x 10 ²	3.77 x 10 ²	4.40x10 ²
	Pull	40.2	60.3	80.4	1.21 x 10 ²	1.61 x 10 ²	2.01 x 10 ²	2.41 x 10 ²	2.81x10 ²
ø25	Push	98.2	1.47 x 10 ²	1.96 x 10 ²	2.95 x 10 ²	3.93 x 10 ²	4.91 x 10 ²	5.89 x 10 ²	6.87x10 ²
	Pull	67.4	1.01 x 10 ²	1.35x10 ²	2.02x10 ²	2.70x10 ²	3.37x10 ²	4.04x10 ²	4.72x10 ²
ø32	Push	1.61 x 10 ²	2.41 x 10 ²	3.22 x 10 ²	4.83 x 10 ²	6.43 x 10 ²	8.04 x 10 ²	9.65x10 ²	1.13 x 10 ³
	Pull	1.21 x 10 ²	1.81 x 10 ²	2.41 x 10 ²	3.62x10 ²	4.83 x 10 ²	6.03x10 ²	7.24 x 10 ²	8.44 x 10 ²

Outline Dimension Drawing

Same as double acting type STR2 series. See P. 672.

Technical Data

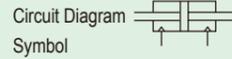
For technical data on measurement methods, please refer to the measurement method (Pneumatic cylinder ② (Catalog No. RJ-003AA) SSD-F, SSD-KF).



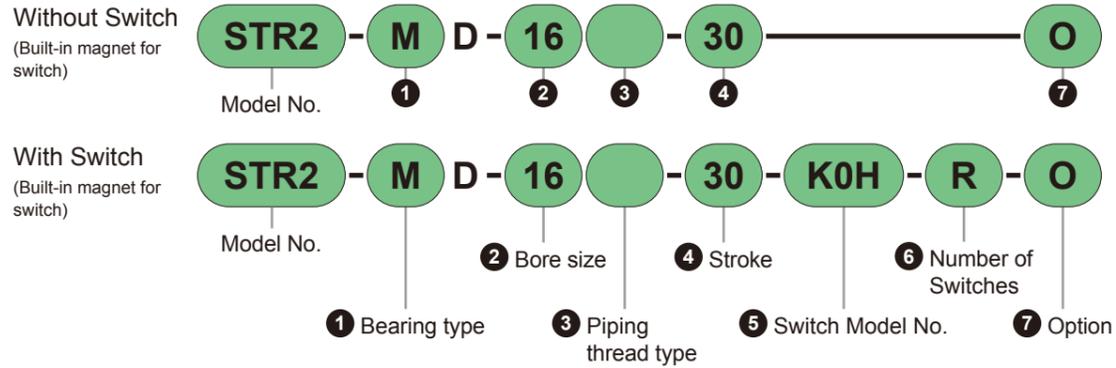
Twin Rod Cylinder Double acting / Double rod type

STR2-MB D Series

● Bore size: $\phi 6$, $\phi 10$, $\phi 16$, $\phi 20$, $\phi 25$, $\phi 32$



Model No. Notation Method



1 Bearing type

Code	Content
M	Plain bearing
B	Rolling bearing

2 Bore size (mm)

Code	Content
6	$\phi 6$
10	$\phi 10$
16	$\phi 16$
20	$\phi 20$
25	$\phi 25$
32	$\phi 32$

Piping thread type

Code	Content
Blank	M5 ($\phi 6$ to $\phi 25$) Rc thread ($\phi 32$)
NN	NPT thread (Custom Product) ($\phi 32$)
GN	G thread (Custom Product) ($\phi 32$)

*In the case of G thread, there is no port on the opposite side (option "O"). There is no port itself, not a plug seal.
⑦ If option "O" is selected, there is no standard port.)

4 Stroke (mm)

Bore size	Stroke
$\phi 6$, $\phi 10$	10 to 50
$\phi 16$ to $\phi 32$	10 to 100

*For standard stroke, please refer to P. 696.

5 Switch Model No.

For switch details, please refer to P. 753.
Switches are included to the product and shipped.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead wire *1		
			AC	DC	AC	DC	Straight	L-shape	
Solid State	1-Color	2-wire	-	10 to 30	-	5 to 20 *2	K2H□	K2V□	
		3-wire (NPN)	-	30 or less	-	50 or less	K3H□	K3V□	
		3-wire (PNP)	-	30 or less	-	50 or less	K3PH□	K3PV□	
Solid State	2-Color	2-wire	-	10 to 30	-	5 to 20	K2YH□	K2YV□	
		3-wire (NPN)	-	30 or less	-	50 or less	K3YH□	K3YV□	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	K0H□	K0V□	
	No Indicator LED			5/12/24	20 or less	50 or less	K5H□	K5V□	

*1: For "□" in the switch model No., enter the code selected from the "Lead wire length" table.

*2: The maximum load current value above, 20 mA, is at 25°C.

If the switch operating ambient temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)

*3: Reed switches cannot be used with STR2-B-6 / 10.

*4: Switches other than the model Nos. listed above are also available. (Custom order) For details, refer to P. 753.

6 Number of Switches

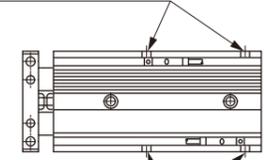
Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

7 Option

Code	Content
F	End plate material: Steel
O	Piping port position 180° change

*The piping port position in the case of "O" is as shown in the diagram below.

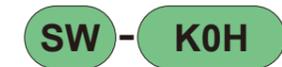
Piping port positions for standard (blank)



Piping port position changed by 180° (code: 0)

For combinations of variations and options, please refer to P. 666 (Plain bearing) and 667 (Rolling bearing).

Switch Single Unit Model No. Notation Method



5 Switch Model No.

* Lead wire length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length 1 m K0H
3 m K0H [3]
5 m K0H [5]

Specifications

Item	STR2-MD (Plain bearing) STR2-BD (Rolling bearing)						
	mm	ø6	ø10	ø16	ø20	ø25	ø32
Bore size	mm	ø6	ø10	ø16	ø20	ø25	ø32
Actuation method	Double Acting/Double Rod Type						
Operating Fluid	Compressed Air						
Max. Working Pressure	MPa	0.7					
Min. Operating Pressure	MPa	0.25	0.2	0.15			
Proof Pressure	MPa	1.05					
Ambient Temperature	°C	-10 to 60 (However, no freezing)					
Port Size		M5					Rc1/8
Stroke tolerance	mm	+2.0 0					
Stroke adjustment range	mm	-5 to 0					
Operating Piston Speed	mm/s	50 to 500					
Non-rotation accuracy (Reference value)	STR2-M	±0.4°		±0.3°		±0.2°	
	STR2-B	±0.2°		±0.1°		±0.3°	
Cushion		Rubber Cushion					
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)					
Allowable absorption energy J ^{*1}	PULL	0.059	0.083	0.083	0.127	0.237	0.311

*1: The allowable absorption energy for double rod type is only on the PULL side.

Stroke

Bore size	Standard Stroke (mm)	Max. Stroke (mm)	Min. Stroke (mm)	Min. stroke with switch (mm)
ø6	10, 20, 30, 40, 50	50	5	10
ø10				
ø16	10, 20, 30, 40, 50 60, 70, 80, 90, 100	100	5	10
ø20				
ø25				
ø32				

Note) Intermediate strokes are custom products.

Theoretical Thrust Table

(Unit: N)

Bore size (mm)	Operating Pressure MPa						
	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø6	-	-	9.42	12.6	15.7	18.8	22.0
ø10	-	20.1	30.2	40.2	50.3	60.3	70.4
ø16	36.8	49.0	73.5	98.0	1.23x10 ²	1.47 x 10 ²	1.72 x 10 ²
ø20	60.3	80.4	1.21 x 10 ²	1.61 x 10 ²	2.01 x 10 ²	2.41 x 10 ²	2.81 x 10 ²
ø25	1.01 x 10 ²	1.35 x 10 ²	2.02 x 10 ²	2.70 x 10 ²	3.37 x 10 ²	4.04 x 10 ²	4.72 x 10 ²
ø32	1.81 x 10 ²	2.41 x 10 ²	3.62 x 10 ²	4.83 x 10 ²	6.03 x 10 ²	7.24 x 10 ²	8.44 x 10 ²

Cylinder Weight

Unit: g

Bore size	Product Weight at Stroke 0 mm		Added Weight per S = 10 mm
	STR2-M	STR2-B	
ø6	100	95	13
ø10	185	200	20
ø16	450	475	44
ø20	735	730	60
ø25	1160	1120	82
ø32	1960	2060	115

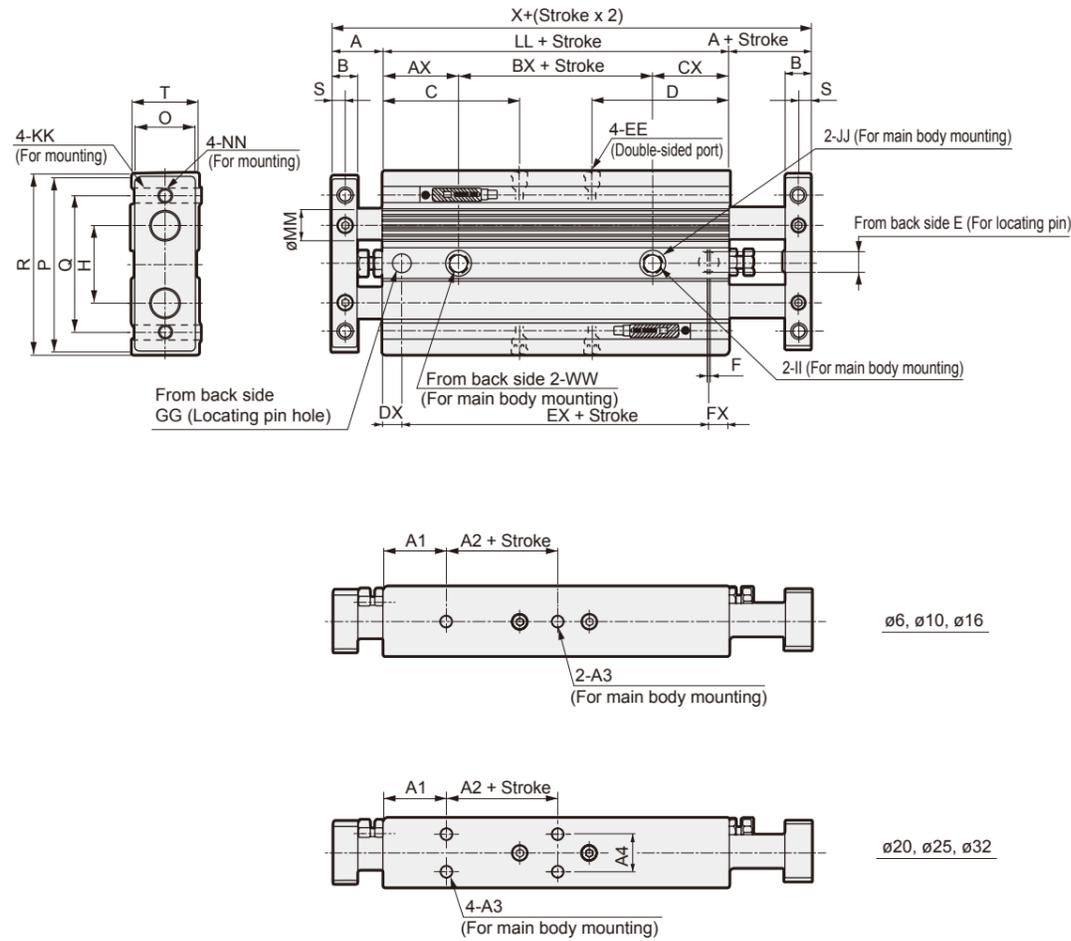
(Example) Product Weight

STR2-MD-6-10-K2H-D

- Product Weight at stroke=0 mm 100 g
- Added weight at stroke 10 mm 13 x 1=12 g
- Weight of cylinder switch (2 pieces) · 18 g x 2=36 g
- Product Weight 100 g + 12 g + 36 g = 149 g

External dimensions diagram (Bore size: ø6 to ø32)

● Double rod type (D), Piping port position 180° change (O)



Code	Basic dimensions																
Bore size (mm)	A	B	C	D	E	EE	F	GG	H	II	JJ	KK	LL	MM	NN	O	P
ø6	12	6	24.5	24.5	4 ^{+0.07} _{-0.02} Depth 4	M5	1	4 ^{+0.07} _{-0.02} Depth 4	14	3.4	6.5 Counterbore depth 3.3	M3 Through	61	4	M3 Through	11	34
ø10	14	6	35	35	4 ^{+0.07} _{-0.02} Depth 4	M5	1	4 ^{+0.07} _{-0.02} Depth 4	20	4.3	8 Counterbore depth 4.4	M4 Through	82.5	6	M4 Through	13	42
ø16	16	8	43	43	6 ^{+0.07} _{-0.02} Depth 6	M5	1	6 ^{+0.07} _{-0.02} Depth 6	25	4.3	8 Counterbore depth 4.4	M5 Through	99	10	M5 Through	19	52
ø20	20	10	46	46	6 ^{+0.07} _{-0.02} Depth 6	M5	1	6 ^{+0.07} _{-0.02} Depth 6	28	5.2	9.5 Counterbore Depth 5.4	M5 Through	108	12	M5 Through	24	60
ø25	22	12	44	44	6 ^{+0.07} _{-0.02} Depth 6	M5	1	6 ^{+0.07} _{-0.02} Depth 6	34	6.3	11 Counterbore Depth 6.5	M6 Through	108	14	M6 Through	30	70
ø32	22	12	56	56	6 ^{+0.07} _{-0.02} Depth 6	Rc 1/8	1	6 ^{+0.07} _{-0.02} Depth 6	44	6.3	11 Counterbore Depth 6.5	M6 Through	133	16	M6 Through	36	94

Code	Basic dimensions															
Bore size (mm)	Q	R	S	T	WW	X	AX	BX	CX	DX	EX	FX	A1	A2	A3	A4
ø6	29	36	3	13	M4 Depth 5	85	20	21	20	7	47	7	15	10	M3 Depth 4	-
ø10	36	44	3	15	M5 Depth 6	110.5	24	34.5	24	8	65.5	9	15	20	M3 Depth 3.5	-
ø16	45	58	4	21	M5 Depth 6	131	24	51	24	8	83	8	20	25	M4 Depth 4	-
ø20	50	62	5	27	M6 Depth 8	148	24	60	24	9	90	9	20	30	M4 Depth 4	13
ø25	60	72	6	33	M8 Depth 8	152	24	60	24	9	90	9	20	30	M5 Depth 6	18
ø32	75	96	6	38	M8 Depth 8	177	24	85	24	9	115	9	20	40	M5 Depth 8	24

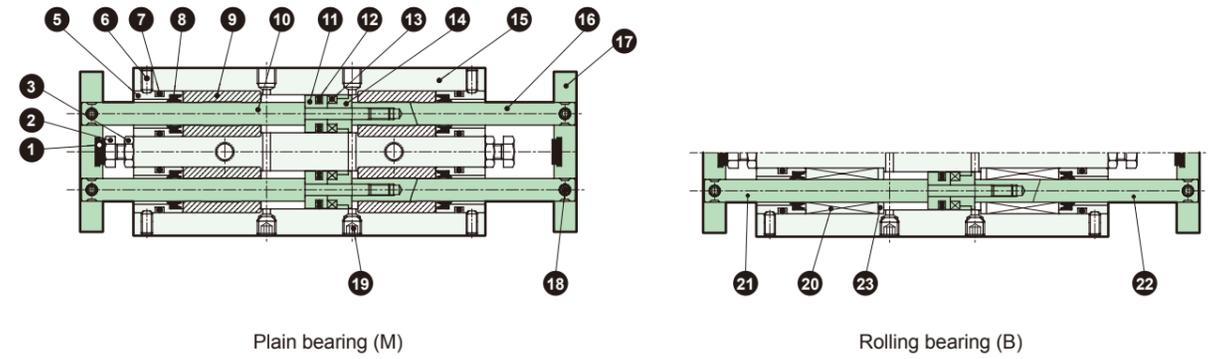
*1: If the surface with the counterbore (JJ) is used as the mounting surface for this cylinder, the cylinder may tilt due to the step. In such cases, use the port position change or port position 180° change option (O) so that the surface with the counterbore is not the mounting surface.
 *2: For dimensions with each switch, refer to P. 700, 701.

Internal Structure Diagram / Material

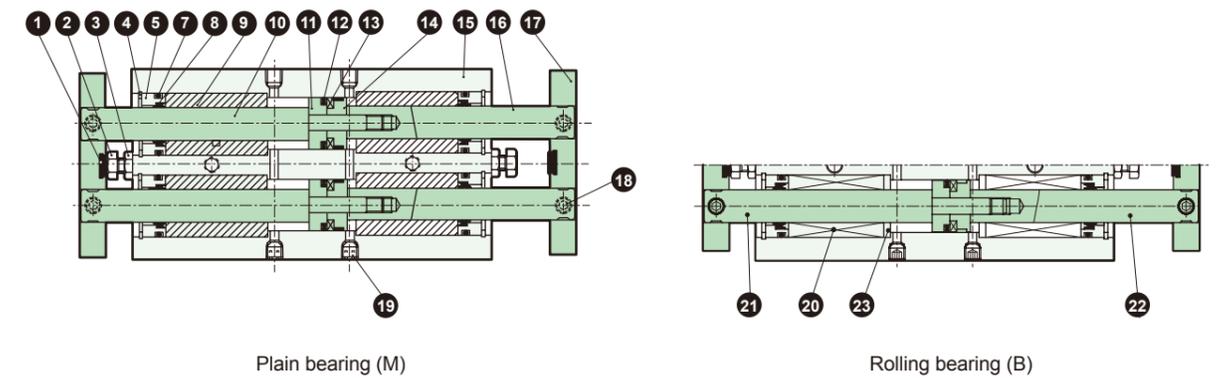
Internal Structure Diagram/Material

● Double rod type
STR2-M_BD

ø6, ø10



ø16, ø32



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Cushion rubber (H)	Urethane Rubber		13	Magnet	Plastic	
2	Hexagon bolt	Stainless Steel		14	Spacer	Aluminum alloy	Chromate
3	Hexagon Nut	Stainless Steel		15	Cylinder Body	Aluminum Alloy	Hard Anodized
4	C-ring for hole	Stainless Steel		16	Piston rod (B)	ø6 to ø20: Stainless steel ø25, ø32: Steel	ø16 to ø32: Industrial Hard Chrome Plating
5	Housing	ø6, ø10: Stainless steel ø16 to ø32: Aluminum alloy	ø16 to ø32: Chromate	17	End plate	Aluminum Alloy	Alumite
6	Hexagon socket set screw	Stainless Steel	ø6, ø10 only	18	Hexagon socket head set screw	Stainless Steel	
7	O-ring	Nitrile rubber		19	Hexagon socket head set screw	Stainless Steel	
8	Rod Packing	Nitrile Rubber		20	Bearing		
9	Bushing	Aluminum Alloy		21	Piston rod (A)	Steel	Industrial Hard Chrome Plating
10	Piston rod (A)	ø6 to ø20: Stainless steel ø25, ø32: Steel	ø16 to ø32: Industrial Hard Chrome Plating	22	Piston rod (B)	Steel	Industrial Hard Chrome Plating
11	Piston	Aluminum Alloy	Chromate	23	Spacer	Aluminum alloy	Chromate
12	Piston Packing	Nitrile Rubber					

Consumable Parts List

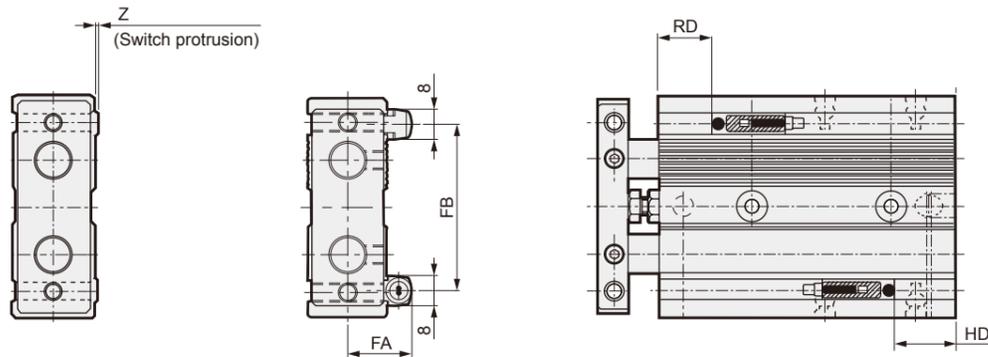
STR2-M_BD

Bore size (mm)	Kit Number	Consumable Part No.
ø6	STR2-D-6K	
ø10	STR2-D-10K	
ø16	STR2-D-16K	1 7 8
ø20	STR2-D-20K	12
ø25	STR2-D-25K	
ø32	STR2-D-32K	

*Please specify the kit number when ordering.

STR2 Series Switch External Dimensions Diagram

- K0H/V, K5H/V, K2H/V, K3H/V, K2YH/V, K3YH/V
- STR2-(M/B) Standard, -R (Rear piping), O, Q-R, Q-H



[In case of K0H/V, K5H/V, K2H/V, K3H/V] [In case of K2YH/V, K3YH/V]

Code	STR2-(M/B) Standard, STR2-(M/B) O								STR2-(M/B)-R (Rear piping)							
	K0, K5, K2, K3				K2Y, K3Y				K0, K5, K2, K3				K2Y, K3Y			
	Z	RD	HD	FA	FB	RD	HD	Z	RD	HD	FA	FB	RD	HD		
Bore size (mm)																
ø6	1.0	21 *1	3.5 *1	13.5	24	20	2.5	1.0	21 *1	13.5 *1	13.5	24	20	12.5		
ø10	1.0	33 *1	2.5 *1	14.5	34	32	1	1.0	33 *1	12.5 *1	14.5	34	32	11		
ø16	0.5	39.5	7	17	44	38.5	5.5	0.5	39.5	17	17	44	38.5	15.5		
ø20	0.5	45	10.5	20	49	44	9.5	0.5	45	20.5	20	49	44	19.5		
ø25	0.5	43.5	11.5	23	58	42.5	10.5	0.5	43.5	21.5	23	58	42.5	20.5		
ø32	0.5	55.5	15.5	25.5	71	54.5	14.5	0.5	55.5	25.5	25.5	71	54.5	24.5		

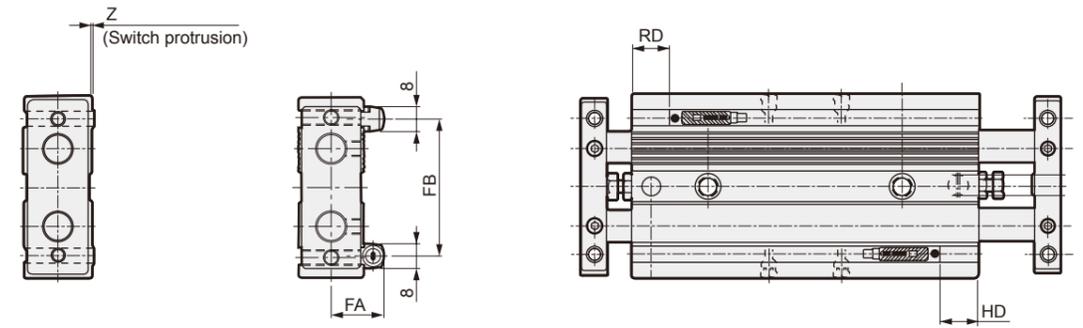
Code	STR2-(M/B)-Q-H								STR2-(M/B)-Q-R							
	K0, K5, K2, K3				K2Y, K3Y				K0, K5, K2, K3				K2Y, K3Y			
	Z	RD	HD	FA	FB	RD	HD	Z	RD	HD	FA	FB	RD	HD		
Bore size (mm)																
ø16	0.5	39.5	37	17	44	38.5	35.5	0.5	69.5	7	17	44	68.5	5.5		
ø20	0.5	45	40.5	20	49	44	39.5	0.5	75	10.5	20	49	74	9.5		
ø25	0.5	43.5	41.5	23	58	42.5	40.5	0.5	73.5	11.5	23	58	72.5	10.5		
ø32	0.5	55.5	45.5	25.5	71	54.5	44.5	0.5	85.5	15.5	25.5	71	84.5	14.5		

*1: For ø6 and ø10, reed switches K0 and K5 cannot be selected.
 *2: For switch mountability, refer to the Model No. display method for each variation.

External Dimensions Diagram with Switch

STR2 Series Switch External Dimensions Diagram

- K0H/V, K5H/V, K2H/V, K3H/V, K2YH/V, K3YH/V
- STR2-(M/B) D



[In case of K0H/V, K5H/V, K2H/V, K3H/V] [In case of K2YH/V, K3YH/V]

Code	STR2-(M/B) D							
	K0, K5, K2, K3				K2Y, K3Y			
	Z	RD	HD	FA	FB	RD	HD	
Bore size (mm)								
ø6	1.0	20.5 *1	21 *1	13.5	24	20	19.5	
ø10	1.0	30.5 *1	32.5 *1	14.5	34	31	29	
ø16	0.5	39	40.5	17	44	39	38	
ø20	0.5	43	45	20	49	44	42	
ø25	0.5	43.5	44.5	23	58	43.5	42.5	
ø32	0.5	55.5	57.5	25.5	71	56.5	54.5	

*1: For ø6 and ø10, reed switches K0 and K5 cannot be selected.
 *2: For switch mountability, refer to the Model No. display method for each variation.

Guided

STM

STG

STS/
STL

STR2

UCA2

Cylinder
Switch

Ending

Guided

STM

STG

STS/
STL

STR2

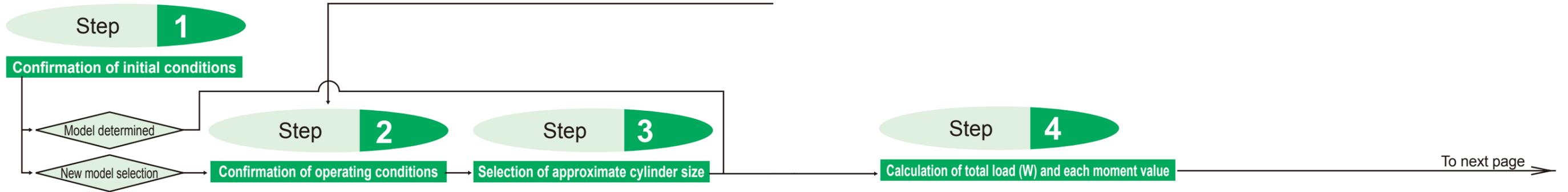
UCA2

Cylinder
Switch

Ending

Model selection guide

Since the selection conditions are different from general air cylinders, please check the suitability using the selection guide.



Step 2 Confirmation of operating conditions

1. Operating pressure P (MPa)
2. Total load W (N)
[Total load]
 $W = (\text{Load}) + (\text{Jig load}) + (\text{Value for weight of the movable part: } Fa)$. The weight of the movable part calculation formula is as shown in Table 1.

Table 1 Weight of movable part calculation formula

Tube	Fa: Weight of the movable part (N)
	STR2
ø6	0.16+0.002ST
ø10	0.38+0.004ST
ø16	1.08+0.013ST
ø20	1.66+0.013ST
ø25	2.82+0.025ST
ø32	4.33+0.025ST

3. Mounting direction
[Operating method]
Horizontal, Vertical - Ascending, Vertical - Descending
4. Stroke ST (mm)
5. Operating time t (s)
6. Operating speed V (mm/s)
Calculation formula for average operating speed Va of cylinder
 $Va = ST / t$ (mm/s)

Step 3 Selection of approximate cylinder size

- Cylinder size (I.D.) calculation formula
 $F = \pi/4 \times D^2 \times P$
 $\therefore D = \sqrt{4F/\pi P}$
D: Cylinder inner diameter (mm)
P: Operating Pressure (MPa)
F: Cylinder theoretical thrust (N)
- When obtaining from the theoretical thrust table
Approximate required thrust \geq Load x 2
(x2 of Load x 2 is when the load factor is about 50% as a safety factor)
[Example] Operating pressure 0.5 (MPa)
Load 25 (N)
Required thrust is 25 (N) x 2=50 (N)
From Table 2, if you select a tube inner diameter with a theoretical thrust of 50N or more at an operating pressure of 0.5 mPa, it will be ø10 or more.
D=ø10

[Cylinder theoretical thrust]

Table 2 Cylinder theoretical thrust table

Bore size (mm)	Operating Direction	Operating Pressure MPa		
		0.1	0.15	0.2
ø6	Push	-	-	11.3
	Pull	-	-	6.28
ø10	Push	-	-	31.4
	Pull	-	-	20.1
ø16	Push	40.2	60.3	80.4
	Pull	24.5	36.8	49.0
ø20	Push	62.8	94.2	1.26 x 10 ²
	Pull	40.2	60.3	80.4
ø25	Push	98.2	1.47 x 10 ²	1.96 x 10 ²
	Pull	67.4	1.01 x 10 ²	1.35 x 10 ²
ø32	Push	1.61 x 10 ²	2.41 x 10 ²	3.22 x 10 ²
	Pull	1.21 x 10 ²	1.81 x 10 ²	2.41 x 10 ²

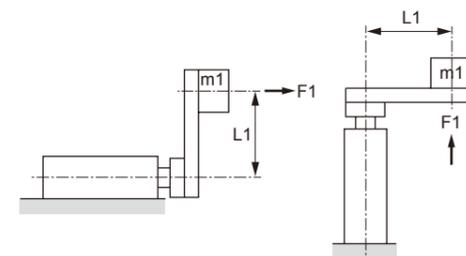
* For the theoretical thrust table, please refer to P. 670.

Step 4 Calculation of total load (W) and each moment value

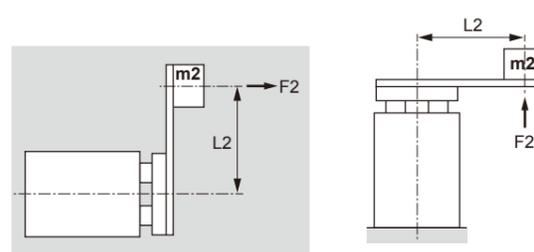
- Static load depending on the cylinder mounting state of the load
Calculate (W₀), moment (M).
 $W_0 = (\text{Load}) + (\text{Jig load})$ (N)
 $M_1 = F_1 \times L_1$ (N·m)
 $M_2 = F_2 \times L_2$ (N·m)
 $M_3 = F_3 \times L_3$ (N·m)
Use Figure 2 for the values of F₁, F₂, F₃

Figure 2 Calculation formula for each moment
Calculate each moment from the load, inertial force coefficient, and eccentric distance.

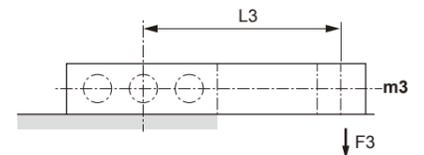
- [Bending moment]
 $M_1 = F_1 \times L_1 = 10 \times m_1 \times G \times L_1$



- [Lateral bending moment]
 $M_2 = F_2 \times L_2 = 10 \times m_2 \times G \times L_2$

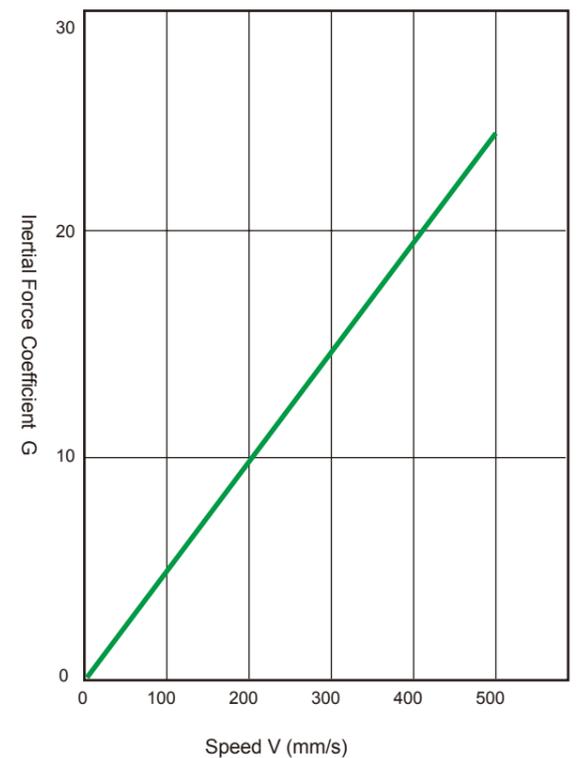


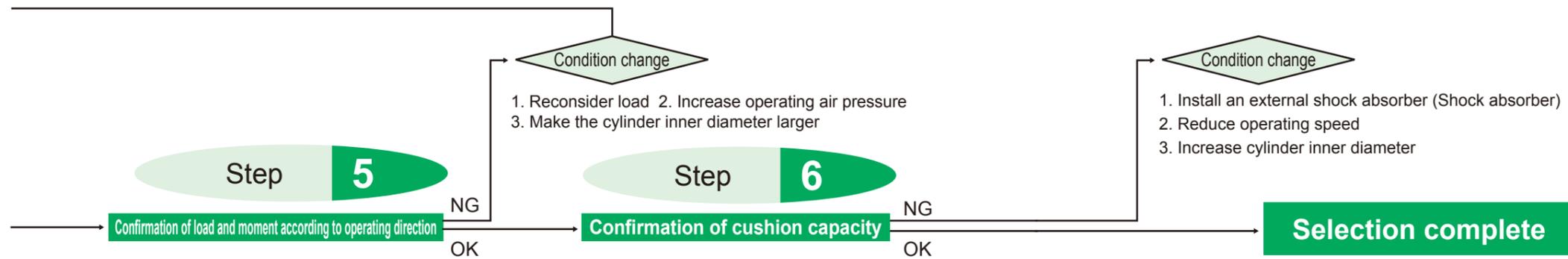
- [Torsional moment]
 $M_3 = F_3 \times L_3 = 10 \times m_3 \times L_3$



- m1: Load weight (kg)
- m2: Load weight (kg)
- m3: Load weight (kg)
- L1: Eccentric distance (m)
- L2: Eccentric distance (m)
- L3: Eccentric distance (m)
- G: Inertial force coefficient

Figure 3 Trend of inertial force coefficient of guided cylinder





Step 5 Confirmation of load and moment according to operating direction

5-1 Confirmation of load

1 During horizontal operation

Static load should be less than or equal to the allowable load value
Torsional moment Static load W_0 Value calculated in Step 4

Allowable lateral load W_{max} Select from Table 3 or the graph depending on the stroke

(For intermediate strokes, select the longer standard stroke)

$$W_0 \leq W_{max}$$

Table 3 Allowable lateral load

● Plain bearing Unit: N

Model	Stroke (mm)			
	10	20	30	40
STR2-M-6	2.4	1.9	1.5	1.3
STR2-M-10	5.8	4.8	4.1	3.5
STR2-M-16	15.9	13.3	11.5	10.1
STR2-M-20	20.3	17.3	15.1	13.4
STR2-M-25	22.1	18.9	16.5	14.7
STR2-M-32	34.9	30.2	26.7	23.9

● Rolling bearing Unit: N

Model	Stroke (mm)			
	10	20	30	40
STR2-B-6	2.6	1.9	1.5	1.2
STR2-B-10	6.0	4.4	3.6	3.0
STR2-B-16	11.4	8.5	7.0	5.9
STR2-B-20	12.7	9.6	7.9	6.8
STR2-B-25	14.7	11.1	9.2	7.9
STR2-B-32	24.3	18.5	15.4	13.3

* For allowable lateral load, please refer to P. 706.

Also, for eccentric loads, please refer to the graphs on P. 707 and P. 708.

2 During vertical operation

Total load should be a value considering the load factor for the theoretical thrust value

● Calculation of load factor

Total load W Value calculated in Step 2
Theoretical thrust of cylinder F Theoretical thrust table P. 670

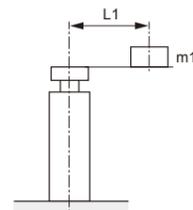
$$\alpha = W/F \times 100 (\%)$$

● The load factor is determined considering the stability margin and life of the cylinder operating speed, and the usage conditions. For general use, the range in Table 4 is desirable.

Table 4 Appropriate range of load factor (Reference value)

Operating pressure (MPa)	Load factor (%)
0.1 to 0.3	$\alpha \leq 40$
0.3 to 0.6	$\alpha \leq 50$
0.6 to 1.0	$\alpha \leq 60$

● During eccentric load, lateral load acts. The acting lateral load should be less than or equal to the allowable lateral load in Table 3



$$\frac{m1 \times L1 \times 10}{L} \leq W_{max}$$

ST: Stroke (m)

Bore size	L	Bore size	L
$\phi 6$	0.022+ST	$\phi 20$	0.032+ST
$\phi 10$	0.027+ST	$\phi 25$	0.034+ST
$\phi 16$	0.026+ST	$\phi 32$	0.036+ST

5-2 Confirmation of moment

1 Divide the bending moment and lateral bending moment by the value in Table 5, obtain the moment ratio, and the total value of the moment ratio should be 1.0 or less

● Calculation of moment ratio

Bending moment M_1 } In Step 4
Radial moment M_2 } Calculated value
 $M_1 / M_{1max} + M_2 / M_{2max} \leq 1.0$

Table 5 Allowable moment value (N·m)

Bore size	Allowable bending moment M_{1max} / M_{2max}
$\phi 6$	3.6
$\phi 10$	3.6
$\phi 16$	9.2
$\phi 20$	9.2
$\phi 25$	74
$\phi 32$	74

2 Torsional moment should be less than or equal to the allowable rotational torque

Torsional moment M_3 Value calculated in Step 4
Allowable rotational torque

M_{3max} Select from Table 6 according to stroke
(For intermediate strokes, select the longer standard stroke)
 $M_3 \leq M_{3max}$

Table 6 Allowable rotational torque

● Plain bearing (N·m)

Model	Stroke (mm)			
	10	20	30	40
STR2-M-6	0.008	0.006	0.005	0.004
STR2-M-10	0.029	0.024	0.020	0.017
STR2-M-16	0.099	0.083	0.071	0.063
STR2-M-20	0.142	0.121	0.105	0.093
STR2-M-25	0.187	0.160	0.140	0.125
STR2-M-32	0.383	0.332	0.293	0.262

● Rolling bearing (N·m)

Model	Stroke (mm)			
	10	20	30	40
STR2-B-6	0.009	0.006	0.005	0.004
STR2-B-10	0.030	0.022	0.018	0.015
STR2-B-16	0.071	0.053	0.043	0.036
STR2-B-20	0.088	0.067	0.055	0.047
STR2-B-25	0.125	0.094	0.078	0.067
STR2-B-32	0.267	0.203	0.169	0.146

* For allowable rotational torque, please refer to P. 709.

Step 6 CONFIRMATION OF CUSHION CAPACITY

Check if the kinetic energy of the load actually used can be absorbed by the cushion capacity of the cylinder itself.

- Use the values in Table 7 for the allowable absorption energy (E_1) of the cylinder.
- Calculation formula for piston kinetic energy (E_2)

$$E_2 = 1/2 \times W \times V^2 \times \frac{1}{10} (J)$$

W : Total applied load (N) In Step 2
 V : Piston impact speed into cushion (m/s) Calculated value

$$V = ST/t \times (1 + 1.5 \times \alpha/100)$$

ST : Stroke (m)
t : Operating Time (s)
 α : Load factor (%)

Allowable absorption energy of cylinder

● The value of kinetic energy absorption capacity by the cylinder cushion mechanism varies depending on the cylinder inner diameter. Compare guided cylinders with the values in Table 7.

Table 7 STR2 Allowable absorption energy (E_1)

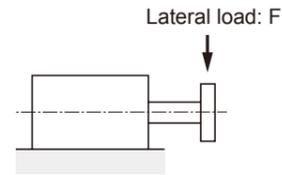
Bore size	Allowable absorption energy (J)	
	Push	Pull
$\phi 6$	0.008	0.059
$\phi 10$	0.061	0.083
$\phi 16$	0.181	0.083
$\phi 20$	0.303	0.127
$\phi 25$	0.68	0.237
$\phi 32$	1.3	0.311

$E_1 > E_2$
(Allowable absorption energy) > (Piston kinetic energy)

Selection complete

$E_1 < E_2$
(Allowable absorption energy) < (Piston kinetic energy)

Allowable Lateral Load



● Plain bearing (N)

Model	Stroke (mm)									
	10	20	30	40	50	60	70	80	90	100
STR2-M-6	2.4	1.9	1.5	1.3	1.1	-	-	-	-	-
STR2-M-10	5.8	4.8	4.1	3.5	3.1	-	-	-	-	-
STR2-M-16	15.9	13.3	11.5	10.1	8.9	8.1	7.3	6.7	6.2	5.8
STR2-M-20	20.3	17.3	15.1	13.4	12.1	10.9	10.0	9.2	8.5	7.9
STR2-M-25	22.1	18.9	16.5	14.7	13.1	11.9	10.9	10.1	9.3	8.7
STR2-M-32	34.9	30.2	26.7	23.9	21.6	19.7	18.1	16.8	15.7	14.7

● Rolling bearing (N)

Model	Stroke (mm)									
	10	20	30	40	50	60	70	80	90	100
STR2-B-6	2.6	1.9	1.5	1.2	1.0	-	-	-	-	-
STR2-B-10	6.0	4.4	3.6	3.0	2.6	-	-	-	-	-
STR2-B-16	11.4	8.5	7.0	5.9	5.1	4.5	4.0	3.7	3.3	3.0
STR2-B-20	12.7	9.6	7.9	6.8	5.9	5.3	4.7	4.3	3.9	3.6
STR2-B-25	14.7	11.1	9.2	7.9	6.9	6.1	5.5	5.0	4.6	4.2
STR2-B-32	24.3	18.5	15.4	13.3	11.7	10.5	9.5	8.7	8.0	7.4

STR2-D Allowable lateral load

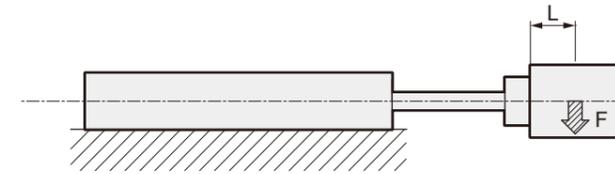
● Plain bearing (Double rod type) (N)

Model	Stroke (mm)									
	10	20	30	40	50	60	70	80	90	100
STR2-MD-6	3.3	3.2	3.1	3.0	2.9	-	-	-	-	-
STR2-MD-10	8.0	7.6	7.3	7.1	7.0	-	-	-	-	-
STR2-MD-16	21.7	20.5	19.7	19.1	18.7	18.3	18.0	17.8	17.6	17.5
STR2-MD-20	26.7	25.3	24.3	23.7	23.1	22.7	22.4	22.1	21.9	21.7
STR2-MD-25	29.3	27.8	26.7	26.0	25.4	24.9	24.6	24.3	24.0	23.8
STR2-MD-32	45.2	42.9	41.3	40.1	39.1	38.3	37.7	37.2	36.7	36.3

● Rolling bearing (Double rod type) (N)

Model	Stroke (mm)									
	10	20	30	40	50	60	70	80	90	100
STR2-BD-6	3.7	3.0	2.7	2.5	2.3	-	-	-	-	-
STR2-BD-10	8.6	6.9	6.2	5.7	5.3	-	-	-	-	-
STR2-BD-16	16.6	13.3	11.7	10.7	10.0	9.4	9.0	8.6	8.3	8.0
STR2-BD-20	17.8	14.3	12.6	11.5	10.8	10.2	9.8	9.3	9.0	8.7
STR2-BD-25	20.8	16.7	14.7	13.5	12.6	11.9	11.4	10.9	10.5	10.2
STR2-BD-32	34.5	27.6	24.2	22.1	20.6	19.5	18.5	17.8	17.1	16.6

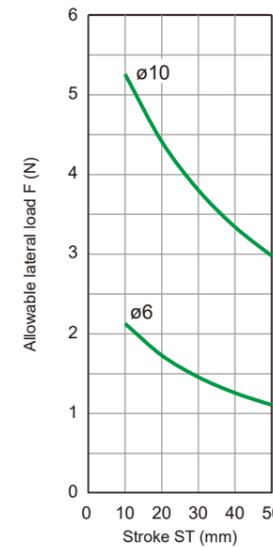
Allowable Lateral Load



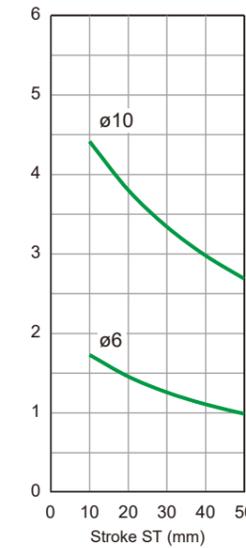
Basic type Plain bearing

STR2-M-6/10

● When L=5

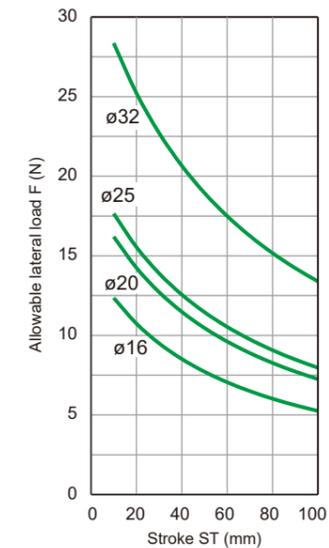


● When L=15

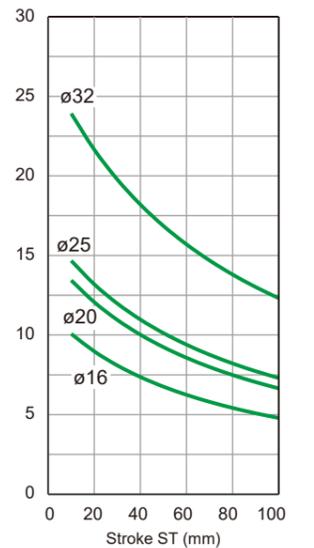


STR2-M-16/20/25/32

● When L=15



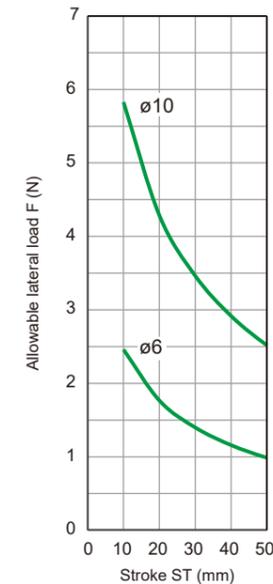
● When L=30



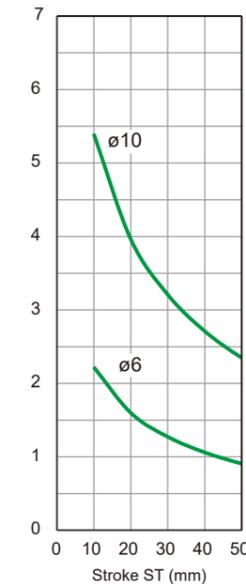
Basic type Rolling bearing

STR2-B-6/10

● When L=5

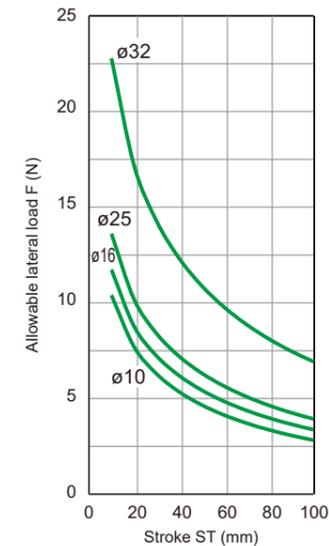


● When L=15

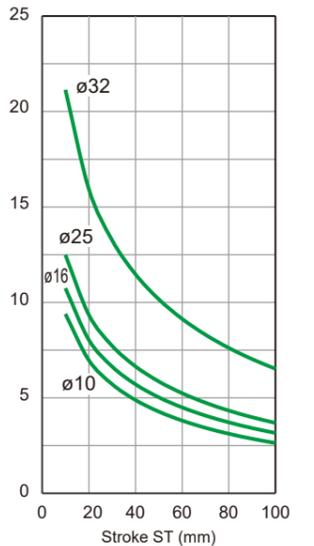


STR2-B-16/20/25/32

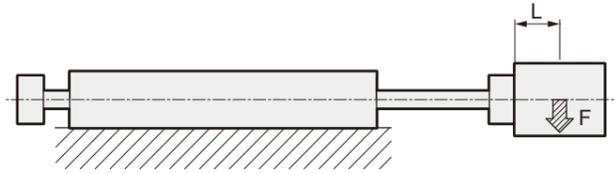
● When L=15



● When L=30



Allowable Lateral Load

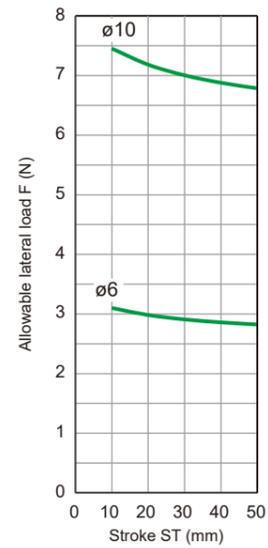


F: Lateral load (kg)
L: Load's center of gravity position (mm)

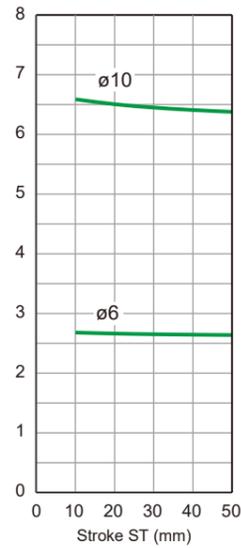
Double rod type Plain bearing

STR2-MD-6/10

● When L=5

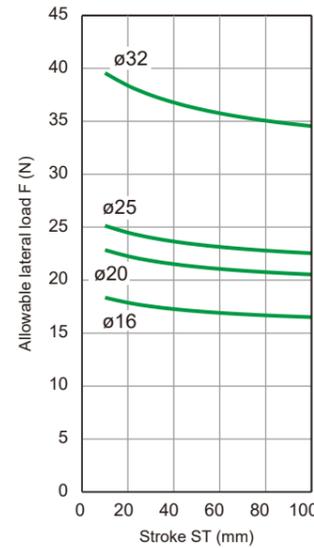


● When L=15

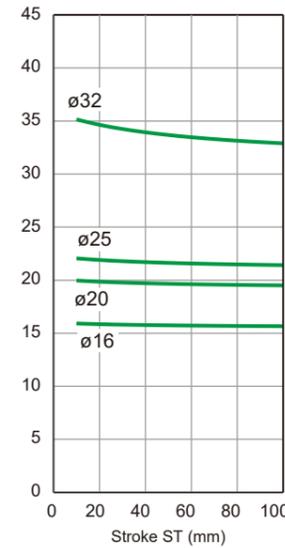


STR2-MD-16/20/25/32

● When L=15



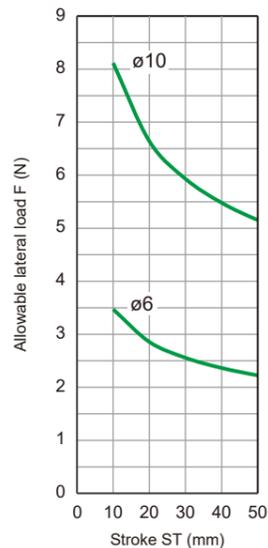
● When L=30



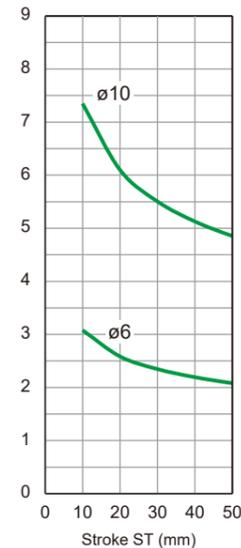
Double rod type Rolling bearing

STR2-BD-6/10

● When L=5

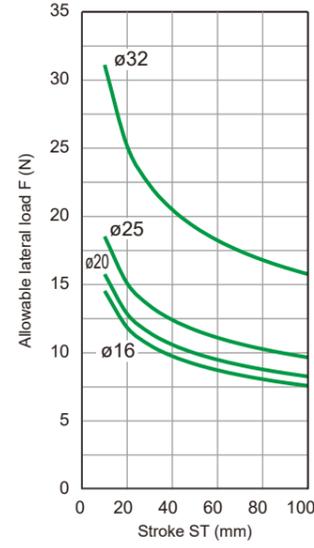


● When L=15

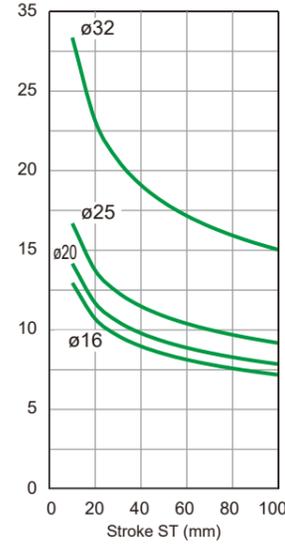


STR2-BD-16/20/25/32

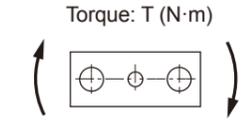
● When L=15



● When L=30



Allowable rotational torque



● Plain bearing

Model	Stroke (mm)									
	10	20	30	40	50	60	70	80	90	100
STR2-M-6	0.008	0.006	0.005	0.004	0.003	-	-	-	-	-
STR2-M-10	0.029	0.024	0.020	0.017	0.015	-	-	-	-	-
STR2-M-16	0.099	0.083	0.071	0.063	0.055	0.050	0.045	0.041	0.038	0.036
STR2-M-20	0.142	0.121	0.105	0.093	0.084	0.076	0.070	0.064	0.059	0.055
STR2-M-25	0.187	0.160	0.140	0.125	0.111	0.101	0.092	0.085	0.079	0.074
STR2-M-32	0.383	0.332	0.293	0.262	0.237	0.216	0.199	0.184	0.172	0.161

● Rolling bearing

Model	Stroke (mm)									
	10	20	30	40	50	60	70	80	90	100
STR2-B-6	0.009	0.006	0.005	0.004	0.003	-	-	-	-	-
STR2-B-10	0.030	0.022	0.018	0.015	0.013	-	-	-	-	-
STR2-B-16	0.071	0.053	0.043	0.036	0.031	0.028	0.025	0.023	0.020	0.018
STR2-B-20	0.088	0.067	0.055	0.047	0.041	0.037	0.032	0.030	0.027	0.025
STR2-B-25	0.125	0.094	0.078	0.067	0.058	0.051	0.046	0.042	0.039	0.035
STR2-B-32	0.267	0.203	0.169	0.146	0.128	0.115	0.104	0.095	0.088	0.081

STR2-D Allowable rotational torque

● Plain bearing (Double rod type)

Model	Stroke (mm)									
	10	20	30	40	50	60	70	80	90	100
STR2-MD-6	0.011	0.011	0.010	0.010	0.010	-	-	-	-	-
STR2-MD-10	0.040	0.038	0.036	0.035	0.035	-	-	-	-	-
STR2-MD-16	0.135	0.128	0.123	0.119	0.116	0.114	0.112	0.111	0.110	0.109
STR2-MD-20	0.186	0.177	0.170	0.165	0.161	0.158	0.156	0.154	0.153	0.151
STR2-MD-25	0.249	0.236	0.227	0.221	0.215	0.211	0.209	0.206	0.204	0.202
STR2-MD-32	0.497	0.471	0.454	0.441	0.430	0.421	0.414	0.409	0.403	0.399

● Rolling bearing (Double rod type)

Model	Stroke (mm)									
	10	20	30	40	50	60	70	80	90	100
STR2-BD-6	0.013	0.010	0.009	0.008	0.008	-	-	-	-	-
STR2-BD-10	0.043	0.034	0.031	0.028	0.026	-	-	-	-	-
STR2-BD-16	0.103	0.083	0.073	0.066	0.062	0.055	0.056	0.053	0.051	0.050
STR2-BD-20	0.124	0.100	0.088	0.080	0.075	0.071	0.068	0.065	0.063	0.060
STR2-BD-25	0.176	0.142	0.125	0.114	0.107	0.101	0.096	0.092	0.089	0.086
STR2-BD-32	0.379	0.303	0.266	0.243	0.226	0.214	0.203	0.195	0.188	0.182

Guided

Guided

STM

STM

STG

STG

STS/
STL

STS/
STL

STR2

STR2

UCA2

UCA2

Cylinder
Switch

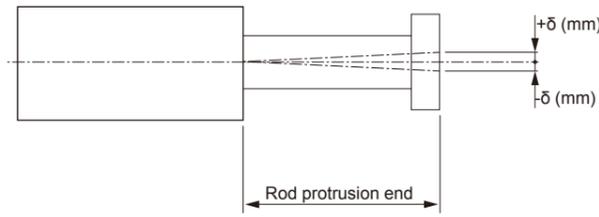
Cylinder
Switch

Ending

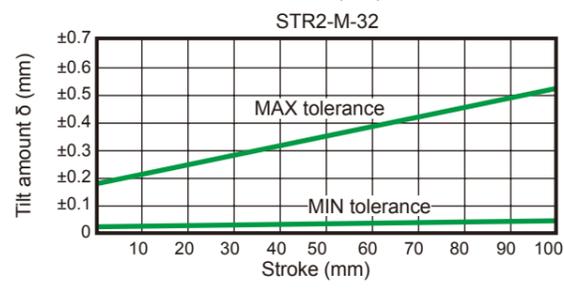
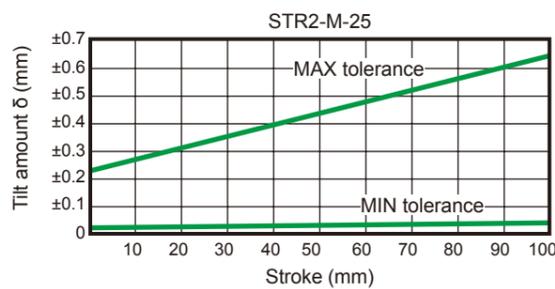
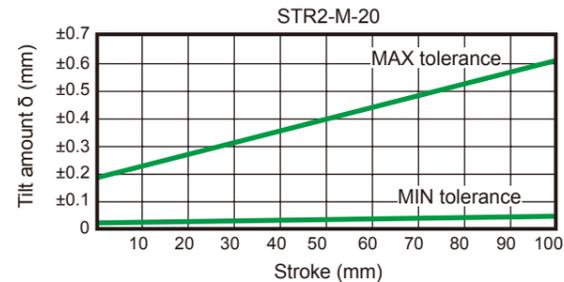
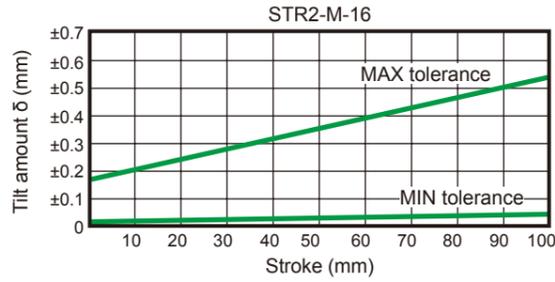
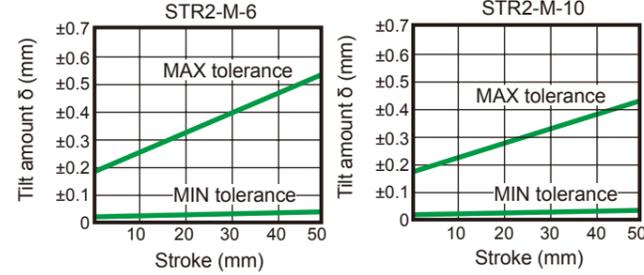
Ending

Runout accuracy (Reference value)

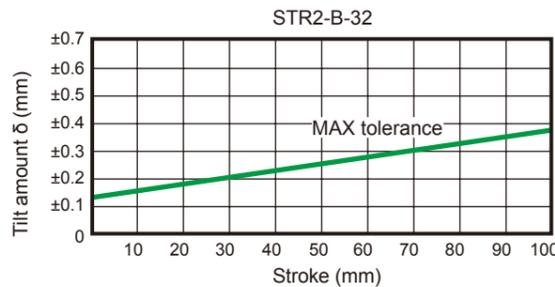
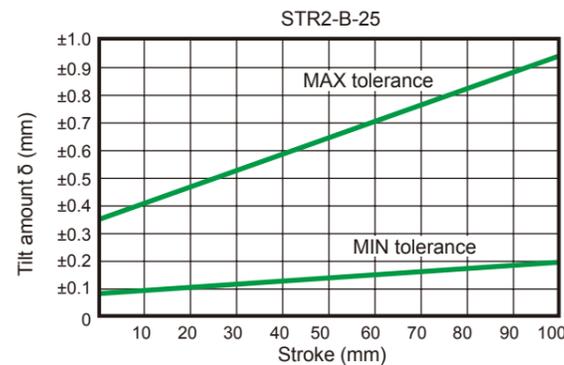
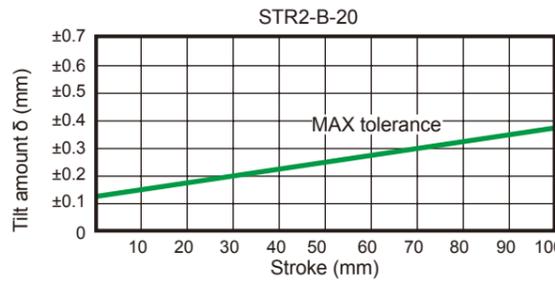
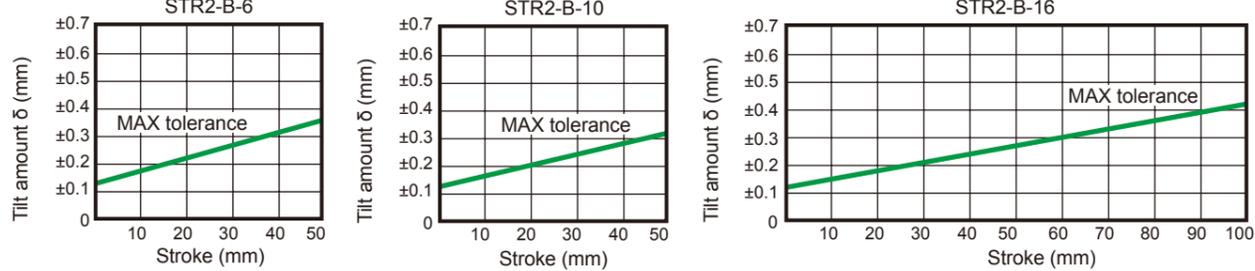
The tilt amount generated at the tip of the end plate when no load is applied is based on the values in the graph below.
(Excluding piston rod deflection amount)



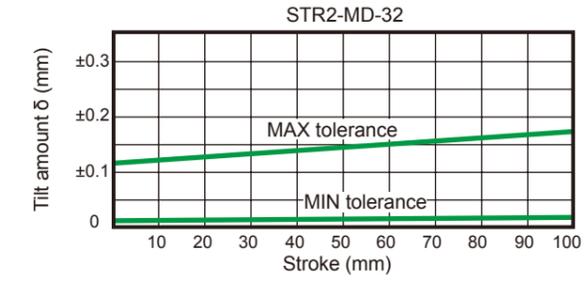
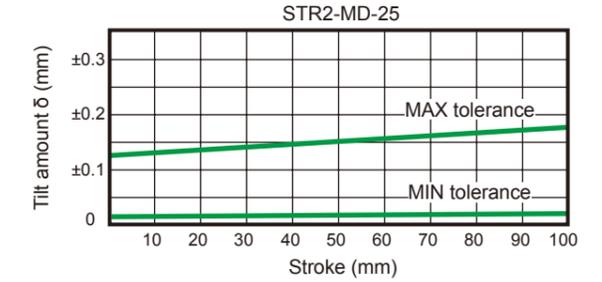
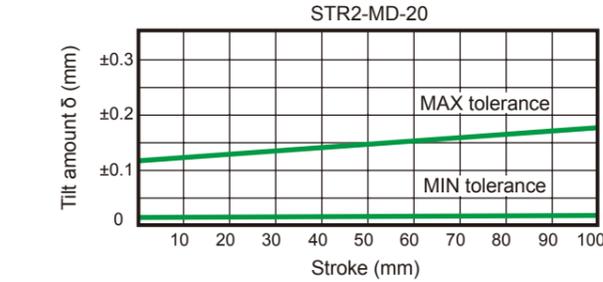
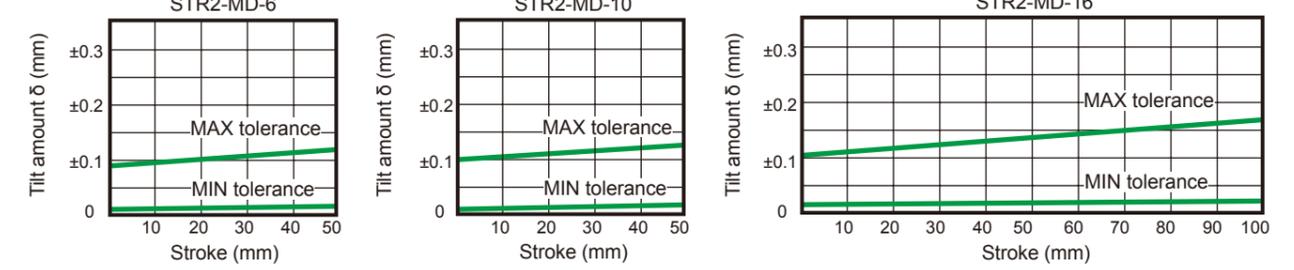
STR2-M



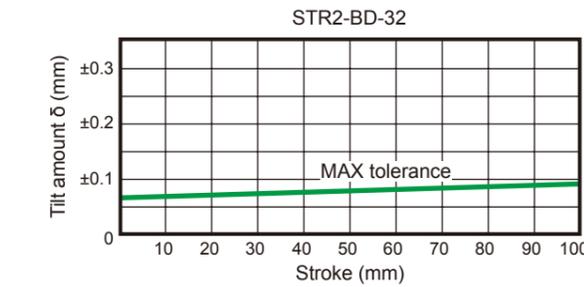
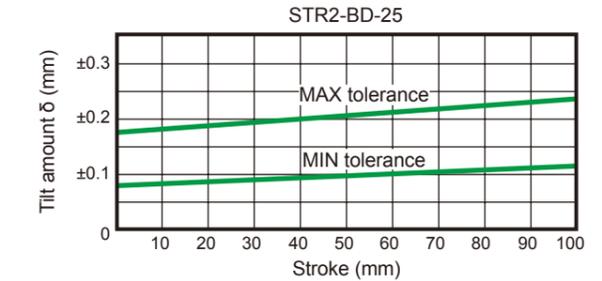
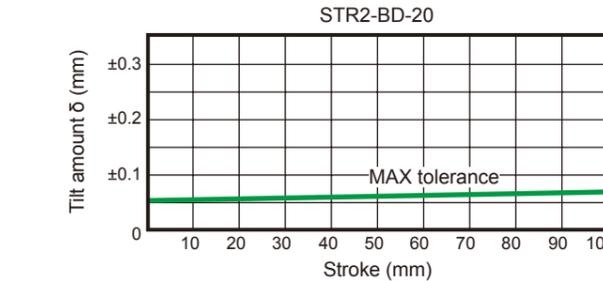
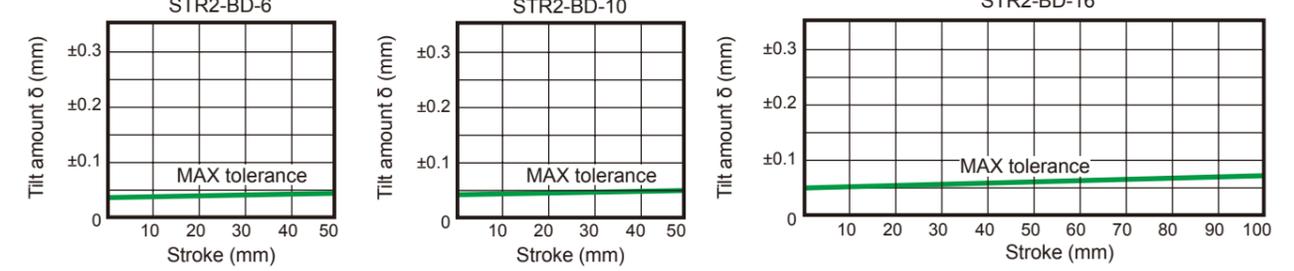
STR2-B



STR2-MD



STR2-BD





To Use This Product Safely

Be sure to read this before use.

For general cylinder information, see Opening Section P. 41, and for cylinder switches, see P. 808.

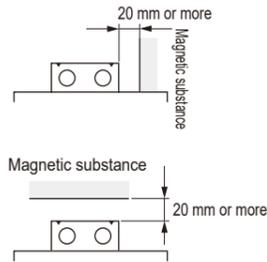
Individual Precautions: Twin Rod Cylinder STR2 series

During Design / Selection

1. Common; With switch

Caution

- If there is a magnetic material such as an iron plate near the cylinder switch, it will cause the cylinder switch to malfunction. Keep a distance of 20 mm or more from the cylinder surface. (Common to all bore sizes)

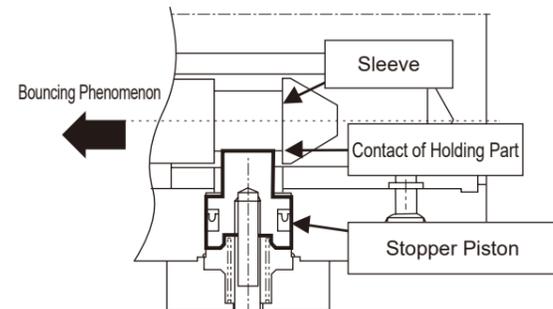


2. Drop prevention type STR2-Q

Warning

- In the locked state, if pressure is supplied to the port on the side with the lock mechanism from a state where both side ports are not pressurized, the lock may not be released, or the lock may suddenly be released and the piston rod may fly out, which is very dangerous. When releasing the lock mechanism, be sure to supply pressure to the opposite side port and release it from a state where no load is applied to the lock mechanism.

- When using a quick exhaust valve to increase the lowering speed, the cylinder may start moving before the lock mechanism operates, and normal release may not be possible. Do not use quick exhaust valves with fall prevention cylinders. When stopping with external shock absorbing equipment (shock absorbers, etc.), adjust so that there is no bounce. If it bounces, the sleeve and stopper piston will make impact contact, leading to damage to the lock mechanism. Also, please perform periodic inspections once or twice a year to check for damage to the holding part due to this phenomenon.



- Do not use 3-position valves.

Do not use in combination with 3-position (especially closed center metal seal type) valves. If pressure is sealed in the piston chamber with the lock mechanism, the lock will not engage. Also, even if locked once, air leaked from the valve may enter the cylinder, and the lock may be released over time.

- During equipment maintenance, please take separate measures for safety so that the load does not fall due to its own weight.

Caution

- Keep the cylinder load factor at 50% or less. If the load factor is high, the lock may not be released, or it may lead to damage to the lock part.

- If back pressure is applied to the lock mechanism, the lock may be released, so use a single solenoid valve or a manifold with individual exhaust.

- Do not use multiple cylinders synchronized.

- Do not use a method where two or more fall prevention type cylinders are synchronized to move one workpiece. The lock of one of the cylinders may become unremovable.

3. Low speed type STR2-F

Caution

- Use without lubrication. Lubrication may change characteristics.

- Install the speed controller near the cylinder. If installed far from the cylinder, the speed will become unstable. Use SC-M3/M5, SC3W, SCD-M3/M5, SC3WU series speed controllers.

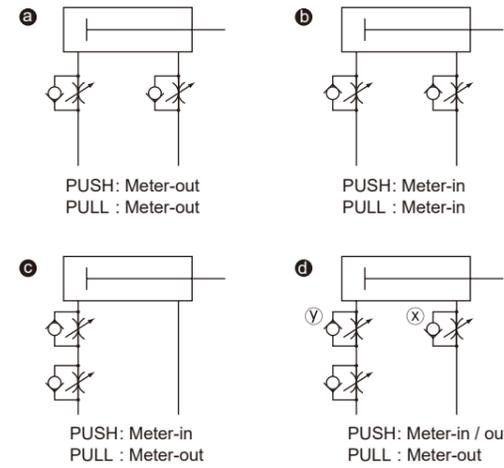
- Generally, the higher the air pressure and the lower the load factor, the more stable the speed. Use with a load factor of 50% or less.

- Do not apply lateral load to the cylinder. Also, install the sliding guide without twisting. Operation will become unstable if there are fluctuations in load or resistance.

Guides with a large difference between static friction and dynamic friction will result in unstable operation.

- Avoid use in places with vibration. Operation becomes unstable due to the influence of vibration.

- Speed control with a meter-out circuit provides stability. When driving a single-rod cylinder at creep speed in the PUSH direction, if the load resistance is small, a flying-out phenomenon may occur at the start of operation. As countermeasures, use circuits **b**, **c** or **d**. In addition, the **d** circuit is the most stable.



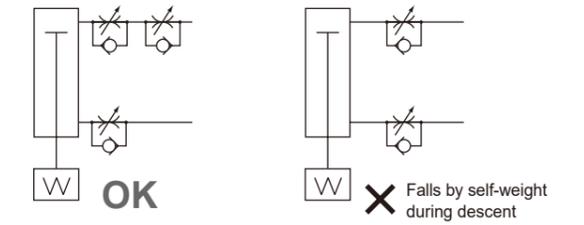
- Speed adjustment method for PUSH operation of the circuit:
 1. Speed setting with x speed controller
 2. Throttle with y speed controller until projection stops.
 3. Reconfirmation of speed

Note¹⁾ Comparing **b**, **c**, **d**, the **d** circuit is the most stable in operation.

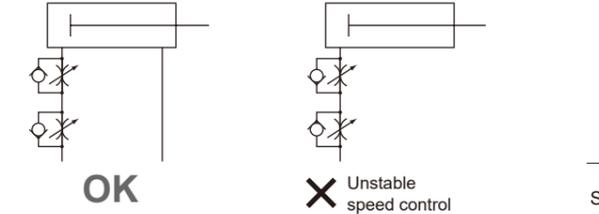
STR2 Series

Individual Precautions

Note²⁾ For vertical mounting, it will fall by its own weight in a meter-in circuit, so combine it with a meter-out circuit.



Note³⁾ For series connection of speed controllers, use the circuit shown in the figure below.



(Guideline for lurching occurrence)

Lurching occurs in the following cases:

- Thrust > Resistance

* Resistance: Thrust due to residual pressure on exhaust side (For creep speed type, + intake pressure = residual pressure)

For horizontal use: Frictional force due to load
For vertical use: Dead weight of the load

- Make adjustments such as alignment so that no lateral load is applied to the cylinder. Also, adjust and install so that there is no twisting with respect to the sliding guide.
 - Operation will become unstable if there are fluctuations in load or resistance.
 - Guides with a large difference between static friction and dynamic friction will result in unstable operation.

During Use

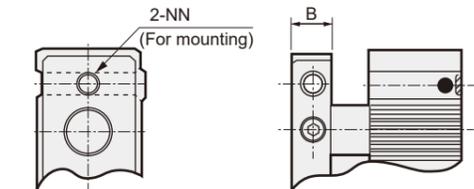
1. Common

Caution

- The Twin Rod Cylinder has two piping ports for each operating direction. Change the plug position according to the usage conditions. After changing, please confirm that there is no air leakage from the plug part.

- To prevent an increase in sliding resistance, do not make dents or scratches on the tube body mounting surface and end plate surface that may impair flatness. The flatness of the mating side included to the end plate should be 0.05 mm or less. If it is difficult to ensure the above flatness, insert shims (customer prepared), etc. between the end plate and the workpiece to adjust the gap. This may help prevent an increase in sliding resistance.

- When using the screw hole NN on the end plate, ensure that the bolt length is equivalent to dimension B. This will cause damage to the end plate.



Bore size (mm)	B dimension
ø6	6
ø10	6
ø16	8
ø20	10
ø25	12
ø32	12

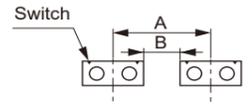
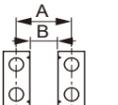
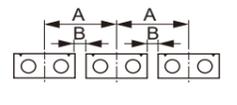
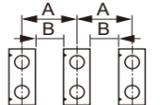
■ When mounting the main body with through bolts, tighten with the tightening torque shown in the table below.

Bore size (mm)	Tightening torque
ø6	0.6 to 1.0 N·m
ø10	1.4 to 2.4 N·m
ø16	
ø20	2.9 to 5.1 N·m
ø25	4.8 to 8.6 N·m
ø32	

■ A rubber cushion is incorporated as a cushion mechanism. The table below shows the kinetic energy that can be absorbed by the rubber cushion. If the energy exceeds this value, consider a separate shock absorber.

Tube I.D. (mm)	Allowable Absorption Energy J	
	PUSH	PULL
ø6	0.008	0.059
ø10	0.061	0.083
ø16	0.181	0.083
ø20	0.303	0.127
ø25	0.68	0.237
ø32	1.3	0.311

■ When using cylinders adjacent to each other, it will cause malfunction of the cylinder switch, so keep the following distance from the cylinder surface.

Adjacent conditions		Switch type	ø6	ø10	ø16	ø20	ø25	ø32	
Cylinder 2 pieces in parallel	Horizontal placement 	A	K2, K3	43	45	56	66	75	111
		B	K0, K5	40 *1	47 *1	62	81	85	111
	Vertical placement Mount switch on the adjacent cylinder side 	A	K2, K3	28	27	36	47	47	58
		B	K0, K5	27 *1	26 *1	36	53	53	58
		A	K2, K3	15	12	15	20	14	20
		B	K0, K5	14 *1	11 *1	15	26	20	20
Cylinder 3 or more pieces in parallel	Horizontal placement 	A	K2, K3	44	45	57	67	77	111
		B	K0, K5	41 *1	47 *1	64	83	86	111
	Vertical placement 	A	K2, K3	33	30	40	51	49	58
		B	K0, K5	30 *1	28 *1	42	60	97	58
		A	K2, K3	20	15	19	24	16	20
		B	K0, K5	17 *1	13 *1	21	33	25	20

*1: Dimensions of STR2-M. Reed switches cannot be used with STR2-B-6, 10.

■ If the surface with the counterbore (JJ) is used as the mounting surface, the cylinder may tilt due to the step. In such cases, use the port position change or port position 180° change option (o) so that the surface with the counterbore is not the mounting surface.

■ Operating units with excessive inertia will cause damage to the cylinder body and malfunction, so be sure to use within the allowable absorption energy range.

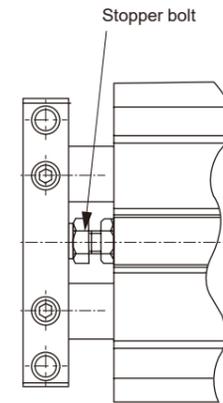
■ Avoid use with the stroke adjustment bolt removed.

2. Drop prevention type STR2-Q

Caution

■ Since the lock mechanism works at the stroke end, if an external stopper is applied mid-stroke, the lock mechanism will not work, and there is a risk of falling. When setting the load, be sure to confirm that the lock mechanism is working before installing.

■ In the case of head side fall prevention, do not adjust or change the stopper bolt to adjust the retraction side stroke, as this will prevent the lock mechanism from working.



■ If the piping on the side with the lock mechanism is thin and long, or if the speed controller is far from the cylinder port, the exhaust speed may be slow and it may take time for the lock to engage, so please be careful. Also, clogging of the silencer included to the EXH. port of the solenoid valve will lead to similar results.

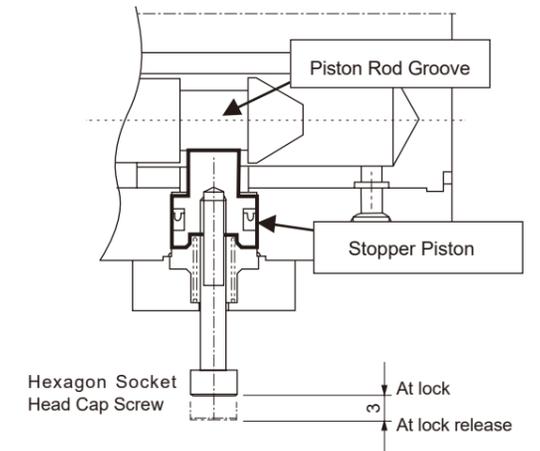
■ After manually operating the lock mechanism, return the lock mechanism to its original state. Also, do not perform manual operations other than during adjustment, as it is dangerous.

■ Release the lock when installing or adjusting the cylinder. Performing installation work, etc. while the lock is engaged may damage the lock part.

■ Use the speed controller with meter-out control.
● Lock may not be released with meter-in control.

Release method

● Screw a hexagon socket head cap screw (M3x20) into the stopper piston and pull the bolt with a force of 20N or more for 3 mm to move the stopper piston and release the lock. Also, when released, the built-in spring returns the stopper piston to its original position, and if it enters the piston rod groove, the cylinder will be locked.



For precautions regarding mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components Product website (<https://www.ckd.co.jp/kiki/en/>) → "Model No." → Instruction Manual