

# STM

## Guided cylinder

### Combined functions

ø6/ø10

#### Overview

This is a super compact guided cylinder that provides high freedom in mounting and abundant variations, with attention to ease of use and of selection.



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SMG
LCM
LCR
LCG
LCX
<b>STM</b>
STG
STR2
MRL2
GRC
Cylinder Switch
MN3E
MN4E
4GA/B
M4GA/B
MN4GA/B
F.R. (module unit)
Clean F.R
Precision R
Press gauge
Diff. press gauge
Electro-pneumatic R
Speed controller
Auxiliary valve
Fitting/ tube
Clean air unit
Pressure sensor
Flow rate sensor
Valve for air blow
Ending

# Super compact handy cylinders

SCPD3
SCM
SSD2
MDC2
SMG
LCM
LCR
LCG
LCX
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STG
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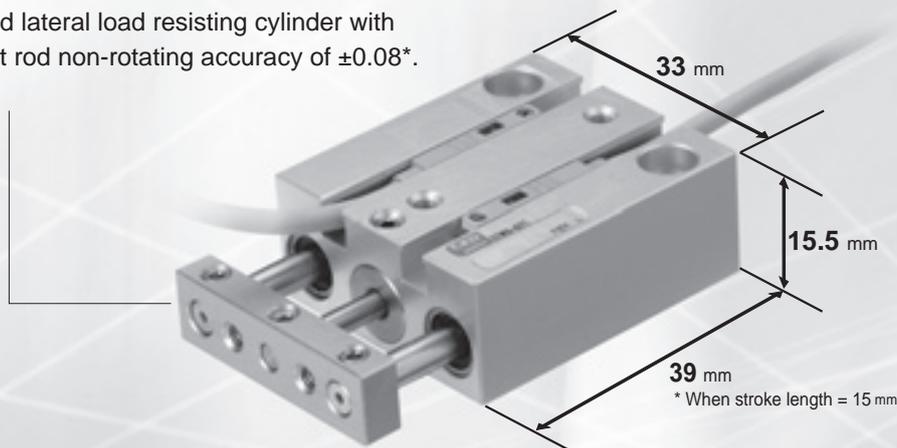
Super compact guided cylinder STM Series ( $\varnothing 6/\varnothing 10$ ) with a high level of mounting flexibility and rich variations promoting ease of use and selection.

## Ball bearing

Clean room specifications are available.

### ■ High-performance guide

Rigid and lateral load resisting cylinder with excellent rod non-rotating accuracy of  $\pm 0.08^*$ .

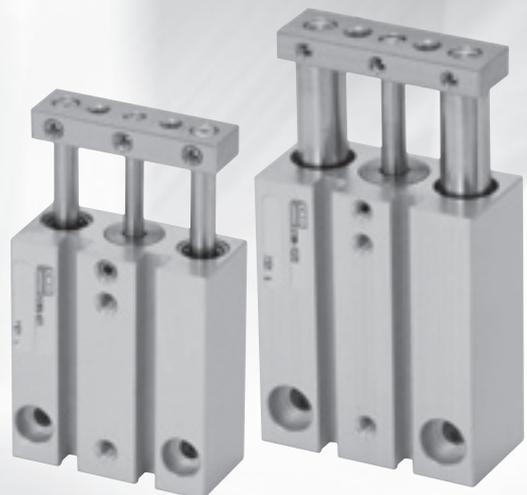


### ■ Super compact size

The smallest size is 33 mm wide and 15.5 mm high. Super compact space saving in guided cylinders.

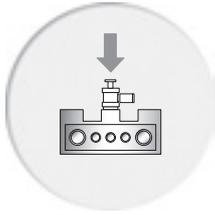
Guided cylinder

# STM Series

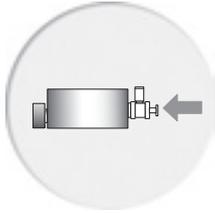


# suitable for various uses

## ● Piping direction

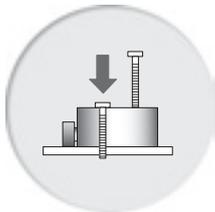


① Front piping

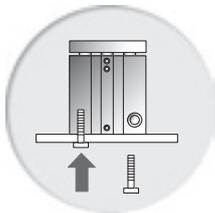


② Rear piping (Option)

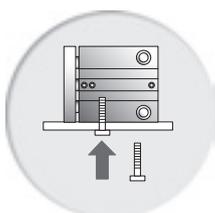
## ● Mounting orientation



① Front mounting



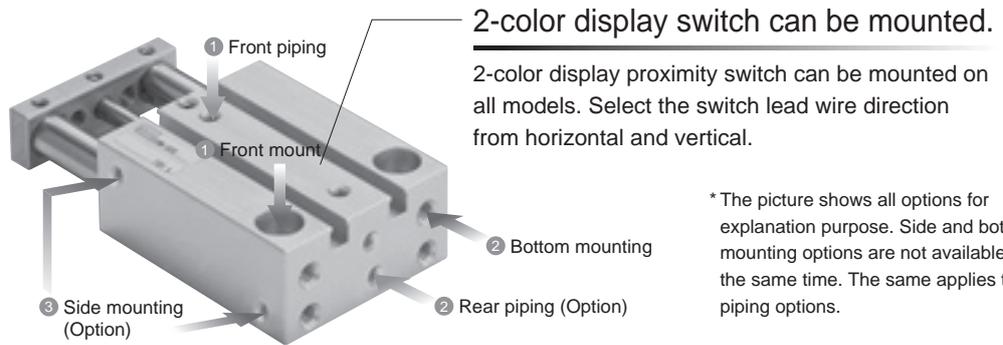
② Bottom mounting



③ Side mounting (Option)

## ■ Supports rear piping and side side mounting

In addition to the front side, common piping on the rear side is possible. (Option)  
Side mounting of cylinder is supported. Multiple units can be installed even in small spaces. (Option)



## 2-color display switch can be mounted.

2-color display proximity switch can be mounted on all models. Select the switch lead wire direction from horizontal and vertical.

\*The picture shows all options for explanation purpose. Side and bottom mounting options are not available at the same time. The same applies to piping options.

## ■ Suitable for clean rooms

Clean room specifications (STM-B...P7) are available.

## ■ Suitable for conveying small parts

Suitable for conveying small parts including semiconductors and precision components where you can use the cylinders for positioning, clamping, press fitting, lifting, pushing and more.

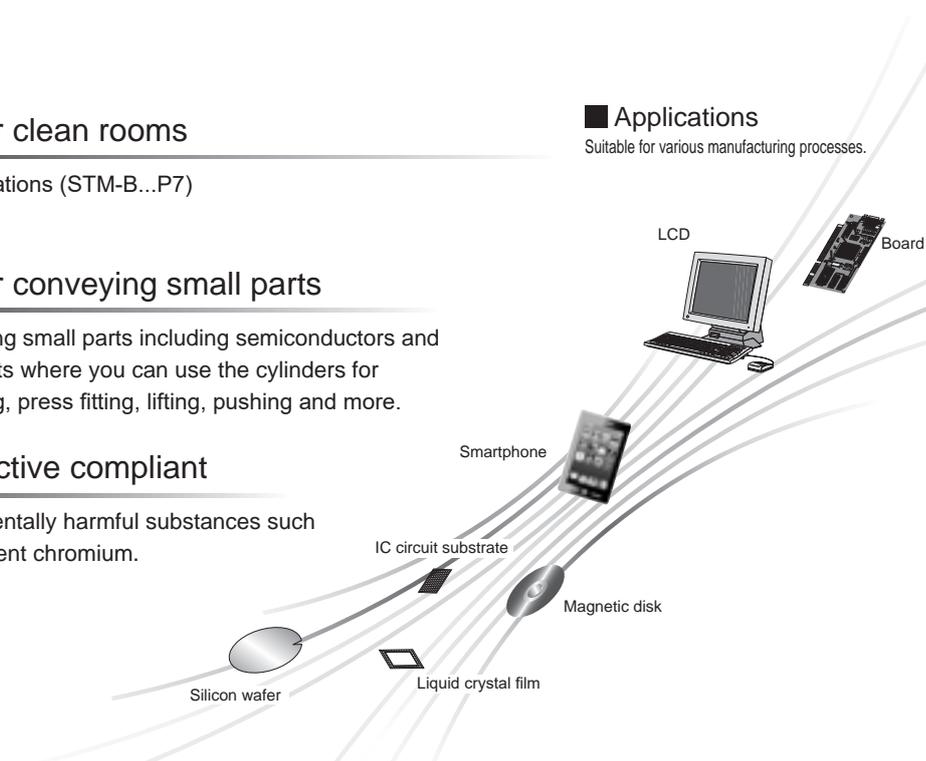
## ■ RoHS Directive compliant

Free from environmentally harmful substances such as lead and hexavalent chromium.

**RoHS**

## ■ Applications

Suitable for various manufacturing processes.



## ■ STM Series variation

Model variations	Bore size	Stroke length (mm)				Option	
		5	10	15	20	A	R
Clean room specifications <b>STM-B-P7* Series</b>	ø 6	●	●	●	●	●	●
	ø 10	●	●	●	●	●	●

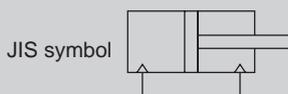
\* Ball bearing only

SCPD3
SCM
SSD2
MDC2
SMG
LCM
LCR
LCG
LCX
<b>STM</b>
STG
STR2
MRL2
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Speed controller
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Fitting/tube
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Pressure sensor
Flow rate sensor
Valve for air blow
Ending

Guided cylinder Double acting/single rod clean room specifications

# STM-B Series

● Bore size:  $\varnothing 6/\varnothing 10$



## Structure and material restriction

	Structure	Model No.
P7 Series	Exhaust treatment	<b>P72</b>
	Vacuum treatment	<b>P73</b>

## Specifications

Descriptions	STM-B	
Bore size mm	$\varnothing 6$	$\varnothing 10$
Actuation	Double acting	
Working fluid	Compressed air	
Max. working pressure MPa	0.7 ( $\approx 100$ psi, 7 bar)	
Min. working pressure MPa	0.2 ( $\approx 29$ psi, 2 bar)	
Proof pressure MPa	1.05 ( $\approx 150$ psi, 10.5 bar)	
Ambient temperature $^{\circ}\text{C}$	-10 (14 $^{\circ}\text{F}$ ) to 60 (140 $^{\circ}\text{F}$ ) (no freezing)	
Port size	M3	
Port size (relief port)	M3	
Stroke tolerance mm	+1.5	
	0	
Working piston speed mm/s	50 to 500	
Cushion	With rubber cushion	
Lubrication	Not available	
Allowable energy absorption J	0.008	0.054

## Stroke length

Bore size	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length	Min. stroke with switch
$\varnothing 6$	5/10/15	15	5	5
$\varnothing 10$	5/10/15/20	20		

Note: Product other than standard stroke length is custom order.

## Switch specifications

Descriptions	Proximity 2-wire	Proximity 3-wire	Proximity 2-wire		Proximity 3-wire		
	F2S	F3S	F2H/F2V	F2YH/F2YV	F3H/F3V	F3PH/F3PV (custom order)	F3YH/F3YV
Applications	Programmable controller	Programmable controller, relay	Programmable controller		Programmable controller, relay		
Output method	-	NPN output	-		NPN output	PNP output	NPN output
Power supply voltage	-	10 to 28 VDC	-		10 to 28 VDC	4.5 to 28 VDC	10 to 28 VDC
Load voltage	10 to 30 VDC	30 VDC or less	10 to 30 VDC	24 VDC ±10%	30 VDC or less		
Load current	5 to 20 mA	50 mA or less	5 to 20 mA (*2)		50 mA or less		
Indicator lamp	Red LED (Lit when ON)		LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)
Leakage current	1 mA or less	10 µA or less	1 mA or less		10 µA or less		
Weight	g 1 m: 10 3 m: 29		g 1 m: 10 3 m: 29		g 1 m: 10 3 m: 29		

\*1: Refer to page 309 for detailed switch specifications and dimensions.

\*2: Max. load current: 20mA at 25°C. The current is lower than 25 mA if the operating ambient temperature around the switch is higher than 20°C.  
(60 to 5 mA at 10°C.)

\*3: The F type switch uses a bend-resistant lead wire.

## Cylinder weight

Unit: g

Model No.	Stroke length (mm)	5	10	15	20	Switch weight
	Bore size (mm)					
STM-B	ø6	56.2	62.5	68.7	-	Refer to weight information provided in the switch specifications.
	ø10	87.9	96.4	104.8	113.3	

## Theoretical thrust table

Unit: N

Bore size (mm)	Operating direction						
		0.2	0.3	0.4	0.5	0.6	0.7
ø6	Push	5.65	8.48	11.3	14.1	17.0	19.8
	Pull	4.24	6.36	8.48	10.6	12.7	14.8
ø10	Push	15.7	23.6	31.4	39.3	47.1	55.0
	Pull	13.2	19.8	26.4	33.0	39.6	46.2

SCPD3

SCM

SSD2

MDC2

SMG

LCM

LCR

LCG

LCX

**STM**

STG

STR2

MRL2

GRC

Cylinder Switch

MN3E  
MN4E

4GA/B

M4GA/B

MN4GA/B

F.R. (module unit)

Clean F.R

Precision R

Press gauge  
Diff. press gauge

Electro-pneumatic R

Speed controller

Auxiliary valve

Fitting/tube

Clean air unit

Pressure sensor

Flow rate sensor

Valve for air blow

Ending

- SCPD3
- SCM
- SSD2
- MDC2
- SMG
- LCM
- LCR
- LCG
- LCX
- STM**
- STG
- STR2
- MRL2
- GRC
- Cylinder switch
- MN3E  
MN4E
- 4GA/B
- M4GA/B
- MN4GA/B
- F.R (module unit)
- Clean F.R
- Precision R
- Press gauge  
Diff. press gauge
- Electro-pneumatic R
- Speed controller
- Auxiliary valve
- Fitting/tube
- Clean air unit
- Pressure sensor
- Flow rate sensor
- Valve for air blow
- Ending

## How to order

Without switch (Magnet for switch incorporated)



With switch (Magnet for switch incorporated)



**A** Bearing

**B** Bore size

**C** Stroke length

**D** Switch model No.  
\*1

**E** Switch quantity

**F** Option

**G** Clean room specifications

### ⚠ Precautions for model No. selection

\*1: When using a 2-color display proximity switch for STM-B-6-P72/P73, avoid mounting the cylinder on a magnetic substance such as a metal plate. This could lead to switch detection malfunction.

[Example of model No.]

### STM-B-10-15-F2H-D-A-P72

Model: Guided cylinder

- A** Bearing : Ball bearing
- B** Bore size :  $\phi 10$  mm
- C** Stroke length : 15 mm
- D** Switch model No. : Proximity F2H switch, lead wire 1 m
- E** Switch quantity : 2
- F** Option : Side mounting
- G** Clean room specifications: Exhaust treatment

## How to order switch



Switch model No.  
(Item **D** above)

**CKD**

Code	Content
<b>A Bearing</b>	
<b>B</b>	Ball bearing

<b>B Bore size (mm)</b>	
<b>6</b>	$\phi 6$
<b>10</b>	$\phi 10$

<b>C Stroke length (mm)</b>			
		Bore size	
		6	10
<b>5</b>	5	●	●
<b>10</b>	10	●	●
<b>15</b>	15	●	●
<b>20</b>	20		●

<b>D Switch model No.</b>						
Lead wire straight	Lead wire L-shaped	Contact	Voltage		Display	Lead wire
			AC	DC		
-	F2S*	Proximity		●	1-color display	2 wires
F2H*	F2V*			●		
-	F3S*			●	1-color display (custom order)	3 wires
F3H*	F3V*			●		
F3PH*	F3PV*			●	2-color display	2 wires
F2YH*	F2YV*			●		
F3YH*	F3YV*		●	3 wires		

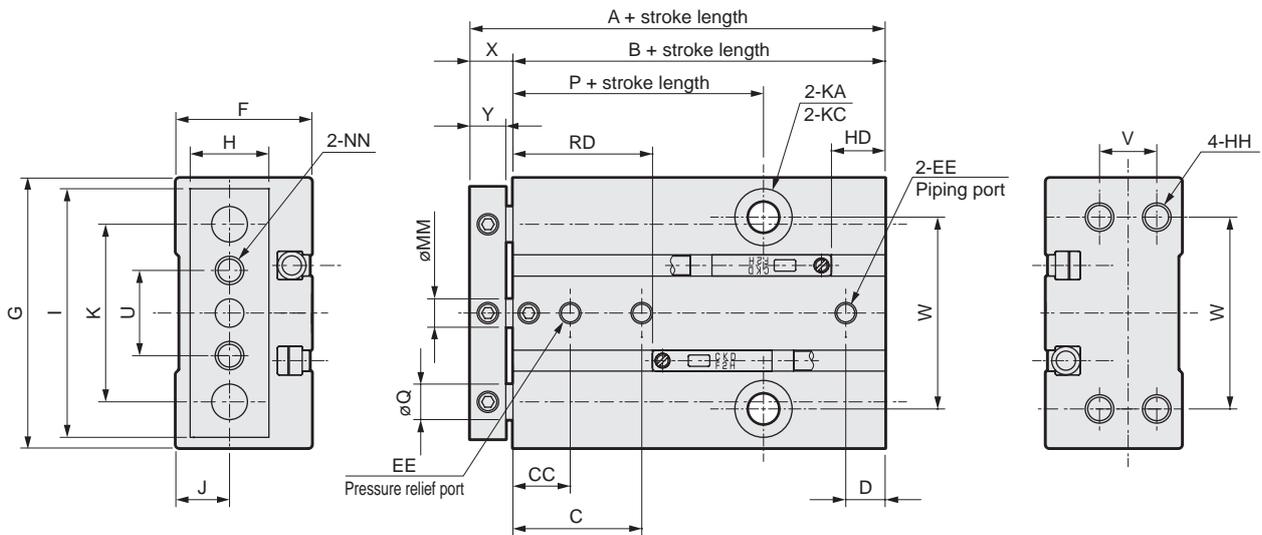
<b>* Lead wire length</b>	
<b>Blank</b>	1 m (standard)
<b>3</b>	3 m (option)

<b>E Switch quantity</b>	
<b>R</b>	1 (on rod end)
<b>H</b>	1 (on head end)
<b>D</b>	2

<b>F Option</b>	
<b>A</b>	Side installation

<b>G Clean room specifications</b>	
Structure	
<b>P72</b>	Exhaust treatment
<b>P73</b>	Vacuum treatment

### Dimensions



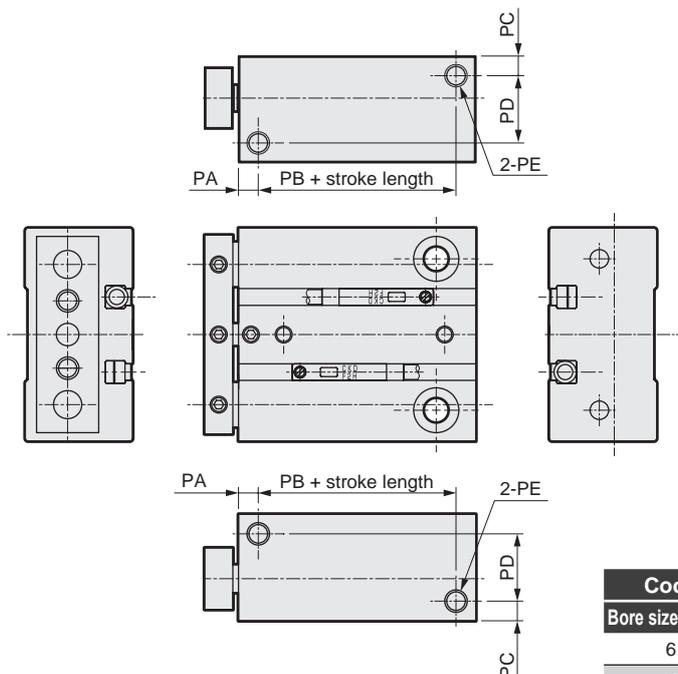
Code	Standard stroke length (mm)	A	B	C	CC	D	EE	F	G	H	HH	I	J	K	KA
6	5/10/15	40	34	17.5	7.5	5	M3	15.5	33	9	M3 depth 5	31	6	23	3.4 penetrating
10	5/10/15/20	44	38	18.5	8.5	7	M3	19	38	11	M4 depth 5	35	7.5	25	4.3 penetrating

Code	KC	MM	NN	P	Q	U	V	W	X	Y	RD	HD
6	6.1 spot face depth 3.3	3	M3 penetrating	17	4	12	6	25	6	5	18	5.5
10	8 spot face depth 4.4	4	M4 penetrating	20.5	5	12	8	27	6	5	20	7.5

### Dimensions with options

- Side mounting (A)



Code	Standard stroke length (mm)	PA	PB	PC	PD	PE
6	5/10/15	3	18	3	10	M3 depth 5
10	5/10/15/20	4	21	4	12	M4 depth 5

SCPD3

SCM

SSD2

MDC2

SMG

LCM

LCR

LCG

LCX

**STM**

STG

STR2

MRL2

GRC

Cylinder

Switch

MN3E

MN4E

4GA/B

M4GA/B

MN4GA/B

F.R. (module

unit)

Clean

F.R

Precision

R

Press gauge

Diff. press gauge

Electro-

pneumatic R

Speed

controller

Auxiliary

valve

Fitting/

tube

Clean

air unit

Pressure

sensor

Flow rate

sensor

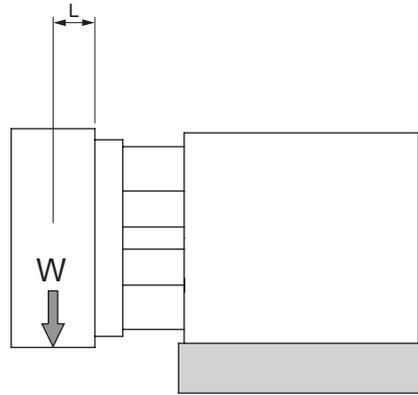
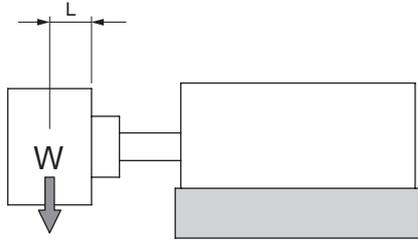
Valve for

air blow

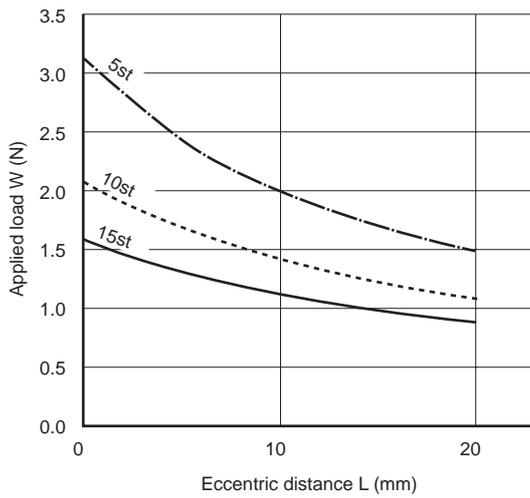
Ending

## Selection guide

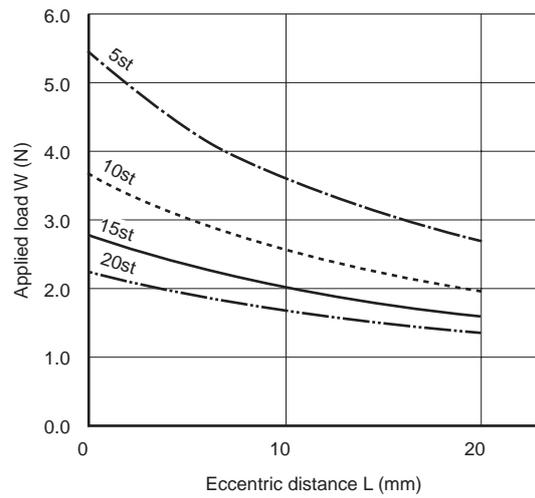
### Allowable lateral load



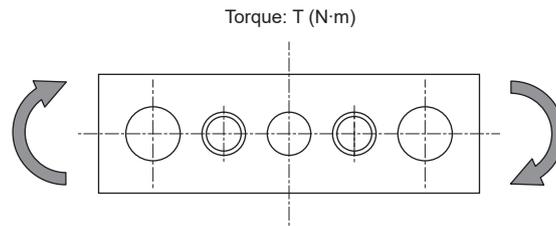
● STM-B-6



● STM-B-10



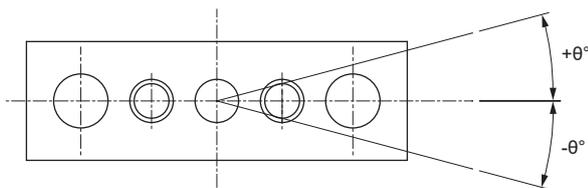
## Allowable torque



Unit: N-m

Bore size (mm)	Model No.	Stroke length (mm)			
		5	10	15	20
ø6	STM-B-6	0.018	0.012	0.009	-
ø10	STM-B-10	0.034	0.023	0.018	0.014

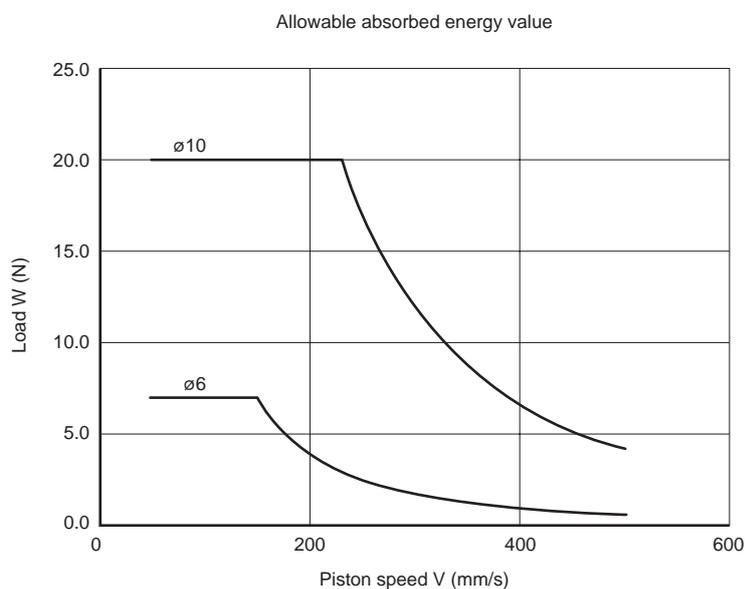
## Non-rotating accuracy (reference value)



Bore size (mm)	Non-rotating accuracy θ (degree)
ø6	±0.08
ø10	±0.08

## Allowable absorbed energy value

Use in the range below and to the left of the curve. For use in the upper right range, provide an external shock absorber.



SCPD3

SCM

SSD2

MDC2

SMG

LCM

LCR

LCG

LCX

**STM**

STG

STR2

MRL2

GRC

Cylinder Switch

MN3E

MN4E

4GA/B

M4GA/B

MN4GA/B

F.R. (module unit)

Clean F.R

Precision R

Press gauge

Diff. press gauge

Electro-pneumatic R

Speed controller

Auxiliary valve

Fitting/tube

Clean air unit

Pressure sensor

Flow rate sensor

Valve for air blow

Ending



# Safety Precautions

Always read this section before use.

Refer to page 2 for general information of the cylinder, and to page 320 for general information of the cylinder switch.

SCPD3

SCM

SSD2

Guided cylinder STM Series

MDC2

## Design & selection

SMG

### CAUTION

- When using a 2-color display proximity switch for STM-B-6, avoid mounting the cylinder on a magnetic substance such as a metal plate. This could lead to switch detection malfunction.

LCM

LCR

LCG

LCX

STM

STG

## Mounting, installation & adjustment

STR2

### 1. Common

MRL2

### CAUTION

- Be sure to attach a speed controller during piping before use. In addition, when mounting the rear piping with through bolt, the applicable fittings are as follows.

GRC

Cylinder switch

MN3E  
MN4E

4GA/B

M4GA/B

MN4GA/B

F.R (module unit)

Clean F.R

Precision R

Press gauge  
Diff. press gauge

Electro-pneumatic R

Speed controller

Auxiliary valve

Fitting/tube

Clean air unit

Pressure sensor

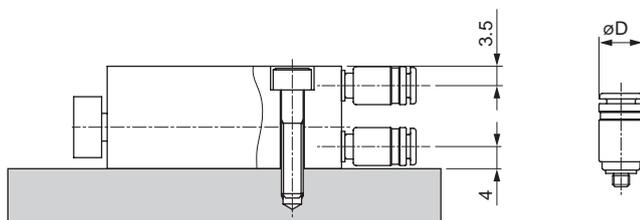
Flow rate sensor

Valve for air blow

Ending

Bore size	Port size	Available fitting/speed controller valve	Fitting O.D. D
ø6 ø10	M3	SC3W-M3-*-P7*	ø8
		SC3U-M3-*-P7*	
		GWS-*-M3-S-P7*	
		FTS4-M3-P80	
		FTL4-M3-P80	
		CG-S2-M3	

\*1: Copper-based materials are used. Please refer to page 946 of this catalog.



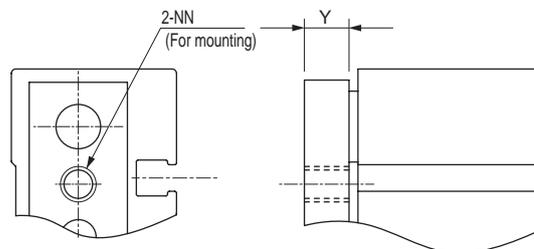
- Observe tightening torque when mounting the switch.

If the tightening torque range is exceeded, the mounting bolt, bracket, switch, etc., could be damaged. In addition, when tightening the set screw with a torque less than the tightening torque range, displacement of switch mounting position could occur.

Tightening torque: 0.03 to 0.08 (N·m)

- Do not damage surface flatness by denting or scratching the tube main body mounting surface or the end plate surface. Make sure that the flatness of the mating surface where the end plate will be attached is 0.02 mm or below.

- When attaching a jig, etc., to the end plate, make sure that the bolt insertion length is equivalent to the Y dimension. Not doing so could cause malfunction or damage of the end plate.



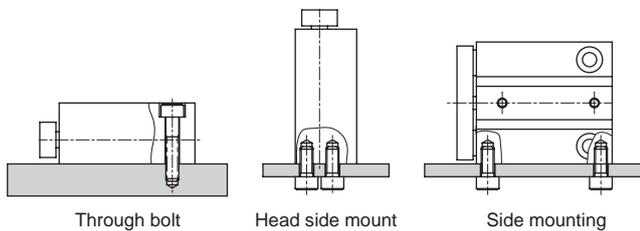
Bore size (mm)	Y dimensions
ø6	5
ø10	

- Rubber cushion is integrated as a cushion mechanism. The table below shows the kinetic energy which can be absorbed by the rubber cushion. If the energy exceeds these values, consider using a separate shock absorber.

Bore size (mm)	Allowable energy absorption (J)
ø6	0.008
ø10	0.054

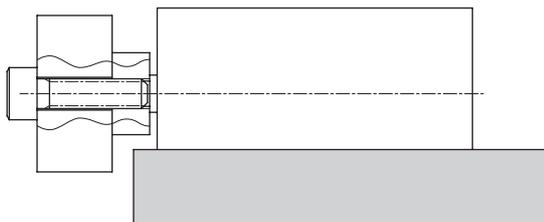
- When mounting the body with bolts, tighten them to the tightening torque as specified in the table below.

Bore size (mm)	Thread size	Tightening torque (N·m)		
		Through bolt	Bottom mount	Head end installation
ø6	M3	1.1		0.6
ø10	M4	2.7		1.6



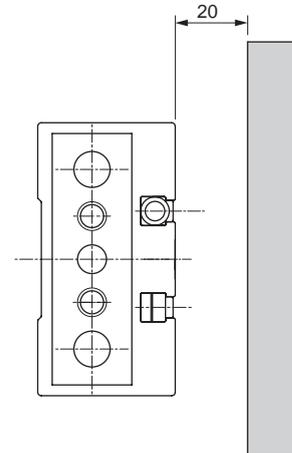
- When mounting the workpiece on the end plate, tighten the bolts to the tightening torque as specified in the table below.

Bore size (mm)	Thread size	Tightening torque (N·m)
ø6	M3	0.6
ø10	M4	1.6

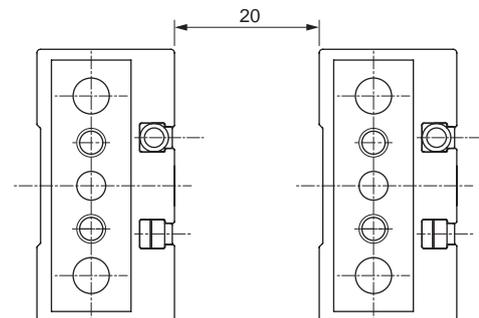


### 2. With switch

- The cylinder switch may malfunction if there is a magnetic substance such as a metal plate installed adjacently. Check that a distance of 20 mm is provided from the surface of the cylinders. (Same clearance for all bore sizes)



- The cylinder switch may malfunction if cylinders are installed adjacently. Check that the following distances are provided between cylinders. (Same clearance for all bore sizes)



## During use & maintenance

### ⚠ CAUTION

- This cylinder cannot be dismantled. Do not forcefully disassemble it.

SCPD3
SCM
SSD2
MDC2
SMG
LCM
LCR
LCG
LCX
<b>STM</b>
STG
STR2
MRL2
GRC
Cylinder Switch
MN3E MN4E
4GA/B
M4GA/B
MN4GA/B
F.R. (module unit)
Clean F.R
Precision R
Press gauge Diff. press gauge
Electro-pneumatic R
Speed controller
Auxiliary valve
Fitting/tube
Clean air unit
Pressure sensor
Flow rate sensor
Valve for air blow
Ending