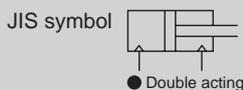


Small direct mounting cylinder double acting/single rod

# MDC2 Series

● Bore size:  $\phi 4/\phi 6/\phi 8/\phi 10$



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

## Structure and material restriction

	Structure	Material restriction			Model No.
P7 Series	Exhaust treatment				<b>P7</b>
	Vacuum treatment				<b>P71</b>
P5 Series (custom order product)	Exhaust treatment	Copper-based materials prohibited	Silicon-based materials prohibited	Halogen-based materials prohibited (fluorine, chlorine, bromine)	<b>P5</b>
	Vacuum treatment	Copper-based materials prohibited	Silicon-based materials prohibited	Halogen-based materials prohibited (fluorine, chlorine, bromine)	<b>P51</b>

## Specifications

Descriptions	MDC2-P7* / P5*, MDC2-L-P7* / P5* (with switch)		
Bore size mm	$\phi 6$	$\phi 8$	$\phi 10$
Actuation	Double acting		
Working fluid	Compressed air		
Max. working pressure MPa	0.7		
Min. working pressure MPa	0.15		0.1
Proof pressure MPa	1.05		
Ambient temperature °C	-10 to 60 (no freezing) (*2)		
Port size	M3		M5
Port size (relief port)	M3		M5
Stroke tolerance mm	+0.5 0		
Working piston speed mm/s	50 to 500		
Cushion	None		
Lubrication	Not available		
Allowable energy absorption J	This product cannot absorb the energy generated by external load mounted on the cylinder. If you use the product with no load, separately provide a shock absorber on the outside.		

\*1: When using the proximity switch, use the cylinder at 40°C or less.

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length with two switches (mm)		Min. stroke length with one switch (mm)	
			Reed switch	Proximity switch Note 2	Reed switch	Proximity switch
$\phi 6$	4/6/8	8	6	4 (8)	4	4
$\phi 8$	4/6/8	8	8	4 (8)	4	4
$\phi 10$	4/6/10	10	6	4 (10)	4	4

\*1: Other than standard stroke length is not available.

\*2: For F3P, F2Y or F3Y, the minimum stroke length will be the dimensions in ( ).

### Switch specifications

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

(g)

Stroke length (mm)	3		4		6		8		10	
	W/o switch	With switch								
ø6	-	-	11.4	13.1	12.4	14	13.4	15	-	-
ø8	-	-	16.1	18.2	17.4	19.5	18.7	20.8	-	-
ø10	-	-	21.4	23.3	22.6	24.5	-	-	25	26.9

### Theoretical thrust table

(Unit: N)

Bore size (mm)	Operating direction	Working pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø6	Push	-	4.24	5.65	8.48	11.3	14.1	17.0	19.8
	Pull	-	2.36	3.14	4.71	6.28	7.85	9.42	11.0
ø8	Push	-	7.54	10.1	15.1	20.1	25.1	30.2	35.2
	Pull	-	4.59	6.13	9.19	12.3	15.3	18.4	21.4
ø10	Push	7.85	11.8	15.7	23.6	31.4	39.3	47.1	55.0
	Pull	5.03	7.54	10.1	15.1	20.1	25.1	30.2	35.2

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

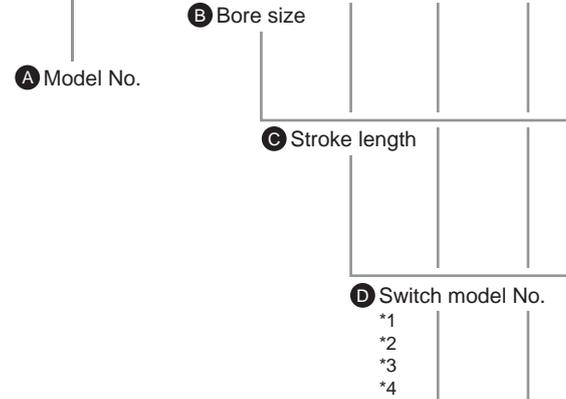
Ending

## How to order

● Without switch (No magnet for switch)



● With switch (Magnet for switch incorporated)



### ⚠ Precautions for model No. selection

- \*1: Minimum stroke length with two reed switches is 6 mm for ø6, 8 mm for ø8, or 6 mm for ø10.
- \*2: For MDC2 with reed switch, the cylinder cannot be mounted on a magnetic substance (iron plate, etc.). This could lead to switch detection malfunction.
- \*3: For MDC2 with proximity switch, use the cylinder at ambient temperature of 40°C or lower. Failure to do so could lead to malfunction of switch detection.
- \*4: When using MDC2-L-6 with reed switch, use the non-magnetic bolt (stainless steel hexagon socket head cap screw, etc.) for cylinder mounting bolt. Failure to do so could lead to malfunction of switch detection.
- \*5: "P5" and "P51" are custom order products.
- \*6: Refer to page 60 for combination of variations/options.

### [Example of model No.]

#### MDC2-L-6-4-F2V-R-P7

Model: Small direct mounting cylinder

- Ⓐ Model No. : Double acting/single rod with switch
- Ⓑ Bore size : ø6 mm
- Ⓒ Stroke length : 4 mm
- Ⓓ Switch model No. : Proximity F2V switch, lead wire 1 m
- Ⓔ Switch quantity : 1 (on rod end)
- Ⓕ Clean room specifications : Exhaust treatment

Code	Content	
<b>Ⓐ Model No.</b>		
MDC2	Double acting/single rod	Without switch
MDC2-L	Double acting/single rod	With switch

<b>Ⓑ Bore size</b>	
6	ø6
8	ø8
10	ø10

<b>Ⓒ Stroke length (mm)</b>	
4	4 (ø6 to ø10)
6	6 (ø6 to ø10)
8	8 (ø6, ø8)
10	10 (ø10)

<b>Ⓓ Switch model No.</b>						
Lead wire straight	Lead wire L-shaped	Contact	Voltage		Display	Lead wire
			AC	DC		
F0H*	F0V*	Reed		●	1-color display	2 wires
F2S*				●		
F2H*	F2V*			●		
F3S*				●		
F3H*	F3V*	Proximity		●	1-color display PNP output (custom order)	3 wires
F3PH*	F3PV*			●		
F2YH*	F2YV*			●	2-color display	2 wires
F3YH*	F3YV*		●	3 wires		

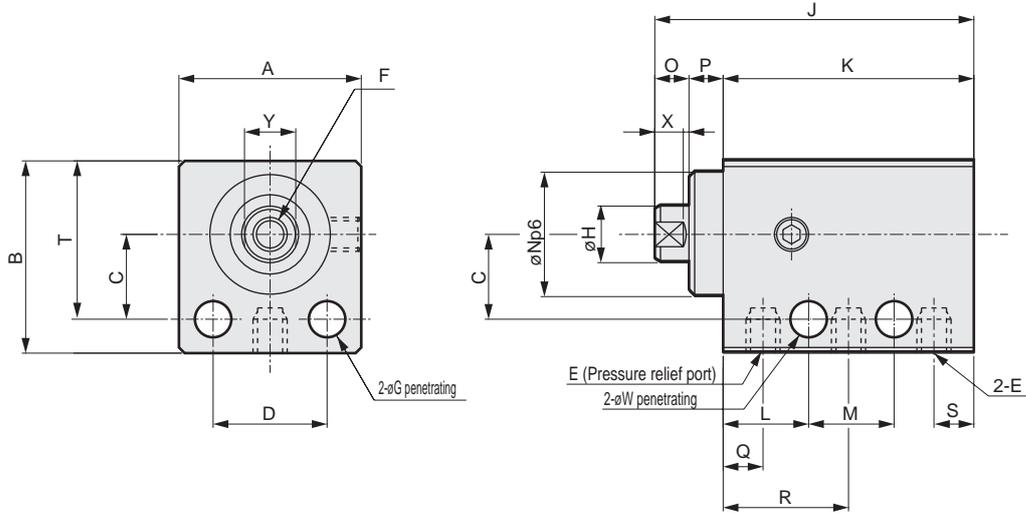
<b>*Lead wire length</b>	
Blank	1 m (standard)
3	3 m (option)

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

<b>Ⓕ Clean room specifications</b>		
	Structure	Material restriction
P7	Exhaust treatment	-
P71	Vacuum treatment	-
P5	Exhaust treatment	Copper-based/silicon-based/halogen-based materials (fluorine, chlorine, bromine) are prohibited
P51	Vacuum treatment	Copper-based/silicon-based/halogen-based materials (fluorine, chlorine, bromine) are prohibited

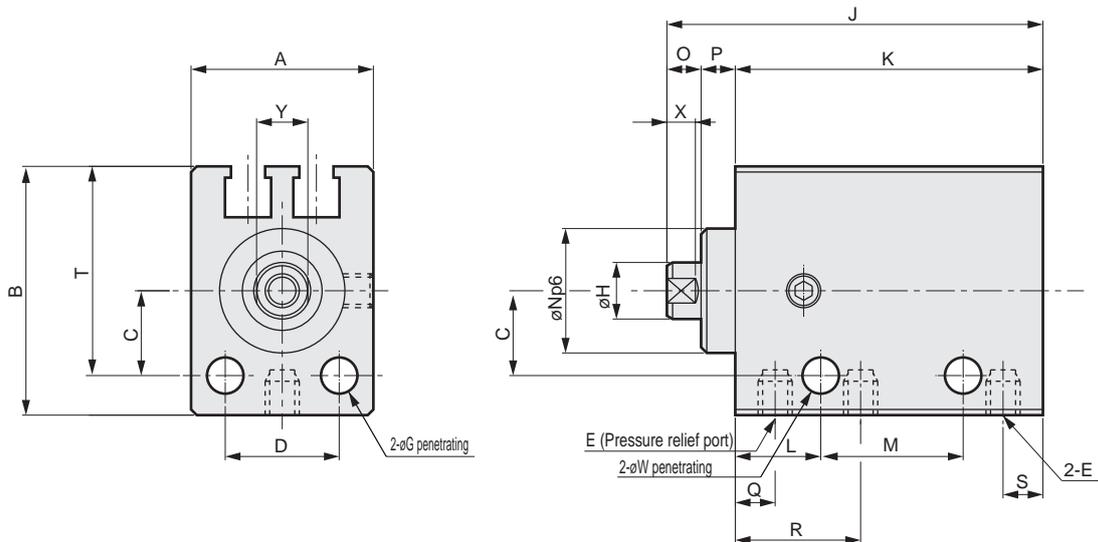
## Dimensions

● MDC2-6, 8, 10



Bore size (mm)	Stroke	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	W	X	Y
ø6	4	14	15	6.5	8.5	M3	M2.5 × 0.45 Depth 4	3.2	4	28	22	7.5	7.5	9	3	3	3.5	11	3.5	12	3.2	2.5	3.5
	6									30	24		9										
	8									32	26		11										
ø8	4	16	17	7.5	10	M3	M3 × 0.5 Depth 5	3.2	5	28	22	7.5	7.5	11	3	3	3.5	11	3.5	14	3.2	2.5	4.5
	6									30	24		9										
	8									32	26		11										
ø10	4	16	17.5	8	10	M5	M3 × 0.5 Depth 5	3.2	6	36	30	10.5	9.5	11	3	3	5	15	5	14.5	3.2	2.5	5
	6									38	32		11.5										
	10									42	36		15.5										

● MDC2-L-6, 8, 10



Bore size (mm)	Stroke	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	W	X	Y
ø6	4	14	19	6.5	8.5	M3	M2.5 × 0.45 Depth 4	3.2	4	33	27	7.5	12.5	9	3	3	3.5	11	3.5	16	3.2	2.5	3.5
	6									35	29		14										
	8									37	31		16										
ø8	4	16	22	7.5	10	M3	M3 × 0.5 Depth 5	3.2	5	33	27	7.5	12.5	11	3	3	3.5	11	3.5	18.5	3.2	2.5	4.5
	6									35	29		14										
	8									37	31		16										
ø10	4	16	22	8	10	M5	M3 × 0.5 Depth 5	3.2	6	39	33	10.5	12.5	11	3	3	5	15	5	19	3.2	2.5	5
	6									41	35		14.5										
	10									45	39		18.5										

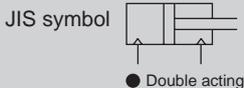
SCPD3  
SCM  
SSD2  
MDC2  
SMG  
LCM  
LCR  
LCG  
LCX  
STM  
STG  
STR2  
MRL2  
GRC  
Cylinder Switch  
MN3E  
MN4E  
4GA/B  
M4GA/B  
MN4GA/B  
F.R. (module unit)  
Clean F.R  
Precision R  
Press gauge  
Diff. press gauge  
Electro-pneumatic R  
Speed controller  
Auxiliary valve  
Fitting/tube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



Compact direct mounting cylinder double acting/fine speed

# MDC2-F Series

● Bore size  $\phi 6/\phi 8/\phi 10$



## Structure and material restriction

	Structure	Model No.
P7 Series	Exhaust treatment	<b>P7</b>
	Vacuum treatment	<b>P71</b>

## Specifications

Descriptions	MDC2-F-P7*, MDC2-LF-P7* (with switch)		
Bore size mm	$\phi 6$	$\phi 8$	$\phi 10$
Actuation	Double acting/single rod		
Working fluid	Compressed air		
Max. working pressure MPa	0.7		
Min. working pressure MPa	0.15		0.1
Proof pressure MPa	1.05		
Ambient temperature °C	5 to 60 (*1)		
Port size	M3		M5
Port size (relief port)	M3		M5
Stroke tolerance mm	+0.5 0		
Working piston speed mm/s	1 to 200		
Cushion	None		
Lubrication	Lubrication not possible		
Allowable energy absorption J	This product cannot absorb the energy generated by external load mounted on the cylinder. If you use the product with no load, separately provide a shock absorber on the outside.		

\*1: 40°C when proximity switch is provided.

## Stroke length

Model No.	Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length with two switches (mm)		Min. stroke length with one switch (mm)	
				Reed switch	Proximity switch *2	Reed switch	Proximity switch
MDC2-F	$\phi 6$	4/6/8	8	6	4 (8)	4	4
	$\phi 8$	4/6/8	8	8	4 (8)	4	4
MDC2-LF	$\phi 10$	4/6/10	10	6	4 (10)	4	4

\*1: Other than standard stroke length is not available.

\*2: For F3P, F2Y or F3Y, the minimum stroke length will be the dimensions in ( ).

## Switch specifications

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

### Theoretical thrust table

(Unit: N)

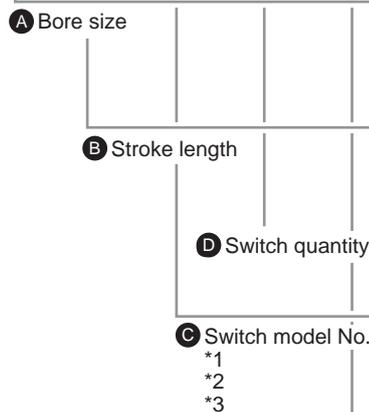
Bore size (mm)	Operating direction	Working pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø6	Push	-	4.24	5.65	8.48	11.3	14.1	17.0	19.8
	Pull	-	2.36	3.14	4.71	6.28	7.85	9.42	11.0
ø8	Push	-	7.54	10.1	15.1	20.1	25.1	30.2	35.2
	Pull	-	4.59	6.13	9.19	12.3	15.3	18.4	21.4
ø10	Push	7.85	11.8	15.7	23.6	31.4	39.3	47.1	55.0
	Pull	5.03	7.54	10.1	15.1	20.1	25.1	30.2	35.2

### How to order

- Without switch (No magnet for switch)



- With switch (Magnet for switch incorporated)



Code	Content			
<b>A Bore size</b>				
6	ø6			
8	ø8			
10	ø10			
<b>B Stroke length (mm)</b>				
		Bore size		
		ø6	ø8	
4	4	●	●	
6	6	●	●	
8	8	●	●	
10	10	-	●	
<b>C Switch model No.</b>				
Lead wire straight	Lead wire L-shaped	Contact	Display	
F0H*	F0V*	Reed	1-color display	
F2S*		Proximity		1-color display PNP output (custom order)
F2H*				
F3S*				
F3H*	F3V*	2-color display	3 wires	
F3PH*	F3PV*			
F2YH*	F2YV*			
F3YH*	F3YV*	3 wires		
<b>*Lead wire length</b>				
Blank	1 m (standard)			
3	3 m (option)			
<b>D Switch quantity</b>				
R	1 (on rod end)			
H	1 (on head end)			
D	2			
<b>E Clean room specifications</b>				
Structure				
P7	Exhaust treatment			
P71	Vacuum treatment			

### ⚠ Precautions for model selection

- \*1: Min. stroke length with two reed switches is 6 mm for ø6, 8 mm for ø8, or 6 mm for ø10.
- \*2: When using MDC2 with reed switch, the cylinder cannot be mounted on a magnetic matter (steel sheet, etc.). Failure to do so could lead to malfunction of switch detection.
- \*3: When using MDC2 with proximity switch, use the cylinder at ambient temperature of 40°C or lower. Failure to do so could lead to malfunction of switch detection.
- \*4: When using MDC2-LF-6 with reed switch, use the non-magnetic bolt (stainless steel hexagon socket head cap screw, etc.) for cylinder mounting bolt. Failure to do so could lead to malfunction of switch detection.
- \*5: Refer to page 60 for combination of variations/options.

### [Example of model No.]

#### MDC2-LF-6-4-F2V-R-P7

Model: Compact direct mounting cylinder fine speed

- A** Bore size : ø6 mm
- B** Stroke length : 4 mm
- C** Switch model No. : Proximity F2V switch, lead wire 1 m
- D** Switch quantity : 1 (on rod end)
- E** Clean room specifications : Exhaust treatment

### Dimensions

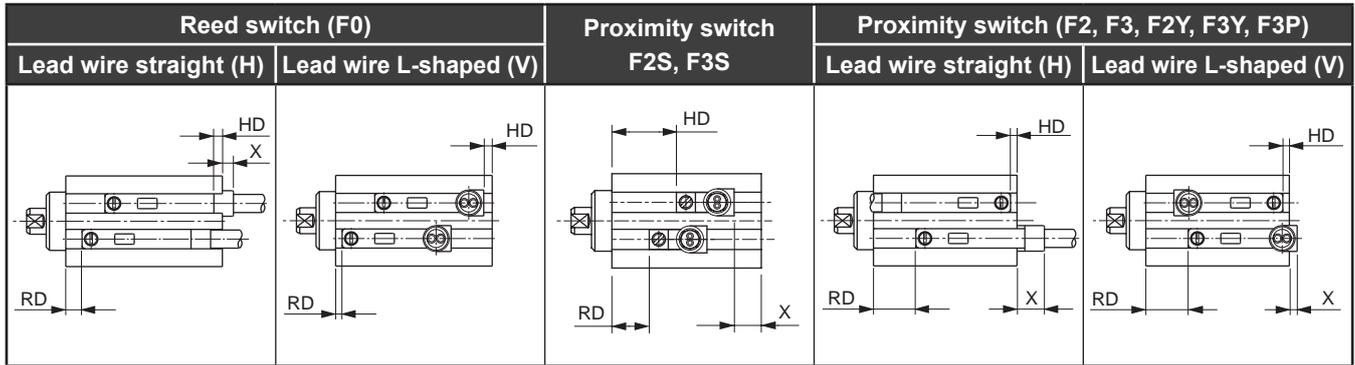
Same as MDC2 Series (double acting/single rod). Refer to page 65.

- 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

# MDC2 Series

## Dimensions with switch

● Switch mounting position



Note: This shows the switch mounting position when shipped.

● Switch installation dimensions

· Reed switch

(mm)

Switch mounting method		F0 <sub>H</sub>								
		RD			HD			X (*2)		
		Stroke length (mm)			Stroke length (mm)			Stroke length (mm)		
Bore size (mm)	Actuation	4	6	8 (10)	4	6	8 (10)	4	6	8 (10)
ø6	Double acting	6	6	6	-0.5	0	0	3.5 0.5	3	3
ø8	Double acting	6	6	6	-1.5	0	0	4.5 1.5	3	3
ø10	Double acting	11.5	11.5	11.5	0.5	0.5	0.5	2.5	2.5	2.5

· Proximity switch

(mm)

Switch mounting method		F2S, F3S						F2 <sub>H</sub> , F3 <sub>H</sub>								
		RD			HD			RD			HD			X (*2)		
		Stroke length (mm)			Stroke length (mm)			Stroke length (mm)			Stroke length (mm)			Stroke length (mm)		
Bore size (mm)	Actuation	4	6	8 (10)	4	6	8 (10)	4	6	8 (10)	4	6	8 (10)	4	6	8 (10)
ø6	Double acting	10.5	10.5	10.5	14.5	16.5	18.5	11.5	11.5	11.5	1	1	1	4.2 1.2	2.2	0.2
ø8	Double acting	10.5	10.5	10.5	14.5	16.5	18.5	11.5	11.5	11.5	1	1	1	4.2 1.2	2.2	0.2
ø10	Double acting	15	15	15	19	21	25	16	16	16	2.5	2.5	2.5	2.7 -0.3	0.7	-

Switch mounting method		F2YH/V, F3YH/V, F3PH/V								
		RD			HD			X (*2)		
		Stroke length (mm)			Stroke length (mm)			Stroke length (mm)		
Bore size (mm)	Actuation	4	6	8 (10)	4	6	8 (10)	4	6	8 (10)
ø6	Double acting	11.5	11.5	11.5	1	1	1	8.7 5.7	6.7 3.7	4.7 1.7
ø8	Double acting	11.5	11.5	11.5	1	1	1	8.7 5.7	6.7 3.7	4.7 1.7
ø10	Double acting	16	16	16	2.5	2.5	2.5	7.2 4.2	5.2 2.2	1.2 -

\*1: Min. stroke lengths when two switches installed are shown in the table below.

\*2: X dimension indicates the protruding dimension from the end surface of the switch body.

The upper column indicates X dimension when axial lead wire is used and the lower column indicates X dimension when L type lead wire is used.

\*3: Installing positions of F2/3Y and F3P are same as F2/3, while X dimensions are longer than F2/3.

Min. stroke length (with 2 switches) (mm)

Bore size (mm)	Reed switch	Proximity switch
ø6	6	4 (8)
ø8	8	4 (8)
ø10	6	4 (10)

Note: For F3P, F2Y or F3Y, the min. stroke length will be the dimensions in ( ).