

MDC2

Small direct mounting cylinder

Space saving structure

ø6/ø8/ø10

Overview

This cylinder body has an inner diameter of ø6 to ø10 and can be directly mounted from 4 directions. Can be used for ejection of workpiece or shutter of parts feeder.

Features

Direct mount

As a square body is adopted, it can be directly mounted.
4 surfaces for mounting direction!

Space saving design

Total length dimension and outer diameter dimension are minimized as much as possible to reduce installation space.

With spigot at rod side

As there is a spigot at the rod metal portion, it is easy to perform centering.

Serialized with switch

Miniature reed/proximity switch can be mounted.



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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

Variation and option selection table

- ◎ : Option variation (check category 2)
- : C5 compatible (check category 3)
- △ : Available depending on conditions (Estimation)
- : Not available

		Clean room specifications				
		Exhaust treatment	Vacuum treatment	Exhaust treatment	Vacuum treatment	
SCPD3						
SCM						
SSD2						
MDC2						
SMG						
LCM						
LCR						
LCG		Code	P7	P71	P5	P51
LCX	Double acting single rod	Blank	◎	◎	○	○
STM	With cylinder switch	L	◎	◎	○	○
STG	Fine speed	F	◎	◎	■	■
STR2	Single acting push	X	■	■	■	■
	Single acting pull	Y	■	■	■	■

Variation

- 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

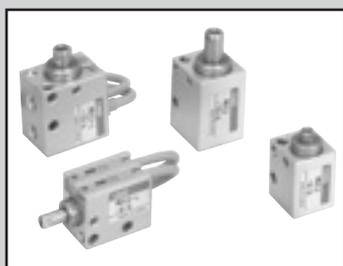
Clean
air unit

Pressure
sensor

Flow rate
sensor

Valve for
air blow

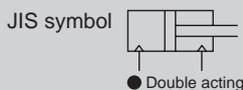
Ending



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
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LCX
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F.R (module unit)
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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				P7
	Vacuum treatment				P71
P5 Series (custom order product)	Exhaust treatment	Copper-based materials prohibited	Silicon-based materials prohibited	Halogen-based materials prohibited (fluorine, chlorine, bromine)	P5
	Vacuum treatment	Copper-based materials prohibited	Silicon-based materials prohibited	Halogen-based materials prohibited (fluorine, chlorine, bromine)	P51

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

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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

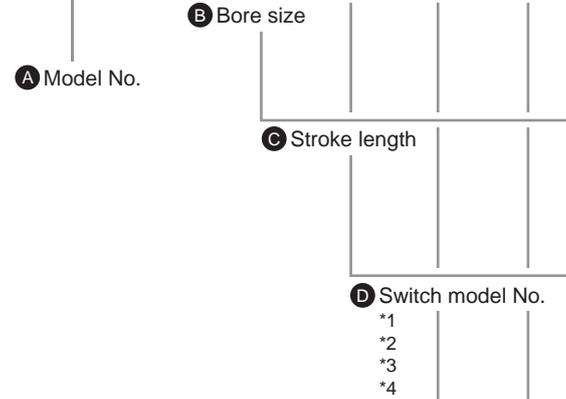
Ending

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 $\phi 6$, 8 mm for $\phi 8$, or 6 mm for $\phi 10$.
- *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

- A** Model No. : Double acting/single rod with switch
- B** Bore size : $\phi 6$ mm
- C** Stroke length : 4 mm
- D** Switch model No. : Proximity F2V switch, lead wire 1 m
- E** Switch quantity : 1 (on rod end)
- F** Clean room specifications : Exhaust treatment

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

B Bore size	
6	$\phi 6$
8	$\phi 8$
10	$\phi 10$

C Stroke length (mm)	
4	4 ($\phi 6$ to $\phi 10$)
6	6 ($\phi 6$ to $\phi 10$)
8	8 ($\phi 6$, $\phi 8$)
10	10 ($\phi 10$)

D Switch model No.						
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		

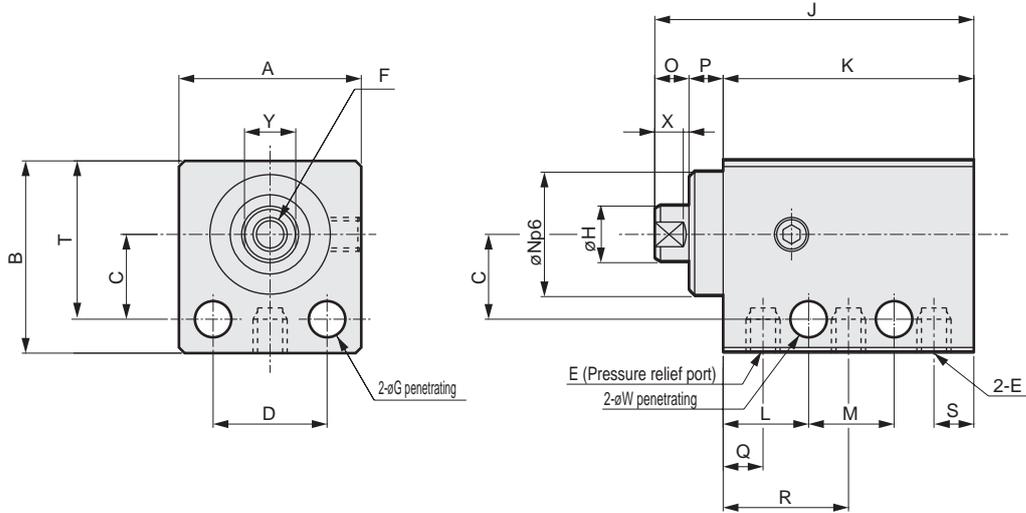
*Lead wire length	
Blank	1 m (standard)
3	3 m (option)

E Switch quantity	
R	1 (on rod end)
H	1 (on head end)
D	2

F Clean room specifications		
	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

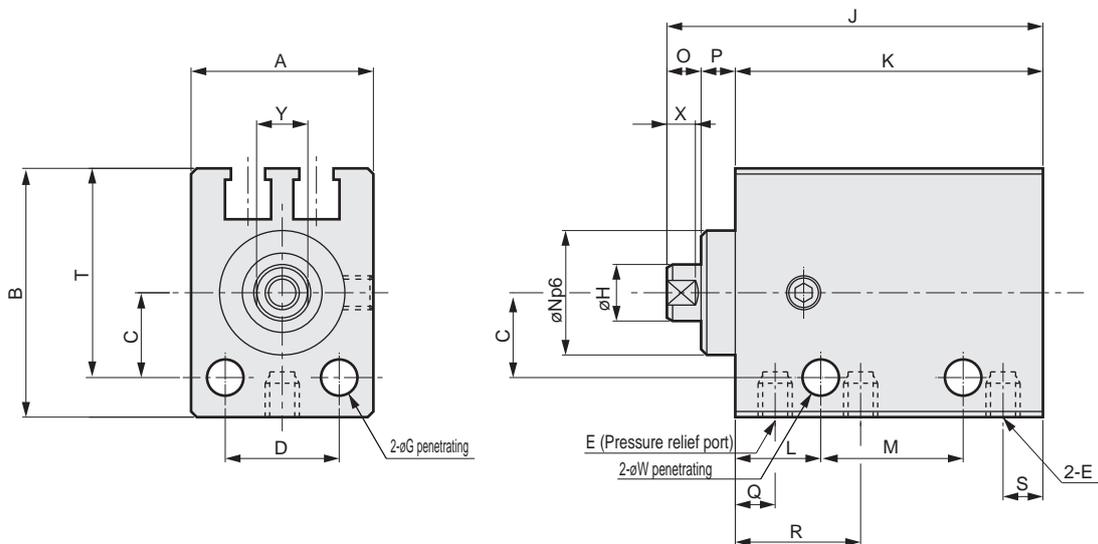
Dimensions

● 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										

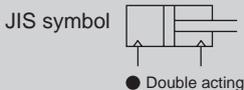
SCPD3
SCM
SSD2
MDC2
SMG
LCM
LCR
LCG
LCX
STM
STG
STR2
MRL2
GRC
Cylinder Switch
MN3E
MN4E
4GA/B
M4GA/B
MN4GA/B
F.R. (module unit)
Clean F.R
Precision R
Press gauge
Diff. press gauge
Electro-pneumatic R
Speed controller
Auxiliary valve
Fitting/tube
Clean air unit
Pressure sensor
Flow rate sensor
Valve for 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	P7
	Vacuum treatment	P71

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 μ 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)

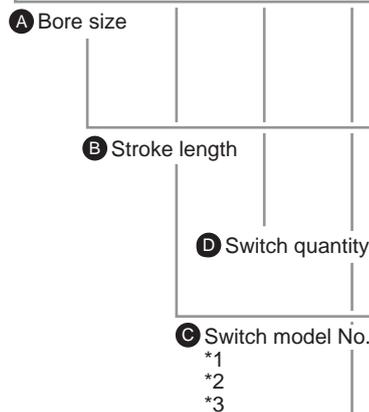
Bore size (mm)	Operating direction	Working pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø6	Push	-	4.24	5.65	8.48	11.3	14.1	17.0	19.8
	Pull	-	2.36	3.14	4.71	6.28	7.85	9.42	11.0
ø8	Push	-	7.54	10.1	15.1	20.1	25.1	30.2	35.2
	Pull	-	4.59	6.13	9.19	12.3	15.3	18.4	21.4
ø10	Push	7.85	11.8	15.7	23.6	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			
A Bore size				
6	ø6			
8	ø8			
10	ø10			
B Stroke length (mm)				
Bore size		ø6	ø8	ø10
4	4	●	●	●
6	6	●	●	●
8	8	●	●	-
10	10	-	-	●
C Switch model No.				
Lead wire straight	Lead wire L-shaped	Contact	Display	Lead wire
F0H*	F0V*	Reed	1-color display	2 wires
F2S*		Proximity		
F2H*	F2V*			
F3S*				
F3H*	F3V*	1-color display PNP output (custom order)	3 wires	
F3PH*	F3PV*			
F2YH*	F2YV*			
F3YH*	F3YV*	2-color display	3 wires	
*Lead wire length				
Blank	1 m (standard)			
3	3 m (option)			
D Switch quantity				
R	1 (on rod end)			
H	1 (on head end)			
D	2			
E Clean room specifications				
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

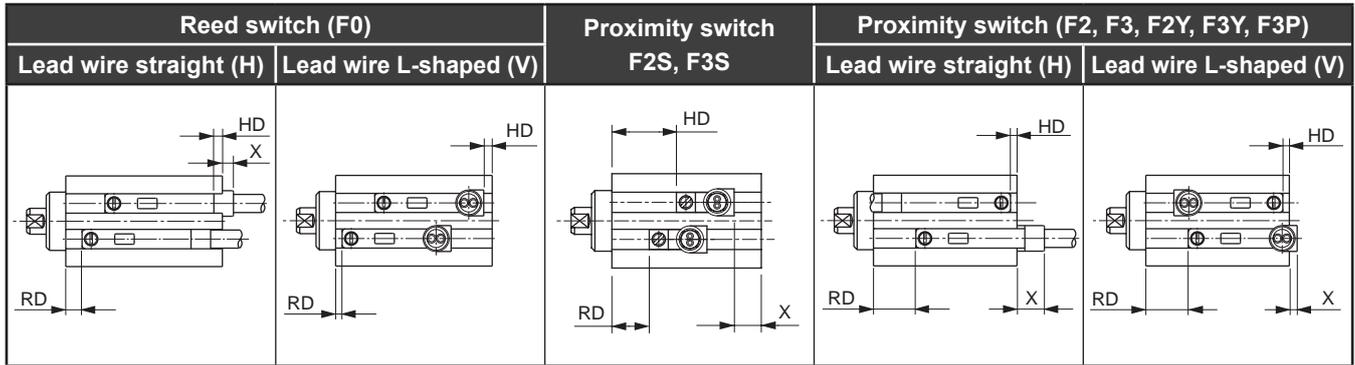
Same as MDC2 Series (double acting/single rod). Refer to page 65.

- 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 _H								
		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 _H , F3 _H								
		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 ().

MEMO

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
- 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

Small direct mounting cylinder MDC2 Series

Design & selection

1. Common

CAUTION

■ When using MDC2 with reed switch, the cylinder cannot be mounted on a magnetic matter (steel plate, etc.). Otherwise, this could lead to switch detection malfunction.

■ For MDC2 with proximity switch, use the cylinder at ambient temperature of 40°C or less. Failure to do so could lead to malfunction of switch detection.

2. Fine speed MDC2-F

CAUTION

■ Use the product with no lubrication.

- Application of lubrication may cause changes in characteristics.

■ Assemble the speed controller near the cylinder.

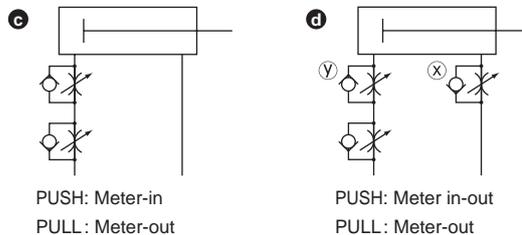
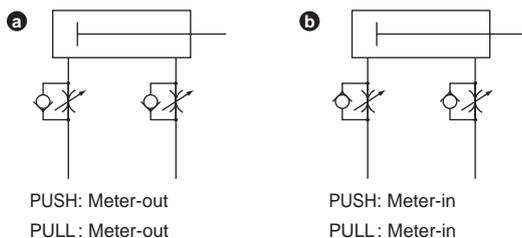
- When installed far from the cylinder, the speed becomes unstable.
- Use the SC-M3/M5-F, SC3W, SCD-M3/M5-F Series speed controller.

■ In general, the speed is stabler at higher air pressure and lower load factor.

- Use at a 50% or less load factor.

■ Stable speed control is achieved with a meter-out circuit.

● When fine speed activation is performed with operating direction PUSH for the single rod cylinder, the popping out phenomenon occurs when operation starts if the load resistance is low. For countermeasures, use the **b**, **c** or **d** circuit. Note that circuit **d** is the most stable.

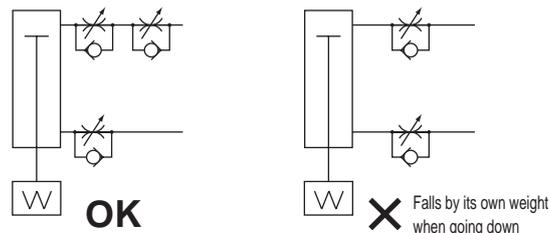


Speed adjustment method for PUSH operation of **d** circuit:

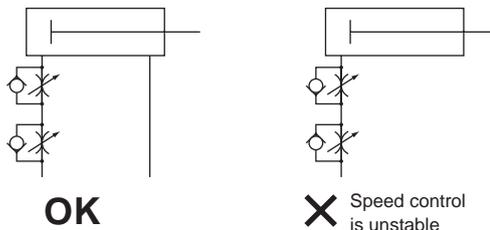
1. Set the speed with the speed controller x.
2. Restrict the speed with the speed controller y until there is no popping out.
3. Check the speed again.

(*1) When comparing **b**, **c**, **d**, operation is the most stable with **d** circuit.

(*2) For vertical mounting, combine the cylinder with a meter-out circuit, as it will fall under its own weight when a meter-in circuit is used.



(*3) Use the circuit shown in the figure below for the serial connection of the speed controllers.



(Guidelines for pop-out generation)

Popping out occurs in the following cases.

- Thrust > Resistance

* Resistance: Thrust caused by residual pressure on the exhaust side (in the fine speed, suction pressure = residual pressure)

+ { When using horizontally: frictional force caused by load
When using vertically: load self-weight

■ Do not apply a lateral load to the cylinder.

- With a lateral load, operation will become unstable.

■ Avoid using this product where vibration is present.

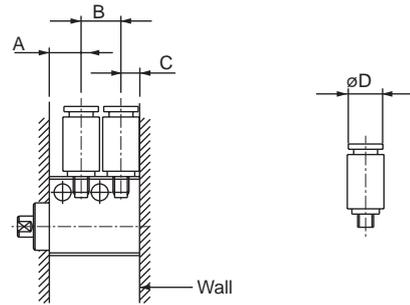
- The product will be adversely affected by vibration and operation will be unstable.

Mounting, installation & adjustment

1. Common

⚠ CAUTION

- As compatible fittings are limited, refer to the table below to select the fitting.



Descriptions Bore size (mm)	Port size	Port position dimensions (mm)				With wall			Without wall		
		Stroke length	A	B	C	Applicable fittings	Fitting O.D. ϕ D	Inapplicable fittings	Applicable fittings	Fitting O.D. ϕ D	Inapplicable fittings
$\phi 6$	M3	4	6	7.5	3.5	GWS3-M3-S-P7* FTS4-M3-P80	$\phi 7$ or smaller	GWS4-M3-S SC3W-M3-3 SC3W-M3-4 SC3U-M3-3	GWS3-M3-S-P7* GWS4-M3-S-P7* FTS4-M3-P80 SC3W-M3*-P7*	$\phi 7.5$ or smaller	GWS4-M3-S
		6	6	9.5	3.5				GWS3-M3-S-P7* GWS4-M3-S-P7* FTS4-M3-P80 SC3W-M3*-P7*	$\phi 9.5$ or smaller	
		8	6	11.5	3.5				↑	$\phi 11.5$ or smaller	
$\phi 8$	M3	4	6	7.5	3.5	GWS3-M3-S-P7* FTS4-M3-P80	$\phi 7$ or smaller	GWS4-M3-S SC3W-M3-3 SC3W-M3-4 SC3U-M3-3	GWS3-M3-S-P7* SC3W-M3*-P7*	$\phi 7.5$ or smaller	GWS4-M3-S
		6	6	9.5	3.5				GWS3-M3-S-P7* GWS4-M3-S-P7* FTS4-M3-P80 SC3W-M3*-P7*	$\phi 9.5$ or smaller	
		8	6	11.5	3.5				↑	$\phi 11.5$ or smaller	
$\phi 10$	M5	4	7	10	5	GWS*-M5-S-P7* SC3W-M5*-P7* GWS4-M5-S-P7* FTS4-M5-P80 FTS6-M5-P80	$\phi 10$ or smaller	GWS*-M5 GWS6-M5-S	GWS*-M5-S-P7* SC3W-M5*-P7* GWS4-M5-S-P7* FTS4-M5-P80 FTS6-M5-P80	$\phi 10$ or smaller	GWS*-M5 GWS6-M5-S
		6	7	12	5				GWS*-M5-S-P7* SC3W-M5*-P7* GWS4-M5-S-P7* GWS6-M5-S-P7* GWS4-M5-P7* FTS4-M5-P80 FTS6-M5-P80	$\phi 12$ or smaller	GWS6-M5
		10	7	16	5				GWS*-M5-S-P7* SC3W-M5*-P7* GWS4-M5-S-P7* GWS6-M5-S-P7* GWS4-M5-P7* GWS6-M5-P7* FTS4-M5-P80 FTS6-M5-P80	$\phi 14$ or smaller	

* Port position dimension indicates dimensions for standard/without switch

2. Fine speed MDC2-F

⚠ CAUTION

- Perform adjustment such as centering so that a lateral load is not applied to the cylinder. Adjust and install the sliding guide so that it is not twisted.
 - When the load or the resistance fluctuates, operation becomes unstable.
 - If the difference between static friction and kinetic friction of the guide is large, operation becomes unstable.

Use/maintenance

1. Common

⚠ CAUTION

- As this cylinder is a non-disassembly type, do not apply excessive force to the rod metal or cylinder body.