MDC2

Small direct mounting cylinder

ø4/ø6/ø8/ø10

Space saving structure

Overview

This cylinder body has an inner diameter of ø4 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 4 mounting directions!

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.

Variation

Depending on applications, double acting/single acting push or single acting pull can be selected.

Serialized with switch

Miniature reed/proximity switch can be mounted. (excluding ø4)

CONTENTS

Series variation

Small direct mounting cylinder MDC2 Series

●: Standard, ◎: Option, : Not available

Variation	Model No. JIS symbol	Bore size (mm)	Standard stroke (mm) 3	4	6	8	10	Min. stroke (mm)	Max. stroke (mm)	Switch	Page
Double acting/ single rod with switch	MDC2 MDC2-L	ø4	●		●			3	6		1348
		ø6		●	●	●		4	8	◎	
		ø8		●	●	●				◎	
		ø10		●	●		●		10	◎	
Single acting/ push with switch	MDC2-X MDC2-XL	ø4	●		●			3	6		1354
		ø6		●	●	●		4	8	◎	
		ø8		●	●	●				◎	
		ø10		●	●		●		10	◎	
Single acting/ pull with switch	MDC2-Y MDC2-YL	ø4	●		●			3	6		1354
		ø6		●	●	●		4	8	◎	
		ø8		●	●	●				◎	
		ø10		●	●		●		10	◎	
Double acting/ fine speed with switch	MDC2-F MDC2-LF	ø6		●	●	●		4	8	◎	1364
		ø8		●	●	●				◎	
		ø10		●	●		●		10	◎	

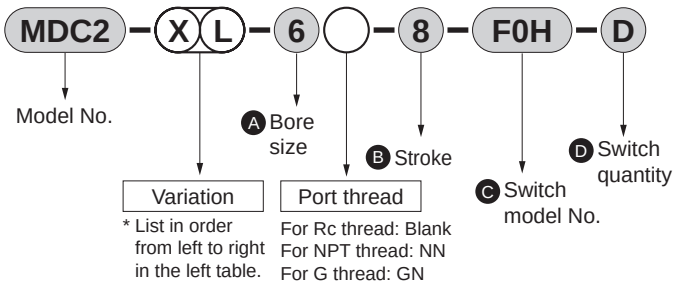
Variation and option combination selection table

◎: Option
○: Available (made-to-order product)
△: Available depending on conditions (Contact CKD.)
x: Not available

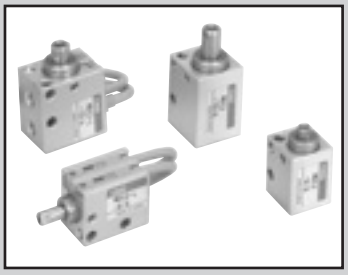
Category		Category	Variation					Port thread			Option		
			Double acting/single rod	Single acting/push	Single acting/pull	With cylinder switch	Fine speed	NPT	G		Copper and PTFE free	Clean-room specifications (exhaust port)	Clean-room specifications (vacuum treatment)
		Code	None	X	Y	L	F	N	G		P6	P7	P71
Variation	Double acting/single rod	Blank						x	x		○	◎	◎
	Single acting/push	X			x	◎	x	x	x		○	x	x
	Single acting/pull	Y				◎	x	x	x		○	x	x
	With cylinder switch	L					◎	x	x		○	◎	◎
	Fine speed	F						x	x		x	◎	◎
Port thread	NPT	N							x		x	x	x
	G	G									x	x	x
Option	Copper and PTFE free	P6										x	x
	Clean-room specifications (exhaust port)	P7											x
	Clean-room specifications (vacuum treatment)	P71											
Accessory	Cylinder switch	Listed separately	◎	◎	◎	◎	◎	x	x		○	◎	◎

*1: Refer to “Components for Clean Room Specifications” No. CB-033SA for the clean room specifications P7 and P71.

[Example of model No.]



Model No.: Small direct mounting cylinder
● Variation: Single acting/push/with switch
A Bore size : ø6 mm
B Stroke : 8 mm
C Switch model No.: Reed FO switch, lead wire 1 m
D Switch quantity : 2

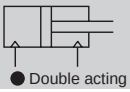


Compact direct mounting cylinder double acting/single rod

MDC2 Series

● Bore size: ø4, ø6, ø8, ø10

JIS symbol



RoHS CAD

Specifications

Item	MDC2 MDC2-L (with switch)			
Bore size mm	ø4 *1	ø6	ø8	ø10
Actuation	Double acting			
Working fluid	Compressed air			
Max. working pressure MPa	0.7 (≈100 psi, 7 bar)			
Min. working pressure MPa	0.2 (≈29 psi, 2 bar)	0.15 (≈22 psi, 1.5 bar)		0.1 (≈15 psi, 1 bar)
Proof pressure MPa	1.05 (≈150 psi, 10.5 bar)			
Ambient temperature °C	-10 (14°F) to 60 (140°F) (no freezing) *2			
Port size	M3			M5
Stroke tolerance mm	+0.5 0			
Working piston speed mm/s	50 to 500			
Cushion	None			
Lubrication	Not required (use turbine oil class 1 ISO VG32 if necessary for lubrication)			
Allowable absorbed energy J	This product cannot absorb the energy generated by an external load mounted on the cylinder. When using the product with no load, separately provide a shock absorber on the outside.			

*1: ø4 is not available for MDC2-L.
*2: When using the proximity switch, use the cylinder at 40°C or less.

Stroke

Bore size (mm)	Standard stroke (mm)	Max. stroke (mm)	Min. stroke with two switches (mm)		Min. stroke with one switch (mm)	
			Reed switch	Proximity switch	Reed switch	Proximity switch
ø4	3/6	6	-	-	-	-
ø6	4/6/8	8	6	4(8)	4	4
ø8	4/6/8	8	8	4(8)	4	4
ø10	4/6/10	10	6	4(10)	4	4

*1: Products with stroke other than standard stroke are not available. *2: For F2Y, F3Y or F3P, the min. stroke will be the dimensions in ( ).

Switch specifications

Item	2-wire reed	2-wire proximity			3-wire proximity			
	FOH/FOV	F2H/F2V	F2S	F2YH/F2YV	F3H/F3V	F3S	F3PH/F3PV (Made to order)	F3YH/F3YV
Applications	Dedicated for programmable controller	Dedicated for programmable controller			For 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 (*3)	5 to 20 mA (*3)			50 mA or less			
Indicator	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 Ending Page 1 for detailed switch specifications and dimensions.
*2: Switches other than the above models, such as switches with connectors, are also available. Refer to Ending Page 1.
*3: The max. load current is 20 mA at 25°C. The current is lower than 20 mA if the operating ambient temperature around the switch is higher than 25°C. (5 to 10 mA at 60°C)
*4: The F-switch uses a bend-resistant lead wire.

Cylinder weight table

(Unit: g)

Stroke (mm)	3		4		6		8		10		Weight per switch
Bore size (mm)	No switch	With switch	No switch	With switch	No switch	With switch	No switch	With switch	No switch	With switch	
ø4	6.4	-	-	-	7.3	-	-	-	-	-	-
ø6	-	-	11.4	13.1	12.4	14	13.4	15	-	-	10
ø8	-	-	16.1	18.2	17.4	19.5	18.7	20.8	-	-	10
ø10	-	-	21.4	23.3	22.6	24.5	-	-	25	26.9	10

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
ø4	Push	-	-	2.51	3.77	5.03	6.28	7.54	8.80
	Pull	-	-	1.88	2.83	3.77	4.71	5.65	6.60
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

● No switch (without magnet for switch)

MDC2 - 6 - 4

● With switch (built-in magnet for switch)

MDC2-L - 6 - 4 - F2V - R

Ⓐ Model No.
Ⓑ Bore size
Ⓒ Stroke
Ⓓ Switch model No. *1 *2 *3 *4
Ⓔ Switch quantity

Precautions for model No. selection

*1 : ø4 with switch is not available.
*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 : When using MDC2-L-6 with reed switch, use a non-magnetic bolt (stainless steel hexagon socket head cap screw, etc.) for cylinder mounting bolt. Failure to do so could lead to switch detection malfunction.
*4 : Refer to page 1348 for the min. stroke with switch.

[Example of model No.]

MDC2-L-6-4-F2V-R

Model: Compact direct mounting cylinder
Ⓐ Model No. : Double acting/single rod/with switch
Ⓑ Bore size : ø6 mm
Ⓒ Stroke : 4 mm
Ⓓ Switch model No.: Proximity switch F2V, lead wire 1 m
Ⓔ Switch quantity: 1 on rod side

Code	Description	
Ⓐ Model No.		
MDC2	Double acting/single rod	No switch
MDC2-L	Double acting/single rod	With switch

Ⓑ Bore size	
4	ø4
6	ø6
8	ø8
10	ø10

Ⓒ Stroke (mm)	
3	3 (ø4)
4	4 (ø6 to ø10)
6	6 (ø4 to ø10)
8	8 (ø6, ø8)
10	10 (ø10)

Ⓓ Switch model No.

Axial lead wire	Radial lead wire	Contact	Voltage AC	Voltage DC	Indicator	Lead wire
F0H*	**F0V***	Reed		●	1-color LED	2-wire
-	**F2S***	Proximity		●		
F2H*	**F2V***			●		
-	**F3S***			●		3-wire
F3H*	**F3V***			●		
F3PH*	**F3PV***			●	1-color LED (PNP output) (custom)	
F2YH*	**F2YV***			●	2-color LED	2-wire
F3YH*	**F3YV***			●		3-wire

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

Ⓔ Switch quantity	
R	1 on rod side
H	1 on head side
D	2

How to order switch

SW - F0H

Switch model No. (Item Ⓓ above)

Clean-room specifications (Catalog No. CB-033SA)
● Anti-dust generation structure for use in cleanrooms

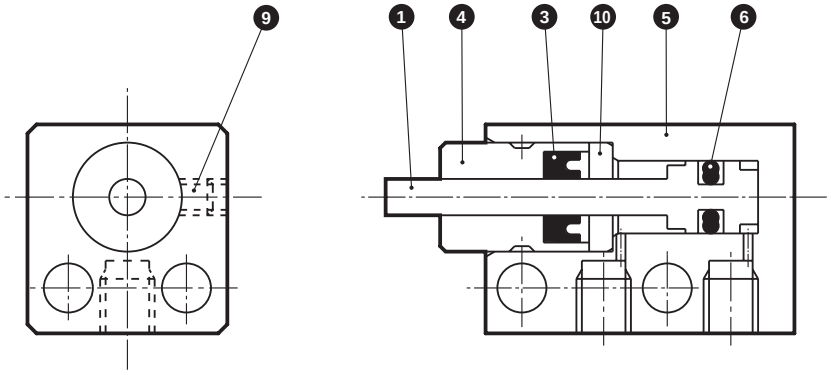
MDC2-.....- P7*
MDC2-.....- P5*

Specifications for rechargeable battery (Catalog No. CC-1226A)
● Design compatible with rechargeable battery manufacturing process

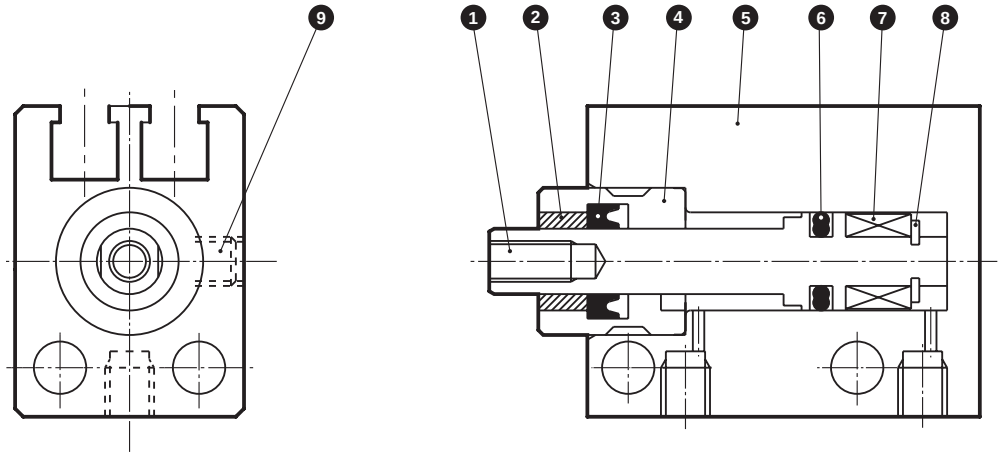
MDC2-.....- P4*

Internal structure and parts list

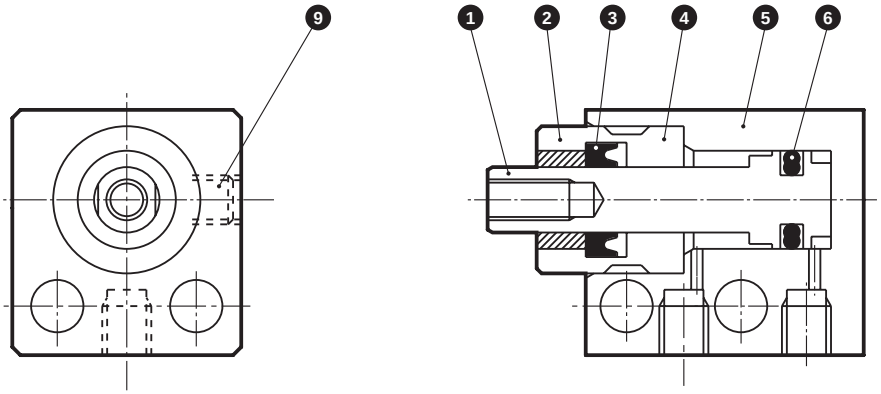
● MDC2-4 (double acting/single rod)



● MDC2-L-6, 8, 10 (double acting/single rod/with switch)



● MDC2-6,8,10 (double acting/single rod)

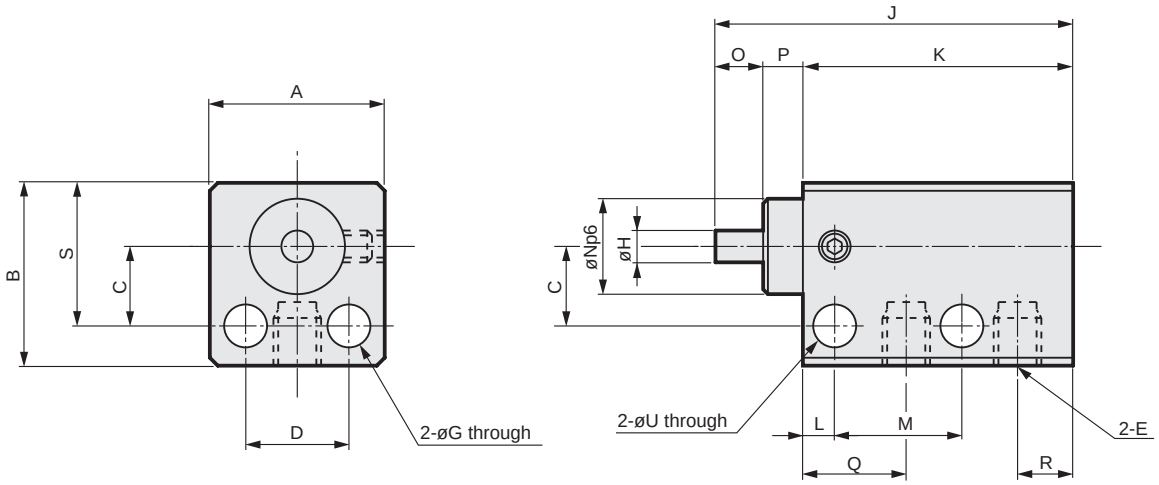


Cannot be disassembled

Part No.	Part name	Material	Remarks	Part No.	Part name	Material	Remarks
1	Piston	Stainless steel		6	Piston packing	Nitrile rubber	
2	Bush	Oil-impregnated brass		7	Magnet	Plastic	
3	Rod packing	Nitrile rubber		8	E type snap ring	Stainless steel	
4	Rod metal	ø4: Phosphor bronze ø6 to ø10: Stainless steel		9	Hexagon socket set screw	Stainless steel	
				10	Color	Stainless steel	
5	Cylinder body	Aluminum alloy	Hard alumite				

Dimensions

● MDC2-4-3,6 (double acting/single rod/without switch)

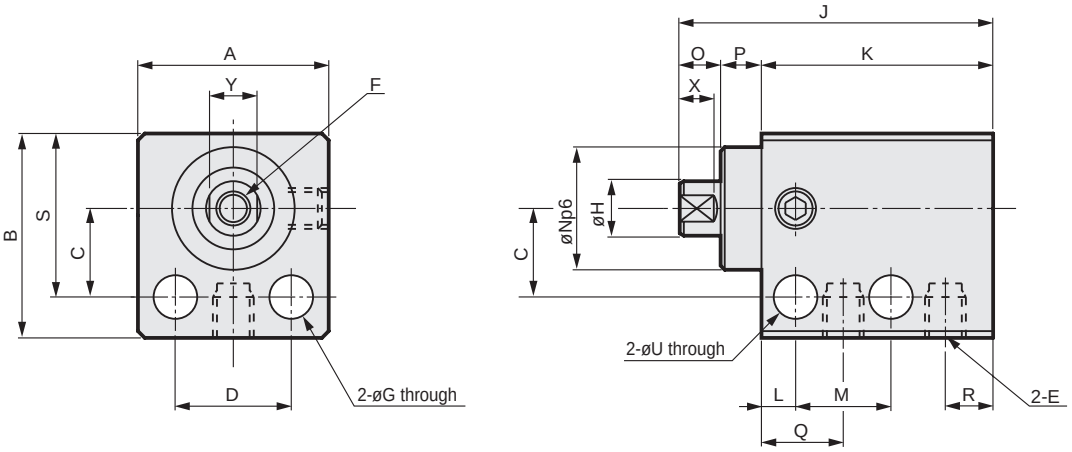


Model No.	A	B	C	D	E	G	H	J	K	L	M	N	O	P	Q	R	S	U
MDC2-4-3	11	11.5	5	6.5	M3	2.7	2	22.5	17	2	8	6	3	2.5	6.5	3.5	9	2.7
MDC2-4-6	11	11.5	5	6.5	M3	2.7	2	25.5	20	2	11	6	3	2.5	6.5	3.5	9	2.7

Note: Width and height dimensions of the body have positive tolerance. When used in parallel, pay attention to the position setting and to interference with external parts.

Dimensions

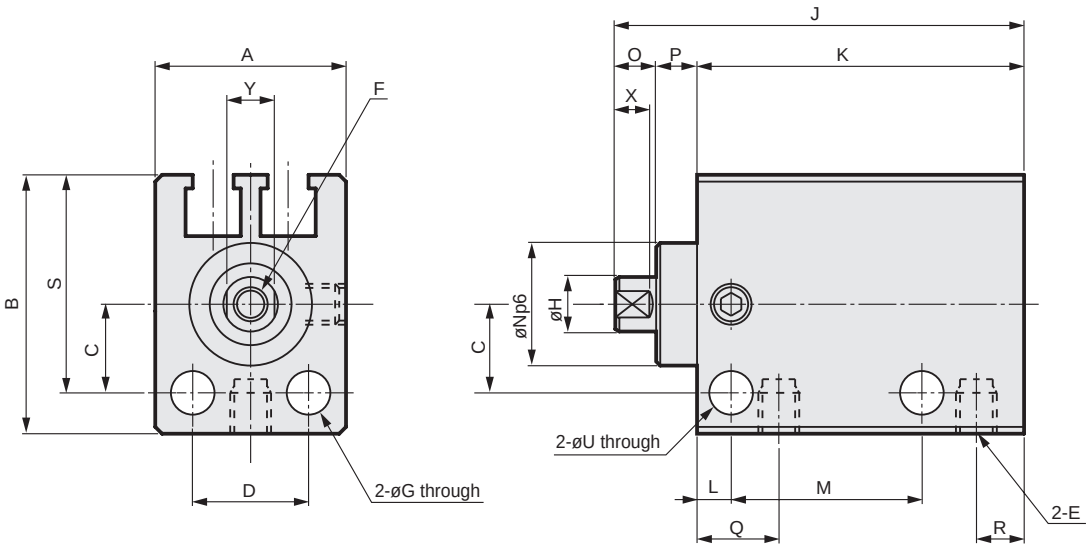
● MDC2-6, 8, 10 (double acting/single rod/without switch)



Model No.	Stroke	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	U	X	Y
MDC2-6	4	14	15	6.5	8.5	M3	M 2.5 x 0.45 Depth 4	3.2	4	23	17	2.5	7.5	9	3	3	6	3.5	12	3.2	2.5	3.5
	6									25	19		9									
	8									27	21		11									
MDC2-8	4	16	17	7.5	10	M3	M3 x 0.5 Depth 5	3.2	5	23	17	2.5	7.5	11	3	3	6	3.5	14	3.2	2.5	4.5
	6									25	19		9									
	8									27	21		11									
MDC2-10	4	16	17.5	8	10	M5	M3 x 0.5 Depth 5	3.2	6	28	22	2.5	9.5	11	3	3	7	5	14.5	3.2	2.5	5
	6									30	24		11.5									
	10									34	28		15.5									

Note: Width and height dimensions of the body have positive tolerance. When used in parallel, pay attention to the position setting and to interference with external parts.

● MDC2-L-6, 8, 10 (double acting/single rod/with switch)



Note) Refer to page 1366 for switch mounting dimensions.

Model No.	Stroke	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	U	X	Y
MDC2-L-6	4	14	19	6.5	8.5	M3	M 2.5 x 0.45 Depth 4	3.2	4	28	22	2.5	12.5	9	3	3	6	3.5	16	3.2	2.5	3.5
	6									30	24		14									
	8									32	26		16									
MDC2-L-8	4	16	22	7.5	10	M3	M3 x 0.5 Depth 5	3.2	5	28	22	2.5	12.5	11	3	3	6	3.5	18.5	3.2	2.5	4.5
	6									30	24		14									
	8									32	26		16									
MDC2-L-10	4	16	22	8	10	M5	M3 x 0.5 Depth 5	3.2	6	31	25	2.5	12.5	11	3	3	7	5	19	3.2	2.5	5
	6									33	27		14.5									
	10									37	31		18.5									

Note: Width and height dimensions of the body have positive tolerance. When used in parallel, pay attention to the position setting and to interference with external parts.

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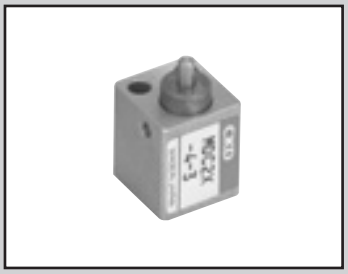
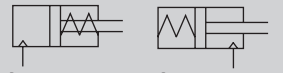


Compact direct mounting cylinder
Single acting/push single acting/pull

MDC2-$^{X}_{Y}$ Series

● Bore size: ø4, ø6, ø8, ø10

JIS symbol



● Single acting push ● Single acting pull

RoHS CAD

Specifications

Item		MDC2-X MDC2-Y MDC2-XL (with switch) MDC2-YL (with switch)			
Bore size mm		ø4 *1	ø6	ø8	ø10
Actuation	MDC2-X(L)	Single acting push			
	MDC2-Y(L)	Single acting pull			
Working fluid		Compressed air			
Max. working pressure MPa		0.7			
Min. working pressure MPa	MDC2-X(L)	0.35	0.3		0.25
	MDC2-Y(L)	0.4		0.3	0.25
Proof pressure MPa		1.05			
Ambient temperature °C		-10 to 60 (no freezing) *2			
Port size		M3			M5
Stroke tolerance mm		+0.5 0			
Working piston speed mm/s		50 to 500			
Cushion		No			
Lubrication		Not required (use turbine oil class 1 ISO VG32 if necessary for lubrication)			
Allowable absorbed energy J		This product cannot absorb the energy generated by an external load mounted on the cylinder. When using the product with no load, separately provide a shock absorber on the outside.			

*1: ø4 is not available for MDC2-XL and MDC2-YL.
*2: When using the proximity switch, use the cylinder at 40°C or less.

Stroke

Bore size (mm)	Standard stroke (mm)	Max. stroke (mm)	Min. stroke with two switches (mm)		Min. stroke with one switch (mm)	
			Reed switch	Proximity switch	Reed switch	Proximity switch
ø4	3/6	6	-	-	-	-
ø6	4/6/8	8	6	4 (8)	4	4
ø8	4/6/8	8	8	4 (8)	4	4
ø10	4/6/10	10	6	4 (10)	4	4

*1: Products with stroke other than standard stroke are not available. *2: For F2Y, F3Y or F3P, the min. stroke will be the dimensions in ( ).

Switch specifications

Item	2-wire reed	2-wire proximity			3-wire proximity			
	FOH/FOV	F2H/F2V	F2S	F2YH/F2YV	F3H/F3V	F3S	F3PH/F3PV (Made to order)	F3YH/F3YV
Applications	Dedicated for programmable controller	Dedicated for programmable controller			For 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 (*3)	5 to 20 mA (*3)			50 mA or less			
Indicator	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 Ending Page 1 for detailed switch specifications and dimensions.
*2: Switches other than the above models, such as switches with connectors, are also available. Refer to Ending Page 1.
*3: The max. load current is 20 mA at 25°C. The current is lower than 20 mA if the operating ambient temperature around the switch is higher than 25°C. (5 to 10 mA at 60°C)
*4: The F-switch uses a bend-resistant lead wire.

Cylinder weight table

(Unit: g)

Stroke (mm)		3		4		6		8		10		Weight per switch
Bore size (mm)	Model No.	No switch	With switch	No switch	With switch	No switch	With switch	No switch	With switch	No switch	With switch	
ø4	MDC2-X	4.9	-	-	-	6.9	-	-	-	-	-	-
	MDC2-Y	7.4	-	-	-	9.4	-	-	-	-	-	
ø6	MDC2-X	-	-	10.9	12.6	11.2	14.4	15.1	16.8	-	-	10
	MDC2-Y	-	-	13.3	15	15	16.7	17.5	19.2	-	-	
ø8	MDC2-X	-	-	16	18	18.4	20.5	20.7	22.8	-	-	10
	MDC2-Y	-	-	19	21	21.4	23.5	23.7	25.8	-	-	
ø10	MDC2-X	-	-	19.6	22	22	24.4	-	-	26.9	29.3	10
	MDC2-Y	-	-	21.2	23.4	23.6	25.8	-	-	28.5	30.7	

Spring load

(Unit: N)

Bore size (mm)	Stroke (mm)	Spring load	
		Set	Operating
ø4	3/6	1.8	2.9
ø6	4/6/8	2.3	5.0
ø8	4/6/8	4.0	7.0
ø10	4/6/10	4.1	7.4

Theoretical thrust table

● MDC2-X

(Unit: N)

Bore size (mm)	Operating direction	Working pressure MPa						
		0.25	0.3	0.35	0.4	0.5	0.6	0.7
ø4	Push	-	-	1.50	2.13	3.38	4.64	5.90
	Pull	-	-	Refer to the spring load value.				
ø6	Push	-	3.48	4.90	6.31	9.1	12.0	14.8
	Pull	-	Refer to the spring load value.					
ø8	Push	-	8.08	10.6	13.1	18.1	23.2	28.2
	Pull	-	Refer to the spring load value.					
ø10	Push	12.2	16.2	20.1	24.0	31.9	39.7	47.6
	Pull	Refer to the spring load value.						

● MDC2-Y

(Unit: N)

Bore size (mm)	Operating direction	Working pressure MPa						
		0.25	0.3	0.35	0.4	0.5	0.6	0.7
ø4	Push	-	-	-	Refer to the spring load value.			
	Pull	-	-	-	0.87	1.81	2.75	3.70
ø6	Push	-	-	-	Refer to the spring load value.			
	Pull	-	-	-	1.28	2.85	4.42	6.0
ø8	Push	-	Refer to the spring load value.					
	Pull	-	2.19	3.72	5.25	8.3	11.4	14.4
ø10	Push	Refer to the spring load value.						
	Pull	5.17	7.68	10.2	12.7	17.7	22.8	27.8

How to order

● No switch (without magnet for switch)

MDC2-X - 6 - 4

● With switch (built-in magnet for switch)

MDC2-XL - 6 - 4 - F2V - R

Ⓐ Model No.
Ⓑ Bore size
Ⓒ Stroke
Ⓓ Switch model No. *1 *2 *3 *4
Ⓔ Switch quantity

Code	Description	
Ⓐ Model No.		
MDC2-X	Single acting/push	No switch
MDC2-Y	Single acting/pull	
MDC2-XL	Single acting/push	With switch
MDC2-YL	Single acting/pull	

Ⓑ Bore size	
4	ø4
6	ø6
8	ø8
10	ø10

Ⓒ Stroke (mm)	
3	3 (ø4)
4	4 (ø6 to ø10)
6	6 (ø4 to ø10)
8	8 (ø6, ø8)
10	10 (ø10)

Ⓓ Switch model No.

Axial lead wire	Radial lead wire	Contact	Voltage AC	Voltage DC	Indicator	Lead wire
F0H*	**F0V***	Reed		●	1-color LED	2-wire
-	**F2S***	Proximity		●		
F2H*	**F2V***			●		
-	**F3S***			●		3-wire
F3H*	**F3V***			●		
F3PH*	**F3PV***			●	1-color LED (PNP output) (Made to order)	
F2YH*	**F2YV***			●	2-color LED	2-wire
F3YH*	**F3YV***			●		3-wire

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

Ⓔ Switch quantity	
R	1 on rod side
H	1 on head side
D	2

Precautions for model No. selection

*1 : ø4 with switch is not available.
*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 : When using MDC2-XL or YL-6 with reed switch, use the non-magnetic bolt (stainless steel hexagon socket head cap screw, etc.) for cylinder mounting bolt.

[Example of model No.]

MDC2-XL-6-4-F2V-R

Model: Compact direct mounting cylinder
Ⓐ Model No. : Single acting/push/with switch
Ⓑ Bore size : ø6 mm
Ⓒ Stroke : 4 mm
Ⓓ Switch model No. : Proximity switch F2V, lead wire 1 m
Ⓔ Switch quantity : 1 on rod side

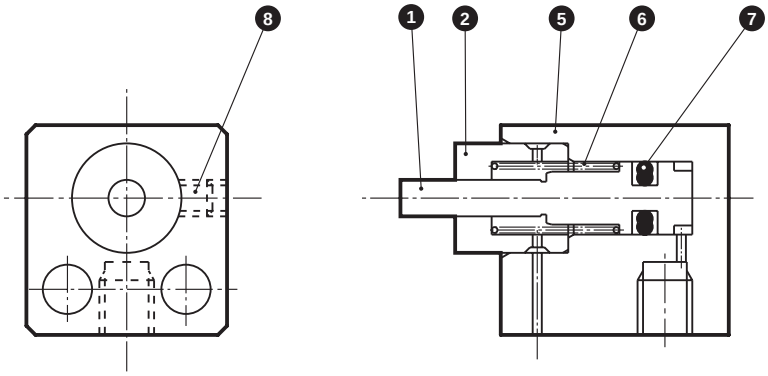
How to order switch

SW - F0H

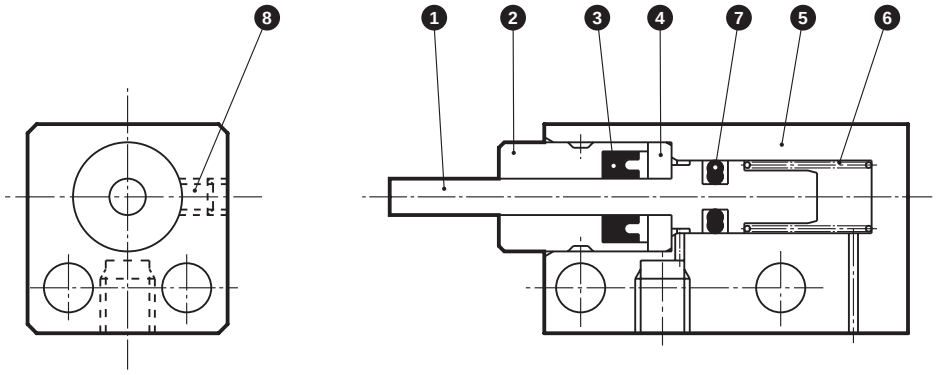
Switch model No.
(Item Ⓓ above)

Internal structure and parts list

● MDC2-X-4 (single acting/push)



● MDC2-Y-4 (single acting/pull)

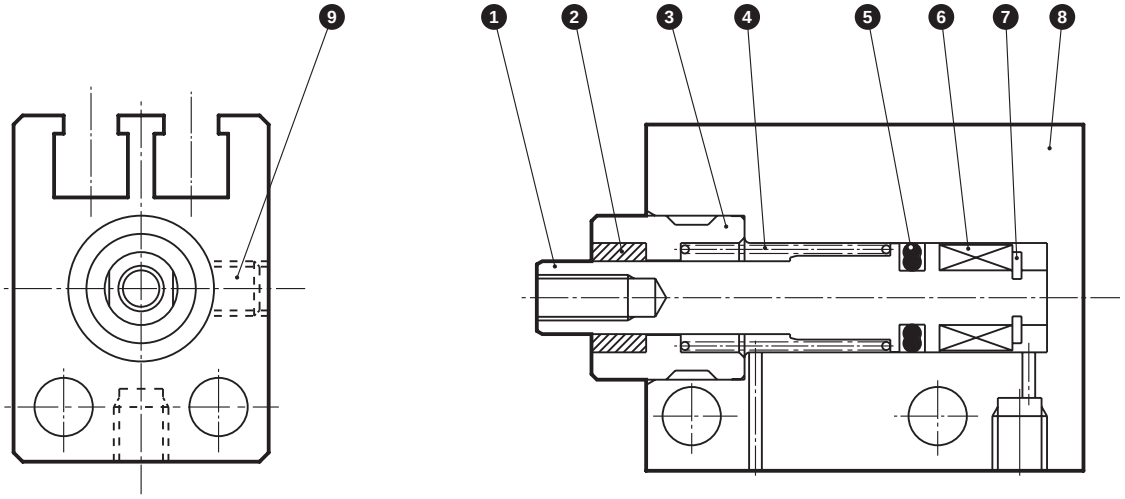


Cannot be disassembled

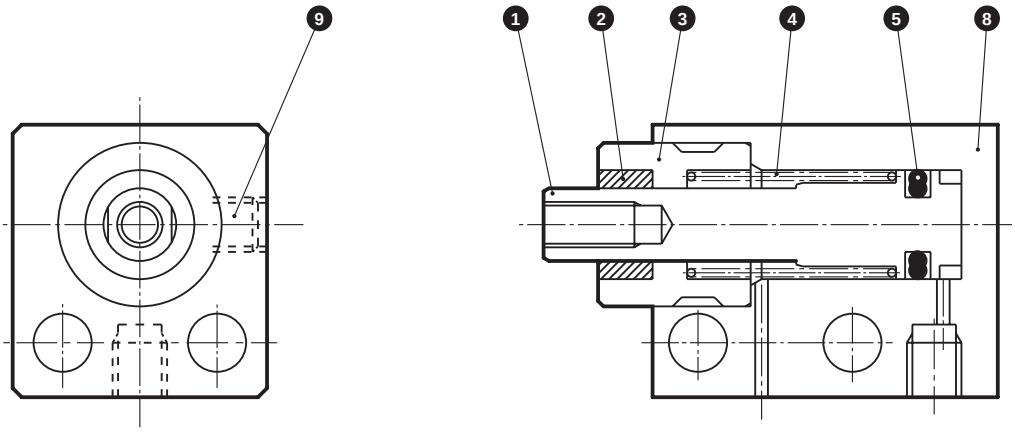
No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Piston	Stainless steel		5	Cylinder body	Aluminum alloy	Hard alumite
2	Rod metal	Phosphor bronze		6	Coil spring	Steel	Electrodeposition
3	Rod packing	Nitrile rubber		7	Piston packing	Nitrile rubber	
4	Collar	Stainless steel		8	Hexagon socket set screw	Stainless steel	

Internal structure and parts list

● MDC2-XL-6, 8, 10 (single acting/push/with switch)



● MDC2-X-6, 8, 10 (single acting/push)

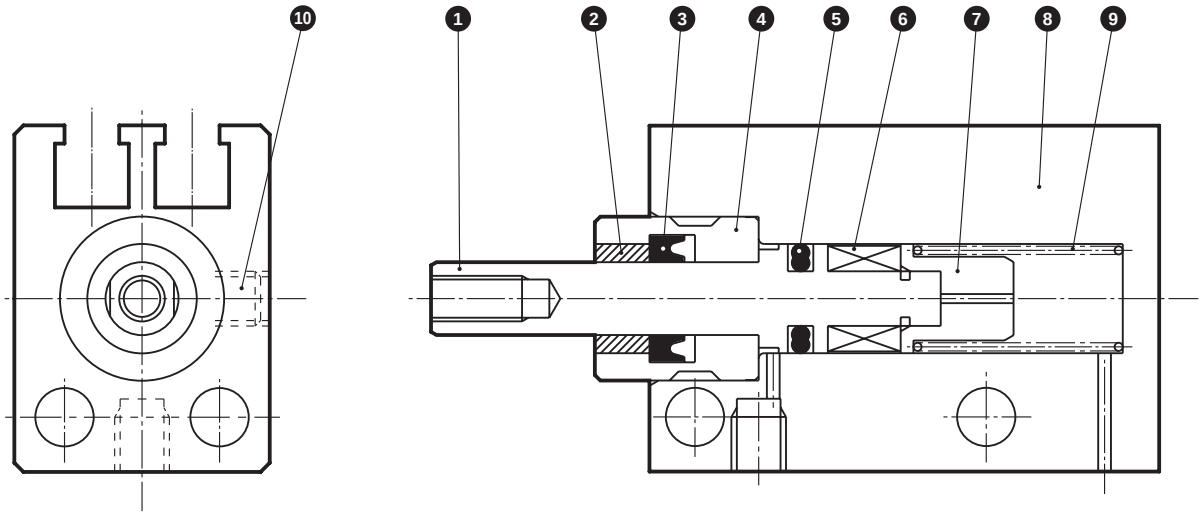


Cannot be disassembled

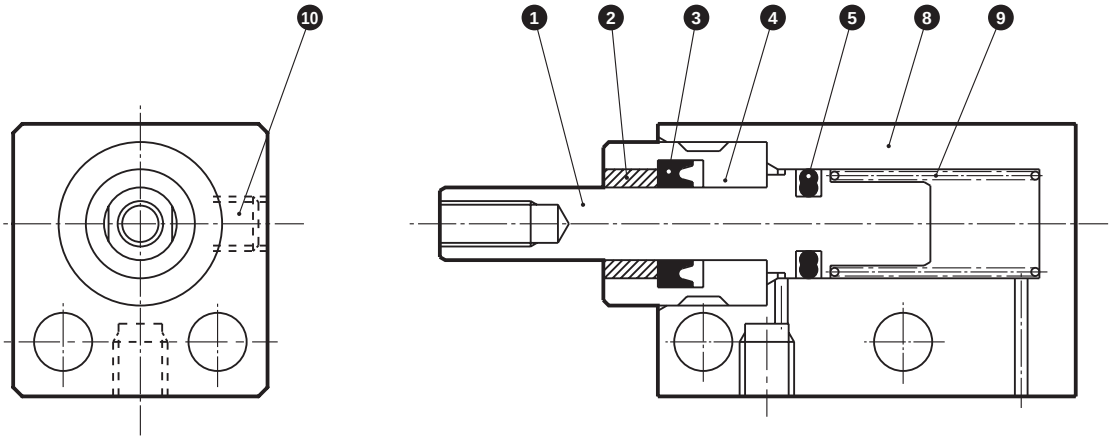
No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Piston	Stainless steel		6	Magnet	Plastic	
2	Bush	Oil-impregnated copper alloy		7	E snap ring	Stainless steel	
3	Rod metal	Stainless steel		8	Cylinder body	Aluminum alloy	Hard alumite
4	Coil spring	Steel	Electrodeposition	9	Hexagon socket set screw	Stainless steel	
5	Piston packing	Nitrile rubber					

Internal structure and parts list

● MDC2-YL-6, 8, 10 (single acting/pull/with switch)



● MDC2-Y-6, 8, 10 (single acting/pull)

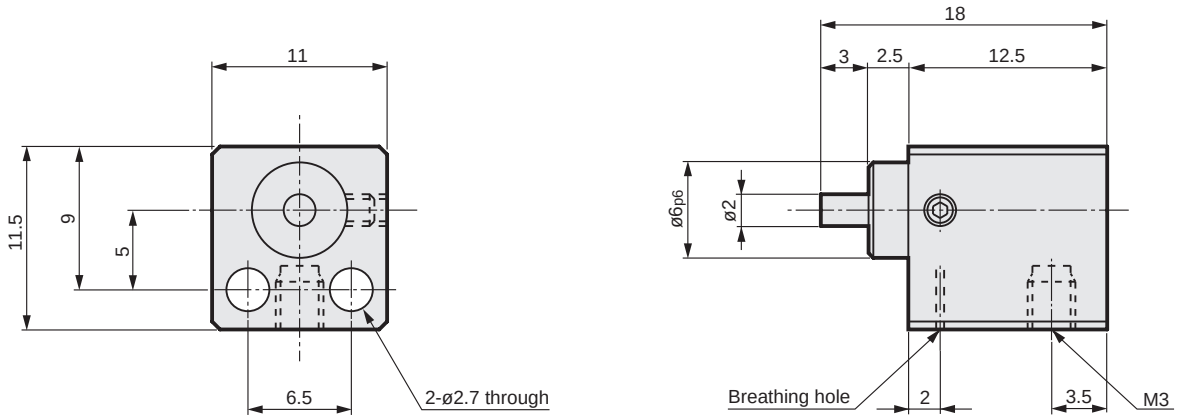


Cannot be disassembled

No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Piston	Stainless steel		6	Magnet	Plastic	
2	Bush	Oil-impregnated copper alloy		7	Spring holder	Stainless steel	
3	Rod packing	Nitrile rubber		8	Cylinder body	Aluminum alloy	Hard alumite
4	Rod metal	Stainless steel		9	Coil spring	Steel	Electrodeposition
5	Piston packing	Nitrile rubber		10	Hexagon socket set screw	Stainless steel	

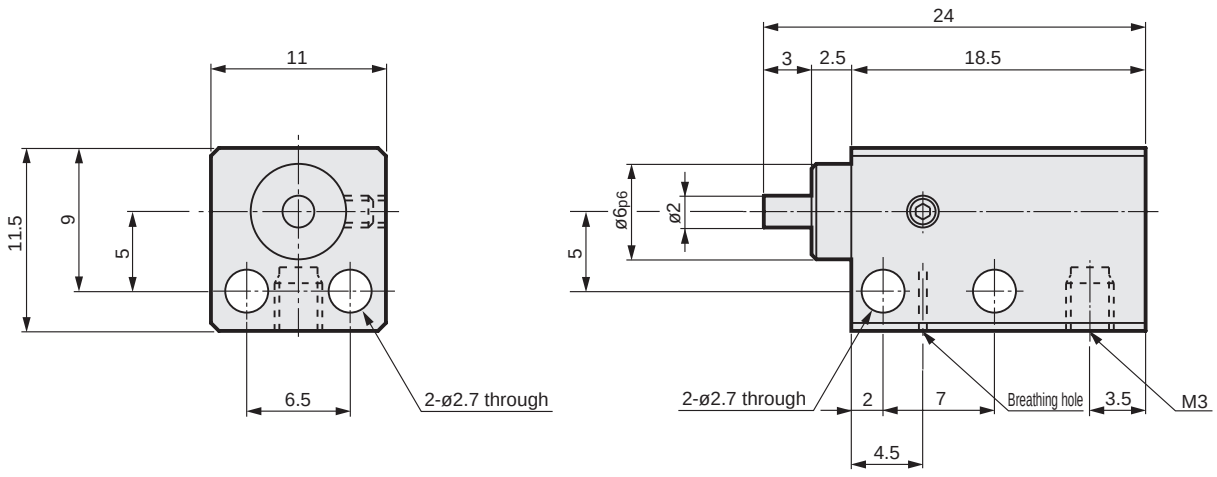
Dimensions CAD

● MDC2-X-4-3 (single acting/push)



Note: Width and height dimensions of the body have positive tolerance. When used in parallel, pay attention to the position setting and to interference with external parts.

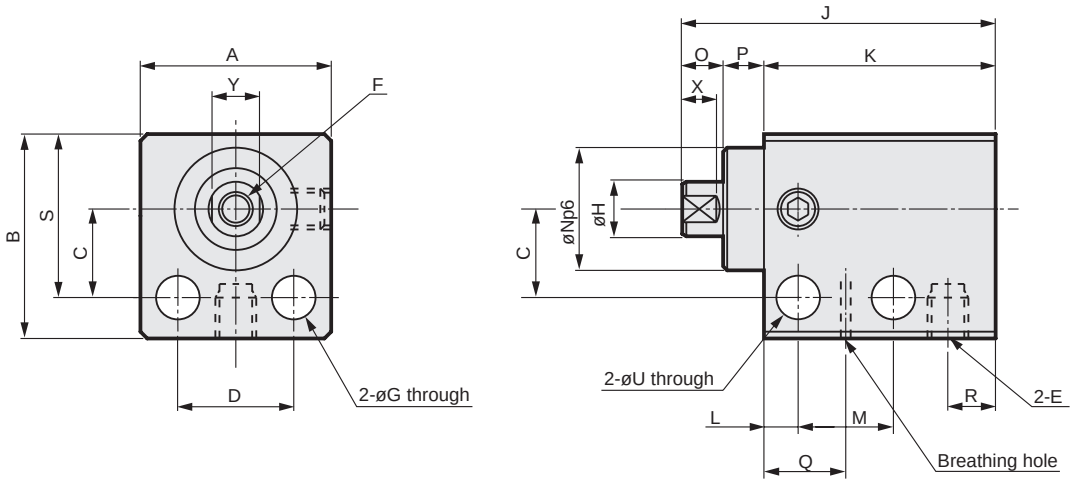
● MDC2-X-4-6 (single acting/push)



Note: Width and height dimensions of the body have positive tolerance. When used in parallel, pay attention to the position setting and to interference with external parts.

Dimensions

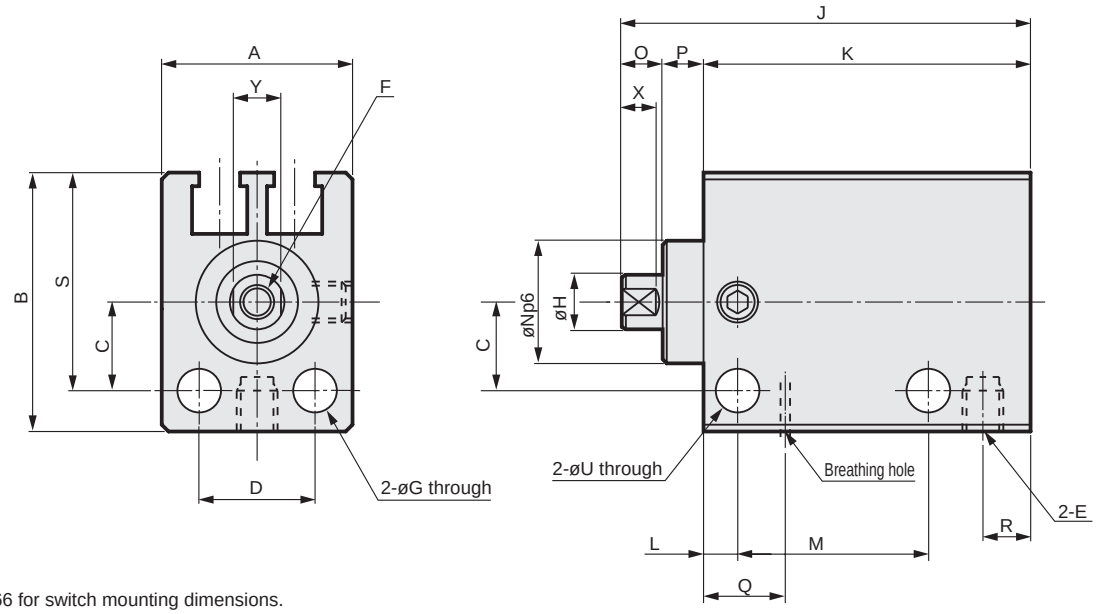
● MDC2-X-6, 8, 10 (single acting/push/without switch)



Model No.	Stroke	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	U	X	Y
MDC2-X-6	4	14	15	6.5	8.5	M3	M2.5x0.45 Depth 4	3.2	4	22	16	2.5	6.5	9	3	3	6	3.5	12	3.2	2.5	3.5
	6									25	19		8.5									
	8									29	23		10.5									
MDC2-X-8	4	16	17	7.5	10	M3	M3x 0.5 Depth 5	3.2	5	23	17	2.5	7.5	11	3	3	7	3.5	14	3.2	2.5	4.5
	6									26	20		9									
	8									29	23		11									
MDC2-X-10	4	16	17.5	8	10	M5	M3x 0.5 Depth 5	3.2	6	26	20	2.5	7.5	11	3	3	7.5	5	14.5	3.2	2.5	5
	6									29	23		9.5									
	10									35	29		13.5									

Note: Width and height dimensions of the body have positive tolerance. When used in parallel, pay attention to the position setting and to interference with external parts.

● MDC2-XL-6, 8, 10 (single acting/push/with switch)



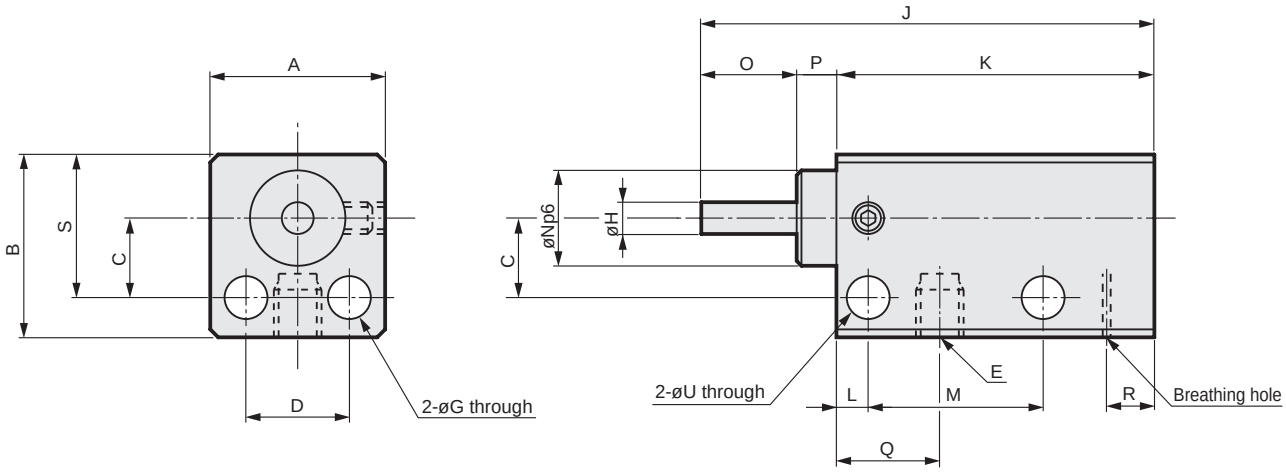
Note) Refer to page 1366 for switch mounting dimensions.

Model No.	Stroke	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	U	X	Y
MDC2-XL-6	4	14	19	6.5	8.5	M3	M2.5x0.45 Depth 4	3.2	4	27	21	2.5	11.5	9	3	3	6	3.5	16	3.2	2.5	3.5
	6									30	24		13.5									
	8									34	28		15.5									
MDC2-XL-8	4	16	22	7.5	10	M3	M3x 0.5 Depth 5	3.2	5	28	22	2.5	12.5	11	3	3	7	3.5	18.5	3.2	2.5	4.5
	6									31	25		14									
	8									34	28		16									
MDC2-XL-10	4	16	22	8	10	M5	M3x 0.5 Depth 5	3.2	6	31	25	2.5	12.5	11	3	3	7.5	5	19	3.2	2.5	5
	6									34	28		14.5									
	10									40	34		18.5									

Note: Width and height dimensions of the body have positive tolerance. When used in parallel, pay attention to the position setting and to interference with external parts.

Dimensions

● MDC2-Y-4-3, 6 (single acting/pull)

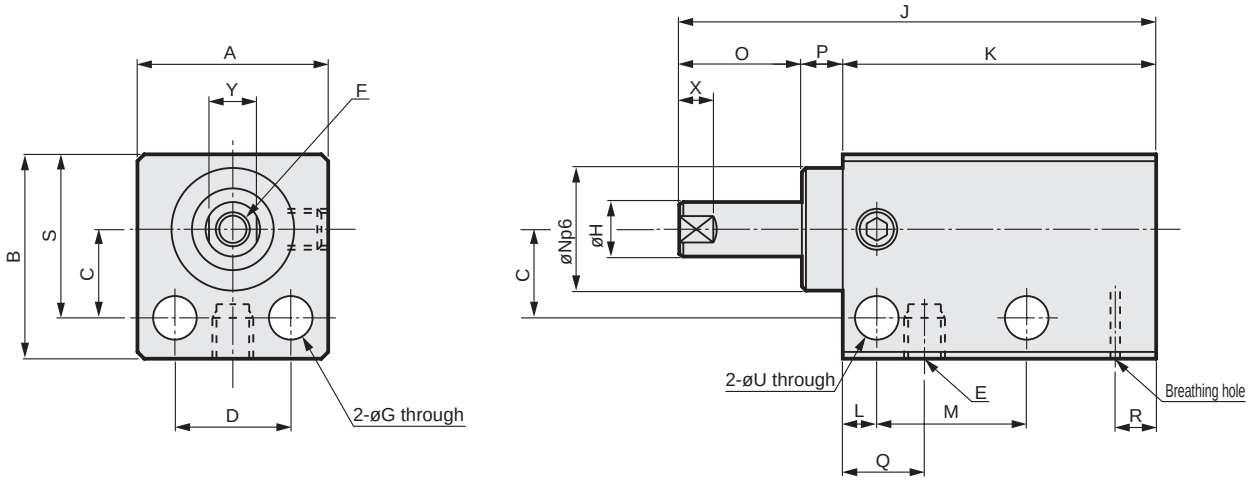


Model No.	A	B	C	D	E	G	H	J	K	L	M	N	O	P	Q	R	S	U
MDC2-Y-4-3	11	11.5	5	6.5	M3	2.7	2	28.5	20	2	11	6	6	2.5	6.5	3.5	9	2.7
MDC2-Y-4-6	11	11.5	5	6.5	M3	2.7	2	37.5	26	2	14	6	9	2.5	6.5	3.5	9	2.7

Note: Width and height dimensions of the body have positive tolerance. When used in parallel, pay attention to the position setting and to interference with external parts.

Dimensions

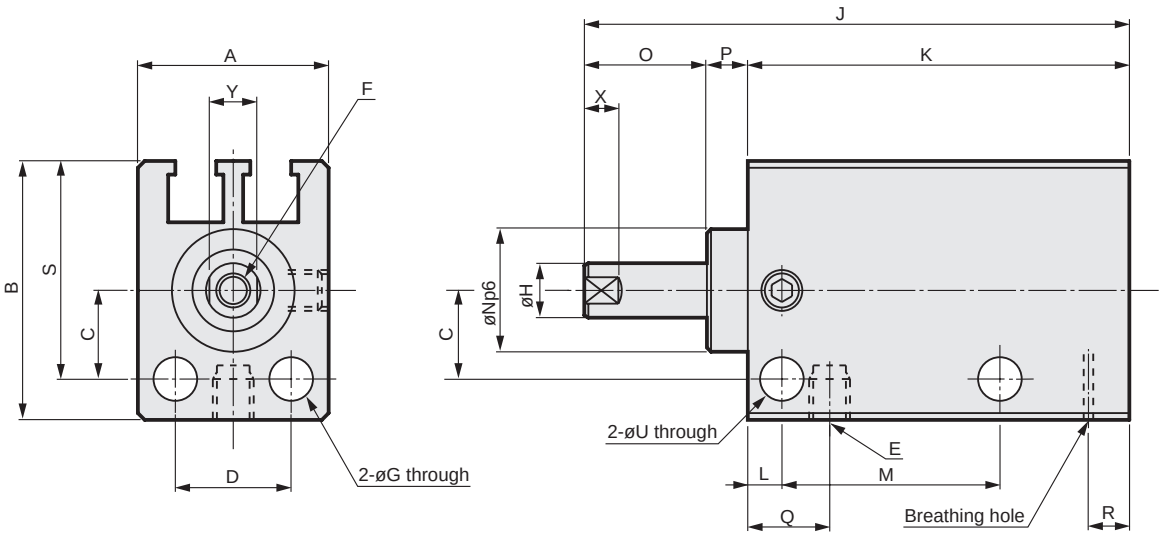
● MDC2-Y-6,8,10 (single acting/pull/without switch)



Model No.	Stroke	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	U	X	Y
MDC2-Y-6	4	14	15	6.5	8.5	M3	M2.5x 0.45 Depth 4	3.2	4	30	20	2.5	9	9	7	3	6	3	12	3.2	2.5	3.5
	6									35	23		11		9							
	8									41	27		13		11							
MDC2-Y-8	4	16	17	7.5	10	M3	M3x 0.5 Depth 5	3.2	5	31	21	2.5	9.5	11	7	3	6	3	14	3.2	2.5	4.5
	6									36	24		11.5		9							
	8									41	27		13.5		11							
MDC2-Y-10	4	16	17.5	8	10	M5	M3x 0.5 Depth 5	3.2	6	32	22	2.5	9.5	11	7	3	7	3.5	14.5	3.2	2.5	5
	6									37	25		11.5		9							
	10									47	31		15.5		13							

Note: Width and height dimensions of the body have positive tolerance. When used in parallel, pay attention to the position setting and to interference with external parts.

● MDC2-YL-6, 8, 10 (single acting/pull/with switch)



Note) Refer to page 1366 for switch mounting dimensions.

Model No.	Stroke	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	U	X	Y
MDC2-YL-6	4	14	19	6.5	8.5	M3	M2.5x 0.45 Depth 4	3.2	4	35	25	2.5	14	9	7	3	6	3	16	3.2	2.5	3.5
	6									40	28		16		9							
	8									46	32		18		11							
MDC2-YL-8	4	16	22	7.5	10	M3	M3x 0.5 Depth 5	3.2	5	36	26	2.5	14.5	11	7	3	6	3	18.5	3.2	2.5	4.5
	6									41	29		16.5		9							
	8									46	32		18.5		11							
MDC2-YL-10	4	16	22	8	10	M5	M3x 0.5 Depth 5	3.2	6	36	26	2.5	13.5	11	7	3	7	3.5	19	3.2	2.5	5
	6									41	29		15.5		9							
	10									51	35		19.5		13							

Note: Width and height dimensions of the body have positive tolerance. When used in parallel, pay attention to the position setting and to interference with external parts.

Compact direct mounting cylinder double acting/fine speed

MDC2-F Series

● Bore size ø6, ø8, ø10

JIS symbol

● Double acting

RoHS CAD

Specifications

Item		MDC2-F/ MDC2-LF (with switch)		
Bore size	mm	ø6	ø8	ø10
Actuation		Double acting		
Working fluid		Compressed air		
Max. working pressure	MPa	0.7 (≈100 psi, 7 bar)		
Min. working pressure	MPa	0.15 (≈22 psi, 1.5 bar)		0.1 (≈15 psi, 1 bar)
Proof pressure	MPa	1.05 (≈150 psi, 10.5 bar)		
Ambient temperature	°C	5 (41°F) to 60 (140°F) *1		
Port size		M3		M5
Stroke tolerance	mm	+0.5 0		
Working piston speed	mm/s	1 to 200		
Cushion		None		
Lubrication		Lubrication not possible		
Allowable absorbed energy	J	This product cannot absorb the energy generated by an external load mounted on the cylinder. When using the product with no load, separately provide a shock absorber on the outside.		

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

Stroke

Model No.	Bore size (mm)	Standard stroke (mm)	Max. stroke (mm)	Min. stroke with two switches (mm)		Min. stroke with one switch (mm)	
				Reed switch	Proximity switch	Reed switch	Proximity switch
MDC2-F MDC2-LF	ø6	4/6/8	8	6	4(8)	4	4
	ø8	4/6/8	8	8	4(8)	4	4
	ø10	4/6/10	10	6	4(10)	4	4

*1: Products with stroke other than standard stroke are not available.
*2: For F2Y, F3Y or F3P, the min. stroke will be the dimensions in ( ).

Switch specifications

Item	2-wire reed	2-wire proximity			3-wire proximity			
	FOH/FOV	F2H/F2V	F2S	F2YH/F2YV	F3H/F3V	F3S	F3PH/F3PV (Made to order)	F3YH/F3YV
Applications	Dedicated for programmable controller	Dedicated for programmable controller			For 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 (*3)	5 to 20 mA (*3)			50 mA or less			
Indicator	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 Ending Page 1 for detailed switch specifications and dimensions.
*2: Switches other than the above models, such as switches with connectors, are also available. Refer to Ending Page 1.
*3: The max. load current is 20 mA at 25°C. The current is lower than 20 mA if the operating ambient temperature around the switch is higher than 25˚C. (5 to 10 mA at 60°C)
*4: The F-switch uses a bend-resistant lead wire.

Clean-room specifications

(Catalog No. CB-033SA)

● Anti-dust generation structure for use in cleanrooms

MDC2-F P7*

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

● No switch (without magnet for switch)

MDC2-F - 6 - 4

● With switch (built-in magnet for switch)

MDC2-LF - 6 - 4 - F2V - R

Ⓐ Bore size

Ⓑ Stroke

Ⓒ Switch model No. *1 *2 *3

Ⓓ Switch quantity

Code	Description
Ⓐ Bore size	
6	ø6
8	ø8
10	ø10

Ⓑ Stroke (mm)

Code	Bore size	ø6	ø8	ø10
4	4	●	●	●
6	6	●	●	●
8	8	●	●	—
10	10	—	—	●

Ⓒ Switch model No.

Axial lead wire	Radial lead wire	Contact	Voltage AC	Voltage DC	Indicator	Lead wire
F0H*	**F0V***	Reed		●	1-color LED	2-wire
-	**F2S***	Proximity		●		
F2H*	**F2V***			●		
-	**F3S***			●		3-wire
F3H*	**F3V***			●		
F3PH*	**F3PV***			●	1-color LED (PNP output) (Made to order)	
F2YH*	**F2YV***			●	2-color LED	2-wire
F3YH*	**F3YV***			●		3-wire

*** Lead wire length**

Blank	1 m (standard)
3	3 m (option)

Ⓓ Switch quantity

R	1 on rod side
H	1 on head side
D	2

Precautions for model selection

*1 : When using MDC2 with reed switch, the cylinder cannot be mounted on a magnetic substance (iron sheet, etc.). This could lead to switch detection malfunction.

*2 : When using MDC2-LF-6 with reed switch, use a non-magnetic bolt (stainless steel hexagon socket head cap screw, etc.) for cylinder mounting bolt. Failure to do so could lead to switch detection malfunction

*3 : Refer to page 1364 for the min. stroke with switch.

[Example of model No.]

MDC2-LF-6-4-F2V-R

Model: Compact direct mounting cylinder, fine speed

Ⓐ Bore size : ø6 mm
Ⓑ Stroke : 4 mm
Ⓒ Switch model No.: Proximity switch F2V, lead wire 1 m
Ⓓ Switch quantity : 1 on rod side

How to order switch

SW - F0H

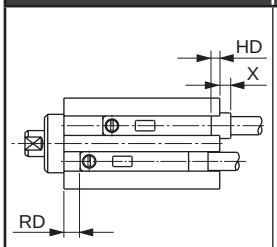
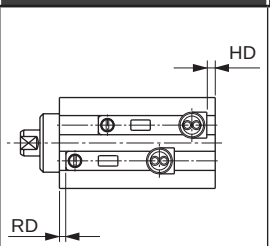
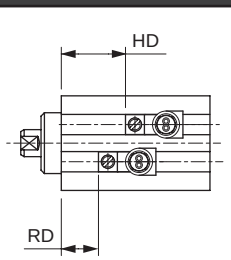
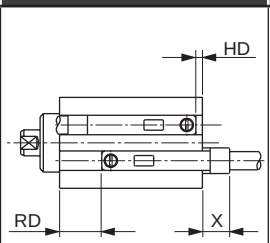
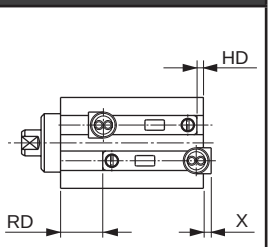
Switch model No. (Item Ⓒ above)

Dimensions

Same as MDC2 Series (double acting/single rod). Refer to page 1352.

Switch installation dimensions

● Switch mounting position

Reed switch (F0)		Proximity switch F2S, F3S	Proximity switch(F2, F3, F2Y, F3Y, F3P)	
Axial lead wire (H)	L-shaped lead wire (V)		Axial lead wire (H)	L-shaped lead wire (V)
				

● Switch installation dimensions

• Reed switch (mm)

Switch mounting method		F0 V/H								
		RD			HD			X (*2)		
Bore size (mm)	Actuation	Stroke (mm)			Stroke (mm)			Stroke (mm)		
		4	6	8(10)	4	6	8(10)	4	6	8(10)
ø6	Double acting	1	1	1	-0.5	0	0	3.5 / 0.5	3 / -	3 / -
	Single acting push (X)	0	1	3	-1	0	0	4 / 1	3 / -	3 / -
	Single acting pull (Y)	2.5	2.5	2.5	1.5	2.5	4.5	1.5 / -	0.5 / -	- / -
ø8	Double acting	1	1	1	-1.5	0	0	4.5 / 1.5	3 / -	3 / -
	Single acting push (X)	1	2	3	-1.5	0	0	4.5 / 1.5	3 / -	3 / -
	Single acting pull (Y)	2.5	2.5	2.5	2.5	3.5	4.5	0.5 / -	- / -	- / -
ø10	Double acting	3.5	3.5	3.5	0.5	0.5	0.5	2.5 / -	2.5 / -	2.5 / -
	Single acting push (X)	4	5	7	0	0	0	3 / -	3 / -	3 / -
	Single acting pull (Y)	3.5	3.5	3.5	1.5	2.5	4.5	1.5 / -	0.5 / -	- / -

• Proximity switch (mm)

Switch mounting method		F2S, F3S						F2 V/H F3 V/H F2Y V/H F3Y V/H F3P V/H											
		RD			HD			RD			HD			X1 (*2, *3)			X2 (*2, *3)		
Bore size (mm)	Actuation	Stroke (mm)			Stroke (mm)			Stroke (mm)			Stroke (mm)			Stroke (mm)			Stroke (mm)		
		4	6	8(10)	4	6	8(10)	4	6	8(10)	4	6	8(10)	4	6	8(10)	4	6	8(10)
ø6	Double acting	5.5	5.5	5.5	9.5	11.5	13.5	6.5	6.5	6.5	1	1	1	4.2 / 1.2	2.2 / -	0.2 / -	8.7 / 5.7	6.7 / 3.7	4.7 / 1.7
	Single acting push (X)	5	6	8	9	12	16	6	7	9	0.5	0.5	0.5	4.7 / 1.7	2.7 / -	0.7 / -	9.2 / 3.2	6.2 / 0.2	5.2 / -
	Single acting pull (Y)	5.5	5.5	5.5	9.5	11.5	13.5	6.5	6.5	6.5	4	5	7	1.7 / -	- / -	- / -	5.7 / 3.2	2.7 / 0.2	- / -
ø8	Double acting	5.5	5.5	5.5	9.5	11.5	13.5	6.5	6.5	6.5	1	1	1	4.2 / 1.2	2.2 / -	0.2 / -	8.7 / 5.7	6.7 / 3.7	4.7 / 1.7
	Single acting push (X)	5.5	6.5	7.5	9.5	12.5	15.5	6.5	7.5	8.5	1	1	1	4.2 / 1.2	2.2 / -	0.2 / -	8.7 / 5.7	6.7 / 3.7	4.7 / 1.7
	Single acting pull (Y)	5.5	5.5	5.5	9.5	11.5	13.5	6.5	6.5	6.5	5	6	7	0.2 / -	- / -	- / -	4.7 / 1.7	1.7 / -	- / -
ø10	Double acting	7	7	7	11	13	17	8	8	8	2.5	2.5	2.5	2.7 / -	0.7 / -	- / -	7.2 / 4.2	5.2 / 2.2	1.2 / -
	Single acting push (X)	7.5	8.5	10.5	11.5	14.5	20.5	8.5	9.5	11.5	2	2	2	3.2 / 0.2	1.2 / -	- / -	7.7 / 4.7	5.7 / 2.7	1.7 / -
	Single acting pull (Y)	7	7	7	11	13	17	8	8	8	3.5	4.5	6.5	1.7 / -	- / -	- / -	6.2 / 3.2	3.2 / 0.2	- / -

*1: Min. stroke with two switches is as 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-shaped lead wire is used.*3: X1 indicates dimensions for F2 V/H, or F3 V/H, and X2 indicates dimensions for F2Y H/V, F3Y H/V, or F3P H/V.

Min. stroke (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 F2Y, F3Y or F3P, the min. stroke is the dimensions in ( ).

MEMO

Safety Precautions

Be sure to read this section before use.

Refer to Intro Page 73 for general information of the cylinder, and to Intro Page 80 for general information of the cylinder switch.

Product-specific cautions: 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 substance (iron plate, etc.).

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

2. Single acting MDC2-X/Y

⚠CAUTION

■ Do not leave the single acting cylinder pressurized. If it is left pressurized for long periods, the piston rod may not return due to spring load when the pressure is released.

■ Take care when mounting so as not to block the breathing hole provided on the body.

● Otherwise, malfunctions may result.

3. Fine speed MDC2-F

⚠CAUTION

■ Use without lubrication.

● Applying 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.

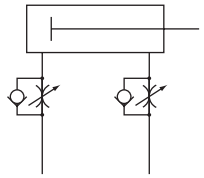
■ In general, the speed is stabler at higher air pressure and lower load factor.

● Use at a 50% or less load factor.

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

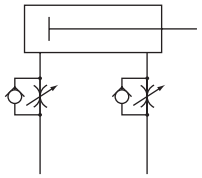
● When fine speed activation is performed with operating direction PUSH for the single rod cylinder, the popping out phenomenon occurs when operation starts if the load resistance is low. For countermeasures, use the ⓑ, ⓒ or ⓓcircuit. Note that circuit ⓓ is the most stable.

ⓐ



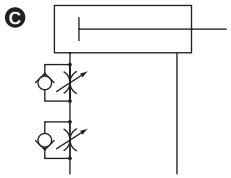
PUSH: Meter-out
PULL : Meter-out

ⓑ



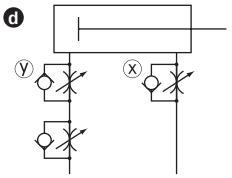
PUSH: Meter-in
PULL : Meter-in

ⓒ



PUSH: Meter-in
PULL : Meter-out

ⓓ



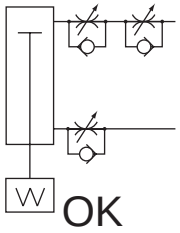
PUSH: Meter in/out
PULL : Meter-out

Speed adjustment method for PUSH operation of ⓓ 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 ⓑ, ⓒ and ⓓ, the ⓓ circuit is the most stable.

(*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.



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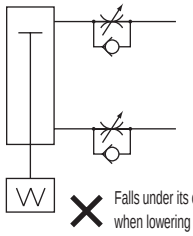
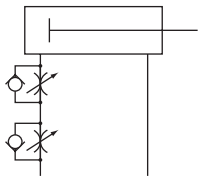


✕ Falls under its own weight when lowering

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



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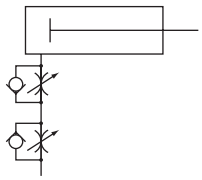


✕ Speed control is unstable

(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.

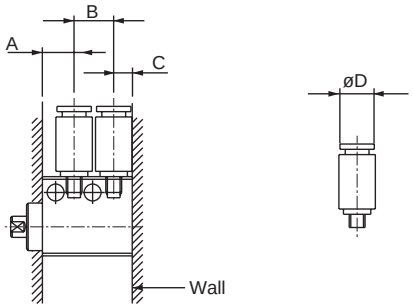
● The product will be adversely affected by vibration and operation will become unstable.

Mounting, installation and adjustment

1. Common

⚠CAUTION

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



Item		Port position dimensions (mm)				With wall			Without wall		
Bore size (mm)	Port size	Stroke mm	A	B	C	Applicable fittings	Fitting O.D. øD	Inapplicable fittings	Applicable fittings	Fitting O.D. øD	Inapplicable fittings
ø4	M3	3	6.5	7	3.5	GWS3-M3-S FTS4-M3	ø7 or less	GWS4-M3-S SC3W-M3-3 SC3W-M3-4 SC3U-M3-3 SC3U-M3-4	GWS3-M3-S FTS4-M3	ø7 or less	GWS4-M3-S SC3W-M3-3 SC3W-M3-4 SC3U-M3-3 SC3U-M3-4
		6	6.5	10	3.5				GWS3-M3-S GWS4-M3-S FTS4-M3 SC3W-M3-* SC3U-M3-*	ø10 or less	
ø6	M3	4	6	7.5	3.5	GWS3-M3-S FTS4-M3	ø7 or less	GWS4-M3-S SC3W-M3-3 SC3W-M3-4 SC3U-M3-3 SC3U-M3-4	GWS3-M3-S SC3W-M3-* SC3U-M3-*	ø7.5 or less	GWS4-M3-S
		6	6	9.5	3.5				GWS3-M3-S GWS4-M3-S FTS4-M3 SC3W-M3-* SC3U-M3-*	ø9.5 or less	
		8	6	11.5	3.5				↑	ø11.5 or less	
ø8	M3	4	6	7.5	3.5	GWS3-M3-S FTS4-M3	ø7 or less	GWS4-M3-S SC3W-M3-3 SC3W-M3-4 SC3U-M3-3 SC3U-M3-4	GWS3-M3-S SC3W-M3-* SC3U-M3-*	ø7.5 or less	GWS4-M3-S
		6	6	9.5	3.5				GWS3-M3-S GWS4-M3-S FTS4-M3 SC3W-M3-* SC3U-M3-*	ø9.5 or less	
		8	6	11.5	3.5				↑	ø11.5 or less	
ø10	M5	4	7	10	5	GWS*-M5-S SC3W-M5-* SC3U-M5-* GWS4-M5-S FTS4-M5 FTS6-M5	ø10 or less	GWS*-M5 GWS6-M5-S	GWS*-M5-S SC3W-M5-* SC3U-M5-* GWS4-M5-S FTS4-M5 FTS6-M5	ø10 or less	GWS*-M5 GWS6-M5-S
		6	7	12	5				GWS*-M5-S SC3W-M5-* SC3U-M5-* GWS4-M5-S GWS6-M5-S GWS4-M5 FTS4-M5 FTS6-M5	ø12 or less	GWS6-M5
		10	7	16	5				GWS*-M5-S SC3W-M5-* SC3U-M5-* GWS4-M5-S GWS6-M5-S GWS4-M5 GWS6-M5 FTS4-M5 FTS6-M5	ø14 or less	

* Port 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.
- With a large difference between static friction and kinematic friction of the guide, operation becomes unstable.

Use/maintenance

1. Common

⚠CAUTION

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