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.

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

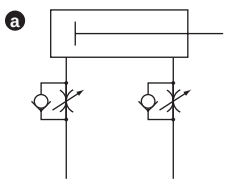
⚠CAUTION

■ Use the product with no lubrication.
- Application of lubrication may cause changes in characteristics.

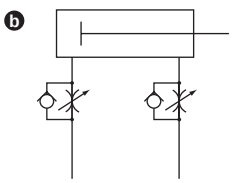
■ Assemble the speed controller near the cylinder.
- When installed far from the cylinder, the speed becomes unstable.
- Use the SC-M3/M5-F, SC3W, SCD-M3/M5-F Series speed controller.

■ In general, the speed is stabler at higher air pressure and lower load factor.
- Use at a 50% or less load factor.

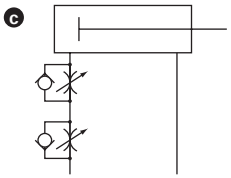
■ Stable speed control is achieved with a meter-out circuit.
- When fine speed activation is performed with operating direction PUSH for the single rod cylinder, the popping out phenomenon occurs when operation starts if the load resistance is low. For countermeasures, use the ⓑ, ⓒ or ⓓ circuit. Note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



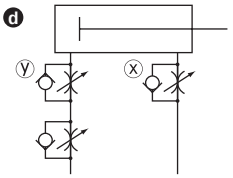
PUSH: Meter-out
PULL : Meter-out



PUSH: Meter-in
PULL : Meter-in



PUSH: Meter-in
PULL : Meter-out

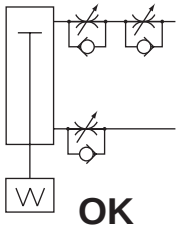


PUSH: Meter in-out
PULL : Meter-out

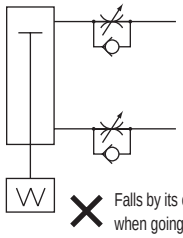
Speed adjustment method for PUSH operation of ⓓ circuit:
1. Set the speed with the speed controller x.
2. Restrict the speed with the speed controller y until there is no popping out.
3. Check the speed again.

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

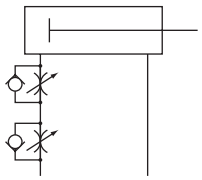


OK

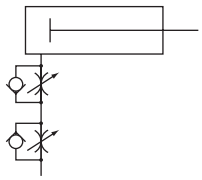


✕ Falls by its own weight when going down

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



OK



✕ Speed control is unstable

(Guidelines for pop-out generation)

Popping out occurs in the following cases.

• Thrust > Resistance

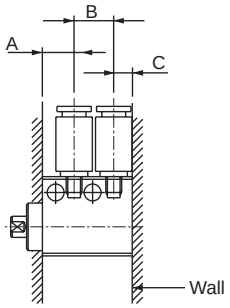
* Resistance: Thrust caused by residual pressure on the exhaust side (in the fine speed, suction pressure = residual pressure) + { When using horizontally: frictional force caused by load / When using vertically: load self-weight }

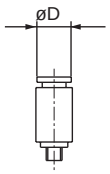
■ Do not apply a lateral load to the cylinder.
- With a lateral load, operation will become unstable.

■ Avoid using this product where vibration is present.
- The product will be adversely affected by vibration and operation will be unstable.

Mounting, installation & adjustment

1. Common





⚠ CAUTION

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

Descriptions		Port position dimensions (mm)				With wall			Without wall		
Bore size (mm)	Port size	Stroke length	A	B	C	Applicable fittings	Fitting O.D. øD	Inapplicable fittings	Applicable fittings	Fitting O.D. øD	Inapplicable fittings
ø6	M3	4	6	7.5	3.5	GWS3-M3-S-P7* FTS4-M3-P80	ø7 or smaller	GWS4-M3-S SC3W-M3-3 SC3W-M3-4 SC3U-M3-3	GWS3-M3-S-P7* SC3W-M3-*-P7*	ø7.5 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*	ø9.5 or smaller	
		8	6	11.5	3.5				↑	ø11.5 or smaller	
ø8	M3	4	6	7.5	3.5	GWS3-M3-S-P7* FTS4-M3-P80	ø7 or smaller	GWS4-M3-S SC3W-M3-3 SC3W-M3-4 SC3U-M3-3 SC3U-M3-4	GWS3-M3-S-P7* SC3W-M3-*-P7*	ø7.5 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*	ø9.5 or smaller	
		8	6	11.5	3.5				↑	ø11.5 or smaller	
ø10	M5	4	7	10	5	GWS*-M5-S-P7* SC3W-M5-*-P7* GWS4-M5-S-P7* FTS4-M5-P80 FTS6-M5-P80	ø10 or smaller	GWS*-M5 GWS6-M5-S	GWS*-M5-S-P7* SC3W-M5-*-P7* GWS4-M5-S-P7* FTS4-M5-P80 FTS6-M5-P80	ø10 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	ø12 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	ø14 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.