Pneumatic Components

To Use This Product Safely

Be sure to read this before use.
For general cylinder information, see Intro 41, and for cylinder switches, see P. 924.

Individual Precautions: Small compact cylinder MSD Series

During Design/Selection

1. Common

Caution

■ Please consult us if you intend to use the cylinder as a stopper.

■ When selecting a cylinder switch, refer to the "Switch Usability Selection Table" on P. 794, 795, and 810.

2. Single acting MSD-X/Y

Caution

■ Do not apply a load when the piston rod is retracting for the push type, or when the piston rod is extending for the retracting type.
The built-in cylindrical spring in the cylinder only has enough force to return the piston rod, so if a load is applied, it will not return to the stroke end.

■ Do not leave pressurized.
If left pressurized, the piston rod may not return by spring force when the pressure is released.

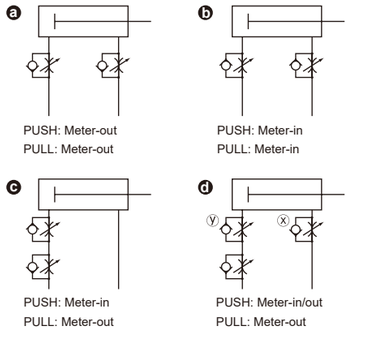
3. Fine speed MSD-(K) F

Caution

■ Use without lubrication.
Lubrication may change characteristics.

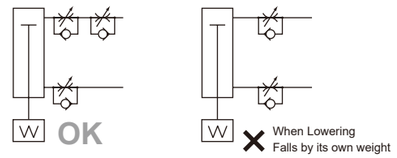
■ Generally, the higher the air pressure and the lower the load factor, the more stable the speed.
Use with a load factor of 50% or less.

■ Speed control is stable with a meter-out circuit.
When driving a single-rod cylinder at creep speed in the PUSH direction, if the load resistance is small, a flying-out phenomenon may occur at the start of operation. As countermeasures, use circuits ⓑ, ⓒ or ⓓ. In addition, the ⓓ circuit is the most stable.

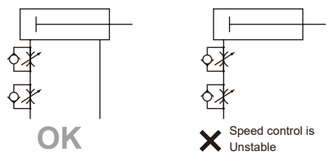


ⓓ Speed adjustment method for PUSH operation of the circuit:
1. Speed setting with x-speed controller
2. Throttle with y-speed controller until lunging stops.
3. Reconfirmation of speed

(*1) When comparing ⓑ ⓒ ⓓ, operation is the most stable with the ⓓ circuit.
(*2) For vertical mounting, it will fall by its own weight in a meter-in circuit, so combine it with a meter-out circuit.



(*3) For series connection of speed controllers, use the circuit shown in the figure below.



(Guideline for lurching occurrence)
Lurching occurs in the following cases:
• Thrust > Resistance
*Resistance: Thrust due to residual pressure on exhaust side (For creep speed type, intake pressure = residual pressure) + { For horizontal use: Frictional force due to load / For vertical use: Dead weight of the load }

■ Do not apply lateral load to the cylinder.
Operation becomes unstable when lateral load is applied.

■ Avoid use in locations with vibration.
Operation becomes unstable due to the influence of vibration.

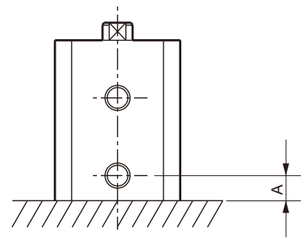
During Use

1. Common

Caution

■ Mount the switch observing the tightening torque.
If tightened beyond the tightening torque range, mounting screws, mounting brackets, switches, etc. may be damaged. Also, if tightened below the tightening torque range, the switch mounting position may shift.
Tightening torque: 29.4 (N·m)

■ During piping
Precautions for piping speed controllers and fittings
There are restrictions on usable piping fittings, so please refer to the table below.



Fitting Usability Table

Code / Bore Size (mm)	Port Size	Port position Dimension A	Usable speed Controller/Fitting	Fitting outer diameter
ø6 ø8	M3	4	SC3W-M3-3 SC3W-M3-4 SC3U-M3-3 SC3U-M3-4	ø8 or less
			GWS3-M3-S GWS4-M4-S	
			FTS4-M3	
ø12 ø16	M5	5	SC3W-M5-3 SC3W-M5-4 SC3W-M5-6 SC3U-M5-3 SC3U-M5-4 SC3U-M5-6	ø10 or less
			GWS4-M5-S GWS6-M5-S	
			FTS4-M5 FTS6-M5	

■ During installation
Please do not make dents, scratches, etc. on the main body (tube) mounting surface and table surface that would impair flatness. The flatness of the mating side to be included to the table should be 0.05 mm or less.

2. Single acting MSD-X/Y

Caution

■ A breather hole is provided on the main body, so be careful not to block it during installation.
This will cause malfunction.

3. Fine speed MSD-(K) F

Caution

■ Install the speed controller near the cylinder.
If installed far from the cylinder, the speed will become unstable. Use SC-M3/M5-F, SC3W, or SCD-M3/M5-F series speed controllers.

■ Adjust alignment etc. so that no lateral load is applied to the cylinder. Also, adjust and install so that there is no twisting with respect to the sliding guide.
Operation will become unstable if there are fluctuations in load or resistance. Guides with a large difference between static friction and dynamic friction will result in unstable operation.

For precautions regarding mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.