



Pneumatic components

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.

SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/
COVPIN2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/
MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd
Contr
Ending

Product-specific cautions: Compact cylinder SMG Series

Design/selection

1. Common

CAUTION

The min. working pressure in the specifications column indicates the initial value.

Depending on the conditions of use or duration of use, the specifications may be exceeded. When using around the min. working pressure, consult with CKD.

1. Fine speed SMG-F

CAUTION

■ Use without lubrication.

Applying lubrication may cause changes in characteristics.

■ Assemble the speed controller near the cylinder.

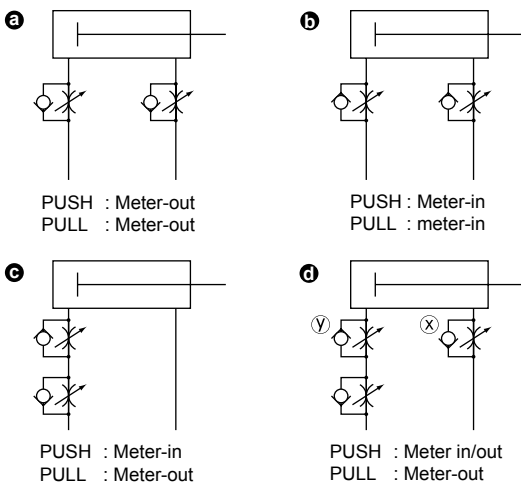
When installed far from the cylinder, the speed becomes unstable.
For the speed controller, SC-M3/M5-F, SCD-M3/M5-F Series are recommended.

■ 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.

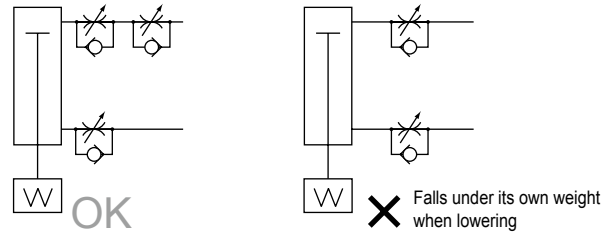


Speed adjustment method for PUSH operation of **d** circuit:

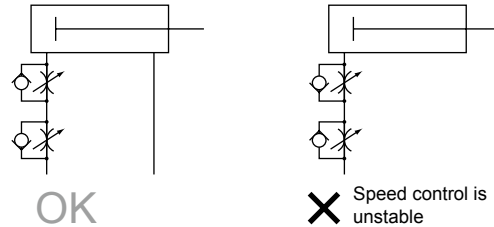
1. Set the speed with the speed controller x.
2. Restrict the speed with the speed controller y until there is no popping out.
3. Check the speed again.

(*1) When compared to **b** **c** **d** the circuit **d** 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.



(*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 + { When using horizontally: frictional force caused by load (in the fine speed, suction pressure = residual pressure) }
{ 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.

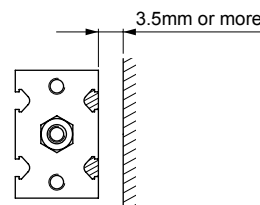
The product will be adversely affected by vibration and operation will become unstable.

Mounting, installation and adjustment

1. Common

⚠ CAUTION

■ The cylinder switch may malfunction if there is a magnetic substance such as a metal plate installed adjacently. Check that a distance of 3.5 mm is provided from the surface of the cylinders. (Same for all bore sizes)



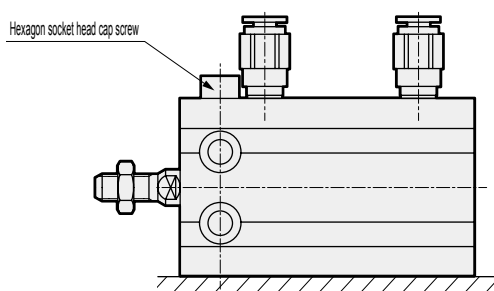
■ The cylinder switch may malfunction when cylinders are installed adjacently. In order to prevent switch malfunctions, provide a mounting pitch of the value in the table below and over.

(Unit: mm)

Adjacent conditions		Switch model No.	φ6	φ10	φ16	φ20	φ25	φ32	Remarks		
Two cylinders in parallel	Horizontal mounting Switch	A	K0, K5	27	29	37	45	55	67		
		A	K2, K3	27	29	37	45	55	67		
	B	K0, K5	4.5								
		K2, K3	4.5								
	Vertical mounting Switches are attached on the opposite side of the horizontal cylinders 	A	K0, K5	28	21	25	33	41	46		Note that switch position cannot be adjusted if the length of the screwdriver is longer than B dimension with cylinders mounted.
		A	K2, K3	25	28	35	40	50	55		
B	K0, K5	5.5	5.5	5.5	6.5	8.5	5.5				
	K2, K3	11.5	12.5	14.5	14.5	17.5	14.5				
Vertical mounting Switches are attached on the side of the adjacent cylinders 	A	K0, K5	14	16	21	27	33	41			
	A	K2, K3	14	16	21	27	33	41			
B	K0, K5	0.5									
	K2, K3	0.5									
Three or more cylinders in parallel	Horizontal mounting 	A	K0, K5	27	29	37	45	55	67		
		A	K2, K3	27	29	37	45	55	67		
	B	K0, K5	4.5								
		K2, K3	4.5								
	Vertical mounting 	A	K0, K5	19	22	26	34	42	47		Note that switch position cannot be adjusted if the length of the screwdriver is longer than B dimension with cylinders mounted.
		A	K2, K3	27	29	35	44	51	56		
B	K0, K5	6.5	6.5	6.5	7.5	9.5	6.5				
	K2, K3	13.5	13.5	14.5	17.5	18.5	15.5				

■ Depending on the stroke length or mounting method, applicable piping fittings are limited. Therefore, use the recommended fittings as below.

Fig. 1



Descriptions Bore size	Port size	Recommended fittings	Descriptions Bore size	Port size	Recommended fittings
6	M5	SC3W-M5-4, 6 SC3U-M5-4, 6 GWS4-M5 GWS6-M5 (*1) GWS4, 6-M5-S GWL4-M5 GWL6-M5 (*1)	20	M5	SC3W-M5-4, 6 SC3U-M5-4, 6 GWS4-M5 GWS6-M5 (*1) GWS4, 6-M5-S GWL4-M5 GWL6-M5 (*1)
10	M5	SC3W-M5-4, 6 SC3U-M5-4, 6 GWS4, 6-M5 GWS4, 6-M5-S GWL4, 6-M5	25	M5	SC3W-M5-4, 6 SC3U-M5-4, 6 GWS4, 6-M5 GWS4, 6-M5-S GWL4, 6-M5
16	M5	SC3W-M5-4, 6 SC3U-M5-4, 6 GWS4-M5 (*1) GWS6-M5 (*2) GWS4-M5-S GWS6-M5-S (*1) GWL4-M5 (*1) GWL6-M5 (*2)	32	Rc1/8	SC3W-6-4, 6, 8 SC3U-6-4, 6, 8 GWS4, 6, 8-6 GWS4, 6, 8-6-S GWL4, 6, 8-6

*1) Excluding 5 stroke length or mounting method in "Fig. 1".

*2) Excluding 5,10 stroke length or mounting method in "Fig. 1".

SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/
COVP/N2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/
MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd
Contr
Ending

SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/
COVPIN2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/
MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd
Contr
Ending

■ When mounting the body with the through bolt, tighten with tightening torque as shown in the table below.

Bore size	Bolt used	Tightening torque
φ6/10	M3	0.6 to 1.1 N·m
φ16	M4	1.5 to 2.7 N·m
φ20/25	M5	3.0 to 5.4 N·m
φ32	M6	5.2 to 9.2 N·m

2. Single acting SMG-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.

3. Fine speed SMG-F

⚠ CAUTION

■ Perform adjustment such as centering so that a lateral load is not applied to the cylinder. In addition, install and adjust the sliding guide to avoid twisting.

- 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.

4. Rotation-stop SMG-M

⚠ CAUTION

■ When attaching load to the piston rod, do not apply more torque than the allowable torque.

Use/maintenance

1. Rotation-stop SMG-M

⚠ CAUTION

■ Do not put your fingers into the gap between the rotation-stop plate and the rotation-stop cylinder tube.

Never put your fingers through the gap because fingers may be pinched between the rotation-stop plate and the cylinder tube while the piston rod is pulled.

■ Do not apply rotation torque to the piston rod. If by any chance torque is applied due to the shape of the jig, use without exceeding the allowable torque.

■ After maintenance, when connecting the piston rod and rotation-stop plate, fasten with hexagon socket set screws, applying the tightening torque given in the table below.

Bore size	Applicable hexagon socket set screw	Tightening torque
φ6/10/16	M3	0.6 N·m
φ20/25	M4	1.4 N·m
φ32	M5	4.2 N·m