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.

Twin rod cylinder STR2 Series

Design & selection

1. Fine speed STR2-F

⚠CAUTION

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

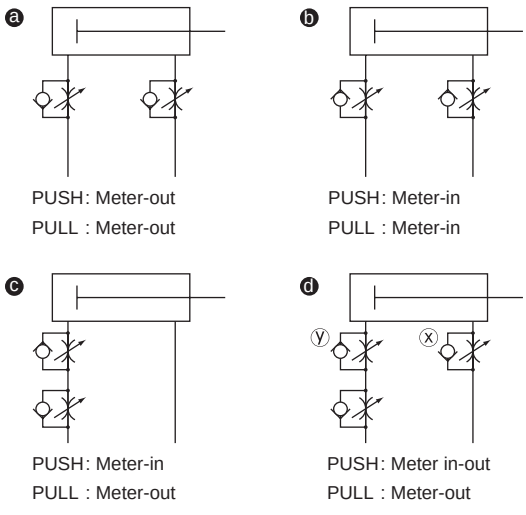
■ Assemble the speed controller near the cylinder.
When installed far from the cylinder, the speed becomes unstable.
Use SC-M3/M5, SC3W, SCD-M3/M5 and SC3WU Series for the speed controller.

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

■ Do not apply a lateral load to the cylinder .
Also install the sliding guide so that it is not twisted.
With a large difference between static friction and kinematic friction of the guide, operation becomes unstable.

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

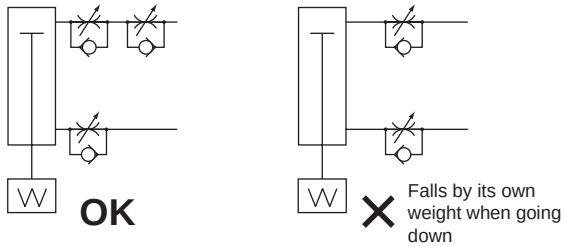
■ Stable speed control is achieved with a meter-out circuit.
When fine speed activation is performed with operating direction PUSH for the single rod cylinder, the popping out phenomenon occurs when operation starts if the load resistance is low. For the countermeasures, choose the circuit of ⓑ, ⓒ, or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



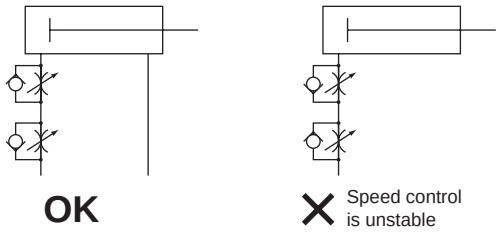
Speed adjustment method for PUSH operation of circuit ⓓ:
1. Set the speed with the speed controller x.
2. Restrict the speed with the speed controller y until there is no popping out.
3. Check the speed again.

(Note 1) When comparing ⓑ ⓒ ⓓ, the circuit ⓓ is most stable.

(Note 2) When installed vertically, the unit falls by its own weight in the meter-in circuit. Combine the cylinder with the meter-out circuit.



(Note 3) Use the circuit as shown in the figure below for the serial connection of the speed control valves.



(Guidelines for pop-out generation)
When the following condition is met, popping out could occur.
• Thrust > Resistance

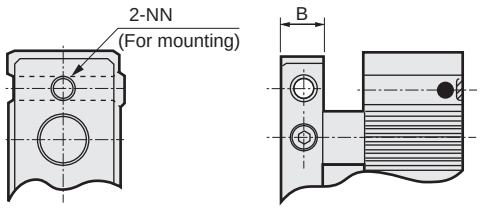
* Resistance: a force produced by a residual pressure on the outlet side (for fine speed, Inlet pressure = Residual pressure) + { For vertical use: friction caused by the load / For horizontal use: self-weight of the load }

Installation & adjustment

1. Common

⚠ CAUTION

- The twin rod cylinder has two piping ports each on both sides in the operating direction. Change the plugged ports according to your application. After the change, confirm that there is no air leakage from the plugged ports.
- Do not damage surface flatness by denting or scratching the body (tube) mounting surface or the end plate surface. Make sure that the flatness of the mating surface where the end plate will be attached is 0.05 mm or below.
- When using a screw hole NN of the end plate, make sure that the bolt length is equivalent to the B dimension. Not doing so could cause malfunction or damage of the end plate.



Bore size (mm)	B dimension
ø6	6
ø10	6
ø16	8
ø20	10
ø25	12
ø32	12

- Rubber cushion is integrated as a cushion mechanism. The table below shows kinetic energy can be absorbed by the rubber cushion. If the energy exceeds these values, consider using a separate shock absorber.

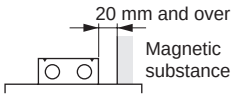
Bore size (mm)	Allowable energy absorption J	
	PUSH	PULL
ø6	0.008	0.059
ø10	0.061	0.083
ø16	0.181	0.083
ø20	0.303	0.127
ø25	0.68	0.237
ø32	1.3	0.311

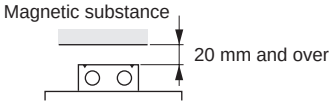
- The cylinder may tilt due to uneven surface if it is installed with the spot face side (JJ) contacted. In this case, change the port position or use the option of piping port position on the 180° opposite side (o) to keep the spot face side from being the contacting surface.
- The cylinder body may be damaged or may malfunction if a unit with excessive inertia, etc., is actuated. Use within the allowable absorbed energy range.
- The twin rod cylinder has a bolt for 0 to -5 mm stroke length adjustment on the piston rod retraction side. Loosen the hexagon nut, adjust to the desired stroke length and tighten the hexagon nut to fix the length.
- Do not use the product with the stroke length adjusting bolt removed.

1. Common; with switch

⚠ CAUTION

- STR2-B-6 and 10 are not compatible with a reed switch. When using a proximity switch for STR2-B-6, avoid mounting the cylinder on a magnetic substance such as a metal plate. Failure to do so could lead to switch detection malfunction.
- The cylinder switch could malfunction if there is a magnetic substance such as a metal plate installed adjacently. Check that the distance of 20 mm is provided from the surface of the cylinders. (Same clearance for all bore sizes)



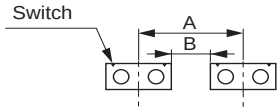
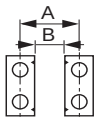
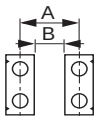
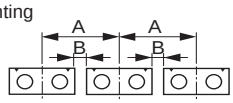
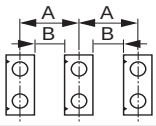


2. Fine speed STR2-F

⚠ 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 differen ce be tw een static friction and kinetic friction of the guide is large, operation becomes unstable.

■ The cylinder switch could malfunction if cylinders are installed adjacently. Check that the following distances are provided between cylinders.

Adjacent conditions			Switch	ø6	ø10	ø16	ø20	ø25	ø32
Two cylinders in parallel	Horizontal mounting Switch 	A	K2,K3	43	45	56	66	75	111
			K0,K5	-	-	62	81	85	111
		B	K2,K3	7	1	2	4	3	15
			K0,K5	-	-	8	19	12	15
	Vertical mounting Switches are attached on the side of the adjacent cylinders 	A	K2,K3	28	27	36	47	47	58
			K0,K5	-	-	36	53	53	58
		B	K2,K3	15	12	15	20	14	20
			K0,K5	-	-	15	26	20	20
	Vertical mounting Switches are attached on the opposite side to the adjacent cylinders 	A	K2,K3	19	16	22	28	34	39
			K0,K5	-	-	22	33	34	39
		B	K2,K3	6	1	1	1	1	1
			K0,K5	-	-	1	6	1	1
More than two cylinders in parallel	Horizontal mounting 	A	K2,K3	44	45	57	67	77	111
			K0,K5	-	-	64	83	86	111
		B	K2,K3	8	1	3	5	5	15
			K0,K5	-	-	10	21	14	15
	Vertical mounting 	A	K2,K3	33	30	40	51	49	58
			K0,K5	-	-	42	60	97	58
		B	K2,K3	20	15	19	24	16	20
			K0,K5	-	-	21	33	25	20

*1: STR2-B-6 and 10 are not compatible with a reed switch.