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: Medium bore size cylinder SCA2 Series

Design/selection

1. Common

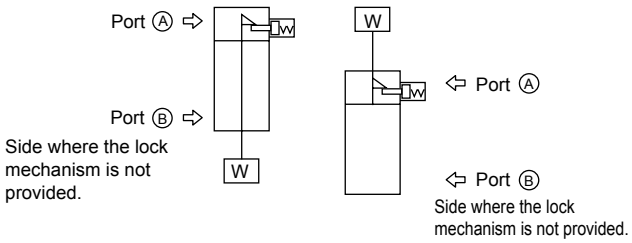
⚠ CAUTION

■ Mount a speed controller on the cylinder.
Mount the speed controller on the cylinder.
Use within the working piston speed range of each series.

2. Position locking SCA2-Q2

⚠ WARNING

■ If pressure is supplied to port A when both ports are not pressurized and the piston is locked, the lock may not be released or the piston rod may suddenly pop out just after the lock is released. This can be extremely hazardous. To release the lock mechanism, make sure to supply pressure to port B. Check that load is not applied to the lock mechanism.



■ For usage where the drop rate is increased using the quick exhaust valve, the lock may not release normally because the cylinder body starts operating before the lock pin.
For the position locking cylinder, do not use the quick exhaust valve.

■ Do not use 3-position valves.
Do not use the cylinder in combination with 3-position (especially closed center metal seal type) valves. If the port at the side where the lock mechanism is provided is pressurized, the lock cannot be engaged. Even if it is locked once, the air leaked from the valve enters the cylinder, and the lock may be released after a certain period of time.

⚠ CAUTION

■ Cylinder load factor must be 50% or less.
If the load factor is high, the lock may not be released, or the lock section may be damaged.

■ If back pressure is applied to the locking mechanism, the lock may be released. Use a single solenoid valve, or an individual exhaust manifold.

■ Do not use multiple synchronized cylinders.
Do not use so that 1 workpiece is moved by synchronizing 2 or more position locking cylinders. Lock release may fail for one of the cylinders.

3. Low friction SCA2-U

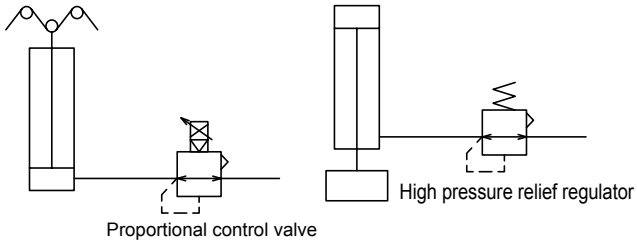
⚠ WARNING

■ Durability differs based on working conditions and model characteristics.
This cylinder is a cylinder that has internal leakage.
Refer to specifications (page 518) for amount of leakage.

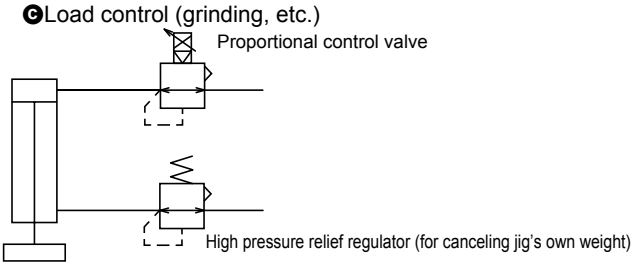
⚠ CAUTION

■ When using the cylinder for a balancer, etc., it may be advisable not to mount a speed controller in order to improve the supply and exhaust efficiency. Depending on the application, circuits ⓐ to ⓒ below are recommended.

ⓐ Tension control (winding machine, etc.) ⓑ Balancer (processing machine Z-axis, etc.)



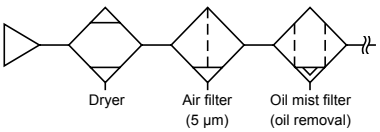
ⓒ Load control (grinding, etc.)



* To improve the supply and exhaust efficiency, make the volume of piping as large as possible.

■ Do not lubricate. The properties fluctuate.

■ Because poor quality air worsens the characteristics and adversely affects the durability, use clean air with the piping below.



■ Mount the speed controller near the cylinder.
When installed far from the cylinder, the speed becomes unstable.

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

4. Low hydraulic SCA2-H

⚠ CAUTION

■ Select the low hydraulic cylinder by combining with the converter unit.
Because the optimized operation of the low hydraulic cylinder can be obtained by combining with the converter unit, select an adequate converter unit.

■ Keep the low hydraulic cylinder load to 50% or less of the theoretical output.
To attain performance similar to the hydraulic cylinder in constant speed operation and stopping accuracy, the low hydraulic cylinder load must be 50% or less.

■ Use petroleum-based turbine oil for the hydraulic fluid. Problems may occur if noncombustible hydraulic fluid is used.
The adequate viscosity is approx. 40 to 100 mm^2/s at the ambient operating temperature. The temperature range is 15 to 35°C for ISO VG32. When using in a range exceeding ISO VG32, use ISO VG46 (25 to 45°C).

ISO VG32 turbine oil
Example: [Non-additive]
Idemitsu : Turbine Oil P32
Nisseki : Turbine Oil 32
Maruzen : Turbine Oil 32
Mitsubishi: Mitsubishi Turbine Oil 32
[Additive]
Idemitsu : Daphne Turbine Oil 32
Nisseki : FBK Turbine 32
Maruzen : Turbine Super 32
Mitsubishi: Diamond Turbine Oil 32

5. Coolant proof SCA2-G2/G3

⚠ CAUTION

■ Do not apply an eccentric load to the piston rod.
The service life of the scraper or bearing could be shortened.

■ In the case that the G2 or G3 Series are not exposed to splattering of cutting oil or water, the lubrication of the piston rod will run out and the service life will be shortened. Use the G, G1 Series in this case.

6. Anti-spatter adherence SCA2-G4

⚠ WARNING

■ The durability of this cylinder series is improved in comparison to standard cylinders when used in an atmosphere exposed to spatter. But durability may be shorter than the standard cylinder when used in other atmospheres.

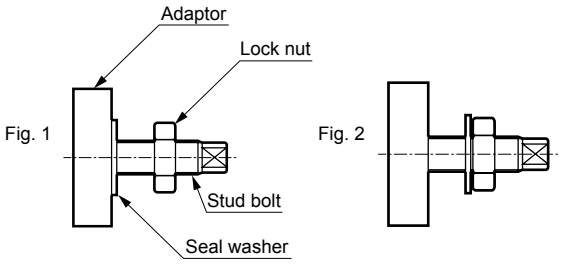
Mounting, installation and adjustment

1. Stroke adjustable SCA2-R

⚠CAUTION

■ Securely lock the stud bolt with the lock nut.

■ Remove the air before adjusting the stroke.
Do not tighten the stud bolt in the state shown in Fig. 1.
Tighten the stud bolt in the state shown in Fig. 2.
Do not tighten the lock nut in the state shown in Fig. 2.
Tighten the lock nut in the state shown in Fig. 1.
When not using the adjustment methods above, the seal washer will break after 1 or 2 usages.



■ Because a seal washer is used for sealing the stud bolt, the sealing cannot withstand frequent adjustment.

■ If the stroke is adjusted, the cushion cannot function.

2. Heat resistant SCA2-T

⚠CAUTION

■ Magnet is not built in.

3. Position locking SCA2-Q2

⚠CAUTION

■ The lock mechanism functions at the stroke end, so that if the stopper is engaged during the stroke by the external stopper, the lock mechanism may not work and the piston could fall. When setting a load, make sure to check that the lock mechanism functions before installing the product.

■ Supply pressure equal to or higher than the min. working pressure to the port on the lock mechanism side.

■ When the piping at the side where the lock mechanism is provided is long and thin, or when the speed controller is far away from the cylinder port, note that it takes time to engage the lock. Clogging in the silencer mounted on the EXH port of the valve may cause the same result.

4. Low friction SCA2-U

⚠CAUTION

■ Do not apply a lateral load to the cylinder.
Install the sliding guide so that it is not twisted.
- When the load or the resistance fluctuates, operation becomes unstable.
- For the long stroke length, the piston rod's self-weight causes the speed to become unstable. Install the guide before use.
- 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 become unstable.

■ Avoid using in environments with water vapor or high humidity or in alkaline atmospheres.

5. Low hydraulic SCA2-H

■ Do not use a push-in fitting to pipe the low hydraulic cylinder.
Do not use a push-in fitting because oil leakage may occur if the push-in fitting is used to pipe the low hydraulic cylinder.

■ Use a steel pipe or copper tube to pipe the low hydraulic cylinder.
Similar to the hydraulic circuit, higher surge than working pressure may be generated in the low hydraulic cylinder piping, requiring safe piping materials.

■ Avoid using this product where air and hydraulics are applied to one side.
An entry of air into the oil may occur, and this could result in malfunction.

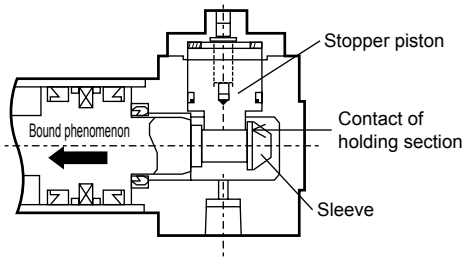
Use/maintenance

1. Position locking SCA2-Q2

⚠WARNING

■ For safety purposes, prevent the load from falling under its own weight during maintenance.

■ In the case of the cylinder with air cushion, if the air cushion needle at the lock mechanism side is tightened excessively, the piston bounds at the stroke end and the sleeve and stopper piston collide strongly, which may result in damage to the locking mechanism. Also, if the air cushion needle is opened too much, the piston bounces off at the stroke end, which may similarly damage the mechanism. Adjust the needle of the air cushion so that there is no bound.



Inspect the piston once or twice a year to make sure there is no damage to the retainer caused by this phenomenon.

⚠CAUTION

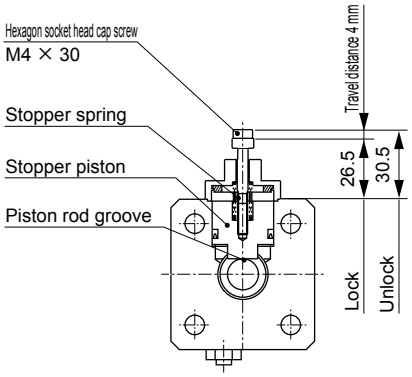
■ After the lock mechanism is manually operated, make sure to confirm manual operation and return the mechanism to the original state before use. Do not perform manual operation except for adjustment, as it is dangerous.

■ When mounting or adjusting the cylinder, release the lock.
If mounting work, etc., is done while the lock is engaged, the lock part may be damaged.

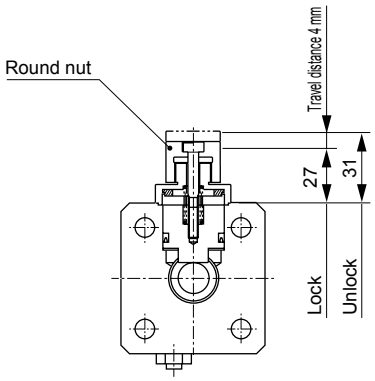
■ Use the speed controller with meter-out.
If the meter-in control is used, the lock may not be able to be released.

■ At the side where the lock mechanism is attached, be sure to use the cylinder from the stroke end.
If the cylinder piston does not reach the stroke end, the lock may not be engaged or the lock may not be able to be released.

■ Manual override non-locking release method
By screwing the hexagon socket head cap screw into the stopper piston and pulling the bolt 4 mm with force of 20 N or more, the stopper piston moves and the lock is released. (when horizontally installed with no load or with the opposite side port pressurized). When the screw is released, the internal spring causes the stopper piston to return. When it fits into the piston rod groove, the piston is locked.



■ Manual override locking release method
By rotating the round nut leftward (counterclockwise), the stopper piston moves and the lock is released. Rotating the round nut to the right (clockwise) to set it in the locked position causes the stopper piston to return. When it fits into the piston rod groove, the piston is locked.



2. Low friction SCA2-U

⚠CAUTION

■ Do not disassemble the product. Once disassembled, the performance may not be retained.
For this product, just the repair parts are not available.

3. Low hydraulic SCA2-H

⚠CAUTION

■ Regularly vent air from the low hydraulic cylinder.
Air may accumulate in the low hydraulic cylinder, so vent air before starting operations, etc. Vent air with the air vent valve provided on piping.

■ If moisture enters the hydraulic fluid, or if hydraulic fluid becomes cloudy or discolored, replace it with new oil. Use the same brand of oil when replacing.