For Safe Use of This Product

Please read before use. Check P. 41 at the beginning for general cylinders and P. 1512 for cylinder switches.

Specific Precautions: Rodless Cylinder with High Precision Guide SRM3 Series

Design / Selection

1. Common

⚠ CAUTION

■ Please be careful when designing the intermediate stop control circuit.

Since slit type rodless cylinders represented by SRL3 structurally have slight external air leakage, intermediate stop control using an all-port block 3-position valve will cause a failure where the table stop position cannot be maintained. Therefore, please use a both-side pressurization control circuit using a PAB connection 3-position valve. However, please note that if air is pressurized in a non-energized state during both-start after a pressure drop, the table may move and deviate from the origin.

■ Basic Circuit Diagram

● For Horizontal Load

Piping as shown in Fig. 1 applies equal pressure to both sides of the piston when stopped, preventing the table from shooting out when restarting.

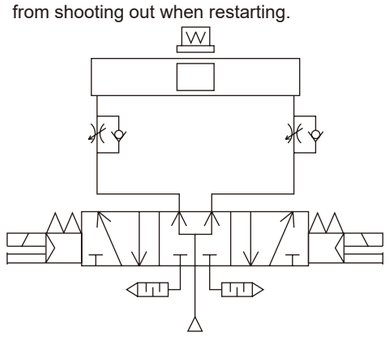


Fig. 1

● For Vertical Load

If a vertical load acts as shown in Fig. 2, the table moves in the Load Direction, so install a pressure reducing valve with check valve on the upper side to reduce the thrust in the Load Direction and balance the load.

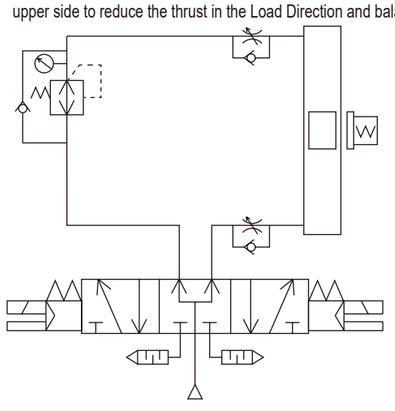
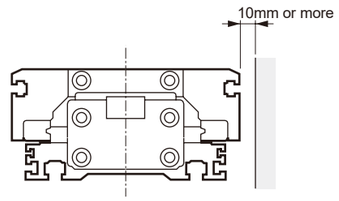


Fig. 2

■ If there is a magnetic material such as an iron plate near the cylinder switch, it may cause a malfunction of the cylinder switch, so keep a distance of 10 mm or more from the side of the table.



■ Cannot be used in places where cutting oil, coolant fluid, oil mist, etc. come directly into contact with the cylinder.

If it is unavoidable due to cylinder installation, be sure to provide a cover etc. to protect the cylinder.

■ Cannot be used in environments where foreign matter such as chips, dust, dirt, spatter, etc., come directly into contact with the cylinder or fly around.

If unavoidable due to cylinder installation, install a cover, etc., to protect it. Also, be sure to consult us when using in such an environment.

■ Be careful not to generate negative pressure inside the cylinder tube. When used as an air balancer or when the table is driven by external force, inertial force, etc. with all ports blocked, negative pressure may be generated in the cylinder, causing the seal belt to detach and air leakage to occur. Be careful not to generate negative pressure in the cylinder by driving with external force, inertial force, etc.

2. Fall Prevention Type SRM3-Q

⚠ CAUTION

■ The cylinder load factor should be 50% or less.

If the load factor is high, the lock may not be released or the lock part may be damaged.

■ When operating the cylinder at a speed of 500 mm/s or more, please decelerate so that the entry speed into the fall prevention mechanism is 500 mm/s or less. As a deceleration method, please use a method such as installing an external shock absorber or a deceleration circuit.

During Use

1. Common

⚠ WARNING

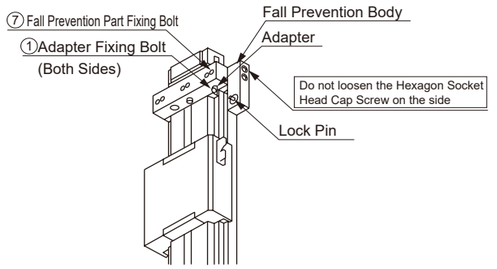
■ Adjustment of Shock Absorber

● Since the gap between the shock absorber and the stopper bolt is narrow, it is recommended to remove the stroke adjustment plate for adjustment.

2. Fall Prevention Type SRM3-Q

⚠ WARNING

■ Adjustment method of stroke adjustment unit



Loosen the ⑦drop prevention part fixing bolt in the figure above to adjust the stroke. Do not loosen the Hexagon Socket Head Cap Screw on the side in the figure above, as the position of the fall prevention part lock pin will shift.

● By loosening the adapter fixing bolt, the fall prevention body can be moved. In this case, use with shock absorber (A, A1, E, E1). Also, if the stroke is finely adjusted with the shock absorber, the fall prevention position will shift and it will not be possible to lock reliably, so please make fine adjustments with the adapter fixing bolt.

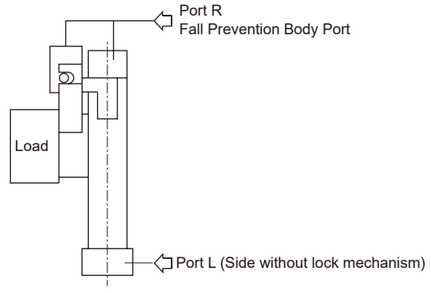
● After moving to an arbitrary position, tighten the adapter fixing bolt with the value in the table below to fix it. If tightened below the value in the table below, the fall prevention body part may shift, so be sure to observe it.

● When setting the load, be sure to confirm that the lock mechanism works before installation.

Model	① Adapter Fixing Bolt ⑦ Fall prevention part fixing bolt Tightening Torque Tightening torque
SRM3-Q-25	6.2 to 7.6
SRM3-Q-32	6.2 to 7.6
SRM3-Q-40	10.4 to 12.8
SRM3-Q-63	19.4 to 23.8

■ About Piping

● Piping to the fall prevention body is required.



● Branch the piping to the R side of the rodless cylinder with a tee etc., and pipe to the fall prevention body with equivalent piping.

● Please note that if the piping to the fall prevention body is thin and long, or if the speed controller is far from the cylinder port, the exhaust speed will be slow and it may take time for the lock to engage. Also, clogging of the silencer attached to the EXH. port of the valve will lead to the same result.

■ Be sure to supply pressure equal to or higher than the minimum Operating Pressure to the fall prevention body port.

■ About Manual Release

● Push in the lock pin for fall prevention with a rod-shaped object to release it. In this case, be sure to supply pressure to port L so that no load is applied to the lock mechanism, and then release the lock.

● It is very dangerous if pressure is supplied to port R while both ports R and L are exhausted and the piston is locked, as the lock may be released and the table may shoot out.

■ About Valve

● If the cylinder is held with pressure applied to the lock mechanism side, the lock pin may come off, which is very dangerous, so do not use 3-position closed center and 3-position PAB connection valves.

● If back pressure is applied during locking, the lock may be released, so use a single valve or an individual exhaust type manifold.

● In a usage method where the descent speed is increased with a quick exhaust valve, the start of movement of the Cylinder Body is faster than the operation of the lock pin, and normal release may not be possible. Do not use a quick exhaust valve for fall prevention type cylinders.

■ During equipment maintenance, for safety, please take separate measures to prevent the load from falling due to its own weight.

■ In the case of a cylinder with air cushion, if the air cushion needle on the lock mechanism side is tightened too much, the piston will bounce at the stroke end, the lock lever and lock pin will contact impactfully, leading to damage of the lock mechanism. Also, if the air cushion needle is opened too much, the piston will rebound at the stroke end, leading to damage as well. Adjust the needle so that the air cushion does not bounce. When stopping with external buffer equipment (shock absorber, etc.), similarly adjust so that there is no bounce. Also, please perform periodic inspection 1 to 2 times/year to check for damage to the holding part due to this phenomenon.

3. Common

⚠CAUTION

■Do not apply strong impact or excessive moment to the table.

■Perform sufficient alignment when connecting to a load that has an external guide mechanism.

● The longer the stroke, the larger the variation in the axis center, so please consider a connection method (floating) that can absorb the displacement amount.

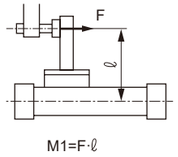
■Ensure that the moment including the inertial force generated during load movement or stopping does not exceed the allowable load. If this value is exceeded, damage will occur.

(When overhang is large)

● When the overhang is large and stopping at both ends with the piston, a bending moment acts due to the inertial force of the load even if it is within the range of the internal cushion's absorbed energy. When kinetic energy is large and an external cushion etc. is used, please hit the workpiece center of gravity as much as possible. (When using an external stopper)

● When an external stopper is used, please select taking into account the bending moment due to cylinder thrust.

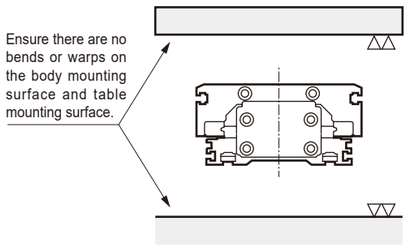
● Moment acting when stopped by an external stopper



M1=F·ℓ

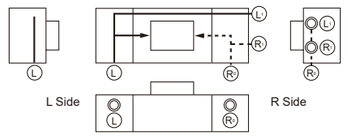
F : Cylinder Thrust
ℓ : Distance from cylinder center to stopper

■Do not make dents or scratches that would impair flatness on the body (tube) mounting surface and table mounting surface.



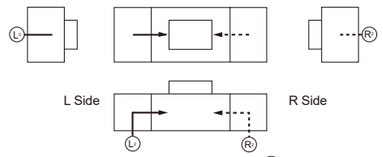
■About Piping Port Position and Operation Direction

● In case of Option Code (No Code, R, B, T)



Ⓡ indicates right side pressurization port, Ⓛ indicates left side pressurization port. At the time of shipment from the factory, ports other than ⓇⓁ(1 location each) are sealed with plugs. Piping to other ports is possible by removing the plugs. However, bottom piping is not possible. If bottom piping is required, please select option (D, S). Ⓛport is for ø25, ø32, ø40 only. ø63 Ⓛ port type is not available.

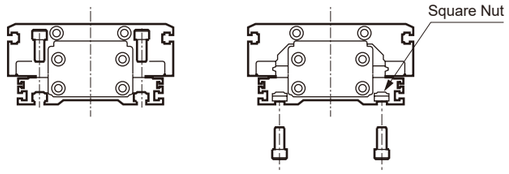
● In case of Option (D, S) (Bottom Piping)

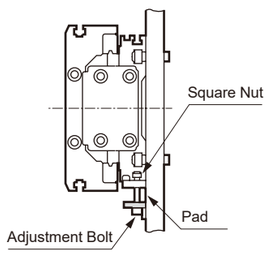


Ⓡ indicates R side pressurization port, Ⓛ indicates L side pressurization port. There are no ports for piping other than Ⓡ and Ⓛ.

■About Body Mounting

SRM3 can be mounted from 2 directions as shown in the figure below. Also, flexible mounting from the side direction is possible using the T-slots. In that case, installation will be easier if level adjustment is possible.





■About T-slots and Square Nuts

SRM3 is provided with T-slots for square nuts as shown in the figure below, and the square nuts in the table below are attached as accessories upon shipment.

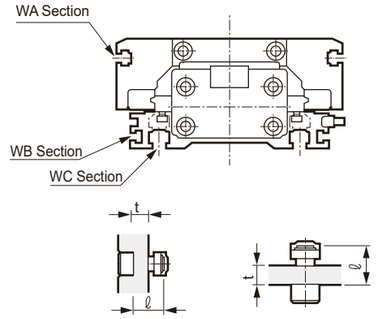
● Accessory square nuts (8 each)

Model	Included Square Nut	
SRM3-25	M4	M5
SRM3-32	M4	M6
SRM3-40	M4	M8
SRM3-63	M5	M10

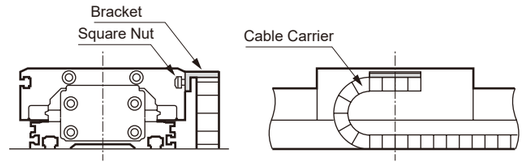
● The following dimensions are recommended for T-slot bolt length R.

mm

Model	WA Section	WB Section	WC Section
SRM3-25	M4 ℓ=t+6	–	M5 ℓ=t+6
SRM3-32	M4 ℓ=t+6	–	M6 ℓ=t+8
SRM3-40	M4 ℓ=t+6	M4 ℓ=t+6	M8 ℓ=t+10
SRM3-63	M5 ℓ=t+7	M5 ℓ=t+7	M10 ℓ=t+12



[Table T-slot Usage Example]

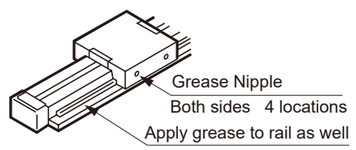


■Please treat our shock absorber as a consumable part.
Replace it when a decrease in energy absorption capacity is observed or when operation is no longer smooth.

■The guide part of the SRM3 series is adjusted for proper pressurization at the time of shipment.
Do not carelessly adjust the pressurization during use.

■For normal use, apply lithium-based grease to the guide of the SRM3 series approximately every 100 km of travel distance (about 6 months in time).
Grease application recommended grease gun
THK: Grease Gun Unit MG70

Tip Shape P Type



4. Fall Prevention Type SRM3-Q

⚠CAUTION

■When the lock mechanism is operated manually, be sure to return it to its original state after manual confirmation before use. Also, do not perform manual operation except during adjustment as it is dangerous.

■Release the lock when mounting or adjusting the cylinder. If mounting work is performed while the lock is engaged, the lock part may be damaged.

■Do not use multiple cylinders in synchronization. Do not use a method where two or more fall prevention type cylinders are synchronized to move one workpiece. The lock of one of the cylinders may not be releasable.

■Use the speed controller with meter-out control. The lock may not be releasable with meter-in control.

■Be sure to use up to the cylinder stroke end on the side with the lock. If the cylinder piston does not reach the stroke end, the lock may not engage or the lock may not be releasable.

■Apply grease periodically to the sliding part of the lock lever.

For precautions during installation, adjustment, use, and maintenance, please refer to "During Use" in this catalog and the Instruction Manual on the CKD Component Product Site (https://www.ckd.co.jp/kiki/en/) -> "Model Number".