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: New handling system / hybrid robot

Design/selection

1. Lubrication

⚠CAUTION

■ Cylinder

This cylinder is no-lubrication. If lubrication is required, use turbine oil class 1 ISO VG32. Packing may be damaged if a different lubricant is used, and operation faults may occur. Take care to avoid lubrication shortages when reapplying lubricant. If lubricant runs out, operation will become unstable.

■ LM guide

Lubricate from the grease nipple every 100 km of travel distance.
Use one of:
Lithium grease (JIS 2)
Urea grease (JIS 2)
for lubrication.

2. Service life

⚠CAUTION

■ The life of the unit is greatly affected by the life of pneumatic components.

General components are used for pneumatic components, so life is 3 to 5 million operations or a travel of approx. 1,000 km.
(Usage conditions and operating environment greatly affects the service life, so the above values are not guaranteed)

Mounting, installation and adjustment

1. Mounting orientation

⚠WARNING

■ Units other than HRL-1(L) are all horizontally mounted only. Damage will result if mounted upside-down.

Select the vertical transfer (Z-axis direction) load capacity according to the inner cylinder's thrust.

2. Quality of air

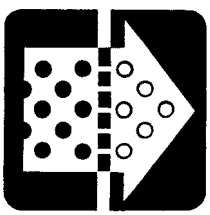
⚠CAUTION

■ The compressed air supplied to drive the unit must be clean and have low moisture.

Install a filter, etc., on the pneumatic circuit. Note the filter's nominal filtration rating, flow rate, and installation (near the direction valve). Thoroughly discharge drainage from the filter. (Regularly inspect to prevent drainage reaching the element.)

- If supplying a toxic compressed gas, the service life of repair parts (packings and gaskets) for the equipment (filters, direction control valves, cylinders, etc.) will be drastically reduced, causing faulty operation.

■ Ultra-dry air will shorten the life of pneumatic components, so should not be used.



3. Piping

⚠CAUTION

■ Before piping to the cylinder, be sure to carefully flush out (blow with compressed air) the inside of the pipes.

Cutting chips, sealing tape or rust from piping construction process may enter the pipes, causing faulty operation such as air leaks.

4. Centering adjustment

⚠CAUTION

When a 3-position all ports closed drive valve is used or if the block valve assembled slider table is slid with external force, negative pressure will be generated on the drive valve, and the seal belt may drop off, leading to air leakage; therefore, adjust with the block released.

Use/maintenance

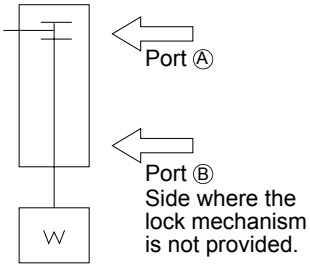
1. Position locking

⚠WARNING

■ Make sure to supply pressure to port Ⓑ, and before unlocking, check that load is not applied to the lock mechanism.
If pressure is supplied to port Ⓐ when both ports Ⓐ and Ⓑ are exhausted and the piston is locked, the lock may not be released or the piston rod may pop out. This can be extremely hazardous.

■ Keeping the cylinder with pressure applied to the lock mechanism may cause the stopper pin to come off.
Do not use 3-position closed center and 3-position P/A/B connection solenoid valves.

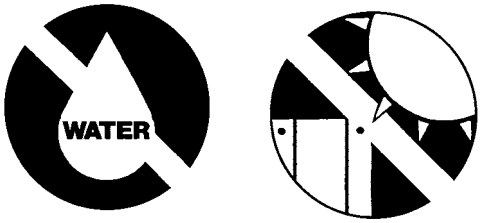
■ If back pressure is applied in the locked state, the lock may be released. Use a discrete solenoid valve or use an individual exhaust manifold.



2. External environment

⚠CAUTION

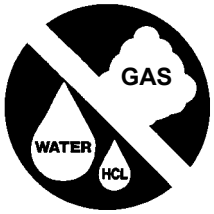
■ Install the unit and other equipment (filter, directional control valve, cylinder, etc.) where they will not be subject to rain or direct sunlight. Also, do not use this product outdoors.



■ Do not use this product where it will be subject to cutting chips, oil, coolant, oil mist, etc.
If this type of environment is unavoidable due to installation, provide a protective cover, etc.

■ Do not use this product where foreign matter such as cutting chips, dust, or spatter, etc., will contact or enter the units.
If this type of environment is unavoidable due to installation, provide a protective cover, etc.

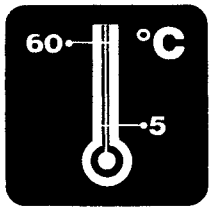
■ Do not use this product in an environment where it may be corroded.
Do not use in this kind of environment, or damage and/or misoperations may occur.



3. Operating ambient temperature

⚠CAUTION

■ The range of the ambient temperature within which the unit can be used is 5°C to 60°C.
Do not use the unit if the temperature exceeds 60°C, or damage and/or misoperations may occur.
If the temperature is less than 5°C, moisture in the circuit may freeze and lead to damage or faults. Take measures to prevent freezing.



4. Repair parts

⚠CAUTION

The cylinder, valve packings, O-rings, gaskets, cushioning rubber and shock absorbers used by this unit are repair parts. Refer to device catalogs for details on model No.
In particular, using a product with an ineffective shock absorber will increase vibrations/shocks and decrease stopping accuracy, potentially damaging the guide or other components; therefore, if it stops working well it should be replaced.