Series variation

Hybrid robot HR Series

2-action pneumatic robot

Model No.	Load capacity (kg)					Basic unit/basic cylinder		Stroke length (mm)			
	1	1.5	2	3	5	X-axis	Z-axis	50	75	100	
HRL-2S	●	●	●	●	●	HRL-1	HRL-1	●	●	●	
HRL-2G	●	●	●	●		SCM	SCM	●	●	●	

Single axis unit

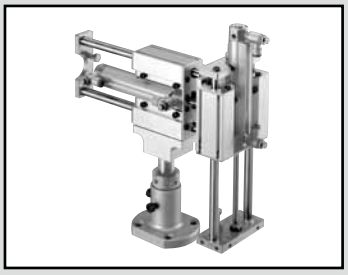
Model No.	Load capacity (kg)	Basic cylinder	Stroke length (mm)		Page
			Basic body shape	Long body shape	
HRL-1*	5/10/15/25/50/65	SCM	50/75/100/125/ 150/200/250/300	350/400/450/ 500/550/600	1418

Discontinue

●: Standard, : Not available

Stroke length (mm)												Page
	X-axis					Z-axis						
	125	150	200	250	300	25	50	75	100	125	150	
	●	●	●	●	●	●	●	●	●	●	●	1412
	●	●	●			●	●	●	●	●	●	1415

Discontinue



Hybrid robot
2-action pneumatic robot

HRL-2S Series

● Load capacity: 1/1.5/2/3/5 kg

RoHS CAD

Specifications

Descriptions		HRL-2S-1005	HRL-2S-1010	HRL-2S-1505	HRL-2S-1510	HRL-2S-1515
Load capacity (*1)	kg	1	1.5	2	3	5
Basic unit	X-axis	HRL-1-10	HRL-1-10	HRL-1-15	HRL-1-15	HRL-1-15
	Z-axis	HRL-1-05		HRL-1-05	HRL-1-10	
Guide rod diameter mm	X-axis	13	13	16	16	16
	Z-axis			13	13	
Speed	mm/s	50 to 300				
Repeatability	mm	±0.1				
Stroke length mm	X-axis	50 to 300				
	Z-axis	25 to 150				
Product weight	kg	7.1 + 0.0037 x X-axis stroke length + 0.0033 x Z-axis stroke length	7.2 + 0.0037 x X-axis stroke length + 0.0037 x Z-axis stroke length	7.8 + 0.0051 x X-axis stroke length + 0.0033 x Z-axis stroke length	7.9 + 0.0051 x X-axis stroke length + 0.0037 x Z-axis stroke length	8.6 + 0.0051 x X-axis stroke length + 0.0051 x Z-axis stroke length
Movable part weight kg	X-axis	3.3 + 0.0027 x X-axis stroke length + 0.0033 x Z-axis stroke length	3.4 + 0.0027 x X-axis stroke length + 0.0037 x Z-axis stroke length	3.6 + 0.0041 x X-axis stroke length + 0.0033 x Z-axis stroke length	3.7 + 0.0041 x X-axis stroke length + 0.0037 x Z-axis stroke length	4.4 + 0.0041 x X-axis stroke length + 0.0051 x Z-axis stroke length
	Z-axis	1.0 + 0.0025 x Z-axis stroke length	1.0 + 0.0027 x Z-axis stroke length	1.0 + 0.0025 x Z-axis stroke length	1.0 + 0.0027 x Z-axis stroke length	1.3 + 0.0041 x Z-axis stroke length
Speed controller		SC3W-6-6				
Shock absorber (*2)		NCK-00-0.7		X-axis NCK-00-1.2		NCK-00-1.2
				Z-axis NCK-00-0.7		
Working pressure	MPa	0.3 (≈44 psi, 3 bar) to 0.7 (≈100 psi, 7 bar)				

*1 : Load capacity varies with air pressure, speed and absorption energy. (Value is for reference.)
*2 : Use at 74% or less of the shock absorber's allowable value at the working speed and working air pressure.

Switch specifications

● 1-color/2-color display/for AC magnetic field proof

Descriptions	Proximity 2-wire			Proximity 3-wire			Reed 2-wire				Proximity 2-wire
	T2H/T2V	T2JH/T2JV	T2YH/T2YV	T3H/T3V	T3PH/T3PV (Custom order)	T3YH/T3YV	T0H/T0V		T5H/T5V		T2YD
Applications	Dedicated for programmable controller			For programmable controller, relay			For programmable controller, relay		For programmable controller, relay, IC circuit (no indicator lamp), serial connection		For programmable controller
Output method	-			NPN output	PNP output	NPN output	-				-
Pwr. supp. V.	-			10 to 28 VDC			-				-
Load voltage	10 to 30 VDC			30 VDC or less			12/24 VDC	110 VAC	5/12/24 VDC	110 VAC	24 VDC ±10%
Load current	5 to 20 mA (*1)			100 mA or less		50 mA or less	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less	5 to 20 mA
Indicator lamp	LED (Lit when ON)		Red/green LED (Lit when ON)	LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)		-		Red/green LED (Lit when ON)
Leakage current	1 mA or less			10 μA or less			0 mA				1 mA or less
Weight	1 m:18 g 3 m:49 g 5 m:80 g		1 m:33 g 3 m:87 g 5 m:142 g	1 m:18 g 3 m:49 g 5 m:80 g		1 m:33 g 3 m:87 g 5 m:142 g	1 m:18 g 3 m:49 g 5 m:80 g				1 m:61 g 3 m:166 g 5 m:272 g

*1 : The above max. load current is 20 mA at 25°C. The current is lower than 20 mA if the operating ambient temperature around the switch is higher than 25°C. (5 to 10 mA at 60°C)
*2 : Switch for AC magnetic field (T2YD) cannot be used in DC magnetic field.
*3 : Refer to Ending Page 1 for other switch specifications.
*4 : Dimensions depend on switch model No. Refer to Ending Page 18 for details.

How to order

HRL-2S - 1005 - 50 - 25 - Q - T0H3

- Ⓐ Load capacity
- Ⓑ X-axis stroke length
- Ⓒ Z-axis stroke length
- Ⓓ Position locking mechanism
- Ⓔ Switch model No. * indicates the lead wire length. *2

Code	Content
Ⓐ Load capacity	
1005	1 kg
1010	1.5 kg
1505	2 kg
1510	3 kg
1515	5 kg

Ⓑ X-axis stroke length (mm)

50, 75, 100, 125, 150, 200, 250, 300

Ⓒ Z-axis stroke length (mm)

25, 50, 75, 100, 125, 150

Ⓓ Position locking mechanism	
Blank	Without
Q	With

Ⓔ Switch model No.

Axial lead wire	Radial lead wire	Contact	Voltage AC	Voltage DC	Display	Lead wire
T0H*	**T0V***	Reed	●	●	1-color display	2-wire
T5H*	**T5V***		●	●	Without indicator lamp	
T2H*	**T2V***	Proximity		●	1-color display	2-wire
T3H*	**T3V***			●		3-wire
T2YH*	**T2YV***			●	2-color display	2-wire
T3YH*	**T3YV***			●		3-wire
T2YD*	**-**			●	2-color display for AC magnetic field	2-wire
T2YDT*	**-**			●		
T2JH*	**T2JV***			●	1-color display off-delay	2-wire

*** Lead wire length**	
Blank	1 m (standard)
3	3 m (option)
5	5 m (option)

⚠ Precautions for model No. selection

*1 The position locking mechanism can be installed on the head side of the cylinder only.
*2 2 pcs. installed per X- and Z-axis as standard.

[Example of model No.]

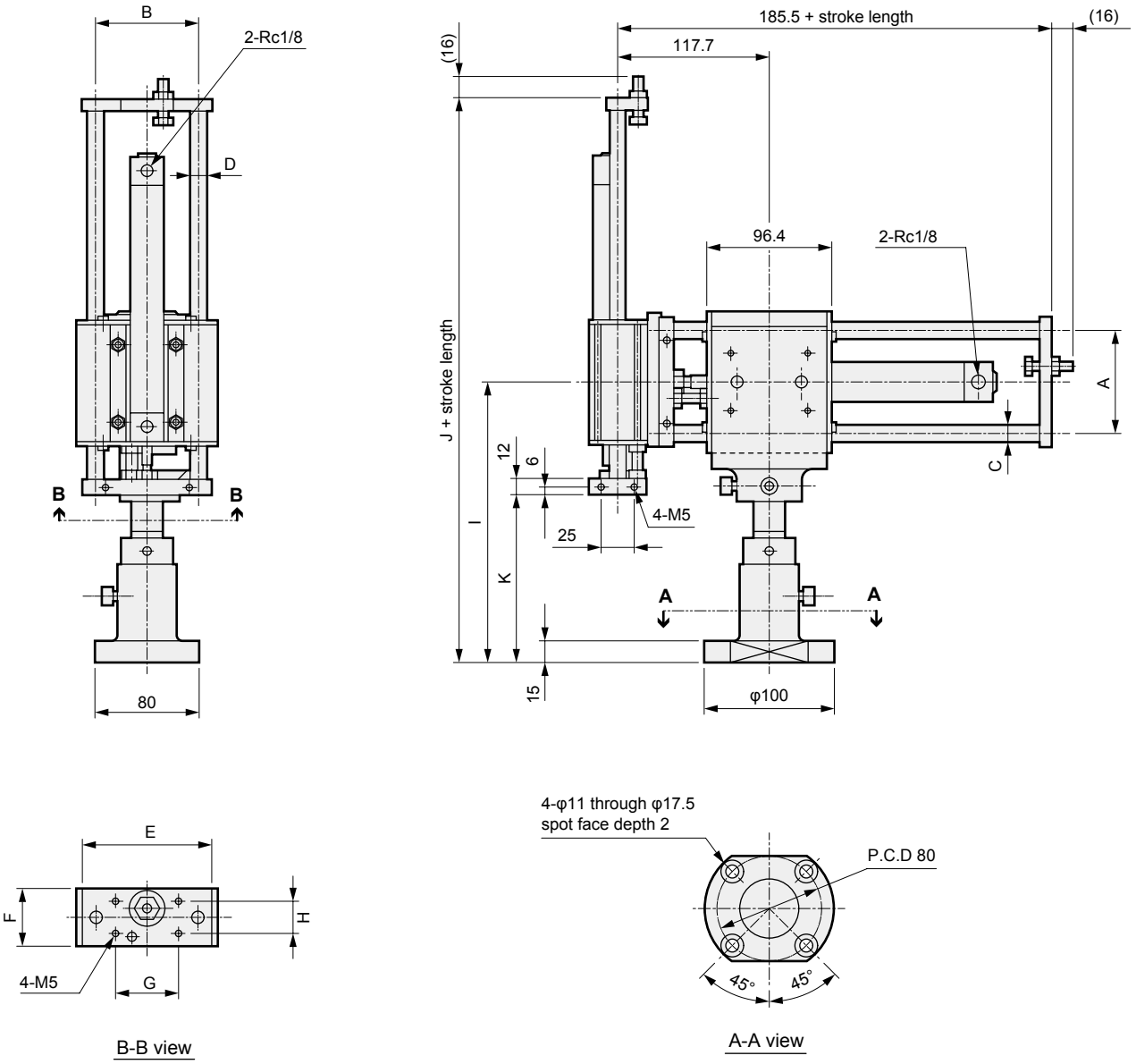
HRL-2S-1005-50-25-Q-T0H3

Model: Hybrid robot HRL-2S Series
Ⓐ Load capacity : 1 kg
Ⓑ X-axis stroke length : 50 mm
Ⓒ Z-axis stroke length : 25 mm
Ⓓ Position locking mechanism : With
Ⓔ Switch model No. : Reed T0H switch, lead wire 3m

Discontinue

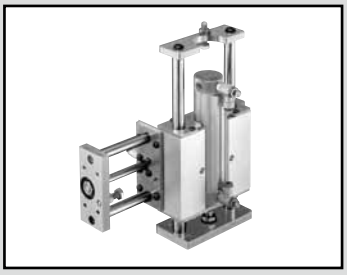
HRL-2S Series

Dimensions CAD



Basic model No.	A	B	C	D	E	F	G	H	I	J	K
HRL-2S-1005	80	80	φ13	φ13	100	44	50	25	215	283	129
-1010											
-1505	94		φ16						225	293	139
-1510											
-1515		94		φ16	120		60				

Discontinue



Hybrid robot
2-action pneumatic robot

HRL-2G Series

● Load capacity: 1/1.5/2/3 kg

RoHS CAD

Specifications

Descriptions		HRL-2G-1005	HRL-2G-1010	HRL-2G-1505	HRL-2G-1510
Load capacity (*1)	kg	1	1.5	2	3
Basic cylinder	X-axis	SCM-00-20D	SCM-00-25D	SCM-00-20D	SCM-00-25D
	Z-axis	SCM-00-25D		SCM-00-32D	
Guide rod diameter	X-axis	13			
mm	Z-axis	13		16	
Speed	mm/s	50 to 300			
Repeatability	mm	±0.1			
Stroke length	X-axis	50 to 200			
mm	Z-axis	25 to 150			
Product weight	kg	4.7 + 0.0033 x X-axis stroke length + 0.0037 x Z-axis stroke length	4.7 + 0.0037 x X-axis stroke length + 0.0037 x Z-axis stroke length	5.7 + 0.0033 x X-axis stroke length + 0.0052 x Z-axis stroke length	5.7 + 0.0037 x X-axis stroke length + 0.0052 x Z-axis stroke length
Movable part weight	X-axis	1.0 + 0.0025 × X-axis stroke length	1.0 + 0.0027 × X-axis stroke length	1.0 + 0.0025 × X-axis stroke length	1.0 + 0.0027 × X-axis stroke length
kg	Z-axis	3.6 + 0.0033 x X-axis stroke length + 0.0007 x Z-axis stroke length	3.7 + 0.0037 x X-axis stroke length + 0.0007 x Z-axis stroke length	4.2 + 0.0033 x X-axis stroke length + 0.0011 x Z-axis stroke length	4.3 + 0.0037 x X-axis stroke length + 0.0011 x Z-axis stroke length
Speed controller		SC3W-6-6			
Shock absorber (*2)		NCK-00-0.7		X-axis NCK-00-0.7 Z-axis NCK-00-1.2	
Working pressure	MPa	0.3 (≈44 psi, 3 bar) to 0.7 (≈100 psi, 7 bar)			

*1 : Load capacity varies with air pressure, speed and absorption energy. (Value is for reference.)
*2 : Use at 74% or less of the shock absorber's allowable value at the working speed and working air pressure.

Switch specifications

● 1-color/2-color display/for AC magnetic field proof

Descriptions	Proximity 2-wire			Proximity 3-wire			Reed 2-wire				Proximity 2-wire
	T2H/T2V	T2JH/T2JV	T2YH/T2YV	T3H/T3V	T3PH/T3PV (Custom order)	T3YH/T3YV	T0H/T0V		T5H/T5V		T2YD
Applications	Dedicated for programmable controller			For programmable controller, relay			For programmable controller, relay		For programmable controller, relay, IC circuit (no indicator lamp), serial connection		For programmable controller
Output method	-			NPN output	PNP output	NPN output	-				-
Pwr. supp. V.	-			10 to 28 VDC			-				-
Load voltage	10 to 30 VDC			30 VDC or less			12/24 VDC	110 VAC	5/12/24 VDC	110 VAC	24 VDC ±10%
Load current	5 to 20 mA (*1)			100 mA or less		50 mA or less	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less	5 to 20 mA
Indicator lamp	LED (Lit when ON)		Red/green LED (Lit when ON)	LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)		-		Red/green LED (Lit when ON)
Leakage current	1 mA or less			10 μA or less			0 mA				1 mA or less
Weight	1 m:18 g 3 m:49 g 5 m:80 g		1 m:33 g 3 m:87 g 5 m:142 g	1 m:18 g 3 m:49 g 5 m:80 g		1 m:33 g 3 m:87 g 5 m:142 g	1 m:18 g 3 m:49 g 5 m:80 g				1 m:61 g 3 m:166 g 5 m:272 g

*1 : The above max. load current is 20 mA at 25°C. The current is lower than 20 mA if the operating ambient temperature around the switch is higher than 25°C. (5 to 10 mA at 60°C)
*2 : Switch for AC magnetic field (T2YD) cannot be used in DC magnetic field.
*3 : Refer to Ending Page 1 for other switch specifications.
*4 : Dimensions depend on switch model No. Refer to Ending Page 18 for details.

Discontinue

HRL-2G Series

How to order

HRL-2G - **1505** - **50** - **25** - **T0H3**

- Ⓐ Load capacity
- Ⓑ X-axis stroke length
- Ⓒ Z-axis stroke length
- Ⓓ Switch model No.
  * indicates the lead wire length.
  *1

Code	Content
Ⓐ Load capacity	
1005	1 kg
1010	1.5 kg
1505	2 kg
1510	3 kg

Ⓑ X-axis stroke length (mm)

50, 75, 100, 125, 150, 200

Ⓒ Z-axis stroke length (mm)

25, 50, 75, 100, 125, 150

Ⓓ Switch model No.

Lead wire straight	Lead wire L-shaped	Contact	Voltage AC	Voltage DC	Display	Lead wire
T0H*	**T0V***	Reed	●	●	1-color display	2-wire
T5H*	**T5V***	Reed	●	●	Without indicator lamp	2-wire
T2H*	**T2V***	Proximity		●	1-color display	2-wire
T3H*	**T3V***	Proximity		●	1-color display	3-wire
T2YH*	**T2YV***	Proximity		●	2-color display	2-wire
T3YH*	**T3YV***	Proximity		●	2-color display	3-wire
T2YD*	**-**	Proximity		●	2-color display AC magnetic field	2-wire
T2YDT*	**-**	Proximity		●	2-color display AC magnetic field	2-wire
T2JH*	**T2JV***	Proximity		●	1-color display off-delay	2-wire

*** Lead wire length**

Blank	1 m (standard)
3	3 m (option)
5	5 m (option)

⚠ Precautions for model No. selection

*1 2 pcs. installed per X- and Z-axis as standard.

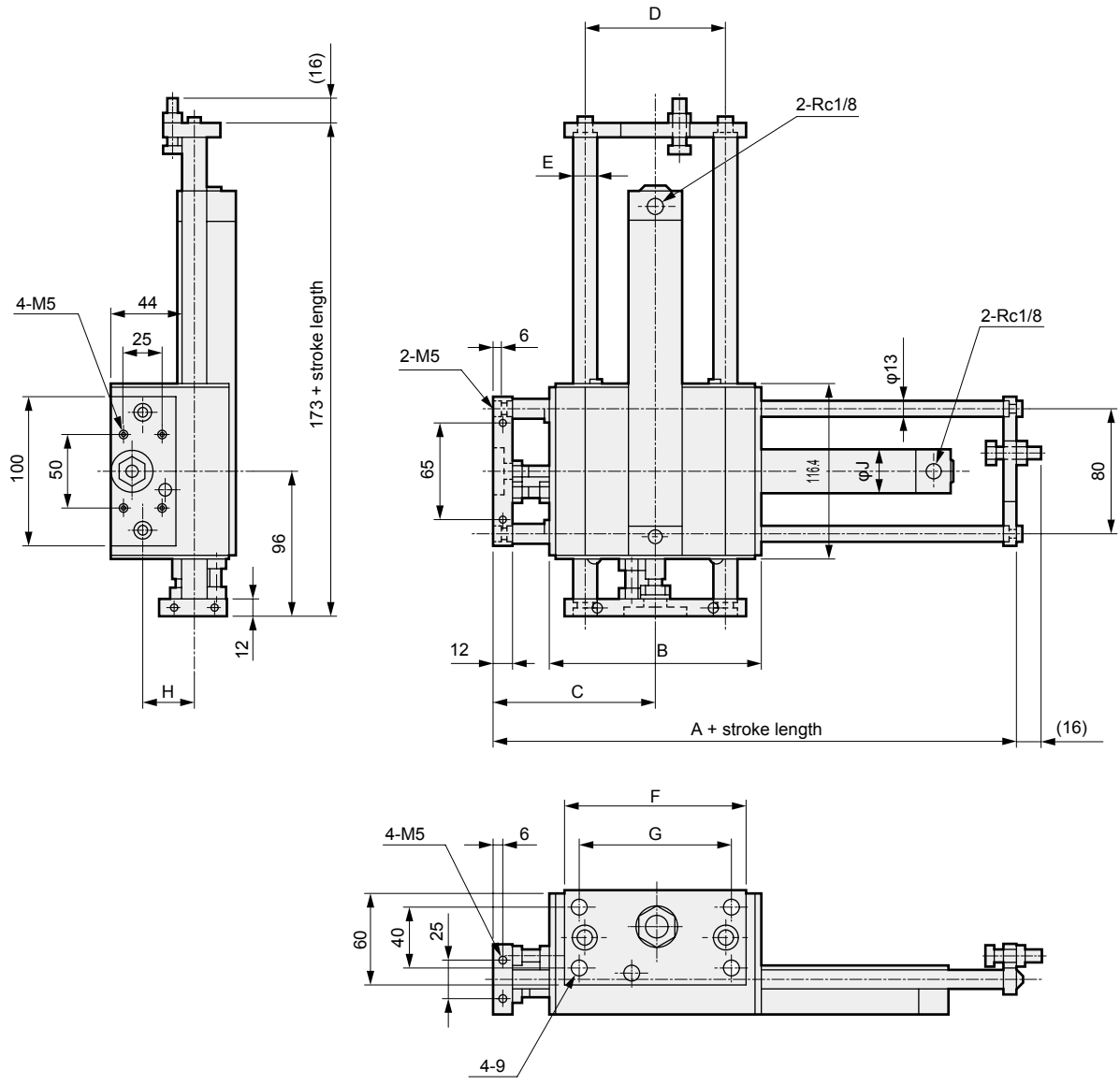
[Example of model No.]

HRL-2G-1505-50-25-T0H3

Model: Hybrid robot HRL-2G Series
Ⓐ Load capacity : 2kg
Ⓑ X-axis stroke length : 50 mm
Ⓒ Z-axis stroke length : 25 mm
Ⓓ Switch model No. : Reed T0H switch, lead wire 3m

Dimensions

● HRL-2G



Basic model No.	A	B	C	D	E	F	G	H	I	J
HRL-2G-1005	174	116.4	96	80	φ13	100	80	31	31	26
-1010										31
-1505	194	136.4	106	94	φ16	120	100	34	38	26
-1510										31

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

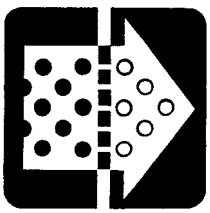
⚠CAUTION

■ 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

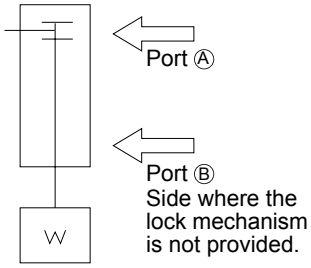
1. Position locking

⚠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.

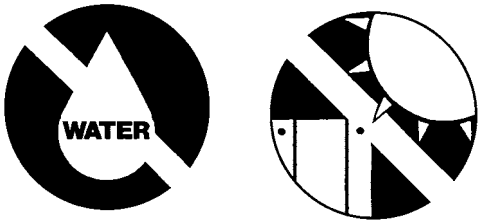
■ If back pressure is applied in the locked state, the lock may be released. Use a discrete solenoid valve or use an individual exhaust manifold.



2. External environment

⚠CAUTION

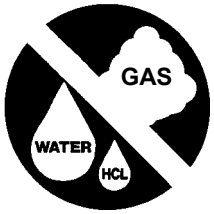
■ Install the unit and other equipment (filter, directional control valve, cylinder, etc.) where they will not be subject to rain or direct sunlight. Also, do not use this product outdoors.



■ 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.

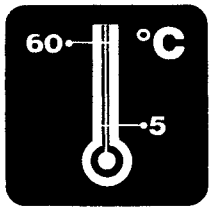
■ Do not use this product in an environment where it may be corroded.
Do not use in this kind of environment, or damage and/or misoperations may occur.



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.