
Operating Instruction

High pressure valve
2way/3way
Series HP



Introduction

This manual includes the instruction regarding 2/3-way Piston valves/ Series HP.

Make sure to read important notice and cautions before conducting any work with a full understanding of the content.

Please refer to each specified delivered drawing because the sketch, drawing, and photos in this instruction are only basic referential purpose.

This manual does not contain the procedures for special type of specification. Please contact us for further details of procedures for the special specification product.

※ Please be advised that the content of this manual may change without any advanced notice.

Contents

Safety Instruction	.....	3
Product feature	.....	4
Main specifications	.....	4
Appearance & Procut coding	.....	5
Explanation of movement	.....	6
Structure	.....	7
Operation condition	.....	11
Installation	.....	14
Operation	.....	16
Disassembly	.....	17
Assembly	.....	20
Trouble shooting	.....	24
Product service system	.....	26

Safety Instruction

Inappropriate handling of the products may lead to the unreliable performance or serious accidents. In order to prevent any accident, be sure to read carefully this catalogue, and fully understand the contents for safe handling.

Remember that your special attention must be paid to the messages with the words “DANGER”, “WARNING” and “CAUTION”. Non-observance of these messages may pose dangers to operators or machines. These are important safety messages and require your strict observance, adding to International Standards (JIS/ISO/IEC), and other safety regulations.

Safety advisories in this catalogue are classified into “DANGER”, “WARNING” and “CAUTION”, according to the degree of risk and hindrance.



Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.



Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

Important instructions are categorized and depicted in this manual as follows.



This symbol indicates an action that should be observed.



This symbol indicates an action that should not be taken.



This symbol indicates mandatory actions that must be adhered to.

Product feature

These piston valves use a single spring-return air cylinder to drive pneumatic pressure, and are offered as 2-way valves for open-close functions and 3-way valves for path switching functions.

2-way valves can be provided in two types: Normal Open (NO) where the port 1-2 path is open when the air supply is off, and Normal Closed (NC) where the port 1-2 path is closed when the air supply is off. For 3-way valves, the port 1-2 path is closed and the port 2-3 path open when the air supply is off, and the port 1-2 path is open and the port 2-3 path closed when the air supply is on. A long-term high-quality seal is maintained under the high temperature, high pressure environment of a tire curing press by specifying the use of a specialized fiber (carbon fiber PTFE) for the stem which connects to the valve set of the valve body.

They are also designed to allow easy maintenance, such as disassembly and assembly for parts replacement. The valves are for use in the internal or external pressure systems, hydraulic systems and air systems of tire curing presses.

Main specifications

Fluid	Hot water、Cold water	
Maximum Working Pressure	10MPa (Flange-type)、15MPa (Threaded type) * ¹	
Maximum Working Temp.	100°C	
Operation Air Pressure	0.25~0.35MPa	
End Connection	Pilot port	Rc1/4
	Ports 1, 2 &3	Threaded End (Rc)
		Flanged End (JIS 63K B 2220 : 2012 * ²)
Material of main parts * ³	Body : SUS304 (Seat: Stellite hard facing)	
	Flange : S25C	
	Lower Seat : SUS304 (Seat: Stellite hard facing)	
	Stem : SUS304 with hard chrome plating	
	Seat: Seat: Stellite hard facing	

* 1 : The maximum usage pressure is limited for port 3. See page 11 for details.

* 2 : Some dimensions differ from JIS standard. See page 12 for details.

* 3 : See valve assembly diagram for details.

Appearance & Product Coding

	2 way		3 way	
Appearance				
Model	HP2211 – □P	HP2212 – □JP	HP2311 – □P	HP2312 – □JP
Ports 1 & 2	Threaded	Flanged	Threaded	Flanged
Port 3	Plugged* ¹	Plugged* ¹	Threaded	Threaded
Max operating pressure	15MPa	10MPa	15MPa* ²	10MPa* ²

* 1 : 2-way valve consists from 3-way valve with a Plug attached to Port 3 of 3 way valve.

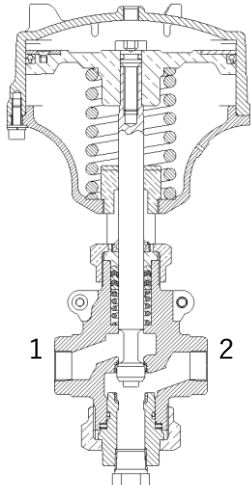
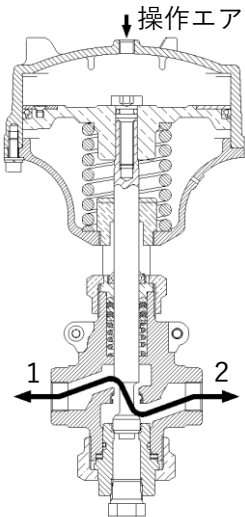
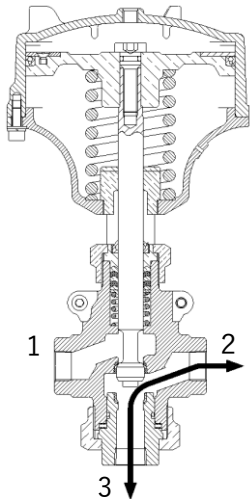
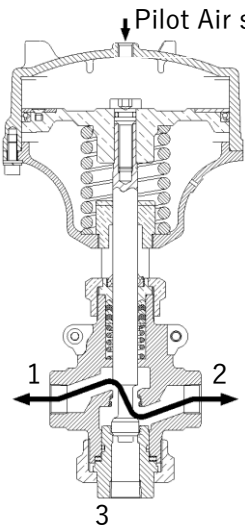
* 2 : Please see “Operation condition” on page 11 regarding pressure limitation of Port 3.

Code

	N1	N2	N3	N4		N5	N6	N7	N8
HP	2	2	1	1	-	25	J	P	Z1

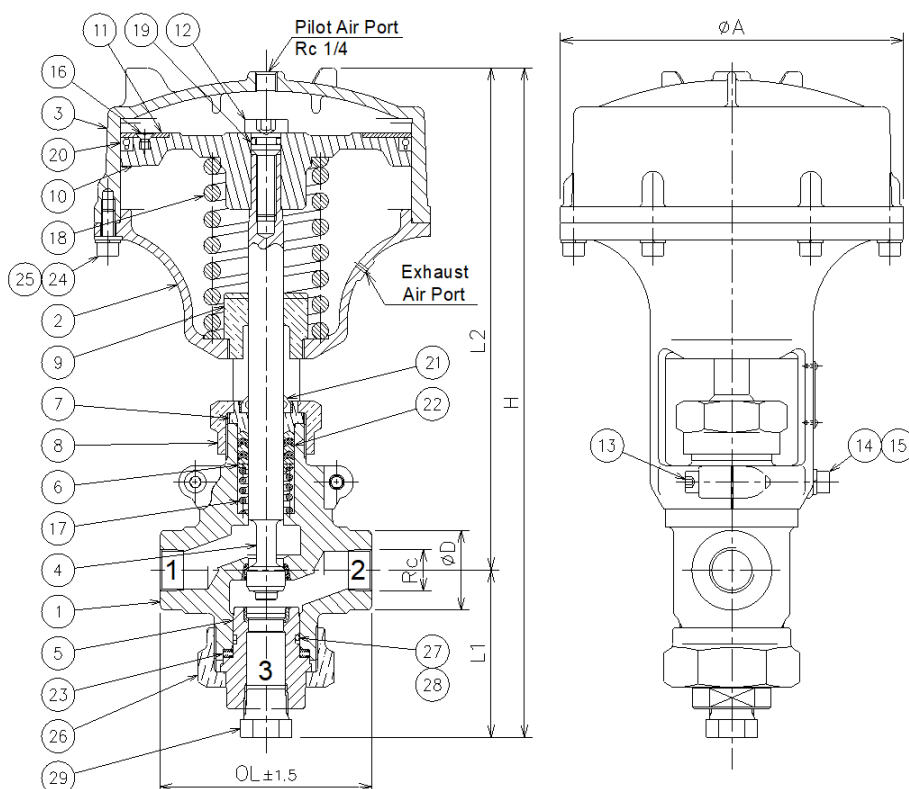
	Meaning of symbol	Code	Meaning of code	Remarks
N1	Model	2	2 nd Model	
N2	Number of Ports	2	2-way type	
		3	3-way type	
N3	Function	1	2-way Normally Closed (NC) or 3-way	
N4	End Connection	1	Ports 1 & 2: Threaded	
		2	Ports 1 & 2: Flanged	
N5	Nominal Size	15	DN15	
		20	DN20	
		25	DN25	
		32	DN32	
		40	DN40	
		50	DN50	
N6	End connection Flange Type	Nil	— (N4 : “When 1”)	
		J	JIS 63K	
N7	End connection/ Pilot Port Thread Type	P	Rc / Rc (Pilot air port size : 1/4”)	
N8	Specialized Code	Z□□	Specialized Specification	

Explanation of movement

	Pilot Air supply OFF	↔	Pilot Air supply ON
2-way valve	 The stem which is coupled to the piston is pushed upwards by the power of the spring so that a barrier forms between port 1 and 2.		 The stem which is coupled to the piston is pushed downwards by air pressure resisting against the power of the spring so that port 1 and 2 connect.
3-way valve	 The stem which is coupled to the piston is pushed upwards by the power of the spring so that a barrier forms between port 1 and 2. In this state, port 2 and 3 connect.		 The stem which is coupled to the piston is pushed downwards by air pressure resisting against the power of the spring so that a barrier forms between port 2 and 3. In this state, port 1 and 2 connect.

Structure

2-way	HP2211-□P	Ports 1, 2	Threaded	Port 3	Plugged
-------	-----------	------------	----------	--------	---------



☆ Recommended spare part

12	Tension Bolt
11	Set Ring Plate
10	Piston
9	Guide Bush
8	Gland Nut
7	Gland
6	Ring Washer
5	Lower Seat
4	Stem
3	Cylinder
2	Yoke Stand
1	Body

☆
☆
☆
☆
☆

24	Socket Cap Screw
23	Gasket Packing
22	Gland Packing
21	Dust Seal
20	Piston Ring
19	O-Ring
18	Spring
17	Packing Spring
16	Flat Head Screw
15	Spring Lock Washer
14	Socket Cap Screw
13	Socket Cap Screw

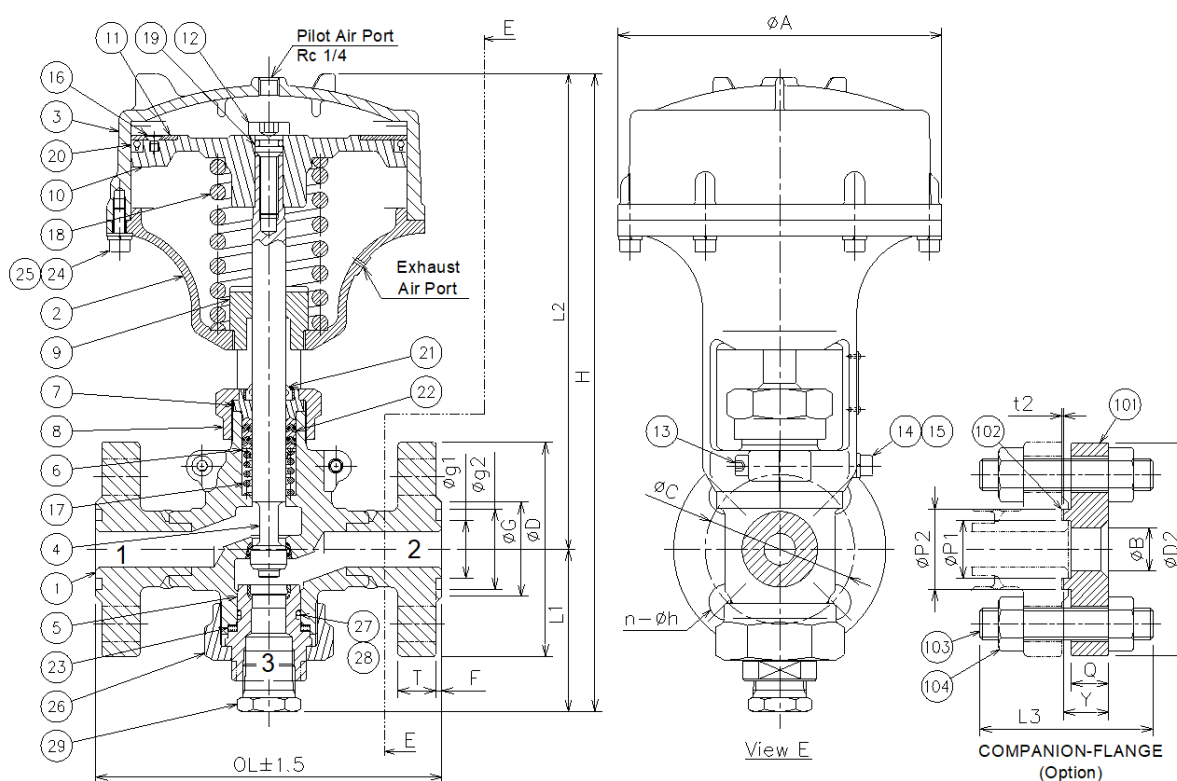
☆
☆

29	Plug
28	Back Up Ring
27	O-Ring
26	Union Nut
25	Spring Lock Washer

Weight	DN15	DN20	DN25	DN32	DN40	DN50
kg	6.5	16.3	16.3	29.5	29.5	35.1

※ See valve assembly drawings for details.

2way HP2212-□JP	Port 1, 2	Flanged	Port 3	Plugged
-----------------	-----------	---------	--------	---------



12	Tension Bolt
11	Set Ring Plate
10	Piston
9	Guide Bush
8	Gland Nut
7	Gland
6	Ring Washer
5	Lower Seat
4	Stem
3	Cylinder
2	Yoke Stand
1	Body & Flange

☆
☆
☆
☆
☆

24	Socket Cap Screw
23	Gasket Packing
22	Gland Packing
21	Dust Seal
20	Piston Ring
19	O-Ring
18	Spring
17	Packing Spring
16	Flat Head Screw
15	Spring Lock Washer
14	Socket Cap Screw
13	Socket Cap Screw

☆ Recommended spare part

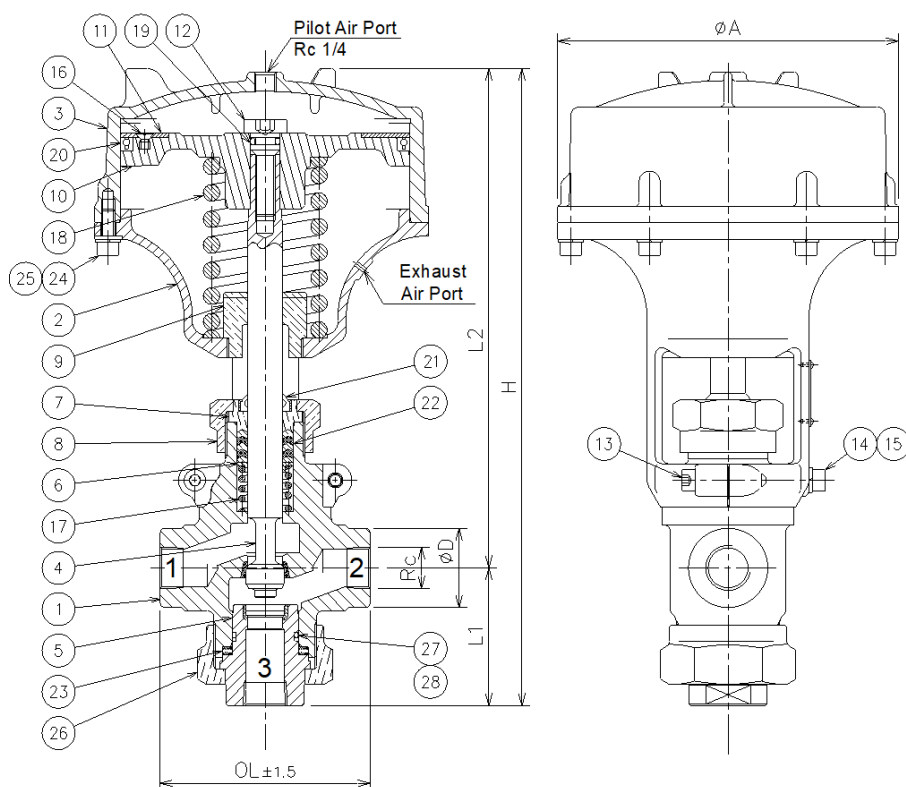
* : Option

* 104	Nut
* 103	Bolt
☆ * 102	Gasket Packing
* 101	Companion Flange
29	Plug
☆ 28	Back Up Ring
☆ 27	O-Ring
26	Union Nut
25	Spring Lock Washer

Weight	DN15	DN20	DN25	DN32	DN40	DN50
kg	10.1	21.2	22.0	36.5	39.7	47.3

※ See valve assembly drawings for details.

3 way	HP2311-□P	Port 1, 2	Threaded	Port 3	Threaded
-------	-----------	-----------	----------	--------	----------



☆ Recommended spare part

12	Tension Bolt
11	Set Ring Plate
10	Piston
9	Guide Bush
8	Gland Nut
7	Gland
6	Ring Washer
5	Lower Seat
4	Stem
3	Cylinder
2	Yoke Stand
1	Body

☆
☆
☆
☆
☆

24	Socket Cap Screw
23	Gasket Packing
22	Gland Packing
21	Dust Seal
20	Piston Ring
19	O-Ring
18	Spring
17	Packing Spring
16	Flat Head Screw
15	Spring Lock Washer
14	Socket Cap Screw
13	Socket Cap Screw

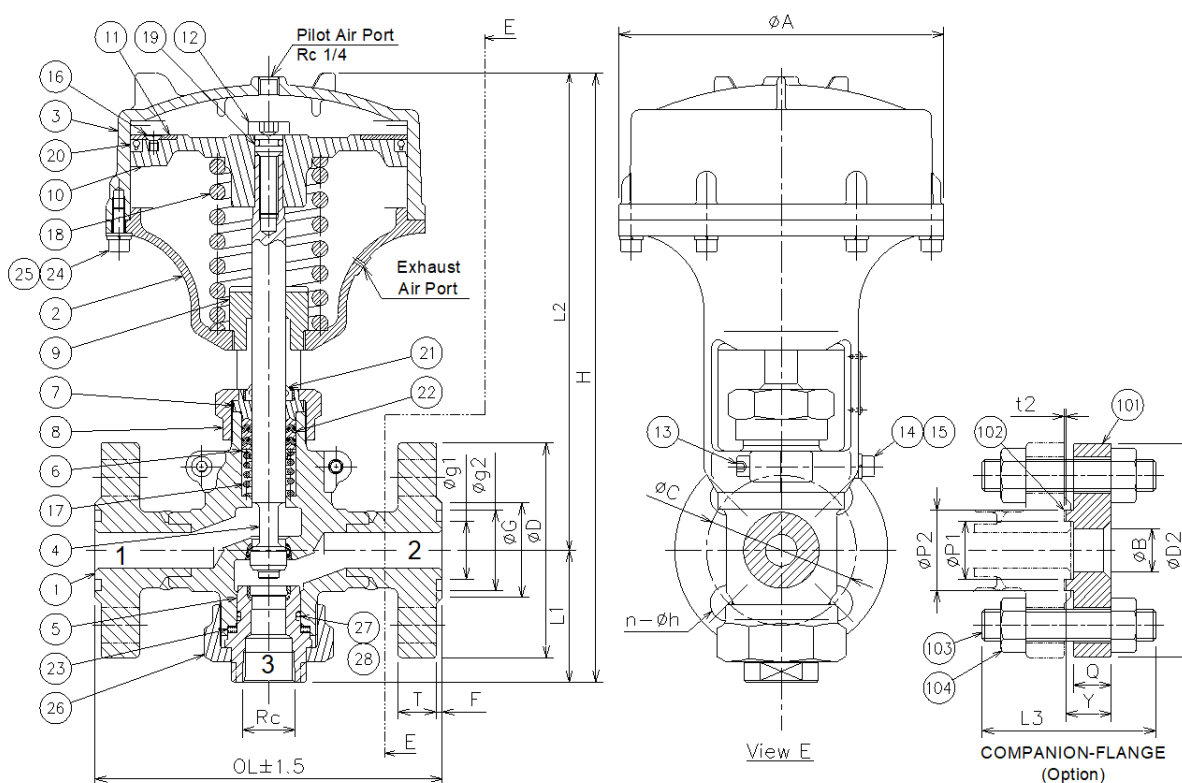
☆
☆

28	Back Up Ring
27	O-Ring
26	Union Nut
25	Spring Lock Washer

Weight	DN15	DN20	DN25	DN32	DN40	DN50
kg	6.4	16.1	16.1	29.2	29.2	34.7

※ See valve assembly drawings for details

3 way HP2312-□JP	Port 1, 2	Flanged	Port 3	Threaded
------------------	-----------	---------	--------	----------



☆ Recommended spare part

12	Tension Bolt
11	Set Ring Plate
10	Piston
9	Guide Bush
8	Gland Nut
7	Gland
6	Ring Washer
5	Lower Seat
4	Stem
3	Cylinder
2	Yoke Stand
1	Body & Flange

☆
☆
☆
☆
☆

24	Socket Cap Screw
23	Gasket Packing
22	Gland Packing
21	Dust Seal
20	Piston Ring
19	O-Ring
18	Spring
17	Packing Spring
16	Flat Head Screw
15	Spring Lock Washer
14	Socket Cap Screw
13	Socket Cap Screw

* : Option

*	104	Nut
*	103	Bolt
☆ *	102	Gasket Packing
*	101	Companion Flange
☆	28	Back Up Ring
☆	27	O-Ring
	26	Union Nut
	25	Spring Lock Washer

Weight	DN15	DN20	DN25	DN32	DN40	DN50
kg	10.0	21.0	21.8	36.2	39.4	46.9

※ See valve assembly drawings for details

Operation condition



WARNING

Use valve according to scope of specification. If not, it may lead to serious accident.

○ Operating Fluids

The fluid that can be used is Water at 100° C or less.

○ Operating Pressure

Maximum Operating Pressure of fluids is 10MPa for Flanged type and 15MPa for Threaded type. However, the maximum usage pressure for port 3 on HP 3-way valve when the air supply is on (when Port 3 is closed) is dependent on the operating air pressure. Set the operating air pressure with reference to the table below.

Maximum Working pressure for HP 3 way valve Port 3 with Operating Air Supply as “ON”

Units: MPa

Nominal size	Operating air pressure (MPa)		
	0.25	0.30	0.35
DN15	2.8	5.4	8.1
DN20	6.4	9.6	12.7* ¹
DN25	6.4	9.6	12.7* ¹
DN32	3.8	5.7	7.5
DN40	3.8	5.7	7.5
DN50	3.3	4.5	5.6

* 1 : Use less than 10MPa for Flange type.

○ Power source

Use clean, moisture-free compressed air (0.25~0.35MPa*⁴) as the operating fluid. If lubricant is used, use one that will not affect the lubricant*² which has been already applied inside Cylinder. The use of a quick exhaust valve, which contributes to the exhaust speed of operating air, may affect seal life due to the increased impact of the soft seat of the valve plug on the valve seat.

* 2 : Lithium-based grease (Daphne Eponex SR No.2/Idemitsu Kosan)

○ Maximum allowable leak rate

This valve is a metal seat type, and the amount of seat leakage when closed complies with the classification rate B*³ of the General Rules for Valve Inspection (JIS B 2003:2018).

The actual leakage amount is much lower than the allowable value because the seat section is sliding lined.

* 3 : 0.3 mm³/s x Nominal size of valve A (Test fluid: Air)

○ Flange dimension

The flange dimensions of the valve body and phase flange are based on the groove type (TG) 63K flange of JIS B 2220 : 2012, but the gasket is assumed to use our standard product, so the values of F and Y are our own dimensions. However, for the phase flange, a JIS-compliant commercially available groove tongue and groove (TG-T) 63K flange can be used.

	HP dimension		JIS B 2220 : 2012
	DN15	DN20-50	DN15-50
F	3	4	5
Y	Q+4	Q+5	Q+6

Please refer to "Structure (p7-10)" for the illustrated locations of F, Y, and Q.

For the gasket, use our standard gasket (Cu x 1t) or equivalent.

○ Mounting position

The mounting position of this product should be used within the range of actuator upright (upward) to horizontal (sideways). Although the actuator can be operated from horizontal to downward, avoid doing so as it may cause trouble.

○ Water Hammer

Design piping to account for water hammer when using hot and cold water. Consider setting up a speed controller to control the supply and exhaust speed of the operating air as an avoidance mitigation measure. This will reduce the operating speed of the stem and is expected to reduce water hammer.

The quick exhaust valves that contribute to the exhaust velocity of the operating air should not be used.

Please contact us for special specifications with a dashpot installed on the top of the cylinder.

○ Usage Environment

This product should be installed indoors and used at an ambient temperature of 80° C or less and an ambient humidity of 80%RH or less. If the product is exposed to radiant heat from the surrounding area, take measures such as installing a heat shield. In addition, make sure that the product is not affected by corrosive or explosive gases, dust, sand, or vibrations. In addition, when the product is used in cold climates, consideration should be given to the prevention of freezing.

○ Location

When installing this product, ensure that a workspace is available for safe and easy operation and maintenance. Also, consider supporting the valve itself or the piping in front of and behind it so that the piping in front of and behind it is not overloaded by the valve's own weight.

Installation

 WARNING	Do not stand under the lift when the goods are lifted during transportation. If not avoided, it could lead to serious injury.
 WARNING	Wear safety gear such as Helmet, protective glasses, protective gloves, safety shoes, and other necessary gear for protection.
 CAUTION	Use machine (such as crane or lift) when handling overweight product.
 CAUTION	Do not step on valve nor actuator during work. If not avoided, It could lead to serious injury by slipping feet and so on.

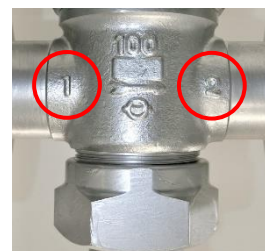
Remove all packing materials from the valve.

Prior to the installation the pipeline should be checked for contamination and foreign particles and cleaned if necessary.

The proper function of the completely mounted valve has to be checked prior to putting the installation into service.

○ Installation/ General information

- The valve body is embossed with markings of Port numbers 「1」 「2」. (There is no 3) Check the piping diagram and install the piping in the correct direction.
- The mounting posture should be within the range of actuator upright (upward) to horizontal (sideways). Although it can be operated from horizontal to downward, avoid doing so as it may cause trouble.



○ Installation/ Threaded connection

- Tapered pipe threads on the pipe side should be free from scratches and retain the default effective thread length.
- After cleaning the taper threads with a brush or cloth, wrap the taper threads with sealing tape or apply sealant. At this time, please follow the specified installation method (winding method, application method, appropriate amount, etc.).
- For parallel threads, use a sealing material (gasket, O-ring, etc.) suitable for the seat surface.
- Use the appropriate torque for the pipe size when tightening. Excessive torque will result in damage such as cracking of the connection.
- When piping to the lower seat, be careful not to apply excessive tension or lateral load. This may cause seal failure of the gasket seal.

- When tightening, hang the tool on the connection end of the valve on the side where the piping is screwed in.
- When tightening the valve to pipes, hang the tool on the connecting end of the valve closer to the pipe connection side.

○ Installation/ Flanged connection

- Make sure that the flange surface and the gasket surface to be used are free from harmful scratches and adherence of foreign matter.
- When tightening bolts, make sure that the flange surfaces are properly parallel. Do not adjust the flange center misalignment by tightening the bolts, nor adjust the distance between the faces.
- When tightening the bolts, first tighten the bolts lightly by hand so that the gasket is evenly tightened, then use a wrench or torque wrench to gradually tighten the bolts at diagonal positions alternately and with even force to avoid one-sided tightening. Final tightening should be torque-controlled to prevent excessive tightening.

○ After installation

- Make sure that the valve and both end pipes are correctly centered.
- Flush inside of the valve and piping with air blowers, etc. During flushing, keep the valve fully open and do not open or close it. Foreign matter (dust, sand, scale, welding spatters, etc.) may enter the piping due to piping work. If the seat or any parts are damaged by such foreign matter, it may cause leakage.

Operation

 CAUTION	Use valve within the specification range. Use of the valve under conditions exceeding temperature and pressure specifications may cause serious accidents.
 CAUTION	Never loosen the bolts, etc. of the piping connections or actuator parts while the fluid is pressurized during operation. Doing so may cause personal injury.

○ Power source

- Use clean, moisture-free compressed air (0.25~0.35MPa*⁴) as the operating fluid. If lubricant is used, use one that will not affect the lubricant* which has been already applied inside Cylinder.

* : Lithium-based grease (Daphne Eponex SR No.2/Idemitsu Kosan)

○ Trial run

- First, visually or audibly check that the stem operates smoothly and that there is no abnormality in any part while repeatedly supplying and exhausting air to the operating air port with no fluid flowing through the valve.
- Next, pass fluid through the valve and check in the same manner. At this time, increase the pressure and temperature of the fluid step by step, and finally check under the operating conditions.

○ Operation

- Start using the products only after confirming that the it is in good working order. Watch for any abnormalities in the valve and its surroundings at the initial stage of use.
- If any abnormality is found, discontinue to use immediately.
- Inspect the valve periodically.

Disassembly

 WARNING	When disassembling the valve, avoid working at high temperatures immediately after use, and allow the valve to cool down sufficiently before starting work.
 CAUTION	Wear protective equipment such as a helmet, safety glasses, protective gloves, and safety shoes when working.
 CAUTION	Disassembly and inspection should be performed by skilled workers who understand the structure.
 CAUTION	Products with large mass should be operated using a machine (e.g. crane).
 CAUTION	When working on the product, use a vise firmly fixed to a stable workbench to ensure safe and proper disassembly.
 CAUTION	When working, be very careful not to pinch hands or fingers.
	When disposing of fluoroplastic products, do not incinerate them. Incineration will generate toxic fumes.
	Do not damage the sealing surface where the packing or gasket contacts.

Follow the instructions below while referring to the structural drawings listed in the "Structure (p. 7-10)" section. For the materials and quantities of each part, refer to the delivery specification drawing (assembly drawing). For special specifications (Z product), please contact us.

○ Disassembly Procedure

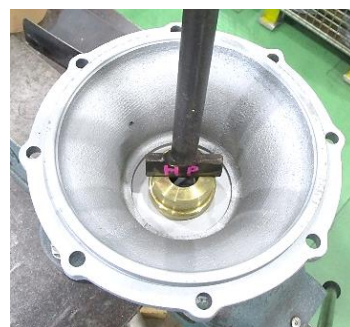
1. HP2211-□P / HP2212-□JP

< Overall Disassembly >

1. Remove Socket Cap Screw ②④ and then remove Cylinder ③.
Make sure that the lock is released, and pull out the Cylinder ③ to remove it.
At this time, pull it straight out so that it does not get caught on the Piston ⑩
2. Remove Tension Bolt assembly (⑫ ⑰) and remove Piston assembly (⑩ ⑪ ⑯ ⑳) .
At this time, pay attention to the reaction force of Spring ⑱.
3. Remove Spring ⑱.
4. Remove Socket Cap Screw ⑭ and loosen Socket Cap Screw ⑬.
5. Remove Yoke Stand assembly (② ⑨ ⑬) from Body ①.
6. Loosen Gland Nut ⑧.
7. Remove Union Nut ②⑥ and then remove Lower Seat assembly (⑤ ⑲ ⑲ ⑲ ⑲) .
8. Remove Stem ④ .
9. Remove Gland Nut ⑧ .
10. Remove Gland assembly (⑦ ⑲) and Gland Packing ⑳ (5 layers) .
11. Remove Ring Washer ⑥ and Packing Spring ⑰.

< Disassembly of each sub-assembly >

12. Remove O-Ring ⑱ from Tension Bolt assembly (⑫ ⑰).
13. Remove Flat Head Screw ⑯ from Piston assembly (⑩ ⑪ ⑯ ⑳) , and then remove Set Ring Plate ⑪ and Piston Ring ⑳.
14. Remove Guide Bush ⑨ from Yoke Stand assembly (② ⑨ ⑬) . At this time, use a tool that matches the groove shape of the Guide Bush. (See figure on the right).
15. Remove O-Ring ⑲ and Back Up Ring ⑲ from Lower Seat assembly (⑤ ⑲ ⑲ ⑲ ⑲) , and then remove Gasket Packing ⑲ and Plug ⑲.
16. Remove Dust Seal ⑲ from Gland assembly (⑦ ⑲) .
Be careful not to damage the Gland ⑦ at this time.



< After disassembly >

- Carefully clean each parts and wipe off the cleaning solution.
In particular, clean off any dirt on the sealing surfaces where packing and gaskets come in contact.
- Prepare new consumable parts (parts marked with☆) for replacement.
O-Ring ⑱ / Piston Ring ⑳ / Dust Seal ⑲ / Gland Packing ⑳
Gasket Packing ⑲ / O-Ring ⑲ / Back Up Ring ⑲

- If any abnormality (wear, damage, corrosion, etc.) is found even in other parts, prepare new parts for replacement.

Parts related to seal performance:

Body ① / Cylinder ③ / Stem ④ / Lower Seat ⑤ / Piston ⑩

Parts related to centering guide performance:

Guide Bush ⑨ / Gland ⑦

Etc..

2. HP2311-□P / HP2312-□JP

Follow the same procedures as 「1. HP2211-□P / HP2212-□JP」.

The only difference is if it has Plug ⑳ or not.

Assembly

 WARNING	Wear protective equipment such as a helmet, safety glasses, protective gloves, and safety shoes when working.
 CAUTION	Assembly should be performed by skilled workers who understand the structure.
 CAUTION	Products with large mass should be worked with a machine (e.g. crane).
 CAUTION	When working, use a vise firmly fixed to a stable workbench to ensure safe and proper assembly.
 CAUTION	When working, be very careful not to pinch hands or fingers.
	Do not damage the sealing surface that the packing or gasket contacts.
	Always use new packings and gaskets. Reusing them may cause leakage.

Follow the instructions below while referring to the structural drawings listed in the "Structure (p. 7-10)" section. For the materials and quantities of each part, refer to the delivery specification drawing (assembly drawing). For special specifications (Z product), please contact us.

Assembly work should basically be performed in the reverse order of "Disassembly".
The following points should be noted.

○ Assembly procedures

1. HP2211-□P / HP2212-□JP

- Select grease and anti-seizing agent according to the temperature environment in which they will be used.

Reference (products used when shipped from our company)

Grease: Lithium type / Daphne Eponex SR No.2 / Idemitsu Kosan

Anti-seize agent: SMOCON/Supero Machine Industry

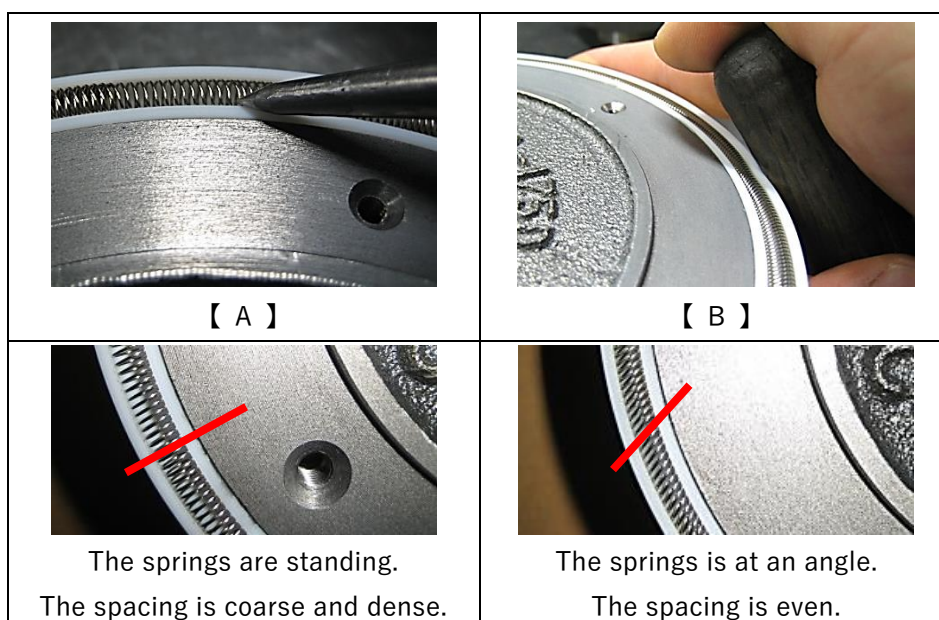
< Assembly of each sub-assembly >

- Piston assembly (⑩ ⑪ ⑯ ⑳)

After applying an appropriate amount of grease to the outer circumference of the Piston ⑩ and after assembling the Piston Ring ⑳, install it against the Piston Ring ⑳ as follows.

To ensure that the springs in the Piston Ring fall in the same direction and are evenly coarse or dense, turn the inside diameter of the spring clockwise with the tip of an ice picker (or equivalent) 【A】. Then, while holding the Teflon part on the outer diameter side of the Piston Ring with a cylindrical part such as the handle of a tool, turn it several times 【B】 so that the spring is slightly slanted.

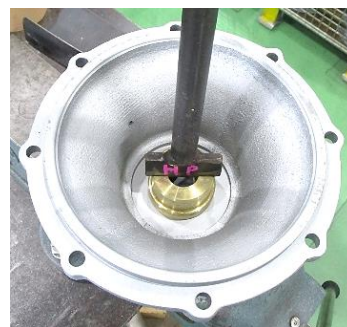
If this work is not performed, it will be difficult to insert the Piston Assembly into the Cylinder ③, and if it is forced, the lip of the Piston Ring may be damaged or premature wear may cause air leaks. On the other hands, if Piston Ring spring is crushed too hard, the lip will not stand up, causing the initial air leakage.



When assembling Set Ring Plate ⑪, apply medium-strength Loctite to Flat Head Screw ⑯

- Yoke Stand assembly (② ⑨ ⑬)

When assembling Guide Bush ⑨ on Yoke Stand ②, apply medium-strength Loctite to the threads of the Guide Bush. Tighten the Guide Bush ⑨ securely using a tool that matches the groove shape of the Guide Bush. (See figure on the right).

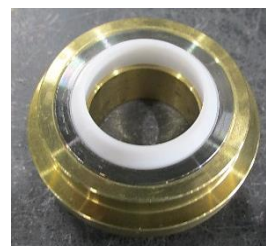


- Lower Seat assembly (⑤ ⑳ ㉓ ㉔ ㉕)

When assembling O-Ring ㉓ and Back Up Ring ㉔ on Lower Seat ⑤, position them so that O-Ring is on the inside pressure side.

- Gland assembly (⑦ ㉑)

When assembling Dust Seal ㉑ to Gland ⑦, since it is a light press-fit, use a jig suitable for the shape of the Dust Seal and press it in until the top surfaces are identical. (See figure on the right).



< Overall Assembly >

- When assembling Gland Packing ㉒ (5-layer structure) into Body ①, grease the casing side of the Body beforehand to make insertion easier. If insertion is difficult, lightly tap with a urethane hammer. Do not misorient the Gland Packing layout (Right figure). If it is difficult to insert, tap it lightly with a urethane hammer.



- When assembling Gland assembly (⑦ ㉑) to Body ①, tighten it lightly at first, and after inserting Stem ④, tighten it firmly.

- When assembling the Yoke Stand assembly (② ⑨ ⑬) to the Body ①, first lightly tighten Socket Cap Screw ⑬, then temporarily assemble the Spring ⑱, Piston assembly (⑩ ⑪ ⑰ ㉒), and Tension Bolt assembly (⑫ ⑲), then tighten firmly so that the two split gaps are evenly distributed on both sides.

- When assembling Piston assembly (⑩ ⑪ ⑰ ㉒) to Stem ④, assemble them so that the two sides of both parts match. (See Right figure)



- When tightening Tension Bolt ⑫, tighten the bolt with the tool until the seating surfaces are in contact, then tap the tool handle with a hammer to retighten the bolt. (Right figure)
- When assembling Cylinder ③ to Yoke Stand ②, insert Piston Ring ⑳ straightly so as not to give any load to Piston Ring ⑳. When tightening Socket Cap Screw ㉔, gradually tighten diagonal bolts alternately and with equal force to avoid one-sided tightening.



< After assembly >

- Supply compressed air to pilot air port and check that there is no air leakage from around Cylinder and that Stem operates smoothly.

2. HP2311-□P / HP2312-□JP

Follow the same procedures as 「1. HP2211-□P / HP2212-□JP」.

The only difference is if it has Plug ㉑ or not.

Trouble Shooting

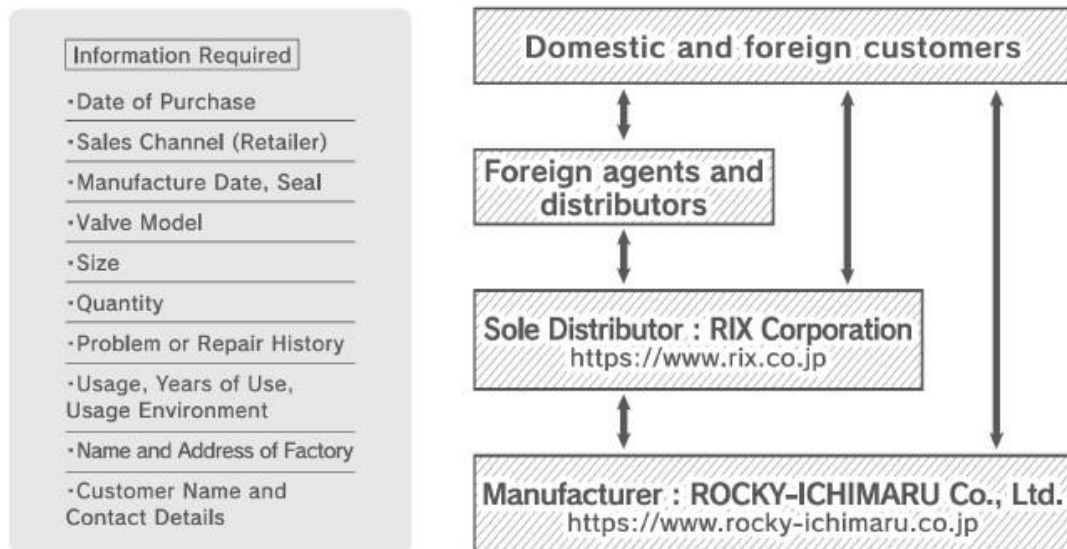
Phenomenon	Cause	Countermeasures
Fluid does not flow	The valve is installed without removing protective poly plug at the connection port.	Remove protective poly plug
Insufficient flow rate	Valve size is too small.	Increase valve size
Inoperative (Valve rod)	Insufficient operating air pressure	Set proper pressure
	Worn sealing parts in the actuator	Seal parts replacement (Piston Ring and O-Rings)
	Damage to inner surface of Cylinder	Cylinder replacement
	Damaged spring in actuator	Spring replacement
	Contamination of foreign matter in actuator.	Foreign material removal
	Contamination of foreign matter in Body.	Foreign material removal
	High fluid pressure	Bring to proper pressure
Seat leakage (Valve seat, Valve)	Insufficient operating air pressure	Bring to proper pressure
	Damaged spring in actuator	Spring replacement
	High fluid pressure	Set proper pressure Check 「Usage condition」
	Foreign matter caught at seat	Foreign material removal
	Foreign matter in actuator	Foreign material removal
	Damage to seat	Replace valve seat and plug
Leakage at screwed connections	Insufficient screw-in	Screw in firmly
	Poor sealing performance	Correctly apply sealing tape and sealant
	Damaged, Worn threads	Parts replacement
Leakage at flange connection	Insufficient bolt/nut fastening force	Fasten firmly
	Gasket failure	Gasket replacement
	One-sided tightening of flange	Gradually tighten diagonally alternately with even force
	Insufficient parallelism of flange	Support installation for front and rear piping Reinstallation of flange piping
	Seat surface damage	Repair/ Replacement

Phenomenon	Cause	Countermeasures
Leakage at Gland	Worn Gland Packing	Gland packing replacement
	Damage to valve Rod	Valve Rod Replacement (Stem)
Leakage at Body	Crack in Body	Body repair/ Replacement
Water Hammer	Rapid closing of Seat	Control operating air supply and exhaust speed by speed controller.

※ If you are unable to determine whether or not the damaged part needs to be replaced, please contact us.

Product service system

When contacting us about problems or repairs, check the diagram below to ensure you contact the most appropriate office.



<Contact>

ROCKY-ICHIMARU Co., Ltd.
601 Oaza Tsunemochi, Chikugo City,
Fukuoka 833-0016 JAPAN
Tel 0942-53-7510 / Fax 0942-52-8799
<https://www.rocky-ichimaru.co.jp/en/>
Email info@ml.rocky-ichimaru.co.jp



Company website



No. IG-800056-R1/ENG 2023.08.31