

MODEL GD-28S-NE, GD-29S-NE

Pressure Reducing Valve

PRODUCT MANUAL

Thank you very much for choosing the Yoshitake's product. To ensure the correct and safe use of the product, please read this manual before use. This manual shall be kept with care for future reference.

The symbols used in this manual have the following meanings.

	Warning	This symbol indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.
	Caution	This symbol indicates a hazardous situation that, if not avoided, may result in minor or moderate injury or may result in only property damage.

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1. Specifications

1.1 Specifications

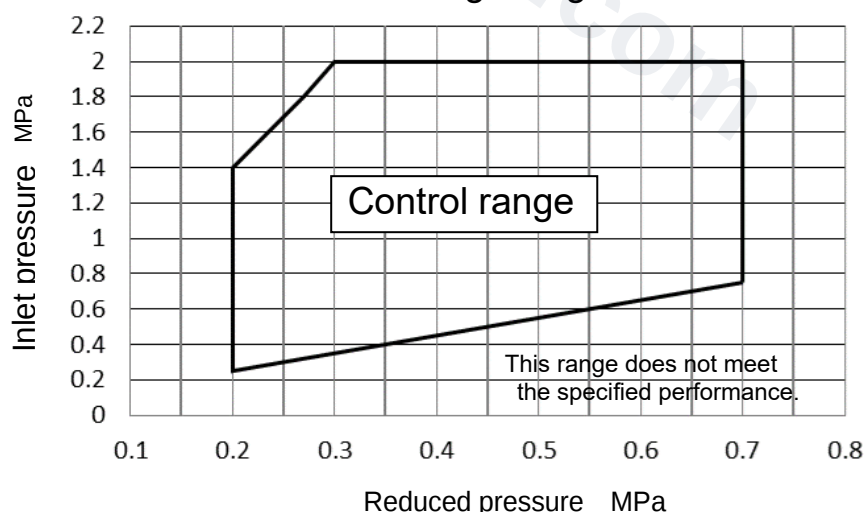
Model		GD-28S-NE	GD-29S-NE
Nominal size		20A - 50A	20A - 100A
Application		Cold and hot water	
Inlet pressure		2.0 MPa or less	
Reduced pressure	A	0.20 - 0.35 MPa	
	B	0.30 - 0.70 MPa	
Min. differential pressure		0.05 MPa	
Control range		See Controllable range diagram *1	
Max. temperature		90°C	
Material	Body	SCS13	
	Valve seat	SCS13	
	Valve disc	FKM	
	Diaphragm	EPDM	
Connection		JIS Rc screwed	JIS 20K RF flanged *2

- The products of the nominal size 20A to 50A incorporate a strainer (40 mesh).
- Pressure gauge connection port is JIS R1/4. The maximum temperature of the pressure gauge is 45°C. If the fluid temperature exceeds 45°C, please protect the pressure gauge by using a siphon tube or similar.
- All the above models conform to the standard of the Japanese Water Supply Act.

*1: It can be used under the condition that the maximum decompression ratio is 7: 1 within the controllable range shown in the figure below.

*2: The flange thickness is thicker than the standard value.

Controllable range diagram *1



If it is out of control, choose two-step decompression or another model.
When the primary side pressure is 2.0MPa, use it so that the secondary side pressure is 0.3MPa or more.



Caution

Please confirm that the indications on the product correspond with the specifications of the ordered product model before use.
* If they are different, please contact us without using the product.

1.2 Nominal size selection

■ Procedure of nominal size selection

1. If the pressure difference before and after the product is 0.15 MPa or more, choose the nominal size from the rated flow table below.

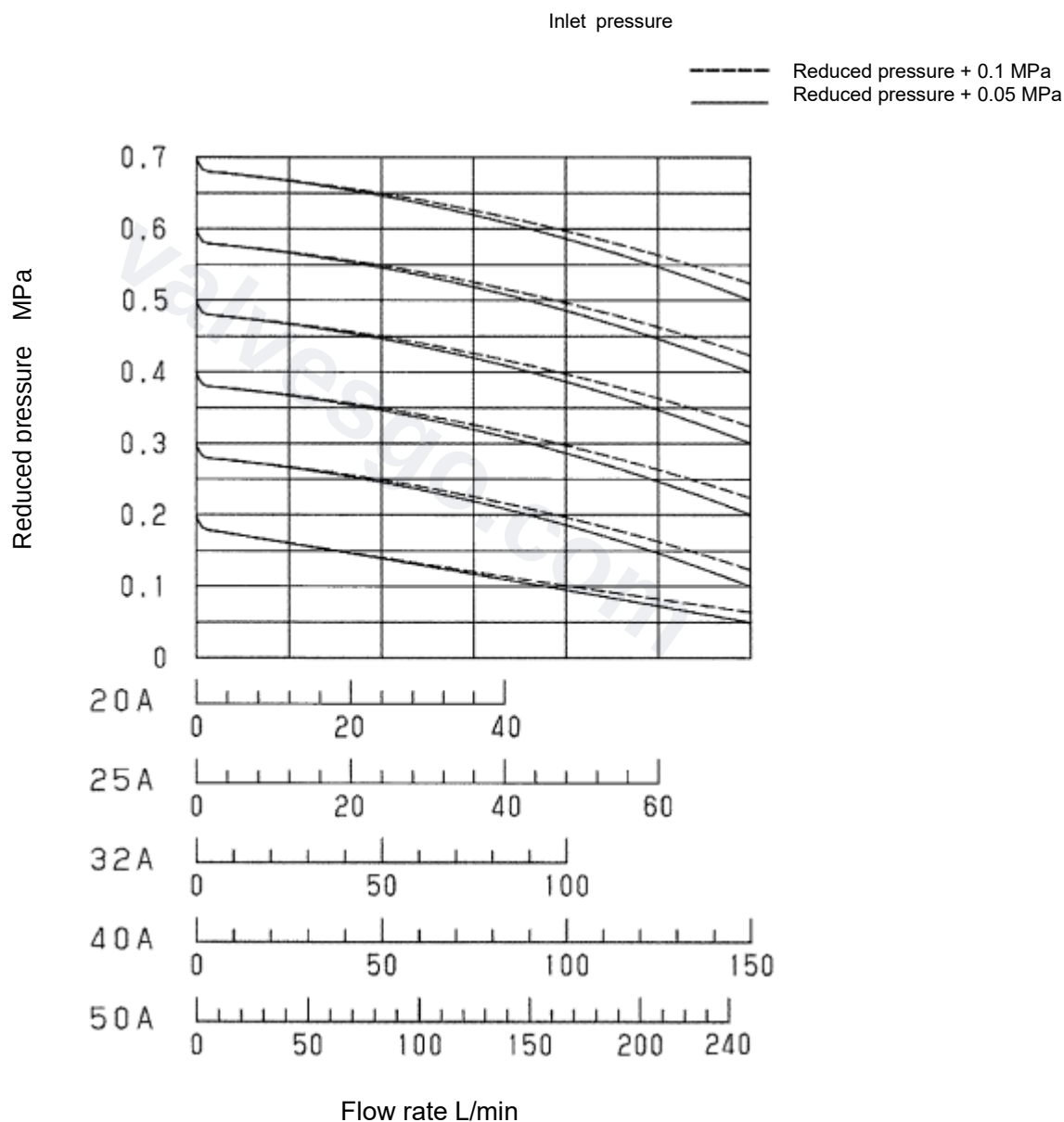
Rated flow table (The pressure difference before and after the product is 0.15 MPa or more)

Nominal size	15A	20A	25A	32A	40A	50A	65A	80A	100A
Rated flow (L/min)	30	40	60	100	150	240	300	450	700

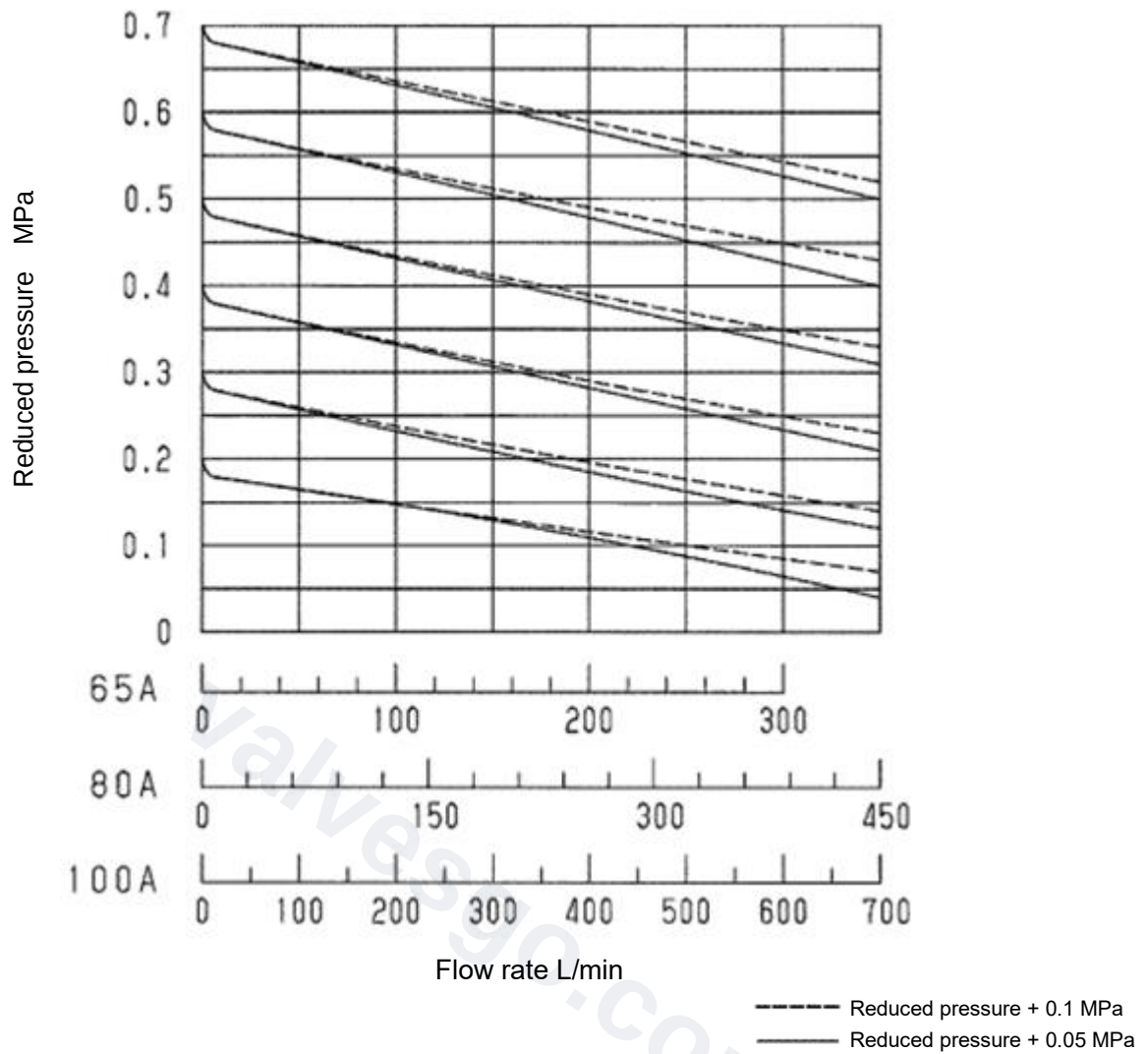
2. If the pressure difference before and after the product is less than 0.15 MPa, choose the nominal size from the nominal size selection charts (for 20A - 50A, 65A - 100A) below.

Nominal size selection chart

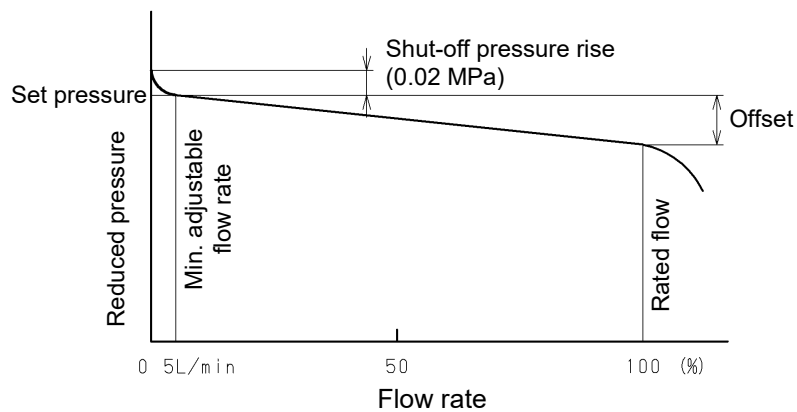
Nominal size 20A - 50A



Nominal size 65A -100A



1.3 Flow rate characteristics chart

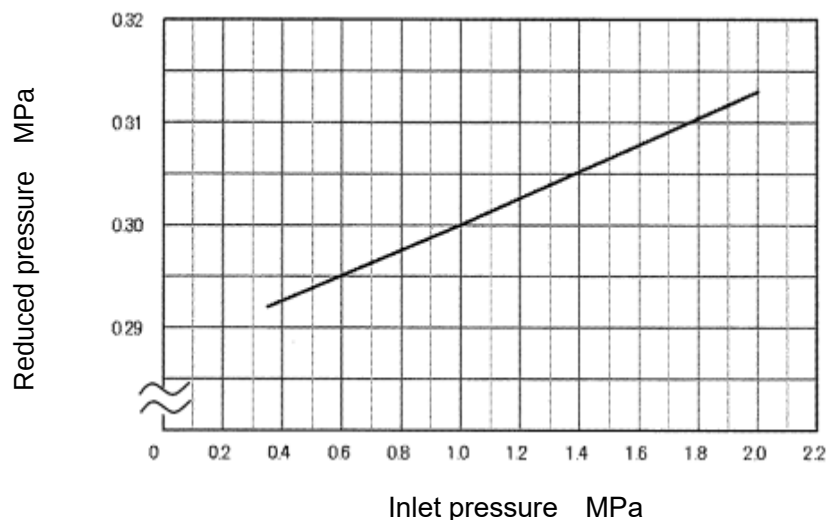


Nominal size	Pressure range	Reduced pressure range	Offset
20A-100A	A	0.20-0.35MPa	0.10MPa or less
	B	0.30-0.70MPa	0.15 MPa or less

(Differential pressure after valve seat 0.15MPa or more)

Offset

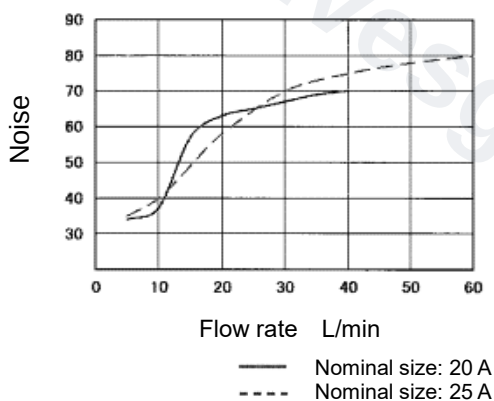
1.4 Pressure characteristics chart



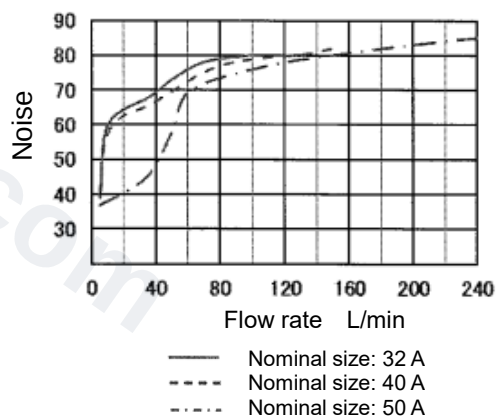
This chart shows variation in the reduced pressure when the inlet pressure of 1.0 MPa is changed between 0.35 MPa and 2.0 MPa after the reduced pressure is set at 0.30 MPa.

1.5 Noise characteristics chart (Fluid: Water)

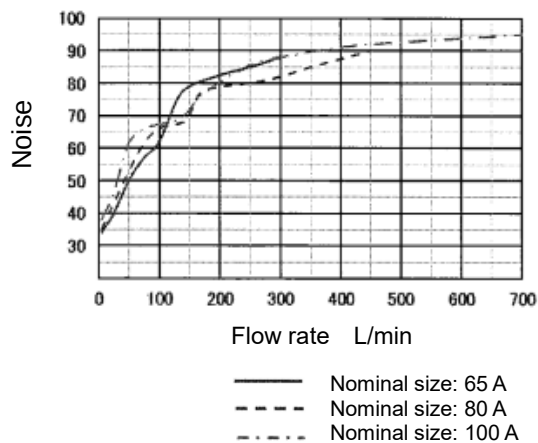
Nominal size 15A - 25 A
Inlet pressure: 2.0 MPa
Reduced pressure: 0.3 MPa



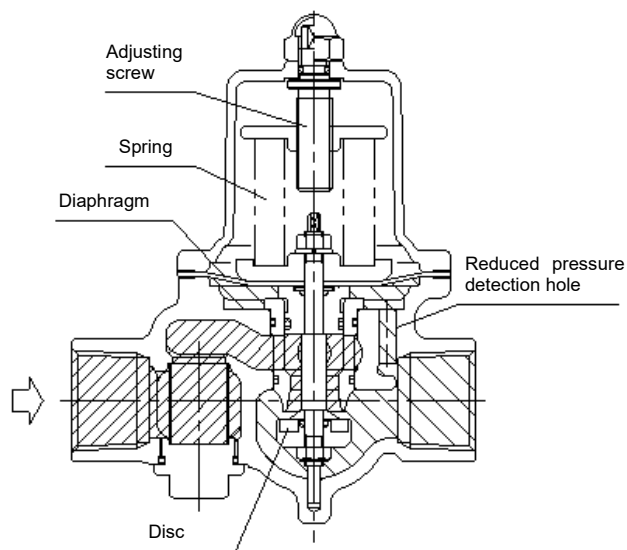
Nominal size 32A - 50 A
Inlet pressure: 2.0 MPa
Reduced pressure: 0.3 MPa



Nominal size 65A - 100
Inlet pressure: 2.0 MPa
Reduced pressure: 0.3 MPa



2. Operation



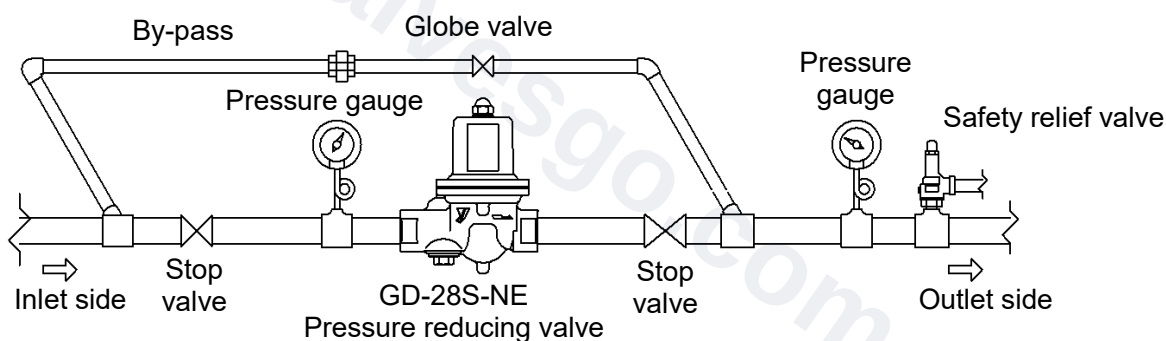
The spring is compressed by the adjusting screw, the diaphragm is pushed down, and thereby the disc directly connected to it is opened.

Fluid coming in from the inlet side flows out from the upper part of the disc to the outlet side, and passes through the reduced pressure detection hole, and is led to the bottom of the diaphragm.

The load of the spring and the reduced pressure act to the diaphragm, and the upper and lower force keeps a balance and regulates the valve opening. As a result, the diaphragm keeps the reduced pressure constant.

3. Installation

3.1 Piping example



* Install a strainer on the inlet side of the pressure reducing valve of the nominal size 65A to 100A.

* Install same diameter 3m pipes on both the primary and secondary sides of the pressure reducing valve.

3.2 Precaution for installation



Warning

1. See the product weight specified in “3. Dimensions and Weights.”
* Failure to follow this notice may cause a falling accident of the product, resulting in an injury.
2. When installing a safety relief valve for equipment protection at the outlet side of the product, connect a blow-off pipe to the outlet side of the safety relief valve, and lead it to a place where there is no risk of physical damage even if fluid blows out.
* Failure to follow this notice may result in injury and scalds in the event that high temperature fluid blows out.



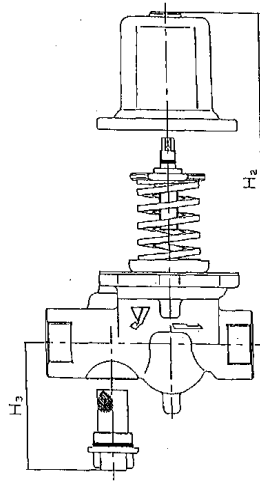
Caution

1. Do not disassemble the product unless it is necessary.
* Unnecessary disassembly prevents the product from functioning properly.
2. Before installing the product in the piping, be sure to remove foreign substances and scale from the piping. Keep foreign substances from entering the piping, including seal tape or liquid seal agent for piping connection.
* Ingress of foreign substances, scale or seal agent into the product leads to valve leakage or malfunction of the product.
* Repairs due to foreign matter or scales will be charged even during the warranty period.
3. If components having negative influence on internal parts are included in fluid or surroundings, deterioration of rubber parts is accelerated and then outside leakage or functional disorder is caused.
4. Be sure to install a strainer at the inlet side of the product of nominal size 65A to 100A.
* Ingress of foreign substances or scale into the product leads to malfunction of the product. It is recommended to use a strainer of 40 mesh or more.
5. Install a safety relief valve for equipment protection at the outlet side of the product.
* Failure to follow this notice may result in damage of the equipment.
6. Be sure to install pressure gauges at the inlet and outlet sides of the product.
* Failure to follow this notice hampers correct pressure adjustment.
7. If a quick operating valve such as a solenoid valve is installed, place it at a distance of at least 3 meters from the product.
* Failure to follow this notice may result in malfunction or a drastically shortened service life of the product.
8. Install the product properly by checking the inlet, outlet and proper posture. The product can be installed either horizontally or vertically.
* Installing the product in wrong directions prevents the product from functioning properly.
9. Install pipes so that excessive load, torque or vibration is not applied to the product.
10. Install 3m pipes of the same diameter on both the primary and secondary sides of the pressure reducing valve.
* If the pipe diameter is narrowed immediately before or after the product, the flow velocity may increase, resulting in malfunction or shortening the life of the product.
11. The product can be installed either horizontally or vertically.
12. A space more than the value shown as H₂ in the table below is required for disassembly and inspection. A space more than the value shown as H₃ in the table below is required for the inspection of the built-in strainer (nominal size 20A to 50A).
13. For two-stage pressure reduction, keep a distance of at least 3 meters between each product.
* Failure to follow this notice may prevent the product from functioning properly due to malfunction.
14. When using a product with a pressure gauge outdoors, provide a canopy or other protection to prevent rainwater from directly hitting the pressure gauge.

- Model GD-28S-NE, GD-29S-NE

(mm)

Nominal size	20A	25A	32A	40A	50A	65A	80A	100A
H ₂	250	250	300	300	320	450	450	550
H ₃	90	90	120	120	150	-	-	-



4. Operation procedure

4.1 Precaution for operation



Warning

When the product is used for hot fluid, do not touch the product with bare hands.
* The product having hot fluid may scald your skin.



Caution

- Before leading fluid into the product, close the stop valves at the inlet and outlet of the product and remove foreign substances and scale from the piping completely by using a bypass line.
* Failure to follow this notice may prevent the product from functioning properly due to the ingress of foreign substances and scale into the product.
- To adjust the set pressure, turn the adjusting screw slowly.
* Failure to follow this notice may result in damage to the product and other equipment due to hunting or other cause.
- If closing outlet side of the product and keeping fluid inside the product for an extended period, sliding parts become stuck and it causes malfunction of the product.
* Check if the product operates normally when resuming the product.
- When the product is not used for an extended period, completely discharge fluid from the product and pipes, and close the stop valves at the inlet and outlet sides of the product.
* Failure to follow this notice causes malfunction of the product due to rusting inside the product and the pipes.
- The set pressure may be affected by ambient temperature (external temperature) and fluid temperature. Install pipes so that the product may not be exposed to direct sunlight.

4.2 Adjusting procedure

Following a wrong adjusting procedure may cause hunting, scale problems or other problem, and can heavily damage the main parts of the valve. To avoid these problems, be sure to follow the procedure given below

- Close the stop valves at the inlet and outlet sides of the reducing valve, and take adequate time to blow out fluid by using a bypass line. In doing this, adjust the opening of the globe valve in the bypass pipe so as not to blow out the safety relief valve. After the end of blowing, close the globe valve without fail.
- Fully open the stop valve at the inlet side slowly, and open the stop valve at the outlet side so that a little fluid can flow through.

3. Remove the domed cap nut [17] and turn the adjusting screw [14] while watching the pressure gauge at the outlet side.
 - Turn the adjusting screw to the right (clockwise) to increase the reduced pressure.
 - Turn the adjusting screw to the left (counterclockwise) to decrease the reduced pressure.

*If the pressure is not set under the condition that the stop valve on the outlet side is slightly opened, closing the stop valve on the outlet side while operation may lead to shut-off pressure rise exceeding the set pressure.
4. Fully open the stop valve at the outlet side slowly.
5. After the adjustment is complete, tighten the domed cap nut [17]

5. Maintenance

5.1 Troubleshooting

Trouble	Cause	Remedy
Abnormal pressure rise at the outlet side.	1. Foreign substances stuck between the disc [8] and the valve seat [3], or scratch on them. 2. The O-ring [6] is damaged. 3. The diaphragm [9] is damaged. 4. There is a leakage from the globe valve of the by-pass line.	1. Disassemble the product and remove the foreign substances. If scratch is observed on the valve disc or valve seat, replace it. 2. Replace the O-ring. 3. Replace the diaphragm. 4. Repair or replace the globe valve.
Reduced pressure does not reach the desired value.	1. The working pressure is improper. 2. The nominal size of the product is too small for the flow rate for use. 3. Pressure adjustment is improper. 4. Strainer [10] built in the product is clogged. 5. The strainer installed at the inlet side of the product is clogged.	1. Correct the working pressure. (See "2.1 Specifications" on Page 1.) 2. Replace the product with the proper nominal size. (See "2.2 Nominal size selection" on Page 3.) 3. Readjust the pressure in accordance with the given procedure. (See "6.2 Adjusting procedure" on Page 12.) 4. Clean the strainer. (See "7.5 Strainer cleaning procedure" on Page 16.) 5. Clean the strainer.
Outside leakage	1. Bolt [18] or [39] is loosened. 2. O-ring [30] is damaged. 3. Strainer cap [11] or plug [31] is loosened.	1. Tighten the bolts. 2. Replace the O-ring. 3. Tighten the strainer cap or plug.
Abnormal sound	1. The nominal size of the product is too large for the specifications of the system. 2. The pressure reduction ratio is too large or the maximum pressure difference is exceeded. 3. Air binding has occurred. 4. A quick operating valve is located near the product. 5. The pipe diameter is narrowed within 3m before and after the pressure reducing valve.	1. Replace the product with the proper nominal size. (See "2.2 Nominal size selection" on Page 3.) 2. Reduce pressure in two stages. (See "2.1 Specifications" on Page 3) 3. Install an air vent device. 4. Keep a distance between them as large as possible. (3 m at least) 5. Before and after the pressure reducing valve, pipe with the same diameter of 3M or more.

- Most of problems with the pressure reducing valve are caused by foreign substances and scale in the piping. Avoid the ingress of dust and dirt to the product with caution.
- A phenomenon similar to valve failure could occur due to the failure of the pressure gauge, leakage or insufficient tightening of the globe valve in the by-pass line, clogging of the strainer, and other causes. Check the above possible causes and take a proper remedy and preventive measures.

5.2 Precaution for maintenance and inspection

Warning

1. Completely discharge the pressure inside of the product, piping and equipment before disassembly and inspection. Disassembly and inspection must be done by experienced professional or valve manufacturer.
* Failure to follow this notice may result in scalds, injury or contamination on the surroundings due to the residual pressure.
2. If fluid is hot, do not touch the product directly with bare hands.
* Failure to follow this notice may result in scalds or injury.

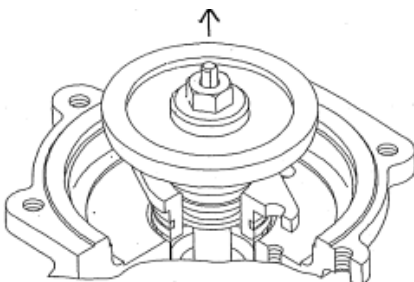
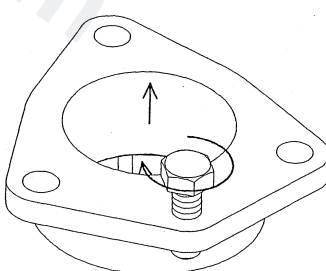
Caution

1. If problem occurs for a cause other than listed in "7.1 Troubleshooting" on Page 13, please contact us.
2. When the product is disassembled, internal fluid flows out. Receive it in a container.
* Failure to follow this notice may result in making the surroundings dirty.
3. Synthetic rubber is a consumable part. The replacement interval of the synthetic rubber part greatly varies depending on the use conditions. The general guide for the replacement interval is shown below.

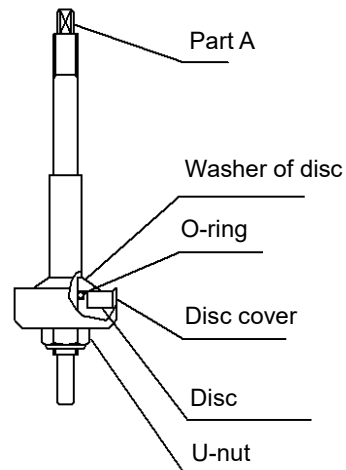
Service life	Part name
Three years	Diaphragm [9], O-ring [6], Disc [8]
Five years	O-ring [20], [24], [26], [28], [30], [45] seal washer [42]

5.3 Disassembly

1. Remove the domed cap nut [17], turn the adjusting screw [14] counterclockwise, and set the spring [15] free (no load).
2. Remove the bolts [18] of the spring chamber [2] and remove the spring chamber [2]. Then take out the spring [15] and the spring plate [13].
3. Remove the nut [22], and then the diaphragm retainer [12], and diaphragm [9].
4. Remove the set screws [25] (bolts [25] in the case of nominal size 65A to 100A) of the valve seat [3], and remove a set of the valve seat (valve seat [3], spindle [4], disc [8], and O-ring [28]).

15A to 50A	65A to 150A
	
Attach the diaphragm retainer [12] to the spindle [4], and pull it up.	Screw the bolt into the valve seat [3], and pull it up.

- (5) Secure the part A of the spindle [4] (two faces), loosen the U-nut [29] with a tool, and remove the disc [8], and O-ring [28].



Width across flats and cross recess dimensions of each part (mm)

	15-25A	32-40A	50A	65-80A	100A	125-150A
Cap nut [17]	17	19	19	24	24	-
Nut [41]	-	-	-	-	-	36
Bolt [18]	10	10	13	17	17	19
Nut [22]	10	13	13	17	19	36
Set screws [25]	#2	#3	#3	-	-	-
Nut [25]	-	-	-	13	13	19
U nut [29]	10	13	17	17	19	24

5.4 Precaution for reassembly



Caution

1. Check to see that there is no foreign substances inside the body and on each part.
*Foreign substances prevent the product from functioning properly. To avoid the problem, remove foreign substances.
2. Check that there is no scratch on the disc or O-ring.
*A scratch on the relevant part prevents the product from functioning properly. Replace the damaged part.
3. Apply silicone grease (harmless to humans) to the O-ring.
*Failure to follow this notice may damage the O-ring.

Assemble the parts in reverse order of disassembly.

Tighten the bolts [18] of the spring chamber [2] evenly in the diagonal order.

- * Bolt [18] of Spring chamber [2] Tightening torque

Size	Torque
20 - 50A	10N•m
65 - 100A	30N•m

- * Nut [22] of Diaphragm [9] Tightening torque

Size	Torque
20 - 25A	8N•m
32 - 50A	12N•m
65 - 80A	18N•m
100A	23N•m

- * Set screws [25] (bolts [25] in the case of nominal size 65A to 100A) of the valve seat [3]
Tightening torque

Size	Torque
20 - 50A	15N•m
65 - 100A	30N•m

- * U-nut [29] of spindle [4] Tightening torque (※Replace the U-nut.)

Size	Torque
20 - 25A	8N•m
32 - 40A	12N•m
50A	13N•m
65 - 80A	18N•m
100A	23N•m

- * Strainer cap [11] Tightening torque

Size	Torque
20 - 25A	40N•m
32 - 50A	80N•m

5.5 Strainer cleaning procedure



Warning

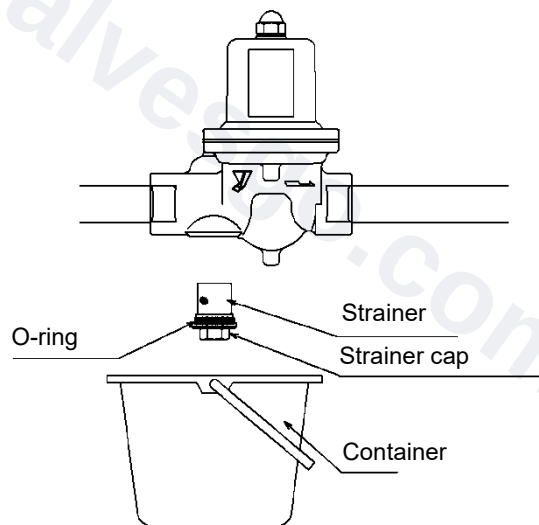
1. If fluid is hot, do not touch the product directly with bare hands.
* Failure to follow this notice may result in scalds.



Caution

1. Clean the strainer regularly at least once or twice a year.
* Too much deposit of scales or the like decreases the flow rate, which prevents the product from functioning properly.
2. When the strainer cap is removed, receive fluid in a container. (See the Figure below.)

1. Close the stop valve at the inlet side and open the stop valve at the end, and remove the internal pressure from the product completely.
2. Turn the strainer cap counterclockwise, and remove it.
3. Remove the strainer from the strainer cap, and wash it in water, and remove deposited scale.
4. After cleaning, reinstall the strainer and strainer cap in the body.
5. Open the stop valve at the inlet side, and check that there is no leakage from the strainer cap. When there is a leakage, replace the O-ring.
6. Open the stop valve at the end, and check that the product operates normally.



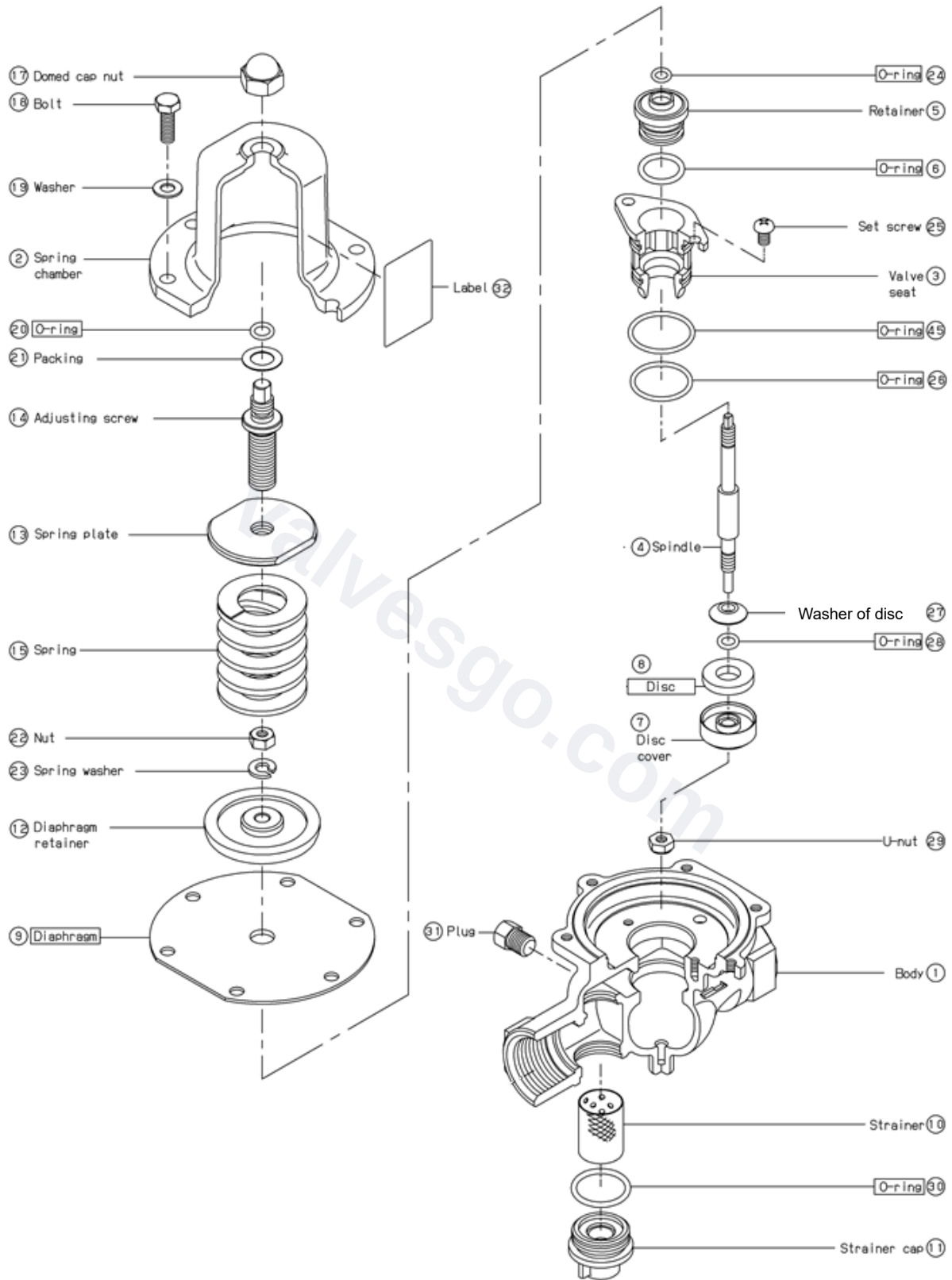
6. Disposal

When disposing of the product, remove the cap nut [17], turn the adjusting screw [14] counterclockwise (counterclockwise), open the adjusting spring [15], and then dispose of the product (no load).

When disposing of parts individually, refer to the drawing and check the material of each part before disposing.

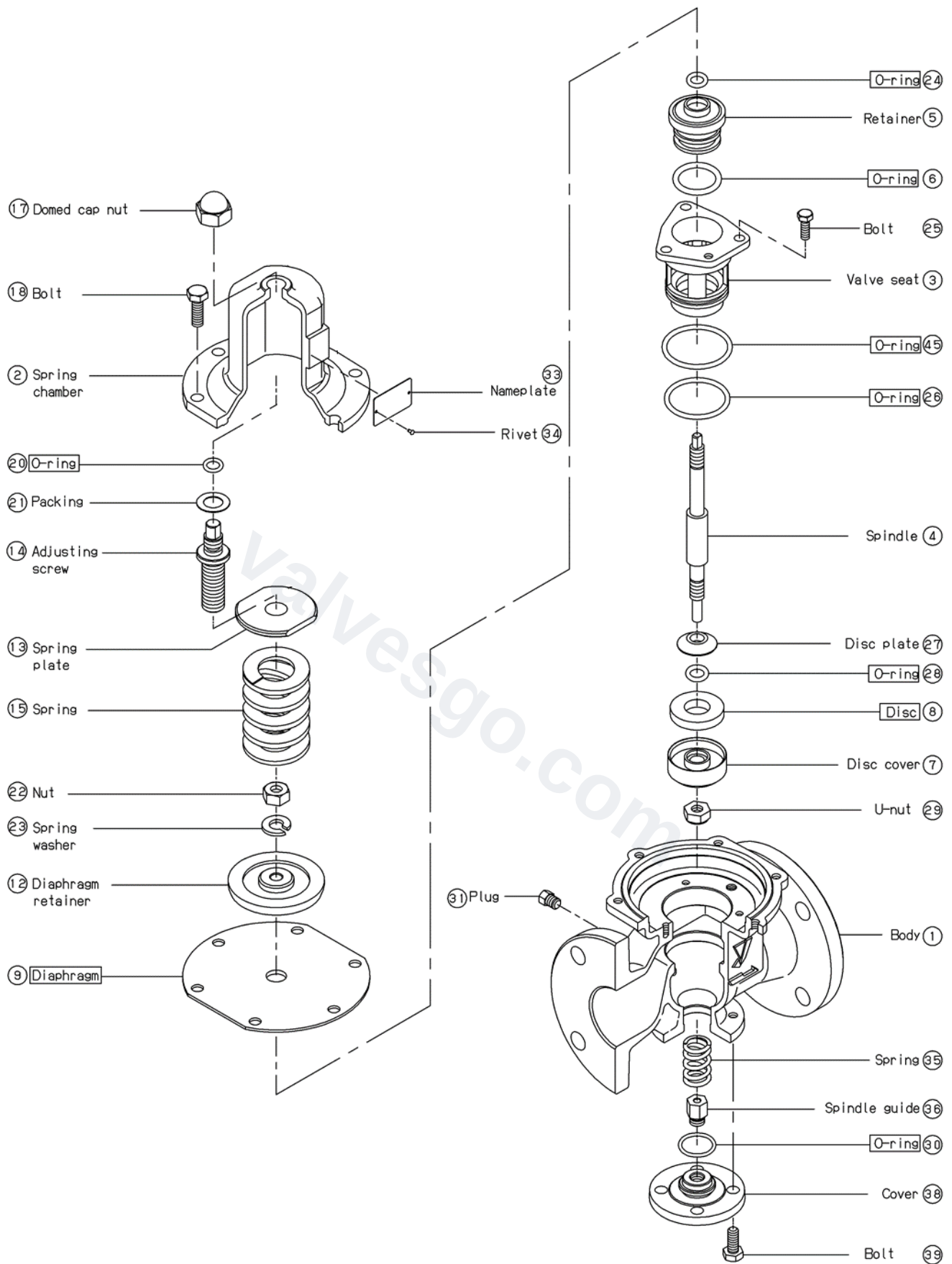
7. Exploded view

Nominal size 20A - 50A



Note) The parts shown in the rectangle boxes are available as consumable supply

Nominal size 65A - 100A



Note) The parts shown in the rectangle boxes are available as consumable supply.

Warranty Information

1. Limited warranty

This product has been manufactured using highly-advanced techniques and subjected to strict quality control. Please be sure to use the product in accordance with instructions on the manual and the label attached to it.

Yoshitake warrants the product to be free from any defects in material and workmanship under normal usage for a period of one year from the date of receipt by the original user, but no longer than 24 months from the date of shipment from Yoshitake's factory.

2. Parts supply after product discontinuation

This product may be subject to discontinuation or change for improvement without any prior notice. After the discontinuation of the product, Yoshitake supplies the repair parts for 5 years otherwise individually agreed.

3. This warranty does not cover the damage due to any of below:

- (1) Valve seat leakage or malfunction caused by foreign substances inside piping.
- (2) Improper handling or misuse.
- (3) Improper supply conditions such as abnormal water pressure/quality.
- (4) Water scale or freezing.
- (5) Trouble with power/air supply.
- (6) Any alteration made by other than Yoshitake.
- (7) Use under severe conditions deviating from the design specifications (e.g. in case of corrosion due to outdoor use).
- (8) Fire, flood, earthquake, thunder and other natural disasters.
- (9) Consumable parts such as O-ring, gasket, diaphragm and etc.

Yoshitake is not liable for any damage or loss caused by malfunction or defect of the product.

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