

Model GD-24GS

Pressure Reducing Valve

Installation & Operation Manual

Please read this manual thoroughly before using the pressure reducing valve, so that you may do so correctly and safely.

Please carefully store this manual in a handy place.

— — — — — The following safety symbols are used in this manual. — — — — —

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. (“Caution” may also be used to indicate other unsafe practices or risks of property damage.)

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1. Specifications

Model		GD-24GS
Nominal size		15~50A
Application (Fluid)		Hot or cold water
Inlet pressure		0.2~1.6MPa
Reduced pressure		0.05~0.55MPa
Min. differential pressure		0.05MPa
Max. pressure reducing ratio		10: 1
Temperature		5~80℃ (*)
Material	Body	Bronze
	Valve (Disc)	Urethane rubber
	Valve Seat	Stainless steel
	Diaphragm	NBR
Connection		JIS Rc

*GD-24GS is a set of pressure reducing valve (GD-24), pressure gauge, and strainer (SY-24).

*The pressure gauge and strainer are included with the product, so attach them to the pressure reducing valve when installing the piping on site.

*The Screen of strainer is 60 mesh (standard mesh).

*The Pressure gauge connection size is R 1/8. 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.

*The accuracy of the pressure gauge is $\pm 3.0\%$ F.S.

*The valve can be mounted in horizontally and vertically.

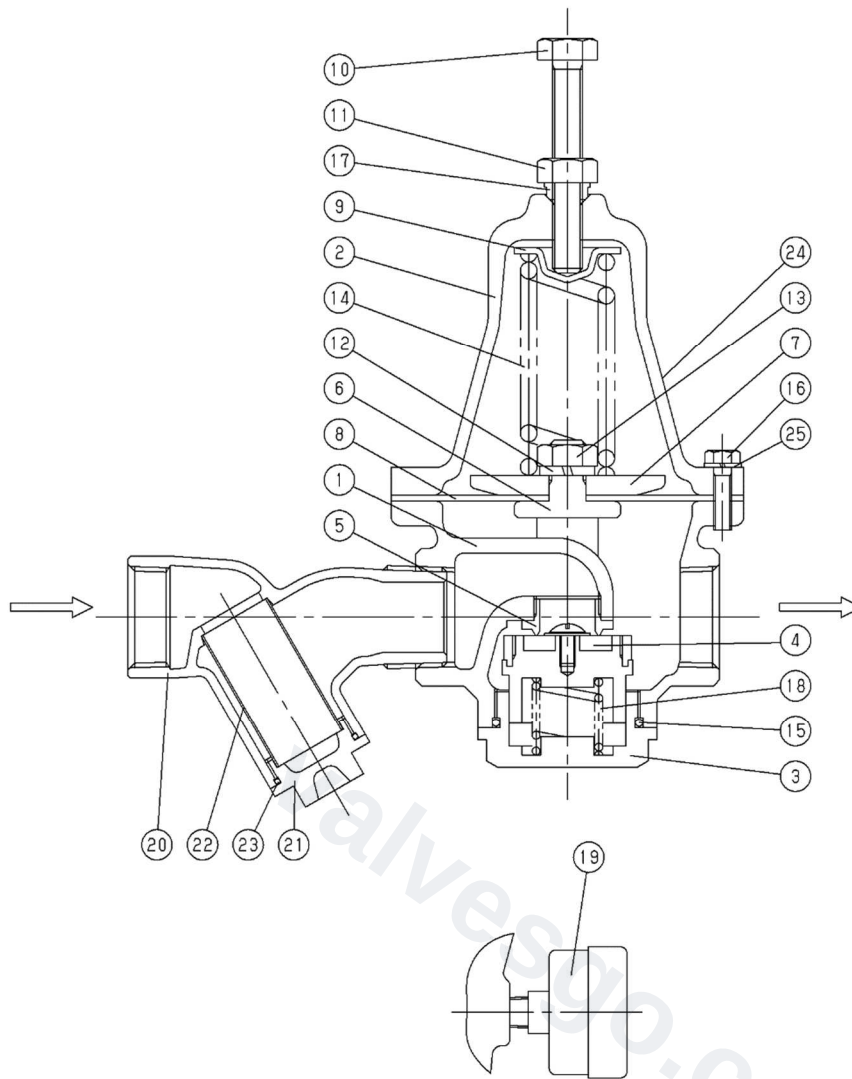
(*) Avoid continuous use at 70 °C.

Caution

Please collate with attached label or plate and specification of ordered model.

*Please consult factory in case they do not match each other.

2. Construction



No.	Name of parts
1	Body (GD-24)
2	Spring Chamber
3	Cap
4	Valve (Disc)
5	Valve Seat
6	Suspension Metal
7	Diaphragm Shell
8	Diaphragm
9	Spring Plate
10	Adjusting Screw
11	Lock Nut
12	Spring Lock Washer
13	Nut
14	Adjusting Spring
15	O-ring
16	Bolt
17	Sealed Nut
18	Spring
19	Pressure Gauge
20	Body (SY-24)
21	Cap
22	Screen
23	O-ring
24	Label
25	Spring Washer

Caution

Be sure to remove the plug of the pressure gauge mounting part that was installed at the time of shipment and replace it with the included pressure gauge.

*Corrosion resistance is not considered because the plug is for airtightness test at the time of shipment.

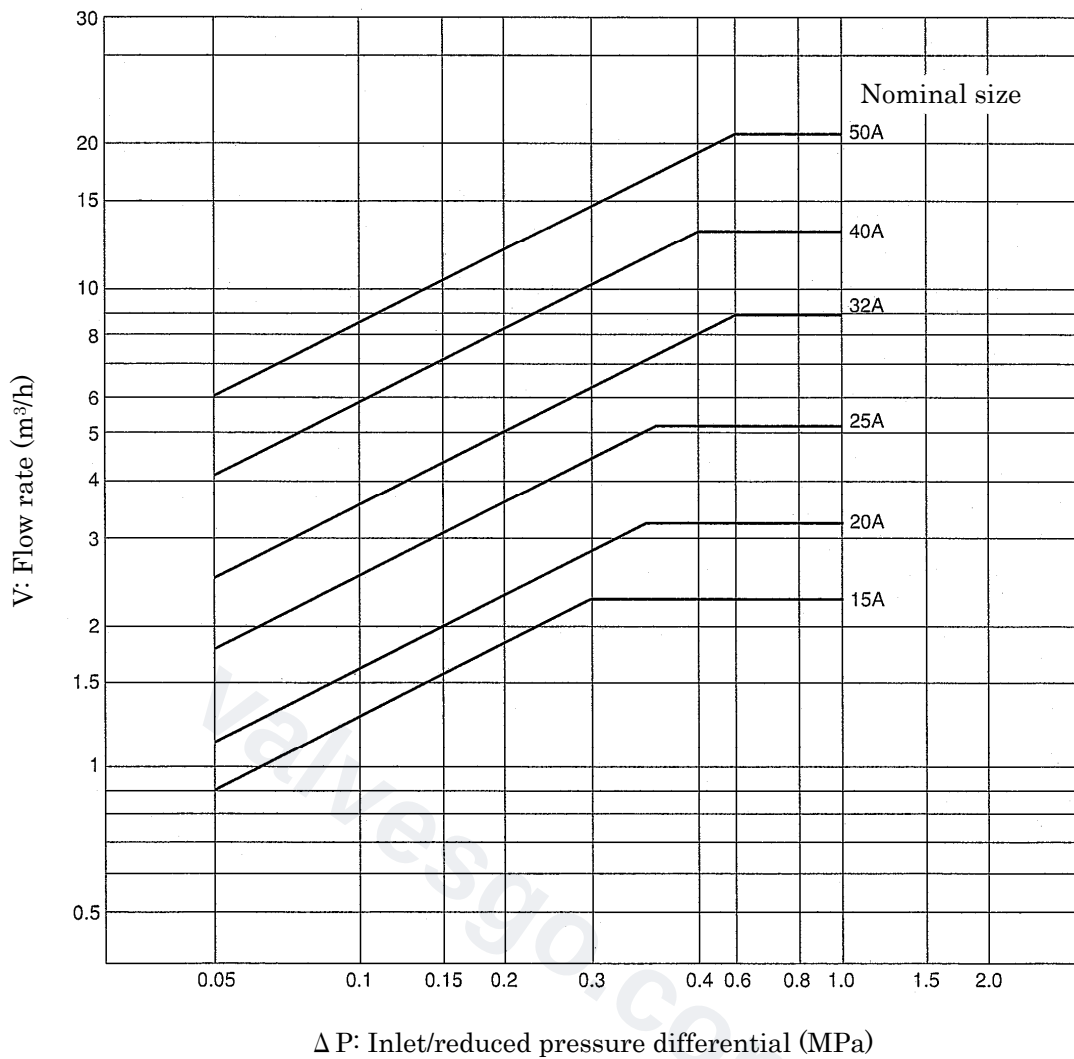
3. Operation

(Refer to the parts number in “2.2 Construction”)

Turning the adjusting screw (10) to compress the adjusting spring (14) and the load of adjusting spring is introduced to the diaphragm (8) and suspension metal (6) to open the valve (4). Then, the fluids begin to flow from the inlet side through the upper side of the valve. The reduced pressure is led to the diaphragm to be balanced with the adjusting spring load, and control the valve travel to maintain the reduced pressure.

4. Nominal Size Selection

4.1 Nominal Size Selection Chart (For Water)



Note: *The Chart shown above is for a GD-24 valve without SY-24.

*Considering such factors as noise and durability, a 2 m/s flow velocity within the pipe is ideal.

● Cv Value

Nominal size	15A	20A	25A	32A	40A	50A
Cv value	1.5	1.9	3	4	7	10

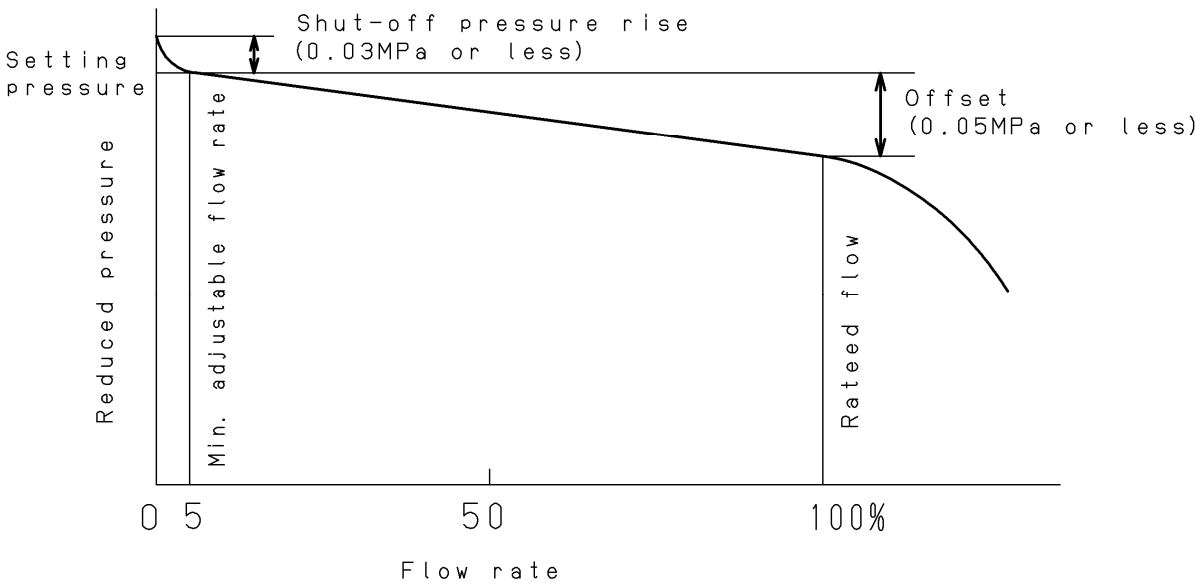
● Calculation formula for Cv value

$$C_v = \frac{0.365V\sqrt{G}}{\sqrt{\Delta P}}$$

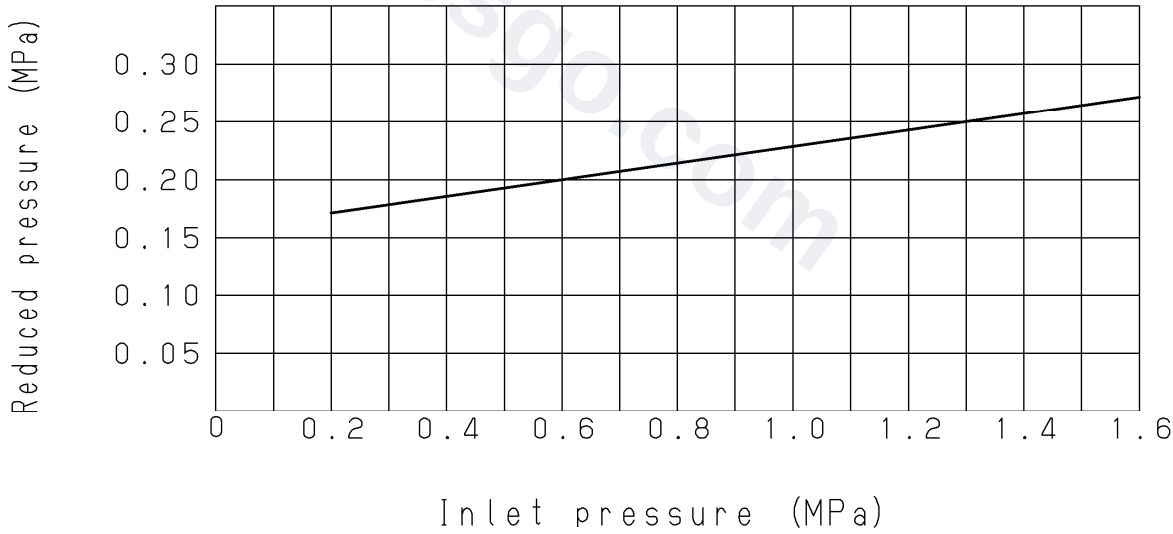
P_1 : Inlet pressure [MPa·A]
 P_2 : Reduced pressure [MPa·A]
 ΔP : $P_1 - P_2$ [MPa]

V : Rated flow rate [m³/h]
 G : Specific gravity relative to water
 C_v : Cv value of the nominal size

4.2 Flow Rate Characteristics Chart

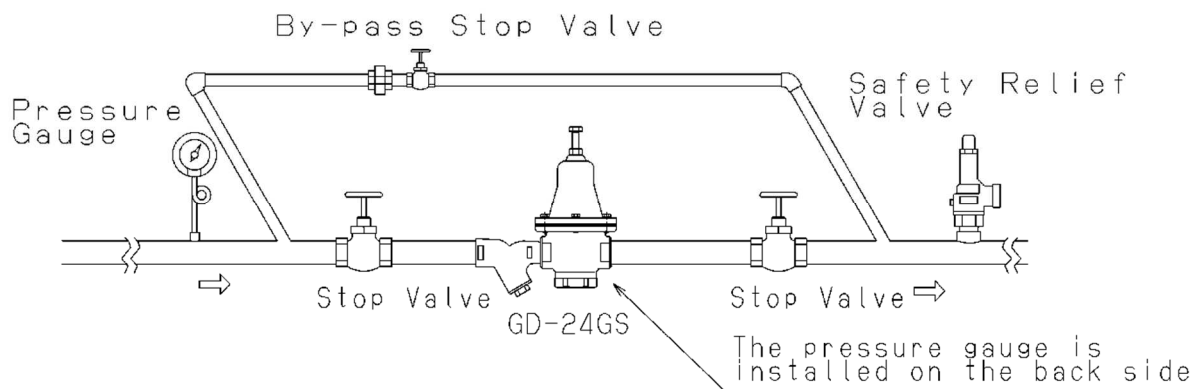


4.3 Pressure Characteristics Chart



5. Installation

5.1 Piping Example



5.2 Warning and precaution on installation

⚠ Warning

In case installing safety relief valve as safety device at outlet side, joint relief pipe at outlet of safety relief valve and guide it to safety place where steam can relief out.

⚠ Caution

- (1) Do not disassemble the valve unreasonably.
*Disassembling the valve at your discretion may affect the original performance.
- (2) Remove foreign matter and scales from the lines before installing the valve.
*Failure to do so may prevent the valve from functioning correctly.
- (3) Install a SY-24 strainer (Screen: 60 mesh) at the valve inlet side.
*Failure to do so may hamper correct pressure control, which affects the original performance.
- (4) Install a safety relief valve at the valve outlet side for protection of equipments.
*Failure to do so prevents problem detection, resulting in equipment damage.
- (5) Install a pressure gauge at the inlet side of the valve.
*Failure to do so may hamper correct pressure adjustment.
- (6) When installing quick open and close valves, such as a solenoid valve, secure at least 3 m from the valve.
*Failure to do so may result in malfunction or drastically shortened service life.
- (7) When pressure reducing in two stages, secure at least 3 m between the valves.
*Failure to do so may result in malfunction, affecting the original performance.
- (8) Install the valve in proper direction of the fluid flow.
*Failure to do so affect the performance.
- (9) Do not apply excessive load, torque or vibration to the valve.
*Doing so may result in malfunction or drastically shortened service life.
- (10) Secure the necessary maintenance space at the installation site of the pressure reducing valve. (See Fig.1)
*In case there is not enough space for maintenance, pressure reducing valve cannot be disassembled at the time of maintenance.
- (11) The set pressure of safety relief valve must be higher than the set pressure of pressure reducing valve.
*In case reseating pressure of safety relief valve is lower than the set pressure of pressure reducing valve, safety relief valve will continue to blow.
- (12) Do not freeze pressure reducing valve.
*Freezing may damage pressure reducing valve.
- (13) Do not allow pipe adhesive materials to leak into pressure reducing valve.
*In case the adhesive material is acquired in pressure reducing valve, it causes malfunction.

- (14) Replace the factory-installed plug at the pressure gauge joint with the pressure gauge enclosed in the package.
 *The factory-installed plug is only for an airtightness test and it is not resistant to corrosion.
- (15) When using a product with a pressure gauge outdoors, provide a canopy or other protection to prevent rainwater from directly hitting the pressure gauge.

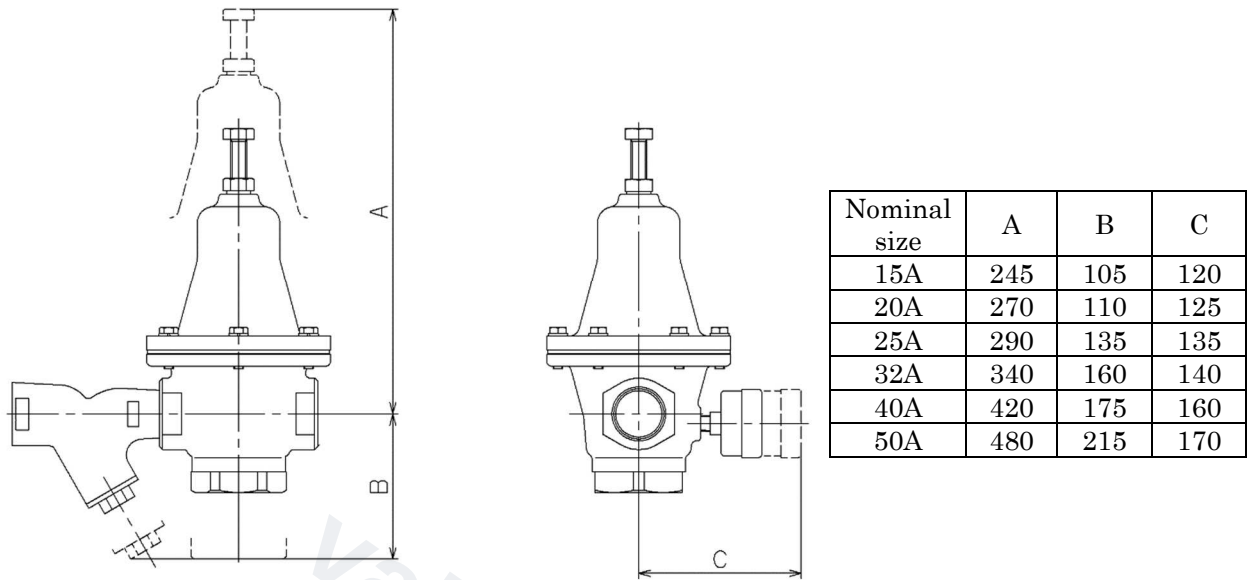


Fig.1

6. Operating Procedure

6.1 Warning and precaution on operation

⚠ Warning

- (1) Do not touch directly to pressure reducing valve with bare hands after flowing hot fluids
 *Doing so may result in burns.
- (2) Before flow the hot fluids in the pipe line, make sure that the fluids will not cause the risks through the end of piping system and the pipes are connected tightly.
 *In case hot fluids blows out, it may result in burns.

⚠ Caution

- (1) When opening the by-pass stop valve, ensure that the reduced pressure will not exceed set pressure of safety relief valve.
 *In case reduced pressure exceeds set pressure of safety relief valve, the safety relief valve operates and blows out the fluids.
- (2) When operation is discontinued for a long period of time, completely purge fluid from pressure reducing valve and piping system, and close the stop valve located up stream and down stream of pressure reducing valve.
 *Water scales developed in the piping may cause erratic operation of pressure reducing valve.

6.2 Adjustment Procedure

GD-24 pressure reducing valve is set at 0.1MPa at the factory. Change the set pressure as appropriate. Wrong or poor adjustment may cause hunting, scale buildup or water hammer, or severely damage relevant parts. Be sure to follow the following steps to complete proper adjustment. (Refer to the parts number in “2.2 Construction”).

- 1) Close the stop valves at both sides of the pressure reducing valve, and thoroughly purge the system through the by-pass line, with the by-pass valve opening adjusted so that the safety relief valve is not activated. When completed, be sure to close the by-pass valve.
- 2) Slowly open the inlet stop valve, then open the outlet stop valve slightly, allowing a trickle to be discharged.
- 3) Loosen the lock nut (11) and the sealed nut (17), and slowly turn the adjusting screw (10) (clockwise to increase, counterclockwise to reduce) while observing the pressure gauge (19) on the body (1).
- 4) Slowly open the outlet stop valve to its full-open position.
- 5) After the adjustment, tighten the lock nut (11) and the sealed nut (17).

7. Maintenance Procedure

Be aware of foreign materials because many of faults on pressure reducing valve are due to the existence of foreign materials. Please be reminded that our warranty does not cover damages caused by foreign materials at the customer site. Failure resulting from faulty pressure gauge, clogged strainer and leakage from by-pass stop valve are phenomena kindred to failure of pressure reducing valve. Clogged strainer will decrease the secondary pressure and leakage from by-pass pipe will increase the secondary pressure. Before do the troubleshooting of pressure reducing valve, check such symptom of the strainer and stop valve.

7.1 Warning and precaution on maintenance and inspection

Warning

The pressure reducing valve shall be disassembled and inspected by qualified persons.

- (1) Completely discharge internal pressure from the valves, lines, and equipment, and cool the valve down to a level where you can touch it with bare hands before disassembly and inspection.
*Failure to do so may result in injury or burns due to residual pressure or spillage around the valve.

Caution

- (1) To maintain the functions and performance of pressure reducing valve, perform periodical inspection.
*User should request to specialized dealer or manufacturer for such tasks.
- (2) Pressure reducing valve should be disassembled and inspected by qualified person or manufacturer.
*Request the treatment to specialized dealer or manufacturer in case of any problems.
- (3) During disassembling, internal fluid flows out. Discharge it into a suitable container. Disassembling pressure reducing valve after all fluids have been discharged.
*Fluid spills will contaminate surroundings.
- (4) Close the stop valves before and after pressure reducing valve, and remove all foreign matter and scales via the by-pass line before operation.
*Failure to do so may cause the malfunction of pressure reducing valve.

• Consumable parts and replacement period

Service life of consumable parts is dependent on the frequency and condition of usage. Rough indication of service life is given below.

(Refer to the parts number in “2.2 Construction”)

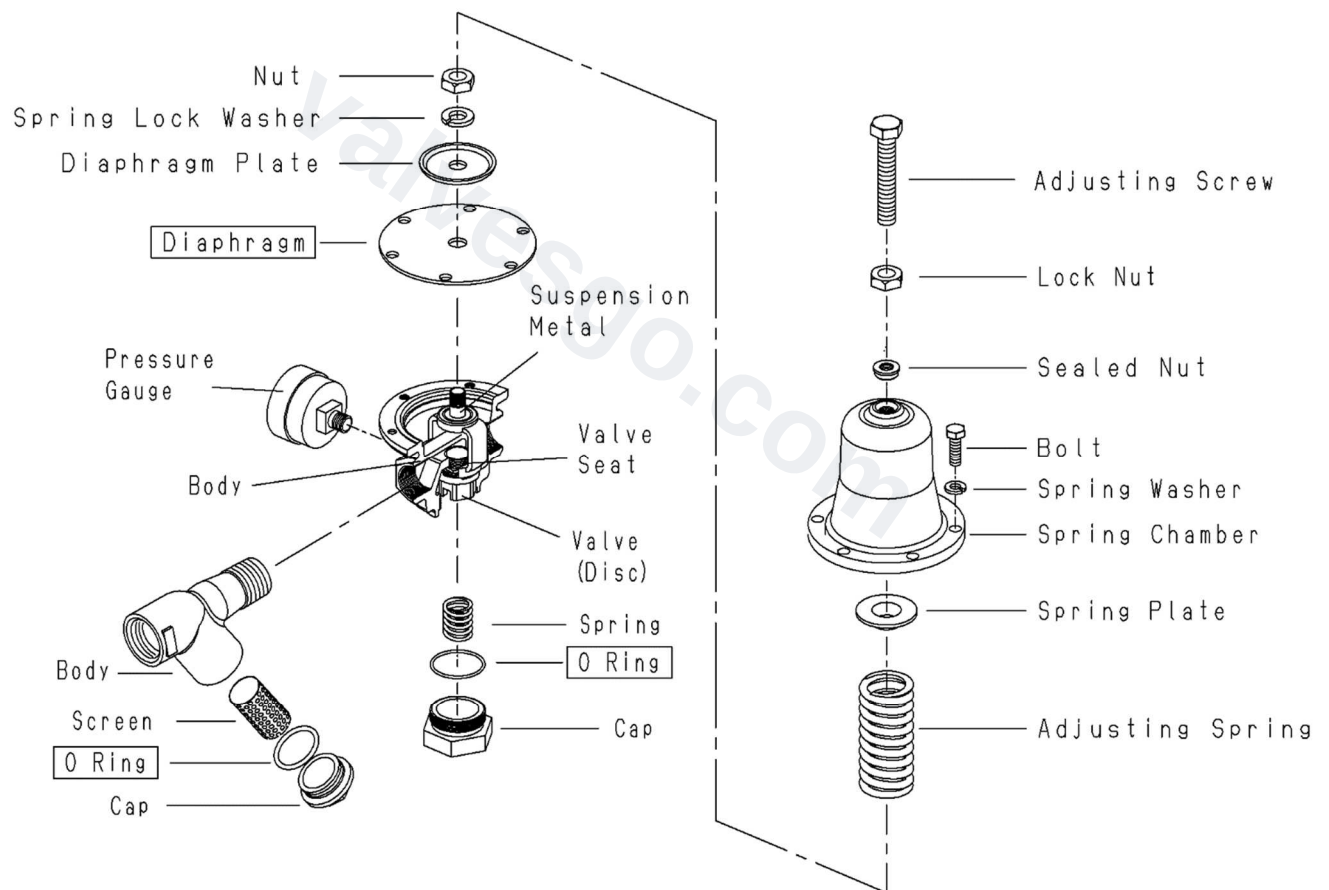
Name of parts	No.	Replacement period
Diaphragm	(8)	3 years
O-ring	(15) • (23)	3 years

7.2 Troubleshooting

(Refer to the parts number in “2. Construction”)

Problem	Cause	Countermeasure
Reduced pressure exceeds prescribed level.	1. Diaphragm (8) is damaged. 2. Foreign matter is embedded in the valve (4) and/or valve seat (5), or else scratches exist.	1. Replace the diaphragm (8). 2. Disassemble and remove the foreign mater. If scratches exist, replace it.
Pressure does not rise to the desired level.	1. Screen (22) is clogged. 2. Pressure gauge (19) malfunction.	1. Disassemble and clean. 2. Replace the pressure gauge (19).
Leakage	1. Loosen Bolt (16). 2. Loosen Cap (3). 3. Broken O-ring (15) for cap.	1. Tighten Bolt (16). 2. Tighten Cap (3). 3. Replace O-ring (15) for cap new one.
Abnormal noise is heard.	1. The suspension metal (6) is in incorrect position.	1. Correct the position of the suspension metal (6).

8. Exploded Drawing



•Part names shown in boxes are consumable parts.

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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