

# MODEL GD-26, GD-27, GD-28, GD-29 series

## 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.

 <b>Warning</b>	This symbol indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.
 <b>Caution</b>	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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# YOSHITAKE

# 1. Specifications

## 1.1 Specifications

Model		GD-26-NE	GD-27-NE	GD-27F-N	GD-28-NE	GD-29-NE
Nominal size		15A - 50A	25A - 100A	125, 150A	15A - 50A	25A - 100A
Application		Cold and hot water				
Inlet pressure		1.0 MPa or less			1.6 MPa or less	
Reduced pressure	A	0.05 - 0.35 MPa		0.05 - 0.20 MPa	0.05 - 0.35 MPa	
	B	0.30 - 0.70 MPa		0.20 - 0.50 MPa	0.30 - 0.70 MPa	
Min. differential pressure		0.05 MPa				
Max. pressure reduction ratio		10:1 *				
Application temperature		5~90°C				
Material	Body	Cast Bronze (NPb-treated)				
	Valve seat	Cast Bronze (NPb-treated)				
	Valve disc	FKM				
	Diaphragm	EPDM		FKM	EPDM	
Pipe end core		None				
Connection		JIS Rc screwed	JIS 10K FF flanged		JIS Rc screwed	JIS 16K FF flanged

\* The maximum differential pressure of the products of 125A and 150A is 0.8 MPa.

- The products of the nominal size 15A to 50A incorporate a strainer (40 mesh).
- Pressure gauge connection port is JIS R1/8. 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.
- All the above models conform to the standard of the Japanese Water Supply Act.

Model		GD-26L-NE				
Nominal size		15A - 50A				
Application		Cold and hot water				
Inlet pressure		1.0 MPa or less				
Reduced pressure	A	0.05 - 0.35 MPa				
	B	0.30 - 0.70 MPa				
Min. differential pressure		0.05 MPa				
Max. pressure reduction ratio		10:1				
Application temperature		5~40°C				
Material	Body	Cast Bronze (NPb-treated)				
	Valve seat	Cast Bronze (NPb-treated)				
	Valve disc	FKM				
	Diaphragm	EPDM				
Pipe end core		Used both for polyvinyl chloride lined steel pipe and powdered polyethylene lined steel pipe				
Connection		JIS Rc screwed				

- The products of the nominal size 15A to 50A incorporate a strainer (40 mesh).
- Pressure gauge connection port is JIS R1/8.
- The GD-26L-NE conforms to the standard of the Japanese Water Supply Act.

Model	GD-26S	GD-27S	GD-26S-NE	GD-27S-NE	GD-28S	GD-29S
Nominal size	20A - 50A	20A - 100A	20A - 50A	20A - 100A	20A - 50A	20A - 100A
Application	Cold and hot water					
Inlet pressure	1.0 MPa or less				1.6 MPa or less	
Reduced pressure	A	0.05 - 0.35 MPa				
	B	0.30 - 0.70 MPa				
Min. differential pressure	0.05 MPa					
Max. pressure reduction ratio	10:1					
Application temperature	5~90°C					
Material	Body	Cast Stainless Steel				
	Valve seat	Cast Stainless Steel				
	Valve disc	EPDM	FKM		EPDM	
	Diaphragm	EPDM				
Pipe end core	None					
Connection	JIS Rc screwed	JIS 10K FF flanged	JIS Rc screwed	JIS 10K FF flanged	JIS Rc screwed	JIS 16K FF flanged

- The products of the nominal size 15A 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.
- Models conforming to Japanese Water Supply Act are GD-26S-NE and GD-27S-NE.



### 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

- 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.

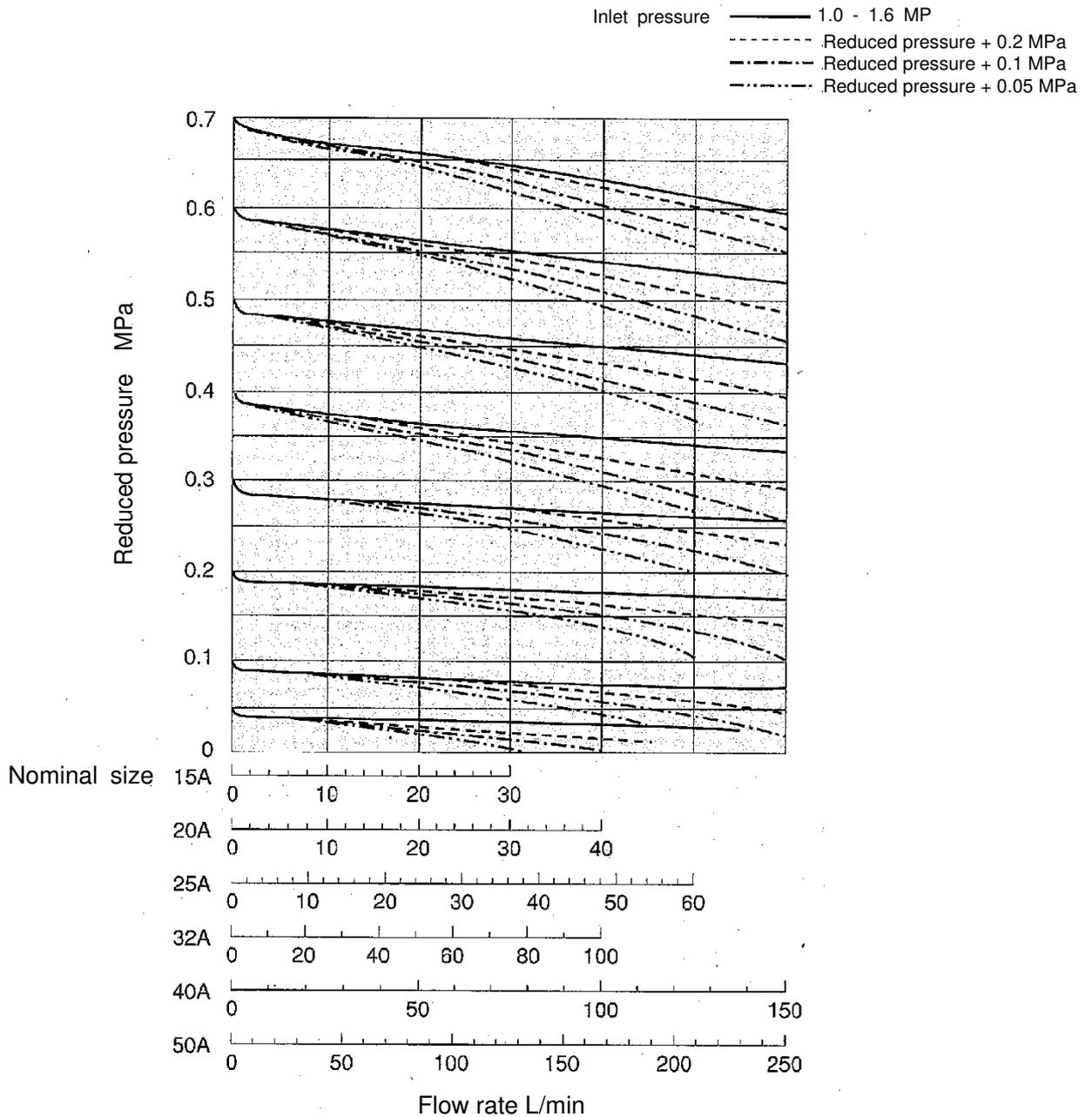
Rated flow table (The pressure difference before and after the product is 0.15 MPa or more)

Nominal size	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A
Rated flow (L/min)	30	40	60	100	150	250	300	450	700	1600	1800

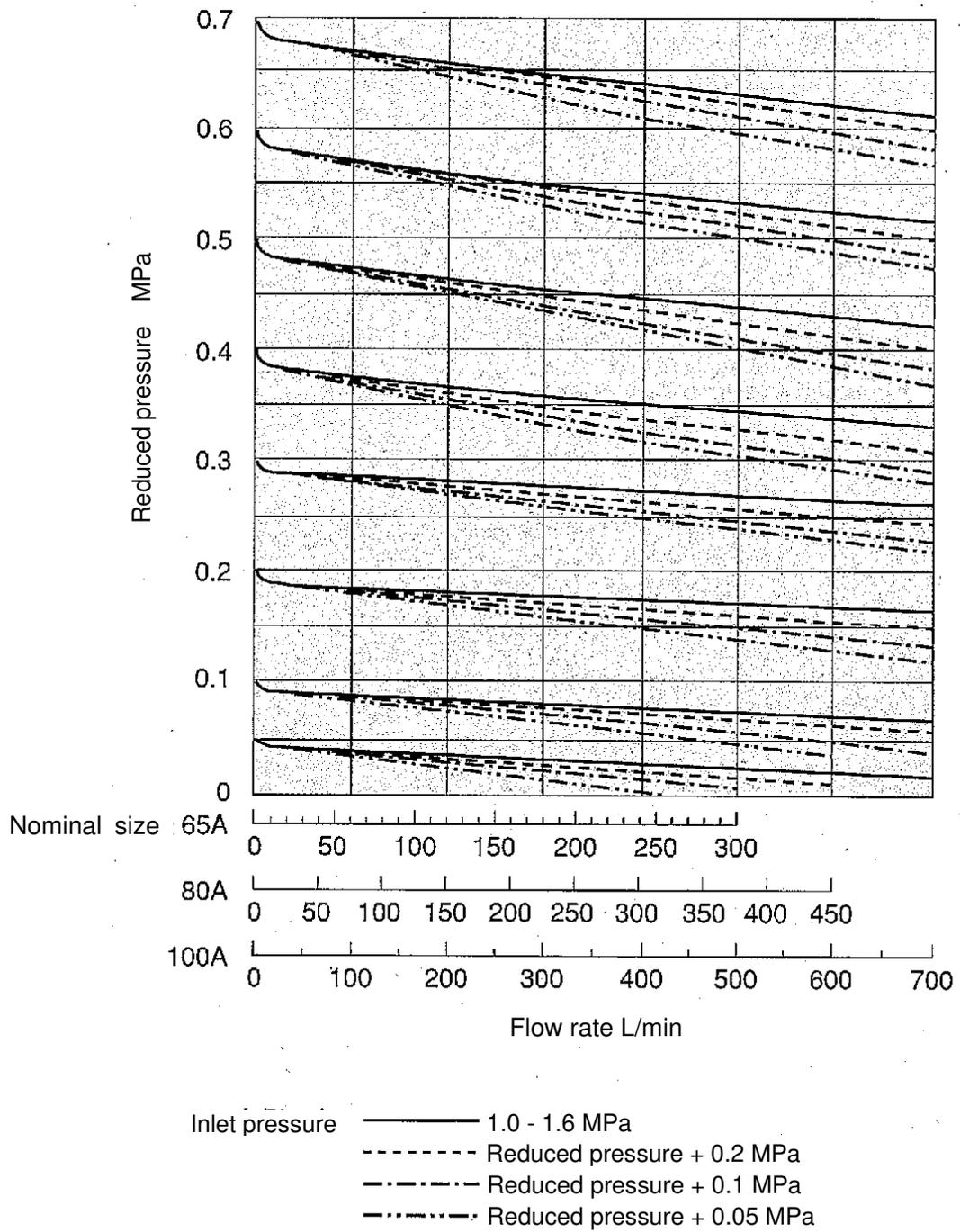
- If the pressure difference before and after the product is less than 0.15 MPa, choose the nominal size from the nominal size selection charts (for 15A - 50A, 65A - 100A, and 125A - 150A) below.

Nominal size selection chart

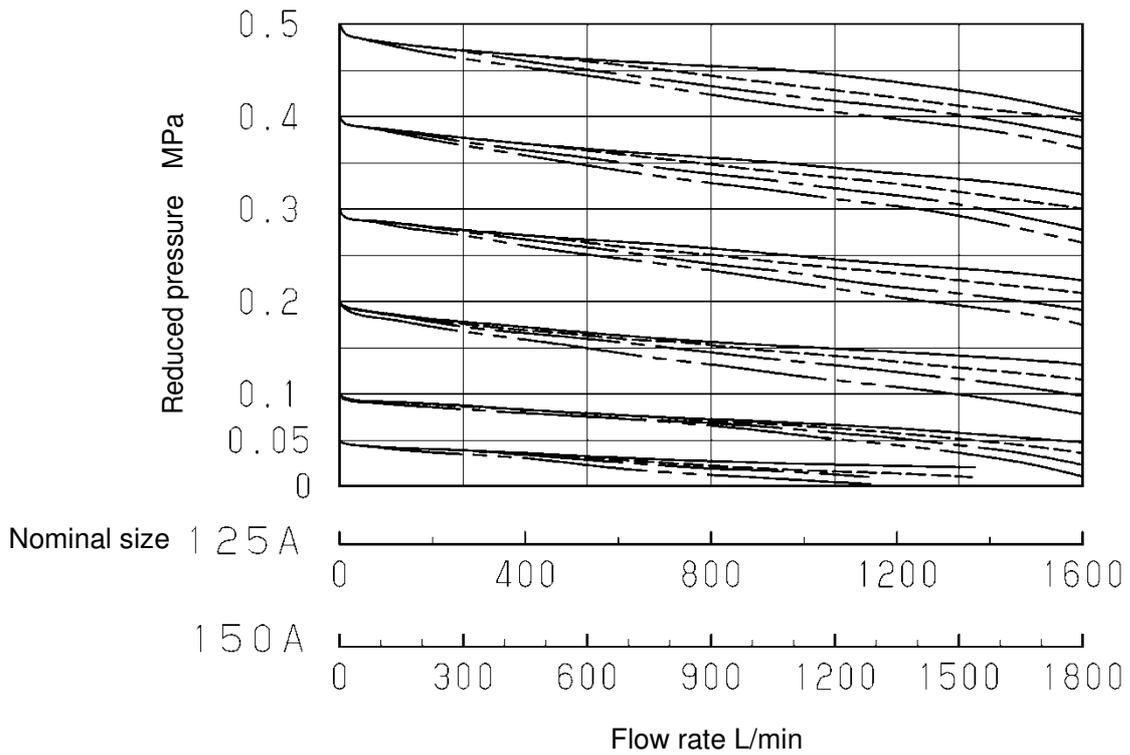
Nominal size 15A - 50A



Nominal size 65A -100A

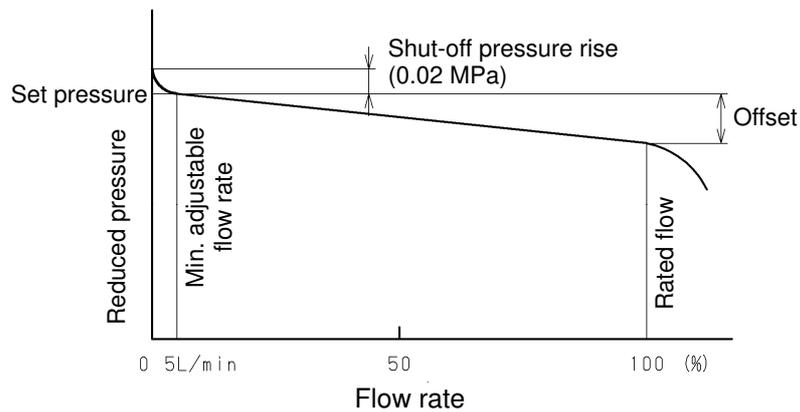


Nominal size 125A -150A



- Inlet pressure ——— 0.5 - 1.0 MPa
- Reduced pressure + 0.2 MPa
- . - . - . Reduced pressure + 0.1 MPa
- Reduced pressure + 0.05 MPa

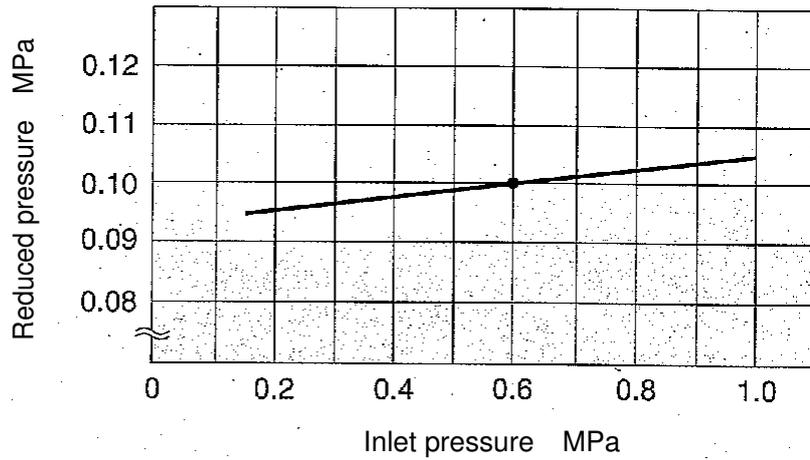
1.3 Flow rate characteristics chart



Offset

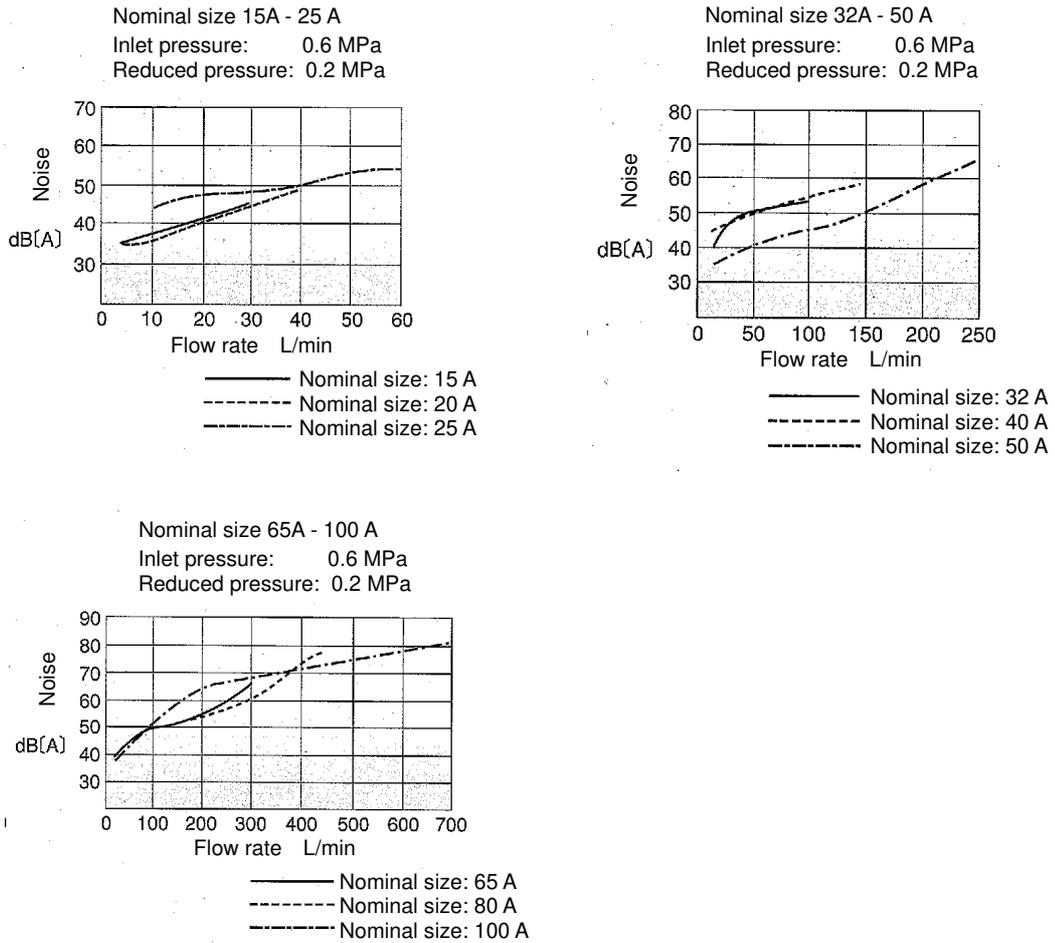
Nominal size	Pressure range	Reduced pressure range	Offset
15A - 100A	A	0.05 - 0.35 MPa	0.05 MPa or less
	B	0.30 - 0.70 MPa	0.10 MPa or less
125A - 150A	A	0.05 - 0.20MPa	0.07 MPa or less
	B	0.20 - 0.50MPa	0.12 MPa or less

### 1.4 Pressure characteristics chart

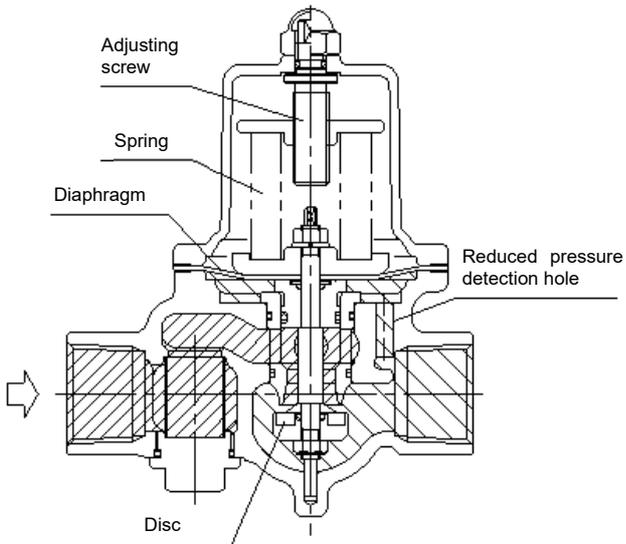


This chart shows variation in the reduced pressure when the inlet pressure of 0.60 MPa is changed between 0.15 MPa and 1.0 MPa after the reduced pressure is set at 0.10 MPa.

### 1.5 Noise characteristics chart (Fluid: Water)



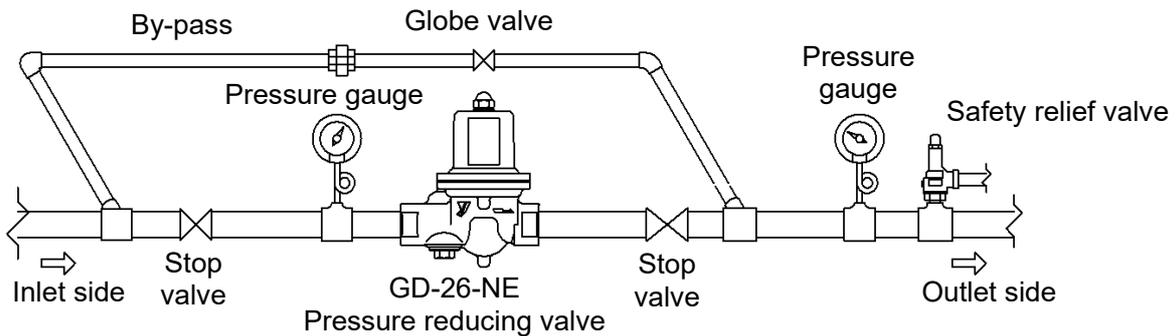
## 2. Operation



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 150A.

### 3.2 Precaution for installation

#### **Warning**

1. Since the products of the nominal size 125A and 150A are heavy, securely support them using lifting devices or the like when installing.  
\* 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.
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 150A.  
\* 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 (nominal size 15A to 100A). In the case of the nominal size 125A and 150A, install the product horizontally.  
\* 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. It is recommended to use a bronze or stainless steel nipple for the outlet side of the GD-26-NE or GD-28-NE when installing.  
\* If a steel pipe (lined steel pipe) is used for the outlet side of the product, corrosion (rust tubercle, etc) at the end of the steel pipe is increased year by year, which clogs the reduced pressure detection hole at the outlet side of the product and result in insufficient fluid flow.
11. The product can be installed either horizontally or vertically (nominal size 15A to 100A). In case of nominal size 125A and 150A, install the product horizontally.
12. A space more than the value shown as H<sub>2</sub> in the table below is required for disassembly and inspection. A space more than the value shown as H<sub>3</sub> in the table below is required for the inspection of the built-in strainer (nominal size 15A 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-26-NE, GD-27-NE, GD-28-NE, GD-29-NE, GD-27F-N, GD-26L-NE

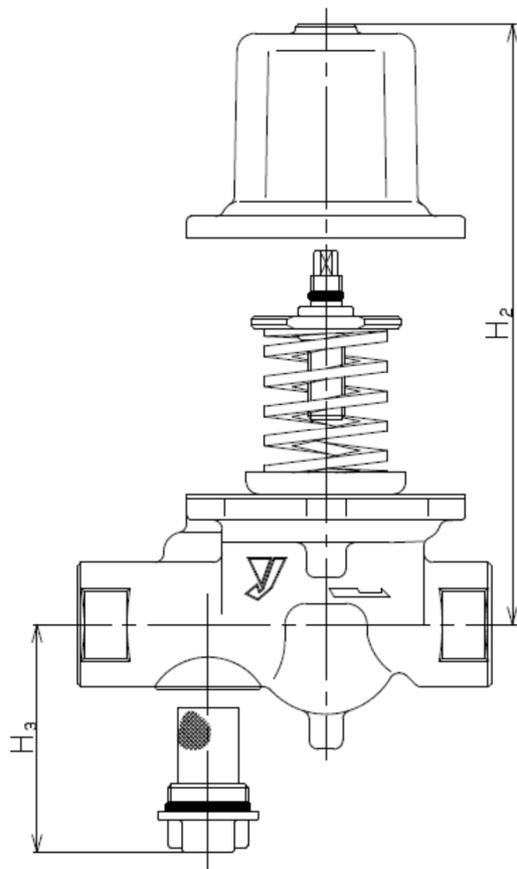
(mm)

Nominal size	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A
H <sub>2</sub>	240	240	250	300	300	320	450	450	550	970	970
H <sub>3</sub>	80	80	90	120	120	150	-	-	-	-	-

- Model GD-26S, GD-27S, GD-28S, GD-29S, GD-26S-NE, GD-27S-NE

(mm)

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



## 4. Operation procedure

### 4.1 Precaution for operation



#### Warning

- (1) 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.
- (2) Before leading fluid, make sure that there is no danger even if fluid leads to the piping end.



#### Caution

1. 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.
2. 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.
3. 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.
4. If there is a possibility of freezing or 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 or damaged by freezing.
5. 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

1. 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.
2. 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] (loosen the nut [41] in the case of nominal size 125A and 150A), 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.
4. Fully open the stop valve at the outlet side slowly.
5. After the adjustment is complete, tighten the domed cap nut [17] (nut [41] in the case of the nominal size 125A and 150A).

## 5. Maintenance

### 5.1 Troubleshooting

Trouble	Cause	Remedy
Abnormal pressure rises at the outlet side.	<ol style="list-style-type: none"> <li>1. Foreign substances stuck between the disc [8] and the valve seat [3], or scratch on them.</li> <li>2. The O-ring [6] is damaged.</li> <li>3. The diaphragm [9] is damaged.</li> <li>4. There is a leakage from the globe valve of the by-pass line.</li> </ol>	<ol style="list-style-type: none"> <li>1. Disassemble the product and remove the foreign substances. If scratch is observed on the valve disc or valve seat, replace it.</li> <li>2. Replace the O-ring.</li> <li>3. Replace the diaphragm.</li> <li>4. Repair or replace the globe valve.</li> </ol>
Reduced pressure does not reach the desired value.	<ol style="list-style-type: none"> <li>1. The working pressure is improper.</li> <li>2. The nominal size of the product is too small for the flow rate for use.</li> <li>3. Pressure adjustment is improper.</li> <li>4. Strainer [10] built in the product is clogged.</li> <li>5. The strainer installed at the inlet side of the product is clogged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Correct the working pressure. (See "1.1 Specifications" on Page 1.)</li> <li>2. Replace the product with the proper nominal size. (See "1.2 Nominal size selection" on Page 3.)</li> <li>3. Readjust the pressure in accordance with the given procedure. (See "5.2 Adjusting procedure" on Page 12.)</li> <li>4. Clean the strainer. (See "6.5 Strainer cleaning procedure" on Page 16.)</li> <li>5. Clean the strainer.</li> </ol>
Outside leakage	<ol style="list-style-type: none"> <li>1. Bolt [18] or [39] is loosened.</li> <li>2. O-ring [30] is damaged.</li> <li>3. Strainer cap [11] or plug [31] is loosened.</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten the bolts.</li> <li>2. Replace the O-ring.</li> <li>3. Tighten the strainer cap or plug.</li> </ol>
Abnormal sound	<ol style="list-style-type: none"> <li>1. The nominal size of the product is too large for the specifications of the system.</li> <li>2. The pressure reduction ratio is too large or the maximum pressure difference is exceeded.</li> <li>3. Air binding has occurred.</li> <li>4. A quick operating valve is located near the product.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the product with the proper nominal size. (See "1.2 Nominal size selection" on Page 3.)</li> <li>2. Reduce pressure in two stages. (See "1.1 Specifications" on Page 2)</li> <li>3. Install an air vent device.</li> <li>4. Keep a distance between them as large as possible. (3 m at least)</li> </ol>

- 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

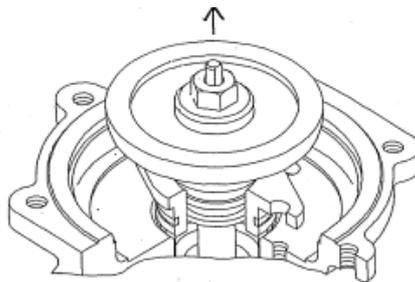
1. If problem occurs for a cause other than listed in "6.1 Troubleshooting" on Page 13, please contact us.
2. When the product is disassembled, internal fluid flows out. Receive it in a container.  
\* Failure to follow this notice may result in making the surroundings dirty.
3. Synthetic rubber is a 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.

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

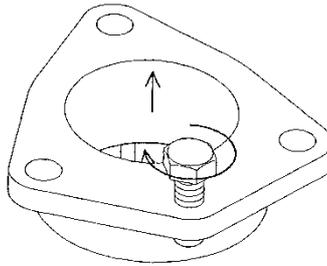
## 5.3 Disassembly

1. Remove the domed cap nut [17] (loosen the nut [41] in the case of nominal size 125A and 150A), 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 150A) of the valve seat [3], and remove a set of the valve seat (valve seat [3], spindle [4], disc [8], and O-ring [28]).

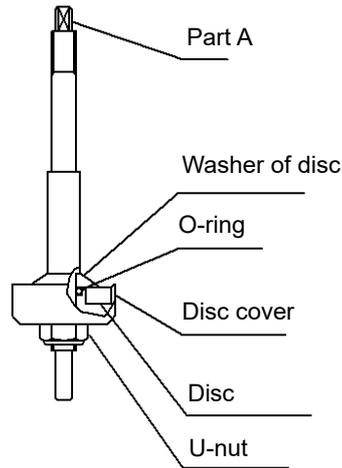
Nominal size 15A to 50A: Attach the diaphragm retainer [12] to the spindle [4], and pull it up.



Nominal size 65A to 150A: 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].



#### 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.

## 5.5 Strainer cleaning procedure

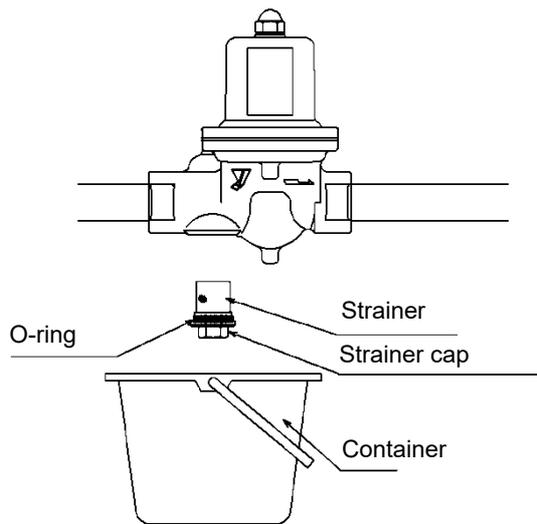
### Warning

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

### Caution

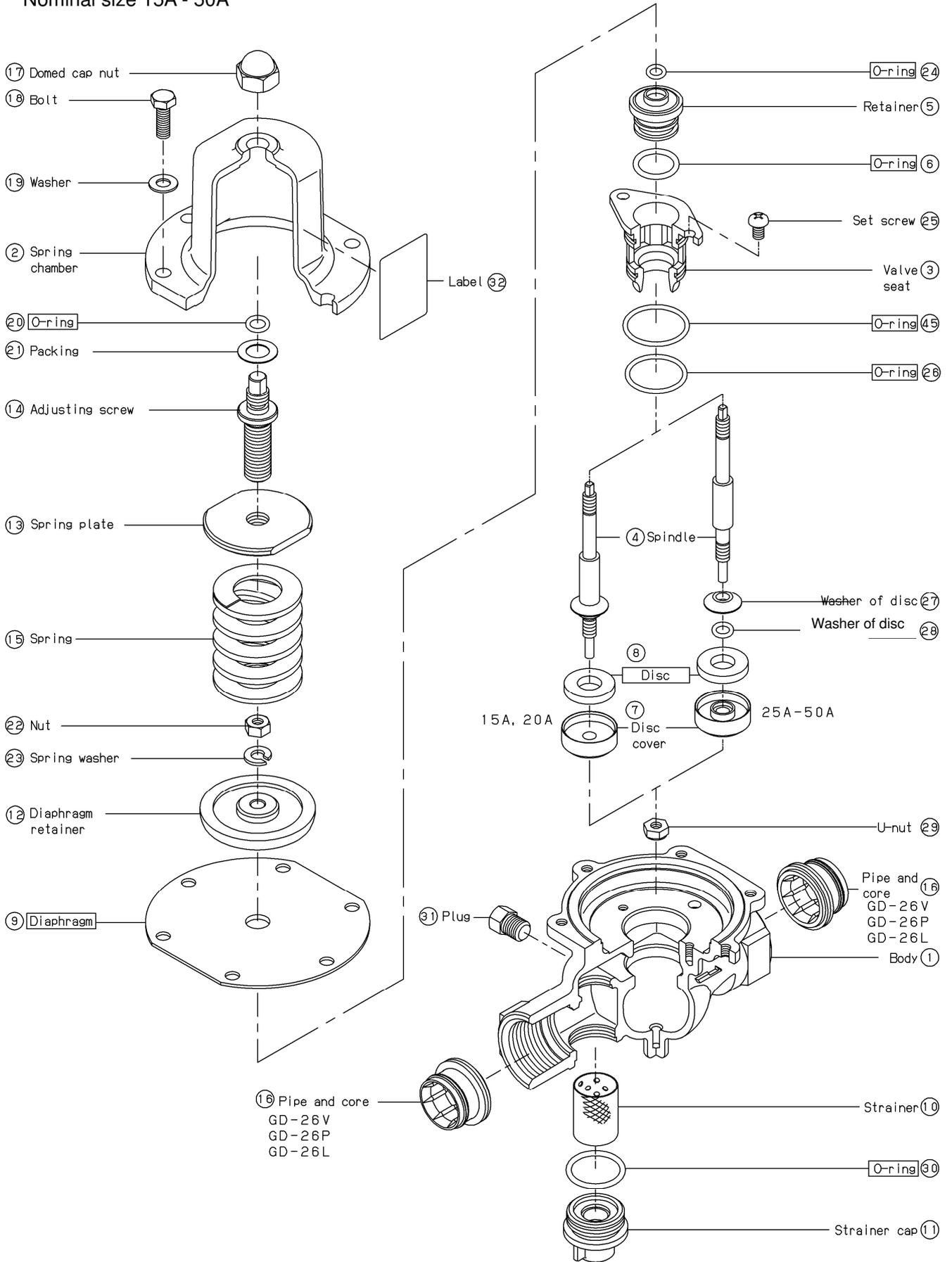
1. Clean the strainer regularly at least once or twice a year.  
\* Too much deposit of scales or the like decreases the flow rate, which prevents the product from functioning properly.
2. When the strainer cap is removed, receive fluid in a container. (See the Figure below.)

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.



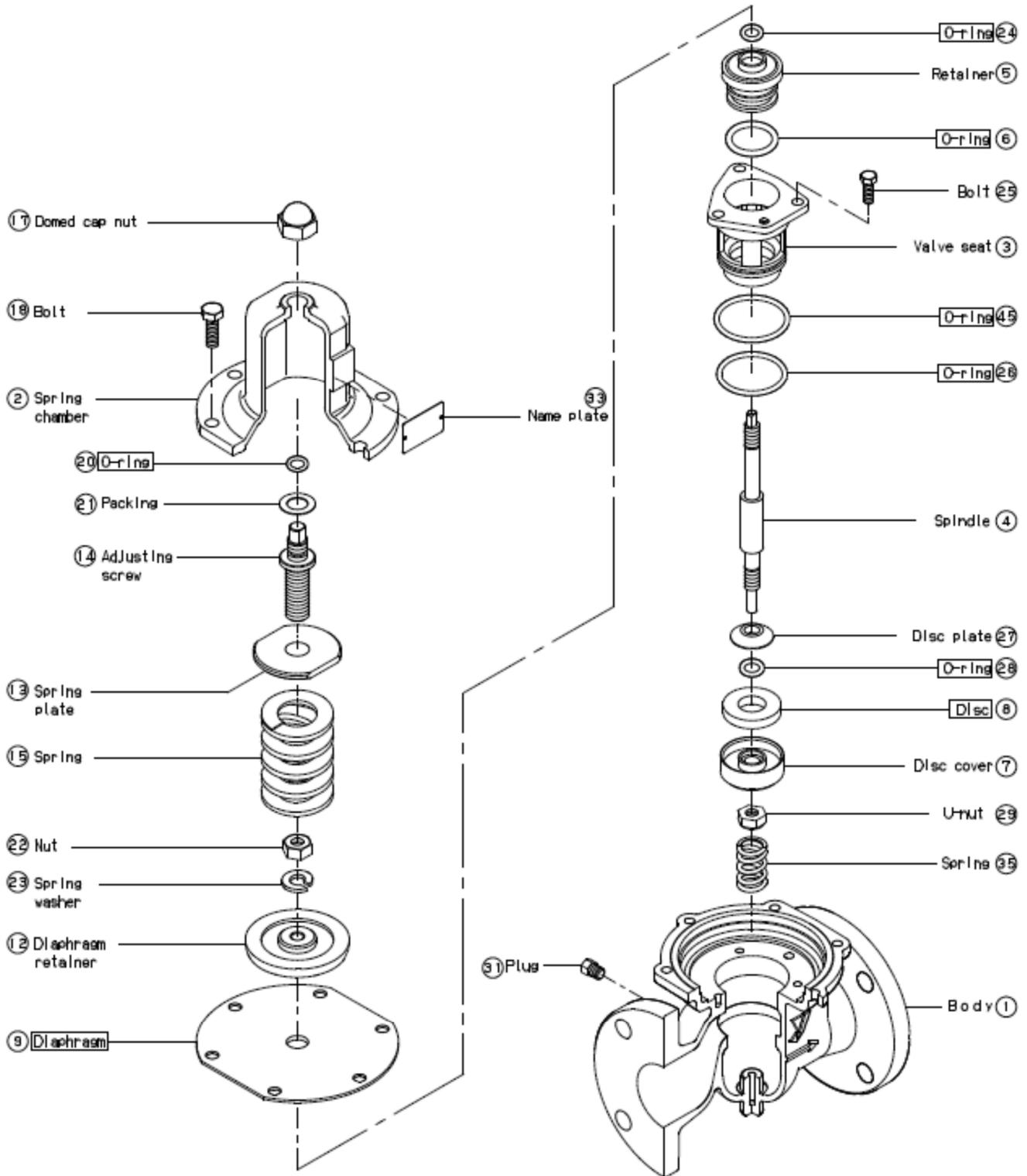
## 6. Exploded view

Nominal size 15A - 50A



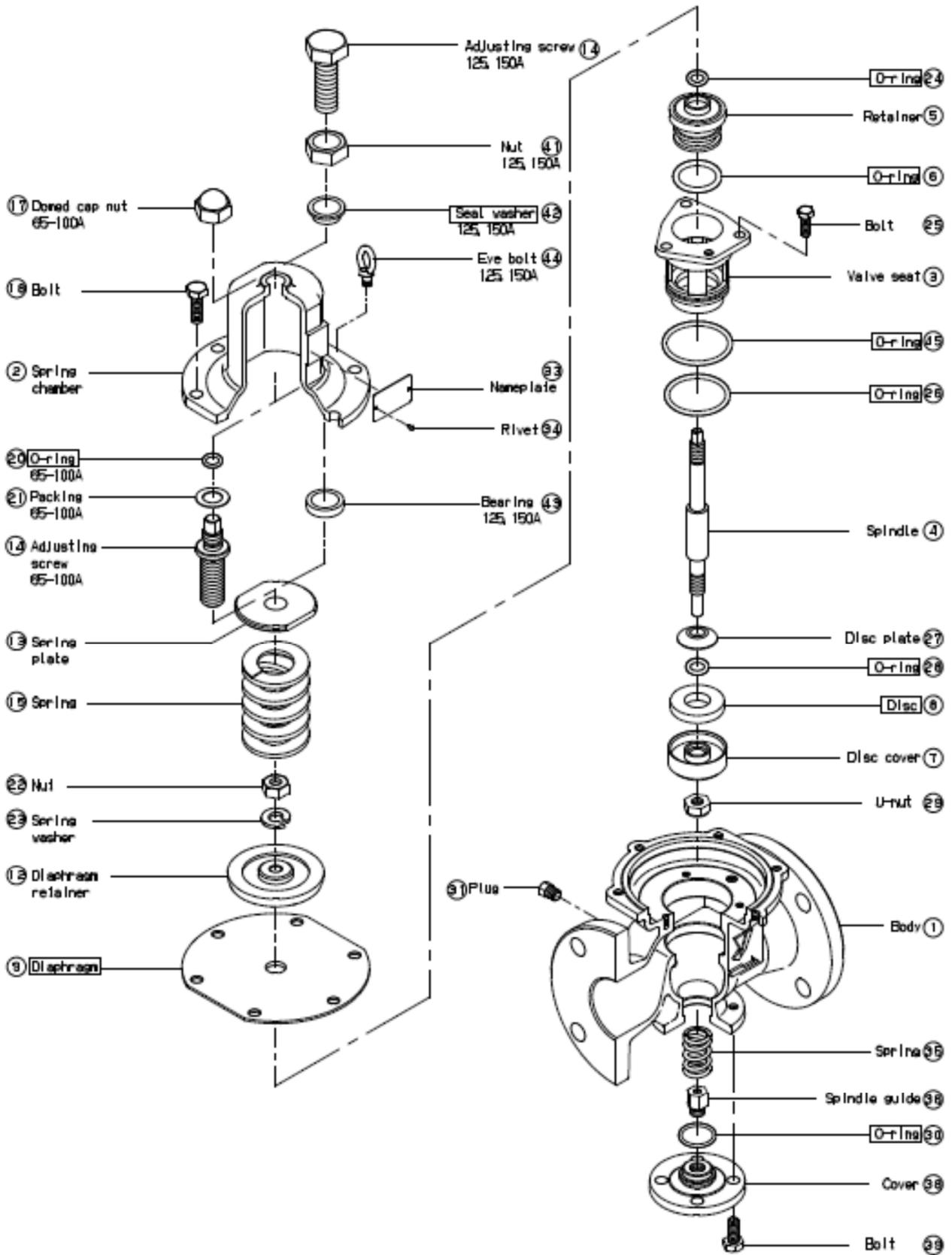
Note) The parts shown in the rectangle boxes are available as consumable supply

Nominal size 65A - 100A(GD-27-NE)  
65A(GD-29-NE)



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

Nominal size 65A - 100A(GD-27S, GD-27S-NE, GS-29S)  
 80-100A(GD-29-NE)  
 125-150A(GD-27F-N)



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

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## Warranty Information

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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.