

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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YOSHITAKE

1. Specifications

1.1 Specifications

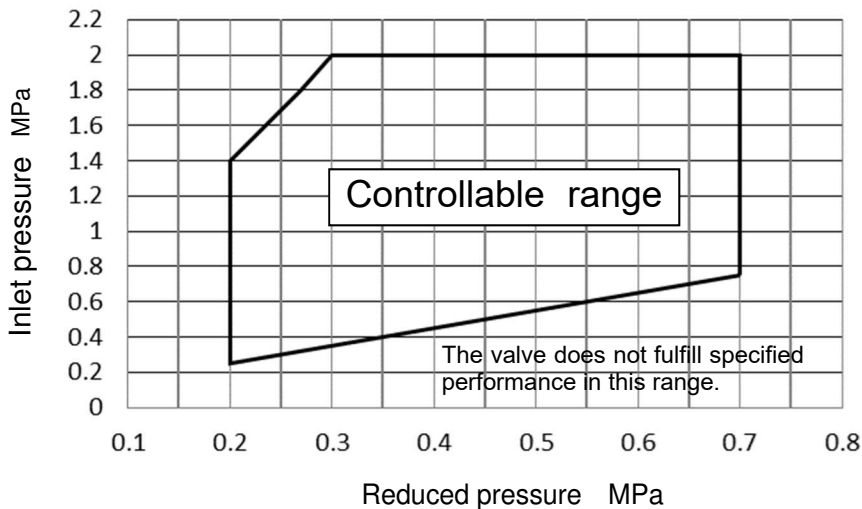
Model		GD-28S-NE	GD-29S-NE
Nominal size		20A - 50A	20A - 100A
Application		Cold and hot water	
Inlet pressure		2.0 MPa or less	
Reduced pressure	A	0.20 - 0.35 MPa	
	B	0.30 - 0.70 MPa	
Min. differential pressure		0.05 MPa	
Controllable range		Refer to Specifications Selection Chart *1	
Max. temperature		90°C	
Material	Body	Stainless Steel	
	Valve seat	Stainless Steel	
	Valve disc	Synthetic rubber	
	Diaphragm	Synthetic rubber	
Connection		JIS Rc screwed	JIS 20K RF flanged *2

- The products from 20A to 50A are equipped with built-in strainer (40 mesh).
- Pressure gauge connection port is JIS R1/4.
- Products complying with the Water Supply Act

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

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

Specifications Selection Chart *1



If it is out of controllable range, employ two-stage pressure reduction or select another model. When inlet pressure is 2.0MPa, make sure that reduced pressure is 0.3MPa or more.



Caution

Please collate the plate or label attached to the product with specifications of ordered model.
* If they do not match each other, please contact us without using the product.

1.2 Nominal size selection

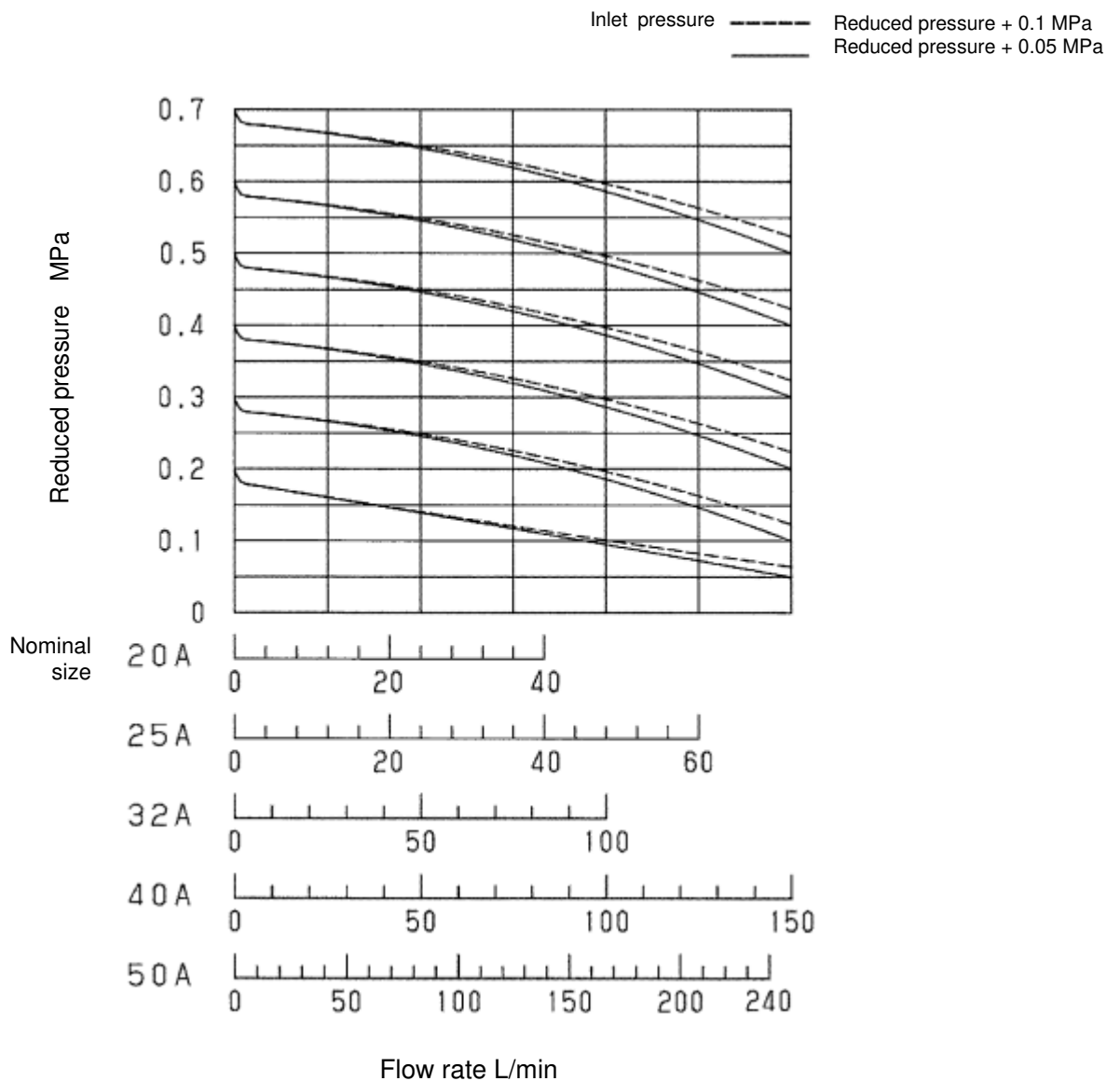
- Procedure of nominal size selection
- 1. If the differential pressure before and after the valve is 0.15 MPa or more, select the nominal size from the rated flow table below.

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

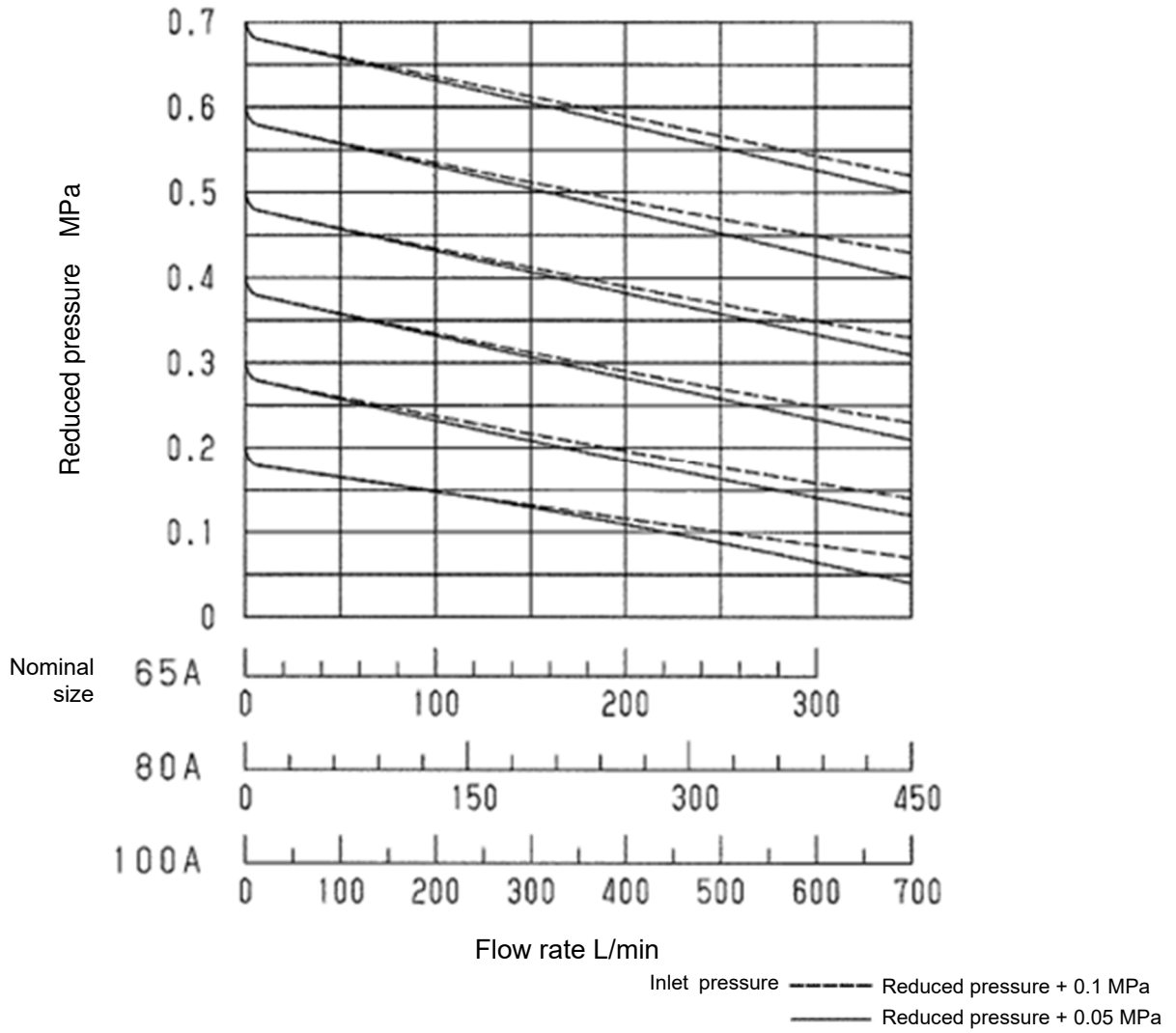
Nominal size	15A	20A	25A	32A	40A	50A	65A	80A	100A
Rated flow (L/min)	30	40	60	100	150	240	300	450	700

- 2. If the differential pressure before and after the valve is less than 0.15 MPa, select the nominal size from the nominal size selection chart (for 20A - 50A, 65A - 100A) below.

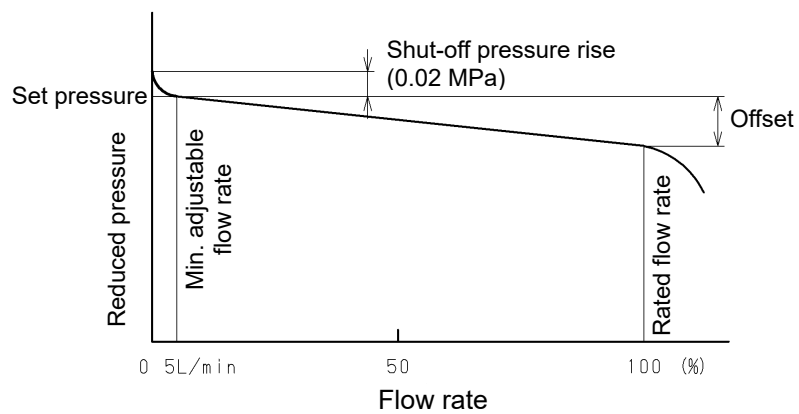
Nominal size selection chart
Nominal size 20A - 50A



Nominal size 65A -100A



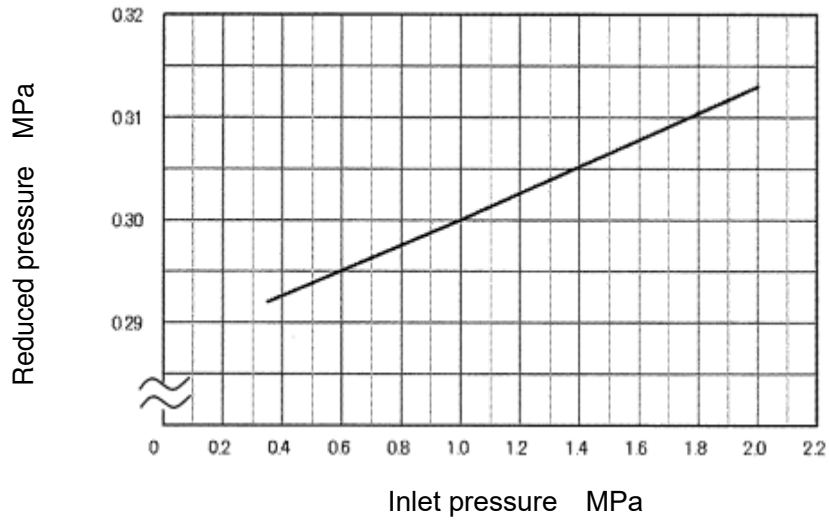
1.3 Flow rate characteristics chart



Offset (Differential pressure after valve seat is 0.15MPa or more)

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

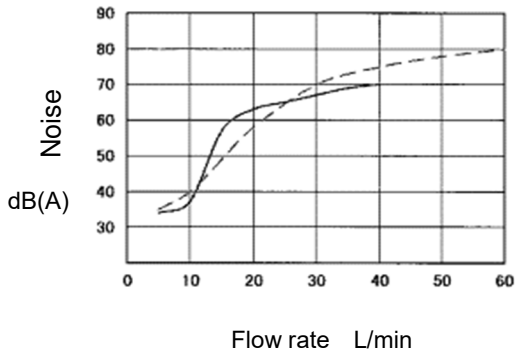
1.4 Pressure characteristics chart



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

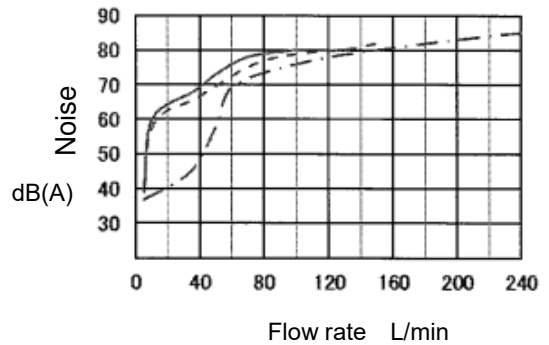
1.5 Noise characteristics chart (Fluid: Water)

Nominal size 20A – 25A
 Inlet pressure: 2.0MPa
 Reduced pressure: 0.3 MPa



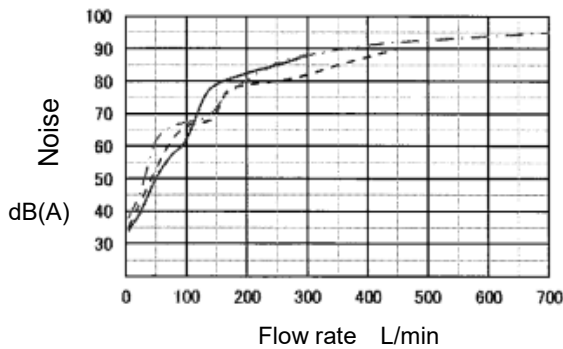
— Nominal size: 20 A
 - - - Nominal size: 25 A

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



— Nominal size: 32 A
 - - - Nominal size: 40 A
 - · - · - Nominal size: 50 A

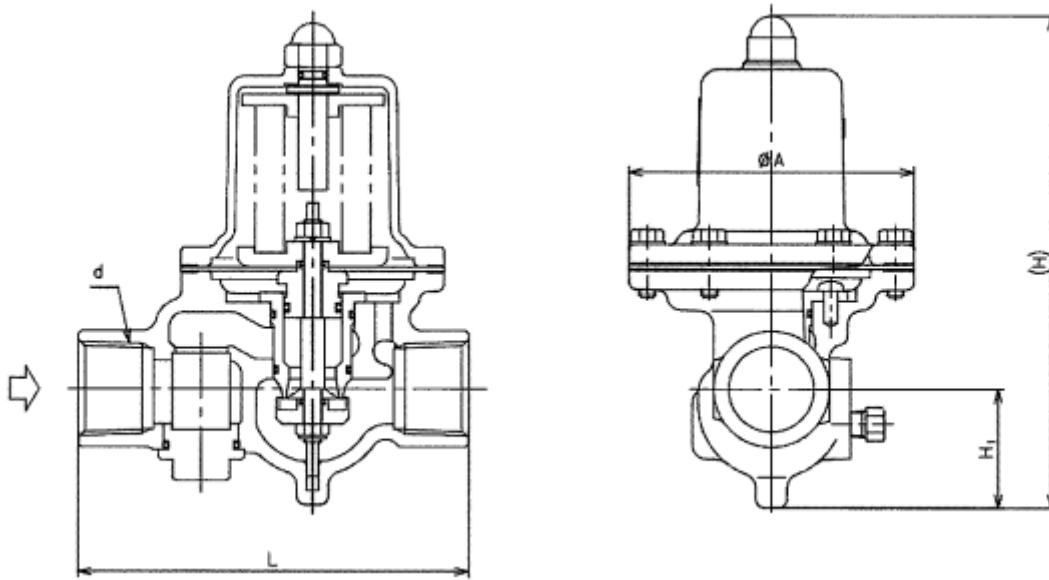
Nominal size 65A - 100 A
 Inlet pressure: 2.0 MPa
 Reduced pressure: 0.3 MPa



— Nominal size: 65 A
 - - - Nominal size: 80 A
 - · - · - Nominal size: 100 A

2. Dimensions and Weights

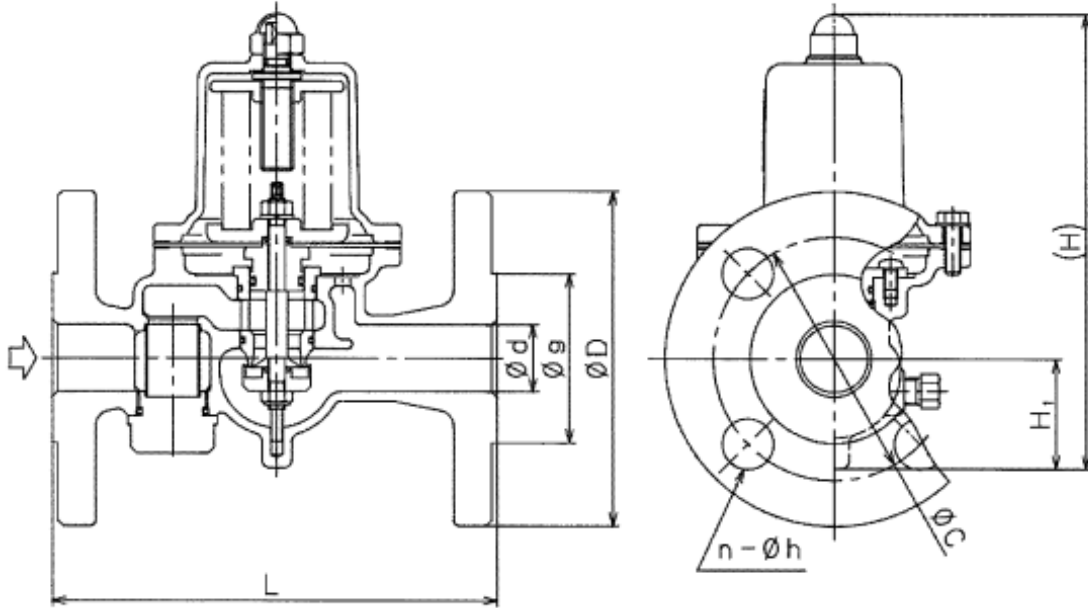
- Model GD-28S-NE



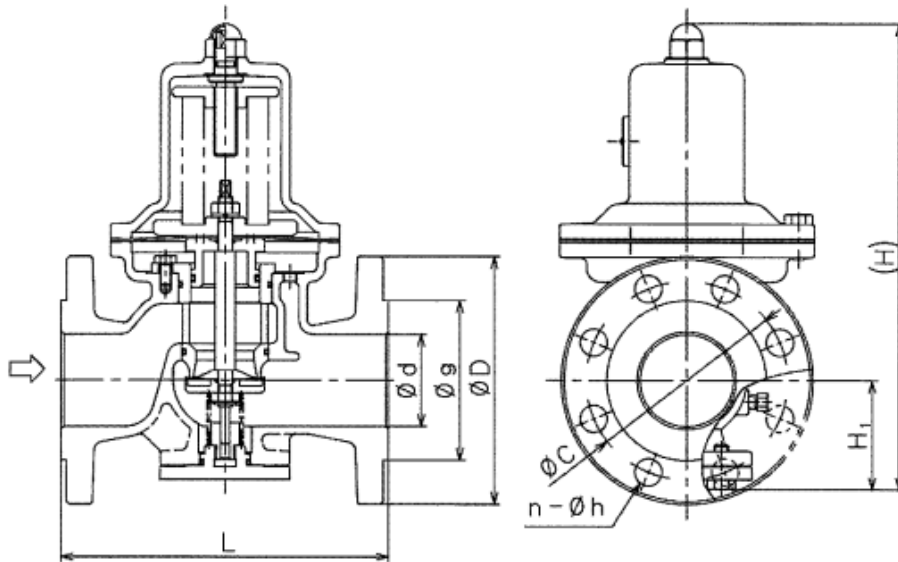
(mm)

Nominal size	d	L	H ₁	H	Weight (kg)
20A	Rc 3/4	135	41	170	2.3
25A	Rc 1	135	41	170	2.3
32A	Rc 1 1/4	180	57	224	4.9
40A	Rc 1 1/2	180	57	224	4.7
50A	Rc 2	200	61	239.5	6.7

- Model GD-29S-NE
Nominal size 20A - 50A



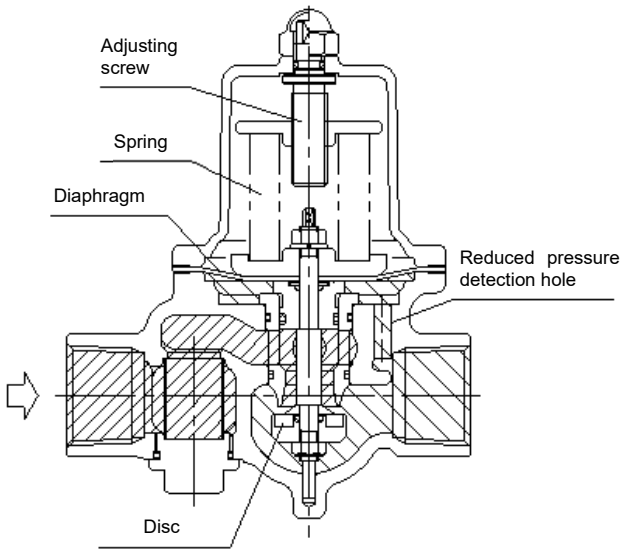
Nominal size 65A - 100A



(mm)

Nominal size	L	H ₁	H	d	JIS 20KRF flanged				Weight (kg)
					g	D	C	n-φh	
20A	164	41	170	20	56	100	75	4-15	4.4
25A	164	41	170	25	67	125	90	4-19	5.4
32A	204	57	224	32	76	135	100	4-19	8.7
40A	204	57	224	32	81	140	105	4-19	9.0
50A	225	61	239.5	50	96	155	120	8-19	11.8
65A	225	77	329	65	116	175	140	8-19	21.0
80A	237	82	345	80	132	200	160	8-23	25.5
100A	290	94	412	100	160	225	185	8-23	40.5

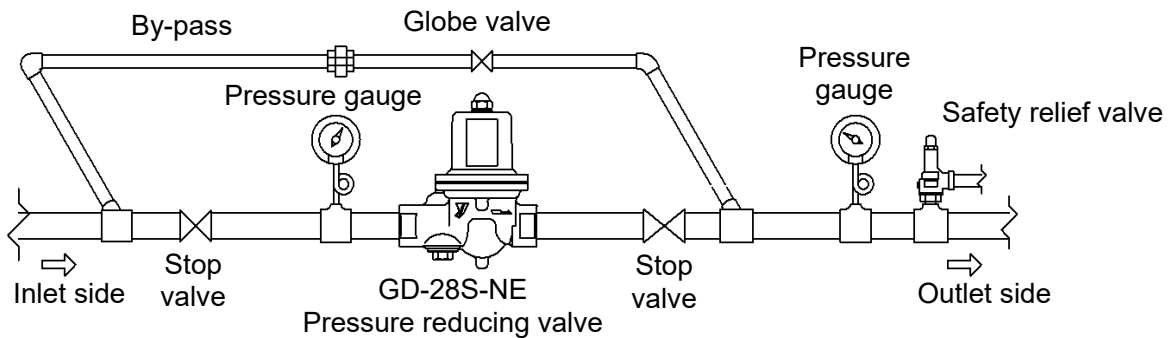
3. Operation



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.

4. Installation

4.1 Piping example



- * Install a strainer on the inlet side of the pressure reducing valve of nominal size 65A to 100A.
- * Make sure that pipes 3m before and after the product, both the inlet side and outlet side, are of the same diameter.

4.2 Precaution for installation

Warning

1. Please refer to “2. Dimensions and Weights.” for product weight.
* 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 on 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.

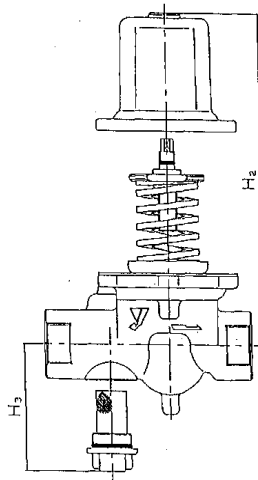
Caution

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 scales from the piping. Keep foreign substances from entering the piping, including seal tape or liquid seal agent for piping connection.
* Ingress of foreign substances, scales or seal agent into the product leads to valve leakage or malfunction of the product.
* Repairs caused by foreign substances or scales will be charged even during the warranty period.
3. If components having a 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 on the inlet side of the product of nominal size 65A to 100A.
* Ingress of foreign substances or scales into the product leads to malfunction of the product. It is recommended to use a strainer of 60 mesh or more.
5. Install a safety relief valve for equipment protection on 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 on both 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.
* 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. Make sure that pipes 3m before and after the product, the inlet side and outlet side, are of the same diameter.
* If the pipe diameter is narrowed immediately before or after the product, the flow velocity may increase and result in malfunction or a drastically shortened service 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.

- 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	-	-	-



5. Operation procedure

5.1 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 on the inlet and outlet sides of the product and remove foreign substances and scales 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 scales 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 causes. See 5.2 Adjusting procedure.
- If outlet side of the product is closed while fluid is kept 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 on 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.

5.2 Adjusting procedure

Following a wrong adjusting procedure may cause hunting, scale problems or other problems, 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 on the inlet and outlet sides of the product, 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 by-pass pipe so that the safety relief valve will not blow out. After finishing blowing, close the globe valve without fail.
- After slowly fully opening the stop valve on the inlet side, open the stop valve on the outlet side slightly so that fluid flows through slightly.

3. Remove the domed cap nut [17] and turn the adjusting screw [14] while watching the pressure gauge on 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 on the outlet side slowly.
5. After the adjustment is complete, tighten the domed cap nut [17]

6. Maintenance

6.1 Troubleshooting

Trouble	Cause	Remedy
Reduced pressure exceeds the set pressure.	<ol style="list-style-type: none"> 1. Foreign substances are stuck between disc [8] and valve seat [3], or either of the parts is damaged. 2. The O-ring [6] is damaged. 3. The diaphragm [9] is damaged. 4. By-pass globe valve leaks. 	<ol style="list-style-type: none"> 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 by-pass globe valve.
Reduced pressure does not reach the desired value.	<ol style="list-style-type: none"> 1. Working pressure is improper. 2. Nominal size of the product is too small for the specifications of the system. 3. Pressure adjustment is improper. 4. Strainer [10] built in the product is clogged. 5. The strainer installed on the inlet side of the product is clogged. 	<ol style="list-style-type: none"> 1. Correct the working pressure. (See "1.1 Specifications".) 2. Replace the product with one of proper nominal size. (See "1.2 Nominal size selection") 3. Readjust the pressure in accordance with the given procedure. (See "5.2 Adjusting procedure") 4. Disassemble and clean it. (See "6.5 Strainer cleaning procedure") 5. Clean the strainer.
Outside leakage	<ol style="list-style-type: none"> 1. Bolt [18] or [39] got loose. 2. O-ring [30] is damaged. 3. Strainer cap [11] or plug [31] got loose. 	<ol style="list-style-type: none"> 1. Tighten the bolts. 2. Replace the O-ring. 3. Tighten the strainer cap or plug.
Abnormal sound	<ol style="list-style-type: none"> 1. 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-induced trouble. 4. An on-off valve is installed near the product. 5. The pipe diameter is narrowed within 3m before and after the pressure reducing valve. 	<ol style="list-style-type: none"> 1. Replace the product with one of proper nominal size. 2. Reduce pressure in two stages. (See "1.1 Specifications") 3. Install an air vent. 4. Take as large distance as possible from the on-off valve. 5. Make sure that pipes at least 3m before and after the pressure reducing valve are of the same diameter.

- 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 measure.

6.2 Precaution for maintenance and inspection

⚠ Warning

1. Completely discharge the pressure inside 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 injury or contamination on the surroundings due to the residual pressure.
2. If the fluid is hot, do not touch the product directly with bare hands.
* Failure to follow this notice may result in scalds or injury.

⚠ Caution

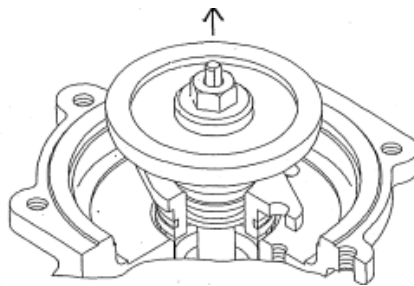
1. If problem occurs for a cause other than listed in "6.1 Troubleshooting", please contact us.
2. When the product is disassembled, internal fluid flows out. Receive it in a container.
* Failure to follow this notice may result in making the surroundings dirty.
3. Synthetic rubber is a consumable part. 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, Part No.
Three years	Diaphragm [9], O-ring [6], Disc [8]
Five years	O-ring [20], [24], [26], [28], [30], [45] seal washer [42]

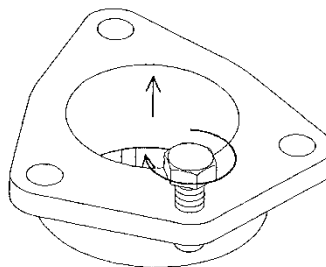
6.3 Disassembly

1. Remove the domed cap nut [17], turn the adjusting screw [14] counterclockwise to release the compression of the spring [15] (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]).

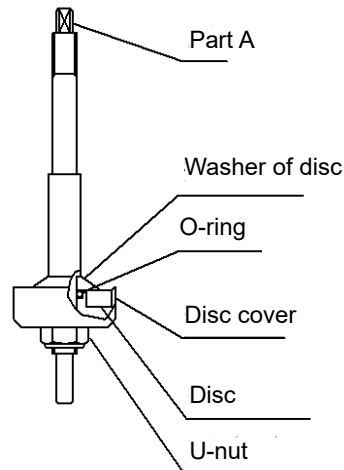
Nominal size 20A to 50A: Attach the diaphragm retainer [12] to the spindle [4], and pull it up.



Nominal size 65A to 100A: 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].



6.4 Precaution for reassembly

⚠ Caution

1. Check that there are 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 damage or scratch on the disc or O-ring.
*Damage or 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

6.5 Strainer cleaning procedure

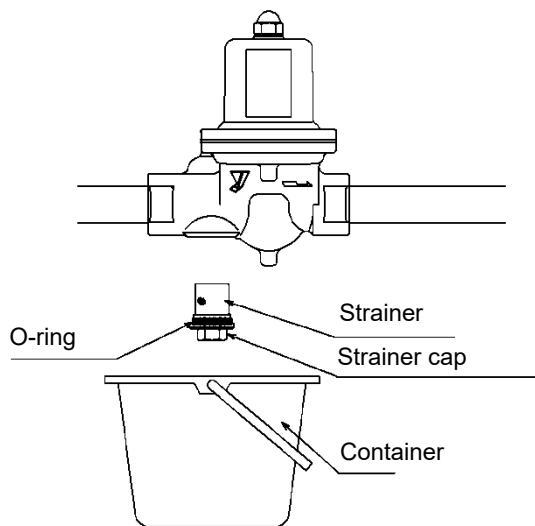
Warning

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

Caution

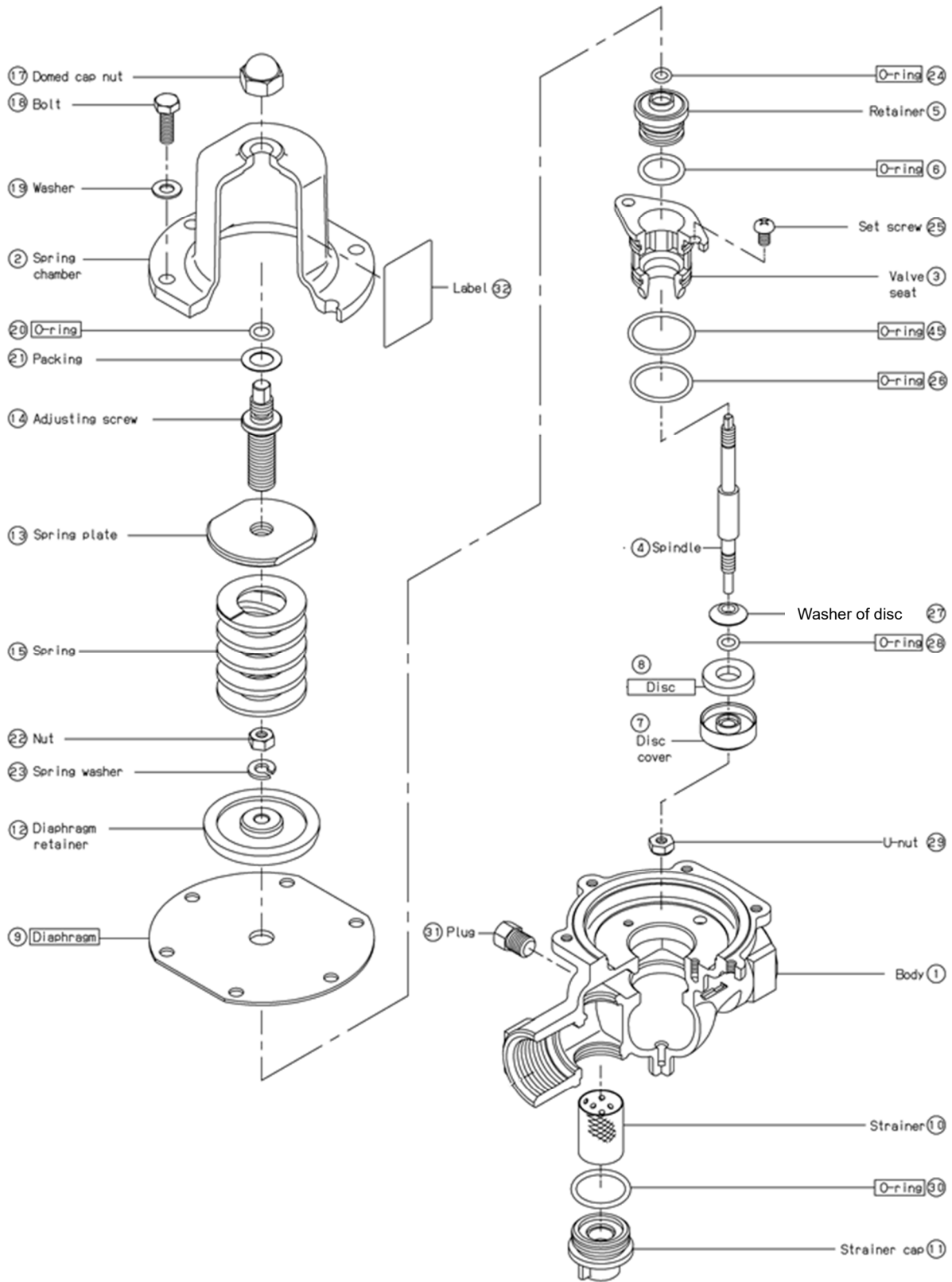
1. Clean the strainer regularly at least once or twice a year.
* Too much deposit of scales or the like decreases the flow rate, which prevents the product from functioning properly.
2. When the strainer cap is removed, receive fluid in a container. (See the Figure below.)

1. Close the stop valve on the inlet side and open the stop valve at the end, and discharge 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, assemble the strainer and strainer cap to the body.
5. Open the stop valve on 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.



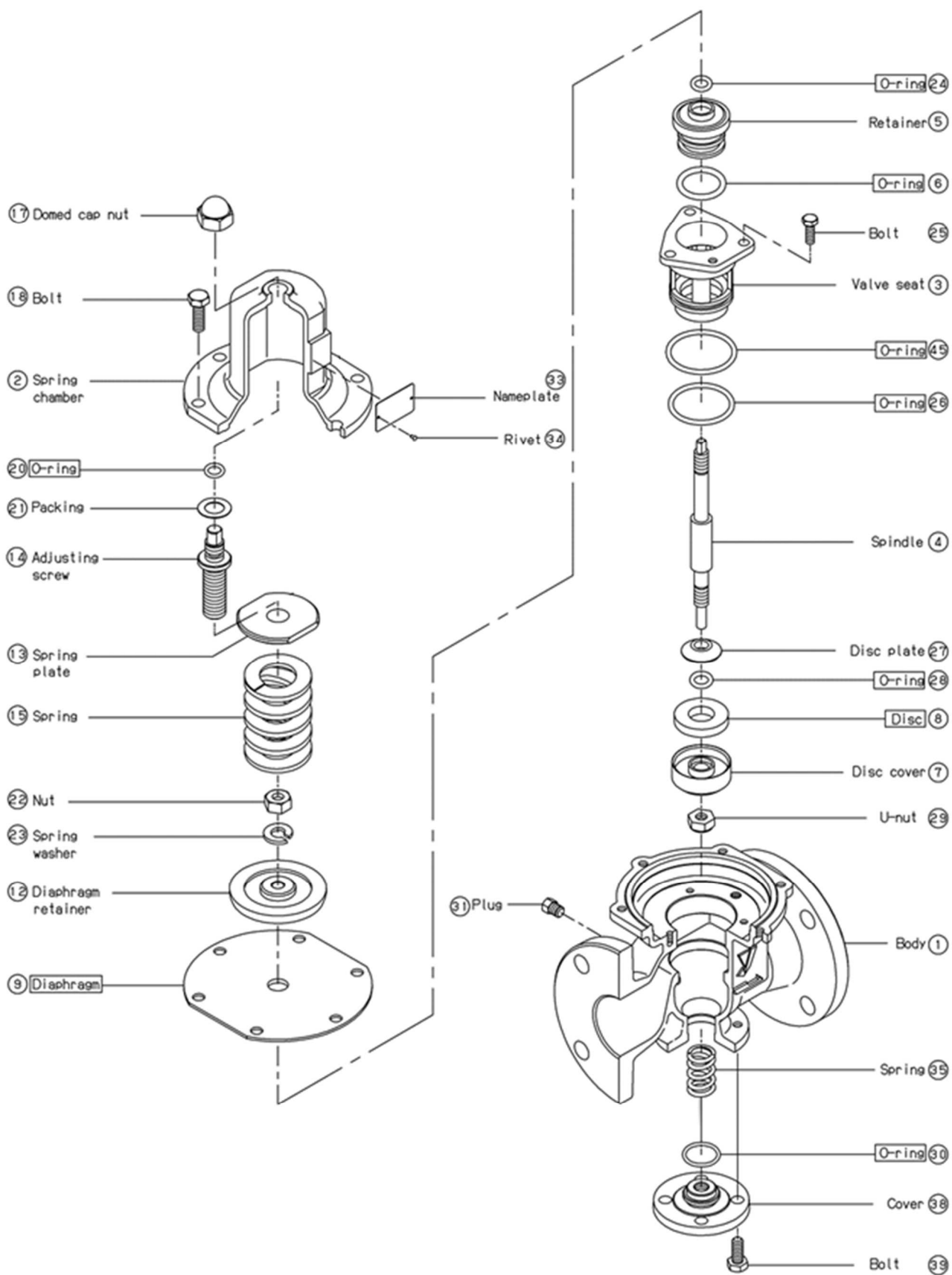
7. Exploded view

GD-28S-NE, GD-29S-NE
Nominal size 20A - 50A



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

GD-29S-NE
Nominal size 65A - 100A



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