TYPE GD-41/43 series

Pressure Reducing Valve

Installation & Operation Manual

Please read this bulletin thoroughly before using the pressure reducing valve, so that you may do so correctly and safely. Please carefully store this bulletin in handy please.

————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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Warranty Information

YOSHITAKE

■EPDT-157j■

1. Specifications & Performance

⚠ Caution

Verify that the contents shown on the label of the product are identical to those of the model you ordered. (For GD-41RB, GD-43RB, GD-41GRB, and GD-43GRB models, the product is laser-printed to eliminate the need for labels. Please check the printed information against the specifications of the model you have ordered.)
※If any difference is found between the label and the specification, contact us.

TYPE	GD-41 Type	GD-43-10 Type	GD-43-20 Type	GD-41G Type	GD-43G-10 Type	GD-43G-20 Type
Connection	JIS Rc screw	JIS10K FF(RF) Flanged	JIS20K RF Flanged	JIS Rc screw	JIS10K FF(RF) Flanged	JIS20K RF Flanged
Nominal Size	15A, 20A, 25A					
Application Fluid	Cold/hot water,			Air, carbon dioxide gas, nitrogen gas,		
	cleaning/sterilizing steam(max. temperature 130 ℃, for continuous flow within 30 minutes)					
Inlet Pressure	0.07～2.0 MPa[*1] (For cleaning/sterilizing steam: 0.2 MPa max.)					
Reduced Pressure	Spring A (yellow):0.02～0.1 MPa Spring B (red):0.1～0.25 MPa Spring C (black):0.25～0.5 MPa					
Min. Differential Pressure	0.05 MPa					
Max. Pressure Reduction Ratio	10:1			20:1		
Operating temperature	5～90 ℃ (Max. temperature 130 ℃ for cleaning/sterilizing steam. Minimum interval between steam blows must be 4 hours.)					
Cv value	15A:0.4 20A:0.6 25A:0.8					
Pressure characteristic	Set pressure±0.05 MPa					
Standard factory pressure setting	Spring A		Spring B		Spring C	
	0.05 MPa		0.1 MPa		0.3 MPa	

[*1] For model GD-43-10 and GD-43G-10, inlet pressure is 0.07～1.0 MPa.

TYPE	GD-41N Type	GD-43N-10 Type	GD-43N-20 Type
Connection	JIS Rc screw	JIS10K FF Flanged	JIS20K RF Flanged
Nominal Size	15A, 20A, 25A		
Application Fluid	Cold/hot water		
Inlet Pressure	0.07～2.0 MPa*2		
Reduced Pressure	Spring A (yellow) : 0.02～0.1 MPa Spring B (red) : 0.1～0.25 MPa Spring C (black) : 0.25～0.5 MPa		
Min. Differential Pressure	0.05 MPa		
Max. Pressure Reduction Ratio	10 : 1		
Operating temperature	5～90 ℃		
Cv value	15A : 0.4　20A : 0.6　25A : 0.8		
Pressure characteristic	Set pressure±0.05 MPa		
Standard factory pressure setting	Spring A	Spring B	Spring C
	0.05 MPa	0.1 MPa	0.3 MPa

■ Models conforming to Japanese Water Supply Act are GD-41N and GD-43N series.

***2 For model GD-43N-10, inlet pressure is 0.07～1.0 MPa.**

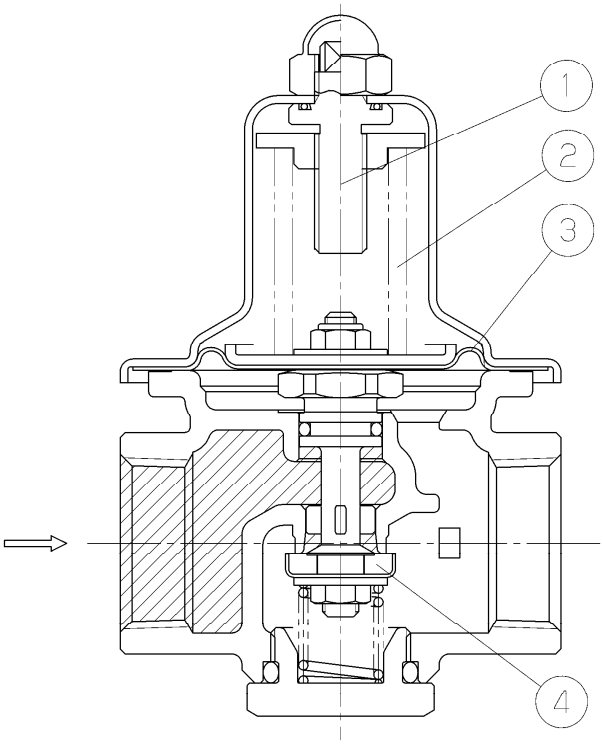
TYPE	GD-41RB Type	GD-43RB-10 Type	GD-43RB-20 Type
Connection	JIS Rc screw	JIS10K FF(RF) Flanged	JIS20K RF Flanged
Nominal Size	15A, 20A, 25A		
Application Fluid	Cold/hot water,		
Inlet Pressure	0.07～2.0 MPa*3		
Reduced Pressure	Spring A:0.02～0.08 MPa Spring B:0.08～0.25 MPa Spring C:0.25～0.5 MPa		
Min. Differential Pressure	0.05 MPa		
Max. Pressure Reduction Ratio	10:1		
Operating temperature	5～90 ℃		
Cv value	15A:0.4 20A:0.6 25A:0.8		
Pressure characteristic	Set pressure±0.05 MPa		
Standard factory pressure setting	Spring A	Spring B	Spring C
	0.05 MPa	0.1 MPa	0.3 MPa

***3 For model GD-43RB-10 inlet pressure is 0.07～1.0 MPa.**

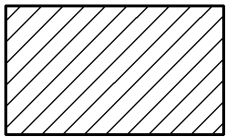
TYPE	GD-41GRB Type	GD-43GRB-10 Type	GD-43GRB-20 Type
Connection	JIS Rc screw	JIS10K FF(RF) Flanged	JIS20K RF Flanged
Nominal Size	15A, 20A, 25A		
Application Fluid	Air, carbon dioxide gas, nitrogen gas,		
Inlet Pressure	0.07～2.0 MPa*4		
Reduced Pressure	Spring A:0.02～0.08 MPa Spring B:0.08～0.25 MPa Spring C:0.25～0.5 MPa		
Min. Differential Pressure	0.05 MPa		
Max. Pressure Reduction Ratio	20:1		
Operating temperature	5～90 ℃		
Cv value	15A:0.4 20A:0.6 25A:0.8		
Pressure characteristic	Set pressure±0.05 MPa		
Standard factory pressure setting	Spring A	Spring B	Spring C
	0.05 MPa	0.1 MPa	0.3 MPa

***4 For model GD-43GRB-10, inlet pressure is 0.07～1.0 MPa.**

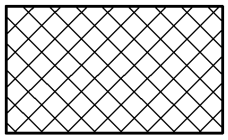
2. Operation



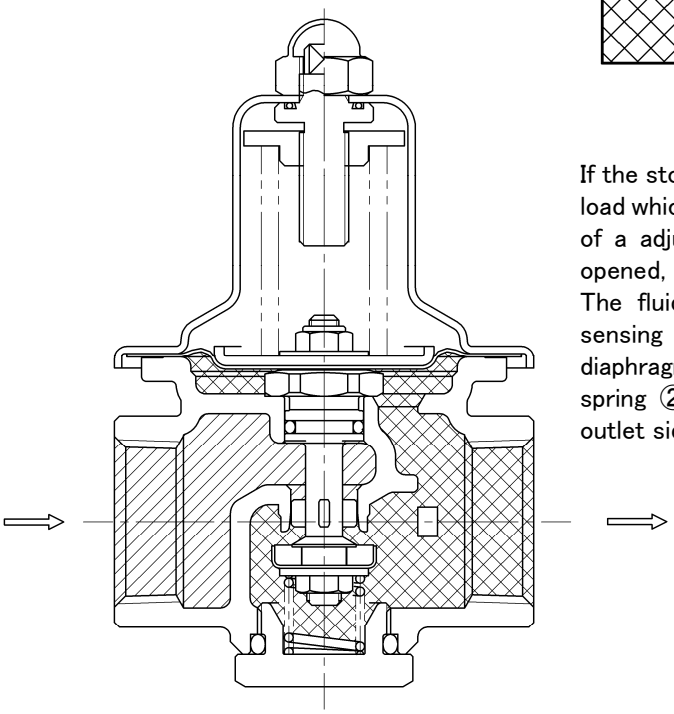
If the adjusting screw ① is turned right, the diaphragm ③ will be depressed with a adjusting spring ② and Disc ④ connected with spindle will open.
The fluid which flowed in from the inlet side carries out the action which pushes up diaphragm ③ through a sensing hole at the same time it flows into outlet side through the Disc ④ upper part.
When the stop valve at the outlet side is closed, the load which pushes up diaphragm ③ increases, the load of a adjusting spring ② is overcome, and Disc ④ is closed.



Fluid of Inlet



Fluid of Outlet

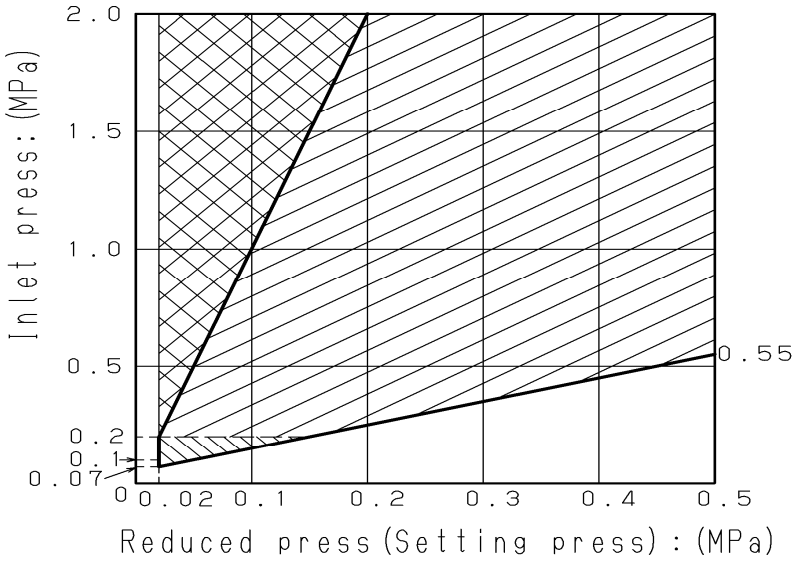


If the stop valve at the outlet side is opened gradually, the load which pushes up diaphragm ③ will decrease, the load of a adjusting spring ② will overcome, Disc ④ will be opened, and fluid will flow into outlet side.
The fluid which flowed into the outlet side through a sensing hole, carries out the action which pushes up diaphragm ③, maintains the balance with a adjusting spring ② load, adjusts the Disc ④ opening, and keeps outlet side pressure constant.

3. Nominal Size Selection

3.1 Pressure reducing valve Specification Selection Chart

《For Cold/hot water》

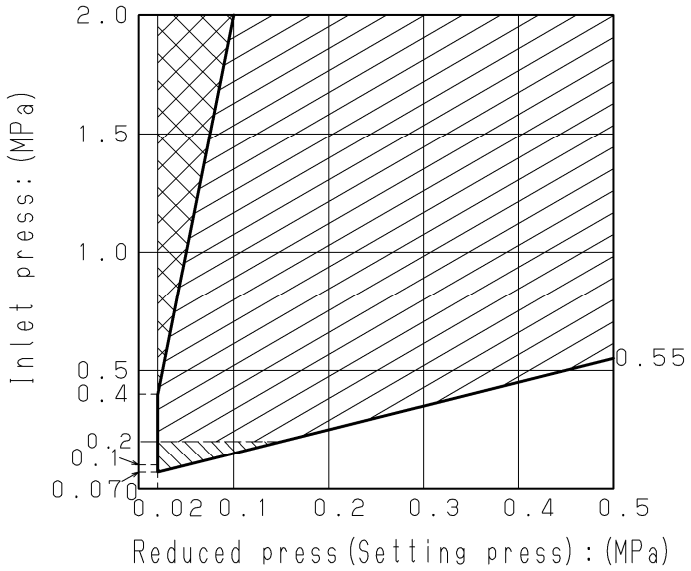


Controllable range.

Two-stage pressure reduction is required within this range.

Fitting in controllable range and it also corresponds to steam for cleaning /Sterilization.

《For Air, Carbon dioxide gas, Nitrogen gas》

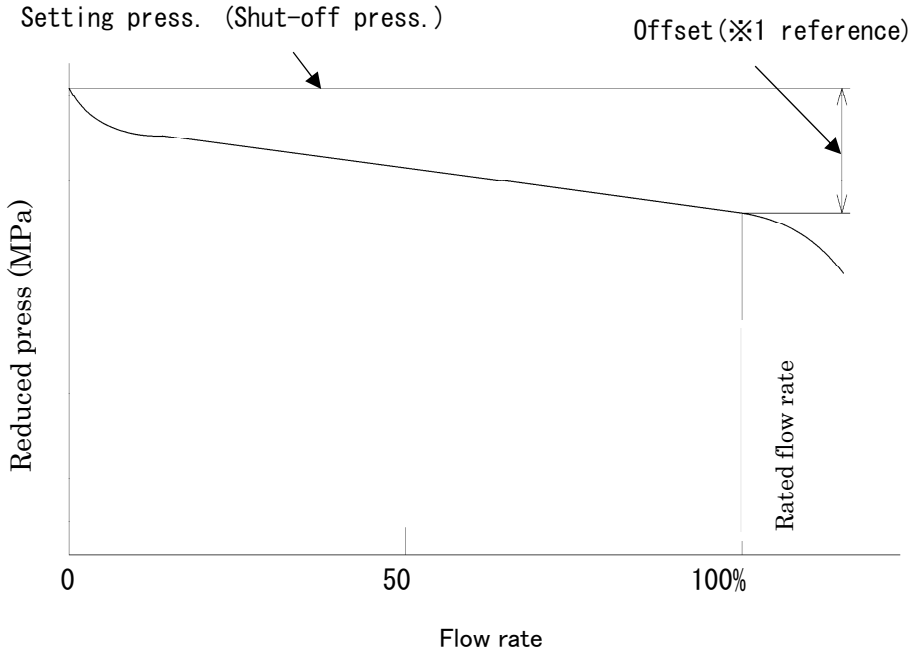


Controllable range.

Two-stage pressure reduction is required within this range.

Fitting in controllable range and it also corresponds to steam for cleaning

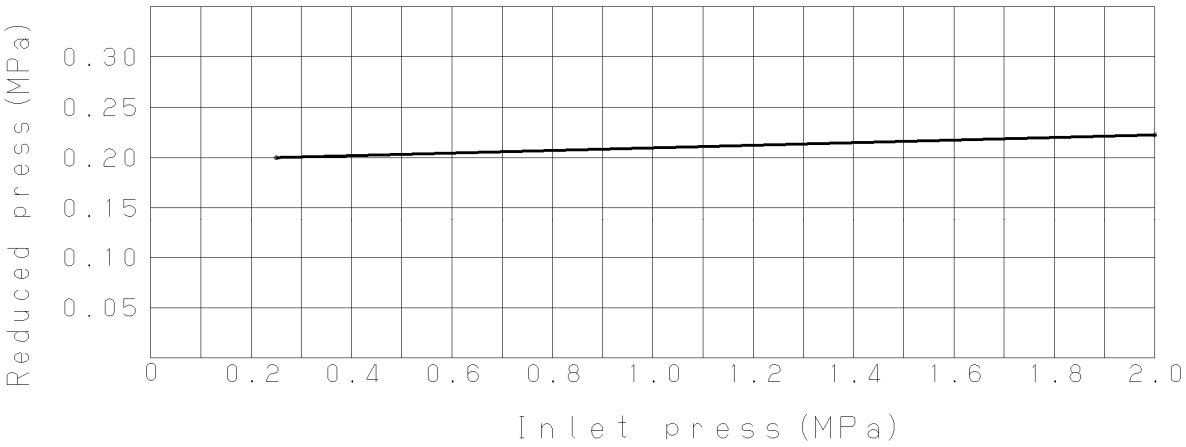
3.2 Flow Rate Characteristics Chart



※1

Set pressure	Offset
0.2 MPa or less	Within 0.05 MPa
More than 0.2 MPa	Within 0.08 MPa

3.3 Pressure Characteristics

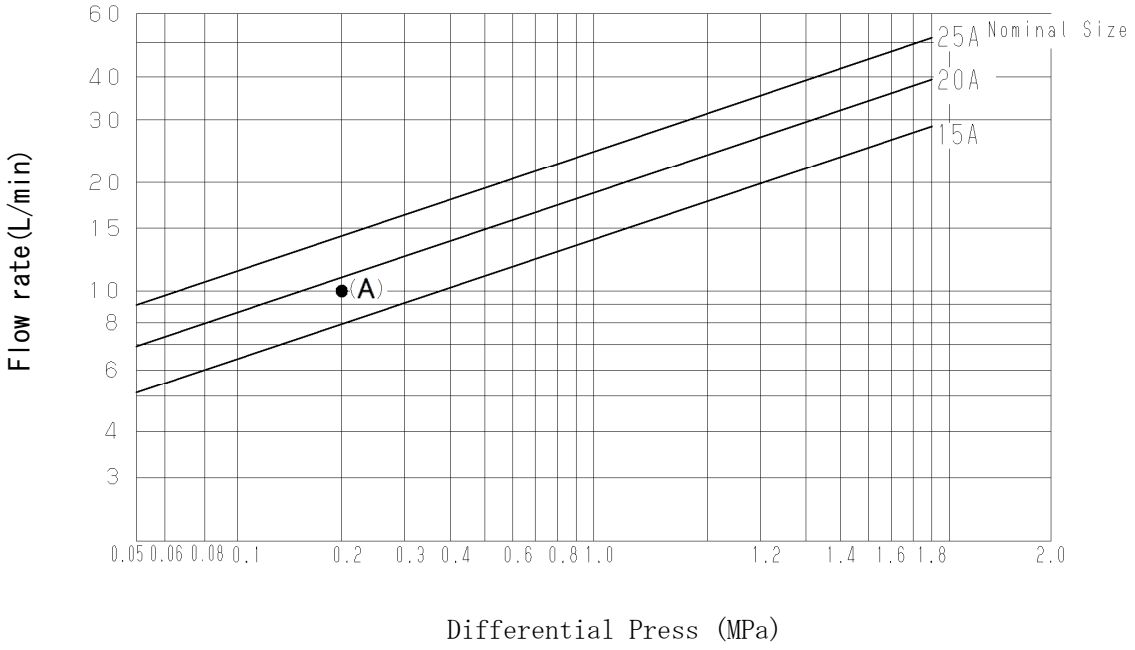


The above chart shows the change in the reduced pressure when the inlet pressure is changed in the range of 0.25 ～2.0 MPa whereas the reduced pressure is set at 0.2 MPa at inlet pressure of 0.25 MPa.

3.4 Nominal Size Selection Method

3.4.1 For Cold/hot water

Nominal Size Selection Chart(Water is at 20℃)



《Example》

Determine the nominal diameter for a pressure reducing valve of primary pressure 0.5 MPa, secondary pressure 0.3 MPa, flow rate 10 L/min.

On the bottom horizontal line of the figure above, start at the point 0.2 (pressure difference between upstream and downstream of the valve 0.2 MPa) and go straight up along the line to the point **A** where the line crosses the flow rate 10 L/min line. This intersecting point **A** is between nominal diameter 15A and 20A. Select the larger one, 20A, which is the required nominal diameter.

《Reference》 Nominal size calculation (in the case of cold/hot water)

※If the required nominal diameter cannot be determined using the selection chart, use the formula shown below.

Cv value

Nominal size	15A	20A	25A
Cv value	0.4	0.6	0.8

Cv Value Calculation Formula

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

P_1 : Inlet pressure(MPa・A)　　G : Specific gravity(Specific gravity relative to water)

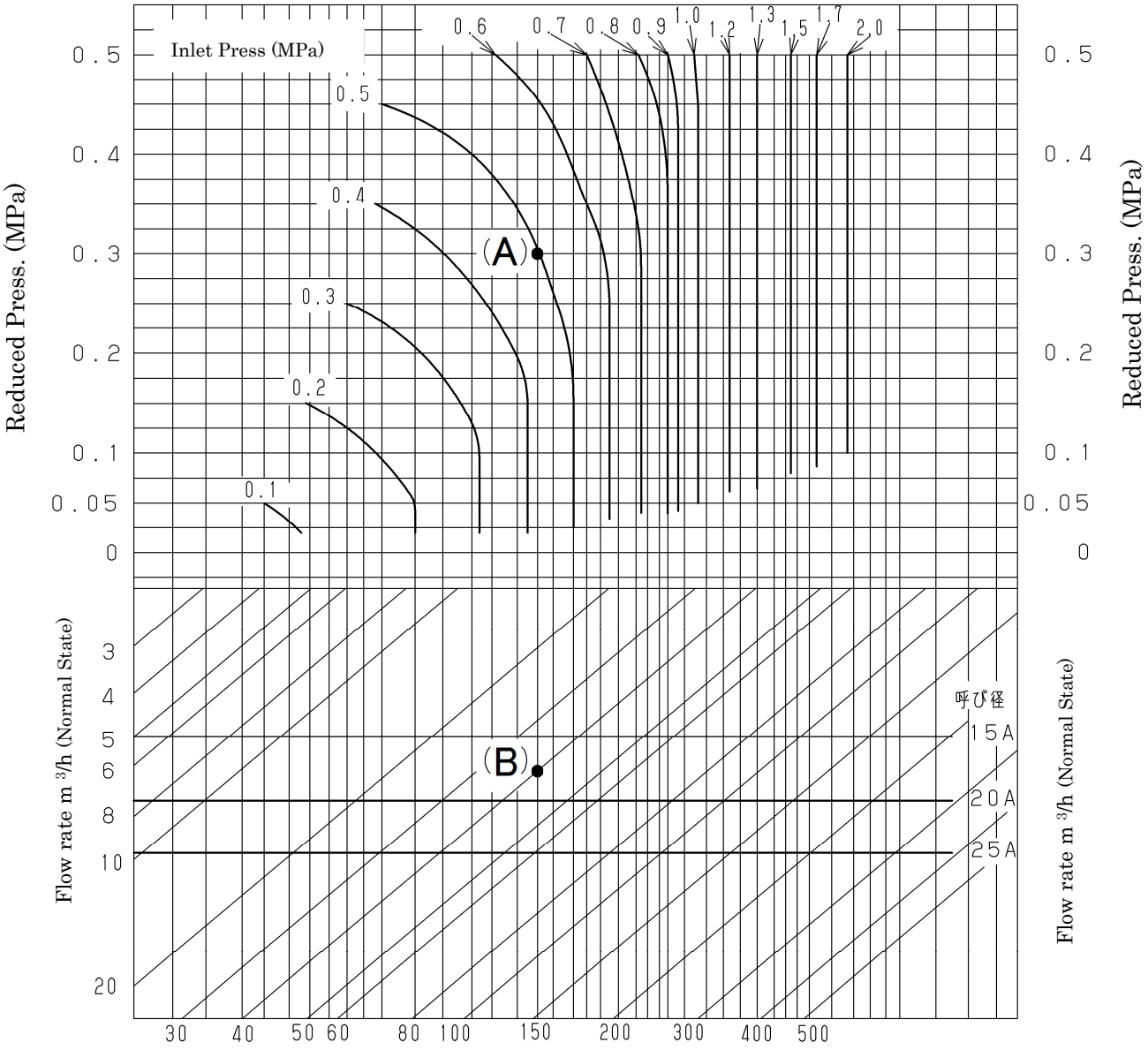
P_2 : Reduced pressure(MPa・A)　　Cv : Cv value of the nominal size

$\Delta P : P_1 - P_2$(MPa)　　V : Max. liquid flow rate (m^3/h)

※flow rate(m^3/h)→flow(L/min)=flow rate(m^3/h)×(1000/60)＝flow rate(L/min)

3.4.2 For Air

Nominal Size Selection Chart (Air is at 20℃)



《Example》

Determine the nominal size for a pressure reducing valve of primary pressure 0.5 MPa, secondary pressure 0.3 MPa, flow rate 40 m^3/h (typical condition).

First locate the point **A** where the line of primary pressure 0.5 MPa and the line of secondary pressure 0.3 MPa intersect. From the pint **A**, go straight down along the line to the point **B** where it crosses the 40 m^3/h (typical condition) flow rate line.

This point **B** is between nominal diameter 15A and 20A. Select the larger one, 20A, which is the required nominal size.

※Performance value of each Normal Size Selection Chart is referential value. Since it can change according to piping condition and usage environment, secure safety factor of 20% or more for performance value when selection.

《Reference》 Nominal diameter calculation (in the case of air)

※If the required nominal diameter cannot be determined using the selection chart, use the formula shown below.

Cv value

Nominal size	15A	20A	25A
Cv value	0.4	0.6	0.8

Cv Value Calculation Formula

In case of $P_2 > \frac{P_1}{2}$

$$Cv = \frac{Q}{2940}\sqrt{\frac{(273+t)G}{\Delta P(P_1+P_2)}}$$

In case of $P_2 \leqq \frac{P_1}{2}$

$$Cv = \frac{Q\sqrt{(273+t)G}}{2550P_1}$$

P_1: Inlet pressure(MPa・A)　　G: Specific gravity(Specific gravity relative to air)

P_2: Reduced pressure(MPa・A)　　Cv: Cv value of the nominal size

ΔP: $P_1 - P_2$(MPa)　　Q: Max. gas flow rate【m^3/h(Normal state)】

t: Temperature(℃)

3.4.3 When steam is used as cleaning and sterilizing fluid

When using steam for cleaning and sterilizing pipes or systems, set the primary pressure to 0.2 MPa or below.

If the regulated secondary pressure is 0.2 MPa or below in the normal operating condition, it is further decreased by the pressure reducing function of the pressure reducing valve. Be careful of the flow rate of the steam. Below shows the formula to calculate the steam flow rate.

Cv value

Nominal size	15A	20A	25A
Cv value	0.4	0.6	0.8

Cv Value Calculation Formula

In case of $P_2 > \frac{P_1}{2}$

$$Cv = \frac{Wk}{138\sqrt{\Delta P(P_1+P_2)}}$$

In case of $P_2 \leqq \frac{P_1}{2}$

$$Cv = \frac{Wk}{120P_1}$$

W: Max. steam flow rate(kg/h)

P_1: Inlet pressure(MPa・A)

P_2: Reduced pressure(MPa・A)

ΔP: $P_1 - P_2$(MPa)

k: 1+0.0013×{super-heated steam temp[℃]－saturated steam temp[℃]}

Cv: Cv value of the nominal size

4. Installation

4.1 Piping example

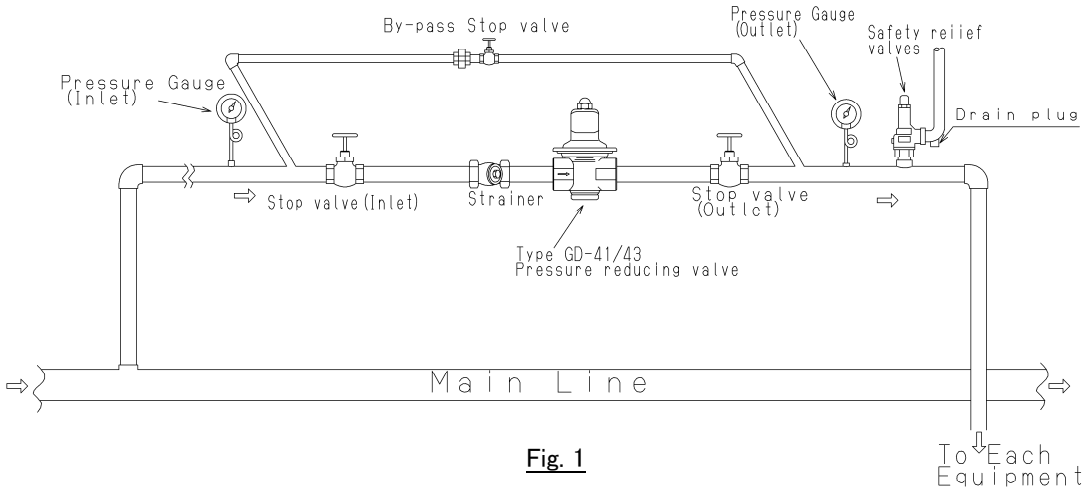


Fig. 1

4.2 Precautions during installation

⚠ WARNING

When installing a safety valve at the outlet side of the pressure reducing valve, connect a blow-off pipe to the outlet of the safety valve to lead the possible discharged fluid to a safety location.

⚠ CAUTION

(1) Do not disassemble the pressure reducing valve unless it is necessary.
※Incorrectly disassembled, the pressure reducing valve cannot function as it should.

(2) Before connecting the pressure reducing valve to the piping, remove foreign materials from the piping.
※If foreign materials are introduced into the pressure reducing valve, it cannot operate at the designed performance and may be damaged.

(3) Be sure to install a strainer at the inlet side of the pressure reducing valve. (Refer to Fig.1)
※Ingress of foreign substances or scale into the pressure reducing valve leads to malfunction of the product. It is recommended to use a strainer of 60 mesh or more.

(4) Installing a safety valve at the outlet side of the pressure reducing valve to protect the equipment.
※Without a safety valve, abnormal condition of the pressure reducing valve cannot be recognized and may damage the equipment.

(5) Be sure to attach a pressure gauge to the inlet and the outlet of the pressure reducing valve.
※Without a pressure gauge, the pressure cannot be regulated correctly.

(6) When installing a quick opening/closing device for example a solenoid valve, the distance between the pressure reducing valve must be at least 3 m.
※A shorter distance may cause malfunctioning and significantly shorten the life of the pressure reducing valve.

(7) When two stage pressure reduction is employed, the distance between the two pressure reducing valves must be 3 m or more.
※A shorter distance may cause malfunctioning and the designed performance cannot be obtained.

(8) Before installing, verify the location of the inlet and the outlet. The arrow on the pressure reducing valve shows the direction of fluid. Observe that the arrow coincides with direction of fluid.
※When installed in opposite direction, the pressure reducing valve cannot function as it should.

(9) Piping to the pressure reducing valve must be so connected that excessive load, deflection and vibrations will not be applied to the valve.
※If it is connected incorrectly, the life of the pressure reducing valve may shorten.

(10) Secure the necessary maintenance space at the installation site of the pressure reducing valve.
※Refer to Fig. 2 for dimensions of the maintenance space. If the space is smaller than these values, the valve cannot be disassembled for maintenance.

(11) The set pressure of the safety valve must be higher than that of the pressure reducing valve.

※If blow-stop of the safety valve is lower than the pressure regulated by the pressure reducing valve, the safety valve will continue to blow.

(12) Do not freeze the pressure reducing valve.

※Freezing may damage the pressure reducing valve.

(13) Do not allow pipe adhesive materials to leak into the pressure reducing valve.

※If adhesive material is accumulated in the pressure reducing valve, it causes malfunctioning.

(14) Consider usage condition (usage frequency or durability) when selection.

(15) If components having negative effect on inner parts is included in fluid and environment, deterioration of rubber parts is accelerated and causes outside leakage and functional disorder.

(16) Horizontal or vertical installation is possible.

(17) When using a product with a pressure gauge outdoors, provide a canopy or other protection to prevent rainwater from directly hitting the pressure gauge.

○Maintenance space for disassembling the pressure reducing valve

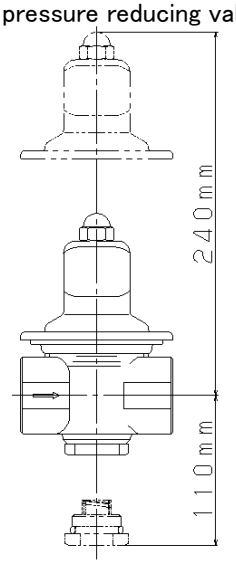


Fig. 2

5. Operating Procedure

5.1 Precautions during operation

⚠ WARNING

(1) Never touch the pressure reducing valve with bare hands while any after hot fluid flows.

※You may suffer from burns on hands.

(2) Before flowing hot fluid, make sure that the fluid will not cause and risk through the end of the piping system and that the pipes are positively connected.

※Blowout of hot fluid will cause burn injury.

⚠ CAUTION

(1) When using the pressure reducing valve for a steam passage, the maximum temperature limit must be 130℃ and the maximum primary pressure limit must be 0.2 MPa.

※Operation outside these limits will cause damage to the pressure reducing valve and make troubles.

(2) Before flowing fluid, close the stop valves at upstream and downstream of the pressure reducing valve and completely remove any foreign materials by using the bypass pipe.

※Foreign materials in the pressure reducing valve degrades the valve performance.

(3) When delivering steam, carbon dioxide gas, or nitrogen gas after cold/hot water, open each stop valve gradually to avoid water hummer.

※If stop valves are opened quickly, hunting, water hummer will generate which will damage the pressure reducing valve and the equipment.

(4) When opening the bypass stop valve, ensure that the secondary pressure will not exceed the set pressure of the safety valve.

※If the secondary pressure exceeds the safety valve set pressure, the safety valve operates and blows out fluid.

(5) When discontinuing the operation for a long period, completely purge fluid from the pressure reducing valve and the piping system and close the stop valves located upstream and downstream of the pressure reducing valve.

※Water scales developed in the piping may cause erratic operation of the pressure reducing valve.

(6) Damage to the diaphragms of Model GD-41G and GD-43G cause the fluid blowout because the spring covers used for these models have holes.

※The fluid blowout may cause injury burns, or contaminate surroundings.

(7) If fluid cannot flow due to closed piping situation of the product, fluid temperature rises, expands volume of fluid in the piping and damages the product.

(8) Keeping fluid in the product for a long-term fix sliding parts and leaks to malfunction of product.

(9) Fluid with viscosity fixes sliding parts and leads to malfunction of the product.

(10) Performance value of each Normal Size Selection Chart is referential value. Since it can change according to piping condition and usage environment, secure safety factor of 20% or more for performance value when selection.

5.2 Adjustment procedures

Wrong or poor adjustment may cause hunting, scale buildup, or water hammer, or severely damage relevant parts. Be sure to follow these steps to complete proper adjustment.

(1) Close the stop valve placed upstream and downstream of the pressure reducing valve and open the bypass stop valve to allow the fluid pass through the piping to fully discharge foreign materials. Be aware of the secondary pressure and adjust the opening of bypass stop valve as necessary so that the safety valve will not be activated. After expelling foreign materials from the piping, be sure to close the bypass stop valve.

(2) Gradually open the primary stop valve.

(3) Remove the hexagon cap nut. Observing the secondary pressure gauge, gradually adjust the adjusting screw (dihedral section) to the desired pressure. While adjusting, be aware of the secondary pressure to keep the safety valve inactive. (To increase the pressure, turn the screw clockwise; to reduce the pressure, turn it counterclockwise, when viewed from the top of the product.)

(4) Finely adjust the secondary pressure by gradually opening the secondary stop valve. After adjustment, fit the hexagon cap nut to the dihedral section.

6. Maintenance Procedure

Be aware of foreign materials in the piping since many of faults in the pressure reducing valve are due to the existence of foreign materials.

Our warranty does not cover damage due to pinched foreign materials resulting from usage by the customer.

Faulty pressure gauge, clogged strainer and leaking of stop valve of bypass tube develop symptoms that look like those from faulty pressure reducing valve. Clogged strainer will decrease the secondary pressure, and leaking bypass tube will increase the secondary pressure. Before troubleshooting the pressure reducing valve, check these symptoms of the strainer and stop valve.

6.1 Precautions during maintenance and inspection

⚠ WARNING

(1) When disassembling or checking, completely release the pressure from the pressure reducing valve, piping and equipment and cool the pressure reducing valve. Never touch the pressure reducing valve with bare hands.
※Residual pressure may cause bodily injury or burn injury or contaminate surroundings.
(2) Before disassembling, check to see if drain residues have been eliminated.
※Residual drain may cause bodily injury or burn injury or contaminate surrounding during disassembling.

⚠ CAUTION

(1) To maintain the functions and performance of the pressure reducing valve, perform periodic check.
※Users should refer such tasks to specialists or maintenance agencies.
(2) Only properly trained individuals or service representatives should disassemble and check the equipment.
※If problem is found, consult the vendor.
(3) During disassembling, internal fluid flows out. Discharge it into a suitable container. Disassembling the pressure reducer valve after all fluids have been discharged.
※Fluid spills will contaminate surroundings.
(4) Before flowing fluid, close the stop valve at upstream and downstream of the pressure reducing valve and completely remove the foreign materials by using the bypass pipe.
※Foreign materials in the pressure reducing valve degrades the valve performance.

※GD-41, GD-43, GD-41G, GD-43G, GD-41N, GD-43N, GD-41RB, GD-43RB, GD-41GRB, and GD-43GRB, use the same internal components. Maintenance, check, disassembling and assembling procedures are common to both models.

○Periodic replacement of expendable parts

Longevity of expendable parts depends on frequency and condition of use. Rough standard of life estimation is given below. (Part number shown in the table below refers to the number in Fig. 3, Exploded drawing of GD-41Type.)

Component	Part number	Replacement interval
Diaphragm set	⑤⑥⑦⑧⑨⑱	3 years
Disc	④	3 years
O Ring	⑲⑳	3 years

6.2 Troubleshooting (Refer to Fig. 3) Same GD-43 Type

Symptom	Possible Cause	Corrective Action
Ⅰ .Reduced pressure is higher than set pressure	1. Damaged diaphragm⑦	1. Replace the diaphragm unit
	2. Foreign material pinched between valving Disc ④ and valve seat. Dents or scratches are seen on the valving element P or valve seat.	2. If foreign materials are pinched between valving element P ④ and valve seat, clean the assembly. If the Disc④ is damaged, replace it with a new one. If the valve seat section is damaged, replace the valve casing
	3. Poor seal of valve stem O ring ⑱	3. Replace valve stem O ring ⑱ with a new one.
Ⅱ . Reduced pressure is lower than the desired pressure. Fluid fails to flow.	4. Valve stem O ring ⑱ is locked.	4. Replace valve stem O ring ⑱ with a new one.
	5. Valving element P ④ and valve seat is locked.	5. Clean Disc ④ and valve seat section. If the Disc ④ is damaged, replace it with a new one. If the valve seat section is damaged, replace the Body ① with a new one.
Ⅲ. Leakage	6. Loosen cross recessed pan head screw ⑮.	6. Tighten cross recessed pan head screw ⑮.
	7. Loosen cap ③.	7. Tighten lower cap ③.
	8. Broken O ring ⑲ for cap.	8. Replace O ring ⑲ for cap with a new one.

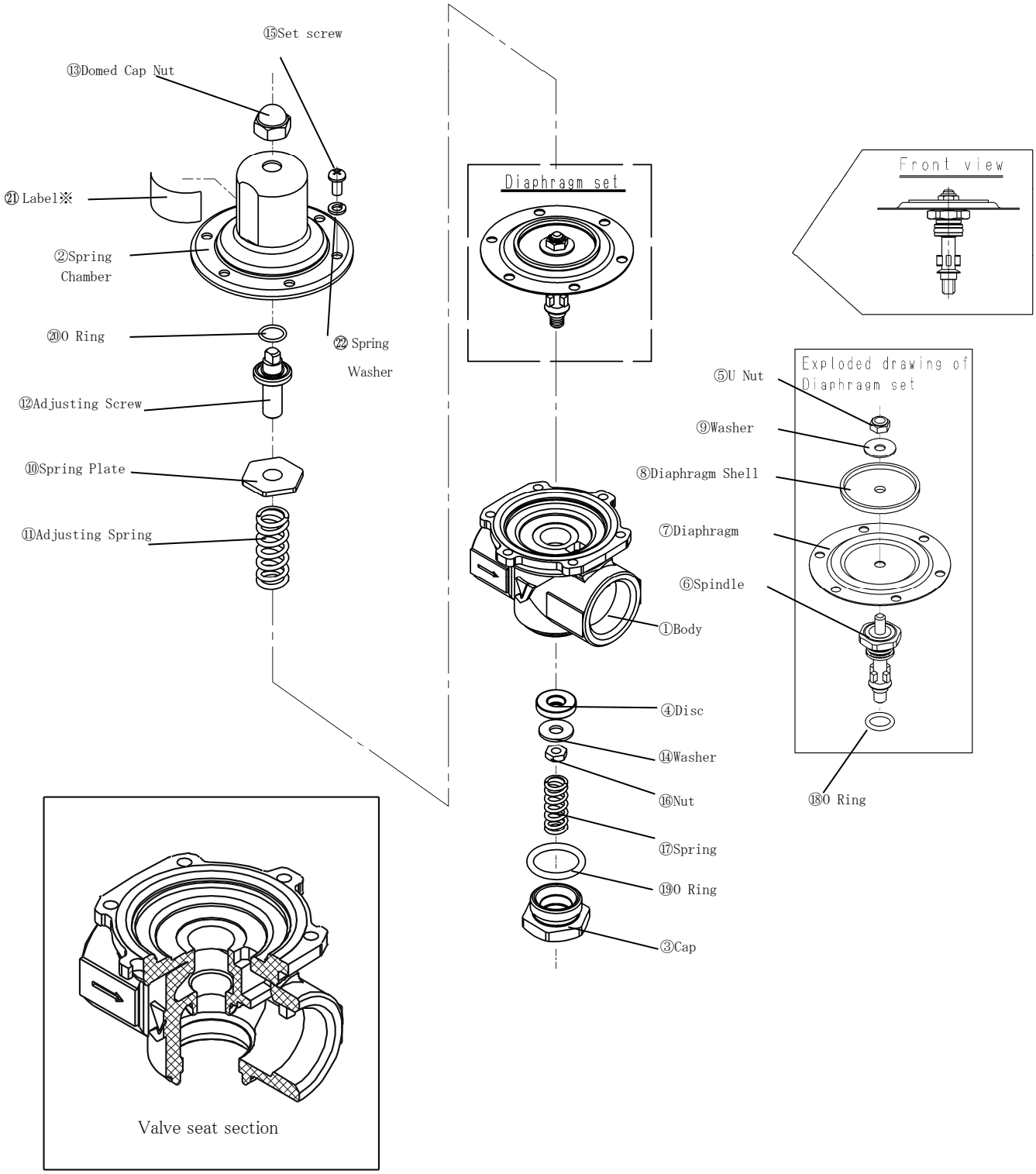


Fig. 3 Exploded drawing of GD-41Type

(GD-41, GD-43, GD-41G, GD-43G, GD-41N, GD-43N, GD-41RB, GD-43RB, GD-41GRB, and GD-43GRB use the same internal components.)

※ GD-41RB, GD-43RB, GD-41GRB, and GD-43GRB models are laser-printed on the product for label-less applications.

6.3 Symptom and corrective action

Symptom Ⅰ. Reduced pressure exceeds the set pressure

Ⅰ. ⅰ Diaphragm is damaged

1) Remove Domed hexagon cap nut.



2) Turn dihedral adjusting screw counterclockwise to completely remove the spring load.



3) Remove 6 cross recessed pan head screws.



4) Remove spring cover, adjusting spring and adjusting screw.



5) Verify that the diaphragm is damaged.

6) Remove lower cap. (Nominal designation of socket is 32.)



7) Remove valving element spring.



8) Applying, respectively but simultaneously, a socket wrench of nominal designation 10 to the U nut on the top of diaphragm and the hexagon nut on the valving element, remove the hexagon nut. Remove flat washer and then valving element P.
(If the nut on the diaphragm becomes loose, remove the U nut first and then go to the step 9'-1).)



9) Remove valving element P, flat washer and hexagon nut. Go to step 10).



10) Remove the diaphragm set.



Read "Precautions on reassembling" described below before going to Step 11).

9'-1) Remove flat washer, diaphragm holding member and diaphragm in that order.



9'-2) Apply a suitable tool to the hexagon portion of the valve stem and remove the hexagon nut from the valving element P.



9'-3) Removed valve stem, valving element P, flat washer, and hexagon nut.



Read "Precautions on reassembling" described below before going to Step11).

Precautions on reassembling

⚠ CAUTION

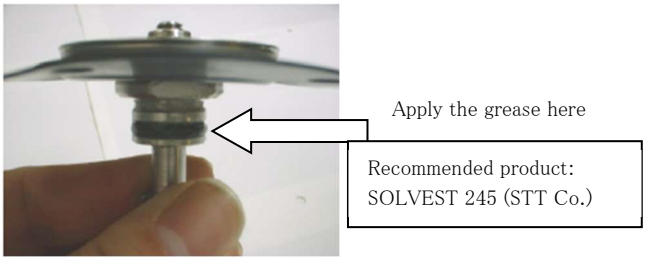
(1) Verify that the Disc and valve seat are free from damage, dent and dirt.
※Any damage, dent or dirt on the seat surface will cause increased secondary pressure. If dirty, clean the part; if damaged, replace it.

(2) Check to see that the valve stem smoothly moves up and down.
※Smooth-less movement causes malfunction.

(3) Replace the O ring on the valve stem with new one upon every maintenance.
※The O ring is a wear-out part. Excessively worn O ring causes malfunction.
※Before attaching the O ring to the valve stem, coat it with fluorine grease.
(If steam is used for cleaning and sterilizing, apply heat-resistant fluorine grease.)
Recommended grease: SOLVEST 245 (STT Co.)

(4) Before assembling, make sure that the seat section, diaphragm, valve stem O ring and lower cap O ring are clean.
※Dirty parts cause malfunction and fluid leakage.

11) Replace the diaphragm set with new one.
Recommended product: SOLVEST 245 (STT Co.)



12) Insert the new diaphragm set into the valve casing.



13) Place the valving element P, flat washer, and hexagon nut onto the valve stem and tighten by hand.



14) Apply socket wrench of nominal designation 10 to the U nut of the diaphragm and tighten the hexagon nut on valve element P by applying a torque of 6N-m
(60 kgf･cm) to the torque wrench.



15) Place the adjusting spring on the diaphragm holding member.





16) Place the adjusting screw on the adjusting spring.



17) Place the spring cover.



18) Insert spring washers and cross recessed pan head screws into the hole on the spring cover and fully retighten the screws in an even, crisscross pattern.



19)Slip a new O ring on the lower cap.
Apply a coat of grease to the O ring.
(For the type of grease to be used, refer to step 11).





20) Place the valving element spring on the lower cap and screw the cap into the valve casing





21) After adjusting the pressure, mount the hexagon cap nut on the thread of the adjusting screw.





Ⅰ. ⅱ Pinched foreign material or flaw found on valving element P or valve seat (For valve seat, see Fig. 3 Exploded drawing of GD-41Type.)

Pinched foreign object or flaw found on Disc

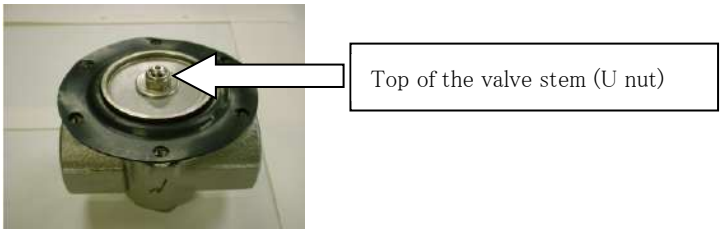
Follow steps 6) to 10) in section I.i. After replacing the valving element P with a new one, go to steps 12) through 21) in section I.i to restore original state.

Pinched foreign object or flaw found on valve seat

Follow steps 6) to 10) in section I.i. After replacing the valve casing with a new one, go to steps 12) through 21) in section I.i to restore original state.

Ⅰ.ⅲ Valve stem O ring is locked

1) Press down the U nut on the valve stem by hand and check to see that the valve stem moves smoothly. It should move by 2.5 mm.



If the valve stem will not move under the pressure, go to section I.i, steps 6) to 10) and replace the valve stem O ring with a new one. After replacing, go to steps 12) through 21) in section I.i to restore original state.

If the valve stem moves under the pressure, go to section I.i, steps 6) to 10) and visually inspect the valve stem O ring for damage. If damage is found, replace the O ring with a new one and go to steps 12) through 21) in section I.i to restore original state.

Symptom II: Secondary pressure does not reach the desired pressure/Fluid does not flow

Ⅱ. i Valve stem O ring is locked

Go to section I.i, steps 1) through 4) and then proceed with section I.ii. If the valve stem O ring is not damaged, go to section II.ii.

Ⅱ. ii Valving element P and valve seat section are locked

Follow steps 1) through 10) in section I.i and replace the valving element P with a new one. After replacing, go to section I.i, steps 12) to 21) to restore original status.

If a flaw(s) is found on the valve seat section, replace the valve casing with a new one by following steps 1) to 10) in section I.i. After replacing, go to section I.i, steps 12) to 21) to restore original status.

Symptom III: Exterior leakage observed

Ⅲ. i Loosen cross recessed pan head screw

Retighten the screws by following step 18) in section I.i.

Ⅲ. ii Loosen cap

Retighten the lower cap. If leakage persists, go to step 6) and 7) in section I.i. Replace the O ring with a new one and go to section I.i, step 19) to restore original status.

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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