

PILOT OPERATED PRESSURE REDUCING VALVE

RE12

USER'S MANUAL

SAFETY PRECAUTIONS

Thank you for purchasing a MIYAWAKI product.

Upon Receipt: Immediately inspect the product and verify that the model and specifications on the nameplate match your order. Ensure that no damage has occurred during transit.

Read Before Use: To ensure safe and optimal performance, read this manual thoroughly before installation. Keep this manual in a readily accessible location for future reference and maintenance.

Safety Symbols and Definitions

The following safety symbols are used in this manual to highlight critical information. Adhere to these instructions to prevent accidents and equipment damage.

 WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury .
 CAUTION	Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury or property damage .

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1. Specifications and Markings

WARNING

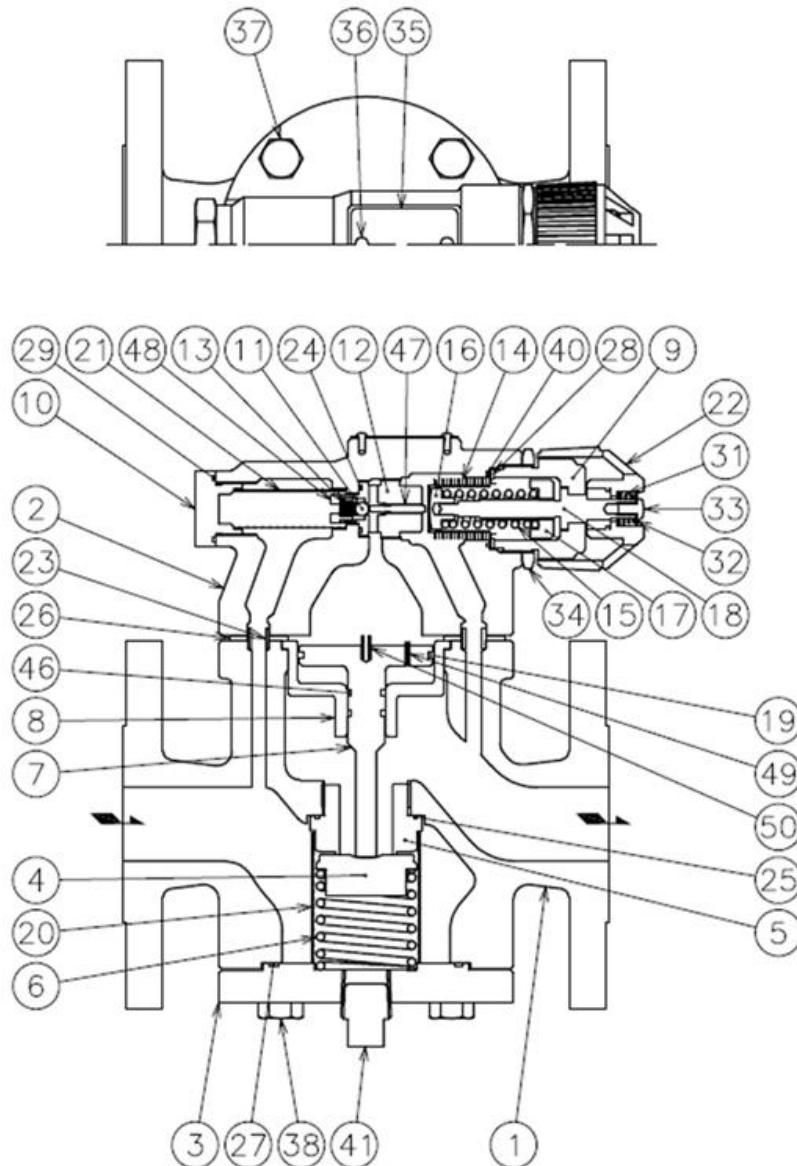
- **DO NOT** use this product outside its specified maximum operating pressure or temperature ranges. Using the product beyond these limits may result in serious injury, death, or equipment failure.

Before installation or operation, verify the following specifications on the product nameplate or the valve body to ensure proper usage.

- **Inlet Pressure Range (PRIMARY P.)** : The range of pressure at the inlet side within which the pressure reducing valve (PRV) operates correctly.
Range: 0.1 – 1.6 MPa (14.5 – 232 psig)
- **Adjustable Outlet Pressure Range (SECONDARY P.)** : The range of reduced pressure that can be set at the outlet side.
Range: 0.034 – 1.2 MPa (4.9 – 174 psig)
- **Max. Operating Temperature (MAX.T.)** : The maximum allowable fluid temperature for safe operation.
Max: 220 °C (428 °F)
- **Size** : Nominal diameter of the connection (A-nominal/mm).
15 mm (1/2") – 50 mm (2")
- **Model** : Product model number (RE12).
- **Flow Direction** : Indicated by an arrow on the valve body.
- **Production Year** : Indicated by the first two digits of the Serial Number (S. No.).

Note: The illustrations and photos in this manual represent standard models. For detailed dimensions and specific model data, refer to the product catalog.

2. CONSTRUCTION DETAILS



- | | | |
|-----------------------|--------------------------|-------------------------|
| (1) Body | (16) Spring Stay | (31) Spring |
| (2) Cover | (17) Sleeve | (32) Washer |
| (3) Bottom Flange | (18) Adjust Bolt | (33) Screw |
| (4) Main Valve | (19) Piston Ring | (34) Lock Nut |
| (5) Main Valve Seat | (20) Main Screen | (35) Nameplate |
| (6) Main Valve Spring | (21) Pilot Screen | (36) Rivet |
| (7) Piston | (22) Adjusting Handle | (37) Cover Bolt |
| (8) Cylinder Liner | (23) Collar | (38) Bottom Flange Bolt |
| (9) Adjust Cover | (24) Pilot Gasket* | (40) Gasket* |
| (10) Screen Plug | (25) Main Gasket* | (41) Plug |
| (11) Pilot Valve | (26) Cover Gasket* | (46) Piston Guide Ring |
| (12) Pilot Valve Seat | (27) Bottom Gasket* | (47) Pilot Shaft |
| (13) Pilot Spring | (28) Bellows Gasket* | (48) Pilot Bush |
| (14) Bellows | (29) Screen Plug Gasket* | (49) Spring Pin |
| (15) Adjust Spring | | (50) Spring Pin |

**Recommended maintenance parts (Gaskets). Always replace with new ones during reassembly.*

3. INSTALLATION GUIDELINES

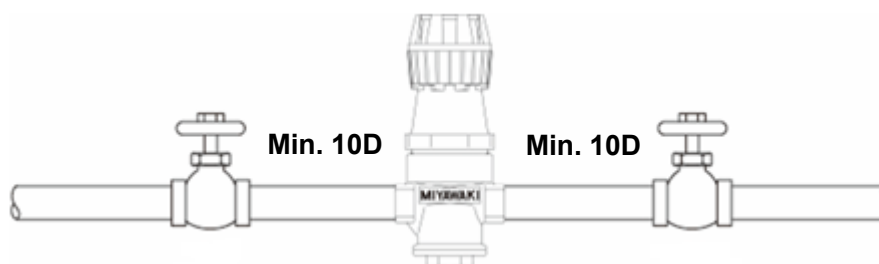
WARNING

- **HOT SURFACES & STEAM:** DO NOT touch the pressure reducing valve (PRV), safety valve (relief valve), or piping outlets with bare hands. Contact with these components or discharged fluids can cause severe burns or injury.
- **PRE-COMMISSIONING CHECK:** Before supplying steam, verify that all pipe joints are securely connected and that there is no danger at the end of the piping line.

CAUTION

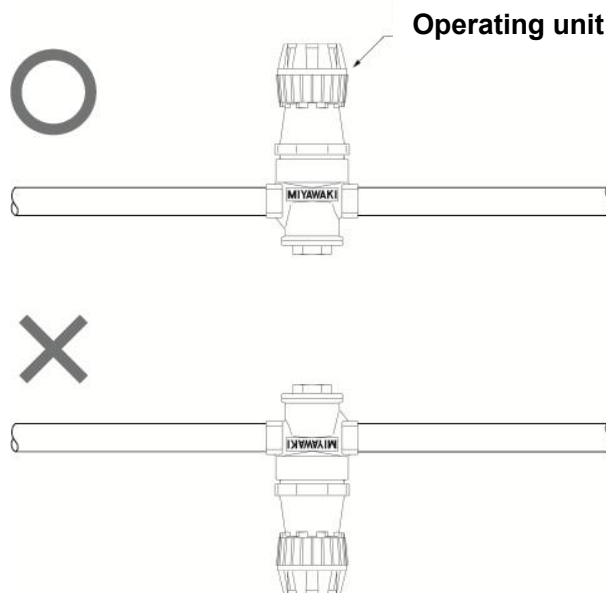
- **PIPING BLOW-OFF:** Before installation, thoroughly **blow off (flush)** the internal piping to remove dirt, scale, and debris. Failure to clear the lines is the leading cause of PRV malfunction.
- **PROPER HANDLING:** Adhere to the following instructions to ensure safety and valve performance.

- **Remove the dustproof seals** from the inlet and outlet ports of the PRV body.
- **Verify the flow direction arrow** on the valve body to ensure the PRV is installed in the correct orientation.
- **Install the PRV in horizontal piping** with the adjusting handle (operating unit) facing upward.
- **Provide straight pipe sections** of at least **10 times the pipe diameter** both upstream and downstream of the PRV (measured from the outlet of any reducers).

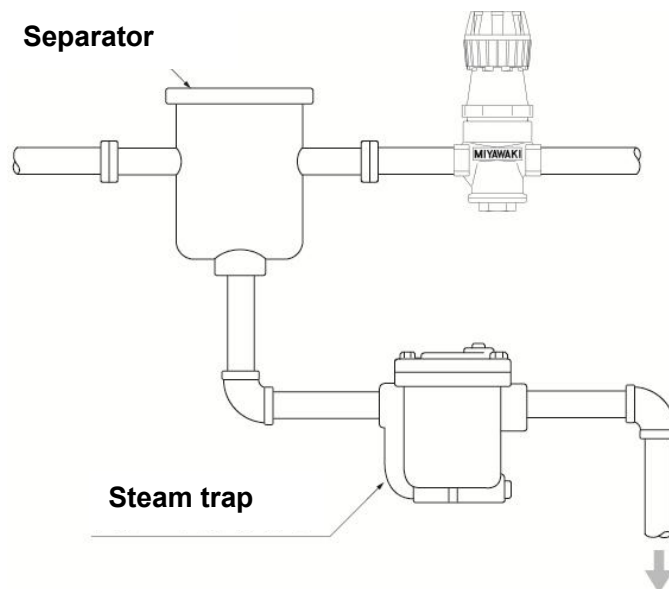


- **To minimize pressure drop**, avoid using any piping or fittings that throttle the flow on the primary (inlet) side.
- **Install pressure gauges and isolation valves** on both the primary and secondary sides, and always provide a **bypass line**. **Install a strainer** on the primary side (typically 60–80 mesh; use 100 mesh in environments with significant scale or debris).
Note: The strainer must be installed **horizontally (sideways)** to prevent condensate from accumulating in the screen area (refer to the plumbing example).
Maintain a distance of at least **1 meter (3.3 ft)** between the PRV and the secondary side pressure gauge.
- **Install a steam trap** on the secondary side of the PRV to ensure condensate is discharged when equipment or systems are inactive.

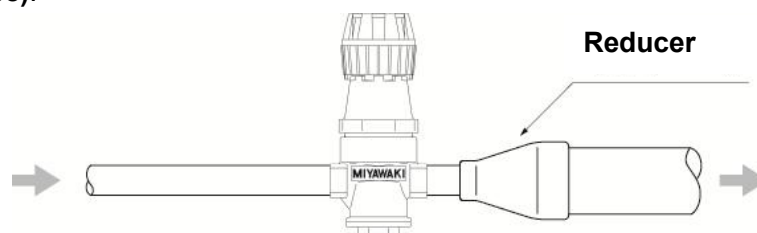
- Install the valve body in horizontal piping with the operating unit facing upward.



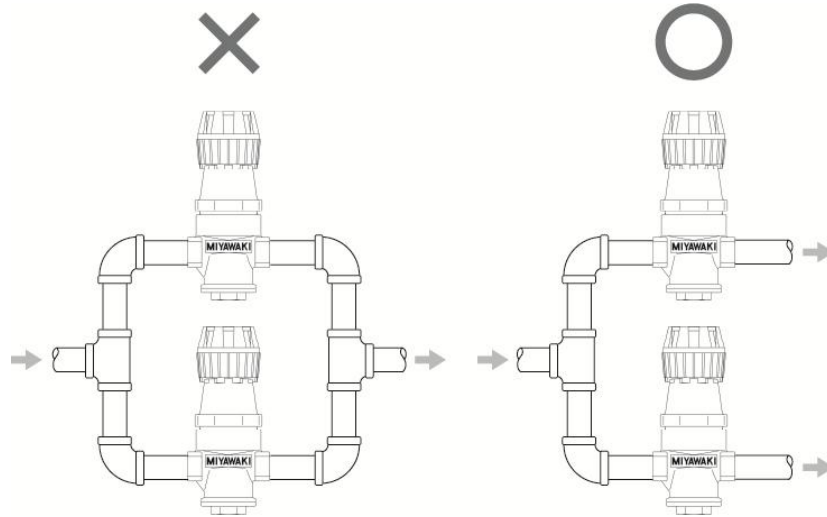
- Always install a steam trap upstream of the PRV. Condensate entering the PRV will cause hunting or vibration.



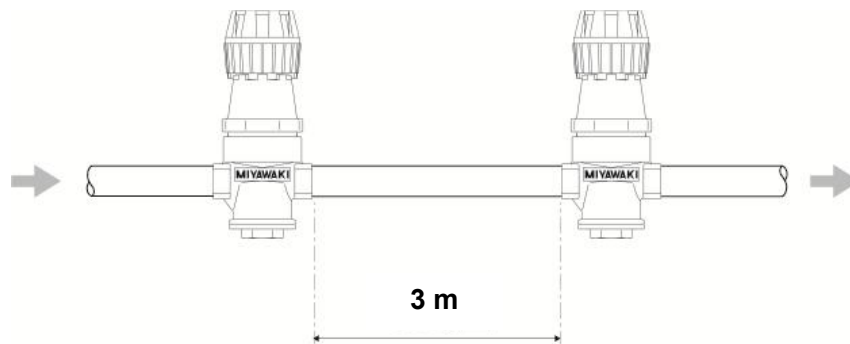
- The use of a reducer is recommended if the steam velocity is likely to exceed the standard 30 m/sec (100 ft/sec).



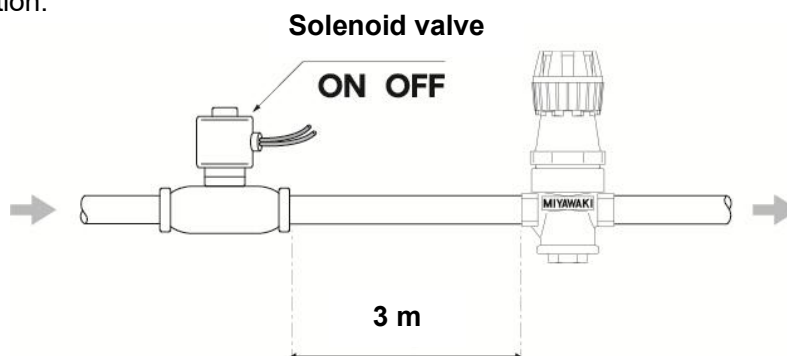
- **Do not use PRVs in parallel.** As self-actuated valves, each unit has slight variations in sensitivity and responsiveness. Since they cannot operate in perfect synchronization, use each valve independently.



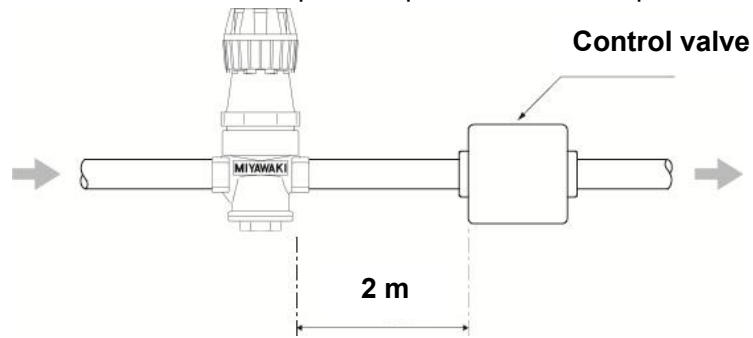
- **Maintain a distance of 3 m (10 ft) or more between PRVs.** Perform two-stage reduction if the pressure reduction ratio exceeds **20:1** (e.g., inlet pressure of 1 MPa and set pressure of 0.05 MPa or less).



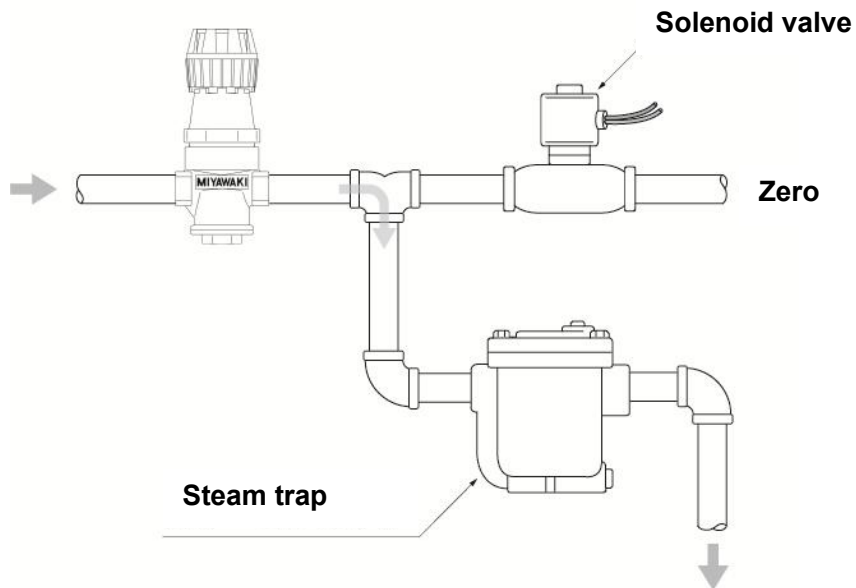
- **Maintain a distance of 3 m (10 ft) or more from any solenoid valve.** When installing a solenoid valve (ON-OFF valve) on the primary or secondary side, this distance is required to prevent unstable operation.



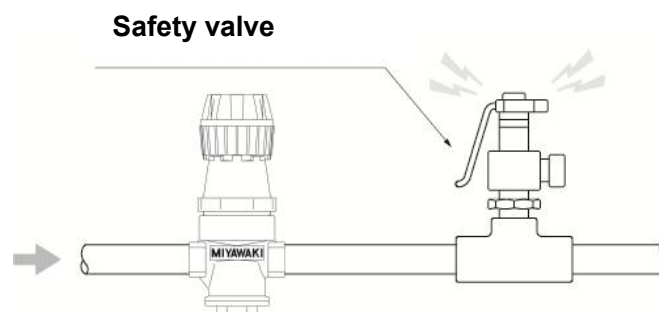
- **Maintain a distance of 2 m (6.6 ft) or more from any control valve.** When using a control valve on the secondary side, this distance is required to prevent unstable operation.



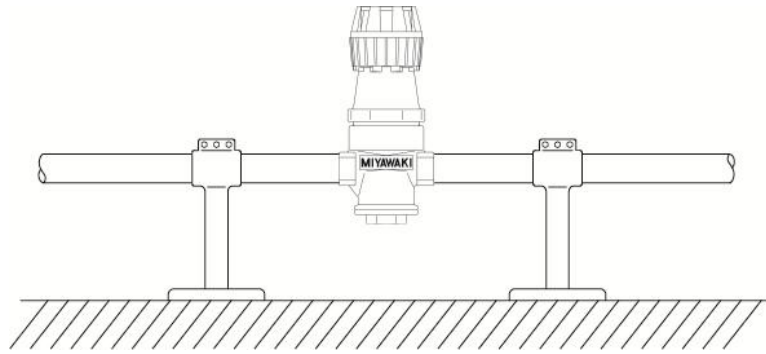
- **Install a steam trap on the secondary side.** Since steam PRVs do not close completely, a steam trap is required for **dead-end service** (where steam consumption is near zero).



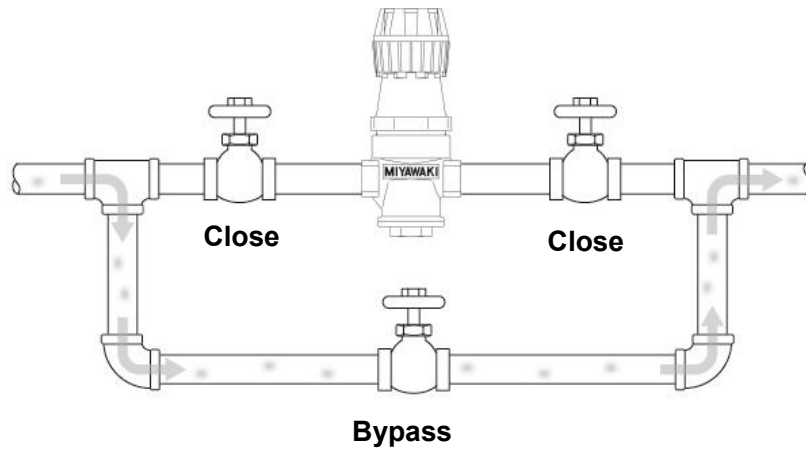
- **Install a safety valve.** To prevent abnormal secondary pressure rise, install a safety valve. If local regulations apply, use a safety valve with the specified discharge capacity. For alarm/relief purposes, the relief valve capacity should be at least **10% of the PRV's rated flow**.



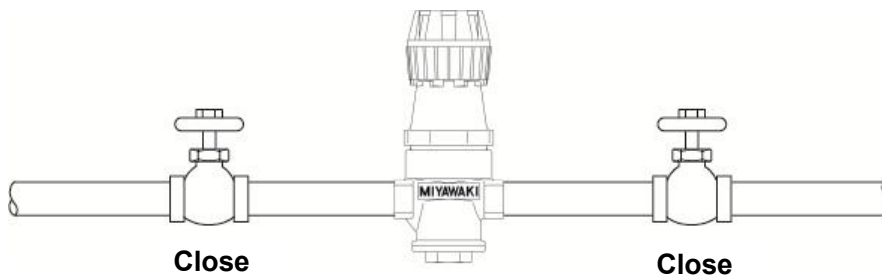
- **Secure and support the piping.** Ensure that piping loads, bending moments, or vibrations are not transmitted directly to the PRV.



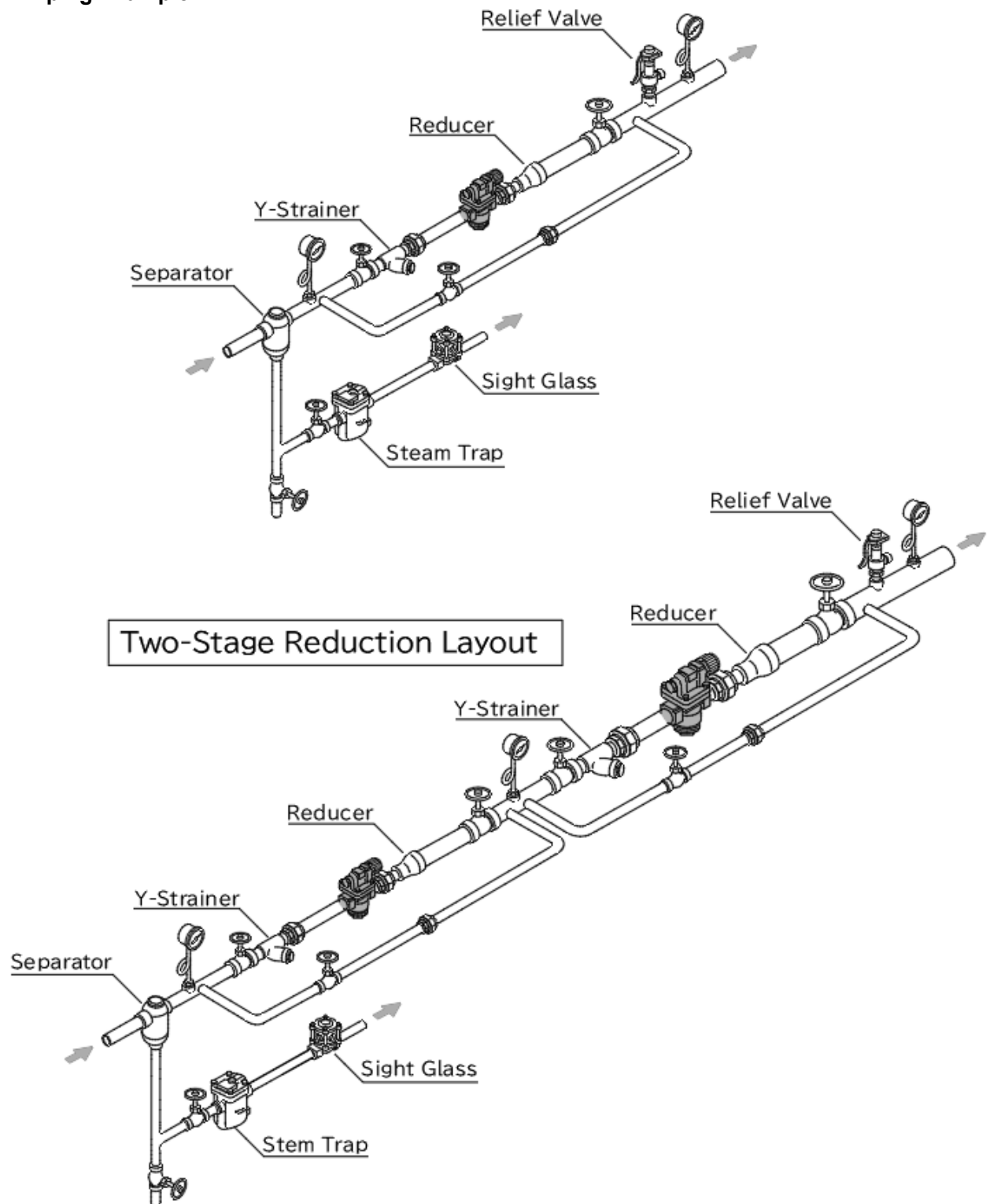
- **Flush the piping via the bypass line before directing steam through the PRV.** In new or long-dormant piping, contaminants such as scale can cause the PRV to malfunction.



- **For extended shutdowns, discharge all condensate and close the isolation valves.** Condensate can be drained by installing a blow valve or steam trap at the bottom flange plug.



■ Piping Example



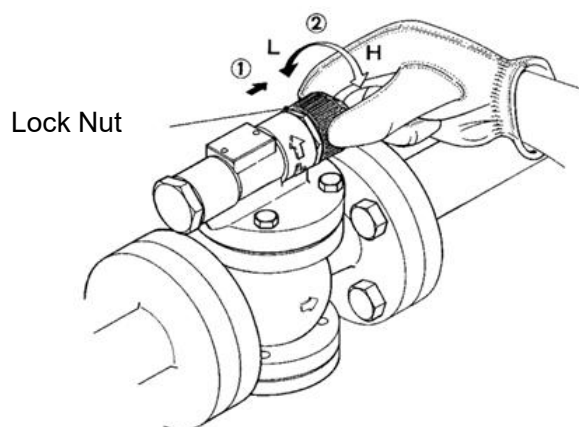
4. PRESSURE ADJUSTMENT PROCEDURE

⚠ WARNING

- **RISK OF BURNS:** The adjusting handle becomes extremely hot during operation. Always wear **heat-resistant work gloves** (leather or industrial grade) when adjusting the pressure.
- **HOT SURFACES:** DO NOT touch the PRV, safety valve, or piping outlets with bare hands. Contact with steam or hot components can cause **severe injury**.

⚠ CAUTION

- **INITIAL BLOW-OFF:** Before adjusting the pressure, open the bypass valve to thoroughly blow off any initial condensate, scale, or debris from the piping.
- **LOCK NUT:** The lock nut (34) secures the adjusting cover. **DO NOT loosen or touch the lock nut** except during disassembly or maintenance.



Adjustment Steps

1. **Preparation:** Ensure both the inlet/outlet isolation (stop) valves and the bypass valve are closed. **Pull the handle (1)** and turn it toward the **"L" direction (2)** to release the adjusting spring tension. The handle will rotate easily when the spring is free.
2. **Supplying Steam:** Slightly open the **outlet side** isolation valve, then **slowly and fully open the inlet side** isolation valve.
3. **Pressure Setting:** **Pull the handle (1)** again and rotate it toward the **"H" direction (2)** while watching the pressure gauge. Continue turning slowly until the **desired set pressure** is attained.
4. **Locking: Release the handle.** It will automatically engage and lock into position.
5. **Final Check:** Fully open the **outlet side** isolation valve to complete the adjustment.
6. **Shutdown Procedure:** When stopping the steam supply, **close the outlet side isolation valve first**, and then close the inlet side isolation valve.

5. MAINTENANCE

WARNING

- **DEPRESSURIZE AND COOL DOWN:** Before removing the PRV from the piping or disassembling it, you **MUST** close the isolation valves on both the inlet and outlet sides.
- **VERIFY SAFETY:** Ensure the internal pressure has reached **0 MPa (0 bar)** and the body surface temperature has cooled to **ambient room temperature**. Venting steam or hot condensate can cause **severe burns**.
- **PROCEED WITH CAUTION:** Always perform a final safety check before beginning maintenance.

CAUTION

- **GENUINE PARTS:** Use only MIYAWAKI genuine replacement parts for all repairs.
- **REPLACEMENT OF GASKETS:** Always replace gaskets with new ones whenever the valve is disassembled.

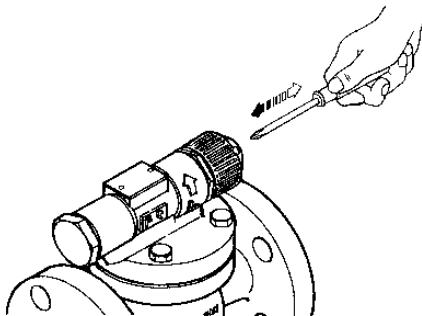
If the pressure reducing valve needs to be disassembled for inspection, refer to the "Disassembly and Assembly" section provided later and proceed with caution.

1. Inspection

1-1. Simplified Blow-off (Clearing Debris from Seats)

The RE12 allows you to momentarily open the main and pilot valves during operation to clear debris from the seats without disassembly. If the secondary pressure fails to reach the set target, try this procedure first:

- Place a large Phillips screwdriver against the **handle set screw**.
- Push the screw straight inward (approx. 3 to 5 mm) against the spring tension, then release.
- Repeat this action several times. *Note: If the set pressure is high and the handle is too stiff to move, turn the handle toward the "L" direction to lower the pressure before performing this procedure.*



1-2. Internal Component Inspection

Regularly clean and inspect the following parts. Replace any damaged components with new ones.

- **Drive Unit:**
 - ▷ Sliding surfaces of the **Piston** and **Cylinder Liner**.
Note: "Piston" refers to the assembly including the piston rings, guide rings, and spring pins.
- **Main Valve Unit:**
 - ▷ Surface of the **Main Screen**.
 - ▷ Seating (contact) surfaces of the **Main Valve** and **Main Valve Seat**.
- **Pilot Unit:**
 - ▷ Surface of the **Pilot Screen**.
 - ▷ Sliding surfaces of the **Pilot Valve Seat** and **Pilot Shaft**.
 - ▷ Seating surfaces of the **Pilot Valve** and **Pilot Valve Seat**.

1-3. External Strainer Inspection

Regularly clean the strainers installed upstream and downstream of the PRV.

2. Disassembly and Reassembly

Observe the following general rules during maintenance:

- **Inspection:** Clean all parts and check for scratches, wear, or damage.
- **Gaskets:** Always replace gaskets with new ones upon reassembly.
- **Tightening:** Tighten all bolts and components evenly in a diagonal pattern.

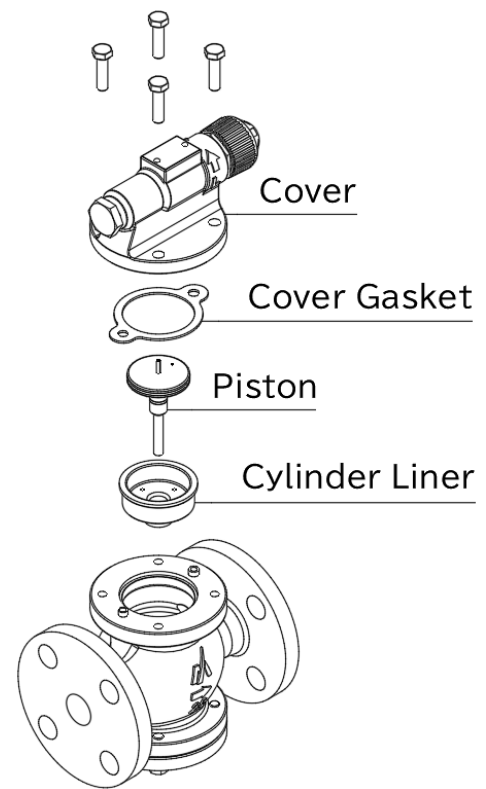
2-1. Drive Unit

■ Disassembly:

1. Loosen the cover bolts and remove the **Cover** and **Cover Gasket** from the body.
2. Pull out the **Piston** from the cylinder liner, then remove the **Cylinder Liner** from the body.

■ Reassembly:

1. Clean all sealing surfaces. Insert the cylinder liner into the body, then insert the piston. **Exercise extreme care not to scratch the sliding surfaces.**
2. Install a new cover gasket and tighten the cover bolts evenly to the specified torque.



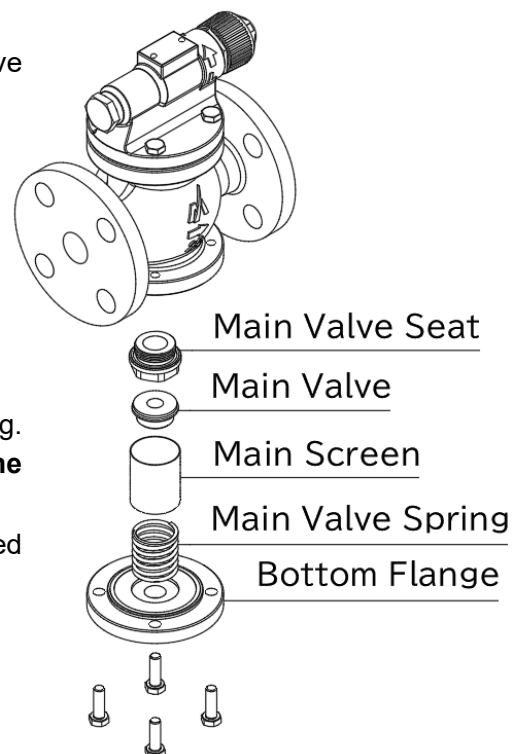
2-2. Main Valve Unit

■ Disassembly:

1. Loosen the bottom flange bolts and remove the **Bottom Flange**, **Main Spring**, and associated parts as a single unit. Remove the **Bottom Gasket**.
2. Unscrew the **Main Valve Seat** from the body and remove the **Main Gasket**.

■ Reassembly:

1. Clean all parts and install new gaskets on the bottom flange and valve seat.
2. Screw the main valve seat into the body. Fit the **Main Screen** onto the hex portion of the seat, then insert the **Main Valve** and **Main Spring**.
3. Align the bottom flange while compressing the spring. **Ensure the spring and screen are correctly seated in the flange.**
4. Tighten the bottom flange bolts evenly to the specified torque.



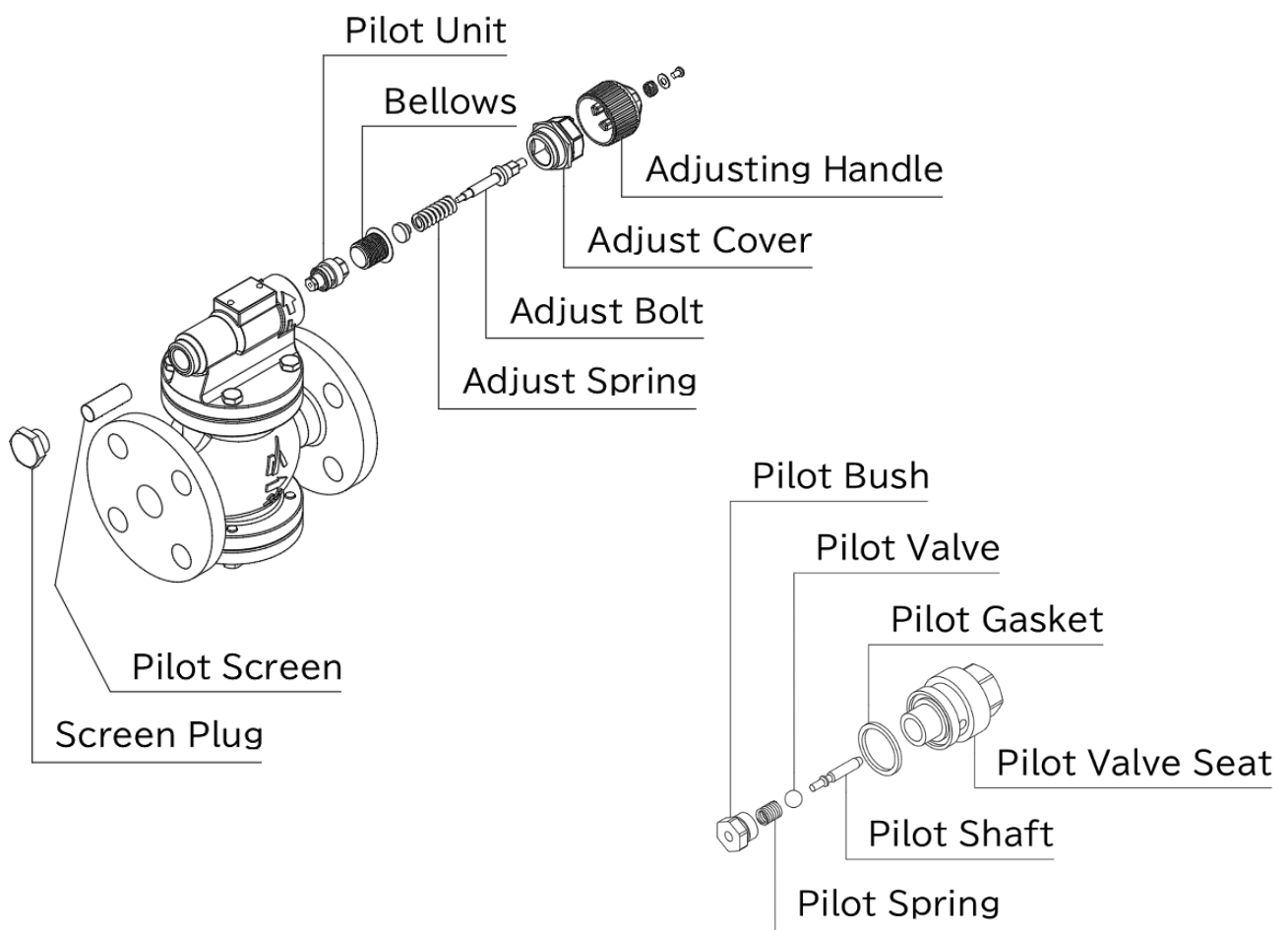
2-3. Pilot Unit

■ Disassembly:

1. Unscrew the **Screen Plug** and remove the **Pilot Screen** and **Screen Plug Gasket**.
2. Loosen the screw and remove the **Handle**, spring, and washer from the adjusting cover.
3. Remove the **Adjusting Cover** to access the **Adjusting Bolt**, **Adjusting Spring**, and **Bellows**.
4. Unscrew the **Pilot Unit** and remove the **Pilot Gasket**.
5. Loosen the **Pilot Bush** to disassemble the pilot unit.

■ Reassembly:

1. Clean all parts. Install new gaskets on the cover, pilot valve seat, and screen plug.
2. Insert the pilot screen and secure the screen plug.
3. Assemble the pilot unit and screw it into the cover.
4. Install the bellows, adjusting spring, and bolt, then secure the adjusting cover.
5. Reattach the handle, spring, and washer, then tighten the screw.





CAUTION

- **Always replace gaskets with new ones during reassembly.** Failure to do so may result in steam leakage or pressure instability.

Tightening Torque Table

Component	Hex Size (Across Flats)	Tightening Torque
Main Valve Seat	32 mm	(15,20,25A) 45 N•m
		(32,40,50A) 65 N•m
Adjust Cover	30 mm	40 N•m
Screen Plug	26 mm	20 N•m
Pilot Valve Seat	14 mm	30 N•m
Cover Bolt Bottom Flange Bolt	(15,20,25A) 13 mm	(15,20,25A) 20 N•m
	(32,40,50A) 17 mm	(32,40,50A) 30 N•m
Pilot Bush	10 mm	4 N•m

- ※ Apply anti-seize compound to all threads before assembly. Ensure the compound does not contaminate the sealing surfaces.

6. TROUBLESHOOTING

If the pressure reducing valve (PRV) does not operate correctly, refer to the table below to identify the cause and perform the appropriate corrective action.

Symptom	Probable Cause	Corrective Action
Secondary pressure does not rise to the set pressure.	Clogged main screen.	Clean the main screen.
	Clogged pilot screen.	Clean the pilot screen.
Secondary pressure rises above the set pressure.	Leakage from the bypass valve.	Repair or replace the bypass valve.
	Poor sliding movement of the piston.	Replace the piston, cylinder liner, piston rings, and guide rings.
	Debris trapped in the main valve.	Clean or replace the main valve and valve seat.
	Debris trapped in the pilot valve .	Clean or replace the pilot valve and valve seat.
Adjusting handle will not turn.	Seizure of the sleeve and adjusting bolt.	Replace the seized components.
Chattering or vibration occurs.	Condensate inflow into the PRV.	Install a steam trap on the primary side.
	Flow rate is below the minimum adjustable limit.	Re-select a PRV with the correct capacity.
External steam leakage.	Damaged or broken gaskets.	Replace all affected gaskets with new ones.

7. WARRANTY

■ Warranty Period

The warranty period is **18 months from the date of shipment** or **12 months from the date of installation**, whichever occurs first.

■ Scope of Warranty

MIYAWAKI INC. will repair or replace the product free of charge if it fails within the warranty period, provided that the failure is not due to any of the following:

1. Failure to observe the instructions and precautions described in this manual.
2. Misuse, inappropriate installation, or negligence by the user (including damage from dropping or impact).
3. Problems caused by equipment or devices other than those supplied by MIYAWAKI, or usage in unauthorized environments.
4. Repairs or modifications performed by any party other than MIYAWAKI or its authorized representatives.
5. Corrosion or rust caused by salt, chemicals, or other substances present in the fluid or the operating environment.
6. Replacement of consumable parts, such as gaskets, packing, O-rings, diaphragms, etc.
7. Accumulation of foreign matter within the piping, such as dirt, scale, or debris.
8. Fire, natural disasters, or other acts of **force majeure** beyond the control of MIYAWAKI.

■ Limitation of Liability

The remedy available under this warranty shall be limited to the repair or replacement of the product. In no event shall MIYAWAKI's liability exceed the sales price of the delivered product.

8. SERIAL NUMBER (S. No.) DESIGNATION

The Serial Number (S. No.) displayed on the product consists of 4, 6, or 9 digits. Use the following tables to identify the date of production.

Serial Number Formats

- **4-digit:** S. No. (A)(A)(B)(C)
- **6-digit:** S. No. (A)(A)(B)(C)(D)(D)
- **9-digit:** S. No. (A)(A)(B)(C)(D)(D)(D)(D)(D)

Component Definitions

(A) Year of Production

Represented by the last two digits of the year (e.g., "26" for 2026).

(B) Month of Production

Represented by a single digit or letter as shown in the table below:

Month	1	2	3	4	5	6	7	8	9	10	11	12
Symbol	1	2	3	4	5	6	7	8	9	X	Y	Z

(C) Day of Production

Represented by a single digit or letter (Note: The letter "I" is not used).

Day	1	2	3	4	5	6	7	8	9	10	11	12
Symbol	1	2	3	4	5	6	7	8	9	A	B	C
Day	13	14	15	16	17	18	19	20	21	22	23	24
Symbol	D	E	F	G	H	J	K	L	M	N	O	P
Day	25	26	27	28	29	30	31					
Symbol	Q	R	S	T	U	V	W					

(D) MIYAWAKI Identification Number

Represents internal tracking and identification codes.

- Examples of Serial Number Designation
 - S. No. 29X4** → Produced on October 4, 2029
 - S. No. 29YF21** → Produced on November 15, 2029
 - S. No. 29ZT5M050** → Produced on December 28, 2029

9. SPECIAL SPECIFICATIONS

The model code indicates product specifications, including special configurations.

Model Number Configuration: The product model and special specifications are indicated as follows:

○○○-○○ - □

(Model Number) - (Special Symbol)

Model Number (○): Represents the product model number.

Special Symbol (□): Represents the special specification (indicated by a single letter following the hyphen).

Common Special Symbols:

Symbol	Description
A	Trap for high-pressure gas facilities (Gas traps only)
C	Equipped with blow valve
K	Change of gasket
L	Change of face-to-face dimension
M	Change of component material
P, T	Change of operating pressure, temperature, discharge capacity, etc.
R	Change of screen mesh
V	Change of air vent
X	Other special specifications, or combination of the above

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- For any questions about the product that you purchased or about the details in this user's manual, please contact the following. This user's manual can also be downloaded from our website.
 - © 2025 MIYAWAKI INC. This user's manual may not be reproduced or copied in whole or in part, without the written consent of MIYAWAKI INC.
 - Some special specifications of the product may differ from the ones in the user's manual. If you have any questions, please contact MIYAWAKI, our local authorized agent, or the company where you purchased the product.
 - In the interest of the development and improvement of our products, MIYAWAKI Inc. reserves the right to change the specification of the products without prior notice.
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MIYAWAKI INC.'s International Sales Dept. or its local representative.
By scanning QR Code, you can access inquiry form.



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