

THERMODYNAMIC AIR TRAP

**AV**

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USER'S MANUAL



 **MIYAWAKI INC.**

# SAFETY GUIDE

The model AV is a cast iron disc-type air trap which has an integrated bypass valve.

In order to get maximum benefit from this product, be sure to read this manual before installing it.

The following warnings and cautions are shown at appropriate places in this manual.



Failure to observe this type of precaution may lead to serious injury or death.



Failure to follow this type of precaution can lead to injury or damage to equipment and property.

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# 1 SPECIFICATIONS AND MARKINGS

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## WARNING

Be sure not to use this product at higher pressures than the specified maximum allowable pressure (PMA) or at temperatures higher than the specified maximum allowable temperature (TMA).

The following items are displayed on the name plate or the side of the product.

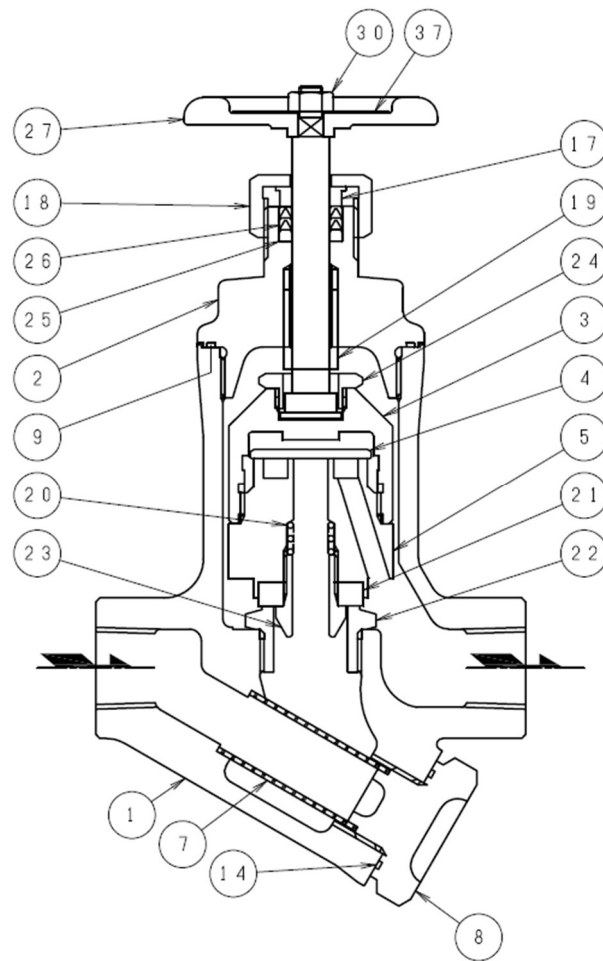
Check each item to avoid misuse of the product.

- 1) Maximum allowable pressure (PMA): 1.6 MPa (232 psig)
  - 2) Maximum allowable temperature (TMA): 220 °C (428 °F)
  - 3) Maximum Operating pressure (PMO): 0.97 MPa (140 psig)  
(Shown on the name plate as MAX. P.)
  - 4) Maximum operating temperature (TMO): 150 °C (302 °F)  
(Shown on the name plate as MAX. T.)
  - 5) Size: AV-4: 15 mm (1/2")  
AV-6: 20 mm (3/4")  
AV-8: 25 mm (1")
  - 6) Year of production: The two leftmost digits in the four-digit or nine-digit "S. No." on the name plate are the last two digits of the year of production.
  - 7) Flow direction: Shown by an arrow
  - 8) Body material: Cast iron FC250
- Some pictures and illustrations in this manual are examples of the models AV. For more details regarding dimensions and other specifications, please refer to the catalog.

The models AV fully comply with the requirements of the European Pressure Equipment Directive 2014/68/EU. It is classified according to Article 4, Section 3 of the PED, which does not allow to bear the CE marking.

## 2 CONSTRUCTION DETAILS

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- |                  |                   |
|------------------|-------------------|
| 1. Body          | 20. Spring        |
| 2. Bonnet        | 21. Disc Valve    |
| 3. Cap           | 22. Valve Seat    |
| 4. Disc          | 23. Bush          |
| 5. Seat          | 24. Nut           |
| 7. Screen        | 25. Gland Bush A  |
| 8. Plug          | 26. Gland Packing |
| 9. Bonnet Gasket | 27. Handle        |
| 14. Plug Gasket  | 30. U-Nut         |
| 17. Gland Bush B | 37. Name Plate    |
| 18. Gland Nut    |                   |
| 19. Spindle      |                   |

### 3 INSTALLATION

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#### WARNING

Pay very careful attention when working in hazardous environments. There is a risk of explosion and the possibility of dangerous gases leaking. Always check whether the pipeline contains flammable, high pressure or high temperature materials before starting to work.

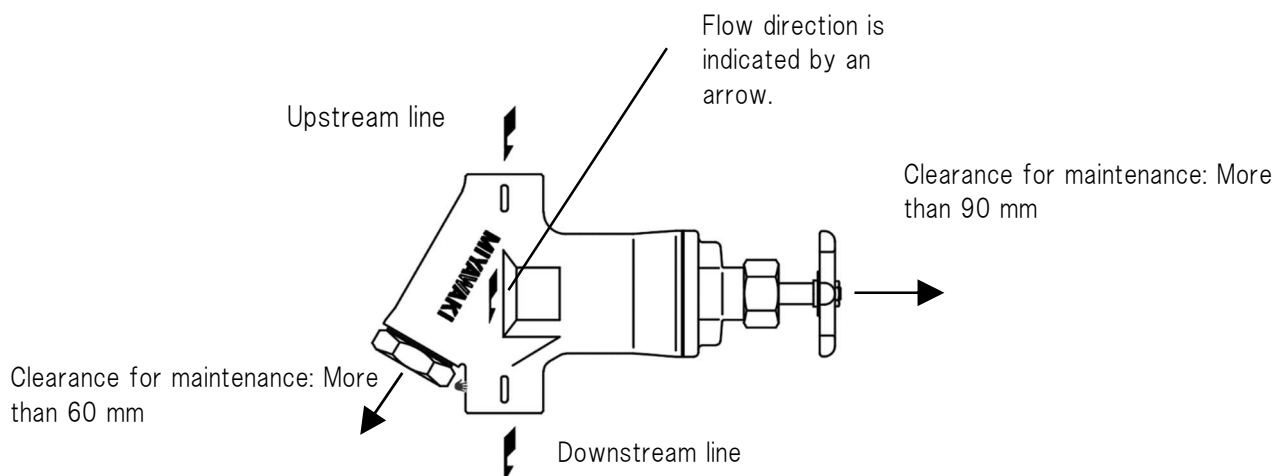
- Make sure that isolation valves are installed on both the upstream and downstream lines.



#### CAUTION

Before installing the product, open both isolation valves and the bypass valve, if one exists, to blow out any debris or dirt inside the pipeline. After blowing out the line, before starting to work, close the isolation valves and allow time for the temperature to drop to a safe working temperature.

When installing the product, be sure to leave clearance for maintaining it.



- 1) Remove the dustproof seals covering both connections.  
※Products shipped in plastic bags may not have dustproof seals.
- 2) Check the flow direction indicated on the side of the body.
- 3) The models AV can be used only for vertical lines. There is no need for a bypass valve.  
※If it is unavoidable to install it on a horizontal lines, tilt the trap body 90 degrees from the position perpendicular to the pipe, and use it sideways so that the handle is horizontal to the pipe.
- 4) Open the isolation valve on the upstream line and make sure the product works normally.

## 4 OPERATION

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### CAUTION

Before starting operation, open the bypass and blow off the scale in the piping.

#### 4.1 Operation procedure

- 1) After blowing off the scale from the piping, close the bypass of the air trap.
- 2) Open the stop valve on the trap inlet side.

#### 4.2 Stop procedure

- 1) Close the stop valve on the trap inlet side.

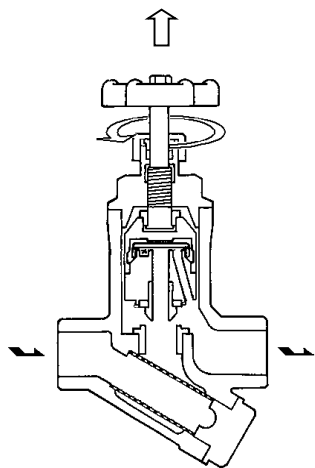
\* When stopping for a long time, completely drain the condensate from the piping and trap and close the valve before the trap.

### CAUTION

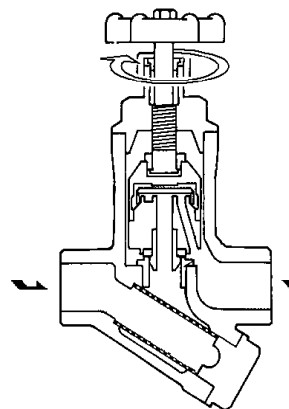
- In normal operation, use the AV with the bypass valve closed (with the handle turned fully clockwise).
- If the AV is used for a long time with the bypass valve open, there is a possibility that parts such as the Valve Seat may be damaged.

Model AV functions as blow off of by-pass valve when handle is turned counter clockwise, and will function as thermodynamic steam trap when handle is turned clockwise to full stop.

**Use as a bypass valve**



**Use as a steam trap**



## 5 MAINTENANCE

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### WARNING

- Before removing the trap from the pipe or disassembling it, be sure to close the isolation valves. Then, release the residual pressure from the trap body (make sure that the pressure in the main body is equal to the atmospheric pressure). After it has fully cooled down (after the temperature of the main body has reached ambient temperature), confirm for safe conditions and then begin work.
- Even when the isolation valves are closed, there may be residual internal pressure due to leaks from the isolation valves. Therefore, be very careful.



### CAUTION

- When replacing parts, make sure the replacement parts are supplied by MIYAWAKI.

The performance of air traps deteriorates gradually over time due to wear, corrosion or dirt accumulating around the valve and the valve seat. Please conduct periodic diagnosis of traps in order to keep the equipment working well.

### 5.1 Repairs

When a trap fails, it is necessary to clean the internal parts and to replace damaged parts. Take the failed trap apart following the steps below.

#### 5.1.1 Disassembling and repairing the air trap unit

- 1) Unscrew the bonnet (2) and remove the trap unit including the handle (27), the gland nut (18) and the spindle (19).
- 2) Firm the seat (5) in a vice.
- 3) While turning the handle (27) clockwise, lift the bonnet (2) until the gland nut (18) touches the handle (27).
- 4) The spindle (19) can be removed from the trap unit by removing the nut (24) from the cap (3).
- 5) Unscrew the cap (3). Now you can take out the disc (4).
- 6) The disc valve (21) and spring (20) can be removed from the seat (5) by removing the bush (23).
- 7) Clean and check these parts. Replace damaged ones with new ones. Then reassemble the parts in reverse order.

If the disc (4) and/or the seat (5) is worn or damaged, replace the complete trap unit.

※Normally, assemble with the ground surface facing the seat. If the amount of drainage is large, turn the disc over and assemble it with the slit side facing the seat.

### 5.1.2 Disassembling the bonnet and replacing the gland packings

- 1) Unscrew the U-nut (30) from the spindle (19).
- 2) Remove the name plate (37) and take off the handle (27).
- 3) Unscrew the gland nut (18) from the bonnet (2). Then remove the gland bush B (17), two gland packings (26) and the gland bush-A (25).
- 4) Replace the gland bushes and the packings. The gland bush A (25) and the two gland packings (26) are PTFE rings. First insert the gland bush A (25) into the bonnet (2). Then insert the gland packings (26). Pay attention that the v-groove of the gland packings (26) should face down. Then insert the gland bush B (17) and screw the gland nut (18) on the bonnet (2).

### 5.2.3 Remove and clean the screen

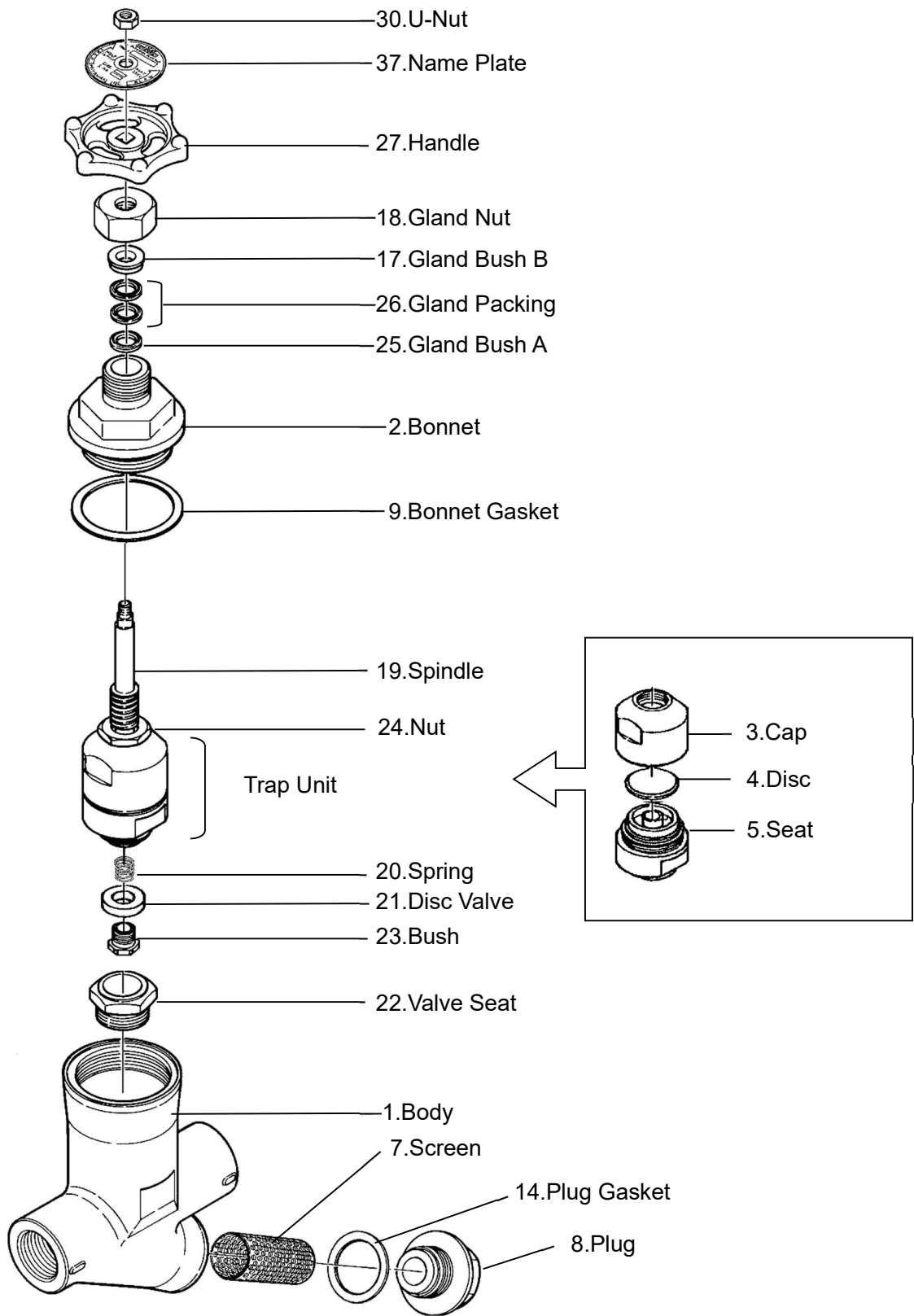
- 1) Turn the plug (8) counterclockwise to remove it from the body (1).
- 2) Take off the screen (7) and clean or replace it. After cleaning or replacing insert the screen (7) into the body (1) and tighten the plug (8).
- 3) The plug gasket (14) is fitted into a groove of the plug. If not damaged, a replacement is not necessary.

After checking, cleaning and replacing all parts, put the handle (27) on the spindle (19), then put the name plate (37) on the handle and screw the u-nut (30) on the spindle (19).

### Torque table

Parts	Model	Tools	Across the flats	Torque
Bonnet (2)	all	Torque wrench	41 mm (1.61")	120 N·m
Cap (3)	all	Spanner	38 mm (1.50")	100 N·m
Bush (23)	all	Torque wrench	17 mm (0.67")	10 N·m
Gland Nut (18)	all	Torque wrench	27 mm (1.06")	25 N·m
Nut (24)	all	Spanner	23 mm (0.91")	20 N·m
Plug (8)	AV-4	Torque wrench	36 mm (1.42")	70 N·m
	AV-6, AV-8	Torque wrench	32 mm (1.26")	100 N·m





## 6 TROUBLESHOOTING

Problem		Possible cause	Solution
<b>Air leaks or blows through.</b>		Dirt is stuck around the disc (4) or the seat (5).	Clean the disc (4) and the seat (5).
		Damage, wear or corrosion of the disc (4)	Replace the trap unit.
		Damage, wear or corrosion of the seat (5).	Replace the trap unit.
		After using the blow-off valve function, the handle (27) remained open or is poorly tightened.	Tighten the handle (27).
		The back pressure is too high. (The back pressure must be less than 50% of the inlet pressure.)	Replace the trap with an appropriate trap.
<b>Air or condensate leaks from the body.</b>	<b>From the bonnet connection</b>	The bonnet (2) is loose.	Tighten the bonnet (2). *1
		The bonnet gasket (9) is damaged.	Replace the bonnet gasket (9).
		The sealing surface on the body (1) or the bonnet (2) is damaged.	Replace the damaged part.
	<b>From the bonnet and gland nut connection</b>	The gland bush A (25) or B (17) or the gland packings (26) are damaged or broken.	Replace the damaged part.
		The gland nut (18) is loose.	Tighten the gland nut (18). *2
	<b>From the plug connection</b>	The plug (8) is loose.	Tighten the plug (8). *3
		The plug gasket (14) is damaged.	Replace the plug gasket (14).
		The sealing surface on the body (1) or plug (8) is damaged.	Replace the damaged part.
	<b>Insufficient condensate discharged, or no condensate discharged.</b>		The screen (7) is clogged.
Dirt has built up around the seat (5).			Clean the seat (5).
Dirt has built up in the fluid path inside the trap unit.			Clean the parts.
Insufficient condensate capacity.			Replace the trap with a larger capacity trap.
Wrong installation direction			Reinstall the product in the correct direction.

\*1, \*2 and \*3: Refer to the torque table in Section 5 "Maintenance" to retighten the parts with the correct torque.

## **7 WARRANTY**

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### **7.1 Warranty period**

The warranty period is 18 months after shipment or 12 months after installation, whichever occurs first.

### **7.2 Details of the warranty**

If the product stops working correctly within the warranty period, we will repair or replace the product free of charge if the cause of the trouble is not one of the following items.

- 1) The precautions described in this manual were not observed.
- 2) User's errors or mistakes such as an inappropriate installation or incorrect handling, or an excessively large impact caused by dropping
- 3) Problems caused by devices or equipment other than MIYAWAKI's, or a disallowed use environment
- 4) When a repair or modification has been performed by anyone other than MIYAWAKI or people who are authorized to make such repairs
- 5) Intrusion of salt or other substances that promote significant rust or corrosion or problems from fluids that contain the same substances
- 6) Consumable parts such as Packing, Gasket, O-ring, Diaphragm, etc.
- 7) Attachment or accumulation of foreign matter in the pipe, such as dust and scale
- 8) Problems from fires, natural disasters, or other force majeure which is not MIYAWAKI's responsibility

### **7.3 Warranty limitation**

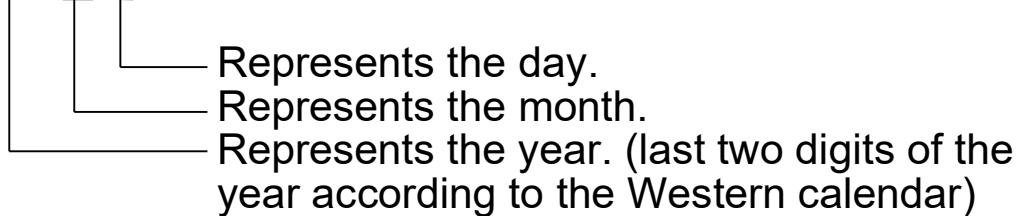
The remedy available under the warranty shall not exceed the sales price of the products delivered, for any cause whatsoever.

## 8 SERIAL NUMBER (S. No.) DESIGNATION

The following 4-digit or 9-digit “S. No.” is displayed on the product.

- For 4-digit display

S.No. □□□□



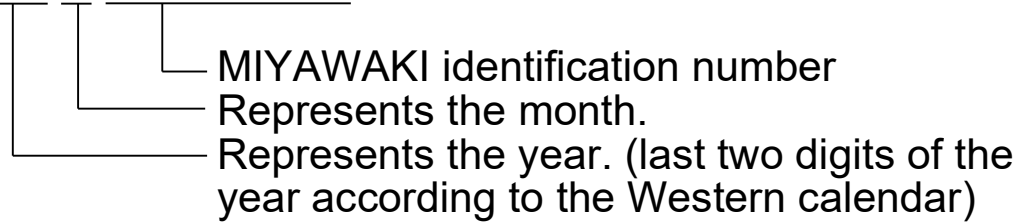
Example of serial number designation

1 7 1 1 → Jan.1, 2017

2 9 X M → Oct. 21, 2029

- For 9-digit display

S.No. □□□□□□□□□



Example of serial number designation

1 7 1 1 2 C 0 2 0 → Jan., 2017

2 9 X 0 5 M 0 5 0 → Oct., 2029

### Month designation system

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

### Day designation system

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

## 9 GUIDANCE FOR READING SPECIAL PRODUCT NAME



**Special symbol:**  
The symbol applies only to  
special products  
(Please refer to table 1 for details)  
English letter after “-“

**Model symbol:**  
Product model number

Table 1 Symbol description

Suffix	Special contents
A	Trap for high-pressure gas installed property (only for Gas Trap)
C	Blow valve attached
K	Change of gasket
L	Special face to face dimension
M	Change of parts material
P, T	Change of operating pressure, temperature, condensate capacity, etc.
R	Change of screen mesh
V	Change of air vent
X	Other than mentioned above or complex of special contents 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.

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- Some special specifications of the product you have, may found to be different from the ones in the user's manual. If you have any question, please contact MIYAWAKI, our local authorized agent, or the place where you purchased.
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