TEMPERATURE CONTROL STEAM TRAP

TBH 71/72/81/82

USER'S MANUAL

MIYAWAKI INC.

SAFETY GUIDE

The MIYAWAKI TBH71/TBH72/TBH81/TBH82 is a bimetal temperature control steam trap that has superior durability and essentially doesn't allow steam to leak.

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.

WARNING

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

CAUTION

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

Table of Contents

1 SPECIFICATIONS AND MARKINGS

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):
TBH71-80F/TBH71-80W/TBH72-80F/TBH72-80W: 8.0 MPa (80bar/1160psig)
TBH71-105F/TBH71-105W/TBH72-105F/TBH72-105W: 10.5 MPa (105 bar/1523 psig)
TBH81-150F/TBH81-150W/TBH82-150F/TBH82-150W: 15.0 MPa (150 bar/2175 psig)
TBH81-200F/TBH81-200W/TBH82-200F/TBH82-200W: 20.0 MPa (200 bar/2900 psig)

(2) Maximum allowable temperature (TMA):
TBH71-80F/TBH71-80W/TBH71-105F/TBH71-105W/TBH72-80F/TBH72-80W/TBH72-105F/TBH72-105W: 470°C (878°F)
TBH81-150F/TBH81-150W/TBH81-200F/TBH81-200W/TBH82-150F/TBH82-150W/TBH82-200F/TBH82-200W: 550°C (1022°F)

(3) Maximum operating pressure (PMO):
TBH71-80F/TBH71-80W/TBH72-80F/TBH72-80W: 8.0 MPa (80bar/1160psig)
TBH71-105F/TBH71-105W/TBH72-105F/TBH72-105W: 10.5 MPa (105 bar/1523 psig)
TBH81-150F/TBH81-150W/TBH82-150F/TBH82-150W: 15.0 MPa (150 bar/2175 psig)
TBH81-200F/TBH81-200W/TBH82-200F/TBH82-200W: 20.0 MPa (200 bar/2900 psig)

(4) Maximum operating temperature (TMO):
TBH71-80F/TBH71-80W/TBH71-105F/TBH71-105W/TBH72-80F/TBH72-80W/TBH72-105F/TBH72-105W: 470°C (878°F)
TBH81-150F/TBH81-150W/TBH81-200F/TBH81-200W/TBH82-150F/TBH82-150W/TBH82-200F/TBH82-200W: 550°C (1022°F)

(5) Size: 15mm (1/2"/DN15), 20mm (3/4"/DN20), 25mm (1"/DN25)

(6) Serial number: Showing the year and date of production

(7) Flow direction: Shown by an arrow.

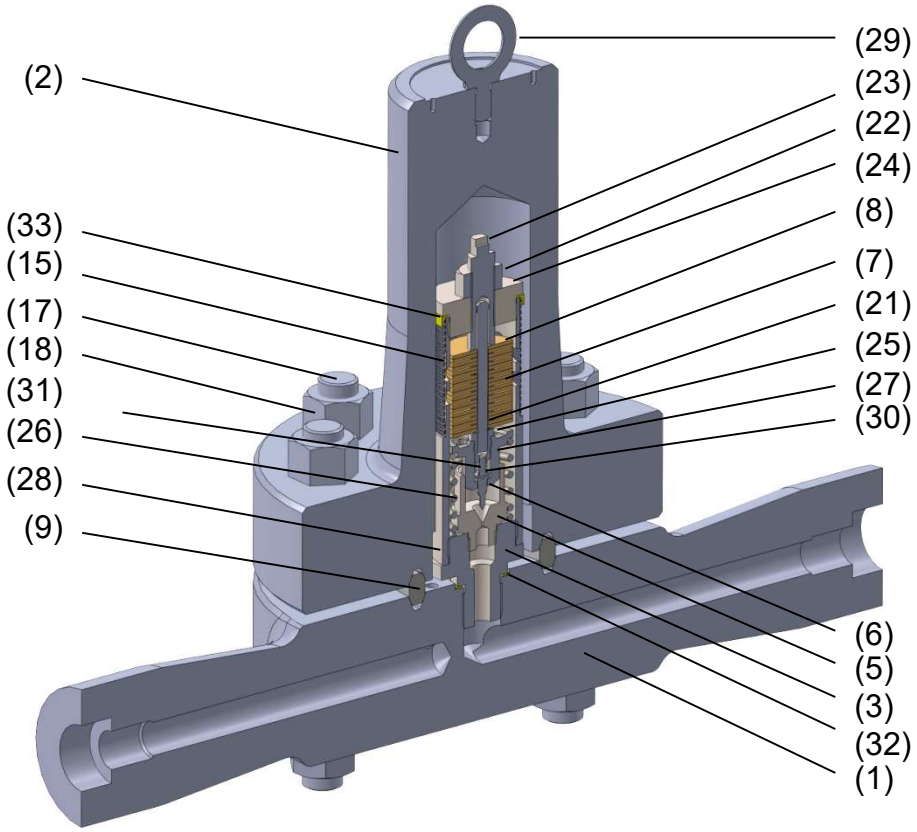
(8) Body material: TBH71/TBH72/TBH81: A217 WC6, TBH82: A217 WC9

(9) Model symbol: Showing the product model name

For more details regarding dimensions and other specifications, refer to the catalog.

The product fully complies 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



1. Body
2. Cover
3. Seat bush
5. Valve seat
6. Valve
7. Washer
8. Bimetal
9. Gasket
15. Screen
17. Bolt
18. Nut
21. Shaft
22. Adjust nut
23. Adjust bolt
24. Adjust bush
25. Bush
26. Spring
27. Holder
28. Guide tube
29. Eye bolt (only for TBH72/TBH81/TBH82)
30. Spring plate
31. Spring
32. Gasket
33. Spacer

3 INSTALLATION

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.

The TBH71/TBH72/TBH81/TBH82 models are heavy products. You are recommended to reinforce lines to support the product's weight.

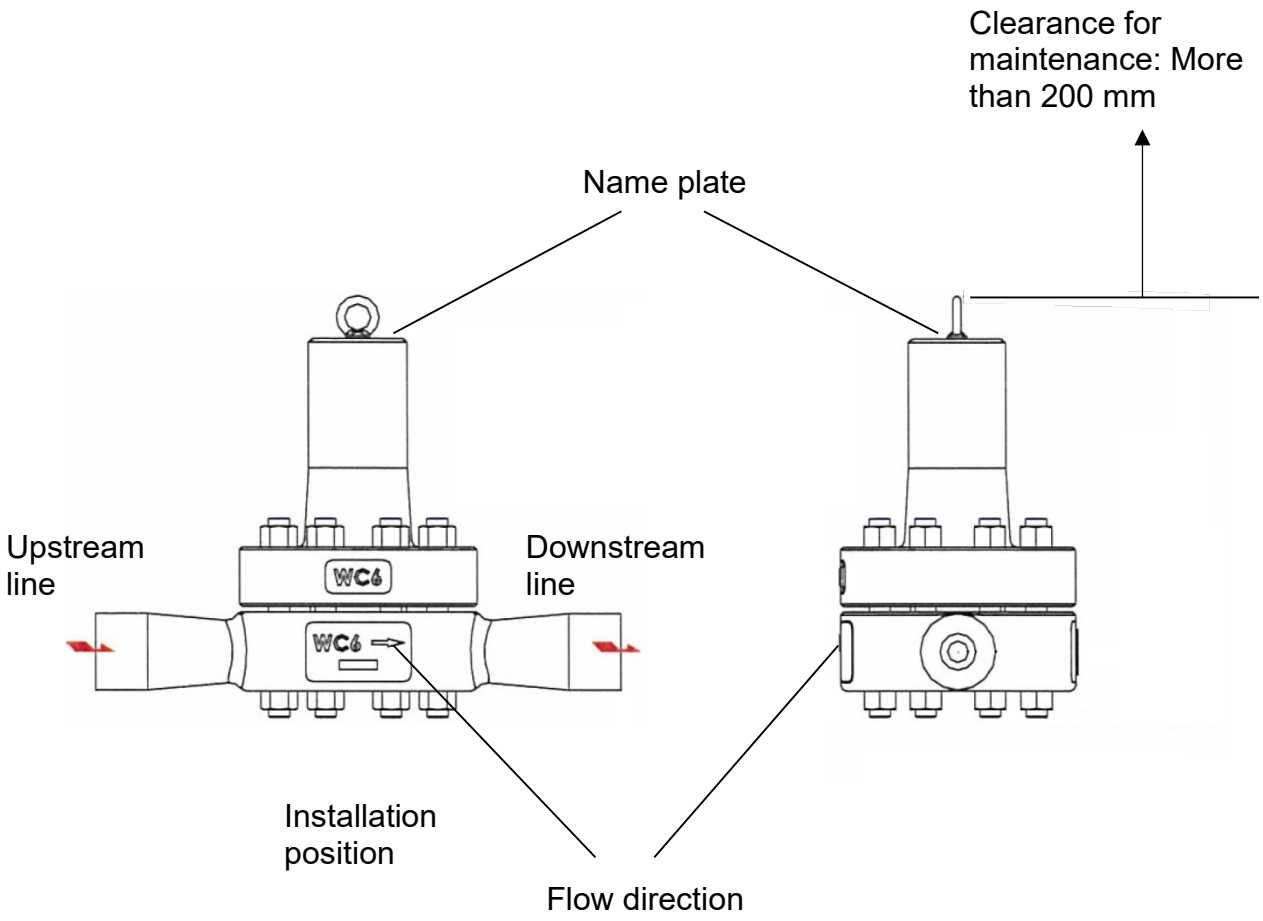
(1) Remove the dustproof seals covering both connections.
(2) Check the flow direction indicated on the side of the body.
(3) When installing the TBH71/TBH72/TBH81/TBH82, install it so that the flow from the upstream line to the downstream line is horizontal and the top label or the name plate is on the top side of the body. Install the TBH71/TBH72/TBH81/TBH82 at the end of a pipe that is angling down, so that condensate flows into the steam trap easily.

- Open the isolation valve on the upstream line slowly and make sure the product works normally.

CAUTION

Installing instructions for welding：

When welding a socket weld type, heat buildup that can be damage internal parts of the trap must be avoided. After welding one side of the socket weld ends quickly, leave it cool. After the trap’s temperature has returned to normal, weld the other side quickly. The body and cover of the TBH71/TBH72/TBH81 are made of A217 WC6 (forged alloy steel). And the body and cover of the TBH82 are made of A217 WC9 (forged alloy steel). Please make sure that the welding is performed according to the correct welding instructions.


Clearance for maintenance: More than 200 mm
Name plate
Upstream line
Downstream line
WC6
WC6
Installation position
Flow direction

4 SETTING THE TEMPERATURE

WARNING

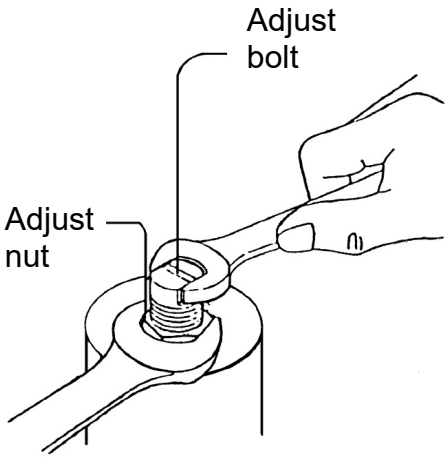
Only set the temperature when the bimetals in the body are flat, before any steam is flowing. Be sure not to set the temperature while the steam is flowing because the steam or condensate may spurt out around the edges in the setting part.

4.1 Set the Temperature

The set temperature is the temperature at which condensate will be discharged from the temperature control trap. It is set to the temperature specified by the customer when shipped. If the customer doesn't specify a temperature, it is always set to 210°C at a pressure of 6.5MPa (TBH71-80/TBH72-80), 230°C at a pressure of 8.0MPa (TBH71-105/TBH72-105), 250°C at a pressure of 10.5MPa (TBH81-150/TBH82-150), 270°C at a pressure of 15.0MPa (TBH81-200/TBH82-200), as the factory default setting. In this case, the set temperature is not stamped on the name plate attached to the body.

4.2 Setting the temperature

1) Remove the cover bolt (17) and cover nut (18), and remove the cover (2).
2) Hold the adjust bolt (23) using a wrench (across the flats: 6 mm)、and loosen the adjust nut (22) using a wrench (across the flats: 17 mm).
3) Screw the adjust bolt (23) slowly clockwise until it stops. This position is the starting point to set the temperature.
4) See the stroke table in Section 5 to find the number of turns corresponding to the temperature you want.
5) Screw the adjust bolt (23) counterclockwise the number of turns specified in the table.
6) Hold the adjust bolt (23) using a screwdriver, and then screw the adjust nut (22) clockwise.
7) And tighten it.

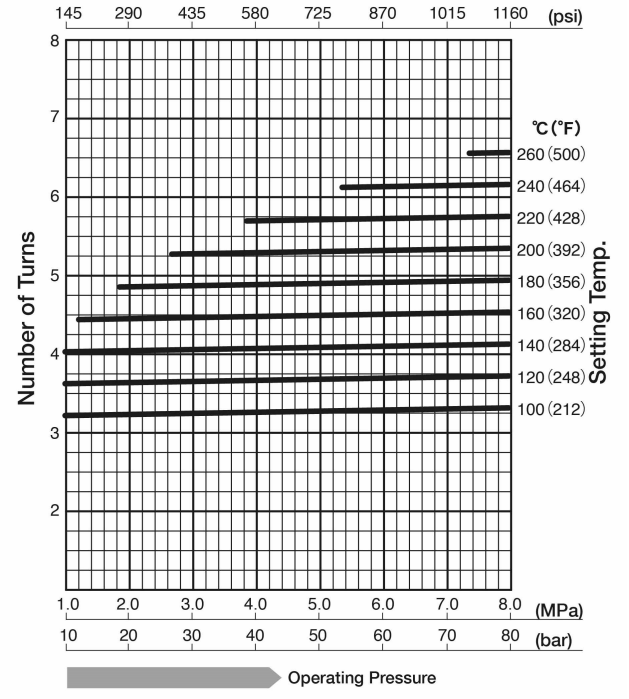


4.3 Precautions for Setting the Temperature

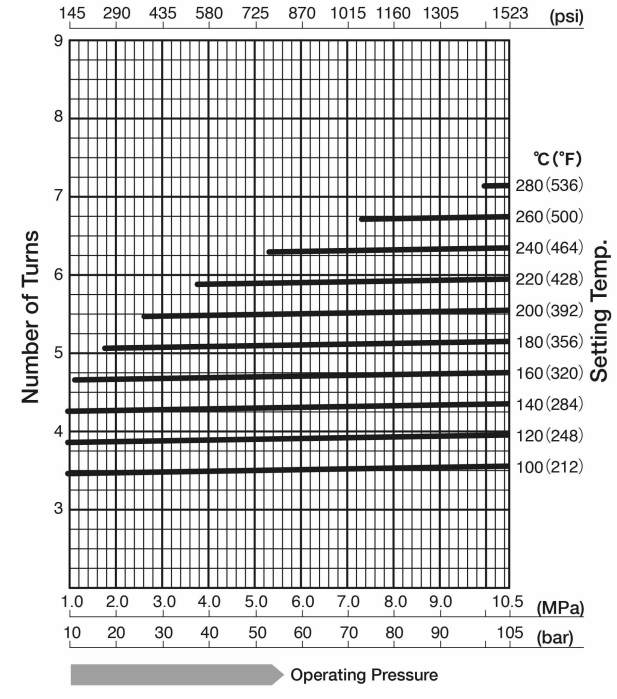
- Steam main lines
  Basically, use a temperature about 30°C lower than the saturated temperature. However, since the appropriate temperature setting will vary with the length of the respective branch pipes, please consult us about our recommendations.

5 STROKE TABLE

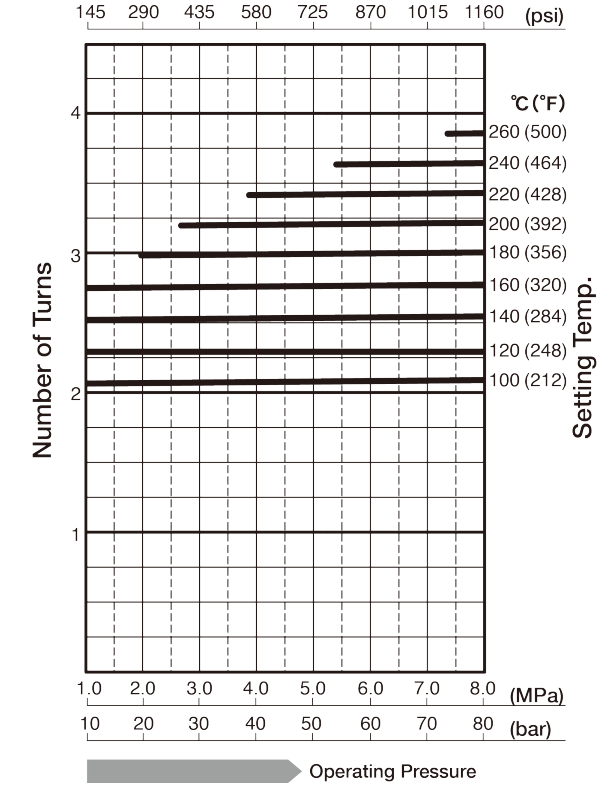
● TBH71-80F(W)



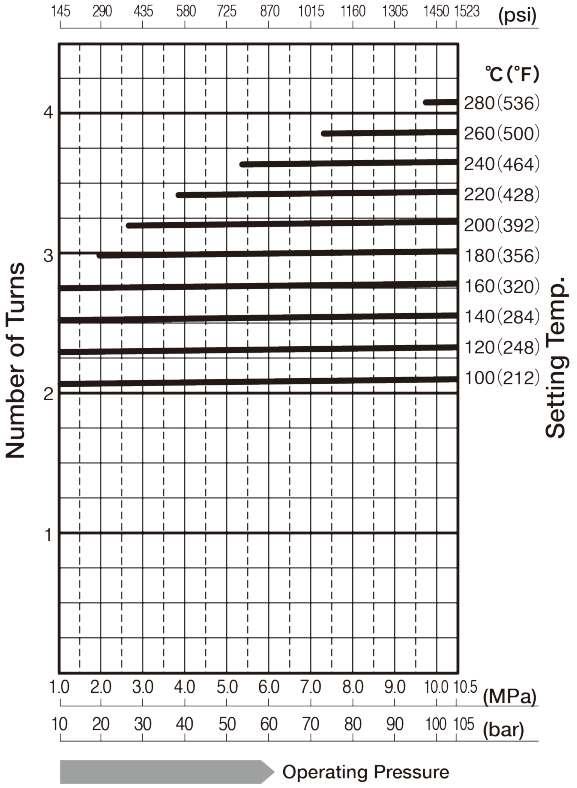
● TBH71-105F(W)



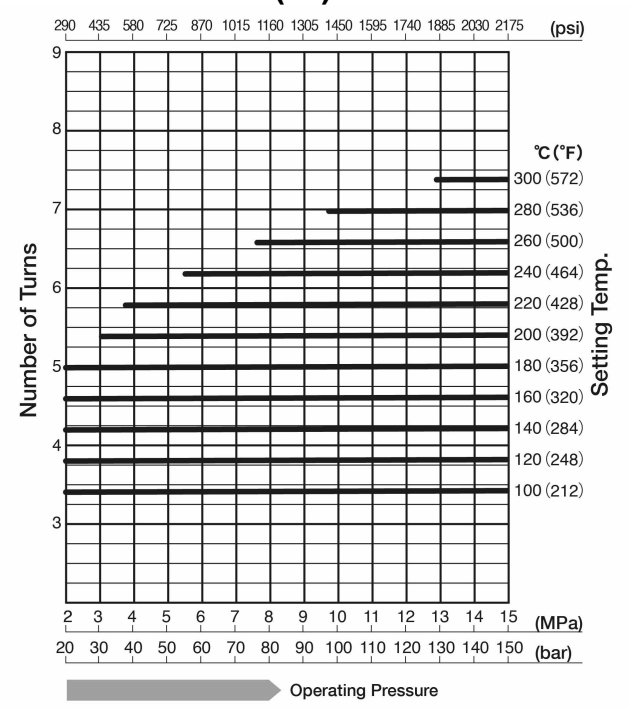
● TBH72-80F(W)



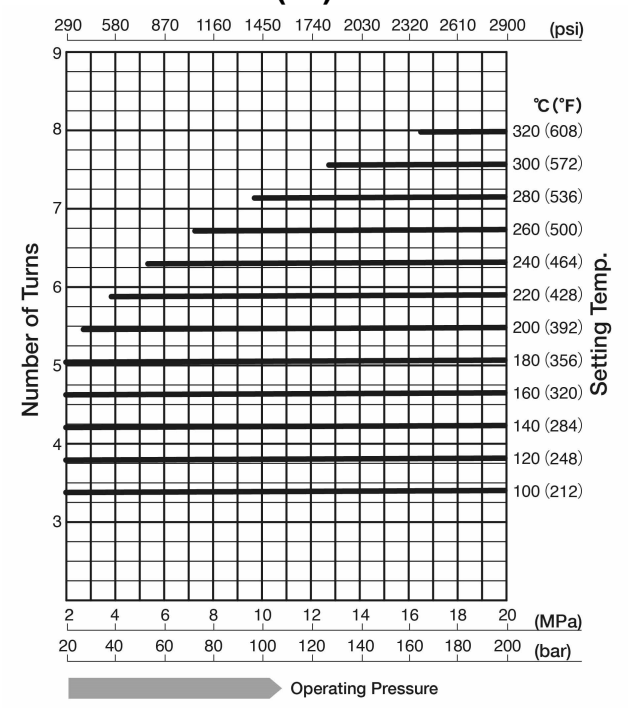
● TBH72-105F(W)



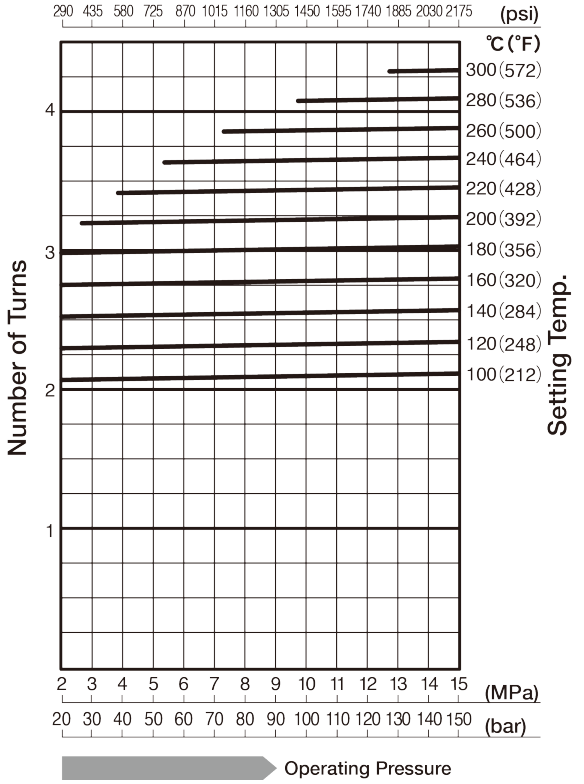
● TBH81-150F(W)



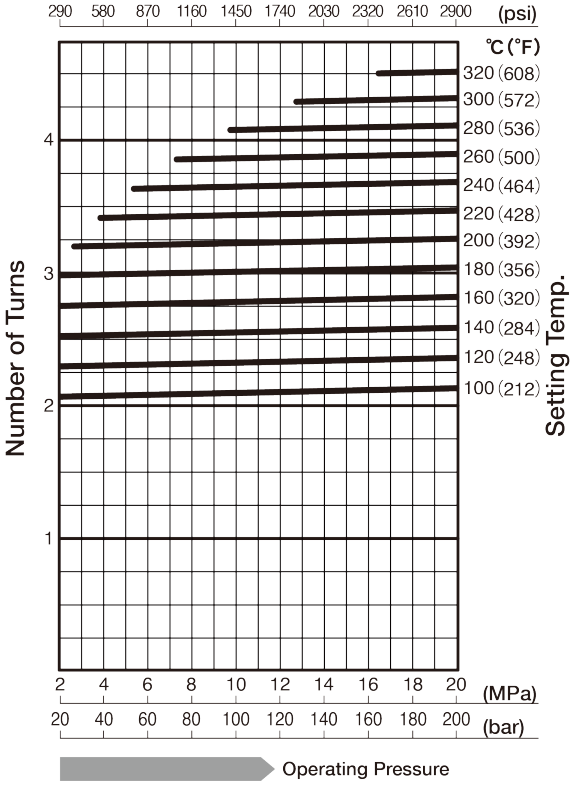
● TBH81-200F(W)



● TBH82-150F(W)



● TBH82-200F(W)



6 MAINTENANCE

CAUTION

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

The performance of steam traps deteriorates gradually over time due to wear, corrosion or dirt accumulating around the valve seat. To keep steam control systems and equipment working well, periodic maintenance of steam traps is essential.

6.1 Tools for Testing Steam Traps

In order to test steam traps, ultrasonic testers, sound detectors, and thermometers have been used for years. These tools are relatively easy to use and are useful for making rough estimates of the level of deterioration of a trap. However, to determine deterioration levels and steam losses quantitatively, special tools for testing steam traps are required. Dr. Trap and Dr. Trap Jr. are testing equipment that was developed specifically for diagnosing steam traps and analyzing survey results automatically. Use these tools to avoid tiresome jobs on site and save working time.

6.2 Working Conditions of a Steam Trap

Steam trap failures can be classified as either 'Leaking' or 'Plugged'. The level of a steam leak is generally determined by the intensity of the ultrasonic vibration generated in the valve seat inside of a steam trap. Plugging is diagnosed by measuring the surface temperature. As plugging progresses due to a buildup of dirt in the trap, it finally becomes completely plugged. Then the surface temperature will drop to around 40 degrees centigrade, or lower.

6.3 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.

1) Remove the cover bolt (17) and cover nut (18), and remove the cover (2).
2) If you loosen the guide tube using a wrench, you can remove the adjustment part, including the screen (15), the adjust nut (22), the adjust bolt (23), and adjust bush as a unit.
3) Take out the valve unit and the bimetal unit. And then remove the spring (26).
4) If there is any abnormality in the valve seat (5), remove the valve seat (5) using a torque wrench.
5) Take the appropriate measures, as described in Section 7, “Troubleshooting”. Reassemble the parts as follows, reversing the procedure used to disassemble them. Refer to the torque table to use the correct torque for each part.

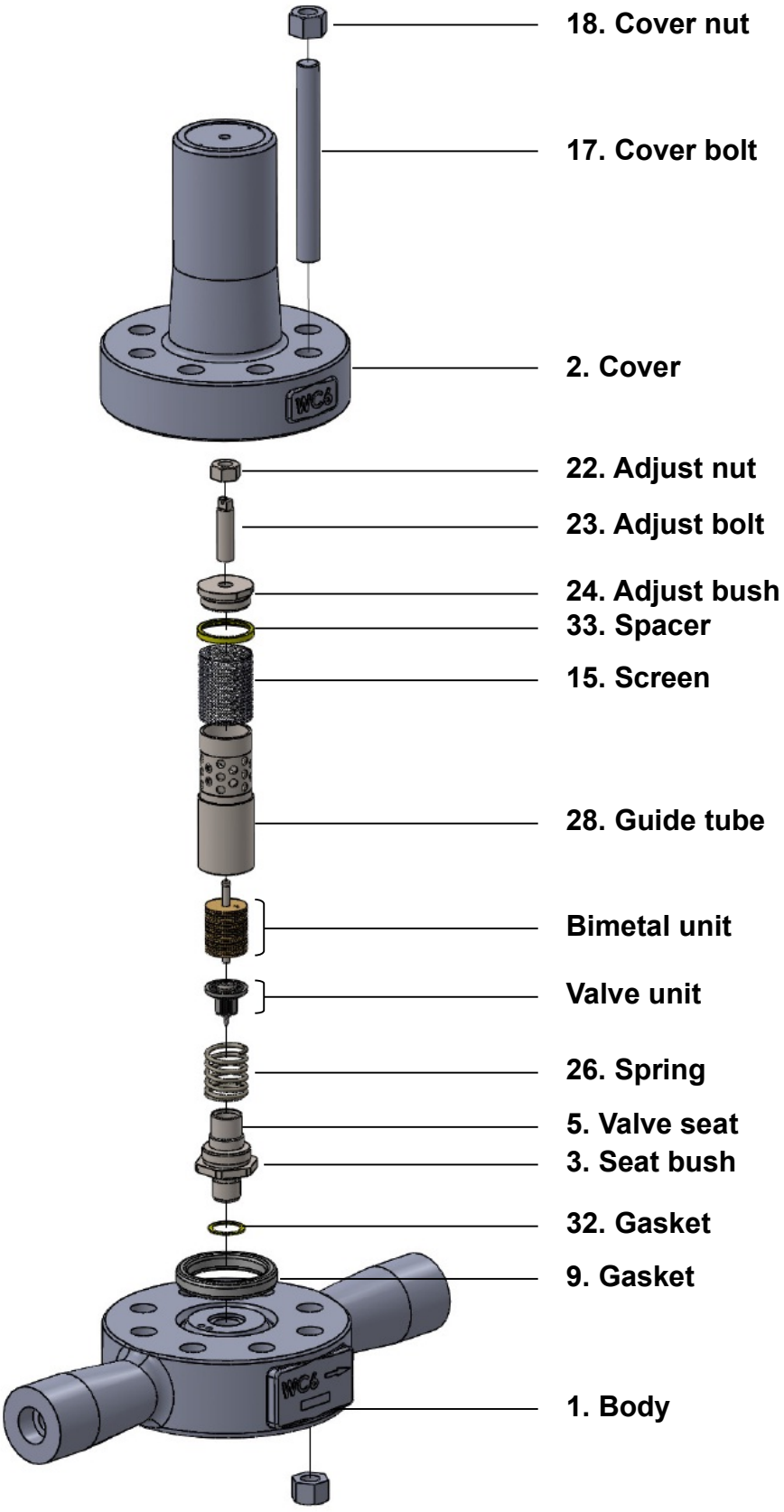
⚠ CAUTION

When reassembling the trap, make sure to replace the gasket (9) with a new one.

Make sure to tighten the cover bolts (17) and cover nuts (18) in a crosswise pattern, to avoid uneven tightening.

The torque for each part

Parts	Models	Tools	Across the flats	Torque
Seat bush (3)	TBH71· 72· 81· 82	Torque wrench	41 mm (1.61 in.)	140N-m (1400kgf-cm)
Valve seat (5)	TBH71· 72· 81· 82	Torque wrench	23 mm (0.91 in.)	80N-m (800kgf-cm)
Bolt (17) Nut (18)	TBH71	Torque wrench	22 mm (0.87 in.)	90N-m (900kgf-cm)
	TBH72· 81		24 mm (0.94 in.)	170N-m (1700kgf-cm)
	TBH82-150		30 mm (1.18 in.)	180N-m (1800kgf-cm)
	TBH82-200		32 mm (1.26 in.)	240N-m (2400kgf-cm)
Adjust nut (22)	TBH71· 72· 81· 82	Wrench	17 mm (0.67 in.)	300N-m (3000kgf-cm)
Adjust bush (24)	TBH71· 72· 81· 82	Wrench	37mm (1.46 in.)	120N-m (1200kgf-cm)


18. Cover nut
17. Cover bolt
2. Cover
22. Adjust nut
23. Adjust bolt
24. Adjust bush
33. Spacer
15. Screen
28. Guide tube
Bimetal unit
Valve unit
26. Spring
5. Valve seat
3. Seat bush
32. Gasket
9. Gasket
1. Body

7 TROUBLESHOOTING

Problem	Possible cause	Solution
Steam leaks or blows through.	The adjustment may not be correct.	Readjust the temperature setting.
	Dirt is stuck around the valve (6) or the valve seat (5).	Clean the valve (6) or the valve seat (5)
	The valve seat (5) is loose.	Retighten the valve seat (5). *1
	The seat bush (3) is damaged	Replace the seat bush (3).
	Damage, erosion or corrosion of the valve (6) or the valve seat (5).	Replace the valve (6) or the valve seat (5).
	A foreign object may be caught in the sliding part.	Remove and clean the sliding part.
	Damage or erosion of the bimetal part (8).	Replace the bimetal unit.
	The adjust bolt (23) is backed out too far.	Tighten the adjust bolt (23) to Set the correct stroke length.
	Wrong installation direction	Reinstall the product in the correct direction.
Steam leaks from the body.	The cover bolt (17) and cover nut (18) are loose.	Retighten them.*2
	Damage, erosion or deterioration of the cover gasket (9)	Replace the cover gasket (9).
	The gasket sealing surface on the body or bottom cover is damaged.	Replace the body with a new one, or replace the bottom cover.
Insufficient condensate discharged, or no condensate discharged.	The screen (15) is clogged.	Clean the screen (15).
	Dirt has built up on around the valve seat (5).	Clean the valve seat (5).
	Dirt accumulated in the fluid passage of the body (1).	Clean the body (1).
	Damage or erosion of the bimetal part (8).	Replace the bimetal unit.
	The adjust bolt (23) is too tight.	The adjust bolt (23) is backed out too far.
	The steam pressure was over the specified maximum operating pressure.	Replace the trap with one that has a higher maximum operating pressure.
	Insufficient condensate capacity.	Replace the trap with a larger capacity trap.
	Discharge condensate capacity of the trap is insufficient.	Replace the trap with a larger capacity trap.

*1 and *2: Refer to the torque table in Section 6, “Maintenance” to retighten the parts to the correct torque.

8 WARRANTY

8.1 Warranty period

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

8.2 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 ours, or a disallowed use environment
4) When a repair or modification has been performed by anyone other than us 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 our responsibility

8.3 Warranty limitation

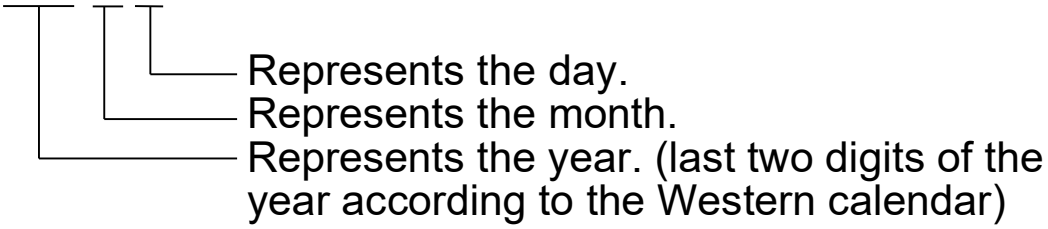
The remedy available under the warranty shall not exceed the sales price of the products delivered, for any cause whatsoever.

9 SERIAL NUMBER（S. No.）DESIGNATION

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

●For 4-digit display

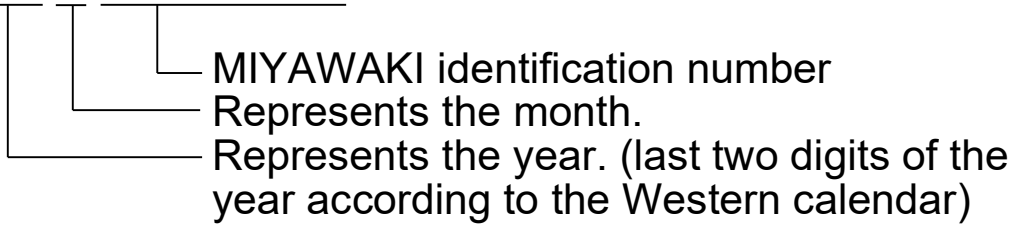
S.No. □□□□



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

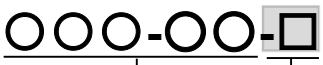
Day designation system

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

10 GUIDANCE FOR READING SPECIAL PRODUCT NAME



Special symbol:
Symbol apply only to special product
(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

For any questions about the product that you purchased or about the details in this user’s manual, please contact the following.

- 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 company where you purchased the product.

MIYAWAKI INC.

If you need any assistance regarding this manual, please contact MIYAWAKI INC.'s International Sales Dept. or its local representative.
By scanning QR Code, you can access inquiry form.

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TBH71/72/81/82