

TB1N



ISO9001
JMI-0205
Head office & Factories



ISO14001
JQA-EM1403
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The MIYAWAKI Supertrace TB1N trap is an energy saving, copper trace, temperature control steam trap that takes advantage of the sensible heat in a condensate by discharging condensate that is lower than the saturated temperature, for any arbitrary temperature setting. Please use this product in a steam trace line or as instrumentation. 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.

1 Specifications and markings



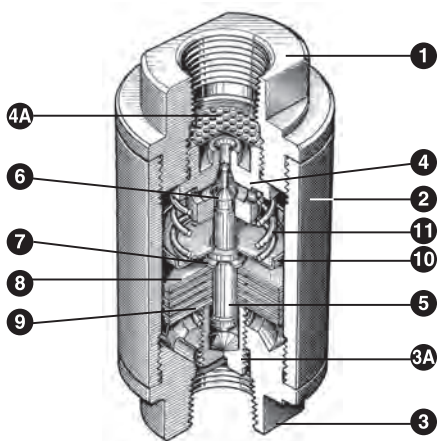
Be sure not to use this product at higher pressures than the specified maximum allowable pressure (PMA) or at temperatures higher than the specified maximum allowable temperature (TMA).

The following items are displayed on the nameplate or the side of the product. Check each item to avoid misuse of the product.

- (1) Maximum allowable pressure (PMA): 1.6 MPa (230 psig)
- (2) Maximum allowable temperature (TMA): 350°C (662°F)
- (3) Maximum operating pressure (PMO): 1.6 MPa (230 psig)
- (4) Maximum operating temperature (TMO): 350°C (662°F)
- (5) Size: 8 mm (1/4"), or 10 mm (3/8")
- (6) Year of production: The two leftmost digits in the four-digit 'S No.' on the nameplate are the last two digits of the year of production.
- (7) Flow direction: Shown by an arrow.
- (8) Body material: S25C

* Refer to the leaflet for details about dimensions and other specifications.

2 Construction details



- 1 Body
- 2 Bonnet
- 3 Cover
- 3A Adjusting bolt
- 4 Valve seat
- 4A Screen
- 5 Shaft
- 6 Valve
- 7 E-ring
- 8 Bimetal
- 9 Washer
- 10 Spring plate
- 11 Spring

3 Installation



- Pay very careful attention when working in hazardous environments such as this. 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.



- 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.

- Remove the dustproof seals covering both connections.
- Check the flow direction indicated on the side of the body.
- The TB1N can be used for both horizontal and vertical lines.
- Open the isolation valve on the upstream line and make sure the product works normally.
- When using as a trace line, install a trap in a trace pipe.

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.

○ **Set 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 70°C at a pressure of 0.5 MPa, as the factory default setting.

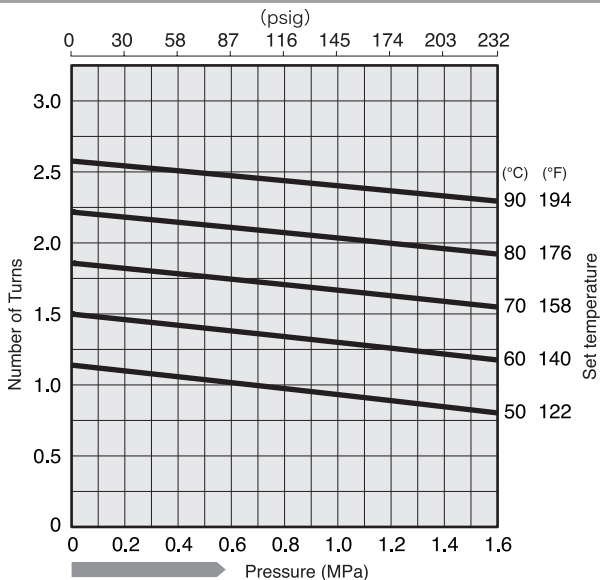
○ **Setting the temperature**

- When the bimetal (11) is resting flat, screw the adjusting bolt (3A) slowly clockwise until it stops. This position is the starting point to set the temperature.
- See the stroke table in Section 5 to find the number of turns corresponding to the temperature you want.
- Screw the adjusting bolt (3A) counterclockwise the number of turns specified in the table.

○ **Precautions for setting the temperature**

- **Steam trace**
Basically, the set temperature should be the temperature used to control the objects being heated. However, please make sure to consult us if you will use the product in a cold climate.
- **Other equipment**
Since the appropriate set temperature depends on the equipment, please consult us.

5 Stroke table



6 Maintenance



- 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.

○ 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 in a defective 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.

○ 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.

○ 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.

Take apart the body of the trap

- 1) Secure the body (1) (or cover (3)) in a vise, and remove the cover (3) (or the body (1)). When the cover (3) and the adjusting bolt (3A) are removed as a unit without disassembling them, it will not be necessary to readjust the temperature setting after reassembly.
- 2) Remove the bimetal part (the bimetal (8), the shaft (5), the E-ring (7), and the washer (9)), the valve (6), the spring plate (10), and the spring (11) by hand.
*Do not take apart the bimetal part. If the bimetal discs come off the bimetal part, each disc has a mark on one face. Place the two marked surfaces facing out, away from each other, and then put the two bimetal discs with the washer in between them back into the bimetal part. Treat the two bimetal discs as a set. If this assembly is wrong, the bimetal part will not function properly.
- 3) When removing the bonnet (2) from the body (1) or the cover (3), be careful to keep the bonnet (2) from being deformed or distorted. Use the proper tools to remove the parts.
- 4) Remove the valve seat (4) using a socket wrench.
- 5) Clean and inspect the parts thoroughly.

After repairing the trap, re-assemble the parts in reverse order, as follows.

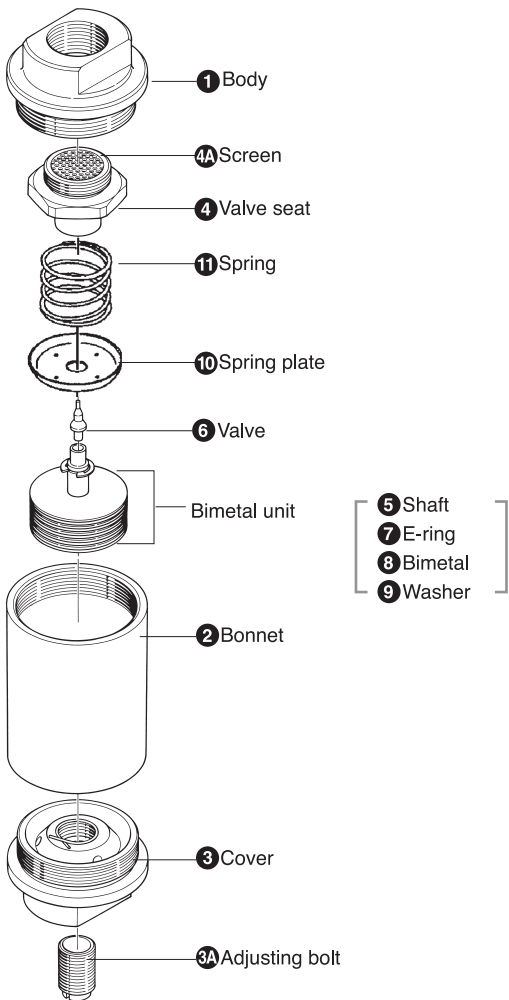
Re-assemble the body

- 1) Screw the valve seat (4) into the body (1).
- 2) Reinstall the spring (11) and the spring plate (10) on the valve seat.
- 3) Put the valve (6) into the center hole in the spring plate (10), and place it on the spring plate (10) so that the tip of the valve (6) can be inserted into the hole in the valve seat (4).
- 4) Reinstall the bimetal part so that the tip of the shaft (5) fits into the hole in the valve (6).
- 5) Screw the bonnet (2) onto the body (1), and the cover (3) onto the bonnet (2). Then, tighten the cover (3).

* The proper torque for the Body (1), cover (3), and valve seat (4) are as shown in the following table.

Parts	Tools	Across the flats	Torque
Body (1)	Torque wrench	22 mm (0.86 in)	56 N-m (560 kgf-cm) (1,232 lbf-in)
Cover (3)	Torque wrench	22 mm (0.86 in)	56 N-m (560 kgf-cm) (1,232 lbf-in)
Valve seat (4)	Torque wrench	22 mm (0.86 in)	56 N-m (560 kgf-cm) (1,232 lbf-in)

* When the adjustment unit is disassembled, after reassembling it set the temperature again, following the steps shown in the Section 4, "Setting the temperature".



7 Troubleshooting

Problem	Possible causes	Solution
Steam leaks or blows through.	Stuck valve or dirt accumulated around the valve (6) or valve seat (4)	Clean the valve (6) and the valve seat (4).
	The valve seat (4) is loose.	Tighten the valve seat (4). *1
	Damage, erosion or corrosion of the valve (6) and the valve seat (4)	Replace the valve part.
	The bimetal (8) is damaged.	Replace the valve part.
	The adjusting bolt (3A) is backed out too far. (Improper set temp.)	Set the temperature again.
Steam leaks from the body.	The body (1) is loose.	Tighten the body (1). *2
	The cover (3) is loose.	Tighten the cover (3). *3
Insufficient condensate discharged, or no condensate discharged.	The screen (4A) is clogged.	Clean the screen (4A).
	Dirt has built up on or around the valve seat (4).	Clean the valve seat (4).
	Dirt accumulated in the fluid passage of the body (1)	Clean the body (1).
	The bimetal (8) is damaged.	Replace the valve part.
	The adjusting bolt (3A) is too tight. (Improper set temp.)	Set the temperature again.
	Improper installation direction	Reinstall the product in the correct direction.
	Insufficient condensate capacity	Replace the trap with a large capacity.

*1, *2 and *3: Refer to the torque table in Section 6, "Maintenance" to retighten the bolts to the correct torque.

8 Warranty

Warranty period

The warranty period shall last 12 months from the date of product delivery.

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 have 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) Extremely worn packing, gaskets, or other parts
- 7) Attachment or accumulation of foreign objects in the pipe, such as dust and scale
- 8) Problems from fires, natural disasters, or other force majeure which is not our responsibility

Warranty limitation

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