

SIGHT GLASS

TS1N

USER'S MANUAL



 **MIYAWAKI INC.**

SAFETY GUIDE

The model TS1N is a sight glass used for visual checking of steam traps, especially when the condensate is discharged into a closed return system. It can be used also for checking the operation of valves which are installed in steam, hot water and water lines.

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



WARNING

Be sure not to use this product at higher pressures than the specified maximum operating pressure (PMO) or at temperatures higher than the specified maximum operating temperature (TMO).

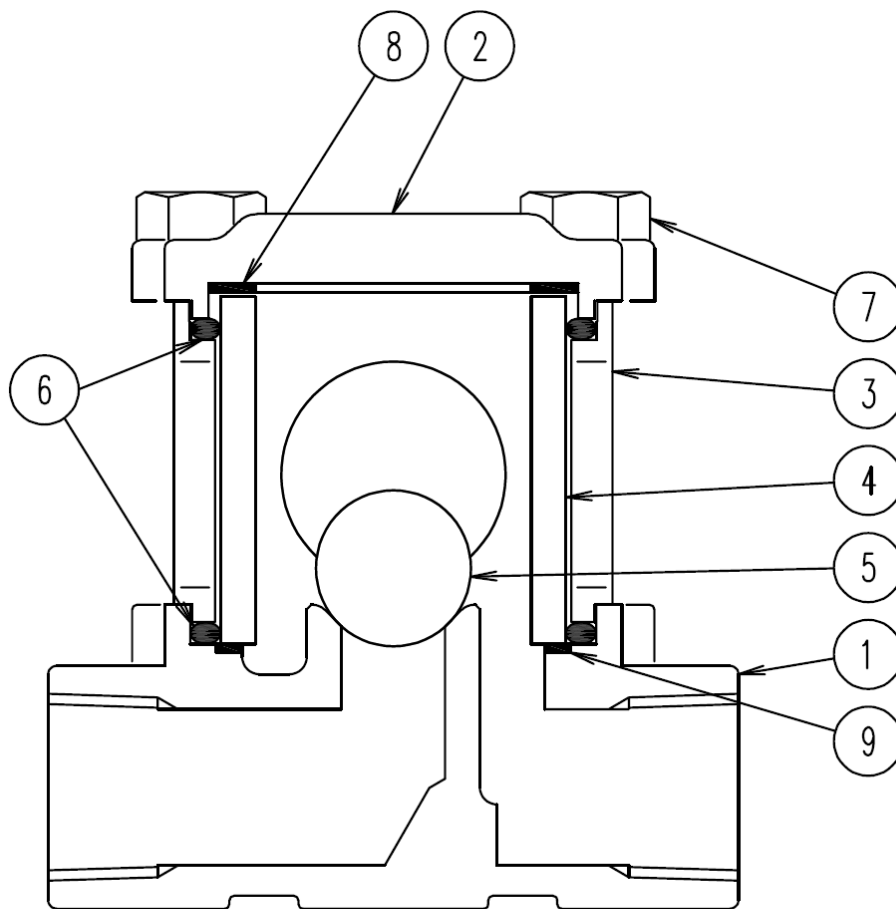
Check the operating characteristics to avoid misuse of the product.

- 1) Maximum allowable pressure (PMA): 1.0 MPa (145 psig)
- 2) Maximum allowable temperature (TMA): 180 °C (356 °F)
- 3) Maximum operating pressure (PMO): Steam: 0.8 MPa (116 psig)
Water: 1.0 MPa (145 psig)
- 4) Maximum operating temperature (TMO): Steam: 180 °C (356 °F)
Water: 100 °C (212 °F)
- 5) Size: Screwed 15 – 25 mm (1/2" – 1")
- 6) Year of production: The two leftmost digits in the four-digit or nine-digit 'S. No.' are the last two digits of the year of production.
- 7) Flow direction: Shown by an arrow
- 8) Body material: Brass C3771
- 9) Model : Showing the product model name

- Some pictures and illustrations in this manual are examples of TS1N models. For more details regarding dimensions and other specifications, please refer to the catalog.

The model TS1N 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 | 6. O-Ring |
| 2. Cover | 7. Bolt |
| 3. Protector | 8. Gasket |
| 4. Glass Tube | 9. Gasket |
| 5. Ball | |

3 INSTALLATION



WARNING

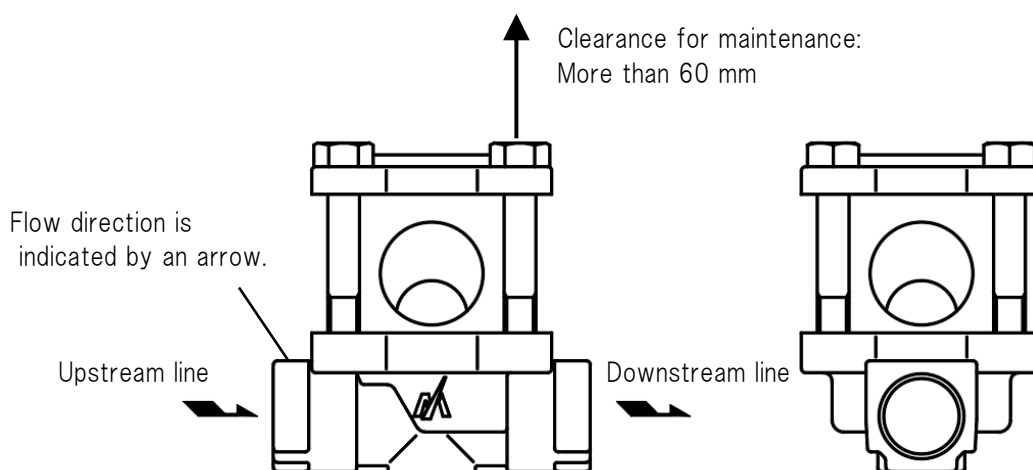
Pay very careful attention when working in hazardous environments. There is a risk of explosion and the possibility of dangerous gases leaking. Always check whether the pipeline contains flammable, high pressure or high temperature materials before starting to work.

- 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.



- 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 body.
- 3) The TS1N can only be installed horizontally. When installing the product in the horizontal position, the cover must be facing up.
- 4) Install the sight glass about 1 m away from the downstream side of the steam trap when using in the steam piping.
- 5) Install it at a point where it can be easily observed.



WARNING

Do not use for piping where water hammer may occur.

4 OPERATION



CAUTION

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

4.1 Operation procedure

- 1) After blowing off the scale from the piping, close the bypass valve or blow valve.
- 2) Open the isolation valve on the trap outlet side.
- 3) Open the isolation valve on the trap inlet side.

4.2 Stop procedure

- 1) Close the isolation valve on the trap inlet side.
- 2) Close the isolation valve on the trap outlet side.

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



WARNING

This product uses heat-resistant glass, but the glass may be damaged if a sudden temperature change happens.

When you start using it, open the inlet valve slowly to avoid water hammer and sudden temperature changes.

Also, if the inside of the main body is hot, be careful not to cool the glass from the outside.

5 MAINTENANCE



WARNING

- Before removing the sight glass from the pipe or disassembling it, be sure to close the isolation valves. Then, release the residual pressure from the valve 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 to 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.

5.1 Repairs

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

5.1.1 Disassembling the sight glass

- 1) Unscrew the bolts (7) and take off the cover (2).
- 2) Remove carefully the protector (3), the glass tube (4), the O-rings (6) and the ball (5).
- 3) Inspect all parts, clean them and replace worn parts with new ones.



CAUTION

Clean the body with care not to damage the sealing surface. Scratches on the sealing surface may cause leakage.

5.1.2 Reassembling the sight glass

- 1) Put a new gasket (9) into inside groove at the body (1).
- 2) Place the ball (5) over the center hole of the body (1).
- 3) Slide an O-ring (6) about the lower part of the glass tube (4) and put the glass tube into the body (1).
- 4) Press the protector (3) over the glass tube (4) into the body (1).
- 5) Insert the other O-ring (6) between the glass tube (4) and the protector (3) and put to the seat of the protector (3).
- 6) Place the gasket (8) on the top of the glass tube (4).

- 7) Put the cover (2) on the glass tube (4), insert the bolts (7) and tighten the bolts evenly crosswise.

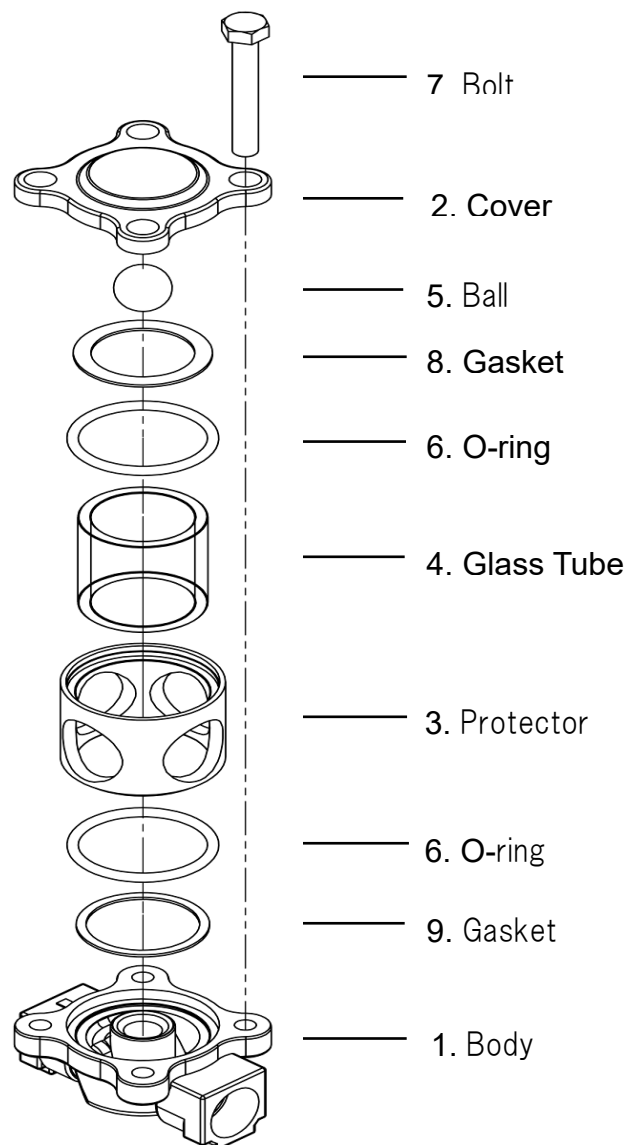
Torque table

Parts	Tools	Across the flats	Torque
Bolt (7)	Torque wrench	13 mm (0.51")	10 N·m



CAUTION

- When reassembling the O-rings (6), avoid twisting or biting.
- When reassembling always replace the Gaskets (8) and (9) and the O-rings (6) with new ones. Tighten the bolts (7) evenly crosswise.
- Replace the glass tube (4) once a year with a new one.



6 TROUBLESHOOTING

Problem	Possible cause	Solution
Poor operation or operation cannot be checked.	Wrong installation direction or wrong installation position	Reinstall the product in the correct direction.
	The ball (5) is damaged.	Replace the ball (5).
	The glass tube (4) is dirty.	Clean the glass tube (4).
Steam leaks from the connection between the body/cover and the glass tube.	The bolts (7) are loose.	Tighten the bolts (7). *1
	The gasket (8) and/or (9) are damaged.	Replace gasket (8) and/or (9). *2
	The glass tube (4) is damaged.	Replace the glass tube (4).

*1: Refer to the torque table in Section 5, "Maintenance" to retighten the parts to the correct torque.

*2: When the steam leak doesn't stop after replacing the gasket (8) or (9), it is recommended to replace the glass tube (4).

7 WARRANTY

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

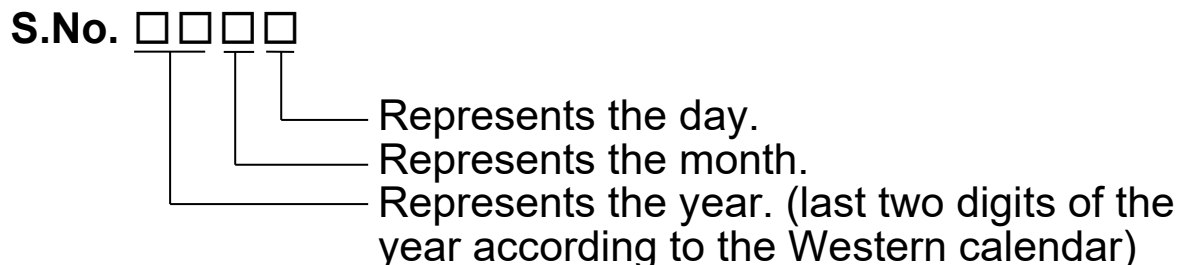
7.3 Warranty limitation

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

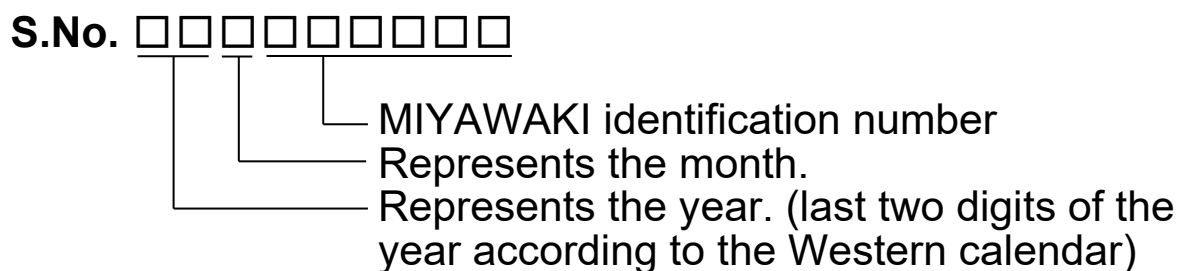


Example of serial number designation

1 7 1 1 → Jan.1, 2017

2 9 X M → Oct. 21, 2029

- For 9-digit display



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

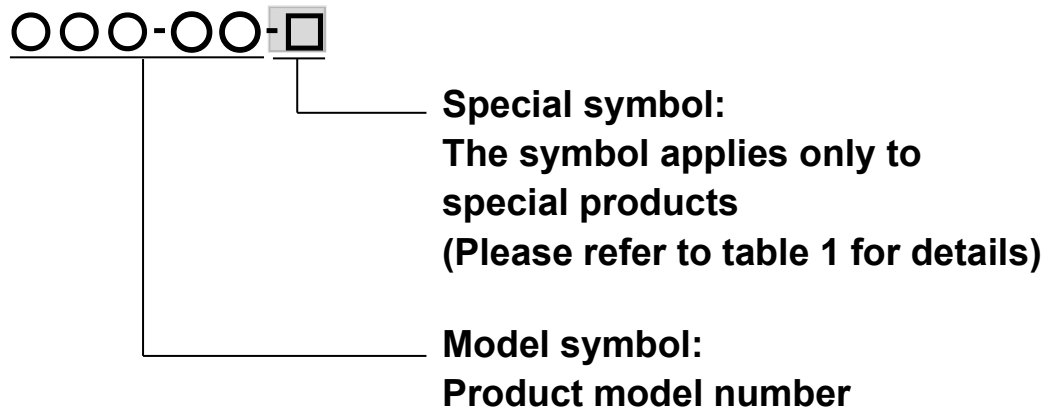


Table 1 Symbol description

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.

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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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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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