

S31N

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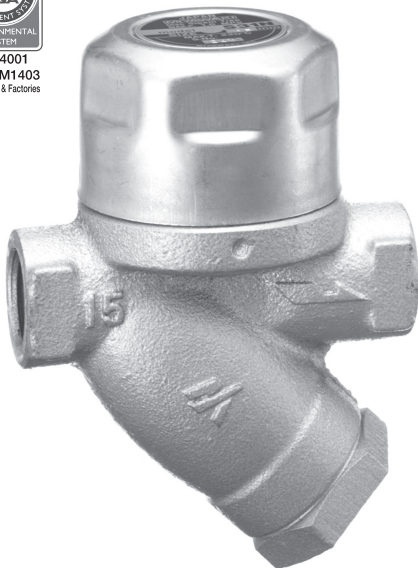
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ISO14001

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The S31N is a disc type steam trap with an automatic blowoff mechanism. 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



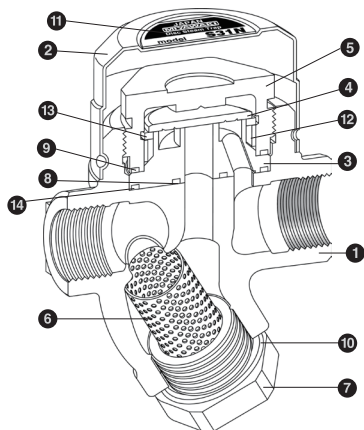
Be sure not to use this product at higher pressures than the specified maximum allowable pressure (PMA) or at temperatures higher than the specified maximum allowable temperature (TMA).

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): 220°C (428°F)
- (3) Maximum operating pressure (PMO): 1.6 MPa (230 psig)
- (4) Maximum operating temperature (TMO): 220°C (428°F)
- (5) Size: 15 mm (1/2"), 20 mm (3/4"), 25 mm (1"), 32 mm (1 1/4"), 40 mm (1 1/2") or 50 mm (2")
- (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: The material for the body (15A, 20A, and 25A only) indicated on the side of the main body is FCD450.

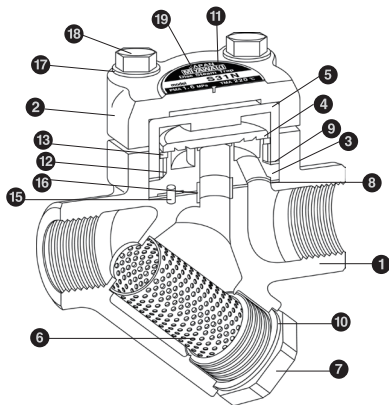
* Refer to the leaflet for details about dimensions and other specifications.

2 Construction details



15A, 20A, 25A

- 1 Body
- 2 Cover
- 3 Seat
- 4 Disc
- 5 Cap
- 6 Screen
- 7 Plug
- 8 Seat gasket
- 9 Cap gasket
- 10 Plug gasket
- 11 Nameplate
- 12 Bimetal ring
- 13 Stopper ring
- 14 Seat gasket



32A, 40A, 50A

- 1 Body
- 2 Cover
- 3 Seat
- 4 Disc
- 5 Cap
- 6 Screen
- 7 Plug
- 8 Seat gasket
- 9 Cap gasket
- 10 Plug gasket
- 11 Nameplate
- 12 Bimetal ring
- 13 Stopper ring
- 15 Pin
- 16 Pipe
- 17 Washer
- 18 Cover bolt
- 19 Rivet

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 S31N can be used for both horizontal and vertical lines. However, when installing a S31N in a horizontal line, be sure to maintain a slight slope to the line, so that any condensate will flow smoothly.
- Open the isolation valve on the upstream line and make sure the product works normally.

4 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.

○ 15A, 20A, 25A

Take apart the body of the trap

- 1) Remove the cover (2) by turning it clockwise until the ● mark on the side of the cover is centered over the ● mark on the body (1).
- 2) Remove the cap (5) by turning it counterclockwise.
- 3) Remove the disc (4), stopper ring (13), and bimetal ring (12). Then remove the seat (3) and pin (15).

Remove the screen

- 1) Turn the plug (7) counterclockwise and remove it.
- 2) Remove the screen (6).

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

Re-assemble the body

- 1) Insert the pin (15) into the hole in the body (1).
- 2) Put the seat (3) back so that the pin (15) is inserted into the hole in the seat.
- 3) Put back the bimetal ring (12), stopper ring (13), and the disc (4) in that order.
*Replace the bimetal carefully, since it is easily deformed.
- 4) Fasten the cap (5).
- 5) Put the cover (2) on the body (1) while aligning the ● mark on it with the gap in the body and then turn in one quarter turn counterclockwise.

Put back the screen

Put the screen (6) back on the plug (7). Then fasten the plug.

Torque table 1

Parts	Tools	Across the flats	Torque
Cap (5)	Torque wrench	41 mm (1.61 in)	220N · m (2,200kgf · cm)(1,910lbf · in)
Plug (7)	Torque wrench	36 mm (1.41 in)	80N · m (800kgf · cm)(695lbf · in)

○ 32A, 40A, 50A

Take apart the body of the trap

- 1) Remove the four cover bolts (18) and washers (17), and remove the cover (2).
- 2) Remove the cap (5), and take out the disc (4), stopper ring (13), bimetal ring (12), and cap gasket (9).
- 3) Remove the seat (3). Then remove the seat gasket (8) and pin (15).

Remove the screen

- 1) Turn the plug (7) counterclockwise and remove it and the plug gasket (10).
- 2) Remove the screen (6).

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

Re-assemble the body

- 1) Insert the pin (15) into the hole in the body (1).
- 2) Put the seat gasket (8) back so that the pin (15) is inserted into the hole in the seat gasket.
*Replace the seat gasket carefully, since it is easily folded.
- 3) Put the seat (3) back so that the pin (15) is inserted into the hole in the seat.
- 4) Put back the cap gasket (9), bimetal ring (12), stopper ring (13), and the disc (4) in that order.
*Replace the cap gasket carefully, since it is easily folded.
*Replace the bimetal ring carefully, since it is easily deformed.
- 5) Put the cap (5) back on.
- 6) Put on the cover (2) and fasten the washers (17) and cover bolts (18).
*Tighten the cover bolts uniformly.

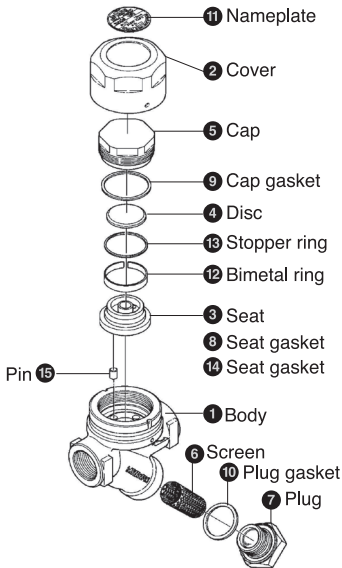
Put back the screen

Put the screen (6) and plug gasket (10) back on the plug (7). Then fasten the plug.
*Be sure to replace the seat gasket (8), cap gasket (9), and plug gasket (10) with new ones.

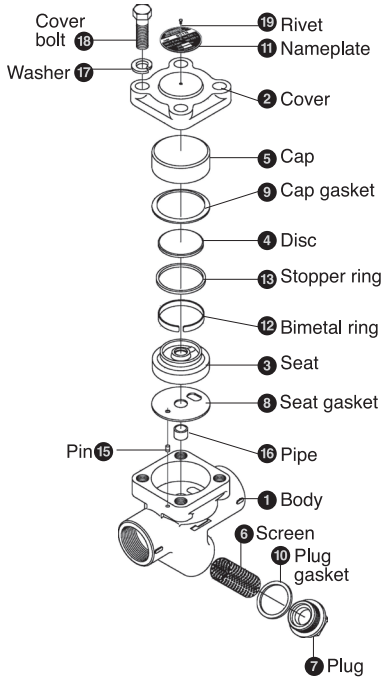
Torque table 2

Parts	Tools	Across the flats	Torque
Cover bolts (18)	Torque wrench	24 mm (0.94 in)	90 N · m (900kgf · cm)(782lbf · in)
Plug (7)	Torque wrench	40 mm (1.57 in)	120N · m (1,200kgf · cm)(1,042lbf · in)

15A, 20A, 25A



32A, 40A, 50A



5 Troubleshooting

Problem		Possible causes	Solution
Steam leaks or blows through.		Stuck valve or dirt accumulated around the valve or valve seat	Clean the disc and the seat.
		Damage, wear or corrosion of the disc	Replace the internal part.
		Damage, wear or corrosion of the seat	Replace the internal part.
		The seat gasket (8) is damaged.	Replace the seat. (15A - 25A) Replace the seat gasket. (32A - 50A)
		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.
Steam leaks from the body.	From the cap connection	The cap is loose. (15A - 25A)	Tighten the cap.* ¹
		The bolts are loose. (32A - 50A)	Tighten the bolts.* ²
		The cap gasket (9) is damaged.	Replace the cap. (15A - 25A) Replace the cap gasket. (32A - 50A)
		The seat gasket (14) is damaged. (15A - 25A)	Replace the seat.
		The seat gasket (8) is damaged. (32A - 50A)	Replace the seat gasket.
		The sealing surface on the body, seat, or cap is damaged.	Replace the damaged part.
	From the plug connection	The plug is loose.	Tighten the plug.* ³
		The plug gasket (10) is damaged.	Replace the plug gasket.
		The sealing surface on the body or plug is damaged.	Replace the damaged part.
	Insufficient condensate discharged, or no condensate discharged.		The screen is clogged.
Dirt has built up around the seat .			Clean the seat.
Dirt has built up in the fluid path inside the body.			Clean the body.
The bimetal ring is damaged.			Replace the bimetal ring.
Insufficient condensate capacity.			Replace the trap with a larger capacity trap.
Improper installation direction			Reinstall the product in the correct direction.

*1, *2 and *3: Refer to the torque tables in Section 4, "Maintenance" to retighten the parts to the correct torque.

6 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.

- お買い上げの製品及びこの取扱説明書内容についてのご質問は下記にお問い合わせください。
また、この取扱説明書を紛失したり、汚損により読めなくなった場合は、同じく下記にご請求ください。

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

If you lose this user's manual or can no longer read it due to stains, please make a request to the following.



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