



Manufacturer  
**TLV. CO., LTD.**

Kakogawa, Japan  
is approved by LRQA LTD. to ISO 9001/14001



# Instruction Manual

Free Float Steam Trap

**SS3N / SS3V**

**SS5N / SS5V**

**SS5NH / SS5VH**

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## Introduction

Thank you for purchasing the **TLV** free float steam trap.

This product has been thoroughly inspected before being shipped from the factory. When the product is delivered, before doing anything else, check the specifications and external appearance to make sure nothing is out of the ordinary. Also be sure to read this manual carefully before use and follow the instructions to be sure of using the product properly.

This free float steam trap uses a precision-polished float and three-point support for the valve body. With no hinges or levers, the trap automatically continuously discharges condensate, preventing it from collecting. The three-point seating for the valve body supports the precision-polished float securely at three points and ensures a high degree of sealing for even minute quantities of condensate.





If detailed instructions for special order specifications or options not contained in this manual are required, please contact **TLV** for full details.


This instruction manual is intended for use with the model(s) listed on the front cover. It is necessary not only for installation, but for subsequent maintenance, disassembly/reassembly and troubleshooting. Please keep it in a safe place for future reference.

## Safety Considerations


- Read this section carefully before use and be sure to follow the instructions.
- Installation, inspection, maintenance, repairs, disassembly, adjustment and valve opening/closing should be carried out only by trained maintenance personnel.
- The precautions listed in this manual are designed to ensure safety and prevent equipment damage and personal injury. For situations that may occur as a result of erroneous handling, three different types of cautionary items are used to indicate the degree of urgency and the scale of potential damage and danger: DANGER, WARNING and CAUTION.
- The three types of cautionary items above are very important for safety: be sure to observe all of them as they relate to installation, use, maintenance and repair. Furthermore, TLV accepts no responsibility for any accidents or damage occurring as a result of failure to observe these precautions.

### Symbols

	Indicates a <b>DANGER, WARNING or CAUTION</b> item.
	Indicates an urgent situation which poses a threat of death or serious injury
	Indicates that there is a potential threat of death or serious injury
	Indicates that there is a possibility of injury or equipment / product damage

	<b>Install properly and DO NOT use this product outside the recommended operating pressure, temperature and other specification ranges.</b> Improper use may result in such hazards as damage to the product or malfunctions that may lead to serious accidents. Local regulations may restrict the use of this product to below the conditions quoted.
	<b>DO NOT use this product in excess of the maximum operating pressure differential.</b> Such use could make discharge impossible (blocked).
	<b>Take measures to prevent people from coming into direct contact with product outlets.</b> Failure to do so may result in burns or other injury from the discharge of fluids.
	<b>When disassembling or removing the product, wait until the internal pressure equals atmospheric pressure and the surface of the product has cooled to room temperature.</b> Disassembling or removing the product when it is hot or under pressure may lead to discharge of fluids, causing burns, other injuries or damage.

Safety considerations continued on next page.

	<p><b>Be sure to use only the recommended components when repairing the product, and NEVER attempt to modify the product in any way.</b> Failure to observe these precautions may result in damage to the product and burns or other injury due to malfunction or the discharge of fluids.</p> <p><b>Use only under conditions in which no freeze-up will occur.</b> Freezing may damage the product, leading to fluid discharge, which may cause burns or other injury.</p> <p><b>Use only under conditions in which no water hammer will occur.</b> The impact of water hammer may damage the product, leading to fluid discharge, which may cause burns or other injury.</p>
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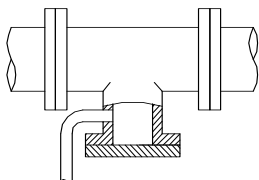
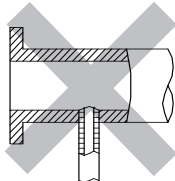
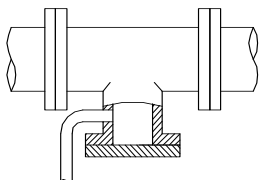
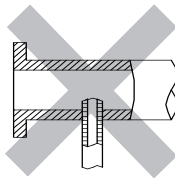
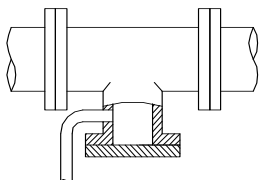
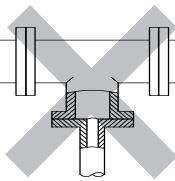
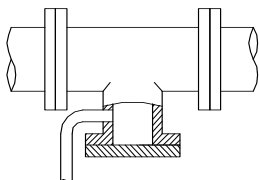
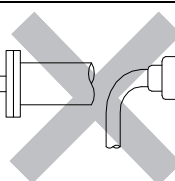
## Checking the Piping



Use only under conditions in which no water hammer will occur. The impact of water hammer may damage the product, leading to fluid discharge, which may cause burns or other injury.

Check to make sure that the pipes to be connected to the trap have been installed properly.

1. Is the pipe diameter suitable?
2. Is the piping where the trap is to be installed horizontal (SS3N / SS5N / SS5NH) or vertical (SS3V / SS5V / SS5VH)?
3. Has sufficient space been secured for maintenance?
4. Have isolation valves been installed at the inlet and outlet? If the outlet is subject to back pressure, has a check valve (TLV-CK) been installed?
5. Is the inlet pipe as short as possible, with as few bends as possible, and installed so the liquid will flow naturally down into the trap?
6. Has the piping work been done correctly, as shown in the figures below?

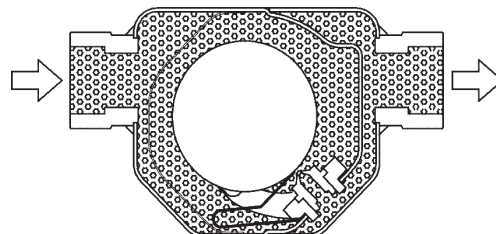
Requirement	Correct	Incorrect
Install catchpot with the proper diameter.		 Diameter is too small.
Make sure the flow of condensate is not obstructed.		 Diameter is too small and inlet protrudes into pipe interior.
To prevent rust and scale from flowing into the trap, the inlet pipe should be connected 25 – 50 mm (1 – 2 in) above the base of the T-pipe.		 Rust and scale flow into the trap with the condensate.
When installing on the blind end, make sure the flow of condensate is not obstructed.		 Condensate collects in the pipe.

## Operation

Principles of air and condensate discharge:

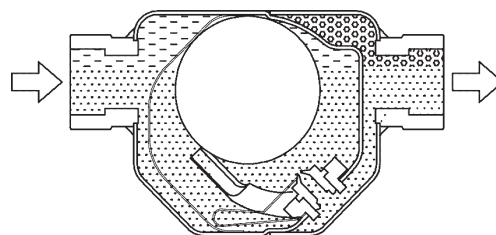
### 1. Start-up Air and Cold Condensate Discharge

At start-up, before steam is supplied, the system is cold and the bimetal air vent strip is expanded, holding the float off of the orifice. This allows for the rapid discharge of air and cold condensate through the orifice when steam is first supplied to the system. After the discharge of initial air and cold condensate, the heat of the inflowing steam and condensate cause the bimetal air vent strip to contract.



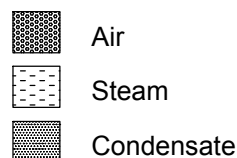
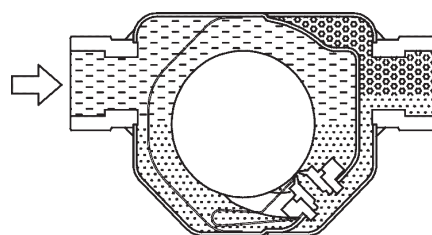
### 2. Condensate Discharge

As steam is supplied, condensate flow begins. The rising condensate level causes the float to rise due to buoyancy, opening the orifice and allowing condensate to be discharged.



### 3. Closed Position

When the condensate flow rate decreases, the float falls, closing off the orifice opening. A water seal is maintained at all times over the orifice to prevent steam loss.



## Specifications



Install properly and **DO NOT** use this product outside the recommended operating pressure, temperature and other specification ranges. Improper use may result in such hazards as damage to the product or malfunctions which may lead to serious accidents. Local regulations may restrict the use of this product to below the conditions quoted.

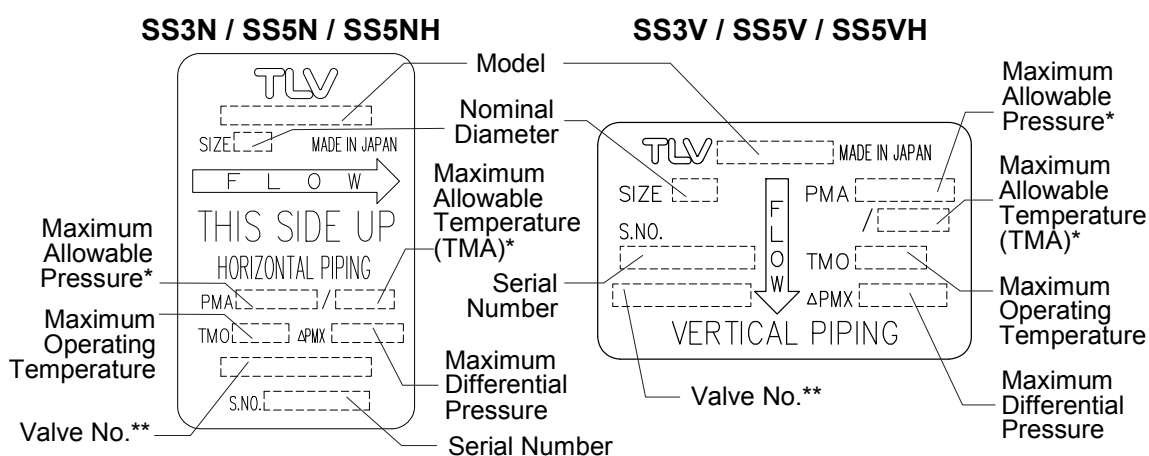


**DO NOT** use this product in excess of the maximum operating pressure differential; such use could make discharge impossible (blocked).



Use only under conditions in which no freeze-up will occur. Freezing may damage the product, leading to fluid discharge, which may cause burns or other injury.

Refer to the product nameplate for detailed specifications.

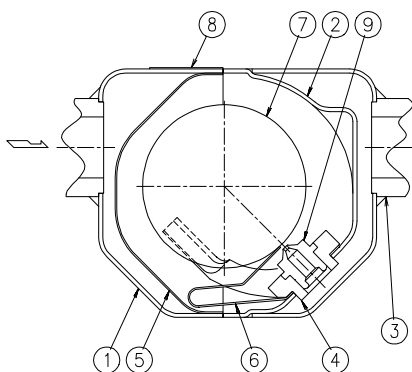


\*Maximum allowable pressure (PMA) and maximum allowable temperature (TMA) are PRESSURE SHELL DESIGN CONDITIONS, **NOT** OPERATING CONDITIONS.

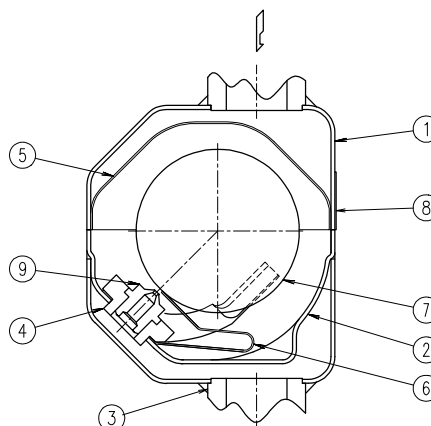
\*\*Valve No. is displayed for products with options. This item is omitted from the nameplate when there are no options.

## Configuration

SS3N / SS5N / SS5NH



SS3V / SS5V / SS5VH



No.	Name	No.	Name	No.	Name
1	Body	4	Guide	7	Float
2	Inner Cover	5	Screen	8	Name Plate
3	Socket / Flange	6	Air Vent Strip (bimetal)	9	Orifice

NOTE: A specialized stainless steel insulation cover with ceramic fiber inlay is included with the SS3N and SS3V.

## Installation



Install properly and **DO NOT** use this product outside the recommended operating pressure, temperature and other specification ranges. Improper use may result in such hazards as damage to the product or malfunctions which may lead to serious accidents. Local regulations may restrict the use of this product to below the conditions quoted.

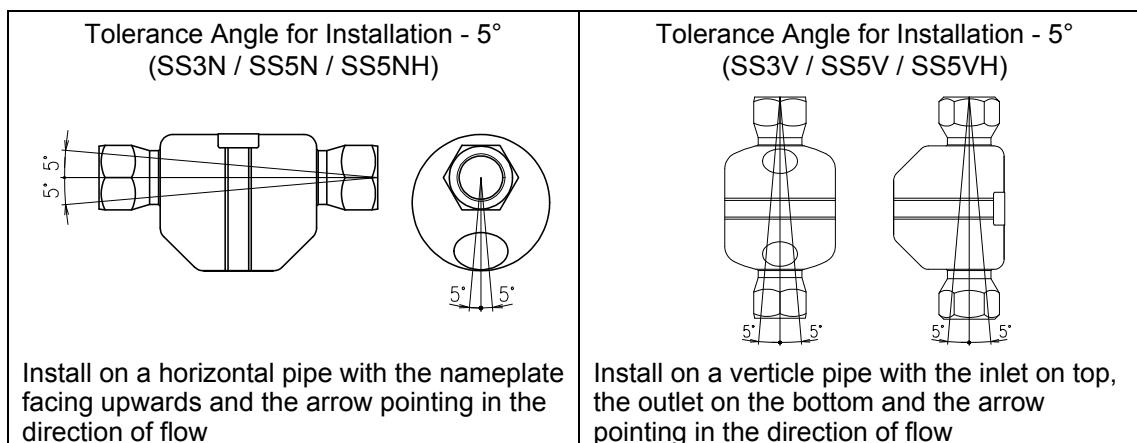


Take measures to prevent people from coming into direct contact with product outlets. Failure to do so may result in burns or other injury from the discharge of fluids.

Installation, inspection, maintenance, repairs, disassembly, adjustment and valve opening/closing should be carried out only by trained maintenance personnel.

1. Before installation, be sure to remove all protective seals.
2. Before installing the product, blow out the inlet piping to remove any piping scraps, dirt and oil. Close the inlet valve after blowdown.
3. Install the product so that the arrow on the body is pointing in the direction of flow.
4. The trap should be inclined no more than 5° in any plane.
5. Install a condensate outlet valve and outlet piping.
6. Open the inlet and outlet valves and check to make sure that the product functions properly.

If there is a problem, determine the cause using the “Troubleshooting” section in this manual.



**NOTE:** For products with socket weld connections the insulation cover shipped with the product should be attached after the products is welded onto the pipe and after its surface has cooled to room temperature.  
For attaching the insulation cover, see the instruction below.

<How to attach the insulation cover>

- Step 1. Wrap the included sealing tape around the inlet and outlet connection at each end of the trap (3 turns for each).
- Step 2. Fit the two halfshells of the insulation cover around the trap until the 5 tabs and 5 holes are perfectly aligned.  
A nameplate is affixed to the insulation cover. Make sure that direction of the arrow on the nameplate matches the direction of condensate flow.
- Step 3. Using the included aluminum tape, seal the area where the halfshells meet. Then wrap 3 more turns of sealing tape over the top of the sealing tape applied in step 1.





## Maintenance



Take measures to prevent people from coming into direct contact with product outlets. Failure to do so may result in burns or other injury from the discharge of fluids.



Be sure to use only the recommended components when repairing the product, and NEVER attempt to modify the product in any way. Failure to observe these precautions may result in damage to the product or burns or other injury due to malfunction or the discharge of fluids.

## Operational Inspection

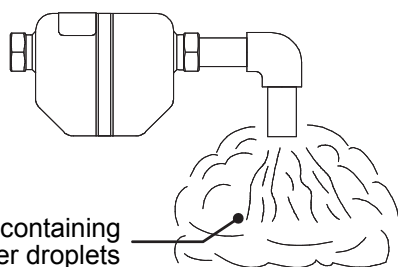
A visual inspection of the following items should be done on a daily basis to determine whether the trap is operating properly or has failed. Periodically (at least biannually) the operation should also be checked by using diagnostic equipment such as a stethoscope, thermometer, TLV Pocket TrapMan or TLV TrapMan.

If the trap should fail, it may cause damage to piping and equipment, resulting in faulty or low quality products or losses due to steam leakage.

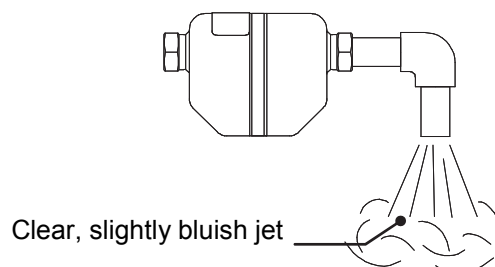
- |                                   |   |   |
|-----------------------------------|---|---|
| Normal                            | : | Condensate is discharged continuously, together with flash steam, and the sound of flow can be heard. If there is very little condensate, there is almost no sound of flow. |
| Blocked<br>(Discharge Impossible) | : | No condensate is discharged. The trap is quiet and makes no noise, and the surface temperature of the trap is low.  |
| Blowing                           | : | Live steam continually flows from the outlet and there is a continuous metallic sound.  |
| Steam Leakage                     | : | Live steam is discharged through the trap outlet together with condensate, accompanied by a high-pitched sound.   |

(When conducting a visual inspection, flash steam is sometimes mistaken for steam leakage. For this reason, the use of a steam trap diagnostic instrument [such as TLV TrapMan if appropriate] in conjunction with the visual inspection is highly recommended.)

**Flash Steam**



**Live Steam Leakage**



## Troubleshooting



When disassembling or removing the product, wait until the internal pressure equals atmospheric pressure and the surface of the product has cooled to room temperature. Disassembling or removing the product when it is hot or under pressure may lead to discharge of fluids, causing burns, other injuries or damage.

If the trap fails to operate properly, use the following table to locate the cause and remedy.

Problem	Cause	Remedy
No condensate is discharged (blocked) or discharge is poor	The trap operating pressure exceeds the maximum specified pressure or there is insufficient pressure differential between the trap inlet and outlet	Compare specifications and actual operating conditions
	The piping is clogged with rust and scale	Clean the piping
	The capacity of the trap is insufficient	Compare specifications and actual operating conditions
	Steam-locking has occurred	Perform a bypass blowdown or close the trap inlet valve and allow the trap to cool
Steam is discharged or leaks from the outlet (blowing) (steam leakage)	Improper installation orientation	Correct the installation
	Trap vibration	Lengthen the inlet piping and fasten it securely
Steam is leaking from a place other than the outlet	The outside of the trap has sustained damage	Replace with a new trap
Float becomes damaged	Water hammer has occurred	Study and correct the piping

NOTE: SS3N · SS3V / SS5N · SS5V / SS5NH · SS5VH steam traps are of all-welded, single unit construction, so they cannot be repaired.

## Product Warranty

1. Warranty Period  
One year following product delivery.
2. Warranty Coverage  
TLV CO., LTD. warrants this product to the original purchaser to be free from defective materials and workmanship. Under this warranty, the product will be repaired or replaced at our option, without charge for parts or labor.
3. This product warranty will not apply to cosmetic defects, nor to any product whose exterior has been damaged or defaced; nor does it apply in the following cases:
  - 1) Malfunctions due to improper installation, use, handling, etc., by other than TLV CO., LTD. authorized service representatives.
  - 2) Malfunctions due to dirt, scale, rust, etc.
  - 3) Malfunctions due to improper disassembly and reassembly, or inadequate inspection and maintenance by other than TLV CO., LTD. authorized service representatives.
  - 4) Malfunctions due to disasters or forces of nature.
  - 5) Accidents or malfunctions due to any other cause beyond the control of TLV CO., LTD.
4. Under no circumstances will TLV CO., LTD. be liable for consequential economic loss damage or consequential damage to property.

\* \* \* \* \*

For Service or Technical Assistance:

Contact your **TLV** representative or your regional **TLV** office.

### Manufacturer

**TLV** CO., LTD.

881 Nagasuna, Noguchi

Kakogawa, Hyogo 675-8511 JAPAN

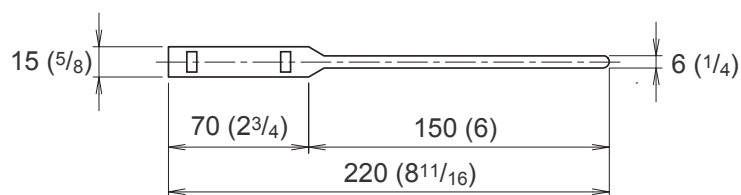
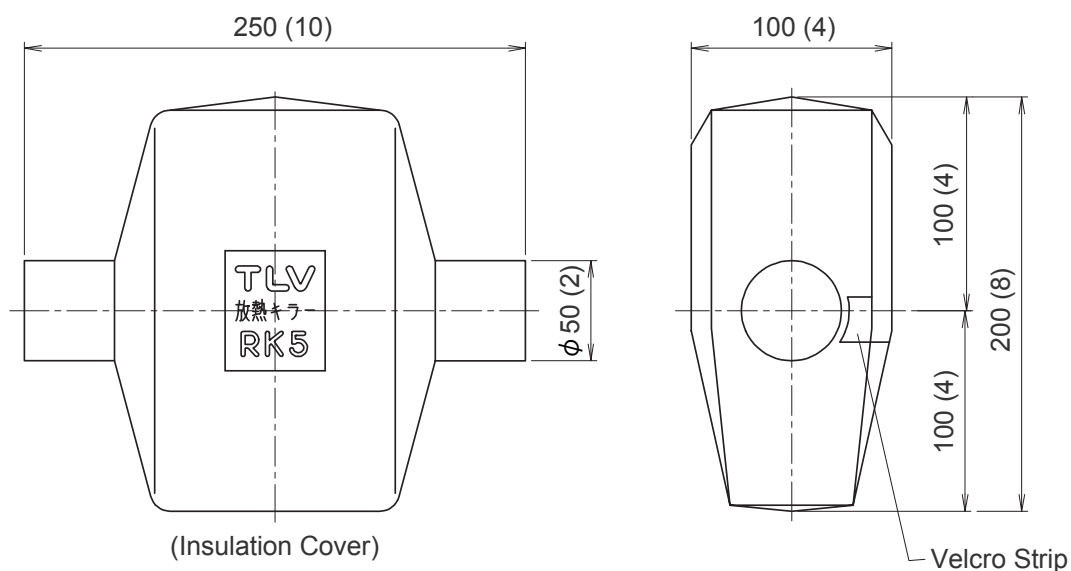
Tel: 81-(0)79-427-1800

## Option

The insulation cover (RK5) for the SS5N / SS5V / SS5NH / SS5VH is available as an option.

Install according to the following steps.

1. Allow the trap to cool to ambient temperature.
2. Open the cover along the Velcro strip.
3. Place cover evenly around the body with the arrow on the cover facing the same direction as the arrow on the trap body.
4. Reattach the Velcro strip.
5. Secure the ends of the cover around the trap inlet and outlet with the binding strips.



(Binding Strip × 2pc.)

t: 0.2 (0.0079)

Unit: mm (in)