

# INSTRUCTION MANUAL

Keep this manual in a safe place for future reference

## TLV® FREE FLOAT STEAM TRAPS SS3/SS5 SERIES

### SS3N/SS3V/SS5N/SS5V/SS5NH/SS5VH



Manufacturer

**TLV® CO., LTD.**

881 Nagasuna, Noguchi, Kakogawa, Hyogo 675-8511, Japan

Tel: [81]-(0)79-427-1800 Fax: [81]-(0)79-422-2277

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**EAC**



# Introduction

Before beginning installation, please read this manual to ensure correct usage of the product, and keep the manual in a safe place for future reference.

The maintenance-free all stainless steel Free Float steam traps of the SS3/SS5-Series, with bimetal thermostatic air vent, are suitable for a wide range of small to medium capacity applications up to 4.6 MPaG (650 psig), such as: steam mains, tracer lines, process heaters, etc. The traps discharge condensate continuously and automatically, at a temperature slightly lower than saturation temperature.

1 MPa = 10.197 kg/cm<sup>2</sup>, 1 bar = 0.1 MPa



For products with special specifications or with options not included in this manual, contact TLV for instructions.

The contents of this manual are subject to change without notice.


## 1. 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.

 <b>DANGER</b>	 <b>WARNING</b>	 <b>CAUTION</b>
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.

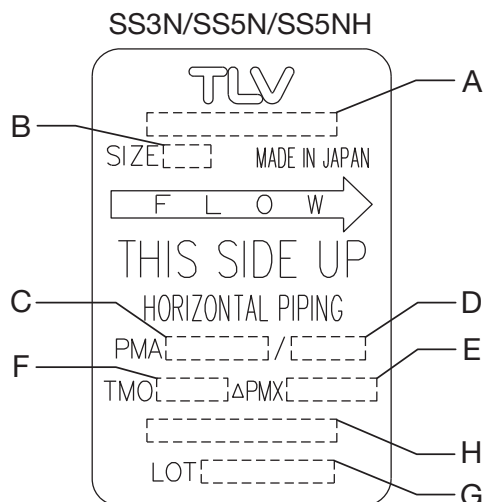
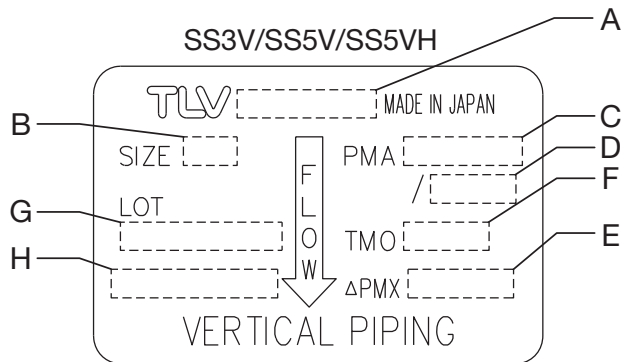
 <b>WARNING</b>	<b>NEVER apply direct heat to the float.</b> The float may explode due to increased internal pressure, causing accidents leading to serious injury or damage to property and equipment.
	<b>Install properly and DO NOT use this product outside the recommended operating pressure, temperature and other specification ranges.</b> Improper use may result in such hazards as damage to the product or malfunctions, which may lead to serious accidents. Local regulations may restrict the use of this product to below the conditions quoted.
 <b>CAUTION</b>	<b>DO NOT use this product in excess of the maximum operating pressure differential.</b> Such use could make discharge impossible.
	<b>Do not subject this product to condensate loads that exceed its discharge capacity.</b> Failure to observe this precaution may lead to condensate accumulation upstream of the trap, resulting in reduced equipment performance or damage to the equipment.
	<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.

Continued on the next page

	<p><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.</p>
	<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 or burns or other injury due to malfunction or the discharge of fluids.</p>
	<p><b>Do not use excessive force when connecting threaded pipes to the product.</b> Overtightening may cause breakage leading to fluid discharge, which may cause burns or other injury.</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 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>

## 2. Specifications

Refer to the product nameplate for detailed specifications.



- A Model
- B Nominal Diameter
- C Maximum Allowable Pressure\*
- D Maximum Allowable Temperature\* TMA
- E Maximum Differential Pressure
- F Maximum Operating Temperature
- G Production Lot No.
- H Valve No.\*\*

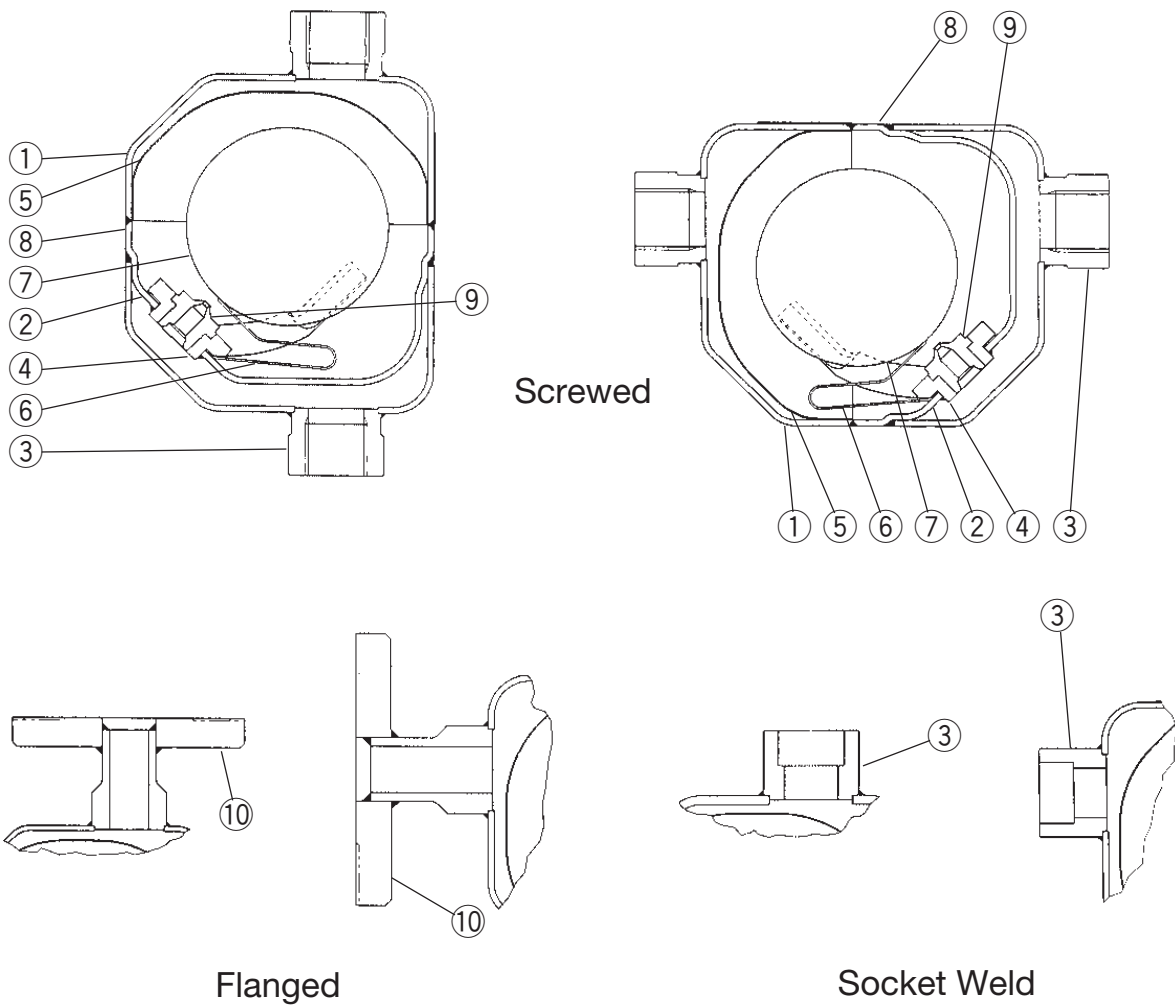
\* Maximum allowable pressure (PMA) and maximum allowable temperature (TMA) are PRESSURE SHELL DESIGN CONDITIONS, **NOT** OPERATING CONDITIONS.

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



To avoid malfunctions, product damage, accidents or serious injury, install properly and DO NOT use this product outside the specification range. Local regulations may restrict the use of this product to below the conditions quoted.

# 3. Configuration



No.	Description	No.	Description	No.	Description
1	Body	5	Screen	9	Orifice
2	Inner Cover	6	Air Vent Strip	10	Flange
3	Socket	7	Float	11	Insulating Cover*
4	Float Guide	8	Nameplate		

\* Option, see page 7, SS3N/V only

## 4. Proper Installation

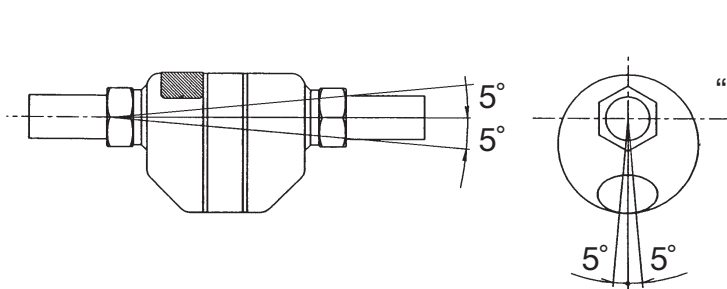


- Installation, inspection, maintenance, repairs, disassembly, adjustment and valve opening/closing should be carried out only by trained maintenance personnel.
- Take measures to prevent people from coming into direct contact with product outlets.
- Do not use excessive force when connecting threaded pipes.
- Install for use under conditions in which no freeze-up will occur.
- Install for use under conditions in which no water hammer will occur.

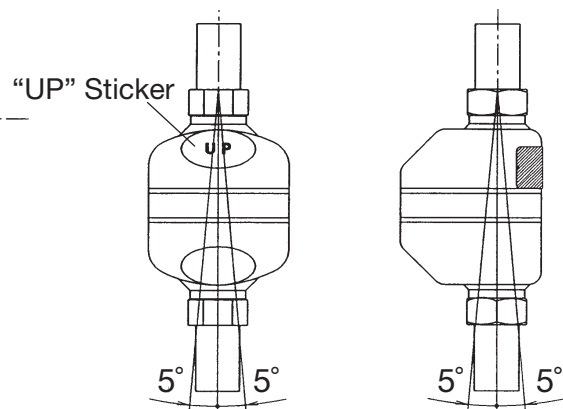
1. Before installation, be sure to remove all protective seals.
2. Before installing the trap, blow out the inlet piping to remove all dirt and oil.
3. Install a bypass valve to discharge condensate, and inlet and outlet valves to isolate the trap in the event of trap failure or when carrying out maintenance.
4. Install the trap in the lowest part of the pipeline or equipment so the condensate flows naturally downward into the trap by gravity. The inlet pipe should be as short and have as few bends as possible.
5. Install the trap within the allowable inclination, as shown below, with the arrow on the nameplate pointing in the direction of flow.
6. Make sure the “UP” sticker on the vertical type, or the name plate on the horizontal type is facing up.
7. Install a check valve at the trap outlet whenever the condensate discharge pipe leads to a tank or recovery line, or whenever the condensate collection pipeline is connected to more than one trap.
8. When completing the piping, support the pipes within 0.8 meters (2.5 ft.) on either side of the trap.
9. The use of unions is recommended to facilitate connection and disconnection of the screwed versions.

### Allowable Inclination

For horizontal installation



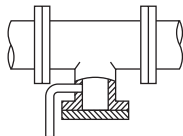
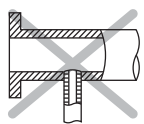
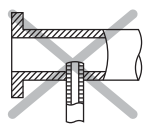
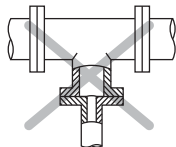
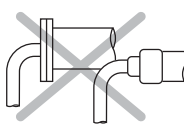
For vertical installation



# 5. Piping Arrangement

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

1. Has the piping work been done with the proper methods, as shown in the table below?

Requirement	Correct	Incorrect
Install a catchpot with the proper diameter.		 <p>Diameter is too small.</p>
Make sure the flow of condensate is not obstructed.		 <p>Diameter is too small and inlet protrudes into pipe.</p>
To prevent rust and scale from flowing into the trap, connect the inlet pipe 25 - 50 mm (1 - 2 in) above the base of the T - pipe.		 <p>Rust and scale flow into the trap with the condensate.</p>
When installing on the blind end, make sure nothing obstructs the flow of condensate.		 <p>Condensate collects in the pipe.</p>

2. Is the pipe diameter suitable?
3. Has the trap been installed within the allowable inclination, with name plate or UP seal facing up and with the arrow on the nameplate pointing in the direction of flow?
4. Has sufficient space been secured for maintenance?
5. Have maintenance valves been installed at the inlet and outlet? If the outlet is subject to back pressure, has a check valve been installed?
6. Is the inlet pipe as short as possible, with as few bends as possible, and installed so that the condensate will flow naturally down into the trap?

# 6. Inspection and Maintenance



- Installation, inspection, maintenance, repairs, disassembly, adjustment and valve opening/closing should be carried out only by trained maintenance personnel.
- Before attempting removal of the trap, close the inlet and outlet isolating valves and wait until the trap has cooled completely. Failure to do so may result in burns.

Periodic operational inspections should be performed, at least twice per year or at intervals according to use. Steam trap failure may result in temperature drop in the equipment, poor product quality or increased losses due to steam leakage.

While the trap itself is maintenance-free, there may be other causes of malfunction, as described in chapter 5 "Piping Arrangement" and chapter 7 "Troubleshooting". If the corrective measures described therein do not solve the problem, the trap has possibly reached the end of its service life and must be replaced.

# 7. Troubleshooting

If the expected performance is unachievable after installation of the steam trap, read chapters 4 and 5 again and check the following points for appropriate corrective measures.

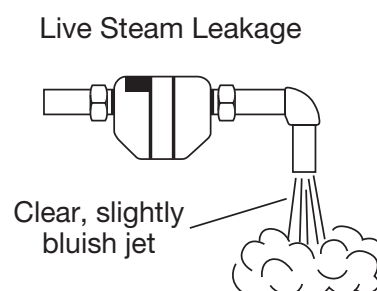
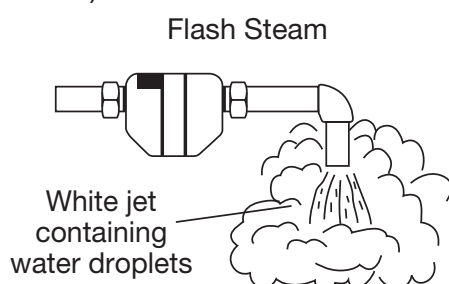
Problem	Cause	Analysis	Corrective Measures
Condensate is not discharged	Float does not float	Pressure exceeds maximum operating pressure	Replace trap with appropriately rated model or, if possible, reduce steam pressure
	Clogging with dirt	Pipelines upstream or downstream of the steam trap are clogged	Clean pipelines
Poor discharge of condensate	Clogging with dirt	Pipelines upstream or downstream of the steam trap are clogged	Clean pipelines
	Trap discharge capacity	Trap capacity is too small	Replace with larger trap
Steam leakage or blow-off	Float does not seat securely on valve seat	Improper trap installation (above the max. allowable inclination angle)	Correct trap installation
		Severe vibration of trap	Reinforce trap piping supports

# 8. Operational Check

A visual inspection can be carried out to aid in determining the necessity for immediate maintenance or repair, if the trap is open to atmosphere. If the trap does not discharge to atmosphere, use diagnostic equipment such as TLV TrapMan or Pocket TrapMan (within its pressure and temperature measurement range).

Normal:	Condensate is discharged continuously 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:	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 the condensate and there is 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 is highly recommended.)

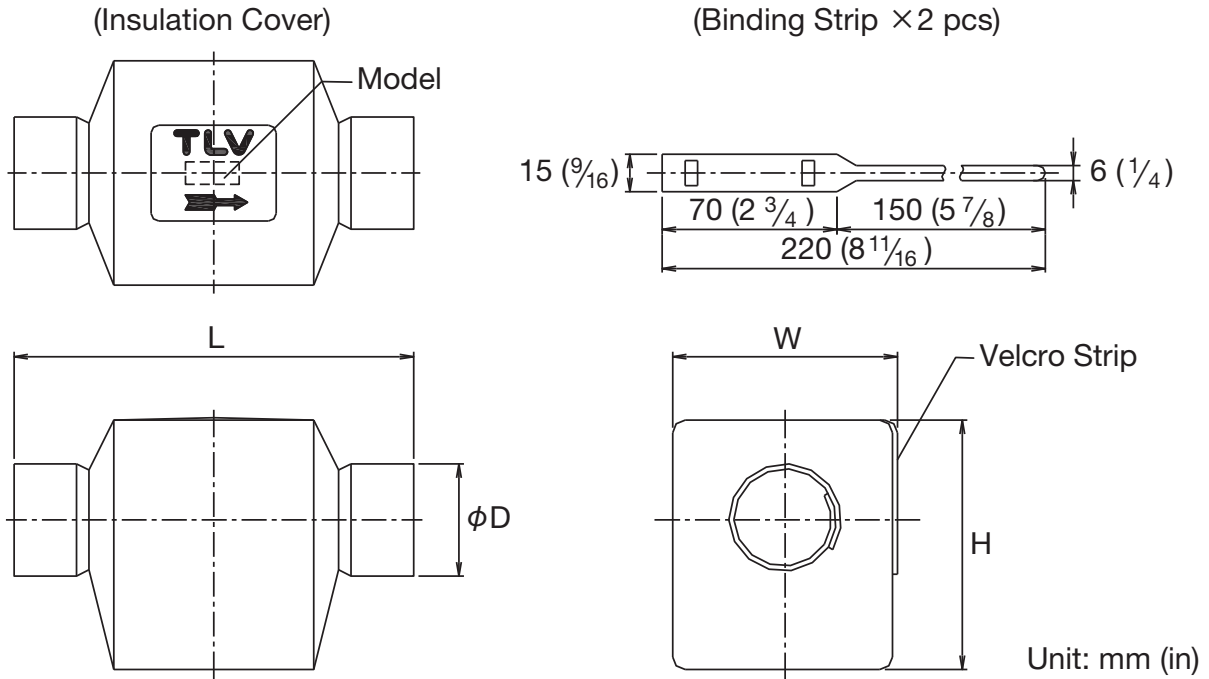


# 9. Optional Insulation Cover on SS3N and SS3V

The insulation cover (glass mat/glass fiber cloth) 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.



Model	Applicable Steam Trap Model	L mm (in)	D mm (in)	W mm (in)	H mm (in)
RK4	SS3N/SS3V	160 (6 5/16)	45 (1 3/4)	90 (3 9/16)	100 (3 15/16)



# 10. TLV EXPRESS LIMITED WARRANTY

Subject to the limitations set forth below, TLV Corporation, a North Carolina corporation (“**TLV**”) warrants that products which are sold by it, TLV CO., LTD., a Japanese corporation (“**TLVJ**”) or TLV International, Inc., a Japanese corporation (“**TII**”), (hereinafter the “**Products**”) are designed and manufactured by TLVJ, conform to the specifications published by TLV for the corresponding part numbers (the “**Specifications**”) and are free from defective workmanship and materials. With regard to products or components manufactured by unrelated third parties (the “**Components**”), TLV provides no warranty other than the warranty from the third party manufacturer(s), if any.

## Exceptions to Warranty

This warranty does not cover defects or failures caused by:

1. improper shipping, installation, use, handling, etc., by other than TLV or service representatives authorized by TLV; or
2. dirt, scale or rust, etc.; or
3. improper disassembly and reassembly, or inadequate inspection and maintenance by other than TLV or service representatives authorized by TLV; or
4. disasters or forces of nature or Acts of God; or
5. abuse, abnormal use, accidents or any other cause beyond the control of TLV; or
6. improper storage, maintenance or repair; or
7. operation of the Products not in accordance with instructions issued with the Products or with accepted industry practices; or
8. use for a purpose or in a manner for which the Products were not intended; or
9. use of the Products in a manner inconsistent with the Specifications; or
10. use of the Products with Hazardous Fluids (fluids other than steam, air, water, nitrogen, carbon dioxide and inert gases (helium, neon, argon, krypton, xenon and radon)); or
11. failure to follow the instructions contained in the TLV Instruction Manual for the Product.

## Duration of Warranty

This warranty is effective for a period of the earlier of: (i) three (3) years after delivery of Products to the first end user in the case of sealed SST-Series Products for use in steam pressure service up to 650 psig; (ii) two (2) years after delivery of Products to the first end user in the case of PowerTrap® units; or (iii) one (1) year after delivery of Products to the first end user in the case of all other Products. Notwithstanding the foregoing, asserting a claim under this warranty must be brought by the earlier of one of the foregoing periods, as applicable, or within five (5) years after the date of delivery to the initial buyer if not sold initially to the first end user.

ANY IMPLIED WARRANTIES NOT NEGATED HEREBY WHICH MAY ARISE BY OPERATION OF LAW, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ANY EXPRESS WARRANTIES NOT NEGATED HEREBY, ARE GIVEN SOLELY TO THE INITIAL BUYER AND ARE LIMITED IN DURATION TO ONE (1) YEAR FROM THE DATE OF SHIPMENT BY TLV.

## Exclusive Remedy

THE EXCLUSIVE REMEDY UNDER THIS WARRANTY, UNDER ANY EXPRESS WARRANTY OR UNDER ANY IMPLIED WARRANTIES NOT NEGATED HEREBY (INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE), IS **REPLACEMENT**; PROVIDED: (a) THE CLAIMED DEFECT IS REPORTED TO TLV IN WRITING WITHIN THE APPLICABLE WARRANTY PERIOD, INCLUDING A DETAILED WRITTEN DESCRIPTION OF THE CLAIMED DEFECT AND HOW AND WHEN THE CLAIMED DEFECTIVE PRODUCT WAS USED; AND (b) THE CLAIMED DEFECTIVE PRODUCT AND A COPY OF THE PURCHASE INVOICE IS RETURNED TO TLV, FREIGHT AND TRANSPORTATION COSTS PREPAID, UNDER A RETURN MATERIAL AUTHORIZATION AND TRACKING NUMBER ISSUED BY TLV. ALL LABOR COSTS, SHIPPING COSTS, AND TRANSPORTATION COSTS ASSOCIATED WITH THE RETURN OR REPLACEMENT OF THE CLAIMED DEFECTIVE PRODUCT ARE SOLELY THE RESPONSIBILITY OF BUYER OR THE FIRST END USER. TLV RESERVES THE RIGHT TO INSPECT ON THE FIRST END USER’S SITE ANY PRODUCTS CLAIMED TO BE DEFECTIVE BEFORE ISSUING A RETURN MATERIAL AUTHORIZATION. SHOULD SUCH INSPECTION REVEAL, IN TLV’S REASONABLE DISCRETION, THAT THE

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### **Exclusion of Consequential and Incidental Damages**

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### **Severability**

Any provision of this warranty which is invalid, prohibited or unenforceable in any jurisdiction shall, as to such jurisdiction, be ineffective to the extent of such invalidity, prohibition or unenforceability without invalidating the remaining provisions hereof, and any such invalidity, prohibition or unenforceability in any such jurisdiction shall not invalidate or render unenforceable such provision in any other jurisdiction.

## **TLV CORPORATION**

13901 South Lakes Drive, Charlotte, NC 28273-6790, U.S.A.

Tel: [1]-704-597-9070

Fax: [1]-704-583-1610





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**Manufacturer: TLV<sup>®</sup> CO., LTD.**  
881 Nagasuna, Noguchi, Kakogawa,  
Hyogo 675-8511, **Japan**

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