

INSTRUCTION MANUAL

Keep this manual in a safe place for future reference

TLV® FREE FLOAT STEAM TRAPS JX SERIES

J3X/J5X



J7X



J7.2X/J7.5X/J8X



Manufacturer

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Introduction

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

The JX Series steam traps with thermostatic air vent (X-element) are suitable for a wide range of applications up to 2.1 MPaG (300 psig), such as tracer lines, unit and process heaters, heating coils, heat exchangers, etc. The traps discharge condensate continuously and automatically, at a temperature slightly lower than saturation temperature.

1 MPa = 10.197 kg/cm², 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.

 DANGER	 WARNING	 CAUTION
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.

 WARNING	NEVER apply direct heat to the float. The float may explode due to increased internal pressure, causing accidents leading to serious injury or damage to property and equipment.
 CAUTION	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.
	DO NOT subject this product to condensate loads that exceed its discharge capacity. Failure to observe this precaution may lead to condensate accumulation upstream of the trap, resulting in reduced equipment performance or damage to the equipment.
	Use hoisting equipment for heavy objects (weighing approximately 20 kg (44 lb) or more). Failure to do so may result in back strain or other injury if the object should fall.
	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.

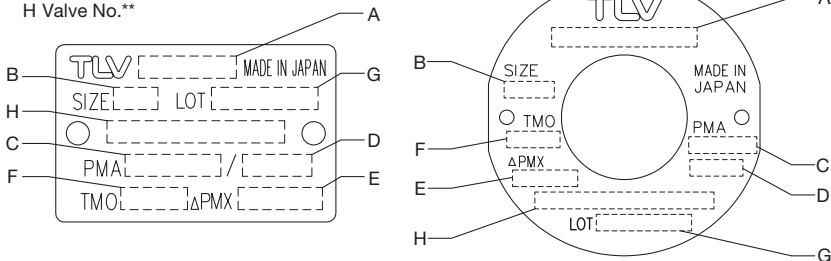
Continued on the next page

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

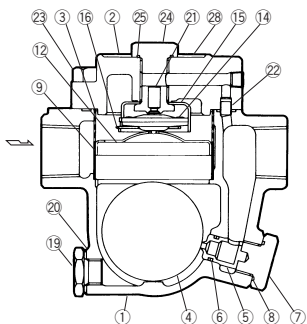
** "Valve No." is displayed for products with options. This item is omitted from the nameplate when there are no options.



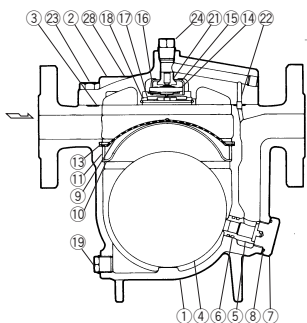
To avoid malfunctions, product damage, accidents or serious injury, install properly and **DO NOT** use this product outside the specification range. Local regulations may restrict the use of this product to below the conditions quoted.

3. Configuration Aufbau Configuration

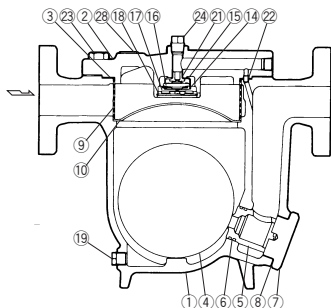
J3X / J5X



J7X / J7.5X / J8X



J7.2X



No.	Description	J3X, J5X			J7X, J7.2X, J7.5X, J8X		
		M	R	F	M	R	F
1	Body						
2	Cover						
3	Cover Gasket	✓	✓		✓	✓	
4	Float			✓			✓
5	Orifice		✓			✓	
6	Orifice O-Ring	✓	✓		✓	✓	
7	Orifice Holder Plug						
8	Orifice Plug Gasket	✓	✓		✓	✓	
9	Screen		✓			✓	
10	Screen Holder						
11	Screen Holder Retainer						
12	Float Cover		✓				
13	Snap-Ring						
14	X-element		✓			✓	
15	X-element Guide		✓			✓	
16	Spring Clip		✓			✓	
17	X-element Cover					✓	
18	Snap-Ring					✓	
19	Drain Plug*						
20	Drain Plug Gasket*	✓	✓				
21	Air Vent Valve Seat		✓			✓	
22	Connector						
23	Cover Bolt						
24	Plug						
25	Plug Gasket	✓	✓				
26	Flange** (JF5X: 20, 25 mm) (JF5X: 3/4", 1")						
27	Pipe** (JF5X: 20, 25 mm) (JF5X: 3/4", 1")						
28	Nameplate						

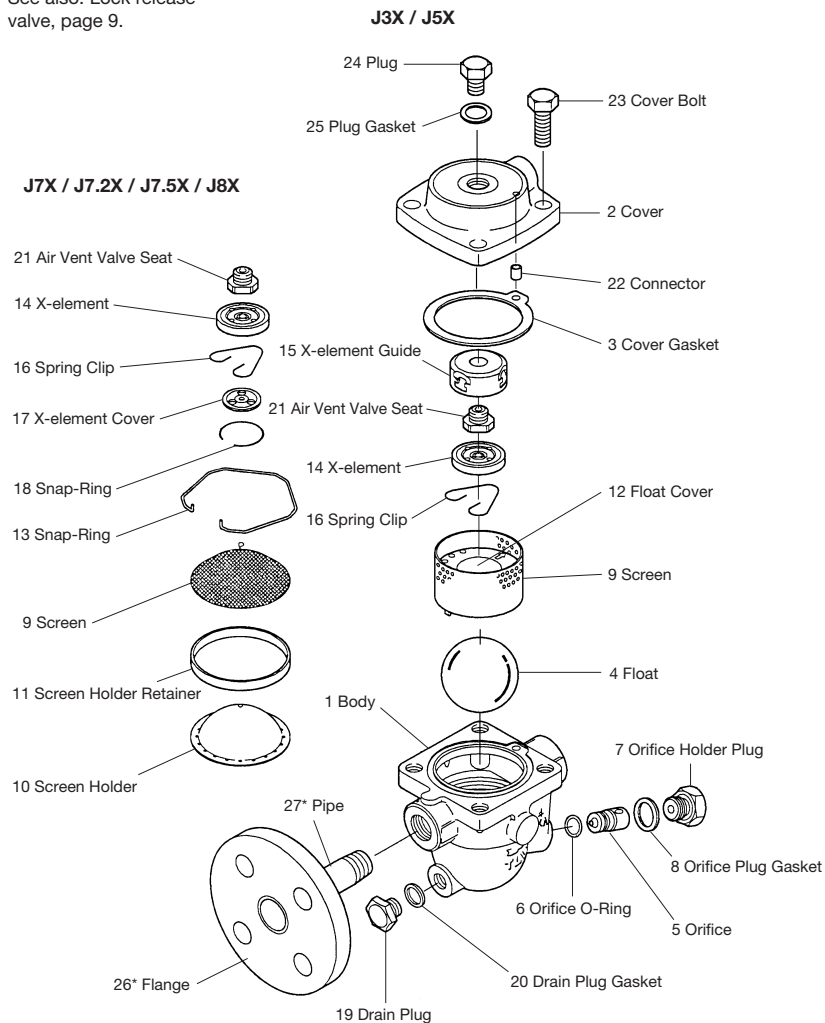
* Option for J3X, J5X ** See page 4

Note: All replacement parts are available only in their respective kits.

M = Maintenance Kit R = Repair Kit F = Float

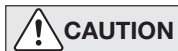
4. Exploded View

See also: Lock release valve, page 9.



* JF5X 20, 25 mm (3/4", 1") only. JF5X 32 - 50 mm (1 1/4" - 2") and all other models have cast-in flanges.

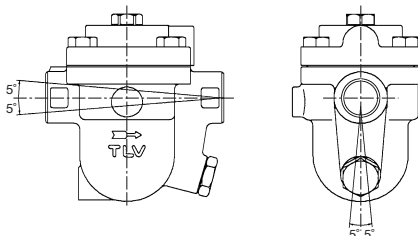
5. Proper Installation



• 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. When hoisting the product, hang the rope around the inlet/outlet as close to the body as possible.
 4. Install the steam trap within the allowable inclination, as shown below. Also make sure that the arrow mark on the body corresponds with the direction of flow.
 5. Install the trap in the lowest part of the pipeline or equipment so the condensate flows naturally into the trap by gravity. The inlet pipe should be as short and have as few bends as possible.
 6. Support the pipes properly within 800 mm (2.5 ft) on either side of the trap.
 7. Install a bypass valve to discharge condensate, and inlet and outlet valves to isolate the trap in the event of trap failure or when performing maintenance.
 8. Install a check valve at the trap outlet whenever more than one trap is connected to the condensate collection pipeline.
 9. The use of unions is recommended to facilitate connection and disconnection of screwed models.

Allowable Inclination



6. Piping Arrangement

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>

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

1. Is the pipe diameter suitable?
2. Has the trap been installed within the allowable inclination and with the arrow on the body pointing in the direction of flow?
3. Has sufficient space been secured for maintenance?
4. Have maintenance valves been installed at inlet and outlet? If the outlet is subject to back pressure, has a check valve been installed?
5. 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. Has the piping work been done with the proper methods as shown in the table on page 5?

7. Inspection and Maintenance

Operational inspections should be performed at least twice per year, or as called for by trap operating conditions. Steam trap failure may result in a temperature drop in the equipment, poor product quality or losses due to steam leakage.



WARNING

NEVER apply direct heat to the float. The float may explode due to increased internal pressure, causing accidents leading to serious injury or property and equipment damage.



CAUTION

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

- Before attempting to open the trap, close the inlet and outlet isolation valves and wait until the trap has cooled completely. Failure to do so may result in burns.
- Be sure to use the proper components and NEVER attempt to modify the product.

Parts Inspection Procedure	
Body, Cover	Check inside for damage, dirt, grease, oil film, rust or scale
Gaskets	Check for warping or damage
X-element	Check for damage
Screen	Check for clogging, corrosion or damage
Float	Check for deformation, damage, oil film or water inside
Air Vent Valve Seat, Orifice	Check for rust, scale, oil film, wear or damage

Tightening Torque and Distance Across Flats										
Model	Cover Bolt (23)		Air Vent Valve Seat (21)		Plug (24)		Orifice Holder Plug (7)		Drain Plug (19)	
	N-m (lbf-ft)	mm (in)	N-m (lbf-ft)	mm (in)	N-m (lbf-ft)	mm (in)	N-m (lbf-ft)	mm (in)	N-m (lbf-ft)	mm (in)
J3X	50 (37)	17 (2 ¹ / ₃₂)	35 (26)	19 (3 ¹ / ₄)	30 (22)	19 (3 ¹ / ₄)	50 (37)	24 (5 ¹ / ₁₆)	35 (26)	21 (5 ¹ / ₁₆)
J5X	80 (59)	22 (7 ¹ / ₈)	35 (26)	19 (3 ¹ / ₄)	30 (22)	19 (3 ¹ / ₄)	80 (59)	32 (1 ¹ / ₄)	35 (26)	21 (5 ¹ / ₁₆)
J7X	70 (51)	17 (2 ¹ / ₃₂)	35 (26)	19 (3 ¹ / ₄)	30* (22)*	12 (1 ⁵ / ₃₂)	120 (88)	36 (1 ¹ / ₃₂)	30* (22)*	12 (5 ¹ / ₁₆)
J7.2X	110 (81)	22 (7 ¹ / ₈)	35 (26)	19 (3 ¹ / ₄)	30* (22)*	12 (1 ⁵ / ₃₂)	400 (290)	70 (2 ³ / ₄)	30* (22)*	12 (5 ¹ / ₁₆)
J7.5X	160 (115)	24 (1 ⁹ / ₁₆)	35 (26)	19 (3 ¹ / ₄)	30* (22)*	12 (1 ⁵ / ₃₂)	600 (440)	85 (3 ¹ / ₃₂)	40* (29)*	14 (5 ¹ / ₁₆)
J8X	250 (185)	32 (1 ¹ / ₄)	35 (26)	19 (3 ¹ / ₄)	30* (22)*	12 (1 ⁵ / ₃₂)	800 (590)	105 (4 ¹ / ₈)	40* (29)*	14 (5 ¹ / ₁₆)

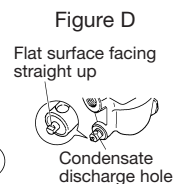
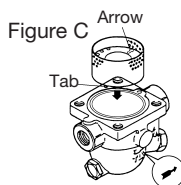
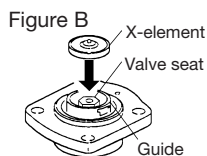
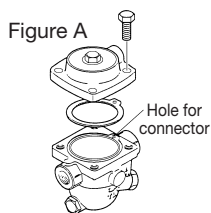
* Indicates torque values with a sealing tape wrapped 3 – 3.5 times around the threads of the plug or drain plug. If drawings or other special documentation were supplied for the product, any torque given there takes precedence over values shown here.

1 N·m ≈ 10 kg·cm

Part & No.	J3X J5X	J7X	J7.2X	J7.5X J8X	During Disassembly	During Reassembly
Plug 24		✓	✓	✓	Remove only if necessary, use a wrench to remove	Wrap threads with sealing tape*
	✓					Coat threads with anti-seize*
Plug Gasket 25	✓				Remove gasket only if worn or damaged	Replace with a new gasket only if worn or damaged
Cover Bolt 23	✓	✓	✓	✓	Use a wrench to remove	Coat threads with anti-seize*
Cover 2	✓	✓	✓	✓	Lift up the cover	Align the cover with the connector to attach the cover (figure A)
Connector 22	✓	✓	✓	✓	Remove the connector	Insert the connector
Cover Gasket 3	✓	✓			Remove gasket only if worn or damaged	Replace with a new gasket only if worn or damaged
			✓	✓	Remove gasket and clean sealing surfaces	Replace with a new gasket, do not apply anti-seize
Drain Plug 19		✓	✓	✓	Use a wrench to remove	Wrap threads with sealing tape*
	✓					Coat threads with anti-seize*
Drain Plug Gasket 20	✓				Remove and clean sealing surfaces	Replace with a new gasket, coat surfaces with anti-seize
Snap Ring 18 (X-element cover)		✓	✓	✓	Use appropriate pliers to squeeze and remove	Squeeze and insert securely into the groove
X-element Cover 17		✓	✓	✓	Lift up the cover	The mesh should face the float
Spring Clip 16 (X-element)	✓	✓	✓	✓	Squeeze the spring clip to remove it from the guide	Squeeze the spring clip and insert it into the X-element guide
X-element 14	✓	✓	✓	✓	Remove from the X-element guide	Make sure the X-element is not upside down (figure B)
Air Vent Valve Seat 21	✓	✓	✓	✓	Use a wrench to remove	Coat threads with anti-seize*
X-element Guide 15	✓	✓	✓	✓	Remove without bending	Make certain the X-element fits in securely
Snap Ring 13 (Screen)		✓		✓	Use appropriate pliers	Insert securely into groove
Screen 9 & Float Cover 12	✓				Lift straight up	Align arrows and insert, insert tab on bottom into guide on body and push in until top is flush (figure C)
Screen 9		✓	✓	✓	Lift straight up	Place screen holder on ledge inside body, round side up; place screen holder retainer next (if applicable), followed by screen
Screen Holder Retainer 11		✓		✓		
Screen Holder 10		✓	✓	✓	Remove without bending	
Float 4	✓	✓	✓	✓	Remove, being careful not to scratch its polished surface	Insert into body, being careful not to scratch its polished surface
Orifice Holder Plug 7	✓	✓	✓	✓	Use a wrench to remove	Coat threads with anti-seize*
Orifice Plug Gasket 8	✓	✓	✓	✓	Remove gasket only if worn or damaged	Replace with a new gasket only if worn or damaged
Orifice 5	✓	✓	✓	✓	Push out from inside the body toward the plug holder	With flat surface of the orifice facing up, push from outside until it contacts interior stop (figure D)
Orifice O-Ring 6	✓	✓	✓	✓	Remove the rubber O-ring and clean sealing surfaces	Replace with a new O-ring, coat with heat-resistant grease

* Tighten to the proper torque (see table Tightening Torque and Distance Across Flats)

"✓" indicates which models contain which parts

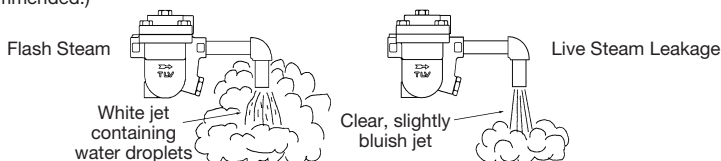


8. Operational Check

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 TLV Pocket TrapMan (within its pressure and temperature measuring 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.)



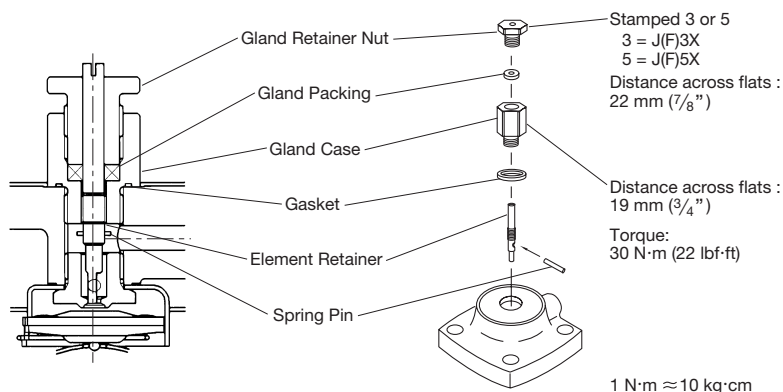
9. Troubleshooting

If the expected performance is unachievable after installation of the steam trap, read chapters 5 and 6 again and check the following points to take appropriate corrective measures.

Problem	Cause	Remedy
No condensate is discharged (blocked) or discharge is poor	Float is damaged or filled with condensate	Replace the float
	Orifice, screen or piping is clogged with rust or scale	Clean
	Steam-locking has occurred	Blowdown through the bypass or close the trap inlet valve and allow the trap to cool
	X-element is damaged	Replace the X-element
Steam is discharged or leaks from the trap outlet (blowing) (steam leakage)	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
	Rust and scale have accumulated around the orifice or under the float	Clean
	Orifice is damaged	Replace the orifice
	Float is deformed or coated with scale	Clean or replace the float
	Trap is installed above the maximum allowable inclination angle	Correct the installation
	Vibration of trap occurs	Lengthen inlet piping, then fasten it securely
Steam leaks from a place other than the trap outlet	The X-element is damaged, or clogged with rust or scale	Clean or replace the X-element
	Deterioration of or damage to gaskets	Replace with new gaskets
	Leakage from eroded cavities of body or cover	Replace the trap
Float is frequently damaged	Improper tightening torque for cover was used	Tighten to the proper torque
	Water hammer occurs	Examine the piping for problems that can cause water hammer

For maintenance parts and repair parts see page 3

10. Lock Release Valve (Option for J(F)3X and J(F)5X)



Operation

When shipped from the factory, the element retainer is in its maximum position. Use a flat-head screwdriver to adjust the amount of steam released. When not in use, the element retainer should be returned to its maximum position. If steam should leak from the gland case or gland retainer, it can be stopped by further tightening the gland retainer.

Inspection and Maintenance

Unscrew the gland retainer nut and the gland case and take off all parts. Check for dirt, oil and damage. Replace damaged parts. Before reassembling replace the gland packing. Replace the gasket only if necessary.

11. 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

CLAIMED DEFECT IS NOT COVERED BY THIS WARRANTY, THE PARTY ASSERTING THIS WARRANTY SHALL PAY TLV FOR THE TIME AND EXPENSES RELATED TO SUCH ON-SITE INSPECTION.

Exclusion of Consequential and Incidental Damages

IT IS SPECIFICALLY ACKNOWLEDGED THAT THIS WARRANTY, ANY OTHER EXPRESS WARRANTY NOT NEGATED HEREBY, AND ANY IMPLIED WARRANTY NOT NEGATED HEREBY, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, DO NOT COVER, AND NEITHER TLV, TII NOR TLVJ WILL IN ANY EVENT BE LIABLE FOR, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO LOST PROFITS, THE COST OF DISASSEMBLY AND SHIPMENT OF THE DEFECTIVE PRODUCT, INJURY TO OTHER PROPERTY, DAMAGE TO BUYER'S OR THE FIRST END USER'S PRODUCT, DAMAGE TO BUYER'S OR THE FIRST END USER'S PROCESSES, LOSS OF USE, OR OTHER COMMERCIAL LOSSES. WHERE, DUE TO OPERATION OF LAW, CONSEQUENTIAL AND INCIDENTAL DAMAGES UNDER THIS WARRANTY, UNDER ANY OTHER EXPRESS WARRANTY NOT NEGATED HEREBY OR UNDER ANY IMPLIED WARRANTY NOT NEGATED HEREBY (INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) CANNOT BE EXCLUDED, SUCH DAMAGES ARE EXPRESSLY LIMITED IN AMOUNT TO THE PURCHASE PRICE OF THE DEFECTIVE PRODUCT. THIS EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES, AND THE PROVISION OF THIS WARRANTY LIMITING REMEDIES HEREUNDER TO REPLACEMENT, ARE INDEPENDENT PROVISIONS, AND ANY DETERMINATION THAT THE LIMITATION OF REMEDIES FAILS OF ITS ESSENTIAL PURPOSE OR ANY OTHER DETERMINATION THAT EITHER OF THE ABOVE REMEDIES IS UNENFORCEABLE, SHALL NOT BE CONSTRUED TO MAKE THE OTHER PROVISIONS UNENFORCEABLE.

Exclusion of Other Warranties

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY DISCLAIMED.

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.

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