

# INSTRUCTION MANUAL

Keep this manual in a safe place for future reference

## TLV® FREE FLOAT AIR TRAPS JA SERIES

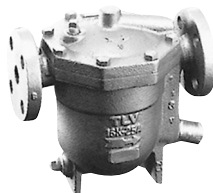
JA5  
JAF5



JA3  
JAF3



JA7



Manufacturer

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**EAC**



# 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 inline repairable air traps of the JA Series are suitable for air systems with pressures up to 1.6 MPaG (230 psig) and temperatures up to 100°C (212°F). The traps discharge condensate continuously and automatically without adjustment.

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>DO NOT use for toxic, flammable or otherwise hazardous fluids.</b> This product is an air trap that discharges condensate from air piping systems. Use only for air and/or air condensate. This product is for intended use only. Improper use may result in such hazards as damage to the product or malfunctions that may lead to serious accidents.
	<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>CAUTION</b>	<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>DO NOT use this product in excess of the maximum operating pressure differential.</b> Such use could make discharge impossible (blocked).
	<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>Use hoisting equipment for heavy objects (weighing approximately 20 kg (44 lbs.) or more).</b> Failure to do so may result in back strain or other injury if the object should fall.
	<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.

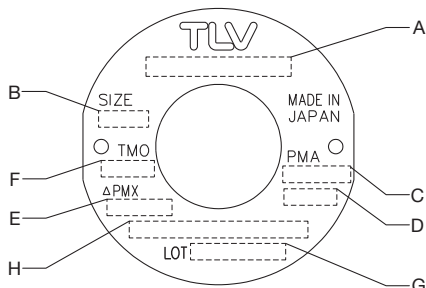
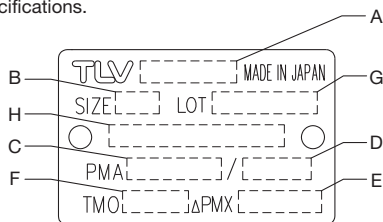
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 <b>CAUTION</b>	<p><b>When disassembling or removing the product, wait until the internal pressure equals atmospheric pressure and the surface of the product has cooled to room temperature.</b> Disassembling or removing the product when it is hot or 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.

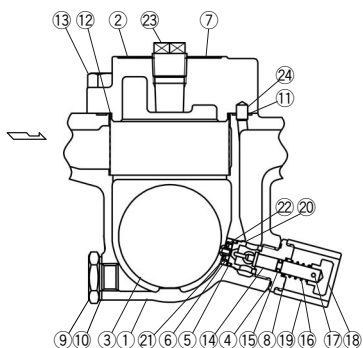
\*\* "Valve No." is displayed for products with options. This item is omitted from the nameplate when there are no options.



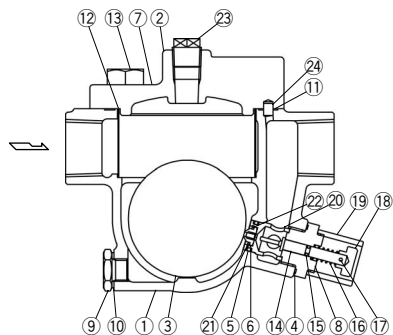
To avoid malfunctions, product damage, accidents or serious injury, install properly and DO NOT use this product outside the specification range. Local regulations may restrict the use of this product to below the conditions quoted.

# 3. Configuration

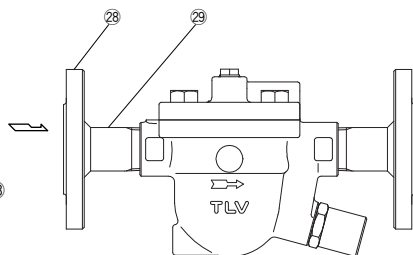
JA3 · JAF3



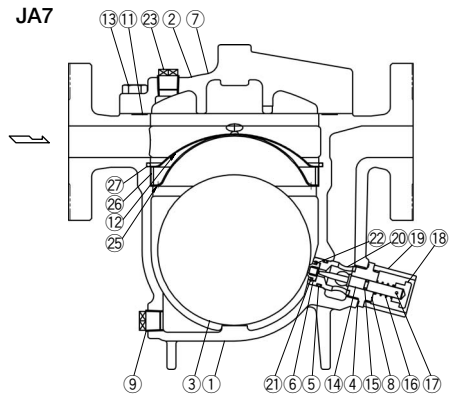
JA5



JAF5



JA7



No.	Description	JA3/JAF3			JA5/JAF5			JA7		
		M*	R*	F*	M*	R*	F*	M*	R*	F*
1	Body									
2	Cover									
3	Float			✓			✓			✓
4	Holder Nut Gasket	✓	✓		✓	✓		✓	✓	
5	Valve Seat Holder O-Ring	✓	✓		✓	✓		✓	✓	
6	Valve Seat		✓			✓			✓	
7	Nameplate									
8	Valve Seat Holder Nut		✓			✓			✓	
9	Drain Plug**									
10	Drain Plug Gasket**	✓	✓		✓	✓				
11	Cover Gasket	✓	✓		✓	✓		✓	✓	
12	Screen		✓			✓			✓	
13	Cover Bolt									
14	Needle		✓			✓			✓	
15	Needle O-Ring	✓	✓		✓	✓		✓	✓	
16	Coil Spring		✓			✓			✓	
17	Split Pin		✓			✓			✓	
18	Plunger		✓			✓			✓	
19	Guard Bushing		✓			✓			✓	
20	Valve Seat Holder		✓			✓			✓	
21	Snap Ring		✓			✓			✓	
22	Washer		✓			✓			✓	
23	Balancing Line Plug									
24	Alignment Pin									
25	Screen Holder									
26	Screen Holder Retainer									
27	Snap Ring									

\*M = Maintenance kit; R = Repair kit; F = Float

Replacement parts are only available in their respective kits

\*\* Option for JA3/JAF3, JA5/JAF5

## 4. Proper Installation

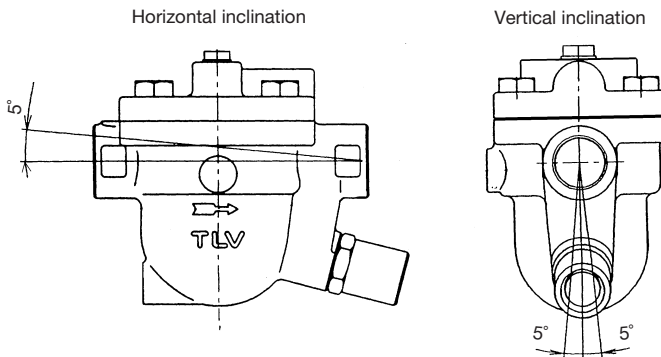


### CAUTION

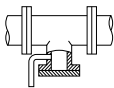


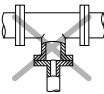
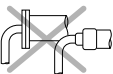
- Installation, inspection, maintenance, repairs, disassembly, adjustment and valve opening/closing should be done only by trained maintenance personnel.
- Take measures to prevent people from coming into direct contact with product outlets.
- Do not use excessive force when connecting threaded pipes.
- Use hoisting equipment for heavy objects.
- 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 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. Also make sure that the arrow mark on the body corresponds with the direction of flow.
6. 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.
7. When completing the piping, support the pipes within 0.8 meters (2.5 ft.) on either side of the trap.
8. To ensure proper condensate flow into the trap, remove the balancing line plug and install a pressure-balancing line. Connect the end of the line to the air system at a place above any possible condensate accumulation as shown on page 6.
9. To facilitate inspection and maintenance, install a union or flange where the trap has connections (condensate inlet & outlet, pressure balancing line).
10. Prime the trap with water through the balancing port or line to ensure a seal.
11. Open the inlet and outlet valves and check to make sure that the trap functions properly.

### Allowable Inclination

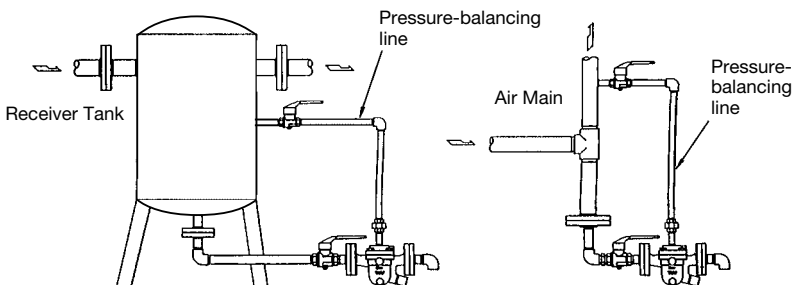


## 5. Piping Arrangement

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 above?
7. Has the pressure-balancing line been connected to the trap and the receiver tank or the air section of the main as shown below?



## 6. Operational Check

A visual inspection can be done to help decide about necessary immediate maintenance or repair if the trap is open to atmosphere. Use diagnostic equipment; such as a stethoscope, thermometer if the trap does not discharge to atmosphere.

Normal:	Condensate is discharged continuously and the sound of flow like that of water draining from a bathtub can be heard. With very little condensate, there is almost no sound of flow.
Blocked:	No condensate is discharged. The trap is quiet and makes no noise The surface temperature of the trap is low.
Blowing:	Air continually flows from the outlet and there is a continuous sound of a forceful stream against a surface.
Air Leakage:	Air is discharged through the trap outlet together with the condensate and there is a hissing sound.

If the trap shows signs of blockage, blowing or air leakage, perform manual blowdown by pushing the plunger in several times with a fingertip to allow dirt and oil to be discharged through the orifice. If this does not remedy the problem, follow the instructions under chapter 8, "Troubleshooting".

## 7. Inspection and Maintenance

Periodic operational inspections should be performed at least biannually or at intervals according to use. Faulty air traps may result in losses due to air 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 done only by trained maintenance personnel.

- Before attempting to open the trap, close the inlet and outlet isolating valves, and the valve in the equalizing pipe and wait until the trap has cooled to room temperature. Reduce the internal pressure to atmospheric pressure by slowly and cautiously turning the drain plug a few degrees so that condensate and air can escape. Then open the drain plug completely to drain the condensate from inside the body. Failure to do so may result in burns or injuries.
- Be sure to use the proper components and NEVER try to modify the product.

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

### Disassembly/Reassembly (to reassemble, follow procedures in reverse)

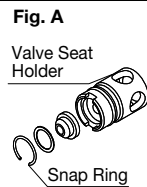
Part & No.	JA3/JAF3	JA5/JAF5	JA7	During Disassembly	During Reassembly
Drain Plug 9	✓*	✓*		Remove with a socket wrench	Consult the table of tightening torques and tighten to the proper torque (page 8)
			✓	Remove with a wrench	Wrap threads with sealing tape, consult the table of tightening torques and tighten to the proper torque (page 8)
Drain Plug Gasket 10	✓*	✓*		—	Replace with a new gasket, coat with anti-seize
Cover Bolt 13	✓	✓	✓	Remove with a socket wrench	Consult the table of tightening torques and tighten to the proper torque (page 8)
Cover 2	✓	✓	✓	Lift the cover up and off	Make sure the arrow on the cover is pointing in the direction of flow (JA7) Align the cover with the alignment pin (except JA7) and reattach
Alignment Pin 24	✓	✓		Remove the alignment pin	Insert into the hole in the body
Cover Gasket 11	✓	✓	✓	Remove the gasket	Replace with a new gasket if damaged

"✓" indicates which models contain which parts.

\*Option



Disassembly/Reassembly (to reassemble, follow procedures in reverse)					
Part & No.	JA3/JAF3	JA5/JAF5	JA7	During Disassembly	During Reassembly
Balancing Line Plug 23 (When connecting the line for the first time)	✓	✓	✓	Remove with a wrench	— (Connect the pressure-balancing line) When the pressure-balancing line is not necessary, wrap threads with sealing tape, consult the table of tightening torques and tighten to the proper torque (see below)
Snap Ring 27			✓	Pinch the insides together and remove from body	Insert securely into the snap ring groove in the body
Screen 12	✓	✓		Remove by lifting straight up and out while turning	Turn gently while inserting, make sure the top of the screen does not stick up out of the body
			✓	Remove by lifting up and out	Make sure that correct side is facing up
Screen Holder Retainer 26			✓	Remove by lifting up and out	Place on the screen holder without tilting
Screen Holder 25			✓	Remove without bending	Place on the ledge inside the body, making sure the rounded side is on top
Float 3	✓	✓	✓	Remove, being careful not to scratch the polished surface	Insert, being careful not to scratch or misshape
Guard Bushing 19	✓	✓	✓	Use fingers to remove from the valve seat holder nut	Use fingers to tighten loosely
Valve Seat Holder Nut 8	✓	✓	✓	Remove with a socket wrench	Consult the table of tightening torques and tighten to the proper torque (see below)
Holder Nut Gasket 4	✓	✓	✓	—	Replace with a new gasket if damaged
Valve Seat Holder 20	✓	✓	✓	Push out from inside the body toward the valve seat holder nut	Pushing it in until it contacts the stopper inside
Valve Seat Holder O-Ring* 5	✓	✓	✓	Be careful not to damage the O-ring as it is made of rubber	Coat with heat resistant grease**; replace with a new O-ring if warped or damaged; fit securely into the groove in the valve seat holder
Snap Ring 21 (for Valve Seat Holder Nut)	✓	✓	✓	Pinch the insides together and remove from the valve seat holder (Fig. A)	Insert securely into groove up against the washer be sure that the break in the snap ring lines up with the slot in the groove
Washer 22	✓	✓	✓	—	—
Valve Seat 6	✓	✓	✓	Be careful not to damage the rubber valve seat	Replace with a new valve seat if sealing surfaces are warped or damaged
Split Pin* 17	✓	✓	✓	Be careful not to lose	—
Plunger* 18	✓	✓	✓	Remove from needle	—
Coil Spring* 16	✓	✓	✓	—	—
Needle* 14	✓	✓	✓	Remove without bending	—
Needle O-Ring* 15	✓	✓	✓	Be careful not to damage the O-ring as it is made of rubber	Coat with heat resistant grease**; replace with a new O-ring if warped or damaged; fit securely into the groove in the needle



Pinch the insides together and remove

\*Detach / Reassemble only when the needle is replaced

\*\*Use silicone grease (for heat resistant grease)

"✓" indicates which models contain which parts

Tightening Torque (T) and Distance Across Flats (D)								
Model	Cover Bolt (13)		Valve Seat Holder Nut (8)		Balancing Line Plug (23)		Drain Plug (9)	
	(T) N·m (lbf·ft)	(D) mm (in)	(T) N·m (lbf·ft)	(D) mm (in)	(T) N·m (lbf·ft)	(D) mm (in)	(T) N·m (lbf·ft)	(D) mm (in)
JA3/JAF3	50 (37)	17 ( <sup>2</sup> / <sub>32</sub> )	50 (37)	24 ( <sup>1</sup> / <sub>16</sub> )	30* (22*)	12 ( <sup>1</sup> / <sub>32</sub> )	35** (26**)	21 ( <sup>1</sup> / <sub>16</sub> )
JA5/JAF5	80 (59)	22 ( <sup>7</sup> / <sub>16</sub> )	80 (59)	32 (1 <sup>1</sup> / <sub>4</sub> )	30* (22*)	12 ( <sup>1</sup> / <sub>32</sub> )	35** (26**)	21 ( <sup>1</sup> / <sub>16</sub> )
JA7	70 (51)	17 ( <sup>2</sup> / <sub>32</sub> )	120 (88)	36 (1 <sup>1</sup> / <sub>32</sub> )	30* (22*)	12 ( <sup>1</sup> / <sub>32</sub> )	30* (22*)	12 ( <sup>1</sup> / <sub>32</sub> )

\* Torque values with sealing tape wrapped 3 ~ 3.5 turns around the threads.

1 N·m = 10 kg·cm

\*\* Option for JA3·JAF3, JA5·JAF5

If drawings or other special documentation were supplied for the product, any torque given there takes precedence over values shown here.

## 8. Troubleshooting

If the expected performance is unachievable after installation of the air trap, read chapter 4. "Proper Installation" and chapter 5. "Piping Arrangement" again and check the following points to take appropriate corrective measures.

<b>Problem</b>	<b>Cause</b>	<b>Remedy</b>
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, scale or dirt	Clean
	The trap operating pressure exceeds the maximum specified pressure, or there is insufficient differential pressure between the trap inlet and outlet	Compare specifications and actual operating conditions
	Air binding occurs	Check and correct balance pipe and inlet pipe arrangement
Air is discharged or leaks from the trap outlet  (blowing) (air leakage)	Orifice is clogged or rust and scale have accumulated 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
	There is no condensate in the air trap body, no water seal around the valve seat	Prime the air trap with water
Air leaks from a place other than the trap outlet	Deterioration of or damage to gaskets	Replace the gaskets
	Improper tightening torque for cover was used	Tighten to the proper torque
Float is frequently damaged	Water hammer occurs	Examine the piping for problems that can cause water hammer and repair

## 9. 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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