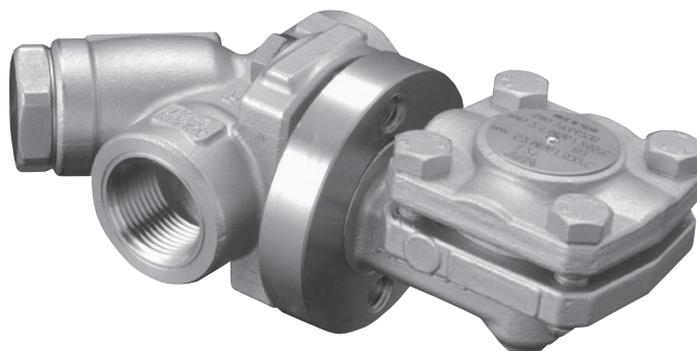


INSTRUCTION MANUAL

Keep this manual in a safe place for future reference

TLV® UNIVERSAL THERMOSTATIC TRAPS
FL SERIES

QuickTrap®
FL5/FL21/FL32
FL5-C/FL21-C/FL32-C
Trap Unit
L5/L21/L32
L5-C/L21-C/L32-C



(Option)
BD2

Manufacturer

TLV® **CO., LTD.**

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EAC



Introduction

Before beginning installation or maintenance, please read this manual to ensure correct use of the product. Keep the manual in a safe place for future reference.

The FL Series steam traps (connector body unit F46 or former connector unit F32* and steam trap units L5, L21, L32 as well as L5-C, L21-C, L32-C, with built-in check valve) can be used without adjustment for medium capacity applications up to 0.5, 2.1, or 3.2 MPaG (75, 300, or 450 psig). These models are suitable for steam-using equipment that discharges condensate at temperatures slightly below saturation temperature, such as tracer lines and light process equipment.

* Configuration of F32 differs slightly from that of F46

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 above types of cautionary items 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.

 Indicates a DANGER, WARNING or CAUTION item.

 **DANGER** Indicates an urgent situation that poses a threat of death or serious injury.

 **WARNING** Indicates that there is a potential threat of death or serious injury.

 **CAUTION** Indicates that there is a possibility of injury, or equipment/product damage.

 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 subject this product to condensate loads that exceed its discharge capacity. Failure to observe this precaution may lead to condensate accumulation upstream of the product, resulting in reduced equipment performance or damage to the equipment.
	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.
	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.

Continued on the next page



Be sure only to use 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.

The pressure and temperature values displayed on the nameplate of the connector body are the values for the connector body itself and not for the entire trap. Improper use may result in such hazards as damage to the product or malfunctions that may lead to serious accidents.

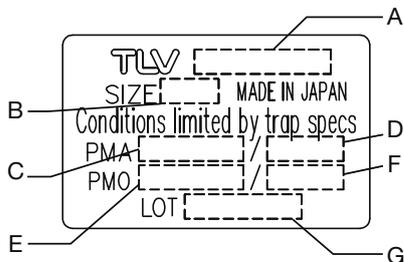
Use only under conditions in which no freeze-up will occur. Freezing may damage the product, leading to fluid discharge, which may cause burns or other injury.

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.

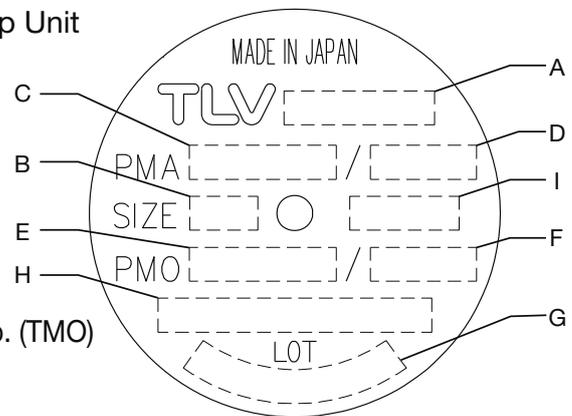
2. Specifications

Refer to the product nameplates on the trap unit AND on the connector body for detailed specifications. The specifications displayed on each nameplate apply only to the unit on which it is mounted. When the trap unit is installed on a connector unit and the PMA/TMA and/or PMO/TMO values displayed on the two nameplates differ, the specifications for the assembled product are restricted to the lower values.

Connector Unit (mounted only on F46)



Trap Unit



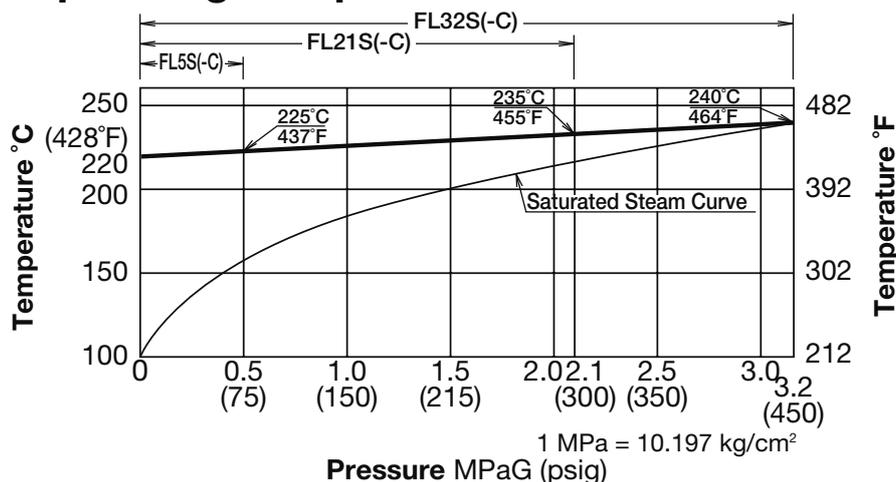
- A: Model
- B: Nominal Diameter*
- C: Max. Allowable Press.**
- D: Max. Allowable Temp.** (TMA)
- E: Max. Operating Press.
- F: Max. Operating Temp. (TMO)
- G: Production Lot No.
- H: Valve No.***
- I: Type of X-Element

- * The nominal diameter is not printed on the trap unit nameplate when the trap unit is shipped by itself.
- ** 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.

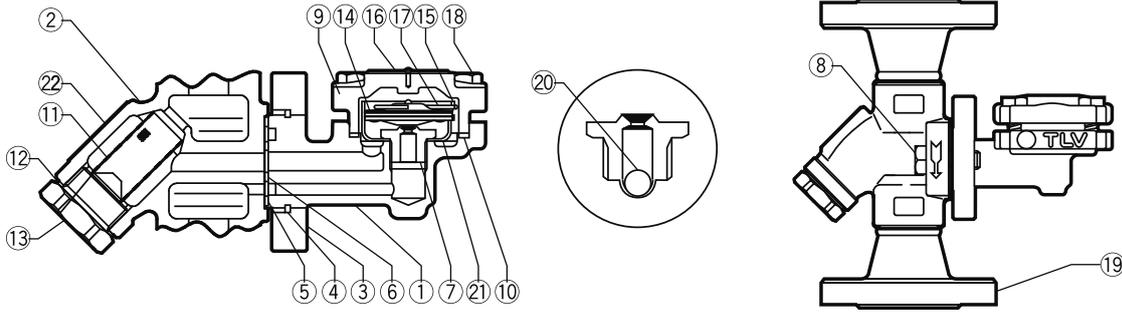


To avoid malfunctions, product damage, accidents or serious injury, install properly and DO NOT use this product outside the specification range. Local regulations may restrict the use of this product to below the conditions quoted.

Maximum Operating Temperature



3. Configuration

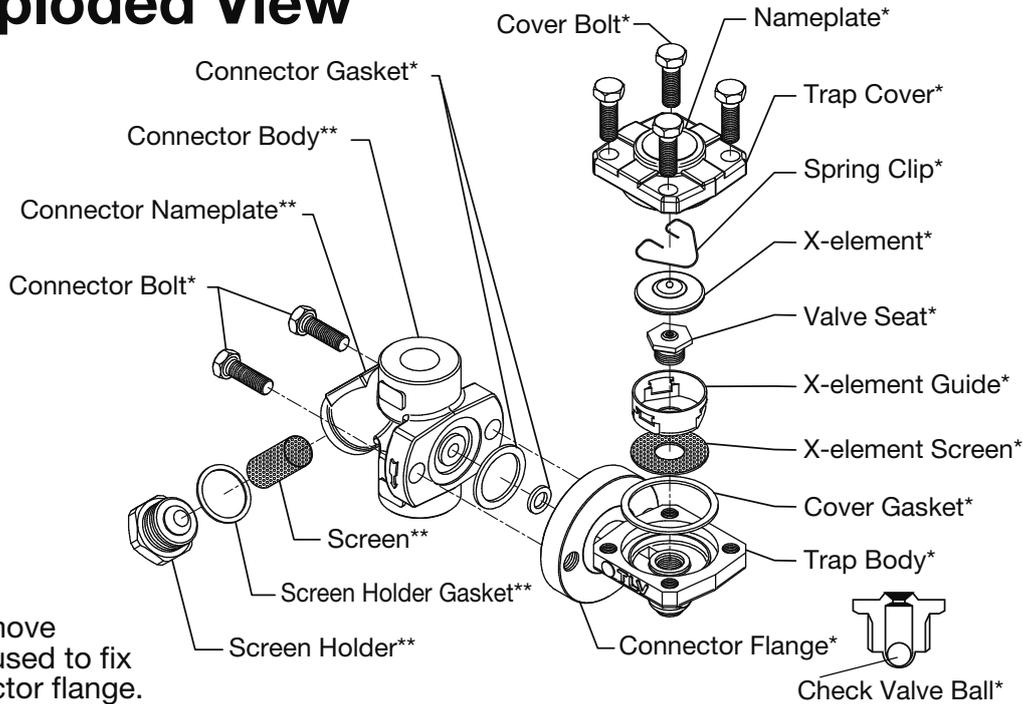


No.	Description	M*	R*	T*	No.	Description	M*	R*	T*	No.	Description	M*	R*	T*
1	Trap Body	-	-	✓	8	Connector Bolt	-	✓	✓	16	Nameplate (Trap Unit)	-	-	✓
2	Connector Body**	-	-	-	9	Trap Cover	-	-	✓	17	Spring Clip	-	✓	✓
3	Connector Flange	-	-	✓	10	Cover Gasket	✓	✓	✓	18	Cover Bolt	-	-	✓
4	Snap Ring	-	✓	✓	11	Screen**	-	✓	-	19	Flange	-	-	-
5	Outer Connector Gasket	✓	✓	✓	12	Screen Holder Gasket**	✓	✓	-	20	Check Valve Ball	-	✓	✓
6	Inner Connector Gasket	✓	✓	✓	13	Screen Holder**	-	-	-	21	X-element Screen	-	✓	✓
7	Valve Seat	-	✓	✓	14	X-element	-	✓	✓	22	Nameplate (Connector Unit)	-	-	-
					15	X-element Guide	-	✓	✓					

* M = Maintenance Kit; R = Repair Kit; T = Trap Unit; replacement parts are available only in their respective kits.

** Replacement parts for F32 differ from those for F46. When you order replacement parts, please include the steam trap model name, size, connection type and also the connector unit name.

4. Exploded View



Do not remove snap ring used to fix the connector flange.

Tightening Torque and Distance Across Flats

Part & Number	N·m (lbf·ft)	mm (in)	Part & Number	N·m (lbf·ft)	mm (in)
Cover Bolt 18	35 (26)	13 (1/2)	Screen Holder (F32) 13	60 (44)	22 (7/8)
Valve Seat 7	35 (26)	19 (3/4)	F: 15, 20, 25mm (1/2, 3/4, 1")***		
Connector Bolt 8	39 (28)	14 (9/16)	S&W: 15, 20mm (1/2, 3/4")***	150 (110)	38 (1 1/2)
Screen Holder (F46) 13	100 (73)	30 (1 3/16)	S&W: 25mm (1")***		

* Trap unit L5, L21, L32 / L5-C, L21-C, L32-C

** Connector body unit F46 or F32

*** F = Flanged, S = Screwed, W = Socket weld

1 N·m ≈ 10 kg·cm

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.
 - 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. In some instances, the trap unit and the connector body are sent as separate units. When attaching them together, make sure the connector gaskets are still in place after having removed their protective seal (See page 6 for details).
 2. There are no restrictions on the installation direction beyond the following conditions:
 - a) The arrow on the connector body must point in the direction of condensate flow.
 - b) The connector body must be adjusted so that the connector flange face (for connecting to the trap unit) is in the vertical plane.
 - c) The nameplate on the trap unit must face upward.
 3. Before installation, be sure to remove all protective seals.
 4. Before installing the trap, blow out the inlet piping to remove all dirt and oil.
 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 maintenance.
 8. Install a check valve at the trap outlet whenever more than one trap is connected to the condensate collection pipeline.
 9. In order to avoid excessive back pressure, make sure the discharge pipes are large enough; (the outlet back pressure allowance should be no more than 90% of the inlet steam pressure).
 10. We recommend unions to facilitate connection and disconnection of screwed version.

Installation Examples: Horizontal Piping

Correct	Incorrect			
	Nameplate is not facing upwards.		Universal Connector Flange is not in the vertical plane.	

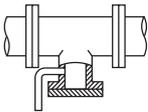
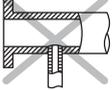
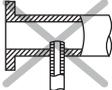
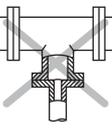
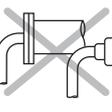
Installation Examples: Vertical Piping

Correct	Incorrect	
	Nameplate is not facing upwards.	

6. Piping Arrangement

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

1. Is the pipe diameter suitable, and has sufficient space been secured for maintenance?
2. Has the trap been installed with the arrow on the body pointing in the direction of flow?
3. Have maintenance valves been installed at the inlet and outlet? If the outlet is subject to back pressure, has a check valve been installed? (Not required for FL5-C, FL21-C, FL32-C).
4. 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?
5. Has the piping work been done correctly, as shown in the table below?

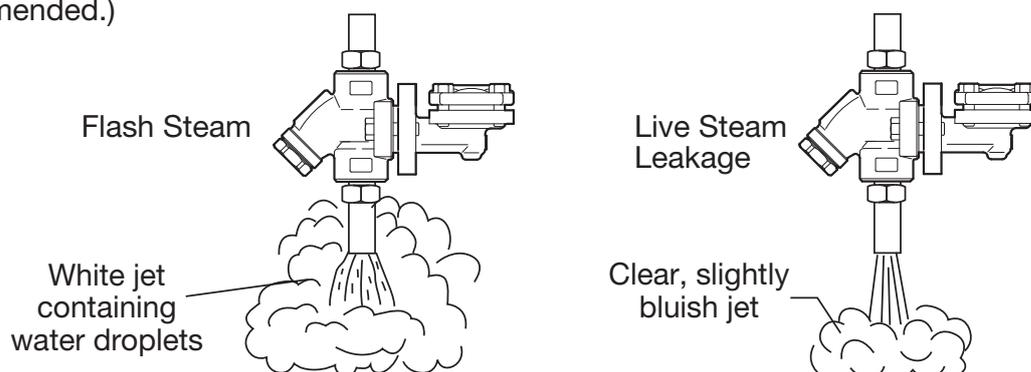
Requirement	Correct	Incorrect
Install a catchpot of the proper diameter.		 Diameter is too small.
Make sure the flow of condensate is not obstructed.		 Diameter is too small and inlet protrudes into pipe.
To prevent rust and scale from flowing into the trap, connect the inlet pipe 25 - 50 mm (1 - 2 in)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

7. 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 intermittently with flash steam and the sound of flow can be heard.
Blocked: (Discharge Impossible)	No condensate is discharged. The trap is quiet and makes no noise. The surface temperature of the trap is low.
Blowing:	Live steam continually flows from the outlet and there may be a high-pitched whistling sound.
Steam Leakage:	Live steam is discharged through the trap outlet together with the condensate and there may be a high-pitched whistling 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.)



8. Inspection and Maintenance

Operational inspections should be performed at least twice per year, or as called for by trap operating conditions. Faulty steam traps may result in losses due to steam leakage. Follow the instructions below for disassembly and reassembly when cleaning or repair is necessary.



• 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 to room temperature. Failure to do so may result in burns or injury.
- Be sure to use the proper components and NEVER attempt to modify the product.

Parts Inspection Procedure	
Gaskets	Check for warping or damage
Screen	Check for clogging or corrosion damage
X-element	Check for rust, scale, oil film, wear or damage
Valve Seat	Check for rust, scale, oil film, wear or damage
Body, Cover	Check inside for rust and scale

Disassembly / Reassembly (to reassemble, follow procedures in reverse)		
Part & No.	During Disassembly	During Reassembly
Connector Bolt 8	Remove with a socket wrench	Coat threads with anti-seize, then tighten to the proper torque (page 3)
Connector Gaskets 5 & 6	See separate instruction 8.1	See separate instruction 8.1
Cover Bolt 18	Use a socket wrench to remove	Coat threads with anti-seize and tighten to the proper torque (page 3)
Trap Cover 9	Lift up the cover and clean the sealing surface	Make sure there are no pieces of old gasket left on the sealing surface and reinstall the cover
Cover Gasket 10	Remove the gasket and clean the sealing surface	Replace with a new gasket, do not apply anti-seize
Spring Clip 17	Use appropriate pliers to squeeze and remove	Use appropriate pliers and insert the spring clip into the slots in the X-element guide (figure A on next page)
X-element 14	Remove from the X-element guide with appropriate pliers grasping the ball at the top of the element	Reinstall, making sure the X-element is not upside down and without catching on the X-element guide
Valve Seat 7	Use a socket wrench to remove	Coat threads with anti-seize and tighten to the proper torque (page 3)
X-element Guide 15	Remove without bending	Fix with valve seat and make sure X-element can be inserted smoothly
Screen Holder 13	Use a socket wrench to remove	Coat threads with anti-seize, then tighten to the proper torque (page 3)
Screen Holder Gasket 12	Remove the gasket and clean the sealing surface	Replace with a new gasket, apply anti-seize to both surfaces
Screens 11 & 21	Remove without bending	Insert without bending

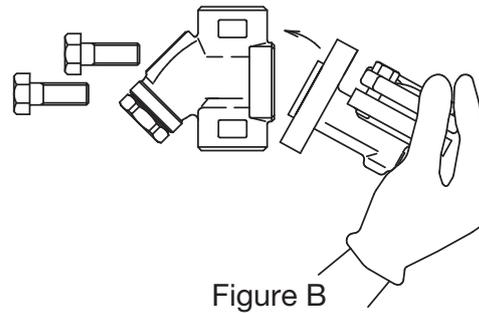
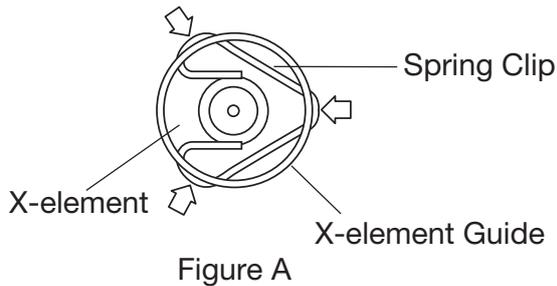
8.1 Separating/Attaching Trap and Connector Bodies

1. Loosen and remove the connector bolts, remove the entire trap unit from the connector body and take it to a repair area where it can be supported in a vise during disassembly.
2. A When reinstalling the original trap:
 - a. Using a small screwdriver, remove the old gaskets from their housings in the trap body, then clean the housings.
 - b. New connector gaskets must be installed.
 - c. To facilitate assembly and prevent loosening of the gaskets, apply a small amount of suitable adhesive at 120° intervals around the outer edge of the gaskets.
 - d. Holding the trap body so that the gasket housings are horizontal, place the gaskets into the housings.

Continued on next page

2. B When installing a replacement trap:
 - a. Be sure to remove all protective seals, making sure the connector gaskets are still in place after having removed their seal.
 - b. Before installation, scrape the mounting surface of the connector body clean using a soft tool.
3. Align the bottom edge of the trap body with that of the connector body (see Fig. B), making sure the gasket housings on the trap body align with the corresponding recesses in the connector body. Maintaining the proper alignment, close the tops together until the two faces are flush, making sure that connector gaskets remain in position.
4. Insert the connector bolts and finger-tighten, keeping trap and connector bodies flush. Tighten the connector bolts to the proper torque (see page 3).

Install the spring clip securely in the X-element guide as shown.



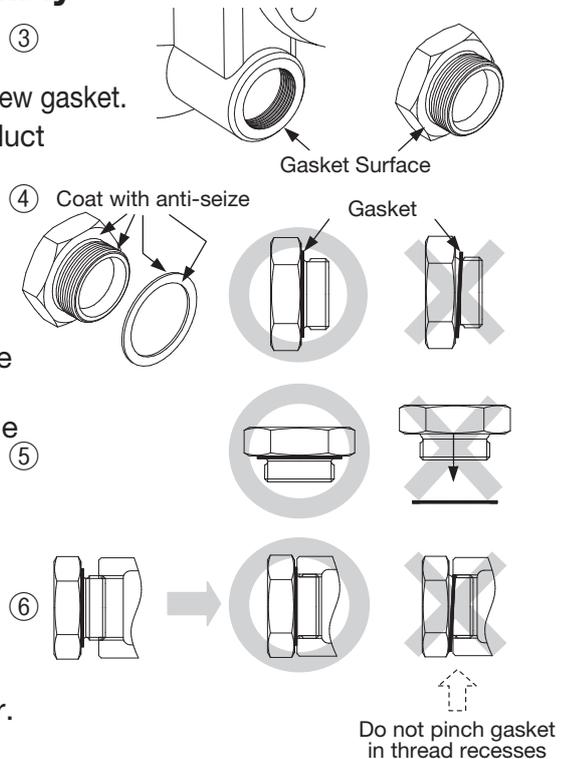
Trap units L5/L21/L32/L5-C/L21-C/L32-C are designed for use with TLV F46 and F32 connector units, trap stations (V1/V2/V1P/V2P Series) and QuickStation QS10. The connector unit name is indicated on the connector body.

9. Instructions for Plug / Holder Disassembly and Reassembly

The seal on the threaded plugs/holders found on TLV products is formed by a flat metal gasket. There are various installation orientations for the gaskets, such as horizontal, diagonal and downward, and the gasket may be pinched in the thread recesses during assembly.

Instructions for Disassembly and Reassembly

- ① Remove the plug/holder using a tool of the specified size (distance across flats).
- ② The gasket should not be reused. Be sure to replace it with a new gasket.
- ③ Clean the gasket surfaces of the plug/holder and the product body using a rag and/or cleaning agents, then check to make sure the surfaces are not scratched or deformed.
- ④ Coat both the gasket surface of the plug/holder and the threads of the plug/holder with anti-seize, then press the gasket onto the center of the gasket surface of the plug/holder, making sure the anti-seize affixes the gasket tightly to the plug/holder. Check to make sure the gasket is not caught in the recesses of the threads.
- ⑤ Hold the plug/holder upside down to make sure that the anti-seize makes the gasket stick to the plug/holder even when the plug/holder is held upside down.
- ⑥ Screw the plug/holder by hand into the product body while making sure that the gasket remains tightly affixed to the center of the gasket surface of the plug/holder. Make sure the entire gasket is making contact with the gasket surface of the product body. It is important at this point to make sure the gasket is not pinched in the thread recesses of the plug/holder.
- ⑦ Tighten the plug/holder to the proper torque.
- ⑧ Next, begin the supply of steam and check to make sure there is no leakage from the part just tightened. If there is leakage, immediately close the inlet valve and, if there is a bypass valve, take the necessary steps to release any residual pressure. After the surface of the product cools to room temperature, repeat the procedure beginning from step ①.



10. Troubleshooting

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

Problem	Cause	Analysis	Corrective Measures	
Condensate is not discharged or (blocked) discharge is poor	Valve does not open	X-element is stuck to the valve seat	Clean	
		Screens and/or inlet/outlet channels are clogged with rust or scale	Clean	
		Steam-locking	Study piping	
		Trap operating pressure exceeds maximum specified operating pressure	Study inlet pressure	
		Differential pressure is insufficient	Study inlet/outlet pressure	
Steam leakage or blow-off	Valve does not close	Valve closure is obstructed by rust or scale, etc	Clean (inspect screens as well)	
		X-element and/or valve seat are worn or damaged	Replace X-element and/or valve seat	
		X-element is broken	Replace X-element	
		Severe vibration of trap	Reinforce trap piping supports	
	Leakage from another location		Gaskets of connector, trap cover, screen holder or valve seat are worn or damaged	Repair gaskets
			Cover bolts, connector flange bolts, screenholder, or valve seat are loose	Tighten to proper torque
			Inlet and discharge channels may be connected due to erosion	Replace trap (study trap capacity)
			Bypass valve is open or damaged	Repair or close valve

NOTE: When replacing parts with new, use the parts list on page 3 for reference, and replace with parts from the respective replacement parts kits.

11. Optional Blowdown Valve BD2

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

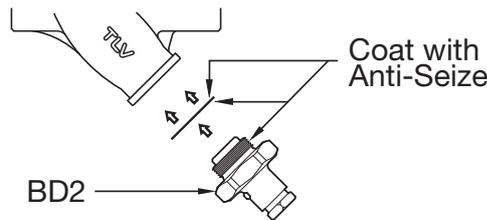
11.1 Reassembly of Blowdown Valve



- 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.

1. Clean the trap, BD2 threads, and sealing surfaces, and apply a small amount of anti-seize.
2. Replace gasket.
3. Carefully place the gasket over the threaded portion, and position carefully so that it does not become off-center.
4. Fasten to the steam trap with the proper torque.

Reassembly



Torque (T) and Distance Across Flats (D)

	①	BD2 Valve		(T): 30 N·m (22 lbf·ft) (D): 17 mm ($2\frac{1}{32}$ ")	
	②	BD2 Valve Seat (Screen Holder)	F46	All connections and sizes (T): 100 N·m (73 lbf·ft) (D): 30 mm ($1\frac{3}{16}$ ")	
			F32	Flanged 15 - 25 mm ($\frac{1}{2}$ " - 1") Screwed & Socket Weld 15, 20 mm ($\frac{1}{2}$ " , $\frac{3}{4}$ ")	(T): 60 N·m (43 lbf·ft) (D): 22 mm ($\frac{7}{8}$ ")
				Screwed & Socket Weld 25 mm (1")	(T) : 150 N·m (110 lbf·ft) (D) : 38 mm ($1\frac{1}{2}$ ")

11.2 Operation Instructions for BD2

The BD2 Blowdown Valve uses internal pressure to blow out condensate or steam (and scale/dirt in the condensate or steam) from inside the unit to atmosphere.

Note: Do not leave the vicinity while the blowdown valve is in the open position.

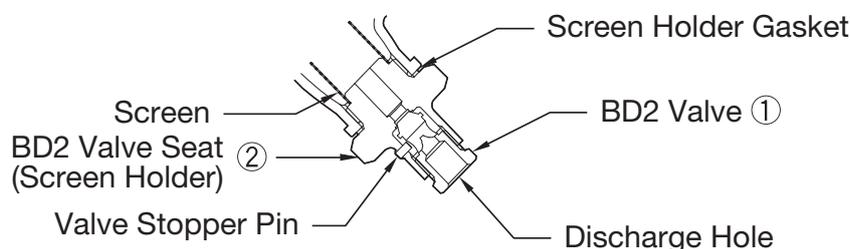


- Always wear eye protection and heat-resistant gloves when operating the blowdown valve. Failure to do so may result in burns or other injury.
- When operating the blowdown valve, stand to the side well clear of the

outlet to avoid contact with internal fluids that will be discharged. Failure to do so may result in burns or other injury.

- Do not use excessive force when opening the blowdown valve. Such force may break the pin equipped as a valve stopper, causing a blowout from internal pressure resulting in burns or other injury.

1. With two wrenches, firmly hold the BD2 Valve Seat (Screen Holder) ② (see table above for distance across flats) in place while slowly opening the BD2 Valve ① ($17\text{ mm}, 2\frac{1}{32}$ "). Be careful to avoid contact with fluid that will be discharged through the hole in the center of the blowdown valve as the valve opens.
2. Close the BD2 Valve ① and tighten to a torque of 30 N·m (22 lbf·ft), and confirm that there is no leakage. If leakage continues, dirt or scale may prevent the valve from sealing. Open and blow out again, then try to close once more.



12. 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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