

**OPERATING & MAINTENANCE  
INSTRUCTIONS FOR ATLANTIC 'ATC'  
NON-STORAGE CALORIFIERS**

**GMS**

## INSTALLATION, OPERATION, MAINTENANCE INSTRUCTIONS FOR GMS 'ATLANTIC' 'ATC' NON-STORAGE HEAT EXCHANGERS



The operating and maintenance instructions contained within this package are for 'Atlantic' 'ATC' steam/water non-storage heat exchangers units supplied with a condensate cooler & associated steam trapping equipment. Please refer to separate instructions for steam/water single unit & with mechanical pump etc (Type AT & type ATC-MP) and 'Pacific' water/water units

Please note that an electronic version of these instructions are available from our website and also on a CD. Please contact our sales office for further information.

Section	Description
1	Standard Unit Information & Description
2	PED Information
3	Installation
4	Commissioning & Operation
5	Maintenance
6	Recommended Spares
7	Steam Trap Instructions
8	Check Valve Instructions

## 1. Standard Unit Information & Description

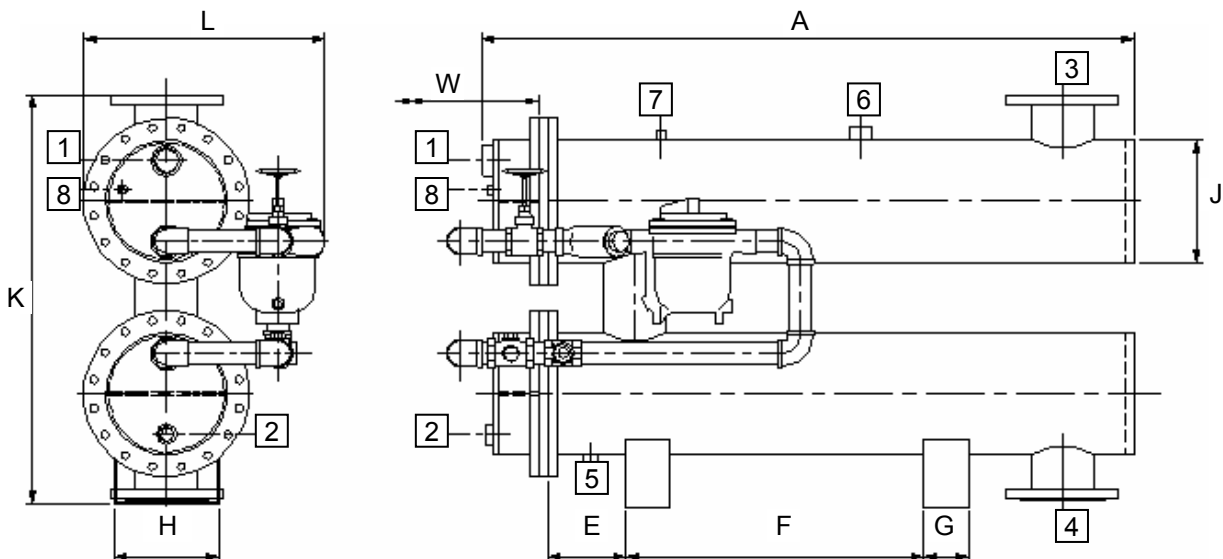
The 'Atlantic ATC' range comprises steam to water calorifiers & condensate coolers. These are mostly used in heating systems to transfer the heat from steam to hot water. The majority of applications are for heating LTHW (82/71°C) although the calorifiers can be used for MTHW and HTHW generation if required. Other applications may also arise with different water temperatures and materials of construction.

Standard Material Schedule	
Shell	Carbon Steel
Header	Carbon Steel
Heater Tubes	Copper 'low-fin' Integron
Tubeplate	Carbon Steel
(Other materials on request)	

Design Data	Shell Side	Tube Side
Maximum Working Pressure	7.0 BarG	10.0 BarG
Hydraulic Test Pressure	11.55 BarG	15.0 BarG
Design Code	BS853 1996 Part 1 Grade A & PED 1999 (SI 1999/2001)	
Higher pressures on request		

Connections					
Ref	Description	Size	Ref	Description	Size
1	Primary Steam Inlet	Varies	5	Drain	3/4" BSP
2	Primary Condensate Outlet	Varies	6	Safety Valve	Varies
3	Secondary Flow	Varies	7	Primary Pressure Gauge	3/8" BSP
4	Secondary Return	Varies	8	Secondary Pressure Gauge	3/8" BSP

Unit	Dimensions in mm									Connections					Weight (dry)kg
	A	E	F	G	H	J	K	L	W	1	2	3	4	6	
ATC075A	770	175	215	50	80	89	390	383	520	3/4"	1/2"	1 1/2"	1 1/2"	3/4"	60
ATC075B	935	175	360	50	80	89	390	383	720	3/4"	1/2"	1 1/2"	1 1/2"	3/4"	65
ATC125A	1220	175	605	65	120	139	525	425	980	1"	1/2"	2"	2"	1"	120
ATC150A	1230	175	535	65	145	168	700	509	985	2"	3/4"	DN80	DN80	1"	170
ATC150B	1370	175	675	65	145	168	700	509	1135	2"	3/4"	DN80	DN80	1"	180
ATC150C	1540	175	850	65	145	168	700	509	1285	2"	3/4"	DN80	DN80	1 1/4"	190
ATC200A	1355	175	540	100	195	219	800	616	1010	2 1/2"	1"	DN100	DN100	1 1/4"	270
ATC200B	1735	175	920	100	195	219	800	616	1320	2 1/2"	1"	DN100	DN100	1 1/2"	305
ATC250A	1630	175	665	100	235	273	900	677	1190	DN80	1 1/2"	DN150	DN150	1 1/2"	440
ATC250B	1860	175	895	100	235	273	900	677	1420	DN80	1 1/2"	DN150	DN150	2"	465
ATC300A	1755	175	685	100	275	324	1020	749	1215	DN100	1 1/2"	DN200	DN200	2"	590
ATC300B	1985	175	895	100	275	324	1020	749	1445	DN100	1 1/2"	DN200	DN200	2"	635
ATC300C	2210	175	1115	100	275	324	1020	749	1675	DN100	1 1/2"	DN200	DN200	2"	680



## 2. PED Information

The standard range of 'Atlantic' steam/water calorifiers are designed in accordance with the requirements of the Pressure Equipment Directive 97/23/EC. Units classed as SEP in the PED category are not supplied with a CE mark. Units in category I & II are CE marked and appropriate markings and certification is supplied with each unit.

It is the responsibility of the user and/or installer to ensure that the unit is installed and operated safely, and in accordance with the instructions supplied within this manual. The 'Atlantic' unit is designed for a steam primary medium (in the tubes) and water secondary medium (in the shell).

## EC DECLARATATION OF CONFORMITY

We

**Manufacturer Name:** GMS Thermal Products Ltd  
**Address:** Riverside Works, Egmont Street  
Mossley, OL5 9NE  
**Country:** England

declare, in sole responsibility, that the following equipment

**Product:** Atlantic Steam/Water Shell & Tube Heat Exchangers  
**Country of Origin:** England

are in accordance with the requirements of the Pressure Equipment Directive 97/23/EC

**GMS PED Certificate Number:** PED-ATC-11-05  
**Date of issue:** 4<sup>th</sup> November 2005

**Applicable Design Standards:** BS853 1996 Part 1 Grade A

Subject products are designed, manufactured and tested according to the appropriate quality control procedures.

**Date:** 4/11/05  
Steve Rawlins  
Technical Director  
GMS Thermal Products Ltd

Model Number	Fluid Group	PED Category	Module
ATC075A	Chart 2 Group 2 Gases	SEP	A
ATC075B		SEP	A
ATC125A		SEP	A
ATC150A		I	A
ATC150B		I	A
ATC150C		I	A
ATC200A		I	A
ATC200B		I	A
ATC250A		I	A
ATC250B		II	A1
ATC300A		II	A1
ATC300B		II	A1
ATC300C		II	A1

### **3. Installation**

Lifting: Use lifting eyes where fitted. Do not lift a calorifier using the insulation (if fitted). Straps may crush the insulation.

Siting: Unless specifically ordered for outside siting, the calorifier must be sited indoors. Foundations must be firm and level to prevent settling, pipe strain or distortion of the calorifier. Unless specifically ordered differently, the calorifier should be installed in a level position. For calorifiers with removable tube bundles, ensure enough room exists to withdraw the bundle from the shell. For calorifiers with inspection openings ensure enough room exists to gain access to the opening.

Protective covers/plugs may be fitted to connections to protect them in transit. These must be removed prior to use. If a connection is not required seal it appropriately. Check for and remove any foreign material which may have got into the connections. Pipe-work connected to the calorifier should be supported to prevent loads being transmitted to the calorifier. Provide for thermal expansion with bends and expansion joints. To avoid corrosion, ensure that pipe-work materials are compatible with calorifier materials. Fit isolation valves prior to calorifier connections to facilitate servicing. For flanged connections tighten bolts in a diametrically opposite sequence to load the flanges evenly onto the gasket. For screwed connections use a thread sealant approved for use with potable water by the local water authority. Ensure that the tube bundle can be isolated and easily disconnected for removal during maintenance. Ensure adequate venting for air removal during filling and operation. Pressure relief valves (and bursting discs if fitted) should have their outlets piped away to a safe disposal point. Allowances must be made for thermal expansion and contraction of the fluids as the 'Atlantic' unit is not designed to withstand any external stresses due to expansion and also where connecting pipework is not adequately supported.

## 4. Commissioning & Operation

Do not operate the equipment at pressures or temperatures in excess of those specified on the nameplate of the vessel marking. Flowrates should not exceed design values specified for the calorifier.

It is assumed here that the secondary pipework is already full

Start with primary, secondary flow, return and cold feed valves closed and secondary re-circulation pump is off.

Close the drain valve.

Slowly fill the calorifier.

If the calorifier is open vented and shares a vent with other calorifiers, connect it to the common vent using the 3-way valve

Carefully open the secondary flow and return valves

Switch secondary re-circulation pump on

Slowly introduce the hot fluid to the tube bundle. If excessive noise is heard this may be caused by:-

- Excessive flowrates
- Over-wet steam
- Insufficient secondary fluid flowrate - causing overheating and “kettling”

Adjust the temperature control gradually and ensure that the correct operating temperature is maintained by it.

Check that all gaskets are effective when the unit is operating - some bolt tightening may be necessary after the unit has been first heated and subsequently from time to time. Following installation and commissioning it is advisable to remove, clean and re-assemble any strainers. All fluids must be drained when the unit is out of operation to prevent freezing or possible corrosion.

## 5. Maintenance

The site insurers may require annual inspection of tube bundle and shell condition. If a loss of performance or increase in primary pressure drop has been observed the following are possible causes:-

- a) Primary fluid restriction (blocked strainer, faulty control valve etc.)
- b) Air lock on primary side.
- c) Scale deposits on the heater battery tube surfaces (primary or secondary side). This can severely affect heat transfer rates.

### **To drain the calorifier down (secondary side)**

Obtain a complete set of replacement gaskets from GMS Thermal Products Ltd.

It is assumed here that all isolation valves (except drain) are open at the start.

Isolate the primary fluid inlet and outlet - switch off primary pump and boilers if necessary.

Switch off the secondary system return pump and isolate secondary return to calorifier.

Let the calorifier cool to a safe temperature

Isolate the secondary flow

If the calorifier shares a vent with other calorifiers, isolate it from the common vent using the 3-way valve (it will now vent to atmosphere).

If the calorifier has no vent it may be necessary to remove a fitting above the calorifier to let air in during draining.

Pipe the drain to a drain point and open the drain valve.

The calorifier shell internal condition can be inspected by removing the inspection cover (if fitted) or the tube-bundle (if removable-see below) to allow visual examination

Re-fit new gaskets and re-fill the calorifier according to the commissioning instructions above.

### **To check for leaking tubes**

Drain the secondary side as above. Mark all relative positions of covers, etc., to ensure correct

re-assembly. Isolate the primary side. Remove primary pipework and header. Bolt the tubeplate fully to the secondary shell. Isolate the secondary flow and return. Fill the secondary shell to normal working pressure (or to test pressure if isolated properly from the system). Inspect tubes for leaks. Do not leave unit standing under test pressure for longer than necessary. Before making repairs reduce the pressure to atmospheric. Leaking tubes can sometimes be sealed using plugs. If the leak is between tube and tube-plate then, for roller expanded tubes, it may be possible to effect repairs using roller expanders. If the tubes have been welded or brazed into the tube-plate then contact GMS for advice and a quotation for repair work. Re-test, drain, re-fit header (with new gaskets) and re-fill as above.

### **Removing and cleaning tube bundles**

Note: Not all tube bundles are removable.

Drain as above. Remove header as above. The tube bundle may be heavy. Ensure that adequate facilities are available to withdraw the bundle without distortion or damage. Avoid damaging surfaces of flanges. When lifting or working on the tube bundle support it by the tubeplates and the support plates - ideally on wooden blocks cut to fit the curvature of the tube bundle. The tube bundle must not be supported on the tubes. Do not bend or distort supports and baffles.

Because tube bundles are fairly tightly packed, chemical cleaning, e.g. using acid solution containing inhibitors, will generally give the best results. Take care that the chemicals used will not cause any adverse or hazardous reaction with the materials of the tube bundle or the deposits being cleaned.

Do not blow steam through single tubes - this will cause the tube to expand and disrupt the tube joint.

Do not blow air through tubes if they may contain inflammable fluids (explosion hazard)

Re-fit the tube bundle using new gaskets and re-fill the calorifier. Check all gaskets and joints for signs of leaks.



**7. Steam Trap Instructions**

# INSTRUCTION MANUAL

**TLV** FREE FLOAT TYPE STEAM TRAPS  
JX SERIES

# EINBAU-UND BETRIEBSANLEITUNG

**TLV** KUGELSCHWIMMER-KONDENSATABLEITER  
JX SERIE

# MANUEL D'UTILISATION

**TLV** PURGEURS DE VAPEUR A FLOTTEUR FERME LIBRE  
GAMME JX

**J3X, J5X**



**J7X, J7LX**



**J7.2X, J7.5X, J8X**



English

Deutsch

Français

**TLV** CO., LTD.

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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/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.

English

# Einführung

Bitte lesen Sie die Betriebsanleitung vor Einbau und Inbetriebnahme sorgfältig durch und bewahren Sie sie für späteren Gebrauch an einem leicht zugänglichen Ort auf.

Die Kugelschwimmer-Kondensatableiter der JX Serie, mit thermischem Entlüfter (X-Element) können für alle Anlagengrößen und mit Betriebsdrücken bis 13 bar ü eingesetzt werden. Sie eignen sich besonders für Anwendungen, bei denen Kondensat mit geringer Unterkühlung unter Sattdampf temperat ur abgeleitet werden soll, insbesondere zur Leitungsentwässerung, sowie für alle Arten von Wärmetauschern und Prozessanlagen.

1 bar = 0,1 MPa

Wenden Sie sich an TLV für Sonderausführungen, die nicht in dieser Einbau- und Betriebsanleitung enthalten sind.

Wir behalten uns vor, den Inhalt dieser Betriebsanleitung ohne Ankündigung zu ändern.

Deutsch

# Introduction

Veillez lire attentivement ce manuel afin d'utiliser correctement le produit. Nous vous recommandons de le garder dans un endroit sûr pour de futures références.

Les purgeurs de vapeur de la gamme JX avec purge d'air thermostatique (élément X) peuvent être utilisés sur des applications de toutes capacités jusqu'à 13 bar. Ces modèles conviennent aux installations de chauffage évacuant le condensat à une température légèrement inférieure à la température de saturation, telles les conduites de vapeur, échangeurs de chaleur et équipement pour procédés de tout genre.

1 bar = 0,1 MPa

Pour tout produit aux spécifications particulières ou comportant des options non reprises dans ce manuel, veuillez contacter TLV.



Le contenu de ce manuel est sujet à modifications sans préavis.

Français

# 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.

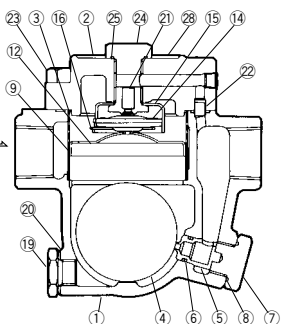
 <b>DANGER</b>	 <b>WARNING</b>	 <b>CAUTION</b>
Indicates an urgent situation which poses a threat of death or serious injury.	Indicates that there is a potential threat of death or serious injury.	Indicates that there is a possibility of injury or equipment/product damage.

	<b>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>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.
	<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 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.
	<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.
	<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.
	<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.
	<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.
<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.	
	

## 2. Configuration Aufbau Configuration

J3X, J5X

English

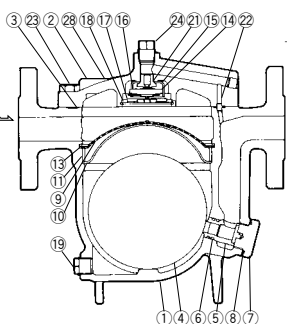


No.	Description	No.	Description
1	Body	15	X-element Guide
2	Cover	16	Spring Clip
3	Cover Gasket	17	X-element Cover
4	Float	18	Snap-Ring
5	Orifice	19	Drain Plug
6	Orifice O-Ring	20	Drain Plug Gasket
7	Orifice Holder Plug	21	Air Vent Valve Seat
8	Orifice Plug Gasket	22	Connector
9	Screen	23	Cover Bolt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

\* See page 6

J7X, J7LX, J7.5X, J8X

Deutsch

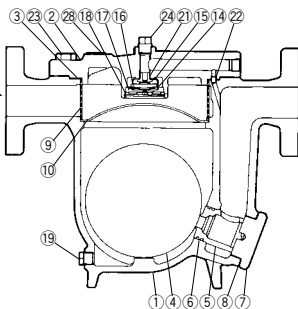


Nr.	Bauteil	Nr.	Bauteil
1	Gehäuse	15	X-Element-Halterung
2	Gehäusedeckel	16	Spannbügel
3	Gehäusedichtung	17	X-Element-Abdeckung
4	Schwimmerkugel	18	Spannring
5	Ventilsitz	19	Entwässerungsstopfen
6	Ventilsitz-O-Ring	20	Stopfendichtung
7	Ventilsitz-Haltestopfen	21	Entlüfterventilsitz
8	Stopfendichtung	22	Verbindungshülse
9	Schmutzsieb	23	Gehäuseschraube
10	Siebhalterung	24	Stopfen
11	Abstandsring	25	Stopfendichtung
12	Schwimmerabdeckung	26	Flansch (JF5X: 20, 25)*
13	Spannring	27	Rohrstück (JF5X: 20, 25)*
14	Entlüfter (X-Element)	28	Typenschild

\* Siehe Seite 6

J7.2X

Français



No.	Désignation	No.	Désignation
1	Corps	15	Guide élément X
2	Couvercle	16	Menotte de ressort
3	Joint de couvercle	17	Capot élément X
4	Flotteur	18	Anneau tendeur
5	Orifice	19	Bouchon de vidange
6	Joint torique	20	Joint de bouchon
7	Bouchon porte-orifice	21	Siège purge d'air
8	Joint de bouchon	22	Tube guide
9	Crépine	23	Boulon de couvercle
10	Porte-crépine	24	Bouchon
11	Bague d'écartement	25	Joint de bouchon
12	Capot de flotteur	26	Bride (JF5X: 20, 25)*
13	Anneau tendeur	27	Tuyau (JF5X: 20, 25)*
14	Purge d'air (élément X)	28	Plaque nominative

\* Voir page 6

# 3. Exploded View Einzelteile Pièces détachées

See also: Lock release valve, page 21.

Siehe auch Seite 21: Bypassventil.

Voir aussi la page 21: Robinet de soulagement.

## J7X, J7LX, J7.2X, J7.5X, J8X

21 Air Vent Valve Seat  
Entlüfterventilsitz  
Siège purge d'air

14 X-element  
X-Element  
Élément X

16 Spring Clip  
Spannbügel  
Menotte de ressort

17 X-element Cover  
X-Element-Abdeckung  
Capot élément X

18 Snap-Ring  
Spanning  
Anneau tendeur

13 Snap-Ring  
Spanning  
Anneau tendeur

9 Screen  
Schmutzssieb  
Crépine

11 Screen Holder Retainer  
Abstandsring  
Bague d'écartement

10 Screen Holder  
Siebhalterung  
Porte-crépine

26\* Flange  
Flansch  
Bride

## J3X, J5X

24 Plug  
Stopfen  
Bouchon

25 Plug Gasket  
Stopfendichtung  
Joint de bouchon

## J3X, J5X

23 Cover Bolt  
Gehäuseschraube  
Boulon de couvercle

22 Connector  
Verbindungshülse  
Tube guide

3 Cover Gasket  
Gehäusedichtung  
Joint de couvercle

21 Air Vent Valve Seat  
Entlüfterventilsitz  
Siège purge d'air

14 X-element  
X-Element  
Élément X

16 Spring Clip  
Spannbügel  
Menotte de ressort

12 Float Cover  
Schwimmerabdeckung  
Capot de flotteur

9 Screen  
Schmutzssieb  
Crépine

4 Float  
Schwimmerkugel  
Flotteur

7 Orifice Holder Plug  
Ventilsitz-Haltestopfen  
Bouchon porte-orifice

8 Orifice Plug Gasket  
Stopfendichtung  
Joint de bouchon

6 Orifice O-Ring  
Ventilsitz-O-Ring  
Joint torique

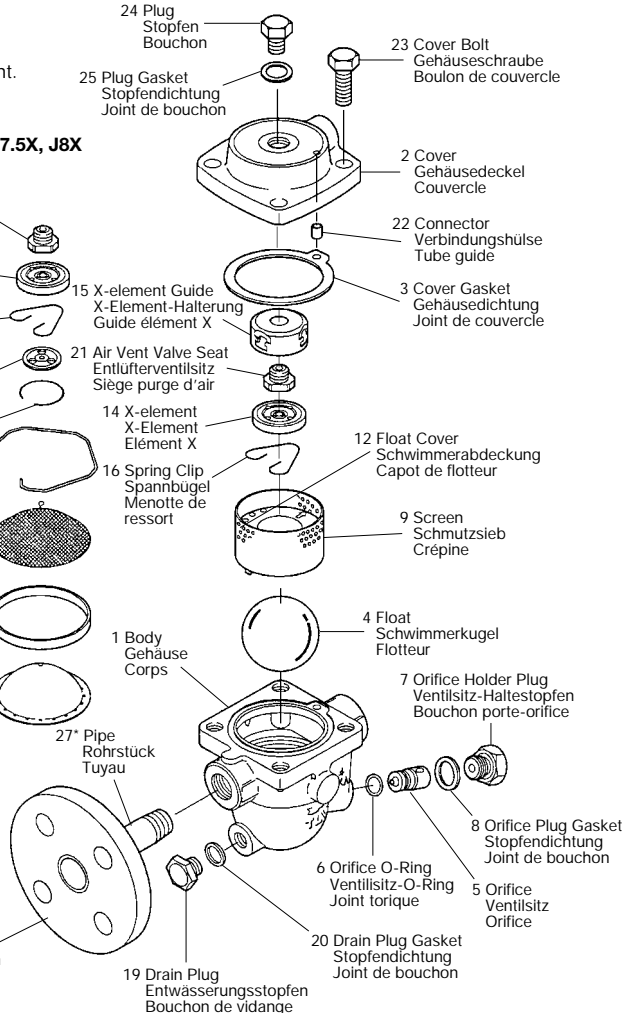
5 Orifice  
Ventilsitz  
Orifice

20 Drain Plug Gasket  
Stopfendichtung  
Joint de bouchon

19 Drain Plug  
Entwässerungsstopfen  
Bouchon de vidange

1 Body  
Gehäuse  
Corps

27\* Pipe  
Rohrstück  
Tuyau



English

Deutsch

Français

\* JF5X 20mm, 25mm (3/4", 1") only. JF5X 32mm-50mm and all other models have cast-in flanges. Nur JF5X DN20, DN25. JF5X DN32-DN50 und alle anderen Typen haben angegossene Flansche. JF5X uniquement en DN20, DN25. JF5X DN32-DN50 et tous les autres modèles ont des brides versées.

# 4. Maintenance Parts and Repair Parts

## Ersatzteile für Wartung und Reparatur

### Pièces d'entretien et de réparation

English

Maintenance Kit: M Repair Kit: R	J3X		J5X		J7X		J7LX		J7.2X		J7.5X		J8X	
	M	R	M	R	M	R	M	R	M	R	M	R	M	R
Cover Gasket 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Orifice 5		✓		✓		✓		✓		✓		✓		✓
Orifice O-Ring 6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Orifice Plug Gasket 8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Screen 9						✓		✓		✓		✓		✓
Float cover 12		✓		✓										
X-element 14		✓		✓		✓		✓		✓		✓		✓
X-element Guide 15		✓		✓		✓		✓		✓		✓		✓
Spring Clip 16		✓		✓		✓		✓		✓		✓		✓
X-element Cover 17						✓		✓		✓		✓		✓
Snap Ring 18						✓		✓		✓		✓		✓
Drain Plug Gasket 20	✓	✓	✓	✓										
Air Vent Valve Seat 21		✓		✓		✓		✓		✓		✓		✓
Plug Gasket 25	✓	✓	✓	✓										

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

Float Replacement | Replacement floats are available for all models above

Deutsch

Wartungssatz: W Reparatursatz: R	J3X		J5X		J7X		J7LX		J7.2X		J7.5X		J8X	
	W	R	W	R	W	R	W	R	W	R	W	R	W	R
Gehäusedichtung 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ventilsitz 5		✓		✓		✓		✓		✓		✓		✓
Ventilsitz-O-Ring 6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Stopfendichtung 8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Schmutzsieb 9						✓		✓		✓		✓		✓
Schwimmerabdeckung 12		✓		✓										
X-Element 14		✓		✓		✓		✓		✓		✓		✓
X-Element-Halterung 15		✓		✓		✓		✓		✓		✓		✓
Spannbügel 16		✓		✓		✓		✓		✓		✓		✓
X-Element Abdeckung 17						✓		✓		✓		✓		✓
Spannring 18						✓		✓		✓		✓		✓
Stopfendichtung 20	✓	✓	✓	✓										
Entlüfterventilsitz 21		✓		✓		✓		✓		✓		✓		✓
Stopfendichtung 25	✓	✓	✓	✓										

Anmerkung:  
Ersatzteile werden nicht einzeln, sondern nur als Teil der Einheiten Wartungssatz und Reparatursatz angeboten.

Ersatz-Schwimmerkugel | Ersatz-Schwimmerkugeln für alle Typen erhältlich

Français

Pièces d'entretien: E Pièces de réparation: R	J3X		J5X		J7X		J7LX		J7.2X		J7.5X		J8X	
	E	R	E	R	E	R	E	R	E	R	E	R	E	R
Joint de couvercle 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Orifice 5		✓		✓		✓		✓		✓		✓		✓
Joint torique 6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Joint de bouchon 8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Crépine 9						✓		✓		✓		✓		✓
Capot de flotteur 12		✓		✓										
Élément X 14		✓		✓		✓		✓		✓		✓		✓
Guide élément X 15		✓		✓		✓		✓		✓		✓		✓
Menotte de ressort 16		✓		✓		✓		✓		✓		✓		✓
Capot élément X 17						✓		✓		✓		✓		✓
Anneau tendeur 18						✓		✓		✓		✓		✓
Joint de bouchon 20	✓	✓	✓	✓										
Siège purge d'air 21		✓		✓		✓		✓		✓		✓		✓
Joint de bouchon 25	✓	✓	✓	✓										

Note:  
Les pièces de remplacement ne sont disponibles que sous la forme de jeux de pièces d'entretien et de réparation.

Remplacement du flotteur | Disponible pour tous les modèles ci-dessus

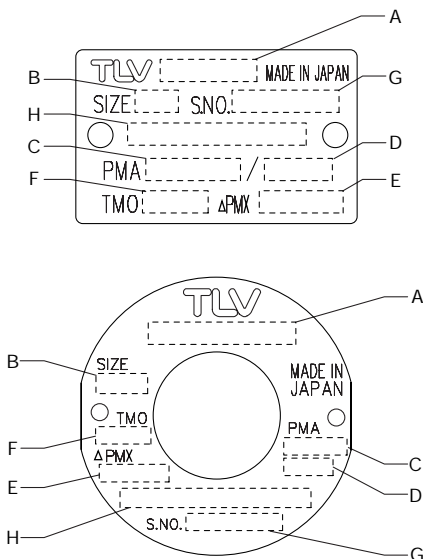
## 5. Specifications Technische Daten Données techniques

Refer to the product nameplate for detailed specifications.

Die Technischen Daten stehen auf dem Typenschild.

Les données techniques sont inscrites sur la plaquette nominative.

- A Model  
Typ  
Modèle
- B Nominal Diameter  
Grösse/DN  
Dimension/DN
- C Maximum Allowable Pressure\*  
Maximal zulässiger Druck\*  
Pression maximale admissible\*
- D Maximum Allowable Temperature\*  
Maximal zulässige Temperatur\*  
Température maximale admissible\*
- E Maximum Differential Pressure  
Maximaler Differenzdruck  
Pression différentielle maximale
- F Maximum Operating Temperature  
Maximale Betriebstemperatur  
Temp. de fonctionnement maximale
- G Serial Number  
Seriennummer  
Numéro de série
- 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.

\* Maximal zulässiger Druck (PMA) und maximal zulässige Temperatur (TMA) sind AUSLEGUNGSDATEN **NICHT** BETRIEBSDATEN.

\*\* Die "Valve No." wird angegeben bei Typen mit Optionen. Bei Typen ohne Optionen bleibt diese Stelle frei.

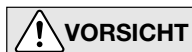
\* Pression maximale admissible (PMA) et Température maximale admissible (TMA) sont les CONDITIONS DE CALCUL DU CORPS, **PAS** LES CONDITIONS DE FONCTIONNEMENT.

\*\* Le "Valve No." est indiqué sur les modèles avec options. Ce numéro ne figure pas sur les modèles sans options.



**CAUTION**

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



**VORSICHT**

Die spezifizierten Betriebsgrenzen NICHT ÜBERSCHREITEN. Nichtbeachtung kann zu Betriebsstörungen oder Unfällen führen. Lokale Vorschriften, können zur Unterschreitung der angegebenen Werte zwingen.



**ATTENTION**

En cas de dépassement des limites de fonctionnement données, des dysfonctionnements ou accidents pourraient survenir. Il se peut que des règlements locaux limitent l'utilisation du produit en-deçà des spécifications indiquées.

English

Deutsch

Français

## 6. Proper Installation

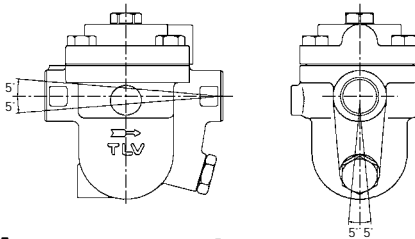


**CAUTION**

• 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. 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.
  3. Before installing the trap, blow out the inlet piping to remove all dirt and oil.
  4. 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.
  5. Support the pipes properly within 800 mm (2.5 ft) on either side of the trap.
  6. 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.
  7. Install a check valve at the trap outlet whenever more than one trap is connected to the condensate collection pipeline.
  8. The use of unions is recommended to facilitate connection and disconnection of screwed models.

Allowable Inclination



## 7. 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>

Continued page 10

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 9?

## 8. 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**

- Inspection, disassembly, maintenance and repairs should be done 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

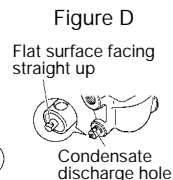
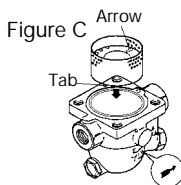
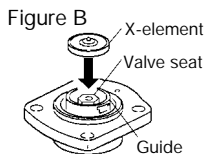
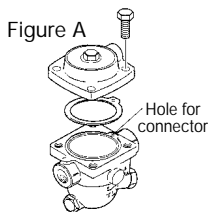
Model	Cover Bolt (23)		Air Vent Valve Seat (21)		Plug (24)		Orifice Holder Plug (7)		Drain Plug (19)	
	Nm (ft-lb)	mm (in)	Nm (ft-lb)	mm (in)	Nm (ft-lb)	mm (in)	Nm (ft-lb)	mm (in)	Nm (ft-lb)	mm (in)
J3X	50 (37)	17 (2 <sup>1</sup> / <sub>32</sub> )	35 (26)	19 (3 <sup>1</sup> / <sub>4</sub> )	30 (22)	19 (3 <sup>1</sup> / <sub>4</sub> )	50 (37)	24 (5 <sup>1</sup> / <sub>16</sub> )	50 (37)	21 (5 <sup>1</sup> / <sub>16</sub> )
J5X	80 (59)	22 (7 <sup>1</sup> / <sub>8</sub> )	35 (26)	19 (3 <sup>1</sup> / <sub>4</sub> )	30 (22)	19 (3 <sup>1</sup> / <sub>4</sub> )	80 (59)	32 (1 <sup>1</sup> / <sub>4</sub> )	50 (37)	21 (5 <sup>1</sup> / <sub>16</sub> )
J7X	70 (51)	17 (2 <sup>1</sup> / <sub>32</sub> )	35 (26)	19 (3 <sup>1</sup> / <sub>4</sub> )	30* (22)*	12 (1 <sup>5</sup> / <sub>32</sub> )	120 (88)	36 (1 <sup>13</sup> / <sub>32</sub> )	30* (22)*	12 (5 <sup>1</sup> / <sub>32</sub> )
J7LX	70 (51)	17 (2 <sup>1</sup> / <sub>32</sub> )	35 (26)	19 (3 <sup>1</sup> / <sub>4</sub> )	30* (22)*	12 (1 <sup>5</sup> / <sub>32</sub> )	130 (95)	46 (1 <sup>13</sup> / <sub>16</sub> )	30* (22)*	12 (5 <sup>1</sup> / <sub>32</sub> )
J7.2X	110 (81)	22 (7 <sup>1</sup> / <sub>8</sub> )	35 (26)	19 (3 <sup>1</sup> / <sub>4</sub> )	30* (22)*	12 (1 <sup>5</sup> / <sub>32</sub> )	400 (290)	70 (2 <sup>3</sup> / <sub>4</sub> )	30* (22)*	12 (5 <sup>1</sup> / <sub>32</sub> )
J7.5X	160 (115)	24 (1 <sup>5</sup> / <sub>16</sub> )	35 (26)	19 (3 <sup>1</sup> / <sub>4</sub> )	30* (22)*	12 (1 <sup>5</sup> / <sub>32</sub> )	600 (440)	85 (3 <sup>11</sup> / <sub>32</sub> )	40* (29)*	14 (9 <sup>1</sup> / <sub>16</sub> )
J8X	250 (185)	32 (1 <sup>1</sup> / <sub>4</sub> )	35 (26)	19 (3 <sup>1</sup> / <sub>4</sub> )	30* (22)*	12 (1 <sup>5</sup> / <sub>32</sub> )	800 (590)	105 (4 <sup>1</sup> / <sub>8</sub> )	40* (29)*	14 (9 <sup>1</sup> / <sub>16</sub> )

\* Indicates torque values with a sealing tape wrapped 3 - 3.5 times around the threads of the plug or drain plug  
1 Nm ≈ 10 kg·cm

Disassembly and Reassembly	J3X J5X	J7.2X	J7X J7LX	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		○	○	○		
Screen Holder Retainer 11				○	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 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*
Holder 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)

“O” indicates which models contain which parts

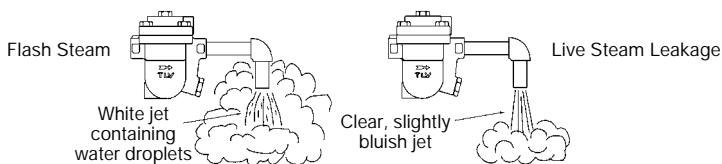


## 9. Operational Check

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 PenCheck (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.)



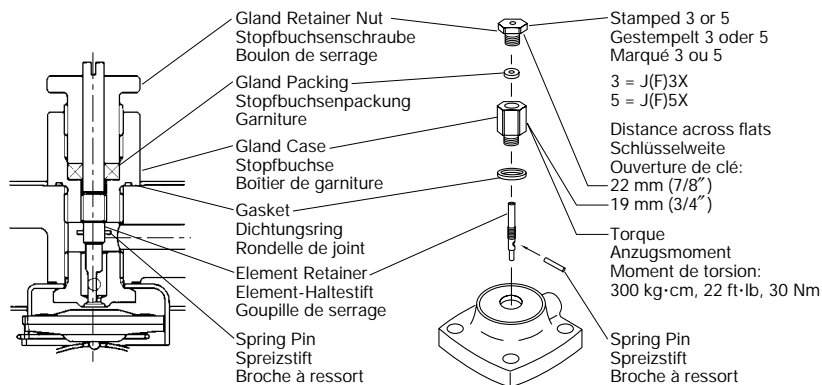
## 10. Troubleshooting

If the expected performance is unachievable after installation of the steam trap, read chapters 6 and 7 again and check the following points to take appropriate corrective measures.

Problem	Cause	Remedy
No condensate is discharged 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
Steam leaks from a place other than the trap outlet	Vibration of trap occurs	Lengthen inlet piping, then fasten it securely
	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
Float is frequently damaged	Leakage from eroded cavities of body or cover	Replace the trap
	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

# 11. Lock Release Valve (Option for J(F)3X and J(F)5X) Bypassventil (Option für J(F)3X und J(F)5X) Robinet de soulagement (Optionnel pour J(F)3X et J(F)5X)

English



Deutsch

## Operation / Gebrauchsanweisung / Mode d'emploi

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.

Der Element-Haltestift wird vor Versand auf seine höchste Stellung gedreht. Zur Einstellung der abzublaseenden Dampfmenge wird ein flacher Schraubenzieher benutzt. Wenn das Ventil nicht in Betrieb ist, sollte die höchste Position eingestellt werden. Dampfverlust durch Stopfbuchsenpackung oder-Schraube kann durch Anziehen der letzteren verhindert werden.

A la sortie de l'usine, la goupille de serrage est à sa position maximale. Utiliser un tournevis à tête plate pour ajuster la quantité de vapeur libérée. Quand elle n'est pas sollicitée, la goupille de serrage doit être ramenée à sa position maximale. Si de la vapeur fuit du boîtier de garniture ou du boulon de serrage, la fuite peut être stoppée en resserrant davantage le boulon.

## Inspection and Maintenance / Inspektion und Wartung / Contrôle et entretien

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 and the snap ring. Replace the gasket only if necessary.

Stopfbuchsen-schraube und Stopfbuchse abschrauben und alle Teile herausnehmen. Auf Verschmutzung durch Öl, Rost und Ablagerungen untersuchen. Beschädigte Teile ersetzen. Vor Zusammenbau die Stopfbuchsenpackung und den Spannung ersetzten. Dichtungsring nur bei Bedarf ersetzen.

Dévisser le boulon de serrage et le boîtier de garniture, et retirer toutes les pièces. Vérifier qu'il n'y ait pas d'huile, de saletés ou de dégâts. Remplacer les pièces endommagées. Avant le rassemblement, remplacer la garniture et l'anneau tendeur. Remplacer le joint seulement si cela est nécessaire.

Français

## 12. Product Warranty

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

## 12. Garantie

- 1) Garantiezeit: Ein Jahr nach Lieferung.
- 2) Falls das Produkt innerhalb der Garantiezeit, aus Gründen die TLV CO., LTD. zu vertreten hat, nicht der Spezifikation entsprechend arbeitet, oder Fehler an Material oder Verarbeitung aufweist, wird es kostenlos ersetzt oder repariert.
- 3) Diese Garantie erlischt in den folgenden Fällen:
  1. Schäden, die durch falschen Einbau oder falsche Bedienung hervorgerufen werden.
  2. Schäden, die durch Verschmutzungen, Ablagerungen oder Korrosion usw. auftreten.
  3. Schäden, die durch falsches Auseinandernehmen und Zusammenbau, oder ungenügende Inspektion und Wartung entstehen.
  4. Schäden verursacht durch Naturkatastrophen und Unglücksfälle.
  5. Unglücksfälle und Schäden aus anderen Gründen, die von TLV CO., LTD. nicht zu vertreten sind.
- 4) TLV CO., LTD. haftet nicht für Folgeschäden.

## 12. Garantie

- 1) Durée de la garantie: Un an à partir de la livraison du produit.
- 2) Champ d'application de la garantie: TLV CO., LTD. garantit à l'acheteur originel que ce produit est libre de tout matériau ou main d'oeuvre défectueux. Sous cette garantie, le produit sera réparé ou remplacé, au choix de TLV CO., LTD., sans aucun frais de pièces ou de main d'oeuvre.
- 3) Cette garantie ne s'applique pas aux détails cosmétiques ni aux produits dont l'extérieur a été endommagé ou mutilé; elle ne s'applique pas non plus dans les cas suivants:
  1. Dysfonctionnements dus à toute installation, utilisation ou maneiement impropre par un agent de services autre que ceux agréés par TLV CO., LTD.
  2. Dysfonctionnements attribuables aux saletés, dépôts, rouille, etc...
  3. Dysfonctionnements dus à un démontage et/ou à un rassembleage inconvenant, ou à tout contrôle ou entretien inadéquat, par un agent autre que ceux agréés par TLV CO., LTD.
  4. Dysfonctionnements dus à toute catastrophe ou force naturelle.
  5. Accidents ou dysfonctionnements dus à toute autre cause échappant au contrôle de TLV CO., LTD.
- 4) En aucun cas, TLV CO., LTD. ne sera responsable des dégâts économiques ou immobiliers consécutifs.

## **8. Check Valve Instructions**

# INSTRUCTION MANUAL

**TLV** DISC TYPE CHECK VALVES  
CK3M • CK3T • CK3R / CKF3M • CKF3R / CK3MG

# EINBAU-UND BETRIEBSANLEITUNG

**TLV** RÜCKSCHLAGVENTILE  
CK3M • CK3T • CK3R / CKF3M • CKF3R / CK3MG

# MANUEL D'UTILISATION

**TLV** CLAPETS DE RETENUE  
CK3M • CK3T • CK3R / CKF3M • CKF3R / CK3MG

English

Deutsch

Français

CK3M • CK3T • CK3R



CKF3M • CKF3R



CK3MG



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## 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.

TLV disc type check valves can be used on fluid lines for steam, gas, air, hot and cold water, with minimum opening pressure differential from 0.001 MPa (0.15 psi) and maximum operating pressure to 3.0 MPaG (420 psig), and temperatures up to 350 °C (662 °F). (Please consult TLV before use with hazardous fluids.) Due to their compact design, the check valves can easily be installed in places where space is limited, and may be installed either horizontally or vertically.

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.

## Einführung

Bitte lesen Sie die Betriebsanleitung vor Einbau und Inbetriebnahme sorgfältig durch und bewahren Sie sie für späteren Gebrauch an einem leicht zugänglichen Ort auf.

Die Rückschlagventile der Serie CK eignen sich zum Einbau in Rohrleitungen für Dampf, Gas Luft, Heiß und Kaltwasser mit minimalem Öffnungsdruck von 0.01 bar, maximalem Betriebsdruck von 30 bar ü und maximaler Betriebstemperatur von 350 °C. (Bei gefährlichen Fluiden konsultieren Sie bitte TLV.) Die Rückschlagventile haben wegen ihrer kompakten Bauweise einen geringen Platzbedarf und können sowohl in horizontale als auch vertikale Rohrleitungen eingebaut werden.

1 bar = 0,1 MPa

Wenden Sie sich an TLV für Sonderausführungen, die nicht in dieser Einbau- und Betriebsanleitung enthalten sind.

Wir behalten uns vor, den Inhalt dieser Betriebsanleitung ohne Ankündigung zu ändern.

## Introduction

Veuillez lire attentivement ce manuel afin d'utiliser correctement le produit. Nous vous recommandons de le garder dans un endroit sûr pour de futures références.

Les clapets de retenue TLV à disque peuvent être utilisés sur des conduites de vapeur, de gaz, d'air ou d'eau (chaude et froide), avec une pression différentielle d'ouverture minimale de 0,01 bar et une pression de fonctionnement maximale de 30 bar, ainsi que des températures jusqu'à 350 °C (Consulter TLV avant l'utilisation avec des fluides dangereux). Grâce à leur conception compacte, les clapets de retenue peuvent facilement être installés à des endroits où l'espace est limité, et ce soit horizontalement soit verticalement.


1 bar = 0,1 MPa


Pour tout produit aux spécifications particulières ou comportant des options non reprises dans ce manuel, veuillez contacter TLV.


Le contenu de ce manuel est sujet à modifications sans préavis.


# 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.

 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.

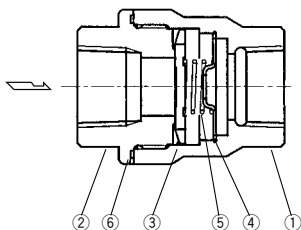
 **CAUTION** Indicates that there is a possibility of injury, or equipment/product damage.

 <b>CAUTION</b>	<p><b>DO NOT use this product outside the recommended operating pressure, temperature and other specification ranges.</b> Improper use may result in such hazards as damage to the product or malfunctions that may lead to serious accidents. Local regulations may restrict the use of this product to below the conditions quoted.</p>
	<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>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>Do not use excessive force when connecting threaded pipes to the product.</b> Over-tightening may cause breakage leading to fluid discharge, which may cause burns or other injury.</p>

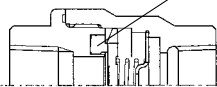
## 2. Configuration Aufbau Configuration

English

### CK3M • CK3T • CK3R



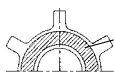
CK3T



CK3T:

- Inlet Union Valve
- Seat PTFE\* Insert
- Einlassmuffe mit PTFE\* Ventilsitzeinlage
- Manchon d'entrée avec siège de soupape PTFE\*

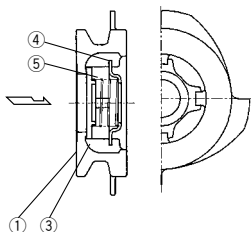
CK3R



CK3R:

- Valve Disc NBR\*\* Inlay
- Ventilteller mit NBR\*\* Dichtring
- Disque avec anneau d'étanchéité NBR\*\*

### CKF3M • CKF3R



CKF3R

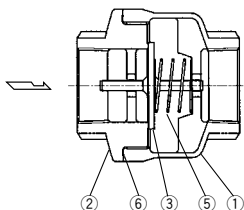


CKF3R:

- Valve Disc FPM\*\*\* Inlay
- Ventilteller mit FPM\*\*\* Dichtring
- Disque avec anneau d'étanchéité FPM\*\*\*

Deutsch

### CK3MG



\* PTFE = Polytetrafluoroethylen

\*\* NBR = Nitrile-Butadiene Rubber

(CK3R: FPM\*\*\* available as option)

\*\*\* FPM = Fluoro Carbon Rubber

\* PTFE = Polytetrafluoroäthylen

\*\* NBR = Nitril-Butadien-Kautschuk

(CK3R: FPM\*\*\* als Option erhältlich)

\*\*\* FPM = Fluorokohlenstoff-Kautschuk

\* PTFE = Résine fluorine (polytétrafluoroéthylène)

\*\* NBR = Caoutchouc nitrile butadiène

(CK3R: Caoutchouc FPM\*\*\* en option)

\*\*\* FPM = Caoutchouc fluorocarbone

No.	Description	No.	Description	No.	Description
1	Body	3	Valve Disc	5	Coil Spring
2	Inlet Union	4	Spring Holder	6	Union Gasket

No.	Bauteil	No.	Bauteil	No.	Bauteil
1	Gehäuse	3	Ventilteller	5	Schließfeder
2	Einlassmuffe	4	Schließfederhalter	6	Gehäusedichtung

No.	Désignation	No.	Désignation	No.	Désignation
1	Corps	3	Disque	5	Ressort spiral
2	Raccord entrée	4	Support du ressort	6	Joint de corps

Français

### 3. Specifications Technische Daten Données techniques

Model	Size mm (in)	Body Material*	Max. Operating Pressure PMO MPaG [psig]	Max. Operating Temperature TMO °C [°F]	Minimum Opening Differential Pressure MPa (psi)
Typ	Größe/DN mm (in)	Gehäusewerkstoff*	Max. Betriebstemperatur PMO MPaG [psig]	Max. Betriebstemperatur TMO °C [°F]	Minimale Öffnungsdifferenzdruck MPa (psi)
Modèle	Dimension mm (in)	Matériau du corps*	Pression de fonctionnement maximale PMO MPaG [psig]	Température de fonctionnement maximale TMO °C [°F]	Pression différentielle d'ouverture minimale MPa (psi)
CK3M	15 - 25 (½ - 1)	BRA	1.0 [150]	220 [428]	0.002 [0.3]
	32 - 50 (1¼ - 2)	BRO			
	15 - 50 (½ - 2)	STA	2.1 [300]		
CK3T	15 - 25 (½ - 1)	BRA	1.0 [150]	185 [365]	
	32 - 50 (1¼ - 2)	BRO			
	15 - 25 (½ - 1)	STA	1.6 [230]		
CK3R	15 - 25 (½ - 1)	BRA	1.0 [150]	90 [194]	
	32 - 50 (1¼ - 2)	BRO			
	15 - 25 (½ - 1)	STA	1.6 [230]		
CKF3M	15 - 100 (½ - 4)	STA	3.0 [420]	350 [662]	
CKF3R	15 - 50 (½ - 2)	STA	1.6 [230]	150 [302]	
CK3MG	25, 40, 50, 80 (1, 1½, 2, 3)	STA	2.1 [300]	220 [428]	0.001 [0.15]

\* BRA = Brass; Messing; Laiton BRO = Bronze; Bronze; Bronze 1 MPa = 10.197 kg/cm<sup>2</sup>  
 STA = Stainless Steel; Edelstahl; Acier inoxydable 1 bar = 0.1 MPa

**PRESSURE SHELL DESIGN CONDITIONS (NOT OPERATING CONDITIONS):**  
 Maximum Allowable Pressure (MPaG) [psig] **PMA:** CK3M, CK3T, CK3R: 1.0 [150] (BRA, BRO), 2.1 [300] (STA); CK3FM & CKF3R: 3.0 [420]; CK3MG: 3.2 [450]  
 Maximum Allowable Temperature (°C) [°F] **TMA:** CK3M, CK3T, CK3R, CKF3R, CK3MG: 220 [428]; CKF3M: 350 [662]

**AUSLEGUNGSDATEN (NICHT BETRIEBSDATEN):**  
 Maximal zulässiger Druck (bar ü) **PMA:** CK3M, CK3T, CK3R: 10 (BRA, BRO), 21 (STA); CK3FM & CKF3R: 30; CK3MG: 32  
 Maximal zulässige Temperatur (°C) **TMA:** CK3M, CK3T, CK3R, CKF3R, CK3MG: 220; CKF3M: 350

**CONDITIONS DE CALCUL DU CORPS (PAS LES CONDITIONS DE FONCTIONNEMENT):**  
 Pression maximale admissible (bar) **PMA:** CK3M, CK3T, CK3R: 10 (BRA, BRO), 21 (STA); CK3FM & CKF3R: 30; CK3MG: 32  
 Température maximale admissible (°C) **TMA:** CK3M, CK3T, CK3R, CKF3R, CK3MG: 220 ; CKF3M: 350

 **CAUTION**

To avoid abnormal operation, accidents or serious injury, DO NOT use this product outside of the specification range. Local regulations may restrict the use of this product to below the conditions quoted.

 **VORSICHT**

Die spezifizierten Betriebsgrenzen NICHT ÜBERSCHREITEN. Nichtbeachtung kann zu Betriebsstörungen oder Unfällen führen. Lokale Vorschriften, können zur Unterschreitung der angegebenen Werte zwingen.

 **ATTENTION**

En cas de dépassement des limites de fonctionnement données, des dysfonctionnements ou accidents pourraient survenir. Il se peut que des règlements locaux limitent l'utilisation du produit en-deçà des spécifications indiquées.

English

Deutsch

Français

### 3. Specifications Technische Daten Données techniques (Continued Fortsetzung Suite)

#### Cv Values Kvs-Werte Valeurs Kvs

English

#### CK3M • CK3T • CK3R

Size: mm (in) Größe/DN: mm (in) Dimension/DN: mm (in)	Cv (US)	Cv (UK)	Kvs (DIN)
15 (1/2)	3.7	3.1	3.2
20 (3/4)	6.6	5.5	5.7
25 (1)	10	8.3	8.6
32 (1 1/4)	15	13	13
40 (1 1/2)	21	17	18
50 (2)	29	24	25

Deutsch

#### CKF3M • CKF3R

Size: mm (in) Größe/DN: mm (in) Dimension/DN: mm (in)	Cv (US)	Cv (UK)	Kvs (DIN)
15 (1/2)	4.6	3.8	3.9
20 (3/4)	8.6	7.3	7.5
25 (1)	16	13	14
32 (1 1/4)	20	17	17
40 (1 1/2)	29	24	25
50 (2)	54	45	46
65* (2 1/2)*	100	83	85
80* (3)*	140	117	120
100* (4)*	240	200	206

\* Only available in CKF3M    Nur CKF3M    CKF3M uniquement

Français

#### CK3MG

Size: mm (in) Größe/DN: mm (in) Dimension/DN: mm (in)	Cv (US)	Cv (UK)	Kvs (DIN)
25 (1)	25	21	21
40 (1 1/4)	55	46	47
50 (2)	91	76	78
80 (3)	180	150	154

## 4. Proper Installation



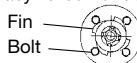
- Installation, inspection, maintenance, repairs, disassembly, adjustment and valve opening/closing should be carried out only by trained maintenance personnel.
- Do not use excessive force when connecting threaded pipes to the product. Over-tightening may cause brakage leading to fluid discharge, which may cause burns or other injury.
- Install for use under conditions in which no freeze-up will occur.

1. Be sure to chose the model that meets operating temperature requirements as shown below:

Flow Temp. °C (°F)	Model				
350 (662) or less	CKF3M	CK3M • CK3MG	CK3T	CKF3R	CK3R*
220 (428) or less					
185 (365) or less					
150 (302) or less					
90 (194) or less					

\* Model CK3R with optional disc inlay ring of FPM rubber can be used to 150 °C (320 °F).

2. Before installation, be sure to remove all protective seals.
3. Before installing the product, blow out the inlet piping to remove all dirt and oil.
4. The product can be installed horizontally or vertically, but vertical installation is recommended.
5. Install the product so the arrow on the body is pointing in the direction of flow.
6. Make sure the weight of the outlet piping does not place an excessive load on the product.
7. CKF3M and CKF3R are wafer/flangeless models, with an easy-to-center design. To center, install with the fins touching the bolts.



## 5. Operational Check

A visual inspection can be carried out to aid in determining the necessity for immediate maintenance or repair. Periodically (at least biannually) the operation should be checked using diagnostic equipment such as a stethoscope.

Normal:	Where inlet pressure is higher than outlet pressure (equal to or greater than the minimum opening differential pressure), flow, in the proper direction, can be verified. If outlet pressure becomes higher than inlet pressure, flow ceases.
Leakage:	There is flow even when outlet pressure becomes higher than inlet pressure.

## 6. Inspection and Maintenance

Operational inspections should be performed at least twice per year, or as called for by the check valve operating conditions.



- Inspection, disassembly, maintenance and repairs should be done only by trained maintenance personnel.
- 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.
- Be sure to use the proper components and NEVER attempt to modify the product.

### Parts Inspection Procedure

Gaskets	Check for warping or damage
Valve Disc, Inlet Union Sealing Surfaces	Check for scratches
Coil Spring, Spring Holder (after cleaning inside the body)	Check for scratches or wear

### Tightening Torque and Distance Across Flats

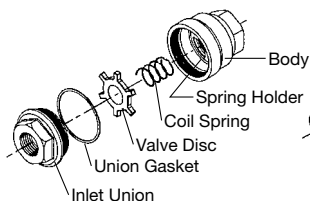
Model	CK3M • CK3T • CK3R			CK3MG		
	Size	Torque	Distance Across Flats	Torque	Distance Across Flats	
	mm (in)	N•m (ft•lb)	mm (in)	N•m (ft•lb)	mm (in)	(in)
15	(1/2)	100 (73)	27 (1 1/16)	—	—	—
20	(3/4)	150 (110)	32 (1 1/4)	—	—	—
25	(1)	180 (130)	41 (1 5/8)	180 (130)	41	(1 5/8)
32	(1 1/4)	250 (185)	50 (2)	—	—	—
40	(1 1/2)	300 (220)	55 (2 3/16)	600 (440)	60	(2 3/8)
50	(2)	400 (290)	70 (2 3/4)	800 (590)	75	(3)
80	(3)	—	—	800 (590)	100	(3 15/16)

1 N•m ≈ 10 kg•cm

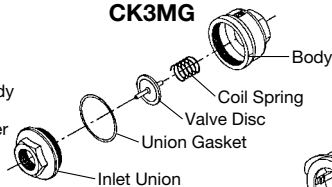
## Disassembly/Reassembly

CK3M • CK3T • CK3R / CK3MG		
Part	During Disassembly	During Reassembly
Inlet Union	Remove with a wrench	Coat threads with anti-seize and tighten to the proper torque (see torque table on page 8)
Union Gasket	—	Make sure the gasket does not get pinched when tightening the inlet union
Valve Disc	—	Insert, making sure the polished or rubber surface is facing the inlet union
Coil Spring	—	CK3M • CK3T • CK3R: Insert into housing CK3MG: Place the coil spring on the disc stem
Spring Holder (except CK3MG)	Tightly inserted in body, DO NOT remove	—
CKF3M • CKF3R		
Spring Holder	Tabs "A" are bent to hold the spring in place, to disassemble, straighten the tabs and turn the spring holder to remove	After insertion, bend tabs "A" again
Coil Spring	—	Insert into the groove in the valve disc
Valve Disc	—	Insert, making sure the polished or rubber surface is facing the body

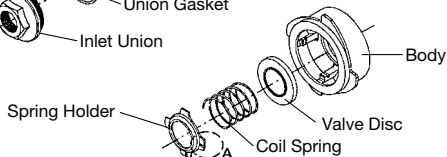
## CK3M • CK3T • CK3R



## CK3MG



## CKF3M • CKF3R



## 7. Troubleshooting

If the expected performance is unachievable after installation of the check valve read chapter 4 again and check the following points for appropriate corrective measures.

Problem	Cause	Remedy
The sound of flow can be heard when outlet pressure is higher than inlet pressure	Dirt or damage on sealing surfaces or build-up inside the body	Clean or replace parts
	Valve disc is catching	Clean or replace parts
	Coil spring is dislodged or broken	Replace with new coil spring
	Spring holder is dislodged or broken	Replace parts or check valve
Leakage to outside of the check valve	Union gasket is warped or damaged	Replace with new gasket
	Inlet union tightening torque is insufficient	Tighten to proper torque
	Check valve is bearing weight of piping	Support piping
Flow is poor	Valve disc is catching due to dirt or rust, etc.	Clean parts
	Incorrect operating pressure	Adjust pressure

## 8. Product Warranty

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

## 8. Garantie

- 1) Garantiezeit: Ein Jahr nach Lieferung.
- 2) Falls das Produkt innerhalb der Garantiezeit, aus Gründen die TLV CO., LTD. zu vertreten hat, nicht der Spezifikation entsprechend arbeitet, oder Fehler an Material oder Verarbeitung aufweist, wird es kostenlos ersetzt oder repariert.
- 3) Diese Garantie erlischt in den folgenden Fällen:
  1. Schäden, die durch falschen Einbau oder falsche Bedienung hervorgerufen werden.
  2. Schäden, die durch Verschmutzungen, Ablagerungen oder Korrosion usw. auftreten.
  3. Schäden, die durch falsches Auseinandernehmen und Zusammenbau, oder ungenügende Inspektion und Wartung entstehen.
  4. Schäden verursacht durch Naturkatastrophen und Unglücksfälle.
  5. Unglücksfälle und Schäden aus anderen Gründen, die von TLV CO., LTD. nicht zu vertreten sind.
- 4) TLV CO., LTD. haftet nicht für Folgeschäden.

## 8. Garantie

- 1) Durée de la garantie: Un an à partir de la livraison du produit.
- 2) Champ d'application de la garantie: TLV CO., LTD. garantit à l'acheteur original que ce produit est libre de tout matériau ou main d'oeuvre défectueux. Sous cette garantie, le produit sera réparé ou remplacé, au choix de TLV CO., LTD., sans aucun frais de pièces ou de main d'oeuvre.
- 3) Cette garantie ne s'applique pas aux détails cosmétiques ni aux produits dont l'extérieur a été endommagé ou mutilé; elle ne s'applique pas non plus dans les cas suivants:
  1. Dysfonctionnements dus à toute installation, utilisation ou maniement impropre par un agent de services autre que ceux agréés par TLV CO., LTD.
  2. Dysfonctionnements attribuables aux saletés, dépôts, rouille, etc...
  3. Dysfonctionnements dus à un démontage et/ou à un rassemblement inconvenant, ou à tout contrôle ou entretien inadéquat, par un agent autre que ceux agréés par TLV CO., LTD.
  4. Dysfonctionnements dus à toute catastrophe ou force naturelle.
  5. Accidents ou dysfonctionnements dus à toute autre cause échappant au contrôle de TLV CO., LTD.
- 4) En aucun cas, TLV CO., LTD. ne sera responsable des dégâts économiques ou immobiliers consécutifs.

