



BALANCED PRESSURE THERMOSTATIC STEAM TRAPS



X-ELEMENT

Extremely strong

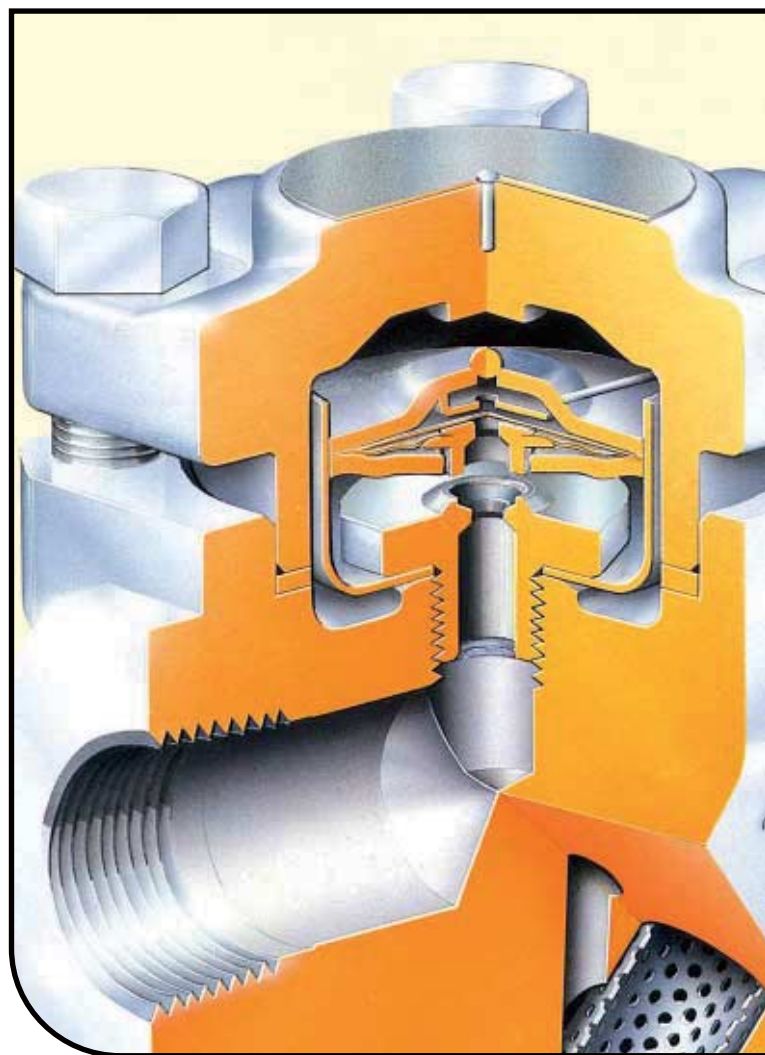
Pressure resistant capsule

The X-Element responds alternately to internal pressure (pressure of evaporated fill) and external pressure (primary steam pressure). The internal pressure builds up according to the steam or condensate temperature. The temperature can be very high as a result of superheated steam (5.0 MPaG and higher) or the external pressure may decrease suddenly (e.g. when steam is blown off during batch operation) while the internal pressure remains high, resulting in sudden and high stress to the element. To withstand such harsh conditions the element is built of sufficiently thick, high-tensile stainless steel plate.

Diaphragm support 1

Shape of valve supports element

The design of the valve matches the shape of the diaphragm so that the latter is well supported and the danger of deformation or rupture of the element is eliminated.



SAFETY - "FAIL OPEN" FEATURE

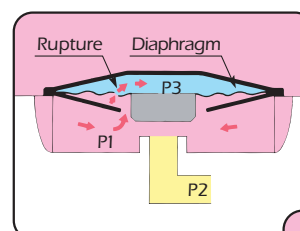
What does "fail open" mean?...

The "fail open" feature means that the valve will open even if the diaphragm (the most delicate part of a thermostatic capsule element) should break. This is an advantage because a valve closed in case of failure allows condensate to accumulate and pose the following problems and hazards:

1. Temperature drop in process equipment.
2. Interruption of production or deterioration of product quality.
3. Water hammer.

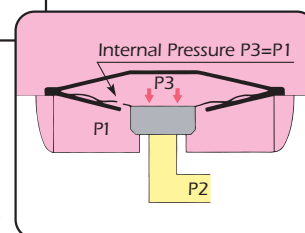
...the "fail open" feature minimizes the danger of production losses and safely avoids water hammer in the event of trap failure.

Failure of capsule elements with only one diaphragm (including some bellows elements):



1. When the diaphragm breaks, its fill escapes and the primary pressure P1 builds up in the element above the diaphragm.

2. The internal pressure of the capsule P3 becomes equal to P1 so that the valve closes.
 $P1 = P3 > P2$



The closed valve causes condensate to accumulate.

ong capsule element for reliability and safety.



Diaphragm support 2

Case supports diaphragm

The case is designed to completely match the shape of the diaphragm. Therefore, even with excessive internal pressure, the diaphragm is effectively protected from damage.



Safety - "fail open" feature

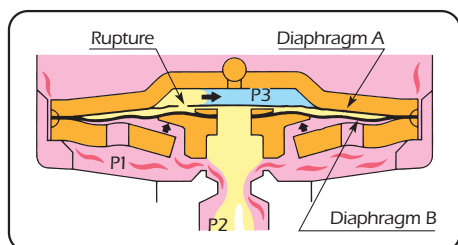
The unique configuration of multiple diaphragms and a valve with a hole through the center of its plug results in a "fail open" valve position should these parts fail. Condensate will be discharged even after damage to the X-element occurs. Consequently, the process will not be disturbed or interrupted, nor will there be a danger of water hammer due to condensate build-up.

Inline repairable

Inline maintenance of valve and screen is easy with L-Series steam traps. After removing trap cover and spring clip the valve is accessible, while the screen can be reached by removing the screen holder plug.



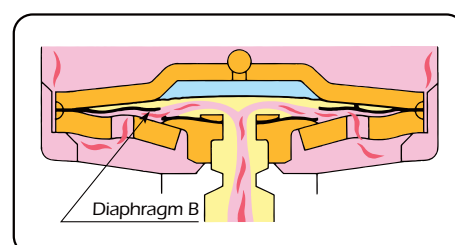
Rupture of Diaphragm A in the X-Element



The pressure P_3 approaches P_2 and the valve plug is pushed up by the primary pressure P_1 to open the valve.

As long as the primary pressure is maintained, the valve remains in the upper position and the "FAIL OPEN" feature works.

Rupture of Diaphragm B in the X-Element

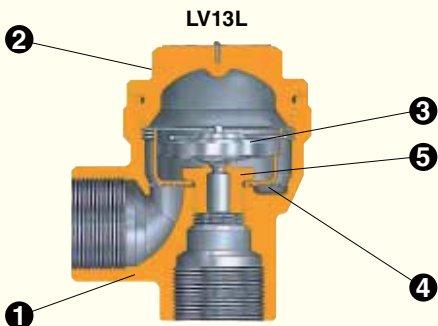
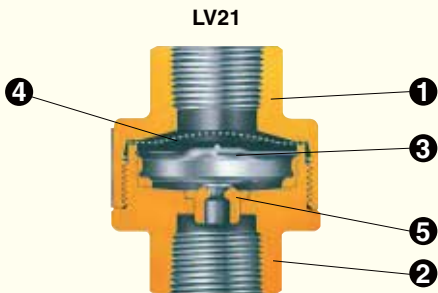
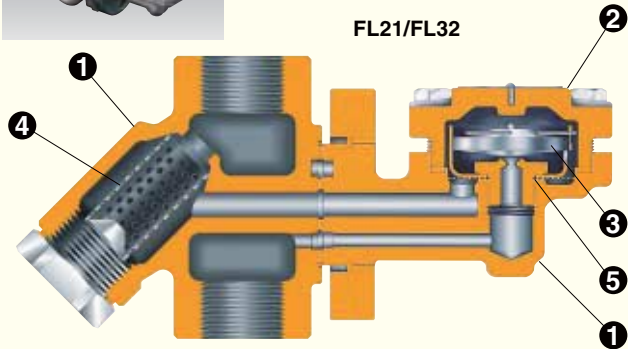
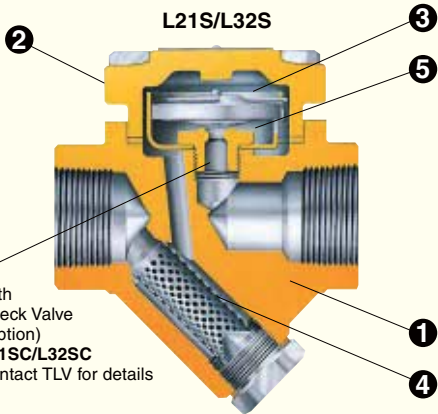


Even in an extreme case, where the valve plug is severed completely from the lower diaphragm, the condensate can drain through the hole in the valve plug center.

In this "OPEN" failure, the condensate discharge rate is approximately 60% of the maximum discharge rate of the steam trap. When the diaphragm B suffers only a slight rupture and the valve plug is not severed, the valve stays 100% open for maximum discharge.

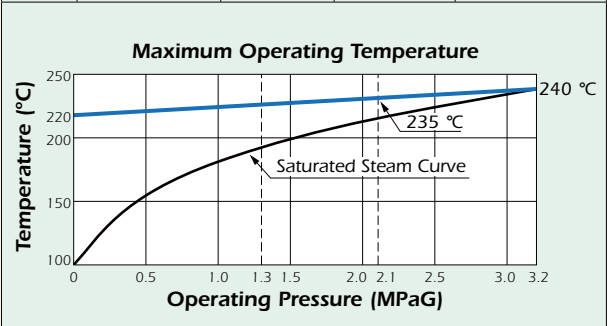


Specifications



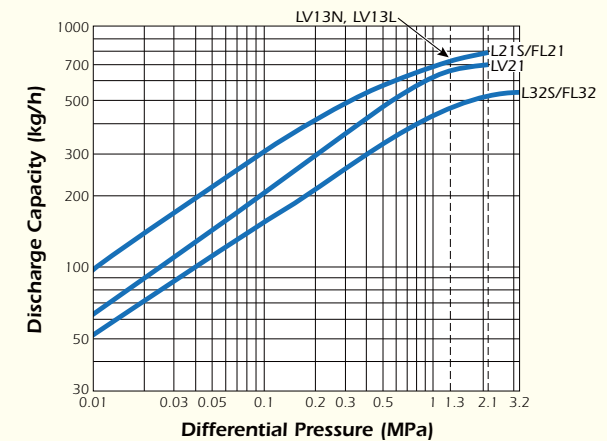
LV13N

Model	Size (mm)	Maximum Operating Pressure (MPaG)	Maximum Operating Temperature (°C)	Connection
L21S	15, 20, 25	2.1	See graph below	Screwed Socket Welded Flanged
L32S		3.2		
FL21		2.1		
FL32	8, 10, 15	3.2		
LV21		2.1		
LV13L	15, 20	1.3	200	Screwed
LV13N				



No.	Description	Material			
		L21S L32S	FL21 FL32	LV21	LV13L LV13N
1	Body	Carbon Steel	Stainless Steel	Stainless Steel	Brass
2	Cover	Carbon Steel	Carbon Steel	Stainless Steel	Brass
3	X-element	Stainless Steel			
4	Screen	Stainless Steel			
5	Valve Seat	Stainless Steel			

Discharge Capacity



- Differential pressure is the difference between the inlet and outlet pressure of the trap.
 - Recommended safety factor: 2
- 1 MPa = 10.197 kg/cm²

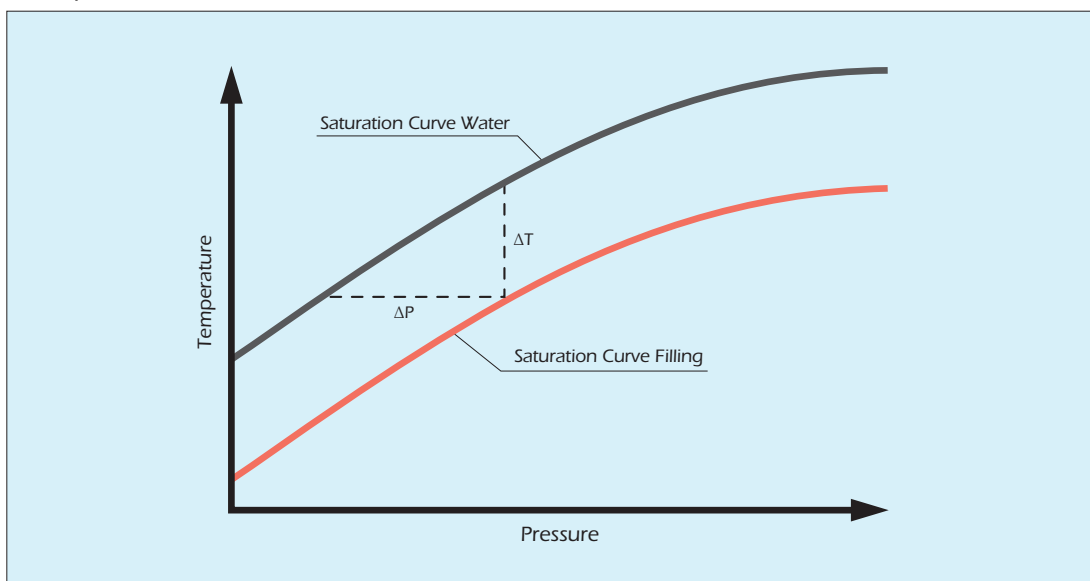


To avoid abnormal operation, accidents or serious injury, DO NOT use this product outside of the specification range. Local regulations may restrict the use of this product to below the conditions quoted.

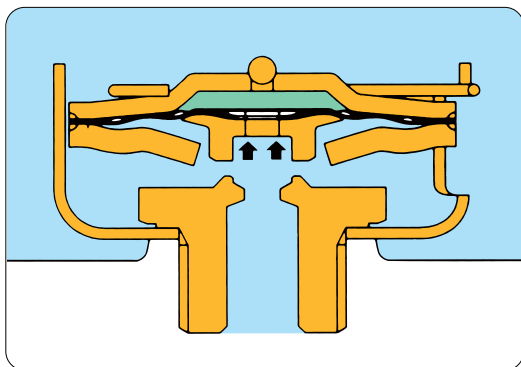
capsule element for reliability and safety.



The capsule element contains a liquid whose saturation temperature is slightly lower than the saturation temperature of water. With rising temperature in the trap, the fill evaporates; the resulting internal pressure expands the diaphragm to close the valve. When the temperature decreases, the fill condenses and the resulting pressure reduction allows the diaphragm to contract and open the valve.

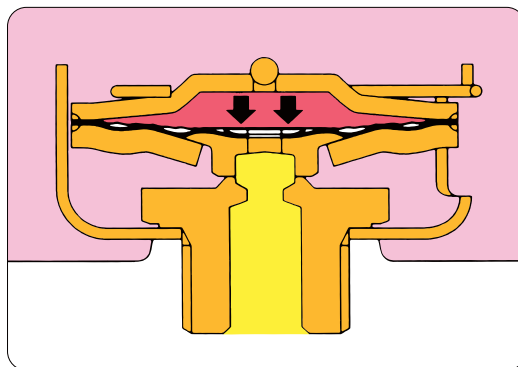


VALVE OPEN



During start up of steam-using equipment while the capsule is still cold, the fill is in liquid state. The internal pressure is lower than the external pressure so that the diaphragm is pushed up to open the valve. Air, gases and condensate are discharged.

VALVE CLOSED



As the condensate temperature approaches steam temperature, the capsule fill boils and evaporates, increasing the internal pressure which expands the diaphragm.

- The valve closes.

When the temperature of the condensate around the element drops due to heat loss to the environment, the fill will cool as well; it condenses and the internal vapour pressure decreases. The diaphragm is lifted up by the higher external pressure.

- The valve opens and discharges condensate again.

The cycle repeats itself frequently.



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ISO 9001
ISO 14001





TEMPERATURE CONTROL STEAM TRAPS

LEX3N-TZ

With Built-in Scale Removal Function

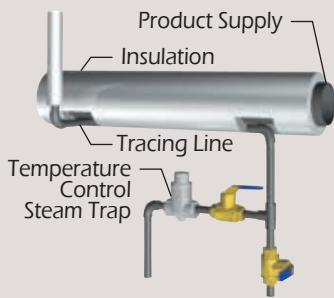


Maintain the proper temperature of oils and other fluids in supply piping and heating tanks

What is a Temperature Control Steam Trap?

Temperature control steam traps can control the temperature of discharged condensate*. Condensate with temperatures above the adjustable set temperature is held back in the piping, allowing the sensible heat in the condensate to be used for various heating applications.

The temperature control trap is useful for maintaining the fluidity of heavy oils, facilitating fluid pumping and transportation, preventing chemical or physical changes in the product due to cooling and preventing water from freezing in transportation pipes in cold areas.



* Temperature of the condensate accumulating in the equipment or pipe and the product temperature cannot be set.

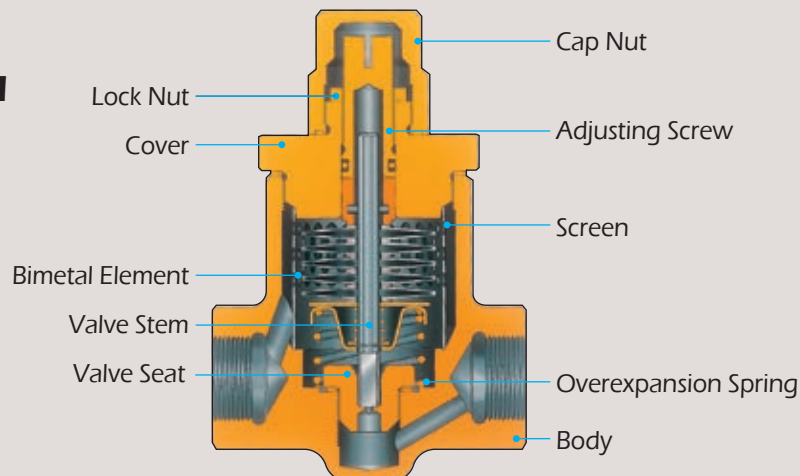
Benefits

1. Maintains temperature at preset levels by adjusting the valve closing temperature.
2. Saves steam by heating the fluid to the optimum temperature utilizing the sensible heat of condensate.
3. No steam leakage.
4. Condensate discharge temperature can be adjusted without disconnecting the trap from the piping.
5. Initial air and cold condensate can be discharged quickly, with no air binding.
6. Scale removal function can eliminate obstructive buildup from the valve seat, even during operation.
7. All stainless construction.
8. The overexpansion mechanism prevents possible damage to the bimetal from superheated steam.
9. Built-in screen ensures trouble-free operation.
10. Easy, inline access to internal parts simplifies cleaning and maintenance.
11. Can be used as an automatic non-freeze valve.
12. Quiet operation.

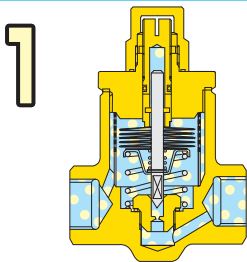
Construction

LEX3N-TZ

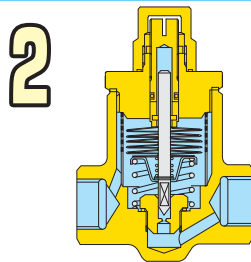
All Stainless Steel



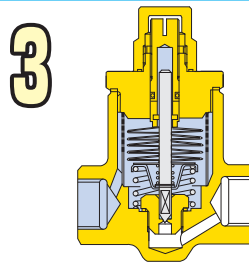
Operation



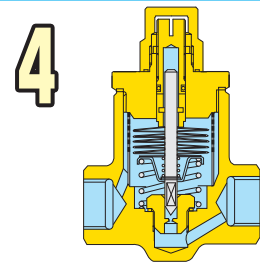
1 At startup, the bimetal element is contracted. The coil spring holds the valve open, quickly discharging the cold air and initial condensate.



2 When the condensate temperature rises, the bimetal begins to expand. The valve begins to close, allowing less condensate to flow.



3 When the condensate reaches the preset temperature, the valve shuts tightly, stopping all condensate discharge.



4 When the condensate temperature drops below the preset level, the element contracts. The coil spring opens the valve, allowing condensate to be discharged. Steps 3 and 4 alternate as condensate temperature changes.

Scale Removal Function

Clogs in the valve seat can be eliminated by simply isolating the trap, no need to remove the trap from the line.

The temperature control steam trap used in tracing lines has a small opening in the valve seat designed to reduce the flow velocity – a functional requirement. However, because of this, the possibility of the valve clogging due to the scale and other buildup is higher than for other traps. The scale removal device enables the elimination of obstructions from the valve seat.

Operating Scale Removal Device

1. Using a flat-head screwdriver, turn the adjusting screw. The sharp edge of the valve head shaves off scale and other buildup blocking the valve seat orifice.
2. By raising the adjusting screw, steam or condensate blows off the residue. This also cleans the other surfaces on the valve seat.



Clogging due to Scale



After Cleaning

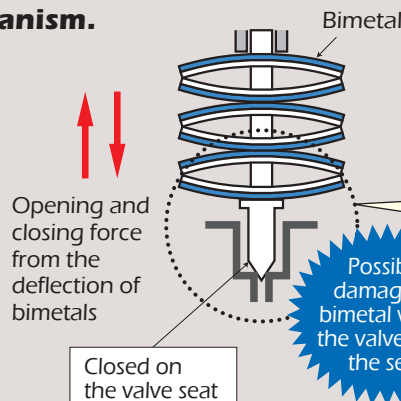


Not only is the obstruction removed from the orifice, but the surrounding valve seat surface is cleaned as well, a result of loosening the buildup followed by steam and condensate blowdown.

Overexpansion Mechanism

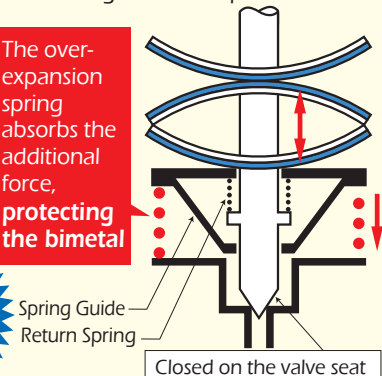
Damage to the bimetal is prevented by the overexpansion mechanism.

Temperature control steam traps function through the deflection of bimetals due to rising or falling temperature, allowing the valve to open and close. Due to the possibility of damage to the bimetal following temperature rises when the valve is already on the seat, the LEX3N-TZ employs a coil spring to allow further expansion of the bimetal while the valve is closed: up to 200 °C above the set value.



● Exceeding the set temperature

The over-expansion spring absorbs the additional force, protecting the bimetal



Temperature Setting

The discharge temperature can be adjusted and set to the desired temperature by simply adjusting the screw on the upper part of the LEX3N-TZ with a flat-head screwdriver.

Increasing the set temperature

Turn the screw:

▶ **Counterclockwise**

Decreasing the set temperature

Turn the screw:

▶ **Clockwise**

Standard Factory Setting ("0" Position)

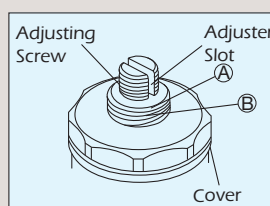
The standard "0" position is the position where point (A), the bottom of the adjusting screw slot is even with point (B), the top surface of the cap threads.

LEX3N-TZ : 100 °C at 0.9 MPaG

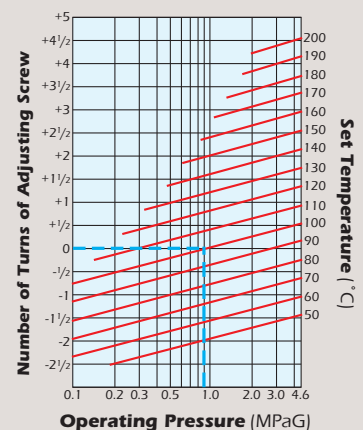
From "0" on the graph, adjust the screw to the desired temperature

⊕ : counterclockwise

⊖ : clockwise



LEX3N-TZ Adjustment chart



DO NOT REMOVE CAP NUT OR COVER WHILE TRAP IS UNDER PRESSURE. Allow trap body temperature to cool to room temperature before removing cap nut or cover. Failure to do so may result in burns or other injury. READ INSTRUCTION MANUAL CAREFULLY.

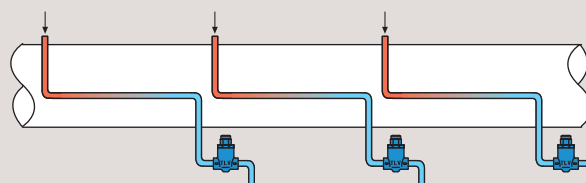
Correct Usage of Temperature Control Steam Traps

Examples of Correct Use:

✓ Applications designed to utilize sensible heat of condensate

- **SUITABLE** for steam tracing lines or storage tank coils **ONLY IF** the required product viscosity will be maintained when the condensate is sub-cooled at least 15 °C, even to the point of the condensate having a lower temperature than the product temperature.
- **SUITABLE** for use on instrument enclosures **ONLY IF** the steam or condensate temperature in the enclosures will **NOT** damage the instrument.
- **SUITABLE** for use as an external air vent for TLV steam traps, or as a non-freeze valve for freeze protection of condensate lines.

Example: Steam tracing on an oil supply pipe



Examples of Incorrect Use:

✗ Applications requiring the rapid removal of condensate or applications designed to use latent heat of steam

- **DO NOT USE** on any application **except** steam tracing lines, storage tank coils, instrument enclosures, steam trap air venting, and freeze protection of condensate lines.
- **NOT SUITABLE FOR USE** on steam tracing lines or storage tank coils **IF** the required product viscosity will **NOT** be maintained when the condensate is sub-cooled at least 15 °C.
- **NOT SUITABLE FOR USE** on steam tracing lines or storage tank coils **IF** the heated product will solidify at temperatures of 80 °C or higher. (e.g., asphalt or sulfur).
- **NOT SUITABLE FOR USE** on steam tracing lines or storage tank coils designed to use only the latent heat of steam to maintain product fluidity at temperatures of 80 °C or less. (e.g., certain heavy oils).

Incorrect use of a temperature control steam trap could lead to significant system problems. Careful consideration is required, bearing the following in mind.

Heating with sensible heat

➔ Temperature control steam trap

Heating with latent heat

➔ General purpose steam trap

Specifications

Model	Connection	Size (mm)	Maximum Operating Pressure (MPaG)	Minimum Operating Pressure (MPaG)	Maximum Operating Temperature (°C)	Condensate Temperature Setting Range (°C)	Maximum Discharge Capacity** (kg/h)
LEX3N-TZ	Screwed	10, 15, 20, 25	4.6	0.1	350	50 - 200*	440
	Socket Welded						
	Flanged	15, 20, 25					

1 MPa = 10.197 kg/cm²

* Set temperature should be more than 15 °C below the steam saturation temperature; see graph, right

** Actual discharge capacity will vary depending on operating conditions; see specification data sheet (SDS) for details

PRESSURE SHELL CONDITIONS (**NOT** OPERATING CONDITIONS): Maximum Allowable Pressure (MPaG) PMA: 6.3
Maximum Allowable Temperature (°C) TMA: 425

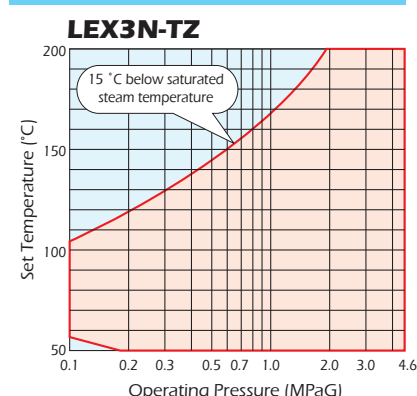
The trap may be installed either horizontally or vertically. However, when installing horizontally, make sure that the trap is installed with the temperature adjusting screw positioned higher than the piping in which the trap is installed. (Upside-down installation is not permissible.)



CAUTION

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Temperature Setting Range



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is approved by LRQA Ltd. to ISO 9001/14001

ISO 9001
ISO 14001



TLV[®]

Clean Steam Traps

**LV6 Series
SS3-P / SS5-P**



Designed for Bio and Clean Steam Applications

Clean Steam Trap

LV6 Series

SS3-P/SS5-P

All Stainless Steel Construction

- Low-quality stainless steel may corrode when exposed to water with even low ionic content. To solve this problem, the LV6 series uses AISI316L, and the SS3-P/SS5-P body and cover are made of A351 Gr.CF3M with an SUS316L float.

Prevents Condensate Accumulation

- Smooth, virtually crevice-free interior allows for complete condensate drainage.
- The SS3-P/SS5-P has a small drain hole to prevent condensate pooling.

LV6 Series

SS3-P

Drain Hole

3-piece clamp

Easy Disassembly and Cleaning

- Consists of only 5 simple components held together by easily removable clamps.
- Clamp pipe connections enable the trap to be easily removed from the pipeline.

Prevents Bacterial Contamination



- Simply constructed clamp has few projections.
- Sanitary high-performance fluorine resin gasket complies with FDA 21 CFR 177, USP Class VI and EN 1935.



- Ferrule clamp joint for clean steam, in accordance with ISO and ASME-BPE (Tri-Clamp compatible) standards, is used for connection to piping. Tube end connections are also available.



- Uniquely designed free-draining X-element* case with large openings allows for complete fluid drainage and easy cleaning. It is electro-polished for the LV6-P and the optional LV6-EP.

*LV6-CE is equipped with a standard X-element.



- The SS3-P and SS5-P free floats have an internal 0.8 μ m Ra buff polish.
(The optional SS3-EP and SS5-EP have a 0.4 μ m Ra buff and electro-polish [internal and external])



AN STEAM TRAP

Thermostatic Clean Steam Trap Compact **LV6 Series**

What is the X-element?

- A multi-diaphragm valve mechanism filled with a thermoliquid which opens and closes the valve at approximately 6 °C less than saturated steam temperature.

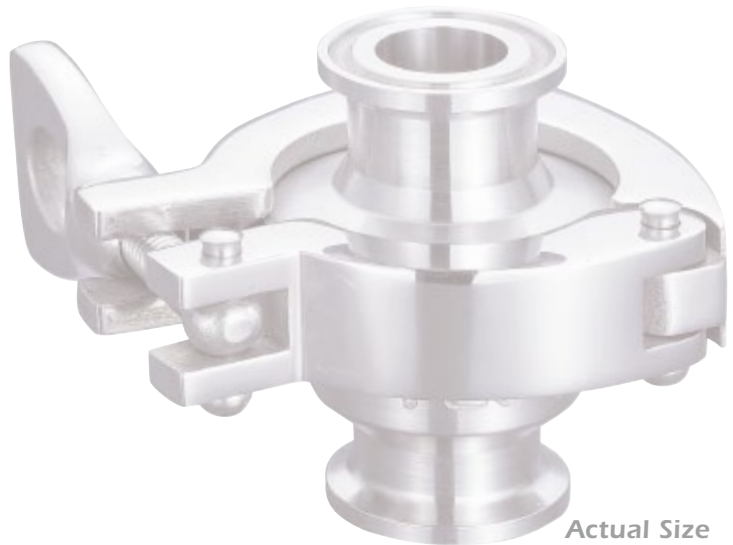


Fail-open Safety Mechanism

- In the event of a damaged diaphragm, the LV6 is not blocked, but remains open, ensuring the operation of the steam using equipment.

Automatic Air Venting

- The LV6 rapidly vents low temperature air and condensate at system start up, therefore reducing overall start-up time and improving productivity.
- In addition to rapid air venting at start up, air at near-to-steam temperature can be almost completely vented during operation, making the LV6 suitable for batch processes.



Free Float Clean Steam Trap Continuous Discharge **SS3-P/SS5-P**

Continuous Discharge of Condensate

- The self-modulating free float automatically adjusts to the level of condensate allowing continuous discharge. There is no condensate backup or accumulation in the equipment.



High Durability and Long Life

- The free float with simple construction and only one moving part, without levers or hinges, has less failure. Valve wear is distributed across the entire float surface, greatly improving valve service life.

Suitable for Condensate Recovery

- Even with a back pressure of 99% of operating steam pressure, the free float operates without fail. The SS3-P and SS5-P are therefore suitable for condensate recovery in closed systems.



LV6 Series



● Specifications

Model	LV6-CE	LV6-SF	LV6-P	LV6-EP*
Material	Stainless Steel AISI316L			
Connection	Clamp End** / Tube End***			
Size (mm)	15, 20, 25 / 8, 10, 15, 20, 25			
Maximum Operating Pressure (MPaG) PMO	0.6			
Minimum Operating Pressure (MPaG)	0.01			
Maximum Back Pressure	90% of Inlet Pressure			
Maximum Operating Temperature (°C) TMO	165			
Maximum Discharge Capacity (kg/h)	770			
Subcooling of X-element Fill (°C)	Up to 6			
X-element type (for Clean Steam Traps)	Standard	Free-draining	Free-draining (Electro-polished)	
Clamp Type	2-piece Clamp (Buff-polished)		3-piece Clamp (Buff-polished)	
Finishing (Internal/External)	Natural Machining	0.8 μm Ra / 1.2 μm Ra Fine Machining	0.8 μm Ra / 1.2 μm Ra Buff-polished	0.4 μm Ra Electro-polished

* Option ** ISO 2852, ASME-BPE (Tri-Clamp compatible), other standards available.

*** ISO 1127, other standards available

1 MPa = 10.197 kg/cm²

PRESSURE SHELL DESIGN CONDITIONS (**NOT** OPERATING CONDITIONS): Maximum Allowable Pressure (MPaG) PMA : 1.0
Maximum Allowable Temperature (°C) TMA : 185

SS3-P/ SS5-P



● Specifications

Model		SS3-E*	SS3-P	SS3-EP*	SS5-P	SS5-EP*
Material		Body: Cast Stainless Steel A351 Gr.CF3M Float: Stainless Steel SUS316L (AISI316L)				
Connection		Clamp End**				
Size (mm)		15, 20			25, 38	
Maximum Operating Pressure (MPaG) PMO		0.6				
Maximum Differential Pressure (MPa) ΔPMX		0.6				
Maximum Operating Temperature (°C) TMO		165				
Maximum Discharge Capacity (kg/h)		155			530	
Finishing***	Internal	25μm Ra Electro-polished	0.8μm Ra Buff-polished	Buff-polished then 0.4μm Ra Electro-polished	0.8μm Ra Buff-polished	Buff-polished then 0.4μm Ra Electro-polished
	External		25μm Ra Electro-polished		Bead blasted and Electro-polished	

* Option ** ISO 2852, ASME-BPE (Tri-Clamp compatible) *** Treated base surfaces are lost-wax casted

1 MPa = 10.197 kg/cm²

PRESSURE SHELL DESIGN CONDITIONS (**NOT** OPERATING CONDITIONS): Maximum Allowable Pressure (MPaG) PMA : 1.0
Maximum Allowable Temperature (°C) TMA : 185



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.

Full product details (sizes, pressures, capacities and materials, etc.) are included in the individual specification data sheets (SDS).

TLV Stainless Steel Product Series

Steam Traps		PowerTrap	Pressure Reducing Valves		Separator Filters	Separators											
	SS1N		J35-X		GP10		COS DR20		DR8-P		SF1		DC7				
	SS3N		JH7RM-P														
Valves		Flowmeters		Air Vents		Air & Drain Traps		Check Valves		Strainers							
	BV1		EF200		VS1C		LA21		VS3-P		SS1VG		CKF3M		CK3		Y3

Contact **TLV** for more information on these and other stainless steel products.

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Manufacturer

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Kakogawa, Japan

is approved by LRQA Ltd. to ISO 9001/14001

ISO 9001
ISO 14001





BYPASS BLOWDOWN STEAM TRAPS

MBT3N BT3N



Shorten Start-up and Batch Cycles;

One of the most effective ways to improve productivity and reduce costs of steam equipment operation is to automate the systems that control processes — from steam supply to condensate discharge. The MBT3N (motorized) and BT3N (hand-operated) bypass blowdown steam traps increase efficiency of production equipment.

FEATURES

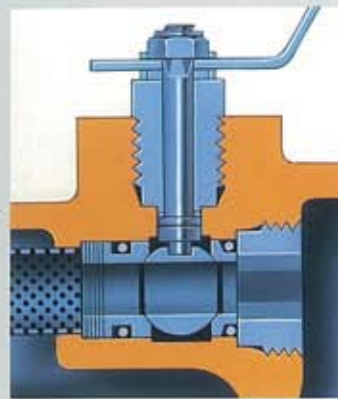
1 Condensate, air, steam and cooling water blowdown operations are automated (motorized), resulting in increased equipment productivity and cost reductions.

The MBT3N, in combination with an MC-COS automatic multi-control valve or various types of sensors, permits automation of the rapid blowdown in a variety of situations, such as when heating patterns for the equipment are changed.



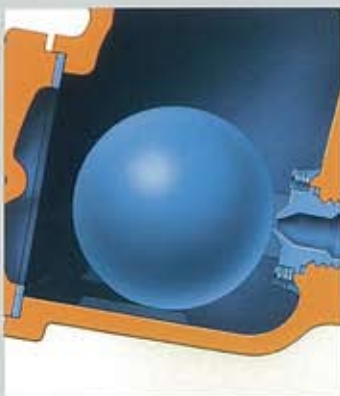
2 Use of a special tight-sealing ball valve as the bypass valve.

A 10mm ball valve ensures immediate response for blowdown operations. Features easy confirmation of whether the valve is open or closed.



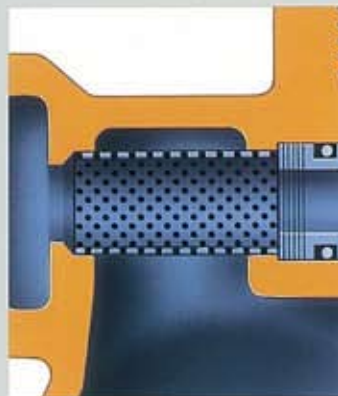
3 Use of a unique "free-float" trap increases the flow.

The highly durable "free-float" trap enables continuous condensate discharge, and the 3-point seating design ensures seal-tight shutoff even under no-load conditions. The bimetal allows the automatic discharge of air even during normal operation.



4 Built-in strainer allows blowdown of rust and scale.

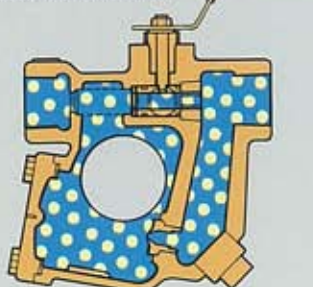
Rust, scale and other impurities which have collected in the strainer will be flushed to the secondary side when the bypass valve is open.



OPERATION

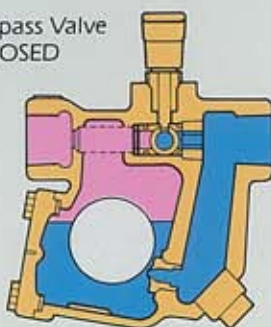
Condensate Air Steam

1 Bypass Valve OPEN



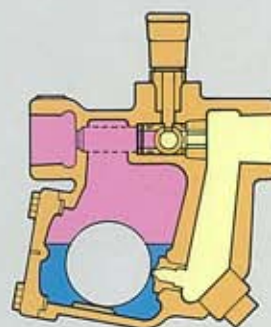
At start-up, the bypass blowdown valve can be opened to allow a large quantity of condensate to be rapidly discharged, minimizing the time required for the unit to warm up. The bimetal holds the float away from the orifice so that initial air in the trap chamber is also discharged.

2 Bypass Valve CLOSED



After the blowdown operation ends, the bimetal strip retracts and the valve closes, the float automatically adjusts the valve opening in response to the fluctuation in load, and the condensate is continuously discharged — no condensate will accumulate ahead of the steam trap.

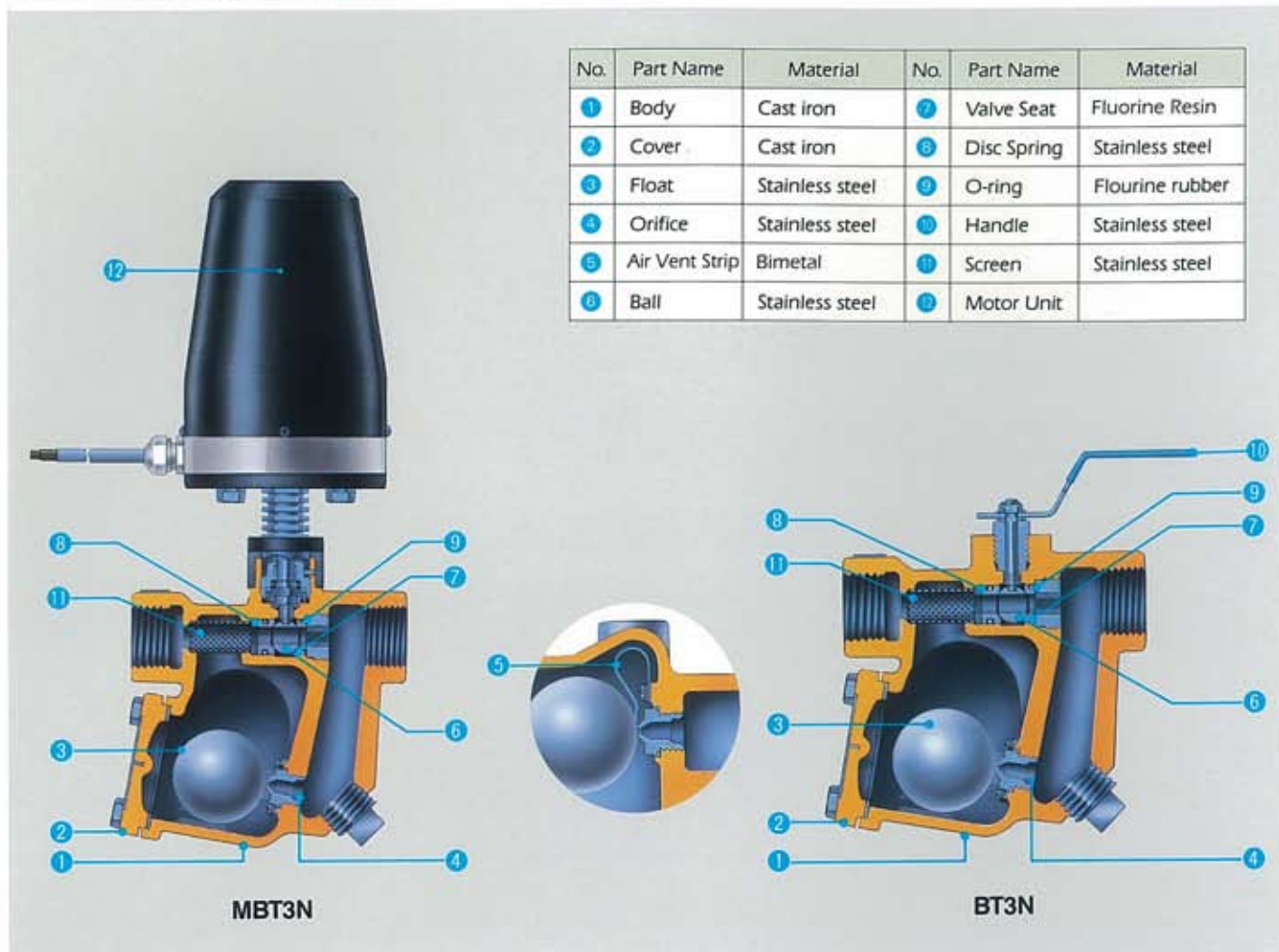
3



When the amount of condensate flowing into the chamber decreases, the float gradually closes the orifice. Steam leakage is prevented through the use of a 3-point seating design and the water sealing of the valve. Normally the bimetal remains retracted and has no effect on the operation of the float, but if air should accumulate in the trap and the temperature drops, it extends, forcing the float up and the air is automatically vented.

Systemize Bypass Blowdown

CONSTRUCTION

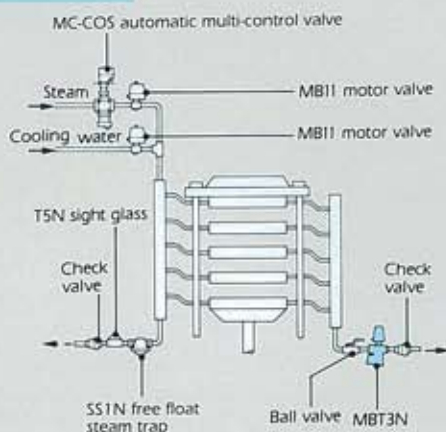


APPLICATION

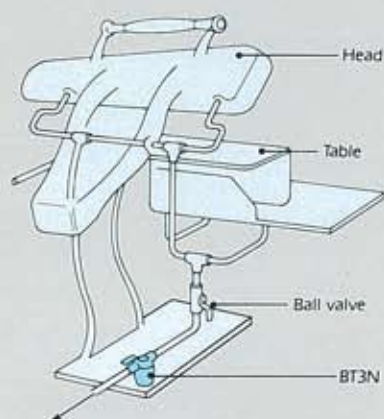
TO REDUCE START-UP TIME

For multi-plate presses, roll heaters.

For garment presses, dryers, double boilers.



Automates the discharge of large quantities of condensate during start-up and the flow of cooling water during the cooling process — reducing batch processing times on presses.

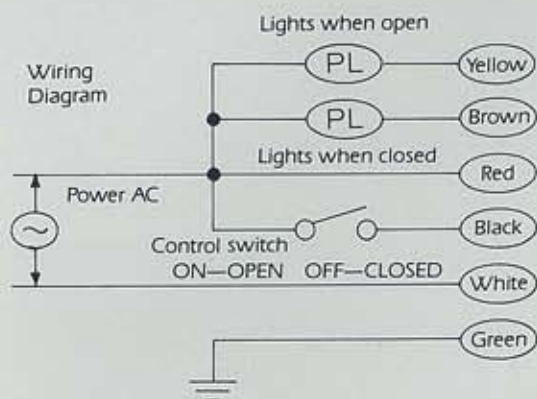


Allows quick-start of the blowdown operation to discharge large quantities of condensate from the chamber during start-up, either automatically (MBT3N) or by hand (BT3N) — shortening the time required to start up the unit.

WIRING • USAGE LIMITS OF MBT3N

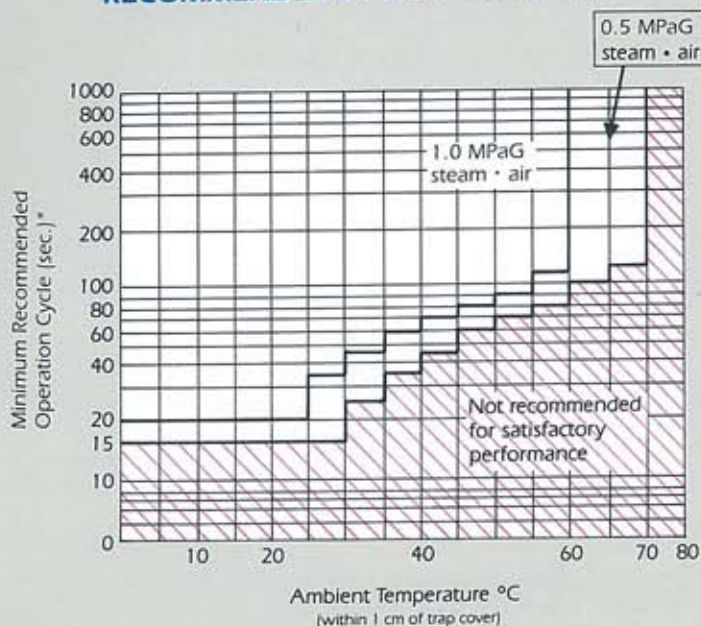
WIRING

1. Connect an ON/OFF control switch as follows:
When the control switch is on, the valve will open; when it is off, the valve will close.



2. Connect the yellow and brown wires to OPEN/CLOSE indicator lamps.
If connected to the yellow wire, a pilot lamp will light when the valve is open; if to the brown, a pilot lamp will light when the valve is closed.
3. Always be sure the power is OFF before doing any electrical work.

AMBIENT TEMPERATURE RANGE AND RECOMMENDED OPERATION CYCLES

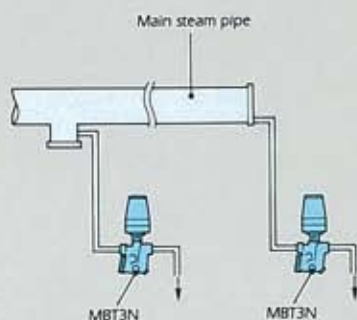


* "Operation cycle" means the interval between the motor stop at the end of one open or close operation and the motor start at the beginning of the next.

1 MPa = 10.197 kg/cm²

TO PREVENT WATER HAMMER

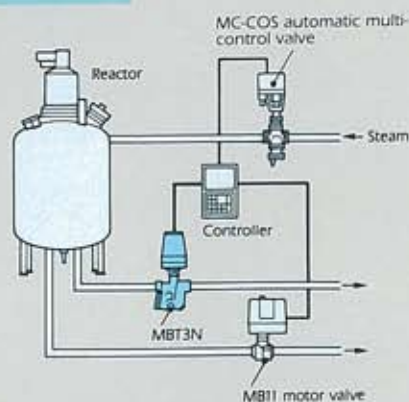
For steam mains, air conditioning units.



The use of a bypass valve is the best way to prevent water hammer. As soon as the equipment is turned on, an MBT3N bypass blowdown trap attached to a temperature sensor will start an automatic blowdown to discharge large quantities of condensate from the chamber — shortening the time required to drain the system and eliminating water hammer.

TO IMPROVE BATCH CYCLE OPERATION

For reactors, steam kettles, vulcanizers.



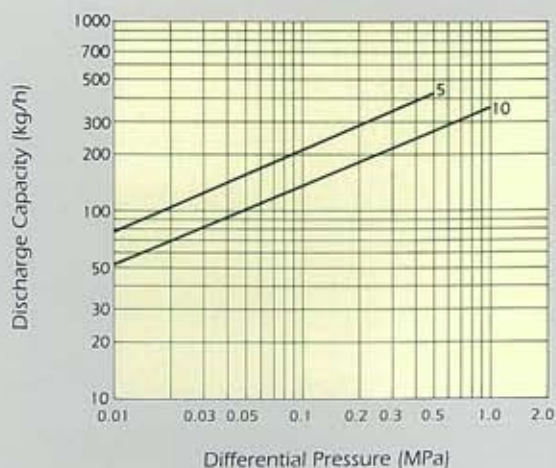
The most effective way to increase the number of batch cycles per unit time is to shorten the start-up and automate a forced rapid blowdown after each cycle.

DISCHARGE CAPACITY

When Bypass valve is CLOSED

TLV STEAM TRAP CAPACITY CHART

MODEL BT3N · MBT3N



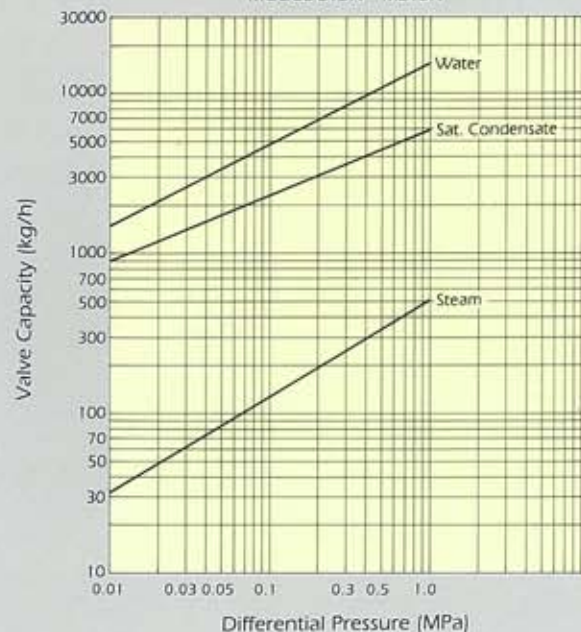
1. Differential pressure is the difference between the inlet and outlet pressure of the trap.
2. Capacities are based on continuous discharge of condensate 6°C below saturated steam temperature.

VALVE CAPACITY

When Bypass valve is OPEN

TLV VALVE CAPACITY CHART

MODEL BT3N · MBT3N



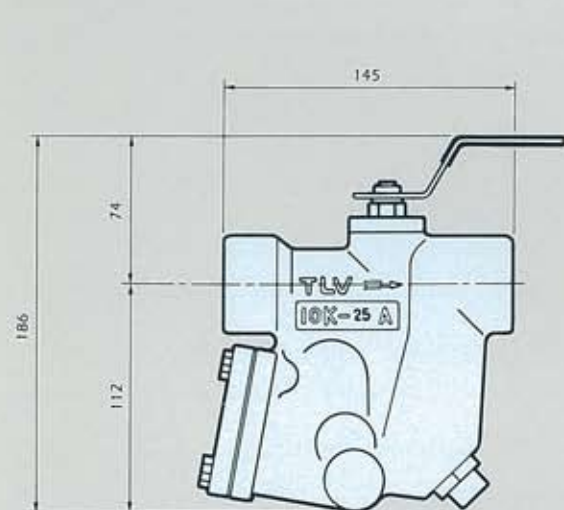
SPECIFICATIONS

Main Unit		
Body material	Cast iron	
Connection	PT, BSPT, NPT	
Size	25 mm	
Orifice No.	5	10
Operating pressure range	0.01~0.5MPaG	0.01~1.0MPaG
Maximum operating temperature	185°C	

Drive Unit (on MBT3N only)	
Motor model	Reversible motor (condenser run type single-phase induction motor)
Start-up current	0.52A (100/110V), 0.31A (200/220V)
Control system	ON-OFF (fully open/fully closed)
Overload protection	Built-in thermal protector 120 ± 5°C
Direction of rotation	90° reciprocating
Open/close time	Approx. 3.5 sec./90° rotation
Water resistance	Rain-resistant

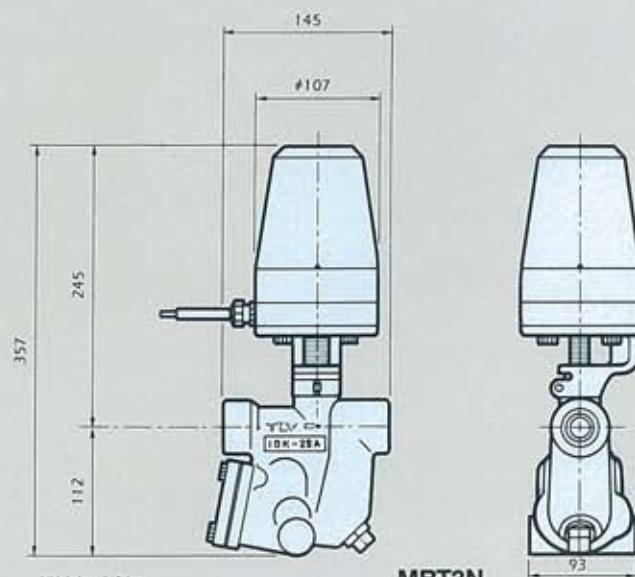
1 MPa = 10.197 kg/cm²

DIMENSIONS



Weight: 3.6 kg

BT3N



Weight: 6.6 kg

MBT3N



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ISO 9001/ISO 14001

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Kakogawa, Japan

is approved by LRQA Ltd. to ISO 9001/14001



(D)

Internet World Wide Web

URL <http://www.tlv.com>

Pamphlet M2000-5 Rev. 9/2003

Specifications subject to change without notice.

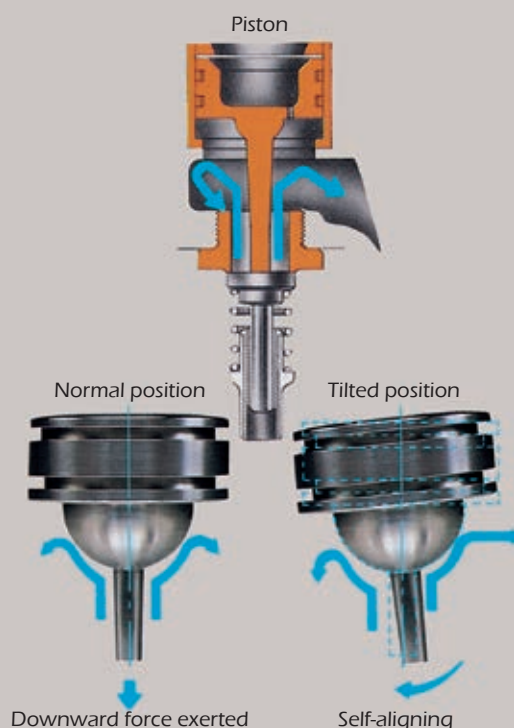
TLV®

STEAM PRESSURE REDUCING VALVES

COSR-3 COSR-16 COSR-21



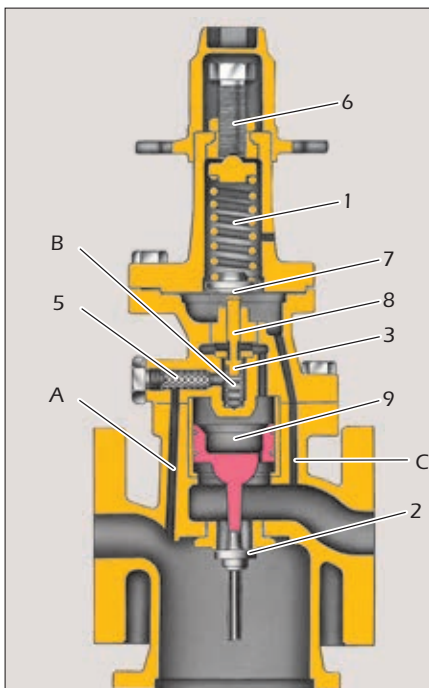
SAS: Shock Absorbing Spherical Piston



Features

- The shock absorbing spherical (**SAS**) piston maintains the secondary pressure with high accuracy.
- Stable secondary pressure can be maintained, even with fluctuations in primary pressure or flow rate.
- Self-aligning feature allows the piston to move smoothly, resulting in accurate responsive control.
- Internal primary and secondary pressure sensing channels make external sensing line attachments to the valve unnecessary for most applications.
- All key internal parts are made of stainless steel.
- Motorized type (**M-COSR**) and computerized (**MC-COSR**) valves are also available.

How It Works



Until upper coil spring (1) is compressed, main valve (2) and pilot valve (3) are closed. Steam enters through passage (A), passes through screen (5) and enters pilot chamber (B).

When secondary pressure is set by tightening adjusting screw (6), upper coil spring (1) is compressed and diaphragm (7) flexes, forcing pilot guide (8) to open pilot valve (3). Steam enters chamber above piston (9), forcing it down. Main valve (2) opens the orifice, providing steam to the secondary side.

Some steam, entering the outlet side, flows through outlet pressure passage (C) into a chamber below the diaphragm (7), and lifts it. The position of pilot valve (3) is then determined by the balance of the upward force on the diaphragm with the downward force of upper coil spring (1). Thus the preset secondary steam pressure itself adjusts the force applied to the piston (9) and the opening of the main valve (2). Secondary pressure remains stable at all times.

Standard Specifications

Model	COSR-3			COSR-16			COSR-21	
Body Material*	Cast Iron		Ductile Cast Iron	Cast Iron		Ductile Cast Iron	Ductile Cast Iron	
Connection	Screwed	Flanged		Screwed	Flanged		Flanged	
		ASME	DIN		ASME	DIN	ASME	DIN
Size (mm)	20, 25	20, 25, 32, 40, 50		15, 20, 25, 40, 50	15, 20, 25, 32, 40, 50, 65, 80, 100, 125**, 150		15, 20, 25, 32, 40, 50, 65, 80, 100	
Max. Operating Pressure (MPaG) PMO	0.3			1.6			2.1	
Max. Operating Temperature (°C) TMO	220			220			220	
Primary Pressure Range (MPaG)	0.1 – 0.3			0.2 – 1.6			1.35 – 2.1	
Adjustable Pressure Range (all conditions must be met)	0.01 – 0.05 MPaG			Within 10 - 84% of primary pressure but with minimum pressure of 0.03 MPaG			From 0.55 MPaG to 84% of primary pressure	
	–			Differential pressure between 0.07 – 0.85 MPa			Maximum differential pressure 0.85 MPa	
Minimum Adjustable Flow Rate	5% of rated flow rate***			5% of rated flow rate*** (65 mm and larger: 10% of rated flow rate***)				

* COSR-3 flanged: cast stainless steel sizes 20, 25, 40, 50 available on request

1 MPa = 10.197 kg/cm² = 10 bar

COSR-16 flanged: cast stainless steel sizes 15 20, 25, 40, 50 (ASME and DIN) and cast steel sizes 65 & 80 (DIN) available on request

** Not available with DIN *** See SDS (Specification Data Sheet) for rated flow rate

PRESSURE SHELL DESIGN CONDITIONS (NOT OPERATING CONDITIONS): Maximum Allowable Pressure (MPaG): PMA: 1.6 (Cast Iron), 2.1 (Ductile Cast Iron)
Maximum Allowable Temperature (°C) TMA: 220

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.

Dimensions

Technical drawing of a valve showing dimensions L, H, H1, and a 10 mm detail.

COSR-3/COSR-16 Screwed, Flanged (mm)										COSR-21 Flanged (mm)									
Size (DN)	Screwed Rc(PT)	L					H	H ₁	Weight** (kg)	Size (DN)	L			H	H ₁	H	H ₁	Weight* (kg)	
		ASME Class				DIN2501					ASME Class	DIN2501	ASME						DIN
		125FF	150RF	250RF	300RF	PN25/40													
(15)	175	—	170	—	170	130	357	285	9.5[8.8]	(15)	161	167	130	405	305	377	305	11[9]	
(20)	—	—	182	—	182	150		285	11[9.5]	(20)	172	178	150	405	305		305	13[9.7]	
25	190	176	188	180	192	160		282	13[11]	25	181	187	160	422	302		302	15[11]	
32	220	206	220	220	220	180	385	295*	17[16]	32	212	219	180	457	322	405	322	19[17]	
40		209		222	224	200		302	19[17]	40	215	222	200		322		21[17]		
50		260		247	255	260		261	230	315	26[24]	50	254		260		230	335	335
65	—	362	372	377	378	290	554	411	55[50]	65	371	377	290	655	430	576	432	59[51]	
80	—	365	374	383	384	310		411	59[52]	80	374	384	310		430		432	62[52]	
100	—	434	434	450	450	350		448	95[80]	100	434	450	350		468		470	95[81]	
125	—	—	—	456	456	—	633	448	119[—]	() No ASME standard exists for ductile cast iron; machined to fit steel flanges Other standards available, but length and weight may vary * Weight is for Class 300 RF, [] DIN PN 25/40									
150	—	600	600	622	622	480		530	205[176]										

Sizes 15 – 25 mm shown. Configuration of larger sizes differs slightly.

() No ASME standard exists for cast iron; machined to fit steel flanges
 Class 125 FF can connect to 150 RF, 250 RF can connect to 300 RF
 Other standards available, but length and weight may vary
 * Screwed ** Weight is for Class 300 RF, [] DIN PN 25/40

Sizes 15 – 25 mm shown. Configuration of larger sizes differs slightly.

() No ASME standard exists for cast iron; machined to fit steel flanges
Class 125 FF can connect to 150 RF, 250 RF can connect to 300 RF
Other standards available, but length and weight may vary
* Screwed ** Weight is for Class 300 RF, [] DIN PN 25/40

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Manufacturer

TLV CO., LTD.

Kakogawa, Japan

is approved by LRQA Ltd. to ISO 9001/14001

ISO 9001
ISO 14001





DIRECT-ACTING PRESSURE REDUCING VALVE

DR20 A-DR20

Stainless steel construction
Pressure reduction ratio of 30:1

Compact (total height 185 mm)

Light-weight (1.8 kg*)
* 25 mm model

For steam & air



DR20

A-DR20

More stable secondary pressure than with conventional direct-acting reducing valves!

Features

Stainless Steel Construction

The body is constructed of stainless steel to prevent the problems caused by rust and the resultant build-up of scale.

Pressure Reduction Ratio of 30:1

A single DR20 is capable of reduction to minute pressures normally requiring two-stage pressure reduction.

Superior Flow Characteristics

A more stable secondary pressure than with conventional direct-acting reducing valves is maintained through the use of a flat valve.



Fine Pressures Adjustment

The easy to grip handle, which fits comfortably in the hand, and a small-pitch adjusting screw make it possible to make extremely small adjustments in the secondary pressure. The locknut prevents accidental adjustment.



Easy Maintenance

No special tools are required for maintenance. Disassembly is easily performed with readily available tools.

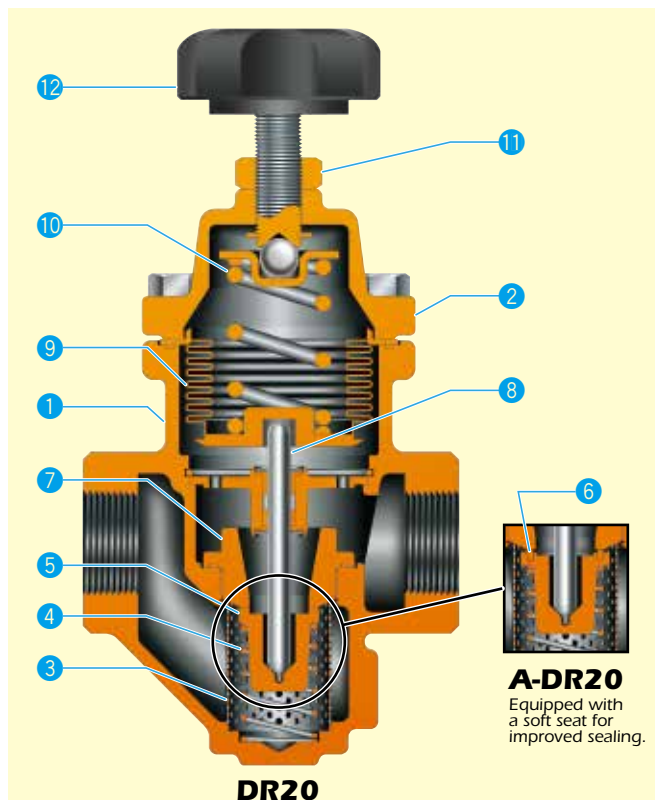
Reusable Gaskets

All gaskets are made of PTFE.

A-DR20: Improved shut-off sealing for use with air

The main valve is equipped with a soft seat (fluorine rubber) to obtain better sealing with dead-end shut-off capability.

Construction



No.	Description	Material	No.	Description	Material
1	Body	Cast Stainless Steel	7	Valve Seat	Stainless Steel
2	Cover	Cast Stainless Steel	8	Valve Stem	Stainless Steel
3	Screen	Stainless Steel	9	Bellows	Stainless Steel
4	Coil Spring	Stainless Steel	10	Coil Spring	Stainless Steel
5	Main Valve	Stainless Steel	11	Locknut	Stainless Steel
6	Soft Seat	Fluorine Rubber	12	Adjustment Handle DR20: Black A-DR20: White	Stainless Steel/ Plastic

Specifications

Model	DR20-2	DR20-6	DR20-10	A-DR20-2	A-DR20-6	A-DR20-10
Applicable Fluids*	Steam, Air			Air		
Connection	Screwed					
Size (mm)	15, 20, 25					
Maximum Operating Pressure (MPaG) PMO	1.6			1.0		
Maximum Operating Temperature (°C) TMO	220			100		
Primary Pressure Range (MPaG)	0.2 – 1.6		0.6 – 1.6	0.2 – 1.0		0.6 – 1.0
Adjustable Pressure Range (MPaG)	0.014** – 0.2	0.18 – 0.6	0.54 – 1.0	0.014** – 0.2	0.18 – 0.6	0.54 – 0.9
	Secondary pressure must not exceed 90% of primary pressure					

* Do not use for toxic, flammable, or otherwise hazardous fluids. ** However, not less than 1/30 of primary pressure 1 MPa = 10.197 kg/cm²
 PRESSURE SHELL DESIGN CONDITIONS (**NOT** OPERATING CONDITIONS): Maximum Allowable Pressure (MPaG) PMA: 2.0
 Maximum Allowable Temperature (°C) TMA: 220

For installation in horizontal piping (with adjustment handle facing up)



CAUTION To avoid abnormal operation, accidents of 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.

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Manufacturer

TLV CO., LTD.

Kakogawa, Japan

is approved by LRQA Ltd. to ISO 9001/14001

ISO 9001
ISO 14001



TLV[®]

SEPARATOR FILTER

SF1



Cleaner filter for longer... ...utilize the cyclone effect

In regular piping, steam carries large quantities of entrained material. With TLV's Separator Filter, improve heating efficiency and product quality by removing condensate, dirt and scale. Ideal for bio-related industries and other applications requiring high-quality dry steam.

SF1, when fitted with a 0.5 micron filter element, conforms to the recommendations for the production of culinary steam to 3-A Accepted Practice No. 609-03.



Improved steam dryness
No moisture droplets

Clamp Construction

Ferrule clamp joint facilitates assembly and disassembly.



Cyclone Separator

Sintered Wire Mesh Filter

All Stainless Steel

Body is made of rust-proof CF8 stainless steel.

Condensate, dirt & scale are removed by centrifugal force

Condensate, Dirt & Scale Outlet

Parts with USP/FDA/EN Compliant Materials		Standard		
		USP	FDA	EN
Filter Gasket	High-performance Fluorine Resin	Class VI	21 CFR 177.1550	1935
Body Gasket				
Seal Tape for Plug	Fluorine Resin	—	21 CFR 177.1615	—

Time between cleaning & replacement is increased, maintenance cost is reduced

Typical Applications

- Sterilizers, steam washers, etc.
- Bio-related steam equipment
- Live steam use - food, pharmaceutical
- Non-hazardous gas applications

Cyclone Separator



Centrifugal Force and Gravity Remove:

■ 98%* of Condensate

Eliminating condensate produces the highest quality steam.

* for steam velocity up to 30m/s

■ Large dirt particles & scale

Preventing major sources of filter blockage from reaching the filter results in a longer service life.

SF1
Separator
& Filter

Filter remains unblocked for a long time.

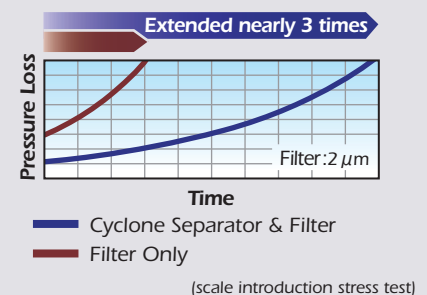
Traditional Filter
Filter Only

Easily blocked by large dirt particles

Maintenance cycle is nearly 3 times longer!

Compared to a filter with no separator, the time between required maintenance is improved by nearly 3 times.

● Pressure Loss vs. Time



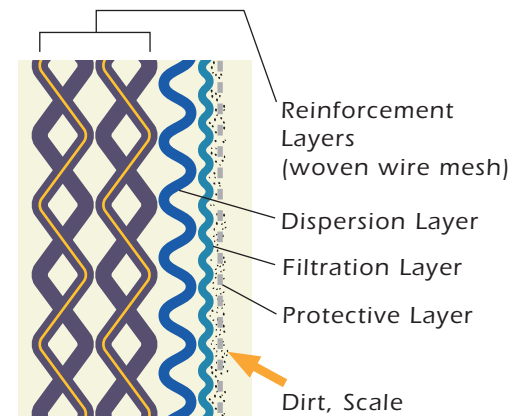
(scale introduction stress test)

5-layer Sintered Wire Mesh Filter



Effective cleaning allows repeated use

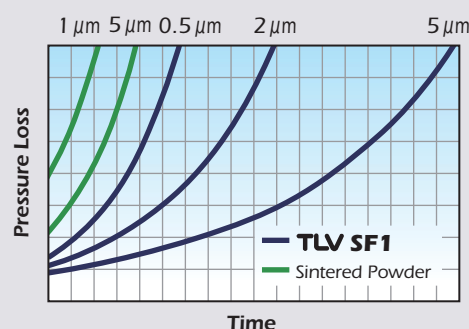
The 5-layer sintered wire mesh filter catches small dirt and scale particles on the outside surface of the filtration layer. Compared to sintered metal powder the wire mesh filter is easier to clean resulting in longer durability, and reusability.



Filter Construction

Low Pressure Loss

TLV's sintered wire mesh filters provide a longer maintenance cycle than powder filters of the same rating. Therefore, the decision to use a finer filter rating or a more compact filter becomes easier.



TLV SF1

Sintered Wire Mesh

(Dia. 40 mm; Length 125 mm; Surface Area 160 cm²)

■ Sintered Powder

(Dia. 60 mm; Length 250 mm; Surface Area 470 cm²)

Stress Test Parameters

- Inlet steam pressure : 0.1 MPaG
- Flow rate : 30 kg/h
- Iron powder introduced : 50 g/h (average size of particles 8 μm)
- Housing : 25 mm

Specifications



Connection	Screwed	Socket Welded	Flanged
Size (mm)	15, 20, 25, 40, 50		
Maximum Operating Pressure (MPaG) PMO	1.0		
Maximum Operating Temperature (°C) TMO	185		
Nominal Filter Rating* (μm)	0.5, 2, 5		
Internal & External Finishing**	Acid Cleaning (lost-wax cast)		
Ferrule Clamp	Two-piece two-bolt clamp		
Applicable Fluids***	Steam, Air		

* Consult TLV for other available filter ratings

** Optional electro-polishing (lost-wax cast) available on request

*** Do not use for toxic, flammable or otherwise hazardous fluids.

PRESSURE SHELL DESIGN CONDITIONS (NOT OPERATING CONDITIONS): Maximum Allowable Pressure (MPaG) PMA: 1.0
Maximum Allowable Temperature (°C) TMA: 185

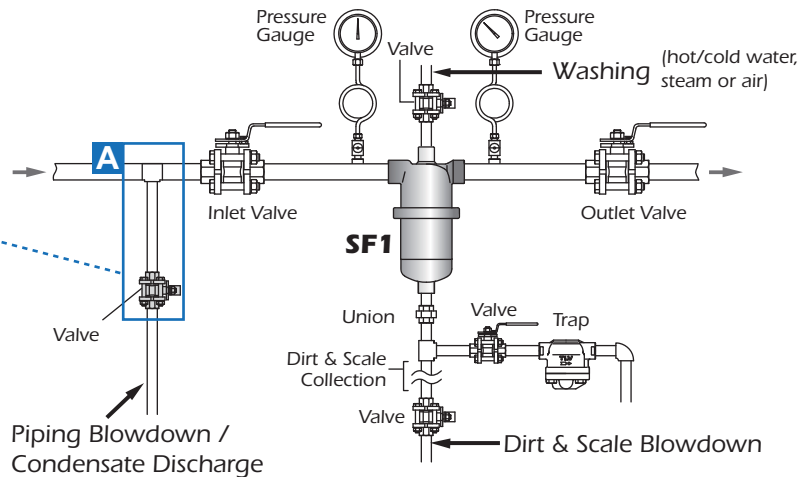
1 MPa = 10.197 kg/cm²

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

Piping Examples

Typical Installation

Ahead of the inlet valve for the **SF1**, install a **valve for piping blowdown** or a **trap** with sufficient discharge capacity when differential pressure is extremely low.

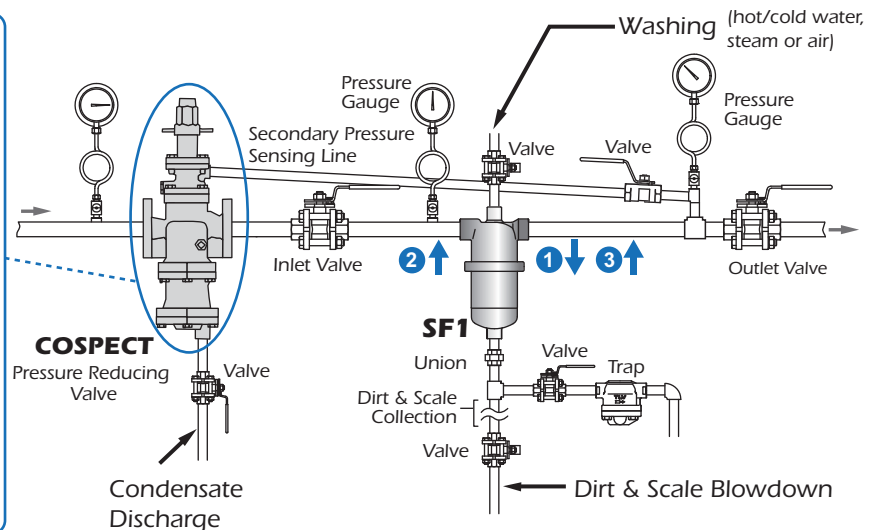


In cases where more stable pressure is needed

For applications where it is desirable to prevent pressure drop at the outlet due to build-up of dirt/scale at the filter.

Installing a **COSPECT PRV** *1 with an external pressure sensing line from the outlet of the **SF1** will help supply stable pressure and minimize pressure drop, which gradually increases due to build-up of dirt/scale at the filter.

- 1 Dirt & scale build up, **SF1** outlet pressure drops.
- 2 PRV detects pressure drop and automatically increases **SF1** inlet pressure.
- 3 **SF1** outlet pressure rises to maintain set pressure*2



*1 If a PRV other than COSPECT (with built-in strainer, separator, and steam/air trap) is installed, the equipment indicated by **A** in the diagram above must be installed ahead of the PRV for the SF1 inlet.

*2 If it becomes impossible to adjust the pressure with the PRV due to build-up of dirt/scale, clean or replace the filter.

For explanation purposes only, not intended as installation designs.

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TLV®

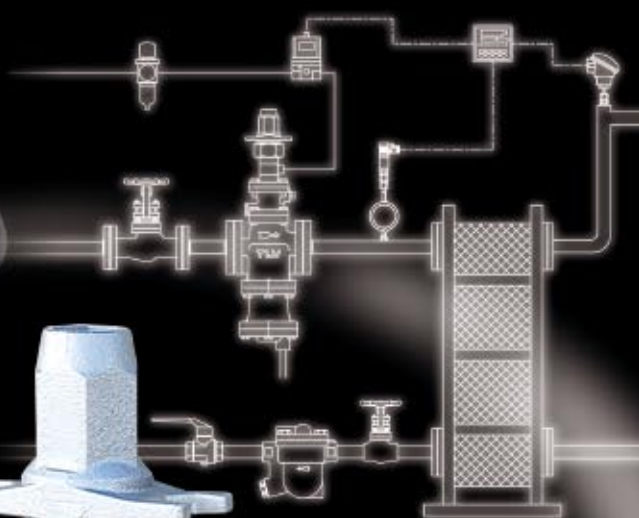
PNEUMATIC CONTROL VALVE FOR STEAM

PN-COS/PN-COSR

NEW

Improve Process Steam Control and Steam Quality*

*PN-COS only



PN-COS

5 Functions in 1

Superior Stability

Employing the self adjusting pressure reducing valve **COSPECT** enables **PN-COS** to respond instantaneously to any fluctuations in primary pressure and flow rate by automatically absorbing them. So it is capable of maintaining a constant supply of steam at a stable secondary pressure.

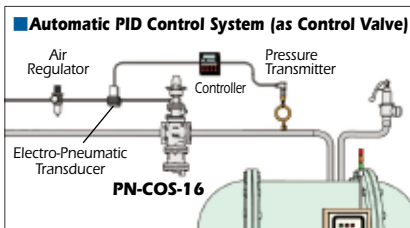
Use as a Control Valve

Combining with a controller and an electro-pneumatic transducer enables automatic PID operation. While primarily for pressure control, temperature control, etc. is possible depending on conditions. Because control operation is pneumatic, and the electro-pneumatic transducer can be installed in a separate location, **PN-COS** can be used in high temperature / humidity environments or hazardous areas.

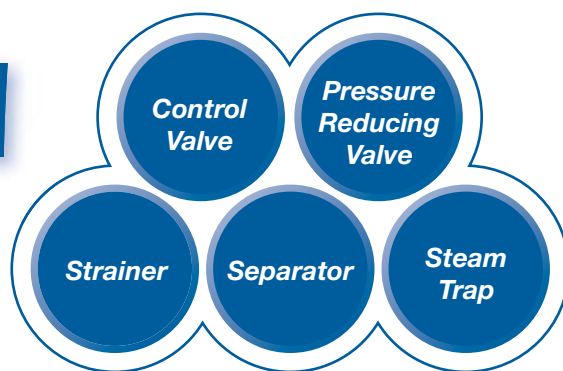
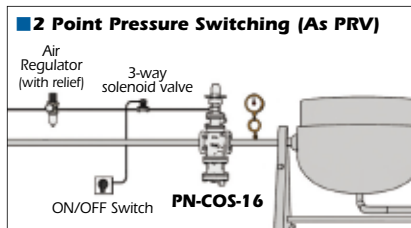
Use as a Pressure Reducing Valve

With the structure of a pilot operated pressure reducing valve, **PN-COS** can be combined with an air regulator* to set secondary pressure remotely. Also, two point pressure setting is possible using motive air and the internal Adjustment Screw. Steam supply will be maintained even with motive air cut off.

* with relief



(For explanation purposes only, not intended as installation designs.)



3 Features Improving Steam Quality

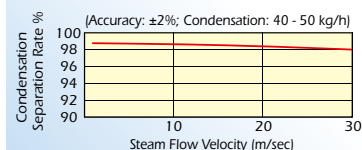
Strainer

A 100 mesh screen captures large rust and scale particles. Trouble-causing foreign matter is not allowed to penetrate into the interior of the control valve or the steam using equipment.

Cyclone Separator

An SCE* Separator with 98% separation efficiency removes entrained condensate and small particles of scale, to deliver dry steam.

* Super Cyclonical Effects



$$\text{Separation Rate(\%)} = \frac{\text{quantity of condensate discharged}}{\text{quantity of incoming condensate}} \times 100$$

Steam Trap

A built-in free float steam trap continuously discharges the separated condensate and small particles of scale.

PN-COSR

Control Valve

Pressure Reducing Valve

Dual Functions

Like the **PN-COS**, the **PN-COSR*** has the dual functions of a control valve and a pressure reducing valve with a great price to performance value, ideal for applications where dry steam is already being supplied through use of a separator, etc.

* Does not include strainer, separator or steam trap functions.



Specifications	Model	Size	Body Material*	Connection	Max. Operating Pressure	Max. Operating Temp.	Primary Pressure Range	Adjustable Pressure Range	Differential Pressure	Minimum Adjustable Flow Rate	Required Motive Air Pressure**
	PN-COS-16	15,20,25,40,50	Cast Iron	Flanged	1.6 MPaG	220 °C	0.2 to 1.6 MPaG	Within 10 to 84% of primary pressure but with a minimum pressure of 0.03 MPaG Max. pressure : [Motive air pressure - 0.1] MPaG	0.07 to 0.85 MPa	5% of rated flow rate	[Desired secondary pressure + 0.1] MPaG to 1.6 MPaG

* Major internal parts are Stainless Steel. Full product details (capacities, etc.) are included in the specification data sheet (SDS).

**Use only oil free air filtered to 5 µm for motive air supply.



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.

TLV® INTERNATIONAL, INC.

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Manufacturer

TLV® CO., LTD.
Kakogawa, Japan

is approved by LRQA Ltd. to ISO 9001/14001

ISO 9001/ISO 14001



Compact Check Valve

Why people choose the **CK3**

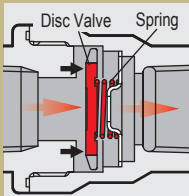
Hidden Bestseller
~ The CK3 Series ~



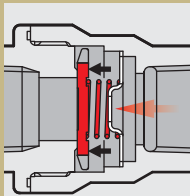
Spring-Disc Type

Fluid flow pressure pushes the disc and opens the valve, but when backflow occurs backflow pressure closes the valve while spring force ensures a tight seal.

■ Open



■ Closed



Compact with Flexible Installation Orientation

Featuring an attractive slim body, with no protrusions, the CK3 performs well in any installation orientation, facilitating neat piping arrangements.

CK3

Swing Type

Vertical
Horizontal
Up, Down
OK



Superior Sealing and Durability

Employing a spring loaded disc enables valve operation in response to minute differences in pressure while also maintaining a high quality seal. And all stainless steel construction translates to high durability.

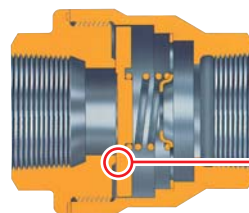
Fluid backflow prevention
Water hammer countermeasures
Vacuum break, Pressure release, etc

Applications

Suitable for Steam, Water and Air

Three different types of seal (metal, rubber, or PTFE) allow for use with various types of fluids*.

* Do not use for toxic, flammable, or otherwise hazardous fluids.



CK3M Metal Seal (~220°C)

CK3T PTFE Seal (~185°C)

CK3R Rubber Seal (~90°C)

Supports Diverse Specifications

In addition to standard products, special check valves with body materials: SUS 304, 316L etc, seat materials: FPM/EPR etc, or with a special spring for minimum opening differential pressures from 0.001 to 0.03 MPa, are available on request. Feel free to contact us.

* FPM = Fluorine-Containing Rubber, EPR = Ethylene-Propylene Rubber.

In addition to the CK3 series, we offer an extensive range of products from flange (wafer) types to large size (DN100) types.



TLV CO., LTD.

881 Nagasuna, Noguchi-Cho, Kakogawa Hyogo 675-8511, JAPAN
Phone: 079-422-8833
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Manufacturer
TLV CO., LTD.
Kakogawa, Japan
is approved by LRQA Ltd. to ISO 9001/14001

ISO 9001/ISO 14001



Rev. 1/2016 (T)



Bypass Blow Valve

BD800

NEW

Reliable Tight Shut-off



47%* of customers who perform bypass blowdown have experienced **internal leakage of valves.**

* Research by TLV CO., LTD.

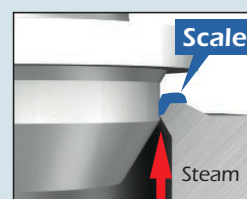
Periodic maintenance of steam system is followed by blowdown on bypass lines by supplying high pressure steam at start-up. However, globe valves often installed on bypass lines are commonly susceptible to internal leakage as the build-up of dirt and scale and the erosion of valve trim prevent the valve from closing completely. The BD800 was developed to eliminate these problems.

API 598 valve with self-cleaning valve trim, clears scale build-up during operation



Valve construction enables effective scale removal for tight shut-off

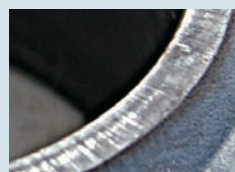
When the valve cannot be fully closed due to rust and scale build-up on the valve head or seat, simple and effective in-line scale removal restores steam tight sealing performance.



Scale is scraped off and flushed with steam by valve operation

Highly durable materials prevent erosion

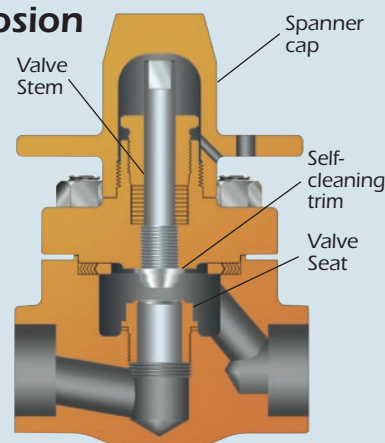
Valve stem and seat are constructed from durable materials to prevent erosion.



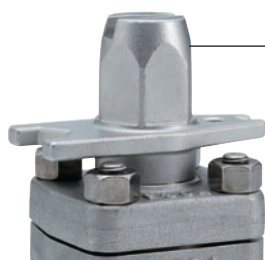
Wall thinning caused by steam leakage from eroded valve trim.

Valve stem, valve seat and other key parts are replaceable

Parts worn by years of use can be replaced, extending product service life.



Spanner cap is used in place of the valve handle



- Protects valve stem from weather and foreign matter, **preventing the valve stem from sticking**
- For applications with infrequent valve operation, the spanner cap can be fixed to the body to **prevent erroneous operation**



Fixed to body

- Can also be used **as a valve handle**



Adjusting the valve aperture



Tightening the gland retainer

Applications

Bypass or other lines: for blowdown or elimination of steam locking

- Applicable fluids: Steam, water, air
- Maximum Operating Pressure PMO: 6.5 MPaG
- Connections: Screwed, socket welded, flanged

- Material: Stainless steel ASTM A182 F304
- Size: 15, 20, 25 mm
- Maximum Operating Temperature TMO: 425 °C

- Applicable standards: API 598, ASME B16.34
- Maximum Cv Value: 3.5 (US)



CAUTION

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Manufacturer
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ISO 9001
ISO 14001





AIR VENTS

**Rapid Initial Air Vent
Automatic Air Vent**



Free Float for Venting Air

No failure-prone levers or hinges. Only one moving part, the free float, eliminates concentrated wear and provides long, maintenance-free service life.

- **Rapid Initial Air Vent**
VAS
VA1/VA3/VA4/VA5
- **Automatic Air Vent**
VC2/VC3/VC4

Precision-ground float with three-point seating provides the tightest seal at high water level.

- **Rapid Initial Air Vent**
VS1A
- **Automatic Air Vent**
VS1C



VAS



VA Series



VS1A



SA3



VC Series



VS1C

X-element for Venting Air & Gas from Steam Systems



LA Series

What is the X-element?

A multi-diaphragm valve mechanism filled with a thermoliquid which opens and closes the vent at a temperature approximately 22 °C less than saturated steam temperature, allowing the discharge of any air or gas.



& Gas* from Liquid Piping

* Do not use for toxic, flammable or otherwise hazardous fluids

Air Vent Class	Medium	Piping Direction	Operating Pressure Range (MPaG)	Maximum Operating Temperature (°C)	Maximum Venting Capacity (ℓ/min)*	Body Material	Model
Rapid Initial Air Vent	Water, Hot Water	Vertical Piping	0.01 – 1.0	100	180	Cast Iron	VAS (20mm)
					500		VAS (40mm)
					1400		VA1
					3200		VA3
					5600		VA4
					11000		VA5
	Special Fluids (Non-toxic and Non-flammable)		0.01 – 2.1	150	270	Cast Stainless Steel	VS1A
Automatic Air Vent	Water, Hot Water	Vertical Piping	0.01 – 0.3	100	5.4	Brass	SA3-3
			0.1 – 1.0		9.2		SA3-10
			0.05 – 0.5	90	25	Bronze	VC2
			0.1 – 0.6		90	Cast Iron	VC3
			0.1 – 1.0		380		VC4
	Special Fluids (Non-toxic and Non-flammable)		0.01 – 1.0	150	170	Cast Stainless Steel	VS1C-10
			0.01 – 2.1		130		VS1C-21

* For air at 20 °C under atmospheric pressure.

Pressure differential is 0.1 MPa for rapid initial air vents, maximum operating pressure for automatic air vents.

Air Vent Class	Medium	Piping Direction	Operating Pressure Range (MPaG)	Maximum Operating Temperature (°C)	Maximum Venting Capacity (ℓ/min)*	Body Material	Model
Automatic Air Vent	Steam	Angle	0.01 – 1.3	200	1900	Brass	LA13L
		Vertical Piping	0.01 – 2.1	235	2000	Cast Stainless Steel	LA21

* For air at 20 °C under atmospheric pressure.

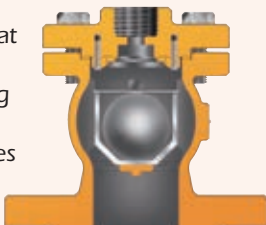
TLV Air Vents

For Liquid

Rapid Initial Air Vent

VAS / VA Series / VS1A

Used for venting large amounts of initial air or gas at system start-up. Once the valve closes after discharging initial air, it will not open again, even if air accumulates inside the product, until the internal pressure drops to near atmospheric pressure.



If air is expected to accumulate in the piping during operation, use together with an automatic air vent.

Automatic Air Vent

SA3 / VC Series / VS1C

Discharge air or gas automatically as it enters the vent at start-up and during operation. Facilitates drainage of the system by introducing air at system shutdown.



If a large volume of air needs to be discharged at start-up, use together with a rapid initial air vent.

Air Vent Class Selection

System for Air Venting	Air Vent Class Required	
	Rapid Initial Air Vent	Automatic Air Vent
Water pumps		
Air conditioners, solar water heating systems		
Supply water pipe, storage tank		

For Steam

LA Series

Remove air or gas from steam systems and shorten start-up time. Facilitates drainage of the system by introducing air at system shutdown.



For Liquid

Rapid Initial Air Vent

Water • Hot Water

VAS



Compact

Features

- Small and compact with simple construction
- Only one moving part, the free float, eliminates concentrate wear and provides long service life
- Precision-ground float and valve seat rubber contact assures seal tightness when vent is closed
- Also functions as a vacuum breaker

Application

- Processes requiring the rapid supply of water
- Water supply pipe, water pump, water tank, etc.

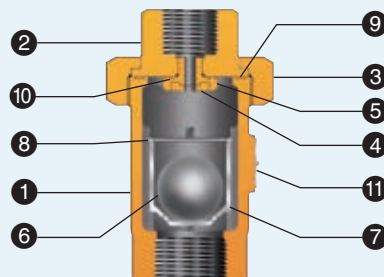
Note: Once the valve closes it will not open again, even if air accumulates. If air is expected to accumulate, use together with an automatic air vent.

Specifications

Model		VAS	
Connection		Screwed (Rc(PT))	
Size (mm)	Inlet	20	40
	Outlet	15	25
Body Material		Cast Iron (FC250)	
Maximum Operating Pressure (MPaG) PMO		1.0	
Minimum Operating Pressure (MPaG)		0.01	
Maximum Operating Temperature (°C) TMO		100	
Maximum Venting Capacity (ℓ/min)*		180	500

PRESSURE SHELL DESIGN CONDITIONS (NOT OPERATING CONDITIONS):
Maximum Allowable Pressure (MPaG) PMA: 1.6
Maximum Allowable Temperature (°C) TMA: 100

Construction



No.	Part Name	No.	Part Name
①	Body	⑦	Float Guide
②	Union	⑧	Snap Ring
③	Cap Nut	⑨	Union Gasket
④	Valve Seat	⑩	Valve Seat Gasket
⑤	Valve Seat Holder	⑪	Nameplate
⑥	Float		



To avoid abnormal operation, accidents or serious injury, DO NOT use this product outside of the specification range.

VA Series



Features

- Simple construction and trouble free operation
- Only one moving part, the free float, eliminates concentrate wear and provides long service life
- Precision-ground float and valve seat rubber contact assures seal tightness when vent is closed
- Also functions as a vacuum breaker

Application

- Processes requiring the rapid supply of water
- Water supply pipe, water pump, water tank, etc.

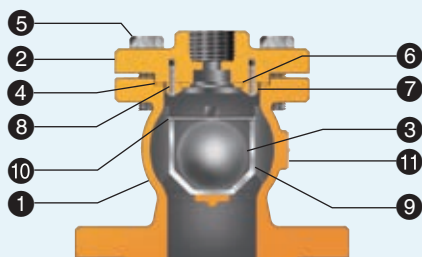
Note: Once the valve closes it will not open again, even if air accumulates.
If air is expected to accumulate, use together with an automatic air vent.

Specifications

Model		VA1	VA3	VA4	VA5
Connection	Inlet	Flanged (ASME 150RF)			
	Outlet	Screwed (Rc(PT))		Flanged (ASME 150RF)	
Size (mm)	Inlet	50	80	100	150
	Outlet	20	32	65	100
Body Material		Cast Iron (FC250)			
Maximum Operating Pressure (MPaG) PMO		1.0			
Minimum Operating Pressure (MPaG)		0.01			
Maximum Operating Temperature (°C) TMO		100			
Maximum Venting Capacity (ℓ/min)*		1 400	3 200	5 600	11 000

PRESSURE SHELL DESIGN CONDITIONS (**NOT** OPERATING CONDITIONS):
Maximum Allowable Pressure (MPaG) PMA: 1.0
Maximum Allowable Temperature (°C) TMA: 150

Construction



No.	Part Name	No.	Part Name
①	Body	⑦	Valve Seat Holder
②	Cover	⑧	Set Screw
③	Float	⑨	Float Guide
④	Cover Gasket	⑩	Snap Ring
⑤	Cover Bolt	⑪	Nameplate
⑥	Valve Seat		

Special Fluids (Non-toxic, Non-flammable)

VS1A



Features

- Achieves the tightest seal with three-point seating
- Works in liquids with low specific gravity ($\rho \geq 0.8$)
- High corrosion resistance due to stainless steel body and fluorine rubber (FPM) valve seat
- Useable with high pressures and temperatures
- Also functions as a vacuum breaker

Application

- Processes requiring rapid supply of special fluids
- Supply pipe, pump, liquid storage tank, etc.

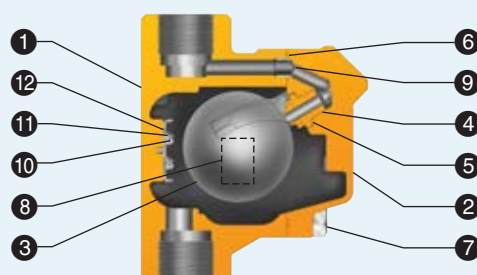
Note: Once the valve closes it will not open again, even if air accumulates.
If air is expected to accumulate, use together with an automatic air vent.

Specifications

Model	VS1A
Connection	Screwed (Rc(PT))
Size (mm)	15, 20, 25
Body Material	Cast Stainless Steel (CF8)
Maximum Operating Pressure (MPaG) PMO	2.1
Minimum Operating Pressure (MPaG)	0.01
Maximum Operating Temperature (°C) TMO	150
Maximum Venting Capacity (ℓ/min)*	270

PRESSURE SHELL DESIGN CONDITIONS (**NOT** OPERATING CONDITIONS):
Maximum Allowable Pressure (MPaG) PMA: 2.1
Maximum Allowable Temperature (°C) TMA: 220

Construction



No.	Part Name	No.	Part Name
①	Body	⑦	Cover Bolt
②	Cover	⑧	Nameplate
③	Float	⑨	Connector
④	Valve Seat	⑩	Screw
⑤	Valve Seat Gasket	⑪	Spring Washer
⑥	Cover Gasket	⑫	Plate

Automatic Air Vent

Water • Hot Water

SA3



Features

- Extremely compact size
- Auxiliary valve seat enables maintenance during operation
- Provides a tight seal, even at extremely low pressure (0.01 MPa for SA3 with no.3 orifice)

Application

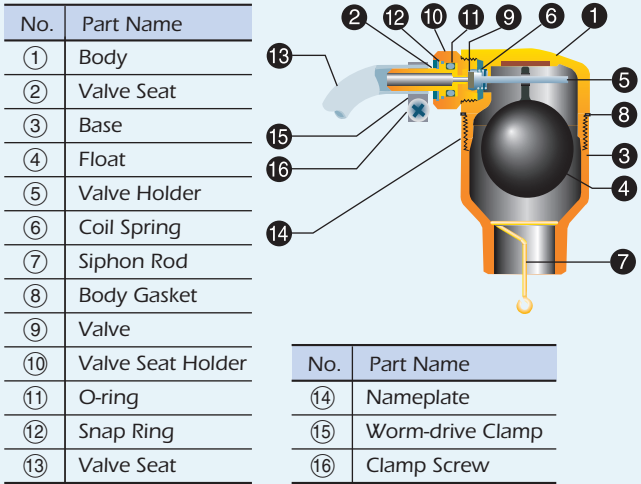
- Suitable for small and narrow installation spaces
- Suitable for small air conditioning equipment
 - Fan coil, radiator, etc.

Specifications

Model	SA3	
Connection	Screwed (Rc(PT))	
Size (mm)	10, 15, 20	
Body Material	Brass (C3771)	
Orifice Number	3	10
Maximum Operating Pressure (MPaG) PMO	0.3	1.0
Minimum Operating Pressure (MPaG)	0.01	0.1
Maximum Operating Temperature (°C) TMO	100	
Maximum Venting Capacity (ℓ/min)*	5.4	9.2

PRESSURE SHELL DESIGN CONDITIONS (NOT OPERATING CONDITIONS):
Maximum Allowable Pressure (MPaG) PMA: 1.0
Maximum Allowable Temperature (°C) TMA: 100

Construction



VC Series



Features

- Simple construction and trouble free operation
- Only one moving part, the free float, eliminates concentrate wear and provides long service life
- Free float and valve seat with rubber contact assures seal tightness when vent is closed
- Also functions as a vacuum breaker

Application

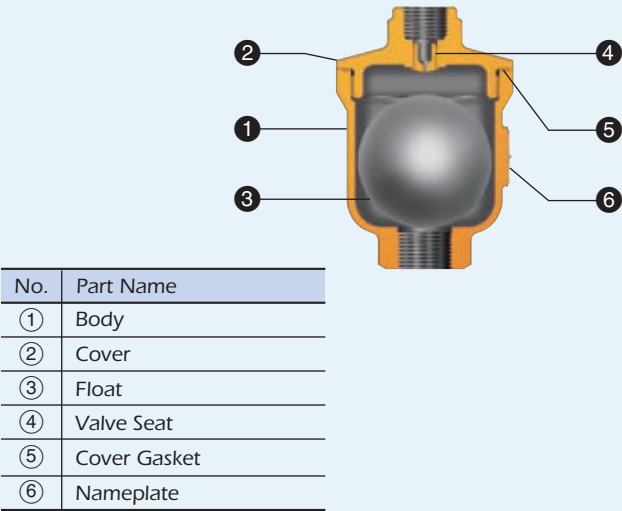
- General use air vent
 - Water supply pipe, cooling/heating equipment, etc.

Specifications

Model	VC2	VC3	VC4
Connection	Screwed (Rc(PT))		
Size (mm)	Inlet	15	25
	Outlet	10	
Body Material	Bronze (CAC406)	Cast Iron (FC250)	
Maximum Operating Pressure (MPaG) PMO	0.5	0.6	1.0
Minimum Operating Pressure (MPaG)	0.05	0.1	0.1
Maximum Operating Temperature (°C) TMO	90		
Maximum Venting Capacity (ℓ/min)*	25	90	380

PRESSURE SHELL DESIGN CONDITIONS (NOT OPERATING CONDITIONS):
Maximum Allowable Pressure (MPaG) PMA: 0.5 (VC2), 0.6 (VC3), 1.0 (VC4)
Maximum Allowable Temperature (°C) TMA: 185 (VC2), 220 (VC3), 150 (VC4)

Construction



Special Fluids (Non-toxic, Non-flammable)

VS1C



Stainless Steel

Tight Sealing

Features

- Achieves the tightest seal with three-point seating
- Works in liquids with low specific gravity ($\rho \geq 0.8$)
- High corrosion resistance due to stainless steel body and fluorine rubber (FPM) valve seat
- Useable with high pressures and temperatures
- Also functions as a vacuum breaker

Application

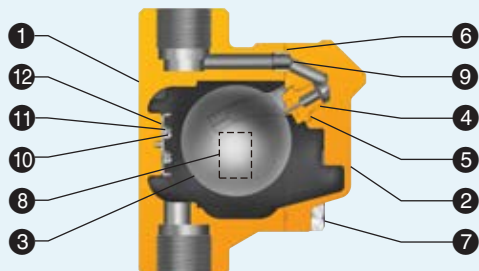
- Suitable for facilities and piping using special fluids
 - Supply pipe, pump, liquid storage tank, etc.

Specifications

Model	VS1C	
Connection	Screwed (Rc(PT))	
Size (mm)	15, 20, 25	
Body Material	Cast Stainless Steel (CF8)	
Orifice Number	10	21
Maximum Operating Pressure (MPaG) PMO	1.0	2.1
Minimum Operating Pressure (MPaG)	0.01	
Maximum Operating Temperature (°C) TMO	150	
Maximum Venting Capacity (ℓ/min)*	170	130

PRESSURE SHELL DESIGN CONDITIONS (NOT OPERATING CONDITIONS):
 Maximum Allowable Pressure (MPaG) PMA: 2.1
 Maximum Allowable Temperature (°C) TMA: 220

Construction



No.	Part Name	No.	Part Name
①	Body	⑦	Cover Bolt
②	Cover	⑧	Nameplate
③	Float	⑨	Connector
④	Valve Seat	⑩	Screw
⑤	Valve Seat Gasket	⑪	Spring Washer
⑥	Cover Gasket	⑫	Plate

LA Series



X-element

Compact

Features

- Vents hot air up to just 22 °C below saturated steam temperature
- Fail-open mechanism
- High heat resistance
- Compact with large venting capacity

Application

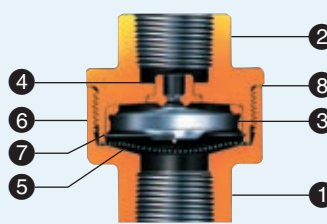
- Batch processes requiring large volume air venting
- Where hot-air locking occurs during operation
 - Double-jacketed kettle, pressing machine, etc.

Specifications

Model	LA13L	LA21
Connection	Screwed (Rc(PT))	
Size (mm)	15, 20	15
Body Material	Brass (C3771)	Cast Stainless Steel (CF8)
Maximum Operating Pressure (MPaG) PMO	1.3	2.1
Minimum Operating Pressure (MPaG)	0.01	0.01
Maximum Operating Temperature (°C) TMO	200	235
Maximum Venting Capacity (ℓ/min)*	1 900	2 000

PRESSURE SHELL DESIGN CONDITIONS (NOT OPERATING CONDITIONS):
 Maximum Allowable Pressure (MPaG) PMA: 1.6 (LA13L), 6.3 (LA21)
 Maximum Allowable Temperature (°C) TMA: 220 (LA13L), 425 (LA21)

Construction



LA21



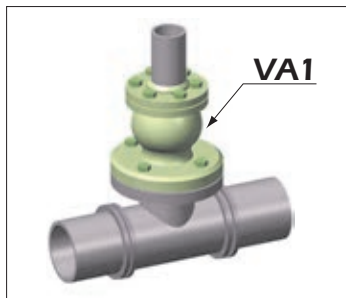
LA13L

No.	Part Name	No.	Part Name
①	Body	⑤	Screen
②	Cover	⑥	Nameplate
③	X-element	⑦	Snap Ring
④	Valve Seat	⑧	Cover Gasket

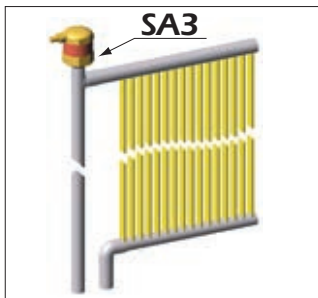
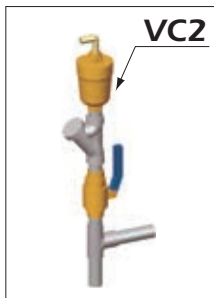
Application Examples

For Liquid

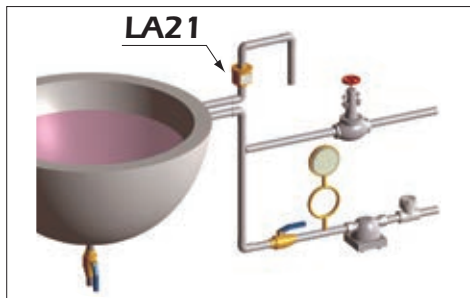
Rapid Initial Air Vent



Automatic Air Vent



For Steam



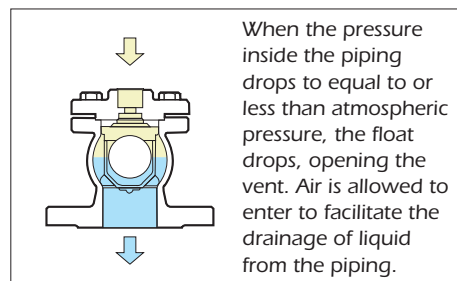
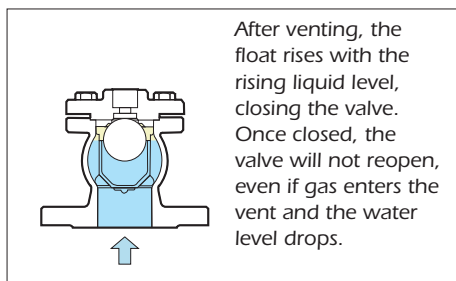
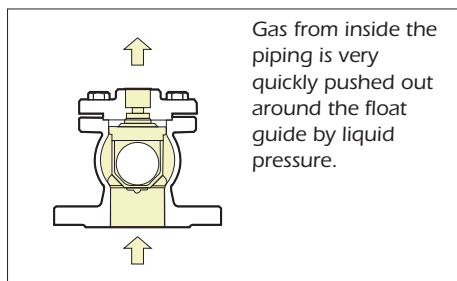
Note: • Inlet piping with no horizontal portion is recommended for water/air displacement. If there is a horizontal portion, make the pipe diameter of the horizontal portion larger than the vertical portion or make the horizontal portion as short as possible.
• Make sure the inlet piping diameter is at least as large as the product's inlet diameter. For the inlet connection especially for products* with a nominal diameter of 15 mm, use a pipe/fitting, etc. with an inner diameter of at least 16 mm, such as a schedule 40 pipe nipple with a nominal diameter of 15 mm. A smaller pipe may prevent water/air displacement. (*Except SA3)

Operation

For Liquid

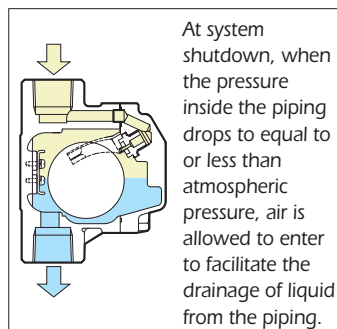
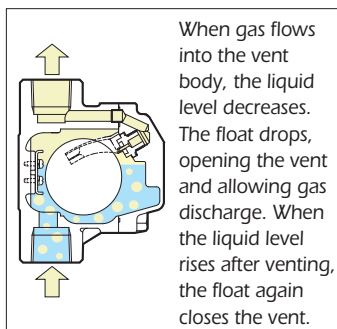
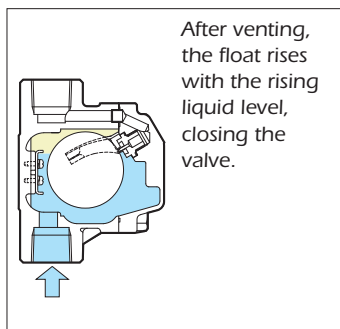
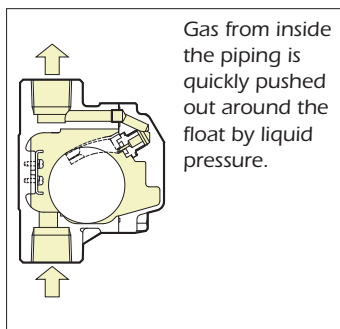
Rapid Initial Air Vent

VA Series



Automatic Air Vent

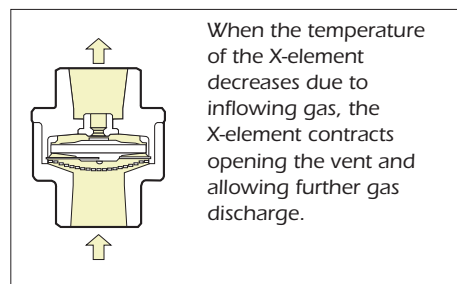
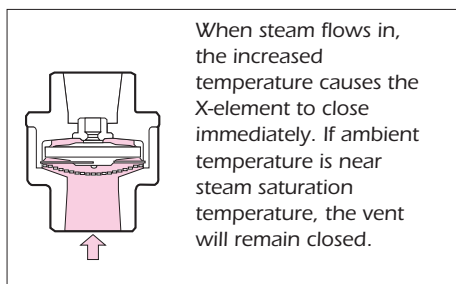
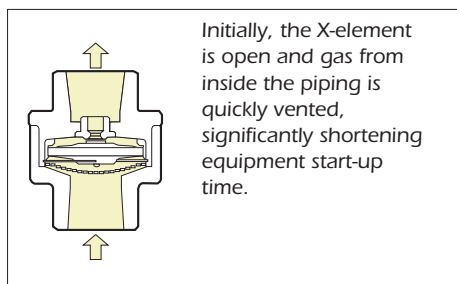
VS1C



For Steam

Automatic Air Vent

LA Series



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Manufacturer
TLV CO., LTD.
Kakogawa, Japan
is approved by LRQA Ltd, to ISO 9001/14001

ISO 9001
ISO 14001
CERTIFIED
LR
ISO 9001-ISO 14001

TLV®

AIR & DRAIN TRAPS

**JA·JAHR Series / G8
TATSU2
SS1VG / JAHRG Series**



TLV® Free Float Technology

AIR TRAPS

For Air

In today's world of automation, compressed air is used in many different industries including high-precision machinery and instrumentation. After air is compressed it is cooled by an after-cooler or in a receiver tank, where condensate is formed from the air as water droplets. This condensate also occurs in compressed air distribution piping, leading to rust and fluctuation in high-precision machinery, as well as causing a reduction in product quality. Air traps protect your equipment and products by discharging condensate automatically.

■ Long Service Life

The hinge-less lever-less free float has one moving part allowing for simple operation. With infinite sealing surfaces, the free float does not suffer from concentrated wear, maintaining initial performance quality over a long time period.

JA·JAHR Series/G8

■ Continuous Condensate Discharge

The float adjusts quickly to changes in condensate flow adjusting the valve seat opening, ensuring continuous rapid discharge without condensate backup.

JA·JAHR Series/G8

■ Rubber Valve Seat for Tight Sealing

The standardized rubber* valve seat allows for tight sealing with the precision ground float.

JA Series*/G8

* JA7.2, JA7.5, JA8 and JAHR Series equip fluorine resin valve seat.

■ Valve Seat Cleaning Mechanism

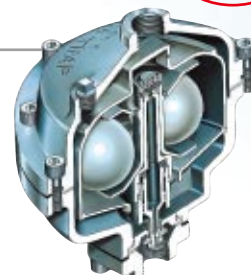
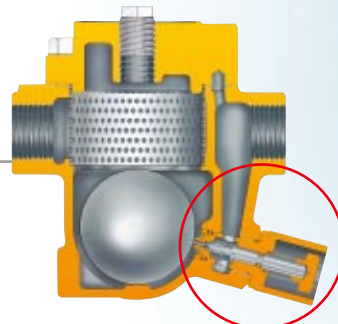
Equipped with an external plunger unit, blockage caused by oils and/or scale can be easily eliminated.

JA Series (JA3D/JA3/JA5/JA7)

■ Discharge High-Viscosity Condensate

With a large (16 mm) orifice, unique intermittent discharge and self-cleaning function, high-viscosity condensate as well as condensate containing dirt/scale can be discharged. Discharges large amounts of condensate (up to approx. 7.4 tons/hour).

TATSU2



for the Highest Reliability

DRAIN TRAPS

For Air and Inert Gases*

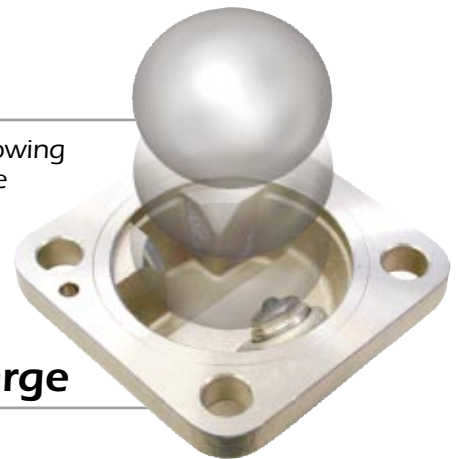
Like compressed air, after air or other inert gases are compressed they are cooled, and condensate is formed from air or the gas as water droplets. Condensate is the cause of many challenges resulting in rust and freezing in the pipes as well as a reduction in product quality. Drain traps for discharging condensate from both compressed air and inert gases protect your equipment and products by discharging condensate automatically as it forms while maintaining a tight seal. These traps are made with durable steel construction for a long service life.

* Do not use with toxic, flammable or otherwise hazardous gases.

■ Long Service Life

The hinge-less lever-less free float has one moving part allowing for simple operation. With infinite sealing surfaces, the free float does not suffer from concentrated wear, maintaining initial performance quality over a long time period.

SS1VG Series/JAHRG Series



■ Continuous Condensate Discharge

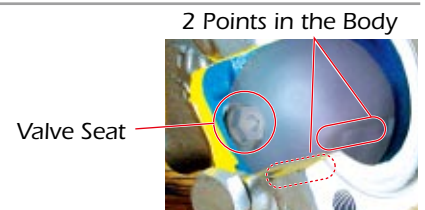
The float adjusts quickly to changes in condensate flow adjusting the valve seat opening, ensuring continuous rapid discharge without condensate backup.

SS1VG Series/JAHRG Series

■ Three Point Seating for Tight Sealing

The high-precision ground float fits securely on the three-point seating creating a high-quality seal even for metal valve seats comparable to that of rubber.

SS1VG Series/JAHRG Series



■ Materials for High-Temperature/Pressure

For higher temperature and pressure applications, TLV Drain Traps offer choices in body and valve seat material to meet specific needs. The SS1VG has all-stainless steel construction with a metal valve seat available for high-temperature applications. The JAHRG Series features cast steel bodies for high-pressure applications with tight-sealing provided by a rubber valve seat, or higher temperatures with a metal valve seat.

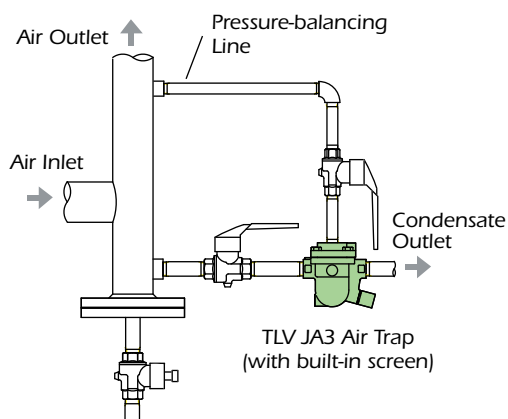
SS1VG Series/JAHRG Series



JA·JAHR Series /G8

AIR TRAPS

■ Sample Application: Air Main Drip



■ Features:

- Free float type for continuous condensate discharge.
- Only one moving part, the free float, simplifies operation and provides reliable service.
- Usable for installation in both horizontal and vertical piping (JA3D).
- External valve seat cleaning mechanism easily eliminates blockage (JA3D/JA Series).
- Large orifice to reduce valve seat blockage (JA7/G8).
- Large capacity (Max. 2.5 t/h) and/or high pressure (PMO 4.0 MPaG).

■ Applications:

- Discharge of condensate in air lines (end of piping after receiver tanks, after coolers, etc.).
- Small compressed air lines (JA3D/JA3).
- Lubricated air compressor systems where small amounts of oil get into the condensate (JA7/G8).



JA3D

Valve-seat
Cleaning



JA5

Valve-seat
Cleaning

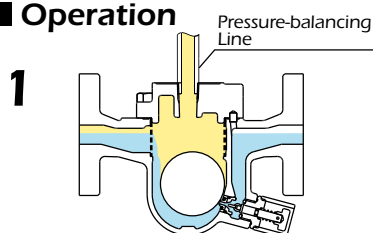


JAH8R

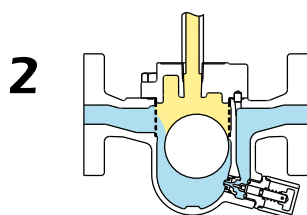


G8

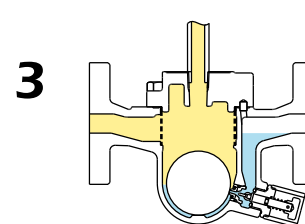
■ Operation



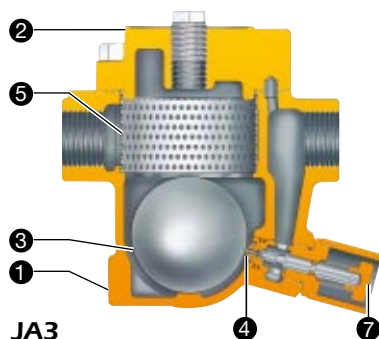
As condensate enters the trap, the float rises controlling the size of the valve seat opening. With the valve open, the condensate is continuously discharged.



If a large condensate load enters the trap at once, the float rises to open the valve seat fully, increasing the condensate discharge capacity.

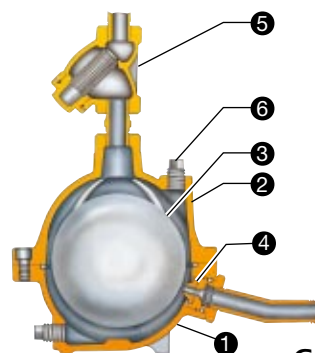


If no condensate enters the trap, the float is fully lowered to close the valve seat. The water level remains above the valve seat, promoting tight sealing.



JA3

No.	Part Name
①	Body
②	Cover
③	Float
④	Valve Seat
⑤	Screen
⑥	Balancing Plug
⑦	Plunger



G8

No.	Part Name
①	Body
②	Cover
③	Float
④	Valve Seat
⑤	Strainer
⑥	Balancing Plug

Model	JA3D	JA3	JAF3	JA5	JAF5	JA7	JA7.2	JA7.5	JA8	G8	JAH7.2R	JAH7.5R	JAH8R
Body Material ¹⁾	ZA	DCI	CI	DCI	DCI	CI	CI	CI	CI	CI	CS	CS	CS
Valve Seat Material ²⁾	NBR	NBR	NBR	NBR	NBR	NBR	PTFE	PTFE	PTFE	NBR	PTFE	PTFE	PTFE
Connection ³⁾	S	S	F	S	F	F	F	F	F	S	SW, F	SW, F	SW, F
Max. Operating Press. (MPaG)	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.0	4.0	4.0	4.0
Max. Operating Temp. (°C)	100	100	100	100	100	100	150	150	150	100	150	150	150
Min. Condensate Load for Tight Sealing (kg/h)	—	—	—	—	—	—	10	10	20 ⁴⁾ , 15	—	10	10	20 ⁴⁾ , 15

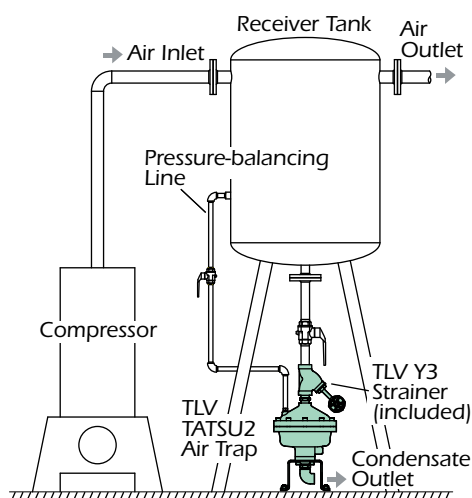
¹⁾ ZA: Zinc Alloy, DCI: Ductile Cast Iron, CI: Cast Iron, CS: Cast Steel ²⁾ NBR: Nitrile Rubber, PTFE: Fluorine Resin

³⁾ S = Screwed, F = Flanged, SW = Socket Welded ⁴⁾ Orifice No. 2 & 5

TATSU2

AIR TRAPS

Sample Application: Receiver Tank



Features:

- Large (16 mm diameter) valve seat for easy discharge of oil, rust and scale.
- Large condensate discharge capacity (approx. 7.4 tons/hour).
- Automatic self-cleaning function during operation keeps the valve seat free of any blockage.

Applications:

- Air piping containing oil, rust or scale.
- Air-using receiver tanks or other equipment with higher viscosity condensate.

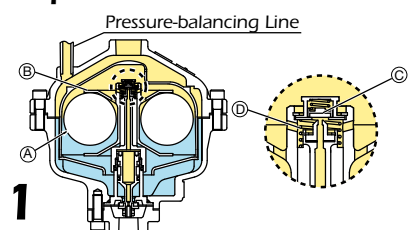


TATSU2

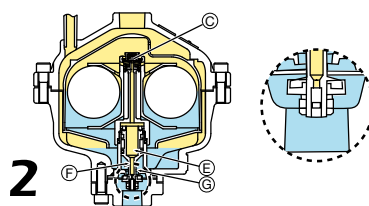
Large Capacity

For High-viscosities

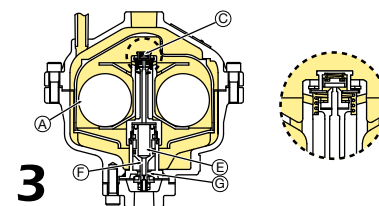
Operation



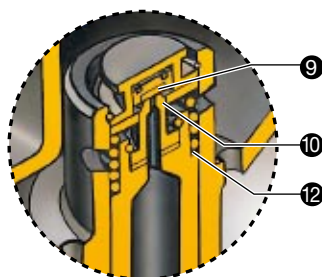
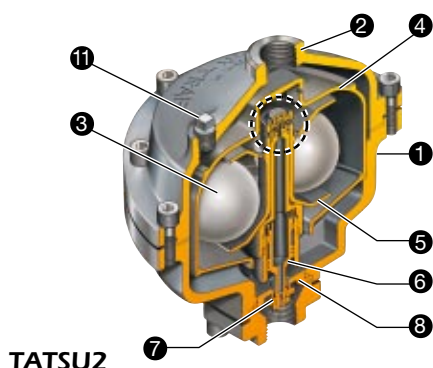
1
Condensate and oil flow into the trap and accumulate. When the level in the trap body rises to a point where the floats (A) rise and lift the float holder (B), the pilot valve (C) opens with the help of the coil spring (D).



2
When pilot valve (C) opens, secondary pressure air enters the pressure chamber (E) lowering the piston (F) and opening the main valve (G) to discharge condensate.



3
While the condensate inside the float cover discharges, the floats (A) fall and cause the pilot valve (C) to close. The pressure in the pressure chamber (E) is released to the outlet and the piston (F) rises to close the main valve (G) after a slight delay to allow the main valve to self-clean during discharge.

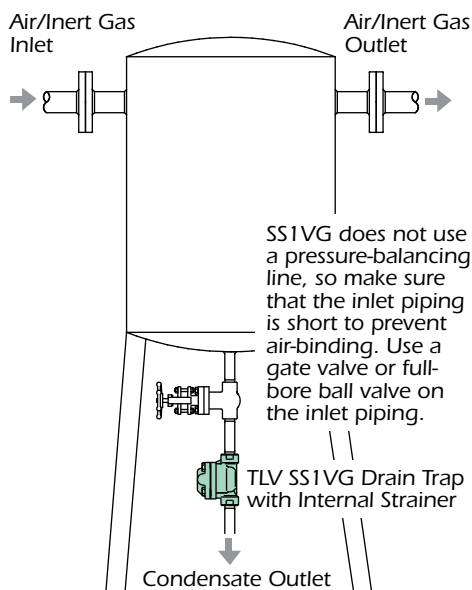


No.	Part Name
①	Body
②	Cover
③	Float
④	Float Cover
⑤	Float Holder
⑥	Piston
⑦	Main Valve
⑧	Main Valve Seat
⑨	Pilot Valve
⑩	Pilot Valve Seat
⑪	Balancing Plug
⑫	Opening Spring

Note: Y Strainer with Blowdown Valve Included

Model	TATSU2
Body Material	Cast Iron
Connection	Screwed
Max. Operating Pressure (MPaG)	1.0
Min. Operating Pressure (MPaG)	0.2
Max. Operating Temperature (°C)	80

Sample Application: Receiver Tank



Features:

- High-precision ground free float with three-point seating technology for tight sealing even during low-load conditions.
- Only one moving part, the free float, simplifies operation and provides reliable service.
- All-stainless steel body with long life for vertical installation.
- Small models allow installation even with limited space.

Applications*:

- Discharge of condensate from compressed air or inert gas-using equipment (compressors, etc.)
- Discharge of condensate in compressed air or inert gas lines (end of piping after receiver tanks, aftercoolers, etc.).
- Small capacity compressed air or inert gas lines.

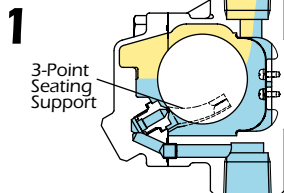
* Do not use for toxic, flammable or otherwise hazardous gases.



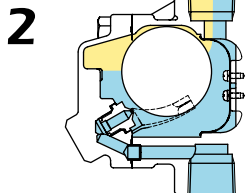
SS1VG



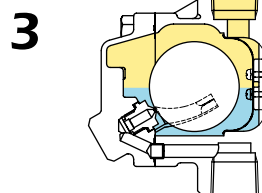
Operation



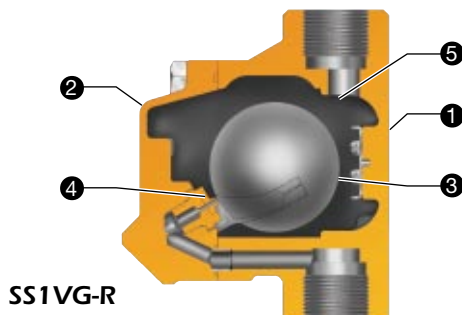
As condensate enters the trap, the float rises controlling the size of the valve seat opening. With the valve open, the condensate is continuously discharged.



If a large condensate load enters the trap at once, the float rises to open the valve seat fully, increasing the condensate discharge capacity.



If no condensate enters the trap, the float is fully lowered to close the valve seat. The water level remains above the valve seat, promoting tight sealing.



SS1VG-R

	Part Name
①	Body
②	Cover
③	Float
④	Orifice (Valve Seat)
⑤	Screen

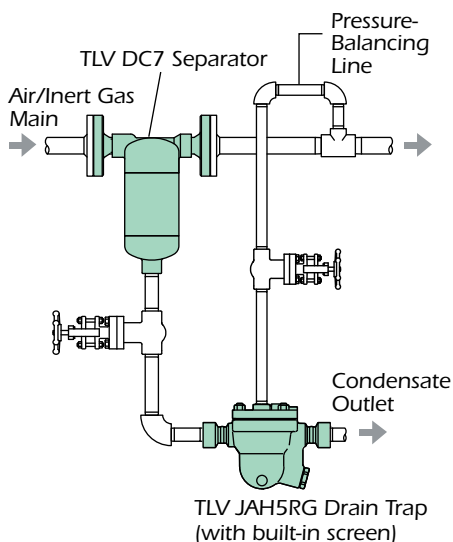
Model	SS1VG-R	SS1VG-M
Body Material	Stainless Steel	Stainless Steel
Valve Seat Material	Fluorine Rubber	Metal
Connection	Screwed	Screwed
Max. Operating Pressure (MPaG)	1.0	2.1
Max. Operating Temperature (°C)	150	220
Min. Condensate Load for Tight Sealing (kg/h)	0	0.5

JAH RG Series

DRAIN TRAPS

Sample Application:

Main Line with Separator



Features:

- High-precision ground free float with three-point seating technology for tight sealing even during low-load conditions.
- Only one moving part, the free float, simplifies operation and provides reliable service.
- Durable pressure-resistant design.
- Small model allows installation even with limited space (JAH5RG).

Applications*:

- Discharge of condensate from compressed air or inert gas-using equipment (compressors, etc.)
- Discharge of condensate in compressed air or inert gas lines (end of piping after receiver tanks, aftercoolers, etc.).
- Large capacity compressed air or inert gas lines.

* Do not use for toxic, flammable or otherwise hazardous gases.



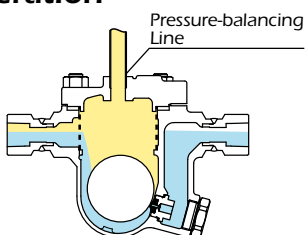
JAH5RG

Three-Point Seating

For High-pressures

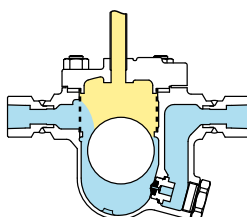
Operation

1



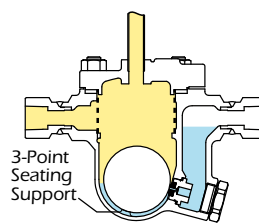
As condensate enters the trap, the float rises controlling the size of the valve seat opening. With the valve open, the condensate is continuously discharged.

2

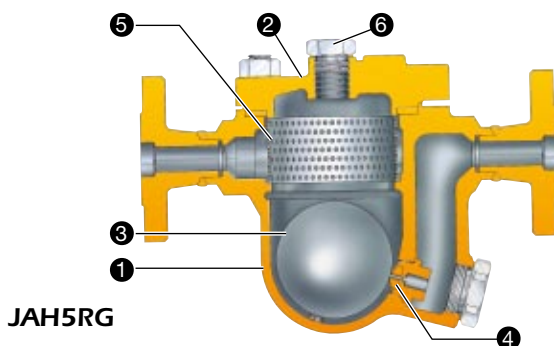


If a large condensate load enters the trap at once, the float rises to open the valve seat fully, increasing the condensate discharge capacity.

3



If no condensate enters the trap, the float is fully lowered to close the valve seat. The water level remains above the valve seat, promoting tight sealing.



JAH5RG

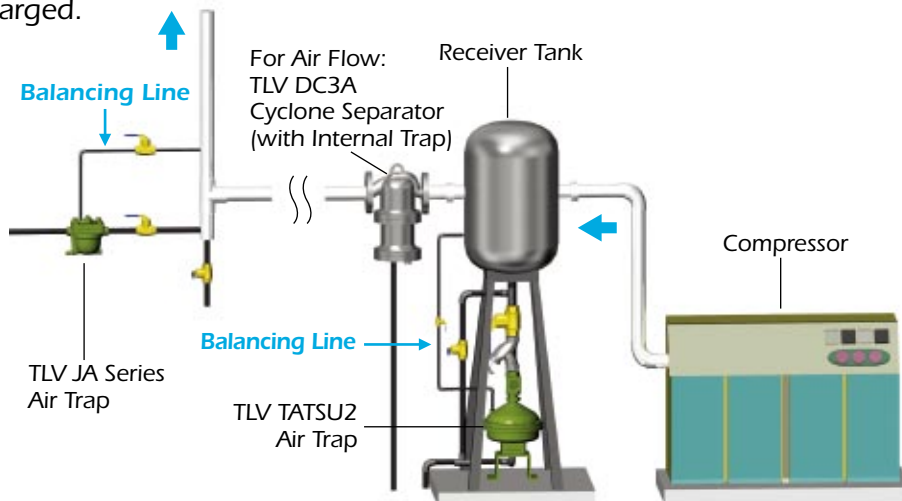
No.	Part Name
①	Body
②	Cover
③	Float
④	Orifice (Valve Seat)
⑤	Screen
⑥	Balancing Plug

Model	JAH5RG-R	JAH5RG-M	JAH7RG-R	JAH7RG-M
Body Material	Cast Steel	Cast Steel	Cast Steel	Cast Steel
Valve Seat Material	Fluorine Rubber	Metal	Fluorine Rubber	Metal
Connection*	S, SW, F	S, SW, F	SW, F	SW, F
Max. Operating Pressure (MPaG)	2.2	4.6	4.0	4.6
Max. Operating Temperature (°C)	150	425	150	425
Min. Condensate Load for Tight Sealing (kg/h)	0	1	0	5

* S = Screwed, SW = Socket Welded, F = Flanged

Pressure-balancing Line

Without a pressure-balancing line connected between the trap cover and a dry portion of the piping/receiver tank, air or gas binding can occur. Air or gas binding occurs when vapor in the trap cavity cannot be displaced by the incoming condensate, which prevents condensate from being discharged.



Note: Since the SS1VG is installed vertically, a balancing line is not generally required. However, to prevent air binding, use as short as possible straight and vertical inlet piping with a minimum nominal diameter of 15 mm.

Selection Guide

Applicable Fluids		Model	Connection	Body Material	Piping Direction	Valve Seat Material	Operating Press. Range (MPaG)	Max. Operating Temperature (°C)	Max. Discharge Capacity (kg/h)	Min. Specific Gravity*	Special Feature	
Air Traps	Air	JA3D	Screwed	Zinc Alloy	Horiz./Vert.	Nitrile Rubber	0.01 - 1.6	100	230	1.0	Plunger for manual valve seat cleaning	
		JA3		Ductile Cast Iron	Horizontal				275			
		JAF3	Flanged	Cast Iron					Ductile Cast Iron			455
		JA5	Screwed	Flanged								1620
		JAF5	Vertical									0.01 - 1.0
		JA7		Horizontal	PTFE**		0.01 - 1.6		9410		Increased capacity	
		G8	Screwed						Cast Iron			0.01 - 4.0
		JA7.2	Flanged			Cast Steel		25770				
		JA7.5					9410					
		JA8					8710					
		JAH7.2R				25770						
		JAH7.5R	8710									
		JAH8R	25770									
		TATSU2	Screwed	Cast Iron	Vertical	Nitrile Rubber	0.2 - 1.0	80	7400	Discharges High-Viscosity Condensate		
Drain Traps	Air and Inert Gases ***	SS1VG-R	Screwed, Socket Welded, Flanged	Cast Stainless Steel	Vertical	Fluorine Rubber	0.01 - 1.0	150	130	0.50	All parts are stainless steel	
		SS1VG-M				Metal**	0.01 - 2.1	220	385			
		JAH5RG-R		Cast Steel	Horizontal	Fluorine Rubber	0.01 - 2.2	150	270		High pressure service	
		JAH5RG-M				Metal**	0.01 - 4.6	425	560			
		JAH7RG-R	Socket Welded, Flanged			Fluorine Rubber	0.01 - 4.0	150	1380			
		JAH7RG-M				Metal**	0.01 - 4.6	425	2000			

* Maximum operating pressure, maximum differential pressure and condensate discharge capacity are affected by the specific gravity of the condensate.

** Metal and PTFE valve seats require a minimum condensate load for tight sealing. See individual product pages for details.

*** Do not use for toxic, flammable or otherwise hazardous gases.

Full product details (sizes, connections, pressures, capacities and materials) are included in the individual specification data sheets (SDS).



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.

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ISO 9001/ISO 14001

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is approved by LRQA Ltd. to ISO 9001/14001

