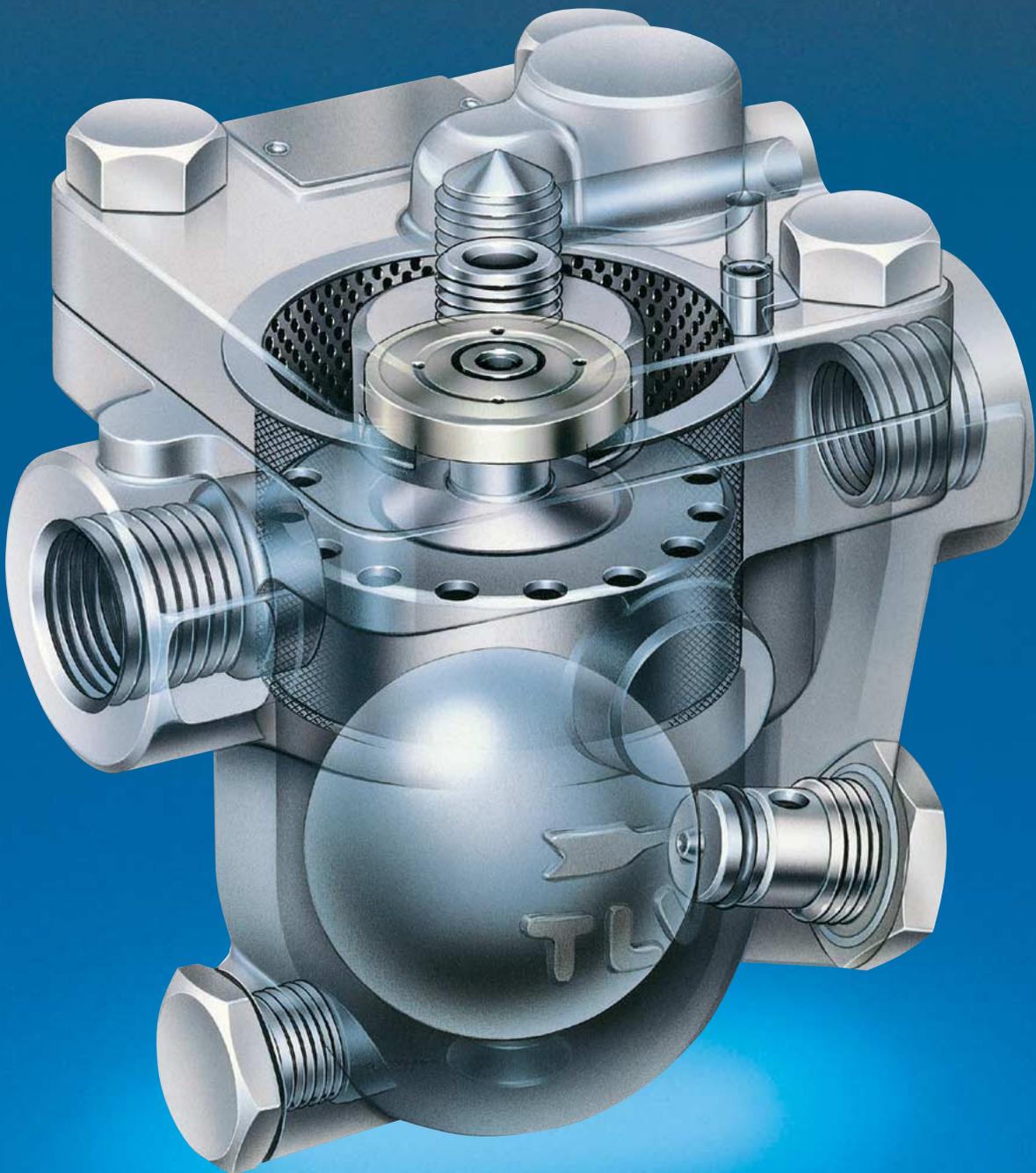


# TLV<sup>®</sup>

## Free Float<sup>®</sup> Steam Trap Series



# Free Float® Steam Traps Revolutionizing Fluid Control Technology

## “Free Float®”

**More than 50 years have passed since TLV introduced the free float concept to the steam industry. Now being used in increasing numbers within manufacturing plants throughout the world, TLV free floats are ensuring that process plant performance is maximised.**

### **Free Float® Principle**

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The failure of mechanical steam traps is related to the number of their moving parts. Compared to the inverted bucket trap, with its complex mechanism incorporating bucket, lever and hinge, the TLV free float, with only one moving part, guarantees long life and reliability.

### **Precision-ground Spherical Float**

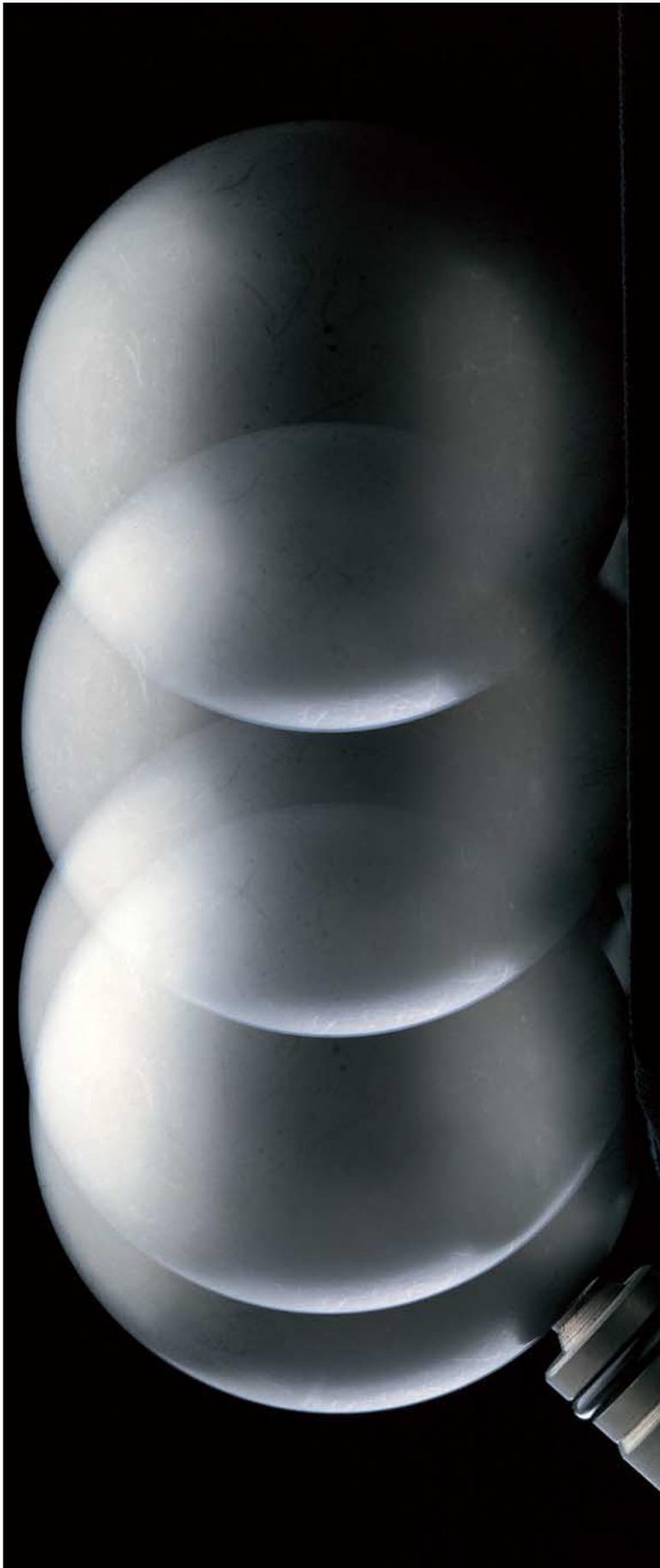
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The high quality manufacturing process produces floats which are almost perfectly spherical. The result is a free float steam trap with unmatched sealing performance, even when operating under conditions of low condensate flow at high pressure and temperature.

### **“Simple is best”**

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The uncomplicated yet sophisticated technology of TLV's free float trap encapsulates the TLV philosophy that simple is best.



# The First Choice for Process Efficiency

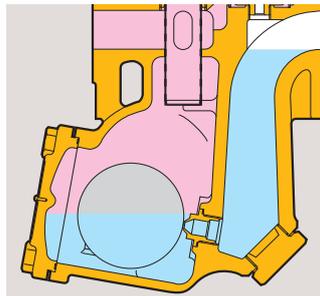
## The Reasons are Simple

### 1 Process Efficiency

The TLV free float adjusts quickly to changes in condensate flow, ensuring rapid discharge and maximum process efficiency. Unaffected by back pressure, the TLV free float is ideal where condensate is to be recovered.

### 2 Energy Conservation

A valve orifice positioned below the "water level" and three-point seating in some models eliminate steam leakage, even under low-load conditions.



### 3 Long Life

The precision-ground float provides an infinite number of contact surfaces with the orifice, ensuring little wear and long reliable service life.

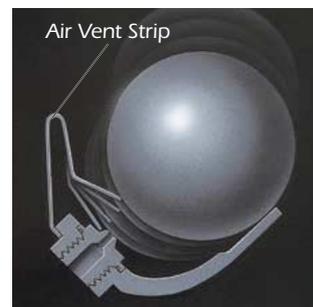


### 4 Built-in Strainer

All internals are protected by an integral perforated stainless steel strainer screen.

### 5 Rapid Start-up

A balanced pressure X-element is included in the JX, JH-X, SJFX and SJHX free float traps, for improved air venting. Other models are equipped with an integral bimetal air vent.



Bimetal



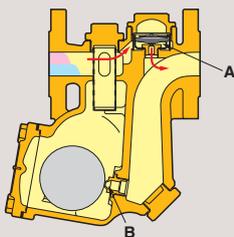
X-element

### 6 Easy maintenance

Free float traps, with the exception of the maintenance-free SS3/SS5 series, can be repaired inline.

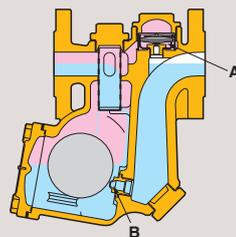
## FREE FLOAT® OPERATION (X-element)

### 1 Start-up



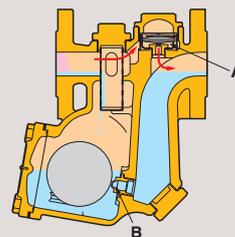
When the trap is cool, a thermo-static capsule (X-element) contracts and valve port (A) opens wide to continuously discharge initial air. As cold condensate enters the trap, the float rises to allow discharge of condensate from valve port (B) and both air and condensate from valve port (A).

### 2 Hot Condensate Discharge



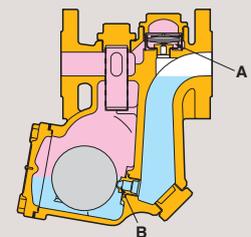
Once all initial air and cold condensate have been discharged, hot condensate heats the X-element which closes valve port (A) before steam reaches the trap. Condensate which simultaneously enters the trap continues to be discharged through valve port (B).

### 3 Continuous Response



Air or retained condensate entering the trap drop the temperature and contract the X-element. Valve port (A) instantaneously opens to discharge both air and condensate. When higher temperature condensate follows, the X-element expands and closes valve port (A).

### 4 Complete Closure



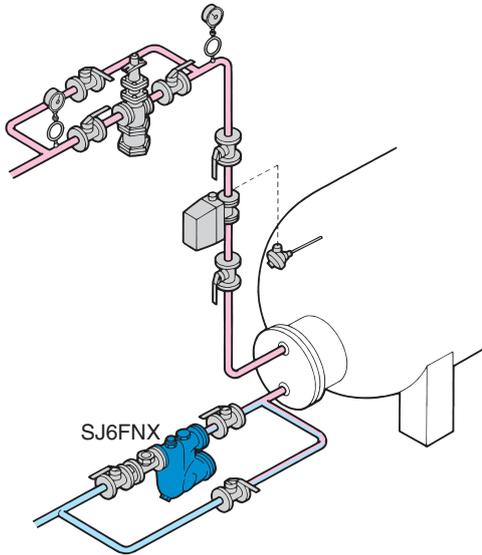
When condensate flow to the trap ceases, the float closes valve port (B) which is always sealed below the water level. The upper section fills with steam and the X-element closes valve port (A). The trap is then completely sealed, preventing any steam leakage.

# SJX/FS Series

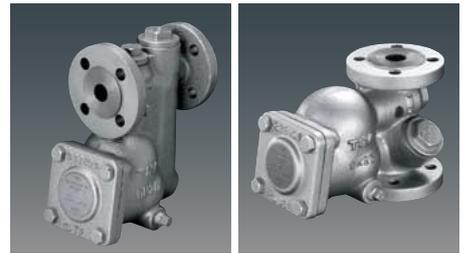
## SJX Series

Medium Pressure	Process
Medium Temperature	Small-to-Large Equipment

### Sample Application: Heat Exchanger

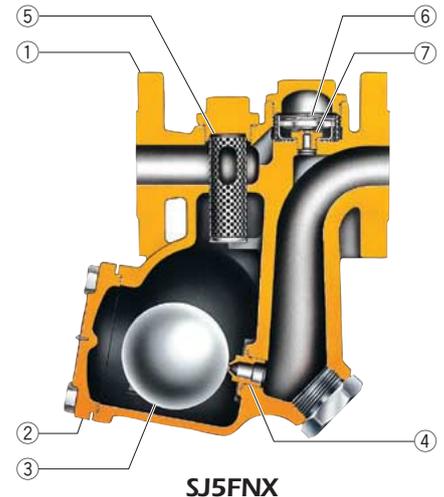


- Ductile cast iron PN 40 steam traps for pressures up to 22 barg.
- Automatic X-element air vent for fast start-up and venting air at close-to-steam temperature.
- The SJFNX models are for horizontal installation, the SJFVX models for vertical installation.
- SJ3V-X with screwed connection for vertical installation only.



SJ5FNX

SJ5FVX

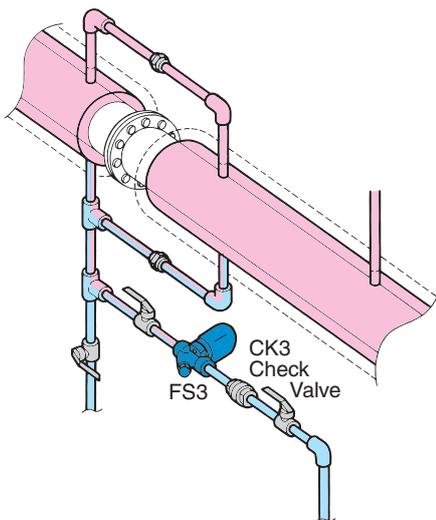


No.	Description/Material
①	Body/Ductile Cast Iron
②	Cover/Ductile Cast Iron
③	Float/Stainless Steel
④	Orifice/ —
⑤	Screen/Stainless Steel
⑥	X-element/Stainless Steel
⑦	Air Vent Seat/Stainless Steel

## FS Series

Medium Pressure	Small Process
Medium Temperature	Drip/Tracer

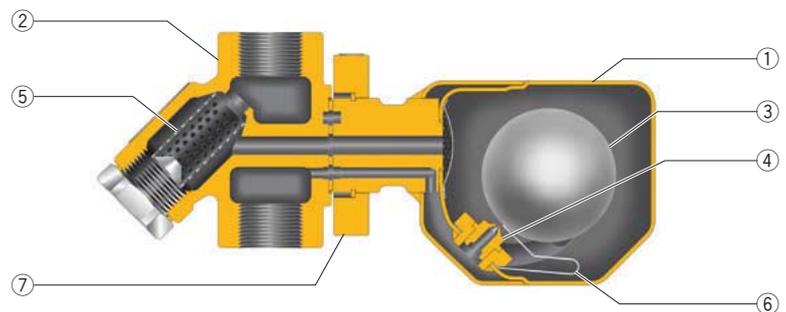
### Sample Application: Jacketed Tracer



- Stainless steel traps with two-bolt universal connector facilitate installation and replacement.
- Universal flange permits correct installation in vertical and horizontal piping.
- Automatic bimetal air vent for fast start-up. (QuickTrap)



FS3



No.	Description/Material	No.	Description/Material
①	Trap Body/Stainless Steel	⑤	Screen/Stainless Steel
②	Connector Body/Stainless Steel	⑥	Air Vent Strip/Bimetal
③	Float/Stainless Steel	⑦	Flange/Forged Steel
④	Orifice/ —		

Model	SJ3V-X	SJ3FN/VX	SJ5FN/VX	SJ6FN/VX	SJ7FN/VX	FS3	FS5	FS5H
Connection*	S	F	F	F	F	S, W, F	W, F	W, F
Maximum Operating Pressure (barg)	22	22	22	22	22	21	32	46
Maximum Operating Temperature (°C)	220	220	220	220	220	400	400	400**/425

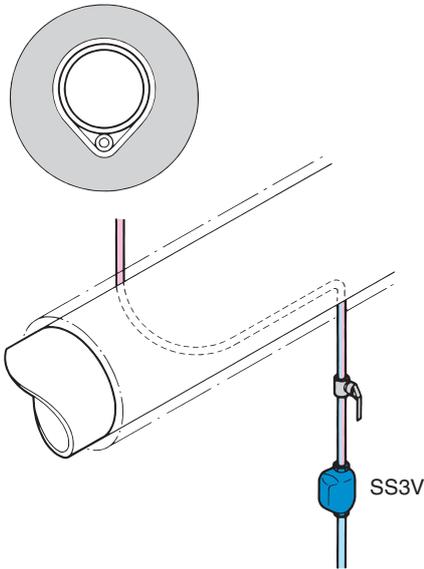
\* S = Screwed, W = Socket Welded, F = Flanged \*\* With PN flange

# SS Series

## SS3/SS5 Series

Medium Pressure	Small Process
Medium Temperature	Drip/Tracer

### Sample Application: Tracer

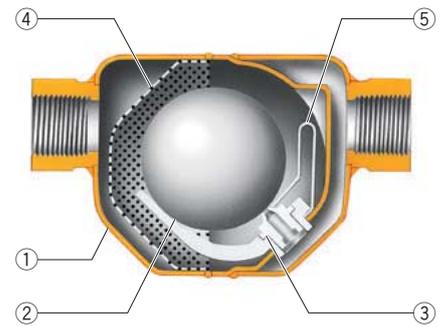


- All stainless steel PN 40; (SS5H: PN 63) Maintenance-free steam traps for pressures up to 46 barg.
- Automatic bimetal air vent for fast start-up.
- SS3N, SS5N, and SS5NH for horizontal installation, SS3V, SS5V, and SS5VH for vertical installation.
- Optional stainless steel insulating cover with ceramic fiber available for SS3N and SS3V.
- Can be used on superheated steam.



SS3N

SS3V



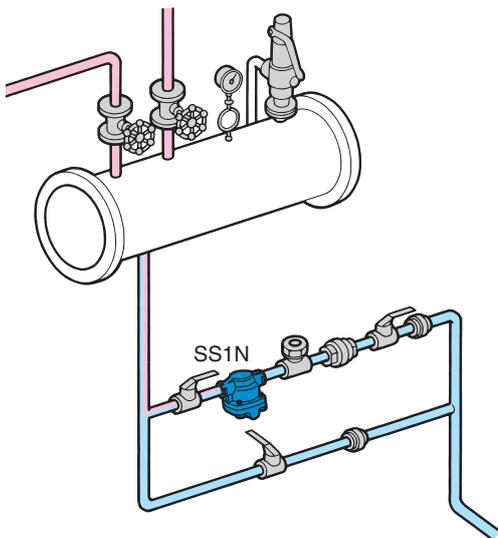
SS3N

No.	Description/Material
①	Body/Stainless Steel
②	Float/Stainless Steel
③	Orifice/ —
④	Screen/Stainless Steel
⑤	Air Vent Strip/Bimetal

## SS1 Series

Medium Pressure	Small Process
Medium Temperature	Drip/Tracer

### Sample Application: Steam Header

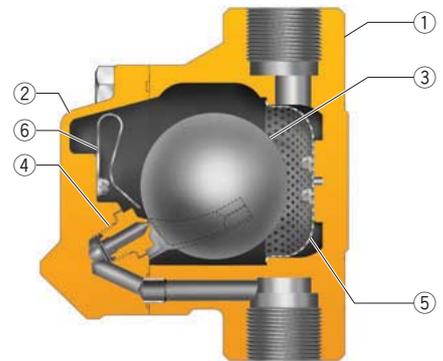


- All stainless steel PN 40 steam traps for pressures up to 21 barg.
- Removable cover allows easy inspection and maintenance.
- Automatic bimetal air vent for fast start-up.
- The SS1N models are for horizontal installation, the SS1V models for vertical installation.
- Can be used on superheated steam.



SS1N

SS1V



SS1V

No.	Description/Material
①	Body/Stainless Steel
②	Cover/Stainless Steel
③	Float/Stainless Steel
④	Orifice/ —
⑤	Screen/Stainless Steel
⑥	Air Vent Strip/Bimetal

Model	SS3N/V	SS5N/V	SS5NH/VH	SS1NL/VL	SS1NH/VH
Connection*	S, W, F	S, W, F	S, W, F	S, W, F	S, W, F
Maximum Operating Pressure (barg)	21	32	46	21	21
Maximum Operating Temperature (°C)	400	400**/425	400**/425	220	400

\* S = Screwed, W = Socket Welded, F = Flanged \*\* With PN flange

# JX/JH-X/JH-B Series

## JX Series

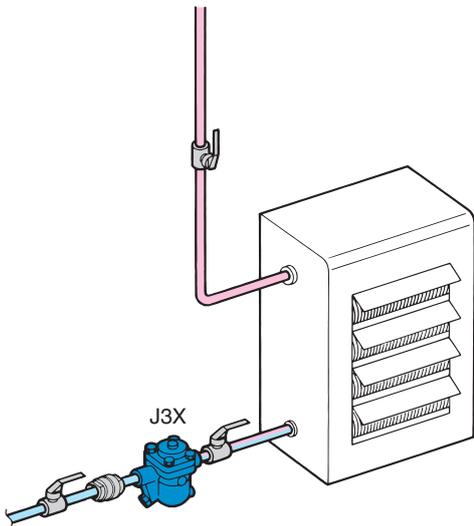
Low-to-Medium Pressure

Process

Medium Temperature

Small-to-Large Equipment

### Sample Application: Air Handling Coil



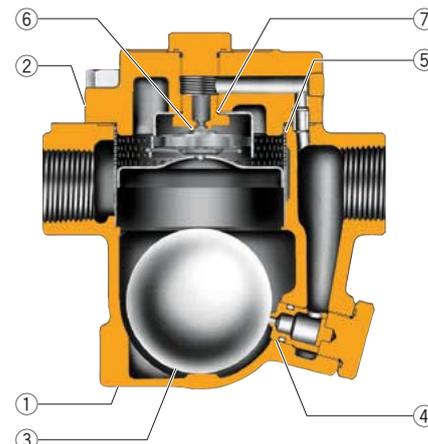
- Cast iron/ductile cast iron, PN 16 or Stainless steel PN 40 steam traps for pressures up to 13 or 21 barg.
- J3S-X, J5S-X and J6S-X have stainless steel bodies, and three-point seating design which ensures a steam-tight seal.
- Automatic X-element air vent for fast start-up and venting air at close-to-steam temperature.
- Externally removable orifice for inline inspection and repair.
- Reusable cover gaskets on J3X, J5X, J3S-X, J5S-X, J6S-X and J7X save maintenance costs.

No.	Description/Material
①	Body/Cast Iron, Ductile Cast Iron, Stain. Steel
②	Cover/Cast Iron, Ductile Cast Iron, Stain. Steel
③	Float/Stainless Steel
④	Orifice/ —
⑤	Screen/Stainless Steel
⑥	X-element/Stainless Steel
⑦	Air Vent Seat/Stainless Steel



J3X

J5X



J3X

## JH-X/JH-B Series

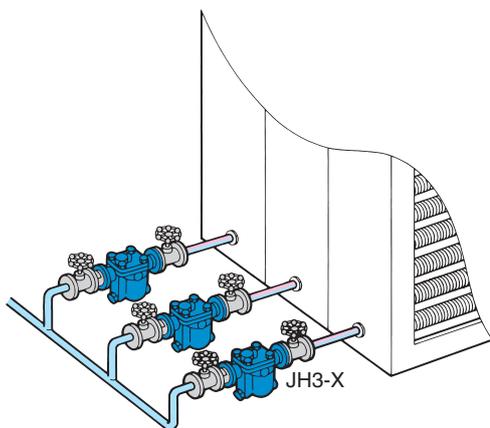
Low-to-High Pressure

Process

Medium-to-High Temperature

Small-to-Large Equipment

### Sample Application: Heater Batteries



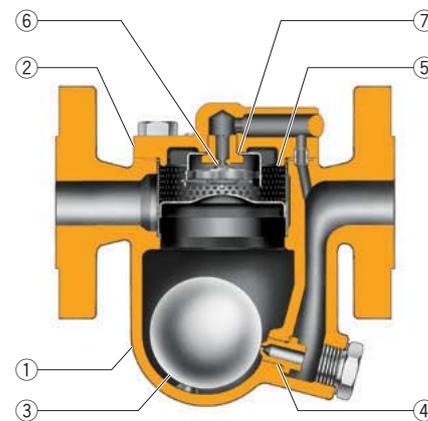
- Cast steel or Stainless Steel PN 40 steam traps for pressures up to 32 barg (JH-X), and up to PN 160 for pressures up to 100 barg (JH-B).
- Automatic X-element air vent (JH-X) or an automatic bimetal air vent (JH-B).
- On most models, three-point seating design ensures a steam-tight seal.
- Externally removable orifice for inline inspection and repair (except for JH7RH-B/P).

No.	Description/Material
①	Body/Cast Steel or Stainless Steel
②	Cover/Cast Steel or Stainless Steel
③	Float/Stainless Steel
④	Orifice/ —
⑤	Screen/Stainless Steel
⑥	X-element (JH-X Series)/Stainless Steel Bimetal Plate (JH-B Series)/ —
⑦	Air Vent Seat/Stainless Steel



JH3-X

JH7RH-B



JH3-X

Model	J3X to J8X <sup>2)</sup>	J3S-X, J5S-X	J6S-X	JH3-X to JH8R-X <sup>2)</sup>	JH3-B to JH8R-B <sup>2)</sup>
Connection <sup>1)</sup>	S, F	S, F	S	S, W, F	S, W, F
Maximum Operating Pressure (barg)	13	21	21	32	32 to 100 (JH7RH-P:120 <sup>3)</sup> )
Maximum Operating Temperature (°C)	200	220	220	240	350 to 400 <sup>4)</sup> /425 (JH7RH-P:530 <sup>3)</sup> )

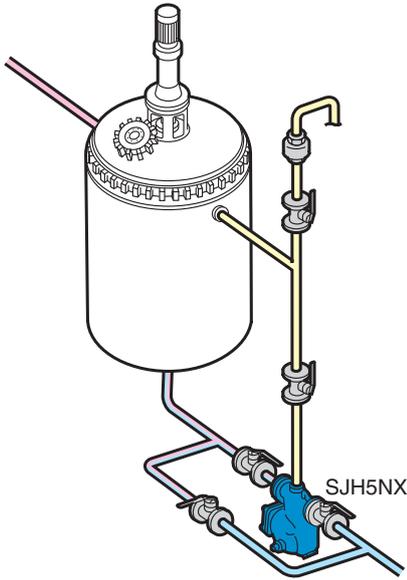
<sup>1)</sup> S = Screwed, W = Socket Welded, F = Flanged <sup>2)</sup> Refer to Specification Data Sheets (SDS) for each model's specifications. Not all connections are available for all models. <sup>3)</sup> JH7RH-P is not equipped with an air vent <sup>4)</sup> With PN Flange

# SJHX/SH Series

## SJHX Series

Low-to-High Pressure	Process
Medium Temperature	Small-to-Large Equipment

### Sample Application: Reactor



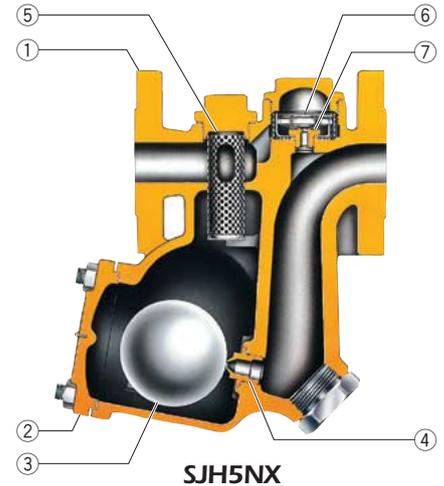
- Cast steel PN 40 steam traps for pressures up to 32 barg.
- Automatic X-element air vent for fast start-up and venting air at close-to-steam temperature.
- The SJHNX models are for horizontal installation, the SJHVX models for vertical installation.
- Models for higher pressure and temperature SJHN/V PN 40 & PN 63 with bimetal air vent are available.



SJH5NX

SJH5VX

No.	Description/Material
①	Body/Cast Steel
②	Cover/Cast Steel
③	Float/Stainless Steel
④	Orifice/ —
⑤	Screen/Stainless Steel
⑥	X-element/Stainless Steel
⑦	Air Vent Seat/Stainless Steel

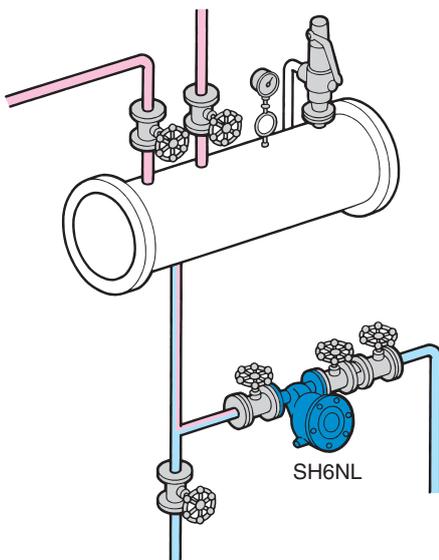


SJH5NX

## SH Series

High Pressure	Small-to-Medium Process
High Temperature	Drip/Turbine

### Sample Application: Steam Header

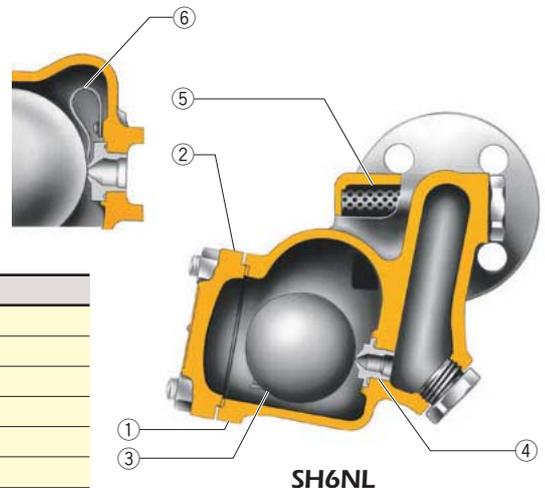


- Cast steel PN 80, PN 100 steam traps for horizontal installation at high pressures.
- Automatic bimetal air vent for fast start-up.
- Can be used on superheated steam.
- Three-point seating design ensures a steam-tight seal.



SH6NL

No.	Description/Material
①	Body/Cast Steel
②	Cover/Cast Steel
③	Float/Stainless Steel
④	Orifice/ —
⑤	Screen/Stainless Steel
⑥	Air Vent Strip/Bimetal

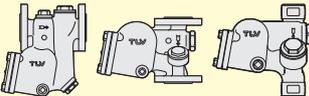
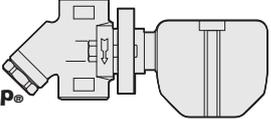
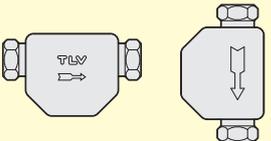
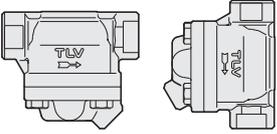
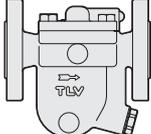
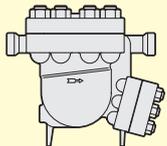
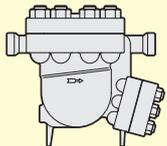
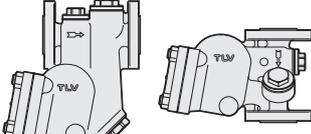
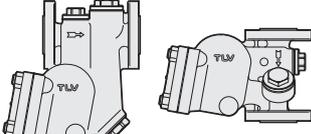
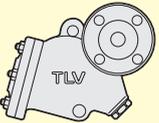


SH6NL

Model	SJH3N/V-X	SJH5N/V-X	SJH6N-X	SJH7N/V-X	SH3NL	SH5NL	SH5NH <sup>5)</sup>	SH6NL	SH6NH <sup>5)</sup>
Connection <sup>1)</sup>	F	F	F	F	W, F	W, F	W, F	W, F	W, F
Maximum Operating Pressure (barg)	32	32 <sup>4)</sup>	32	32 <sup>4)</sup>	45	65	80	65	100
Maximum Operating Temperature (°C)	240 <sup>2)</sup>	240 <sup>2)</sup>	240 <sup>2)</sup>	240 <sup>2)</sup>	400 <sup>3)/425</sup>				

<sup>1)</sup> S = Screwed, W = Socket Welded, F = Flanged <sup>2)</sup> 400 °C models with bimetal air vent available <sup>3)</sup> With PN Flange <sup>4)</sup> 46 barg models with bimetal air vent and PN 63 flange available for horizontal models <sup>5)</sup> Not a standard model, contact TLV for details

# Selection Guide

Model	Max. Operating Pressure (barg) PMO	Max. Operating Temp. (°C) TMO	Max. Operating Capacity (kg/h)	Body Material	Air Venting	Application
<b>SJX Series</b> 	22	220	5000	Ductile Cast Iron	Automatic X-element	Heat Exchangers Tank Heaters Dryers Process Equipment
<b>FS Series QuickTrap®</b> 	21 to 46	400 to 425	680	Stainless Steel	Automatic Bimetal	Steam Mains Turbines Tracer Lines Small Process Equipment
<b>SS3 SS5 Series</b> 	21 to 46	400 to 425	680	Stainless Steel	Automatic Bimetal	Steam Mains Tracer Lines Small Process Equipment
<b>SS1 Series</b> 	21	220 to 400	210	Stainless Steel	Automatic Bimetal	Steam Mains Tracer Lines Small Process Equipment
<b>JX Series</b> 	13 to 21	200 to 220	26000	Cast Iron Stainless Steel	Automatic X-element	Heat Exchangers Tank Heaters Coils, Dryers Unit Heaters Process Equipment
<b>JH-X Series</b> 	32	240	28000	Cast Steel Stainless Steel	Automatic X-element	Heat Exchangers Tank Heaters Coils, Dryers Unit Heaters Process Equipment
<b>JH-B Series</b> 	32 to 100	350 to 425	27000	Cast Steel Stainless Steel	Automatic Bimetal	Tracer Lines Process Heaters Heat Exchangers
<b>JH7RH-P</b> 	120	530	440	Low Alloy Cast Steel	—*	Process Equipment
<b>SJHX Series</b> 	32	240	4800	Cast Steel (Option: Stainless Steel)	Automatic X-element	Heat Exchangers Tank Heaters Coils, Dryers Unit Heaters Process Equipment
<b>SJH Series</b> 	32 to 46	400	4300		Automatic Bimetal	
<b>SH Series</b> 	45 to 100	400 to 425	700	Cast Steel	Automatic Bimetal	Superheated or High-Pressure Steam Mains Process Equipment

\* Instead of a built-in air vent, JH7RH-P has a threaded port for connecting to an external air vent.

1 bar = 0.1 MPa

The highest figures listed may not apply to all traps within each series. Free Float traps for special applications and traps with higher discharge capacities are available upon request.

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

Local regulations may restrict the use of these products to below the conditions quoted.

Contact TLV directly or your local representative for further information.

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Manufacturer

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Kagogawa, Japan

is approved by LRQA Ltd. to ISO 9001/14001

ISO 9001  
ISO 14001

