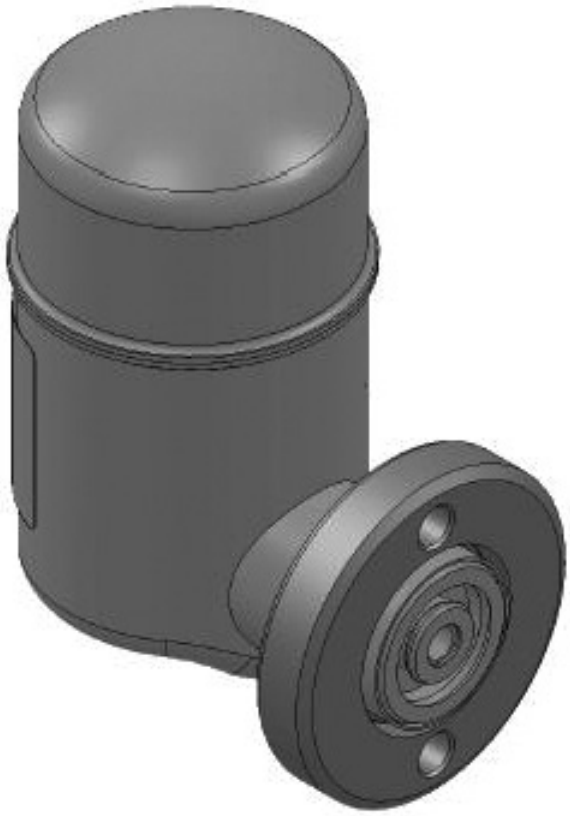
FF-4000 Series Steam Trap
Installation and Operation Manual



Please read and save these instructions

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Contents

General Safety Information

This bulletin should be used by experienced personnel as a guide to the installation of the Armstrong FF-4000 Series Float and Thermostatic steam traps. Selection or installation of equipment should always be accompanied by competent technical assistance. You are encouraged to contact Armstrong International, Inc. or its local sales representative for additional information.

Product Information

With the FF-4000 Series and the 360° universal connectors, you can install the float and thermostatic trap in a vertical position to fit any piping configuration. You get the reliability of the freely floating ball and thermostatic design plus all the benefits of all stainless steel construction.

- A sealed, tamper proof package
- A compact, lightweight trap
- Exceptional corrosion resistance
- A one-year guarantee against defective materials and workmanship. FF-4000 Series Float and Thermostatic steam traps combine savings in three important areas: energy, installation and replacement.

Maximum Operating Conditions

Maximum allowable pressure (vessel design):

Model FF-4250 300 psig @ 650°F (20.6 bar @ 343°C)

Model FF-4450 600 psig @ 800°F (41.3 bar @ 427°C)

Maximum operating pressure:

Model FF-4250 250 psig @ 650°F (17.2 bar @ 343°C)

Model FF-4450 450 psig @ 800°F (31.0 bar @ 427°C)

Materials:

Body: ASTM A240 Grade 304L

Internals: All stainless steel-304

Ball seat: Stainless Steel

Float: Stainless Steel

Air Vent: Bimetal

360° Universal Connector Styles:

- Standard 2-bolt connector
- IS-2 connector with integral strainer and optional blowdown valve
- TVS-4000 - Trap Valve Station

FF-4250 with TVS-4000

Product Installation

Before installation, verify that the maximum allowable pressure/temperature and maximum operating pressure of the trap are sufficient to handle the system design pressure and temperature. This information can be found on the label located on the trap. Steam trap installation is critical from both a performance and maintenance aspect. Installation of the trap is simplified if you follow these guidelines.

1. Before installing the trap, ensure the line is clean. Blow down the strainers ahead of the trap.
2. Install the trap so that it is accessible for inspection and replacement, below the drip point and close to the vertical drip leg.
3. The trap must be installed on a 2 bolt connector block (TVS-4000, IS2 or Standard Connector) See sections “Installing Connector Blocks” and “Installing Steam Traps on Connector blocks” for more details. Armstrong recommends the trap to be installed in a horizontal line. If the trap needs to be installed on a vertical line with a connector block, please make sure there is a strainer ahead of the trap with a blowdown valve. This will ensure no dirt or scale will enter the trap.
4. Proper piping and drip legs of adequate size and diameter are essential for the successful operation of the Armstrong traps, see Chart 4.1 and Figure 4.1.
5. Isolation valves are needed before and after traps. When starting a new trap, be sure to open the valve slowly.

CAUTION: Due to the high temperatures of steam, trap surface will be hot. For personal safety, ensure proper precaution is taken while working near the steam trap.

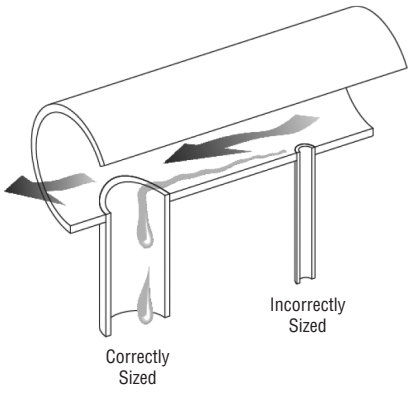
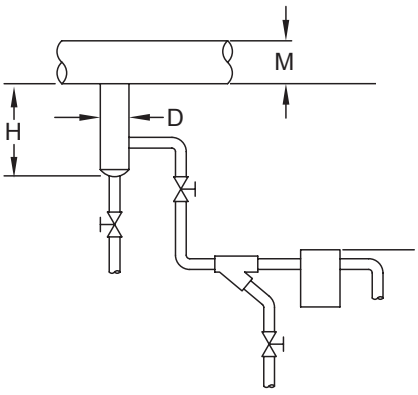


Figure 4.1



Note: *Drip leg same as the header diameter up to 4” (102 mm). Above 4” (102 mm), 1/2 header size, but never less than 4” (102 mm).*

M		D		H Drip Leg Length Minimum (in)			
Steam Main Size		Drip Leg Diameter (in)		Supervised Warm-Up		Automatic Warm-Up	
in	mm	in	mm	in	mm	in	mm
1/2	13	1/2	13	10	254	28	711
3/4	19	3/4	19	10	254	28	711
1	25	1	25	10	254	28	711
2	51	2	51	10	254	28	711
3	76	3	76	10	254	28	711
4	102	4	102	10	254	28	711
6	152	4	102	10	254	28	711
8	203	4	102	12	305	28	711
10	254	6	152	15	381	28	711
12	305	6	152	18	457	28	711
14	356	8	203	21	533	28	711
16	406	8	203	24	607	28	711
18	457	10	254	27	686	28	711
20	508	10	254	30	762	30	762
24	610	12	305	36	914	36	914

Chart 4.1

Installing Connector Blocks

Standard

The Standard connector block should be installed in piping with the flow direction stamp pointing in the correct direction as indicated on the connector block.

Note: Armstrong strongly recommends adding an upstream strainer before the trap and isolation valves upstream and downstream of the trap. Refer to figures 5.1 and 5.2.

Figure 5.1

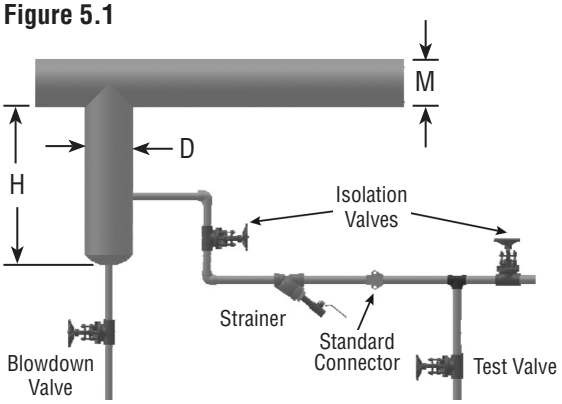
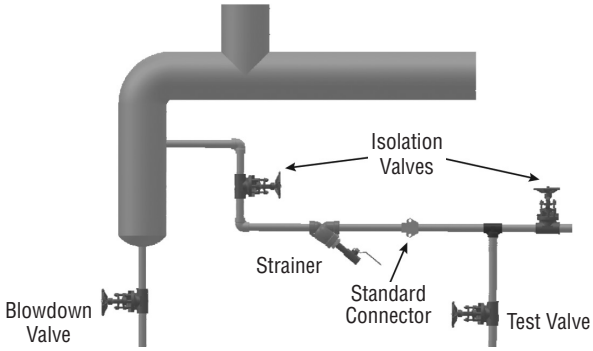


Figure 5.2



IS2

The IS2 connector block should be installed in piping with the flow direction stamp pointing in the correct direction as indicated on the connector block.

Note: Armstrong strongly recommends isolation valves upstream and downstream of the trap. Refer to figures 5.3 and 5.4.

Figure 5.3

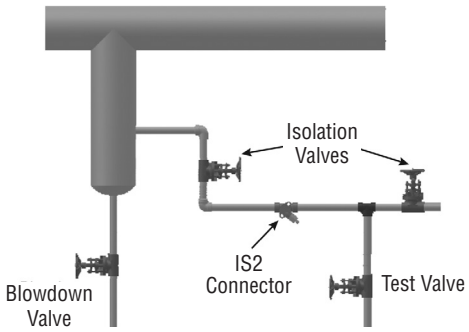
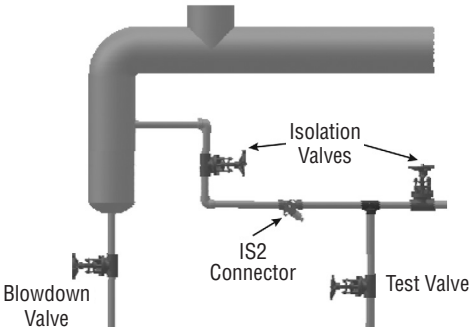


Figure 5.4



TVS-4000

The TVS-4000/TVS-4000F connector block should be installed in piping with the flow direction stamp pointing in the correct direction as indicated on the connector block.

Note: The TVS-4000 has integral strainer and isolation valves. Refer to figures 5.5 and 5.6.

Figure 5.5

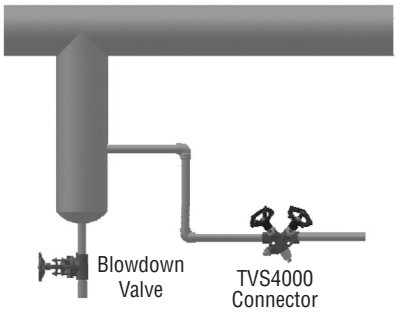
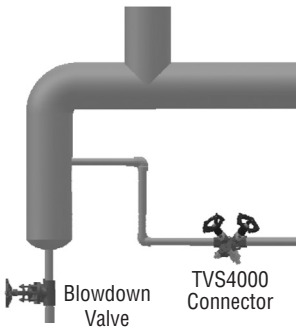


Figure 5.6



Installing the Steam Trap on Connector Block

Important: Even though the connector block can be installed in any direction, FF-4000 Series steam traps need to be installed in the vertical position (up right) as shown on figure 6.1 below. The flange of the steam trap rotates 360 degrees to allow the trap to be installed this way regardless of the installation of the connector block.

- The trap will need to be bolted to the connector block after the connector block has been installed.
- When installing the trap to the connector block, apply 35-50 ft-lbs of torque to the bolts using a 9/16" wrench. Allow 2.5" clearance for bolt installation and removal.
- When starting up a system, be sure to open the valve slowly.

Note: Connector block below is the model IS2. The same applies when installing the steam trap on a Standard or TVS-4000 connector block.

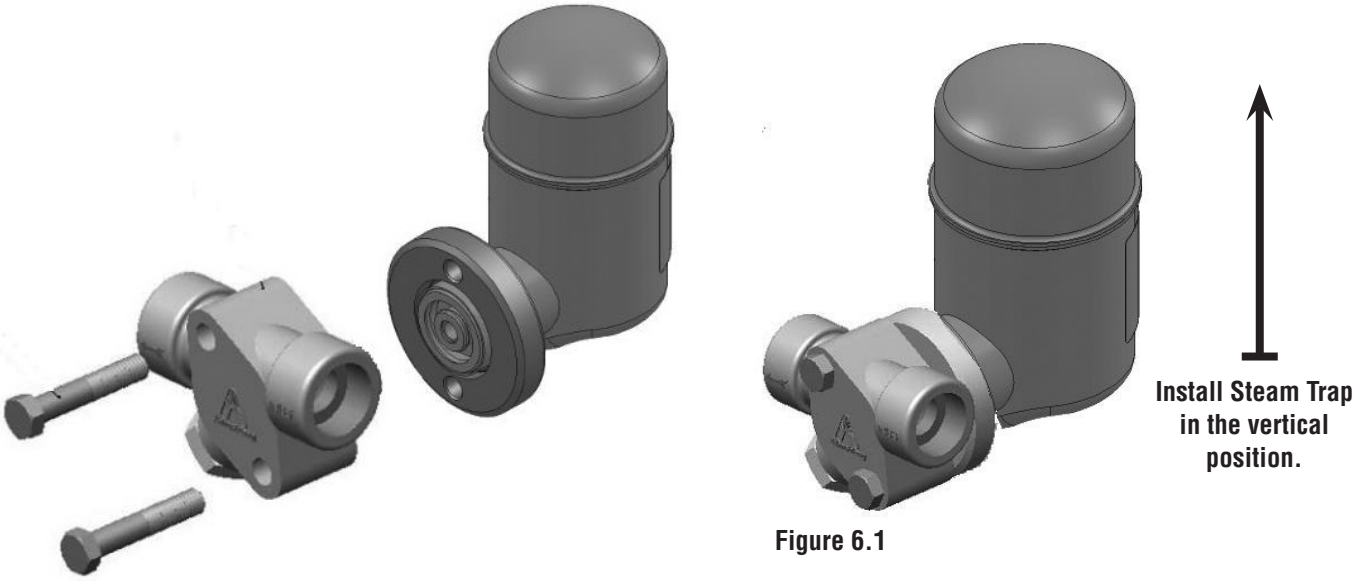


Figure 6.1

Maintenance Requirements

When the steam trap is suspected of malfunctioning, it can be checked by observing the discharge of the trap.

Normal trap operation would be indicated by:

- Trap discharging condensate continuously
- Trap discharge in cycles (on-off)

All discharges are accompanied by large amounts of flash steam. Do not confuse the discharge of flash steam with live steam loss. If the trap blows live steam, isolate the trap and replace.

Troubleshooting

Whenever a steam trap fails to operate and the reason is not readily apparent, the discharge from the trap should be observed. If the trap is installed with a test outlet or discharges to atmosphere, this will be a simple matter - otherwise, it will be necessary to break the discharge connection.

1. Cold Trap - No Discharge
No condensate or steam coming to trap.
    a) Stopped or plugged strainer ahead of trap.
    b) Broken valve in line to trap.
    c) Pipe line or elbows plugged.
    d) Pressure reducing valve out of order.
    e) Isolation valves are off/closed

2. Steam Loss: If the trap leaks or blows live steam, trouble may be due to any of the following causes:
    a) Ball float may fail to seat
    b) Piece of scale lodged in orifice
    c) Worn seating surface
    d) Damaged float

Imaginary Troubles: If it appears that steam escapes every time trap discharges, remember: Hot condensate forms flash steam when released to lower pressure, but usually condenses quickly in the return line.

If the trap is found defective:

1. Isolate the trap
2. Blow down/bleed off the internal pressure
3. With the connector block in line, remove the two bolts that hold the trap to the connector block using a 9/16” wrench.
4. Remove the trap from the connector block
5. Replace the failed trap with a working trap (refer to the installation section for details on how to install)

Repair Parts

FF-4000 Series is a sealed trap and is non-repairable. If the trap fails, a new one will need to be installed.

Limited Warranty and Remedy

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