Models SH-300, SH-900, SH-1500, and SH-4000 Bimetallic Superheat Steam Traps Installation and Maintenance

This bulletin should be used by experienced personnel as a guide to the installation of Models SH-300, SH-900, SH-1500, and SH-4000 Bimetallic Steam Traps. Selection or installation of equipment should always be accompanied by competent technical assistance. You are encouraged to contact Armstrong International, Inc., or it's local sales representative for additional information.

Installation

Steam trap installation is critical from both a performance and maintenance aspect. Installation of the trap is simplified if you follow these guidelines:

Before installing the trap, ensure the line is clean. Blow down any strainers ahead of the trap.

Installing the trap so that it is accessible for inspection and repair, below the drip point whenever possible, and close to the vertical drip leg.

For proper operation the trap should be installed in the horizontal line with the domed cap in the up position. SH-4000 cap will be horizontal.

What little condensate there is on the superheat and high pressure/low load service usually forms in drip legs and in the trap themselves. Therefore, proper piping and drip legs of adequate size and diameter are essential for the successful operation of the Armstrong superheat traps, see Chart 1-1 and Figures 1-1, 1-2 and 1-3.

Use pipe dope sparingly on male threads only. Leave the end thread exposed to avoid introducing sealant into the system.

The SH Series have internal strainers screens, but if necessary install strainers ahead of traps if specified or when dirt conditions warrant placement.

Shut-off valves ahead of traps are needed when traps drain steam mains or where the system cannot be shut down for trap maintenance. When valving a new trap into a hot system, be sure to open valve slowly.

For typical hook-ups, see Figures 1-1 and 1-2.

Figure 1-1.

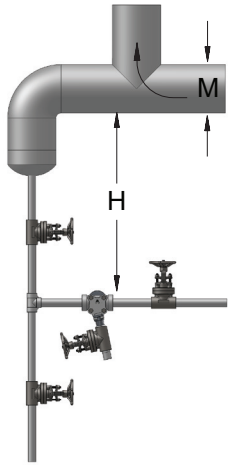


Figure 1-2.

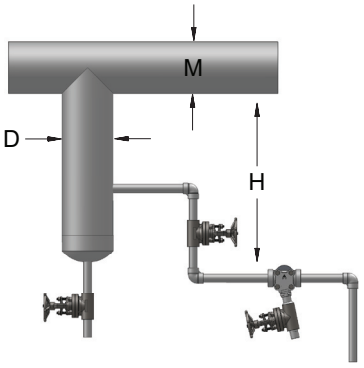
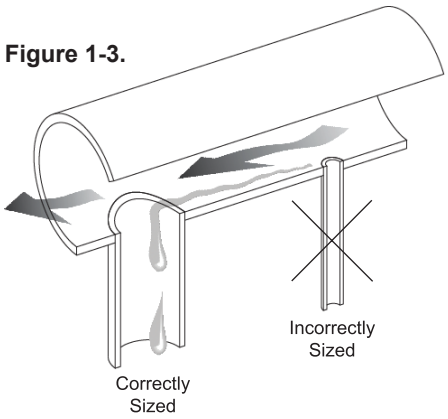


Chart 1-1. Recommended Steam Main and Branch Line Drip Leg Sizing.

M	D	H Drip Leg Length Minimum (in)	
Steam Main Size (in)	Drip Leg Diameter (in)	Supervised Warm-Up	Automatic Warm-Up
1/2	1/2	10	28
3/4	3/4	10	28
1	1	10	28
2	2	10	28
3	3	10	28
4	4	10	28
6	4	10	28
8	4	12	28
10	6	15	28
12	6	18	28
14	8	21	28
16	8	24	28
18	10	27	28
20	10	30	30
24	12	36	36

Figure 1-3.



Basic Maintenance
Maintenance Schedule: High pressure drips traps should be tested at least three times per year.

Check Trap: When the bimetallic 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 continously (modulating)
- Trap discharge in cycles (on-off)
- Not discharging or cycling at all (when no condensate is present)

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 continues to blow live steam, isolate the trap and repair or replace.

Check Application: If it cannot be made to operate normally, verify that the trap is correct for the application (capacity, differential pressures, etc.). If correct, repair or install a new steam trap of the same series and of capacity in its place.

Troubleshooting
Whenever a 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.

Cold Trap - No Discharge

A. No condensate or steam coming to trap.
   1. Stopped or plugged strainer ahead of trap.
   2. Broken valve in line to trap.
   3. Pipe line or elbows plugged.
   4. Pressure reducing valve out of order.

Caution: Superheated steam is invisible. Do not place objects directly in the path of trap discharge. In a blow through situation a loud roar should be heard even though there may not be visible steam.

Steam Loss:
If the trap leaks or blows live steam, trouble may be due to any of the following causes:

A. Valve may fail to seat
   1. Piece of scale lodged in orifice.
   2. Worn parts.

A. 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.

Continues Flow
A. Trap not up to temperature. Allow more time for condensate removal. The trap is working as designed.

How to Determine Flash Steam

$$\% \text{ flash steam} = \frac{SH - SL}{H} \times 100$$

SH = Sensible heat in the condensate at the higher pressure before discharge.
SL = Sensible heat in the condensate at the lower pressure to which discharge takes place.
H = Latent heat in the steam at the lower pressure to which the condensate has been discharged.

For additional information on SH Series Bimetallic Steam Traps, contact your local Armstrong Representative.