The Float and Thermostatic Steam Trap

The float and thermostatic trap is a mechanical trap that operates on both density and temperature principles. The float valve operates on the density principle: a lever connects the ball float to the valve and seat. Once condensate reaches a certain level in the trap the float rises, opening the orifice and draining condensate. A water seal formed by the condensate prevents live steam loss.

Since the discharge valve is under water, it is not capable of venting air and non-condensables. When the accumulation of air and non-condensable gases causes a significant temperature drop, a thermostatic air vent in the top of the trap discharges it. The thermostatic vent opens at a temperature a few degrees below saturation so it's able to handle a large volume of air – through an entirely separate orifice – but at a slightly reduced temperature.

Armstrong F&T traps provide high air-venting capacity, respond immediately to condensate and are suitable for both industrial and HVAC applications.

Reliable Operation on Modulating Steam Pressure

Modulating steam pressure means that the pressure in the heat exchange unit being drained can vary anywhere from the maximum steam supply pressure down to vacuum under certain conditions. Thus, under conditions of zero pressure, only the force of gravity is available to push condensate through a steam trap. Substantial amounts of air may also be liberated under these conditions of low steam pressure. The efficient operation of the F&T trap meets all of these specialized requirements.

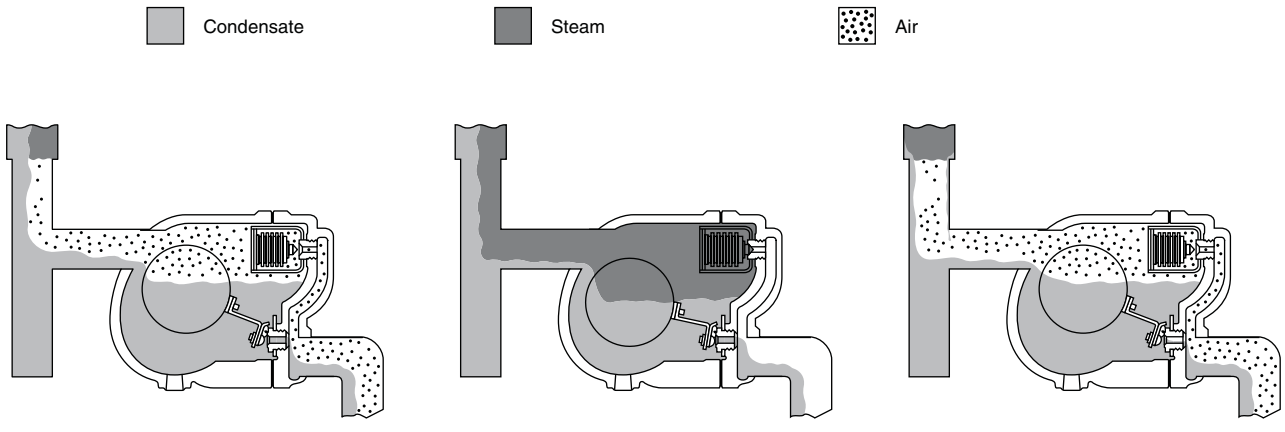
High Back Pressure Operation

Back pressure has no adverse effect on float and thermostatic trap operation other than capacity reduction due to low differential. The trap will not fail to close and will not blow steam due to the high back pressure.

Table CG-18-1. Typical Design Parameters for Float and Thermostatic Traps

Body and Cap Materials	**Cast Iron**	**Cast Steel**
Connections (mm)	15 - 80	15 - 80
Type Connections	Screwed or Flanged	Screwed, Socketweld or Flanged
Operating Pressure (bar)	0 thru 17	0 thru 32
Capacity (kg/h)	To 94 000	To 170 000

Figure CG-18-1. Operation of F&T Steam Trap



1. On start-up, low system pressure forces air out through the thermostatic air vent. A high condensate load normally follows air venting and lifts the float, which opens the main valve. The remaining air continues to discharge through the open vent.

2. When steam reaches the trap, the thermostatic air vent closes in response to higher temperature. Condensate continues to flow through the main valve, which is positioned by the float to discharge condensate at the same rate that it flows to the trap.

3. As air accumulates in the trap, the temperature drops below that of saturated steam. The balanced pressure thermostatic air vent opens and discharges air.

NOTE: These operational schematics of the F&T trap do not represent actual trap configuration.

The Float & Thermostatic Steam Trap

The More Your Steam Pressure Varies, the More You Need Armstrong F&T Traps

When steam pressure may vary from maximum steam supply pressure to vacuum, Armstrong F&Ts are your most energy-efficient choice. Our line of F&Ts brings Armstrong performance, dependability and long life to trapping services requiring continuous drainage with high air venting capacity. Thanks to separate orifices for condensate and air, they provide continuous condensate drainage and air venting – even under conditions of zero pressure.

All the benefits detailed below have been designed into Armstrong F&Ts through long experience in the manufacture of pressure float-type drain traps. They assure you of optimum operating efficiency for long periods with minimum trouble.

No water seal at inlet

Inlet high on body and condensate discharge valve in the bottom of the body prevent formation of a water seal that could block flow of air to vent under very low pressure conditions.

Optional integral vacuum breaker

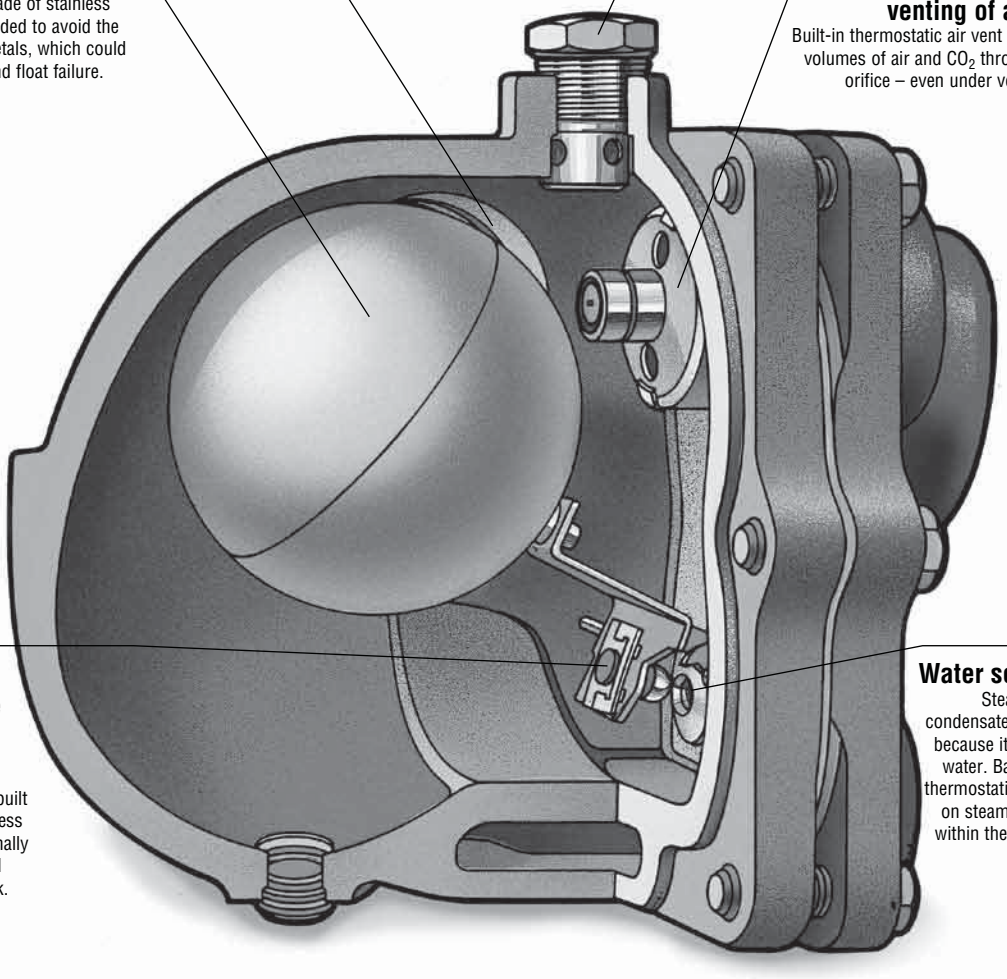
Provide maximum protection against freezing and water hammer in condensing equipment under modulated control. They also eliminate another fitting being installed in the line.

Corrosion resistance

Entire float mechanism is made of stainless steel. The float is Heliarc welded to avoid the introduction of dissimilar metals, which could lead to galvanic corrosion and float failure.

High-capacity venting of air and CO_2

Built-in thermostatic air vent discharges large volumes of air and CO_2 through its separate orifice – even under very low pressure conditions.



Long life and dependable service

Valve is stainless steel in all sizes. Seat is heat treated in 1 1/2" pipe size and larger. Rugged float mechanism is built to resist wear, and the stainless steel float provides exceptionally high collapsing pressure and resistance to hydraulic shock.

Water sealed valve

Steam cannot reach condensate discharge valve because it is always under water. Balanced pressure thermostatic air vent closes on steam at any pressure within the operating range of the trap.

Operation against back pressure

Trap operation is governed solely by the condensate level in the trap. Back pressure in the return line will not render the trap inoperative as long as there is any pressure differential to force condensate through the discharge valve.

Continuous drainage

No pressure fluctuations due to intermittent condensate drainage. Condensate is discharged at very close to steam temperature. No priming needed.

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Float & Thermostatic Steam Trap

Built as Tough as the Jobs They Do

Armstrong float and thermostatic traps are unique in their super heavy duty construction. Armstrong uses high quality ASTM A48 Class 30 cast iron or astm A216 WCB cast steel – normally found in pressure vessels rated to 17 bar or 32 bar. Internal mechanisms are made from stainless steel and are heavily reinforced. No brass cotter pins here. Valves and seats are stainless steel, hardened, ground and lapped to withstand the erosive forces of flashing condensate.

Why go to all this trouble on traps normally recommended for low-pressure, modulating service? The answer is in the word modulating. Modulating pressures mean widely varying loads, thermal cycling and high air and non-condensable gas loads.

In other words, tough service. Inferior, lightweight construction is a mistake waiting to happen. Trap failures on modulating pressure may lead to water hammer, corrosion and even heat exchanger damage.

Armstrong's published capacities are based on actual measurements of traps handling hot, flashing condensate. Competitive F&Ts may utilize theoretical calculated capacities. Armstrong uses its own steam lab to give you actual capacity – especially important on high-capacity traps such as those in our ultra-capacity line. Not only does Armstrong offer super heavy duty construction for long life and reliability, but we also supply the data to back up performance. Here's a simple, easy-to-remember summary: The more your pressure varies, the more you need Armstrong F&Ts.