DS100 Series Thermostatic Steam Traps

Figure 1. *DS100 Series Thermostatic Steam Trap*

Introduction

A steam trap is an automatic valve which discharges condensate, undesirable air and non-condensibles from a system while trapping, or holding in, steam. Thermostatic steam traps operate in direct response to the temperature within the trap.

DS100 Series are thermostatically actuated and maintenance free. Actuator is single piece, fail open design consisting of 1.2 in. / 12.7 mm diamater, welded 316L stainless steel plates. Trap is constructed entirely of 316L stainless steel components with wetted body surfaces finished to 20 µ in. Ra or better. Trap is self draining when installed vertically in piping systems. It has a tube or universal ferruled connections. Ferruled connections is Tri-clamps compatible and designed to fit both 1/2 and 3/4 in. / 12.7 and 19.1 mm service.

Features

- **Self Centering Valve** — Leak tight shut off. Assembly of actuator and valve to impingement plate allows valve to self-align with center of valve seat orifice. Provides long lasting valve and seat.
- **Temperature Sensitive Actuator** — 316L Stainless welded actuator for maximum corrosion, thermal and hydraulic shock resistance. One moving part.
- **Thermal and Hydraulic Shock Resistant** — Impingement plate plus welded construction prevents damage to actuator.
- **Long Life Valve and Seat** — Stainless steel valve and seat matched together for water tight seal.
- **Maintenance** — All models are sealed and maintenance-free.
- **Directional Discharge** — Erosion prevented by directing discharge into the center of pipe or tubing.

DS100 Series

Specifications

The Specifications section gives some general specifications for the DS100 Series thermostatic steam traps. The nameplates give detailed information for a specific steam trap as built in the factory.

Available Configurations
Type DS100: Ferrule clamp end 1 7/8 in. / 47.6 mm OAL
Type DS100TE: Tube end
Type DS110: Ferrule clamp end 2 5/8 in. / 66.7 mm OAL

Body Sizes
NPS 1/2, 3/4 and 1 / DN 15, 20 and 25

End Connection Styles
Tube
Ferrule

Maximum Operating Temperature[1]
366°F / 186°C

Maximum Operating Pressure[1]
150 psig / 10.3 bar

Maximum Allowable Temperature[1]
500°F / 260°C

Maximum Allowable Pressure[1]
300 psig / 20.7 bar

Capacity Information
See Table 1

Construction Materials
316L Stainless steel

Body Surface Finish
<20 µ in. RA internal
Machine Polished external

Option
Check valve for Type DS110

Applications
CIP/SIP System Condensate Drainage
Sterilization of Process Vessels
Culinary Steam
Humidifiers
WFI System Sterilization
Main Drips

Approximate Weights
1.1 to 1.6 lbs / 0.5 to 0.73 kg

1. The pressure/temperature limits in this Bulletin and any applicable standard or code limitation should not be exceeded.

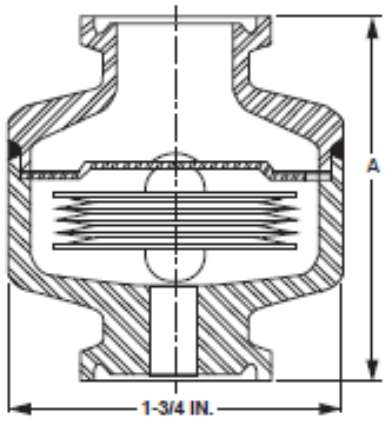
Table 1. Maximum Capacity - lbs/hr 10°F Below Saturation (Kg/hr 5°C Below Saturation)

TYPE	ORIFICE, In. / mm	DIFFERENTIAL, psig / bar g											
		5 / 0.34	10 / 0.7	20 / 1.4	30 / 2.1	40 / 2.8	50 / 3.4	60 / 4.2	70 / 4.9	80 / 5.6	90 / 6.2	100 / 6.9	125 / 862	150 / 10.3
		lbs/hr / kg/hr												
DS100	1/4 / 6.35	550 / 249	825 / 374	1210 / 549	1495 / 678	1750 / 794	1975 / 896	2175 / 987	2350 / 1066	2525 / 1145	2650 / 1202	2825 / 1281	3140 / 1424	3425 / 1554

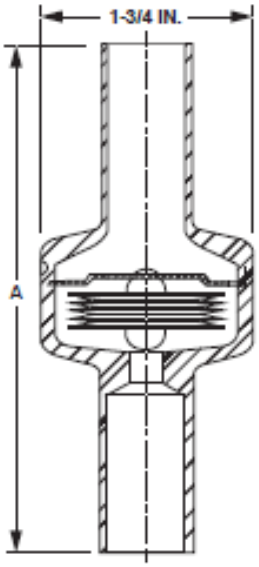
- **Best Air Handling Capacity** — Fast start up and operation.
- **Fast Response** — Quickly adjusts to condensate load or temperature changes.
- **One Size Suits Most Services** — Universal ferruled end connection fits both 1/2 and 3/4 / 12.7 and 19.1 mm piping.

Principle of Operation

Thermal actuator is filled at its free length with a liquid having a lower boiling point than water. On start-up, valve is normally open to discharge air, non-condensibles and condensate. When steam enters trap, thermal actuator fill vaporizes to a pressure higher than line pressure. This forces valve into seat orifice to prevent any further flow. As condensate collects, it takes heat from thermal actuator, lowering internal pressure. Line pressure will then compress thermal actuator to open valve and discharge condensate. Valve opening automatically adjusts to load conditions from minimum on very light loads to full lift at maximum load.



TRI-CLAMP CONNECTION



TUBE CONNECTION

***Figure 2**. DS100 Series Thermostatic Steam Trap Dimension*

***Table 2**. DS100 Series Dimension*

TYPE	END CONNECTIONS	SIZE	A, In. / mm
DS100	Tube	NPS 1/2, 3/4 and 1 / DN 15, 20 and 25	4-1/8 / 105
DS100	Ferrule	NPS 1/2 and 3/4 / DN 15 and 20	1-7/8 / 47.6
DS110	Ferrule	NPS 1/2 and 3/4 / DN 15 and 20	2-5/8 / 66.7

Installation

1. Before installing trap, blow all dirt and scale from apparatus and piping.
2. Install trap with arrow on body in flow line as close as possible to apparatus with strainer and valve upstream of trap.
3. Pitch all drain lines toward trap.

Note

Approved practice is to install separate traps on each piece of apparatus to be drained. Steam supplied to inlets of several units may be of uniform pressure, but invariably there is a differential at the outlets. Although this differential may be small, unit discharging highest pressure will control the action of trap, while other units become air-bound and water logged. Piping upstream and downstream of trap should be at least equal to or one size larger than trap connection.

4. Record the location of the trap for maintenance accessibility.

Ordering Information

When ordering, complete the ordering guide on this page. Refer to the Specifications section. Review the description to the right of each specification and the information in each referenced table or figure. Specify your choice whenever a selection is offered.

Ordering Guide

Available Configurations (Select One)
- ☐ Type DS100
- ☐ Type DS100TE
- ☐ Type DS110

Body Sizes (Select One)
- ☐ NPS 1/2 / DN 15
- ☐ NPS 3/4 / DN 20
- ☐ NPS 1 / DN 25

End Connection (Select One)
- ☐ Tube
- ☐ Ferrule

Options
- ☐ Check valve (for Type DS110 only)