

DS200 SERIES THERMOSTATIC STEAM TRAPS

Pressures To 100 PSIG (6.9 barg)
Temperatures to 338°F (170°C)

Stainless Steel Body - Body materials are Type 316L Stainless Steel.

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 - One moving part. Inconel welded actuator for maximum corrosion, thermal and hydraulic shock resistance.

Thermal and Hydraulic Shock Resistant - Impingement plate plus welded construction prevents damage to actuator.

Valve and Seat - Long life, stainless steel valve and seat lapped and matched together for water tight seal.

Maintenance - All models are sealed and maintenance free.

Additional Features - Best air handling capability for fast start up and operation. Fastest response to condensate load or temperature changes. Broad application range. Selection of orifice and pipe sizes meet majority of condensate removal demands in deionized steam systems.

Unique SLR Orifice Option - Provides drainage at saturated temperatures, instant reaction to load changes and fail-open operation for extra critical operations.



Applications

- Platen Presses
- Plating Tanks
- Sterilizers
- Tire Presses
- Cooking Equipment
- Laundry Equipment
- Other Process Equipment

Canadian Registration # OE0591.9C

MODELS

- **DS202**—Low capacity
- **DS203**—Medium capacity
- **DS204**—High capacity

Operation

Thermal actuator is filled at it's free length with a liquid having a lower boiling point than water. As assembled, valve is normally open. On startup, air passes through vent. As air is eliminated, hot steam reaches vent and the thermal actuator fill vaporizes to a pressure higher than line pressure. This forces

valve into seat orifice to prevent any further flow. Should more air collect, it takes heat from the actuator, lowering internal pressure. Line pressure will then compress thermal actuator to open valve and discharge air. Valve lift automatically adjusts to variations.

DS200 SERIES

THERMOSTATIC STEAM TRAPS

SPECIFICATION

Steam trap shall be of balanced pressure design with stainless steel welded bellows capable of releasing condensate within 10°F of saturated pressure. Where drainage at saturated temperatures is required, trap shall have SLR orifice. All other components shall be of 316 or 316L stainless steel. Trap shall be self draining and normally open.

Maximum operating conditions

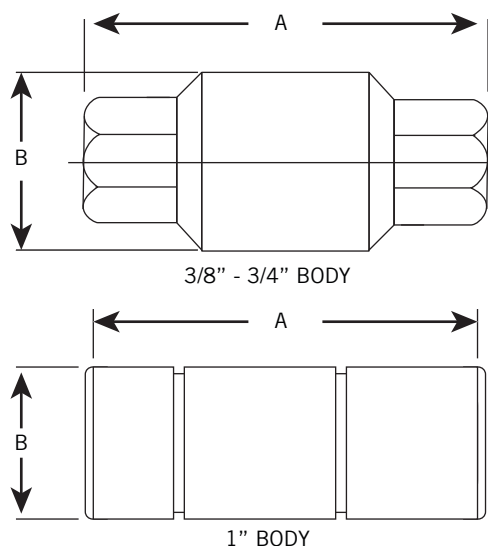
PMO: Max. Operating Pressure	100 psig	(6.9 barg)
TMO: Max. Operating Temperature	338°F	(170°C)
PMA: Max. Allowable Pressure	150 psig*	(10.3 barg)
TMA: Max. Allowable Temperature	366°F	(186°C)

Materials of construction

Body ASTM 743 CF-8M Stainless Steel
 1" - 316SS, ASME SA479
 Welded Actuator 316L Fittings & Plates
 Valve & Seat 316L Stainless Steel

SLR Orifice Option

Specify when immediate elimination of condensate and improved sensitivity is desired. A 1/32" orifice at the apex of the valve allows for continuous discharge of condensate. Trap will nominally pass 50 lbs/hr of condensate at 50 psi within 2°F of saturated temperature.



Connections: 3/8" - 1" NPT or socketweld

Dimensions			
NPT or Socket weld	Inches (mm)		Weight Lbs. (kg)
	A	B	
3/8", 1/2"	3 3/4 (95)	1 3/4 (44)	1.1 (0.5)
3/4"	3 15/16 (100)	1 3/4 (44)	1.2 (0.54)

Maximum Capacity—lbs/hr 10°F Below Saturation (Kg/hr 5°C Below Saturation)															
Trap	Orifice Inches	Differential PSIG (barg)													
		5 (0.34)	10 (0.7)	20 (1.4)	50 (3.5)	100 (6.9)	125 (8.6)	150 (10.3)	200 (13.8)	250 (17.2)	300 (20.7)	350 (24.1)	400 (27.6)	450 (31.0)	500 (34.5)
DS202	1/8 (3)	216 (98)	265 (120)	375 (170)	592 (269)	778 (354)	838 (381)	890 (405)	980 (445)	1055 (480)	1121 (510)	1180 (536)	1235 (561)	1284 (584)	1323 (601)
DS203	1/4 (6)	550 (249)	825 (374)	1210 (549)	1975 (896)	2825 (1281)	3140 (1424)	3425 (1554)	3650 (1656)	3960 (1796)	4100 (1860)	4230 (1919)	4420 (2005)	4600 (2086)	4760 (2161)
DS204	5/16 (8)	860 (390)	1220 (554)	1725 (783)	2725 (1237)	3575 (1623)	3850 (1748)	4090 (1857)	4505 (2045)	4850 (2202)	5155 (2340)	5425 (2463)	5675 (2576)	5900 (2679)	6110 (2774)

May 2023

Spence DS200 Series Thermostatic Steam Traps



Figure 1. DS200 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.

The DS200 Series thermostatic steam trap is balanced pressure design with Stainless steel welded bellows capable of releasing condensate within 10°F / 5°C of saturated pressure. Traps are self draining and normally open. It has SLR orifice where drainage at saturated temperatures is required. All components are 316 or 316L Stainless steel.

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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** — One moving part. Inconel® welded actuator for maximum corrosion, thermal and hydraulic shock resistance.
- **Thermal and Hydraulic Shock Resistant** — Impingement plate plus welded construction prevents damage to actuator.
- **Valve and Seat** — Long life, stainless steel valve and seat lapped and matched together for water tight seal.

DS200 Series

Specifications

The Specifications section gives some general specifications for the DS200 Series thermostatic steam traps. The nameplates give detailed information for a specific steam trap as built in the factory.

Available Configurations Type DS202: Low capacity Type DS203: Medium capacity Type DS204: High capacity	Capacity Information See Table 1
Body Sizes NPS 1/2, 3/4 and 1 / DN 15, 20 and 25	Construction Materials Body: Stainless steel Welded Actuator: 316L Fittings and Plates Valve and Seat: 316L Stainless steel
End Connection Styles NPT or Socketweld	Option SLR Orifice ⁽²⁾
Maximum Operating Temperature⁽¹⁾ 338°F / 170°C	Applications Platen Presses Plating Tanks Sterilizers Tire Presses Cooking Equipment Laundry Equipment Other Process Equipment
Maximum Operating Pressure⁽¹⁾ 100 psig / 6.9 bar	Approximate Weights 1.1 to 1.6 lbs / 0.5 to 0.73 kgs
Maximum Allowable Temperature⁽¹⁾ 366°F / 186°C	
Maximum Allowable Pressure⁽¹⁾ 150 psig / 10.3 bar	

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

2. Specify when immediate elimination of condensate and improved sensitivity is desired. A 1/32 in. / 0.79 mm orifice at the apex of the valve allows for continuous discharge of condensate. Trap will nominally pass 50 lbs/hr / 22.7 kg/hr of condensate at 50 psi / 3.45 bar within 2°F / 0.5°C of saturated temperature.

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

TYPE	ORIFICE		DIFFERENTIAL PRESSURE, psig / barg													
			5 / 0.34	10 / 0.7	20 / 1.4	50 / 3.5	100 / 6.9	125 / 8.6	150 / 10.3	200 / 13.8	250 / 17.2	300 / 20.7	350 / 24.1	400 / 27.6	450 / 31.0	500 / 34.5
	In.	mm	lbs/hr / kg/hr													
DS202	1/8	3	216 / 98	265 / 120	375 / 170	592 / 269	778 / 354	838 / 383	890 / 405	980 / 445	1055 / 480	1121 / 510	1180 / 536	1235 / 561	1284 / 584	1323 / 601
DS203	1/4	6	550 / 249	825 / 374	1210 / 549	1975 / 896	2825 / 1281	3140 / 1424	3425 / 1554	3650 / 1656	3960 / 1796	4100 / 1860	4230 / 1919	4420 / 2005	4600 / 2086	4760 / 2161
DS204	5/16	8	860 / 390	1220 / 554	1725 / 783	2725 / 1237	3575 / 1623	3850 / 1748	4090 / 1857	4505 / 2045	4850 / 2202	5155 / 2340	5425 / 2463	5675 / 2576	5900 / 2679	6110 / 2774

- **Maintenance** — All models are sealed and maintenance-free.
- **Additional Features** — Best air handling capability for fast start up and operation. Fastest response to condensate load or temperature changes. Broad application range. Selection of orifice and pipe sizes meet majority of condensate removal demands in deionized steam systems.
- **Unique SLR Orifice Option** — Provides drainage at saturated temperatures, instant reaction to load changes and guaranteed fail-open operation for extra critical operations.

Principle of Operation

Thermal actuator is filled at its free length with a liquid having a lower boiling point than water. As assembled, valve is normally open. On start-up, air passes through vent. As air is eliminated, hot steam reaches vent and the thermal actuator fill vaporizes to a pressure higher than line pressure. This forces valve into seat orifice to prevent any further flow. As more air collects, it takes heat from the actuator, lowering internal pressure. Line pressure will then compress thermal actuator to open valve and discharge air. Valve lift automatically adjusts to variations.

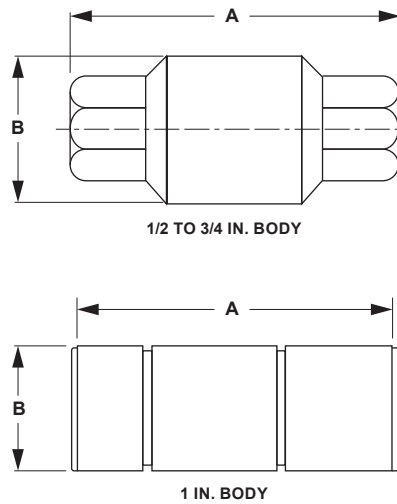


Figure 2. DS200 Series Thermostatic Steam Trap Dimension

Table 2. DS200 Series Dimension

BODY SIZE	A		B		WEIGHT	
	In.	mm	In.	mm	lbs	kgs
NPS 1/2 / DN 15	3-3/4	95	1-3/4	44	1.1	0.5
NPS 3/4 / DN 20	3-15/16	100	1-3/4	44	1.2	0.54
NPS 1 / DN 25	4-3/8	111	1-3/4	44	1.6	0.73

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.

DS200 Series

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 DS202 - Low capacity
- ☐ Type DS203 - Medium capacity
- ☐ Type DS204 - High capacity

Body Sizes (Select One)

- ☐ NPS 1/2 / DN 15
- ☐ NPS 3/4 / DN 20
- ☐ NPS 1 / DN 25

End Connection (Select One)

- ☐ NPT
- ☐ Socketweld

Options

- ☐ SLR Orifice

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