

Spence™ CDS and CDH Series Sanitary Thermostatic Steam Trap



Figure 1. CDS and CDH Series Sanitary Thermostatic Steam Trap

Introduction

The CDS and CDH Series steam traps are balanced pressure design with Inconel® welded bellows capable of releasing condensate within 10°F / -12°C of saturated pressure. All other interior wetted components are of 316L stainless steel. It has an interior body finish of at least 20 µ in. Ra and exterior body finish of at least 32 µ in. Ra. Trap utilizes sanitary body clamp allowing disassembly for inspection or cleaning and be entirely self draining in horizontal or angle piping configuration. Trap end connections are standard tri-clamp. Thermostatic actuator employs a conical valve lapped to the seat. Traps have SLR orifice where drainage at saturated temperatures is required.

Features

- **Steepest Interior Surfaces** - Designed to completely drain without puddling.
- **Stainless Steel Body** - Body material is 316L Stainless Steel with 20 µ in. Ra internal finish and 32 µ in. Ra external finish.
- **Self-centering Valve** - Leak tight shut off. Assembly of actuator and valve to impingement plate allows the valve to self align with center of the orifice.

CDS and CDH Series

Specifications

The specifications section on this page provides the ratings and other specifications for the CDS and CDH Series.

Available Configurations

- Type **CDS202**: Low capacity
- Type **CDS203**: Medium capacity
- Type **CDS204**: High capacity
- Type **CDH-AI-AO**: Horizontal inlet and outlet
- Type **CDH-AI**: Horizontal inlet, vertical outlet
- Type **CDH-AO**: Vertical inlet, horizontal outlet

Maximum Operating Pressure⁽¹⁾

100 psig / 6.9 barg

Maximum Operating Temperature⁽¹⁾

338°F / 170°C

Maximum Allowable Pressure⁽¹⁾

150 psig / 10.3 barg

Maximum Operating Temperature⁽¹⁾

366°F / 186°C

Maximum Capacity

See Tables 2 and 3

Materials of Construction

- Body**: 316L Stainless steel
- Gasket**: Viton®, Teflon®, Ethylene Propylene Diene Monomer (EPDM) or Tef-Steel
- Actuator and Actuator nut**: 316L Stainless steel
- Valve**: 316L Stainless steel

Options

- Electropolish
- SLR Orifice
- B Bellows for low subcool

Approximate Weights

- CDS Series**: 1.8 to 2.3 lbs / 0.8 to 1.0 kg
- CDH Series**: 2.6 to 3.9 lbs / 1.2 to 1.8 kg

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

- **Temperature Sensitive Actuator** - One moving part. 316L Stainless Steel, fail open, welded actuator for maximum corrosion, thermal and hydraulic shock resistance.
- **Directional Discharge** - Erosion prevented by directing discharge to center of piping.
- **Maintenance** - Can be easily removed and disassembled for sterilization and/or repair.
- **Industry Standard Food Grade Gasket** - White Viton® food grade gasket offers superior performance for higher pressure steam applications.
- **Large Orifice Selection** - Broad selection of orifice sizes provide greatest sizing and selection flexibility.
- **Superior Air Handling** - Best air handling capability provides for fast startup.
- **Unique SLR Orifice Option** - Provides drainage at saturated temperatures, instant reaction to load changes and guaranteed fail-open operation for extra critical operations.
- **Bar Stock** - Connection fittings are not welded onto inlet and outlet pieces.

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 the 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.

Installation

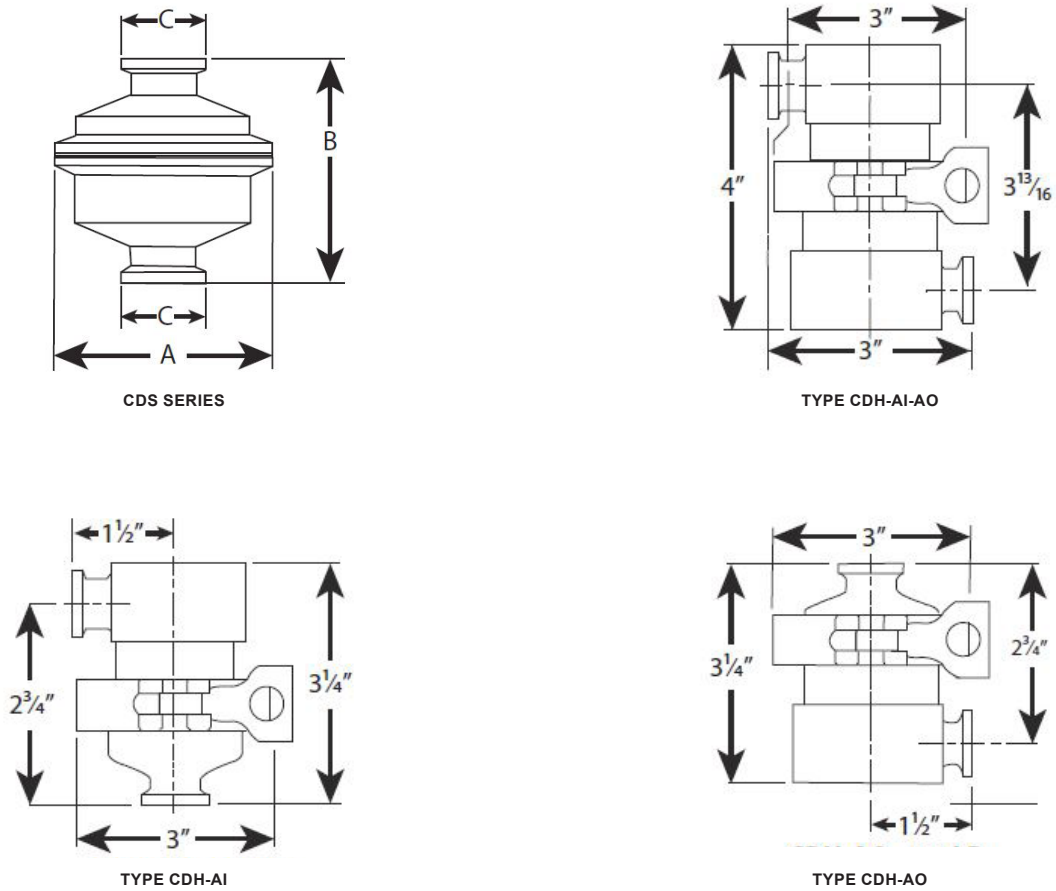
1. Install trap in a vertical line with the inlet at the top and the outlet at the bottom.

Note

Although this trap functions both horizontally and vertically, the vertical installation allows full self-draining.

2. Install NPS 1/2 to 3/4 / DN 15 to 20 service trap with 3/4 in. / 19.0 mm inlet gasket.
Install NPS 1 to 1-1/2 / DN 25 to 40 service trap with 1-1/2 in. / 38.1 mm inlet gasket.
3. Isolate the sanitary steam trap by using a valve suitable for sanitary steam applications.

CDS and CDH Series



IN. / mm

Figure 2. CDS and CDH Series Dimension

Table 1. CDS Series Dimensions

SERVICE		A		B		C		WEIGHT	
NPS	DN	In.	mm	In.	mm	In.	mm	lbs	kg
1/2 and 3/4	15 and 20	2-1/2	64	2-5/8	67	63/64	25	1.8	0.8
1 and 1-1/2	25 and 40	2-1/2	64	2-5/8	67	1 63/64	50	2.3	1.0

Table 2. CDS and CDH Series Maximum Capacity in lbs/hr 10°F Below Saturation (Imperial)

TRAP TYPE	ORIFICE SIZE	DIFFERENTIAL PRESSURE (PSIG)										
		5	10	20	30	40	50	60	70	80	90	100
CDS	5/32	291	411	581	719	831	919	1000	1075	1130	1174	1207
	1/4	550	825	1210	1495	1750	1975	2175	2350	2525	2650	2825
	5/16	861	1217	1722	2150	2475	2722	2940	3125	3290	3450	3575
CDH	1/4	550	825	1210	1495	1750	1975	2175	2350	2525	2650	2825

CDS and CDH Series

Table 3. CDS and CDH Series Maximum Capacity in kg/hr 5°C Below Saturation (Metric)

TRAP TYPE	ORIFICE SIZE	DIFFERENTIAL PRESSURE (BARG)										
		0.35	0.7	1.4	2.1	2.8	3.4	4.2	4.9	5.6	6.2	6.9
CDS	5/32	132	186	264	326	377	417	454	488	513	533	547
	1/4	249	374	549	678	794	896	987	1066	1145	1202	1281
	5/16	391	552	781	975	1123	1235	1334	1417	1492	1565	1622
CDH	1/4	249	374	549	678	794	896	987	1066	1145	1202	1281

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 Configuration (Select One)

- Type CDS202
- Type CDS203
- Type CDS204
- Type CDH-AI-AO
- Type CDH-AI
- Type CDH-AO

Options

- Electropolish
- SLR Orifice
- B Bellows for low subcool

 SpenceValve.com

Emerson

Americas

McKinney, Texas 75060 USA
T +1 800 558 5853
+1 972 548 3574

Europe

Bologna 40013, Italy
T +39 051 419 0611

Asia Pacific

Singapore 128461, Singapore
T +65 6777 8211

Middle East and Africa

Dubai, United Arab Emirates
T +971 4 811 8100

VCBUL-15801-EN © 2021, 2026 Emerson Electric Co. All rights reserved. 03/26 Spence is a mark owned by a subsidiary of Emerson Electric Co. The Emerson logo is a trademark and service mark of Emerson Electric Co. All other marks are property of their respective owners.

Neither Emerson nor any of its affiliated entities assume responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use, and maintenance of any product remains solely with the purchaser and end user.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available upon request. We reserve the right to modify or improve the designs or specifications of such products at any time without notice.

