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Spence™ Conqueror C and CS Series Thermostatic Steam Traps

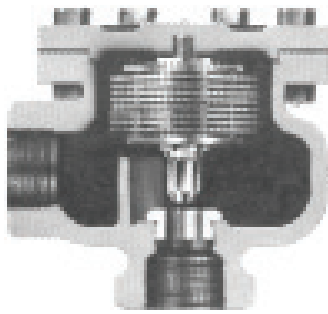


Figure 1. C and CS Series Thermostatic Steam Traps

Features

- **Freeze Proof** — When installed with horizontal inlet and vertical outlet.
- **Renewable In-line** — Renew trap in-line with factory packaged precision matched internal parts, replacement kits.
- **Compact** — Requires minimum space while providing condensate capacities equal to larger mechanical traps.
- **Superior Performance** — Maximum air handling capability. Immediate response to changing pressure and condensate loads. No adjustment necessary.
- **Sensitivity** — Increased when installed on side with cover perpendicular to ground.
- **Temperature Sensitive Actuators** — One moving part, stainless steel, fail open or closed, welded actuator provides maximum sensitivity, corrosion and thermal and hydraulic shock resistance.

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.

C and CS Series are angle pattern trap and balanced pressure design with stainless steel, welded actuator capable of discharging condensate within 10°F / -12°C of saturated temperature.

For greater sensitivity or protection from flash steam locking, SLR orifice is available to allow condensate and flash steam evacuation at or near saturated temperatures.

Thermostatic actuator has a conical valve lapped in matched sets with the seat ring assuring tight shut off. Trap is cast iron or cast steel-bodied suitable for pressures up to 250 psig / 17.2 bar and available in NPS 1/2 to 2 / DN 15 to 50 in NPT or socket weld end connection.

C and CS Series

Specifications

This section lists the specifications for the C and CS Series. Factory specifications are stamped on the nameplate fastened on the steam trap at the factory.

Available Configuration

C Series - Cast Iron

Type C33: NPS 1/2 / DN 15
Type C43: NPS 3/4 / DN 20
Type C53: NPS 1 / DN 25
Type C63: NPS 1-1/4 / DN 32
Type C73⁽¹⁾: NPS 1-1/2 / DN 40
Type C83⁽¹⁾: NPS 2 / DN 50

CS Series - Cast Steel

Type CS33: NPS 1/2 / DN 15
Type CS43: NPS 3/4 / DN 20
Type CS53: NPS 1 / DN 25
Type CS63: NPS 1-1/4 / DN 32
Type CS73⁽¹⁾: NPS 1-1/2 / DN 40
Type CS83⁽¹⁾: NPS 2 / DN 50

Body Size

NPS 1/2, 3/4, 1, 1-1/4, 1-1/2 and 2 /
DN 15, 20, 25, 32, 40 and 50

End Connection

C Series: NPT
CS Series: NPT or socket weld

Maximum Operating Pressure⁽¹⁾

C Series: 250 psig / 17.2 bar g
CS Series: 300 psig / 20.7 bar g

Maximum Allowable Pressure⁽¹⁾

C Series: 250 psig / 17.2 bar g
CS Series: 300 psig / 20.7 bar g

Maximum Operating Temperature⁽¹⁾

C Series: 450°F / 232°C
CS Series: 500°F / 260°C

Maximum Allowable Temperature⁽¹⁾

C Series: 450°F / 232°C
CS Series: 500°F / 260°C

Capacity Information

See Table 1

Materials of Construction

Body and Cover: Cast Iron and Cast Steel
Actuator: Welded Stainless Steel
Cover Gasket: Graphite
Valve and Seat: Hardened 416 Stainless Steel

Applications

Unit Heaters
Pipe Coils
Blast Coils
Steam Mains
Dry Kilns
Jacketed Kettles
Hot Water Heaters
Dryers (all types)
Large Heat Exchangers

Options

SW: Socket weld
SLR: SLR Orifice
HC: High capacity orifice

Approximate Weight

See Table 2

1. Add (-HC) to end of model number for high capacity.

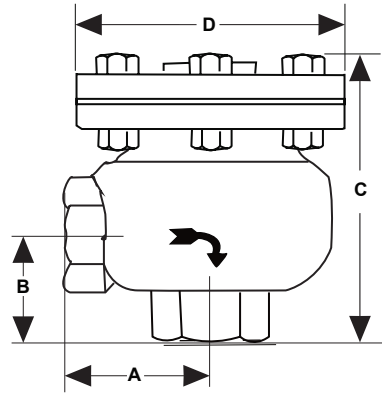
2. The pressure/temperature limits in this Bulletin and any applicable standard or code limitation should not be exceeded.

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. 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.

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.



C AND CS SERIES

Figure 2. C and CS Series Dimension

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

TYPE	ORIFICE, IN. / mm	DIFFERENTIAL PRESSURE, psig / bar g													
		1 / 0.07	2 / 0.14	5 / 0.34	10 / 0.7	20 / 1.4	50 / 3.5	100 / 6.9	125 / 8.6	150 / 10.3	175 / 12.1	200 / 13.8	225 / 15.5	250 / 17.2	300 / 20.7
		lbs/hr / kg/hr													
C33, CS33	3/8 / 10	985 / 448	1390 / 632	2180 / 991	3070 / 1395	3735 / 1698	5040 / 2291	6645 / 3070	7315 / 3325	7560 / 3436	8045 / 3657	8200 / 3727	8615 / 3916	8915 / 4052	9220 / 4191
C43, CS43	7/16 / 11	1460 / 664	2055 / 934	3240 / 1473	4560 / 2073	5550 / 2523	7480 / 3400	9865 / 4484	10,850 / 4932	11,225 / 5102	11,935 / 5425	12,165 / 5530	12,770 / 5805	13,225 / 6011	13,685 / 6220
C53, CS53, C63, CS63	1/2 / 12	1825 / 830	2575 / 1170	4050 / 1841	5700 / 2591	6925 / 3148	9350 / 4750	12,340 / 5609	13,565 / 6166	14,030 / 6377	14,920 / 6782	15,230 / 6923	15,960 / 7255	16,540 / 7518	17,120 / 7782
C73, CS73, C83, CS83	3/4 / 19	2760 / 1255	3890 / 1768	6120 / 2782	8610 / 3914	10470 / 4759	14,125 / 6420	18,660 / 8482	20,520 / 9327	21,235 / 9652	22,580 / 10264	23,015 / 10461	24,190 / 10995	25,055 / 11389	25,915 / 11780
C73HC, C83HC	1-1/4 / 32	3555 / 1616	5030 / 2286	7950 / 3614	11,240 / 5109	15,900 / 7227	25,140 / 11,427	33,000 / 15,000	----	----	----	----	----	----	----

Table 2. C and CS Series Series Dimension and Weight

TYPE	PIPE SIZE		A		B		C		D		WEIGHT			
											C Series		CS Series	
	NPS	DN	In.	mm	In.	mm	In.	mm	In.	mm	lbs	kg	lbs	kg
C33, CS33	1/2	15	2-5/8	67	1-13/16	46	4-15/16	125	4-1/2	114	8.3	3.8	8.6	3.9
C43, CS43	3/4	20	2-3/4	70	2-1/16	52	5-7/16	138	5-1/16	129	11.1	5.0	13	5.9
C53, CS53	1	25	3-1/2	89	2-13/16	71	6-1/16	154	5-13/16	148	17.8	8.1	19.6	8.9
C63, CS63	1-1/4	32	3-1/2	89	2-13/16	71	6-1/16	154	5-13/16	148	17.5	8.0	19.3	8.8
C73, CS73	1-1/2	40	5	127	3-3/4	95	8-3/8	213	7-3/4	197	39.1	17.8	39.2	17.8
C83, CS83	2	50	5	127	3-3/4	95	8-3/8	213	7-3/4	197	39	17.7	31.1	14.1

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.

- Record the location of the trap for maintenance accessibility.

C and CS Series

Capacity Information

Capacity information for every Type of C and CS Series is shown in Table 1.

Ordering Information

When ordering, complete the ordering guide on this page. Refer to the Specifications section on page 2.

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

Type (Select One)

C Series

- Type C33
- Type C43
- Type C53
- Type C63
- Type C73
- Type C83

CS Series

- Type CS33
- Type CS43
- Type CS53
- Type CS63
- Type CS73
- Type CS83

End Connection (Select One)

CS Series

- NPT
- Socket weld

Option

- SLR: SLR Orifice
- HC: High capacity orifice (For Types CS73, C83, CS73 and CS83 only)

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