

November 2021

Spence S610 Series Steam Trap

PRODUCT PHOTO

Figure 1. S610 Series Thermodynamic Steam Trap

Features

- **Improved Energy Savings** - Lowers steam waste due to steam jacketing. Trap cycle is unaffected by ambient temperatures or precipitation.
- **Extended Trap Life** - Integral strainer keeps disk and seat clean. Non-violent discharge reduces wear. Heavy disk prevents warpage and improves performance.
- **Easily Maintained** - Completely renewable without disturbing piping connections by removing cover, unscrewing and replacing Celtron® cartridge. Celtron® replacement cartridges are packaged individually with cover and gaskets in a protective bag.
- **Freeze Proof** - When mounted vertically or on its side horizontally.
- **Multi-functional** - Integral check valve eliminates need for additional fittings.

- **Economical** - First cost and maintenance cost are low.
- **Spiral-wound Cover Gasket** - assures positive closure.
- **Integral Strainer** - prevents dirt problems.

Introduction

The S610 Series is a thermodynamic cartridge design steam trap. Body is forged carbon steel construction housing stainless steel Celtron® cartridge. Celtron® cartridge contains all working components. Cartridge is hardened throughout. Seat is stress relieved to eliminate warpage. Trap contains integral strainer with available blowdown port and valve. Cover seals to body utilizing spiral wound graphite gasket. Trap is suitable for pressures through 600 psi / 41.3 bar and available in 3/8 through 1/2 in. / 9.53 to 12.7 mm.

S610 Series

Specifications

The specifications section on this page provide the ratings and other specifications for the S610 Series.

Available Configurations

- Type **S610L**: Low capacity
- Type **S610**: 3/8 and 1/2 in. / 9.53 and 12.7 mm
- Standard capacity**
- Type **S611L**: Low capacity
- Type **S611**: 3/4 in. / 19.1 mm Standard capacity
- Type **S612**: 1 in. / 25.4 mm Standard capacity

Maximum Operating Pressure⁽¹⁾

600 psig / 41.3 barg

Maximum Operating Temperature⁽¹⁾

800°F / 426°C

Maximum Allowable Pressure⁽¹⁾

650 psig / 44.8 barg

Maximum Allowable Temperature⁽¹⁾

800°F / 426°C

Maximum Capacity

See Tables 1 and 2

Materials of Construction

- Body and Cover**: A105 Forged steel
- Celtron® Cartridge**: 416 Stainless steel with hardened disk and seat
- Cover Gasket**: 304 Stainless steel spiral wound with graphite fill
- Bolts**: High Temperature Alloy
- Integral Strainer**: 304 Stainless steel

Options

- Socketweld Connections
- Tapped Blowdown Connection
- Blowdown Valve

Approximate Weights

2.3 lbs / 1.05 kg

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

Principle of Operation

Incoming air and condensate flow through the trap body and into the Celtron® cartridge. Line pressure raises the disk off the seat allowing complete discharge. When flashing condensate enters the cartridge, flow velocity increases, creating low pressure underneath the disk. Flashing condensate at high velocity strikes the inside wall of the disk chamber and is deflected to the top of the disk causing a pressure buildup. The disk is forced down onto the seat by this pressure imbalance. The trap remains closed as steam in the jacket prevents exposure of the Celtron® cartridge to ambient temperatures. Pressure inside the cap is not lowered until the trapped flash vapor condenses. Condensing steam lowers the pressure above the disk. Disk is then lifted and the cycle repeated.

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 (20 mesh) and valve upstream of trap.

NOTE

Strainer is not required with S610S Series which has integral strainer and blow-off plug in cover.

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 but a few ounces, unit discharging highest pressure will control the action of trap, while other units become air-bound and waterlogged. Piping upstream and downstream of trap should be at least equal to or one size larger than trap connection.

4. Retighten cap screws of all socket weld traps after field or shop welding.

Table 1. S610 Series Maximum Capacity in lbs/hr 10°F Below Saturation (Imperial)

TRAP TYPE	SIZE, IN.	DIFFERENTIAL PRESSURE, psig									
		5	10	25	50	75	100	200	300	400	600
S610L	3/8 to 1/2	105	150	235	330	395	435	550	630	690	790
S610	3/8 to 1/2	240	265	420	590	700	770	980	1120	1240	1400
S611L	3/4	105	150	235	330	395	435	550	630	690	790
S611	3/4	450	500	790	1130	1340	1460	1850	2100	2300	2630
S612	1	1090	1090	1900	2700	3200	3550	4450	5100	5650	6400

Table 2. S610 Series Maximum Capacity in kg/hr 5°C Below Saturation (Metric)

TRAP TYPE	SIZE, mm.	DIFFERENTIAL PRESSURE, bar									
		0.34	0.7	1.7	3.4	5.2	6.9	13.8	20.7	27.6	41.3
S610L	9.53 to 12.7	47.6	68.0	107	150	179	197	249	286	313	358
S610	9.53 to 12.7	109	120	191	268	318	349	445	508	562	635
S611L	19.1	47.6	68.0	107	150	179	197	249	286	313	358
S611	19.1	204	227	358	513	608	662	839	953	1043	1193
S612	25.4	494	494	862	1225	1452	1610	2019	2313	2563	29030

NOTE

Heat generated during welding causes reduction in original assembly torque. Loss is not great enough to cause cover leaks, but re-tightening will bring values to recommended design parameters. Celtron® is far enough away from welding heat and is not similarly affected.

5. Locate trap for maintenance accessibility

Capacity

The S610 Series steam trap works efficiently at all line pressures between 5 and 600 psi / 0.34 and 41.3 bar and back pressures to 80% of line pressure.

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

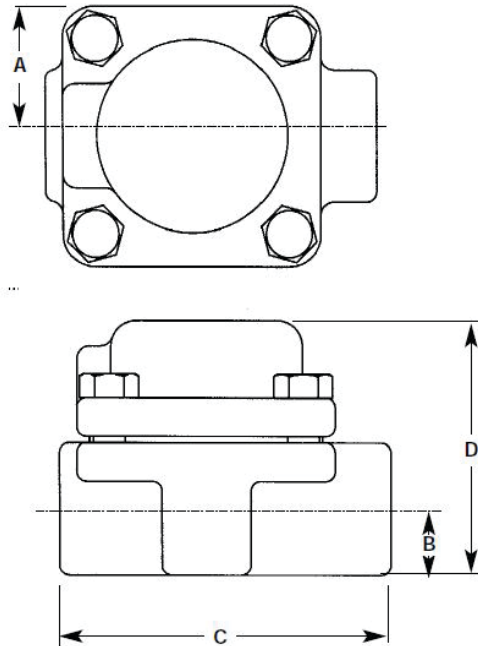
Available Configuration (Select One)

- Type S610L
- Type S610
- Type S611L
- Type S611
- Type S612

Options

- Socketweld Connections
- Tapped Blowdown Connection
- Blowdown Valve

S610 Series



IN. / mm

Figure 2. S610 Series Dimension

Table 3. S610 Series Dimensions

SIZE		A		B		C		D		WEIGHT	
In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	lbs	kg
3/8 and 1/2	9.53 and 12.7	1 17/64	32	21/32	17	3 1/4	83	2 15/32	63	2.3	1.05

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