

November 2021

# Spence™ Believer B Series Thermostatic Steam Traps

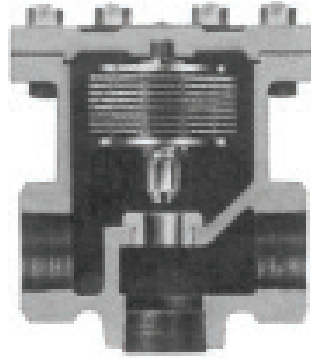


Figure 1. B Series Thermostatic Steam Traps

## Features

- **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 corrosion, thermal and hydraulic shock resistance and sensitivity.

## 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.

B Series is a straight thru trap and is a 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 end connection.

# B Series

## Specifications

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

### Available Configuration<sup>(1)</sup>

- Type B33: NPS 1/2 / DN 15
- Type B43: NPS 3/4 / DN 20
- Type B53: NPS 1 / DN 25
- Type B63: NPS 1-1/4 / DN 32
- Type B73: NPS 1-1/2 / DN 40
- Type B83: 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

NPT

### Maximum Operating Pressure<sup>(2)</sup>

250 psig / 17.2 bar g

### Maximum Allowable Pressure<sup>(2)</sup>

250 psig / 17.2 bar g

### Maximum Operating Temperature<sup>(2)</sup>

400°F / 204°C

### Maximum Allowable Temperature<sup>(2)</sup>

400°F / 204°C

### Capacity Information

See Table 1

### Materials of Construction

- Body and Cover:** Cast Iron
- 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

- 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.

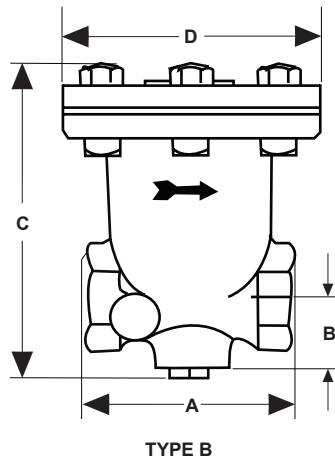
## Note

**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.

## Capacity Information

Capacity information for every type of B Series is shown in Table 1.



**Figure 2. B Series Dimension**

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

| TYPE            | ORIFICE,<br>IN. /<br>mm | DIFFERENTIAL PRESSURE, psig / bar g |                |                |                  |                  |                    |                    |                  |                  |                    |                    |                    |                    |
|-----------------|-------------------------|-------------------------------------|----------------|----------------|------------------|------------------|--------------------|--------------------|------------------|------------------|--------------------|--------------------|--------------------|--------------------|
|                 |                         | 1 /<br>0.07                         | 2 /<br>0.14    | 5 /<br>0.34    | 10 /<br>0.7      | 20 /<br>1.4      | 50 /<br>3.5        | 100 /<br>6.9       | 125 /<br>8.6     | 150 /<br>10.3    | 175 /<br>12.1      | 200 /<br>13.8      | 225 /<br>15.5      | 250 /<br>17.2      |
|                 |                         | lbs/hr / kg/hr                      |                |                |                  |                  |                    |                    |                  |                  |                    |                    |                    |                    |
| B33             | 3/8 /<br>10             | 985 /<br>448                        | 1390 /<br>632  | 2180 /<br>991  | 3070 /<br>1395   | 3735 /<br>1698   | 5040 /<br>2291     | 6645 /<br>3070     | 7315 /<br>3325   | 7560 /<br>3436   | 8045 /<br>3657     | 8200 /<br>3727     | 8615 /<br>3916     | 8915 /<br>4052     |
| B43             | 7/16 /<br>11            | 1460 /<br>664                       | 2055 /<br>934  | 3240 /<br>1473 | 4560 /<br>2073   | 5550 /<br>2523   | 7480 /<br>3400     | 9865 /<br>4484     | 10,850 /<br>4932 | 11,225 /<br>5102 | 11,935 /<br>5425   | 12,165 /<br>5530   | 12,770 /<br>5805   | 13,225 /<br>6011   |
| B53, B63        | 1/2 /<br>12             | 1825 /<br>830                       | 2575 /<br>1170 | 4050 /<br>1841 | 5700 /<br>2591   | 6925 /<br>3148   | 9350 /<br>4750     | 12,340 /<br>5609   | 13,565 /<br>6166 | 14,030 /<br>6377 | 14,920 /<br>6782   | 15,230 /<br>6923   | 15,960 /<br>7255   | 16,540 /<br>7518   |
| B73, B83        | 3/4 /<br>19             | 2760 /<br>1255                      | 3890 /<br>1768 | 6120 /<br>2782 | 8610 /<br>3914   | 10,470 /<br>4759 | 14,125 /<br>6420   | 18,660 /<br>8482   | 20,520 /<br>9327 | 21,235 /<br>9652 | 22,580 /<br>10,264 | 23,015 /<br>10,461 | 24,190 /<br>10,995 | 25,055 /<br>11,389 |
| B73HC,<br>B83HC | 1-1/4 /<br>32           | 3555 /<br>1616                      | 5030 /<br>2286 | 7950 /<br>3614 | 11,240 /<br>5109 | 15,900 /<br>7227 | 25,140 /<br>11,427 | 33,000 /<br>15,000 | ----             | ----             | ----               | ----               | ----               | ----               |

**Table 2. B Series Dimension and Weight**

| TYPE | PIPE SIZE |    | A     |     | B     |    | C       |     | D       |     | WEIGHT |      |
|------|-----------|----|-------|-----|-------|----|---------|-----|---------|-----|--------|------|
|      | NPS       | DN | In.   | mm  | In.   | mm | In.     | mm  | In.     | mm  | lbs    | kg   |
| B33  | 1/2       | 15 | 3-7/8 | 98  | 1-1/8 | 29 | 5-7/8   | 149 | 4-1/2   | 114 | 7      | 3.2  |
| B43  | 3/4       | 20 | 4-1/4 | 108 | 1-3/8 | 35 | 6-3/4   | 171 | 5-1/16  | 129 | 10.3   | 4.7  |
| B53  | 1         | 25 | 5-1/2 | 140 | 1-7/8 | 48 | 7-11/16 | 195 | 5-13/16 | 148 | 15.6   | 7.1  |
| B63  | 1-1/4     | 32 | 5-1/2 | 140 | 1-7/8 | 48 | 7-11/16 | 195 | 5-13/16 | 148 | 15.3   | 7.0  |
| B73  | 1-1/2     | 40 | 7-1/4 | 184 | 1-3/4 | 44 | 9-1/16  | 230 | 7-3/4   | 197 | 33.6   | 15.3 |
| B83  | 2         | 50 | 7-1/4 | 184 | 1-3/4 | 44 | 9-1/16  | 230 | 7-3/4   | 197 | 32.4   | 14.7 |

# B Series

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## 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)

- Type B33
- Type B43
- Type B53
- Type B63
- Type B73
- Type B83

### Options

- SLR: SLR Orifice
- HC: High capacity orifice

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