May 2023

TA Series Thermostatic Steam Traps



Figure 1. TA SeriesThermostatic Steam Traps

Features

- Sealed Stainless Steel Body Lightweight, compact and corrosion resistant. No bolts or gaskets. Eliminates body leaks.
- Self Centering Valve Leak tight shutoff. Improved energy savings. Assembly of actuator and valve to impingement plate allows valve to selfalign with center of valve seat orifice. Provides long lasting valve and seat.
- **Temperature Sensitive Actuators –** One moving part. Stainless Steel, fail open or fail closed, welded actuator for maximum corrosion, thermal and hydraulic shock resistance.
- For Superheated Steam Applications Because the trap closes at saturated steam temperature, superheated steam cannot reach trap.
- Thermal and Hydraulic Shock Resistant Impingement plate plus welded construction prevent damage to actuator.
- Hardened Stainless Steel Valve and Seat Long life. Lapped as a matched set for water tight seal.

- Inexpensive Low initial cost.
- **Maintenance Free** Sealed unit. Replacement traps cost less than repair of more expensive in-line repairable traps.
- Freeze Proof Self draining when installed vertically.
- **Directional Discharge** Pipe thread erosion prevented by directing discharge to center of pipe.
- Air Vent Efficient steam service air vent when equipped with ISO Bellows and installed in air vent location.

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 TA Series is a balanced pressure design with stainless steel welded actuator capable of discharging condensate within 10°F / -12°C of saturated pressure.



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Specifications

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

Available Configuration ⁽¹⁾	Materials of Construction
Type TA502: Reduced capacity	Body and Cover: Stainless steel
Type TA503: Standard capacity	Actuator: Welded Stainless Steel
Type TA504: High capacity	Valve and Seat: Hardened 416 Stainless Steel
Body Size	Applications
NPS 3/8, 1/2, 3/4 and 1 / DN 10, 15, 20 and 25	Unit Heaters
End Connection	Air Vents
NPT and Socket Weld	Steam Tracing
Maximum Operating Pressure ⁽²⁾ Standard Traps: 500 psig / 34.5 bar g ISO Option Traps: 650 psig / 44.8 bar g	Drip Legs Platen Presses Plating Tanks Sterilizers
Maximum Allowable Pressure ⁽²⁾ 650 psig / 44.8 barg	Tire Presses Cooking Equipment Laundry Equipment
Maximum Operating Temperature ⁽²⁾	Other Process Equipment
Standard Traps: 600°F / 316°C	Options
ISO Option Traps: 650°F / 343°C	ISO: ISO Filled Actuator
Maximum Allowable Temperature ⁽²⁾	SW: Socket weld
750°F / 399°C	SLR: SLR Orifice
Capacity Information	Approximate Weight
See Table 2	Table 1

Add (-FC) for fail closed or (-FO) for fail open to end of Type number.
 The pressure/temperature limits in this Bulletin and any applicable standard or code limitation should not be exceeded

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. If subcooling of condensate is desired, alternate thermostatic actuator is available to allow condensate evacuation at or near 40°F / 4.4°C below saturated temperatures.

Thermostatic actuator has a conical valve lapped in matched sets with the seat ring assuring tight shut off. A minimum of three orifice sizes is available allowing for custom capacity sizing. Trap is stainless steel-bodied suitable for pressures up to 650 psig / 44.8 bar and available in NPS 3/8 to 1 / DN 10 to 25 in NPT or socket weld end connection.

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. When very hot condensate 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. Restricted orifice in Type TA502 (small opening at bottom of valve seat) prevents trap from discharging continuously on light loads such as are encountered on tracer lines..



Figure 2. TA Series Dimensions

Table 1. TA Series Dimensions and Weight

NPT OR SOCKET WELD		IN. /				
NPS	DN	А	В	WEIGHT, LBS / kg		
3/8, 1/2	10, 15	3-3/4 / 95	1-3/4 / 44	1.1 / 0.5		
3⁄4	20	3-15/16 / 100	1-3/4 / 44	1.2 / 0.54		
1	25	4-3/8 / 111	1-3/4 / 44	1.6 / 0.73		

	DIFFERENTIAL PRESSURE, psig / barg																
IN. /	5 /	10 /	20 /	50 /	100 /	125 /	150 /	200 /	250 /	300 /	350 /	400 /	450 /	500 /	550(1 /	600(1 /	650(1 /
	0.34	0.7	1.4	3.5	6.9	8.62	10.3	13.8	17.2	20.7	24.1	27.6	31.0	34.5	37.9	41.4	44.8
		lbs/hr / kg/hr															
1/8 /	216 /	265 /	375 /	592 /	778 /	838 /	890 /	980 /	1055 /	1121 /	1180 /	1235 /	1284 /	1331 /	1377 /	1425 /	1471 /
3	98	120	170	269	354	381	405	445	480	510	536	561	584	604	625	646	667
1/4	550 /	825 /	1210 /	1975 /	2825 /	3140 /	3425 /	3650 /	3960 /	4100 /	4230 /	4420 /	4600 /	4760 /	4910 /	5060 /	5190 /
6	249	374	549	896	1281	1424	1554	1656	1796	1860	1919	2005	2086	2161	2232	2297	2359
5/16 /	860 /	1220 /	1725 /	2725 /	3575 /	3850 /	4090 /	4505 /	4850 /	5155 /	5425 /	5675 /	5900 /	6110 /	6310 /	6480 /	6625 /
8	390	554	783	1237	1623	1748	1857	2045	2202	2340	2463	2576	2679	2774	2868	2945	3011
	mm 1/8 / 3 1/4 6 5/16 /	IN. / 0.34 1/8 / 0.34 1/8 / 216 / 98 1/4 550 / 6 249 5/16 / 860 /	IN. / mm 257 107 0.34 0.7 107 0.7 107 0.34 0.7 107 0.7	IN. / mm 57 107 207 0.34 0.7 1.4 1/8 / 216 / 265 / 375 / 3 98 120 170 1/4 550 / 825 / 1210 / 6 249 374 549 5/16 / 860 / 1220 / 1725 /	IN. / mm 5 / 0.34 10 / 0.7 20 / 1.4 50 / 3.5 1/8 / 3 216 / 98 265 / 120 375 / 170 592 / 269 1/4 550 / 249 825 / 374 1210 / 549 1975 / 896 5/16 / 860 / 1220 / 1725 / 1725 / 2725 /	IN. / mm 5/ 0.34 0.7 1.4 3.5 6.9 1/8 / 3 98 120 170 267 592 / 778 / 354 1/4 550 / 825 / 1210 / 1975 / 2825 / 6 249 374 549 896 1281 5/16 / 860 / 1220 / 1725 / 2725 / 3575 /	IN. / mm 57 107 207 507 1007 1257 0.34 0.7 1.4 3.5 6.9 8.62 1/8 / 3 98 120 170 269 354 381 1/4 550 / 825 / 1210 / 1975 / 2825 / 3140 / 6 249 374 549 896 1281 1424 5/16 / 860 / 1220 / 1725 / 2725 / 3575 / 3850 /	ORIFICE, IN. / mm 5 / 0.34 10 / 0.7 20 / 1.4 50 / 3.5 100 / 6.9 125 / 8.62 150 / 10.3 1/8 / 3 216 / 98 265 / 120 375 / 170 592 / 269 778 / 354 838 / 381 890 / 405 1/4 - 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1. Emerson recommends ISO filled Actuator above 500 psi / 34.5 bar and for superheated steam.

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 TA Series is shown in Table 2.

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 TA502-FO

 □ Type TA502-FC

 □ Type TA503-FO

 □ Type TA503-FC

 □ Type TA504-FO

 □ Type TA504-FC

Body Size (Select One) □ NPS 3/8 / DN 10 □ NPS 1/2 / DN 15 □ NPS 3/4 / DN 20

□ NPS 1 / DN 25

End Connection (Select One)

□ NPT □ Socket Weld

Options

□ ISO - ISO Filled Actuator □ SW - Socket Weld □ SLR - SLR Orifice

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