

# TA SERIES THERMOSTATIC STEAM TRAPS

**Pressures To 650 PSIG (44.8 barg)  
Temperatures to 750°F (400°C)**



## Applications

- Unit Heaters
- Air Vents
- Steam Tracing
- Drip Legs
- Platen Presses
- Plating Tanks
- Sterilizers
- Tire Presses
- Cooking Equipment
- Laundry Equipment
- Other Process Equipment

## Options *See page 8*

- ISO - ISO Filled Actuator
- SLR - SLR Orifice
- SW - Socketweld

Canadian Registration # 0E0591.9

**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 self-align with center of valve seat orifice. Provides long lasting valve and seat.

**Temperature Sensitive Actuators** — One moving part. Stainless Steel, fail open, welded actuator for maximum corrosion, thermal and hydraulic shock resistance. Optional fail closed convoluted Monel actuator for caustic corrosion 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.

**Guaranteed** — Guaranteed against defects in materials or workmanship. Traps with Welded Actuator—3 Years. Traps with Monel Actuator—1 Year

## Models

- **TA502**—Reduced capacity w/welded SS actuator
- **TA502M**—Reduced capacity w/monel actuator
- **TA503**—Standard capacity w/welded SS actuator
- **TA503M**—Standard capacity w/monel actuator
- **TA504**—High capacity w/welded SS actuator
- **TA504M**—High capacity w/monel actuator

## Operation

Thermal actuator is filled at it's 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 TA502 (small opening at bottom of valve seat) prevents trap from discharging continuously on light loads such as are encountered on tracer lines.

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## Typical Specification

Steam trap shall be of balanced pressure design with monel convoluted actuator or stainless steel welded actuator capable of discharging condensate within 10°F of saturated temperature. Where greater sensitivity is required or protection from flash steam locking, a SLR orifice will be available to allow condensate and flash steam evacuation at or near saturated temperatures. Where subcooling of condensate is desired alternate thermostatic actuator will be available to allow condensate evacuation at or near 40°F below saturated temperatures. Thermostatic actuator shall employ a conical valve lapped in matched sets with the seat ring assuring tight shut off. A minimum of three orifice sizes shall be available allowing for custom capacity sizing. Trap shall be stainless steel bodied suitable for pressures to 650 psig and available in 3/8" through 1" NPT or socketweld.

## Maximum Operating Conditions

Traps with Monel Convoluted Actuator

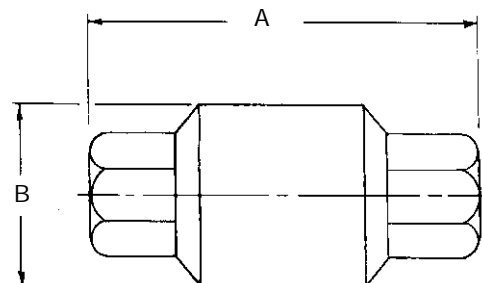
|                                 |          |             |
|---------------------------------|----------|-------------|
| PMO: Max. Operating Pressure    | 300 psig | (20.7 barg) |
| TMO: Max. Operating Temperature | 500°F    | (260°C)     |
| PMA: Max. Allowable Pressure    | 650 psig | (44.8 barg) |
| TMA: Max. Allowable Temperature | 750°F    | (400°C)     |

Traps with Welded Stainless Actuator

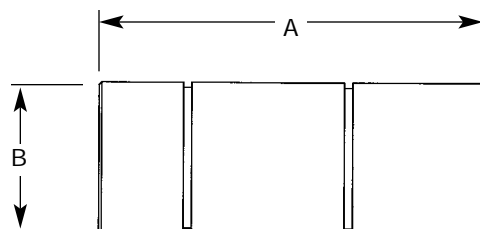
|                                 |          |             |
|---------------------------------|----------|-------------|
| PMO: Max. Operating Pressure    | 500 psig | (34.5 barg) |
| TMO: Max. Operating Temperature | 600°F    | (316°C)     |
| PMA: Max. Allowable Pressure    | 650 psig | (44.8 barg) |
| TMA: Max. Allowable Temperature | 750°F    | (400°C)     |

Traps with Welded Stainless Actuator, ISO

|                                 |          |             |
|---------------------------------|----------|-------------|
| PMO: Max. Operating Pressure    | 650 psig | (44.8 barg) |
| TMO: Max. Operating Temperature | 650°F    | (343°C)     |
| PMA: Max. Allowable Pressure    | 650 psig | (44.8 barg) |
| TMA: Max. Allowable Temperature | 750°F    | (400°C)     |



3/8" - 3/4" BODY



1" BODY

Connections:  
3/8" – 1" NPT or socketweld

| Dimensions               |                  |               |                        |
|--------------------------|------------------|---------------|------------------------|
| NPT or<br>Socket<br>weld | inches<br>(mm)   |               | Weight<br>Lbs.<br>(kg) |
|                          | A                | B             |                        |
| 3/8, 1/2"                | 3 3/4<br>(95)    | 1 3/4<br>(44) | 1.1<br>(0.5)           |
| 3/4"                     | 3 15/16<br>(100) | 1 3/4<br>(44) | 1.2<br>(0.54)          |
| 1"                       | 4 3/8<br>(111)   | 1 3/4<br>(44) | 1.6<br>(0.73)          |

## Materials of Construction

|               |                               |
|---------------|-------------------------------|
| Body & Cover: | ASTM A351 Grade CF3M (316L)   |
| Actuator:     | Welded SS or Convoluted Monel |
| Valve & Seat: | Hardened 416 Stainless Steel  |

## Maximum Capacity—lbs/hr 10°F Below Saturation (Kg/hr 5°C Below Saturation)

| Trap              | Orifice<br><br>Inch<br>(mm) | Differential PSIG (barg) |               |               |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |
|-------------------|-----------------------------|--------------------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--|
|                   |                             | 5<br>(0.34)              | 10<br>(0.7)   | 20<br>(1.4)   | 50<br>(3.5)    | 100<br>(6.9)   | 125<br>(8.62)  | 150<br>(10.3)  | 200<br>(13.8)  | 250<br>(17.2)  | 300<br>(20.7)  | 350<br>(24.1)  | 400<br>(27.6)  | 450<br>(31.0)  | 500<br>(34.5)  | 550*<br>(37.9) | 600*<br>(41.4) | 650*<br>(44.8) |  |
| TA502<br>TA502M** | 1/8<br>(3)                  | 216<br>(98)              | 265<br>(120)  | 375<br>(170)  | 592<br>(269)   | 778<br>(354)   | 838<br>(381)   | 890<br>(405)   | 980<br>(445)   | 1055<br>(480)  | 1121<br>(510)  | 1180<br>(536)  | 1235<br>(561)  | 1284<br>(584)  | 1331<br>(604)  | 1377<br>(625)  | 1425<br>(646)  | 1471<br>(667)  |  |
| TA503<br>TA503M** | 1/4<br>(6)                  | 550<br>(249)             | 825<br>(374)  | 1210<br>(549) | 1975<br>(896)  | 2825<br>(1281) | 3140<br>(1424) | 3425<br>(1554) | 3650<br>(1656) | 3960<br>(1796) | 4100<br>(1860) | 4230<br>(1919) | 4420<br>(2005) | 4600<br>(2086) | 4760<br>(2161) | 4910<br>(2232) | 5060<br>(2297) | 5190<br>(2359) |  |
| TA504<br>TA504M** | 5/16<br>(8)                 | 860<br>(390)             | 1220<br>(554) | 1725<br>(783) | 2725<br>(1237) | 3575<br>(1623) | 3850<br>(1748) | 4090<br>(1857) | 4505<br>(2045) | 4850<br>(2202) | 5155<br>(2340) | 5425<br>(2463) | 5675<br>(2576) | 5900<br>(2679) | 6110<br>(2774) | 6310<br>(2868) | 6480<br>(2945) | 6625<br>(3011) |  |

\* Nicholson recommends ISO filled Actuator above 500 psi (34.5 bar) and for superheated steam.

\*\*Maximum pressure for Monel Actuator Traps is 300 PSI (20.7 bar).