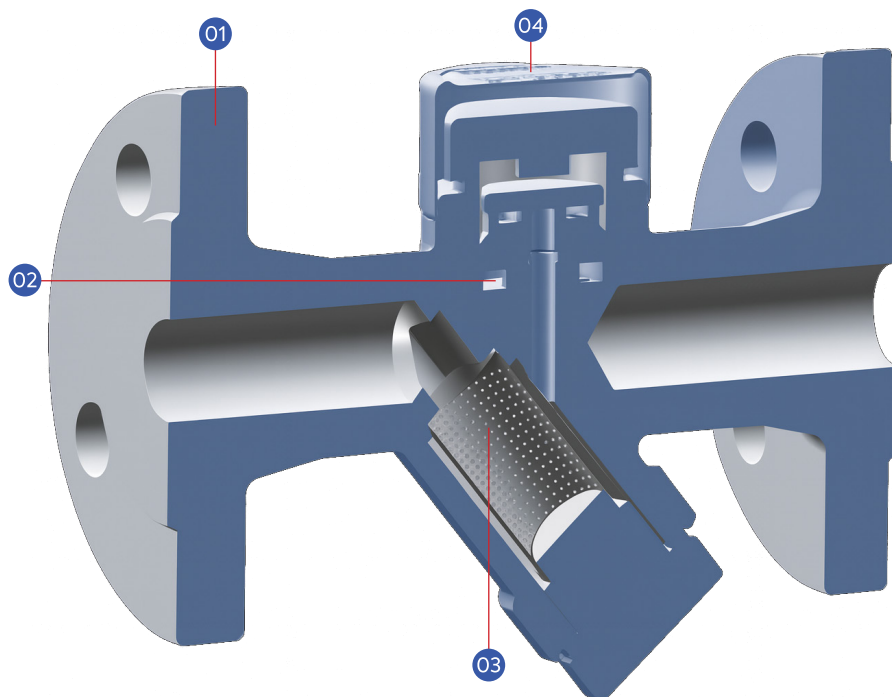


# THERMODYNAMIC STEAM TRAP

Thermodynamic steam traps are commonly used in low, medium, and high-pressure steam delivery systems, process heat tracing, and small displacement equipment. They are valued for their Compact size, high discharge capacity, energy efficiency, long service life, and excellent resistance to low temperatures.

The technical strengths of ValveWerkz thermodynamic traps lie in their well-engineered construction and precision internal components.



## 1. High-Strength Corrosion Resistance

Manufactured using A105 or 15CrMo materials, with careful consideration given to corrosion allowance, shell wall thickness, and temperature rating in the design process.

## 2. Precision Valve Seat and Disc

The valve seat and disc are made from martensitic stainless steel. Specialised heat treatment enables effective condensate removal and minimises flash steam, tailored to various operating conditions.

## 3. Integrated Filtering Device

Prevents pipeline impurities from entering the valve, ensuring consistent and reliable trap performance.

## 4. Stainless Steel Insulation Cover

The stainless steel cover protects the internal chamber from outdoor environmental conditions, reducing the risk of malfunctions or mechanical instability due to external factors.

## Structural Features

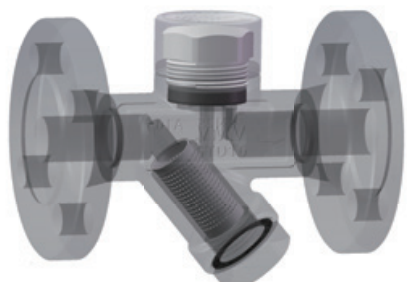
ValveWerkz thermodynamic steam trap use A105 material for low-pressure valve bodies, while 15CrMo is used for medium-pressure variants.

Based on Bernoulli's equation, and following extensive testing and calculation, each trap is optimised to support either low-temperature or saturated condensate discharge:

- The low-temperature type discharges condensate at lower temperatures (with greater subcooling). It operates with minimal noise but has limited air discharge capacity.
- The saturated type discharges condensate close to saturation temperature (with minimal subcooling). It offers better air discharge capability but operates with higher noise levels.

Thermodynamic steam traps function by responding to the flow rate difference between steam and condensate. When condensate passes through the valve seat, the low flow rate causes the valve plate to open and discharge the water. As steam enters, the high flow rate forces the valve seat to close.

The low-temperature type uses flash steam to assist in valve closure. ValveWerkz addresses the common drawbacks of conventional thermal traps, such as energy inefficiency, noise, and steam leakage, by offering a Compact, low-noise solution with long service life, reliable operation, and minimal maintenance requirements. The design ensures no original steam leakage, particularly in the low-temperature model.



## Material and Performance Specifications

The body and bonnet of the thermodynamic steam trap are made from ASTM A105 (15CrMo), with internal components made of stainless steel and an integrated filter.

- Nominal pressure: PN25 / PN63
- Maximum allowable temperature: 425°C
- Maximum working pressure: 16 to 42 Bar
- Maximum working temperature: 400 to 425°C
- Connection options: Threaded RC or flange (GB/T9115.1-2000; HG/T20515-2009; HG/T20592-2009, etc.)

## Selection and Installation

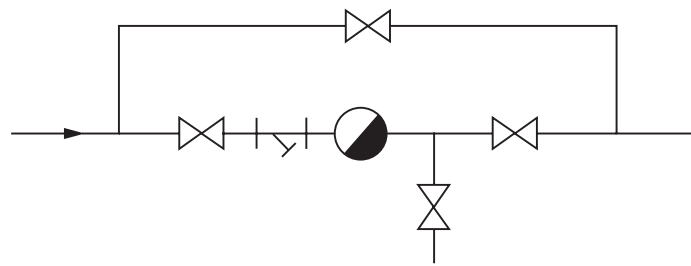
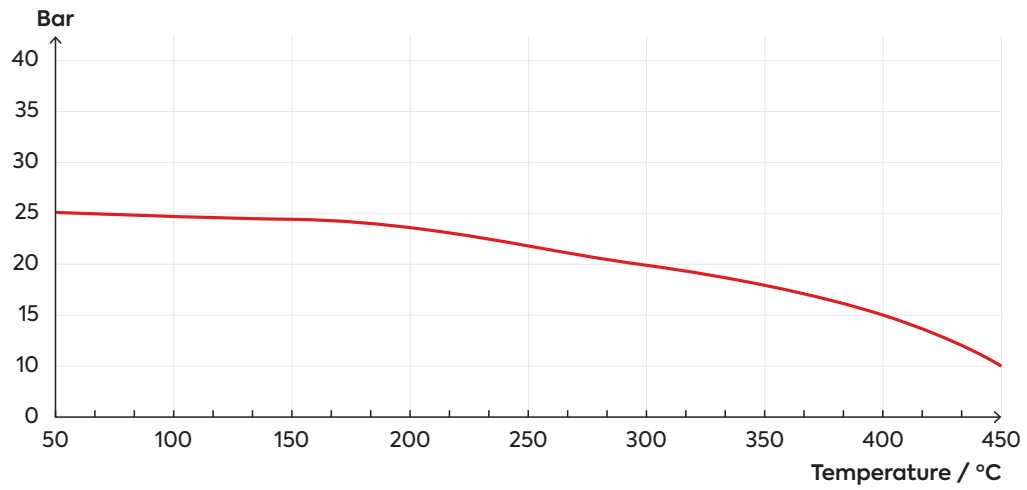
Thermodynamic steam traps are intermittent drainage. Normally, orifice of 16 bar have a subcooling degree of 5-10°C, and orifice of 42 bar has a subcooling degree of 20-50°C. If there is a requirement for subcooling, indicate when ordering. The back pressure rate of thermodynamic traps can reach  $\geq 80\%$  (back-end pipeline pressure/steam pressure), which is suitable for pipelines and small equipment to remove condensate. In general, the safety factor is 2-3 times.

Warm reminder: The condensed water volume and pressure difference of steam equipment are important indicators for type selection.

### Note

The volume of condensate and the pressure differential in your steam system are key factors when selecting the appropriate trap type.

## Valve Body Pressure - Rating Temperature (25 Bar; WCB)



The displacement capacity of a steam trap increases with rising pressure difference. Please refer to the displacement curve for accurate sizing. Do not confuse this with a large-diameter trap, which may have a different displacement profile.



# ST61 Series

## Thermodynamic Steam Trap

- Carbon Steel
- SS304

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- SS304

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- Threaded End
- Socket Weld End
- Flanged End

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- DN15 (1/2") to DN25 (1")

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- Max Discharge = 800 kg/hr

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- PN25 - PN63

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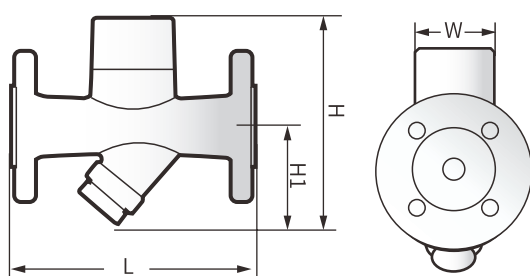
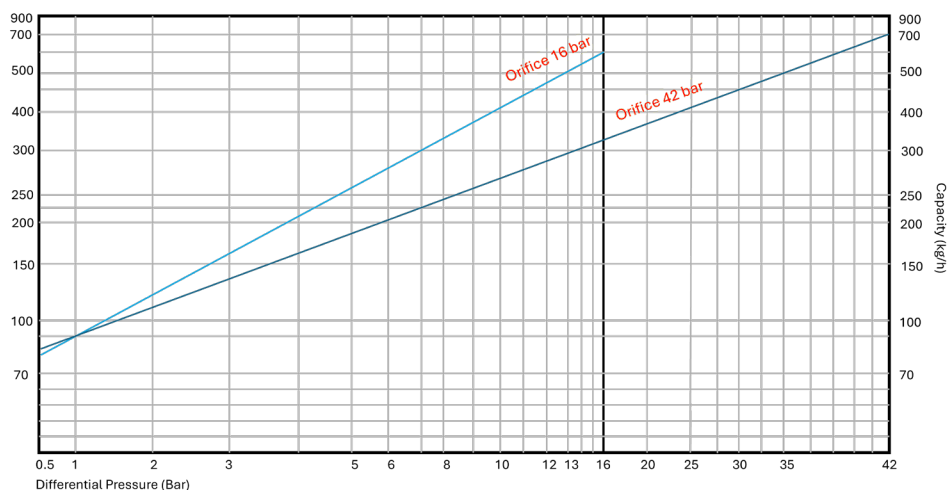
- Max W.P = 16 Bar, 42 Bar

### ST61

Nominal pressure	PN25	PN63
Max. allowable pressure (Shell)	24.5 Bar / 200°C	62.7 Bar / 200°C
Max. allowable temperature (Shell)	450°C / 10.3 Bar	450°C / 26.7 Bar
Factory steam action test	>3 times / 16 Bar	>3 times / 16 Bar

Nominal pressure	PN25	PN63
Max. operating pressure	16 Bar	42 Bar
Max. operating temperature	350°C	350°C
Factory cold test pressure	38 Bar	95 Bar
Air test	20 Bar	20 Bar

### Displacement Curve



Part Name	Material
Bonnet	A105 / F304 / F316
Body	A105 / F304 / F316
Seat	440C
Disc	440C
Other Internal Parts	304

### Data Size Table

Connection	Size	L(mm)	H(mm)	H1(mm)	W(mm)	Weight(kg)
Threaded	DN15 - 25	90	120	68	48	1/1.5
Butt Weld / Socket Weld	DN15 - 25	90	120	68	48	1/1.5
Flanged	DN15 - 25	150	120	68	48	2.5 - 3

