



KLINGER Delta Steam Traps



Permanently reduce energy costs and eliminate steam trap maintenance.



The DELTA Steam Trap works by combining venturi technology with the orifice, so:

- » part of the capacity of the DELTA Trap is related to the size of the orifice
- » part is also related to the back pressure that is generated inside the venturi.

How the Delta Steam Traps Work.

It is a combination of the pressure drop across the orifice and the back pressure generated in the venturi that gives the DELTA Trap its overall capacity. As the condensate passes through the orifice of the DELTA Trap there is a pressure drop. On the upstream side of the orifice the condensate is at the same pressure as the steam and it has a high energy content. As the pressure drops across the orifice, the temperature and pressure of the condensate reduces, so it contains less energy.

However, energy cannot be destroyed, so the transfer of energy between the HP upstream side and the LP downstream side causes some of the condensate to be converted into 'flash' steam. The higher the pressure difference across a trap, the more condensate has to be converted into 'flash' steam.

The Delta Trap uses this Flash Steam to Create a Back Pressure Inside our trap. As the condensate is forced through the orifice of the DELTA Trap by the upstream pressure, the resultant pressure drop generates flash steam. This flash steam is about 1000 times the volume of the condensate, so the sudden expansion results in the condensate being accelerated in the venturi of the DELTA Trap. This sudden acceleration creates an equal and opposite force or back pressure inside the venturi, which restricts the flow of less dense steam through the orifice, while allowing the denser condensate to be ejected.

Because the amount of flash steam changes depending upon the operating conditions then the resultant back pressure also changes. This is then regulating the flow of condensate through the trap and hence gives it its variable capacity characteristics.

As less condensate arrives at the trap there is less pressure forcing it through the orifice, but because the temperature of the condensate has reduced, there is less flash steam generated. The percentage of flash steam drops and the mass flow reduces.

ADVANTAGES:

- » Reduce boiler fuel costs by between 20% – 30%
- » Improved heat transfer
- » 10 year Guarantee
- » No moving parts
- » No more steam trap maintenance
- » No more steam trap surveys
- » Handles varying or constant loads with ease

THE FUNCTION OF A STEAM TRAP:

- » To vent air and non-condensable gases
- » To release condensate that forms continuously as steam give up its latent heat and condenses
- » To prevent the escape of steam
- » To operate reliably for long periods in harsh environments
- » A Delta Venturi Orifice Steam Traps does all of this and has no moving parts that can fail open

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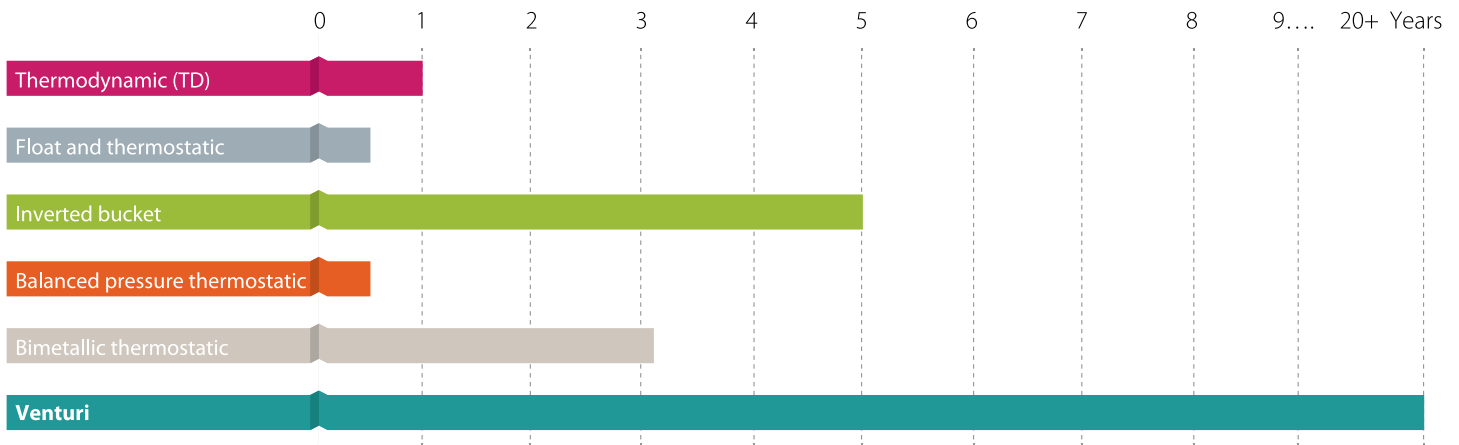
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COMPARATIVE SERVICE LIFE OF STEAM TRAPS

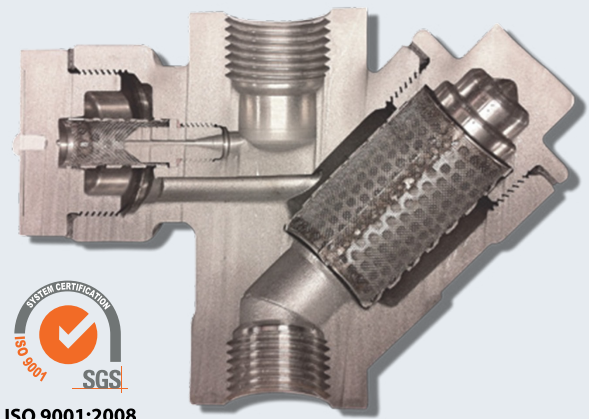


Average Service Life for Various Mechanical Steam Traps at 14 bar Steam Pressure



APPLICATIONS WHERE DELTA STEAM TRAPS CAN BE USED

- » Steam mains drainage
- » Tracer lines
- » Cooking pots
- » Sterilizers
- » Autoclaves
- » Batch Process Applications
- » Heat exchangers
- » Control valve applications
- » Evaporators



The capacity of the DELTA Trap is a function of the orifice size and the dimensions of the venturi section. By utilising the natural laws of physics, i.e. the change in the amount flash steam with change in pressure, the capacity of the DELTA Trap can vary with the changes in process conditions. The internal dimensions of the DELTA Trap are designed in such a way that the capacity of the DELTA Trap changes with the changing capacity of the application.

Hence the DELTA Trap works on varying loads from minimum through to maximum capacity!



KLINGER Mzansi Head Office
247 Davidson Road, Wadeville, Germiston, 1428
Tel: +27 (0) 11 842 8300
Email: services@klinger.co.za
Website: www.klinger.co.za