

THERMOSTATIC STEAM TRAPS

Thermostatic steam traps, as their name implies, operate in direct response to the temperature within the trap. There are two primary types: *BELLOWS* and *BIMETALLIC*.

BELLOWS TRAPS

Of all actuating devices, the bellows trap most nearly approaches ideal operation and efficiency and is most economical. It is positive in both directions, is fast acting and does not require adjustment. Bellows traps employ only one moving part - a liquid filled metal bellows - which responds quickly and precisely to the presence or absence of steam.

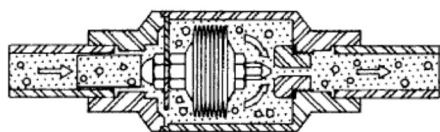


FIGURE 13

During startup and warmup, a vacuum in the bellows keeps it retracted, with the valve lifted well clear of the seat permitting air and non-condensibles to be freely discharged (Figure 13).

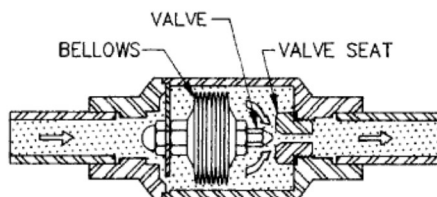
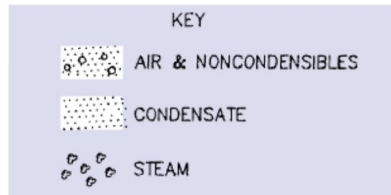


FIGURE 14

Next, condensate is discharged (Figure 14). Then heat from arriving steam will cause the liquid in the bellows to vaporize and close the valve (Figure 15).

At temperature, the valve will remain closed indefinitely opening only when condensate, air or other non-condensibles cause it to retract and open.

When live steam re-enters the trap housing, the bellows extends immediately, trapping the steam (Figure 15).

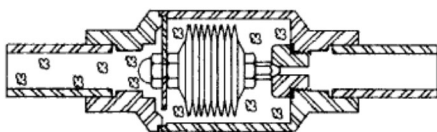


FIGURE 15

The bellows, unlike a disc trap, is a temperature sensitive rather than a time cycle device. There is no way that air can be mistaken for steam and cause binding, since bellows react to temperature only. And unlike bucket traps, bellows traps do not require a variety of sizes for valves and seats for various pressures.

BIMETALLIC TRAPS

Bimetallic traps work like the differential metal strip in a thermostat, using the unequal expansion of two different metals to produce movement which opens and closes a valve.

Figure 16: When the cooler condensate contacts the bimetallic discs, the discs relax. Inlet pressure forces the valve away from its seat and permits flow.

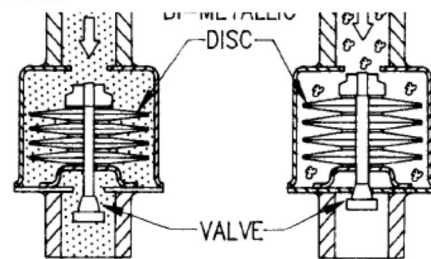


FIGURE 16

FIGURE 17

Figure 17: When steam enters the trap and heats the bimetallic discs, the discs expand forcing the valve against its seat preventing flow.

Bimetallic traps are simple and positive in both directions. However, they have a built-in delay factor which makes them inherently sluggish. Moreover; they do not maintain their original settings because the elements tend to take a permanent set after use, which requires repeated adjustment to maintain efficiency.

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