

3.4.4. BULB AND CAPILLARY THERMOSTATS

They are mainly used in industrial applications because the vapor pressure can achieve quite easily adjustable differential devices.



3.4.5 AIR DISPLACEMENT THERMOSTATS

These devices were using a filament style heating system in a glass bulb partially filled with air and containing mercury. Pushed by the expanding air, the mercury passed through a tube into a compartment containing an electrode with which it established an electrical contact. This system, coupled with a slow break bimetal thermostat contact avoided contact triggering, and achieved very low differential and high electrical rating. This system, very accurate, very reliable, has completely disappeared.



3.4.6 THERMOMETERS

The gas expansion thermometers are used in industrial applications, they have a low thermal inertia and can be used in high temperatures.

3.5 PHYSICAL STATE CHANGE THERMOSTATS

3.5.1 "CALORSTATS"

They use the wax melting temperature expansion. There is little use of them in systems operating an electrical contact, but they are widely used to provide mechanical movements (Car engine thermostats, radiator thermostats, door locks, valve control). This system can actuate an electrical contact, or operate a valve to control the flow of water when the temperature changes. Current ranges from 30 to 150 ° C.



3.5.2 THERMAL FUSES

This is the main system used in thermal cut out. Millions of these devices are currently produced in the world. It is a highly reliable system, whose operation is safe. The electrical contacts are either cut by the conductor melting (Rating generally limited to 4A) or by melting of a pellet releasing a spring contact (Rating up to 25A).



Current ranges from 60 to 300 ° C.

The melting part is made of metal or plastic.

This system, known as TCO (thermal cut-off) is the ultimate security system. It is inexpensive.

A variant of these systems are also used in non-electric appliances for releasing a mechanism, in particular in fire detection apparatus.

3.5.3 BOILING THERMOSTATS

The most common thermostat of this type is the failsafe capillary limiter with manual reset.

This system measures the boiling of a liquid contained in a capillary or a bulb at the end of the capillary. Temperature sensing on + / -300 mm capillary is required to operate the contact. For this reason, models often have their capillary curled at the end, with dimensions similar to a bulb. These devices are always fixed temperature types, most of time calibrated within the 50 to 170 ° C span, and the capillary length is limited to + / -900 mm for transmission of the excess pressure due to the boiling reasons or depression due to the rupture of the capillary.



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