

STAY COOL WHEN SOURCING THERMOSTATS

E-mech product specialist at Charcroft, Jeff Gurr, unravels the complexities of thermostat ordering guides

If you are buying components for a product which has the potential to exceed its normal operating temperature range, the chances are that your bill of materials (BoM) will include some form of temperature protection. This could be a thermostat, a thermal cut-out, or a negative temperature coefficient (NTC) thermistor.

Technology options

All of these components can be used to safeguard equipment from temperatures which are outside the normal operating temperature range, but the ways in which they work are *very different*. Many applications will use an NTC thermistor to monitor the temperature, however thermistors need a control circuit and that can add to the overall component count, as well as introducing the possibility that the sensing circuit could fail.

Thermal cut-outs and thermostats offer the advantage of not requiring any control electronics to operate: they act independently of the equipment itself and require no additional power to operate them. While thermal cut-outs are typically used to protect against over-temperature conditions, thermostats provide the flexibility to control and protect across a wider range of temperature conditions.



E-mech product specialist, Charcroft, Jeff Gurr

Buying choices

Thermostats also offer a range of package styles in addition to different functions, options and settings. All of these factors need to be specified within the part number, which can make ordering thermostats more of a challenge for buyers.

Some typical thermostat package styles include probe, dual in-line package (DIP) and bimetal disc. Electro-mechanical half-inch bi-metal discs are typically used in higher-current applications where the thermostat can be mounted onto the heat source or directly onto the printed circuit board.

For space-constrained applications, the thermostat is more likely to be specified in a solid-state TO-220 or DIP package.

Understanding function

The order number will also need to specify the function. In over-temperature conditions, thermostats can be used to either cut the power to the circuit to protect sensitive components, or they can trigger a fan to actively cool the system. Typically, thermostats are specified as being 'open on rise' if they are being used to cut the power when the temperature rises, or 'close on rise' when they need to close to create the circuit which starts a fan.

For protection against frost and under-temperature conditions, such as in cooling systems, thermostats can be specified as 'close on fall' to switch on a heater, or 'open on rise' to turn the heater off when the correct temperature is reached.

Other options include the type of terminals and brackets as well as the opening and closing temperatures. The datasheets of most thermostats will include an ordering guide and additional help in building the correct part number is available from Charcroft's live online help desk.

Electronics Sourcing May 2015

> www.charcroft.com