

Constant wattage parallel technology



Constant wattage cable with protective braid

These flat ribbon-shaped cables are composed of two non-heating copper conductors delivering the 230V supply over the entire length of the ribbon.

The thermal effect is provided by the flow of current from one conductor to the other through a parallel mesh composed of resistive nickel-chromium wires alternately welded to one and the other of the two conductors. The electrical insulation is typically PVC, polyolefin, silicone, or FEP. The cables are flat section and may receive a mechanical protection by a metal braid which can itself be coated with a flexible insulator. These cords are connected to the power supply at one end, the other end to receive electrical insulation covering the cut.

They are defined by a watts per meter value. This technology allows the cutting of the heating cable to length, with an output directly proportional to the length.

It is adapted to maintain a medium heat, because its resistance does not vary as a function of temperature like for the self-regulating cables, and it is not restricted in temperature by the characteristics of the semiconductor resistive compound in self-regulating cables.

Cable ends :

The cable ends must be fitted with a non-heating portion, cable or wires, which may be crimped or soldered, then coated with an insulation (silicone sleeve, heat shrink sleeve or molding: see pages 103-104)

Use heat shrink sleeves with caution for wire terminations if they are PVC, Polyolefin or flexible polymer-type TPR coated.

Temperature control :

This technology requires a temperature control system. A fixed setting thermostat, mostly a disc thermostat, can be molded at one end of the cable in the two parallel conductor versions (see pages 93)

Parallel technology, self-regulating type



Self regulating cable with protective metal braid



Limiting power cable with spacer between conductors

These flat ribbon-shaped cables are composed of two non-heating copper conductors (sometimes 3), delivering the power supply over the entire length.

The thermal effect is ensured by an extruded plastic polymer conductor, connecting the two copper conductors.

This polymer main thermal characteristic is the variation in its resistivity and thus its power per linear meter, depending on its temperature. This temperature is the result of its self-heating by Joule effect and its heat exchange outwardly by the wall on which it is placed, as well as the external temperature. The power reduction is in the region of 65% between 0 and 140 ° C (maximum temperature withstood by the polymer semiconductor).

This helps delivering the required power depending on environmental conditions.

This cable is also self-limiting and its power is greatly reduced when approaching the polymer temperature limit, thus avoiding destruction by overheating in the event of improper installation (overlapping or crossing wires, crossing insulation, etc). However, one must ensure that, in any case, the temperature of the fluid flowing in the pipe does not exceed the polymer critical temperature or it would cause its destruction.

The counterpart of this resistivity increase as a function of temperature is a resistivity decrease when the temperature drops. The starting power will be a function of ambient temperature. In the case of very cold environments, this causes large surges until the cable reaches its operating temperature. The startup power will be a function of ambient temperature. In the case of very cold environments, it causes large surges until the cable reaches its operating temperature.

A variant of this technology called power-limiting uses a coiled composite wire around two parallel conductors separated by a spacer of constant width. The characteristics of this wire allow a power limitation as its (.../...) power raises quite strongly with temperature.