

Introduction to different soft heating cable technologies

To reflect the maximum temperatures allowed by the insulating polymers, the powers of flexible heating cables are generally between 5 and 30W/meter, exceptionally 40W/m and 60W/m for self-regulating cables. These cables are coiled or laid longitudinally and in contact with the walls to heat. They are held in place by adhesives or metal strips. Classification for fire resistance is governed by EN 60332 Standard.

Main recommendations for the use of flexible heating cables

Connections : the heating cable ends must necessarily be connected to a non-heating section before entering the electrical control box.

Electrical protection :

All heating cables and ribbons must be installed with power protection complying with local regulations. For self regulating cables, the French Standard NFC 15-100 requires a circuit breaker or a GFCI with 30mA magnetic gauge to ensure the protection of persons.

Specific issues related to current peaks of self-adjusting cables :

These cables cause a significant current surge when they power up when cold. Refer to records of cable manufacturers to check the value.

Therefore, it is important to:

1. To adjust the breaker rating based on that surge (values indicated by the standard CEI60898).
2. Take into account this fact when selecting solid state relays. These surcharges are repetitive when the self-regulating cables are controlled by an external control system, we recommend over sizing SSRs, since repetition of these current peaks limits the lifetime of solid state relays (See above § for solid state relays).

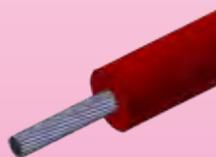
Series technology



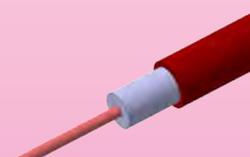
Bare series cable coiled on a fiberglass core



Bare series cable coiled on a fiberglass core with PVC, silicone or FEP (PTFE) insulation



Multi-strand series cable with PVC, silicone or FEP (PTFE) insulation



Series cable in metal tubing with magnesia insulation



Series cable with metal protection braiding



Series cable with non-heating return conductor



Series cable with two heating conductors

The heating cables are composed of a multi-strand single conductor, the strands can be straight or wound on a fiberglass core. The electrical insulation is typically PVC, Silicone, or FEP. The cables have a circular cross section and can accommodate a metal braid as a mechanical protection that can itself be coated with a flexible insulator. Each cable end is connected to the power supply. They are also available with two parallel conductors, one heating and one not-heating for return connection back, and also with two parallel heating conductors. They are defined by their metric resistance (Ohms / m) to be calculated according to the power and voltage, as well as technical limitations (composition of the strands, the maximum temperature withstood by insulation). Their length cannot be on-site adjusted. Models without protective braid are generally used in the refrigeration industry for defrosting cold room doors, defrost and evaporator flow, freeze protection of pipes, valves, water meters, etc. Models with protective braid are used for heat-tracing of great length pipes in petro chemistry for example.

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 insulator (silicone sleeve, heat shrink sleeve or molding: see pages 62-63)

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 60-61)