

TRACE HEATING

WHAT IS TRACE HEATING?

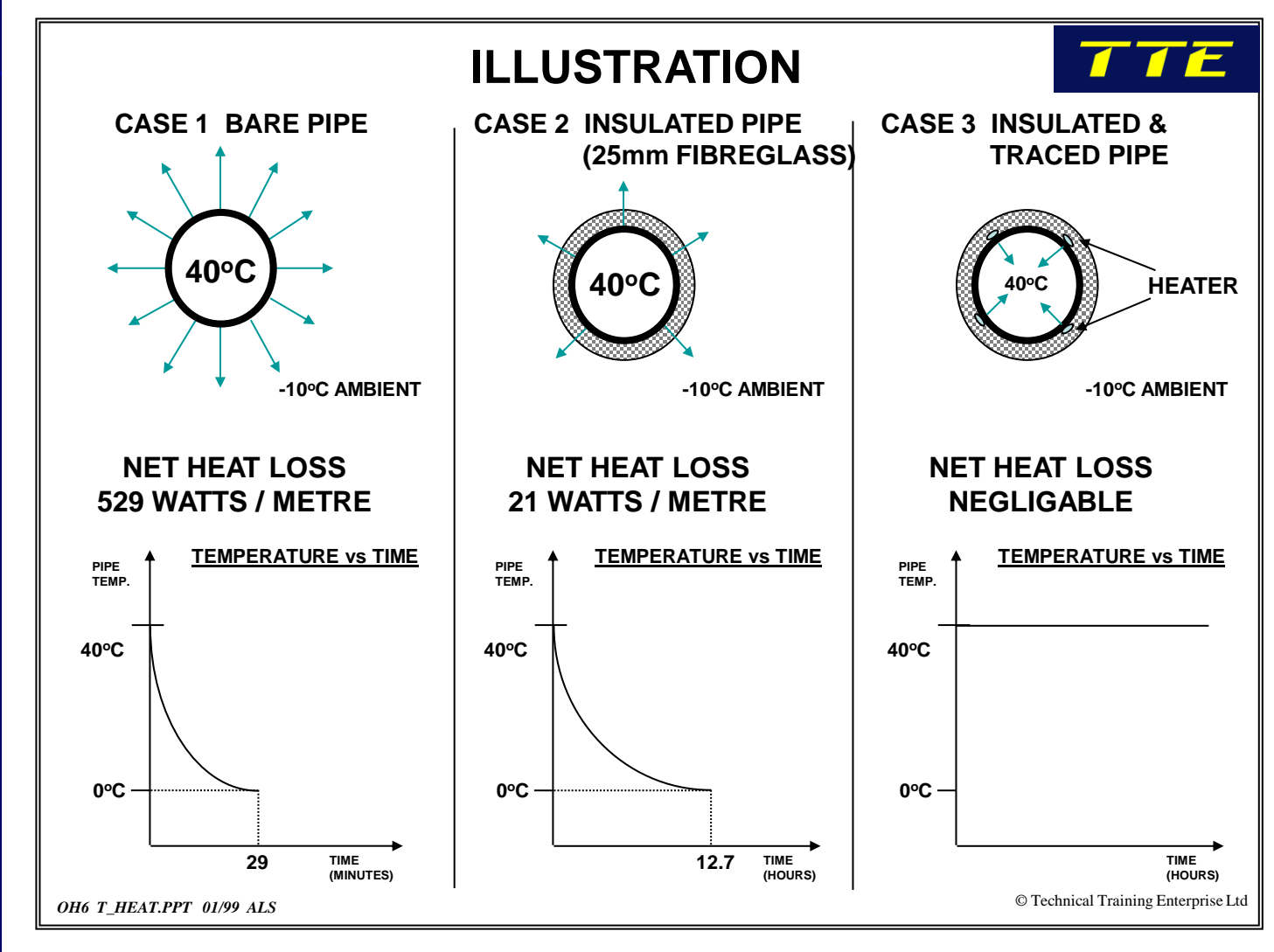
It is the application of a controlled amount of surface heating to pipes, tanks, valves or process equipment to either maintain its temperature or to affect an increase in its temperature.

The primary function of heat trace cable systems is the prevention of freezing within water pipes and subsequently bursting.

Did You Know..... A gallon of water, when frozen, will expand to a volume 9% greater than the original gallon.

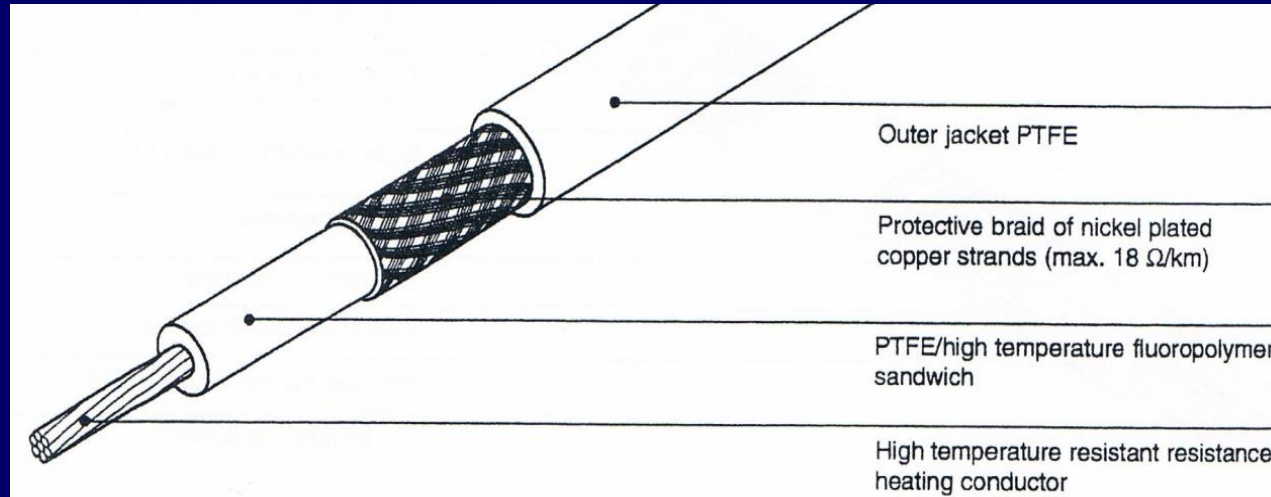


HEAT LOSS?



HOW DO HEAT TRACING CABLES WORK?

It can be achieved simply by connecting a voltage across a length of wire, which will then dissipate a fixed level of power, based on ohms law.



This is known as **Series** trace heating and it is a much a simplified solution, but practically it presents certain complications.

For one thing, it results in the need to bring both ends of the wire together for connection to the electrical supply, which is not always practical.

Additionally, it requires the need for a high variety of different resistances to be available, in order to facilitate the design of different outputs at different lengths of heating cable.

Also requires a thermostat as it would be on all the time and where the cable crosses or touches **it can cause overheating** and failure.

PARALLEL HEAT TRACING CABLES

CONSTANT WATTAGE & SELF REGULATING

Parallel heating cables are typically available in two distinct variants; constant wattage and self regulating (also known as self limiting)

CONSTANT WATTAGE

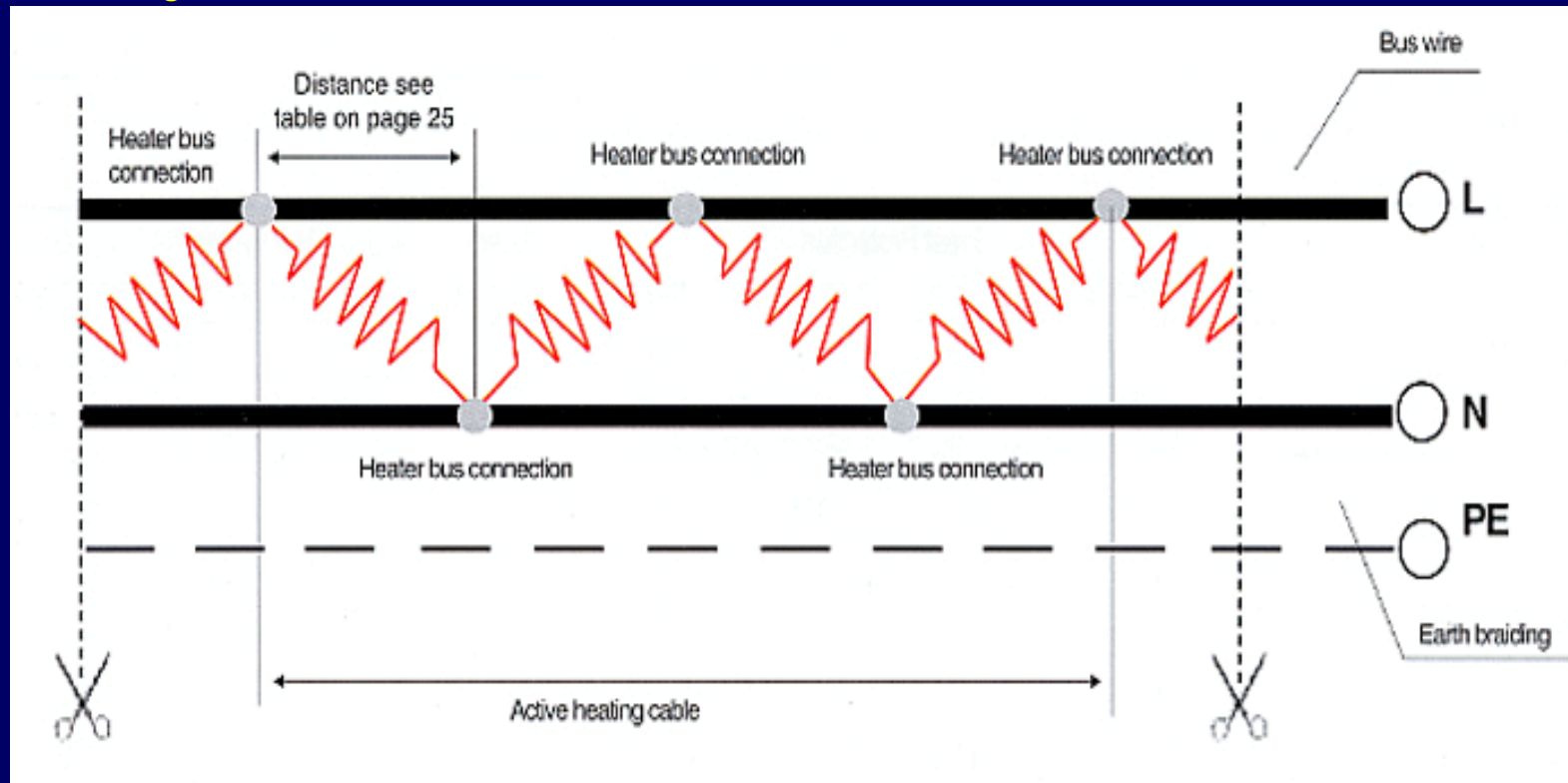


SELF REGULATING



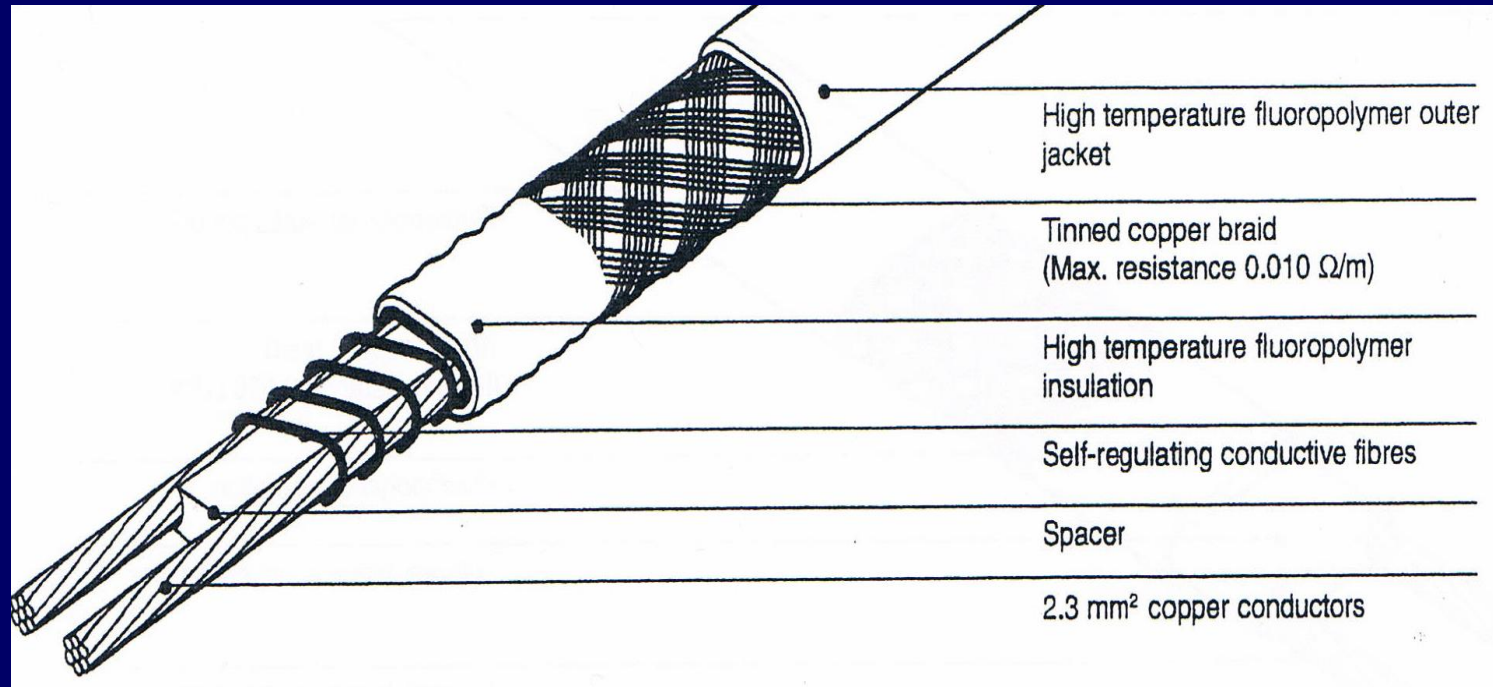
CONSTANT WATTAGE

Two copper wires run in parallel along the length of the wire and form the basis of live and neutral. A fixed resistive element is then spiralled along the length of the cable and soldered alternately to the live and neutral wire in fixed distances creating what are referred to as heating zones. Essentially, every zone is a fixed resistance circuit supplied by a fixed voltage, providing a constant wattage along its length. Since each zone of heating is essentially in parallel with the zone before it, the supply voltage will remain constant along the length of the heating cable.

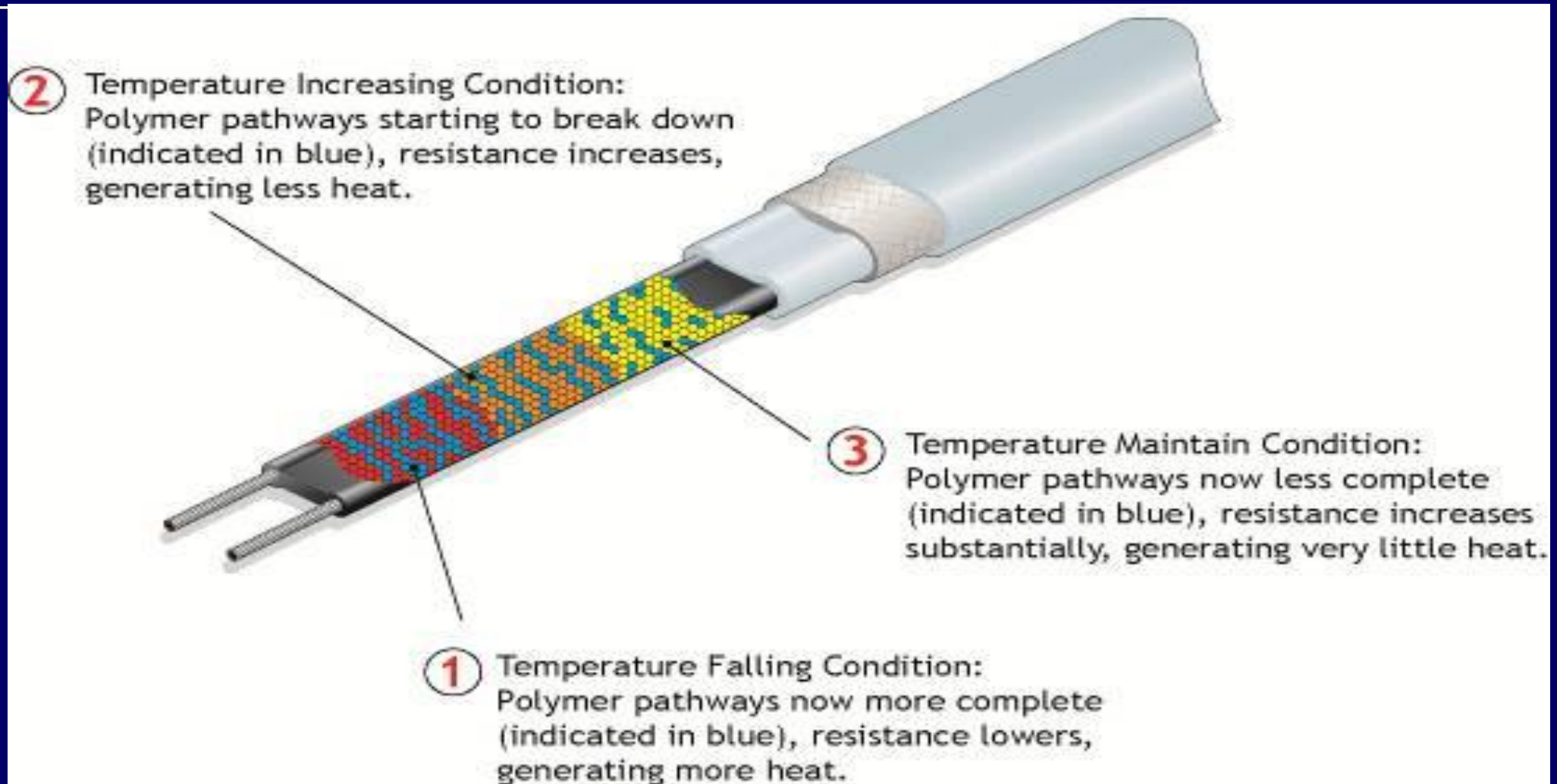


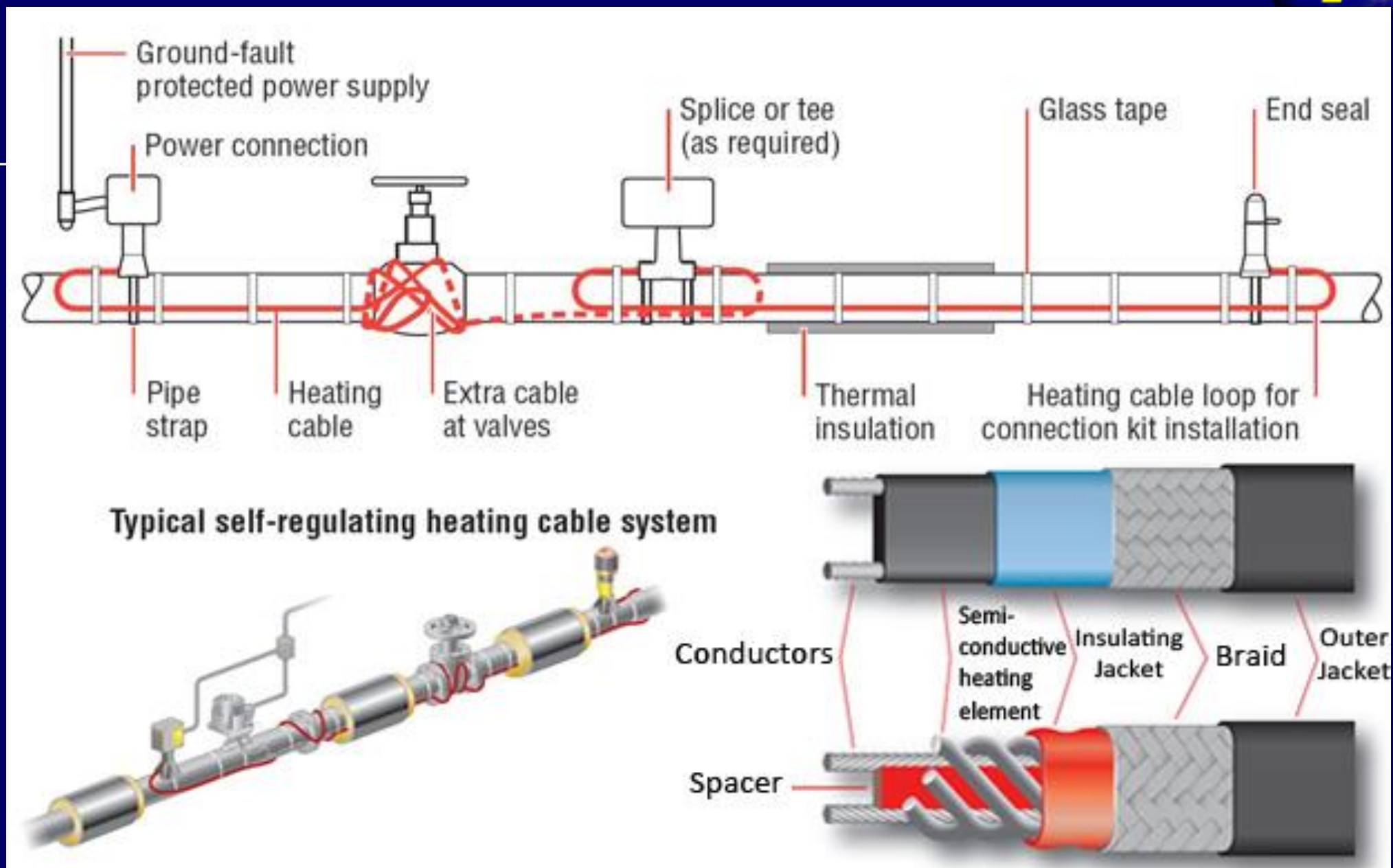
SELF REGULATING

The live and neutral wires are co-extruded into a polymer based material containing particles of carbon, providing a resistance path and hence circuit along the length of the heating cable. However, this resistance and therefore the output of the heating cable varies depending upon the temperature, due to microscopic expansion and contraction of the polymer. This type of cable then has the feature of reducing its power output as temperature increases and conversely at lower temperatures, the power is increased. Efficiency is improved with thermal insulation.



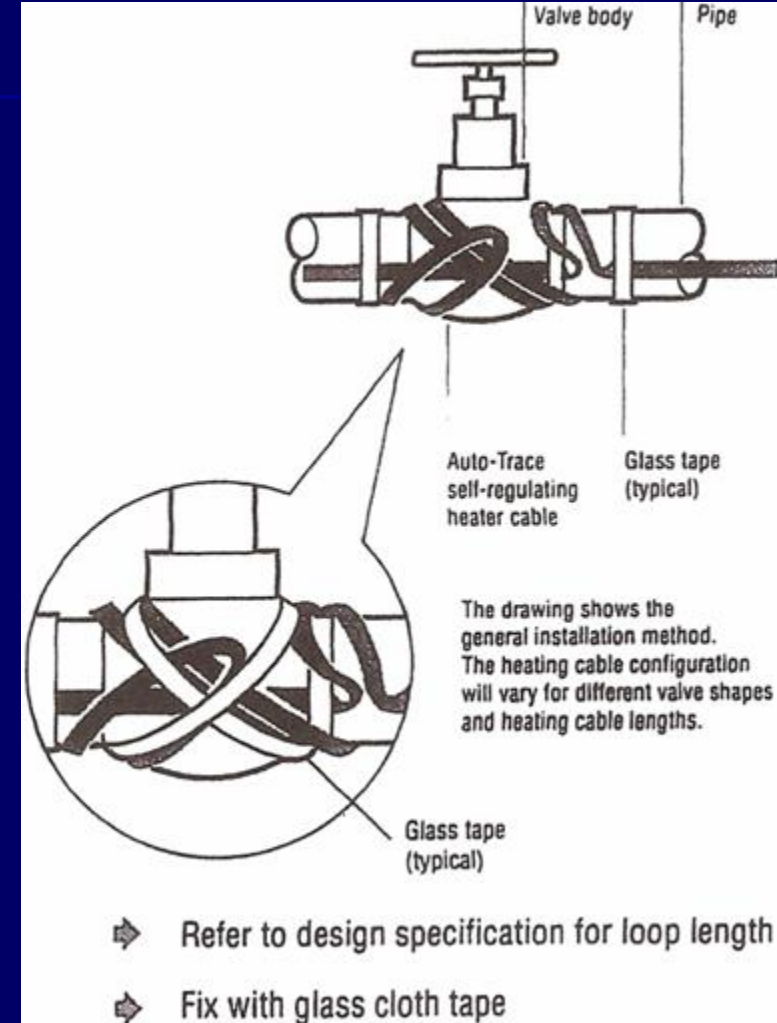
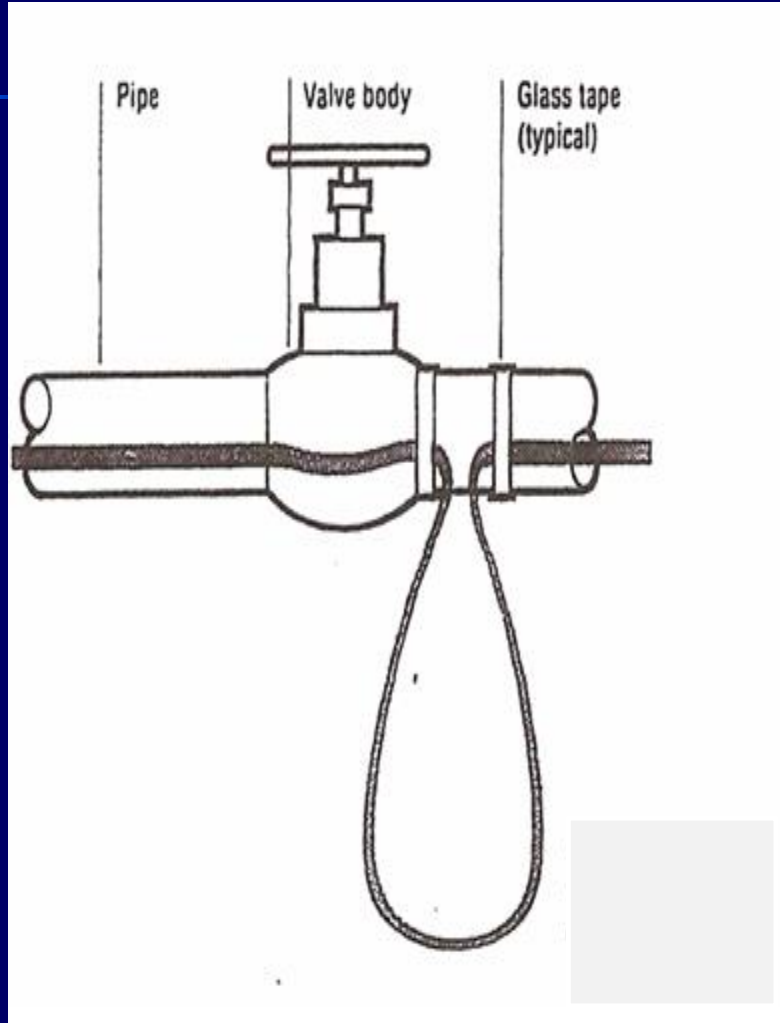
SELF REGULATING



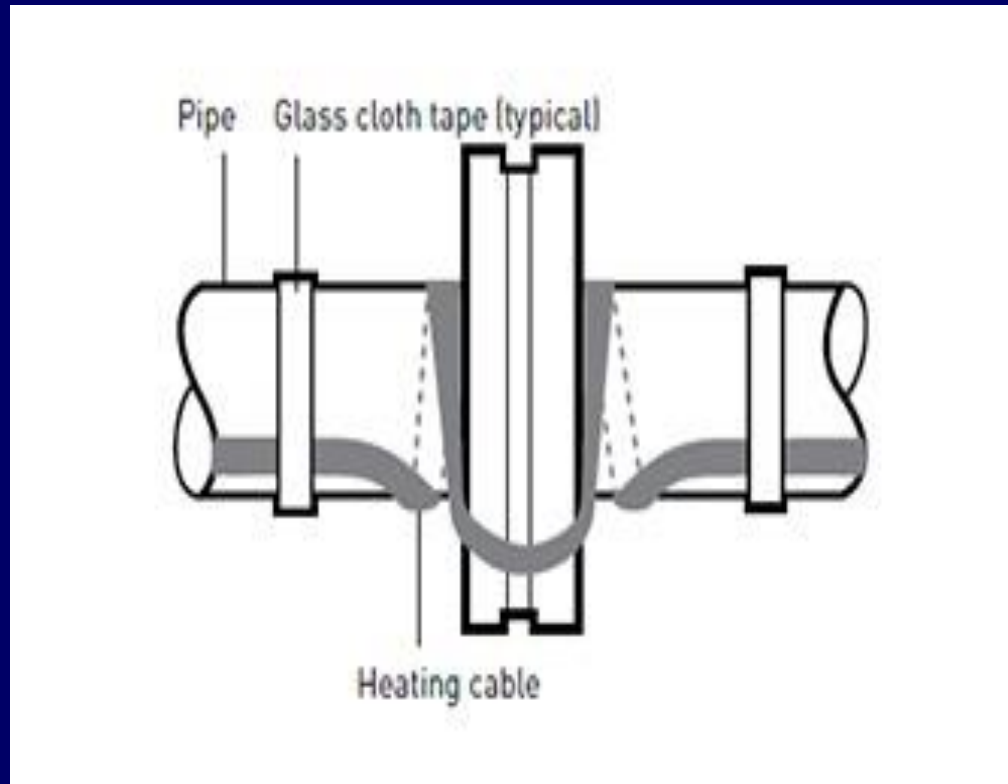




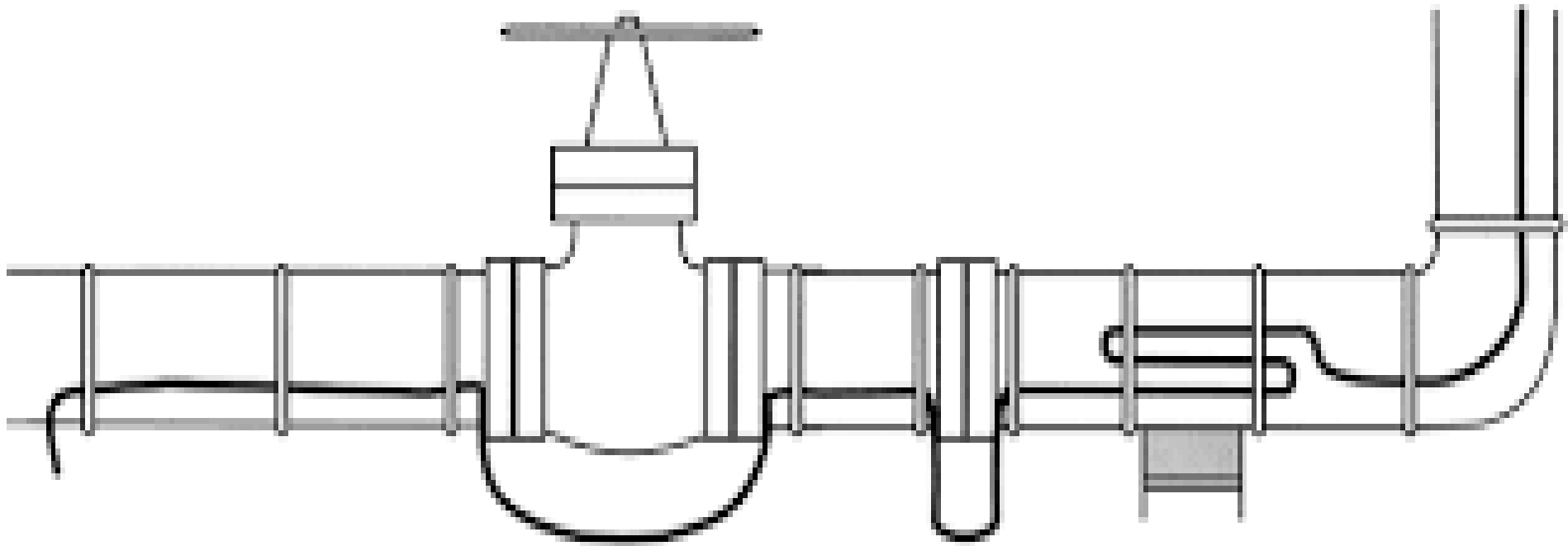
Valves & Flanges



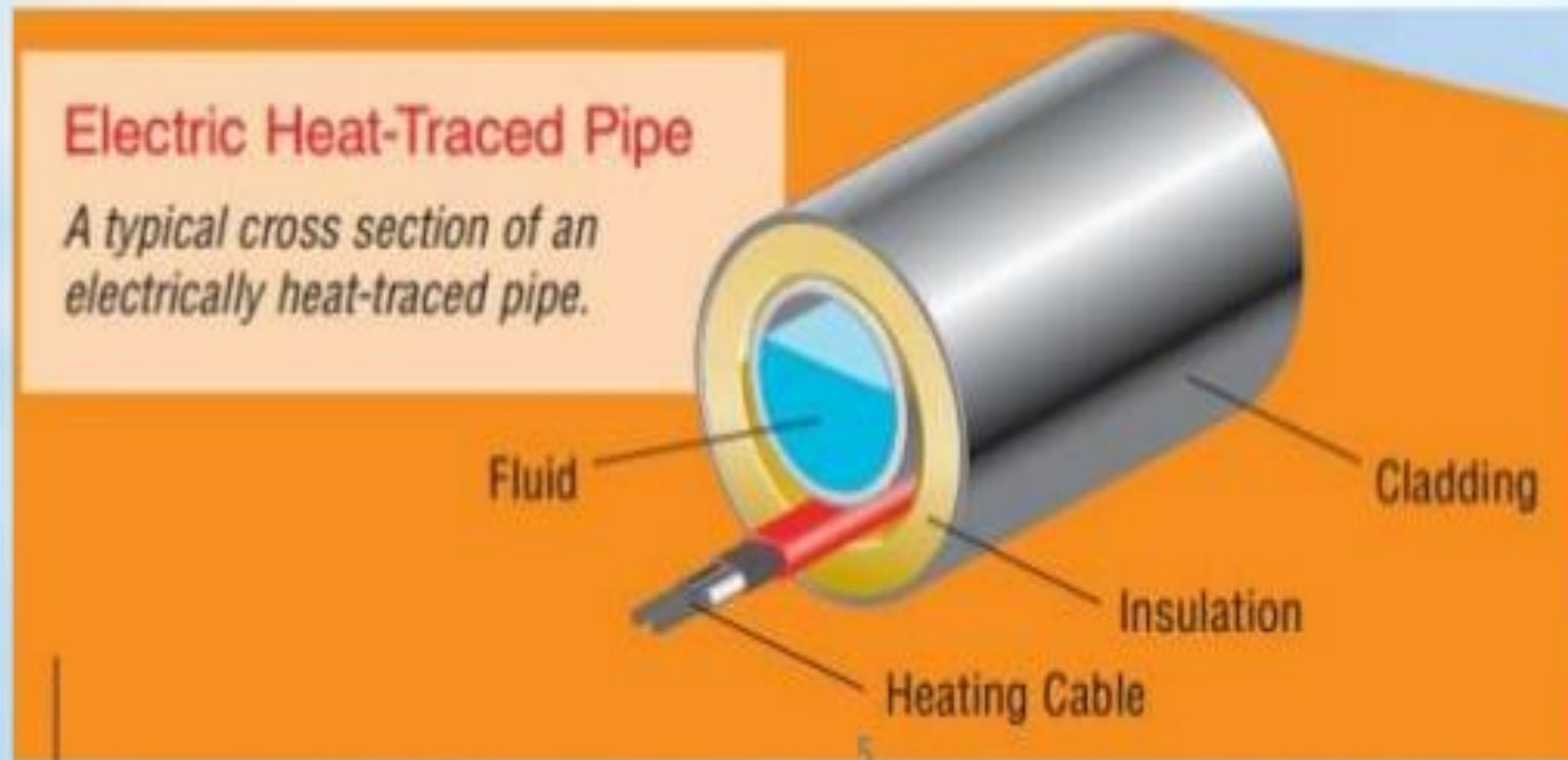
Valves & Flanges



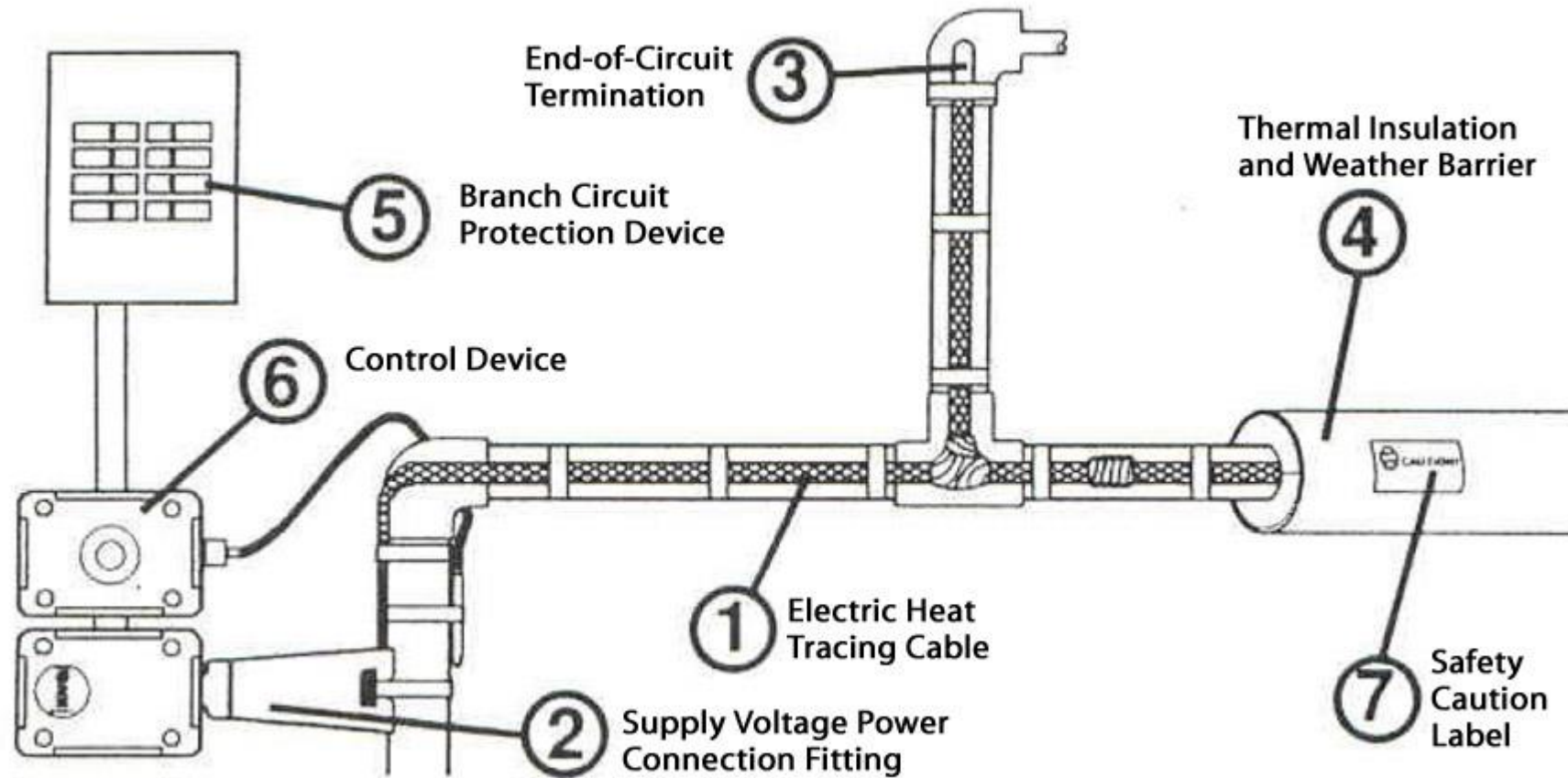
Valves & Flanges



- * Electric Trace/Surface Heating replaces the losses of heat from a surface, to allow temperature maintenance of the product, which Thermal Insulation alone can not maintain.



Typical Electric Heat Tracing System for Industrial Processes



Additional protection by RCD's



Where an RCD has an integral test device (test button), it should be tested at six-monthly intervals.

Operation of the test button does **NOT** provide a means of checking that the RCD will operate within the specified time.

Additional protection by RCD's



Where an RCD with a rated residual operating current not exceeding 30mA is used for additional protection.

Regular testing with an approved tester to BS 61557-6 should be carried out, and its effectiveness will be deemed verified when a test current equal to or higher than 5 times its rated residual disconnects within 40ms.