Power Adjustment

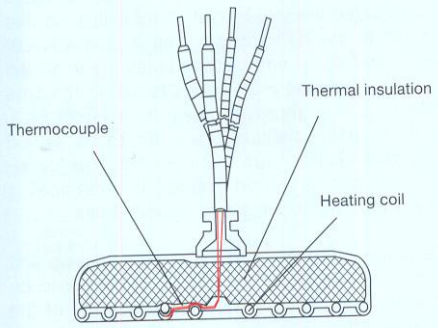

Figure 79: Thermocouple bedding

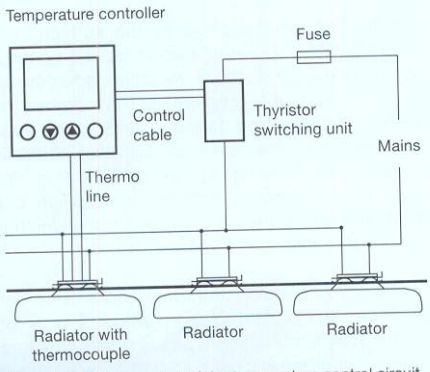

Figure 80: Block diagram of the temperature control circuit

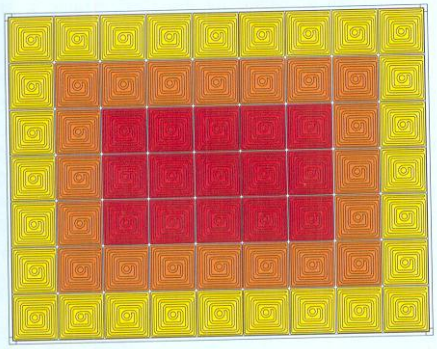

Figure 81: Heating area with 3 heating zones

Elstein infrared radiators are available with varying power levels. The HTS for example has power levels ranging from 250 W to 1000 W. In practice however powers different to these are mostly required. There are three ways of adjusting the radiator power to the power requirements of the material to be heated. The most simple way is to change the distance between the radiator and the material to be heated. This is only recommended if individual radiators are used. The second way is power control, for example using proprietary dimmers, like those used for lighting purposes.

The third and best way is to adjust the power via temperature control using radiators with an integrated thermocouple. In Elstein's infrared radiators with thermocouple, the thermocouple is located between the radiator surface and the heating coil (Figure 79).

The thermocouple signal is passed via a special thermo line, for example to the input of the Elstein TRD 1 digital temperature controller (Figure 80). The temperature controller switches individual or whole groups of radiators on and off with the help of one or several Elstein TSE thyristor switching units. An average power sets in at the radiators, depending on the length of time they are switched on. A super-agile fuse is fitted upstream of the thyristor switching units to protect them against short circuits.

This method enables compliance with the prescribed radiator temperature with an accuracy of one degree and thus enables the production conditions to be reproduced. It can also be modified so that the temperature of the material to be heated is measured. However, this requires reliable recording of the temperature of the material to be heated. In most cases it suffices to control the radiator temperature.

By using several controllers, zones can be formed in the heating areas, for example, to specifically heat certain areas of the product more strongly or weakly. Annular heating zones are frequently realised for large heating areas in order to uniformly heat up the material to be heated from the boundary area through to the middle (Figure 81).

Special programmable controls can also be used instead of a controller. Here it must be noted that the inputs for the thermocouples must be floating.