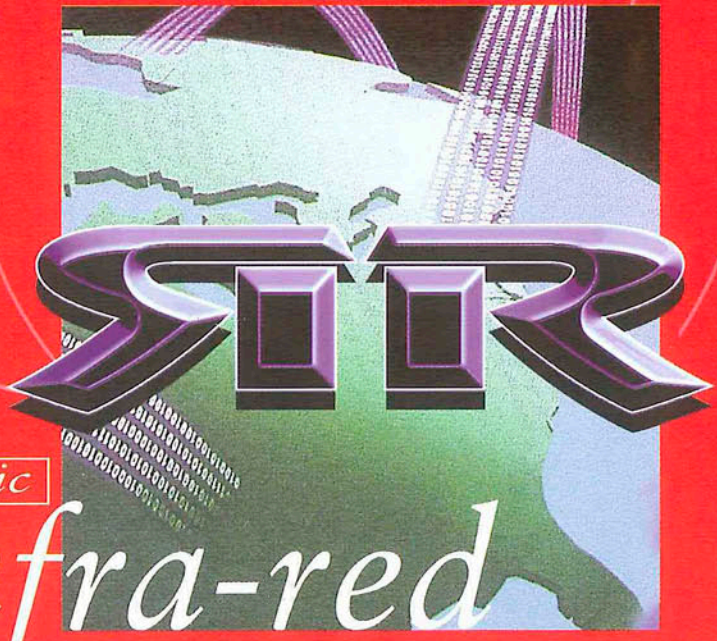


innovative
developed

unique

recognised



electric

infra-red

systems for industrial processes



SIR
DOUBLE R CONTROLS

Double R Controls manufacture a full range of robustly constructed Infra-Red Heater modules suitable for industrial use.

From a basic design, these enclosures can be readily tailored to meet the specific requirements of the customer and their process. Associated Control Systems form part of a typical system, using Double R Controls' PHAB controller, which provides all necessary soft start facilities with selectable manual or automatic power output control.

When required, Double R Controls will design and manufacture support structures, conveyor systems and complete Infra-Red Tunnels, thus providing a single-supplier option to industrial users.

The Company has built up a reputation for flexibility in design and quality in manufacture, whatever the size of project.

Electric Infra-Red systems for industrial processes.



CONTROL SYSTEMS.

A wide range of options is available, from energy regulators to sophisticated PC based, non-contact temperature monitoring feedback control systems.

MUFFLE HEATER.

The drying, heating or curing of cables or extrusion products in a continuous process can be effected using the 3.9kW short wave, or fast response medium wave, Muffle Heater. Temperatures in excess of 700°C can be achieved in the product depending on the process speed and the material being processed.



This fast warm-up Muffle Heater has a clam shell design which makes threading the product through the heater straightforward and maintenance is easy in the event of emitter cleaning or changing being necessary. The unit is supplied on its own height adjustable support stand complete with control cubical housing the power output adjustment for the emitters over the range 10 – 100%. An outfeed support roller is optionally provided as part of the Muffle Heater which can incorporate a motion detection system. The outfeed roller will also support the product as it passes through the Muffle Heater and, in the event of the product ceasing motion, as detected by the free running roller mounted on the out-feed, the power output to the heater enclosure will be automatically switched off.

INDUSTRIAL PROCESS SIMULATOR.



For some potential users of Infra-Red heating, drying or curing systems it is desirable to determine the most appropriate wavelength of emitter before embarking on the purchase of a full-scale system. The Industrial Process Simulator is designed to provide just this facility.

A full range of modules is available to fit on the Industrial Process Simulator (the IPS) and the unit is designed to operate from a single phase, 230 volt, 13 amp supply. The height of the modules above the product is adjustable and the conveyor speed is infinitely variable over the range 0–10 meters per minute. The IPS incorporates a table top conveyor having a stainless steel wire mesh belt as a mechanism for transporting the product to be processed. Both power output of the module and speed of the conveyor are adjustable from the integral control unit.

Along with its ability to operate as a piece of test equipment, the IPS is eminently suited to processing products having a maximum width of 200mm. Typical applications are the drying of pad or screen printed small components. The equipment is designed to be easily transported around a customer's plant when evaluating the suitability of Infra-Red energy to process the product.

EMITTERS.

Dependent upon the application, Short, Medium or Long Wave emitters can be fitted to the enclosures. Double R Controls' unique, *Affordable, Fast Response, Medium Wave* emitters bring rapid response to otherwise relatively slow medium wavelength installations – at a sensible price. In summary, the wavelength, speeds of warm up and power densities offered are:-

- ◆ Short Wave – 1.1 micrometers – 3 secs - power densities up to 450kW per m².
- ◆ Standard Medium Wave – 2.5 micrometers – 30 secs - power densities up to 80kW per m².
- ◆ Fast Response Medium Wave – 2 micrometers – 4.5 secs - power densities up to 80kW per m².
- ◆ Long Wave – 3 micrometers – 3 min - power densities up to 60kW per m².

(Note – Long wave emitters are available in both ceramic and metal sheathed formats).

The optimum is to use a wavelength of Infra-Red which matches the natural frequency of the material to be processed. Energy in the form of electromagnetic radiation is generated within the heat source which is then emitted to the product causing molecules in the product to vibrate and therefore generate heat. The peak wavelength at which maximum Infra-Red emission occurs is expressed according to Wein's Law which, in its simplest interpretation, is as follows :

$$\text{Peak Wavelength in Micrometers} = \frac{2898}{\text{Absolute Temperature}}$$

i.e. A short wave emitter operating at 2,000°K has its peak wavelength at 1.1 micrometers.

EQUIPMENT FOR FIELD TRIALS.

A full range of equipment is available to prospective customers to undertake trials in their production environment. This includes enclosures covering the full range of wavelengths, IPS systems and Muffle Heaters. This field-trial equipment can be hired prior to the purchase and is a fundamental part of Double R Controls' philosophy of Proof by Demonstration.



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