



#### Features and Benefits

- 0-10Vdc control input
- Over temperature protection with auto reset
- LED Indication
- Efficient electronic switching
- No additional heat sinks or RFI filters required

#### Technical Overview

The panel mounting Power Controllers RE-3P range are suitable for providing control of electric heating loads from an analogue signal. Applications include electric heating coils, heating cables and electric furnaces. The units utilise solid-state switching with "zero crossing technology" to provide accurate switching control.

The RE-3P series are designed to mount on the control panel back plate.

#### Product Codes

**RE-3P-105**      105kW, 3-phase 146A (per phase), Panel Mount Heating Regulator

#### Specification

Input signal	0-10Vdc
Input impedance	47k ohms
Heater duty	105kW
Rated load	146A
Rated supply	415Vac (+10/-15%) 50/60Hz
LED indication	ON when output is on
Terminals:	
Control	Rising cage terminals
Power	Din-rail terminals (35mm <sup>2</sup> )
Fuse type	315FM
Temperature	-10 to +40°C Max without re-rating*
Dimensions (H W D)	252 x 265 x 159mm
Fixing centres	243 x 194mm
Country of origin	UK
Conformity	EMC, LVD, CE & UKCA Marked

\* Units are rated at 40°C. If using at higher ambient temp, de-rate the units by 20% at 50°C

#### WEEE Directive:



At the end of the products useful life please dispose as per the local regulations. Do not dispose of with normal household waste. Do not burn.



## **SAFETY REQUIREMENTS & ADVICE SHEET**

### **Introduction**

The objective of this leaflet is to provide information to ensure that the safety of the person(s) installing or maintaining the equipment is not compromised and its location and method of installation does not endanger others, either during or after installation. Customers should be aware of the Health and Safety at Work Act 1974 (HSW 1974) and the EC "Provision and Use of Work Equipment Regulations 1992" (PUWER). Both are available from the Health and Safety Executive (HSE) publications, within the UK.

### **Installation**

### **CE Directives**

These are European regulations which apply to our industry. They affect the equipment emissions and immunity to Radio Frequency Interference (RFI) and various elements of safety for electrical equipment.

The European Community 'CE' Directives that mainly concern Sontay Ltd are the Low Voltage Directive (LVD) and the Electromagnetic Compliance Directive (EMC).

A Declaration of Conformity may be supplied with the product or supplied on request.

### **Torque Settings**

Good working practises must be adhered to ensuring appropriate electrical and mechanical installation. This would include the mechanical fixing of potentiometer bushes and electrical set screw and/or pillar connections. These Electrical Connections and Mechanical Fastenings must not be over tightened. We would recommend a typical torque setting of 1 to 5Nm. For specific product information, see appropriate product data sheet, where applicable.

### **Cooling Requirements**

The use of an additional heatsink (this could be a conductive panel) suitably attached or mounted with the unit, will help to dissipate heat away from the device(s). An alternative or additional method would be forced air-cooling (using a fan), to assist the natural convection of airflow over an existing heatsink within the unit. The product fins should be mounted in line with the forced and/or natural airflow.

The equipment's environment and its initial ambient temperature also need to be considered, as this could have an adverse effect on the overall operating conditions.

### **Fusing**

We recommend that semiconductor, fast acting to BS88 IEC 269, type fuses or circuit breakers (Semiconductor - MCB) should be used for unit and/or device protection. The appropriate maximum load current should be known to select the required fuse or MCB, but must not exceed the equipment rating. The  $I^2 t$  ( $A^2 s$ ) rating of the selected fuse must be less than that of the equipment so as to protect the equipment's discrete device. Further appropriate fusing may be required for protection of the unit supply using standard fuse links and holders. Failure to address these requirements and the use of incorrectly selected fuses may cause the equipment to fail.

### **Earthing**

The protective conductor terminal of the equipment must be utilised at all times and bonded to a 'good' Earth (ground). The earth bonding (strapping) leads of any combined equipment should be as short as possible and be substantial, i.e. at least rated higher than the equipment's load. For further information, refer to BS7671. Following these simple guidelines will ensure optimum use of any appropriate filter circuits which may be required.

### **Insulation (over-voltage category) and Protection from electric shock Classification of Equipment**

All equipment, unless otherwise stated, is rated to CLASS II Insulation (Over-voltage category) and CLASS I (Protection category).

### **Maintenance**

Before any servicing is carried out, reference should be made to appropriate installation instructions, drawings and labelling which may come with the equipment. Personnel should switch off the unit supply before accessing or removing any safety cover and be aware of hazardous live parts.

### **Safety Interlocks for Sontay RE Electric Heater Battery Controllers**

Sontay Ltd. recommends that the installation and maintenance of all RE electric heater battery controllers should be done with reference to BS 7671:2008+A3:2015 (Requirements for Electrical Installations. IET Wiring Regulations).

All users of the IET Wiring Regulations should be aware of changes in Amendment No. 3 to the 17th Edition. Amendment No. 3 came into effect on 1 July 2015.

For international installations, please refer to local regulations for guidance.

## **SAFETY REQUIREMENTS & ADVICE SHEET (continued)**

Adherence to BS 7671, Chapter 42 (Protection Against Thermal Effects), and in particular;

- 420.3 – General Requirements,
- 421 – Protection Against Fire Caused by Electrical Equipment
  - 421.1
  - 421.2
- 422 – Precautions Where Particular Risks of Fire Exist
  - 422.1.2
  - 422.1.3

should be undertaken, and as a minimum, a mains isolation switch, a load-breaker switch and a contact breaker should be installed in the electric heater battery controller supply. The supply to the contactor coil should be interrupted by an over-temperature (hi-limit) thermostat located in the heater battery and also upon detection of airflow loss (fan proving), via an air flow switch, air DP switch across the fan or fan current switch in the fan supply.

Additionally, EN 61508-1:2010 (Functional safety of electrical/electronic/ programmable electronic safety-related systems. General requirements) stipulates the general requirements for electrical, electronic and programmable electronic safety devices, and covers the safety systems of electrical equipment and their components that could have an impact on the safety of people and the environment if they fail. BS EN 61508-1 also applies to protection and control systems, and helps organisations to identify hazards to improve overall equipment safety in the workplace.

Failure to incorporate these safety interlocks may result in the invalidation of fire insurance, building and contents insurance, and in extreme cases may result in the disconnection of the electrical supply by the distributor.

## **Operation, Installation & Configuration**

The RE-3P-105 has been designed to control electric heating loads in proportion to the incoming, selectable analogue signal. Control of the load is facilitated by the use of solid-state semiconductor devices and feature zero crossing point switching of the AC load which virtually eliminates RFI problems.

### **Caution**

In normal operation the heat sink surface can exceed 90°C.

Dangerous voltages exist on the PCB and particular care should be taken. The RE-3P-105 must be installed in accordance with the relevant statutory regulations and installation must be carried out by an experienced and fully qualified engineer.

### **Ventilation / Location**

Install power controller with heatsink fins in the vertical plane. Allow a minimum of 100mm clearance top and bottom, and 25mm horizontally. Control panels should have sufficient ventilation (grills or louvres as required) to maintain the ambient temperature through the thyristor unit to below 40°C to run unit to specified kW rating.

### **Over Temperature Monitoring**

The RE-3P-105 is provided with an electronic thermal cut-out fitted to the heat sink to protect against over temperature. The unit will switch off the load if the heat sink temperature exceeds 95°C and will automatically reconnect the load once the heat sink temperature has dropped below 85°C.

The heat sink temperature will not reach 95°C under normal operating conditions. However, this might occur if the ambient temperature exceeds 40°C.



Installation must be carried out by a suitably trained electrician, and in accordance with the relevant statutory regulations.

### **Load Supply and Back-up Protection**

High speed fuses or miniature circuit breakers should be utilised to provide back-up protection to the switching devices. It is recommended that a load disconnect switch and a contactor are installed in the load supply. The supply to the contactor coil should be interrupted by an over-temperature thermostat located in the heater battery and also upon detection of airflow loss.

### **Control Supply**

There is a transformer fitted to the unit removing the requirement for a 24V supply (see wiring for details).

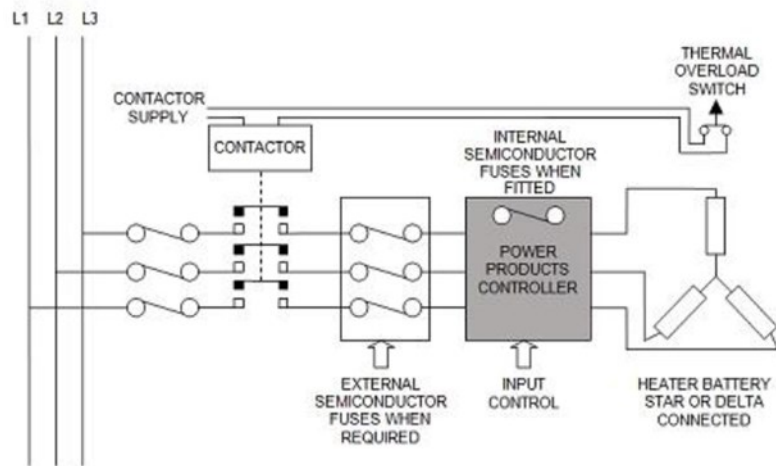
The control supply common is linked to the 0-10V Input Signal common. Screened cable should be used for connections to BMS Controllers, where possible the cable screen should be connected to a functional earth and at one end only to avoid earth loops.

### **Maximum Heating Load**

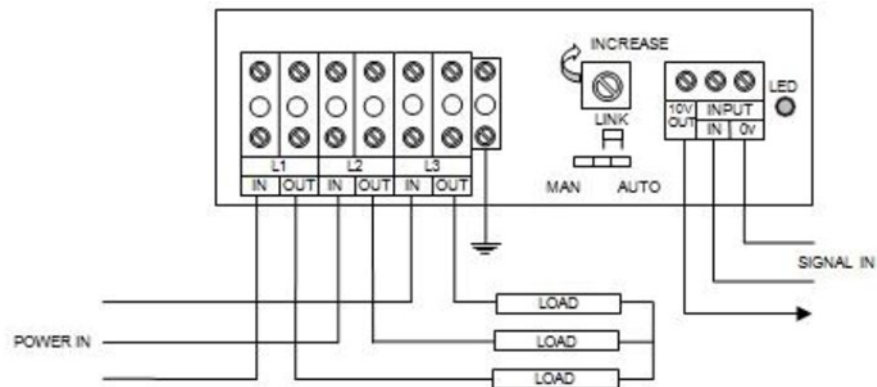
The power rating of the units are given as a guide. The maximum current (which is dependent on the actual supply voltage and heating load) must not be exceeded.

## Jumper Settings & Connections

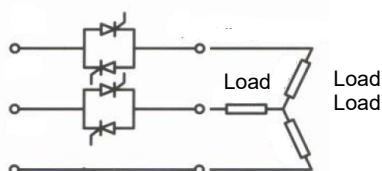
Typical 3-Phase installation



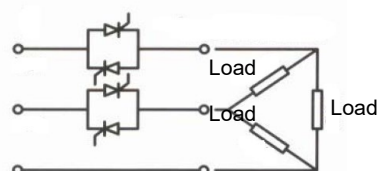
Input configuration



**Star configuration:**



**Delta configuration:**



### WARNING!

Do **NOT** connect the neutral to the star point of heater.

Whilst every effort has been made to ensure the accuracy of this specification, Sontay cannot accept responsibility for damage, injury, loss or expense resulting from errors or omissions. In the interest of technical improvement, this specification may be altered without notice.