

# 1.5, 3 and 6kW HVAC RANGE 1-PHASE BURST FIRE POWER CONTROLLER INSTALLATION INSTRUCTIONS

**PR1-E  
SERIES**

**X10591**

## INTRODUCTION

The PR1 range of thyristor stacks provides full seamless control of single phase resistive loads. Signal control is by a DC signal. These burst firing control stacks use fast pulse zero volts switching technology, to minimise flicker and eliminate RFI problems. They also incorporate an automatic-reset over temperature protection trip, integral semiconductor fuses and heatsink, all enclosed. The three models in this build include the smaller 1.5kW model and the 3kW and 6kW models in the larger enclosure. All have easy access to signal & power terminals for simple installation.



## APPLICATIONS

These are suitable for single phase 'mains' resistive loads. This includes the Heating, Ventilating and Air Conditioning (HVAC) market which would provide control applications for battery heaters. but also for hot water tanks, heating cables and various processing equipment.

## CONNECTIONS

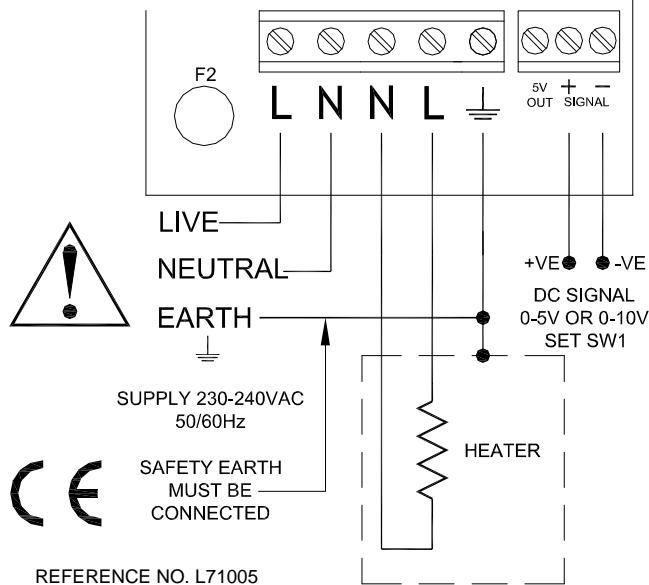
CAUTION:- DISCONNECT MAIN SUPPLY PRIOR TO ANY SERVICE WORK  
MOUNT THE CONTROLLER WITH THE COOLING FINS IN A VERTICAL POSITION  
ENSURE THERE IS ADEQUATE UNRESTRICTED AIR FLOW THROUGH THE FINS

### STATUS LED CONDITIONS

1. VARIABLE BRIGHTNESS TRACKS CONTROL SIGNAL
2. PULSING AT 1 SEC. INTERVALS = SENSOR LOSS
3. PULSING AT 0.5 SEC INTERVALS = OVER TEMPERATURE

F1=POWER FUSE

F2=1 A TRANSFORMER FUSE



**RoHS Compliant**

## FUNCTIONS

### **Over temperature protection**

When heat sink temperature of above 90°C is detected by the sensor, the LED pulses at 0.5 second on/off intervals. The power to the load will be disconnected and will not return until the temperature drops to 85°C.

### **Temperature sensor loss**

The LED pulses at 1 second on/off intervals if the sensor fails.

*Photograph above:  
Left to right – 1.5kW and 3kW/6kW models*

## WARNING

1. This unit is supplied with a fail-safe fuse for unit protection. See SPECIFICATION/INSTALLATION sections for further details.
2. The enclosure has HAZARDOUS LIVE parts and terminal connections – isolate supply before commencing any installation work.
3. Unit must be secured using the appropriate fixing/mounting holes provided.

## INSTALLATION

### Cooling requirements

This robust stack assembly has an operational temperature of 65°C when naturally cooled and has a built in 90°C over temperature trip on the heatsink as a safety feature. The unit should be mounted vertically, with heatsink fins top to bottom, and with sufficient surrounding air space to maximise natural convection cooling. If the unit is mounted in an enclosure or cabinet, adequate ventilation and/or forced air-cooling should be fitted.

### Load considerations

The PR-series of power controllers are designed for resistive type loads, e.g. Heaters. Unusual heating loads such as Molybdenum, Platinum or Tungsten have a typical, 10:1, hot to cold, resistance ratio and therefore, when cold, draw larger currents than normal. This range is fitted with a TRIAC power device.

### Connections

This unit has simple clamp type terminal connectors for all auxiliary-wiring requirements.

### Fastening

The unit is secured by four fixing holes, two of which have key-hole slots for quick installation/removal

### Fusing

It is recommended that the specified type fuses (as supplied) be used as replacements for fail-safe protection. See SRA Data sheet X10255 for further information. Other external supplies should be fused accordingly.

### CE Marking

This family carries a "CE" marking. These burst fire controllers do not normally require a remote filter. For more information contact our sales desk. A Declaration of Conformity available on request.

## SPECIFICATIONS

<b>Power/(current ratings):</b>	1.5kW (6.3A), 3.0kW (12.5A), 6.0kW (25A) @ a typical supply of 240V rms		
<b>Input voltage:</b>	230V rms +/- 10%		
<b>Frequency:</b>	50/60Hz		
<b>Control input - Signal:</b>	0 to 10V dc (factory set) <b>OR</b> 0 to 5V <b>(Selected by switch SW1)</b>		
<b>- Manual:</b>	Manual control (using 5kΩ potentiometer – NOT supplied)		
<b>Status indicator:</b>	(Tracking control signal) LED indicator changes <b>intensity</b>		
<b>Over temperature:</b>	Trip in temperature @ 90°C, +/- 1°C (LED indicator ' <b>flashes</b> ' at 0.5sec. on/off intervals) Trip out temperature @ 85°C, +/- 1°C		
<b>Sensor loss detection:</b>	LED indicator ' <b>flashes</b> ' at 1sec. on/off intervals.		
<b>Cable terminations:</b>	Power & earth	6.0kW	4.0mm <sup>2</sup> maximum cable entry
	Power & earth	1.5 & 3.0kW	2.5mm <sup>2</sup> maximum cable entry
	Control signal	all models	2.5mm <sup>2</sup> maximum cable entry
<b>Terminal torque settings:</b>	0.5Nm for all power and earth terminals.		
<b>Fusing 1.5kW</b>	F10A (6mm Ø x 32mm) – ceramic quick blow type ferrule fuse.		
<b>3kW</b>	F16A (6mm Ø x 32mm) – ceramic quick blow type ferrule fuse.		
<b>6kW</b>	30A (10mm Ø x 38mm) - high-speed semiconductor type ferrule fuse.		
<b>Working temperature:</b>	65°C (maximum operational).		
<b>Dimensions (1.5kW):</b>	140mm (L) x 99mm (W) x 45mm (H).		
<b>Dimensions (3 &amp; 6kW):</b>	140mm (L) x 99mm (W) x 80mm (H).		
<b>Fixing centres (all):</b>	4 x 4.5mm clear holes on centres 75mm (W) x 120mm (L) – top two are key-hole slots.		
<b>Weight:</b>	(1.5kW): 0.5kg	(3 & 6kW): 1.1kg	

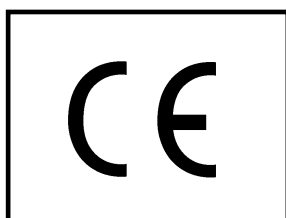
**Note: SAFETY WARNING** – Isolate supply before removing cover; Metal parts, in particular the heatsink, may get very hot when the unit is fully operational; DO NOT COVER enclosure ventilation slots.

It is essential that a load break switch and a contact breaker is 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.

## RECOMMENDATIONS

Additional supporting documents addressing installation and safety, are available on request. These include X10255: SRA – Safety Advise; X10213: ITA – Interaction (Causes and remedies for burst-fire and phase-angle control), P01.1 – UAL Conditions of Sale

**NOTE:** It is recommended that installation and maintenance of this equipment should be done with reference to the current edition of the I.E.T. (formally I.E.E.) regulations (BS7671) by suitably qualified/trained personnel. The regulations contain important requirements regarding installation and safety of electrical equipment. Specific installers should refer to local and



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Page No. 2 of 2	Issue 12
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