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X10788

HVAC | HEATER BATTERY CONTROLLER

PR3-E SERIES

6kW, 8A, 415v
Three Phase Burst Fire Power Controller



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KEY FEATURES:

- ✓ **Seamless Control**: Full seamless control of three-phase resistive loads.
- ✓ **Advanced Switching Technology**: Uses fast pulse zero volts switching technology to minimise flicker and eliminate RFI problems.
- ✓ **Easy access** to signal and power terminals for simple installation.
- ✓ **Auto-Reset Temperature Trip**: Incorporates auto-reset temperature trip for enhanced safety.
- ✓ **Integral Semiconductor Fuses**: Built-in fuses for added protection.
- ✓ **Manual and Automatic Control**: Options for both DC signal control and manual control via a 5kΩ potentiometer.
- ✓ **Compact Design**.

APPLICATIONS:

The PR3-E Series is suitable for 3-wire, 3-phase floating-star or closed-delta configured resistive loads. It is ideal for:

- Heating, Ventilating, and Air Conditioning (HVAC) systems, particularly for air curtain applications
- Furnaces
- Ovens
- Dryers
- Hot plates

The **PR3-E Series** thyristor stack offers precise and seamless control of three-phase resistive loads using a two-thirds control technique. Designed for optimal performance, this controller uses fast pulse zero volts switching technology to minimise flicker and eliminate RFI problems. It features a DC signal or manual control via a 5kΩ potentiometer, an auto-reset temperature trip, integral semiconductor fuses, and a heatsink. Naturally air-cooled, the PR3-E Series ensures easy access to signal and power terminals, facilitating straightforward installation.

The **PR3-E Series** Three Phase Burst Fire Power Controller is engineered to provide reliable, efficient, and seamless control for a variety of industrial heating applications, ensuring optimal performance and minimal maintenance.

TECHNICAL SPECIFICATIONS

Power / Current Ratings	6kW (8A) controlling 2 phases of a typical supply of 415V rms	
Input Voltage	400V RMS ± 10%	
Frequency	50/60Hz	
Control Input Options	**Signal:** (using SW3**):** 0 to 10V dc (set as standard) / 0 to 5V OR **Manual:** using 5K Potentiometer **For 4-20mA signal:** set **SW –I/V** to “ON”, fit supplied 270R (0.25W) across SIG.+/- and set **SW3** to 0-5V.	
Alarms relay circuit rating	2A @ 125V ac Max.	
Alarms relay circuit rating	Typically 55°C (For 27kW model only)	
Fan ‘switch-on’ Temp	(Tracking control signal) LED indicator changes **intensity**	
Over-temperature	Trip in temperature @ 90°C ± 1°C (LED indicator **‘flashes’** continuous fast pulsing) Trip out temperature @ 85°C, ± 1°C SW1 = Off – Relay is continuously energised (normally closed); trips in fault condition SW1 = ON – Relay is de-energised (normally open); closes in fault condition	
Phase Loss Detection	LED indicator **‘flashes’** continuous slow pulsing	
Sensor Loss Detection	LED indicator **‘flashes’** on/off fast pulsing	
Cable Terminations	**Phase Power**	10mm² rising clamp terminal block
	Earth	10mm² rising clamp terminal block
	Remote supply auxiliary alarm (relay)	2.5mm² rising clamp terminal block
	Control Signal	2.5mm² rising clamp terminal block
Terminal Torque Settings	1.2Nm (10mm²) Power terminals only	
Fusing	16A, High-Speed semiconductor type, ferrule fuse (6mm Ø x 32mm long)	
Max. Ambient Temperature	65°C (maximum operational)	
Dimensions	105mm(D) x 193mm (W) x 68mm (H)	
Fixing Centres (all)	2 x 5mm Ø holes on horizontal centre line at 178mm (W)	
Weight	770 grammes	

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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. This unit has a built in thermal trip that turns the power off when the heatsink gets too hot (see SPECIFICATIONS).

Load Considerations

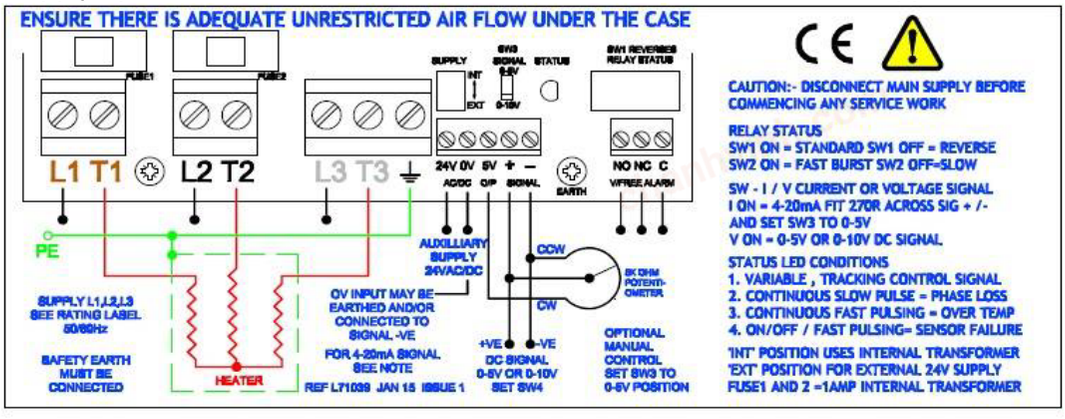
The PR3 series power controllers are designed for 3-wire, 3-phase floating-star or closed delta resistive loads. These controllers are unsuitable for 4-wire, 3-phase loads with a star point to neutral configuration. For details on load configurations, refer to the 'Application Circuits' section in our datasheet (APC ref. X10322).

Unusual heating loads, such as Molybdenum, Platinum, or Tungsten, may exhibit a 10:1 hot-to-cold resistance ratio, causing higher current draw when cold.

CONNECTIONS

The unit uses clamp-type connectors for all auxiliary wiring.

NOTE: It is factory-set for an internal power supply. For details on alternative voltage-free alarm supply options, refer to the Functions section or contact Technical Support.



SAFETY WARNING:

- **Isolate the Supply:** Always disconnect the power supply before removing the cover.
- **High Temperatures:** Be aware that metal parts, particularly the heatsink, may become very hot during operation.
- **Ventilation:** DO NOT OBSTRUCT the ventilation slots of the enclosure.
- **Load Break Switch:** Ensure a load break switch and a contact breaker are installed in the load supply circuit.
- **Over-Temperature Protection:** The supply to the contactor coil should be interrupted by an over-temperature thermostat located in the heater battery, as well as in the event of airflow loss.

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FUNCTIONS

Alarm Relay Functions (3-Way Terminal – Voltage-Free Alarm “NO_NC_C”)

The alarm circuit features voltage-free relay contacts rated up to 2A at 125V AC (RMS). The relay is powered through two 20mm 1A fuses connected to the L1 and L2 phases. As a result, the relay and LED will only activate under the following conditions: over-temperature, sensor fault, or L3 phase loss.

Over-Temperature Protection

When the heatsink temperature exceeds 90ºC, the alarm relay state changes, and the LED pulses rapidly. Power to the load will be disconnected and will not be restored until the temperature falls below 85ºC.

Temperature Sensor Loss

If the temperature sensor fails, the LED will display a fast pulsing ON/OFF pattern.

Phase Loss with Auxiliary Supply

If any of the three phase inputs are missing, the relay will change state, and the LED will flash with ON/OFF bursts every 1.5 seconds. This function is only active with a remote supply (see below).

Fault Condition

By default, the DIL switch (SW1) is in the ON position, meaning the alarm relay will be energized during a fault condition. Switching SW1 to the OFF position will cause the relay to energize continuously until a fault condition occurs.

Remote Supply

The unit is initially set for internal supply with the switch in the “INT” position. For the alarm relay and LED to activate during a phase fault condition using an external supply, set the switch to the “EXT” position.

NOTE: If using a remote supply, ensure the main supply (L1, L2, and L3) is active before switching on the remote supply.

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RECOMMENDATIONS

FUSING

It is recommended that fast acting semiconductor type fuses (as supplied) be used for 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 is available on request.

DOCUMENTS

Other documents available on request, which may be appropriate for your application:

Code	Identity	Description
X10213	ITA	Interaction: Uses for phase angle and for burst fire control
X10255	SRA	Safety Requirements: Addressing the Low Voltage Directive (LVD) including, Thermal Data/Cooling, Live Parts Warning, Earthing Requirements and Fusing Recommendations
P01.1	COS	UAL Conditions of Sale

It is recommended that installation and maintenance of this equipment should be done with reference to the current edition of the I.E.T. regulations (BS7671) by suitably qualified/trained personnel. The regulations contain important requirements regarding the safety of electrical equipment. For International standards refer STANDARDS on D of C.

OPTIONAL EXTRAS

Product Code	Product Description
T30201	Auxiliary transformer for ‘Failsafe’ alarm
A403011	Potentiometer with 0.5m long leads for manual control option
Available on request	Spares, 16A SCR-type

PRODUCT CODE AND RELATED PRODUCT CODE

Product Code	Product Description
A437405-HV	PR1-E-6kW, 8A, 415v - Three Phase – Enclosed

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