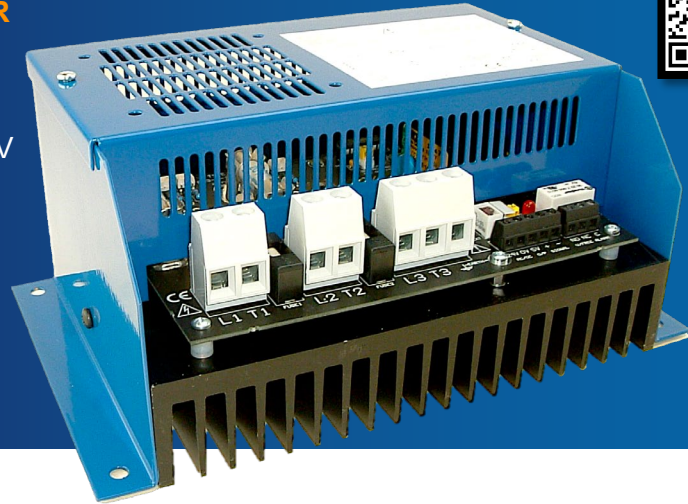


X10592

HVAC | HEATER BATTERY CONTROLLER

# PR3-E SERIES

12kW (17A), 18kW (25A), 27kW (38A), 415V  
Three Phase Burst Fire Power Controller



## CONTACT US:

☎ 0044 (0) 1704-516 501

✉ enquiries@united-automation.com

🌐 www.united-automation.com

## KEY FEATURES:

- ✓ **Seamless Three-Phase Control:** Ensures smooth operation of resistive loads.
- ✓ **Advanced Switching Technology:** Fast pulse zero volts switching reduces flicker and RFI.
- ✓ **Flexible Control Options:** Manage via DC signal or manual 5kΩ potentiometer.
- ✓ **Automatic Temperature Trip:** Built-in protection with auto-reset for enhanced safety.
- ✓ **Integral Semiconductor Fuses:** Ensures reliable protection against overloads.
- ✓ **Easy Installation:** Accessible signal and power terminals simplify setup.
- ✓ **Forced-Air Cooling:** 27kW model includes forced-air cooling for improved performance.

The **PR3-E Series** thyristor stacks provide seamless control of three-phase resistive loads using a two-thirds control technique. These advanced power controllers can be managed via a DC signal or manually through a 5kΩ potentiometer. Utilizing fast pulse zero volts switching technology, the PR3-E Series minimizes flicker and eliminates RFI problems. Each model incorporates an automatic resetting temperature trip, integral semiconductor fuses, and a heatsink. The range includes a 27kW model with forced-air cooling, ensuring robust performance even under demanding conditions. All models offer easy access to signal and power terminals for straightforward installation.

The **PR3-E Series** is the optimal choice for precise and reliable control of three-phase resistive loads in HVAC systems and other industrial applications.

## TECHNICAL SPECIFICATIONS

<b>Power / Current Ratings</b>	12kW (17A); 18kW (25A); 27kW (38A) @ 415V RMS nominal	
<b>Input Voltage</b>	400V RMS ± 10%	
<b>Frequency</b>	50/60Hz	
<b>Control Input Options</b>	<b>Signal:</b> (using SW4): 0 to 10V DC (Set as standard) / 0 to 5V <b>Manual:</b> using 5kΩ Potentiometer <b>4-20mA signal:</b> set SW3 to I (ON), For 0 to 5V DC set SW4 to 0-5V	
<b>Alarms Relay Circuit Rating</b>	2A @ 125V AC Max.	
<b>Fan "switch-on" Temp</b>	Typically, 55°C (27kW Model only)	
<b>Status Indicator</b>	(Tracking control signal) LED Indicator Changes Intensity	
<b>Over-temperature</b>	Trip in temperature @ 90°C ± 1°C (LED indicator 'flashes' continuous fast pulsing)	
<b>Phase Loss Detection</b>	LED indicator 'flashes' continuous slow pulsing	
<b>Sensor Loss Detection</b>	LED indicator 'flashes' on/off fast pulsing	
<b>Cable Terminations</b>	<b>Phase Power &amp; Earth</b>	10mm <sup>2</sup> Rising Clamp Terminal Block
	<b>Remote Supply Auxiliary Alarm (relay)</b>	2.5mm <sup>2</sup> Rising Clamp Terminal Block
	<b>Control Signal</b>	2.5mm <sup>2</sup> Rising Clamp Terminal Block
<b>Terminal Torque Specs</b>	1.2Nm (10mm <sup>2</sup> ) Power Terminals Only	
<b>Fusing</b>	<b>12 to 18kW</b>	20A, 30A, High-Speed Semiconductor type, ferrule fuse (10mm ø x 38mm long)
	<b>27kW only</b>	40A High-Speed Semiconductor type, ferrule fuse (14mm ø x 51mm long)
<b>Max. Ambient Temperature</b>	40°C	
<b>Dimensions</b>	150mm (D) x 240mm (W) x 100mm (H)	
<b>Fixing Centres</b>	4 x 5.5 ø holes on centres 220mm (W) x 130mm (D)	
<b>Weight</b>	2.6kg (All models)	

## APPLICATIONS:

The PR3-E Series is ideal for 3-wire, 3-phase floating-star or closed-delta configured resistive loads. This versatility makes it suitable for various HVAC applications, including air curtains, as well as furnaces, ovens, dryers, and hot plates.



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Southport PR8 4HQ  
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## INSTALLATION

### Cooling Requirements

This robust stack assembly operates at 65°C when naturally cooled and includes a built-in 90°C over-temperature trip on the heatsink as a safety feature. Mount the unit vertically with heatsink fins oriented top to bottom and ensure sufficient surrounding air space to maximize natural convection cooling. If mounted in an enclosure or cabinet, provide adequate ventilation and/or forced air-cooling. The 27kW model features a built-in fan that activates when the heatsink gets hot (see SPECIFICATIONS).

### Load Considerations

The PR3 series power controllers are designed for 3-wire, 3-phase floating-star or closed-delta configured resistive loads. As 2-leg thyristor controllers, they are unsuitable for 4-wire, 3-phase with star point to neutral configured loads. For additional details on configured loads, refer to the 'Application Circuits' section of our supporting datasheet – APC (ref. X10322).

Unusual heating loads such as Molybdenum, Platinum, or Tungsten have a typical 10:1 hot to cold resistance ratio and, therefore, draw larger currents when cold.

### Safety Warning

- Isolate supply before removing cover.
- Metal parts, particularly the heatsink, can get very hot when the unit is operational.
- **DO NOT COVER** enclosure ventilation slots.

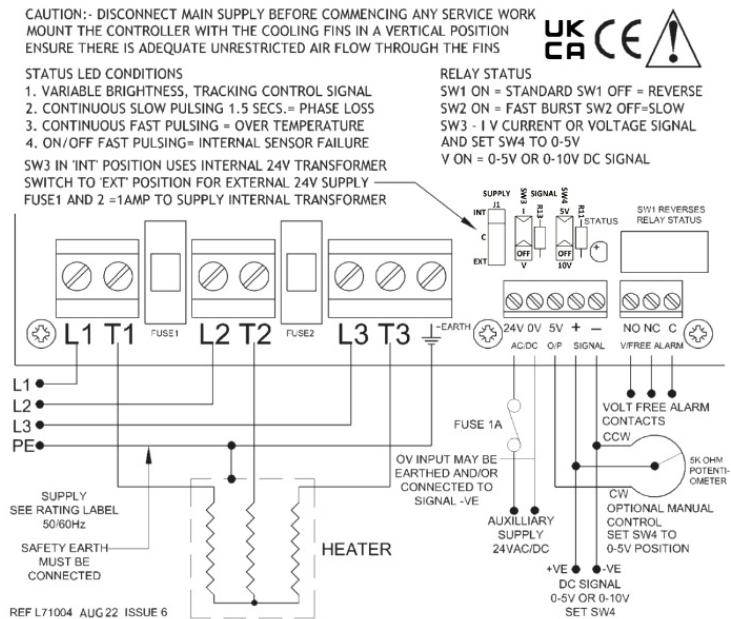
Ensure a load break switch and a contact breaker are installed in the load supply. The supply to the contactor coil should be interrupted by an over-temperature thermostat located in the heater battery and upon detection of airflow loss.

## CONNECTIONS

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

**Note:** The unit is factory set for an internal power supply. For alternative voltage 'free alarm' supply details, see the Functions section.

Please contact our technical support for further information.



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## FUNCTIONS

### Alarm Relay Functions (3-way terminal – V/free alarm “NO\_NC\_C”)

The alarm circuit features voltage-free relay contacts rated up to 2A at 125V AC (RMS) load. The relay's internal supply is derived from the transformer via two 20mm 1A fuses connected to the L1 and L2 phases. Consequently, the relay and LED can only be energized in the event of an over-temperature condition, sensor fault, or L3 phase loss.

### Over-Temperature Protection

If the heatsink temperature exceeds 90°C, the alarm relay changes state, and the LED pulses rapidly. The power to the load is disconnected and will only be restored once the temperature drops below 85°C.

### Temperature Sensor Loss

If the sensor fails, the LED status changes to ON/OFF (fast pulsing).

### Phase Loss with Auxiliary Supply

When any of the three-phase inputs are missing, the relay changes state, and the LED flashes with ON/OFF bursts of 1.5 seconds. This function is only active with a remote supply.

### Fault Condition

By default, the DIL switch (SW1) is set to the ON position, causing the alarm relay to energize under a fault condition. Changing SW1 to the OFF position will keep the alarm relay continuously energized until a fault occurs.

### Remote Supply

The unit is factory-set for an internal supply (SUPPLY Jumper J1 in the “INT” position). If it is necessary for the alarm relay and LED to energize when a phase fault occurs, an external 24V AC or DC supply can be used (SUPPLY Jumper J1 in the “EXT” position).

**Note:** If using the remote supply, ensure the main (L1, L2, & L3) supply is on before activating the remote supply.

## Control Options Guide

### Burst Fire Control Options (SW2)

Two methods are available to suit specific applications:

- **Fast Burst Control (SW2 ON):** This 'inhibited flicker' mode minimizes flicker.
- **Slow Burst Control (SW2 OFF):** This is the basic burst firing mode.

### Control Input Options (SW4 & SW3)

These are connected via the terminals 5V O/P and “+” and “-” signal. Ensure correct polarity as shown in the CONNECTIONS section.

- **[SW4] Voltage Signals:** For input voltage signals of 0-5V or 0-10V DC, use the “+” and “-” SIGNAL terminals. (Control Options Guide Continue to the Next Page)



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- **[SW4] Manual Control:** Using a 5kΩ, 1W potentiometer, use all three terminals 5V O/P, and “+” and “-” SIGNAL terminals.
- **[SW3 “I/V”] Current Signal:** For an input current signal of 4-20mA, set SW3 to I “ON”.

Refer to the CONNECTIONS and SPECIFICATIONS sections for detailed instructions.

## 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	Spare fuses: 20A, 30A or 40A HS SCR-type

## PRODUCT CODE AND RELATED PRODUCT CODE

Product Code	Product Description
A437407-HV	PR3-E-12kW, 17A, 415v, 2/3rds control - Three Phase
A437408-HV	PR3-E-12kW, 25A, 415v, 2/3rds control - Three Phase
A437409-HV	PR1-E-27kW, 38A, 415v, 2/3rds control - Three Phase



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