

X10593

HVAC | HEATER BATTERY CONTROLLER

PR3-E Series

36kW (50A), 54kW (75A), 415v

Three Phase Burst Fire Power Controller



KEY FEATURES:

- ✓ **Seamless Three-Phase Control:** Provides smooth and precise control of resistive loads.
- ✓ **Advanced Technology:** Utilizes fast pulse zero volts switching to reduce flicker and RFI.
- ✓ **Enhanced Safety Features:** Includes automatic resetting temperature trip and integral high-speed semiconductor fuses.
- ✓ **Efficient Cooling:** Built-in heatsink and a cooling fan for the 54kW model.
- ✓ **Fault Detection and Alarms.**
- ✓ **Robust Construction:** Durable terminal blocks and compact design with keyhole slots for easy mounting.

APPLICATIONS:

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

Ideal for the **Heating, Ventilating, and Air Conditioning (HVAC)** market, especially for air curtain applications, it is also perfect for furnaces, ovens, dryers, and hot plates.

The **PR3-E Series** of thyristor stacks offers advanced control for three-phase resistive loads using a two-thirds control technique. These power controllers utilize DC signal control and fast pulse zero volts switching technology to minimize flicker and eliminate RFI problems. Featuring an automatic resetting temperature trip, integral semiconductor fuses, and a heatsink, the series includes two models: the 36kW and the forced-air cooled 54kW model. Both models are designed for easy installation with accessible signal and power terminals.

The **PR3-E Series 36/54kW HVAC Range 3-Phase Burst Fire Power Controllers** are engineered for seamless control of resistive loads in various industrial applications. With advanced features like zero volts switching, automatic temperature trips, and robust construction, these controllers ensure efficient and reliable operation. Whether used in HVAC systems or industrial heating applications, the PR3-E Series delivers precise control and easy installation.

TECHNICAL SPECIFICATIONS

Power/Current Rating	36kW (50A); 54kW (75A) @ 415V RMS Nominal	
Input Voltage	400V RMS $\pm$ 10%	
Frequency	50/60Hz	
Control Input Options	Signal (using SW3): 0-10V DC (set as standard) Manual: using 5k Ω potentiometer For 4-20mA Signal: set S/W I/V to "ON", fit 270 Ω (1/4W) across SIG $\pm$ and set SW3 to 0-5V	
Burst Fire Control Options	Slow Burst: 1 second proportional time base	Fast Burst: variable and un-proportional time base
Alarm Relay Functions	The voltage free alarm circuit is rated for 125V AC @ 2A	
Alarm Relay Status Options	SW1 = "OFF" – Relay is continuously energised (normally closed); trips in fault condition SW1 = "ON" – Relay is de-energised (normally open); closes in fault condition	
Status Indicator	(Tracking control signal) status LED indicator changes intensity	
Cooling Fan	24V AC (NOTE: Fan fitted on 54kW model only); Fan 'switch-on' Temp. sensor: typically, 55°C	
Over Temperature	Trip in temperature @ 90°C $\pm$ 1°C (Status LED indicator 'flashes' with ON/OFF rapid pulsing) Trip out temperature @ 85°C $\pm$ 1°C	
Phase Loss Detection	Status LED indicator 'flashes' ON/OFF continuously in slow 1.5 second intervals	
Sensor Loss Detection	Status LED indicator 'flashes' ON/OFF continuously in equal intervals	
Cable Terminations	Phase Power	10mm ² (36kW) or 16mm ² (54kW) rising clamp terminal block
	Earth	10mm ² (36kW) or 16mm ² (54kW) rising clamp terminal block
	Remote supply Auxiliary alarm (relay)	2.5mm ² rising clamp terminal block
	Control signal	2.5mm ² rising clamp terminal block
Terminal Torque Specs	2Nm (10mm ² – 36kW), 2.5Nm (16mm ² – 54kW) Power terminals only	
Fusing	36kW	63ET (63A) High-speed Semiconductor type fuse, or equivalent
	54kW	100ET (100A) High-speed Semiconductor type fuse, or equivalent
Working Temperature	65°C (maximum operational)	
Dimensions	200mm (D) x 155mm (W) x 120mm (H) 36kW	250mm (D) x 155mm (W) x 120mm (H) 54kW
Fixing Centres	4 x 4.5mm-clear keyhole slots on fixing centres 140mm (W) x 150mm (D)	
Weight	(36kW) 2.6kg (54kW) 3.5kg	



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INSTALLATION

Cooling Requirements

The robust PR3 stack assembly operates efficiently at a maximum temperature of 65°C with natural cooling. It features a built-in safety mechanism that trips at 90°C to prevent overheating. For optimal performance, mount the unit vertically with heatsink fins aligned top to bottom, ensuring sufficient surrounding air space for natural convection cooling. When installing the unit in an enclosure or cabinet, ensure adequate ventilation or implement forced air-cooling. The 54kW model includes a fan that activates automatically at high heatsink temperatures (refer to SPECIFICATIONS for fan switch-on temperatures).

Load Considerations

The PR3 series power controllers are designed for 3-wire, 3-phase floating-star or closed-delta configured resistive loads. These 2-leg thyristor controllers are unsuitable for 4-wire, 3-phase star point to neutral configured loads. For further details on load configurations, refer to the 'Application Circuits' section of our supporting datasheet – APC (ref. X10322). Note that unusual heating loads such as Molybdenum, Platinum, or Tungsten, which have a typical 10:1 hot-to-cold resistance ratio, draw significantly higher currents when cold.

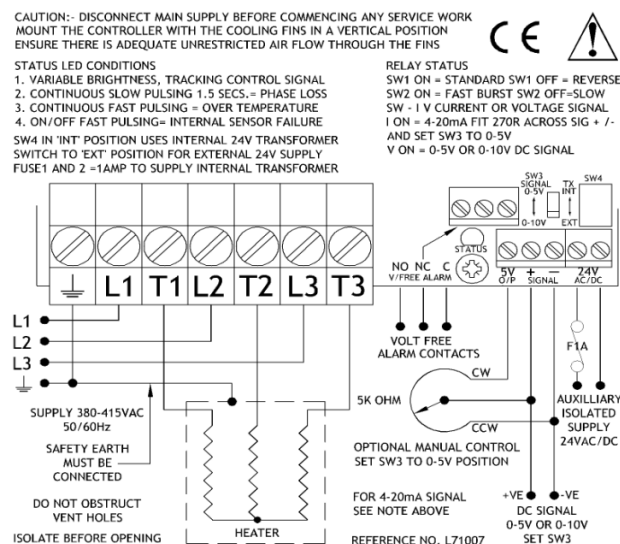
Fusing and Over-Temperature Protection

For protection, use the recommended fast-acting semiconductor type fuses (as supplied). Refer to SRA Datasheet X10255 for additional information. It is also advisable to install a load break switch and a contact breaker 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 has simple clamp type connectors for all auxiliary-wiring requirements.

NOTE: It is factory set for an internal power supply. For alternative 'voltage free' alarm supply details see Functions set section. Please contact our technical support for further details.



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FUNCTIONS

Function	Description
Alarm relay functions (3-way terminal – V/free alarm “NO NC C”)	The alarm circuit features ‘voltage-free’ relay contacts rated up to 2A @ 125V AC (RMS) load. Connection is made via the PCB terminal. For alarm relay status options, refer to the SPECIFICATIONS section. The internal relay supply is derived from the transformer through two 20mm 1A fuses connected to the Black (L2) and Grey (L3) phases. Consequently, the relay and LED will only energize in the event of an over-temperature condition, sensor fault, or phase loss on the L1 phase. For remote supply options, refer to the appropriate section.
Over-Temperature Protection	When the heatsink temperature exceeds 90°C, the alarm relay changes state, and the status LED indicator rapidly flashes. Power to the load will be disconnected and will only return when the temperature drops to 85°C. The 54kW model includes a cooling fan that activates at approximately 55°C.
Temperature Sensor Loss	If the sensor fails, the status LED indicator will flash with continuous equal ON/OFF pulsing.
Phase Loss with Auxiliary Supply	In the event of a phase input loss, the relay changes state, and the LED flashes in ON/OFF bursts of 1.5 seconds. This function is only operational with a remote supply.
Fault Condition	With the default setting of DIL switch (SW1) in the ON position, the alarm relay will be energized under a fault condition. Changing SW1 to the OFF position will keep the alarm relay energized until a fault condition occurs.
Remote Supply	The unit is factory-set for an internal supply (SW4 in the “INT” position). To enable the alarm relay and LED to energize during a phase fault condition, provision is made for an external 24V AC or DC supply (SW4 in the “EXT” position). Note that if using the remote supply, the main (L1, L2, and L3) supply must be on before the remote supply is switched on.

Control Options Guide

Burst Fire Control Options (SW2)

Two methods are available to suit specific applications:

SW2 DIL switch in the “ON” position provides fast burst control in ‘inhibited flicker’ mode.

SW2 DIL switch in the “OFF” position provides slow burst control in basic burst firing mode.

Control Input Options (SW3 & SW “I/V”)

Connections are made via the terminals 5V output and “+” and “-” signal. Ensure correct polarity as shown in the CONNECTIONS section: [

SW3]: For input voltage signals of 0-5V or 0-10V DC, use the “+” and “-” SIGNAL terminals. [

SW3]: For manual control using a 5kΩ, 1W potentiometer, use all three terminals (5V-O/P, and “+” and “-” SIGNAL terminals). [

SW “I/V”]: For input current signal of 4-20mA, set DIL switch SW-I/V to “ON”, fit a 270Ω, 0.25W resistor across the “+” and “-” SIGNAL terminals, and set SW3 to 0-5V. Note that a 270Ω resistor is supplied for the 4-20mA signal. The factory-set ‘default’ setting is 0-10V.

Refer to the CONNECTIONS and SPECIFICATIONS sections for additional details.



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RECOMMENDATIONS

FUSING

It is recommended that high speed semiconductor type fuses (as supplied on SPM models) 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 0/240/415 10-0-10V 2VA
A403011	Potentiometer with 0.5m long leads for manual control option
Available on request	Spare HS fuses: 63ET (63A) or 100ET (100A) SCR-type

PRODUCT CODE AND RELATED PRODUCT CODE

Product Code	Product Description
A437432-HV	PR3-E-36kW, 36A, 415v, 2/3rds control - Three Phase
A437442-HV	PR3-E-54kW, 75A, 415v, 2/3rds control - Three Phase

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