X10759

HVAC | HEATER BATTERY CONTROLLER

PR3-E SERIES

150kW (210A), 180kW (250A), 415V
Three Phase Burst Fire Power Controller

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KEY FEATURES:

- ✓ **High Power Ratings:** Available in 150KW (210A) and 180KW (250A) at a typical supply of 415V RMS.
- ✓ **Versatile Control Options:** Accepts DC signal control, ensuring smooth operation.
- ✓ **Burst Firing Technology:** Offers efficient load management and reduces power fluctuations.
- ✓ **Thermal Protection:** Features an automatic reset thermal trip for enhanced safety.
- ✓ **Compact Design:** Same physical size for both models, simplifying installation

APPLICATIONS:

Ideal for heating, ventilation, air conditioning (HVAC), furnaces, ovens, dryers, and other resistive load applications.

The **PR3-E 150KW & 180KW 3-Phase Burst Fire Power Controllers** are robust and versatile thyristor stacks, providing precise control of three-phase resistive loads using a two-thirds control technique. These units feature fast pulse zero voltage switching technology, minimizing flicker and eliminating RFI issues. Designed for industrial HVAC systems, furnaces, ovens, and other heating applications, the PR3 series supports both manual and signal input control, with advanced safety features like automatic temperature trips and phase loss detection.

TECHNICAL SPECIFICATIONS

Power / Current Ratings	**150KW (210A) & 180kW (250A) @ 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 **Manual**: using 5kΩ Potentiometer **For 4-20mA signal**: set SW -I/V to "ON", fit 270R (0.25W) across SIG.+/- 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:	120mm² fan, 230V AC supply fitted as standard – other options available (i.e. 110V,& 24V ac).	
Over Temperature:	Trip in temperature @ 90ºC, +/- 1ºC (Status LED indicator **'flashes'** with ON/OFF rapid pulsing). Trip out temperature @ 85ºC, +/- 1ºC	
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**	M8 nut & washer stud terminal.
	Earth:	M6 nut & clamp washer stud terminal.
	Remote supply Auxiliary alarm (relay):	2.5mm² rising clamp terminal blocks.
	Control signal:	2.5mm² rising clamp terminal blocks.
Terminal Torque Specs	M8 @ 12 to 15Nm, M6 @ 4.5 to 5.5Nm for power and earth terminals only.	
Fusing	High-Speed Semiconductor fuse: 250EET (250A) for 150KW or 315EET (315A) for 180KW	
Working temperature:	65°C (maximum operational)	
Dimensions	266mm (D) x 345mm (W) x 250mm (H)	
Fixing Centres	4 x 5mmø holes on centres 322mm (W) x 160mm (L).	
Weight	Approximately 15kg.	
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.		

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 PR3-E – range have forced air cooling fans fitted, which are designed to be permanently "on" when in use.

Load considerations

The PR3 series of power controllers are designed for 3-wire, 3-phase floating-star or closed delta configured resistive loads. The PR3 series are 2-leg thyristor controllers and therefore unsuitable for 4-wire, 3-phase with star point to neutral configured loads. For further information on configured loads, see 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, when cold, draw larger currents than normal.

Connections

This unit has Power terminals and simple clamp type terminal connectors for all auxiliary wiring requirements (see SPECIFICATIONS below).

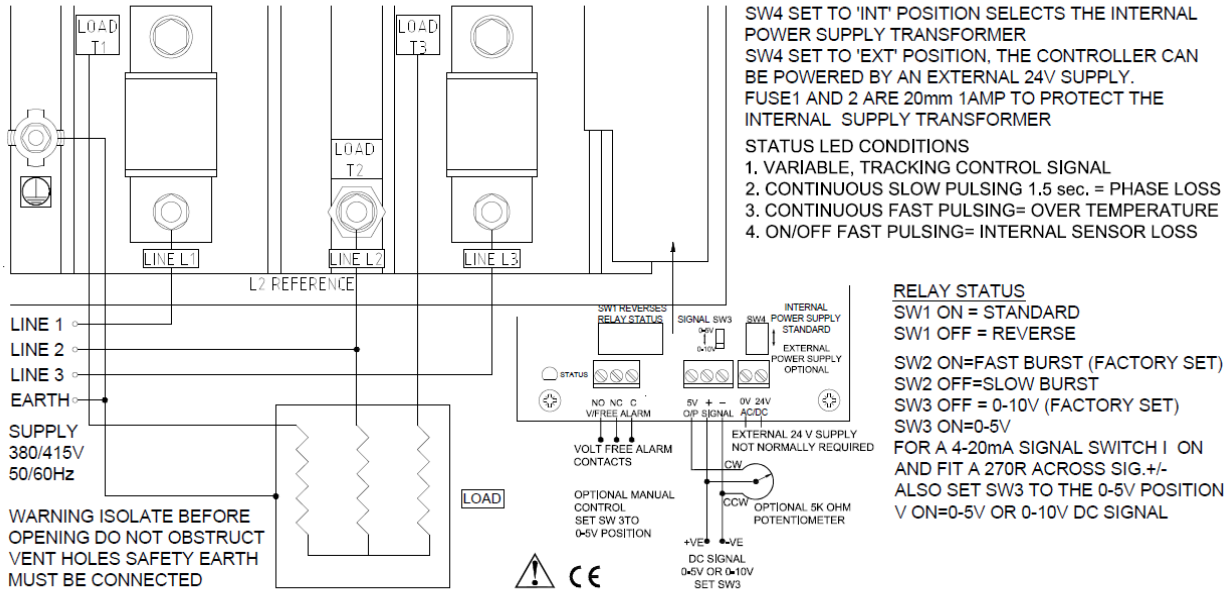
NOTE: It is factory set for an internal power supply. For alternative 'voltage free' alarm supply details see Functions section. Please contact our Technical support for further details.

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.

PR3-E SERIES

150kW (210A), 180kW (250A), 415V | **Three Phase Burst Fire Power Controller**

CONNECTIONS & CONTROL OPTIONS



SW4 SET TO 'INT' POSITION SELECTS THE INTERNAL POWER SUPPLY TRANSFORMER
SW4 SET TO 'EXT' POSITION, THE CONTROLLER CAN BE POWERED BY AN EXTERNAL 24V SUPPLY.
FUSE1 AND 2 ARE 20mm 1AMP TO PROTECT THE INTERNAL SUPPLY TRANSFORMER

STATUS LED CONDITIONS
1. VARIABLE, TRACKING CONTROL SIGNAL
2. CONTINUOUS SLOW PULSING 1.5 sec. = PHASE LOSS
3. CONTINUOUS FAST PULSING= OVER TEMPERATURE
4. ON/OFF FAST PULSING= INTERNAL SENSOR LOSS

RELAY STATUS
SW1 ON = STANDARD
SW1 OFF = REVERSE

SW2 ON=FAST BURST (FACTORY SET)
SW2 OFF=SLOW BURST
SW3 OFF = 0-10V (FACTORY SET)
SW3 ON=0-5V
FOR A 4-20mA SIGNAL SWITCH I ON AND FIT A 270R ACROSS SIG.+/-
ALSO SET SW3 TO THE 0-5V POSITION
V ON=0-5V OR 0-10V DC SIGNAL

FUNCTIONS

Alarm relay functions (3-way terminal – V/free alarm "NO_NC_C")

The alarm circuit has 'voltage free' relay contacts and is rated up to 2A @ 125V ac (RMS) load. The connection is via the PCB terminal.

For alarm relay status options see SPECIFICATIONS.

Note: The internal supply to the relay is obtained from the transformer via two 20mm 1A fuses. These are connected to the Black (L2) and Grey (L3) phases and therefore the relay and LED can only energise when there is an over-temperature condition, a sensor fault, or a phase loss on L1 phase. See Remote Supply Option section.

Over temperature protection

When a heatsink temperature of above 90ºC is detected by the sensor, the alarms relay changes state and the status LED indicator flashes continuous rapid pulsing. The power to the load will be disconnected and will not return until the temperature drops to 85ºC.

Temperature sensor loss

The Status LED indicator changes to continuous equal ON/OFF pulsing if the sensor fails.

Phase loss with auxiliary supply

When any one of the three phase inputs are missing, the relay changes state and the LED flashes with ON/OFF bursts of 1.5 seconds.

This is only functional with a remote supply (see below).

Fault condition

The default setting of DIL switch (SW1) is in the ON position, the alarm relay will be energised under a fault condition. Changing SW1 to the off position will energise the alarm relay continuously until a fault condition occurs.

Remote supply

The unit will be factory set for an internal supply (SW4 in the "TX-INT" position). If there is a requirement for the alarm relay and LED to energise when a phase fault condition occurs, then there is provision for an external 24V ac or dc supply (SW4 in the "INT" position).

NOTE – If the remote supply is utilised, the main (L1, L2 and L3) supply must come on before this supply is switched on.

RECOMMENDATIONS

FUSING & OVER TEMPERATURE

It is recommended that fast acting semiconductor type fuses (as supplied) be used for protection. See SRA Data sheet X10255 for further information. It is recommended 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.

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 carried out by suitably qualified/trained personnel with reference to the current edition of the I.E.E. wiring regulations (BS7671 The regulations contain important requirements regarding the safety of electrical equipment. For International Standards refer to I.E.C/ Directive IEC 950.

OPTIONAL EXTRAS

Product Code	Product Description
T30201	Auxiliary transformer for 'Failsafe' alarm (0/240/415 10-0-10V 2VA)
A403001	Potentiometer with 0.5m long leads for manual control option
Available on request	Spare fuses: 315A HS SCR-type (315EET)

PRODUCT CODE AND RELATED PRODUCT CODE

Product Code	Product Description
A447444-HV	PR3-E-150kW, 210A, 415v, (230Vfans), 2/3rds control - Three Phase
A447445-HV	PR3-E-180kW, 250A, 415v, (230Vfans), 2/3rds control - Three Phase