

X10598 – PR3-E Series 12-18Kw DIN Rail Mounting HVAC Range 3 PHASE BURST FIRE AC POWER CONTROLLERS

Issue 8



1 Introduction

The PR3-DIN range of thyristor stacks provides full seamless control of three phase electric heating loads from a BMS or similar controller. These burst firing controllers use zero volts switching technology, to minimise RFI problems. A 12kW or 18kW model is available for a typical ac voltage supply of 415V using the two-thirds control technique. Both models have the same features that include:- DIN rail mounting capability; dc voltage signal control; temperature trip with automatic reset, alarm output and LED 'OUTPUT-ON' indication; easy access to internal signal & power terminals; no additional heatsink is required for each power rating.



2 Applications

Suitable applications include electric heating coils, heating cables and electric furnaces.

RoHS Compliant
Directive

3 Functions

3.1 Cycle Time and Signal Rescaling

The cycle time is preset. A 0 to 10V DC input signal of 5V equates to the load being at 50% ON and likewise with a load of 2.5V the load will be 25% ON. A 10v input signal will therefore equal 100% i.e. fully ON.

CAUTION: Adjustment of the cycle time and signal rescaling is possible using HD3, HD4, VR1 and VR2 but is not normally required. Incorrect settings of these controls can cause an overload condition, failure and permanent PR3-DIN –series damage.

DO NOT ATTEMPT TO ADJUST THESE CONTROLS WITHOUT REFERENCE TO THE SUPPLIER/MANUFACTURER.

3.2 Manual Override

The PR3-DIN series are supplied preset to the auto 'A' position. It is possible to manually override the input signal by placing the HD2 jumper plug in the 'M' position. With the jumper in the 'M' position the load will be 100% ON. The output load can be adjusted downwards using the signal rescaling facility (see above section).

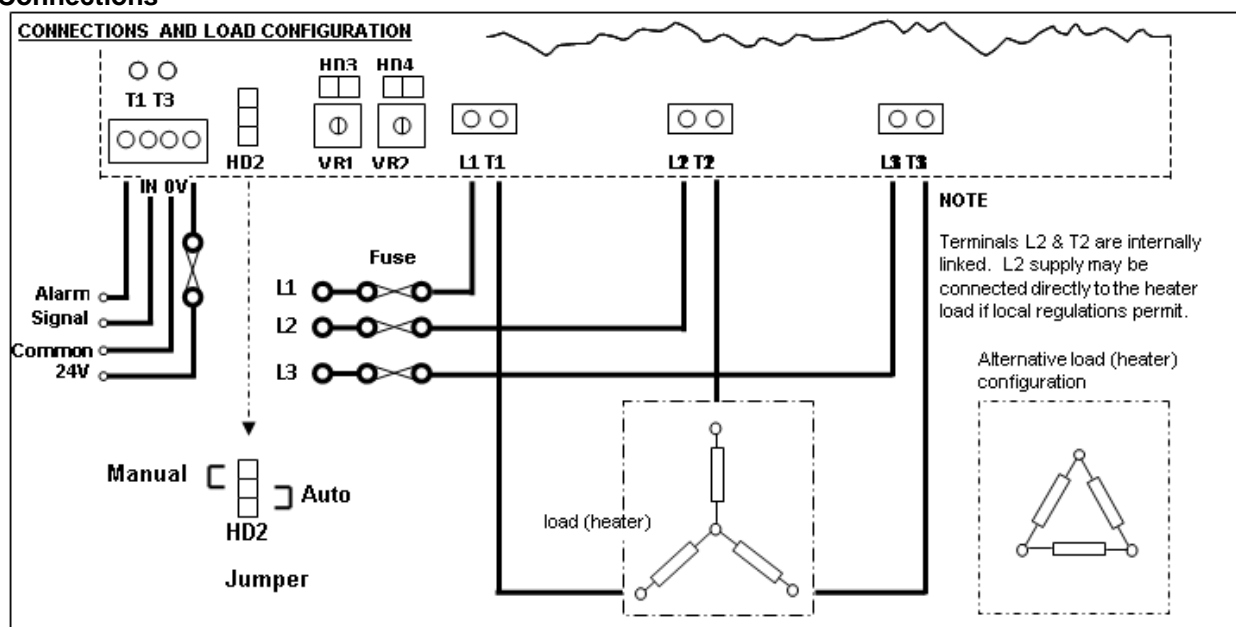
Over Temperature Protection

An electronic thermal cut-out is fitted to the heatsink to protect against over temperature. The PR3-DIN series will switch off the load if the heatsink temperature exceeds 90°C and will reconnect to the load once the heatsink temperature has dropped below 85°C. Under normal operating conditions the heatsink temperature will not reach 90°C but this might occur, for example when the ambient temperature exceeds 40°C.

3.3 Alarm Output

The alarm OUTPUT is referenced to 0V and the alarm terminal input. The alarm is triggered by zero voltage present (as specifications).

4 Connections



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5 Installation

5.1 Cooling Requirements

The PR3-DIN series are designed for a maximum ambient temperature of 40°C which should not be exceeded. Environmental conditions should be assessed and, where necessary (e.g. enclosures with limited air changes), adequately ventilated with a cooling fan.

Location

The units are designed to be mounted on TS35 section DIN rail and should be installed, with their heatsink cooling fins in a vertical plane. Sufficient surrounding air space (typically 100mm minimum in a vertical plane) should be allowed to maximise natural convection cooling.

Load supply and backup protection considerations

The PR3 series of power controllers are designed for resistive type loads in 'Floating-Star' or 'Closed-Delta' configurations. It is recommended that a load disconnection switch and contactor are installed in the load supply. The supply to the contactor coil should be interrupted by sensors for over temperature in the heater and also upon air flow loss.

5.2 Control Supply

The control circuitry is fully isolated from the load supply and needs its own 24V (AC or DC) supply. The control supply common is linked to the 0 to 10V input signal common. All low voltage signal and supply cables should be kept separate from high voltage or mains cables, separate trays or conduit should be used. Screened cable should be used for connections to BMS controllers and, where possible, the cable screen should be connected to a functional earth (NOT mains safety earth). It is normal good practice for the screen to be earthed at one end only to avoid earth loops.

The unit has simple clamp type connectors for all auxiliary-wiring requirements. See inside lid for wiring details.

6 Specifications

Power / Current Ratings	12kW (17A); 18kW (25A) @ 415V RMS
Input Voltage	3 phase from 24V to 440V ac RMS
Frequency	50/60Hz
Input signal (0V-24V)	0 to 10V dc
Power supply (0-24V)	Remote 24V ac or dc +/- 10% @ 40mA (not supplied)
Terminal ratings	(Input signal/alarm/24v supply input) – rising clamp terminal block for 2.5mm ² cable entry
Alarm output	24V ac or dc (as power supply) normally present. Drops to 0V in the event of over temperature or power supply failure.
Over-temperature	Trip in temperature @ 90°C +/- 5°C, Trip out temperature @ 85°C +/- 5°C
Status Indicator	T1 and T3 indicate output ration
Power Terminations	Rising clamp terminal block for 6mm ² cable entry
Terminal Torque Settings	0.8Nm (Power Terminals Only)
Fusing	12kW: 20A (20ET) & 18kW: 30A (32ET) – both High-Speed Semiconductor type fuses or equivalent MCB's
Max. Ambient Temperature	40°C
Dimensions	12kW 217mm (W) x 87mm (H) x 90mm (including DIN chips) (D) – with firing circuit terminals front facing 18kW 217mm (W) x 87mm (H) x 110mm (including DIN chips) (D) – with firing circuit terminals front facing
DIN rail mounting	Using TS35 section DIN rail
Weight	12kW 0.6kg & 18kW 0.95kg

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.

7 Recommendations

These supporting documents, which may be appropriate for your application, are available on request:

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
X10617		Wiring connection details are attached to the inside of the lid
X3-00-001	HVAC	Brochure: Heating Ventilation and Air Conditioning Power Controllers

Note: 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.T. wiring regulations (BS7671). The regulations contain important requirements regarding the safety of electrical equipment. For International Standards refer to standards on the D of C.

8 Fusing

It is recommended that fast acting semiconductor type fuses (as specifications) be used in line with the supply (L1, L2, L3) for protection of the devices. The 24V remote supply should be fused accordingly (e.g. F500mA). See SRA Data sheet X10255 for further information.

9 CE Marking

This family carries a "CE" marking. These burst fire controllers do not normally require a remote filter. For more information see recommendations section and contact our sales desk. See Declaration of Conformity.

10 Order Code

When ordering directly, please use the following stock codes:

Manufacturer Stock Code	Product Description	Rating
A437317-HV	PR3-E-DIN-12kW	3-phase, 12kw, 17A @ 415V, 2/3rds control
A437318-HV	PR3-E-DIN-18kW	3-phase, 18kw, 25A @ 415V, 2/3rds control



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