

AX-PPR3-27, -36 & -54

27kW, 36kW and 54kW Three Phase Power Regulators

AXIO



Product overview

The AX-PPR3-xx range of panel mounting Power Regulators (thyristors) provide continuously adjustable control of electric heating loads from a BMS Controller or similar. Applications include electric heating coils, heating cables and electric furnaces. The AX-PPR3 Series use solid-state switching with “zero crossing technology” for minimum RFI and provide accurate switching control. All Power Controllers in this series feature Over Temperature Protection with automatic reset and Alarm Output, and LED Indication of output operation. The AX-PPR3-54 features integral cooling fans which turn on automatically when required. No additional heatsinks or fans are needed.

Features

- 0-10Vdc Control Input
- 27kW, 36kW and 54kW Models
- Burst-fire Control
- Auto Reset Over-Temperature Protection
- 24Vac/dc Powered
- Alarm Output
- LED Indication
- Small Footprint

Product specifications

Input:	0-10Vdc at 0.2mA maximum
Control Power Supply:	AX-PPR3-27,AX-PPR3-36 24Vac \pm 10% at 50mA, or 22 - 40Vdc at 30mA AX-PPR3-54 24Vac \pm 10% at 185mA, or 22 - 40Vdc at 110mA
Alarm Output:	250Vac at 5A VFC - contact closed when over temperature alarm is active or on removal of Control Supply
Max. Heater Duty:	See detailed table on Page 2
Rated Load:	See detailed table on Page 2
Rated Supply:	380-440Vac / 50-60Hz
LED Indication:	ON when output is on
Control isolation:	3,000V
Dissipated Heat:	See detailed table on Page 2
Terminals:	Control Rising Clamp for 0.5-1.5mm ² Cable Power Rising Clamp for 0.5-16mm ² stranded or 0.5-25mm ² solid core
Ambient Temperature Range:	0 to 55°C. Note: The units are rated at 40°C. If using at higher ambient temperature de-rate the unit by 10% for every 5°C above 40°C.
Over temperature:	Load is disconnected when heatsink temperature exceeds 90°C Load is reconnected when heatsink temperature falls below 85°C
Dimensions:	See detailed table on Page 2. Refer to drawing for fixing holes
Weight:	See detailed table on Page 2
Country of Origin:	United Kingdom

Order codes

AX-PPR3-27	27kW Three Phase Power Regulator
AX-PPR3-36	36kW Three Phase Power Regulator
AX-PPR3-54	54kW Three Phase Power Regulator

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Specification continued

Series Code	Nominal Heater Duty	Max. Load per phase Amps @40°C	Maximum Dissipated heat	Dimensions (W x H x D)	Weight
AX-PPR3-27	27kW	37.5A	85W	188 x 132 x 130mm	2.05 kg
AX-PPR3-36	36kW	52.2A	167W	188 x 132 x 130mm	2.05 kg
AX-PPR3-54	54kW	78.2A	250W	188 x 162 x 130mm	2.45 kg

Operation

The AX-PPR3 series control electric heating loads in linear proportion to the applied 0-10Vdc control signal. Solid-state semiconductor devices switch the load using burst-fire control, combined with zero-crossing point switching which virtually eliminates RFI emissions.

Burst-fire control is where the ac load is switched fully on for an integer number of complete half cycles in a burst. Assume a cycle time of 4 seconds: With a 0-10Vdc Input Signal of 10V the load will be on all of the time i.e. fully ON. At 5V input the load will be switched ON for 2 seconds and OFF for 2 seconds, i.e. on average the load is at 50% power. At 2.5V input the load will be switched ON for 1 second and OFF for 3 seconds, i.e. on average the load is at 25% power. Note that whenever the load is switched ON, full load current will be drawn for that period of control time.

Installation and configuration

The AX-PPR3 series Power Regulators must be mounted vertically on a panel. Allow a minimum of 100mm between units mounted in a vertical plane. It is important that free air movement around the enclosure is not restricted.

CAUTION!

In normal operation the heatsink surface can exceed 90°C. Dangerous potentials exist on the unit and particular care should be taken.

Electrical Installation:

Installation must be carried out by a suitably trained electrician, and in accordance with the relevant statutory regulations.

Load Supply and Protection:

It is recommended that a suitably rated contactor is installed in the supply to the unit. The contactor coil should be interrupted by sensors for over temperature in the heater and also ideally upon air flow loss. Fuses or MCB's (miniature circuit breakers) are required to provide overload protection. High Speed Fuses will protect the solid-state switching devices against short circuit currents.

Maximum Heating Load:

The power rating of the units are given as a guide. The maximum current (which is dependant on the actual supply voltage and heating load) as shown in the specification table must not be exceeded.

Earthing:

The M6 earth bolt must always be bonded to a good Earth. This earth bond lead should be appropriately rated according to the maximum load and fusing in the installation. Refer to BS7671.

Control Supply:

The control circuitry is fully isolated from the load supply and requires a 24Vac/dc supply. The control supply common is internally connected to the 0-10V Input Signal common.

Control Signal:

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. Where possible the cable screen should be connected to a functional earth (not mains safety earth). The screen should be earthed at one end only to avoid earth loops.

Ventilation:

The ambient temperature of the installation should not exceed 55°C. If necessary, enclosures or control panels should be ventilated with a cooling fan. See note in product specification for de-rating to be applied above ambient temperatures of 40°C.

Cycle Time:

The Cycle Time is preset for 4 seconds. Adjustment is possible using the Cycle Time potentiometer, but is not normally required.

Over Temperature Monitoring:

An electronic thermal cutout is fitted to the heatsink to protect against over temperature. The AX-PPR3 series will switch off the load if the heatsink temperature exceeds approximately 90°C and will reconnect the load once the heatsink temperature has dropped below 85°C. The Alarm output will also change state. Under normal operating conditions the heatsink temperature will not reach 90°C but this might occur, for example, if the ambient temperature exceeds 40°C.

The Alarm output is an isolated volt-free contact, which closes on over-temperature detection, or on control voltage power fail.

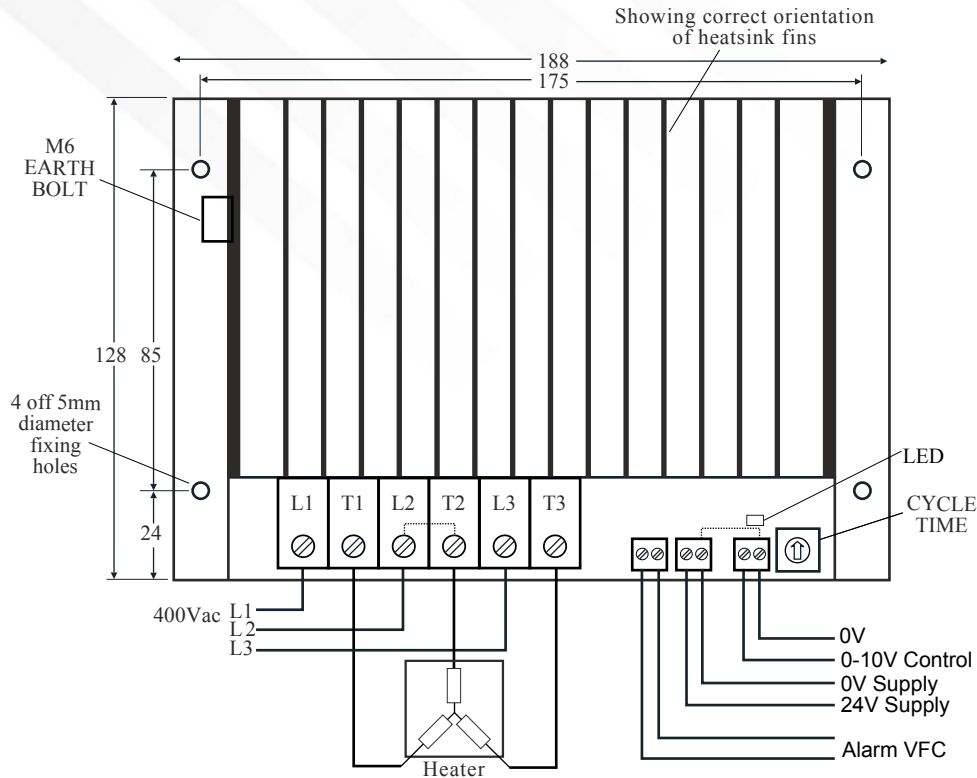
The AX-PPR3-54 is fitted with an integral fan deck. The fans will turn on and off automatically as required to control the heatsink temperature.

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Connections

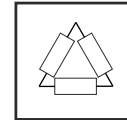


All models:

Terminals L2 & T2 are connected internally. If the load is connected in star, the star point must not be connected to neutral.

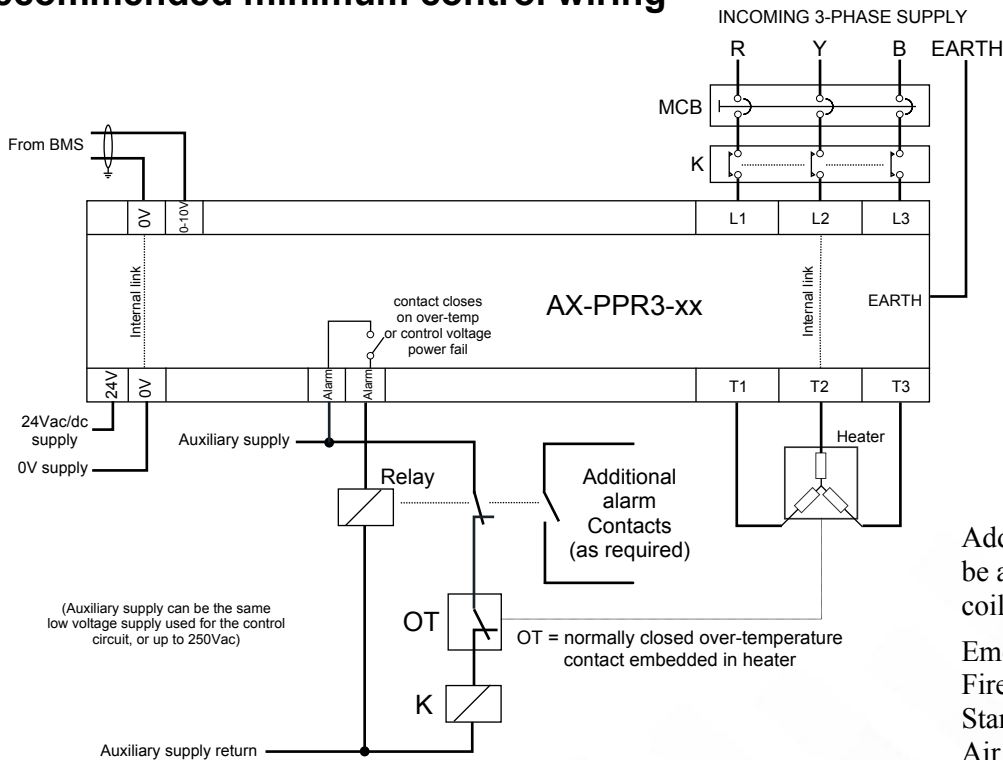
It is imperative that the power connections are fully tightened, without excessive force, and ensure the maximum area of cable is in contact with the terminals.

The M6 Earth bolt must be used with an appropriately rated cable to bond the unit to an earth point.



Alternative heater load - star connected for 400V elements

Recommended minimum control wiring



Additional interlocks that could be added in to the contactor (K) coil circuit:

- Emergency stop signal
- Fire signal
- Start/Stop from BMS
- Air flow switch

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