

SINGLE PHASE 12kW and 20kW RANGE TWO PHASE 22kW and 30kW DUAL MODE POWER CONTROLLER

DMPR1 SERIES

X10746

INTRODUCTION

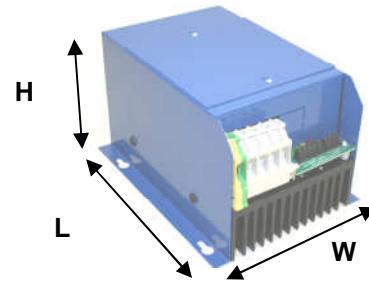
The complete enclosed single phase Dual Mode Power Regulator (DMPR) thyristor assembly provides control of inductive/resistive loads of up to 30kW at 400V AC. The user selectable control modes, via the internal switches offer either phase angle, burst firing or a combination of the two i.e. start up in phase angle and then continue in burst firing. The controllers also come with frequency tracking allowing the unit to be installed in many applications where the supply is unstable. There are a number of signal control options to meet most industrial requirements.

All are housed in a bespoke enclosure and have easy access to internal signal & power terminals for simple installation. With Integral semiconductor fuses and heatsink, the controller offers a solution for many applications requiring single or dual mode control.

APPLICATIONS

Suitable for furnaces, ovens, dryers, air curtains, hot plates and many other heating and ventilation applications. Also suitable for inductive loads such as transformers

Picture shows: DMPR1-E-30kW, 75A, 400V



Features

- Phase Angle/Burst Fire Control or combination of both.
- Frequency Tracking 4-400Hz
- Integral High Speed Fuse
- Adjustable ramp control 1 to 30 seconds.

SPECIFICATIONS

| | |
|--|--|
| Power/(current ratings): | 12kW (52A): 20kW (87A) @ a nominal supply of 230V RMS 22kW (55A): 30kW (75A) @ a nominal supply of 400V RMS |
| Input voltage: | 230V RMS +/- 10%, 400V RMS +/- 10% Phase to Phase |
| | Note: 110V RMS Option Available on request |
| Supply frequency: | 4 to 400Hz active tracking |
| Control input signal: | 0 to 5Vdc up to a maximum of 24Vdc or Manual - 5K Potentiometer (SW1 position 3 Off) 0-20mA/4-20mA (SW1 position 3 On) |
| Alarm relay rating: | 125V ac @ 2A |
| LED indicator: | Power LED (Green) – Illuminates when the on board 5V dc supply is present. Status LED (Yellow) – Brightness increases in phase angle mode and pulses on a one second time base with a variable mark space (on-off) ratio determined by the control signal in burst fire mode. Fault LED (Red) – Continuously pulses when heatsink temperature rises to 90 °C and is fully on if the internal High Speed fuse fails. |
| Over temperature: | Trip in temperature @ 90°C, +/- 1°C (LED indicator 'flashes' continuous fast pulsing) Fixed Level of 55°C brings on Fan (When Fitted) Level of 90°C shuts down power and alarm relay de-energises. |
| Zero Settings: | Sets the minimum output level, zero's the output with signal of up to 2 volts |
| Span Setting: | Sets the maximum output with input signals of up to 24 volts DC |
| Soft Start: | 0-30 seconds initiated at power up. Also initiated when enable is used |
| Current Limit: | Built in and user resettable (SW1 position 4 and VR1) |
| Switch Options: | Phase angle, Burst Fire, "V/I" signal and Current limit enabled or disabled. |
| Cable terminations: | Phase power (unit dependent) 10mm ² (12/22kW); 16mm ² (20/30kW) - rising clamp terminal blocks Earth (unit dependent) 10mm ² (12/22kW); 16mm ² (20/30kW) - rising clamp terminal blocks Remote supply Auxiliary alarm (relay) 1.5mm ² rising clamp terminal block Control signal - 1.5mm ² rising clamp terminal block |
| Terminal torque settings: | 4Nm (for Power terminals 10mm ² & 16mm ²) |
| Fusing : | 230V: 80ET (12kW), 100ET (20kW) / 400V: 80ET (22kW) 100ET (30kW) Semiconductor type, lug fuses |
| Working temperature: | 60°C (maximum operational) |
| Ingress protection (IP) rating: | IP20 (Protection against solid bodies greater than 12mm; No protection against liquid) |
| Dimensions: | 205mm (L) x 155mm (W) x 120mm (H); with Fan Cowl: 250mm (L) x 155mm (W) x 120mm (H) |
| Fixing centres: | 4 x 5mm \varnothing holes on centres 140mm (W) x 140mm (L) |
| Product Weight | 12kW: (2.8kg): 20kW (3.5kg) with Fan Cowl: add 0.52kg 22kW: (2.8kg): 30kW (3.5kg) |

RoHS Compliant
Directive
2002/95/EC

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

FUNCTIONS

Alarm relay

The alarm circuit has voltage free relay contacts, rated up to 2A @ 125V ac (RMS) load and is energised on power up. De-energises if the heatsink temperature rises to 90°C or if the internal High Speed fuse fails.

Over temperature protection

When the heat sink temperature rises above 55°C (detected by the heat sink sensor) the cooling fan is switched on, if fitted. Should the heat sink temperature reach 90°C, the power to the load will be disabled and will not return until the temperature drops to 85°C. During this period the alarm relay is de-energised and fault led flashes continuously.

Control Options

Phase Angle (SW1 position 1 ON)

Burst Fire (SW1 position 2 ON)

Combination of Phase Angle and Burst Fire (SW1 position 1 and 2 ON), i.e. output starts up in phase angle mode and then switches to burst fire mode when the control has ramped up to the setpoint.

INSTALLATION

Cooling requirements

This robust stack assembly has an operational temperature of 60°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.

LOAD CONSIDERATIONS

It is always best to detail the type of load when ordering. For industrial reliability, based on long experience, the DMPR range has considerable current overload capacity on the power devices used. The rated currents are maximum continuous RMS values for use within the temperature guidelines as shown in the table below.

Unusual heating loads such as Molybdenum, Platinum or Tungsten, have a typical 10 to 1, hot to cold, resistance ratio and therefore, when cold, draw larger currents than normal. Transformer and other inductive loads have surge starting currents and require the correct type of phase angle firing circuit. These and similar types of surge loads should be advised so that appropriate slow start or larger rated units can be correctly supplied to the specific needs.

Connections

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

Fusing

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

CE Marking

This family carries a "CE" marking, In burst fire mode the controllers do not normally require a remote filter. For more information contact our sales desk. A Declaration of Conformity available on request.

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, Earth requirements and fusing recommendations. |
| X10322 | APC | AC Power Control – Three phase application circuits |
| X10617 | | Wiring connection details are attached to the inside of the lid. |

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.E. wiring regulations (BS7671 The regulations contain important requirements regarding the safety of electrical equipment. For International Standards refer to standard IEC 60950.

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ORDERING

Product Reference

Ratings V/P/I (RMS)

| | |
|---------------------|-----------------|
| DMPR1-E-12kW-230V | 230V, 12kW, 52A |
| DMPR1-E-20kW-230V | 230V, 20kW, 87A |
| DMPR1-E-22kW-400V | 400V, 22kW, 55A |
| DMPR1-E-30kW-400V | 400V, 30kW, 75A |
| DMPR1-F-E-30kW-400V | 400V, 30kW, 75A |

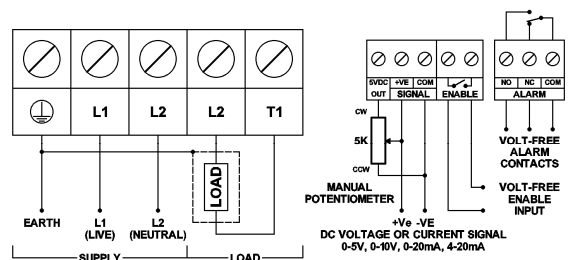
OPTIONAL EXTRAS

Manual control option: A403011 - 5K, 1W potentiometer with 0.5m leads.

Supply voltage variation: 110V AC available on request.

High ambient Temperatures: DMPR1-F – additional fan & cowl option for 30kW model where ambient temperatures could get above 40°C.

CONNECTIONS Example shown with Heater Bank



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