

# 36kW and 54kW RANGE 3-PHASE DUAL MODE POWER CONTROLLER INSTALLATION INSTRUCTIONS

## DMPR3 SERIES

X10747

### INTRODUCTION

The complete enclosed three phase Dual Mode Power Regulator (DMPR3) thyristor assembly provides control of inductive/resistive loads of up to 54kW at 415V. The user selectable control modes, via the internal switches are 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 application 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



### Features

- Phase Angle/Burst Fire Control or Combination of both
- Frequency Tracking 30-80Hz
- Integral High Speed Fuses
- Adjustable ramp control 0 to 30 seconds.

### SPECIFICATIONS

#### Power/current Ratings:

36KW (50A); 54KW (75A) @ a typical supply of 415V RMS

#### Input Voltage:

400V RMS +/- 10%

#### Frequency:

30-80Hz

#### Control input options:

**Signal** 0 to 5V / 0 to 10V **Manual** 5K Potentiometer / 4-20mA

#### Load Type/ Selectable (SW4)

Resistive or Inductive

#### Phase Loss Detection:

LED indicator flashes for 1.5sec. pulse bursts

#### Sensor Loss Detection:

LED indicator flashes for 1sec. pulse bursts

#### Adjustable ramp control from power up

0-30 seconds

#### Control limit or over current trip

0-100mV dc or 0-25V dc

RoHS Compliant  
Directive  
2002/95/EC

#### Cable terminations:

(all internal)

Phase power: M6 nut & washer stud terminal.

Earth: M6 nut & clamp washer stud terminal.

#### Cable entry (power + signal):

6 x 20mm Ø cable knock-outs + 2 x 12mm Ø holes – front side only. Cable glands NOT supplied.

#### Terminal torque settings:

4.5 to 5.5Nm - Power and earth terminals only.

#### Fusing

**36kW (56ET) 54kW 80ET** High-Speed Semiconductor type fuses

#### Working temperature:

65°C (maximum operational)

#### Dimensions:

232mm (D) x 340mm (W) 124x mm (H) – length is viewed with heatsink fins going top to bottom (see photo)

#### Fixing centres:

4 x 6mm holes on centres 322mm (W) x 200mm (D)

#### Weight:

(all models) 5.2kg

**Note: SAFETY WARNING - Metal parts, in particular the heatsink, may get very hot when the unit is fully operational.**

### Manual Control

The FC36M firing circuit has a 5Vdc output that can be used to supply the clockwise end of a 5K ohm potentiometer. The wiper is connected to the terminal marked SIG I/P and the counterclockwise end to 0V.

### Voltage control

For control using a remote dc signal the positive input should be connected to the terminal marked SIG I/P and the negative input to be connected to 0V. The input impedance is 10K ohms for 0-5V input and 20K ohms for 0-10V input.

### Current control

For current control connect a 4-20mA dc signal between terminals marked 4-20mA and 0V. This input can also be used as 1-5V dc input. The input impedance is 240 ohms.

### Phase Angle control

Option 1 - the switch marked SW1 should be switched to the on position. This position connects terminals A with 5V.

Option 2 – (see Soft Starting) the switch marked SW1 can be switched to the OFF position. The OFF position isolates the inputs and disconnects terminals A from 5V. Inputs (A and C) then require an external supply between 5 and 24V dc.

### Burst Firing control

The switch marked SW1 should be switched to the OFF position and the terminal marked B should be linked to 5V.

### Phase Angle to Burst Firing control

The switch marked SW1 should be switched to the ON position and terminals A and B should be linked together. The firing circuit will start in phase angle mode and switch to burst mode when the control signal ramps up to the set point. It will stay in the burst mode even if the signal drops below the set point. It will restart in phase angle mode when the unit is switched off or reset.

### Soft Start

When the FC36M is initially powered up the output is inhibited for 0.5 seconds, then the soft start is automatically enabled and the firing circuit will ramp up at a rate determined by VR3 (0-30 seconds). The ramp time relates to full conduction, for example, if the ramp time is set to maximum (30 seconds) and the set point is 50% the controller will ramp to the set point in 15 seconds.

## INSTALLATION

### COOLING REQUIREMENTS

Heatsink temperature rating for standard stack assembly is calculated when naturally cooled. If mounted in enclosure or cabinet, adequate ventilation and/or forced air-cooling should be fitted. Thermal trips are fitted on 75A to 100A rated controllers. This is in order to switch off the thyristors in an over temperature situation, which is indicated by an LED. The trip resets when the temperature falls below 90 °C.

### LOAD CONSIDERATIONS

It is always advisable to indicate the type of load when ordering. For industrial reliability, based on long experience, the SAC 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. Transformers 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 indicated, so that appropriate slow start or larger rated units can be correctly supplied for the specific needs.

| Maximum Heatsink Ambient | Maximum RMS Line Current (3 Phase Supply) |
|--------------------------|-------------------------------------------|
| 30°C                     | 100A                                      |
| 40°C                     | 85A                                       |
| 50°C                     | 75A                                       |
| 60°C                     | 65A                                       |

### Fusing

It is recommended that fast acting semiconductor type fuses (as supplied) 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. 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 I.E.C/ Directive IEC 950.

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## ORDERING

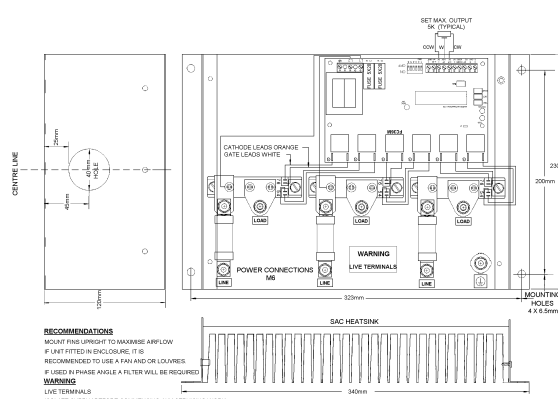
### Product Reference Description Ratings (RMS)

|           |                 |
|-----------|-----------------|
| DMR3-36kW | 230V, 18kW, 50A |
| DMR3-54kW | 230V, 30kW, 80A |

## OPTIONAL EXTRAS

A403011  
5K 1W potentiometer with 0.5m long lead for manual control option

## CONNECTIONS



## UNITED AUTOMATION LIMITED

1 Southport Business Park  
Kew  
Southport, PR8 4HQ  
ENGLAND

Tel: 0044 (0) 1704 – 516500 Main  
Fax: 0044 (0) 1704 – 516501  
Enquiry@united-automation.com

www.united-automation.com  
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