

X10714

THYRISTOR CONTROLLER | THREE PHASE

DMPR3 Series

36kW(50A), 54kW(75A) / 415V
3-Phase Dual Mode Power Controller



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KEY FEATURES:

- ✓ **Dual Mode Control:**
Phase-Angle, Burst Fire, or Hybrid
- ✓ **Frequency Tracking:** 30-80Hz for unstable supply environments
- ✓ **Integrated High-Speed Fuses** for enhanced protection
- ✓ **Adjustable Ramp Control:** 0 to 30 seconds for smooth power-up
- ✓ **Easy Installation:** Accessible internal terminals and multiple cable entry options

APPLICATIONS:

- **Heating systems** (furnaces, ovens, dryers)
- **Ventilation systems** (air curtains, hot plates)
- **Inductive loads** (transformers)

The **DMPR3 series** offers robust control for inductive and resistive loads, handling up to 54kW at 415V. This fully enclosed thyristor assembly provides versatile operation with user-selectable control modes—phase-angle, burst-firing, or a hybrid mode combining both. This flexibility, combined with frequency tracking from 30-80Hz, makes it ideal for installations with unstable power supplies.

Designed for easy installation, the DMPR3 features accessible internal signal and power terminals, along with integrated high-speed fuses and a heatsink for reliable performance. It is suitable for a wide range of heating, ventilation, and industrial applications, including furnaces, ovens, dryers, and air curtains, as well as inductive loads like transformers.

TECHNICAL SPECIFICATIONS

Power / (Current) Ratings	36kW (50A); 54kW (75A) @ a typical supply of 415V RMS nominal	
Input Voltage	415V RMS +/- 10%	
Frequency	30 – 80Hz	
Control Input Options	Signal 0–5V/0-10V Manual 5kΩ Potentiometer/4-20mA	
Load Type/Selectable (SW4)	Resistive or Inductive	
Adjustable Ramp Control from Power Up	0-30 seconds	
Control Limit or over current trip	0-100mV dc or 0-25V dc	
Over Current Warning	LED2/LED3 pulse alternately	
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 holes – front side only. Cable glands not supplied.	
Terminal Torque Specs	4.5 to 5.5Nm – Power and earth terminals only.	
Fusing	36kW (63ET) 54kW (100ET) High Speed Semiconductor type fuses	
Working Temperature	65°C (maximum operational)	
Dimensions	232mm (D) x 340mm (W) x 124mm (H) – length is viewed with heatsink fins going top to bottom (see photo)	
Fixing Centres	4 x 6mm ø holes on centres 322mm (W) x 200mm (D)	
Weight	All models 5.2kg	



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FUNCTIONS

Manual Control

The FC36M firing circuit features a 5V DC output, which is designed to supply the clockwise terminal of a 5kΩ potentiometer. The wiper should be connected to the terminal labelled "I/P," while the counterclockwise terminal should be connected to 0V.

Voltage Control

For remote DC signal control, connect the positive input to the terminal labelled "I/P" and the negative input to 0V. The input impedance is 10kΩ for a 0-5V input and 20kΩ for a 0-10V input.

Current Control

To utilise current control, connect a 4-20mA DC signal between the terminals labelled "4-20mA" and 0V. This input can also accept a 1-5V DC signal. The input impedance for current control is 240Ω.

Phase-Angle Control

- **Option 1:** Set the switch labelled SW1 to the "ON" position. This action connects terminal A with the 5V supply.
- **Option 2:** For alternative control (see "Soft-Starting"), switch SW1 to the "OFF" position, isolating the inputs and disconnecting terminal A from the 5V supply. Inputs A and C will then require an external supply between 5V and 24V DC.

Burst-Firing Control

To enable burst-firing control, switch SW1 to the "OFF" position and link terminal B to either the onboard 5V supply or an external 5-24V DC supply.

Phase-Angle to Burst-Firing Transition

For a seamless transition from phase-angle to burst-firing control, switch SW1 to the "ON" position and link terminals A and B together. The firing circuit will initiate in phase-angle mode and automatically switch to burst-firing mode as the control signal ramps up to the set point. It will remain in burst-firing mode even if the signal drops below the set point and will only restart in phase-angle mode when the unit is turned off or reset.

Soft-Start

Upon initial power-up, the FC36M's output is inhibited for 0.5 seconds. The soft-start feature is then automatically enabled, and the firing circuit will gradually ramp up according to the rate set by VR3 (adjustable from 0 to 30 seconds). The ramp time corresponds to full conduction; for example, if the ramp time is set to 30 seconds and the set point is 50%, the controller will reach the set point in 15 seconds.



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INSTALLATION

Cooling Requirements

The standard stack assembly's heatsink temperature rating is calculated under natural cooling conditions. If the unit is installed in an enclosure or cabinet, adequate ventilation and/or forced air-cooling should be provided. Thermal trips are installed on all controllers, and it is recommended to wire them in line with the signal to disable the controller in case of an over-temperature situation.

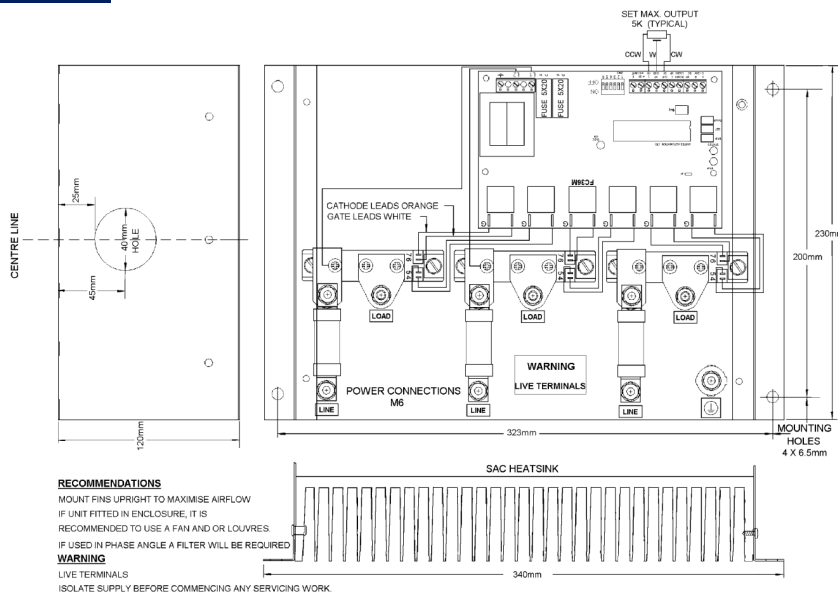
Load Considerations

When ordering, it is crucial to specify the type of load. The DMPR range is engineered with substantial current overload capacity on the power devices, ensuring industrial reliability. The rated currents represent maximum continuous RMS values within the specified temperature guidelines.

Special heating loads, such as those involving molybdenum, platinum, or tungsten, exhibit a hot-to-cold resistance ratio of approximately 10:1, resulting in significantly higher current draw when cold. Inductive loads like transformers also experience surge-starting currents, necessitating the correct type of phase-angle firing circuit. Indicate these surge loads when ordering to ensure that appropriately rated units or slow-start options are supplied to meet specific application requirements.

Max. Heatsink Ambient Temp (°C)	Model (kW)	Max. rms (A)	Model (kW)	Max. rms (A)
30	36	50	54	75
40	36	50	54	75
50	36	50	54	75
60	36	50	54	65

CONNECTIONS



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



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RECOMMENDATIONS

FUSING

It is recommended that fast acting semiconductor type fuses (as supplied) be used for protection. See SRA datasheet X10255 for further information. Other external supplies should be fused accordingly.

CE Marking

This product family carries a "CE" marking. These burst firing type controllers do not require a filter. For information see recommendation section and contact our sales desk. See the Declaration of Conformity.

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
X10322	APC	AC Power Control – Three phase application circuits
X10617		Wiring connection details are attached to the inside of the lid
P01.1	COS	UAL Conditions of Sale

It is recommended that installation and maintenance of this equipment should be done with reference to the current edition of the I.E.T. regulations (BS7671) by suitably qualified/trained personnel. The regulations contain important requirements regarding the safety of electrical equipment. For International standards refer STANDARDS on D of C.

OPTIONAL EXTRAS

Product Code	Product Description
A403001	Manual (5K) Potentiometer Knob and Leads

PRODUCT CODE AND RELATED PRODUCT CODE

Product Code	Product Description
A481831	DMPR3-E-36kW-50A-415v – Three Phase
A481841	DMPR3-E-54kW-75A-415v – Three Phase

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