

X20101

POWER FACTOR CORRECTION | THYRISTOR SWITCHING

PFC2 Series

80kVAR (150A), 100kVAR (150A), 415V
Power Factor Switch – 2-Channel Controller

CONTACT US:

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✉ enquiries@united-automation.com🌐 www.united-automation.com**KEY FEATURES:**

- ✓ **High-Power PFC:** 80kVAR and 100kVAR options for three-phase capacitor banks.
- ✓ **Reduced Inrush Current:** Two-leg solid-state switching minimises inrush and electrical flicker.
- ✓ **Rapid Switching:** Supports fast, repetitive switching without mechanical contacts.
- ✓ **Fan Cooled:** 24V DC fan cooling activates at approximately 55°C.
- ✓ **Thermal & Fuse Protection:** Automatic overtemperature protection and high-speed semiconductor fuses.
- ✓ **Fault Monitoring:** LED indicators and alarm relay provide clear system and fault status.
- ✓ **Flexible Control:** 8–24V DC control input supports multiple configurations.

APPLICATIONS:

Ideal for **three-phase power factor correction** in:

- Industrial power systems
- Capacitor banks
- Welding plants
- Lifts and cranes
- Wind turbines
- High-power capacitive loads
- Rapidly changing power demand applications

Fast switching, low inrush current and reliable power factor correction make the PFC2 ideal for demanding industrial environments.

The **PFC2 80kVAR** and **100kVAR Power Factor Switches** enable fast and reliable control of three-phase capacitive loads for **Power Factor Correction (PFC)**. Designed for 3-wire systems, they use a two-leg control technique to optimise capacitor switching and reduce high inrush currents typical of conventional contactor systems.

These models accept an 8–24V DC control signal and allow rapid, repetitive switching without mechanical contacts, minimising electrical flicker and radio frequency interference (RFI) in industrial applications.

Additionally, the fan-cooled switches feature an automatic reset temperature trip, high-speed semiconductor fuses, and LED status indicators for effective thermal management and fault monitoring.

Enhance your electrical system with the PFC2 80kVAR and 100kVAR Power Factor Switches.

TECHNICAL SPECIFICATIONS

Power/(current ratings):	80kVAR (125A); 100kVAR (150A) @ a typical supply of 415V RMS
Input voltage:	415V RMS +/- 10%
Frequency:	50/60Hz
Control signal input:	8 to 24V DC, Common 0V or Common +VE, Open Collector or Volt Free Contact
Alarm relay functions:	The voltage-free alarm relay is rated for 125V AC @ 2A
LED indicators:	■Green = DC Power ON, ■Red = Fault, ■Orange = Signal enabled, ■Red/Orange = Capacitors discharging
Cooling fan:	24V DC
Fan 'switch-on':	Typically 55 °C
Over Temperature:	Trip in temperature @ 90°C, +/- 1°C (Status LED indicator 'flashes' with ON/OFF rapid pulsing) Trip out temperature @ 85°C, +/- 1°C
Phase loss detection:	Phase loss or Fuse failure orange and red LEDs flash alternately
Status LED Fault condition:	Status LED indicator 'flashes' ON/OFF continuously at 1.5 second intervals
Sensor loss detection:	Status LED indicator 'flashes' ON/OFF continuously in equal intervals.
Power cable terminations:	Supply, Load and Earth 35mm ² rising clamp terminal block.
Power cable size:	80KVAR 35mm ² 100KVAR 50mm ² .
Terminal torque settings:	3.2Nm min, 3.7Nm max (35mm ²) Power terminals only.
Signal cable terminations:	Remote supply Auxiliary alarm (relay) 2.5mm ² rising clamp terminal block Control signal 2.5mm ² rising clamp terminal block
Protection:	IP20
Fusing 80kVAR:	160EET (160A) High-Speed Semiconductor type fuse, or equivalent.
Fusing 100kVAR:	200EET (200A) High-Speed Semiconductor type fuse, or equivalent.
Working temperature:	65°C (maximum operational)
Dimensions:	(80 and 100kVAR) 270mm (D) x 250mm (W) x 130mm (H).
Fixing centres:	4 x 4.5mm-clear keyhole slots on fixing centres 227mm (W) x 200mm (D).
Weight:	(80 and 100kVAR) 5.6kg (Max.)

Note: SAFETY WARNING – Isolate supply before removing cover; Metal parts, in particular the case may get very hot when the unit is fully operational; DO NOT COVER enclosure ventilation slots.

YOU MUST READ THIS BEFORE INSTALLATION

 ELECTRICAL SAFETY	 INSTALLATION REQUIREMENTS	 USER RESTRICTIONS	 USAGE ENVIRONMENT	 HOT SURFACE WARNING
WARNING: RISK OF ELECTRIC SHOCK Always consult the Installation & Maintenance Instructions before connecting this product to the power supply. WARNING: Disconnect Power Before Servicing Ensure the electrical supply is safely disconnected before connecting to any supply, load, or control terminals.	WARNING: Installation by Qualified Personnel Only This product must only be installed or fitted by a competent, qualified installer familiar with the relevant electrical standards and installation practices.	WARNING: Not for Use by Vulnerable Individuals This product is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they are supervised or instructed by a person responsible for their safety.	WARNING: Industrial Use Only This is an industrial-grade product and is not intended for household use.	WARNING: Hot Surfaces On certain models, surfaces marked with this symbol become hot during use. Avoid direct contact and follow all thermal safety precautions.

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Power Factor Switch – 2-Channel Controller

FUNCTIONS

Operation

These solid state capacitor switches are comprised of two anti-parallel thyristor diode modules with appropriate transient protection connected across them. These modules are mounted on a heat sink and are controlled by a microprocessor based trigger module which determines the precise time to trigger the thyristor so as to eliminate any high current switching transients.

The processor monitors the heat sink temperature of both the 80 and 100 KVAR models. It will turn the cooling fan on when the heat sink temperature reaches 55°C. The controller will turn off if the heat sink temperature rises above 90°C and it will reset again when the temperature drops below 85°C.

The switching of the controller is by a control signal from 8 to 24V DC, this can be from an external power supply (J2 EXT). These input signals can be either common positive or common negative.

You can also use the onboard internal DC power supply (J2 INT) which provides a +12V DC output, this can be fed back into the controller into the +VE SIGNAL input via 'voltage free' contacts or semiconductor switches.

The maximum DC voltage present when the thyristors are not conducting can be 150% of the peak mains voltage, so any discharge resistors used should be rated accordingly. Discharge reactors should not be used because the continuous DC voltage that is present would destroy them. It is recommended that discharge resistors are used and that they are designed to meet the peak DC voltages which may be seen in a permanent installation.

Fuse fail Alarm

If the supply or fuse fails in either L1 or L3 inputs, the red fault LED and the orange status LED will flash alternately, if the control signal is turned on during this period, the red fault LED and the relay will energise and remain latched on continuously until the firing card power supply is turned off. The controller must be powered down in order to allow the controller to reset.

Fault delay timer VR1

This allows the power factor load capacitors to discharge before indicating a possible fault condition; the following table shows some recommended settings for various KVAR ratings.

Power (kVAR)	Delay Time (Seconds)	VRI Setting
80	60	3
100	80	4

Over Temperature Alarm

If the temperature of the heat sink reaches 90°C the red fault LED will flash rapidly, the controller and the orange status LED will go off and the fault relay will energise. When the heat sink temperature drops below 85 °C the controller will reset, the status LED will come back on the red fault LED will turn off and the relay will de-energise.

Enable input

The contacts of the enable input must be closed for the controller to operate.

Fan activation 80 and 100 KVAR unit

When the temperature of the heat sink reaches 55°C, the cooling fan is activated, and it will remain on until the heat sink temperature drops below 50°C.

Maintenance

Generally, thyristor switches are maintenance-free, but the following points should be observed;

This controller is equipped with a fan, and it should be checked every two years. If it has become defective, it should be replaced with a fan of the same type.

Generally, the heat sinks should be checked regularly to ensure that the fins are not obstructed with dust or debris; it is worth checking that the thyristor terminals are also free from any pollution.

Continuous over-temperature tripping will be indicated by the normally open contacts of the alarm relay closing; this may indicate that one of the above fault modes has occurred.

INSTALLATION

If the PFC2 controllers are mounted in a control panel they should be mounted in a vertical position with the heat sink fins running top to bottom. Care must be taken to ensure that sufficient cooling is available for the PFC2 power switches; in continuous operation at maximum current the heat sink temperature can reach 90°C. Ensure that the heat sink fins are not obstructed by cables or ducting and that the controllers are not fixed directly above one another. Ensure the cabinet is cooled sufficiently to avoid the controllers tripping on over temperature, they will reset when the temperature drops below 85°C but they will be out of action for that period of time.

Maximum dissipated heat:-

1 x PFC2 controller 80KVAR at 400V AC, 2 x116A is approximately 210W.

1 x PFC2 controller 100KVAR at 400V AC, 2 x144A is approximately 260W.



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COOLING REQUIREMENTS

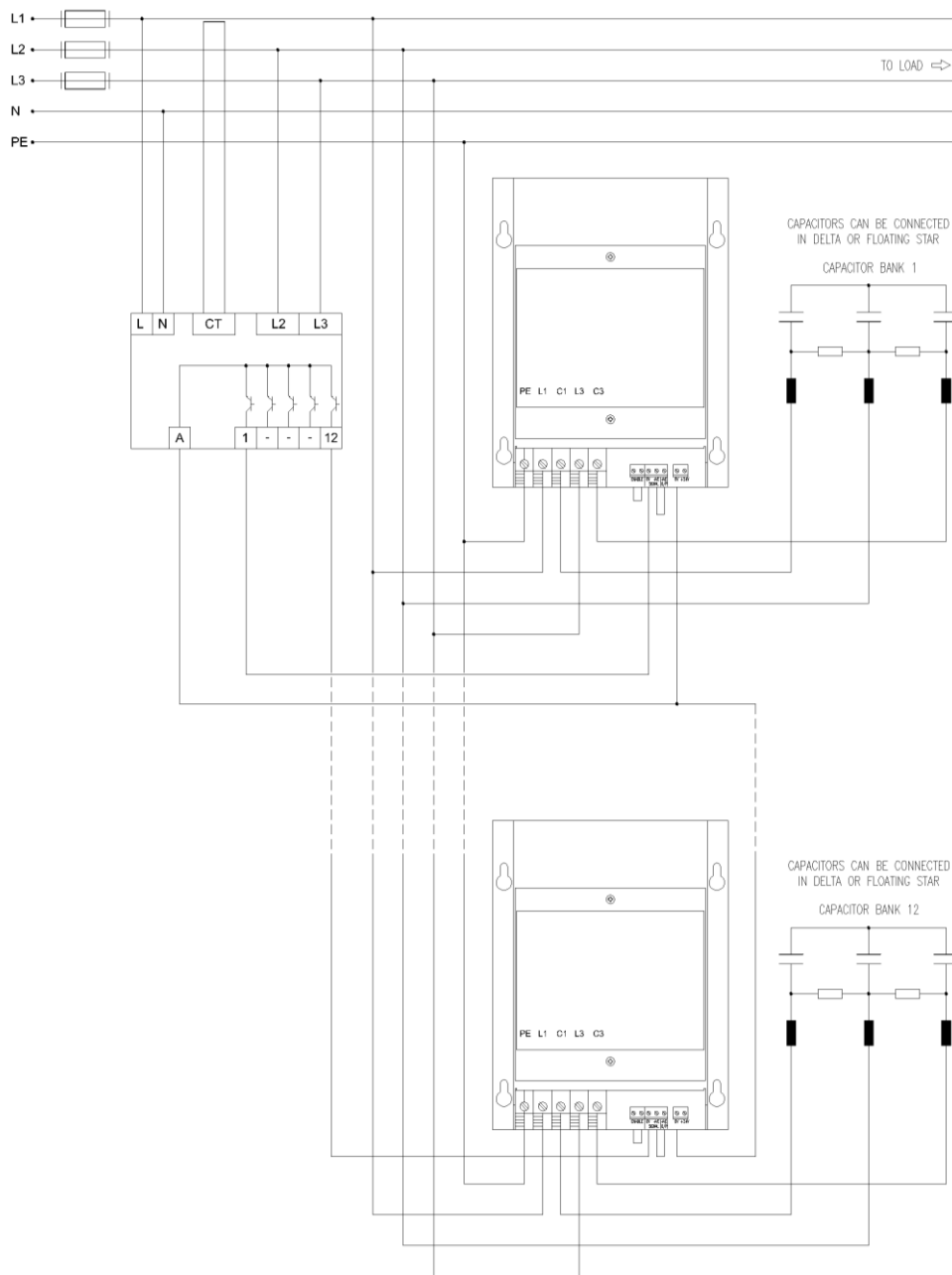
This robust stack assembly has an operational temperature of 65°C when naturally cooled and has a built in 90°C over temperature trip on the heatsink as a safety feature. The unit should be mounted vertically, with heatsink fins aligned top to bottom, and with sufficient surrounding air space to maximise natural convection cooling. If the unit is mounted in an enclosure or cabinet, adequate ventilation and/or forced air-cooling should be fitted. These controllers have a fan which is normally off, but automatically turns on at high heatsink temperatures (see SPECIFICATIONS – Fan switch-on and over temperature).

CONNECTIONS

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

NOTE: The controller is factory set for an internal power supply. For alternative 'voltage free' alarm supply details see *Functions* section. Please contact our Technical support for further details.

Connection Diagram Fig.1
FOR SWITCHING A COMMON OV SIGNAL



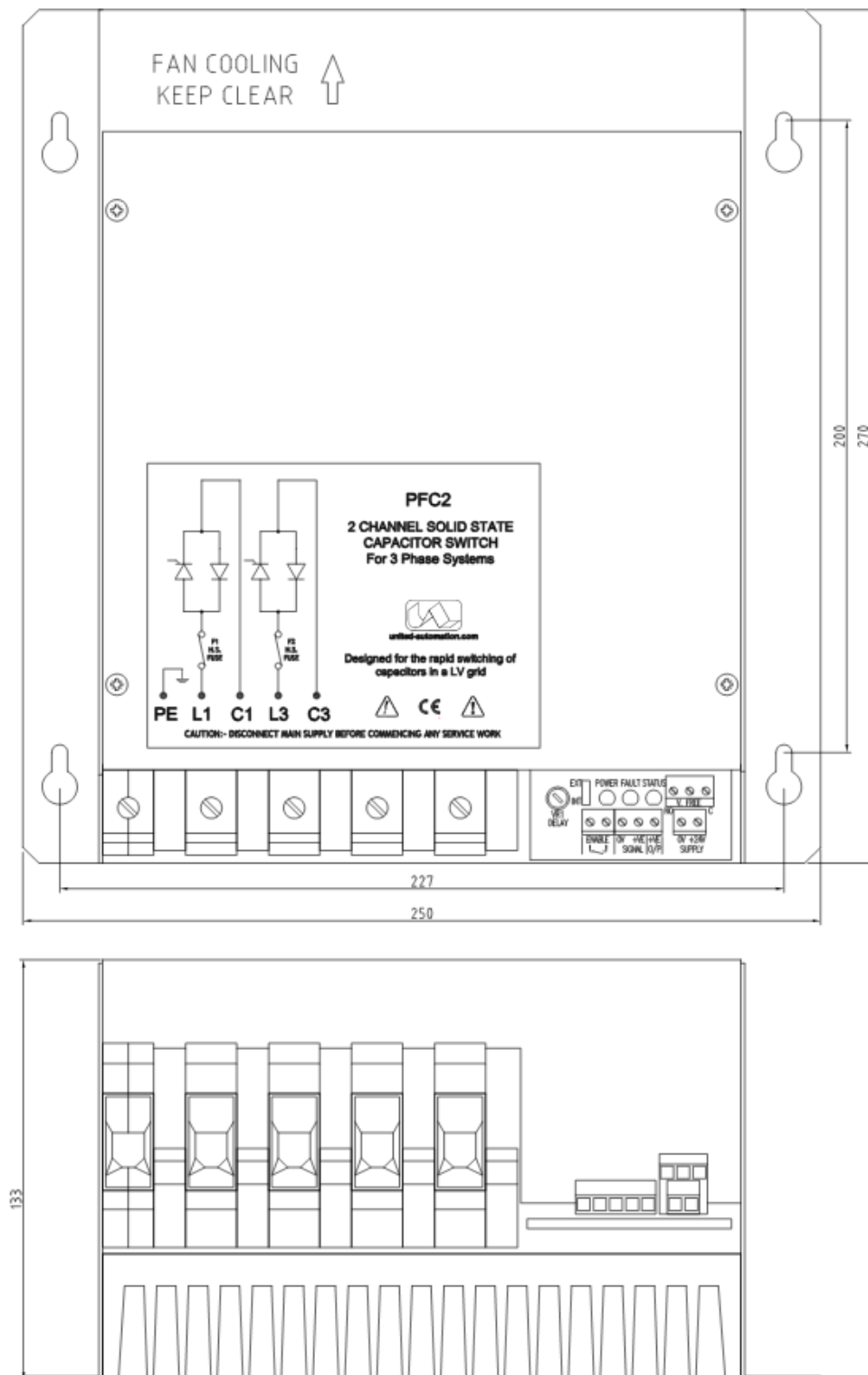
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Mechanical drawings

Fig. 2

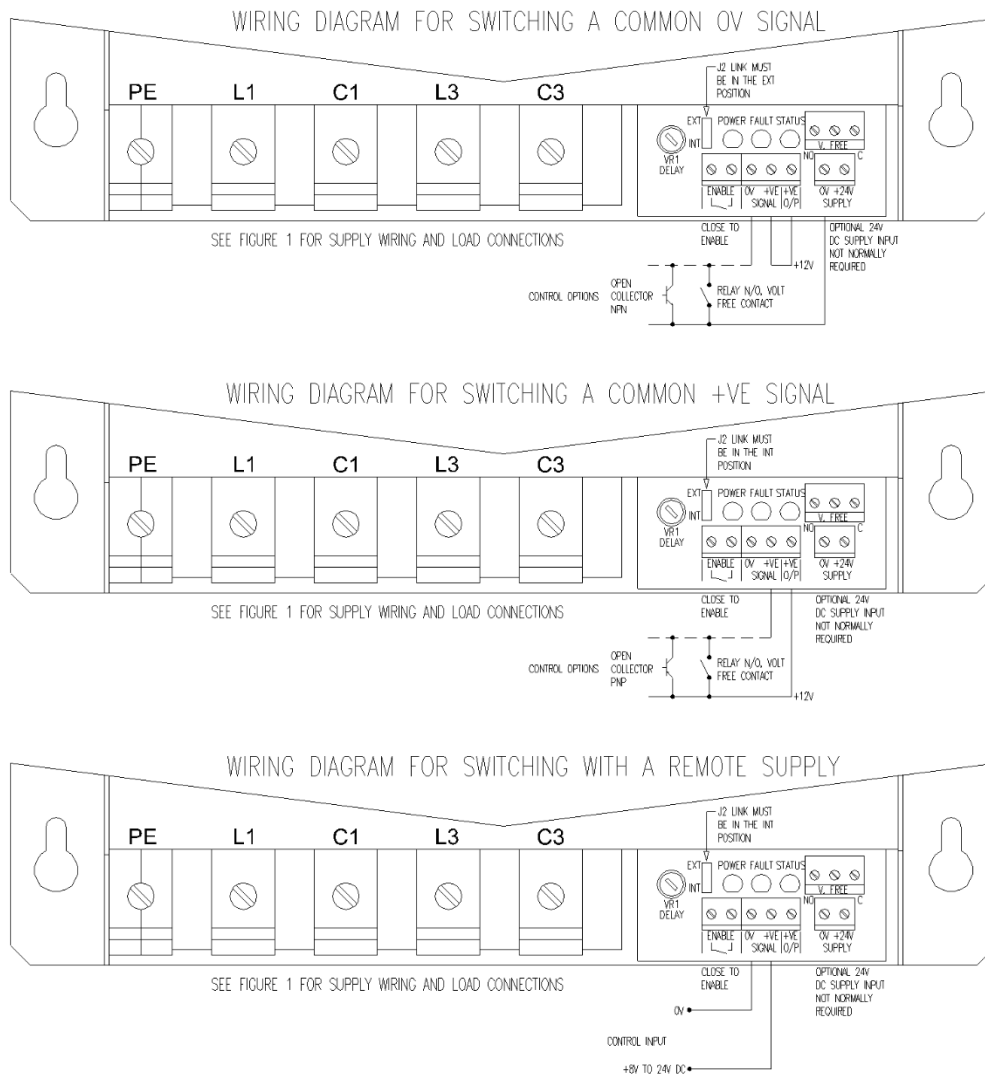


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Control Options – Fig. 3



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RECOMMENDATIONS

FUSING & OVER TEMPERATURE

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

CE Marking

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

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
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
Available on request	Spare HS fuses: 160EET (160A) or 200EET (200A) SCR-type

PRODUCT CODE AND RELATED PRODUCT CODE

Product Code	Product Description
A418303	PFC2 80kVAR, 125A, 415V, 2/3rds control - Three Phase
A418304	PFC2 100kVAR, 150A, 415V, 2/3rds control - Three Phase

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