3P Technik

PC3S Pump Starter Panels

Installation & Operating Manual

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Installation

Safety

Mains Voltage – There are exposed electrical conductors inside this appliance. This appliance must be installed and serviced by a competent electrical technician to the current requirements of BS7671 and IEEE recommendations. Before servicing this appliance, normal safe isolation procedures should be implemented.

Do not touch the PCB while energised, it carries mains voltage.

Do not touch any connection terminals while energised.

Do not attempt to service this item when wet, or in a wet or high humidity environment.

If the housing of the control panel becomes damaged, you must shut down and securely isolate this appliance immediately.

You must connect this appliance to a grounded 4 wire supply, protected by suitable overcurrent and residual current protection. Connected pumps are earthed via the control panel, and may otherwise become live.

If the power cables are damaged, either to of from the controller then shut down and isolate this appliance.

The combined loading of pumps connected to this appliance must not exceed the rating of the thermal overload in this device. Contact the manufacturer for advice if you need to exceed this rating.

If you need to replace any of the component inside this device, refer to the manufacturer for advice.

Note – The 24v transformer in this appliance is powered by 2 phases of the 400v primary circuit. This means the voltage at terminal 0v on the transformer is only 0v relative to the other phase at the 400v terminal and is not 0v relative to ground or earth (they are both live).

We recommend that the product and it's installation should be fully tested after installation and be inspected and tested periodically thereafter.

Included Components

1 x Control Panel
1 x GSM Remote Control Module (optional)

Model Numbers

First 4 digits – PC3S – Pump Control 3 Phase Starter Single Pump (Direct-On-Line starting up to 5.5kw)
Digits 5 - 7 – Current Rating in Amperes
Additional Digits

- C – Additional undercurrent protection (dry run detection where no float switch can be used)
- T – Additional scheduling timer (7 day programmer)
- GSM – Optional GSM module for remote start/stop and fault reporting
- R1 – Remote panel via radio 1km range
- R16 – Remote panel via radio 16km range

Layout

The PC3S panel is designed to be wall mounted.

You will need to consider the following constraints,
The control panel cannot be mounted outside, it is splash resistant but not suitable for long term exposure.

Voltage drop will affect the cable size needed to take power to your pump. It is strongly recommended that you calculate voltage drop for cable runs in excess of 20m. Failure to do so may result in cable overheating, conductor migration, and risk of fire.

Also note that all control cabling (GSM module and float switches) beyond a few metres and installed in electrically noisy environments may need to be shielded to avoid false switch detection or unstable behaviour.

Do not install control cabling next to mains power cables, particularly over long distances. Adequate separation from power cables will reduce potential problems. Where control cabling must cross mains wiring it should be done at right angles and kept to a minimum.

It is expected that the installer is suitably competent with regard to electrical installation, and the provisions of and testing in accordance with the current regulations in force in your area. It is also expected that the installer is competent to install, validate and resolve any issues with regard to control cabling.

Control Panel Mounting

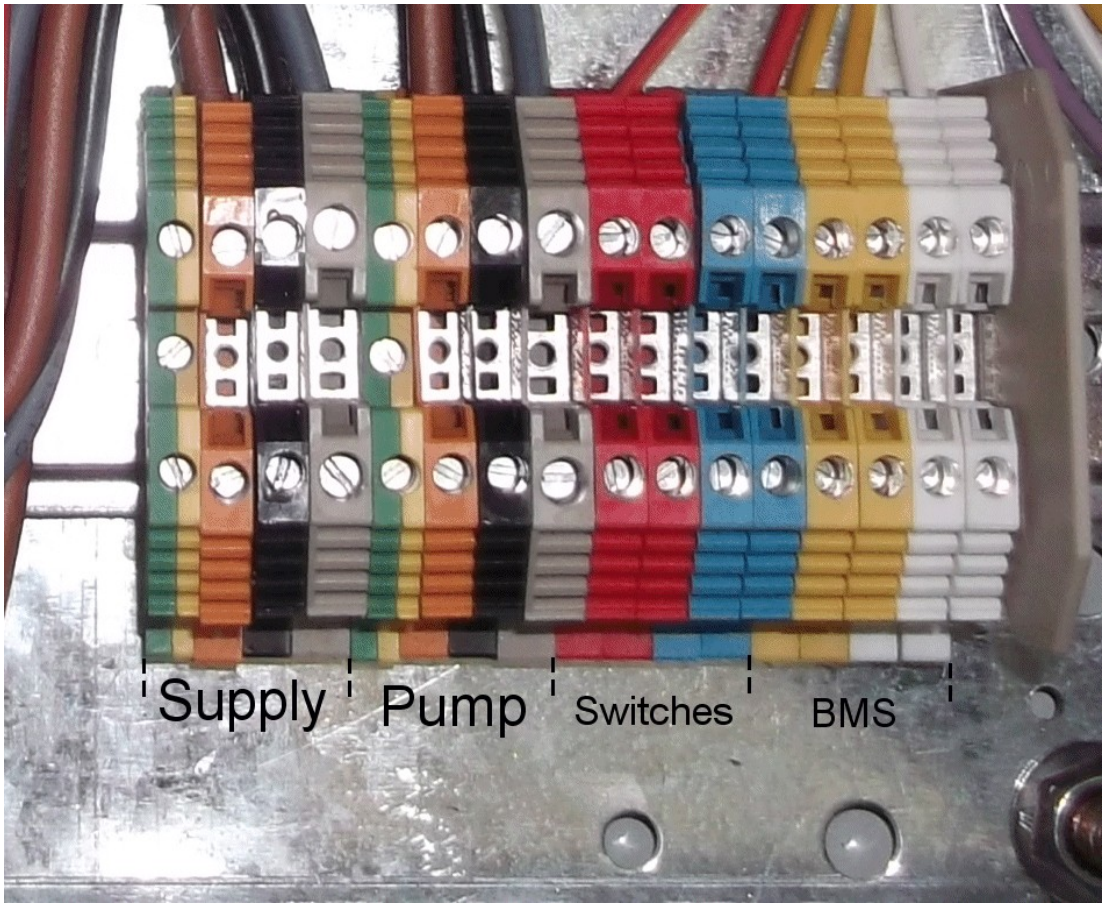
Having selected a suitable location, unlock the front door of the panel and locate the 4 drilled holes which are initially blocked with plastic plugs. Remove the plugs and mark suitable drilling locations on the wall. Drill and fix the panel using appropriate fixings for the wall type you are attaching to.

Mains Power Connection

The power supply to the control panel enters via a the larger cable gland on the bottom of the housing. Insert the cable, connect to the incoming power terminals (first 4 from the left) and tighten the cable gland. If using armoured cable, remove the cable gland and replace with a gland suitable for armoured cable, use a step drill to enlarge the hole if needed.

Terminal colours are

- Green/Yellow – Earth
- Orange – L1 (Brown wire)
- Black – L2 (Black wire)
- Grey – L3 (Grey Wire)



Pump Power Connection

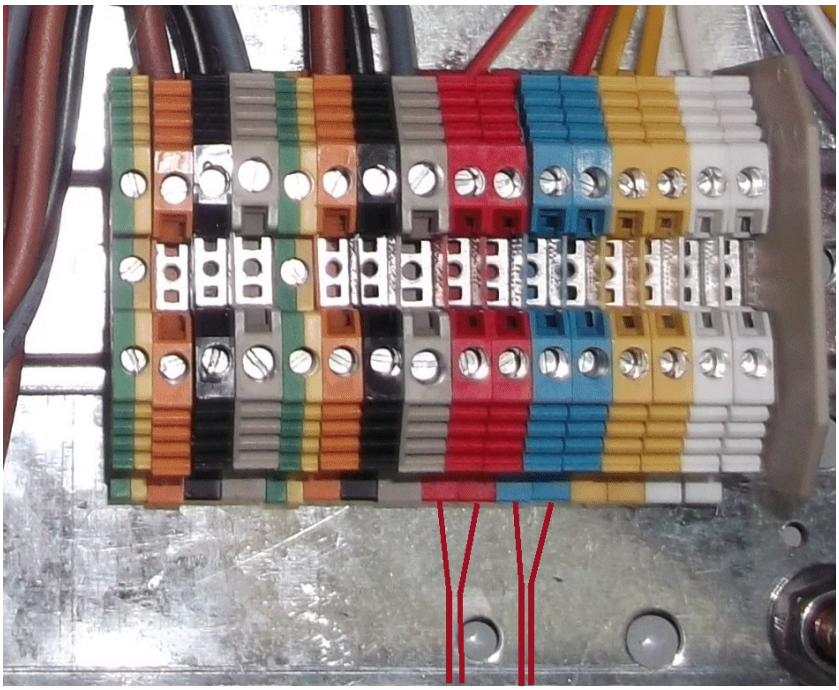
The Pumps is powered from the terminals next to the incoming power. These use the same colour coding as the incoming power terminals.

Float Switch/Pump Control connections

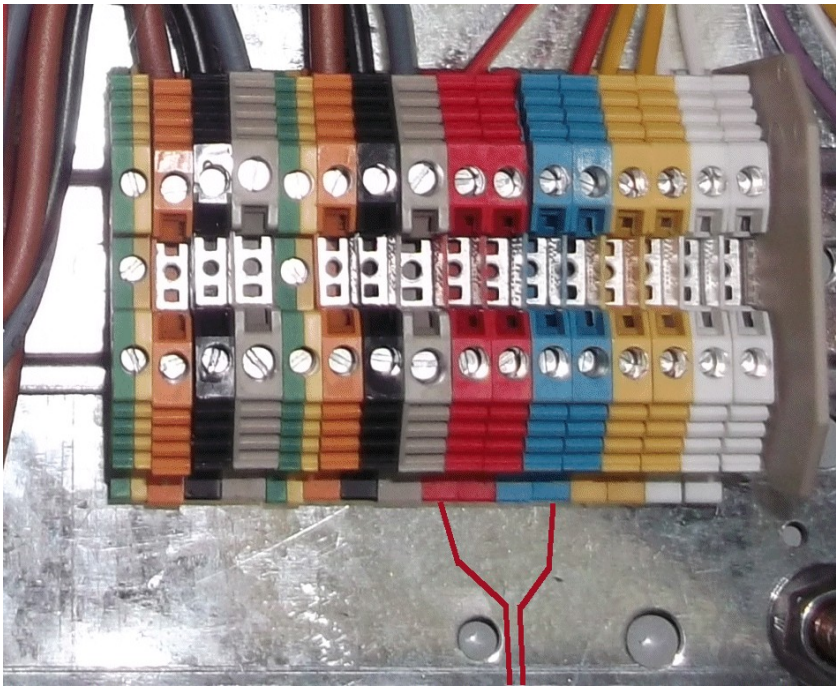
There are 2 connection points for pump control switches. Either a single or 2 devices may be connected to activate the pump and both must be closed in order for the pump to run. These may be a float switch, pressure switch, , switch, timer, or any combination of 2 such devices.

A float switch is usually required in all installations to stop the pump from running dry. Panels with undercurrent protection (C versions) may omit the float switch if the dry run shut off by undercurrent detection has been correctly tested.

Where a system is supplying a distribution main under direct pressure to float valves or taps, you will need to use one of the inputs with a pressure switch to avoid running the pump against a closed outlet as without movement of water the pump would otherwise overheat, as well as being uneconomical. A pressure switch should be set to shut off well within the maximum pressure rating of the pump for efficient operation, we recommend about 75 to 80%.



If only a single device is used then ignore the centre 2 terminals and connect across the outer 2 terminals as shown below.



BMS connection

The BMS connection provides a non-voltage relay capable of switching any 230V source up to 10A. Four contacts are provided, a pair which closes when an alarm occurs and a pair which opens when an alarm

occurs. They can e used to trigger an alarm input to a BMS system, activate another device such as a sounder, strobe, or a backup pump system via a suitable contactor. Or using the normally closed terminals this output can also be used to inhibit another device such as process equipment or other pump systems.

Terminal colours are as follows

Yellow – Normally Open
White – Normally Closed

GSM Module (Optional)

The GSM module connects with 2 wires, one is pre-wired and connected to a waterproof plug at the bottom right of the panel. This provides the power and control signals which activate the pump.

The second cable contains 2 wires which relay the fault signal from the panel to the GSM module. Connection is optional but provides the ability for the panel to send a fault signal to a mobile phone via text message. Connect this to the yellow terminals inside the panel.

The power output to the GSM module is 15vdc on the red and black wires.

Troubleshooting

Refer to the Safety instructions. No electrical works should be carried out other than by an appropriately qualified Electrician. Permits to work may be required at local site conditions. If in any doubt, consult your system supplier.

Problem	Probable Cause	Solutions
Fault light comes on almost immediately, voltage relay shows red light.	Check phase rotation of incoming power	
Fault light comes on after a delay of several seconds once powered. Voltage relay shows red light.	Incorrect voltage	Check incoming voltage
Fault light comes on several seconds after pump is run, Voltage	Inadequate supply cable size, or low supply voltage.	Check connection and supply impedance.

relay shows red light.		
Fault light comes on several seconds after pump is run, Thermal overload has tripped.	Phase missing Pump stalled or bearings failing Thermal overload not set correctly for pump Oversized pump	Check supply wiring and contactor Test pump and replace if necessary Adjust thermal overload correctly Replace pump with correct rating
Pump run light is on but the pump does not run	Not connected correctly Contactor failed	Check pump connection to control panel Test contactor, replace if necessary

Terminals (left to right)

Terminal	Function	Colour
1	Supply earth	Green/Yellow
2	Supply L1	Orange
3	Supply L2	Black
4	Supply L3	Grey
5	Pump earth	Green/Yellow
6	Pump L1	Orange
7	Pump L2	Black
8	Pump L3	Grey
9	Float Switch 1	Red
10	Float Switch 1	Red
11	Float Switch 2	Blue
12	Float Switch 2	Blue
13	BMS NO	Yellow
14	BMS NO	Yellow
15	BMS NC	White

16	BMS NC	White

Setting up the GSM control module

The GSM module (if fitted) is supplied with 3m of cable allowing it to be situated away from the panel in a location likely to receive a signal. Do not attempt to shorten the shielded cable with the plug on the end unless you are competent with soldering. Both cables can be coiled if needed without affecting operation as long as they are sufficiently separated with mains power cabling (at least 300mm).

For operation refer to the attached GSM module instructions. The unit has been pre-configured with the following settings.

Password	1234
Unit Identity	PUMP1
Output 1 Name	PUMP
Output 2 Name	STOP
Delay SMS on input activation	60 seconds
Output on time	2 seconds

You will need to set the following settings

Input1 number to text	Up to 5 phone numbers for fault notification
Number to text on power failure	Up to 5 phone numbers for power failure notification

We recommend using a contract sim card to avoid failures due to running out of credit.

Operation

Safety Considerations

Mains Voltage – There are exposed electrical conductors inside this appliance. This appliance must be installed and serviced by a competent electrical technician to the current requirements of BS7671 and IEEE recommendations. Before servicing this appliance, normal safe isolation procedures should be implemented.

Do not touch any components while energized, most parts operate at mains voltage.

Do not touch any connection terminals while energised.

Do not attempt to service this item when wet, or in a wet or high humidity environment.

If the housing of the control panel becomes damaged, you must shut down and securely isolate this appliance immediately.

You must connect this appliance to a grounded 4 wire supply (3P+PE), with suitable circuit protection. Connected pumps are earthed via the control panel, and may otherwise become live.
If the power cables are damaged, either to or from the controller then shut down and isolate this appliance.

Do not exceed the rated capacity of the control panel by upgrading the overload or contactor, the wiring within this appliance is sized for the rating originally supplied. Contact the manufacturer for advice if you need to exceed this rating.

Description of Operation

This product is designed to control the activation of a 3 phase pump with Direct-On-Line (DOL) starting, operation triggered via external switch (usually a float switch), with protection for thermal overload (motor stall), phase failure, incorrect phase rotation, and incorrect voltage on one or more phases.

It is also available with the ability to enable or disable operation from any mobile phone via text messaging, or with an additional control panel located remotely via a radio link with range up to 16km.

For enhanced safely all lights and switches at the front panel and external switches run at 24vac.

Control Panel Operations

The control panel has 3 modes of operation selected by the front panel switch.

Hand – Operates the pump by hand. In this position the pump is on regardless of the state of any switch inputs or GSM controller. Use this setting only when needed to test the pump and do not leave the system in this mode unattended.

Off – Stops all operation regardless of switch inputs or GSM module.

Auto – Operates the pump automatically based on connected switches (float switch etc) and GSM module. When in this mode GSM enabled versions will not operate until a text message has been sent to switch the pump on (see GSM module manual), once this is done operation is the same as a non-GSM enabled unit until a command is sent to switch the system off.

Warranty

All products are covered by a 12 month limited RTB (Return To Base) warranty against materials and manufacturing defects from the date of purchase. The warranty does not cover malfunctioning due to a failure to properly install and / or commission the product in accordance with the installation instructions. The warranty does not cover modification, physical damage or misuse, or operation outside of the products electrical or environmental limits. The warranty is limited to the repair, replacement or cost of replacement of the product at the discretion of 3P Technik UK Limted and does not cover inconvenience or consequential losses. We do not guarantee continuity of operation of any product under any circumstances. For full details see 3P Technik UK Limited terms and conditions.

Specifications

Control Panel

Dimensions	300mm x 300mm x 150mm
Supply Voltage	400 Vac 50Hz 3 phase
Power Consumption	25w max (excluding pump)
Operating temperature range	0 to 40 degrees Celsius
Ingress Protection	IP65
Electrical Insulation	Class 1