

Fire Pump Remote Alarm Panel

INSTALLATION, COMMISSIONING AND MAINTENANCE MANUAL

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2	Global relay contact operation amended	NH	23/09/05
3	Monitored contact description amended (section 7)	NH	11/10/07
4	Correction of typographical error in section 11.0	NH	08/01/10



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1.0 Fire Pump Remote Panel Overview

The Protec Fire Pump Remote Panel monitors the 'state' of pumps and reports this status via front panel indicators. Remote units can be connected using the 4-wire communications interface.

The Protec Fire Pump Remote Panel main features are:

- Fabricated in a robust metal enclosure.
- Eight monitored inputs.
- All inputs are fully monitored for open or short circuit wiring faults.
- Well defined front panel indications continuously showing the state of the system (activation's and faults).
- Internal buzzer for audible indication of system activation's and faults.
- Activation's and faults are muted or reset by operation of a front panel key-switch.
- The front panel key-switch can be used to test all the front panel indications and the internal buzzer.
- A clean contact output per input, for connection to other equipment. Configurable for operation on input activation or input fault.
- A global clean contact output, for connection to other equipment. Configurable for operation on any input activation or any fault.
- Fully monitored, battery backed power supply, providing 24-hour backup in case of a mains power failure.
- Up to three serial repeat panels can be connected. Each providing full display and control functions in remote parts of a site.
- Comprehensive self-checking features ensuring all critical parts of the panel are operating correctly.

Note: Due to a policy of continuous improvement, Protec Fire Detection PLC reserve the right to alter the specification without prior notice.

2.0 Important Notes – PLEASE READ

- **THE FIRE PUMP REMOTE PANEL AND ITS ASSOCIATED CONNECTIONS MUST BE INSTALLED, COMMISSIONED AND MAINTAINED BY SUITABLY SKILLED AND COMPETENT PERSONNEL.**
- **THIS EQUIPMENT MUST BE EARTHED.**
- **THIS EQUIPMENT IS NOT GUARANTEED UNLESS INSTALLED AND COMMISSIONED IN ACCORDANCE WITH CURRENT NATIONAL STANDARDS.**
- **CE THIS EQUIPMENT HAS BEEN DESIGNED AND MANUFACTURED TO CONFORM WITH THE REQUIREMENTS OF ALL APPLICABLE EU COUNCIL DIRECTIVES.**
- **THIS MANUAL MUST BE THOROUGHLY READ AND UNDERSTOOD BEFORE THE INSTALLATION AND COMMISSIONING OF THIS EQUIPMENT IS UNDERTAKEN.**

3.0 Items Supplied with the Fire Pump Remote Panel

Within the packaging with the Fire Pump Remote Panel is a mounting template and an accessory pack.

The Accessory Pack, comprises:

- 8 x 6k8 monitored circuit end of line units
- 8 x 2k2 monitored circuit series units
- 1 x red battery lead
- 1 x black battery lead
- 1 x 1A HRC Mains fuse (FS1)
- 1 x 1 Amp F battery fuse (FS2)
- 1 x M4 Allen key

4.0 Cabling Requirements

4.1 General System Wiring Requirements

All external wiring associated with the system must conform to the current I.E.E Regulations and cabling must conform to the relevant BS specifications.

ECA recommended Cable Separation for Electromagnetic Compatibility in Buildings must be followed.

To comply with EMC regulations Protec recommends the use of screened cabling throughout the installation. The screens must be securely connected to the screwed earthing studs provided inside the enclosure.

Proper glanding of the cable is vital for the correct performance of the system.

4.2 Mains Wiring Requirements

The panel requires a dedicated mains supply that uses fixed three core wiring (between 0.75mm² and 2.5mm²) which is routed from an isolating fused spur, fused at 3A.

Unauthorised operation of the mains supply should not be allowed and the fused spur should be labelled "DO NOT SWITCH OFF"

Important Note:

Do not connect the mains wiring to the panel until all other connections (input wiring, clean contact wiring and serial repeat panel wiring) have been checked.

5.0 Installation Procedure

The Fire Pump Remote Panel circuit boards are housed in a metal enclosure. The display board is mounted on the rear of the metal front plate.

The panel can be surface or flush mounted (a bezel is required for flush mounting).

The panel must be located internally in an area that is not subject to damp, extremes of temperature or physical abuse. The environmental limits are given in section 12.0

- 1) **Unpacking**
After opening the box remove the installation template from the packaging, leave the panel in the cardboard box for protection.
- 2) **Preparing the Mounting Position**
Use the installation template in conjunction with a level to mark out the fixing locations for the panel. Drill and plug the marked locations.
- 3) **Removal of the Main Board.**

NOTES ON ANTI-STATIC HANDLING OF THE PCBs

Before handling any of the circuit boards in the panel it is vital that any operatives discharge themselves of any build up of static charge. This is done by momentarily touching a solid earth point (a non-painted part of a radiator, for example).

Handle the PCB by its sides and DO NOT touch any of the electronic components.

The PCB should be stored in a clean, dry place away from the place of work.

Disconnect the 20 way display board ribbon cable from the main PCB take care not to strain the PCB during the removal.

Remove the supplementary earth cable from the mains terminal block.

Unscrew the six posi-drive screws on the main PCB and remove it. The PCB, screws and washers and the power supply insulation sheet should be placed in the cardboard box for protection.

- 4) **Preparing and Fixing the Unit**
Using the installation template, mark out suitable positions for cable entry on the back or top of the enclosure (not behind the main board or battery locations). The mains cable entry position should be kept away from other system cabling.

Cut out the cable entry positions and mount the enclosure at the position prepared in (2) whilst feeding the cables into the enclosure.

Ensure that all metal swarf and debris is completely removed from the enclosure before refitting the PCBs.

5) Refitting of the Main Board.

Note: Do not over-tighten any screws.

Carefully replace the power supply insulation sheet removed in (3).

Replace the main PCB and secure with the six posi-drive screws removed in (5) take care to replace the metal washers on the top right mounting correctly. This uses a metal washer to provide earth connectivity.

Carefully reconnect the 20 way display board IDC plug to the main PCB.

6.0 Testing of Cabling Prior to Connection

Before connecting any external cables to the panel, tests must be carried out using a 500V DC. insulation tester (Megger™). The readings between each cable core, and each core and earth should be greater than 10MΩ.

Important Notes:

- Equipment connected to the cabling during insulation tests could be damaged with the high voltages used during the test.
- The panel **MUST NOT** be connected when high voltage insulation tests are being performed on the cabling, the cabling **must** be completely discharged prior to connection to the panel.

7.0 Monitored Circuit Connections

Eight monitored inputs (zones) are provided for connection to volt free contacts of ancillary equipment (typically a pump unit).

The contacts must be normally closed (short circuit) when the pump is not operating, and switch open (open circuit) when the pump operates.

Figure 7.0 shows the recommended method of connecting a zone to the pump contacts.

To ensure the wiring from the Fire Pump Panel to the remote pump is fully monitored this network should be connected at the remote pump end.

NOTE 1: All unused zones must be terminated with a 2k2 resistor.

NOTE 2: The negative connection of all zones is common.

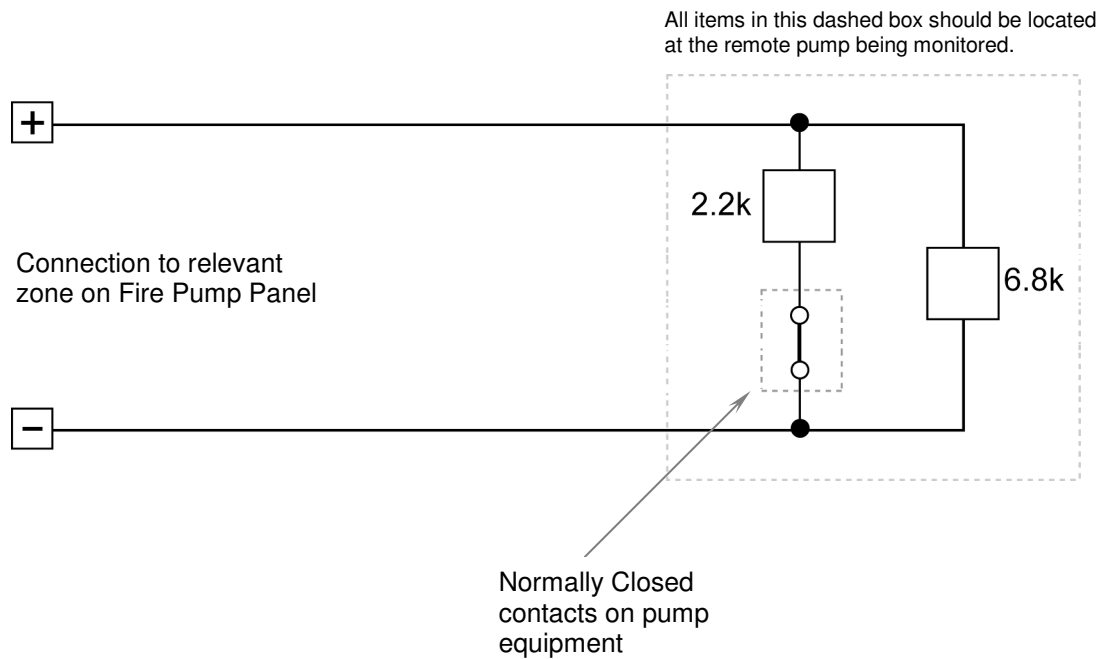


Figure 7.0 Monitored circuit connections.

8.0 Repeat Panel Wiring

The panel has an in built repeat panel port, designed to be connected to up to three serial repeat panels.

The port has four connections on the terminal block on left of the main board. These are:

1. +24V (fused at 100mA, self resetting (when power is removed), non-monitored)
2. 0V
3. Data +
4. Data -

Repeat panel wiring should be in screened cable to ensure compliance with relevant EMC regulations. Figure 8.0 shows an installation with two repeat panels.

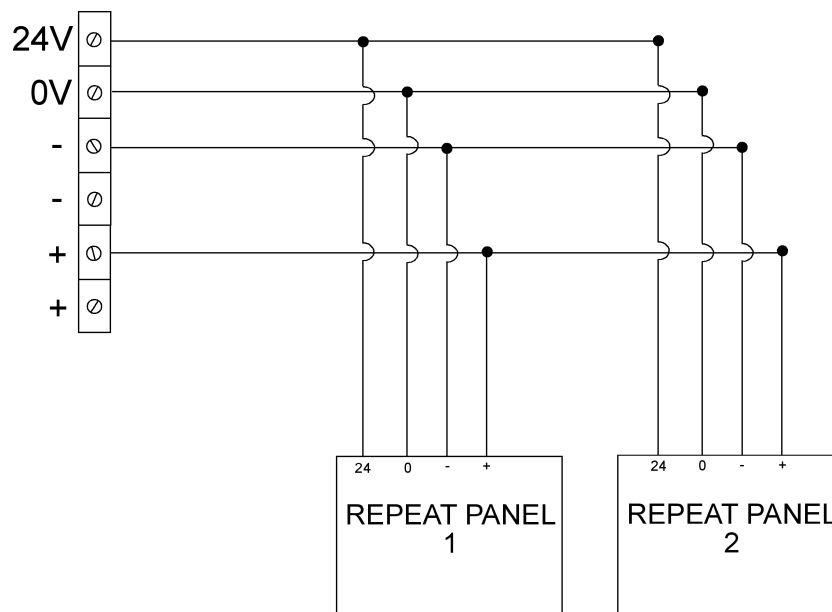


Figure 8.0 Typical Repeat Panel Installation.

9.0 Commissioning the Panel

9.1 Connecting the Mains

Important Notes:

- The on-board power supply uses lethal Voltages, take **extreme** care when the panel door is open and the PCB exposed.
- Pay particular attention that the earth cable is firmly connected to the earth terminal of the power supply, and that the earth strap from the power supply PCB to the main panel metalwork is sound.

After making and checking the connections to the control panel detailed in previous sections, the power supply may be connected.

After ensuring that the fused double pole isolator is in the 'OFF' position, connect the incoming mains cable to the appropriate terminals on the power supply PCB.

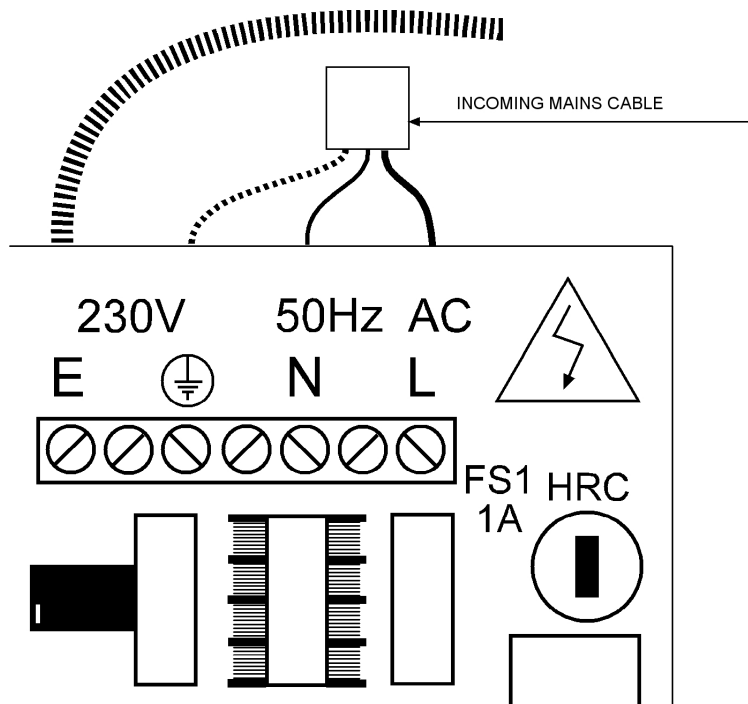


Figure 9.0 Power Supply Terminal Details

9.2 Connecting the Battery

As the system will not power up without first being connected to the mains supply, it is safe to connect the battery.

Connect a new and fully charged 12V 1.2Ah Valve Regulated Sealed Lead Acid Battery (SLA) as shown in figure 9.1

NOTE: Check battery polarity before connecting the leads to the battery.

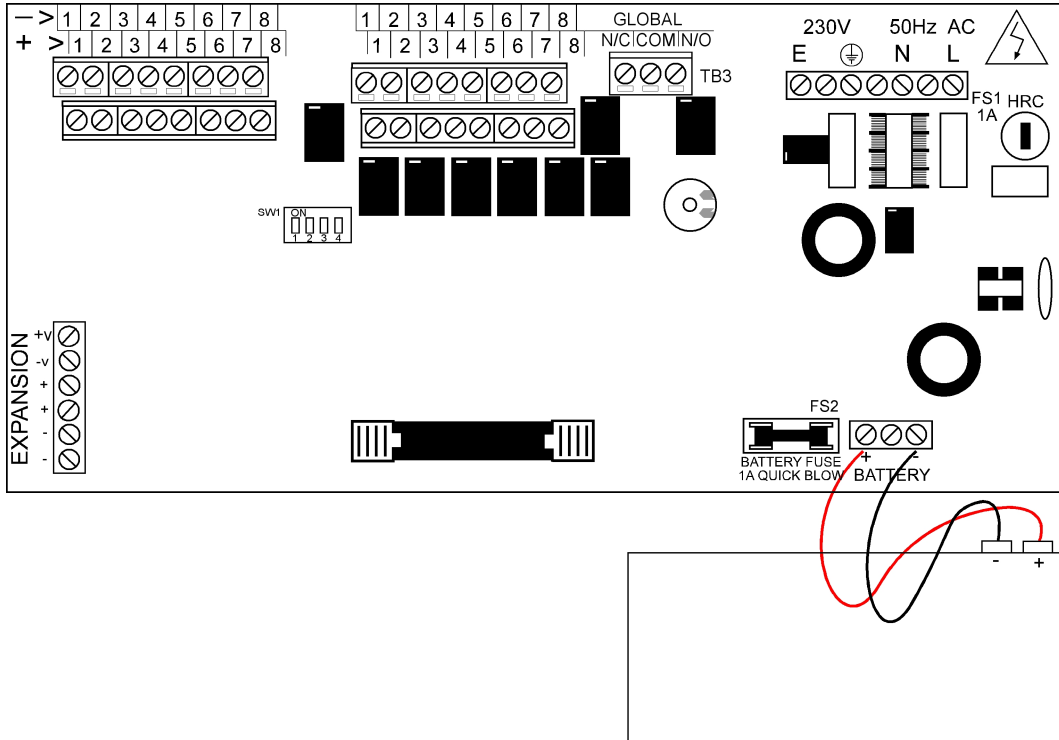


Figure 9.1 Installation of Standby Battery

9.3 Switching On

Switch the fused isolator to the 'ON' position. The 'Supply Present' indicator will illuminate on the front of the panel and, assuming all other connections are correct and the end of line units are present (and the correct value), no faults will be displayed.

Note that Operating Instructions are printed on the front of the equipment.

10.0 Configuring the Panel

The panel has a four way DIL Switch (SW1) located toward the centre of the main board (see appendix 2). This switch is used to configure the panel settings.

10.1 Configuring the number of repeat panels on the system

The number of repeat panels connected to the main panel must be set-up when commissioning the system. The maximum number of repeat panels allowed is three. Switches 1 and 2 of the configuration switch are used, as shown in figure 10.0.

A separate instruction leaflet is supplied with Repeat Panels for configuration.

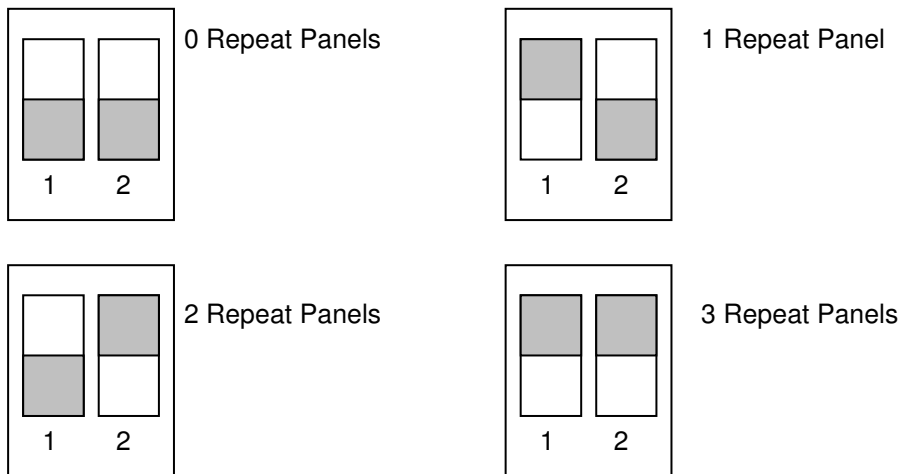
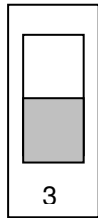


Figure 10.0 SW1 settings for setting up the number of repeat panels on the system

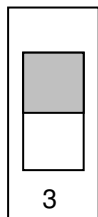
10.2 Configuring the clean contact relay operation

The panel's eight clean contact relays are for connection to ancillary equipment. Each relay operates with respect to its monitored input (i.e. relay 1 is activated by monitored input 1).

The relay operation is set-up on element 3 of SW1.



Relay contacts operate on zone activation.



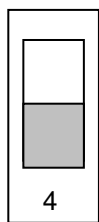
Relay contacts operate on zone fault (open or short circuit).

Figure 10.1 SW1 settings for Relay Contact Operation

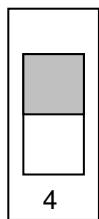
10.3 Configuring the global clean contact relay operation

The panel's global relay contacts may be configured to operate on either a global activation, or a global fault. When global activation mode is selected the global relay is normally de-energised and then energises on any zone activation. When global fault mode is selected the relay is normally energised and de-energises on any panel fault.

The global relay operation is set-up on element 4 of SW1. As shown in figure 10.2



Global relay energises on any zone activation.



Global relay de-energises on any zone fault, a PSU fault, a system fault or a repeat panel fault.

Figure 10.2 SW1 settings for Global Relay Contact Operation

11.0 Fault Rectification Guidelines

Fault	Suggested Action
Monitored zone open / short circuit fault.	Disconnect the wiring to the faulty zone and re-connect the end of line unit directly at the terminals. If the zone fault clears the zone wiring should be thoroughly investigated, and any faults rectified.
System fault	An internal software fault has been detected. Reset the panel by turning the key-switch to the reset position for three seconds. If the fault re-appears within 2 minutes the main board is suspect and must be replaced.
Repeat panel fault	A repeat panel has been detected as missing or faulty. Check all repeat panels to ensure their address switches are all correct (set from address 1 onwards). If so, determine which repeat panel is missing or faulty and rectify the problem on that repeat panel.
Power supply fault	<p>A fault has been detected in the power supply, charger or battery.</p> <p>Verify the integrity of the mains input. If it is acceptable, check the mains fuse (FS1) has not ruptured (if it has, replace it with a 1A HRC 20mm).</p> <p>If no problems are found with the mains input and fuse, remove the battery and measure the DC Voltage across the battery terminals on the main board. If the voltage is below 13V the main board is suspect and should be replaced.</p> <p>Replace the battery with a new one of the same type, if the power supply fault returns after 3 minutes the main board is suspect and should be replaced.</p>

12.0 Technical Specification

Power Supply Mains	230V AC. Nominal (+/-10%).
Integral Charger	500mA switch mode, 150mA battery charge current. Batteries monitored for disconnection, failure and deep discharge.
Maximum Battery Size	12V 1.2Ah.
Battery Standby Time	24 Hours (Mains failure, no activated zones, buzzer slow pulsing, General and PSU Fault indicators illuminated)
Mains Fuse	1 Amp HRC Ceramic 5 x 20mm
Battery Fuse	1.6 Amp F 20mm 5 x 20mm
Working Voltage	10V to 15V DC.
Current Consumption	30mA (12V supply, mains failure, no activated zones, buzzer slow pulsing, General and PSU. Fault indicators illuminated)
Number of Monitored Zones	8
Maximum Zone Cable Resistance	15Ω per conductor.
Monitored Zone EOL Resistor Value	6.8kΩ ¼ W +/- 5%
Series Contact Resistor Value	2.2kΩ ¼ W +/- 5%
Repeat Panel Communications	2 wire Communication + 2 wire Power.
Temperature Range	0 to 40 degrees C.
Humidity Limit	85% Non-Condensing.
Environment	Meets IP30 if mounted in a dry position that does not exceed the temperature and humidity limits.
Mounting	3 points surface mount.
Ability to Accept Repeat Panels	Up to three Repeat Panels may be connected to provide a full main panel display mimic from remote areas. No extra drivers are required to run the repeat panels.

Appendix 1 Spares List

<u>Spare Description</u>	<u>Protec Stock Code</u>
6.8k Ω end of line resistor	41-789-70
2.2k Ω series contact resistor	41-797-45
1 Amp F battery fuse	15-050-35
1 Amp HRC mains fuse	15-131-35
M4 Allen key	26-981-78
Spares pack (all of above)	62-609-65
Red battery lead	41-791-64
Black battery lead	41-790-63
Replacement main board	41-637-55 (latest Issue)



Appendix 2 Main PCB Details

The diagram below shows the main PCB and highlights the connections and controls,

