

# Troubleshooting Guide

Merlin CT1750 Gas Proving & Interlock System



26/01/2016

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## 1 General information

The Merlin CT1750 is a ventilation interlock panel with optional gas pressure proving facilities. One of the main features of the panel is to provide an analogue output signals to regulate the speed on the fans.

The Merlin CT1750 can receive connections from remote air pressure differential switches or external current monitors, remote emergency shut-off buttons, CO detectors and a CO2 monitor. It can also be integrated with a BMS and fire alarm.

## 2 Fault LED

### 2.1 No Power LED Illuminated

- 1 If the system is connected to the mains supply, the Power LED will illuminate. Please ensure there is in fact 230/240V going to the 'Power' terminal.
- 2 If the system is connected to the mains supply and the power LED, located at the bottom right side of the board, isn't illuminated please check to see if the 3A fuse is still intact.
- 3 Please make sure the ribbon, which connects the front and back PCB's, is securely connected.
- 4 If none of the above have rectified the fault please contact S&S Northern for further assistance.

### 2.2 Emergency Stop Fault

- 1 If the front fascia emergency stop has been pressed, please re-press the button to release then reset the panel using the key switch.
- 2 If you have a remote emergency stop connected to the Merlin CT1750 please ensure this has not been activated. If this has please reset the emergency stop then reset the CT1750 with the key.
- 3 If you have multiple remote emergency stops connected to the same control panel, please ensure these have been wired in a loop series to our panel and connected to the 'EM REMOTE' terminal in the Merlin CT1750.
- 4 If you are not using an additional emergency stop, please ensure the 'EM REMOTE' terminal is linked out. Check that the link is securely connected by ensuring you have continuity.
- 5 If none of the above have rectified the fault please contact S&S Northern for further assistance.

### 2.3 Fan Fault

- 1 Ensure the fan(s) are operational.
- 2 If you are using an air pressure differential switch please ensure this is correctly wired using the normally open contact on the air pressure differential switch so that a closed signal is sent back to the Merlin CT1750 when air flow is seen. For further information on the location and installation please contact S&S Northern for further assistance.
- 3 If you are using a PM2 current monitor, please ensure this has been calibrated as detailed in the manufacturer instructions.
- 4 If you are using a CS switch, please ensure that the red 'on' LED light is illuminated. If it is not illuminated firstly confirm that the fan is in fact on, if it is, to increase the sensitivity of the switch you may need to increase the number of loops the live wire is taken through the coil.
- 5 If none of the above have resolved the error please contact S&S Northern for further assistance.

## 2.4 CO Sensor

- 1 Please ensure there is not an actual gas leak.
- 2 If you have a carbon monoxide sensor please ensure this is wired correctly to the 'CO Sensor' terminal.
- 3 If you are not using any gas detectors please ensure that the  $\lrcorner$  terminal has been linked out as factory set and is securely above the metal plate.
- 4 If none of the above have resolved the error please contact S&S Northern for further assistance.

## 2.5 CO2 High

- 1 If the CO2 monitor is detecting levels of CO2 higher than the permitted alarm level (generally 4500ppm) for this unit, which in turn is sending a fault signal to isolate the gas supply. To prevent this please try increasing the ventilation or contact S&S for any further back up.
- 2 If you are not using a CO2 monitor please ensure the 'CO2 Monitor' terminal has been linked out and is securely above the metal plate.
- 3 Please make sure the wiring is correct between the Merlin CT1750 and the CO2 monitor, this will be wired normally closed & common into the alarm or pre-alarm terminals.
- 4 If none of the above have resolved the error please contact S&S Northern for further assistance.

## 2.6 Temperature Sensor

- 1 This terminal is for a remote duct thermostat. The duct thermostat we supply is a sonday type which has an adjustable set point. If the temperature sensor senses temperatures higher than the permitted set point this will send a fault signal pack to our panel and in turn send the panel into alarm.
- 2 If the temperature sensor is in fault but isn't higher the permitted set point, please ensure this is correctly wired.
- 3 If you are not using a temperature sensor please ensure the 'TEMP SENSOR terminal has been linked out and is securely above the metal plate.
- 4 If none of the above have resolved the error please contact S&S Northern for further assistance.

## 2.7 Fire Panel

- 1 If you have a fire alarm connected to the Merlin CT1750 please ensure this has not been activated.
- 2 If you are not linking the fire alarm to this system, please ensure the 'FIRE PANEL' terminal is linked out and the link is securely connected above the metal plate.
- 3 Please note, this should be volt free, normally closed (open in alarm) and wired to the Merlin CT1750 using two core cable.
- 4 If none of the above have rectified the fault please contact S&S Northern for further assistance.

## 2.8 Disabling gas pressure proving

The Merlin CT1750 has a built in gas pressure proving feature. There is a dip-switch located on the inside fascia of the Merlin CT1750 labelled "Prove Dis". This is factory set in the 'off' position. If you require gas pressure proving this can be enabled by turning the relevant dip switch to the on position.

**(If a gas pressure transducer is connected to the system)****2.9 Test Fail**

- 1 Please ensure all gas appliances from the downstream of the gas solenoid valve are isolated then reset the system by turning the key off and back on.
- 2 If there are no open appliances a gas engineer should investigate if there is a gas leak on the pipework.
- 3 Please check that the gas has not been isolated before the gas solenoid valve.
- 4 Please ensure the downstream gas line pressure of the gas solenoid valve is above 12mbar, if it isn't this will have to be increased as the Merlin CT1750 has a minimum working pressure of 12mbar.
- 5 Please check the wiring:  
+ = RED  
- = Black  
IN = Yellow or Blue
- 6 Using the resistor supplied in the box please link between the '+' & 'IN' on the pressure sensor terminal. If the panel completes the 30 second testing period and illuminates 'GAS ON', this shows the panel is working and the issue is transducer or gas related. (Re-check point 1,2 and 3)
- 7 With the resistor in, please ensure this is securely connected, if this or any of the above points raised doesn't result in the panel going to 'Gas On' please contact S&S Northern for further assistance.

**2.10 Pressure Low**

- 1 Please check the gas line pressure, this fault generally means the pressure being detected is below 12mbar which is below the minimum gas working pressure of the Merlin CT1750.
- 2 Ensure there is gas reaching the gas valve and no upstream quarter turn valves are closed during the panels working condition. Also, you may need to check to see if the gas solenoid valve is lifting.
- 3 If none of the above have resolved the error please contact S&S Northern for further assistance.

**2.11 Gas fill and prove time**

Gas fill and prove times are adjustable. There are two dip-switches located on the inside facia of the Merlin CT1750 labelled "Fill Time" and "Prove Time". They are factory set in the 'off' position. Fill and prove time can be changed by turning the relevant dip switch to on position.

Fill time: Off – 5 seconds, On – 10 seconds

Prove time: Off – 30 seconds, On – 50 seconds

Once the settings has been changed please remove power from the fuse spur for 10 seconds.

Fill time is the amount of time the gas valve is open to fill the gas line.

Prove time is the amount of time the system tests the gas line for any leaks.

**2.12 Additional common faults**

- 1 Gas is on without the fans running - The fan PD terminal links have been left in? The links should be removed for the fans we are monitoring. By having the link still in the panel will never detect a fan fault regardless of it being calibrated or not.
- 2 Incorrect air pressure differential switch wiring.
- 3 0-10VDC output - Please ensure this is connected correctly to the chosen fan using a 0-10VDC inverter. Speed 1 = 3.5VDC, speed 9 = 10VDC.

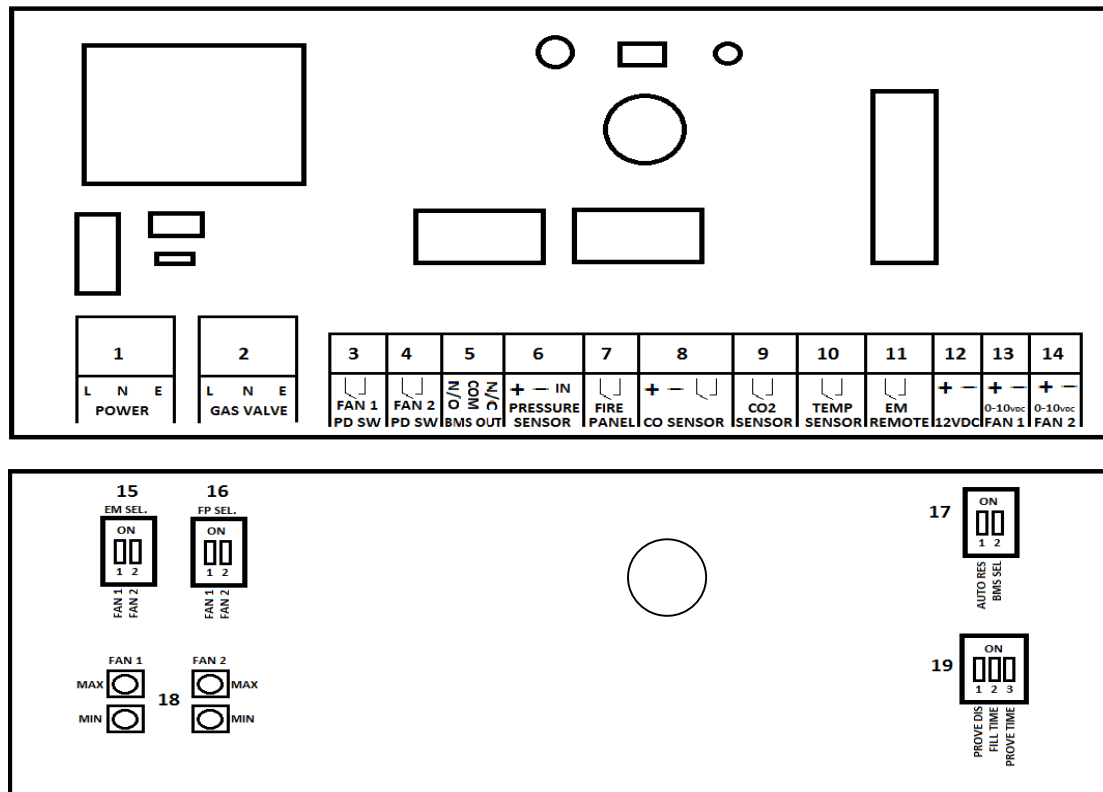
- 4 If the panel fascia illuminates either 'CO', 'CO2' or 'Temp' the panels LCD display on the front fascia for both speeds will automatically change from the current speed to a dash display. This will signify that the panel has ramped up the fans to full speed (10VDC to the speed controller). This will continue to run at full speed until the gas has dispersed or the fault has cleared. This function is available as long as the fan isolators are turned to the on position and mains is powering the board so this will even be available when the key is turned to the off position on the Merlin CT1750.

## **3 Operation Instructions**

### **3.1 How to turn the system on and off**

1. Turn off all open gas appliances.
2. To turn the fans on turn the isolator on.
3. Turn the key switch to on position.
4. To turn the system off, turn the key switch to off position.

## CT1750 Wiring Diagram



1. Mains Input 230VAC.
2. Gas Solenoid Valve Power Output, 230VAC.
3. Fan 1 pressure differential switch or current switch. **VOLT FREE INPUT**
4. Fan 2 pressure differential switch or current switch. **VOLT FREE INPUT**
5. BMS output contacts. Normally Open, Common and Normally Closed.
6. Gas pressure transducer, Red + positive, Black – negative and Yellow or Blue IN.
7. Fire panel (Supplied by others). **VOLT FREE INPUT**
8. Carbon Monoxide Detector, power supply and **volt free input** (purchased separately).
9. CO2 Monitor (purchased separately). **VOLT FREE INPUT**
10. Fusible Links (purchased separately). **VOLT FREE INPUT**
11. Remote EM Stop buttons and Fire Alarm input wired in series (purchased separately). **VOLT FREE INPUT**
12. Permanent 12VDC output (Normally used to power a PM2 Current Monitor).
13. 0-10VDC output.
14. 0-10VDC output.
15. EM selection dipswitches.
16. Fire Panel selection dipswitches.
17. BMS Selection & disabled function dipswitches.
18. Fan 1 & Fan 2 Speed Calibrator dipswitches.
19. Gas Pressure Proving Disable, fill time & prove time dipswitches.

Please note, Mains wires and low voltage wires should not be run in the same conduit as per the **LOW VOLTAGE DIRECTIVE**

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