

Gas Safety Products

Merlin CT1750 Gas Proving & Interlock System



Installation, operating and maintenance

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1 General information

The Merlin CT1750 is a ventilation interlock panel with gas pressure proving and features analogue output signals to regulate the speed on the fans.

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

It is recommended that the user reads this guide before using the system. Please do NOT attempt to operate the unit until the contents of this document have been read and are thoroughly understood.

2 Installation

- 2.1 Panel Mounting.** The control panel is designed for surface mounting using 4 mounting screws. Removing the cover on the panel gives access to the circuit board. The PCB should be removed before drilling entry holes into the case.
- 2.2 Mains Supply.** A 230vac electrical supply should be supplied to the panel. This should be externally fused at 3 Amps using a fused spur and should be connected to the terminals marked "LNE Power"
- 2.3 Gas solenoid valve.** The gas solenoid valve should be powered using the terminals on the Merlin CT1750 marked "LNE GAS VALVE".
- 2.4 Supply Fan & Extract Fan PD Switches.** These terminals are used to receive an input signal from external air pressure switches or external current monitors. These are linked out as a factory setting. Wiring to the air pd switches & current monitors should be made using two-core volt free connections. If only one fan is being used the terminals not in use should be left linked out.
- 2.5 BMS Connections.** Terminal connections are available on the circuit board for connections to Building Management systems etc. Detailed on the circuit board as "BMS OUT N/O, COM and N/C" these are volt free connections.
- 2.6 Pressure Sensor.** The terminals marked pressure sensor "+ - in ". These wire to the gas pressure sensor which is screwed into the downstream port on the gas solenoid valve. Red + positive, Black – negative and Yellow IN. Please ensure this is wired as instructed.
Minimum Operating Pressure = 12Mbar
Maximum Operating Pressure = 100Mbar.
- 2.7 Fire Alarm.** The terminal for fire alarms is detailed on the circuit board as "FIRE PANEL". These connections are linked out as a factory setting. Fire alarms should be volt free and wired to the Merlin CT1750 using two-core cable.
- 2.8 Gas Detector.** The terminals detailed on the circuit board as "CO SENSOR". These connections are "+, -" and "  " these can be wired to a Merlin carbon monoxide sensor. If no detector is being used leave the link in between the "  ". Other detector types are available.
- 2.9 CO2 Monitor.** This terminal can be wired to CO2 monitor to shut off the system in the event of CO2 being at alarm level. If no CO2 monitor is supplied leave the terminal link in.
- 2.10 Heat Detector.** The terminal for heat detectors is detailed on the circuit board as "TEMP SENSOR". These connections are linked out as a factory setting. Heat detectors should be volt free and wired to the Merlin CT1750 using two-core cable.

- 2.11 Remote emergency shut off buttons.** The terminal for remote emergency shut-off buttons is detailed on the circuit board as “EM REMOTE”. These connections are linked out as a factory setting. Remote emergency shut-off buttons should be volt free and wired to the Merlin CT1750 using two-core cable.
- 2.12 12vDC.** This is a permanent 12vDC output when there is power at the panel. This is normally used to power a PM2 current monitor. (Supplied separately)
- 2.13 0-10vDC Output.** The terminal for the two 0-10vDC outputs is detailed on the circuit board as “0-10vDC Output Fan 1” & “0-10vDC Output Fan 2”. These connections are used to regulate external fan speed controllers which can accept this control signal.
- 2.14 Internal Buzzer.** Operates at 65dB measured 30cm from closed panel.
- Note: all low voltage connections should be made using a screened cable. To avoid electrical interference this should not be in the same conduit as mains cable as per the low voltage directive.**

3 Operation Instructions

3.1 How to turn the system on and off

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

3.2 Explanation of LED status

3.2.1 Power LED

When the system is connected to the mains supply, the Red LED of the S&S Logo located in the bottom right corner of the panel will illuminate. When no power is present, this LED will not light up.

RED = OK

OFF = No power to CT1750, a loose ribbon connection or the fuse may not be intact.

3.2.2 Gas on LED

When the fans are operational and the key switch is turned on, the Merlin CT1750 will check the installation for gas leaks. If gas proving is successful, the gas valve will open and the green ‘Gas On’ LED will illuminate.

GREEN = Gas On

OFF = Gas Off

3.2.3 Testing LED

This LED will illuminate GREEN for approximately 30 seconds when the panel is checking the integrity of the gas installation upon start up. GREEN = proving the gas line, do NOT operate any appliances during the testing period.

3.2.4 Test Fail LED

Under normal working conditions this LED is off. When the panel detects a gas leak on start-up, the LED will illuminate AMBER. Gas valve will remain closed.

OFF = OK

AMBER = gas proving test failed

3.2.5 Pressure Low LED

Under normal working conditions the LED is off. The LED will illuminate AMBER when the incoming gas pressure drops below 12mBar for 10 seconds. The gas valve will close.

OFF = OK

AMBER = gas supply pressure low.

3.2.6 Fire Alarm Panel LED

If a fire alarm panel has been triggered, the LED will illuminate Amber and the gas will be turned off. The Fire alarm panel must be re-set before restarting the system.

Off = OK

AMBER = Fire alarm panel pressed.

3.2.7 CO Sensor LED

Under normal working conditions this LED is off. If the external Merlin detector connected detects gas this will show RED. The Gas valve will turn off and the panel will send a signal to the fan controller to increase the fan speed.

3.2.8 CO2 Sensor LED

Under normal working conditions this LED is off. If the concentration of CO2 in the air is at alarm level (relevant detector required), the LED will show RED. The Gas valve will turn off and the panel will send a signal to the fan controller to increase the fan speed.

OFF = OK

RED = the concentration of CO2 is at alarm level.

3.2.9 Heat Detector LED

Under normal working conditions this LED is off. If the fusible link melts at 72 Degrees Celsius or higher, the LED will show AMBER. The Gas valve will turn off and the panel will send a signal to the fan controller to increase the fan speed.

3.2.10 Fan 1 LED

Under normal working the LED will illuminate GREEN. If a fan fault is detected on fan 1, the LED will be flashing.

GREEN = OK

FLASHING = at least one of the supply fans is not running.

3.2.11 Fan 2 LED

Under normal working the LED will illuminate GREEN. If a fan fault is detected on fan 2, the LED will be flashing.

GREEN = OK

FLASHING = at least one of the extract fans is not running

IF SUPPLY AND/OR EXTRACT FANS LED FLASHES FOR MORE THAN 20 SECONDS, THE Merlin CT1750 WILL SHUT OFF THE GAS.

3.2.12 Fan Fault LED

Under normal working conditions this LED is off. If a fan fault is present for more than 20 seconds, the LED will illuminate RED.

OFF = OK

RED = the gas supply has been shut off due to a ventilation fault.

WHEN A FAULT IS PRESENT YOU WILL NEED TO CONTACT YOUR SERVICE/MAINTENANCE COMPANY.

YOU SHOULD NOT ATTEMPT TO CARRY OUT A REPAIR OR RECTIFY THE FAULTS UNLESS YOU ARE QUALIFIED TO DO SO.

3.2.13 EM Stop LED

If an emergency shut off button (either remote or on the panel) is pressed, the LED will illuminate AMBER and the gas will be turned off. The EM Stop button must be re-set before restarting the system.

OFF = OK

AMBER = EM Stop button pressed

3.3 Using the emergency shut off

The Emergency shut off button is located on the front of the panel. There is also a facility for remote shut off buttons to be wired in series.

The Emergency shut off button(s) will cut off the gas supply when activated.

To reinstate the system, the Emergency shut off button(s) will need to be reset and the panel restarted.

3.4 BMS integration

The Merlin CT1750 can be integrated with a BMS to make or break a circuit on gas on/gas off, (valve open or valve closed). This will tell the BMS whether or not 230V is being sent to the solenoid.

There is a dip-switch located on the inside fascia of the Merlin CT1750 labelled 'BMS Selection'. This is factory set in the 'off' position which signals the BMS on gas on/gas off. When switched to the 'on' position, the CT1750 will only signal the BMS on a fault, i.e. fan fault, CO2 high level detected, gas detected, EM Stop pressed, etc.

3.5 Fire alarm integration

The Merlin CT1750 can be integrated with a fire alarm to close the gas supply automatically in the event of a fire.

3.6 Gas fill and prove time

Gas fill and prove times are adjustable. There are two dip-switches located on the inside fascia 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.

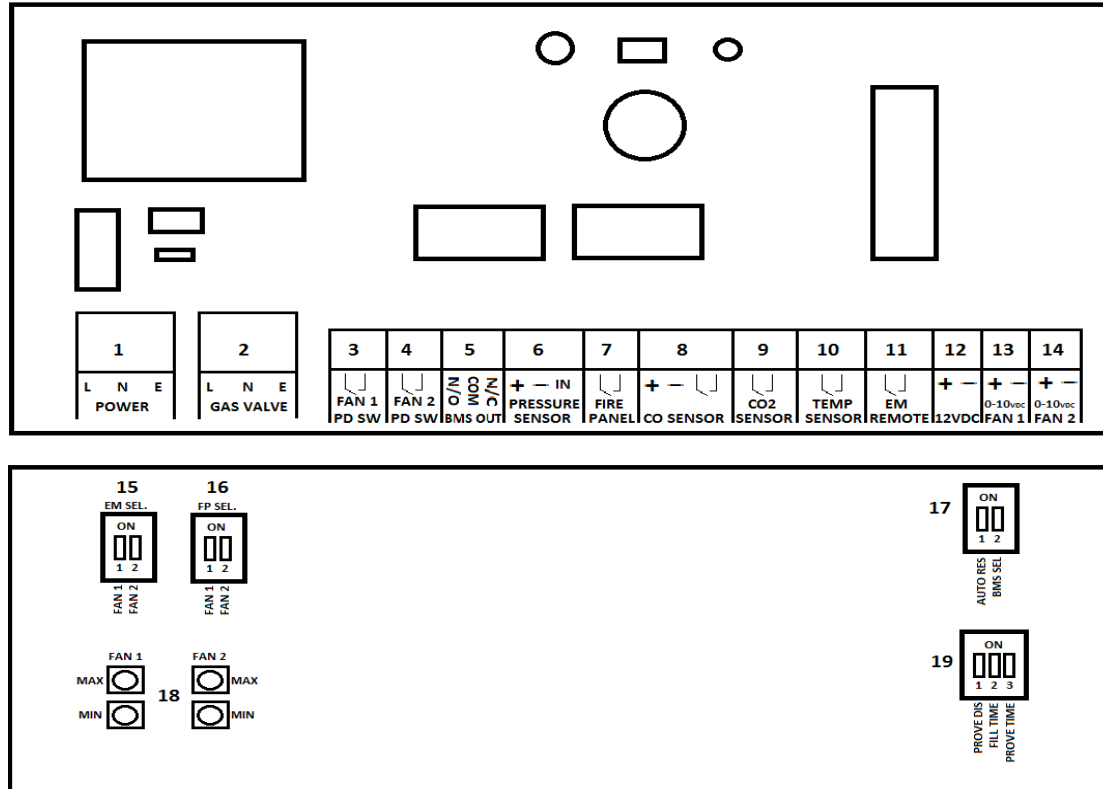
3.7 Disabling gas pressure proving

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.

3.8 Auto reset

The Merlin CT1750 has a built-in auto reset feature. There is a dip-switch located on the inside fascia of the Merlin CT1750 labelled "Auto Reset". This is factory set in the 'off' position. When the power is restored after the power cut, the panel has to be restarted manually. On installation, this can be switched to the 'on' position if required. This will instruct the system to restart automatically when power is restored after a power cut. This should only be done if the system has gas proving.

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, power supply and returned signal (supplied).
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. FP selection dipswitches.
17. BMS Selection & Auto Reset 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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