

# Gas Safety Products

## Merlin 1000S Gas Proving System



## Installation, operating and maintenance

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## 1 General information

The Merlin 1000S is a gas pressure proving & gas detection panel

The system comprises of a control panel and a gas pressure sensor. The Merlin 1000S can receive connections from 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 230-volt 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 IN"
- 2.3 Gas solenoid valve.** The gas solenoid valve should be powered using the terminals on the Merlin 1000S marked "LNE to VALVE".
- 2.4 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/C, COM and N/O" these are volt free connections.
- 2.5 Gas Pressure Transducer.** The terminals marked pressure sensor "+ - IN ".These wire to the gas pressure transducer which is screwed into the downstream port on the gas solenoid valve. Red + positive, Black – negative and Yellow or Blue IN. Please ensure this is wired as instructed.
- Minimum Operating Pressure = 12Mbar  
Maximum Operating Pressure = 100Mbar.
- 2.6 Timeout Facility.** The Merlin 1000S has a built-in Auto-shut down feature and it will turn itself off after predefined time. Auto-shut down timeout is selectable. There are two dip-switches located on the inside facia of the Merlin 1000S labelled "Time1" and "Time2". They are factory set in the 'off' position for a 2 hour timeout. On installation, they can be switched to the 'on' position to select required timeout.
- Time1 Off, Time2 Off – 2 hours  
Time1 On, Time2 Off – 4 hours  
Time1 Off, Time2 On – 8 hours  
Time1 On, Time2 On – no timeout (auto-shut down disabled)  
On Auto-shut down gas supply will be turned off.
- 2.7 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 1000S using two-core cable.
- 2.8 Gas Detector.** The terminals detailed on the circuit board as "Gas Detector". These connections are "+,-" and "↔" these can be wired to a Merlin Natural gas, Carbon monoxide or LPG detector. If no detector is being used leave the link in between the "↔". Other detector types are available.

- 2.9 FS 123.** This terminal switches when the key is turned on and off. This can be linked to a fan switch (panel supplied separately) which can provide power to the fans when the control panel is switched on.
- 2.10 CO2 Monitor.** This terminal can be wired to CO2 monitor to shut off the system in the event of High CO2 levels. If no CO2 monitor is supplied leave the terminal link in.
- 2.11 12v DC.** This is a permanent 12v DC output when there is power at the panel.
- 2.12 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 appliances.
2. Turn the key switch to on position.
3. 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 1000S, a loose ribbon connection or the fuse may not be intact.

#### 3.2.2 Gas on LED

When the key switch is turned on, the Merlin 1000S 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

#### 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 failed

#### 3.2.5 Pressure Low LED

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

OFF = OK

AMBER = gas supply pressure low.

### 3.2.6 Timeout LED

Under normal working conditions this LED is off. This LED will illuminate AMBER when auto-shut down has occurred.

OFF = OK

AMBER = auto-shut down

### 3.2.7 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

### 3.2.8 Gas Detected LED

Under normal working conditions this LED is off. If the external Merlin detector connected detects gas this will show RED and the Gas valve will turn off.

OFF = OK

RED = Gas detected.

### 3.2.9 CO2 High

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 and the Gas valve will turn off.

OFF = OK

RED = the concentration of CO2 is at alarm level.

## 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 1000S 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 facia of the Merlin 1000S 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 1000S will only signal the BMS on a fault, i.e. CO2 high level detected, gas detected, EM Stop pressed, etc.

## 3.5 Fire alarm integration

The Merlin 1000S can be integrated with a fire alarm to close the gas supply automatically in the event of a fire.

The volt free fire alarm signal can be wired in series with any remote emergency shut off buttons.

If there is no remote emergency stop buttons installed wire this directly to the terminal marked 'EM REMOTE'.

### 3.6 Fan switch integration

There is the facility to connect a Fan Switch (FS1 or FS2 sold separately).

The Fan Switch provides the facility to turn on the fan(s) when the key switch on the Merlin 1000S is in the on position and turn the power off to the fan(s) when the key switch on the Merlin 1000S is in the off position.

There is a dip-switch located inside the fascia of the Merlin 1000S labelled EM Selection.

This is factory set in the 'off' position which instructs the system to shut down the fan(s) and gas supply on activation of the Emergency shut off button(s). On installation, this can be switched to the 'on' position if required. This will instruct the system to leave the fans on and only shut off the gas supply on activation of the Emergency shut off button(s). Note: This option is not available if Fan Switch is not installed.

### 3.7 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 1000S 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 secs, On – 10 secs

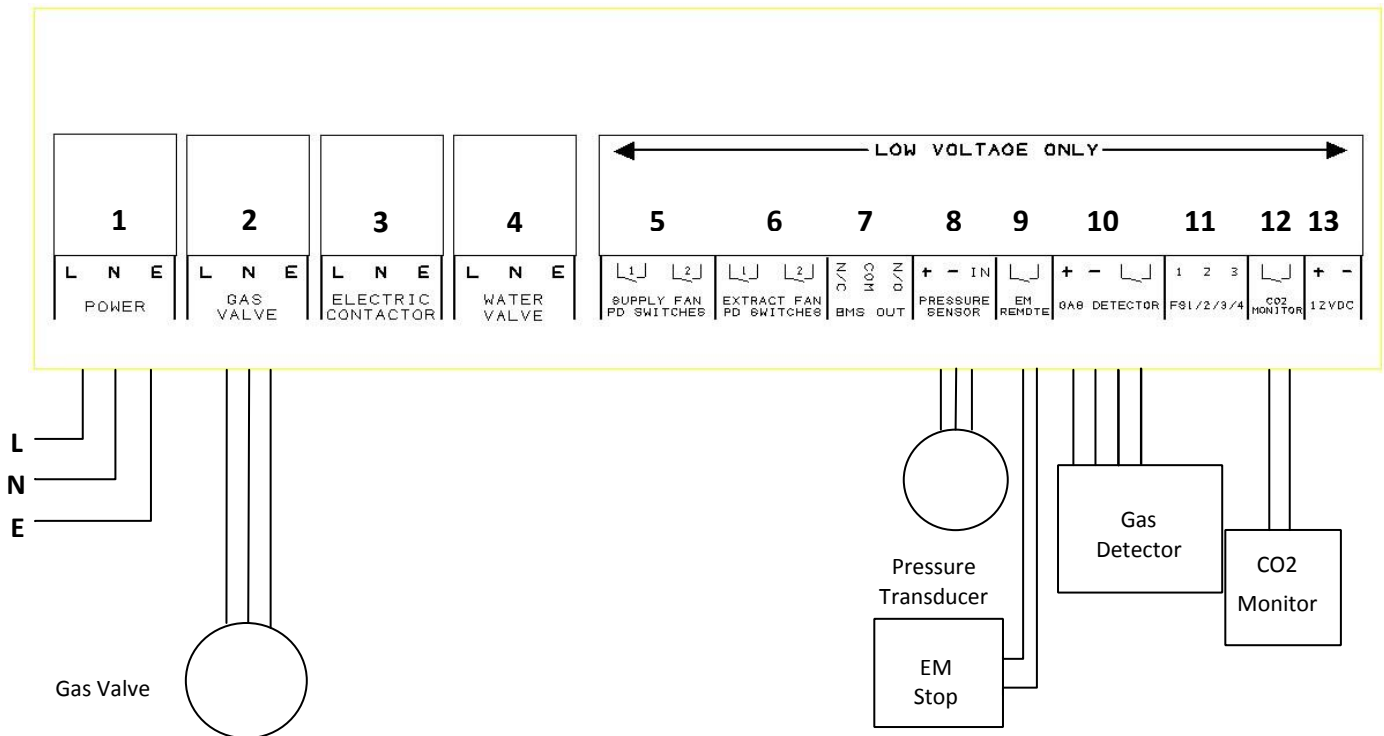
Prove time: Off – 30 secs, On – 50 secs

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

### 3.8 Auto reset

The Merlin 1000S has a built-in auto reset feature. There is a dip-switch located on the inside fascia of the Merlin 1000S 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 the power cut.

## 1000S Wiring Diagram



1. Mains Input 230V Single Phase.
2. Gas Solenoid Valve Power Output, 230VAC, Max 3A.
3. Electric Contactor, this is disabled on this system.
4. Water Valve, this is disabled on this system.
5. Supply Fan PD Switches terminal, this is disabled on this system.
6. Extract Fan PD Switches terminal, this is disabled on this system.
7. BMS output contacts. Normally Closed, Common and Normally Open. Max.1A @ 230VAC.
8. Gas pressure transducer, Red + positive, Black – negative and Blue IN.
9. Remote EM Stop buttons and Fire Alarm input wired in series (purchased separately). **VOLT FREE INPUT**
10. Methane, CO or LPG Detector, power supply and **volt free input** (purchased separately).
11. Fan Switch output (purchased separately). For wiring instruction see Fan Switch user manual.
12. CO2 Monitor (purchased separately). **VOLT FREE INPUT**
13. Permanent 12VDC output when there is power at the panel.

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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