

Installation Instructions

The GPPS-evo v4 is a gas pressure proving system with optional gas detection and ventilation interlocking.

The system will perform a down stream integrity check ensuring gas tightness before use, close the gas solenoid valve in the event of; a high-level gas alarm, low incoming gas pressure, activation of the emergency stop/fire alarm or ventilation failure.

It is designed for use primarily in laboratories.



- Gas Pressure proving.
- Gas Detection. (up to 16 detectors with a power pack)
- Fan interlock. (optional)
- 5 year warranty - 10 years when commissioned

GPPS-evo v4 features

Before commencing installation please familiarise yourself to the equipment by reading the comprehensive installation instructions. If in doubt then please call 0161 233 0600.

It is a statutory requirement that this safety system is installed and commissioned to the satisfaction of the manufacturer.

A commissioning certificate must be issued to the end user along with instructions for the operation of the equipment.

As the Manufacturer, Medem UK should commission this safety system whereupon a commissioning report will be forwarded to the installing agent who should provide a copy to the end user.

At the point of our commissioning an individual serial number will be attached to the system along with a 24 hour help line number. Photos and all relevant information for the installation will then be stored on the Medem site database to be accessed in the event of a call on the 24 hour help line.

The warranty period for the panel and sender unit will then be extended to Ten years.

Gas pressure proving system and detection system.

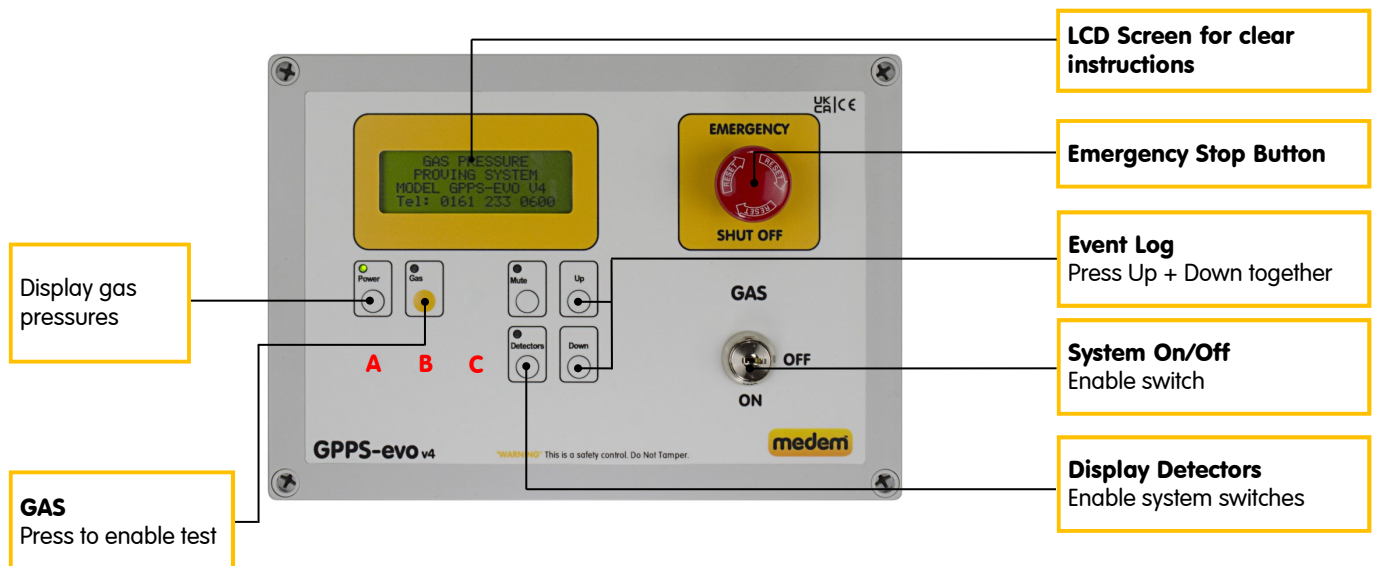
The GPPS-evo v4 is a gas proving and detection system designed to monitor the atmosphere for target gases.

The GPPS-evo v4 system comprises of a mains powered control panel and a low voltage pressure sender unit and fitting kit. The pressure sender unit is mounted onto the gas valve (with the fitting kit) and transmits the gas pressure information back to the main panel in order to perform its integrity test and low/high pressure monitoring.

Capable of monitoring up to six combustible and two carbon monoxide detectors directly or up to a total of any 16 detectors in conjunction with a Medem AD-PP transformer pack, (Combustible, Carbon Monoxide, Carbon Dioxide & Oxygen). The detectors are pre-calibrated by Medem (UK) Ltd such that they only require to be connected to the panel and functionally tested.

In the event of a high alarm from one of the detectors the system will isolate the gas supply by closing a connected electric control valve. Emergency stop buttons and Thermal Links can be fitted and a fire alarm can close the gas valve when connected to the panel.

Control Panel



Control Panel

The front of the panel has the following controls and indications:

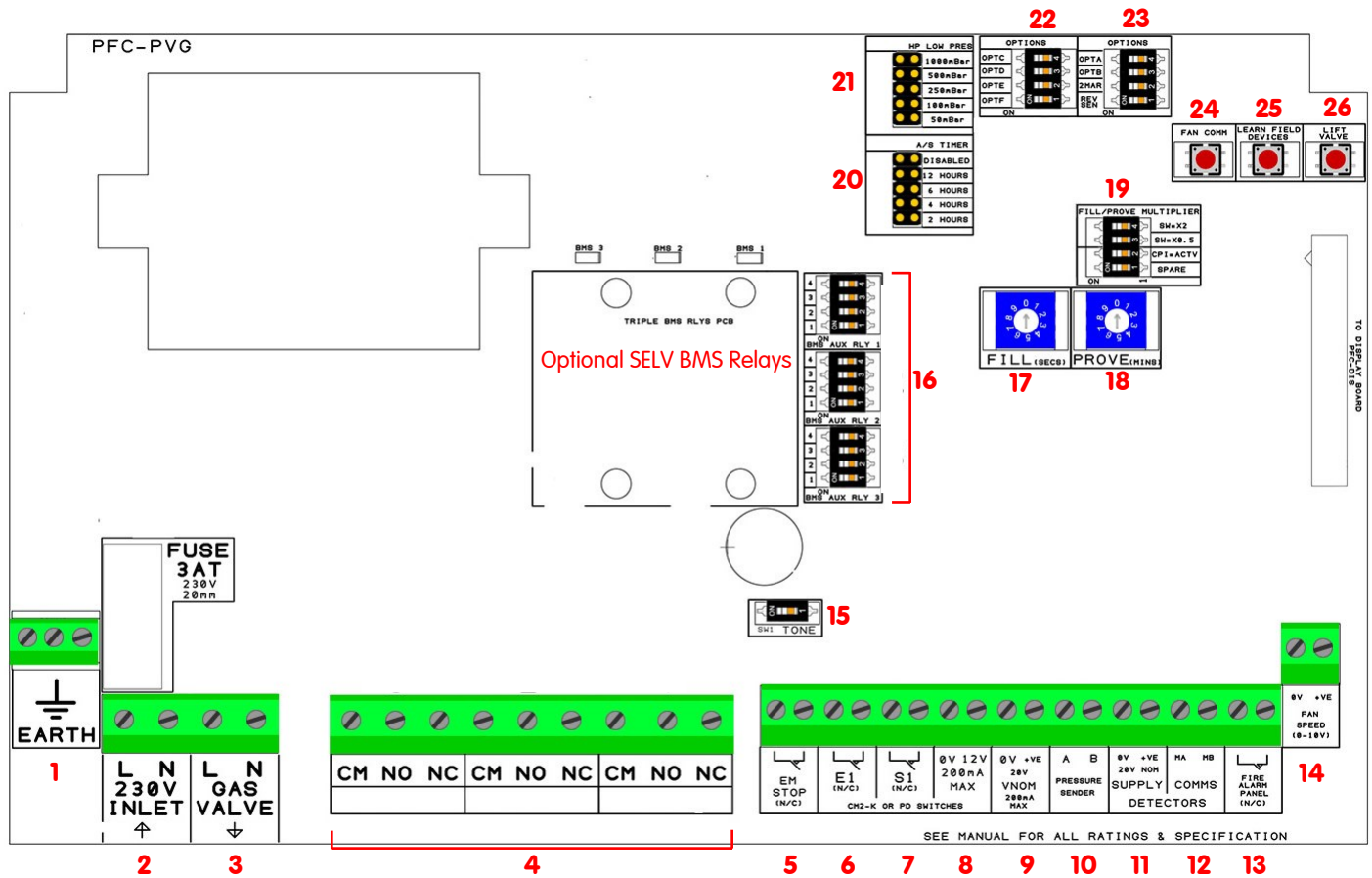
- Emergency Stop button.
- System On/Off key-switch.
- Yellow soft touch On/Off button for gas service.
- White engineer functions for displaying gas pressures on the LCD screen.
- White 'Detectors' button for detector review, Up + Down to scroll - Press and hold Up + Down to enter event log.
- White 'Mute' button.
- A** White fan boost button
- B** White engineer function for fan running time review
- C** White fire test isolation mode (Triple Press to activate)

LED indications:

- Power On - GREEN.
- Gas - RED when active to warn of live service - Flashes during prove sequence.
- Mute - Flashing RED while active.
- Detectors - RED when active.

LCD display:

For displaying system status during both installation and normal use, also for displaying diagnostics



Connections to panel: marked on board

1. Earth connection terminals.
2. Live & Neutral 230 volts supply from 3amp switched fuse spur.
3. 230 volts out to gas solenoid valve.
4. Mains rated BMS relay set using switch 16.
5. Remote emergency stop and thermal links, SELV, connect in series multiple buttons (requires a N/C circuit).
6. Extract fan interlock for current monitor (CM2M-K) or PD switches.
7. Supply fan interlock for current monitor (CM2M-K) or PD switches.
8. 12 volt power for current monitor (CM2M-K).
9. Nominal voltage supply (circa 22volts).
10. Pressure sender unit SELV and comm's both through "A" & "B" terminals (2 wire) **(Required)**.
11. Power connections for detectors, Methane, LPG, CO, CO2, Oxygen, Temperature.
12. Comms connections for detectors, Methane, LPG, CO, CO2, Oxygen, Temperature.
13. Fire alarm input signal (N/C contact required).
14. 0-10 volt output to fan speed controllers based on CO2 and temperature levels & boost button.
15. Enable/Disable internal toner.
16. BMS relays settings for relays AUX 1,2,3 (4) See page 4.
17. Fill time for gas pressure proving, see page 5.
18. Prove time for gas pressure proving, see page 5.
19. Fill and Prove time option switches.
20. Auto stop timer to isolate gas after set length of time. Factory set for model & use.
21. High pressure low cut out adjustment (*when high pressure sender unit is used 1 bar*).
22. Option Switches see page.
23. Option Switches see page.
24. Fan comm button, enables commissioning of the gas supply without fans running.
25. Learn field device button, press once only when all detectors are connected and powered (verify with detectors button).
26. Lift Valve - will power open the gas valve (3) while the button is held down.

The main circuit board should be removed before drilling for cable entry.

Pressure Sender Unit

Pressure sender unit transmits pressure information back to the main panel in order for it to perform its integrity test. It is not optional and must be connected, **the system will not work without it.**

It is mounted to the gas solenoid valve inlet and outlet test ports using 8mm OD copper pipe. Use the appropriate Medem fitting kit to fit the control valve size (see page 12,13).

The pressure sender is connected to the control panel with low voltage two core cable using the terminal marked A & B.

NOTE: This is low voltage and should be segregated from mains wiring.



Pressure sender unit

BMS Relay Mains & SELV PCB

There are three mains rated relays and three optional (at the point of order) SELV relays on the system which can be used for connecting to a BMS or Sounder/Beacon etc., these can be set for switching to various conditions using the table below.

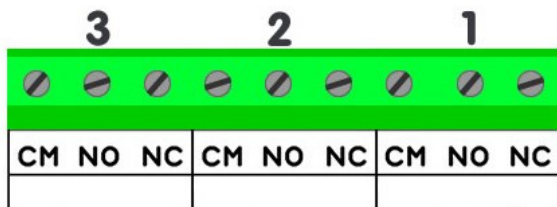
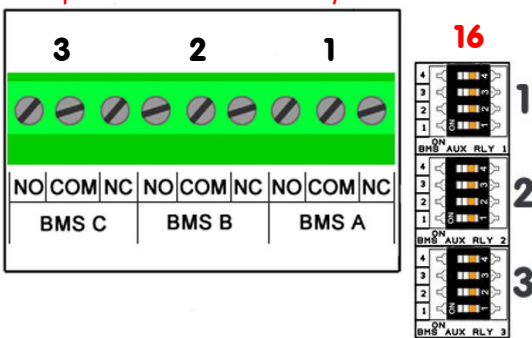
Three Mains rated. (230v 5amps)

Three optional SELV relays. (48 volts 1 amp)

Mains AUX Relays and **Optional SELV BMS Relays**: are set using switches 16

Settable conditions via dip switches (One condition selectable for each pair of relays)

Optional SELV BMS Relays



Mains AUX Relays

	1	2	3	4
Low Pressure (Any State) - LP	OFF	OFF	OFF	OFF
High Pressure (Any State) - HP	ON	OFF	OFF	OFF
Test Fail	OFF	ON	OFF	OFF
Fan Fault - FF	ON	ON	OFF	OFF
EM Stop - ES	OFF	OFF	ON	OFF
Fire Panel Active -FA	ON	OFF	ON	OFF
High Alarm (Any State) - HA	OFF	ON	ON	OFF
Low Alarm (Any State) - LA	ON	ON	ON	OFF
Gas On State	OFF	OFF	OFF	ON
Detector Fault	ON	OFF	OFF	ON
Generic Fault (LP,HP,FF,ES,FA,HA)	OFF	ON	OFF	ON
Key Switch State	ON	ON	OFF	ON

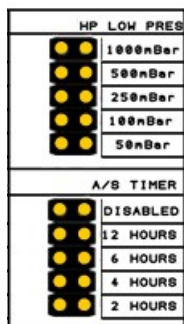
Option switch settings 19, 22 & 23

There are various option switches available on the system for accommodating some of the more common situations.

There always needs to be careful consideration to risk when changing any of the default settings, Medem (UK) Ltd would always recommend an onsite risk assessment be carried out before any changes are implemented.

19	SW= X2	This doubles the fill & prove time.
	SW= X0.5	This halves the fill and prove time test, please note the minimum prove time is 30 seconds which can't be reduced any lower.
	CPI= ACTV	Enable CPI mode. (CPI sender unit required)
	SPARE	Change low pressure alert level to 4mbar
22	OPT C	CO2 Low/High alarm levels from 2800/5000PPM to 2300/2800PPM
	OPT D	Disable Gas Proving
	OPT E	Allows BMS relays to indicate gas detector status when main "Gas On" switch is off
	OPT F	Factory Set, do not adjust
23	OPT A	Over pressure alert 70mb
	OPT B	Disables isolating gas on CO2 high alarm. CM & CO still isolate as normal
	2MAR	Changes CO alarm levels from 20 & 30 PPM to 80 & 100PPM
	REV SEN	Reverse sender unit inlet & outlet readings

Option Headers 20, 21.



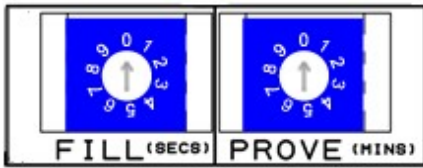
21

22. High pressure sender unit: Low pressure cut out adjustment (for systems over 1 bar)

20

20. Auto stop timer to isolate gas after set length of time. Factory set for model & use

21. Fill and Prove



Gas Fill Time.

The Fill Time should be set such that there is sufficient time to fill an empty pipe work system to full / normal pressure while ensuring a minimum escape of gas where a leak exists. (Factory default setting is 5 seconds).

Gas Prove Time. This should be set such that the smallest leak can be detected. This time can be set up to a maximum of 9 minutes. Increasing this time effectively makes the system more sensitive to gas leaks.

(Factory default setting is 1 minute).

FILL switch @ 1,2,3,4,5,6,7,8,9,0 = 1s, 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s,

PROVE switch @ 1,2,3,4,5,6,7,8,9,0 = 1m, 2m, 3m, 4m, 5m, 6m, 7m, 8m, 9m, 30s,

The prove time can be extended using FILL/PROVE MULTIPLIER, see [No 19](#).

24, 25, 26 Fan Comm, Learn Detectors, Lift Valve

Fan Comm.

To enable the commissioning of the gas portion of the system before the ventilation interlock is completed you may temporarily disable the interlocking by pressing button [24](#).

This will bypass the ventilation interlock allowing the gas to be tested, the system must not be left in this state and as such is only for a maximum 24hour period before auto exiting. **While in commissioning mode the display will show the message "Not to current standards"**. Pressing the button again at anytime will cancel commissioning mode.

Learn Field Devices.

Any gas detectors connected to the system will require "learning". First ensure all detectors are set to a unique ID address using the selector switch on the detectors themselves, with CO & CO2 detectors numbered before any natural gas detectors.

Having addressed each detector press the learn field devices button ([25](#)), the system will scan and store any connected detectors. To verify that all detectors have been successfully learnt press the "Detectors" button on the front panel to view address details.

Lift Valve.

Allows power to be applied to the gas valve to check the operation of the gas valve and facilitate a gas purge.

Out of hours CO & CO2 ventilation control.

Using the 0-10v Fan Speed Output ([14](#)) it is possible to continue to control ventilation in response to CO & CO2 levels with the system switch off. This is particularly useful to enable fan control based on occupancy even when gas is not in use.

Fan boost, Fan Run Time, Fire Test Isolation

A) Enables a 30 min fan boost using the 0-10v Fan Speed Output ([14](#)) (if connected).

B) Review fan running times - Helps identify an intermittent fan failure.

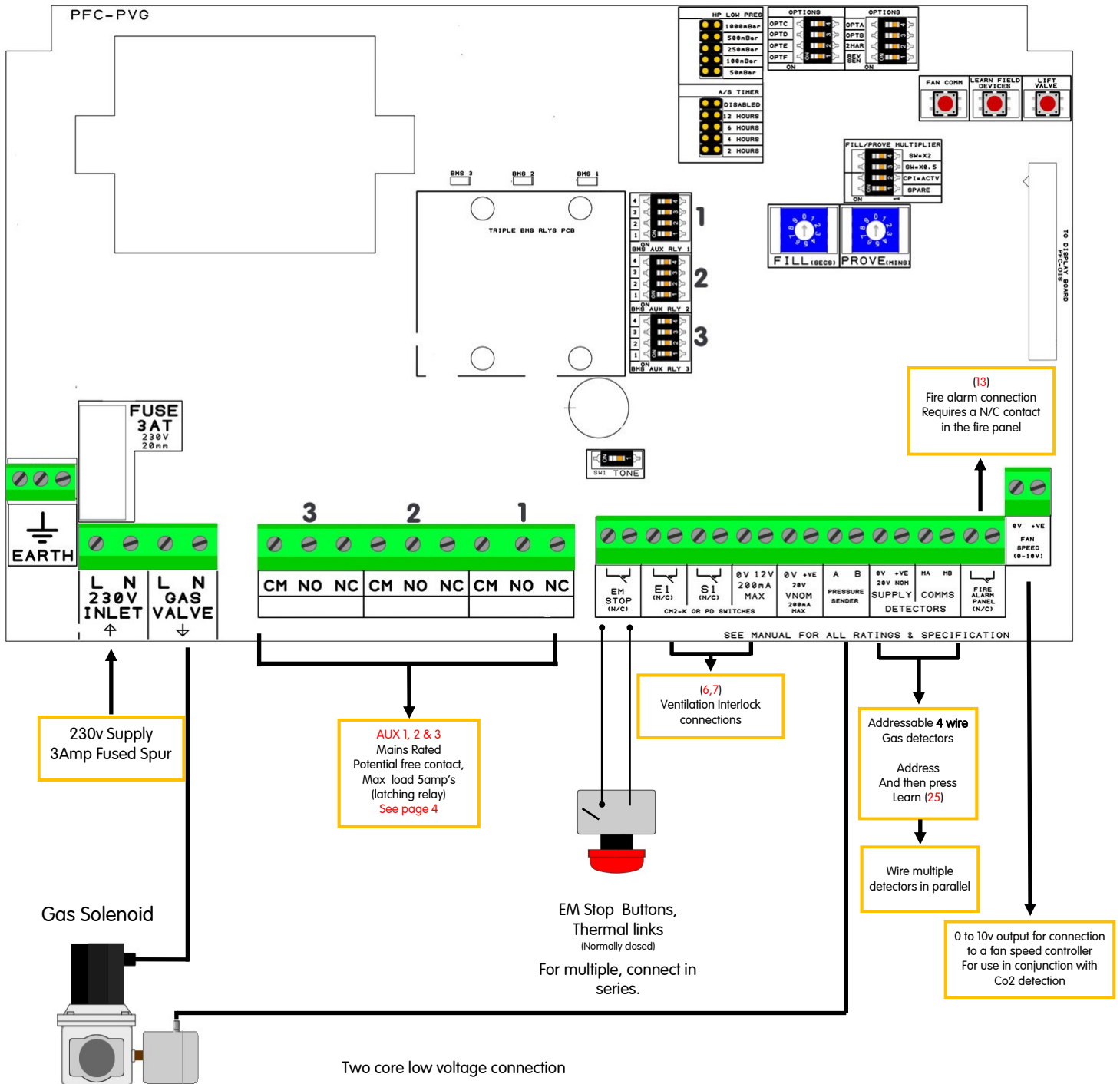
C) When connected to a fire alarm panel using the fire alarm terminal ([13](#)) the system will isolate the gas during a fire alarm.

If for the purposes of a fire test you wish to temporarily disable this interlock the system can be put into a "fire test mode" by pressing blind button **C** three times in quick succession.

This is a timed feature and will auto clear after 45mins. Press again three times to manually clear and return to normal running.

Basic Connections

Earth Connections not shown



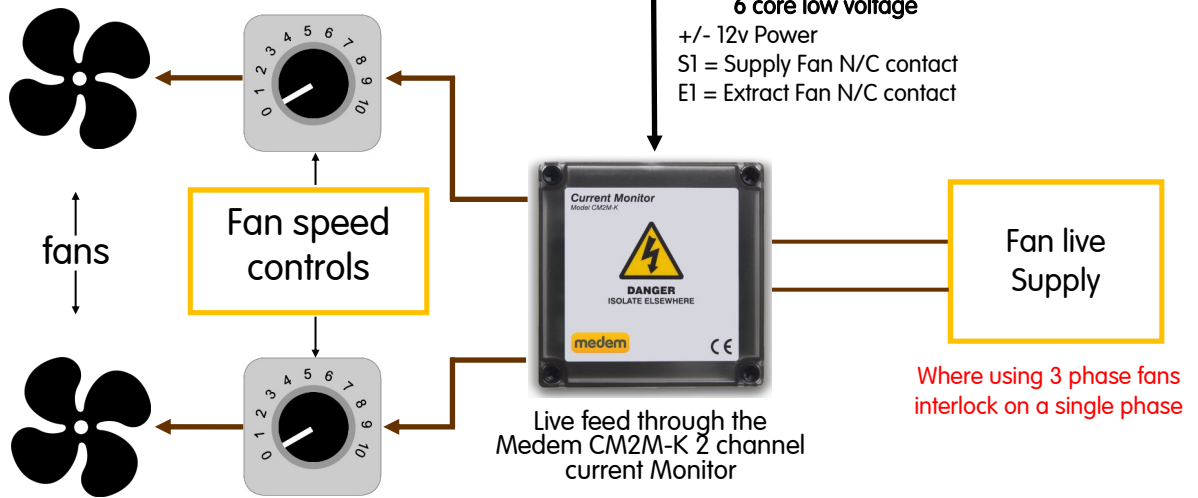
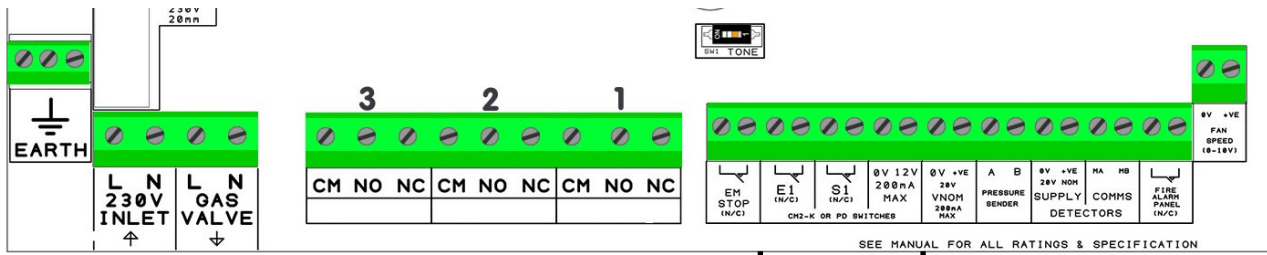
All current wiring regulations must be followed with reference to running low and mains voltage cables together. The maximum cable length between a detector and the control panel should not exceed 100 metres, if the distance between the main panel and the detectors is greater than 20 metres a 1mm screened cable must be used on the +VE, 0v terminals

Gas detectors, require a four core screened Belden type security cable or 600v rated BMS cable (max cable length of 100 meters.)

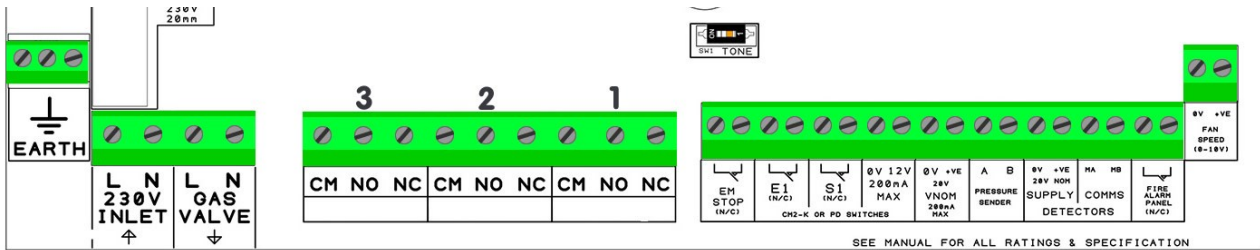
Remote emergency stops and thermal links require a two core screened cable.

Warranty will be void if Fire Protection Cable or cable over 1mm dia. is used on the SELV side.

Fan Interlock Connections (9,10)



Fan interlock with airflow switches



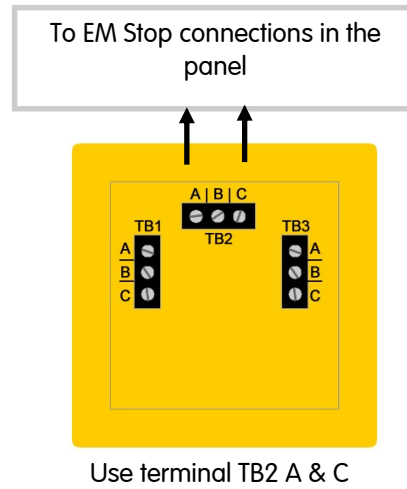
If using airflow switches connect to terminals **6 & 7**

Single Stop Buttons

Remote stop buttons can be connected to the panel terminal marked as "EM STOP" (number 5).

The remote buttons must be wired as shown in order to provide a "closed contact" for the control panel.

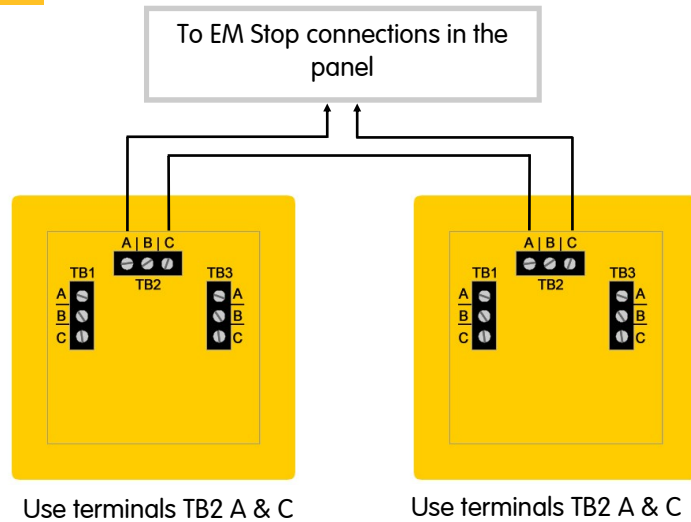
If thermal links are to be installed these should be wired in series with the EM stop buttons



Multiple Stop Buttons

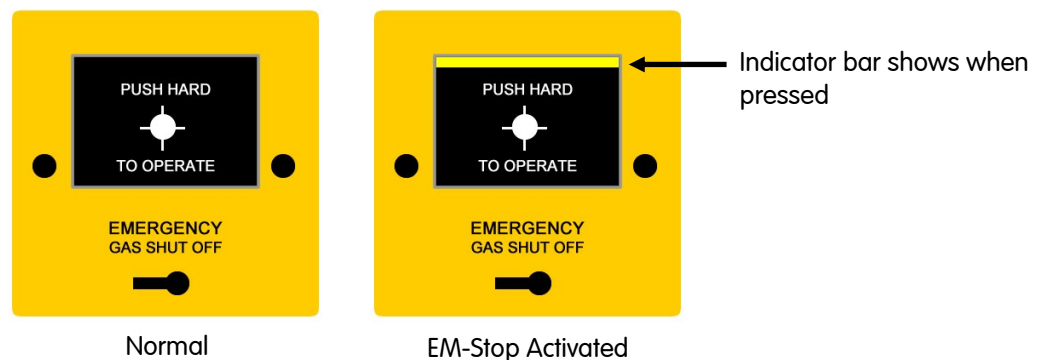
Multiple stop buttons are wired in series.

If thermal links are to be installed these too should be wired in series with the EM stop buttons



Resetting (indicator bar)

The stop buttons supplied by Medem are of a "Push Glass, key resettable" style, when activated a yellow indicator bar will show and the unit will require resetting using the key provided.



Gas Detection

Gas Detectors

IMPORTANT - Gas Detectors should not be installed until all building, construction or painting work etc.. Is completed, as these works can effect the sensitivity and longevity of the detectors.



Ensure that the protective cover labels (**RED**) are removed only after the completion of all building work.

The labels are required to be removed for the detectors to operate, but removal before the completion of works risks contaminating the sensor element.

The system is capable of operating a mix of up to 16 detectors (additional power pack may be required).

The detector types are:

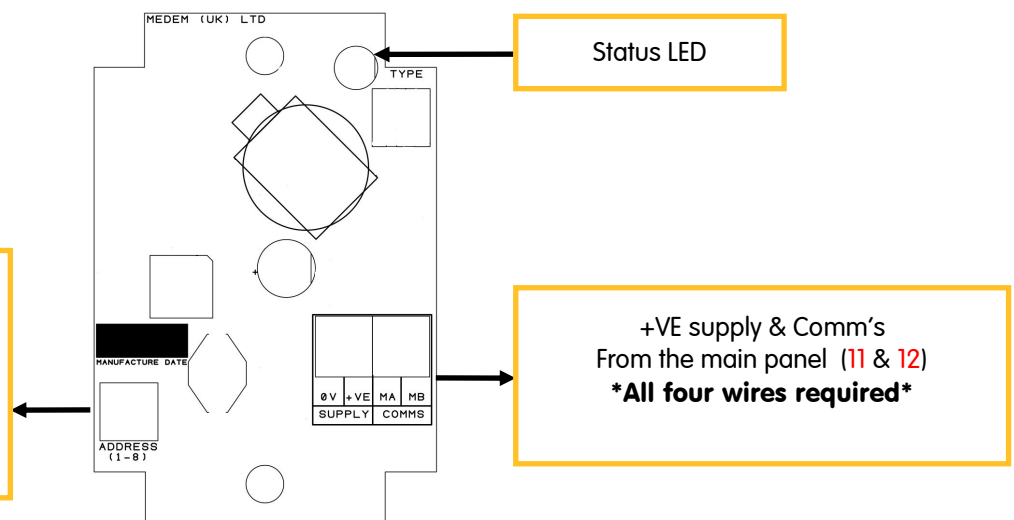
- Carbon Monoxide: set to alarm at 20 PPM (pre alarm) and 30ppm for (high alarm).
- Carbon Dioxide: settable high alarms of 2800 PPM & 5000 PPM's.
- Combustible gases (Methane, Propane etc): set to alarm at 5% LEL (pre alarm) and 10% LEL for the (high alarm).
- Oxygen: set to alarm at 19% (pre alarm) and 18% (high alarm).

Detector location will vary dependant on the individual characteristics of the target gas that is being monitored for. See the gas detectors own instructions for more guidance.

Connection and addressing

When addressing gas detectors CO & CO2 detectors must be numbered before combustible gas detectors.

Address Selector
Each detector must be set to its own address.
And then "learnt" using button (25)



All current wiring regulations must be followed with reference to running low and mains voltage cables together. The maximum cable length between a detector and the control panel should not exceed 100 meters, if the distance between the main panel and the detectors is greater than 20 meters a 1mm screened cable must be used on the +VE, 0v terminals
Gas detectors, require a four core screened Belden type security cable or 600v rated BMS cable (max cable length of 100 meters.)

Remote emergency stops and thermal links require a two core screened cable.
Warranty will be void if Fire Protection Cable or cable over 1mm dia. is used on the SELV side.

Detector Indications

Each detector has its own Bi-Colour LED which is used to indicate the status of that detector.

Note: There is a warm up period after initial power up of approximately 90 seconds. During this time the green LED will flash once per second and the output signal will be inhibited. This is to prevent spurious alarms. After the warm up period and on application of gas, the red LED will light when a high gas alarm level is reached.

Not Lit:	No power/comm's. These are four wire units and all connections are required, check the polarity of both the power and the comm's (MA/MB) terminals are correct. Check the detector is address set to the correct channel and the detector has been learnt using (25)
Flashing Green:	Detector is warming up, the detectors will flash green on power up for 90 seconds while the sensor elements stabilize. The system will ignore any detectors while flashing.
Solid Green:	Detector is powered and active.
Flashing Red:	Low level alarm. All detectors have both a low and high level alarm, low level alarms serve as a warning that an unsafe condition maybe building and gives chance to intervene before loss of gas service.
Solid Red:	High level alarm. An unsafe level of the target gas have been reached and the system will isolate the gas supply. The cause of the alarm will require identifying and resolving before the gas supply can be re-established.

After installation a simple bump test can be performed by using an appropriate level test gas in order to check operation. Full testing and calibration checking takes place during a Medem commissioning.

Detector Location information

Detector location will vary dependant on the individual characteristics of the target gas that is being monitored for. The descriptions below describe the position for each detector after considering these characteristics.

For proper function care must be taken not to site a detector in a "dead space" or in the flow of any ventilation.

Natural Gas/Methane

Natural gas detectors should be mounted at high level on a wall approximately 150mm from the ceiling height and avoiding corners and potential dead air areas.

Natural gas detectors should not be mounted below the height of the top of a doorway for example. This is because as the gas is slightly lighter than air it will rise filling the room from the ceiling down and will spill through the top of a door opening into the next room. If the detectors are mounted below this height then it will take longer for the gas to reach the detector.

LPG/Propane

LPG gas is heavier than air so detectors need to be mounted at low level 100mm from the floor, consideration should be given to any potential mopping or wet floor height.

Carbon Monoxide

Carbon Monoxide is slightly lighter than and defuses evenly so detectors should be mounted within the 'breathing zone' approximately 1.6m - 1.8m from the floor.

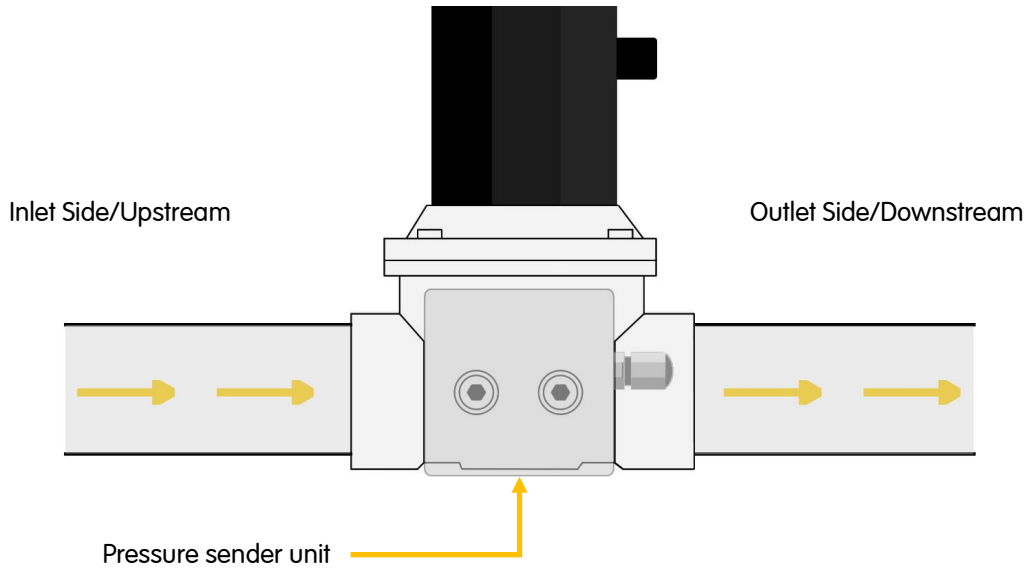
Carbon Dioxide (created by gas appliances or human respiration)

Carbon Dioxide detectors should be installed so they monitor the general level of CO2 within the area. They should be mounted above standing head height and between 1m and 3m from the potential source. Care should be taken so they are not located close to the edge of a canopy or in direct flow of the supply or extract ventilation.

For monitoring of piped or bottled CO2 or guidance on site specific requirements of any gas please don't hesitate to contact us.

Direction of flow

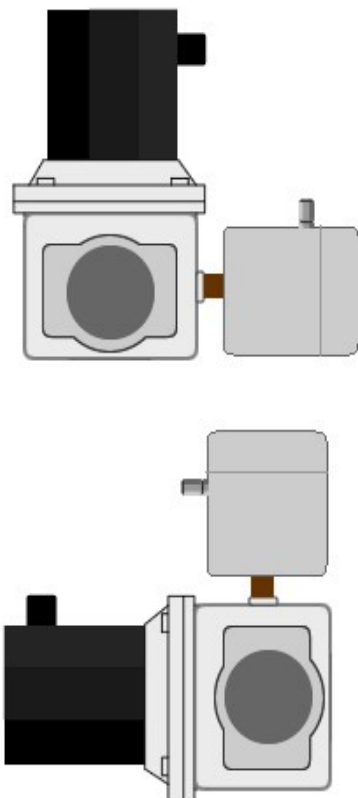
Ensure that the valve is correctly installed with regard to the direction of the flow of gas and that the Sender Unit is fitted the correct way round. (Note: there is no flow "through" the pressure sender unit, it is purely reading the pressures either side of the valve).



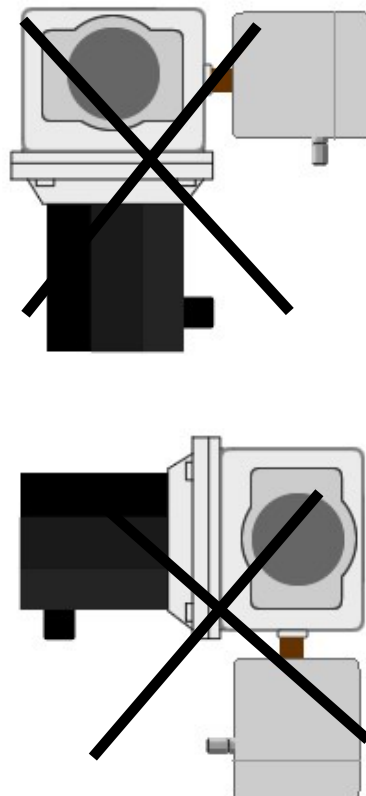
Gas Solenoid and Sender Unit Mounting

Never mount the valve such that the Solenoid or Sender Unit are below the horizontal.

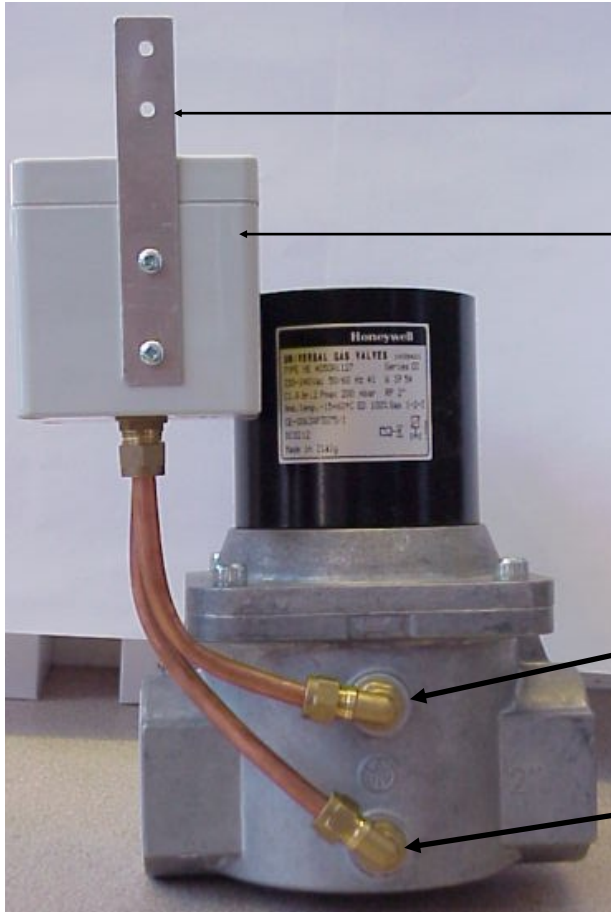
Correct



Incorrect



Mounting details - Fitting kit



WALL MOUNTING STRAP

PRESSURE SENDER UNIT

INLET PORT & OUTLET PORT
Note: These ports could be side by side,

INLET PORT

OUTLET PORT
Note: If this port is blanked off, use port on base of valve.

NOTES:

Solenoid coil of the valve should never be mounted below the horizontal.

Pressure sender unit should never be mounted upside down (to protect from water ingress).

Fitting kit - Contents



Approx 400mm length

It is essential that the installation is carried out in the order given below to ensure the correct operation of the system.

First read the system description sheet before following the instructions below

The main circuit board should be removed before drilling for cable entry.

1. Connect the gas valve to the marked terminals "gas valve".
2. Connect current monitors where required (6 & 7 on diagram).
3. Connect the pressure sender unit to the marked terminals (10).
4. Connect any additional EM stop buttons or thermal links in series to the terminals marked "EM stop" (5).
5. Each detector/device has a rotary address switch, each switch should be set to a different number or letter starting with "0". Then connect the gas detectors to terminals marked "detectors" on the panel. Detectors are wired in parallel. "Daisy chain" (11 & 12).
6. Connect fire alarm, ensure potential free n/c (13)
7. Connect 0-10 volt to speed controllers 0-10 volt inputs where required (14)
8. Ensure any BMS connections are made to the relays (Mains relays No.4 (Optional for SELV use BMS A, B & C No.16).
9. Connect the 3 amp fused spur 240 volt supply to marked terminals.
10. At this point check that the sender unit has been fitted to the control valve and that gas is available.
11. Once power is connected to the panel the detectors will flash the green LEDs for 90 seconds after which the LEDs will be on continuously.
12. Press the "learn field button" (25) this is on the main circuit board at the top of the board, pressing this once allows the panel to learn how many and which type of detectors are fitted.
13. Press the "display detectors" button whilst checking on the display that all the detectors have been recognised by the panel. A recognised detector will appear as "CMOX" Carbon Monoxide, "CMBS" combustible, "CDOX" Carbon Dioxide, "OXYG" Oxygen depletion and "TEMP" Temperature. Count the number of "seen" detectors on screen and ensure total is the same as the number of detectors installed. "INVL" means no detector on that channel. If more than 4 detectors are fitted then press the up/down buttons to page through the entire range. Note that a detector set at 0 appears as 1 on the LCD and a detector set as 1 appears as 2 on the LCD etc.
14. At this point turn the on/off switch to the on position press the "gas" button, the panel will test to ensure gas tightness and provided there are no leaks the panel will allow gas through and the gas on LED will light. Should the gas test fail then press the pressure button (A) to see the pressure in mBar on both sides of the valve. Thus you can see the pressure drop downstream provided the valve is closed.
15. Check that the panel can see the smallest allowable pressure drop if it does not then increase the proving time by adjusting the blue rotary dials (prove time 18, see page 6) on the circuit board and or by switching on SW=X2 (19).
16. Check the operation of the electric contactor by pressing the 'Electric' button on the panel lid to switch on and off.

Notes.

It is recommended that all systems are commissioned after installation by Medem UK. This will extend the warranty period from 5 years to 10 years and ensure the system is working as designed. Please see warranty conditions that came with the main panel

**Please do not hesitate to call for advice on the following number:
0161 233 0600 during office hours**

In the event of any alert the system will always give a reason on screen as to the cause.

Common messages you may receive are shown below with further explanation.

If you require any help or if anything is unclear then please contact technical support on 0161 233 0600

Test fail check all appliances:

The system has found an escape of gas, the most common cause is an open appliance. Check all appliances are off and restart the pressure test. If the system still reports test fail then a leak will be on the pipe work. Using "Blind button A" (see page 2) you can view the gas pressures at the valve, the outlet pressure must remain at least 90% of the value of the inlet pressure or a leak will be declared.

Error from valve sender unit:

System is not receiving data from the sender unit. The pressure sender is a required part of the system and cannot be "linked out". Verify the sender is correctly wired and that you have a green flashing LED on the sender unit.

Detector fault XX:

The system believes it has lost connection to a detector on address XX, verify detector addresses and press the "learn button" (25). Verify all connected detectors are being registered by pressing "Detectors button" (see page 2). If you have no detectors connected to the system pressing the learn button will clear the error message.

Supply and/or Extract fans not running:

The system can monitor the fan status via a current monitor or air pressure switches. These provide a closed contact to terminals S1 and E1, it is a requirement when using fan interlocking that the fans be running (and therefore the S1 and E1 receiving a closed contact) before the system can begin a gas pressure test. If at any point the fans stop running (opening the S1 or E1 contact) the system will isolate the gas and report fans not running. Check that the fans are not only switched on, but actually running and moving air.

Low incoming gas pressure:

The system requires a minimum of 13 mBar of pressure at the inlet side of the gas valve, this is to ensure a correct strength flame. If at any time the incoming pressure drops below 13mBar for more than 10 seconds the system will isolate the gas and report "low incoming gas pressure"

Note: if this occurs during installation check the sender unit direction of flow, if the sender is installed backwards the system will believe the "outlet" to be the "inlet" and therefore see an open end as being low incoming gas pressure. This can be resolved using the "rev sen" option switch (23)

Emergency stop button pressed:

The system has an panel mounted emergency stop and connection inside for remote buttons. First check the panel button (once pressed some require resetting by twisting and releasing). Clear the message by turning the main system switch off and then back on, if the message remains check any remote buttons and their connections. The terminal for the remote buttons requires a volt free normally closed contact, ensure all remote stop buttons, thermal links any another connected systems (BMS/Fire panels) are reset and the contacts are closed.

Specifications

General	
Model Number:	GPPS-evo v4
Size (W x H x D):	255mm x 180 x 60mm
Housing Material:	Polycarbonate RAL 7035 -light grey. Gasket: Polyurethane
Mounting:	Wall Mount
User Interface	
Indications:	LCD Display and LED's
Audible Alarm:	85DB @ 10CM
Language:	English
Power	
Power:	6W max
Voltage:	210-240v 50Hz
Fuse (internal):	3Amp Anti-Surge 250Vac, 5.00x20.00mm
Wiring	
Supply cable (Mains 230v):	1.5mm ² cross-section.
Detectors (SELV):	Four core screened Belden type security cable or 600v rated BMS cable. (max cable length of 100meters.)
Others (SELV):	Remote emergency stops and thermal links require a two core screened cable
Environmental	
Operating Temperature:	0°C to 40°C (32°F to 104°F), 30% to 80% relative humidity
Altitude:	2000m
Approvals	
EMC Testing (CE/UKCA)	BSEN 61000 6-1 2007
	BSEN 61000 6-3 2007

Warranty

Medem UK Warranty - Terms & Conditions

1. The warranty is a parts warranty and Medem UK Ltd will not cover or accept any labour or other expenses that may be incurred in the process of changing faulty product.
2. All panels and sender units are covered by a five year warranty.
3. Gas detector units and other remote detectors carry a two year warranty. Installation of the detectors should not be undertaken until all building and construction work is completed.
4. Gas solenoid valves carry the original manufacturers warranty, though as the supplier Medem UK will exchange faulty valves for return to the manufacturer.
5. Where a Medem UK engineer (or another company appointed by Medem UK) commission and installed system then that system will carry a ten year warranty. This applies to the main panel and the sender unit. At the time of commissioning a security label with a serial number will be attached to the main panel box. photographs and a comprehensive record of the installation will be held by Medem UK.
6. Where a warranty claim is made then, where appropriate, a written order to attend site must be provided to Medem UK A cost for labour and travel to site will be prepared as a quote. The cost must be included in the order.
7. Where it is found that the installation and/or the quality of workmanship has contributed to or wholly caused the failure of the product then we reserve the right to charge the whole or a proportion of the cost of the faulty item.

WEEE Directive

Information on disposal of electrical & electronic equipment.



Responsibility for Proper Disposal: As the manufacturer of this electronic system, we adhere to the Waste Electrical and Electronic Equipment (WEEE) Directive. It is the responsibility of the customer to ensure the proper disposal of this product at the end of its life cycle, in accordance with local regulations and guidelines for electronic waste management. Please consider recycling or returning the product to authorized collection points to minimize environmental impact. Thank you for your cooperation in protecting our environment.

While every effort has been made to ensure the accuracy and completeness of the instructions provided with this product, we cannot guarantee that errors or omissions may not have occurred. Therefore, we cannot be held responsible for any consequences resulting from the use of this product based on these instructions. If you discover any inaccuracies or discrepancies, we kindly ask that you inform us promptly so that we may address and correct them accordingly.