

Multi Function Control System for Boiler and Plant rooms

SEC-B



MODERN PLANT

The Home of
Control & Automation
in Ireland

medemTM

Multi-Function Control System For Boiler and Plant Rooms



The SEC-B, Gas detection and Gas Pressure Proving system has been designed for use in boiler houses and plant rooms with low and high pressure isolation.

Low voltage sensors for the detection of natural gas, LPG, carbon monoxide or carbon dioxide are connected to the panel that will alarm and close the electric control valve in the event of dangerous levels being detected.

The SEC-B is also a gas pressure proving system so that the IGE UP1A edition 2 standard can be complied with in relation to ensuring that there are no gas leaks before the control valve is opened after a closer for any reason.

Under HSE document PM5 and BS5885 the SEC-B can auto reset after an electricity supply failure when used in boiler room applications. This is also supported in BB100 for educational boiler room projects.

Industry leading 5 year warranty or 10 years when commissioned by Medem UK.

Design Features

Automatic restart after power supply failure in boiler applications, refer to HSE PM5 or BB100 for education

Gas & electric isolation of a boiler room in one control panel, provides control for use and an individual isolation point for an emergency.

Protects people and property by testing for leaks and open appliances before allowing gas available by using Medem **patented** true differential **gas pressure measuring** across the solenoid valve. This eliminates **nuisance tripping** of the gas supply as can happen with mechanical switches.

Extremely simple to use, LCD panel tells the operator its status and what to do, with connections to a BMS and an internal an audible buzzer.

Continual dynamic monitoring of the inlet pressure ensures a **low pressure** of 12mbar or less causes an isolation of the gas solenoid valve to prevent the risk of Bunsen burners extinguishing.

An **Over pressure** of 70mbar. or above would also cause an isolation, this is to protect operators or equipment from a over specked high gas pressure.

Quick proving time, typically 50 seconds from switch on to ready for use.

In the event of a fire alarm test being undertaken the system can be set into a **fire test isolation** mode, once the test is completed the panel will revert to normal operation and be included in a fire alarm activation.

As a guidance, **an engineer**, can see classroom & valve seat gas leakage on the LCD.

Emergency shut off button, more can be added all low voltage.

Gas detection of Natural gas, Carbon Dioxide, Carbon monoxide, Oxygen and L.P.G

Auto stop timer no complicated timer resetting, protects building out of hours.

Ventilation interlock , with fan status displayed on the easy to use LCD.

The **SEC-B** is designed to protect people and property by means of testing for leaking gas each time the system is switched on. Whether gas is escaping from an appliance that has been left or damaged or leaking pipe work the system will not open the gas solenoid valve until the gas line is gas tight. This system can also isolate the electric supply.

Gas Detection

The SEC has been designed to accept multiple Gas detectors, these include: natural & LPG gases, Carbon Monoxide, Oxygen depletion & enrichment. Isolation of gas will occur upon detection of the target gases at prescribed levels.

The **LCD screen** displays the current status of the system. The panel offers solutions and advice instead of rows of flashing LED's that can often be confusing to the end user. A number of engineer functions are available within the panel in order to facilitate faster installation and testing of equipment. Amongst others, a tightness test indication of the gas line and a solenoid valve let by test can be carried out from the panel using the function buttons on the circuit board. Gas pressure readings from both sides of the valve can be displayed on the LCD unit .

Gas Pressure Proving

Using the patented differential pressure proving method the SEC-K can test for low pressure (natural/LPG) gas pipe work or can pressure prove a variety of gas delivery lines including Oxygen up to 10bar. Overpressure can also be monitored and reported on the LCD display.



Fan interlocking

To meet current regulations should the boiler room rely on mechanical ventilation the system can interlock so that all fans are operating before gas can be used.

Fire Test Isolation

In the event of a fire alarm test being undertaken the system can be set into a fire test isolation mode, once the test is completed the panel will revert to normal operation and be included in a fire alarm activation.

All features are installed as standard which can either be utilised at the point of installation or at a later date should requirements or legislation change.

Technical data sheet

The SEC-B system comprises of a pressure sender unit and a 230volt gas solenoid valve. The panel housing is an ABS enclosure, rated IP65, measuring 183mm high, 212mm wide & 97mm deep. The pressure sender unit and the gas solenoid valve are supplied with a fixing kit for connection on site. The pressure sender unit is wired to the control panel using single pair low voltage wire. The connection terminals are marked "A & B" on both the sender unit and control panel connections. The 230volt mains supply to the panel should be from a 3amp fused switch. The solenoid valve is connected to the terminals marked "Valve" on the panel connections. The connections marked "EM STOP" are provided in order that extra emergency stops can be operated by the panel. Wiring of emergency stop buttons should be series normally closed, extra low voltage. The connections marked "CM2 or PD switches are for the connection of a current monitor or pressure switches for interlocking fans with the gas supply. The connections marked "detectors" are for the connection of up to 16 devices including, Methane, LPG, Co2, CO, Oxygen and temperature. Mixed devices can be connected.

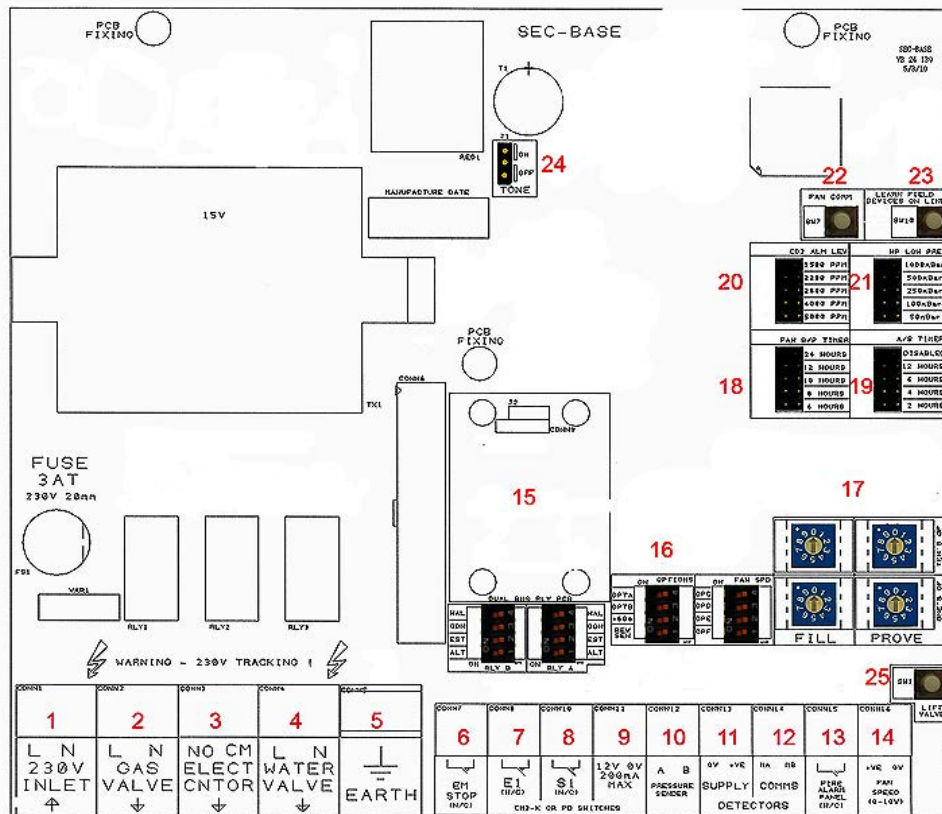
At the time of installation adjustments to the system can be made to suit the individual site, these include: Auto stop timer, alarm sounder on/off, fill time and prove time for pressure proving to find the smallest leak. All are factory set for a typical installation.

For guidance purposes only, a let by and a tightness test can be activated by the engineer using the push buttons on the circuit board. This is a diagnostic indicator. The Gas pressure readouts appear on the LCD display indicating the pressure on both sides of the valve.



System On/Off enables gas detection and use of each service button

- A** Blind button for displaying gas pressures on the LCD screen
 - B** Blind button for displaying first 8 detectors (Gas & temperature) on the LCD screen.
- Press **A & B** together to display second set of 8 detectors.
*(Press button **B** 3 times in quick succession to enable fire test mode see page 4)*



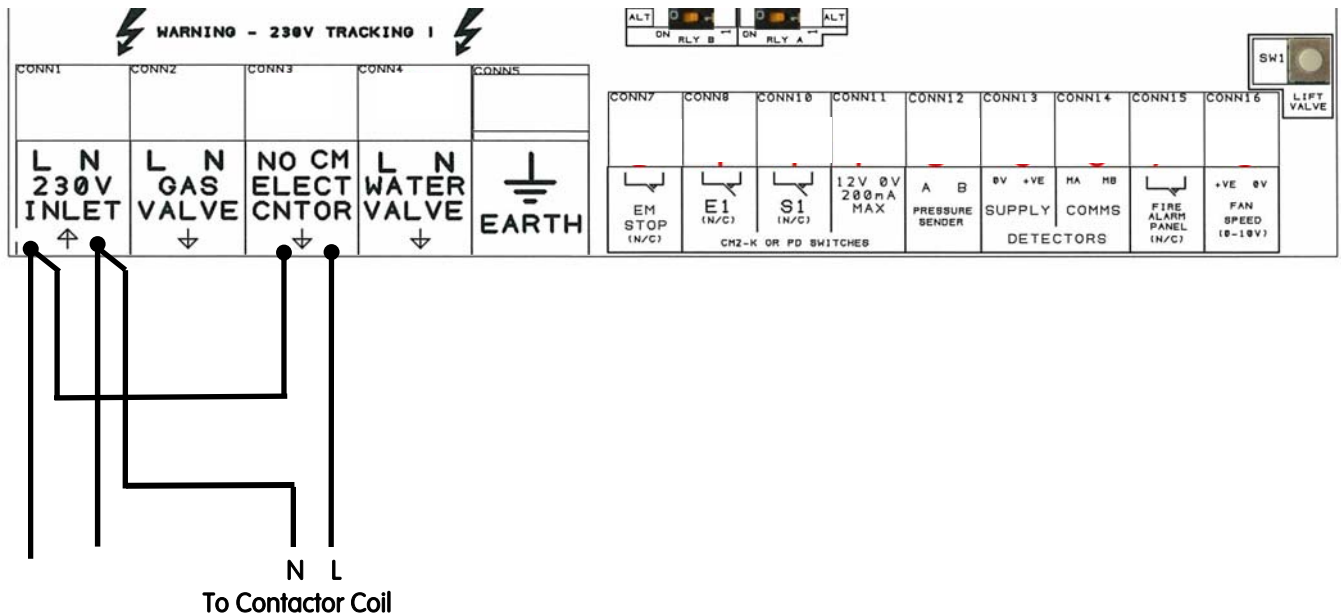
Power at 230 volts from a 3amp fused spur

Connections to panel: marked on board

1. Live & Neutral 230 volts supply from 3amp switched fuse spur
2. 230 volts out to gas solenoid valve
3. To contactor for isolating bench socket electricity supply
4. 230 volts out to water supply isolation valve
5. Earth connection terminals
6. Remote emergency stop buttons SELV, connect in series multiple buttons (requires a N/C circuit)
7. Extract fan interlock for current monitor (CM2M-K) or PD switches.
8. Supply fan interlock for current monitor (CM2M-K) or PD switches.
9. 12 volt power for current monitor (CM2M-K)
10. Pressure sender unit SELV and comm's both through "A" & "B" terminals (2 wire) **MUST BE FITTED**
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
15. Two relays, for connection to a BMS to indicate, high alarm, gas on, EM stop, low alarm. (One selectable for each relay)
16. OPTA=Over pressure check, will isolate gas supply if pressure exceeds 70 mbar
17. Fill & prove time for gas pressure proving, see page 4.
18. Timer adjustment for fan commissioning, allows timed period for gas installation commissioning.
19. Auto stop timer to isolate gas after set length of time. Factory set for model & use
20. CO2 alarm level adjustment depending on application. Factory set for model & use
21. High pressure low cut out adjustment (*where high pressure sender unit is used 1 bar*>)
22. Fan comm button, enables commissioning of the gas supply without fans running.
23. Learn field device button, press once only when all detectors are connected and powered (verify with Blind button B).
24. Jumper link to disable audible alarm sounder.
25. Lift valve button, opens the gas valve only whilst the button is continuously pressed, for commissioning purposes.

Method 1 (Preferred)

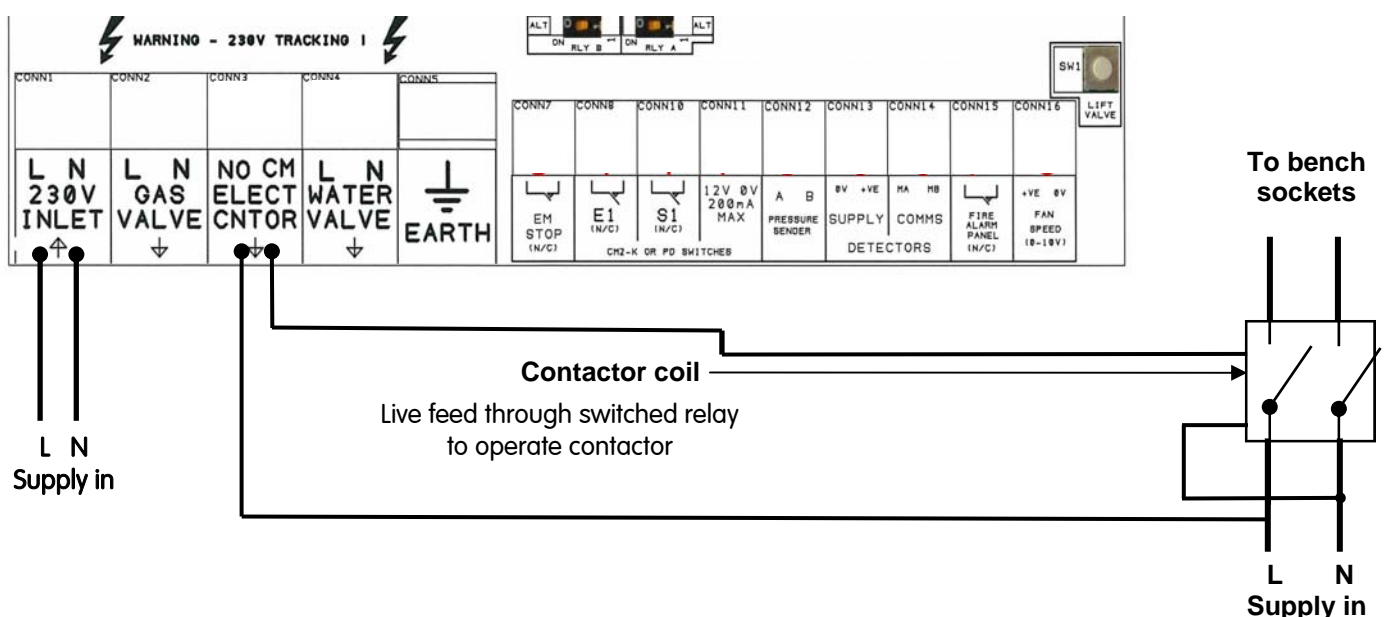
Using this wiring method, when isolating the supply there are no other voltages present within the panel.

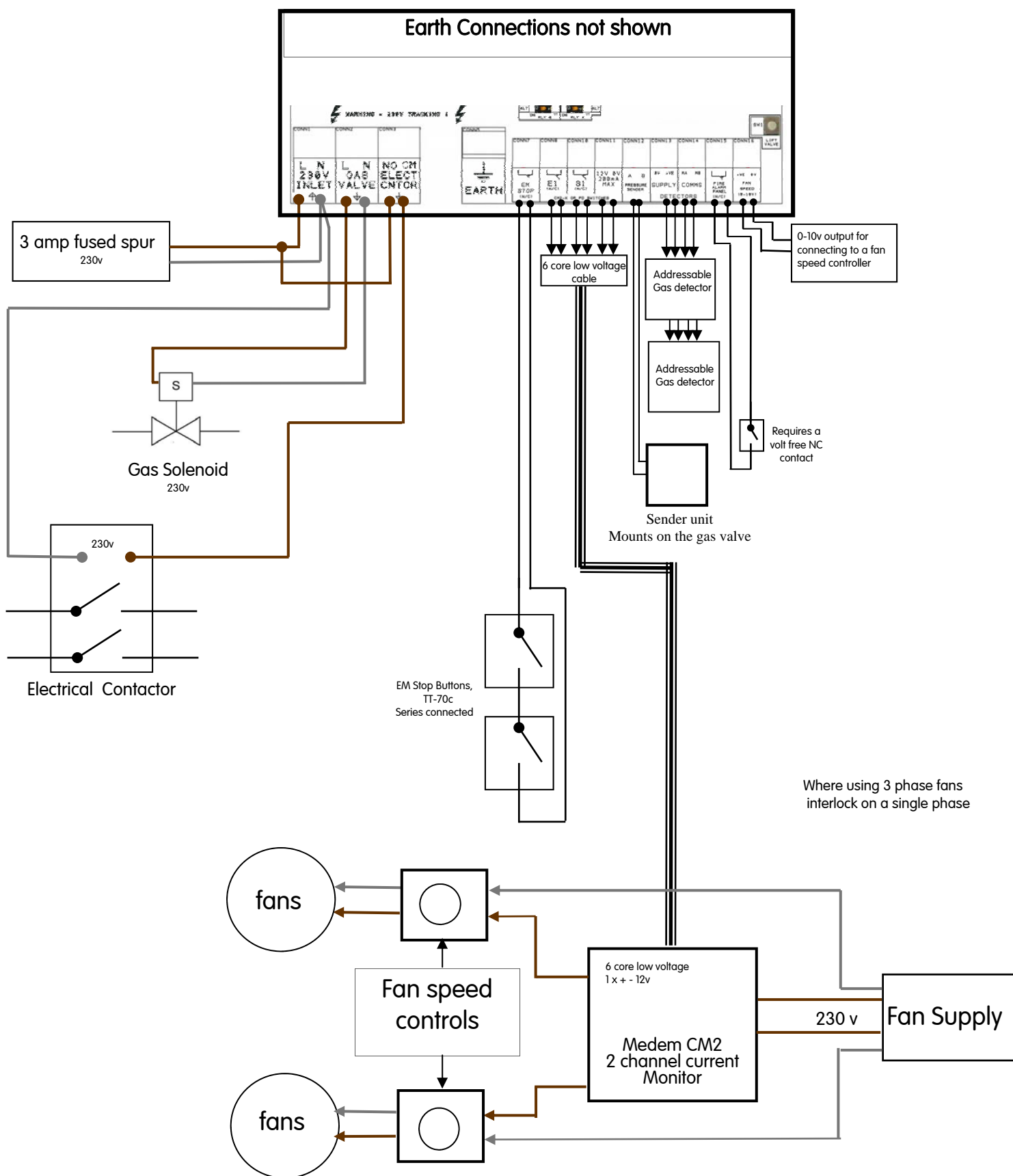


Earth Connections not shown

Method 2

IMPORTANT! If wired this way, a warning notice must be attached to the panel to indicate that there are two separate mains feeds.





Warranty & Commissioning

The Medem main panels come with an industry leading **5 year** parts warranty as standard and when commissioned by a Medem engineer this can be increased to **10 years** and includes a **24hr helpline**.

During the commissioning process a Medem engineer would attend site to ensure full and correct operation of the supplied Medem equipment, all site information including gas pressures, amperages and photographs would be taken and then uploaded to our service database.

This information is then instantly available for precise service back up and support via our 24hr telephone helpline. The 24hr helpline is manned by Medem personnel only.

"We design it, We build it, We back it up"



Please read this sheet as it contains important information

Before commencing installation please familiarise yourself to the equipment by reading the comprehensive installation instructions. If in doubt then please call 0161 233 0600. Out of hours please call 07894 684080 or 07843 355163.

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 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.

Multi gas detection, air quality monitor, fan interlock and gas pressure proving system

The SEC-B is a gas pressure proving system with electric isolation, gas detection and ventilation interlock. By monitoring the carbon dioxide and temperature the system can control ventilation levels where required. It is designed for use primarily in boiler rooms.

The system comprises of a mains powered panel capable of operating a mix of up to 16 devices of different types. The device types are, carbon dioxide, carbon monoxide, combustible gases, oxygen depletion and temperature.

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 or ventilation failure, low incoming gas pressure or if the emergency stop button is pressed.

Control Panel *the front of the panel has the following controls and indications:*

Emergency stop button
key switch
On/off buttons for gas and electric
Blind button **A** and **B**

LED indications:

Power On - green.....**A** blind button for displaying gas pressures on the LCD screen
Gas/Electric - red
Fans running light – yellow....**B** blind button for displaying connected devices (detectors & temperature) on the LCD screen

LCD display:

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



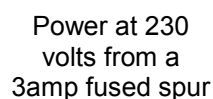
System On/Off enables gas detection and use of each service button

A Blind button for displaying gas pressures on the LCD screen
B Blind button for displaying first 8 detectors (Gas & temperature) on the LCD screen.
Press **A** & **B** together to display second set of 8 detectors.
(Press button **B** 3 times in quick succession to enable fire test mode see page 4)

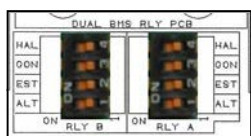
Other points to note

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 20metres 1mm cable should be used on the +VE, 0v terminals.

Pressure Sender Unit Mounting. This has an inlet and an outlet port (1/4 inch NPT). The inlet must be connected to the inlet test point on the solenoid valve (see fitting kit page) and the outlet port after the solenoid valve typically using 8mm OD copper pipe. Use the appropriate Medem fitting kit to fit the control valve size. 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.**

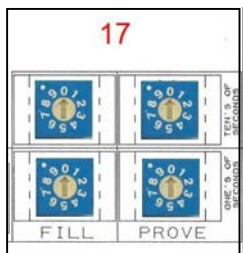


1. Live & Neutral 230 volts supply from 3amp switched fuse spur
2. 230 volts out to gas solenoid valve
3. To contactor for isolating bench socket electricity supply
4. To gas supply
5. Earth connection terminals
6. Remote emergency stop buttons SELV, connect in series multiple buttons (requires a N/C circuit)
7. Extract fan interlock for current monitor (CM2M-K) or PD switches.
8. Supply fan interlock for current monitor (CM2M-K) or PD switches.
9. 12 volt power for current monitor (CM2M-K)
10. Pressure sender unit SELV and comm's both through "A" & "B" terminals (2 wire) **MUST BE FITTED**
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
15. Two relays, for connection to a BMS to indicate, high alarm, gas on, EM stop, low alarm. (One selectable for each relay)
16. OPTA=Over pressure check, will isolate gas supply if pressure exceeds 70 mbar
OPTB= Auto restart on power failure (off by default)
17. Fill & prove time for gas pressure proving, see page 4.
18. Timer adjustment for fan commissioning, allows timed period for gas installation commissioning.
19. Auto stop timer to isolate gas after set length of time. Factory set for model & use
20. CO2 alarm level adjustment depending on application. Factory set for model & use
21. High pressure low cut out adjustment (*where high pressure sender unit is used 1 bar>*)
22. Fan comm button, enables commissioning of the gas supply without fans running.
23. Learn field device button, press once only when all detectors are connected and powered (verify with Blind button **B**).
24. Jumper link to disable audible alarm sounder.
25. Lift valve button, opens the gas valve only whilst the button is continuously pressed, for commissioning purposes.
26. OPTL Enable/Disable the front panel "FANS" LED (link on to disable)



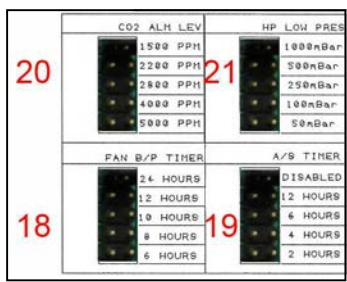
HAL - High alarm
GON - Gas On
EST - Emergency stop
ALT - Low Alarm

15. BMS Relay PCB. Two relays, for connection to a BMS to indicate, high & low alarm, gas on, EM stop. (One selectable from each relay) Max switching 48 volts 1 amp



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.

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 99 seconds. Increasing this time effectively makes the system more sensitive to gas leaks. (Factory default setting is 50 seconds). An extra 60 seconds prove time can be added onto the 99 seconds by adjusting the DIP switch under the options bank, see **No 16**.



18. Timer adjustment for fan commissioning, allows timed period for gas installation commissioning.

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

20. CO2 alarm level adjustment depending on application. Factory set for model & use

21. High pressure low cut out adjustment



Fan comm.

To enable the commissioning of the gas portion of the system before the ventilation interlock is completed to you may temporarily disable the interlocking by pressing button 22. 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 this for a maxim 24hour period but 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. Having addressed each detector press the learn field devices button (23), the system will scan and store any connected detectors. To verify that all detectors have been successfully learnt press the "blind button B" on the front panel to view address details.



Press button A

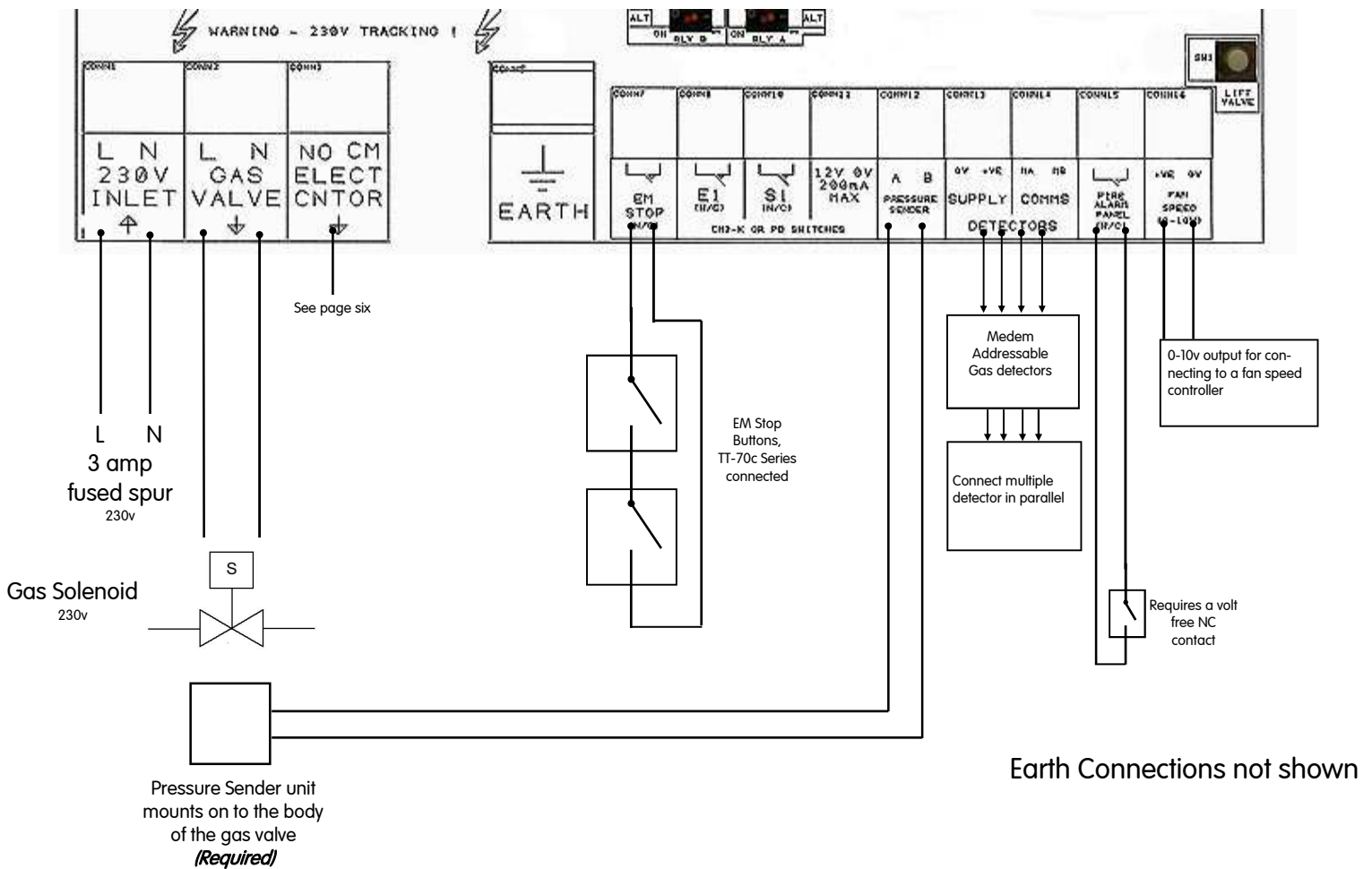
To display the gas pressures and view the set pressure proving set times.

Press button B

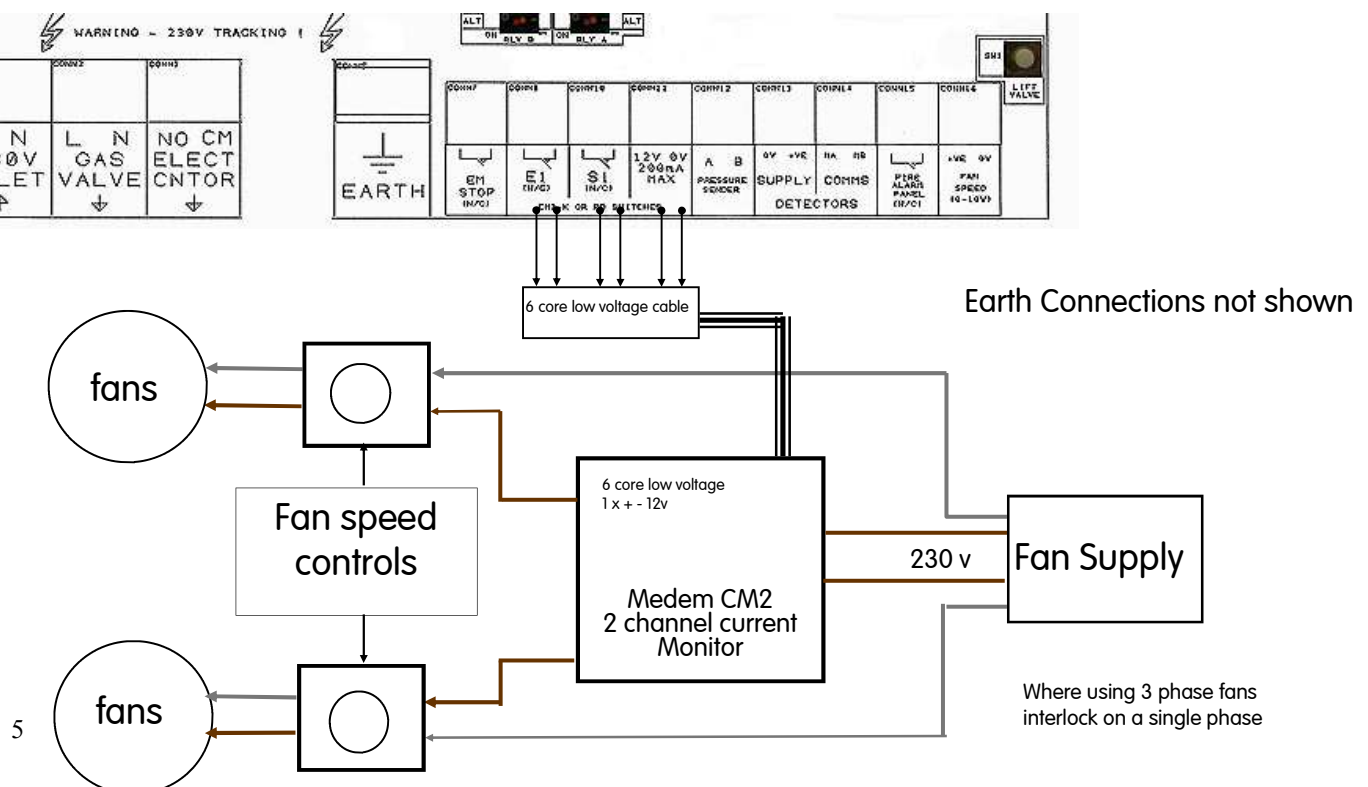
To display the gas installed gas detectors 1-8 press A & B together to view 9-16.

Fire Test Mode (Press button B three times)

When connected to a fire alarm panel using the fire alarm terminal (no.13) the system will isolate the gas during an fire alarm. If for the purposes of a fire test you wish to temporarily disable this interlock the SEC system can be put into a "fire test mode" by pressing blind button **B** 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.

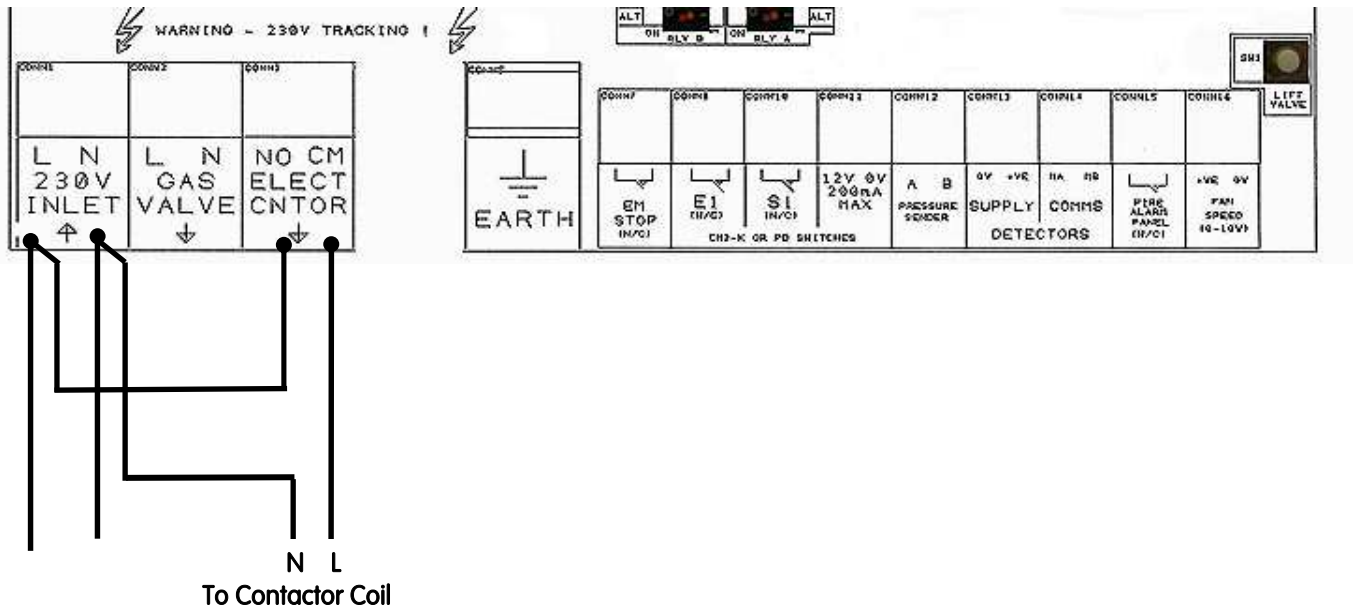


Fan Interlock Connections



Method 1 (Preferred)

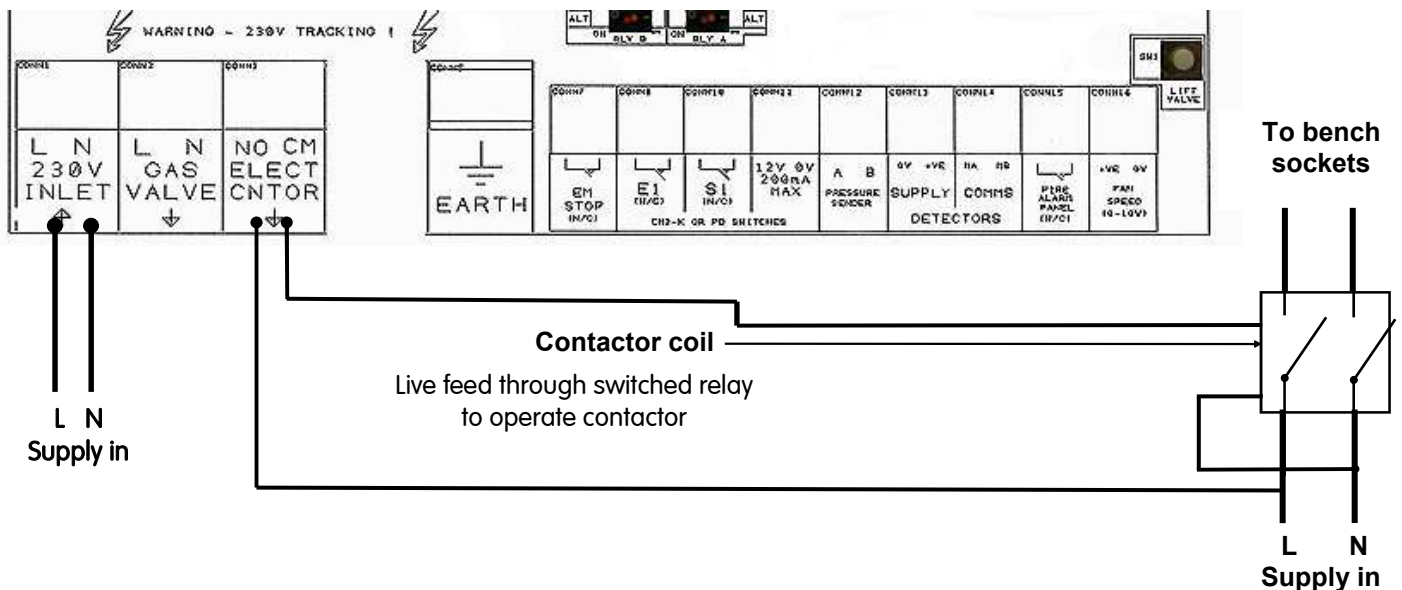
Using this wiring method, when isolating the supply there are no other voltages present within the panel.



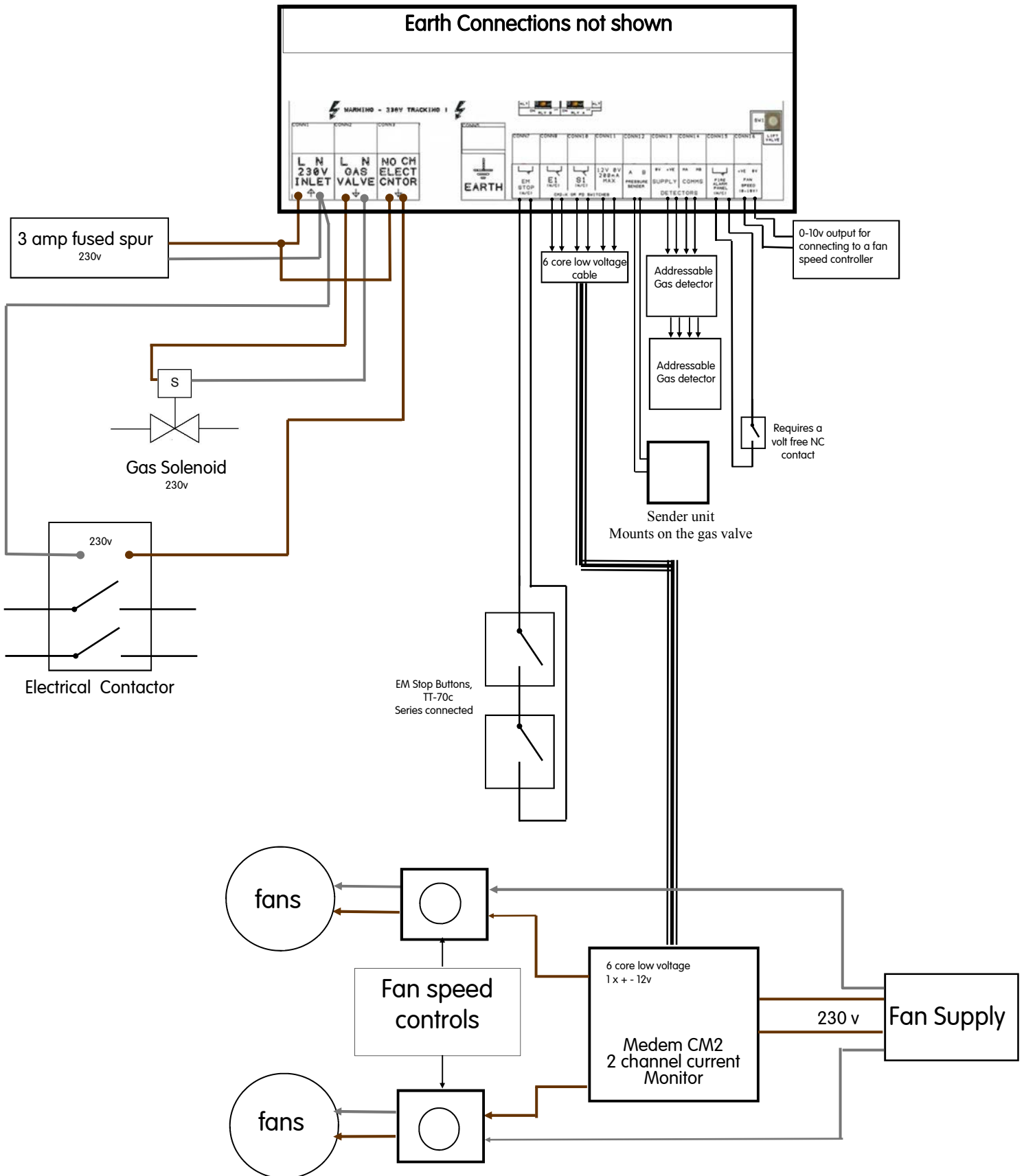
Earth Connections not shown

Method 2

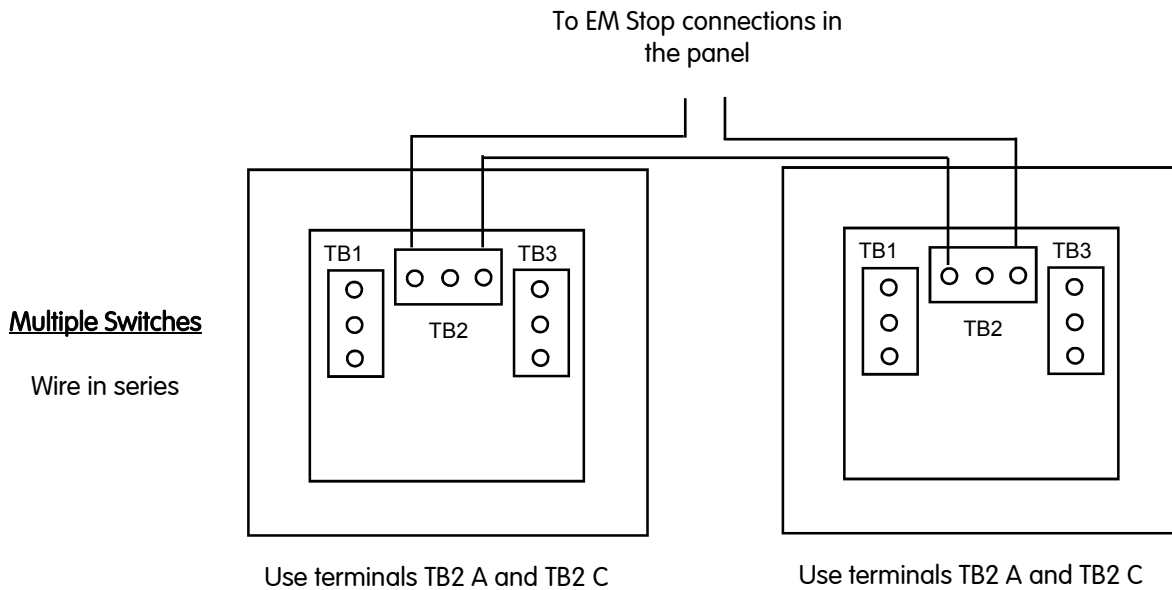
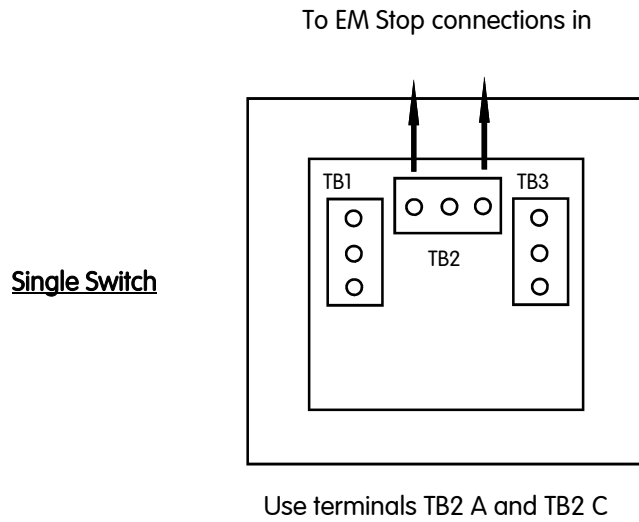
IMPORTANT! If wired this way, a warning notice must be attached to the panel to indicate that there are two separate mains feeds.



SEC-B



Where using 3 phase fans interlock on a single phase



Remote stop buttons can be connected to the panel terminal marked as "EM STOP" (number 6). The remote buttons must be wired as above in order to provide a "closed contact" for the control panel.

Detector Location

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.

Natural Gas

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 the gas to reach the detector.

LPG

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 similarly weighted to air so detectors should be mounted between 1 to 2 meters from the floor.

Carbon Dioxide

Classroom Carbon Dioxide detectors under guidance from IGEM/UP11/Edition2 should be mounted at a seated head height. However following onsite experience this mounting height can make detectors susceptible to false readings due to direct breath contact. We would suggest following the guidance for mounting as per a commercial kitchen to reduce the potential for false alarm readings.

Commercial kitchen Carbon Dioxide detectors should be installed so they monitor the general level of CO₂ within the cooking area. They should be mounted above standing head height and between 1m and 3m from the cooking line. 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 additional information or guidance on site specific requirements please don't hesitate to contact us.

Detector Testing

Any installed gas detector can be tested by allowing a small amount of the target gas onto the detector head until a change of state is registered on the control panel.

If the level of gas applied is of the set low alarm level, the LED on the detector will change from a solid green to a flashing red. An LED* or LCD* message indicating a low level alarm detection combined with an audible alarm on the panel will begin.

If the level of gas drops below the set low alarm level the detector LED will return to a solid green and the panels audible alarm and LED* or LCD* message will clear.

Should an emergency shut-off valve be connected to the panel this will remain open during a low alarm level detection.

If the level of gas applied is of the high alarm level or above, the LED on the detector will change from a solid green to a solid red. An LED* or LCD* message indicating a high level alarm detected combined with an audible alarm on the panel will begin.

Should an emergency shut-off valve be connected to the panel this will automatically close.

Once the level of gas drops below the high alarm level the audible alarm will continue and the high alarm LED* or LCD* message will remain.

The valve cannot be reinstated until the gases have been cleared and the control panel reset.

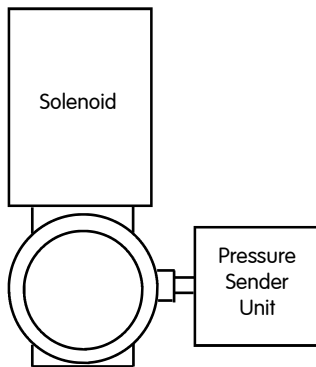
It is essential that the installation of the SEC-B is carried out in the order given below to ensure the correct operation of the system.

This guide, when completed, should be posted to Medem UK in order that the warranty period can be activated.

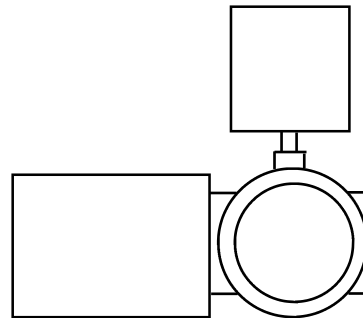
Site Name	Return one copy of this sheet to the address below: Modern Plant Limited, Otter House, Naas Road, Clondalkin, Dublin 22 Tel: 00353 1 461 4300 E: sales @ modernplant.ie, W: www.modernplant.ie
Installing Company	
Engineers Name	
Date Completed	
<p>First read the system description sheet before following the instructions below</p> <ol style="list-style-type: none"> 1, Connect the gas valve to the marked terminals "gas valve" 2, Connect current monitors where required (7 & 8 on diagram) 3, Connect the pressure sender unit to the marked terminals (10) 4, Connect any additional EM stop buttons in series to the terminals marked "em stop" (6) 5, Each detector/device has a blue rotary 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 (15) 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" (23) this is on the main circuit board on the right hand side, just over half way up the board. pressing this once allows the panel to learn how many and which type of detectors are fitted 13, Press and keep pressed the "display detectors" button whilst checking on the LCD display that all the detectors have been recognised by the panel. A recognised detector will appear as "CO" Carbon Dioxide, CM, combustible, CL, Carbon Dioxide low, (labs), CH, Carbon Dioxide High (kitchens), OX, Oxygen and TP, Temperature. Count the number of "seen" Detectors on screen and ensure total is the same as the number of detectors installed. NM in the third column means that number is not monitored. If more than 8 detectors are fitted then press both the "display detectors" and the "pressure" buttons together to view the next 8 detectors. 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 to see the pressure in mbars 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) on the circuit board and or by switching on the +60 seconds dip switch 16, Check the operation of the bench electric and water valve by pressing the appropriate buttons on the panel lid to switch on and off. <p>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</p>	
<div style="border: 1px solid black; height: 150px; margin-top: 10px;"></div> <p style="text-align: center;">Installers comments</p>	
<p>Please do not hesitate to call for advice on the following number: 00353 1 461 4300 office hours</p>	

Mounting of gas solenoid valve with Sender Unit for Medem Gas Pressure Proving System

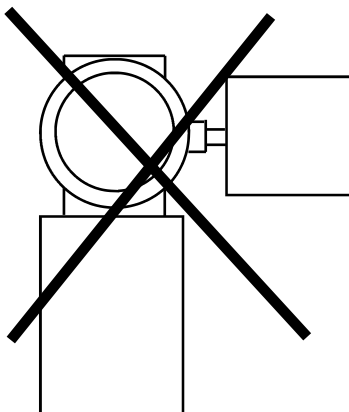
Correct



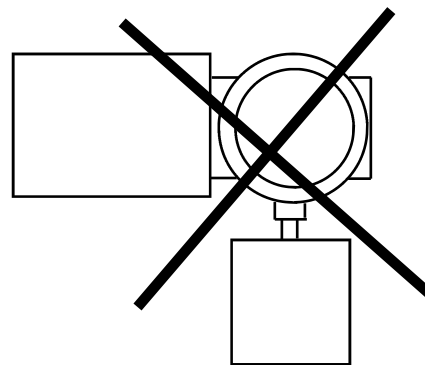
Correct



Incorrect



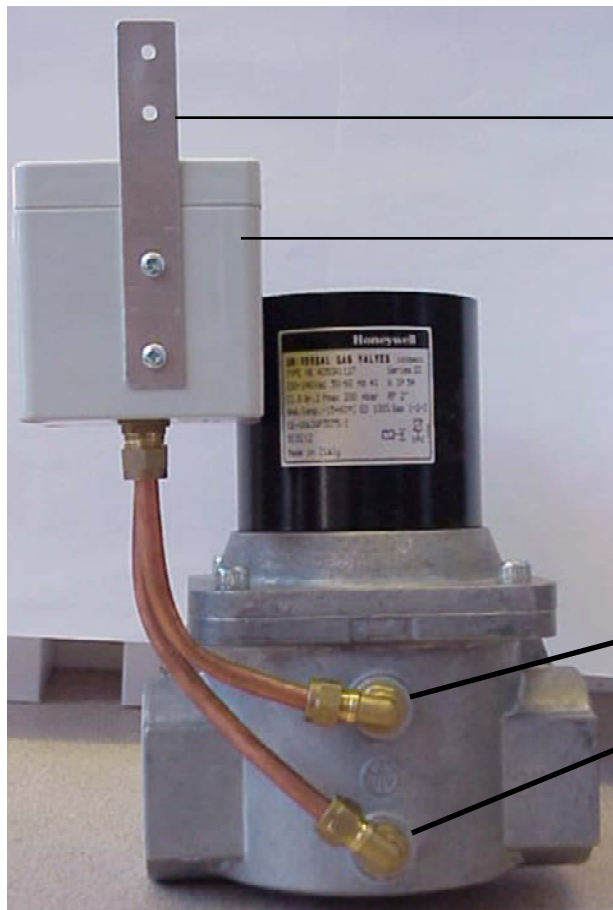
Incorrect



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

In addition, check 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, (Sender Unit cable gland should be on the outlet side of the Solenoid Valve).

MOUNTING DETAILS FOR PRESSURE SENDER UNIT ON VALVE



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)

CONTENTS OF FITTING KIT FOR SOLENOID VALVE



Approx 400mm length



As Ireland's official distributor for Grohe, Modern Plant stock-holds and displays a large range of Grohe Commercial and Domestic products including showers, taps, frames and accessories.

GROHE



Modern Plant Ltd are an official stocking distribution centre for Emerson Rosemount industrial flow, level, pressure, analytical and temperature instrumentation products.

EMERSON
Process Management



Modern Plant Ltd offer a wide range of Stiebel Eltron products, from instantaneous hot water heating, stored water and electric space heating solutions.

STIEBEL ELTRON
Comfort through technology



We are one of Ireland's leading suppliers of Stuart Turner pumps to suit a variety of water boosting and water transfer applications across multiple market sectors.

STUART TURNER
ENGINEERED TO EXCEL



Modern Plant Ltd are official stocking distributors for the full range of SMC products and have a wide range of parts available from our trade counter.

SMC



Modern Plant Ltd is the sole Irish distributor for the complete Medem gas safety product range. Both companies work closely to ensure the products remain best in class.

medem



We stock a comprehensive range of Haws AG emergency equipment. We also supply special models to the highest level of quality as well as attractive, stylish drinking fountains and water coolers.

Haws
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