



**TRENT**  
MAKING **SENSE** OF CONTROLS



# LabSense *PLUS*

## INSTALLATION & COMMISSIONING INSTRUCTIONS

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## Important Notes

Ensure that the electrical installation has been installed in accordance with the current edition of the IEE regulations.

Ensure that the gas installation has been installed and commissioned by a competent person in accordance with the current gas regulations and standards.

Ensure that the ventilation and extract system has been set to the correct air flow design levels in accordance with the current regulations.

If in doubt, ask!

Ensure that the client has been shown how to operate the system and that they have been handed the operator's guide.

## Product Overview

**LabSensePLUS** is an electronic gas interlock with ventilation control for use in teaching laboratories and preparation rooms.

For compliance with IGEM/UP/11 and Building Bulletin 101.

**SINGLE PHASE VERSION FOR EC FANS**

# Installation & Safety Information

## Commercial Data

(LS = Product, YY = Year, NNN = Serial No)

Product barcode (enclosure), LS-EYY-NNN

Main PCB barcode, LS-PYY-NNN

Facia PCB barcode, LS-FYY-NNN

Country of origin, UK

Package Weight,

Product Weight,

## Safety Information

Installation, commissioning, and maintenance of the **LabSense plus** should only be undertaken by competent persons.

The **LabSense plus** is a safety control. Do not tamper.

## Gas Installation

For gas pressure proving, the Maximum Operating Pressure (MOP) for Natural Gas is 25mBar and 40mBar for LPG.

For gas pressure proving, the maximum pipe work volume for Natural Gas is 0.15m<sup>3</sup> and 0.025m<sup>3</sup> for LPG.

## Electrical Installation

An unswitched fused spur 230 Vac, 50 Hz single phase electricity supply must be provided in accordance with the latest edition of BS 7671 (IEE Wiring Regulations), and relevant Building Regulations.

## Control Cabling (Terminals 1-22)

Screened cable must be used on all control circuits.

## Drain Wires

Screened cables must have their drain wires terminated only at the **LabSense plus** ground terminals.

Do not connect drain wire to sensor ground terminals. Insulate any bare drain wire or metallic cable screen.

## Power Cabling (Terminals 23-34)

Maximum Full Load Current (FLC) for fans powered from PCB, 8.3A

Maximum amperage for gas valve, 6.3A

## Controller Component Re-order Codes

Main PCB - LSP-MAIN

Facia PCB - LSP-FASCIA

Expansion module - VV-EM-02

Ribbon cable - CS-RIBBON

Enclosure, please contact Trent.

# Technical Data

Power consumption (unit)	5W
Power consumption (CO <sub>2</sub> /temperature sensor)	2.4W
Power consumption (Gas pressure transducer)	<0.24W
Transformer power rating	10VA
Enclosure material	High Impact Polystyrene
Operating temperature	-20 to 60°C
Ingress protection rating	IP40
Recommended control cable	Belden 8723 or equivalent
Minimum recordable on board current	0.3A

Power terminals	Number	Spec. Max torque - 0.6Nm Max conductor - flexible 4mm <sup>2</sup> / solid 6mm <sup>2</sup> Stripping length, 8mm
Power supply	32 ( E ) 33 ( L ) 34 ( N )	250 V ~ (F4 - 1A fuse, Type T)
Power output 1 (Fan 1)	23 ( E ) 24 ( L ) 25 ( N )	8.3 A 250 V ~ (F2 - 10A fuse, Type T)
Power output 2 (Fan 2)	26 ( E ) 27 ( L ) 28 ( N )	8.3 A 250 V ~ (F3 - 10A fuse, Type T)
Power output 3 (Gas valve)	29 ( E ) 30 ( L ) 31 ( N )	6.3 A 250 V ~ (F1 - 10A fuse, Type F)

Control terminals	Number	Spec. Max torque - 0.6Nm Max conductor -flexible / solid 1.5mm <sup>2</sup> Stripping length, 6mm
Analogue input 1 (Gas pressure)	1 (24Vdc) 2 (0 to 10Vdc) 3 (0Vdc)	Range 0 to 50mBar
Analogue input 2 (CO <sub>2</sub> )	5 (24Vdc) 6 (0 to 10Vdc) 7 (0Vdc)	Range 0 to 5000ppm
Analogue input 3 (Speed selector)	S- (-12Vdc), RTN (0Vdc)	Switched
Analogue input 4 (Temperature)	S+ (0 to 10Vdc), S- (0Vdc)	Range 0 to 50°C
Discreet input 1 (Fire alarm)	9 & 10	Switched (2Vdc)
Discreet input 2 (E-stop)	11 & 12	Switched (2Vdc)
Analogue output 1 (Fan 1 speed)	13 (0 to 10Vdc) 14 (0Vdc) 15 (SCR)	0 to 10Vdc
Analogue output 2 (Fan 2 speed)	16 (0 to 10Vdc) 17 (0Vdc) 18 (SCR)	0 to 10Vdc
Discreet output 1 (Fan enable)	19 & 20	Switched VFC (24Vac/dc Max)
Discreet output 2 (Fan early warn-	21 & 22	Switched VFC (24Vac/dc Max)

# Locations Guide

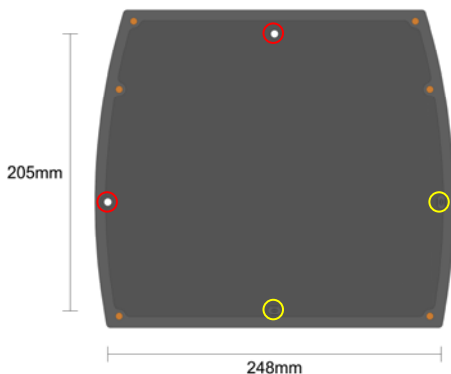
## Location of Controller and Emergency Stop Button

An emergency stop button should be installed near the teacher's desk, and at either the main light switches or the exit from the room.

The unit should be protected from water ingress, splashes, and be located at least 1 metre away from sinks, basins, or similar.

## Mounting points

The **LabSense plus** has 4 mounting points.



○ - Mounting points.

○ - Knock-out mounting points.

## Selection of Fans

**LabSense plus** provides a 0 to 10Vdc speed control signal, please ensure fan(s) are compatible.

## Location of Gas Pressure Transducer and Gas Valve Junction Box

Transducer **Must**:

Be located at least 6 pipe diameters downstream of gas valve.

Be installed in a pipework fitting, **NOT** into automatic isolation gas valve body.

Be positioned to avoid mechanical damage.

**NOT** be installed pointing upwards (i.e. with cable facing downwards) to avoid collection of dirt and moisture.

Transducer cable length 500mm, Install Gas Valve Junction Box accordingly.

## Location of Combined CO<sub>2</sub> and Temperature Sensor

Mount in a location to reflect the general CO<sub>2</sub> levels and temperature within the laboratory and at student's head height whilst seated.

Avoid mounting in direct sunlight, near doors, openable windows, air supply louvres, or close to sources of heat.

# Maintenance

All products require regular maintenance to ensure safe and reliable operation.

Maintenance should be carried out on an annual basis as a minimum and should only be carried out by persons competent to do so.

It is recommended that maintenance of the LabSense Plus system is carried out in conjunction with the servicing of the ventilation system.

## Inspection Procedure

Ask site staff whether there have been any problems with the system.

Isolate supply and remove fascia.

Check condition of cables, PCB and enclosure for signs of damage or deterioration.

Replace fascia and reinstate power to carry out functional tests.

## Maintenance Procedure

Carry out the following checks:

Fan diagnostic check	PG.15
Gas leak simulation	PG.16
Combined CO <sub>2</sub> & temperature sensor setup	PG.16
Fire alarm functionality check	PG.16
E-stop check	PG.16
Functional test	Refer to Operator's Guide

Clean with a dry cloth, removing any build-up from the LabSense and any ancillary equipment (sensors etc).

Following maintenance please carry out recommissioning in accordance with fan setup flowchart PG14.

# Ancillary Data

## CO<sub>2</sub> & Temperature Sensor

<b>Product Code</b>	CS-CO2-01A
<b>Power Supply</b>	24Vdc
<b>Ingress Protection Rating</b>	IP40
<b>Power Consumption</b>	2.4W
<b>Dimensions</b>	125mm x 86mm x 26mm
<b>CO<sub>2</sub> Detection Range</b>	0 to 5000ppm
<b>Temperature Detection Range</b>	0 to 50°C

## Gas Pressure Transducer

<b>Product Code</b>	CS-GPS-01
<b>Power Supply</b>	24Vdc
<b>Ingress protection rating</b>	IP66
<b>Power consumption</b>	<0.24W
<b>Pressure Detection Range</b>	0 to 50mBar
<b>Connection Size</b>	G 1/4" BSP Parallel Male

## Gas Valve Junction Box

<b>Product Code</b>	CS-GVJB-01
<b>Power Supply</b>	230V ~
<b>Ingress protection rating</b>	IP40

## Emergency Push Buttons

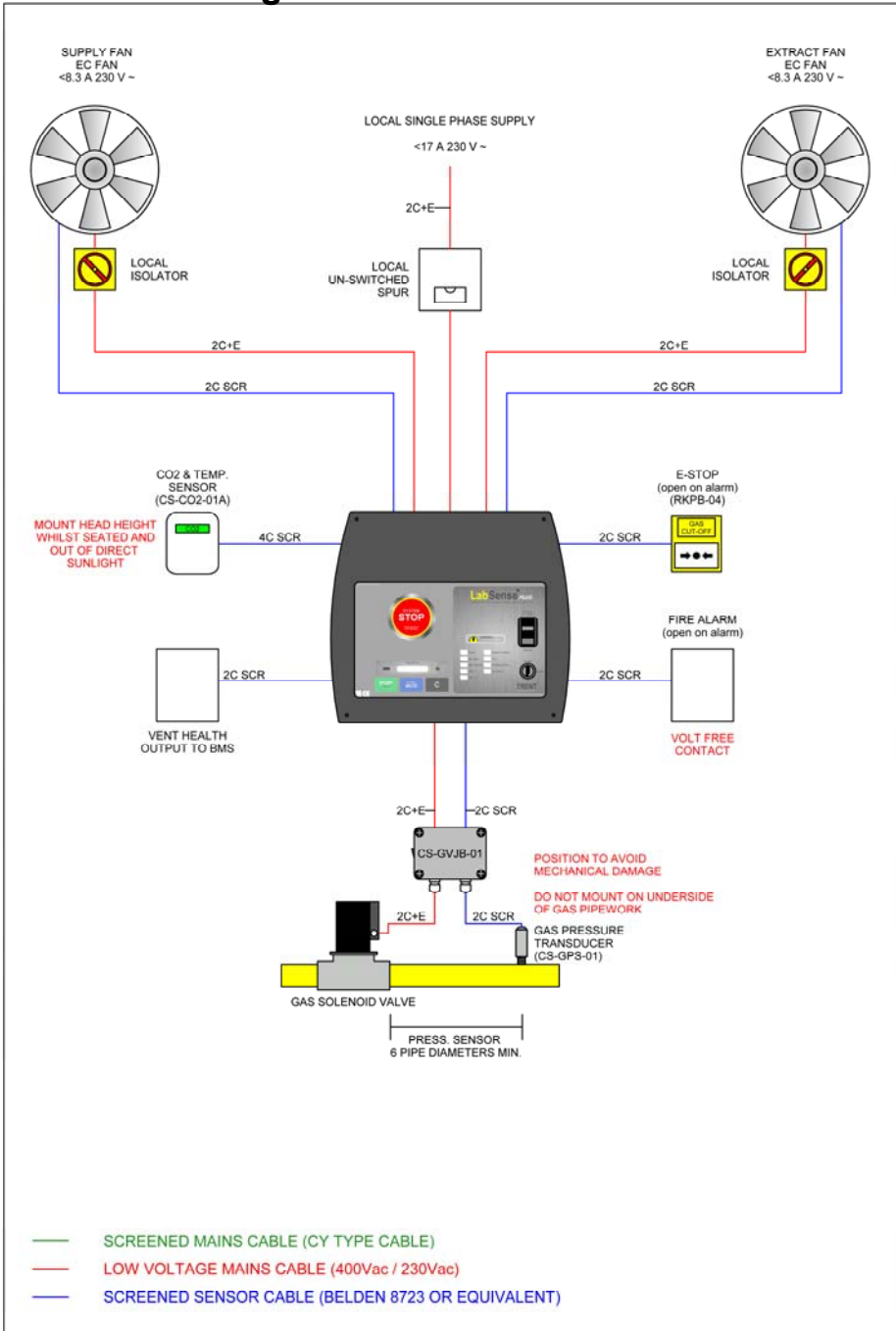
<b>Mushroom-head</b>	RKPB-01
<b>Mushroom-head with key-release</b>	RKPB-02
<b>Mushroom-head with shroud</b>	RKPB-03
<b>Yellow call point</b>	RKPB-04

## Gas Solenoid Valve

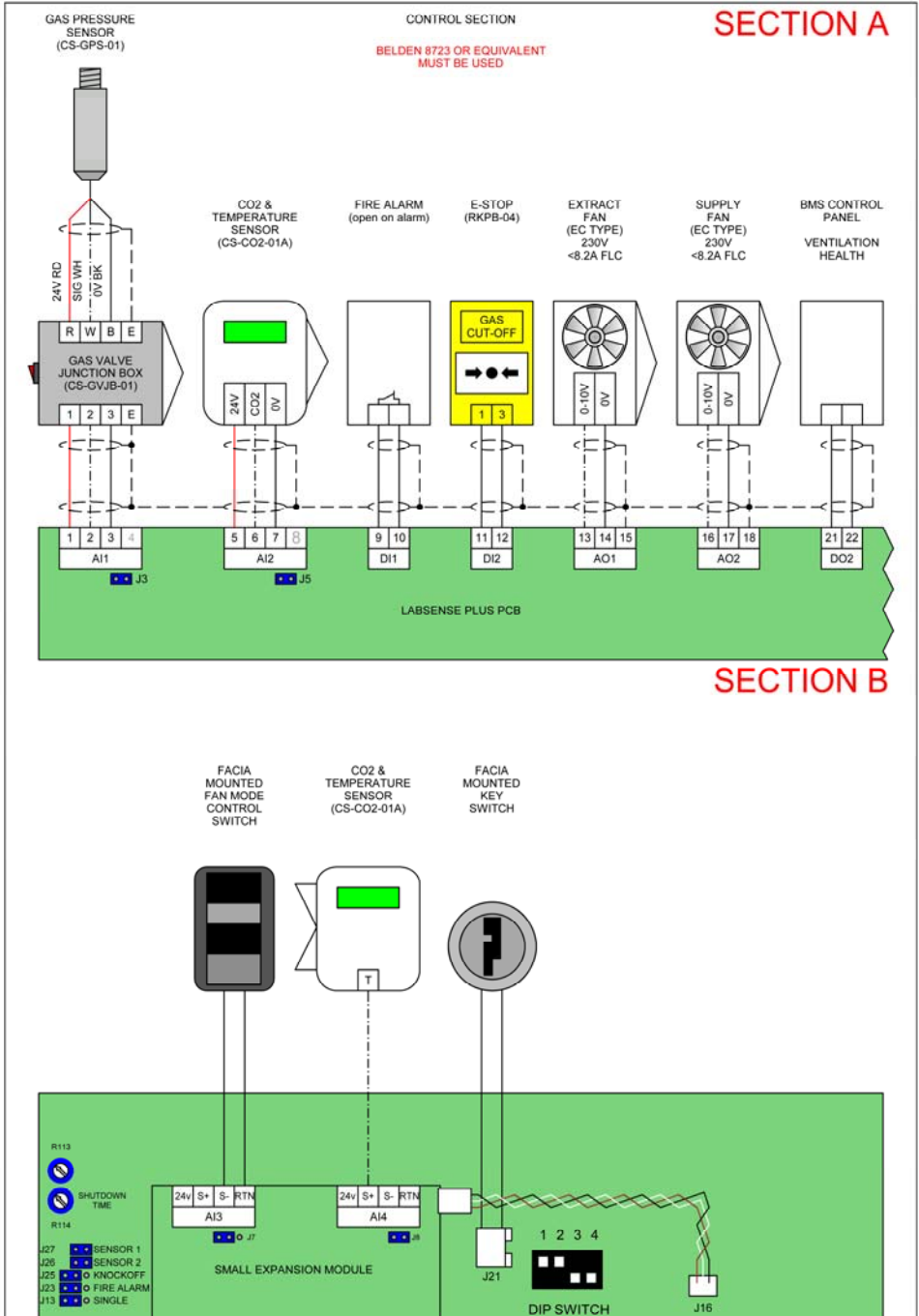
<b>Product Code</b>	1/2" to 6"
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# Schematic Diagram - EC Fans

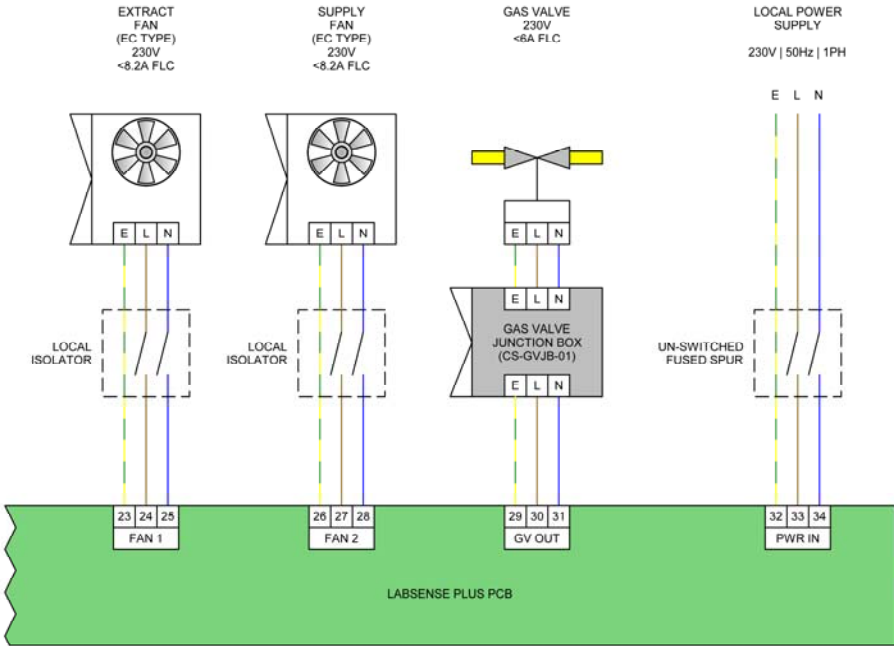


# Wiring Diagrams

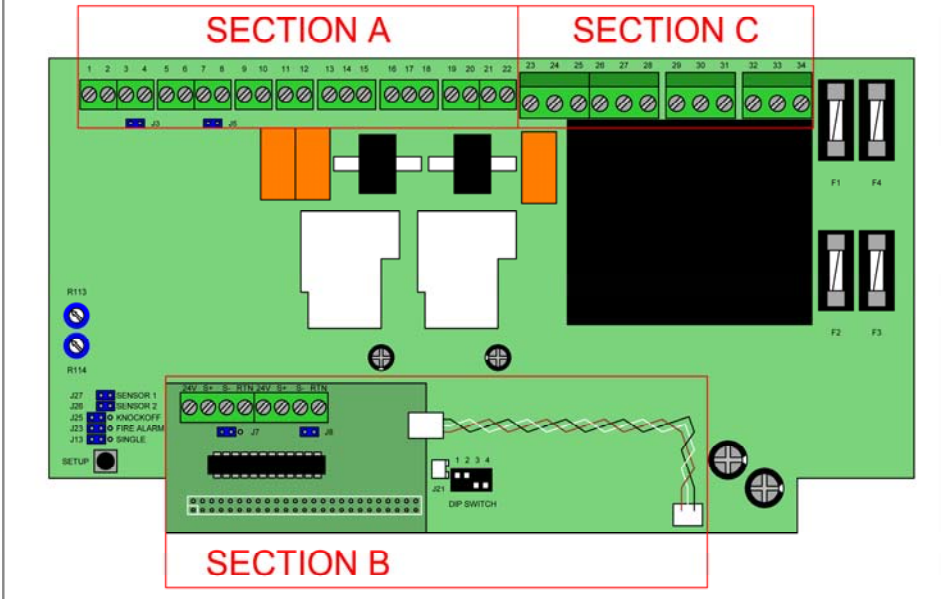


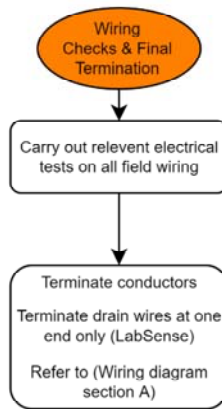
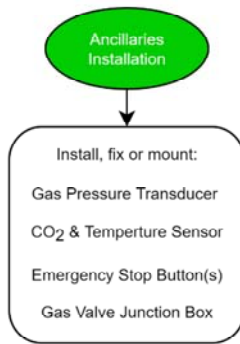
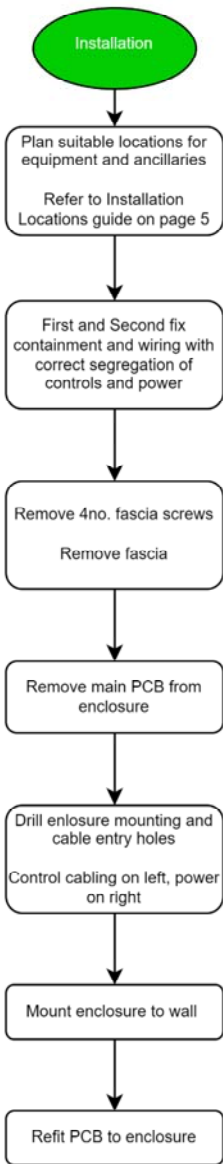
# SECTION C

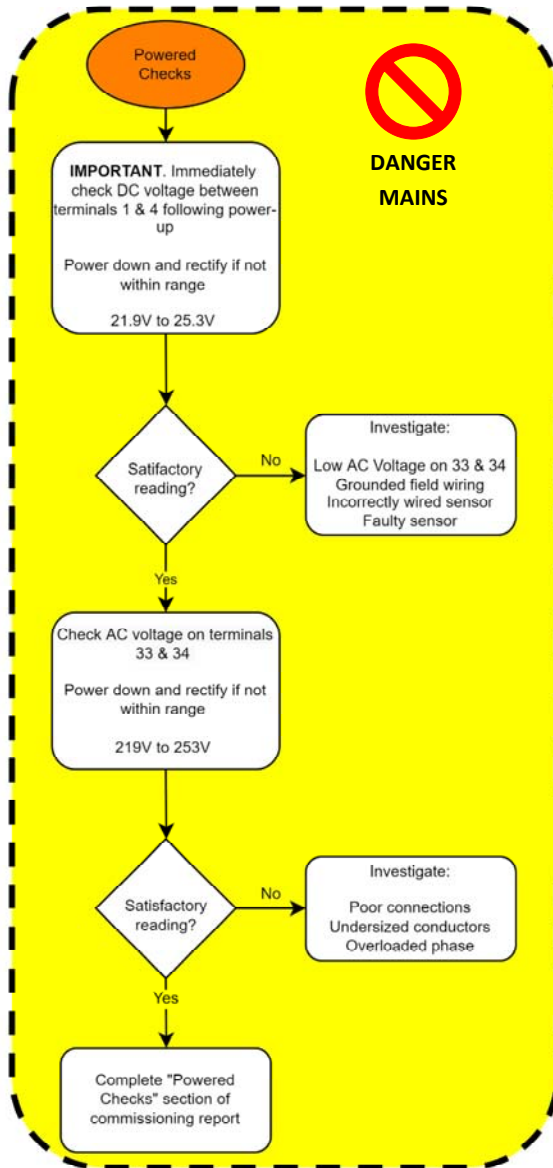
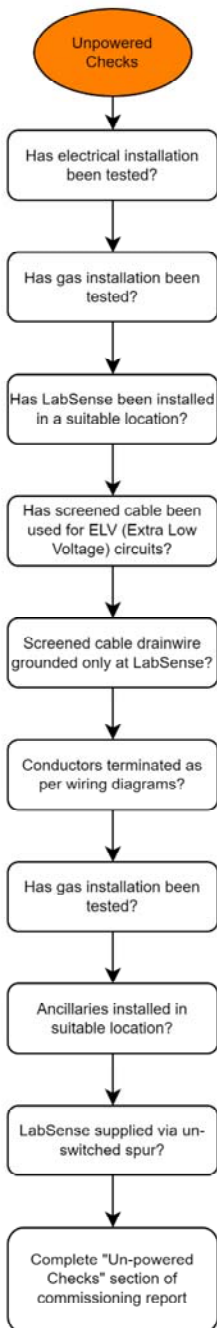
## POWER SECTION

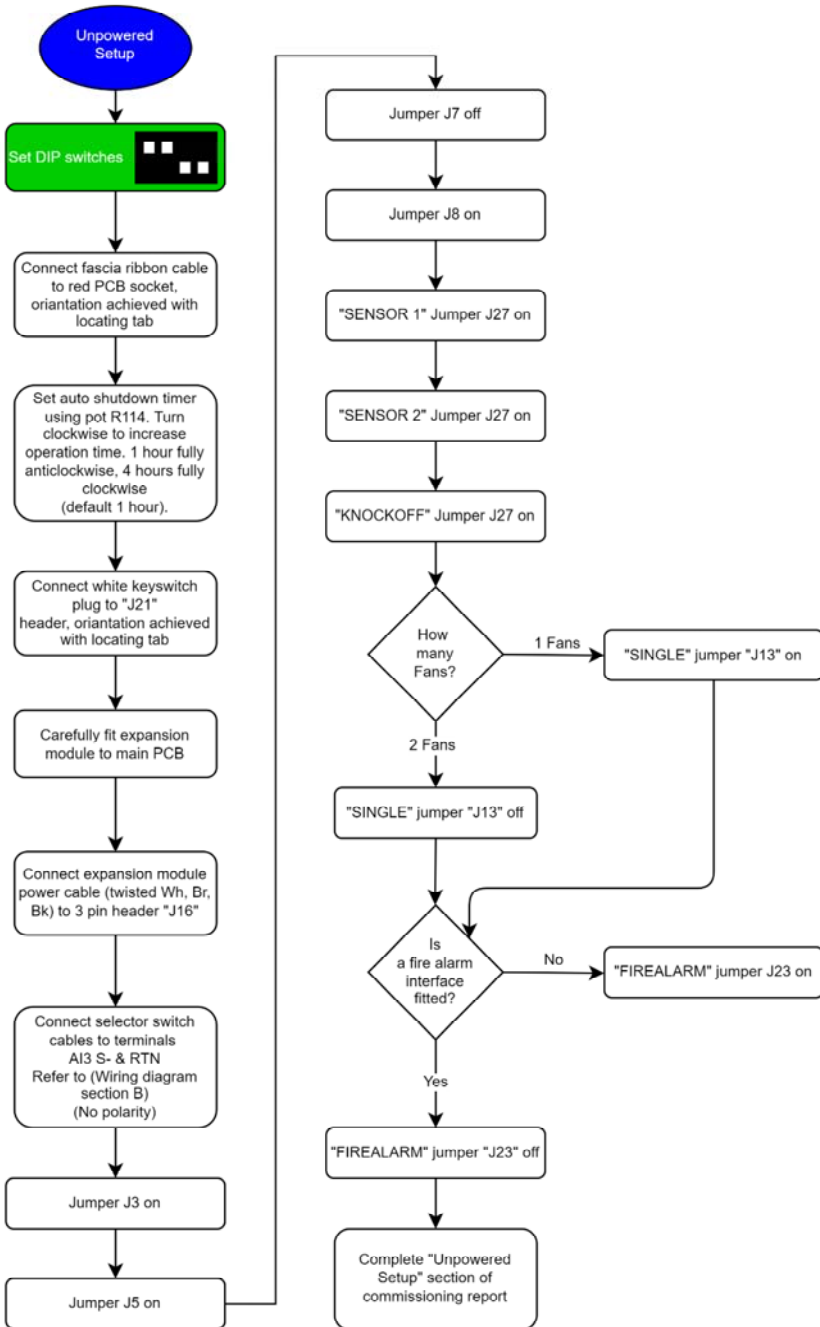


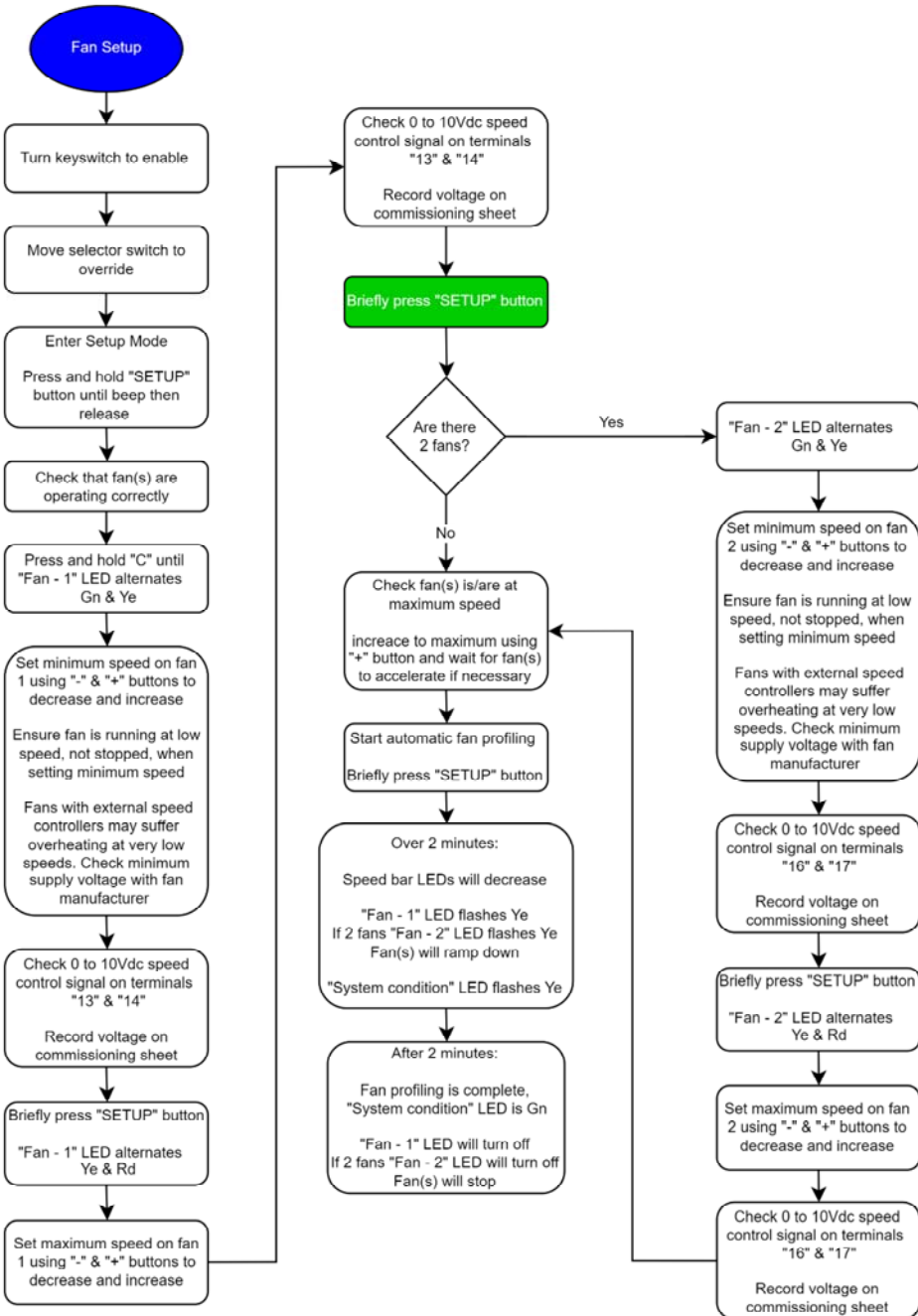
Installation

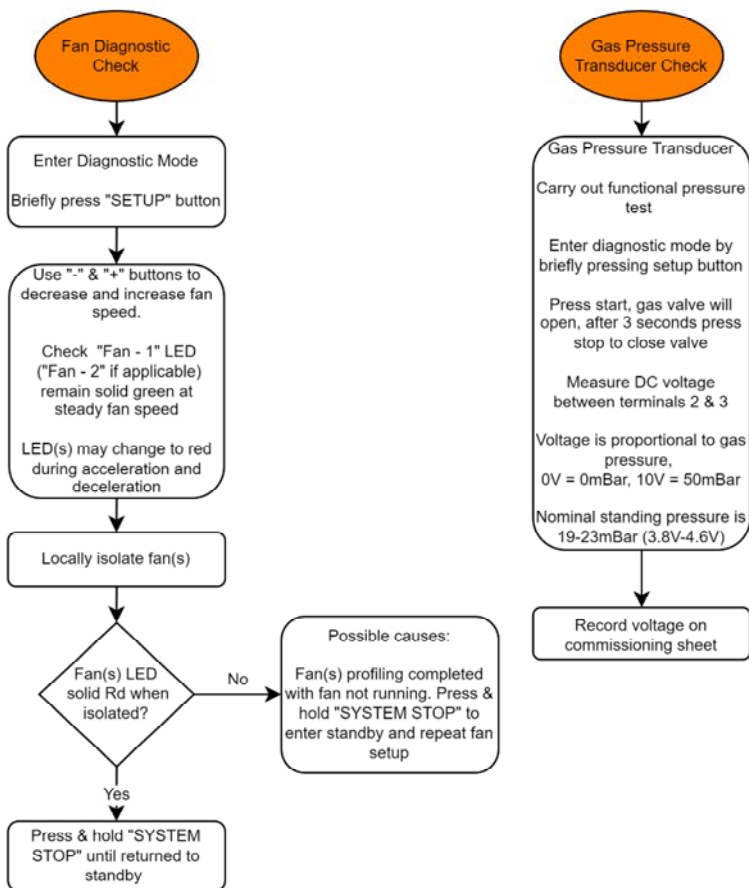




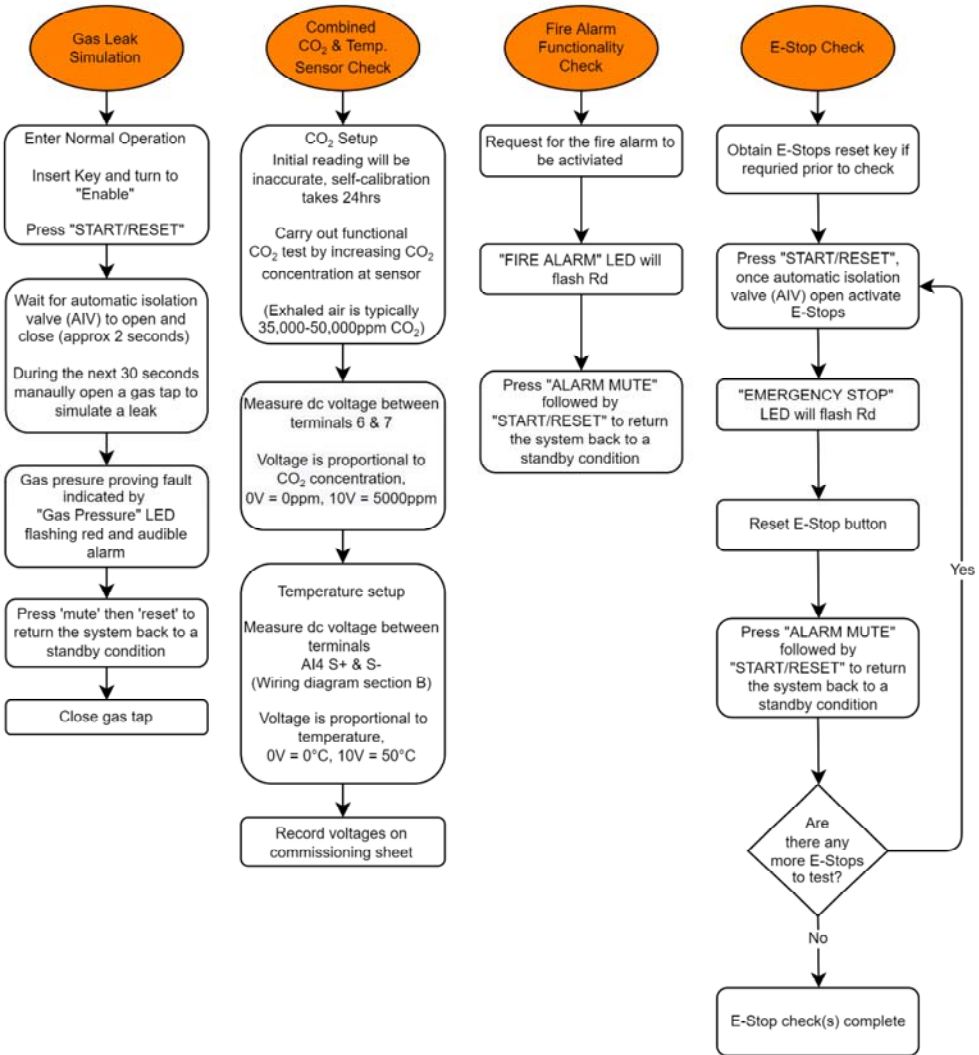






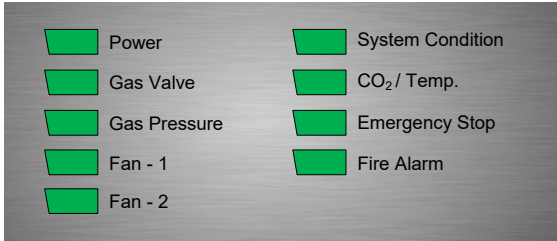






# Troubleshooting

## Fascia LED Layout



## Fault Indication



### Gas pressure fault on start up

Cause - System has detected a pressure drop or less than 12mBar.

Solution - Ensure all gas appliances are turned off. Check operating pressure and integrity of pipe work.



### Gas pressure fault during operation

Cause - System has detected less than 12mBar.

Solution - Check operating pressure and integrity of pipe work.



### Emergency stop fault

Cause - Circuit between terminals 11 & 12 has been broken.

Solution: - Ensure emergency stops are not activated. Check wiring and continuity to each emergency stop.



### Fire alarm fault

Cause - Circuit between terminals 9 & 10 has been broken.

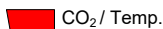
Solution - Ensure fire alarm is not activated. Check wiring and continuity to fire alarm Interface panel.



### Fan fault early warning - Undercurrent

Cause - System has detected a 10% decrease in fan current.

Solution - Check running current matches commissioned values and fan motor plate.



### **Fan fault early warning - Overcurrent**

Cause - System has detected a 10% increase in fan current.

Solution - Check running current matches commissioned values and fan motor plate.

### **Fan fault - Undercurrent**

Cause - System has detected a 20% decrease in fan current.

Solution - Check running current matches commissioned values and fan motor plate.

### **Fan early warning - Overcurrent**

Cause - System has detected a 20% increase in fan current.

Solution - Check running current matches commissioned values and fan motor plate.

### **Temperature control**

Cause - System has detected room temperatures have reached 25°C

Solutions - Increase natural ventilation and/or reduce appliance usage.

### **CO<sub>2</sub> Warning - stage 1**

Cause - System has detected CO<sub>2</sub> levels between 800 to 2799ppm.

Solutions: - Increase natural ventilation and/or reduce appliance usage.

### **CO<sub>2</sub> Warning - stage 2**

Cause - System has detected CO<sub>2</sub> levels between 2800 to 4949ppm.

Solutions: - Increase natural ventilation and/or reduce appliance usage.

### **CO<sub>2</sub> Fault**

Cause - System has detected CO<sub>2</sub> levels reached 4950ppm.

Solutions: - Increase natural ventilation and/or reduce appliance usage.

FOR FURTHER TECHNICAL ASSISTANCE, PLEASE CONTACT US BY

Phone: 01782 844688 (Option 2)

E-mail: [info@trentproducts.com](mailto:info@trentproducts.com)

Website: [www.trentproducts.com](http://www.trentproducts.com)



This symbol on this product or the package indicates that disposal of this product after its lifecycle could harm the environment.

DO NOT dispose of this product (or batteries if used) as unsorted municipal waste.

It should be disposed by a specialised company for recycling.

This product should be returned to your distributor or to a local recycling service.

Respect the local environmental rules.