GDS Defender – Sensor

FLAMMABLE / TOXIC / OXYGEN / REFRIGERANT GAS ALARM

Not for use in potentially explosive atmospheres (zoned areas)

Technical Sheet
ref C1714A v.1

Operation

The gas sensor continuously monitors the atmosphere for any hazardous gas conditions, on detection of gas the sensor will indicate the level status by red LED indication and sounder.

LOW alarm (A1), the green indicator will change to slow flashing red and repeat ON/OFF sounder.

An increasing level of gas will cause the HIGH alarm (A2) to activate which is indicated by rapid flashing of the red alarm indicator, and corresponding increase in sounder rate. Should the over range DANGER alarm (A3) be reached, the red alarm indicator and sounder will go constant.

Pressing the reset will mute the sounder and only reset the alarm condition once the gas has cleared. Unit Fault is indicated by the indication LED turning AMBER with a very slow repeat ON/OFF sounder. Alarm Relay Operation will activate end user selected controls or alarms, details of which should be recorded and kept adjacent to the alarm unit.

Installation – By approved electrical installer

All sensors are supplied gas tested with preset alarm levels, ready to install and operate.The alarm unit should be mounted in a position which is accessible, away from direct heat, in the field of vision and in accordance with the units IP Rating. Mains supply should be from a 1A fused spur.

SITING THE SENSOR (DETECTOR)

A key feature of the installation is the correct siting of detectors. Several considerations must be taken into account, the most important being the density of the gas with respect to air.

HEAVIER THAN AIR GASES (LPG, Propane, Butane, Refrigerant Gases) – locate at 15 to 20cm above floor level.

LIGHTER THAN AIR GASES (Methane, Natural Gas, Town Gas) – locate at 5 to 10cm from the ceiling.

EQUAL TO AIR GASES (Carbon Monoxide, Oxygen) – locate at 1.5 metres above floor level.

Under still air conditions, a 'lighter than air' gas such as methane leaking from a small orifice at ground level, will rise in a plume the shape of which approximates an inverted cone. As the gas rises, it draws air from the surroundings and creates a turbulence. Resulting from this there occurs rapid dilution and, unless a sensor is positioned within the plume, there will be no initial indication of a leak.

As gas continues to escape, the diluted concentration rises to ceiling level and begins to layer. In time the concentration at ceiling level will increase and this, in turn, will displace air downwards.

Dangerous levels will, therefore, tend to occur at ceiling level and the thickness of this layer will increase with the passage of time.

Ventilation of the room will of course alter the situation significantly but it should be remembered that if the ventilator is not at ceiling level, a dangerous concentration can still occur between the top of the ventilator and the ceiling.

For heavier than air gases such as propane or butane, the formation of dangerous layers occurs at ground level. These gases tend to behave like water and will run down gradients and pool at the lowest point.

The number of sensors required in individual rooms is determined by the number of possible hazards in the vicinity.

Gas leakage may occur around valves, flanges and anywhere where gas pipes are jointed. It may be possible to cover several probable gas leaks in one room by the careful siting of a single detector. Ducts, trenches and manholes are also likely places where a build up of heavy gases may collect.

When siting a detector in such places it is most important to ensure that there is no likelihood of flooding by water, or excessive dust which may block the sensor mesh element and prevent gas reaching the sensor.

When monitoring gases outside, those lighter than air will be quickly dispersed, but gases heavier than air will tend to form in layers and again causing a dangerous hazard. When siting detectors outside prevailing winds must be taken into consideration and adequate protection given against wind and rain.

POISONING OF CATALYTIC SENSORS

Catalytic elements used in most flammable gas sensors are liable to be rendered inactive due to 'poisoning' by certain groups of compounds.

In general contact with any gaseous compound capable of producing an involatile residue upon heating is to be avoided.

Examples of such substances are:

a. Silicon containing vapours, as emitted by silicone polishes, greases and oils.

b. Petroleum vapours containing tetra–ethyl lead or other organo–metallic compounds.

Switching ON

Having fully installed the unit switch ON the power from the fused spur. During the one minute stabilising period the green LED indicator will flash going constant on warm up completion. Control or warning devices which have been connected to the alarm relays should be tested for correct operation.

Unit Test

The unit may be electrically tested by pressing the reset button for 15 seconds. The LED indicator will flash RED and the sounder will toggle ON/OFF, alarm relays will activate at which time attached warning devices or valves should be checked for correct operation.

Gas Test: To ensure that the sensor responds correctly to the presence of gas it should be exposed to test gas at six–monthly intervals. For further details please contact your product supplier.

Fig. 1: Mains PCB

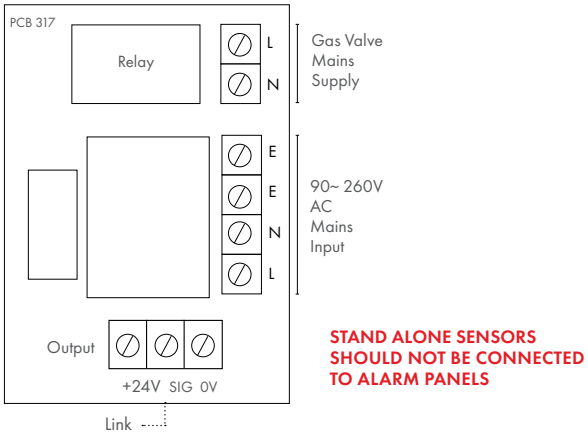


Fig. 2

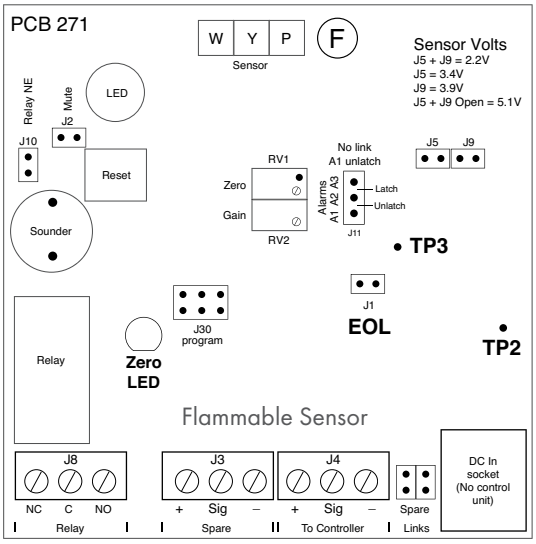
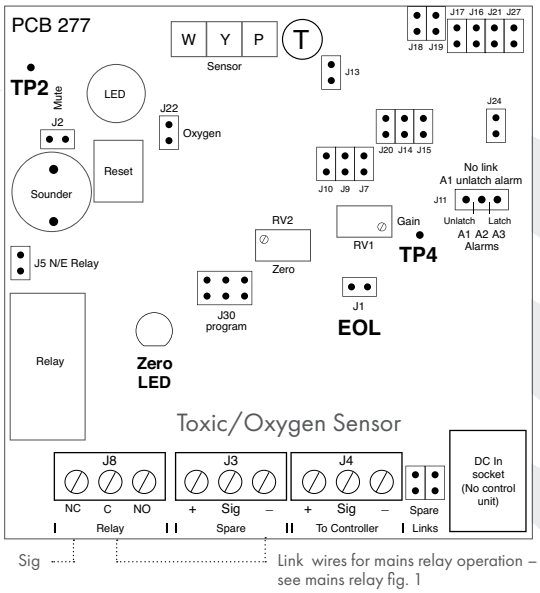


Fig. 3



TECHNICAL

Not for use in hazardous zone areas

Sensor Type	Flammable – catalytic Toxic, Oxygen – electrochemical Refrigerant – semiconductor CO2 – infrared
Power Supply	18 to 30vDC optional 90~260vAC
Consumption	1.2 W
Alarm Relays	
Signal Relay	1 SPCO volt free contact 3A @ 230vAC Global A1/A2/A3 A2/A3 only option latched/unlatched – selectable N/E – N/D
Mains Relay	Flammable sensors - mains option only (see fig. 1) A2 alarm level operation. Permanent mains supply-solonoid valves. PCB 317 relay NE with N/C contacts. For other gas type sensor operation, add link wires (see fig. 1 and 3)
Indicators	Power (Green LED) Gas alarm – Green LED to Red
Alarm 1	Slow flash + intermittent sounder
Alarm 2	Rapid flash + high rate sounder
Alarm 3	Constant + constant sounder
Fault	Amber + slow intermittent sounder
Sounder	85dB @ 10cm Permanent mute option
Ambient Temp	Operation: –5 to +50°C Storage: +5 to +55°C
Protection	Standard Sensor – IP42 Weatherproof – IP64
Dimensions	Standard L 83mm x H 83mm x D 36mm Weatherproof L 145mm x H 145mm x D 60mm
Options	Duct sensor probe – L27mm x 28mm diameter
Factory Settings	Alarms – latched Mains Relay – normally energised Signal Relay – normally de–energised – Active AL1, AL2, AL3
Testing/ Maintenance	Press and hold the reset button for 15 seconds the relay will activate the LED will flash and the sounder will toggle ON/OFF. If the sensor is connected to the Defender control panel the alarm will be displayed on that zone. Releasing the test button will return the sensor to normal operating mode. To ensure that the sensor responds correctly to the presence of gas it should be exposed to test gas at six monthly intervals. For further details contact your product supplier service technician.
Adjustments	Sensor zero in clean air – turn zero pot until the green zero LED is ON. Calibration – FSD = 4v measured at (TP2/3) Fig. 2 and (TP2/4) fig. 3 adjust using gain pot for test gas value. NOTE: Link selection must be made with power off.

This document is not contractual and the equipment specification may be modified at any time without prior notice.

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