

## Specifications

Supply voltage	12 Volts or 24 Volts DC
Sensor voltage	5 Volts DC nominal.
Alarm loudness	95 dBA
Dimensions	117W x 77H x 80D (mm)

### Current Consumption

12 Volt Model	
Single sensor	120 mA
Dual sensor	200 mA

24 Volt Model	
Single sensor	70 mA
Dual sensor	100 mA



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# INSTALLATION and OPERATION manual for the **GM2S-CFC** Combined CFC (Freon), COMBUSTIBLE GAS AND VAPOUR MONITOR

The **SYSTEMS GM2-CFC** is a highly sensitive gas monitor which will detect and warn of the presence of chloro-fluorocarbon gases (such as R-12, R-22, R-134a, etc) before dangerous concentrations are reached. It is also an effective gas leak alarm for combustible vapours.

By applying up-to-the-minute power management technology, an extremely low battery drain has been achieved.

In use, the monitor displays a green "safe" light as long as no gas has been detected.

As soon as vapour at a concentration greater than that indicated in the following table is detected, an alarm buzzer sounds and a red warning light illuminates.

Vapour	Concentration at alarm set point
R-22	25 ppm
Ethanol	150 ppm
R-134a	200 ppm
R-12	400 ppm

If this occurs, all naked lights and cigarettes should be extinguished and the location should be immediately evacuated and ventilated.

### **IMPORTANT WARNING**

To ensure continued protection against gas leaks, regularly check the system for proper operation by testing each sensor with gas (refer to the Sensor Test Procedure on page 7).

# INSTALLATION

## Mounting

The GM2S is designed to be mounted onto a bulkhead or control panel. It can also be flush mounted into a fascia or switchboard by separating the face panel from the mounting block.

The control module should be located away from radio equipment in order to reduce the likelihood of interference or spurious operation.

After separating the face panel from the mounting block, fix the mounting block to the mounting surface using appropriate screws. The wiring can be run through a hole in the bulkhead or through the side of the mounting block using microduct.

All associated wiring should then be connected according to the connection diagram on page 5 and the face panel screwed to the mounting block (**do not overtighten terminal screws or face panel mounting screws**).

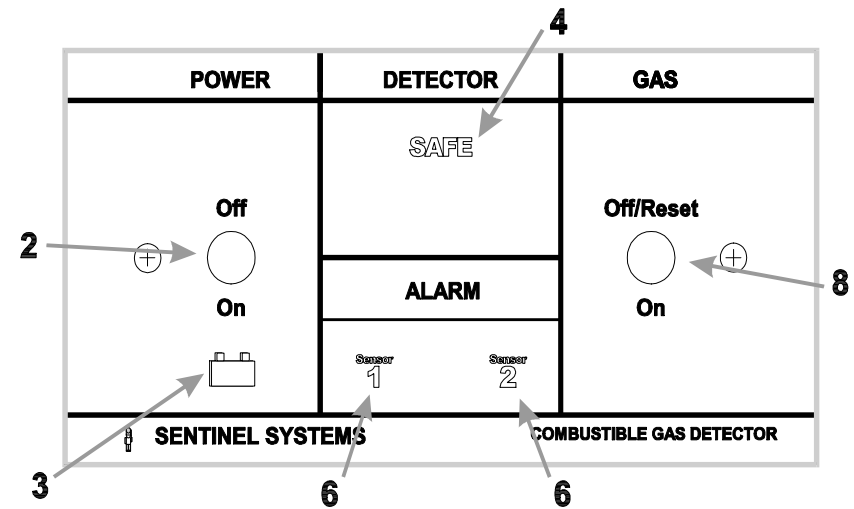
The wiring shown by dashed lines is only required if the relevant item is fitted.

## Sensor Installation

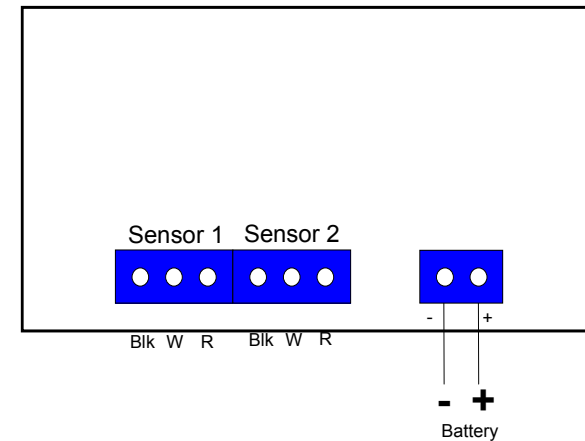
The location of the sensors should be carefully chosen. Because CFC gas is heavier than air, it is important that one sensor be installed in the lowest part of the vessel, but out of reach of damaging bilge water. Sensors should preferably be mounted horizontally in a location protected from knocks, either using the mounting saddle provided, or by inserting from behind into a bulkhead or panel hole of 14.5mm (9/16") diameter. If it is necessary to lengthen the sensor cable, **do not lengthen it to more than 10 metres**. Connections should be soldered or screwed tightly using cable joiners. For longer runs, contact the manufacturer.

If only one sensor is fitted, it should be connected to the sensor 1 terminals. The other sensor input can be left unconnected

## Front Panel



## Rear Panel



# OPERATION

## Power Switch

After switching on power switch (2), there is a wait period of approximately 20 seconds to allow the sensor(s) to stabilise.

During this time, the detector goes through a self-test routine where all the LEDs are illuminated and the buzzer sounds, before sequentially lighting each LED in turn, until the wait period has ended.

At the end of this initialisation period, the "SAFE" indicator (4) will illuminate if no gas is present.

The gas detector is now ready to detect CFC gases.

If gas is present, the red indicator (6) marked "Sensor 1" or "Sensor 2" as appropriate, will light up, and a buzzer will sound

When the gas or vapour has dispersed, and the concentration is below 200 ppm, the indicator (6) will go off, the buzzer will stop, and the "Sensor 1" or "Sensor 2" indicator will change from continuously on to flashing on-and-off to indicate past danger. No attempt should be made to reset the detector until the cause of the alarm has been checked.

## Fault conditions

If there is damage to a sensor or its cable, this will be indicated by the appropriate LED.

For example, if the black cable or its associated filament goes open circuit, the LED and buzzer stay on continuously

## Stability

The long term stability of the sensor is shown in fig. 2.

This indicates that over the long term, sensitivity does not change significantly even under conditions of high temperature and humidity.

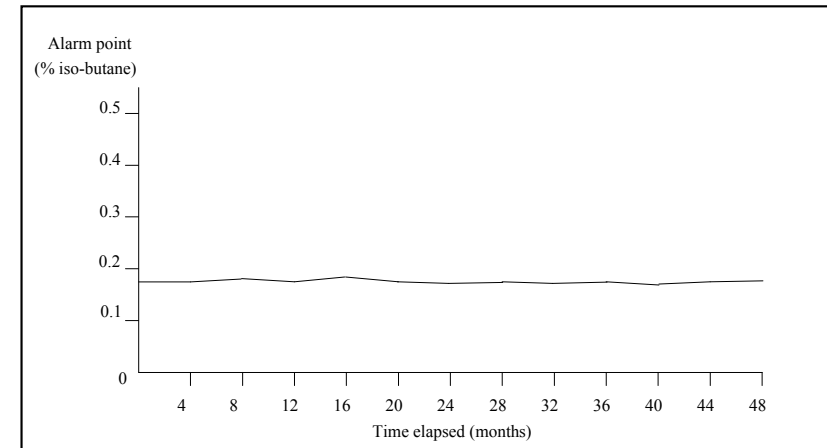


fig. 2

This resistance to corrosion and level of stability is essential in a marine environment.

# SENSOR

## Description

The gas sensor used consists of a platinum heater wire. Covering the heater wire is a tin dioxide semiconductor sensor which has a low electric conductivity in fresh air. When exposed to the target gas, the conductivity of the catalytic bead drops in proportion to the concentration of the gas.

The element is housed in a double layer of #316 stainless steel fine mesh.

## Resistance to contaminants

The sensor is virtually unaffected by short-term immersion in water, including sea water. Salt contamination has very little effect on the sensitivity of the sensor, which will still trip at or below the required gas concentration threshold. This exposure, however, may make the sensor more susceptible to long-term corrosion problems. If the sensor element has come into contact with contaminants such as oil or fuel, it may have been damaged, and should be checked by a qualified technician.

## Gas On/Off / Reset Switch

The right-hand switch (8) allows the alarm condition to be cleared Once the danger has passed, by moving the switch (8) to the "Off/Reset" position, leaving it there for a second and then to the "On" position

## Low Battery Alarm

If the voltage of the battery connected to the monitor drops below approximately 10.5 Volts (21 Volts for the 24 Volt Model), the buzzer will sound for about 10 seconds and the "Low Battery" LED (3) will remain alight until the battery is recharged.

## Sensor Test Procedure

The sensors and monitor can be tested by allowing a very small amount of gas from a cigarette lighter near the sensor with the gas flowing but not ignited. Do not point the stream of gas directly into the sensor, as it may be damaged. The alarm should operate within 10 seconds. This test can also be carried out with methylated spirit, petrol or alcohol vapour.