



TOC-30 SERIES SAFE AREA DETECTORS 4-20mA OUTPUT MANUAL V1.2



CO
CO2
O2
Flammables
NH3
CH2O
ETO
H2S
HCL
HCN
HF
O3
CL
BCL3
CLO2
H2
NO
NO2
SO2
SIH4

This guide is intended for the use of system specifiers, surveyors, designers and installers. The intention of this guide is to provide information for the correct installation of IGD's 30 series safe area analogue gas detectors. This guide indicates correct cabling practice, types of cabling which can be used and options available. This guide is not intended as a design or specification guide, these are available separately.

Failure to follow this guide could compromise operation so please follow the enclosed information carefully.

Systems should be designed and installed by competent persons. A competent person being defined by the UK Health and Safety Executive as:

A competent person is someone who has sufficient training and experience or knowledge and other qualities that allow them to assist you properly. The level of competence required will depend on the complexity of the situation and the particular help you need.

IGD's gas detection systems are capable of installation by electrical installation engineers. Design of a system is not covered in this guide and should be undertaken by a competent person. The design should include:

The Nature of the Gas Hazard and Appropriate Placement of Detectors
Clear Indication to workers That a Gas Hazard Exists and the Action They Must Take
Interaction Between the Gas Detection System and Other Systems
The Necessary Safe Operating Procedures That Must be in Place

IGD can provide help to design systems where help is required and can also provide training for surveyors, specifiers, designers and installers.

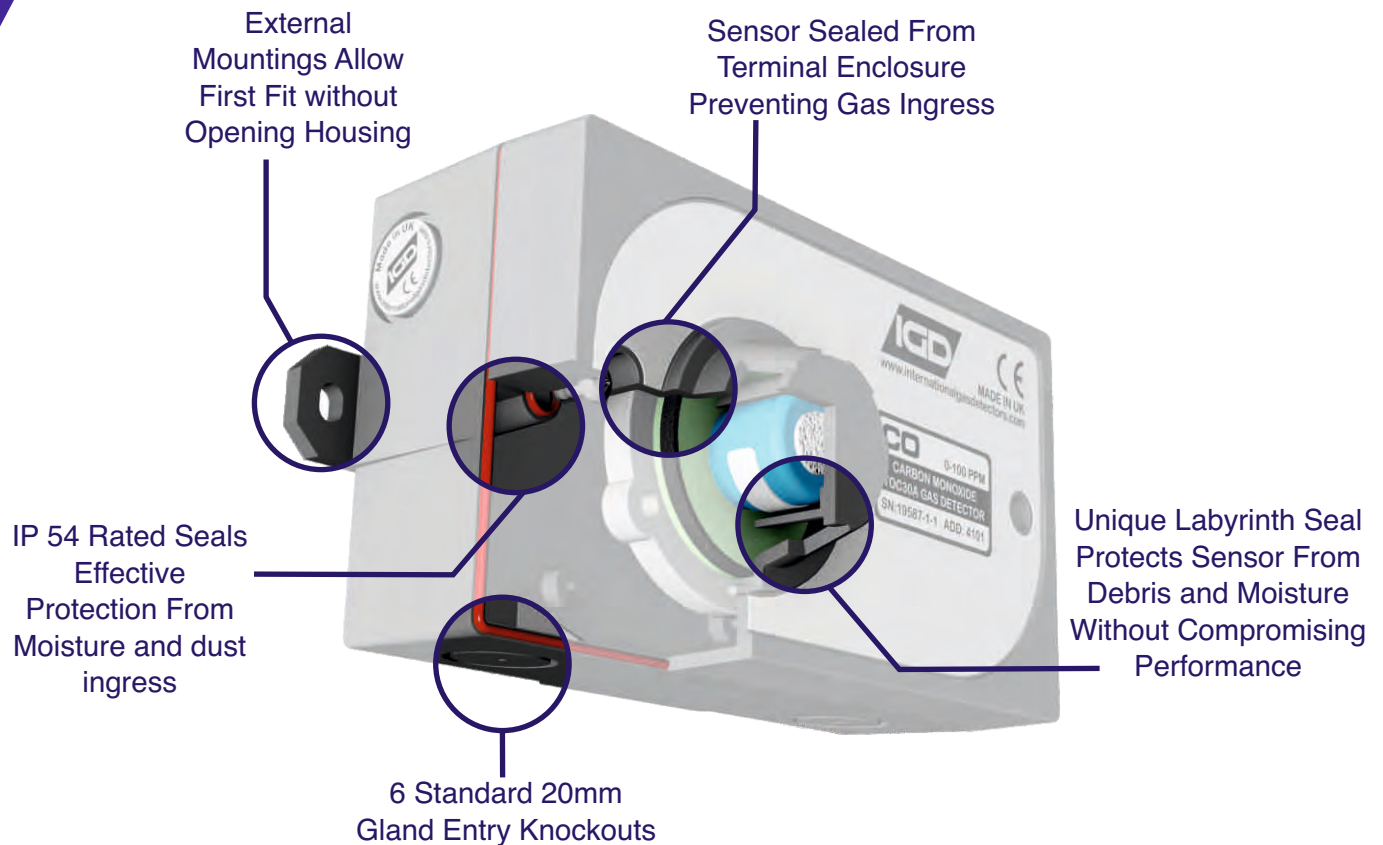
All Gas Detectors shipped from IGD are pre-calibrated. It is not always necessary to re-calibrate a newly installed system on site but it is recommended that commissioning is undertaken.

Commissioning should be undertaken by persons trained to do so. Commissioning should ensure that the system performs and interfaces correctly to all connected devices, host systems and operates to the required cause and effect.

TOC-30 Series analogue 4-20mA gas detectors are designed for use in un-zoned or safe areas. They find many applications in laboratories, Universities, Process Industries, Ventilation Control and similar.

The following diagram indicates some of the mechanical features of the housing design.

Note that a splash guard is available for this housing PN TOC-750-GD1



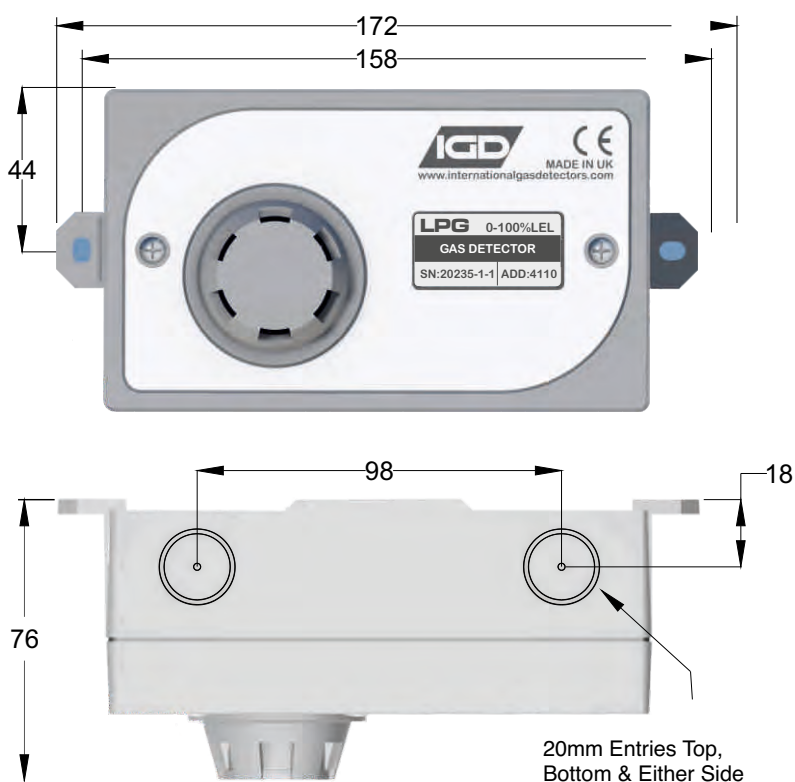
Refer to data sheet TOC-750-GD1 Splash Guard Instructions for Full Details



SPECIFICATIONS

Power	18 to 28V DC Max 4W 
Construction	ABS
Sensor	Toxic,Oxygen, Infra red and Pellistor options
Interface	2 or 3 Wire 4-20mA Linear O/P Interface Current Sourcing
Temperature	-5 to 55 Deg C
Humidity	15-95% RH Non-Condensing
Sealing	IP54
Mounting	Wall Mount
Weight	Typically 180 g Sensor Type Dependant
Standards Applied/Considered	EN50194-1:2009 Type A Equipment (Flammable Gas Detectors) EN60335-1:2002 EN50270 IEC/UL/CSA 61010-1 EN 45544-1

DIMENSIONS



Gas detectors usually fall into two groups for placement

1. Plant Protection. Typically flammable gas detectors fall into this category. Aside from asphyxiation flammable gases are typically not directly toxic and so detectors are placed strategically where the gas is expected to accumulate based on its relative density to air (lighter or heavier)

2. Life Safety Systems. Here the concern is that a toxic or asphyxiant gas is directly hazardous to personnel and so the gas detection is placed based on the normal operating zone for the people present

Note that in many cases both life safety and plant protection sensors may be appropriate on a site. For example a plant using liquid helium may have plant protection sensors at high level to ventilate roof spaces in the event of leaks. However in the event of ventilation failure Helium could accumulate down towards the zone where personnel operate. In this case a second set of life safety sensors would be appropriate.

Each site should be surveyed and assessed on its own merits. This document presents general guidance only.



Consider ceiling divisions, follow rules for smoke detectors

Lighter than air gases, detectors placed at highest ceiling points
Consider fitting collector cones at lower level for gas bottle stores boiler plant and gas meters (see separate application note).

Methane, Helium, Hydrogen, Ammonia etc

Life Safety Zone



CO, CO₂, O₂
H₂S, NO₂, NO
HCN, HCL, HF
NH₃ etc

1800mm

1000mm

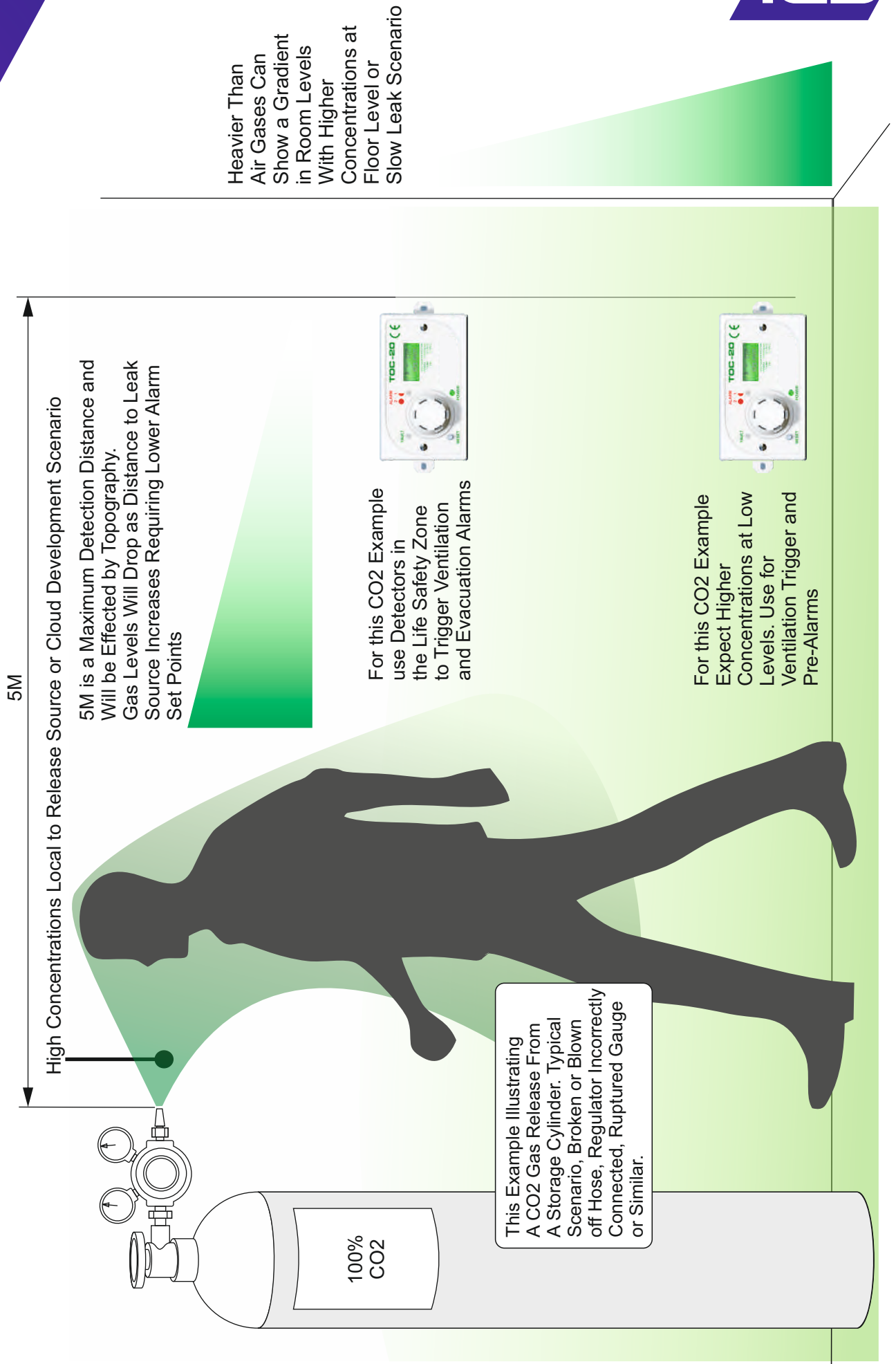


LPG, CO₂

400mm

Consider fitting splash/dust guards to protect low level sensors

Consider sensors in under floor areas/voids/drains where heavier than air gases are present

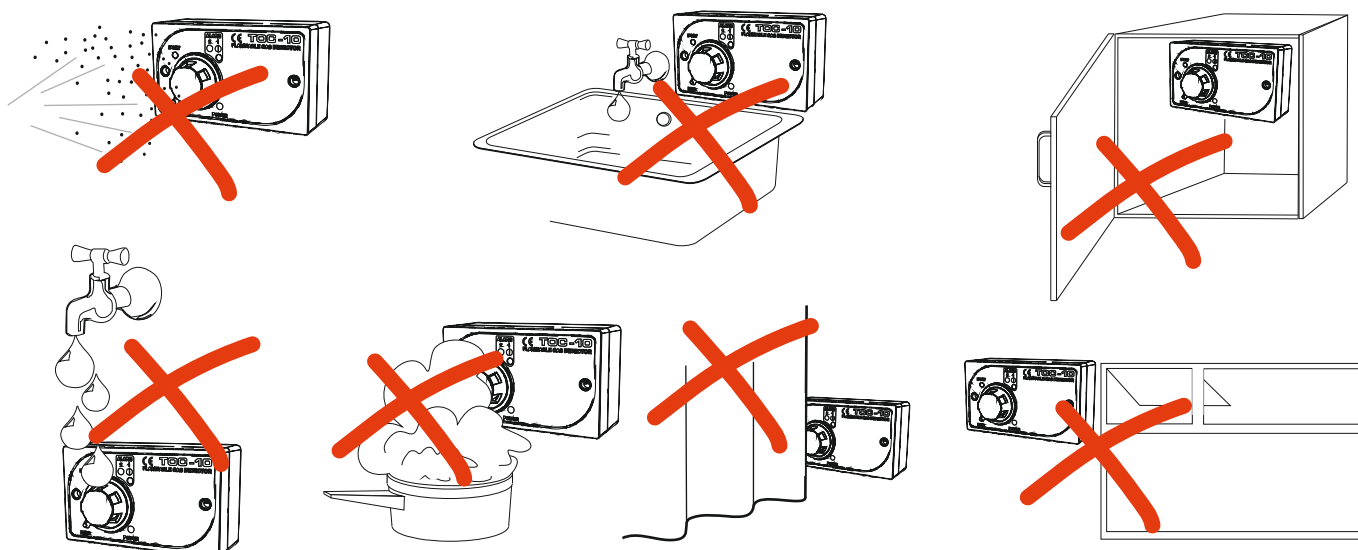
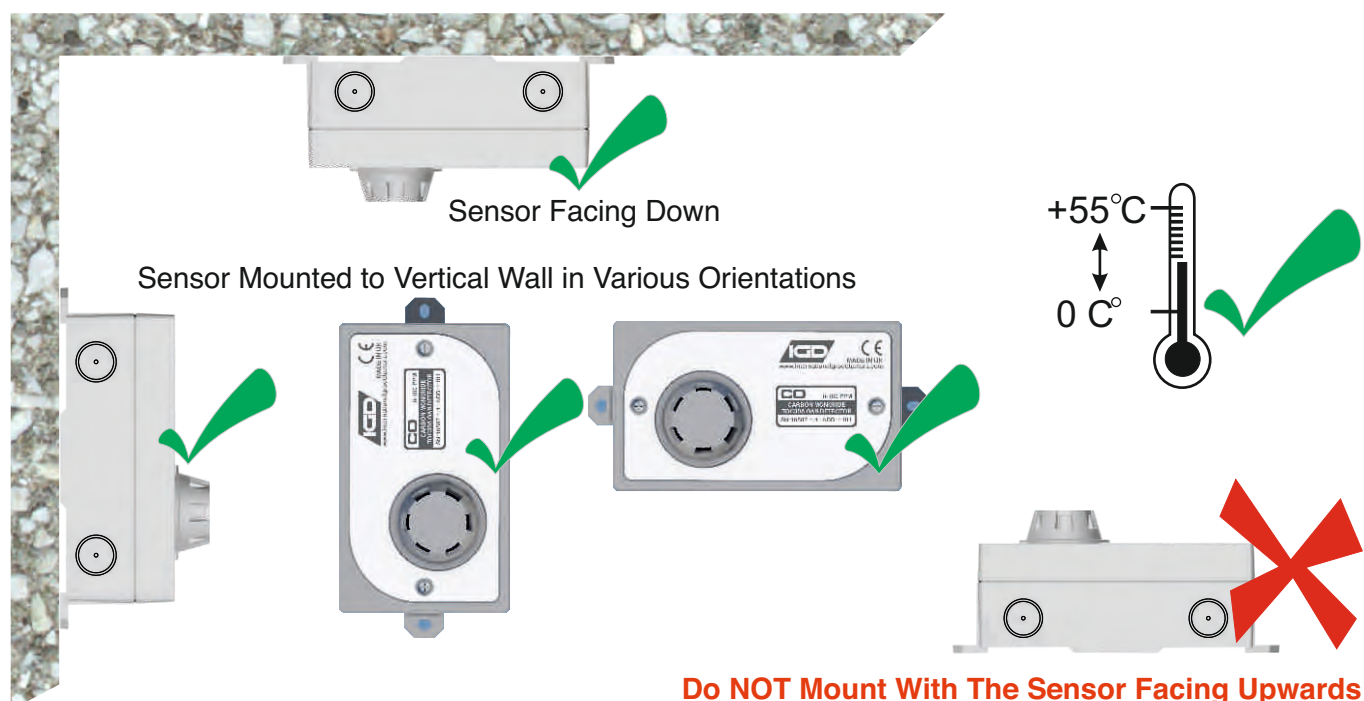


Detectors in Airflows Mounting Positions Safe Area

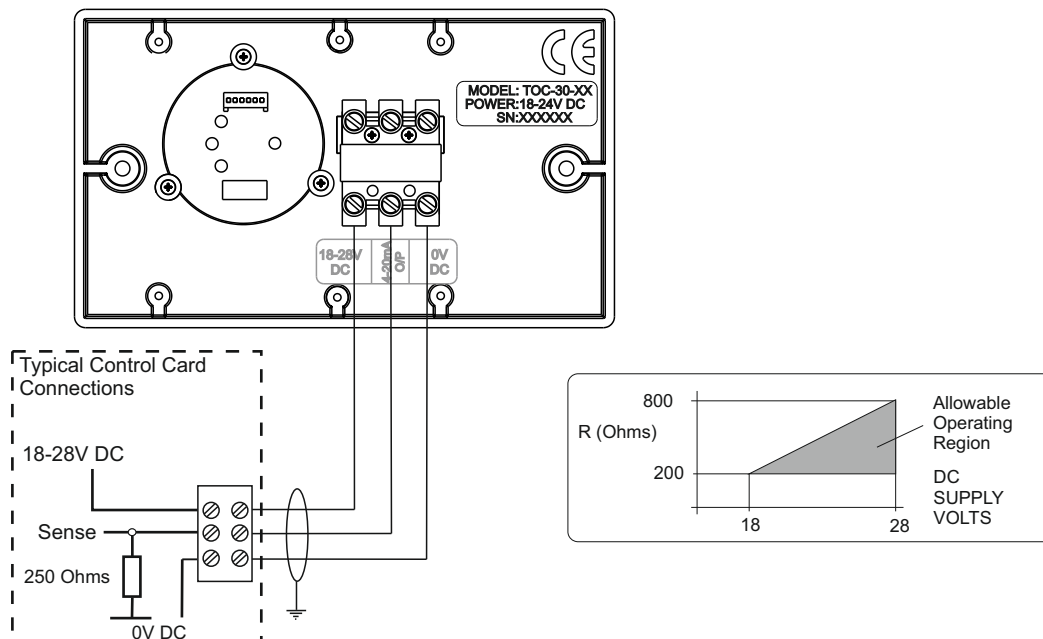
Air Flows up to 1M/S Are Allowable Without Any Performance Issue



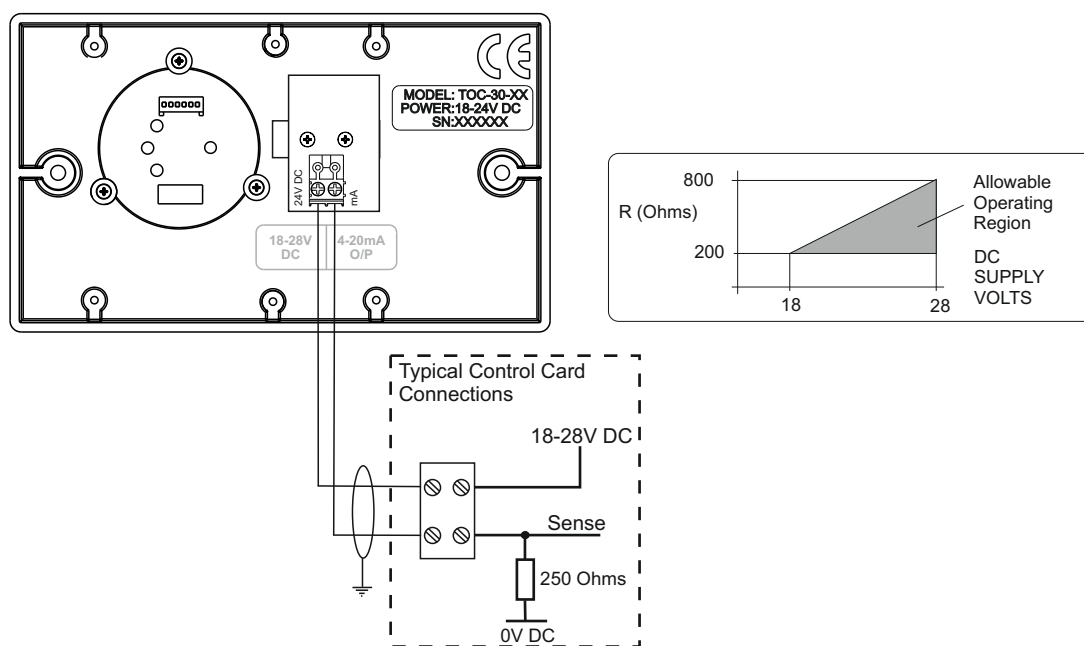
General Detector Mounting Positions Safe Area



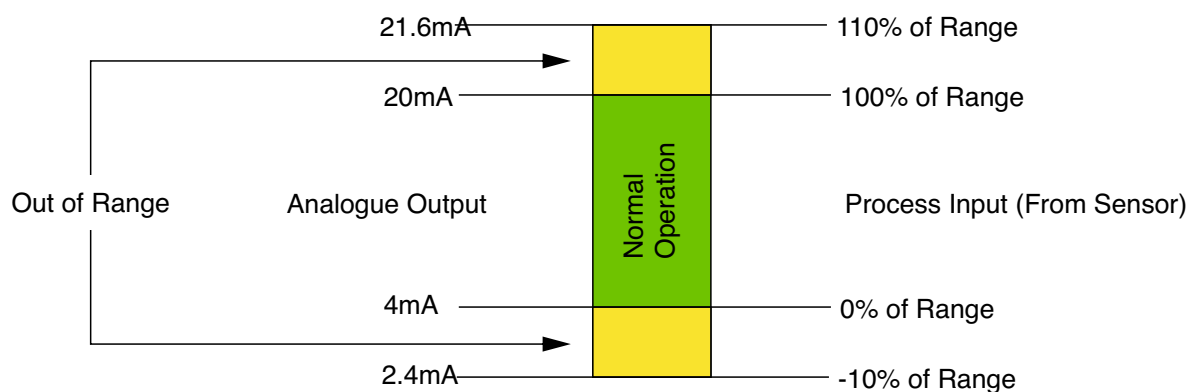
3 Wire Connection (Typically CO2 Sensors)



2 Wire Loop Powered Connection (Typical for CO,NO,NO2,O2)



Range and mA indication



Gas detectors require regular calibration. As with all such devices calibration periods are a function of the environment into which the detector is installed. A detector installed onto an offshore oil platform where it sees large temperature swings, vibration, salt spray etc will require a different calibration regime to the same detector installed into a closely controlled environment clean room. As a minimum calibration should be undertaken every 12 months with gas response checks (bump tests) every 6 months. Detectors **MUST** be bump tested to confirm correct operation if the measured range has been exceeded.

Only competent persons should undertake calibration. A competent person being defined by the UK Health and Safety Executive as:

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The following details requirements to 'bump' test the gas detector using a calibration set. For calibration refer to IGD 'configurator' software.

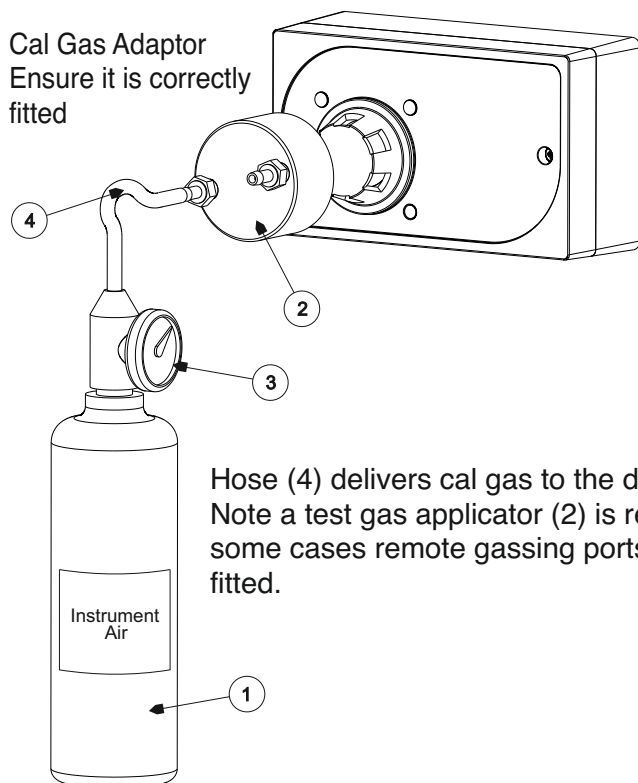
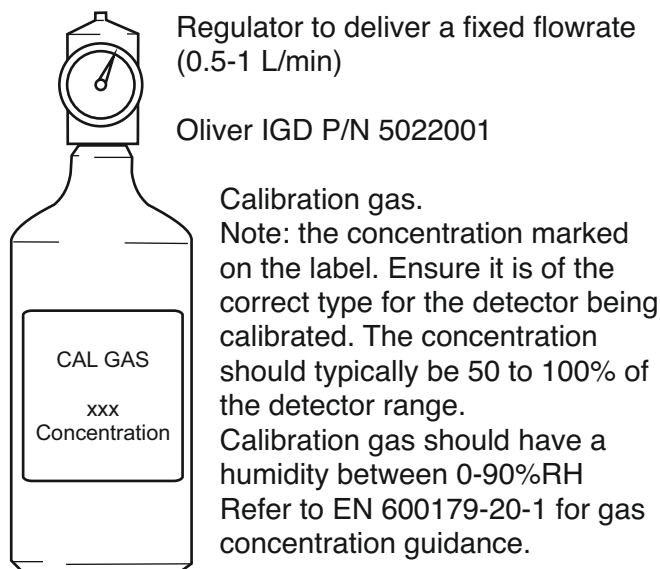
To undertake calibration or a calibration check you will need as a minimum:

Either instrument grade air or Nitrogen
A suitable calibration gas (1)
Correct calibration gas adaptor (#4011109) (2)
Correct regulator to suit the gas bottles capable of delivering a fixed flow of 0.5L/Min (3)

Calibration gas kits are available from IGD. If calibration is required IGD configurator software will be required, contact IGD for details.

Calibration gases are 'dry' (zero humidity)

Gases must be flowed for a minimum of 60 seconds



Response time of the detector can be tested using a stopwatch to check the time for the detector to reach 90% of the applied calibration gas value from first application of the calibration gas.

1. First zero and calibrate the detector.
2. Flow zero gas ensuring a stable zero
3. Fit the calibration gas bottle and time response to 90% of the bottle value.

Response time requirement to meet 60079-29-1 is less than 60 seconds and a T50 time in under 20 seconds for flammable types.

Accessories

Item	Description
TOC-30-UNI	Uni Strut Adaptor
TOC-750-GD1	Clip On Splash Guard
TOC-750-GD	Gas Collector Cone Assembly
5925801	Universal Pole Clamp
TOC-30-DCT	Pitot Tube Duct Adaptor (Factory Fit)
TOC-RMGP	Remote Gassing Port

