

CTH-SGOES - GAS DETECTOR - COMBUSTIBLE

SIL2
CERT

CTH, Safety's Model **SGOES** Gas Detector measures the concentration of hydrocarbon gases present in the monitored environment. The **SGOES** is configured to report alarms when the gas concentrations in the environment reach the two independently programmable levels, expressed as a percentage of the lower explosive limit (LEL) in air. As determined by application requirements, the **SGOES** is factory calibrated with one of eight hydrocarbon-based gases (typically methane or propane). Conversion factors are used to correct for gases other than the factory calibration gas.

The **CTH-SGOES** sensor detects and quantifies the presence of hydrocarbons by measuring their absorption of infrared light (IR). Because the device does not depend on the presence of oxygen in a mixture of gases, it can function effectively in environments where other sensor technologies cannot. Moreover, it is not sensitive to gases such as nitrogen, oxygen, carbonic acid, ammonia, and hydrogen sulfide, that may adversely affect other types of sensors. This makes the **CTH-SGOES** an excellent choice for environments where non-hydrocarbon gases are present and where monitoring of hydrocarbons like methane and propane is required.

The explosion-proof design of **CTH-SGOES** makes it ideal for use in hazardous environments such as:

- Oil and gas facilities
- Pumping

- Refineries
- Tank farms

- Pipelines
- Loading racks

CTH-SGOES is FM-certified for use in potentially explosive gas/vapor environments in compliance with FM3615 and CSA-C22.2 No 30 standards for explosion proof protection. In addition, it meets CSA standard E60079-1 for flameproof protection, and ANSI/ISA standard 12.13.01-2000 for performance of combustible gas detectors. The **CTH-SGOES** gas detector is typically used as an indicating device in fire and gas (F&G) detection and suppression systems as well as emergency shutdown (ESD) systems. The rugged **CTH-SGOES** design allows it to be used in harsh environments. It will operate from -76°F to +185°F (-60°C to +85°C) at relative humidity up to 95%.

Features and Benefits

- High sensitivity to all hydrocarbon gases/vapors for maximum property protection and personal safety
- Open path optical sensor - no physical contact between sensor and environment
- IR optical path obstruction monitoring (dust, paint, etc.) provides maintenance alerts
- Heated optics, secondary heater function helps to prevent condensation problems
- Low power (<4.5W) operation for cost savings
- Versatile indoor/outdoor installation
- Source analog 4-20mA, standard RS-485 communication channel under protocol Modbus RTU and relay outputs are used for remote alarm and fault indications
- Resistance to vibration ensures reliability and durability
- Operates effectively in fog and high humidity
- Wide operating temperature range provides flexibility and reliability
- Tri-color status LED on the device is easily viewable for a visual report of the device's operating status
- Automatic temperature compensation
- Expected life > 10 years
- 5 years warranty

Applications

- Drilling and production platforms
- Shipping tankers, freighters, and other vessels
- Fuel loading facilities
- Refineries, bulk terminals, and tank farms
- LNG/LPG processing and storage facilities
- Compressor stations and pipeline facilities
- Petrochemical, paint, and fertilizer plants
- Power plants and gas turbine facilities
- Transportation facilities (airports and subways)
- Oil and gas fired boilers / furnaces
- Aircraft hangars

ELECTRICAL SPECIFICATION

Supply Voltage	+24VDC Nominal (+18 to 32 VDC)	
Power Consumption	Standby	< 2 W
	Alarm	< 4.5 W
	with heater on maximum	< 7.9 W
Analog Outputs	Analogue Signal 4-20mA sourcing NAMUR NE43	
	Circuit Opening	0 mA ± 0.1 mA
	Fault signal	1.8 mA ± 0.1 mA
	Normal Operating reading	4 mA ± 0.1 mA
	Gas Concentration reading	4 mA to 20 mA (100%LEL) ±0.01mA
	Calibration Mode	3.2 mA ± 0.1 mA
HART Communication	HART protocol Version 7	
Digital Outputs	RS 485, Modbus RTU	
Relay Contact	Alarm: Two normally open / normally closed (NO/NC) user selectable, latching or non-latching Fault: One normally open / normally closed (NO/NC) user selectable Normally Energized	
Wiring	14 AWG (2.5 sq.mm) or 16 AWG (1.5 sq.mm) Shielded cable is recommended	
Terminals	14 AWG - 2.5 sq.mm	

FUNCTIONAL SPECIFICATION

Gases	Methane, Propane, Butane, Pentane, Hexane, Isobutane, Cyclopentane, Ethanol. (The target gas is factory-configured according to customer request)
Range	0 to 100% LEL (lower explosive level - in air)
Accuracy	±2% LEL, tor 0 to 100% LEL
Response Time (for 100% LEL Methane)	50% full scale < 1.5 seconds 90% full scale < 2.0 seconds
Warm-up time	10 minutes
Local Indication	Tri-color status LED indicates operational mode, fault, and gas presence. (optional by request available remote OLED display)
False Alarm Immunity	Integrated
Calibration	Factory calibrated at 0%, 20%, 50%, and 95% LEL with methane or propane. Calibration with NIST traceable calibration gas is optional.
Custom Gas configuration options:	-Volatile Organic Compounds (VOC) -Optional calibration with gas mixtures directly traceable to NIST standard reference materials.

MECHANICAL SPECIFICATION

Material	316SS Electropolished
Conduit Connection	Two (2) Conduit Entries 3/4"NPT NPT (ISO M20 with adapter)
Dimensions	8.01" x 5.30" x 5.12" 203.5mm x 134.50mm x 130mm
Weight	316 SS: 14.3 lbs. (6.5 kg)
Ingress Protection	IP66
Warranty	5 years

ENVIRONMENTAL SPECIFICATION

Operating Temperature	-40°F to +185°F (-40°C to +85°C)
Extended Operating Temperature (On Request)	-76°F to +257°F (-60°C to +125°C)
Storage Temperature	-76°F to +185°F (-60°C to +85°C)
Humidity	0 to 95% relative humidity (can withstand 100% condensing humidity for short periods of time) - tropicalized/conformal coated electronics G3

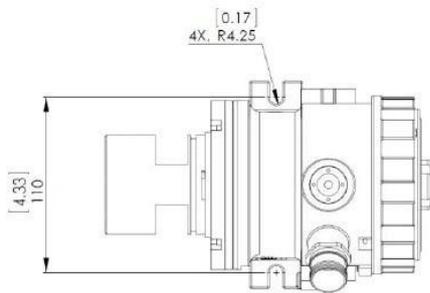
PERFORMANCE

EMC/RFI	Complies with IEC 61000-6-2 and 4
Combustible gases detector performance	Complies with ISA-12.13.01 IEC 60079-29-1

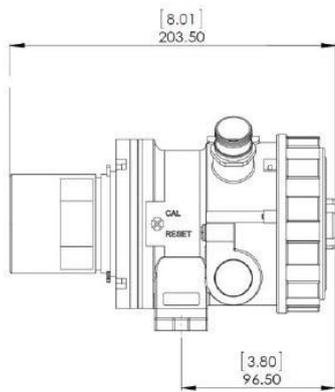
APPROVALS

North America	FM: Class I, Division 1 Groups B, C & DT4 Ta = -40°F to +167°F (-40°C to +75°C), IP66 ABS: Class I, Division 1 Groups B, C & D T4 Ta = -40°F to +167°F (-40°C to +75°C), IP66
Canadian	CSA: Class I, Division 1 Groups B, C & D T4 Ta = -40°F to +167°F (-40°C to +75°C), IP66
European	ATEX: Ex d IIC T4 -40°F to +185°F (-40°C to +85°C) CE Mark for EMC (TUV), CE Mark for IECEx, IP66
International	IEC, IECEx: Ex d IIC T4 -40°F to +185°F (-40°C to +85°C) IP66
SIL Rating	IEC61508 SIL Assessment SIL 2
UAE	ECAS-Ex

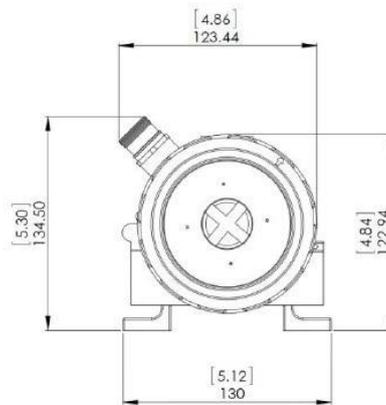
GENERAL ARRANGEMENT DRAWING



Top View



Side View



Front View



SGOES can be combined with Vector FCU as local display



*For **SGOES** remote Display refer to Vector Gas Detector section of ESP Product Catalogue.

SKU parts included in each configuration:

- **P/N 125-0008** **CTH-SGOES Protective Cap**
- **P/N 125-0020** **Mounting Screw Kit (Qty 2)**

Accessories:

- **P/N 125-0041-SS** **Universal 2" Pole mounting plate, Includes SS316L Mounting Plate and U-bolts for 2" Pole mount (Qty. 2)**
- **P/N 120-0091-GRP** **Awning Shield GRP 350 (width) 350 (depth) 130 (height)**
- **P/N 120-0091-SS** **Awning Shield Stainless Steel 350 (width) 350 (depth) 65 (height)**
- **P/N 120-0100-AL** **CTH-SGOES Direct HVAC Duct Mounting Kit Aluminum**
- **P/N 120-0100-SS** **CTH-SGOES Direct HVAC Duct Mounting Kit Stainless Steel**
- **P/N 120-0082-AL** **CTH-SGOES Sampling HVAC Duct Mounting Kit Aluminum**
- **P/N 120-0082-SS** **CTH-SGOES Sampling HVAC Duct Mounting Kit Stainless Steel**
- **P/N 125-0012** **Plug 3/4" NPT ****
- **P/N 125-0025** **3/4" NPT male to M20 female reducer ****

(**) adapters and plugs are available in nickel plated brass and stainless steel

Spare Part:

- **P/N 125-0008** **CTH-SGOES Protective Cap**
- **P/N 125-0020** **Mounting Screw Kit (Qty 2)**
- **P/N 540-0016** **O-Ring, CTH-SGOES End Cap Seal**
- **P/N 540-0017** **O-Ring, CTH-SGOES Weather Cap Rear Seal**
- **P/N 540-0014** **O-Ring, SGOES Weather Cap Front Seal**

Tools:

- **P/N 120-0078** **Hex L-Key. With Standard Tip, 10 mm Size, 4-11/16" Overall Length.**
- **P/N 120-0076** **Magnetic wand**
- **P/N 260-0007** **Cable Assembly, HART Communicator to VECTOR & SGOES; 6-pin connector to HART connector**
- **P/N 580-XXXX** **Calibration Kit Gas, (Refer to Gas Calibration Kit List)**



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