SIL2 CERT

Model **TGAES** hydrocarbon gas detector is an open path gas detection system that provides continuous monitoring of combustible hydrocarbon gas concentrations in the range of 0 to 5 LEL/m, over a distance of 15 to 650 feet (5 to 200 meters). Standard system outputs include 4-20mA, HART and RS-485 Modbus RTU serial communication. **TGAES** is capable of detecting most hydrocarbon gases and vapors including methane, propane, butane, propylene and others. No direct electrical connection between the two modules is required. In some applications, one **TGAES** detection system can provide protection equivalent to as many as eight point detectors.

The **TGAES** transmitter module illuminates a direct linear path ending at the **TGAES** receiver module. As flammable hydrocarbon gases intersect the light beam between the two modules, certain IR wavelengths are absorbed by the gas, while other IR wavelengths are not. A pair of optical detectors and associated electronics located in the receiver module measures the absorption for both the active wavelength and reference wavelength. The ratio of absorption between the active and reference wavelengths determines the amount of gas intersecting the beam along its entire length. A microprocessor computes the gas concentration and converts the value into a 4-20mA signal and MODBUS register value.

THE LONGEST DETECTION RANGE
Monitors a path distance of up to 650ft (200m).

OPERATES IN ANY OUTDOOR CONDITIONS
TGAES distinguishes hydrocarbon gas even when obscured by rain, fog, dust, snow or blowing sand

EASY ALIGNMENT
Use HART communicator or software via RS485 for the fine alignment.

3 YEARS WARRANTY
Long reliable product life, low cost to operate aver time

Features and Benefits

- Detects methane and most common hydrocarbon gases including ethane, propane, butane and propylene with equal sensitivity
- Detection range of up to 200m
- T90 less than 3 seconds
- Corrosion-resistant 316 stainless steel enclosures
- Widest operating temperature range: -40°F to +140°F, (-40°C to +60°C)
- Ultra-reliable xenon flash-lamp
- Tri-color status LED or 96 character LCD for full graphical indication w/ Vector
- Source analog 4-20mA, standard RS-485 communication channel under protocol Modbus RTU and relay outputs
- HART communication
- Primary heater protects optics from ice and secondary heater protects the internal electronics
- Able to operate even when obscured by fog, rain, dust, snow, or blowing sand.
- Automatic temperature compensation
- Expected life > 10 years

Applications

- Tank ships and other vessels
- Refineries, bulk terminals, tank farms
- LNG/LPG processing and storage
- Chemical, paint and fertilizer plants
- Power plants and gas turbines
- Transportation facilities

ELECTRICAL SPECIFICATION

Supply Voltage	+24VDC Nominal (+18 to 32 VDC)		
Power Consumption*		Transmitter	Receiver
	Typical	7 W	6 W
	Maximum (w/ Optics Heating ON)	15 W	15 W
	*Optional (low power consumption)	8W	12 W
Analog Outputs	Analogue Signal 4-20mA sourcing NAMUR NE43		
	Out of Alignment		2 mA ± 0.1 mA
	Alignment		2.5 mA ± 0.1 mA
	Normal		4 mA ± 0.1 mA
	Zero Trim		3.8mA ± 0.1 mA
	Fault		2 mA ± 0.1 mA
	Glass filter reading		8.48 mA ± 1.6 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 Enerized		
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

Detected Gases	Methane, Propane, Ethane, Butane, Isobutane, Pentane, Cyclopentane, Propylene, Hexane, Methanol, Ethanol, other combustible gases including complex hydrocarbons. (The target gas is factory-configured according to customer request)
Gas Detection Range (factory default setting)	0 to 1 LEL•m 0 to 2.5 LEL•m 0 to 5 LEL•m
Detection Range	from 15ft to 650ft (5 to 200m)
Accuracy	+/- 0.25 LEL- meters or 10% of applied gas range
Response Time	T90 < 3.0 seconds
Warm-up time	Alarm status indication- Tri-color LED indicator (optional by request available remote OLED display)
Local Indication	T90 < 3.0 seconds
Self Test and Diagnostics	Transmitter self-testing: 2x/sec, Receiver self-testing: 2x/sec
False Alarm Immunity	Integrated

MECHANICAL SPECIFICATION

Material	316SSL Electropolished
Conduit Connection	Two (2) Conduit Entries 3/4" NPT (ISO M20 with adapter)
Dimensions	10.43" x 6.96" x 7.17" 262mm x 176mm x 182mm (each module with Mounting Bracket)
Weight	316 SSL: 16.5 lbs (7.5 kg) (each module with Mounting Bracket)
Ingress Protection	IP66
Warranty	3 years

ENVIRONMENTAL SPECIFICATION

Operating Temperature	-40°F to +140°F (-40°C to +60°C)
Storage Temperature	-58°F to +167°F (-50°C to +75°C)
Humidity	0 to 100% non-condensing - tropicalized/conformal coated electronics G3

PERFORMANCE

EMC/RFI	Complies with IEC 61000-6-2 and 4
Performance reference standard	According to EC 60079-29-4, ANSI/ISA-12.13.04

APPROVALS

North America	FM: Class I, Division 1 Groups B, C & DT4 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 (Pending)

GENERAL ARRANGEMENT DRAWING

Dimensions
in Inches (millimeters)

Front View

7"
(178mm)

7.165"
(182mm)

Side View

7"
(178mm)

10.5"
(264mm)
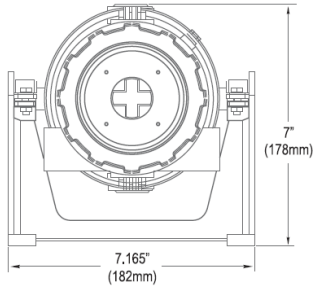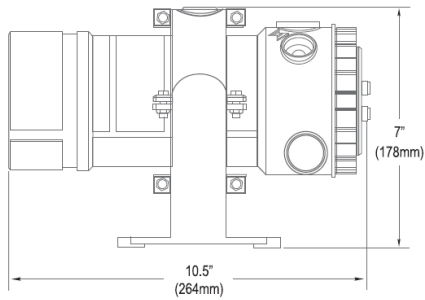
FIELD OF VIEW

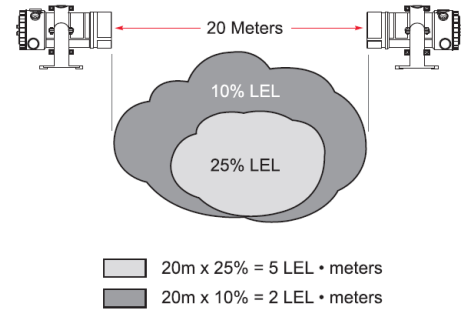**FIELD OF VIEW**

20 Meters

10% LEL

25% LEL

20m x 25% = 5 LEL • meters
20m x 10% = 2 LEL • meters

The measurement of combustible gas and air along the optical path length is expressed in LEL• meters, a unit of measurement for the amount of gas present in the length of the light beam.

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

SKU parts included in each configuration:

- **P/N 125-0006**   TGAES Protective Visor
- **P/N 125-0021**   Mounting Hardware Kit (8 screws)
- **P/N 125-0017**   Aperture Kit (5 pc. set includes 5 distances)
- **P/N 120-0084**   TGAES Mounting Plate SS316
- **P/N 120-0056**   Functional Test Filter (Calibration filter PT-3, 1.55 – 2.40 LEL.m Methane and: 2.35 – 3.55 LEL.m Propane)

Accessories:

- **P/N 125-0049-SS**
- **P/N 120-0099-GRP**   TGAES 3" pole mounting kit Includes SS316L 3" U-bolts (Qty 4)
- **P/N 120-0099-SS**   No.2 Awning Shield GRP 350 (width) 350 (depth) 130 (height) No.2 including No. 2 SS316L 3" U-bolts
- **P/N 125-0012**   No.2 Awning Shield SS 350 (width) 350 (depth) 65 (height) No.2 including No. 2 SS316L 3" U-bolt
- **P/N 125-0025**   Plug 3/4" NPT **

     ¾" NPT male to M20 female reducer **

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

Spare Part:

- **P/N 100-0024-01**   TGAES Open Path Gas Detector Transmitter - Stainless Steel housing; Includes protective visor, mounting bracket and stainless-steel mounting hardware
- **P/N 100-0025-01**   TGAES Open Path Gas Detector Receiver Propane - Stainless Steel housing; Includes protective visor, mounting bracket and stainless-steel mounting hardware
- **P/N 100-0025-02**   TGAES Open Path Gas Detector Receiver Methane - Stainless Steel housing; Includes protective visor, mounting bracket and stainless-steel mounting hardware
- **P/N 125-0006**   TGAES Protective Visor
- **P/N 125-0017**   Aperture is used to properly set the signal for the TGAES Open Path gas detector; 1 kit of 5 disc sizes per Detector
- **P/N 540-0xxx**   O-Ring, TGAES Weather Cap Rear Seal
- **P/N 125-0021**   Mounting Hardware Kit (8 screws)
- **P/N 120-0084**   TGAES Mounting Plate SS316

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 120-0058**   Calibration filter PT-1
- **P/N 120-0057**   Calibration filter PT-2
- **P/N 120-0056**   Calibration filter PT-3
- **P/N 260-0009**   Cable Assembly, HART Communicator