

Combustible Analog Gas Transmitters



ITS-1710

DESCRIPTION

Analog gas transmitters for the detection of combustible gases and vapors in the ambient air.

APPLICATION

To sense a wide variety of combustible gases and vapors in commercial applications such as boiler rooms (i.e. Methane), dry cell battery rooms (i.e. Hydrogen), gas/fuel spill locations (i.e. Gasoline, Hexane), laboratories and industries (i.e. Butane, Propane) and transmit to any compatible electronic analog control, DDC/PLC control or automation system.



FEATURES

- Continuous monitoring
- 4-20 mA analog signal output
- Long-life sensor
- Polarity protected
- RFI/EMI protected
- Modular plug-in technology
- Enclosure, NEMA 4X, 7, 9
- Easy maintenance

SPECIFICATIONS

Electrical

Power supply 24 VDC (12-30 VDC)

Power consumption 125 mA max.

Sensor Performance

Gas detected Combustible gases, refer to section "Ordering Information"

Sensor element Catalytic bead (pellistor), diffusion

Range 0 - 100% LEL

Accuracy ± 1% LEL methane

Repeatability ± 1% LEL methane

Zero drift < 2% of full scale/month at 68°F (20°C)

Long term sensitivity drift < 2% LEL_{methane}/month

Response time $t_{50} < 10 \text{ sec. methane}$

$t_{90} < 30 \text{ sec. methane}$

Calibration

- interval recommended 3 to 12 months, dependent on combustible gas type

- adjustment Simple 2-point settings, applying calibration gas standards

Sensor life expectancy 3-5 yrs. normal operating environ

Sensor coverage 2,500 sq. ft., max. 4,000 sq. ft. (233 m², max. 372 m²)

Installation Location

Mounting height Refer to table "Mounting Height"

Type of Control

General Continuous proportional analog sensor signal output

Analog output 4-20 mA, mA DC into 700 Ω at 24 VDC, 3-wire configuration

Environment

Permissible ambient

- working temperature -40°F to 104°F (-40°C to 40°C)

- storage temperature 41°F to 104°F (5°C to 40°C)

- humidity, continuous 15 to 90% RH, non-condensing

- humidity, intermitted 0 to 99% RH, non-condensing

- working pressure Atmospheric ± 10%

| Combustible Gases/Vapors | | % v/v* |
|--------------------------|--|--------|
| Acetone | (CH ₃) ₂ CO | 2.6 |
| Acetylene | C ₂ H ₂ | 2.5 |
| Benzene | C ₆ H ₆ | 1.2 |
| Cyclohexane (Gasoline) | C ₆ H ₁₂ | 1.3 |
| Ethylene | CH ₂ | 2.3 |
| Ethane | C ₂ H ₆ | 3.0 |
| Ethyl Acetate | CH ₃ COOC ₂ H ₅ | 2.2 |
| Ethyl Alcohol | C ₂ H ₅ OH | 3.3 |
| Fuel Oil Vapor | - | 1.2 |
| Hydrogen | H ₂ | 4.0 |
| Isopropyl Alcohol | (CH ₃) ₂ CHOH | 2.2 |
| JP8 | - | 0.9 |
| Methane | CH ₄ | 5.0 |
| Methanol | CH ₃ OH | 6.7 |
| n-Butane | C ₄ H ₁₀ | 1.8 |
| n-Heptane | C ₇ H ₁₆ | 1.05 |
| n-Hexane | C ₆ H ₁₄ | 1.1 |
| n-Octane | C ₈ H ₁₈ | 0.95 |
| n-Pentane | C ₅ H ₁₂ | 1.4 |
| Propane | C ₃ H ₈ | 2.1 |

*x% v/v = 100% LEL

LEL = Lower Explosive Limit

v/v = Volume by Volume

Physical

Enclosure, explosion proof

- enclosure material Cast aluminum, epoxy coated

- sensor material Stainless steel .316

- color Blue

- protection NEMA 4X, 7, 9

rated Class 1, Div. 1,

Groups A, B, C and D

- installation Wall (surface) mounted

SPECIFICATIONS

Physical (cont...)

| | |
|------------------------|--|
| Dimensions (H x W x D) | 7.0 x 5.0 x 3.0 in. (178 x 127 x 89 mm) |
| Cable entry | 1 hole for 3/4 in. conduit for wall (surface) mounting |
| Wire connection | Terminal blocks, screw type for lead wire |
| Wire size | Min. 24 AWG (0.25 mm ²), max. 14 AWG (2.5 mm ²) |
| Wire distance | Max. loop resistance 500 Ω. (= wire resistance plus controller input resistance) |
| Weight | 5.0 lbs. (2.3 kg) |

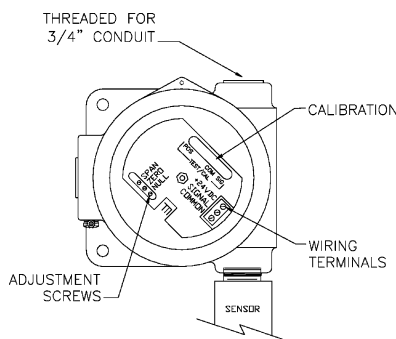
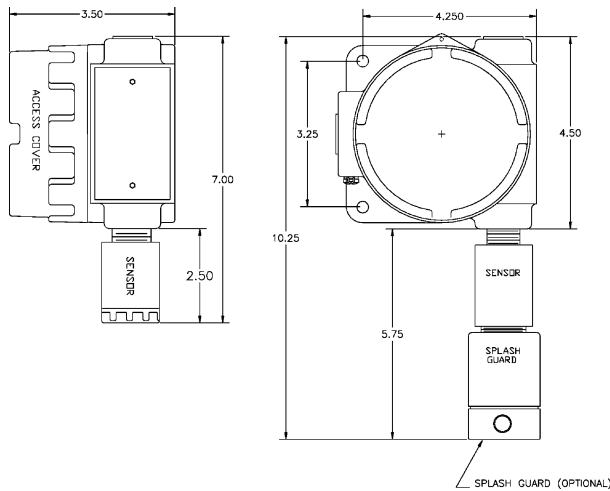
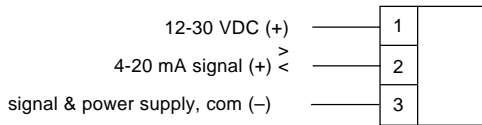
Approvals/Listings

| | |
|--------------------|----------------------------------|
| - enclosure rating | UL Listed, CSA Certified, FM, Ex |
| - unit | CSA, C22.2 |

WIRING CONFIGURATION

ITS-171X1-S

24 VDC, 3-wire configuration



ORDERING INFORMATION

ITS-171X1 - SXX

| Gases | | | Options | |
|-------|------------------------|--------------------------------|---------|----------------------------|
| 0 | Methane | CH ₄ | D | Duct mount |
| 1 | Acetylene | C ₂ H ₂ | F | Remote Calibration adapter |
| 2 | Ethane | C ₂ H ₆ | W | Conformal coating |
| 3 | Propane | C ₃ H ₈ | P | Protective sensor guard |
| 4 | n-Butane | C ₄ H ₁₀ | X | Non-standard calibration |
| 5 | n-Pentane | C ₅ H ₁₂ | | |
| 6 | n-Octane | C ₈ H ₁₈ | | |
| 7 | Hydrogen | H ₂ | | |
| 8 | Cyclohexane (Gasoline) | C ₆ H ₁₂ | | |
| 9 | Other on request | | | |

Sample, ordering part number:

ITS-17171-S

Combustible gas transmitter, 0-100% LEL (2.1% v/v) propane range, for power supply 24 VDC, 4-20mA output signal, surface mount, NEMA 4x, 7, 9 enclosure

| Mounting Height "Recommended" | |
|------------------------------------|-------------------|
| - Above Floor | = A.F. |
| - Below Ceiling | = B.C. |
| Methane | = B.C. 1ft (0.3m) |
| Acetylene | = A.F. 5ft (1.5m) |
| Ethane | = A.F. 5ft (1.5m) |
| Propane | = A.F. 1ft (0.3m) |
| n-Butane | = B.C. 1ft (0.3m) |
| n-Pentane | = A.F. 1ft (0.3m) |
| n-Octane | = A.F. 1ft (0.3m) |
| Hydrogen | = B.C. 1ft (0.3m) |
| Cyclohexane (Gasoline) | = B.C. 1ft (0.3m) |
| "Install sensor pointing downward" | |

