

CONTINUOUS MONITOR FOR HYDROGEN SULFIDE METHANE AND OXYGEN DEFICIENCY ENMET MODEL ISA-44-2-OD

1.0 GENERAL

The gas monitor shall detect and be calibrated for hydrogen sulfide (H_2S), methane (CH_4), and oxygen (O_2). The equipment shall provide alarms when the gas concentrations exceed, or the oxygen concentration falls below, preset limits at the respective sensor locations. The instrument shall also have the capability of being used to control ventilation, remote alarm(s) or other equipment by means of relay contact closures at each alarm level. The system shall include the control panel and the appropriate sensor assemblies.

2.0 SENSORS

The H_2S and CH_4 sensors shall be of the non-specific, metallic oxide semiconductor (MOS) variety for maximum user safety. The MOS sensor for H_2S shall be calibrated for 10 ppm H_2S but shall generate alarms due to fuel spills, chemicals and solvents. The H_2S and CH_4 sensor assemblies shall have Class 1, Division 1, Group A, B, C, D explosionproof approval as defined by the National Electrical Code, when used in conjunction with an approved housing, which shall be provided as part of each gas sensor assembly. The housing shall include a terminal strip for sensor wiring. The H_2S and CH_4 sensor assemblies shall also be provided with a sintered cup for protection from moisture and dust. The cup shall be made of stainless steel and filter to 100 microns. A second internal sintered cup with a 20 micron porosity shall protect the sensing element.

The O_2 sensor shall be of an electrochemical design. The O_2 sensor and associated circuitry shall be non-incendive and shall be provided with a NEMA-4X enclosure. The instrument shall have an appropriate intrinsic safety barrier installed in the control panel for sensor operation in Class 1, Div. 1, Group A, B, C, D atmospheres.

3.0 CONTROL PANEL

The control panel enclosure shall be NEMA-4X fiberglass. The control panel shall have individual analog meters to indicate gas concentrations for each sensor. Indicating lights for each sensor shall be clearly visible on the front of the panel to signify operating conditions. All lights, switches and meters shall be sealed in such a way to be compatible with the instrument enclosure rating. A common horn shall be provided to activate at the high level alarm point for H_2S or CH_4 , or in an oxygen deficiency alarm condition. The horn shall be rated for at least 90 dB at 3 feet. The horn shall be capable of being defeated by a HORN OFF switch on the front of the control panel, with a separate indicating light activating whenever the switch is in the HORN OFF position.

The instrument shall be powered by 110 VAC, 220 VAC or 12 VDC supply. While connected to 110 VAC or 220 VAC primary power supply, the instrument shall also have the capability of being connected to a secondary 12 VDC supply to provide continuity of operation in case of primary power failure.

3.1 ELECTRONICS

The processing electronics shall employ all solid state analog components.

All power supply, relays, and terminal strip components shall have appropriate UL, CSA, or approved equal listings.

A SPDT relay shall activate at the low alarm point and another at the high alarm point for both the H₂S and CH₄ sensors. The relays shall be rated at 2 Amps continuous, 5 Amps surge at 110VAC, and shall activate in an alarm condition or in a complete power loss situation.

A SPDT relay shall activate at the oxygen deficiency alarm point.

The alarm points shall be:

- 10 ppm H₂S (low), 20 ppm H₂S (high)
- 10 %LEL CH₄ (low), 20 %LEL CH₄ (high)
- 19.5 % oxygen deficiency

4.0 INSTALLATION

The control panel shall be wall mounted by means of holes provided in the enclosure.

Primary power shall be supplied to a barrier terminal strip located inside the control panel enclosure.

The sensor enclosures shall be 3/4 or 1/2 inch conduit mounted.

Wiring, conduit from the sensor enclosures to the control panel, and conduit hardware shall be provided by the owner or installer and shall meet the National Electric Code and applicable local electrical codes. Gauge of the wiring shall be in accordance with the manufacturer's recommendation, as it is dependent on the distance between the sensor and control panel. Three-conductor cable shall be required between each gas (H₂S and CH₄) sensor and the control panel. Gas sensor wiring shall be capable of being run in the same conduit as the power supply and relay wiring. Oxygen sensor wiring shall be separate from other wiring and two conductor shielded wiring is recommended. At the control panel and sensor locations, conduit entrance hardware and techniques shall be compatible with the control panel enclosure rating and the classification of the environment where the sensor is installed.

5.0 WARRANTY

The instrument shall have a warranty of at least one year from the date of shipment from the factory, with the oxygen sensor having at least a six month warranty. The warranty shall include workmanship and material under normal use.