2003
APPROVAL GUIDE

CHAPTER 10

GAS DETECTION INSTRUMENTS

COMBUSTIBLE GAS DETECTORS

Combustible gas detectors detect the presence of flammable vapors and gases and warn when concentrations in air approach the explosive range. Approved detectors, portable and fixed, have specified hazardous location suitability.

Many gas detectors use a catalytic sensor, while others use semiconductors or a temperature sensitive resistor in a flame which burns the gas. The material either reaches the sensor by molecular diffusion or is drawn through tubing to the sensor.

The material to be detected must be known and the instrument must be calibrated with that particular material. Where an instrument is to be used for detecting more than one material, calibration curves are provided for the materials other than that for which it has been calibrated. Low readings may result when a sample is taken from heated areas and part of the vapors condense out before reaching the sensor.

Unless otherwise indicated, these units are not Approved for use in temperatures in excess of 104°F (40°C) or below 32°F (0°C). Diffusion sampling is not recommended where the air has excessive moisture or dust, or where air movement would prevent a representative sample from reaching the sensor. Manufacturer's instructions should be consulted as to materials and environmental conditions which may affect the functional performance of the instrument.

COMBUSTIBLE GAS DETECTORS, Fixed

Fixed combustible gas detectors indicate concentrations over the range of 0 to 100% of the lower explosive limit. They may be arranged to provide an audible or visual alarm or to control other equipment. Unless otherwise specified, sensors are to be installed indoors or in areas protected from rain, snow and sleet.

Once installed, a high standard of maintenance by properly trained personnel is required, and the equipment should be checked per the manufacturer's instructions and the requirements of the particular application. A maintenance contract with the manufacturer is recommended.

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Stationary Gas Detection System. SENTRY system consists of 2, 4 and 8 channel controller Models 5000-02, 5000-04 and 5000-08 for connection to remote digital combustible gas sensor/transmitter Model 5100-02. The system monitors 0-99% LFL of combustible gas-in-air atmospheres. The controller is for use in indoor or optional outdoor (NEMA 4X) nonhazardous locations, the combustible gas sensor/ transmitter is for use in Class I, Division 1, Groups C and D hazardous (classified) indoor locations. The controller is panel mounted and can be operated from 120 Vrms, 220 Vrms, 50/60 Hz or 12 V dc. The controller provides the following standard functions: 2, 4 or 8 channel measurement, displays, keypad and common High/Low Trouble alarm contacts. The following are Approved controller options: Model 5380-00 Controller 19 in. rack mounting accessory, Model 5383-00 Controller NEMA 4X enclosure, Model 5392-00 individual 8 channel high and low alarm contacts, and Model 5387-00 Serial RS-232 printer port software. Included in the Approval are: conventional and multiplexed sensor/transmitter installation configurations, normal and global calibration modes, user editable channel tag function, combustible gas calibration delivery system Model 1200-26 with methane gas cylinder Model 1290-02 and delivery fitting Model 5360-00, calibration adaptors

Models 5358-00 and 5358-01. Operating temperatures are 0° to 50°C (32° to 122°F) for the controller, -40° to 80°C (-40° to 176°F) for the combustible gas sensor/transmitter. Approval covers use of the instrument when the instrument calibration is performed using the gas to be monitored and when the higher of the two alarm set points is preset within 10% LFL of the monitored calibration gas concentration. Stationary Combustible Gas 4-20 mA Sensor/Transmitter. Model 4101-02 stand alone sensor/transmitter monitors 0-99% LFL of combustible gas-in-air atmospheres. The Approved apparatus is explosion proof for use in Class I, Division 1, Groups C and D hazardous (classified) indoor locations. Included in the Approval are combustible gas calibration delivery system Model 1200-26 with methane gas cylinder Model 1290-02 and delivery fitting Model 5360-00, calibration adaptors Models 5358-00 and 5358-01. Operating temperatures for the sensor/transmitter are -40° to 80°C (-40° to 176°F). Approval covers use of the instrument when the instrument calibration is performed using the gas to be monitored.