Model **IR400**

Infrared Point Detector for Combustible Gas Detection

General Monitors



Applications

- Chemical plants
- Compressor stations
- Drilling and production platforms
- Fuel loading facilities
- Oil well logging
- LNG/LPG processing and storage facilities
- Refineries
- Wastewater treatment facilities

Features & Benefits

- Low maintenance; no routine calibration required.
- True fail-to-safe operation provides outstanding gas detection performance.
- Multiple communication outputs provide complete status and control capability in the control room.
- Heated optics eliminate condensation.
- Dirty optics indication discriminates between true fault and cleaning requirements.
- T90 < 3 seconds (w/splash guard) offers industry-leading speed of response.

Description

Model IR400 infrared (IR) point detector is a microprocessor-based combustible gas detector that continuously monitors combustible gases in the lower explosive limit (LEL) range and provides a 4 to 20 mA analog signal proportional to the 0 to 100% LEL concentration. The detector also monitors other conditions such as supply voltage and optical path integrity.

The IR400 detection principle is based on measuring absorption of infrared radiation passing through a volume of gas using a dual beam, single detector method. IR detector measures the intensity of two specific wavelengths, one at an absorption wavelength and another outside of the absorption wavelength. The gas concentration is determined by a comparison of these two values.

Most industrial point IR gas detection applications require a splash guard to protect the sensing element from rain and other environmental conditions. In many cases, the addition of a splash guard slows the speed of response considerably and should be taken into consideration. The IR400 gas detector responds within three seconds to gas leaks even with a splash guard installed.

Configurations with analog output, Modbus, and HART are available. IR400 provides a two-wire RS-485 addressable communications link conforming to Modbus protocol that is used to monitor the IR400's status and settings in order to simplify installation and maintenance. Data available through HART or Modbus, such as configuration device settings and stored maintenance records, can be used to perform diagnostics and take corrective action before a problem occurs.

The IR400 is calibrated at the factory and needs no routine field calibration. It requires only a periodic cleaning of the windows and re-zeroing to ensure dependable performance.

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General Monitors by MSA

System Specifications	
DETECTOR TYPE	Infrared absorption type
MEASURING RANGE	0 to 100% LEL 0 to 100% by volume (methane only)
GASES	Methane, propane, ethane, ethylene, butane, hexane, pentane, benzene *Consult factory for other gases*
DETECTOR LIFE	Greater than 5 years
ACCURACY @ 25°C	± 3% LEL at ≤ 50% LEL reading ± 5% LEL at > 50% LEL reading
ZERO DRIFT	< 2% per year
RESPONSE TIME WITH SPLASH GUARD	T50 ≤ 1.5 s, T60 ≤ 1.5 s, T90 ≤ 3 s *Except ethylene where T60 ≤ 2 s and T90 ≤ 4 s*
READOUT/RELAY DISPLAY MODULES	DC110; TA102A; IR4000 display, and relay alarms
ACCESSORIES	Junction box, duct mount junction box, calibration cup, flow block, splash guard, rain guard, portable purge calibrator
CLASSIFICATION	Class I, Zone 1, IIB + H_2 (Ta=-40° C to +75° C) Ex d, IIB + H2 T5 Gb Ex tb IIIC, T100° C Db, IP66 (Ta=-60° C to +75° C)
WARRANTY	Two years
APPROVALS	ATEX, IECEx, MED, DNV GL, CE, FM 6310, 6320 and CSA 22.2 No. 152 EN 60079-29-1 Performance Approved HART Registered, SIL 3 suitable FM Certified to IEC 61508
Environmental Specifications	
OPERATING TEMPERATURE RANGE FM, CSA, GOST-R ATEX, IECEx ETHYLENE	 -40° F to +167° F (-40° C to +75° C) -76° F to +167° F (-60° C to +75° C) -40° F to +140° F (-40° C to +60° C)
STORAGE TEMPERATURE RANGE	-58° F to +185° F (-50° C to +85° C)
OPERATING HUMIDITY RANGE	10% to 95% RH, non-condensing

Electrical Specifications	
INPUT POWER	20-36 VDC @ 200 mA max. 24 VDC nominal
ANALOG SIGNAL START UP, FAULT *(non-HART)* START UP, FAULT *(HART)** CAL, ZERO, GAS CHECK* DIRTY OPTICS* 0 TO 100% LEL OVER-RANGE	0-21.7 mA (600 ohms max.) 0 mA 1.25 mA 1.5 mA 2.0 mA 4 to 20 mA *(proportional)* 20 to 21.7 mA
EMC	Complies with EN 50270, EN 61000-6-4
CABLE REQUIREMENTS	Max. distance between IR400 and power source @ 24 VDC nominal (20 ohm loop resistance): 14 AWG (2.0 mm2) - 3600 ft (1100 m) Max. distance for analog output (500 ohms max): 14 AWG (2.0 mm2) - 9000 ft. (2740 m)
FAULTS MONITORED	Re-calibration error, EPROM checksum error, optics failure/blockage; low supply voltage, EEPROM checksum error, reference or active lamp failure, heater failure, time to re-zero unit, short circuit on CAL_IO wire
RS-485 OUTPUT	Modbus RTU, suitable for linking up to 128 units or up to 247 units with repeaters
BAUD RATE	2400, 4800, 9600, or 19200 BPS
HART (OPTIONAL)	HART 6, HART Device Descriptor available. AMS aware
WIRELESS COMMUNICATION	Available with ELPRO Technologies wireless devices
Mechanical Specifications	
DIAMETER	2.9" (74 mm)
LENGTH	8.87" (225 mm)
WEIGHT ALUMINUM STAINLESS STEEL	 3 lbs (1.35 kg) 6 lbs (2.7 kg)
MOUNTING	¾" NPT
INGRESS PROTECTION	Type 4X, IP66
HOUSING	Aluminum 6061-T6 alloy or 316 stainless steel
STANDARD CONFIGURATION	**IR400-0-01-1-2-0-1-0** Methane, 4-20 mA, Modbus, aluminum, splashguard w/screen, no junction box

* *Under HART, the analog output minimum level can be configured as 3.5 mA or as stated above, depending on user selection.*

Specifications subject to change without notice.

Note: This Bulletin contains only a general description of the products shown. While uses and performance capabilities are described, under no circumstances shall the products be used by untrained or unqualified individuals and not until the product instructions including any warnings or cautions provided have been thoroughly read and understood. Only they contain the complete and detailed information concerning proper use and care of these products. Specifications subject to change without notice.

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