Model D12-IR Gas Transmitter

ATI's Series D12 gas transmitter product line has been expanded. Now available in this versatile package is an LEL transmitter utilizing an Infrared sensor that resists the poisoning problems inherent in catalytic bead sensors. The D12-IR incorporates a compact sensor that picks up hydrocarbons by measuring the amount of infrared energy absorbed by the target gas or vapor. The sensor is housed in a corrosion resistant stainless steel housing with sintered flame arrestor to meet hazardous area classification requirements, and is suitable for most plant environments.

While catalytic LEL sensors often operate with little trouble in many applications, the presence of silicon vapors, hydrogen sulfide, and halogenated hydrocarbons can quickly degrade sensor operation. Measurement using an infrared sensor does not result in the combustion of the target gas, so the formation of acid gases or catalytic poisons does not occur on the sensor. This often means better zero stability and much longer sensor life with the IR system. In addition, calibration stability of IR sensors tends to be greatly improved, as the sensor is automatically compensated for changes in the IR source and detector that might cause calibration drift.

The D12-IR is also available with an infrared sensor designed for CO_2 measurements in ambient air or in pumped gas samples. Two carbon dioxide sensors may be specified, one for low range use and another for higher levels of CO_2. The low range sensor may be scaled from 0-2000 PPM minimum to 0-5% maximum, while the high range sensor covers ranges from 0-5% minimum to 0-50% maximum.

For gas measurements in hospital or lab environments, another version of the D12IR is available for monitoring nitrous oxides in the ambient air. The N_2O sensor is capable of measurements over a range of 0-2000 PPM Min. to 0-1% Max., with a resolution down to about 50 PPM. As with other IR systems, the sensor can operate in either diffusion mode or with a pumped sample.

D12-IR transmitters provide features that make the system ideal for a variety of gas monitoring applications.

- **Explosion-proof Sensor Design:** Infrared sensing element is protected inside a stainless steel assembly with a sintered stainless steel flame arrestor.

- **Fail-safe Sensor Operation:** Because the IR sensor is always in an active state, the transmitter continuously monitors critical sensor functions and indicates any sensor problems both on the display and through the analog output. Trouble can also be indicated by use of optional relays.

- **High Range Methane Measurement:** D12IR transmitters can be supplied calibrated for volumetric methane measurements for special applications. Ranges from 0-10% to 0-100% by volume are available. A separate sensor is also available for high percent level measurements of heavier hydrocarbons such as butane and propane.

- **Three Internal Alarm Relays**: D12 transmitters contain relays that can be used for local alarm functions. All relays are programmable for setpoint, hysteresis, on-delay, off-delay, and other variables.

- **Serial Communication Interface**: The transmitter is available with either HART™ or MODBUS™ protocol. The HART protocol supports the HART Universal and Common Practice Commands at 1200 baud using the Bell 202 FSK modem standard. The MODBUS protocol supports 9600 baud access to concentration and status information, and supports alarm setup and many other functions on either RS485 or RS232 (software selectable). Comes with a register/tag database on a 3 ½" diskette

- **LCD Graphics Display**: Gas Concentrations are displayed in large, easy to read numbers. The display also provides alarm indication and complete menus for setting up operating parameters. A back-light is available when operating in 3-wire mode.

- **Internal Data Logger**: Measured gas values are stored at user definable intervals and can be recalled when needed on the LCD display. Data can be downloaded using an ASCII interface to terminal or printer only.

- **Sensor Calibration History**: Each time a sensor is zeroed or calibrated, the data is stored in memory. Calibration history can be recalled and sensor condition reviewed by operating personnel whenever necessary.

- **Non-intrusive Operation**: Operating functions such as calibration, alarm setup, alarm reset, data view, and setup options are all available using a magnetic tool. It is never necessary to open the enclosure when making adjustments.

- **Password Protection**: Program setting stored in the transmitter may be protected by a user selectable password. Operators may still review all functions, but changes may only be made by authorized personnel.

- **Output Simulation**: Transmitter analog output can be set to user definable values and relay outputs can be set to specific states for complete simulation of detection system operation. Output and alarms may also be inhibited for maintenance and calibration.

- **Modular Transmitter Electronics**: The D12 electronic assembly plugs easily into a terminal board in the base of the enclosure. Transmitters can be easily removed for wiring and quickly replaced in the event of a fault condition.

- **Explosion-proof Enclosure**: Transmitters are designed for operation in hazardous areas. The cast aluminum housing for the D12 transmitter is rated for Class 1, Division 1, Group B, C, D locations and is UL, FM, and CSA certified.

Specifications

Gas Type:	Combustible Gas, Carbon Dioxide, Volumetric Methane, or Nitrous Oxide Combustible Gas selectable for methane, ethane, propane, or butane.
Sensor Type:	Single path Non-dispersive Infrared (NDIR)
Sensor Separation:	Maximum 25' cable from sensor to transmitter
Range:	Combustible Gas: 0-50% LEL Min., 0-100% LEL Max., or 0-100% V/V Methane High Hydrocarbon: 0-10% Min, 0-100% Max V/V for heavier hydrocarbons Carbon Dioxide: 0-2000 PPM% Minimum, 0-50% Maximum Nitrous Oxide: 0-2000 PPM Minimum, 0-1% Maximum
Response Time:	90% in 10 seconds
Accuracy:	Generally ±5% of value, but limited by available calibration gas accuracy.
Electronic Repeatability:	±1%
Electronic Linearity:	±0.5%
Zero Drift:	Less than 1% full scale per month, non-cumulative
Span Drift:	Dependent on operating environment but generally less than 1% per month
Analog Output:	4-20 mA, 675 ohms maximum at 24 VDC
Serial Interface:	HART™ (1200 baud modem interface) MODBUS™ (1200-9600 – RS232 or RS485, s/w selectable)
Power:	12 – 30 VDC, 350 mA maximum, 3-wire connection
Optional Alarm Relays:	Three SPST, 5 A @ 230 VAC resistive
Relay Coil:	Programmable either normally energized or normally de-energized.
Enclosure:	Explosion-proof, Class 1, Div. 1, Groups B, C, & D.
Controls:	4 magnetic switches on front of transmitter
Operating Temperature:	-40º to +75º C
Weight:	4 Lbs (1.8 Kg.)

Ordering Information

MODEL D12IR – E – F – G Gas Transmitter

SUFFIX E – TRANSMITTER TYPE

1 – Integral sensor, no relays
2 – Integral sensor, with relays
3 – Remote sensor, no relays
4 – Remote sensor, with relays

SUFFIX F – GAS & RANGE

1 – Combustible Gas, 50%/100% LEL
2 – High Hydrocarbon, 100% V/V
3 – CO_2, 1%/5% by volume
4 – CO_2, 5%/50% by volume
5 – N_2O, 1% by volume

SUFFIX G – DIGITAL OUTPUT

1 – None
2 – MODBUS™ interface (requires alarm in Suffix E)
3 – HART™ interface

ACCESSORIES

00-0258 Calibration adapter
00-0261 Splash guard / remote calibration adapter
00-0298 Sensor Flow Cell