Toxic Gas Detection

GAS TRANSMITTER

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ATi   SERIES F12

ATi
Analytical Technology

Model F12
Toxic Gas Detection

Smart Sensor Technology

The Series F12 Gas Transmitter is an Intrinsically Safe (IS) version of our explosion-proof D12 transmitter. In its standard form, it is designed for detection of a variety of toxic gases in hazardous area applications requiring IS devices. In addition, it is also well suited for all general purpose applications where toxic gas measurement is required. For IS installations, this transmitter is also available with a Hart™ communication option.

F12 Transmitters use ATI's standard smart sensors for maximum flexibility. Sensors are easily exchanged and contain all calibration constants in sensor memory, eliminating the need for field calibration of transmitters. Sensors may be calibrated separately on the bench and then simply plugged into the transmitter. Calibration data is read into the transmitter automatically and no other adjustments are normally required.

For general purpose gas detection applications, the F12 transmitter is also available in Non-IS versions. One version provides for easy interface to RS-485 networks using a standard MODBUS™ communication protocol. A second version provides a complete AC powered instrument with 3 alarm relays (SPST) available for external alarming.

Model F12 With Optional Auto-Test Generator

Optional Auto-Test Generator   *Smart Sensor*

Sensor Calibration Adapter   *Sensor Flow Cell*

Specifications

Gas Type:	Customer selected from available sensor list.
Sensor Type:	Electrochemical for toxic gases and oxygen.
	User adjustable within limits of selected sensor module.
Response Time:	Sensor dependent.
Accuracy:	Generally ±10% of value, but limited by available calibration gas accuracy.
Electronic:	Repeatability: ±1%
Electronic Linearity:	±0.5%
Zero Drift:	Less than 2% full scale per month, non-cumulative.
Span Drift:	Dependent on operating environment but generally less than 3% per month.
Analog Output:	Loop-powered 4-20 mA, 800 ohms maximum at 24 VDC
Serial Interface:	HART™ (1200 baud modem interface)
	MODBUS™ (1200-9600,14.4k, 28.8k – RS232 or RS485, s/w selectable)
Power:	12 - 30 VDC, 25 mA maximum in loop-powered mode.
	12 – 30 VDC, 200 mA maximum in 3-wire mode.
	115 or 230 VAC, 50/60 Hz.
Heated Sensor Power:	24 VDC connection, 250 mA max. (AC Units Supply Heater Power)
Alarm Relay Option:	Three SPST, 5 A @ 230 VAC resistive.
Relay Coil:	Programmable either normally energized or normally de-energized.
Enclosure:	Nema 4X poly carbonate.
Controls:	4 program switches on front of transmitter.
Operating Temperature:	-30º to +60º C (Minimum temp. for O2 sensor is -10º C).
Weight:	1 lb. (.5 Kg.)

Remote Sensor Option

Seperated Sensor with Flow Cell

Features

- **Intrinsically Safe Design:** Transmitters are designed for use in applications requiring intrinsically safe devices for safety purposes.
- **Interchangeable Sensors:** Every transmitter will accept up to 45 different sensor modules, greatly reducing the need for multiple transmitter models.
- **Sensor Auto-Test:** Gas generators permanently installed on the sensor verify sensor operation by providing a "bump test" of the sensor from daily to once a week.
- **Smart Sensor Modules:** Plug-in sensors store calibration data, allowing sensors to be calibrated separately from the transmitter. This allows bench calibration (or factory calibration) of sensors to reduce the necessity for carrying calibration gas around the plant.
- **Alarm & Relay Option:** A non-IS version of the transmitter provides 3 integral alarm relays. Relays are programmable for setpoint, hysteresis, on-delay, off-delay, and other variables. Systems with alarms are available for operation from 12-30 VDC supplies or from 115 or 230 VAC power.
- **Serial Communication Interface:** The IS version of the transmitter is available with HART™ communications. The HART protocol supports the HART Universal and Common Practice Commands at 1200 baud using the Bell 202 FSK modem standard. The non-IS versions of the transmitter are available with MODBUS™ communications. The MODBUS protocol supports 9600 baud access to concentration and status information, and supports alarm setup and many other functions.

Insertion Sensor with Duct Mount Adapter

- **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.
- **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 a HART™ or MODBUS™ interface.
- **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 sealed front panel switches on the face of the Nema 4X transmitter enclosure.
- **Heated Sensor Option:** For use in applications where condensation is a problem, this heater option keeps the sensor above the dew point to eliminate loss of sensitivity due to moisture blockage on the sensor face.
- **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.

Available Series F12 Transmitter Electrochemical Sensors

Note: The correct generator part number used to provide the Auto-Test feature for a specific sensor is shown in parenthesis after the sensor price.

Part No.	Gas & Range	A/T Gen. No.
00-1000*	Bromine, 0-1/5 PPM (2 PPM Standard)	(00-1538)
00-1001*	Bromine, 0-5/100 (20 PPM Standard)	(00-1538)
00-1002*	Chlorine, 0-1/5 PPM (2 PPM Standard)	(00-1538)
00-1003*	Chlorine, 0-5/100 (20 PPM Standard)	(00-1538)
00-1004*	Chlorine Dioxide, 0-1/5 PPM (2 PPM Standard)	(00-1538)
00-1005*	Chlorine Dioxide, 0-5/100 (20 PPM Standard)	(00-1538)
00-1359	Chlorine Dioxide, 200/1000 PPM (1000 PPM Standard)	
00-1425*	Chlorine Dioxide, 1/5 PPM (low Cl2 response)	(00-1538)
00-1006*	Fluorine, 0-1/5 PPM (2 PPM Standard)	(00-1538)
00-1007*	Fluorine, 0-5/100 (20 PPM Standard)	(00-1538)
00-1008*	Ozone, 0-1/5 PPM (2 PPM Standard)	(00-1538)
00-1009*	Ozone, 0-5/100 PPM (20 PPM Standard)	(00-1538)
00-1358	Ozone, 200/1000 PPM (1000 PPM Standard)	
00-1010*	Ammonia, 0-50/500 PPM (200 PPM Standard)	(00-1539)
00-1011	Ammonia, 0-500/2000 PPM (1000 PPM Standard)	
00-1012*	Carbon Monoxide, 0-50/1000 PPM (200 PPM Standard)	(00-1540)
00-1013	Hydrogen, 0-1/10% (4% Standard)	
00-1014	Oxygen, 0-5/25% (25% Standard)	
00-1015	Phosgene, 0-1/5 PPM (2 PPM Standard)	
00-1016	Phosgene, 0-5/100 PPM (100 PPM Standard)	
00-1017*	Hydrogen Chloride, 0-10/200 PPM (20 PPM Standard)	(00-1541)
00-1018*	Hydrogen Cyanide, 0-10/200 PPM (20 PPM Standard)	(00-1542)
00-1019*	Hydrogen Fluoride, 0-10/200 PPM (20 PPM Standard)	(00-1538)
00-1020*	Hydrogen Sulfide, 0-10/200 PPM (50 PPM Standard)	(00-1541)
00-1021	Nitric Oxide, 0-50/500 PPM (200 PPM Standard)	
00-1022*	Nitrogen Dioxide, 0-10/200 PPM (20 PPM Standard)	(00-1538)
00-1023*	Sulfur Dioxide, 0-10/500 PPM (20 PPM Standard)	(00-1542)
00-1024	Arsine, 0-500/2000 PPB (1000 PPB Standard)	
00-1025	Arsine, 0-10/200 PPM (10 PPM Standard)	
00-1026	Diborane, 0-500/2000 PPB (1000 PPB Standard)	
00-1027	Diborane, 0-10/200 PPM (10 PPM Standard)	
00-1028	Germane, 0-500/2000 PPB (1000 PPB Standard)	
00-1029	Germane, 0-10/200 PPM (10 PPM Standard)	
00-1030	Hydrogen Selenide, 0-500/2000 PPB (1000 PPB Standard)	
00-1031	Hydrogen Selenide, 0-10/200 PPM (10 PPM Standard)	
00-1032	Phosphine, 0-500/2000 PPB (1000 PPB Standard)	
00-1033	Phosphine, 0-10/200 PPM (10 PPM Standard)	
00-1034	Phosphine, 0-200/2000 PPM (1000 PPM Standard)	
00-1035	Silane, 0-10/200 PPM (10 PPM Standard	
00-1036*	Iodine, 0-1/5 PPM (2 PPM Standard)	(00-1538)
00-1037*	Iodine, 0-5/100 PPM (20 PPM Standard)	(00-1538)
00-1038*	Acid Gases, 0-10/200 PPM (20 PPM Standard)	(00-1538)
00-1039*	Ethylene Oxide, 0-20/200 PPM (20 PPM Standard)	(00-1540)
00-1040*	Formaldehyde, 0-20/200 PPM (20 PPM Standard)	(00-1540)
00-1041	Hydrogen, 0-500/2000 PPM (2000 PPM Standard)	
00-1042*	Hydrogen Peroxide, 0-10/100 PPM (20 PPM Standard)	(00-1542)
00-1169	Hydrogen Peroxide, 200/2000 PPM (1000 Standard)	
00-1043	Alcohol, 0-50/500 PPM (200 PPM Standard)	
00-1044	Alcohol, 0-500/2000 PPM (2000 PPM Standard)	
00-1057	Acetylene, 200/2000 PPM (500 PPM Elandard)	
00-1181	No$_X$, 0-50/500 PPM (200 PPM Standard)	
00-1349	Formaldehyde, 500/2000 PPM (1000 Standard)	
00-1450*	Dimethylamine (DMA), 100/200 PPM (100 PPM Standard)	
00-1455*	Hydrogen Bromide, 10/200 PPM (20 PPM Standard)	(00-1539)
00-1516	HC Sensor (Specify Gas - Consult Factory)	(00-1538)

Auto-Test Gas Generators

00-1538	E18-11 Chlorine gas generator
00-1539	E18-15 Ammonia gas generator
00-1540	E18-16 Carbon Monoxide gas generator
00-1541	E18-24 Hydrogen Sulfide gas generator
00-1542	E18-27 Sulfur Dioxide gas generator

F12 transmitters are designed to use electrochemical sensors only. This transmitter uses the same sensors as those used in the PortaSens II and D12 series products. This transmitter series does not support catalytic bead or IR sensors. Specify transmitter first and them select the sensor and the Auto-Test generator if required.

Suffix A: Transmitter Type
- 1 – 2-wire only (IS design only without heated sensor)
- 2 – Non-IS system for RS-485 communication
- 3 – Non-IS system, 115 VAC, 50/60 HZ with alarms
- 4 – Non-IS system, 230 VAC, 50/60 HZ with alarms
- 5 – Non-IS system, 12-30 VDC with alarms

Suffix B: Sensor Holder Style
- 1 – Integral sensor holder
- 2 – Remote sensor holder with junction box (order 31-0162 interconnect cable below)
- 3 – Integral heated sensor holder
- 4 – Remote heated sensor holder with junction box (see note 1)
- 5 – Duct mount sensor holder with 25' extension cable (requires 00-1388 Adapter)
- 6 – Remote sensor holder with 6 foot cable

Suffix C: Sensor Auto-Test
- 1 – No Auto-Test Generator Holder
- 2 – With Auto-Test Generator Holder

Suffix D: Digital Output
- 1 – None
- 2 – Hart interface
- 3 – Modbus interface (Requires option 2 or 3 under suffix A)

Note 1: Interconnection of remote heated sensor holder requires 2 interconnect cable, the 31-0162 for the sensor and the 31-0008 2-conductor cable for the heater.

Accessories

00-1056	Calibration adapter
00-1251	Flowcell assembly
00-0981	Sensing module keeper for 4 sensors
00-1388	Duct sensor adapter, 1½" MNPT
31-0162	Remote Interconnect Cable, specify length, max. 50 ft.
31-0008	2-conductor, unshielded interconnect cable .

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