



O & M Manual



F12/D Toxic Gas Transmitter With H10 Smart Sensor

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Part1 - Introduction

1.1 General

F12/D Gas Transmitter

The F12/D Gas Transmitter is used to monitor for gas leaks near storage cylinders, process piping, or gas feed equipment in nearly any type of industrial plant environment. It is housed in NEMA 4X, polycarbonate enclosure and features an H10 Smart Sensor, a non-intrusive four button user interface with a backlit transfective graphics display, three level alarms with three (optional) alarm relays, a high-resolution 4-20mA current loop output, real-time clock, data-logger, and optional HART™ or Modbus™ communication interface. In addition, the transmitter offers several optional E18 gas generators for automatic, timed testing of H10 sensors.

H10 Smart Sensor and E18 Gas Generator

H10 Smart Sensors and E18 generators contain non-volatile memory to store information about the target gas they were designed to monitor, or generate. They contain general information about the target gas, such as the name, range, units, alarm settings, along with specific calibration information, such as response to gas, mA-Hr of usage, and calibration history. Information is transferred into the transmitter at startup, and whenever one of the components is inserted into a live transmitter. Because all calibration data is stored in the memory, sensor modules may be calibrated using a spare transmitter in the shop, and subsequently installed into a field transmitter, eliminating the need for field calibration.

Sensors are inserted into the housing at the base of the transmitter. They are easily removed, and installation is simplified by way of an indexing groove that aligns the connector for a perfect fit. Once installed, a threaded port cap secures it in place.



Figure 1- Transmitter w/Sensor & Generator

Sensors are designed for use in ambient air at temperatures of -30 °C to +60 °C, at a relative humidity between 20 and 98 %RH (some sensors are rated to -40 °C, oxygen sensors are rated to -10 °C). Operating sensors in extremely dry air, or in condensing gas streams, is not recommended.

Generators are inserted into the optional generator housing attached to the bottom of the sensor housing at the base of the transmitter. Installation of a generator is simplified by way of an indexing groove that aligns the connector for a perfect fit. Once installed apply a little pressure to the top of the generator, and tighten the set screw (using the ATI screwdriver) on the housing to provide a secure fit. An O-Ring in the sensor cap provides the mechanism for securing the generator to the transmitter. Simply press the generator into the bottom of the sensor cap until it is secure.

Table 7. H10 sensor modules

| Part No. | Description |
|-----------------|---|
| 00-1000 | Bromine, 0-1/5 PPM (2 PPM Standard) |
| 00-1001 | Bromine, 0-5/200 (20 PPM Standard) |
| 00-1002 | Chlorine, 0-1/5 PPM (2 PPM Standard) |
| 00-1003 | Chlorine, 0-5/200 (20 PPM Standard) |
| 00-1004 | Chlorine dioxide, 0-1/5 PPM (2 PPM Standard) |
| 00-1005 | Chlorine dioxide, 0-5/200 (20 PPM Standard) |
| 00-1006 | Fluorine, 0-1/5 PPM (2 PPM Standard) |
| 00-1007 | Fluorine, 0-5/200 (20 PPM Standard) |
| 00-1008 | Ozone, 0-1/5 PPM (2 PPM Standard) |
| 00-1009 | Ozone, 0-5/200 PPM (20 PPM Standard) |
| 00-1010 | Ammonia, 0-50/500 PPM (200 PPM Standard) |
| 00-1011 | Ammonia, 0-500/2000 PPM (1000 PPM Standard) |
| 00-1012 | Carbon monoxide, 0-50/1000 PPM (200 PPM Standard) |
| 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) |
| 00-1018 | Hydrogen cyanide, 0-10/200 PPM (20 PPM Standard) |
| 00-1019 | Hydrogen fluoride, 0-10/200 PPM (20 PPM Standard) |
| 00-1020 | Hydrogen sulfide, 0-10/200 PPM (50 PPM Standard) |
| 00-1021 | Nitric oxide, 0-50/500 PPM (200 PPM Standard) |
| 00-1022 | Nitrogen dioxide, 0-10/200 PPM (20 PPM Standard) |
| 00-1023 | Sulfur dioxide, 0-10/500 PPM (20 PPM Standard) |
| 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) |
| 00-1037 | Iodine, 0-5/200 PPM (20 PPM Standard) |
| 00-1038 | Acid gases, 0-10/200 PPM (20 PPM Standard) |
| 00-1039 | Ethylene oxide, 0-20/200 PPM (20 PPM Standard) |
| 00-1040 | Formaldehyde, 0-20/200 PPM (20 PPM Standard) |
| 00-1041 | Hydrogen, 0-500/2000 PPM (2000 PPM Standard) |
| 00-1042 | Hydrogen peroxide, 0-10/100 PPM (20 PPM Standard) |
| 00-1043 | Alcohol, 0-50/500 PPM (200 PPM Standard) |
| 00-1044 | Alcohol, 0-500/2000 PPM (2000 PPM Standard) |

| | |
|---------|---|
| 00-1057 | Acetylene, 0-50/500 PPM (0-200 PPM Standard) |
| 00-1169 | Hydrogen peroxide, 200/2000 PPM (500 PPM Standard) |
| 00-1181 | NOx, 50/500 PPM (200 PPM Standard) |
| 00-1285 | Silane, 500/2000 PPB (1000 PPB Standard) |
| 00-1349 | Formaldehyde, 500/2000 PPM (1000 PPM Standard) |
| 00-1358 | Ozone, 200/1000 PPM (1000 PPM Standard) |
| 00-1359 | Chlorine dioxide, 200/1000 PPM (1000 PPM Standard) |
| 00-1425 | Chlorine dioxide, 1/5 PPM (low Cl2 response) |
| 00-1450 | Dimethylamine (DMA), 100/200 PPM (100 PPM Standard) |
| 00-1455 | Hydrogen bromide, 10/200 PPM (20 PPM Standard) |
| 00-1469 | Hydrogen sulfide, 200/1000 PPM (500 PPM Standard) |

Table 8. E18 gas generators

| Part No. | Description |
|-----------------|--------------------|
| 00-1538 | Chlorine |
| 00-1539 | Ammonia |
| 00-1540 | Carbon Monoxide |
| 00-1541 | Hydrogen Sulfide |
| 00-1542 | Sulfur Dioxide |

Table 9. Miscellaneous accessories

| Part No. | Description |
|-----------------|--|
| 00-1388 | H10 Duct Mount Adapter |
| 00-1389 | H10 Duct Mount Sensor Holder |
| 46-0003 | Sensor Gasket for (00-1389) |
| 03-0414 | Duct Mount Cable Assembly |
| 03-0370 | Communications Jumper Plug (for RS232/RS485 Options) |

PRODUCT WARRANTY

Analytical Technology, Inc. (Manufacturer) warrants to the Customer that if any part(s) of the Manufacturer's products proves to be defective in materials or workmanship within the earlier of 18 months of the date of shipment or 12 months of the date of start-up, such defective parts will be repaired or replaced free of charge. Inspection and repairs to products thought to be defective within the warranty period will be completed at the Manufacturer's facilities in Collegeville, PA. Products on which warranty repairs are required shall be shipped freight prepaid to the Manufacturer. The product(s) will be returned freight prepaid and allowed if it is determined by the manufacturer that the part(s) failed due to defective materials or workmanship.

This warranty does not cover consumable items, batteries, or wear items subject to periodic replacement including lamps and fuses.

Gas sensors, except oxygen sensors, are covered by this warranty, but are subject to inspection for evidence of extended exposure to excessive gas concentrations. Should inspection indicate that sensors have been expended rather than failed prematurely, the warranty shall not apply.

The Manufacturer assumes no liability for consequential damages of any kind, and the buyer by acceptance of this equipment will assume all liability for the consequences of its use or misuse by the Customer, his employees, or others. A defect within the meaning of this warranty is any part of any piece of a Manufacturer's product which shall, when such part is capable of being renewed, repaired, or replaced, operate to condemn such piece of equipment.

This warranty is in lieu of all other warranties (including without limiting the generality of the foregoing warranties of merchantability and fitness for a particular purpose), guarantees, obligations or liabilities expressed or implied by the Manufacturer or its representatives and by statute or rule of law.

This warranty is void if the Manufacturer's product(s) has been subject to misuse or abuse, or has not been operated or stored in accordance with instructions, or if the serial number has been removed.

Analytical Technology, Inc. makes no other warranty expressed or implied except as stated above.

WATER QUALITY MONITORS

Dissolved Oxygen
Free Chlorine
Combined Chlorine
Total Chlorine
Residual Chlorine Dioxide
Potassium Permanganate
Dissolved Ozone
pH/ORP
Conductivity
Hydrogen Peroxide
Peracetic Acid
Dissolved Sulfide
Residual Sulfite
Fluoride
Dissolved Ammonia
Turbidity
Suspended Solids
Sludge Blanket Level

MetriNet Distribution Monitor

GAS DETECTION PRODUCTS

| | |
|--|--------------------------|
| NH ₃ | Ammonia |
| CO | Carbon Monoxide |
| H ₂ | Hydrogen |
| NO | Nitric Oxide |
| O ₂ | Oxygen |
| CO | Cl ₂ Phosgene |
| Br ₂ | Bromine |
| Cl ₂ | Chlorine |
| ClO ₂ | Chlorine Dioxide |
| F ₂ | Fluorine |
| I ₂ | Iodine |
| H _x | Acid Gases |
| C ₂ H ₄ O | Ethylene Oxide |
| C ₂ H ₆ O | Alcohol |
| O ₃ | Ozone |
| CH ₄ Gas) | Methane (Combustible |
| H ₂ O ₂ | Hydrogen Peroxide |
| HCl | Hydrogen Chloride |
| HCN | Hydrogen Cyanide |
| HF | Hydrogen Fluoride |
| H ₂ S | Hydrogen Sulfide |
| NO ₂ | Nitrogen Dioxide |
| NO _x | Oxides of Nitrogen |
| SO ₂ | Sulfur Dioxide |
| H ₂ Se | Hydrogen Selenide |
| B ₂ H ₆ | Diborane |
| GeH ₄ | Germane |
| AsH ₃ | Arsine |
| PH ₃ | Phosphine |
| SiH ₄ | Silane |
| HCHO | Formaldehyde |
| C ₂ H ₄ O ₃ | Peracetic Acid |
| DMA | Dimethylamine |