GasSens

Modular Gas Detector

F12/D Toxic Gas Detector

Features

- **Power:** Available in 12…24 V DC, 115V AC or 230V AC configurations
- **Interchangeable Sensors:** The F12/D accommodates 60 different sensor modules
- **Sensor Verification:** Auto-test generator option provides a true gas response test. Test history is stored in sensor memory for user review at any time
- **LCD Graphic Display:** Allows clear gas concentration display plus complete menu-driven operator interface
- **Heated Sensor Option:** A heated sensor holder allows operation in high humidity to avoid condensation problems
- **Remote Sensor:** A junction box with digital output allows sensor location up to 100 ft from the F12/D display unit
- **Internal Data Logger:** Gas values are stored at user defined intervals from 1…60 minutes. Stored data may be reviewed or graphed on the LCD display
- **Calibration History:** Sensor calibration adjustments of zero and span are stored in sensor memory and may be viewed on the F12/D display
- **Communication:** F12/D is available with either HART® or Modbus RTU
- **Approvals:** CE and RoHS Compliant

Flow Cell and Calibration Adapters

Calibration adapters slide into the sensor holder for easy connection of calibration gas. A flow cell assembly is also available where pumped sampling systems are used.

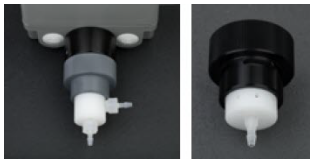


Figure 1: Calibration adapters

An accessory device called a "sensor keeper" is available for storing standby spares. The keeper provides sensor bias circuitry that maintains spare sensors in a ready-to-use state without the need for stabilization time.

Figure 2: Sensor keeper

Installation Options

The sensor holder in the F12/D is normally mounted to the transmitter enclosure. For applications where this configuration is not ideal, there are a number of different configurations for meeting specific requirements. These include a 6 ft (1.9 m) cable extension, a remote junction box for longer sensor separation distances and a duct mount sensor.

Figure 3: F12/D with integral sensor holder
Figure 4: F12/D with integral sensor holder and auto-test generator

Figure 5: 6 ft extended sensor holder
Figure 6: Insertion sensor assembly
Figure 7: Remote sensor holder and digital interface

Badger Meter

ATI-DS-05299-EN-01 (November 2025)

Product Data Sheet

Smart Sensors

The F12/D uses Badger Meter smart sensors that allow easy interchangeability. Each sensor contains signal conditioning electronics and data memory. Sensors can be calibrated using a spare unit in the shop to avoid using calibration gases in the plant. Sensors may be returned to Badger Meter for factory calibration, which is useful for gases that are costly or difficult to obtain. Each sensor adjustment (xero or span) is stored in sensor memory and can be reviewed on the F12/D display. This data is very useful in assessing the sensor's condition and estimating sensor life.

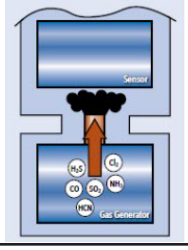
Available Sensors

00-1000*	Br_2, 0…1/5 ppm (00…1538)	**00-1024**	AsH_3, 0…500/2000 ppb
00-1001*	Br_2, 0…5/200 ppm (00…1538, 20 max)	**00-1025**	AsH_3, 0…10/200 ppm
00-1002*	Cl_2, 0…1/5 ppm (00…1538)	**00-1026**	$B2H_6$, 0…500/2000 ppb
00-1003*	Cl_2, 0…5/200 ppm (00…1538, 20 max)	**00-1027**	$B2H_6$, 0…10/200 ppm
00-1004*	ClO_2, 0…1/5 ppm (00…1538)	**00-1028**	GeH_4, 0…500/2000 ppb
00-1005*	ClO_2, 0…5/200 ppm (00…1538, 20 max)	**00-1029**	GeH_4, 0…10/200 ppm
00-1359	ClO_2, 200/1000 ppm	**00-1030**	H_2Se, 0-500/2000 ppb
00-1425*	ClO_2, 0…1/5 ppm (low Cl_2) (00…1538)	**00-1031**	H_2Se, 0…10/200 ppm
00-1006*	F_2, 0…1/5 ppm (00…1538)	**00-1032**	PH_3, 0…500/2000 ppb
00-1007*	F_2, 0…5/200 (00…1538, 20 max)	**00-1033**	PH_3, 0…10/200 ppm
00-1008*	O_3, 0…1/5 ppm (00…1538)	**00-1034**	PH_3, 0…200/2000 ppm
00-1008*	O_3, 0…5/200 ppm (00…1538, 20 max)	**00-1035**	SiH^4, 0…10/200 ppm
00-1358	O_3, 200/1000 ppm	**00-1036***	I_2, 0…1/5 ppm (00…1538)
00-1163	O_3, 500/2000 ppb (00…1538)	**00-1037***	I_2, 0…5/200 ppm (00…1538, 20 max)
00-1010*	NH_3, 0…50/500 ppm (00…1539, 100 max)	**00-1038***	Acid Gas, 0…10/200 ppm (00…1538,20 max)
00-1011	NH_3, 0…500/2000 ppm	**00-1039***	ETO, 0…20/200 ppm (00…1540, 20 max)
00-1012*	CO, 0…50/1000 ppm (00…1540, 100 max)	**00-1040**	HCOH, 0…20/200 ppm (00…1540, 20 max)
00-1013	H_2, 0…1/10%	**00-1349**	HCOH, 500/2000 ppm
00-1041	H_2, 0…500/2000 ppm	**00-1042**	H_2O_2, 0…10/100 ppm (00…1542)
00-1014	O_2, 0…5/25%	**00-1169**	H_2O_2, 200/2000 ppm
00-1015	$COCl_2$, 0…1/5 ppm	**00-1043**	Alcohol, 0…50/500 ppm
00-1016	$COCl_2$, 0…5/100 ppm	**00-1044**	Alcohol, 0…500/2000 ppm
00-1017*	HCl, 0…10/200 ppm (00…1541, 20 max)	**00-1057**	C_2H_2, 0…50/500 ppm
00-1018*	HCN, 0…10/200 ppm (00 … 1611, 20 max)	**00-1181**	NOX, 0…50/500 ppm
00-1019*	HF, 0…10/200 ppm (00…1538, 20 max)	**00-1450***	DMA, 100/200 ppm (00…1539, 100 max)
00-1020*	H_2S, 0…10/200 ppm (00…1541, 100 max)	**00-1455***	HBr, 10/200 ppm (00…1538, 20 max)
00-1469	H_2S, 200/1000 ppm	**00-1516**	HC Sensor – (consult factory)
00-1021	NO, 0…50/500 ppm	**00-1045**	CH_3COOH, 100/500 ppm
00-1022*	NO_2, 0…10/200 ppm (00…1538, 20 max)	**00-1704**	PAA Vapor, 1/5 ppm
00-1023*	SO_2, 0…10/500 ppm (00…1542, 20 max)	**00-1705**	PAA Vapor, 10/100 ppm

Notes: X/XX for each sensor indicates minimum and maximum ranges for that sensor.
* indicates availability of auto-test. Generator part number shown (i.e. 00-XXXX).
Auto-test not available for ranges above indicated maximum.

Automatic Sensor Verification

With the F12/D, users can take advantage of the unique auto-test sensor verification system. While other gas transmitters rely on less reliable electronic sensor tests, the auto-test system consists of an actual gas test. A test gas is generated right at the sensor and the response of the sensor is verified. Manual bump testing to verify response is eliminated, greatly reducing maintenance requirements.



Auto-Test 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
00-1611	E18-22 HCN gas generator

SPECIFICATIONS

Sensor Type	Electrochemical cell
Gas Type	Select sensor from *"Available Sensors" on page 2*
Range	User adjustable within limits of selected sensor
Response Time	Sensor dependent
Accuracy	Generally ±10% of value, but limited by available calibration gas accuracy
Repeatability	±1% (Electronic)
Linearity	±0.5% (Electronic)
Zero Drift	Less than 2% full scale per month
Span Drift	Dependent on operational environment but generally less than 3% per month
Analog Output	4…20 mA, 700 Ω max.@24V DC, 100 Ω max.@12V DC
Serial Interface	(Optional) HART® digital signaling over the 4…20mA current loop (Optional) Modbus RTU over RS232/485
AC Transmitter Power Requirements	120V AC, 50/60 Hz., 7 W max 220V AC, 50/60 Hz., 7 W max
DC Transmitter Power Requirements	Standard or optional HART FSK, 2-wire loop: 25 mA @ 12…30V DC, max Standard or optional HART FSK, 2-wire loop: 25 mA @ 12…30V DC, max With optional Modbus RS485: additional 50 mA @ 24V DC With Optional Heated Sensor Housing option: additional 93 mA @ 24V DC
Enclosure	IP 65, (dust protected, water jets) polycarbonate with stainless steel hardware. Weatherproof and corrosion resistant Refer to F12/D support drawings for dimensions
CE Mark	2014/35/EU – Low voltage directive 2014/30/EU – Electromagnetic compatibility
Mounting	(Standard) Wall or pipe mount bracket. U-Bolts suitable for 1.5 in. or 2 in. I.D. (Optional) Panel mount kit available.
Auto-Test Option	Dependent on sensor gas type and full scale range
Display	96x32 dot-matrix graphic LCD, backlit, transflective
Controls	Four dome-type push buttons Remote alarm reset input (with optional alarm relays only)
Temperature	–30…60° C (min temperature for O_2 sensor is –20° C)
Operating Environment	–30…60° C (Min.temp.for O2 sensor is –10° C) 10…95% RH (non-condensing) IP65 (dust protected, water jets)
Weight	1.5 lb (0.68 kg)

ORDERING INFORMATION

F12/D transmitters are designed to use electrochemical sensors only.
Specify transmitter and then select sensors from page 3.
Add the auto-test generator if that feature is desired.

Model F12D-A-B-C-D Toxic Gas Transmitter

Suffix A - Transmitter Type	
2	Non-IS system for RS485 communication
3	Non-IS system, 115V AC, 50/60 Hz, with alarms
4	Non-IS, 230V AC, 50/ Hz, with alarms
5	Non-IS, 12…30V DC, with alarms
Suffix B - Sensor Holder Style	
1	Integral
2	Remote with junction box (order 31-0185 interconnect cable below)
3	Integral heated
4	Remote heated with junction box (order 31-0068 interconnect cable below)
5	Duct mount with 25 ft extension cable (requires 00-1388 adapter)
6	Sensor holder with 6 ft cable
7	Remote junction box plus 6 ft cable with holder
8	Heated sensor holder with 6 ft 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

ACCESSORIES

00-1056	Calibration adapter
00-1251	Flow cell assembly
03-0118	Flow cell with 03-0460 sensor cap
00-0981	Sensing module keeper for 4 sensors
00-1388	Duct sensor adapter, 1 1/2 in. MNPT
31-0185	4 conductor Interconnect cable, specify length, max 100 ft
31-0068	6 conductor interconnect cable, specify length, max 100 ft
05-0094	Panel mount bracket kit

Note: When ordering an F12/D unit with a flow cell, the 03-0460 sensor cap will be supplied in place of the standard sensor cap and does not need to be ordered separately. If a flow cell is being added to an existing F12/D, order the 03-0118 assembly which includes both the flow cell and sensor cap.