

## Summary

The Foxboro brand PH12 Series is a family of rugged, cost effective pH and ORP sensors in the widely used 12 mm form factor, and provide fast response, long life, high accuracy and stability.

## Business Value

Foxboro PH12 Series Sensors are precision electrochemical sensors that are used with a popular set of mounting accessories to measure pH and ORP. These sensors provide a unique electrode technology in the widely used 12 mm form factor, and provide fast response, long life, and high accuracy and stability. They are rugged, easy-to-use devices particularly well suited for low and high temperature installations. The low cost construction renders the sensor disposable, and therefore eliminates costly sensor maintenance.

# Model PH12 Series pH and ORP Sensors

## FEATURES / BENEFITS

- Durable PEEK body**  
 Excellent strength and chemical resistance. Longer service life and better resistance to the rigors of maintenance.
- Best performing flat membrane electrode**  
 High temperature capability to 125°C greatly expands the range of applications for flat glass. Rugged construction extends service life in the harshest of applications.
- Non-metallic wetted parts**  
 Sensor is immune to attack from most process fluids, greatly extending the service life.
- Wide range and high temperature electrodes**  
 Domed glass electrodes for very wide range (-25 to +125° C) and very high temperature (140° C) allow optimization of sensor type for your application, providing the best performance and longest service life.
- Biocompatible and 3-A Sanitary Compliant**  
 Certifications permit the use of these sensors in food, beverage, dairy and biopharmaceutical processes that require strict compliance with applicable standards.



## DESCRIPTION

For pH and ORP applications requiring a rugged, yet cost effective sensor in a 12 mm form factor, the Foxboro Model PH12 provides the most durable materials and construction available.

Unlike other 12 mm pH and ORP sensors, the Foxboro Model PH12 incorporates a chemical resistant PEEK body, flat membrane sensing electrode, and no metallic wetted parts. This combination of design features, together with temperature ratings of 125° C (flat glass) or 140° C (domed glass), provides unrivaled ruggedness and length of service life.

In addition, the PH12 incorporates a nonmetallic solution ground as a standard feature, allowing for sensor diagnostics in a cost effective platform.

Invensys Operations Management offers a complete line of Foxboro brand Model FIT12 mounting accessories. Various configurations of accessories are offered, including sanitary, ANSI flange, NPT and retraction/insertion types. A configurable model code allows the user to select features such as guarded or unguarded holder, materials of construction and immersion length.

## SPECIFICATIONS

Measuring Electrode:	Domed Glass or Flat Ruggedized Glass for pH Platinum ORP
Measurement Range:	Domed Glass pH Electrode: 0-14 pH Flat Glass pH Electrode: 0-12 pH ORP: -2000 to +2000 mV
Temperature Rating:	Electrodes Types -1, -4, -A: -25 to +125°C Electrodes Types -2, -B: 0 to 140°C Electrodes Types -3, -C: -15 to +125°C
Pressure Rating:	-7 to 150 psig
Accuracy and Stability:	+/- 0.02 pH/24 hours
EMF Efficiency:	98.5 +/- 1.5%
Electrometric Response:	< 15 seconds
Temperature Response:	< 1 minute
Wetted Parts:	Sensor Body: PEEK or Glass, as specified Measuring Electrode: Domed Glass, Flat Glass, or Platinum Reference Junction: Ceramic Outer Reference Solution: Gelled KCl electrolyte Process O-ring and Process Electrode Seal: Viton standard; EPDM and Perfluoroelastomer optional
Automatic Temperature Compensation:	3-wire 100 $\Omega$ platinum RTD or 3-wire 1000 $\Omega$ platinum RTD
Certifications:	<b>Biocompatibility:</b> Biocompatible according to United States Pharmacopeia and National Formulary (USP 87) and ANSI/AAMI/ISO 10993-5 criteria. <b>3-A Sanitary:</b> compliant with 3-A Standard 74 for use in dairy product processes <b>Safety:</b> The PH12 Sensor meets the requirements of a simple apparatus, as it contains no integral preamp or other electronics. The PH12 Sensor may be connected to an intrinsically safe 876PH or 870ITPH Transmitter without violating the intrinsic safety certification of the measurement loop.

## Model Code - pH Sensor/12 mm

### DESCRIPTION

pH Sensor - 12mm.....Model PH12

### Electrode Type

Domed Glass 0-14 pH .....-1  
 High Temperature Domed Glass, 0-14 pH (f) .....-2  
 Flat Ruggedized Glass, 0-12 pH.....-3  
 ORP, Platinum .....-4  
 Combination pH/ORP, 0-14 pH and ORP,  
 Domed Glass and Platinum..... -A  
 Combination pH/ORP, 0-14 pH and ORP,  
 High Temperature Domed Glass and Platinum (f) ...-B  
 Combination pH/ORP, 0-12 pH and ORP,  
 Flat Ruggedized Glass and Platinum ..... -C

### Sensor Body Material and Length

Glass Body, 120 mm (4.7 in) ..... G1  
 PEEK Body, 120 mm (4.7 in) ..... P1  
 PEEK Body, 225 mm (8.9 in) ..... P2  
 PEEK Body, 360 mm (14.2 in) ..... P3  
 PEEK Body, 425 mm (16.7 in) ..... P4

### Temperature Compensation

100  $\Omega$  Platinum RTD, 3-wire (a) ..... 1  
 1000  $\Omega$  Platinum RTD, 3-wire (a) ..... 2

### Sensor Termination

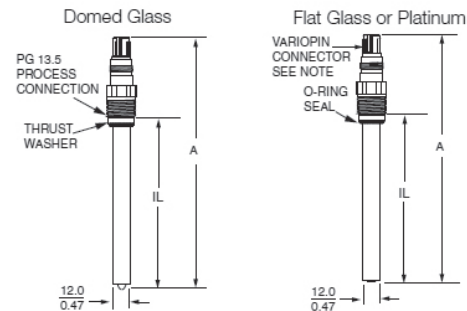
Variopin "Quick" Connector  
 Integral to Sensor Body (b)..... Q

### Optional Selections

EPDM Process O-Ring Seal  
 and Process Electrode Seal (c).....-E  
 Autoclave Cap (d) ..... -A  
 Detailed Instruction Manual (e) .....-M  
 3-A Compliant (g) (h) (i).....-S  
 Biocompatibility .....-B  
 Perfluoroelastomer O-Ring Seal  
 and Process Electrode Seal(c).....-P

- (a) Compatible with Analyzers and Transmitters that accept either 2-wire or 3-wire temperature elements.
- (b) A mating Patch Cord with an integral Variopin Quick Connector on one end is required.
- (c) The standard process seals are Viton.
- (d) Autoclave cap protects the variopin connections during steam sterilization and autoclaving. The cap is shipped separate from the sensor.
- (e) A CD-ROM and a "Quick-Start" pamphlet are shipped as standard with each sensor.
- (f) Only available with Sensor Body Material and Length codes P1, P2, P3, P4.
- (g) Electrode Type Codes -1, -2, -3, and -4, when used with option -S, use a stainless steel solution ground.
- (h) Not available with Sensor Body Material Code G (Glass Body).
- (i) Not available with Optional Selection -P (Perfluoroelastomer Seals).

MODEL PH12 SENSOR WITH NO MOUNTING ACCESSORIES



Dimensions IL and A

Table 15. Dimensions, Electrode Type, and Sensor Lengths

Dimension (a)	Electrode Type	Sensor Length			
		120 mm (4.7 in)	225 mm (8.9 in)	360mm (14.2 in)	425mm (16.7 in)
IL	Domed Glass	120 (4.7)	225 (8.9)	360 (14.2)	425 (16.7)
	Flat Glass or Platinum	117 (4.6)	222 (8.7)	357 (14.1)	422 (16.6)
A	Domed Glass	176 (6.9)	281 (11.1)	416 (16.4)	481 (18.9)
	Flat Glass or Platinum	173 (6.8)	278 (10.9)	413 (16.3)	478 (18.8)

(a) IL = Maximum Immersion Length

#### NOTE

1. An optional Autoclave Cap (PH12 Sensor Option -A) screws on to the Variopin connector, and protects the Variopin connections during the steam sterilization and autoclaving process. See Optional Autoclave Cap further in this document.
2. Also refer to Dimensional Print DP 611-214.



## TRANSMITTERS AVAILABLE FOR USE WITH PH12 SENSORS:



876PH Transmitter



875 Analyzer, pH Version

