

Industrial Process Control & Monitoring

- **Patented Axial Ion Path™ Reference**
- **Specialized pH Glass Formulations and ORP Electrodes**
- **Proprietary Low-Noise, High Temperature Signal Cable**
- **Sensors are Compatible with Most Major Manufacturer's Analyzers**
- **Industrial Mounting Options**
- **Industry Leading Pressure and Temperature Ratings**



Axial Ion Path™ Reference

- Patented design increases sensor life, accuracy and reliability
- High resistance to poison: Reduced calibration offset error
- Large surface area reference junction eliminates plugging issues
- Eliminates error due to fluctuating pressure
- No exotic gel or polymer electrolyte which may be incompatible with the process

Specialized Electrode Glass Formulations & Styles

- High accuracy and lifespan in strong acids and bases
- Coating resistant glass electrode reduces fouling
- Silica resistant option to eliminate bonding to glass
- Ruggedized hemispherical and flat glass options resist breaking

Proprietary Sensor Signal Cable

- Designed to eliminate measurement fluctuation due to noise
- Chemical and UV resistant
- Highest temperature rating (130°C)

Compatibility with Most Major Vendor's Electronics

- Proven with major vendors of pH analyzers (Rosemount, ABB, Foxboro, E&H, Mettler Toledo, GLI/Hach, Knick)
- Get higher accuracy and longer life in your application by upgrading the sensor

Industrial Mounting Options

- Mounting fittings for sample line installations
- Submersible cleaners and scrubbers
- Ball Valve "Hot Tap" retraction solutions
- Variety of materials for corrosive applications

Highest Pressure & Temperature Ratings

- In-line sensor installation to 2,500 PSIG (172 BAR)
- Quick Change "Nut Lock" to 300 PSIG (20 BAR)
- Retractable "Hot Tap" to 300 PSIG (20 BAR)
- Process temperature to 266°F (130°C)

Performance Series pH/ORP Sensors

Performance Series

The Barben Analyzer Technology Performance Series products are 3rd generation combination pH/ORP electrodes targeted at harsh, industrial measurement applications. High pressures, strong chemicals, and elevated temperatures typically shorten the lifespan of conventional double-junction pH probes. In these applications the Performance Series sensor offers extended sensor lifespan, as well as decreased drift, and longer calibration intervals.

Each sensor is manufactured with our patented Axial Ion Path™ reference technology, proprietary Low-Noise & High-Temp Signal Cable along with proprietary ruggedized, high temp and coat resistant glass formulations.

A wide selection of sensor body styles and process fittings in a variety of corrosion resistant materials allow direct replacement of short-lived OEM pH/ORP sensors. BAT Performance Series sensors are compatible with all major manufacturers of pH analyzers and transmitters. Upgrade your analytical measurement without the hassle and expense of replacing costly field instruments.

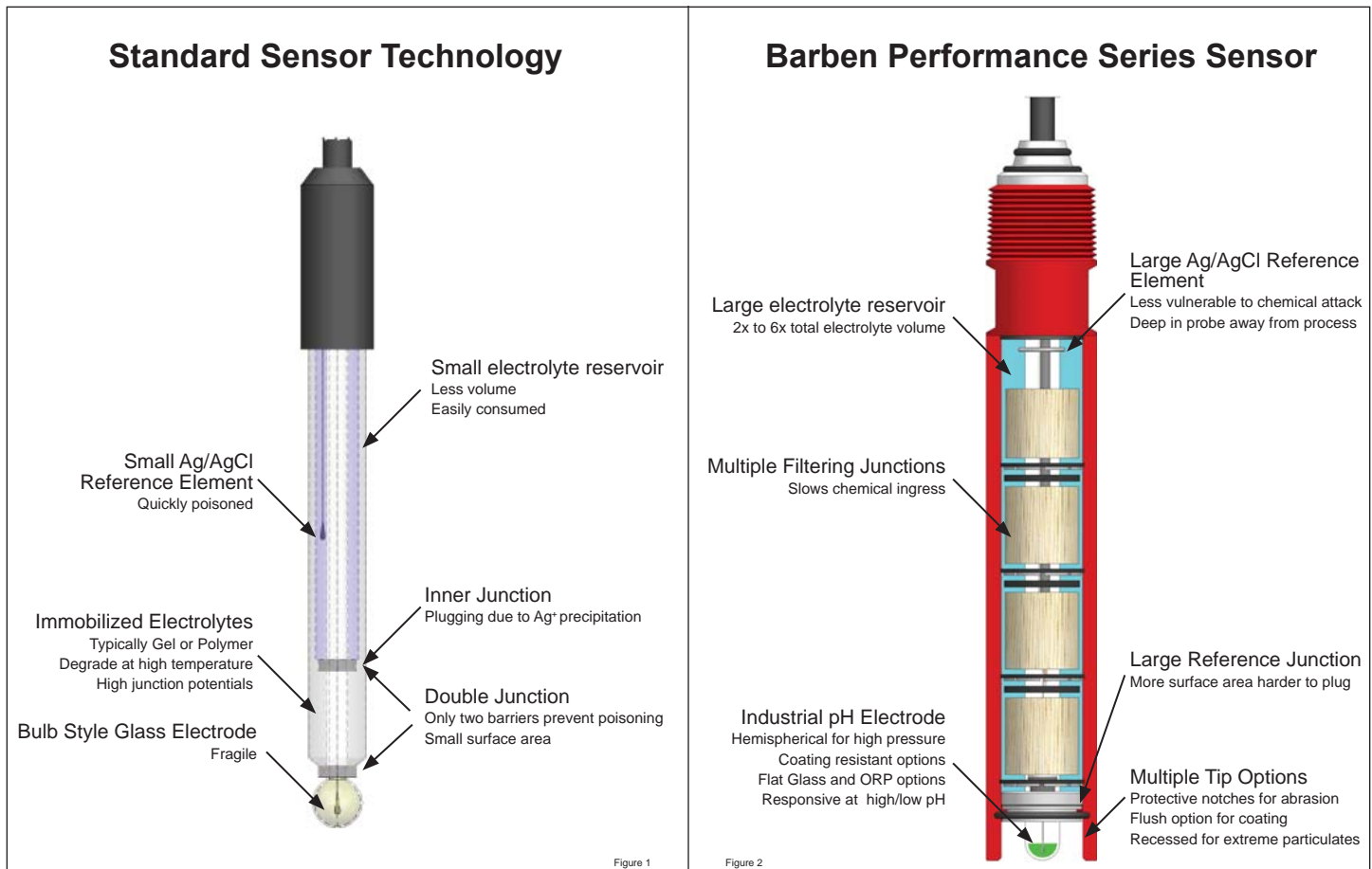
Typical Process Applications

Many industrial processes shorten pH/ORP sensor lifespan. Barben Performance Series sensors excel in applications that may have the following characteristics:

- **H₂S (Sulfides)¹**
- **High Ion-Strength Solutions**
- **Ammonia**
- **Heavy Metals [Ag, Pb, Hg]²**
- **Strong Caustics**
- **Strong Acids**
- **High Cyclic Pressures**
- **High Temperature**
- **Proteins¹**
- **Organics**
- **Mercaptans¹**
- **Cyanides¹**
- **Iodides¹**
- **Bromines**

NOTES

1. Chemicals that react with Ag⁺ (Silver) and restrict traditional reference junction designs
2. Heavy metals which react with Cl⁻ (Chloride) and reduce the voltage potential of the sensor.



Performance Series pH/ORP Sensors

Industry Leading Reference Technology Axial Ion Path™

In 90% of industrial applications the reference cell is the cause of sensor failure. The typical industry standard “double junction” pH sensor (fig. 1) uses reference technology designed to minimize mixing of internal electrolyte and process liquid. This simplistic design is achieved by dividing the reference cell into two chambers, each protected with a porous junction. Once process liquid penetrates each junction poisoning of the sensor may occur or the measurement signal may be impeded by plugging of the porous junction.

The Barben sensor (fig. 2) has a unique, patented reference cell design which combats these common problems.

Performance Series sensor’s reference technology utilizes multiple innovations within the reference cell to greatly extend sensor life.

- Multiple annular wood filtering junctions
- Axial Ion Path™ Communication Disks
- Large volume of electrolyte
- Large surface area Ag/AgCl reference element
- Teflon junction

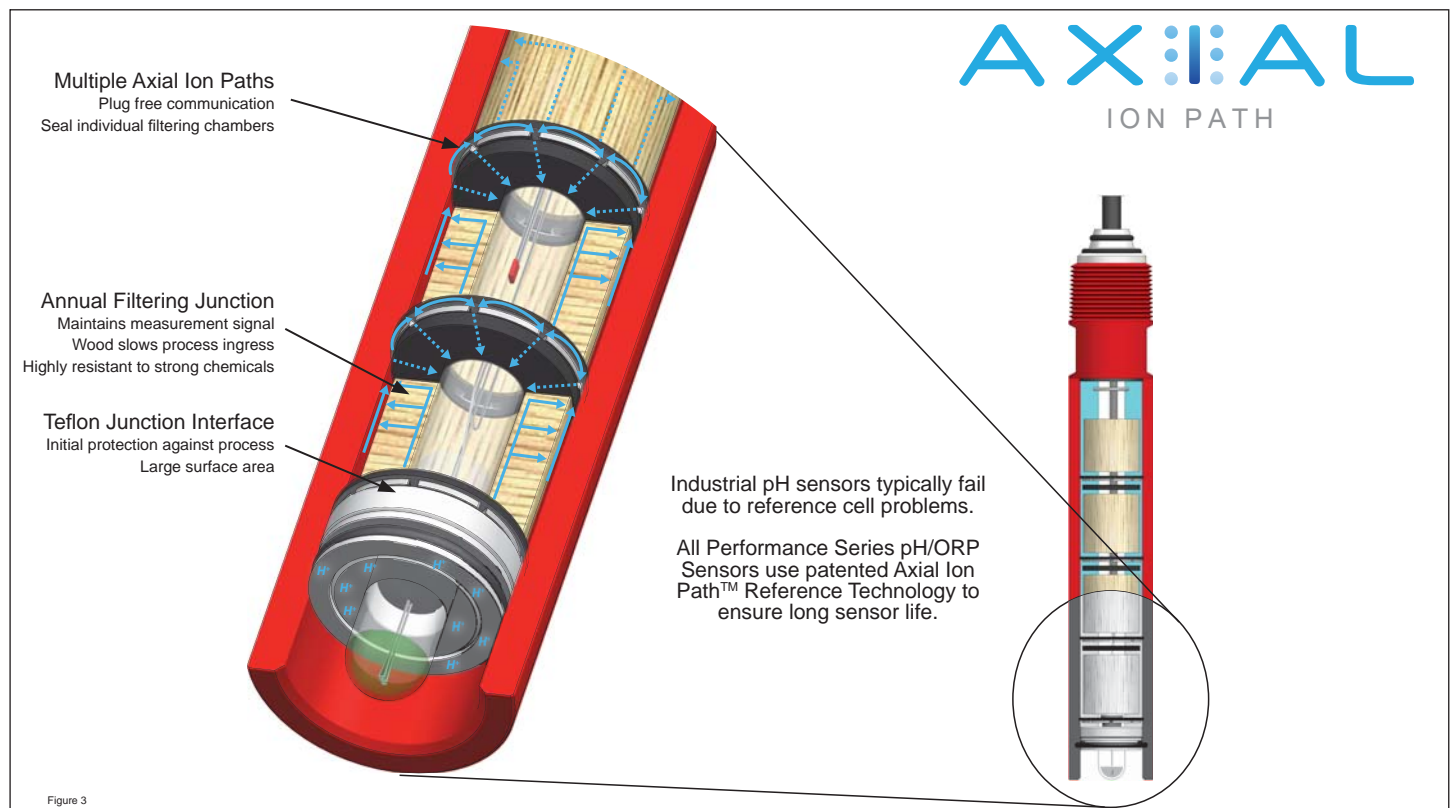
Each sensor uses multiple “solid-state” annular wood

filtering junctions. Wood’s natural cellular makeup greatly slows the ingress of process liquid into the sensor. Each wood filtering junction chamber is separated by patented **Axial Ion Path™** communication disks. The communication disk seals each chamber while providing multiple electrolyte paths thus ensuring a reliable measurement signal.

Barben Performance Series sensors contain a much higher volume of KCl electrolyte than typically found in double junction sensors. More electrolyte provides on-going insurance against the leaching effects of fluctuating process pressure and temperature.

An oversized Ag/AgCl reference element is located near the rear of the sensor. This innovation serves two purposes. Distancing the reference element far from the sensor tip keeps it away from process chemicals. Over time, if chemicals such as sulfides were to penetrate within the sensor, then the large reference element is capable of withstanding long-term poisoning while maintaining a stable measurement.

As a final preventative measure, a porous Teflon insert placed at the tip of the sensor provides a large surface area to prevent plugging. Teflon also serves as a great initial barrier to chemical attack. All of these features combine to make the Performance Series sensors the best choice for industrial measurement applications.



Performance Series pH/ORP Sensors

Low Noise, High Temperature Cable

Since Performance Series sensors are commonly mounted directly into the process, all products are manufactured with proprietary low-noise, high temperature cable. Competitive designs may use low-temperature cable to reduce signal noise (thus de-rating the sensor). Alternately, when high temperature cable is improperly specified, triboelectric noise can cause signal error. Barben Analyzer Technology has developed a proprietary cable that can withstand 130°C (266°F) process temperatures while providing stable pH measurement.

Specialized Glass Formulations and Configurations

Barben glass pH measurement electrodes are designed with unique formulations to prevent coating and scaling. Additional coating resistant options further improve lifespan in strong caustic (NaOH) and silica applications. These specialty glass formulations are manufactured to precision impedance ranges to ensure the best balance between high strength signal, speed of response, structural integrity under high pressure, long life in high temperatures and extreme acid and caustic pH conditions. Unique billet style ORP electrodes completely eliminate glass from the process thus further eliminating potential breakage.

Industrial Grade Mounting Options and Accessories

Barben Analyzer Technology offers the most comprehensive accessories to ensure convenient, safe and economical installation into your applications. In-line, submersible and hot tap (retractable through a isolation ball valve) are all standard options. In-line threaded sensors with quick adapters, rated to 300 psig, allow for easy access for calibration or maintenance in an isolated sample stream. In-line high pressure housings allow for operations up to 2,500 psig. Hot-Tap or Ball-valve retraction systems, rated to 300 psig allow for direct use into process without the need for sample or bypass lines. We offer hardware in 316 Stainless, Titanium and Hastelloy C-276, sensor bodies in Kynar, CPVC and PEEK and seals in Viton, EPDM, and Kalrez to meet the specific demands of your process.

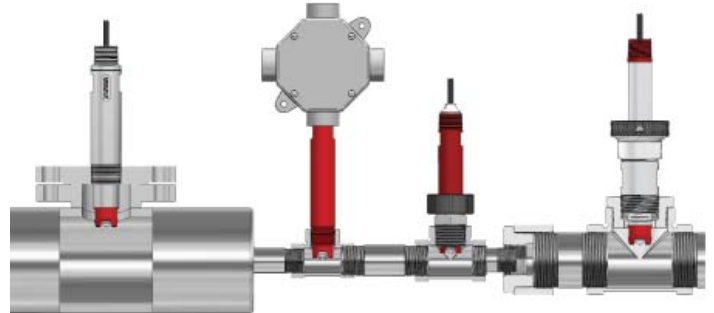
Interconnection with Existing pH and ORP Analyzers

Performance Series Sensors are compatible with all major manufacturers pH analyzers accepting milli-volt input. Temperature compensation options for PT100, PT1000, 3K ohm RTD (Balco), and 8550 ohm (Honeywell) ensure full compatibility with your installations. Now you can upgrade your process without replacing your field instrument. Wiring diagrams for many analyzers can be found at www.bat4pH.com.

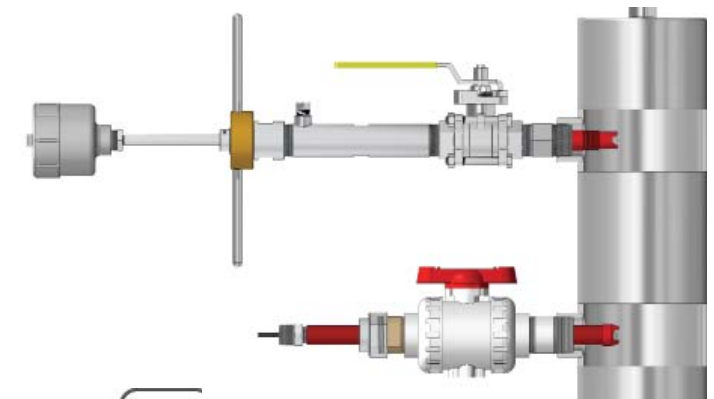
Sensor Selection: Mounting

The first consideration when selecting a pH sensor is how will it be mounted into the process. Examples of various process mounting configurations are provided below.

In-line Sensor Mounting: In-line installations are common on sample streams off the main process. Isolation valves should be upstream / downstream of sensor for removal.



Hot Tap Sensor Mounting: Hot Tap refers to the ability to remove the sensor from the process while under pressure. A ball valve is used to isolate the sensor for removal.



Submersible Sensor Mounting:

Submersible mounting installations are required when the measurement is needed directly into a tank, reactor vessel or open channel. Typically the sensor must be mounted on a "dip tube" which is the hardware to submerge the sensor in the application.

Performance Series pH/ORP Sensors

Sensor Installation Mounting orientation

Sensor mounting for optimum performance should be considered prior to installation. The illustration below shows the proper angle for sensor installation into a pipeline.

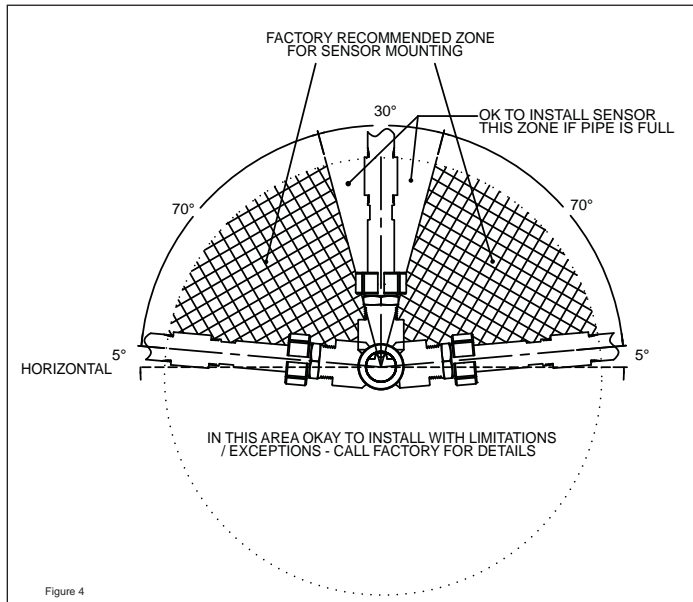


Figure 4

Isolation

pH / ORP sensors require periodic removal for cleaning, calibration, and eventual sensor replacement. Consideration in the piping design should be given as to how to isolate the sensor from the process.

Hot tap retractable sensors are popular since they can be extracted from the flowing process, isolated with a ball valve, and then removed. If a non-retractable sensor is installed then isolation valves need to be installed upstream and downstream.

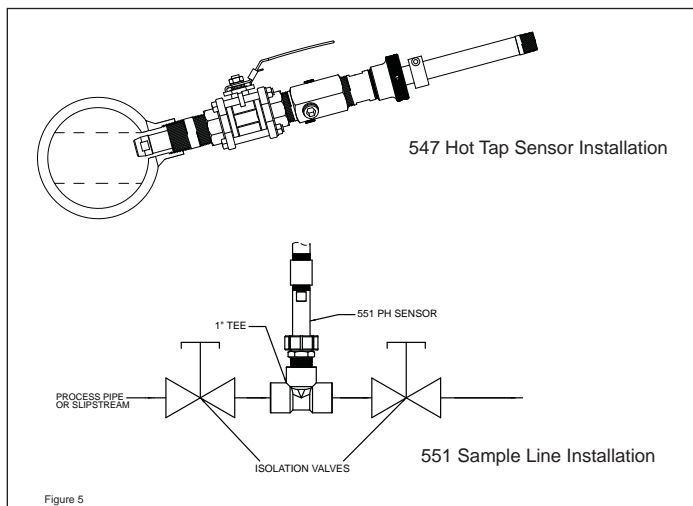


Figure 5

Insertion depth

The depth that pH / ORP sensor protrudes into the pipeline can greatly affect the measurement. Applications where the sensor tip is recessed can lead to coating and slow response. In high particulate applications abrasion of the electrode can be a concern.

A typical installation goal is to get the sensor tip at least 1/4" (6mm) into the stream. At this depth coating issues lessen and response improves due to flow velocity. 546, 551 and 547 sensors offer a variety of tip lengths. Here are some guidelines.

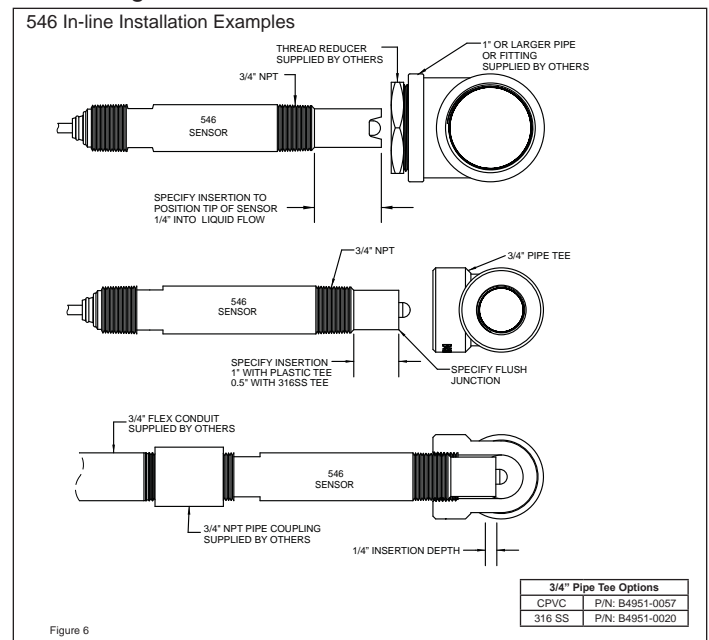


Figure 6

3/4" Pipe Tee Options	
CPVC	P/N: B4951-0057
316 SS	P/N: B4951-0020

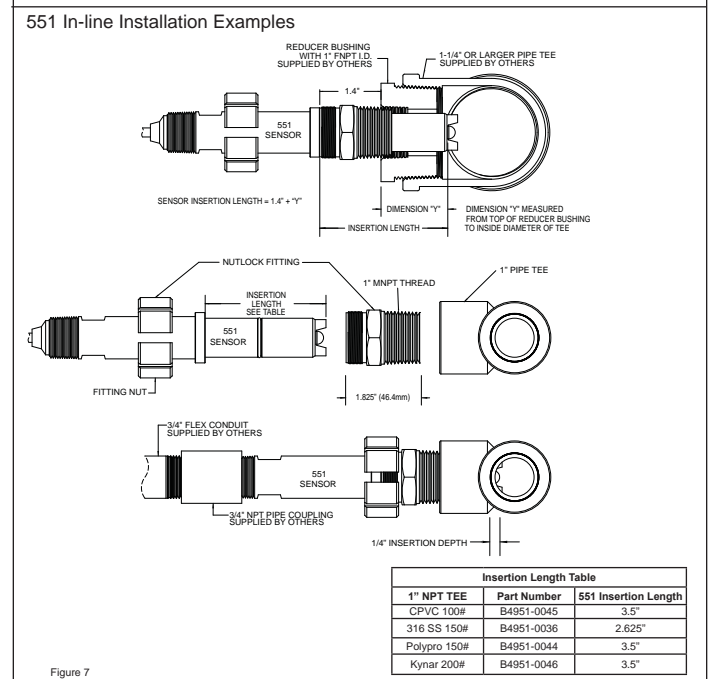


Figure 7

Insertion Length Table		
1" NPT TEE	Part Number	551 Insertion Length
CPVC 100#	B4951-0045	3.5"
316 SS 150#	B4951-0036	2.625"
Polypro 150#	B4951-0044	3.5"
Kynar 200#	B4951-0046	3.5"

Performance Series pH/ORP Sensors

547 In-line Sizing Example

Insertion
Depth = (A) - (B) - (C)

The insertion depth should exceed any mounting hardware (flange, standoff or thread-o-let) plus the pipe wall thickness by at least 1/4" (6mm) to get the tip of the sensor into the process.

Figure 8

Valve & Nipple	"B" Dim.	Compression Fitting	"C" Dim.
1-1/4" SS Valve	6.5"	Wrench Tight	3.0"
		Hand Tight	3.5"
1-1/2" SS Valve	7.1"	Wrench Tight	3.0"
		Hand Tight	4.5"
1-1/4" Kynar Valve	8.0"	Wrench Tight	3.0"
		Hand Tight	3.5"
1-1/2" Kynar Valve	8.6"	Wrench Tight	3.0"
		Hand Tight	4.5"

Sensor Selection: Electrode Options

Code	Glass Type	Suggested Applications	Recommended Measurement Range	Recommended Temp Range	Maximum Temp Range
R CR	Industrial High Temp (Hemi) Industrial High Temp Coat Resist (Hemi)	Best choice for hi/low pH & high pressure. Coat resistant excels in NaOH. Hemispherical glass.	0 to 14 pH	15 to 100°C 59 to 212°F	15 to 130°C 59 to 266°F
FG CF	Flat Industrial Glass Flat Industrial Glass Coat Resist	Best choice for in-line slurries. Consult if rapid pressure changes are present.	0 to 14 pH	20 to 85°C 68 to 185°F	20 to 130°C 68 to 266°F
PX	Redox (ORP)	Flat Platinum (Pt) Billet. Non-glass. Easy to clean.	0 to ±1500mV	0 to 130°C 32 to 266°F	0 to 130°C 32 to 266°F
E CE	General Purpose General Purpose Coating Resist	Light to medium duty pH electrode for low temperature applications. Not for high pH.	2 to 11 pH	-10 to 40°C 14 to 104°F	-20 to 50°C -4 to 122°F
FA	Antimony (Sb) Non-glass Electrode	Antimony (metal) pH electrode for abrasives or HF acid or low temperature applications.	3 to 11 pH	-20 to 80°C -4 to 176°F	-20 to 80°C -4 to 176°F
FR	Fluoride / HF Acid (Hemi)	Resistant to etching by HF and other strong acids. Hemispherical pH glass.	1 to 14 pH	15 to 100°C 59 to 212°F	15 to 130°C 59 to 266°F
HR	Silica Resistant High Temp (Hemi)	Best choice for extreme pH where silica may coat traditional electrodes. Hemispherical glass.	1 to 14 pH	15 to 100°C 59 to 212°F	15 to 130°C 59 to 266°F
FH	Silica Resistant Flat Glass	Best choice for slurries and heavy fouling where silica may coat traditional glass electrodes.	1 to 14 pH	15 to 85°C 59 to 185°F	15 to 130°C 59 to 266°F

= Most common electrodes

= Special Application (Consult with factory)

Sensor Selection: Additional Options

Temperature Compensation

- PT100 RTD
- PT1000 RTD
- 3.01K Ohm RTD Balco
- 8550 Ohm (Honeywell / Leeds & Northrup)

Sensor Body Material

- Kynar PVDF: *Red, White, or Blue based on model*
- PEEK: *Beige*
- CPVC: *Gray*

Sensor O-Ring Material

- Viton
- EPDM
- Kalrez

Sensor Tip Examples

Notched Tip Flat Glass

Notched Tip Hemispherical Glass

Flush Tip Flat Glass

Flush Tip Hemispherical Glass

When selecting the sensor tip consider the process. Notches protect against breakage from heavy particulates. Flush tips are effective for soft coatings. For extreme abrasion a recessed tip can be offered (*not shown*).

Figure 9

Sensor Wiring Termination Examples

Tinned Leads: This option is commonly specified when the sensor is directly wired to the analyzer.

BNC Connector: BNC's offer a low impedance connector to the coaxial wire carrying the pH signal. It is often used when the sensor will connect to an extension cable.

TOP68: The industry standard TOP68 connector provides a quick disconnect option at the sensor.

Figure 10

Performance Series pH/ORP Sensors

Model 546

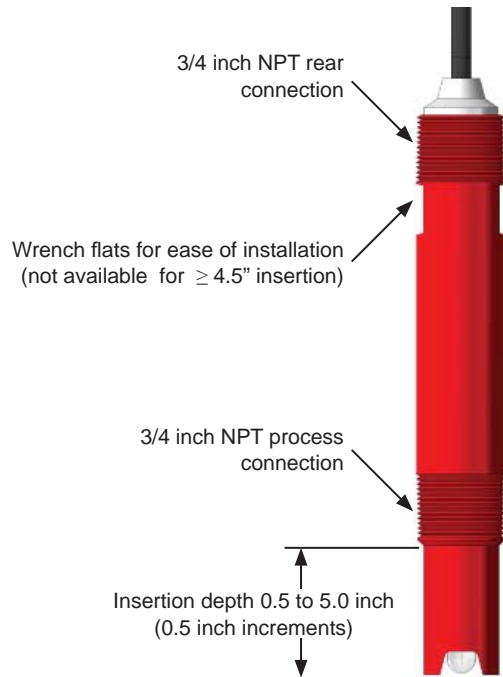
Threaded In-line, Submersible, High Pressure Hot Tap

The versatile Model 546 is suitable for in-line sample stream applications using the 3/4 inch NPT process connection. A similar 3/4 inch NPT connection on the rear of the sensor is used to mount the sensor in submersible and high pressure hot tap installations. With tip lengths from 0.5 to 5.0 inches the 546 sensor can fit through extended pipe nipples and flanges to reach into the process and provide optimum pH/ORP measurement.

Pressure / Temperature Ratings

Sensor Material	Installation Type	
	3/4" In-line or Submersible*	High Pressure Hot Tap
Kynar <i>(red / blue**)</i>	150 PSIG @ 158°F (70°C) 40 PSIG @ 266°F (130°C)	300 PSIG @ 176°F (80°C) 40 PSIG @ 266°F (130°C)
CPVC <i>(grey)</i>	100 PSIG @ 167°F (75°C) 35 PSIG @ 212°F (100°C)	Not Recommended
PEEK <i>(tan)</i>	150 PSIG @ 158°F (70°C) 40 PSIG @ 266°F (130°C)	300 PSIG @ 176°F (80°C) 40 PSIG @ 266°F (130°C)

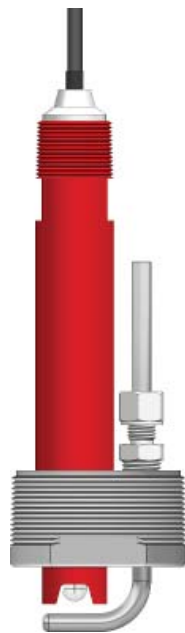
* When using jet cleaner please consult accessories documentation for pressure ratings
** Blue Kynar (used with solution ground) not recommended in high pressure hot tap applications.



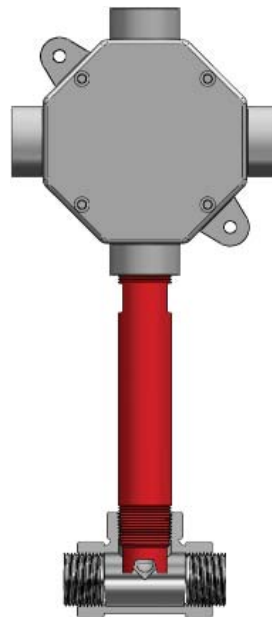
546 Examples



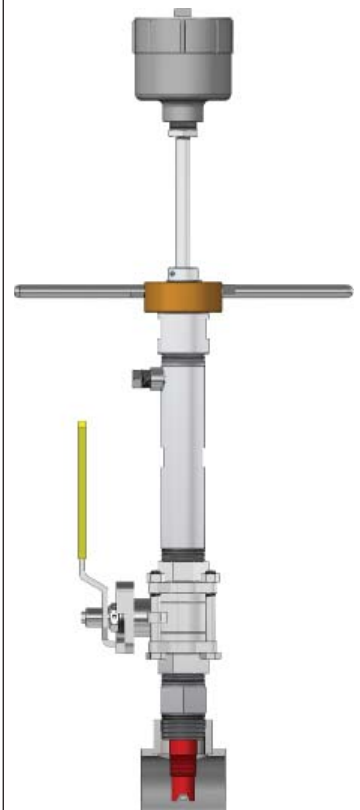
546 Submersible with Dip Tube and Analyzer



546 Submersible with Jet Cleaner (1.5 inch tip required)



546 in-line 3/4 inch pipe tee with optional junction box



546 High Pressure Hot Tap (0.5 inch tip recommended)

Figure 11

Performance Series pH/ORP Sensors

546 In-line / Submersible / High Pressure Hot Tap 3/4 inch NPT pH / ORP Sensors

Material	Axial Ion Path	Body	Electrode	Tip	TC	Body Options	Insertion Depth	Cable	Reference Wire	Terminations	
Body Material											
C	CPVC (not available with Solution Ground)										
B	PVDF Kynar										
K	PEEK (not available with Solution Ground)										
O-Ring Seal Material											
V	Viton										
E	EPDM										
K	Kalrez										
Body Style											
546	3/4" MNPT Thread Inline/Submerged, Kynar/PEEK High Pressure for valve insertion available to 300PSIG (Drawings: 2P0001 Cartridge; 2P0007 Installation Examples; 2P0034 Flow Installations)										
Measuring Electrode											
R	Ruggedized, Hemi-glass (0 - 14 pH) 15°C to 130°C										
E	Low Temp Hemi-glass (2 - 11 pH) -20°C to 50°C										
CE	Coating Resistant, Low Temp Hemi-glass (2 - 11 pH) -20°C to 50°C										
CF	Coating Resistant, Ruggedized, Flat-glass (0 - 14 pH) 20°C to 130°C										
CR	Coating Resistant, Ruggedized, Hemi-glass (0 - 14 pH) 15°C to 130°C										
FA	Antimony measuring electrode for Hydrofluoric Acid applications (3 - 8 pH) min -20°C to 80°C										
FG	Ruggedized, Flat-glass (0 - 14 pH) 20°C to 130°C										
FR	Hydrofluoric Acid Resistant, Ruggedized, Hemi-glass (1 - 14 pH) 15°C to 130°C										
FH	Silica resistant coating, Ruggedized, Flat-glass (1 - 14 pH) 20°C to 130°C										
HR	Silica resistant coating, Ruggedized, Hemi-glass (1 - 14 pH) 15°C to 130°C										
PX	Platinum ORP, Flat Solid Billet (0 to ±1500 mV) 0°C to 130°C										
GX	Gold ORP, Flat Solid Billet										
SX	Silver Cyanide Flat Billet										
Tip Configuration with Teflon Liquid Junction											
FT	Flush no tip protection										
GT	Flush no tip protection, with Solution Ground (Not for High Pressure)										
ST	Recessed										
UT	Recessed with Solution Ground (Not for High Pressure)										
DT	Dual Notch										
LT	Dual Notch with Solution Ground (Not for High Pressure)										
Temperature Compensation (TC)											
N	None										
B	Balco 3.01K Ohm										
C	PT100 RTD										
H	Honeywell 8550 ohm										
K	PT1000 RTD										
Body Options											
S	Standard Body 546										
C	High pressure certification, Kynar/PEEK only										
Insertion Depth from small end of front pipe thread to front of body											
0.5	0.5"										
1.0	1.0"										
1.5	1.5"										
2.0	2.0"										
2.5	2.5"										
3.0	3.0"										
3.5	3.5"										
4.0	4.0"										
4.5	4.5" (No Wrench Flats)										
5.0	5.0" (Max Length 546 Tip No Wrench Flats)										
Cable Configuration - High Temperature, Low Noise TPE Jacket											
T	8" Pigtail - for use with junction box										
T3	8" Pigtail for High Pressure Hot Tap										
PH	TOP68 Quick Disconnect Plug Head										
1 to 5	1' to 5' - Standard										
6 to 15	6' to 15'										
16 to 30	16' to 30'										
31 to 100	Longer lengths available. Consult factory for installation, application and leadtime. For lengths >30 feet, please consider Junction Box, Extension Cable and possible pre-amp.										
Reference Wire											
C	Reference wire on Coax Shield (BNC Termination)										
E	Reference on Separate Wire										
Lead Terminations											
BN	BNC for Coax only, NO TC										
BT	BNC & Tinned Leads for TC										
B2	BNC & 2 Pin Conn (use with B39 Ext Cables) for TC										
TT	All Tinned Leads										
PT	TOP68 Quick Disconnect Plug Tail on cable										
PN	Wire Ferrules Coax, NO TC										
PP	All Wire Ferrules										
TN	Tinned Leads for Coax only, NO TC										
Mtl	AIP	Body	Elec	Tip	TC	Opt	Depth	Cable	Ref	Term	
B	V	546	R	DT	C	S	0.5	15	E	TT	Typical Sensor Configuration

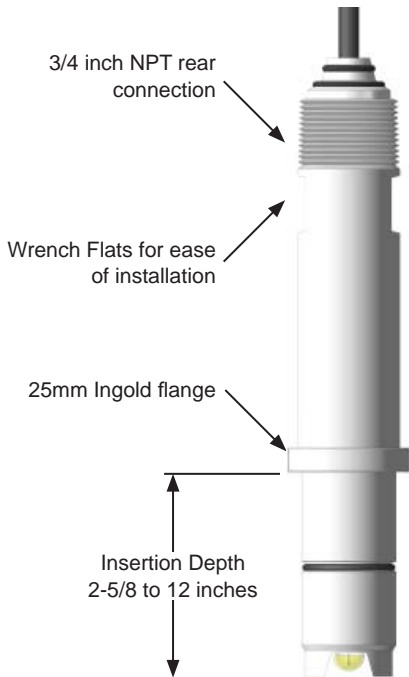
Performance Series pH/ORP Sensors

Model 551 Quick Change In-line

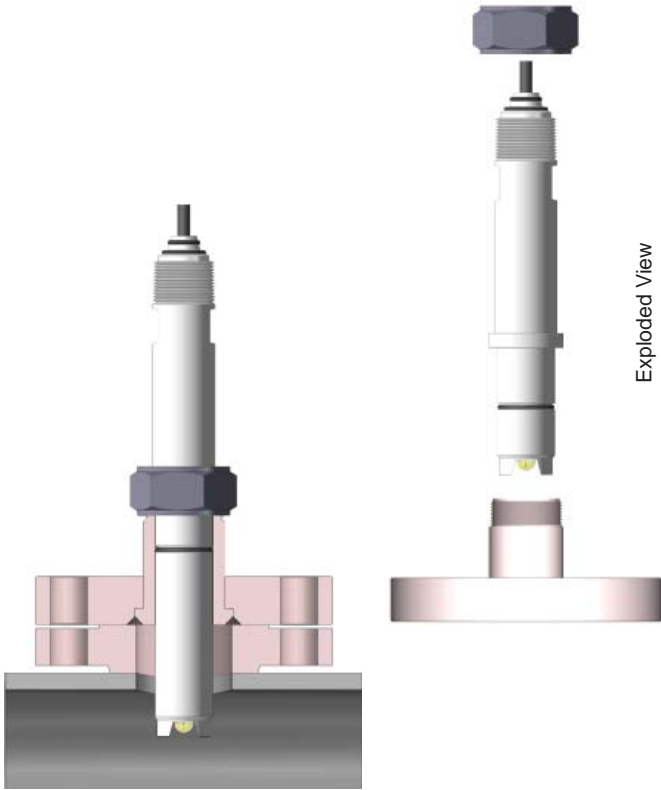
In some in-line applications sensor removal for routine cleaning or calibration becomes difficult due to conduit or cabling. The 551 Quick Change Sensor offers a unique method to extract the sensor through a “Nut Lock” adapter system. The Nut Lock adapter threads directly into 1 inch NPT process connections. Sensor length options up to 12 inches allows the sensor to fit through flanges and stand-off piping. The 551 sensor also includes a 3/4 inch rear connection for use in submersible applications.

Pressure / Temperature Ratings

Sensor Material	Quick Change Nut Lock Type		
	Threaded plastic or metal body with hand nut	Threaded metal body with metal hex nut	Plastic body with metal hex nut (flanged or threaded mounting)
Kynar <i>(White)</i>	150 PSIG @ 158°F (70°C) 40 PSIG @ 266°F (130°C)	300 PSIG @ 176°F (80°C) 40 PSIG @ 266°F (130°C)	150 PSIG @ 73°F (25°C) 25 PSIG @ 266°F (130°C)
CPVC <i>(grey)</i>	100 PSIG @ 167°F (75°C) 40 PSIG @ 212°F (100°C)	100 PSIG @ 167°F (75°C) 40 PSIG @ 212°F (100°C)	150 PSIG @ 73°F (25°C) 50 PSIG @ 212°F (100°C)

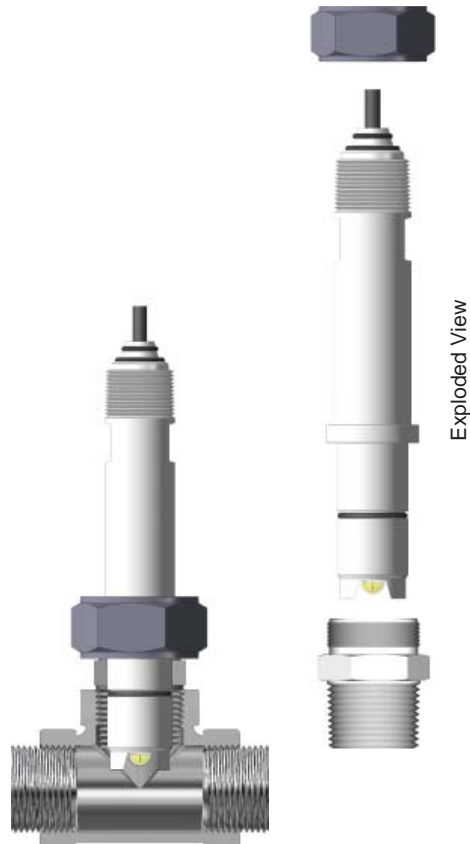


551 Examples



551 with Nut Lock Flange adapter (extended tip)

Figure 12



551 with Nut Lock adapter in 1 inch NPT pipe tee (Metal hex nut)

Performance Series pH/ORP Sensors

551 Quick Change In-line / Submersible pH / ORP Sensors

Material	Axial Ion Path	Body	Electrode	Tip	TC	Body Options	Insertion Depth	Cable	Reference Wire	Terminations
Body Material										
C		CPVC (not available with Solution Ground)								
B		PVDF Kynar								
O-Ring Seal Material										
V		Viton								
E		EPDM								
K		Kalrez								
Body Configuration										
551		Quick-Change Inline, Kynar available High Pressure to 300PSIG								
Measuring Electrode										
R		Ruggedized, Hemi-glass (0 - 14 pH) 15°C to 130°C								
E		Low Temp Hemi-glass (2 - 11 pH) -20°C to 50°C								
CE		Coating Resistant, Low Temp Hemi-glass (2 - 11 pH) -20°C to 50°C								
CF		Coating Resistant, Ruggedized, Flat-glass (0 - 14 pH) 20°C to 130°C								
CR		Coating Resistant, Ruggedized, Hemi-glass (0 - 14 pH) 15°C to 130°C								
FA		Antimony measuring electrode for Hydrofluoric Acid applications (3 - 8 pH) -20°C to 80°C								
FG		Ruggedized, Flat-glass (0 - 14 pH) 20°C to 130°C								
FR		Hydrofluoric Acid Resistant, Ruggedized, Hemi-glass (1 - 14 pH) 15°C to 130°C								
FH		Silica resistant coating, Ruggedized, Flat-glass (1 - 14 pH) 20°C to 130°C								
HR		Silica resistant coating, Ruggedized, Hemi-glass (1 - 14 pH) 15°C to 130°C								
PX		Platinum ORP, Flat Solid Billet (0 to ±1500 mV) 0°C to 130°C								
GX		Gold ORP, Flat Solid Billet								
SX		Silver Cyanide Flat Billet								
Tip Configuration with Teflon Liquid Junction										
FT		Flush with no tip protection								
GT		Flush with no tip protection with Solution Ground (Not for High Pressure)								
ST		Recessed								
UT		Recessed with Solution Ground (Not for High Pressure - PVDF Kynar 2.625" insertion depth only)								
DT		Dual Notch								
LT		Dual Notch with Solution Ground (Not for High Pressure)								
Temperature Compensation (TC)										
N		None								
B		Balco 3.01K Ohm								
C		PT100 RTD								
H		Honeywell 8550 ohm								
K		PT1000 RTD								
Body Options										
S		Standard Body 551								
C		High pressure certification, Kynar only								
Insertion Depth from Rib to Front of Body (Not available with solution ground except with "N")										
N		Standard (2.625" from rib) (only one with solution)								
3.0		3.0"								
3.5		3.5"								
4.0		4.0"								
4.5		4.5"								
5.0		5.0"								
5.5		5.5"								
6.0		6.0"								
6.5		6.5"								
7.0		7.0"								
7.5		7.5"								
8.0		8.0"								
8.5		8.5"								
9.0		9.0"								
9.5		9.5"								
10.0		10.0"								
10.5		10.5"								
11.0		11.0"								
11.5		11.5"								
12.0		12.0"								
100		100mm								
150		150mm								
200		200mm								
250		250mm								
300		300mm								
Cable Configuration - High Temperature, Low Noise TPE Jacket										
T		8" Pigtail - for use with junction box								
PH		TOP68 Quick Disconnect Plug Head								
1 to 5		1' to 5' - Standard								
6 to 15		6' to 15'								
16 to 30		16' to 30'								
31 to 100		Longer lengths available. Consult factory for installation, application and leadtime. For lengths >30 feet, please consider Junction Box, Extension Cable and possible pre-amp.								
Reference Wire										
C		Reference wire on Coax Shield (BNC Termination)								
E		Reference on Separate Wire								
Lead Terminations										
BN		BNC for Coax only, NO TC								
BT		BNC & Tinned Leads for TC								
B2		BNC & 2 Pin Conn (use with B39 Ext Cables) for TC								
TT		All Tinned Leads								
PT		TOP68 Quick Disconnect Plug Tail on cable								
PN		Wire Ferrules Coax, NO TC								
PP		All Wire Ferrules								
TN		Tinned Leads for Coax only, NO TC								
Mtl	AIP	Body	Elec	Tip	TC	Opt	Depth	Cable	Ref	Term
B	V	551	R	DT	C	S	N	15	E	TT
Typical Sensor Configuration										

Performance Series pH/ORP Sensors

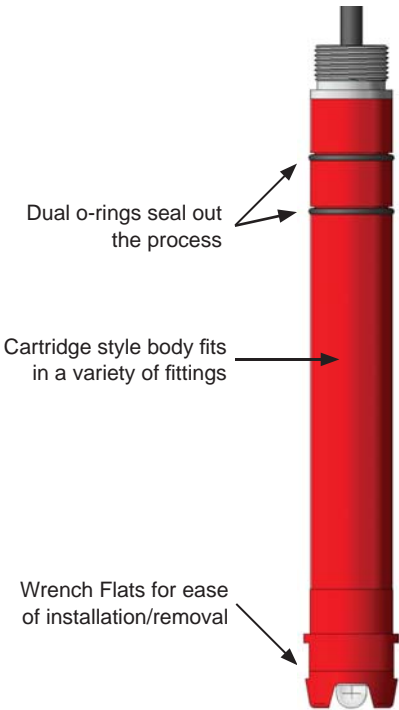
Model 547 In-line, High Pressure In-line, Hot Tap Retractable

The Model 547 is a replaceable, cartridge style sensor. It is designed to fit into a variety of sensor holders for direct insertion into the process. When used with a metallic sheath the 547 sensor can provide variable insertion depth for hot tap ball valve installations as well as the ability to withstand pressures up to 2500 PSIG with Barben's high pressure housing assembly.

Pressure / Temperature Ratings

Sensor Material	Installation Type	
	Threaded In-line High Pressure	Retractable
Kynar (red / blue*)	2500 PSIG @ 122°F (50°C) 50 PSIG @ 266°F (130°C)	150 PSIG @ 158°F (70°C) 40 PSIG @ 266°F (130°C)
CPVC (grey)	Not Recommended	100 PSIG @ 167°F (75°C) 35 PSIG @ 212°F (100°C)
PEEK (tan)	2500 PSIG @ 122°F (50°C) 50 PSIG @ 266°F (130°C)	150 PSIG @ 158°F (70°C) 40 PSIG @ 266°F (130°C)

* Blue Kynar rated to 150PSIG @ 158°F (70°C) in threaded in-line high pressure applications.



547 Examples

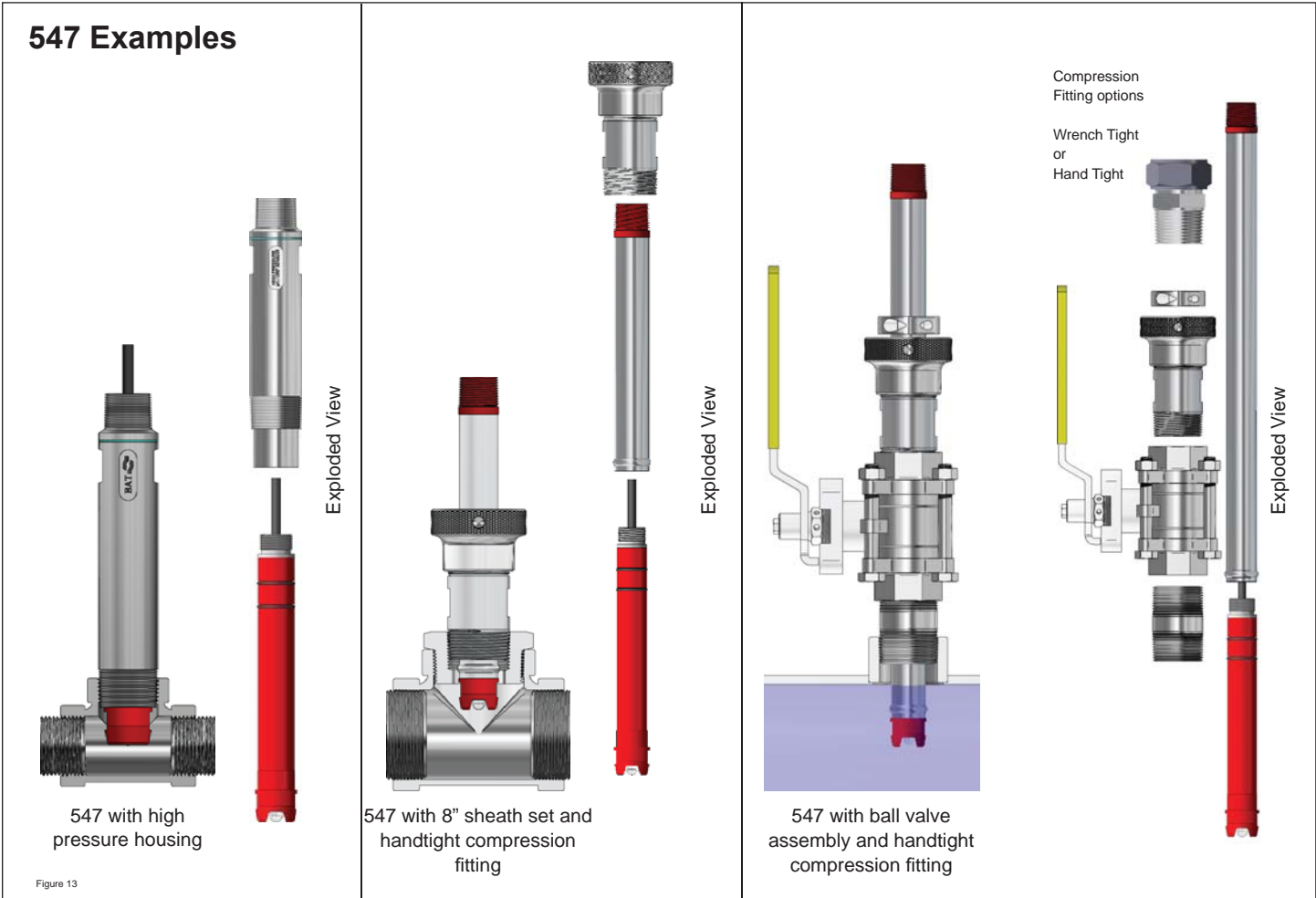


Figure 13

Performance Series pH/ORP Sensors

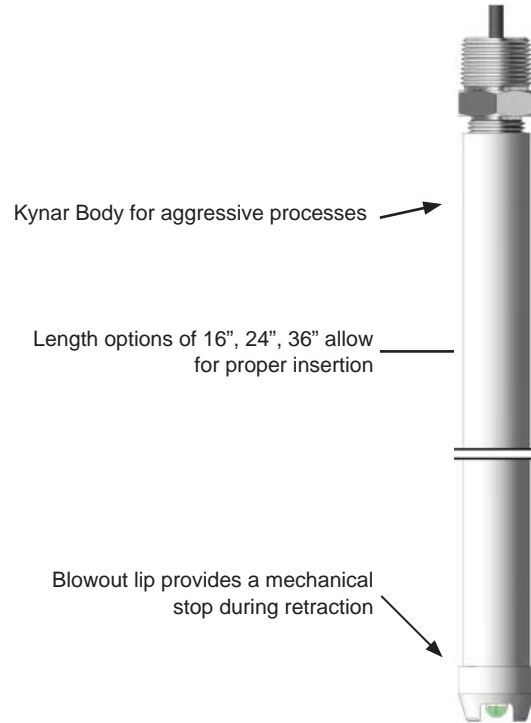
547 In-line, High Pressure In-line, Hot Tap Retractable pH / ORP Sensors

Material	Axial Ion Path	Body	Electrode	Tip	TC	Body Options	Insertion Depth	Cable	Reference Wire	Terminations	
Body Material											
C	CPVC (not available with Solution Ground)										
B	PVDF Kynar										
K	PEEK (not available with Solution Ground)										
O-Ring Seal Material											
V	Viton										
E	EPDM										
K	Kalrez										
Body Configuration											
547	Replacement Cartridge, Valve Ins, Flow Cell, Kynar or PEEK avail High Pressure to 2500PSIG										
Measuring Electrode											
R	Ruggedized, Hemi-glass (0 - 14 pH) 15°C to 130°C										
E	Low Temp Hemi-glass (2 - 11 pH) -20°C to 50°C										
CE	Coating Resistant, Low Temp Hemi-glass (2 - 11 pH) -20°C to 50°C										
CF	Coating Resistant, Ruggedized, Flat-glass (0 - 14 pH) 20°C to 130°C										
CR	Coating Resistant, Ruggedized, Hemi-glass (0 - 14 pH) 15°C to 130°C										
FA	Antimony measuring electrode for Hydrofluoric Acid applications (3 - 8 pH) -20 °C to 80°C										
FG	Ruggedized, Flat-glass (0 - 14 pH) 20°C to 130°C										
FR	Hydrofluoric Acid Resistant, Ruggedized, Hemi-glass (1 - 14 pH) 15°C to 130°C										
FH	Silica resistant coating, Ruggedized, Flat-glass (1 - 14 pH) 20°C to 130°C										
HR	Silica resistant coating, Ruggedized, Hemi-glass (1 - 14 pH) 15°C to 130°C										
PX	Platinum ORP, Flat Solid Billet (0 to ±1500 mV) 0°C to 130°C										
GX	Gold ORP, Flat Solid Billet										
SX	Silver Cyanide Flat Billet										
Tip Configuration with Teflon Liquid Junction											
FT	Flush no tip protection										
GT	Flush no tip protection, with Solution Ground (Not for High Pressure)										
ST	Recessed										
UT	Recessed with Solution Ground (Not for High Pressure)										
DT	Dual Notch										
LT	Dual Notch with Solution Ground (Not for High Pressure)										
Temperature Compensation (TC)											
N	None										
B	Balco 3.01K Ohm										
C	PT100 RTD										
H	Honeywell 8550 ohm										
K	PT1000 RTD										
Body Options											
S	Standard Body										
C	High pressure certification, Kynar/PEEK only										
Insertion Depth											
N	Standard										
Cable Configuration - High Temperature, Low Noise TPE Jacket											
T1	8" Pigtail for (8" assy or High Pressure or SS Flow Cell)										
T2	8" Pigtail for (16" assy)										
T3	8" Pigtail for (20" assy)										
T4	8" Pigtail for (24" assy)										
T5	8" Pigtail for (30" assy)										
T6	8" Pigtail for (36" assy)										
T7	8" Pigtail for (60" assy)										
1 to 5	1' to 5' - Standard										
6 to 15	6' to 15'										
16 to 30	16' to 30'										
31 to 100	Longer lengths available. Consult factory for information and leadtime. For lengths >30 feet, please consider Junction Box, Extension Cable and possible pre-amp.										
Reference Wire											
C	Reference wire on Coax Shield (BNC Terminations)										
E	Reference on Separate Wire										
Lead Terminations											
BN	BNC for Coax only, NO TC										
BT	BNC & Tinned Leads for TC										
B2	BNC & 2 Pin Conn (use with B39 Ext Cables) for TC										
TT	All Tinned Leads										
PT	TOP68 Quick Disconnect Plug Tail on cable										
PN	Wire Ferrules Coax, NO TC										
PP	All Wire Ferrules										
TN	Tinned Leads for Coax only, NO TC										
Mtl	AIP	Body	Elec	Tip	TC	Opt	Depth	Cable	Ref	Term	
B	V	547	R	DT	C	S	N	15	E	TT	Typical Sensor Configuration

Performance Series pH/ORP Sensors

Model 567 All Plastic Hot Tap Retractable

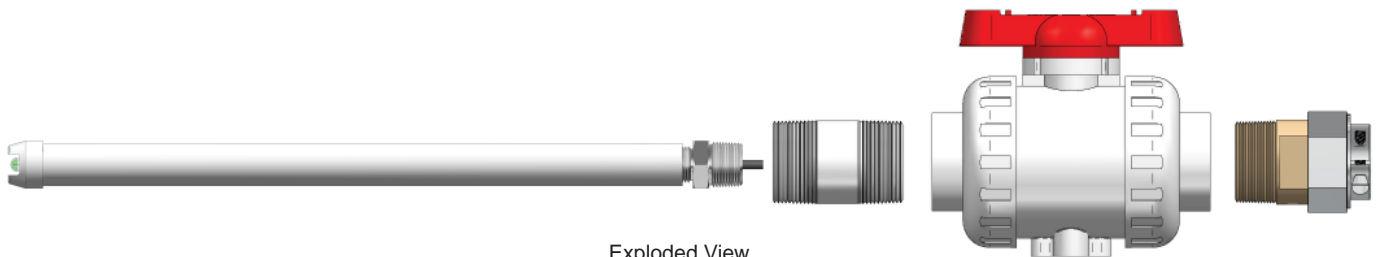
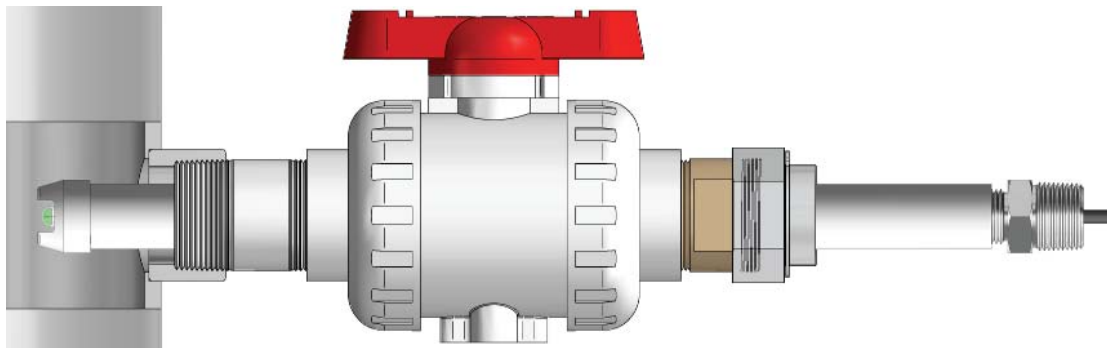
If your piping is corrosion resistant plastic, shouldn't your pH sensor be the same? The Model 567 is specifically designed for use in the most aggressive measurement applications. It is the only "All Plastic" hot tap retractable pH sensor available to the market. The 567 sensor uses a Kynar insertion body thus eliminating the metallic sheath typically used with cartridge style hot tap sensors. Not only can it withstand strong chemicals; the Kynar body provides a great solution in applications that build-up and adhere to metallic parts.



Pressure / Temperature Ratings

Sensor Material	Installation Type	
	Teflon or Kynar Compression Fitting	PEEK Stop Lock Compression Fitting
Kynar (white)	40 PSIG @ 167°F (75°C)	100 PSIG @ 167°F (75°C) 35 PSIG @ 212°F (100°C)

567 Examples



Exploded View
567 All Plastic hot tap sensor with Ball Valve assembly
and PEEK Stop Lock Compression Fitting

Figure 14

Performance Series pH/ORP Sensors

567 All Plastic Hot Tap Retractable pH / ORP Sensors

Material	Axial Ion Path	Body	Electrode	Tip	TC	Body Options	Insertion Depth	Cable	Reference Wire	Terminations	
Body Material											
B		PVDF Kynar Body Industrial pH sensor									
		O-Ring Seal Material									
	V	Viton									
	E	EPDM									
	K	Kalrez									
		Body Configuration									
		567 All plastic (Kynar only) valve insertion									
		Measuring Electrode									
	R	Ruggedized, Hemi-glass (0 - 14 pH) 15°C to 130°C									
	E	Low Temp Hemi-glass (2 - 11 pH) -20°C to 50°C									
	CE	Coating Resistant, Low Temp Hemi-glass (2 - 11 pH) -20°C to 50°C									
	CF	Coating Resistant, Ruggedized, Flat-glass (0 - 14 pH) 20°C to 130°C									
	CR	Coating Resistant, Ruggedized, Hemi-glass (0 - 14 pH) 15°C to 130°C									
	FA	Antimony measuring electrode for Hydrofluoric Acid applications (3 - 8 pH) -20°C to 80°C									
	FG	Ruggedized, Flat-glass (0 - 14 pH) 20°C to 130°C									
	FR	Hydrofluoric Acid Resistant, Ruggedized, Hemi-glass (1 - 14 pH) 15°C to 130°C									
	FH	Silica resistant coating, Ruggedized, Flat-glass (1 - 14 pH) 20°C to 130°C									
	HR	Silica resistant coating, Ruggedized, Hemi-glass (1 - 14 pH) 15°C to 130°C									
	PX	Platinum ORP, Flat Solid Billet (0 to ±1500 mV) 0°C to 130°C									
	GX	Gold ORP, Flat Solid Billet									
	SX	Silver Cyanide Flat Billet									
		Tip Configuration with Teflon Liquid Junction									
	FT	Flush with no tip protection									
	ST	Recessed									
	DT	Dual Notch									
		Temperature Compensation (TC)									
	N	None									
	B	Balco 3.01K Ohm									
	C	PT100 RTD									
	H	Honeywell 8550 ohm									
	K	PT1000 RTD									
		Body Options									
	S	Standard Body									
		Insertion Depth									
	16	16"									
	24	24"									
	36	36"									
		Cable Configuration - High Temperature, Low Noise TPE Jacket									
	1 to 5	1' to 5' Hi-temp - Standard									
	6 to 15	6' to 15' Hi-temp									
	16 to 30	16' to 30' Hi-temp									
	31 to 100	Longer lengths available. Consult factory for information and leadtime. For lengths >30 feet, please consider Junction Box, Extension Cable and possible pre-amp.									
		Reference Wire									
	C	Reference wire on Coax Shield (BNC Terminations)									
	E	Reference on Separate Wire									
		Lead Terminations									
	BN	BNC for Coax only, NO TC									
	BT	BNC & Tinned Leads for TC									
	B2	BNC & 2 Pin Conn (use with B39 Ext Cables) for TC									
	TT	All Tinned Leads									
	PN	Wire Ferrules Coax, NO TC									
	PP	All Wire Ferrules									
	TN	Tinned Leads for Coax only, NO TC									
Mtl	AIP	Body	Elec	Tip	TC	Opt	Depth	Cable	Ref	Term	
B	V	567	R	DT	C	S	16	15	E	TT	Typical Sensor Configuration

Performance Series pH/ORP Sensors

Sensor Replacement Cross Reference

Because of their improved longevity in harsh processes, Barben Performance Series Sensors allow the user to upgrade their process measurement simply by changing out their existing sensor. Barben Sensors are fully compatible with most major manufacturer's analyzers. The cross reference guide below provides some basic guidelines on changing out sensors. Consult technical support for additional information on replacing competitive sensors.

Vendor	Vendor Model	Temperature Compensation	BAT Model	Barben Application Notes
ABB (Formerly TBI)	TB551 Next Step	3kΩ Balco PT100	551	Use standard "N" insertion depth, may require Nut Lock adapter
	TB556 Next Step		546	
	TB557 Next Step		547	547 will fit directly into ABB retractable sheath
	TB561 Next Step		551	
	TB564 Next Step		554	Consult factory on special Barben 554 Sensor
	TB567 Next Step		547	Request use of Barben high pressure sensor housing
Broadley-James	ST924 DynaProbe	3kΩ Balco PT100 PT1000	551	Use standard "N" insertion depth
	ST856 / ST956 DynaProbe		546	Use either 0.5" or 1.0" insertion depth
	ST873 / ST973 DynaProbe		551	Use 551 with Nut Lock Adapter, 547 with 8" sheath and wrench tight compression fitting can also be used
	ST864 DynaProbe		554	Consult factory on special Barben 554 Sensor
	ST857 / ST977 DynaProbe		547	Barben 547 will fit directly into Broadley-James retractable sheath
	ST851 / ST951 DynaProbe		551	Use standard "N" insertion depth. May require Nut Lock adapter
Endress & Hauser	CPF81 / CPF82	PT100	546	1" insertion with notched tip, 0.5" insertion with flush tip
	<i>NOTE - Many E&H Sensor are based on the 12mm (PG13.5) standard. These sensors use adapters to mount into the process. Consult us on application</i>			
Foxboro (Invensys)	PH10 Dolphin (3/4" inline)	3kΩ Balco PT100 PT1000	546	If PH10 uses 1" bushing then consider Barben 551 or 547 with 8" sheath and wrench tight compression fitting
	871A (1" Inline)	PT100 PT1000	551	Foxboro 871A uses 1" NPT process connection. Barben 551 Sensor with Nut Lock Adapter for inline applications
	871PH	PT1000	551	871PH uses a twist lock in-line connection. Consult Barben on fitting size for 551 sensor
Hach	pH Sensors (DPD, DRD, PD, and RD)	NTC 300 Ω	551	Verify temperature sensor options transmitter can accept
	LCP Sensors (6028)		546	Verify temperature sensor options transmitter can accept, Hach Sensor has 1.5" NPT process connection thus fittings may be needed to mount Barben 546 sensor in process.
	DPC/DRC/PC1/PC2/PC3/RC1/RC2 Combination Probes	PT1000	546	1" insertion depth
Mettler Toledo	InPro 4501	PT100 PT1000	551	Needs 1" NPT Nut Lock Adapter
	InPro 4550	PT100 PT1000	551	Needs 1" NPT Nut Lock Adapter
<i>NOTE - Many Mettler Toledo Sensors are based on the 12mm (PG13.5) standard. These sensors use fittings to mount into the process. Consult BAT on application.</i>				
Rosemount	385 / 385+	3kΩ Balco PT100	547	Barben 547 with 16" sheath (Rosemount sheath is Titanium but other materials can be used)
	389		551	Rosemount 389 uses 1" NPT process connection. Barben 551 Sensor with Nut Lock Adapter for inline applications
	3900		551	Rosemount 3900 has both 3/4" and 1" threads on sensor body. Select Barben 546 if 3/4" threads are used.
	3300 PERpH-X	PT100	546	Select Barben 551 with Nut Lock Adapter if 1" NPT threads are used
	3400 PERpH-X		547	Barben 547 with 8" sheath (Rosemount sheath is Titanium but other materials can be used)
	3500 PERpH-X	547	Barben 547 with 24" or 36" sheath (Rosemount sheath is Titanium but other materials can be used)	
	372	PT100	546	Rosemount 3500 uses 1" NPT process connection. Barben 551 Sensor with Nut Lock Adapter for inline applications
Signet	2714/2715/2716/2717	3kΩ Balco	551	Use 546 with 2" insertion depth. This sensor for HF Acid applications thus consider "FR" glass or Antimony electrode
	2774/2775/2776/2777	3kΩ Balco PT1000	546	Signet offers additional fittings for in-line mounting
	2724 / 2726	PT1000	546	1" insertion with notched tip, 0.5" insertion with flush tip. Signet offers additional fittings for in-line mounting
	2764/2765/2766/2767	3kΩ Balco PT1000 NTC 300 Ω	551	1" insertion with flush tip, 1.5" with notched tip. Signet offers additional fittings for in-line mounting
Yokogawa	FU20	PT1000	546	Signet offers additional fittings for in-line mounting
	FU24		551	FU20 probes use a variety of adapters. Consult BAT on how sensor is mounted
	PH20		551	FU24 probes use a variety of adapters. Consult BAT on how sensor is mounted
	PH97		547	PH20 probes use a variety of adapters. Consult BAT on how sensor is mounted
				Barben 547 with 8" or 24" sheath (Yokogawa sheath is Titanium but other materials can be used)

Performance Series pH/ORP Sensors

Contact Us

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Ametek has nearly 14,000 colleagues at over 120 manufacturing locations around the world. Supporting those operations are more than 80 sales and service locations across the United States and in more than 30 other countries around the world.

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