Competitive Advantages & Sensor Design Overview

Competitive Advantages of IOTRON™ & ZEUS™

pH & ORP Industrial Sensor Design & Technology

The ASTI proprietary and novel highly modular and application specific sensor design provides the needed versatility and flexibility to create customized solutions to meet the most demanding measurement applications. Each built-to-order sensor model chosen and selected options invoked are based upon a thorough review of the customer supplied application information by senior in-house chemists to ensure that the best possible pH sensor or ORP sensor which is suitable for the intended process measurement & installation scheme is supplied at the lowest possible price by not including any unnecessary features. These custom built-to-order sensors can interface with most all existing control equipment to serve as replacement sensors to retrofit existing installations or else are also available as smart digital sensors for use in new installation complete with mating intelligent digital transmitters.

Highlighted Benefits:

- Substantially improved sensor service lifetime leading to substantially reduced cost of ownership
- Reduced cleaning and calibration requirements due to rugged industrial construction and solid-state reference
- Reduced damage from mechanical wear with extremely rugged industrial construction and fault-tolerant design
- Optimized sensor components, design and fabrication that is individually selected for your exact application requirements ensure optimal performance all while while minimizing cost of ownership

Integrated Modular Sensor Design for IOTRON™ Customized Built-to-Order Sensors

1. Application specific **pH and ORP sensing** elements are optimized for each application.

2. **Solid State Reference Junctions** employ non-porous cross-linked conductive polymer optimized for each process

3. **Resilient Plastic Housings** in the most cost effective configuration to meet the thermal and chemical resistivity necessitated by each application supplied in the necessary configuration to support the desired installation scheme.

4. **Integrated electronics components include:**

- Temperature Compensation Elements – Pt100, Pt1000, 3K Balco, …etc
- Solution Ground (Liquid Earth) Elements – 316SS, Titanium, Hastelloy C-276, Platinum Mat'l of Construction
- Analog Conventional & Differential Preamplifiers for Rosemount, HACH/GLI, Foxboro,… OEM Transmitters
- Smart Digital Sensor Boards for use with ASTI 3TX-HiQ-pH Intelligent Digital Transmitter (New Systems)

5. **Waterproofing options** for **fully submersible sensor assemblies** WITHOUT using of an immersion tube or standpipe

Electronics are embedded into sensors as required to interface existing process control equipment for retrofit installations.

1. Specialized pH Glasses & Platinum ORP Redox Sensing Elements

Various specialized pH elements have been developed to accommodate conditions which make pH elements from competitor sensors falter or suffer a premature death. These specialized pH elements are designed not only to survive such conditions but perform with great repeatability, accuracy and sensitivity. Examples of features that are imparted to a significant extent by the specific type of pH glass element chosen including the following options:

- ASTI only unique low-profile thick-wall break-resistant parabolic pH glass element ("X3XX" & "X5XX" series)
  - Ideal for high viscosity solutions or high particulate abrasive slurries
  - Substantially minimize breakage even with process upsets, mechanical abuse or even accidents

- Low-Profile Platinum Ball Style ORP sensing element (“X8XX” series)
- Suitable for applications requiring resistant to high velocity flow, high pressure installations up to 200 psig as well as aggressive dissolved gases and volatile organic solvents with suitable options invoked.
    - Saturated Sodium (Brine) Resistant pH glass element (“X9XX” series)
    - High Temperature & Pressure Resistant pH Glass elements (“X3XX” & “X5XX” series)
- Supports down to -30 °C and up to 150 °C at pressures up to 200 psig
    - Wide range pH glass (“V”) for use from -0.5 pH (~6 Molar Acid) up to +14.5 pH (~6 Molar Base)
    - Low impedance pH glass (“Z”) to support OEM pH transmitter with limited support for high impedance glass
    - Dual pH & ORP All-In-One (“PtD”) configuration for simultaneous measurement of pH & ORP from one sensor

Most pH & ORP sensing element configuration options can be combined to applications requiring multiple features for best results. Please inquire to factory for assistance with any desired blended base model part number compatibility.

2. Non-Porous Cross-Linked Polymer Reference System

ASTI pH & ORP sensors employ the ***ONLY truly solid state reference system*** in existence. A solid state reference is a non-porous & non-permeable system in which only selective ionic communication with the secondary junction (and tertiary junction) is permitted. This creates a very stable reference potential even during harsh process conditions.

The advantages of a solid state reference system over more conventional porous gel filled systems are that:

- Experiences much less aging and deterioration over long periods of time for low drift and maintenance
- Solid-state construction allows for scraping clean with a straight-edge razor to extend sensor lifetime when fouled
    - Competitor sensors cannot undergo rigorous mechanical & chemical cleaning to maximize lifetime
- It is not easily dried out when exposed to air for prolonged periods
    - Can be “recuperated” even after left dry in storage or process to salvage sensors from improper use
    - Available in “Extreme Dehydration Resistant” version for intermittent wet and dry use (“E”)

- Does not absorb fluids or gases into junction and is significantly more impervious to solvents
    - Ideal for applications with dissolved ammonia (“A”), chlorine (“C”), sulfide (“X6XX”) gases present
    - Ideal for applications where volatile organic solvents may be present (“X7XX” series)
- Stable operation even in the presence of harsh chemical attack at high temp in the presence of abrasive slurries
- Composition of solid-state conductive polymer is optimized for the intended application based upon a combination of the base model series designation and the invoked options
    - Standard as double junction type with triple junction (“TJ”) available as option

This solid state reference system is embedded in a support matrix of either High-Density-Poly-Ethylene (HDPE) or Poly-Vinyli-Dene-Fluoride (PVDF, Trade name KYNAR) to impart robust industrial mechanical properties for heavy field use.

The combination of the pH and/or ORP sensor element(s) and the reference system employed defines the ten base model designation as detailed below. Note that not all base model series are available in sensor body materials of construction.

Base Model	**Description of Base Model Sensor Series**
X0XX Series:	General Purpose *(Capabilities vary with materials of construction)*
X1XX Series:	High Temperature Resistant (-5 to 135 °C)
X2XX Series:	Ultra High Temperature Resistant (-30 to 150 °C)
X3XX Series:	Slurry & Viscous Material Resistant *i.e. abrasive slurries and high particulate media*
X4XX Series:	Acid & Fluoride (HF) Resistant
X5XX Series:	Pulp & Paper Resistant
X6XX Series:	Dissolved Sulfides resistant *i.e. hydrogen sulfide gas (H_2S) and hydrogen sulfide (H_S^-) are present*
X7XX Series:	Aggressive Dissolved Gas & Volatile Organic Resistant
X8XX Series:	ORP Redox Sensing Sensor (Low-Profile Platinum Ball)

X9XX Series: Saturated Sodium (Brine) Resistant

Selected Additional Features Designated by Alpha Prefix Option Callouts:

Ammonia gas resistant (“A”) Chlorine gas resistant (“C”) Organic Media Resistant (“L”)

Solvent Resistant (“TS”) Triple Junction (“TJ”) ACCU-TEMP Fast-Response TC (“X”)

4 each Protective Tines (“GR”) 2 ea Protective Tines (“GRO”) No Protective Tines (“NG”)

Extreme Dehydration Resistant (“E”) Wide Range pH Glass (“V”) Low-Impedance Style pH glass (“Z”)

Selected Suffix Callouts for End of Cable Terminations:

Terminations for Analog pH & ORP sensors WITHOUT preamplifier or smart digital sensor board

· Male BNC Connector (“MBNC”) or Tinned Lead Wires (“TL”) à Black Cable

Terminations for Analog pH & ORP sensors WITH integral analog preamplifiers

· Tinned Lead Wires (“TL”) or NEMA 6P & IP67 rated quick disconnect snap connector (“Q7M”) à Gray Cable

· Braid Reinforced with Tinned Lead Wires (“BL”) à Blue Cable

Terminations for pH & ORP sensors WITH smart digital sensor board

· NEMA 6P & IP67 rated quick disconnect snap connector (“HiQ4M”) is standard à Green Cable

3. Resilient Plastic Body Housings

The plastic body housings based on the application’s requirements for temperature and pressure as well as the required chemical resistivity to the process constituents. Each plastic body housings is available in a wide variety of configurations.

Body Housing Materials of Construction:

Chlorinated Poly-Vinyl-Chloride (CPVC, XX1X series)

Poly-Phenyl-Sulfone (PPSU, trade name RADEL, XX3X series)

Poly-Ether-Ether-Ketone (PEEK, trade name KETASPIRE, XX4X series)

Poly-Phenylene-Sulfone (PPS, trade name RYTON, XX5X series)

Installation Configurations:

¾” – ¾” MNPT Inline/Immersion/Submersible 1” MNPT Twist Lock Bayonet Quick Disconnect

¾” – 1” MNPT Inline/Immersion/Submersible 1.5”, 2.0” & 2.5” TRI-CLOVER Sanitary

1” – 1¼” MNPT Inline/Immersion/Submersible 1.5”& 2.0” NPT HOT-TAP Valve Retractable

4. Integrated Electrical Components

Thermocompensators & Solution Grounds: Temperature Compensation Elements (TC’s) are embedded into each sensor to be compatible with the particular make of process instrumentation to which it shall mate. Some manufacturer’s instrumentation also requires a conventional or differential preamplifier (miniature high impedance CMOS operational amplifier used as a signal conditioner) as well as a temperature compensation element. Solution grounds (a.k.a. Liquid Earth) elements can be integrated for instruments employing differential preamplifiers or for sensor diagnostics support.

Analog Preamplifiers: can be integrated all mounting configurations (internal preamplifier) which are compatible with most all third party instrumentation make and model. The appropriate temperature compensation & solution ground elements are always embedded into each sensor as may be required. Analog preamplifiers are available in versions to operate up to a maximum operating temperature of 150 °C for inline installations and 115 °C when fully submersed in process. Analog preamplifiers are ideal for use in noisy electrical areas and long cable lengths up to 500 feet.

Smart Digital Sensor Boards: are available for all pH & ORP sensor models, configurations & installation types. This style is recommended for all new installation points to take advantage of all of the modern features such as the ability to calibrate at one location and to install the sensor into service at another location while having those calibration values automatically loaded to the transmitter. Additional benefits include tracking of last five calibrations, sensor model (item), installation & last used in field date, total time in service as well as traceability for purchase order & invoice number. Distances up to 610 meters (2,000 feet) between sensor & transmitter with standard NEMA 6P rated snap connectors without loss of signal quality allows for locating transmitter away from hazardous areas to reduce new system costs.

5. Waterproofing Options for Submersible Installations

The waterproofing options are available for all pH & ORP sensor and divided into four “families”: The “A” family is for basic isolation from washdown, moisture or

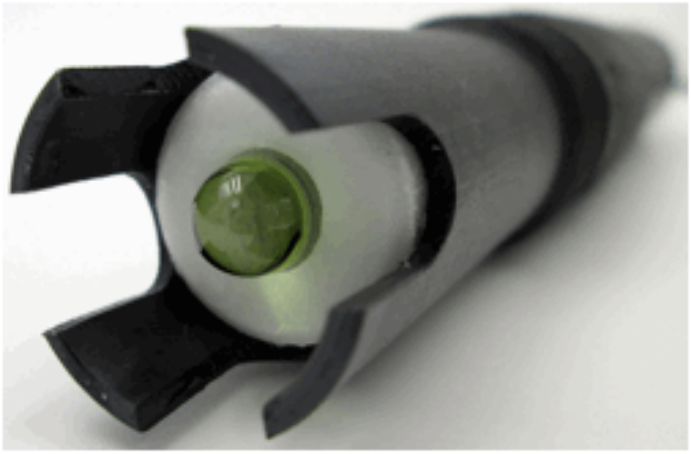
rain. The “B” family is fully submersible without an immersion tube and include a hose to protect the sensor cable for the entire wetted depth. The “C” family has robust sealing cap added for extra isolation compared to the “A” type seal. The “A”, “B” & “C” families all come standard with a double moisture sealing barrier. The “IT” family is a compact seal that still includes tubing for cable isolation. Waterproofings available in polypropylene (PP) or CPVC materials with installed sealing hoses in braid-reinforced vinyl or NORPRENE materials.

ZEUS™ Analog & Smart Digital pH Sensors *(Typically In Stock for Fast Shipment)*

The ZEUS sensor series are typically in stock to handle urgent critical installations. The ZEUS sensors include standard the various features needed for use in slurry/viscous media in dissolved ammonia, chlorine and sulfide gases as well as aggressive volatile organic solvents at temperature up to 150 °C and pressures up to 200 psig. The ZEUS sensor is fully submersible even without the use of an immersion tube or standpipe. Analog configurations are available without an integral preamplifier (Item # 1202) or else with an integral conventional (Item # 1203) or differential (Item # 1204) preamplifier. ZEUS smart digital configuration (Item # 1205) is for use with the 3TX-HiQ-pH Intelligent pH transmitter.

Selected Photos for Visualization of Design Aspects of IOTRON™ & ZEUS™ Industrial pH & ORP Sensors

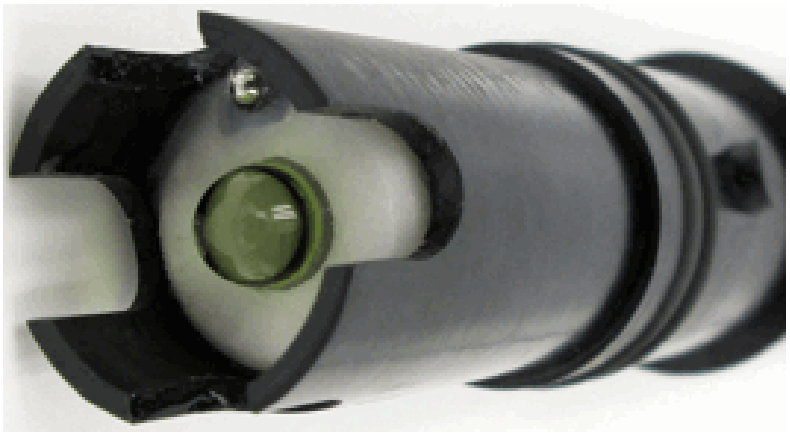
Close-Ups of Sensor Tip



Model: PN 6053-100-15-TL General Purpose Analog Inline & Immersion pH Sensor (Submersible with Immersion Tube)

1. *General Purpose Hemispherical 8mm MUGG pH Glass (X0XX)*
2. *General Purpose Solid-State Conductive Polymer Double Junction Reference*

System in HDPE Junction Support Matrix (X0XX)
3. ¾”- ¾” MNPT RYTON Sensor Body Housing shown in the default 4 each Protective Tines Configuration (6X53 Series)
4. Integral Pt100 Temperature Compensation (TC) Element, Complete with 15 feet (4.6 meters) cable & Tinned Lead Wires



Model: PNGRXPtD 8052-1000-10-TL Dual pH/ORP All-In-One Sensor for Inline Bayonet Style Quick Disconnect Installations

1. General Purpose Dual pH/ORP All-In-One Style Sensor (X0XX) with “PtD” Option Invoked (Two each Reference Half-Cells Style)
2. General Purpose Solid-State Conductive Polymer Double Junction Reference System in HDPE Support Matrix (X0XX)
3. 1” MNPT RYTON Twist Lock Quick Disconnect Sensor Body in the 4 each Protective Tines “GR” Configuration (8X52 series)
4. Integral ACCU-TEMP Fast-Response Pt1000 TC, Complete with 10 feet (3 meters) cable & Tinned Lead Wires Terminations

Model: PNTJ 6831/6631-HiQ Sulfide Resistant Smart Digital Inline & Immersion ORP Sensor (Submersible with Standpipe)

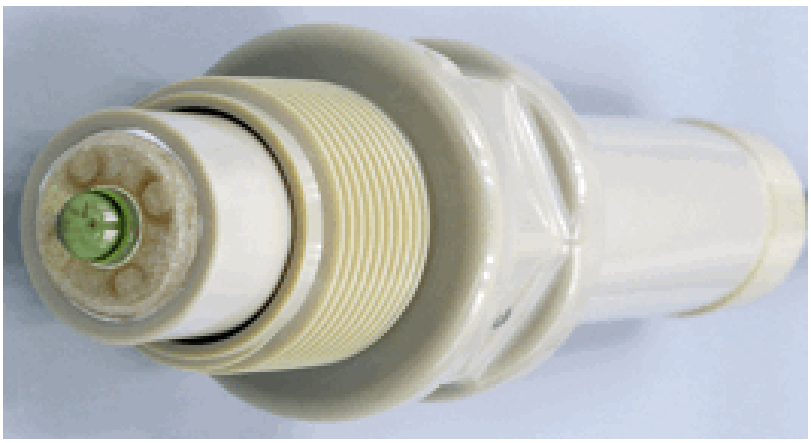
1. Low-Profile Platinum Ball ORP Sensing Element (X8XX)
2. Sulfide Resistant Solid-State Conductive Polymer Triple Junction (“TJ”)

Reference in KYNAR Junction Support Matrix (X6XX)
3. ¾”- 1” MNPT RADEL Sensor Body shown in the default 4 each Protective Tines Configuration (6X31 Series)
4. Integral Pt1000 TC and Smart Digital Sensor Board, Complete with 20 feet (6 meters) cable & HiQ4M NEMA 6P snap connector

Model: PNACXTJ 5331-CONV-30-Q7M High Viscosity & Slurry Resistant pH Sensor for HOT-TAP Valve Retractable Installs

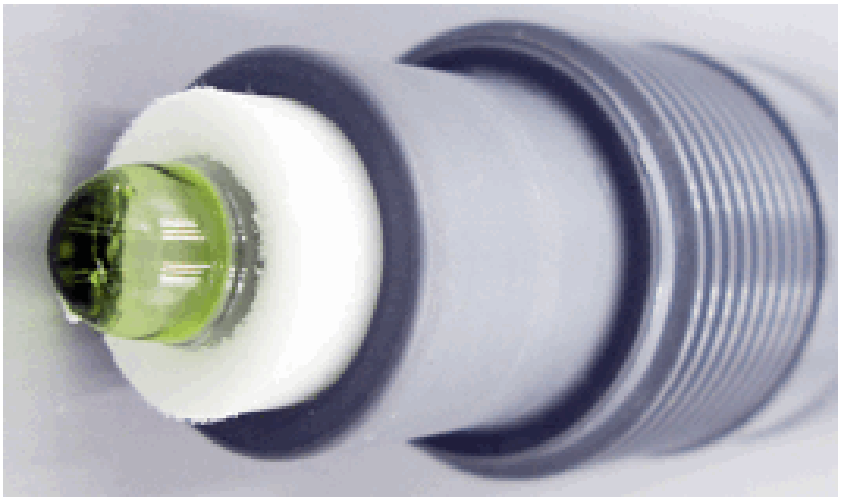
1. Low-Profile Thick-Wall Break-Resistant Parabolic pH Glass for high Viscosity Solutions & up to 50% Abrasive Slurries (X3XX series)
2. Slurry (X5XX), Dissolved Ammonia & Chlorine Gas (“AC”) Resistant Triple Junction (“TJ”) Reference in KYNAR Matrix
3. Sanitary & HOT-TAP Style Sensor Body in no tines configuration, Double O-ring Seals for use with High Pressure Sensor Holder
4. Integral Pt1000 TC and Analog Conventional Preamp, Complete with 30 feet (9 meters) cable & Q7M NEMA 6P snap connector

General Note: The large surface area solid-state non-porous conductive polymer reference system can seen in the photos above between the pH/ORP glass element and sensor body housing (white for HDPE & brown for KYNAR support matrix). Normal operation is possible even when a significant percent of the reference is fouled from process media thus minimizing the required cleaning frequency.



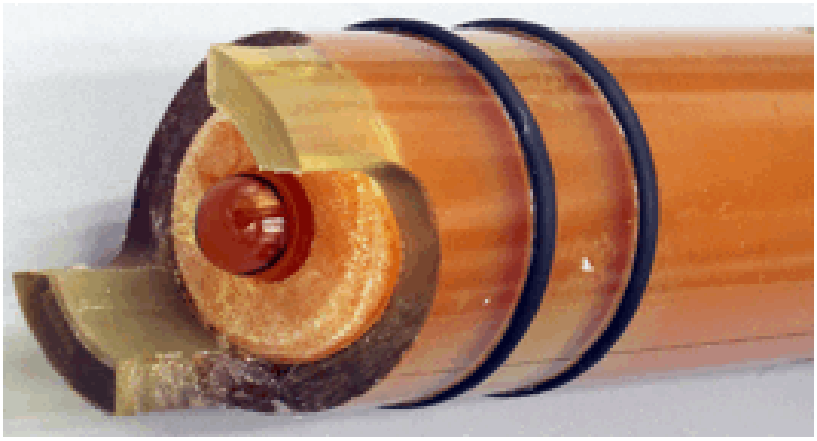
Model: PNK 8741-3000-20-MBNC Aggressive Dissolved Gas & Volatile Solvent Resistant Twist Lock Quick Disconnect Sensor

1. Dissolved Gas & Organic Solvent Resistant pH Glass (X7XX)
2. Dissolved Gas & Volatile Organic Solvent Resistant Solid-State Double Junction Reference in KYNAR Junction Matrix (X7XX)
3. 1” MNPT PEEK Twist Lock Quick Disconnect Sensor Body in the default No Protective Tines Configuration (8X41 series)
4. Integral Balco 3K Temperature Compensation (TC) Element, Complete with 20 feet (6 meters) cable & Male BNC Connector



Model: PN 2012-1000-10-MBNC Low-Cost Inline pH Sensor for General Purpose Applications Optimized for Longevity

1. General Purpose pH Glass (X0XX)
2. General Purpose Solid-State Double Junction Reference in Compact Form Factor HDPE Junction Support Matrix (2X12 & 6X11 series)
3. ¾”- ¾” MNPT CPVC Sensor Body Housing in the No Protective Tines Configuration (Optional removal ¾” NPT guard is available)
4. Integral Pt1000 Temperature Compensation (TC) Element, Complete with 10 feet (3 meters) cable & Male BNC Connector Special Note: The 2X12 & 6X11 hold a gross excess of potassium chloride in the reservoir for excellent longevity in moderate service conditions. For more aggressive conditions other sensor models should be employed.



Model: PNXGRO 5131/5931-HiQ Hi-Temp & Saturated Sodium Resistant Smart Digital Sanitary Sensor (TRI-CLOVER Installs)

1. Saturated Brine & Hi-Temp Resistant pH Glass (X1XX & X9XX)
2. Saturated Sodium & High Temperature Resistant Solid-State Double Junction Reference in KYNAR Matrix (X1XX & X9XX)
3. Sanitary & HOT-TAP Style Sensor Body in 2 each protective tines "GRO" configuration, for TRI-CLOVER sanitary sensor holder
4. Integral ACCU-TEMP Pt1000 TC & Smart Digital Sensor Board, With 20 feet (6 meters) cable & HiQ4M NEMA 6P snap connector

Model: ZEUS™ Smart Digital pH Sensor (Item # 1205) for Severe Service Industrial Inline, Immersion & Submersible Process Use

1. Low-Profile Thick-Wall Break-Resistant Parabolic pH Glass for high Viscosity Solutions & up to 50% Abrasive Slurries & High Temp. & Pressure Service Conditions (Max 150 °C @ 200 psig)
2. Slurry, Ammonia, Chlorine, Sulfide Gas & Organic Solvent Resistant Triple Junction ("TJ") Reference in KYNAR Matrix
3. 1"- 1¼" MNPT RADEL Sensor Body with 4 each Extra Thick Wall Protective Tines Configuration (ZEUS pH Sensor Series)
4. Integral Pt1000 TC and Smart Digital Sensor Board, Complete with 20 feet (6

meters) cable & HiQ4M NEMA 6P snap connector5. Waterproofing Style "IT" for 1¼" MNPT sensors fully submersible up to 12 feet without using an immersion tube of standpipe

Note for Sanitary, HOT-TAP & Twist Lock Quick Disconnect Bayonet Style Sensors:

*The standard material of construction for the double (redundant) sealing O-rings for all sanitary & HOT-TAP series sensors (5X31, 5X41 & 5X51) is Viton® -75. Alternatively these sealing O-rings can be supplied in the CV75 ("W"), Simriz® 485 ("U") or Kalrez® 4079 ("K") materials **

** Additional charges apply for these options. Not all options available on all models (inquire to factory). ® Viton and Kalrez are registered trademarks of DuPont. Simriz is a registered trademark of Freudenberg Sealing Technologies (SIMRIT).*

Standing Side Views of Selected Sensor Assemblies

¾”– ¾” MNPT RYTON Inline & Immersion Series *Shown with the basic grommet only sealing on back of sensor*

1”MNPT RYTON Twist Lock Inline Sensor Series *PEEK Receptacle Fitting, Waterproofing “IT” on back of sensor*

¾”– 1” MNPT PEEK Inline & Immersion Series *Inline & Immersion Use Submersible without use of immersion tube*

1”– 1¼ “ MNPT RADEL ZEUS pH Sensor Series *Inline & Immersion Use Submersible without use of immersion tube*

¾”– 1” MNPT RADEL Inline & Immersion Series *For submersible use seal the rear threads onto a mating immersion tube*

The photos above are not exhaustive of all of the available sensor configurations & installation styles but rather are merely meant for visualization purposes of a few models. The **IOTRON™ customized built-to-order sensors** ensure that the materials of construction are compatible with the process media & conditions while minimizing cost by selecting only the required features. The sensors with RADEL material of construction for the sensor body the position and size of the solid-state non-porous non-permeable conductive polymer reference system can be seen until the point where the sealing layers obstruct the view. The large surface area single construction solid-state reference system occupies more than 65% of the sensor volume ensuring long lasting operation in even the most aggressive process media and sever service conditions.

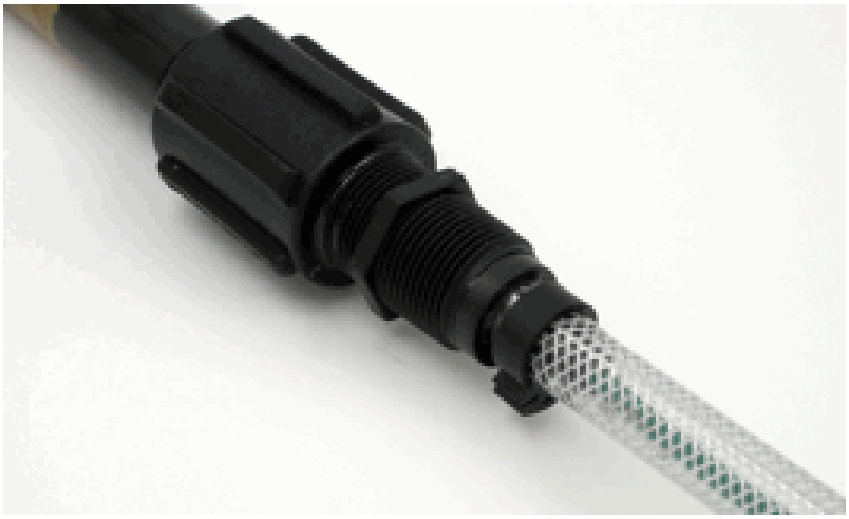
Close-Up Views of Waterproofing Sealing Options for Submersible Installations

***Standard (Default) Grommet on Cable* Sealing Complete with double heat-shrink sealing**

for basic isolation

The standard grommet on cable sealing is suitable for use in installations where the back of the sensor will not be exposed to any significant amount of process fluid, moisture, washdown or rain. For outdoor installation some type of waterproofing should be installed unless the cable is run in conduit. If the sensor will be installed as an immersion of submersible style the rear threads must be carefully sealed onto an immersion tube or standpipe if not waterproofing option is invoked. No coding is necessary for this grommet sealing since it is the default style.

Waterproofing "B" Suitable for Very Aggressive Agitated Slurry Solutions & Corrosive Liquids with Complete Cable



Isolation *Complete isolation of back end threaded fitting from liquid process and good protection of cable from corrosion and chemical attack. Rear threads are identical to that specified on original sensor specifications prior to application of Waterproofing "B" Option. Hex heads for wrench flats enable easy installations into fixtures. Recommended for extremely corrosive installations, especially those that do*

not utilizes any kind of immersion tube, standpipe, guide rod or conduit. WPB sealing is the best choice for extremely slurry/viscous process media that can abraid cables.

***Waterproofing "A" Suitable For Most Submersible Installations when installed with immersion tube (a.k.a.* guiderod or standpipe)**

Complete isolation of back end threaded fitting from liquid process and good protection of cable from corrosion and chemical attack. The rear threading is identical to that specified on original sensor specifications prior to application of Waterproofing "A" Option. Hex heads for wrench flats enable easy installations into fixtures. Not recommended for very corrosive installations or submersible without sealing rear threads. WPA is primarily for elongating sensor life where attack of liquid from back causes failure prior to chemical or physical attack through front of probe.

Waterproofing "WPIT" Suitable For Most Submersible Installs Cost Effective Waterproofing Option with Complete

Isolation *Complete isolation of back end threaded fitting from liquid process and good protection of cable from corrosion and chemical attack. Optional NEOPRENE type tubing is shown above for use in high temperature and highly corrosive solutions. Major rear threading is identical to that specified on original sensor specifications prior to application of Waterproofing "IT" option. WPIT uses polypropylene material of construction and WPITC comes with CPVC material of construction. WPITC sealing is only available with thin-style vinyl tubing.*

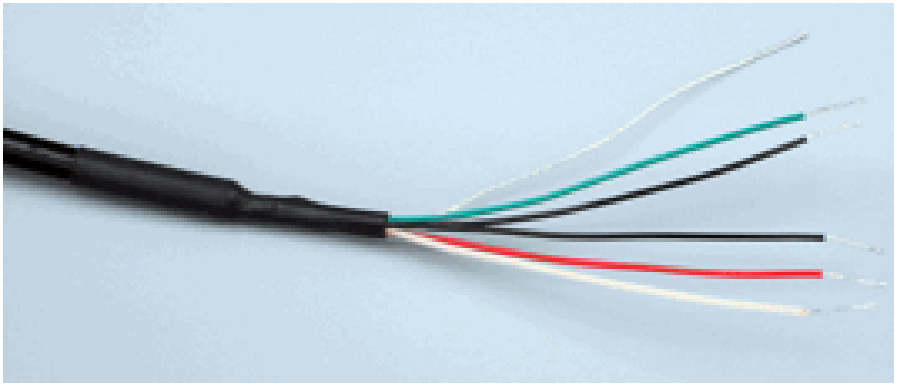
General Note on Waterproofing Materials of Construction & Sealing Hose Options:

The standard material of construction for the WPA/WPB/WPC/WPIT waterproofing seals is polypropylene (PP). Alternatively CPVC material of construction is available equivalent to the PP series as WPG/WPH/WPITC (note that CPVC material is not available as an equivalent to the WPC). For the WPB, WPH, WPIT, WPITC seals tubing can be installed. Standard tubing braid reinforced vinyl tubing with NORPRENE available for especially corrosive applications or process media that is either not compatible with or too high a temperature for vinyl tubing. Sensors that have a Q7M or HiQ4M snap connector the tubing seal must be installed by the ASTI factory at time of manufacture. No metal components are used in any of the waterproofing sealing options. Upon request a nylon hose clamp can be fitted to the tubing for the WPB, WPH, WPIT & WPITC assemblies.

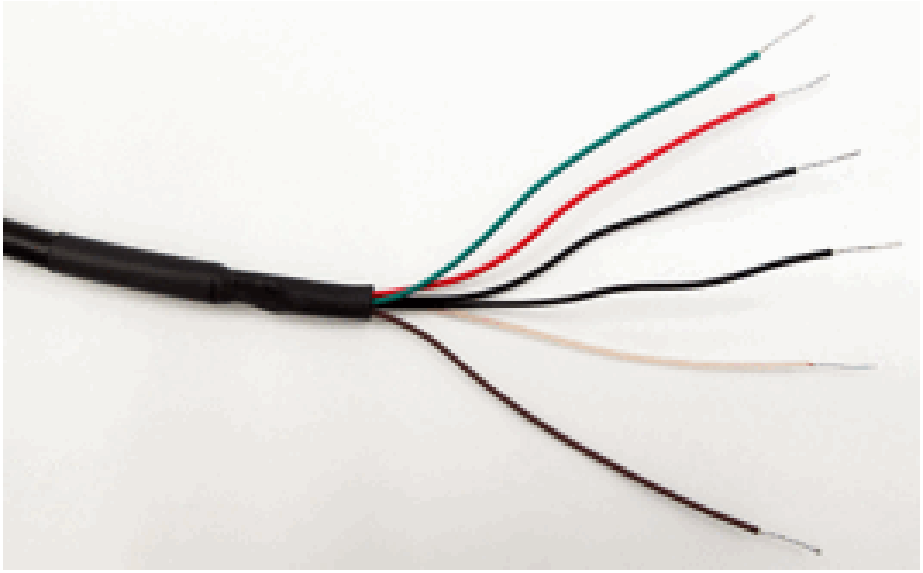
End of Cable Termination Options Available for Analog pH & ORP Sensors

Terminations for Analog pH & ORP sensors WITHOUT preamplifier or digital sensor board (Black Composite Cable)

"-MBNC" Male BNC connector for pH/ORP & Reference Signals, Temperature Compensation Signal on Two Black Leads

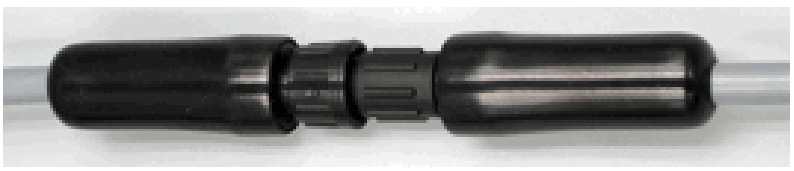


“-TL” Tinned Lead Wires: Clear is pH or ORP Signal, Red is for Reference, Black Leads are for TC, Green is Solution Ground a.k.a. Liquid Earth (if present) & Optional Drain for Outer Shield

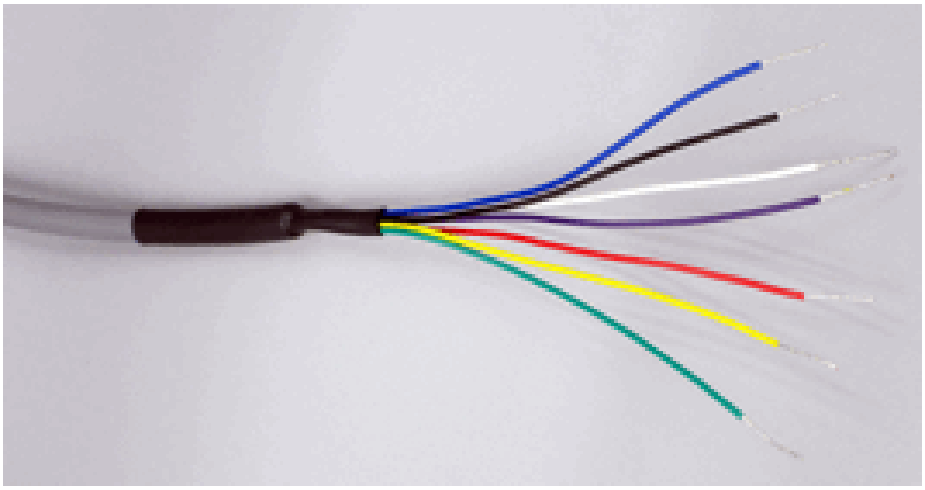


Tinned Leads For “PtD” Dual pH/ORP All-In-One Type Sensors:Clear for pH Signal, Brown is Reference for pHRed is ORP Signal, Green is Reference for ORP, Blacks Leads are for Temperature Compensation Elements

Terminations for Analog pH & ORP sensors with integral preamp (Gray or Blue Braid Reinforced Multiconductor Cable)



“-Q7M” quick disconnect male snap connector interfaced to Q7F female extension cable at top (NEMA 6P rated), Close-up of Q7M at bottom with rugged field sealing cap for longevity in field use



“-TL” for Gray Cable or “-BL” for Blue Braid Reinforced Cable Tinned Lead Wires: Color coding will vary depending upon mating transmitters. See hook-up schematics webpage or contact ASTI factory for wiring assistance BEFORE INSTALLATION.

Sample Complete Analog pH Sensor Assembly Photos for Visualization\

Submersible High HF Resistant pH Sensor with WPH Sealing & Integral Preamplifier with Braid Reinforced Blue Cable Option

Submersible High HF Resistant pH Sensor with WPH Sealing & Integral Preamplifier with Braid Reinforced Blue Cable Option TO RIGHT: Special Order Ultra-High Temperature Submersible Model 6261 PAEK Bodied pH Sensor with Parabolic pH glass & Polypropylene WPIT waterproofing with NORPRENE sealing hose, High Temperature rated analog preamplifier with braid reinforced blue cable for RF rejection

6X31 Series pH Sensor with Q7M Snap & Q7F Snap Extension

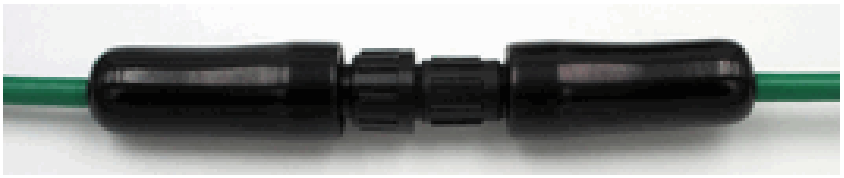
Cable 5731 Solvent Resistant pH Sensor Without Preamplifier & Tinned Leads

Sample Smart Digital pH Sensor Assembly Photos for Visualization

PNXGRE 5631/5331-HiQ-12m-WPB/20 Submersible Sulfide & Slurry/Viscous Resistant Smart Digital pH Sensor with Extreme Dehydration Resistant Junction for Intermittent Wet and Dry Use,12 meters (40 feet) of integral cable & WPB with 6 meters (20 feet) of reinforced vinyl tubing for installs down in a sewer through a manhole

PNHF 6431-HiQ-WPH/10 Fully Submersible Acid/Fluoride High HF Resistant Smart Digital pH Sensor with WPH waterproofing seal,6 meters (20 feet) of integral cable & 3 meters (10 feet) of braid-reinforced vinyl tubing; Typical applications include acid fluoride etching control & monitoring or industrial wastewater treatment (WWT) plants

Smart Digital ZEUS pH Sensor (Item # 1205) with 12 meters (40 feet) female snap to male snap extension cable shown interfaced; Max rating of 150 °C @ 200 psig, Fully Submersible to 12 feet, Typically uses include processes with dissolved ammonia, chlorine, sulfides & abrasive slurries.



HiQ4F Female Snap connector shown to Left,HiQ4M Male Snap connector shown to Right HiQ4M Male Snap & HiQ4F Female Snap connectors shown interfaced, NEMA 6P fully waterproof and corrosion resistant allow for convenient installation & maintenance in any industrial facility or site location.