



PNHF 6431 RADEL-KYNAR High HF & Fluoride Resistant series pH sensor without preamplifier; Complete with shielded black cable with tinned lead wire terminations



6X31 RADEL-KYNAR series pH sensor with integral preamplifier and Q7M quick disconnect snap connector interfaced with mating Q7F to tinned leads extension cable. The Q7M/Q7F connector system is rated NEMA 6P when interfaced and suitable for rugged field use.

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Inline, Immersion & Submersible Series pH & ORP Sensors for Continuous Measurement in Nearly Any Process Application & Installation Scheme

ASTI offers unique solutions for process measurement problems

- Leading novel and proprietary solid-state industrial pH sensor & ORP sensor design and technology combined with built-to-order extensively configurable manufacturing offer the best possible service lifetime at the most cost effective pricepoint.
 - Best reference service lifetime in process industry through proprietary, novel, non-porous, cross-linked, conductive polymer technology; Available in double junction (standard) or triple junction (optional "TJ") configurations
 - Rugged industrial grade sensors can operate in a temperature range from -35 to 150 degrees Celsius at pressures up to 150 psig for 3/4" MNPT screw-in type inline style installations
 - The solid state reference is highly resistant to dehydration and our thick wall glass is nearly impervious to cracking, even under high pressure conditions.
 - Base models for general purpose, high temperature resistant, ultra-high temperature resistant, slurry & viscous material resistant, acid/fluoride & HF resistant, pulp & paper resistant, aggressive dissolved gas & volatile organic solvent resistant, Oxidation Reduction Potential (ORP) and saturated sodium (brine) resistant.
 - Selected optional features include Ammonia gas resistant ("A"), Chlorine gas resistant ("C"), Wide Range -0.5 to +14.5 pH Media Resistant ("V"), Organic Media Resistant ("L"), Solvent Resistant ("TS"), 3-Wire TC ("M"), ACCU-TEMP Fast Response Temperature Compensation (TC) Element ("X"), 2 each Protective Tines Only Configuration ("GRO"), No Protective Tines Configuration ("NG"), Shielded Preamplifier Cable ("BL").
- Available with most any integral temperature compensation element (Pt100 or Pt1000 Standard), Solution Ground Liquid Earth (316SS or Platinum), Dual pH/ORP All-In-One Configuration and Conventional or Differential Analog preamplifier to allow for interfacing with most any existing OEM transmitter.
 - Available end of cable terminations include tinned leads, BNC connector sensors without integral preamplifier.
 - **Quick disconnect IP67 & NEMA 6P** rated waterproof and corrosion resistant **Q7M/Q7F snap connector** option is available for pH sensors and ORP sensors with integral preamplifiers.
 - **Available in smart digital configurations for use with intelligent pH/ORP digital transmitters. Detailed information about this smart digital type configuration option can be found in the separate 3TX-HiQ digital pH/ORP measurement product webpage.**
 - Wrench flats feature is standard for 3/4"-1" MNPT series pH sensors and ORP sensors (6X52, 6X51, 6X31, 6X41) and knurls feature is standard for 3/4"-3/4" MNPT series pH sensors and ORP sensors (6X53, 6X54, 6X32, 6X42 and 2X12, 6X11, 6X13, 6X12) to allow for securing sensor into threaded 3/4" FNPT inline process connection or 3/4" FNPT and 1" FNPT immersion tube without damaging sensor body.

- Back of sensor 3/4" MNPT and 1" MNPT threads can be sealed with waterproofing option for use in immersion or submersible type applications as well as for inline use. All inline, immersion & submersible sensor series except the 2X12 & 6X11 are suitable for immersion and submersible type installations since they come standard 4 each protective tines as the default configuration. It is recommended to also consider selecting a Waterproofing Option for Fully Submersible Assemblies. Inline, immersion & submersible sensor series are available in 2 each only protective tines configuration ("GRO") for ease of cleaning for process measurements where extensive buildup is common as well as the no protective tines configuration ("NG") for cases where this is desirable to minimize fouling build-up on the measuring tip (typically only used in conjunction with the low-profile thick-wall break-resistant parabolic style pH glass configurations).
- Wrench flats feature is standard for 3/4"-1" MNPT series pH sensors and ORP sensors (6X52, 6X51, 6X31, 6X41) and knurls feature is standard for 3/4"-3/4" MNPT series pH sensors and ORP sensors (6X53, 6X54, 6X32, 6X42 and 2X12, 6X11, 6X13, 6X12) to allow for securing sensor into threaded 3/4" FNPT inline process connection or 3/4" FNPT and 1" FNPT immersion tube without damaging sensor body.
 - Care must be taken not to over-tighten any sensor to avoid damage during commissioning or insertion and removal from process for cleaning, recalibrating or replacement during maintenance. Consult ASTI factory for assistance to ensure best practice care and use.
- Each standard sensor selection and/or special customized sensor design are based upon a thorough review of the customer supplied application information by senior in-house chemists to ensure that the best possible choice of available pH sensor or ORP sensor model and options is made at the lowest possible price configuration which is suitable for the intended process measurement & installation scheme.
- pH sensors & ORP sensors are manufactured with sensor body housing materials of construction ranging from cost-effective Chlorinated-Polyvinyl-Chloride (CPVC) for simpler measurement requirements to rugged RADEL® (Poly-Phenyl-Sulfone, PPSU), KETASPIRE® (Poly-Ether-Ether-Ketone, PEEK) or RYTON® (Poly-Phenylene-Sulfone, PPS) to handle even the most difficult field process measurement applications.
- Thick-wall break resistant low-profile parabolic pH glass element for slurry and viscous type process media extends service life for tough installations. This type of rugged parabolic thick-wall, low-profile, break-resistant pH glass is now standard for all X3XX series pH sensors.
- Novel extreme dehydration resistant reference technology option allows sensor to endure prolonged exposure to dryness as well as intermittent wet and dry operation conditions for batch applications and uncertain fluid levels



Q7M sensor end of cable snap connector detail close-up view.



Q7F-Xm-TL Female snap to tinned leads extension cable



Q7M/Q7F connectors are NEMA 6P rated when properly interfaced (protective boots are supplied when not in use).



PNHF 6431 high HF resistant submersible pH sensor with integral preamplifier using shielded & braid reinforced blue cable for use in high noise areas. WPH seal for fully submersible use.



**APPLICATIONS FOR IOTRON™ IMMERSION SERIES
BUILT-TO-ORDER pH SENSORS & ORP SENSORS
WITH EXTENSIVE CUSTOMIZATION OPTIONS**

- Measurement in strong acids or bases
- Acid fluoride etching solutions
- HF waste treatment systems
- High Temperatures & Pressures
 - Examples include ammonium nitrate manufacturing, sugar extraction
 - Treatment of discharge from processes employing autoclaves
- Pulp digesters for Kraft type mills
- Bleaching lines for white paper mills
- Abrasives and Viscous Processes
- Extraction of precious metal ore with floatation tanks and concentrators
- Gold extraction circuits with cyanide (batch or continuous)
- Cyanide destruction with peroxide and/or sulfur dioxide
- Dissolved Sulfides such as hydrogen sulfide gas (H₂S), hydrogen sulfide (HS⁻) or sulfide ion (S²⁻)
- Solvent extraction (SX) with kerosene and other long chain hydrocarbons
- Measurement in most Volatile Organic Compounds (VOC) and most Organic Solvents
- Biodiesel and ethanol fuels
- Processes employing dissolved chlorine (Cl₂), chlorine dioxide (ClO₂), ammonia (NH₃), sulfur dioxide (SO₂) and nitric oxide (NO) and nitrous oxide (NO₂) sometimes together referred to as (NO_x) type gases
- Municipal or industrial wastewater treatment
- General Purpose pH monitoring or control for discharge compliance

**TECHNICAL CAPABILITIES OF IOTRON™ IMMERSION
SERIES BUILT-TO-ORDER pH & ORP SENSORS WITH
EXTENSIVE CUSTOMIZATION OPTIONS**

- Low pH range down to -0.5 (with ASTI calibration procedures and buffers)
- High pH range up to 14.5 (with ASTI calibration procedures and buffers)
- Low Temperatures down to -15 degrees Celsius (°C)
- High Temperatures up to 150 degrees Celsius (°C)
- High Pressures up to 150 psig (with RADEL or PEEK bodied type sensors)
- Insertion depths up to 6 feet into tank or line with compression fitting assembly installation scheme
- Mining Slurries up to 50% solid & particulate content
- Solids Content up to 12% consistency pulp
- Fluorides up to 50,000 ppm and -0.5 pH
- Support for measurement in most dissolved gases up to saturation
 - Examples include chlorine, chlorine dioxide, ammonia, sulfide gases
- Cyanides up to 10,000 ppm
- Almost All Organic Chemical Mixtures
 - Minimum ~1% aqueous content required to ensure stable readings
- Clean in Place (CIP) processes with hot acid and hot base for food and beverage and pharmaceutical use
- Sterilization with Peroxide (H₂O₂) and Ozone (O₃)
- Up to 600% Saturation Dissolved Oxygen (O₂)
- Fully submersible assembly that can be installed by thick reinforced vinyl tubing seal on cable
 - For best results the use of a suitable immersion tube, standpipe or guiderod is recommended to fix the installation location and to minimize mechanical related damage is recommended

**Photos of Selected of Inline & Immersion pH Sensors & ORP Sensors
For Visualization of Available Configurations & Options**



** 6841 PEEK-KYNAR
ORP sensor*

** Organic Solvent &
Gas Resistant*

** Low-Profile Platinum
Ball ORP Element is
ideal for slurries and
high velocity inline
process installations*



** 6741 PEEK-KYNAR
pH sensor*

** Organic Solvent &
Gas Resistant*

** Wide range -0.5 to
+14.5 MUGG pH glass
element for
measurements in
organic synthesis &
solvent recovery*



** 6X31 RADEL-KYNAR
Series ORP sensor*

** Excellent chemical,
thermal, mechanical
properties for multiple
uses from one sensor*

** Solid-state double or
triple junction reference
systems for low-
maintenance*



** 6X11 CPVC-HDPE
Series pH sensor*

** Cost effective for
price sensitive uses*

** Inline, Immersion
or Submersible use*

** Available without
tines (inline only) or
2 each tines "GRO"
or 4 each "GR" tines*



** 2X12 CPVC-HDPE
Inline pH sensor*

** No protective tines
to minimize fouling*

** Rugged 8MM
MUGG pH glass
* Precise readings in
cleaner solutions*

** Holds calibration
for long periods*

**Materials of Construction for Sensor Body of
Inline, Immersion & Submersion Series pH Sensors & ORP Sensors**

Body Housing ProTherm®
Chlorinated-Polyvinyl-
Chloride, CPVC

2X12, 6X11, 6X13, 6X12
Series Sensors

Body Housing RADEL®
Poly-Phenyl-Sulfone, PPSU

6X32, 6X31
Series Sensors

Body Housing KETASPIRE®
Poly-Ether-Ether-Ketone,
PEEK

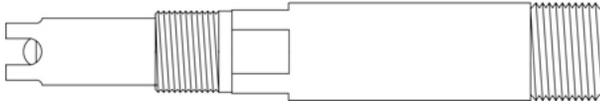
6X42, 6X41
Series Sensors

Body Housing RYTON®
Poly-Phenylene-Sulfone,
PPS

2X12, 6X11, 6X53, 6X54, 6X52,
6X51 Series Sensors

Dimensional Drawings for 3/4"-1" MNPT & 3/4"-3/4" MNPT Inline, Immersion & Submersion pH Sensor & ORP Sensor Bodies

3/4"-1" MNPT SERIES SENSORS FOR INLINE, IMMERSION & SUBMERSIBLE INSTALLATIONS



3/4"-1" MNPT pH Sensor Dimensional Drawing 6-1 Hemispherical pH Glass Element

- 6052/6051/6031/6041
General Purpose & Wide Range Resistant
- 6151/6131/6141 & 6231/6241
High Temperature & Ultra-High Temperature Resistant
- 6452/6451/6431/6441
Acid, Fluoride & HF Resistant
- 6651/6631/6641
Hydrogen sulfide gas (H₂S), hydrogen sulfide (HS⁻) or sulfide ion (S²⁻) Resistant
- 6731/6741
Aggressive Dissolved Gas & Volatile Solvent Resistant
- 6952/6951/6931/6941
Saturated Sodium (Brine) Resistant

3/4"-3/4" SERIES SENSORS FOR INLINE, IMMERSION & SUBMERSIBLE INSTALLATIONS



3/4"-3/4" MNPT pH Sensor Dimensional Drawing 6-5 Hemispherical pH Glass Element

- 6012/6013/6032/6042/6053/6054
General Purpose & Wide Range Resistant
- 6132/6142/6154 & 6232/6242
High Temperature & Ultra-High Temperature Resistant
- 6412/6413/6432/6442/6453/6454
Acid, Fluoride & HF Resistant
- 6632/6642/6654
Hydrogen sulfide gas (H₂S), hydrogen sulfide (HS⁻) or sulfide ion (S²⁻) Resistant
- 6732/6742
Aggressive Dissolved Gas & Volatile Organic Solvent Resistant
- 6912/6913/6932/6942/6953/6954
Saturated Sodium (Brine) Resistant

3/4"-1" MNPT pH Sensor Dimensional Drawing 6-2 Low-Profile Parabolic Thick-Wall Break-Resistant pH Glass

- 6352/6351/6331/6341
Slurry & Viscous Media Resistant
- 6551/6531/6541
Pulp & Paper Resistant

3/4"-3/4" MNPT pH Sensor Dimensional Drawing 6-6 Low-Profile Parabolic Thick-Wall Break-Resistant pH Glass

- 6312/6313/6332/6342/6353/6354
Slurry & Viscous Media Resistant
- 6532/6542/6554
Pulp & Paper Resistant

3/4"-1" MNPT ORP Sensor Dimensional Drawing 6-1-Pt Low-Profile Platinum Ball Style ORP Sensing Element

- 6852/6851/6831/6841
Oxidation Reduction Potential (ORP)

3/4"-3/4" MNPT ORP Sensor Dimensional Drawing 6-5-Pt Low-Profile Platinum Ball Style ORP Sensing Element

- 6812/6813/6832/6842/6853/6854
Oxidation Reduction Potential (ORP)

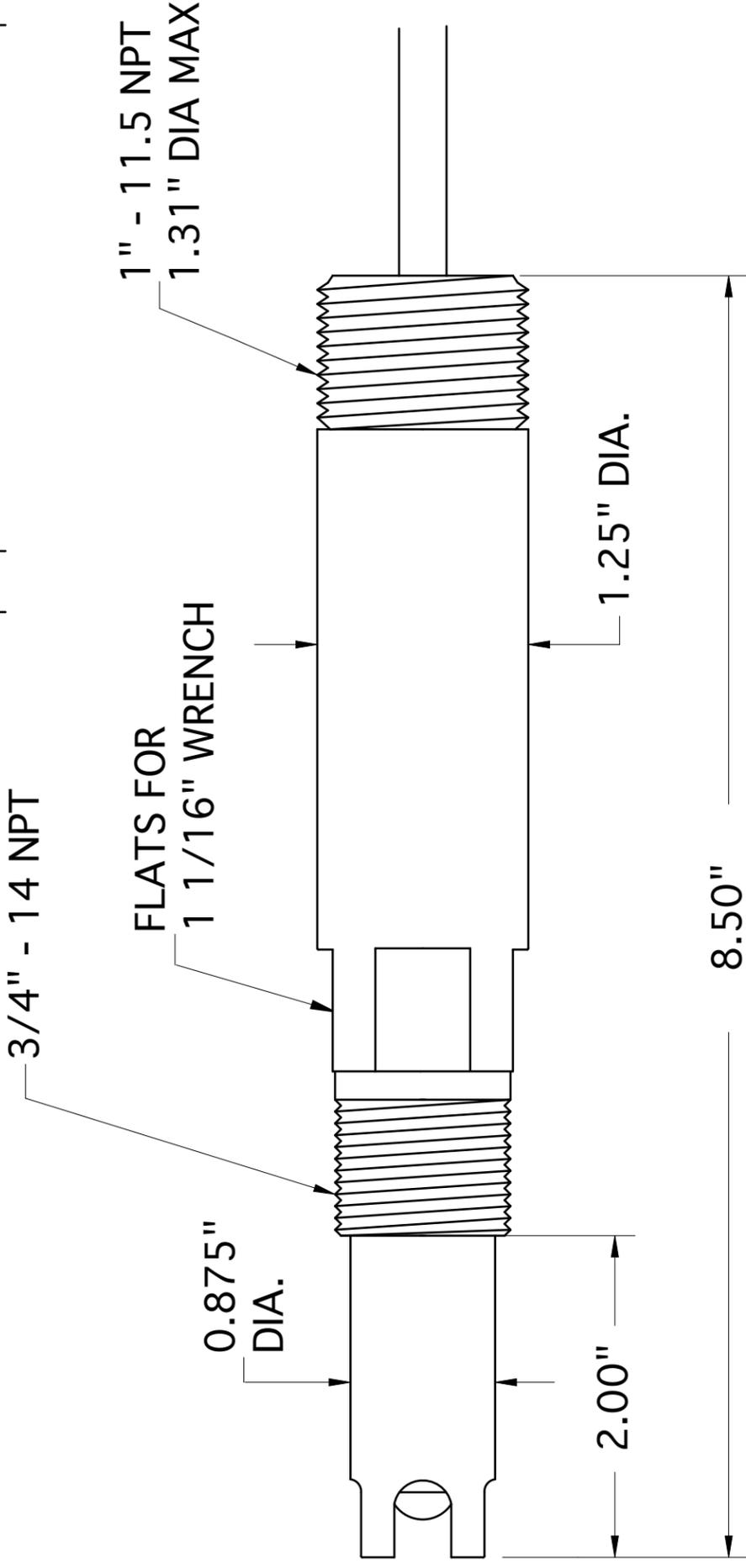
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REVISION HISTORY		
REV	DESCRIPTION	DATE

APPROVED



A

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NOTES

- All dimensions are in inches, unless otherwise indicated with tolerances as detailed below
- Sensor body material of construction is RADEL (6X31), PEEK (6X41) or RYTON (6X51, 6X52)
- Drawing shown in the standard with protective tines configuration (4 places, 90 degrees apart). The 2 protective tines only "GRO" configuration (2 places, 180 degrees apart) is optional.
- In the alternate without tines configuration ("NG") the sensor body is exactly 8.0 inches in length. The max displacement for hemispherical pH glass is 0.3" yielding a max insertion depth of 1.8 inches past threads & overall max length of 8.3 inches.
- Do not use any sensor beyond the factory defined maximum temperature or pressure rating.

B

B



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 Website: <http://www.astisensor.com>

TITLE		3/4"-1" MNPT Inline / Immersion / Submersible	
SIZE	PROJECT	DRAWING NO.	REV
B	IMMERSION	6-1 pH SENSORS	/
SCALE	Not to Scale	MODEL	SHEET
		6X31,6X41,6X51,6X52	1 OF 1

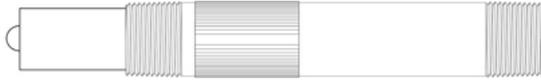
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Dimensional Drawings for 3/4"-1" MNPT & 3/4"-3/4" MNPT Inline, Immersion & Submersion pH Sensor & ORP Sensor Bodies (Continued)

3/4"-3/4" SERIES SENSORS FOR INLINE, IMMERSION* & SUBMERSIBLE* INSTALLATIONS



[3/4"-3/4" MNPT pH Sensor Dimensional Drawing 6-3 Hemispherical pH Glass Element](#)

- 6011 Series General Purpose & Wide Range Resistant
- 6411 Series Acid, Fluoride & HF Resistant
- 6911 Series Saturated Sodium (Brine) Resistant

[3/4"-3/4" MNPT pH Sensor Dimensional Drawing 6-4 Low-Profile Parabolic Thick-Wall Break-Resistant pH Glass](#)

- 6311 Series Slurry & Viscous Media Resistant

[3/4"-3/4" MNPT ORP Sensor Dimensional Drawing 6-3-Pt Low-Profile Platinum Ball Style ORP Sensing Element](#)

- 6811 Oxidation Reduction Potential (ORP) Sensor

* Immersion or Submersible installations for these sensor series require that either the "GR" or "GRO" option is invoked to avoid breakage during field use of maintenance operations such as cleaning and re-calibration.

3/4"-3/4" SERIES SENSORS FOR INLINE, IMMERSION** & SUBMERSIBLE** INSTALLATIONS



[3/4"-3/4" MNPT pH Sensor Dimensional Drawing 6-9 Hemispherical pH Glass Element](#)

- 2012 Series General Purpose & Wide Range Resistant
- 2412 Series Acid, Fluoride & HF Resistant
- 2912 Series Saturated Sodium (Brine) Resistant

[3/4"-3/4" MNPT pH Sensor Dimensional Drawing 6-10 Low-Profile Parabolic Thick-Wall Break-Resistant pH Glass](#)

- 2312 Series Slurry & Viscous Media Resistant

[3/4"-3/4" MNPT ORP Sensor Dimensional Drawing 6-9-Pt Low-Profile Platinum Ball Style ORP Sensing Element](#)

- 2812 Oxidation Reduction Potential (ORP) Sensor

** Immersion or Submersible installations for these sensor series require a separate removable CPVC protective guard to be installed to protect from breakage in use or maintenance. Inquire to factory for details about this item.

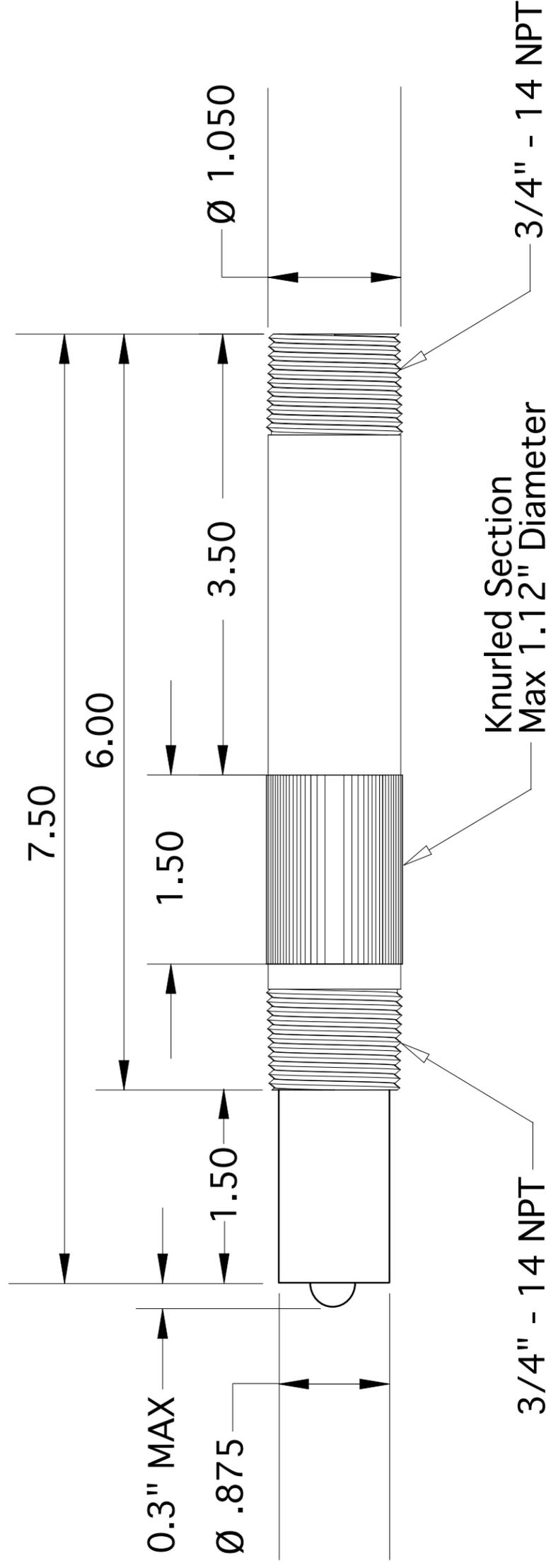
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REVISION HISTORY		
REV	DESCRIPTION	DATE

APPROVED



NOTES

- All dimensions are in inches, unless otherwise indicated with tolerances as detailed below
- Sensor body material of construction is CPVC standard or RYTON when Alpha Prefix "PPS" is invoked
- Drawing shown in the standard without protective tines configuration typical for inline installations.
- In no guard configuration the max displacement for hemispherical pH glass is 0.3" yielding max insertion depth of 1.8 inches past front 3/4" MNPT threads yielding an overall max length of 7.8 inches.
- Optional protective tines guard recommended for immersion & submersible installations (not shown).
"GR" Alpha Prefix option yields four (4) each protective tines, 90 degrees apart or
"GRO" Alpha Prefix option yields two (2) each protective tines, 180 degrees apart
- Overall sensor length is 8.00 inches in either the "GR" or "GRO" configuration with 0.5 inch guard.
- Do not use any sensor beyond the factory defined maximum temperature or pressure rating.

B



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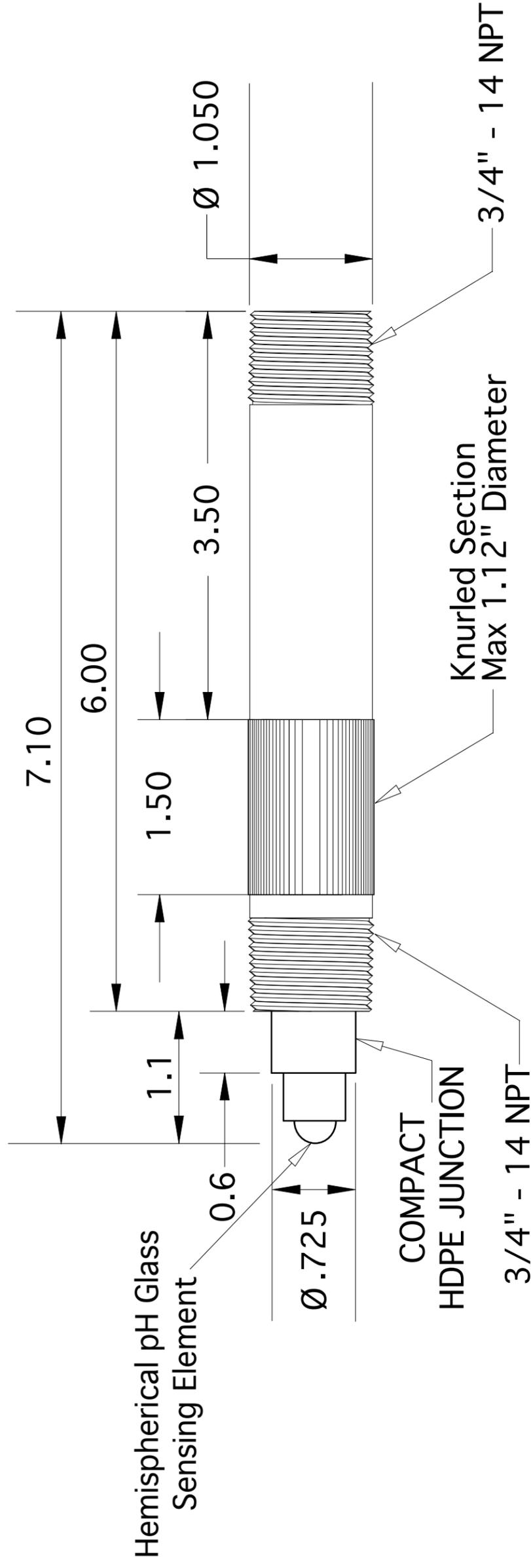
TITLE		3/4"-3/4" MNPT Inline / Immersion / Submersible	
SIZE	PROJECT	DRAWING NO.	REV
B	IMMERSION	6-3 pH SENSORS	/
SCALE	Not to Scale	MODEL	SHEET
		6X11 ONLY	1 OF 1

1

2

3

REVISION HISTORY		
REV	DESCRIPTION	DATE



Hemispherical pH Glass Sensing Element

COMPACT HDPE JUNCTION

Knurled Section Max 1.12" Diameter

NOTES

1. All dimensions are in inches, unless otherwise indicated with tolerances as detailed below
2. Sensor body material of construction is CPVC standard or RYTON when Alpha Prefix "PPS" is invoked
3. Drawing shown in the standard without protective tines configuration used for inline installations.
4. Protective tines option is not available for 2X12 series pH/ORP sensors. These sensors are intended for inline type installations only. The recommended line size is a standard 3/4" FNPT pipe tee.
5. The rear 3/4" MNPT threads are only intended for sealing the back of cable with 3/4" conduit.
6. Use alternate sensor models available with protective tines option for immersion or submersion use.
7. Do not use any sensor beyond the factory defined maximum temperature or pressure rating.



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TITLE		3/4" MNPT Inline Installation Styles Only	
SIZE	PROJECT	DRAWING NO.	REV
B	INLINE	6-9 pH SENSORS	/
SCALE		MODEL	SHEET
Not to Scale		2X12 ONLY	1 OF 1



Inline, Immersion & Submersion Sensor Selection Guide for 3/4" - 1" MNPT Series Product Lines

Iotron™ Sensor Selection Guide	3/4" - 1" MNPT Sensor Body Housing Configuration Sensor Series			
Description of pH/ORP Sensor Series	Sensor Body Housing RYTON® Poly-Phenylene-Sulfone, PPS <i>Large HDPE Junction</i>	Sensor Body Housing RYTON® Poly-Phenylene-Sulfone, PPS <i>Large KYNAR® Junction</i>	Sensor Body Housing RADEL® Poly-Phenyl-Sulfone, PPSU <i>Large KYNAR® Junction</i>	Sensor Body Housing KETASPIRE® Poly-Ether-Ether-Ketone, PEEK <i>Large KYNAR® Junction</i>
<i>General Purpose</i>	6052	6051	6031	6041
<i>High Temperature Resistant</i>	N/A	6151	6131	6141
<i>Ultra High Temperature Resistant</i>	N/A	N/A	6231	6241
<i>Slurry & Viscous Material Resistant</i>	6352	6351	6331	6341
<i>Acid, Fluoride & HF Resistant</i>	6452	6451	6431	6441
<i>Paper & Pulp Resistant</i>	N/A	6551	6531	6541
<i>Sulfide Resistant</i>	N/A	6651	6631	6641
<i>Aggressive Dissolved Gas & Volatile Organic Solvent Resistant</i>	N/A	N/A	6731	6741
<i>Oxidation Reduction Potential a.k.a. ORP</i>	6852	6851	6831	6841
<i>Saturated Sodium (Brine) Resistant</i>	6952	6951	6931	6941

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**Inline, Immersion & Submersion Sensor Selection Guide for
3/4" - 3/4" MNPT Series Product Lines**

Iotron™ Sensor Selection Guide	3/4" - 3/4" MNPT Sensor Body Housing Configuration Sensor Series			
Description of pH/ORP Sensor Series	Sensor Body Housing RYTON® Poly-Phenylene-Sulfone, PPS <i>Large HDPE Junction</i>	Sensor Body Housing RYTON® Poly-Phenylene-Sulfone, PPS <i>Large KYNAR® Junction</i>	Sensor Body Housing RADEL® Poly-Phenyl-Sulfone, PPSU <i>Large KYNAR® Junction</i>	Sensor Body Housing KETASPIRE® Poly-Ether-Ether-Ketone, PEEK <i>Large KYNAR® Junction</i>
<i>General Purpose</i>	6053	6054	6032	6042
<i>High Temperature Resistant</i>	N/A	6154	6132	6142
<i>Ultra High Temperature Resistant</i>	N/A	N/A	6232	6242
<i>Slurry & Viscous Material Resistant</i>	6353	6354	6332	6342
<i>Acid, Fluoride & HF Resistant</i>	6453	6454	6432	6442
<i>Paper & Pulp Resistant</i>	N/A	6554	6532	6542
<i>Sulfide Resistant</i>	N/A	6654	6632	6642
<i>Aggressive Dissolved Gas & Volatile Organic Solvent Resistant</i>	N/A	N/A	6732	6742
<i>Oxidation Reduction Potential a.k.a. ORP</i>	6853	6854	6832	6842
<i>Saturated Sodium (Brine) Resistant</i>	6953	6954	6932	6942

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Inline, Immersion & Submersion Sensor Selection Guide for Budget 3/4" - 3/4" MNPT CPVC & RYTON Series Product Lines

Iotron™ Sensor Selection Guide	3/4" - 3/4" MNPT Chlorinated-Polyvinyl-Chloride (CPVC) Sensor Body Housing Configuration Sensor Series			
Description of pH/ORP Sensor Series	<i>Compact HDPE Junction *</i>	<i>Compact HDPE Junction **</i>	<i>Large HDPE Junction</i>	<i>Large KYNAR® Junction</i>
<i>General Purpose</i>	2012	6011	6013	6012
<i>Slurry & Viscous Material Resistant</i>	2312	6311	6313	6312
<i>Acid, Fluoride & HF Resistant</i>	2412	6411	6413	6412
<i>Paper & Pulp Resistant</i>	N/A	N/A	N/A	6512
<i>Sulfide Resistant</i>	N/A	N/A	N/A	6612
<i>Oxidation Reduction Potential a.k.a. ORP</i>	2812	6811	6813	6812
<i>Saturated Sodium (Brine) Resistant</i>	2912	6911	6913	6912

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NOTE: 2X12 and 6X11 series pH sensors ORP sensors are available with RYTON (Poly-Phenyl-Sulfone, PPS) sensor body material of construction by invoking Alpha Prefix Option "PPS" without incurring any surcharge.

* Immersion or Submersible installations for these sensor series require that either the "GR" or "GRO" option is invoked to avoid breakage during field use of maintenance operations such as cleaning and re-calibration.

** Immersion or Submersible installations for these sensor series require that a separate removable CPVC protective guard is installed to protect from breakage during use or maintenance. Please inquire to factory for details about this item.

Inline, Immersion & Submersion pH & ORP Sensor Options

- All 6X52/6X51/6X31/6X41 & 6X12/6X13/6X32/6X42/6X53/6X54 series pH sensors and ORP sensors are supplied standard (default) in the four (4) each protective tines ("GR") configuration. The number of protective tines can be reduced to the 2 each ("GRO") configuration or the guard feature removed altogether ("NG"). The reduction to 2 protective tines type guard (or else no guard at all) is sometimes desirable for ease of cleaning, particularly in heavy slurry and high viscous media process media applications.
 - No guard configuration is most typically used for sensors with break resistant parabolic pH glass element (X3XX series) or for ORP sensors (X8XX series)
- All 6X11 series pH sensors and ORP sensors are supplied standard (default) in the without any protective tines (no guard) configuration. The number of protective tines can be increase to the two (2) each protective tines ("GRO") or four (4) each protective tines ("GR") configuration if desired. These options are typically invoked on the 6X11 sensor for immersion and submersible type installation use.
- The 2X12 series pH sensors and ORP sensors are intended ONLY for 3/4" NPT inline installation only. Do not use these sensors for immersion or submersion style installations.
- Fast temperature compensation response may be desired for some installations with variable temperature conditions (Iotron™ ACCU-TEMP™).
 - The ACCU-TEMP™ ("X") option is recommended for most inline installations for best temperature compensation as well as for immersion and submersible installations where the sensor will be frequently removed from service for cleaning and recalibration.
- All inline and immersion sensors can have the waterproofing option added for submersible sensor installations.
- All series pH sensors or ORP sensors may be mounted from rear using the 3/4" or 1" MNPT threads for immersion installations using a suitable mating insertion tube, standpipe or guide rod
- Sensors employed for immersion of submersible style installations have some form of a protective tines (with guard) configuration to minimize possibility of accidental breakage during handling and field use.
- The inline & immersion series pH sensors or ORP sensors can also be installed with a variable insertion depth into a process line or tank using a compression fitting only scheme (see link below)
- Sensors with integral preamplifiers can be supplied with the rugged field ready Q7M/Q7F NEMA 6P rated quick disconnect snap connector system.

* Additional charges may apply for these options. Not all options available on all models & not all combination of options are compatible (inquire to factory).

APPENDIX "A"

Custom Applications

	<u>Alpha Prefix</u>
Dissolved Gas Resistant	"A" or "C"
Organic Media Applications*	"L"
Teflon Silicone Required*	"TS"
Triple Junction*	"TJ"
High-Level HF Resistant*	"HF"
Impact & break resistant low-profile parabolic pH glass for slurries*	"X3XX" & "X5XX" series
Aggressive Dissolved Gas & Organic Solvent Resistant Configuration*	"X7XX" series
Extreme Dehydration Resistant*	"E"

Custom Configurations

	<u>Alpha Prefix</u>
ACCU-TEMP™ Option for Fast Temperature Response*	"X"
Low Impedance Glass*	"Z"
316SS Solution Ground Addition*	"Y"
Platinum Solution Ground Addition*	"Pt"
Platinum Solution Ground; 2 each half-cells for use on 2 channels/transmitter*	"PtD"
3-wire TC*	"M"
No guard configuration (without tines)	"NG"
Add 4 each Tines (6X11 series only)*	"GR"
Add/Reduce to 2 each Protective Tines*	"GRO"
Reinforced Preamplifier Blue Cable*	"BL"



**Replacement pH & ORP Sensors
 For Transmitters that support and/or require
 Integrated Preamplifiers**

The instruments listed below require and/or support integral preamplifiers. Sensors to mate with these OEM pH & ORP transmitters are supplied with the appropriate integrated temperature compensation element, solution ground & OEM compatible high-impedance CMOS operational amplifier (a.k.a. preamplifier) as may be required to ensure full compatibility and optimal performance. Some manufacturers and analyzer models can support both sensors with or without preamplifiers on the same instrument. A sensor hook-up schematics for interfacing to the given OEM pH/ORP transmitter is supplied with each sensor, and some of the most common wiring schematic are posted on our website (please inquire for any not listed).

Fully Supported Hardware - FULL COMPATIBILITY

Manufacturer	pH & ORP Transmitters
Rosemount Analytical Liquid Division A Part of Emerson Process Management	LEGACY: 1050, 1181, 1055, 2081, 3081, 81, 54pH, 54epH, XMT MODERN: 1056, 1057, 56, 1066, 5081, 6081
Foxboro Analytical by Schneider Electric (a Division of Invensys)	LEGACY: 870IT MODERN: 875PH, 876PH, 873PH, 873DPX
Honeywell (formerly Leeds and Northrup, a.k.a. L&N)	LEGACY: 7030, 7075, 7076, 7079, 7081, 7082 , 7083, 7084, 7096, 9782 MODERN: UDA2182, APT2000PH, APT4000PH
Electro-Chemical Devices (a.k.a. ECD)	LEGACY: T20, T21, T27, T29, T30, C22 MODERN: T23, T28

* ASTI offers pH & ORP sensors compatible with the transmitters listed above as an alternative to mating OEM pH & ORP sensors detailed.

Trademarks (indicated with ™) are registered to the respective corporations as listed above.

**Replacement pH & ORP Sensors
 For Transmitters DO NOT SUPPORT
 Integrated Preamplifiers**

The instruments listed below do not support preamplifiers. Sensors to mate with these OEM pH & ORP transmitters are supplied with the appropriate internal temperature compensation and/or solution ground signals to ensure compatibility. A sensor hook-up schematics for interfacing to the given OEM pH/ORP transmitter is supplied with each sensor, and some of the most common wiring schematic are posted on our website (please inquire for any not listed). If longer cable runs may be required for your planned installation, it is recommended to select a transmitter that supports preamplifiers (see list to the left).

Fully Supported Hardware - FULL COMPATIBILITY

Manufacturer	pH & ORP Transmitters
Endress+Hauser (a.k.a. E+H)	LEGACY: CPM152, CPM280, CPM431 MODERN: CPM153, CPM223, CPM253
Mettler-Toledo International (formerly Ingold)	LEGACY: 1120, 1140, 2050, 2100, 2220, 2400, 2500, 2800X, 2050e, pH 2100-PA, pH 2100e MODERN: M200, M300, M400, M700, M800
ABB (formerly TBI-Bailey)	LEGACY: TB515, TBN580, TB701/702, 4630, 4631, 4635, 4636, AX416, AX436, AX468, AX460, AX466 MODERN: AX460, AX416, AX436, APA592, TB82pH, TB84pH
Knick	LEGACY: Stratos Eco 2402 MODERN: Stratos Evo, Stratos Pro A2 pH, Stratos Pro A4 pH, Stratos Eco 2405 pH, Stratos 2221 pH, Stratos Stratos 2231 pH, Protos 3400(X)-035, PHU 3400(X)-110

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**Replacement pH & ORP Sensors
For Transmitters that support and/or require
Integrated Preamplifiers**

The instruments listed below require and/or support integral preamplifiers. Sensors to mate with these OEM pH & ORP transmitters are supplied with the appropriate integrated temperature compensation element, solution ground & OEM compatible high-impedance CMOS operational amplifier (a.k.a. preamplifier) as may be required to ensure full compatibility and optimal performance. Some manufacturers and analyzer models can support both sensors with or without preamplifiers on the same instrument. A sensor hook-up schematics for interfacing to the given OEM pH/ORP transmitter is supplied with each sensor, and some of the most common wiring schematic are posted on our website (please inquire for any not listed).

Supported Hardware with Some Known Issues

LIMITED COMPATIBILITY

Manufacturer	pH & ORP Transmitters
Rosemount Analytical Liquid Division, Part of Emerson Process Management	LEGACY: 1054, 1054A, 1054B, 1055
HACH (formerly Great Lakes Instruments, a.k.a. GLI)	LEGACY: 33, 53, 60, 62, 63, 70, 83, 90, 95, 570, 670, 671, 690, 691, 692, P33, P53, P63 MODERN: si792, si794, PRO-P3 GLI PRO series, sc200
GF (Georg Fischer) Signet a.k.a +GF+	LEGACY: 710, 2720, 9030, 9040, 8710, 5700 MODERN: 9900, 8900, 8750

* ASTI offers pH & ORP sensors compatible with the transmitters listed above as an alternative to mating OEM pH & ORP sensors detailed.

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**Replacement pH & ORP Sensors
For Transmitters DO NOT SUPPORT
Integrated Preamplifiers**

The instruments listed below do not support preamplifiers. Sensors to mate with these OEM pH & ORP transmitters are supplied with the appropriate internal temperature compensation and/or solution ground signals to ensure compatibility. A sensor hook-up schematics for interfacing to the given OEM pH/ORP transmitter is supplied with each sensor, and some of the most common wiring schematic are posted on our website (please inquire for any not listed). If longer cable runs may be required for your planned installation, it is recommended to select a transmitter that supports preamplifiers (see list to the left).

Supported Hardware with Some Known Issues

LIMITED COMPATIBILITY

Manufacturer	pH & ORP Transmitters
Yokogawa Electric Corporation (Formerly Johnson Yokogawa Controls, a.k.a. JYC)	LEGACY: pH/ORP 200, pH/ORP 400, pH/ORP 202, pH/ORP 402, pH150, pH100, OR100 MODERN: PH450G, PH202G

* ASTI offers pH & ORP sensors compatible with the transmitters listed above as an alternative to mating OEM pH & ORP sensors detailed.

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Most of the pH/ORP transmitter models listed also have a both contacting conductivity and toroidal (inductive contactless) conductivity transmitter counterpart to which ASTI can also supply alternative sensors to the OEM model sensors. Please inquire for any such conductivity retrofit and replacement sensor needs as well as for the pH & ORP measurements.

The manufacturers and models detailed on this webpage are not a complete listing of the supported OEM pH & ORP transmitters, analyzers and controllers to which ASTI can retrofit our replacement pH, ORP and conductivity sensors.

PLEASE INQUIRE FOR COMPATIBILITY INFORMATION ABOUT ANY INSTRUMENTATION NOT LISTED HERE

Naturally, all the ASTI pH, ORP and Ion selective (ISE) sensors are compatible with our own **2TX, 3TX and 4TX transmitters**

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