



ZEUS™ SMART DIGITAL HIQDT MODBUS RTU pH SENSORS WITH ULTRA RUGGED CONSTRUCTION FOR TOUGH PROCESS MEASUREMENT APPLICATIONS

Description of Most Important
 Common Core Features:

- Industrial pH Sensors for Severe Service Inline, Immersion & Submersible Installs**
- Waterproofing seal for complete cable isolation for submersion and field washdowns
 - Solid-state reference nearly impervious to ammonia, chlorine, sulfides & most solvents
 - ACCU-TEMP Fast Response Pt1000 Temperature Compensation "TC" element
 - Rugged thick 3.0mm (0.12") protective tines guard configuration, 4 each 90° apart
 - Thick 5.6mm (0.22") sensor body for 1.66" O.D. to endure tough mechanical wear
 - Standard 6 meters (20 feet) of integral cable with thick PVC jacket for aggressive use

Smart Digital HIQDT MODBUS RTU Configuration of ZEUS™ pH Sensors:

Short lead times available for urgent commissioning of new systems or replacement of existing installs with very robust & advanced smart digital ORP sensor suitable for direct connection to any MODBUS RTU master such as any modern PLC, SCADA, DCS or datalogger.

ZEUS™ pH SMART DIGITAL HIQDT MODBUS RTU DIGITAL FEATURES

- * Integral smart MODBUS RTU sensor board stores calibrations and analytics in sensor
- * Waterproof NEMA 6P quick disconnect HiQ4M Snap Corrosion Resistant Connector
- * Up to 1,000 meters (3,280 feet) noise free digital cable with snap extension cables
- * True plug & play hot-swap use; pH is always temperature compensated & calibrated
- * Calibrate conveniently in lab or shop and install quick-disconnect sensor in the field
- * Automatic recognition of 1.68, 4.00, 6.86, 7.00, 9.18, 10.00 & 12.45 NIST traceable pH buffers with built-in correction for temperature induced changes to pH buffer values (autobuffer recognition feature requires Windows software or touchscreen controller)
- * Separate acid slope and base slope automatically assigned during calibration to ensure accurate measurements anywhere across the pH range (important for batch systems).
- * Time since asymmetric potential (offset), acid slope & base slope performed is stored.
- * Calibrate with Windows software or battery powered handheld communicator (HHC)
- * Analytics stored in sensor include total time in field use, min and max temp during operation, sensor item number & serial number as well as month & year of fabrication
- * Complete systems available with advanced touchscreen controllers suitable for use in Class I, Division II areas as well as for Explosion-Proof Class I, Division I locations

Process Connections:

- 1" MNPT Threads on Front for Inline Screw-in Installations
- 1.25" MNPT Threads on Back for Immersion & Submersible Installations

General Sensor Specifications:

- Operating Temperature Range: -35 to +150°C for Inline/Immersion Use (Max +125 °C for fully submersible installations)
- Operating Pressure Range: 1 to **200 psig** (6.9 to 1379 kPa)
- Sensor Body Material: RADEL® R-5000 NT (Poly-Phenyl-Sulfone, PPSU)
- Junction Support Matrix Material: KYNAR® (Poly-Vinylidene-Fluoride, PVDF)
- External Dimensional Drawing: ZEUS™ Smart HIQDT pH Sensor 1"-1.25" MNPT Inline / Immersion / Submersible

pH Measurement Specifications:

- Measurement pH Range: -0.5 to +14.5
- Measuring Glass Type: **Low-Profile Parabolic**, Thick-Wall Break-Resistant
- pH Glass Dimensions: 0.315" (8.0 mm) DIA
- Sodium Ion Error: Less than 0.15 pH in sodium (Na⁺) solutions at pH 14.00
- Acidic Error: Less than 0.05 pH in hydrochloric acid (HCl) solutions at 0.00 pH

Reference System Specifications:

- Type: Triple Junction Standard
- Reference Half Cell: Ag/AgCl, Saturated KCl
- Triple Junction: - Solid-State Non-Porous Cross-Linked Polymer embedded in Kynar Support Matrix holds excess KCl assuring saturation at all temps for stability & long sensor service life
- Primary & Secondary Junctions: - Porous Ceramic, Saturated KCl in crosslinked polymer, Interfaced to Triple Junction

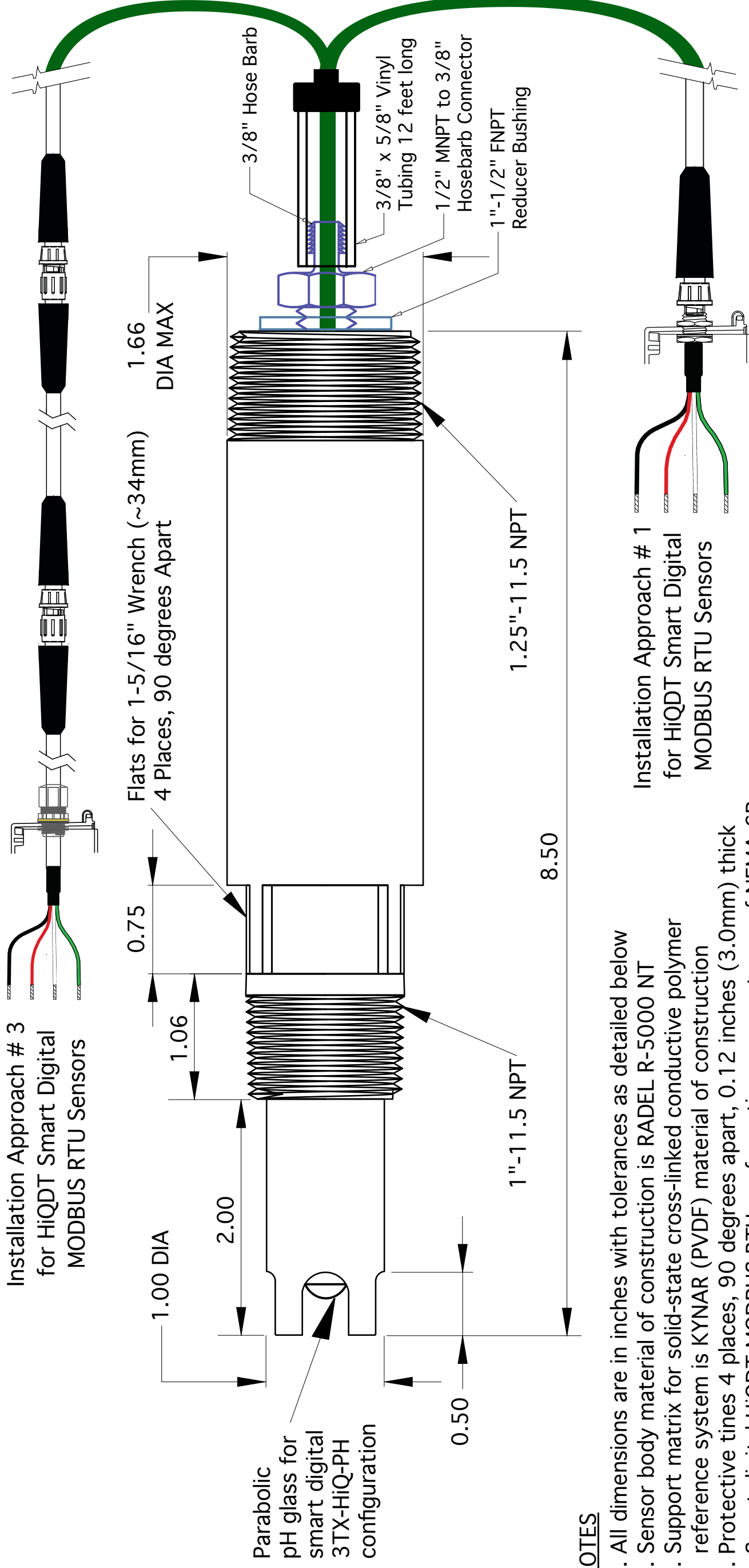
Some Selected Examples of Recommended Applications:

Industrial & mining autoclaves, abrasive slurry & high viscosity solutions, sulfide service. Any measurement where aggressive chemical cleaning is needed to remove fouling or low-maintenance operation is required with minimal cleaning and re-calibration.
Not for use in low conductivity, steam sterilization or steam type processes.

Storage and Shelf Life:

One (1) year from date of dispatch from ASTI factory when stored at indoor ambient room temperature with proper orientation & protector cap.

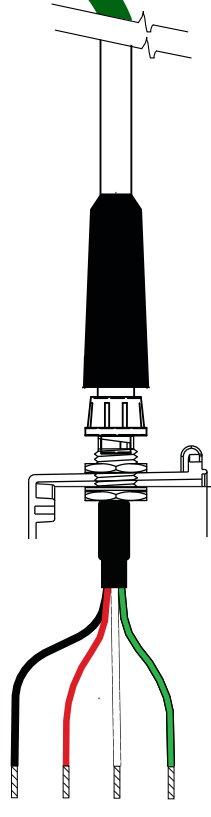
Installation Approach # 3
for HiQDT Smart Digital
MODBUS RTU Sensors



NOTES

- All dimensions are in inches with tolerances as detailed below
- Sensor body material of construction is RADEL R-5000 NT
- Support matrix for solid-state cross-linked conductive polymer reference system is KYNAR (PVDF) material of construction
- Protective tines 4 places, 90 degrees apart, 0.12 inches (3.0mm) thick
- Smart digital HiQDT MODBUS RTU configuration uses waterproof NEMA 6P rated HiQ4M snap disconnect quick snap connector with 6 meters (20 feet) integral cable and 3.7 meters (12 feet) integral braid reinforced hose seal.
- Use snap to snap and/or snap to tinned lead extension cables to achieve total cable runs to 1,000 meters (3,280 feet)
- See field installation guide for smart digital HiQDT MODBUS RTU sensors for wiring and commissioning.
- Do not use any sensor beyond the factory defined maximum temperature or pressure rating.

Installation Approach # 1
for HiQDT Smart Digital
MODBUS RTU Sensors



Advanced Sensor Technologies U.S.A.
Website: <http://www.astisensor.com>

DRAWN BY TADP		CHECKED BY TADP		APPROVED BY MJP	
1 Place: ± .1		3 Places: ± .005		Angular: ± 0.25°	
2 Places: ± .01		4 Places: ± .0005			
TOLERANCES					
TITLE 1"-1.25" MNPT Inline / Immersion / Submersible					
SIZE B	PROJECT ULTRA RUGGED	DRAWING NO. ZEUS™ HiQDT pH Sensor	REV /		
SCALE Not to Scale	MODEL HiQDT MODBUS RTU	SHEET 1	OF 1		



CLEANING, CARE & MAINTENANCE RECOMMENDATIONS FOR ZEUS™ pH SENSORS

Note: The recommendations given in this document are valid the ZEUS™ Industrial pH sensors. Best practice care and maintenance for your particular installation may vary from that described here. Contact the factory for specific information regarding proper care and maintenance of your given installation scheme and process application conditions.

Storage

The standard shelf life for all Iotron™ pH and ORP sensors is one year from the date of shipment. Sensors stored longer than this period may still be functional but are no longer under warranty. Sensors should be stored in a cool, dry location with the sensor tip (where the pH/ORP element is located) oriented toward the ground. All sensors come standard with a conditioning solution in the cap. This conditioning solution is 50% pH 4 buffer and 50% saturated potassium chloride (mixed by volume). The sensor cap should be kept tightly affixed to the sensor body and sealed with common piping teflon tape when the sensor is not in use. Sensors that are to be returned for shelf life warranty claim must have the original sensor cap and conditioning solution intact to be eligible for warranty replacement. Contact the ASTI factory before returning any sensor for warranty claim to obtain a valid RMA.

Cleaning

Cleaning methods can vary greatly depending upon the application for which the sensor is used. Some common rules for cleaning include:

- 1) Never scratch or aggressively scrub the pH or ORP elements. These are delicate glass electrochemical electrodes. They can be broken easily by mechanical force.
- 2) The reference junction is a solid state non-porous cross-linked conductive polymer embedded in a porous kynar matrix. Since the reference is solid state, it can be cleaned with aggressive chemicals. This solid state reference can also be cleaned effectively by using a sharp razor edged tool. GREAT CARE SHOULD BE TAKEN NOT TO SCRATCH THE pH GLASS OR ORP ELEMENT DURING CLEANING OF THE REFERENCE JUNCTION.

Common approved cleaning solutions include:

5-15% Hydrochloric Acid – (For Alkaline deposits)
5-15% Sodium Hydroxide – (For Organic Contaminants)
Surfactant (NON-IONIC SOAPS SUCH AS MICRO-90)

Please inquire to the factory if you plan to use any other cleaning agent.

Conditioning for Calibration

After the sensor has been cleaned, it must be thoroughly rinsed with deionized water to remove any residual cleaning reagents. The sensor can then be soaked in pH 4 buffer to recondition the pH and reference elements. Some sensors will also require a conditioning in saturated potassium chloride if the reference junction has been depleted of the ions in the solid state conductive polymer (typical for clean water applications). Condition the sensor in saturated potassium chloride and/or pH 4 buffer for whatever period of time is required to achieve optimal calibration results.

Sensor Selection for Individual Process Lines

No sensor should be used beyond the indicated temperature and pressure limitations for that given sensor. Sensors should only be used for the application(s) that an authorized ASTI representative has recommended. If you are unsure that your sensor is recommended for a particular application, please contact the factory.

If you should have any doubt about whether the exact sensor model that you are using is appropriate for the installation style that you are planning to implement, please contact the factory for further assistance!