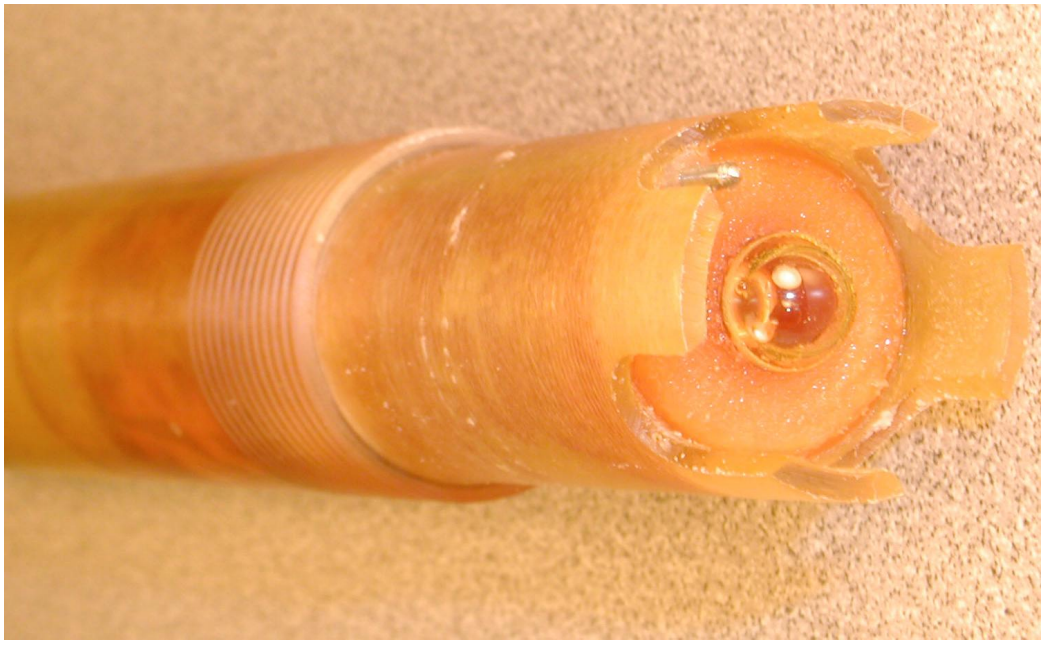
Advanced Sensor Technologies, Inc.
Orange, California USA

Superior pH / ORP / ISE Industrial Sensors

Features

- Guaranteed Longest Lasting Sensors Available with performance guarantee *
- Sensors are compatible with most existing pH/ORP Meters, Transmitters & Analyzers **
- Application Specific Engineering results in optimum Lifetime & Performance ***
- Integrated Temperature Compensation, Preamplifiers & Solution Ground Elements
- Solid State Reference System offers superior resistance to Fouling & Dehydration
- Applications such as Acid/Fluoride, Hi-Temp, Saturated Sodium and Sulfide Resistant are available as standard options
- Custom Applications are available, often at no additional charge
- Most Installation Styles are Supported Including: Immersion, Twist Lock, Valve Retractable & Sanitary
- Available in a wide range of plastics, from cost effective CPVC to thermally & chemically resilient ULTEM® and PEEK thermoplastic
- High Pressure Applications up to 100 psi for Valve Retractable & 150 psi for Inline Installations can be supported for continuous use
- Operating Temperatures from $^{-}30$ to $^{+}150$ ºC ($^{-}22$ to $^{+}302$ ºF) can be supported for continuous use



Case Study No. 3 – pH Control in NO_x Treatment Systems

NO_x Treatment System and pH Sensors for High Nitric Low Process Media

- High Acid – Wide Range pH Sensor for aggressive acid media
- Deep Insertion Distance from Hardware Interface Point
- Retrofit to Existing pH Transmitter for cost savings

The Problem

A catalyst manufacturer, in order to prevent the pollution of the atmosphere through the byproduct of its process, had to eliminate nitrogen oxides (NO_x). The process requires the monitoring of the pH value, because the process acid has to be neutralized. Depending upon the hold on the environmental system, the pH could range from value of 2.0 to -0.3 (well over two Molar nitric acid). The oscillation in pH values depending upon system load and the necessity for measurement at very low pH values caused problems for the previously used pH sensors both in terms of drift and accuracy. The tank configuration presented a logistical problem due to the small 1¼" MNPT process connection suitable for 1.0" O.D. sensors when used with 1.0" compression fitting. The process solution was more than sixty inches away from the hardware installation point.

One of the other major problems with this installation was the build up of precipitation on the reference element, necessitating frequent cleaning and recalibration. In addition, the tank would sometimes have reduced solution volumes that resulted in the sensor being left exposed to only air for extended periods of time. Due to the mounting configuration and thus required overall sensor length, removal and insertion of the previously used sensor was quite time consuming and cumbersome. The maintenance and short lifetime of the sensor reduced the plant's process efficiency and profitability.

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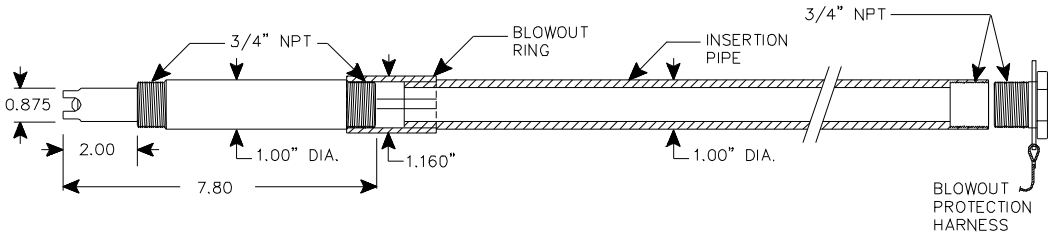
The Solution

Many specialized options from our sensor line were required to solve the various application problems. A high acid resistant, wide range pH glass element was employed in combination with a solid state conductive polymer reference junction. This improved measurement accuracy greatly. The use of a solid state reference system made pH sensor much more resistant to dehydration, minimizing the effect of prolonged exposures to only air at various times during its service life. The long insertion distance was accomplished by utilizing a 1.0" compression fitting together with a 1.0" O.D. sixty inch long 316 stainless steel insertion tube.

The solid state reference system enabled both aggressive mechanical and chemical cleaning methods to be employed when required, and reduce the overall necessity for maintenance time due to reduced cleaning requirements. Due to the sensor's stability and reproducible slope, only one point grab sample performed remotely using a grab sample from process. The use of grab sample calibration resulted in greatly reduced calibration time, and better process efficiency. The pH sensor interfaced readily to the existing Great Lakes pH transmitter resulting in excellent cost savings.

The pH Sensor Used**:**

Model: PN 6432-GLI5-25 pH Sensor
Description: ¾"- ¾" MNPT Immersion ULTEM Bodied High Acid/Fluoride Resistant pH Sensor with integrated 301 Ohm GLI TC Assembly, Stainless Steel Solution Ground and GLI Compatible 5-Wire Differential preamplifier; 25 feet cable to connect directly to GLI pH Analyzer/Transmitter



Choosing the Correct pH/ORP Sensor

1. Choose a sensor body type that suits the physical parameters of the installation (refer to the ***Configurations Portion of pH/ORP and Ion Selective webpages***).
2. Choose a sensor that suits the process application, temperature, chemistry, and physical parameters of the installation (refer to ***Sensor Selection Guides and call factory or local sales agent for support***)
3. Choose a sensor housing material that is compatible with the process chemistry, temperature & pressure (refer to ***Chemical Resistance Charts as posted under the Technical Documents portion of the website***).
4. Select suitable temperature compensation element, solution ground & integrated preamplifier based upon the mating pH/ORP Instrument (refer to ***Electrochemical Instrumentation Page & ask for factory support***).
5. Specify the required cable length based upon installation location (refer to ***Part Numbering Guide***).

* Subject to application qualification and review by an approved ASTI sales agent and/or factory. Performance guarantee is posted on the ASTI online application questionnaire page.
** See list of supported pH/ORP/ISE Instruments webpages as posted on the ASTI website.
*** Completion of Application Questionnaire form is required. Other restrictions may apply.

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