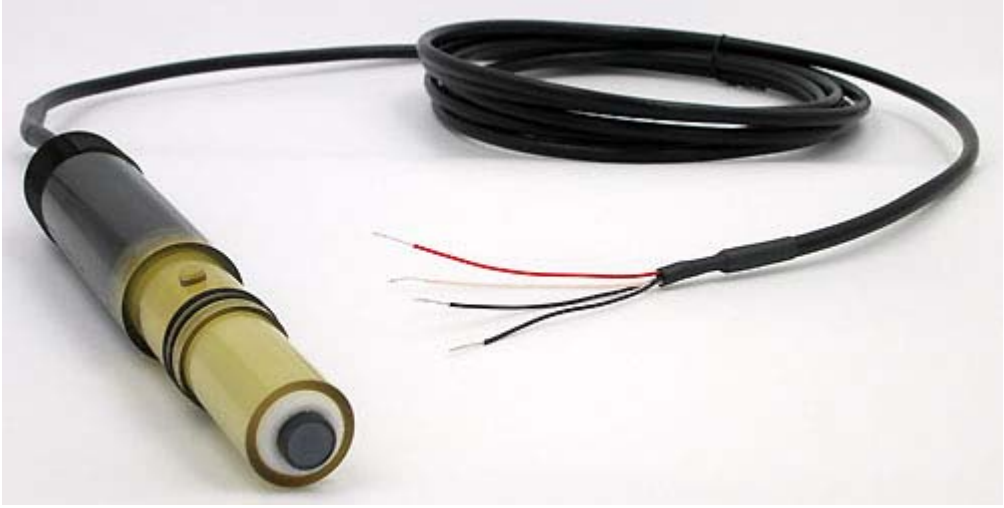
Ion Selective (ISE) Sensors

Rugged Industrial Grade Ion Selective (ISE) Sensors for Continuous Inline, Immersion, Submersible, Sanitary & HOT-TAP Valve Retractable Field Measurements:

AB 6100 Fluoride Ion Selective ISE sensor for Acid Service and Fluoride WWT applications; Integral Preamplifier with Braid Reinforced Blue Cable; Fully submersible assembly with waterproofing sealing option "H"

ABGR 8XX0 Submersible Ion Selective ISE sensor with WPB Seal. Rugged Industrial Thick Large Surface Organic PVC Membrane; With 4 each "GR" tines & no preamplifier; tinned lead wires.

ABX 6100H-1000-20-TL-WPIT/5 Immersion Fluoride Ion Selective Sensor with WPIT sealing option in the without preamplifier configuration



AB 8XX0 Twist Lock Quick Disconnect Inline Silver Halide series ISE sensor with no preamplifier and tinned lead wire terminations

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ASTI offers unique solutions for process measurement problems. Features and options are detailed below:

ION MEASUREMENTS AVAILABLE:

- HiQDT SMART DIGITAL MODBUS RTU ION SELECTIVE (ISE) SENSORS FOR DIRECT CONNECTION TO ANY PLC, HMI, SCADA or any other data acquisition or control device that can serve as the MODBUS RTU master.
    - The PLC or HMI employed can either be customer supplied or else ASTI supplied as a part of a turn-key ready system ready for plug and play field commissioning right out of the box.
    - ASTI supplied HMI & PLC include options for advanced smart touchscreen controllers with full remote access over ethernet suitable for use in for Class I, Division II hazardous locations to support remote in-situ offset grab sample calibrations. Lower cost options exist for instrumentation are available for use in safe non-hazardous locations as well as blind installations if no local display is required.
    - Calibration & configuration of smart HiQDT MODBUS RTU ion selective (ISE) sensors can be accomplished with free of charge Windows software or battery powered handheld communicator.

- Unique rugged industrial grade fluoride (F^-) monocrystal sensing element is linear across a very wide range of concentrations (up to saturation and linear to 2%, a.k.a. 20,000ppm) as well as down to the ppb levels
    - Special calibration scheme may be required for very low level or high level

type measurements.

- Solid-state silver halide based ion selective sensors for measurement of chloride (Cl^-), bromide (Br^-), iodide (I^-), cyanide (CN^-) and silver (Ag^+).
- PVC membrane based ion selective sensors for measurement of ammonium (NH_4^+), sodium (Na^+), calcium (Ca^{2+}), lithium (Li^+), chloride (Cl^-), nitrate (NO_3^-), nitrite (NO_2^-) and perchlorate (ClO_4^-)
- Download the individual specification sheets for the fluoride, silver halide and PVC membrane type ISE sensors on the **Industrial Ion Selective (ISE) Sensor selection guide**
- View some **highlighted typical field applications for ASTI ion selective sensors** highlighting unique technical advantages.
- For any ion selective measurements not listed on our website **inquire to factory to see if it is available on a special order custom built basis**
- Review the **Understanding Ion Selective Sensors** technical literature as background reference information to better understand the foundational principle of operation for analytical potentiometric ISE sensors and capabilities and limitations detailed in the various ion selective sensor specification sheets such as lowest limit of detection, linear measurement range and selectivity coefficients.

CORE ION SELECTIVE SENSOR FEATURES:

- 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”) configuration.
- Large surface area industrial grade PVC membrane for measurement of ammonium (NH_4^+), sodium (Na^+), calcium (Ca^{2+}), lithium (Li^+), chloride (Cl^-), nitrate (NO_3^-), nitrite (NO_2^-) and perchlorate (ClO_4^-) are solvent bound to PVC electrode for excellent mechanical integrity during long term use and for aggressive field process installations.
- Fluoride (F^-) ion selective sensing elements offers nearly no interfering ions and excellent linearity across avery wide range of use. Available for use in application from 0-12 pH ranges with AB 6100 model or 5.5 to 9.5 with AB 8100, AB 5100 or AB 6100H models.
- Solid-state silver halide type ion sensing elements for measurement of chloride (Cl^-), bromide (Br^-), iodide (I^-), cyanide (CN^-) and silver (Ag^+) are designed for use at elevated temperatures due to unique design and manufacturing scheme. Very large surface area and thick crystals allow for repeated repolishing as may be required for extended sensor service lifetime.
- Available in no protective tines to minimize air bubbles for inline low-flow type installations. Also configuration are also offered in 2 each (“GRO”) or 4 each (“GR”) protective tine configurations recommended for immersion and submersible installations.
- All ion selective sensors come standard with Pt1000 temperature compensation

element. ACCU-TEMP option for fast temperature response is recommended for inline and sanitary installation styles were only the sensor tip is in contact with the process solution.

- Selected optional features include ACCU-TEMP Fast TC (“X”) which is critical for accurate temperature compensation of inline measurements. The braid reinforced thick PVC jacketed blue preamplifier cable (“BL”) is available to best results in high noise environments or for installation where mechanical wear on cable may be a potential installation issue.

- Ion selective sensors in base without integral preamplifier configuration can be used for installation up to 35 feet (~10 meters) maximum. The leads must be wired directly into the ISE transmitter with this configuration and cannot be bridged. ISE probes without preamplifier should be keep to a cable length of 20 feet (6 meters) whenever possible. For longer cable runs or to bridge the signal use the with integral preamplifier configuration.

- ISE sensors are available with integral conventional analog preamplifier to support cable lengths up to 100 meters (330 feet) as well as Q7M/Q7F NEMA 6P rated snap connector system (see more below). ISE sensors with integral preamplifiers can have their tinned leads bridges across terminal strips in a waterproof J-box enclosure assembly).

- End of cable terminations are tinned leads standard for both with and without integral preamplifier configurations

- **Quick disconnect IP67 & NEMA 6P rated** waterproof and corrosion resistant **Q7M/Q7F snap connector** option is available for ion selective (ISE) sensors with integral preamplifiers. Photos and installation guides can be found on the **Ion Selective (ISE) Sensors Options** webpage.

FIELD INSTALLATION CONFIGURATIONS SUPPORTED & ISE SENSOR OPTIONS:

- Quick-Disconnect Twist Lock Bayonet Style Receptacles allow for easy and fast insertion and removal from process line for calibration and cleaning. Standard in KYNAR® (Poly-Vinylidene-Fluoride, PVDF) material of construction with stainless steel locking pins. Review the **Ion Selective (ISE) Sensor Supported Installation Configurations** for further details and drawings about the twist lock installation style.

- The 6XX0 series ion selective sensor can be installed into inline low-flow panel assemblies as well immersed into a tank using a suitable standpipe or guiderod. It is submersible when a waterproofing option is invoked even without the use of an immersion tube to seal the rear threads.

- Sanitary TRI-CLOVER style installations are supported using the 5XX0 series ion selective sensors employing the same 316SS hardware as for the sanitary pH & ORP sensors. See the pH & ORP sensor configuration page for details about the mating sanitary sensor holder with welded 1.5″, 2.0″ or 2.5″ TRI-CLOVER flange.

- HOT-TAP valve retractable style installations are also supported using the 5XX0 series ion selective sensors employing the same 316SS retraction hardware assemblies as for the valve retractable pH & ORP sensors. See the **HOT-TAP valve retraction assemblies hardware webpage** and the valve retractable pH & ORP sensor configuration page for details.

- Double O-ring design ensures secure seal during operation with twist lock quick disconnect bayonet (8XX0) type ISE sensors and sanitary/HOT-TAP style ISE sensors (5XX0).
    - Standard material of construction is Viton®-75, with CV75, Simriz® 485 and Kalrez® 4079 Optional.

- Back of sensor can be sealed with waterproofing option for use in immersion or submersible type applications as well as for inline use. For immersion and submersible installation it is recommended to add a protective tines option (“GR” or “GRO”) to the 8XX0 twist lock and 5XX0 sanitary/HOT-TAP ISE sensor configuration as well as a **Waterproofing Option for Fully Submersible Assemblies**.

- Available options for the ion selective sensors in the 6XX0 series immersion/submersible, 8XX0 series inline twist lock quick disconnect and 5XX0 series sensors for sanitary and HOT-TAP valve retractable installations are detailed on the **ISE sensor options webpage**.

- Extensive **ISE addendum field installation support documentation** is provided for best practice field installation of the ion measurement systems using the industrial ion selective sensors should be reviewed prior to purchase and commissioning.

MATERIALS OF CONSTRUCTION & CORE TECHNICAL SPECIFICATIONS:

- Most ISE sensor with PVC type ion sensing elements (ammonium, calcium, sodium, lithium, …etc) have a temperature range of +5 to +40 degrees Celsius (41 to 104 degrees Fahrenheit) with a pressure of 1 to 10 psig (6.9 to 69 kPag)
    - Some PVC type ion sensing elements are available in a special style to support use up to +50 degrees Celsius (+122 degrees Fahrenheit). Inquire to factory if your inline application will be over +40 degrees Celsius to see if your measurement type is available in this style.

- Most ISE sensors with solid-state ion sensing element (fluoride, chloride, bromide, iodide, cyanide, ..etc) have a temperature range of +5 to +50 degree Celsius (41 to 104 degrees Fahrenheit) with a pressure of 1 to 20 psig (6.9 to 138 kPag)
    - Special AB 6100 fluoride ISE sensor support up to 70 degrees Celsius (158 degrees Fahrenheit) continuous use

- Sensor body housing material of construction is rugged RADEL® (Poly-Phenyl-Sulfone, PPSU) for all ISE sensor configuration. Visit the **ion selective (ISE) sensors configuration webpage** to view information on material of construction for ISE sensors and dimensional details for ISE sensor and mating installation hardware. Available physical installation configurations and thermoplastic body materials of construction

- The standard material of construction for the support matrix of the solid-state non-porous conductive polymer is high-density poly-ethylene (HDPE) to ensure the most accurate reading possible.
    - HDPE material of construction for the primary junction support supports the max 70 degrees Celsius max temperature condition possible in many acid etching processes for metal, glass and silicone wafer etching using the special AB 6100 special fluoride ISE sensor

- KYNAR® (Poly-Vinylidene-Fluoride, PVDF) material of construction for the primary junction support matrix offered on selected ISE probes for heavy industrial service applications to maximize the sensor lifetime, particularly in the presence of various dissolved gases and other intrusive fouling constituents.

**** AB 6100 Industrial Fluoride ISE sensor for use in acid etching & fluoride WWTP***
**** Unique Special Sealing Cap allows for continuous use in strong acid conditions***
**** WPH sealing installed for fully submersible installation use***

**** AB 8100 Fluoride ISE Sensor for measurement in neutral pH conditions***
**** Double O-ring seals ensure secure leak-proof process connection (Viton Std)***
**** Industrial grade fluoride sensing element & large surface solid-state reference system***

**** ABGR 8410 Ammonium ISE Sensor available in standard & ultalow type membrane configurations***
**** Thick "GR" 4 each protective tines and WPB sealing option invoked for fully submersible installation into process tanks***

**** AB 6410 Immersion Ammonium ISE Sensor with WPA sealing for use in submersible installation with standpipes***
**** Large surface rugged industrial grade ammonium ion sensing membrane is suitable for aggressive field service***

**** Solid-state ion selective sensor with large surface industrial sensing element***
**** Flush no guard configuration ideal for inline installation to minimize fouling***
**** Solid-state type ISE sensors available for measurement of chloride, bromide, iodide, cyanide & silver ions***