# Conductivity (EC) Sensors

## Contacting & Toroidal Conductivity Sensors

**COST EFFECTIVE & LONG-LASTING**
Superior performance and lifetime compared to most any OEM sensor due to optimal selection of materials, design and workmanship for each built-to-order sensor. A very low total cost of ownership is possible due to superior service lifetime and extremely competitive sensor unit cost comparable to much lesser quality sensors from competitors.

CLICK HERE for details on SMART DIGITAL HiQDT MODBUS RTU configuration of CONDUCTIVITY (EC) SENSORS

## All sensors are made in the USA.

## Wetted Materials of Construction:

- **Contacting Conductivity Cells**
  - **Sensing Electrode**
    - **316 Stainless Steel, Titanium, Monel, Hastelloy C, Nickel, Zirconium and others upon request**
  - **Insulator**
    - **CPVC, TEFLON (PTFE), KYNAR(PVDF), PEEK and others upon request**
  - **“O”-Rings**
    - **EPDM & EPR, Viton, Kalrez, and others upon request**
  - **Sealing Fittings**
    - **316SS, Propylene, KYNAR (PVDF), and others upon request**
- **Toroidal Conductivity Sensors**
  - **Polypropylene, and others upon request**

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# Selected Applications & Uses:

- **High-Temperature and High-Pressure Applications up to 250 psig @ 205 degrees Celsius or 500 psig @ 100 degrees Celsius**
- **Resistance to strong acid, bases, slurries and organic solvents**
- **Cell Constants 0.01, 0.02, 0.05, 0.1, 0.2, 1, 2, 3, 5, 10 & 20 available**
  - **Measure in solutions from ultra-pure water (0.01 microSiemens) to saturated electrolytes, acid and bases (1,000,000 microSiemens a.k.a. 1,000 milliSiemens)**
- **Integrated temperature compensation elements:**
  - **100 & 1000 Ohm Platinum, 10K Thermistor, 3K Balco, 8.55K NTC and many others**
- **Custom designs are available upon request (Inquire to factory)**
- **Sanitary applications requiring USDA FDA 3A compliance are supported**
- **High slurry media as well as aggressive and corrosive process media and environments**

**MEASURE IN TOUGH APPLICATIONS**
These conductivity sensors can operate in the most difficult of process conditions and interface with most existing instrumentation. Alternatively, complete electrochemical systems including mating transmitter can also be readily supplied as detailed in the **conductivity measurement with the 3TX-CON transmitter brochure**. Through our custom built-to-order design philosophy and business model, many applications that cannot be serviced by our competitors are quite feasible for our conductivity product line.

A selection of photos to represent the various types of conductivity are shown below together with various technical specification sheet for the same. These photos are not meant to exhaustive but rather only illustrative. Many additional photos, drawings and other technical details are available upon request from the factory.

**AST10 & AST51 1/2″ (12mm) Contacting Conductivity Sensors – For Inline Installations (Immersion/Submersion Also Supported)**



*AST51 Sensor with K=1.0/cm Cell and ½”MNPT 316SS Compression Fitting for use up to 500 psig*



*AST51 Sensor with K=0.1/cm Cell and ¾”MNPT Polypropylene Compression Fitting (½”MNPT size also available)*



*AST10 Sensor with K=10.0/cm Cell with ½”MNPT KYNAR (PVDF) Compression Fitting*

AST10 is available cell constants 0.01 to 10.0 & AST51 is available in cell constants 0.1 to 1.0; both AST10 & AST51 are compact sensors for general purpose use and mounting into 3/4” or 1” pipe fittings to avoid the use of special flow cells. Are supplied with polypropylene, stainless steel, or KYNAR (PVDF) compression fittings available for all models.

**Download AST10 & AST51 Specification Sheet**

Special short style K=0.01/cm cell to support smaller lines for inline low conductivity use (i.e. RO or DI systems):

**Download AST10 Short Style K=0.01/cm Specification Sheet**

AST10 Inline & Immersion Contacting Conductivity Sensor with Cell Constant K=10 for high conductivity sample have a long form factor and special a installation scheme:

**Download AST10 with K=10.0/cm Specification Sheet**

**AST41 High Temperature & Pressure Inline Contacting Conductivity Sensors**



*AST41 with K=0.05/cm Cell for RO & Ultrapure Water*



*AST41 with K=2.0/cm Cell for High Conductivity Brine & Desalination Use*

AST41 High temperature & pressure boiler condensate and blow down control. Double seal design extends sensor life over twice that of single or epoxy sealed units. Cell constants: 2.0, 1.0, 0.2, 0.1, 0.05. Temperatures to 205 °C and pressures up to 500 psig with PEEK insulator & 316SS electrodes standard.

**Download AST41 Specification Sheet**

# ASTXX-TRI Sanitary Tri-Clover & Ladish Contacting Conductivity Sensors



*AST10-TRI Sanitary Contacting Conductivity Sensors shown in K=3.0/cm & K=0.1/cm cell constants with 1.5” and ¾” TRI-CLOVER flanges*



*AST40-TRI Sanitary Contacting Conductivity Sensor shown in K=2.0/cm cell constant with 2″ TRI-CLOVER flange*

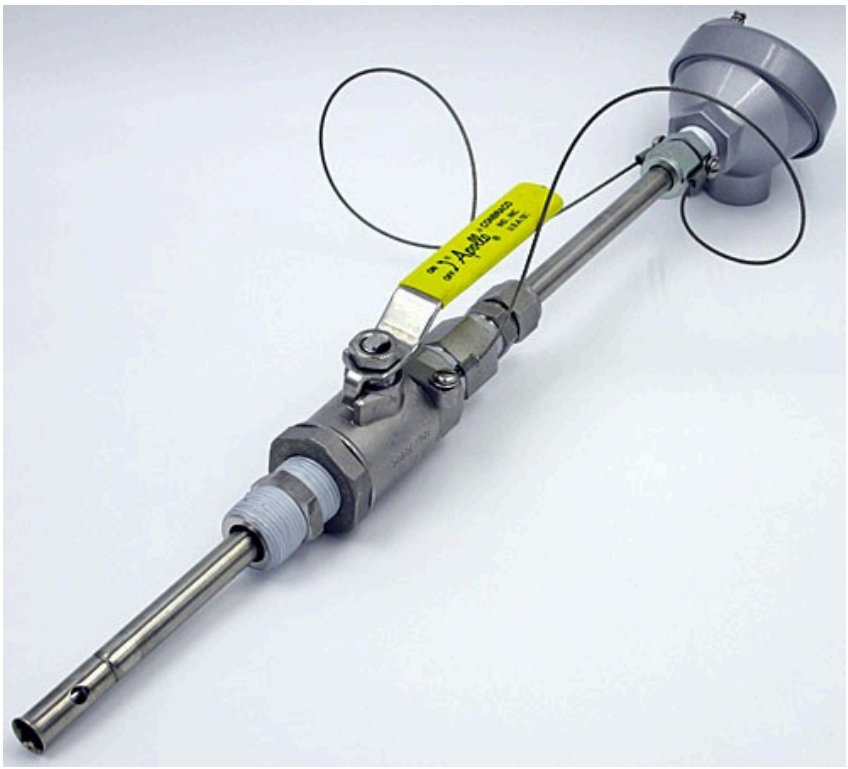
ASTXX-TRI small size sensor available with optional TRI sanitary clean in place (CIP) flange. FDA compliant food grade materials. Flange sizes 1/2″, 1″, 1.5″, 2″ and 2.5″. Rated for use up to 150 psig at 130 degree Celsius. Cell Constants from 0.01 to 10.0 are available. Special K=2.0/cm, 3.0/cm and 5.0/cm cell constant styles are often ideal for chemical CIP inline installation to directly replace existing toroidal installation schemes.

**Download ASTXX-TRI Specification Sheet**

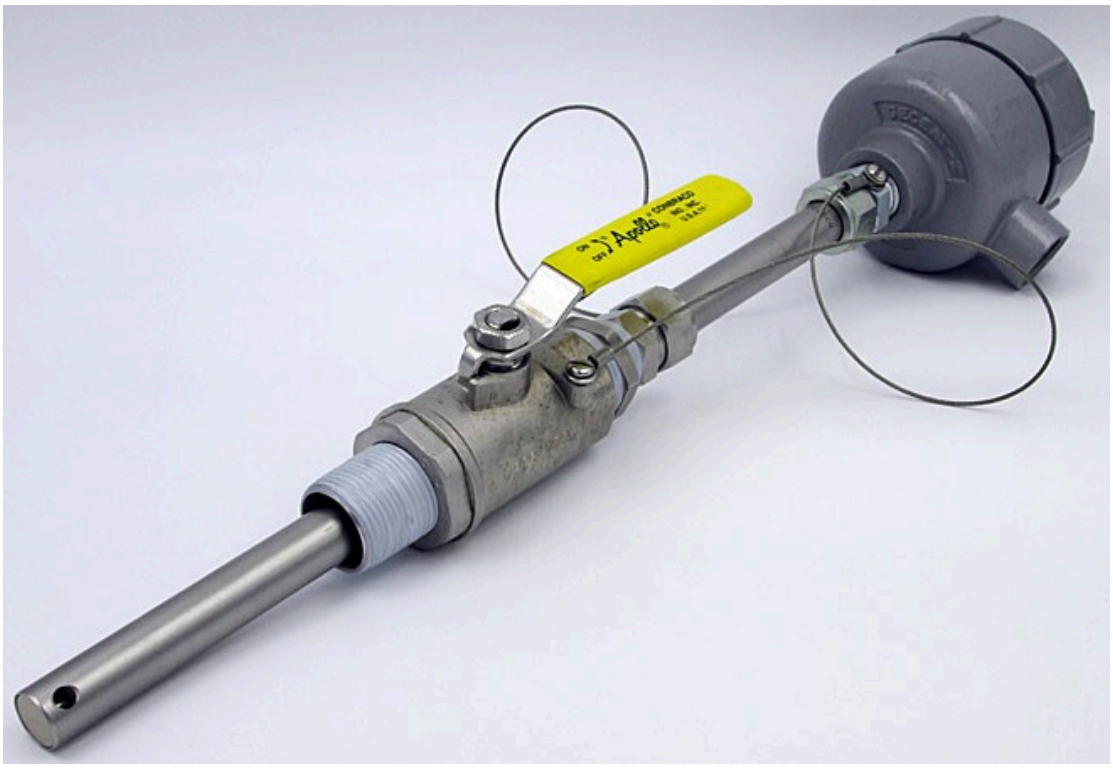
A selection guide is linked below for initial determination of the most optimal cell constant for your sanitary installation. Before placing a firm order, please contact the ASTI factory to confirm your planned choice.

**Sanitary Sensor Cell Constant and Range Selection Guide (with Dimensional Details)**

## AST10, AST40 & AST42 for “HOT-TAP” Valve Retractable Installations



*AST10 HOT-TAP Valve Retractable Assembly with ¾”MNPT 316SS Ball Valve in K=0.05/cm cell configuration with flared tip and safety lanyard; 316SS Electrodes with TEFLON insulator*



*AST40 HOT-TAP Valve Retractable Assembly with 1”MNPT 316SS Ball Valve in K=1.0/cm cell configuration with safety lanyard; 316SS Electrodes and PEEK insulator*

AST40 is a sensor for cell constant range of 0.01 to 20.0 and various mountings, including insertion, submersible or valve retractable assemblies for insertion/removal under line pressure. Wetted materials 316 SS & PEEK, with double O-ring seals for high chemical concentrations of acid, bases and salts. Alternate materials of construction are available for the sensor body, electrodes and insulator upon request.

**Download AST40 & AST42 Specification Sheet**

AST40 Contacting Conductivity Sensor for “HOT-TAP” Valve Insertion & Retraction installation with Cell Constant K=10 (Max Pressure 50 psig)

**Download AST40 Valve Retractable Drawings for High-Cells**

AST10 Contacting Conductivity Sensor for “HOT-TAP” Valve Insertion & Retraction installation with Cell Constant K=0.1, 1.0 & 10.0 (Max Pressure 150 psig)

**Download AST10 Valve Retractable Drawings**

## AST50 & AST60 for Inline, Immersion & Submersible Installations – Low Maintenance, Easy to Clean for

## Slurry & Dirty Solutions



*AST50 CPVC General Purpose Contacting Conductivity Sensor shown in the K=0.1/cm, K=1.0/cm and K=2.0/cm cell constant configuration from left to right*



*AST60 TEFLON-KYNAR High-Temperature Contacting Conductivity Sensor shown in the K=0.1/cm, K=1.0/cm and K=2.0/cm cell constant configuration from left to right*



*AST60 TEFLON-KYNAR Sensor in K=2.0/cm cell constant shown in a fully submersible assembly configuration complete with polypropylene (PP) waterproofing option “B” with integral NORPRENE tubing sealing for high temperature applications and Q5M/Q5F NEMA 6P rated waterproof snap connector quick-disconnect system employed*

Download AST50 & AST60 Specification Sheet

**AST52 for Compact Inline Installations of High Conductivity Samples**



*The AST52 offers a small footprint for the high cell constant K=10.0/cm with economical pricing & customizability for the materials of construction of the insulator, electrodes & sensor body (threaded process connection). As shown above from left to right the insulator is TEFLON, CPVC & CPVC with sensor body & exposed thermowell (for fast temperature response) being 316SS, 316SS & CPVC. The material construction for the electrodes is 316SS standard with Monel, Titanium and Hastelloy C-276 being special order options.*



*The sensor shown above has 316SS electrodes and sensor body with CPVC insulator. The 316SS electrodes are not visible as they are located inside of the two bored holes that go along the length of the insulator and are purged by the two corresponding vent holes on each side. The exposed 316SS thermowell is, however, visible which provide for fast temperature measurement to ensure accuracy conductivity values at any process condition.*

AST52 High 10.0 cell constant in compact size for a variety of applications including skid mounted R.O. systems, water treatment, chemical dilution. The insulator comes standard as CVPC but can also be supplied with TEFLON (PTFE) upon request. Alternative material of construction are also available for the measuring electrodes (316SS standard).

**Download AST52 Specification Sheet**

ASTX-37PP toroidal conductivity sensor is a perfect choice for high conductivity solutions and applications where little or no maintenance is required.  Chemically resistant copolymer polpropylene plastic is ideal for aggressive process applications. Versions can be supplied that are compatible with most major OEM toroidal conductivity transmitter including but not limited to HACH (GLI), Rosemount and Foxboro.

**Download ASTX-37PP Specification Sheet**

**Download Torroidal Inline Tee Drawing**

## Custom Applications & Special Materials of Construction

Nearly any custom sensor that may be required can be designed and fabrication upon request for specific needs. Although in some cases minimum orders may be required to justify the engineering and startup costs but quite often such minimums are quite modest. You are encouraged to inquire to the factory for all special order needs. Just a few selected examples are below of some custom sensors that have been designed and fabricated upon special customer request in the past as an illustration of just some of the engineering and built-to-order capabilities.

**Special version of AST60 Conductivity Sensor for High Pressure Low-Fouling Operation for Inline Slurries (K=0.1/cm cell constant)**

This special conductivity sensor is a very good choice for highly abrasive process applications and those where more frequent cleaning is required. The open geometry allows for minimal fouling and supports high pressures up to 500 psig and high velocity inline use as well as supporting high temperature conditions up to 205°C. Photos taken from the side view with explosion-proof J-Box installed and a close-up of the wetted sensor tip are shown below. The dimensional detail drawing for this special AST60-0.1-PT1000-HPPK-JB contacting conductivity sensor is linked directly below the photos.





**Download Special AST60 High-Pressure Sensor Specification Sheet**

**Special version of AST41 Inline/Immersion/Submersible Conductivity Sensor for applications that require IP69K installation rating (K=0.2/cm cell constant)**

This special conductivity sensor is ideal for food and beverage facilities that require 1000 psig high pressure steam washdowns for sterilization of their tanks between batches. This sensor can support high temperature conditions inline installations where the process media can get up to 205°C. Photos taken from the side view and the rear view with the IP69K rated sealing cable are shown below. The dimensional detail drawing for this special AST41-0.2-2.25″ contacting conductivity sensor is linked directly below the photos.





**Download Special AST41 Sensor Specification Sheet for IP69K Rated Installations**

# ASTI Supplied Conductivity Transmitters for Complete Systems

**ASTI 3TX** Single, Dual, Triple, Quad Contacting Conductivity Analyzer, Transmitter & Controller.

A summary of the system capabilities are detailed in the **conductivity measurement with the 3TX-CON transmitter brochure**.

The high resolution MODbus output **3TX-CON-E** version allows your control system to make use of the full capabilities of our 3TX-CON contacting conductivity transmitters throughout the entirety of the working range and is available for any desired cell constant.

The special **3TX-CON-F** version is optimized for accurate temperature compensation in situations where you need to measure the conductivity in both the positive and negative temperature conditions. This is accomplished by means of supporting multiple adjustable temperature compensation coefficients; one coefficient is used in the above zero (0°C) condition while another is used in the below zero (0°C) condition. The supported temperature range for the 3TX-CON-F transmitter is -40°C to +210°C.

**Rosemount 1056** Single and Dual Contacting and Toroidal Conductivity Analyzer, Transmitter & Controller

**Rosemount 1057** Single, Dual and Triple Contacting and Toroidal Analyzer

**Rosemount 5081** Single Contacting Conductivity Analyzer

**Rosemount 1066** Single Contacting Conductivity Analyzer

**Rosemount 56** Single and Dual Contacting Conductivity Analyzer

## Wiring Schematics for Selected Conductivity Transmitters

**ASTI 3TX Contacting Conductivity Analyzer Wiring Schematic** (Single, Dual, Triple or Quad)

**1056/1057/56 Contacting Conductivity Analyzer Wiring Schematic** (Single, Dual or Triple)

**1056/1057/56 Toroidal Conductivity Analyzer Wiring Schematic** (Single, Dual or Triple)

**HACH / GLI Toroidal Conductivity Analyzers Wiring Schematic** (E33, E53, E63, 672E, PRO-E3 & Others)

Our contacting and toroidal conductivity sensors are compatible with most any OEM transmitters. Please inquire to factory if your conductivity transmitter or analyzer is not listed above and we will be happy to supply the appropriate wiring schematic. You should ALWAYS define the planned mating instrument before the time of purchase to ensure compatibility.

## Conductivity Technical Articles and Literature

**Best practice guide for installation and calibration of contacting conductivity sensors with the 3TX-CON contacting conductivity transmitters**

**Total Dissolved Solids (TDS) conversion table to conductivity**

**General cleaning instructions for conductivity sensors**

**Final factory cleaning procedure for conductivity sensors**

**Increasing the Accuracy of Conductivity Measurements**

**Conductance Data for Common Used Chemicals**

**Basic Theory of Conductivity Measurements**

**Download ALL contacting & torroidal conductivity sensor specifications and hook-up schematics**

This is only a partial list of technical materials available.  Please contact your local representative of the factory to get further information.

CLICK HERE for details on SMART DIGITAL HiQDT MODBUS RTU configuration of CONDUCTIVITY (EC) SENSORS