Contacting & Toroidal Conductivity Sensors

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), PEEK KYNAR (PVDF), and others available upon request**
  - **"O"-Rings**
    - **EPDM & EPR, Viton, Kalrez, and others upon request**
  - **Sealing Fittings**
    - **316SS, KYNAR (PVDF), PolyPropylene & others**
- Toroidal Conductivity Sensors
  - **Polypropylene, and others available upon request**

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, 5, 10 & 20 available and other specials upon request
  - **Measure in solutions from ultra-pure water (0.01 microSiemens) to saturated electrolytes, acid and bases (600,000 microSiemens a.k.a. 600 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

COST EFFECTIVE & LONG-LASTING

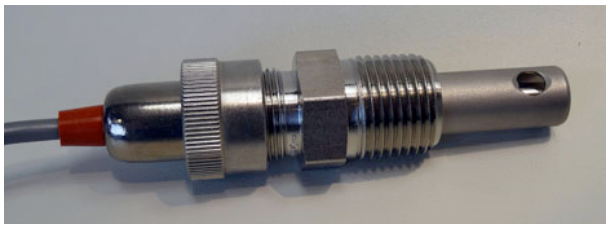
Superior performance and lifetime compared to most any OEM sensor due to optimal selection of materials, design and workmanship for each built-to-order sensor. A very low total cost of ownership is possible due to superior service lifetime and extremely competitive sensor unit cost comparable to much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

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. 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 sensors 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 and you are encouraged to inquire.

AST10 & AST51 1/2" (12mm) Contacting Conductivity Sensors - For Inline Installations (Immersion/Submersion Styles Also Supported)



AST51 Sensor with K=0.1/cm Cell, 316SS Compression Fitting

AST10 Sensor with K=0.01/cm Short Style Cell, PolyPropylene Compression Fitting

AST10 Sensor with K=10.0/cm Cell, PolyPropylene Compression Fitting

AST10 is available cell constants 0.01 to 10.0 & AST51 is available in cell constants 0.1 to 1.0, compact sensors for general purpose use and mounting into 3/4" or 1" pipe fittings to avoid the use of special flow cells. With polypropylene, stainless steel, or KYNAR (PVDF) compression fittings available for all models. Special short style K=0.01/cm cell to support smaller lines for inline low conductivity use (shown above). The longer AST10 Inline & Immersion Contacting Conductivity Sensor with Cell Constant K=10 is also shown.

AST41 High Temperature & Pressure Inline Contacting Conductivity Sensors

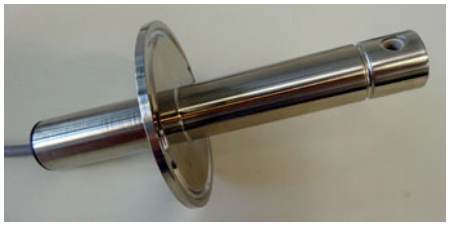
AST41 with K=0.1/cm Cell

AST41 with K=1.0/cm Cell

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.

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

AST10-TRI with K=1.0/cm Cell & 1.5" Tri-Clover



AST40-TRI with K=2.0/cm Cell & 2" Tri-Clover

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. Special K=2.0/cm style ideal for chemical CIP inline installation to directly replace existing toroidal installation schemes.

AST10, AST40 & AST42 for "HOT-TAP" Valve Retractable Installations

AST10 with K=0.05/cm Cell,
3/4" HOT-TAP Valve Retractable Assembly

AST10 with K=1.0/cm Cell,
1" HOT-TAP Valve Retractable Assembly

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. The AST40 ¾" O.D. Contacting Conductivity Sensor is available for 1" MNPT "HOT-TAP" Valve Insertion & Retraction installation with various cell constants, including K=10.0/cm for higher range measurements (Max Pressure 50 psig). The AST10 ½" O.D. Contacting Conductivity Sensor for ¾" MNPT "HOT-TAP" Valve Insertion & Retraction installation with Cell Constant K=0.1, 1.0 & 10.0 (and other upon request), for a max pressure of 150 psig.

AST52, ASTX-37PP and Other Sensors for High Conductivity Measurements

ASTX-37PP Toroidal Sensor
Shown with PolyPropylene Encapsulation

AST52 with K=10.0/cm Cell
(CPVC Shown, PTFE - TEFLON Version Optional)

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 materials of construction are also available for the measuring electrodes (316SS standard).

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.

AST50 & AST60 for Inline, Immersion & Submersible Installations
Low Maintenance, Easy to Clean for Slurry & Dirty Solutions

AST50 with K=1.0/cm Cell

AST60 with K=2.0/cm Cell

AST50 with K=0.1/cm Cell

AST50 & AST60 are compact double threaded 1”-1” MNPT bodied sensors for cell constants 0.1 to 2.0 offer fouling resistance & low maintenance for RO, drinking water inline quality measurements to wastewater submersion installations from low 50 µS all the way up to high 50,000 µS samples.

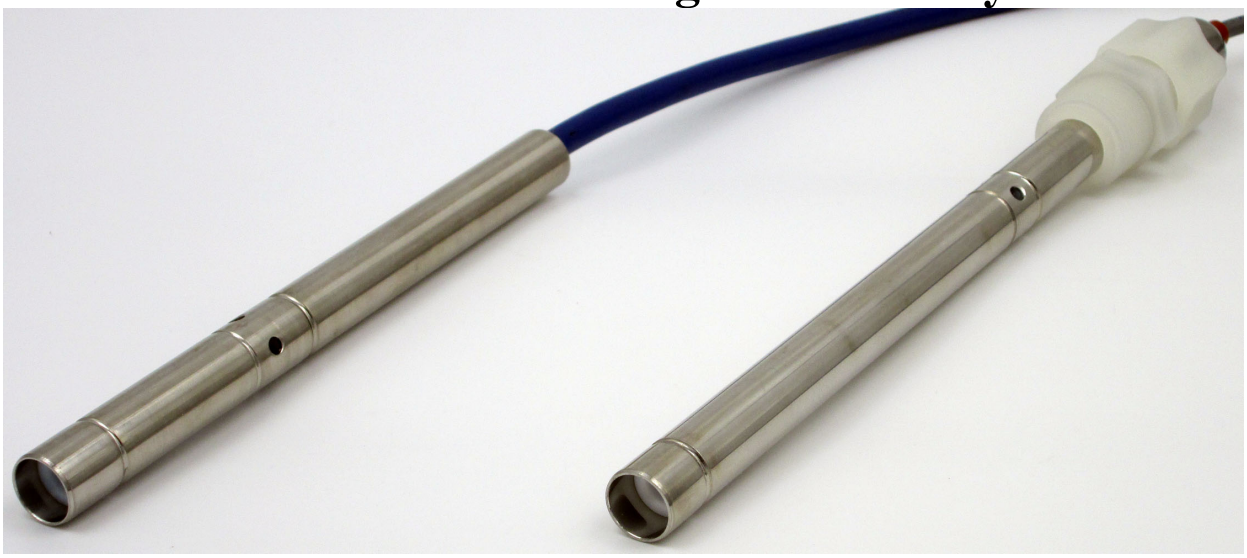
Custom Applications & Special Materials of Construction

Very many custom sensors are available upon request for specific needs. Although in some cases minimum orders may be required, quite often such minimums are quite modest. You are encouraged to inquire to the factory for all special order needs. A few selected examples are below for various cutom sensors that have been done for others before. One example is a special high cell constant K=10.0/cm sensor for high HF Applications (a.k.a. rinse tank applications). Another example is a special AST60 high pressure low-fouling sensor for inline slurries with a cell constant K=0.1/cm or K=0.2/cm. With special mating instrumentation, these cell constant can be operated as high as 20,000 µS.

In addition to altogether special conductivity sensor design with custom form factor and functionality, most of the standard sensors are available in alternate materials of construction upon request, including USP Class VI material traceability requirements and USDA FDA 3A certifications.

Last Revised March 9th, 2013

AST10 & AST51 Contacting Conductivity Sensors



AST10 Contacting Conductivity Sensors in K=3.0/cm cell constant (without cap & without compression fitting) & K=10.0/cm cell constant with Hastelloy C-276 & Viton Wetted Materials (with KYNAR compression fitting) shown from left to right, respectively

- The AST10 and AST51 sensors offer a compact design that allows installation into standard pipe fittings in small line sizes such as ¾" and 1" avoiding the need for special flow cells. Simplicity of design allows these conductivity sensors to be economically offered in exotic metals for especially corrosive chemical processes.
- Wetted materials of construction are 316 stainless steel (standard) with titanium & Hastelloy C-276 optional. The insulator material of construction is always and TEFLON (PTFE). Double redundant EPR O-ring seals (Viton optional) ensure reliability in long-term continuous field measurements. Only the process side O-ring is in contact with the stream so that the back O-ring maintains reliable sealing, free from chemical attack.
- Temperature measurement is achieved by potting the suitable temperature compensation (TC) element for the mating conductivity transmitter to be employed into the inner electrode. This approach ensures a fast responding and accurate automatic temperature compensation no matter the conductivity instrument used.
- Process connections are made via ½" or ¾" MNPT threads on a bored through compression fitting. This fitting can be screwed into a line, or tank, and turned around and connected to a standpipe for use in a submersion configuration. Compression fittings are available in polypropylene (PP), KYNAR (PVDF) or 316SS materials of construction (max 500 psig rating achieved when the 316SS compression fitting)
- The AST51 is good for general purpose use up to about 20,000 micromhos (µS) on most analyzers, while the AST10 covers a broader range of cell constants and of conductivities anywhere from 0.05 to 1,000,000 micromhos (µS)
- Available in cell constants from K=0.01/cm all the way up to K=10.0/cm and anywhere in between to support all possible measurements ranges of interest. Inquire to factory for best choice for your application.
- Cable length is 10 feet standard but extended lengths up to 100 feet (30 meters) are available upon request.
- Quick-disconnect waterproof & corrosion-resistant snap connectors for easy removal for maintenance.
- Available with braid-reinforced blue cable which is suitable for use with high pressure IP69K rated fittings.

AST10 & AST51 Contacting Conductivity Sensors Specifications

Measurement Range: Dependent Upon Cell Constant and Mating Transmitter Employed *

Operating Temperature: -35 to +100 °C (-31 to +212 °F) with POLYPROPYLENE fitting **
-35 to +120 °C (-31 to +248 °F) with KYNAR & 316SS fitting **

Operating Pressure: Max 100 psig @ 100°C with POLYPROPYLENE compression fitting
Max 150 psig @ 120°C with KYNAR compression fitting
Max 500 psig @ 100°C or 200 psig @ 120°C with 316SS compression fitting

Process Connections: ½" or ¾" MNPT Depending upon Type of Compression Fitting Selected

Wetted Materials of Construction:

- Insulator: TEFLON (PTFE)
- O-Rings: EPDM (Standard), Viton or Kalrez (Optional)
- Electrodes: 316SS (Standard), Titanium or Hastelloy C-276 (Optional)
- Process Fitting: ½" or ¾" MNPT Polypropylene (Std), ½" MNPT KYNAR or 316SS (Optional)

Temperature Element: Standard with Pt1000 or Pt100 temperature sensor; Other TC elements such a Balco 3K resistor and 10K Thermistor are also available upon request

Cell Constants Available for Models

AST10: K = 0.01, 0.02, 0.05, 0.1, 1.0, 3.0, 10.0 **/cm**

AST51: K = 0.1, 1.0 **/cm**

Cable Length Limits: Standard 10 feet (3 meters), Max is 100 feet (30 meters)

End of Cable Terminations: Tinned Leads (-TL) or NEMA 6P rated waterproof and corrosion-resistant quick disconnect snap connector in 5-pole (Q5M/Q5F) or 4-pole (Q4M/Q4F) version

Storage and Shelf-Life: One (1) years from date of dispatch from factory when stored at ambient.

Dimensional Details: See Following Pages for drawing of each particular cell constant configuration.

Cell Constant	DIMENSIONS "A"	"B"	"C"
0.01	1.98	5.25	3.50
0.01	1.175	3.50	1.36
0.02	0.95	5.25	3.50
0.05	0.825	5.25	3.50
0.1	0.30	5.25	3.50
0.1	0.30	2.75	1.00
1.0	0.30	5.25	3.50
1.0	0.30	2.75	1.00
3.0	2.17	6.00	3.50
10.0	5.10	8.50	7.00

NOTES ON AST10 & AST51 SENSOR DIMENSIONS

"A" is distance from tip of sensor to center of vent hole

"B" is distance from tip of sensor to tip of cap

"C" is distance from the tip of sensor to start to threads

Cells shaded in orange are for the short style version.
Cells shaded in blue are for the AST51 models.
All other dimensions are for the standard AST10 models.

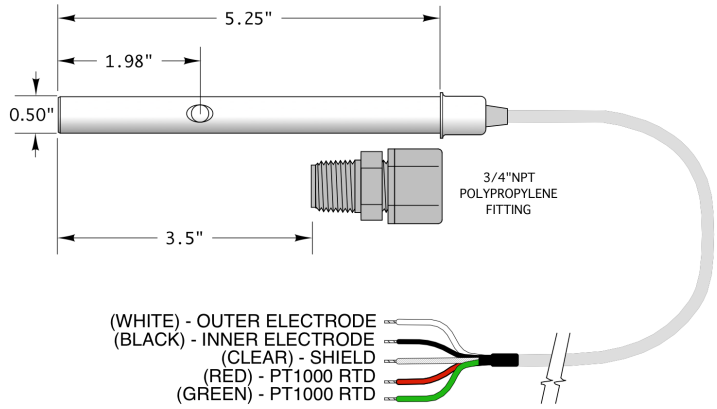
All dimensions are in inches.

* *Contact factory to confirm that your desired measurement range is suitable for the chosen cell constant & mating instrument.*

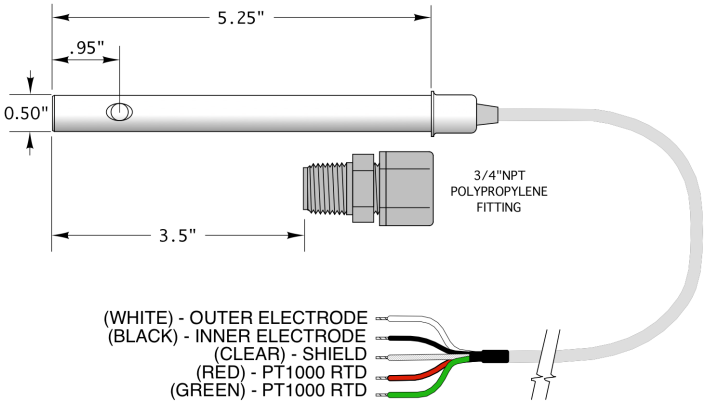
** *Contact factory for applications where the measurement is below 0°C prior to specifying sensor for project or commissioning.*

Dimension Details for AST10 in Cell Constants 0.01, 0.02 & 0.05

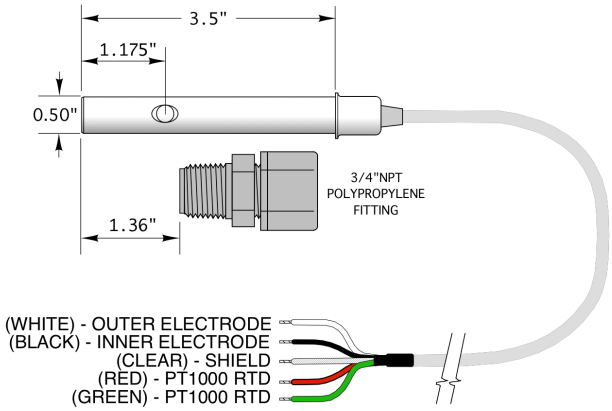
AST10 K=0.01/cm Cell Constant



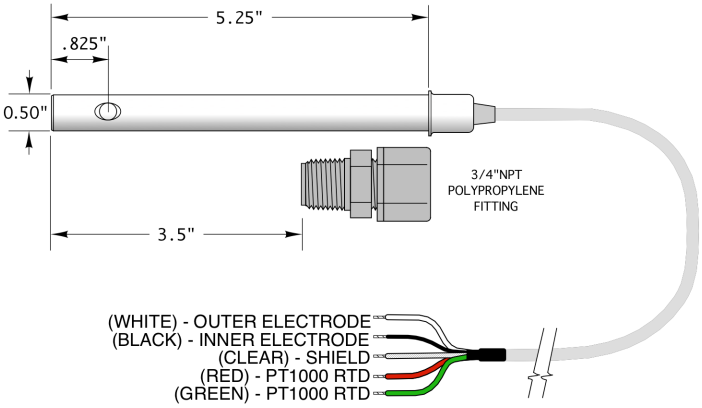
AST10 K=0.02/cm Cell Constant



AST10 K=0.01/cm Short Style Cell Constant



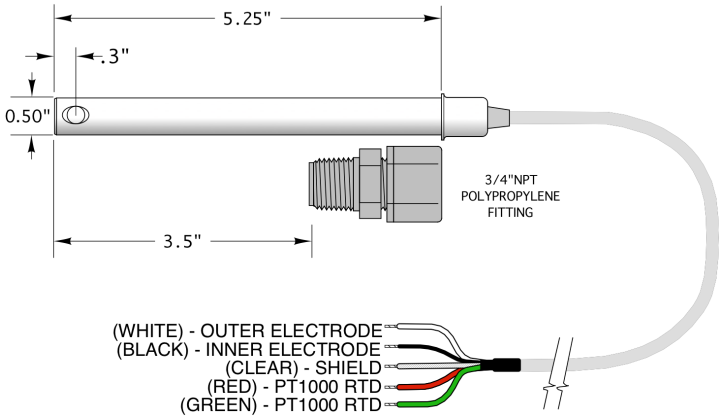
AST10 K=0.05/cm Cell Constant



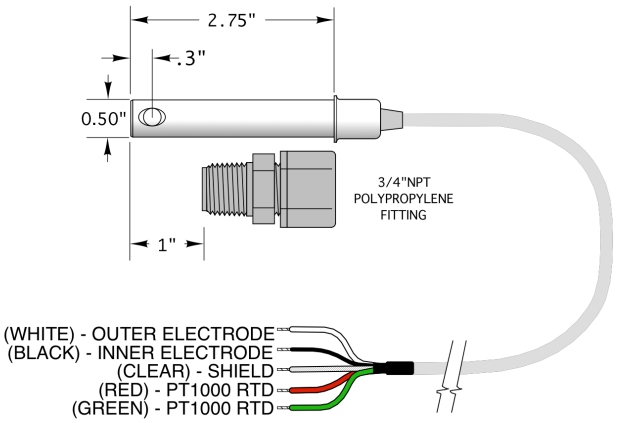
The cell constants 0.01/cm, 0.02/cm & 0.05/cm are typically used for measurement in deionized (DI) water, reverse osmosis (RO) water, distilled & demineralized water as well as othertypes of low conductivity applications. Cell constants 0.1/cm & 1.0/cm are suitable for most general purpose measurements with the exact range depend upon the mating instrument. The insertion depth of the sensor when installed orthogonal to direction of flow (such as in a pipe tee) must be at least the distance "A" from the tip of the sensor to the center of the vent hole and at most distance "C" from the tip of the sensor to the start of the threads. The compression fitting can be slid down to minimize distance "C" so long as it does not obstruct or cover any portion of the vent holes. The cell constants 0.01/cm, 0.02/cm, 0.05/cm & 0.1/cm may also be installed with the tip pointed into the direction of flow (see drawing for K=10.0/cm cell constant for visualization of this type of installation scheme). As always contact factory for assistance if required.

Dimension Details for AST 10 & AST51 in Cell Constants 0.1 & 1.0

AST10 K=0.1/cm & K=1.0/cm Cell Constants

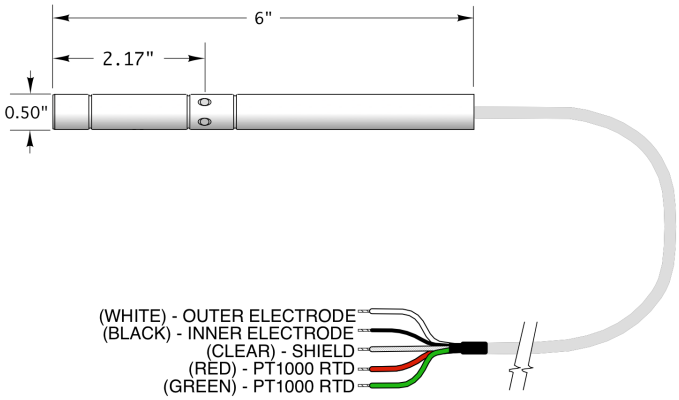


AST51 K=0.1/cm & K=1.0/cm Cell Constants

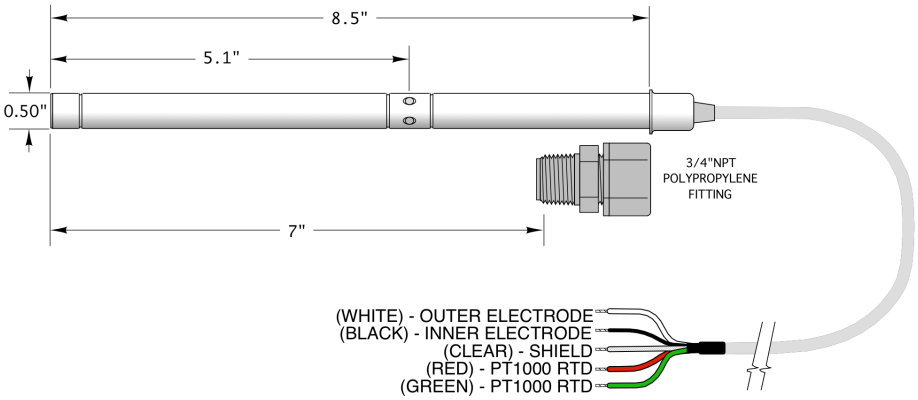


Dimension Details for AST10 in Cell Constants 3.0 & 10.0

AST10 K=3.0/cm Cell Constant (without cap)

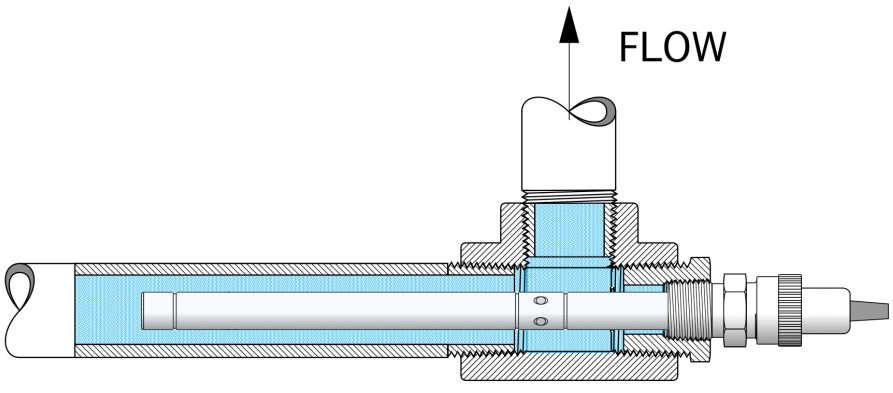


AST10 K=10.0/cm Cell Constant



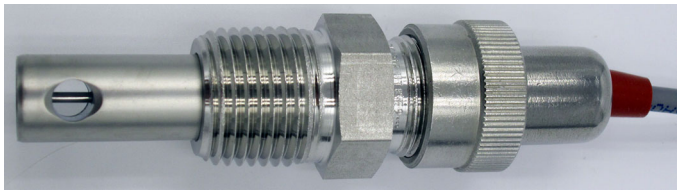
The distance "C" from the tip of sensor to start of threads is valid for ¾" polypropylene compression fittings. This distance may vary slightly when using the ½" MNPT polypropylene, KYNAR (PVDF) or 316SS compression fittings. AST10 & AST51 sensors available without any cap as a special-order option although some special care is needed when using this approach (see drawing for K=3.0/cm cell constant above as an example of this configuration). The AST10 sensors are quite often installed with the tip into the direction of flow when line sizes are too small to ensure that the vent holes will be wetted at all times (see below for visualization of this scheme).

Typical Installation Scheme for AST10 in Cell Constant 10.0/cm

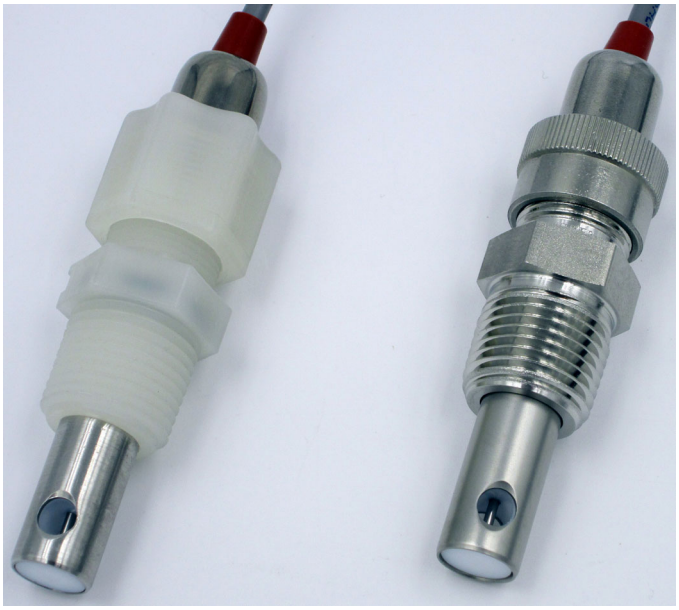


Selected Photos for Visualization of AST51 Sensors

AST51 sensors shown with ¾" MNPT polypropylene (PP) compression fittings in the K=1.0/cm & K=0.1/cm cell constant configurations from left to right, respectively.



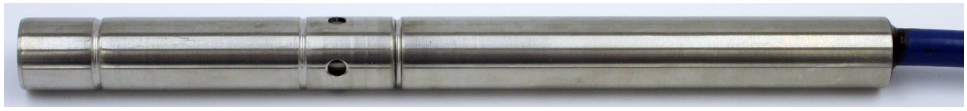
AST51 sensor with ½" MNPT 316SS compression fitting rated to 500 psig shown in the K=1.0/cm cell constant configuration.



AST51 sensors shown with ½" MNPT KYNAR (PVDF) and 316SS compression fittings both in the K=1.0/cm cell constant configuration from left to right, respectively. Wetted materials of construction 316SS (standard), titanium, Hastelloy C-276 for electrodes & EPDM (standard), Viton or Kalrez for elastomers. TEFLON (PTFE) is always the wetted insulator material.

Selected Photos for Visualization of AST10 Sensors

AST10 Contacting Conductivity Sensor in K=10.0/cm cell constant with Hastelloy C-276 & Viton Wetted Materials & KYNAR fitting



AST10 Sensor in K=3.0/cm cell constant without cap & with blue braid-reinforced cable

GENERAL INSTALLATION NOTES:

The sensors may be installed at any orientation as desired. Care should be taken that the installation scheme is such that the measuring cell is completed full at all time (no entrapped air bubbles or times when this part of the line is dry). In the case of batch operation where the tank is periodically drained, installation with the sensor tip to the top of the tank (inverted style) is preferred. For inline installations, the vent hole should be entirely in the path of flow and unobstructed by the compression fitting to ensure that the sample in the measuring cell is representative of the process fluid at all times. Alternatively, if the vent hole cannot be installed to be entirely in the flow the tip should be installed into the direction of flow typically at an elbow in the piping. For low-flow installations please contact the factory for additional assistance. Dimensions for all drawings are in inches. Custom insertion depth may be available for selected sensor configurations as special order options upont request.

Last Revised February 9, 2018

AST41 Contacting Conductivity Sensors for Inline Installations at High Pressures to 500 psig & High Temperature to 205°C

AST41 in K=0.05/cm cell constant with J-Box

AST41 in K=2.0/cm cell constant with J-Box

- AST41 was designed for high pressure and temperature conductivity measurement, and is an ideal choice for:
  - Blowdown control, condensate monitoring, leak detection on heat exchangers and steam purity measurements
  - Ideal for boiler condensate and blowdown control without cooler type installations
- High temperature and pressure water and steam is a severe environment for any elastomer requiring special features:
  - Dual EPDM O-ring seals ensure reliability (Viton & Kalrez Optional). Front seal absorbs brunt of chemical attack, allowing rear O-ring to operate in protected environment ensuring continued sealing & long service.
  - The result is that sensor life is more than double what can be expected of single sealed, or epoxy sealed units.
- Compact design for ¾" NPT process interface with longer insertion depths available as special-order option
- With explosion proof junction box; Class I, Groups C, D & Class II, Groups E, F, G; weatherproof painted aluminum
- Wetted insulator materials of construction are PEEK insulator with 316SS sensor body and inner electrode as standard.
- Available cell constants of K=0.05/cm, K=0.1/cm, K=0.2/cm, K=1.0/cm & K=2.0/cm cover many conductivity ranges.
  - Typical area of use is 5 to 200,000 µS/cm. Below 5µS/cm a cell constant of K=0.01/cm or lower is required
  - K=0.05/cm cell constant can be used for ranges as low as 5-100 µS/cm or as high as 25-2,500 µS/cm
  - K=0.1/cm cell constant can be used for ranges as low as 10-200 µS/cm or as high as 50-5,000 µS/cm
  - K=0.2/cm cell constant can be used for ranges as high as 20-20,000 µS/cm
  - K=1.0/cm cell constant can be used for range as high as 100-100,000 µS/cm
  - K=2.0/cm cell constant can be used for range as high as 200-200,000 µS/cm
- Cable length is 10 feet standard but extended lengths as integral cable or else by means of quick-disconnect waterproof and corrosion-resistant snap connections are available for ease of removal for cleaning and/or recalibration.

AST41 Contacting Conductivity Sensors Specifications

Measurement Range: Dependent Upon Cell Constant and Mating Transmitter Employed *

Operating Temperature: -35 to +150 °C (-31 to +302 °F) for Standard Version **

-35 to +205 °C (-31 to +401 °F) for Hi-Temp Version **

Operating Pressure: Max 100 psig @ 150°C for Standard Version

Max 250 psig @ 205°C for Hi-Temp Version

Max 500 psig @ 100°C for Standard & Hi-Temp Versions

Process Connections: 3/4" MNPT Front Threads with EX J-Box Installed for Inline Installations

3/4" MNPT Front & Rear Threads without J-Box for Immersion

Wetted Materials of Construction:

- Insulator: PEEK
- O-Rings: EPDM (Standard) or Viton/Kalrez (Optional), Redundant
- Electrodes: 316SS Standard
- Sensor Body: 316SS Standard
- **Temperature Element:** Standard with Pt1000 or Pt100 temperature sensor; Other TC elements such a Balco 3K resistor and 10K Thermistor are also available upon request

Cell Constants Available for Models AST41: K = 0.05, 0.1, 0.2, 1.0 or 2.0 **/cm**

Cable Length Limits: Standard 10 feet (3 meters), Max is 100 feet (30 meters)

End of Cable Terminations: Tinned Leads (-TL) or NEMA 6P rated waterproof and corrosion-resistant quick disconnect snap connector in 5-pole (Q5M/Q5F) or 4-pole (Q4M/Q4F) version

Storage and Shelf-Life: One (1) year from date of dispatch from factory when stored at ambient.

Dimensional Details: See following pages for drawing of each particular cell constant configuration.

* *Contact factory to confirm that your desired measurement range is suitable for the chosen cell constant & mating instrument.*

** *Contact factory for applications where the measurement is below 0°C prior to specifying sensor for project or commissioning.*

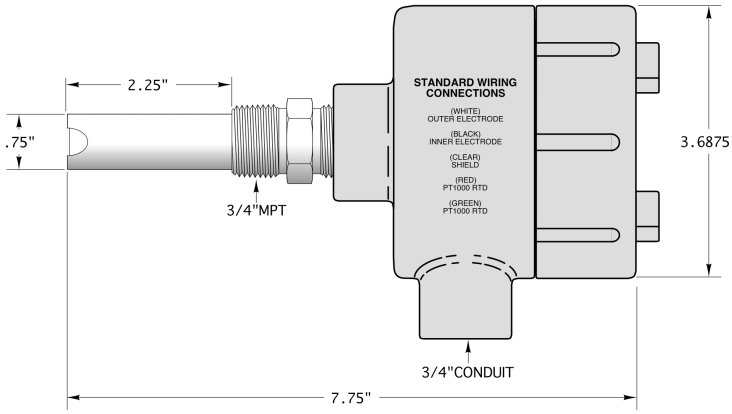
The table below contains the various available full conductivity ranges when the 3TX-CON transmitter is employed for various cells.

LOW RANGE OPTIMIZED			STANDARD RANGE			HIGH RANGE OPTIMIZED		
NOM CELL	CAL CELL RANGE	FULL RANGE	NOM CELL	CAL CELL RANGE	FULL RANGE	NOM CELL	CAL CELL RANGE	FULL RANGE
0.1L	0.05-0.15	0-200µS	0.1	0.03-0.17	0-5,000µS	0.2	0.06-0.34	0-20,000µS
1.0L	0.5-1.50	0-2mS	1.0	0.30-1.70	0-50mS	2.0	0.60-3.40	0-200mS
			2.0	0.60-3.40	0-100mS			

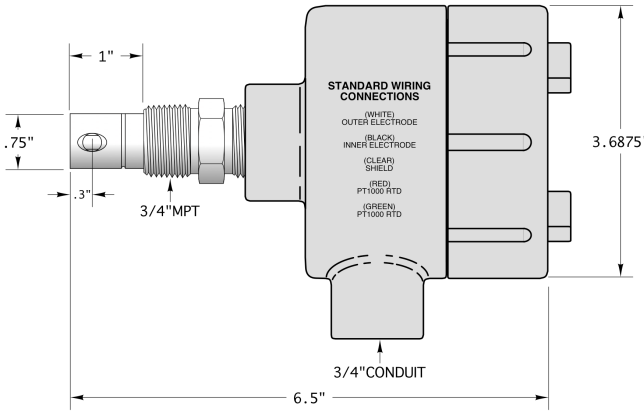
Last Revised November 28, 2017

Dimension Details for AST41 in Cell Constants 0.05, 0.1, 0.2, 1.0 & 2.0

AST41 K=0.2/cm Cell Constant with Extended Insertion Depth Option



AST41 K=0.05/cm, K=0.1/cm, K=1.0/cm & K=2.0/cm Cell Constants



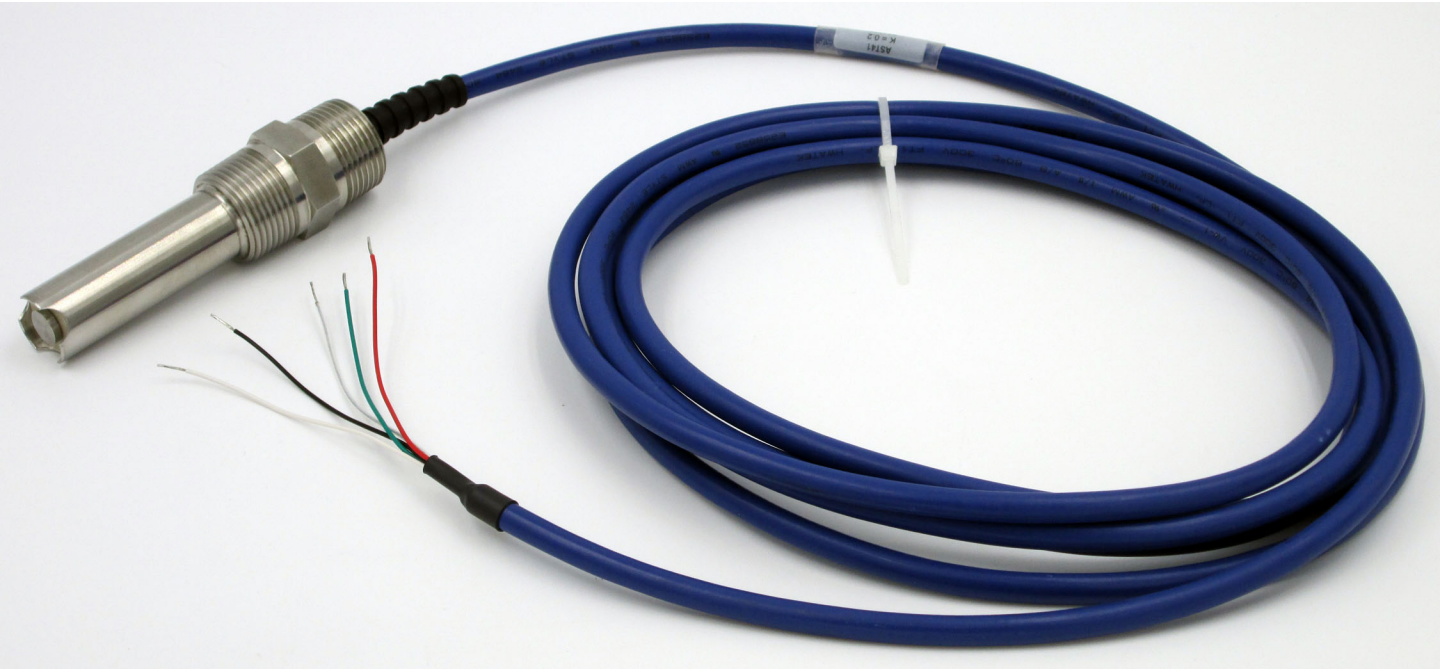
NOTE 1: The AST41 sensor can be supplied with ASTI supplied cable or else customer supplied cable can be used and connected to the terminals in the J-Box.
NOTE 2: The AST41 sensors can be supplied without J-Box if customer shall supply and install their own. Contact factory for assistance if you wish to use this scheme.

Close-up of AST41 in K=0.05/cm cell constant. The K=0.1/cm cell constant is largely similar except for diameter & position of inner electrode.

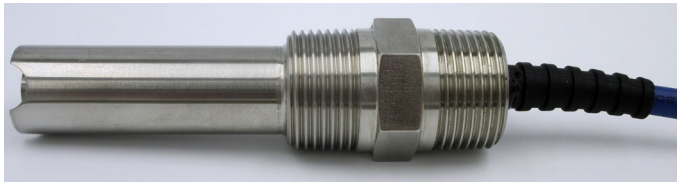
Close-up of AST41 in K=2.0/cm cell constant. The K=1.0/cm cell constant is largely similar except for diameter & diameter of vent hole.

AST41 in K=0.05/cm cell constant shown with J-Box & 30 feet of cable (top)
AST41 in K=2.0/cm cell constant shown with J-Box & 30 feet of cable (right)

Photos of AST41 in Cell Constant K=0.2/cm with extended insertion depth and without J-box



The AST41 in the K=0.2/cm with extended insertion depth is an ideal choice for rugged submersible measurements especially when combined with the braid-reinforced blue cable option. The rear ¾" MNPT threads should be interfaced with a suitable immersion tube (a.k.a. standpipe) if the planned installation is submersible style.



Various close-up views of the *AST41 in the K=0.2/cm with extended insertion depth in the without J-Box configuration. The open geometry can be ideal for situations of low-flow, high viscosity or else other potential fouling constituents that may be present in slurries and other abrasives in the solution. When used with the 3TX-CON transmitter this sensor can be used to measure up to 20,000 µS/cm (20mS/cm) making it suitable for a wide range of potential applications.*

Sanitary TRI-CLOVER Contacting Conductivity Sensors

The K=3.0/cm cell constant sensor is shown to the left with 1.5" TRI-CLOVER flange. The middle and right sensors are both K=0.1/cm cell constants with the middle having a 1.5" TRI-CLOVER and the right having a ¾" TRI-CLOVER.

- FDA Compliant; Suitable for use in food, dairy, beverage and pharmaceutical applications
- Designed for insertion into Ladish or Tri-Clover fittings from ¾" up to 2½" in size
- Redundant O-ring seals used on all versions for high on-stream reliability
- Steam Sterilizable; Suitable for processes employing Chemical Clean in Place (CIP) sterilization
- The AST10, AST51 and AST40 sensors are welded to blind flanges of customer specified size, and can then be inserted into standard tee fittings in sanitary systems using fittings by Ladish or Alfa-Laval Tri-Clover.
- Available in cell constants from K=0.01/cm all the way up to K=10.0/cm and anywhere in between to support all possible measurements ranges of interest. Inquire to factory for best choice for your application.
- Wetted materials of construction are 316 stainless steel and Teflon or PEEK, with double redundant EPR O-ring seals (Viton optional). The process side O-ring is the only one in contact with the stream, allowing the back O-ring to maintain reliable sealing, free from chemical attack. TC elements are potted in the body itself.
- Cable length is 10 feet standard but extended lengths are available. Quick-disconnect waterproof and corrosion-resistant snap connections are available for ease of removal for cleaning and/or recalibration.
- Process connections are customer specified sanitary flanges. The insertion depth is tailored for each flange size to obtain proper positioning in the standard tee fittings of the given piping system. The sensor is amenable to both steam sterilization, or cleaning by solutions of bleach, ozone, or caustic.
- Available with braid-reinforced blue cable which is suitable for use with high pressure IP69K rated fittings.

ASTXX-TRI Sanitary Contacting Conductivity Sensors Specifications

Measurement Range: Dependent Upon Cell Constant and Mating Transmitter Employed *

Operating Temperature: -35 to +130 °C (-31 to +266 °F) with TEFLON insulator **
-35 to +205 °C (-31 to +401 °F) with PEEK insulator **

Operating Pressure: Max 150 psig @ 130°C with TEFON INSULATOR
Max 200 psig @ 205°C with PEEK INSULATOR

Process Connections: Sanitary Flange from ¾" up to 2½" in size

Wetted Materials of Construction:

- Insulator: TEFLON (PTFE) or PEEK Depending upon Cell Constant, FDA Compliant
- O-Rings: EPDM (Standard) or Viton (Optional), Redundant, FDA Compliant
- Electrodes: 316SS Standard, Titanium available upon request as special order
- Process Fitting: 316SS Standard, Titanium available upon request as special order

Temperature Element: Standard with Pt1000 or Pt100 temperature sensor; Other TC elements such a Balco 3K resistor and 10K Thermistor are also available upon request

Cell Constants Available for Models

AST10-TRI: K = 0.01, 0.02, 0.05, 0.1, 1.0, 3.0, 10.0 **/cm** (TEFLON INSULATOR)

AST51-TRI: K = 0.1, 1.0 **/cm** (TEFLON INSULATOR) – *Drawings for these upon request*

AST40-TRI: K = 2.0, 5.0 **/cm** (PEEK INSULATOR)

Cable Length Limits: Standard 10 feet (3 meters), Max is 100 feet (30 meters)

End of Cable Terminations: Tinned Leads (-TL) or NEMA 6P rated waterproof and corrosion-resistant quick disconnect snap connector in 5-pole (Q5M/Q5F) or 4-pole (Q4M/Q4F) version

Storage and Shelf-Life: One (1) year from date of dispatch from factory when stored at ambient.

Dimensional Details: See Following Pages for drawing of each particular cell constant configuration.

The table below details the various critical dimensions for design and commissioning purposes. Inquire to factory for assistance.

Cell	DIMENSIONS		
Constant	"A"	"B"	DIA
0.01	1.97	5.25	0.50
0.02	1.97	5.25	0.50
0.05	0.80	2.65	0.50
0.1	0.30	2.65	0.50
1	0.30	2.65	0.50
2.0	0.30	3.00	0.75
3.0	2.17	4.90	0.50
5.0	3.00	4.0 to 7.0	0.75
10.0	5.20	9.20	0.50

NOTES FOR SANITARY SENSOR DIMENSIONS

"A" is distance from tip of sensor to center of vent hole

"B" is distance from tip of sensor to front of flange. Custom insertion depths available as special order.

"DIA" is diameter of outer electrode shaft

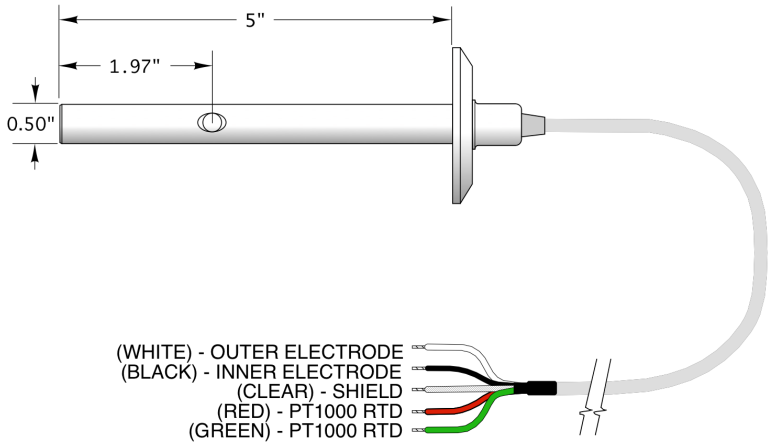
All dimensions are in inches

* *Contact factory to confirm that your desired measurement range is suitable for the chosen cell constant & mating instrument.*

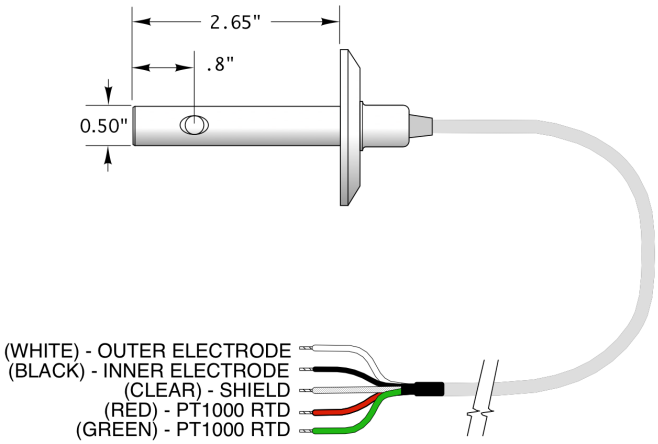
** *Contact factory for applications where the measurement is below 0°C prior to specifying sensor for project or commissioning.*

Dimension Details for Cell Constants 0.01, 0.02, 0.05, 0.1 & 1.0

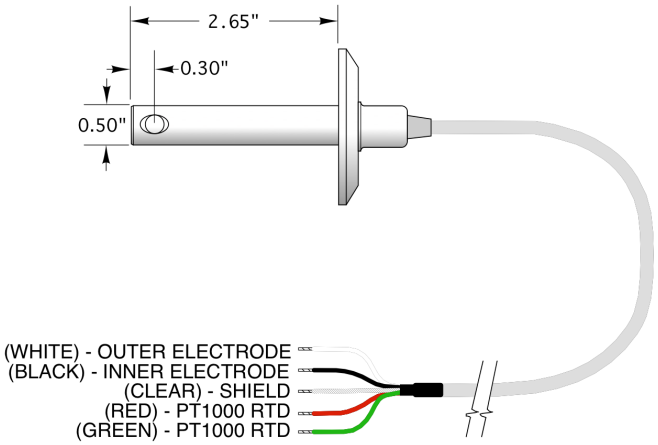
K=0.01/cm & K=0.02/cm Cell Constants



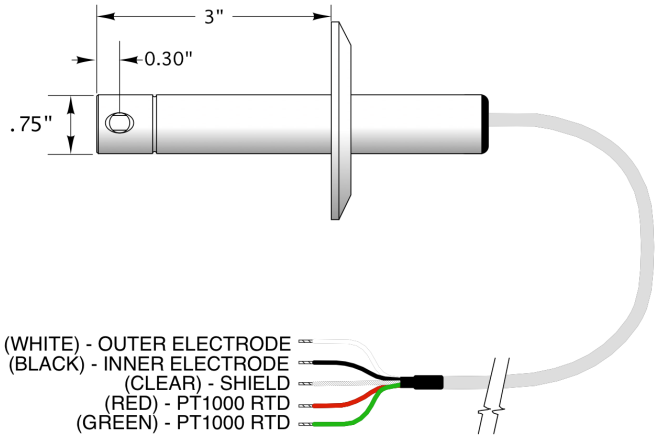
K=0.05/cm Cell Constant



K=0.1/cm & K=1.0/cm Cell Constants



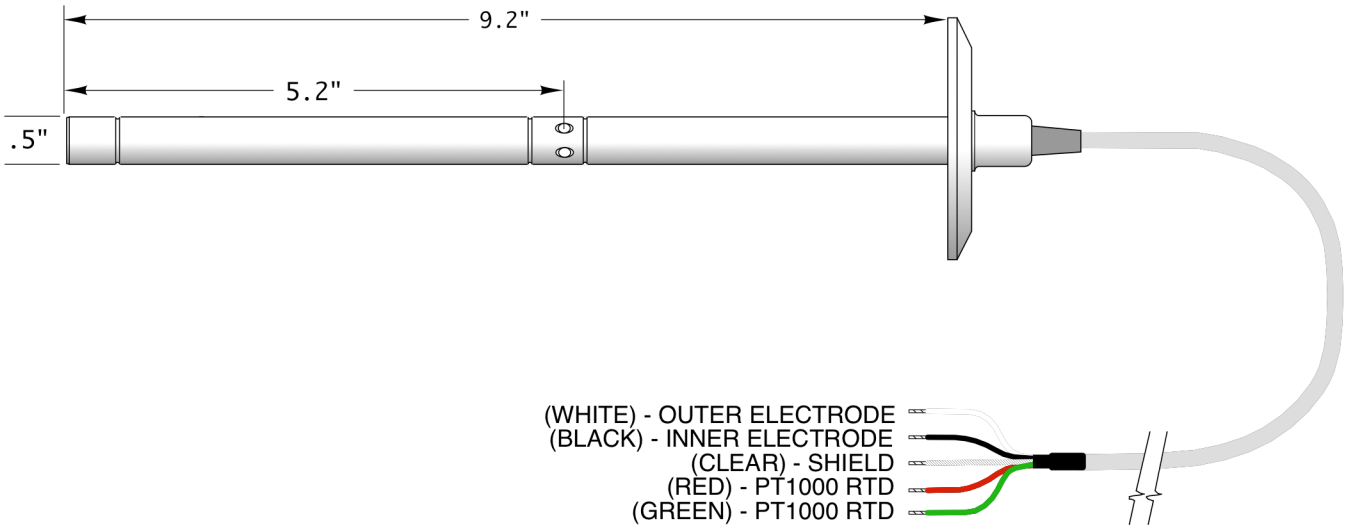
K=2.0/cm Cell Constant



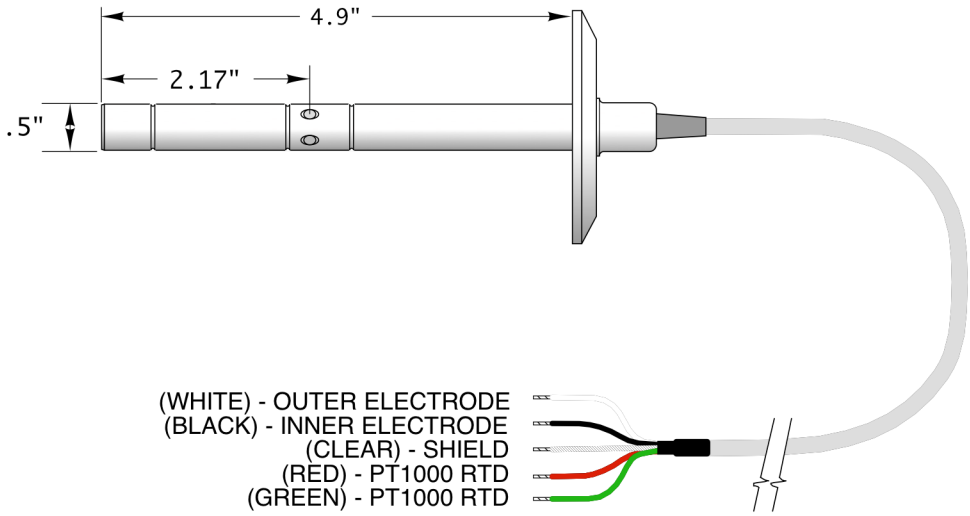
The flanges for the K=0.01/cm, K=0.02/cm, K=0.05/cm, K=0.1/cm & K=1.0/cm sanitary conductivity sensors are shown with a 1.5" TRI-CLOVER flange. The K=2.0/cm sanitary conductivity sensor is shown with a 2" TRI-CLOVE flange. The smallest TRI-CLOVER flange for K=2.0/cm sensor is the 1.5" where all sizes are available for all other cell constants. All dimension in inches.

Dimension Details for Cell Constants 3.0 & 10.0

K=10.0/cm Cell Constant



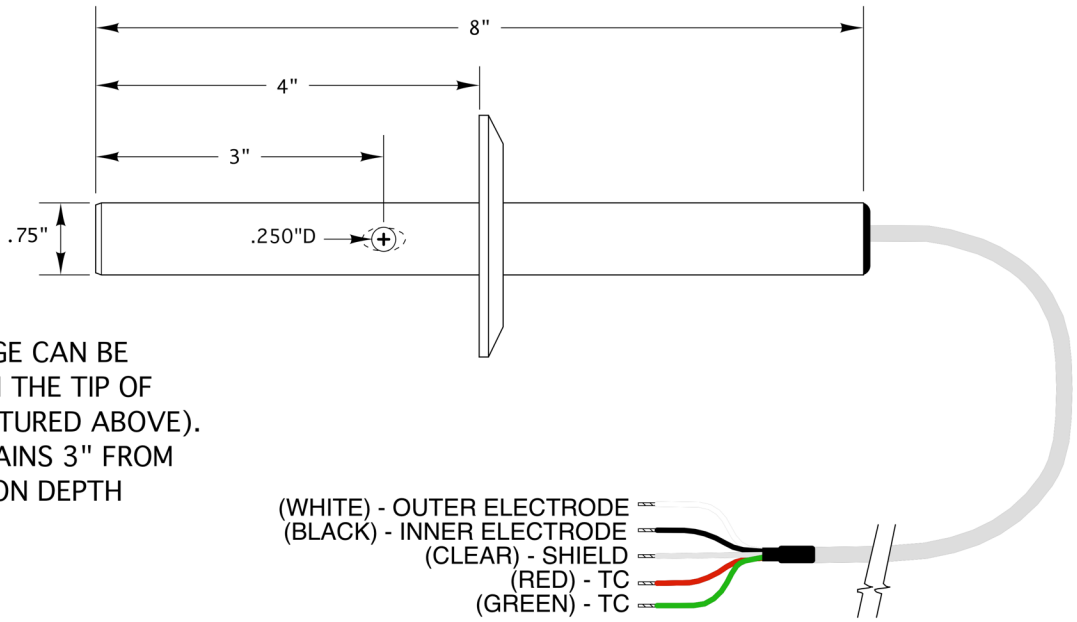
K=3.0/cm Cell Constant



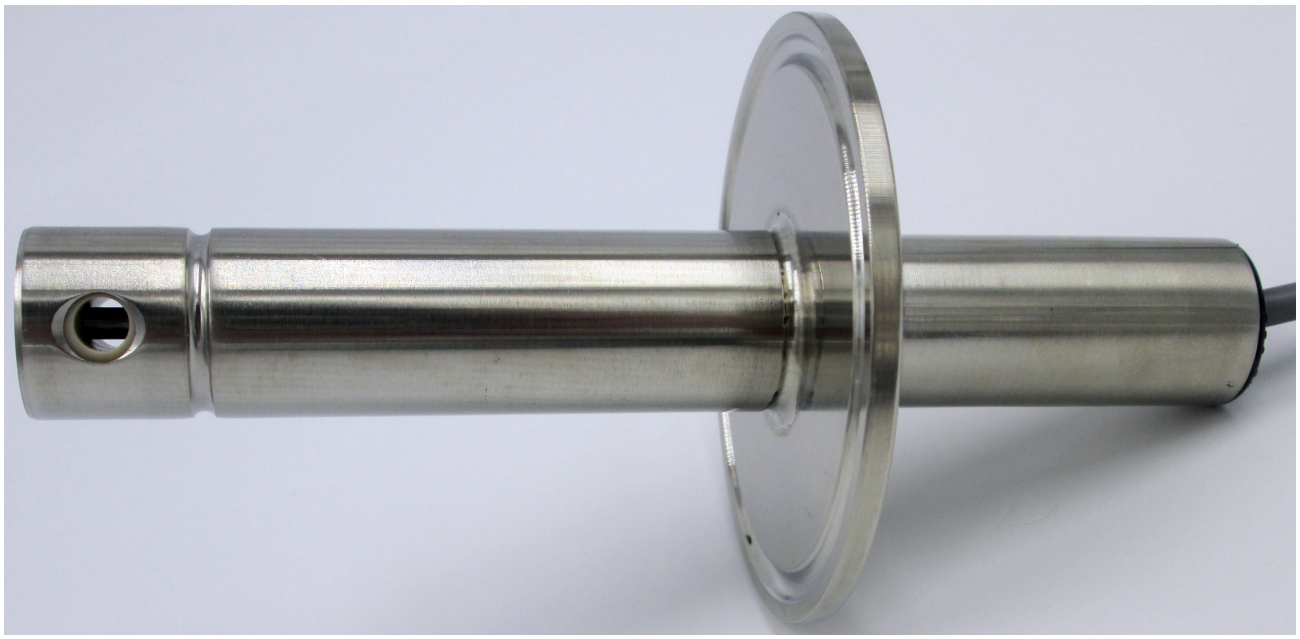
The sensors may be installed at any orientation as desired. Care should be taken that the installation scheme is such that the measuring cell is completed full at all time (no entrapped air bubbles). In the case of batch operation where the tank is drained, typically installation with the sensor tip to the top of the tank is preferred (inverted). For inline installations, the vent hole should be entirely in the path of flow to ensure that the sample in the measuring cell is representative at all times. Alternatively, if the vent hole cannot be installed to be entirely in the flow the tip should be installed into the direction of flow typically at an elbow in the piping.

Sensors shown with 2" sanitary flanges in the drawings above. Any flange size from ¾" to 2½" available. All dimension in inches.

Dimension Details for Cell Constant 5.0



NOTES:
THE SANITARY FLANGE CAN BE WELDED 4"-7" FROM THE TIP OF SENSOR BODY (4"PICTURED ABOVE). THE VENT HOLE REMAINS 3" FROM TIP FOR ANY INSERTION DEPTH



The photo above shows the K=2.0c/m cell constant configuration with the vent hole and inner electrode visible near the tip of the sensor. The K=2.0/cm and K=5.0/cm cell constant configuration both have the 0.75 inch shaft diameter for the outer electrode although the K=5.0/ configuration has a larger vent hole diameter which can be convenient for process conditions where air bubble or fouling are likely to occur. Please refer to the sanitary dimension summary table for all relevant details for the desired cell constant as most suitable for your planned measurement and mating contacting conductivity instrument to be used.

Sensors are shown with 2" Sanitary TRI-CLOVER flange in the drawing and photo above. Any flange size from ¾" to 2½" available. All dimension in inches.

Last Revised February 19, 2018

Sanitary Conductivity Sensor Dimensional Details & Mating 3TX-CON Transmitter Selection Guide

Cell	DIMENSIONS			LOW			STANDARD			HIGH		
Constant	"A"	"B"	DIA	NOM CELL	CAL CELL RANGE	FULL RANGE	NOM CELL	CAL CELL RANGE	FULL RANGE	NOM CELL	CAL CELL RANGE	FULL RANGE
0.01	1.97	5.25	0.50	0.01L	0.005-0.015	0-20uS	0.01	0.005-0.015	0-500uS	0.02E	0.006-0.034	0-2,000uS
0.02	1.97	5.25	0.50				0.02E	0.006-0.034	0-2,000uS			
0.05	0.80	2.65	0.50				0.1	0.03-0.17	0-5,000uS			
0.1	0.30	2.65	0.50	0.1L	0.05-0.15	0-200uS	0.1	0.03-0.17	0-5,000uS	0.2	0.06-0.34	0-20,000uS
1	0.30	2.65	0.50	1.0L	0.5-1.50	0-2mS	1.0	0.30-1.70	0-50mS	2.0	0.60-3.40	0-200mS
2.0	0.30	3.00	0.75				2.0	0.60-3.40	0-200mS			
3.0	2.17	4.90	0.50				2.0	0.60-3.40	0-200mS			
5.0	3.00	4.00 to 7.00	0.75				10.0	3.0-17.0	0-500mS	20.0	6.0-34.0	0-1,000mS
10.0	5.20	9.20	0.50				10.0	3.0-17.0	0-500mS	20.0	6.0-34.0	0-1,000mS

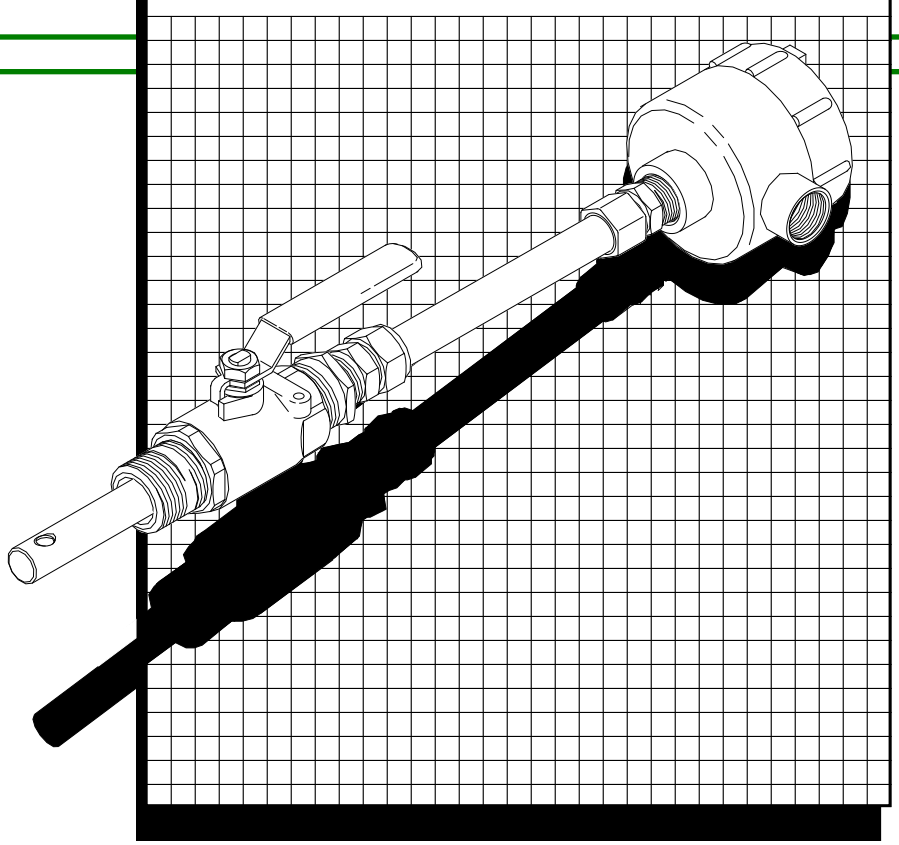
NOTES:
"A" is distance from tip of sensor to center of vent hole
"B" is distance from tip of sensor to front of flange
"DIA" is diameter of outer electrode shaft
All dimensions are in inches

"L" series 3TX-CON have a minimum scaling that is 25% of the full range
Standard series 3TX-CON have a minimum scaling that is 10% of full range
X2 series 3TX-CON have full range shown for 0-105C use. For 0-210C use, the full range is half that of 0-105C condition. Min scaling is 10% of full range.
For specification of High-Resolution "E" series please see separate 3TX-CON-E supplement. Not all CON-E options are listed on this guide.

The best choice of cell constant and mating 3TX-CON transmitter is found based upon a combination of meeting the dimensions constraints that may exist for the process installation point together with finding the pairing that is as close to 50% of full range as possible. If the sample conductivity oscillates, consider the condition that is of greatest interest when making the selection. In cases where the conductivity does vary substantially up and down the working range, the CON-E high resolution MODbus is often a very good choice to get the maximum possible precision at any given conductivity value.

Last Revised February 9, 2018

Model AST40
CONDUCTIVITY SENSOR



Measure conductivity directly in process temperatures up to 205°C with Hi-Temp option

O-ring seals used on all versions for highest on-stream reliability

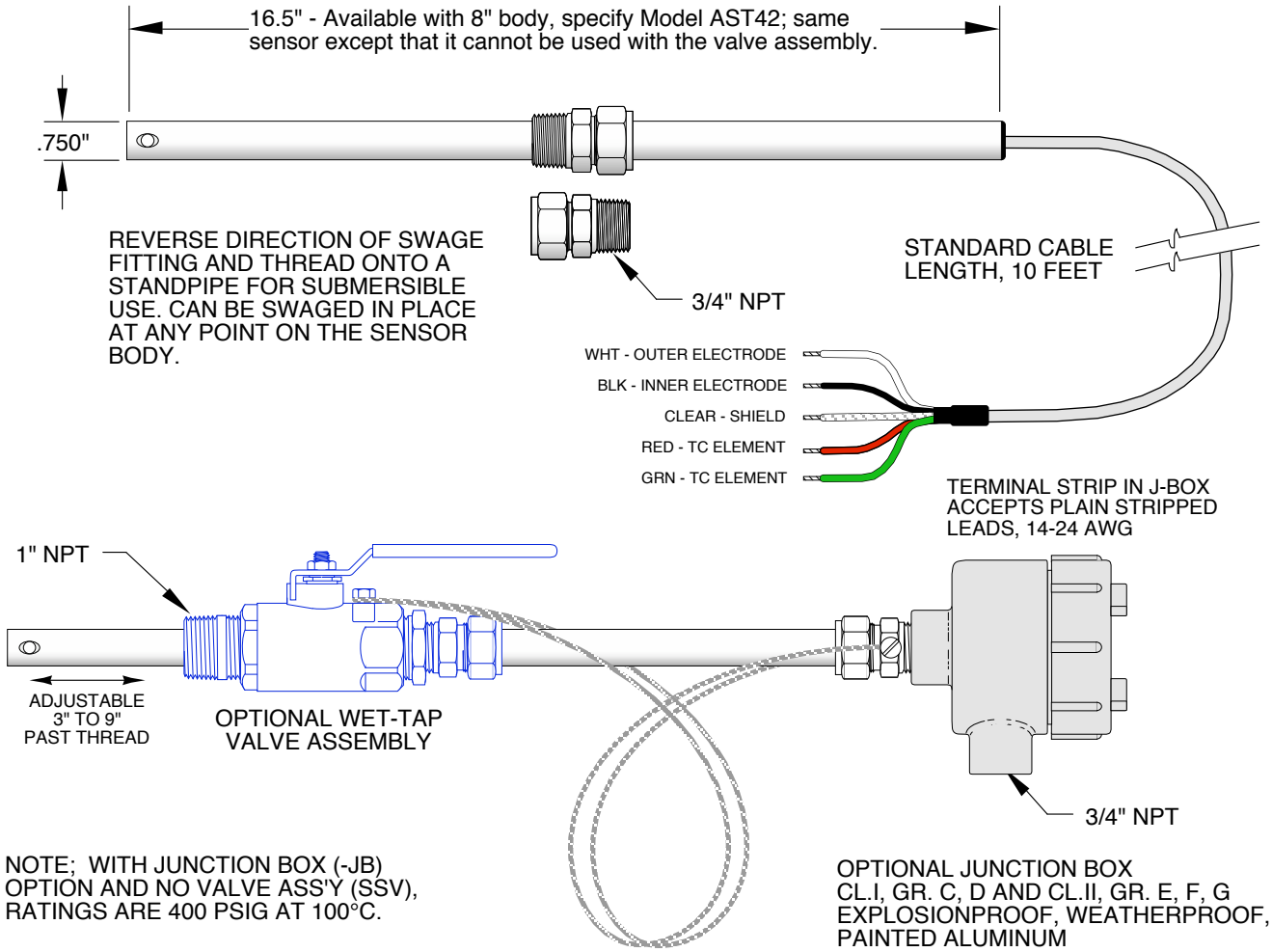
Optional wet-tap valve allows insertion and removal with line under pressure

The Model AST40 sensor has been designed for a wide measurement range in difficult process conditions. It can be installed in submersion, insertion, or wet-tap configurations, and is good for most applications from high purity water to high chemical concentrations.

Application Notes

Wetted materials of construction are 316 stainless steel and PEEK, with alternate materials available on request. All possible leak paths through the sensor are double sealed qith EPDM O-rings for maximum on-stream reliability. The front O-rings isolate the back ones from chemical attack, giving more than double the service life that can be expected from single sealed units.

Process connections are made via a bored through swage fitting with 3/4" NPT threads. This fitting can be screwed into a line, a tank, or the optional wet-tap valve assembly. It can also be turned around and connected to a standpipe for use in a submersion configuration. Available cell constants range from 0.01 to 20.0 giving it a very broad scope of application.



SPECIFICATIONS

MAX. PRESSURE/TEMP. RATINGS:

Standard Sensor - 100 PSIG at 150°C
Hi Temp. Sensor - 250 PSIG at 205°C
Valve Assembly - 50 PSIG at all temps.

WETTED MATERIALS:

Electrodes - 316 Stainless Steel
Insulator - Teflon std, PEEK Hi Temp.
O-Rings - EPDM

CELL CONSTANT:

20/10/5/2/1/0.2/0.1/0.05/0.02/0.01

CONNECTIONS:

Process - 3/4" NPT for sensor/1" NPT for valve

Electrical - Stripped and tinned 24 gauge ends; optional j-box has 3/4" hub and terminal strip to accept plain stripped wire ends, 14-24 ga.

TEMPERATURE COMPENSATION:

10KΩ@25°C/32.66KΩ@0°C NTC is standard. Available options include Pt1000, Pt100, 3K BALCO, 8.55K NTC, Ni100 and many others. Reference the make and model of instrument for assistance in selecting the right element.

Advanced Sensor Technologies, Inc.
Orange, California 92868 -1011 USA
Toll-Free: 888-969-2784
Phone: 714-978-2837
Fax: 714-978-6339
Website: http://www.astisensor.com

AST50 & AST60 Contacting Conductivity Sensors for Inline, Immersion & Submersible Installations

AST60 contacting conductivity sensors shown in K=0.1, 1.0 and 2.0 cell constants from left to right, respectively.

- Double 1"MNPT threaded body can be used for either immersion/submersion or inline installation
- Redundant O-ring seals used on all versions for high on-stream reliability and long sensor service lifetime
- Can be used with most any mating conductivity transmitter simply by specifying proper TC
- For general purpose applications up to about 200,000 microSiemens with outstanding chemical resistance for a wide variety of media. Open front-end geometry resists clogging and reduces maintenance. Ideal for remote installations.
- Wetted insulator materials of construction are CPVC for AST50 or TEFLON/KYNAR for AST60 with 316SS electrodes as standard. The option to select other metals as electrode materials such as titanium, Monel and Hastelloy C-276 provides an unequalled chemical resistance capability with only minimal increase in cost.
- Dual EPDM O-ring seals ensure sensor reliability (Viton & Kalrez Optional). Front seal absorbs the brunt of chemical attack, allowing the rear O-ring to operate in a protected environment, and insure continued sealing.
- Available in cell constants of K=0.1/cm, K=1.0/cm & K=2.0/cm cover the most common conductivity ranges
    - Exact recommended conductivity range for each cell constant depends upon mating instrument. Typical area of use is 10 to 200,000 µS/cm. For use below 10µS/cm a cell constant of K=0.05/cm or lower is required
    - K=0.1/cm cell constant can be used for ranges as low as 10-200 µS/cm or as high as 50-5,000 µS/cm
    - K=1.0/cm cell constant can be used for range as high as 100-100,000 µS/cm
    - K=2.0/cm cell constant can be used for range as high as 200-200,000 µS/cm
- Cable length is 10 feet standard but extended lengths as integral cable or else by means of quick-disconnect waterproof and corrosion-resistant snap connections are available for ease of removal for cleaning and/or recalibration.
- Waterproofing sealing option for completely submersible installation without the use of an immersion rod or standpipe. Ideal for corrosive environments where the seal on the back of the sensor may be degraded in the course of time.
    - Available in polypropylene (PP) and CPVC with integral vinyl or NORPRENE sealing hoses factory installed.

AST50 & AST60 Contacting Conductivity Sensors Specifications

Measurement Range:	Dependent Upon Cell Constant and Mating Transmitter Employed *
Operating Temperature:	-35 to +95 °C (-31 to +203 °F) for AST50 with CPVC insulator **
	-35 to +120 °C (-31 to +248 °F) for AST60 with TEFLON insulator **
Operating Pressure:	Max 100 psig @ 95°C for AST50
	Max 100 psig @ 120°C for AST60 (Max 500 psig with PEEK insulator option)
Process Connections:	1" MNPT for both Front & Rear Threads
Wetted Materials of Construction:	
Insulator:	CPVC for AST50, TEFLON for AST60 (PEEK as a Special Order Option)
O-Rings:	EPDM (Standard) or Viton/Kalrez (Optional), Redundant
Electrodes:	316SS Standard; Titanium, Monel, Hast C-276 and other upon request optional
Sensor Body:	CPVC for AST50, KYNAR for AST60 (316SS as a Special Order Option)
Temperature Element:	Standard with Pt1000 or Pt100 temperature sensor; Other TC elements such a
	Balco 3K resistor and 10K Thermistor are also available upon request
Cell Constants Available for Models	
AST50 & AST60:	K = 0.1, 1.0 or 2.0 **/cm**
Cable Length Limits:	Standard 10 feet (3 meters), Max is 100 feet (30 meters)
End of Cable Terminations:	Tinned Leads (-TL) or NEMA 6P rated waterproof and corrosion-resistant quick
	disconnect snap connector in 5-pole (Q5M/Q5F) or 4-pole (Q4M/Q4F) version
Storage and Shelf-Life:	One (1) year from date of dispatch from factory when stored at ambient.
Dimensional Details:	See following pages for drawing of each particular cell constant configuration.
Submersible Assemblies:	WPA, WPB, WPC Polypropylene Waterproofing Options for AST60 Sensors
	WPG & WPH CPVC Waterproofing Options for AST50 Sensors
Sealing Hose Options:	Braid reinforced vinyl tubing available for both WPB & WPH options
	High-Temperature Resistant NORPRENE tubing available only for WPB option

* *Contact factory to confirm that your desired measurement range is suitable for the chosen cell constant & mating instrument.*

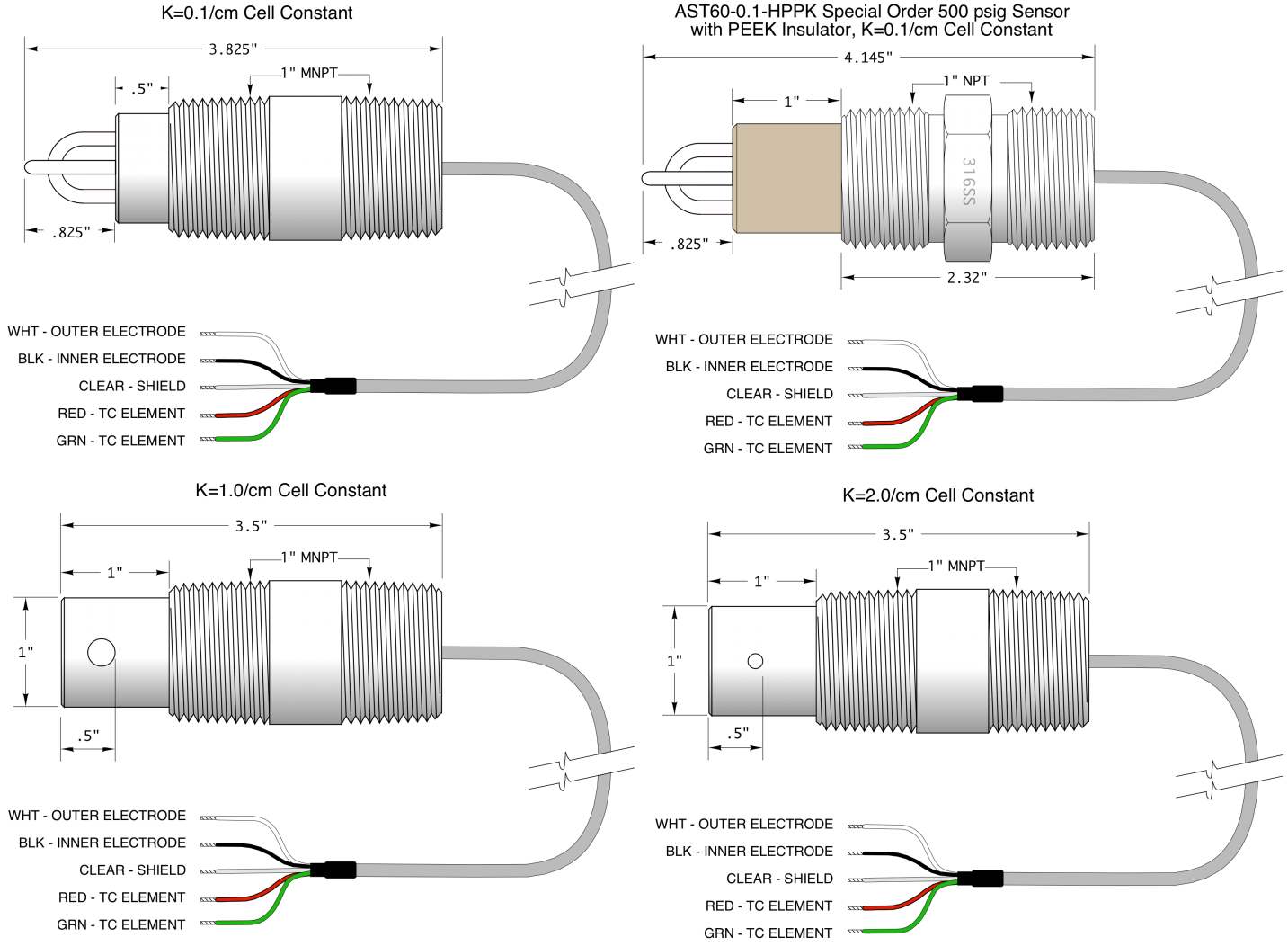
** *Contact factory for applications where the measurement is below 0°C prior to specifying sensor for project or commissioning.*

The table below contains the various available full conductivity ranges when the 3TX-CON transmitter is employed for various cells.

LOW RANGE OPTIMIZED			STANDARD RANGE			HIGH RANGE OPTIMIZED		
NOM CELL	CAL CELL RANGE	FULL RANGE	NOM CELL	CAL CELL RANGE	FULL RANGE	NOM CELL	CAL CELL RANGE	FULL RANGE
0.1L	0.05-0.15	0-200µS	0.1	0.03-0.17	0-5,000µS	0.2	0.06-0.34	0-20,000µS
1.0L	0.5-1.50	0-2mS	1.0	0.30-1.70	0-50mS	2.0	0.60-3.40	0-200mS
			2.0	0.60-3.40	0-100mS			

Last Revised August 11, 2017

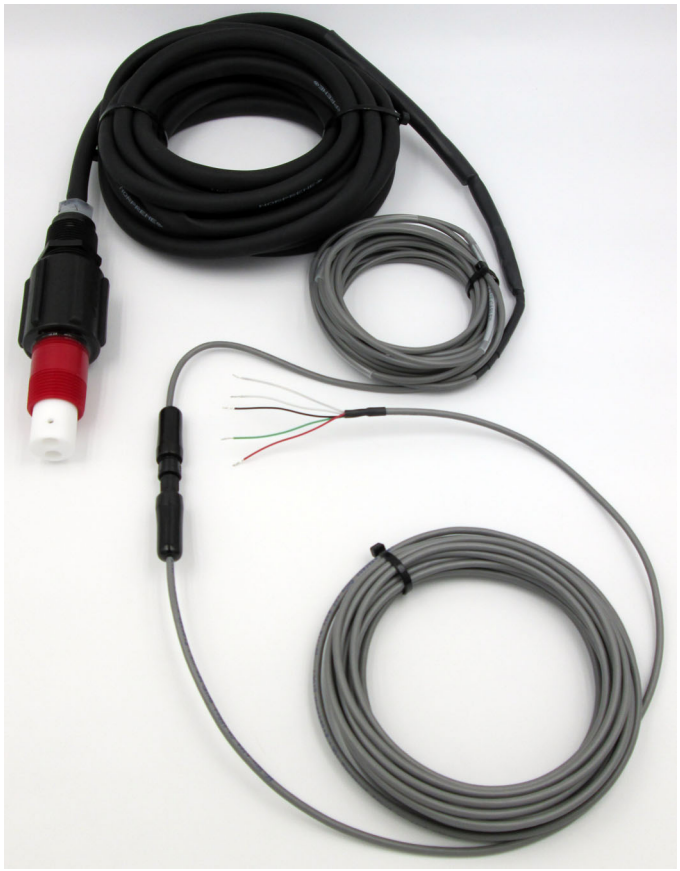
Dimension Details for AST50/AST60 Cell Constants 0.1, 1.0 & 2.0



Drawings of AST50 and AST60 in the available K=0.1/cm, K=1.0/cm and K=2.0/cm cell constant configurations are shown without waterproofing option. Please inquire to factory for overall sensor length and dimensional details is a waterproofing option is to be added to sensor.

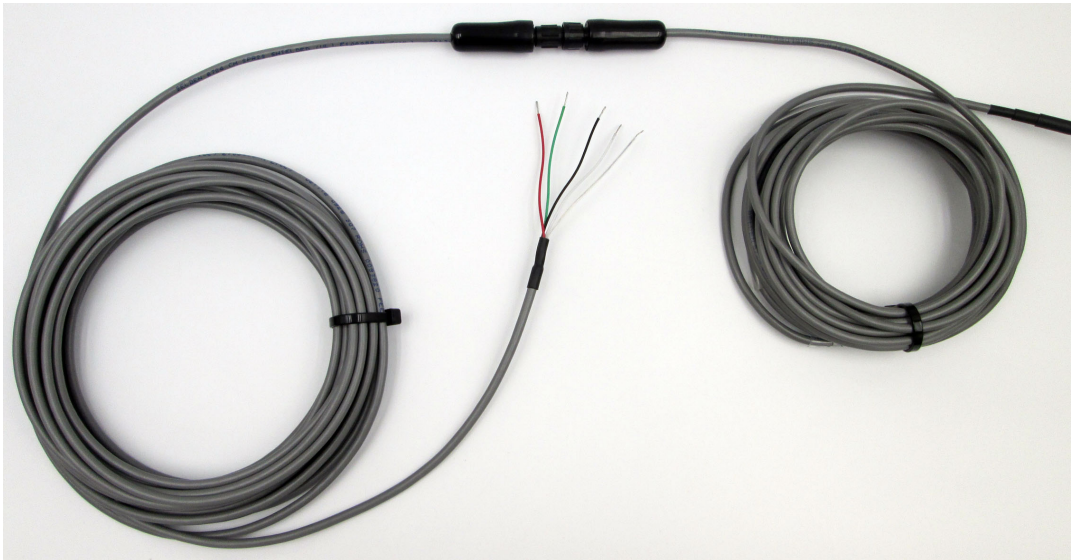
AST50 contacting conductivity sensors shown in K=0.1, 1.0 and 2.0 cell constants from left to right, respectively.

Fully Submersible AST50 & AST60 Conductivity Sensors with Waterproofing Seal & Quick-Disconnect Snap Connector



AST60-HastC-2.0-1000-40-Q5M-WPB/20PP-VITON Submersible Contacting Conductivity K=2.0/cm Sensor with Hastelloy C-276 electrodes and VITON O-rings; 40 feet cable with Q5M snap connector; 20 feet NORPRENE hose installed

Close-ups of waterproofing "B" sealing with NORPRENE tubing installed onto AST60 sensor in K=2.0/cm cell constant. Assembly is fully submersible without immersion tube.



The Q5M male snap connector (right) is interfaced with the Q5F female snap to tinned lead extension cable (left). The NEMA 6P waterproof and corrosion-resistant rating is valid when the connectors are interfaced (caps should be installed when on in use).

AST52 Compact K=10.0/cm Cell Contacting Conductivity Sensors for Inline, Immersion & Submersible Installations

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.

- Dual EPDM O-ring seals ensure sensor reliability (Viton & Kalrez Optional). Front seal absorbs the brunt of chemical attack, allowing the rear O-ring to operate in a protected environment, and insure continued sealing.
- Can be used with most any mating conductivity transmitter simply by specifying proper temperature compensation element (TC). The thermowell containing the temperature sensing element in its tip is exposed directly to the stream assuring rapid automatic temperature compensation of conductivity reading for maximum accuracy.
- Process connections are ¾" NPT for inline insertion type installations up to 500 psig pressure; the rear portion of sensor is ¾" stainless steel tubing which can be gripped by a swage fitting for immersion and submersion applications.
- For use up to 1,000,000 microSiemens/cm (1,000mS/cm) with outstanding chemical resistance for a wide variety of media due to availability of multiple materials of construction for insulators and electrodes as may be required. Exact supported range will be determined by the mating contacting conductivity transmitter that is employed.
- Wetted materials of construction are 316SS standard for the electrodes and thermowell. The option to select other metals as electrode materials such as titanium, Monel and Hastelloy C-276 provides an unequalled chemical resistance capability with only minimal increase in cost. The wetted materials of construction for the insulator is CPVC standard, with TEFLON (PTFE) or PEEK available as special-order options. The wetted material of construction for the sensor body and threads is 316SS standard, with CPVC available as a special-order option.
- Cable length is 10 feet standard but extended lengths up to 100 feet as integral cable or by means of quick-disconnect waterproof and corrosion-resistant snap connections are available for ease of removal for cleaning and/or recalibration.
- Compression fitting installed onto rear of sensor for completely submersible installations when used with immersion rod or standpipe. Ideal for corrosive environments where seal on the back of the sensor may be degraded in time.

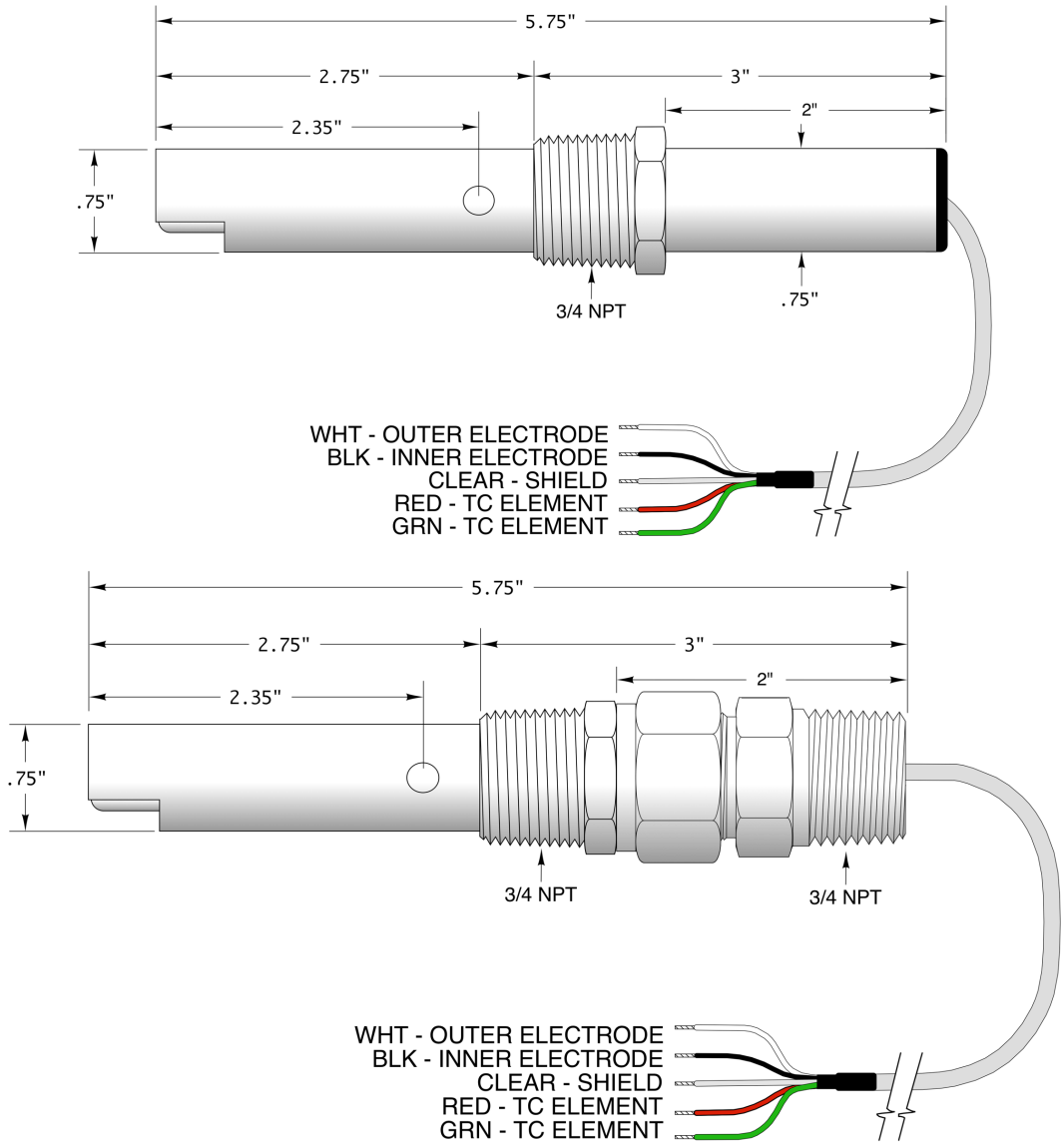
AST52 Contacting Conductivity Sensors Specifications

Measurement Range:	Dependent Upon Cell Constant and Mating Transmitter Employed *
Operating Temperature:	-35 to +95 °C (-31 to +203 °F) for AST52 with CPVC insulator **
	-35 to +120 °C (-31 to +248 °F) for AST52 with TEFLON insulator **
	-35 to +150 °C (-31 to +302 °F) for AST52 with PEEK insulator **
Operating Pressure:	Max 100 psig @ 95°C or Max 500 psig @ 50°C with CPVC Insulator
	Max 100 psig @ 120°C or Max 500 psig @ 80°C with TEFLON Insulator
	Max 100 psig @ 150°C or Max 500 psig @ 100°C with PEEK Insulator
Process Connections:	¾" MNPT Front Threads; ¾" MNPT Rear Threads with compression fitting
Wetted Materials of Construction:	
Insulator:	CPVC Standard (TEFLON PTFE or PEEK as Special Order Option)
O-Rings:	EPDM (Standard) or Viton/Kalrez (Optional as Special Order), Redundant
Electrodes:	316SS Standard; Titanium, Monel, Hast C-276 and others as special orders
Sensor Body:	316SS Standard (CPVC as Special Order Option, Max 95°C @ 80 psig)
Temperature Element:	Standard with Pt1000 or Pt100 temperature sensor; Other TC elements such a
	Balco 3K resistor and 10K Thermistor are also available upon request
Cell Constants Available for Models	
AST52:	K = 10.0/cm
Cable Length Limits:	Standard 10 feet (3 meters), Max is 100 feet (30 meters)
End of Cable Terminations:	Tinned Leads (-TL) or NEMA 6P rated waterproof and corrosion-resistant quick
	disconnect snap connector in 5-pole (Q5M/Q5F) or 4-pole (Q4M/Q4F) version
Storage and Shelf-Life:	One (1) year from date of dispatch from factory when stored at ambient.
Dimensional Details:	See following pages for drawing of each particular cell constant configuration.
Submersible Assemblies:	¾" MNPT Compression Fitting in 316SS or KYNAR materials of construction
	WPG & WPH CPVC Waterproofing Available with CPVC Sensor Body Option
Sealing Hose Options:	Braid reinforced vinyl tubing available for both WPB & WPH options
	High-Temperature Resistant NORPRENE tubing available only for WPB option

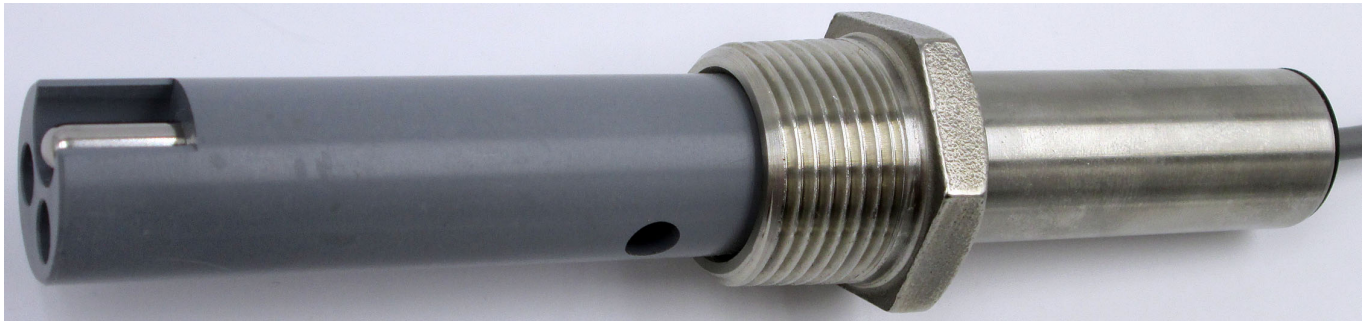
* *Contact factory to confirm that your desired measurement range is suitable for the chosen cell constant & mating instrument. This upper bound of conductivity range can vary anywhere from 200mS to 1,000mS depending upon the transmitters that is employed.*

** *Contact factory for applications where the measurement is below 0°C prior to specifying sensor for project or commissioning.*

Dimension Details for AST52 Contacting Conductivity Sensors

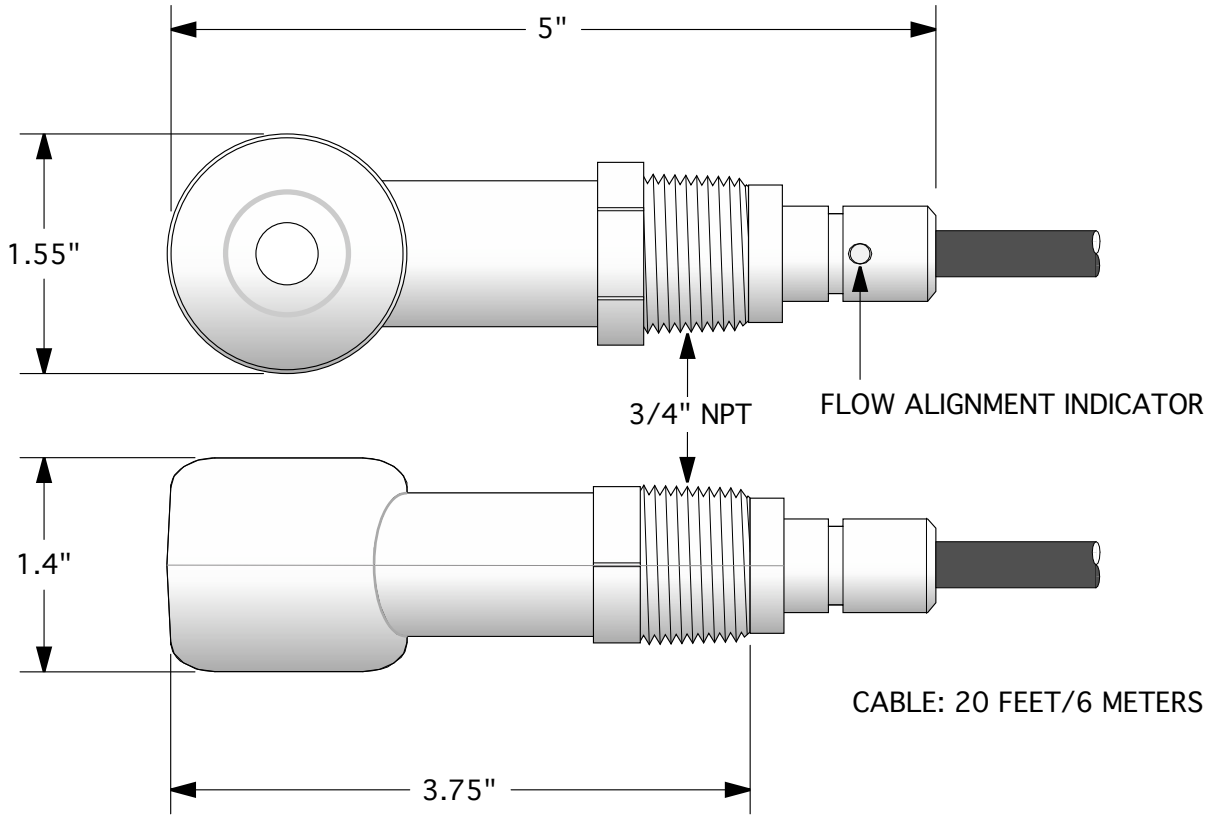


Drawings of AST52 cell constant configurations shown without waterproofing option. Please inquire to factory for overall sensor length and dimensional details is a waterproofing option is to be added to sensor. The compression fitting style assembly can also be used for fully submersible so long as a suitable immersion rod (a.k.a. standpipe) is secured to the rear ¾"MNPT threads.



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.

Last Revised February 19, 2018



SPECIFICATIONS ASTX-37PP TOROIDAL CONDUCTIVITY SENSOR

MAX. PRESSURE/TEMP. RATINGS:

Standard Sensor - 200 PSIG at 105°C
High Temp Sensor - 100 PSIG at 150°C

WETTED MATERIALS:

Block Copolymer Polypropylene

COMPATIBILITY VERIFIED FOR:

GLI.....E33, E53, E63, PRO 3
Knick.....2401, 2402, 2405 Condi
Uniloc-Rosemount.....1181T
Mettler-Toledo.....MOST MODELS
Foxboro.....870ITEC, 875

CONNECTIONS:

Process - 3/4" MNPT
Electrical - 20ft (6m) cable, stripped and tinned ends

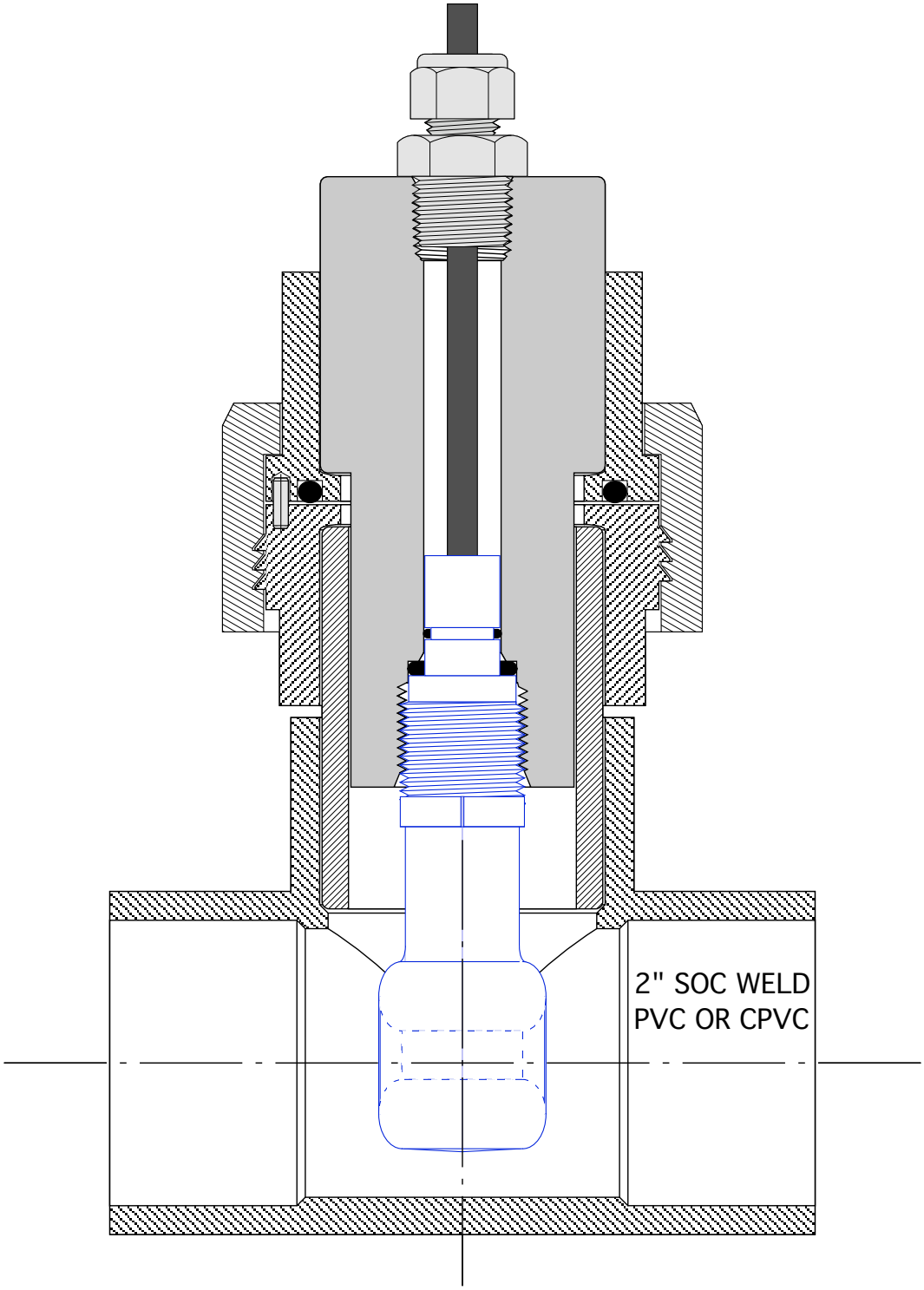
CELL CONSTANT:

Nominal 5.0

TEMPERATURE ELEMENT

Pt1000 RTD, others on request

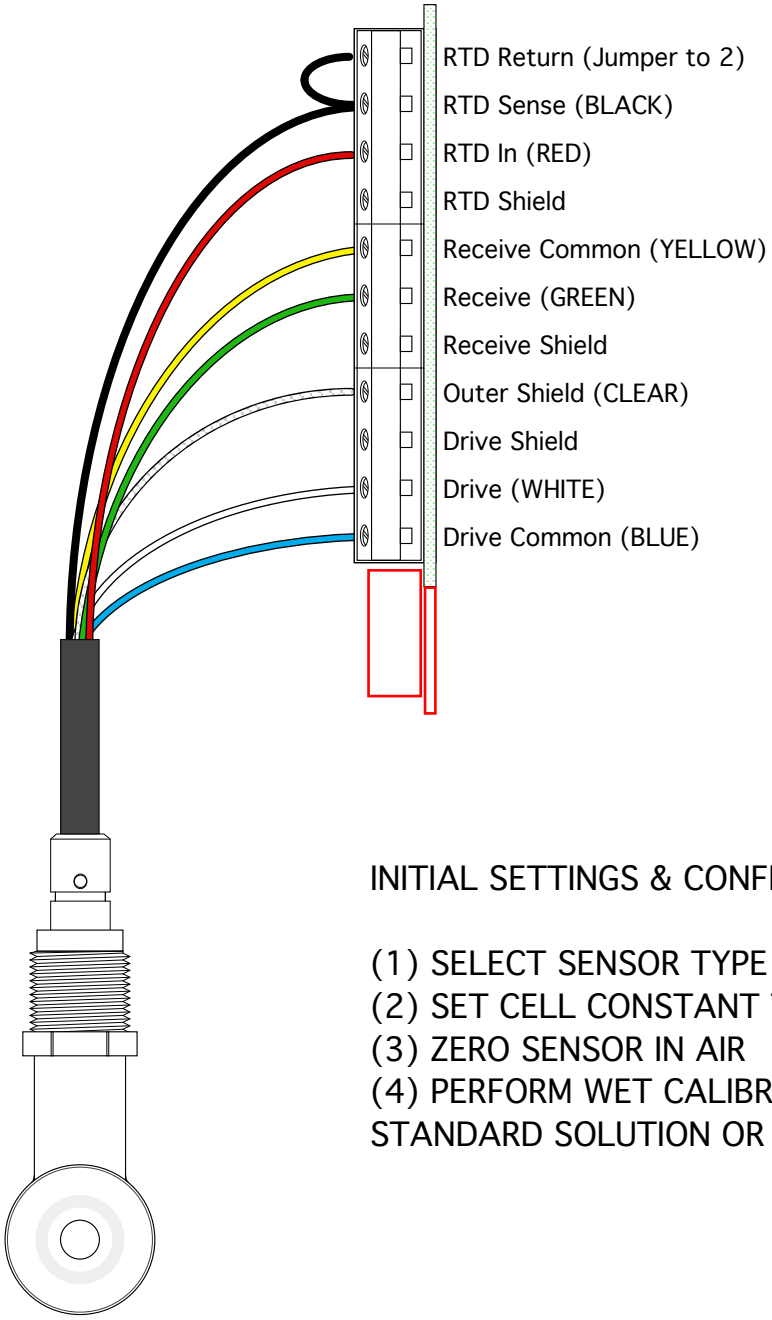
Advanced Sensor Technologies, Inc.
Orange, California 92868 -1011 USA
Toll-Free: 888-969-2784
Phone: 714-978-2837
Fax: 714-978-6339
Website: http://www.astisensor.com



Advanced Sensor Technologies, Inc.
Orange, California 92868 -1011 USA
Toll-Free: 888-969-2784
Phone: 714-978-2837
Fax: 714-978-6339
Website: http://www.astisensor.com

NOTES UNLESS OTHERWISE SPECIFIED:

DRAWN: TADP	TITLE: ASTX-37PP Inline Tee Drawing		
CHECKED: MJP			
APPROVED: MJP 08/10/2005	SCALE: x0.75	DRAWING NO.: ASTX-37PP-Tee	REV.: /
	SHEET: 1 OF 1		



INITIAL SETTINGS & CONFIGURATION:

(1) SELECT SENSOR TYPE AS "OTHER"
(2) SET CELL CONSTANT TO 4.8
(3) ZERO SENSOR IN AIR
(4) PERFORM WET CALIBRATION WITH STANDARD SOLUTION OR PROCESS MEDIA

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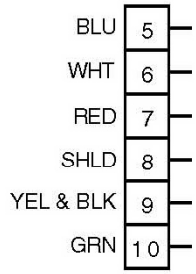
NOTES UNLESS OTHERWISE SPECIFIED:

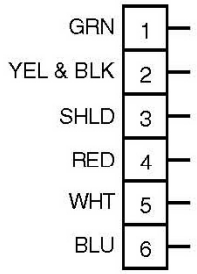
DRAWN **9/18/08**	TITLE **ASTX-37PP TORROIDAL SENSOR WIRING TO ROSEMOUNT 1056 / 1057 / 56**		
CHECKED			
APPROVED	SCALE **NONE**	DRAWING NO. **ASTX-37PP-1056**	REV.
	SHEET **1 OF 1**		

REV	DESCRIPTION	DATE	APPROVED

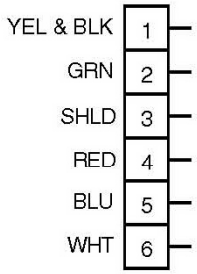
GLI E33 - TB3



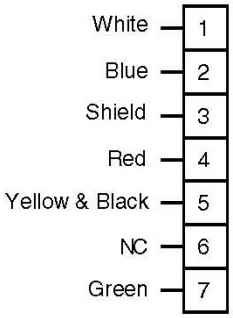
GLI E63 - TB1

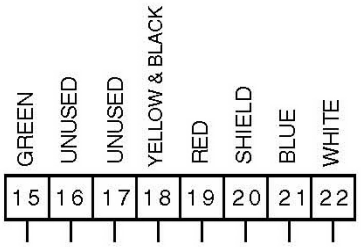


GLI 672E - TB2



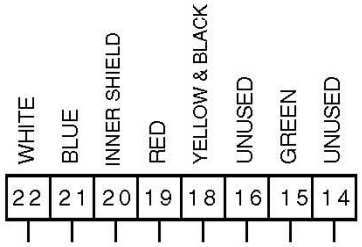
GLI PRO-E3 - TB2





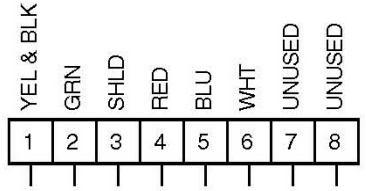
GLI E53 - TB1

WITH NO LETTER PREFIX
IN FRONT OF SERIAL NO.
FOR CE HOOKUP CONNECT
OUTER SHIELD TO TB1-11



GLI E53 - TB1

WITH LETTER "B" PREFIX
IN FRONT OF SERIAL NO.
FOR CE HOOKUP CONNECT
OUTER SHIELD TO CASE GRD.



GLI 692E - TB2

NOTES:

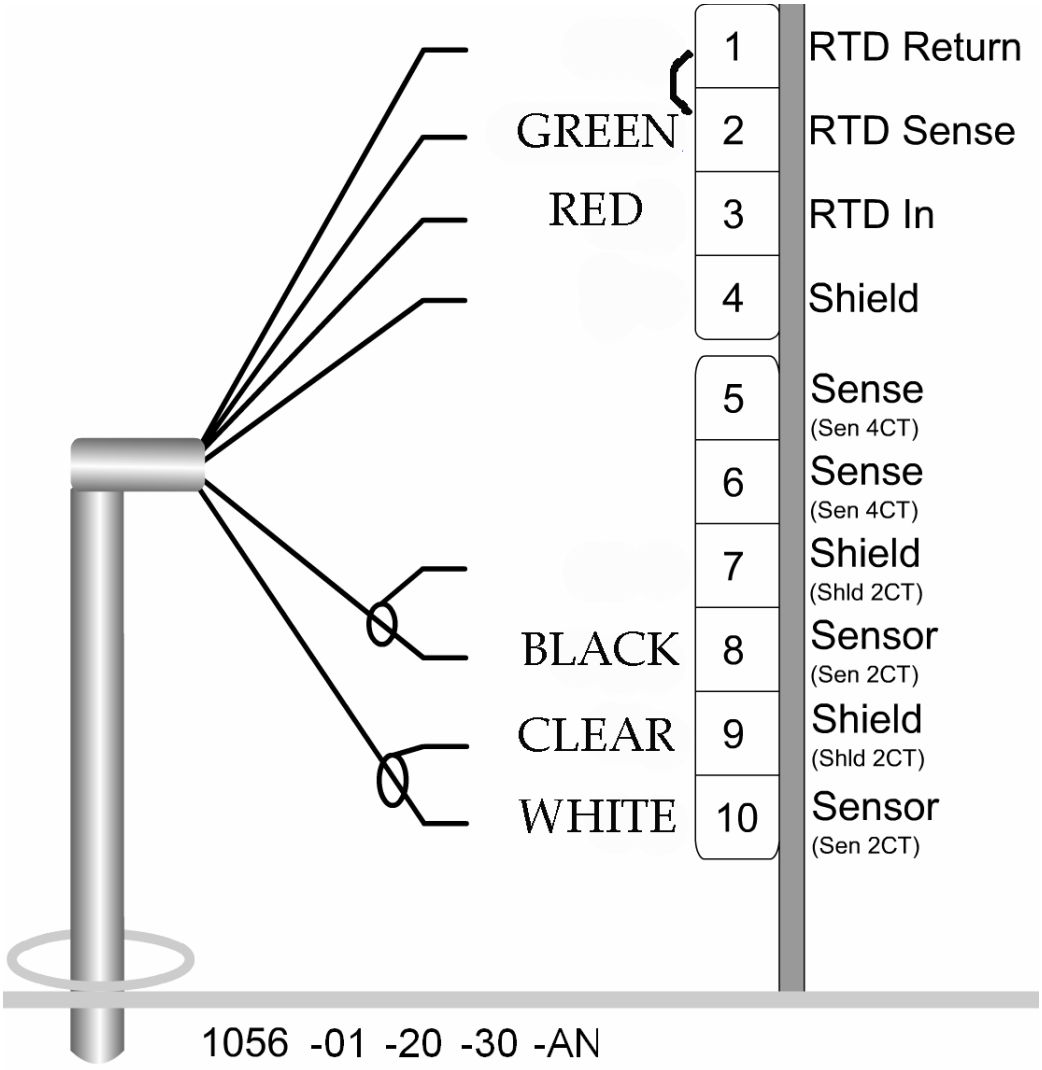
1. THE CABLE HAS 2 SHIELDS, AN OUTER (CLEAR w/BLK BAND) AND INNER (CLEAR). ALL SHIELD CONNECTIONS SHOWN ARE THE INNER SHIELD. THE OUTER SHIELD IS ONLY USED FOR CE HOOKUPS, AND IT CONNECTS TO EARTH OR CASE GROUND.

Advanced Sensor Technologies, Inc.
Orange, California USA
Phone: 714-978-2837

TOLERANCES		DRAWN BY	TITLE			
1 Place: ± .1	3 Places: ± .005	Thomas Patko	ASTX-37PP to Great Lakes (GLI) Wiring Details			
2 Places: ± .02	4 Places: ± .0005	CHECKED BY Martin Patko	SIZE A	PROJECT	DRAWING NO. ASTX-37PP to GLI	REV E
Angular: ± 0.25°		APPROVED BY Martin Patko	SCALE x1			SHEET 1 OF 1

Connection Diagram of ASTI Conductivity Sensors to Rosemount 1056 Contacting Conductivity Analyzers

Connection from ASTI Sensor to Terminal Block in Rosemount Transmitter



Note 1: The temperature compensation element is 1000 Ohm Platinum.

Note 2: Terminals 1 & 2 must be tied together to satisfy the analyzer temperature compensator input requirements.

Note 3: For Dual Channel Analyzers, please ensure that the proper type of sensor is connected to the proper input board.

Note 4: If problems are experienced with conductivity reading, please disconnect clear (shield) wire.

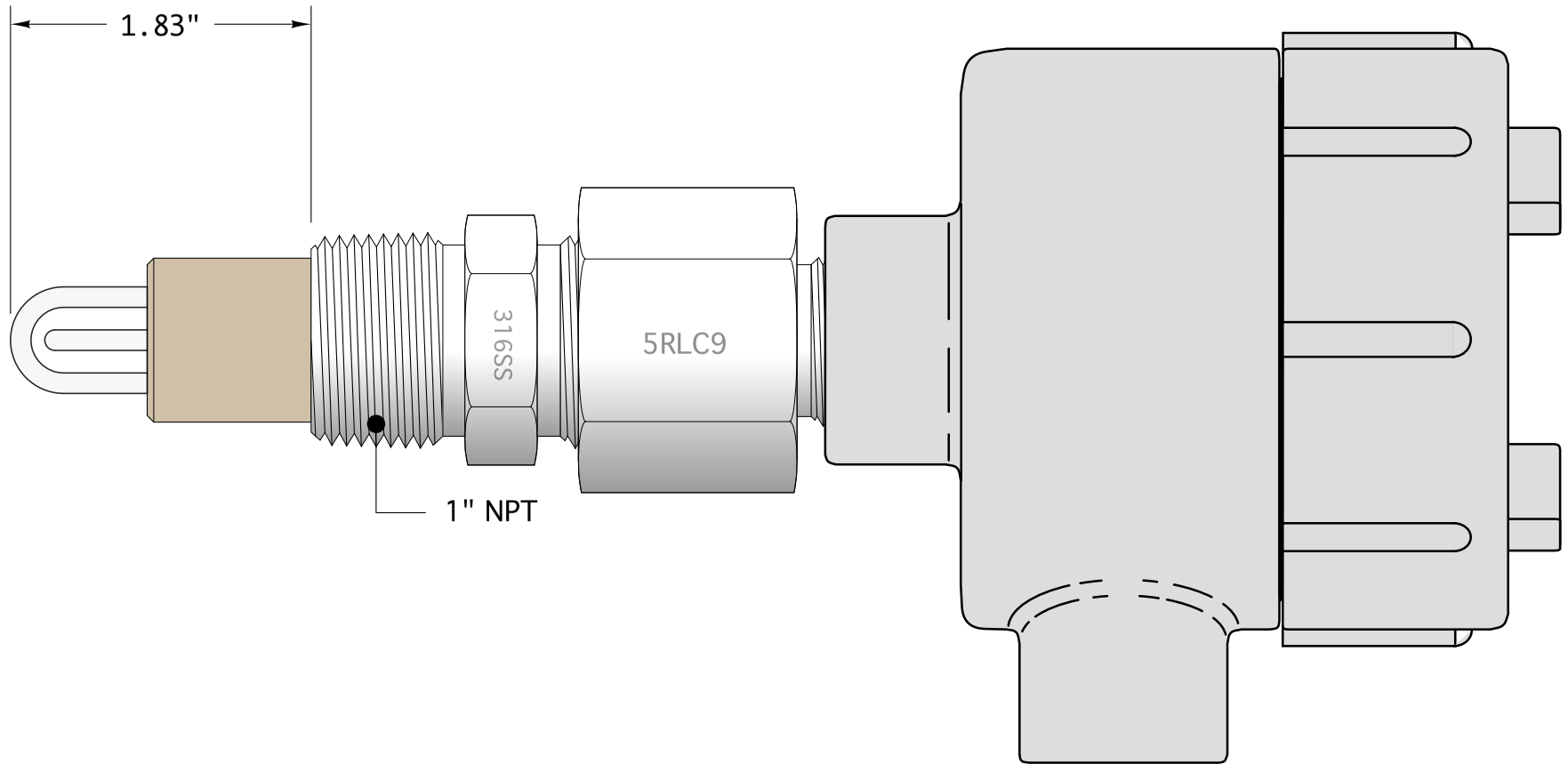
Connection Diagram of ASTI Contacting Conductivity Sensors (Tinned Leads Only) to 3TX-CON Contacting Conductivity Transmitters

ASTI Cable Color Coding	Instrument Terminal Value	3TX-CON Terminal Number
White	Outer Electrode	1
Black	Inner Electrode	2
Clear (Optional)	Shield/Ground (Optional)	3
Red	Pt100 or Pt1000	4
Green	Pt100 or Pt1000	5

Note 1: Cell Constant and Range must be defined at time of purchase an cannot be changed after receipt of transmitter. See labels on 3TX-CON transmitter for details about cell constant and range and/or contact ASTI factory prior to purchase to ensure correct selection of cell constant and range.

Note 2: Depending upon the TC ordered it may be necessary to change the parameter 04 from PT1000 (default) to PT100 (selectable).

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED
A	ADDED PIPE ADAPTER 5RLC9	1/19/13	T. PATKO



AST60-0.1-PT1000-HPPK-JB

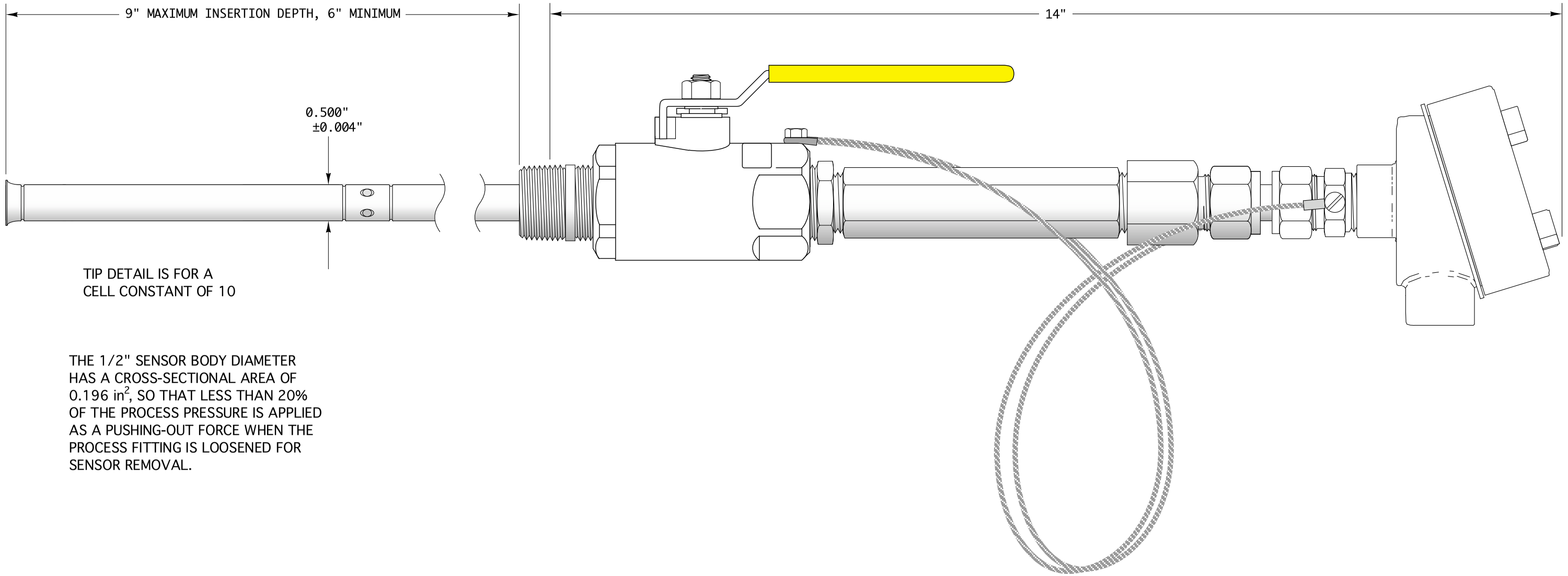
MAX PRESSURE/TEMP: 500 PSIG AT 120°C

WETTED MATERIALS: 316SS, PEEK, EPDM

TOLERANCES		DRAWN BY	TITLE
1 Place: ± .1	3 Places: ± .005	RH	AST60-0.1-PT1000-HPPK-JB * SPECIAL *
2 Places: ± .01	4 Places: ± .0005	CHECKED BY TADP	SIZE B / PROJECT DUPONT / DRAWING NO. AST60 HPPK SPECIAL / REV A
Angular: ± 0.25°		APPROVED BY MJP	SCALE Not to Scale / MODEL AST60-0.1-HPPK / SHEET 1 OF 1

Advanced Sensor Technologies, Inc.
Orange, California USA
Toll-Free: 888-969-2784

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED



TIP DETAIL IS FOR A
CELL CONSTANT OF 10

THE 1/2" SENSOR BODY DIAMETER HAS A CROSS-SECTIONAL AREA OF 0.196 in^2, SO THAT LESS THAN 20% OF THE PROCESS PRESSURE IS APPLIED AS A PUSHING-OUT FORCE WHEN THE PROCESS FITTING IS LOOSENED FOR SENSOR REMOVAL.

0" 1" 2" 3" 4" 5"

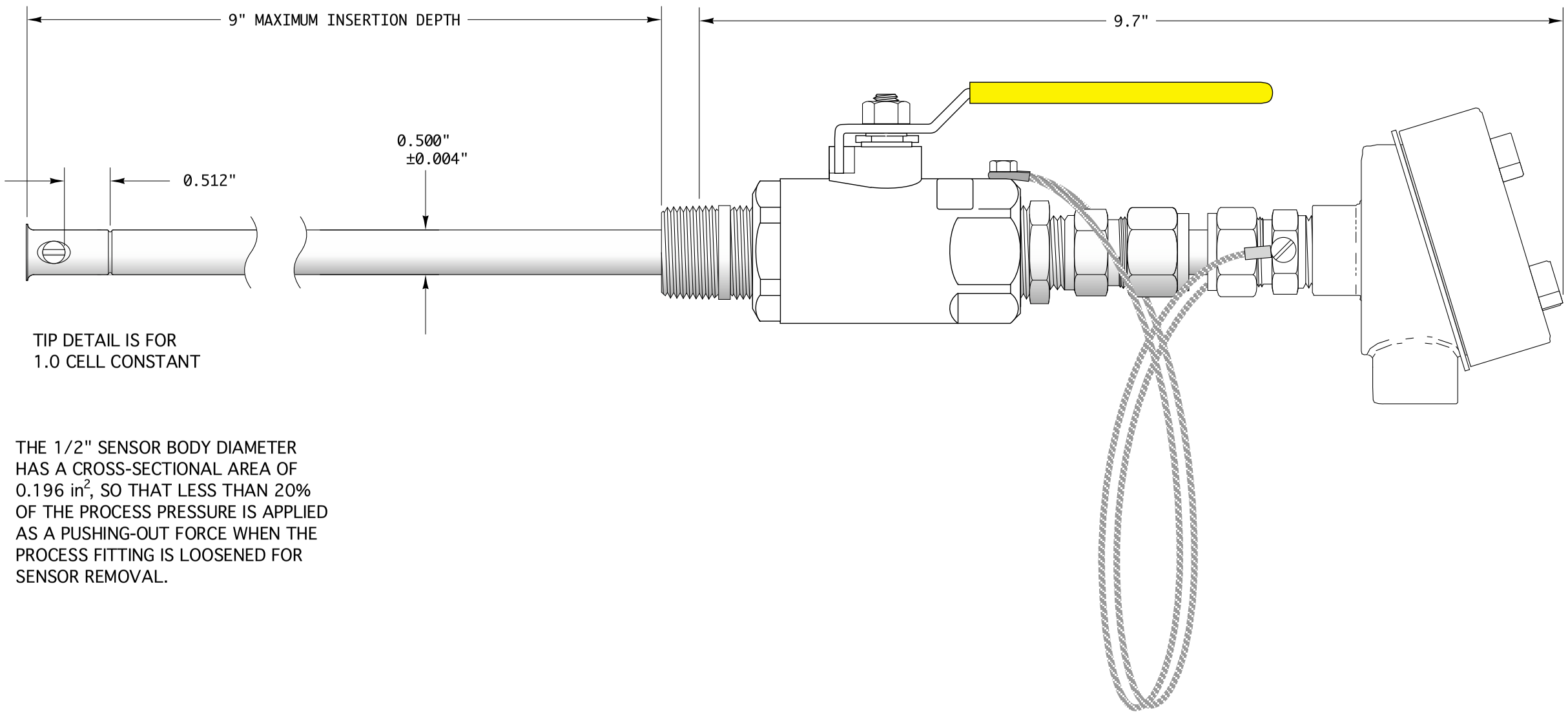
TOLERANCES		DRAWN BY	TITLE
1 Place: ± .1	3 Places: ± .005	TADP 10/08/08	AST10-HT WITH VALVE INSERTION ASSEMBLY
2 Places: ± .02	4 Places: ± .0005	CHECKED BY BH	
Angular: ± 0.25°		APPROVED BY BH	

Advanced Sensor Technologies, Inc.
Orange, California USA
Phone: 714-978-2837

SIZE	PROJECT	DRAWING NO.	REV
B	- -	AST10-10.0-HT-PT1000-SSV-JB	/

SCALE	MODEL	SHEET
0.75X	-	1 OF 1

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED



TIP DETAIL IS FOR
1.0 CELL CONSTANT

THE 1/2" SENSOR BODY DIAMETER HAS A CROSS-SECTIONAL AREA OF 0.196 in^2, SO THAT LESS THAN 20% OF THE PROCESS PRESSURE IS APPLIED AS A PUSHING-OUT FORCE WHEN THE PROCESS FITTING IS LOOSENED FOR SENSOR REMOVAL.

0" 1" 2" 3" 4" 5"

TOLERANCES	
1 Place: ± .1	3 Places: ± .005
2 Places: ± .02	4 Places: ± .0005
Angular: ± 0.25°	

DRAWN BY: TADP 10/08/08
CHECKED BY: BH
APPROVED BY: BH

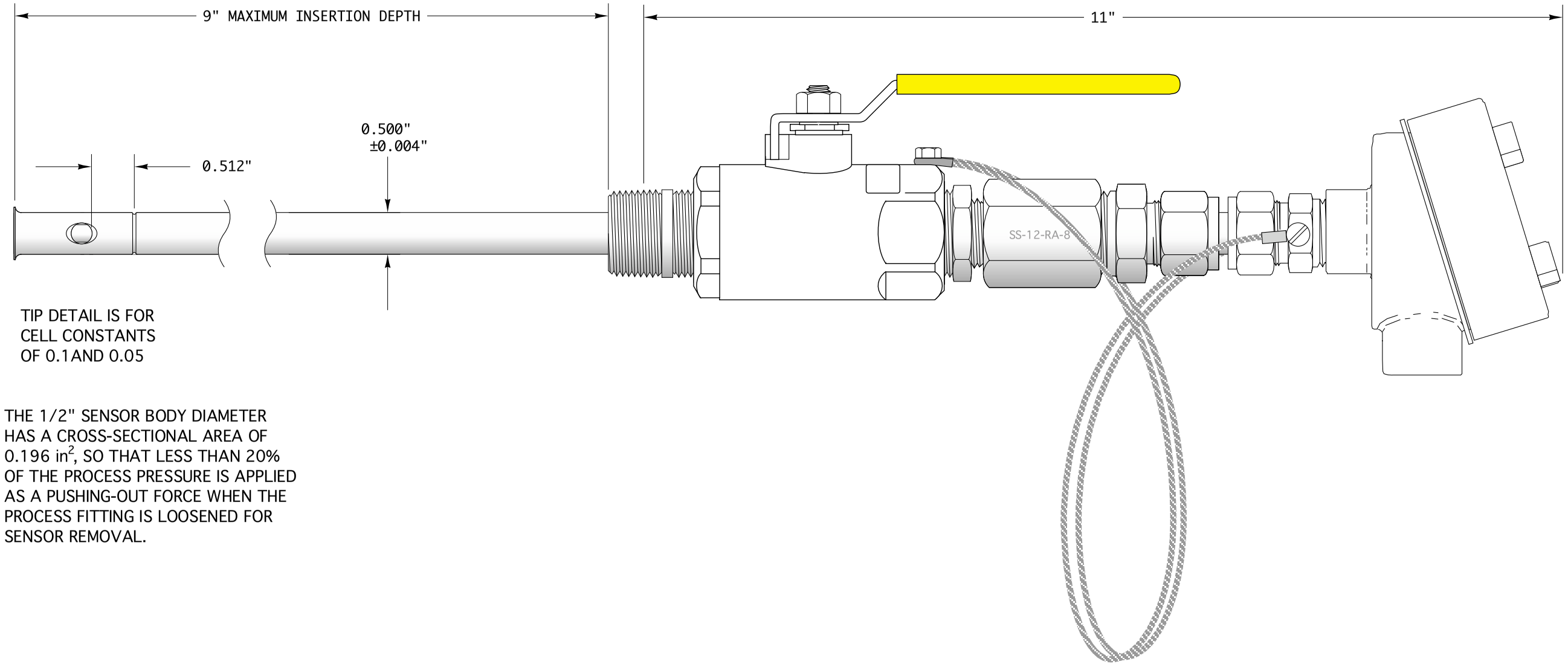
Advanced Sensor Technologies, Inc.
Orange, California USA
Phone: 714-978-2837

TITLE: AST10-HT WITH VALVE INSERTION ASSEMBLY

SIZE	PROJECT	DRAWING NO.	REV
B	- -	AST10-1.0-HT-PT1000-SSV-JB	/

SCALE 0.75X | MODEL - | SHEET 1 OF 1

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED



TIP DETAIL IS FOR
CELL CONSTANTS
OF 0.1AND 0.05

THE 1/2" SENSOR BODY DIAMETER HAS A CROSS-SECTIONAL AREA OF 0.196 in^2, SO THAT LESS THAN 20% OF THE PROCESS PRESSURE IS APPLIED AS A PUSHING-OUT FORCE WHEN THE PROCESS FITTING IS LOOSENED FOR SENSOR REMOVAL.

0" 1" 2" 3" 4" 5"

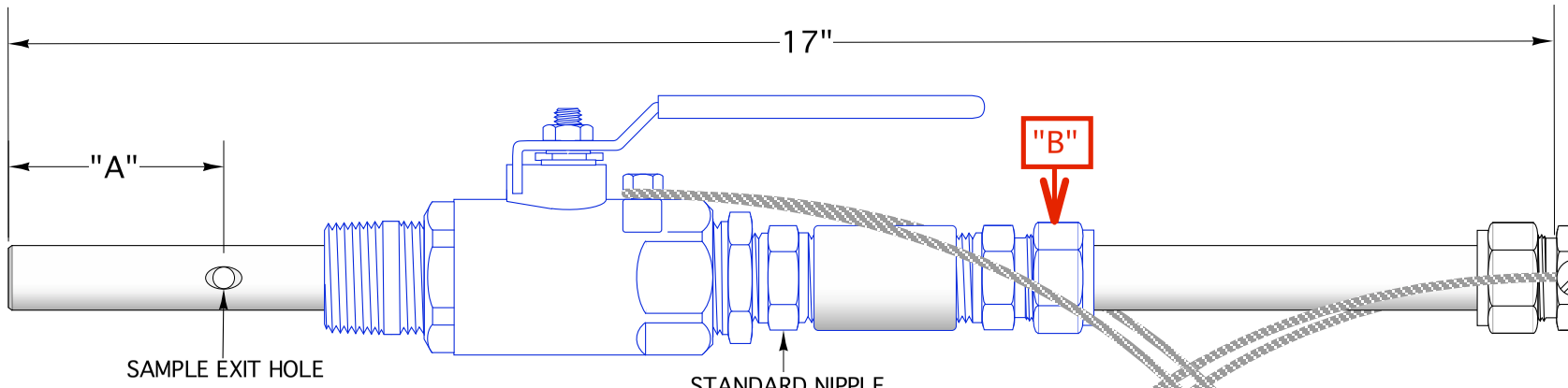
TOLERANCES		DRAWN BY	TITLE
1 Place: ± .1	3 Places: ± .005	TADP 10/08/08	CS10-HT WITH VALVE INSERTION ASSEMBLY
2 Places: ± .02	4 Places: ± .0005	CHECKED BY BH	
Angular: ± 0.25°		APPROVED BY BH	

Advanced Sensor Technologies, Inc.
Orange, California USA
Phone: 714-978-2837

SIZE	PROJECT	DRAWING NO.	REV
B	- -	AST10-0.1-HT-PT1000-SSV-JB	/

SCALE	MODEL	SHEET
0.75X	-	1 OF 1

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED



"A" IS THE WORKING LENGTH OF THE SENSOR TIP, A VALUE DETERMINED BY THE LENGTH OF THE INTERNAL FLOW PATH AND LOCATION OF THE TEMP. COMPENSATION ELEMENT.

FOR THE STANDARD K=5/10/20 CONFIGURATION, THIS LENGTH IS 3", THE ENTIRE BODY LENGTH OF THE SENSOR IS 17". MINIMUM INSERTION DEPTH IS 3.5" AND MAXIMUM IS 8".

FOR THE SPECIAL LARGE BORE K=10.0 THE WORKING LENGTH "A" INCREASES TO 8".

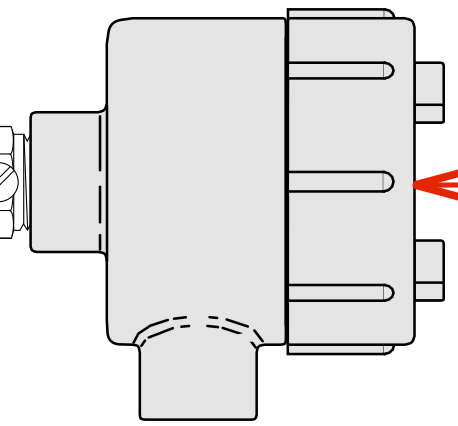
MINMUM INSERTION DEPTH OF THE SENSOR IS .5" LONGER THAN THE WORKING LENGTH IN ORDER TO ENSURE THAT THE ATC ELEMENT IS FULLY SUBMERGED.

EXTRA COMPONENTS ARE ADDED AT THE BACK OF THE VALVE SO THAT THE SAMPLE EXIT HOLE IS STILL INSIDE THE SWAGE SEAL AT FULL LANYARD EXTENSION TO PREVENT LEAKAGE DURING REMOVAL.

FOR LONGER SENSOR TIP WORKING LENGTHS, CHANGE THE LENGTH OF NIPPLE, LANYARDS, AND SENSOR BODY BY THE WORKING LENGTH BEYOND THE STANDARD 3".

FOR GREATER INSERTION DEPTHS ONLY, INCREASE THE LENGTH OF LANYARDS AND SENSOR BODY AND DO NOT CHANGE THE NIPPLE

TO REMOVE THE SENSOR, PRESS IN FIRMLY ON THE J-BOX LID WHILE REMOVING THE SWAGELOK NUT "B", AND ALLOW THE SENSOR TO BACK OUT SLOWLY UNTIL THE LANYARDS ARE STRETCHED TIGHT.



PRESS IN AND HOLD FIRMLY WHILE LOOSENING SWAGE NUT "B" AND DO NOT ALLOW THE SENSOR TO SNAP BACK ON THE LANYARDS. LET THE PROCESS PRESSURE BRING IT BACK SLOWLY AGAINST YOUR CONTINUOUS PUSH.

DUAL WIRE-ROPE SAFETY LANYARDS WILL LOCATE THE SENSOR TIP JUST PAST THE VALVE BALL SO THAT IT CAN BE SHUT OFF WITH MINIMAL PROCESS LEAKAGE PAST THE O-RING IN THE SHOULDER OF THE SWAGE FITTING.

WITH LANYARDS FULLY EXTENDED, SHUT OFF THE VALVE AND ALLOW THE TRAPPED PROCESS FLUID TO COOL FOR SEVERAL MINUTES IF NECESSARY. THEN DISCONNECT THE LANYARDS AND REMOVE THE SENSOR. TAKE CARE THAT THE EXTENDED SENSOR BODY IS NOT BENT WHILE IN THIS EXTENDED POSITION AND BEING HELD BY ITS TIP (SUPPORT ITS WEIGHT IF IT'S IN A HORIZONTAL POSITION).

INSPECT O-RING IN SWAGE SHOULDER, AND IF VENT HOLE HAS NICKED IT ON REMOVAL, REPLACE IT BEFORE REINSTALLING SENSOR (PARKER #2-018). A LIGHT COAT OF SILICONE O-RING GREASE ON A CLEAN SENSOR BODY WILL EASE REINSTALLATION. AVOID APPLYING GREASE ON THE SENSOR TIP AROUND AND BEYOND THE VENT HOLE IN THE "A" LENGTH.

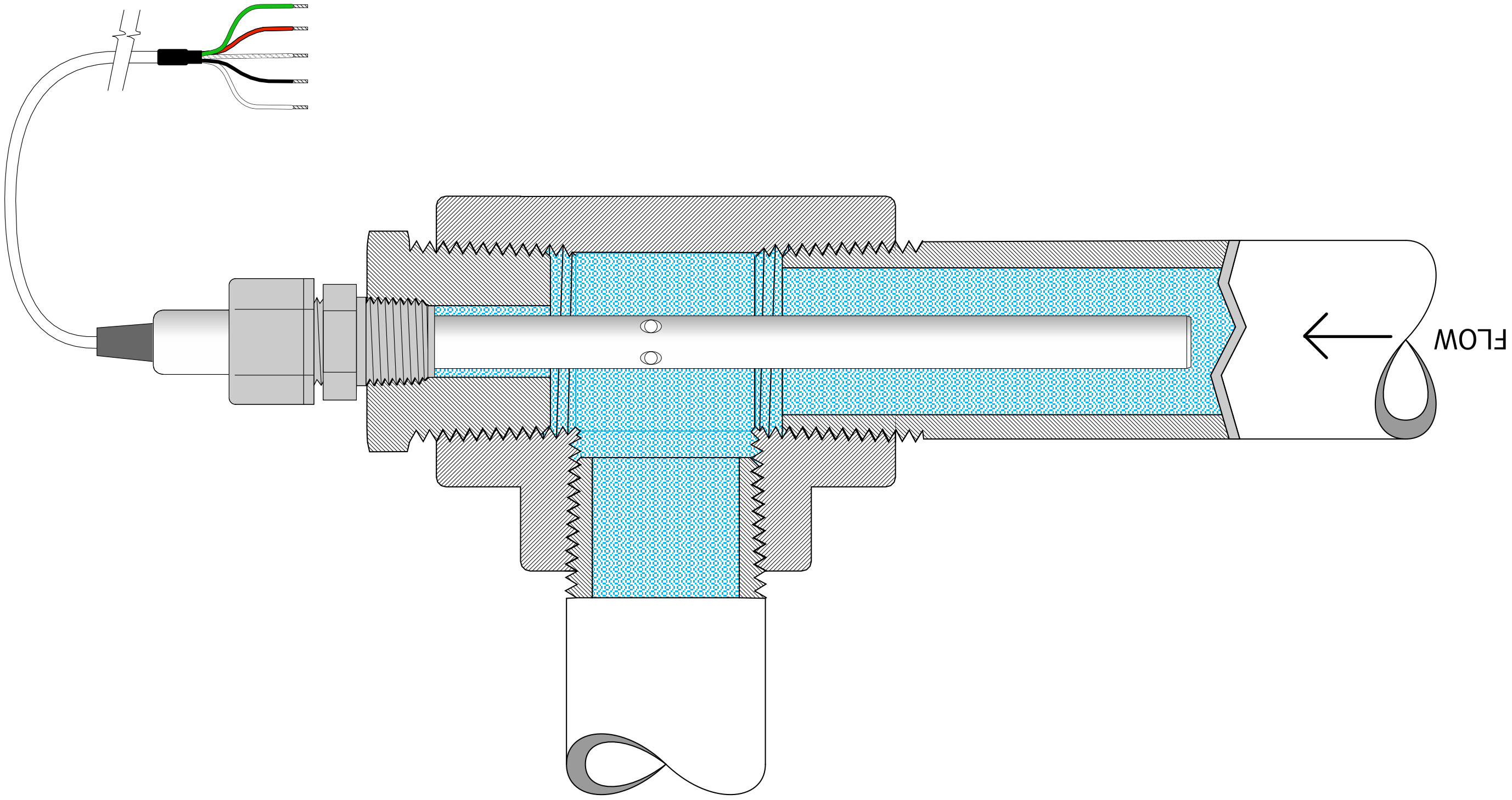
TOLERANCES	
1 Place: ± .X	3 Places: ± .XXX
2 Places: ± .XX	4 Places: ± .XXXX
Angular: ± .XX\U+02DA	

Advanced Sensor Technologies, Inc.
Orange, California USA
Phone: 714-978-2837

TITLE
AST40-5.0/10.0/20.0 CONFIGURATION WITH NOTES ON EXTENDED WORKING LENGTH TIPS

DRAWING NO.	REVISION	SIZE
AST40-10.0-ID-101	/	B

SCALE x 0.5 | FILE NAME AST40 OMD AND REMOVAL


FLOW