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## pH & ORP Sensors for HOT-TAP Valve Retractable Installations

Unique solutions for process measurement problems. Features & options itemized below:



*Shown above is a complete HOT-TAP insertion assembly with an ORP sensor installed from the process view*

- Best reference lifetime in process industry through proprietary, novel, non-porous, cross-linked, conductive polymer technology; Available in double junction (standard) or triple junction (optional) configurations
- Rugged industrial grade sensors can operate in a temperature range from -35 to 150 degrees Celsius at pressures up to 200 psig (100 psig max for HOT-TAP insertion)
- Base models for general purpose, high temperature and ultra-high temperature resistant, slurry & viscous material resistant, acid/fluoride & HF resistant, pulp & paper resistant, aggressive dissolved gas & volatile organic solvent resistant, Oxidation Reduction Potential (ORP) and saturated sodium (brine) resistant
- Selected options: Ammonia gas (“A”) and Chlorine (“C”) Gas Resistant, Wide Range -0.5 to +14.5 pH Resistant (“V”), Organic Media Resistant (“L”), Solvent Resistant (“TS”), 3-Wire TC (“M”), Accu-Temp Fast TC (“X”), 4 each Tines (“GR”), 2 each Tines (“GRO”), Shielded Preamp Cable (“BL”)
- Available with integral temperature compensation element (Pt100 or Pt1000 Standard), Solution Ground Liquid Earth (316SS or Platinum), Dual pH/ORP All-In-One Configuration and Conventional or Differential Analog preamplifier to allow for interfacing with most any existing OEM transmitter
- End of cable options include tinned leads & BNC connector for sensors without integral preamplifier. Quick disconnect snap connector available for pH sensors and ORP sensors with integral preamplifiers.
- Convenient HOT-TAP 316SS sensor holder allows for cleaning and calibrations without removing fitting
- Double sealing O-rings ensure watertight seal during operation; Standard material of construction is Viton®-75, with CV75, Simriz® 485 and Kalrez® 4079 Optional
- Back of sensor insertion tube available sealed with watertight cable gland assembly to ensure watertight operation and protection from washdowns, moisture and outside installations
- Sensor selection and/or special custom sensor design are based upon customer application information
- pH sensors & ORP sensors are manufactured with rugged RADEL® (Poly-Phenyl-Sulfone, PPSU), KETASPIRE® (Poly-Ether-Ether-Ketone, PEEK) or RYTON® (Poly-Phenylene-Sulfone, PPS) for the sensor body housing material of construction
- The solid state conductive polymer reference system is highly resistant to dehydration and our thick wall glass is nearly impervious to cracking, even under high pressure conditions.
- Solid state reference resistant to dehydration. Thick wall glass is resists cracking even under high pressure.
- Parabolic thick-wall, low-profile, break-resistant pH glass standard for all X3XX series pH sensors.
- Extreme Dehydration Resistant option invoked with Alpha Prefix “E” on supported sensor models allows for intermittent wet/dry operation and supports periods of exposure to prolonged dryness in field or shelf.



*Shown above is a complete 2" NPT HOT-TAP Ball Valve Retractable Assembly including:*

- 316SS Sensor Holder with 5X31, 5X41 or 5X51 series pH/ORP sensor installed with completed with sealing double O-rings
- 36 inch 316SS extension Tube for insertion up to 18 inches into process (maximum 42 inch insertion with 60 inch extension tube) with sealing cable gland installed to ensure watertight cable sealing
- 2.0 Inch full port ball valve HOT-TAP assembly with purge port
  - Also available in smaller 1.5 inch version for smaller process connections
- 1" MNPT X 1.00 inch compression fitting with Viton-75 Sealing O-ring
  - CV75, Simriz® 485 and Kalrez® 4079 are optional upgrades for the O-ring material of construction

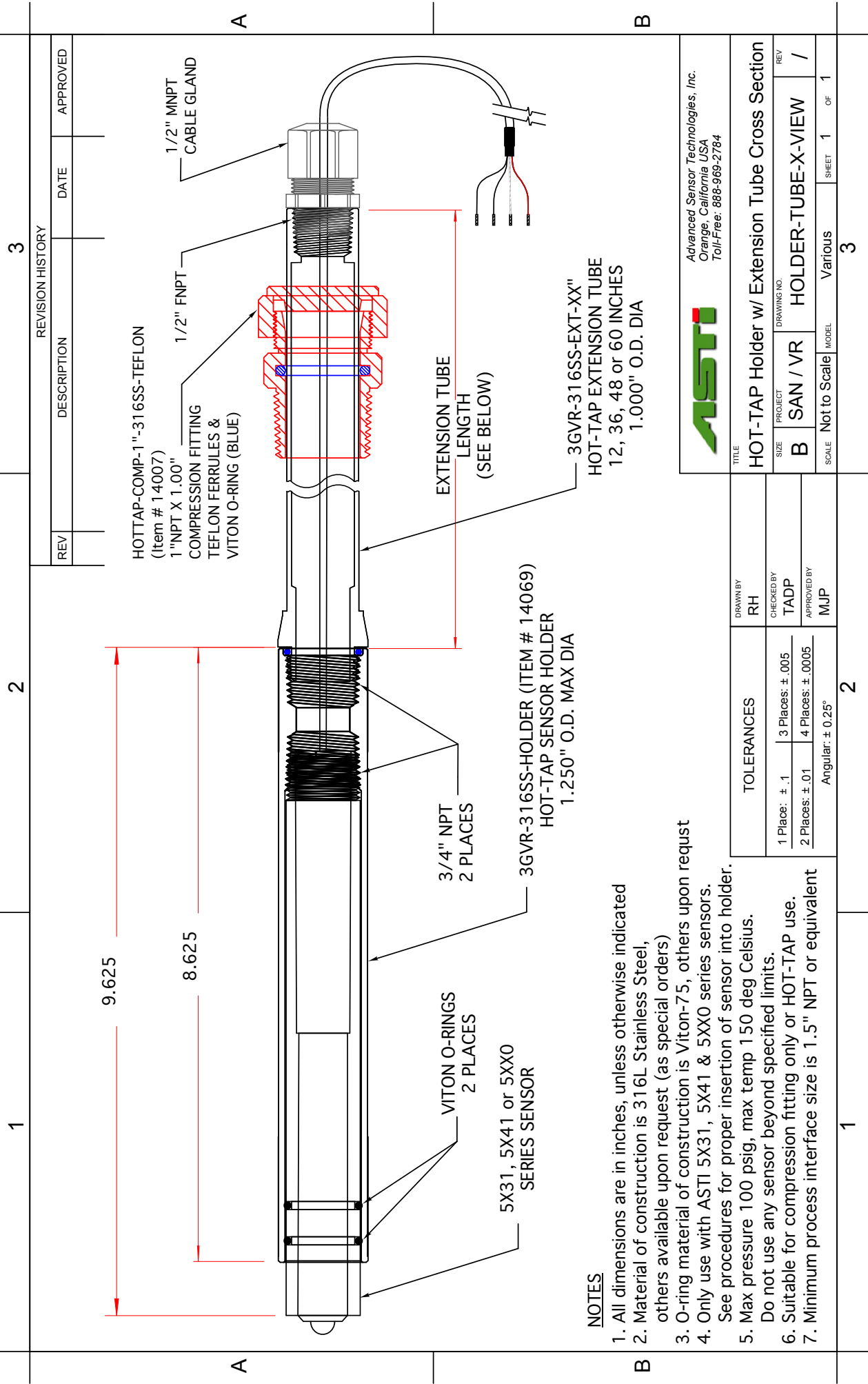
*Shown below is a 5X31 series pH sensor installed into 316SS sensor holder close-up*



*Shown below is a 5X31 series ORP sensor only close-up (sealing Viton O-rings installed)*



® Viton & Kalrez registered trademarks of DuPont. Simriz is registered trademark of Freudenberg Sealing Technologies (SIMRIT).



REVISION HISTORY		
REV	DESCRIPTION	DATE

HOTTAP-COMP-1"-316SS-TEFLON  
 (Item # 14007)  
 1"NPT X 1.00"  
 COMPRESSION FITTING  
 TEFLON FERRULES &  
 VITON O-RING (BLUE)

1/2" FNPT  
 1/2" MNPT  
 CABLE GLAND  
 EXTENSION TUBE  
 LENGTH  
 (SEE BELOW)

3GVR-316SS-EXT-XX"  
 HOT-TAP EXTENSION TUBE  
 12, 36, 48 or 60 INCHES  
 1.000" O.D. DIA

3/4" NPT  
 2 PLACES  
 3GVR-316SS-HOLDER (ITEM # 14069)  
 HOT-TAP SENSOR HOLDER  
 1.250" O.D. MAX DIA

VITON O-RINGS  
 2 PLACES  
 5X31, 5X41 or 5XX0  
 SERIES SENSOR

		Advanced Sensor Technologies, Inc. Orange, California USA Toll-Free: 888-969-2784	
<b>TITLE</b> HOT-TAP Holder w/ Extension Tube Cross Section			
<b>SIZE</b> B	<b>PROJECT</b> SAN / VR	<b>DRAWING NO.</b> HOLDER-TUBE-X-VIEW	<b>REV</b> /
<b>SCALE</b> Not to Scale		<b>MODEL</b> Various	<b>SHEET</b> 1 OF 1

<b>TOLERANCES</b>		<b>DRAWN BY</b> RH
1 Place: ±.1	3 Places: ±.005	<b>CHECKED BY</b> TADP
2 Places: ±.01	4 Places: ±.0005	<b>APPROVED BY</b> MJP
Angular: ± 0.25°		

**NOTES**  
 1. All dimensions are in inches, unless otherwise indicated  
 2. Material of construction is 316L Stainless Steel, others available upon request (as special orders)  
 3. O-ring material of construction is Viton-75, others upon request  
 4. Only use with ASTI 5X31, 5X41 & 5XX0 series sensors.  
 See procedures for proper insertion of sensor into holder.

5. Max pressure 100 psig, max temp 150 deg Celsius.  
 Do not use any sensor beyond specified limits.  
 6. Suitable for compression fitting only or HOT-TAP use.  
 7. Minimum process interface size is 1.5" NPT or equivalent

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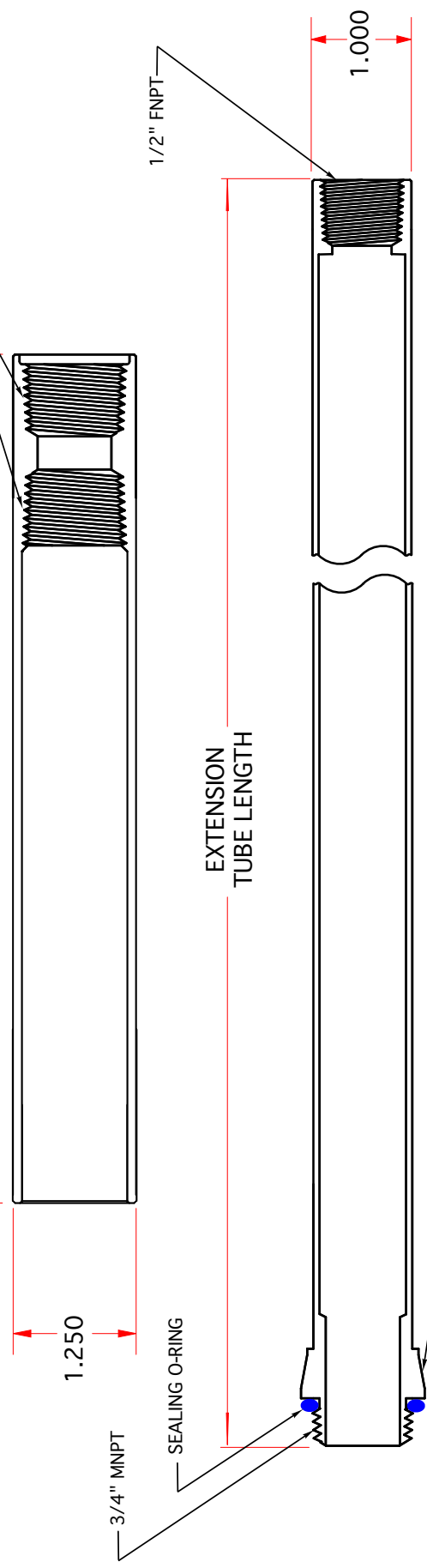
3

EXTENSION TUBE LENGTH OPTIONS	
14070	Extension Tube, 12 Inch Length
14071	Extension Tube, 36 Inch Length
14072	Extension Tube, 48 Inch Length
14073	Extension Tube, 60 Inch Length

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED

8.625

3/4" FNPT  
2 PLACES



A

B

**NOTES**

- All dimensions are in inches, unless otherwise indicated
- Material of construction is 316L Stainless Steel, others available upon request (as special orders)
- Only use with ASTI 5X31, 5X41 & 5XX0 series sensors. See procedures for proper insertion of sensor into holder.
- 3GVR-316SS-HOLDER sensor holder for HOT-TAP valve retractable installations is shown on top (Item # 14069)
- Extension tube part number is 3GVR-316SS-EXT-XX" where XX is the desired length in inches of the tube



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

TITLE			
SIZE	PROJECT	DRAWING NO.	REV
B	SAN / VR	HOLDER-TUBE-X-View	/
SCALE		MODEL	SHEET
Not to Scale		Various	1 OF 1

TOLERANCES		DRAWN BY
1 Place: ± .1	3 Places: ± .005	RH
2 Places: ± .01	4 Places: ± .0005	CHECKED BY
Angular: ± 0.25°		TADP
		APPROVED BY
		MJP

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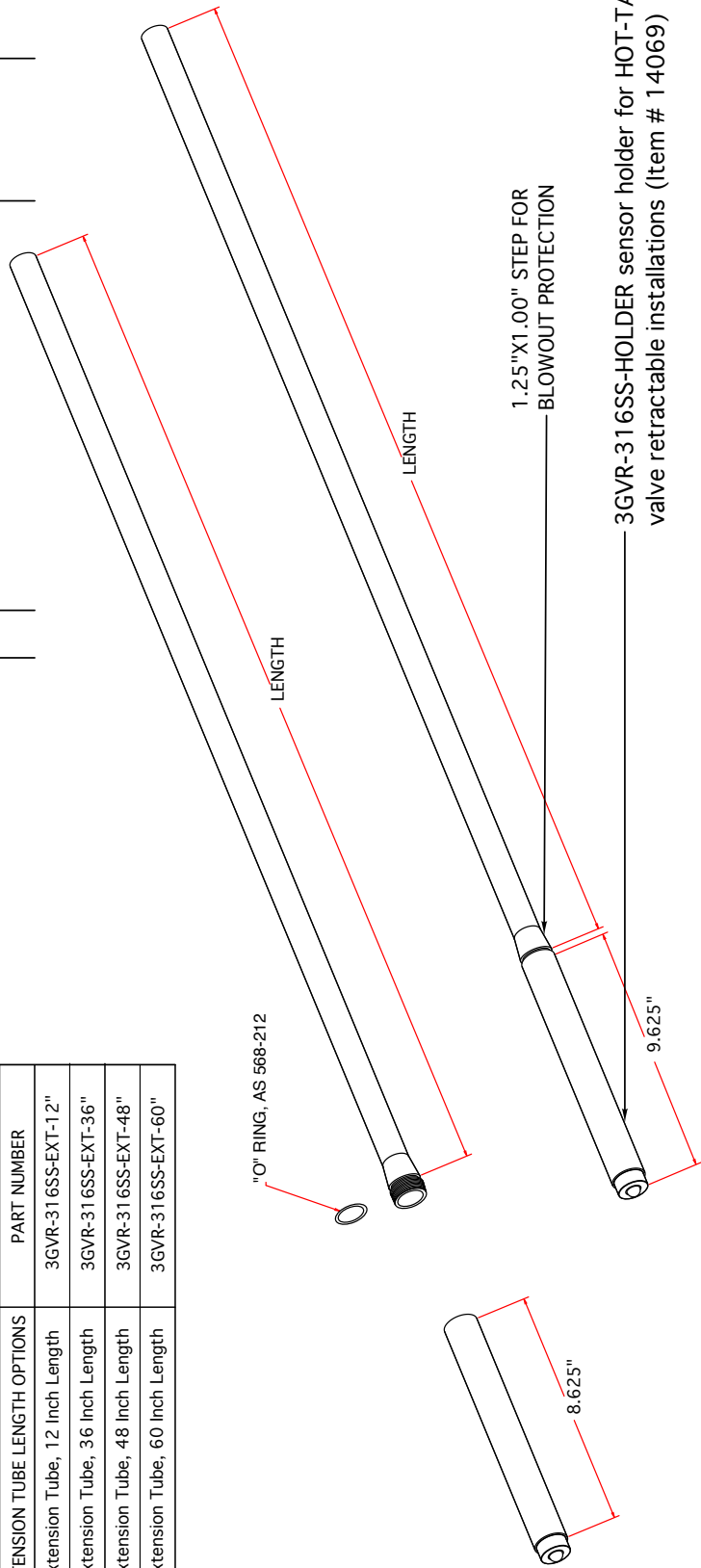
3

ITEM #	EXTENSION TUBE LENGTH OPTIONS	PART NUMBER
14070	Extension Tube, 12 Inch Length	3GVR-316SS-EXT-12"
14071	Extension Tube, 36 Inch Length	3GVR-316SS-EXT-36"
14072	Extension Tube, 48 Inch Length	3GVR-316SS-EXT-48"
14073	Extension Tube, 60 Inch Length	3GVR-316SS-EXT-60"

REV	DESCRIPTION	DATE	APPROVED

A

A



**NOTES**

1. All dimensions are in inches, unless otherwise indicated
2. Material of construction is 316L Stainless Steel, others available upon request (as special orders)
3. O-ring material of construction is Viton-75, others upon request
4. Only use with ASTI 5X31, 5X41 & 5XX0 series sensors. See procedures for proper insertion of sensor into holder.
5. Max pressure 100 psig, max temp 150 deg Celsius. Do not use any sensor beyond specified limits.
6. HOT-TAP ball valve retractable assy must be installed at an angle as shown (Min 15 degrees below horizontal)

B

B

 Advanced Sensor Technologies, Inc. Orange, California USA Toll-Free: 888-969-2784	
<b>TITLE</b> HOT-TAP Holder with Extension Tube - Isometric	
<b>SIZE</b> B	<b>PROJECT</b> SAN / VR
<b>DRAWING NO.</b> HOLDER-TUBE-ISO	<b>REV</b> /
<b>SCALE</b> Not to Scale	<b>MODEL</b> Various
<b>SHEET</b> 1	<b>OF</b> 1

3

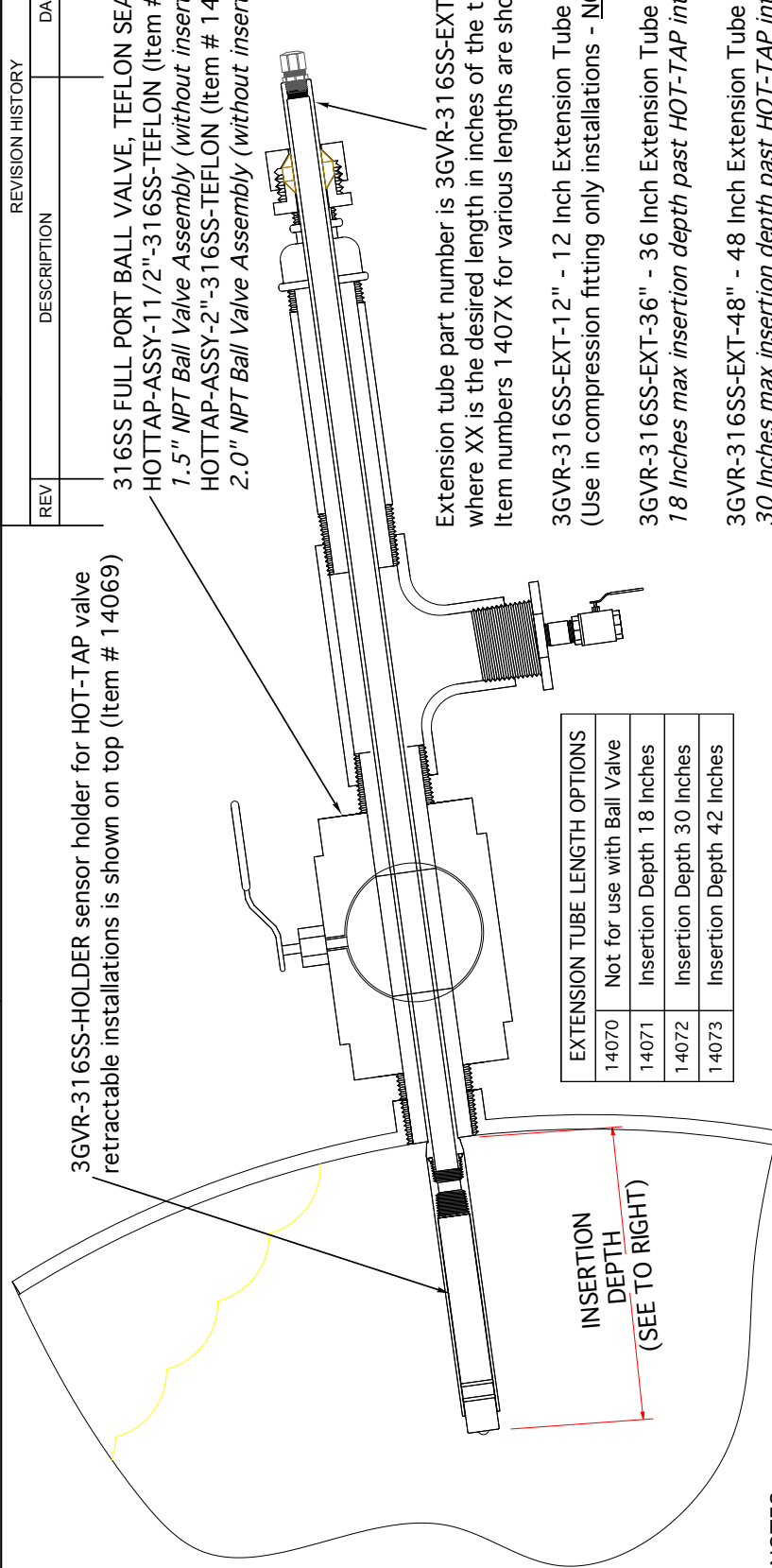
2

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REVISION HISTORY		
REV	DESCRIPTION	DATE

316SS FULL PORT BALL VALVE, TEFLON SEATS & FERRULES, HOTTAP-ASSY-11 1/2"-316SS-TEFLON (Item # 14016)  
 1.5" NPT Ball Valve Assembly (without insertion tube assy)  
 HOTTAP-ASSY-2"-316SS-TEFLON (Item # 14030)  
 2.0" NPT Ball Valve Assembly (without insertion tube assy)

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Extension tube part number is 3GVR-316SS-EXT-XX where XX is the desired length in inches of the tube  
 Item numbers 1407X for various lengths are shown in chart:

EXTENSION TUBE LENGTH OPTIONS	
14070	Not for use with Ball Valve
14071	Insertion Depth 18 Inches
14072	Insertion Depth 30 Inches
14073	Insertion Depth 42 Inches

3GVR-316SS-EXT-12" - 12 Inch Extension Tube (14070)  
 (Use in compression fitting only installations - NO HOT-TAP)

3GVR-316SS-EXT-36" - 36 Inch Extension Tube (14071)  
 18 Inches max insertion depth past HOT-TAP interface

3GVR-316SS-EXT-48" - 48 Inch Extension Tube (14072)  
 30 Inches max insertion depth past HOT-TAP interface

3GVR-316SS-EXT-60" - 60 Inch Extension Tube (14073)  
 42 Inches max insertion depth past HOT-TAP interface

**NOTES**

- All dimensions are in inches, unless otherwise indicated
- Material of construction is 316L Stainless Steel, others available upon request (as special orders)
- O-ring material of construction is Viton-75, others upon request
- Only use with ASTI 5X31, 5X41 & 5XX0 series sensors. See procedures for proper insertion of sensor into holder.
- Max pressure 100 psig, max temp 150 deg Celsius. Do not use any sensor beyond specified limits.
- HOT-TAP ball valve retractable assy must be installed at an angle as shown (Min 15 degrees below horizontal)

B

B

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

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**TITLE** HOT-TAP Assembly Drawing Inserted View

SIZE	PROJECT	DRAWING NO.	REV
B	SAN / VR	HOT-TAP INSERTED	/

SCALE: Not to Scale    MODEL: Various    SHEET 1 OF 1

TOLERANCES	
1 Place: ± .1	3 Places: ± .005
2 Places: ± .01	4 Places: ± .0005
Angular: ± 0.25°	

3GVR-316SS-HOLDER sensor holder for HOT-TAP valve retractable installations is shown on top (Item # 14069)

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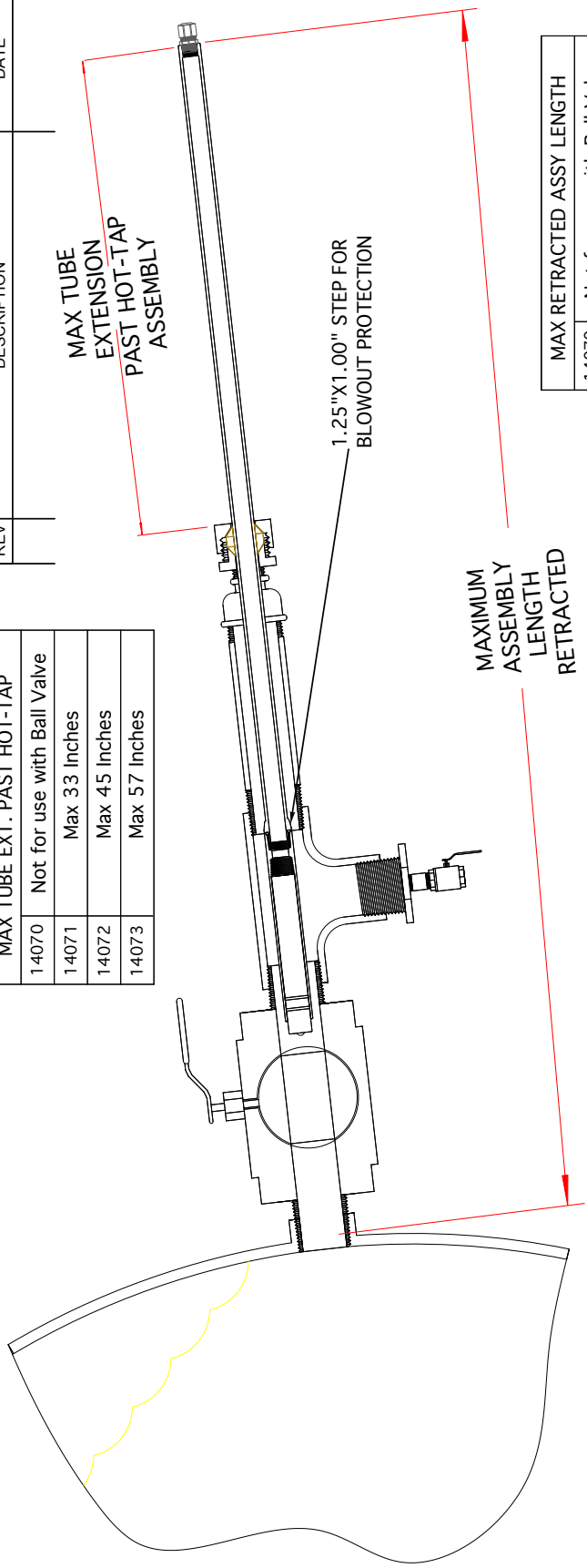
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REV	DESCRIPTION	DATE	APPROVED

MAX TUBE EXT. PAST HOT-TAP
14070 Not for use with Ball Valve
14071 Max 33 Inches
14072 Max 45 Inches
14073 Max 57 Inches



MAX RETRACTED ASSY LENGTH
14070 Not for use with Ball Valve
14071 Max 55 Inches
14072 Max 67 Inches
14073 Max 79 Inches

**NOTES**

1. All dimensions are in inches, unless otherwise indicated
2. Material of construction is 316L Stainless Steel, others available upon request (as special orders)
3. O-ring material of construction is Viton-75, others upon request
4. Only use with ASTI 5X31, 5X41 & 5XX0 series sensors. See procedures for proper insertion of sensor into holder.
5. Max pressure 100 psig, max temp 150 deg Celsius. Do not use any sensor beyond specified limits.
6. HOT-TAP ball valve retractable assy must be installed at an angle as shown (Min 15 degrees below horizontal)
7. 1/2" MNPT sealing cable glands available in a variety of plastic and metal materials of construction
8. Optional secondary blowout protection is wire rope harness on 1/2" MNPT metal cable gland (not shown)

A

B



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

TITLE			
HOT-TAP Assembly Drawing Retracted View			
SIZE	PROJECT	DRAWING NO.	REV
B	SAN / VR	HOT-TAP RETRACTED	/
SCALE		MODEL	SHEET
Not to Scale		Various	1 OF 1

3

2

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2

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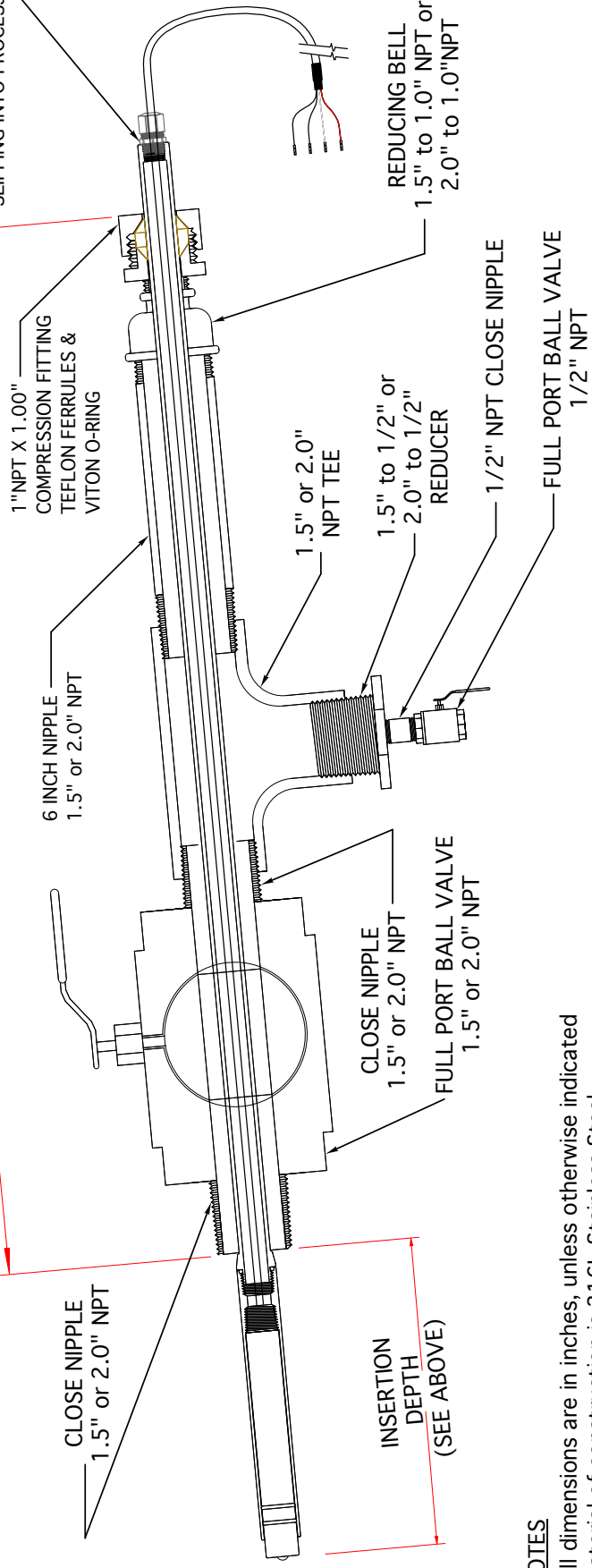
EXTENSION TUBE LENGTH OPTIONS	
14070	Not for use with Ball Valve
14071	Insertion Depth 18 Inches
14072	Insertion Depth 30 Inches
14073	Insertion Depth 42 Inches

REVISION HISTORY

REV	DESCRIPTION	DATE	APPROVED

FLATS ON CABLE GLAND  
PREVENT INSERTION ASSY  
FROM ACCIDENTALLY  
SLIPPING INTO PROCESS

22 INCHES  
MAX LENGTH



**NOTES**

1. All dimensions are in inches, unless otherwise indicated
2. Material of construction is 316L Stainless Steel, others available upon request (as special orders)
3. O-ring material of construction is Viton-75, others upon request
4. Only use with ASTI 5X31, 5X41 & 5XX0 series sensors.  
See procedures for proper insertion of sensor into holder.
5. Max pressure 100 psig, max temp 150 deg Celsius.  
Do not use any sensor beyond specified limits.
6. HOT-TAP ball valve retractable assy must be installed at an angle as shown (Min 15 degrees below horizontal)

A

B



Advanced Sensor Technologies, Inc.  
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TITLE  
**HOT-TAP Assembly Drawing Detail View**

SIZE	PROJECT	DRAWING NO.	REV
B	SAN / VR	HOT-TAP ASSY DETAILS	/

SCALE: Not to Scale MODEL: Various SHEET 1 OF 1

3

2

1



**Replacement pH & ORP Sensors For Transmitters that support and/or require Integrated Preamplifiers**

The instruments listed below require and/or support integral preamplifiers. Sensors to mate with these OEM pH & ORP transmitters are supplied with the appropriate integrated temperature compensation element, solution ground & OEM compatible high-impedance CMOS operational amplifier (a.k.a. preamplifier) as may be required to ensure full compatibility and optimal performance. Some manufacturers and analyzer models can support both sensors with or without preamplifiers on the same instrument. A sensor hook-up schematics for interfacing to the given OEM pH/ORP transmitter is supplied with each sensor, and some of the most common wiring schematic are posted on our website (please inquire for any not listed).

**Fully Supported Hardware - FULL COMPATIBILITY**

Manufacturer	pH & ORP Transmitters	OEM pH & ORP Sensors *
<b>Rosemount Analytical</b> Liquid Division A Part of Emerson Process Management	<b>LEGACY:</b> 1000, 1001, 1002, 1003, 1050, 1181, 1055, 2081, 3081, 81, 54pH, 54epH, XMT <b>MODERN:</b> 1056, 1057, 56, 1066, 5081, 6081	385/385+, 389, 3900 pH & ORP sensors 3300HT, 3400HT & 3500P PERpH-X™ pH & ORP sensors 397, 398/398R, TF396 TUpH™ pH & ORP sensors
<b>Foxboro Analytical</b> EChem by Schneider Electric (a Division of Invensys)	<b>LEGACY:</b> 870IT <b>MODERN:</b> 875PH, 876PH, 873PH, 873DPX	PH10 DolpHin™ pH sensors, ORP10 DolpHin™ ORP sensors, 871A & 871PH pH & ORP sensors, EP460 & EP466 pH & ORP sensors
<b>Honeywell</b> (formerly Leeds and Northrup, a.k.a. L&N)	<b>LEGACY:</b> 7030, 7075, 7076, 7079, 7081, 7082, 7083, 7084, 7096, 9782 <b>MODERN:</b> UDA2182, APT2000PH, APT4000PH	7773, 7774/7774D, 7777/7777D/7777DVP, 7794DVP Sanitary DURAFET™, HB/HB546, HB/HBD547, HB/HB551
<b>Electro-Chemical Devices</b> (a.k.a. ECD)	<b>LEGACY:</b> T20, T21, T27, T29, T30, C22 <b>MODERN:</b> T23, T28	S10 (PHS10) and S17 (PHS17)

**Replacement pH & ORP Sensors For Transmitters DO NOT SUPPORT Integrated Preamplifiers**

The instruments listed below do no support preamplifiers. Sensors to mate with these OEM pH & ORP transmitters are supplied with the appropriate internal temperature compensation and/or solution ground signals to ensure compatibility. A sensor hook-up schematics for interfacing to the given OEM pH/ORP transmitter is supplied with each sensor, and the some of the most common wiring schematic are posted on our website (please inquire for any not listed). If longer cable runs may be required for your planned installation, it is recommended to select a transmitter that supports preamplifiers (see list to the left).

**Fully Supported Hardware - FULL COMPATIBILITY**

Manufacturer	pH & ORP Transmitters	OEM pH & ORP Sensors *
<b>Endress+Hauser</b> (a.k.a. E+H)	<b>LEGACY:</b> CPM152, CPM280, CPM431 <b>MODERN:</b> CPM153, CPM223, CPM253	Inquire to ASTI Factory for alternatives to E+H pH & ORP sensors
<b>Mettler-Toledo International</b> (formerly Ingold)	<b>LEGACY:</b> 1120, 1140, 2050, 2100, 2220, 2400, 2500, 2800X, 2050e, pH 2100e <b>MODERN:</b> M200, M300, M400, M700, M800	Inquire to ASTI Factory for alternatives to Mettler-Toledo pH & ORP sensors
<b>ABB</b> (formerly TBI-Bailey)	<b>LEGACY:</b> TB515, TBN580, TB701/702, 4630, 4631, 4635, 4636, AX416, AX436, AX468, AX460, AX466 <b>MODERN:</b> AX460, AX416, AX436, APA592, TB82pH, TB84pH,	AP100, AP200, AP300, TB(X)551, TB(X)556, TB(X)557, TB(X)561, TB(X)567, TB(X)587
<b>Knick</b>	<b>LEGACY:</b> 2402 <b>MODERN:</b> Stratos Evo, Stratos Pro A2 pH, Stratos Pro A4 pH, Stratos Eco 2405 pH, Stratos 2221 pH, Stratos Stratos 2231 pH, Protos 3400(X)-035, PHU 3400(X)-110	Inquire to ASTI Factory for alternatives to Knick pH & ORP sensors



# IOTRON™

## pH / ORP / ISE / DO / Conductivity Measurement Products Lines

### Supported Hardware with Known Issues -

#### LIMITED COMPATIBILITY

Manufacturer	pH & ORP Transmitters	OEM pH & ORP Sensors *
Rosemount Analytical Liquid Division A Part of Emerson Process Management	LEGACY: 1054, 1054A, 1054B, 1055	385/385+, 389, 3900 pH & ORP sensors 3300HT, 3400HT & 3500P PERpH-X™ pH & ORP sensors 397, 398/398R, TF396 TUpH™ pH & ORP sensors

HACH (formerly Great Lakes Instruments, a.k.a. GLI)	LEGACY: 33, 53, 60, 62, 63, 70, 83, 90, 95, 570, 670, 671, 690, 691, 692, P33, P53, P63 MODERN: si792, si794, PRO-P3 GLI PRO series, sc200	<b>Encap Diff pH Sensors:</b> Such as 6028P0, 6028P020, 6028P050, 6028P033, 6058P0, 6022P0... <b>3/4 in Combination pH/ORP Sensors:</b> Such as PC1R1A, RC1R5N, PC1R2A, PC1R1N, PC1R3A, PC1R1A-V12... <b>Analog Differential pH/ORP Sensors:</b> Such as PD1P1, PD1R1, PD2P1, PD1R3, PD1P3, PD3P1, PD2P1A30, PD2P1A50, ...
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GF (Georg Fischer) Signet a.k.a +GF+	LEGACY: 710, 2720, 9030, 9040, 8710, 5700 MODERN: 9900, 8900, 8750	2724-2726 pH/ORP Electrodes, 2734-2736 pH/ORP Electrodes, 2774-2777 Threaded DryLoc pH/ORP Electrodes, 2764-2767 Differential DryLoc pH/ORP Electrodes, 3719 pH/ORP Wet-Tap, 2714-2717 pH/ORP Electrodes
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\* ASTI offers pH & ORP sensors compatible with the transmitters listed above as an alternative to mating OEM pH & ORP sensors detailed.

Trademarks (indicated with ™) are registered to the respective corporations as listed above.

### Supported Hardware with Known Issues -

#### LIMITED COMPATIBILITY

Manufacturer	pH & ORP Transmitters	OEM pH & ORP Sensors *
Yokogawa Electric Corporation (Formerly Johnson Yokogawa Controls, a.k.a. JYC)	LEGACY: pH/ORP 200, pH/ORP 400, pH/ORP 202, pH/ORP 402, pH150, pH100, OR100 MODERN: PH450G, PH202G	FU20 pH/ORP Combined Sensor, PH8EFP, PH8ERP, OR8EFG, OR8ERG pH/ORP Sensors

*Most of the pH/ORP transmitter models listed also have a both contacting conductivity and toroidal (inductive contactless) conductivity transmitter counterpart to which ASTI can also supply alternative sensors to the OEM model sensors. Please inquire for any such conductivity retrofit and replacement sensor needs as well as for the pH & ORP measurements.*

**The manufacturers and models detailed on this webpage are not a complete listing of the supported OEM pH & ORP transmitters, analyzers and controllers to which ASTI can retrofit our replacement pH, ORP and conductivity sensors.**

### PLEASE INQUIRE ABOUT COMPATIBILITY FOR ANY INSTRUMENTATION NOT LISTED HERE

Naturally, all of the ASTI pH, ORP and Ion selective (ISE) sensors are compatible with our own **2TX, 3TX and 4TX series transmitters**



### STANDARD APPLICATIONS

- Acid/Fluoride
- High / Ultra High Temperature
- Paper/Pulp
- Slurry/Viscous Materials
- Saturated Sodium
- Oxidation Reduction Potential
- Sulfides
- Ultrapure Water
- General Purpose

### Special Applications

- Organic Solvents Resistant
- Cyanide Resistant
- Dissolved Gases:
- Cl<sub>2</sub>, ClO<sub>2</sub>, NH<sub>3</sub>, SO<sub>2</sub> / SO<sub>3</sub> / NO<sub>x</sub> Resistant

### LIMITS & CAPABILITIES (PARTIAL LIST)

#### pH & ORP MEASUREMENTS

- Fluorides up to 50,000 PPM and -0.5 pH
- Sulfides up to Saturation
- Cyanides up to 500 PPM
- High pH range up to 14.5 (with ASTI calibration procedures and buffers)
- Low pH range up to -0.5 (with ASTI calibration procedures and buffers)
- Low Temperature up to -30 °C
- High Temperature up to 150 °C
- High Pressure up to 150 p.s.i.
- Solids Content up to 12% Consistency Pulp
- Almost All Organic Chemical Mixtures (Minimum 1-2 % aqueous content)
- ORP Measurements in Completely Non-Aqueous Medium
- Bleaching Applications using Chlorine and Chlorine Dioxide
- Sterilization Applications using Peroxide, Ozone & Dissolved O<sub>2</sub>

**PLEASE INQUIRE FOR ANY APPLICATIONS NOT LISTED HERE**

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## Sensor Configurations for use with 3rd Generation HOT-TAP Valve Retractable Assemblies



*RADEL 5X31 SERIES pH SENSOR SHOWN ABOVE FOR VISUALIZATION PURPOSES*

**5X31 Series pH/ORP Sensors**  
**Body Housing RADEL®**  
**Poly-Phenyl-Sulfone, PPSU**

**Grade R-5000 NT**

**5X41 Series pH/ORP Sensors**  
**Body Housing KETASPIRE®**  
**Poly-Ether-Ether-Ketone, PEEK**

**Grade KT-880 NT**

**5X41 Series pH/ORP Sensors**  
**Body Housing KETASPIRE®**  
**Poly-Ether-Ether-Ketone, PEEK**

**Grade R-4-230BL**

® RADEL, KETASPIRE and RYTON are registered trademarks of Solvay

### SANITARY SENSOR DIMENSIONAL DRAWINGS

#### Sanitary pH Sensor Dimensional Drawing 5-1

**50X1 Series General Purpose & Wide Range Resistant**  
**51X1 & 52X1 Series High Temp & Ultra-High Temp Resistant**  
**54X1 Series Acid, Fluoride & HF Resistant**  
**55X1 Series Pulp & Paper Resistant**

**56X1 Series hydrogen sulfide gas (H<sub>2</sub>S), hydrogen sulfide (HS<sup>-</sup>) or sulfide ion (S<sup>2-</sup>) Resistant**  
**57X1 Series Aggressive Dissolved Gas & Volatile Organic Solvent Resistant**  
**59X1 Series Saturated Sodium (Brine) Resistant**

#### Sanitary pH Sensor Dimensional Drawing 5-2

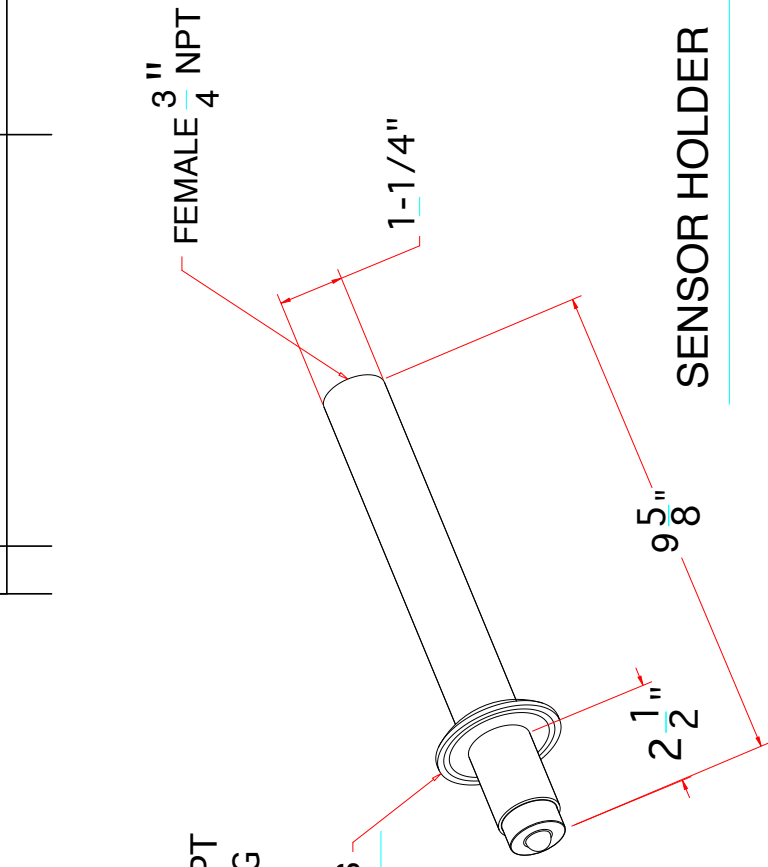
**53X1 Series Slurry & Viscous Media Resistant**  
**55X1 Series Pulp & Paper Resistant**

#### Sanitary ORP Sensor Dimensional Drawing | 5-1-Pt

**58X1 Oxidation Reduction Potential (ORP) Series**

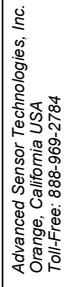
1 2 3

REV	DESCRIPTION	DATE	APPROVED



**NOTES**

- All dimensions are in inches, unless otherwise indicated
- Material of construction is 316L Stainless Steel, others upon request
- Insertion depth past welded fitting for sensors without protective tines is 2.8 inches maximum while insertion depth for sensors with protective tines is 2.5 inches maximum.
- While the insertion depths are as described in note # 3 is standard, custom insertion depths are available upon request by modifying the location of the welded fitting (inquire to factory)
- Waterproof sealing assembly on back of sensor holder is not shown above. This consists of a 316L SS 3/4"x1/2" NPT reducer busing with 1/2" MNPT sealing cable gland. This waterproof sealing assy adds about 3 inches to the overall holder length.
- When sensor holder is to be for valve retractable HOT-TAP installation use, no fitting is welded at all.
- Only use with ASTI 5X31, 5X41 & 5XX0 series sensors. See installation procedures for proper insertion.



TITLE		Sensor Holder for Sanitary & HOT-TAP Use	
SIZE	PROJECT	DRAWING NO.	REV
B	SAN / VR	Sensor Holder Universal	/
SCALE	MODEL	SHEET	OF
Not to Scale	Various	1	1

3

2

1

## Selection Guide for Sensors for use with 3rd Generation

### HOT-TAP Valve Retractable Assemblies

Short Description of pH/ORP Sensor Series <i>KYNAR Junction used in all 5XX1 Sensors</i>	Sensor Body Housing <b>RADEL®</b> Poly-Phenyl-Sulfone PPSU	Sensor Body Housing <b>KETASPIRE®</b> Poly-Ether-Ether-Ketone PEEK	Sensor Body Housing <b>RYTON®</b> Poly-Phenylene-Sulfone PPS
<i>General Purpose</i>	5031	5041	5051
<i>High Temperature Resistant</i>	5131	5141	5151
<i>Ultra High Temperature Resistant</i>	5231	5241	N/A
<i>Slurry &amp; Viscous Material Resistant</i>	5331	5341	5351
<i>Acid, Fluoride &amp; HF Resistant</i>	5431	5441	5451
<i>Paper &amp; Pulp Resistant</i>	5531	5541	5541
<i>Sulfide Resistant</i>	5631	5641	5651
<i>Aggressive Dissolved Gas &amp; Volatile Organic Solvent Resistant</i>	5731	5741	N/A
<i>Oxidation Reduction Potential a.k.a. ORP</i>	5831	5841	5851
<i>Saturated Sodium (Brine) Resistant</i>	5931	5941	5951

® RADEL, KETASPIRE and RYTON are registered trademarks of Solvay

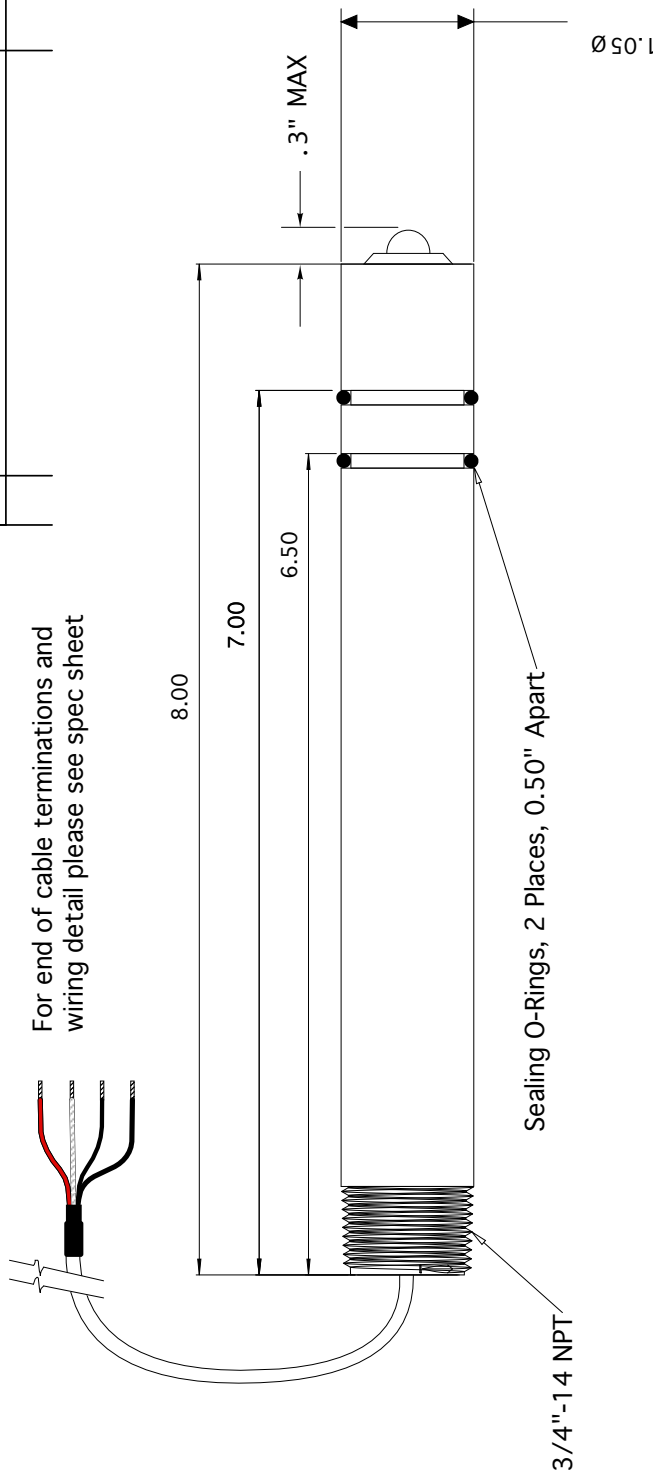
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2

3

REVISION HISTORY		
REV	DESCRIPTION	DATE


For end of cable terminations and wiring detail please see spec sheet



**NOTES**

1. All dimensions are in inches, unless otherwise indicated with tolerances as detailed below
2. Sensor body material of construction is RADEL (5X31), PEEK (5X41) or RYTON (5X51)
3. O-ring material of construction is Viton-75 standard; CV75, Simriz 485 & Kalrez 4079 Optional
4. Drawing as shown is without protective tines. The maximum displacement of the sensor past the end of the body in this configuration is 0.30" inches yielding a max overall length of 8.30 inches.
5. With Protective tines "GR" (4 places, 90 degrees apart) or "GRO" (2 places, 180 degrees apart) configurations overall sensor length is 8.00 inches.
6. This sensor is only for use with ASTI supplied sanitary and valve retractable sensor holders.
7. See installation procedures for proper insertion of this sensor into the mating holder.

TOLERANCES		DRAWN BY
1 Place: ± .1	3 Places: ± .005	RH
2 Places: ± .01	4 Places: ± .0005	CHECKED BY
Angular: ± 0.25°		TADP
		APPROVED BY
		MJP



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

TITLE		
Sensor for Sanitary & HOT-TAP/Retractable Use		
SIZE	PROJECT	DRAWING NO.
B	SAN / VR	5-1 pH SENSORS
SCALE	Not to Scale	MODEL: 5X31, 5X41, 5X51
		REV
		/
		SHEET 1 OF 1

2

3

1

A

B

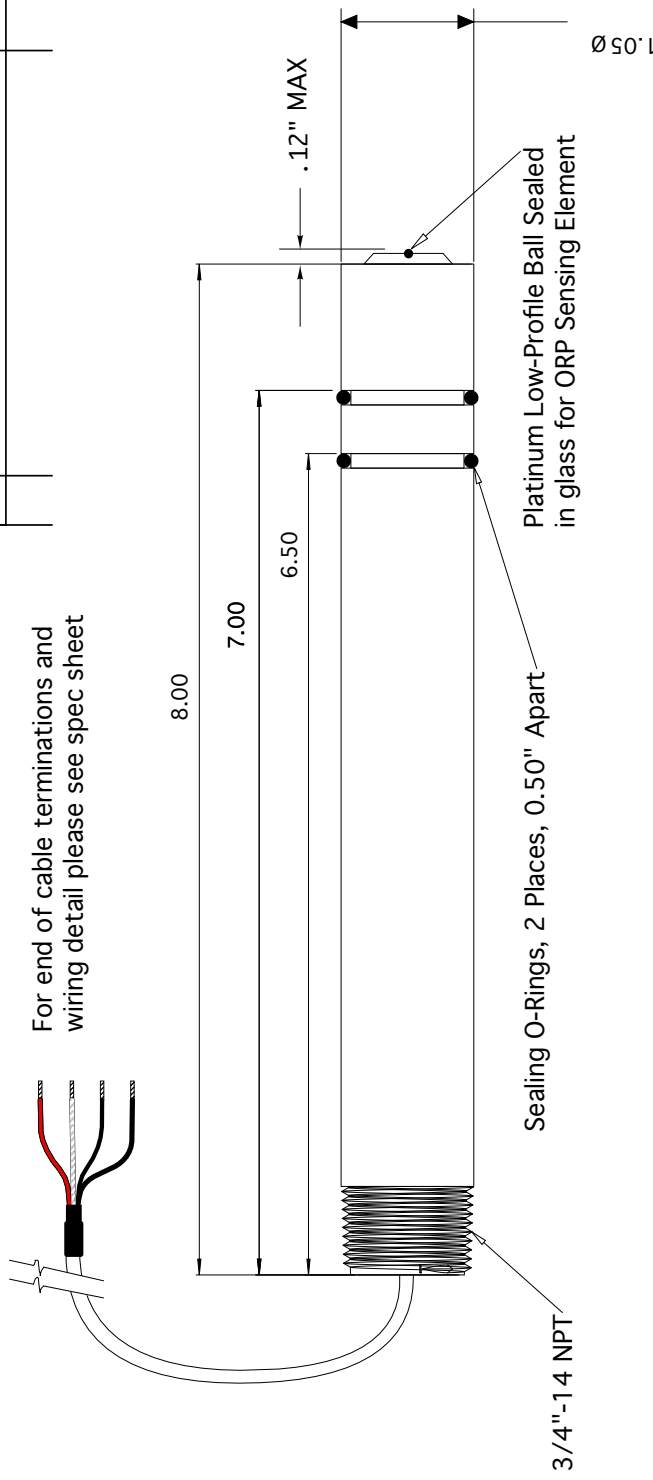
1

2

3

REVISION HISTORY		
REV	DESCRIPTION	DATE

For end of cable terminations and wiring detail please see spec sheet




**NOTES**

1. All dimensions are in inches, unless otherwise indicated with tolerances as detailed below
2. Sensor body material of construction is RADEL (5X31), PEEK (5X41) or RYTON (5X51)
3. O-ring material of construction is Viton-75 standard; CV75, Simriz 485 & Kalrez 4079 Optional
4. Drawing shown without protective tines. Max protusion of low-profile platinum ball style X8XX series ORP sensor past body is 0.12" inches yielding a max overall length of 8.12 inches.
5. With Protective tines "GR" (4 places, 90 degrees apart) or "GRO" (2 places, 180 degrees apart) configurations overall sensor length is 8.00 inches.
6. This sensor is only for use with ASTI supplied sanitary and valve retractable sensor holders.
7. See installation procedures for proper insertion of this sensor into the mating holder.

A

B

		Advanced Sensor Technologies U.S.A. Website: <a href="http://www.astisensor.com">http://www.astisensor.com</a>	
<b>TITLE</b> Sensor for Sanitary & HOT-TAP/Retractable Use			
<b>SIZE</b> B	<b>PROJECT</b> SAN / VR	<b>DRAWING NO.</b> 5-1-Pt Low-Profile ORP	<b>REV</b> /
<b>SCALE</b> Not to Scale		<b>MODEL</b> 5X31, 5X41, 5X51	<b>SHEET</b> 1 OF 1

3

2

1

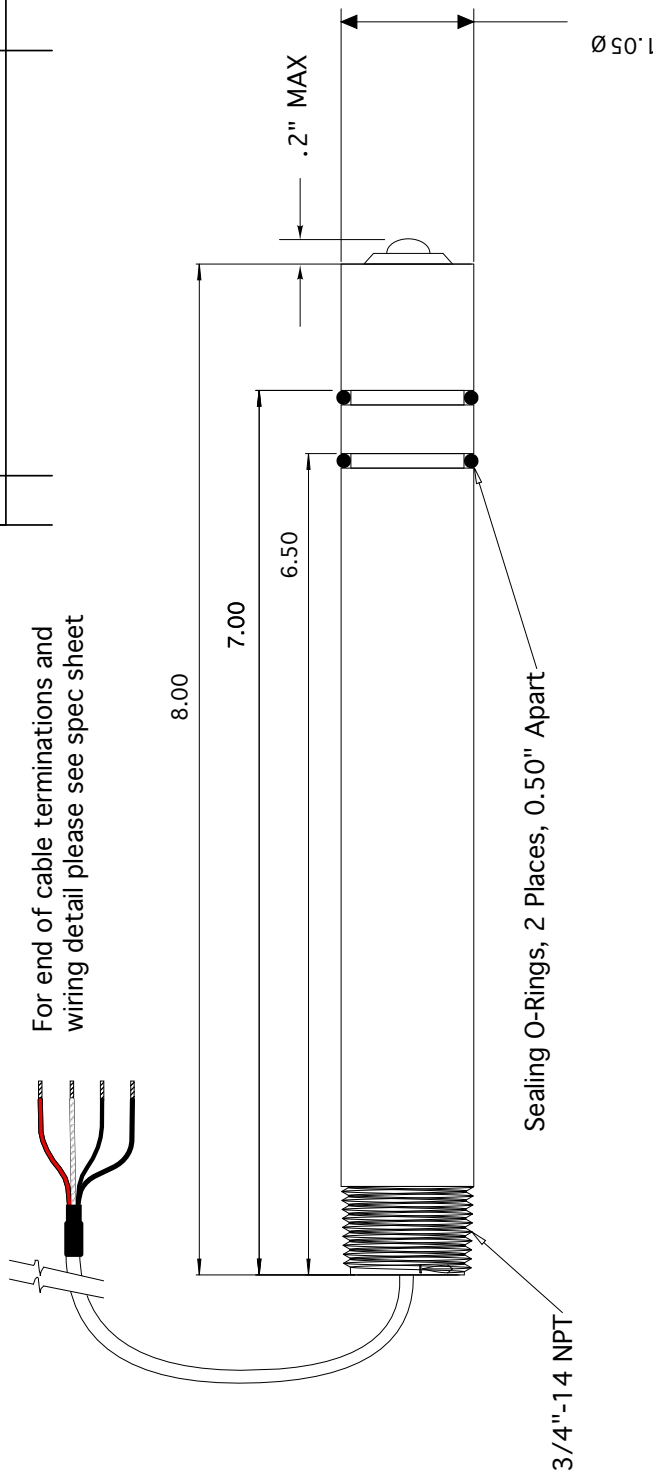
1

2

3

REVISION HISTORY		
REV	DESCRIPTION	DATE

For end of cable terminations and wiring detail please see spec sheet



A

B

**NOTES**

- All dimensions are in inches, unless otherwise indicated with tolerances as detailed below
- Sensor body material of construction is RADEL (5X31), PEEK (5X41) or RYTON (5X51)
- O-ring material of construction is Viton-75 standard; CV75, Simriz 485 & Kalrez 4079 Optional
- Drawing shown without protective tines. Max protrusion of low-profile parabolic slurry/viscous resistant X3XX series pH sensor past body is 0.20" inches yielding a max overall length of 8.20 inches.
- With Protective tines "GR" (4 places, 90 degrees apart) or "GRO" (2 places, 180 degrees apart) configurations overall sensor length is 8.00 inches.
- This sensor is only for use with ASTI supplied sanitary and valve retractable sensor holders.
- See installation procedures for proper insertion of this sensor into the mating holder.



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

TITLE			
Sensor for Sanitary & HOT-TAP/Retractable Use			
SIZE	PROJECT	DRAWING NO.	REV
B	SAN / VR	5-2 Low-Profile pH Glass	/
SCALE		MODEL	SHEET
Not to Scale		5X31, 5X41, 5X51	1 OF 1

3

2

1

## HOT-TAP Valve Retractable Sensor & Assembly Options

- All 5X31, 5X41 & 5X51 series pH sensors and ORP sensors are supplied without tines (no guard) as the standard configuration (default). Four (4) each protective tines ("GR") or 2 each protective tines ("GRO") are available in both the full length 0.5" inches (for pH sensors) or the reduced 0.3" inch length (typically for parabolic pH or ORP sensors).
  - Contact ASTI to decide which guard configuration is most appropriate for your planned installation.
- Fast temperature compensation response (Iotron™ AccuTemp™) recommend for all sanitary sensor installations.



Compression fitting only assembly shown above with 5X31 series sensors, 316SS sensor holder, 12 inch extension tube, 1"MNPT X 1.00"O.D. compression fitting & sealing cable gland. This installation is ideal for batch processes where the process is periodically shut-down & the assembly can be periodically removed from service.



1.25" MNPT inline 316SS fitting shown above with 5X31 series sensors, 3/4"X1/2" reducer bushing and sealing cable gland. This installation style is ideal for installations where plastic threaded sensors are insufficient for the process conditions due severe process flow, pressure or mechanical wear. Special order options include customizable insertion depth up to 6.0 inches (minimum order quantity may apply for special order options).

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\* Additional charges apply for these options. Not all options available on all models (inquire to factory).

## APPENDIX "A"

### Custom Applications

Dissolved Gas Resistant

Organic Media Applications\*

Teflon Silicone Required\*

Triple Junction\*

High-Level HF Resistant\*

Impact & break resistant low-profile parabolic pH glass for slurries\*

Extreme Dehydration Resistant\*

### Custom Configurations

Accu-Temp Fast Temperature Response\*

Low Impedance Glass\*

316SS Solution Ground Addition\*

Platinum Solution Ground Addition\*

Platinum Solution Ground for use on two separate input channels or transmitters\*

3-wire TC\*

4 each Protective Tines\*

2 each Protective Tines\*

Shielded Preamplifier Blue Cable\*

Upgrade from standard Viton® -75 to CV75, Simriz® 485 or Kalrez® 4079\*

### Add-On Alpha Prefix

“A” or “C”

“L”

“TS”

“TJ”

“HF”

“X3XX” & “X5XX” series

“E”

### Add-On Alpha Prefix

“X”

“Z”

“Y”

“Pt”

“PtD”

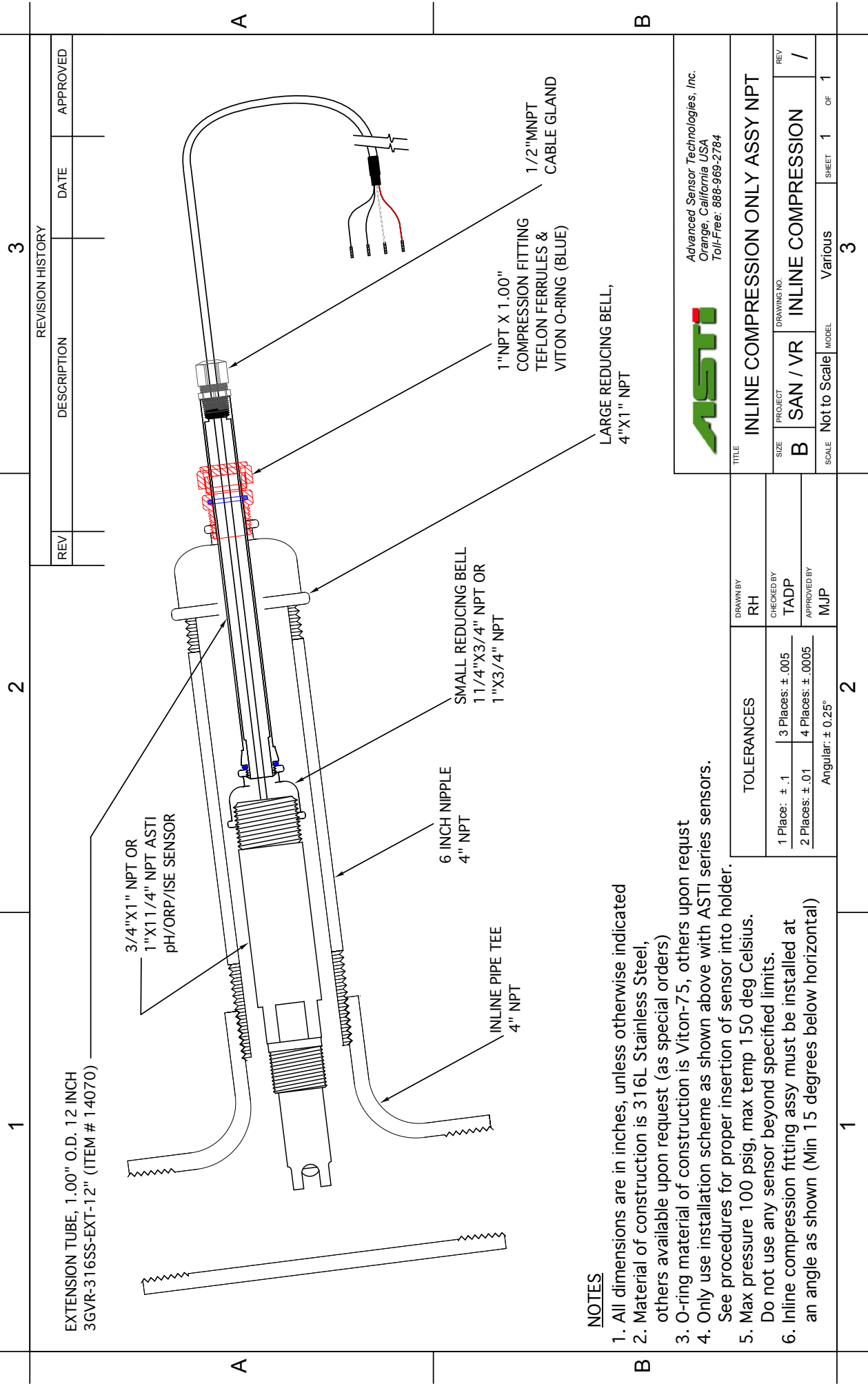
“M”

“GR”

“GRO”

“BL”

“W”, “U” or “K” respectively



REV	DESCRIPTION	DATE	APPROVED

EXTENSION TUBE, 1.00" O.D. 12 INCH 3GVR-316SS-EXT-12" (ITEM # 14070)

3/4"X1" NPT OR 1"X1 1/4" NPT ASTI PH/ORP/ISE SENSOR

6 INCH NIPPLE 4" NPT

SMALL REDUCING BELL 1 1/4"X3/4" NPT OR 1"X3/4" NPT

LARGE REDUCING BELL, 4"X1" NPT


1" NPT X 1.00" COMPRESSION FITTING TEFLON FERRULES & VITON O-RING (BLUE)

1/2" MNPT CABLE GLAND

INLINE PIPE TEE 4" NPT

**NOTES**

1. All dimensions are in inches, unless otherwise indicated
2. Material of construction is 316L Stainless Steel, others available upon request (as special orders)
3. O-ring material of construction is Viton-75, others upon request
4. Only use installation scheme as shown above with ASTI series sensors. See procedures for proper insertion of sensor into holder.
5. Max pressure 100 psig, max temp 150 deg Celsius. Do not use any sensor beyond specified limits.
6. Inline compression fitting assy must be installed at an angle as shown (Min 15 degrees below horizontal)

 Advanced Sensor Technologies, Inc. Orange, California USA Toll-Free: 888-969-2784	
<b>TITLE</b> INLINE COMPRESSION ONLY ASSY NPT	
<b>PROJECT</b> SAN / VR	<b>DRAWING NO.</b> INLINE COMPRESSION /
<b>SCALE</b> Not to Scale	<b>MODEL</b> Various
<b>SHEET</b> 1	<b>OF</b> 1

1

2

3

1

2

3