Instruction Manual
LIQ-MAN-PERpH-X
Rev. J
April 2017

Rosemount™3300HT/3300HTVP/3400HT/ 3400HTVP/3500P/3500VP

PERpH-X High Performance pH/ORP Sensors

EMERSON™

Essential Instructions
Read this page before proceeding!

Emerson designs, manufactures and tests its products to meet many national and international standards. Because these sensors are sophisticated technical products, you MUST properly install, use, and maintain them to ensure they continue to operate within their normal specifications. The following instructions MUST be adhered to and integrated into your safety program when installing, using, and maintaining Rosemount products. Failure to follow the proper instructions may cause any one of the following situations to occur: loss of life; personal injury; property damage; damage to this sensor; and warranty invalidation.

- Read all instructions prior to installing, operating, and servicing the product.
- If you do not understand any of the instructions, contact your Emerson representative for clarification.
- Follow all warnings, cautions, and instructions marked on and supplied with the product.
- Inform and educate your personnel in the proper installation, operation, and maintenance of the product.
- Install your equipment as specified in the Installation Instructions of the appropriate Instruction Manual and per applicable local and national codes. Connect all products to the proper electrical and pressure sources.
- To ensure proper performance, use qualified personnel to install, operate, update, program, and maintain the product.
- When replacement parts are required, ensure that qualified people use replacement parts specified by Emerson. Unauthorized parts and procedures can affect the product's performance, place the safe operation of your process at risk, and VOID YOUR WARRANTY. Third-party substitutions may result in fire, electrical hazards, or improper operation.
- Ensure that all equipment doors are closed and protective covers are in place, except when maintenance is being performed by qualified persons, to prevent electrical shock and personal injury.

The information contained in this document is subject to change without notice.

⚠ CAUTION

Sensor/Process Application Compatibility

The wetted sensor materials may not be compatible with process composition and operating conditions. Application compatibility is entirely the responsibility of the user.

⚠ WARNING

Before removing the sensor, be absolutely certain that the process pressure is reduced to 0 psig and the process temperature is lowered to a safe level!

⚠ CAUTION

Special Conditions for Safe Use

1. All pH/ORP sensors have a plastic enclosure which must only be cleaned with a damp cloth to avoid the danger due to a build up of an electrostatic charge.

2. All pH/ORP sensor models are intended to be in contact with the process fluid and may not meet the 500V r.m.s. a.c. test to earth.

This must be taken into consideration at installation.

About This Document

This manual contains instructions for installation and operation of the Rosemount 3300HT/3300HTVP/3400HT/3400HTVP/3500P/3500VP.

The following list provides concerning all revisions of this document.

Rev. Level	Date	Notes
J	04/2017	Updated information with new Emerson Style Guidelines, Updated Ordering Information, Specifications, and Wiring Diagrams. Added Accessories Information, EC Declaration of Conformity and FM Installation Drawings.

Contents

Section 1: Specifications

1.1 Specifications

Table 1-1: Percent linearity over pH

pH Range	HT Series
0-2 pH	94%
2-12 pH	99%
12-13 pH	97%
13-14 pH	92%

Table 1-2: Rosemount 3300HT/3300HTVP sensor specifications

Measured Range	
pH range	0 to 14 pH
ORP range	-1500 mV to 1500 mV
Operating Temperature	
Without Preamplifier	41 to 311 °F (5 to 155 °C)
With Preamplifier	up to 212 °F (100 °C)
Storage Temperature	
14 to 138 °F (-10 to 70 °C)	
Maximum Process Pressure	
400 psig (2859 kPa [abs])	
CRN Rating: 200 psig at room temperature	
Wetted Materials	
Titanium, Ryton, Teflon, Glass, and User Specified O-ring Material (EPDM, Viton or Kalrez)	
Reference Electrode	
Double junction with replaceable process side electrolyte and Teflon junction	
Temperature Sensor	
Pt-100 RTD	
Process Connections	
Must use 1 in. compression process connector (P/N 23166-00 or 23166-01)	
Weight/Shipping Weight	
1 lb/2 lb (0.5 kg/0.9 kg)	
Cable Length	
15 ft. integral cable (Rosemount 3300HT) or VP8 Cable for Rosemount 3300HTVP (sold separately)	

Table 1-3: Rosemount 3400HT/3400HTVP sensor specifications

Measured Range	
pH range	0 to 14 pH
ORP range	-1500 mV to 1500 mV
Operating Temperature	
Without Preamplifier	41 to 311 °F (5 to 155 °C)
With Preamplifier	up to 293 °F (145 °C)
Storage Temperature	
14 to 138 °F (-10 to 70 °C)	
Maximum Process Pressure	
400 psig (2859 kPa [abs])	
CRN Rating: 200 psig at room temperature	
Wetted Materials	
Titanium, Ryton, Teflon, Glass, and User Specified O-ring Material (EPDM, Viton or Kalrez)	
Reference Electrode	
Double junction with replaceable process side electrolyte and Teflon junction	
Temperature Sensor	
Pt-100 RTD	
Process Connections	
Must use 1 in. compression process connector (P/N 23166-00 or 23166-01)	
Can be inserted through a ball valve	
Weight/Shipping Weight	
21 inch Sensor	2 lbs/3 lbs (0.9 kg/1.4 kg)
36 inch Sensor	3 lbs/4 lbs (1.4 kg/1.8 kg)

Table 1-4: Rosemount 3500P/3500VP sensor specifications

Measured Range	
pH range	0 to 14 pH
ORP range	-1500 mV to 1500 mV
Operating Temperature	
41 to 248 °F (5 to 120 °C)	
Storage Temperature	
14 to 122 °F (-10 to 50 °C)	
Maximum Process Pressure	
100 psig (790 kPa [abs])	
CRN Rating: 40 psig at room temperature	
Wetted Materials	
Titanium, Ryton, Teflon, Glass, and User Specified O-ring Material (EPDM, Viton or Kalrez)	
Reference Electrode	
Double junction with replaceable process side electrolyte and Teflon junction	
Temperature Sensor	
Pt-100 RTD	
Process Connections	
1in. MNPT Front and Rear facing threads	
Weight/Shipping Weight	
21 inch Sensor	2 lbs/3 lbs (0.9 kg/1.4 kg)

1.2 Product Certifications

Please see online certificates for further details.

IECEx

Sensors without preamp – Ex ia IIC T4 Ga (-20 °C ≤ Ta ≤ +60°C)

Sensors with SMART preamp (pH only) – Ex ia IIC T4 Ga (-20°C ≤ Ta ≤ +60°C)

Sensors with standard preamp (ORP only) – Ex ia IIC T4 Ga (-20°C ≤ Ta ≤ +80°C) or Ex ia IIC T5 Ga (-20°C ≤ Ta ≤ +40°C)

Per standards IEC60079-0 : 2011, IEC 60079-11 : 2011

ATEX

Sensors without preamp – Ⓔx II 1 G Ex ia IIC T4 Ga (-20˚C ≤ Ta ≤ +60˚C)

Sensors with SMART preamp (pH only) – Ⓔx II 1 G Ex ia IIC T4 Ga (-20˚C ≤ Ta ≤ +60˚C)

Sensors with standard preamp (ORP only) – Ⓔx II 1 G Ex ia IIC T4 Ga (-20˚C ≤ Ta ≤ +80˚C) or Ⓔx II 1 G Ex ia IIC T5 Ga (-20˚C ≤ Ta ≤ +40˚C)

Per standards EN 60079-0: 2012+A11:2013, EN 60079-11:2012

FM

See online FM Certificate of Compliance for applicable sensor options:

Intrinsically Safe for use in Class I, II, and III, Division 1, Groups A, B, C, D, E, F, and G; Temperature Class T6 Ta = -20˚C to +60˚C

Intrinsically Safe for use in Class I, Zone 0, AEx ia IIC T6 Ta = -20˚C to +60˚C

Nonincendive for use in Class I, Division 2, Groups A, B, C, and D; Temperature Class T6 Ta = -20˚C to +60˚C

Suitable for use in Class II and III, Division 2, Groups E, F, and G; Temperature Class T6 Ta = -20˚C to +60˚C Hazardous (Classified) Locations

IS/I,II,III/1/ABCDEFG/T6 Ta = 60°C - 1400332; Entity; I/0/AEx ia IIC/T6 Ta = 60°C - 1400332; Entity; NI/I/2/ABCD/T6 Ta = 60°C; S/II,III/2/EFG/T6 Ta = 60°C

Per standards 3600:1998, 3610:2010, 3611:2004, 3810:2005

CSA

See online CSA Certificate of Compliance for applicable sensor options:

Sensors with preamp – Intrinsically Safe:

Class I, Division 1, Groups ABCD; Class II, Division 1, Groups EFG; Class III; Class I, Division 2, Groups ABCD; Ambient temperature rating -20˚C to +60˚C; Ex ia IIC; T6

Sensors without preamp – Intrinsically Safe and Non-Incendive:

Class I, Division 1, Groups ABCD; Class II, Division 1, Groups EFG; Class III; Class I, Division 2, Groups ABCD; Ex ia IIC; T6; Ambient temperature rating -20˚C to +60˚C: (Simple Apparatus)

Per standards C22.2 No. 0-10, C22.2 No. 0.4-M2004, C22.2 No. 94-M1991, C22.2 No. 142 – M1987, C22.2 No 157 – M1992, CAN/CSA E60079-0:07, CAN/CSA E60079 - 11:02, UL50 11th Ed, UL508 17th Ed, UL913 7th Ed, UL 60079-0: 2005, UL 60079-11: 2002

1.3 Ordering Information

Table 1-5: Rosemount 3300HT sensor ordering information

Model	Sensor type
3300HT	pH/ORP Sensor
Measuring Electrode	
10	pH - GPHT Glass
12	ORP
O-ring Material	
30	EPDM
31	Viton
32	Kalrez
Typical Model Number: 3300HT-10-30	

Table 1-6: Rosemount 3300HTVP sensor ordering information

Model	Sensor type
3300HTVP	pH/ORP Sensor
Measuring Electrode	
10	pH - GPHT Glass
12	ORP
O-ring Material	
30	EPDM
31	Viton
32	Kalrez
Preamplifier Option	
_	No selection
70	SMART Preamplifier (1)
Typical Model Number: 3300HTVP-10-30-70	

1. *Only available if selected with option 10.*

Table 1-7: Rosemount 3400HT sensor ordering information

Model	Sensor type
3300HTVP	pH/ORP Sensor
Measuring Electrode	
10	pH - GPHT Glass
12	ORP
Sensor Length	
21	21 in. Titanium Tube
22	36 in. Titanium Tube
O-ring Material	
30	EPDM
31	Viton
32	Kalrez
Cable Length	
61	9.5 in. cable without BNC (1)
62	15 ft. cable without BNC (2)
Typical Model Number: 3400HT-10-21-30-62	

1. *For use with sensor head junction boxes.*
2. *For wiring directly to transmitter or junction box.*

Table 1-7: Rosemount 3400HTVP sensor ordering information

Model	Sensor type
3400HT	pH/ORP Sensor
Measuring Electrode	
10	pH - GPHT Glass
12	ORP
Sensor Length	
21	21 in. Titanium Tube
22	36 in. Titanium Tube
O-ring Material	
30	EPDM
31	Viton
32	Kalrez
Preamplifier Option	
_	No Selection
70	SMART Preamplifier (1)
Typical Model Number: 3400HTVP-10-21-30-70	

1. *Only available if selected with option 10.*

Table 1-7: Rosemount 3500P sensor ordering information

Model	Sensor type
3500P	pH/ORP Sensor
Electrolyte Selection	
BF	Bio-Film Resistant
HT	High Temperature
MR	Metal Resistant
OR	Oil Resistant
PR	Poisoning Resistant
SR	Scaling Resistant
Preamplifier/Cable	
01	Preamplifier with 25 ft. (1)
02	No Preamplifier with 15 ft. Cable
Measuring Electrode Type	
10	pH – GPHT Glass
12	ORP
Reference Type	
21	Double Junction Reference
O-ring Material	
30	EPDM
31	Viton
32	Kalrez
Typical Model Number: 3500P-HT-01-10-21-30	

1. *Preamplifier is SMART if selected with option 10. Preamplifier is standard if selected with option 12.*

Table 1-7: Rosemount 3500VP sensor ordering information

Model	Sensor type
3500VP	pH/ORP Sensor
Electrolyte Selection	
BF	Bio-Film Resistant
HT	High Temperature
MR	Metal Resistant
OR	Oil Resistant
PR	Poisoning Resistant
SR	Scaling Resistant
Preamplifier/Cable	
01	Preamplifier (1)
02	No Preamplifier
Measuring Electrode Type	
10	pH – GPHT Glass
12	ORP
Reference Type	
21	Double Junction Reference
O-ring Material	
30	EPDM
31	Viton
32	Kalrez
Typical Model Number: 3500VP-HT-01-10-21-30	

1. *Preamplifier is SMART if selected with option 10. Preamplifier is standard if selected with option 12.*

Section 2: Installation

2.1 Storage

1. It is recommended that electrodes be stored in their original shipping containers until needed.
2. Do not store Rosemount 3500P at temperatures below 14 °F (-10 °C). Rosemount 3300HT, 3300HTVP, 3400HT, and 3400HTVP below 23 °F (-5 °C).
3. Electrodes should be stored with a protective cap containing KCl solution.
4. For overnight storage, immerse the sensor in tap water or 4 pH buffer solution.
5. A pH glass electrode has a limited shelf life of one year.

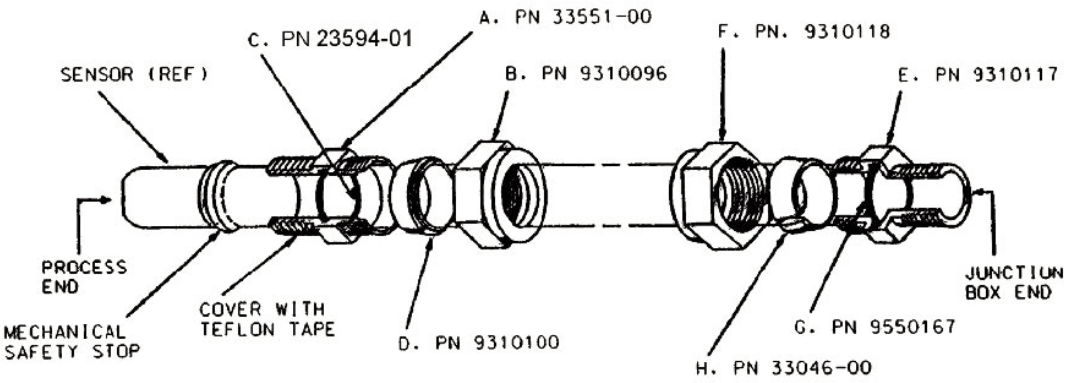
2.2 Installation

For sensor dimensions, see Figure 2-1 to Figure 2-3.

For sensor orientation and installation, see Figure 2-4 to Figure 2-13.

For wiring, see Figure 2-14 to Figure 2-17.

Figure 2-1: Example of sensor tube replacement



PROCESS END (A.B.C. & D SOLD TOGETHER AS
SST. PROCESS CONNECTOR KIT PN 23166-00 OR
TITANIUM PROCESS CONNECTOR KIT PN23166-01)

A. MALE CONNECTOR BODY
B. HEX NUT
C. O-RING
D. TEFLON FERRULE (SST. FERRULE AVAILABLE AS PN 9310094)

JUNCTION BOX END (E. F. G. & H SOLD TOGETHER AS
SENSOR HEAD JUNCTION BOX FITTING KIT PN 23472-00)

E. MALE CONNECTOR BODY
F. HEX NUT
G. O-RING
H. SST. SPLIT FERRULE

Figure 2-2: Rosemount 3300HT and 3300HTVP sensor dimensional drawing

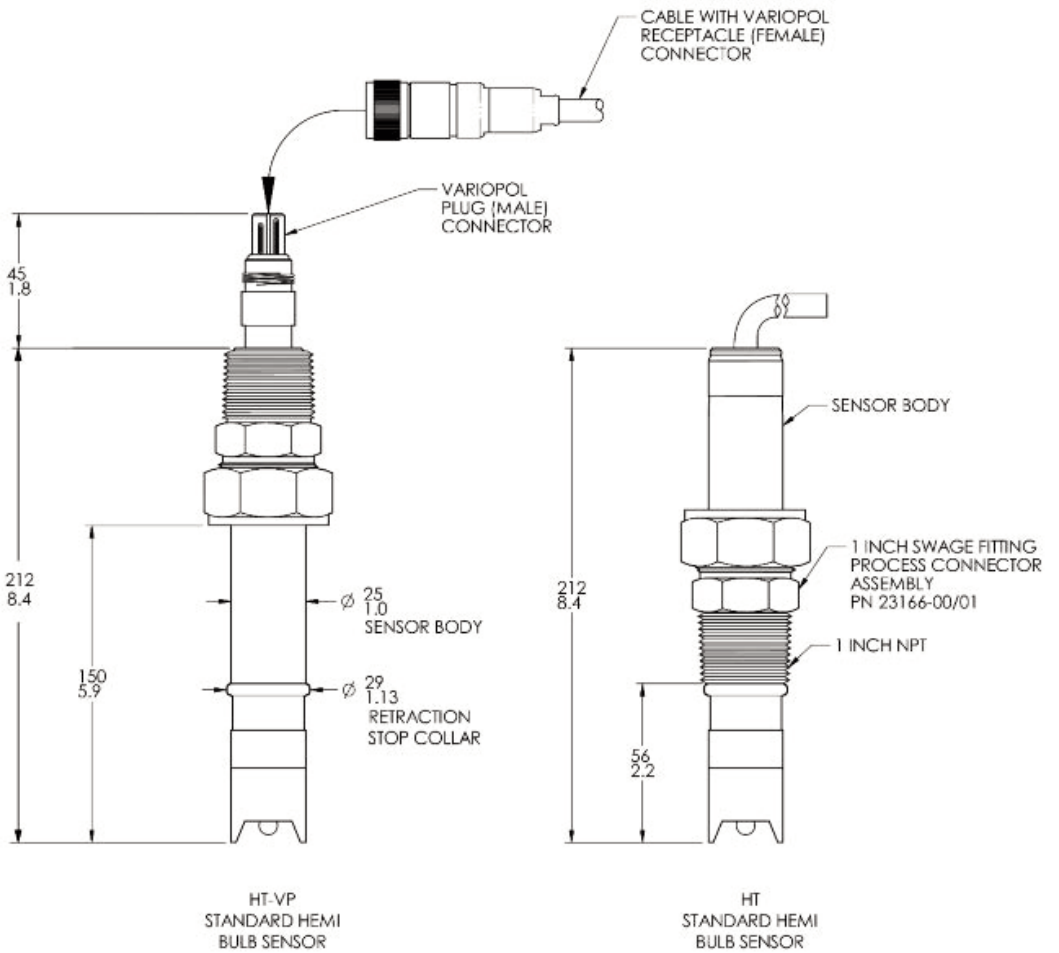


Figure 2-3: Rosemount 3400HT and 3400HTVP sensor dimensions with optional Ball Valve PN 23240-00

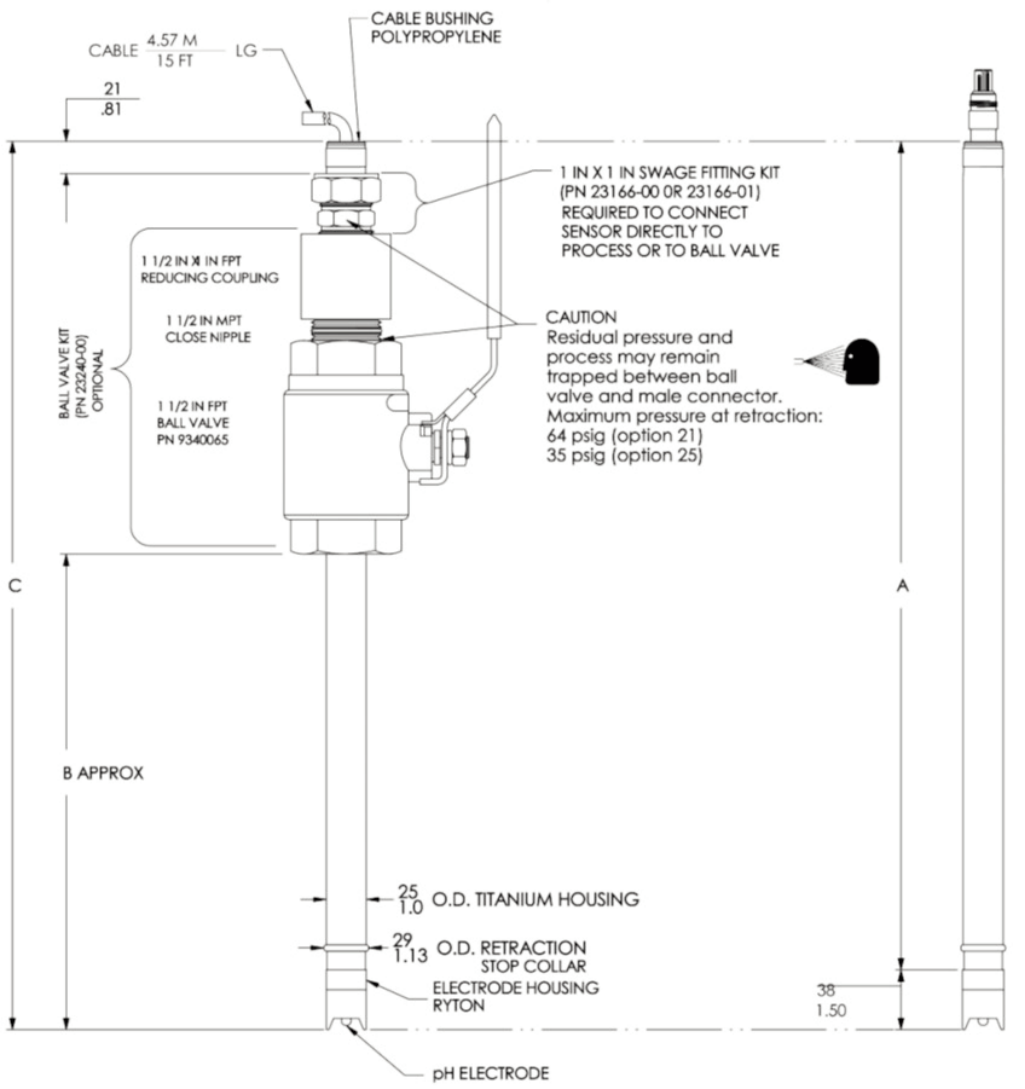


Figure 2-4: Rosemount 3400HT and 3400HTVP sensor dimensions with optional Ball Valve PN 23765-00

A	B	
IN / MM	IN / MM	OPTION
21.6/549	12.2/310	21
36.1/917	26.7/678	25

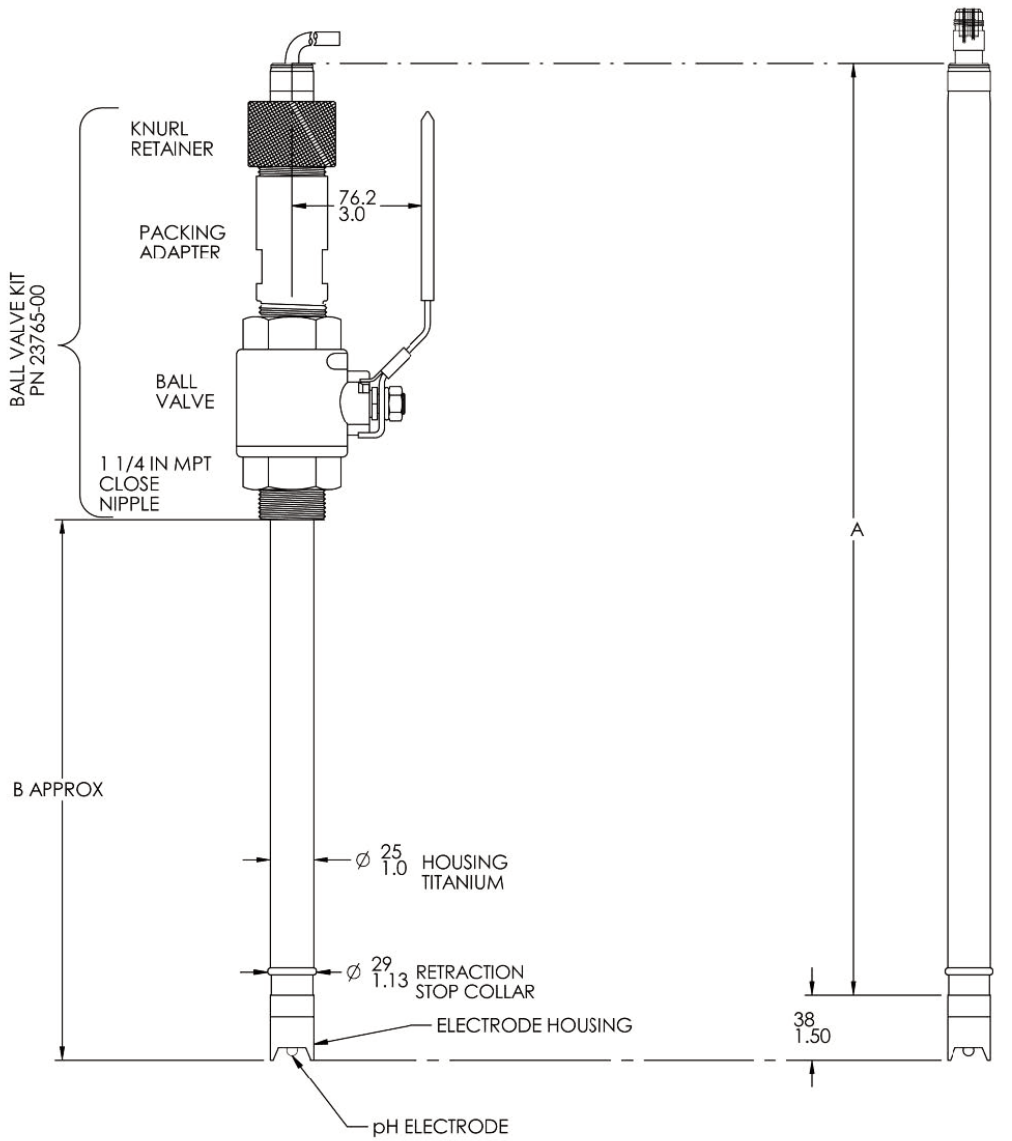
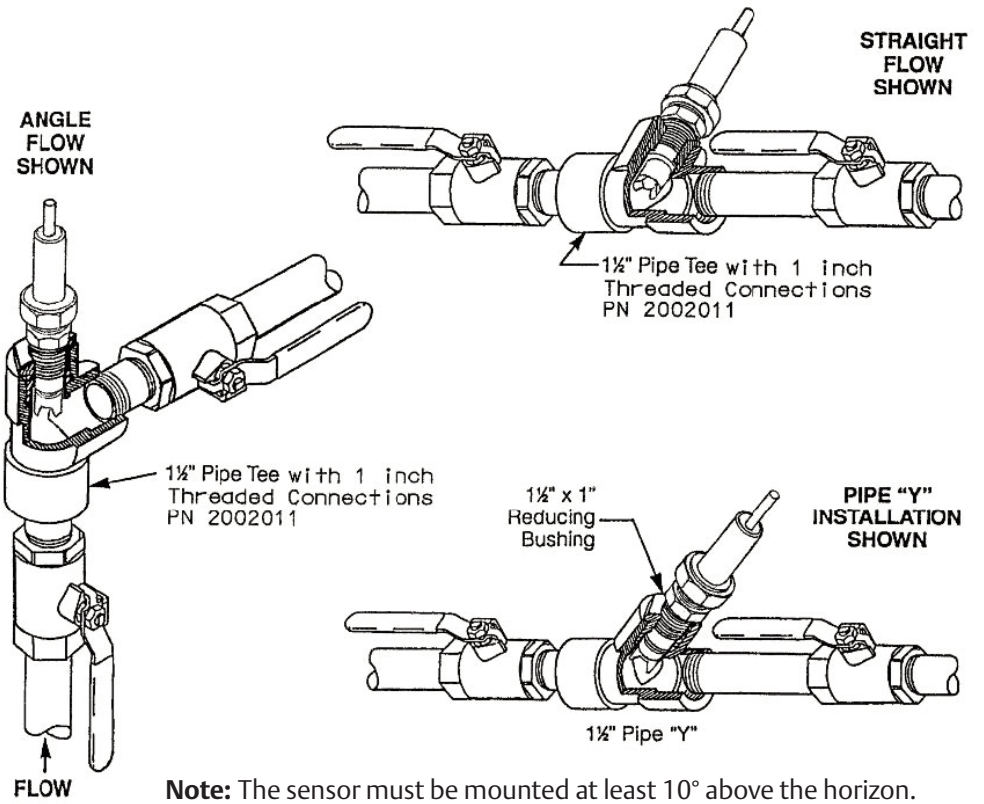


Figure 2-5: Rosemount 3300HT and 3300HTVP flow through and insertion installation. 1½ in. pipe Tee (PN 2002011) with 1 in. threaded connections.



Note: The sensor must be mounted at least 10° above the horizon.

Figure 2-6: Rosemount 3500P and 3500VP sensor dimensional drawing

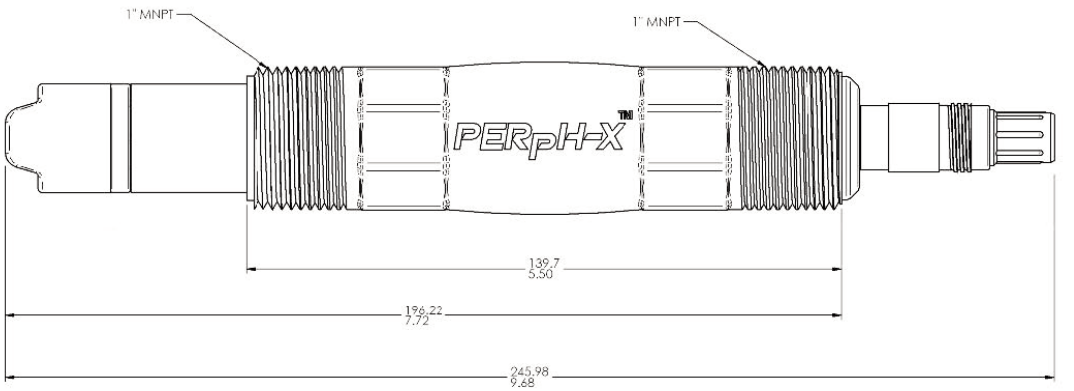
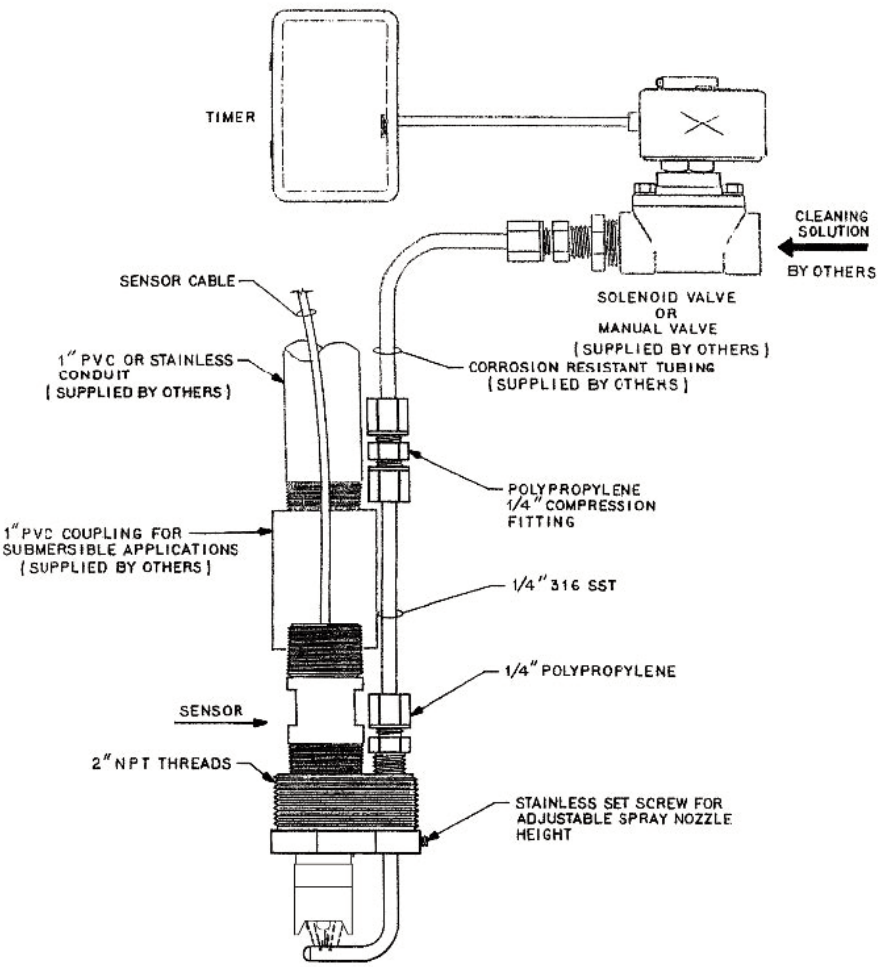


Figure 2-7: Rosemount 3500P AND 3500VP Jet Spray Cleaner (PN 12707-00) for Submersion Installation.



This accessory is especially useful for keeping the sensor clean in dirty ponds or tanks. It can be mounted using the Handrail Mounting Assembly or a similar submersion accessory.

Figure 2-8: Rosemount 3500P and 3500VP flow through installation

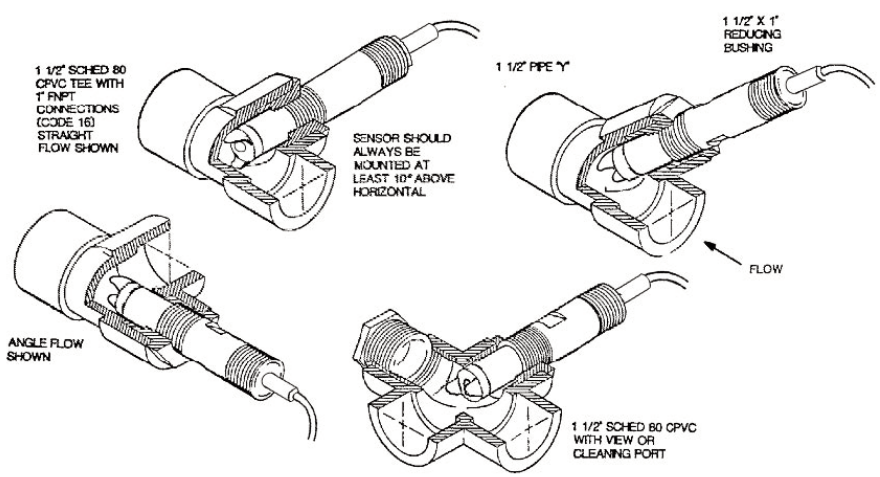
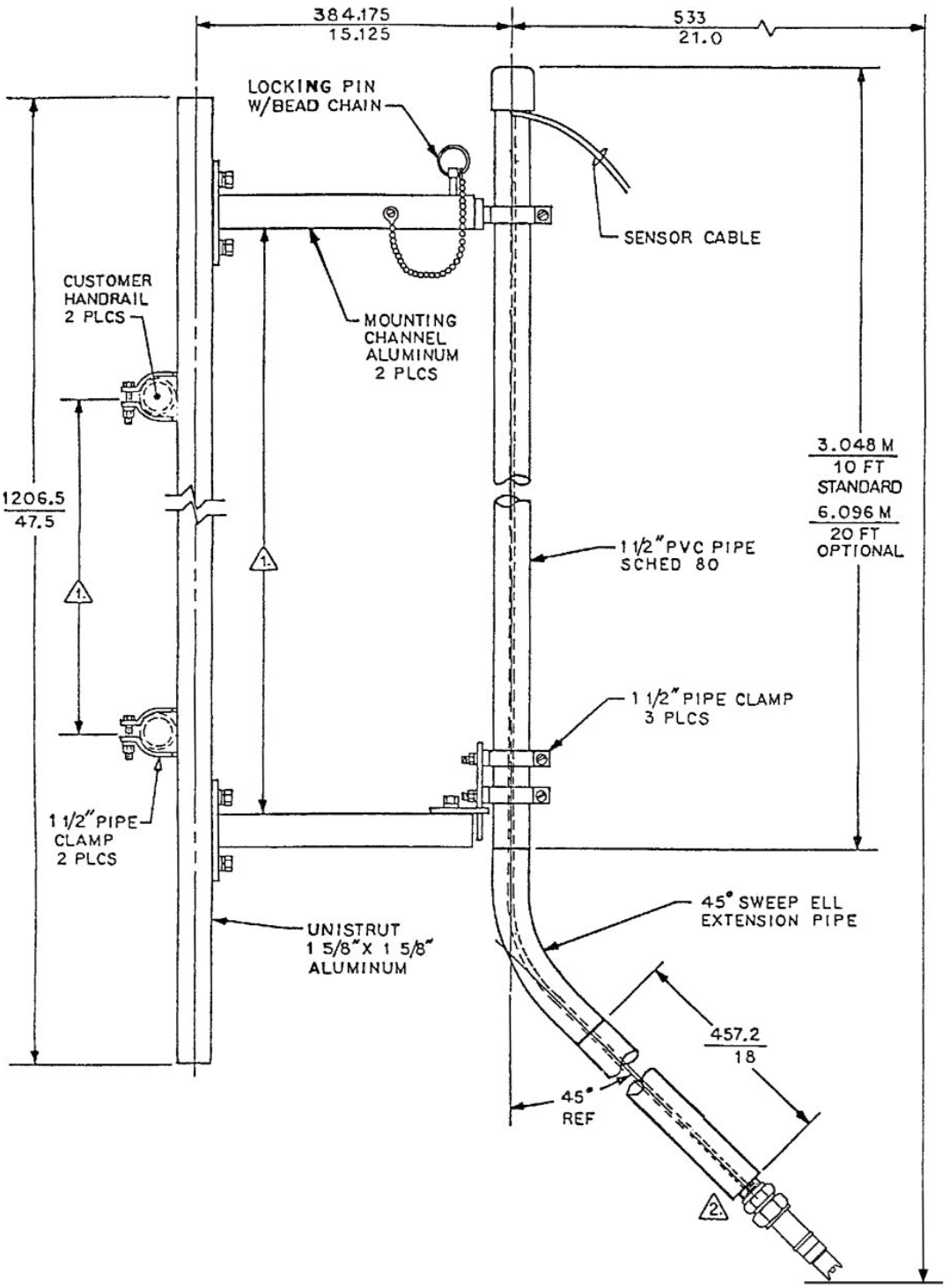


Figure 2-9: Rosemount 3500P or 3500VP for Submersion Installation using the Handrail Mounting Assembly (PN 11275-01)



All parts shown are supplied. Sensor sold separately.

Figure 2-10: Rosemount 3400HT and 3400HTVP mounting details – retraction version

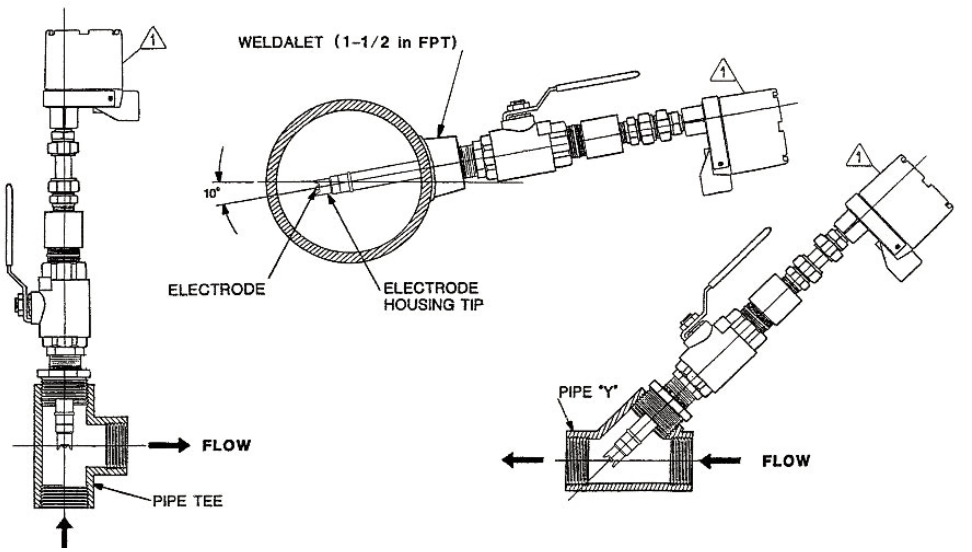
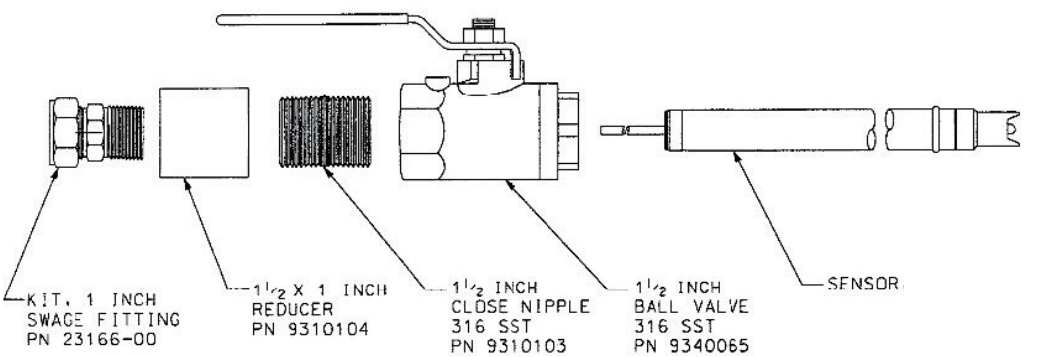


Figure 2-11: Exploded view of 1½ in. ball valve kit PN 23240-00 used with process connector PN 23166-00 (or PN 23166-01).



Ball valve kit includes 11/2" x 1" reducer, 11/2" close nipple, and 11/2" ball valve.

Figure 2-12: Exploded view of 1¼ in. ball valve kit (PN 23765-00)

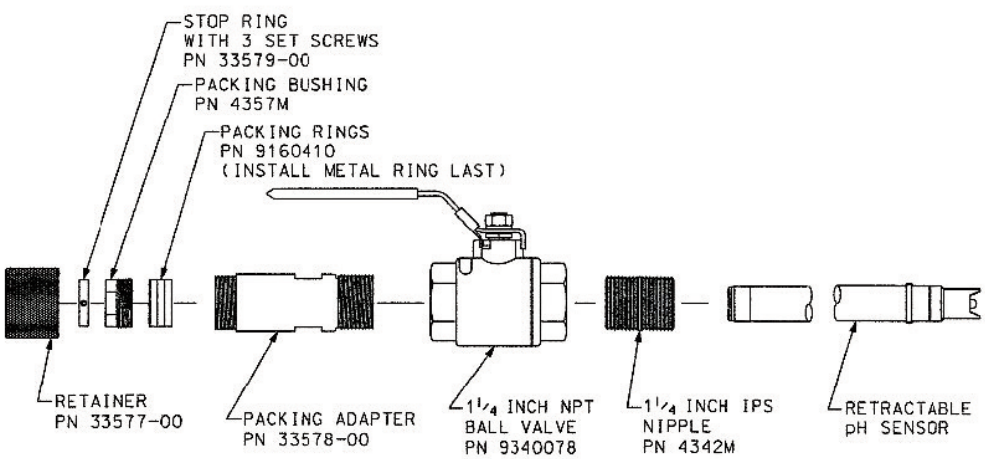
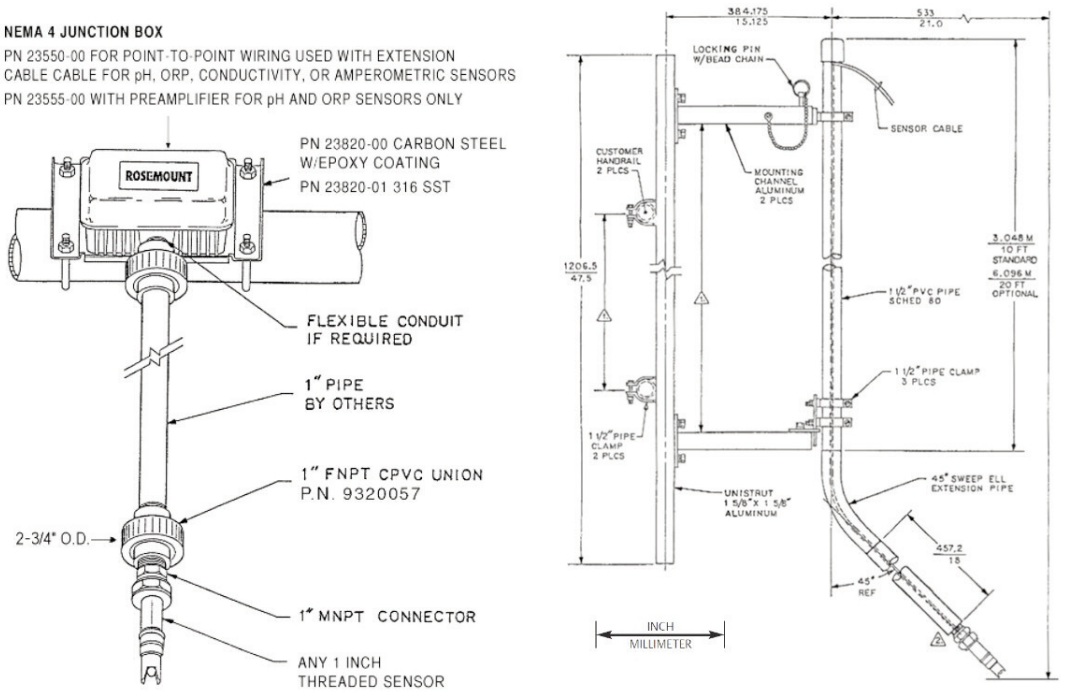


Figure 2-13: Rosemount 3300HT or 3300HTVP typical submersion installation



2.3 Retraction with Kit P/N 23240-00

WARNING

System pressure may cause the sensor to blow out with great force unless care is taken during removal.

2.3.1 Rosemount 3400HT/3400HTVP-21 (21 in. Tube)

Be certain system pressure at the sensor is below 64 psig (542 kPa) before proceeding with the retraction. It is also recommended that the personnel wear a face shield and have a stable footing. Refer to Figure 2-1. Push in on the sensor end or the top of the J-box and slowly loosen the hex nut (B) of the process end male connector (A).

2.3.2 Rosemount 3400HT/3400HTVP-25 (36 in. Tube)

1. Be certain that pressure at the sensor is below 35 psig (343 KPa) before proceeding with the retraction. It is also recommended that the personnel wear a face shield and have a stable footing. Refer to Figure 2-1. Push in on the sensor end or the top of the J-box and slowly loosen the hex nut (B) of the process end male connector (A).

CAUTION

Do not remove nut at this time.

2. When the hex nut is loose enough, slowly ease the sensor back completely until the retraction stop collar is reached.

NOTICE

Failure to withdraw the sensor completely may result in damage to the sensor when the valve is closed.

3. Close the ball valve slowly. If there is resistance, the valve may be hitting the sensor. Double check that the sensor has been retracted to the retraction stop collar.

WARNING

Before removing the sensor from the ball valve, be absolutely certain that the ball valve is fully closed. Leakage from the male connector threads may indicate that the male connector is still under pressure. Leakage through a partially open valve could be hazardous, however with the ball valve closed, some residual process fluid may leak from the connector's pipe threads.

4. The male connector body (A) may now be completely unthreaded from the reducing coupling and the sensor removed for servicing.

NOTICE

If the male connector leaks during insertion or retraction, replace the O-ring (PN 23594-01) in the male connector A.

2.4 Electrical Installation

For additional wiring information on this product, including sensor combinations not shown here, please refer to Transmitter Wiring Diagrams.

Figure 2-14: PERpH-X sensors, preamplifier in instrument

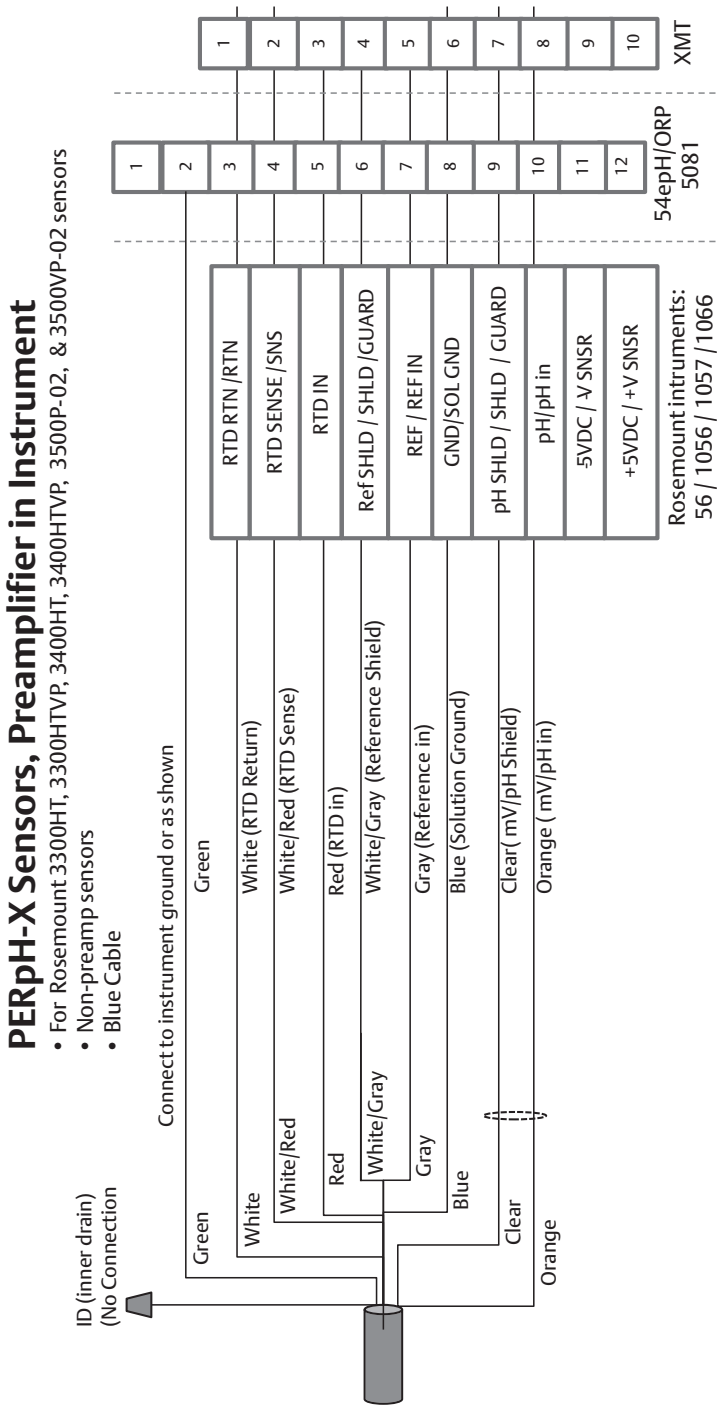


Figure 2-15: PERpH-X sensors, preamplifier in junction box

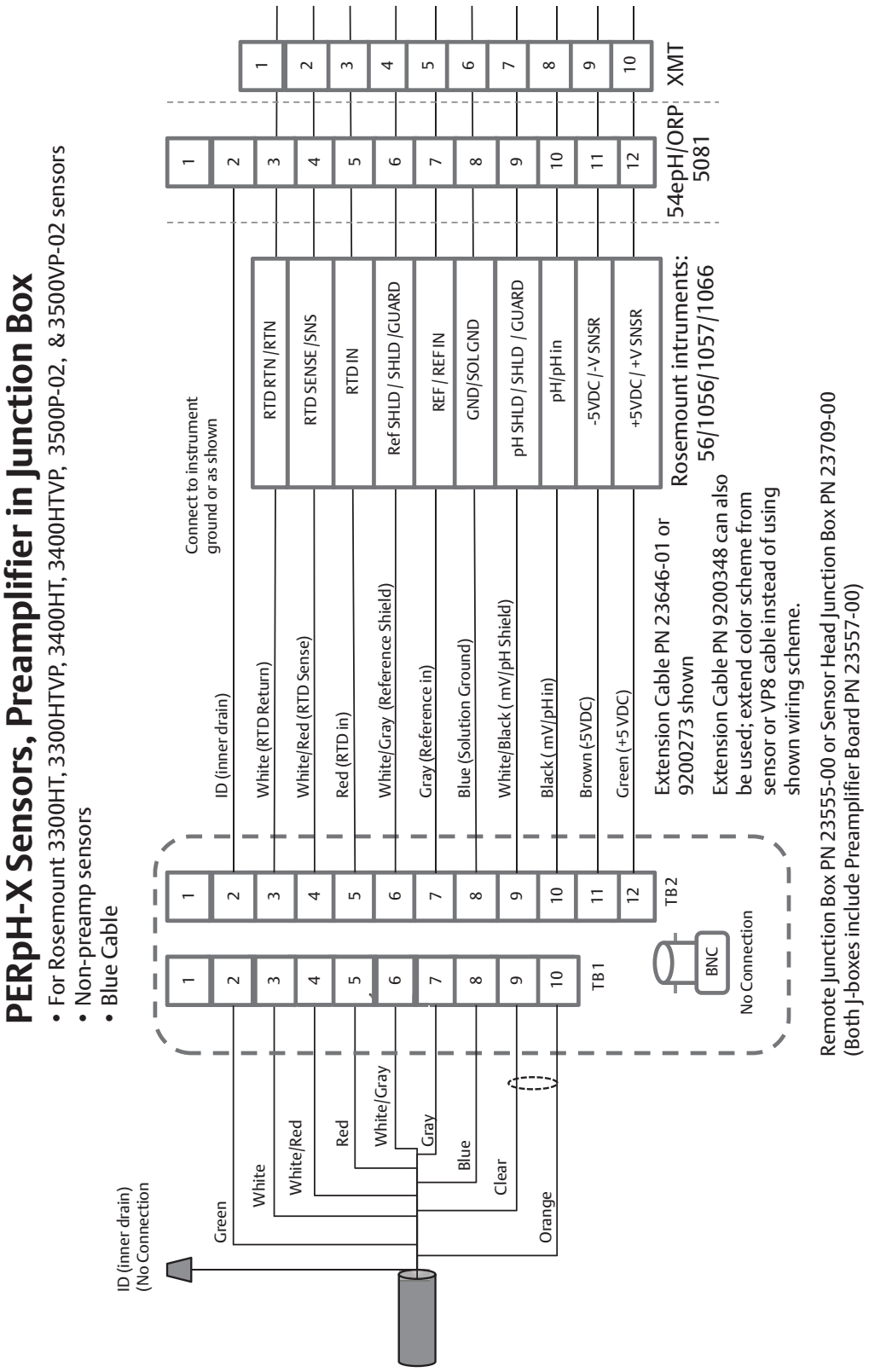


Figure 2-16: PERpH-X sensors, preamplifier in sensor

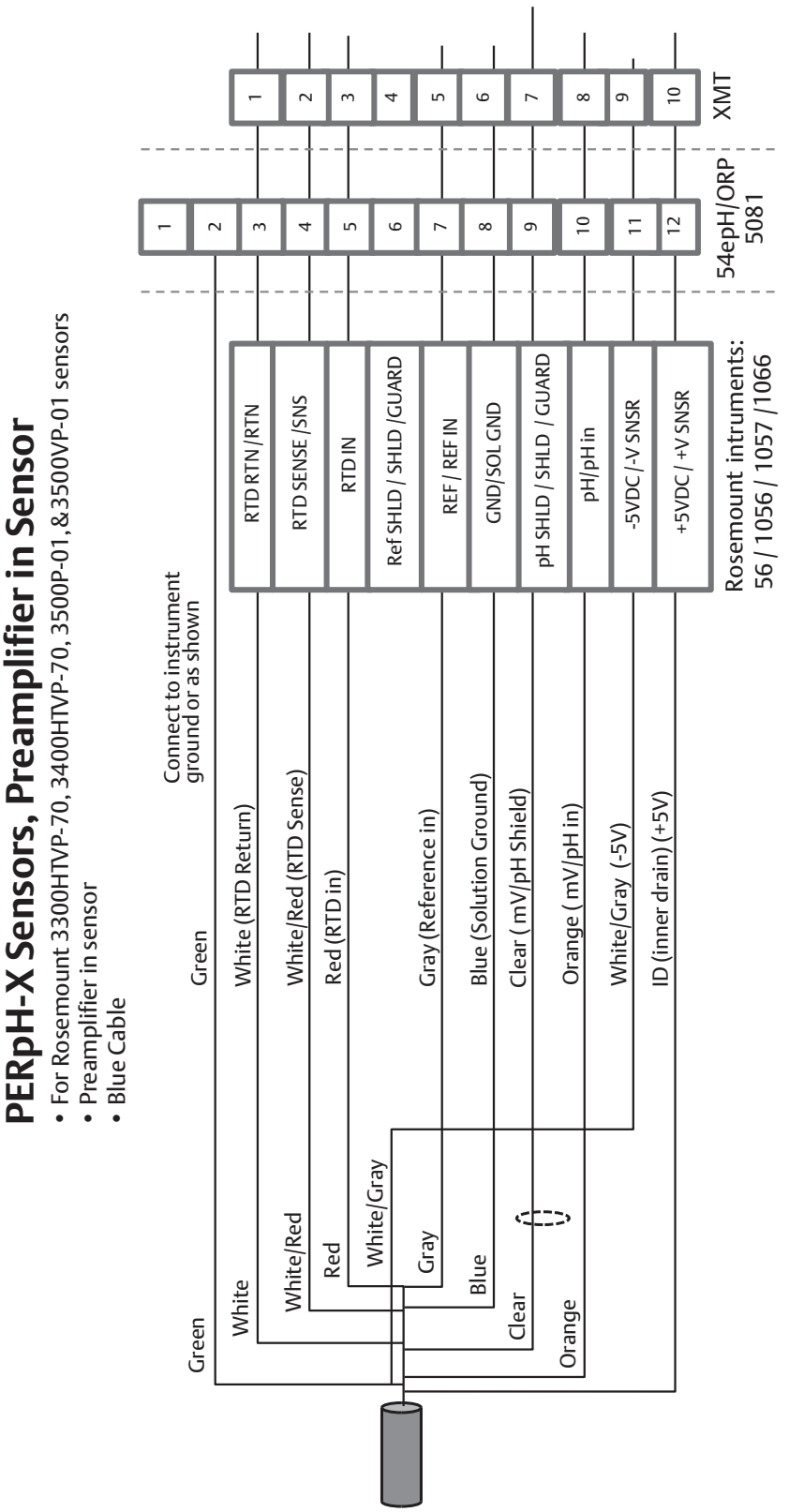
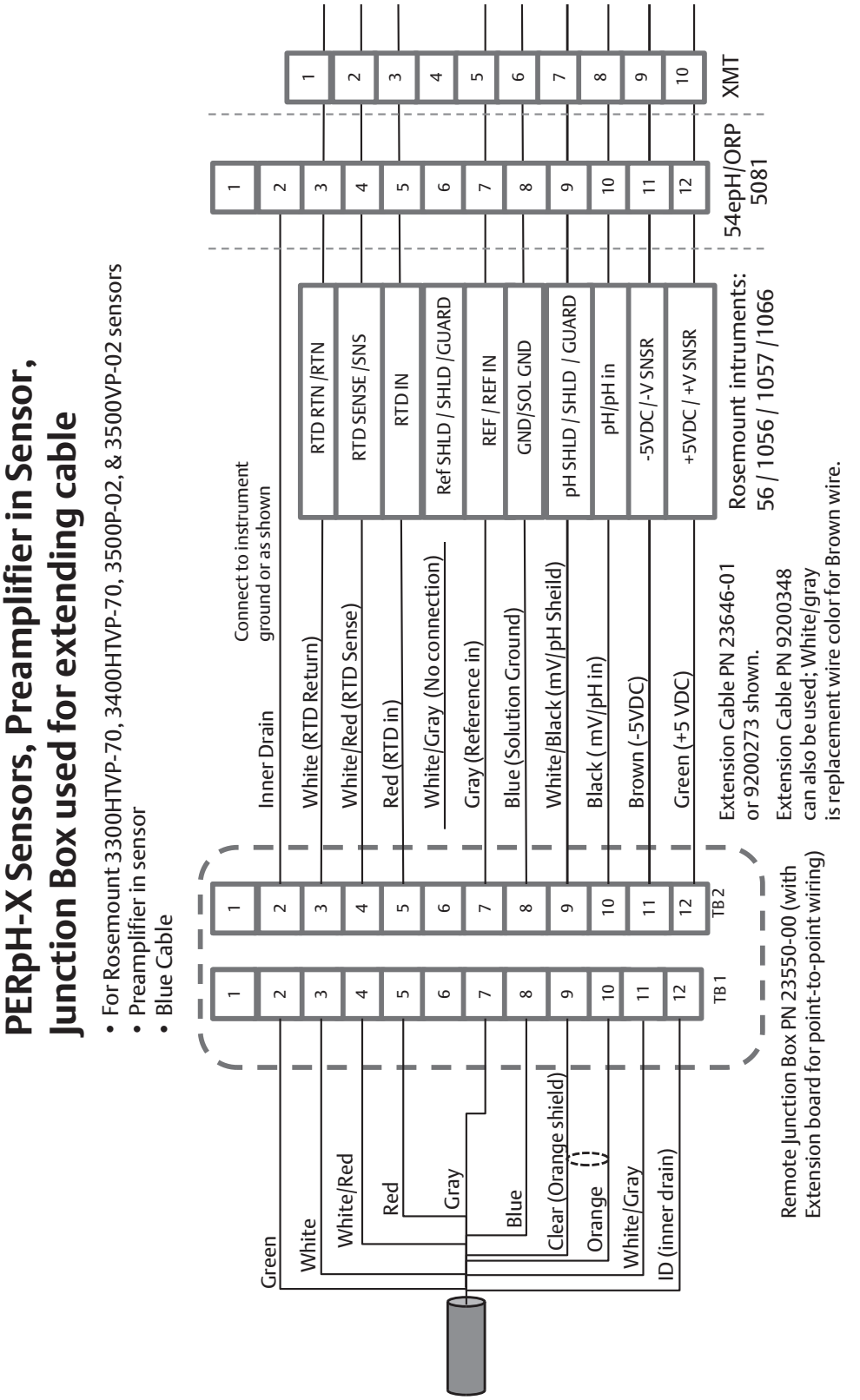


Figure 2-17: PERpH-X sensors, preamplifier in sensor – junction box used for extending cable



Section 3: Startup and Calibration

3.1 Electrode Preparation

1. Remove electrode from shipping container.
2. Remove the protective boot covering the electrode bulb.
3. Rinse away salt film with clean water, then gently shake the electrode so that the internal solution fills the bulb, thus removing any air trapped there.

⚠ CAUTION

The buffer in the protective boot may cause skin or eye irritation.

3.2 pH Sensor Calibration

3.2.1 Two Point pH Buffer Calibration

Select two stable buffer solutions, preferably pH 4.0 and 7.0 (pH buffers other than pH 4.0 and pH 7.0 can be used as long as the pH values are at least two pH units apart).

Note: A pH 7 buffer solution reads a mV value of approx. zero, and pH buffers read approximately ± 59.1 mV for each pH unit above or below pH 7. Check the pH buffer manufacturer specifications for millivolt values at various temperatures since it may affect the actual value of the buffer solution mV/pH value.

1. Immerse the sensor in buffer solution. The buffer solution must contact the metal housing of the sensor which acts as the solution ground contact. Allow sensor to equilibrate to the buffer temperature and wait for reading to stabilize. Value of buffer can now be acknowledged by the transmitter.
2. Once the first buffer has been acknowledged by the transmitter, rinse the buffer solution off of the sensor with distilled or deionized water.
3. Repeat steps 1 and 2 using the second buffer solution.
4. The theoretical slope value, according to the Nernst equation for calculating pH, is approximately 59.17 mV/pH. Over time the sensor will age, both in the process and in storage, and will result in reduced slope values. To ensure accurate readings, it is recommended that the electrode be replaced when the slope value falls below 47 to 49 mV/pH.

3.3 Recommended pH Sensor Standardization

For maximum accuracy, the sensor can be standardized on-line or with a process grab sample after a buffer calibration has been performed and the sensor has been conditioned to the process. Standardization accounts for the sensor junction potential and other interferences. Standardization will not change the sensor's slope but will simply adjust the analyzer's reading to match that of the known process pH.

Section 4: Maintenance

4.1 Electrode Cleaning

Electrodes should respond rapidly. Sluggishness, offsets, and erratic readings are indicators that the electrodes may need cleaning or replacement.

1. To remove oil deposit, clean the electrode with a mild non-abrasive detergent.
2. To remove scale deposits, soak electrodes for 30 to 60 minutes in a 5% hydrochloric acid solution.

4.2 Reference Junction Replacement and Sensor Electrolyte Recharge

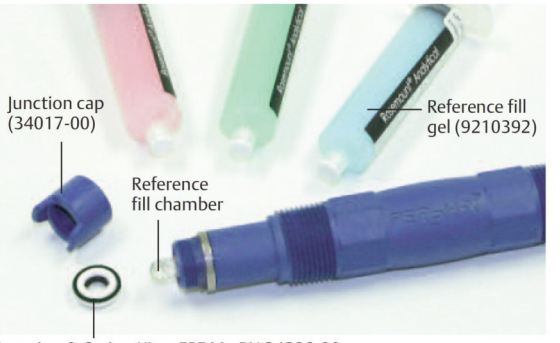
The reference junction and reference fill gelled solution is replaceable to facilitate longer sensor life due to electrolyte depletion and junction plugging and contamination. Use the junction replacement kit and reference fill gel to accomplish this procedure.

1. Remove the junction cap by turning counter clockwise.
2. Remove the liquid junction by pulling the junction straight out.

⚠ CAUTION

The reference electrolyte may cause skin or eye irritation.

3. Remove the old reference fill gel by rinsing with water.
4. Fill the reference fill chamber with the reference fill gel using the syringe and remove any air bubbles. Top off the reference fill chamber until it is completely filled.
5. Replace the junction O-ring and liquid junction by sliding over the glass electrode. Excess reference gel should flow out.
6. Replace junction cap by turning clockwise. Hand tighten the junction cap only do not use pliers to tighten the cap.
7. Buffer check and calibrate the sensor as described in the previous section.



Junction & O-ring Kits: EPDM - PN 24238-00
Viton - PN 24239-00
Kalrez - PN 24240-00

Section 5: Accessories

5.1 Accessories

Table 5-1: Rosemount 3300HT/3300HTVP/3400HT/3400HTVP/3500P/3500PVP sensors accessories

Part Number	Description
Rosemount 3300HT/3300HTVP/3400HT/3400HTVP Sensors	
23166-00	1 in. MNPT process connector, stainless steel with EPDM O-ring
23166-01	1 in. MNPT process connector, titanium with EPDM O-ring
23796-00 (1)	316 SST retraction kit for use with a 1-¼ in. full port ball valve
9550220	Process connector O-ring, Kalrez, 2-214
23594-01	Process connector O-ring, EPDM, 2-214
23555-00	Remote junction box with preamplifier
2002565	Mounting bracket kit (for remote junction box)
23709-00 (1)	Sensor head junction box with preamplifier
23646-01	Extension cable, 11 conductor, shielded, prepped (for use with junction box)
9200273	Extension cable, 11 conductor, shielded, unprepped (for use with junction box)
Rosemount 3500P/3500VP Sensors	
23555-00	Remote junction box with preamplifier
23646-01	Extension cable, 11 conductor, shielded, prepped (for use with junction box)
9200273	Extension cable, 11 conductor, shielded, unprepped (for use with junction box)
915240-03	PVC flow through Tee, ¾ in. NPT process connection
915240-04	PVC flow through Tee, 1 in. NPT process connection
915240-05	PVC flow through Tee, 1-½ in. NPT process connection
2002011	CPVC flow through Tee, 1-1/2” NPT process connection
11275-01	Handrail mounting assembly
24091-00	Low flow cell, 1 in. NPT adapter
12707-00	Jet spray cleaner
Common Accessories	
24281-00	15 ft. cable with mating VP8 connector
24281-01	25 ft. cable with mating VP8 connector
24281-02	2.5 ft. cable with mating VP8 connector
24281-03	50 ft. cable with mating VP8 connector
24281-04	100 ft. cable with mating VP8 connector
24281-05	4 ft. cable with mating VP8 connector
24281-06	10 ft. cable with mating VP8 connector
24281-07	20 ft. cable with mating VP8 connector
24281-08	30 ft. cable with mating VP8 connector
9210012	Buffer Solution, 4.01 pH, 16 oz
9210013	Buffer Solution, 6.86 pH, 16 oz
9210014	Buffer Solution, 9.18 pH, 16 oz
R508-8OZ	ORP Solution, 475 mV, 8 oz

Part Number	Description
Solution Kits (2)	
24231-00	High temperature solution kit (0 to 145 °C) with EPDM O-rings
24231-01	Bio-film resistant solution kit (0 to 60 °C) with EPDM O-rings
24231-02	Poisoning resistant solution kit (0 to 100 °C) with viton O-rings
24231-03	Oil resistant solution kit (0 to 100 °C) with viton O-rings
24231-04	Scaling resistant solution kit (0 to 100 °C) with EPDM O-rings
24231-05	Metals resistant solution kit (0 to 145 °C) with EPDM O-rings
Reference Junction Kits (3)	
24238-00	High temperature porous teflon liquid junction (EPDM O-rings)
24239-00	High temperature porous teflon liquid junction (Viton O-rings)
24240-00	High temperature porous teflon liquid junction (Kalrez O-rings)
24238-01	Bio-film resistant porous teflon liquid junction (EPDM O-rings)
24238-02	Poisoning resistant porous teflon liquid junction (Viton O-rings)
24238-03	Oil resistant porous teflon liquid junction (Viton O-rings)
24238-04	Scaling resistant porous teflon liquid junction (EPDM O-rings)
24238-05	Metals resistant porous teflon liquid junction (EPDM O-rings)
Refill Kits (4)	
9210392	High temperature refill kit (0 to 145 °C)
9210426	Bio-film resistant refill kit (0 to 60 °C)
9210425	Poisoning resistant refill kit (0 to 100 °C)
9210423	Oil resistant refill kit (0 to 100 °C)
9210424	Scaling resistant refill kit (0 to 100 °C)
9210422	Metals resistant refill kit (0 to 145 °C)
Replacement O-rings for Teflon Junction	
24250-00	Viton O-ring kit
24251-00	Kalrez O-ring kit
24270-00	EPDM O-ring kit

1. *For 21 in. and 36 in. extended length sensors only.*
2. *Solution kits contain one Teflon junction, replacement O-rings, and a syringe with reference electrolyte.*
3. *Reference junction kits include one Teflon junction and listed O-rings.*
4. *Refill kits include one syringe with 30 cc of electrolyte refill. (Approximately 4 to 5 refills per syringe).*

EC Declaration of Conformity

Note: Please see website for most recent Declaration.

EMERSON

EU Declaration of Conformity

(No. 1700911)

CE

pH/ORP Sensors

This declaration is issued under the sole responsibility of the manufacturer:
Rosemount Inc., 8200 Market Blvd., Chanhassen, MN 55317 USA
The sensor models:

328A, 385, 385+ -04, 385+ -02/03, 385+-03-12, 389-01, 389-01-10/11-50, 389-01-10/11-54, 389-01-12-50, 389-01-12-54, 389-01-12-55, 389-02, 389VP, 389VP-70, 396, 396P-01-10/13-50, 396P-01-10/13-54, 396P-01-12-50, 396P-01-12-54, 396P-01-12-55, 396P-01-55, 396VP, 396VP-70, 396R, 396RVP, 396RVP-70, 396P-02, 396PVP, 396PVP-70, 397, 398, 398VP, 398R, 398RVP, 398RVP-70, 3200HP, 3300HT, 3300HT VP, 3300HTVP-70, 3400HT, 3400HT VP, 3400HTVP-70, 3500P-01, 3500P-01-12, 3500P-02, 3500VP-01, 3500VP-01-12, 3500VP-02, 3800, 3800VP, 3900-01, 3900-02, 3900VP-01, 3900VP-02

to which this declaration relates, are in conformity with relevant Union harmonization legislation:
(2014/34/EU) ATEX Directive
Intrinsically Safe, Examination Certificate: Baseefa10ATEX0156X
Provisions of the directive fulfilled by the equipment:
Equipment Group II, Category 1 G Ex ia IIC T4 Ga (-20°C ≤ Ta ≤ +60°C) exceptions noted below

Model 328A Steam sterilizable pH sensor with integral cable
Model 385 Retractable pH/ORP sensor with integral cable
Model 385+ -04 pH/ORP sensor with integral cable
Model 385+ -02/03 pH/ORP sensor with integral cable & Smart preamplifier
Model 385+ -03-12 ORP sensor with integral cable & preamplifier: T4 (-20°C ≤ Ta ≤ +80°C), T5 (-20°C ≤ Ta ≤ +40°C)
Model 389-01 pH sensor with integral cable & Smart preamplifier
Model 389-01-10/11-50 pH sensor with integral cable & preamplifier: T4 (-20°C ≤ Ta ≤ +80°C) or T5 (-20°C ≤ Ta ≤ +40°C)
Model 389-01-10/11-54 pH sensor with integral cable & preamplifier: T4 (-20°C ≤ Ta ≤ +80°C) or T5 (-20°C ≤ Ta ≤ +40°C)
Model 389-01-12-50 ORP sensor with integral cable & preamplifier: T4 (-20°C ≤ Ta ≤ +80°C)
Model 389-01-12-54 ORP sensor with integral cable & preamplifier: T4 (-20°C ≤ Ta ≤ +80°C)
Model 389-01-12-55 ORP sensor with integral cable & preamplifier: T4 (-20°C ≤ Ta ≤ +80°C)
Model 389-02 pH/ORP sensor with integral cable
Model 389VP-70 pH sensor with Variopol connector & Smart preamplifier
Model 389VP pH/ORP sensor with Variopol connector
Model 396 TUpH sensor with integral cable
Model 396P-01-10/13-50 polypropylene pH sensor with integral cable & preamp: T4 (-20°C ≤ Ta ≤ 80°C) or T5 (-20°C ≤ Ta ≤ 40°C)
Model 396P-01-10/13-54 polypropylene pH sensor with integral cable & preamp: T4 (-20°C ≤ Ta ≤ 80°C) or T5 (-20°C ≤ Ta ≤ 40°C)
Model 396P-01-12-50 ORP sensor with integral cable & preamp: T4 (-20°C ≤ Ta ≤ +80°C)
Model 396P-01-12-54 ORP sensor with integral cable & preamp: T4 (-20°C ≤ Ta ≤ +80°C)
Model 396P-01-12-55 ORP sensor with integral cable & preamp: T4 (-20°C ≤ Ta ≤ +80°C)
Model 396P-01-55 pH sensor with integral cable & Smart preamp
Model 396VP TUpH sensor with Variopol connector
Model 396VP-70 TUpH sensor with Variopol connector & Smart preamplifier
Model 396R TUpH Retractable pH/ORPsensor with integral cable
Model 396RVP TUpH Retractable pH/ORP sensor with Variopole connector
Model 396RVP-70 TUpH Retractable pH sensor with Variopole connector & Smart preamplifier
Model 396P-02 TUpH Polypropylene pH/ORP sensor with integral cable
Model 396PVP TUpH Polypropylene pH/ORP sensor with Variopole connector
Model 396PVP-70 TUpH Polypropylene pH sensor with Variopole connector & Smart preamplifier
Model 397 TUpH sensor with integral cable
Model 398 TUpH pH/ORP sensor with integral cable
Model 398VP TUpH pH/ORP sensor with Variopole connector
Model 398R TUpH Retractable pH/ORP sensor with integral cable
Model 398RVP TUpH Retractable pH/ORP sensor with Variopole connector
Model 398RVP-70 TUpH Retractable pH sensor with Variopole connector & Smart preamplifier
Model 3200HP Flowing junction pH sensor with Variopole connector
Model 3300HT Insertion/submersion pH sensor with integral cable
Model 3300HTVP Insertion/submersion pH sensor with Variopole connector
Model 3300HTVP-70 Insertion/submersion pH sensor with Variopole connector & Smart preamplifier
Model 3400HT Retractable pH sensor with integral cable
Model 3400HTVP Retractable pH sensor with Variopole connector
Model 3400HTVP-70 Retractable pH sensor with Variopole connector & Smart preamplifier
Model 3500P-01 High performance pH sensor with integral cable & Smart preamplifier
Model 3500P-01-12 PerpH-X ORP sensor with integral cable & preamplifier: T4 (-20°C ≤ Ta ≤ +80°C)
Model 3500P-02 High performance pH sensor with integral cable
Model 3500VP-01 High performance pH sensor with Variopole connector & Smart preamplifier
Model 3500VP-01-12 PerpH-X ORP sensor with Variopole connector & preamplifier: T4 (-20°C ≤ Ta ≤ +80°C)
Model 3500VP-02 High performance pH sensor with Variopole connector
Model 3800 Steam sterilizable pH sensor with single pole Eurocap connector

Model 3800VP Steam sterilizable pH sensor with Variopole connector
Model 3900-01 pH/ORP sensor with integral cable & Smart preamplifier
Model 3900-02 pH/ORP sensor with integral cable
Model 3900VP-01 pH sensor with Variopole connector & Smart preamplifier
Model 3900VP-02 pH/ORP sensor with Variopole connector

Special conditions for safe use:

1) All pH/ORP sensor models with a plastic enclosure or exposed plastic parts may provide an electrostatic ignition hazard and must only be cleaned with a damp cloth to avoid the danger of ignition due to a build up of electrostatic charge.
2) All pH/ORP sensor models with a metallic enclosure may provide a risk of ignition by impact or friction. Care should be taken during installation to protect the sensor from this risk.
3) External connections to the sensor must be suitably terminated and provide a degree of protection of at least IP20.

All pH/ORP sensor models are intended to be in contact with the process fluid and may not meet the 500V r.m.s test to earth. This must be taken into consideration at installation.

ATEX Notified Body for EC Type Examination Certificate & Quality Assurance:
SGS Baseefa[Notified Body Number:1180], Rockhead Business Park, Staden Lane, Buxton SK17 9RZ UNITED KINGDOM

Assumption of conformity is based on the application of the harmonized standards:
EN 60079-0:2012+A11:2013 Explosive atmospheres. Equipment. General requirements
EN 60079-11:2012 Explosive atmospheres. Equipment protection by intrinsic safety "i"

K Freeman

(Signature)

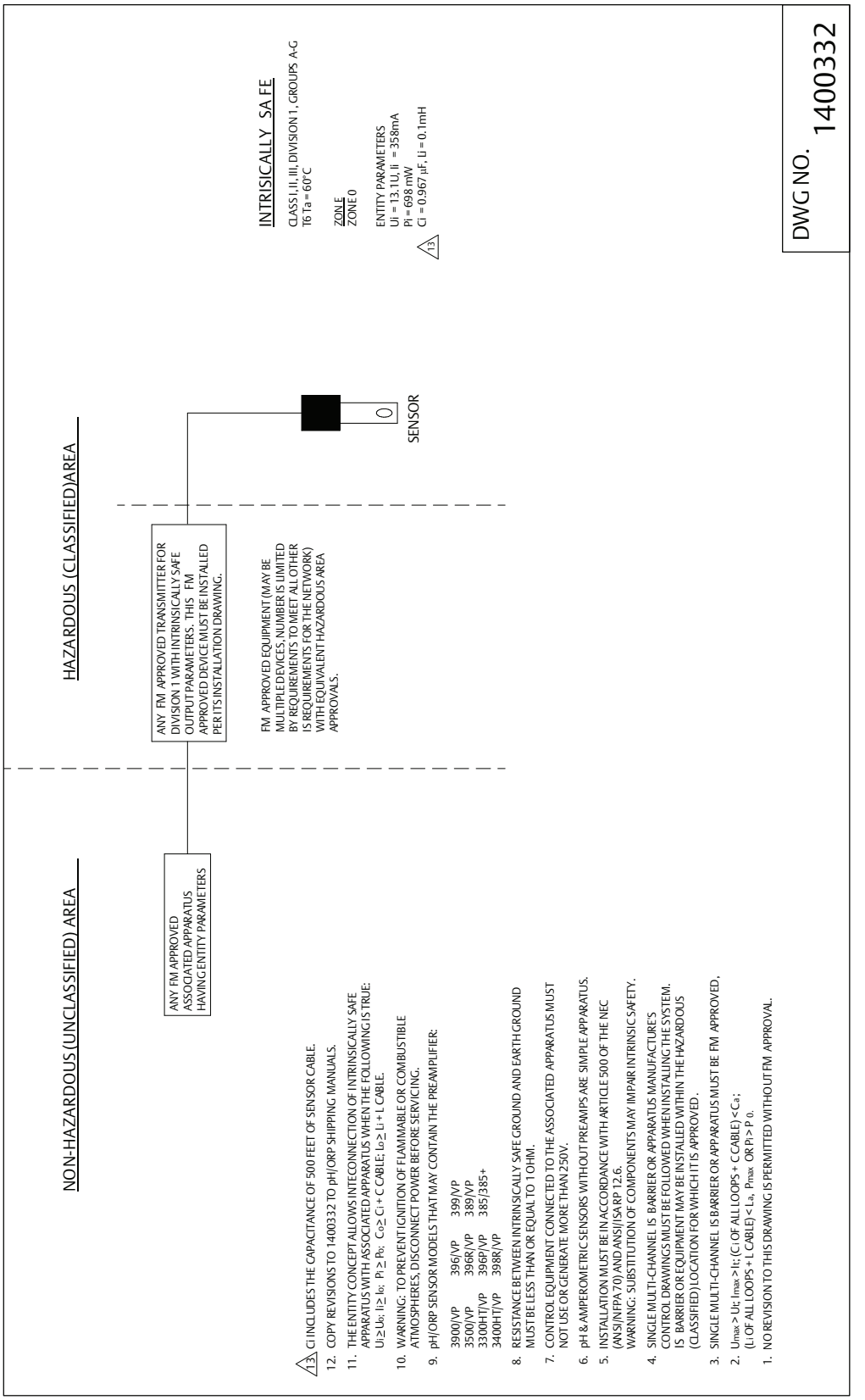
Kim Freeman
(Name printed)

Director of Global Quality
(Function name)

March 23, 2017
(Date of issue)

CE marking was first affixed to this product in 2011

Intrisicallly Safe Sensor Installation Drawing - FM



LIQ-MAN-PERpH-X
Rev. J
April 2017

www.Emerson.com/RosemountLiquidAnalysis

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