

**Thermo Scientific AquaSensors™
AnalogPlus™ Differential 1.5 Inch
ORP Sensors**
User Guide



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The specifications, descriptions, drawings, ordering information and part numbers within this document are subject to change without notice.

This publication supersedes all previous publications on this subject.

Preface

This instruction manual serves to explain the use of the Thermo Scientific AquaSensors AnalogPlus 1.5 inch ORP sensor and is written to cover as many applications as possible. Please do not hesitate to contact Thermo Fisher Scientific or an authorized representative with questions or concerns.

The information presented in this instruction manual is subject to change without notice as improvements are made, and does not represent any commitment whatsoever on the part of Thermo Fisher Scientific.

Thermo Fisher Scientific cannot accept any responsibility for damage or malfunction of the sensor due to improper use.

Contact Information

To contact Thermo Scientific AquaSensors Technical Support:

Within the United States call 1.800.225.1480 or fax 978-232-6015.

Outside the United States call 978.232.6000 or fax 978.232.6031.

In Europe, the Middle East and Africa, contact your local authorized dealer.

Visit us on the web at www.thermo.com/processwater

Safety Information



The Thermo Scientific AquaSensors AnalogPlus 1.5 inch ORP sensor shall be installed and operated only in the manner specified. Only a skilled, trained or authorized person should carry out installation, set up and operation of the sensor system.

Before using the sensor, make sure that the sensor cable is connected as specified. Failure to do so may result in permanent damage to the sensor or controller.

Protection against electric shock will be achieved only by observance of the corresponding installation rules.

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1. INTRODUCTION

1.1. General Information


Thank you for purchasing the Thermo Scientific AquaSensors AnalogPlus Differential ORP Sensor. This industrial sensor has many enhanced features that offer superior performance in process applications:


- Differential ORP measurement technology minimizes susceptibility to ground loops.
- A built in pre-amplifier eliminates high impedance wiring problems.
- A replaceable heavy-duty quad junction salt bridge for extended life in severe applications.
- A large reference reservoir filled with buffered solution minimizes the effects of dilution and extends the life of the reference electrode.
- Easily refurbished in the field by replacing the salt bridge and reference solution, extending the life of the sensor.

The product is designed for continuous use in industrial process applications and complies with safety regulations currently in force. Improper use could lead to hazards for the user or a third-party, and/or adverse effects to the plant or other equipment.

Thermo Fisher Scientific does not accept any liability for damage that may arise if information in this manual is not followed. Therefore, the operating instructions and specifications must be read and understood by all persons involved in installation and operation of this equipment.

This manual identifies safety instructions and additional information by means of the following symbols:

	This symbol draws attention to safety instructions and warnings of potential danger, which if neglected, could result in injury to persons and/or damage to property.
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	This symbol identifies additional information and instructions, which if neglected, could lead to inefficient operation and possible loss of production.
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It is recommended that this manual be made accessible to everyone who may need it as a reference.

Please contact Thermo Fisher Scientific or an authorized representative with any questions.

1.2. Intended use

The Thermo Scientific AquaSensors AnalogPlus 1.5 inch ORP sensor is designed to continuously measure ORP and temperature in aqueous solutions in accordance with the technical product specifications in Section 2.2 of this manual.

Any other use, or use not mentioned here, that is incompatible with the technical specifications is deemed inappropriate. The operator is solely responsible for any damage arising from such use.

Other prerequisites for appropriate use include:

- Observing the instructions, notes and requirements set out in this instruction manual.
- Observing all local safety regulations.
- Observing all warnings and cautions in the documentation regarding all products used in this measurement system, including the ORP sensor, mounting hardware, analyzer electronics and cabling.
- Observing the prescribed environmental and operational conditions.
- Observing chemical compatibility with all wetted materials.

1.3. Safety Instructions

The AnalogPlus 1½ inch ORP sensor should be installed and operated only by personnel familiar with the sensor and qualified for such work.

A defective sensor should be returned to Thermo Fisher Scientific for repair or replacement. Contact Thermo Fisher Scientific to obtain a Return Material Authorization (RMA) number.



No modifications to the AnalogPlus 1½ inch ORP sensor are allowed. The manufacturer/supplier accepts no responsibility for damage caused by unauthorized modifications. The risk is borne entirely by the user.

1.4. Removal from Service / Correct Disposal of the Sensor

Removal from Service

- Disconnect the cable wiring from the controller terminal block.
- Remove the sensor from the mounting hardware.

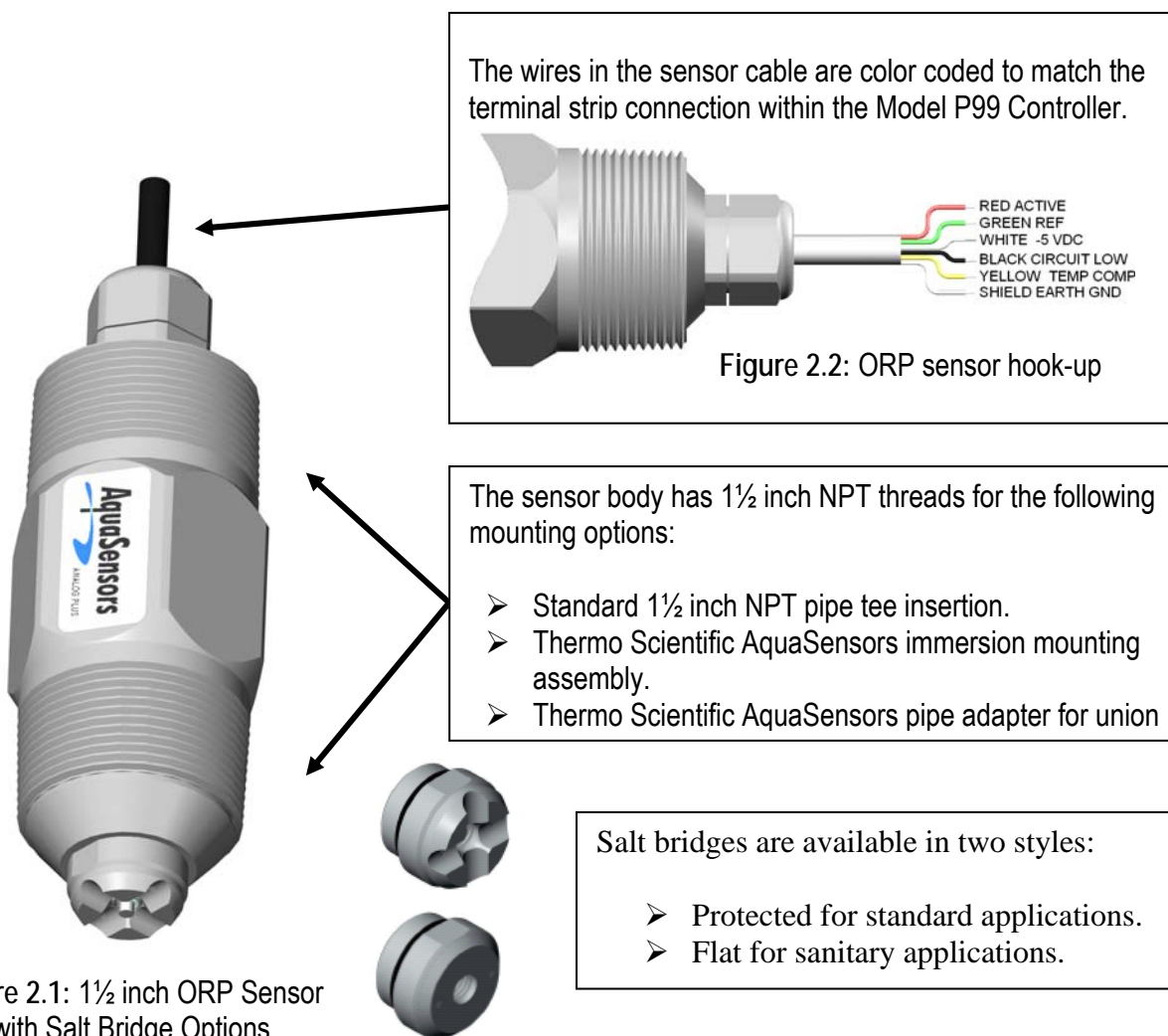
Correct Disposal of Unit

- When the sensor is taken out of service, observe the local environmental regulations for correct disposal.

2. PRODUCT DESCRIPTION

2.1. Sensor Description

The Thermo Scientific AquaSensors 1½ inch ORP sensor uses a differential measurement technique to maximize lifetime in continuous industrial applications. The ground rod and encapsulated preamplifier construction reduce the effects of ground loops and allow the ORP signals to be transmitted up to 3,000 feet. A replaceable heavy-duty quad junction salt bridge makes it simple to refurbish the sensor when necessary. The large reference reservoir filled with buffered solution minimizes the effects of dilution and extends the life of the reference electrode. The wires in the sensor cable are color coded to allow for quick and easy installation into the Model P99 controller.



2.2. Specifications

Wetted Materials.....	Sensor Body - CPVC Salt Bridge Junctions - Kynar® ORP Electrode - Platinum/Glass Ground Rod - 316 Stainless Steel O-Ring Seals - Viton® (Consult factory for customized material construction)
Operating Temperature.....	23°F to 203°F (-5°C to 95°C)
Maximum Pressure.....	100 psi @ 212°F (100 psi @ 100°C)
Maximum Flow Rate.....	10 ft/sec (3 m/sec)
Measuring Range.....	-2000 mV to +2000 mV
Resolution.....	1 mV
Standard Sensor Cable Length.....	10 ft (3 m)
Cable Wire Colors.....	White Wire (-5V) Black Wire (Ground) Red Wire (ORP Active Electrode) Green Wire (Reference Electrode) Yellow Wire (Temperature/NTC 300) Drain/Shield (Earth)
Maximum Transmission Distance.....	3,000 ft (914 m)



The sensor will arrive with a protective cap that keeps the sensor hydrated.

For short-term storage, put several drops of Thermo Scientific AquaSensors storage solution (P/N RSC04) on the absorbent material in the protective cap and replace the cap on the sensor. This keeps the process electrode and salt bridge moist.

For extended storage, repeat the above short-term storage procedure every 2 to 4 weeks, depending on the surrounding environmental conditions.



Make sure all wetted materials are compatible with process chemicals at operating temperatures and pressures.

3. INSTALLATION

3.1. Wiring

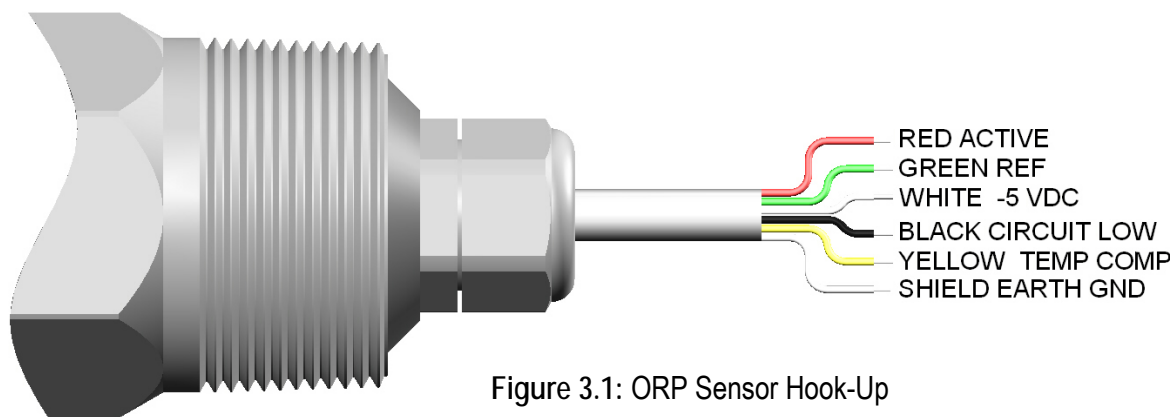


Figure 3.1: ORP Sensor Hook-Up

There are two different methods for electrical connection between the sensor and the ORP controller: either direct or through a junction box.

3.1.1. Direct Connection

1. Insert the sensor cable through a watertight cord grip into the Model P99 Controller. Conduit holes are found on the bottom of the P99 controller for this purpose.
2. Connect the sensor wires to the P99 controller as outlined in the controller manual.

3.1.2. Indirect Connection (Using a Junction Box)

1. Insert the sensor cable and the interconnect cable through a watertight cord grips into the junction box that has a terminal strip designed to make the proper connections.
2. Connect both the sensor cable wires and the interconnect wires to the terminal strip.
3. Insert the interconnect cable through a watertight cord grip into the Model P99 Controller. Conduit holes are found on the bottom of the P99 controller for this purpose.
4. Connect the sensor wires to the P99 controller as outlined in the controller manual.








Be sure that the wire colors of the sensor cable match those of the interconnect cable on either side of the terminal strip.



Route the interconnect cable through metal conduit to minimize electrical noise that may interfere with the sensor signal.

3.2. Mounting Hardware

Thermo Fisher Scientific offers two distinct body types for its 1½ inch differential ORP sensor. The short nose sensor (Fig 3.2) has insertion threads located closer to the sensing elements and is recommended for short branch tees (typically metal tees and SCH 40 plastic tees). The long nose sensor (Fig 3.3) has a longer section between the insertion threads and the sensing elements. It is recommended for long branch tees to optimize insertion depth.

	Save the protective cap and use it to keep electrodes moist whenever the sensor is removed from service.
	If the sensor does not calibrate, refer to Section 4 to review maintenance, refurbishment and troubleshooting options.
	The sensor should be positioned at least 15° up from horizontal. This will insure that entrained air does not form a pocket around the sensor head.
	DO NOT USE PIPE SEALANT. Pipe sealants may not provide adequate sealing or may react with different plastic materials. Use thread tape.
	DO NOT OVER TIGHTEN! Maximum torque: 65 lbs·in (7 N·m)

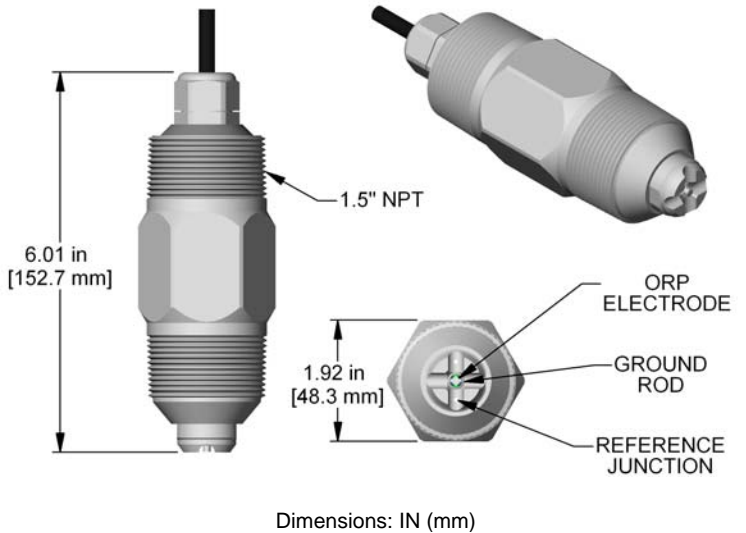


Figure 3.2: Short Nose Sensor Body

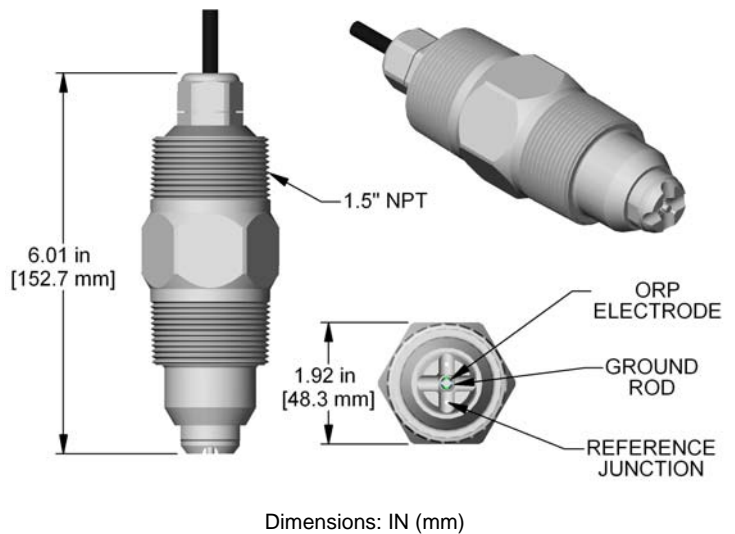


Figure 3.3: Long Nose Sensor Body

3.2.1. Pipe Tee Mounting

Thermo Fisher Scientific' two distinct body types for its 1½ inch differential ORP sensor ensure optimal positioning of the active sensor electrode in the process flow. Normally available pipe tees vary widely in construction dimensions. CPVC pipe tees are most generally available with schedule 80 walls. Stainless steel tees have thinner walls that change the final position of the sensor.

Common mounting arrangements are shown for the short nose and long nose ORP sensors.

Recommended Tee Mounting Configurations

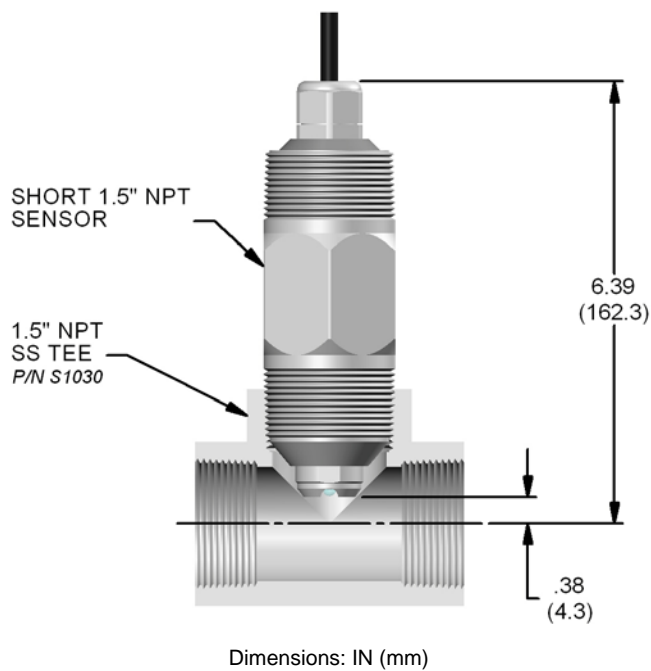


Figure 3.4: Short Nose Sensor Mounted in Steel Tee or Schedule 40 PVC Tee

Optimal electrode placement with minimum flow restriction

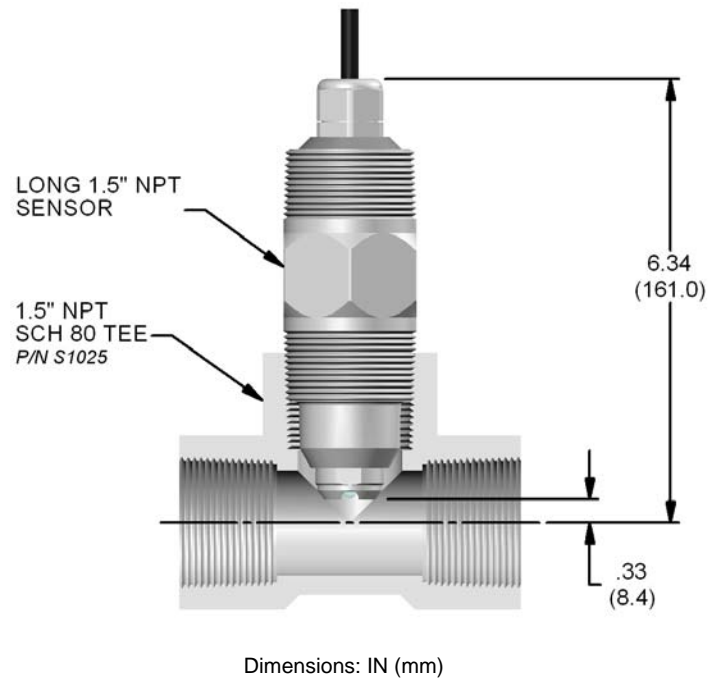


Figure 3.5: Long Nose Sensor Mounted in Schedule 80 PVC Tee

Optimal electrode placement with minimum flow restriction

Acceptable Tee Mounting Configurations for Specific Applications

The long nose and short nose sensor bodies can be installed in a variety of tee pipes but optimal electrode positioning may not be maintained. If the sensor body does not extend far enough it may be possible for an air pocket to form. Alternatively, if the sensor body extends past the midway point it may restrict flow. As long as precautions are taken these setups can be used.

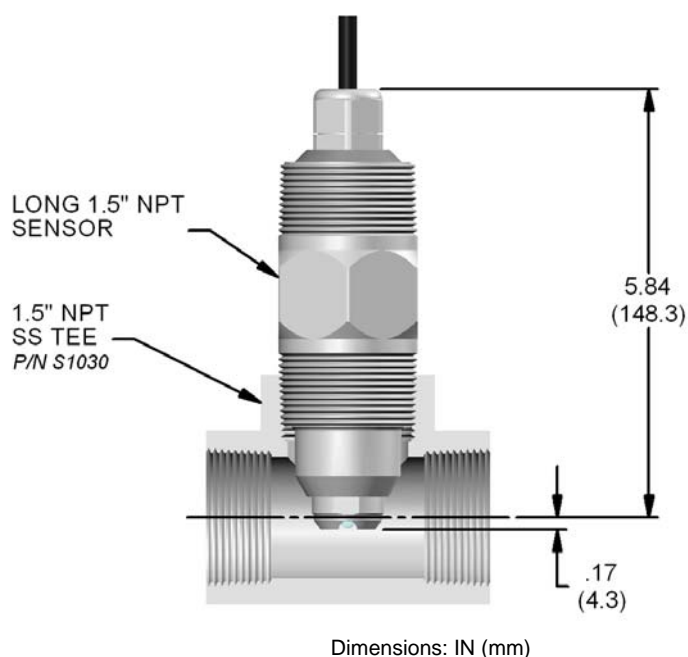


Figure 3.6: Long Nose Sensor in Steel Tee or Schedule 40 PVC Tee

Maximum flow restriction with electrode placed in the pipe center

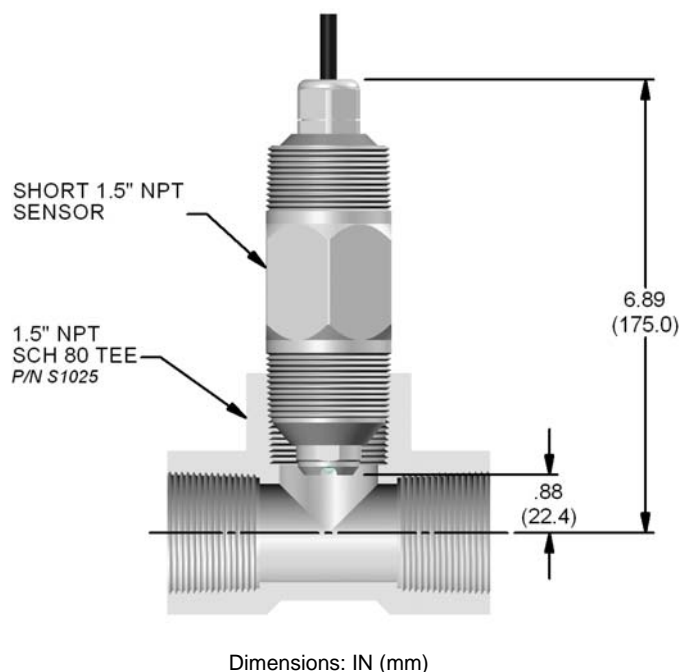


Figure 3.7: Short Nose Sensor in Schedule 80 PVC Tee

Minimum flow restriction, must be pressurized to avoid air pockets

Detailed Pipe Tee Installation Instructions

1. Wiring:
 - a. Route the cable either through conduit or on a cable tray.
 - b. Insert the sensor cable into the Model P99 controller through a watertight cord grip. Conduit holes are provided for the cord grip on the bottom of the P99 controller.
 - c. Connect the sensor wires into the P99 sensor terminal block as shown in the P99 manual.

2. Calibrate:
 - a. Power the P99 controller.
 - b. Remove the protective cap from the sensor head and make sure moisture is present and that the salt bridge has not dried out. If the protective cap is dry, the sensor should be hydrated in tap water for at least 1 hour prior to calibration.
 - c. Calibrate the ORP sensor as explained in the P99 manual.
 - d. If measurement response time is slow or if the sensor will not calibrate, refer to Section 4 for maintenance, refurbishment and troubleshooting suggestions.

3. Mount:
 - a. Apply Teflon® tape to the sensor body threads.
 - b. Insert the sensor into the tee and slowly turn clockwise until secure. Tighten the sensor with a wrench until snug to prevent leaking. Be sure the pipe remains full when the sensors are installed.

3.2.2. Union Mounting

Union mount hardware makes it easy to remove and insert the sensor for applications where calibration and/or cleaning is frequent. For this mounting arrangement, the long nose 1½ inch ORP sensor body is used.

Union Mount Advantages

- ✓ Optimal positioning of sensing surface.
- ✓ Trouble-free installation.
- ✓ Quick disconnect.
- ✓ No cable twisting during installation or removal.
- ✓ Easy maintenance.

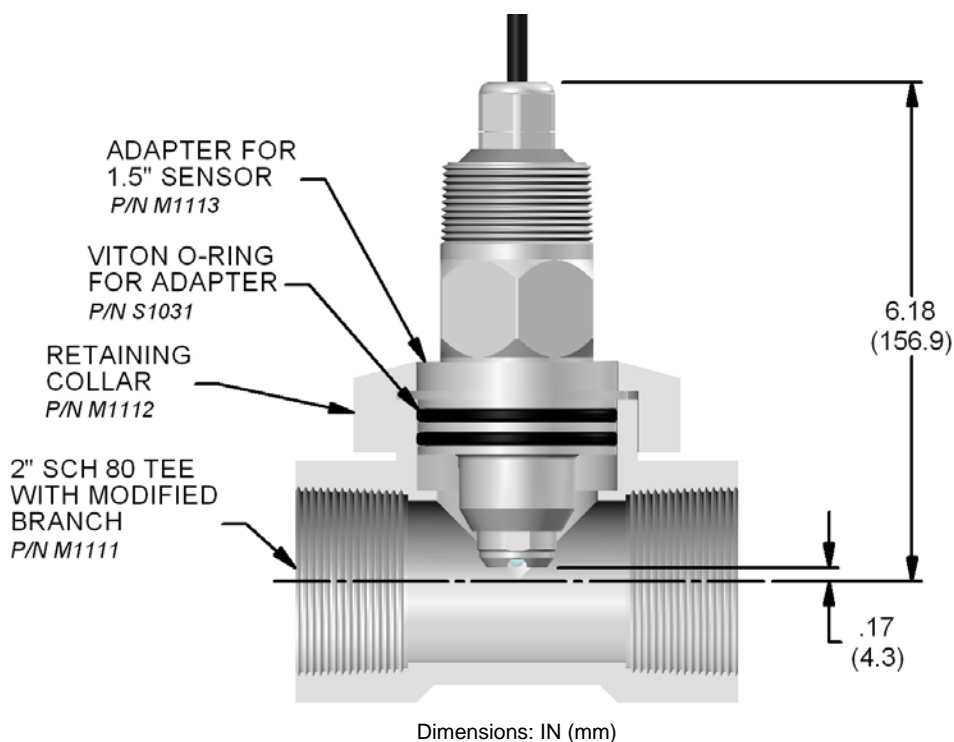


Figure 3.8: Union Mounting

Detailed Union Mount Installation Instructions

1. Wiring:
 - a. Apply Teflon® tape to the front sensor body threads and pass the cable through the adapter. Thread the adapter onto the sensor clockwise until it is secure.
 - b. Pass the retaining collar over the cable and onto the adapter with the threads facing the sensor.
 - c. Route the cable either through conduit or on a cable tray.
 - d. Insert the sensor cable into the Model P99 controller through a watertight cord grip. Conduit holes are provided for the cord grip on the bottom of the P99 controller.
 - e. Connect the sensor wires into the P99 sensor terminal block as shown in the P99 manual.
2. Calibrate:
 - a. Power the P99 controller.
 - b. Remove the protective cap from the sensor head and make sure moisture is present and that the salt bridge has not dried out. If the protective cap is dry, the sensor should be hydrated in tap water for at least 1 hour prior to calibration.
 - c. Calibrate the ORP sensor as explained in the P99 manual. It is recommended to use a calibration on installation of the sensor. Subsequent calibrations should be scheduled based on process demands.
 - d. If measurement response time is slow or if the sensor will not calibrate, refer to Section 4 for maintenance, refurbishment and troubleshooting suggestions.
3. Mount:
 - a. Inspect the O-ring on the union-mounting threaded flange for imperfections or particles of dirt that may prevent the O-ring seal from seating properly.
 - b. Carefully insert the sensor into the Thermo Scientific AquaSensors union mounting tee. Turning the retaining collar clockwise and hand tighten until snug. Be sure the pipe remains full when the sensor is installed.

3.2.3. Immersion Mounting

For immersion mounting applications the sensor is connected to a 1.5 inch extension pipe to protect the cable from damage.

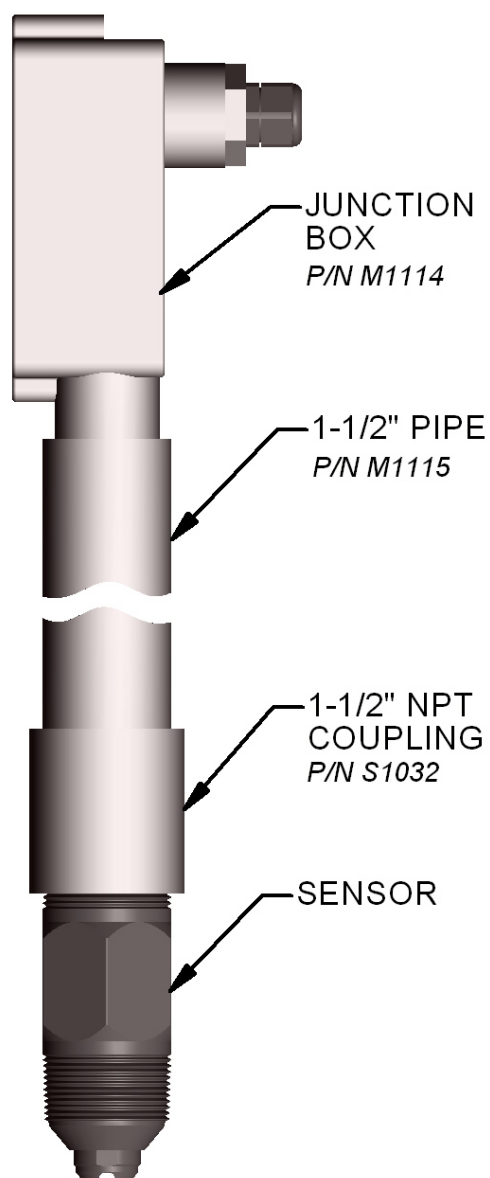


Figure 3.9: Immersion mounting assembly

Detailed Insertion Mount Installation Instructions

1. Wiring:
 - a. Route the sensor cable through the 1.5 inch extension pipe.
 - b. Apply Teflon® tape to the sensor threads.
 - c. Attach the sensor to the 1.5 inch NPT coupling by turning the sensor in a clockwise direction until secure.
 - d. Either route the cable directly to the P99 or splice the wires in a junction box and use an extension cable.
 - e. Insert the cable into the Model P99 controller through a watertight cord grip. Conduit holes are provided for the cord grip on the bottom of the P99 controller.
 - f. Connect the sensor wires into the P99 sensor terminal block as shown in the P99 manual.
2. Calibrate:
 - a. Power the P99 controller.
 - b. Remove the protective cap from the sensor head and make sure moisture is present and that the salt bridge has not dried out. If the protective cap is dry, the sensor should be hydrated in tap water for at least 1 hour prior to calibration.
 - c. Calibrate the ORP sensor as explained in the P99 manual.
 - d. If measurement response time is slow or if the sensor will not calibrate, refer to Section 4 for maintenance, refurbishment and troubleshooting suggestions.
3. Mount:

Secure the pipe assembly so that the sensor is fully immersed in the process.
Handrail mounting hardware can be ordered from Thermo Fisher Scientific.



Be sure that the wire colors of the sensor cable match those of the interconnect cable on either side of the terminal strip.



Do not route the interconnect cable conduit where there are AC or DC power cables which create electrical noise that may interfere with the sensor signal.



Route the interconnect cable through metal conduit to minimize electrical noise that may interfere with the sensor signal.

4. ORP SENSOR MAINTENANCE

4.1. Cleaning the ORP Sensor Head

- 4.1.1. In order to maintain an accurate measurement value, the sensor will need occasional maintenance. The maintenance interval will be dictated by the process in which it is installed. The harsher the process, the more often the sensor will require maintenance. Regular maintenance will yield a longer sensor life.
- 4.1.2. The sensor cleaning procedure is as follows:
 - 4.1.2.1. Remove sensor from service and rinse or spray it with warm water to remove heavy deposits.
 - 4.1.2.2. Soak the sensor in a container of hot detergent water for one hour. Do not use detergents that contain oily skin softeners like aloe or lanolin that can coat the electrode. Alconox® and Dawn™ dishwashing liquid work well.
 - 4.1.2.3. Use a soft-bristled brush, such as a soft toothbrush, and hot detergent water to scrub the entire electrode end of the sensor, being careful not to scratch the platinum electrode.
 - 4.1.2.4. Rinse the electrode end with clean warm water.
 - 4.1.2.5. If deposits are still present on the electrode repeat steps 2 and 3. In the case of lime or other mineral deposits a weak solution (about 0.1 M) of hydrochloric acid may be used. In some cases, a dilute solution (about 10:1) of water and chlorine bleach or a solution of water and EDTA may also work. Stubborn oil or grease deposits may require cleaning with a solvent such as acetone or alcohol. Protein deposits may be cleaned with a pepsin-based cleaning solution. Bacterial or mold growth may be removed with dilute chlorine bleach.



Caution: Ensure that dangerous chemical reactions will not occur between process deposits and cleaning solutions. Compounds of cyanide and hydrochloric acid will react and pose health risks. Cyanide is often used in electroplating and in gold refining. If in doubt about potential chemical reactions, check with a chemist before cleaning.

- 4.1.3. Before returning the sensor to service, allow it to soak in water at ambient temperature for about an hour to stabilize the ORP electrode and the salt bridge.
- 4.1.4. After cleaning the sensor, calibrate sensor per instructions in the Model P99 controller manual.
- 4.1.5. Reinstall sensor in process.


4.2. ORP Sensor Refurbishment - Replacing the Salt Bridge and Reference Solution

4.2.1. If the sensor head has been cleaned (see section 4.1.2) and calibration cannot be achieved, replace the salt bridge and reference solution.


4.2.2. Hold the sensor firmly with the electrode tip facing upwards. Remove the existing salt bridge by using a 15/16 wrench (24mm) and turning it counterclockwise. Dispose of the salt bridge using an approved method.

4.2.3. Pour out the old reference solution. Rinse the reservoir with distilled or de-ionized water.


4.2.4. Slowly fill the reservoir with 7 pH Standard Cell Filling Solution (P/N RCS01) so the solution just covers the reference O-ring.

	Do not overfill. Overfilling will lead to excessive pressures that will affect the junction potentials of the reference.
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4.2.5. Slowly screw the new salt bridge clockwise onto the sensor head until secure. Tighten the salt bridge with a 15/16 wrench (24mm) until snug.

	Do not over tighten. Maximum torque: 10 lbs-in (1.1 N·m)
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4.2.6. After replacing the salt bridge and reference solution, calibrate the sensor according to the instructions in the P99 controller manual.

	If after cleaning and refurbishment sensors still have slow responses, low measurement slopes or are seriously abraded or scratched, they must be replaced. Contact your local distributor or call Thermo Fisher Scientific Customer Service.
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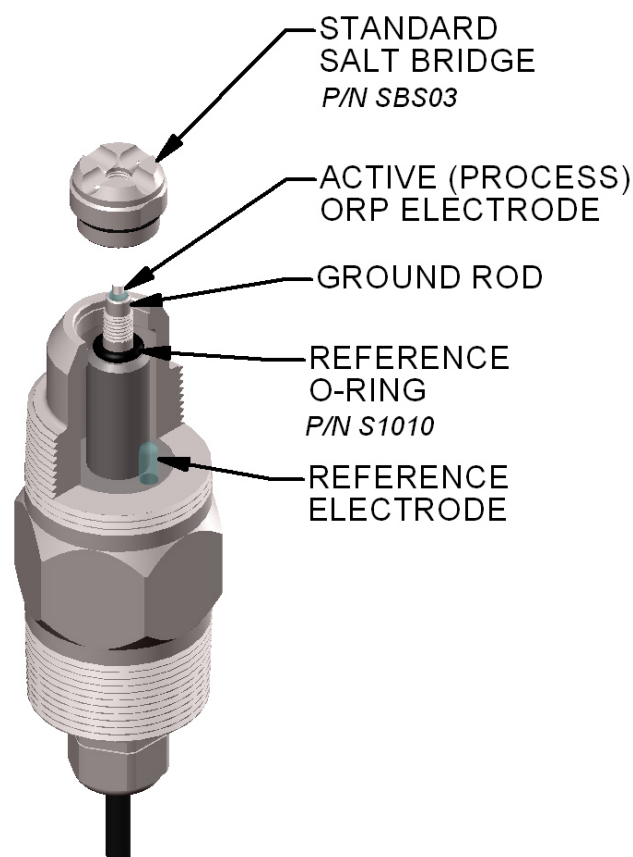


Figure 4.1: Replacing the salt bridge and reference solution

4.3. ORP Sensor Troubleshooting

General Inspection

If the sensor is not providing reasonable signals to the analyzer, check the following:

1. Inspect the integrity of the platinum electrode. If the electrode is damaged, replace the sensor.
2. Inspect the integrity of the salt bridge junctions. Be sure that they are clean and moist. If the salt bridge has been allowed to dry out it may be necessary to replace the salt bridge and filling solution.
3. Inspect the sensor cable for damage to the outer jacket. Any cuts or kinks may damage signal connections.
4. Inspect terminal block connections to be sure wires are not corroded or loose.
5. Make sure all sensor wires are connected to the correct places on the analyzer terminal block. Depending on the analyzer, some terminal block jumpers may be required and it is possible to put those jumpers in the wrong place.
6. The sensor electrodes should be immersed in a solution of known ORP.
7. Establish that the analyzer electronics are working correctly by verifying operation with another sensor.



Note: Any new sensor that has been in storage for more than a few days should be soaked in tap water or a solution of known ORP for at least 30 minutes before reviewing measurement performance.



Note: The salt bridge of any ORP sensor in storage must be kept moist at all times. Protective caps should be filled with Thermo Scientific AquaSensors storage solution for best performance. The protective cap should be placed securely over the sensor head.

If the sensor passes the general inspection, there are two basic tests that can verify operation, the temperature measurement and the ORP measurement. If the sensor passes these tests it should be ready for service.

Temperature Span

Disconnect the BLACK and YELLOW sensor wires from the analyzer. Use an ohmmeter to measure the resistance between the BLACK and YELLOW wires. The meter should measure a resistance corresponding to the sensor temperature as outlined in the following table.

Sensor Temperature	5°C	15°C	25°C	35°C	45°C
Thermistor Resistance	630 Ω	430 Ω	300 Ω	215 Ω	155 Ω

If the measured resistance is within 10 to 20 ohms of the expected value, the element should be satisfactory. If not, please consult the factory.

ORP Measurement Test

1. Disconnect the RED and GREEN sensor wires from the analyzer terminal block while leaving the other wires connected. Connect the (+) lead of a millivolt meter to the RED wire and the (-) lead of the millivolt meter to the GREEN wire.
2. Place the sensor in +200 mV solution (PN ORPSOL200). Stir the sensor for 10 to 20 seconds and then allow the sensor to stabilize in solution for as long as required to get a stable reading. The meter should read $+200 \text{ mV} \pm 40 \text{ mV}$. If the reading is higher or lower than specified, replace the salt bridge and filling solution and try again.



Note: It is recommended that an ORP sensor be checked or calibrated in a single solution that is of the same polarity as the process it will be used in. Using solutions of opposite polarity can cause chemical reactions that can plug the salt bridge junctions.

Sensor Power Test

If the sensor does not respond with any reasonable millivolt signal, it may be worthwhile to verify that power is being supplied to the sensor from the analyzer. To do this, connect a voltmeter from the BLACK lead to the WHITE lead (It is not necessary to disconnect the wires from the terminal block). The meter should read $-5 \text{ VDC} \pm 0.3 \text{ VDC}$. If the voltage is low, disconnect the white wire from the terminal block and measure the voltage on the terminal block. If the voltage comes is within specification there is a defect in the sensor that is loading down the analyzer. If the voltage remains low then the analyzer may be defective.

If the sensor passes the temperature, ORP, and power tests but the analyzer is not displaying the correct values, the analyzer may be defective.

5. ORP SENSOR SPARE PARTS and ACCESSORIES

5.1 Reference Cell Replacements

Description	Part Number
7 pH Standard Cell Filling Solution (500 ml)	RCS01
Protected PEEK® Salt Bridge (O-ring included)	SBS01
Flat PEEK® Salt Bridge (O-ring included)	SBS02
Protected CPVC Salt Bridge (O-ring included)	SBS03
Flat CPVC Salt Bridge (O-ring included)	SBS04
ORP Sensor Storage Solution	RCS04
Protective Cap	SBC01

5.2 Thermo Scientific AquaSensors ORP Buffer Standards

Description	Part Number
ORP 200 mV Calibration Solution, (500 ml)	ORPSOL200

5.3 Mounting Hardware Replacements

Union Mounting Assembly

Description	Part Number
Sensor adapter	M1113
Viton® O-ring for sensor adapter	S1031
Retaining collar	M1112
Schedule 80 CPVC tee	M1111

Immersion Mounting Assembly

Description	Part Number
Junction box	M1114
1½" PVC pipe	M1115
1½" PVC NPT coupling	S1032

5. Limited Warranty

DIFFERENTIAL pH and ORP SENSOR WARRANTY/REPLACEMENT PLAN

Thermo Fisher Scientific warrants its AnalogPlus 1.5 Inch Differential pH and ORP sensors against material and workmanship defect for a period of two years from the date of shipment in accordance with the following prorated schedule:

0 to 12 months	Sensor repaired or replaced
12 to 18 months.....	Sensor repaired or replaced at one third of the current list price
18 to 24 months.....	Sensor repaired or replaced at two thirds of the current list price

In the event that a defect is discovered during the warranty period, Thermo Fisher Scientific agrees, at its option, to repair or replace the defective product according to the proration schedule listed in this limited warranty. Any product repaired or replaced under this warranty will be warranted only for the remainder of the original product warranty period.

This warranty does not apply to consumable products associated with this product including, but not limited to, chemical reagents and salt bridges.

Products may not be returned without authorization from Thermo Fisher Scientific. To obtain authorization, please call Thermo Fisher Scientific for a return material authorization number.

Limitations:

This warranty does not cover:

1. Damage caused by misuse, neglect (lack of appropriate maintenance), alteration, accident or improper application or installation.
2. Damage caused by any repair or attempted repair not authorized by Thermo Fisher Scientific.
3. Any product not used in accordance with the instructions furnished by Thermo Fisher Scientific.
4. Damage caused by acts of God, natural disaster, acts of war (declared or undeclared), acts of terrorism, work actions, or acts of any governmental jurisdiction.
5. Freight charges to return merchandise to Thermo Fisher Scientific.
6. Travel fees associated with on-site warranty repair.

This warranty is the sole expressed warranty made by Thermo Fisher Scientific in connection with its products. All other warranties, whether expressed or implied, including without limitation, the warranties of merchantability and fitness for a particular purpose are expressly disclaimed.

The liability of Thermo Fisher Scientific shall be limited to the cost of the item giving rise to the claim. In no event shall Thermo Fisher Scientific be liable for incidental or consequential damages.

This warranty is the sole and complete warranty for Thermo Fisher Scientific. No person is authorized to make any warranties or representations on behalf of Thermo Fisher Scientific.

Thermo Fisher Scientific reserves the right to change or modify this warranty at any time.

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6. Terms and Conditions

Terms and Conditions of Sale

The following terms and conditions will be presumed acceptable unless changes are made in writing and accepted by both parties in a reasonable amount of time.

Any standard or boilerplate terms and conditions supplied with a written purchase order will not be applicable unless accepted in writing by both parties.

Quotations: All quotations shall be in writing. Written quotations shall be valid for 30 days from the date issued. Verbal quotations or price lists are not valid.

Pricing: All pricing is in US Dollars. Thermo Fisher Scientific reserves the right to change pricing without notice.

Terms: Payment terms are net 30 days from the date of invoice with approved credit. Thermo Fisher Scientific reserves the right to deny credit or revoke previously extended credit. Past due accounts are subject to interest charges. Other acceptable payment terms are cash, certified check, money order, credit card or letter of credit confirmed by any United States of America bank. Other payment terms are not valid unless accepted in writing.

Sales taxes shall be included on the invoice unless a valid tax exemption certificate is supplied.

Return Material Authorization: Contact Thermo Fisher Scientific Customer Service for a Return Material Authorization (RMA) number. Items returned without an RMA number will be rejected.

All returned merchandise must be in unused, resalable condition, and must not be contaminated with hazardous materials.

Cancelled orders must be returned within 30 days of the date on the invoice and shall be subject to expenses incurred that may include, but are not limited to, inspection and restocking fees. Items returned within 60 days shall be subject to a restocking charge that is equal to 15% of the purchase price. Items returned after more than 60 days shall be subject to a restocking charge equal to 25% of the purchase price. Thermo Fisher Scientific reserves the right to reject any return that is not under warranty after 60 days. Non-stock items are normally not returnable.

Transportation: Orders are shipped FOB Thermo Fisher Scientific, or factory, by the most efficient means available. Appropriate charges, such as freight and insurance will be added to invoices. All shipments will be insured. Goods damaged in shipment must be reported by the recipient to the freight carrier for claims.

Thermo Fisher Scientific

Environmental Instruments

Process Water Instruments



North America

166 Cummings Center
Beverly, MA 01915 USA
Toll Free: 1-800-225-1480
Tel: 1-978-232-6000
Dom. Fax: 1-978-232-6015
Int'l Fax: 978-232-6031

Europe

P.O. Box 254, 3860 AG Nijkerk
Wallerstraat 125K, 3862 BN Nijkerk,
Netherlands
Tel: (31) 033-2463887
Fax: (31) 033-2460832

Asia Pacific

Blk 55, Ayer Rajah Crescent
#04-16/24, Singapore 139949
Tel: 65-6778-6876
Fax: 65-6773-0836

www.thermo.com/processwater

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