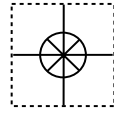


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User's Guide

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PH-2720-PA Preamplifier



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The information contained in this document is believed to be correct, but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING: These products are not designed for use in, and should not be used for, patient-connected applications.

OMEGA PH-2720-PA pH/ORP Preamplifier Instructions

WARNING!



SAFETY INSTRUCTIONS FOR IN-LINE ELECTRODE INSTALLATION

1. Do not remove from pressurized lines.
 2. Do not exceed maximum temperature/pressure specifications.
 3. Wear safety goggles or face shield during installation/service.
 4. Do not alter product construction.
- Failure to follow safety instructions may result in severe personal injury!



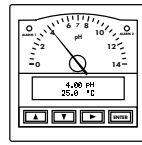
1. Wiring

Preamplifier: PH-2720-PA



pH Electrodes:
PHE-3271
PHE-2716

ORP Electrodes:
ORE-2715
ORE-2717



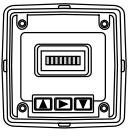
OMEGA
PHCN-5700

Preamplifier: PH-2720-PA



pH Electrodes:
PHE-3271
PHE-2716

ORP Electrodes:
ORE-2715
ORE-2717

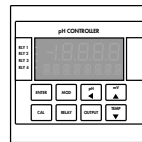


OMEGA
PHCN-5700

Preamplifier: PH-2720-PA



pH Electrodes:
PHE-3271
PHE-2716



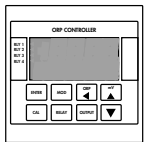
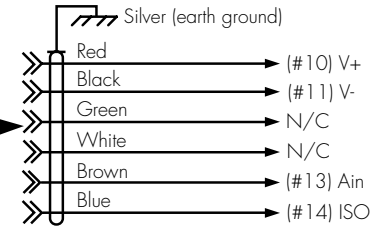
OMEGA
PHCN-90

- Use X1 gain selection

Preamplifier: PH-2720-PA



ORP Electrodes:
ORE-2715
ORE-2717



OMEGA
ORCN-90

- Use X1 gain selection

Technical Notes:

- Use 6-conductor shielded cable for cable extensions to 120 m (400 ft)
- Shield must be maintained through cable splice

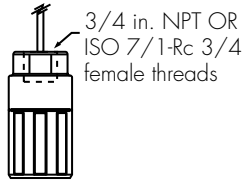
2. Installation Fittings

Type	Description
<p>Plastic tees</p>	<ul style="list-style-type: none"> • 0.5 to 4 in. • PVC or CPVC • Mounts via glue-on fittings
<p>PVC glue-on saddles (O-ring not required)</p>	<ul style="list-style-type: none"> • 2 to 4 in., use 1-7/16 in. hole in pipe • Align wedge arrows with saddle arrows during assembly.
<p>Iron strap-on saddles</p>	<ul style="list-style-type: none"> • 2 to 4 in., use 1-7/16 in. hole in pipe

Type	Description
<p>Carbon steel weld-on weldolets</p>	<ul style="list-style-type: none"> • 2 to 4 in., use 1-7/16 in. hole in pipe • Remove insert before welding • Installed by certified welder only
<p>Carbon steel threaded tees</p>	<ul style="list-style-type: none"> • 0.5 to 2 in. • Mounts on threaded pipe ends
<p>Universal pipe adapter for large pipes</p>	<ul style="list-style-type: none"> • For existing pipe fittings 2 in. and up • External 1-1/4 inch NPT male threads

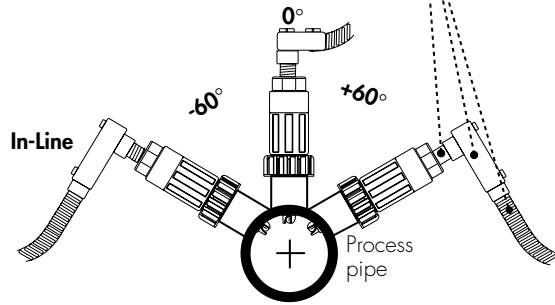
Consult OMEGA for additional fitting information.

3. Recommended Position

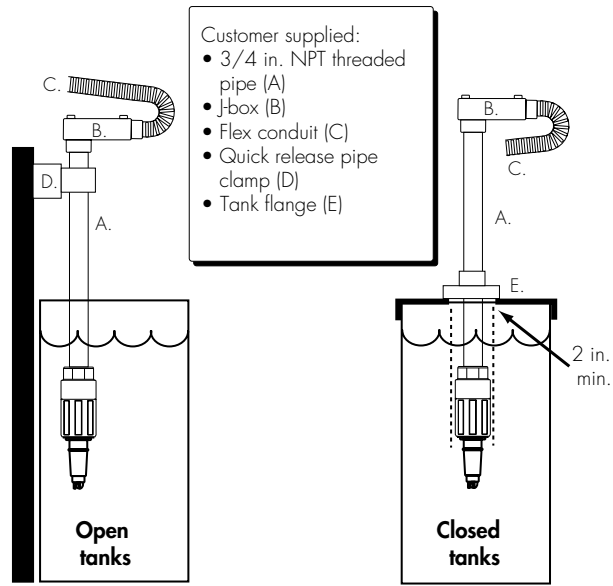


Customer supplied:

- 3/4 in. NPT nipple (male)
- J-box
- flex conduit



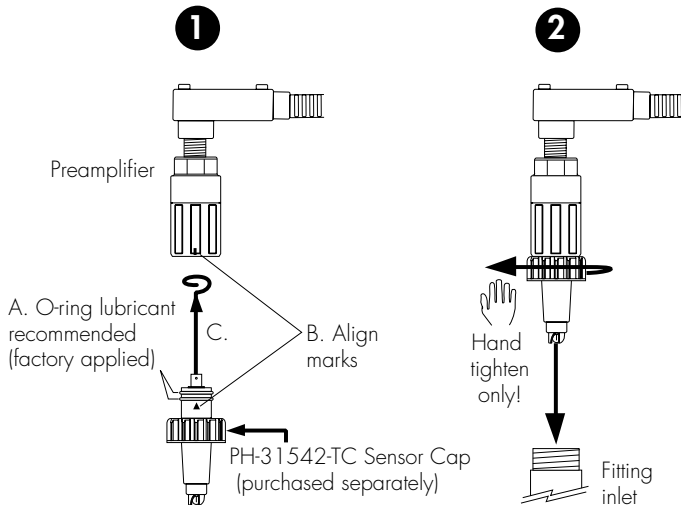
- Vertical (0°) position optimum
- 4 fps or less for max. performance and sensor life



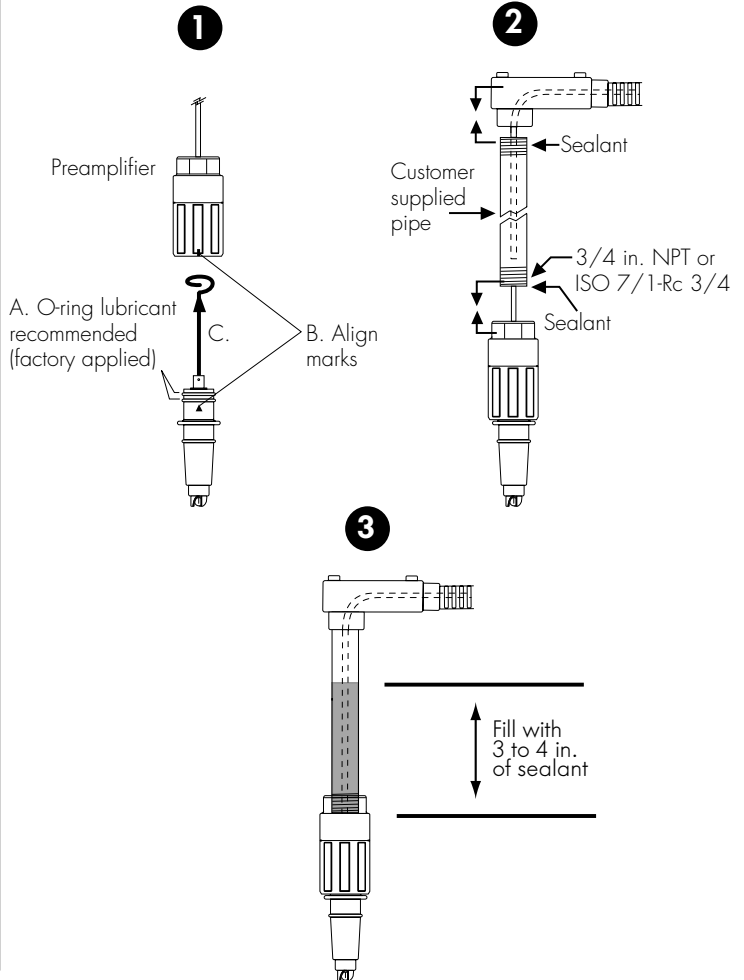
Caution: If liquid level is not constant, always ensure liquid contact with electrode tip

4. Installation

In-line Applications





Submersible Applications



Attach 3/4 in. watertight pipe to the top of the preamplifier. Secure the threaded connection to prevent any leakage. For additional defense against possible accumulation of condensation at the back seal area of the sensor, fill the lower 3-4 inches (75-100 mm) of conduit or extension pipe with a flexible sealant such as silicone.

5. Accessories

Part no.	Description	Material
PH-31542-TC	Sensor cap 	PP
FPP-1220-0021 FPP-1224-0021 FPP-1228-0021	Sensor O-ring, 2 required 	Viton® EPR Kalrez



CAUTION!

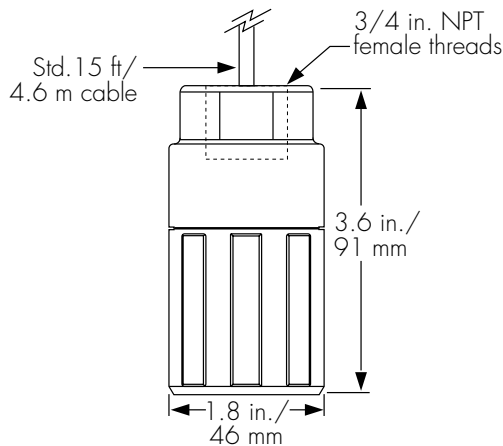
When replacing O-rings, apply O-ring lubricant to sensor O-rings prior to preamplifier/electrode assembly. Unlubricated O-rings may score the preamplifier sealing surface.

6. Specifications

PH-2720-PA pH/ORP Preamplifier

Housing material:	CPVC
Compatible sensors:	PHE-3271 Flat Surface pH Electrode PHE-2716 Bulb pH Electrode ORE-2715 Flat Surface ORP Electrode ORE-2717 Bulb ORP Electrode
Input Impedance:	$>10^{11} \Omega$
Operating temp.:	0 to 80 °C
Gain:	X1 (unity)
Input power:	± 4.5 to ± 8 VDC, dual supply
Current consumption:	<1 mA, dual supply
Quality standard:	CE

Dimensions:



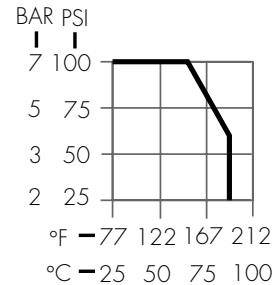
PHE Series pH Electrodes - ORE Series ORP Electrodes

General Specifications

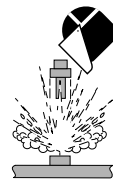
Wetted parts:	
Sensor body:	CPVC
O-rings:	Viton®
Electrode junction:	Porous UHMW polyethylene
Quality standard:	CE

Maximum pressure/temperature ratings:

- 7 bar (100 psi) max. @ ≤ 65 °C (149 °F)
- 4 bar (58 psi) max. @ ≤ 85 °C (185 °F)



WARNING!



SAFETY INSTRUCTIONS FOR IN-LINE ELECTRODE INSTALLATION

1. Do not remove from pressurized lines.
2. Do not exceed maximum temperature/pressure specifications.
3. Do not install/service without following installation instructions (see sensor manual).
4. Wear safety goggles and faceshield during installation/service.
5. Do not alter product construction.
6. Failure to follow safety instructions could result in severe personal injury!

7. Preamplifier Troubleshooting

Procedure:

- A. Install sensor adapter into preamplifier
- B. With preamplifier and instrument connected, simulate pH 4, 7, and 10 and record displayed mV readings (right) and approximate preamplifier response time between simulations.
- C. Refer to table on next page for preamplifier troubleshooting tips.

Simulator Input	Actual displayed mV
4.00, +177 mV	_____
7.00, 0 mV	_____
10.00, -177 mV	_____
Preamplifier response time: _____	

With simulator connected	Error Condition	Possible Cause	Possible Remedy
	A) mV output stuck at zero B) mV output erratic C) mV output stuck at 1.4 VDC	A) Shorted input signal B) Faulty preamplifier or wiring C) Faulty preamplifier	A) Check preamplifier cable connections and shielding. B) Verify preamplifier shield connections. Verify cable shield wire has been maintained through each cable splice. C) Replace preamplifier
Ok with simulator connected but fails with electrode	A) mV output stuck near zero B) mV output erratic C) Output stuck at 1.4 VDC	A) Cracked electrode glass B1) Poor contact between electrode and preamplifier connectors B2) Fouled electrode reference or aged electrode B3) Ground loop C) Faulty preamplifier	A) Replace electrode B1) Check contacts between electrode and preamplifier. Contacts must be clean and dry. B2) Clean electrode, see electrode manual B3) Isolate electrode in test beaker. If output is stable, ground loops may exist causing erratic behavior; isolate instrument outputs (i.e. 4 to 20 mA, 0 to 5 VDC). C) Replace preamplifier

8. Electrode Maintenance and Cleaning

8.1 Maintenance

Variables can affect long term pH or ORP electrode life. For this reason, a maintenance log is recommended for trend analysis. When storing boxed sensors, lay the sensor flat to maximize hydration of the glass surface. Keep the glass surface wet at all times. Soak the sensor tip in pH 4.0 buffer during system maintenance intervals. In-line applications should be plumbed with a depression (trap) which ensures liquid is maintained around the sensor tip. If sensor dehydration has occurred, soak the sensor tip in pH 4 buffer for 24 to 48 hours, then visually inspect the electrode for surface cracks, swelling, or discoloration.

8.2 Cleaning

Cleaning techniques vary depending on the type of coating present on the glass electrode surface or reference junction.

- **Soft coatings:** can be removed by vigorous stirring, or with directed spray of an applicable detergent or solvent onto the glass electrode surface. Chlorine bleach or mild detergent may be used to remove soft coatings. Always rinse electrode tip in clean water after cleaning.

- **Hard coatings:** can be chemically removed. Always use the least harsh chemical which will remove the contaminant within two (2) minutes without attacking the materials of construction. e.g. calcium carbonate may be removed with a 5% HCL (muriatic acid) solution.
- **Oily or Organic Coatings:** can be removed with detergents or an appropriate solvent that does not attack the materials of construction e.g. isopropyl alcohol may be used but acetone must be avoided to prevent damage to the CPVC sensor body.
- **ORP electrode surface (platinum rod):** can be gently sanded with 600 grit wet and dry silicone or carbide sandpaper, jewelers rouge, crocus cloth, or very fine steel wool.



WARNING!

When using chemicals or solvents care should be taken and appropriate eye, face, hand, body, and/or respiratory protection should be used.



WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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