

Neomeris Select pH Electrode Platform

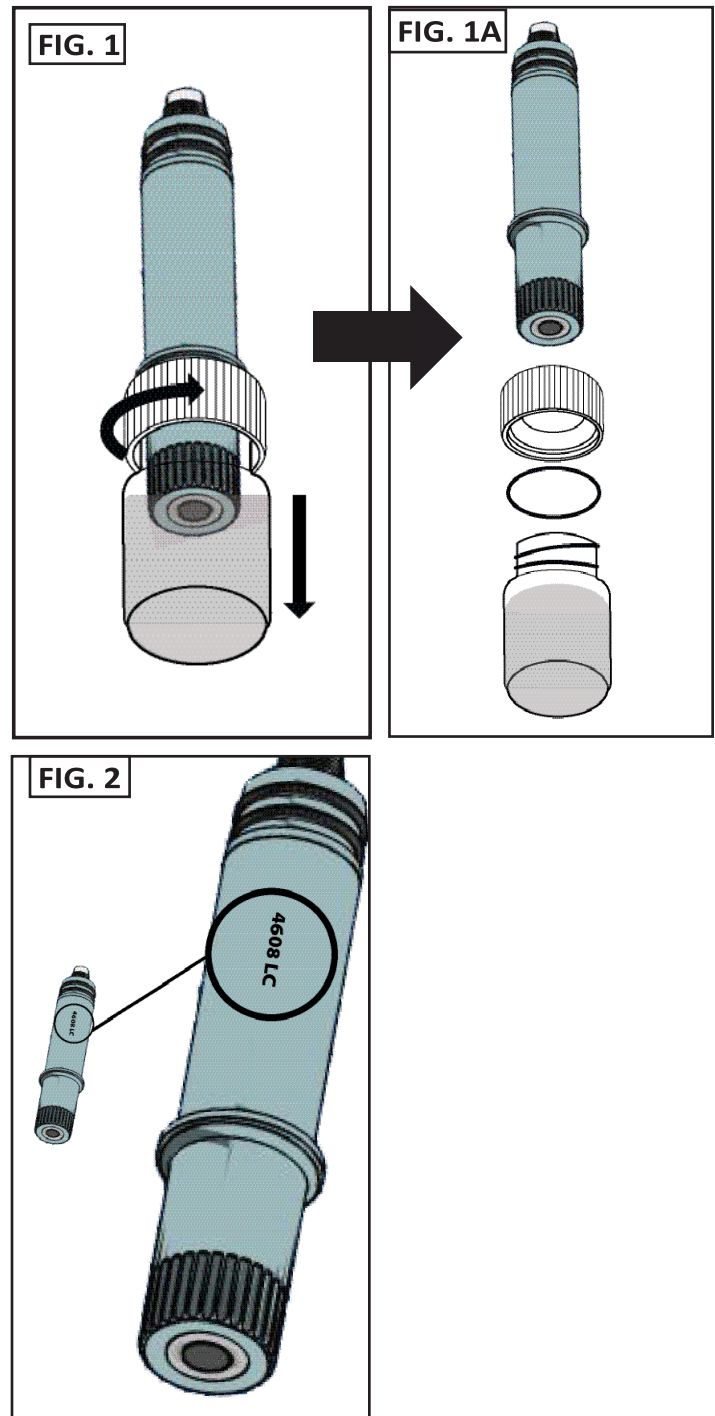
Product Instructions

Introduction

Congratulations on your purchase of your Neomeris Select pH electrode. The Neomeris Select system is designed in a modular fashion with the flexibility to use only the parts needed, or to add or modify installation and interface requirements with little or minimal cost impact. All mounting adapters and cables are designed to be reusable. Replace only the electrode cartridge as needed.

Electrode Care and Use Tips

1. The Neomeris Select pH electrode are shipped with a cap containing a solution of pH 4 buffer and potassium chloride. The cap should remain on the electrode until it is used. If the electrode is used infrequently the cap and its solution should be saved and the electrode stored in it. Store pH electrodes in pH 4 buffer solution if soaking solution is discarded. Before using the pH electrode remove the tape around the top of the black cap then slide the black cap off of the electrode. Next, remove small o-ring under black cap and keep with black cap or discard (see Fig. 1 and 1A).
2. Electrodes are a form of battery and have limited shelf lives. Electrodes in inventory should be rotated so that the older electrodes are used first. The date code is stamped on each electrode by fiscal week and year (Example: 4608 = week 2 of November 2008). See Fig. 2.
3. After exposure to a sample, buffer or rinse solution, carryover can be minimized by blotting—never by wiping—the electrode with a clean non-abrasive paper or a clean cloth towel. Do not use a brush on pH glass.
4. As a rinse solution, measure and use a portion of the next sample or buffer. This action will minimize carryover contamination.
5. When calibrating pH electrodes, use a Neomeris buffer solution close in value to that expected from the sample for one-point calibrations or as the second buffer for two-point calibrations (See below). This action will minimize span errors.

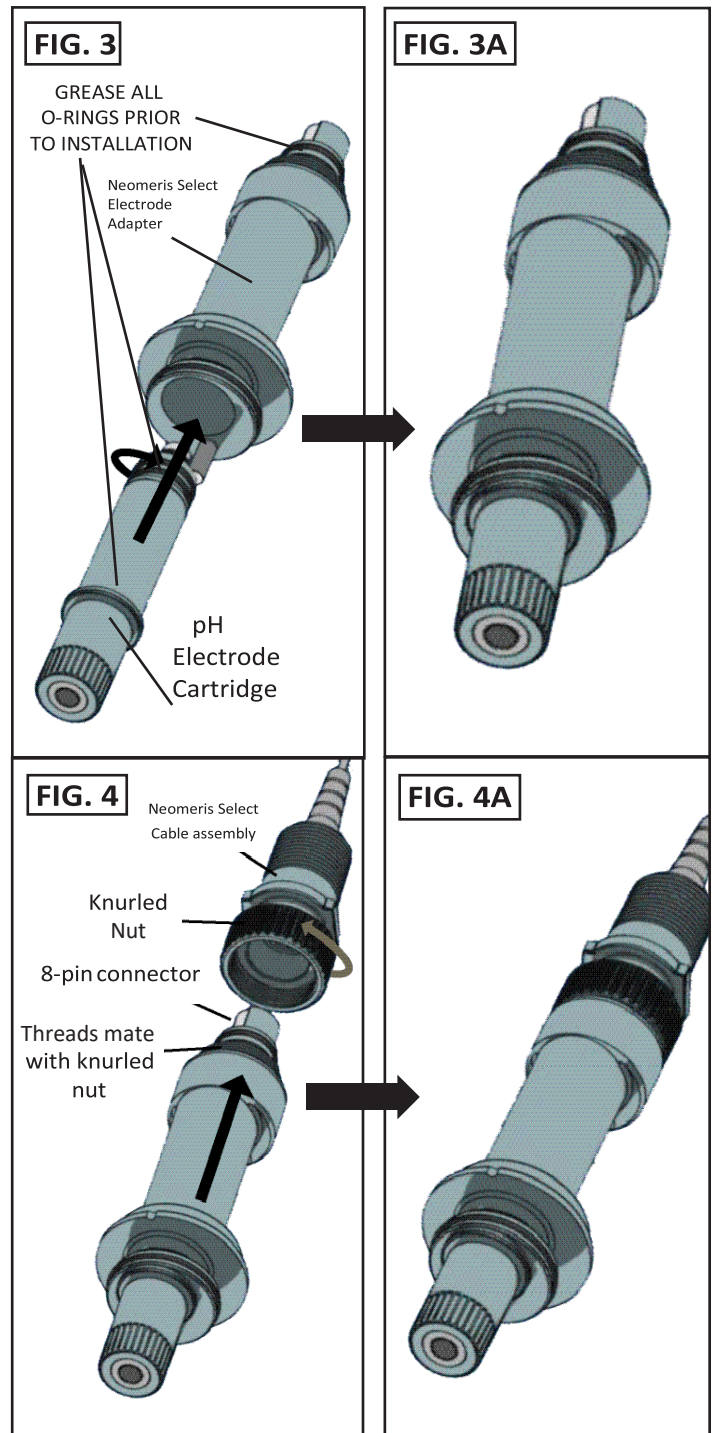


- A) Readings stabilize faster in some solutions than in others; allow time for the readings to stabilize. In general, new pH electrodes stable readings in buffer are obtained in 10-15 seconds.
- B) All pH electrodes age with time. Aging is characterized by shortened span and slower speed of response. Aging is best detected by the two-point calibration method. If the pH meter has manual or microprocessor slope (span) controls, the controls can be adjusted to compensate for electrode span errors (but will not affect the speed of response).
- C) Electrodes should be replaced when their readings cannot be corrected by the meter's controls and/or when their speed of response is too slow for the application for which they are being used. The frequency of electrode replacement is a function of the application; electrodes operating in hot liquids at very high or very low pH values will have shorter lives than those operating at neutral pH and ambient temperature.
- D) Coatings on an electrode's surface prevent new liquids from contacting an electrode's measuring surface and can mimic the effects of electrode aging. Before concluding that an electrode needs replacing, check its surface for coatings by removing the pH electrode cartridge and looking at the pH glass.
- E) Temperature affects electrode readings in two ways. First, the output of an electrode varies with temperature. For pH electrodes this effect can be corrected by manual or automatic temperature compensation. Secondly, the real pH value, independent of the electrode measuring the value or use of the temperature compensation, is temperature dependent.

Mechanical Installation

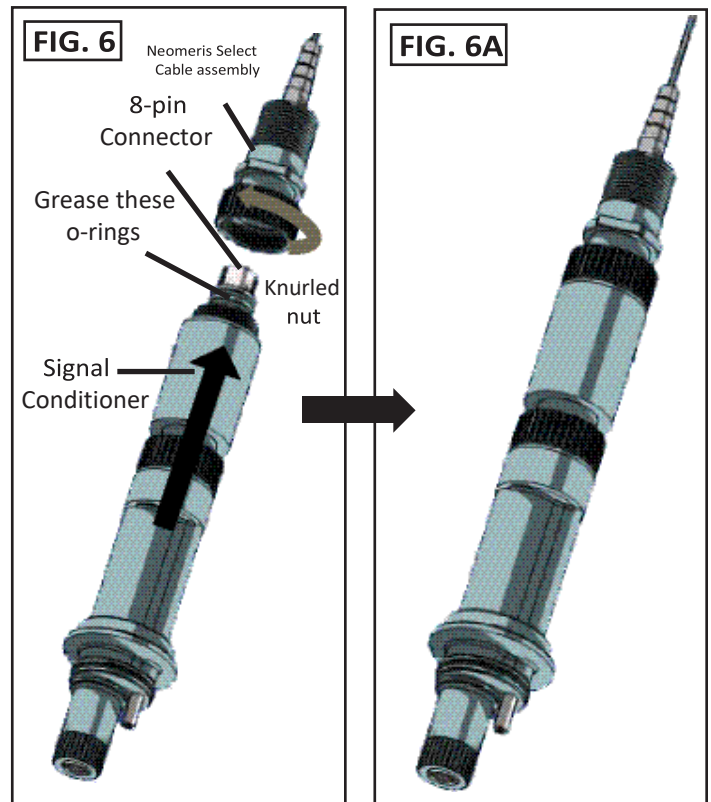
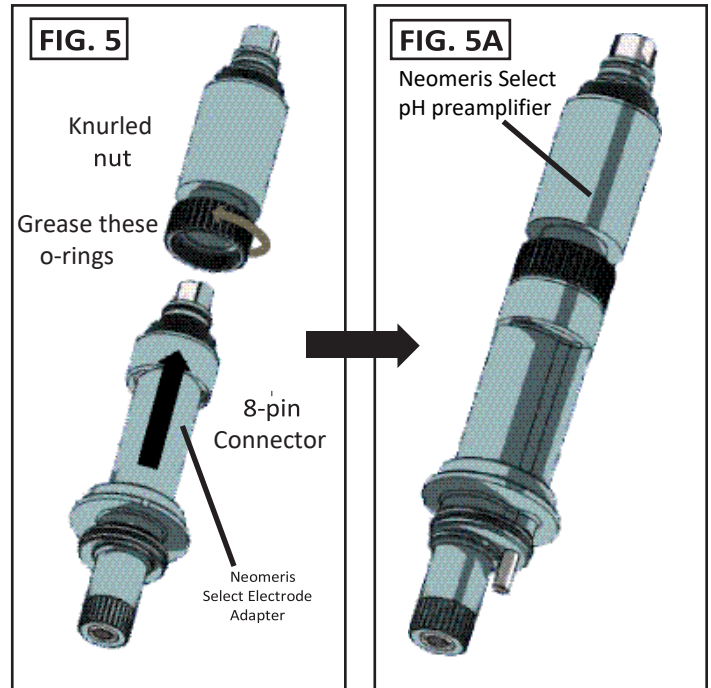
Immersion installation with automatic Temperature compensation

- A) Apply silicone or other waterproof o-ring grease to all three o-rings of the electrode cartridge (890800 EC >100 μ S/cm, 890822 EC >50 μ S/cm). Install electrode cartridge into the Neomeris Select Electrode Adapter (890801 PT1000/ 890802 PT100) by pushing it up into the housing until you feel resistance at the connector. Next, rotate the cartridge clockwise until it stops turning. The electrode should only be installed hand-tight. Fig. 3 and Fig. 3A show before and after images of this operation.
- B) Grease the Neomeris Select Electrode Adapter o-rings then install the cable assembly (890803, 3m cable/ 890804, 6m cable) onto the top of the pH sensor and housing assembly from step A, by aligning the eight-pin connector receptacle in the cable assembly with the eight-pin mating connector on the housing. Hand-tighten knurled nut onto threads of sensor housing until it stops turning. Before and after images are shown in Fig. 4 and Fig. 4A.



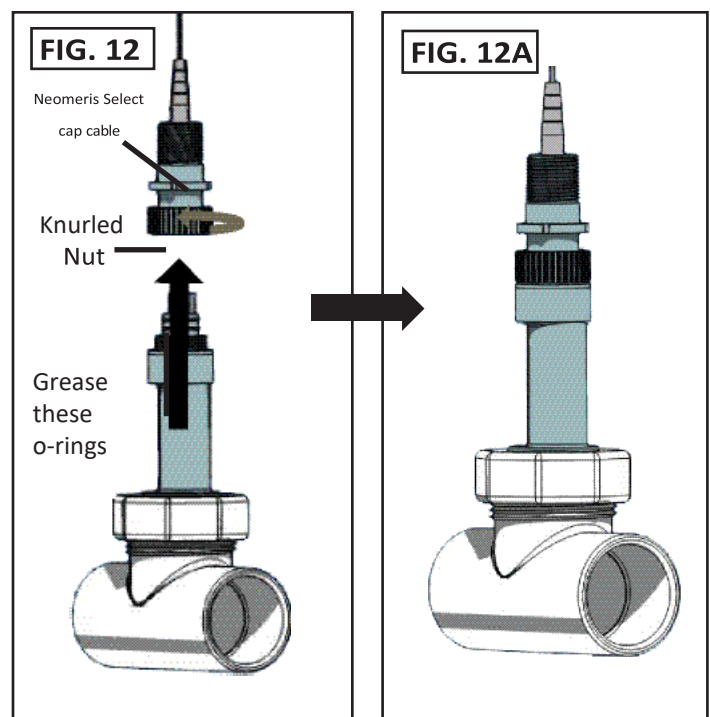
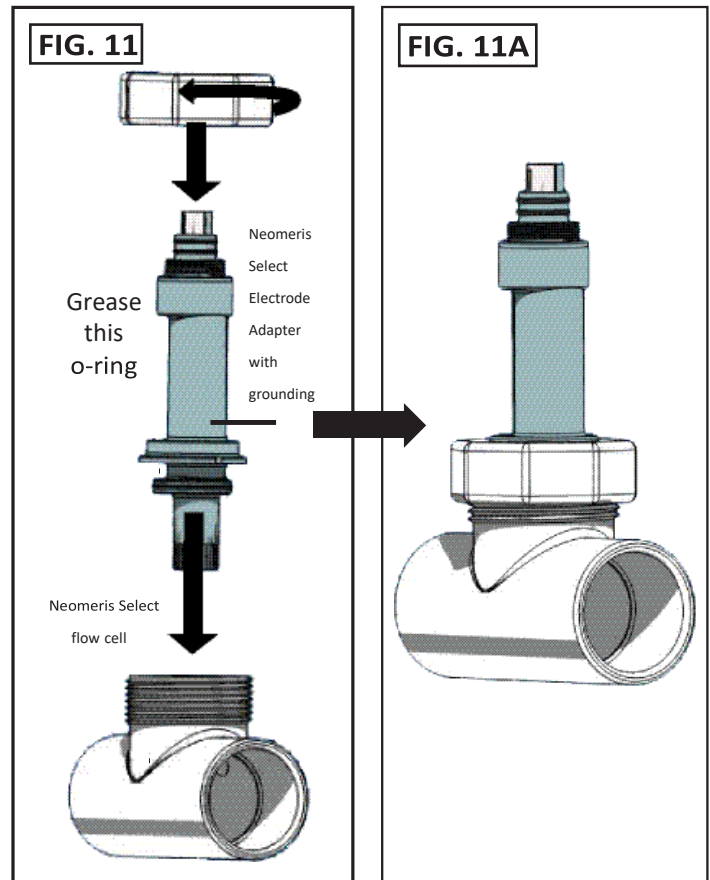
Submersion Installation with ATC and preamplifier

- A) Follow steps in Fig. 3.
- B) Install the Neomeris Select pH preamplifier (890824) assembly onto the top of the pH sensor and housing assembly by aligning the eight-pin connector receptacle in the cable assembly with the eight-pin mating connector on the housing. Hand-tighten knurled nut onto threads of sensor housing until it stops turning. See Fig. 5 and Fig. 5A.
- C) Install the Neomeris Select cable assembly onto the top of the pH sensor and housing assembly by aligning the eight-pin connector receptacle in the cable assembly with the eight-pin mating connector on the housing. Hand-tighten knurled nut onto threads of sensor housing until it stops turning. Before and after images are shown in Fig. 6 and Fig. 6A.



In-line Installation without ATC

- A) Apply grease to all three o-rings of the electrode cartridge. Install the pH electrode cartridge into housing by pushing it up into the housing until you feel resistance at the connector. Next rotate the cartridge clockwise until it stops turning. The electrode should only be installed hand-tight. Fig. 3 shows before and after images of this operation.
- B) Install electrode and housing assembly into flow cell. Flow cell choices include: Neomeris Select 1" flow cell with 3/4" inner thread NPT (890821) or Neomeris Select 1.5" flow cell with 1" inner thread NPT (890861). Use alignment tabs on housing and slots on top of tee to ensure parts mate together. Grease o-rings on housing before installing into tee to ensure proper sealing and ease of installation. Next, slide hex nut over top of housing and down until it mates with threads of tee. Hand-tighten nut only (See Fig. 11 and 11A).
- C) Install the Neomeris Select cable (890803, 3m cable/ 890804, 6m cable) assembly onto the top of the pH sensor and housing assembly by aligning the eight-pin connector receptacle in the cable assembly with the eight-pin mating connector on the housing. Thread knurled nut onto threads of sensor housing until it stops turning. Before and after images are shown in Fig. 12 and Fig. 12A.



In-line Installation with ATC and signal converter

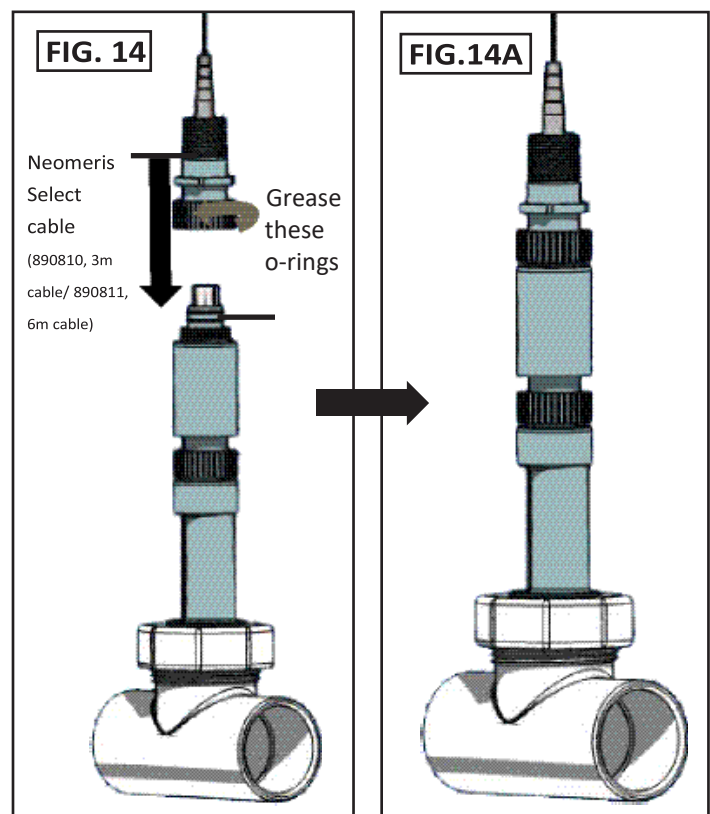
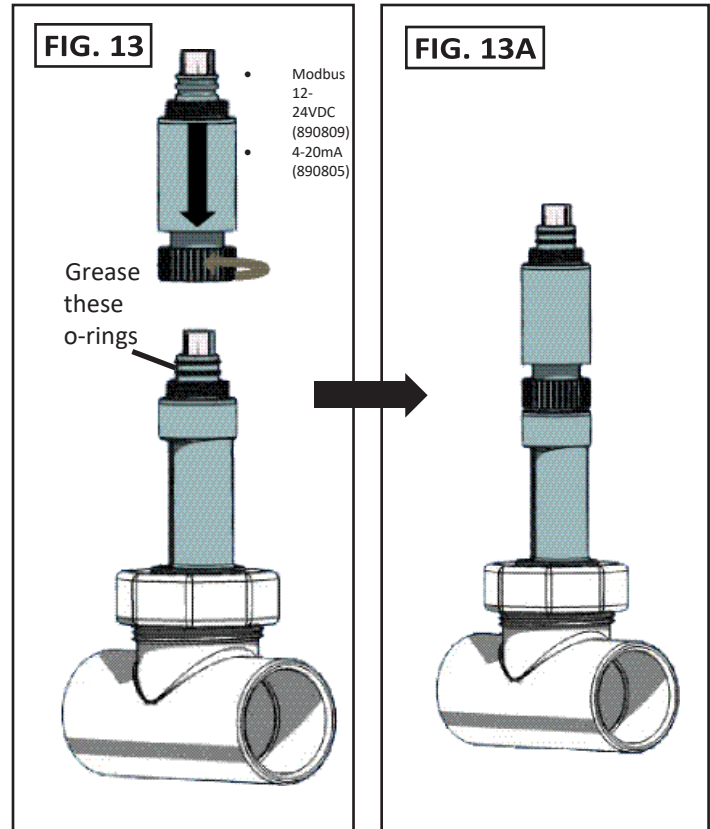
A) Apply grease to all three o-rings of the electrode cartridge. Install electrode cartridge into housing by pushing it up into the housing until you feel resistance at the connector. Next rotate the cartridge clockwise until it stops turning. The electrode should only be installed hand-tight. Fig. 3 shows before and after images of this operation.

B) Install electrode and housing assembly from step A into tee. Use alignment tabs on housing and slots on top of tee to ensure parts mate together. Grease o-rings on housing before installing into tee to ensure proper sealing and ease of installation. Next, slide hex nut over top of housing and down until it mates with threads of tee. Hand-tighten nut only (See Fig. 11 & 11A).

C) Install the signal converter as shown in Fig. 13 and Fig. 13A shown.

D) Install the cable assembly onto the top of the signal converter by aligning the eight-pin connector receptacle in the cable assembly with the eight-pin mating connector on the housing. Hand-tighten knurled nut onto threads of sensor housing until it stops turning. Before and after images are shown in Fig. 14 and Fig. 14A.

In-line Installation Notes: Make sure to install tee at least 45 degrees above horizontal position. *Do not install horizontally.* See Fig. 15.



Installation of Neomeris Select Pipe Adapter

Product Specifications

Electrode Specifications:

Neomeris Select pH electrode

(890800 EC >100µS/cm, 890822 EC >50µS/cm)

pH range:

0 - 14 pH (0-12.3 pH with low Na + ion error)

Temperature range:

0-80 ° C when installed in flow cell

0-70 ° C with submerged electronics module

Pressure range:

0-100 psig (7.5 bar)

Speed of Response:

95% in 5 seconds

Wetted Materials:

PPS (Body), HDPE (junction), pH glass,

Viton o-rings

Cable Connections:

NEOMERIS SELECT pH connection cable 3 m
or 6 m, BNC plug a. tinned cable ends f.
temperature sensor (890803 / 890804)

Coaxial:	Center = pH	} BNC connector
	Braid = Reference	
	Red: Temperature	
	Black: Temperature	
	Green: Solution Ground	

Neomeris Select connection cable for use
with 4-20mA / Modbus module, 3m or 6m,
tinned cable ends (890810 / 890811)

for use with 4-20mA (2-wire) electronic module:

wire color function description

Red: V+ 24 VDC

Black: V -

White: Not used for 4-20mA for Modbus only

Green: Not used for 4-20mA for Modbus only

for use with Modbus electronic module:

wire color function description

Red: V+ 12-24 VDC (MB 12-24 VDC)

Black: V -

White: A+ Modbus A Connection

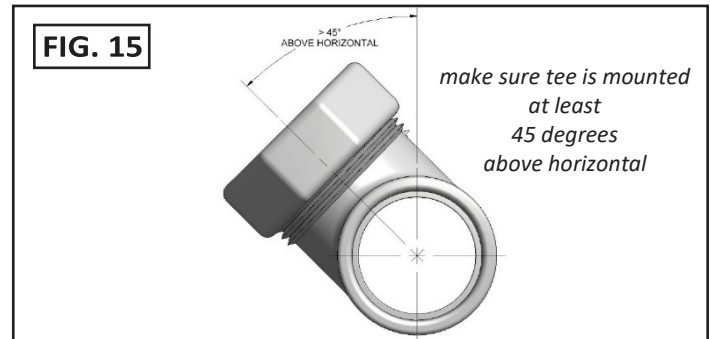
Green: B- Modbus B Connection

Mounting Hardware Electronic Module Specifications:

(890824 preamplifier / 890809 12-24VDC Modbus / 890805 4-20mA)

Temp Range: 0-80C in Tee, 0-70C with module
(derated based on pressure)

Pressure Range: 0-100psig (derated based on temp); max. 7.5 Bar



Electrode Calibration Guidelines:

As a rule, follow the procedures shown in the pH Meter's Instruction Manual. These procedures will vary depending on whether the meter is a simple type with manual adjustments, a micro-processor type or a pH transmitter.

The frequency of calibration is a function of many factors. These factors include:

- 1) The accuracy required by the application.
- 2) The value of the off-specification product versus the cost of calibration.
- 3) The coating or abrasive nature of the application.
- 4) The stability of the pH Electrode and pH Meter as a system.

The frequency of calibration is really determined by experience. At a new installation, calibration might initially be checked every few hours or shift with the calibration changes noted in a log. As a pattern of longer stability is found, the time between calibration checks can be increased to once a day or once a week.

System Calibration Concepts

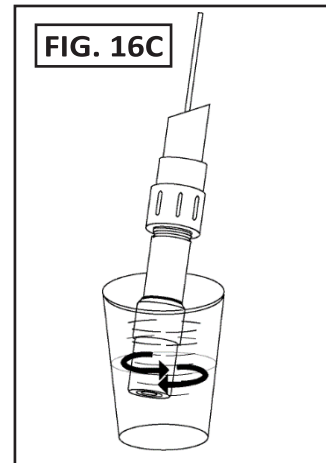
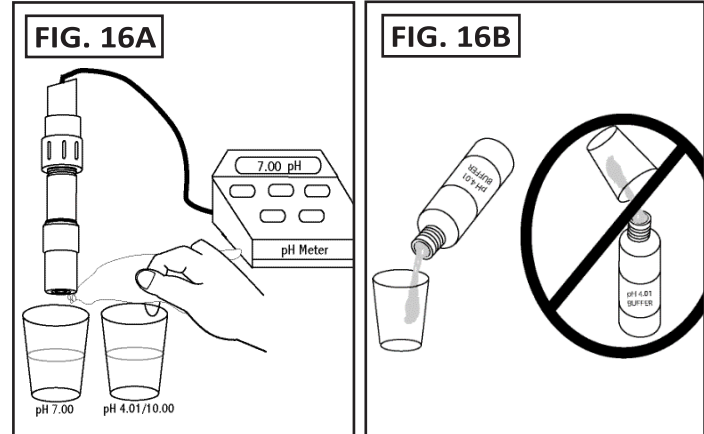
The pH Electrode and the pH Meter should always be calibrated as a system. Electronic calibration of a pH Meter with a pH signal simulator checks the meter only and does not correct for imperfections of the pH electrode. Even if perfect when new, the performance of pH electrodes varies with time, usually in an unpredictable way. When changing electrodes or connecting an electrode to a different pH meter re-calibration must be performed.

Two-Point Calibrations

Two-point calibrations correct for both the pH electrode's offset and span errors. Since both the offset and span vary with time the two-point method is the our preferred. Select the pH 7 buffer and a second buffer, close to the normal operating range (normally pH 4.01 or pH 10.00). S. Fig. 16 A-C.

Calibration based on grab samples

The Grab Sample Calibration method is used when it is difficult or undesirable to remove an electrode from a system. This method involves obtaining a sample of the liquid being measured and noting the meter's reading at that time. The sample's reading is obtained by use of a calibrated lab or portable meter and that reading is compared to that of the on-line meter. The on-line meter is adjusted by the difference between the readings. It is important to use the difference between the readings because the system's reading may have changed in the intervening time. It is important that the sample being measured by the lab meter be at the process temperature or erroneous results may occur.



Part Nr.	Neomeris Buffer Solution coloured, 250ml bottle with hygienic closure
890687	pH 4.01, +0,01 @25°C, red
890688	pH 7.00, +0,01 @25°C, green
890689	pH 9,21, +0,02 @25°C, blue
890690	pH 10,01, +0,02 @25°C, yellow

Intermittent Operation

Some facilities are only operated part of the time. When out of operation, electrodes must not be allowed to be exposed to air and become dry. Electrodes should be removed from such systems and stored in their bottles or caps or in a beaker filled, preferably, with pH 4.0 Buffer solution. In some instances, power to the meter is shut off; this condition can be harmful to electrodes. Electrodes should be disconnected from un-powered meters.

Electrode Cleaning Tips:

Coating of an electrode's measuring surface can lead to erroneous readings including shortened span and slow response times. The type of coating determines the type of cleaning technique.

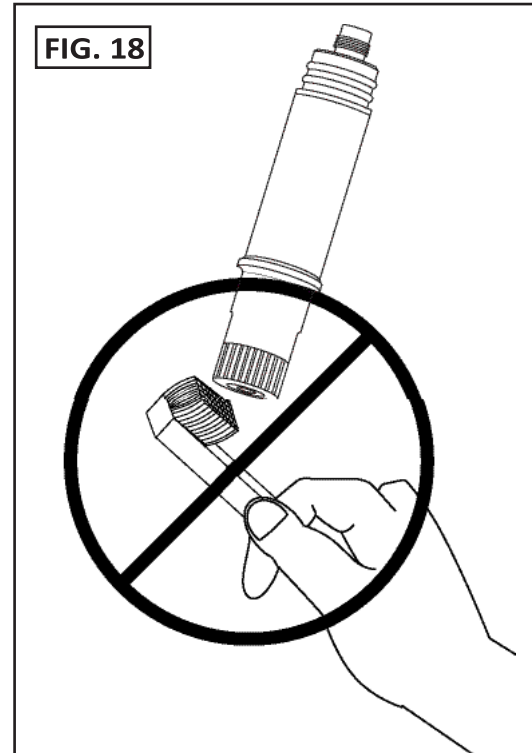
Soft Coatings can be removed by vigorous stirring, by use of a squirt bottle or very carefully, by gently wiping with a soft, clean non-abrasive paper or cloth. *Do not use any brush or abrasive cleaner on pH glass* (See Fig. 18).

Hard Coatings should be chemically removed. The chemical used to remove the coating should be the least harsh chemical that dissolves the coating in one or two minutes and does not attack the electrode's materials of construction. For example, a calcium carbonate coating might be removed with 5% HCl (muriatic acid).

Oily or Organic Coatings are best removed with detergents or an appropriate solvent that does not attack the electrode's materials of construction. For example, isopropyl alcohol might be used but acetone should be avoided if the electrode's body is made of CPVC.

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

Protein-based coatings are best removed with an enzyme-based cleaner. Abrading or sanding a pH electrode's surface should never be done.

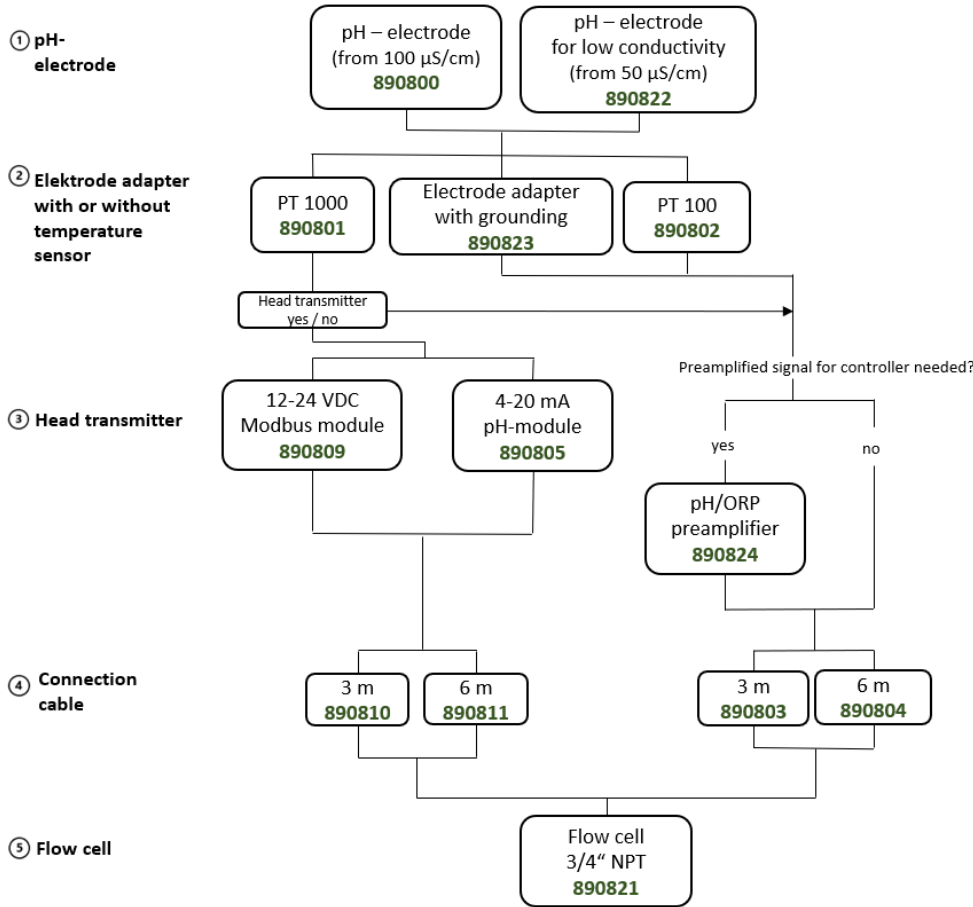


Neomeris Select pH Overview

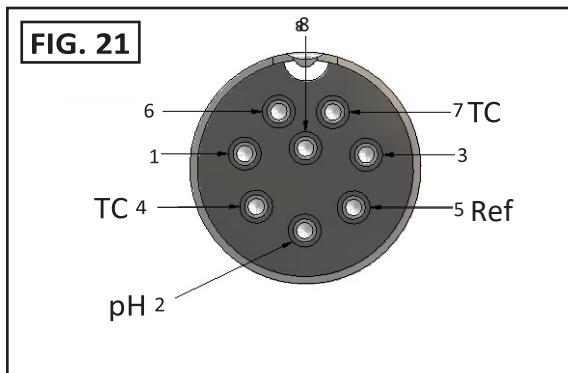
Cap Cable Assemblies

See page 6 "cable connection" for wire designs.

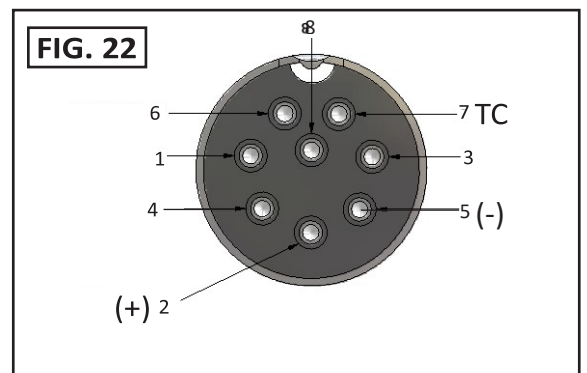
NOTE: When using a Neomeris Select Electrode Adapter (890801 / 890802 / 890823) with a Neomeris Select pH / REDOX preamplifier (890824), please note that the temperature sensor passes by the electronic module's circuit board (is not conditioned) and is then directly connected to the temperature input connections of the pH transmitter or controller.



Neomeris Select Preamplifier connector diagram



Neomeris Select Electronic Module connector diagram (Modbus / 4-20mA)



Neomeris Select pH electronic module with a 4-20 mA output Wiring (890805)

See page 6 "Cable Connections" for wiring. Please note that the pH electronic module with 4-20mA output is not adjustable.

Troubleshooting Your Neomeris Select System

General Troubleshooting

Always check all electrical connections. Make sure all parts are assembled correctly and o-rings are well greased.

Electrode Module Troubleshooting

Neomeris Select pH preamplifier (890824)

This module is battery-powered and sealed. The battery cannot be replaced. This module must be paired with a Neomeris Select electrode adapter (has solution ground input, necessary for correct function of the differential amplifier circuit). If the module fails (reads pH always), then replace with a new one. Typical life is about three years from the date stamped on the module (MMYY).

Neomeris Select pH electronic module with a Modbus output for 12VDC-24VDC (890809) / Neomeris Select pH electronic module with a 4- 20 mA output (890805)

These modules are line-powered and does not have a limited service life. A 12-24V DC power supply is suggested.

Electrode Adapter Troubleshooting

To verify that the electrode adapter is functioning properly you can:

- 1) Remove the electrode from the adapter and use a paperclip to short out the internal connector. For pH, the value should read pH7.
- 2) Use a pH simulator adapter to simulate pH4, 7 & 10 inputs.

If the adapter fails the tests, please contact the factory. Check electrode to make sure o-rings are installed. *Make sure electrode is installed in adapter before installation.* If the adapter passes the test, then the electrode is the source of the problem.

pH ELECTRODE TROUBLESHOOTING		
Buffer reading	Possible Cause	Corrective Action
6.2-6.8 in all buffers	a) Cracked pH glass b) Stress crack	a) Replace electrode b) Contact Neomeris for Return Authorization
7.00 in all buffers	a) Bad connection b) Internal short circuit	a) Check/fix connection b) Contact Neomeris for Return Authorization
Buffers read close to expected value but speed of response* is slow (>30 seconds)	a) Dirty electrode pH glass and/or reference junction b) Temperature too low	a) Clean electrode b) Flat pH glass pH electrodes should be used at Temp>10C/50F
Large offset in buffers	a) Ground loop****	a) Ground solution for tank or line to known earth ground or buy EM899TC
Short span*** (Less than 70%)	a) Dirty pH glass or reference junction b) Aged electrode	a) Clean electrode b) Replace electrode (too old)
Unstable or drifting reading	Reference dirty or plugged	Clean electrode

FIG. 24