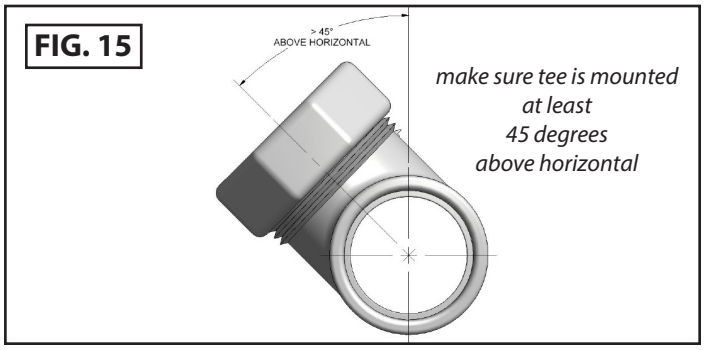
Installation of FC801 Pipe Adapter

A) Find adapter size marking on part prior to gluing into FC800 tee (SEE FIG 16).

B)Insert and glue opposite side of adapter into FC800 tee as shown in FIG 17 and 17A. Use standard recommended pipe gluing practices. Use CPVC primer and adhesive *only*.



Product Specifications

Electrode Specifications:

S8000CD

pH Range:	0-14 (sodium ion error above pH 12.3)
Temp Range:	0-100C (derated based on pressure) 0-80C (in FC800) 0-70C with EM modules
Pressure Range:	0-100psig (derated based on temp)
Speed of Response:	95% in 5 seconds
Wetted Materials:	PPS (Body), HDPE(junction), pH glass, Viton o-rings

S8000CD-HF

pH Range:	0-12
Temp Range:	0-50C (derated based on pressure)
Pressure Range:	0-100psig (derated based on temp)
Speed of Response:	95% in 5 seconds
Wetted Materials:	PPS (Body), HDPE(junction), HF-resistant pH glass, Viton o-rings

S8000CD-ORP

Range:	+/- 1000mV
Temp Range:	0-100C (de-rated based on pressure) 0-80C (in FC800 or with EM modules)
Pressure Range:	0-100psig (derated based on temp)
Wetted Materials:	PPS (Body), HDPE(junction), Platinum, Viton o-rings

Cable Connections:

S853

Coaxial: Center = pH or ORP *
Braid = Reference **

S855

Coaxial: Center = pH or ORP *
Braid = Reference **
(Note: * = 4-20mA (+) with EM802
** = 4-20mA (-) with EM802
Red: Temperature
Black: Temperature
Green: Solution Ground

Mounting Hardware Electronic Module Specifications:

FC800, FC801, EM800, EM801, EM802

Temp Range:	0-80C in Tee, 0-70C with module (derated based on pressure)
Pressure Range:	0-100psig (derated based on temp)

Electrode Calibration Guidlines:

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 onr preferred. Choose buffer pH 7 for zero-point and a second buffer close to your normal operating range (usually pH4.01 or pH 10.00). See FIG 16 A-C.

Grab Sample Calibrations

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.

FIG. 16A

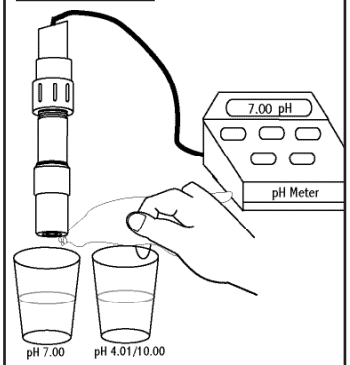


FIG. 16B

FIG. 16C

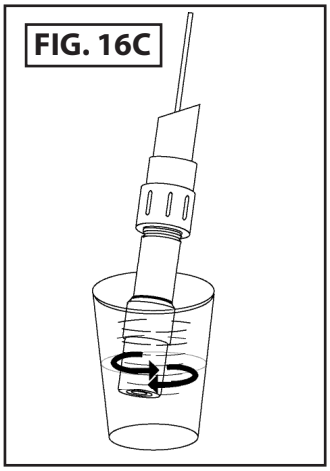


FIG. 17

PLATINUM ORP ELECTRODE IN 7 BUFFER/QUINHYDRONE MIXTURE

Temperature	20C (68F)	**25C (77F)**	30C (86F)
Readings (mV)	89-107	**83-101**	76-94
Readings (pH)	5.20-5.50	**5.30-5.60**	5.42-5.72

PLATINUM ORP ELECTRODE IN 4 BUFFER/QUINHYDRONE MIXTURE

Temperature	20C (68F)	**25C (77F)**	30C (86F)
Readings (mV)	260-287	**254-281**	247-274
Readings (pH)	2.15-2.60	**2.25-2.70**	2.37-2.82

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 (SEE FIG 10). 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.

ORP Calibration - Some instruments permit ORP calibration while others do not. Please refer to your meter's instruction manual for details. There are many types of ORP/mV standards available. See FIG 19 for quinhydrone + pH buffer standards. For all other standards, please refer to label on standard solution for acceptable measurement range.

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.

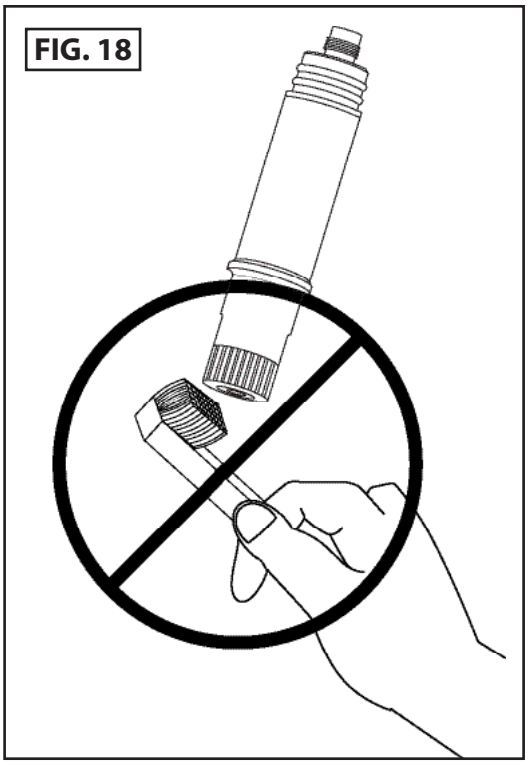
Soft Coatings can be removed by vigorous stirring, by use of a squirt bottle or very carefully, by gently wiping with a soft, clean non-abrasive paper or cloth. *Do not use any brush or abrasive cleaner on pH glass* (SEE FIG 18).

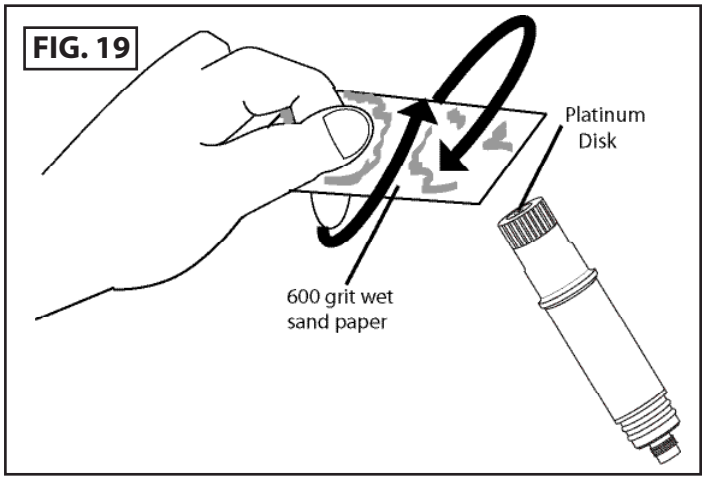
Hard Coatings should be chemically removed. The chemical used to remove the coating should be the least harsh chemical that dissolves the coating in one or two minutes and does not attack the electrode's materials of construction. For example, a calcium carbonate coating might be removed with 5% HCl (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 such as TERG-A-ZYME (www.alconox.com). Abrading or sanding a pH electrode's surface should never be done. However, the measuring surface of an ORP/REDOX electrode may be gently abraded by use of 600 grade wet silicon carbide paper (SEE FIG 19), jeweler's rouge or very fine steel wool, but try to clean chemically before abrading with 600 paper.





Electronic Modules

Three types of electronic modules are offered within the S8000 Series product line. See FIG 20 for choices. Model EM800, a unity gain amplifier module, allows users to send a signal up to 1000 feet remotely from the electrode to the transmitter or controller.

You can choose cable S853 or S855 to use with EM800. The S853 cable will transmit the electrode output only (no temperature compensation). Cap cable model S855 will send the signal via the coaxial cable and will also transmit the temperature signal. Model EM801 is a differential amplifier that requires the use of electrode adapter EA899TC, which incorporates a stainless steel solution ground that feeds into the EM801. This module (EM801) is useful for application in which the ground potential of the liquid is elevated (ground loop). Like the EM800, you can use either S853 or S855 cap cable with the EM801. Model EM802pH is a blind 4-20mA loop-powered transmitter module that is factory calibrated and is not adjustable. An external power supply is required (user supplied). The EM802pH module should be used with electrode adapter EA899TC. The 4-20mA output from the EM802pH will already be temperature compensated via the Pt1000 RTD that will be in the EA899TC-P1k module. Module EM802ORP can be used with electrode adapter EA891(submersion without temperature sensor) or EA899 (in-line without temperature sensor).

NOTE: When using EA899TC with either EM800 or EM801, 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.

Cap Cable Assemblies

See page 8 "Cale Connections" for wire designations.

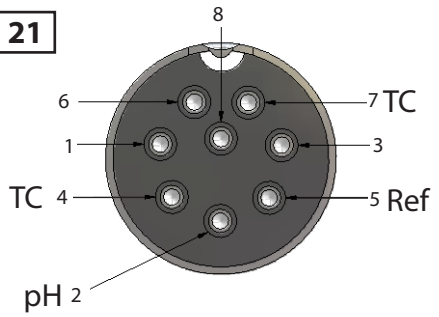
MODULE, ADAPTER AND CABLE CHOICES

Electronic Module	Electrode Adapter	Cable Assembly
EM800	EA891, EA899 EA899TC	S853 S855
EM801	EA899 EA899TC	S853 S855
EM802pH	EA899TC-P1k	S853
EM802ORP	EA891 or EA899	S853

FIG. 20

EM800 & EM801 CONNECTOR DIAGRAM TO S853 AND S855 CABLE ASSEMBLIES

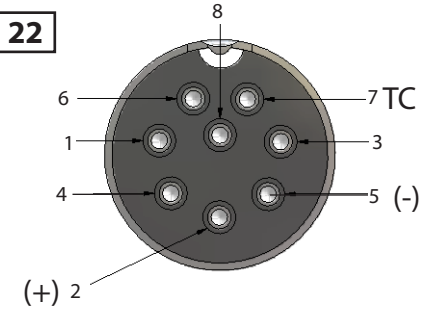
FIG. 21



TC's are for S855 cable only

EM802 CONNECTOR DIAGRAM TO S853 CABLE ASSEMBLY

FIG. 22



EM802pH and EM802ORP Wiring

See FIG 23 for wiring. Please note that EM802's 4-20mA output is not adjustable.

Troubleshooting Your S8000 System

General Troubleshooting

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

Electrode Module Troubleshooting

EM800 - This module is battery-powered and sealed. The battery cannot be replaced. If the module fails (reads 7pH always or 0mV for ORP), then replace with a new one. Typical life is about three years from the date stamped on the module (MMYY).

EM801 - This module is battery-powered and sealed. The battery cannot be replaced. This module must be paired with electrode adapter EA899TC (has solution ground input, necessary for correct function of the differential amplifier circuit). If the module fails (reads 7pH always or 0mV for ORP), then replace with a new one. Typical life is about three years from the date stamped on the module (MMYY).

EM802 - This module is line-powered and does not have a limited service life. Wire the EM802 + S853 cable as shown in FIG 25. 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 paper-clip to short out the internal internal connector. For pH, the value should read pH7. ForORP it shold read 0mV.
2) Use C110 simulator + CX3 adapter (from Sensorex) to simulate pH4, 7 &10 inputs or +700 & -700mV for ORP.

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.

Electrode Troubleshooting

See FIG 24 table for typical electrode symptoms, causes and corrective actions.

EM802 LOOP-POWERED pH AND ORP TRANSMITTER WIRING

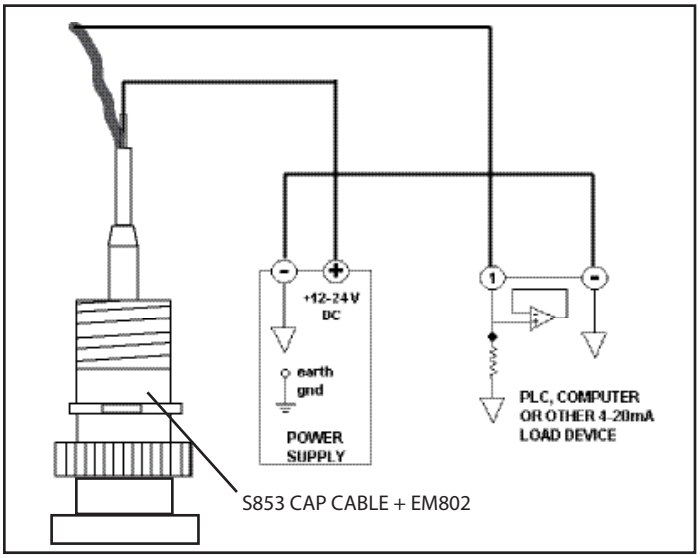


FIG.23

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 Sensorex for Return Authorization
7.00 in all buffers	a) Bad connection b) Internal short circuit	a) Check/fix connection b) Contact Sensorex 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