

Signet 2750 DryLoc® pH/ORP Sensor Electronics



3-2750.090 Rev. N 10/16

Operating Instructions

2750-1, 2750-2



2750-3, 2750-4



2750-7



- [English](#)
- [Deutsch](#)
- [Français](#)
- [Español](#)



Description

Signet 2750 pH/ORP Sensor Electronics provide two-wire 4 to 20 mA loop output for pH and ORP measurements, without the expense of local display and other luxuries available in full-featured transmitters. Pre-amplification is built-in, reducing system costs while ensuring absolute signal integrity up to 305 m (1,000 ft).

These sophisticated field-mount devices also provide digital (S³L) output. The 2750 Sensor Electronics self-configure for pH or ORP operation via automatic recognition of electrode type, and the DryLoc® electrode connector quickly forms a robust assembly for submersible and in-line installations.

NEMA 4X Junction Boxes are integral parts of the in-line versions (2750-1, 2750-2, and 2750-7) and are available as accessories for the submersible versions (2750-3 and 2750-4). The optional EasyCal feature allows simple push-button calibration and includes an LED for visual feedback.

Table of Contents

Warranty Information	2
Product Registration	2
Safety Information	2
Chemical Compatibility	2
Specifications	2-3
In-Line Installation Notes	3
In-Line Dimensions	3
Mounting Position	4
In-Line Assembly	4-5
Submersible Installation	5-6
Digital (S ³ L) Wiring	6
4 to 20 mA Loop Wiring	7
Calibration	7
Troubleshooting	8
Ordering Information	8

Warranty Information

Refer to your local Georg Fischer Sales office for the most current warranty statement.

All warranty and non-warranty repairs being returned must include a fully completed Service Form and goods must be returned to your local GF Sales office or distributor. Product returned without a Service Form may not be warranty replaced or repaired.

Signet products with limited shelf-life (e.g. pH, ORP, chlorine electrodes, calibration solutions; e.g. pH buffers, turbidity standards or other solutions) are warranted out of box but not warranted against any damage, due to process or application failures (e.g. high temperature, chemical poisoning, dry-out) or mishandling (e.g. broken glass, damaged membrane, freezing and/or extreme temperatures).

Product Registration







Thank you for purchasing the Signet line of Georg Fischer measurement products.

If you would like to register your product(s), you can now register online in one of the following ways:

- Visit our website www.gfsignet.com. Under **Service and Support** click on **Product Registration Form**
- If this is a pdf manual (digital copy), [click here](#)

Safety Information

1. Depressurize and vent system prior to installation or removal.
2. Confirm chemical compatibility before use.
3. Do not exceed maximum temperature/pressure specifications.
4. Wear safety goggles or faceshield during installation/service.
5. Do not alter product construction.
6. When using chemicals or solvents care should be taken and appropriate eye, face, hand, body, and/or respiratory protection should be used.

	Caution / Warning / Danger Indicates a potential hazard. Failure to follow all warnings may lead to equipment damage, injury, or death
	Personal Protective Equipment (PPE) Always utilize the most appropriate PPE during installation and service of Signet products.
	Pressurized System Warning Sensor may be under pressure, take caution to vent system prior to installation or removal. Failure to do so may result in equipment damage and/or serious injury.
	Hand Tighten Only Overtightening may permanently damage product threads and lead to failure of the retaining nut.
	Do Not Use Tools Use of tool(s) may damage product beyond repair and potentially void product warranty.
	Note / Technical Notes Highlights additional information or detailed procedure.

Chemical Compatibility

The retaining nuts of pH and ORP sensors are not designed for prolonged contact with aggressive substances.

Strong acids, caustic substances and solvents or their vapor may lead to failure of the retaining nut, ejection of the sensor and loss of the process fluid with possibly serious consequences, such as damage to equipment and serious personal injury.

Retaining nuts that may have been in contact with such substances e.g. due to leakage or spilling, must be replaced.



Specifications

General

Compatible Electrodes.....	Signet DryLoc Electrodes (PT1000 or 3K Balco temperature sensor versions for pH)
Operational Range 2750.....	0.00 to 14.00 pH, ±2000 mV ORP, 0 °C to 85 °C (32 °F to 185 °F)
Response Time (includes electrode response):	
pH	<6 s for 95% of change
ORP	application dependent
pH Temp T90	200 s (2724 and 2734) 132 s (2726 and 2736) 438 s (2756-WT)

Materials

In-line:	2750-1, 2750-2, 2750-7..... PBT (thermal plastic polyester)
Submersible:	2750-3, 2750-4..... CPVC
Cable for 2750-3, 2750-4, 2750-7:	
•	5 m (15 ft) 3-conductor shielded, 22 AWG
•	May be extended up to 305 m (1000 ft) with current output
•	May be extended up to 305 m (1000 ft) with (S ³ L) output

Shipping Weight

2750-1, 2750-2.....	0.75 kg (1.75 lb)
2750-3, 2750-4, 2750-7	0.64 kg (1.4 lb)

Environmental

Ambient Temp.....	0 °C to 85 °C (32 °F to 185 °F)
Storage Temp.	-20 °C to 85 °C (-4 °F to 185 °F)
Relative Humidity	95% max, non-condensing
Immunity.....	EN50082-2
Emissions.....	EN50081-1

Enclosure Rating

In-line:	2750-1, 2750-2, 2750-7 NEMA 4X/IP65 (with electrode connected)
Submersible:	2750-3, 2750-4..... NEMA 6P/IP68 (with electrode and watertight extension pipe connected)

Electrical

Input Impedance	>10 ¹¹ Ω
Input response time	500 ms
Temperature drift.....	±0.002 pH per °C, ±0.1 mV ORP per °C
Input resolution.....	0.02 pH, 1 mV ORP, 0.3 °C

Specifications


Current Output

pH.....	Fixed 4 to 20 mA, isolated, 0 to 14 pH (custom scaling available)
ORP.....	Fixed 4 to 20 mA, isolated, -1000 to 2000 mV (custom scaling available, -2000 to 2000 mV)
Power.....	Regulated 12-24 VDC \pm 10%, 20 mA max.
Max Loop Resistance.....	50 Ω max. @ 12V 325 Ω max. @ 18V 600 Ω max. @ 24V
Accuracy.....	\pm 32 μ A @ 25 $^{\circ}$ C
Temperature drift.....	\pm 1 μ A per $^{\circ}$ C
Output resolution.....	\pm 5 μ A
Error indication.....	3.6 mA

Digital (S³L) Output:

Description.....	Serial ASCII, TTL level 9600 bps
Power.....	5 VDC \pm 10% regulated, 3 mA max
Accuracy:	
pH.....	\pm 0.03 pH @ 25 $^{\circ}$ C
ORP.....	\pm 2 mV @ 25 $^{\circ}$ C
Resolution:	
pH.....	0.01 pH
ORP.....	1 mV
Temp.....	0.2 $^{\circ}$ C
Error indication.....	Temp output "+999.9"

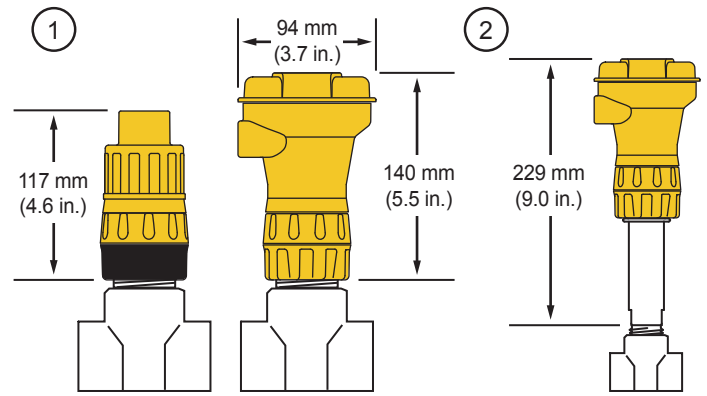
Standards and Approvals

- CE, RoHS Compliant
 - Manufactured under ISO 9001 for Quality, ISO 14001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety.
-  China RoHS (Go to www.gfsignet.com for details)
- FC** Declaration of Conformity according to FCC Part 15.
This device complies with Part 15 of the FCC rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and,
(2) This device must accept any interference received, including interference that may cause undesired operation.

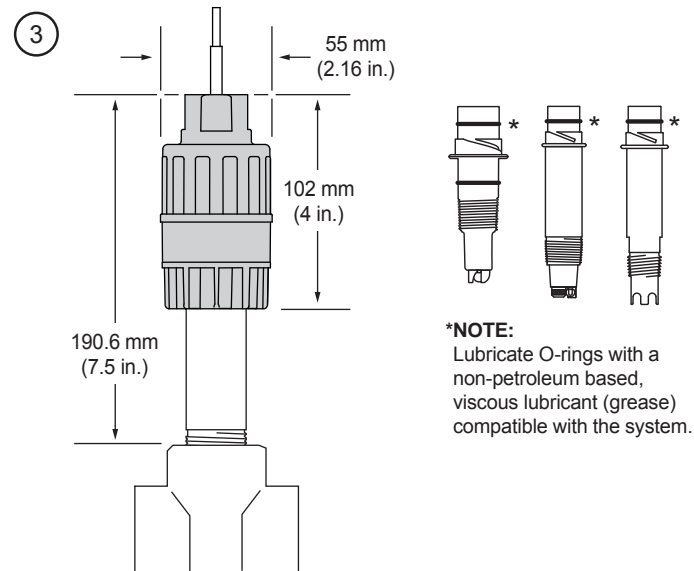
In-Line Installation Notes

- A Signet installation fitting (12.7 mm to 101.6 mm [1/2 in. to 4 in.]) or a threaded tee is required to secure the electrode in the pipe.
 - The Signet Measurement and Instrumentation catalog offers a complete selection of fittings.
 - 2724, 2734, 2764, and 2774 series sensors thread directly into standard 1 in. or 3/4 in. NPT fittings.
1. 2750-1 and 2750-7 In-Line sensor (without EasyCal) are designed for applications where electrode calibration is facilitated by remote equipment. A 8050-2 or 8052-2 junction box is required to use EasyCal with the 2750-1 or 2750-7.
 2. 2750-2 In-Line sensor includes EasyCal.
 3. The 2750-3 and 2750-4 submersible sensor electronics are recommended for in-line applications using the 2764 series differential sensors and the 2774 series Threaded DryLoc sensors. A 8050-2 or 8052-2 junction box is required to use EasyCal with the 2750-3 or 2750-4.
 4. 2756 and 2757 Wet-Tap sensors require the 3719 Wet-Tap assembly and can use the 2750-1, 2750-2 or 2750-7 versions.

In-Line Dimensions

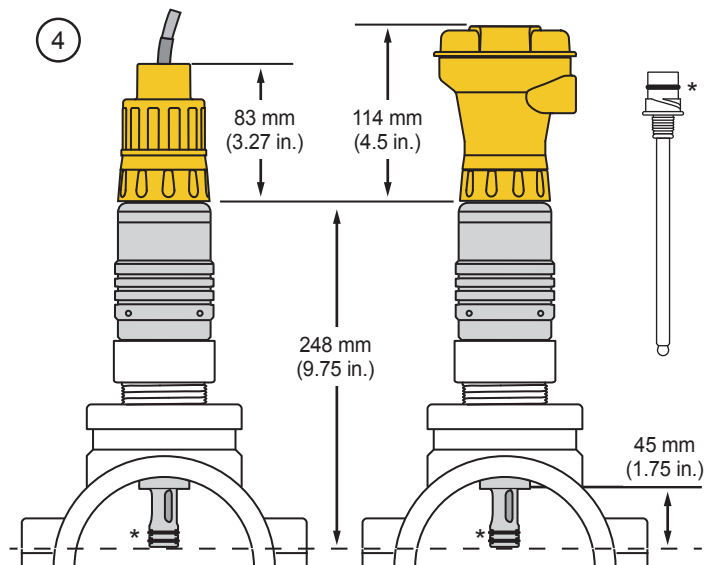


2750-1, 2750-2 and 2750-7 with 272X, 273X, 2764 or 2774 sensors



2750-3 and 2750-4 with 2764 or 2774 sensors

***NOTE:**
Lubricate O-rings with a non-petroleum based, viscous lubricant (grease) compatible with the system.



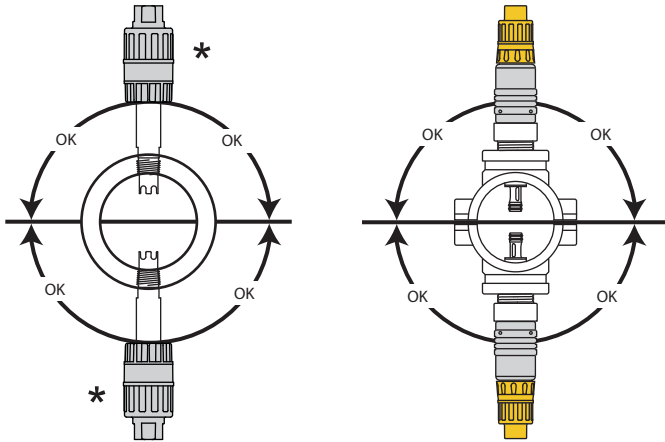
2750-1, 2750-2 and 2750-7 with 3719 and 2756 or 2757 Wet Tap Sensors

Mounting Position

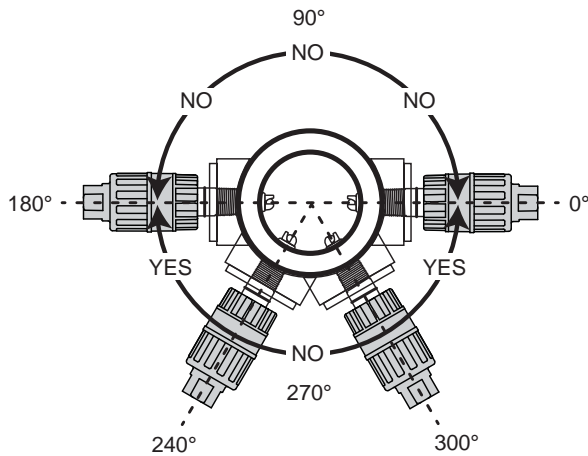
Wet-Tap electrodes, 2724, 2734, and 2774 series electrodes

Mounting Angle using GF Signet Fittings.

*Avoid locations with air pockets and/or sediment (90° and 270°).

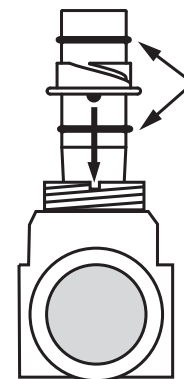
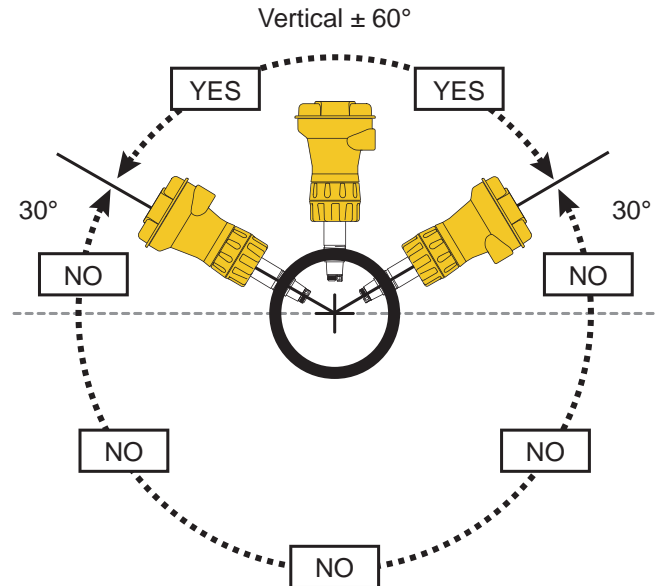


When mounting in a standard threaded fitting, the electrode must be mounted horizontal to 60 degrees below horizontal position only:



2764 series electrodes MUST be mounted upright.

- Vertical (0°) position optimum.
- DO NOT install within 30° of horizontal (Contact factory for horizontal or inverted installation requirements).



2750 In-Line Assembly

NOTE:

This procedure applies to systems using 2724-2726 and 2734-2736 electrodes. If the 3719 pH/ORP Wet-Tap is used, refer to the 3719 manual for instructions.

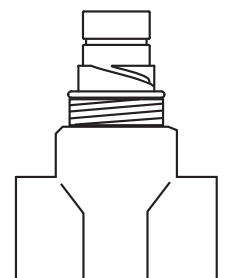
1. Insert electrode into Signet installation fitting. Seat the electrode tabs into the alignment notches in the fitting.

2. Thread the in-line retaining nut onto fitting to secure the electrode into place.



HAND-TIGHTEN THE THREADED NUT ONTO THE INSTALLATION FITTING. DO NOT USE TOOLS! DO NOT USE THREAD SEALANT OR LUBRICANTS ON THE FITTING THREADS OR THE SENSOR CAP.

Retaining nut



Chemical Compatibility Warning

- The retaining nuts of pH and ORP sensors are not designed for prolonged contact with aggressive substances.
- Strong acids, caustic substances and solvents or their vapor may lead to failure of the retaining nut, ejection of the sensor and loss of the process fluid with possibly serious consequences, such as damage to equipment and serious personal injury.
- Retaining nuts that may have been in contact with such substances e.g. due to leakage or spilling, must be replaced.

2750 In-Line Assembly

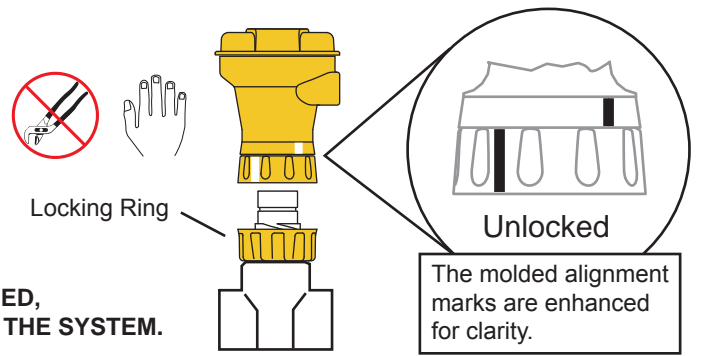
NOTE:

Keep the electrical interconnection between electrode and sensor electronics dry and clean at all times.

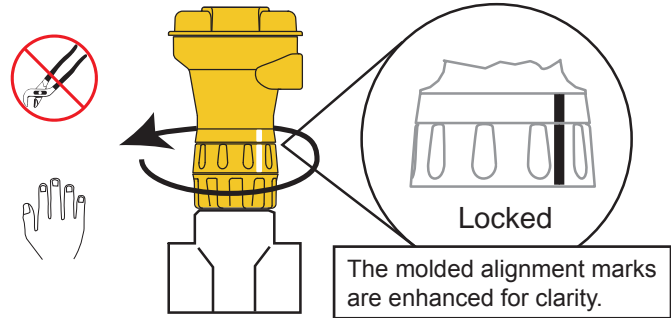
- Unlock the ring on base of 2750 (The ring is unlocked when the lines on the ring and body of the 2750 are not aligned.)



LUBRICATE O-RINGS WITH A NON-PETROLEUM BASED, VISCOUS LUBRICANT (GREASE) COMPATIBLE WITH THE SYSTEM.



- Place 2750 onto top of electrode and turn until the assembly drops into position.
- Turn locking ring $\frac{1}{4}$ turn to secure the 2750 assembly. (The ring is locked when the line on the ring and the line on the body of the 2750 are aligned.)



In-Line Sensor and Electrode Removal

- To remove electronics assembly only: Turn locking ring $\frac{1}{4}$ turn; lift assembly straight up.
- To remove electrode from the pipe: Remove electronics assembly, then unthread retaining nut; pull electrode straight up.
- To remove the complete 2750 system: Hold locking ring in place. Unthread retaining nut and pull electrode straight up.

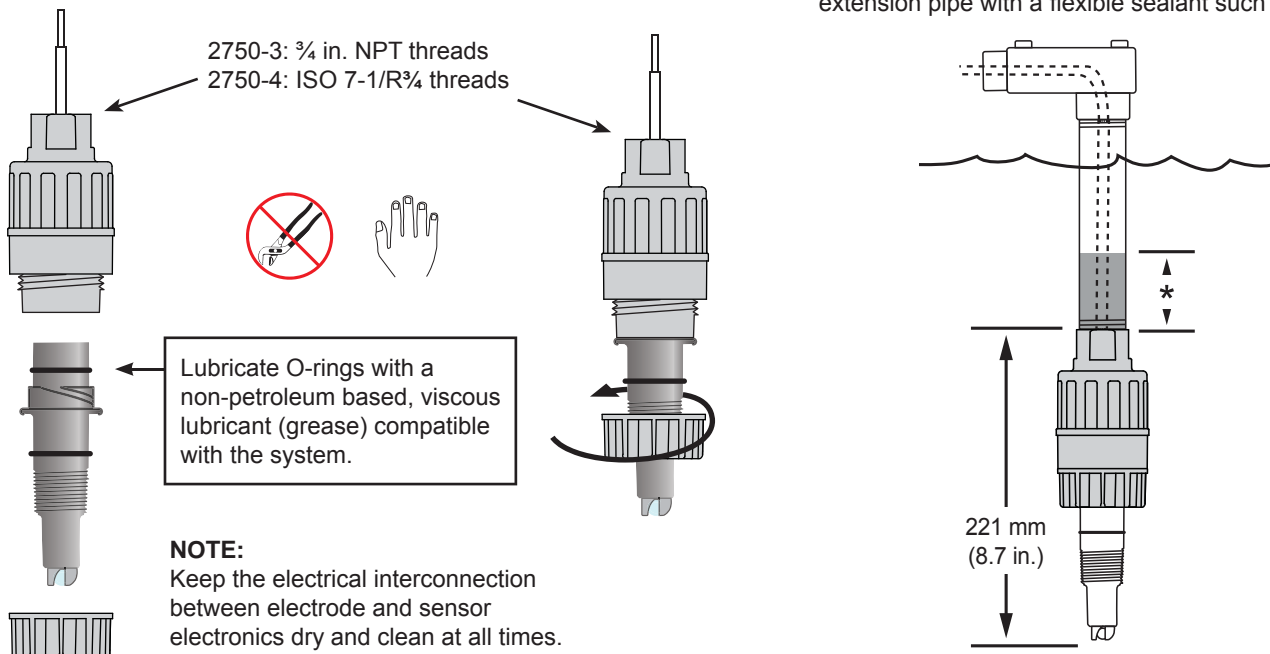


CAUTION!

- Do not remove the electrode from a pressurized pipe.
- Wear appropriate protective clothing when working with chemicals in pressurized pipe.

2750-3, 2750-4 Submersible Installation

- Insert electrode into base of the 2750-3 or 2750-4 and turn until keyed contacts are seated.
NOTE: Lubricate O-ring if installing sensor is difficult.
- Thread retaining nut over electrode and hand-tighten onto 2750.
- Attach $\frac{3}{4}$ in. watertight pipe to the top of the 2750. 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 75 mm to 100 mm (3 in. to 4 in.) of conduit or extension pipe with a flexible sealant such as silicone.



2750-3, 2750-4 Submersible Installation

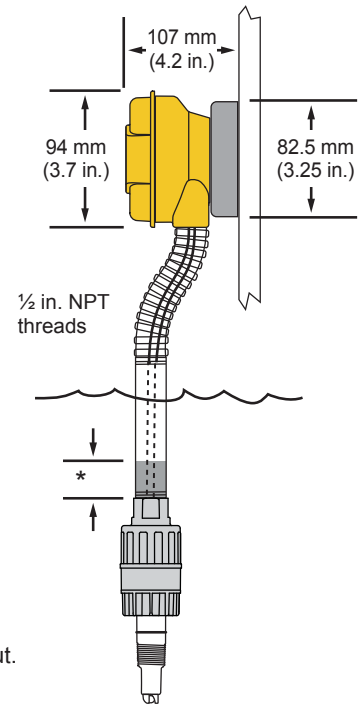
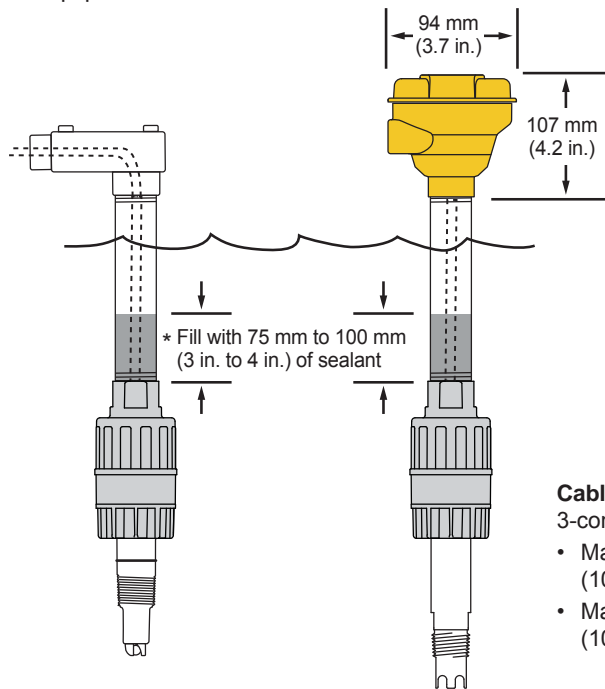
Use standard installation hardware to connect the submersible 2750-3 or 2750-4 directly to external equipment.

OR

The 8052-1 NPT Mount Junction box (or 8052-2 with EasyCal) connects to ¼ in. pipe or conduit and provides convenient wiring termination.

OR

The 8050-1 Universal Mount junction box (or 8050-2 with EasyCal) mounts flat onto a wall or can be strapped to a post or pipe.

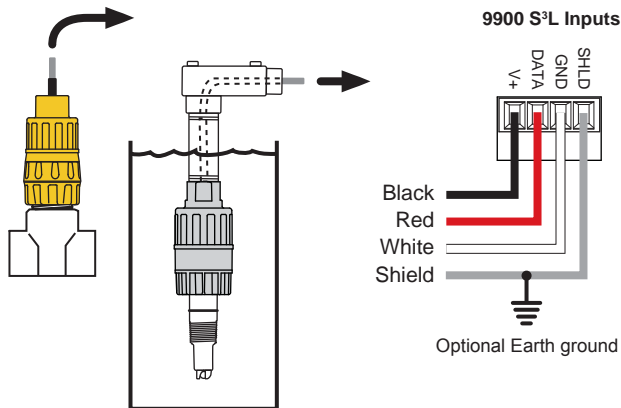


- Cable supplied:** 5 m (15 ft)
3-conductor + shield, 22 AWG.
- May be extended up to 305 m (1000 ft) with current output.
 - May be extended up to 305 m (1000 ft) with Digital (S³L) output.

Digital (S³L) Wiring

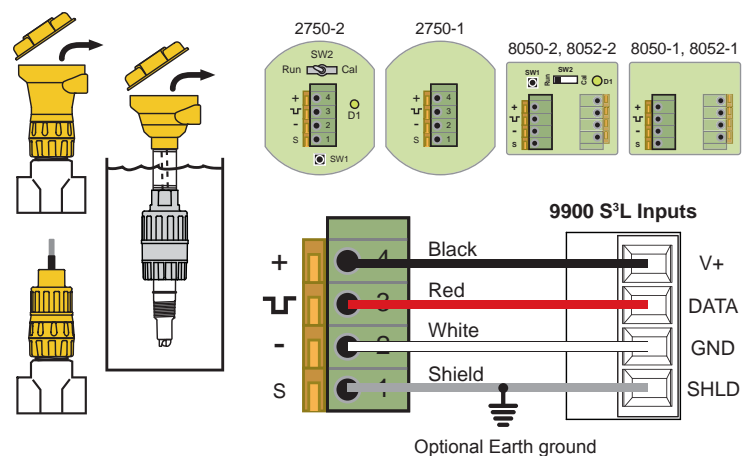
- When the 2750 is powered with 5 VDC, the digital (S³L) serial data output is automatically selected.
- (S³L) data is used exclusively by Signet instruments.
- Remove approximately 10 mm (0.4 in.) of insulation and tin each conductor before inserting into connectors.
- To add the EasyCal function to the 2750-1, 2750-3, 2750-4 and 2750-7, use the 8050-2 or 8052-2 junction box.

Digital (S³L) with no junction box



- Connect the 2750 cable directly to digital (S³L) terminals.
- **8900 and 9900 users:**
If this direct wiring is used, set the CALIBRATE menu to perform Calibration at "INSTRUMENT"

Digital (S³L) with Junction box

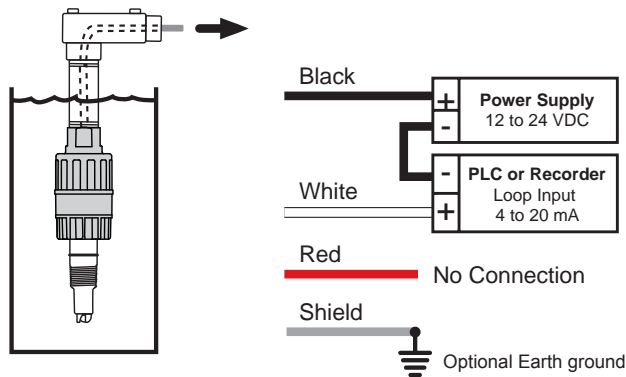


- Connect the terminals as shown to any digital (S³L) terminals.
- **8900 and 9900 users:**
If using EasyCal, set the CALIBRATE menu to either perform Calibration at "SENSOR" or "INSTRUMENT"
 - If SENSOR, use standard pH buffer values (pH 4, 7, or 10; ORP 87 and 264 mV) to perform periodic calibration.
 - If INSTRUMENT, any pH/ORP value can be used.

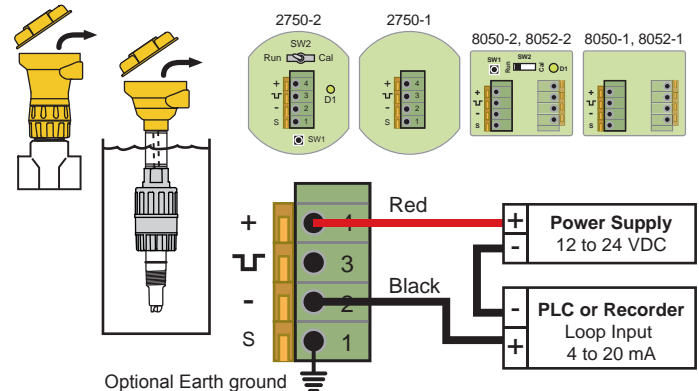
4 to 20 mA Loop Wiring

- When the 2750 is powered with 12 to 24 VDC, the 4 to 20 mA loop output is automatically selected.
- Remove approximately 10 mm (0.4 in.) of insulation and tin each conductor before inserting into connectors.
- To add the EasyCal function to the 2750-1, 2750-3 and 2750-4, use the 8050-2 or 8052-2 junction box.

Current Loop with no junction box



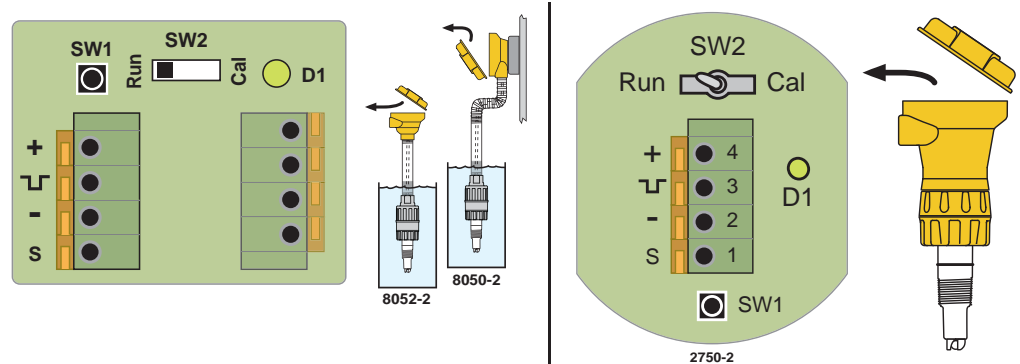
Current loop with Junction box



Calibration

All 2750 pH/ORP Sensor Electronics are factory-calibrated for maximum out-of-the-box accuracy. Periodic calibration is required to compensate for electrode aging.

The optional EasyCal feature allows calibration to be performed local to the sensor.



Required Equipment:

- 2750-2 with built-in EasyCal
or
- Any 2750 with 8050-2 or 8052-2 junction box with EasyCal
- Standard pH buffers (pH 4, 7 or 10)

SW1 EasyCal button
SW2 RUN/CALIBRATE switch for (S³L) system
D1 EasyCal Indicator (green LED)

EasyCal Procedure:

The first step (Reset) is recommended each time an electrode is replaced, but is NOT necessary upon initial installation or periodic calibration.

In fact, for periodic calibration it is best for the electrode/sensor assembly to remain intact to minimize the possibility of moisture or other contamination entering the electrical interconnection area. The electrode/sensor connection must remain dry and clean at all times.

1. Reset the 2750 pH/ORP Sensor Electronics to factory calibration: With no electrode connected to the Sensor, press and hold SW1 until the LED (D1) comes on steady then goes off again (approx. 10 seconds). When the LED goes off, release SW1; reset is complete.
2. Connect an electrode to the 2750 pH/ORP Sensor Electronics.
3. **If digital (S³L) output is being used, place SW2 in the "Cal" position. If 4 to 20 mA output is being used, SW2 position is of no consequence.**
4. Place the electrode/sensor assembly into a calibration solution as follows: (If the electrode is "healthy", then the 2750 will automatically recognize the solution. The order in which the solutions are used during the calibration procedure is of no consequence).
 - For pH calibration, use any two of these international standards: pH 4.0, 7.0 or 10.0 buffer solutions. (Signet part number 3-0700.390 contains one capsule of each value)
 - To produce standards for ORP calibration, mix the chemical Quinhydrone into pH 7.0 and 4.0 buffers to saturation (1/8 g per 50ml).
 - Regardless of the size of the container used for calibration, one inch of solution is adequate to completely submerge the tip of the electrode.
 - **Allow at least 30 seconds for the electrode response to stabilize before calibration.**
5. Press and hold SW1 for approximately 8 to 10 seconds. During this time, the LED (D1) will come on steady then go back off. Release SW1 (If the LED blinks several times rapidly, the calibration was not successful. See the troubleshooting section.)
6. Remove the electrode/sensor assembly from the first calibration solution, rinse the electrode with clean water, and place it in a second solution. **Allow at least 30 seconds for the electrode response to stabilize before calibration.**
7. Press and hold SW1 for approximately 8 to 10 seconds. During this time, the LED will come on steady then go back off. Release SW1. (If the LED blinks several times rapidly, the calibration was not successful. See the troubleshooting section.)
8. **For digital (S³L) systems ONLY: Return SW2 to the RUN position.**

Calibration is complete. Return the system to service.

Troubleshooting

LED and Output Condition	Possible Causes	Suggested Solutions
Current Output: LED off, current output is 3.6 mA Digital (S³L): Transmitter (8900 or 9900) displays "Check Sensor"	<ul style="list-style-type: none"> No electrode installed. Bad/dirty contacts between electrode and 2750. 	<ul style="list-style-type: none"> Install electrode. Check interconnection between electrode and 2750, clean contacts, and/or lubricate sensor o-ring.
During EasyCal, the LED blinks rapidly for 4 seconds and the current output is frozen at a random fixed value.	<ul style="list-style-type: none"> Buffer solution is outside of the accepted tolerance for the 2750. The electrode is depleted (> 1.1 pH or 65 mV offset). 	<ul style="list-style-type: none"> pH system: Use fresh 4 pH, 7 pH, or 10 pH buffer and restart the calibration. ORP system: Use fresh 4 pH and 7 pH buffer solution saturated with Quinhydrone, or Light's Solution. Clean or replace the electrode.
After completing calibration procedure, the output values are inaccurate.	<ul style="list-style-type: none"> Insufficient time allowed for electrode stabilization during calibration. 	Recalibrate: <ul style="list-style-type: none"> Verify that test solutions are at room temperature Wait at least 30 seconds after placing electrode in solution before pressing S1 EasyCal button.

Ordering Information

DryLoc pH/ORP Sensor Electronics

Mfr. Part No.	Code	Description
3-2750-1	159 000 744	In-line Sensor Electronics with Junction Box
3-2750-2	159 000 745	In-line Sensor Electronics with Junction Box and EasyCal
3-2750-3	159 000 746	Submersible Sensor Electronics with 4.6 m (15 ft) cable, ¼ in. NPT threads
3-2750-4	159 000 842	Submersible Sensor Electronics with 4.6 m (15 ft) cable, ISO 7-1/R¾ threads
3-2750-7	159 001 671	In-line Sensor Electronics, Digital (S ³ L), with 4.6 m (15 ft) cable, ¼ in. NPT threads
3-2750-8		In-line Sensor Electronics, with 4.6 m (15 ft) cable, ISO 7-1/R¾ threads (Special Order Only)

Parts and Accessories

3-0700.390	198 864 403	pH Buffer Kit
3-2700.395	159 001 605	Calibration kit: included 3 PP cups, cup stand, 1 pint pH 4.01, 1 pint pH 7.00
3-2759	159 000 762	pH/ORP Simulator/System tester
3-2759.391	159 000 764	Adapter cable to connect 2759 and 2750
3-8050-1	159 000 753	Universal Mount Junction Box
3-8050-2	159 000 754	Universal Mount Junction Box with EasyCal
3-8052-1	159 000 755	¼ in. NPT mount Junction Box
3-8052-2	159 000 756	¼ in. NPT mount Junction Box with EasyCal
3-9900.392-1	159 000 839	Liquid tight connector kit, NPT (1 connector)
3-9900.392-2	159 000 840	Liquid tight connector kit, PG 13.5 (1 connector)
3822-7004	159 001 581	pH 4.01 buffer solution, 1 pint (473 ml) bottle
3822-7007	159 001 582	pH 7.00 buffer solution, 1 pint (473 ml) bottle
3822-7010	159 001 583	pH 10.00 buffer solution, 1 pint (473 ml) bottle
3822-7115	159 001 606	20 gram bottle Quinhydrone for ORP calibration
5523-0322	159 000 761	Cable, 3-conductor + shield (blk/red/wht/shld) 22 AWG (per ft)
P31515-0P200	159 000 630	Universal Pipe Adapter PVC
P31515-0C200	159 000 631	Universal Pipe Adapter CPVC
P31515-0V200	159 000 459	Universal Pipe Adapter PVDF
3-8050.390-1	159 001 702	Retaining Nut Replacement Kit, NPT, Valox®
3-8050.390-3	159 310 116	Retaining Nut Replacement Kit, NPT, PP



Georg Fischer Signet LLC, 3401 Aero Jet Avenue, El Monte, CA 91731-2882 U.S.A. • Tel. (626) 571-2770 • Fax (626) 573-2057
 For Worldwide Sales and Service, visit our website: www.gfsignet.com • Or call (in the U.S.): (800) 854-4090
 For the most up-to-date information, please refer to our website at www.gfsignet.com