Signet 2764-2767 Differential DryLoc™ pH/ORP Electrodes

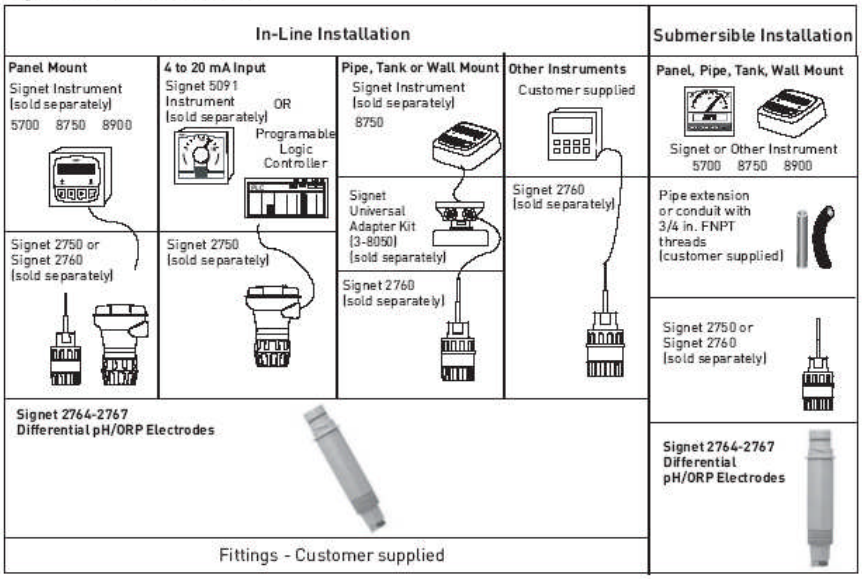
Description

The Signet 2764-2767 Differential pH & ORP electrodes are built with the DryLoc™ connector, a Ryton® body, and PTFE reference junction to handle even the most extreme and harshest of chemical applications.

These differential electrodes use the field-proven 3-electrode differential technique: the pH and reference electrodes are measured against a ground electrode, insuring a steady and stable signal. The key feature of the differential design is the reference electrode. The reference element is housed in a glass half-cell embedded in the reference chamber and is protected from compounds that may contain sulfides (H_2S) and metals, including lead, mercury, and silver. To ensure a long service life, the reference features a refillable electrolyte chamber and a replaceable equitransferant salt bridge, both easily serviced in the field. The patented porous PTFE reference junction resists fouling, clogging and chemical attack.

The other elements of the design are the solution ground, the pH/ORP electrodes, and the temperature element. The solution ground eliminates noisy measurements by draining electrical current away from the reference electrode. The pH/ORP electrodes are designed with a flat or bulb measurement surface, and a temperature device that is positioned at the tip of the measurement surface, making the temperature response of $T_{95\%}$ less than 1 minute. Various temperature devices offered include 3KΩ, 300Ω, or PT-1000 RTD. The electrodes are used with the Signet 2750 Sensor Electronics, which provides a blind 4 to 20 mA output or using the digital (S^3L) output may be used to connect to the Signet 8900 instrument. The electrodes can also be used with the Model 2760 preamplifier to connect to the Signet 5700, 8750, or other suppliers' instruments.

System Overview



Features

- Differential design for stable measurements in the most aggressive applications
- Long service life even in severe or difficult chemical applications
- Water-tight DryLoc™ connector with foul-proof gold contacts
- Porous PTFE reference junction
- Rebuildable reference electrode
- Solution ground
- Temperature sensor (pH)
- Easy sensor replacement using DryLoc™ electrode connector
- Quick temperature response
- Compatible with all Signet instruments and other suppliers' pH/ORP instruments

Applications

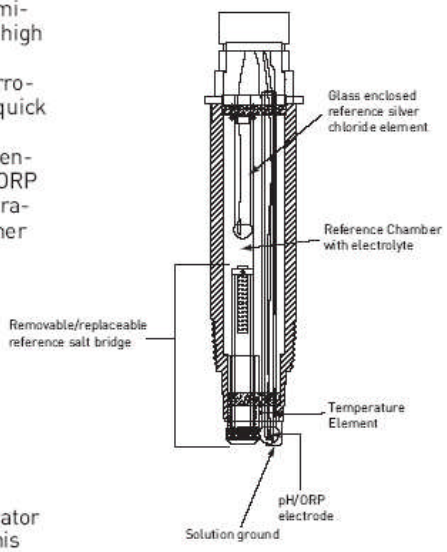
- Water and Waste Water Treatment
- Coagulation and Flocculation
- Plant Effluent
- Plating Baths
- Scrubbers
- Textile Dye Process
- Harsh Chemical Applications
- Heavy metal Removal and Recovery
- Toxics Destruction
- Surface Finishing

CE

Electrode Key Feaures and Benefits:

- Glass encased reference electrode protects the Ag+ element from reacting with certain chemical compounds that typically leach into the reference chambers. Keeps the pH/ORP reading stable.
- Large volume reference electrolyte chamber resists dilution over time for a long service life. Chamber is refillable.
- Salt Bridge serves as a double reference junction and is the first line of defense to keep out process chemicals from the reference electrolyte chamber. It is built with a porous PTFE reference junction which is highly compatible to chemicals , resists fouling and build-up of dirt.
- Ryton® body for chemical compatibility to most harsh chemicals. Also able to withstand high temperatures.
- DryLoc™ connector with corrosion resistant gold pins for quick and easy sensor removal.
- Capillary TC (temperature sensor) embedded in tip of pH/ORP electrode for quicker temperature response than most other electrodes on the market.

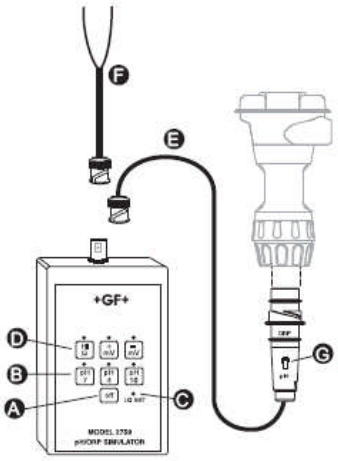
Electrode Cut-away View



2759 pH/ORP System Tester

The Signet 2759 pH/ORP Simulator is a battery-powered millivolt generator that simulates pH values of 4, 7 and 10, plus ORP values of ±700 mV. This device is useful as a troubleshooting aid and for general verification of system operation. It is not a substitute for periodic system calibration with pH buffers or test solutions. Accessory adapter cables (sold separately) enable the 2759 to connect directly to Signet 2760 preamplifiers or 2750 pH/ORP Sensor Electronics. The adapters include a selector switch for pH or ORP simulation. The switch triggers automatic sensor-recognition software in Signet pH/ORP instrumentation.

A) Power OFF Button
B) Output simulation buttons and indicators. Simulate pH and ORP output at five fixed values: pH 4, pH 7, pH 10, -700 mV and +700 mV. Pressing one of these buttons turns the 2759 on.
C) Low battery indicator
D) High switch: Adds 1000MΩ resistance in series with output. Simulates high impedance of pH electrodes. Used to verify proper preamplifier operation.
E) 3-2759.391: Adapter cable for use with 2750 and 2760
F) 3-2759.390: Bypass adapter cable (included with 2759)
G) Mode selector switch: Trigger automatic sensor recognition software in Signet pH/ORP instrumentation.



Model 2764-2767 Electrode Compatibility to Sensors, Preamplifiers, and Instruments

			Compatible Signet Instruments					
		Sensor Temp. Element	5700	8750	8900	PLC	Other Mfg's Instruments with internal preamplifiers*	Other Mfg's Instruments requiring external preamplified signals**
Compatible Electrodes	2764-1	3 Kohm	2760-1, -2, -11, or -21	2760-1, -2, -11, or -21	-	-	Differential sensors must use preamplifier at sensor location; otherwise, sensor signal will be too erratic due to high impedance signals	2760-1, -2, -11, or -21
	2764-2	PT 1000	-	-	any 2750 w/ digital output	any 2750 w/4 to 20 mA output		2760-1, -2, -11, or -21
	2764-3	300 ohm	-	-	-	-		2760-1, -2, -11, or -21
	2765-1	10 Kohm	2760-1, -2, -11, or -21	2760-1, -2, -11, or -21	any 2750 w/ digital output	any 2750 w/4 to 20 mA output		2760-1, -2, -11, or -21
	2765-2	PT 1000	-	-	-	-		2760-1, -2, -11, or -21
	2765-3	300 ohm	-	-	-	-		2760-1, -2, -11, or -21
	2766-1	3 Kohm	2760-1, -2, -11, or -21	2760-1, -2, -11, or -21	-	-		2760-1, -2, -11, or -21
	2766-2	PT 1000	-	-	any 2750 w/ digital output	any 2750 w/4 to 20 mA output		2760-1, -2, -11, or -21
	2766-3	300 ohm	-	-	-	-		2760-1, -2, -11, or -21
	2767-1	10 Kohm	2760-1, -2, -11, or -21	2760-1, -2, -11, or -21	any 2750 w/ digital output	any 2750 w/4 to 20 mA output		2760-1, -2, -11, or -21
	2767-2	PT 1000	-	-	-	-		2760-1, -2, -11, or -21
	2767-3	300 ohm	-	-	-	-		2760-1, -2, -11, or -21

*Must have internal preamplifier in instrument

**Must use sensor with compatible temperature element; contact technical service for questions

Specifications

General
Compatibility: Signet 2750 and 2760
Operating Range:
- 2764/2766: 0 to 14 pH
- 2765/2767: +/-1500 mV (ORP)

Pipe Size Range: 1 inch and up.

Mounting:
- In-line/vertical mounting: Use sensor 1 inch threads. Sensor must be mounted at least 15 degrees above the horizontal axis.
- Submersible mounting: Use threads on Model 2750 or 2760; requires 3/4 inch NPT or ISO7-1/ 3/4 inch male threaded extension.

Reference:
Electrolyte:
3.5 M KCl, solidified acrylamide gel
Element: Ag/AgCl

Temperature Sensor:
- pH: 3KΩ, PT1000 RTD, or 300Ω
- ORP: 10 KΩ, PT1000 RTD, or 300Ω

Temperature response time: $t_{95\%}$ < 1 min.

Primary Functions:
- 2764 and 2765:
  Flat surface resists fouling
- 2766 and 2767:
  Bulb surface for general use

Wetted Materials:
Body: Ryton®
Reference junctions: PTFE
Sensing surface:
- Glass membrane: (pH)
- Platinum: (ORP)

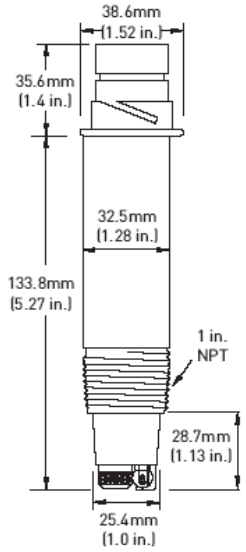
O-rings: FPM
Solution ground: carbon graphite

Max. Temperature/Pressure rating:
Operating Temperature:
0°C to 195°C (32°F to 203°F)
Max. Operating Pressure:
6.89 bar (100 psi) @ 95°C (203°F)
Storage Temperature: > 0°C (15°F)

Shipping Weight: 0.25 kg (0.55 lbs.)

Standards & Approvals
- CE
- Manufactured under ISO 9001:2000 for Quality and ISO 14001:2004 for Environmental Management

Dimensions



A differential electrode solves many common problems typically experienced by standard pH/ORP electrodes at troublesome measuring points. See the table below to find the common problem, cause and effect, and the Differential pH/ORP electrode solution.

Standard pH/ORP electrode problem:	Cause and Effect	The Differential Electrode Solves the Problem!
Reading slowly drifts over time and/or responds slowly	• Chemical attack from Hg++, Cu+, Pb++, ClO4- or other compounds which dilute the KCl reference electrolyte concentration.	• Salt bridge will slow or stop attack. If attacking ions penetrate the salt bridge and affect the KCl, simply refill KCl solution
	• Reference junction gets clogged from oils, grease, and dirt from the process.	• Readings do not drift due to stable differential reference design, however may require cleaning or replacement of the salt bridge if electrode gets too dirty.
Reading slowly drifts over time and/or becomes erratic	• Chemical attack of the Ag+ reference billet from Br-, I-, CN-, and S- compounds.	• Will not affect electrode due to Ag+ element protected in glass encased reference electrode.
	• Clogged reference and slowed reading from silver compounds forming on the inside of the reference electrode from Ag+ of reference element reacting and precipitating AgS, AgBr, AgI, AgCN, or other silver compounds.	• Will not affect electrode due to Ag+ element protected in glass encased reference electrode
Reading suddenly and unexpectedly shifts	• Stray electrical currents in the process liquid; Ag+ reference element picks up current and shifts reference reading, resulting in shifted pH reading. The Ag+ element will eventually become totally stripped. Process must be properly grounded or place metal rod close to electrode.	• Will not affect electrode due to Ag+ element protected in glass encasement; also, electrode has a built in solution ground, so if there is a stray current, it will not be seen by the electrode

Application Notes:
- Use the flat glass electrodes when a self-cleaning feature is desired; especially useful in applications with abrasive chemicals.
- Use bulb electrodes for general purpose applications
- ORP electrodes are generally used for chemical reaction monitoring, not control.
- Ensure that electrode materials are chemically compatible with the process liquid.

Model 2764-2767
Ordering Notes:

1) pH and ORP electrodes require connection to model 2750 or 2760.
2) To replace electrodes, simply un-twist from preamplifier to replace with new electrode.
3) Conduit and mounting brackets for submersible installations must always be used (customer supplied)
4) Adapters from 1 1/2 in. to 1 in. are available.
5) Use sensor threads for in-line mounting; Model 2750 or 2760 threads for submersible mounting.
6) Reference electrode can be rebuilt with replacement electrolyte and salt bridge.

Ordering Information

Electrode Part Number- Choose either a pH or ORP Electrode		
pH Electrodes		
3-2764	Flat pH surface differential electrode	
3-2766	Bulb pH differential electrode with bulb protection	
	Temperature Element - Choose one	
	-1	3K Ω for pH for connection to 8750 or 5700 instruments when used with the 2760 preamplifier
	-2	PT1000 RTD for pH for use with the 8900 instrument when used with the 2750 sensor electronics
	-3	300 Ω for connection to other instruments when used with the 2760 preamplifier or connector
3-2766	-1	**Example Part Number**

ORP Sensors		
3-2765	Flat ORP surface differential electrode	
3-2767	Bulb ORP differential electrode with bulb protection	
	Temperature Element - Choose one	
	-1	10 KΩ ID resistor for connection to 8750 or 5700 when used with the 2760 preamplifier or connection to the 8900 with used with the 2750 sensor electronics
	-2	PT1000 RTD for connection to other instruments using the 2760 preamplifier or connector
	-3	300 Ω for connection to other instruments using the 2760 preamplifier or connector
3-2765	-1	**Example Part Number**

Sensor Electronics - Choose one (required for installation of any pH or ORP electrode)	
The sensor electronics below can be used with the Signet 8900 or as a blind transmitter with 4 to 20 mA output. For connection to PLC/PC, chart recorders, etc.	
3-2750-1	In-line Sensor electronics w/junction box (yellow body)
3-2750-2	In-line Sensor electronics w/junction box and EasyCal (yellow body)
3-2750-3	Submersible Sensor electronics w/4.6m (15 ft.) cable and 3/4 inch NPT conduit threads
3-2750-4	Submersible Sensor electronics w/4.6m (15 ft.) cable and ISO 7/1-R 3/4 conduit threads

Sensor Part Number			
3-2760	pH/ORP Preamplifier (for use with the 8750 or 5700 instrument) or with 4.6m (15 ft.) cable (for use with other manufacturers instruments)		
	Preamplifier or Connector Style; Choose one		
	-1	Preamplifier with 3/4 inch NPT threads	
	-2	Preamplifier with 3/4 inch ISO threads	
		Mounting Configurations	
		-	Submersible mounting (gray body)
		1	In-line mounting (yellow body)
3-2760	-2	1	**Example Part Number**

Mfr. Part No.	Code	Mfr. Part No.	Code	Mfr. Part No.	Code
3-2764-1	**159 000 943**	3-2766-3	**159 000 951**	3-2760-1	**159 000 939**
3-2764-2	**159 000 944**	3-2767-1	**159 000 952**	3-2760-2	**159 000 940**
3-2764-3	**159 000 945**	3-2767-2	**159 000 953**	3-2760-11	**159 001 367**
3-2765-1	**159 000 946**	3-2767-3	**159 000 954**	3-2760-21	**159 001 368**
3-2765-2	**159 000 947**	3-2750-1	**159 000 744**		
3-2765-3	**159 000 948**	3-2750-2	**159 000 745**		
3-2766-1	**159 000 949**	3-2750-3	**159 000 746**		
3-2766-2	**159 000 950**	3-2750-4	**159 000 842**		

Accessories and Replacement Parts

Mfr. Part No.	Code	Description
3864-0001	**159 001 007**	Replacement Salt Bridge
3864-0002	**159 001 008**	Replacement reference electrolyte solution, 500 mls
2120-0015	**159 001 009**	CPVC adapter: 1.5 in. MNPT to 1 in. FNPT
2122-0015	**159 001 010**	PVDF adapter: 1.5 in. MNPT to 1 in. FNPT
3-0700.390	**198 864 403**	pH Buffer kit
3-2759	**159 000 762**	pH/ORP System Tester
3-2759.391	**159 000 764**	Adapter Cable for use with 2750

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