Signet 2850 Conductivity/Resistivity Sensor Electronics and Integral Systems

Universal Mount Junction Box

NPT Mount Junction Box

2850 Integral Conductivity System for in-line installations

The Signet 2850 Conductivity/Resistivity Sensor Electronics are available in various configurations for maximum installation flexibility. The universal mount version is for pipe, wall, or tank mounting and enables single or dual (digital versions only) inputs using any standard Signet conductivity / resistivity sensor. The threaded j-box version can be used with these same Signet sensors for submersible sensor mounting. It is also available as a combined integral system configuration for in-line mounting and includes a conductivity electrode in a choice of 0.01, 0.1, 1.0, 10.0 or 20.0 cm^{-1} cell constants. The 2850 is ideal for applications with a conductivity range of 0.055 to 400,000 µS or a resistivity range of 18.2 MΩ to 10 kΩ.

All 2850 units are available with a choice of a single or dual digital (S^3L) outputs, or a single 4 to 20 mA. The single digital (S^3L) output version can be paired with the 9900 Transmitter to extend the distance between the measuring points to 120 m (400 ft).

The 8900 Multi-Paramater Controller allows for up to six sensor inputs directly into the Signet 8900 Multi-Parameter Controller. All 2850 units are built with NEMA 4X/IP65 enclosures which allow output wiring connections with long cable runs of up to 305 m (1,000 feet).

The two-wire 4 to 20 mA output version is available with eight 4 to 20 mA output ranges for each electrode cell constant. Each range can be inverted and is field selectable.

EasyCal is a standard feature that automatically recognizes conductivity test solution values for simple field calibration. A certification tool is available for validation of the sensor electronics according to USP requirements.

Features

- **Integral mount systems for quick and easy installation**
- **Compact design for maximum installation flexibility**
- **Extends the distance between the measuring point and the 9900 Transmitter to 120 m (400 ft)**
- **Digital (S^3L) interface or two-wire 4 to 20 mA output**
- **EasyCal with automatic test solution recognition**
- **Dual channel unit available for low cost installation with Signet 8900 Multi-Parameter Controller**
- **For use with ALL Signet conductivity electrodes**

Applications

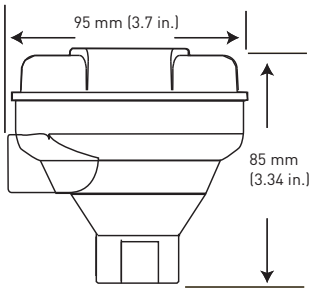
- **Water Treatment & Water Quality Monitoring**
- **Reverse Osmosis**
- **Deionization**
- **Demineralizer, Regeneration & Rinse**
- **Scrubber, Cooling tower and Boiler Protection**
- **Aquatic Animal Life Support Systems**

Specifications

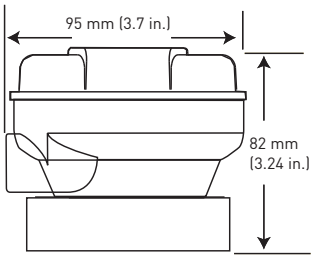
General			
Compatible Electrodes		All Signet sensors	
Materials			
NPT Mount Junction Box for Integral Mount		PBT	
Universal/Remote Mount		PBT, CPVC	
EasyCal - Automatic recognition of the following conductivity values			
	146.93 µS, 1408.8 µS, 12856 µS (@25 °C) (Test solutions Per ASTM D1125-95)		
	10 µS, 100 µS, 200 µS, 500 µS, 1000 µS, 5000 µS, 10,000 µS, 50,000 µS, 100,000 µS (@ 25 °C) (Standard test solutions)		
Electrical			
Power	12 to 24 VDC ±10%, regulated for 4 to 20 mA output (typically called "Loop Powered")		
	5 to 6.5 VDC ±5% regulated recommended (provided by the Signet 8900), 3.0 mA max for Digital (S^3L) output (Reverse polarity and short circuit protected)		
Digital (S^3L) Output: Serial ASCII, TTL level 9600 bps			
Accuracy	Conductivity	±2% of reading	
	Temperature	‹ 0.2 °C	
Resolution	Conductivity	0.1% of reading	
	Temperature	‹ 0.2 °C	
Update Rate	Single channel models	‹ 600 ms	
	Dual channel models	‹ 1200 ms	
Available data via Digital (S^3L) Output			
	Raw conductivity		
	Calibrated conductivity		
	Calibrated temperature-compensated conductivity		
	Temperature		
Max. Temperature/Pressure Rating			
Operating Temperature	-10 °C to 85 ° C		14 °F to 185 °F
Storage Temperature	-20 °C to 85 ° C		-4 °F to 185 °F
Relative Humidity	0 to 95%, non-condensing		
Enclosure	NEMA 4X/IP65		
Current Output			
Field-selectable ranges			
Factory Set Span (Integral mount only)	0.01 cell (2819, 2839)		4 to 20 mA = 0 to 100 µS
	0.10 cell (2820, 2840)		4 to 20 mA = 0 to 1000 µS
	1.0 cell (2821, 2841)		4 to 20 mA = 0 to 10,000 µS
	10.0 cell (2822, 2842)		4 to 20 mA = 0 to 200,000 µS
Available only as a special order	20.0 cell (2823)		4 to 20 mA = 0 to 400,000 µS
Max. Loop Resistance	50 Ω @ 12 VDC		
	325 Ω @ 18 VDC		
	600 Ω @ 24 VDC		
Accuracy	±2% of output span		
Resolution	7 µA		
Update Rate	‹600 ms		
Error Indication	22 mA		
Pure Water Compensation	When using 0.01-cm cell and raw conductivity value ‹ 0.5 µS, the 2850 auto-switches to compensate for non-linear temperature effects found in this low conductivity (high resistivity) range.		
Shipping Weight			
	NPT Mount Junction Box	1.75 lb	0.75 kg
	Universal Mount	1.75 lb	0.75 kg
Standards and Approvals			
	CE		
	RoHS compliant		
	China RoHS		
	Manufactured under ISO 9001 for Quality and ISO 14001 for Environmental Management		

Dimensions

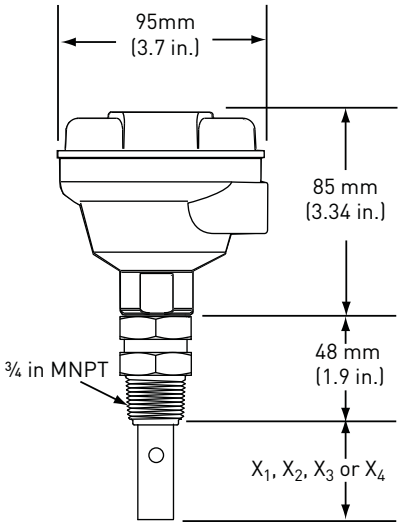
2850-5X NPT Mount Junction Box Systems



2850-6X Universal Mount Systems



2850-5X-XX Integral Mount Systems

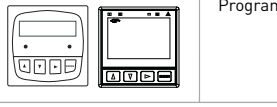


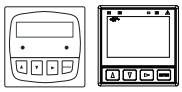
Sensor	Insertion Depth
X1 (3-2839-1)	73 mm (2.88 in.)
X2 (3-2840-1)	35 mm (1.38 in.)
X3 (3-2841-1)	41.3 mm (1.63 in.)
X4 (3-2842-1)	41.3 mm (1.63 in.)

System Overview

In-Line Installation

Panel Mount	4 to 20 mA input	Panel Mount	4 to 20 mA input
Signet Instruments 8900 9900	Customer Supplied Programmable Logic Controller	Signet Instruments 8900 9900	Customer Supplied Programmable Logic Controller





Signet 2850
Conductivity System

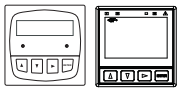
Signet 2850
Universal Mount

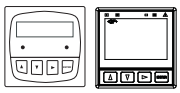
Fittings - Customer Supplied 3/4 in. NPT or ISO threads

All sold separately

Submersible Installation

Panel Mount	Panel Mount	4 to 20 mA input
Signet Instruments 8900 9900	Signet Instruments 8900 9900	Customer Supplied Programmable Logic Controller

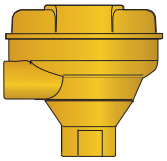




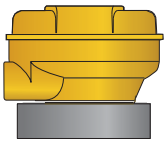
Signet 2850 Universal Mount
or NPT Mount Junction Box

Fittings - Customer Supplied 3/4 in. NPT or ISO threads

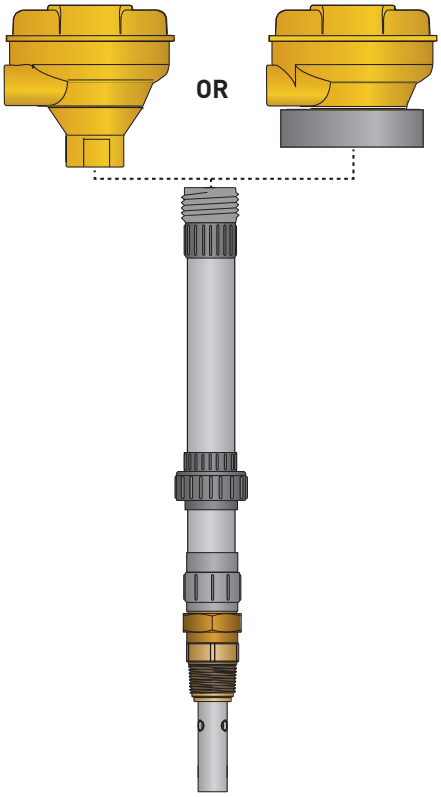
All sold separately

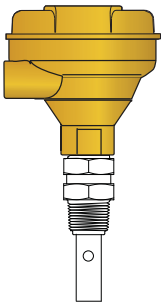


-5X NPT Mount
Junction Box



-6X Universal Mount
Junction Box





Integral System includes the 2850 sensor electronics and a choice of Conductivity/Resistivity electrode.

Submersible application options - Please see Signet Submersion Kit brochure, 3-0000.707, for more information

Field Selectable Ranges for 4 to 20 mA Operation

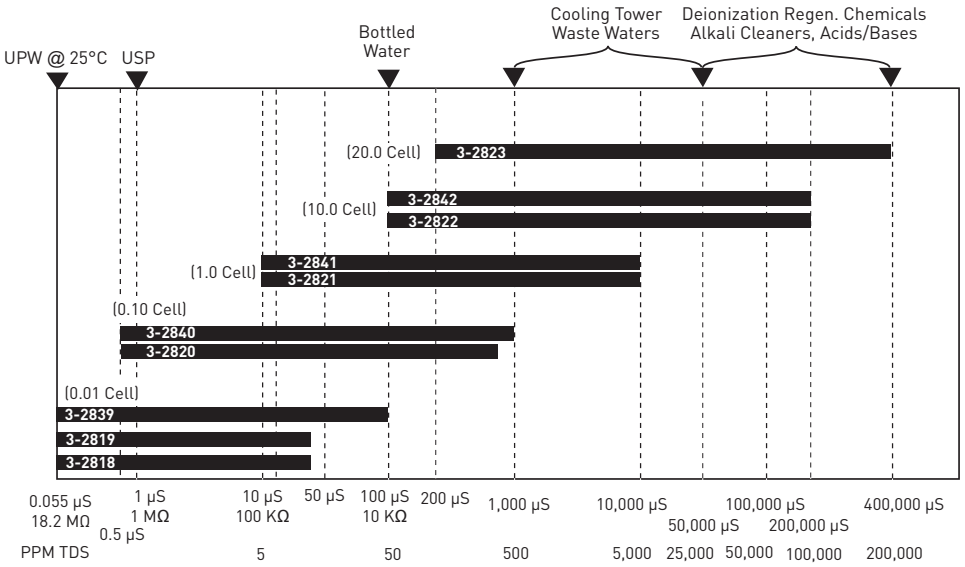
The chart below indicates the field selectable ranges in which the 2850 sensor electronics can be set via internal switches. All ranges can be inverted if required. Signet Models listed below are compatible Conductivity/Resistivity electrodes.

0.01 Cell	0.10 Cell	1.0 cell	10.0 Cell	20.0 Cell
Signet Model 2819 or 2839	Signet Model 2820 or 2840	Signet Model 2821 or 2841	Signet Model 2822 or 2842	Signet Model 2823
10 to 20 MΩ	0 to 2 µS	0 to 20 µS	0 to 200 µS	0 to 400 µS
2 to 10 MΩ	0 to 5 µS	0 to 50 µS	0 to 500 µS	0 to 1,000 µS
0 to 2 MΩ	0 to 10 µS	0 to 100 µS	0 to 1,000 µS	0 to 2,000 µS
0 to 1 MΩ	0 to 50 µS	0 to 500 µS	0 to 5,000 µS	0 to 10,000 µS
0 to 5 MΩ	0 to 100 µS	0 to 1000 µS	0 to 10,000 µS	0 to 20,000 µS
0 to 10 MΩ	0 to 200 µS	0 to 2000 µS	0 to 50,000 µS	0 to 100,000 µS
N/A	0 to 500 µS	0 to 5,000 µS	0 to 100,000 µS	0 to 200,000 µS
N/A	0 to 1,000 µS	0 to 10,000 µS	0 to 200,000 µS	0 to 400,000 µS

The 4 to 20 output ranges shown in this chart can be inverted using the internal switch **Resistivity Ranges are in BOLD**

Operating Range Chart

The 2850 is capable of measuring conductivity and resistivity values over a wide range. Below is a chart of Signet Conductivity/Resistivity electrodes (listed in each range box) that is recommended for the specified measurement range.



Ordering Notes

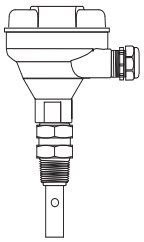
1) All 2850 units can be used with any Signet Conductivity/Resistivity electrode
2) Integral systems are only offered with Signet models 2839-2842 electrodes. 2818-2823 require a special order sensor.
3) Dual channel units are only available in the universal mount junction box/remote mount configuration and with digital (S^3L) output for use with the Multi-Parameter instruments.

Application Tips

- Maximum distance between sensor and 2850 electronics is 4.6 m (15 ft).
- Longer cable runs may result in small temperature compensation offsets, but can be adjusted through calibration in the 8900 or 9900. (Not available for 4 to 20 mA versions).

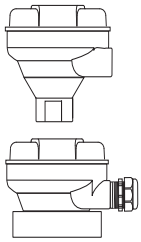
Please refer to Wiring, Installation, and Accessories sections for more information.

Ordering Information



Mfr. Part No.	Code	Sensor	Process Threaded Connection
2850 Integral Mount Systems* (includes Sensor Electronics and Electrodes) with EasyCal			
Digital (S^3L) output			
3-2850-51-39	**159 001 339**	2839 Electrode, 0.01 cell	NPT threads
3-2850-51-40	**159 001 340**	2840 Electrode, 0.1 cell	NPT threads
3-2850-51-41	**159 001 341**	2841 Electrode, 1.0 cell	NPT threads
3-2850-51-42	**159 001 342**	2842 Electrode, 10.0 cell	NPT threads
3-2850-51-39D	**159 001 343**	2839 Electrode, 0.01 cell	ISO threads
3-2850-51-40D	**159 001 344**	2840 Electrode, 0.1 cell	ISO threads
3-2850-51-41D	**159 001 345**	2841 Electrode, 1.0 cell	ISO threads
3-2850-51-42D	**159 001 346**	2842 Electrode, 10.0 cell	ISO threads
4 to 20 mA output			
3-2850-52-39	**159 001 347**	2839 Electrode, 0.01 cell	NPT threads
3-2850-52-40	**159 001 348**	2840 Electrode, 0.1 cell	NPT threads
3-2850-52-41	**159 001 349**	2841 Electrode, 1.0 cell	NPT threads
3-2850-52-42	**159 001 350**	2842 Electrode, 10.0 cell	NPT threads
3-2850-52-39D	**159 001 351**	2839 Electrode, 0.01 cell	ISO threads
3-2850-52-40D	**159 001 352**	2840 Electrode, 0.1 cell	ISO threads
3-2850-52-41D	**159 001 353**	2841 Electrode, 1.0 cell	ISO threads
3-2850-52-42D	**159 001 354**	2842 Electrode, 10.0 cell	ISO threads

*For use when an integral 2850 system is desired (uses 2839-2842 series electrodes). Integral systems are shipped with a sensor and 2850 combined. Other 2850 systems are available with Signet 2818 to 2823 electrodes upon request. See individual electrode product pages for more information.



Mfr. Part No.	Code	Output
2850 Sensor Electronics** with EasyCal		
NPT mount junction box (¾ inch threaded) for standpipe mounting, single input only		
3-2850-51	**159 001 398**	One input/one digital (S^3L) output
3-2850-52	**159 001 399**	One input/one 4 to 20 mA output
Universal mount junction box for remote mount, single or dual input		
3-2850-61	**159 001 400**	One input/one digital (S^3L) output for use with 8900 or 9900
3-2850-62	**159 001 401**	One input/one 4 to 20 mA output
3-2850-63	**159 001 402**	Dual input, dual (S^3L) output for use with 8900 only

**For use when remote sensor mounting is desired. Compatible with ALL Signet conductivity electrodes. See individual electrode product pages for more information.

Accessories and Replacement Parts

Mfr. Part No.	Code	Description
3-2850.101-1	**159 001 392**	Plug-in NIST traceable recertification tool, 1.0 µS simulated
3-2850.101-2	**159 001 393**	Plug-in NIST traceable recertification tool, 2.5 µS simulated
3-2850.101-3	**159 001 394**	Plug-in NIST traceable recertification tool, 10.0 µS simulated
3-2850.101-4	**159 001 395**	Plug-in NIST traceable recertification tool, 18.2 MΩ simulated
3-2850.101-5	**159 001 396**	Plug-in NIST traceable recertification tool, 10.0 MΩ simulated
3-2839-1	**159 000 921**	Electrode - 0.01 µS/cm, ¾ inch NPT, 4.6 m (15 ft) cable
3-2839-1D	**159 000 923**	Electrode - 0.01 µS/cm, ISO 7/1-R 3/4, 4.6 m (15 ft) cable
3-2840-1	**159 000 786**	Electrode - 0.1 µS/cm, ¾ inch NPT, 4.6 m (15 ft) cable
3-2840-1D	**159 000 788**	Electrode - 0.1 µS/cm, ISO 7/1-R 3/4, 4.6 m (15 ft) cable
3-2841-1	**159 000 790**	Electrode - 1.0 µS/cm, ¾ inch NPT, 4.6 m (15 ft) cable
3-2841-1D	**159 000 792**	Electrode - 1.0 µS/cm, ISO 7/1-R 3/4, 4.6 m (15 ft) cable
3-2842-1	**159 000 794**	Electrode - 10.0 µS/cm, ¾ inch NPT, 4.6 m (15 ft) cable
3-2842-1D	**159 000 796**	Electrode - 10.0 µS/cm, ISO 7/1-R 3/4, 4.6 m (15 ft) cable
5523-0322	**159 000 761**	Sensor cable (per ft), 3 cond. plus shield, 22 AWG

3-2850.099 Rev D (04/12)
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