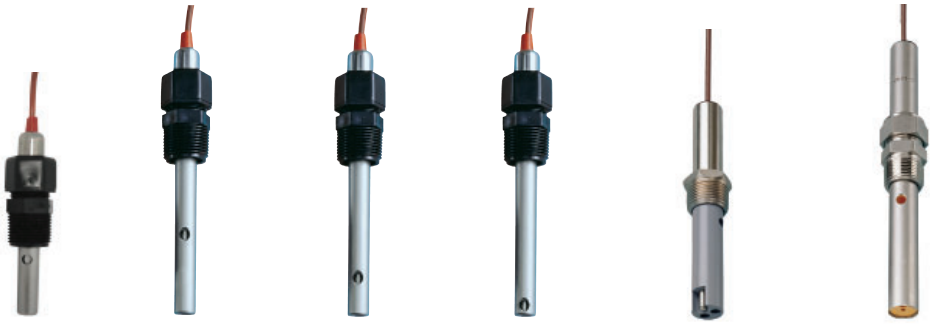
Signet Conductivity/Resistivity Electrodes



		2818	2819	2820	2821	2822	2823
Cell Constant		0.01		0.1	1.0	10.0	20.0
Operating Range		0.055 µS to 100 µS (18.2 MΩ to 10 KΩ)		1 µS to 1000 µS (1 MΩ to 1 KΩ)	10 µS to 10,000 µS	100 µS to 200,000 µS	200 µS to 400,000 µS
Compatible Sensor Electronics		2850					
Temperature Element		Pt1000					
Operating Temperature/Pressure		Optional 1/2: NPT 316 SS fitting, 13.8 bar (200 psi), 120 °C (248 °F) max. Standard Polypro fitting, 6.9 bar (100 psi), 100 °C (212 °F) max.				6.9 bar (100 psi) @ 95 °C (203 °F)	6.9 bar (100 psi) @ 150 °C (302 °F)
Process Connection		¾ in. NPT					
Wetted Materials	**Body**	316 SS or Titanium*, PTFE				CPVC	316 SS/PEEK®
	O-rings	EPR (EPDM)					
	Process Connection	Poly Pro (standard) , Stainless steel NPT				316 SS	
Compatible Signet Instruments		8860 Direct connection, 8900 via 2850, 9900 direct using conductivity module or 2850, Profibus Concentrator, 9950 single channel conductivity module					
Applications Usage		R.O., ultrapure water, resistivity measurements		R.O., deionized and distilled water	R.O., distilled & drinking water, cooling tower water	R.O., cooling tower water, waste water, salinity, brackish water, sea water	R.O., salinity, brackish water, sea water, acids/ bases, cleaners other concentrated chemicals
Standards and Approvals		RoHS compliant, China RoHS					

*Titanium available as a standard for all sanitary sensors and as a special order for all other sensors.

Specification Matrix

		2839-1V	2840-1V	2841-1V	2842-1V
Cell Constant		0.01	0.1	1.0	10.0
Operating Range		0.055 µS to 100 µS (18.2 MΩ to 10 KΩ)	1 µS to 1000 µS (1 MΩ to 1 KΩ)	10 µS to 10,000 µS	100 µS to 200,000 µS
Compatible Sensor Electronics		2850			
Temperature Element		Pt1000			
Operating Temperature/Pressure		-10 °C to 85 °C @ 6.9 bar (14 °F to 185 °F @ 100 psi)			
Process Connection		-1V versions: ¾ in. NPT or -1VD versions: ISO 7/1-R 3/4			
Wetted Materials	**Body**	PVDF			
	O-rings	FKM			
	Process Connection	PVDF			
Compatible Signet Instruments		8860 Direct connection, 8900 via 2850, 9900 direct using conductivity module or 2850, Profibus Concentrator, 9950 single channel conductivity module			
Applications Usage		R.O., ultrapure water, resistivity measurements	R.O., deionized and distilled water	R.O., distilled water, condensate, drinking water, cooling tower water	R.O., cooling tower water, wastewater, salinity, brackish water, sea water
Standards and Approvals		RoHS compliant, China RoHS			

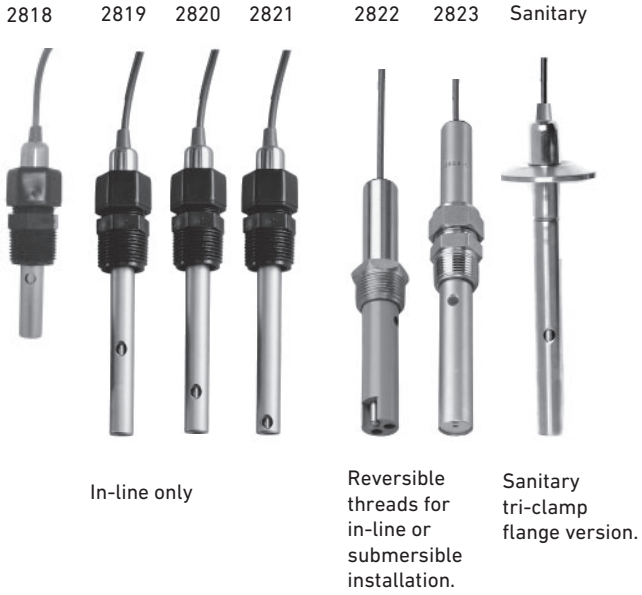
Signet Conductivity/Resistivity Sanitary

		Sanitary		
		2819	**2820**	**2821**
Cell Constant		0.01	0.1	1.0
Operating Range		0.055 µS to 100 µS (18.2 MΩ to 10 KΩ)	1 µS to 1000 µS	10 µS to 10,000 µS
Compatible Sensor Electronics		2850		
Temperature Element		Pt1000		
Operating Temperature/Pressure		5.2 bar (75 psig) max., 130 °C (266 °F) max.		
Wetted Materials	**Body**	316 SS or Titanium. Material and surface finish > RA 25 for all sensors		
	O-rings	EPR (EPDM)		
	Process Connection	1-1½ in. or 2 in. Sanitary Tri-Clamp		
Compatible Signet Instruments		8860 direct connection, 8900 via 2850, 9900 direct using conductivity module or 2850, Profibus Concentrator, 9950 single channel conductivity module		
Applications Usage		R.O., ultrapure water, resistivity measurements	R.O., deionized and distilled water	R.O., distilled & drinking water, cooling tower water
Standards and Approvals		RoHS compliant, China RoHS, NIST cert available		

Specification Matrix

		Sanitary	
		2822 (Special Order)	**2823 (Special Order)**
Cell Constant		10.0	20.0
Operating Range		100 µS to 200,000 µS	200 µS to 400,000 µS
Compatible Sensor Electronics		2850	
Temperature Element		Pt1000	
Operating Temperature/Pressure		5.2 bar (75 psig) max., 130 °C (266 °F) max.	
Wetted Materials	**Body**	316 SS or Titanium. Material and surface finish > RA 25 for all sensors	
	O-rings	EPR (EPDM)	
	Process Connection	1-1½ in. or 2 in. Sanitary Tri-Clamp	
Compatible Signet Instruments		8860 direct connection, 8900 via 2850, 9900 direct using conductivity module or 2850, Profibus Concentrator, 9950 single channel conductivity module	
Applications Usage		High conductivity applications	
Standards and Approvals		RoHS compliant, China RoHS, NIST cert available	

Signet 2818-2823 Conductivity/Resistivity Electrodes



Signet 2818-2823 Conductivity/Resistivity Electrodes are designed to provide versatile installation and accurate sensing across a very broad dynamic range. These electrodes are built with a controlled surface finish to ensure accuracy and repeatability.
The standard electrode is constructed 316 SS, but there are other materials available for maximum chemical compatibility.

Reversible threads or sanitary flanges allow for maximum installation versatility.

Sanitary flange versions are available in stainless steel and Titanium with surface quality finish of less than RA 25 and with an optional NIST Traceability Certificate to meet USP requirements.

Coupled with Signet patented measuring circuitry, a three decade measurement range is achieved without the need for troublesome electrode platinization. A platinum RTD (Pt1000) located within the electrode allows optimal temperature sensing.

Features

- **Standard process connections**
  - **¾ in. NPT Polypro**
  - **¾ in. NPT SS on 10 and 20 cell**
  - **Tri-clamp 1 -1½ in., 2 in.**
  - **Opt. ½ in. NPT 316 SS**
- **316 SS or Titanium (indicated tri-clamp only) standard electrode**
- **Alternative electrode materials available**
  - **Hastelloy-C**
  - **Monel**
  - **Titanium**
- **In-line or submersible mounting**
- **NIST traceable certified cells ±1% meet USP requirements**

Applications

- **Pure Water Treatment**
  - **Reverse Osmosis**
  - **Deionization**
  - **Distillation**
- **Boiler Condensate**
- **Semiconductor Water Production**
- **Rinse Water Monitoring and Control**
- **TDS (Total Dissolved Solids)**
- **Salinity**
- **USP Purified Water**
- **WFI Water Production**
- **Ultra Pure Water**

Specifications

Models 3-2818-1 (0.01 cm^{-1} Cell), 3-2819-1* (0.01 cm^{-1} Cell), 3-2820-1* (0.1 cm^{-1} Cell), Models 3-2821-1* (1.0 cm^{-1} Cell)

* Certified versions available (add "C" suffix to part no.)

General				
Operating Range	3-2818, 3-2819	0.055 to 100 µS	18.2 MΩ to 10 KΩ	0.02 to 50 ppm
	3-2820	1 to 1000 µS	1 MΩ to 1 KΩ	0.5 to 500 ppm
	3-2821	10 to 10,000 µS	5 to 5,000 ppm	
Cell Constant Accuracy		±2% of reading (certified cells ±1%)		
Temperature Compensation Device		Pt1000		
Cable Length (use for the 2818, 19, 20, 21, 22 and 23)	Standard	4.6 m (15 ft)		
	Maximum	30 m (100 ft) all sensors when used with 9900 or 9950 and Direct Conductivity/ Resistivity Module. 2818, 2819 maximum 4.6 m (15 ft) when used with 2850		
Wetted Materials				
O-rings		EPR (EPDM)		
Insulator Material		Carbon fiber reinforced PTFE		
Electrodes		316L stainless steel (1.4408, DIN 17440) or Titanium		
Maximum Temperature/Pressure Rating				
Standard Polypro Fitting		6.9 bar @ 100 °C	100 psi @ 212 °F	
Optional 1/2: NPT 316 SS fitting (3-2820.392)		13.8 bar @ 120 °C	200 psi @ 248 °F	
Sanitary Connection		6.9 bar @ 120 °C	100 psi @ 248 °F	
Temperature Response, τ				
	0.01 cell	7 sec.		
	0.1 cell	53 sec.		
	1.0 cell	21 sec.		
Temperature Accuracy		0.3 °C		
Shipping Weight				
		0.4 kg	0.8 lb	
Standards and Approvals				
		RoHS compliant, China RoHS		

Model 3-2822-1 (10.0 cm^{-1} Cell)

General			
Operating Range		100 to 200,000 µS	50 to 100,000 ppm
Cell Constant Accuracy		±2% of reading (certified cells ±1%)	
Temperature Compensation Device		Pt1000	
Cable Length	Standard	4.6 m	15 ft
	Maximum	30 m	100 ft
Wetted Materials			
O-rings		EPR (EPDM)	
Body		CPVC	
Electrodes		316 stainless steel (1.4408, DIN 17440)	
Process Connection		Standard 316 SS fitting	¾ in. NPT threads
		Optional 316 SS submersion adapter fitting (3-2820.390)	¾ in. NPT threads
Maximum Temperature/Pressure Rating			
		6.9 bar @ 95 °C	100 psi @ 203 °F
Temperature Response, τ		5 seconds	
Temperature Accuracy		0.3 °C	
Shipping Weight			
		0.4 kg	0.8 lb
Standards and Approvals			
		RoHS compliant, China RoHS	

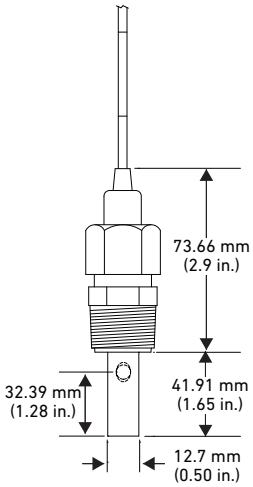
Model 3-2823-1 (20.0 cm^{-1} Cell)

General		
Operating Range	200 to 400,000 µS	100 to 200,000 ppm
Cell Constant Accuracy	±2% of reading	
Temperature Compensation Device	Pt1000	
Cable Length	Standard	4.6 m (15 ft)
	Maximum	30 m (100 ft)
Wetted Materials		
O-rings	EPR (EPDM)	
Insulator Material	PEEK®	
Process Connection	Electrodes	316 stainless steel (1.4408, DIN 17440)
	Standard 316 SS fitting	¾ in. NPT thread
Maximum Temperature/Pressure Rating		
	6.9 bar @ 150 °C	100 psi @ 302 °F
Temperature Response, τ	120 seconds	
Temperature Accuracy	±0.3 °C	
Shipping Weight		
	0.3 kg	0.6 lb
Standards and Approvals		
	RoHS compliant, China RoHS	

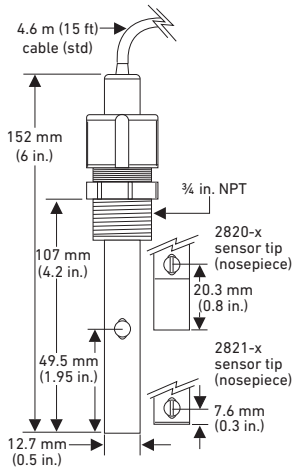
See Temperature and Pressure graphs for more information.

Dimensions

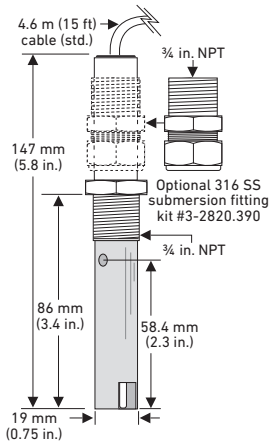
2818



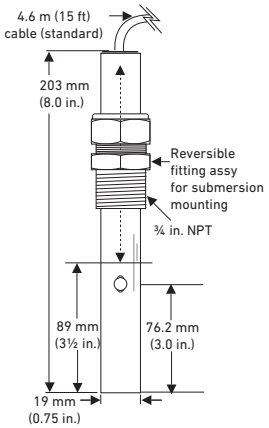
2819, 2820, 2821



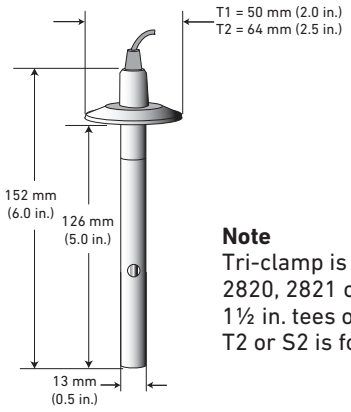
2822



2823



Sanitary



Note
Tri-clamp is available for 2819, 2820, 2821 only. T1 or S1 is for 1 to 1½ in. tees or flanges.
T2 or S2 is for 2 in. tees or flanges.

System Overview

In-Line Installation

Panel Mount*	Pipe, Tank, Wall Mount	4 to 20 mA Output*	Automation System	Field (Integral) Mount*
Signet Instruments with 2850 Sensor Electronics - 8900 - 9900 or with 3-9900.394 Direct Conductivity/Resistivity Module - 9950 or with 9950.394 Direct Conductivity/Resistivity Module or with 3-9950.394-2 Dual Channel Conductivity Module	Signet Instruments with 2850 Sensor Electronics - 9900 and Rear Enclosure or with 3-9900.394 Direct Conductivity/Resistivity Module and Rear Enclosure	Signet 2850 Sensor Electronics with - Customer Supplied Programmable Logic Controller or - Programmable Automation Controller	Signet 2850 Sensor Electronics with - 0486 Profibus Concentrator and - Customer Supplied Programmable Logic Controller or - Programmable Automation Controller	Signet Instrument - 9900 with 3-9900.394 Direct Conductivity/Resistivity Module and Angle Adapter

Signet 2818-2823 Conductivity Electrodes

Note: Conductivity electrodes need to go thru 2850 sensor (S^3L or 4 to 20 mA) or go thru a 9900/9950 (4 to 20 mA) via direct conductivity module

Signet 2819-2823 Conductivity Electrodes

Special order for 0.01, 0.1 and 1.0 cells**

Fittings- Customer Supplied

All sold separately

Submersible Installation

Panel Mount	Pipe, Tank, Wall Mount*	4 to 20 mA Output*	Automation System
Signet Instruments with 2850 Sensor Electronics - 8900 - 9900 or with 3-9900.394 Direct Conductivity/Resistivity Module - 9950 or with 9950.394 Direct Conductivity/Resistivity Module or with 3-9950.394-2 Dual Channel Conductivity Module	Signet Instruments with 2850 Sensor Electronics - 9900 and Rear Enclosure or with 3-9900.394 Direct Conductivity/Resistivity Module, Rear Enclosure and customer supplied pipe extension or conduit with 3/4 in. FNPT threads***	Signet 2850 Sensor Electronics with - Customer Supplied Programmable Logic Controller or - Programmable Automation Controller	Signet 2850 Sensor Electronics with - 0486 Profibus Concentrator and Customer Supplied Programmable Logic Controller or - Programmable Automation Controller

Signet 2818-2823 Conductivity Electrodes

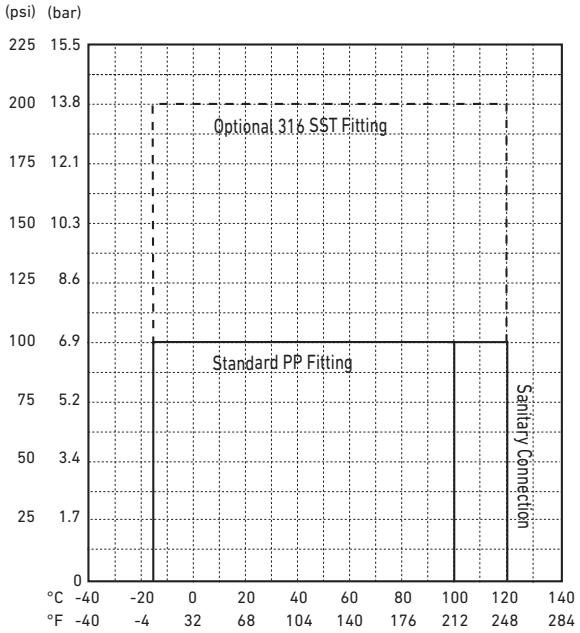
Special order for 0.01, 0.1 and 1.0 cells**

All sold separately

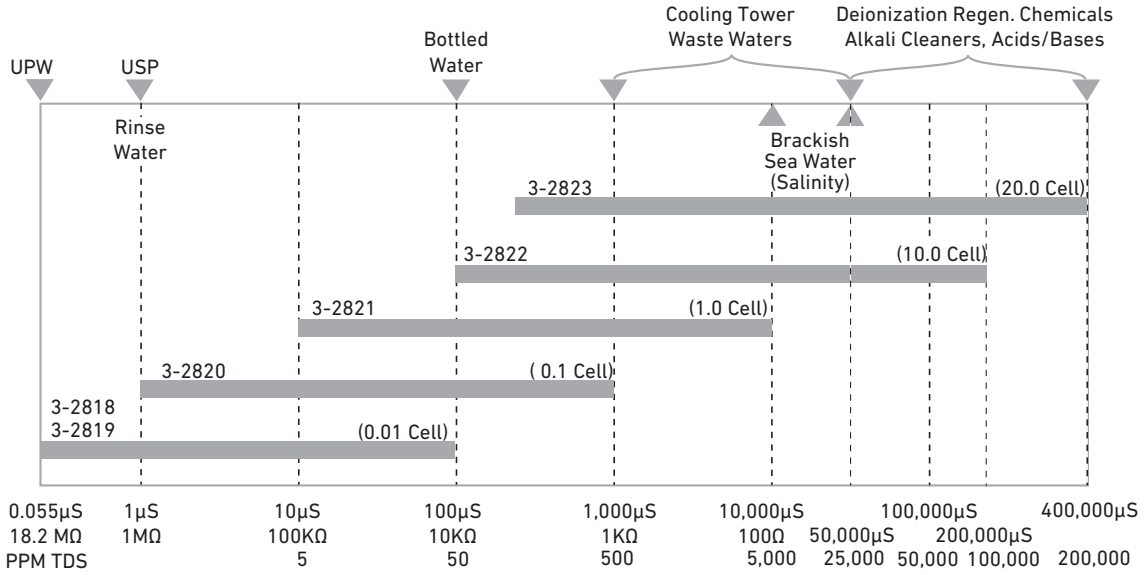
*If required distance is greater that 100 ft, use 3-2850-52 (S^3L) or 3-2850-52 4 to 20 mA sensor electronics.
** Special Order for 0.01, 0.1 and 1.0 cells. Submersible installation not applicable for Sanitary Conductivity Electrode.
***Refer to the Signet Submersion Kit brochure (3-0000-707) located on our website for installation suggestions and options.

Temperature/Pressure Graphs

Note:
The pressure/temperature graphs are specifically for the Signet sensor. During system design the specifications of all components must be considered. In the case of a metal piping system, a plastic sensor will reduce the system specification.



Operating Range Chart



Application Tips

- GF Signet advises all conductivity sensors be installed in a piping system as shown in Fig 1.
- Liquid levels must be high enough to cover vent hole on sensor body.
- Threads on models 2823 can be reversed in the field.
- Use 2819 series electrodes with the 3-2850-63 electronics and 8900 for applications requiring multiple measuring points.
- Install sensors in an area that will remain free of air bubbles and sediment build-up.
- Conductivity measurements are affected if electrodes are coated by process substances.

Ordering Notes

1) Alternate wetted materials and sensor lengths are available through special order.
2) The 2818 and 2819 maximum cable length is 7.6 m (25 ft) unless used with the 9900 or 9950 with Direct Conductivity/Resistivity Module.
3) All other sensors - cable lengths of up to 30 m (100 ft) are available - consult factory.
4) Use PN 3-2820.390 or 3-2820.391 for a submersible threaded connection.

Example of NIST Traceability Certificate

CERTIFICATE

Date: November 10, 2017

Sensor Part Number:	3-2819-T1C
Sensor Serial Number:	980159-04
Sensor Cell Constant:	0.0102
Temp. Element Offset:	0.1 °C
Measured at:	24.8 °C

NIST Certified

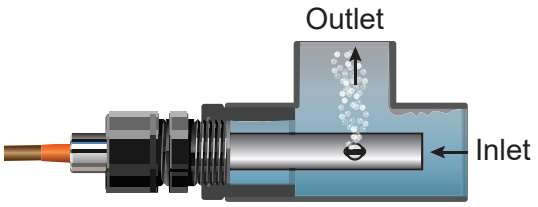
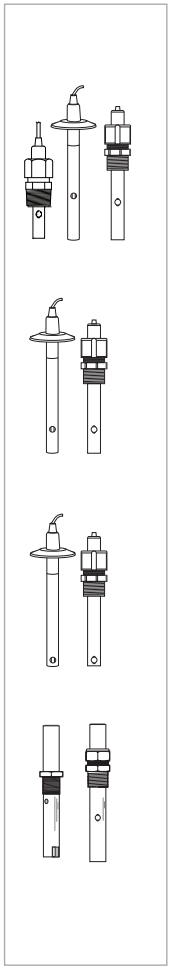


Fig. 1

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

Ordering Information



Mfr. Part No.	Code	Cell Constant	Sensor Material and Mounting	Insertion into Tee Size
3-2818-1**	**159 001 718**	0.01 cm-1	316 SS Electrode, ¾ in. Threads	in-line only
3-2819-1	**198 844 010**	0.01 cm-1	316 SS Electrode, ¾ in. Threads	in-line only
3-2819-1C	**159 000 651**	0.01 cm-1	316 SS Electrode, ¾ in. Threads (certified)	in-line only
3-2819-S1	**159 000 085**	0.01 cm-1	316 SS Electrode, Sanitary Tri-clamp Flange	1 to 1½ in.
3-2819-S1C†*	**159 000 087**	0.01 cm-1	316 SS Electrode, Sanitary Tri-clamp Flange	1 to 1½ in.
3-2819-S2†	**159 000 086**	0.01 cm-1	316 SS Electrode, Sanitary Tri-clamp Flange	2 in.
3-2819-S2C†*	**159 000 088**	0.01 cm-1	316 SS Electrode, Sanitary Tri-clamp Flange	2 in.
3-2819-T1†	**159 000 081**	0.01 cm-1	Titanium Electrode, Sanitary Tri-clamp Flange	1 to 1½ in.
3-2819-T1C†*	**159 000 083**	0.01 cm-1	Titanium Electrode, Sanitary Tri-clamp Flange	1 to 1½ in.
3-2819-T2†	**159 000 082**	0.01 cm-1	Titanium Electrode, Sanitary Tri-clamp Flange	2 in.
3-2819-T2C†*	**159 000 084**	0.01 cm-1	Titanium Electrode, Sanitary Tri-clamp Flange	2 in.
3-2820-1	**198 844 000**	0.1 cm-1	316 SS Electrode, ¾ in. threads	in-line only
3-2820-1C	**159 000 654**	0.1 cm-1	316 SS Electrode, ¾ in. threads (certified)	in-line only
3-2820-S1	**159 000 089**	0.1 cm-1	316 SS Electrode, Sanitary Tri-clamp flange	1 to 1½ in.
3-2820-S1C†*	**159 000 091**	0.1 cm-1	316 SS Electrode, Sanitary Tri-clamp flange	1 to 1½ in.
3-2820-S2†	**159 000 090**	0.1 cm-1	316 SS Electrode, Sanitary Tri-clamp flange	2 in.
3-2820-S2C†*	**159 000 092**	0.1 cm-1	316 SS Electrode, Sanitary Tri-clamp flange	2 in.
3-2820-T1†	**159 000 624**	0.1 cm-1	Titanium Electrode, Sanitary Tri-clamp flange	1 to 1½ in.
3-2820-T2†	**159 000 625**	0.1 cm-1	Titanium Electrode, Sanitary Tri-clamp flange	2 in.
3-2821-1	**198 844 001**	1.0 cm-1	316 SS Electrode, ¾ in. Threads	in-line only
3-2821-1C	**159 000 650**	1.0 cm-1	316 SS Electrode, ¾ in. Threads (certified)	in-line only
3-2821-S1†	**159 000 093**	1.0 cm-1	316 SS Electrode, Sanitary Tri-clamp Flange	1 to 1½ in.
3-2821-S1C†*	**159 000 095**	1.0 cm-1	316 SS Electrode, Sanitary Tri-clamp Flange	1 to 1½ in.
3-2821-S2†	**159 000 094**	1.0 cm-1	316 SS Electrode, Sanitary Tri-clamp Flange	2 in.
3-2821-S2C†*	**159 000 096**	1.0 cm-1	316 SS Electrode, Sanitary Tri-clamp Flange	2 in.
3-2821-T1†	**159 000 626**	1.0 cm-1	Titanium Electrode, Sanitary Tri-clamp Flange	1 to 1½ in.
3-2821-T2†	**159 000 627**	1.0 cm-1	Titanium Electrode, Sanitary Tri-clamp Flange	2 in.
3-2822-1	**198 844 002**	10 cm-1	316 SS Electrode with fixed ¾ in. Threads	in-line or submersible mounting only
3-2823-1	**198 844 003**	20 cm-1	316 SS Electrode, ¾ in. Reversible Threads	in-line or submersible mounting only

†Available for 0.01 cm^{-1}, 0.1 cm^{-1}, and 1.0 cm^{-1} cells only
*NIST Certified
**NIST certificate available. Contact the factory.

Special Order Options - Please consult the factory
High Temperature and Pressure options.
Wetted materials (Hastelloy-C, Monel and Titanium) and sensor lengths.
Wet-Tap, ball valve retractable sensor for long insertion length available as a special order.

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, for use with 8900, 9900, 9950, 2850 and the 2850 4-20 mA output
3-2850.101-2	**159 001 393**	Plug-in NIST Traceable Recertification Tool, 2.5 µS Simulated, for use with 8900, 9900, 9950, 2850 and the 2850 4-20 mA output
3-2850.101-3	**159 001 394**	Plug-in NIST Traceable Recertification Tool, 10.0 µS Simulated, for use with 8900, 9900, 9950, 2850 and the 2850 4-20 mA output
3-2850.101-4	**159 001 395**	Plug-in NIST Traceable Recertification Tool, 18.2 MΩ Simulated, for use with 8900, 9900, 9950, 2850 and the 2850 4-20 mA output
3-2850.101-5	**159 001 396**	Plug-in NIST Traceable Recertification Tool, 10.0 MΩ Simulated, for use with 8900, 9900, 9950, 2850 and the 2850 4-20 mA output
3-2820.390	**198 840 223**	¾ in. NPT Fitting, 316 SS for use with 2822-1 and 2823-1 for submersible mounting
3-2820.391	**198 840 221**	¾ in. NPT Fitting, Polypro replacement for 2819-1, 2820-1 or 2821-1
3-2820.392	**198 840 222**	½ in. NPT Fitting, 316 SS for use with 2819-1, 2820-1 or 2821
3-2850-61	**159 001 400**	Universal Junction Box, Conductivity Electronics, digital (S^3L) output
3-2850-62	**159 001 401**	Universal Junction Box, Conductivity Electronics, 4 to 20 output
5523-0322	**159 000 761**	Sensor Cable (per ft), 3 cond. plus shield, 22 AWG (for cable extension through a junction box for the following sensors: 3-2820, 3-2821, 3-2822, 3-2823
3-8050-1	**159 000 753**	Universal Mount Junction Box

Note: GF Signet recommended sensors that require extended cable lengths be ordered from the factory.

Signet 2839-1V(D) to 2842-1V(D) PVDF Conductivity Electrodes

2839-1V | 2840-1V | 2841-1V 2842-1V

The Signet 2839-1V(D) to 2842-1V(D) Conductivity/ Resistivity Electrodes are available in four cell constants from 0.01 to 10.0 cm^{-1}, and are suitable for a wide variety of applications from high purity water quality monitoring to weak acids and bases. 316 SS electrode surface finishes are controlled in a precision bead blasting operation to ensure measurement accuracy and repeatability.

The PVDF insulator and process connections are injection over-molded to minimize variance between electrodes. Double threaded connections in either ¾ in. NPT or ISO 7/1-R 3/4 enable quick and easy installation in submersible or in-line configurations. Transmitter integral mounting kit and junction boxes are available as accessories.

A Certificate of Calibration is included with all 2839-1V(D) to 2842-1V(D) Conductivity/Resistivity Electrodes. The electrodes are calibrated to meet ± 2% accuracy. Electrodes can be shipped back to the GF Signet factory for recertification.

The certificate includes calculated cell constant and temperature offset which when entered into the "custom cell" menu of any Signet meter would provide a 2% accuracy of the sensors reading.

Features

- **± 2% accuracy - Custom calibration certificate provided**
- **Dual-threaded**
- **Compact electrode length for easy in-line installation in small pipe sizes**
- **Triple orifice flow-through design reduces clogging and bubble entrapment**
- **316 SS electrodes with injection molded PVDF process connections and insulators**
- **Meets USP requirements**

Applications

- **Water Treatment & Water Quality Monitoring**
- **Reverse Osmosis**
- **Deionization**
- **Cooling Tower and Boiler Protection**
- **Distillation**
- **Desalination**
- **Demineralizer**
- **Semiconductor**
- **Aquatic Animal Life Support Systems**

Specifications

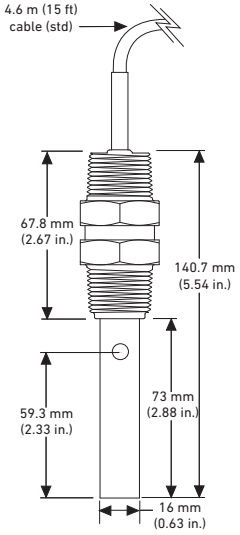
General				
Operating Range				
	2839	0.055 to 100 µS	0.02 to 50 ppm	18.2 MΩ to 10 KΩ
	2840	1 to 1,000 µS	0.5 to 500 ppm	1 MΩ to 1 KΩ
	2841	10 to 10,000 µS	5 to 5,000 ppm	
	2842	100 to 200,000 µS	50 to 100,000 ppm	
Cell Constant Accuracy		±2% when the information provided on the certificate of calibration is entered into the transmitter/meter or when wet calibrated with a traceable standard.		
Dual-Threaded Process Connection		-1V versions: ¾ in. NPT		
		-1VD versions: ISO 7/1-R 3/4		
Cable Length (use for the 2839, 40 ,41 and 42)	Standard	4.6 m (15 ft)		
	Maximum	30 m (100 ft) all sensors when used with the 9900, 9950 and direct conductivity/resistivity modules		
	0.01 cells	4.6 m (15 ft) when used with 2850*		
Temperature Element		Pt1000		
Temperature Response, t				
	0.01 cell	5 sec.		
	0.10 cell	10 sec.		
	1.0 cell	20 sec.		
	10.0 cell	30 sec.		
Temperature Accuracy		±0.5 °C	±0.9 °F	
Wetted Materials				
Internal O-ring (2841 and 2842)		FKM		
Insulator Material		PVDF		
Electrode Material		316 SS		
Threaded Process Connection		PVDF		
Max. Temperature/Pressure Rating				
		131 °C @ 2.76 bar	268 °F @ 40 psi	
Storage Temperature		-20 °C to 131 °C	-4 °F to 268 °F	
Shipping Weight				
2839		0.34 kg	0.74 lb	
2840, 2841, 2842		0.30 kg	0.66 lb	
Standards and Approvals				
		RoHS compliant, China RoHS		
		Manufactured under ISO 9001 for Quality and ISO 14001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety		

*2850 cable length 4.6 m (15 ft) maximum for all cells.
See Temperature and Pressure graphs for more information.

Dimensions

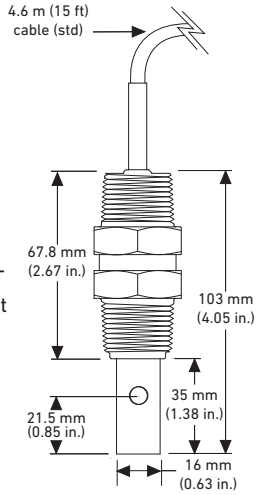
Dual-Threaded Electrodes

3-2839-1V(D) (0.01 cell)

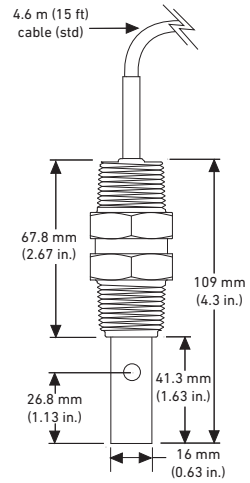


Dual threads 3/4 NPT or ISO 7/1-R 3/4 front and back

3-2840-1V(D) (0.1 cell)

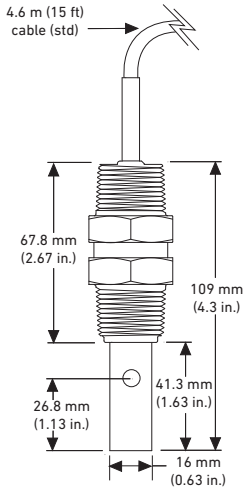


3-2841-1V(D) (1.0 cell)*



Dual threads 3/4 NPT or ISO 7/1-R 3/4 front and back

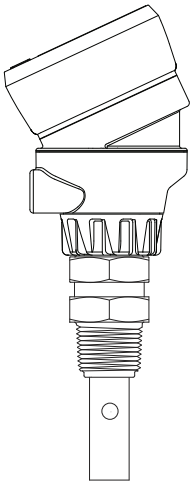
3-2842-1V(D) (10.0 cell)*



* Although these electrodes look similar in design, there is an inherent difference. From the bottom view, the 2841 electrode features a simple plastic insert. However, the 2842 electrode features a complex plastic insert with four holes through which liquid flows.

Integral Mount Sensor

The 2839-2842 Dual Threaded Conductivity Electrodes can be directly mounted to a 3-9900-1 transmitter, 3-9900.396 direct conductivity module, 3-9900.396 angle adjust adapter and the 8052 Integral Mount Kit. Customer to modify the cable length of the standard cable assembly. See sensor manual for details.



System Overview

In-Line Installation

Panel Mount*	Pipe, Tank, Wall Mount	4 to 20 mA Output*	Automation System	Field (Integral) Mount*
Signet Instruments with 2850 Sensor Electronics - 8900 - 9900 or with 3-9900.394 Direct Conductivity/Resistivity Module - 9950 or with 9950.394 Direct Conductivity/Resistivity Module or with 3-9950.394-2 Dual Channel Conductivity Module	Signet Instruments with 2850 Sensor Electronics - 9900 and Rear Enclosure or with 3-9900.394 Direct Conductivity/Resistivity Module and Rear Enclosure	Signet 2850 Sensor Electronics with - Customer Supplied Programmable Logic Controller or - Programmable Automation Controller	Signet 2850 Sensor Electronics with - 0486 Profibus Concentrator and Customer Supplied Programmable Logic Controller or - Programmable Automation Controller	Signet Instrument - 9900 with 3-9900.394 Direct Conductivity/Resistivity Module and Angle Adapter

Signet 2839-2842 Conductivity Electrodes

Customer Supplied Fittings, 3/4 in. NPT or ISO threaded — All sold separately

Submersible Installation

Panel Mount	Pipe, Tank, Wall Mount*	Field (Integral) Mount	4 to 20 mA Output*	Automation System
Signet Instruments with 2850 Sensor Electronics - 8900 - 9900 or with 3-9900.394 Direct Conductivity/Resistivity Module - 9950 or with 9950.394 Direct Conductivity/Resistivity Module or with 3-9950.394-2 Dual Channel Conductivity Module	Signet Instruments with 2850 Sensor Electronics - 9900 and Rear Enclosure or with 3-9900.394 Direct Conductivity/Resistivity Module, Rear Enclosure and customer supplied pipe extension or conduit with 3/4 in. FNPT threads***	Signet Instrument - 9900 with 3-9950.394 Direct Conductivity/Resistivity Module and Angle Adapter	Signet 2850 Sensor Electronics with - Customer Supplied Programmable Logic Controller or - Programmable Automation Controller	Signet 2850 Sensor Electronics with - 0486 Profibus Concentrator and Customer Supplied Programmable Logic Controller or - Programmable Automation Controller

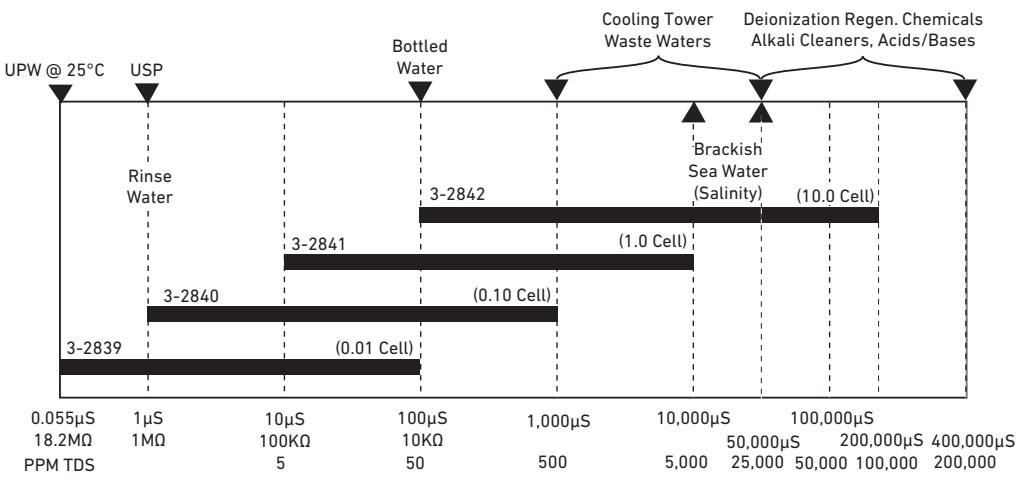
Signet 2839-2842 Conductivity Electrodes

Note: Conductivity electrodes need to go thru 2850 sensor electronics or go thru a 9900/9950 direct conductivity module

All sold separately

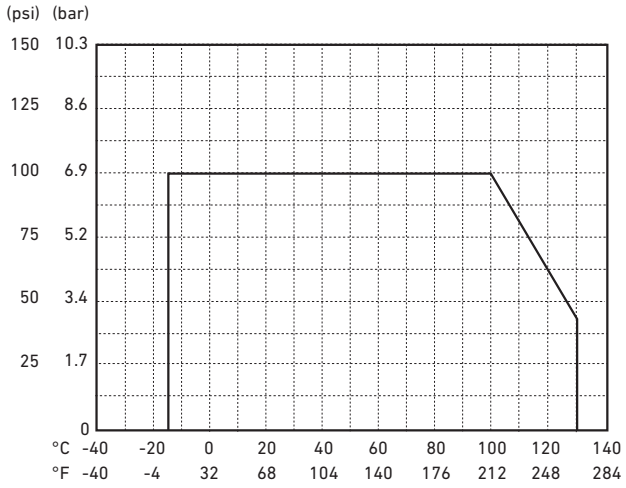
*Refer to the Signet Submersion Kit brochure (3-0000.707) located on our website for installation suggestions and options.

Operating Range Chart



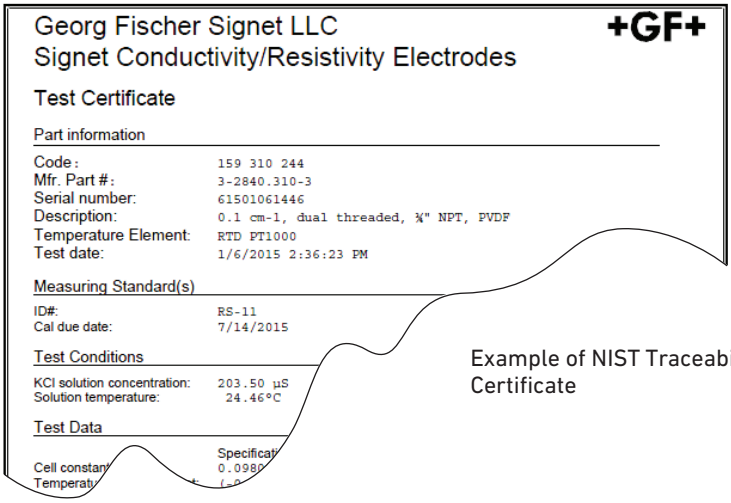
Temperature/Pressure Graphs

Note:
The pressure/temperature graphs are specifically for the Signet sensor. During system design the specifications of all components must be considered. In the case of a metal piping system, the PVDF process connector provided with the sensor may reduce the overall system working pressure.



Application Tips
- Use 2839 series electrodes with the 3-2850-63 electronics and 9950 or 8900 for applications requiring multiple measuring points.
- Liquid levels must be high enough to cover vent hole on sensor body.
- Install sensors in an area that will remain free of air bubbles and sediment build-up.
- Conductivity measurements are affected if electrodes are coated by process substances.
- Use Model 2839 with the 2850/9900, 9950 or the 8900 for low conductivity applications requiring multiple measuring points.

Ordering Notes
1) The Conductivity Certification tools are compatible with the following Signet Instruments: 8900, 9900, and 9950.
2) The sensor cable can be extended up to 30 m (100 ft). See restrictions under general specifications.


Georg Fischer Signet LLC
Signet Conductivity/Resistivity Electrodes
+GF+

Test Certificate

Part information

Code:	159 310 244
Mfr. Part #:	3-2840.310-3
Serial number:	61501061446
Description:	0.1 cm-1, dual threaded, ¾" NPT, PVDF
Temperature Element:	RTD PT1000
Test date:	1/6/2015 2:36:23 PM

Measuring Standard(s)

ID#:	RS-11
Cal due date:	7/14/2015

Test Conditions

KCl solution concentration:	203.50 µS
Solution temperature:	24.46°C

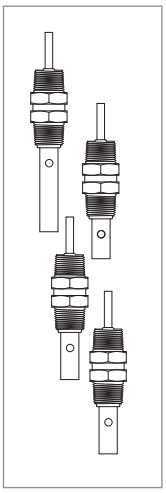
Test Data

Specificat
Cell constan 0.098
Temperatu

Example of NIST Traceability Certificate

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

Ordering Information



Sensors for use with 9900, and 2850 instruments

Mfr. Part No.	Code	Cell Constant	Connection	Thread Size(s)	Cable Length
3-2839-1V	**159 001 810**	0.01 cm-1	Dual Threaded	¾ inch NPT	4.6 m (15 ft)
3-2839-1VD	**159 001 811**	0.01 cm-1	Dual Threaded	ISO 7/1-R 3/4	4.6 m (15 ft)
3-2840-1V	**159 001 812**	0.1 cm-1	Dual Threaded	¾ inch NPT	4.6 m (15 ft)
3-2840-1VD	**159 001 813**	0.1 cm-1	Dual Threaded	ISO 7/1-R 3/4	4.6 m (15 ft)
3-2841-1V	**159 001 814**	1.0 cm-1	Dual Threaded	¾ inch NPT	4.6 m (15 ft)
3-2841-1VD	**159 001 815**	1.0 cm-1	Dual Threaded	ISO 7/1-R 3/4	4.6 m (15 ft)
3-2842-1V	**159 001 816**	10 cm-1	Dual Threaded	¾ inch NPT	4.6 m (15 ft)
3-2842-1VD	**159 001 817**	10 cm-1	Dual Threaded	ISO 7/1-R 3/4	4.6 m (15 ft)

Special Order Options - Please consult the factory
Cable length extensions of up to 30 m (100 ft) are available.
For any sensor being used with the 2850-6X, cable length should not exceed 4.6 m (15 ft).

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, for use with 8900, 9900, 9950, 2850 and the 2850 4-20 mA output
3-2850.101-2	**159 001 393**	Plug-in NIST Traceable Recertification Tool, 2.5 µS Simulated, for use with 8900, 9900, 9950, 2850 and the 2850 4-20 mA output
3-2850.101-3	**159 001 394**	Plug-in NIST Traceable Recertification Tool, 10.0 µS Simulated, for use with 8900, 9900, 9950, 2850 and the 2850 4-20 mA output
3-2850.101-4	**159 001 395**	Plug-in NIST Traceable Recertification Tool, 18.2 MΩ Simulated, for use with 8900, 9900, 9950, 2850 and the 2850 4-20 mA output
3-2850.101-5	**159 001 396**	Plug-in NIST Traceable Recertification Tool, 10.0 MΩ Simulated, for use with 8900, 9900, 9950, 2850 and the 2850 4-20 mA output
3-2850-61	**159 001 400**	Universal Junction Box, Conductivity Electronics, digital (S^3L) output
3-2850-62	**159 001 401**	Universal Junction Box, Conductivity Electronics, 4 to 20 output
3-8052	**159 000 188**	¾ in. Integral Mounting Kit
5523-0322	**159 000 761**	Sensor cable (per ft), 3 cond. plus shield, 22 AWG, for cable extension through a junction box for the following sensors: 3-2840, 3-2841, 3-2842
3-8050-1	**159 000 753**	Universal Mount Junction Box

Signet 2850 Conductivity/Resistivity Sensor Electronics and Integral Systems with PVDF Sensor

Universal Mount Junction Box

NPT Mount Junction Box

2850 Integral Conductivity System for in-line installations, PVDF

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 digital (S^3L) output, or a single 4 to 20 mA. The digital (S^3L) output version can be paired with the 9900 or 9950 Transmitter to extend the distance between the measuring points to 120 m (400 ft).

The 8900 Multi-Parameter Controller allows for up to six 2850 (S^3L) output conductivity sensors to be used with 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 ft).

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

- **Test certificate supplied with all sensors**
- **Custom cell constant programmed into the electronics**
- **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**
- **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**

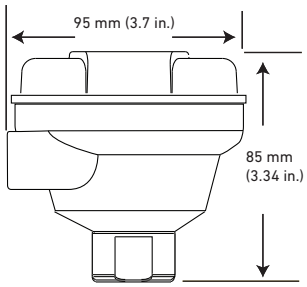
U.S. Patent No.: 7,550,979 B2

Specifications

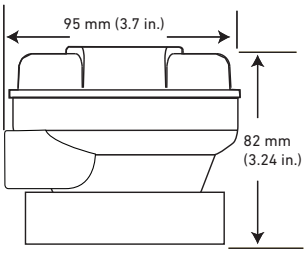
General			
Compatible Electrodes		All Signet Sensors	
Materials			
NPT Mount Junction Box for Integral Mount		PBT	
Universal/Remote Mount		PBT, CPVC	
EasyCal - Automatic Recognition of the Following Conductivity Values			
	146.93 µS, 1408.8 µS, 12856 µS (@25 °C) (Test solutions Per ASTM D1125-95)		
	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, 9900, 0486), 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	Conductivity and Temperature	< 600 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 (2839**)	4 to 20 mA = 0 to 100 µS	
	0.10 cell (2840**)	4 to 20 mA = 0 to 1000 µS	
	1.0 cell (2841**)	4 to 20 mA = 0 to 10,000 µS	
	10.0 cell (2842**)	4 to 20 mA = 0 to 200,000 µS	
	20.0 cell (2823)*	4 to 20 mA = 0 to 400,000 µS	
*Special Order			
**Test certificate supplied with all sensors. Custom cell constant programmed into the electronics.			
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	0.75 kg	1.75 lb
	Universal Mount	0.75 kg	1.75 lb
Standards and Approvals			
	CE, FCC		
	RoHS compliant, China RoHS		
	Manufactured under ISO 9001 for Quality and ISO 14001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety		

Dimensions

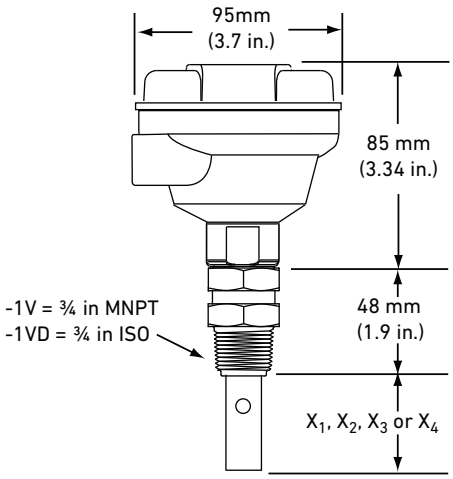
2850-5X NPT Mount Junction Box Systems



2850-6X Universal Mount Systems



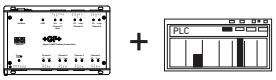
2850-5X-XX-1V(D) Field (Integral) Mount Systems



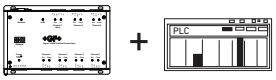
Sensor	Insertion Depth
X1 (3-2839-1V(D))	73 mm (2.88 in.)
X2 (3-2840-1V(D))	35 mm (1.38 in.)
X3 (3-2841-1V(D))	41.3 mm (1.63 in.)
X4 (3-2842-1V(D))	41.3 mm (1.63 in.)

System Overview

In-Line Installation

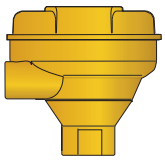
Panel, Wall Mount	4 to 20 mA Output	Automation System
Signet Instruments - 8900 - 9900* - 9950 	- Customer Supplied Programmable Logic Controller, or - Programmable Automation Controller 	- 0486 Profibus Concentrator and Customer Supplied Programmable Logic Controller or - Programmable Automation Controller 
Signet 2850 Conductivity System or 2850 Universal Mount  		
Fittings - Customer Supplied 3/4 in. NPT or ISO threads		All sold separately

Submersible Installation

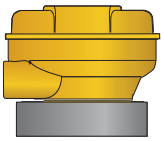
Panel, Wall Mount	4 to 20 mA Output	Automation System
Signet Instruments - 8900 - 9900* - 9950 	- Customer Supplied Programmable Logic Controller, or - Programmable Automation Controller 	- 0486 Profibus Concentrator and Customer Supplied Programmable Logic Controller or - Programmable Automation Controller 
Signet 2850 Universal Mount or NPT Mount Junction Box  		
Fittings - Customer Supplied 3/4 in. NPT or ISO threads		All sold separately

* If the 2850 is used with the 9900, it is not necessary to use the 9900 conductivity module.

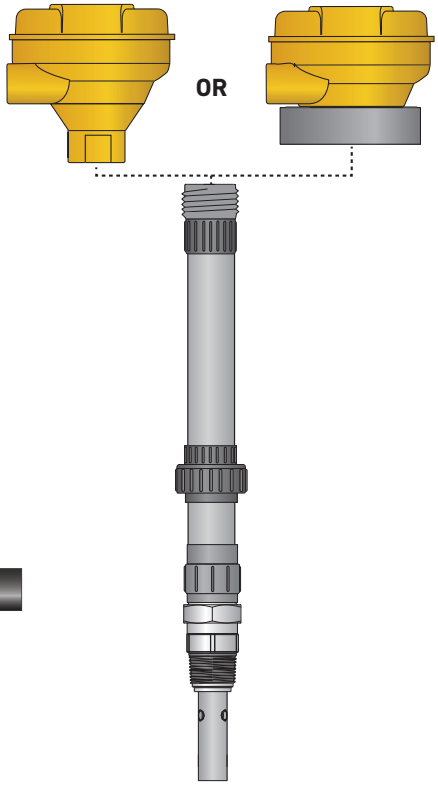
Note:
The 9900 (with Direct Conductivity/Resistivity module) can run all conductivity sensors with 30 m (100 ft) of cable.
The 2850 (S^3L) signal can be used for distances over 30 m (100 ft). The 2850 has a limited sensor cable input length of 4.6 m (15 ft).

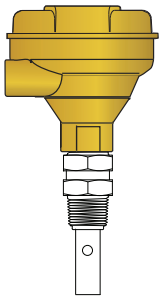


-5X NPT Mount
Junction Box

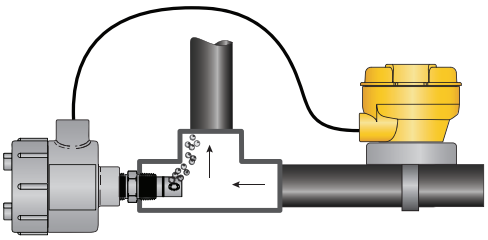


-6X Universal Mount
Junction Box





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



Universal J-box assembly allows sensors without the 3/4 " rear thread to be used.

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

Field Selectable Ranges for 4 to 20 mA Operation

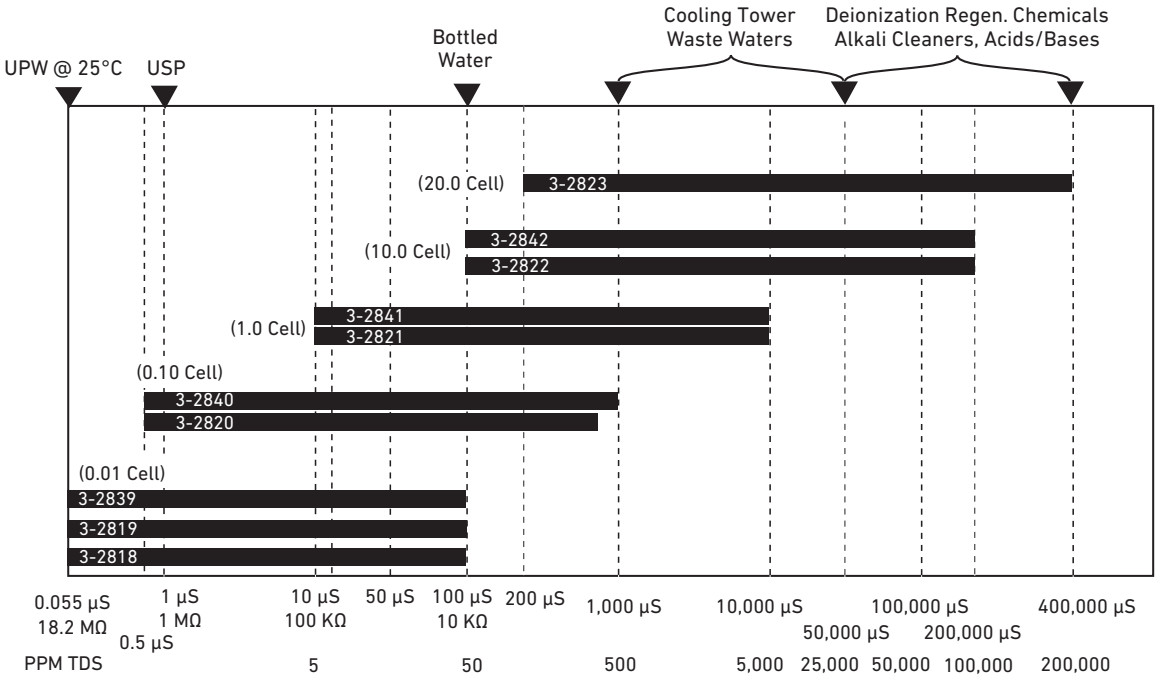
The chart below indicates the field selectable ranges in which the 2850 sensor electronics can be set via internal switches. All ranges can be inverted if required. Signet Models listed below are compatible Conductivity/Resistivity electrodes.

0.01 Cell	0.10 Cell	1.0 cell	10.0 Cell	20.0 Cell
Signet Model 2839	Signet Model 2840	Signet Model 2841	Signet Model 2842	Signet Model 2823 (Special Order)
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 mA output ranges shown in this chart can be inverted using the internal switch Resistivity. Ranges are in BOLD
Note: The 2819-2823 series Integral Systems must be ordered through special order products.

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

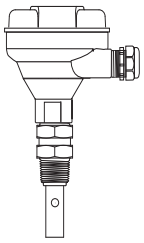
1) All 2850 units can be used with any Signet Conductivity/Resistivity electrode
2) Integral systems are only offered with Signet models 2839-2842 electrodes. 2818-2823 require a special order sensor.
3) Dual channel units are only available in the universal mount junction box/remote mount configuration 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).

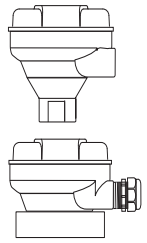
Please refer to Wiring, Installation, and Accessories sections for more information.

Ordering Information



Mfr. Part No.	Code	Sensor	Process Threaded Connection
2850 Integral Mount Systems, PVDF* (includes Sensor Electronics and PVDF Electrodes) with EasyCal			
		Digital (S^3L) output	
3-2850-51-39V	**159 001 818**	2839 Electrode, 0.01 cell	NPT threads
3-2850-51-40V	**159 001 819**	2840 Electrode, 0.1 cell	NPT threads
3-2850-51-41V	**159 001 820**	2841 Electrode, 1.0 cell	NPT threads
3-2850-51-42V	**159 001 821**	2842 Electrode, 10.0 cell	NPT threads
3-2850-51-39VD	**159 001 822**	2839 Electrode, 0.01 cell	ISO threads
3-2850-51-40VD	**159 001 823**	2840 Electrode, 0.1 cell	ISO threads
3-2850-51-41VD	**159 001 824**	2841 Electrode, 1.0 cell	ISO threads
3-2850-51-42VD	**159 001 825**	2842 Electrode, 10.0 cell	ISO threads
		4 to 20 mA output	
3-2850-52-39V	**159 001 826**	2839 Electrode, 0.01 cell	NPT threads
3-2850-52-40V	**159 001 827**	2840 Electrode, 0.1 cell	NPT threads
3-2850-52-41V	**159 001 828**	2841 Electrode, 1.0 cell	NPT threads
3-2850-52-42V	**159 001 829**	2842 Electrode, 10.0 cell	NPT threads
3-2850-52-39VD	**159 001 830**	2839 Electrode, 0.01 cell	ISO threads
3-2850-52-40VD	**159 001 831**	2840 Electrode, 0.1 cell	ISO threads
3-2850-52-41VD	**159 001 832**	2841 Electrode, 1.0 cell	ISO threads
3-2850-52-42VD	**159 001 833**	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 or integral mounting, single input only
3-2850-51	**159 001 398**	One input/one digital (S^3L) output for use with 8900 , 9900 or 9950
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 , 9900 or 9950
3-2850-62	**159 001 401**	One input/one 4 to 20 mA output

**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
3-2839-1V	**159 001 810**	Electrode PVDF/SS- 0.01 µS/cm, ¾ inch NPT, 4.6 m (15 ft) cable
3-2839-1VD	**159 001 811**	Electrode PVDF/SS- 0.01 µS/cm, ISO 7/1-R 3/4, 4.6 m (15 ft) cable
3-2840-1V	**159 001 812**	Electrode PVDF/SS- 0.1 µS/cm, ¾ inch NPT, 4.6 m (15 ft) cable
3-2840-1VD	**159 001 813**	Electrode PVDF/SS- 0.1 µS/cm, ISO 7/1-R 3/4, 4.6 m (15 ft) cable
3-2841-1V	**159 001 814**	Electrode PVDF/SS- 1.0 µS/cm, ¾ inch NPT, 4.6 m (15 ft) cable
3-2841-1VD	**159 001 815**	Electrode PVDF/SS- 1.0 µS/cm, ISO 7/1-R 3/4, 4.6 m (15 ft) cable
3-2842-1V	**159 001 816**	Electrode PVDF/SS- 10.0 µS/cm, ¾ inch NPT, 4.6 m (15 ft) cable
3-2842-1VD	**159 001 817**	Electrode PVDF/SS- 10.0 µS/cm, ISO 7/1-R 3/4, 4.6 m (15 ft) cable
5523-0322	**159 001 807**	Sensor Cable (per ft), 3 cond. plus shield, 22 AWG

Note: Although a customer can extend the cable of a conductivity sensor, GF Signet does not recommend this, and offers extended cable lengths from the factory.

Signet Conductivity/Resistivity Instruments

	9950	9900
Description	Multi-Channel (2 Channel), Multi-Parameter Controller	Single-Channel, Multi-Parameter Transmitter
Modular Components	Yes	
Number of Flow Totalizers	2 Permanent 2 Resettable	1 Permanent 1 Resettable
Max. Sensor Inputs	2 frequency or (S^3L) inputs	1
Mounting Options	Panel	Panel, Wall, Pipe, Tank
Display	LCD, Dot matrix	LCD with digital bar graph
Analog Output Types	(2) Passive 4 to 20 mA outputs, standard up to 6 via optional modules (optional relay module)	(2) Passive 4 to 20 mA (1) standard, (1) optional with 4 to 20 mA output module HART optional with H COMM module
Max. Relays / O.C.	4 dry contact relays or 2 mechanical and 2 solid state relays (optional relay module)	1 open collector (standard) 2 relays (optional relay module)
Derived Measurements	6 Derived Measurements Sum, Delta (Difference), Ratio, % Passage% Reject, % Recovery	N/A
Languages	English, French, German, Spanish and Simplified Chinese	English
Ambient Temperature (°C) **Storage Temperature (°F)**	DC -10 °C to 70 °C (14 °F to 158 °F) AC -10 °C to 60 °C (14 °F to 140 °F) -15 °C to 70 °C (5 °F to 158 °F)	-10 °C to 70 °C (14 °F to 158 °F) -15 °C to 70 °C (5 °F to 158 °F)
Relative Humidity	0 to 95%, non-condensing	
Power Requirements	DC - 24 VDC nominal (12 to 32 VDC, ±10% regulated) AC - 100 to 240 VAC, 50 to 60 Hz, 24 VA	24 VDC input range: 10.8 to 35.2 VDC regulated
Standards and Approvals	CE, FCC, UL, CUL, RoHS compliant, China RoHS, NEMA TYPE 4X/IP65 (front face only on panel mount)	CE, FCC, UL, CUL, RoHS compliant, Lloyd's Register, China RoHS, NEMA TYPE 4X/IP65 (front face only on panel mount); field mount is 100% NEMA TYPE 4X/IP65

Specification Matrix

	8900
Description	Multi-Channel, Multi-Parameter Controller
Modular Components	Yes
Number of Flow Totalizers	6 Permanent 6 Resettable
Max. Sensor Inputs	up to 2 frequency and 4 (S^3L) or 6 (S^3L) 6 total sensor inputs
Mounting Options	Panel
Display	LCD
Analog Output Types	(4) Passive/Active 4 to 20 mA or (2) 0 to 5/10 VDC
Max. Relays / O.C.	Up to 8 relays (via 8059)
Derived Measurements	Sum, Difference, % Recovery, % Reject, % Passage, Ratio, Power (BTU)
Languages	English, French, German, Spanish, Italian, and Portuguese
Ambient Temperature (°C) **Storage Temperature (°F)**	-10 °C to 55 °C (14 °F to 131 °F) -15 °C to 80 °C (5 °F to 176 °F)
Relative Humidity	0 to 95%, non-condensing
Power Requirements	12 to 24 VDC ±10%, regulated or 100 to 240 VAC ±10%, regulated, 50/60 Hz
Standards and Approvals	CE, FCC, UL, CUL, RoHS compliant, China RoHS NEMA 4X/IP65 (front face only)

Signet 8860 Two-Channel Conductivity/Resistivity Controller

Member of the ProcessPro® Family of Instruments

Not recommended for new designs, please see the 9950 Transmitter

The Signet 8860 Two-Channel Conductivity/Resistivity Controller is packed with a set of features and capabilities ideal for the real needs of water treatment applications. It accommodates two separate and independent input sources and can be powered with AC/DC voltage. The 8860 programs via a simple and intuitive menu system. The unit can also be programmed to measure a raw conductivity value by turning off the temperature compensation mode.

To control the process, the 8860 is equipped with four dry contact relays and three 4 to 20 mA output loops. Calculated measurement include Difference, Ratio or % Rejection. Two of the relays may be converted into open collector outputs with the flip of a switch. Operating modes for the relays and open collector outputs are high, or low alarm, pulse, or special USP alarm mode. The 8860 is offered with a NEMA 4X/IP65 front panel with a self-healing window in a ¼ DIN package for easy panel installation.

Features

- **Meets USP requirements for measuring raw conductivity, USP alarm mode**
- **Dual sensor input**
- **AC or DC powered**
- **Display and/or control: µS, mS, PPM or PPB (TDS), kΩ, MΩ, % rejection, difference, ratio, °C or °F**
- **Three fully scaleable 4 to 20 mA outputs**
- **Two open collector outputs**
- **Four programmable relays**
- **Time delay relay function**
- **Proportional pulse control capability**
- **Compatible with ALL Signet conductivity electrodes**
- **Programmable temperature compensation**
- **NEMA 4X/IP65**

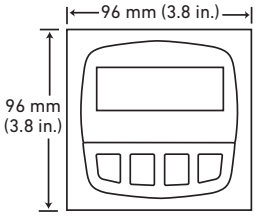
Applications

- **RO/DI System Control**
- **Demineralizer Regeneration and Rinse**
- **Scrubber, Cooling Tower & Boiler Protection**
- **Chemical Concentration**
- **Rinse Tank Water Quality**
- **Desalination**
- **Leak Detection**
- **Aquatic Animal Life Support Systems**
- **Aquaculture**
- **Environmental Studies**

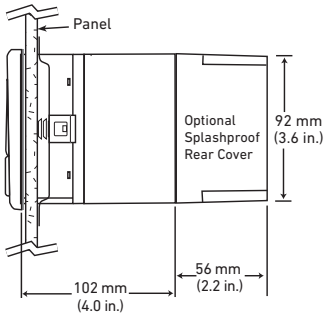
Specifications

General			
Compatible Electrodes		All Signet conductivity/resistivity electrodes	
Operating Range			
	Conductivity	0.055 to 400,000 µS/cm	
	Resistivity	10 KΩ•cm to 18.2 MΩ•cm	0.055 to 100 µS/cm
	TDS	0.001 to 999999 ppm or ppb (display limit)	
	Temperature	Pt1000: -25 °C to 120 °C	-13°F to 248°F
Accuracy			
	Conductivity/Resistivity	±2% of reading	
	Temperature	±0.5 °C	
Materials			
Case		PBT	
Keypad		Sealed 4-key silicone rubber	
Window		Polyurethane coated polycarbonate	
Electrical			
Power Requirements			
	3-8860-AC	100 to 240 VAC ±10%, regulated 50-60 Hz, 20 VA	
	3-8860	12 to 24 VDC ±10%, regulated, 0.5 A max.	
Display		Alphanumeric 2 x 16 LCD	
Contrast		User selected, 5 levels	
Update Rate		1.5 seconds	
Current Outputs		(3 each) 4 to 20 mA, isolated, passive, fully adjustable and reversible	
Maximum Loop Impedance		150 Ω @ 12 V	
		450 Ω @ 18 V	
		750 Ω @ 24 V	
Update Rate		Approx. 100 mS	
Accuracy		±0.03 mA @ 25 °C, 24 VDC	
Open-Collector Outputs		(2 each) Isolated, 50 mA sink or source, 30 VDC max. with pull-up resistor	
Operational Settings		High, Low, USP, Pulse, Off	
Hysteresis		User adjustable	
Time Delay		0 to 6400 seconds	
Maximum Pulse Rate		400 pulses/min	
Alarm Contacts		(up to 4 each) SPDT relays	
Maximum Voltage Ratings		5 A @ 30 VDC or 5 A @ 250 VAC	
Operational Settings		High, Low, USP, Pulse, Off	
Hysteresis		User adjustable	
Time Delay		0 to 6400 seconds	
Maximum Pulse Rate		400 pulses/min.	
Environmental			
Operating Temperature		-10 °C to 55 °C	14 °F to 131 °F
Storage Temperature		-15 °C to 80 °C	5 °F to 176 °F
Relative Humidity		0 to 95%, non-condensing	
Maximum Altitude		2,000 m (6,560 ft)	
Enclosure		NEMA 4X/IP65 (front face only)	
Shipping Weight			
		8860-AC	0.581 kg	1.3 lb
		8860	0.544 kg	1.2 lb
Standards and Approvals			
		CE, FCC, UL, CUL	
		RoHS compliant, China RoHS	
		Manufactured under ISO 9001 for Quality and ISO 14001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety	

Dimensions



Front View

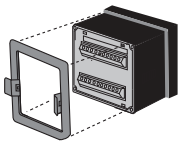


Side View

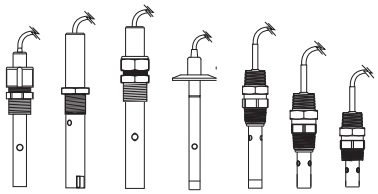
System Overview

Panel Mount

Signet 8860 Conductivity/Resistivity Controller



Signet Electrodes
2818-2823
2839-2842



Note: Submersible installation not applicable for Sanitary Electrode. All sold separately

In-line Installation - Customer supplied fittings	Submersible Installation - 3-8050 Universal Mount Kit or 3-8052 Integral Mount Kit and Pipe extension or conduit with 3/4 in. FNPT threads*

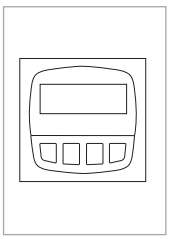
*Refer to the Signet Submersion Kit brochure (3-0000.707) located on our website for installation suggestions and options.

Ordering Notes

1) An optional splashproof rear cover can be ordered separately if needed.
2) Use the heavy duty wall mount bracket to mount instrument on a wall
3) Order RC filter kits to protect relays from voltage spikes.

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

Ordering Information



Mfr. Part No.	Code	Description	Power
Two-channel Conductivity/Resistivity Controller			
3-8860	**159 000 677**	with three 4 to 20 mA outputs and 4 relays or 2 relays with 2 open collectors (switch selectable)	12 to 24 VDC
3-8860-AC	**159 000 678**	with three 4 to 20 mA outputs and 4 relays or 2 relays with 2 open collectors (switch selectable)	100 to 240 VAC

Accessories and Replacement Parts

Mfr. Part No.	Code	Description
Mounting		
3-8050.395	**159 000 186**	Splashproof Rear Cover (panel mount only)
3-8050.392	**159 000 640**	¼ DIN Retrofit Adapter
3-5000.399	**198 840 224**	Panel Adapter, 5 x 5 in. to ¼ DIN
3-0000.596	**159 000 641**	Heavy Duty Wall Mount Bracket (panel mount only)
3-5000.598	**198 840 225**	Surface Mount Bracket (panel mount only)
Liquid Tight Connectors		
3-9000.392	**159 000 368**	Liquid Tight Connector kit for rear cover (3 connectors)
3-9000.392-1	**159 000 839**	Liquid Tight Connector kit, NPT (1 connector)
3-9000.392-2	**159 000 841**	Liquid Tight Connector kit, PG 13.5 (1 connector)
Other		
3-8050.396	**159 000 617**	RC Filter Kit (for relay use), 2 per kit

Signet Conductivity/Resistivity Integral Systems with 9900 Transmitter

Member of the SmartPro® Family of Instruments

Signet has combined the 9900 SmartPro® Transmitter with conductivity and resistivity sensors to create integral systems that are easy to order and simple to install. Also available in flow, level, temperature and pressure configurations, each integral system features a 9900 Transmitter which provides a local and easy to read LCD display. The push button keypad makes it easy to navigate through the transmitter's menu. The DC-powered 9900 features a scalable 4 to 20 mA output and open collector for process control.

The integral system is also offered with a choice of Signet conductivity and resistivity sensors, Models 2839, 2840, 2841, and 2842 in 0.01, 0.1, 1.0, or 10.0 cm^{-1} cell constants, respectively. These sensors are field proven and reliably perform in ranges from 18.2 MΩ (0.055 µS) to 200,000 µS. They are ideal for installation into standard pipes via the ¾ inch sensor threaded (NPT or ISO) process connection.
The sensors are available with 316 stainless steel and PVDF wetted materials.

Features

- **Local Display for sensor mounted instruments**
- **Provides 4 to 20 mA output**
- **"At a glance" visibility**
- **"Dial-type" digital bar graph**
- **NEMA 4X/IP65 enclosures**
- **Large selection of Signet Conductivity and Resistivity sensors available**

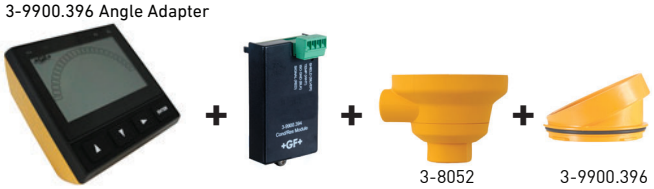
Applications

- **RO/DI System Control**
- **Cooling Tower Control**
- **Water Quality Monitoring**
- **Filtration Systems**
- **Scrubber Systems**
- **Boiler Condensate**
- **Semiconductor Water Production**
- **Leak Detection**

System Overview

Integral Installation

Signet Model 9900 Transmitter
3-9900.394 Direct Conductivity/Resistivity Module, 3-8052 Integral Mount Kit and 3-9900.396 Angle Adapter



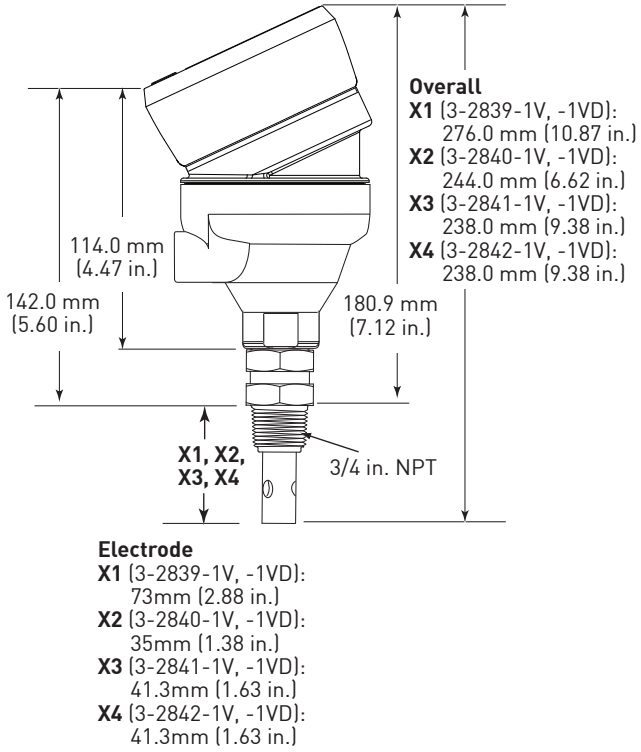
Signet Dual Threaded Conductivity Electrodes
2839 2841
2840 2842

Customer supplied standard ¾ in fittings

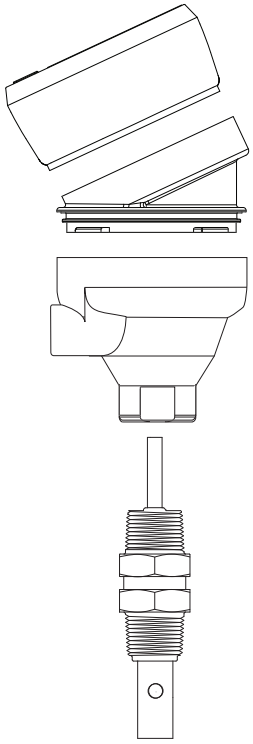
Specifications

See individual instrument and sensor/electrode catalog pages for more information. Refer to Models 2839, 2840, 2841, 2842, and 9900 technical specifications for more details on these products.

Dimensions



Electrode
X1 (3-2839-1V, -1VD): 73mm (2.88 in.)
X2 (3-2840-1V, -1VD): 35mm (1.38 in.)
X3 (3-2841-1V, -1VD): 41.3mm (1.63 in.)
X4 (3-2842-1V, -1VD): 41.3mm (1.63 in.)



3-9900 + 3-9900.394
Instrument + Direct Conductivity/Resistivity Module

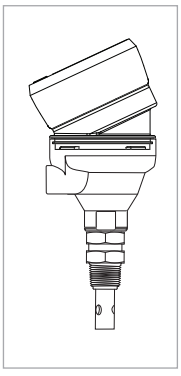
3-9900-396
Angle Adjustment Adapter Kit

3-8052
Integral Mount Kit

3-28XX-XX
Conductivity Electrode

Ordering Notes
Integral Mounts are available with all parts conveniently assembled (transmitter, conductivity module, angle adapter, integral mount kits and electrode). Alternatively, all five parts can be purchased separately. See individual instrument and sensor pages for more information. Part numbers below can be ordered in Europe. All other global regions contact GF Signet Special Order products for pricing and availability.

Ordering Information



Mfr. Part No. /Code	Instrument + Sensor	Description
159 001 728	3-9900-1 + 3-2839-1V	Cell Constant: 0.01 cm-1, ¾ in. NPT
159 001 729	3-9900-1 + 3-2840-1V	Cell Constant: 0.1 cm-1, ¾ in. NPT
159 001 730	3-9900-1 + 3-2841-1V	Cell Constant: 1.0 cm-1, ¾ in. NPT
159 001 731	3-9900-1 + 3-2842-1V	Cell Constant: 10.0 cm-1, ¾ in. NPT
159 001 757	3-9900-1 + 3-2839-1VD	Cell Constant: 0.01 cm-1, ISO 7/1-R ¾
159 001 758	3-9900-1 + 3-2840-1VD	Cell Constant: 0.1 cm-1, ISO 7/1-R ¾
159 001 759	3-9900-1 + 3-2841-1VD	Cell Constant: 1.0 cm-1, ISO 7/1-R ¾
159 001 732	3-9900-1 + 3-2842-1VD	Cell Constant: 10.0 cm-1, ISO 7/1-R ¾

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

Signet 9900 Conductivity/Resistivity Systems

COMING 2020

Member of the SmartPro® Family of Instruments

Panel Mount

Field Mount

The Signet 9900 Conductivity/Resistivity Systems pair the 9900 SmartPro Transmitter with a Direct Conductivity Module in a single convenient package. Add any GF Signet conductivity electrode to complete your conductivity system. The 9900 Conductivity/ Resistivity system features a 9900 Transmitter which provides a local and easy to read LCD display. The push button keypad makes it easy to navigate through the transmitter's menu. The DC-powered 9900 features a scalable 4 to 20 mA output and open collector for process control.

Expand your conductivity system with an optional mechanical relay module, and HART or Modbus Communication modules.

Features

- **Simplify ordering and inventory with a single part number Conductivity System.**
- **Provides 4 to 20 mA and Open Collector outputs**
- **Optional Mechanical Relay Module, HART Module, or Modbus Module Available to complete your system**
- **"At a glance" visibility**
- **"Dial-type" digital bar graph**
- **NEMA 4X/IP65 enclosures**
- **Large selection of Signet Conductivity and Resistivity sensors available**

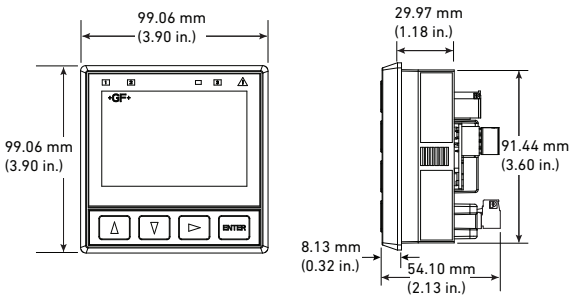
Applications

- **RO/DI System Control**
- **Cooling Tower Control**
- **Water Quality Monitoring**
- **Filtration Systems**
- **Scrubber Systems**
- **Boiler Condensate**
- **Semiconductor Water Production**
- **Leak Detection**

Specifications

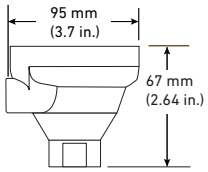
Refer to the 9900 technical specifications for more details on these products.

Dimensions - Panel Mount

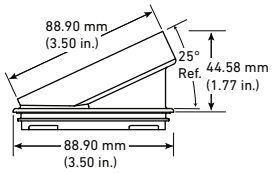


Integral Mount

3-8052
Integral Mount Kit

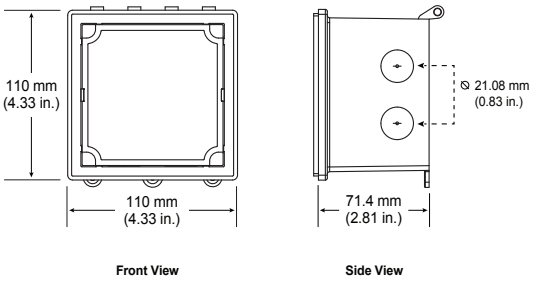


3-9900.396
Angle Adjustment Adapter Kit

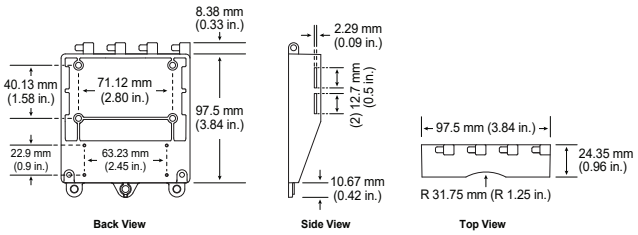


Note: The Angle Adjustment Adapter is required for Integral or Universal Field Mount systems. Sold separately.

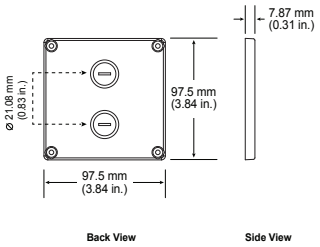
Dimensions - Rear Enclosure



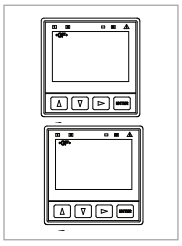
Hinged Cover



Flat Cover



Ordering Information



Mfr. Part No.	Code	Description
3-9900-1-C	**159 001 921**	Field Mount 9900 Conductivity Transmitter
3-9900-1P-C	**159 001 922**	Panel Mount 9900 Conductivity Transmitter
3-9900-1P-C-R	**159 001 923**	Panel Mount 9900 Conductivity Transmitter with 2 Dry Contact Relays

Accessories

Mfr. Part No.	Code	Description
3-9900.270-M2	**159 200 121**	Modbus Module with Terminal Block Assembly, (panel mount only)
3-9900.270-M3	**159 200 122**	Modbus Module with M12 Connector (field mount only)
3-9900.270-M4	**159 200 128**	Modbus Module with 5 Wire Cable Assembly (field or panel mount)
3-9900.393	**159 001 698**	Relay Module - 2 Dry Contact Relays (1P unit only)
3-9900.395	**159 001 697**	H COMM, HART, Communication Module
3-9900.396	**159 001 701**	Angle Adapter Kit
3-8050	**159 000 184**	Universal Mounting Kit
3-8052	**159 000 188**	3/4 in Integral Mounting Kit
3-9900.388-1	**159 001 834**	Rear Enclosure Kit, Hinged Cover
3-9900.388-2	**159 001 835**	Rear Enclosure Kit, Flat Cover

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

Signet 9950 Dual Channel Conductivity System

COMING 2020

Member of the SmartPro® Family of Instruments

The 9950 Conductivity Transmitter is a two channel controller that is factory configured for one or two channels of conductivity, resistivity, or salinity measurements. Single channel conductivity units will support a second measurement channel with any of the following sensor types; Signet Flow, pH/ORP, Conductivity/ Resistivity, Salinity, Temperature, Pressure, Level, Dissolved Oxygen, and devices that transmit a 4 to 20 mA signal with the use of the 8058 iGo® Signal Converter.

The 9950 includes advanced features such as derived functions, advanced multiple relay modes, and timer based relay functions. Derived function allows for the control of a relay or current loop with the sum, delta (difference), or ratio of two measurements, for example delta pressure and delta temperature. The 9950, with dual conductivity channels, offers support for direct calculation of Reverse Osmosis systems via RO specific derived functions, % Passage and % Reject. Multiple relay modes allow up to three signals to be used for the control of a single relay. This can be any combination of analog and binary inputs. The timer relay modes allow a relay to be activated on a repeating basis from every minute to once every 30 days. Weekday timer mode allows a relay to be energized on a specific day or days of the week at a specific time.

The 3-9950.393-3 Relay Module includes the ability to interface up to four binary inputs. The binary inputs are compatible with either open collector or mechanical contacts. The binary inputs can supply power to the four inputs or accepts powered outputs from external devices. These inputs can be used with level switches, flow switches, pressure switches or other devices. The inputs can be used to directly control the relays of the 9950 or can be used in combination with the measurement readings for advanced control of your process.

The 9950 supports the following relay modules:

- Four Channel Mechanical Relay Module
- Two Mechanical and Two Solid State Relay Module
- Two Mechanical Relays and Four Binary Inputs Module

The 9950 supports single or dual channel direct conductivity modules for conductivity, resistivity or salinity measurements.

A dual channel 4 to 20 mA passive output module is available. This will allow expansion from a base of 2 current loop outputs to a maximum of 6 current loop outputs in a single transmitter.

The 9950 Modbus Module allows for remote access to measurements, derived functions, state of current loop outputs and relays over a serial RS485 Modbus automation network.

Features

- **Simplified ordering and inventory with a single part number for Conductivity Systems**
- **Multiple language support for Simplified Chinese, English, French, German and Spanish**
- **Two different sensor types can be combined in one instrument**
- **Configurable display**
- **Derived measurements**
- **Advanced boolean logic**
- **Single and Dual Channel Direct Conductivity/ Resistivity Modules**
- **Two passive, 4 to 20 mA current loop outputs in base unit**
- **Optional Dual Channel, passive 4 to 20 mA Current Loop Module for 2 or 4 additional loop outputs**
- **USB Port for Field Upgrades using standard USB Flash Drive**
- **Optional Modbus Module for connections to Serial RS485 automation networks**

Applications

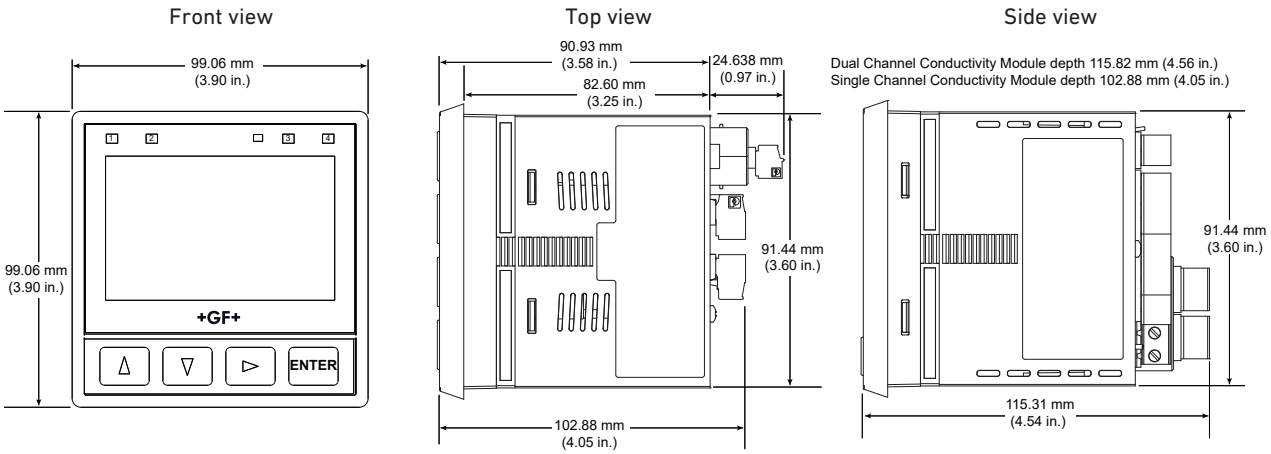
- **Wastewater Treatment**
- **Reverse Osmosis**
- **Deionization**
- **Chemical Manufacturing / Addition**
- **Metal and Plastic Finishing**
- **Fume Scrubber**
- **Cooling Towers**
- **Media Filtration**
- **Chemical Dosing/ Injection**
- **Aquatic Life Support**
- **Pools & Fountains**
- **Rinse Tanks**
- **Chemical Neutralization**

Specifications

Refer to the 9950 technical specifications for details on these products

Dimensions

9950 with Dual Channel Conductivity Module and all connector plugs installed (no Relay Module illustrated)



Binary Input compatible sensors. For use with 3-9950.393-3 Relay Module

Sensor Model	Binary Input
2280	X
2281	X
2282	X
2284	X
2285	X

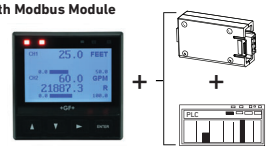
System Overview

Panel or Wall Mount

Signet Model 9950 Transmitter
(Includes mounting bracket and panel gasket)

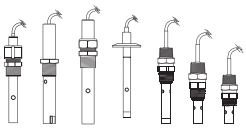
Automation System

Signet Model 9950 Transmitter with Modbus Module
and
- PLC (Customer supplied)



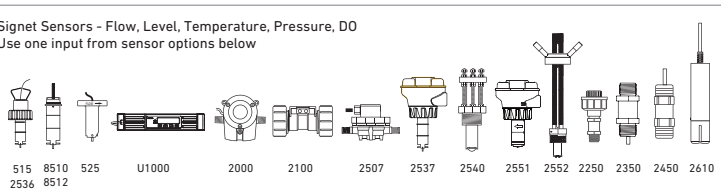
Signet Sensors - Conductivity/Resistivity and Salinity Electrodes
Use one input from electrode options below
with Conductivity System

Signet Electrodes
2818-2823
2839-2842



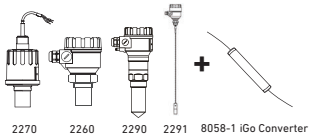
Note: Submersible installation not applicable for Sanitary Electrode.

Signet Sensors - Flow, Level, Temperature, Pressure, DO
Use one input from sensor options below



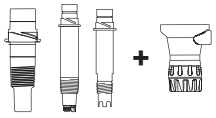
515 2536 8510 8512 525 U1000 2000 2100 2507 2537 2540 2551 2552 2250 2350 2450 2610

Other Level with 8058 iGo Converter
plus other 4 to 20 mA

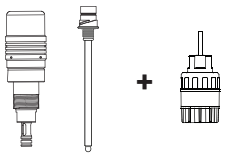


2270 2260 2290 2291 8058-1 iGo Converter

Signet Sensors - pH/ORP
Use one input from sensor options below
with 2750 or 2751 pH/ORP Smart Sensor Electronics

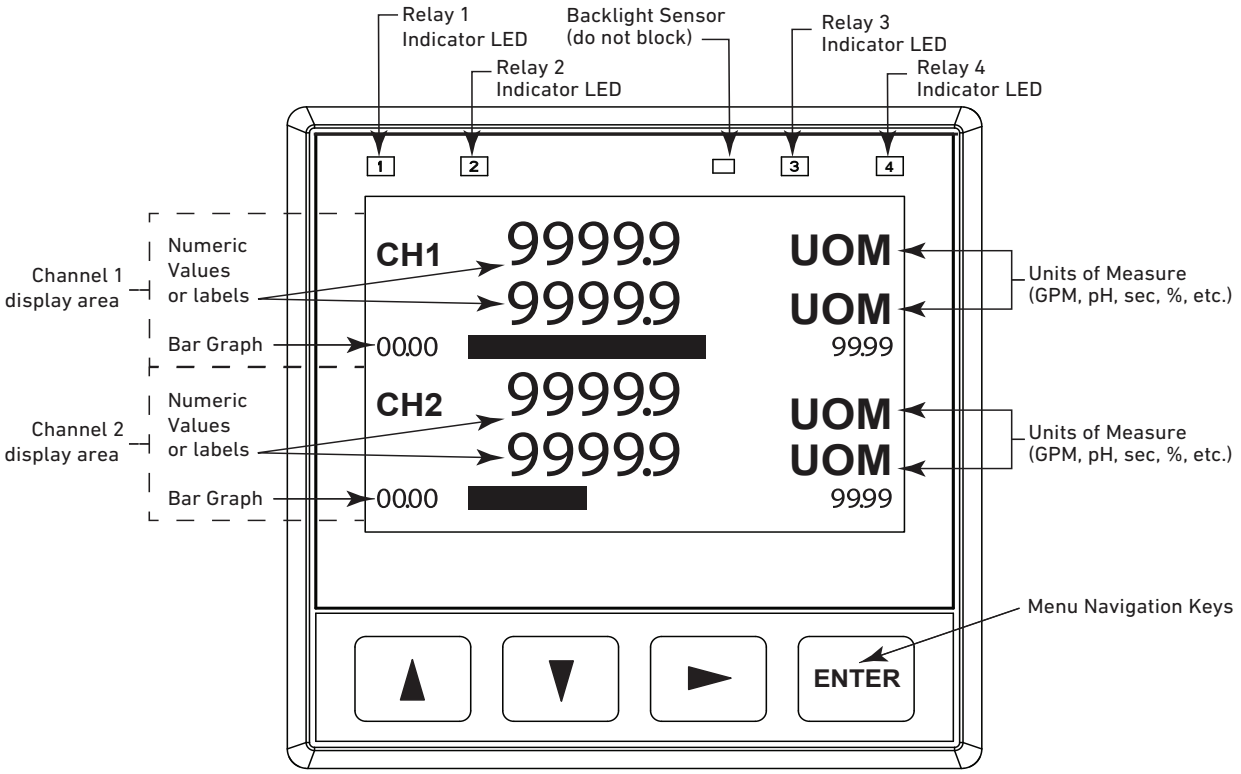


Signet Wet-Tap Electrode Model 2756, 2757 and 3719 Wet-Tap
with 2750 or 2751 pH/ORP Smart Sensor Electronics



Signet Fittings - See individual sensor data sheets

All sold separately

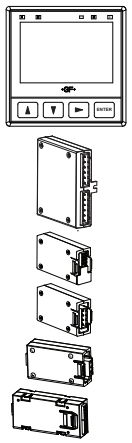


The 9950 is compatible with all GF Signet products listed in the column to the right.

- pH and ORP electrodes require the Signet 2750 or 2751 DryLoc® Sensor Electronics (sold separately).
- Conductivity/Resistivity or measurement requires the Signet 2850 Conductivity/Resistivity sensor electronics (sold separately).

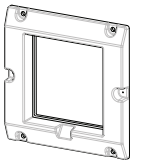
Sensor Model	Freq Output	Digital (S^3L) Output	Requires 8058
515/8510	X		
525	X		
2000	X		
2100	X		
2250		X	
2350		X	
2450		X	
2507	X		
2536/8512	X		
2537-5		X	
2540	X		
2551	X	X	
2552	X	X	
U1000	X		X
U3000	X		X
U4000	X		X
2260			X
2270			X
2290			X
2291			X
2610-51		X	
2724-2726		X	
2734-2736		X	
2750, 2751		X	
2756-2757		X	
2764-2767		X	
2774-2777		X	
2819-2823		X	
2839-2842		X	
2850		X	

Ordering Information

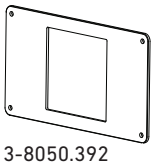


Mfr. Part No	Code	Description
9950 Conductivity Systems - Single Channel, Multi-Parameter, AC Power and DC Power		
3-9950-1-C	**159 001 924**	Single Channel Conductivity, DC Power
3-9950-1-C-1	**159 001 925**	Single Channel Conductivity, 4 Mech Relays, DC Power
3-9950-1-C-2	**159 001 926**	Single Channel Conductivity, 2 Mech 2SS Relays, DC Power
3-9950-1-C-1-L	**159 001 927**	Single Channel Conductivity, 4 Mech Relays, 4 Current Loops, DC Power
3-9950-1-C-2-L	**159 001 928**	Single Channel Conductivity, 2 Mech 2SS Relays, 4 Current Loops, DC Power
3-9950-2-C	**159 001 929**	Single Channel Conductivity, AC or DC or DC Power
3-9950-2-C-1	**159 001 930**	Single Channel Conductivity, 4 Mech Relays, AC or DC Power
3-9950-2-C-2	**159 001 931**	Single Channel Conductivity, 2 Mech 2SS Relays, AC or DC Power
3-9950-2-C-1-L	**159 001 932**	Single Channel Conductivity, 4 Mech Relays, 4 Current Loops, AC or DC Power
3-9950-2-C-2-L	**159 001 933**	Single Channel Conductivity, 2 Mech 2SS Relays, 4 Current Loops, AC or DC Power
9950 Conductivity Systems - Dual Channel, Multi-Parameter, AC Power and DC Power		
3-9950-1-2C	**159 001 934**	Dual Channel Conductivity, DC Power
3-9950-1-2C-1	**159 001 935**	Dual Channel Conductivity, 4 Mech Relays, DC Power
3-9950-1-2C-2	**159 001 936**	Dual Channel Conductivity, 2 Mech 2SS Relays, DC Power
3-9950-1-2C-1-L	**159 001 937**	Dual Channel Conductivity, 4 Mech Relays, 4 Current Loops, DC Power
3-9950-1-2C-2-L	**159 001 938**	Dual Channel Conductivity, 2 Mech 2SS Relays, 4 Current Loops, DC Power
3-9950-2-2C	**159 001 939**	Dual Channel Conductivity, AC or DC Power
3-9950-2-2C-1	**159 001 940**	Dual Channel Conductivity, 4 Mech Relays, AC or DC Power
3-9950-2-2C-2	**159 001 941**	Dual Channel Conductivity, 2 Mech 2SS Relays, AC or DC Power
3-9950-2-2C-1-L	**159 001 942**	Dual Channel Conductivity, 4 Mech Relays, 4 Current Loops, AC or DC Power
3-9950-2-2C-2-L	**159 001 943**	Dual Channel Conductivity, 2 Mech 2SS Relays, 4 Current Loops, AC or DC Power
Optional Accessory Modules		
3-9950.393-1	**159 310 268**	Relay Module with 4 Mechanical Relays
3-9950.393-2	**159 310 269**	Relay Module with 2 Mechanical and 2 Solid State Relays
3-9950.393-3	**159 310 270**	Relay Module with 2 Mechanical Relays and 4 Binary Inputs
3-9950.394-1	**159 001 846**	Single Channel Direct Conductivity/Resistivity Module
3-9950.394-2	**159 001 847**	Dual Channel Direct Conductivity/Resistivity Module
3-9950.395-M	**159 001 905**	Modbus Module
3-9950.398-2	**159 001 848**	Dual Channel 4 to 20 mA Current Loop Output Module

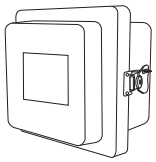
Accessories



3-5000.399



3-8050.392



3-9900.392

Mfr. Part No	Code	Description
3-5000.399	**198 840 224**	5 x 5 inch Retrofit Adapter
3-8050.392	**159 000 640**	CR200 ¼ DIN Retrofit Adapter
3-8050.396	**159 000 617**	RC Filter Kit (for relay use), 2 per kit
3-8058-1	**159 000 966**	i-Go® Signal Converter, wire-mount
3-9950.391	**159 310 278**	Connector Kit, In-line, 9950 Transmitter
3-9950.392	**159 310 279**	Relay Module Connector Kit, 9950 Transmitter
3-9900.392	**159 001 700**	Wall Mount Enclosure Kit
3-9000.392-1	**159 000 839**	Liquid Tight Connector Kit, NPT (1 pc.)