

2850 DryLoc™ Conductivity/Resistivity Sensor

3-2850.099 (B - 3 / 03)



Features

- S³L™ Digital Interface
- Two-wire 4 to 20mA output with many range settings
- In-line integral mount and submersible installation versions
- Automatic electrode cell constant recognition (0.01, 0.10, 1.0, 10.0)
- Automatic temperature compensation
- DryLoc™ electrode connector
- Optional EasyCal with automatic standard test solution recognition
- Junction boxes for convenient wiring

Description

The 2850 Conductivity/Resistivity Sensors provide two-wire 4 to 20mA output without the expense of local display and other luxuries available in full-featured transmitters. Eight 4 to 20mA output ranges for each electrode cell constant, plus the ability to invert each range, are selectable by the user in the field. These sophisticated sensors also provide S³L™ (Signet Sensor Serial Link) digital interface, another example of leading-edge technology from +GF+ SIGNET.

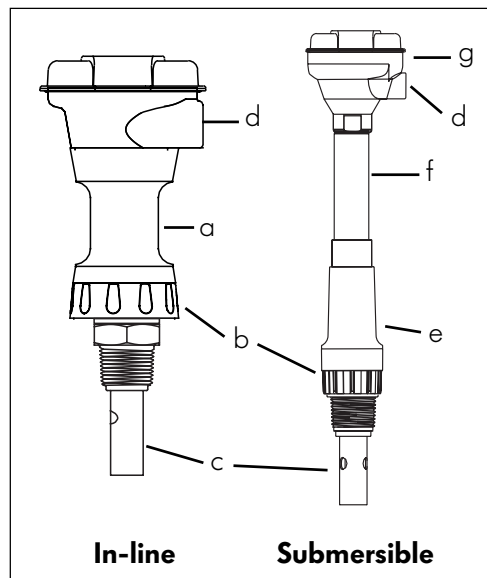
The DryLoc™ electrode connector quickly forms a robust assembly for submersible and in-line installations. NEMA 4X Junction Boxes are integral parts of the in-line version and are available as accessories for the submersible version. With the optional EasyCal feature, the devices automatically recognize standard conductivity test solution values for simple field calibration.

Applications

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

System Features

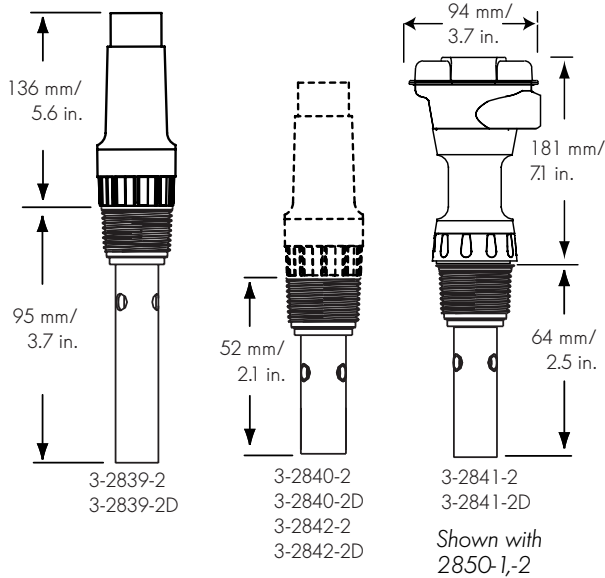
- 2850-1, -2 Sensor Electronics
- DryLoc™ electrode connector
- 2839-2842 DryLoc™ Conductivity/Resistivity Electrodes (sold separately)
- S³L™ or 4 to 20mA Output (field selectable)
- 2850-3, -4 Sensor Electronics
- Extension pipe (customer supplied)
- 8052-1CR, -2CR Junction Box (sold separately)



Options

Sensor Options					
	2839-2x	2840-2x	2841-2x	2842-2x	2837
2850	●	●	●	●	●

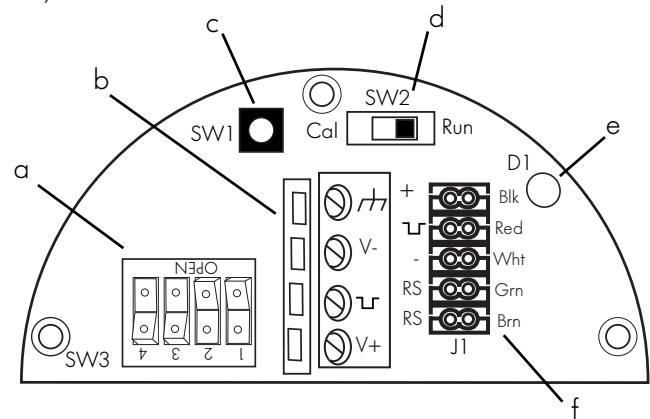
Dimensions



Shown with 2850-3, -4
(available with either 3/4 in. NPT
or ISO 7-1/R 3/4 male threads)

Wiring

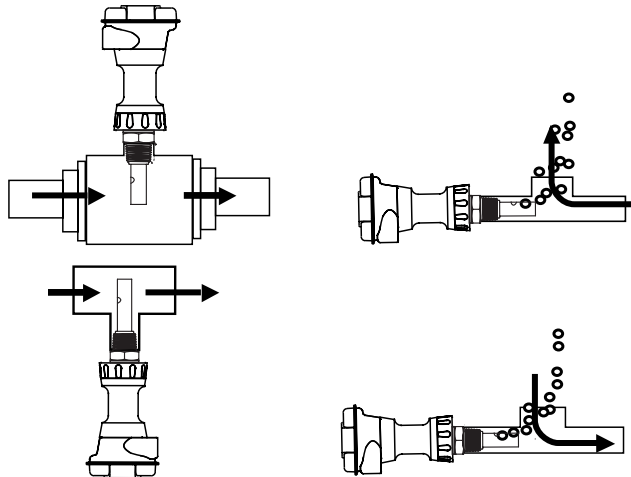
EasyCal Board shown here.



- a) 4 to 20mA output range selection switches
- b) Power and 4 to 20mA or S³L™ output terminal block
- c) Push-button calibration (EasyCal option)
- d) S³L™ output interrupt (EasyCal option)
- e) LED indicator (EasyCal option)
- f) I/O terminal block to sensor electronics

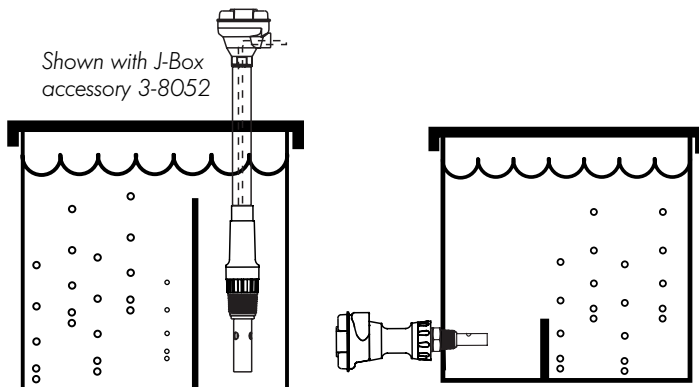
Note: Maximum wire length between 2850-X and 805X-XCR junction boxes is 4.5m (15 ft.)

Installation



In-line Installation

- Position the electrode to avoid entrapment of air bubbles.
- The preferred installation for in-line applications directs flow straight into the electrode.
- If the electrode is mounted vertically in a tee, do not recess the orifices inside the tee. Mounting upside down may help prevent air entrapment.
- An oversized tee or flow cell may be helpful for inline installations.



Submersible/Tank Installation

- If installed in an aerated vessel, ensure that the electrode is in a stillwell to avoid entrapment of air bubbles.
- Select a location that will remain free of sediment.
- To prevent moisture accumulation at the cable-end of the electrode, fill the lower 3 to 4 in. of conduit or extension pipe with a flexible sealant, such as silicone.

Specifications

General

Compatible Electrodes: +GF+ SIGNET 2839-2842
DryLoc™ CR Electrodes

Operational Range:

0.01 cell (2839-2X): 0.010 to 100µS
 0.10 cell (2840-2X): 1 to 1,000µS
 1.0 cell (2841-2X): 10 to 10,000µS
 10.0 cell (2842-2X): 100 to 200,000µS
 Temperature: -10° to 85°C (14° to 185°F)

Materials/Shipping Weight:

2850-1, -2 (in-line): PBT = 0.75kg (1.75 lbs.)
 2850-3, -4 (submersible): CPVC = 0.64kg (1.4 lbs.)

Temperature Compensation: Automatic

Cable: 4.5m/15ft., 5-conductor shielded
 22AWG (2850-3, -4)

Optional EasyCal

Automatic recognition using the following cond. values:

10µS	1,000µS	50,000µS
100µS	1,408.8µS*	100,000µS
146.93µS*	5,000µS	
200µS	10,000µS	
500µS	12,856µS*	

* = per ASTM D1125-95

All other values are standard test solutions available from VWR Scientific.

Electrical

Power: 12 to 24VDC for 4 to 20mA output
 5VDC ±5% regulated, 2mA max., for S³L™ output
 Reverse polarity and short circuit protected

Note: applied power determines output mode (S³L™ or 4 to 20mA)

Current Output

- 2850-1, -2 (in-line): Field-selectable ranges
 - 2850-3, -4 (submersible): Full-scale fixed 4 to 20mA dependent upon cell constant of electrode as follows:
 - 0.01 cell (2839-2X): 4 to 20mA = 0 to 100µS
 - 0.10 cell (2840-2X): 4 to 20mA = 0 to 1,000µS
 - 1.0 cell (2841-2X): 4 to 20mA = 0 to 10,000µS
 - 10.0 cell (2842-2X): 4 to 20mA = 0 to 200,000µS
- Use 8050-XCR and 8052-XCR accessory J-Boxes for field-selectable ranges.

Field Selectable Ranges for 4 to 20mA Operation

SW3 Switch Setting				0.01 Cell	0.10 Cell	1.0 Cell	10.0 Cell
#4	#3	#2	#1	Resistivity Ranges in BOLD			
O	C	C	C	10 to 20 MΩ	0 to 2µS	0 to 20µS	0 to 200µS
C	C	C	C	20 to 10 MΩ	2 to 0µS	20 to 0µS	200 to 0µS
O	C	C	O	2 to 10 MΩ	0 to 5µS	0 to 50µS	0 to 500µS
C	C	C	O	10 to 2 MΩ	5 to 0µS	50 to 0µS	500 to 0µS
O	C	O	C	0 to 2 MΩ	0 to 10µS	0 to 100µS	0 to 1,000µS
C	C	O	C	2 to 0 MΩ	10 to 0µS	100 to 0µS	1,000 to 0µS
O	C	O	O	0 to 1µS	0 to 50µS	0 to 500µS	0 to 5,000µS
C	C	O	O	1 to 0µS	50 to 0µS	500 to 0µS	5,000 to 0µS
O	O	C	C	0 to 5µS	0 to 100µS	0 to 1,000µS	0 to 10,000µS
C	O	C	C	5 to 0µS	100 to 0µS	1,000 to 0µS	10,000 to 0µS
O	O	C	O	0 to 10µS	0 to 200µS	0 to 2,000µS	0 to 50,000µS
C	O	C	O	10 to 0µS	200 to 0µS	2,000 to 0µS	50,000 to 0µS
O	O	O	C	0 to 50µS	0 to 500µS	0 to 5,000µS	0 to 100,000µS
C	O	O	C	50 to 0µS	500 to 0µS	5,000 to 0µS	100,000 to 0µS
O	O	O	O	0 to 100µS	0 to 1,000µS	0 to 10,000µS	0 to 200,000µS
C	O	O	O	100 to 0µS	1,000 to 0µS	10,000 to 0µS	200,000 to 0µS

C = closed O = open Switch #4 inverts the output: OPEN = 4 to 20mA, CLOSED = 20 to 4mA

Current Output (continued)

Max Loop Resistance: 50Ω @ 12VDC
 325Ω @ 18VDC
 600Ω @ 24VDC
 Accuracy: ± 2% of full scale
 Resolution: 7µA
 Update rate: < 600mS
 Error indication: 22mA

S³L™ Output

Serial ASCII, TTL level 9600 bps
 Accuracy: (Conductivity) 2% of reading
 (Temperature) ±0.5°C
 Resolution: (Conductivity) <0.1% of reading
 (Temperature) <0.07°C

Update Rate: < 600mS

Available Data:

- Raw conductivity
- Calibrated conductivity
- Calibrated temperature compensated conductivity
- Temperature

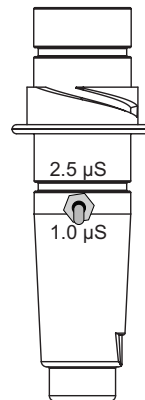
Error Indication: Open input and out of range diagnostics for conductivity and temperature

Environmental

- Storage Temp: -20° to 85°C (-4° to 185°F)
- Operating Temp: -10° to 85°C (14° to 185°F)
- Relative Humidity: 0 to 95%, non-condensing (without electrode connected)
- Enclosure Rating:
 - 2850-1, -2 (in-line): NEMA 4X/IP65 with electrode connected
 - 2850-3, -4 (submersible): NEMA 6P/IP68 with electrode and watertight conduit and/or extension pipe connected

Standards & Approvals

- CE
- Immunity: EN61326-1
- Emissions: EN55011 Class A
- Manufactured under ISO 9001 and ISO 14001



Pictured on the left is the 2831 Conductivity Certification Tool and below is a sample copy of the new label installed on each unit.

+GF+ SIGNET 2831
Conductivity
Certification Tool

0.01 Cell Constant
Simulates 1.0µS □
and 2.5µS, ± 0.1µS

For use with
+GF+ SIGNET 3-2850
Cond. / Res.
Sensor Electronics.

Ordering Information

Mfr. Part No.	Code	Description
3-2850-1	159 000 783	In-line Sensor Electronics
3-2850-2	159 000 784	In-line Sensor Electronics w/EasyCal
3-2850-3	159 000 785	Submersible Sensor Electronics, 3/4 in. NPT male threads
3-2850-4	159 000 857	Submersible Sensor Electronics, ISO 7-1/R 3/4 male threads

Accessories

Mfr. Part No.	Code	Description
3-2831	159 000 888	Conductivity Certification Tool (for system verification per USP requirements)
3-2839-2	159 000 922	Cell 0.01, DryLoc™, 3/4 in. NPT
3-2839-2D	159 000 924	Cell 0.01, DryLoc™, ISO 7/1-R 3/4
3-2840-2	159 000 787	Cell 0.1, DryLoc™, 3/4 in. NPT
3-2840-2D	159 000 789	Cell 0.1, DryLoc™, ISO 7/1-R 3/4
3-2841-2	159 000 791	Cell 1.0, DryLoc™, 3/4 in. NPT
3-2841-2D	159 000 793	Cell 1.0, DryLoc™, ISO 7/1-R 3/4
3-2842-2	159 000 795	Cell 10.0, DryLoc™, 3/4 in. NPT
3-2842-2D	159 000 797	Cell 10.0, DryLoc™, ISO 7/1-R 3/4
3-2842.390	159 000 925	2842 Replacement Insulator w/FPM O-ring
3-8050-1	159 000 753	Universal Mount Junction Box
3-8050-1CR	159 000 889	Universal Mount J-Box w/CR Cell Ranges
3-8050-2CR	159 000 802	Universal Mount J-Box w/CR EasyCal
3-8052	159 000 188	3/4 in. Integral Mounting Kit
3-8052-1	159 000 755	3/4 in. NPT Mount Junction Box
3-8052-1CR	159 000 890	3/4 in. NPT Mount Junction Box w/CR Cell Ranges
3-8052-2CR	159 000 803	3/4 in. NPT Mount Junction Box w/CR EasyCal
3-9000.392-1	159 000 839	Liquid-tight Connector Kit, 1 set, 1/2 in. NPT
3-9000.392-2	159 000 841	Liquid-tight Connector Kit, 1 set, PG 13.5

Engineering Specifications

- The sensor shall provide 4 to 20mA or S³L™ (Signet Sensor Serial Link) outputs, and be available with ISO and NPT threads for the submersible model and include a junction box with/without EasyCal for the in-line version.
- The sensor shall be compatible with the 2839-2842 DryLoc™ Conductivity/Resistivity Electrodes and will recognize cell constant inputs of 0.01, 0.10, 1.0 and 10.0.
- The sensor shall have an operating temperature of -10° to 85°C (14° to 185°F) and an accuracy of ±2% of reading at 25°C.
- The sensor shall have power requirements of 5VDC ±5% regulated for S³L™, and 12 to 24VDC for 4 to 20mA current output, and shall meet CE requirements and be manufactured under ISO 9001 and ISO 14001.
- The sensor shall be +GF+ SIGNET Model 3-2850.

For more information on these products, please contact your local sales company:

A	Georg Fischer Rohrleitungssysteme GmbH, Sandgasse 16, A-3130 Herzogenburg, Tel. 02782/56 43-0, Fax 02782/51 56
AUS	George Fischer IPS Pty Ltd., 186-190 Kingsgrove Road, Kingsgrove, NSW 2208, Tel. 02 9554 3977, Fax 02 9502 2561
B/L	Georg Fischer N.V./S.A., Digue du Canal 109-111 – Vaartdijk 109-111, B-1070 Bruxelles/Brussel, Tél. 02/556 40 20, Fax 02/524 34 26
BAR	George Fischer Ltda Av. dos Nações Unidas, 21689 CEP 04795-100 - S.Paulo - SP Tel.: 155111 247 1311 Fax: 155111 247 6009
CH	Georg Fischer Rohrleitungssysteme (Schweiz) AG, Amsler-Laffon-Strasse 1, Postfach, CH-8201 Schaffhausen, Tel. 052/631 3026, Fax 052/631 2897
D	Georg Fischer GmbH, Daimlerstraße 6, Postfach 1154, D-73093 Albershausen, Tel. 07161/302-0, Telex 727867, Fax 07161/302259
DK	Georg Fischer A/S, Klintehøj Vænge 17, DK-3460 Birkerød, Tel. 42/81 1975, Fax 42/81 1622
E	Georg Fischer S.A., Sistemas de tuberías para la industria, Calle Isla de la Palma, 32 – Nave 1, E-28700 San Sebastián de los Reyes (Madrid), Tel. 91/663 80 00, Fax 91/663 81 76
F	Georg Fischer S.A., 105-113, rue Charles Michels, B.P.174, F-93208 Saint-Denis Cedex 1, Tél. 1/49 22 1341, Fax 1/49 22 1300
GB	George Fischer Sales Limited, Paradise Way, Coventry, CV2 2ST, Tel. 01203/53 55 35, Telex 330032, Fax 01203/53 04 50-51
I	Giorgio Fischer S.p.A., Via Sondrio 1, I-20063 Cernusco S/N (MI), Agente generale di vendita Tufira S.r.l., Tel. 02/92 18 61, Fax 02/92 14 07 85
J	Georg Fischer Ltd., 2-47, Shikitsuhigashi, 1-chome, Naniwa-ku, Osaka 556, Tel. 6/648 28 38, Telex 526 77 85, Fax 6/648 25 65
N	Georg Fischer A.S, Bygdøy Allé 23, Postboks 3223 Elisenberg, N-0208 Oslo 2, Tel. 22/44 41 10, Fax 22/43 40 19
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RA	George Fischer Inc., Lavalle 2614, 1640 Martinez Buenos Aires, Tel. 01/798 74 01, Fax 01/798 40 74
NL	Georg Fischer N.V., Lange Veenteweg 19, Postbus 35, NL-8160 AA Epe, Tel. 0578678222, Fax 0578621768
S/SF	Georg Fischer AB, Box 113, S-12523 Alvsjö-Stockholm, Tel. 08/7274700, Fax 08/7492370
SGP	George Fischer Pte. Ltd., 15 Kaki Bukit Road 2, KB Warehouse Complex, SGP-417 845 Singapore/Singapore, Tel. 747 06 11, Fax 747 05 77
USA*	George Fischer Inc., 2882 Dow Ave., Tustin, CA 92780-7285, Tel. 714/731-8800, Toll Free 800/854-4090, Fax 714/731-4688, e-mail: info@us.piping.georgefischer.com, Internet: http://www.us.piping.georgefischer.com

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