Type 2881-2884 Conductivity/Resistivity Electrodes

2881	2882	2883	2884
Cell constant 0.01	Cell constant 0.1	Cell constant 1.0	Cell constant 10.0

Product description

The Type 2881-2884 conductivity/resistivity electrodes are available in four cell constants from 0.01 to 10 cm^{-1} and are suitable for a wide range of applications, from high purity water quality monitoring to chemical process solutions.
The electrodes themselves are made of 316L stainless steel and offer excellent measurement accuracy of ± 2% as standard, with the certified version meeting ± 1% cell constant accuracy.
The Type 2881-2883 conductivity electrodes consist of two coaxial 316L stainless steel electrodes with a flow cell construction, a PEEK insulator, and a 316L thermowell. Dual-threaded process connections in Polypropylene, CPVC, PVDF or PEEK materials are available to meet various process requirements.
Type 2884 conductivity electrodes consist of a flow cell with two parallel 316L stainless steel electrodes, PTFE insulators, and a 316L stainless steel thermowell. The housing and process connection are made of CPVC.
All Type 2881-2884 conductivity/resistivity electrodes have an integral platinum resistance thermometer (Pt1000) in the electrode, which provides optimum temperature sensing. Dual threaded process connections in ¾ NPT or ISO 7/1-R ¾ allow for quick and easy installation in immersion or inline configurations, as well as integrated mounting options for integration into sensor electronics or transmitters.

Features

- CPVC process connections:
  - ¾" Dual NPT or ISO for all types
- PP, PVDF and PEEK process connections:
  - ¾" Dual NPT or ISO for 0.01, 0.1 and 1.0 cell constant types
- 316L stainless steel electrodes material
- Triple flow-through vent holes reduce clogging and bubble entrapment
- In-line or submersible mounting
- Option for NIST traceable certified cell constant ±1%

Applications

- Pure Water Treatment
  - Microfiltration
  - Ultrafiltration
  - Reverse Osmosis
  - Ion Exchange
  - Deionization
  - Distillation
- Boiler Condensate
- Semiconductor Water Production
- USP Purified Water
- Rinse Water
  - Coating
  - Cooling towers
  - Fertilization
  - Desalination
  - WFI Water production

Specifications

Nominal Cell Constant				
Type	Cell cm $^{-1}$	Operating Range (at 25°C / 77°F)		
2881	0.01	Conductivity	0.055...100 µS/cm	
		Resistivity	0.01...18.2 MΩ	
		TDS	0.02...50 ppm	
2882	0.1	Conductivity	1...1000 µS/cm	
		Resistivity	0.001...1 MΩ	
		TDS	0.5...500 ppm	
2883	1.0	Conductivity	10...10,000 µS/cm	
		TDS	5...5,000 ppm	
2884	10.0	Conductivity	100...200,000 µS/cm	
		Salinity	0.25...50 PPT	
		TDS	50...100,000 ppm	

Accuracy		
Cell Constant Accuracy	± 2% (standard)	± 1% certified (optional)

Temperature		
Temperature Compensation	Pt1000	
Temperature range	-20 ... 95 °C (- 4 ... 203 °F)	
Storage temperature	-20 ... 131 °C (-4 ... 268 °F)	
Temperature Accuracy	0.3 °C	
Temperature Response Time, τ for 90% of change	2881	<40 s
	2882	<47 s
	2883	<89 s
	2884	<15 s

Cable length	
Standard	7.6 m (25 ft)
Maximum	30 m (100 ft.) with 3-9900 and 3-9950 direct conductivity resistivity modules.* 4.6 m (15 ft.) probe to 3-2850 conductivity electronics.
Do not splice cable. If longer cable is needed, contact factory.	
For 0.01 cell constant, measurements above 10 MΩ·cm and/or below 20 °C, the maximum cable length should not exceed 15 ft. (4.6 m).	

* Calibrate the temperature to offset the resistance of the cable.

Materials		
2881, 2882, 2883	Electrodes	316L Stainless Steel (1.4408, DIN 17440)
	Process Connection	Polypropylene, CPVC, PVDF, PEEK
	Insulator Material	PEEK
	O-Rings	EPR (EPDM)
2884	Electrodes	316L Stainless Steel (1.4404, DIN 17440)
	Body	CPVC
	Process Connection	CPVC
	Insulator Material	PEEK
	O-Rings	EPR (EPDM)

Maximum Temperature/Pressure Rating	
2881-2884 Fittings	
CPVC	6.9 bar at 80 °C (100 psi at 140 °F)
Polypropylene*	6.4 bar at 95 °C (93 psi at 203 °F)
PVDF	2.8 bar at 131 °C (40 psi at 268 °F)
PEEK	2.8 bar at 131 °C (40 psi at 268 °F)
*Proof Pressure in accordance with DIN 16962-5 standard and PED (Pressure Equipment Directive, 2014/68/EG Art. 3, Sec. 3)	

Shipping Weight	
2881	0.23 kg (0.50 lb.)

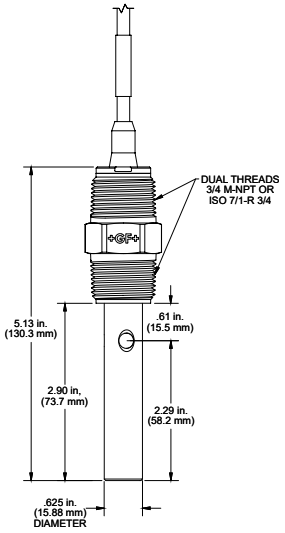
2882, 2883, 2884	0.20 kg (0.45 lb.)

Standards and Approvals

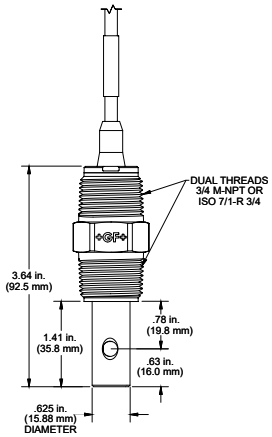
CE, UKCA, RoHS compliant
China RoHS (Go to www.gfps.com for details)
Manufactured under ISO 9001, ISO 14001 and ISO 45001

Dimensions

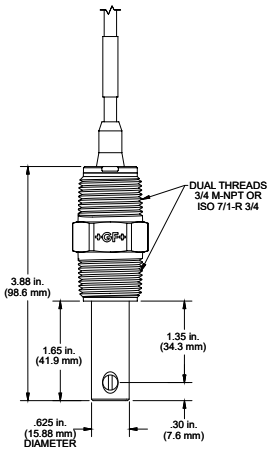
2881



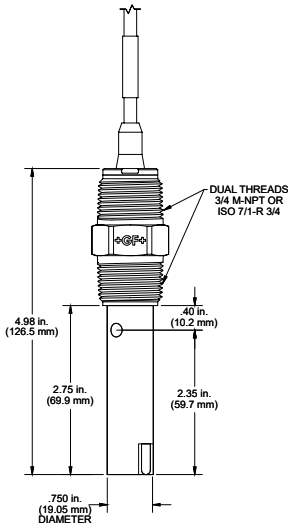
2882



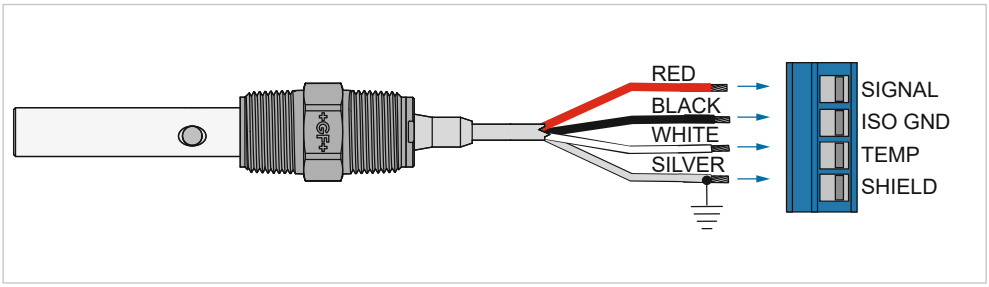
2883



2884

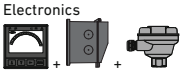
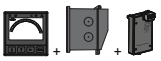
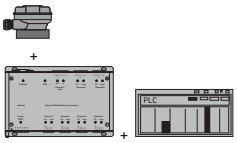
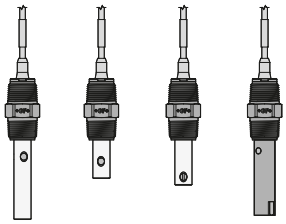


Connection diagram

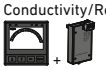
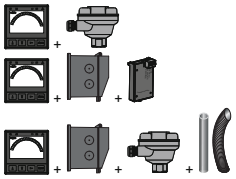
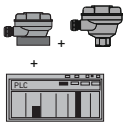
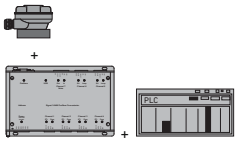
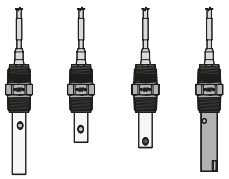


System Overview

In-Line Installation

Panel Mount	Pipe, Tank, Wall Mount	4 to 20 mA Output	Automation System	Field (Integral) Mount
GF Instruments with 2850 Sensor Electronics  Type 9900 Transmitter with 3-9900.394 Direct Conductivity/ Resistivity Module  Type 9950 Transmitter with 3-9900.394 Direct Conductivity/ Resistivity Module  Type 9950 Transmitter with 3-9950.394-2 Dual Channel Conductivity/Resistivity Module 	GF Instruments with 2850 Sensor Electronics  9900 and Rear Enclosure or with 3-9900.394 Direct Conductivity/ Resistivity Module and Rear Enclosure 	Type 2850 Sensor Electronics with - Customer Supplied Programmable Logic Controller or - Programmable Automation Controller 	Type 2850 Sensor Electronics with - 0486 Profibus Concentrator and - Customer Supplied Programmable Logic Controller or - Programmable Automation Controller 	GF Instrument - 9900 with 3-9900.394 Direct Conductivity/Resistivity Module and Angle Adapter 
Type 288X Conductivity Electrodes				
Fittings- Customer Supplied				All Sold Separately

Submersible Installation

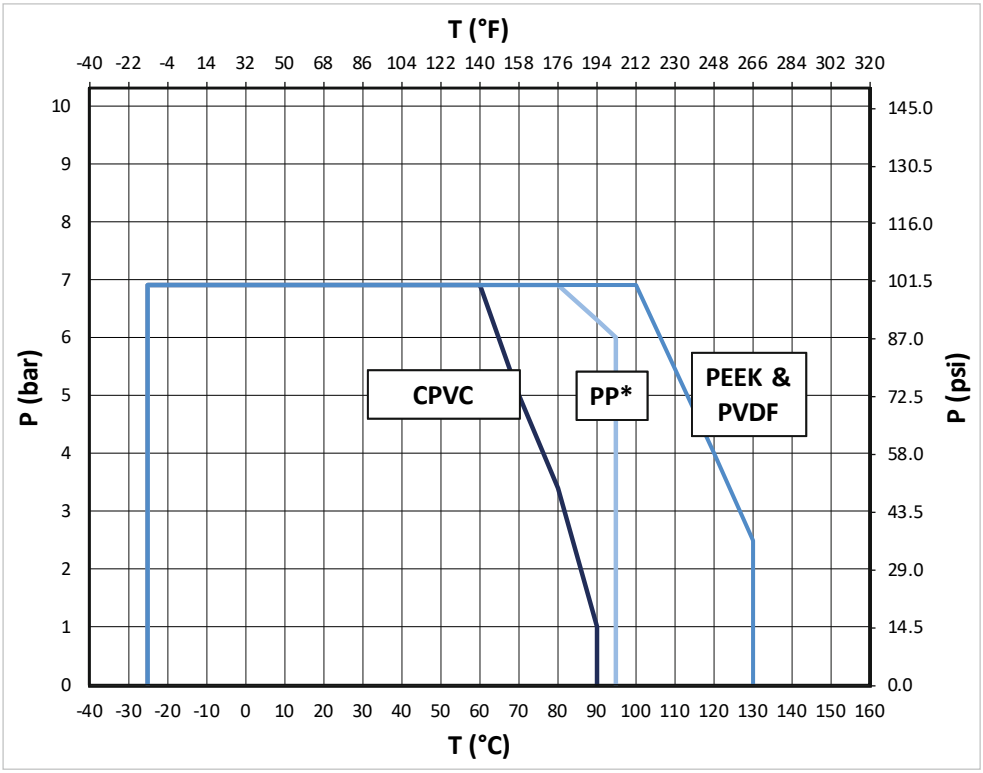
Panel Mount	Pipe, Tank, Wall Mount	4 to 20 mA Output	Automation System
GF Instruments with 2850 Sensor Electronics  Type 9900 Transmitter with 3-9900.394 Direct Conductivity/Resistivity Module  Type 9950 Transmitter with 3-9900.394 Direct Conductivity/Resistivity Module  Type 9950 Transmitter with 3-9950.394-2 Dual Channel Conductivity/Resistivity Module 	GF 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 	Type 2850 Sensor Electronics with - Customer Supplied Programmable Logic Controller or - Programmable Automation Controller 	Type 2850 Sensor Electronics with - 0486 Profibus Concentrator and Customer Supplied Programmable Logic Controller or - Programmable Automation Controller 
Type 288X Conductivity Electrodes				
				All Sold Separately

If the required distance between the measurement point and the display is greater than 100 ft, use 3-2850-51 (S^3L).

Pressure-temperature diagram

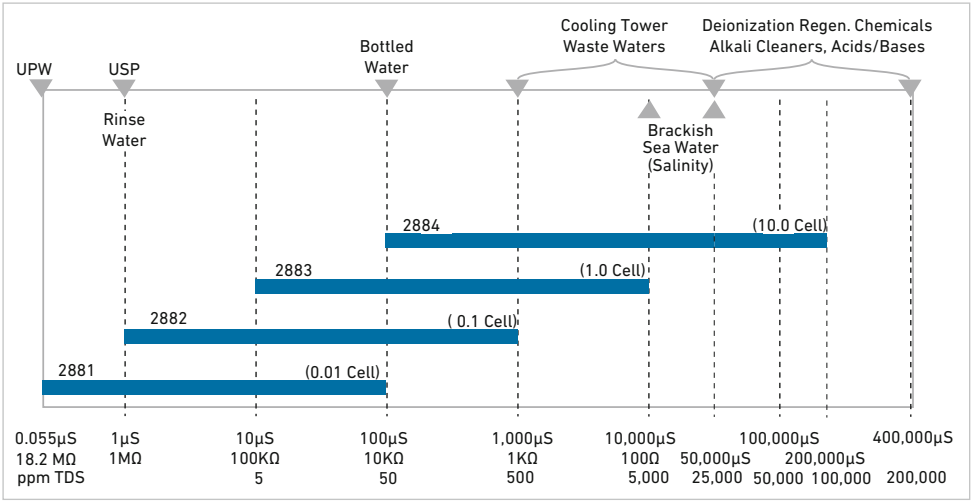
Note

The pressure-temperature diagrams are specifically for the GF 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.



*Maximum pressure rating above 80 °C is in accordance with DIN 16962-5 standard and PED (Pressure Equipment Directive, 2014/68/EG Art.3, Sec.3).

Operating Range Chart



Application Tips

- GF advises all conductivity sensors be installed in a piping system in a mounting position that minimizes air bubbles and where the solution will flow through the tube.
- When used in a tank application the 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 measurement is affected if the metal electrodes become coated by the process media.

Ordering Information

Ordering Notes

- When using the 3-2850 conductivity electronics, the maximum cable length probe to electronics should not exceed 15 ft. (4.6 m).
- When used with the 9900 and 9950 direct conductivity modules, the cable length is limited to 30 m (100 ft) maximum.

**Sensors with cable lengths of up to 30 m (100 ft) are available - consult factory.

Test Certificate

Georg Fischer Signet LLC
2882 Conductivity Sensor

Code:	159002019
Part number:	3-2882-1
Serial number:	6xxxxxxxxxx
Description:	Conductivity Probe, K=0.1, 316L SS, 25ft Cable
Temperature element:	RTD PT1000
Date of certification:	2024-01-18
Reference ID:	RS-1xx
Reference cal Date:	2024-02-28
Verified by:	000xxxxxxxxx

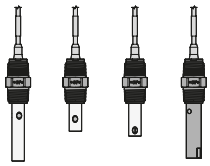
Test	Test Condition	Certified cell constant	Test Result
Cell constant calibration	202.12 uS/cm	0.10086	Pass

Test	Test Condition	Certified temperature offset	Test Result
Temperature calibration	27.13 °C	0.22 °C	Pass

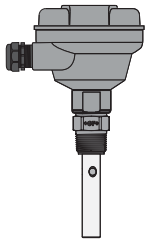
Example of cell constant certificate of calibration.

Conductivity Electrodes and Integral Systems with CPVC Process Connection

Mfr. Part No.	Code	Description
3-2881-1	159002017	Cell 0.01, 7.6 m (25 ft) cable, CPVC NPT
3-2882-1	159002019	Cell 0.1, 7.6 m (25 ft) cable, CPVC NPT
3-2883-1	159002021	Cell 1.0, 7.6 m (25 ft) cable, CPVC NPT
3-2884-1	159002023	Cell 10.0, 7.6 m (25 ft) cable, CPVC NPT
3-2881-1D	159002024	Cell 0.01, 7.6 m (25 ft) cable, CPVC ISO
3-2882-1D	159002026	Cell 0.1, 7.6 m (25 ft) cable, CPVC ISO
3-2883-1D	159002028	Cell 1.0, 7.6 m (25 ft) cable, CPVC ISO
3-2884-1D	159002030	Cell 10.0, 7.6 m (25 ft) cable, CPVC ISO

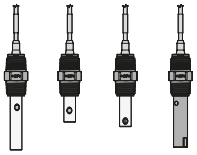


Mfr. Part No.	Code	Description
Digital (S^3L) output		
3-2850-51-81	159002156	Integral 2850 system, Digital (S^3L) output, 0.01 cell, CPVC NPT
3-2850-51-82	159002157	Integral 2850 system, Digital (S^3L) output, 0.1 cell, CPVC NPT
3-2850-51-83	159002158	Integral 2850 system, Digital (S^3L) output, 1.0 cell, CPVC NPT
3-2850-51-84	159002159	Integral 2850 system, Digital (S^3L) output, 10.0 cell, CPVC NPT
3-2850-51-81D	159002160	Integral 2850 system, Digital (S^3L) output, 0.01 cell, CPVC ISO
3-2850-51-82D	159002161	Integral 2850 system, Digital (S^3L) output, 0.1 cell, CPVC ISO
3-2850-51-83D	159002162	Integral 2850 system, Digital (S^3L) output, 1.0 cell, CPVC ISO
3-2850-51-84D	159002163	Integral 2850 system, Digital (S^3L) output, 10.0 cell, CPVC ISO
4 to 20 mA output		
3-2850-52-81	159002164	Integral 2850 system, 4 to 20 mA output, 0.01 cell, CPVC NPT
3-2850-52-82	159002165	Integral 2850 system, 4 to 20 mA output, 0.1 cell, CPVC NPT
3-2850-52-83	159002166	Integral 2850 system, 4 to 20 mA output, 1.0 cell, CPVC NPT
3-2850-52-84	159002167	Integral 2850 system, 4 to 20 mA output, 10.0 cell, CPVC NPT
3-2850-52-81D	159002168	Integral 2850 system, 4 to 20 mA output, 0.01 cell, CPVC ISO
3-2850-52-82D	159002169	Integral 2850 system, 4 to 20 mA output, 0.1 cell, CPVC ISO
3-2850-52-83D	159002170	Integral 2850 system, 4 to 20 mA output, 1.0 cell, CPVC ISO
3-2850-52-84D	159002172	Integral 2850 system, 4 to 20 mA output, 10.0 cell, CPVC ISO

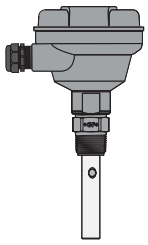


Conductivity Electrodes and Integral Systems with Polypropylene Process Connection

Mfr. Part No.	Code	Description
3-2881-1P	159002031	Cell 0.01, 7.6 m (25 ft) cable, Polypropylene NPT
3-2882-1P	159002033	Cell 0.1, 7.6 m (25 ft) cable, Polypropylene NPT
3-2883-1P	159002035	Cell 1.0, 7.6 m (25 ft) cable, Polypropylene NPT
3-2881-1PD	159002037	Cell 0.01, 7.6 m (25 ft) cable, Polypropylene ISO
3-2882-1PD	159002039	Cell 0.1, 7.6 m (25 ft) cable, Polypropylene ISO
3-2883-1PD	159002041	Cell 1.0, 7.6 m (25 ft) cable, Polypropylene ISO

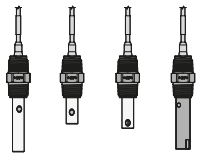


Mfr. Part No.	Code	Description
Digital (S^3L) output		
3-2850-51-81P	159002172	Integral 2850 system, Digital (S^3L) output, 0.01 cell, Polypropylene NPT
3-2850-51-82P	159002173	Integral 2850 system, Digital (S^3L) output, 0.1 cell, Polypropylene NPT
3-2850-51-83P	159002174	Integral 2850 system, Digital (S^3L) output, 1.0 cell, Polypropylene NPT
3-2850-51-81PD	159002175	Integral 2850 system, Digital (S^3L) output, 0.01 cell, Polypropylene ISO
3-2850-51-82PD	159002176	Integral 2850 system, Digital (S^3L) output, 0.1 cell, Polypropylene ISO
3-2850-51-83PD	159002177	Integral 2850 system, Digital (S^3L) output, 1.0 cell, Polypropylene ISO
4 to 20 mA output		
3-2850-52-81P	159002178	Integral 2850 system, 4 to 20 mA output, 0.01 cell, Polypropylene NPT
3-2850-52-82P	159002179	Integral 2850 system, 4 to 20 mA output, 0.1 cell, Polypropylene NPT
3-2850-52-83P	159002180	Integral 2850 system, 4 to 20 mA output, 1.0 cell, Polypropylene NPT
3-2850-52-81PD	159002181	Integral 2850 system, 4 to 20 mA output, 0.01 cell, Polypropylene ISO
3-2850-52-82PD	159002182	Integral 2850 system, 4 to 20 mA output, 0.1 cell, Polypropylene ISO
3-2850-52-83PD	159002183	Integral 2850 system, 4 to 20 mA output, 1.0 cell, Polypropylene ISO

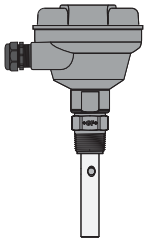


Conductivity Electrodes and Integral Systems with PEEK Process Connection

Mfr. Part No.	Code	Description
3-2881-1K	159002144	Cell 0.01, 7.6 m (25 ft) cable, PEEK NPT
3-2882-1K	159002146	Cell 0.1, 7.6 m (25 ft) cable, PEEK NPT
3-2883-1K	159002148	Cell 1.0, 7.6 m (25 ft) cable, PEEK NPT
3-2881-1KD	159002150	Cell 0.01, 7.6 m (25 ft) cable, PEEK ISO
3-2882-1KD	159002152	Cell 0.1, 7.6 m (25 ft) cable, PEEK ISO
3-2883-1KD	159002154	Cell 1.0, 7.6 m (25 ft) cable, PEEK ISO



Mfr. Part No.	Code	Description
Digital (S^3L) output		
3-2850-51-81K	159002196	Integral 2850 system, Digital (S^3L) output, 0.01 cell, PEEK NPT
3-2850-51-82K	159002197	Integral 2850 system, Digital (S^3L) output, 0.1 cell, PEEK NPT
3-2850-51-83K	159002198	Integral 2850 system, Digital (S^3L) output, 1.0 cell, PEEK NPT
3-2850-51-81KD	159002199	Integral 2850 system, Digital (S^3L) output, 0.01 cell, PEEK ISO
3-2850-51-82KD	159002120	Integral 2850 system, Digital (S^3L) output, 0.1 cell, PEEK ISO
3-2850-51-83KD	159002121	Integral 2850 system, Digital (S^3L) output, 1.0 cell, PEEK ISO
4 to 20 mA output		
3-2850-52-81K	159002202	Integral 2850 system, 4 to 20 mA output, 0.01 cell, PEEK NPT
3-2850-52-82K	159002203	Integral 2850 system, 4 to 20 mA output, 0.1 cell, PEEK NPT
3-2850-52-83K	159002204	Integral 2850 system, 4 to 20 mA output, 1.0 cell, PEEK NPT
3-2850-52-81KD	159002205	Integral 2850 system, 4 to 20 mA output, 0.01 cell, PEEK ISO
3-2850-52-82KD	159002206	Integral 2850 system, 4 to 20 mA output, 0.1 cell, PEEK ISO
3-2850-52-83KD	159002207	Integral 2850 system, 4 to 20 mA output, 1.0 cell, PEEK ISO



Accessories and Replacement Parts

Mfr. Part	Code	Description
3-2850.101-1	159 001 392	Plug-in NIST traceable recertification tool, 1.0 µS simulated, for use with 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 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 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 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 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
3-2850-63	159 001 402	Universal junction box, conductivity electronics, dual digital (S^3L) outputs

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

3-2880.099 Rev A
11/2024-A

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