Type 2751 DryLoc® pH/ORP Smart Sensor Electronics

In-line
2751-1

In-line EasyCal
2751-2

Submersible
2751-3 or 2751-4

DryLoc® Electrodes sold separately

Product description

The type 2751 pH/ORP Smart Sensor Electronics featuring the DryLoc® connector, is the solution for field-free calibration, out of range glass impedance and broken glass detection, alerting the operator to probe failure or maintenance needs.
The 2751 features two different outputs: a two-wire 4 to 20 mA loop output with optional EasyCal function or a digital (S^3L) output which allows for longer cable lengths and is compatible with all types 9900, 9950-1/2*, 9950-10/-11 instruments or in blind, 4 to 20 mA.
The pH/ORP Smart Sensor Electronics will allow for calibration of electrodes in a laboratory setting and installation of pre-calibrated probes in the field, reducing system downtime. Memory chip enabled electrodes will store operational data such as minimum and maximum pH/mV readings, runtime, minimum and maximum temperature (pH only), for troubleshooting and operational evaluation. To take full advantage of all features and benefits of the 2751, use with types 9900 (Generation IV or later), 9950 Transmitter or 0486 Profibus Concentrator.
The 2751 self-configures for pH or ORP operation via automatic recognition of the electrode type. The optional EasyCal feature allows simple push-button calibration and includes an LED indicator for visual feedback.
The 2751 pH/ORP Smart Sensor Electronics available for submersible and inline installations. Can be used with GF installation fittings ½" to 4".

Features

- Probe health monitoring, glass impedance and broken glass detection
- Memory chip interface that allows for transferable calibration, runtime data, and manufacturing information
- In-line integral mount and submersible installation versions
- Automatic pH temperature compensation
- Auto configuration for pH or ORP operation
- Optional EasyCal calibration aid with automatic pH buffer recognition for 4, 7 and 10 pH and ORP solutions: quinhydrone saturated pH 4 or 7 buffers and Light's Solution +469 mV
- Patented DryLoc® connector provides a quick and secure connection to the sensor**

* Users of 9950 Gen I and 9950 (Gen 2a) should update to 9950 (Gen 2b or later) to take full advantage of the 2751 features and benefits. Visit www.gfps.com for the latest software update.

** U.S. Patent No.: 6,666,701

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Applications

- Water and Wastewater Treatment
- Neutralization Systems
- Scrubber Control
- Effluent Monitoring
- Surface Finishing
- Flocculent Coagulation
- Heavy Metal Removal and Recovery
- Toxics Destruction
- Sanitization Systems
- Pool & Spa Control
- Aquatic Animal Life Support Systems

Specifications

General			
Compatible Electrodes			
DryLoc® pH and ORP Electrodes, types 2724-2726, 2734-2736, 2744-2747, 2756-2757 Wet-Tap, 2774-2777			
Operating Range	pH	-1 to 15 pH	
	ORP	±2'000 mV	
Response Time	pH	Electrode dependent	
	ORP	Application dependent	
Materials	In-line	PBT (thermal plastic polyester) and polypropylene (retaining nut)	
	Submersible	CPVC	

Electrical			
Cable	4.6 m 15 ft	3-conductor shielded (3-2751-1 in-line and the 3-2751-3 or -4 submersible sensor electronics only) See ordering information for additional cable sizes	
	22 AWG	For 9900, 9950 and 4 to 20 mA max. cable length is 305 m (1'000 ft.).	
Power	12 to 24 VDC	±10%, regulated for 4 to 20 mA output	
	5 to 6.5 VDC	±5% regulated recommended, 3 mA max., for digital (S^3L) output	
Current Output	pH	Fixed 4 to 20 mA, isolated, = 0 to 14 pH (custom scaling available with 0252 tool)	
	ORP	Fixed 4 to 20 mA, isolated, = -1'000 to +2'000 mV (custom scaling available from ± 2000 mV with 0252 tool)	
Max Loop Resistance	100 Ω max. @ 12 V	325 Ω max. @ 18 V	600 Ω max. @ 24 V
Accuracy	±32 µA		
Resolution	±5 µA		
Update Rate	0.5 seconds		
Error Indication	3.6 mA, 22 mA, or none		
Digital (S^3L) Output	Serial ASCII, TTL level 9600 bps		
Accuracy	pH	± 0.02 pH @ 25 °C	± 0.02 pH @ 77 °F
	ORP	± 1.5 mV @ 25 ° C	± 1.5 mV @ 77 °F
	Temperature	≤ 0.4 °C	0.72 °F
Resolution	pH	≤ 0.01 pH	
	ORP	1.5 mV	
Update Rate	0.5 seconds		
Available Data	Raw mV, pH or ORP, Temperature (pH), Glass Impedance (pH), Minimum mV (pH), Maximum mV (pH), Minimum Temperature (pH), Maximum Temperature (pH), type Number, Serial Number, Manufacturing Date, Runtime, Slope pH/mV, Measurement Offset, and Temperature		
Error Indication	Open input diagnostic, broken glass detection (pH), High Impedance		
Input Impedance, Z	$>10^{11}\Omega$		

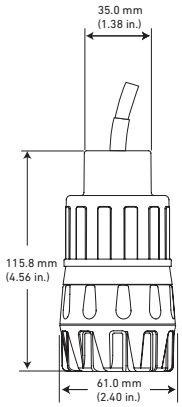
Environmental		
Enclosure	3-2751-1 & -2	NEMA 4X/IP65 with electrode connected
	3-2751-3 & -4	NEMA 6P/IP68 with electrode and watertight conduit and/or extension pipe connected

Max. Temperature/Pressure Rating		
Operating Temperature		
Submersible	0 °C to 85 °C	32 °F to 185 °F
In-line	0 °C to 85 °C	32 °F to 185 °F
Storage Temperature	-20 °C to 85 °C	-4 °F to 185 °F
Relative Humidity	0 to 95%, non-condensing (without electrode connected)	

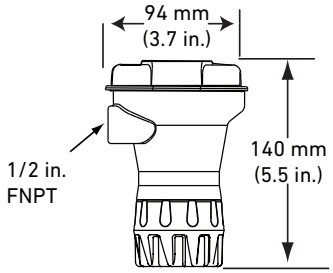
Shipping Weight			
	2751-2	0.75 kg	1.65 lb
	2751-1, -3 & -4	0.64 kg	1.41 lb

Standards and Approvals	
	CE, UKCA, FCC
	RoHS compliant, China RoHS
	Manufactured under ISO 9001, ISO 14001 and ISO 45001

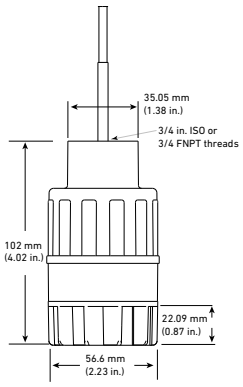
Dimensions



3-2751-1

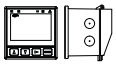
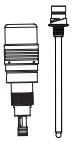
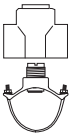
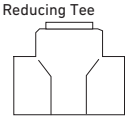
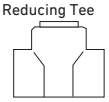
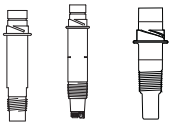


3-2751-2



3-2751-3, -4

System Overview

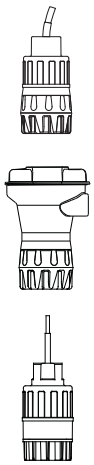
Panel Mount	Pipe, Tank, Wall Mount	4 to 20 mA Output*	Automation System
GF Instruments - 9900 - 9950 Digital (S^3L) output from sensor electronics	GF Instruments - 9900 and Rear Enclosure  Digital (S^3L) output from sensor electronics	Type 2751 Smart Sensor Electronics with - Customer Supplied Chart Recorder or Programmable Logic Controller or - Programmable Automation Controller 4-20mA Output from sensor electronics	- 0486 Profibus Concentrator and - Customer Supplied Programmable Logic Controller or - Programmable Automation Controller Digital (S^3L) output from sensor electronics
In-Line Installation type 2751 Smart Sensor Electronics		**In-Line Installation type 2751 Smart Sensor Electronics** **OR**	
 3-2751-1	 3-2751-2 with EasyCal	 2751-3 (Digital [S^3L] output from sensor electronics	 2751-3 (4-20mA Output from sensor electronics)
GF Electrodes - 2724-2726 - 2734-2736 	3719-xx 275x 1½" or 2" MNPT 	2744-2747 1" MNPT **OR** 	2744-2747 ¾" MNPT
½" to 4" GF Installation Fitting 	¾" FNPT Reducing Tee 	1½" or 2" FNPT Reducing Tee or Saddle 	1"FNPT Reducing Tee 	¾" FNPT Reducing Tee 
Submersible Installation GF 2751 Smart Sensor Electronics			
OR			
 2751-3 (Digital [S^3L] output from sensor electronics		 2751-3 (4-20mA Output from sensor electronics)	
GF Electrodes 2724-2726 2734-2736 2744-2747 2774-2777  All sold separately			

* See fittings section for more information.
**Refer to the GF Submersion Kit brochure (3-0000.707) located on our website for installation suggestions and options.

Application Tips

- The EasyCal feature automatically recognizes standard 4.0, 7.0, and 10.0 pH buffer or ORP quinhydrone solutions of +87 and +264 mV or Light's Solution, +469 mV, and simplifies calibration. For EasyCal ORP only single point calibration is used.
- Frequency of calibration of electrodes is dependent upon the application.
- It is recommended to clean and condition pH/ ORP electrodes prior to recalibration. See instruction manual for cleaning and conditioning recommendations.

Ordering Information

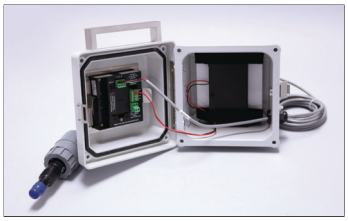


Mfr. Part No.	Code	Description
In-line pH/ORP Smart Sensor Electronics (yellow body)		
3-2751-1	159 001 804	with 4.6 m (15 ft) cable, recommended for 9900 or 9950 instruments
3-2751-1-025	159 070 110	with 7.6 m (25 ft) cable, recommended for 9900 or 9950 instruments
3-2751-1-050	159 070 111	with 15.2 m (50 ft) cable, recommended for 9900 or 9950 instruments
3-2751-1-100	159 070 112	with 30.5 m (100 ft) cable, recommended for 9900 or 9950 instruments
3-2751-2	159 001 805	with junction box and EasyCal, recommended for 4 to 20 mA use
Submersible pH/ORP Smart Sensor Electronics (gray body)		
3-2751-3	159 001 806	with 4.6 m (15 ft) cable and ¾ in. NPT threads - when 4 to 20 mA is required use the 3-8050-2 junction box with EasyCal
3-2751-3-025	159 070 113	with 7.6 m (25 ft) cable and ¾ in. NPT threads - when 4 to 20 mA is required use the 3-8050-2 junction box with EasyCal
3-2751-3-050	159 070 114	with 15.2 m (50 ft) cable and ¾ in. NPT threads - when 4 to 20 mA is required use the 3-8050-2 junction box with EasyCal
3-2751-3-100	159 070 115	with 30.5 m (100 ft) cable and ¾ in. NPT threads - when 4 to 20 mA is required use the 3-8050-2 junction box with EasyCal
3-2751-4	159 001 807	with 4.6 m (15 ft) cable and ISO 7/1-R 3/4 threads - when 4 to 20 mA is required use the 3-8050-2 junction box with EasyCal

Sensor Electronics with preamplified signal and Digital (S^3L) output (for use with the SmartPro Instruments) or 4 to 20 mA output - power supplied to unit dictates output type.

i The 2751 Smart Sensor Electronics is compatible with 9900 and 9950 SmartPro Transmitters, and type 0486 Profibus Concentrator. To take full advantage of the 2751 features, use 9900 (Generation IV or later), 9950 or 0486 Profibus Concentrator.

9900 pH/ORP Calibrator (150 399 007)



The 9900 battery operated calibrator is built to enhance the user experience with the new line of 2751 Smart pH/ORP sensor electronics. This unit can be kept in a lab or taken in to the field. The calibration storage capability of the pH/ORP electrodes when used with the 2751 Smart sensor electronics, allows the user the ability to rotate electrodes, meaning unplug an aged/ dirty electrode replacing with a pre-calibrated electrode.

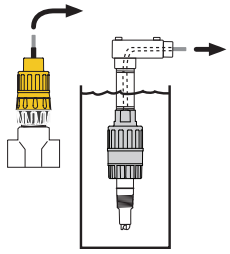
With larger installations, all collected dirty and uncalibrated electrodes can be taken to a central well organized location where proper cleaning and calibration can be performed. This improves efficiency of this process resulting more stable readings, higher sensitivity, faster response time, and overall more accurate readings. Runs on (8) AA Alkaline batteries (included).

Accessories and Replacement Parts

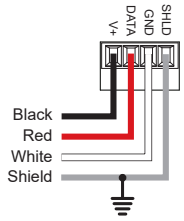
Mfr. Part No.	Code	Description
Calibration		
3-2700.395	**159 001 605**	Calibration kit: includes 3 polyproplyene cups, box used as cup stand, 1 pint pH 4.01, 1 pint pH 7.00
3822-7115	**159 001 606**	20 gm bottle quinhydrone for ORP calibration (must use pH 4.01 and/or pH 7.00 buffer solutions)
3-2759	**159 000 762**	pH/ORP system tester (adapter cable sold separately)
3-2759.391	**159 000 764**	2759 adapter cable for use with 2751 DryLoc sensor electronics
3-0700.390	**198 864 403**	pH buffer kit (1 each 4, 7, 10 pH buffer in powder form, makes 50 ml of each)
3822-7004	**159 001 581**	pH 4 buffer solution, 1 pint (473 ml) bottle
3822-7007	**159 001 582**	pH 7 buffer solution, 1 pint (473 ml) bottle
3822-7010	**159 001 583**	pH 10 buffer solution, 1 pint (473 ml) bottle
Mounting		
3-8050.390-3	**159 310 116**	Retaining nut replacement kit, Black Polypropylene
3-8050-1	**159 000 753**	Universal mount junction box
3-8050-2	**159 000 754**	Universal mount junction box w/EasyCal (for submersible applications, use with 3-2751-3 and -4 where 4 to 20 mA is required)
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		
3-8050.390-1	**159 001 702**	Retaining Nut Replacement Kit, NPT, Valox
3-8050.390-3	**159 310 116**	Retaining Nut Replacement Kit, NPT, PP
5523-0322	**159 000 761**	Sensor cable (per ft), 3-cond. plus shield, 22 AWG, black/ red/white (for use with 2751)
P31515-0P200	**159 000 630**	Universal Pipe Adapter PVC
P31515-0C200	**159 000 631**	Universal Pipe Adapter CPVC
7310-1024	**159 873 004**	24 VDC power supply, 10W, 0.42 A
7310-2024	**159 873 005**	24 VDC power supply, 24W, 1.0 A
7310-4024	**159 873 006**	24 VDC power supply, 40W, 1.7 A
7310-6024	**159 873 007**	24 VDC power supply, 60W, 2.5 A
7310-7024	**159 873 008**	24 VDC power supply, 96W, 4.0 A
3-2700.398	**159 001 886**	O-ring Lubricant Kit (5 packs of Super Lube®, 1cc each)

Wiring information

2751 Digital (S³L) Wiring with no junction box

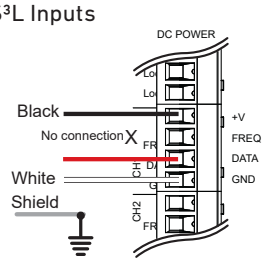


9900 S³L Inputs

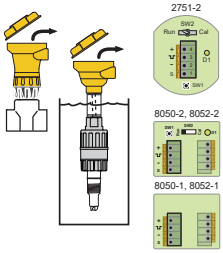


Optional Earth ground

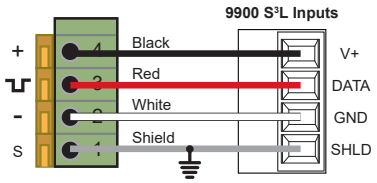
9950 S³L Inputs



2751 Digital (S³L) Wiring with junction box

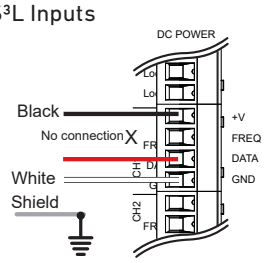


9900 S³L Inputs

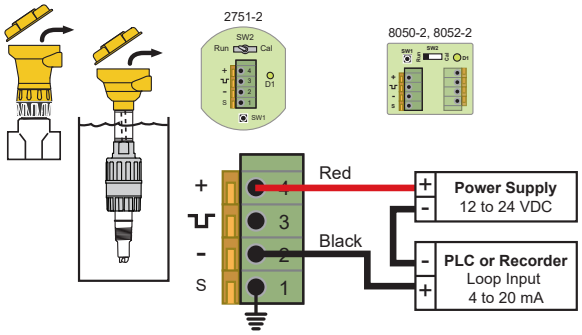


Optional Earth ground

9950 S³L Inputs



2751 4 to 20 mA Loop Wiring - Current loop, junction box with Easy Cal



Optional Earth ground