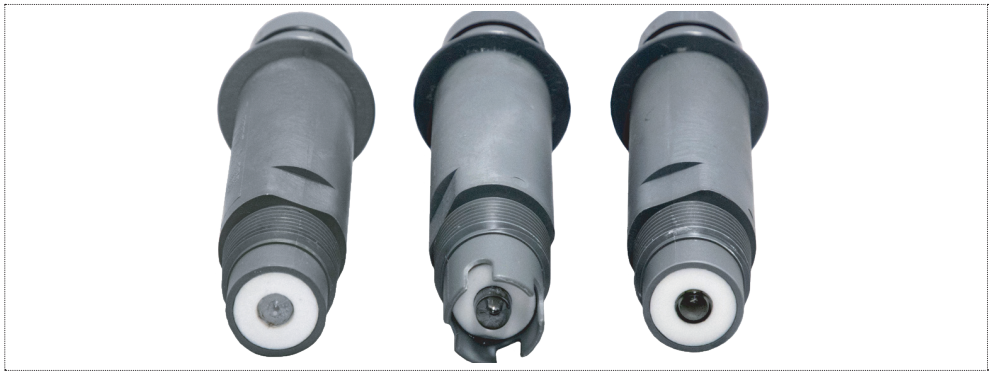
Type 2774-2777 DryLoc pH/ORP Electrodes

General Purpose / Industrial



Product description

The type 2774-2777 pH and ORP electrodes are high performance sensors ideal for a wide range of applications. The unique foul-proof DryLoc® connector with gold-plated contacts is designed specifically for use with the type 2751 pH/ORP Smart Sensor Electronics. These dependable and highly responsive electrodes feature a PTFE double reference junction with potassium nitrate (KNO3) in the front chamber to block various poisoning ions such as Copper (CU2+), Lead (Pb2+), Mercury (Hg2+), and a large reference chamber that combine to extend the service-life.

The positioning of the temperature element embedded in the pH sensing tip allows the temperature response to be quick and accurate. The electrodes are offered with either flat or bulb style sensing elements. The flat versions allow sediment and particles to sweep past the measurement surface, minimizing risks of abrasion, breakage and coating. The bulb versions can be used for low temperature applications or where fast response is required. Due to the specially designed chambers which keep electrolyte in place, all sensor models can be installed at any angle, even inverted.

The quick temperature response is available in either a Pt1000 or 3KΩ temperature sensor and allows compatibility with all GF pH/ORP instruments.

Features

- Double reference PTFE junction to block various poisoning ions and resist fouling and dirt buildup
- PPS body for broad range of chemical compatibility
- Memory chip enabled for access to a wide range of unique features when connected to the GF 2751 pH/ORP Smart Sensor Electronics
- Patented DryLoc® connector with gold plated contacts*
- Special design allows for installation at any angle, even inverted or horizontal
- Temperature sensor (pH)
- Quick temperature response
- Easy sensor replacement using DryLoc electrode connector
- High temperature versions available
- Mounts into standard ¾ inch threads
- Compatible with all GF instruments

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

Applications

- Water Treatment & Water Quality Monitoring
- Cooling Tower and Boiler Protection
- Aquatic Animal Life Support System
- Pool and Spa Control
- Neutralization Systems
- Process Control

Specifications

General			
Compatibility	Types 2751		
Operating Range	2774/2776	0 to 14 pH	
	2775/2777	±1'500 mV (ORP)	
Process Connection	¾" MNPT. For use in reducing tees. Up to 1" insertion depth.		
Reference	Electrolyte	KNO_3/KCl polyacrylamide gel	
	Element	Ag/AgCl	

Wetted Materials			
	Body	PPS	
	Reference junctions	PTFE	
	Sensing surface	pH	Glass membrane
		ORP	Platinum
	O-rings	FKM	

Max. Temperature/Pressure Rating		
Operating Temperature	0 °C to 85 °C	32 °F to 285 °F
Max. Operating Pressure	6.9 bar	100 psi
Higher temperature and pressure sensors are available upon request		

Recommended Storage Temperature		
	0 °C to 50 °C	32 °F to 122 °F
The electrode glass will shatter if shipped or stored at temperature below 0 °C (32 °F)		
The performance life of the electrode will shorten if stored at temperatures above 50 °C (122 °F)		

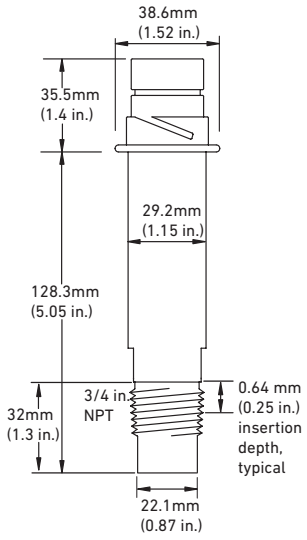
Mounting		
In-line/Vertical Mounting	Use the electrodes ¾ inch threads to install into pipe fitting. Electrode can be mounted at any angle.	
Submersible Mounting	Use threads on type 2751 or 2760; requires ¾ inch NPT or ISO 7/1-R 3/4 male threaded extension.	
Temperature Sensor	pH	3 KΩ or PT1000 RTD
	ORP	none

Shipping Weight		
	0.25 kg	0.55 lb

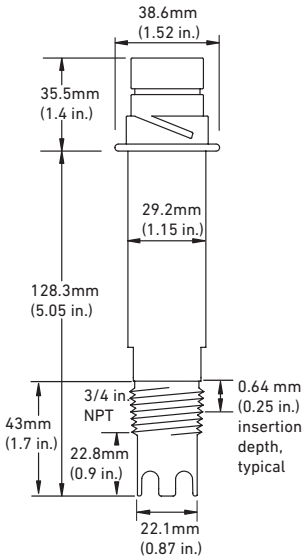
Standards and Approvals	
	Manufactured under ISO 9001, ISO 14001 and ISO 45001

Dimensions

Flat Electrode



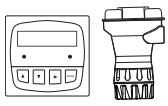
Bulb Electrode



System Overview

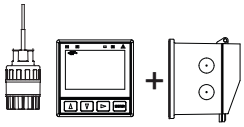
Panel Mount

GF Instruments
with 2751 Smart Sensor
Electronics
- 9900
- 9950



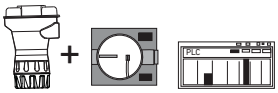
Pipe, Tank, Wall

GF Instruments
with 2751 Smart Sensor Electronics
- 9900 and Rear Enclosure



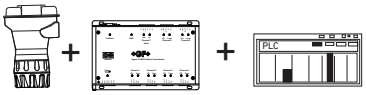
4 to 20 mA Output

2751 Smart Sensor Electronics with
- Customer Supplied Chart Recorder
  Programmable Logic Controller, or
- Programmable Automation Controller



Automation System

2751 Smart Sensor Electronics with
- 0486 Profibus Concentrator and
  Customer Supplied Programmable Logic
  Controller or
- Programmable Automation Controller



Type 2774-2777
DryLoc® pH/ORP
Electrodes

All sold separately

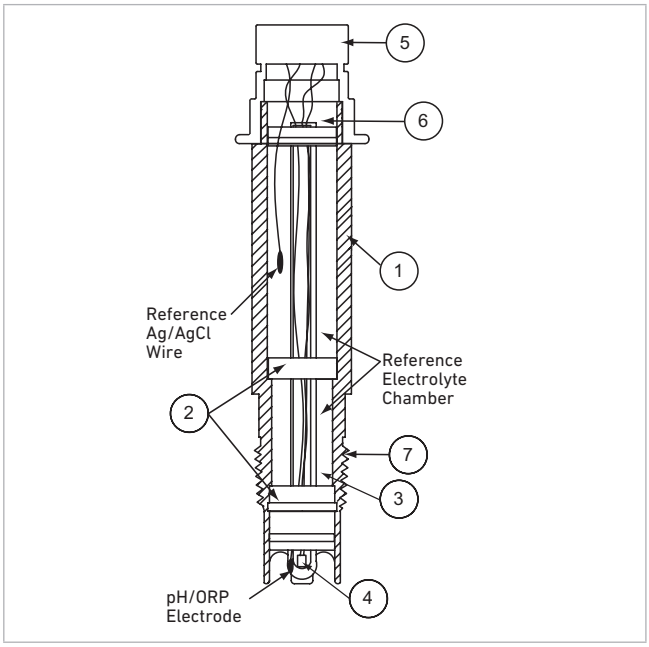
In-Line Installation -
threaded fittings only

Submersible Installation -
Customer supplied pipe extension
or conduit with 3/4 in. NPT or ISO 7/1-R 3/4 threads and pipe assembly*

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

Electrode Key Features and Benefits

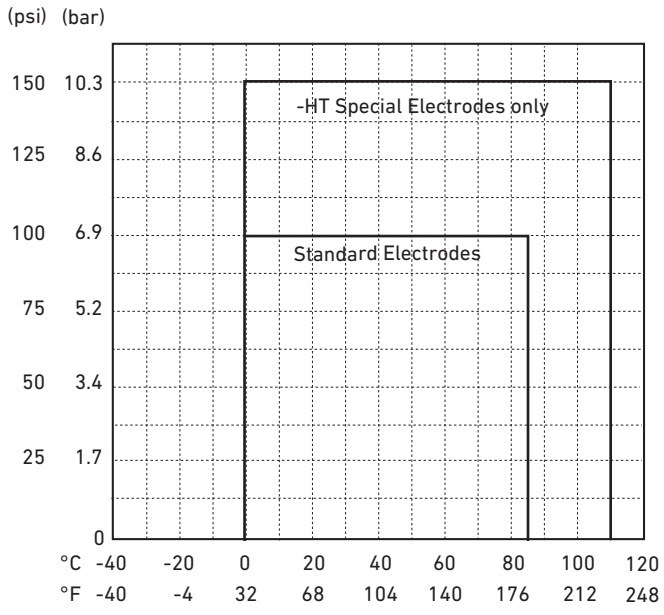
1. PPS body for chemical compatibility to resist most harsh chemicals. Also able to withstand high temperatures.
2. Porous PTFE junction resists fouling, chemicals, and build-up.
3. First reference chamber with KNO_3 protects Ag/AgCl wire for a prolonged sensor life.
4. Capillary TC (temperature sensor) embedded in tip of pH/ORP electrode for quicker temperature response.
5. DryLoc connector with corrosion resistant gold plated pins for quick and easy sensor removal.
6. Memory chip enabled for convenient data storage and access (calibration data, operational data, and manufacturing data), electrode health monitoring via glass impedance measurement when used in connection with the 2751 pH/ORP Smart Sensor Electronics.
7. Threads for NPT process connection into reducing tees. Use off the shelf GF reducing tees DN20 to DN100 (¾ to 4 in.).



Pressure-temperature diagram

Note

The pressure-temperature diagram 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.



Application Tips

- Use the flat glass electrodes for in-line pH sensor applications when a self-cleaning feature is desired; especially useful in applications with abrasive chemicals in in-line applications.
- Use bulb protected electrodes for low temperature applications or where fast response is required.
- ORP electrodes are generally used for chemical reaction monitoring, not control.
- Ensure that sensor materials are chemically compatible with the process liquid.
- Keep electrode tip wet, avoid air pockets and sediment.

Buffer solutions

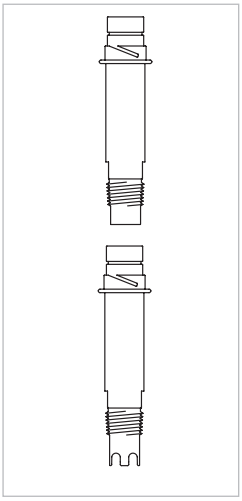
Buffer Solution	Quinhydrone
3822-7004 3822-7007 3822-7010	3822-7115

The GF pH buffers are ideal for calibration. The liquid solutions are conveniently packaged in one pint (473 ml) bottles. pH buffer kits in powder pillows are available for mixing fresh solutions with water at the time of use.
All pH buffes are color coded for easy identifiation; 4.01 pH is red, 7.00 pH is yellow, and 10.00 pH is blue.
All pH buffers are traceable to NIST standards. The 4.01 and 7.00 buffer solutions can be used to calibrate ORP sensors when saturated with quinhydrone

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

Ordering Information

Mfr. Part No.	Code	Tip Design	Temperature Element
pH Electrodes			
3-2774	159 000 955	Flat	3 KΩ RTD[1]
3-2776	159 000 959	Bulb with Protection	3 KΩ RTD[1]
3-2774-1	159 000 956	Flat	PT1000 RTD[2]
3-2776-1	159 000 960	Bulb with Protection	PT1000 RTD[2]
3-2774-HT	159 001 796	Flat	3 KΩ Balco RTD, High Temperature [4]
3-2774-HT-C	159 001 795	Flat	BNC connector, 3 KΩ Balco RTD, NPT, High Temperature [4) 5)]
3-2774-HT-ISO	159 001 794	Flat	3 KΩ Balco, High Temperature [4)]
ORP Electrodes			
3-2775	159 000 957	Flat	10 K ID resistor[3]
3-2777	159 000 961	Bulb with Protection	10 K ID resistor[3]



[1] 3 KΩ Balco RTD for connection to ProPoint and ProcessPro pH/ORP instrument series when used with the 2760 preamplifier.

[2] Pt1000 RTD for connection to the 9900, 9950 or 0486 Profibus Concentrator when used with the 2751 Smart Sensor Electronics. The 2751 has a digital (S^3L) output which is used with the 9900, or 9950 transmitter, and the 0486 Profibus Concentrator. It also has a 4 to 20 mA output for connection to PLC's, data recorders, etc.

[3] 10 KΩ ID resistor for connection to the 9900 or 9950 when used with the 2751 pH/ORP Smart Sensor Electronics

[4]
- -HT pH electrode, flat glass, high temperature (110 °C, 230 °F), 3/4" NPT, 3KΩ TC, in-line install only.
- -HT-C pH electrode, flat glass, high temperature (110 °C, 230 °F), 3KΩ TC, BNC connector, NPT, 15 ft cable, no memory chip.
- -HT-ISO pH electrode, flat glass, high temperature (110 °C, 230 °F), 3/4" ISO, 3KΩ TC, in-line install only.

[5] Option -HT-C can only be connected to the 2751 sensor electronics if used with the 3-2722 BNC adapter.

Special Order Options - Please consult the factory.

Accessories and Replacement Parts

Mfr. Part	Code	Description
3-2700.395	**159 001 605**	Calibration kit: includes 3 polypropylene 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)
3-0700.390	**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 4.01 buffer solution, 1 pint (473 ml) bottle
3822-7007	**159 001 582**	pH 7.00 buffer solution, 1 pint (473 ml) bottle
3822-7010	**159 001 583**	pH 10.00 buffer solution, 1 pint (473 ml) bottle
3-2759	**159 000 762**	pH/ORP System Tester (adapter cable sold separately)
3-2759.391	**159 000 764**	2759 DryLoc adapter cable (for use with 2750 and 2760)
3-2722	**Special order**	BNC adapter
3800-5000	**159 838 107**	3.0M KCl storage solution for pH and ORP, 1 pint (473 ml) bottle
3-2700.398	**159 001 886**	O-ring lubricant kit (5 packs of Super Lube®, 1cc each)

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