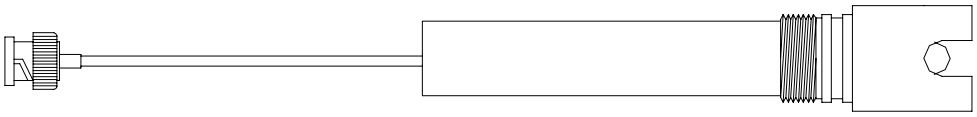
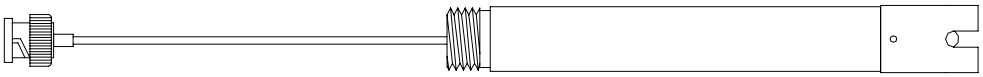
LAKEWOOD INSTRUMENTS
MODEL 520

pH SENSORS

INSTALLATION & OPERATION MANUAL



5205 Replacement Tip (CPVC)



5207 Replacement Tip (316 SS)

Lakewood Instruments

7838 North Faulkner Road, Milwaukee, WI 53224 USA
Phone (800) 228-0839 • Fax (414) 355-3508
http://www.lakewoodinstruments.com

Lakewood Instruments

Congratulations on your purchase of a Lakewood Instruments product. We would like to take this opportunity to welcome you to the Lakewood Instruments product family.

With proper care and maintenance, your product should give you trouble-free service. Please take the time to read and understand the operation manual, paying special attention to the sections on **INSTALLATION** and **MAINTENANCE**.

If, in the future, any parts or repairs are required, we strongly recommend that only original replacement parts be used. Our Customer Service Department would be happy to assist you with your parts or service requests.

We thank you for your selection and purchase of a Lakewood Instruments product.

MODEL 520

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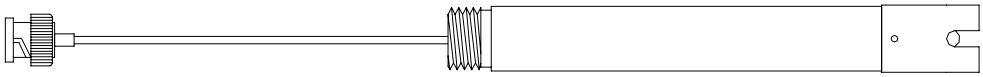
520 Series
pH Sensors

5205 Replacement Tip (CPVC)



5207 Replacement Tip (316 SS)

Lakewood Instruments uses the latest technology in pH electrode construction. Lakewood's differential electrode design prevents ground loop problems and excessive dependence on the reference electrode connection to the process stream for stable readings. With three different body materials, three mounting options, and six different glass electrodes, Lakewood Instruments can supply pH sensors to fit your needs.

Specifications

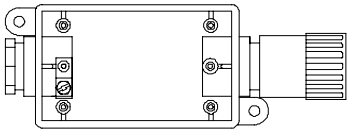
Option	Body Material	Max Temp*	Pressure	Wetted Materials
-5x	CPVC	150°F (66°C)	100 psi (7 bar)	CPVC, Glass, Carbon, Viton
-7x	316 SS	230°F (110°C)	150 psi (10 bar)	316 SS, Glass, Viton

Electrode	Description	Max Temperature*
-STD	Standard Electrode	212°F (100°C)
-HT	High Temperature	230°F (110°C)
-FG	Flat Glass	212°F (100°C)
-DG	Dome Glass	176°F (80°C)
-HSHT	High Sodium w/ High Temp	212°F (100°C)
-DGHT	Dome Glass w/ High Temp	212°F (100°C)

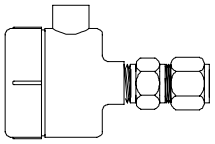
Temperature Compensator: 10K PTC

* *Temperature rating of sensors depends on the combination of the body and glass electrode. Use the lower temperature of the sensors body or glass electrode to determine sensors temperature specification.*

Enclosures

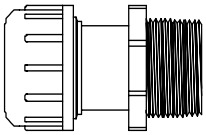


-1 NEMA 4X w/ amplifier*
-5 NEMA 4X

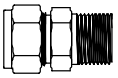


-2 Cl I Div 2 w/ amplifier*
-3 Cl I Div 2

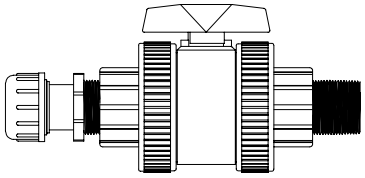
Inline Mounting Options



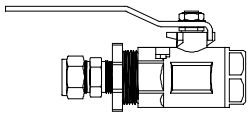
-5I 1-1/2 in NPT CPVC Compression fitting



-7I ¾ in NPT 316 SS Swagelock



-5R 1 ½ in NPT CPVC Ball valve



-7R 1I NPT 316 SS Ball valve

Ordering Information

pH Sensor	Cable Length or Enclosure	Material, Inline Fitting	Body Length	Electrode
520	**-0** ½ in NPT adapter	**-5S** CPVC no fitting	**-10 in** =	**-STD**
	-1 NEMA-4X w/ amplifier*	**-5I** CPVC w/ compress fitting 1½ in NPT	**-18 in**	**-HT**
	-2 CL I DIV 1 w/ amplifier*	**-5R** CPVC w/ ball valve 1½ in NPT	**-48 in**	**-FG**
	-3 CL I DIV 1 enclosure	**-7S** 316 SS no fitting		**-DG**
	-4 180 Inches of cable	**-7I** 316 SS w/ Swagelock fitting ¾ in NPT		**-HSHT**
	-5 NEMA-4X enclosure	**-7R** 316 SS w/ ball valve 1 in NPT		**-DGHT**

Example

520	-4	-5R	-18	-STD

** amplifier option **-1** and **-2** are only available with 350-RP, 352, 820 and 1020 controllers.*

*= 10 in body not available with **-5R** option*

INSTALLATION

Installation

The pH sensor should be mounted vertically with the glass bulb facing down. It may be mounted at an angle as long as it is no more than 75° from the vertical position (see DWG #04258 in the back of this manual). Due to the bubble position, however, the preferred mounting angle is no more than 45° from vertical.

The sensor must also be mounted in a location so that it is always wet. If is located in a pipe or tank with variable fluid levels, it is important that the sensor is installed where it can remain wet. Failure to do so will damage the sensor.

The 520 series sensors have 4 wires and a coaxial cable with a BNC fitting. They are as follows:

- BNC center — pH signal
- BNC shield — (not used)
- Black wire — Temp compensation 10K PTC
- Red wire — Temp compensation
- White wire — Solution GND
- Green wire — Reference

The cable length of pH sensors is measured from the glass bulb to the BNC connector. Fifteen (15) feet is the maximum cable length. Lakewood Instruments guarantees operation up to 15 feet. If a cable extension is used Lakewood Instruments will not guarantee operation of the sensor.

Storage

Proper storage of pH sensors is crucial to sensor life. It is important that the pH sensor glass bulb is always moist. The pH sensor is shipped with a plastic cover which is filled with tap water, a sponge and sealed with electrical tape. Save the cap for future storage use. Use only tap water or a 50/50 mixture of 4.0 pH buffer with KCl (potassium chloride) for storage. **DI or distilled water will damage pH sensors if exposed for extended periods.**

Sensor Life

pH sensor life varies with the following

- Type of process water and chemicals used
- Temperature of water
- Placement of sensor which may cause it to dry out

NOTE: KEEP THE pH SENSOR MOIST AT ALL TIMES

Cleaning

pH sensors may be cleaned with distilled or tap water. A bottle with a spout may be used to rinse the probe free of debris. If the debris cannot be removed with water, you may use a cotton swab with isopropyl alcohol. Do not clean the sensor with a rag or brush since this may scratch the glass bulb. Cleaning frequency will vary according to the type of process water. Cleaning should be done at least once a month or if pH readings become unstable.

REPLACEMENT PARTS

Replacement Tips

520 series sensors may be replaced by simply unscrewing the tip of the sensor. The body, fittings, and other options may be reused with the new sensor tip.

***NOTE:* WHEN ORDERING A pH SENSOR TIP, BE SURE TO SPECIFY THE CABLE LENGTH IN INCHES FROM THE GLASS BULB TO THE BNC CONNECTOR.**

Replacement numbers are a follows:

SENSOR REPLACEMENT TIPS
5205 CPVC sensor replacement tip
5207 316 SS sensor replacement tip

ELECTRODE OPTIONS (required, select one only)
-STD Standard glass electrode
-HT High temperature process electrode, use with 7I,R,S,T
-FG Flat pH glass electrode
-DG Dome glass pH sensor
-HSHT High sodium with high temperature electrode. Corrects sodium error
-DGHT Dome glass pH sensor with high temperature electrode

Accessories

SENSOR TEES
1166604 CPVC sensor tee, 1½ in connection
1166549 316 SS sensor tee, ¾ in connection

REPLACEMENT AMPLIFIER/DRIVER
1167124 pH standard amplifier
1168899 pH preamp manual
1166317 Preamp cable. 4 conductor shielded. per ft
1169780 Male/Female BNC with 4 conductor cable, 5 ft
1169781 Male/Female BNC with 4 conductor cable, 10 ft

REPLACEMENT FITTINGS
1167261 CPVC 1½ in NPT compression fitting
1167090 CPVC ball valve with 1½ in NPT process connection
1167374 316 SS ¾ in NPT compression fitting
1167375 316 SS ball valve with 1in NPT process connection

MAINTENANCE AND TECHNICAL SERVICE

Technical Service/Return Material Procedure

☎ **Technical Support for Lakewood Instruments can be reached by calling (800) 228-0839 or faxing (414) 355-3508, Monday through Friday, 7:30 a.m. - 5:00 p.m. CST.**

Mail and returns should be sent to:

Lakewood Instruments
7838 North Faulkner Road
Milwaukee, WI 53224 USA

When any merchandise is returned to the factory, please call and obtain a Return Goods Authorization (RGA) number and have the following information available:

- Customer's name, address, phone and fax numbers (shipping and billing).
- A hard copy purchase order number (no exceptions) for cases where repairs or parts are required that are not under warranty.
- A contact person's name and phone number to call if the equipment is beyond repair or to discuss any other warranty matter.
- Equipment model and serial numbers.
- Reason for return (i.e., repair, warranty, incorrect part, etc.).

We will then fax to your attention an RGA form that must accompany the returned item.

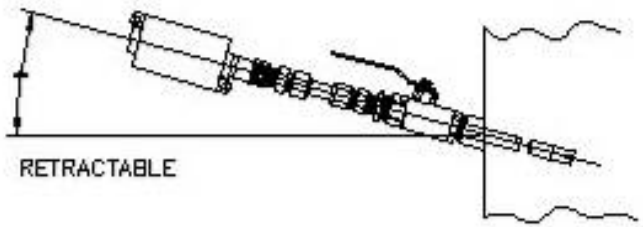
NOTE: THE RGA NUMBER MUST BE CLEARLY WRITTEN ON THE OUTSIDE OF THE PACKAGE(S) BEING RETURNED.

ANY ITEMS SENT BACK TO THE FACTORY WITHOUT AN RGA NUMBER WILL BE REFUSED AND RETURNED TO SENDER

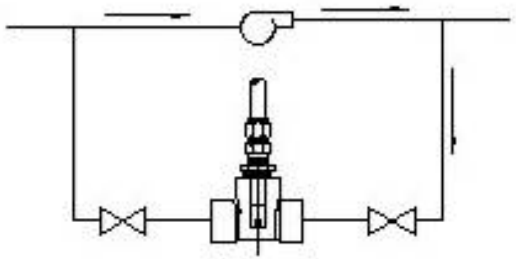
Drawings

REVISION HISTORY						
REV	ECN#	DESCRIPTION	DRN	APP	DATE	APVD
A		RELEASE	TDH	EV	5/18/07	

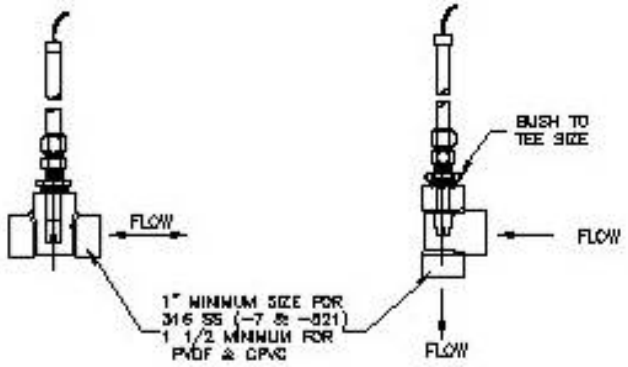
pH/ORP SENSOR MOUNTING SUGGESTIONS



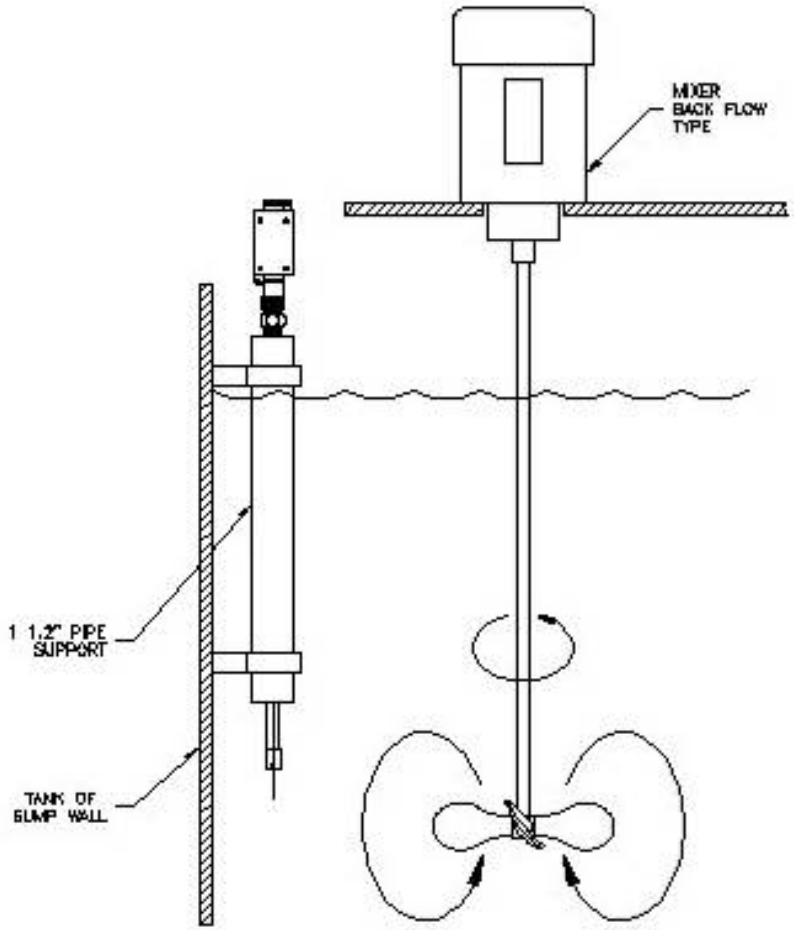
RETRACTABLE



TYPICAL BYPASS PLUMBING



BYPASS FLOW CELL



SUBMERSION

NOTICE OF REPRESENTATIVES

MATERIAL			
FINISH	.XX ± .010 .XXX ± .005 ±1		
ORDER NO.	DRN EV	DATE 5/18/07	
QUANTITY	APVD	DATE	
SUBSTITUTE FOR	APVD	DATE	
DO NOT SCALE	APVD	DATE	

Loveland INSTRUMENTS

TITLE: INSTALLATION LAYOUT
520, 521, 530 pH/ORP MOUNT SENSOR

SIZE C	DWG NO. 1B40520_Jo		REV A
SCALE NONE	FILE TYPE ASM	SHEET 1 OF 1	

For more information call toll free in the USA (800) 228-0839

Manufactured in the USA

Lakewood Instruments

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Printed in USA, P/N 1109986 Rev. A