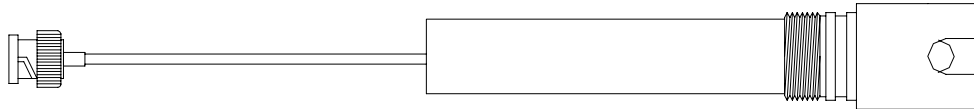


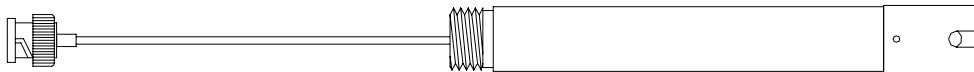
**LAKWOOD INSTRUMENTS
MODEL 520**

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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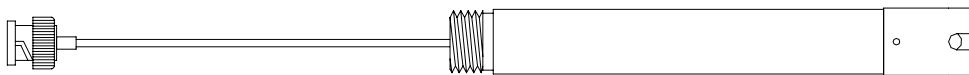
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Features, Benefits, Specifications

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

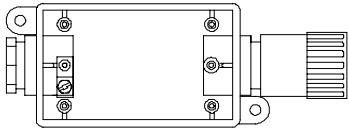
| Option | Body Material | Max Temp* | Pressure | Wetted Materials |
|--------|---------------|---------------|------------------|----------------------------|
| -5x | CPVC | 150°F (66°C) | 100 psi (7 bar) | CPVC, Glass, Carbon, Viton |
| -7x | 316 SS | 230°F (110°C) | 150 psi (10 bar) | 316 SS, Glass,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

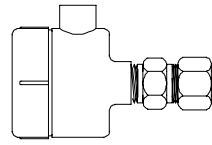
Temperature Compensator: 10K PTC

* 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

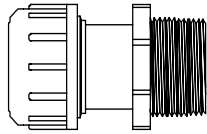


- 1 NEMA 4X w/ amplifier*
- 5 NEMA 4X

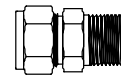


- 2 CL I Div 2 w/ amplifier*
- 3 CL I Div 2

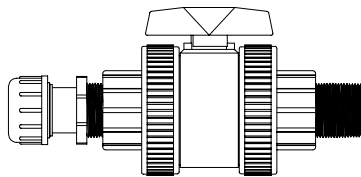
Inline Mounting Options



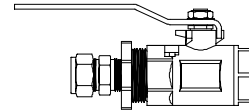
- 5I 1-1/2 in NPT CPVC Compression fitting



- 7I 3/4 in NPT 316 SS Swagelock



- 5R 1 1/2 in NPT CPVC Ball valve



- 7R 1 in NPT 316 SS Ball valve

Ordering Information

| pH Sensor | Cable Length or Enclosure | Material, Inline Fitting | Body Length | Electrode |
|-----------|-----------------------------|--|-------------|-----------|
| 520 | -0 1/2 in NPT adapter | -5S CPVC no fitting | -10 in = | -STD |
| | -1 NEMA-4X w/ amplifier* | -5I CPVC w/ compress fitting 1 1/2 in NPT | -18 in | -HT |
| | -2 CL I DIV 1 w/ amplifier* | -5R CPVC w/ ball valve 1 1/2 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 3/4 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 as 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 1 in 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.).

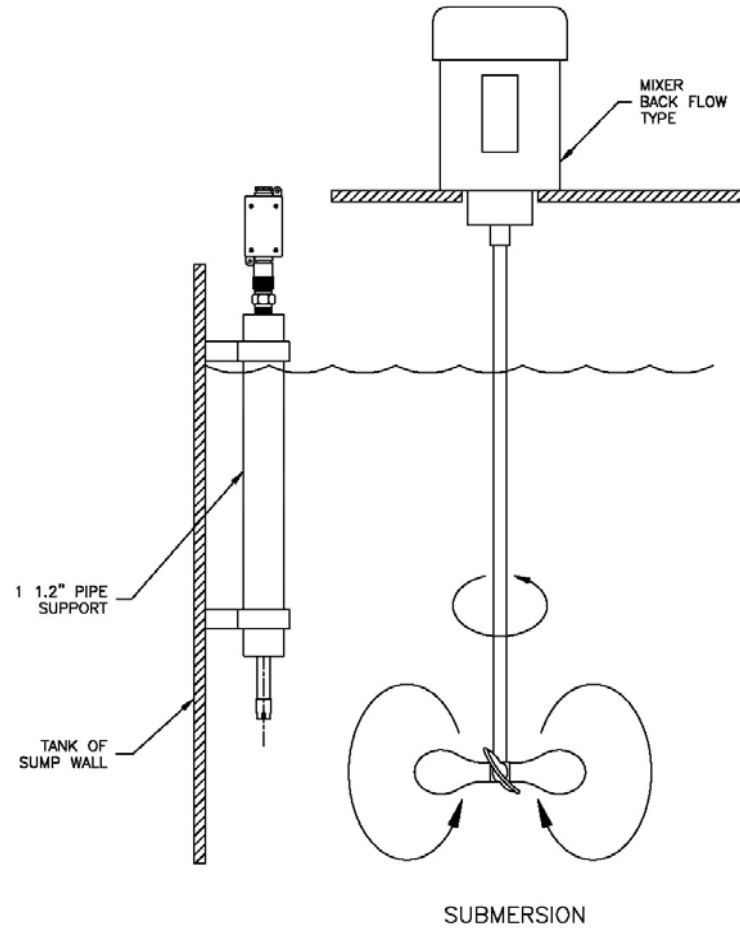
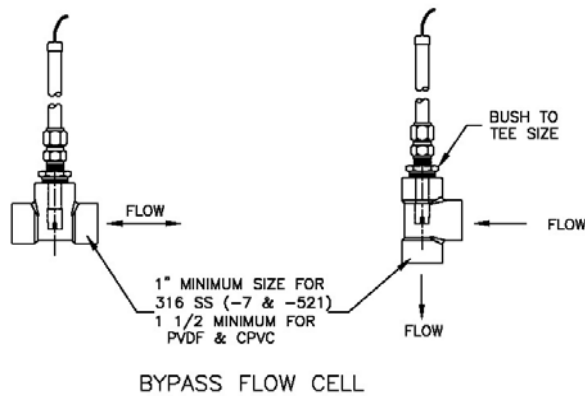
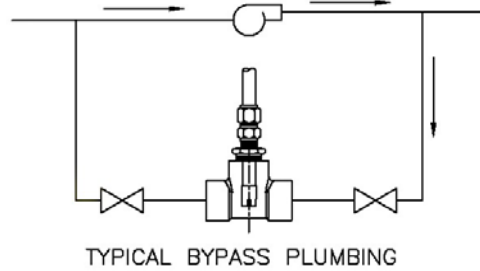
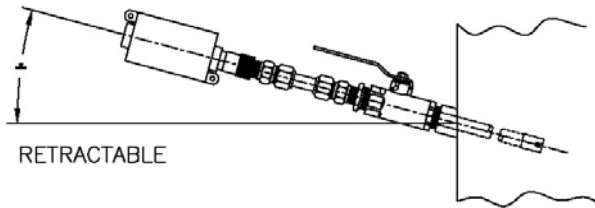
We will then fax to your attention an RGA form that must accompany the returned item.

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**

pH/ORP SENSOR MOUNTING SUGGESTIONS

| REVISION HISTORY | | | | | | |
|------------------|------|-------------|------|-----|---------|------|
| REV | ZONE | DESCRIPTION | ECD | DWN | DATE | APVD |
| A | | RELEASE | 1034 | EV | 5/16/97 | |



| NOTICE ON REPRODUCTIONS | | | | OSMONICS | |
|---|------|-----------------------------------|--------------|-----------------------------------|----------------|
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| MATERIAL | | DIMENSIONS UNLESS NOTED OTHERWISE | | TITLE | |
| FINISH | FRAC | DECIMALS | ANGLES | INSTALLATION LAYOUT | |
| | | .XX ± .08 | ∠ ± .1 | 520, 521, 530 pH/ORP MOUNT SENSOR | |
| ORDER NO. | DWN | EV | DATE 5/16/97 | SIZE | DWG NO./PRN |
| CUSTOMER | CHKD | DATE | | C | 04258 |
| CUSTOMER LOC. | APVD | DATE | | SCALE | FILE TYPE .DWG |
| DO NOT SCALE | APVD | DATE | | SCALE NONE | 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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