



PH/ORP CONTROLLERS

USER MANUAL

| | | |
|--------|--------------|--------------|
| MODELS | 290-PHORP-1 | 290-PHORP-P3 |
| | 290-PHORP-P1 | |

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Check for the latest manual updates at JPTech.com

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INSTALLATION

Step-by-Step Guide

1. Read Manual to familiarize yourself with the operation of the meter.
2. Mount Unit. **FOR PUMP (P) MODELS:** Attach feed tubes to the Squeeze tubes using wire ties or stainless hose clamps. **NOTE:** Pick up tube may float so you might need to weigh it down.
3. Connect the 120VAC power source plug into the 120VAC receptacle.
4. Apply power to the unit.
5. Go the SETUP screen and enter the values and settings you want to work with. Channels or Relays not needed can be disabled.
6. Get material for the calibration procedure. Connect probe to either Channel 1 or Channel 2.
7. Go to the CALIBRATION screen and calibrate the meter. Since the meter was preliminarily calibrated already, calibrate with the temperature set at AUTO or MANUAL in the TMP ADJ screen.
8. Go to the PROPORTIONING screen and set for ENABLED or DISABLED.
9. Go to the Main screen (RLY#1 and/or RLY#2) and enter the SETPOINT OFF, SETPOINT ON, and ALARM values you want to use.

NOTE FOR PUMP (P) MODELS: CHECK PUMP SQUEEZE TUBE REGULARLY FOR INTEGRITY

INSTALLATION

PHORP-P1 Model

PUMP OUTPUT

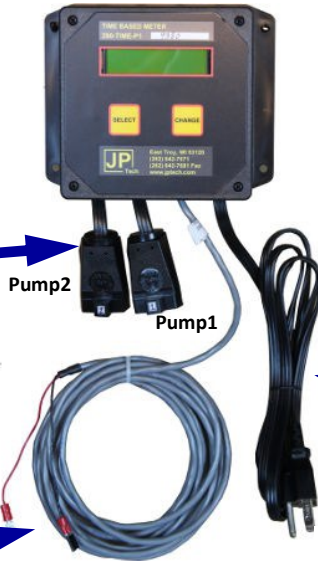
(Only in Pump Control Versions)

The PHORP-P1 models come with either one or two 120 VAC pigtails with female receptacles. Any 120 VAC pump which draws no more than **five amps** can be plugged into these receptacles. When the preset number of seconds is attained, the pump will be energized for the length of time that the operator has designated in TIMER1 and TIMER2.

TWISTED PAIR

All models of the meter come with 15 feet of twisted pair wire to be connected to a switchable device. The "OFF" position is the normal, open state. When contact is made ("ON"), the meter begins to accumulate seconds. The **red** wire must be connected to the positive terminal and the **black** wire to the negative terminal.

USE WITH A DRY CONTACT ONLY



120 VAC POWER

The meter operates off 120 VAC. The PHORP-1 meter uses a two wire cord and plug while all pump models use a three wire grounded plug.

230 VAC POWER users should connect directly to the terminal strip inside the meter.

WARNING:

All board components and circuitry use a "floating ground" and must remain isolated from all other circuits and grounds. This is only an issue if the board is removed from its protective casing.

PHORP-P3 Model

PUMP OUTPUT

(Only in Pump Control Versions)

The PHORP-P3 models come with either one or two peristaltic pumps. When the preset number of seconds is attained, the pump(s) will be energized for the length of time that the operator has designated in TIMER1 or TIMER2. Facing the controller, Pump 1 is to the left and Pump 2 is to the right.

120 VAC POWER

The meter operates off 120 VAC. Pump models of the PHORP meters use a three wire grounded plug.

230 VAC POWER users should connect directly to the terminal strip inside the meter.



WARNING:

All board components and circuitry use a "floating ground" and must remain isolated from all other circuits and grounds. This is only an issue if the board is removed from its protective casing.

PUMP PARAMETERS (PHORP-P3 ONLY)

10' HEAD MAX

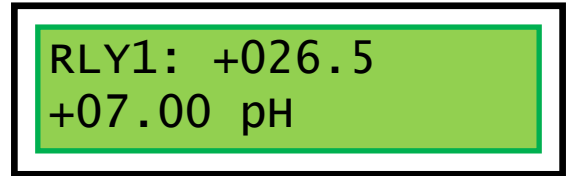
75' LATERAL RUN MAX

QUICK START

USING THE METER

JP Tech's PH/ORP meters are designed for measuring pH and ORP (oxidation/reduction potential). PHORP-P1 and PHORP-P3 models of the PH/ORP meters can also control two (2) pumps and one (1) alarm, or up to three (3) pumps.

JP Tech's PH/ORP meters incorporate a simple menu design featuring a two (2) button keypad. Pressing the **SELECT** key once cycles through different menu screens. Holding the **SELECT** key for about three (3) seconds will enable changes to be made on the menu screen chosen (not applicable on all screens; see the *Menu Operation* section for information on which values are editable).



The default menu screen, showing the Relay 1 status

After holding the **SELECT** key for about three (3) seconds, a flashing cursor will appear, allowing for changes to be made. In this mode, the **SELECT** key moves your cursor right, and the **CHANGE** key advances the selected value by one. Once you have set the values you want, hold the **SELECT** key to return to the menu.

NOTE: The **SELECT key will not change any values by itself! It only provides a way to move through menu screens or move the flashing cursor.**

When the cursor is not flashing, pressing both the **SELECT** and **CHANGE** keys together will take you back to the default 'RELAY 1' screen (as shown above). However, while editing values (cursor is flashing), pressing both the **SELECT** and **CHANGE** keys together will reset the value to zero.

MENU OPERATION

Menu Hierarchy

1. Relay 1 (**Default Screen**) / 2. Relay 1 Minutes
3. Relay 2 / 4. Relay 2 Minutes
5. Relay 3 / 6. Relay 3 Minutes
7. Prime
 - 7.1. Prime Relay 1
 - 7.2. Prime Relay 2
 - 7.3. Prime Relay 3
8. Calibrate
 - 8.1—8.16. Channel 1-8 Offset/Span
9. Setup
 - 9.1. Channel 1 Mode
 - 9.2. Channel 1 Temperature Adjust
 - 9.3. Channel 2 Mode
 - 9.4. Channel 2 Temperature Adjust
 - 9.5. Channel 3 Mode
 - 9.6. Channel 4 Mode
 - 9.7. Proportioning
 - 9.8. Relay 1 Source
 - 9.9. Relay 2 Source
 - 9.10. Relay 3 Source
 - 9.11. Pump Max On Time
 - 9.12. Temperature Unit Display
 - 9.13. Alarm Delay
 - 9.14. Special Function

MENU OPERATION

Main Menu Screens

NOTE: There are four input values for this meter: pH1/ORP1, pH2/ORP2, Temperature for pH1/ORP1 and, Temperature for pH2/ORP2.

(P Models Only): If pumps are enabled, **1** (pump 1), **2** (pump 2), or **12** (pumps 1 and 2) will appear in the lower right hand corner of the screen.

1./3./5. RELAY

This menu screen (top) displays the current relay value (as designated in SETUP; see page 8). To adjust the setpoints at which pumping should start and stop, hold **SELECT** for 5 seconds. You will see a flashing cursor. Set your values for SETPOINT OFF and SETPOINT ON and hold the **SELECT** key for 5 seconds each time to save the setting and go to the next screen.

The SETPOINT OFF screen sets the value at which the pump will **stop** pumping.

The SETPOINT ON screen sets the value at which the pump will **start** continuously pumping.

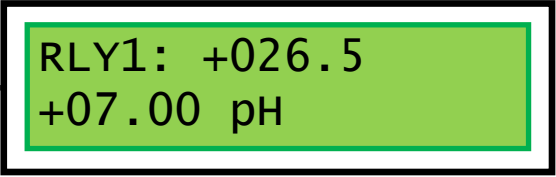
The ALARM screen (bottom) allows you to set a value (usually beyond the SETPOINT ON value) at which an alarm will be triggered following a set delay (set this delay in SETTINGS; see page 8). This can be a high or low value. Using two (2) relays can allow a high *and* a low alarm.

2./4./6. RELAY MINUTES

This menu screen shows the total “on/off” time cycles of each relay. The user can reset this value to zero or enter another value if they choose.


7. PRIME

The prime pump function is typically only used for adding chemicals occasionally or to prime pumps (Relay 1 or 2) if needed. Holding the SELECT key allows you to choose the relay that is affected. **NOTE:** Priming will not work if the relay (or alarm) is disabled in the **SETUP** menu.




RLY1: +026.5
+07.00 pH

The default relay screen, displaying the current relay value



SETPOINT OFF
00.00

Set the value at which the meter will **STOP** pumping




SETPOINT ON
00.00

Set the value at which the meter will **START** pumping



ALARM1
00.00

Set the value at which the meter will **START** pumping



RELAY1 MINUTES
000000



PRIME

MENU OPERATION

Meter Calibration

8. CALIBRATE

In a “first time” or complete calibration it is necessary to do the following:

- If channels 1 or 2 will be calibrated and are currently set to pH, set “Temp Adjust” (see page 8; SETUP) for this channel to “Disabled” before calibrating.

- It’s unnecessary to change your temperature settings for channels 3 & 4 if you are only making a small adjustment.

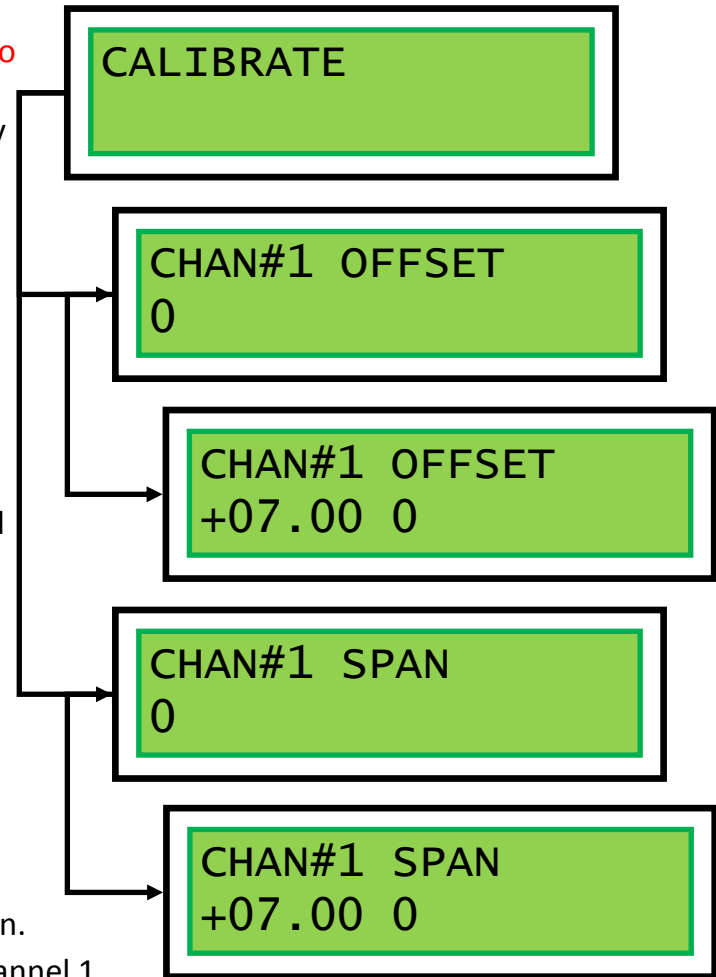
- You do not need to do anything to the temperature setting when calibrating for ORP.

For each CHANNEL, there is an OFFSET value and a SPAN value. For pH the value range is from 0 to 14 with a value of 7 being neutral. The OFFSET value ideally should be calibrated to a pH of 7.0 (0.00mV) and the SPAN value ideally should be calibrated to a pH of either 0.0 (+414mV) or 14.0 (-414mV) depending on your solution to test. This unit comes pre-calibrated using a buffer of 7.0 and 2.0. For ORP, the range is – 1000 mV to a +1000 mV with “0” being the OFFSET and either plus or negative 1000 being the SPAN.

To Calibrate pH:

1. Place the pH probe into a buffer of 7.00 pH. **NOTE: Always rinse the probe with water before placing in another solution. Dab dry with a paper towel.**
2. Toggle with the SELECT key to the Calibration screen.
3. Press and Hold the SELECT key to bring up the “Channel 1 Offset” screen.
4. Press and Hold the SELECT key again to enter this screen to calibrate the Offset. This screen will show the pH value the probe is measuring on the lower left and a calibration number on the lower right.
5. Toggle the CHANGE key to bring the pH value shown up or toggle the SELECT key to bring the pH value shown down. Toggle either one so that the pH value on the left equals 7.00. Press and Hold the SELECT key to lock in the calibration number and to back out of that screen.
6. Toggle the SELECT key again to go to the CHANNEL 1 SPAN screen. Place the probe into a pH solution of either 4.0 or 2.0
7. Press and Hold the SELECT key to enter this calibration screen. Again, the number in the lower left is the pH reading and the number to the lower right is the calibration value. Adjust like the Offset but your target will be either 4.0 or 2.0. Press and Hold the SELECT key to lock in the calibration number and back out of the menu screen.
8. Do the same procedure for CHANNEL #2. Do not calibrate channels 3 and 4.

NOTE: Calibrating ORP is done the same way.



To Calibrate Temperature:

Generally this does not need to be done since it was resistively calibrated at the factory.

Place a 1000 Ohm resistance across the input channel (#3 or #4) to be calibrated. Adjust the **OFFSET** to read 0°C or 32°F depending on your display setting.

Place a 1391.6 Ohm resistance across the input channel(#3 or #4) to be calibrated. Adjust the **SPAN** to read 100.0°C or 212.0°F.

NOTE: When using a non-temperature compensated cable, you must enter a temperature value of the bath into the MANUAL setting in the TEMP ADJ screen. Use the AUTO setting for a temperature compensated cable.

MENU OPERATION

Setup Options

9.1/9.3/9.5/9.6 CHANNEL MODE

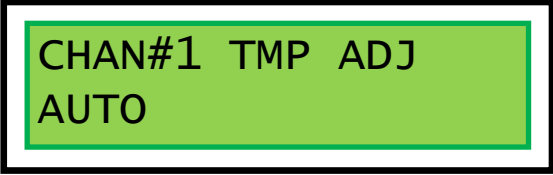
There are four input values for this meter: pH1/ORP1, pH2/ORP2, Temperature for pH1/ORP1 and, Temperature for pH2/ORP2. Here you may select the mode of each input. Channels 1 & 2 may read pH, ORP, or be Disabled. Channels 3 & 4 may read temperature or be Disabled. **On this meter, Channel 3 is the temperature for Channel 1, and Channel 4 is the temperature for Channel 2.**



CHANNEL #1
pH

9.2/9.4 CHANNEL TEMPERATURE ADJUST

This screen will only appear if "pH" is selected on the Channel 1 or Channel 2 Mode screens. Temperature may be adjusted manually, automatically (according to the Nernst equation), or adjustment may be Disabled.



CHAN#1 TMP ADJ
AUTO

NOTE: When using a non-temperature compensated cable, you must enter a temperature value of the bath into the MANUAL setting in the TEMP ADJ screen or choose DISABLED. Use the AUTO setting for a temperature compensated cable. Temperature compensation is not needed for ORP!

9.7 PROPORTIONING

SEE NEXT PAGE FOR AN OVERVIEW ON PROPORTIONING

9.8/9.9/9.10 RELAY SOURCE

These screens allow you to change which input source the meter uses to control the relays. You may set each relay to read from either CHANNEL #1, CHANNEL #2, CHANNEL #3, CHANNEL #4, ALARM, or you can Disable the relay.




RELAY1
CHAN#1 pH

Typically, Relay 1 is set for CHANNEL #1, Relay 2 is set for CHANNEL #2, and Relay 3 is set for ALARM.

9.11 PUMP MAX ON TIME

When Proportioning is ENABLED, the value set in this screen is the maximum time the pump will run if the SETPOINT ON value is reached before the meter checks the pH value. If the pH value is between the SETPOINT OFF and SETPOINT ON values, the time the pump will run will be proportional to the % of pH being read. For example, with a Max On Time of 30 seconds, if the pH reading is halfway between the SETPOINT OFF and SETPOINT ON values, the pump will run only 15 seconds (HALF the time) before checking the pH value. As the pH value gets closer to the SETPOINT OFF, the less time the pump will run. One cycle is an ON/OFF state of the pump. This value can be set for any value between 1 and 99 seconds.



PUMP MAX ON TIME
00

NOTE: When not using Proportioning, the pump turns on for 30 seconds, takes a reading, then turns off for 30 seconds. If the SETPOINT OFF value is not reached, it will pump again.

9.12 TMP DISPLAY (Temperature Unit Display)

This menu screen allows you to toggle between Fahrenheit (F) and Celsius (C) units of temperature.

9.13 ALARM DELAY

To prevent pre-mature alarms due to fluctuations of pH, this screen sets the number of seconds that will pass before the alarm relay is activated. Choose a value between 1 and 99 seconds. This will become the time in which an alarm will be triggered after reaching the ALARM state setting determined in the main RELAY#1 or RELAY#2 screens.

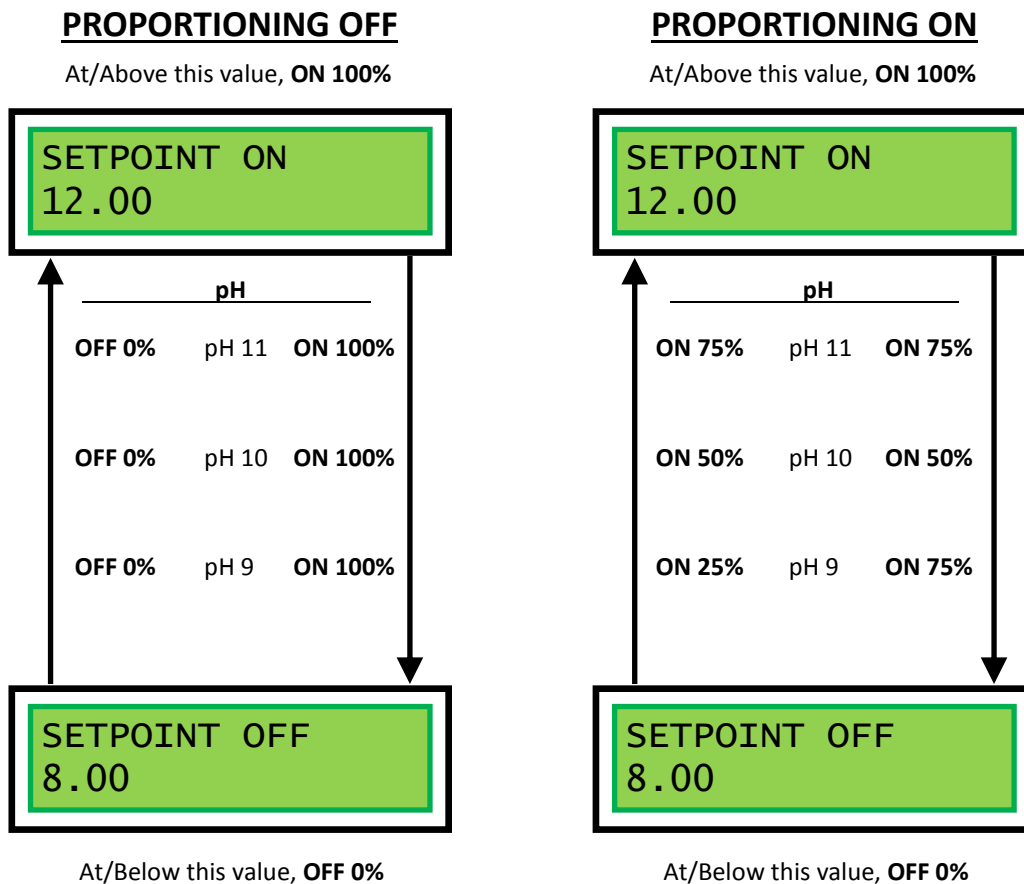
MENU OPERATION

Proportioning

Without Proportioning on, the pumps act like an On/Off switch. When the SETPOINT ON level is reached, the meter will turn ON 100% for 30 seconds, take a reading, then turn off for 30 seconds. This cycle happens until the SETPOINT OFF level is reached, at which point it turns OFF 0% until the SETPOINT ON level is reached and the cycle continues. The only time the pump will change its state is if one of the SETPOINT levels is reached.

With Proportioning on, the pumps will operate at a proportion equal to the percentage shift of the pH/ORP reading between the SETPOINT OFF and SETPOINT ON levels. For example, if the pH/ORP reading increases to 20% above the SETPOINT OFF level, then the pump will operate for 20% of the PUMP MAX ON TIME. If the pH/ORP reading reaches the SETPOINT ON level, it will operate for 100% of the PUMP MAX ON TIME. As the pH/ORP reading falls, so does the percentage of time the pump will stay on until the SETPOINT OFF level is reached, and the pump will turn OFF.

Here is a visual representation of the difference between Proportioning ON and OFF. If the values of your setpoints are the opposite (a low pH SETPOINT ON, a high pH SETPOINT OFF), proportioning will function inversely as well.



TROUBLESHOOTING

pH Electrode Problems

Questions to ask **before** sensor is returned: (Call first to get a RMA number)

1. How OLD is the sensor?

The 4 digit date code should be heat stamped into the top cap. First 2 numbers are the fiscal week of the year, the last 2 are the year. For example, 0306 is the third week of January in 2006. **NOTE: Actual manufacturer codes may vary.**

Bulb electrodes have a 12 month warranty and flat surface electrodes have a 6 month warranty. Warranty covers material and workmanship only. Mis-application or chemical attack is NOT covered.

2. What does the electrode read in 7.0 buffer and in 4.0 buffer ?

Check readings in buffers before moving any further.

Constant readings between 6.2 and 6.8, may indicate a cracked pH glass, or stem. NOT a warranty replacement if visible crack is evident.

A constant reading of 7.00 indicates an electrical short inside the electrode or cable. This could be a warranty replacement, if cable or connector is not damaged.

Slow or sluggish response, (more than 30 seconds to respond to change), indicates a coating on the electrode, or aged electrode or very low temperature. NOT a warranty replacement. Electrode should be cleaned & re-tested.

Inability to calibrate sensor to 7.00 pH indicates a coating on the electrode, low ionic sample, or organic solvent. NOT a warranty replacement. Electrode should be cleaned & re-tested.

Inability to calibrate sensor in 4 buffer indicates a coating on electrode or aged electrode. NOT a warranty replacement.

Readings go to 14 pH or off-scale. Electrical open circuit. This could be a warranty replacement.

Unstable or drifting readings indicate plugged reference or electrode not plugged into meter or broken cable wire or defect in meter. PERHAPS a warranty replacement.

3. Inspection

Look for visible signs of coating, scratches etching or breakage of pH glass.

Look for obvious signs of cuts, or breaks on cable or connector.

Warranty does NOT cover mishandling/misuse by customer. pH electrodes are sensitive, and delicate analytical instruments.

4. What is the application for this sensor?

Please take note of your particular use for this sensor.

TROUBLESHOOTING

pH Electrode Problems

5. Electrode calibrates in buffer, but when I install it into my system, the reading is fixed or the reading drifts all over the place.

The electrode worked for a short time, and then it died. I installed another electrode, and it lasted for about the same time, and it also died.

These are both classic symptoms of a ground loop. The user should take a multi-meter out to the installation. One lead of the meter should be immersed into the water. The other lead should be connected to an earth ground (or known electrical ground bus). Measure for millivolts. The presence of any millivolts is cause for ground loop failure.

Ground loops can be solved in several ways. The solution is the use of our Ground Loop "GLI SERIES" electrodes or an add-in pre-amp module.

An ORP electrode installed in-line, is a useful way of checking if there is ground loop in a closed piping system. One lead of the multimeter is connected to the center pin of the ORP electrode. If an ORP electrode is not available, the user may take a pipe plug, and drill out a small hole. A wire is inserted into the hole, and the hole is sealed with epoxy or other sealant. That wire is connected to the multimeter, and the other lead connected to electrical ground.

The Care and Cleaning of a pH Electrode

STORAGE

ALL pH electrodes must always be kept wet. **DO NOT STORE DRY!**

Electrodes are best stored in the SOAKER SOLUTION that came with the probe.

If soaking solution is not available, store in buffer 4.0

If not buffer 4.0 is not available, store in buffer 7.0

If buffers are not available, store in TAP WATER. **DO NOT** store in de-ionized, distilled or pure water.

CLEANING:

Treat the delicate pH measuring surface as you would a pair of eyeglasses. Soft coatings may be removed by vigorous stirring in water or buffer.

Hard mineral salts may be removed by submersing in a dilute 5% HCl acid or a citric acid bath for 10 – 15 minutes.

Oily coatings may be removed by using household detergent or isopropyl alcohol. Caution: **DO NOT** use Acetone or other organic solvents.

Protein build-up may be removed using an enzyme based solution, such as Terg-A-Zyme cleaner manufactured by Alconox.

You may wipe the sensing surface using a soft cloth with care, but a toothbrush or other abrasive brush will likely scratch the delicate glass.

FOLLOWING CLEANING, CALIBRATE THE ELECTRODE!

MAINTENANCE

The PERISTALTIC Series of metering pumps require a minimal amount of maintenance to achieve optimal performance. Periodically check the squeeze tube for cracks, deterioration, or swelling. The squeeze tube will typically need to be replaced about every 6 months (chemical compatibility and duty cycle can cause this interval to vary). NOTE: squeeze tubes are NOT a warranty item.

VERY IMPORTANT: When replacing squeeze tubes, **DO NOT TWIST THE TUBES WHEN FITTING THEM AROUND THE ROLLERS.** Insert them so they remain flat in the same plane. (The writing on the tubes should be inline on both sides of the rollers.)

Applying lube to the squeeze tube once a month can extend the life of the tube, minimize wear on other contacting parts, and promote smoother pump operation. Use Knight Tube Lube (P/N 245-4-SQZLUBE) or an equivalent silicone-based lubricant.

1. Remove the faceplate of the pump.
2. Apply a thin bead of Tube Lube to the inner surface (the side that the rollers contact) of the squeeze tube between the 9 o'clock and 3 o'clock positions. Avoid getting the lube near the pinch points where the bottom of the faceplate grips the tube.
3. Put the faceplate back on the pump

Activate the pump under normal conditions—the lubricant will be evenly distributed as the pump rotates.

CAUTION: To avoid severe or fatal shock, always disconnect main power when servicing the unit.

PARTS LIST

| <u>ITEM</u> | <u>PART NUMBER</u> |
|---|--------------------|
| ELASTIC SQUEEZE TUBE <i>(Standard with unit. Good for weak to strong alkalis, weak to medium acids.)</i> | 245-4-ELSQZTUB |
| THERMISTANT SQUEEZE TUBE <i>(Has superior acid-resistant and alkali-resistant qualities.)</i> | 245-4-TMSQZTUB |
| FLUORO-VITON SQUEEZE TUBE <i>(Good for strong solvents and acids.)</i> | 245-4-FVSQZTUB |
| SQUEEZE TUBE LUBRICANT | 245-4-SQZLUBE |
| 100 RPM/24 VDC PERISTALTIC GEARMOTOR | 245-4-GEARMOTOR-FV |
| ROLLER FOR PERISTALTIC UNITS | 245-4-ROLLER |
| FACEPLATE FOR PERISTALTIC UNITS | 245-4-FACEPLATE |
| ROLLER / TUBE PUMP HOUSING | 245-4-PMPBODY |
| DELIVERY TUBING—20' ROLL <i>(Polyethylene 1/4' OD, rigid wall tubing)</i> | 245-4-PLYTB20 |
| DELIVERY TUBING—50' ROLL | 245-4-PLYTB50 |
| DELIVERY TUBING—100' ROLL | 245-4-PLYTB100 |
| PERISTALTIC HINGE | 245-4-HINGE |
| PICK UP TUBE | 245-4-PICKUP |
| STD Probe | 290-PRB-PH-Q1T |
| F Probe | 290-PRB-FPH-Q1T |
| ORP Probe | 290-PRB-ORP-Q1T |
| GLI Probe | 290-PRB-PH-GLIT |
| F GLI Probe | 290-PRB-FPH-GLIT |
| No Temp Cable | 290-CBL-Q1 |
| Temperature Compensated Cable | 290-CBL-Q1T |

NOTE: CHECK YOUR SQUEEZE TUBES PERIODICALLY FOR INTEGRITY (ABLE TO EXPAND AFTER BEING SQUEEZED BY THE ROLLERS).

| <u>ORDER PARTS</u> | |
|--------------------|---|
| PHONE: | 262-642-7671 |
| FAX: | 262-642-7681 |
| E-MAIL: | sales@jptech.com |
| MAIL: | JP TECH, INC. P.O. Box 863 East Troy, WI 53120 USA |
| WEB: | JPTech.com |

JP TECH, INC.

LIMITED PRODUCT WARRANTY

JP Tech warrants to first user of each new JP Tech product or component that it is free from defect in material and workmanship. The obligations of JP Tech under this warranty are expressly limited to the following:

- JP Tech will repair or replace, at its option, any defective components for a period of twelve (12) months from date of shipment. No charges are covered for the removal or replacement of defective components.
- This warranty applies only if the product is defective under normal use. It does not apply to breakage or defect from accident, alteration, misuse, or abuse of the product or component. In addition, this warranty is effective only if the product or component is installed in a location and manner prescribed by JP Tech's instructions and only if it is so maintained. This warranty becomes null and void if the product or component is altered by anyone other than JP Tech, its authorized representatives, or by expressed written authorization for a specific situation.
- If JP Tech elects to send a service technician to a customer site to repair a defect, the cost of transportation and/or living expenses will be paid for by the customer. Should the defect turn out to be the result of the customer's misuse, improper installation, or maintenance of the product or component, the customer will be responsible for the full cost of the service call including labor charges plus the aforementioned travel and living expenses.
- JP Tech will repair or replace any defective part within a product at the sole discretion of JP Tech. If JP Tech should choose to supply a part to the customer as a no-charge warranty replacement, the customer assumes all cost of installation associated with the replacement part. If the product needs to be returned for warranty service, a Returned Material Authorization (RMA) must be issued by JP Tech prior to such return. All returned material must be sent freight prepaid or it will not be accepted by JP Tech irrespective of warranty issues.
- There are no implied warranties of merchantability or of fitness for a particular purpose. The above warranty is made in lieu of all other guarantees or warranties, express or implied. JP Tech distributors or OEMs who purchase JP Tech products for resale are not authorized to assume any other obligation or liability for JP Tech.
- JP Tech will in no case or under any circumstances be liable for special, incidental or consequential damages, loss of profit or commission for any loss caused by any delay in production or shipment of product, or defect of any kind in any product or component covered by the sale. Without limitation, JP Tech will not be so liable with respect to furnishing of any product, or component, delay in such furnishing, use, resale, or other cause. JP Tech's liability arising out of the supply of any product or component, its use, resale or other disposition, or out of any guarantee or warranty, express or implied, or any other cause, shall in no way exceed the cost to JP Tech of the product or component which JP Tech agrees to repair or replace. JP Tech's liability for any product or component terminates upon expiration of the applicable repair or replacement period.

This implementation of this warranty may, under separate agreement, be subrogated to exclusive distributors or manufacturers who shall assume all or portions of the liability associated with warranty costs.

This warranty may be modified, wholly or in part, at any time by JP Tech without notice to past or future customers. The warranty revision in effect at the time of shipment shall prevail in any claims rendered.

JP TECH, INC.

TERMS AND CONDITIONS OF SALE

The purchase of any products or services supplied by JP Tech shall be governed by the terms of this agreement. Purchaser of these products and services acknowledges and agrees to these terms without modification by any competing document or any agreement not reduced to writing and authorized by an officer of JP Tech, Inc.

- Pricing is the effective price at the time of the order. If the shipment of product is postponed by buyer, the price may be changed to reflect any price changes enacted by JP Tech. Prices may be changed by JP Tech at any time for any reason without notice to purchaser except for accepted orders not affected by a purchaser initiated delay. Prices, unless otherwise stipulated, do not include shipping and handling charges.
- Certain products may require initial and progress payments before the commencement and continuation of design, engineering, component procurement, and manufacture. These products will not be shipped until all progress payments have been made. Cancellation of any orders in progress will necessitate the forfeitures of any payments received to date as well as payment of any costs accrued in excess of paid amounts.
- Orders must be accepted by JP Tech at their home office. Acceptance of any purchase order, regardless of the method, is conditioned on assent of buyer to the terms and conditions contained herein.
- Sales are FOB point of shipment. Sales terms are net 30 days from date of shipment. Present or future sales, use, or other taxes on sales, installation or use shall be paid by purchaser. Purchaser shall pay 1% interest per month on all outstanding amounts due to JP Tech. Interest accrual shall begin on the 31st day after shipment for all outstanding amounts.
- All sales are final. Any decisions to accept return of product after shipment and receipt by purchaser shall be at the sole discretion of JP Tech and not until payment has been made and agreement by purchaser to pay all shipping, cancellation, and restocking charges that may accrue.
- Shipping dates given prior to shipment are estimated, actual delivery will be based on factory and engineering loading at the time of manufacture as well as the availability of parts required for manufacture. JP Tech shall not be liable for any costs or damages arising out of or related to any delays in shipment or delivery, including but not limited to liquidated damages, unless otherwise agreed in writing.
- JP Tech may change design or construction of any product or component in any way they see fit. Upgrades for previously purchased products may be available for certain products for a price that will be determined when appropriate.
- Except as provided herein, any controversy, claim or dispute arising out of or related to any order or sale or breach thereof, including but not limited to any breach of warranty claims, shall be litigated in state court, Walworth or Waukesha Counties, Wisconsin, and shall be governed by the laws of Wisconsin. If JP Tech is the prevailing party, JP Tech shall be entitled to collect all reasonable fees and costs, including court costs and attorney fees.