

UNPACKING

Please open and inspect your package upon receipt. Your package was packed with great care and all the necessary packing materials to arrive to you undamaged. If you do find an item that is broken or damaged, you must contact the delivering carrier to report the claim.

RATIO:GUARD®

Model P-2S

pH Monitor

GETTING TECHNICAL ASSISTANCE

The H.E. Anderson Company is dedicated to assisting our customers with installation and use of our products. Our technical staff are available each weekday from 8:30am to 4:30pm central time. You may call us toll free at **1-800-331-9620** from anywhere in the U.S.A. and Canada. If no one is available, we will promptly return your call.

Before you call, we suggest that you review this manual. You may find the answer to your question here. But even if you do not, reviewing the manual will help us to help you.

There is some information you should have available when you call. You should know the model and serial number of your monitor. You should also have the program version number (See page 2.) We may not need all this information, but having it available at the start can sometimes save a lot of time and trouble for you.

If you need an additional owners manual for any H.E. Anderson Company product, please visit our website at <http://heanderson.com/manuals.php>

SERIAL _____ PROGRAM VERSION _____



Model P-2 pH Monitor

This manual is organized to put the most often referred to information in the front for easier access. Information on installation and servicing follows.

Display Functions

Normal Display

The normal display is the pH value. If there is a high alarm condition the reading will also show a blinking **H** in the left most position. Conversely, if there is a low alarm it will show a blinking **L**.

Setpoint Display

Pressing the **↑** key will show the high setpoint, which is designated by an **H** in the first position, followed by the value. Like wise, pressing the **↓** key will show the low setpoint which is designated by **L**.

Version Number Display

Whenever power is initially applied to the unit it will briefly display the program version number, for example **P111** You should note this number and write it down along with the serial number on the title page of this manual. We may ask you for your program version if you should you call us for assistance.

Alarm Functions

The monitor is designed for easy operation. The first time the monitor is plugged in the alarm function will be off. This section tells how to turn alarm functions on by entering high and low setpoints.

If the alarm function is not turned on, the monitor will serve as an indicator only. Alarm operation is turned on by entering a high setpoint and may be turned off by setting the high setpoint to 0.

Setting the High Alarm Setpoint

To set the high alarm setpoint you must first display it by pressing the **↑** key. The setpoint will remain on the display for a short time after releasing the key. While the setpoint is still on the display press both the **MODE** and **ENTER** keys. Hold them until the setpoint display starts to blink. This means you are in the change mode and the value can be changed using the **↑** and **↓** keys. Press either key to move the setpoint to the desired value. If a key is held depressed, the

setpoint will change slowly at first, then will speed up. Releasing the key will cause it to revert to slow changing. You may set it to any value between 1.0 and 13.0.

When the setpoint is at the right value, you may press **ENTER** to go back to the regular pH display, or you may let the display blink until it automatically goes back to the normal display.

Setting the Low Alarm Setpoint

The low setpoint is set exactly as the high setpoint by pressing the **↓** key and then the **MODE** and **ENTER** keys to enter the change mode. You will notice that there is a limit as to how high the setpoint will go. The low setpoint is limited to 0.2 pH units below the high setpoint. This is to insure a minimum differential between high and low setpoints.

Calibrating the pH Electrode

YOU MUST CALIBRATE YOUR pH MONITOR TO THE ELECTRODE BEFORE USING IT!



WARNING! Removing the electrode from pressurized water line is dangerous and can cause personal injury.



WARNING! Removing the electrode from a closed water line can be difficult and can destroy the electrode.

You should shut off the water and open a valve to atmosphere or remove the seal-screw on the side of the electrode tee before slowly removing the electrode. Place the electrode in tap water or a pH 4 buffer solution. DO NOT STORE THE pH ELECTRODE IN DISTILLED WATER.



The pH monitor will start operation with default calibration values, however these values may not give accurate readings. The readings may vary by as more than 0.5 pH from the actual value. It is important to calibrate the unit before using it.

Refer to the instructions included with the calibration kit for the complete calibration procedure, plus additional information. These instructions are available at the web link http://www.heanderson.com/pH_Calibration.pdf

Cleaning goes hand in hand with calibration; the electrode should always be cleaned before recalibrating. The flat surfaced electrode used in the Ratio:Guard® monitor was selected for easy cleaning. Cleaning and calibration should be performed regularly to keep your instrument operating at peak performance. **You should clean and recalibrate your electrode every 4-6 weeks or any time you suspect that reading may not be accurate.**

All pH electrodes eventually wear out. At some point, when the electrode will not calibrate at both calibration points, it will need to be replaced.

Calibration of pH the electrode is not difficult. But you must have both pH 7 and pH 4 (4.01) buffer solutions. A pH electrode calibration kit. (**Part No. 06916 Kit pH Calibration**) was included with your monitor for initial calibration. Calibration solutions are available from many chemical supply houses, or you may order additional kits or pH pillows (**Part No. 06924 pH Pillows-10 Ea**) from us. You will also need some distilled (or deionized) water and some ordinary tap water.

Innovative Design

Anderson Ratio:Guard® pH monitor have always had an innovative design that allows long cable runs while still maintaining accuracy and top performance. The disadvantage of this design was that electronic signal conditioning was required at the electrode. This meant that only expensive proprietary electrodes could be used, and these need to be periodically replaced.

The new model P-2S separates the electronic signal conditioning from the electrode and encloses it in a small metallic enclosure. This feature offers the following advantages:

- Still allows long cable runs.
- Cable is now much less expensive and easier to install.
- Replacement electrodes are much less expensive.
- Will work with pH electrodes and electrode mounts (tees) from other suppliers.
- Provides better electrode isolation from ground currents.

- Allows availability of both 120VAC model P-2S or 12VDC model P-2D.

Installation

- The unit comes with the signal conditioner pre-wired to the monitor with a 15 foot 3-conductor cable. This may be extended if needed. (See Table 1, page 5)
For underground runs, or runs longer than 50 feet, contact us for recommendations. (See front page for contact info.)
- A five foot electrode cable connects to the signal conditioner with a BNC connector. The electrode cable should not be extended.
- Both monitor and signal conditioner should be mounted out of direct sunlight and protected from direct spray. The monitor enclosure and front panel are not UV resistant.

The recommended installation is shown in Figure 1. It can be varied to suit your needs, but remember the following:

- The electrode tee should be installed in a bypass with isolation valves so it can be

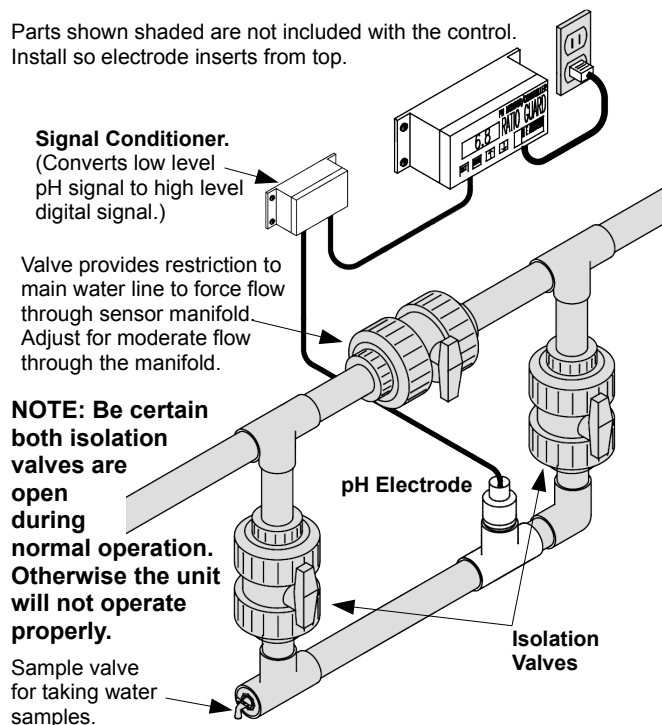


Figure 1. Installing the Controller

Model P-2 pH Monitor

removed without shutting off the water flow.

- The bypass for the tee should always be below the main water line so that the electrode will always be kept wet.



WARNING! The electrode should never be allowed to dry out. Keep the protective cap on and do not install the electrode until the bypass has been filled with water.

- You must have some restriction in the main water line to insure water flow past the electrode.
- The Tee should be installed so the pH electrode will insert vertically from the top.
- A sample valve (a hose bib will do) installed as shown in Figure 1. is a great convenience. It can also make electrode removal much easier by opening it to allow air to enter the line when removing the electrode.
- The bypass should be flushed before inserting the electrode.
- **Be sure to remove the protective cap before inserting the electrode.**

SPECIFICATIONS Model P-2

Display Range

0–14 pH indication

Setpoint Range

1–13 pH

Accuracy*

Within 0.05 pH @ 77°F (25°C)

Display

0.7 in. LCD numeric

Outputs

10 amp. SPDT contact outputs for both high and low alarms

Optional output latching

Enclosure

Water resistant with gasketed cover;

Sealed front panel

Power Requirements

120 VAC (Model P-2S)

12 VDC (Model P-2D)

Setpoint Memory Retention

Greater than seven days with zero power.

*If properly calibrated to electrode, using standard buffers.

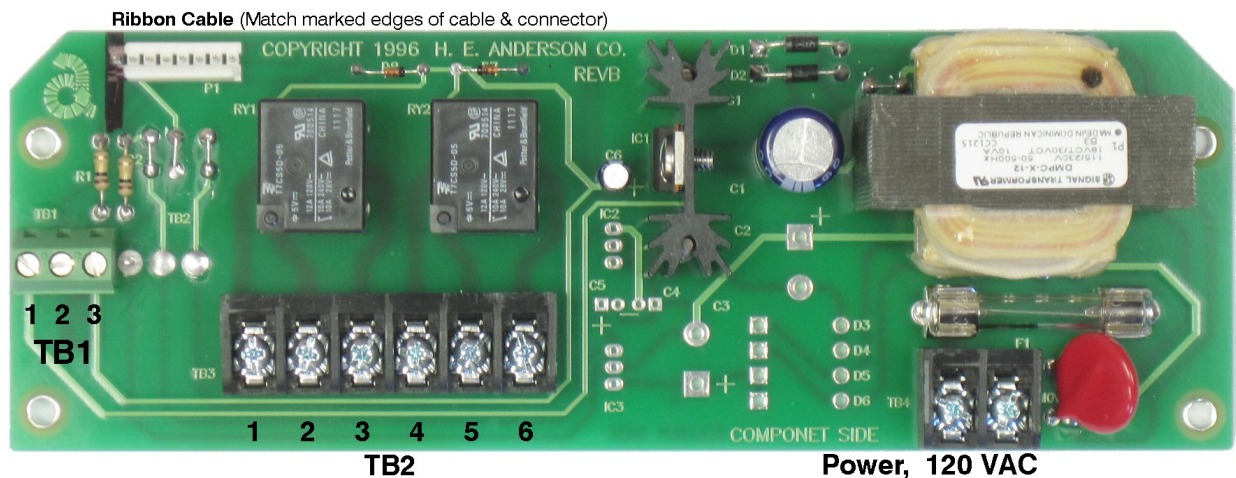


Photo 1. Back Board for Model P-2S, 120 VAC. See Table 1.

Alarm Relay Connections



Caution! Disconnect power before removing the front panel of the monitor.

The alarm relays are labeled in Table 1 as to alarm function, with Common, normally open (N.O.) and normally closed (N.C.) contacts brought out to the terminal block. Contacts are rated at ten amperes. For ease of wiring, use the smallest wire suitable to the current required by the external circuit.

Power Connections

Model P-2S (120 VAC)

The monitor comes with a power cord. If you wish to use conduit, remove the power cord and entrance assembly. Refer to Photo 1. when reconnecting power connections. The power connections are not polarized.

Circuit Protection

The circuit is fused and includes MOV devices to suppress voltage spikes on the AC line. However, MOVs cannot protect against all possibilities and do not last forever. Each time the MOV absorbs an unusually large spike it suffers some damage. Eventually it will fail.

Table 1 – Terminal Board Connections								
Caution! Disconnect power before removing front panel.								
TB1 – Signal Conditioner			TB2 – Relay					
1	2	3	1	2	3	4	5	6
Ground (5 v)	pH Signal	+5 VDC	High Alarm Relay			Low Alarm Relay		
Black	White	Red	N.C.	N.O.	Common	N.C.	N.O.	Common

To provide the best protection for your monitor use a spike suppressor which goes between the line cord and power outlet. This will help. However, if you have a storm or power surge that damages any of your other equipment, you should replace your spike suppressor. it may be damaged even though it does not appear to be.

NOTE: Damage from power line spikes or lightning strikes is not covered by our warranty

Model P-2D (12 VDC)

This model is designed for a 12 VDC power supply. Refer to Photo 2 below for the wiring polarity. Operating with a 12 VDC power supply may provide some isolation and protection power surges and lightning strikes.

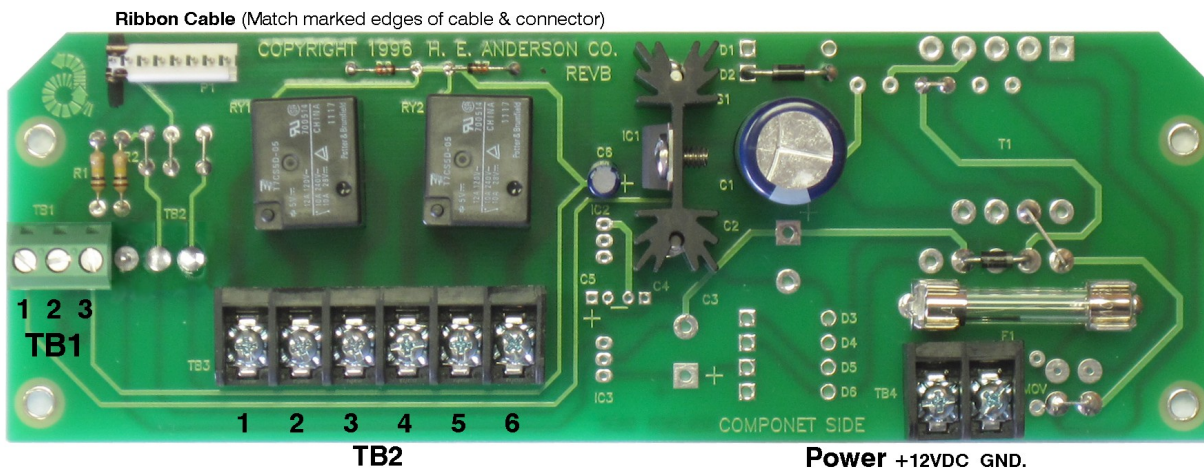


Photo 2. Back Board for Model P-2D, 12 VDC. See Table 1.

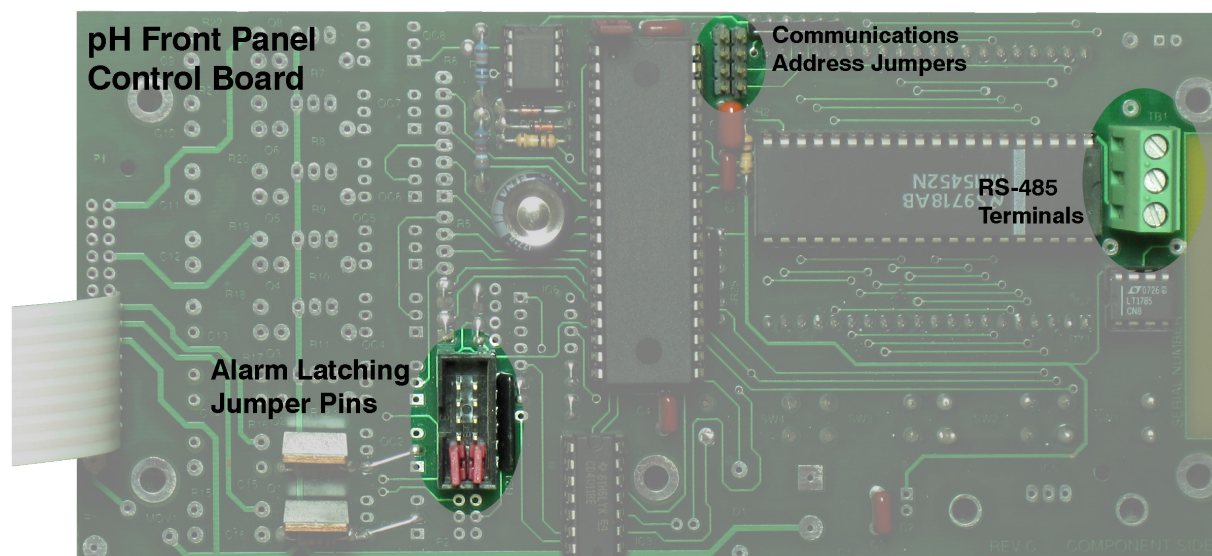


Photo 3. Front Panel Control Board

ALARM RELAY LATCHING

As the unit is shipped from the factory, alarms will automatically clear when the alarm condition is corrected. Some people prefer that the alarm relays latch when an alarm condition is detected. They must then be manually cleared after the alarm condition has been corrected. The Model P-2S allows both the high and low alarm relays to be independently programmed to latch when an alarm is detected.

Alarm latching may be optionally and individually set by setting the alarm latching jumpers.



Caution! Disconnect power before removing the front panel of the monitor.

- Disconnect power
- Remove the front panel by removing the four corner screws.
- You do not need to disconnect the front panel from the rear panel to set the jumpers
- Refer to Photo 3. for the location of the alarm latching jumper pins.
- Refer to Photo 4. to see how to set the jumpers.
- If you have disconnected the front panel, refer to the CAUTION label on the ribbon cable for a guide on reconnecting to the back board. (See also photo 1 or 2)

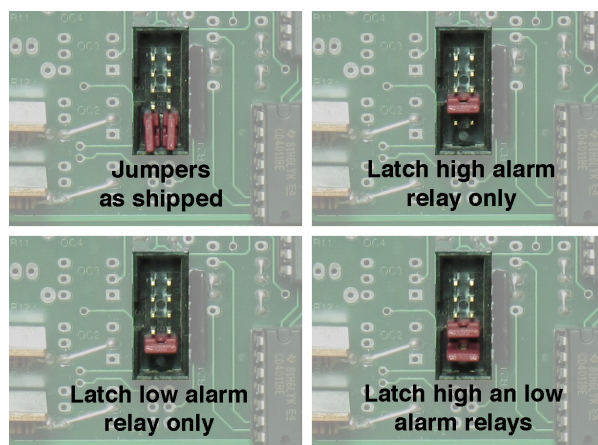


Photo 4. Setting the Alarm Latching Jumpers

Clearing Alarms

Pressing both the **↑** and **↓** keys will clear the alarms. This is only needed if alarm relay latching has been set. ✱

RATIO:GUARD® LIMITED WARRANTY

WHAT IS COVERED

The H.E. Anderson Company of Muskogee, Oklahoma, will make any necessary repairs and/or replace any parts of any Ratio:Guard® monitor/alarm made necessary because of defects in materials or workmanship for the periods specified below. Warranty repairs and/or replacements will be performed without charge to the owner by H.E. Anderson Company within a reasonable time after prepaid delivery of the monitor/alarm to the H.E. Anderson Company, 2100 Anderson Drive, Muskogee, Oklahoma 74403.

WARRANTY PERIODS

MONITOR ELECTRONICS	Fifteen months from date of manufacture.
EC & TEMPERATURE SENSORS	Fifteen months from date of manufacture.
pH & ORP SENSORS	Six months from date of manufacture.

WHAT IS NOT COVERED

Repairs and/or replacements of parts caused by failure to follow prescribed installation instructions and limitations issued by H.E. Anderson Company. In addition, this warranty does not cover failure caused by misuse, negligence, alteration, accident, or lack of specified maintenance. Specifically, improper handling of pH sensors, including letting the pH electrode dry out, storage in distilled water, or damage to sensor caused by failure to open a valve to atmosphere or remove seal-screw when removing the sensor from the tee. will void the warranty on the sensor. This warranty does not cover damage from power line spikes or lightning strikes. This warranty does not cover components used by, but not manufactured by H.E. Anderson Company, in the manufacture of said monitor/alarm, except to the extent of said component manufacturer's warranty.

This warranty specifically excludes liability for consequential damages or for charges for labor or expense in making repairs or adjustments, or losses of time or inconvenience.

This warranty gives you specific legal rights and you may also have other legal rights which may vary from state to state. H.E. Anderson Company does not authorize any person to create for it any other obligation or liability in connection with these products. **ANY IMPLIED WARRANTY APPLICABLE TO THESE PRODUCTS IS LIMITED TO THE DURATION OF THIS WARRANTY.** H.E. Anderson Company shall not be liable for consequential damages resulting from breach of this written warranty.

NOTE: Some states do not allow limitation on how long an implied warranty will last or the exclusion of limitations of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

WHAT TO DO IF THERE IS A QUESTION REGARDING WARRANTY

- 1) Promptly notify the consumer adviser at H.E. Anderson Company by telephone.
- 2) Confirm the report in writing to the H.E. Anderson Company, stating the circumstances surrounding the problem.

PURCHASER'S OBLIGATION

- a) Purchaser must give H.E. Anderson Company immediate written notice on discovery of defect.
- b) Purchaser must pay for shipment of the defective product to the H.E. Anderson Company, 2100 Anderson Drive, Muskogee, Oklahoma 74403.