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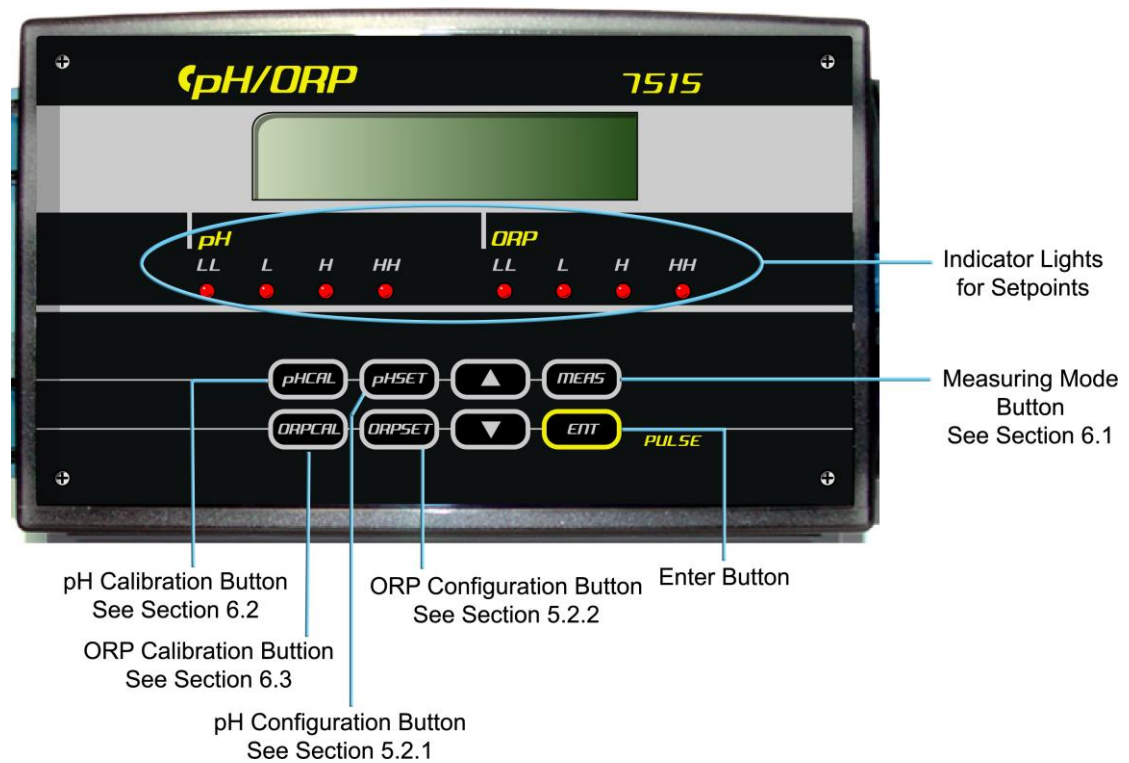
1. Overview

Model 7515, an automated control system, monitors pH and ORP and controls alarms and pumps for multiple applications.

Functions:

- pH Dual Control: Acid and Base
- ORP Dual Control: Oxidation and Reduction
- Alarm High and Low Independent Relay Output
- Auto Calibration and Buffer Recognition
- Flow Switch Input
- Analog 4-20mA Dual Recorder Output
- Automatic Temperature Compensation
- Wall Mount NEMA 4X
- Microprocessor Based

2. Keypad Layout

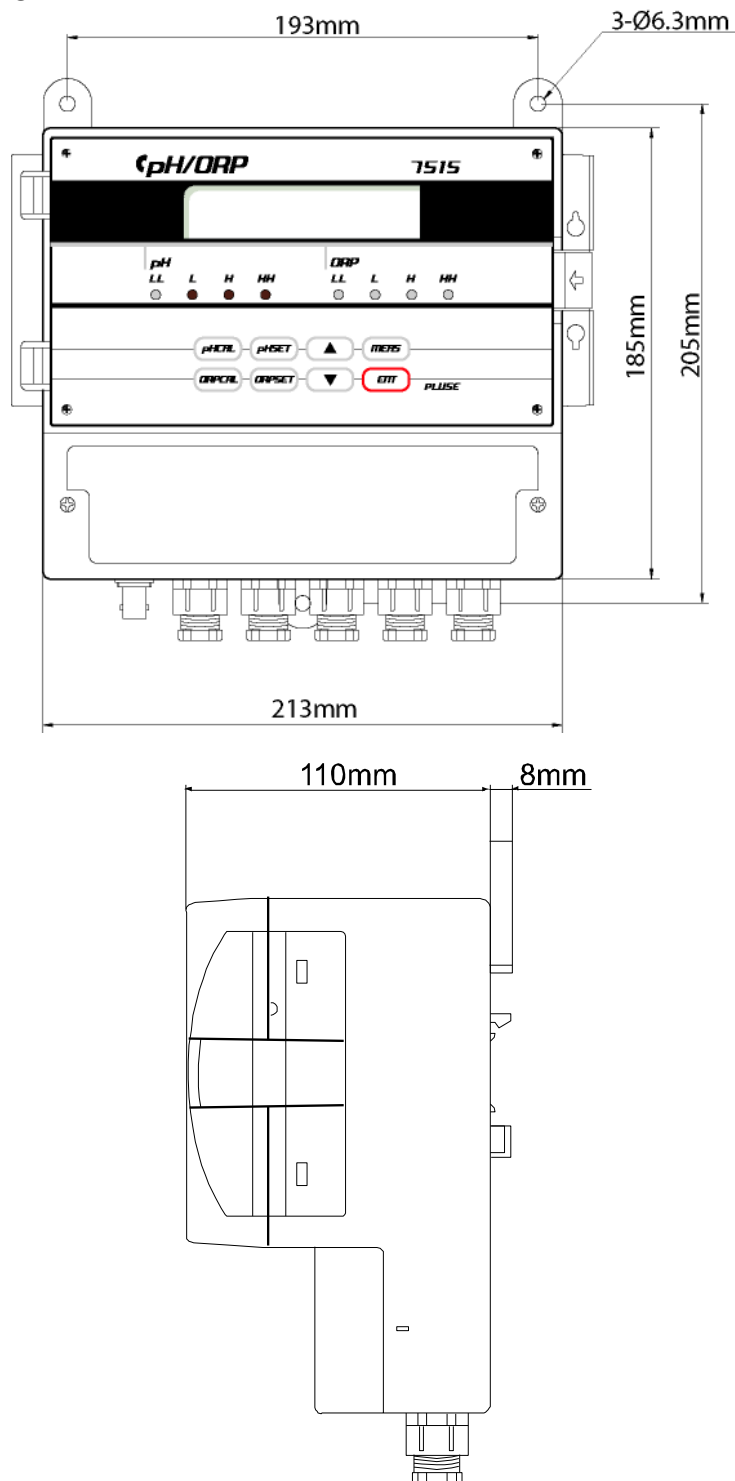


3. Specifications

Condition	Specifications
Range	pH: 0 to 14.0 pH ORP: 0 to 1000 mV Temperature: -9.9 to +99.9 °C (14.18 to 211.82 °F)
Resolution	pH: 0.01 pH ORP: 1 mV Temperature: 0.1 °C
Accuracy	pH: ± 0.05 ORP: $\pm 5\text{mV}$
Output	4-20mA Analog Output Max. Load Resistance: 500 Ω Linearity: 0.3%
Output Range	pH: 0 to 14pH ORP: $\pm 700\text{mV}$, $\pm 1400\text{mV}$, 0 to 1000mV (User Selectable)
Temperature Compensation Range	0-100 °C
Power	AC 110V/220 V ($\pm 20\%$) 50/60 Hz; 5 VA
Weights	4 lbs
Dimension	Height x Width x Depth: 205mm x 213mm x 110mm

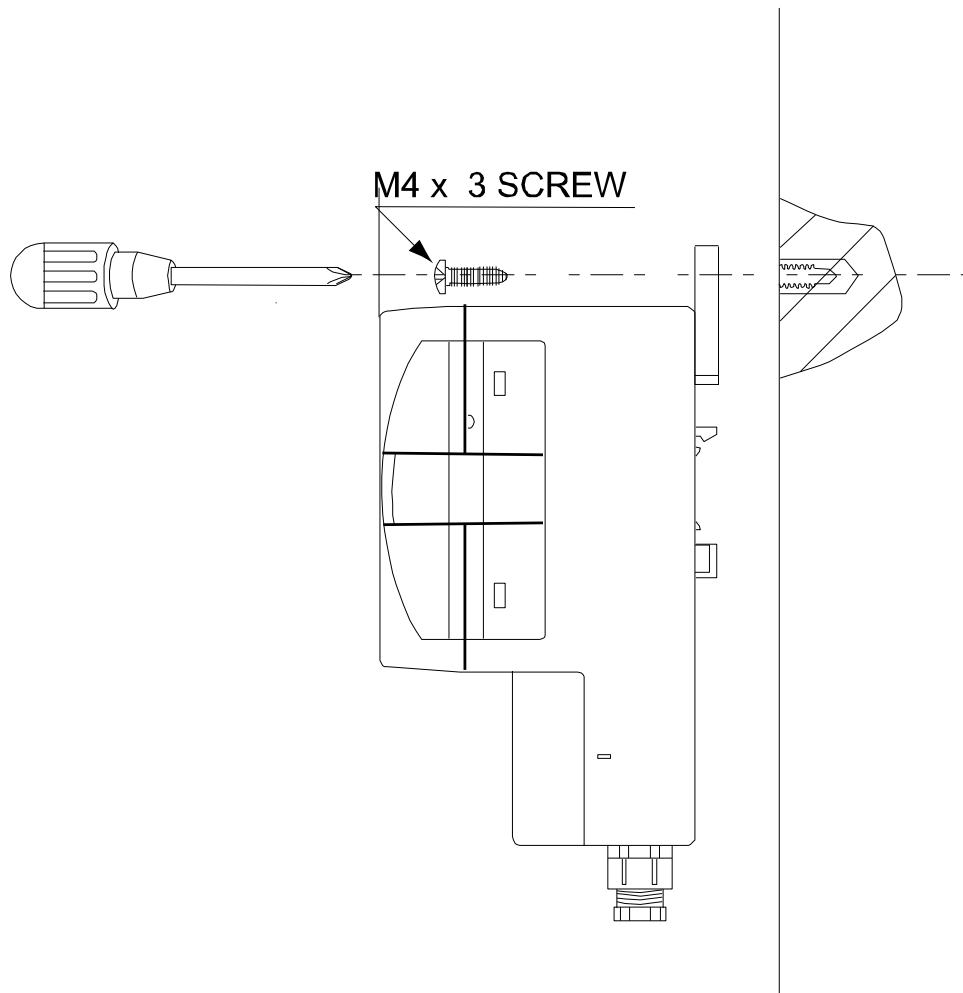
4. Installation

4.1 Dimension



4.2 Mounting and Location

Mount the control panel on a secure stand, bracket, or wall using the mounting feet provided. It is preferable to locate the control panel in a dry environment whenever possible even though it is rated for wet environments at NEMA 4X. The control panel should be accessible for routine maintenance, and easy viewing of the front digital display. It should also be located with enough space underneath of at least two feet for mounting the Injection Manifold, along with the switches and cables.



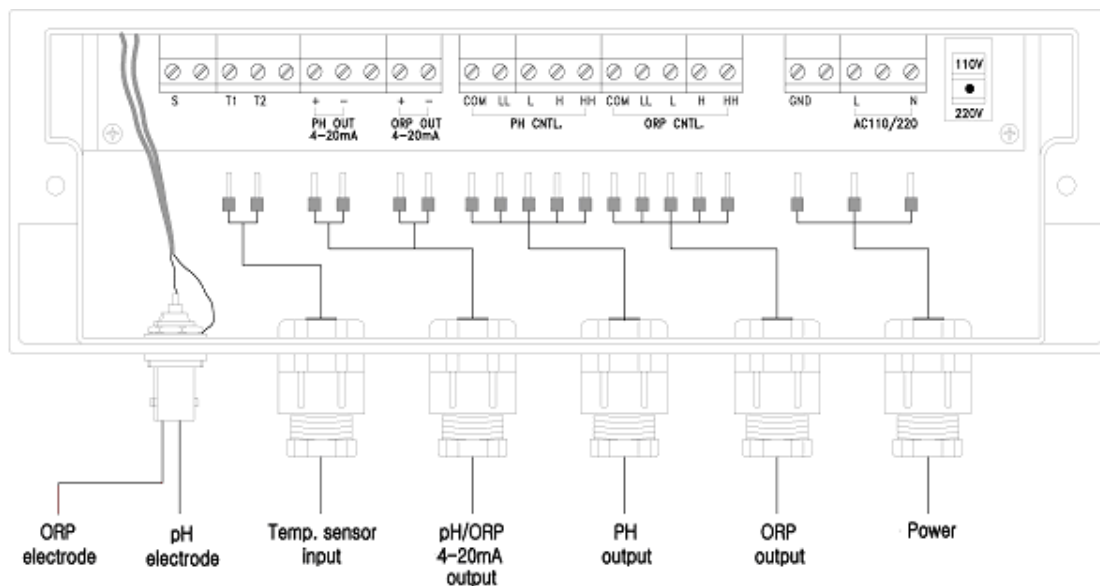
4.3 Electrical and Power

The control panel requirements are **115 VAC at 10 Amps**. The panel is supplied with a three prong grounded plug. Extra attached loads such as valves, mixers, and other such devices should be accounted in the total electrical requirements.

WARNING: To reduce the risk of electrical shock, the control panel must be plugged into a grounded outlet with ratings conforming to the requirements of the control panel, and any other electrical loads connected to it. The panel should be connected to a good ground. **DO NOT USE ADAPTERS!** All wiring must conform to local electrical codes.

4.4 Wiring Diagram

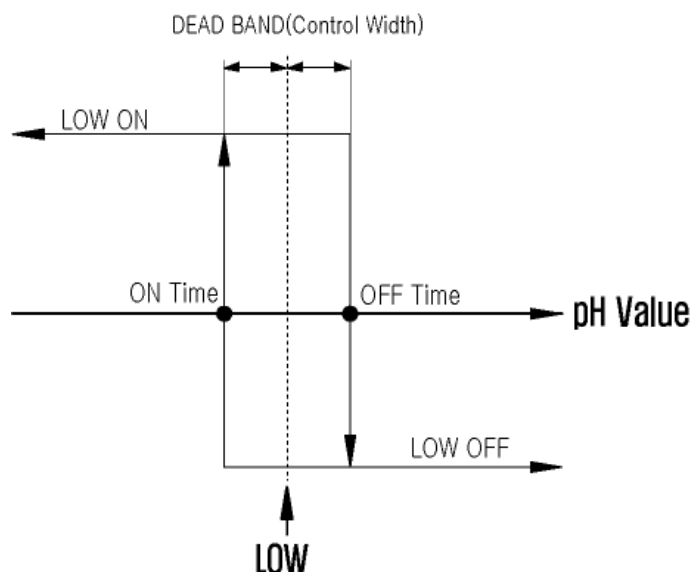
4.4.1 Terminal Connection



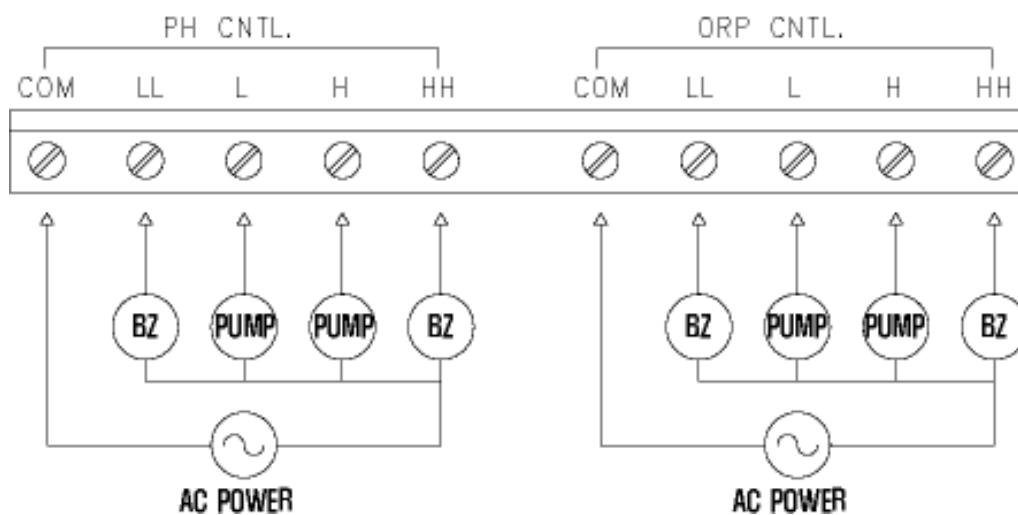
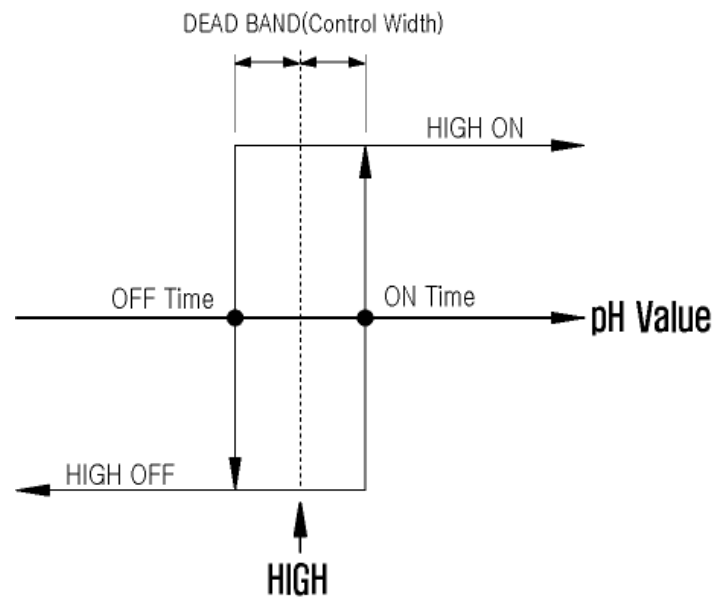
4.4.2 Setpoint connection

WARNING: Contact capacity is AC 110V / 250V, 3A. Do not exceed the capacity. Be sure to ground the instrument properly

Operation of Low Low (LL) and Low (L) Setpoint



Operation of High High (HH) and High Setpoint



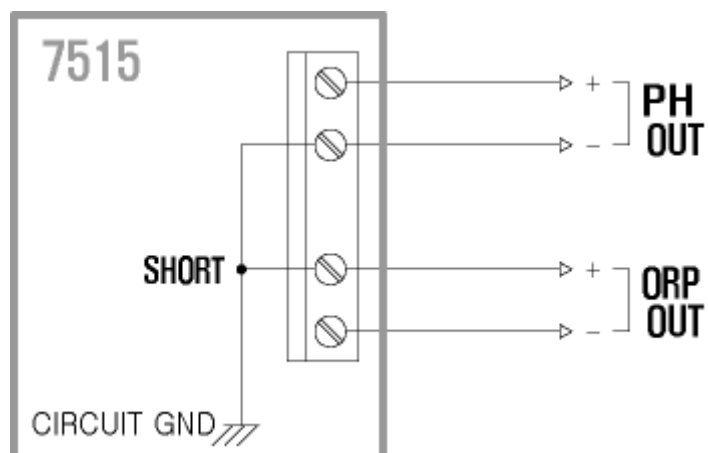
pH Control:

LL: Alarm
L: Base Pump
H: Acid Pump
HH: Alarm
COM: AC Power

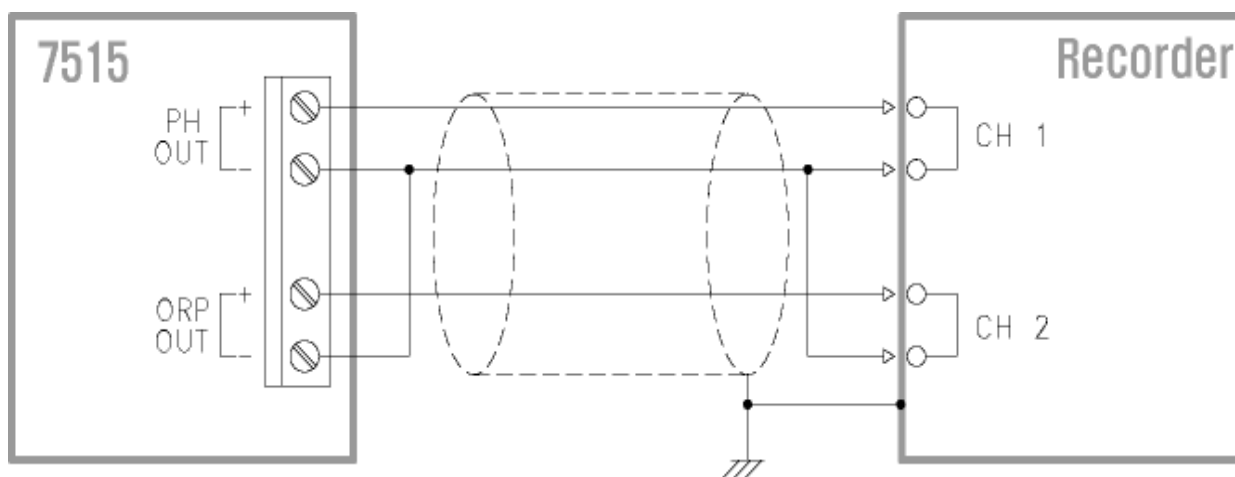
ORP Control:

LL: Alarm
L: Oxidation Pump
H: Reduction Pump
HH: Alarm
COM: AC Power

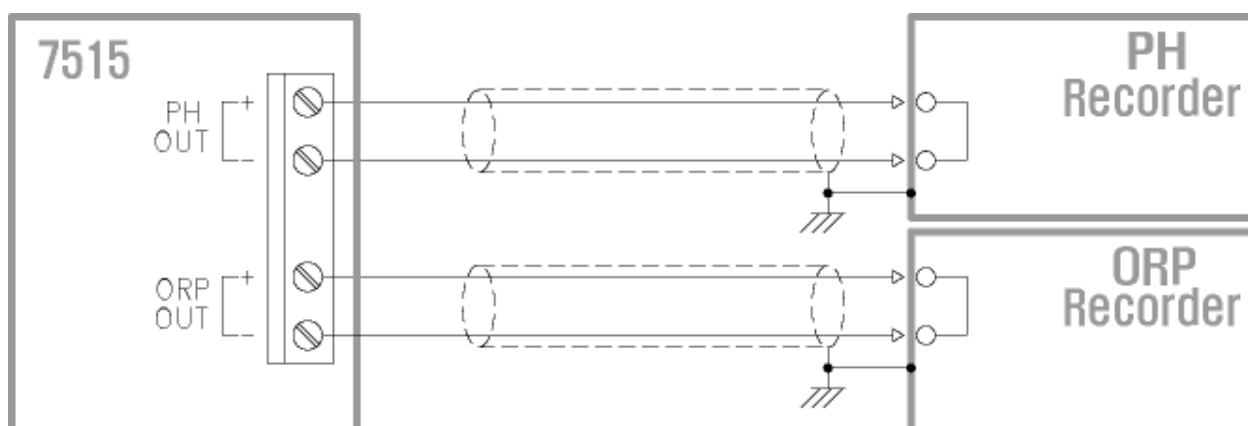
4.4.3 4-20mA Connection



Wiring Diagram for One Recorder



Wiring Diagram for Two Recorders



5 Configuration /Setup

5.1 Power Up

To set up a new unit, first check that the power supply connections are correct, the outlet is 110VAC, and that the connection and power sources are free of any ground loops, inductive loads or magnetic fields. Shared loads on the same circuit may cause interference, and therefore a clean power circuit is recommended. Also, when using the AC supply, ensure that a 3-way grounded main lead is used to connect the unit.

5.2 Control Configuration (Setpoint)

		Factory Preset
pH Low Low	Low Alarm	5.5
pH Low	Base	6.0
pH High	Acid	7.2
pH High High	High Alarm	8.5
pH dead band	Hysteresis	0.1
ORP Low Low	Low Alarm	200 mV
ORP Low	Oxidation	670 mV
ORP High	Reduction	800 mV
ORP High High	High Alarm	900 mV
ORP dead band	Hysteresis	10 mV

5.2.1 pH

1. Push the pHSET button to select pH setup options.
2. Hold down the button for a few seconds to make changes to any option.
3. Use the UP or DOWN button to change the value.
4. Push the ENT button to save the modification. If you do not want to save the value, push the pHSET or the MEAS button to exit without saving

Options	Range	Explanation
pH-LL CNTL	0 - 14.00pH	Low Low (LL) control setpoint
pH-LL DB	0.01 - 2.00pH	Low Low (LL) control dead band
pH-L CNTL	0 - 14.00pH	Low (L) control setpoint
pH-L DB	0.01 - 2.00pH	Low (L) control dead band
pH-H CNTL	0 - 14.00pH	High (H) control setpoint
pH-H DB	0.01 - 2.00pH	High control dead band
pH-HH CNTL	0 - 14.00pH	High High (HH) control setpoint
pH-HH DB	0.01 - 2.00pH	High High (HH) control dead band
pH CAL	ACAL MCAL	Auto calibration Manual calibration
pH OUTPUT 4mA CAL	± 999	pH 4mA output calibration value
pH OUTPUT 20mA CAL	± 999	pH 20mA output calibration value
TEMP CAL	± 9.9 °C	Calibrate temperature to compensate the error between temperature sensor and cable length

5.2.2 ORP

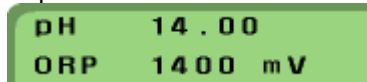
1. Push the ORPSET button to select ORP setup options.
2. Hold down the button for a few seconds to make changes to any options.
3. Use the UP or DOWN button to change the value.
4. Push the ENT button to save the modification. If you do not want to save the value, push the ORPSET or the MEAS button to exit without saving.

Options	Range	Explanation
ORP-LL CNTL	$\pm 1400\text{mV}$	Low Low (LL) control setpoint
ORP -LL DB	1 - 200mV	Low Low (LL) control dead band
ORP -L CNTL	$\pm 1400\text{mV}$	Low (L) control setpoint
ORP -L DB	1 - 200mV	Low (L) control dead band
ORP -H CNTL	$\pm 1400\text{mV}$	High (H) control setpoint
ORP -H DB	1 - 200mV	High control dead band
ORP -HH CNTL	$\pm 1400\text{mV}$	High High (HH) control setpoint
ORP -HH DB	1 - 200mV	High High (HH) control dead band
ORP OUTPUT RANGE	$\pm 700\text{mV}$	ORP output range is $\pm 700\text{mV}$
	$\pm 1400\text{mV}$	ORP output range is $\pm 1400\text{mV}$
	0 - 1000mV	ORP output range is 0 - 1000mV
ORP OUTPUT 4mA CAL	± 999	ORP 4mA output calibration value
ORP OUTPUT 20mA CAL	± 999	ORP 20mA output calibration value

6. Maintenance

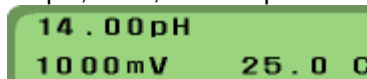
6.1 Measuring Mode

Press the MEAS button once and pH and ORP measurements will be shown.



A green rectangular display showing two lines of text. The first line reads 'pH 14.00' and the second line reads 'ORP 1400 mV'.

Press the MEAS button again and pH, ORP, and temperature measurements will be shown.



A green rectangular display showing three lines of text. The first line reads '14.00pH', the second line reads '1000mV', and the third line reads '25.0 C'.

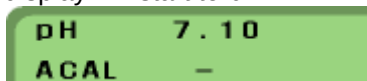
6.2 pH Calibration

IMPORTANT: Do not mix any used buffer solution with new buffer solution as it may decrease the accuracy.

NOTE: If you interrupt the calibration procedure, press the MEAS button and it will return to measuring mode.

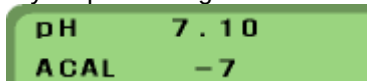
6.2.1 Automatic Calibration

1. Place the pH electrode into calibration solution 7.00 and allow sufficient time for the electrode to reach the calibration solution value.
2. Press and hold the pHCAL button for a few seconds to initialize calibration. The value on the top of the display will start to blink.



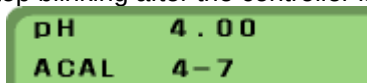
A green rectangular display showing two lines of text. The first line reads 'pH 7.10' and the second line reads 'ACAL -'.

3. The controller will automatically calibrate the controller to the calibration solution pH value (7.00). The display stops blinking after the controller is calibrated to pH 7.00.



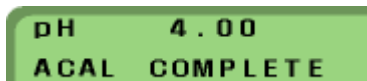
A green rectangular display showing two lines of text. The first line reads 'pH 7.10' and the second line reads 'ACAL -7'.

4. Rinse the electrode with water and place it into calibration solution 4.00 and allow sufficient time for the electrode to reach the calibration solution value.
5. Press the ENT button to save the calibration.
6. The controller will automatically calibrate itself to the calibration solution pH value (4.00). The display stop blinking after the controller is calibrated to pH 4.00.



A green rectangular display showing two lines of text. The first line reads 'pH 4.00' and the second line reads 'ACAL 4-7'.

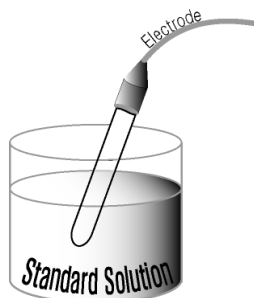
7. Press the ENT button to save the calibration. The display returns to measuring mode automatically.



A green rectangular display showing two lines of text. The first line reads 'pH 4.00' and the second line reads 'ACAL COMPLETE'.

6.2.2 Manual Calibration

1. Place the pH electrode into a known calibration solution and allow sufficient time for the electrode to reach the calibration solution value.



2. Press and hold the pHCAL button for a few seconds. The measured value on the display will blink.

pH	7.10
MCAL	-1-

3. Press the ENT button. The MCAL value on the display will blink.

pH	7.10
MCAL	7.10

4. Change the MCAL value on the display using the UP or DOWN button.

pH	7.10
MCAL	7.00

5. Press the ENT button to save the value. The calibration of the first solution is complete and calibration mode for the known second solution will blink.

pH	7.00
MCAL	-2-

6. Place the electrode into the second known pH solution and allow sufficient time for the electrode to reach the calibration solution value.



7. Press the ENT button and the MCAL value on the display will blink.

pH	3.90
MCAL	3.90

8. Change the MCAL value on the display using the UP or DOWN button.

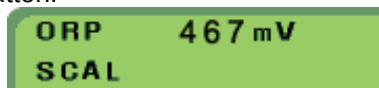
pH	3.90
MCAL	4.00

9. Press the ENT button to save the value and manual calibration is complete.

pH	4.00
MCAL	COMPLETE

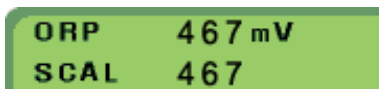
6.3 ORP Calibration

1. Put the electrode into a known standard ORP solution (ORP 468).
2. Press the ORPCAL button.



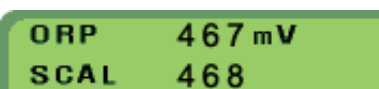
ORP 467 mV
SCAL

3. Press the ENT button after the value stabilizes. The measured value on the display will start to blink.



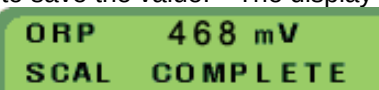
ORP 467 mV
SCAL 467

4. Change the value using the UP or DOWN button to the known standard solution value.



ORP 467 mV
SCAL 468

5. Press the ENT button to save the value. The display returns to measuring mode.



ORP 468 mV
SCAL COMPLETE

7. Error Code

Error code	Explanation
E-S1	System Error: Loss of memory (setting value, calibrated value etc.)
E-T1	Temperature exceed 110 °C
E-T2	Temperature is below - 10 °C
E-P1	pH exceed 15pH
E-P2	pH is below -1pH
E-01	ORP exceed 1500mV
E-02	ORP is below -1500mV
E-C1	pH Calibration Error: the sensitivity of pH electrode changed during calibration.
E-C2	pH Calibration Error: the sensitivity of pH electrode changed during calibration.
E-C3	ORP Calibration Error: out of range during ORP calibration.
E-C4	ORP Calibration Error: there is a big difference between the calibration solution value and the measured value during ORP calibration.