

## 1. 1 & 2 Point pH Calibration

### Single Point pH Calibration

Cooling towers either control the pH within a narrow range or the conductivity/bleed controls maintain a relatively fixed pH. In either case, sampling the water, measuring its pH and single point calibration of the pH sensor results in an accurate pH measurement.

Single point calibration requires a pH tester but does not require removal of the sensor or flow shutdown to the sampling piping. Its quick & simple but may not be applicable to your application.

### Two Point pH Calibration

Waste water pH or process pH applications may measure and/or control over a wide pH range. Two point pH calibration is used for these sites.

Calibration of pH requires flow shutdown to the sampling piping and removal of the pH sensor and the following sequence:

<b>1</b>	Place the pH sensor in the 1 <sup>st</sup> buffer.	Buffers can be any value & in any order.
<b>2</b>	Enter the value of the 1 <sup>st</sup> buffer into the controller.	
<b>3</b>	Wait for the pH display to stabilize & ENTER/SUBMIT	Time to stabilize increases at lower temperatures.
<b>4</b>	Place the pH sensor in the 2 <sup>nd</sup> Buffer.	
<b>5</b>	Enter the value of the 2nd buffer into the controller.	Buffers must be at least 1 pH apart. 10 & 4 buffers are typically used
<b>6</b>	Wait for the pH display to stabilize & ENTER/SUBMIT	Keypad users key ENTER. Browser users select SUBMIT

The controller either displays the modified pH following a successful calibration or provides an error message to both Keypad & Browser users.

### Selecting a pH Calibration Method

Users with Aegis controllers running 'M' series firmware may select either 1 or 2 point pH calibration for each measured pH.

Users with Aegis controllers running 'A' series firmware support only 1 pH calibration for cooling tower applications.

## 2. Solution Grounds

Amplified pH sensor typically includes a solution ground in the pH sensor.

If you using the BLUE, 12mm – 1/2" pH sensors, you'll need to put a solution ground in the buffer solution connecting a wire to the ground terminal on the pH card and exposing a 1/4" of bare wire immersed in the buffer.

***Do not 2 point calibrate 12mm pH sensors without a solution ground wire in the buffer.***

**3. Keypad pH Calibration**

Key **UP** or **DOWN** to the target pH sensor  
then press **ENTER**.

Press **ENTER** @ **Calibrate**.

Press **ENTER** @ **1<sup>st</sup> pH buffer**.  
You can use 10 buffer then 4 buffer or any 2 buffers  
more than 1pH apart, in any order.

Key **RIGHT** to move the underline and then  
**UP** or **DOWN** to change the number.  
Press **ENTER** or **EXIT** to escape.

Press **ENTER** when the displayed pH has stopped changing.  
This user set the digits after the decimal =2.  
You may be displaying more or fewer digits after the  
decimal.

Press **ENTER** @ **2<sup>nd</sup> pH buffer**.

Key **RIGHT** to move the underline and then  
**UP** or **DOWN** to change the number.  
Press **ENTER** or **EXIT** to escape.

Press **ENTER** when the displayed pH has stopped changing.

The current, calibrated pH displays on a  
successful calibration.  
See the following page for fault displays.

**2 Point Calibration**

Waste water pH ← C  
7.46 pH



Calibrate ←  
Alarms ↓



1st pH buffer ←  
7.45 pH ↓



Editing, ← or Exit  
4.00 pH →



Stable= ← or Exit  
3.94 pH ←



2nd pH buffer ←  
3.94 pH ↓



Editing, ← or Exit  
10.00 pH →



Stable= ← or Exit  
10.03 pH ←



Waste water pH ← C  
10.00 pH

**3. Keypad pH Calibration** continued

**Sensor Fault** displays if the calibration resulted in a pH correction of more than +/- 1pH. Indicates a sensor, wiring or test method problem.

Press **ENTER** and the sensor calibrates. Tracking and pH control problems are likely.

Press **EXIT** and the sensor return to the pH value prior to calibration.

**No Difference!** displays if the calibration measured two pHs less than 1 pH apart. Typically caused by a keying error or a failure to move the pH sensor between buffers..

Press **ENTER** and re-calibrate.

**Sensor Fault**

Sensor Fault ←↵  
Ignore warning

Ignore = ↵

Waste water pH↵↵C  
7.68 pH

Escape = ⓧ

Waste water pH↵↵C  
7.46 pH

**No Difference Fault**

Waste water pH  
No difference! ←↵

↵

Calibrate ←↵  
Alarms ↕

**Sidebar:**

The fault responses to pH calibration are the same for both 1 & 2 point pH calibration.

See the following page & the **Factory Reset** option to return the pH sensor measurement to its default settings.

3. Keypad pH Calibration continued

Key **UP** or **DOWN** to the target pH sensor  
then press **ENTER**.

Press **ENTER** and @ **Calibrate**  
For **Factory Reset** & 1 **Point Calib** option

Press **DOWN** @ **1<sup>st</sup> pH buffer**.  
If **1 Point Calib = YES**, **Enter Value** displays  
In place of **1<sup>st</sup> pH buffer**.

Press **ENTER** and @ **Factory Reset**  
to return the pH sensor measurement to it's  
default calibration.

Press **ENTER, DOWN, ENTER** and @ **1 Point Calib**.  
to select 2 point pH calibration.

Select 1 or 2 Point

Waste water pH ←↵  
7.46 pH



Calibrate ←↵  
Alarms ↕



1<sup>st</sup> pH buffer ←↵  
7.45 pH ↕



Factory Reset ←↵  
Yes ↕



1 Point Calib. ←↵  
No ↕

**Sidebar:**

Select **Factory Reset** to help you diagnose a problem sensor:

1. If you are more than 1 pH away from the actual pH you may have a failed pH sensor.
2. If the pH is not stable, verify the solution ground & make sure the excess pH cable is coiled @ the sensor & not in the enclosure.
3. If the sensor displays 5.5 when it should be 8.5 you may have miswired it.
4. Make sure the pH tip is immersed, installed vertically and not damaged. If the tip looks shiny & metallic, it's an ORP, not a pH sensor.
5. If you are measuring both ORP & pH sensors, or more than one pH sensor, verify you haven't switched cables between sensors and connection terminals.

**3. Keypad pH Calibration** continued

Key **UP** or **DOWN** to the target pH sensor  
then press **ENTER**.

Press **ENTER** @ **Calibrate**.

Press **ENTER** @ **Enter Value**.  
Grab a sample @ the pH sensor & measure its pH

Key **RIGHT** to move the underline and then  
**UP** or **DOWN** to change the number.  
Press **ENTER** or **EXIT** to escape & end calibration.

The current, calibrated pH displays on a  
successful calibration.  
See the page 2 for fault displays.

**1 Point Calibration**

Waste water pH ← C  
7.46 pH



Calibrate ← C  
Alarms ↓



Enter value ← C  
7.45 pH ↓



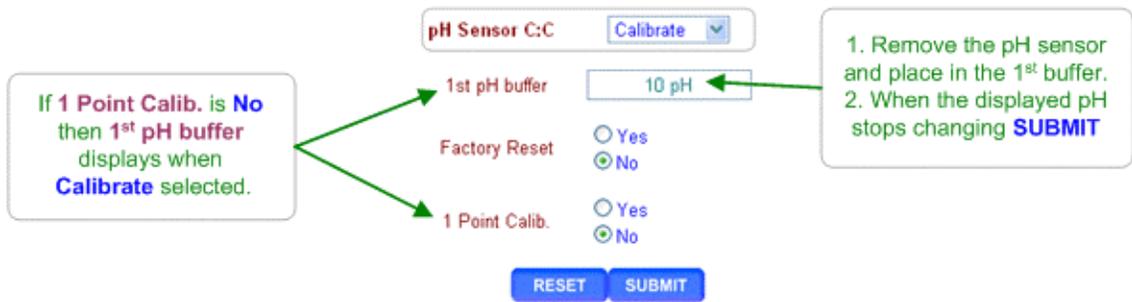
Editing, ← or Exit  
7.68 pH →



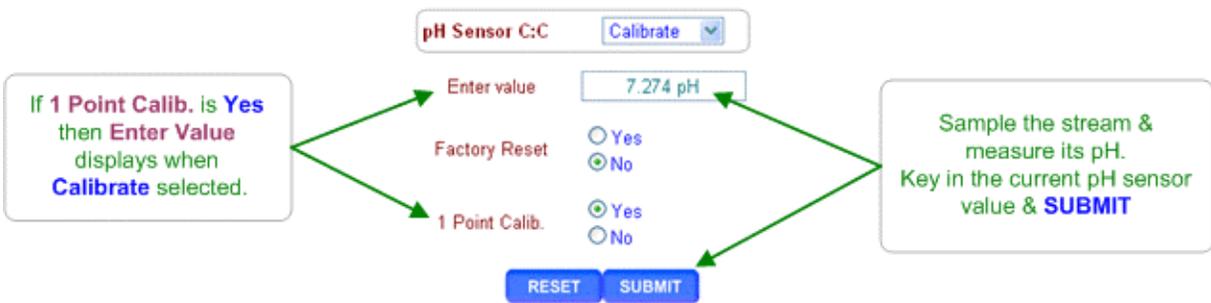
Waste water pH ← C  
7.68 pH

4. Browser pH Calibration

2 Point pH Calibration



Single Point pH Calibration



4. Browser pH Calibration continued

Successful Calibration

pH Sensor C:C

Status **Sensor Calibrated**

Sensor type pH Sensor

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Period Maximum 13.034 pH

Period Minimum 2.207 pH

Period Average 7.122 pH

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Sample size 653

Current Period 19 minutes

Log Period 60 minutes

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Compensation None

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Measured Level 152.7 mV

Gain Multiply 0.0176

Default Gain 0.0170

Offset Adjust 7.3174

Default Offset 7.0000

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Input card ID 1444 mV

Calibration exits to the Diagnostic display. Status displays Sensor Calibrated.

1 point calibration adjusts the sensor Offset.

2 point calibration adjusts both the sensor Gain & Offset.

1. Fails Calibration

pH Sensor C:C

Status **Sensor fault**

1st pH buffer 4.045 pH

Factory Reset  Yes  No

Ignore warning  Yes  No

As sensors age you'll see Offset move away for the 7.0000 Default Offset.

Fracturing the sensor glass causes an immediate calibration failure.

If the Offset Adjust required to calibrate the pH sensor exceeds 1 pH, a Sensor fault displays.

If you set Ignore Warning to Yes & SUBMIT the pH sensor value is modified. **WARNING:** The pH sensor may not track the process pH

2. Fails Calibration

pH Sensor C:C

Status **No difference;fault**

1st pH buffer 7.267 pH

Factory Reset  Yes  No

1 Point Calib.  Yes  No

A disconnected, miswired or failed sensor can cause this fault

You can cause this fault by not waiting long enough for the sensor to respond to a new buffer.

No difference;fault displays when there is less than 1 pH between buffers