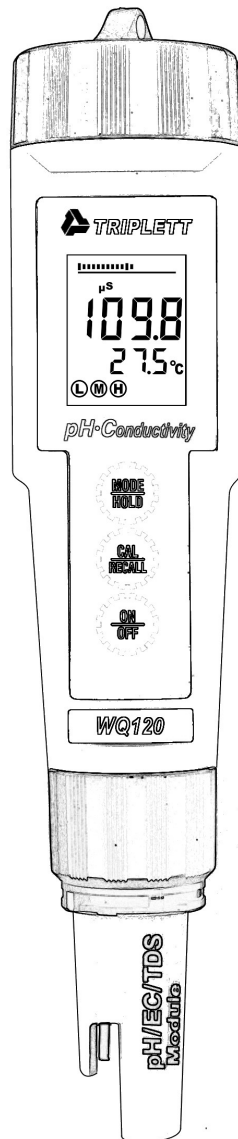


# User Manual



## WQ120

pH / Conductivity / TDS / Salinity / Temperature Meter



# Introduction

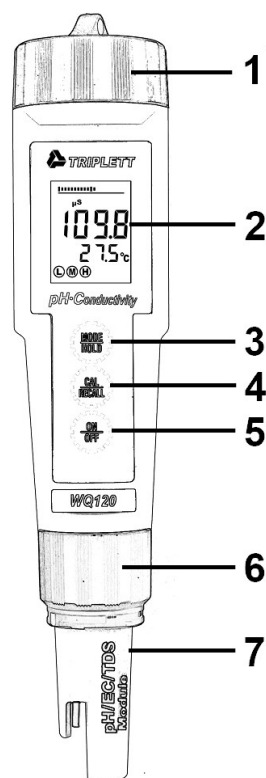
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Thank you for selecting the Triplet WQ120 pH/Conductivity/Total Dissolved Solids (TDS) / Salinity meter. With the WQ120's dynamic cell-constant technology it is possible to measure a wide range of Conductivity, TDS, and Salinity with the same electrode. Careful use and maintenance provide years of reliable service.

# Description

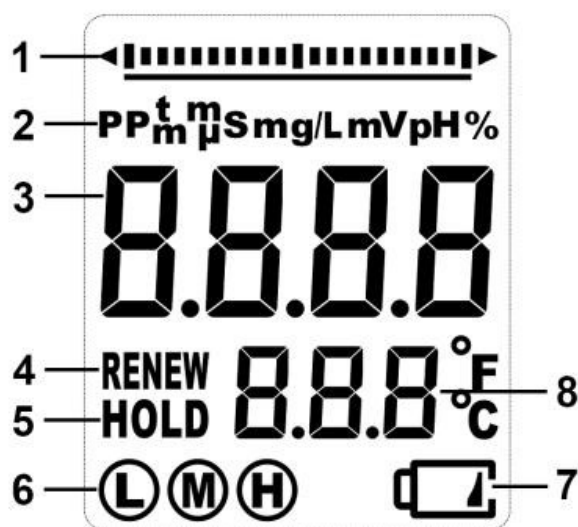
## METER DESCRIPTION

1. Battery compartment cap
2. LCD Display
3. MODE / HOLD button
4. CAL / RECALL button
5. ON/OFF button
6. Electrode collar
7. pH/Conductivity Electrode



## LCD DISPLAY

1. Bar graph reading
2. Measurement Units
3. Main Display
4. RENEW Indicator
5. HOLD Indicator
6. RANGE Calibration Indicator
7. Low Battery Indicator
8. Temperature Display



# Powering On

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The WQ120 uses four (4) CR2032 Lithium Ion Batteries (included). If the batteries are weak, the 'Low Battery' indicator appears on the LCD. Press the ON/OFF key to turn the WQ120 on or off. The auto power off feature shuts the WQ120 off automatically after 10 minutes of inactivity to preserve battery life.

## Getting Started

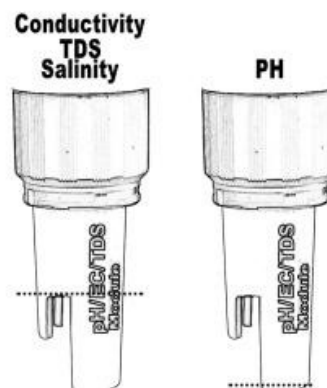
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- Remove the cap from the bottom of the WQ120 to expose the pH electrode, reference junction and conductivity electrodes.
- Before the first use or after storage, soak the electrode in tap water or pH 4 buffer solution for about 10 minutes.
- White KCL crystals may be present in the cap or on the electrode. This is to be expected depending on the length of time in storage. These crystals will dissolve while soaking the electrode or they can be rinsed away with tap water.
- For best results calibrate with pH 7 buffer solution first, then calibrate with the buffer solution closest to the expected pH value of the solution or material to be tested.
- To preserve the pH electrode life, keep the sponge in the protective cap soaked with tap water or pH 4 buffer solution.
- For best results, calibrate for conductivity with a standard in the expected range of the sample. For maximum accuracy calibrate from low conductivity value standards to high value standards.


# Measurement Procedure

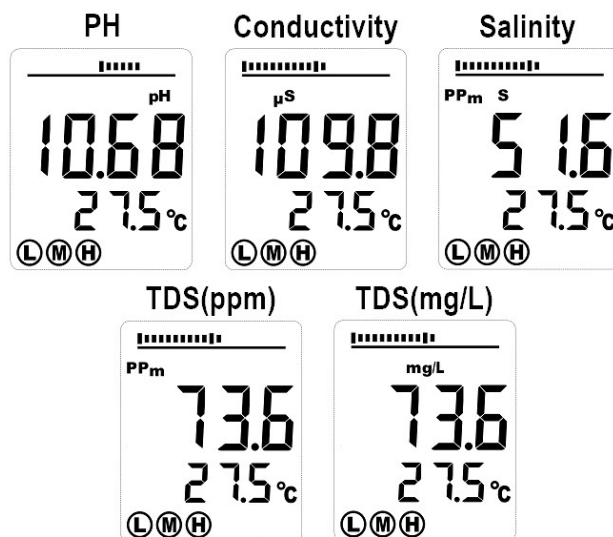
## Sample Preparation:

1. For Conductivity, TDS or Salinity place the test sample in a sample cup with enough depth (2.5cm minimum) to cover the electrode. Stir the solution to remove any air bubbles.
2. For pH, place the tip of the electrode in the sample or make contact with a wet surface.



## Measurement:

1. Press the **ON** button. (  and then “SELF CAL” will appear in the display during the turn-on diagnostics)
2. Depress and hold the **MODE/HOLD** key to scroll to the desired measurement mode.
3. Insert the electrode into the sample making sure that the electrodes are completely submersed.
4. Slowly stir the solution with the electrode to remove air bubbles if in the Conductivity, TDS or Salinity mode.
5. If in the Conductivity, TDS or Salinity modes, the meter will auto-range to the proper range and then display the reading.



## Changing Measurement Function

The meter can be set to measure pH, Conductivity, TDS or Salinity.

To change the mode:

1. Press and Hold the **MODE/HOLD** button for 2 seconds and the display will begin to scroll through the units.

**pH**; **μS** (Conductivity); **ppm S** (Salinity); **ppm** (TDS); **mg/l** (TDS);

**Note:** The “HOLD” function cannot be on when changing the measurement function. If “HOLD” is displayed in the lower left corner of the display, briefly press the **MODE/HOLD** button to turn it off.

2. When the desired units are displayed, release the MODE/HOLD button.

## TDS Compensation Ratio

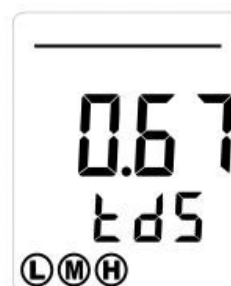
The TDS value is determined by multiplying a conductivity reading by a known ratio factor. The meter allows for selecting a conversion ratio in the range of 0.40 to 1.00. The ratio varies with the application, but is typically set between 0.50 and 0.70.

Note: The stored ratio will briefly appear in the lower temperature display when the meter is first turned on, or when changing measurement function to TDS.

**Note: In the Salinity mode the ratio is 0.40 to 0.60 auto.**

To change the ratio, while in the TDS measurement mode (ppm or mg/l):

1. Press and release the **CAL/RECALL** button twice in succession. The stored ratio will appear in the display.
2. Press the **MODE/HOLD** button to increase the ratio value in steps of 0.01.
3. When the desired ratio is displayed, press and release the CAL/RECALL button to store the value and return to the normal mode.
4. If no buttons are pressed for 5 seconds, the meter returns to measure mode.



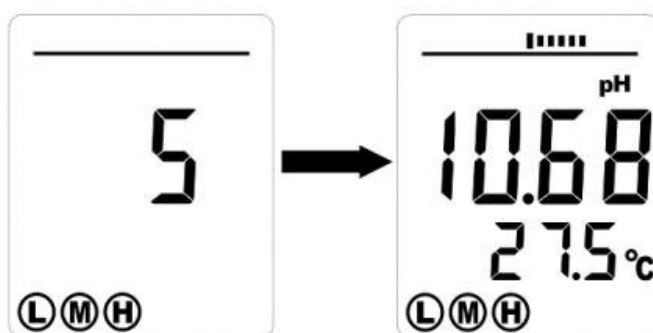
## Storing Readings

1. Press the **MODE/HOLD** button to store a reading. The storage location number will be displayed on the lower display, while the main display shows the stored reading. The meter will enter the HOLD mode and the “HOLD” indicator will appear.
2. Press the **MODE/HOLD** button again to exit the HOLD mode and return to normal operation.
3. If more than 25 readings are stored, previously stored readings (starting with number 1) will be overwritten.



## Recalling Stored Readings

1. Press the **CAL/RECALL** button and then press the **MODE/HOLD** button. A location number (1 through 25) will briefly appear and then the value stored in that location will appear. The displayed units will flash, indicating that the storage recall mode is active.



2. The last stored reading will be displayed first. Pressing and releasing the **MODE/HOLD** button will scroll through the stored readings one at a time. The location number is displayed first, followed by the reading stored in that location.
3. To exit the storage mode, press the **CAL/RECALL** button and the meter will return to normal operation, after displaying “End”.

## Clear Stored Memory

With the unit on, press and hold ON/OFF for 4 seconds. “CLr” will be briefly displayed when the memory is cleared.

## Changing Temperature Units

To change the displayed temperature units (°C or °F):

1. With the unit OFF, press and hold down the **CAL/RECALL** button.
2. With the **CAL/RECALL** button depressed momentarily press the **ON/OFF** button. When “SELF CAL” appears in the display release the **CAL/RECALL** button. The unit will power on with temperature displayed in the new units.

## Data Hold Mode

Press the **MODE/HOLD** button to hold (freeze) a reading in the display. The meter will enter the HOLD mode and the “HOLD” indicator will appear.

Note: This also stores the reading.

Press the **MODE/HOLD** button again to return to normal operation.

## Auto Power OFF

The auto power off feature automatically shuts the meter off 10 minutes after the most recent button press.

## Auto Power OFF Disable


To disable the Auto Power Off feature:

1. Turn the unit on.
2. Press **CAL/RECALL** once (**Quickly**)
3. Immediately and simultaneously press the **MODE/HOLD** and **ON/OFF** buttons for approximately 2 seconds, until “oFF” is briefly displayed

To disengage this feature, turn the unit off with the **ON/OFF** button. The next time the unit is powered up, Auto Power OFF mode will be engaged again.



## Low Battery Indication

When the batteries become weak the “” icon will appear in the display. Refer to the Maintenance section for battery replacement information.

## Calibration - pH (1, 2, or 3 points)

1. Place the electrode into a buffer solution (4, 7, or 10). Press and hold the **CAL/RECALL** key until “CAL” appears in the lower (temp.) display. When doing a 2 or 3 point calibration, calibrate with pH 7 buffer first, then follow with pH 4 then the pH 10 buffer.
2. The WQ120 automatically recognizes the solution and calibrates itself to that value (the circled number on the LCD will match the solution). Note that if the solution is more than 1 pH unit off from the L (4), M (7), or H (10) pH buffer, or if the electrode slope is low, the WQ120 will assume an error and abort the calibration (‘End’ will be displayed, and the unit will return to measure mode.)
3. During calibration, the pH reading flashes on the main display.
4. When calibration is complete, the WQ120 automatically displays “SA”, then “End” and returns to normal operation mode.
5. The appropriate circled indicator (L, M, or H) appears on the LCD when a particular calibration or series of calibrations has been completed within one power on cycle. When the WQ120 is turned off, the circled indicator configuration and the calibration data will be retained.
6. For a two or three-point calibration, repeat steps 1-4.
7. See **Reset Calibration Data** to clear all calibration data from the meter.

## CAL Reminder Display

When in pH measurement mode, a “CAL” icon will appear after 15 on/off cycles of the meter without performing a calibration. The CAL display is simply a reminder to calibrate pH, and will turn off when the pH electrode is recalibrated. The reminder does not affect function in any way.

## RENEW Display

A flashing 'RENEW' warning indicates that the probe is not performing to expected specifications. If cleaning and recalibration does not cause the RENEW icon to disappear, replace the probe (see optional accessories on the last page of this manual). The RENEW display appears as a result of the pH electrode slope falling below 65% of a nominal slope.

## Measurement and Display Considerations

If the unit appears to be locked (display frozen). It is possible that the Data Hold mode has been inadvertently accessed by pressing the **MODE/HOLD** button. ("HOLD" will be displayed in the bottom left of the LCD.) Simply press the **MODE/HOLD** button again or turn the meter off and then on.

For maximum accuracy, allow sufficient time for the temperature of the probe to reach the temperature of the sample before calibrating. This will be indicated by a stable temperature reading on the display.

## Reset Calibration Data

Follow this procedure to clear all calibration data from the meter. Resetting the calibration data may be necessary when new calibration solutions are used or accuracy of measurements is in question.

1. Turn off the meter.
2. Press and Hold the Cal/Recall and Mode/Hold buttons.
3. Momentarily press the On/Off button, as soon as the display comes on, release all 3 buttons.
4. The display will show "dFLt rSt" (default reset) and all of the calibration data will be erased. If "dFLt rSt" does not appear, retry the procedure.
5. Proceed to the calibration routine for pH and Conductivity.

## Calibration - Conductivity

Meter accuracy verification should be performed on a periodic basis. Once per month is the recommended cycle for normal use. If calibration is required, a conductivity standardizing solution must be obtained. The meter can be calibrated in any or all of the three ranges. Standardizing solutions of 84 $\mu$ S/cm, 1413 $\mu$ S/cm or 12.88mS/cm (12,880 $\mu$ S/cm) are used for the automatic calibration recognition procedure. No other calibration values are permitted.

Calibration is always done in conductivity mode. Since salinity and TDS values are calculated from conductivity values, this procedure also calibrates the salinity and TDS ranges.

Fill a sample cup with the standardizing solution.

1. Turn the meter ON and insert the electrode into the solution. Tap or move the electrode in the sample to dislodge any air bubbles.
2. Press and hold the **CAL/RECALL** button (approximately 2 seconds) until "CAL" appears in the lower (temp) display. The main display will start flashing.
3. The meter will automatically recognize and calibrate to the standardizing solution. The display will briefly indicate "SA", End and then return to the measurement mode after a calibration.
4. Note: The "SA" will not appear if the calibration fails.
5. The "range calibrated" symbol will appear in the display for each range that is calibrated during that power on cycle.

Ⓛ Low range, 84 $\mu$ S/cm

Ⓜ Medium range, 1413 $\mu$ S/cm

ⓗ High range, 12.88mS/cm (12,880 $\mu$ S/cm)

Note: Each time the calibration mode is entered all calibration symbols on the display are cleared, but only the calibration data for the currently calibrated range is replaced. The other two ranges keep the existing calibration data, just the symbols are removed. Calibration of all three ranges must be performed during one power on period for all three range calibration symbols to appear.

See **Reset Calibration Data** to clear all calibration data from the meter.

Note: The meter allows for a 1, 2 or 3 point calibration. If calibration is done for more than one point the lowest value standard should be done first to obtain the best accuracy.

## Considerations and Techniques

Do not touch the inner surfaces of the conductivity electrodes. Touching the surface of the platinized electrodes may damage and reduce the life of the probe.

Store the electrode in the wetting cap with the sponge moistened with pH 4.01 buffer solution.

Always rinse the electrode in de-ionized water between measurements to avoid cross contamination of the sample. Double rinsing is recommended when high accuracy is required.


Periodically, accumulated salt deposits from the reference electrode may build up in the storage cap, and should be rinsed away. These deposits could affect measured values of low conductivity samples.

When measuring low conductivity samples, extra care is recommended in rinsing the probe to avoid contamination of the sample with electrolyte from the pH reference electrode. This will only be a factor when measuring in the low range, and can be further minimized by increasing the volume of the sample. (Example: Try a 200 to 500 mL sample.)

If the 20mL sample cup is to be used, then the electrode should not be allowed to sit in the sample for any longer than necessary, to avoid pH electrolyte leakage into the sample, raising the conductivity value.

# Specifications

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Display	2000 count LCD with Bargraph
pH Range	0.00 to 14.00
pH Accuracy	±0.01 pH typical
pH ATC Range	32°F to 194°F (0°C to 90°C)
pH Reference Junction	Permanent gel, non-refillable
Conductivity ranges	0.0 to 199.9µS 200 to 1999µS 2.00 to 19.99mS
TDS ranges (Variable ratio)	0.0 to 99.9ppm or mg/L 100 to 999ppm or mg/L 1.00 to 9.99ppt or g/L
Salinity range	0.0 to 99.9ppm 100 to 999ppm 1.00 to 9.99ppt
TDS Ratio	0.40 to 1.00 adjustable
Salinity Ratio	0.40 to 0.60 auto
Conductivity ATC	2.0% per oC
Conductivity ATC Range	32.0°F to 140oF (0.0°C to 60.0oC)
Temperature Range	32.0°F to 194oF (0.0°C to 90.0oC)
Temperature Resolution	0.1 up to 99.9, 1 >100
Temperature Accuracy	±1.8°F; 1°C
Accuracy	Conductivity: ±2% full scale TDS: ±2% full scale Salinity: ±2% full scale
Measurement Memory	25 tagged (numbered) readings
Low battery indication	'  ' appears on the LCD
Power	Four (4) CR2032 Lithium Ion Batteries
Auto power off	After 10 minutes (override available)
Operating conditions	23°F to 122oF (-5°C to 50oC)
Dimensions	1.5 x 7.8 x 1.5" (38 x 198 x 38 mm)
Weight	3.5 oz (100 g)

# Maintenance

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## Battery Replacement

1. Twist off the battery compartment cap
2. Replace the four (4) 2032 batteries observing polarity.
3. Replace the battery compartment cap



## Electrode Replacement

1. To remove an electrode, unscrew and completely remove the electrode collar (turn the collar counter-clockwise to remove).
2. Gently rock the electrode from side to side, pulling it downwards, until it disconnects from the meter.
3. To attach an electrode, carefully plug the electrode into the meter socket (note that the electrode connector is keyed, ensuring proper connection).
4. Tighten the electrode collar firmly enough to make a good seal (a rubber gasket seals the electrode with the meter).

## Cleaning Recommendations

When cleaning the probe, take care not to scratch or damage the sensing surface or the platinized electrode surfaces.

<b><i>Contaminant</i></b>	<b><i>Cleaning Solution</i></b>	<b><i>Instructions</i></b>
Water soluble substances	Deionized water	Soak or scrub with a soft brush. Recondition in 4 or 7 buffer for 1 hour.
Grease & Oil	Warm water and household detergent	Soak or scrub with a soft brush, maximum of 10 minutes. Rinse thoroughly with DI water, recondition in 4 or 7 buffer for 1 hour.
Heavy grease & Oil	Alcohol	Maximum of 5 minute soak, scrub with a soft brush. Rinse thoroughly with DI water, recondition in 4 or 7 buffer for 1 hour.
Lime and hydroxide coatings	10% acetic acid	Soak until coating dissolved, maximum of 5 minutes. Rinse thoroughly with DI water, recondition in 4 or 7 buffer for 1 hour.

**Please Note:** Since the WQ120 does not have a refillable pH reference electrolyte chamber, it is important not to soak the electrode in the above solutions for more than the recommended times. To do so may cause a reference potential shift, which will cause degradation in performance or failure.

# Warranty

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Triplett / Jewell Instruments extends the following warranty to the original purchaser of these goods for use. Triplett warrants to the original purchaser for use that the products sold by it will be free from defects in workmanship and material for a period of (1) one year from the date of purchase. This warranty does not apply to any of our products which have been repaired or altered by unauthorized persons in any way or purchased from unauthorized distributors so as, in our sole judgment, to injure their stability or reliability, or which have been subject to misuse, abuse, misapplication, negligence, accident or which have had the serial numbers altered, defaced, or removed. Accessories, including batteries are not covered by this warranty

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