

CARDY TWIN PH METER

OPERATION MANUAL

CATALOG #2103



Spectrum
Technologies, Inc.

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This manual will familiarize you with the features and operation of your new Twin pH meter. Please read this manual thoroughly before using your instrument. For customer support, or to place an order, call Spectrum Technologies, Inc. at (800)248-8873 or (815) 436-4440 between 7:30 am and 5:30 p.m. CST
FAX at (815)436-4460,
E-Mail at info@specmeters.com.
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Spectrum Technologies, Inc
12360 S. Industrial Dr. East
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GENERAL OVERVIEW

Congratulations on the purchase of your Cardy Twin pH Meter. This manual describes your Cardy pH Meter, tells you how to use it, and keep it working accurately.

The Cardy Twin pH Meter delivers high quality answers with an accuracy of +/- 0.1 pH. This self-contained digital meter allows you to test the pH levels in water, soil, sap and much more.

The replaceable sensor makes measurement of small samples much more convenient. See page 7 for details.

There is a two-point automatic calibration (4.0, and 7.0 pH), with a range of pH 2.0-12.0. The display will read out your results to the hundredth place.

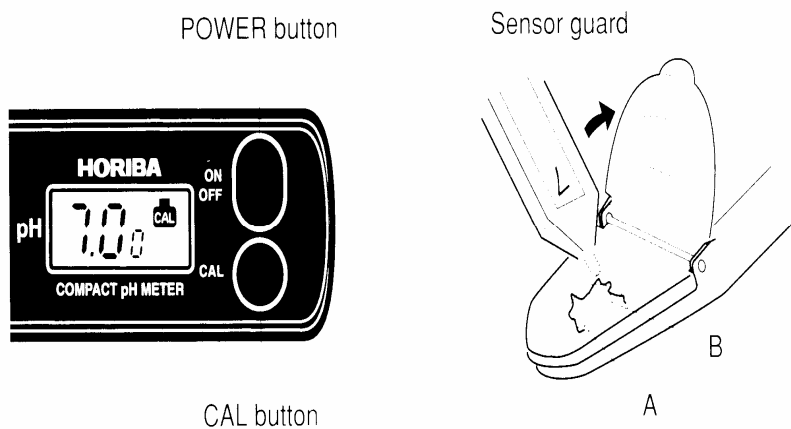
SPECIFICATIONS

Model:	B-213
Measurement:	Glass electrode method
Calibration:	Automatic two point calibration
Display:	LCD, digital. (Resolution: 0.1 pH)
Range:	pH 2.0 - pH 12.0
Reproducibility:	+/- 0.1pH
Accuracy:	+/- 0.1pH
Operating Temperature:	5 - 40°C (41 - 104°F)
Temperature Compensation:	Automatic temperature compensation sensor
Power Source:	3V (Lithium dry cell CR2032) x 2
Dry Cell Service Life:	Approx. 150 hours for continuous use, except dry cells supplied with the pH meter
Dimensions:	165 x 29 x 19 mm (5.6 x 1.1 x 0.6")
Weight:	48 g (1.7 oz)

METER COMPONENTS

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1. **Glass Electrode Sensor (B)**
2. **Reference Junction (A)** - Measurement is made when the Liquid Junction and the Sensor **are connected** by a solution
3. **LCD**
 - CAL
 - Lighting: Calibrate, or lighting won't be made
 - Blinking: During Calibration
 - Off: Measurement can be made
 - BATTERY
 - Lighting: Replace the Dry Cells with new ones
4. **Power Switch-** On/Off switch of power supply
5. **CAL Switch-** Button for Calibration
6. **Sensor Guard-** Protects the sensor during and after measurement



CALIBRATION &

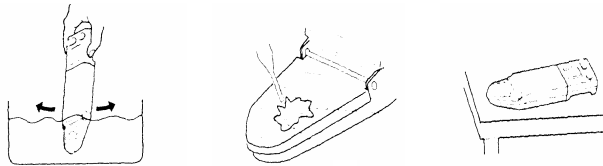
- 1) Turn power supply on.
- 2) Rinse the Sensor with distilled water. Gently blot the drops of water dry.
- 3) Apply a few drops of pH 7.0 Standard Solution to the Sensor. Confirm that the Sensor and the Liquid Junction **are connected** with the Standard Solution.
- 4) Press the CAL button once. "CAL" will blink on the LCD; Calibration has started.
- 5) Calibration is complete when "CAL" symbol disappears and the readout shows around pH 7.0 .
- 6) Rinse the Sensor with distilled water. Blot the drops of water dry.
- 7) Apply a few drops of pH 4 standard solution to the Sensor. Make sure that the Sensor and the Liquid junction **are covered** with the Standard Solution.
- 8) Press and hold the CAL button until CAL and pH 4.01 appear on the display, or press and release the CAL button twice.
- 9) Calibration is complete when "CAL" symbol disappears and the readout shows around pH 4.0.
- 10) Apply the sample to the Sensor by placing a small amount of the sample (use the pipet) on the Sensor, immersing the Sensor in the sample, or by spooning-out a representative measurement sample. Confirm that the Glass Sensor Chip and the Liquid Junction **are entirely covered** by the sample.
- 11) Read the data when figure on the LCD is stabilized and a smiley face appears.
- 12) After measurement, rinse the sensor with distilled water thoroughly. Replace the sensor cap on the sensor.

HOW TO COLLECT AND MEASURE A SOIL SAMPLE

- 1) Collect a representative soil sample.
- 2) Mix the soil and distilled water using a 1:1 proportion; stir for 30 seconds.
- 3) Allow 1 to 2 minutes before you begin the test.
- 4) Submerge the sensor into the mixture of soil and distilled water. Read the results.
- 5) Wash the sensor with distilled water and blot dry.

How to Measure Samples

- 1) Apply the sample solution to the sensor. There are three ways to apply the sample to the sensor.



1. Open the slide cap of the sensor guard and submerge the sensor into the sample solution.
2. Open the sensor guard and apply the solution to the sensor
3. Open the slide cap, spoon-out measurement and then set meter on a level surface.

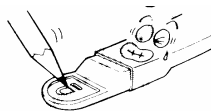
Note: This pH meter is water resistant. However, do not make any measurements by completely submerging the meter in the sample solution. If by mistake the meter is dropped into the sample solution, recover it immediately and dry it quickly and thoroughly.

PRECAUTIONS

- Prior to the first use, always calibrate the meter. It is recommended that the calibration is made daily.

Meter will not function correctly when calibration is performed under the following conditions:

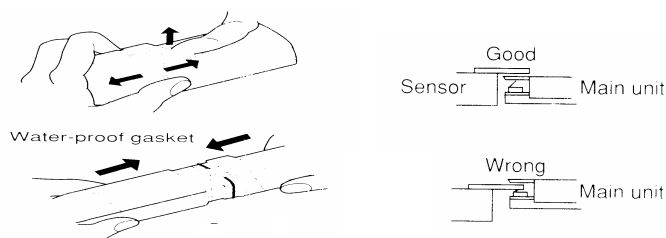
- No Standard Solution on the Sensor
 - Bubbles on the surface of the Sensor
 - No connection between the Sensor and the Liquid Junction by means of the Standard Solution
 - Sensor not properly set in the pH Meter
 - Sensor service life over
- Measurement cannot be made while the LCD shows "CAL."
 - Don't calibrate with a standard solution other than pH 7.0 or pH 4.0. Otherwise, inaccurate data will be shown.
 - Should inaccurate data be shown during operation, or should the display not change after applying pH calibration agent, stop the measurement immediately and contact the distributor.
 - Measurement will not be made correctly when the Reference Electrode exceeds the service life.
 - In measurement of tap water, rainwater, or other solution with extremely low ion concentration, note the following:
 - Rinse the Sensor thoroughly before the measurement.
 - Apply to the Sensor a few drops of solution to be measured. The pH value might be unstable when the sensor is immersed into the solution to be measured.
 - In measurement of soil or other solid matter, dissolve it in **distilled water**.
 - Do not apply excessive pressure to the glass sensor for it will break easily if mishandled.



REPLACEMENT OF

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- 1) Wipe water off the pH Meter.
- 2) Pull the bottom part of the housing away from meter by pushing the tongue located on the backside of the meter and sliding the sensor away from the unit body.
- 3) Confirm that the watertight O-Ring is properly seated.
- 4) Insert the new Sensor into the pH meter firmly.
- 5) Confirm that the calibration is accurate.



NOTE:

- Do not remove the Reference Electrode when the pH Meter is wet. Water entering the pH Meter will cause trouble.
- Insufficient watertightness will result in error.

When Reference Electrode is to be Replaced

- Sensor response is slow, measured value is unstable, or calibration cannot be made.
- Measured value does not change when the sample is changed.
- Display of 0.0 blinks during measurement. Temperature warning °C blinks.

Cleaning the Sensor:

- 1) Thoroughly wipe any existing moisture from the surface of the Meter.
- 2) Wipe the Sensor by means of soft material moistened with water until the Sensor gets shiny.
- 3) Confirm that the calibration is accurate.

BATTERY

When the batteries need to be replaced:

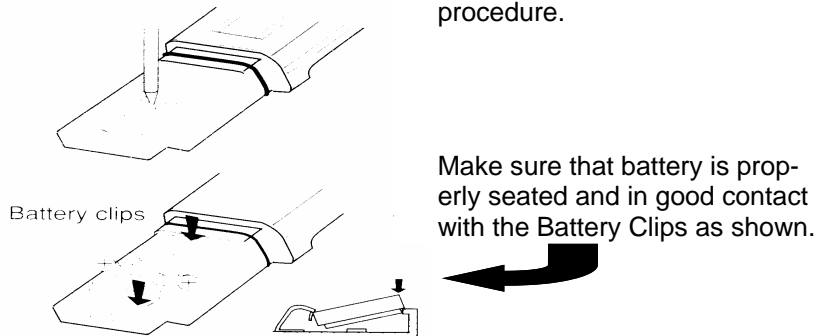
- LCD shows “B” while the power is turned on.
- LCD shows nothing when you press the POWER switch.

Replacement:


1. Wipe water off the pH Meter thoroughly.
2. Pull out upper Housing of the pH Meter.
3. Remove the Dry Cell Holder.
4. Put two new batteries in with the “+” surface facing upward.
5. Confirm that the watertight O-Ring is properly placed in the Housing of the pH Meter. Re-assemble Housing of the pH Meter.
6. Confirm that the power supply is turned on.
7. Calibrate the pH Meter.

CAUTIONS

- Don’t remove Housing of the pH Meter when the pH Meter is wet. Water entering the pH Meter will cause error.
- Insufficient watertightness will result in error if...
 - 1) Housing of the pH Meter isn’t in its place
 - 2) Watertight O-Ring is not in its proper place
 - 3) Watertight O-Ring is placed together with a foreign matter.
- Re-calibrate the pH Meter after the batteries are replaced. Calibration value is deleted when the batteries are removed.
- If the pH Meter does not work properly, check the voltage of the batteries and repeat the procedure.



HANDLING CAUTIONS

- Measurement cannot be made while the LCD indicates "CAL".
- Prior to the first use, never fail to calibrate.
- Don't scratch or the Sensor, or it  apply excessive force to will be damaged.
- Don't pull or supply excessive force to the Reference Electrode, or it will be damaged.
- Keep the Sensor Chip clean. Refer to "Cleaning of the Sensor."
- Measurement cannot be made without covering the entire Sensor and Reference Junction. Sensor is replaceable.
- Don't press the POWER or the CAL Switches in water.
- Don't replace the batteries or the Reference Electrode when the pH Meter is wet. Water may enter inside and cause error.
- Don't press the POWER or the CAL Switches with a needle-like object.
- Don't use the pH Meter at temperatures out of the working range of 5°C-40°C(41°F-104°F). Otherwise, the service life of the Sensor will be shortened.
- Don't measure the following, or the Sensor will be damaged: Organic Solvent (thinner, benzene, etc.) Strong acid (pH 0-2), Strong alkali (pH 12-14), Surface active agent, Alcohol, Oil, Adhesive and Cement.

(CONT.) HANDLING CAUTIONS

- When the irregular data is shown, stop the measurement immediately and calibrate the pH Meter.
- Keep the Sensor away from direct sunrays or strong light during calibration and measurement as accuracy will be adversely affected. Pay careful attention to this point especially when using outdoors.
- For the first use or use after a long interval, immerse the Sensor in water for five minutes and calibrate before measurement. Otherwise, unstable data will be displayed.
- White powder or solution generated at the Sensor is not a symptom of trouble. Rinse the Sensor before use.
- Accuracy will be heightened when the Standard Solution is at the same temperature as that of sample to be measured.
- In cleaning, don't use thinner, benzene, or other organic solvents. Wipe with a soft dry or cloth dipped in neutral detergent and wrung dry.
- Don't place the pH Meter close to heaters or where the pH Meter might be exposed to direct sunrays. Avoid extremes of temperature.
- Don't bend or drop the pH Meter.
- Don't disassemble the Sensor.
- Standard solution is caustic acid. If the Standard Solution is in contact with skin, wash the skin thoroughly with water.

WARRANTY

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This product has been brought to you having passed severe quality control and inspections. Should any trouble occur during the course of normal use, the meter shall be repaired or replaced free of charge in accordance with the stipulations laid down herein. The term of this warranty shall be for one year from date of purchase. This warranty excludes batteries, sensor and accessories.

Warranty Stipulations:

1. The product shall be repaired or replaced free of charge should any trouble occur during the course of normal use if returned within the warranty period (one year from date of purchase). In which event, contact the dealer of purchase. Return the meter with proof of date of purchase.
2. Expenses shall be incurred in the following instances within the warranty period. (Costs such as postage shall be born by the customer)
 - a) When the date of purchase and store name is not written on the warranty.
 - b) When trouble or damage has been incurred due to misuse, abuse, and/or improper handling.
 - c) When the meter has been repaired, modified and dismantled by persons other than the designated agent or service shop.
 - d) In the event of changes in external appearance such as scratches or dirt caused during use or battery fluid leakage.
 - e) In the event of unsuitable movement, dropping or accidents such as fire, earthquakes, floods or a burglary.
 - f) When replacing consumables and accessories.
 - g) When cause of trouble lies not in the meter itself.
 - h) When this warranty is not shown and when necessary particulars have not been written in the warranty.

Our obligation under this warranty is to repair or replace the meter free of charge in accordance with the conditions laid down herein. Accordingly, this warranty doesn't limit your specific legal rights.

PRODUCT RETURN

If for any reason you are not satisfied, or the meter has failed and you need to return the product for service, you will need to contact Spectrum Technologies, Inc.

Before returning a failed unit, you must obtain a Returned Goods Authorization (RGA) number from Spectrum Technologies. You must ship the product(s), properly packaged against further damage, back to Spectrum Technologies (at your expense) with the RGA number marked clearly on the outside of the package. Spectrum Technologies is not responsible for any package that is returned without a valid RGA number, or for the loss of the package by any shipping company.

SERVICE AND SUPPORT

For technical service and support call your distributor or Spectrum Technologies, Inc.

When calling for technical support have a detailed explanation of the problem that you are experiencing. The more information you can provide the faster and easier a technical support person will be able to assist you.

For technical support call (800) 248-8873 or (815) 436-4440.

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NOTES

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