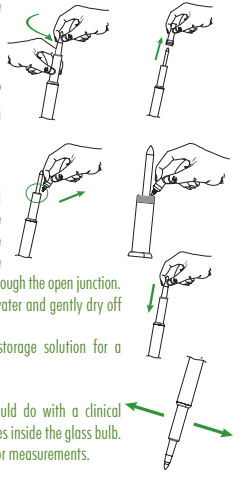
Care and Maintenance

To obtain the highest accuracy for measurements it is important to follow these tips:

- Fresh buffer should be used for each calibration. Calibration is only as good as the buffer being used. The pH buffer values change over time once the sachets are opened.
- The probe should be rinsed with purified water each time before placing in buffer or sample to be tested.
- When the meter is not in use it is important to add several drops of storage solution to the protective cap to keep the probe hydrated. If storage solution is not available, pH 4.01 or pH 7.01 buffer can be used.
- For improved accuracy it is recommended to calibrate in two buffers.
- It is important to calibrate and measure samples at the same temperature as there is no temperature compensation. A dramatic change in temperature between buffer solutions and samples to be tested will give inaccurate readings.

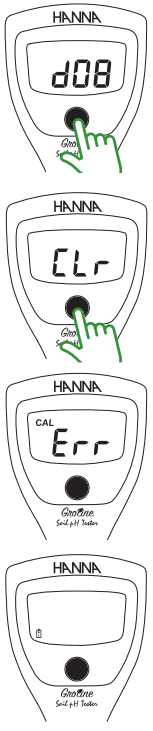
Refilling the Electrode

- If fouled, remove the sleeve and rinse sleeve and sensor tip with purified water. Turn over the probe, remove the sleeve by carefully rotating it and pull straight along the axis of the electrode. Use care as the pH stem is made of glass. Rinse off any traces of electrolyte gel.
- Soak the sensor tip in HI70061G, HI700661P, HI700663P or HI700664P cleaning solution for 20 minutes then rinse with purified water.
- Refill the reference well with HI9071 Gelled Bridge Electrolyte.
- Replace the reference sleeve: insert and push the sleeve onto the electrode. Make sure the black O-ring is fixed inside the electrode body. Any excess of gel will be expelled from the end of the electrode through the open junction.
- Rinse any excess gel off with purified water and gently dry off body with a soft cloth or tissue.
- Soak assembled probe in Electrode storage solution for a minimum of 30 minutes.
- Rinse probe with purified water.
- Shake the electrode down as you would do with a clinical thermometer to eliminate any air bubbles inside the glass bulb.
- Calibrate in fresh buffers before using for measurements.



Warranty

The meter is warranted for a period of one year against defects in workmanship and materials when used for their intended purpose and maintained according to instructions. This warranty is limited to repair or replacement free of charge. Damage due to accidents, misuse, tampering or lack of prescribed maintenance is not covered. If service is required, contact your local Hanna Instruments Office. If under warranty, report the model number, date of purchase, serial number and the nature of the problem. If the repair is not covered by the warranty, you will be notified of the charges incurred. If the instrument is to be returned to Hanna Instruments, first obtain a Returned Goods Authorization (RGA) number from the Technical Service department and then send it with shipping costs prepaid. When shipping any instrument, make sure it is properly packaged for complete protection.



Auto-off

From measurement mode, press and hold the ON/OFF button. The meter will cycle through "OFF," "CAL," then current auto-off setting.
The default setting is 8 minutes ("d08"). Press ON/OFF button to change. "d60" is auto-off after 60 minutes, and "d--" disables the auto-off feature. Press and hold the button to exit the menu.

Clear Calibration

Place meter in calibration mode. Press and hold ON/OFF until "CLr" is displayed. The meter will now be at default calibration.

"Err" Message

In calibration mode, if the meter displays an "Err" message when in the correct fresh buffer solution then the probe should be cleaned. Place the probe in the cleaning solution for 20 minutes. Rinse with purified water and place in storage solution for a minimum of 30 minutes before calibrating.

Battery Indicator

The meter features a low battery indicator. When the battery is running low, the tag will blink on screen. When the battery has been depleted, "Erb" will appear on screen and the meter will turn off.

Recommendations for Users

Before using this product, make sure it is entirely suitable for your specific application and for the environment in which it is used. Any variation introduced by the user to the supplied equipment may degrade the meters' performance. For yours and the meter's safety do not use or store the meter in hazardous environments.

Certification

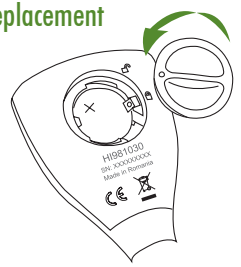
All Hanna Instruments conform to the **CE European Directives**. CE RoHS compliant

Disposal of Electrical & Electronic Equipment. The product should not be treated as household waste. Instead hand it over to the appropriate collection point for the recycling of electrical and electronic equipment which will conserve natural resources.

Disposal of waste batteries. This product contains batteries, do not dispose of them with other household waste. Hand them over to the appropriate collection point for recycling.

Ensuring proper product and battery disposal prevents potential negative consequences for the environment and human health. For more information, contact your city, your local household waste disposal service, the place of purchase or go to www.hannainst.com.

Battery Replacement



To change the CR2032 Li-ion battery, turn the battery cover located on the back of the meter counterclockwise to unlock. Remove cover and replace the battery with + side facing up.

Note: Batteries should only be replaced in a safe area using the battery type specified in this instruction manual. Old batteries should be disposed in accordance with local regulations.

Accessories

pH Buffer Solution

Code	Description
HI70004G	GroLine pH 4.01 buffer solution, 20 mL sachets (25 pcs.)
HI70007G	GroLine pH 7.01 buffer solution, 20 mL sachets (25 pcs.)
HI77400P	pH 4.01 & 7.01 buffer solution, 20 mL sachets (10 pcs., 5 ea.)

Electrode Cleaning Solutions

Code	Description
HI70061G	GroLine general purpose cleaning solution, 20 mL sachets (25 pcs.)
HI700661P	General purpose cleaning solution for agriculture, 20 mL sachets (25 pcs.)
HI700663P	Cleaning solution for soil deposits, 20 mL sachets (25 pcs.)
HI700664P	Cleaning solution for humus deposits, 20 mL sachets (25 pcs.)

Electrode Storage Solutions

Code	Description
HI70300G	GroLine electrode storage solution, 20 mL sachets (25 pcs.)
HI70300-023	GroLine electrode storage solution, 230 mL bottle
HI9072	Electrode storage solution, 13 mL dropper

Electrode Fill Solution

Code	Description
HI9071	Gelled Bridge Electrolyte

Other Accessories

Code	Description
HI721319	Soil auger
HI7051M	Soil preparation solution, 230 mL bottle

IST981030 05/18-1

INSTRUCTION MANUAL

GroLine
HI981030
Soil pH Tester

HANNA® instruments

Thank You

Thank you for choosing a Hanna Instruments product. Please read this instruction manual carefully before using this instrument.

For technical support, contact your local Hanna Instruments Office or email us at tech@hannainst.com.

To find your local Hanna Instruments Office or for additional information on Hanna Instruments products, visit www.hannainst.com

Preliminary Examination

Remove the meter from the packing material and examine it carefully to make sure that no damage has occurred during shipment. If noticeable damage is evident, contact your local Hanna Instruments Office.

Each meter is supplied with:

- pH 4.01 buffer solution liquid sachet (2 pcs.)
- pH 7.01 buffer solution liquid sachet (2 pcs.)
- Cleaning solution for soil deposits
- Cleaning solution for humus deposits
- Electrode storage solution, 13 mL dropper
- Electrode fill solution
- Instruction manual
- Quality certificate

Note: Save all packing material until you are sure that the instrument functions correctly. All defective items must be returned in the original packaging with the supplied accessories.

Procedure for Direct Ground Measurement

1) Verify meter is set up correctly and pH probe is calibrated.
2) Dig, discarding 5 cm of topsoil.
3) Perforate the soil (with HI721319 soil auger) to a depth of about 20 cm or more.
4) If the soil is dry, moisten it with a small amount of tap water.
5) Wash the electrode with tap water (not distilled).
6) Insert the electrode pushing it slightly into the soil to ensure proper contact.
7) Observe the measurement.
8) Wash the electrode with tap water (not distilled) and (using a finger) gently remove any soil remaining on the electrode (avoid using a rag or cloth).
9) Repeat the procedure in different locations in the field.
10) Consider the average of the measured data.

For best result, it is advisable to measure the pH of a soil solution, using a sample of soil and soil preparation solution HI7051; it is better to use this procedure if you have to test a stony field in which you risk damaging the electrode.

Probe Features

Removable PVDF reference sleeve

Polyvinylidene fluoride (PVDF) is a durable plastic that is resistant to most chemicals and solvents, including sodium hypochlorite. It has high abrasion resistance, mechanical strength and resistance to ultraviolet. PVDF is also resistant to fungal growth.

Open Reference Junction with removable sleeve design

Suspended solids can permanently clog the pores of a ceramic reference junction. The open junction design provides a constant junction potential and minimizes blockage by providing an open gel interface between the sample and internal Ag/AgCl reference. Should soil enter into the junction, the junction can be easily cleaned and refreshed with new bridge electrolyte.

Specifications

Range	0.0 to 14.0 pH
Resolution	0.1 pH
Accuracy	±0.2 pH @25 °C/77 °F
Calibration	Automatic, one or two-point
Electrode	Built-in probe for specific application
Battery Type	CR2032 Li-ion
Battery Life	Approximately 1000 hours of continuous use
Auto-off	8 minutes, 60 minutes or can be disabled
Environment	0 to 50 °C (32 to 122 °F); RH 95% max
Dimensions	51 x 151 x 21 mm (2 x 5.9 x 0.9")
Weight	44 g (1.6 oz.)

Meter Overview

Preparation:

The pH electrode is shipped ready for use with a protective cap containing storage solution. Before using the meter, **remove the protective cap** and inspect the probe to verify the bridge gel has not dried out. Refresh the bridge electrolyte if necessary. Following care procedure (ignoring the cleaning procedures).

Alternately, rinse off the probe tip with water and condition the electrode by soaking the tip (bottom 4 cm (1.5")) in pH 7.01 buffer solution for several minutes. Perform a probe calibration before using.

- Do not be alarmed if white crystals appear around the cap. This is normal with pH electrodes. Rinse off the probe tip with water before using.
- Turn the meter on by pressing ON/OFF button.
- Remove the protective cap. DO NOT SCRATCH THE GLASS. Do not use the probe to bore a hole through the soil. Make sure an entry hole is made in the soil and water has been added. After placing the probe in the hole, wait for a stable reading.

NEVER IMMERSE THE ELECTRODE OVER THE MAXIMUM IMMERSION LEVEL.

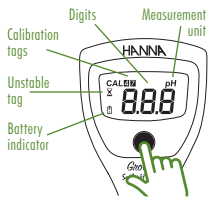
- For best results, recalibrate periodically.
- After use, rinse the electrode with water and store it with a few drops of storage solution in the protective cap.
- Reattach the protective cap after each use.

DO NOT USE DISTILLED OR DEIONIZED WATER FOR STORAGE PURPOSES.

Operation

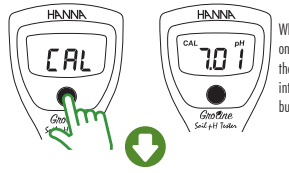
Press the ON/OFF button to turn the meter on. All tags will be displayed.

The meter will go into measurement mode: current reading and calibrated buffers are displayed.



Meter Calibration

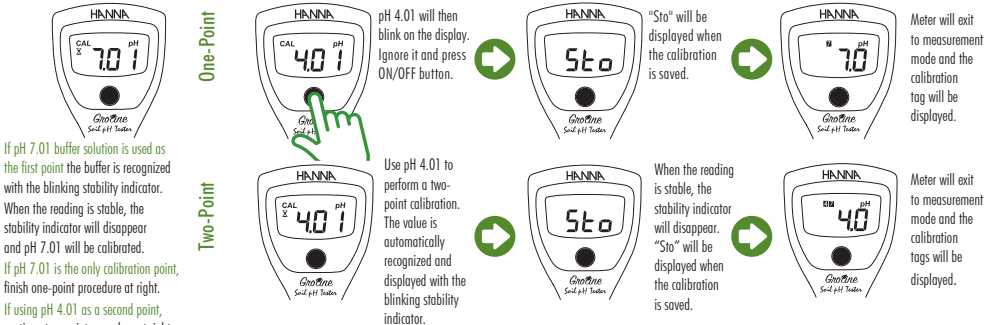
From measurement mode, press and hold the ON/OFF button until "CAL" is displayed.



A For one or two-point calibration using pH 7.01 buffer go to procedure A

B For one-point calibration using pH 4.01 buffer go to procedure B

A One or Two-Point Calibration with pH 7.01



B One-Point Calibration with pH 4.01