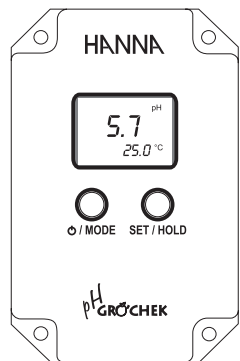


## Instruction Manual

pH  
**GRO-CHEK**

(HI991401)



**HANNA**<sup>®</sup>  
instruments  
www.hannainst.com

## WARRANTY

HI 991401 is warranted for two years against defects in workmanship and materials when used for their intended purpose and maintained according to instructions. **Electrodes and probes are warranted for six months.** This warranty is limited to repair or replacement free of charge.

Damages due to accident, misuse, tampering or lack of prescribed maintenance are not covered.

If service is required, contact the dealer from whom you purchased the instrument. If under warranty, report the model number, date of purchase, serial number and the nature of the failure. 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 Number from the Customer Service department and then send it with shipment costs prepaid. When shipping any instrument, make sure it is properly packaged for complete protection.

All rights are reserved. Reproduction in whole or in part is prohibited without the written consent of the copyright owner.

Dear Customer,  
Thank you for choosing a Hanna product.  
This manual will provide you with the necessary information for a correct operation. Please read it carefully before using the meter. If you need additional technical information, do not hesitate to e-mail us at [tech@hannainst.com](mailto:tech@hannainst.com).  
This instrument is in compliance with the CE directives.

## PRELIMINARY EXAMINATION

Remove the instrument from the packing material and examine it carefully. If any damage has occurred during shipment, immediately notify your dealer or the nearest Hanna Customer Service Center.

The meter is supplied with:

- HI 1293D pH-electrode
- temperature probe (fixed)
- pH 4.01 and pH 7.01 buffer solutions (20 mL each)
- 12 Vdc power adapter and instructions

**Note:** Conserve all packing material until the instrument has been observed to function correctly. Any defective item must be returned in its original packing.

## GENERAL DESCRIPTION

HI 991401 indicator features a large, dual-level backlit LCD to give instantaneous readings of both pH and temperature, even from a distance.

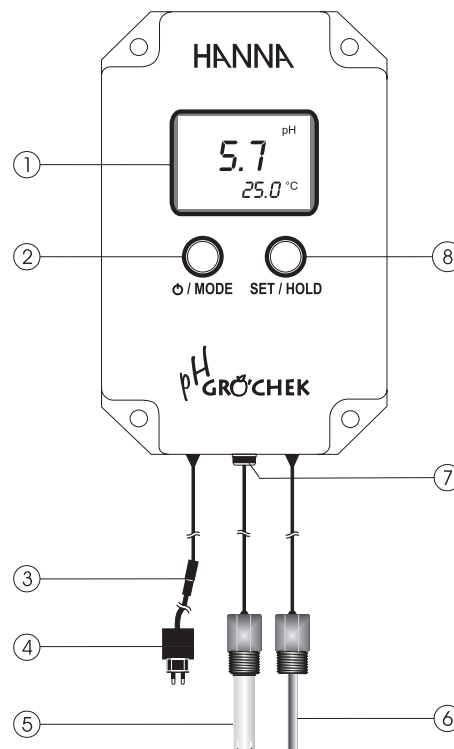
This waterproof indicator has been specially designed to meet the grower's need for equipment suited to the aggressive environments of agricultural and hydroponics applications.

Measurements are highly accurate and the meter can be calibrated at one or two points. Low battery and battery changes are no longer a problem thanks to a 12 Vdc power supply included with the meter.

The HI 1293D pH electrode & the temperature probe have been molded with pipe thread (1/2" NPT), which allows the user to attach them to an in-line system.

Moreover, the pH electrode has been specially designed to guarantee greater clogging resistance in fertilizer solutions with high concentrations of phosphate and nitrate.

## FUNCTIONAL DESCRIPTION



1. Liquid Crystal Display
2. ON/OFF/MODE button
3. Power supply connector
4. 12 Vdc power adapter
5. HI 1293D pH electrode with differential input and pipe thread 1/2" NPT
6. Temperature probe with pipe thread 1/2" NPT (also working as matching pin for pH electrode)
7. DIN connector
8. SET/HOLD button

## SPECIFICATIONS

|                          |   |
|--------------------------|---|
| Range                    | 0.0 to 14.0 pH<br>0.0 to 60°C / 32.0 to 140°F                         |
| Resolution               | 0.1 pH / 0.1°C / 0.1°F  |
| Accuracy (@20°C/68°F)    | ±0.1 pH / ±0.5 °C / ±1°F  |
| Typical EMC Deviation    | ±0.1 pH / ±1°C / ±2 °F  |
| pH Calibration           | Automatic, 1 or 2 point<br>with auto-buffer recognition               |
| Temperature Compensation | Automatic   |
| Probes                   | HI 1293D pH electrode (included)<br>HI 1294 temperature probe (fixed) |
| Power supply             | 12 Vdc power adapter (included)                                       |
| Environment              | 0 to 50°C (32 to 122°F);<br>RH max 95% non-condensing                 |
| Dimensions               | 160 x 105 x 31 mm (6.2 x 4.1 x 1.2")                                  |
| Weight                   | 190 g (6.7 oz.)   |

### Recommendations for Users

Before using this product, make sure that it is entirely suitable for the environment in which it is used. Operation of this instrument in residential areas could cause unacceptable interferences to radio and TV equipment. The glass bulb at the end of the electrode is sensitive to electrostatic discharges. Avoid touching this glass bulb at all times. During operation, ESD wrist straps should be worn to avoid possible damage to the electrode by electrostatic discharges.  
Any variation introduced by the user to the supplied equipment may degrade the instrument's EMC performance.  
To avoid electrical shock, do not use this instrument when voltages at the measurement surface exceed 24 Vac or 60 Vdc.  
To avoid damages or burns, do not perform any measurement in microwave ovens.

## OPERATIONAL GUIDE

### Preliminary operations

Connect the pH electrode to the meter.

Connect the 12 Vdc adapter to the meter and to the mains; the display will lit.

Press and hold the MODE button for 2-3 seconds. All the used segments on the LCD will be visible for a few seconds.

### To change the temperature unit

To change the temperature unit (from °C to °F), from measurement mode, press and hold the MODE button until "TEMP" and the current temperature unit are displayed on the lower LCD (E.g. TEMP °C).

Use the SET/HOLD button to change the temperature unit, and then press MODE button twice to return to normal measurement mode.

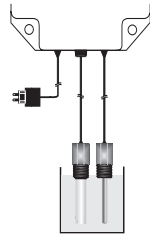
### To freeze the display

Press and hold the SET/HOLD button for 2-3 seconds, until "HOLD" appears on the secondary display.

Press either button to return to normal mode.

### Taking measurements

Immerse the electrode and the temperature probe in the solution to be tested. For better accuracy, the electrode should not touch or stand close to the walls or bottom of the sample vessel.



The pH value automatically compensated for temperature is shown on the primary LCD, while the secondary LCD displays the temperature of the sample.

Measurements should be taken when the stability symbol □ on the top left of the LCD disappears.

### IMPORTANT NOTE

Measurements have to be taken with both pH electrode and temperature probe (also working as matching pin) immersed in the same vessel.

### To turn the meter off

Press the MODE button while in normal measurement mode. "OFF" will appear on the lower part of the display. Release the button. The display still lit, until the power supply is connected.

### Notes:

- Before taking any measurement make sure the meter has been calibrated.
- To clear a previous calibration, press the MODE button after entering the calibration mode. The lower LCD will display "ESC" for 1 second and the meter will return to normal measurement mode. The "CAL" symbol on the LCD will disappear. The meter will be reset to the default calibration.
- If measurements are taken in different samples successively, rinse the electrode thoroughly with water, and then with some of the sample to be measured.

## pH ELECTRODE MAINTENANCE

- When not in use, rinse the electrode with water and store it with a few drops of **HI 70300** storage solution in the protective cap.  
NEVER DISTILLED OR DEIONIZED WATER FOR STORAGE PURPOSES.
- If the electrode has been left dry, soak in storage or pH 7 solution for at least one hour to reactivate it.
- To prolong the life of the pH electrode, it is recommended to clean it monthly by immersing it in the **HI 7061** cleaning solution for half an hour. Afterwards, rinse it thoroughly with tap water and recalibrate the meter.

## pH CALIBRATION

### Calibration buffer set

- From measurement mode, press and hold the MODE button until "TEMP" and the current temperature unit are displayed on the lower LCD (E.g. TEMP °C).
- Press the MODE button again to show the current buffer set: "pH 7.01 BUFF" for standard set (pH 4.01/7.01/10.01) or "pH 6.86 BUFF" for NIST set (pH 4.01/6.86/9.18).
- Press the SET/HOLD button to change the buffer value.
- Press the MODE button to return to the normal mode.

### Calibration procedure

From measurement mode, press and hold the MODE button until "CAL" is displayed on the lower LCD. Release the button. The LCD will display "pH 7.01 USE" (or "pH 6.86 USE" if you have selected the NIST buffer set). The CAL tag blinks on the display.

- For a **single-point pH calibration**, immerse the electrode and the temperature probe in any buffer from the selected buffer set (eg. pH 7.01 or pH 4.01 or pH 10.01). The meter will recognize the buffer value automatically. If using pH 4.01 or pH 10.01, the meter will display "OK" for 1 second and then return to measurement mode. If using pH 7.01, after recognition of the buffer the meter will ask for pH 4.01 as second calibration point. Press the MODE button to return to measurement mode or, if desired, proceed with the 2 point calibration as explained below.

**Note:** For better accuracy it is always recommended to carry out a two-point calibration.

- For a **two-point pH calibration**, place the electrode and the temperature probe in pH 7.01 buffer (or pH 6.86 if you have selected the NIST buffer set). The meter will recognize the buffer value and then display "pH 4.01 USE".

Rinse the electrode thoroughly and immerse it in the second buffer value (pH 4.01 or 10.01, or, if using NIST, pH 4.01 or 9.18). When the second buffer is also recognized, the LCD will display "OK" for 1 second and the meter will return to the normal mode.

**Note:** For storing calibration data in the non-volatile memory, turn the meter OFF and then ON again through the MODE button.

The "CAL" symbol on the LCD means that the meter is calibrated.

## ACCESSORIES

|             |   |
|-------------|---|
| HI 1293D    | Spare pH electrode with differential input, pipe thread 1/2" NPT and DIN connector          |
| HI 1294 (*) | Temperature probe, pipe thread 1/2" NPT (also working as matching pin for the pH electrode) |
| HI 70004P   | pH 4.01 solution, 20 mL sachet (25 pcs)   |
| HI 70006P   | pH 6.86 solution, 20 mL sachet (25 pcs)   |
| HI 70007P   | pH 7.01 solution, 20 mL sachet (25 pcs)   |
| HI 70009P   | pH 9.18 solution, 20 mL sachet (25 pcs)   |
| HI 70010P   | pH 10.01 solution, 20 mL sachet (25 pcs)  |
| HI 7004M    | pH 4.01 solution, 230 mL bottle   |
| HI 7006M    | pH 6.86 solution, 230 mL bottle   |
| HI 7007M    | pH 7.01 solution, 230 mL bottle   |
| HI 7009M    | pH 9.18 solution, 230 mL bottle   |
| HI 7010M    | pH 10.01 solution, 230 mL bottle  |
| HI 7061M    | Electrode cleaning solution, 230 mL bottle  |
| HI 70300M   | Electrode storage solution, 230 mL bottle   |
| HI 710005   | 12 Vdc power adapter, US plug   |
| HI 710006   | 12 Vdc power adapter, European plug   |
| HI 710012   | 12 Vdc power adapter, Australian plug   |
| HI 710013   | 12 Vdc power adapter, South Africa plug   |
| HI 710014   | 12 Vdc power adapter, UK plug   |

(\*) To be replaced by authorized technical personnel only