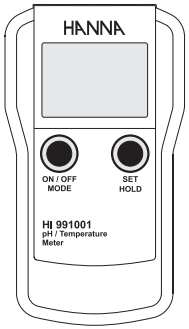
Instruction Manual

HI 991001

Extended Range Waterproof pH / Temperature Meter



HANNA instruments

www.hannainst.com

WARRANTY

All Hanna Instruments **meters are warranted for two years** against defects in workmanship and materials when used for their intended purpose and maintained according to instructions. **The probes are warranted for a period of six months.**

This warranty is limited to repair or replacement free of charge**.** Damage due to accidents, 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 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 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.

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Dear Customer,

Thank you for choosing a Hanna Instruments Product.

Please read this instruction manual carefully before using the instrument. If you need additional technical information, do not hesitate to e-mail us at **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 to make sure that no damage has occurred during shipment. If noticeable damage is evident, notify your dealer.

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

GENERAL DESCRIPTION

HI 991001 is a portable, microprocessor-based pH and temperature meter.

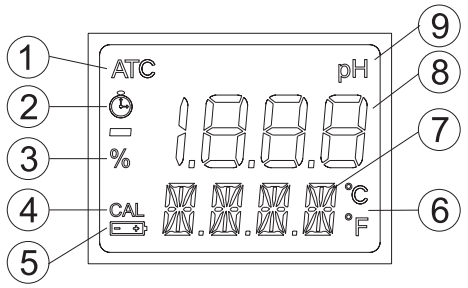
Main features include: extended pH and temperature ranges; waterproof and compact casing; large dual-line display; low battery detection; automatic pH calibration at one or two points with two memorized buffer sets (standard or NIST); selectable temperature unit (°C or °F).

The pH electrode has a built-in temperature sensor for simultaneous pH and temperature readings, and also contains a mini amplifier to render measurements impervious to noise and electrical interferences.

Each meter is supplied complete with

- **HI 1296D** pH/temperature probe with DIN connector and 1 m (3.3') cable
- calibration & cleaning solution sachets
- 3x1.5V AA alkaline batteries
- instruction manual
- rugged carrying case.

LCD DESCRIPTION



1. Automatic Temperature Compensation indicator
2. Stability indicator
3. Battery percentage
4. pH calibration indicator
5. Low battery indicator
6. Selectable temperature unit
7. Secondary display
8. Primary display
9. Measuring unit for primary display

ACCESSORIES

HI 1296D	Combination amplified pH/temperature probe with DIN connector and 1 m (3.3') cable
HI 7004L	pH 4.01 buffer solution, 500 mL
HI 7006L	pH 6.86 buffer solution, 500 mL
HI 7007L	pH 7.01 buffer solution, 500 mL
HI 7009L	pH 9.18 buffer solution, 500 mL
HI 7010L	pH 10.01 solution, 500 mL
HI 70300L	Storage solution, 500 mL
HI 7061L	Cleaning solution, 500 mL
HI 710007	Blue shockproof rubber boot
HI 710008	Orange shockproof rubber boot
HI 721312	Rugged carrying case
HI 76405	Electrode holder

SPECIFICATIONS

Range (*)	-2.00 to 16.00 pH -5.0 to 105.0°C / 23.0 to 221.0°F
Resolution	0.01 pH 0.1°C / 0.1°F
Accuracy (@20°C)	±0.02 pH ±0.5°C up to 60°C; ±1°C outside ±1°F up to 140°F; ±2°F outside
Typical EMC Deviation	±0.02 pH ±0.2°C or ±0.4°F
Temperature Compensation	Automatic
pH Calibration	Automatic, 1 or 2 point with 2 sets of memorized buffers (pH 4.01/7.01/10.01 or 4.01/6.86/9.18)
Probe (included)	**HI 1296D** amplified pH/temperature probe with DIN connector and 1 m (3.3') cable
Battery Type	3 x 1.5V AA / IEC LR6
Battery Life	Approx. 2000 hours
Auto-off	After 8 minutes of non-use
Environment	0 to 50°C (32 to 122°F); RH max 100%
Dimensions	150 x 80 x 36 mm (5.9 x 3.1 x 1.4")
Weight	210 g (7.4 oz.)

(*) the temperature range is limited to 80°C (176°F) if using the HI1296D probe.

To clean the meter, use water only.

Hanna Instruments reserves the right to modify the design, construction and appearance of its products without advance notice.

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OPERATIONAL GUIDE

To connect the probe

With the meter turned off, connect the **HI 1296D** probe to the DIN socket on the top of the meter by aligning the pins and pushing in the plug. Tighten the nut to ensure a good connection. Remove the protective cap from the probe before taking any measurements.

To turn the meter ON and check the battery status

Press the ON/OFF/MODE button until the display lights up. At start-up, all the LCD segments are displayed for 1 second, then the percent indication of the remaining battery life is shown for another second (E.g. % 100 BATT). The meter then enters the normal measuring mode.

Note: If the display needs to be checked, keep the ON button pressed while turning the meter on. The meter will display all segments as long as the button is pressed.

To freeze the display

While in measurement mode, press the SET/HOLD button, HOLD appears on the secondary display and the reading will be frozen on the LCD (E.g. pH 5.73 HOLD). Press any button to return to normal mode.

To turn the meter OFF

While in normal measurement mode, press the ON/OFF/MODE button. OFF will appear on the secondary display. Release the button.

Note: The meter is provided with an acoustic signal feature, which can be disabled using the switch located in the battery compartment.

Note: When the meter detects the absence of a temperature probe at its input, the Automatic Temperature Compensation is turned off, and the meter uses a default value of 25°C (77°F) for the temperature measurement and compensation. In this condition, the secondary LCD shows 25.0°C (77.0°F) blinking. When a probe is connected, the meter automatically returns to the ATC mode, the ATC tag is turned on, and the temperature is shown on the secondary display.

pH MEASUREMENT & CALIBRATION

- Make sure the meter has been calibrated before use.
- If the probe is dry, soak it in **HI 70300** storage solution for one hour to reactivate it.
- Place the tip of the probe into the sample to be tested.
- Stir briefly and wait until the symbol on the top left of the LCD is turned off.
- The LCD shows the pH value (automatically compensated for temperature) on the primary LCD, while the secondary LCD shows the temperature of the solution.
- If measurements are taken in different samples successively, rinse the probe tip thoroughly to eliminate cross-contamination. After cleaning, rinse the probe tip with some of the sample to be measured.

pH calibration

For better accuracy, frequent calibration of the instrument is recommended. In addition, the instrument must be recalibrated whenever:

a) The pH electrode is replaced.
b) After testing aggressive chemicals.
c) Where high accuracy is required.
d) At least once a month.

- From normal mode, press and hold ON/OFF/MODE until OFF on the secondary display is replaced by CAL. Release the button.
- The LCD enters the calibration mode, displaying “pH 7.01 USE” (or “pH 6.86 USE” if the NIST buffer set was selected). After 1 second the meter activates the automatic buffer recognition feature. If a valid buffer is detected, then its value is shown on the primary display, and REC appears on the secondary LCD. If no valid buffer is detected, the meter keeps the USE indication active for 12 seconds, and then replaces it with WRNG, indicating that the sample being measured is not a valid buffer.
- For a *single-point calibration* with buffers pH 4.01, 9.18 or 10.01, the meter automatically accepts the calibration when the reading is stable; the meter will show on the primary display the accepted buffer, with the message “OK 1” on the secondary display, and an audible signal is produced. After 1 second the meter automatically returns to the normal measuring mode.
  If a single-point calibration with buffers pH 7.01 or 6.86 is desired, then after the calibration point has been accepted the ON/OFF/MODE button must be pressed in order to return to the normal measuring mode. After the button is pressed, the meter shows "7.01" (or "6.86") - "OK 1", and an audible signal is produced. After 1 second, the meter automatically returns to the normal measuring mode.

Note: It is always recommended to carry out a two-point calibration for better accuracy.

- For a *two-point calibration*, place the probe in pH 7.01 (or pH 6.86) buffer. After the calibration point has been accepted, the “pH 4.01 USE” message appears. The message is held for 12 seconds, unless a valid buffer is recognized. If no valid buffer is recognized, then the WRNG message is shown. If a valid buffer (pH 4.01, pH 10.01 or pH 9.18) is detected, then the meter completes the calibration procedure. When the buffer is accepted, the LCD shows the accepted value with the “OK 2” message on the secondary display. The meter then returns to the normal measuring mode.

Note: When the calibration procedure is completed, the CAL tag is turned on.

To quit calibration and to reset to the default values

- After entering the calibration mode and before the first point is accepted, it is possible to quit the procedure and return to the last calibration data by pressing the ON/OFF/MODE button. The secondary LCD displays ESC for 1 second and the meter returns to normal mode.
- To reset to the default values and clear a previous calibration, press the SET/HOLD button after entering the calibration mode and before the first point is accepted.
  The secondary LCD displays CLR for 1 second, the meter resets to the default calibration and the “CAL” tag on the LCD disappears.

METER SETUP

Setup mode allows the selection of the temperature unit and of the pH buffer set.
To enter the Setup mode, press and hold the ON/OFF/MODE button until CAL on the secondary display is replaced by TEMP and the current temperature unit (E.g. TEMP °C). Then:

- *for °C/°F selection*, use the SET/HOLD button. After the temperature unit has been selected, press ON/OFF/MODE to enter the buffer set selection mode; press ON/OFF/MODE twice to return to the normal measuring mode.

- *to change the calibration buffer set*, after setting the temperature unit, the meter will show the current buffer set: “pH 7.01 BUFF” (for 4.01/7.01/10.01) or “pH 6.86 BUFF” (for 4.01/6.86/9.18). Change the set with the SET/HOLD button, then press ON/OFF/MODE to return to normal mode.

BATTERY REPLACEMENT

The meter displays the remaining battery percentage when turned on. When the level is below 5%, the symbol on the bottom left of the LCD blinks to indicate a low battery condition. If the battery level is low enough to cause erroneous readings, the Battery Error Prevention System (BEPS) turns the meter off.
Unscrew the 4 screws located on the back of the meter and carefully replace the 3 AA batteries located in the battery compartment, while paying attention to their polarity. Reattach the back making sure that the gasket is in place and tighten the 4 screws to ensure a watertight seal.