Dear Customer,
Thank you for choosing a Hanna product. This manual will provide you with the necessary information for a correct operation.

If you need additional technical information, do not hesitate to e-mail us at tech@hannainst.com. These instruments are 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, notify your dealer or the nearest Hanna Service Center.

The meters are supplied with:
- HI 1293D pH electrode and HI 7630 fixed EC probe
- pH 4.01 and 7.01 buffer solutions (20 mL each)
- 1413 µS/cm calibration solution (20 mL), for HI 991404
- 12.88 mS/cm calibration solution (20 mL), for HI 991405
- 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 991404 and HI 991405 have been designed for continuous, high accuracy pH, EC/TDS and temperature measurements. These indicators continuously monitor the three most important nutrient parameters in hydroponics, greenhouses and horticultural applications with a single instrument. These micro-processor based meters feature a large, dual level, backlit LCD to give instantaneous readings of pH, EC or TDS and temperature, even from a distance.

Calibration and temperature compensation are automatic, while the TDS conversion factor and temperature coefficient are user adjustable for application-specific measurements. The HI 1293D advanced, non-clogging double-junction pH electrode and the rugged conductivity probe will withstand even the most aggressive environments.

The instruments are powered by a 12 Vdc transformer and are easy to install and use.

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, pipe thread 1/2” NPT
6. EC/TDS/Temperature probe, pipe thread 1/2” NPT (works also as matching pin for pH-electrode)
7. DIN connector
8. SET/HOLD button

WARRANTY

HI 991404 and HI 991405 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 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.

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To change the TDS conversion factor (CONV) and the
temperature compensation coefficient β (BETA):

- 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 conversion factor (E.g. 0.50 CONV).
- Use the SET/HOLD button to change the conversion factor.
- Press the MODE button to show the current temperature coefficient (E.g. 2.1 BETA).
- Use the SET/HOLD button to change the value.
- Press MODE to return to normal measuring mode.

To freeze the display
Press and hold the SET/HOLD button for 2-3 seconds, until “OFF” appears on the secondary display. Press either button to return to normal mode.

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).

To wash the electrode
The electrode should be rinsed with water before use. This helps to remove any debris or contamination that may have accumulated on the surface.

To store the electrode

- Immersing the electrode in a solution that is temperature compensated for temperature is shown on the primary LCD while the secondary LCD shows the temperature of the sample.
- Immerse the probes in the solution to be measured.
- Place the electrode and probe in any buffer from the selected buffer set (e.g. pH 7.01, 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” after entering the calibration mode. The lower 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 LCD.
- For a single-point pH calibration, place the electrode and the probe in any buffer from the selected buffer set (e.g. pH 7.01, 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 probe in pH 7.01 (or 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 solution (pH 4.01 or 10.01), or, if using NIST, pH 4.01 or 9.18.
- When the second buffer is recognized, the LCD will display “OK” for 1 second and the meter will return to normal measurement 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.

EC calibration procedure

- From EC measurement mode, press and hold the MODE button until “CAL” is displayed on the lower LCD.
- Release the button and immerse the probe in the proper calibration solution. HI 70031 (1413 µS/cm) for HI 991404 and HI 70030 (12.88 mS/cm) for HI 991405.
- Once the calibration has been automatically performed, the LCD will display “OK” for 1 second and the meter will return to normal measurement mode.
- Since there is a known relationship between EC and TDS readings, it is not necessary to calibrate the TDS range.

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.