



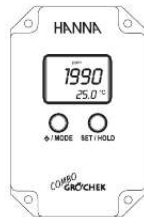
# Your PDF Guides

You can read the recommendations in the user guide, the technical guide or the installation guide for HANNA INSTRUMENTS HI 991404. You'll find the answers to all your questions on the HANNA INSTRUMENTS HI 991404 in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

**User manual HANNA INSTRUMENTS HI 991404**  
**User guide HANNA INSTRUMENTS HI 991404**  
**Operating instructions HANNA INSTRUMENTS HI 991404**  
**Instructions for use HANNA INSTRUMENTS HI 991404**  
**Instruction manual HANNA INSTRUMENTS HI 991404**

### Instruction Manual

**COMBO  
GRÖC'HEK**  
(HI 991404 - HI 991405)



### 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.

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

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

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](mailto: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.

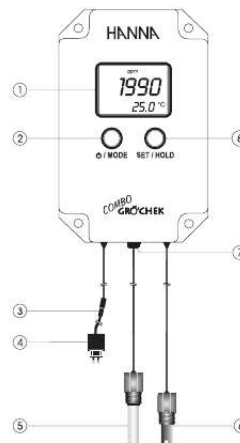
These micro-processor based meters feature a large, dual level, backlit LCD to give instantaneous readings of pH, EC or TDS and temperature, even from a distance.

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-lagging 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.

### 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, 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. SEV/HOLD button

### SPECIFICATIONS

Range	0.0 to 14.0 pH / 0.0 to 60.0°C / 32.0 to 122.0°F 0 to 3999 µS/cm / 0 to 2000 ppm (HI 991404) 0.00 to 20.00 mS/cm / 0.00 to 10.00 ppt (HI 991405)
Resolution	0.1 pH / 0.1°C / 0.1°F 1 µS/cm / 1 ppm (HI 991404) 0.01 mS/cm / 0.01 ppt (HI 991405)
Accuracy (@20°C/68°F)	±0.1 pH / ±0.5°C / ±1°F / ±2% FS for EC/TDS
Typical EMC Deviation	±0.1 pH / ±1°C / ±2°F / ±2.5 FS for EC/TDS
Temperature Compensation	Automatic, with β adjustable from 0.0 to 2.4%/°C for EC/TDS
TDS Factor	Adjustable from 0.45 to 1.00 (CONV)
Probes	HI 1293D pH electrode (included) HI 7630 conductivity probe (fixed)
pH Calibration	Automatic, 1 or 2 point with auto-buffer recognition
EC/TDS Calibration	Automatic, 1 point
Power Supply	12 Vdc power adapter (included)
Environment	0 to 50°C (32 to 122°F); RH max 95% non-condensing
Dimensions / Weight	160 x 105 x 31 mm (6.2x4.1x1.2") / 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 interference 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.

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### Manual abstract:

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](mailto:tech@hannainst.com). These instruments are in compliance with the directives. **FUNCTIONAL DESCRIPTION** Range **SPECIFICATIONS 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  $\mu\text{S}/\text{cm}$  calibration solution (20 mL), for HI 991404 · 12.88  $\text{mS}/\text{cm}$  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. [www.hannainst.com](http://www.hannainst.com) 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. @@@@All rights are reserved.

@@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. 0.0 to 14.0 pH / 0.0 to 60.0°C / 32.

0 to 122.0°F 0 to 3999  $\mu\text{S}/\text{cm}$  / 0 to 2000 ppm (HI 991404) 0.00 to 20.00  $\text{mS}/\text{cm}$  / 0.00 to 10.00 ppt (HI 991405) Resolution 0.1 pH / 0.1°C / 0.1°F 1  $\mu\text{S}/\text{cm}$  / 1 ppm (HI 991404) 0.01  $\text{mS}/\text{cm}$  / 0.

01 ppt (HI 991405) Accuracy (@20°C/68°F)  $\pm 0.1$  pH /  $\pm 0.5^\circ\text{C}$  /  $\pm 1^\circ\text{F}$  /  $\pm 2\%$  FS for EC/TDS Typical EMC Deviation  $\pm 0.1$  pH /  $\pm 1^\circ\text{C}$  /  $\pm 2^\circ\text{F}$  /  $\pm 2.5$  FS for EC/TDS Temperature Compensation Automatic, with adjustable from 0.

0 to 2.4%/°C for EC/TDS TDS Factor Adjustable from 0.45 to 1.00 (CONV) Probes HI 1293D pH electrode (included) HI 7630 conductivity probe (fixed) pH Calibration Automatic, 1 or 2 point with auto-buffer recognition EC/TDS Calibration Automatic, 1 point Power Supply 12 Vdc power adapter (included) Environment 0 to 50°C (32 to 122°F); RH max 95% non-condensing Dimensions / Weight 160 x 105 x 31 mm (6.2x4.

1x1.2") / 190 g (6.7 oz.) 1. 2. 3. 4. 5. Liquid Crystal Display ON/OFF/MODE button Power supply connector 12 VDC power adapter 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 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. @@@@Press and hold the MODE button for 2-3 seconds. All the used segments on the LCD will be visible for a few seconds. @@@TEMP °C).

@@@Press either button to return to normal mode. @@Immerse the probes in the solution to be tested. @@@@TEMP °C). @@@0.50 CONV). · Use the SET/HOLD button to change the conversion factor. @@@2.1 BETA). · Use the SET/HOLD button to change the value. · Press MODE to return to normal measuring mode.

@@ "OFF" will appear on the lower part of the display. Release the button. The display still lits, until the power supply is connected. @@@@The "CAL" symbol on the LCD will disappear. The meter will be reset to the default calibration. @@@TEMP °C). @@@ Press the SET/HOLD button to change the buffer value. · Press MODE to return to normal measuring mode. @@@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 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. 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  $\mu\text{S}/\text{cm}$ ) for HI 991404 and HI 70030 (12.

88  $\text{mS}/\text{cm}$ ) 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. @@@NEVER USE DISTILLED OR DEIONIZED WATER FOR STORAGE PURPOSES. @@@@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.



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



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