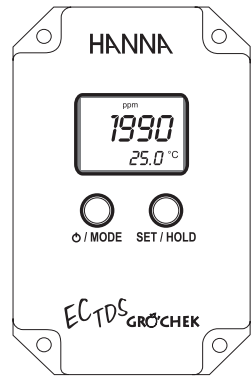


Instruction Manual

EC/TDS GRÖCHEK

(HI 993301 - HI 993302)



HANNA
instruments
www.hannainst.com

WARRANTY

HI 993301 and HI 993302 are warranted for two years against defects in workmanship and materials when used for their intended purpose and maintained according to instructions. **The probe is warranted for a period of 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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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.
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 7630 conductivity probe
- calibration solution sachet, 20 mL:
 - HI 70031 (1413 $\mu\text{S}/\text{cm}$) for HI 993301
 - HI 70030 (12.88 mS/cm) for HI 993302
- 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

The waterproof EC/TDS indicators HI 993301 and HI 993302 have been designed to meet the grower's need for equipment suited to the aggressive environments of agricultural and hydroponics applications.

The instruments feature a large, dual-level, backlit LCD to give instantaneous readings of both EC/TDS and temperature even from a distance.

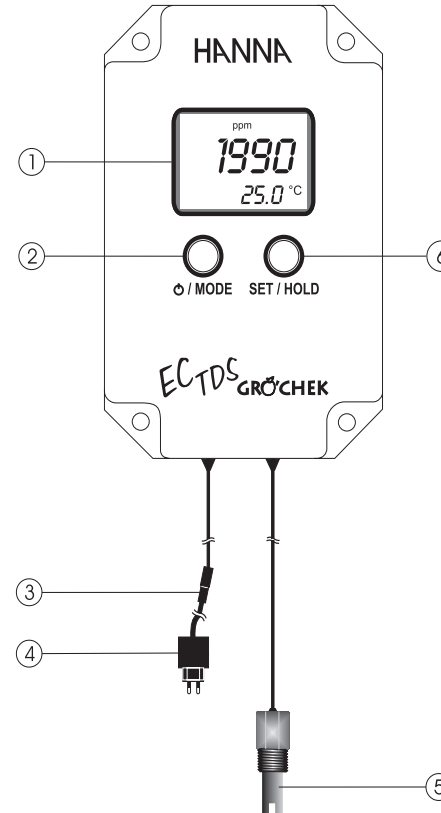
Calibration and temperature compensation are automatic, while the TDS factor and temperature coefficient are user adjustable for application specific measurements.

The HI 7630 probe is provided with built-in temperature sensor, and has been molded with pipe thread (1/2" NPT) for an easy in-line installation.

Choose the indicator according to the proper EC/TDS ranges for your application:

- HI 993301 measures EC from 0 to 3999 $\mu\text{S}/\text{cm}$ and TDS from 0 to 2000 ppm
- HI 993302 measures EC from 0.00 to 20.00 mS/cm and TDS from 0.00 to 10.00 ppt

FUNCTIONAL DESCRIPTION



1. Liquid Crystal Display
2. ON/OFF/MODE button
3. Power supply connector
4. 12 Vdc power adapter
5. HI 7630 conductivity probe with built-in temperature sensor and pipe thread 1/2" NPT
6. SET/HOLD button

SPECIFICATIONS

Range	0.0 to 60°C / 32.0 to 140°F 0 to 3999 $\mu\text{S}/\text{cm}$ / 0 to 2000 ppm (HI 993301) 0.00 to 20.00 mS/cm / 0.00 to 10.00 ppt (HI 993302)
Resolution	0.1°C / 0.1°F 1 $\mu\text{S}/\text{cm}$ / 1 ppm (HI 993301) 0.01 mS/cm / 0.01 ppt (HI 993302)
Accuracy (@20°C/68°F)	$\pm 0.5^\circ\text{C}$ / $\pm 1^\circ\text{F}$ / $\pm 2\%$ FS for EC/TDS
Typical EMC Deviation	$\pm 1^\circ\text{C}$ / $\pm 2^\circ\text{F}$ / $\pm 2.5\%$ FS for EC/TDS
Calibration	Automatic, 1 point
Probe	HI 7630 (fixed)
Temperature Compensation	Automatic, with β adjustable from 0.0 to 2.4%/°C
TDS Factor	Adjustable from 0.45 to 1.00 (CONV)
Power Supply	12 Vdc power adapter (included)
Environment	0 to 50°C (32 to 122°F); 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.) - meter only

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.

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 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

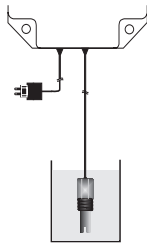
Press and hold the SET/HOLD button for 2-3 seconds until "HOLD" appears on the secondary display. Press either button to return to normal mode.

Taking measurements

Select either EC or TDS mode with the SET/HOLD button.

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

The EC or TDS value automatically compensated for temperature variations, is shown on the primary LCD, while the secondary LCD shows the temperature of the sample.



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

To change the TDS 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 compensation coefficient β (E.g. 2.1 BETA).
- Use the SET/HOLD button to change the value.
- Press MODE to return to normal measuring mode.

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 probe thoroughly with water and then with some of the sample to be measured.

CALIBRATION PROCEDURE

- From 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 993301 and HI 70030 (12.88 mS/cm) for HI 993302.
- 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 meter in TDS

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 7630 (*)	Conductivity probe with built-in temperature sensor and pipe thread 1/2" NPT
HI 70030P	12.88 mS/cm calibration solution, 20 mL sachet (25 pcs)
HI 70031P	1413 $\mu\text{S}/\text{cm}$ calibration solution, 20 mL sachet (25 pcs)
HI 70032P	1382 ppm calibration solution, 20 mL sachet (25 pcs)
HI 70038P	6.44 ppt calibration solution, 20 mL sachet (25 pcs)
HI 70442P	1500 ppm calibration solution, 20 mL sachet (25 pcs)
HI 7030M	12.88 mS/cm solution, 230 mL bottle
HI 7031M	1413 $\mu\text{S}/\text{cm}$ solution, 230 mL bottle
HI 7032M	1382 ppm solution, 230 mL bottle
HI 7038M	6.44 ppt solution, 230 mL bottle
HI 70442M	1500 ppm 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 710013	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.