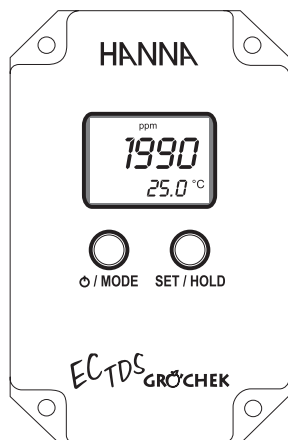


Instruction Manual

ECTDS GROČHEK

(HI 993301 - HI 993302)



HANNA
instruments
www.hannainst.com

CE
These Instruments are in
Compliance with CE
Directives

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.

All rights are reserved. Reproduction in whole or in part is prohibited without the written consent of the copyright owner, Hanna Instruments Inc., Woonsocket, Rhode Island, 02895, USA.

Hanna Instruments reserves the right to modify the design, construction 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. 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, immediately notify your Dealer or the nearest Hanna Customer Service Center.

The meters are supplied with:

- HI 70031 1413 $\mu\text{S}/\text{cm}$ calibration solution, for HI 993301;
- HI 70030 12.88 mS/cm calibration solution, for HI 993302;
- Hanna 12 VDC power adapter;
- Instruction manual.

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

EC/TDS GROČHEK is a combined EC/TDS/temperature meter specially designed to meet the needs of growers in greenhouses and hydroponic applications.

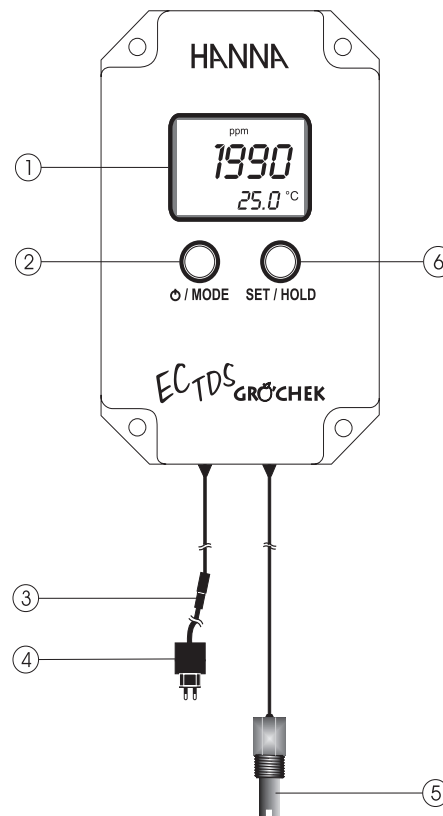
You can simply install the meter above the sample to be tested for continuous measurement.

The EC/TDS/Temperature probe has been molded with pipe thread (1/2" NPT), which allows the user to attach it to an in-line system.

Measurements are accurate and the meter can be calibrated at one point.

You no longer need to worry about battery changes either: the unit runs without interruption on 12 VDC power supply.

FUNCTIONAL DESCRIPTION



1. Liquid Crystal Display
2. ON/OFF/MODE button
3. Power supply connector
4. 12 VDC power adapter
5. EC/TDS/Temperature probe, pipe thread 1/2" NPT
6. SET/HOLD button

SPECIFICATIONS

HI 993301

EC/TDS Range	0 to 3999 $\mu\text{S}/\text{cm}$ - 0 to 2000 ppm
Resolution	1 $\mu\text{S}/\text{cm}$ - 1 ppm
Accuracy (@20°C/68°F)	±2% f.s.
Typical EMC Deviation	±2.5% f.s.

HI 993302

EC/TDS Range	0.00 to 20.00 mS/cm - 0.00 to 10.00 ppt
Resolution	0.01 mS/cm - 0.01 ppt
Accuracy (@20°C/68°F)	±2% f.s.
Typical EMC deviation	±2.5% f.s.

Common specifications

Temperature Range	0.0 to 60°C (32.0 to 140°F)
Resolution	0.1°C or 0.1°F
Accuracy (@20°C/68°F)	±0.5 °C or ±1°F
Typical EMC Deviation	±1 °C or ±2 °F
Temp. Compensation	$\beta=0.0$ to 2.4%/°C
TDS Conversion factor	0.45 to 1.00 (CONV)
Calibration	Automatic at 1 point
Power supply	12VDC power adapter (included)
Environment	0 to 50°C (32 to 122°F); RH 95% non-condensing
Dimensions (meter only)	160 x 105 x 31 mm (6.2 x 4.1 x 1.2")
Weight (meter only)	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.

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

To turn the meter on

Connect the 12VDC 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. Eg. **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

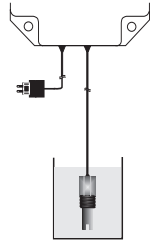
Press and hold the SET/HOLD button for 2-3 seconds until **HOLD** appears on the secondary display.

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. In order to ensure better accuracy, 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 is shown on the primary LCD while the secondary LCD shows the temperature of the sample.

The measurements should be taken when the stability symbol α on the top left of the LCD disappears.

To change the EC/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. Eg. **TEMP °C**.

- Press the MODE button again to show the current conversion factor. Eg. **0.50 CONV**.

- Press the SET/HOLD button to change the conversion factor.

- Press the MODE button to show the current temperature compensation coefficient β . Eg. **2.1 BETA**.

- Press the SET/HOLD button to change the temperature compensation coefficient β .

- Press the MODE button 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 to eliminate cross-contamination; and after cleaning, rinse the probe 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 70030P	12.88 mS/cm @25°C cal. solution, 20 mL sachet (25 pcs)
HI 70031P	1413 $\mu\text{S}/\text{cm}$ @25°C cal. solution, 20 mL sachet (25 pcs)
HI 70032P	1382 ppm @25°C cal. solution, 20 mL sachet (25 pcs)
HI 70038P	6.44 ppt @25°C cal. solution, 20 mL sachet (25 pcs)
HI 70442P	1500 ppm @25°C cal. solution, 20 mL sachet (25 pcs)
HI 7061M	Electrode cleaning solution, 230 mL bottle
HI 70300M	Electrode storage solution, 230 mL bottle
HI 710005	12VDC power adapter, US plug
HI 710006	12VDC power adapter, European plug
HI 710012	12VDC power adapter, Australian plug
HI 710013	12VDC power adapter, Southern Africa plug
HI 710014	12VDC power adapter, UK plug