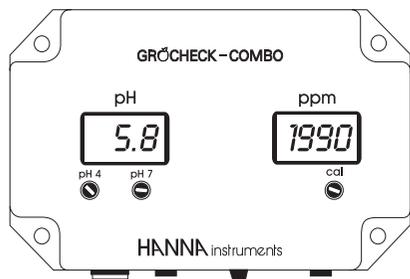


# Instruction Manual

## GRÖCHECK - COMBO

(HI 981404N and HI 981405N)

### pH & TDS/EC Monitors



**HANNA**  
instruments  
www.hannainst.com

### WARRANTY

HI 981404N and HI 981405N 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.

Damages 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 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.

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.  
Please read carefully this instruction manual before using the meter.  
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, immediately notify your Dealer or the nearest Hanna Customer Service Center.

Each meter is supplied complete with:

- HI 1286 pH electrode
- HI 1283 grounding probe
- Conductivity probe
- HI 7634 for HI 981404N & HI 7632 for HI 981405N
- Calibration screwdriver
- 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 981404N (pH and TDS) and HI 981405N (pH and EC) are specially designed to meet the needs of simple continuous monitoring.

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

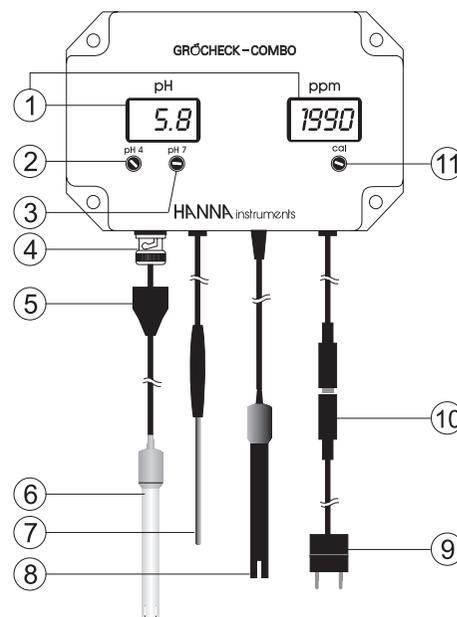
The HI 1286 gel-filled pH electrode features a waterproof sheath to protect BNC connector against humidity and vapours. Moreover, the unique design of the electrode provides longer life in aggressive solutions.

The meter is equipped with two large LCDs for easy-to-read measurements even from a distance.

Measurements are accurate and the meters can be calibrated at one or two points for pH, and at a single point for TDS and EC.

You no longer need to worry about battery changes because these units run without interruption on 12 Vdc power supply.

### FUNCTIONAL DESCRIPTION



1. Liquid Crystal Displays
2. "pH 4" calibration trimmer
3. "pH 7" calibration trimmer
4. BNC connector
5. Protective sheath
6. HI 1286 pH electrode
7. HI 1283 grounding probe
8. HI 7632 or HI 7634 probe (depending on model)
9. 12 Vdc power adapter
10. Power supply connector
11. EC or TDS calibration trimmer

### SPECIFICATIONS

Common Specifications	
Range	0.0 to 14.0 pH
Resolution	0.1 pH
Accuracy (@ 25°C/77°F)	±0.2 pH
Calibration	Manual, 1 or 2 point
Probes	HI 1286 pH electrode (included) and HI 1283 grounding probe (fixed)
Environment	0 to 50°C (32 to 122°F); RH max 95%
Power Supply	12 Vdc adapter (included)
Dimensions	160 x 110 x 35 mm (6.3 x 4.3 x 1.4")
Weight	300 g (10.6 oz.)
<b>HI 981404N only</b>	
Range	0 to 1990 mg/L (ppm)
Resolution	10 mg/L (ppm)
Accuracy (@ 25°C/77°F)	±2% f.s.
TDS Factor	0.7 ppm = 1 µS/cm
Temperature Compensation	Automatic, 5 to 50°C (41 to 122°F) TDS only
Calibration	Manual, 1 point
TDS Probe	HI 7634 (fixed)
<b>HI 981405N only</b>	
Range	0.00 to 9.99 mS/cm
Resolution	0.01 mS/cm
Accuracy (@ 25°C/77°F)	±2% f.s.
Temperature Compensation	Automatic, 5 to 50°C (41 to 122°F) EC only
Calibration	Manual, 1 point
EC Probe	HI 7632 (fixed)

#### 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 the 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 voltage at the measurement surface exceeds 24 Vac or 60 Vdc. To avoid damage or burns, do not perform any measurement in microwave ovens.

## OPERATIONAL GUIDE

### pH ELECTRODE CONNECTION

In order to protect the instrument against vapors and humidity, the BNC connector is shielded behind a waterproof sheath.

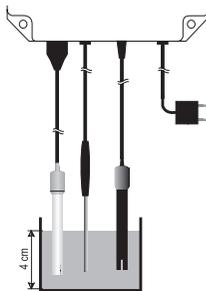
- Slide the protective sheath down, connect the pH electrode to the BNC connector and then slide the protective sheath back up. For maximum waterproof protection, make sure the connector is completely covered.
- Do not be alarmed if white crystals appear around the electrode protective cap. This is normal with pH electrodes and they dissolve when rinsed with water.

### TAKING MEASUREMENTS

- Turn the meter on by connecting the 12 Vdc power adapter to the meter and the mains.
- Remove the protective cap from the pH electrode.
- Immerse the tips (4cm/1½") of pH electrode, conductivity and grounding probes into the sample.

For better accuracy, the probes should not touch or stand close to the vessel's walls or bottom.

- The two LCDs will show the pH and EC (or TDS) values. Any initial variation may be due to the pH electrode conditioning and EC/TDS temperature compensation. Allow the readings to stabilize.



### pH ELECTRODE MAINTENANCE

- When not in use, rinse the electrode with water and store it with a few drops of storage (HI 70300) or pH7 (HI 7007) solution in the protective cap. Always replace the protective cap after use.

DO NOT USE DISTILLED OR DEIONIZED WATER FOR STORAGE PURPOSES.

- If the electrode has been left dry, soak the tip in a storage (HI 70300) or pH7 (HI 7007) solution overnight to reactivate it.

- To minimize clogging and provide longer life for the pH electrode, it is recommended to clean it at least once a month. Immerse the tip of the electrode in HI 7061 cleaning solution for half an hour and then rinse it with tap water.

### CONDUCTIVITY PROBE MAINTENANCE

The following cleaning procedure is recommended at least once a month:

- Immerse the tip of the probe in HI 7061 cleaning solution for half an hour.
- If a more thorough cleaning is required, brush the metal pins with very fine sandpaper.
- After cleaning, rinse the probe with tap water.

## CALIBRATION

The instrument must be recalibrated whenever:

- a) After cleaning or replacing the probe
- b) Where high accuracy is required
- c) At least once a month

### pH CALIBRATION

Pour small quantities of pH 7.0 (HI 7007) and pH 4.0 (HI 7004) or pH 10.0 (HI 7010) solution into two clean beakers.

For accurate calibration use two beakers for each buffer solution, the first one for rinsing the tip of the electrode and the second one for calibration.

- Turn the meter on.
- Remove the protective cap, rinse and immerse pH electrode and grounding probe in pH 7.0 buffer solution. Stir gently and wait for the reading to stabilize.

**Note:** The pH electrode should be submerged approximately 4 cm (1½") in the solution.

- With the calibration screwdriver, adjust the "pH 7" trimmer until the LCD shows "pH 7.0".
- Rinse and immerse pH electrode and grounding probe in pH 4.0 (or pH 10.0) buffer. Stir gently.

- Wait a couple of minutes and then adjust the "pH 4" trimmer until the LCD shows "pH 4.0" (or "pH 10.0").

The pH calibration is now complete.

### CONDUCTIVITY CALIBRATION

- Turn the meter on.
- Pour a small quantity of the proper calibration solution in a beaker (HI 7031 for HI 981405N and HI 70442 for HI 981404N). If possible, use plastic beakers to minimize any EMC interference.
- Immerse the conductivity probe in the solution, making sure that the metal pins are completely submerged.

**Note:** For best accuracy, the probe body does not touch nor stand close to the side walls of the beaker.

- Wait for a couple of minutes for thermal equilibrium to be reached and the temperature to be compensated.
- Tap the probe gently on the bottom, then shake it to make sure no air bubbles have remained trapped.
- With the supplied screwdriver, adjust the calibration trimmer until the display shows 1.41 mS/cm (HI 981405N) or 1500 ppm (HI 981404N).

Calibration is now complete.

## ACCESSORIES

HI 1286	Double junction, plastic body pH electrode with 2 m (6.6') cable and BNC connector
HI 1283*	Stainless steel grounding probe with 2 m (6.6') cable
HI 7632*	Conductivity probe with 2 m (6.6') cable for HI 981405N
HI 7634*	Conductivity probe with 2 m (6.6') cable for HI 981404N
HI 70004P	pH 4.01 buffer, 20 mL sachet, 25 pcs
HI 70007P	pH 7.01 buffer, 20 mL sachet, 25 pcs
HI 70010P	pH 10.01 buffer, 20 mL sachet, 25 pcs
HI 7004M	pH 4.01 buffer solution, 230 mL bottle
HI 7007M	pH 7.01 buffer solution, 230 mL bottle
HI 7010M	pH 10.01 buffer solution, 230 mL bottle
HI 7004L	pH 4.01 buffer solution, 500 mL bottle
HI 7007L	pH 7.01 buffer solution, 500 mL bottle
HI 7010L	pH 10.01 buffer solution, 500 mL bottle
HI 70031P	1.41 mS/cm solution, 20 mL sachet, 25 pcs
HI 70442P	1500 ppm solution, 20 mL sachet, 25 pcs
HI 7031M	1.41 mS/cm standard solution, 230 mL bottle
HI 70442M	1500 ppm standard solution, 230 mL bottle
HI 7031L	1.41 mS/cm standard solution, 500 mL bottle
HI 70442L	1500 ppm standard solution, 500 mL bottle
HI 70300M	Storage solution, 230 mL bottle
HI 70300L	Storage solution, 500 mL bottle
HI 7061M	Cleaning solution, 230 mL bottle
HI 7061L	Cleaning solution, 500 mL bottle
HI 710005	12 Vdc power adapter, US plug
HI 710006	12 Vdc power adapter, European plug
HI 710012	12 Vdc power adapter, Australian plug
HI 710013	12 Vdc power adapter, Southern Africa plug
HI 710014	12 Vdc power adapter, UK plug

\* To be replaced by authorized technical personnel only

## CE DECLARATION OF CONFORMITY

<b>DECLARATION OF CONFORMITY</b>	
We	
Hanna Instruments Italia Srl via E.Fermi, 10 35030 Sarmeola di Rubano - PD ITALY	
herewith certify that the meters:	
<b>HI 981404N and HI 981405N</b>	
have been tested and found to be in compliance with EMC Directive 89/336/EEC and Low Voltage Directive 73/23/EEC according to the following applicable normatives:	
EN 50082-1: Electromagnetic Compatibility - Generic Immunity Standard IEC 801-2: Electrostatic Discharge IEC 801-3: RF Radiated IEC 801-4: Fast Transient	
EN 50081-1: Electromagnetic Compatibility - Generic Emission Standard EN 55022: Radiated, Class B	
EN61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use	
Date of Issue: 02.08.2000	 A. Marsilio - Technical Director On behalf of Hanna Instruments S.r.l.