Instruction Manual

HI 9835

Waterproof
EC/TDS/NaCl/°C Meter
for Lab and Field

Manual abstract:

hannainst.com Dear Customer, Thank you for choosing a HANNA instruments® product. Please read this instruction manual carefully before using the instrument. This manual will provide you with the necessary information for correct use of the instrument, as well as a precise idea of its versatility. If you need additional technical information, do not hesitate to e-mail us at tech@hannainst.com. This instrument is in compliance with the directives. PRELIMINARY EXAMINATION Remove the instrument from the packing material and examine it carefully to make sure that no damage has occurred during shipping. If there is any damage, notify your Dealer. Each meter is supplied complete with: · · · · HI 76309 conductivity probe with 1 m (3. 3') cable Batteries (4 x 1.5V AA alkaline) Instruction manual Rugged carrying case. Note: Save all packing material until you are sure that the instrument functions correctly. Any defective item must be returned in its original packaging together with the supplied accessories. TABLE OF CONTENTS PRELIMINARY EXAMINATION .

..... 19 GENERAL DESCRIPTION HI 9835 is a portable microprocessor-based EC/TDS/NaCl/temperature meter. The autoranging feature of the EC and TDS ranges automatically sets the meter to the scale with the highest possible resolution. The measurements are automatically (ATC) or manually (MTC) compensated for temperature.

The temperature coefficient value is user selectable as well as the TDS conversion factor. The temperature compensation can also be disabled to measure the actual conductivity. The housing is completely waterproof and built to stand the harsh conditions of field use. For extended time operations, this meter can be connected to an external 12 Vdc power supply. *2 3 FUNCTIONAL DESCRIPTION SPECIFICATIONS Range EC 0.00 to 29.99 S/cm (Autoranging) 30.0 to 299.*
9 S/cm 300 to 2999 S/cm 3.00 to 29.99 mS/cm 30.0 to 200.0 mS/cm up to 500.
0 mS/cm actual(*) conductivity TDS 0.00 to 14.99 ppm (Autoranging) 15.0 to 149.9 ppm 150 to 1499 ppm 1.

50 to 14.99 g/L 15.0 to 100.0 g/L up to 400.0 g/L actual(*) TDS (with 0.80 factor) NaCl 0.0 to 400.0 % Temp. 0.0 to 60.

0 °C Resolution EC 0.01 S/cm (0.00 to 29.99 S/cm) 0.1 S/cm (30.0 to 299.9 S/cm) 1 S/cm (300 to 2999 S/cm) 0.01 mS/cm (3.00 to 29.99 mS/cm) 0.
1 mS/cm (over 30.0 mS/cm) TDS 0.01 ppm (0.00 to 14.99 ppm) 0.
1 ppm (15.0 to 149.9 ppm) 1 ppm (150 to 1499 ppm) 0.01 g/L (1.50 to 14.
99 g/L) 0.1 g/L (over 15.0 g/L) NaCl 0.1 % Temp. 0.1°C EC TDS NaCl Temp. ±1% of reading ± (0.05 S/cm or 1 digit) ±1% of reading ± (0.03 ppm or 1 digit) ±1% of reading ±0.4°C ±1% of reading ±1% of reading ±1% of reading ±0.

1 °C Power adapter socket Probe connector Liquid Crystal Display (LCD) ON/OFF key, to turn the meter on and off ALT key, to activate alternate key function RANGE/FIXED key, to select measurement range or (with ALT) freeze the current range on the LCD 7) CAL/CALT key, to enter calibration mode 8) CFM key, to move down or (with ALT) confirm values 9) ATC/TC key, to select temperature compensation mode or (with ALT) view the temperature coefficient value 10) FNC key, to move up or (with ALT) enter setup mode 4 1) 2) 3) 4) 5) 6) Accuracy Typical EMC EC Deviation TDS NaCl Temp. (*) Actual conductivity (or TDS) is the conductivity (or TDS) value of a solution without temperature compensation. 5 EC Calibration NaCl Calibration Temperature Calibration Temperature Compensation Temperature Coefficient TDS Factor Probe Auto-off Power supply Casing Environment Dimensions Weight 1 point, with 6 memorized buffers 84,1413,5000,12880,80000,111800 S/cm 1 point, with HI 7037 buffer (optional) 2 point, at 0 and 50°C (plus ±1°C adjustment) Automatic or Manual from 0 to 60°C (can be disabled to measure actual conductivity) Adjustable from 0.00 to 6.00 %/°C (EC and TDS only); default value is 1.90%/°C Adjustable from 0.40 to 0.80 (default 0.50) HI 76309 4-ring probe with K=1 (nominal) and built-in temperature sensor (included) After 5 minutes of non-use (can be disabled) 4x1.5V AA alkaline type batteries (included), or 12 Vdc adapter IP 67 0 to 50°C (32 to 122°F); RH max 100% 196 x 80 x 60 mm (7.
7 x 3.1 x 2.4") 500 g (1.1 lb.) TAKING MEASUREMENTS Press the ON/OFF key to turn the meter on.
Immerse the probe into the solution to be tested. The sleeve holes must be completely submerged. @@If needed, press the RANGE key repeatedly until the desired range (EC, TDS or NaCl) is selected on the LCD. Allow for the reading to stabilize. The upper LCD displays the measure in the selected range while the temperature is displayed on the lower LCD.
Notes: I If the meter displays "----" the reading is out of range. II If the reading is unstable, the stability indicator " " blinks. III The "gm" indication on the LCD means "g/L". IV Make sure the meter is calibrated before taking measurements. V If measurements are taken successively in different samples, it is recommended to rinse the probe thoroughly with deionized water before immersion in the samples. VI To maximize battery life, the meter automatically switches off after 5 minutes of non-use. To reactivate the instrument press ON/OFF. This feature can be disabled by entering the setup mode and selecting the "AoF" item (see "Setup" section for details). VII TDS reading is obtained multiplying the EC reading by the TDS factor, which has a default value of 0.50.

It is possible to change the TDS factor in the 0.40 to 0.80 range by entering the setup mode and selecting the "tdS" item (see "Setup" section for details). @@Replace the back cover. @@Tighten the threaded ring. @@@@@@"F1" symbol blinks on the LCD. To restore the autoranging option press ALT+FIXED again. @@@@To enter EC calibration, select the EC range and press the CAL key. @@Pressing CAL while TDS range is selected has no effect. @@Immerse the probe into the solution.
The sleeve holes must be completely submerged. @@For zero calibration, just leave the dry probe in air. The indications "BUF" and "CAL" are displayed. The upper LCD shows the uncalibrated EC reading. The lower LCD shows the buffer value.
The stability indicator " " blinks. Select the desired value with the and keys, if necessary. When the " " symbol stops blinking, the reading is stable. @@@@This is the default option. @@The compensation is referenced at 25°C.
The "°C" symbol blinks when this option is active.

@@The reading displayed on the upper LCD is the actual EC or TDS value. @@@@Note: The default compensation mode is ATC. @@@@@@@@@@@@II For best results choose a calibration solution with an EC value as close as possible to the sample to be measured. 9 III IV V Use plastic beakers to minimize any EMC interference. The meter uses 1.90%/°C compensation factor during calibration. If the setup item "tc" has been set to a different value, when exiting the calibration mode the value displayed on the upper LCD could be different from the solution nominal value. It is possible to set the cell constant value directly without following the calibration procedure. Enter the setup mode and select "CEL" (see "Setup" section for details).

TEMPERATURE CALIBRATION (for technical personnel only) The temperature calibration is a 2 point procedure, at 0 and 50°C. · Immerse the probe in a 0°C temperature bath. · Press ALT+CALT to enter temperature calibration mode. · The lower LCD displays "0.0 °C"; "BUF" and "CAL" tags appear. · When the reading is stable, "CON" symbol starts blinking. · Press ALT+CFM to confirm. The lower LCD displays "50910 12150 12390 12640 12880 13130 13370 13620 13870 14120 14370 776 896 1020 1147 1173 1199 1225 1251 1278 1305 1332 1359 1386 1413 1440 1467 1494 1521 1548 1575 64 65 67 68 70 71 73 74 76 78 79 81 82 84 86 87 89 90 92 94 48300 53500 59600 65400 67200 68500 69800 71300 72400 74000 75200 76500 78300 80000 81300 83000 84900 86300 88200 90000 65400 74100 83200 92500 94400 96300 98200 100200 102100 104000 105900 107900 109800 111800 113800 115700 117700 119700 121800 123900 2760 3180 3615 4063 4155 4245 4337 4429 4523 4617 4711 4805 4902 5000 5096 5190 5286 5383 5479 5575 or Note: Press ALT+FNC before confirmation to escape without changing the previously set value. 12 13 The following table lists the setup items, their valid range of values and the factory settings (default): Item tc tcE tdS CEL Aof vEr Chr Description Temp. compensation coeff.

Temp. compensation mode TDS factor Cell constant (K) Auto-off enable Firmware release Battery level test Valid values Default 0.00 to 6.00 %/°C 1.90 Atc, Mtc, notc Atc 0.

40 to 0.80 0.50 0.500 to 1.700 1.

000 On, OFF On BATTERY REPLACEMENT When the batteries are inserted and no power adapter is connected, the meter can recognize the following battery charge levels: · Low battery - "LOBAT" indication is displayed on the LCD. Backlight is automatically disabled and it is not possible to enable it until new batteries are inserted or an external power adapter is used. When "LOBAT" appears, batteries have typically 10% of their life left and the meter is still measuring properly. · Very weak battery - The meter shuts off to avoid erroneous operations. Note: If the meter is not powered for several minutes (e.g. in dead battery condition), the current date and time are lost. Battery replacement must only take place in a safe area and using 1.5V alkaline AA type batteries. In order to replace run down batteries, simply remove the two screws on the rear cover of the instrument and replace the four 1.

5V AA batteries with new ones, paying attention to the correct polarity. New batteries allow approximately 150 hours of continuous use. A 12 Vdc power adapter can also be used. It is recommended to use the HANNA voltage adapters that provide the proper polarity configuration. However, other adapters can be used. In this case, check the polarity of the adapter before connecting it to the meter. Notes I Once enabled, the Auto-off time is fixed at 5 minutes. II When the battery level test is selected (Chr), the LCD will display the remaining percentage of battery charge. 100% means fully charged battery and 0% corresponds to the minimum battery level that allows the meter to operate. The battery charge level calculation is based on a typical alkaline battery discharge curve.

If the meter is connected to an external power adapter and "Chr" is selected, the LCD will display "LINE". PROBE MAINTENANCE After measurements, rinse the probe with clean water. If a more thorough cleaning is required, remove the probe sleeve and clean the probe with a cloth or a nonabrasive detergent. Make sure to reinsert the sleeve onto the probe properly and in the right direction. After cleaning the probe, recalibrate the instrument. 14 15 ACCESSORIES CONDUCTIVITY CALIBRATION SOLUTIONS HI 70030P HI 7030L HI 7030M HI 70031P HI 7031L HI 7031M HI 70033P HI 7033L HI 7033M HI 7034L HI 7034M HI 7035L HI 7035M HI 70039P HI 7039L HI 7039M HI 7037L 12880 S/cm solution, 20 mL sachet (25 pcs.) 12880 S/cm solution, 500 mL bottle 12880 S/cm solution, 230 mL bottle 1413 S/cm solution, 20 mL sachet (25 pcs.) 1413 S/cm solution, 500 mL bottle 1413 S/cm solution, 230 mL bottle 84 S/cm solution, 20 mL sachet (25 pcs.) 84 S/cm solution, 500 mL bottle 84 S/cm solution, 230 mL bottle 80000 S/cm solution, 500 mL bottle 80000 S/cm solution, 230 mL bottle 111800 S/cm solution, 500 mL bottle 111800 S/cm solution, 230 mL bottle 5000 S/cm solution, 20 mL sachet (25 pcs.) 5000 S/cm solution, 500 mL bottle 5000 S/cm solution, 230 mL bottle 100% NaCl standard solution, 500 mL bottle OTHER ACCESSORIES HI 76309 HI 76310 HI 710005 HI 710006 HI 710012 HI 710013 HI 710014 HI 740036 HI 740034 HI 76405 Stainless steel 4-ring conductivity probe with builtin temperature sensor and 1 m (3.

3') cable. Platinum 4-ring conductivity probe with built-in temperature sensor and 1 m (3.3') cable. 12 Vdc voltage adapter, US plug 12 Vdc voltage adapter, European plug 12 Vdc voltage adapter, UK plug 12 Vdc voltage adapter, South-african plug 12 Vdc voltage adapter, Australian plug 100 mL plastic beaker (6 pcs) Cap for 100 mL beaker (6 pcs) Electrode holder PROBE CLEANING SOLUTIONS HI 7061M HI 7061L General cleaning solution, 230 mL bottle General cleaning solution, 500 mL bottle 16 17 WARRANTY All Hanna Instruments meters are warranted for two years against defects in workmanship and materials when used for their intended purpose and maintained according to instructions. The electrodes and 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.

@@@@@@@Avoid touching these metal bands at all times. To maintain the EMC performance of this equipment the recommended cables must be used. Any variation introduced by the user to the supplied equipment may degrade the instruments EMC performance.

Hanna Instruments reserves the right to modify the design, construction and appearance of its products without advance notice. To avoid electrical shock, do not use this instrument when voltage at the measurement surface exceeds 24 Vac or 60 Vdc. To avoid damages or burns, do not perform any measurement in microwave ovens. 18 19 SALES AND TECHNICAL SERVICE CONTACTS Australia: Tel. (03) 9769.0666 · Fax (03) 9769.0699 China: Tel. (10) 88570068 · Fax (10) 88570060 Egypt: Tel. & Fax (02) 2758.683 Germany: Tel. (07851) 9129-0 · Fax (07851) 9129-99 Greece: Tel. (210) 823. 5192 · Fax (210) 884.0210 Indonesia: Tel. (21) 4584.2941 · Fax (21) 4584.2942 Japan: Tel. (03) 3258.9565 · Fax (03) 3258.9567 Korea: Tel. (02) 2278.5147 · Fax (02) 2264.1729 Malaysia: Tel. (603) 5638.9940 · Fax (603) 5638.9829 Singapore: Tel. 6296.

7118 · Fax 6291.6906 South Africa: Tel. (011) 615.6076 · Fax (011) 615.8582 Taiwan: Tel. 886.2.2739.3014 · Fax 886.2. 2739.2983 Thailand: MAN9835R2 Tel. 66.2619.0708 · Fax 66. 2619.0061 United Kingdom: Tel. (01525) 850.855 · Fax (01525) 853.668 09/05 USA: Tel. (401) 765.7500 · Fax (401) 765.7575 For e-mail contacts and complete list of Sales and Technical offices, please see www.hannainst.com .