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You can read the recommendations in the user guide, the technical guide or the installation guide for HANNA INSTRUMENTS HI 8711. You'll find the answers to all your questions on the HANNA INSTRUMENTS HI 8711 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 8711**  
**User guide HANNA INSTRUMENTS HI 8711**  
**Operating instructions HANNA INSTRUMENTS HI 8711**  
**Instructions for use HANNA INSTRUMENTS HI 8711**  
**Instruction manual HANNA INSTRUMENTS HI 8711**

**Instruction Manual**

**HI 8510 • HI 8512**  
**HI 8710 • HI 8711**  
**HI 8720**

**Panel Mounted  
pH and ORP  
Indicators and Controllers**



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**Manual abstract:**

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 noticeable damage, immediately notify your dealer. Each model is supplied complete with transparent splash-proof front cover, mounting brackets and instruction manual. Note: Save all packing materials until you are sure that the instrument functions correctly. All defective items must be returned in the original packing materials together with the supplied accessories. GENERAL DESCRIPTION HI 8510 and HI8512 pH and ORP panelmounted indicators, and HI 8710, HI 8711 and HI 8720 pH and ORP controllers, are ideal for process control monitoring in a wide range of industrial applications. These instruments have been designed for easy and fast installation, and are provided with membrane keypads on the front panel, large display and autodiagnostic functions. All connections are made through screw terminals on the rear panel. Two versions are available for each model, to accept either a direct input from a pH or ORP electrode (E version) or from a transmitter through 4-20 mA input (T version). Moreover, you can choose the output configuration for connecting a recorder or a PLC, between 0-20 or 4-20 mA. TABLE OF CONTENTS Preliminary Examination .

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..... 55 2 2£ 3 AVAILABLE MODELS HI 8510E020 HI 8510E420 HI 8510T020 HI 8510T420 pH indicator with electrode input and 0-20 mA recorder output  
pH indicator with electrode input and 4-20 mA recorder output pH indicator with input from transmitter and 0-20 mA recorder output pH indicator with input  
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with input from transmitter and 0-20 mA recorder output ORP controller with input from transmitter and 4-20 mA recorder output HI 8711E020 HI 8711E420 HI 8512E020 HI 8711T020 HI 8512E420 HI 8711T420 HI 8512T020 HI 8720E020 HI 8512T420 HI 8720E420 HI 8710E020 HI 8720T020 HI 8710E420 HI 8720T420 4 4£ 5 MECHANICAL DIMENSIONS The meters are provided with a black anodized aluminum body, front and back panels in shockproof ABS plastic and a transparent splash-proof front cover. Front view of the panel-mounted unit FUNCTIONAL DESCRIPTION HI 8510 FRONT PANEL pH HI 8510E pH 141mm 5.55" 144mm 5.

67" SLOPE 69mm 2.71" 72mm 2.83" SENSOR TEST The dimensions show the cutout size for the installation. Side view of the panel-mounted unit 0.25/4mm 0.

01/0.160" ADJUSTABLE LOCATION BRACKET pH 7 TEST pH 4 TEST Keypad 144mm 5.67" 135mm 5.31" 190mm MIN 7.50" Adjustable location brackets (supplied with the meter) allow the indicator to slide into the cutout and will hold the unit securely in place.

190 mm (7.50") is the minimum space required to install the indicator with complete wiring. 6 SENSOR TEST To display the mV reading of the electrode and, therefore, verify its working condition pH 7 TEST To verify the internal circuit of the meter in terms of Offset compensation pH 4 TEST To verify the amplifier circuit of the meter Trimmers For Offset calibration O SLOPE For Slope calibration 7 6£ REAR PANEL HI 8510E REAR PANEL HI 8510T 5 ELECTRODE INPUT 4 3 PT100 + mA OUT - FUSE 1 FUSE 2 220 110 L 1. Fuse holder 2. Power supply terminals 3. Recorder output terminals 4. Connections for Pt100 temperature sensor 5. BNC socket for pH electrode 1. Fuse holder 2. Power supply terminals 3.

Recorder output terminals 4. Connections to the transmitter Unplug the instrument from the power supply before replacing the fuse. 8 Unplug the instrument from the power supply before replacing the fuse. 8£ 9 FUNCTIONAL DESCRIPTION HI 8512 FRONT PANEL REAR PANEL HI 8512E ORP HI 8512E 4 ELECTRODE INPUT mV 3 SLOPE + mA OUT - FUSE 0 mV TEST 500 mV TEST 1 FUSE 2 220 110 L Keypad 0 mV TEST To verify the instrument calibration at 0 mV 500 mV TEST To verify the slope at 500 mV Trimmers SLOPE For slope calibration 1. Fuse holder 2. Power supply terminals 3. Recorder output terminals 4. BNC socket for ORP electrode Unplug the instrument from the power supply before replacing the fuse. 10 10£ 11 FUNCTIONAL DESCRIPTION HI 8710 REAR PANEL HI 8512T FRONT PANEL pH HI 8710E pH SLOPE ACID BASE 0 AL SET MEA SURE COARSE SENSOR TEST AL SET FINE pH 7 TEST pH 4 TEST To set the pH dosage limit To enter measurement mode and to enable diagnostic tests SENSOR TEST To display electrode mV reading and verify its working condition To display & set alarm tolerance AL pH 7 TEST To verify Offset compensation pH 4 TEST To verify amplifier circuit Keypad SET MEASURE 1. Fuse holder 2.

Power supply terminals 3. Recorder output terminals 4. Connections to the transmitter Unplug the instrument from the power supply before replacing the fuse. 12 Trimmers O SLOPE AL SET/COARSE SET/FINE For Offset calibration For Slope calibration To set the alarm tolerance To coarsely adjust the setpoint To finely adjust the setpoint LEDs ACID Show that acid dosage is active BASE Show that basic dosage is active AL (blinking) Indicate an active alarm 13 12£ REAR PANEL HI 8710E REAR PANEL HI 8710T 9 ELECTRODE INPUT 8 7 3 PT100 + mA OUT OPEN: ACID SHORT: BASE 5 4 6 2 SET CONSENT FUSE ALARM 1 FUSE 1.



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Fuse holder 2.

Power supply terminals 3. Acid/Basic dosage selection terminals 4. Red/ox dosage consent terminals 5. Connections for dosing pump 6. Alarm contacts 7. Recorder output contacts 8. Connections for Pt100 temperature sensor 9. BNC socket for pH electrode Unplug the instrument from the power supply before replacing the fuse. 14 220 110 L 1. Fuse holder 2. Power supply terminals 3. Acid/Basic dosage selection terminals 4. Red/ox dosage consent terminals 5. Connections for dosing pump 6. Alarm contacts 7.

Recorder output contacts 8. Connections to the transmitter Unplug the instrument from the power supply before replacing the fuse. 15 14€ FUNCTIONAL DESCRIPTION HI 8711 FRONT PANEL Al pH 7 TEST pH HI 8711E pH 4 TEST Trimmers O SLOPE AL To display and set the alarm tolerance To verify Offset compensation To verify amplifier circuit pH SLOPE ACID SET BASE SET AL MEA SURE COARSE ACID SET SENSOR TEST AL FINE COARSE pH 7 TEST HI 8711E pH 4 TEST BASE SET FINE For Offset calibration For Slope calibration To set the tolerance of the alarm ACID SET/COARSE To coarsely adjust acid setpoint ACID SET/FINE To finely adjust acid setpoint BASE SET/COARSE To coarsely adjust basic setpoint BASE SET/FINE To finely adjust basic setpoint Keypad ACID SET BASE SET MEASURE SENSOR TEST To set the working point of acid dosage To set the working point of basic dosage To enter measurement mode and to enable diagnostic tests To display electrode mV reading and, therefore, verify its working condition LEDs ACID SET (Blinking) Show that acid dosage is active BASE SET (Blinking) Show that basic dosage is active Indicate active alarm AL (Blinking) 16 16€ 17 REAR PANEL HI 8711E REAR PANEL HI 8711T 8 ELECTRODE INPUT 7 6 PT100 + mA OUT - 4 3 5 2 BASE ACID FUSE ALARM 1 FUSE 1. Fuse holder 2. Power supply terminals 3. Connections for dosing pump for acid 4. Connections for dosing pump for base 5. Alarm contacts 6. Recorder output contacts 7. Connections for Pt100 temperature sensor 8.

BNC socket for pH electrode Unplug the instrument from the power supply before replacing the fuse. 18 220 110 L 1. Fuse holder 2. Power supply terminals 3. Connections for dosing pump for acid 4.

Connections for dosing pump for base 5. Alarm contacts 6. Recorder output contacts 7. Connections to the transmitter Unplug the instrument from the power supply before replacing the fuse. 19 18€ FUNCTIONAL DESCRIPTION HI 8720 FRONT PANEL Trimmers SLOPE AL ORP HI 8720E mV For Slope calibration To display and set the alarm tolerance SET/COARSE To coarsely adjust the setpoint SET/FINE To finely adjust the setpoint LEDs OXID DOSAGE OXID.

REDUC. SLOPE AL MEA SURE SET COARSE SET FINE AL Show that the oxidant dosage is active REDUC Show that the reductant dosage is active Indicate an active alarm AL (blinking) 0 mV TEST 500 mV TEST To set the working point of ORP dosage MEASURE To enter measurement mode and to enable diagnostic tests To display and set the alarm Al tolerance 0 mV TEST To verify the instrument calibration at 0 mV 500 mV TEST To verify the slope at 500 mV 20 Keypad SET 20€ 21 REAR PANEL HI 8720E REAR PANEL HI 8720T 8 ELECTRODE INPUT 4 7 3 CONSENT + mA OUT OPEN: OXD SHORT: RDX 5 SET FUSE 6 2 ALARM 1 FUSE 1. Fuse holder 2. Power supply terminals 3. Ox/Red dosage selection terminals 4. Ox/red dosage consent terminals 5. Connections for dosing pump 6. Alarm contacts 7. Recorder output contacts 8. BNC socket for ORP electrode Unplug the instrument from the power supply before replacing the fuse.

22 220 110 L 1. Fuse holder 2. Power supply terminals 3. Ox/Red dosage selection terminals 4. Ox/red dosage consent terminals 5. Connections for dosing pump 6. Alarm contacts 7. Recorder output contacts 8. Connections to the transmitter Unplug the instrument from the power supply before replacing the fuse. 23 22€ SPECIFICATIONS Range Resolution Accuracy HI 8510E Range Resolution Accuracy Typical EMC Dev.

Installation Category Input Calibration Temperature Compensation Recorder Output Power Supply Environment Panel Cutout Weight 10 Ohm 12 HI 8710E 0.01 pH  $\pm 0.02$  pH II HI 8710T 0.00 to 14.00 pH  $\pm 0$ .

5% HI 8510T 0.01 pH Typical EMC Dev. Installation Category Input  $\pm 0.1$  pH /  $\pm 0.2$  mA 1012 Ohm 4 to 20 mA 0.

00 to 14.00 pH  $\pm 0.02$  pH II 4 to 20 mon), make a short circuit across the ACID/BASE selection terminals with a jumper wire. The HI 8720 models are single dosage controllers with oxidant/reductant selection. If oxidant dosage is needed (e.g. in cyanide oxidation), leave open the OX/RED selection terminals (see picture), while for reductant dosage (e.g. in chromium VI reduction), make a short circuit across the OX/RED selection terminals with a jumper wire. Set contacts (HI 8710 and HI 8720): these contacts (max.

2A, 240 V) are used to connect the dosing pump, and act only as a switch for the power to the drive. Acid contacts (HI 8711): these contacts are used to connect the dosing pump for acid, and act as a switch for the power to the drive. Base contact (HI 8711): these contacts are used to connect the dosing pump for base, and act as a switch for the power to the drive. OPEN: ACID SHORT: BASE OPEN: ACID SHORT: BASE OPEN: OXD SHORT: RDX OPEN: OXD SHORT: RDX SET · · Consent contacts (HI 8710 and HI 8720): these contacts (max. 2A, 240 V) are used for reduction and oxidation reactions when the pH controller works in conjunction with an ORP controller and vice versa. In these applications, the consent contacts of both meters are connected together to link the ORP and pH controllers, so that ORP dosage will occur only if the actual pH value is correct. This feature avoids overdosages which may lead to undesirable pollution. For HI 8710, the "Consent" contacts can be left open if the instrument is used independently as pH controller only. For HI 8720, the "Consent" contacts should be shorted if the instrument is used independently as ORP controller only. Alarm contacts (HI 8710, HI 8711 and HI 8720): if the pH or ORP measurement is not within the set value tolerance, the alarm contact is closed.

ALARM FUSE FUSE FUSE Note: All external cables connected to the rear panel should be ended with cable lugs. FUSE ACID FUSE FUSE BASE FUSE FUSE 28 28€ 29 OPERATIONAL GUIDE All instrument settings are made via front panel keys and trimmers. When each key is pressed, the corresponding LED lights up to show the operating function. If using a model with input from electrode, make sure that the meter is calibrated before starting any operation (see "Calibration" section for details). SET POINTS (HI 8710 and HI 8720) To set the working point for pH or ORP dosage, press SET and the display will show the set value.



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Using a small screwdriver adjust the ACID SET COARSE and FINE trimmers to display the desired acid set value. ACID SET BASE SET COARSE pH ACID SET FINE To set the working point for alkaline dosage, press the BASE SET key and the display will show the set value for base dosage. ACID SET BASE SET pH COARSE BASE SET FINE SET COARSE SET FINE pH Using a small screwdriver adjust the BASE SET COARSE and FINE trimmers to display the desired base set value. ACID SET BASE SET Using a small screwdriver adjust the COARSE and FINE trimmers to display the desired set value. pH COARSE BASE SET FINE SET COARSE SET FINE pH ALARMS (HI 8710, HI 8711 and HI 8720) To set the alarm tolerance, press AL key and the display will show the current value.

AL SET POINTS (HI 8711) To set the working point for acid dosage, press the ACID SET key and the display will show the set value for acid dosage. AL pH ACID SET BASE SET pH COARSE Using a small screwdriver adjust the AL trimmer to display the desired tolerance. ACID SET FINE 30 30€ 31 AL AL pH When acid dosage is active, the ACID LED lights up, while during alkaline dosage, the BASE LED turns on (HI 8710 only). When oxidant dosage is active, the OXID LED lights up, while during reductant dosage, the REDUC LED turns on (HI 8720 only). DOSAGE SLOPE ACID BASE AL MEA SURE SET COARSE SET FINE Examples: For HI 8710, if the set value is pH 3 and the Alarm is 1.5 pH, the instrument generates an alarm every time the pH reading is higher than 4.5 pH or lower than 1.5pH. For HI 8711, if the set values are pH 7 and pH 8, and the Alarm is 1.5 pH, the instrument generates an alarm every time the pH reading is higher than 9.

5 pH or lower than 5.5 pH. For HI 8720, if the set value is 300 mV and the Alarm is 100 mV, the instrument generates an alarm every time the ORP reading is higher than 400 mV or lower than 200 mV. MEASUREMENTS After setting the pH (or ORP) and alarm (if available) thresholds, immerse the electrode in the solution to be tested and press MEASURE. The actual pH or ORP value of the test solution is displayed. MEA SURE DOSAGE OXID. REDUC. SLOPE AL MEA SURE SET COARSE SET FINE COARSE SET FINE pH mV 32 32€ 33 pH CALIBRATION Make sure that the instrument is in measurement mode (MEASURE LED is on) before proceeding with calibration. Measure the temperature of the calibration buffer with a ChecktempC or another accurate thermometer. Remove the protective cap from the electrode, rinse and immerse in pH 7.

01 solution (HI 7007). Note: The electrode should be submerged at least 4 cm (1½") into the solution. The thermometer should be located as close as possible to the pH electrode. MEA SURE COARSE SET FINE Rinse pH electrode and thermometer probe thoroughly with water, then immerse them in pH4.01 (HI 7004) or pH 10.

01 (HI 7010) buffer solution. Note: For accurate readings, use pH 4.01 if you are going to measure acid samples or pH 10.01 for alkaline measurements. Shake briefly and wait one minute before adjusting the slope trimmer to display the pH value of the buffer solution, i.

e. pH 4.01 (or 10.01) at 25°C (77°F). °C 4 cm (1½") HI 7007 DOSAGE SLOPE ACID BASE O MEA SURE SET COARSE pH SET FINE °C HI 7004 If the buffer solution temperature is different from 25°C (77°F), refer to the "pH vs. temperature" chart on page 36 for the appropriate pH value at the noted temperature. The calibration is now complete and the instrument is ready for use. @@@@ Follow the procedure described below.

@@@@ This phenomenon is rough on the electrode. To make correct redox measurements, it is necessary that the surface of the electrode is clean and smooth, and that a preventive treatment is performed.

Because the Pt/PtO system depends on the solution pH level, the electrode pre-treatment may be determined by the pH and the redox potential of the solution to be measured. 41 B) Light blinking 25% on, 75% off The mode is not displayed but it is active, e.g. the alarm contact is closed but the alarm setpoint is not displayed. C) Light blinking 75% on, 25% off The mode is active and being displayed. D) Light off The function is neither active nor displayed. 40 40€

Generally, if the ORP (mV) reading corresponding to the pH solution value is higher than the value in the table below, an oxidizing pre-treatment is necessary; otherwise a reducing pre-treatment is necessary: pH 0 5 10 mV pH mV pH 990 1 920 2 680 6 640 7 400 11 340 12 mV pH mV pH 860 3 800 4 580 8 520 9 280 13 220 14 mV 740 460 160 ELECTRODE MAINTENANCE Reference Filling Hole Reference Filling Hole Fill Hole Screw Sensitive Wire Reference Wire Reference Junction Glass Bulb Plastic Body pH Electrode Reference Wire Sensitive Wire Reference Junction Glass Bulb Glass Body pH Electrode Reducing pre-treatment: immerse the electrode for some minutes in HI 7091 solution. Oxidizing pre-treatment: immerse the electrode for some minutes in HI 7092 solution. If no pre-treatment is performed, the electrode will have long response times. If working with refillable electrodes, always check the internal electrolyte level and refill with HI 7071 solution, if necessary (the level must be at least 2.

5 cm below the filling hole). If measurements are taken in solutions containing sulfides or proteins, the cleaning of the electrode junction must be performed (see "Cleaning Procedure" section for details). To check the correct functioning of the ORP electrode, immerse it into HI 7020 test solution and verify that the reading is within 200 and 275 mV. After the test, rinse the electrode thoroughly with water and proceed with the oxidizing or reducing pre-treatment before taking any measurement. When not in use, the electrode tip should be kept moist and far from any type of mechanical stress which might cause damage.

For this reason, it is recommended to store the electrode with a few drops of HI 70300 storage solution in the supplied protective cap. 42 Reference Wire Reference Junction Platinum or Gold tip Reference Wire Reference Junction Platinum or Gold tip Glass Body ORP Electrode Plastic Body ORP Electrode PREPARATION Remove the protective cap. DO NOT BE ALARMED IF ANY SALT DEPOSITS ARE PRESENT. This is normal with electrodes and they will disappear when rinsed with water. During transport tiny air bubbles may form inside the glass bulb, and the electrode cannot function properly under these conditions.

Remove the bubbles by "shaking down" the electrode as you would do with a glass thermometer. 43 42€ If the bulb and/or junction are dry, soak the electrode in HI 70300 storage solution for at least one hour. For refillable electrodes: If the internal electrolyte solution is more than 1 cm (½") below the filling hole, add HI 7082 solution (3.



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5M KCl) for double junction electrodes or HI 7071 (3.5M KCl+AgCl) for single junction electrodes. For a faster response unscrew the filling hole screw during measurements. For AmpHel electrodes: If the electrode does not respond to pH changes, the battery is run down and the electrode should be replaced. MEASUREMENT Rinse the electrode tip with distilled water. Immerse the electrode tip (4 cm) in the sample and stir gently for approximately 30 seconds. For a faster response and to avoid cross contaminations, before taking measurements, rinse the electrode tip with some solution to be tested.

**STORAGE** To minimize clogging and assure a quick response time, the electrode glass bulb and junction should be kept moist at any time. Store the electrode with a few drops of HI 70300 storage solution in the protective cap (in its absence, use HI 7071 electrolyte for single junction, or HI 7082 for double junction electrodes). Follow the above "Preparation Procedure" before taking measurements. Note: NEVER STORE THE ELECTRODE IN DISTILLED WATER OR DRY. AmpHel® is a registered Trademark of "Hanna Instruments" ® PERIODIC MAINTENANCE Inspect electrode and cable. The cable used for the connection to the meter must be intact and there must be no points of broken insulation on the cable or cracks on the electrode stem or bulb. Connectors must be perfectly clean and dry. If any scratches or cracks are noted, replace the electrode. Rinse off any salt deposits with water. For refillable electrodes: Refill the electrode with fresh electrolyte solution (HI 7071 for single junction electrodes or HI 7082 for double junction).

Allow the electrode to stand upright for 1 hour. Follow the above "Storage Procedure". **CLEANING PROCEDURE** General Soak in HI 7061 general cleaning solution for approximately 1 hour. Removal of films, dirt or deposits on the membrane/junction: Protein Soak in Hanna HI 7073 protein cleaning solution for 15 minutes. Inorganic Oil/grease Soak in Hanna HI 7074 inorganic cleaning solution for 15 minutes.

Rinse with Hanna HI 7077 oil & fat cleaning solution. **IMPORTANT:** After performing any of the cleaning procedures, rinse the electrode thoroughly with distilled water, drain and refill the reference chamber with fresh electrolyte, (not necessary for gel-filled electrodes) and soak the electrode in HI 70300 storage solution for at least 1 hour before taking measurements. 44 44£ 45 **TROUBLESHOOTING** Evaluate your electrode performance based on the following: · Noise (readings fluctuate up and down) could be due to: - Clogged/Dirty Junction: refer to the above "Cleaning Procedure" - Loss of shielding due to low electrolyte level (in refillable electrodes only): refill with HI 7071 solution for single junction or HI 7082 for double junction electrodes · Dry Membrane/Junction: soak in HI70300 storage solution for at least 1 hour · Drifting: soak the electrode tip in warm HI7082 solution for one hour and rinse the tip with distilled water; refill with fresh electrolyte (HI 7071 for single junction and HI 7082 for double junction electrodes) · Low Slope: refer to the above "Cleaning Procedure" · No Slope: check the electrode for cracks in glass stem or bulb (replace the electrode if cracks are found) · Slow Response/Excessive Drift: soak the tip in HI 7061 solution for 30 minutes, rinse thoroughly in distilled water and then follow the above "Cleaning Procedure"

· For ORP Electrodes: polish the metal tip with a light abrasive paper (pay attention not to scratch the surface) and rinse thoroughly with water **SUGGESTED INSTALLATIONS SHORT DISTANCE, INDOOR INSTALLATION** Due to the low current involved, a very high grade of insulation is required. A dry environment is needed in order to obtain an insulation level not lower than 1012 . @@@@The standard cable length for AmpHel® electrodes is 5 m (16.

5'). Additional lengths 47 46 46£ of regular cable up to 50 m (165'), can be installed without special connectors. AmpHel® electrodes feature a built-in a microamplifier to boost the signal, drastically reducing susceptibility to noise and drift. The sealed electrode body can stand a moisture up to 100% RH without any effect on the signal. **MAXIMUM 50 METERS ACCESSORIES** pH CALIBRATION SOLUTIONS HI 7004M pH 4.01 buffer solution, 230 mL HI 7004L pH 4.01 buffer solution, 500 mL HI 7006M pH 6.86 buffer solution, 230 mL HI 7006L pH 6.86 buffer solution, 500 mL HI 7007M pH 7.01 buffer solution, 230 mL HI 7007L pH 7.

01 buffer solution, 500 mL HI 7009M pH 9.18 buffer solution, 230 mL HI 7009L pH 9.18 buffer solution, 500 mL HI 7010M pH 10.01 buffer solution, 230mL HI 7010L pH 10.01 buffer solution, 500 mL ORP SOLUTIONS HI 7020M ORP test solution @200/275 mV, 230 mL bottle HI 7020L ORP test solution @200/275 mV, 500 mL bottle HI 7091M Pre-treatment reducing solution, 230 mL bottle HI 7091L Pre-treatment reducing solution, 500 mL bottle HI 7092M Pre-treatment oxidizing solution, 230 mL bottle HI 7092L Pre-treatment oxidizing solution, 500 mL bottle **ELECTRODE MAINTENANCE SOLUTIONS** HI 70300M Storage solution, 230 mL bottle HI 70300L Storage solution, 500 mL bottle HI 7061M General cleaning, 230 mL bottle HI 7061L General cleaning, 500 mL bottle HI 7073M Protein cleaning solution, 230 mL HI 7073L Protein cleaning solution, 500 mL HI 7074M Inorganic cleaning, 230 mL HI 7074L Inorganic cleaning, 500 mL HI 7077M Oil & fat cleaning, 230 mL HI 7077L Oil & fat cleaning, 500 mL HI 7071 3.5M KCl+AgCl electrolyte solution (4 x 50 mL) HI 7072 1M KNO3 electrolyte (4 x 50 mL) HI 7082 3.5M KCl electrolyte solution (4 x 50 mL) 49 **WET ENVIRONMENT RELATIVE HUMIDITY UP TO 100% pH-ORP METER pH METER WITH AN AmpHel® ELECTRODE MEASUREMENTS CAN BE TAKEN FROM DISTANCES UP TO 50 METERS (165 FEET) LONG DISTANCE INSTALLATIONS, ISOLATED OUTPUT FOR PC INTERFACE** If the needed installation distance is greater than 50 m (165'), it is necessary the use of a transmitter. HANNA instruments® offers a full line of pH and ORP transmitters with or without display. 3m **MAXIMUM 300 METERS WET ENVIRONMENT RELATIVE HUMIDITY UP TO 100% pH-ORP METER pH METER WITH A pH TRANSMITTER AND CONVENTIONAL ELECTRODE MEASUREMENTS CAN BE TAKEN FROM DISTANCES UP TO 300 METERS (1000 FEET)** AmpHel® is a registered Trademark of "Hanna Instruments" 48 48£ pH ELECTRODES M13 x 1.5 DIA 16.

5mm 5mm DIA 7.6mm DIA 12mm HI 1090T Screwcap PG13.5 connector, double junction, glass body PG13.5 THREAD DIA 16 mm 25 7 mm mm 12mm 9.5mm 25mm 150mm HI 1115S HI 1135B/3 HI 1210T 30mm 110mm Screwcap PG13.

5 connector, double junction, plastic body PG13.5 THREAD 12mm HI 1110S Screw connector, single junction, glass body HI 1130B/3 BNC connector, 3 m (9.9') cable, single junction, glass body M13 x 1.5 DIA 16 mm 25 7 mm mm 30mm 110mm 3/4 x 16 UNF DIA 9.



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5mm DIA 12mm HI 1910B DIA 20.

5mm BNC connector, 1 m (3.3') cable, double junction, plastic body, builtin amplifier 3/4 x 16 UNF DIA 12mm DIA 20.5mm 38.5mm 110mm HI 1110S HI 1130B/3 HI 1110T Screwcap PG13.5 connector, double junction, glass body PG13.5 THREAD 38.5mm 110mm HI 1911B 12mm 9.5mm BNC connector, 1 m (3.3') cable, double junction, plastic body, builtin amplifier 3/4 x 16 UNF DIA 12mm DIA 20.5mm 30mm 110mm 38.

5mm 110mm HI 1114S Screw connector, double junction, plastic body HI 1134B/3 BNC connector, 3 m (9.9') cable, double junction plastic body M13 x 1.5 DIA 16 mm 25 7 mm mm HI 1912B BNC connector, 1 m (3.3') cable, double junction, plastic body, builtin amplifier 3/4 x 16 UNF DIA 9.5mm DIA 12mm DIA 20.5mm 3/4 x 16 UNF DIA 12mm DIA 20.5mm 38.5mm 110mm 38.5mm 110mm HI 1114S HI 1134B/3 Screw connector, single junction, glass body HI 1135B/3 BNC connector, 3 m (9.9') cable, single junction, glass body HI 1115S HI 1912B/5 BNC connector, 5 m (16.5')

5') cable, double junction, plastic body, builtin amplifier 3/4 x 16 UNF DIA 12mm DIA 20.5mm 38.5mm 110mm 50 50£ 51 HI 2114B/5 BNC connector, 5 m (16.5') cable, double junction, plastic body 3/4 x 16 UNF DIA 12mm HI 3210T Screwcap PG13.5 connector, Pt, plastic body PG13.

5 THREAD 12mm DIA 20.5mm 38.5mm 110mm HI 2910B/5 BNC connector, 5 m (16.5') cable, double junction, plastic body, builtin amplifier 3/4 x 16 UNF DIA 12mm 30mm 110mm HI 3410S Screw connector, Pt, plastic body HI 3430B/3 BNC connector, 3 m (9.9') cable, Pt, plastic body M13 x 1.

5 DIA 16 mm 25 7 mm mm DIA 20.5mm 3/4 x 16 UNF DIA 12mm 38.5mm 110mm DIA 20.5mm ORP ELECTRODES HI 2930B/5 BNC connector, 5 m (16.5') cable, Pt, plastic body, built-in amplifier HI 3110S Screw connector, Pt, glass body HI 3130B/3 BNC connector, 3 m (9.9') cable, Pt, glass body M13 x 1.5 DIA 16 mm 25 7 mm mm 3/4 x 16 UNF DIA 12mm DIA 20.5mm 38.5mm 110mm HI 3410S HI 3430B/3 HI 3932B/5 BNC connector, 5 m (16.5') cable, Pt, plastic body, built-in amplifier 3/4 x 16 UNF DIA 12mm DIA 20.

5mm 38.5mm 110mm 38.5mm 110mm HI 3110S HI 3130B/3 HI 3110T Screwcap PG13.5 connector, Pt, glass body PG13.5 THREAD HI 4110S Screw connector, Au, glass body HI 4130B/3 BNC connector, 3 m (9.9') cable, Au, glass body M13 x 1.5 DIA 16 mm 25 7 mm mm 3/4 x 16 UNF DIA 12mm 12mm 1mm DIA 20.5mm 38.5mm 110mm HI 4110S 30mm 110mm HI 4130B/3 Screw-type connector, side-arm, Pt, glass body HI 3135B/3 BNC connector, 3 m (9.9') cable, side-arm, Pt, glass body M13 x 1.

5 DIA 16 mm 25 7 mm mm HI 3115S HI 4932B/5 BNC connector, 5 m (16.5') cable, Au, plastic body, built-in amplifier 3/4 x 16 UNF DIA 12mm DIA 20.5mm DIA 16.5mm 5mm DIA 7.6mm 38.

5mm 110mm DIA 12mm 25mm 150mm HI 3115S HI 3135B/3 52 52£ 53 OTHER ACCESSORIES HI 98501 ChecktempC thermometer with penetration probe and 0.1°C resolution (-50.0 to 150.0°C) HI 8614 pH transmitter HI 8614L pH transmitter with display HI 8615 ORP transmitter HI 8615L ORP transmitter with display BL PUMPS Dosing pumps with flow rate from 1.5 to 20 lph HI 7871 & HI 7873 Level controllers HI 6050 & HI 6051 Submersible electrode holders HI 6054 & HI 6057 Electrode holders for in-line applications HI 778P Coaxial cable and connectors for screw-type electrodes HI 8427 pH/ORP electrode simulator with 1 m (3.

3') coaxial cable ending with female BNC connectors (HI 7858/1) HI 931001 pH/ ORP electrode simulator with display and 1 m (3.3') coaxial cable ending with female BNC connectors (HI 7858/1) 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. Probes, electrodes and sensors are warranted for a period of six months. Damages due to accident, misuse, tampering or lack of prescribed maintenance are not covered. This warranty is limited to repair or replacement free of charge. 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. Obtain a Returned Goods Authorization from the Customer Service department first and then return the instrument with the Authorization # included along with shipment costs prepaid. If the repair is not covered by the warranty, you will be notified of the charge for repair or replacement. When shipping any instrument, make sure it is properly packaged for complete protection.

Recommendations for Users Before using these products, make sure that they are entirely suitable for the environment in which they are used. Operation of these instruments in residential area could cause unacceptable interferences to radio and TV equipments, requiring the operator to take all necessary steps to correct interferences. The trimmers are sensitive to electrostatic discharges. It is recommended to use antistatic screwdrivers. Any variation introduced by the user to the supplied equipment may degrade the instruments' EMC performance. To avoid electrical shock, do not use these instruments 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. 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, construction and appearance of its products without advance notice.

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