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You can read the recommendations in the user guide, the technical guide or the installation guide for HANNA INSTRUMENTS HI8615L. You'll find the answers to all your questions on the HANNA INSTRUMENTS HI8615L 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 HI8615L**  
**User guide HANNA INSTRUMENTS HI8615L**  
**Operating instructions HANNA INSTRUMENTS HI8615L**  
**Instructions for use HANNA INSTRUMENTS HI8615L**  
**Instruction manual HANNA INSTRUMENTS HI8615L**

Instruction Manual

HI 8614 • HI 8614L  
HI8615 • HI8615L

pH and ORP Transmitters



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**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 all the necessary information for the correct use of the instrument. 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 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 noticeable damage, notify your Dealer. Note: Save all packing material until you are sure that the instrument functions correctly.

All defective items must be returned in the original packing material together with the supplied accessories. GENERAL DESCRIPTION HI 8614 / HI 8614L (pH) and HI 8615 / HI 8615L (ORP) are 2-wire water-resistant transmitters specially designed for long distance measurement of pH or ORP in industrial applications. Two versions are available: the standard HI 8614 and HI 8615, and the HI 8614L and HI 8615L models with LCD. The LCD allows easy verification and monitoring of measured values, and provides easier calibration and maintenance. The pH or ORP signal is transmitted in a 2-wire current loop in the range of 4 to 20 mA.

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35 2 The transmitters use a universal BNC socket for quick and secure connection to any electrode with a BNC connector. For HI 8614 and HI 8614L the temperature compensation is performed by the transmitter's ATC circuitry if the temperature probe (HI 76608, optional) is attached. If ATC is not required, it is possible to substitute the temperature probe with a fixed resistor. The input is isolated from the current loop to eliminate problems related to ground loop, low insulation cables, multiple electrode connections, and a common mode voltage of up to 100 V ensures true differential readings. The terminal board of the transmitter provides for connection of power supply, pH or ORP electrodes and temperature probe (for HI 8614 and HI 8614L models only). The unit is enclosed in a protective casing conforming to IP 65 standards. SPECIFICATIONS OF HI 8614 & HI 8614L Range 4 to 20 mA / 0.00 to 14.00 pH Resolution 0.01 mA / 0.

01 pH Accuracy (@20°C/68°F) ±0.02 mA / ±0.02 pH Typical EMC Deviation ±0.25 mA / ±0.2 pH Calibration Offset: ±2.

2 mA / ±2 pH Slope: ±0.5 mA / 86 to 116% Temperature Compensation Fixed or automatic from 0 to 100°C (32 to 212°F) with HI76608 probe Input

Impedance 1012 Ohm Output 4-20 mA (isolated) Installation Category II Protection IP 65 Environment 0 to 50°C (32 to 122°F); RH max 95% non-condensing Power Supply HI8614: 18 to 30 Vdc HI8614L: 20 to 36 Vdc Load Max 500 Ohm Dimensions 165 x 110 x 90 mm (6.5 x 4.3 x 3.5") Weight 1 kg (2.2 lb.) pH pH TRAN HI 8614 R ITTE SM H ATOR pH INDIC ITER SM & TRAN I 8614 L 4 5 SPECIFICATIONS OF HI8615 & HI8615L Range 4 to 20 mA / ±1000 mV Resolution 0.01 mA / 1 mV Accuracy (@20°C/68°F) ±0.02 mA / ±5 mV Typical EMC Deviation ±0.25 mA / ±15 mV Calibration Offset: ±0.8 mA / ±100 mV Slope: ±0.8 mA / 90 to 110% Input Impedance 1012 Ohm Output 4-20 mA (isolated) Installation Category II Protection IP 65 Environment 0 to 50°C (32 to 122°F); RH max 95% non-condensing Power Supply HI8615: 18 to 30 Vdc HI8615L: 20 to 36 Vdc Load Max 500 Ohm Dimensions 165 x 110 x 90 mm (6.5 x 4.3 x 3.5") Weight 1 kg (2.

2 lb.) **TERMINAL BOARD CONNECTIONS** Unscrew the 4 screws and remove the top cover. There are three cable glands on the transmitter cover. The large cable gland with the split in the rubber is for the electrode. **ELECTRODE CABLE GLAND WIRE CABLE GLANDS** Connect the positive supply to the strip terminal "+VE LOOP" and the negative supply to the terminal "-VE LOOP" of the transmitter terminal block. mV HI 8615 SMITTER ORP TRAN HI 8615 TER ANSMIT ORP TR 6 7 The wire between the transmitter and the recorder/indicator/controller should be a PVC insulated two wire with a wire diameter of at least 0.7 mm. This wire is fed through one of the smaller cable glands. The maximum distance between the power supply and the amplifier is 300 m (1000').

*It is not necessary to use shielded cable.*

The transmitter is protected against inversion of supply voltage. Electrode connection: connect the BNC of the cable to the BNC socket on the transmitter. For HI 8614 & HI 8614L only: for automatic temperature compensation, connect the 2 terminals of the temperature probe (HI 76608, optional) to "TEMP.

PROBE" terminals. If automatic temperature compensation is not required, short the "TEMP.

PROBE" terminals with a resistance according to the external temperature: pH CALIBRATION WITH AUTOMATIC TEMPERATURE COMPENSATION (HI 8614 & HI 8614L) Initial preparation · Connect the pH electrode to the BNC socket. · Connect the temperature probe to the transmitter. Pour small quantities of pH 7.01 and pH 4.01 solution into two clean beakers.

HI 70 04 HI 7004 HI 7007 For accurate calibration use two beakers for each buffer solution, the first one for rinsing the electrode, the second one for calibration. RINSE CALIBRATION HI 7007 HI 7007 Temperature (°C) Resistance (Ohms) 0 1634 10 1774 20 1922 30 2078 40 2242 50 2412 60 2590 A 2 kohm resistor is factory mounted for 25°C temperature compensation. To get accurate readings, use pH 7.01 and pH 4.01 if you are going to measure acid samples or pH 7.01 and pH 10.01 for alkaline measurements. Note: with HI8614L the instruments display can be used during calibration without the need to connect the ammeter and the reading is directly expressed in pH units. 8 9 Procedure · Disconnect the +ve supply cable from "+VE LOOP" terminal and connect a 20mA f.s.

ammeter between the +ve cable and "+VE LOOP" terminal. For other buffer temperatures, refer to page 13 for the appropriate mA / pH reading. · Rinse the electrode with tap water or distilled water and a small amount of pH 4.01 or 10.01 buffer solution or immerse it in the pH 4 rinse solution (2nd calibration point). Dip the electrode and HI 7004 the temperature probe into pH 4.01 (or 10.01) calibration buffer solution, shake briefly and wait for a few minutes for reading to stabilize. Adjust the slope trimmer until the ammeter reads 8.58 mA or the display shows "4.



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01" at 25°C. For other buffer temperatures, refer to page 13 for the appropriate mA / pH reading (HI 8614L). · Remove the protective cap from the electrode, rinse it with some pH 7.01 solution or immerse it in the pH 7 rinse solution, then immerse the pH electrode and temperature probe into pH 7.01 calibration buffer solution; shake briefly and wait for the reading to stabilize.

Note: the tip of the electrode should be submerged approximately 4 cm (1½") into the solution. The temperature probe should be located as close to the pH electrode as possible. HI 7007 · SLOPE ADJUSTMENT OFFSET ADJUSTMENT mA 4 cm 1½" If you are using pH 10.01 buffer solution adjust the slope trimmer until the ammeter read 15.43 mA at 25°C (77°F) or the value indicated at page 13.

FOR HI 8614L ONLY mA · Adjust the offset trimmer until the ammeter reads 12mA or the display shows "7.01" (HI 8614L only) if the temperature of the buffer is at 25°C. The Display Module is factory calibrated, so that the LCD display results are referred to the 4-20 mA loop current (e.g. LCD displays 0.00 pH when loop current is 4.00 mA and displays 14.00 pH when current is 20.00 mA). SLOPE ADJUSTMENT OFFSET ADJUSTMENT mA 10 11 Under normal application, adjustment on this module may not be necessary.

@@@Simulate a 4.00 mA loop current for the transmitter (i.e. pH 0.00 as Electrode input) and check for display reading. Simulate a 20.00 mA loop current for the transmitter (i.e. pH 14.00 as Electrode input) and check for display reading.

@@Connect the appropriate resistor to the "TEMP. @@@@ammeter between the +ve cable and the "+VE LOOP" terminal. @@In this case the values are directly expressed in mV units. Pour a small quantity of HI 7020 ORP solution into a beaker. @@@@Connect the ORP transmitter to the simulator.

SLOPE ADJUSTMENT OFFSET ADJUSTMENT mA · Connect the ORP electrode to the transmitter and immerse the tip of the electrode inaking measurements. @@@Follow the Preparation Procedure above before taking measurements. @@@Connectors must be perfectly clean and dry.

@@Rinse off any salt deposits with water. @@Allow the electrode to stand upright for 1 hour.

Follow the Storage Procedure above. @@@Oil/ grease 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. 20 21 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

Cleaning Procedure above. · Loss of shielding due to low electrolyte level (in refillable electrodes only): HI 7071 for single junction or HI 7082 for double junction electrodes. · Dry Membrane/Junction: soak in HI 70300 storage solution for at least one hour. · Drifting: soak the electrode tip in warm Hanna solution HI 7082 for one hour and rinse the tip with distilled water. Refill with fresh HI 7071 for single junction electrodes and HI 7082 for double junction electrodes. · Low Slope: refer to the Cleaning Procedure above.

· No Slope: check the electrode for cracks in glass stem or bulb and replace the electrode. · Slow Response/Excessive Drift: soak the tip in Hanna HI 7061 cleaning solution for 30 minutes, rinse thoroughly in distilled water and then follow the Cleaning Procedure above. TEMPERATURE-RESISTANCE CORRELATION FOR HANNA pH SENSITIVE GLASS The resistance of glass electrodes partially depends on the temperature. The lower the temperature, the higher the resistance. It takes longer time for the reading to stabilize if the resistance is higher. In addition, the response time will suffer to a greater degree at temperatures below 10°C. 2x10 9 -10 1x10 9 -10 -10 2x10 8 1x10 8 -10 2x10 7 -10 1x10 7 -10 -20 -20 0 +10+20 +30+40 +50+60+70 +80+90 °C

Since the resistance of the pH electrode is in the range of 200 Mohm, the current across the membrane is in the pico Ampere range. Large currents can disturb the calibration of the electrode for many hours. For these reasons high humidity environments, short circuits and static discharges are detrimental for a stable pH reading. The pH electrode's life also depends on the temperature.

If constantly used at high temperatures, the electrode life is drastically reduced. 22 23 Typical Electrode Life Ambient Temperature 1- 3 years 90 °C Less than 4 months 120°C Less than 1 month INSTALLATION PROCEDURE AND EXAMPLES High concentrations of sodium ions interfere with readings in alkaline solutions; the pH at which the interference starts to be significant depends upon the composition of the glass. This interference is the alkaline error and causes the pH to be underestimated. Hanna's glass formulations have the indicated characteristics. Alkaline Error Sodium Ion Correction for the Glass at 20-25°C Concentration pH Error 0.

10 13.00 0.1 Mol L-1 Na+ 0.14 13.50 0.

20 14.00 0.10 12.50 -1 + 1.0 Mol L Na 0.18 13.00 0.29 13.50 0.40 14.

00 The HI 8614, HI 8614L, HI 8615 and HI 8615L transmitters may be wall mounted in any convenient location near the measurement point. To minimize thermal drift due to extreme temperature fluctuations during the measurement process, particularly if the measurement is conducted outdoors, it is best to protect the transmitter in an enclosed casing. General Installation Procedure For most industrial application involving long term monitoring and control, it is also recommended to use tank electrode holders (HI 6050 or HI 6051) to protect the pH electrode and the temperature probe from contamination by the test solution. Controlling the pH / ORP with a recorder 24 25 Monitoring the pH/ORP with Panel Mounting pH (HI 8510)/ORP (HI 8512) Indicator Monitoring and Controlling the pH with (HI 8711) Panel Mounting Indicator/ Regulator with Independent Dosage Control for Acid and Base Controlling the pH/ORP with an Industrial Regulator Monitoring and Controlling the pH/ORP with Panel Mounting Indicator/Regulator and Dosage Control of either Acid or Base 26 27 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, 230 mL HI 7010L pH 10.01 buffer solution, 500 mL ORP SOLUTIONS HI 7020M 200-275 mV test solution, 230 mL HI 7020L 200-275 mV test solution, 500 mL HI 7091M Reducing pretreatment solution, 230 mL HI 7091L Reducing pretreatment solution, 500 mL HI 7092M Oxidizing pretreatment solution, 230 mL HI 7092L Oxidizing pretreatment solution, 500 mL ELECTRODE MAINTENANCE SOLUTIONS HI70300M Storage solution, 230 mL HI70300L Storage solution, 500 mL HI 7061M General cleaning solution, 230 mL HI 7061L General cleaning solution, 500 mL HI 7073M Protein cleaning solution, 230 mL HI 7073L Protein cleaning solution, 500 mL HI 7074M Inorganic cleaning solution, 230 mL HI 7074L Inorganic cleaning solution, 500 mL HI 7077M Oil & Fat cleaning solution, 230 mL HI 7077L Oil & Fat cleaning solution, 500 mL HI 7071 3.



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5M KCl + AgCl electrolyte solution, 4 x 50 mL bottle, for single junction electrodes HI 7072 1M KNO<sub>3</sub> electrolyte solution, 4 x 50 mL bottle HI 7082 3.5M KCl electrolyte solution, 4 x 50 mL bottle, for double junction electrodes pH ELECTRODES HI 1090T Screwcap PG13.5 connector, double junction, glass body 12mm 9.5mm PG13.5 THREAD 30mm 110mm 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 HI 1110S 3/4 x 16 UNF DIA 9.5mm DIA 12mm DIA 20.5mm 38.5mm 110mm HI 1110S HI 1130B/3 HI 1110T Screwcap PG13.5 connector, double junction, glass body 12mm 9.5mm PG13.5 THREAD 30mm 110mm 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 1114S 3/4 x 16 UNF DIA 12mm DIA 20.5mm 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 M13 x 1.5 DIA 16 mm 25 7 mm mm HI 1115S DIA 16.5mm 5mm DIA 7.6mm DIA 12mm 25mm 150mm HI 1115S HI 1135B/3 28 29 HI 1210T Screwcap PG13.5 connector, double junction, plastic body 12mm PG13.5 THREAD HI 2910B/5 BNC connector, 5 m (16.5') cable, double junction, plastic body, builtin amplifier 3/4 x 16 UNF DIA 12mm DIA 20.5mm 30mm 110mm 38.5mm 110mm HI 1910B BNC connector, 1 m (3.

3') cable, double junction, plastic body, builtin amplifier DIA 12mm 3/4 x 16 UNF ORP ELECTRODES HI 2930B/5 BNC connector, 5 m (16.5') cable, Pt, plastic body, built-in amplifier 3/4 x 16 UNF DIA 12mm DIA 20.5mm DIA 20.5mm 38.5mm 110mm HI 1911B BNC connector, 1 m (3.

3') cable, double junction, plastic body, builtin amplifier DIA 12mm 38.5mm 110mm 3/4 x 16 UNF DIA 20.5mm Screw-type connector, Pt, glass body HI 3130B/3 BNC connector, 3 m (9.9') cable, Pt, glass body M13 x 1.5 3/4 x 16 UNF DIA 12mm HI 3110S 38.

5mm 110mm BNC connector, 1 m (3.3') cable, double junction, plastic body, builtin amplifier HI 1912B/5 BNC connector, 5 m (16.5') cable, double junction, plastic body, builtin amplifier 3/4 x 16 UNF DIA 9.5mm DIA 12mm DIA 20.5mm HI 1912B DIA 16 mm 25 7 mm mm DIA 20.5mm 38.5mm 110mm HI 3110S HI 3130B/3 HI 3110T Screwcap PG13.5 connector, Pt, glass body 12mm 1mm PG13.5 THREAD 30mm 38.5mm 110mm 110mm HI 2114B/5 BNC connector, 5 m (16.

5') cable, double junction, plastic body 3/4 x 16 UNF DIA 12mm 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 16.5mm 5mm DIA 7.6mm DIA 12mm HI 3115S DIA 20.5mm DIA 16 mm 25 7 mm mm 38.5mm 110mm 25mm 150mm HI 3115S HI 3135B/3 30 31 HI 3210T Screwcap PG13.5 connector, Pt, plastic body PG13.5 THREAD 12mm EXTENSION CABLES FOR SCREW-TYPE ELECTRODES ONLY (SCREW TO BNC CONNECTOR) HI 7855 SERIES CABLE CONNECTORS CONNECTOR AND 3.0 mm (0.

12") CABLE WITH BNC CONNECT TO SCREW TYPE ELECTRODES CONNECT TO THE BNC SOCKET OF THE METER 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 3/4 x 16 UNF DIA 12mm DIA 20.5mm HI7855/1 HI7855/3 HI7855/5 HI7855/10 HI7855/15 Extension cable 1 m (3.3') long Extension cable 3 m (9.

9') long Extension cable 5 m (16.5') long Extension cable 10 m (33') long Extension cable 15 m (49.5') long 38.5mm 110mm HI 3410S HI 3430B/3 HI 3932B/5 BNC connector, 5 m (16.5') cable, Pt, plastic body, builtin amplifier 3/4 x 16 UNF DIA 12mm DIA 20.

5mm 38.5mm 110mm HI 4110S Screw-type 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 DIA 20.5mm 38.5mm 110mm OTHER ACCESSORIES BL PUMPS Dosing pumps with flow rate from 1.5 to 20 lph HI 98501 Pocket-size, thermometer with penetration probe and 0.1°C resolution (range -50.0 to 150.0°C) HI 6050 & HI 6051 Submersible electrode holders HI 6054 & HI 6057 Electrode holders for in-line applications HI 7871 & HI 7873 Level controllers HI 8427 pH / ORP electrode simulator HI931001 pH / ORP electrode simulator with LCD HI 4110S HI 4130B/3 HI 4932B/5 BNC connector, 5 m (16.

5') cable, Au, plastic body, builtin amplifier 3/4 x 16 UNF DIA 12mm DIA 20.5mm 38.5mm 110mm 32 33 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 probes and the electrodes 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.

@@@ 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.

Any variation introduced by the user to the supplied equipment may degrade the instruments' EMC performance. To avoid damages or burns, do not perform any measurement in microwave ovens. 35 SALES AND TECHNICAL SERVICE CONTACTS Australia: Tel. (03) 9769.0666 · Fax (03) 9769.

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