



# Your PDF Guides

You can read the recommendations in the user guide, the technical guide or the installation guide for HANNA INSTRUMENTS HI 96745. You'll find the answers to all your questions on the HANNA INSTRUMENTS HI 96745 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 96745 User guide HANNA INSTRUMENTS HI 96745 Operating instructions HANNA INSTRUMENTS HI 96745 Instructions for use HANNA INSTRUMENTS HI 96745 Instruction manual HANNA INSTRUMENTS HI 96745

### INSTRUCTION MANUAL

### NI 96745

### pH, Chlorine, Hardness and Iron LR ISM

**Preliminary examination:**  
Please examine this product carefully. Make sure that the instrument is not damaged. If any damage occurred during shipment, please notify your dealer.

Each HI 96745 has 3 detectors: three ISM is supplied complete with:  
• Two Sample Connectors and Caps  
• 10 Batteries  
• Instruction Manual

**Read:** see all packing material and you can see that the instrument is not damaged. If any damage occurred during shipment, please notify your dealer.

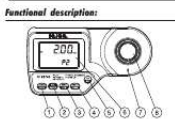
**For more details about spare parts and accessories see "Accessories".**

| Technical specifications: |  |
|---------------------------|--|
| <b>Range</b>              | pH 6.5 to 8.5<br>Total Cl <sub>2</sub> 0.00 to 5.00 mg/L<br>Total Cl <sub>2</sub> 0.00 to 5.00 mg/L<br>Mg Hardness 0.00 to 2.00 mg/L<br>Ca Hardness 0.00 to 2.70 mg/L<br>Total Hardness 0.00 to 4.70 mg/L<br>Free Cl <sub>2</sub> 0.00 to 1.40 mg/L                                      |
| <b>Resolution</b>         | 0.1 pH<br>0.01 mg/L water 2.50 mg/L Cl <sub>2</sub><br>0.10 mg/L water 2.50 mg/L Cl <sub>2</sub><br>0.01 mg/L Hardness<br>0.01 mg/L Free Cl <sub>2</sub>   |
| <b>Accuracy</b>           | pH ±0.1 pH @ 25°C<br>Total Cl <sub>2</sub> ±0.02 mg/L ±1% of reading @ 25°C<br>Total Cl <sub>2</sub> ±0.03 mg/L ±1% of reading @ 25°C<br>Mg Hardness ±0.11 mg/L ±1% of reading @ 25°C<br>Ca Hardness ±0.11 mg/L ±1% of reading @ 25°C<br>Total Hardness ±0.02 mg/L ±1% of reading @ 25°C |
| <b>Typical EMC Dev.</b>   | ±0.1 pH<br>±0.02 mg/L Cl <sub>2</sub><br>±0.02 mg/L Mg Hardness<br>±0.02 mg/L Ca Hardness<br>±0.02 mg/L Free Cl <sub>2</sub>   |
| <b>Light Source</b>       | Longspan LED   |
| <b>Light Detector</b>     | Silicon Photocell with narrow band interference filter @ 525 nm  |



For Iron LR, Adaptation of the IPT method. The reaction between the iron and the reagent reagent is able test in this range.  
**Measurement** 100 µg/l to 12.0 mg/l  
max 99.99 mg/l (see conversion)

**Series Type:** HI 96745  
**Auto-Rinse Off:** After 12" of in-use in measurement mode, after 1 hour of in-use in calibration mode, with 30" loading variable.  
**Dimensions:** 180 x 114 x 41 mm (7.1 x 4.5 x 1.6")  
**Weight:** 340 g (12.1 oz.)



- RANGE SELECTOR key press to change the parameter, press and hold for three seconds to enter OFF mode. In calibration mode press to add the salt and fill.
- CAL CHECK key press to perform the calibration of the meter, at press and hold for three seconds to enter calibration mode.
- ZERO/ON key press to zero the meter prior to measurement, to confirm correct values or to confirm battery calibration status.
- READ/ENTER key press to make a measurement to press and hold for three seconds to start a pre-programmed routine prior to measurement. In OFF mode press to view the next screen.
- ON/OFF key to turn the meter on and off.
- Liquid Crystal Display (LCD)
- Control display indicator
- Control holder

#### DISPLAY ELEMENT DESCRIPTION:

- The measuring values: Easy, smooth, accurate, appears during different phases of use in reading measurement.
- Start message and warning
- The battery low indicates the charge state level of the battery
- The flashlight appears when an internal check is in progress
- Service message

- The character appears when the reaction time is running
- The ready-to-use and data read appear when a data is displayed
- Four digit main display
- Four digit secondary display

#### Errors and warnings:

**ON ZERO ERROR:**

- Light High. There is too much light to perform a measurement. Please check the preparation of the use water.
- Light Low. There is not enough light to perform a measurement. Please check the preparation of the use water.

**ON SAMPLE ERROR:**

**Inverted zeroes:** The sample and the use water are inverted.

**Zero:** A zero reading was not taken. Follow the indication of the measurement procedure for setting the water.

**Under Range:** A blinking "LE" indicates that the sample exceeds the light limit. The use water. Check the preparation and make sure you use the same water for reference liquid and measurement.

**Over Range:** A flashing value of the measured concentration indicates a new range condition. The concentration of the sample is beyond the programmed range of the sample and use water.

**ONLINE CALIBRATION PROCEDURE:**

**Standard Low:** The standard reading is low, that reported.

**Standard High:** The standard reading is high that reported.

**Cap error:** Appears when internal light test in the method cell. Alarm that the control unit is present.

**Control lamp:** The instrument waits for the lamp to cool down.

**Battery low:** The battery must be replaced soon.

**Dead battery:** This indicates that the battery is dead and must be replaced. Once this indicator is displayed, correct operation of the instrument will be interrupted. Charge the battery and restart the meter.

#### Measurement procedure:

**Measurement:**

1. Use the reference liquid with the same parameters as the sample. Fill the 10 ml sample container with the reference liquid to the top. Insert the sample connector into the reference liquid. Wait 30 seconds before measurement.
2. Turn on the instrument. Press the ON/OFF key. The display shows "0.00". Press the RANGE/ENTER key. The display shows "pH". Press the READ/ENTER key. The display shows "pH 7.00". Press the ON/OFF key. The display shows "pH 7.00". Press the RANGE/ENTER key. The display shows "pH 7.00". Press the READ/ENTER key. The display shows "pH 7.00". Press the ON/OFF key. The display shows "pH 7.00". Press the RANGE/ENTER key. The display shows "pH 7.00". Press the READ/ENTER key. The display shows "pH 7.00".
3. Place the sample in the beaker and allow that the rest on the top is performed slowly into the instrument.
4. Press the ON/OFF key to turn on the instrument. The display shows "pH". Press the RANGE/ENTER key to select the parameter to be measured. The display shows "pH". Press the READ/ENTER key to start the measurement. The display shows the measurement result. Press the ON/OFF key to stop the measurement. The display shows "pH". Press the RANGE/ENTER key to select the parameter to be measured. The display shows "pH". Press the READ/ENTER key to start the measurement. The display shows the measurement result. Press the ON/OFF key to stop the measurement. The display shows "pH". Press the RANGE/ENTER key to select the parameter to be measured. The display shows "pH". Press the READ/ENTER key to start the measurement. The display shows the measurement result. Press the ON/OFF key to stop the measurement. The display shows "pH".
5. Press the ON/OFF key to stop the measurement. The display shows "pH". Press the RANGE/ENTER key to select the parameter to be measured. The display shows "pH". Press the READ/ENTER key to start the measurement. The display shows the measurement result. Press the ON/OFF key to stop the measurement. The display shows "pH". Press the RANGE/ENTER key to select the parameter to be measured. The display shows "pH". Press the READ/ENTER key to start the measurement. The display shows the measurement result. Press the ON/OFF key to stop the measurement. The display shows "pH".
6. Press the ON/OFF key to stop the measurement. The display shows "pH". Press the RANGE/ENTER key to select the parameter to be measured. The display shows "pH". Press the READ/ENTER key to start the measurement. The display shows the measurement result. Press the ON/OFF key to stop the measurement. The display shows "pH". Press the RANGE/ENTER key to select the parameter to be measured. The display shows "pH". Press the READ/ENTER key to start the measurement. The display shows the measurement result. Press the ON/OFF key to stop the measurement. The display shows "pH".
7. Press the ON/OFF key to stop the measurement. The display shows "pH". Press the RANGE/ENTER key to select the parameter to be measured. The display shows "pH". Press the READ/ENTER key to start the measurement. The display shows the measurement result. Press the ON/OFF key to stop the measurement. The display shows "pH". Press the RANGE/ENTER key to select the parameter to be measured. The display shows "pH". Press the READ/ENTER key to start the measurement. The display shows the measurement result. Press the ON/OFF key to stop the measurement. The display shows "pH".

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### Manual abstract:

This manual will provide you with the necessary information for the correct use of the instrument. 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](mailto:tech@hannainst.com). Preliminary examination: Please examine this product carefully. Make sure that the instrument is not damaged. If any damage occurred during shipment, please notify your Dealer. Each HI 96745 Ion Selective Meter is supplied complete with: · Two Sample Cuvettes and Caps · 9V Battery · Instruction Manual Note: save all packing material until you are sure that the instrument works correctly. Any defective item must be returned in its original packing. For more details about spare parts and accessories see "Accessories".

For Iron LR: Adaptation of the TPTZ method. The reaction between iron and the reagent causes a violet tint in the sample. Environment 0 to 50°C (32 to 122°F); max 95% RH non-condensing Battery Type 1 x 9 volt Auto-Shut off After 10' of non-use in measurement mode; after 1 hour of non-use in calibration mode; with last reading reminder. Dimensions 192 x 104 x 69 mm (7.6 x 4.1 x 2.7") Weight 360 g (12.7 oz.). 6.

7. 8. 9. 10. The chronometer appears when the reaction timer is running The month, day and date icons appear when a date is displayed Four digit main display Measuring units Four digit secondary display Measurement procedure: Measurement 2 Errors and warnings: ON ZERO READING: Light High: There is too much light to perform a measurement. Please check the preparation of the zero cuvette. Light Low: There is not enough light to perform a measurement. Please check the preparation of the zero cuvette. No Light: The instrument cannot adjust the light level. Please check that the sample does not contain any debris.

ON SAMPLE READING: Inverted cuvettes: The sample and the zero cuvette are inverted. Zero: A zero reading was not taken. @@@@The concentration of the sample is beyond the programmed range: dilute the sample and re-run the test. DURING CALIBRATION PROCEDURE: Standard Low: The standard reading is less than expected. Standard High: The standard reading is higher than expected. OTHER ERRORS AND WARNINGS: Cap error: Appears when external light enters in the analysis cell. Assure that the cuvette cap is present. Cooling lamp: The instrument waits for the lamp to cool down.

Battery low: The battery must be replaced soon. Dead battery: This indicates that the battery is dead and must be replaced.

Once this indication is displayed, normal operation of the instrument will be interrupted. Change the battery and restart the meter. #1 #2 3 Functional description: #1 #2 #3 Technical specifications: pH 6.5 to 8.5 Free Cl<sub>2</sub> 0.

00 to 5.00 mg/L Total Cl<sub>2</sub> 0.00 to 5.00 mg/L Mg Hardness 0.00 to 2.

00 mg/L Ca Hardness 0.00 to 2.70 mg/L Total Hardness 0.00 to 4.70 mg/L Iron LR 0.00 to 1.60 mg/L Resolution 0.1 pH 0.01 mg/L under 3.50 mg/L Cl<sub>2</sub> 0.

10 mg/L above 3.50 mg/L Cl<sub>2</sub> 0.01 mg/L Hardness 0.01 mg/L Iron LR Accuracy pH ±0.1 pH @ 25°C Free Cl<sub>2</sub> ±0.03 mg/L ±3% of reading @ 25°C Total Cl<sub>2</sub> ±0.03 mg/L ±3% of reading @ 25°C Mg Hardness ±0.11 mg/L ±5% of reading @ 25°C Ca Hardness ±0.11 mg/L ±5% of reading @ 25°C Iron LR ±0.01 mg/L ±8% of reading @ 25°C Typical EMC Dev.

±0.1 pH ±0.01 mg/L Cl<sub>2</sub> ±0.02 mg/L Mg Hardness ±0.02 mg/L Ca Hardness ±0.

01 mg/L Iron LR Range Tungsten lamp Silicon Photocell with narrow band interference filter @ 525 nm Method For pH: Phenol red method. The reaction with reagents causes a red tint in the sample. For Cl<sub>2</sub>: Adaptation of the USEPA method and Standard Method 4500-Cl G. The reaction with reagents causes a pink tint in the sample. For hardness: Adaptation of the Standard Methods for the Examination of Water and Wastewater, 18th Edition, colorimetric method.

The reaction between Mg/Ca and reagents causes a violet tint in the sample. Light Source Light Detector 1. RANGE/GLP/ key: press to change the parameter, press and hold for three seconds to enter GLP mode. In calibration mode press to edit the date and time. 2. CAL CHECK key: press to perform the validation of the meter, or press and hold for three seconds to enter calibration mode. 3. ZERO/CFM key: press to zero the meter prior to measurement, to confirm edited values or to confirm factory calibration restore. 4. READ/TIMER key: In measurement mode, press to make a measurement, or press and hold for three seconds to start a preprogrammed countdown prior to measurement.

In GLP mode press to view the next screen. 5. ON/OFF key: to turn the meter on and off. 6. Liquid Crystal Display (LCD) 7. Cuvette alignment indicator 8. Cuvette holder DISPLAY ELEMENTS DESCRIPTION: 4 5-6 8-9 or [www.hannainst.com](http://www.hannainst.com) 1. The measuring scheme (lamp, cuvette, detector), appears during different phases of zero or reading measurement 2.

Error messages and warnings 3. The battery icon indicates the charge state level of the battery 4. The hourglass appears when an internal check is in progress 5. Status messages 10 11 1. Turn the meter on by pressing ON/OFF. 2. When the beeper sounds briefly and the LCD displays dashes and "P1" (pH), "P2" (Free Chlorine), "P3" (Total Chlorine), "P4" (Total Hardness) or "P5" (Iron LR) the meter is ready.

The code that appears on the secondary display is the one of the last selected parameter. If necessary, press RANGE/GLP/ to change parameter. The blinking "ZERO" indicates that the instrument needs to be zeroed first. 3. Fill the cuvette with 10 mL of unreacted sample, up to the mark, and replace the cap. For Total Hardness: Fill a graduated beaker up to the 50mL mark with the sample.

Add 0.5 mL of HI 93719A-0 Calcium And Magnesium Reagent indicator solution and mix. Add 0.5 mL of HI 93719B-0 Alkali solution for Calcium and Magnesium and mix. Fill three cuvettes with 10mL of sample each. Add 1 drop of HI 93719C-0 EDTA solution to one cuvette, replace the cap and swirl the solution. This is the ZERO sample. Add 1 drop of HI 93719D-0 EGTA solution to the second cuvette, replace the cap and swirl the solution. This is the READ1 sample. For Iron LR: Fill one graduated mixing cylinder up to the 25 mL mark with deionized water.

@@This is the blank. Fill a cuvette with 10 mL of the blank up to the mark and replace the cap. 4. Place the cuvette into the holder and ensure that the notch on the cap is positioned securely into the groove. @@@@After a few seconds the display will show "-0.0-". @@Press and hold READ/TIMER for three seconds. The display will show the countdown prior to measurement. The beeper is playing a beep at the end of countdown period. Alternatively, wait for 30 seconds. @@@@7. Remove the cuvette.

@@@@@The beeper is playing a beep at the end of countdown period. @@For pH and Hardness press READ/TIMER directly.



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@@@INTERFERENCES: · Chlorine: Bromine, Iodine, Chlorine dioxide. Ozone and Oxidized forms of Manganese and Chromium. @@To resolve this, neutralize the sample with diluted HCl or NaOH.

@@@· Total Hardness: Excessive amounts of heavy metals. @@7· Place the specific CAL CHECKTM Standard Cuvette B into the cuvette holder, for: pH: B, HI 96710-11 Free Chlorine: B, HI 96701-11 Total Chlorine: B, HI 96711-11 Hardness: B, HI 96719-11 Iron LR: B, HI 96746-11 Ensure that the notch on the cap is positioned securely into the groove. 8· Press CAL CHECK key and the lamp, cuvette and detector icons together with "CAL CHECK" will appear on the display, depending on the measurement phase. 9· At the end of the measurement the display will show the validation standard value. The reading should be within specifications as reported on the CAL CHECKTM Standard Certificate.

If the value is found out of specifications, please check that the cuvettes are free of fingerprints, oil or dirt and repeat validation. If results are still found out of specifications then recalibrate the instrument. 7 8 9 Validation and Calibration procedures Warning: do not validate or calibrate the instrument with standard solutions other than the Hanna CAL CHECKTM Standards, otherwise erroneous results will be obtained. For accurate validation and calibration results, please perform tests at room temperature (18 to 25°C; 64.5 to 77.0°F). Use the Hanna CAL CHECKTM cuvettes (see "Accessories") to validate or calibrate instruments. VALIDATION Validation Note: The validation is performed only for the selected parameter. For full validation of 3 the instrument, the following procedure must be performed for each parameter. 1· Turn the meter on by pressing ON/OFF.

2· When the beeper sounds briefly and the LCD displays dashes, the meter is ready. 4-5 3· Place the CAL CHECKTM Standard Cuvette A into the cuvette holder and ensure that the notch on the cap is positioned securely into the groove. 4· Press ZERO/Curning to measurement mode. Factory Calibration Restore Accessories REAGENT SETS HI 93701-01 HI 93701-03 HI 93710-01 HI 93710-03 HI 93711-01 HI 93711-03 HI 93719-01 HI 93719-03 HI 93746-01 HI 93746-03 HI 96701-11 HI 96710-11 HI 96711-11 HI 96719-11 Reagents for 100 Free Chlorine tests Reagents for 300 Free Chlorine tests Reagents for 100 pH tests Reagents for 300 pH tests Reagents for 100 Total Chlorine tests Reagents for 300 Total Chlorine tests Reagents for 100 Hardness tests Reagents for 300 Hardness tests Reagents for 100 Iron Low Range tests Reagents for 300 Iron Low Range tests OTHER ACCESSORIES CAL CHECKTM Standard Cuvettes for Free Chlorine (1 set) CAL CHECK TM Standard Cuvettes for pH (1 set) CAL CHECK TM Standard Cuvettes for Total Chlorine (1 set) CAL CHECKTM Standard Cuvettes for Hardness (1 set) (equivalent with 1.00 mg/L Mg Hardness) HI 96746-11 CAL CHECK TM Standard Cuvettes for Iron LR (1 set) HI 721310 9V battery (10 pcs.) HI 731318 Cloth for wiping cuvettes (4 pcs.) HI 731331 Glass cuvettes (4 pcs.) HI 731335 Caps for cuvettes HI 93703-50 Cuvette cleaning solution (230 mL) Battery management To save the battery, the instrument shuts down after 10 minutes of nonuse in measurement mode and after 1 hour of non-use in calibration mode. If a valid measurement was displayed before auto-shut off, the value is displayed when the instrument is switched on. The blinking "ZERO" means that a new zero has to be performed.

One fresh battery lasts for around 750 measurements, depending on the light level. The remaining battery capacity is evaluated at the instrument startup and after each measurement. The instrument displays a battery indicator with three levels as follows: · 3 lines for 100 % capacity · 2 lines for 66 % capacity · 1 line for 33 % capacity · Battery icon blinking if the capacity is under 10 %. If the battery is empty and accurate measurements can't be taken any more, the instrument shows "dEAd bAtt" and turns off. To restart the instrument, the battery must be replaced with a fresh one.

To replace the instrument's battery, follow the steps: · Turn the instrument off by pressing ON/OFF. · Turn the instrument upside down and remove the battery cover by turning it counterclockwise. Warranty HI 96745 is warranted for two years against defects in workmanship and materials when used for its intended purpose and maintained according to the instructions. 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 your dealer. 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. To validate your warranty, fill out and return the enclosed warranty card within 14 days from the date of purchase. Recommendations for Users Before using these products, make sure that they are entirely suitable for your specific application and for the environment in which they are used. Operation of these instruments may cause unacceptable interferences to other electronic equipments, this requiring the operator to take all necessary steps to correct interferences. @@@@The calibration month and day will appear on the main display and the year on the secondary display. 2· If no calibration was performed, the factory calibration message, "F.

CAL" will appear on the main display and the instrument returns to measurement mode after three seconds. 1 Hanna Instruments reserves the right to modify the design, construction and appearance of its products without advance notice. For additional information, contact your dealer or the nearest 2 · Extract the battery from its location and replace it with a fresh one. · Insert back the battery cover and turn it clockwise to close. Hanna Customer Service Center. To find the Hanna Office in your area, visit our web site IST96745 11/10 w w w . h a n n a i n s t . c o m .



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