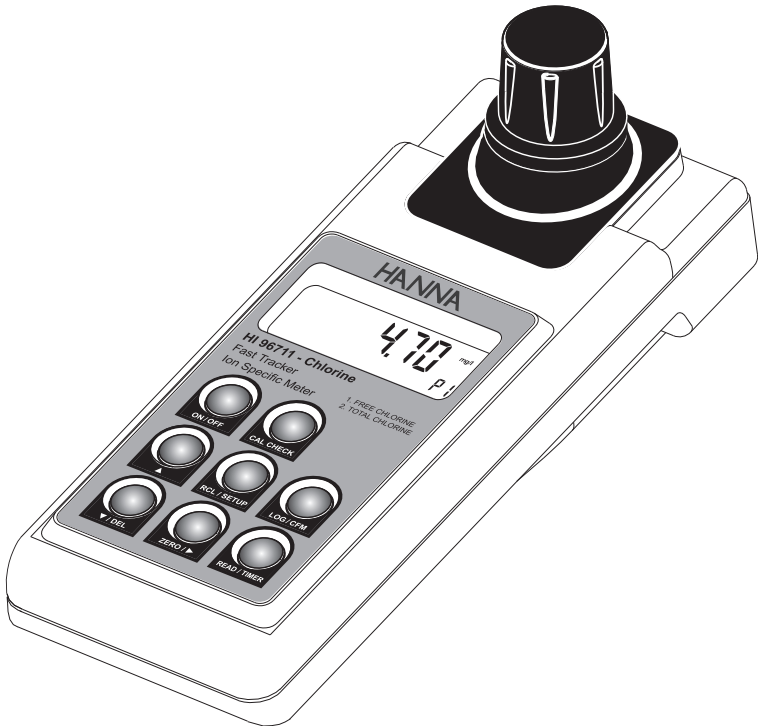


Instruction Manual

HI 96711 Free & Total Chlorine Fast Tracker Ion Specific Meter



 **HANNA**[®]
instruments
www.hannainst.com

Dear Customer,

Thank you for choosing a Hanna Instruments product. This manual will provide you with the necessary information for correct use of the meter.

Please read this instruction manual carefully before using the instrument.

If you need additional technical information, do not hesitate to e-mail us at tech@hannainst.com or see the back side of this manual for our worldwide sales and technical service contacts.

This instrument is in compliance with **CE** directives.

WARRANTY

HI 96711 is warranted for two years against defects in workmanship and materials when used for its intended purpose and maintained according to instructions. This warranty is limited to repair or replacement free of charge.

Damage due to accidents, misuse, tampering or lack of prescribed maintenance is 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 Technical Service Department and then send it with shipping costs prepaid. When shipping any instrument, make sure it is properly packed for complete protection.

To validate your warranty, fill out and return the enclosed warranty card within 14 days from the date of purchase.

TABLE OF CONTENTS

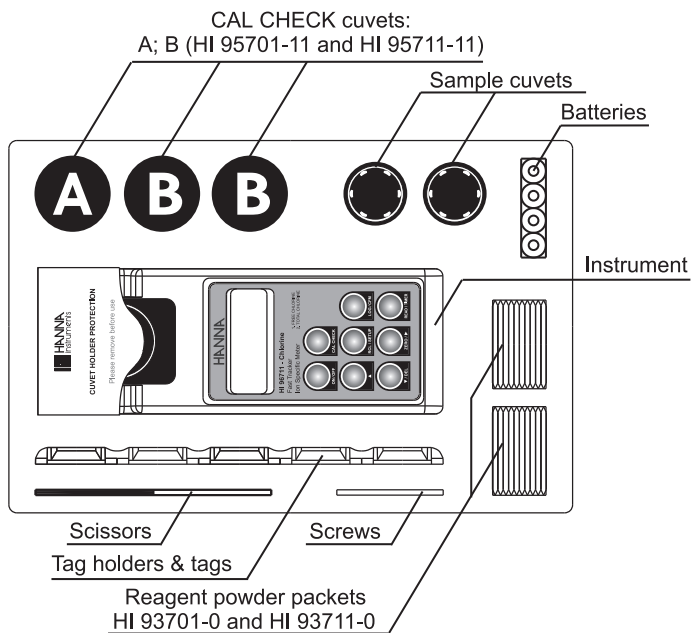
WARRANTY	2
PRELIMINARY EXAMINATION	3
GENERAL DESCRIPTION	4
FAST TRACKER FEATURE	4
ABBREVIATIONS	5
SPECIFICATIONS	6
PRECISION AND ACCURACY	6
PRINCIPLE OF OPERATION	7
FUNCTIONAL DESCRIPTION	9
GUIDE TO DISPLAY CODES	11
GENERAL TIPS FOR AN ACCURATE MEASUREMENT	14
MEASUREMENT PROCEDURE	15
VALIDATION PROCEDURE	17
CALIBRATION PROCEDURE	18
SETUP	20
LOGGING	23
TAG INSTALLATION	26
BATTERIES REPLACEMENT	26
ACCESSORIES	27
RECOMMENDATIONS FOR USERS	27

PRELIMINARY EXAMINATION

Please examine this Product carefully. Make sure the instrument is not damaged. If any damage has occurred during the shipment, please notify your dealer.

This HI 96711 Ion Specific Meter is supplied complete with:

- Two Sample Cuvets and Caps
- Three CAL CHECK™ cuvetts (HI 95701-11 & HI 95711-11)
- Reagent powder packets (HI 93701-0 & HI 93711-0) (10 packets each)
- Tissue for wiping the cuvetts
- Five Tag holders with Tags (HI 920005)
- Batteries (4 pcs.)
- Scissors
- Instruction Manual
- Quick Reference Guide
- Instrument Quality Certificate
- Rigid carrying case



Note: Save all packing material until you are sure that the instrument works correctly. Any defective item must be returned in the original packing with the supplied accessories.

GENERAL DESCRIPTION

HI 96711 is an auto diagnostic portable microprocessor meter that benefits from Hanna's years of experience as manufacturer of analytical instruments. It has an advanced optical system based on a special tungsten lamp and a narrow band interference filter that allows most accurate and repeatable readings. All instruments are factory calibrated and the electronic and optical design minimizes the need of frequent calibration.

With the powerful **CAL CHECK™** validation function you are able to validate good performance of your instrument at any time. The validation procedure is extremely user friendly. Just use the exclusive Hanna ready-made, NIST traceable standards to verify the performance of the instrument and recalibrate if necessary.

All instruments are splash proof and the lamp and filter units are protected from dust or dirt by a transparent cup. This makes the instruments fulfill field applications.

Display codes aid the user in routine operation. Acoustic signals are used to make the instrument more user-friendly. The meter has an auto shut-off feature that will turn off the instrument after 10 minutes of non-use or after 1 hour if left in *calibration mode*.

The meter uses an exclusive positive-locking system to ensure that the cuvet is in the same position every time it is placed into the measurement cell. It is designed to fit a cuvet with a larger neck making it easier to add both sample and reagents. The cuvet is made from special optical glass to obtain best results.

The **HI 96711** meter measures the free and total chlorine (Cl_2) content in water samples in the 0.00 to 5.00 mg/L (ppm) range. The method is an adaptation of the **USEPA Method 330.5** for wastewater and **Standard Method 4500-Cl G** for drinking water.

The reagents are in powder form and are supplied in packets. The amount of reagent is precisely dosed to ensure the maximum repeatability.

FAST TRACKER FEATURE

Hanna is the first manufacturer of colorimeters that has decided to add the unique T.I.S.-Tag Identification System to our Fast Tracker Ion Specific Meters, to meet the more restrictive needs for traceability of our clients. This means that from now on you can benefit all advantages of this system for your colorimetric measurements and data management.

The system is designed for scientific and industrial applications, or to prove during safety audits and inspections that samples have been truly taken on preestablished locations.

The system is as easy to install as to operate. Just fix the so-called iButton® tags near your sampling sites that need to be checked often, and with this the T.I.S. is setup. The tag contains a computer chip embedded in a durable stainless steel can. It is designed to withstand the harsh environments, indoors or outdoors. The number of tags that can be installed is practically unlimited, because each tag has a unique identification code.

Immediately after installation of the tags you can start collecting data. Use the Fast Tracker Ion Specific Meter to take measurement and memorize the test result by pressing the Log-on-Demand key. Then, the meter will ask for the tag identification. Simply touching the iButton® with the matching connector on the Fast Tracker does identify and authenticate logging, time and date stamp events.

The power of the Fast Tracker and T.I.S. features resides in the PC application. Download all test data to your PC and use our **HI 92000** Windows® compatible application software for further data management. You can sort or filter all your collected test data on different criteria like on a specific sampling location, parameter, date and time intervals, or fix range to filter measured values. The data can be plotted in a graph, exported to other common Windows® applications or printed for reporting purpose.

It is possible to add also new tags later on, thus increasing an already existing database. Each time the PC software recognizes a not already register tag it will ask for a description of the new sampling location.

ABBREVIATIONS

°C	degree Celsius
USEPA	US Environmental Protection Agency
°F	degree Fahrenheit
LCD	Liquid Crystal Display
mg/L	milligrams per liter. mg/L is equivalent to ppm (parts per million)
mL	milliliter
RTC	Real Time Clock
RH	Relative Humidity

iButton® is registered Trademark of "MAXIM/DALLAS semiconductor Corp."

SPECIFICATIONS

Range	Free Cl ₂ 0.00 to 5.00 mg/L Total Cl ₂ 0.00 to 5.00 mg/L
Resolution	0.01 mg/L from 0.00 to 3.50 mg/L; 0.10 mg/L above 3.50 mg/L
Precision	±0.02 mg/L @ 1.00 mg/L
Typical EMC Deviation	±0.01 mg/L
Light Source	Tungsten lamp with narrow band interference filter @ 525 nm
Light Detector	Silicon Photocell
Method	Adaptation of the USEPA Method 330.5 and Standard Method 4500-Cl G . The reaction between chlorine and DPD reagent causes a pink tint in the sample
LOG Memory	99 records
Serial Interface	RS232 @ 9600 baud rate
Environment	0 to 50°C (32 to 122°F); max 95% RH non-condensing
Power supply	4 x 1.5V AA alkaline batteries
Auto Shut-off	After 10 minutes of non-use in <i>measurement mode</i> After 1 hour of non-use in <i>calibration mode</i>
Dimensions	216 x 83 x 65 mm (8.5 x 3.26 x 2.55")
Weight	420 g (17 oz.)

REQUIRED REAGENTS

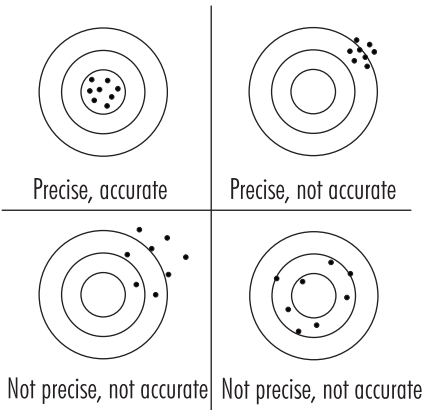
Code	Unit	Description	Quantity/test
HI 93701-0	Free Cl ₂	Free Chlorine Reagent	1 packet
HI 93711-0	Total Cl ₂	Total Chlorine Reagent	1 packet

PRECISION AND ACCURACY

Precision is how closely repeated measurements agree with each other. Precision is usually expressed as standard deviation (SD).

Accuracy is defined as the nearness of a test result to the true value.

Although good precision suggests good accuracy, precise results can be inaccurate. The figure explains these definitions. In a laboratory using a standard solution of 1.00 mg/L chlorine and a representative lot of reagent, an operator obtained with a single instrument a standard deviation of 0.02 mg/L.



PRINCIPLE OF OPERATION

Absorption of light is a typical phenomenon of interaction between electromagnetic radiation and matter. When a light beam crosses a substance, some of the radiation may be absorbed by atoms, molecules or crystal lattices.

If pure absorption occurs, the fraction of light absorbed depends both on the optical path length through the matter and on the physical-chemical characteristics of the substance, according to the Lambert-Beer law:

$$-\log \frac{I}{I_0} = \epsilon_{\lambda} c d$$

or

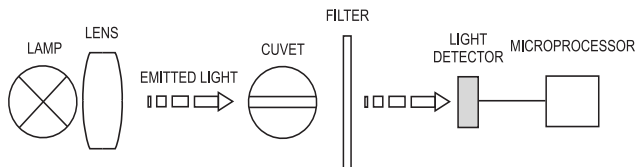
$$A = \epsilon_{\lambda} c d$$

Where:

- $-\log \frac{I}{I_0} =$ Absorbance (A)
- $I_0 =$ intensity of incident light beam
- $I =$ intensity of light beam after absorption
- $\epsilon_{\lambda} =$ molar extinction coefficient at wavelength λ
- $c =$ molar concentration of the substance
- $d =$ optical path through the substance

Therefore, the concentration “c” can be calculated from the absorbance of the substance as the other factors are known.

Photometric chemical analysis is based on the possibility to develop an absorbing compound from a specific chemical reaction between sample and reagents. Given that the absorption of a compound strictly depends on the wavelength of the incident light beam, a narrow spectral bandwidth should be selected as well as a proper central wavelength to optimize measurements. The optical system of Hanna's **HI 96** colorimeters series is based on special subminiature tungsten lamps and narrow-band interference filters to guarantee both high performance and reliable results.



Block diagram (optical layout)

A microprocessor controlled special tungsten lamp emits radiation which is first optically conditioned and beamed to the sample contained in the cuvet. The optical path is fixed by the diameter of the cuvet. Then the light is spectrally filtered to a narrow spectral bandwidth, to obtain a light beam of intensity I_0 or I .

The photoelectric cell collects the radiation I that is not absorbed by the sample and converts it into an electric current, producing a potential in the mV range.

The microprocessor uses this potential to convert the incoming value into the desired measuring unit and to display it on the LCD.

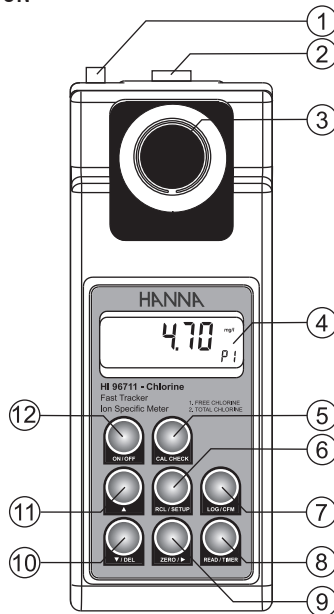
The measurement process is carried out in two phases: first the instrument is zeroed and then the actual measurement is performed.

The cuvet has a very important role because it is an optical element and thus requires particular attention. It is important that both the measurement and the calibration (zeroing) cuvetts are optically identical to provide the same measurement conditions. Whenever possible use the same cuvet for both. It is necessary that the surface of the cuvet is clean and not scratched. This to avoid measurement interference due to unwanted reflection and absorption of light. It is recommended not to touch the cuvet walls with hands.

Furthermore, in order to maintain the same conditions during the zeroing and the measuring phases, it is necessary to close the cuvet to prevent any contamination.

FUNCTIONAL DESCRIPTION

INSTRUMENT DESCRIPTION

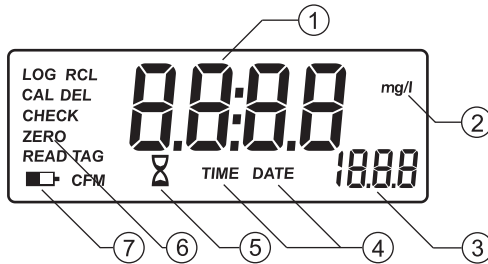


- 1) Serial interface connector.
- 2) Tag reader connector.
- 3) Cuvet Holder.
- 4) Liquid Crystal Display (LCD).

KEYPAD DESCRIPTION

- 5) CAL CHECK bi-functional key, press shortly to validate the actual calibration, or hold the key for 3 seconds to enter calibration.
- 6) RCL/SETUP bi-functional key, press shortly to view log records, or hold the key for 3 seconds to enter setup.
- 7) LOG/CFM, to save the log records or to confirm the selected option.
- 8) READ/TIMER bi-functional key, press shortly to take measurements, or hold the key for 3 seconds to start a pre-programmed countdown prior to measurement.
- 9) ZERO/▶, to zero the instrument prior to measurement or to display the content of a record.
- 10) ▼/DEL, to change down the parameter program (P1 or P2), to decrease set values or to scroll the log and to restore the factory calibration.
- 11) ▲, to change up the parameter program (P1 or P2), to increase set values or to scroll the log.
- 12) ON/OFF, to turn the instrument ON and OFF.

DISPLAY DESCRIPTION



- 1) Four digit main display.
- 2) Measurement unit.
- 3) Three and a half digit secondary display.
- 4) "TIME" and "DATE": appear with time (hh:mm) and date (yyyy.mm.dd) presentation.
- 5) The hourglass icon: appears when the instrument is making an internal check-up.
- 6) Status information.
- 7) Battery icon: appears when the battery voltage is getting low.

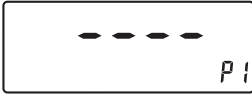
BEEPER

A beeper is used for confirmation and error signals. The error signal is distinguished from confirmation by a long beep.

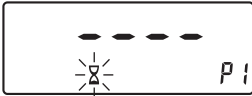
GUIDE TO DISPLAY CODES



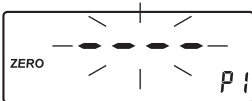
This prompt appears for one second each time the instrument is turned ON.



Indicates that the meter is ready to operate and zeroing can be performed (P1 or P2). The secondary LCD shows a number which indicates the program that is selected.



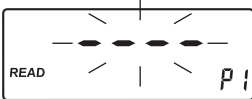
This flashing prompt appears each time the meter is performing an internal check-up.



Indicates that the meter is performing a zero measurement and if necessary, auto-calibrates the light intensity.



The instrument is zeroed and a measurement can be made.



Indicates that the meter is making a measurement.



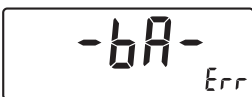
Light over range: the cuvet is not inserted correctly and an excess of ambient light is reaching the detector. If the cuvet is properly installed, then contact your dealer or the nearest Hanna Customer Service Center.



The meter has lost its configuration. Contact your dealer or the nearest Hanna Customer Service Center.



Batteries voltage is getting low and the batteries need to be replaced.



Indicates that the batteries are dead and must be replaced. Once this message is displayed, the instrument will lock-up. Press ON/OFF to switch off the meter, change the batteries and restart the instrument.

CALIBRATION MODE MESSAGES



This prompt appears each time the meter enters calibration mode. The meter is ready for a new calibration and asks for zero measurement.



This indicates that the meter was not calibrated by the user.



This prompt appears for one second at the end of a new calibration to indicate that the new calibration has been stored.



A confirmation of the factory calibration is selected.



This indicates that the user calibration was deleted.



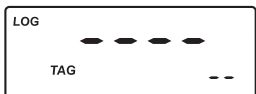
“Error”: the concentration of the used calibration solution is not correct. Repeat the **calibration procedure** with the right standard solution, and verify it is not expired. If the calibration procedure fails again, contact your dealer or the nearest Hanna Customer Service Center.

LOGGING MODE MESSAGES

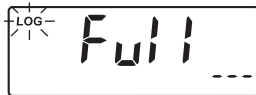


The blinking “READ TAG” indicates that the meter asks to read the tag for identification of the sampling location.

Note: If the tag is not read within 20 seconds, the logging procedure is canceled.



A record is stored without identification of the sampling location.



Indicates that the memory is full and no other record can be stored.

LOG RECALL MODE MESSAGES



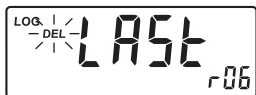
This prompt appears when entering recall data. The records number appear on the primary display.



Measurement date: year (yyyy), month (mm), day (dd).



Measurement time: hour (hh) and minutes (mm).



Delete the last record. The blinking "DEL" indicates that the last record will be deleted if the ▼/DEL key is pressed.

Note: To delete a record, a second confirmation is required.

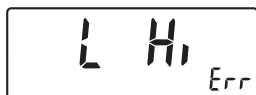


Delete all records. The blinking "DEL" indicates that all records will be deleted if the ▼/DEL key is pressed.

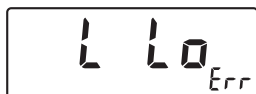
Note: To delete all records, a second confirmation is required.

ERROR MESSAGES

a) on zero reading:



"Light high": there is too much light to perform a measurement. Please check the preparation of the zero cuvet.

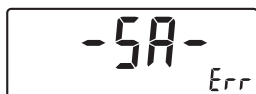


"Light low": there is not enough light to perform a measurement. Please check the preparation of the zero cuvet.



"No Light": the instrument cannot adjust the light level. Please check that the sample does not contain any debris.

b) on sample reading:



There is too much light for the sample measurement. Please check if the right sample cuvet is inserted.



"Inverted": the sample and the zero cuvet are inverted.



"Zero": a zero reading was not taken. Follow the instruction in the **measurement procedure** for zeroing the instrument.



The sample absorbs less light than the zero reference. Check the procedure and make sure you use the same cuvet for reference (zero) and measurement.

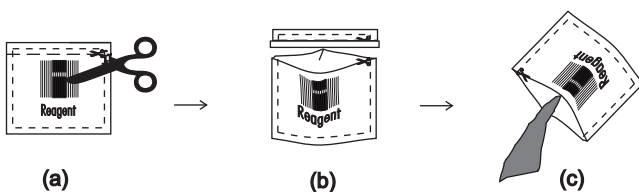


A flashing value of the maximum concentration indicates an over range condition. The concentration of the sample is beyond the programmed range: dilute the sample and measure again.

GENERAL TIPS FOR AN ACCURATE MEASUREMENT

The instructions listed below should be carefully followed during testing, to ensure best accuracy.

- For filling correctly the cuvet: the liquid in the cuvet forms a convexity on the top; the bottom of this convexity must be at the same level of the 10 mL mark.
- Proper use of the powder reagent packet:
 - (a) use scissors to open the powder packet;
 - (b) push the edges of the packet to form a spout;
 - (c) pour out the content of the packet.

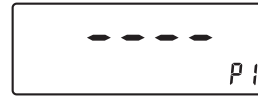


- It is important that the sample does not contain any debris. This would corrupt the reading.
- Each time the cuvet is used, the cap must be tightened to the same degree.
- Whenever the cuvet is placed into the measurement cell, it must be dry outside, and completely free of fingerprints, oil or dirt. Wipe it thoroughly with the supplied tissue (HI 731318) or a lint-free cloth prior to insertion.
- Shaking the cuvet can generate bubbles in the sample, causing higher readings. To obtain accurate measurements, remove such bubbles by swirling or by gently tapping the vial.
- Do not let the reacted sample stand too long after reagent is added, or accuracy will be lost.
- It is possible to take multiple readings in a row, but it is recommended to take a new zero reading for each sample and to use the same cuvet for zeroing and measurement.
- After the reading it is important to discard immediately the sample, otherwise the glass might become permanently stained.
- All the reaction times reported in this manual are referred to 20°C (68°F). As a general rule of thumb, they should be doubled at 10°C (50°F) and halved at 30°C (86°F).
- In order to maximize accuracy, prior to a measurement follow the **validation procedure**, to be sure that the instrument is properly calibrated. If necessary, calibrate the instrument.



MEASUREMENT PROCEDURE

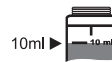
- Turn the meter on by pressing ON/OFF.
When the LCD displays "----", the meter is ready. On the secondary LCD "P1" or "P2" will appear, indicating that the free or total chlorine parameter is selected. The display code that appears is the one of the last selected parameter.



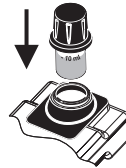
- Select the parameter program for Free Chlorine "P1", or Total Chlorine "P2", by pressing the UP or DOWN keys.



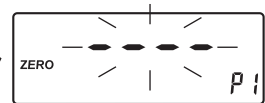
- Fill the cuvet with 10 mL of unreacted sample, up to the mark, and replace the cap.



- Place the cuvet into the holder and ensure that the notch on the cap is positioned securely into the groove.



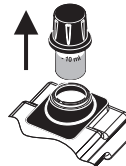
- Press ZERO/▶ and "----" will blink on the display.



- Wait for a few seconds and the display will show "-0.0-". The instrument is now zeroed and ready for measurement.



- Remove the cuvet from the instrument.



- Remove the cap.

- Add the content of one packet of the specific test reagent, for:

Free Chlorine
1 packet of
HI 93701-0

or

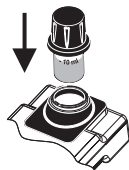
Total Chlorine
1 packet of
HI 93711-0



- Replace the cap and shake gently for 20 seconds (or 2 minutes in case of seawater analysis).



- Replace the cuvet into the holder and ensure that the notch on the cap is positioned securely into the groove.

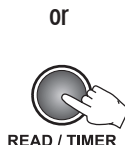


- Hold READ/TIMER for three seconds. The display will show the hourglass blinking and the count-down prior to measurement.

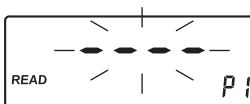


Alternatively, wait for:

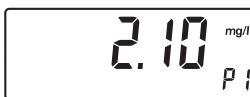
<u>Free Chlorine:</u>		<u>Total Chlorine:</u>
1 minute	or	2 minutes and 30 seconds



Then just press READ/TIMER. In both cases "----" will blink during measurement.



- The instrument directly displays the concentration in mg/L of free chlorine (P1) or total chlorine (P2) on the LCD.



Note: If the value is over range, the maximum value (5.00) will blink.

INTERFERENCES

- Bromine (positive error).
- Chlorine dioxide (positive error).
- Iodine (positive error).
- Oxidized Manganese and Chromium (positive error).
- Ozone (positive error).

Alkalinity above 250 mg/L CaCO₃ or acidity above 150 mg/L CaCO₃ will not reliably develop the full amount of color or it may rapidly fade. To resolve this, neutralize the sample with diluted HCl or NaOH.

In case of water with hardness greater than 500 mg/L CaCO₃, shake the sample for approximately 2 minutes after adding the powder reagent.

VALIDATION PROCEDURE

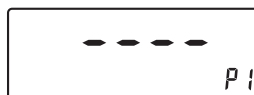
Use the validation procedure to ensure that the instrument is properly calibrated.

Warning: Do not validate or calibrate the instrument with standard solutions other than Hanna CAL CHECK™ Standards, otherwise erroneous results will be obtained. For accurate validation and calibration please perform test at room temperature, 18 to 25°C (64.5 to 77.0°F).

- Turn the meter on by pressing ON/OFF.
When the LCD displays "----", the meter is ready. On the secondary LCD "P1" or "P2" will appear, indicating that the free or total chlorine parameter is selected. The display code that appears is the one of the last selected parameter.



ON / OFF



- Select the parameter program for Free Chlorine "P1", or Total Chlorine "P2", by pressing UP or DOWN keys.

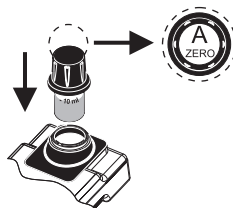


▲



▼ / DEL

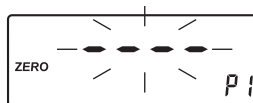
- Place the CAL CHECK™ Standard Cuvet A into the holder and ensure that the notch on the cap is positioned securely into the groove.



- Press ZERO/▶ and "----" will blink on the display.



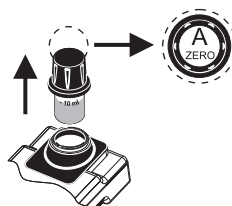
ZERO / ▶



- Wait for a few seconds and the display will show "-0.0-". The instrument is now zeroed and ready for validation.



- Remove the cuvet.



- Place the specific CAL CHECK™ Standard Cuvet B into the holder:

Free Chlorine

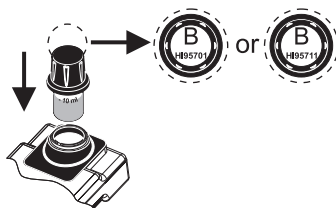
B, HI 95701-11

or

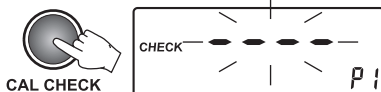
Total Chlorine

B, HI 95711-11

Ensure that the notch on the cap is positioned securely into the groove.



- Press CAL CHECK and “----” will blink during measurement.



- Wait for a few seconds and the display will show the validation standard value.



Note: The reading should be within specifications as reported on the CAL CHECK™ 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 out of specifications, then recalibrate the instrument.

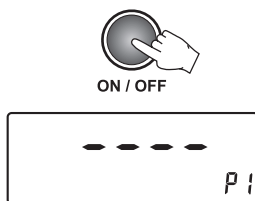
CALIBRATION PROCEDURE

Note: It is possible to interrupt the calibration procedure by pressing CAL CHECK or ON/OFF.

Warning: Do not validate or calibrate the instrument with standard solutions other than Hanna CAL CHECK™ Standards, otherwise erroneous results will be obtained. For accurate validation and calibration please perform test at room temperature, 18 to 25°C (64.5 to 77.0°F).

CALIBRATION PROCEDURE

- Turn the meter on by pressing ON/OFF. When the LCD displays “----”, the meter is ready. On the secondary LCD “P1” or “P2” will appear, indicating that the free or total chlorine parameter is selected. The display code that appears is the one of the last selected parameter.

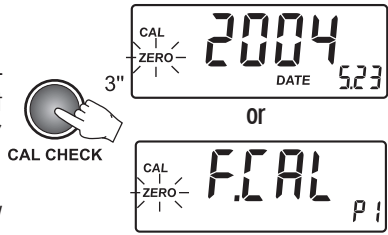


- Select the parameter program for Free Chlorine “P1”, or Total Chlorine “P2”, by pressing UP or DOWN keys.

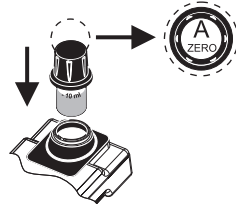


- Enter the calibration mode by holding the CAL CHECK key for three seconds. The date of the last calibration appears (e.g. 2004 05 23). "F.CAL" means that the factory calibration is selected.

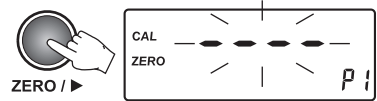
Note: At this moment it is possible to restore Factory Calibration (see instructions, page 20).



- Place the CAL CHECK™ Standard Cuvet A into the holder and ensure that the notch on the cap is positioned securely into the groove.



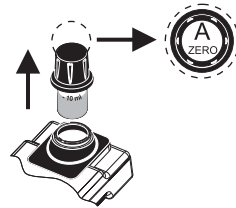
- Press ZERO/▶ and "----" will blink on the display.



- After a few seconds the display will show "-0.0-". The meter is now zeroed and ready for calibration.



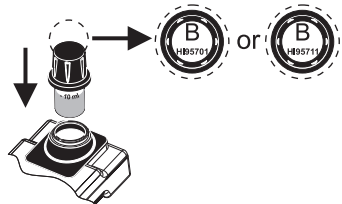
- Remove the cuvet.



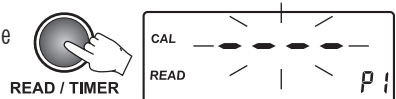
- Place the specific CAL CHECK™ Standard Cuvet B into the holder:

Free Chlorine B, HI 95701-11 or Total Chlorine B, HI 95711-11

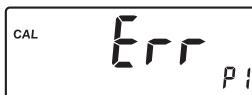
Ensure that the notch on the cap is positioned securely into the groove.



- Press READ/TIMER and "----" will blink on the display.



- The instrument will show for two seconds the CAL CHECK standard value and then “Stor” to confirm that the new calibration data has been accepted. The meter returns automatically to the measurement mode.



Note: If the display shows “Err”, the calibration procedure failed. Verify that the right CAL CHECK™ Standard Cuvet **B** is inserted or that both **A** and **B** cuvetts are free from fingerprints or dirt.

Factory Calibration Reset

It is possible to restore factory calibration.

- Enter the calibration mode by holding CAL CHECK for three seconds. The date of last calibration appears on the display.



- Press ▼/DEL and “CAL”, “DEL” will appear, with “CFM” blinking.



- Press LOG/CFM to restore factory calibration. The display will show for two seconds “F.CAL” and the meter returns automatically to the measurement mode.



SETUP

- Turn the meter on by pressing ON/OFF.



- Enter setup by holding the RCL/SETUP key for three seconds. The current date appears on the LCD.



- Use the UP or DOWN keys to switch between time and date.

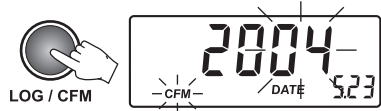


Setting the date

The year is displayed on the main display and the month and day on the secondary one.



- To set a new date, press LOG/CFM. The last two digits of the year start blinking.



- Set the year by using the UP and DOWN keys.



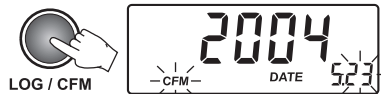
- Press LOG/CFM to switch to the month.



- Set the month by using the UP and DOWN keys.



- Press LOG/CFM to switch to the day.



- Set the day by using the UP and DOWN keys.



- Finally press LOG/CFM. The instrument saves the new date and returns to the main setup menu.

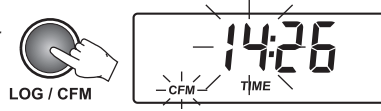


Setting the time

The time is displayed in hours and minutes.



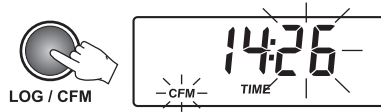
- To set a new time, press LOG/CFM and the hour start blinking.



- Set the hour by using the UP and DOWN keys.



- Press LOG/CFM to switch to minutes.



- Set the minutes by using the UP and DOWN keys.



- Press LOG/CFM. The instrument saves the new time and returns to the main setup menu.



Note: The internal clock will lose the date and time if the battery is removed for more than 30 seconds.

LOGGING

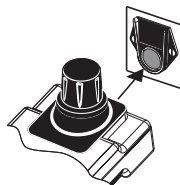
LOG DATA

The log on demand feature is active after a valid measurement is obtained (no errors).

- To log a value, press LOG/CFM when a measurement result is displayed. The meter asks to "READ TAG" for identification of the sampling location.



- To give the ID code for the identification of the sampling location, simply touch the iButton® tag with the matching connector, located on the back of the instrument (see page 9).



- If the tag is successfully read, the meter will beep once, displaying the unique hexadecimal string of the tag, and store the data in a log record. Each logged measurement is stored in a separate record, with a different record number (e.g. "r06").

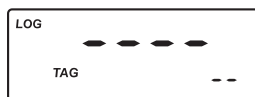


- After the data is stored, the meter returns to the measurement mode.

Note: If the tag is not read within 20 seconds, the logging procedure is canceled.

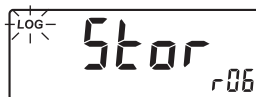
A measurement can be stored only once. Also an over range value can be stored.

- To store a record without identification of the sampling location, press LOG/CFM when "READ TAG" is displayed. "----" will appear on the display.

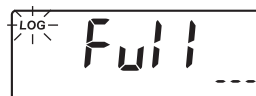


- If another key is pressed, the log procedure is canceled.

- If less than five free records are available, the "LOG" will blink while storing data.



- If the log memory is full, the "Full" message appears for two seconds and the meter returns to the measurement mode.



Note: See Delete Records for free log space.

RECALL DATA

The log records are organized in chronological order. The first displayed record is the last one stored.

- To view logged data, press RCL/SETUP.



- Use the UP or DOWN keys to scroll the log memory, record by record.



- Press ZERO/▶ key to scroll through the record contents. The record panels are displayed one by one.



Each record contains several panels:

- Record number and parameter number.



- Sample value and parameter number.



- The hexadecimal string of the tag for the identification of the sampling location. If data was stored without the identification of the sampling location, "----" is displayed.



- Measurement date.



- Measurement time.



- Delete the last record.



- Delete all records.



Notes: To make log searching easier, the following features are available:

It is allowed to scroll from any record panel, except from delete last or delete all.

If you scroll between records, the new selected record number is displayed for one second on the secondary LCD, together with "TAG" if the identification of the sampling location was made.

If the logged sample value is an over range reading, the maximum value (5.00) will blink, when recall the log.

Delete Records

- To delete the last or all records, press ▼/DEL.



- The instrument asks to confirm that you want to delete the record(s).



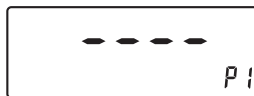
or



- Press LOG/CFM to confirm. The meter will display the first panel for the previous record (if delete last record was chosen) or will remove all records and returns to the measurement mode.

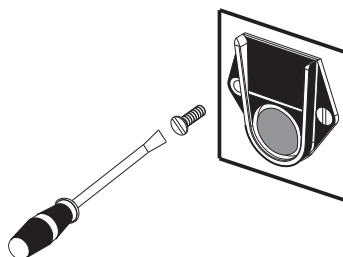


or



TAG INSTALLATION


Place the tag near a sampling point. Fix it securely with the provided screws, in such a way that the metallic iButton® is easily accessible for reading the tag.



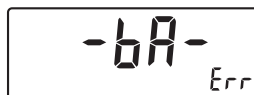
The number of tags that can be installed is practically unlimited. Additional tags can be ordered (HI 920005 - five tag holders with tags).

BATTERIES REPLACEMENT

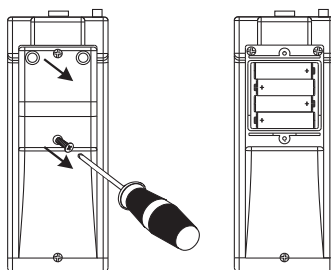
Warning: Replace batteries only in a non-hazardous area.

The blinking “” will appear when the batteries power gets low. From this moment, approximately 100 measurements can be taken until the battery is dead.

When batteries are completely discharged, “bA Err” will appear and the instrument will lock-up. Press the ON/OFF key to turn off the meter.



Unscrew the 2 screws from the battery cover and take it away. Take out the batteries and insert 4 fresh 1.5V batteries, while paying attention to the correct polarity.



Replace the cover and screw the 2 screws on again.

Note: If batteries are removed from the instrument for more than 30 seconds, the date and time are lost and need to be set again.

ACCESSORIES

REAGENT SETS

- HI 93701-01 Reagents for 100 Free Chlorine tests
- HI 93701-03 Reagents for 300 Free Chlorine tests
- HI 93711-01 Reagents for 100 Total Chlorine tests
- HI 93711-03 Reagents for 300 Total Chlorine tests

OTHER ACCESSORIES

- HI 95701-11 CAL CHECK™ Standard Cuvets for Free Chlorine (1 set)
- HI 95711-11 CAL CHECK™ Standard Cuvets for Total Chlorine (1 set)
- HI 731318 Tissue for wiping cuvetts (4 pcs)
- HI 731331 Glass cuvetts (4 pcs)
- HI 93703-50 Cuvets cleaning solution (230 mL)
- HI 920005 5 tag holders with tags
- HI 740027P 1.5V AA battery (12pcs)
- HI 92000 Windows® compatible software
- HI 920011 5 to 9 pins RS232 connection cable

RECOMMENDATIONS FOR USERS

Before using this product, make sure that it is entirely suitable for your specific application and for the environment in which it is used.

Operation of this instrument may cause unacceptable interferences to other electronic equipments, requiring the user to follow all necessary steps to correct interferences.

Any variation introduced by the user to the supplied equipment may degrade the instrument's EMC performance.

To avoid damage or burns, do not put the instrument in microwave ovens. For your own and the instrument safety do not use or store the instrument in hazardous environments.

Hanna Instruments reserves the right to modify the design, construction and appearance of its products without advance notice.

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:

Tel. 66.2619.0708 • Fax 66.2619.0061

United Kingdom:

Tel. (01525) 850.855 • Fax (01525) 853.668

USA:

Tel. (401) 765.7500 • Fax (401) 765.7575

MAN96711
12/04R1

*For e-mail contacts and a complete list of Sales and Technical offices, please see
www.hannainst.com.*