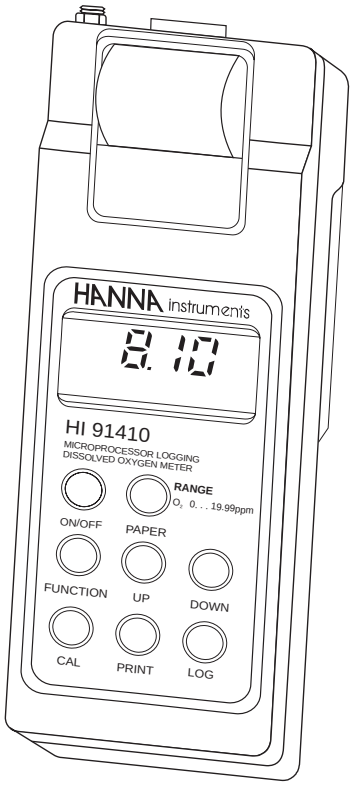
Instruction Manual

HI 9141 • HI 91410

Printing and Logging Dissolved Oxygen Meters



HANNA instruments®

www.hannainst.com

Dear Customer,

Thank you for choosing a HANNA product.

Please read this instruction manual carefully before using the instrument.

This manual will provide you with all the necessary information for a correct use.

If you need additional technical support, do not hesitate to e-mail us at **tech@hannainst.com**

These instruments are in compliance with the CE directives.

TABLE OF CONTENTS

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 the instructions. **Probes are warranted for six months**.

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 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 charge for repair or replacement. If the instrument is to be returned to Hanna Instruments, obtain a Return Goods Authorization from the Customer Service Department first and then send it with shipment cost prepaid. When shipping any instrument, make sure it is properly packaged for complete protection.

PRELIMINARY EXAMINATION

Remove the instrument from the packing material and examine it to make sure that no damage has occurred during shipping. If there is any damage, immediately notify your dealer. Each meter is supplied complete with:

- **HI 76407/4** DO probe with 4 m cable
- **HI 7041S** electrolyte solution (30 mL)
- Protective cap
- 2 spare membranes with O-ring
- 5 pPaper rolls
- Batteries (4 x 1.5V AA)
- Instruction manual
- Rugged carrying case

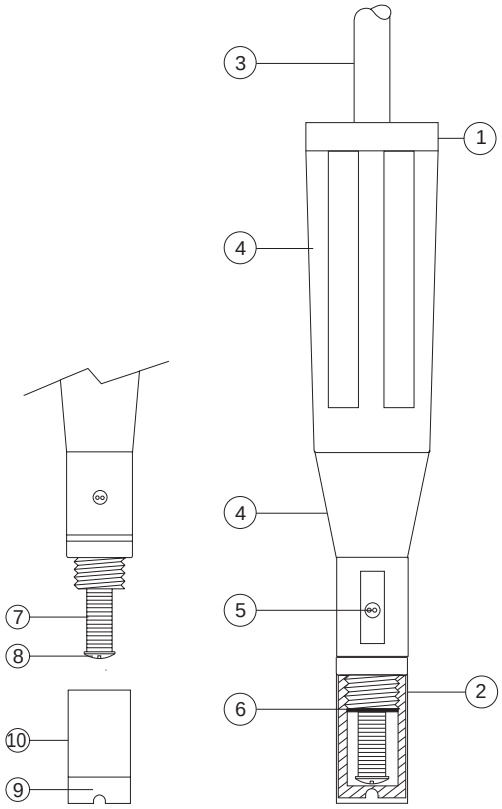
Note: Save all packing material until you are sure that the instrument functions correctly. All defective items must be returned in the original packing with the supplied accessories.

GENERAL DESCRIPTION

HI 9141 and **HI 91410** are portable, printing DO meters designed for continuous monitoring and recording at selectable time intervals. The low-power printer uses regular paper that is easily sourced and will not fade over time. **HI 91410** combines all of the comprehensive printing functions of the **HI 9141**, with the capability to log measurements. In addition to supplying the user with instant print-outs of DO, **HI 91410** also provides datalogging facilities that will store up to 8000 readings. These measurements can be scrolled through at any time, printed or even transferred to a computer system for elaboration or permanent storage. An optional **HI 9200** infrared transmitter can be used to take the data from **HI 91410** and send it to a computer without any cords. Simply place the meter on the cradle and, at the touch of a button, all of the recorded lots are transferred in seconds. This infrared connection is important in humid environments, where a standard RS232 plug on a meter could become damaged.
In addition to the automatic calibration feature, both meters automatically compensate for altitude (from 0 to 1900 meters) and salinity (from 0 to 40 g/L).
The dissolved oxygen probe has a membrane covering the polarographic sensors and a built-in thermistor for temperature measurements and compensation. This permeable membrane isolates the sensor elements from the testing solution, but allows oxygen to enter. When a voltage is applied across the sensor, oxygen that has passed through the membrane reacts causing a current flow.

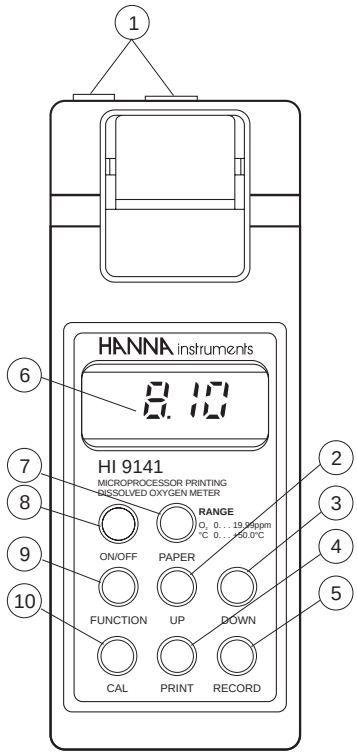
Hanna Instruments reserves the right to modify the design, construction and appearance of its products without advance notice.

PROBE FUNCTIONAL DESCRIPTION



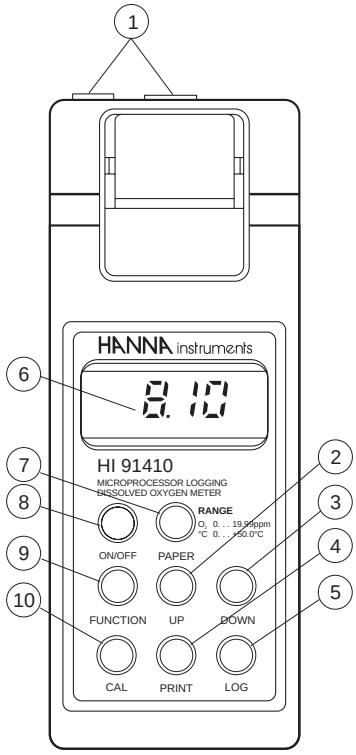
1. Dissolved Oxygen (DO) probe
2. Protective cap
3. Watertight shielded cable
4. Polypropylene probe body
5. Temperature sensor
6. O-Ring seal
7. AgCl (silver chloride) anode
8. Platinum cathode (sensor)
9. Oxygen permeable membrane
10. Membrane cap

FUNCTIONAL DESCRIPTION HI 9141



1. Probe and power adapter sockets
2. **UP** key, to set date, time, printing interval, altitude & salinity factors
3. **DOWN** key, to set date, time, printing interval, altitude & salinity factors
4. **PRINT** key, to print on-demand
5. **RECORD** key, to enter recording mode
6. Liquid Crystal Display (LCD)
7. **PAPER** key, to move the paper up
8. **ON/OFF** key, to turn the meter on or off
9. **FUNCTION** key, to select the DO or temperature mode, and for compensation selection
10. **CAL** key, to enter/exit calibration mode

FUNCTIONAL DESCRIPTION HI91410



1. Probe and power adapter sockets
2. **UP** key, to set date, time, printing interval, altitude & salinity factors
3. **DOWN** key, to set date, time, printing interval, altitude & salinity factors
4. **PRINT** key, to print on-demand
5. **LOG** key, to enter/exit logging mode
6. Liquid Crystal Display (LCD)
7. **PAPER** key, to move the paper up
8. **ON/OFF** key, to turn the meter on or off
9. **FUNCTION** key, to select the D.O. or temperature mode, and for compensation selection
10. **CAL** key, to enter/exit calibration mode

SPECIFICATIONS

Range	0.00 to 19.99 ppm (mg/L) O_2 0.0 to 50.0°C
Resolution	0.01 ppm (mg/L) O_2 0.1°C
Accuracy	±1.5% FS (O_2) ±0.5°C
Typical EMC Deviation	±0.6 ppm (mg/L) O_2 / ±3°C
Calibration	Automatic, in saturated air, at 100%
Temperature Compensation	Automatic, 0 to 30°C (32 to 86°F)
Altitude Compensation	0 to 1900 m (resolution 100 m)
Salinity Compensation	0 to 40 g/L (resolution 1 g/L)
Probe	**HI 76407/4**, polarographic, with 4 m (13') cable (**included**)
Printer	Low power impact type belt, common 38 mm plain paper (**HI 710034**)
Printing / Logging (HI 91410 only) Interval	Selectable at 1, 2, 5, 10, 15, 30, 60, 120 or 180 min.
PC Connection (HI 91410 only)	RS232 port with **HI 9200** transmitter and **HI 92000** software (not included)
Power Supply	4 x 1.5V AA batteries / approx. 70 hours of use; auto-off after 4 hours of inactivity; or 12 Vdc input
Environment	0 to 50°C (32 to 122°); RH max 95%
Dimensions	220 x 82 x 66 mm (8.7 x 3.2 x 2.6")
Weight	550 g (1.2 lb.)

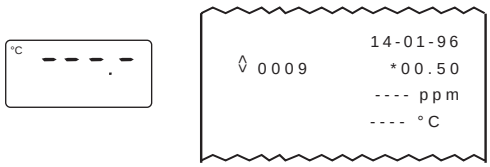
INITIAL PREPARATION

Each meter is supplied complete with four 1.5V AA batteries. Remove the back cover, unwrap the batteries and install them while paying attention to the polarity (see "Battery Replacement" section for details).

To prepare the instrument for use, connect the DO probe to the meter by aligning the pins with the socket located on the top of the meter, pushing the plug in and tightening the threaded ring. See the "Initial Probe Preparation" procedure explained on page 10.

To switch the meter on, press the ON/OFF key and "Cond" appears on the display to inform that the probe is in the auto-conditioning (polarization) mode. Once the "Cond" disappears, the instrument can be calibrated.

If the probe is not connected, the meter will display "°C ---.-", and print "---- ppm" & "---- °C" to alert the user.
This can also indicate a broken probe cable.



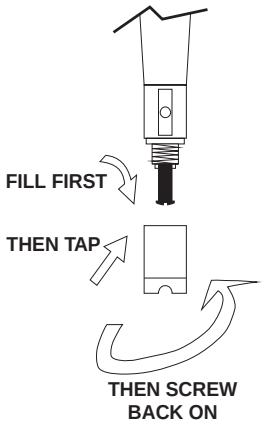
To save the battery life, the display is automatically switched off after 4 hours of non-use. However, the meter will continue to monitor the dissolved oxygen and temperature (if in recording/logging mode) .

INITIAL PROBE PREPARATION

All HANNA DO probes are shipped dry.
To hydrate the probe and prepare it for use, connect it to the meter and proceed as follows:

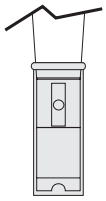
1. Remove the red & black plastic cap. This cap is for shipping purposes and can be thrown away.
2. Wet the sensor by soaking the bottom 2.5 cm (1") of the probe in **HI 7041S** electrolyte solution for 5 minutes.

3. Rinse the membrane (**HI76407A** supplied with the meter) with electrolyte solution while shaking it gently.
   Refill with fresh electrolyte.
4. Gently tap the sides of the membrane cap with your finger to ensure that no air bubbles remain trapped. To avoid damaging the membrane, do not tap the membrane directly on the bottom.



5. Make sure that the rubber O-ring sits properly inside the membrane cap.
6. With the sensor facing down, slowly screw the cap clockwise. Some electrolyte will overflow.

When not in use, protect the membrane with the supplied cap.



CALIBRATION

PROBE POLARIZATION

The probe is under polarization with a fixed voltage of approximately 800 mV. Probe polarization is essential for stable measurements with the same recurring degree of accuracy.

With the probe properly polarized, oxygen is continually "consumed" when it passes through the sensitive diaphragm and dissolves in the electrolyte solution inside the probe.

If polarization is interrupted, the electrolyte solution continues to be enriched with oxygen until it reaches an equilibrium with the surrounding solution.

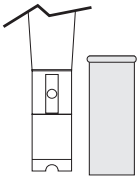
Whenever measurements are taken with a non-polarized probe, the measured oxygen level is both that of the tested solution as well as that present in the electrolyte solution. This reading is not correct.

The calibration procedure is very simple and should be performed every time the meter is turned on.

- Make sure the probe is ready for measurements (see page 10), i.e. the membrane cap is filled with electrolyte, the probe is connected to the meter and properly polarized.
- Switch the meter on by pressing ON/OFF. The "Cond" message appears on the display to inform that the probe is in autoconditioning (polarization) mode.

- Once the "Cond" disappears, the instrument can be calibrated.

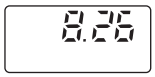
- For an accurate calibration, it is recommended to wait for 5-10 minutes to ensure precise conditioning of the probe.



- Remove the protective cap.
- Press the CAL key. The "CAL" message is displayed to indicate that the calibration mode has been entered.

- The instrument will automatically standardize itself to the actual saturation value and after approximately 1 minute, will show the ppm value corresponding to the maximum oxygen level soluble in water at that particular temperature, altitude and salinity (previously set).

  Once the ppm value is displayed, the calibration is completed.



- Press the FUNCTION key and make sure F1 and F2 are set to the appropriate altitude and salinity values (see "Altitude Compensation" and "Salinity Compensation" sections for details).

Notes: • The instrument must also be calibrated whenever the probe, the membrane or the electrolyte solution are changed.

- To exit the calibration mode at any time, press the CAL key.

TAKING MEASUREMENTS

Make sure the meter has been calibrated and the protective cap has been removed. Immerse the tip of the probe in the sample to be tested.

Make sure the temperature sensor is also immersed.

Allow approximately one minute for the meter to stabilize before reading on the display the mg/L (ppm) value of dissolved oxygen.

For accurate measurements a minimum water movement of 0.3 m/sec is required. This is to ensure that the oxygen-depleted membrane surface is constantly replenished. A moving stream provides adequate circulation.

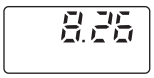
During field measurements, this condition may be met by manually agitating the probe. Accurate readings are not possible while the liquid is at rest.

During laboratory measurements, the use of a magnetic stirrer to ensure a certain velocity in the fluid is recommended. In this way, errors due to the diffusion of air oxygen into the solution are minimized.

Always allow the time necessary for thermal equilibrium to occur between probe and tested sample (a few minutes if the temperature difference is only several degrees).

ppm READINGS

The meters display the concentration of the dissolved oxygen directly in ppm (mg/L).



If the sample contains significant salinity concentration or measurements are performed at an altitude different from sea level, the readout values must be corrected,

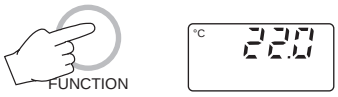
taking into account the lower degree of oxygen solubility in such conditions (see "Altitude Compensation" and "Salinity Compensation" sections for details).

Remember to set altitude and/or salinity before taking ppm measurements, and the meter will automatically compensate for these factors.

TEMPERATURE READINGS

The supplied probe is provided with a built-in temperature sensor.

Press the FUNCTION key to display the measured temperature.

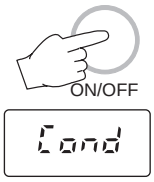


Allow the probe to reach the thermal equilibrium before taking any measurement. This can take several minutes. The greater the difference between the temperature at which the probe was stored and the temperature of the sample, the longer the time will be.

If the display shows "°C ---.-", the D.O. probe is not properly connected. This can also indicate a broken probe cable.

SETTING DATE, TIME & PRINTING INTERVAL

Turn the instrument on by pressing the ON/OFF key and wait for the "Cond" message to disappear.



Press the FUNCTION key twice and the display will show "F1".

Press the CAL key and the display will show the date setting.

Press the CAL key again and the year will start blinking on the secondary LCD.

Use the UP or DOWN keys to set the year.

When the correct year is selected, press the CAL key. The month will start blinking.

Set the month with the UP or DOWN keys.

Press CAL, and the day will start blinking.

Use the UP or DOWN keys to set the day.

Press CAL to confirm the selected date, then FUNCTION to leave the date setting mode.

Press FUNCTION key again to display "F2".

Press CAL and the display will show the time and printing interval setting.

Press the CAL key again and the printing interval will start blinking.

Any interval can be selected from among 1, 2, 5, 10, 15, 30, 60, 120 or 180 minutes by using the UP and DOWN keys.
Set the desired interval by pressing the CAL key once and the hour starts blinking.

To select the hour, press the UP or DOWN keys (24 hour clock).

Press CAL and the minutes will start blinking.

Use UP or DOWN keys to set the minutes.

Press the CAL key to confirm the selected time and printing interval.

Press the FUNCTION key to leave the time setting mode.
Press the FUNCTION key again to display D.O. readings.
Selected time, date and printing interval are now stored in the memory even when the display is switched off.

TO VIEW DATE / TIME / TEMPERATURE

To view the temperature, press FUNCTION.

To view the date, press the FUNCTION key to display "F1" and then press CAL.

To view the time, press the FUNCTION key until the display shows "F2" and then press CAL. This also displays the selected prinitng interval.

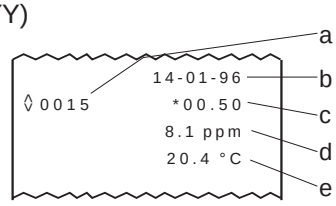
Press the FUNCTION key until the display returns to the D.O. readings.

PRINTING / RECORDING WITH HI 9141

To print the measured values, press the PRINT key.

The printout provides the following information:

a - Current sample number
b - Date (DD-MM-YY)
c - Time (HH-MM)
d - D.O. value in ppm.
e - Temperature value in °C.

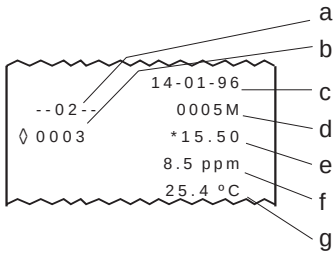


RECORDING MODE (PROGRAMMED PRINTOUTS)

Press the RECORD key to enter the recording mode. The log number and the interval time will be displayed for a few seconds to indicate the correct operational mode.

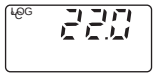
The meter will print the measurement taken in that moment, and will print at the interval selected thereafter until the RECORD key is pressed.

Each printout provides the following information:



a - Current log number
b - Current sample number (in that log)
c - Date (DD-MM-YY)
d - Printing interval indicator in minutes
e - Time (HH.MM)
f - D.O. value in ppm
g - Temperature value in °C.

When the meter is in recording mode, "LOG" is displayed on the LCD with the temperature value.



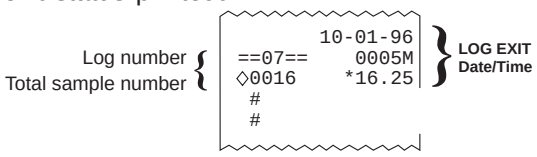
Notes:

- It is recommended to use an external power supply during recording mode, especially when many printouts are required.
- Before proceeding with recording, make sure there is enough paper. When the paper is finished, the meter will not advise the operator and printouts could be lost.
- It is possible to insert a new paper roll during recording session (see "Printer Maintenance" section).
- If PRINT is pressed while in recording mode, a printout is produced without affecting the running sample number.

- Once in recording mode, the printing interval cannot be changed. Exit the recording mode by pressing the RECORD key, before setting the new interval.

TO STOP RECORDING

In order to quit the recording mode, press the RECORD key. This will generate a recording exit status printout.



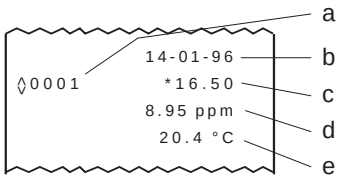
PRINTING / LOGGING WITH HI 91410

To print the measured values shown on display, press the PRINT key.

This function can be activated in normal operation mode as well as during logging.

When in measurement mode, the printout provides the following information:

a - Current sample number
b - Date (DD-MM-YY)
c - Time (HH-MM)
d - DO value in ppm
e - Temperature value in °C



LOGGING MODE

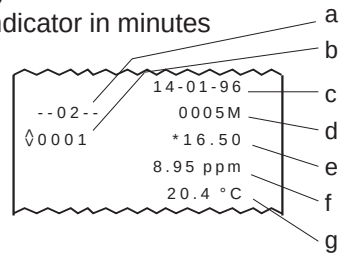
This function is suggested when remote measurements have to be taken automatically without the necessity of an operator and for a long period of time. In this mode data will be stored directly into memory.

Set the appropriate logging interval, then press the LOG key to enter the logging mode. The log number and page number will be displayed for a few seconds to indicate the correct operational mode.

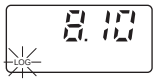
The printer will print a complete set of data and the "LOG" symbol appears on the LCD.

The printout provides the following information:

a - Current log number
b - Current sample number (in that log)
c - Date (DD-MM-YY)
d - Printing interval indicator in minutes
e - Time (HH-MM)
f - DO value in ppm
g - Temperature value in °C



To continue logging without printing, press CAL. The "LOG" symbol will start blinking and no printout will be generated.



To restart printing, press the CAL key again.

Notes:

- Once in logging mode, the interval cannot be changed. First exit the logging mode by pressing the LOG key, then set the new interval.

- If PRINT is pressed while in logging mode, a printout is produced without affecting the running sample number.

LOGGING MODE WITH PRINTING

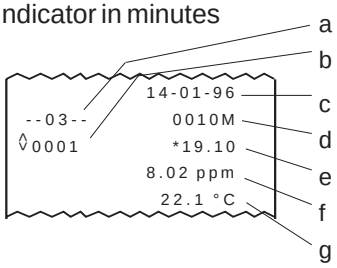
This function is suggested when an immediate report of measurement is required in addition to the recording of the data into memory.

Press the LOG key. The log number and page number will be displayed for a few seconds on the display to indicate the correct operational mode.

The printer will print a complete set of data and the "LOG" symbol is displayed.

Each printout provides the following information:

a - Current log number
b - Current sample number (in that log)
c - Date (DD-MM-YY)
d - Printing interval indicator in minutes
e - Time (HH-MM)
f - DO value in ppm
g - Temperature value in °C



It is always possible to switch from the logging with printing function to the logging function. Press the CAL key and the "LOG" symbol will start blinking to indicate that the data are now stored only into memory.

Notes:

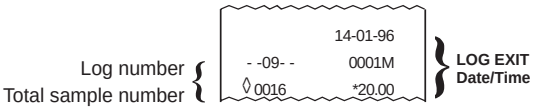
- It is recommended to use the external power supply during logging with printing mode, especially when many printouts are required.
- Before proceeding with logging with printing, make sure there is enough paper for your measurements. When the paper is finished the meter will not advise the operator and the printouts could be lost. Anyway, data will continue to be stored into the meter memory.
- It is possible to insert a new paper roll during logging session (see "Printer Maintenance" section for details).

- Once in logging mode, the interval cannot be changed. First exit the logging mode by pressing the LOG key, and then set the new interval.

- If the PRINT key is pressed while in logging mode, a printout is produced without affecting the running sample number.

TO STOP LOGGING

Press the LOG key, this will generate a log exit status printout.



ALTITUDE COMPENSATION

Press the FUNCTION key twice and "F1" will be displayed.

Use the UP and DOWN keys to set the altitude between 1 and 1900 m, in steps of 100 m (1 meter = 3.28 feet).

Altitude affects the disssolved oxygen concentration by decreasing its value. The following table reports the maximum oxygen solubility at various temperatures and altitudes.

	Altitude, Meters above Sea Level							
℃	0 m	300 m	600 m	900 m	1200 m	1500 m	1800 m	℉
0	14.6	14.1	13.6	13.2	12.7	12.3	11.8	32.0
2	13.8	13.3	12.9	12.4	12.0	11.6	11.2	35.6
4	13.1	12.7	12.2	11.9	11.4	11.0	10.6	39.2
6	12.4	12.0	11.6	11.2	10.8	10.4	10.1	42.8
8	11.8	11.4	11.0	10.6	10.3	9.9	9.6	46.4
10	11.3	10.9	10.5	10.2	9.8	9.5	9.2	50.0
12	10.8	10.4	10.1	9.7	9.4	9.1	8.8	53.6
14	10.3	9.9	9.6	9.3	9.0	8.7	8.3	57.2
16	9.9	9.7	9.2	8.9	8.6	8.3	8.0	60.8
18	9.5	9.2	8.7	8.6	8.3	8.0	7.7	64.4
20	9.1	8.8	8.5	8.2	7.9	7.7	7.4	68.0
22	8.7	8.4	8.1	7.8	7.7	7.3	7.1	71.6
24	8.4	8.1	7.8	7.5	7.3	7.1	6.8	75.2
26	8.1	7.8	7.5	7.3	7.0	6.8	6.6	78.8
28	7.8	7.5	7.3	7.0	6.8	6.6	6.3	82.4
30	7.5	7.2	7.0	6.8	6.5	6.3	6.1	86.0
32	7.3	7.1	6.8	6.6	6.4	6.1	5.9	89.6
34	7.1	6.9	6.6	6.4	6.2	6.0	5.8	93.2
36	6.8	6.6	6.3	6.1	5.9	5.7	5.5	96.8
38	6.6	6.4	6.2	5.9	5.7	5.6	5.4	100.4
40	6.4	6.2	6.0	5.8	5.6	5.4	5.2	104.4

SALINITY COMPENSATION

Press FUNCTION key until "F2" is displayed.

Use the UP and DOWN keys to set the salinity between 0 and 40 g/L.

Salinity affects the dissolved oxygen concentration by decreasing its value. The table below shows the maximum solubility of oxygen at various temperature and salinity.

	Salinity (g/L) at Sea Level					
℃	0 g/L	10 g/L	20 g/L	30 g/L	35 g/L	℉
10	11.3	10.6	9.9	9.3	9.0	50.0
12	10.8	10.1	9.5	8.9	8.6	53.6
14	10.3	9.7	9.1	8.6	8.3	57.2
16	9.9	9.3	8.7	8.2	8.0	60.8
18	9.5	8.9	8.4	7.9	7.6	64.4
20	9.1	8.5	8.0	7.6	7.4	68.0
22	8.7	8.2	7.8	7.3	7.1	71.6
24	8.4	7.9	7.5	7.1	6.9	75.2
26	8.1	7.6	7.2	6.8	6.6	78.8
28	7.8	7.4	7.0	6.6	6.4	82.4

TEMPERATURE COMPENSATION

The DO probe features a built-in temperature sensor, so that DO readings are automatically compensated for temperature effects.

PROBE & MEMBRANE MAINTENANCE

The DO probe body is made of reinforced plastic for maximum durability.
A built-in thermistor temperature sensor provides temperature measurements. It is always recommended to keep the protective cap on the probe when it is not used, to provide protection against damage and dirt.

To replace the membrane or refill with electrolyte, proceed as follows:

- Remove the protective cap by gently twisting and pulling it off the probe body (fig.1).
- Unscrew the membrane cap by turning it counterclockwise (fig.2).
- Wet the sensor by soaking the bottom (2.5 cm / 1") of the probe in **HI 7041S** electrolyte for 5 minutes.
- Rinse the new membrane (**HI 76407A**, supplied with the meter) with electrolyte solution while shaking it gently. Refill with fresh electrolyte solution.
- Gently tap the sides of the membrane cap with your finger to ensure that no air bubbles remain trapped. Do no directly tap the bottom with your finger as this will damage the membrane.

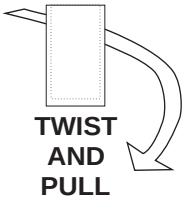


fig. 1

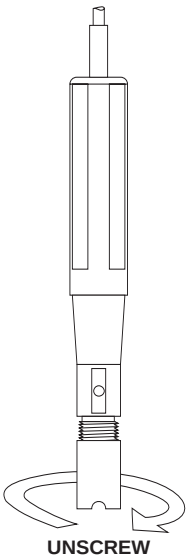


fig. 2

- Make sure that the rubber O-ring sits properly inside the membrane cap.
- With the sensor facing down, slowly screw the membrane cap clockwise. Some electrolyte will overflow.

The platinum cathode should always be bright and untarnished.

If it is tarnished or stained, which could be due to contact with certain gases or extended use with a loose or damaged membrane, the cathode should be cleaned. Use a clean lint-free cardboard or cloth. Rub the cathode very gently side to side 4-5 times. This will be enough to polish and remove any stains without damaging the platinum tip.

Afterwards, rinse the probe with deionized or distilled water, and install a new membrane cap using fresh electrolyte and follow the above procedure.

Re-calibrate the instrument.

Important: For accurate and stable measurements, it is important that the surface of the membrane is in perfect condition. This semipermeable membrane isolates the sensor elements from the environment but allows oxygen to enter. If any dirt is observed on the membrane, rinse carefully with distilled or deionized water. If any imperfection still exists, or any damage is evident (such as wrinkles or tears-holes), the membrane should be replaced.

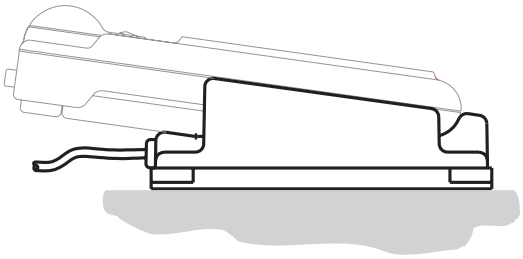
Make sure that the O-Ring sits properly in the membrane cap.

DATA TRANSFER TO PC (HI 91410)

Press the FUNCTION key until "F2" is displayed on the secondary LCD.

Place the instrument on the **HI 9200** infrared transmitter (ensuring that the infrared LEDs of meter and interface match). The memory can be downloaded to your PC through a serial port.

During the data transfer the instrument displays the "r 232" message.



Using the **HI 9200** infrared transmitter, all recorded data can be fed to your PC for easy reproduction, storage or elaboration without any interference from cables or cords between meter and transmitter.

Data transmission from the instrument to the PC is handled with the **HI 92000** Windows® compatible software by HANNA instruments®.

HI 92000 allows you to use the powerful means of the most common spread sheet programs (e.g. Excel©, Lotus 1-2-3©).

Simply run your favorite spread sheet and open the file downloaded by **HI 92000**. It is possible to make any elaboration available with your software (e.g. graphics, statistical analysis).

HI 92000 offers a variety of features and has an on-line help to support the user throughout any situation.

To install **HI 92000** you need a 3.5" drive and a few minutes to follow the instructions conveniently printed on the disk label.

FAULT FUNCTIONS

HI 9141 and **HI 91410** are factory programmed to automatically diagnose a fault, that is displayed with the corresponding error code.

Error codes:

PEr 0, PEr 1, PEr 2 = Short circuit on the system, the meter should be returned for repair. Contact your dealer

PEr 3 = Printer mechanism fault. Repair needed, contact your dealer.

PEr 4 = Printer clutch jammed. Reset printer (see "Printer Maintenance" section).

PEr 9 = Printer jammed. Reset printer (see "Printer Maintenance" section).

MEMORY ORGANIZATION (HI 91410 ONLY)

Capacity: 8000 data samples, divided into 16 pages.

Data capacity per page: 500 data samples.

Each time a new logging period starts, it automatically starts from a new page.

If “LOGGING” is still on, and the available page is “0” the meter will overwrite the first LOT DATA in the existing meter memory. During logging the meter automatically returns to the oldest page in the memory and if it contains data, it will overwrite it. In this case the first log will not correspond to the oldest set of data.

It is recommended to periodically “clean” the memory. Save the data on your PC if you need to keep a record and then disconnect the batteries for about 1 minute. Afterwards, remember to re-set the date, time, altitude and salinity.

WARNING

If batteries need to be replaced and data is not to be lost, power the meter through a 12Vdc adapter before proceeding with battery replacement.

Once batteries have been changed, the external power supply can be disconnect without losing the previously memorized data.

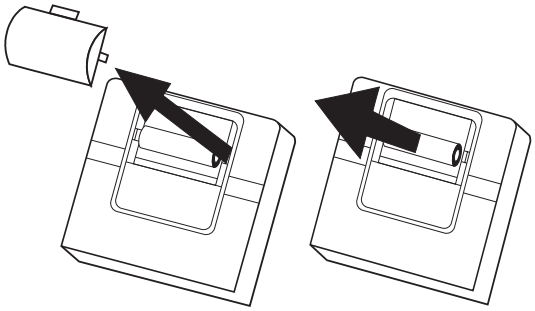
PRINTER MAINTENANCE

CHANGING THE INK CARTRIDGE

When printouts become faint, it might be necessary to change the ink cartridge. Contact your dealer or the nearest HANNA Office for technical service.

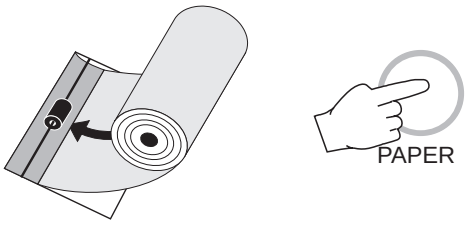
INSERTING PAPER ROLL

HI 9141 and **HI 91410** use plain 38 mm wide paper rolls. To insert a new roll gently pull out the printer cover.

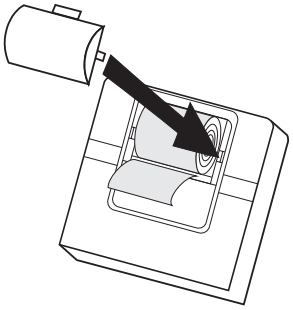


Take out the used paper cylinder.

Insert the paper edge in the printer slot and feed the paper through by pressing the PAPER key.

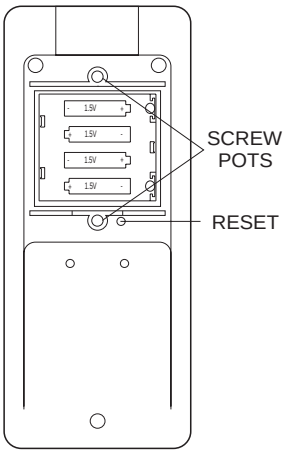


Allow about 5 cm (2") of paper to exit from the printer and then replace the cover.



TO RESET THE PRINTER

Take off the battery compartment cover by removing the screws on the back of the meter.



Using a sharp pencil press the black reset button. This will reset the printing mechanism.

Before replacing the battery cover, investigate likely cause of the printer jam (e.g. the paper might be caught under the cover preventing the paper from advancing).

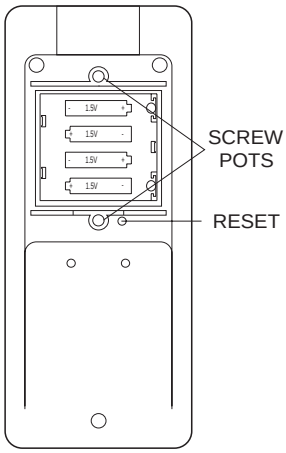
Replace the battery cover and tighten the screws.

BATTERY REPLACEMENT

When batteries become weak, the "LO BAT" indication is displayed to warn the user. If it blinks during printing, it means that 200 printouts can be made before the batteries are exhausted. When there is only sufficient power for 100 printouts, the "LO BAT" indication is displayed continuously.

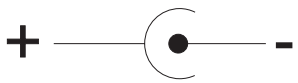
Battery replacement must only take place in a safe area and using the battery type specified in this instruction manual.

To replace the batteries, simply remove the two screws on the rear cover of the instrument and replace the four 1.5V AA batteries with new ones, while paying attention to the correct polarity.



A 12 Vdc power source can also be used to power the unit.

Note: The instrument uses the following configuration.



It is recommended to use the HANNA **HI710005** or **HI710006** voltage adapters with the proper polarity configuration.

HI9141 and **HI91410** can also be used with other adapters. In this case, remember to check the correct polarity of your adapter before connecting it to the meter.

WARNING: In **HI91410**, if the external power supply and batteries are disconnected, all stored data will be erased. Always apply external power supply to the instrument before replacing the batteries, to prevent data from being lost.

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.

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

In particular cases the meters could turn off. In such cases, the meters can be turned on by pressing the ON/OFF key.

ACCESSORIES

HI 76407/4	DO probe with 4 m (13') cable
HI 76407/10	DO probe with 10 m (33') cable
HI 76407/20	DO probe with 20 m (66') cable
HI 76407A/P	Spere membrane (5 pcs)
HI 7041S	Refilling electrolyte solution, 30 mL
HI 710005	115 Vac/12 Vdc power adapter
HI 710006	230 Vac/12 Vdc power adapter
HI 710034	Paper roll (10 pcs)
HI 710035	Ink cartridge
HI 9200	Infrared transmitter
HI 92000	Windows® compatible software

Windows® is registered Trademark of "Microsoft Co."

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

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

MANDOPRNR2 09/05