

HI 83224

# COD Meter and Multiparameter Photometer

With Bar Code Recognition of Sample Vials



- Measures Ammonia, Chlorine, COD, Nitrate, Nitrogen and Phosphorus
- Bar code reader detects the method and range automatically
- Three operation modes: Automatic, Semi-automatic and Manual
- Bar coded pre-dosed reagent vials
- On-screen step-by-step tutorial
- Logs up to 200 samples
- Context sensitive help screen at a touch of a button
- Selection of languages
- USB connection
- Graphic LCD

## A Complete Lab for Wastewater Analysis

The HI 83224 is a multiparameter bench photometer that has 15 methods for measurement of COD, chlorine, nitrate, nitrogen and phosphorus.

Automatic recognition of bar coded samples is an exciting feature of the HI 83224. This advanced meter scans each vial inserted into the vial holder and automatically identifies the sample method and range. This feature eliminates errors and simplifies the testing process.

The HI 83224 features a powerful interactive user support system that assists you before, during and after analysis. On-screen tutorials guide you through set-up, calibration and measurement while context sensitive help screens are available at a push of a button.

HI 83224 uses a new series of pre-dosed reagent vials for the 15 methods. Each reagent vial is bar coded with specific reagent information at our factory (with the exception of chlorine). This information is automatically scanned by the HI 83224 to assure that the vial and method are the same.

Users have the choice of operating the HI 83224 in automatic mode, semi-automatic mode and manual mode.

HI 83224 can log and recall up to 200 different measurements. Stored data includes parameter, test results, sample number, lot number, instrument id, date and time. HI 83224 bench photometer can be connected to a PC via USB. The HI 92000 Windows® compatible software (optional) aids users in managing data.

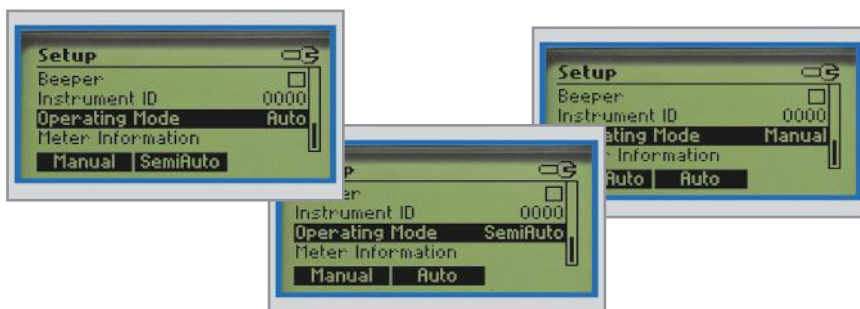
## Operating Mode

The instrument has 3 operating modes.

**In Automatic mode**, no user involvement is required in the method selection.

**In Semi-Automatic mode**, user involvement is required when a different vial is identified related to the current method.

**In Manual mode**, the user involvement is required at every level in the method selection.



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## Automatic Sample Scanning

### Avoid vial confusion and wrong samples with bar code identification

Sample vials inserted into the HI 83224 are identified using bar codes. The bar codes for different methods are shown in the table below. For parameters that don't use a bar coded reagent, the vials supplied with the instrument should be used. The bar code has 4 digits. The first 2 digits are for parameter identification and the second 2 digits are for reagent lot ID.

HI 83224 has a powerful interactive help system that assists the user during the analysis process. At a touch of a button, users can get detailed help tailored to the current information on the LCD. A tutorial mode is also available and can be accessed via the setup menu.

### Vial Identification

Vials for different methods can be distinguished by a bar code printed on the vial and the cap color.

Part Code	Method	Vial bar code
HI 94764A-25	Ammonia, LR	01xx
HI 94764B-25	Ammonia HR	02xx
HI 93701-01	Chlorine, Free	N/A
HI 93711-01	Chlorine, Total	N/A
HI 94766-50	Nitrate	05xx
HI 94767A-50	Nitrogen, Total LR	16xx 06xx
HI 94767B-50	Nitrogen, Total HR	17xx 07xx
HI 94754A-25	Oxygen Demand, Chemical (COD) LR	12xx
HI 94754B-25	Oxygen Demand, Chemical (COD) MR	13xx
HI 94754C-25	Oxygen Demand, Chemical (COD) HR	24xx
HI 94758A-50	Phosphorus, Reactive	30xx
HI 94758B-50	Phosphorus, Acid Hydrolyzable	31xx
HI 94758C-50	Phosphorus, Total	32xx
HI 94763A-50	Phosphorus, Reactive HR	33xx
HI 94763B-50	Phosphorus, Total HR	34xx

**Note:** xx represents the reagent lot code.



### Identification

Bar coded vials provide automatic recognition of samples and ranges.

Once placed in the holder, the HI 83224 scans the sample and displays the results on-screen.



HI 83224

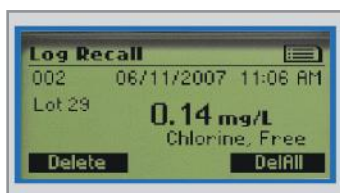
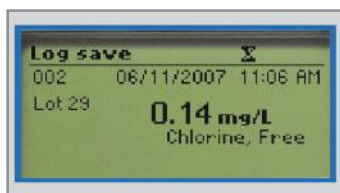
# COD Meter and Multiparameter Photometer

With Bar Code Recognition of Sample Vials

## Display Examples

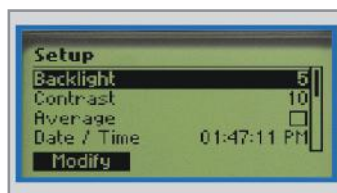
### Data Management

Keep track of your data with the HI 83224 quickly and easily. Save and recall up to 200 measurements at any time complete with date and time stamps.



### Setup Screen

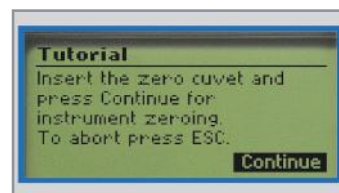
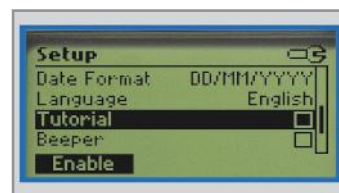
The HI 83224's extensive setup screen allows users to adjust the screen display as well as date and time formats, language and more!



### Tutorial

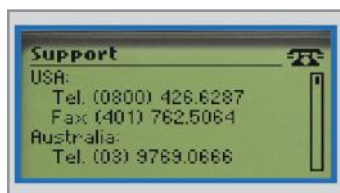
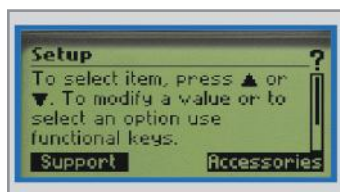
If enabled a short message is displayed on the LCD providing information about the current action.

Use the function key to enable/disable the tutorial mode.



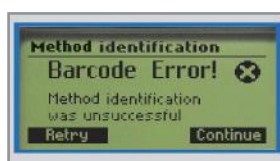
### HELP Screens

The HELP key gives users information about the current screen, support numbers and accessories.



### Errors and Warnings

The instrument displays messages if error conditions occur or when measured values are outside the expected range. These messages are described below.



**Barcode Error:** The instrument cannot identify the vial's bar code or the vial has no code.



**Wrong vial:** The expected bar code is not found.



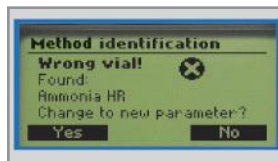
**No Light:** The light source is not functioning properly.



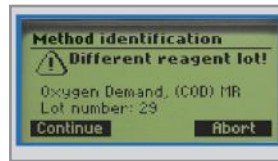
**Light Leak:** There is too much light entering the cell for accurate measurement.



**Inverted vials:** The sample and the zero vials are inverted.



**Wrong vial:** The current method doesn't correspond to the current vial.



**Different reagent lot:** The reagent lot doesn't correspond to the current lot code.

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## SPECIFICATIONS

## HI 83224

Light source	Tungsten lamps with narrow-band interference filters
Light detector	Silicon photocells
Data Logging	Up to 200 samples
Power supply	230 Vac or 115Vac power adapter
Dimensions	235 x 212 x 143 mm (9.2 x 8.34 x 5.62")
Weight	2.3 kg (5.1 lb)

METHOD	RANGE	RESOLUTION	PRECISION	METHOD	REAGENT CODE
Ammonia LR	0.00 to 3.00 mg/L (as NH <sub>3</sub> -N)	0.01 mg/L	±0.03 @ 1.50 mg/L	Nessler	HI 94764A-25 (25 tests)
Ammonia HR	0 to 100 mg/L (as NH <sub>3</sub> -N)	1 mg/L	±3 @ 50 mg/L	Nessler	HI 94764B-25 (25 tests)
Chlorine, free ‡	0.00 to 5.00 mg/L	0.01 mg/L from 0.00 to 0.99 mg/L; 0.1 mg/L above 0.99 mg/L	±0.04 @ 1.00 mg/L	DPD	HI 93701-01 (100 tests)
Chlorine, total ‡	0.00 to 5.00 mg/L	0.01 mg/L from 0.00 to 0.99 mg/L; 0.1 mg/L above 0.99 mg/L	±0.04 @ 1.00 mg/L	DPD	HI 93711-01 (100 tests)
Chemical Oxygen Demand LR	0 to 150 mg/L (as COD)	1 mg/L	±4 @ 150 mg/L	Dichromate, Mercuric Sulfate	HI 94754A-25 (25 tests)
Chemical Oxygen Demand MR	0 to 1500 mg/L (as COD)	1 mg/L	±22 @ 1000 mg/L	Dichromate, Mercuric Sulfate	HI 94754B-25 (25 tests)
Chemical Oxygen Demand HR	0 to 15000 mg/L (as COD)	10 mg/L	±220 @ 10000 mg/L	Dichromate, Mercuric Sulfate	HI 94754C-25 (25 tests)
Nitrate	0.0 to 30.0 mg/L (as NO <sub>3</sub> -N)	0.1 mg/L	±0.5 @ 25 mg/L	Chromotropic Acid	HI 94766-50 (50 tests)
Nitrogen, Total LR	0.0 to 25.0 mg/L (as N)	0.1 mg/L	±0.5 @ 15 mg/L	Chromotropic Acid	HI 94767A-50 (50 tests)
Nitrogen, Total HR	10 to 150 mg/L (as N)	1 mg/L	±3 @ 75 mg/L	Chromotropic Acid	HI 94767B-50 (50 tests)
Phosphorus, Acid Hydrolyzable	0.00 to 1.60 mg/L (as P)	0.01 mg/L	±0.02 @ 0.80 mg/L	Ascorbic acid	HI 94758B-50 (50 tests)
Phosphorus, Reactive	0.00 to 1.60 mg/L (as P)	0.01 mg/L	±0.02 @ 0.80 mg/L	Ascorbic acid	HI 94758A-50 (50 tests)
Phosphorus, Reactive HR	0.0 to 32.6 mg/L (as P)	0.1 mg/L	±1.0 @ 25.0 mg/L	Vanadomolybdophosphoric acid	HI 94763A-50 (50 tests)
Phosphorus, Total	0.00 to 1.15 mg/L (as P)	0.01 mg/L	±0.02 @ 0.80 mg/L	Ascorbic acid	HI 94758C-50 (50 tests)
Phosphorus, Total HR	0.0 to 32.6 mg/L (as P)	0.1 mg/L	±1.0 @ 25.0 mg/L	Vanadomolybdophosphoric acid	HI 94763B-50 (50 tests)

‡ For chlorine analysis, liquid reagents are also available.

Some analytical methods require digestion of the sample. For digestion of the vials, use the **HANNA** HI 839800 reactor only. For safety, the optional HI 740217 safety shield and HI 740216 test tube cooling rack for the HI 839800 are strongly recommended.

## ORDERING INFORMATION

**HI 83224-01** (115V) and **HI 83224-02** (230V) are supplied with sample vials (10), vial cleaning cloths (4), scissors and instruction manual.

## SOLUTIONS and REAGENTS

<b>HI 93701-01</b>	100 free chlorine tests
<b>HI 93701-03</b>	300 free chlorine tests
<b>HI 93711-01</b>	100 total chlorine tests
<b>HI 93711-03</b>	300 total chlorine tests
<b>HI 94754A-25</b>	25 COD LR tests
<b>HI 94754B-25</b>	25 COD MR tests
<b>HI 94754C-25</b>	25 COD HR tests
<b>HI 94758A-50</b>	50 reactive phosphorus tests
<b>HI 94758B-50</b>	50 acid hydrolyzable phosphorus tests
<b>HI 94758C-50</b>	50 total phosphorus tests
<b>HI 94763A-50</b>	50 reactive phosphorus HR tests

<b>HI 94763B-50</b>	50 total phosphorus HR tests
<b>HI 94764A-25</b>	25 ammonia LR tests
<b>HI 94764B-25</b>	25 ammonia HR tests
<b>HI 94766-50</b>	50 nitrate tests
<b>HI 94767A-50</b>	50 total nitrogen LR tests
<b>HI 94767B-50</b>	50 total nitrogen HR tests
<b>HI 94703-50</b>	Vial cleaning solution, 250 mL

## ACCESSORIES

<b>HI 839800-01</b>	HANNA Reactor (115 Vac)
<b>HI 839800-02</b>	HANNA Reactor (230 Vac)
<b>HI 731318</b>	Cloth for wiping vials (4)
<b>HI 731340</b>	200 µL automatic pipette
<b>HI 731341</b>	1000 µL automatic pipette
<b>HI 731342</b>	2000 µL automatic pipette
<b>HI 731350</b>	Tips for HI 731340 (25)
<b>HI 731351</b>	Tips for HI 731341 (25)
<b>HI 731352</b>	Tips for HI 731342 (4)

<b>HI 740142</b>	1 mL graduated syringe
<b>HI 740143</b>	1 mL graduated syringe (6 pcs)
<b>HI 740144</b>	Pipette tip (6 pcs)
<b>HI 740157</b>	Plastic refilling pipette (20 pcs)
<b>HI 740216</b>	Test tube cooling rack (25 holes)
<b>HI 740217</b>	Laboratory bench safety shield
<b>HI 92000</b>	Windows® Compatible Software



HI 731340 200 µL Automatic Pipette