HI83224

COD Meter and Multiparameter Photometer

with Barcode Recognition of Sample Vials

Application Designed Photometers

From ammonia to phosphorus, the HI83224 benchtop photometer offers 15 measurement methods for different key water quality parameters in addition to chemical oxygen demand (COD) in 3 different ranges. The HI83224 features a barcode reader that can be used for barcoded sample vials. The reader scans each vial and automatically identifies the method and range, eliminating potential errors and simplifying the testing process.

This photometer features an advanced optical system that uses special tungsten lamps, narrow band interference filters, and silicon photodetectors to ensure accurate photometric readings every time. The HI83224 uses a graphic backlit LCD that allows for an intuitive user interface, offering a tutorial mode that gives a step-by-step procedure for performing a measurement. The result obtained can be displayed in various chemical forms based on the user's preference. For tracking of data, results can be logged and then exported to a Windows® compatible PC using the HI92000 software and HI920013 USB cable.

Barcode Recognition

Automatic recognition of bar coded samples is an exciting feature of the HI83224. This advanced meter scans each vial inserted into the vial holder and automatically identifies the sample method and range. The barcode has four digits: the first two digits are for parameter identification and the second two digits are for reagent lot ID. Vials for different methods can be distinguished by a barcode printed on the vial and the cap color - the barcodes for different methods are shown in the table below. For parameters that don't use a barcoded reagent, the vials supplied with the instrument can be used.

Vial Rotation

During the measurement phase of the analysis, the state-of-the-art vial rotator spins the vial to identify the method via the barcode, then rotates while taking a number of absorbance readings. The instrument then converts the readings to concentration units and displays the result on the easy to read screen.

- Improved Accuracy
  - Using the "average" function further improves reading accuracy. When enabled in the setup menu, the instrument takes 180 absorbance readings through the vial as it rotates. Each individual reading represents a measurement through a new optical path. Averaging the absorbance readings minimizes errors due to vial inconsistencies.
- Method Verification
  - A dedicated METHOD CHECK button is available to verify the vial barcode, eliminating the potential for vial confusion or incorrect sample readings.
- Backlit Graphic LCD Display
  - The HI83224 features an adjustable backlit graphic display with virtual keys and on-screen help to provide for an intuitive user interface.
- Data Logging
  - Users can store up to 200 readings by simply pressing the LOG key. Logged readings are just as easily recalled by pressing the dedicated RCL button. Stored data includes parameter, test results, sample number, lot number, instrument ID, date and time.
- PC Connectivity
  - Logged readings can be transferred to a PC via USB using HI92000 Windows® compatible software.
- Result Conversion
  - Eliminates confusion by automatically converting readings to other chemical forms. Common conversions are available at the touch of a button.
- On-screen Tutorial
  - With the tutorial function enabled, short guides relating to the current operation are displayed.
- Built-in Timer
  - Display of time remaining before a measurement is taken. Ensures that all readings are taken at the appropriate reaction intervals for the test being performed.
- Error Messages
  - Messages on display alerting to problems including barcode error, wrong vial, and different reagent lot.
- Cooling Lamp Indicator
  - To maintain the desirable wavelength to be used for absorbance, it is necessary to ensure components are not overheated from the heat generated by the tungsten lamp. Each photometer is designed to allow a minimal amount of time for components to cool.

Specifications	HI83224
Light Source	tungsten lamps with narrow band interference filters
Light Detector	silicon photocell
Data Logging	up to 200 samples
PC Connectivity	USB
Environment	0 to 50°C (32 to 122°F); RH max 90% non-condensing
Power Supply	230 VAC or 115 VAC
Dimensions	235 x 212 x 143 mm (9.2 x 8.34 x 5.62")
Weight	2.3 kg (5.1 lb)
Ordering Information	**HI83224-01** (115V) and **HI83224-02** (230V) are supplied with sample vials (10), vial cleaning cloths (4), scissors, power cable, and instruction manual.

- Bar code reader detects the method and range automatically

COD Test	Range	Resolution	Accuracy	Method	Reagent Code
COD LR - 150°C, 2 hours	0 to 150 mg/L (as O_2) 0 to 150 mg/L 0 to 150 mg/L	1 mg/L 1 mg/L 1 mg/L	±5 mg/L or ±5% of reading** ±5 mg/L or ±5% of reading** ±5 mg/L or ±5% of reading**	dichromate EPA‡ dichromate mercury-free◊◊ dichromate ISO◊	**HI94754A-25** (24 tests) **HI94754D-25** (24 tests) **HI94754F-25** (24 tests)
COD MR - 150°C, 2 hours	0 to 1500 mg/L (as O_2) 0 to 1500 mg/L 0 to 1500 mg/L	1 mg/L 1 mg/L 1 mg/L	±15 mg/L or ±4 % of reading** ±15 mg/L or ±4% of reading** ±15 mg/L or ±4% of reading**	dichromate EPA‡ dichromate mercury-free◊◊ dichromate ISO◊	**HI94754B-25** (24 tests) **HI94754E-25** (24 tests) **HI94754G-25** (24 tests)
COD HR - 150°C, 2 hours	0 to 15000 mg/L (as O_2)	1 mg/L	±150 mg/L or ±3 % of reading**	dichromate	**HI94754C-25** (24 tests)

COD Rapid Method: It is now possible to get results for process control monitoring in a fraction of the time using any of the Hanna COD reagents. The Rapid Method digestion time is reduced from 2 hours to 15 minutes when the digestion temperature is increased from 150°C to 170°C.

COD Test	Range	Resolution	Accuracy	Rapid Method	Reagent Code
COD LR / Rapid Method - 170°C, 15 minutes	0 to 150 mg/L (as O_2) 0 to 1500 mg/L 0 to 1500 mg/L	1 mg/L 1 mg/L 1 mg/L	±8 mg/L or 5% of reading** ±8 mg/L or 5% of reading** ±8 mg/L or 5% of reading**	adaptation of dichromate EPA adaptation of dichromate mercury-free adaptation of dichromate ISO	**HI94754A-25** (24 tests) **HI94754D-25** (24 tests) **HI94754F-25** (24 tests)
COD MR / Rapid Method - 170°C, 15 minutes	0 to 150 mg/L (as O_2) 0 to 1500 mg/L 0 to 1500 mg/L	1 mg/L 1 mg/L 1 mg/L	±20 mg/L or 4% of reading** ±20 mg/L or 4% of reading** ±20 mg/L or 4% of reading**	adaptation of dichromate EPA adaptation of dichromate mercury-free adaptation of dichromate ISO	**HI94754B-25** (24 tests) **HI94754E-25** (24 tests) **HI94754G-25** (24 tests)

Test	Range	Resolution	Accuracy*	Method	Reagent Code
Ammonia LR	0.00 to 3.00 mg/L (as NH_3–N)	0.01 mg/L	±0.10 mg/L or ±5 % of reading**	Nessler	**HI94764A-25** (25 tests)
Ammonia HR	0 to 100 mg/L (as NH_3–N)	1 mg/L	±1 mg/L or ±5 % of reading**	Nessler	**HI94764B-25** (25 tests)
Chlorine, Free**	0.00 to 5.00 mg/L	0.01 mg/L below 0.99 mg/L; 0.1 mg/L above 0.99 mg/L	±0.03 mg/L or ±4 % of reading**	DPD	**HI93701-01** (100 tests) **HI93701-03** (300 tests)
Chlorine, Total**	0.00 to 5.00 mg/L	0.01 mg/L below 0.99 mg/L; 0.1 mg/L above 0.99 mg/L	±0.03 mg/L or ±4 % of reading**	DPD	**HI93711-01** (100 tests) **HI93711-03** (300 tests)
Nitrate	0.0 to 30.0 mg/L (as NO_3–N)	0.1 mg/L	±1.0 mg/L or ±5 % of reading** @25°C	chromotropic acid	**HI94766-50** (50 tests)
Nitrogen, Total LR	0.0 to 25.0 mg/L (as N)	0.1 mg/L	±1.0 mg/L or ±5 % of reading** @25°C	chromotropic acid	**HI94767A-50** (49 tests)
Nitrogen, Total HR	10 to 150 mg/L (as N)	1 mg/L	±3 mg/L or ±4 % of reading**	chromotropic acid	**HI94767B-50** (49 tests)
Phosphorus, Acid Hydrolyzable	0.00 to 1.60 mg/L (as P)	0.01 mg/L	±0.05 mg/L or ±5 % of reading**	ascorbic acid	**HI94758B-50** (50 tests)
Phosphorus, Reactive LR	0.00 to 1.60 mg/L (as P)	0.01 mg/L	±0.05 mg/L or ±5 % of reading**	ascorbic acid	**HI94758A-50** (50 tests)
Phosphorus, Reactive HR	0.0 to 32.6 mg/L (as P)	0.1 mg/L	±0.5 mg/L or ±5 % of reading**	vanadomolybdophosphoric acid	**HI94763A-50** (49 tests)
Phosphorus, Total LR	0.00 to 1.15 mg/L (as P)	0.01 mg/L	±0.05 mg/L or ±6 % of reading**	ascorbic acid	**HI94758C-50** (50 tests)
Phosphorus, Total HR	0.0 to 32.6 mg/L (as P)	0.1 mg/L	±0.5 mg/L or ±5 % of reading**	vanadomolybdophosphoric acid	**HI94763B-50** (49 tests)

Notes:
‡ Method with chromium-sulfuric acid is officially recognized by EPA for wastewater analysis.
◊ The HI94754F-25 and HI94754G-25 method follows the official method ISO 15705.
◊◊This method is recommended for general purpose analysis with no chloride interference.
* @ 25°C (77°F) unless otherwise stated
** Whichever is greater