

DR 5000™ UV-Vis Laboratory Spectrophotometer



Spectrophotometry

Features and Benefits

More than 240 Analytical Methods and Chemistries

The Hach DR 5000 UV-Vis Laboratory Spectrophotometer can test for all of the parameters listed on page 3. All of the chemistries and supplies needed for these tests are available from Hach.

Easily Add New Analytical Methods

As Hach releases new test methods and chemistries, the DR 5000 spectrophotometer can easily be updated via a USB memory stick.

Detect and Run Analytical Methods Automatically

More than 20 pre-packaged tests are available with integrated bar codes. The DR 5000 spectrophotometer automatically reads the bar codes to detect the appropriate test procedure. Less time is spent testing and potential errors are reduced, resulting in increased productivity and confidence in test results.

Stability and Accuracy

The design of the DR 5000 spectrophotometer ensures measurements are accurate, precise, and stable over time, resulting in repeatable results.

Multiple Cell Sizes and Delivery Methods

A single multiple-cell adapter for the DR 5000 spectrophotometer holds the five most common vial types, including 5-cm path length cells. Moreover, the optional Pour-Thru™ Cell kit is ideal for rapid liquid methods. For additional throughput, the integrated carousel accessory holds seven 1-cm rectangular vials.

The Hach DR 5000™ UV-Vis Laboratory Spectrophotometer offers a broad range of water analysis methods with more than 240 pre-programmed tests. Automatic method detection capability reduces test time and potential errors. The intuitive touch screen interface makes this instrument easy to use.

DW

WW

PW

IW

E

FB

Large Touch Screen Display and Interface

The touch screen display of the DR 5000 spectrophotometer is intuitive to use and ergonomic in design.

TNTplus™ Reagent Vials Designed for the DR 5000 Spectrophotometer

Hach has developed TNTplus™ reagent vials for selected analytical methods that provide the following features when used with the DR 5000 spectrophotometer:

- *Automatic method detection—the DR 5000 spectrophotometer automatically reads the bar code, identifies the appropriate method, and takes the measurement.*
- *No reagent blank is necessary.*
- *Built-in accuracy—while rotating the vial, DR 5000 spectrophotometer takes 10 absorbance measurements in less than 5 seconds. The average value is used to calculate the results.*

DW = drinking water WW = wastewater municipal PW = pure water / power
IW = industrial water E = environmental C = collections FB = food and beverage



Be Right™

Specifications*

Operating Mode

Transmittance (%), Absorbance and Concentration

Source Lamp

Tungsten (visible) and Deuterium (UV)

Pre-Installed Programs

More than 240

Available User Programs

50

Data Storage

2000 points

Scan Data Storage

20 Scans

Export Capability

.csv (comma-separated values) file format

Wavelength Range

190 to 1100 nm

Wavelength Accuracy

±1 nm

Wavelength Resolution

0.1 nm

Wavelength Calibration

Automatic

Wavelength Selection

Automatic—based on selected method

Manual—from the touch screen in all modes except stored methods

Scanning Speed

One complete scan per minute in 1 nm steps

Spectral Bandwidth

2 nm

Photometric Range

±3.0 A

Photometric Accuracy

5 mA at 0.0 to 0.5 A

1% at 0.50 to 2.0 A

Photometric Linearity

Deviation less than 0.5% at 2 A

Deviation less than or equal to

1% at greater than 2 A

Stray Light

KI-solution at 220 nm: greater than

3.3 Abs

Enclosure Rating

IP 32

Multiple Language Interface

English, Spanish, French, German, Italian, Portuguese, Dutch, Swedish, Polish, Danish, Hungarian, Czech, Slovak, and Romanian (please contact your Hach representative for availability of additional languages)

Operating Temperature

10 to 40°C (50 to 104°F)

Operating Humidity

90% relative humidity (non-condensing)

maximum

Storage Requirements

-25 to 60°C (-13 to 140°F)

80% relative humidity (non-condensing)

maximum

Power Requirements

100 to 120 V or 200 to 240 V; 50/60 Hz; automatic changeover

Interface

USB 1.1

Connections

USB Master 2x

(keyboard, drive, or sipper)

USB Slave 1x (PC)

Sample Cell Compatibility

1x1-cm, 2x1-cm, 5x1-cm,

10x1-cm (with adapter)

13 and 16 mm round

AccuVac® 1-in. round

1-inch round

1-inch square, glass and plastic

Pour-Thru™ with 1-in. path length

Accessories

Sipper with 1 cm cell

Internal sample changer (carousel)

(7 rectangular cells, 1x1-cm)

Pour-Thru™ Cell

Brewery analysis software package

DataTrans™ Software

Printer: USB (PCL printer)

Personal computer connection: USB

External keyboard: USB

External barcode reader: USB

Serial port: USB to RS232 adapter

Dimensions

450 x 200 x 500 mm

(17.7 x 7.9 x 19.7 in.) width, height, depth

Weight

15.5 kg (34.2 lb.)

*Specifications subject to change without notice.

Engineering Specifications

- The spectrophotometer instrument shall be a multi-wavelength, UV-Visible, single beam spectrophotometer designed for laboratory analysis of multiple analytes.
- The instrument shall be capable of measuring the following substances or characteristics:alachlor; aluminum; arsenic; atrazine; barium; benzotriazole; boron; bromine; cadmium; chloramines; chloride; chlorine dioxide; chlorine; chromium; cobalt; color; copper; cyanide; fluoride; formaldehyde; hardness; hydrazine; iodine; iron; lead; manganese; mercury; metolachlor; molybdenum; molybdate; nickel; nitrogen (as ammonia, nitrate, nitrite, total nitrogen); oxygen; chemical oxygen demand; oxygen scavengers; ozone; pcb (polychlorinated biphenyls); phenols; phosphonates; phosphorus; potassium; quaternary ammonium compounds; selenium; silica; silver; sulfate; sulfide; sulfite; surfactants; suspended solids; tannin and lignin; total organic carbon; tolyltriazole; total petroleum hydrocarbons (TPH); trihalomethanes (THM); toxicity; volatile acids; and zinc.
- The following tests shall conform to USEPA-approved methods: arsenic; chlorine dioxide; chlorine, free; chlorine, total; chromium, hexavalent; copper; fluoride; iron (total); manganese; nickel; nitrogen (ammonia); nitrogen (nitrite); chemical oxygen demand; phenols; phosphorus (reactive); phosphorus (total); sulfate; sulfide; and zinc.
- The wavelength range of the instrument shall be from 190 to 1100 nm with accuracy of ±1 nm and resolution of 0.1 nm.
- The instrument, depending on the test selection, shall automatically select the wavelength.
- Readout modes shall include transmittance, absorbance, concentration, optional wavelength scan and time course graphs.
- The interface of the instrument shall be graphical with touch screen.
- The instrument shall provide graphical display and be capable of printing test results.

Engineering Specifications *continued*

9. The instrument shall be equipped with storage capacity for 2000 data points (date, time, results, sample ID, user ID) and 50 user-defined calibrations.
10. Information stored in the instrument shall be capable of being downloaded in standard report format.
11. The instrument shall be capable of accepting 1-in. (25.4-mm) round cells/vials, 1-in. square cells, 13-mm round cells, 16-mm round cells, 1-, 2-, 5-, and 10-cm rectangular cells, and Pour Thru cells with 1-in. path.
12. Power requirement shall be 100/240 Vac, 50/60 Hz.
13. The instrument shall be warranted for one full year against defects in materials and workmanship.
14. The instrument shall be model DR 5000 UV-Vis Laboratory Spectrophotometer, manufactured by Hach Company.

Available Tests

The following table lists available tests and overall ranges for the Hach DR 5000 UV-Vis Laboratory Spectrophotometer. The ranges may represent more than one available test for the instrument. Consult your Hach representative, customer service, the Hach Products for Analysis catalog (Literature #2436), the Hach Laboratory and Field Products for Water Analysis catalog (Lit. #2401), or the Hach web site at www.hach.com for complete details of all available tests for this instrument.

Parameter	Range	TNTplus Test	Parameter	Range	TNTplus Test
Aalachlor	Low ppb		Manganese	0.006 to 20.0 mg/L	
Aluminum	0.002 to 0.800 mg/L	•	Mercury	0.1 to 2.5 µg/L	
Ammonia, Nitrogen	0.015 to 50.0 mg/L	•	Methylethylketoxime (MEKO)	15 to 1000 µg/L	
Ammonium, Nitrogen	0.05 to 45.0 mg/L		Metolachlor	Low ppb	
Arsenic	0.020 to 0.200 mg/L		Molybdenum, Molybdate	0.02 to 40.0 mg/L	
Atrazine	Low ppb		Nickel	0.006 to 1.80 mg/L	•
Barium	2 to 100 mg/L		Nitrate, Nitrogen	0.01 to 35.0 mg/L	•
Benzotriazole	0.2 to 16.0 mg/L		Nitrite, Nitrogen	0.002 to 250 mg/L	•
Boron	0.02 to 14.0 mg/L		Nitrogen, Total	0.5 to 150 mg/L	•
Bromine	0.05 to 4.50 mg/L		Nitrogen, Total Inorganic	0.2 to 25.0 mg/L	
Cadmium	0.7 to 300.0 µg/L	•	Nitrogen, Total Kjeldahl	1 to 150 mg/L	
Carbohydrazide	5 to 600 µg/L		Organic Constituents (UV-254 absorbing)	Direct Reading	
Chloramine, Mono	0.04 to 10.0 mg/L		Ozone	0.01 to 1.50 mg/L	
Chloride	0.1 to 25.0 mg/L		PCB (Polychlorinated Biphenyls)	Low ppb	
Chlorine Dioxide	20 µg/L to 1000 mg/L		Phenols	0.002 to 0.200 mg/L	
Chlorine, Free	0.02 to 10.0 mg/L		Phosphonates	Multiple Ranges	
Chlorine, Total	2 µg/L to 10.0 mg/L		Phosphorus, Acid Hydrolyzable	0.06 to 3.50 mg/L	
Chromium, Hexavalent	0.010 to 1.00 mg/L	•	Phosphorus, Reactive (Orthophosphate)	20 µg/L to 100 mg/L	•
Chromium, Total	0.01 to 0.70 mg/L	•	Phosphorus, Total	0.06 to 100 mg/L	
Cobalt	0.01 to 2.00 mg/L		Potassium	0.1 to 7.0 mg/L	
Color	0 to 500 units		Quaternary Ammonium Compounds	0.2 to 5.0 mg/L	
COD (Chemical Oxygen Demand)	0.7 to 15,000 mg/L	•	Selenium	0.01 to 1.00 mg/L	
Copper	1 µg/L to 5.00 mg/L		Silica	3 µg/L to 100 mg/L	
Cyanide	0.002 to 0.240 mg/L		Silver	0.005 to 0.700 mg/L	
DEHA (Diethylhydroxylamine)	3 to 450 µg/L		Sulfate	2 to 70 mg/L	
Dissolved Oxygen	6 µg/L to 40 mg/L		Sulfide	5 to 800 µg/L	
Erythorbic Acid (Isoascorbic acid)	13 to 1500 µg/L		Surfactants, Anionic	0.002 to 0.275 mg/L	
Fluoride	0.02 to 2.00 mg/L		Suspended Solids	5 to 750 mg/L	
Formaldehyde	2 to 500 µg/L		Tannin and Lignin	0.10 to 0.90 mg/L	
Hardness, Total (Calcium and Magnesium as CaCO ₃)	4 µg/L to 4.00 mg/L		TOC (Total Organic Carbon)	0.3 to 700 mg/L	
Hydrazine	4 to 600 µg/L		Tolyltriazole	1.0 to 20.0 mg/L	
Hydroquinone	9 to 1000 µg/L		Toxicity	0 to 100% Inhibition	
Iodine	0.07 to 7.00 mg/L		TTHM (Trihalomethanes, Total)	10 to 600 µg/L	
Iron, Ferrous	0.02 to 3.00 mg/L		TPH (Total Petroleum Hydrocarbons)	Threshold	
Iron, Total	0.009 to 3.00 mg/L		Volatile Acids	27 to 2800 mg/L	
Lead	3 to 300 µg/L	•	Zinc	0.01 to 3.00 mg/L	

Ordering Information

- DR5000-01** DR 5000 UV-Vis Spectrophotometer, 115 Vac; includes multi-cell holder, instrument manual, power cord (115V), 1-inch matched glass sample cells, 1-cm matched quartz sample cells
- DR5000-02** DR 5000 UV-Vis Spectrophotometer, 240 Vac; includes multi-cell holder, instrument manual, power cord (230V), 1-inch matched glass sample cells, 1-cm matched quartz sample cells

Optional Accessories

- A23620** Carousel Sample Changer; holds up to seven 1-cm rectangular sample cells
- LZV485** Sipper Module; includes 1-cm rectangular quartz cell and installation instructions
- LZV479** Pour-Thru Cell Kit; includes sipper housing with lid, Pour-Thru cell (1-inch) and holder, funnel, tubing, and knurled screws
- LZY421** 10 cm Cell Adapter; Adapter for 10cm x 1cm rectangular cells
- LZY274** DataTrans™ Software
Hach DataTrans Software transfers measurement output from Hach DR 2800 or DR 5000 spectrophotometers to a PC via USB port. This direct computer file input saves time and eliminates keying errors. Data can be transferred to an Excel spreadsheet or to LIMS. The software also displays wavelength scan and time course graphs, and underlying raw data points can be easily exported to Excel. A powerful search function allows customer to sort by: Result (parameter), Date (range), Operator, Instrument (type, serial number), Program (name, type), and Sample name. For recurring searches, users may also create custom search programs and save under separate names.
- LZV659** Brewery Methods
The New Brewery Analysis Package software is designed for breweries utilizing the Hach DR 5000 Spectrophotometer. This upgrade contains 12 specific brewery assays that conveniently upload via USB to a DR 5000. Assays are based on published and observed brewing methods and include procedures for: • Anthocyanogens • Iron • Steam volatile phenols • Beer color • Iso-alpha-acids • Total polyphenols • Bitterness units • Photometric iodine • Thiobarbituric acid number (TAN) • Free amino nitrogen • Reductones • Vicinal diketones

To complete your laboratory analytical instrumentation, choose from these new chemistries...

TNTplus™ Reagent Vials

New Hach TNTplus reagent vials are bar-coded for automatic method detection and auto-blanking when used with the DR 2800 Portable Spectrophotometer to save time, minimize errors, and reduce laboratory costs. Superior glassware provides the best precision and the vials flat bottom improves handling in the lab. (For a complete list of available TNTplus parameters, see the table on page 3)



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In the interest of improving and updating its equipment, Hach Company reserves the right to alter specifications to equipment at any time.

At Hach, it's about learning from our customers and providing the right answers. It's more than ensuring the quality of water—it's about ensuring the quality of life. When it comes to the things that touch our lives...

Keep it pure.

Make it simple.

Be right.

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Be Right™