

# DR 5000™ UV-Vis Laboratory Spectrophotometer



Spectrophotometry

*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 with TNTplus reagents reduces test time and potential errors. The intuitive touch screen interface makes this instrument easy to use.*

DW

WW

PW

IW

E

FB

## 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.

### 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 multi-cell adapter for the DR 5000 spectrophotometer holds the five most common sample cell types, including 5 cm path length cells. Moreover, the optional Pour-Thru™ Cell Module is ideal for Rapid Liquid™ methods.

### Large Touch Screen Display and Interface

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

### High-Speed Wavelength Scanning

The DR 5000 spectrophotometer features full-range wavelength scanning from 190-1100 nm. Use this feature to develop custom methods or maintain consistency of colored products.

### TNTplus™ Reagent Vials Designed for the DR 5000 Spectrophotometer

Hach has developed TNTplus™ reagent vials for more than 30 selected analytical methods that provide the following features when used with the DR 5000 spectrophotometer:

- *Increased productivity and confidence in results—testing with TNTplus reagents takes less time, and potential errors are reduced.*
- *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

1000 points

### Scan Data Storage

20 Scans

### Export Capability

.csv (comma-separated values)  
file format

### Wavelength Range

190 to 1100 nm

### Wavelength Accuracy

±1 nm in wavelength range 200-900 nm

### Wavelength Resolution

0.1 nm

### Wavelength Calibration

Automatic

### Wavelength Selection

Automatic—based on selected program  
Manual—in all modes except stored programs

### Scanning Speed

900 nm per minute in 1 nm steps

### Spectral Bandwidth

2 nm

### Photometric Range

±3.0 Abs in wavelength range  
200-900 nm

### Photometric Accuracy

5 mAbs at 0.0 to 0.5 Abs  
1% at 0.5 to 2.0 Abs

### Photometric Linearity

Deviation less than 0.5% up to 2 Abs  
Deviation less than or equal to  
1% at greater than 2 Abs

### Stray Light

KI-solution at 220 nm: greater than  
3.3 Abs / less than 0.05%

### Enclosure Rating

IP 31

### Multiple Language Interface

English, Spanish, French, German,  
Italian, Portuguese, Chinese, Japanese,  
Korean (please contact your Hach  
representative for availability of  
additional languages)

### Operating Temperature

10 to 40°C (50 to 104°F)

### Operating Humidity

80% 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

1 x USB type B (PC)  
2 x USB type A (USB storage device,  
printer, keyboard, barcode scanner)

### Sample Cell Compatibility

1 x 1 cm, 2 x 1 cm, 5 x 1 cm,  
10 x 1 cm (with optional adapter)  
13 and 16 mm round  
1-in. round  
1-in. square  
AccuVac®  
Pour-Thru™ with 1-in. and  
1 cm path lengths

### Accessories

Sipper Module with 1 cm cell

Carousel Holder (sample changer)  
(Seven 1 x 1 cm cells)

Pour-Thru™ Cell Module, 1-in. or 1 cm

Brewery Analysis Software

DataTrans™ Software

Printer: USB (PCL3 Language)

External keyboard: USB

External barcode reader: USB

### 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, reference 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; chloramine (mono); chloride; chlorine dioxide; chlorine; chromium; cobalt; color; copper; cyanide; fluoride; formaldehyde; hardness; hydrazine; iodine; iron; lead; manganese; mercury; molybdenum; nickel; nitrogen (as ammonia, nitrate, nitrite, total nitrogen, total Kjeldahl nitrogen); dissolved oxygen; chemical oxygen demand; oxygen scavengers; ozone; pcb (polychlorinated biphenyls); phenols; phosphonates; phosphorus; potassium; quaternary ammonium compounds; selenium; silica; silver; sulfate; sulfide; 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-compliant 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 1000 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 mm) round cells/vials; 1-in. square cells; 13 mm round vials; 16 mm round vials; 1 cm square cells, 2, 5, and 10 cm rectangular cells; and Pour Thru cells with 1-in. and 1 cm path lengths.
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 Master Catalog (Literature #2550) or the Hach web site at [www.hach.com](http://www.hach.com) for complete details of all available tests for this instrument.

| Parameter   | Range                     | TNTplus Test | Parameter                                      | Range                   | TNTplus Test |
|---|---------------------------|--------------|--|-------------------------|--------------|
| <b>Alachlor</b>   | 0.1 to 0.5 ppb, threshold |              | <b>Manganese</b>                               | 0.006 to 20.0 mg/L      |              |
| <b>Alkalinity, Total</b>  | 25 to 400 mg/L            | •            | <b>Mercury</b>                                 | 0.1 to 2.5 µg/L         |              |
| <b>Aluminum</b>   | 0.002 to 0.800 mg/L       | •            | <b>Methylethylketoxime (MEKO)</b>              | 15 to 1000 µg/L         |              |
| <b>Ammonia, Nitrogen</b>  | 0.015 to 50.0 mg/L        | •            | <b>Molybdenum, Molybdate</b>                   | 0.02 to 40.0 mg/L       |              |
| <b>Arsenic</b>  | 0.020 to 0.200 mg/L       |              | <b>Nickel</b>                                  | 0.006 to 6.0 mg/L       | •            |
| <b>Atrazine</b>   | 0.5 to 3.0 ppb, threshold |              | <b>Nitrate, Nitrogen</b>                       | 0.01 to 35 mg/L         | •            |
| <b>Barium</b>   | 2 to 100 mg/L             |              | <b>Nitrite, Nitrogen</b>                       | 0.002 to 250 mg/L       | •            |
| <b>Benzotriazole</b>  | 0.2 to 16.0 mg/L          |              | <b>Nitrogen, Simplified Total Kjeldahl</b>     | 0 to 16 mg/L            | •            |
| <b>Boron</b>  | 0.2 to 14.0 mg/L          |              | <b>Nitrogen, Total</b>                         | 0.5 to 150 mg/L         | •            |
| <b>Bromine</b>  | 0.05 to 4.50 mg/L         |              | <b>Nitrogen, Total Inorganic</b>               | 0.2 to 25.0 mg/L        |              |
| <b>Cadmium</b>  | 1.3 µg/L to 0.30 mg/L     | •            | <b>Nitrogen, Total Kjeldahl</b>                | 1 to 150 mg/L           |              |
| <b>Carbohydrazide</b>   | 5 to 600 µg/L             |              | <b>Organic Constituents (UV-254 absorbing)</b> | Direct Reading          |              |
| <b>Chloramine, Mono</b>   | 0.04 to 10.0 mg/L         |              | <b>Ozone</b>                                   | 0.01 to 1.50 mg/L       |              |
| <b>Chloride</b>   | 0.1 to 25.0 mg/L          |              | <b>PCB (Polychlorinated Biphenyls)</b>         | 1 to 50 ppm, threshold  |              |
| <b>Chlorine Dioxide</b>   | 0.01 to 1000 mg/L         |              | <b>Phenols</b>                                 | 0.002 to 0.200 mg/L     |              |
| <b>Chlorine, Free</b>   | 0.02 to 10.0 mg/L         | •            | <b>Phosphonates</b>                            | 0.02 to 125.0 mg/L      |              |
| <b>Chlorine, Total</b>  | 2 µg/L to 10.0 mg/L       | •            | <b>Phosphorus, Acid Hydrolyzable</b>           | 0.06 to 100.0 mg/L      |              |
| <b>Chromium, Hexavalent</b>   | 0.010 to 1.00 mg/L        | •            | <b>Phosphorus, Reactive (Orthophosphate)</b>   | 19 µg/L to 100.0 mg/L   | •            |
| <b>Chromium, Total</b>  | 0.01 to 0.70 mg/L         | •            | <b>Phosphorus, Total</b>                       | 0.06 to 100.0 mg/L      | •            |
| <b>Cobalt</b>   | 0.01 to 2.00 mg/L         |              | <b>Potassium</b>                               | 0.1 to 7.0 mg/L         |              |
| <b>Color</b>  | 3 to 500 units            |              | <b>Quaternary Ammonium Compounds</b>           | 0.2 to 5.0 mg/L         |              |
| <b>COD (Chemical Oxygen Demand)</b>                                     | 0.7 to 15,000 mg/L        | •            | <b>Selenium</b>                                | 0.01 to 1.00 mg/L       |              |
| <b>Copper</b>   | 1 µg/L to 8.0 mg/L        | •            | <b>Silica</b>                                  | 3 µg/L to 100 mg/L      |              |
| <b>Cyanide</b>  | 0.002 to 0.240 mg/L       |              | <b>Silver</b>                                  | 0.005 to 0.700 mg/L     |              |
| <b>DEHA (Diethylhydroxylamine)</b>                                      | 3 to 450 µg/L             |              | <b>Sulfate</b>                                 | 2 to 900 mg/L           | •            |
| <b>Dissolved Oxygen</b>   | 6 µg/L to 40 mg/L         |              | <b>Sulfide</b>                                 | 5 to 800 µg/L           |              |
| <b>Erythorbic Acid (Isoascorbic acid)</b>                               | 13 to 1500 µg/L           |              | <b>Surfactants, Anionic</b>                    | 0.002 to 0.275 mg/L     |              |
| <b>Fluoride</b>   | 0.02 to 2.00 mg/L         |              | <b>Suspended Solids</b>                        | 5 to 750 mg/L           |              |
| <b>Formaldehyde</b>   | 2 to 500 µg/L             |              | <b>Tannin and Lignin</b>                       | 0.1 to 9.0 mg/L         |              |
| <b>Hardness, Total</b><br>(Calcium and Magnesium as CaCO <sub>3</sub> ) | 4 µg/L to 4.00 mg/L       |              | <b>TOC (Total Organic Carbon)</b>              | 0.3 to 700 mg/L         |              |
| <b>Hydrazine</b>  | 4 to 600 µg/L             |              | <b>Tolyltriazole</b>                           | 1.0 to 20.0 mg/L        |              |
| <b>Hydroquinone</b>   | 9 to 1000 µg/L            |              | <b>Toxicity</b>                                | 0 to 100% Inhibition    |              |
| <b>Iodine</b>   | 0.07 to 7.00 mg/L         |              | <b>TTHM (Trihalomethanes, Total)</b>           | 10 to 600 µg/L          |              |
| <b>Iron, Ferrous</b>  | 0.02 to 3.00 mg/L         |              | <b>TPH (Total Petroleum Hydrocarbons)</b>      | 2 to 200 ppm, threshold |              |
| <b>Iron, Total</b>  | 0.009 to 6.0 mg/L         | •            | <b>Volatile Acids</b>                          | 27 to 2800 mg/L         | •            |
| <b>Lead</b>   | 3 µg/L to 2.0 mg/L        | •            | <b>Zinc</b>                                    | 0.01 to 3.00 mg/L       |              |

## Ordering Information

**DR5000-03** DR 5000 UV-Vis Spectrophotometer, 100-240 Vac; includes multi-cell holder, instrument manual, power cords (115V and 230V), 1-in. matched glass sample cells, 1 cm matched quartz sample cells

### Optional Accessories

- LZV478** Carousel Sample Changer; holds up to seven 1 cm square sample cells
- LZV485** Sipper Module; includes 1 cm square quartz cell
- LZV479** Pour-Thru Cell Kit, 1-in.
- LZV789** Pour-Thru Cell Kit, 1 cm
- LZY421** Cell Adapter for 10 cm x 1 cm rectangular cells
- LZY274** DataTrans™ Software  
Hach DataTrans Software transfers measurement output from Hach DR 2700, 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 Analysis Package  
The Brewery Analysis Software package 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
- LZV537** Certified Test Filter Set  
Consists of six filters for checking the absorbance accuracy, stray light, and wavelength accuracy. Designed for use with the standard 10mm cell holder. The set is supplied in a sturdy wooden case. For identification purposes, the filter name, set number and part number are printed on each filter mount. The absorbance values and/or peak position wavelengths of each filter are quoted in the accompanying calibration certificate.
- 2960100** Citizen PD-24 Printer Package  
Includes printer, universal power supply, 115V power cord, battery pack, USB cable, RS232 cable with gender adapter, and one roll of thermal paper.

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

### TNTplus™ Reagent Vials

Hach TNTplus reagent vials are bar-coded for automatic method detection when used with the DR 5000 Spectrophotometer to save time, minimize errors, and reduce laboratory costs. 10-fold measurement and rejection of outliers allows for improved accuracy and precision. (Complete list of available parameters 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.*

*For current price information, technical support, and ordering assistance, contact the Hach office or distributor serving your area.*

*In the United States, contact:*

HACH COMPANY World Headquarters  
P.O. Box 389  
Loveland, Colorado 80539-0389  
U.S.A.  
Telephone: 800-227-4224  
Fax: 970-669-2932  
E-mail: orders@hach.com  
**www.hach.com**

*U.S. exporters and customers in Canada, Latin America, sub-Saharan Africa, Asia, and Australia/New Zealand, contact:*

HACH COMPANY World Headquarters  
P.O. Box 389  
Loveland, Colorado 80539-0389  
U.S.A.  
Telephone: 970-669-3050  
Fax: 970-461-3939  
E-mail: intl@hach.com  
**www.hach.com**

*In Europe, the Middle East, and Mediterranean Africa, contact:*

HACH LANGE GmbH  
Willstätterstraße 11  
D-40549 Düsseldorf  
GERMANY  
Tel: +49 (0) 211 5288-0  
Fax: +49 (0) 211 5288-143  
E-mail: info@hach-lange.de  
**www.hach-lange.com**



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