DR 5000™
UV-Vis Laboratory Spectrophotometer

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.
Specifications

1. The spectrophotometer instrument shall be a multi-wavelength, UV-Visible, split-beam spectrophotometer designed for laboratory analysis of multiple analytes.

2. The instrument shall be capable of measuring the following substances or characteristics: alachlor; alkalinity; 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; phenols; phosphorus (reactive); phosphorus (total); sulfate; sulfide; and zinc.

3. 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.

4. The wavelength range of the instrument shall be from 190 to 1100 nm with accuracy of ±1 nm and resolution of 0.1 nm.

5. The instrument, depending on the test selection, shall automatically select the wavelength.

6. Readout modes shall include transmittance (%), absorbance, concentration, optional wavelength scan and time course graphs.

7. The interface of the instrument shall be graphical with touch screen.

8. The instrument shall provide graphical display and be capable of printing test results.

Engineering Specifications

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**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 for complete details of all available tests for this instrument.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range</th>
<th>TNTplus Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alachlor</td>
<td>0.1 to 0.5 ppb, threshold</td>
<td></td>
</tr>
<tr>
<td>Alkalinity, Total</td>
<td>25 to 400 mg/L</td>
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<tr>
<td>Aluminum</td>
<td>0.002 to 0.800 mg/L</td>
<td></td>
</tr>
<tr>
<td>Ammonia, Nitrogen</td>
<td>0.015 to 50.0 mg/L</td>
<td></td>
</tr>
<tr>
<td>Arsenic</td>
<td>0.020 to 0.200 mg/L</td>
<td></td>
</tr>
<tr>
<td>Atrazine</td>
<td>0.5 to 3.0 ppb, threshold</td>
<td></td>
</tr>
<tr>
<td>Barium</td>
<td>2 to 100 mg/L</td>
<td></td>
</tr>
<tr>
<td>Benzotriazole</td>
<td>0.2 to 16.0 mg/L</td>
<td></td>
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<tr>
<td>Boron</td>
<td>0.2 to 14.0 mg/L</td>
<td></td>
</tr>
<tr>
<td>Bromine</td>
<td>0.05 to 4.50 mg/L</td>
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<tr>
<td>Cadmium</td>
<td>1.3 µg/L to 0.30 mg/L</td>
<td></td>
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<tr>
<td>Carbohydrate</td>
<td>5 to 600 µg/L</td>
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</tr>
<tr>
<td>Chloramine, Mono</td>
<td>0.04 to 1.00 mg/L</td>
<td></td>
</tr>
<tr>
<td>Chloride</td>
<td>0.1 to 25.0 mg/L</td>
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<tr>
<td>Chlorine Dioxide</td>
<td>0.01 to 1000 mg/L</td>
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<tr>
<td>Chlorine, Free</td>
<td>0.02 to 10.0 mg/L</td>
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<tr>
<td>Chromium, Hexavalent</td>
<td>2 µg/L to 10.0 mg/L</td>
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<tr>
<td>Chromium, Total</td>
<td>0.01 to 0.70 mg/L</td>
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<tr>
<td>Cobalt</td>
<td>0.01 to 2.00 mg/L</td>
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<tr>
<td>Color</td>
<td>3 to 500 units</td>
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<tr>
<td>COD (Chemical Oxygen Demand)</td>
<td>0.7 to 15.000 mg/L</td>
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<tr>
<td>Copper</td>
<td>1 µg/L to 8.0 mg/L</td>
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<tr>
<td>Cyanide</td>
<td>0.002 to 0.240 mg/L</td>
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<tr>
<td>DEHA (Diethylhydroxylamine)</td>
<td>3 to 450 µg/L</td>
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<tr>
<td>Dissolved Oxygen</td>
<td>6 µg/L to 40 mg/L</td>
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<tr>
<td>Erythorbic Acid (Isoascorbic acid)</td>
<td>13 to 1500 µg/L</td>
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<tr>
<td>Fluoride</td>
<td>0.02 to 2.00 mg/L</td>
<td></td>
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<tr>
<td>Formaldehyde</td>
<td>2 to 500 µg/L</td>
<td></td>
</tr>
<tr>
<td>Hardness, Total (Calcium and Magnesium as CaCO₃)</td>
<td>4 µg/L to 4.00 mg/L</td>
<td></td>
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<tr>
<td>Hydrazine</td>
<td>4 to 600 µg/L</td>
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<tr>
<td>Hydroquinone</td>
<td>9 to 1000 µg/L</td>
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<tr>
<td>Iodine</td>
<td>0.07 to 7.00 mg/L</td>
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<tr>
<td>Iron, Ferrous</td>
<td>0.02 to 3.00 mg/L</td>
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<tr>
<td>Iron, Total</td>
<td>0.009 to 6.0 mg/L</td>
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<tr>
<td>Lead</td>
<td>3 µg/L to 2.0 mg/L</td>
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</tbody>
</table>

**Parameter** | **Range** | **TNTplus Test**
Manganese | 0.006 to 20.0 mg/L |
Mercury | 0.1 to 2.5 µg/L |
Methylethylketoxime (MEKO) | 15 to 1000 µg/L |
Molybdenum, Molybdate | 0.02 to 40.0 mg/L |
Nickel | 0.006 to 6.0 mg/L |
Nitrate, Nitrogen | 0.01 to 35 mg/L |
Nitrite, Nitrogen | 0.002 to 250 mg/L |
Nitrogen, Simplified Total Kjeldahl | 0 to 16 mg/L |
Nitrogen, Total | 0.5 to 150 mg/L |
Nitrogen, Total Inorganic | 0.2 to 25.0 mg/L |
Nitrogen, Total Kjeldahl | 1 to 150 mg/L |
Organic Constituents (UV-254 absorbing) Direct Reading
Ozone | 0.01 to 1.50 mg/L |
PCB (Polychlorinated Biphenyls) | 1 to 50 ppm, threshold |
Phenols | 0.002 to 0.200 mg/L |
Phosphonates | 0.02 to 125.0 mg/L |
Phosphorus, Acid Hydroyzable | 0.06 to 100.0 mg/L |
Phosphorus, Reactive (Orthophosphate) | 19 µg/L to 100.0 mg/L |
Phosphorus, Total | 0.06 to 100.0 mg/L |
Potassium | 0.1 to 7.0 mg/L |
Quaternary Ammonium Compounds | 0.2 to 5.0 mg/L |
Selenium | 0.01 to 1.00 mg/L |
Silica | 3 µg/L to 100 mg/L |
Silver | 0.005 to 0.700 mg/L |
Sulfate | 2 to 900 mg/L |
Sulphide | 5 to 800 µg/L |
Surfactants, Anionic | 0.002 to 0.275 mg/L |
Suspended Solids | 5 to 750 mg/L |
Tannin and Lignin | 0.1 to 9.0 mg/L |
TOC (Total Organic Carbon) | 0.3 to 700 mg/L |
Tolytriazole | 1.0 to 20.0 mg/L |
Toxicity | 0 to 100% Inhibition |
TTHM (Trihalomethanes, Total) | 10 to 600 µg/L |
TPH (Total Petroleum Hydrocarbons) | 2 to 200 ppm, threshold |
Volatile Acids | 27 to 2800 mg/L |
Zinc | 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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