

# DR/800

Series Colorimeters

High-Value, High-Capability Instruments  
for Water Quality Analysis



Be Right™

# DR/800

## Series Colorimeters

Hach DR/800 Series Colorimeters combine ease of use, multiple testing capabilities and field readiness. Analysis requires minimal time and preparation, with results displayed directly on the large liquid-crystal display in concentration, percent transmittance, or absorbance units.

### Choose from Three Models

Depending on your testing needs, you can select a DR/820, DR/850 or DR/890 Colorimeter, preprogrammed to test for at least 20, 50 or 90 parameters, respectively. All three models include the same convenient features: auto-wavelength selection, datalogging capabilities and user-generated calibrations. Refer to the table on pages 6-7 to select the colorimeter that tests the parameters required by your program. These durable, hand-held, filter-photometer instruments are designed specifically for the rigors of on-site testing, with rugged components and waterproof, dustproof, chemical-resistant housings. DR/800 Series Colorimeters offer simple, push-button program selection and step-by-step prompts that guide users through the testing procedure. These instruments are equally appreciated by experienced analysts who value test efficiency and by operators who require ease of use with accurate results.



## Advanced Features Add Value

- Easy-to-use software offers push-button method selection, automatic wavelength selection and a preprogrammed method timer. Result, units, and parameter name are displayed immediately, with no countdown. The large digit display is very easy to read.
- The DR/800 retains the selected method until a new method is entered, even if it is turned off and then back on. This allows a series of analyses to be performed for the same parameter without reselecting the method.
- Datalogging capability includes push-button record management. Easily store data in the field for later access, with no delay in testing. The instrument stores up to 99 measurements in an internal, non-volatile memory. Data stored includes date/time, parameter, program number, concentration/absorbance/%T, sample number, and instrument serial number.
- Results are displayed directly in units of concentration, absorbance, or % transmittance. In many methods, concentration in alternate chemical forms is also available. For example, phosphate readings are available as P, PO<sub>4</sub> and P<sub>2</sub>O<sub>5</sub>. Displayed results can be changed from one form to the next at the touch of a button.
- User-program feature allows users to generate up to 10 custom procedures, with up to 12 data points each, and store them in a non-volatile instrument memory for later use.
- Advanced software includes automatic correction for reagent blanks and the option to fine-tune calibration curves with the standard adjust feature.
- Batteries provide self-contained power for field-testing. All battery-powered instruments listed in this brochure are marked with the battery symbol (🔋).

## Accessories Simplify Data Management

The Data Transfer Adapter (DTA) fits on the colorimeter and accepts data sent from the instrument's infrared LED transmitter. The DTA converts data to a standard RS-232 format and connects directly to a computer or printer. Data can be printed or downloaded conveniently, after storage or during collection.

DR/800 Series Colorimeters are compatible with HachLink™ Software, a Microsoft® Windows® compatible application that links instrument and computer, providing a convenient means of accessing and managing test data. Information including date/time, parameter, concentration/absorbance/%T, sample number, operator identity, and instrument serial number is accepted and stored in either text or tabular (spreadsheet) format, and can be easily transferred to popular spreadsheet or word-processing applications.

## Easy Quality Control

DR/Check™ ABS Standards are the optional choice to verify the performance of your DR/800 Colorimeter in seconds. Standards are formulated with neutral density gel that produces similar absorbance readings at any wavelength. For all parameters at all wavelengths, running three secondary absorbance standards will verify your instrument's calibration easily, anytime.

## Affordable COD Analysis

All three models include Hach's Manganese III COD procedure (mercury-free version). The DR/850 Colorimeter also performs our traditional USEPA-approved low-range COD procedure, and the DR/890 Colorimeter performs both low-range and high-range USEPA-approved COD procedures. An adapter suitable for COD vials, Test 'N Tube™ (TNT) vials, and *UniCell*™ vials is included with each instrument.

## Push-Button Operation Speeds Analysis

Using Hach prepared reagents, testing is normally accomplished in just a few minutes, following this simple procedure:

1. When turned on, the instrument automatically recalls the last program used. To change programs, press the program key and enter the program number from the procedures manual. The instrument displays the program number, parameter, units, and the zero icon.
2. Prepare the blank (zero) according to the procedure, place it in the instrument, and press the zero key. The instrument displays the zero and the read icon.
3. Prepare the sample according to the procedure. (An internal timer is preprogrammed for methods that require a fixed reaction time. Timer duration is automatically displayed for the selected procedure; simply start the timer at the start of the reaction.) After reacting the sample, place the sample cell in the instrument and press the read key.
4. The instrument displays the result in concentration units. The user can also toggle the ABS %T key to display absorbance or % transmittance. Some results can be displayed in alternate chemical forms (e.g., Cr may be displayed as mg/L CrO<sub>4</sub> or Cr<sub>2</sub>O<sub>7</sub>). Scroll through available forms by pressing the concentration key.
5. Save the results by pressing the store key. The instrument will store up to 99 measurements in an internal, non-volatile memory. Results may be printed or transferred to a computer at any time using the Data Transfer Adapter.



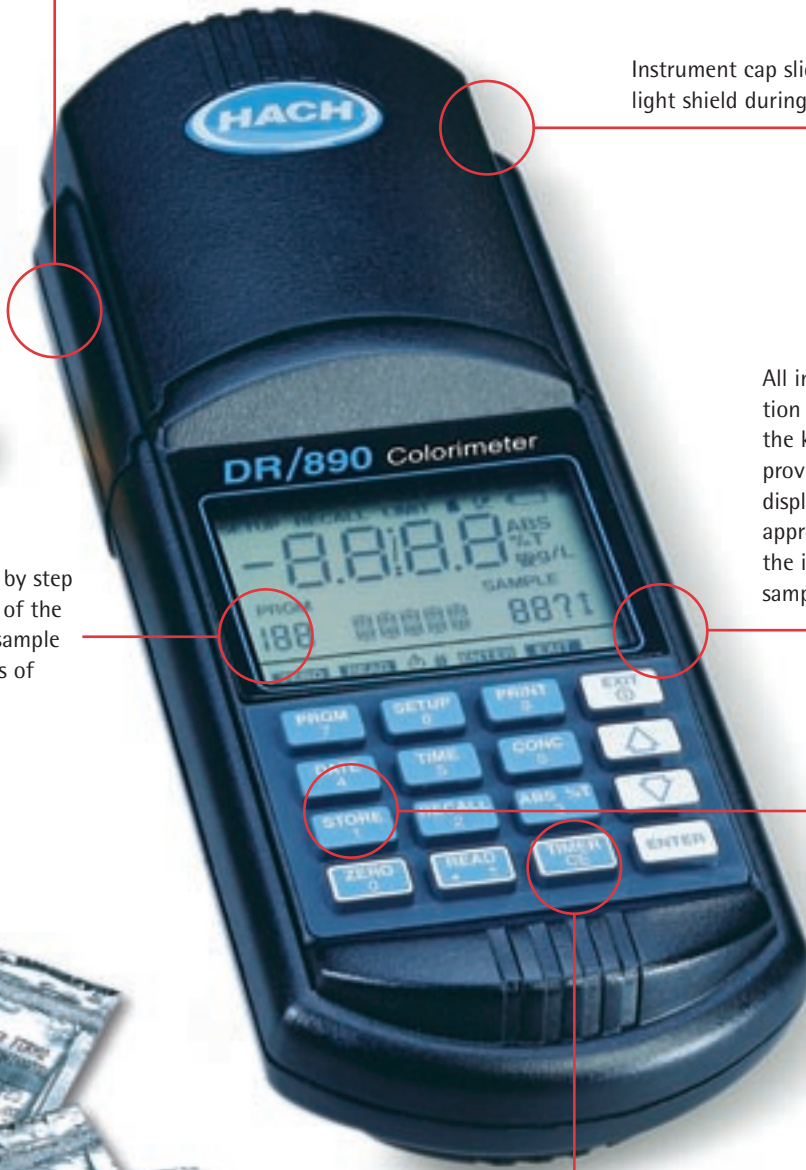
# DR/800

## Series Colorimeters

Ergonomically designed instrument fits comfortably in the palm of your hand, with all functions easily accessible.



Large LCD display prompts user step by step through procedures. Separate areas of the display indicate procedure number, sample number, parameter, test results, units of measure, and other data.



Instrument cap slides off and is used as a light shield during measurement.

All instrument setup and operation functions are accessible by the keypad. Following prompts provided on the instrument display, the user selects the appropriate program, zeroes the instrument, reacts the sample, and reads the results.

Up to 99 individual readings can be stored and recalled with the touch of a button.

Built-in timer is preprogrammed for methods requiring a fixed reaction time and can be set by the user.



## Instrument Specifications

**Wavelength Selection:** Auto Select

**Photometric Range:** 0 to 2 A

**Operational Modes:** Concentration, ABS, %T

**Concentration Units:** µg/L, mg/L, g/L, ABS, %T

**External Outputs:** Data Transfer Adapter (optional), IR to RS-232

**Datalogging:** 50 sample readings (each reading includes date/time, parameter, program number, concentration, absorbance, % transmittance, sample number, instrument serial number)

**User Programs:** 10 user-entered programs, 12 data points each

**Display:** Large liquid-crystal display (LCD) shows results, parameter name, and units

**Dimensions:** 23.6 x 8.7 x 4.7 cm (9.3 x 3.4 x 1.9")

**Weight:** 470 g (1 lb)

**Power:** 4 AA alkaline or rechargeable alkaline batteries, nominal life of six months


**Storage Temperature Range:** -40 to 60°C (-40 to 140°F)

**Operating Temperature Range:** 0 to 50°C (32 to 120°F)

**Environmental:** Meets IP67 standard, dustproof and waterproof to one meter for 30 minutes

**Compliance:** European CE Mark

## How To Order

Each DR/800 Series Colorimeter includes two sample cells marked at 10, 20 and 25 mL, 16-mm COD/TNT/UniCell<sup>®</sup> adapter, batteries and illustrated instrument and procedure manuals. 

48440-00 DR/820 Colorimeter

48450-00 DR/850 Colorimeter

48470-00 DR/890 Colorimeter



Optional carrying cases provide ample room for the instrument, accessories, manual, and additional reagent sets.

## Optional Instrumentation

51700-10 sensIon™1 Portable pH Meter with Platinum Series pH Electrode

51800-10 sensIon™5 Conductivity Meter with Electrode and 1 m (40") Cable

54650-15 sensIon™156 Meter. A combination, portable meter available in different configurations combining pH, conductivity, and dissolved oxygen capability with different types of probes. Ask your sales representative for model details.

54750-15 sensIon™378 Meter. A combination, laboratory meter available in different configurations combining pH, conductivity, and dissolved oxygen capability with different types of probes. Ask your sales representative for model details.

45600-00 COD Reactor for efficient digestion of up to 25 COD/TNT/UniCell<sup>®</sup> vials

DRB 100 Compact digital reactor accommodating up to 16 COD/TNT/UniCell<sup>®</sup> vials

46500-00 2100 Portable Turbidimeter Kit

52600-00 Pocket Turbidimeter™ Analysis System

16900-01 Digital Titrator

Request Lit. No. 4360 for more e-chem products.

## Accessories

48490-00 Data Transfer Adapter, IR to RS-232, with cable

27639-00 DR/Check™ Absorbance Standards for DR/800 verification

49425-00 Instrument carrying case (hard sided)

27220-00 Instrument carrying case with shoulder strap (soft sided)

49430-00 CEL Portable Laboratory carrying case. Roomy field case includes space for the colorimeter, optional instrumentation, accessories, reagent sets and apparatus.

49665-00 HachLink™ Software Package

19380-04 Alkaline batteries size AA, pk/4

49427-00 Rechargeable Alkaline Batteries (Rayovac<sup>®</sup> Renew) size AA, pk/4

49428-00 Recharging Unit for Rayovac Renew Batteries



Data Transfer Adapter converts infrared signals from the instrument to standard RS-232 protocol. The adapter fits over the instrument in place of the cap and connects directly to a printer or computer.

# Parameter List and Reagent Sets

DR/800

Parameter	Range*	No. of Tests	Cat. No.	DR/820	DR/850	DR/890
Aluminum, Aluminon	0 - 0.8	100	22420-00	•	•	•
Aluminum, <i>UniCell</i> <sup>™</sup> ***	0.02 - 0.50	23	HCT 150 <sup>††</sup>			•
Ammonium, <i>UniCell</i> <sup>™</sup> ***	1.5 - 45	23	HCT 102			•
Ammonium, <i>UniCell</i> <sup>™</sup> ***	0.05 - 1.5	23	HCT 100			•
Benzotriazole	0 - 16	100	21412-99			•
Boron, LR	0 - 1.60	100	26669-00			•
Bromine	0 - 4.50	100	21056-69	•	•	•
Bromine (AccuVac <sup>®</sup> )	0 - 4.50	25	25030-25	•	•	•
Cadmium, <i>UniCell</i> <sup>™</sup> ***	0.02 - 0.30	23	HCT 154			•
Chlorine, Free, HR	0 - 5.00	100	14070-99	•	•	•
Chlorine, Free (USEPA)	0 - 2.00	100	21055-69	•	•	•
Chlorine, Free (AccuVac <sup>®</sup> ) (USEPA)	0 - 2.00	25	25020-25	•	•	•
Chlorine, Free, TNT	0 - 5.00	25	21055-25	•	•	•
Chlorine, Total, HR	0 - 5.00	100	14064-99	•	•	•
Chlorine, Total (USEPA)	0 - 2.00	100	21056-69	•	•	•
Chlorine, Total (AccuVac <sup>®</sup> ) (USEPA)	0 - 2.00	25	25030-25	•	•	•
Chlorine, Total, TNT	0 - 5.00	25	21056-25	•	•	•
Chlorine Dioxide, MR	0 - 50	—	—			•
Chromium, Hexavalent (USEPA)	0 - 0.60	100	12710-99			•
Chromium, Hexavalent (AccuVac <sup>®</sup> ) (USEPA)	0 - 0.60	25	25050-25			•
Chromium, Total	0 - 0.60	100	22425-00			•
Chromium, <i>UniCell</i> <sup>™</sup> ***	0.03 - 1.00	23	HCT 156 <sup>††</sup>			•
Color, True and Apparent	0 - 500	—	—			•
Copper, Bicinchoninate (USEPA)**	0 - 5.0	100	21058-69			•
Copper, Bicinchoninate (AccuVac <sup>®</sup> ) (USEPA)**	0 - 5.0	25	25040-25			•
Copper, Porphyrin, LR	0 - 210 µg/L	100	26033-00			•
Copper, <i>UniCell</i> <sup>™</sup> ***	0.1 - 6.00	23	HCT 163 <sup>††</sup>			•
Cyanide	0 - 0.240	100	24302-00		•	•
Cyanuric Acid	7 - 55	50	2460-66	•	•	•
DEHA	0 - 500 µg/L	100	24466-00			•
Detergents (Surfactants)	0 - 0.30	100	24468-00		•	•
Fluoride, SPADNS***	0 - 2.0	100	444-49		•	•
Fluoride, SPADNS (AccuVac <sup>®</sup> )***	0 - 2.0	25	25060-25		•	•
Fluoride, <i>UniCell</i> <sup>™</sup> ***	0.1 - 1.5	23	HCT 132			•
Hardness, Calcium as CaCO <sub>3</sub>	0 - 4.0	100	23199-00	•	•	•
Hardness, Magnesium as CaCO <sub>3</sub>	0 - 4.0	100	23199-00	•	•	•
Hydrazine	0 - 500 µg/L	100	1790-32			•
Hydrazine (AccuVac <sup>®</sup> )	0 - 500 µg/L	25	25240-25			•
Iron, Ferrous	0 - 3.0	100	1037-69	•	•	•
Iron, Ferrous (AccuVac <sup>®</sup> )	0 - 3.0	25	25140-25	•	•	•
Iron, Total, FerroMo <sup>™</sup>	0 - 1.8	100	25448-00		•	•
Iron, Total, FerroVer <sup>®</sup> (USEPA)**	0 - 3.0	100	21057-69	•	•	•
Iron, Total, FerroVer <sup>®</sup> (AccuVac <sup>®</sup> ) (USEPA)**	0 - 3.0	25	25070-25	•	•	•
Iron, Total, FerroZine <sup>®</sup>	0 - 1.3	50	2301-66			•
Iron, Total, TPTZ	0 - 1.8	100	26087-99		•	•
Iron, Total, TPTZ (AccuVac <sup>®</sup> )	0 - 1.8	25	25100-25		•	•
Iron, <i>UniCell</i> <sup>™</sup> ***	0.1 - 5.00	23	HCT 159 <sup>††</sup>			•
Lead, <i>UniCell</i> <sup>™</sup> ***	0.1 - 2.00	23	HCT 152 <sup>††</sup>			•
Manganese, HR (USEPA)**	0 - 20	100	24300-00	•	•	•
Manganese, LR	0 - 0.70	50	26517-00			•
Metal Prep Set, <i>UniCell</i> <sup>™</sup>	-	23	HCT 200			•
Molybdenum, Molybdate, HR	0 - 40	100	26041-00			•
Molybdenum, Molybdate, HR (AccuVac <sup>®</sup> )	0 - 40	25	25220-98			•
Molybdenum, Ternary Complex, LR	0 - 3.0	100	24494-00		•	•
Nickel, PAN	0 - 1.0	100	22426-00			•
Nickel, <i>UniCell</i> <sup>™</sup> ***	0.1 - 6.00	23	HCT 167 <sup>††</sup>			•
Nitrate, Cadmium Reduction, HR	0 - 30	100	21061-69	•	•	•
Nitrate, Cadmium Reduction, HR (AccuVac <sup>®</sup> )	0 - 30	25	25110-25	•	•	•
Nitrate, Cadmium Reduction, MR	0 - 5.0	100	21061-69			•

# Series Colorimeter Reagent Sets

Parameter	Range*	No. of Tests	Cat. No.	DR/820	DR/850	DR/890
Nitrate, Cadmium Reduction, MR (AccuVac®)	0 - 5.0	25	25110-25			•
Nitrate, Cadmium Reduction, LR	0 - 0.50	100	24298-45	•	•	•
Nitrate, Chromotropic Acid, HR, TNT	0 - 30	50	26053-45			•
Nitrite, HR	0 - 150	100	21075-69			•
Nitrite, LR (USEPA)	0 - 0.35	100	21071-69	•	•	•
Nitrite, LR (AccuVac®) (USEPA)	0 - 0.35	25	25120-25	•	•	•
Nitrite, TNT	0 - 0.50	50	26083-45	•	•	•
Nitrogen, Ammonia, Salicylate	0 - 0.50	100	26680-00		•	•
Nitrogen, Ammonia, LR, TNT	0 - 2.50	50	26045-45		•	•
Nitrogen, Ammonia, HR, TNT	0 - 50	50	26069-45		•	•
Nitrogen, Monochloramine and Free Ammonia, Salicylate	0 - 0.50	50	26184-00		•	•
Nitrogen, Monochloramine and Free Ammonia, Salicylate (AccuVac®)	0 - 0.50	25	25210-98		•	•
Nitrogen, TKN with Nessler finish**	0 - 150	100	24953-00			•
Nitrogen, Total, Persulfate Digestion, TNT	0 - 25	50	26722-45†			•
Nitrogen, Total, HR, TNT	0 - 150	50	27141-00†			•
Nitrogen, Total Inorganic, TNT	0 - 25	50	26049-45		•	•
Oxygen, Dissolved, HR (AccuVac®)	0 - 15	25	25150-25	•	•	•
Oxygen, Dissolved, LR (AccuVac®)	0 - 1000 µg/L	25	25010-25		•	•
Oxygen Demand, Chemical, LR (USEPA)	0 - 150	25	21258-25†			•
Oxygen Demand, Chemical, HR (USEPA)	0 - 1500	25	21259-25†		•	•
Oxygen Demand, Chemical, HR	0 - 15,000	25	24159-25†		•	•
Oxygen Demand, Chemical, Manganese III	20 - 1000	25	26234-25†	•	•	•
Ozone, LR (AccuVac®)	0 - 0.25	25	25160-25		•	•
Ozone, MR (AccuVac®)	0 - 0.75	25	25170-25		•	•
Ozone, HR (AccuVac®)	0 - 1.5	25	25180-25		•	•
pH	6.5 - 8.5 pH	50	26575-12	•	•	•
Phosphate, UniCell™ †††	1.5 - 15	23	HCT 121†			•
Phosphate, UniCell™ †††	6 - 60	23	HCT 122†			•
Phosphonates	0 - 125	100	24297-00		•	•
Phosphorus, Molybdovanadate	0 - 45	100	20760-32			•
Phosphorus, Molybdovanadate (AccuVac®)	0 - 45	25	25250-25			•
Phosphorus, PhosVer® 3 (USEPA)	0 - 2.5	100	21060-69		•	•
Phosphorus, PhosVer® 3 (AccuVac®) (USEPA)	0 - 2.5	25	25080-25		•	•
Phosphorus, PhosVer® 3, TNT (USEPA)	0 - 5.0	50	27425-45		•	•
Phosphorus, Total, PhosVer® 3, TNT (USEPA)	0 - 3.5	50	27426-45†		•	•
Phosphorus, Acid Hydrolyzable, PhosVer® 3, TNT	0 - 5.0	50	27427-45†		•	•
Phosphorus, Amino Acid	0 - 30	100	22441-00	•	•	•
Silica, UHR	0 - 200	100	22443-00			•
Silica, HR	0 - 75.0	100	24296-00			•
Silica, LR	0 - 1.6	100	24593-00			•
Sulfate (USEPA)	0 - 70	100	21067-69	•	•	•
Sulfate (AccuVac®) (USEPA)	0 - 70	25	25090-25	•	•	•
Sulfate, UniCell™ †††	40 - 150	23	HCT 125			•
Sulfate, UniCell™ †††	150 - 900	23	HCT 126			•
Sulfide (USEPA)	0 - 0.7	100	22445-00		•	•
Suspended Solids	0 - 750	—	—		•	•
Tannin and Lignin	0 - 9.0	100	22446-00		•	•
Total Organic Carbon, HR	100 - 700	50	27604-45†		•	•
Total Organic Carbon, MR	15 - 150	50	28159-45†		•	•
Total Organic Carbon, LR	0 - 20.0	50	27603-45†		•	•
ToxTrak™ Toxicity	% inhibition	100	25972-00		•	•
Triazole	0 - 15	100	21412-99		•	•
Turbidity	1 - 1000 FAU	—	—	•	•	•
Volatile Acids	0 - 2800	90	22447-00	•	•	•
Zinc (USEPA)**	0 - 3.0	100	24293-00		•	•

\*mg/L unless noted otherwise.

\*\*Requires digestion.

\*\*\*Requires distillation.

HR: High Range MR: Mid Range LR: Low Range UHR: Ultra High Range

USEPA: USEPA accepted or approved AV: AccuVac TNT: Test 'N Tube™

†Vial test requires digestion; order COD Reactor or the DRB 100 Reactor separately.

††UniCell™ metals tests require use of the Metal Prep Set HCT 200 and digestion with DRB 100 Reactor or COD Reactor, all ordered separately, for "total" metal reading.

†††User-installed method.