

DR/2400

Portable Spectrophotometer



Be Right™



**With Hach's new
DR/2400 Portable
Spectrophotometer,
you get:**

- The portable solution you need to optimize your water analysis program, anywhere, anytime.
- The superior technology you expect in a spectrophotometer.
- The ease of use you require to support all personnel.
- The attractive price and value you want.

The DR/2400 Portable Spectrophotometer brings you the technically superior operation and innovative user interface of the popular DR/2500 Spectrophotometer, plus a design that makes it completely portable. Now you can have it all in your photometric water analysis program, whether it's municipal, industrial, environmental, or educational; in the lab, at the process site, or in the field.

Automatic wavelength selection and calibration

Eliminate manual dialing and reduce errors

“Favorite” programs menu

Store your frequently-used tests to your own short list for easy access

More than 130 preprogrammed tests

Just call up the test you need, each includes operator prompting selectable in four languages; select “favorite” programs quickly; add up to 50 single-wavelength, user-generated calibrations

High-performance optical system

Achieve testing accuracy, instrument stability and longevity found in higher-priced systems

Graphic user interface with touch-screen display

Navigate easily through setup and testing with the touch of your finger; replaces the traditional keypad, repetitive scrolling, and keystroke combinations

Comprehensive data management

Select time/date stamp, operator and sample ID; collect up to 1000 data points; download via RS-232 communication directly to printer or computer

Battery-powered/compact size

Benefit from sophisticated spectrophotometer capability anywhere; line power converter included with instrument

Programmed accuracy checks

Improve test technique and results with built-in, software-assisted standard additions checks

Update capability

Keep your hardworking system updated with new Hach tests, using the plug-in Update Module programmed with new test calibrations; you add the calibration to your instrument memory without tedious keying sequences.

Accessories as you need them

Pay only for the options you need, including HachLink™ Software for data formatting, the Pour-Thru Cell for convenient and accurate high-volume testing, and a variety of sample cells to match your requirements. Available alone or as a completely equipped portable laboratory: take your DR/2400 Portable Spectrophotometer wherever needed.



Parameters, Methods, Reagent Sets and Ranges

Test	Method	Range	Cat. No.
Alachlor	Immunoassay Method	–	28130-00
Aluminum	Aluminon	0.008-0.800 mg/L	22420-00
Aluminum	Eriochrome Cyanine R	0.002-0.250 mg/L	26037-00
Aluminum, <i>UniCell</i> [™]	Chromazurol S	0.02 - 0.50 mg/L	HCT 150††
Ammonium, <i>UniCell</i> [™]	Indophenol	0.05 - 1.50 mg/L	HCT 100
Ammonium, <i>UniCell</i> [™]	Indophenol	1.50 - 45.0 mg/L	HCT 102
Arsenic (USEPA)*	Silver Diethyldithiocarbamate	0-0.200 mg/L	–
Atrazine	Immunoassay Method	–	27627-00
Barium	Turbidimetric	1-100 mg/L	12064-99
Barium (AccuVac [®])	Turbidimetric	1-100 mg/L	25130-25
Benzotriazole	UV Photolysis	1-16.0 mg/L	21412-99
Boron	Carmine	0.2-14.0 mg/L	–
Boron, LR	Azomethine-H	0.02-1.50 mg/L	26669-00
Bromine	DPD	0.05-4.50 mg/L	21056-69
Bromine (AccuVac [®])	DPD	0.05-4.50 mg/L	25030-25
Cadmium, <i>UniCell</i> [™]	Cadion/CN ⁻	0.02 - 0.30 mg/L	HCT 154††
Chloramine, Mono, LR	Indophenol	0.04-4.50 mg/L	28022-46
Chloramine, Mono, HR	Indophenol	0.1-10.0 mg/L	28051-45
Chloride	Mercuric Thiocyanate	0.1-25.0 mg/L	23198-00
Chlorine, Free (USEPA)	DPD	0.02-2.00 mg/L	21055-69
Chlorine, Free (AccuVac [®]) (USEPA)	DPD	0.02-2.00 mg/L	25020-25
Chlorine, Free (USEPA)	DPD	0.1 - 10.0 mg/L	14070-99
Chlorine, Free TNT	DPD	0.09-5.00 mg/L	21055-45
Chlorine, Free RL	DPD	0.02-2.00 mg/L	25569-00
Chlorine, Total (USEPA)	DPD	0.02-2.00 mg/L	21056-69
Chlorine, Total (AccuVac [®]) (USEPA)	DPD	0.02-2.00 mg/L	25030-25
Chlorine, Total (USEPA)	DPD	0.1 - 10.0 mg/L	14064-99
Chlorine, Total, ULR (USEPA)	DPD	2-500 µg/L	25630-00
Chlorine, Total RL	DPD	0.02-2.00 mg/L	25570-00
Chlorine, Total TNT	DPD	0.09-5.00 mg/L	21056-45
Chlorine Dioxide (USEPA)	DPD	0.04-5.00 mg/L	27709-00
Chlorine Dioxide (AccuVac [®]) (USEPA)	DPD	0.04-5.00 mg/L	27710-00
Chlorine Dioxide, LR	Chlorophenol Red	0.01-1.00 mg/L	22423-00
Chlorine Dioxide, HR	Direct Reading	5-1000 mg/L	–
Chromium, Hexavalent (USEPA)	1,5-Diphenylcarbohydrazide	0.01-0.70 mg/L	12710-99
Chromium, Hexavalent (AccuVac [®]) (USEPA)	1,5-Diphenylcarbohydrazide	0.01-0.70 mg/L	25050-25
Chromium, Total	Alkaline Hypobromite	0.01-0.70 mg/L	22425-00
Chromium, <i>UniCell</i> [™]	Acid Persulfate Digestion, DPC	0.03 - 1.00 mg/L	HCT 156††
Cobalt	PAN	0.01-2.00 mg/L	26516-00
Color, True and Apparent	APHA Pt-Co	5-500 units	–
Copper (USEPA)*	Bicinchoninate	0.04-5.000 mg/L	21058-69
Copper (AccuVac [®]) (USEPA)	Bicinchoninate	0.04-5.000 mg/L	25040-25
Copper	Porphyrin	2-210 µg/L	26033-00
Copper, <i>UniCell</i> [™]	Bathocuproine	0.1 - 6.00 mg/L	HCT 163††
Cyanide	Pyridine-Pyrazalone	0.001-0.240 mg/L	24302-00
Cyanuric Acid	Turbidimetric	5-50 mg/L	2460-66
Fluoride (AccuVac [®]) (USEPA)**	SPADNS	0.02-2.00 mg/L	25060-25
Fluoride (Reagent Solution) (USEPA)**	SPADNS	0.02-2.00 mg/L	444-49
Fluoride, <i>UniCell</i> [™]	SPADNS	0.1 - 1.5 mg/L	HCT 132
Formaldehyde	MBTH	3-500 µg/L	22577-00
Hardness, Total, ULR	Chlorophosphonazo	4-1000 µg/L	26031-00
Hardness, Calcium or Magnesium as CaCO ₃	Calmagite, Colorimetric	0.07-4.00 mg/L	23199-00

Parameters, Methods, Reagent Sets and Ranges

Test	Method	Range	Cat. No.
Hydrazine	p-Dimethylaminobenzaldehyde	4-600 µg/L	1790-32
Hydrazine (AccuVac®)	p-Dimethylaminobenzaldehyde	4-600 µg/L	25240-25
Iodine	DPD	0.07-7.00 mg/L	21056-69
Iodine (AccuVac®)	DPD	0.07-7.00 mg/L	25030-25
Iron, Ferrous	1,10-Phenanthroline	0.02-3.00 mg/L	1037-69
Iron, Ferrous (AccuVac®)	1,10-Phenanthroline	0.02-3.00 mg/L	25140-25
Iron, Total (USEPA)*	FerroVer®	0.02-3.00 mg/L	21057-69
Iron, Total (AccuVac®) (USEPA)*	FerroVer®	0.02-3.00 mg/L	25070-25
Iron, Total	FerroZine®	0.009-1.400 mg/L	2301-66
Iron, Total, RL	FerroZine®	0.009 to 1.400	2301-49
Iron, Total	TPTZ	0.012-1.800 mg/L	26087-99
Iron, Total (AccuVac®)	TPTZ	0.012-1.800 mg/L	25100-25
Iron, Total	FerroMo™	0.01-1.80 mg/L	25448-00
Iron, UniCell™	Phenanthroline	0.01 - 5.00	HCT159††
Lead (LeadTrak®)	Fast Column Extraction	5-150 µg/L	23750-00
Lead, UniCell™	PAR/CN ⁻	0.1 - 2.00	HCT 152††
Manganese, LR	PAN	0.007-0.700 mg/L	26517-00
Manganese, HR (USEPA)*	Periodate Oxidation	0.2-20.0 mg/L	24300-00
Mercury	Cold Vapor	0.1-2.5 µg/L	26583-00
Metals Prep Set, UniCell™	-	-	HCT 200††
Metolachlor	Immunoassay Method	-	28135-00
Molybdenum, Molybdate, LR	Ternary Complex	0.03-3.00 mg/L	24494-00
Molybdenum, Molybdate, HR	Mercaptoacetic Acid	0.1-50.0 mg/L	26041-00
Molybdenum, Molybdate, HR (AccuVac®)	Mercaptoacetic Acid	0.1-50.0 mg/L	25220-25
Nickel (USEPA)*	Heptoxime	0.02-1.80 mg/L	22435-00
Nickel	PAN	0.007-1.000 mg/L	26516-00
Nickel, UniCell™	Dimethylglyoxime	0.1 - 6.00	HCT167††
Nitrate, UniCell™	Dimethylphenol	1.0 - 60.0	HCT 106
Nitrogen, Ammonia (USEPA)**	Nessler	0.02-2.50 mg/L	24582-00
Nitrogen, Ammonia	Salicylate	0.01-0.50 mg/L	26680-00
Nitrogen, Ammonia TNT, LR	Salicylate	0.02-2.50 mg/L	26045-45
Nitrogen, Ammonia TNT, HR	Salicylate	0.4-50.0 mg/L	26069-45
Nitrogen, Nitrate, LR	Cadmium Reduction	0.01-0.50 mg/L	24298-00
Nitrogen, Nitrate, MR	Cadmium Reduction	0.1-10.0 mg/L	21061-69
Nitrogen, Nitrate, MR (AccuVac®)	Cadmium Reduction	0.1-10.0 mg/L	25110-25
Nitrogen, Nitrate, HR	Cadmium Reduction	0.3-30.0 mg/L	21061-69
Nitrogen, Nitrate, HR (AccuVac®)	Cadmium Reduction	0.3-30.0 mg/L	25110-25
Nitrogen, Nitrate, HR TNT	Chromotropic Acid	0.2-30.0 mg/L	26053-45
Nitrogen, Nitrite TNT	Diazotization	0.003-0.500 mg/L	26083-45
Nitrogen, Nitrite, LR (USEPA)	Diazotization	0.002-0.300 mg/L	21071-69
Nitrogen, Nitrite, LR (AccuVac®) (USEPA)	Diazotization	0.002-0.300 mg/L	25120-25
Nitrogen, Nitrite, HR	Ferrous Sulfate	2-250 mg/L	21075-69
Nitrogen, Total Kjeldahl*	Nessler	1-150 mg/L	24953-00
Nitrogen, Total Inorganic TNT	Titanium Trichloride Reduction	0.2-25.0 mg/L	26049-45
Nitrogen, Total, LR TNT	Persulfate Digestion	0.5-25 mg/L	26722-45
Nitrogen, Total, HR TNT	Persulfate Digestion	10-150 mg/L	27141-00
Nitrogen, Total, UniCell™	Alkaline Digest/Dimethylphenol	5.0 - 40.0	HCT 111†
Oxygen Demand, Chemical (USEPA)	Reactor Digestion	3-150 mg/L	21258-25*
Oxygen Demand, Chemical, HR (USEPA)	Reactor Digestion	20-1500 mg/L	21259-25*
Oxygen Demand, Chemical, HR Plus	Reactor Digestion	200-15,000 mg/L	24159-25*
Oxygen Demand, Chemical, Mn III	Manganese III	30-1000 mg/L	26234-25*
Oxygen, Dissolved, HR (AccuVac®)	HRDO	0.3-15.0 mg/L	25150-25

Test	Method	Range	Cat. No.
Oxygen, Dissolved, LR (AccuVac®)	Indigo Carmine	6-800 µg/L	25010-25
Oxygen, Dissolved, SHR (AccuVac®)	SHRDO	1.0-40.0 mg/L	25150-25
Oxygen Scavengers	Iron Reduction	varies/analyte	24466-00
Ozone, LR (AccuVac®)	Indigo Trisulfonate	0.01-0.25 mg/L	25160-25
Ozone, MR (AccuVac®)	Indigo Trisulfonate	0.01-0.75 mg/L	25170-25
Ozone, HR (AccuVac®)	Indigo Trisulfonate	0.01-1.50 mg/L	25180-25
Phenols (USEPA)**	4-Aminoantipyrine	0.002-0.200 mg/L	22439-00
Phosphate, UniCell™	Digestion - Molybdate/Ascorbic Acid	1.5 - 15.0	HCT 121†
Phosphate, UniCell™	Digestion - Molybdate/Ascorbic Acid	6.0 - 60.0	HCT 122†
Phosphonates	Persulfate/UV Oxidation	0.2-2.50 and 1.0-125 mg/L	24297-00
Phosphorus, Reactive	Molybdovanadate	0.09-45.0 mg/L	20760-32
Phosphorus, Reactive (AccuVac®)	Molybdovanadate	0.09-45.0 mg/L	25250-25
Phosphorus, Reactive, HR TNT	Molybdovanadate	1.0-100.0 mg/L	27673-45
Phosphorus, Reactive TNT (USEPA)	PhosVer® 3	0.01-5.00 mg/L	27425-45
Phosphorus, Acid Hydrolyzable TNT	PhosVer® 3	0.06-5.00 mg/L	27427-45
Phosphorus, Reactive, HR	Amino Acid	0.04-30.00 mg/L	22441-00
Phosphorus, Reactive (USEPA)	PhosVer® 3	0.02-2.50 mg/L	21060-69
Phosphorus, Reactive (AccuVac®) (USEPA)	PhosVer® 3	0.02-2.50 mg/L	25080-25
Phosphorus, Reactive, LR RL	Ascorbic Acid	9-3,000 µg/L	26786-00
Phosphorus, Reactive, HR RL	Molybdovanadate	0.3-45.0 mg/L	20760-49
Phosphorus, Total TNT (USEPA)	PhosVer® 3	0.06-3.5 PO ₄ mg/L	27426-45
Phosphorus, Total TNT	Molybdovanadate	0.0-100.0 PO ₄ mg/L	27672-45
Phosphorus, Total	Acid Persulfate Digestion	-	2451-99
			2450-32
			2449-32
Potassium	Tetraphenylborate	0.1-7.0 mg/L	24591-00
Quaternary Ammonium Compounds	Direct Binary Complex	0.2-5.0 mg/L	24592-00
Selenium	Diaminobenzidine	0.01-1.00 mg/L	22442-00
Silica, ULR	Heteropoly Blue	3-1000 µg/L	25535-00
Silica, ULR RL	Heteropoly Blue	3-1000 µg/L	26785-00
Silica, LR	Heteropoly Blue	0.01-1.600 mg/L	24593-00
Silica, HR	Silicomolybdate	1.0-100.0 mg/L	24296-00
Silver	Colorimetric	0.005-0.700 mg/L	22966-00
Sulfate (USEPA)	SulfaVer® 4	2-70 mg/L	21067-69
Sulfate (AccuVac®) (USEPA)	SulfaVer® 4	2-70 mg/L	25090-25
Sulfate, UniCell™	Barium Sulfate Turbidity	40-50 mg/L	HCT 125†
Sulfate, UniCell™	Barium Sulfate Turbidity	150-900 mg/L	HCT 126†
Sulfide (USEPA)	Methylene Blue	5-800 µg/L	22445-00
Surfactants, Anionic	Crystal Violet	0.002-0.275 mg/L	24468-00
Suspended Solids	Photometric	0-750 mg/L	-
Tannin & Lignin	Tyrosine	0.1-9.0 mg/L	22446-00
Total Organic Carbon, LR	Direct Method	0.3-20 mg/L	27603-45
Total Organic Carbon, MR	Direct Method	15-150 mg/L	28159-45
Total Organic Carbon, HR	Direct Method	100-700 mg/L	27604-45
Tolyltriazole	UV/Photolysis	1-16 mg/L	21412-99
Toxicity	ToxTrak™	0-100% Inhibition	25972-00
Volatile Acids	Esterification	27-2800 mg/L	22447-00
Zinc (USEPA)*	Zincon	0.01-3.00 mg/L	24293-00

* Requires digestion

** Requires distillation

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

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

USEPA means the procedure meets all requirements of the applicable U.S. Environmental Protection Agency approved method or has been approved as an alternate test procedure. LR = Low Range; MR = Mid Range; HR = High Range; SHR = Super High Range; ULR = Ultra Low Range; RL = Rapid Liquid; TNT = Test 'N Tube"

Technical Specifications:

Wavelength Range	400-880 nm
Bandwidth	4 nm \pm 1 nm
Wavelength Accuracy	\pm 1 nm, 400 - 880 nm
Wavelength Resolution	1.0 nm
Wavelength Selection	Automatic
Optical System	Concentric Spectrophotometer
Wavelength Calibration	Automatic at power up
Photometric Range	-3.2 to 3.2 Abs
Photometric Resolution	0.001 Abs
Photometric Linearity	5mA from 0.0 to 0.5 Abs; \pm 1% from 0.5 to 2.0 Abs
Stray Light	> 2.5 A, <0.3 %T @ 430 nm
Readout Modes	Transmittance, Absorbance, Concentration
RS232 Output	Standard 9-pin bi-directional
Line Power	Converter included
Battery Power	3 'D' cell batteries included; optional rechargeable battery pack
Cell Compatibility	25 mm round (AccuVac® Vials); COD/Test 'N Tube' / Unicell vials; 1-cm square; 1-cm x 1-inch dual pathlength
Interface	Graphic user interface 320x240 pixel graphic display; test prompting selectable in English, French, German, and Spanish
Data Storage	1000 data points (date, time, results, sample ID, user ID)
Dimensions	32 x 17.8 x 18.7 cm nominal
Enclosure	IP 32 rated (splash proof)
Weight with battery	2.26 kg nominal
Operating Environment	0 to 40°C; 90% relative humidity, non-condensing
Storage Environment	-25 to 60°C; 90% relative humidity, non-condensing
Report generation	Download stored information in a standard report format. Meets GLP guidelines, including a minimum of: date, time, sample identification tag, analyst initials (3), and concentration.
Real time clock	Yes
Real time calendar	Yes



See www.hach.com for complete information and availability.

How to Order:

- 59400-00 DR/2400 Portable Spectrophotometer - includes six, 1-inch sample cells; a 16-mm vial adapter; instrument and procedures manuals, printed and CD-ROM; line power converter
- 59400-02 DR/2400 Portable Spectrophotometer - same as above, with Euro Power Cord
- 28318-00 DR/2400 Portable Spectrophotometer with hard-side carrying case, order reagents and apparatus separately as needed
- 28325-00 DR/2400 Industrial Water Quality Reagent and Apparatus Laboratory - spectrophotometer, carrying case, reagents and apparatus for 25 industrial water parameters
- 28326-00 DR/2400 Basic Water Quality Reagent and Apparatus Laboratory - spectrophotometer, carrying case, reagents and apparatus for 18 of the most basic water testing parameters
- 28327-00 DR/2400 Complete Water Quality Reagent and Apparatus Laboratory - spectrophotometer, carrying case, reagents and apparatus for 24 water quality parameters

Replacement Parts:

- 59400-22 Manual, Procedures (each)
- 59400-18 Manual, Instrument (each)
- 18010-00 Power Cord, UL-listed
- 46836-00 Power Cord, VDE (Euro) certified (each)
- 59456-00 Lamp Replacement Module (each)
- 59107-00 Power Supply (line power converter), 100-240V, 9Vdc, 18w
- 59457-00 Sample Cell Adapter, 16-mm (each)

Optional Accessories:

- 20950-00 Sample Cells, 1-in. (2.54 cm) round, glass, matched pair (2/pkg)
- 49665-00 HachLink™ 2000 Software (each)
- 48129-00 Cable, computer interface (each)
- 59404-00 Pour-Thru Cell Kit (each)
- 59495-00 Rechargeable Battery Pack (each)
- 27639-00 DR/Check™ Absorbance Standards Kit
- 24102-00 Sample Cells, 1-inch (2.54 cm) round, polystyrene, with caps (2/pkg)
- 20951-00 Sample Cells, 1-cm microcell, glass, matched pair (2/pkg)
- 26295-00 Sample Cells, 1-cm microcell, plastic, disposable (100/pkg)
- 59459-00 Sample Cell Adapter, 1-cm square (each)
- 59405-00 Sample Cells, 1-cm x 1-inch dual-pathlength (6/pkg)
- 59466-00 Sample Cell Adapter, 1-inch dual-pathlength (each)
- 54650-10 sensION™156 Portable pH/Conductivity Meter with Platinum Series pH and 4-wire conductivity probes

Lock-out Specifications:

The Hach DR/2400 Portable Spectrophotometer has a wavelength range of 400 to 880 nm, with a bandwidth of 4 nm. The optics system utilizes a concentric polychromator to measure multiple wavelengths simultaneously and provides automatic wavelength selection for each test. The instrument features a touch screen display giving the user easy access to more than 130 stored water analysis programs with test prompting user-selectable in English, Spanish, Portuguese, French, or German. The instrument offers data storage for sample ID and test operator. The spectrophotometer operates on battery and line power. The instrument meets IP 32 ratings to be both splash-proof and rainproof. The instrument has UL, CSA, and CE approval markings and certifications for electronic safety and emissions. Instrument weight is 2.6 kg (5 lbs); the dimensions are 32 x 17.8 x 18.7 cm (12.6 x 7.0 x 7.4 inches).

To order, or for a quotation, call 800-227-4224, or visit www.hach.com.

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

www.hach.com

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