

PART 1 PRODUCTS

1.1 Manufacturer

- A. Hach Company, Loveland, CO
 - 1. Model DR 3900 Laboratory Spectrophotometer

1.2 Manufactured Unit

- A. The power requirements for the DR 3900 spectrophotometer 100/240 Vac, 50/60 Hz.
- B. The wavelength capability is 320-1100 nm.
- C. The characteristics of the optical system are:
 - 1. Accuracy 5 mAbs at 0.0-0.5 Abs, <1% at 0.5-2.0 Abs at 546 nm
 - 2. Linearity: 0.01 nm at <2 Abs (with neutral glass at 546 nm)
 - 3. Bandwidth: 5 nm
 - 4. Wavelength accuracy: +/- 1.5 nm
 - 5. Wavelength Reproducibility: +/- 0.1 nm
- D. Readout modes of the DR 3900 are:
 - 1. Transmittance (%)
 - 2. Absorbance
 - 3. Concentration
 - 4. Scanning wavelength
- E. The DR 3900 is equipped with a USB interface, type A (2), USB type B
 - 1. RFID module optional
- F. The sample compartment and cell compatibility of the DR 6000 is as follows.
 - 1. 13 mm round
 - 2. 16 mm round
 - 3. 1-cm & 5 cm rectangular
 - 4. 1" round
 - 5. 1" rectangular
- G. The DR 3900, depending on the test selection, automatically selects the appropriate wavelength.
- H. The DR 3900 can store up to 2000 data points (date, time, results, sample ID, user ID) and 200 user-programs.
- I. The DR 3900 is capable of measuring the following parameters.
 - 1. Alachlor: 0.1 to 0.5 ppb
 - 2. Alkalinity: 250 to 400 mg/l
 - 3. Aluminum: 0.002 to 0.800 mg/L
 - 4. Ammonia, nitrogen: 0.015 to 50.0 mg/L
 - 5. Arsenic: 0.020 to 0.200 mg/L
 - 6. Atrazine: 0.5 to 3.0 ppb
 - 7. Barium: 2 to 100 mg/L
 - 8. Benzotriazole: 0.2 to 16.0 mg/L
 - 9. Boron: 0.02 to 14.0 mg/L
 - 10. Bromine: 0.05 to 4.50 mg/L
 - 11. Cadmium: 1.3 µg/L to 0.30 mg/L
 - 12. Carbohydrazide: 5 to 600 µg/L
 - 13. Chloramine, mono-: 0.04 to 10.0 mg/L
 - 14. Chloride: 0.1 to 25.0 mg/L
 - 15. Chlorine dioxide: 0.01 to 1000 mg/l

16. Chlorine, free: 0.02 to 10.0 mg/L
17. Chlorine, total: 2 µg/L to 10.0 mg/L
18. Chromium, hexavalent: 0.010 to 1.00 mg/L
19. Chromium, total: 0.01 to 0.70 mg/L
20. Cobalt: 0.01 to 2.00 mg/L
21. Color: 0 to 500 units
22. COD (Chemical Oxygen Demand): 0.7 to 15,000 mg/L
23. Copper: 1 µg/L to 8.00 mg/L
24. Cyanide: 0.002 to 0.240 mg/L
25. Cyanuric Acid: 5 to 50 mg/l
26. DEHA (Diethylhydroxylamine): 3 to 450 µg/L
27. Dissolved oxygen: 6 µg/L to 40 mg/L
28. Erythorbic acid (isoascorbic acid): 13 to 1500 µg/L
29. Fluoride: 0.02 to 2.00 mg/L
30. Formaldehyde: 2 to 500 µg/L
31. Hardness, total (calcium and magnesium as CaCO₃): 4 µg/L to 4.00 mg/L
32. Hydrazin: 4 to 600 µg/L
33. Hydroquinone: 9 to 1000 µg/L
34. Iodine: 0.07 to 7.00 mg/L
35. Iron, ferrous: 0.02 to 3.00 mg/L
36. Iron, total: 0.009 to 6.00 mg/L
37. Lead: 3µg/L to 2 mg/l
38. Manganese: 0.006 to 20.0 mg/L
39. Mercury: 0.1 to 2.5 µg/L
40. Methylenechloroform (MCKO): 15 to 1000 µg/L
41. Molybdenum, molybdate: 0.02 to 40.0 mg/L
42. Nickel: 0.006 to 6 mg/L
43. Nitrate, nitrogen: 0.01 to 35.0 mg/L
44. Nitrite, nitrogen: 0.002 to 250 mg/L
45. Nitrogen Simplified Total Kjeldahl: 0 to 16 mg/l
46. Nitrogen, total: 0.5 to 150 mg/L
47. Nitrogen, total inorganic: 0.2 to 25.0 mg/L
48. Nitrogen, total Kjeldahl: 1 to 150 mg/L
49. Ozone: 0.01 to 1.50 mg/L
50. PCB (polychlorinated biphenyls): 1 to 50 ppm
51. Phenols: 0.002 to 0.200 mg/L
52. Phosphonates: 0.02 to 125.0 mg/l
53. Phosphorus, acid hydrolyzable: 0.06 to 100 mg/L
54. Phosphorus, reactive (orthophosphate): 19 µg/L to 100 mg/L
55. Phosphorus, total: 0.06 to 100 mg/L
56. Potassium: 0.1 to 7.0 mg/L
57. Quaternary ammonium compounds: 0.2 to 5.0 mg/L
58. Selenium: 0.01 to 1.00 mg/L
59. Silica: 3 µg/L to 100 mg/L
60. Silver: 0.005 to 0.700 mg/L
61. Sulfate: 2 to 900 mg/L
62. Sulfide: 5 to 800 µg/L
63. Surfactants, anionic: 0.002 to 0.275 mg/L
64. Suspended solids: 5 to 750 mg/L
65. Tannin and lignin: 0.10 to 0.90 mg/L

- 66. TOC (Total Organic Carbon): 0.3 to 700 mg/L
 - 67. Tolyltriazole: 1.0 to 20.0 mg/L
 - 68. Toxicity: 0 to 100% Inhibition
 - 69. TTHM (trihalomethanes, total): 10 to 600 µg/L
 - 70. TPH (Total Petroleum Hydrocarbons): 2 to 200 ppm,threshold
 - 71. Volatile Acids: 27 to 2800 mg/L
 - 72. Zinc: 0.01 to 3.00 mg/L
 - J. Manufacturer shall provide high quality pre-mixed reagents and standards.
- 1.3 Instrument includes
- A. Adapter A for 1 inch round and 1 cm square cells
 - B. Manual
 - C. Power supply
 - D. Dust Cover
 - E. 1 inch square matched glass sample cells
- 1.4 Accessories
- A. USB Barcode Scanner (if specified)
 - B. USB Keyboard (if specified)
 - C. Test Filter set (if specified)
 - D. Sipper units for flow thru application (if specified)
 - E. Sample Identification set (if specified)
 - F. Multi-cell holder for 5x1 Inch square cells (if specified)
 - G. Multi-cell holder for 7x1 cm square cells (if specified)
- 1.5 Dimensions
- A. Length: 255 mm (10.0 in)
 - B. Width: 350 mm (19.8 in)
 - C. Height: 151 mm (5.9 in)
 - D. Weight: 4.2 kg (9.26 lb)

PART 2 EXECUTION

- 2.1 Preparation
- A. None required.
- 2.2 Installation
- A. None required.
- 2.3 Manufacturer's Service and Start-Up
- A. Contractor will include the manufacturer's services to perform start-up on instrument to include basic operational training and certification of performance of the instrument.

- B. Contractor will include a manufacturer's Service Agreement that covers all the manufacturer's recommended preventative maintenance, regularly scheduled calibration and any necessary repairs beginning from the time of equipment startup through to end user acceptance / plant turnover and the first 12 months of end-user operation post turnover.
- C. Items A and B are to be performed by manufacturer's factory-trained service personnel. Field service and factory repair by personnel not employed by the manufacturer is not allowed.
- D. Use of manufacturer's service parts and reagents is required. Third-party parts and reagents are not approved for use.

END OF SECTION