

## PART 1 GENERAL

## 1.1 Section includes:

- A. 9525sc Degas System for measurement of degassed conductivity in ultra pure water.

## 1.2 Measurement Procedures

The 9525sc degas system removes CO<sub>2</sub> and measures degassed conductivity from the sample stream. This is a critical parameter in the continuous monitoring of steam in a power plant and is used by operators to monitor process trends during plant startups and/or blowdowns, and before ramping up power to peak load.

The degas system is comprised of a heater, condenser, cooler, temperature controller, conductivity sensor, and sensor controller. The degas system boils the sample and distills the liquid through the crossover system to remove CO<sub>2</sub> gas from the sample stream. The unit removes CO<sub>2</sub> gas via the steam vent and distills the flow through the sample cooler. The resultant conductivity of the degassed sample is then measured.

The 9525 unit conforms to ASTM method D4519

## 1.3 System Description

## A. Performance Requirements for 8315 Sensor

- 1. Cell Constant: 0.01 cm<sup>-1</sup>
- 2. Measurement Range: 0.01-200 µS/cm
- 3. Accuracy: < 2%

## B. Power Requirements

- 1. Degas Unit
  - a. US: 110 to 120 VAC, 1 phase, 50/60 Hz
  - b. EU: 220 to 240 VAC, 1 phase, 50/60 Hz
  - c. Main supply voltage fluctuation: ± 10% of nominal voltage
  - d. Power consumption: 1.6 kVA
- 2. Hach Controller
  - a. 100 to 240 VAC ± 10%, 50/60 Hz

## 1.4 Certifications

## A. (110-120V):

- 1. cCSAus (US: UL61010-1 and UL61010-2-010, Canada: CSA C22.2 No. 61010-1 and CSA C22.2 No. 61010-2-010)

## B. (220-240V):

- 1. CE 2014/35/EU Low Voltage Directive (LVD), EN 61010-1:2010 and EN 61010-2-010:2014 Safety Standard
- 2. CE 2014/30/EU EMC Directive, EN 61326-1:2013 EMC Standard (Table 2 Industrial Requirements)
- 3. CE 2011/65/EU RoHS Directive, EN5081:2012 RoHS Standard

## 1.5 Environmental Requirements

## A. Operational Criteria

- 1. Storage Temperature: 0 to 49 °C (32 to 120 °F)
- 2. Recommended Operating Temperature: 23 to 27°C (75 to 80 °F)
- 3. Ambient Temperature Range: 2 to 50 °C (36 to 122 °F)

4. Relative humidity: 0 to 85 %, non-condensing
5. Altitude: < 2000m (6,562 ft)

1.6 Warranty

- A. Warranted from manufacturer defects for 2 years (EU) or 1 year (all other geographies) from date of shipment.

1.7 Maintenance Service

- A. Maintenance of Degas Unit
  1. On a routine basis check all connectors, valves, and other components for signs of leakage. Repair as required.
- B. Maintenance of Hach controller
  1. Clean controller keypad
  2. Calibrate mA output signals
- C. Maintenance of 8315 Conductivity Sensor
  1. Annually
    - a. Temperature
      - 1) Calibration
    - b. Measurement
      - 1) Calibration
    - c. Instrument Qualification
    - d. External Audit
  2. Unscheduled Maintenance
    - a. Clean sensor with appropriate cleaning solution at appropriate intervals depending on the sample tested.

PART 2 PRODUCTS

2.1 Manufacturer

- A. Hach Lange Sàrl Geneva, Switzerland
  1. 8315 Conductivity Sensor
- B. Hach Company, Loveland, Colorado USA and Hach Lange GmbH, Berlin, Germany
  1. Hach model sc200 Controller. Hach Polymetron 9500 Controller.
- C. Sentry Equipment Corporation, Oconomowoc, Wisconsin USA
  1. Degas Unit and 9525 Degas System

2.2 Manufactured Unit

- A. The Hach 9525sc Degas System consists of Hach sc200 or Hach Polymetron 9500 controller and Hach Polymetron 8315 conductivity sensor(s) and cable(s) integrated with a Sentry degas unit.
- B. The Sentry degas unit is comprised of a heater, condenser, cooler, flow through cell, and temperature controller.
- C. The Hach controller is available with the following power requirements:
  1. AC powered: 100 to 240 Vac  $\pm$ 10%, 50/60 Hz; 15 W with 7 W sensor/network card load, 37 W with 25 W sensor/network card load.
- D. The Hach controller uses a menu-driven operation system.
- E. The Hach controller display is graphic dot matrix LCD with LED backlighting.
- F. The Hach controller is equipped with a real-time clock.
- G. The Hach controller is equipped with two security levels.
- H. The Hach controller is equipped with a data logger with RS-232 capability.
- I. The Hach controller shall have worded operation menus in 19 languages.

- J. The Hach controller is equipped with an SD card reader for data download and controller SW upload.
- K. Four electromechanical SPDT (Form C) contacts, 1200 W, 5 A
- L. Two analog 0/4-20 mA outputs are provided with a maximum impedance of 500 ohms.
- M. The Hach controller can be equipped with the following forms of communication:
  - 1. MODBUS RS-232
  - 2. MODBUS RS-485
  - 3. Profibus DP
  - 4. HART
- N. All user settings of the Hach controller are retained for 10 years in flash memory.
- O. The Hach controller is equipped with a system check for:
  - 1. Power up test (monitoring and shutdown)
  - 2. Total power draw
  - 3. Memory devices
  - 4. Temperature mother board

### 2.3 Equipment

- A. Degas Unit Materials
  - 1. Steel panel
- B. Hach Controller Materials
  - 1. Housing: polycarbonate, aluminum (powder coated), and stainless steel
  - 2. Rating: NEMA 4X enclosure, rated IP66
- C. Hach 8315 Conductivity Sensor Materials
  - 1. The Polymetron 8315 Conductivity Sensors work with Hach model sc200 or Polymetron 9500 controllers only.
  - 2. The probe has a built in Pt 100 temperature compensator.
  - 3. Wetted materials as follows:
    - a. 8315 Sensor
      - 1) Electro polished Stainless Steel
      - 2) Polyether sulfone with 30% glass fiber
      - 3) Viton

### 2.4 Components

- A. Standard equipment
  - 1. Instrument panel
  - 2. Sensor controller
  - 3. Conductivity sensor and cable
  - 4. Flow chamber
  - 5. Temperature controller
  - 6. Sample heater
  - 7. Condenser
  - 8. Sample cooler
  - 9. Flow Indicator
  - 10. Basic User Manual
- B. Dimensions without analyzer side plate (W x H x D): 44.5 x 91 x 38 cm (17.5 x 36 x 15 in)
- C. Dimensions with analyzer side plate (W x H x D): 62 x 91 x 38cm (24.5 x 36 x 15 in)
- D. Weight: 28 kg (61 lb.)

- 2.5 Optional Accessories
  - A. RS-232 / RS-485 MODBUS output card
  - B. PROFIBUS DP output card
  - C. HART
  - D. Additional mA output card
  - E. Specific and cationic conductivity analyzer, and pH calculator
  - F. Conductivity probe
  - G. Cable for conductivity probe
  - H. Degas System Heater, 120V
  - I. Degas System Heater, 240V
  - J. Degas System Extension Panel Kit
  - K. Degas Temperature Controller
  - L. Degas System Sample Cooler
  - M. Degas Fuse, 15.00A 600V
  - N. Degas Fuse, 0.50A 600V
  - O. Degas Fuse, 8.00A 600V

### PART 3 EXECUTION

- 3.1 Preparation
  - A. Mounting
    - 1. Bench or wall mount
  - B. Sample inlet and outlet
    - 1. 1/4-inch NPT fitting, gravity drain
  - C. Cooling water inlet and outlet
    - 1. 1/2 inch FNPT fitting, gravity drain
  - D. Sample Flow
    - 1. Needle valve/rotameter: 100 to 150 ml/min; 6 to 9 L/hr, 1.5 to 2.4 gph
  - E. Cooling Water Flow
    - 1. 0.2 gpm (0.8 Lpm) at 22C (71.6F)
- 3.2 Installation
  - A. Contractor will install the analyzer in strict accordance with the manufacturer's instructions and recommendation.
  - B. Manufacturer's representative will include a half-day of start-up service by a factory-trained technician, if requested.
    - 1. Contractor will schedule a date and time for start-up.
    - 2. Contractor will require the following people to be present during the start-up procedure.
      - a. General contractor
      - b. Electrical contractor
      - c. Hach Company factory trained representative
      - d. Owner's personnel
      - e. Engineer
- 3.3 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