

PART 1 GENERAL

- 1.1 Section includes:
- A. A multi-parameter controller that works with digital sensors.
 - B. Optional in predictive diagnostics capability which increases available operation time for enabled sensors. The predictive diagnostics produces alerts for upcoming maintenance tasks by monitoring the instrument's internal components and tracking service requirements. When paired with an enabled sensor, the controller will display status indicators for each sensor with predictive diagnostics capability.
- 1.2 Measurement Procedures
- A. Microprocessor-based sensor controller.
 - B. Change digital sensors connected to the controller by unplugging and plugging in sensors as necessary.
 - C. The controller accepts up to eight sensor inputs from the following digital sensors in any combination
 1. Hach 1200-S sc Digital pH sensor
 2. Hach 1720E sc Turbidimeter
 3. Hach 3400 sc Contacting Conductivity Sensor
 4. Hach 3700 sc Electrodeless Conductivity Sensor
 5. Hach 5740 sc Membrane Dissolved Oxygen Sensor
 6. Hach 9184 sc Free Chlorine Amperometric Sensor
 7. Hach 9185 sc Ozone Amperometric Sensor
 8. Hach 9187 sc Chlorine Dioxide Amperometric Sensor
 9. Hach Amtax sc Ammonia Analyzer
 10. Hach A-ISE Ammonium Sensor
 11. Hach AN-ISE combination Ammonium and Nitrate Sensor
 12. Hach ClF10 Free Chlorine Amperometric Sensor
 13. Hach ClT10 Total Chlorine Amperometric Sensor
 14. Hach Digital PC sc and RC sc Combination pH and ORP Sensors
 15. Hach Evita Insitu 4100 sc Ammonium and Orthophosphate Sensors
 16. Hach FilterTrak 660 sc Laser Nephelometer
 17. Hach FP360 Oil in Water Sensor
 18. Hach LDO Luminescent Dissolved Oxygen Sensor
 19. Hach LDO Model 2 Luminescent Dissolved Oxygen Sensor
 20. Hach NH₄D sc Ammonium Sensor
 21. Hach N-ISE Nitrate Sensor
 22. Hach NO₃D Nitrate Sensor
 23. Hach Nitratax sc Nitrate Sensor
 24. Hach pHD sc Differential pH and ORP Sensors
 25. Hach Phosphax sc Low and High Range Phosphate Analyzer
 26. Hach Solitax sc Turbidity and Suspended Solids Sensor
 27. Hach Sonatax sc Sludge Level Probe
 28. Hach Surface Scatter 7 sc High Range Turbidimeter
 29. Hach TSS sc Suspended Solids/Turbidity Sensor
 30. Hach Ultraturb sc Turbidimeter (Including *plus* and *seawater* versions)
 31. Hach UVAS sc SAC sensor
 - D. Probe modules of the controller can be networked together to accommodate more than eight sensors on one network.
 1. Only one display module is required/accepted for the entire network of probe modules.

- 1.3 Alternates
 - A. Parameter specific controllers that do not allow changing parameter configurations in the field are unacceptable.
 - B. Multi-parameter controllers that require field change-out of boards and/or EPROM are unacceptable.
 - A. Other controllers that do not have the option for predictive diagnostic capabilities on connected instruments are unacceptable.
- 1.4 System Description
 - A. Performance Requirements:
 - 1. When paired with an enabled sensor, the overall status of the sensor performance is displayed as a percentage value via a measurement indicator
 - 2. When paired with an enabled sensor, the overall time remaining until maintenance tasks are due for the sensor is displayed in days
- 1.5 Certifications
 - A. EMC: CE compliant for conducted and radiated emissions CISPR 11 (Class A limits), EMC Immunity EN 61326-1 (Industrial limits)
 - B. Safety: General Purpose UL/CSA 61010-1 with cTUVus safety mark
 - C. Australian C-TICK and Korean KC Markings
 - D. FCC ID QIPMC56/IC ID 267W-MC56
 - E. IP65 dust and water ingress ratings
- 1.6 Environmental Requirements
 - A. Operational Criteria
 - 1. Operating temperature: -4 to 131 °F (-20 to 55°C)
 - 2. Storage Temperature: -4 to 158 °F (-20 to 70°C)
 - 3. Humidity Requirements: 0 to 95% relative humidity, non-condensing
- 1.7 Warranty
 - A. Warranted for 12 months from the date of shipment from manufacturer's defects
- 1.8 Maintenance Service
 - A. Unscheduled Maintenance
 - 1. Clean controller keypad
 - 2. Calibrate mA output signals

PART 2 PRODUCTS

- 2.1 Manufacturer
 - A. Hach Company, Loveland, CO
 - 1. Hach Model sc1000 Multi-parameter Universal Controller
- 2.2 Manufactured Unit
 - A. The sc1000 controller is microprocessor-based and is housed in an IP65 rated enclosure.
 - B. The sc1000 controller is a modular system consisting of:
 - 1. Display Module (separate CSI specifications are available for this part of the unit)
 - 2. Probe Module
 - C. The sc1000 controller has up to eight connections for Hach digital sensors.

2.3 Equipment

- A. The controller is available with the following power requirements:
 - 1. AC powered: 100 to 240 Vac \pm 10%, 50/60 Hz; maximum 1000 VA, Category II
 - 2. 24 VDC powered: 18 to 30 VDC, maximum 75 W
- B. The controller uses a menu-driven operation system.
- C. The controller display is a ¼ VGA graphical backlit TFT Color Glass/Glass-Touch Screen
 - 1. Screen size is 4.5 x 3.4 in (11.4 x 8.6 cm)
 - 2. Screen resolution is 320 x 240 pixels
- D. The controller is equipped with a real-time clock.
- E. The controller is equipped with two security levels.
- F. The controller is equipped with a data logger that can output to a storage card or directly to a computer hard drive.
- G. The controller can be equipped with an SD card reader for data download and controller software upload.
- H. The controller can have software updated through a direct network connection
- I. Four electromechanical, UL rated, SPDT relays (Form C) can be installed for user-configurable contacts rated 100 to 250 Vac, 5 Amp at 30 VDC resistive maximum.
 - 1. The following can be programmed:
 - a. Alarm
 - b. Feeder Control
 - c. Two Point Control
 - d. Pulse Width Modulation Control
 - e. Frequency Control
 - f. Timer
 - g. System Error
 - 2. The following can be assigned:
 - a. Primary value measurement I
 - b. Secondary value measurement I
 - c. Tertiary value measurement I
 - d. Quaternary value measurement I
 - e. Primary value Measurement II
 - f. Secondary value measurement II
 - g. Tertiary value measurement II
 - h. Quaternary value measurement II
 - i. Real time clock
 - j. Calculated values
- J. The controller can be equipped with up to twelve 0/4-20mA outputs with a maximum impedance of 500 ohms per probe module.
 - 1. The following can be programmed:
 - a. Alarms:
 - 1) Low alarm point
 - 2) Low alarm point deadband
 - 3) High alarm point
 - 4) High alarm point deadband
 - 5) Off delay
 - 6) On delay
 - b. Controls:
 - 1) Linear
 - 1) PID
 - 2) High/Low Phasing

- 3) Set-Point
 - 4) Deadband
 - 5) Overfeed timer
 - 6) Off Delay
 - 7) On Delay
- K. The probe module can be equipped with the following forms of communication:
1. MODBUS RS485
 2. Profibus DP
 3. Ethernet (standard)
 4. Additional communication options are available on the sc1000 Display Module.
- L. All user settings of the controller are retained for 10 years in non-volatile EEPROM memory.
- M. The 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
- N. The controller has the option of graphical measurement that tracks measurement values over time.

2.4 Components

- A. Standard Equipment
1. sc1000 Probe Module
 2. User Manual
- B. Dimensions: 9.5 x 4.7 x 12.3 in (242 x120 x315 mm)
- C. Weight: 14.6 lbs (6.6 kg)

2.5 Accessories

- A. Required
1. sc1000 Display Module
- B. Optional
1. Relay board
 2. Profibus DP board
 3. Modbus RS485 board
 4. 4-20mA Input board
 5. 4-20mA Output board
 6. Mounting hardware
 7. Sun shield
 8. DIN rail expansion modules
 9. Internal network connector and cables
 10. UDG1000™ Universal Data Gateway software

PART 3 EXECUTION

3.1 Preparation

1. Mounting
 - a. Controller can be wall, panel, or pole mounted.

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