PART 1 GENERAL

1.1 Section includes:

A. Oxygen scavenger process analyzer for continuous monitoring of oxygen scavengers in water.

1.2 Measurement Procedures

A. A polarization voltage is applied between a platinum anode (working electrode) and a stainless steel cathode (counter-electrode). The oxygen scavenger is oxidized at the surface of the working electrode and the resulting current is directly proportional to the oxygen scavenger concentration.

1.3 System Description

A. Performance Requirements
   1. Measurement Range
      a. 0-500 ppb dissolved N_2H_4 (hydrazine), 0-100 ppb dissolved carbohydrazide
   2. Detection Limit
      a. Drift is negligible; detection limit is 1ppb
   3. Repeatability
      a. ±2% of measurement or 1 ppb, whichever is greater
   4. Response time at 90%
      a. <60 seconds

1.4 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
C. Australian C-TICK and Korean KC Markings

1.5 Environmental Requirements

A. Operational Criteria
   1. Storage Temperature: -4.0 to 140.0 °F (-20.0 to 60.0 °C)
   2. Operating Temperature: 41-113 °F (5-45 °C)
   3. Relative humidity: 10 to 95%, non-condensing

1.6 Warranty

A. Warranted for two years (Europe) or one year (all other geographies) from date of shipment from manufacturer defects.

1.7 Maintenance Service

A. Scheduled Maintenance
   1. Every month
      a. Inspect platinum anode for deposits. If dirty, clean measuring block.
      b. Inspect reagent level to ensure sufficient amount for next month’s usage
      c. Calibrate
   2. Every six months

a. In-line filter
1) Replace (may need to be replaced sooner depending on sample conditions)
3. Annually
a. Tubing
1) Replace only with Kynar® or Teflon® tubing
B. Unscheduled Maintenance
1. Reagents and standards:
a. Replace
b. Clean reagent compartment and tubing
2. Replace fuse
3. Clean Instrument
4. Clean Measuring Block

PART 2 PRODUCTS

2.1 Manufacturer

A. Hach Lange Sárl Geneva, Switzerland
1. Hach 9586sc Oxygen Scavengers Analyzer

2.2 Manufactured Unit

A. The Hach 9586sc Oxygen Scavenger analyzer consists of a microprocessor controlled analyzer designed to continuously monitor concentration of oxygen scavengers in a sample stream.

2.3 Equipment

A. The controller is available with the following power requirements:
1. AC powered: 100 to 240 Vac ±10%, 50/60 Hz; 15 W with 7 W sensor/network card load, 37 W with 25 W sensor/network card load.
2. 24 VDC powered: 24 VDC, -15%, +20%; 16 W with 7 W sensor/network card load, 34 W with 25 W sensor/network card load (optional Modbus RS232/RS485 and Profibus DPV1 network connection).
B. The controller uses a menu-driven operation system.
C. The controller display is graphic dot matrix LCD with LED backlighting.
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 with RS-232 capability.
G. The controller shall have worded operation menus in 19 languages.
H. The controller is equipped with an SD card reader for data download and controller software upload.
I. Four electromechanical, UL rated, SPDT relays (Form C) are provided for user-configurable contacts rated 100 to 230 Vac, 5 Amp at 30 VDC resistive maximum.
1. The following can be programmed:
a. Alarm
b. Warning
c. Timer/scheduled cleaning
d. Feeder control
e. Event control
f. Pulse width modulation
g. Frequency modulation

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. Two analog 0/4-20 mA outputs are provided with a maximum impedance of 500 ohms.
   1. The controller can be equipped with three additional 4-20 mA outputs with a maximum impedance of 500 ohms.
   2. 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) Bi-linear
         2) Logarithmic
         3) PID
   1. 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. Calculated values

K. The controller can be equipped with the following forms of communication:
   1. MODBUS RS-232
   2. MODBUS RS-485
   3. Profibus DP

L. All user settings of the controller are retained for 10 years in flash 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 menu should allow for the choice of the water chemistry being used: NaOH, NH_3, or ethanolamine.

O. Samples are continuously purged to assure fresh sample to the analyzer and reduce analysis lag time.

P. The controller has the option of graphical measurement that tracks measurement values over time.
Q. The analyzer uses temperature compensated, 3-electrode amperometry to measure the concentrations of oxygen scavengers, hydrazine, and carbohydrazide at a sample pH ≥10.2
R. The analyzer is capable of electrical zero, set automatically or chemical zero with hydrazine-free water. Calibration of the slope compared with a laboratory instrument.
S. Samples are continuously purged to assure fresh sample to the analyzer and reduce analysis lag time.
T. All standards and reagents are isolated from the analyzer electronics in separate drip-proof glass containers.
U. An automatic burette is used to dispense metered volumes of sample, standards, and reagents.

2.4 Components

A. Standard equipment
   1. Instrument Panel
   2. Sc200 Controller
   3. Reference Electrode
   4. Working Electrode
   5. Counter Electrode
   6. Basic User Manual
B. Dimensions: 817 mm x 300 mm x 200 mm (32.1 in x 11.8 in x 7.8 in)
C. Weight: 14.5 kg (32.1 lbs)

2.5 Optional Accessories

A. RS-232 / RS-485 MODBUS output card
B. PROFIBUS DP output card
C. Additional mA input card
D. Additional mA output card
E. Two Year Spare Parts Kit
F. Connection Cables for Electrodes

PART 3 EXECUTION

3.1 Preparation

1. Mounting
   a. Bench or wall mount
2. Sample inlet
   a. 1/4” OD NPT fitting (4x6 mm stainless steel tubing)
3. Drain Fitting
   a. 3/8” NPT barbed hose fitting (6x8 mm)
4. Sample Flow
   a. 166 to 250 mL/min (10 to 15 L/h)

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