**PLEASE NOTE: The following specification contains areas, highlighted in yellow and with the [ ] symbol. In these areas, the engineer has to make a selection, add specific, project related information and has to delete what is not applicable for the specific project.**

GENERAL

* 1. Section includes:
     1. Instrument for semi-continuous, online monitoring of Toxicity in wastewater using respirometry technology.
  2. Measurement Procedures

The analytical method to determine Toxicity in water is respirometry. Monitoring Toxicity allows to protect the microorganisms in activated sludge from toxic substances in the wastewater influent. The measuring results are given in %inhibition of the respiration rate.

* 1. Alternates
     1. Analyzers that do not use fresh sludge from the wastewater treatment plant are not acceptable.
     2. Analyzers without standard automatic procedures for calibration, validation and cleaning are not acceptable.
     3. Analyzers without the ability for single sample ("grab sample") measurement are not acceptable.
     4. Analyzers without option for up to 8 sample streams are not acceptable.
     5. Analyzers without analog and digital output options are not acceptable.
     6. Analyzers without an integrated industrial panel PC are not acceptable.
  2. System Description
     1. Performance Requirements
        1. Measuring Range
           1. 0 – 100 % inhibition
        2. Limit of detection
           1. NA
        3. Precision / Repeatability
           1. Better than 5% full scale range for standard test solutions
     2. Other Specifications
        1. Cycle Time
           1. 10 – 15 minutes
        2. Cleaning
           1. Automatic; frequency freely programmable
        3. Calibration
           1. Automatic; standard at every analysis cycle
        4. Validation
           1. Manual; by means of standard solution
        5. Alarm
           1. 1x malfunctioning, 4x user-configurable, max. 24 VDC/0.5 A, potential free contacts
        6. Protection class
           1. Analyzer cabinet: IP55
           2. Panel PC: IP65
        7. Material
           1. Hinged part: Thermoform ABS, door: plexiglass
           2. Wall section: Galvanized steel, powder coated
  3. Certifications
     1. CE compliant
     2. UL certified
  4. Environmental Requirements
     1. Operational Criteria
        1. Operating temperature: 10 to 30 °C ±4 °C deviation (50 to 86 °F ±7.2 °F deviation)
        2. Reagent temperature: keep between 10 to 30 °C (50 to 86 °F)
        3. Relative humidity: 5 to 95 %, non-condensing
  5. Warranty
     1. Warranted from manufacturer defects for two years (Europe) or one year (all other geographies) from date of shipment.
  6. Maintenance and Service
     1. Unscheduled Maintenance
        1. Check and clean the analyzer components, depending on cleanliness of the sample
     2. Scheduled Maintenance / preventative
        1. Monthly
           1. Reagents refill; validation and / or calibration
        2. Quarterly
           1. Pump tubing replacement
        3. Annually
           1. Calibration
           2. Replacement of all tubing
           3. Replacement of valves and pistons

1. PRODUCTS
   1. Manufacturer
      1. Hach
      2. EZ7900 Series Toxicity Analyzer
   2. Manufactured Unit
      1. The Toxicity analyzer consists of a microprocessor controlled respirometric analyzer designed to monitor Toxicity semi-continuously in a sample stream. Automatic cleaning and calibration are available.
   3. Equipment
      1. Online Analyzer
         1. Utilizes freshly sampled sludge for respirometric measurement.
         2. With automatic calibration, priming and cleaning
         3. If chosen, the instrument can monitor up to 8 sample streams.
         4. Plug-and-play airtight fittings for connecting reagent tubing
         5. High precision micropumps for reagent dosing and dilution
      2. Controller
         1. Industrial panel PC with 5.7” TFT color display, compact flash memory, modular compact I/O system
         2. User interface with different user levels (Automatic, User Level 1, User Level 2, Administrator)
         3. If chosen, includes capability to communicate measurements via 4-20 mA outputs, Modbus TCP/IP, Modbus RS485 or RS232.
      3. Reagents and Standards
         1. The analyzer shall use quick connect reagent containers with pre-installed tubing.
         2. Reagents and standards shall be prepared according instructions on the Method + Reagent sheet.
   4. Components
      1. Analytical instrument  
         To deliver:
         1. Toxicity Analyzer as selected in section 1.1.A.
         2. Wall-mount bracket
         3. Reagent containers
         4. User Manual
         5. Method + Reagent Sheet
      2. Dimensions: refer to analyzer drawings
      3. Weight: 25 kg (55 lb)
   5. Instrument Options,

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Must be added to instrument at time of order.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Number of sample streams (fill in, select up to 8):

[ ] sample streams

Outputs (select / fill in one)

[ ]x 4-20 mA Outputs (fill in, select up to 8)

[ ]x 4-20 mA Outputs and Modbus RS485 (fill in, select up to 4)

[ ]x 4-20 mA Outputs and Modbus TC/IP (fill in, select up to 4)

[ ] Modbus RS485

[ ] Modbus TCP/IP

[ ] RS232

* 1. Instrument Accessories

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Select as many as required

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[ ] Table Stand

[ ] Floor Stand

Most applications require the use of a combined sampling / filtration unit for sludge and wastewater.

Preconditioning system for sludge

[ ] Self-cleaning heavy-duty filtration system for sludge applications,   
pore size [ ] (fill in, select 1,000 µm or 2,000 µm),   
stand-alone unit (24 VDC needed)

[ ] Self-cleaning heavy-duty filtration system for sludge applications,   
pore size [ ] (fill in, select 1,000 µm or 2,000 µm),   
powered through analyzer

Preconditioning system for wastewater

[ ] Self-cleaning heavy-duty filtration system for sample preconditioning of wastewater,   
pore size [ ] (fill in, select 50 µm, 100 µm, 200 µm, 500 µm),   
[ ] sample streams (fill in, select up to 8),   
stand-alone unit (24 VDC needed)

[ ] Self-cleaning heavy-duty filtration system for sample preconditioning of wastewater,   
pore size [ ] (fill in, select 50 µm, 100 µm, 200 µm, 500 µm),   
[ ] sample streams (fill in, select up to 8),   
powered through analyzer

Specifications

* + - 1. Cleaning: Automatic blowback by solenoid controlled instrument air
      2. Required fast loop: 2 m/s
      3. Sample temperature: max. 65 °C
      4. Instrument air: Dry and oil free according to ISA-S7.0.01-1996 quality standard for instrument air
      5. Drain: Overflow sample D=50 mm; overflow Static Pressure Regulator 3/8” OD
      6. Rinse water pressure: 3/8” BSPF, 4 bar max.
      7. Power: 24 VDC, powered by analyser or external supply
      8. Earth connection: Dry and clean earth pole with low impedance (< 1 Ohm) using an earth cable of > 2.5 mm²
      9. Protection class: IP55
      10. Material:
          1. Filter: SS 316L
          2. Piping: PVC
          3. Manual ball valves: PVC
          4. Tubing: Norprene, PFA, PE
          5. Panel: weather resistant Trespa
      11. Dimensions (H x W x D): 1150 mm x 750 mm x 200 mm
      12. Weight: 18 kg

1. EXECUTION
   1. Preparation
      * 1. Mounting
           1. As shown on the drawings
        2. Inlet and outlet connection sizes
           1. As shown on the drawings
        3. Sample Flow Rate
           1. 100 to 300 mL/minute
        4. Sample Pressure
           1. By external overflow vessel
        5. Sample Temperature
           1. 10 to 30 °C ±4 °C deviation (50 to 86 °F ±7.2 °F deviation)
        6. Other sample requirements
           1. Maximum particle size 100 µm, <0.1 g/L suspended solids, turbidity <50 NTU
        7. Instrument air
           1. Dry and oil free according to ISA-S7.0.01-1996 quality standard for instrument air
        8. Demineralized water
           1. For rinsing and/or dilution
        9. Cooling water
           1. Flow rate approx. 5L/h
           2. Temperature max. 30 °C (86 °F)
           3. Pressure max. 0.5 bar
        10. Drain
            1. Atmospheric pressure, vented, min. ø 64 mm
        11. Earth connection
            1. Dry and clean earth pole with low impedance (> 1 Ohm) using an earth cable of > 2.5 mm2
            2. Power supply
   2. Installation
      1. Install analyzer following transmittal drawings and instrument user manual.
   3. Manufacturer’s Service and Start-Up
      1. 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.
      2. 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.
      3. 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.
      4. Use of manufacturer’s service parts is required. Third-party parts are not approved for use.

END OF SECTION

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