HL2
WASTEWATER DISINFECTION CONTROL SYSTEM
SPECIFICATIONS

PART 1 GENERAL

1.01 DESCRIPTION

A. System shall be a single, fully integrated monitor, controller and datalogger to provide consistent compliance with regulations regarding pH, disinfection, chlorination and dechlorination. System shall be a HL2 by Steltec Inc..

B. System function shall have up to two-channels with the following configurations:
   1. ORP Only (for chlorination or dechlorination)
   2. pH Only
   3. All of the Above

C. Oxidative disinfection shall be done by sensing chlorine demand and pacing the feed device to achieve a consistent ORP level regardless of variations in flow, organic load, pH, and temperature.

D. Dechlorination with ORP shall be done by sensing the oxidation value after sulfonation and controlling a feed device to maintain a selected setpoint. The Setpoint may be selected to simultaneously achieve control of < ___mg/L chlorine and < ___ mg/L sulfite residual regardless of variations in flow, organic load, pH, and temperature.

E. pH monitoring shall be done by measuring the process water pH accurate to within 0.05pH regardless of variations in flow, organic load and temperature.

PART 2 PRODUCTS

2.01 SYSTEM DESCRIPTIONS

A. Input to each channel shall be from a sensor assemblies located at the appropriate points in the process stream and connected to the HL2 Controller by a single "twisted pair" shielded cable in a "net worked" arrangement.

B. Inputs & Outputs available for the HL2 shall include:
   (2) 4-20 mA Flowmeter Inputs
   (2) 4-20 mA outputs suitable for direct connection to chemical feeder
   (2) 4-20 mA recorder signal equaling 0-100% of full scale of measured variable
   (6) Dry contact (mechanical switch closure) output relays
   (2) RS-485 Digital Network Input from sensor assemblies
   (1) DF1 or mini Webserver (for setpoint control via a web browser)
   (1) Ethernet port

Full function data logging.

Set up and scaling of all outputs shall be via front panel touch screen with digital visual display/confirmation. No analog potentiometer adjustment shall be required.

HL2 enclosure shall be wall mountable and NEMA 4X.. Each sensor assembly shall operate on 120 VAC, 60 Hz, 15 Amp service.

C. Control
   1. The operator shall select each channels setpoint which in turn shall be maintained by a 4-20 mA output signal to the chemical feeder.
      a. Response lag time shall be derived by determining the fixed lag time from the chemical feeder to the point of injection and adding it to the variable lag time which is a function of contact chamber volume and flow rate.
      b. Variable lag time may be input continuously by a 4-20 mA signal from a flow meter or manually at any time.
   2. The 4-20 mA control output(s) shall modulate stepwise.
      a. The period between step changes in output shall equal the response lag time.
      b. The magnitude of the change shall be determined by a control algorithm which takes into consideration:
         - The average offset between setpoint and actual measured value.
         - Multiple successive trends of the measured value.
         - Rate of change last adjustment caused
   3. All tuning parameters shall be accessible via front panel data entry screen with digital visual display/confirmation of value selected.
   4. In addition, the controller shall respond to rapid changes in flow input value by making stepwise changes to the control output value at intervals as required.
      a. Flow changes that occur at a rate less than a selected value shall be ignored and cause no stepwise change in control output.
   5. In this way, the system shall avoid over and under dosing even at the widest extremes of operation to provide precise and consistent results in accordance with local requirements.
      a. Systems using conventional PID control will not be considered equal to these specifications owing to the failure of PID to adequately control at predicted response lag.
   6. The system shall be capable of switching between primary control and secondary control based on a set of parameters and operator programmed settings. This shall be an automatic function and not require any manual intervention.

D. Datalogging

The system shall store for each channel the ORP, cPPM, pH and 4-20 mA flow meter inputs, 4-20 mA outputs (control) at an interval of time that is user adjustable 1 -99 minutes, user selectable for an estimated storage capacity of up to 3 years. The system shall also store any and all alarms

F. Security
   1. System shall prevent adjustment by anyone not entering current passcode at the HL2.
      a. System shall display current status to, but prevent access by, all passersby.
      b. The status information shall include measured variable for each channel, current level of output to chemical feeder for each channel, and all other current feed and/or alarm conditions.
      c. An expert operator passcode will provide access to all user serviceable settings including the high level maintenance setting.

2. All system settings shall be maintained in semi-permanent memory (EEPROM) and by lithium battery backup in case of power failure.

G. Sensor Assembly
An ORP/pH sensor assembly shall be supplied for each channel in use. Each assembly shall consist of:

Sensor Assembly

1). A sensor assembly shall be supplied for each channel in use. Each assembly shall consist of:
   a. ORP sensing sensor incorporating 99.9995% pure platinum. Sensor shall contain not less than 50 ml of inorganic reference gel capable of being stored at temperatures between 0°F- 120°F. Sensor shall be equipped with porous Teflon® liquid junction.
   b. Electronically isolated, preamplifier.
   c. Waterproof/corrosion-proof (stainless steel, PVC) submersible housing for mounting sensor and preamp.
   d. Sensor interface:
      - converts analog sensor signal to serial digital format for network transmission to HL2
   e. All mounting hardware required to install sensor.

2). Frequency of automatic sensor cleaning event shall be selectable anywhere from once per day to once per week commencing at any selected hour.

3). On commencement of cleaning event the sensor. The value shall be maintained for a period of time selectable by operator before reverting to actual sensor value after recovery from the auto-cleaning event.

PART 3 EXECUTION

3.01 START-UP AND WARRANTY

A. Check-out of final installation, start-up, calibration, and instruction of operating personnel shall be performed by authorized representative of the manufacturer.

B. The representative shall also provide a service contract covering all travel, labor, and parts for one year following start-up.

C. In addition, manufacturer shall warrant the controller and sensing ORP/pH probe to be free of defects in material and workmanship for a period of two years following start-up.

D. At any time during the first 30 days following start-up, the customer, if dissatisfied for any reason, shall have the right to return the equipment to the manufacturer for a full refund of manufacturers selling price.