

Continuous Closed-Loop Dissolved Oxygen System
All-Star Products Maxi-Aeration DO Control System
Sample Specification - Aeration Blowers

FREE FOR USE

SECTION 1 - General

- 1.1 The Contractor shall furnish and install a closed loop control system that monitors the Dissolved oxygen levels in the aeration basin and automatically changes the air flow to the aeration basin to optimize the microbe efficiency. The DO control system shall be furnished by the by the manufacturer of the aeration equipment and shall furnish and warrant the aeration blowers and the DO control system as part of the aeration system to assure system performance.
- 1.2 The equipment manufacturer shall furnish ____ sets of equipment "Submittals" to be sent to the engineer for approval prior to fabrication. The following items shall be included in the submittal package.
 - 1.2.1 Complete shop drawings detailing blower layout and system piping with all appurtenances. Detail drawings of individual components showing dimensions and materials of construction of all components shall be provided.
 - 1.2.2 Engineering calculations as detailed in these specifications shall be provided to demonstrate compliance with these specifications.
 - 1.2.3 Blower system calculations are to include blower performance curves at design conditions as well as at maximum flow and pressure conditions. If V-belts are used, these calculations shall demonstrate compliance with the equipment specifications.
 - 1.2.4 Blowers provided for use with the aeration system shall show calculations by the aeration system manufacturer re in compliance with these performance specifications and as a minimum, shall include: Air flows required; headless calculations through all air piping; headloss through diffuser and orifice; and system operating pressures at normal and maximum airflows. These calculations assure that the system pressures are within the rated operating limits of the blower and motor at the normal and peak conditions, as well as assuring system compatibility.
- 1.3 The aeration system manufacturer shall furnish the Contractor ____ sets of equipment "Installation, Operation and Maintenance manuals upon Engineer's approval of Submittals. The manuals for the aeration and blower system shall detail all components and include initial installation instructions, start-up procedure and normal operation and maintenance procedures. One copy of the manual shall be provided to the Owner or Plant Superintendent, prior to installation of the blower system.
- 1.4 The aeration equipment manufacturer shall provide the services of a factory/field service engineer for ____ period, totaling ____ working days at the job site. The first trip is to deliver the equipment and to provide preliminary installation instructions to the Contractor and Owner. Subsequent trips are to inspect the overall aeration and blower system as well as to oversee the blower service and start-up with the diffusers underwater. Operator shall be instructed on proper start-up, operation and maintenance procedures.
- 1.5 A written report by the aeration system manufacturer covering the manufacturer's factory/field service engineers' findings and installation approval shall be supplied to the Plant Engineer covering all inspections and outlining, in detail, any and all deficiencies noted.

SECTION 2 Equipment

- 2.1 DO System: Contractor is to supply ____ Maxi-Aeration DO Control System, a closed-loop DO control system as manufactured by All-Star Products that shall include the following:
 - 2.1.1 The DO system shall be designed for automatic control of DO for ____ blowers, including ____ one stand-by blower.
 - 2.1.2 A NEMA 4 enclosure sized for 40 Deg C ambient and sized to adequately dissipate the heat created within the system operating at 115% of full load.
 - 2.1.3 All electrical components are to be mounted and completely wired within an electrical enclosure by a UL approved facility. The enclosure shall contain a UL label.

2.1.4 The running power supply shall be 3/60/_____ and the control voltage shall be _____

2.1.5 Components supplied

- Main circuit disconnect with a through-the-door handle
- All-Star VFDs designed for aeration-duty, rated constant torque to 50% base speed and 50% torque below 50% base speed. VFD shall include RFI filters.
- Line reactors shall be supplied between VFD and each blower motor
- ACL starters, thermal overloads for by-pass operation
- Operators digital MMI interface, two line scrollable English read out of blower discharge temperature, DO level and up to eight additional selectable readouts. MMI to function as a set-point controlled and permit field adjustment for DO (ppm) and blower discharge temperature settings.
- Accept DO sensor input and provide a scalable and proportional output error signal to All-Star Aeration Duty VFDs.
- Alarm indicators for loss of DO signal and over-temperature of blower discharge air temperature. System shall shut down blowers upon any alarm notification.
- CPU for controlling following functions
 - a. Time cycling for lead and lag blowers
 - b. Auto transfer of blower to ACL service after running at 60Hz speed for a minimum of 30 minutes.
 - c. Time delay when restarting blower motors to allow motors to decelerate to zero speed.
- Operator Controls & Indicators
 - a. Run light for each blower
 - b. Power on light for control enclosure
 - c. DO alarm indicator light
 - d. High discharge air temperature indicator alarm light
 - e. Alarm red strobe warning light
 - f. By-pass selector switch
 - g. Auto-Manual-Off selector switch for VFD operation
- Thermistor installed into discharge housing of blower with adequate shielded cable to wire back to location of electric control enclosure
- All-Star Products DO fluorescence sensor with 100 ft of cable to connect to location of electric control enclosure.

SECTION 3 System Test

- 3.1 The DO system manufacturer shall demonstrate and warrant written compliance with these specifications. A written report outlining each control function shall be provided prior to delivery. Delivery of equipment shall only occur following written acceptance by the contractor.

SECTION 4 Field Start-Up and Training

- 4.1 ___ 8-hour day/s shall be provided to verify installation of DO system and all of the sensor components, to program the set-points and read outs for the DO sensor (ppm) and the alarm point for the temperature thermistor. An additional ___ 8 hour day shall be provided for onsite operator training.