

CSI 3-PART SPECIFICATIONS
 ROBUSTAIRE DIFFUSED AERATION SYSTEM
 DIVISION 46 – WATER AND WASTEWATER SECONDARY TREATMENT EQUIPMENT
 SECTION 51 – FLEXIBLE MEMBRANE TUBE DIFFUSERS

Project name and location:

Model(s) specified:			
Amps:			
Number of diffusers:			
Total tubing length:			

PART 1 - GENERAL

1.01 SUMMARY

Section includes furnishing and the installation of the following equipment:

Diffused aeration equipment.

1.02 REFERENCES

Reference Standards:

1. ETL – Edison Testing Laboratories (Intertek).
2. UL – Underwriters Laboratory.
3. CSA – Canadian Standards Association.
4. NEC – National Electrical Code.
5. NEMA – National Electrical Manufacturer’s Association.

1.03 SUBMITTALS

- A. Shop Drawings and Product Data: Submit detailed specifications, drawings, unit anchorage details, thrust results, and data covering all materials, parts, devices, equipment, and other accessories forming part of the equipment for the complete operational system. Mark each submittal to show which products and options are applicable to the project.
- B. Include the following information, as applicable:
 - Manufacturer catalog cut sheets.
 - Installation, start-up, operation, and maintenance manuals/instructions from the equipment manufacturer.
 - Notation of coordination requirements.
 - Availability and delivery time information.
- C. Manufacturer’s Instructions: Furnish manufacturer’s printed instruction for delivery, handling, storage, assembly, installation, start-up, wiring diagrams, and factory-recommended maintenance schedule, as appropriate.
- D. Operations and Maintenance Data: Submit data on all parts, devices, equipment, and other accessories furnished forming the complete operational system.

1.04 QUALITY ASSURANCE

- A. The equipment manufacturer must have at least 50 continuous years' experience in the design, application, and manufacture of mechanical agitation, mixing, and aerator assemblies of similar size and capacity. All material and equipment shall be new and of the highest quality.
- B. Manufacturer must have a dedicated engineering team including design, mechanical, quality, and electrical qualifications.
- C. Manufacturer must have documented quality requirements and procedures which include component sampling and testing and build instructions.
- D. Manufacturer must have dedicated service and repair department in house.
- E. Manufacturer must have dedicated customer service team with at least 4 employees.
- F. Diffuser systems, complete with compressor, cabinet, diffuser heads, and self-weighted tubing shall be furnished by the diffuser manufacturer to ensure compatibility and integrity of the individual components and provide the specified warranty for all components.
- G. In order to assure uniform quality, ease of maintenance, and minimal parts storage, it is the intent of these specifications that all diffuser assemblies and accessories called for under this section shall be supplied by a single manufacturer or authorized sales representative. The authorized sales representative shall, in addition to the Contractor, assume the responsibility for proper installation and functioning of the equipment if contracted for the installation and maintenance of the aerators.

1.05 FACTORY TESTING

- A. Each diffused aeration system is tested for:
 - 1. Proper function of compressor
 - 2. Proper orientation and function of cooling fans
 - 3. Proper function of pressure relief valve

1.06 THIRD PARTY TESTING

- A. Diffuser heads shall be independently tested at an accredited testing facility to move no less than 927 GPM with 1.5 CFM of air being delivered to the diffuser head in 6.5' of water.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Delivered materials shall be stockpiled and stored at locations approved by the Owner until required for installation. Materials shall be stored in accordance with manufacturer's instructions.
- B. Contractor shall inspect materials upon delivery for loss or damage in transit. Contractor shall be responsible for the replacement of damaged materials. All damaged materials shall be removed from the Site.
- C. Delivery and start-up shall be supplied by a factory trained and authorized distributor.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

- A. Kasco Marine, Inc. of Prescott, Wisconsin (Contact factory at 715-262-4488).

2.02 GENERAL

- A. Each diffuser system shall be complete with a rocking piston, oil-less compressor, enclosed cabinet, dual diffuser heads, and self-weighted tubing.
- B. Provide each diffuser system complete with all accessories and appurtenances, as required, for a complete operational system.
- C. The power source for the diffuser system shall be _____ single phase grid power to allow the unit to operate continuously, (24 hours per day, 7 days per week, 365 days per year), where necessary.

2.03 FEATURES

Each diffuser system shall consist of the following components regardless of the power source selected:

- A. Compressor(s):
 - 1. Compressors shall be available as 1/4HP or 1/2HP, _____ and built for continuous operation and equipped with thermal overload protection, 25 PSI pressure relief valves, and proprietary sound dampening equipment for quiet operation. They shall be oil-free rocking piston type, include intake air filter assemblies and have a ramped reed valve. Compressors shall be serviceable and capable of operating in water depths up to 50ft.
- B. Enclosure Cabinet:
 - 1. Cabinet will include patent-pending technology designed to provide negative pressure within and have integral exhaust fans with thermal protection, producing a minimum of 290 CFM for RA 1-3, 370 CFM for RA 4-6, and 740 CFM for RA 7-12 to guard against excessive compressor operating temperatures. Includes power cord(s).
 - 2. Shall be powder coated aluminum construction, rectangular in shape and designed to set on ground, concrete pad, or mounting bracket (small cabinet only).
 - 3. Cabinet will have dedicated secondary filtration media for the motors of the compressors.
 - 4. Shall include a Patent Pending mechanical sound reduction device.
 - 5. Shall include a custom designed visual Air Filter maintenance indicator.
 - 6. Shall allow for a sound of 65dB at 5' distance when compressor(s) are running.
- C. Diffuser Head:
 - 1. Dual loop, self-sinking and constructed of stainless steel with integral strain relief for weighted tubing and rope tie-offs. It will include molded plastic edge guards and two oval diffuser sections made from a proprietary linear low-density polyethylene and rubber hose material. It shall provide superior resistance to fouling, calcium scaling, chemicals, fats, oils, grease, hydrocarbons, fuels and solvents. It shall produce millions of 3mm fine bubbles. It shall include a polypropylene check valve with Viton seals and Hastelloy spring. The Diffuser material shall sit 6" above bottom of stainless-steel substrate.
- D. Weighted Air Tubing:
 - 1. Tubing shall be self-weighted and constructed of flexible PVC composite for use with standard 0.5" insert fittings. 5/8" tubing shall have .63" ID X 1.15" OD and a .27" wall thickness, for long term durability and protection against punctures. It shall remain flexible in cold temperatures.
- E. Remote Air Manifold (Optional):
 - 1. Shall be machined anodized aluminum with T Handle Full Port ¼ turn brass valves.

2.04 Project Details

Qty	Model Number	Voltage	Amps	# of Diffusers	Amount of Air Tubing (ft.)*	Tubing Size**

* Use increments of 100 feet.

PART 3 – EXECUTION

3.01 EXAMINATION AND PREPARATION

- A. Contractor shall inspect all equipment immediately upon receipt.
- B. The equipment shall not be installed, if damaged, until repairs have been made in accordance with the manufacturer's written instructions.

3.02 INSTALLATION

- A. Contractor shall furnish the unit(s) and install per manufacturer's recommendations. Coordinate work with the Electrical Contractor for all wiring and controls work to make a complete and operational system. Installation, start-up, and on-site water testing of all equipment shall be per the manufacturer's recommendations. Contractor shall:
 - 1. Ensure proper machine spatial placement in the reservoir.
 - 2. Ensure proper intake depth setting.
 - 3. Diffused aeration system shall be installed complete with all necessary connections.
- B. Coordinate locations of each diffuser with Owner and Engineer prior to installation.
- C. The diffuser system shall be installed in accordance with manufacturer's procedures, including outlined "slow start procedure", unless otherwise approved in writing from the manufacturer.
- D. Contractor shall be responsible for providing and installing a complete and functional system.

3.03 FIELD SERVICE

- A. Contractor (or a representative of the manufacturer) shall check and inspect the diffuser system(s) after installation, place the diffuser unit(s) in operation, and make necessary adjustments.
- B. The diffuser system manufacturer (or their representative) shall instruct designated Owner personnel in the safe and proper operation of the diffuser system. This training shall reference the operations manual provided and demonstrate proper function of the equipment.

3.04 SPARE PARTS

- A. Contractor shall provide spare parts as recommended or supplied with this diffuser assembly by the equipment manufacturer.

3.05 WARRANTY REQUIREMENTS

- A. A written manufacturer's warranty shall be provided for the equipment specified in this Section. The Product shall be warranted to be substantially free from defects in material and workmanship from the date of delivery for: lifetime for diffuser heads, limited lifetime against rust for enclosure cabinet, 15 years for weighted air tubing, 3 years for exhaust fans, 3 years for compressor motors, and 2 years for piston cups and cylinders. This equipment warranty shall be directly from the manufacturer of the equipment to the Owner. Such warranty shall cover all defects or failures of materials or workmanship that occur as the result of normal operation and service.

END OF SECTION