

## SECTION 15185—HYDRONIC PUMPS

## PUMPS PART 1 - GENERAL

## 1.1 WORK INCLUDED

- A. This Section governs the materials and installation of closed hydronic systems associated with building heating and cooling. The following systems, where applicable, shall be installed as specified herein.

## Hot Water Heating System

1. Chilled Water Cooling System
2. Dual Temperature Water System
3. Heat Pump Circulating System
4. Closed Circuit Cooling Tower System
5. Run-Around Heat Recovery System

## 1.2 EQUIPMENT SUBSTITUTION

- A. Most items in this DIVISION are eligible for substitution in accordance with the General Conditions and Supplements thereto. Where a proprietary specification is written for a particular item, then only that item may be used. All items eligible for substitution require submission of request for substitution 10 days prior to bid date. This submittal shall include specific models and capacities of equipment and not just manufacturer's literature. Only those manufacturers listed and those receiving written prior approval communicated via addendum shall be considered for review. Verbal approvals will not be given.

## 1.3 TESTING &amp; APPROVING AGENCIES

- A. Where items of equipment are required to be provided with compliance to U.L., A.G.A., or other testing and approving agencies, the contractor may submit a written certification from any nationally recognized testing agency, adequately equipped and competent to perform such services, that the item of equipment has been tested and conforms to the same method of test as the listed agency would conduct.

## 1.4 SUBMITTAL DATA

- A. See Section 01300 for general submittal requirements.
- B. Provide manufacturer's literature for all products specified in this Section, which will be installed under this project.
- C. Provide performance curves for all pumps. Plot the specified operating point for each pump on its respective curve.
- D. Provide complete literature for all components of packaged systems. These include pump performance, heat exchanger calculations, expansion tank capacity, data for all accessories and valves and complete wiring diagrams specific to the exact unit to be supplied. The wiring diagram shall indicate all required field and factory wiring.

## PART 2 - PRODUCTS

## 1.5 PUMPS

## A. In-Line Wet Rotor Pumps.

Pumps shall be Taco Model Viridian (VR) Series. The pumps shall be single stage, canned-rotor type, in-line design. The capacities and characteristics shall be as called for in the plans / schedules. Pump casing shall be constructed of EN-GJL-250 or ASTM-A 48 Class 35 cast iron. The pump casing / volute shall be rated for 175psi working pressure for all jobs. The pump flanges shall be matched to suit the working pressure of the piping components on the job, with ANSI Class 125 flanges.

1. All casings shall be flanged connections.
2. The impeller and shaft shall be Class 304 stainless steel.
3. The pump and motor form an integral unit without a mechanical seal. The bearings are lubricated by the pumped liquid. No petroleum lubricated bearings will be accepted.
4. The pumps shall be able to operate as single or parallel variable speed pumps, where the speed is regulated by an integrated variable speed drive. The integrated electronics shall allow these pumps to run in parallel, standby or alternating modes.
  - Parallel pump communication via Ethernet cabling
  - 24 hour run time automatic operation
  - Main/standby operation in the event of failure
  - Simultaneous parallel operation as required by system demand
5. The commissioning and set up of the pump shall be accessed via:
  - A web interface (data exchange) and use HTML 1.1 web language.The pump shall provide a port for a RJ-45 cable connection.
  - A user interface located on the face of the speed controller
  - The user interface:
    - Adjusts modes and mode values
    - LED display reads real time mode set values, flow, head, speed and power
    - Lockouts unauthorized adjustment of the pump
6. The electronics shall provide "Auto" as factory default whereas the slope of the proportional curve will automatically match the required system curve, constant pressure control ( $\Delta p$ -c), variable differential pressure control ( $\Delta p$ -v), and constant curve duty (uncontrolled pump), RPM regulation. RPM (speed) regulation can be accomplished by:
  - Manual (via user interface or HTML)
  - Remote via 0-10Vdc
  - Modbus RTU data protocol
7. The pump electronics shall come standard with multiple digital inputs and one external digital output to be available for additional mechanical room control and pump status monitoring.
8. The wiring / electronics enclosure shall be class 2, IP44.
9. Pumps shall meet UL 778, 1004-1, 508C, CAN/CSA C22.2 #108, #100, #107.1, EMC (89/366 EEC): EN 61000, LVD (73/23/EC): EN 60335-1, EN 60335-2-51, and machine safety (98/37/EC): EN ISO 12100.
10. The pumps shall be electronically protected, be rated for continuous duty and have a built-in startup circuit. The pump electronics shall provide overcurrent, line surge and current limit protection, thermal monitoring, heat sink status and over temperature protection.
11. The pump shall be capable of being monitored 24/7 via integrated internet link.
12. The pump must be driven by an electrically commutated electrical motor (ECM) with permanent magnet rotor. The rotor magnets shall be time stable, non-toxic ceramic magnets (Sr-Fe). The electrically commutated electrical motor shall be driven by a frequency converter with an integrated PFC filter.

## PART 3 - EXECUTION

### 1.7 PUMPS

#### A. General

1. Contractor shall install pump in accordance with the manufacturer's instructions. Pipe connections to pumps shall be made in such a manner so as not to exert any stress on pump housings. Pumps may be suspended direct in the pipes provided the piping can support the pump. If necessary to meet this requirement, provide additional pipe supports and flex connectors.
2. The pump shaft shall be installed horizontally. The pump may be installed in horizontal or vertical pipes as long as the pump shaft is parallel to the ground.
3. Arrows on the pump housing indicate the liquid flow direction through the pump. The liquid flow direction can be horizontal or vertical, depending on the pump motor and wiring box (as a group). Motor/wiring box may be turned to various positions and is described in the manufacturer's instructions.
4. For indoor use only.
5. Pumps shall **NOT** be run dry to check rotation.

END OF SECTION 15185