Bell & Gossett
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SPECIFICATIONS
BGECO2018SP-100029 R1

ecocirc+ 20-18

High Efficiency Wet Rotor Pump for Heating, Cooling and Potable Water Systems

DIVISION 23 – Heating, Ventilating, and Air-Conditioning (HVAC)
23 21 00 – Hydronic Piping and Pumps
23 21 23 – Hydronic Pumps

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. Provide pumps and required system trim for heating, chilled water, and dual temperature water systems including all related appurtenances for a complete and operating systems.

1.02 SECTION INCLUDES

A. Wet Rotor, Inline Pump

1.03 RELATED SECTIONS

A. Drawings and general provisions of the contract, including general and supplementary Conditions and Division 1 Specification Sections, apply to these Sections.
- Section *** - Mechanical General Requirements
- Section *** - Supports, Anchors, and Sleeves
- Section *** - Motors and Starters
- Section *** - Drives
- Section *** - Mechanical Identification
- Section *** - Vibration Isolation
- Section *** - Piping Insulation
- Section *** - Equipment Installation
- Section *** - Hydronic Piping and Specialties
- Section *** - Testing, Adjusting, and Balancing
- Section *** - Meters and Gauges
- Section *** - Electrical

1.04 REFERENCES

A. HI - Hydraulic Institute.
B. ANSI - American National Standards Institute.
C. OSHA - Occupational Safety & Health Administration.
D. ASHRAE – American Society of Heating, Refrigeration and Air-Conditioning Engineers.
E. NEMA - National Electrical Manufacturers Association.
F. UL - Underwriters Laboratories.
G. ETL - Electrical Testing Laboratories.
H. CSA - Canadian Standards Association.
I. NEC - National Electric Codes.
J. ISO - International Standards Organization.
K. IEC - International Electrotechnical Commission.
L. ASME – American Society of Mechanical Engineers.

1.05 SUBMITTAL

A. Submit each item in this article according to the Conditions of the Contract and Division 1 Specification Sections.
B. Submit manufacturer's installation instructions under provisions of General Conditions and Division 1.
- Operation and Maintenance Data: Include installation instructions, assembly views, and replacement parts lists.
- Under provisions of commissioning documentation, testing of pumps, as well as training of owner's operation and maintenance personnel may be required in cooperation with the commissioning consultant.

C. Product Data including published performance curves and rated capacities of selected model, shipping weights, furnished specialties, and accessories. Indicate pump's operating point on curves.
D. Complete Package information:
- System summary sheet (where applicable)
- Shop drawing indicating dimensions, required clearances and location and size of each field connection
- The wiring diagram from the IOM
- System profile analysis including pump curves, system curve, and variable speed pump curves (where applicable)
- Pump data sheets - Rated capacities of selected models and indication of pump's operating point on curves.
- Submittals on furnished specialties and accessories
- Submittals must be specific to this project. Generic submittals will not be accepted

E. Hanging and support requirements should follow the recommendations in the manufacturer's installation instructions.

1.06 QUALITY ASSURANCE

A. All equipment or components of this specification section shall meet or exceed the requirements and quality of the items herein specified, or as denoted on the drawings.

B. Ensure that pump operates at specified design conditions without vapor binding and cavitation, is non-overloading in parallel or individual operation, and operates to ANSI/HI 9.6.3.1 standard for Preferred Operating Region (POR) unless otherwise approved by the engineer.
C. Ensure pump pressure ratings are at least equal to system's maximum operating pressure at point where installed but not less than specified.
D. Equipment manufacturer shall be a company specializing in manufacture, assembly, and field performance of provided equipment with a minimum of 20 years experience.
E. Equipment provider shall be responsible for providing certified equipment start-up and, when noted, an in the field certified training session. New pump start-up shall be for the purpose of determining pump alignment, lubrication, voltage, and amperage readings. All proper electrical connections, pump's balance, discharge and suction gauge readings, and adjustment of head, if required. A copy of the start-up report shall be made and sent to both the contractor and to the engineer.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the site in such a manner as to protect the materials from shipping and handling damage. Provide materials on factory provided shipping skids and lifting lugs if required for handling. Materials which could be damaged by the elements should be packaged in such a manner that they could withstand short-term exposure during transportation.
B. Store materials in clean, dry place and protect from weather and construction traffic. Handle carefully to avoid damage.
C. Use all means necessary to protect equipment before, during, and after installation.
D. All scratched, dented, and otherwise damaged units shall be repaired or replaced as directed by the Architect Engineer.

1.08 WARRANTY:

A. Provide a minimum 36 month warranty on materials and installation under provision of Section 01 78 36

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. The specifying engineer reserves the right to specify a primary supplier / lead spec manufacturer on all supplied schedule and specification documents. These primary suppliers have led their respective industry in research and development and their products have had proven track records in the field. These primary suppliers, in the opinion of this engineering firm, produce a superior product to the alternately listed manufacturers. The contractor may choose to supply equivalent equipment as manufactured by the alternately specified manufacturer. This alternately specified equipment shall be supplied on a deduct alternate basis and based on the approval of the supplied alternate manufacturer's submittals. The use of a primary supplier and deduct alternates protects the specifying engineer's design concept, but allows for a check-and-balance system to protect the post-commissioning owner.
B. Contractor shall furnish and install new wet rotor inline pump for hydronic radiant and geothermal heating and cooling systems as indicated on the drawings. Pumps shall be ecocirc+ 20-18 as manufactured by **Bell & Gossett, a Xylem Company**, under base bid. Equivalent units as manufactured by other manufacturers may be submitted as deduct alternates. Pumps shall meet types, sizes, capacities, and characteristics as scheduled on the Equipment Schedule and drawings. Pump substitutions shall be provided with connection sizes equal to those scheduled. Pump connections shall not be downsized. Pump substitutions shall not be provided at efficiencies less than those scheduled.

2.02 COMPONENTS

A. The pumps shall be a wet rotor inline pump, in cast iron or stainless steel construction specifically designed for quiet operation. Suitable standard operations at 230° F and 145 PSIG working pressure.
B. The pump internals shall be capable of being serviced without disturbing piping connections.
C. Pump shall be equipped with a water-tight seal to prevent leakage.
D. Pump volute shall be of a cast iron design for heating systems or stainless steel for domestic water systems. The connection style on the cast iron and stainless steel pumps shall be flanged.
E. Flange to Flange dimension shall be standard Bell & Gossett booster sizes such as 6-3/8". Flange dimensions shall be HVAC industry standard 2 bolt size.
F. Motor shall be a synchronous, permanent-magnet (PM) motor and tested with the pump as one unit. Conventional induction motors will not be acceptable.
G. Each motor shall have an Integrated Variable Frequency Drive tested as one unit by the manufacturer.
H. Integrated motor protection shall be verified by UL to protect the pump against over/under voltage, over temperature of motor and/or electronics, over current, locked rotor and dry run (no load condition).
I. Pumps shall be UL 778 listed and bear the UL Listed Mark for USA and Canada with on-board thermal overload protection.
J. Each pump shall be factory performance tested before shipment.
K. Each pump to include pump body insulation shell and check valve.
L. Digital Display (ecocirc+ 20-18 only) alternates automatically to show power consumption, head and

flow rate.

M. Bluetooth connectivity (ecocirc+ only) provides the ability to connect directly to the pump to control and monitor pump.

2.03 OPERATING MODES

A. Proportional Pressure - The differential pressure continuously increases or decreases based on the flow demand. The set point head can be set on the pump user interface. Use for systems with large pressure losses.
B. Constant Pressure - The pump maintains a constant differential pressure at any flow demand until the maximum speed is reached. The desired head of the pump can be set via user interface. Recommended for use in systems with small or constant pressure losses.
C. Constant speed - The pump maintains a constant speed at any flow rate. The desired speed is set on the interface panel of the pump.
D. Night mode (ecocirc+ 20-18 only) - The pump will automatically reduce speed when there is an abrupt change in fluid temperature. The change in fluid temperature is from a boiler operating in night time setback mode. The external temperature sensor is used. (Fixed Speed, Constant Pressure, Proportional Pressure)
E. Set Point Temperature (Delta P-T) (ecocirc+ 20-18 only) - The pump maintains a constant temperature in a system, such as domestic hot water system or a single temperature heating system. Uses an external temperature sensor.
F. Set Point temperature (T)(ecocirc+ 20-18 only) - The pump maintains a constant temperature in a system, such as domestic hot water system or a single temperature heating system. Uses an external temperature sensor.
G. eAdapt (ecocirc+ 20-18 only) - The pump will optimize the energy consumption by identifying the ideal duty point.
H. Air Purge - Air purge will remove the dissolved gases from the pump.
I. Input signals (ecocirc+ 20-18 only) - One 0-10V (analag): Speed control by external controller. One external temperature sensor input for temperature modes.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Install equipment in accordance with manufacturer's instructions.
B. Reduction from line size to pump connection size shall be made with eccentric reducers attached to the pump with tops flat to allow continuity of flow and to avoid air pockets.
C. Furnish and install a line size shut-off valve on the suction and discharge sides of the pumps.
D. Provide temperature and pressure gauges where and as detailed or directed.
E. Provide an adequate number of isolation valves for service and maintenance of the system and its components.
F. Circulating pump shall have sufficient capacity to circulate the scheduled GPM against the scheduled external head (feet) with the horsepower and speed as scheduled and/or as denoted on the drawings. Motors shall be of electrical characteristics as scheduled, denoted and/or as indicated on the electrical plans and specifications.
G. All piping shall be brought to equipment and pump connections in such a manner so as to prevent the possibility of any load or stress being applied to the connections or piping.
H. Power wiring, as required, shall be the responsibility of the electrical contractor. All wiring shall be performed per manufacturer's instruction and per applicable state, federal, and local codes.
I. Control wiring for remote mounted switches and sensor / transmitters shall be the responsibility of the control's contractor. All wiring shall be performed per manufacturer's instructions and applicable state, federal, and local codes.
J. Power and control wiring shall run in separate channel.
K. Pumps are supplied with an integrated VFD and should not be used with any external VFDs.
L. Pumps shall NOT be run dry to check rotation.

END OF SECTION

NOTES

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