**SECTION 232123 – Hydronic Pumping Package**

PART 1 ‑ GENERAL

1.01 SUMMARY

1. This Section includes process pumping packaged system construction, components, required trim, controls, and accessories necessary for hydronic pumping.

1.02 REFERENCES

1. Comply with applicable Codes/Standards of ANSI, ASME, AGA, NEC, UL, FM, and the State.
2. Section 15185 – Hydronic Pumps and Hydronic Specialties

1.03 QUALITY ASSURANCE

1. Provide factory tests to check construction integrity and control function of the complete system.
2. Installed materials not meeting specification requirements of the Contract Documents will be subject to removal and replacement

1.04 SUBMITTALS

1. Comply with provisions of Section 01 30 00 - Submittals.
2. Manufacturer's descriptive literature, operating instructions, maintenance and repair data.
3. Manufacturer's installation instructions.
4. Detail Drawings showing dimensions and electrical diagrams.
5. Submit package start up, testing, and adjusting certificate.

PART 2 ‑ PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

1. Contractor to furnish and install a pre-assembled, pre-piped, hydronic pumping equipment package as manufactured by FlowTherm Systems or approved equal. Alternate package system manufacturers must be able to demonstrate a successful history of manufacturing similar systems for a minimum of 10 years.

2.02 MOTORS AND CONTROLS

 A. Motors: Provided with equipment. Refer to Section 26XXXX ‑ ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT.

 B. Motors Starters: Provided with equipment. Refer to Section 26XXXX - ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT.

2.03 EQUIPMENT REQUIREMENTS

 A. General:

1. The packaged system shall include, as a minimum, the following components:
	1. Two (2) system pumps
	2. Expansion tank.
	3. Air separator.
	4. System control panel with local control
	5. Thermometers, gauges, isolation valves and inter-connecting piping.
2. All components shall be mounted on a structural steel baseplate covered with ¼” steel decking. The entire assembled unit shall be primed with red oxide and finished with a heavy coat of exterior-grade industrial enamel. It is acceptable to provide the packaged system as multiple skids which are field installed directly adjacent to one another with factory-supplied interconnecting piping and electrical.
3. The package(s) shall be designed to supply, monitor, and control the hydronic circulation loop within the specified flow and pressure conditions of the system.
4. The Package(s) shall be UL Listed according to Standard #508A for control panels and UL Standard #778 for Pumping Systems.
5. Performance: Refer to Schedule on Drawings.

PUMPING SKID CONSTRUCTION

1. SYSTEM PUMP(S)

The secondary heating loop pumps shall have performance conditions as per equipment schedule and shall be:

* 1. Bell & Gossett Series 1510 base-mounted or 1531 close-coupled end suction pumps with cast iron body and stainless steel impeller with standard mechanical seal, TEFC Premium Efficient motor rated for VFD operation.
1. AIR SEPARATOR
	1. Centrifugal air separator shall be furnished and installed as part of the packaged system. The inlet and outlet connections of the separator shall be tangential to the vessel shell. The vessel shell diameter shall be three times the nominal inlet / outlet pipe diameter.
	2. The separator shall have an internal steel air collector tube with 5/32” diameter perforations and 63% open area designed to direct accumulated air to a high capacity air vent via an NPT vent connection at the top of the unit.
	3. The air separator must be designed, constructed and stamped for 125 PSIG at 350oF in accordance with Section VIII, Division I of the ASME Board and Pressure Vessel Code Inspectors.
2. SYSTEM CONTROL PANEL WITH LOCAL CONTROL

A System control panel will provide a single point power connection for all packaged equipment, PLC system control, variable frequency drives, and BACnet communication. The panel shall include:

* Single point power connection with non-fused main power disconnect
* NEMA 1 enclosure
* PLC controller with 6” color touch screen HMI
* VFDs for system pumps
* Wire-to-Water Power Optimization of system pumps
* Through-the-door power disconnects for system pumps
* Hand-Off-Auto selector switch with green “Run” light and red “Fail” light for each system pump
* BACnet field server to provide BMS interface to all equipment
* System differential pressure transmitter (shipped loose for field installation by others)
1. EXPANSION TANK

The boiler heating package shall include an ASME Section VIII rated expansion tank. Bell & Gossett B-LA Series bladder style construction with a one-piece replaceable heavy duty butyl bladder. The tank shall have an NPT system connection with a charging valve connection to facilitate on-site charging of the tank to meet system requirements.

1. CHEMICAL POT FEEDER

A chemical pot feeder with isolation and bypass valves shall be provided. The pot feeder shall have a maximum operating temperature of 200 o F at 200 PSI. The pot feeder shall have ¾” NPT connections and shall have a capacity of 2 gallons.

1. ISOLATION VALVES

Isolation valves shall be provided to service of all major components of the pumping package. These valves will facilitate the removal of a component for servicing without the need of draining the water from the system piping.

1. The following items shall be single point connections
	1. Power
	2. Cold Water Make-up
	3. System Water Supply
	4. System Water Return
2. Hydrostatic Test: Shop-assembled pressure parts of the package shall be hydrostatically tested at the factory at a pressure of 1‑1/2 times the design pressure
3. Functionality Test: Perform a factory functional test of all system electrical components and skid wiring prior to shipment.

PART 3 ‑ EXECUTION

3.01 FIELD ASSEMBLY REQUIREMENTS

1. Place and mount skid on a level concrete equipment pad
2. Make utility and system connections as described in item 2.04.J of this section.

3.02 INSTALLATION

1. Provide services of manufacturer's representative to supervise rigging, hoisting, and installation of the boiler.
2. Coordinate electrical and control work.
3. Install ship loose items, such as sensors, sight glasses, safety valves, and gauges.
4. Pipe safety valves to floor drain.

3.03 START UP

1. Provide services of manufacturer's representative to inspect package after installation is complete and submit report prior to start up, verifying installation is in accordance with specifications and manufacturer's recommendations.
	1. The package manufacturer shall provide the services of a trained technician to assist in starting up, adjustment and operation of equipment furnished by the manufacturer. In addition, the technician shall perform requisite field tests and instruct the Owner's operating personnel in the proper operation and maintenance of the unit.

END OF SECTION