Guide Specification

Model FT-N _____

BTU/Hr Input _____ Fired _____

Fulton Thermal Fluid Electric Heat Transfer Systems

Section I. General Description

Contractor shall furnish and install a _____ KW BTU/Hr. electric thermal fluid heat transfer system per plans. The system shall be "Fulton" as manufactured by Fulton Thermal Corporation, Pulaski, New York.

The system shall be a complete package including a vertical jacket type heater; combination expansion deaerator thermal buffer tank to allow for expansion of thermal fluid during heat up to operating temperature and to prevent oxidation of the thermal fluid during operation, even when tank is vented to atmosphere; for operating temperatures up to 650°F complete with instrumentation and controls.

Section II. Heater Size and Operating Temperature

The heater shall produce a minimum of _____ BTU/Hr. output as measured at the thermal fluid outlet. The heater shall _____ KW and be supplied complete with control panel and all required safety devices for a maximum operating temperature of _____°F (standard 650°F max). It shall have a flow rate of _____GPM and an element voltage of _____ with a control voltage of _____.

Section III. Heater Design

The heater shall be of a vertical, annular shell type and the pressure vessel construction shall be carbon steel ASME SA-53B/106B, SA-285C and SA-516 GR 70 with a design pressure of 150 PSI (trimmed at 100 PSI) standard at 700°F. Test pressure will be per ASME Code Section VIII Division I and the heater shall bear the ASME stamp*.The heater shall be insulated with 4" of high temperature glass fiber insulation and surrounded in a neatly finished stainless steel jacket. It shall be completely factory piped, wired and tested. Thermal efficiency shall be 96% minimum.

The following instrumentation/controls/safety devices shall be supplied as a minimum requirement**:

A. High temperature Indicator/Controller - Yokogawa
B. High temperature safely switch for shutdown - Yokagawa
C. Heater operation interlock with circulation pump.
D. High system pressure switch for complete shutdown (outlet) – Danfoss
E. Low system pressure switch for complete shutdown (inlet) – Danfoss
F. Low differential pressure switch to shut down the pump and heater due to a low flow condition - United Electric
G. Expansion tank low level switch for shutdown - Square D
H. Heater inlet pressure gauge - by Fulton
I. Pump supply (Vacuum) gauge - by Fulton
J. Heater outlet pressure gauge - by Fulton
K. ASME Certified safety relief valve - Kunkle Model 910
L. Fused magnetic contactors for electric elements
M. Magnetic starter for thermal fluid circulation pump
N. Step controller for sequential control of elements - Solitec **Note:** an SCR is an available option
O. Three Position Selector Switch: Off/Pump On/Heater On
P. Four Indicating Lights:
    1. Power
    2. Pressure & Flow
    3. Heat Demand
    4. Alarm
Q. Low flow interlock
R. Non-fused disconnect
S. Single source power connection

*** Units may be built and stamped to ASME Code Section I upon request.**

**** Controls/Instrumentation brands may be different for NEMA 4 or hazardous duty applications.**

Section IV. Combination Expansion/Deaerator Thermal Buffer Tank Size

The combination expansion/deaerator thermal buffer tank shall have _____gallon capacity and be supplied complete with liquid level switch. It shall be suitable for a maximum total system fluid content of _____gallons, including heater and expansion/ deaerator tank capacities (based on a _____% expansion rate of the hot oil - to be verified by the client).

Section V. Combination Expansion/Deaerator Thermal Buffer Tank Design

The combination expansion/deaerator thermal buffer tank will be constructed of carbon steel. It shall be supplied with expansion tank liquid level switch and 300# ANSI flanged connections. The tank may be built to ASME Code Section VIII Division I upon request.

Section VI. Thermal Fluid Circulating Pump Size

The thermal fluid circulating pump shall be air cooled with mechanical seal design for 650°F maximum operating temperature, _____GPM at _____PSI, _____HP motor, RPM motor, complete with motor starter, _____voltage.

Section VII. Thermal Fluid Circulating Pump Design

The thermal fluid circulating pump shall be of centrifugal design, with a mechanical seal air cooled for temperatures up to 650°F or water cooled for operating temperatures above 650°F and shall be supplied complete with motor starter for proper motor HP, voltage and cycles.

Section VIII. Tests

A. Shall include a hydrostatic test of the pressure vessel in the presence of an inspector having a National Board Commission. Inspector shall certify a Data Report which shall be delivered with the heater as evidence of ASME Code compliance. In addition to ASME symbol, the heater shall bear a National Board Registration Number.
B. Full electrical checks will be performed including testing of all controls and circuitry.

Section X. Operating Manual

A. Instructions for installation, operation, and maintenance of the heat transfer system shall be contained in a manual provided with each unit.
B. A complete wiring diagram, corresponding to the equipment supplied, shall be part of the manual and one shall also be affixed to the inside of the heater's panel box.

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