

Negative Pressure Heat Transfer System Model HTS-NP

The Model **HTS-NP**, Negative Pressure Heat Transfer System features the latest in steam-heating applications which allows the heat transfer system to operate under vacuum conditions on the steam side. The **HTS-NP** allows *energy savings up to 15%* versus conventional building hydronic heating systems. Other advantages include that no vent is required in the condensate system, eliminating the unsightly exhausts flumes seen in conventional systems. Additionally, the **HTS-NP** incorporates condensate pumping, eliminating the need for additional condensate handling units. Hot water is supplied at a standard 180°F and is recirculated through the building system by use of centrifugal pumps which are sized to meet specific building requirements. The Model **HTS-NP** provides hot water at a controlled flow rate, while automatically refilling to meet system demands. A UL-listed control panel with single-point power connection is prewired to all electrical sources. Each system is custom engineered and designed to meet specific requirements. All systems are UL-listed, fabricated and welded per ASME Section IX Code and Standards, and are Hydrostatically tested prior to shipment. The most remarkable feature of the **HTS-NP** is the ability to provide a *cost reduction* to building owners. Additionally, this fully integrated ready-to-install system speeds installation and start-up of building hydronic heating systems which provide significant savings to contractors, engineers, and building owners.

STANDARD CONSTRUCTION

- Structural Channel Base
- Carbon Steel Piping
- Operational Testing
- Pump Isolation Valves
- Hydrostatically Tested
- High Temperature Industrial Enamel Paint

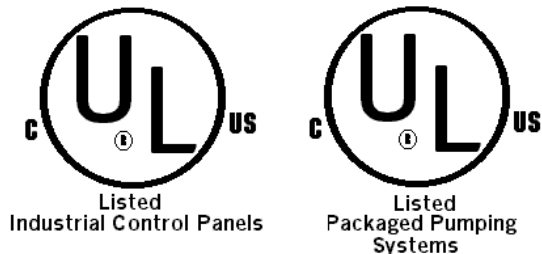
CONDITIONS OF OPERATION

Max. Allowable Pressure:	125 psig / 8.6 bar
Max. Allowable Temperature:	375 °F / 190.5 °C



Legend:

- A. Base-mounted, End-suction Centrifugal Pumps
- B. Shell and Tube, U-tube Heat Exchanger with Steam Trap
- C. Triple Duty Valve
- D. Air Separator with Auto Air Vent
- E. Expansion / Compression Tank
- F. System Inlet / Outlet Thermometers
- G. Pump Differential Pressure Gauge
- H. UL-listed Electrical Control Panel
- I. Make-up Water Assembly
- J. Condensate Recovery System



SYSTEM OPTIONS

- Stand-by Pumps
- Suction Diffuser
- Panel-mounted Gauges
- Flexible Connectors
- Vibration Isolation

Model HTS-NP
Heat Transfer System Order Form

Form 00-HTS-NP

Specify the following parameters:

- I. System Heat Load = _____ BTU/hr
- II. System Differential Pressure Required = _____ psid
- III. Steam Pressure (@ Heat Exch.) = _____ psig

- IV. Return Temperature = 160 °F
- V. Supply Temperature = 180 °F
- VI. System Electrical = _____ V _____ Hz
- VII. System Volume = _____ Gal.

Note: Tube-side medium assumed to be water, unless otherwise specified.

SYSTEM OPTIONS

Pneumatic-operated Steam Control Valve
Electronic Positioner
Pneumatic Positioner

Stand-by Pump

Steam Pressure Gauges

Steam Separator

Vacuum Breaker

Thermostatic Air Vent

Pump Suction Diffuser

Vertical In-line Pump

Split-coupled Vertical In-line Pump

Closed-coupled end-suction Centrifugal Pump

Auto standby pump start on lead pump failure

Auto Pump Alternation

Remote start connection

System drain valves

Flexible Connectors

Vibration Isolation

Digital Temperature Controller with PID Loop and Thermocouple

Remote Temperature Control

1/3:2/3 Control Valve arrangement for Variable Loads

Control Valve Bypass and Isolation

Condensate Isolation and Check Valves

Condensate Y- Strainer

Single-pass Shell and Tube Heat Exchanger

Panel-mounted Differential Pressure Gauges

Pump Run-time Hour Meter

Outdoor-use Rating

Outdoor Cabinet

System Inlet/Outlet Isolation Valves

System Flow Switch

Differential Pressure Switch across Pump suction/discharge

Regardless of system size, temperature, pressure, fluid medium, or space requirements, **EnviroSep** can provide solutions to all specialized needs.

EnviroSep • Fluid & Heat Recovery Systems
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Typical Specifications for HTS-NP

Furnish and install one **EnviroSep** Model HTS-NP- [A] - [B] - [C] - [D] Heat Transfer System with the system capacity to heat _____ BTU/hr from 160 °F to 180 °F when _____ psig steam is available at the Heat Exchanger.

KEY:

[A] = Model # (BTU/hr)

[B] = # of pumps (1,2,3,etc.)

[C] = Parallel (P) or Stand-by (S) pump designation

[D] = Manual (M) or Automatic (A) alternation for multiple pumps

GENERAL - This package shall be factory assembled with pump(s), heat exchanger, hydronic accessories, shell and tube heat exchanger, fabricated steel frame, interconnection piping(welded per ASME Section IX certified welders), UL-listed Industrial Control Panel factory wired for single-point field connection per NEC, (and including Condensate Steam Trap).

PUMPS-Pump(s) shall be single, end-suction type with radically split, top center-line discharge, self-venting casing. Pump construction shall be cast iron, bronze fitted and shall be fitted with a long-life, product lubricated, drip tight mechanical seal, with O-ring seat retainer. Impeller shaft to be 416SS fitted with a SS shaft sleeve and be supported by two heavy duty ball bearings. The design shall allow back pull out servicing, enabling the complete rotating assembly to be removed without disturbing casing piping connections. The pump shall be mounted on a rigid, single base plate and by flexible with guard to the motor. Seal shall be rated for continuous duty at 270°F, motor shall be open drip proof, NEMA MG-1 with 1.15 service factor

HEAT EXCHANGER - Heat exchanger shall be shell and tube type with removable tube bundle. Shell is carbon steel with cast iron heads and tube sheets. Tubes are ¾" OD copper. Unit is rated for 150 psig at 375 °F. Shell-side connections 4" and larger are 150 lb. ANSI flanges and all 3" and smaller are NPT connection. Unit shall carry U-1 form and have ASME stamp for 150 psig operation.

AIR REMOVAL EQUIPMENT- System shall include one tangential air separator with internal stainless steel collector tube. Connections to be flanged with a rating of 150 psig. System shall be equipped with ¾" Pressure Relief Valve, ¾" Pressure Regulating Valve, ASME Compression / Expansion Tank (sized by or provide system volume and temperature difference), and tank fitting, sight glass, and tank drain connections to tank.

TRIPLE DUTY VALVE- System shall include, on the discharge of each pump, a combination valve incorporating three functions in one body: tight shut-off,

spring closure type silent non-slam check, and flow measured/throttling. Valve body shall be ductile iron with two ¼" NPT connections on each side of the valve seat. The valve disc shall be bronze plug disc type with high impact engineered resin seat to ensure tight shut-off and silent check valve operation. Valve stem shall be SS with flat surfaces provided for adjustment with open end wrench.

SUCTION DIFFUSER- System shall include, on the suction of each pump a suction diffuser with cast iron body, outlet guide vanes and removable SS strainer.

CONTROL PANEL - System shall include one (1) UL - Listed, NEMA 12, Industrial Control Panel with single-point power connection, pre-wired to all electrical components. Panel shall have thru-the-door fused disconnect; magnetic circuit breaker supplementary motor protector with fast-closing contacts, non-reversing 3-pole contactor, and variable setting, bi-metallic overload relay for each motor; 30 mm Foundry-duty switches; 30 mm Corrosion Resistant pilot lights; control transformer; Automatic Alternator (if required). Operation of each pump shall be Hand-Off-Auto with external connection to terminal blocks. When standby pump(s) are used, the standby pump(s) shall manually/automatically(customer specified) start on primary pump failure. All internal wiring shall be placed in conduit.

STEAM TRAP - Steam trap shall be of the mechanical ball float type with cast iron body, NPT connections, and all stainless steel internals. A stainless steel balanced pressure thermostatic air vent shall be incorporated into the trap body withstanding 45°F of superheat and resisting waterhammer without sustaining damage. Internals shall be serviceable without disturbing piping

STEAM-POWERED CONDENSATE PUMP - Pump shall be low profile, steam-powered, operated by steam up to 125 psig, not requiring any electrical energy, and safe for use in flammable atmospheres. Body construction shall be cast iron or fabricated steel. The pump shall contain a float operated snap-action mechanism with no external seals or packing, stainless steel trim, and hardened bearing components. Pump shall include stainless steel Inlet and Outlet check valves, and gauge glass.

MANUFACTURER - Shall assume system liability, and performance guarantee and warranty all equipment on system for 12 months after initial start-up.

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