

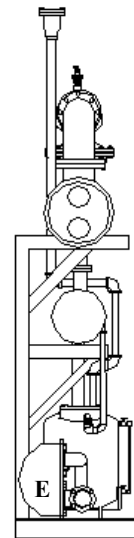
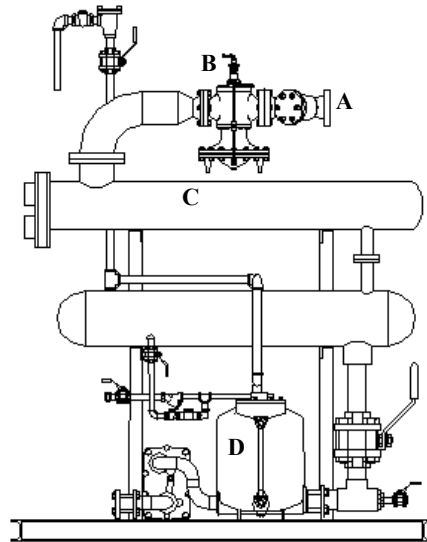
Closed-Loop Heat Transfer Unit with Steam-Powered Condensate Pump

The Model HTUC, Totally Closed-Loop Heat Transfer Unit with integrally assembled steam-powered condensate pump is a complete manufactured system employing the latest technological innovations in closed-loop steam systems. The closed-loop steam system negates Flash Steam loss, thereby delivering efficient heat transfer and condensate removal, with significant savings over conventional Heat Transfer Units. At modulating loads, the Model HTUC operates in a vacuum, utilizing steam at optimal Latent Heat Values, thereby decreasing the mass (lbs.) of steam consumed. The Model HTUC unit features an ASME Shell and Tube, U-tube Heat Exchanger; Pilot-operated Steam Control Valve; Cast Iron Y-Strainer; and Steam-Powered Condensate Pump with motive steam and exhaust connections. Each Unit is custom engineered and designed to meet specific system requirements. All systems are fabricated and welded per ASME Section IX Code and Standards, and are Hydrostatically tested prior to shipment.

SIZING AND SELECTION

Units are custom engineered for individual systems, based upon the selection of the system parameters:

- I. System Flow Rate: Range of 5 gpm to 2,000 gpm
- II. Inlet Temperature: Range of 40°F to 160°F
- III. Outlet Temperature: Range of 120°F to 320°F
- IV. Steam Pressure: Range of 2 psig to 125 psig
- V. Dimensions: Based on specific requirements



Legend:

- A. Inlet Steam Y- Strainer
- B. Steam Control Valve (Pilot-Operated or Pneumatic-Operated)
- C. Shell and Tube Heat Exchanger
- D. Steam-powered Condensate Pump
- E. Steam Trap

STANDARD CONSTRUCTION

- Fabricated Floor-mount Steel Base and Frame
- ASME Shell and Tube, U-Tube Heat Exchanger
- Inlet Steam Y-Strainer
- Cast Iron Pilot-operated Temperature Control Valve with 8ft. capillary tube connected to Temperature Sensor
- Steam-powered Condensate Pump
- Motive Steam Connection with Drip Leg Station
- Pump Exhaust pre-installed
- 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

Note: Condensate back pressure is assumed at 0 psig unless otherwise specified.

EXAMPLES OF TYPICAL SAVINGS

I. System Steam Pressure : 30 psig

Make-up Water-side Flow rate: 15.1gpm

Water side flow rate based on 80 °F temperature change from 60 °F to 140 °F.

Based on continuous system operation of 8400 hr./yr., approximate energy savings are **5100 Million Btu per year**. At an estimated steam cost of \$5.00 / MM Btu, potential yearly savings are **\$25,270.00**

II. System Steam Pressure : 100 psig

Make Water side Flow rate: 45.1gpm

Water side flow rate based on 80 °F temperature change from 60 °F to 140 °F.

Based on continuous system operation of 8400 hr./yr., approximate energy savings are **15,171 Million Btu per year**. At an estimated steam cost of \$5.00 / MM Btu, potential yearly savings are **\$75,858.00**

EnviroSep • Fluid & Heat Recovery Systems
A Division of TMT, Inc.
PO Box 857 • Georgetown, SC 29442
Phone (843) 546-7400 / Fax (843) 546-7407
www.envirosep.com

Model HTUC Heat Transfer Unit Order Form

Specify the following parameters:

Form 98-HTUC

- I. System Flow Rate = _____ gpm
II. Inlet Temperature = _____ °F
III. Outlet Temperature = _____ °F
IV. Steam Pressure
(@ Control Valve) = _____ psig

- V. Max. Allowable
Pressure Drop = _____ psid
VI. Motive Steam Pressure = _____ psig
VII. Condensate Back Pressure = _____ psig
VIII. Fouling Factor = _____

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

PACKAGE OPTIONS

Pneumatic-operated Steam Control Valve
Electronic Positioner
Pneumatic Positioner

Inlet Isolation Gate Valve

Steam Pressure Gauges

Steam Separator

Inlet / Outlet waterside Thermometers

Pre-installed Temperature Sensor

Low Demand Recirculation Switch

Pressure Relief Valves
Steam-side
Water-side

Digital Temperature Controller with PID
Loop and Thermocouple

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

Thermostatic Air Vent

Condensate Isolation and Check Valves

Condensate Y- Strainer

Tube-side Recirculation Pump with UL-
Listed Control Panel

Single-pass Shell and Tube Heat Exchanger

Double-walled tube construction on Heat
Exchanger for Potable water use

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

EnviroSep offers Professional
Engineering Service including complete facility,
steam, and condensate system layout and design.

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Typical Specifications for HTUC Units

Furnish and install one **EnviroSep** Model HTUC - [A] - [B] - [C] - [D] - [E] - [F] - [G] - [H] Heat Transfer Unit with unit capacity to heat ____ gpm from ____ °F to ____ °F when ____ psig steam is available at the factory installed, Steam Control Valve.

KEY:

[A] = System Flow Rate (gpm)
[B] = Inlet Temperature (°F)
[C] = Outlet Temperature (°F)
[D] = Steam Pressure at Control Valve
[E] = Pressure Drop (psid)
[F] = Motive Steam Pressure (psig)
[G] = Condensate Back Pressure (psig)
[H] = Fouling Factor

GENERAL - This unit shall be factory assembled with steam control valve, steam trap, 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, (if required).

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 3/4" 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.

FLOAT & THERMOSTATIC 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.

PILOT-OPERATED STEAM CONTROL VALVE

- The control valve shall be pilot-actuated, diaphragm-operated, and shall be single-seated, with hardened stainless steel trim and cast iron body. The pilot shall be bolted directly to the valve body and shall be removable without disturbing control connections. The temperature setting shall be adjustable and indicated on a calibrated dial. Temperature sensor shall be solid fill.

PNEUMATIC- OPERATED STEAM CONTROL VALVE - The control valve shall be pneumatically actuated with valve body constructed of cast iron and having stainless steel plug, seat, and stem. The pneumatic actuator shall be of the spring-closed design and shall have a fabric reinforced nitrile rubber diaphragm. Actuator yoke shall incorporate electro-pneumatic, intrinsically safe positioner requiring a 4-20 ma input signal, and compressed air connection for valve operation. The positioner shall compare the electrical signal from a controller with the valve position feedback to overcome varying differential pressure, stem friction, and diaphragm hysteresis.

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. 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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