

Heat Transfer Unit with Steam-Powered Condensate Pump

The Model HTUP, Heat Transfer Unit with integrally assembled steam-powered condensate pump is a complete manufactured system providing efficient heat transfer, steam utilization, and condensate removal. The Model HTUP unit features an ASME Shell and Tube, U-tube, Heat Exchanger; Pilot-operated Steam Control Valve; 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

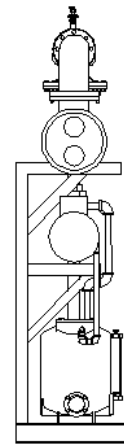
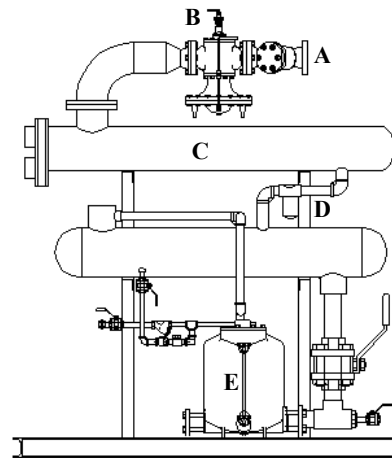
Units are custom engineered for individual systems, based upon the selection of the system parameters:

- 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

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.



Legend:

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

STANDARD CONSTRUCTION

- Fabricated Floor-mount Steel Base and Frame
- ASME Shell and Tube, U-Tube Heat Exchanger
- Inlet Steam Y-Strainer
- Cast Iron Inverted Bucket Steam Trap with Air Vent
- 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

Model HTUP Heat Transfer Unit Order Form

Form 98-HTUP

Specify the following parameters:

- 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

Thermostatic Air Vent

Vacuum Breaker

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

Condensate Isolation and Check Valves

Condensate Y- Strainer

Float and Thermostatic Steam Trap

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

Steam Separator

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.

EnviroSep • Fluid & Heat Recovery Systems
A Division of TMT, Inc.
PO Box 857 • Georgetown, SC 29442
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Typical Specifications for HTUP Units

Furnish and install one **EnviroSep** Model HTUP - [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.

INVERTED BUCKET STEAM TRAP - Steam trap

shall be of the mechanical inverted bucket type with cast iron body, screwed NPT horizontal connections and stainless steel valve head and seat. An internal bi-metal air vent shall be included.

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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