Plate Water Heaters

Brazed Plate Water Heaters-BPH Series
Plate & Frame Water Heaters-PFH Series

- Designed to be used with condensing boilers.
- Increase the boiler efficiency by allowing condensing boilers to condense.
- Lower return temperatures to the boiler.
- Operate the boiler at a lower temperature.
Standard Equipment
Brazed Plate Heater-BPH Series
Plate & Frame Heater-PFH Series

Cemline Brazed Plate Heaters are completely packaged and ready to use. All components are sized, mounted and piped prior to shipment. These heaters come complete and require only connection to services.

Advantages of Cemline®
Packaged Plate Boiler Water Fired Water Heater

Cemline Packaged Plate Boiler Water Fired Water Heaters (BPH/PFH) are a perfect choice for domestic water heating systems using hydronic boilers including cast iron, copper tube, water tube, or specialty high efficiency boilers. The BPH uses a brazed plate heat exchanger for smaller loads while the PFH uses a plate and frame heat exchanger for larger loads. The BPH/PFH heat exchanger allows these boilers to operate more efficiently since the BPH/PFH heat exchangers can return the boiler water to the hydronic boiler at lower temperatures than the traditional U-bend heat exchanger. The boiler water can be returned to the boiler as low as 90°F from the BPH/PFH water heaters.

Cemline Plate Heaters (BPH/PFH) are completely packaged and ready for use. The BPH/PFH can be used in conjunction with an existing tank or used as an instantaneous water heater. The heaters come complete and require only connection to services.

The BPH/PFH heat exchanger has a high heat transfer rate allowing for maximum heat transfer between the boiler water and the domestic water. As the heat is transferred from the boiler water to the domestic water, the boiler water can experience large temperature drops through the heat exchanger. The BPH/PFH can achieve larger temperature drops through the heat exchanger requiring less gallons per minute of boiler water than a traditional U-bend heat exchanger that is performing a 20°F delta T on the boiler water side. The large temperature drops occur without laminar flow on the boiler water side of the heat exchanger. The heat exchanger can even allow for temperature crosses between the boiler water outlet and the domestic water outlet temperature, meaning the domestic water outlet temperature can be greater than the returned boiler water temperature.

The boiler can be run at lower temperatures with the BPH/PFH’s ability to perform temperature crosses and to take large delta T’s as a lower boiler water temperature can be used to make domestic hot water.

Cemline Corporation Plate Water Heaters are available with a storage tank either a cement lined STONESTEEL® or 316-L stainless steel vessel in sizes 60, 120, 200, 300, 500, and 680 gallon capacity. See Cemline SPH brochure for more details.

The Cemline BPH/PFH comes factory standard with a 2-way electronically operated control valve. The 2-way electronically operated control valve allows for close temperature control of the boiler water through the heat exchanger. The BPH/PFH can achieve +/-2°F with a steady state flow and +/-4°F under normal operating conditions. The 1000:1 turn down ratio of the control valve allows for accurate control of these water heaters.

The Cemline BPH/PFH can be used for a variety of heat recovery systems or in hot water or chilled water systems. Contact Cemline Corporation with your specific application.

Basic BPH/PFH Package Includes:

- 16 gauge steel frame with hammertone enamel paint
- Steel channel base
- Electronic temperature gauge.
- Water pressure gauge
- Brazed Plate Heat Exchanger (BPH)
- Plate & Frame Heat Exchanger (PFH)
- Integral bronze circulator
- Clean out ports
- Single safety system with electronic limit control
- 2-Way Electronic Boiler Water Control Valve
- CEM-TROL® II Control Module
- Boiler water temperature gauge
- Inlet boiler water strainer
- Inlet domestic water strainer
- Pressure temperature relief valve

Optional Trim

- Double Walled Plate Heat Exchanger (Brazed Plate or Plate & Frame)
- Boiler water pump
- Aquastat for boiler water pump
- Balance valve
- 3-way electronic boiler water control valve
- Multiple Brazed Plate units can be piped together with by-passes for larger flow rates or for redundancy
- Blowdown valves on strainers
- PT plugs
- California AB-1953 “Lead-Free” components
Standard Equipment
Cemline Brazed Plate Heaters and Plate & Frame Heaters

Cemline Brazed Plate Heaters and Plate & Frame Heaters are completely packaged and ready to use. All components are sized, mounted and piped prior to shipment. These heaters come complete and require only connection to services.

CEM-TROL® II Control Module and Electronically Operated Control Valve

Cemline CEM-TROL® II Solid State Water Heater Control Module incorporates operating and limit functions in one solid state controller. The controller features a LCD touch screen display of the temperature and on board operating PID temperature control along with high temperature safety cut offs and alarm indications. The CEM-TROL® II simplifies the control of Cemline Water Heaters, enhances the look of the product, and follows the industry trend to solid state controls.

Electronically operated control valve used for boiler water applications.

Electronically operated control valves use a solid state temperature sensor which is wired to the CEM-TROL® II control module. The CEM-TROL® II has an adjustable set point. The control module compares the set point with the sensed temperature and sends an electric signal to a magnetic linear actuator on the control valve. The magnetic linear actuator modulates the control valve and regulates the amount of boiler water through the valve to maintain the set point of the controller. When the set point is achieved the CEM-TROL® II sends a signal to the valve actuator and the valve closes. In the event of high temperature or loss of building power the CEM-TROL® II shuts off the electric power to the control valve closing the valve.

Digital Electronic Temperature Limit Control. BPH/PFH Water Heaters have a Digital Electronic Limit Control with LCD readout.

The ASME code requires that water heaters utilizing boiler water as the energy source have a high limit temperature control. The CEM-TROL® II has an easily field-programmable high limit set point and differential.

CEM-TROL® II Features

- Built in PID Control Signal
  - PID Control Signal to control electronic valve or control I-P transducer on Air operated control valve
- Built in LCD Touch Screen Display
  - Display of operationing temperature, setpoint temperature, control output signal along with user friendly interface of the controller
- Built in On-Off Switch
- Built in Single Point Wiring
- Built in High Temperature Set Point
  - Closes control valve in event of a high temperature situation
- Built in Secondary High Temperature Set Point
  - Opens a water solenoid to dump over heated water down the drain
- Built in Remote Temperature Setting
  - Building Automation System can remotely set the operating temperature using a 4-20 mA signal
- Built in LCD Touch Screen Display of Functions
  - Power On
  - Primary High Temperature Indication
  - Secondary High Temperature Indication
- Built in Modbus Interface
  - Building automation system can remotely communicate with the CEM-TROL® II via RF-485 Connection.
- Built in contacts to notify BAS (Building Automation System) of functions
  - Power On
  - Primary High Temperature
  - Secondary High Temperature
  - Operating Temperature (4-20 mA)
  - Any Limit

CEM-TROL® II Ratings

- Input Selectable 120/220 VAC-50/60 HZ
- Output Contacts: 1 amp at 24 VAC
- Building Automation outputs:
  - Dry contacts, NO/NC 0.5 amp maximum, non inductive
  - Display: LCD display with resolution of 0.3% of scale
- Available temperature ranges:
  - 32°F - 200°F
- Operating ambient temperature:
  - Min 32°F Max 140°F
- Operating Humidity: 5% to 95% relative humidity (RH) non-condensing
- NEMA 4 enclosure
- UL listed
Recovery Capacities
Cemline Brazed Plate and Plate & Frame Heaters

Heat exchanger sizing for BPH/PFH can be obtained by using Cemline Corporation’s automatic sizing program on the Cemline website at www.cemline.com. Please contact Cemline or your local representative for sizing or for access to the on-line sizing program.

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<th>Outlet Temp. (°F)</th>
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<th>Outlet Temp. (°F)</th>
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BPH water heaters are not recommended for water with hardness over 140 parts per million. If water hardness exceeds 140 ppm either put a water softener in the system or use Cemline SEH, SSH, or SWH series water heaters.

* When using a double wall heat exchanger a plate and frame style is required for these conditions.
Heat exchanger sizing for BPH/PFH can be obtained by using Cemline Corporation’s automatic sizing program on the Cemline website at www.cemline.com. Please contact Cemline or your local representative for sizing or for access to the on-line sizing program.

<table>
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<th>Model Number</th>
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<td>BPH 2000 and Above</td>
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Recovery Capacities
Dimensional Data - Plate & Frame Heaters

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<th>Model Number</th>
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<tr>
<td>PFH 3000 and Above</td>
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<td>54&quot;</td>
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BPH and PFH Water Heaters - Sample Specifications

For specifying Cemline Packaged Brazed Plate Boiler Water Fired Water Heater water heaters, select model from charts and use specification below. Cemline has representation in most major cities, or consult factory.

**BPH Water Heaters**

Plate heater shall be Cemline Series BPH (or PFH); factory assembled and packaged.

Heater shall be mounted on an enameled metal base, 16 gauge minimum thickness. Heater shall be factory assembled and piped including electronic operated 2-way temperature regulating valve. Heat exchanger shall be single walled brazed copper brazed 316L stainless steel plate type (or double walled copper brazed 316L stainless steel plate type) and shall have an integral valved circulator to re-circulate the water through the heat exchanger.

Heater shall be supplied with solid-state control module with LCD touch screen display and LED pilot lights to indicate on-off, primary high limit, and secondary high limit. Solid-state control module shall be provided with a field programmable digital electronic PID controller allowing the owner to set operating and temperature limits on the display screen. Solid-state control module shall have red alarm light and alarm horn with built in alarm silence relay. Solid-state control module shall be supplied with dry contact closure outputs to indicate to building automation system (BAS) the occurrence of power on, primary high temperature, and secondary high temperature. The control module shall allow the BAS to turn the heater on or off through a remote relay. The control module shall allow the BAS to remotely set the temperature of the heater using a 4-20 mA input signal. The control module shall allow the BAS to remotely monitor the operating temperature via a 4-20 mA signal. Control module shall communicate with the BAS using Modbus Protocol via an RS-485 connection. Control module shall be supplied with an on-off switch and shall be mounted in a NEMA 4 panel. All solenoids and limits shall be 24 VAC.

Heater shall be furnished with a water pressure gauge and an A.S.M.E. pressure temperature relief valve of sufficient size to relieve total BTU input of heat exchanger.

Manufacturer shall assume responsibility for correct sizing of components to assure performance designated in design criteria.

Heater shall be CEMLINE Corporation Model BPH/PFH___________.

Unit dimensions _______" width x _______" long x _______" height.

Plate exchanger to heat _______ GPH from _______ °F to _______ °F with _______ GPM of _______ °F inlet _______ °F outlet Hot Water.

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Cemline BPH/PFH Series Packaged Heaters are normally piped as shown below.
Available Cemline Brochures

- STONESTEEL®
  - Water Storage Tanks
  - Jacketed Storage Tanks
  - Commercial Electric and Packaged Copper Coil Water Heaters
  - Submerged Heating Coils
  - Replacement Tube Bundles
  - Steel Tanks
  - Chilled Water Buffer Tanks
  - System Efficiency Buffer Tanks
  - Electric Boilers
  - Stainless Compact Packaged Copper Coil Water Heaters - Semi-Instantaneous, Instantaneous
  - Untired Steam Generators
  - Condensed Catalog

Cemline is represented in all major cities. Please contact your local representative or call Cemline Corporation.