



(HX-1) Heat Exchanger Requirements

- Heat exchanger shall be plate and frame type single-pass counterflow design.
- Heat exchanger shall be built in accordance with ASME Code and ARI 400 certified.
- Max. working pressure shall be no less than 125 PSIG at 180 °F.
- Plates: 316 stainless steel.
- Gaskets: One-piece construction with double gasket barrier at the port region. Area isolated by double gasket shall be vented to atmosphere with visible leak detection ports. Mechanically-fixed gaskets of material approved for use with design fluids and temperatures. Glued gaskets not acceptable.
- Units with 2-1/2" or larger connections shall have studed ports to mate with raised face ANSI flanges. Units with 2" and smaller connections shall have carbon steel threaded NPT connections.
- Heat exchanger shall be selected using campus water temperatures of 180 °F HWS and 180 °F HWR and shall be sized to minimize pressure drop.
- If heat exchanger is used to generate domestic hot water, heat exchanger shall have double-wall construction and the building side of the above diagram shall be modified accordingly.

(HXP-1,2) Heat Exchanger Pump Requirements

- Pumps shall be vertical inline type.
- Pumps shall be provided with minimum 18-pulse variable speed drive.
- Pumps shall be selected as 100% redundant, with each pump being individually capable of delivering the full design flow at a duty head sized to account for the head loss from the point of connection at the campus heating water supply main, through all piping and components, and back to the campus heating water return main.
- Pumps shall be provided with differential pressure sensor with integral transmitter manufactured by Veris Industries or approved equal. Sensor span and zero shall be adjustable. Electronics housing shall be NEMA 4. Sensor shall have integral LCD display with range appropriate for application. Accuracy shall be 1% of full scale.
- Pumps shall be provided with suction guide with removable strainer. Include 10-mesh or better start-up strainer and final stainless steel strainer.

(TCV-1) Temperature Control Valve Requirements

- Control valve shall be a pressure independent control valve (PICV) which includes an integral regulator valve that maintains the differential pressure across a flow control valve. Provide valves with factory installed pressure/temperature measurement ports to measure the pressure drop to determine the valve flow rate.
- PICV must accurately control the flow from 0-100 percent full rated flow regardless of changes in the piping pressure and not vary the flow more than plus or minus 5 percent at any given flow control valve position when the PICV differential pressure lies between the manufacturer's stated minimum and maximum. Rated minimum differential pressure for steady flow must not exceed 5 PSIG across the PICV.
- PICV shall have an FCI 70-2 Class 4 shut-off rating for all sizes and shall maintain proportional/linear flow coil characteristics.
- Provide either globe or ball type valve.
- PICV shall incorporate control, balancing, and flow limiting functions.
- Provide valves with a flow tag listing full rated flow and minimum required pressure drop.



CAMPUS HOT WATER
PIPING DETAIL

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