	Title: YALE OFFICE OF FACILITIES PROCEDURE MANUAL Chapter: 01 - Yale Design Standard Division: Plumbing Standards	Section: 22 35 00 DHW Generators
		Date: 08/05/17
		Author: Office of Facilities
CC: Project Folder		

Date	Description of Change	Pages / Sections Modified	ID
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PART 1 - INTRODUCTION

1.1 PURPOSE

- A. This section refers to the requirements for Building Heat Exchanger Systems.

PART 2 - GENERAL DESIGN REQUIREMENTS

2.1 GENERAL REQUIREMENTS

- A. Refer to Plumbing General Requirements for
 - 1. Redundancy requirements
 - 2. Hot water recirculation
- B. Domestic Hot Water Temperature
 - 1. Water heaters shall produce at least 140F water.
 - 2. Water for dormitories, and other non-commercial end use shall be supplied at a minimum of 120 F. Water shall be tempered with the use of a central Thermostatic Mixing Valve.
- C. HX's shall comply with Code required double-wall requirements, as an example.

2.2 SIZING


- A. Maximum demand shall be based on one of the two following:
 - 1. Per Plumbing Code Requirements, but corrected for low flow fixtures.
 - a. Consultant shall provide calculations.
 - 2. Imperial data provided by the university.

2.3 PRESSURE VESSEL RATING

- A. The shell of the generator shall be designed for a minimum working pressure of 150 psig and shall bear the ASME code for Unfired Pressure Vessels, and shall comply with State Code requirements.

2.4 SOURCE STEAM PRESSURE

- A. Source steam pressure shall be LPS, or MPS. LPS is defined as 0 to 15 psig, MPS is defined as 16 to 50 psig.

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2.5 COLD WATER TEMPERING

Where feasible, the cold water shall be preheated with steam condensate.

2.6 DOMESTIC HOT WATER RECIRCULATION

- A. Provide DHW recirculation pump to maintain a minimum temperature at the most remote circuit of the DHW distribution system.
- B. Pump shall have means for on/off local HOA.. Provide visual flow indicator, equal to Dwyer Series SFI-100.
- C. Provide balancing valve where there are multiple recirculation circuits connected to a common manifold.

2.7 OPERATION AND MAINTENANCE REQUIREMENTS

- A. Provide a minimum of 36 inch working clearance around the perimeter of the system, and conform to manufactures minimum clearance requirements. The greater of the two clearance requirements shall apply.
- B. Provide sufficient clearance to remove the HX bundle.
- C. Provide isolation valves for both the steam and domestic hot water circuits at locations to permit isolating any one HX or water circuit to allow non-interruptible domestic how water service.

PART 3 - MINIMUM PRODUCT CRITERIA

3.1 ACCEPTABLE MANUFACTURERS


- A. Armstrong
- B. Leslie
- C. Patterson-Kelly

3.2 PACKAGE SYSTEM REQUIREMENT

- A. The unit shall be complete with ASME rated pressure and temperature relief valves, inlet and outlet thermometers, pressure gauges upstream and downstream of the control valve, bronze body circulating pump, PRV, condensate strainer, steam condensate trap, control valve, vacuum breaker, steam line strainer and all auxiliaries necessary to compose a complete working unit.

3.3 CONTROL VALVE

- A. Control valve shall be electrically operated, and at a minimum have the following functions

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1. +/-2°F water temperature control at points of use 25’ downstream during demand
2. +/-2°F water temperature control at the DRV during zero system demand “idling” periods
3. 2°F minimum valve inlet to outlet temperature requirement (system recirculation temperature loss)
4. Automatic shutoff of hot water flow upon cold water inlet supply failure
5. Automatic shutoff of hot water flow in the event of a power failure
6. Programmable set point range of 81-158°F
7. Programmable thermal disinfection mode
8. Programmable 1st level hi/lo temp alarm display
9. Programmable temperature error level for safety shutdown

3.4 DOUBLE WALL TUBE SIDE CONSTRUCTION

- A. Heat exchangers utilizing an essentially toxic transfer fluid shall be separated from the potable water by double-wall construction. An air gap open to the atmosphere shall be provided between the two walls. Heat exchangers utilizing an essentially nontoxic transfer fluid shall be permitted to be of single-wall construction, if acceptable by governing codes.