

AMTROL Commercial BoilerMate

Heat Generator and Space Heating

Evaluation and Sizing Form

Introduction

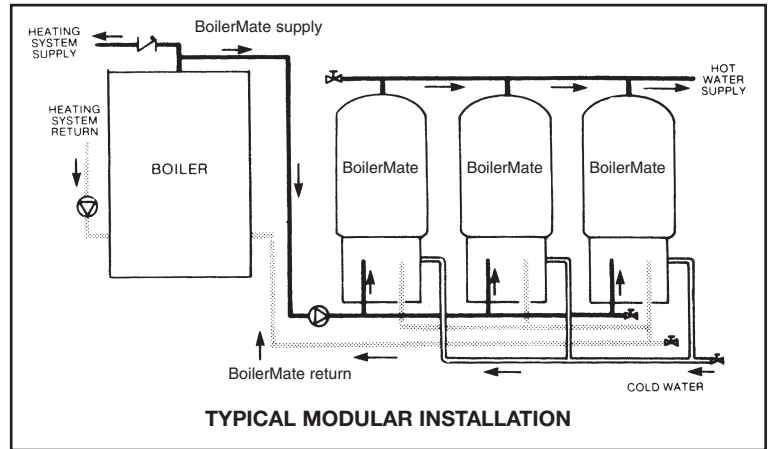
There are two installation conditions that must be considered when sizing a heat generator/commercial BoilerMate installation:

- A. When the heat generator is to work with the BoilerMate to provide **service hot water load only**.
- B. When there are commercial applications that require sizing the heat generator for the **combined space heating and service hot water loads** the heat generator must be large enough to accommodate both loads. However, since both peaks do not occur simultaneously, it is advantageous to take diversity factors into consideration in sizing, since unnecessarily large equipment is wasteful of energy.

The following guide will provide a "rule of thumb" method of estimation the additional heat generating capacity required for service hot water heating on typical BoilerMate installations.

NOTE: This guide is to be used in conjunction with Figure 1 from AMTROL's Commercial Evaluation and Sizing Forms for":

1. Apartment Houses
2. Motels
3. Nursing Homes



A. SERVICE HOT WATER LOAD ONLY

The heat generator installed to take care of the **service hot water load only** must meet the minimum capacity shown in Figure 1 in the Evaluation and Sizing Forms for the particular application.

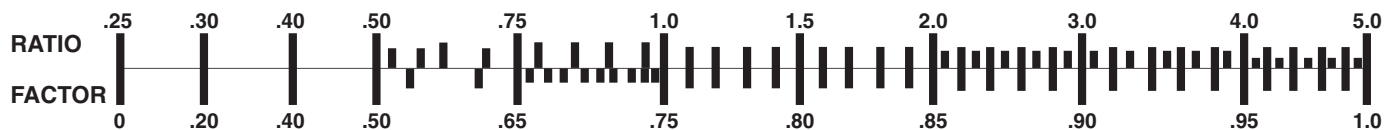
B. SPACE HEATING AND SERVICE HOT WATER LOADS COMBINED

The factors which affect sizing for this type of installation are:

1. The piping and pickup losses which are typically applied when a boiler is installed only for space heating.
2. The number of hours of occurrence of temperatures anywhere near design temperatures for space heating represent an extremely low percentage of the total hours in the heating season.
3. The maximum space heating requirements do not occur at the time of day when the maximum peak service demands occur.
4. Service hot water heating equipment must be sized to supply the maximum rate of use for various periods of time from a few minutes to any hour or longer, and since these periods differ from day to day, and from month to month, the design capacity is significantly greater than that required for the vast majority of hours of service hot water usage.

RULE-OF-THUMB ESTIMATING METHOD

The factors shown in Figure 2 provide a "rule-of-thumb" method for estimating the additional heat generating capacity required for service hot water heating on typical installations. The first is to calculate the ratio of maximum service hot water load to the **gross** output for space heating (including the normal allowance for piping and pickup). From Figure 2 determine the equivalent factor - this is multiplied by the service hot water load, and the product added to the gross space heating load, to determine the total heat generator capacity.



EXAMPLE: 50 unit apartment, gross output required for space heating is 1,100,000 btu/h. Service hot water usage is minimal.

Step 1. From **Figure 1**, Curve I, required for capacity for service hot water = 330,000 btu/h

Step 2. The ratio of service hot water capacity to gross space heating capacity:

$$\frac{\text{Maximum service hot water load}}{\text{Gross space heating}} = \frac{330,000}{1,100,000} = 0.3$$

Step 3. From **Figure 2**, factor = 0.2

$$0.2 \times 330,000 = 66,000 \text{ btu/h}$$

Step 4. Size of heat generator for combined service hot water and space heating loads:

$$1,100,000 + 66,000 = 1,166,000 \text{ btu/h}$$



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