

## **7 PLANT INPUT**

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## 7 PLANT INPUT

### 7.1 Introduction

The plant input segment of ASEAM3.0 is an interactive program that asks for all the data needed to characterize the plant equipment for supplying heating, cooling, and domestic hot water. Some energy costs are also requested in this segment for use in estimating annual energy costs. The plant equipment is actually selected in the systems input routine, when you chose a plant type for a system component energy source (e.g., heating and cooling coils). After the systems input data have been entered for all systems, the various plant energy assignments are compared. Although only one type of chiller can be assigned to system #1, a different chiller type could be assigned to system #2.

Because ASEAM3.0 uses many of the DOE program algorithms, many additional input parameters have been included. If you are unsure of a proper response to a question, it is suggested that you use the default key (function key F8) to enter a typical value.

### 7.2 Entering Plant Input Data

#### 7.2.1 Creating a New Plant Input File

To create a new plant input file, you must first access the plant input program of ASEAM3.0 from the "Exit" menu of any program or from the Main Menu program. The procedure for doing this is discussed in detail in Chapter 3. Once within this program, choose "Enter New Data" from the main plant input bar menu (shown in 7.3).

Your selection of plant components to meet the coil loads, as specified in the systems input file, will determine which input screens subsequently appear. You do not have a choice of the order for the data entry. Fill out each screen, as it appears, with the parameters of the plant equipment.

*Note:* If you begin entering plant data but do not complete the input process in one sitting, you should save the input file. Later, when you are ready to complete the data entry, use the "Get" command to retrieve this file and edit it. "Enter New Data" is used only when there is no existing data entered for the building.

#### 7.2.2 Editing an Existing Plant Input File

To modify an existing plant input file stored in the data subdirectory, you first need to access the plant input program and then retrieve the existing data with the "Get Plant File" command. The procedure for doing this is discussed in detail in Chapter 3. Briefly, you should use the following steps:

1. Access the plant input program from the "Exit" menu of any program or from the Main Menu program.
2. Choose "Get Plant File" from the Plant Input Menu.

3. Choose the file you wish to edit from the list. (This will copy the plant input data from the subdirectory into memory.)
4. Choose "Edit Plant Data."

### 7.3 Input Sequence

When editing an existing file, you have a choice of which data to edit. You may edit all data or only a particular subset in which you are interested. The Plant Input menu, with the editing menu, is shown below.

#### ASEAM3.0 Plant Input

```

|Get Plant File  Save Plant File  Edit Plant Data  Enter New Data  Exit|
|-----|
|All Data  Energy Costs & BTU  Misc Energy Cons  Screen Menu  Exit  |
|-----|
|Centrifugal Chiller  |
|Absorption Chiller  |
|Double Bundle Chiller  |
|Reciprocating Chiller  |
|Cooling Tower  |
|Domestic Hot Water  |
|Boiler  |
|Exit  |
|-----|

```

*Note:* Although all possible plant components appear on the pull-down menu, only components specified in the systems data file are used in the calculations. If you try to edit data for an unspecified component, an error message will be issued. You may add data for the component at this point, but the data will never be used unless you go back and assign this plant component in the systems input file.

### 7.4 Plant Input Screens

The plant input screens will now be discussed individually. Each screen is shown exactly as it will look on your computer. The seven- or eight-letter name above each screen is the name of the .PIS file that defines screen appearance and input parameters. See Appendix C for a discussion on changing input screen parameters.

The input screens for the various chiller types contain many of the same questions, so all of the chiller screens are reprinted first, and the line-by-line discussion follows. There are a few additional questions for specific chillers.

#### 7.4.1 Energy Costs and BTU Conversion Screen

On this screen you specify unit costs and energy conversion factors (site and source) for the building's fuel types. Default values may be used by pressing the F8 function key.

### PIENEDAT

```

|ASEAM3 PLANT INPUT
|ENERGY COSTS/CONVERSIONS                                PLANT FILE:
-----
|Fuel Type      Energy  Unit Cost  Conversion Factors (BTU/Unit)
|               Units   $ / Unit   Site       Source
-----
|Electricity    KWH
|Natural Gas    Therms
|#2 Oil         Gallons
|#4 Oil         Gallons
|#6 Oil         Gallons
|Dist Heating   MBTU
|Dist Cooling   MBTU
  
```

#### Unit cost

Enter dollars per unit. This is the cost of the energy source in dollars per unit. Average unit cost, including demand and fuel adjustment charges, should be entered for electricity.

#### Conversion factors

Enter MBTU/energy unit of fuel type. These conversion factors are multiplied by the energy consumption (in the units listed to the left on the input screen) to yield the consumption in MBTU. The site conversion factor yields site energy consumption; the source conversion factor yields source energy consumption.

### 7.4.2 Miscellaneous Energy Consumption Screen

On this screen you enter miscellaneous building energy consumption that would not normally be part of a building energy analysis. Examples include exterior lighting, cooking and process energy consumption, elevators, etc. Each of the five consumption items will appear in the building energy end-use summary (BEPS report) as a separate line item and will be totaled in the final building energy consumption.

### PIMECDAT

```

|ASEAM3 PLANT INPUT
|MISCELLANEOUS ENERGY CONSUMPTION                      PLANT FILE:
-----
|Label for Miscellaneous      Fuel Units      Annual Consumption
|Energy Consumption          (See Codes Below)  in Energy Units
-----
|_____ - _____
|_____ - _____
|_____ - _____
|_____ - _____
-----
|      Fuel Code  Fuel Type  Energy Units
|      -----  -----  -----
|      1      Natural Gas  therms
  
```

	2	Oil	gallons
	3	Electricity	KWH
	4	Dist Heating	MBTU
	5	Dist Cooling	MBTU

**Label**

For your information. This user-entered name appears as a separate item in the building energy end-use summary at the end of the calculations.

*Note:* The categories of energy end-use calculated by ASEAM3.0 are printed with a capital letter first (e.g., Fans). If you enter all capital letters, they will appear in the summary as capital letters also.

**Fuel units**

Enter the code number for fuel type and units:

- 1 - natural gas (therms)
- 2 - oil (gallons)
- 3 - electricity (KWH)
- 4 - district heating (MBTU)
- 5 - district cooling (MBTU)

*Note:* The notation MBTU in ASEAM3.0 means 'millions' of BTUS; the abbreviation 'KBTU' is used for 'thousands' of BTUS.

**Annual consumption**

Enter the annual energy consumption of the miscellaneous item in the units specified in the previous column.

**7.4.3 Chiller Screens**

ASEAM3.0 can model reciprocating, absorption, centrifugal, and double bundle chillers. The input screens for these four types of chillers are nearly identical so line-by-line definitions for many questions are the same for all four screens. Additional questions pertaining to both the absorption and double bundle chiller are also discussed.

**PICENDAT**

ASEAM3 PLANT INPUT			
CENTRIFUGAL CHILLER		PLANT FILE:	
	Type 1	Type 2	
Centrifugal Chiller Cooling Capacity	_____	_____	tons
Chiller cooling capacity (per chiller)	_____	_____	%
(or) Percent design load satisfied per chiller	_____	_____	%
Number of chillers of this capacity	-	-	
Cooling Performance			
Design coefficient of performance	_____	_____	
Minimum unloading ratio (% of capacity)	_____	_____	%
Minimum part load ratio (% of capacity)	_____	_____	%
Load management/operating method	-	-	
(1 = always on 2 = as needed)			

Chilled Water Parameters				
Chilled water temperature at design load	___	___	°F	
Chilled water temperature at minimum load	___	___	°F	
Chilled water flow (blank=autosized)	___	___	gpm	
Chilled water pump KW (blank=autosized)	___	___	KW	

PIABCDAT

ASEAM3 PLANT INPUT				
ABSORPTION CHILLER	PLANT FILE:			
	-----			
	Type 1	Type 2		
Absorption Chiller Cooling Capacity				
Chiller cooling capacity (per chiller)	___	___	tons	
(or) Percent design load satisfied per chiller	___	___	%	
Number of chillers of this capacity	___	___		
Heat input energy source (1=Boiler 2=Dist Heat)	-	-		
Cooling Performance				
Design coefficient of performance	___	___		
Minimum unloading ratio (% of capacity)	___	___	%	
Number of absorption stages	-	-		
Load management/operating method	-	-		
(1 = always on 2 = as needed)				
Chilled Water Parameters				
Chilled water temperature at design load	___	___	°F	
Chilled water temperature at minimum load	___	___	°F	
Chilled water flow (blank=autosized)	___	___	gpm	
Chilled water pump KW (blank=autosized)	___	___	KW	

PIDBCDAT

ASEAM3 PLANT INPUT		PLANT FILE:	
DOUBLE BUNDLE CHILLER			
	Type 1	Type 2	
Double Bundle Chiller Cooling Capacity			
Chiller cooling capacity (per chiller)	_____	_____	tons
(or) Percent design load satisfied per chiller	_____	_____	%
Number of chillers of this capacity	-	-	
Cooling Performance			
Design coefficient of performance	_____	_____	
Minimum unloading ratio (% of cap - clg mode)	_____	_____	%
Minimum unloading ratio (% of cap - htg mode)	_____	_____	%
Minimum part load ratio (% of capacity)	_____	_____	%
Load management/operating method	-	-	
(1 = always on 2 = as needed)			
Chilled Water Parameters			
Chilled water temperature at design load	_____	_____	°F
Chilled water temperature at minimum load	_____	_____	°F
Chilled water flow (blank=autosized)	_____	_____	gpm
Chilled water pump KW (blank=autosized)	_____	_____	KW
Heat Recovery Parameters			
Design heat recovery temperature	_____	_____	°F
Heat recovery backup (1=Boiler 2=Dist Htg)	-	-	

PIRECDAT

ASEAM3 PLANT INPUT		PLANT FILE:	
RECIPROCATING CHILLER			
	Type 1	Type 2	
Reciprocating Chiller Cooling Capacity			
Chiller cooling capacity (per chiller)	_____	_____	tons
(or) Percent design load satisfied per chiller	_____	_____	%
Number of chillers of this capacity	-	-	
Cooling Performance			
Design coefficient of performance	_____	_____	
Minimum unloading ratio (% of capacity)	_____	_____	%
Minimum part load ratio (% of capacity)	_____	_____	%
Load management/operating method	-	-	
(1 = always on 2 = as needed)			
Chilled Water Parameters			
Chilled water temperature at design load	_____	_____	°F
Chilled water temperature at minimum load	_____	_____	°F
Chilled water flow (blank=autosized)	_____	_____	gpm
Chilled water pump KW (blank=autosized)	_____	_____	KW

Chiller cooling capacity per chiller

Enter tons *per chiller*. Note that because ASEAM3.0 calculates the chiller's cooling capacity for each bin from variables such as chilled water and condenser water temperatures, the capacity at ARI rating conditions should be entered. This capacity value is then adjusted for conditions other than ARI rating conditions. If multiple chillers are available in the cooling plant, you should specify the cooling capacity of *one* chiller and indicate there are multiple chillers available with this capacity. If you leave this entry blank, the chiller cooling capacity will be autosized, and the next question is asked.

Percent design load satisfied per chiller

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Enter percent. The sum of all system energy requirements (using diversified loads) on a given chiller type is used to determine the peak load for the chiller. If you enter 100% (and there is only *one* chiller), the chiller would be perfectly sized (with no excess capacity). If multiple chillers are installed, enter the value *per chiller*.

### Design coefficient of performance

Dimensionless. As with the cooling capacity, the cooling COP should be entered at ARI rating conditions. ASEAM3.0 adjusts the design COP for each bin according to the DOE program algorithms.

### Minimum unloading ratio

Enter percent of capacity. The minimum unloading ratio is defined as the lowest part-load ratio at which the chiller will operate without false loading itself. If the part-load ratio (actual load/capacity) is less than this value, the chiller is assumed to false load itself up to this part-load ratio. For double bundle chillers, the unloading ratio is specified also for the heat recovery mode.

### Minimum part-load ratio

Enter percent of capacity. The minimum part-load ratio is defined as the lowest part-load ratio at which the chiller will operate continuously. That is, if the part-load ratio (actual load/capacity) is less than this value, the chiller is assumed to be cycling on and off.

### Number of absorption stages

Enter number 1 or 2. This question is asked for absorption chillers only.

### Load management/operating method

Enter the load management/operating method: 1, always on; 2, on as needed. The first method will simulate that all chillers are "on" (regardless of load), possibly causing a low part-load operating efficiency at marginal chiller loads. The second method will simulate that additional chillers will be activated if the total chiller load exceeds the capacity of one chiller.

### Chilled water temperature at design load

Enter degrees F. This temperature is used to determine a chilled water reset schedule. See also the following question.

### Chilled water temperature at minimum load

Enter degrees F. This temperature is used in conjunction with the above question to determine a reset schedule for the chilled water temperature.

### Chilled water flow

Enter gallons per minute. If you leave this line blank, the chilled water flow rate will be autosized.

### Chilled water pump KW

Enter in KW. If you leave this line blank, the chilled water pump KW will be autosized.

*The following questions are asked for double bundle chillers only:*



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### Design heat recovery temperature

Enter degrees F. This value is the water temperature leaving the condenser of the double bundle chiller when in a heat recovery mode. If there is no calculated heating load on the double bundle chiller, it is assumed to be in a cooling mode.

### Heat recovery backup

Enter the backup source for heating energy:

- 1 - boiler
- 2 - district heating

This question is asked when you have specified bundle double chillers as a heating source in the systems input. If the calculated heating load on the double bundle condenser is larger than the heat rejected by the cooling load, the additional heating load is added to the backup source.

*Note:* ASEAM3.0 assumes that the double bundle chiller operates only when there is a cooling load. Therefore, it will not false load itself to satisfy a heating load.

### 7.4.4 Cooling Tower Screen

On this screen you specify cooling tower parameters. Although most plant equipment types are specified in the systems input, cooling towers are automatically selected if you have a chiller or if they are specified as the cooling plant type for water source heat pump systems.

ASEAM3.0 assumes that cooling towers are used for all chillers (i.e., closed-loop fluid coolers or air-cooled condensers are not modeled by ASEAM3.0).

```

                                PITOWDAT
    _____
    | ASEAM3 PLANT INPUT          |
    | COOLING TOWER                | PLANT FILE: |
    |-----|
    | Cooling Tower Heat Rejection Capacity |
    | Total heat rejection                | _____ tons |
    | (or) Percent of design heat rejection load satisfied | _____ % |
    |                                     |
    | Tower Performance                |
    | Number of tower cells (blank=autosized) | _____ |
    | Fan KW per cell (blank=autosized)      | _____ KW |
    | Number of fan speeds (1 or 2)         | _____ |
    | Approach temperature                 | _____ °F |
    |                                     |
    | Condenser Water Parameters          |
    | Condenser water temperature at design load | _____ °F |
    | Condenser water temperature at minimum load | _____ °F |
    | Condenser water flow rate (blank=autosized) | _____ gpm |
    | Condenser water pump KW (blank=autosized) | _____ KW |
    |                                     |
    |_____
  
```

### Total heat rejection capacity

Enter in tons. Because ASEAM3.0 calculates the cooling tower heat rejection

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capacity for each bin from variables such as condenser water and wet-bulb temperatures, the capacity at ARI rating conditions should be entered. This capacity value is then adjusted for conditions other than ARI rating conditions.

### Percent of design heat rejection load satisfied

Enter a percent. The sum of all system and chiller heat rejection requirements is used to determine the maximum load on the tower. If you enter 100% for this question, the tower would be perfectly sized (with no excess capacity).

### Number of tower cells

Enter the number. With additional cells, the tower can better regulate the tower-leaving temperature. If you leave this line blank, the number of tower cells will be autosized based on DOE-2 algorithms.

### Fan KW per cell

Enter KW. If you leave this line blank, the fan KW per cell will be autosized based on DOE-2 algorithms.

### Number of fan speeds (1 or 2)

Enter 1 or 2 to specify the number of fan speeds. With a two-speed fan motor, the condenser water temperature can be lowered by both low- and high-speed fan operation and by natural convection (fans off).

### Approach temperature

Enter degrees F. The tower approach temperature is the difference between the condenser-leaving water temperature and the outside air wet-bulb temperature. Since this value may change for each bin calculation, you should enter this value for design (ARI) conditions.

### Condenser water temperature at design load

Enter degrees F.

### Condenser water temperature at minimum load

Enter degrees F. This value and the above value are used to determine the condenser water reset schedule.

### Condenser water flow rate

Enter gallons per minute. If you leave this line blank, the condenser water flow rate will be autosized.

### Condenser water pump KW

Enter KW. If you leave this line blank, the pump KW will be autosized.

## 7.4.5 Domestic Hot Water Screen

On this screen you enter parameters used to calculate the energy consumption for domestic hot water.

### PIDHWDAT

ASEAM3 PLANT INPUT:	
DOMESTIC HOT WATER	PLANT FILE:
-----	

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Domestic Hot Water Energy Source	
Domestic Hot Water Energy Source	
(0=None 1=Electric 2=Nat Gas 3=Oil 4=Boiler 5=District)	
(if oil) Oil Type (2 or 4 or 6)	
(if gas) Annual pilot consumption	therms
DHW Capacity and Usage	
Domestic Hot Water Heating Capacity (blank=autosized)	KBTUH
(if autosized) Peak hourly DHW usage	gal/hour
Average hourly DHW usage - occupied cycle	gal/hour
Average hourly DHW usage - unoccupied cycle	gal/hour
DHW Temperatures	
Domestic hot water supply temperature	°F
DHW inlet temperature - design summer	°F
DHW inlet temperature - design winter	°F
Circulating Pumps	
Circulating pump KW - occupied cycle	KW
Circulating pump KW - unoccupied cycle	KW
DHW Efficiency and Losses	
Design DHW heating efficiency	%
DHW losses - occupied cycle	BTUH
DHW losses - unoccupied cycle	BTUH

### Domestic hot water energy source

Choose from the following domestic hot water energy sources:

- 0 - none
- 1 - electric
- 2 - natural gas
- 3 - oil
- 4 - boiler
- 5 - district

ASEAM3.0 assumes the existence of a separate DHW heater if you select option 1, 2, or 3. If either of the last two options is chosen, the domestic hot water load is added to any existing boiler or district heat load.

### Oil type

Enter 2 or 4 or 6. If the domestic hot water energy source is oil, specify the type of fuel oil.

### Annual pilot consumption

Enter therms. For a gas water heater, enter annual consumption of the pilot.

*The next four questions specify the DHW capacity and usage:*

### Domestic hot water heating capacity

Enter KBTUH. Enter the domestic hot water heating capacity if it is known. Leave blank if you want autosizing.

### Peak hourly DHW usage

Enter gallons per hour. This value is used to the DHW heater if you select autosizing.

### Average hourly DHW usage (occupied cycle)

Enter gallons per hour. This value, along with usage during the unoccupied cycle (below), is used to specify the consumption load.

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Average hourly DHW usage (unoccupied cycle)  
Enter gallons per hour.

*The next three questions pertain to domestic hot water temperatures:*

Domestic hot water supply temperature  
Enter degrees F. This is the domestic hot water heater discharge temperature, assumed to be constant throughout the year.

DHW inlet temperature (design summer)  
Enter degrees F. This is the inlet water temperature at design summer outside temperature. Note that the inlet temperature is reset on outdoor air temperature (see also the following question).

DHW inlet temperature (design winter)  
Enter degrees F. This is the inlet water temperature at design winter outside air temperature.

*The next two questions pertain to the circulating pump:*

Circulating pump KW (occupied cycle)  
Enter KW. Enter any of the building's additional DHW pump power requirements for the occupied cycle.

Circulating pump KW (unoccupied cycle)  
Enter KW. Note that in some cases, the circulating pump may be turned off in the unoccupied cycle, so a '0' value would be appropriate.

*The following three questions pertain to domestic hot water heater efficiencies and losses:*

Design DHW heating efficiency  
Enter percent. The design efficiency of the DHW heater is adjusted for each bin according to efficiency equations found in the DOE program. Because ASEAM3.0 differentiates only between occupied and unoccupied cycles, average hourly usage and demand must be used. This results in relatively low efficiencies on a bin basis.

DHW losses (occupied cycle)  
Enter BTUH. These are heat losses that may occur in the system during the occupied cycle, such as tank and pipe transmission losses. The losses are added to the usage load to determine the total load on the DHW plant.

DHW losses (unoccupied cycle)  
Enter BTUH.

### **7.4.6 Boiler Screen**

The boiler input screen appears if a boiler was specified during systems input as the energy source of either baseboard, preheat, heating, or humidification. It is also

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possible for the boiler to be the backup energy source for a double bundle chiller heat recovery system, the heat source for an absorption chiller, as well as the supplier of domestic hot water heating energy.

Regardless of the source of the heating requirements, all loads are added together to determine the total boiler load. When autosizing, it is possible that the boiler capacity is based on the absorption heat requirement rather than the maximum heating load demand.

### PIBLRDAT

ASEAM3 PLANT INPUT		PLANT FILE:
BOILER		
-----		
Boiler Energy		
Boiler Energy Source	- -	
(1=Electric 2=Nat Gas 3=Oil)		
(if oil) Oil type (2 or 4 or 6)		
(if gas) Annual pilot consumption	___	therms
Boiler Heating Capacity		
Boiler heating capacity (per boiler)	___	KBTUH
(or) % max heating load satisfied (per boiler)	___	%
Number of boilers with this capacity	___	
Load management/operation	- -	
(1 = always on 2 = as needed)		
Boiler Performance		
Boiler efficiency method (1=user entered 2=calc)	-	
Design boiler efficiency	___	%
(if calc) Combustion air temperature	___	°F
(if calc) Stack temperature	___	°F
(if calc) Air-Fuel ratio	___	Lb/Lb
Minimum part load operating ratio (% of capacity)	___	%
Boiler pump KW (blank=autosized)	___	KW
Boiler losses - percent of capacity	___	%
Boiler losses - percent of load	___	%

#### Boiler energy source

Choose from the following boiler energy sources:

- 1 - electric
- 2 - natural gas
- 3 - oil

Select the boiler's energy source. If the fuel used for heating is not on the list, you are advised to select district heat as the heating source, and manually calculate the total fuel consumption from the total district heat requirement (which assumes 100% conversion efficiency).

#### Oil type

Enter 2 or 4 or 6. If the boiler energy source is oil, specify the type of fuel oil.

#### Annual pilot consumption

Enter therms. For a gas boiler, enter the annual consumption of the pilot. Note that these losses are not considered a heating load on the boiler, but are totaled at the end of the calculations.

#### Boiler heating capacity (per boiler)

Enter KBTUH. Enter the boiler design heating capacity (per boiler) in KBTUH

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here. This input is not required if the percent of maximum heating load satisfied is entered below. If multiple boilers are available in the heating plant, you should specify the heating capacity of *one* boiler and indicate there are multiple boilers available with this capacity.

Percent of maximum heating load satisfied (per boiler)

Enter the percent of the maximum heating load satisfied per boiler. A value of 100% indicates perfect sizing if there is only one boiler. This input is not required if the boiler heating capacity is entered above.

Number of boilers with this capacity

Enter the number of boilers with the capacity entered in the previous questions.

Load management or operation

Choose the method of boiler management or operation: 1, always on; 2, on as needed.

The first method simulates all boilers as "on" (regardless of load), possibly causing a low part-load operating efficiency at marginal boiler loads. The second method simulates additional boilers being activated if the total boiler load exceeds the capacity of one boiler.

Boiler efficiency method

Specify the method used to calculate boiler efficiency: 1, user-entered; 2, calculated.

The user-entered method uses the DOE-2 program algorithms, whereas the calculated method uses the BLAST algorithms. Electric boilers can only use the user-entered method. If you use the "calculated" efficiency method, you will enter several inputs below.

Design boiler efficiency

Enter percent. ASEAM3.0 uses the boiler algorithms from the DOE program manual. The actual bin efficiency is therefore calculated for each bin and is a function of many variables, one of which is the design efficiency. If you specify the "calculated" efficiency method above, this question is not asked.

*The next three questions are asked if the boiler efficiency is to be calculated for a fossil fuel boiler:*

Combustion air temperature

Enter degrees F.

Stack temperature

Enter degrees F.

Air-fuel ratio

Enter pounds of air per pound of fuel.

Minimum part-load operating ratio (percent of capacity)

Enter percent of capacity. The minimum part-load operating ratio is the smallest part-load ratio at which the boiler can operate continuously without cycling on and off.

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### **Boiler pump KW**

Enter KW. Enter the boiler hot water pump KW requirements. If you leave this line blank, the pump KW will be autosized and assume a pump exists. If you have a steam boiler, enter `0'.

### **Boiler losses - percent of capacity**

Enter percent of capacity. These losses are totaled with the heating load on the boiler to determine total boiler load. Examples of such losses include stand-by heat losses for an idling boiler, steam trap losses, and piping heat loss.

### **Boiler losses - percent of load**

Enter percent of load. These losses are calculated as a percentage of the heating load, not boiler capacity. These losses are totaled with the heating load on the boiler to determine total boiler load. Examples may include piping heat loss where the hot water temperature is reset on outside air.

This concludes the discussion of the plant input screens. You have now defined loads, systems, and plant for a building. You may proceed to the calculations by exiting from the Plant Input segment (remember to save your file) and entering the Specify Analyses segment from the Main Menu.

