



# HOT WATER/GAS Modular Boilers APPLICATION GUIDE

Guidelines for the design, purchase and installation of Slant/Fin Caravan gas-fired, hot water modular boiler systems.

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## CODES AND STANDARDS

All Caravan installations must comply to local codes or, in the absence of local codes, to the National Fuel Gas Code, ANSI, Z223.1-latest edition.

In addition where required by the authority having jurisdiction, the installation must conform to American Society of Mechanical Engineers Safety Codes for controls and safety devices for automatically fired boilers, No. CSD-1. The installation must also conform to the additional requirements of Slant/Fin Instruction Book publication no. GG-100-40 latest edition.

All electrical wiring is to be done in accordance with the National Electrical Code ANSI/NFPA No. 70-latest edition and all local electrical codes. The unit must be electrically grounded if an external power source is used.

In Canada, the installation must be in accordance with standards CGA B149.1 and B149.2, installation codes for gas burning appliances and equipment and/or local codes. All electrical connections are to be made in accordance with Standard C.S.A. C22.1 Canadian Electrical Code Part 1 and/or local codes.

Many state and local codes require intermittent ignition devices for gas boilers. Please specify if necessary.

## LOCAL CODE APPROVALS

### ***New York City:***

GGT and GGHT Caravan Modules - MEA 283-93-E Vol. II  
Slant/Fin vent damper NYS approval No. 8859

### ***Pennsylvania:***

Caravan boilers are approved in Pennsylvania by PA Cert. 174-BT-S

## INTRODUCTION OF FRESH WATER

Introduction of excessive amounts of fresh water into a system can cause scaling and leave deposits in the boiler and the surrounding pipes. This will lead to inefficient boiler operation and breakdown. Fresh water will enter the system as a result of hidden leaks such as may occur in underground piping. Relief valves should be piped to a location that shows visible signs of relief.

Process applications that use fresh water, require the use of heat exchangers. Any process application that results in introduction of fresh water into a boiler can cause scaling with deposits forming in the boiler and surrounding piping. This will damage the boiler. Introduction of fresh water from leaks will cause similar damage.

In some areas it may be necessary to use a feed water treatment to control the corrosive makeup of the feed water. Check with the local authority, to determine if the feed water will need a conditioning treatment before being supplied to the boiler.



# INTRODUCTION

This Caravan application manual is intended to simplify the selection and application of Slant/Fin modular systems for a variety of space heating and domestic hot water requirements. It applies to gas-fired, hot water applications only. Where intermittent pilot, vent damper or any additional information is required, contact your local wholesaler, Slant/Fin sales representative, or the Slant/Fin factory.

Due to design flexibility of a Caravan modular boiler system, BTU input capacities are unlimited.

**A. Boiler room design, size and flexibility** - since Caravan modules have the burner and controls mounted to the front, they can be installed with minimum clearances as per codes, thus saving a significant amount of floor space.

**B. Faster, easier installation** - modules are completely factory assembled, including individual jackets to save on-site labor. Optional easy to install return and supply headers with flexible quick connect fittings are available for hot water systems.

**C. Safety** - each module contains an individual high limit control and a dual combination gas valve. ASME relief valve is provided separately for mounting directly on each module.

**D. Fast domestic hot water recovery** - Caravan offers an external heat exchanger of the positive circulating type.

**Table 1: Gas Caravan ratings and dimension/hot water model—GGT Series (100 psi maximum working pressure)**

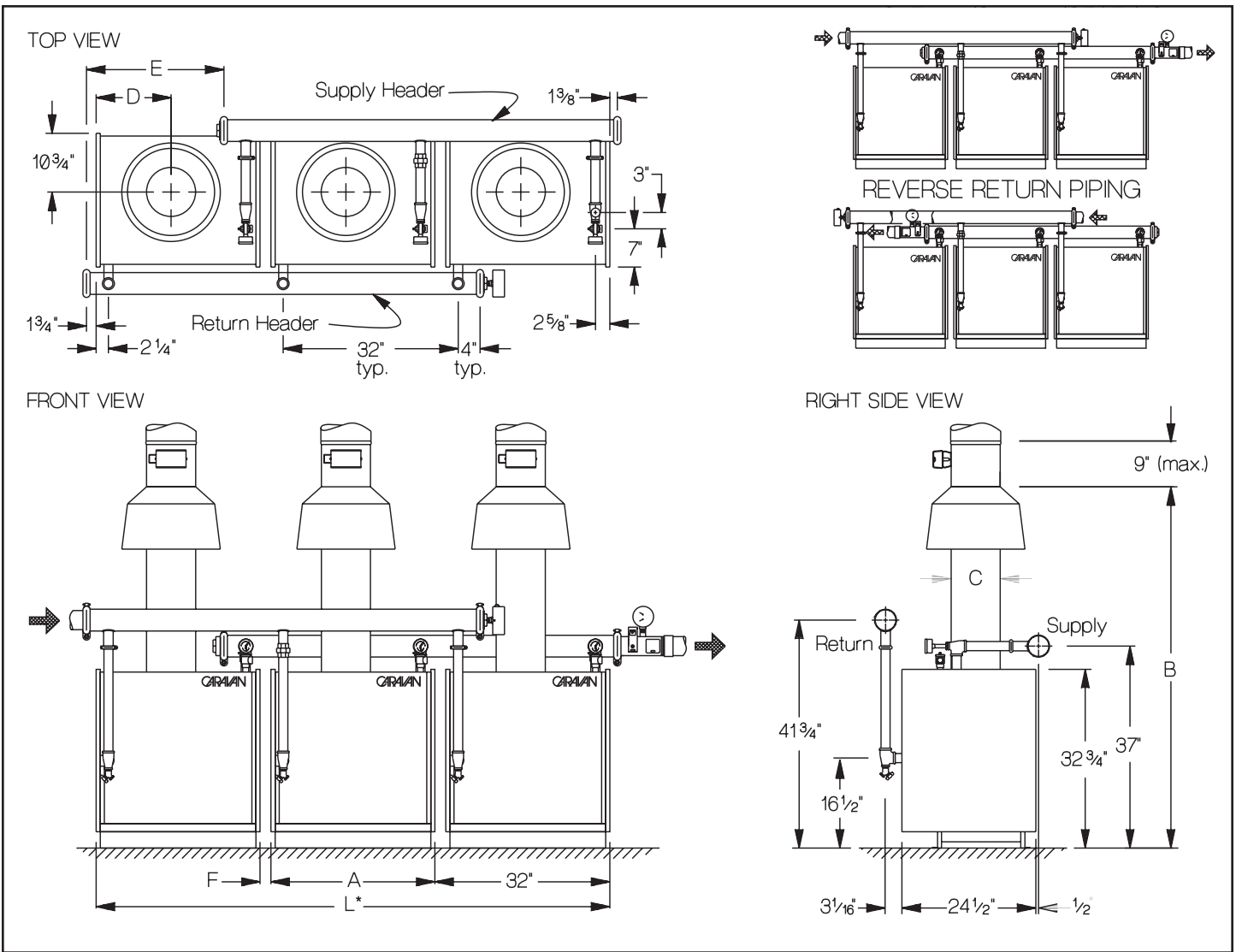
Model No.	Consists of		I=B=R Ratings (MBH)		EDR Water† (Sq. Ft.)	I=B=R Net Output†	Boiler Horse-power	Water Content (gal.)	Ship Wt.	Jkt. Width A§	Draft Hood Ht. B§	Flue Collar C§	Draft Hood Ht. D§	Header to Header E§	Space Btwn. Mods. F§	Length with Header L§	Min. Header Size‡
	No. of Htg. Mod.	Module Model Number	Input	Gross Output													
GGT-400E	2	GG-200EC	400	332	1866	280	9.9	14.2	820	19 <sup>1</sup> / <sub>16</sub>	57 <sup>1</sup> / <sub>2</sub>	7	8 <sup>3</sup> / <sub>32</sub>	15 <sup>1</sup> / <sub>16</sub>	12 <sup>1</sup> / <sub>16</sub>	4'4"	2"
GGT-500E	2	GG-250EC	500	402	2333	350	12.0	16.4	950	23 <sup>3</sup> / <sub>16</sub>	59 <sup>1</sup> / <sub>2</sub>	8	10 <sup>1</sup> / <sub>32</sub>	18 <sup>1</sup> / <sub>16</sub>	8 <sup>1</sup> / <sub>16</sub>	4'8"	2"
GGT-600E	2	GG-300EC	600	480	2780	417	14.3	18.4	1080	26 <sup>1</sup> / <sub>16</sub>	59 <sup>1</sup> / <sub>2</sub>	8	12 <sup>1</sup> / <sub>32</sub>	21 <sup>1</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	4'11"	2"
GGHT-750E	2	GG-375HEC	750	608	3520	529	18.1	20.6	1230	30 <sup>1</sup> / <sub>16</sub>	59 <sup>1</sup> / <sub>2</sub>	10	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	5'2"	2"
GGHT-800E	2	GG-399HEC	798	654	3786	569	19.5	20.6	1230	30 <sup>1</sup> / <sub>16</sub>	62 <sup>1</sup> / <sub>2</sub>	10	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	5'2"	2"
GGT-900E	3	GG-300EC	900	720	4173	626	21.5	27.6	1590	26 <sup>1</sup> / <sub>16</sub>	59 <sup>1</sup> / <sub>2</sub>	8	12 <sup>1</sup> / <sub>32</sub>	21 <sup>1</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	7'7"	2"
GGHT-1125E	3	GG-375HEC	1125	912	5286	793	27.2	30.9	1830	30 <sup>1</sup> / <sub>16</sub>	59 <sup>1</sup> / <sub>2</sub>	10	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	7'10"	2"
GGHT-1200E	3	GG-399HEC	1197	981	5686	853	29.3	30.9	1830	30 <sup>1</sup> / <sub>16</sub>	62 <sup>1</sup> / <sub>2</sub>	10	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	7'10"	3"
GGT-1200E	4	GG-300EC	1200	960	5560	834	28.7	36.8	2140	26 <sup>1</sup> / <sub>16</sub>	59 <sup>1</sup> / <sub>2</sub>	8	12 <sup>1</sup> / <sub>32</sub>	21 <sup>1</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	10'3"	3"
GGHT-1500E	4	GG-375HEC	1500	1216	7046	1057	36.3	41.2	2440	30 <sup>1</sup> / <sub>16</sub>	59 <sup>1</sup> / <sub>2</sub>	10	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	10'6"	3"
GGT-1500E	5	GG-300EC	1500	1200	6950	1043	35.9	46.0	2675	26 <sup>1</sup> / <sub>16</sub>	59 <sup>1</sup> / <sub>2</sub>	8	12 <sup>1</sup> / <sub>32</sub>	21 <sup>1</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>16</sub>	12'11"	3"
GGHT-1600E	4	GG-399HEC	1596	1308	7580	1137	39.0	41.2	2440	30 <sup>1</sup> / <sub>16</sub>	62 <sup>1</sup> / <sub>2</sub>	10	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	10'6"	3"
GGHT-1875E	5	GG-375HEC	1875	1520	8806	1321	45.4	51.5	3050	30 <sup>1</sup> / <sub>16</sub>	59 <sup>1</sup> / <sub>2</sub>	10	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	13'2"	3"
GGHT-2000E	5	GG-399HEC	1995	1635	9473	1421	48.8	51.5	3050	30 <sup>1</sup> / <sub>16</sub>	62 <sup>1</sup> / <sub>2</sub>	10	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	13'2"	3"
GGHT-2250E	6	GG-375HEC	2250	1824	10573	1586	54.4	61.8	3660	30 <sup>1</sup> / <sub>16</sub>	59 <sup>1</sup> / <sub>2</sub>	10	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	15'10"	3"
GGHT-2400E	6	GG-399HEC	2394	1962	11373	1706	58.6	61.8	3660	30 <sup>1</sup> / <sub>16</sub>	62 <sup>1</sup> / <sub>2</sub>	10	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	15'10"	3"
GGHT-2625E	7	GG-375HEC	2625	2128	12333	1850	63.5	72.1	4270	30 <sup>1</sup> / <sub>16</sub>	59 <sup>1</sup> / <sub>2</sub>	10	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	18'6"	3"
GGHT-2800E	7	GG-399HEC	2793	2289	13266	1990	68.3	72.1	4270	30 <sup>1</sup> / <sub>16</sub>	62 <sup>1</sup> / <sub>2</sub>	10	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	18'6"	3"
GGHT-3000E	8	GG-375HEC	3000	2432	14093	2115	72.6	82.4	4880	30 <sup>1</sup> / <sub>16</sub>	59 <sup>1</sup> / <sub>2</sub>	10	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	21'2"	3"
GGHT-3200E	8	GG-399HEC	3192	2616	15160	2275	78.1	82.4	4880	30 <sup>1</sup> / <sub>16</sub>	62 <sup>1</sup> / <sub>2</sub>	10	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	21'2"	3"
GGHT-3375E	9	GG-375HEC	3375	2736	15860	2379	81.7	92.7	5490	30 <sup>1</sup> / <sub>16</sub>	59 <sup>1</sup> / <sub>2</sub>	10	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	23'10"	3"
GGHT-3600E	9	GG-399HEC	3591	2943	17060	2559	87.9	92.7	5490	30 <sup>1</sup> / <sub>16</sub>	62 <sup>1</sup> / <sub>2</sub>	10	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	23'10"	3"
GGHT-3750E	10	GG-375HEC	3750	3040	17620	2643	90.8	103.0	6100	30 <sup>1</sup> / <sub>16</sub>	59 <sup>1</sup> / <sub>2</sub>	10	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	26'6"	3"
GGHT-4000E	10	GG-399HEC	3990	3270	18953	2843	97.6	103.0	6100	30 <sup>1</sup> / <sub>16</sub>	62 <sup>1</sup> / <sub>2</sub>	10	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	26'6"	3"
<b>83% Efficiency Modules</b>																	
GGHT-700E	2	GG-350HEC	700	581	3368	505	17.3	20.6	1230	30 <sup>1</sup> / <sub>16</sub>	67 <sup>1</sup> / <sub>2</sub>	9	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	5'2"	2"
GGHT-1050E	3	GG-350HEC	1050	872	5052	758	26	30.9	1830	30 <sup>1</sup> / <sub>16</sub>	67 <sup>1</sup> / <sub>2</sub>	9	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	7'10"	2"
GGHT-1400E	4	GG-350HEC	1400	1162	6736	1010	34.7	41.2	2440	30 <sup>1</sup> / <sub>16</sub>	67 <sup>1</sup> / <sub>2</sub>	9	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	10'6"	3"
GGHT-1750E	5	GG-350HEC	1750	1453	8420	1263	43.4	51.5	3050	30 <sup>1</sup> / <sub>16</sub>	67 <sup>1</sup> / <sub>2</sub>	9	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	13'2"	3"
GGHT-2100E	6	GG-350HEC	2100	1743	10104	1516	52	61.8	3660	30 <sup>1</sup> / <sub>16</sub>	67 <sup>1</sup> / <sub>2</sub>	9	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	15'10"	3"
GGHT-2450E	7	GG-350HEC	2450	2034	11788	1768	60.7	72.1	4270	30 <sup>1</sup> / <sub>16</sub>	67 <sup>1</sup> / <sub>2</sub>	9	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	15'10"	3"
GGHT-2800E	8	GG-350HEC	2800	2324	13472	2021	69.4	82.4	4880	30 <sup>1</sup> / <sub>16</sub>	67 <sup>1</sup> / <sub>2</sub>	9	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	21'2"	3"
GGHT-3150E	9	GG-350HEC	3150	2615	15157	2273	78.1	82.4	5490	30 <sup>1</sup> / <sub>16</sub>	67 <sup>1</sup> / <sub>2</sub>	9	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	23'10"	3"
GGHT-3500E	10	GG-350HEC	3500	2905	16841	2526	86.7	92.7	6100	30 <sup>1</sup> / <sub>16</sub>	67 <sup>1</sup> / <sub>2</sub>	9	13 <sup>23</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	26'6"	3"

**FOR LARGER SIZES, USE MULTIPLES OF THE ABOVE.**

\* Specify gas by name, "Natural" or "Propane".  
 † Net ratings are based on piping and pick-up allowance of 1.15. Slant/Fin should be consulted before selecting a boiler for installation having unusual piping and/or pick-up requirements. Ratings must be reduced by 4% at 2,000 ft. elevation and an additional 4% for every additional 1,000 ft. elevation over 2,000 ft.

‡ Net ratings in square feet based on emission rate of 150 Btuh/sq. ft.  
 § Refer to figures 1 and 8. Headers shown are optional.  
 †† All factory supplied headers use 3" system connections.  
 Modules in excess of 10 should be piped in parallel in two or more batteries.  
 Note: For higher capacities, specify correct combination of standard Caravan modules shown.

**Figure 1: Gas Caravan dimensions and typical piping/hot water models**

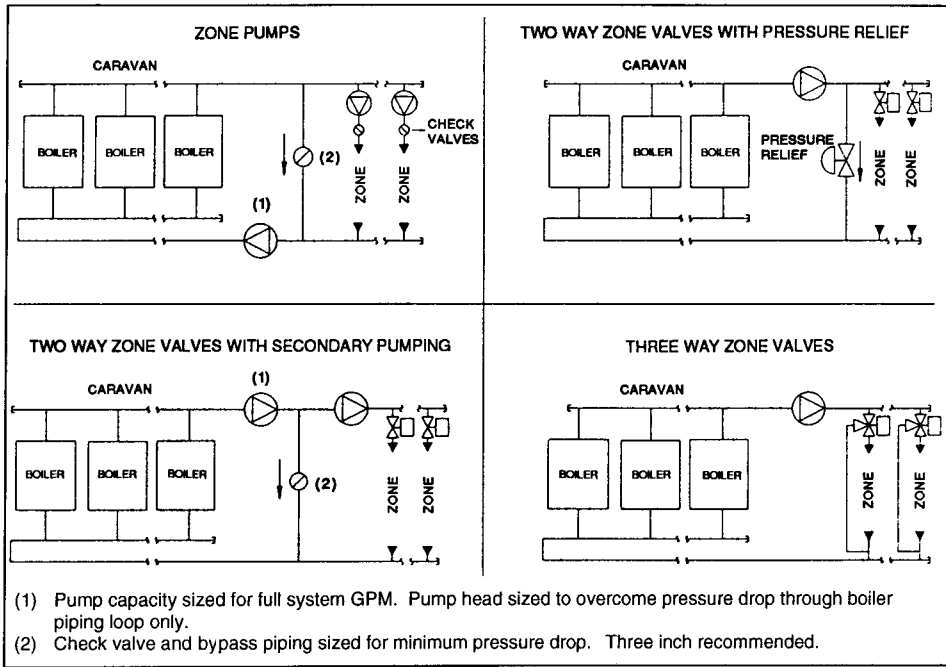


**Design Data**

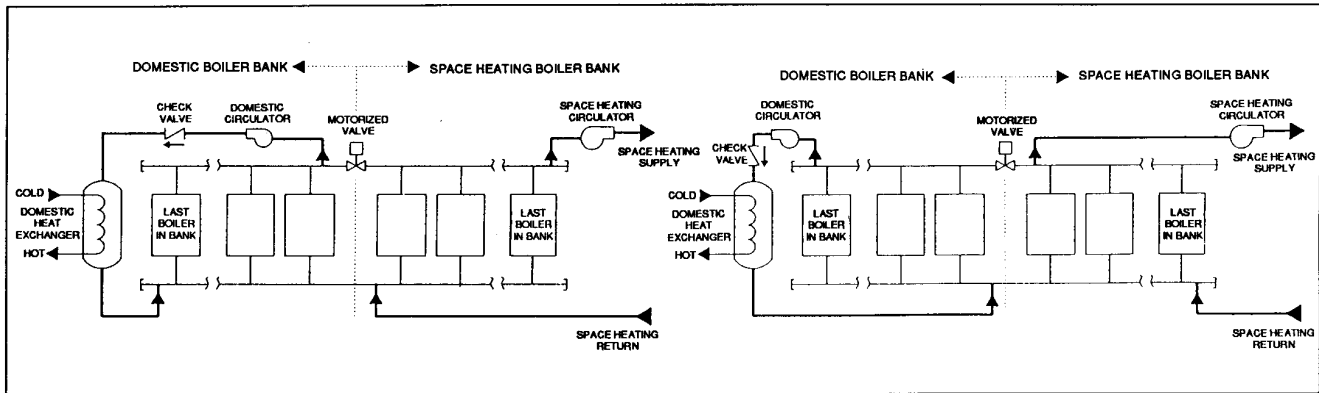
Max. ASME Working Pressure: 100 psi

Power Requirements: 120 volts, 60 HZ, .34 amps per module

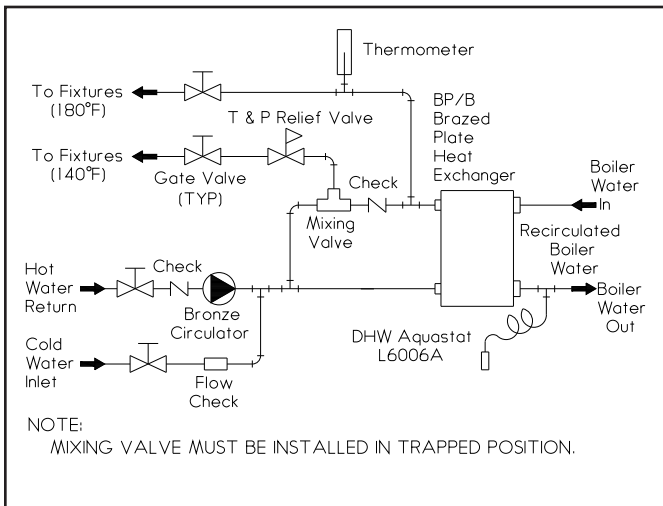
## RECOMMENDED PIPING



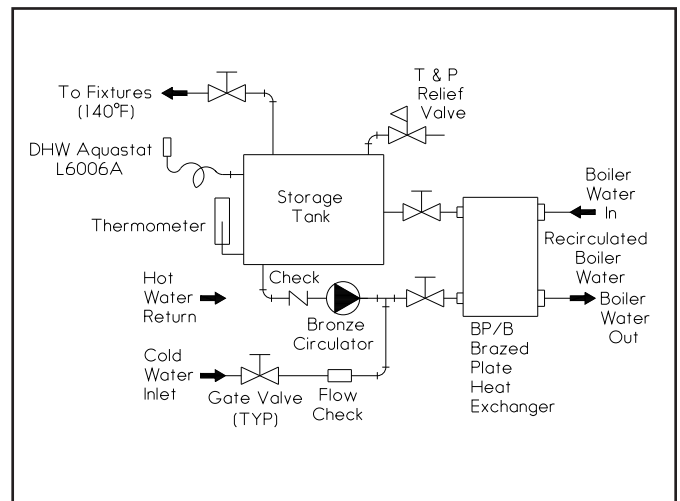
**Figure 2. Recommended boiler piping for variable circulation**



**Figure 3. Supply and return piping locations**



**Figure 4. Instantaneous tankless coil—two temperature with recirculation**



**Figure 5. Storage tank from tankless coil with recirculation**

## EQUIPMENT INCLUDED GGT SERIES — Hot Water Models

### One per module unless otherwise noted

- Pre-assembled heat exchangers with built-in air separators and insulated jacket.
- Base.
- Flue collector.
- Gas burners, gas orifices and manifold assembly.
- Combination gas valve including manual shut-off pressure regulator.
- Pilot adjustment and automatic pilot-thermocouple safety.
- Hi-limit control.
- System pressure and temperature gauge (unmounted, one per system).

- Module pressure and temperature gauge (unmounted).
- Module pressure relief valve (ASME) (unmounted). Specify 30, 50 or 100 psi.
- Control header (unmounted, one per system).
- Draft hoods (unmounted).

### OPTIONAL EQUIPMENT

- Hot water supply and return header assemblies.
- Control panel with automatic lead lag.
- Spark ignition system.
- Vent dampers.
- External DHW heat exchanger.

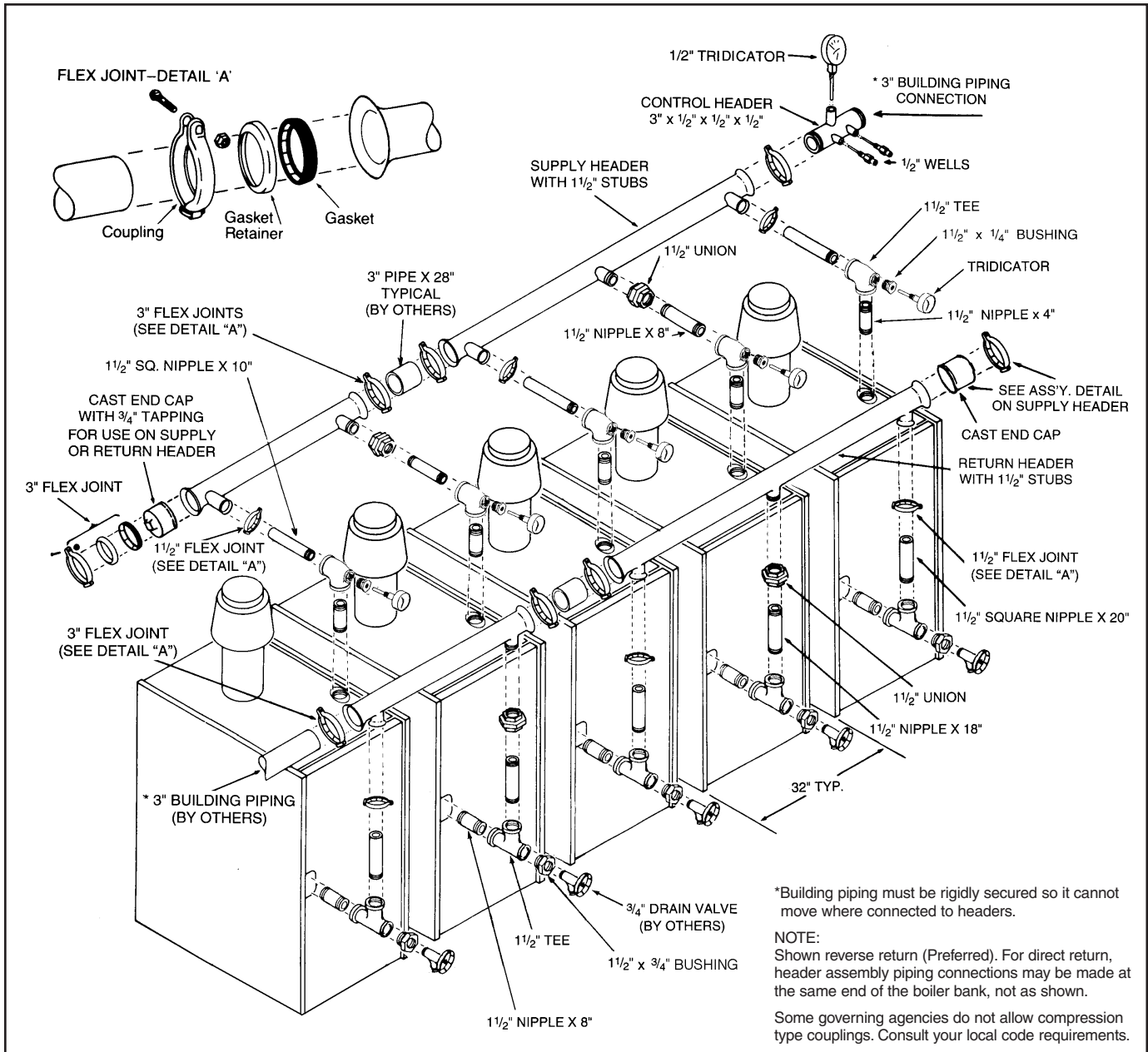


Figure 6. Gas Caravan—optional header assembly for all models GGT hot water Caravan systems

## BOILER ROOM DESIGN

Caravan modular boiler systems allow better utilization of floor space and permit future expansion with minimum cost. Caravan modules are hand truckable, fit through doorways and often may be installed around an existing inoperative boiler. They can be grouped in heating module batteries of single, multiple or angular rows. Gas-fired boiler systems consisting of 11 or more modules should be piped in parallel in two or more batteries. Illustrated on the following page are typical boiler room layouts and dimensional data on the size requirements of gas-fired hot water boilers.

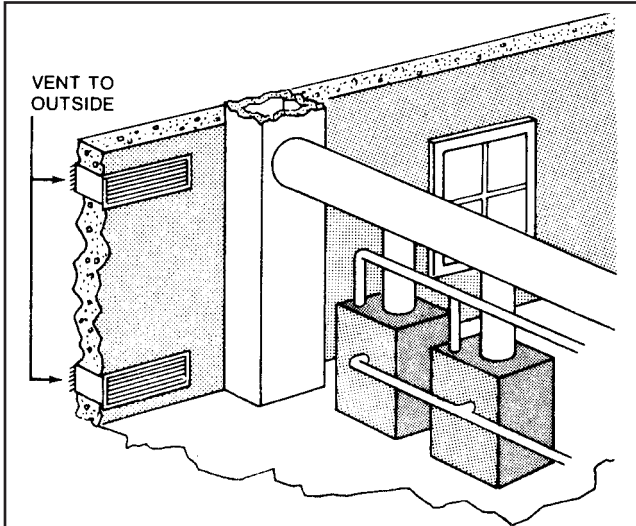


Figure 7: Correct location of combustion-air supply ducts

## BOILER ROOM AIR SUPPLY

To ensure safe, efficient operation, the modular boiler system must be supplied with sufficient air to support complete combustion, replacing air entering draft dampers or draft hoods and ventilating the boiler room or areas.

For additional information, not listed below, see ANSI, Z223.1, section 5.3.3.

INSTALLATION IN ENCLOSED BOILER ROOM REQUIRES TWO UNOBSTRUCTED OPENINGS FOR PASSAGE OF AIR INTO THE BOILER ROOM:

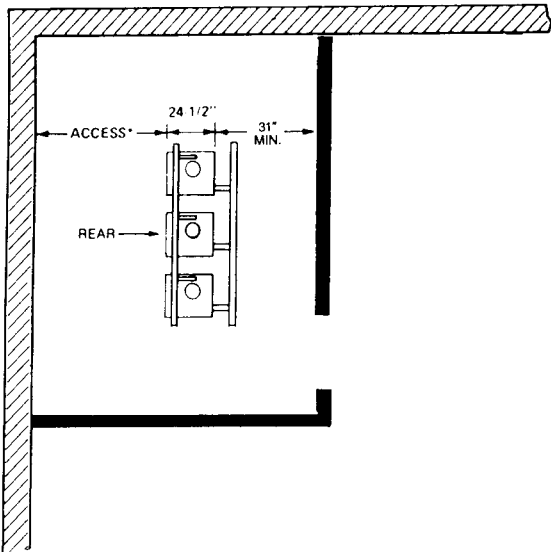
1. **Air drawn horizontally from outdoors DIRECTLY through an outside wall;** one louvered opening near the floor (below burner air inlet) and one louvered opening near the ceiling (above the highest draft regulator), each opening with a minimum FREE air passage area of **1 square inch per 4000 BTUH** of total system input.
2. **Air drawn horizontally through HORIZONTAL DUCTS;** one opening near the floor (below burner inlet) and one opening near the ceiling (above the highest draft regulator), each opening with a minimum FREE air passage area of **1 square inch per 2000 BTUH** of total system input.
3. **Air drawn VERTICALLY from outdoors;** one opening at the floor and one opening at the ceiling, each opening with a minimum FREE air passage area of **1 square inch per 4000 BTUH** of total system input.
4. **Air drawn from inside the building;** one opening near the floor (below burner inlet) and one opening near the ceiling (above the highest draft regulator), each opening with a minimum FREE air passage area of **1 square inch per 1000 BTUH** of total system input.

IF BOILERS ARE INSTALLED ADJACENT TO OTHER FUEL BURNING EQUIPMENT, THE AREA OF FREE OPENINGS MUST BE APPROPRIATELY INCREASED TO ACCOMMODATE THE ADDITIONAL LOAD.

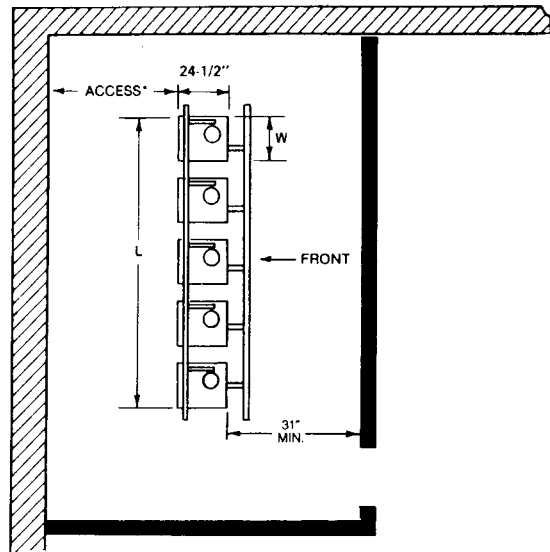
UNLESS PROPERLY CONTROLLED, AVOID THE USE OF FORCED VENTILATION, SINCE IT CAN CREATE AN UNDESIRABLE PRESSURE DIFFERENTIAL BETWEEN BOILER ROOM AND AIR SOURCE.

See Table 1 and Figure 1 for "L" and "D" dimensions and for the distance that the OPTIONAL factory

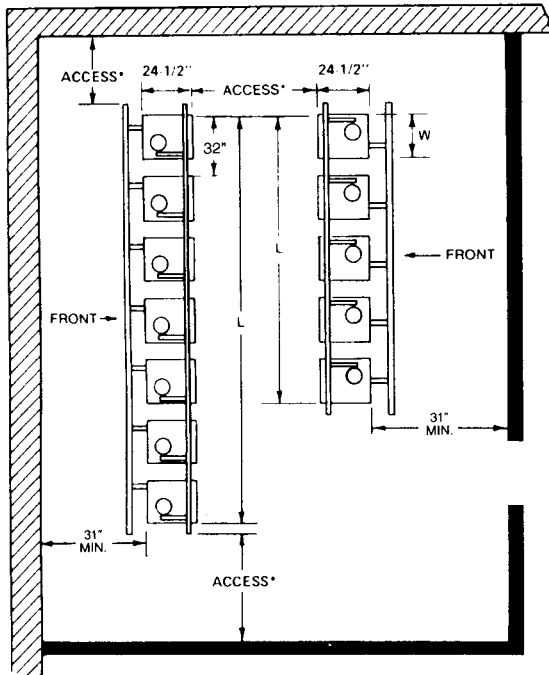
header piping extends over the left and right ends of the boiler bank.



One battery of Model GGT-1125 hot water boilers with 375 MBh input per module.

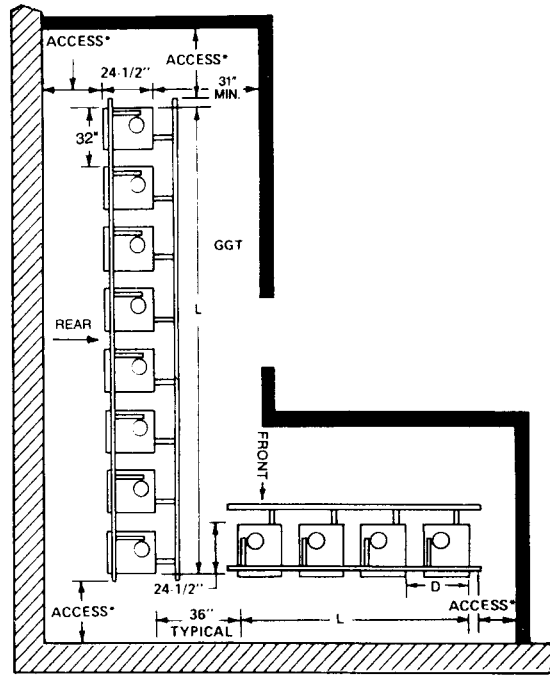


One battery of Model GGT-1875 hot water boilers with 375 MBh input per module.



One battery of Model GGT-2625 and one battery of Model GGT-1875 hot water boilers total input 4500 MBh, with 375 MBh input per module.

\*Caravan can be installed with minimum clearances to the walls as per local codes. However 24" is ideally recommended for service inspection access.



One battery of Model GGT-3000 hot water boiler with 375 MBh input per module and one battery of GGT-1200 hot water boilers with 300 MBh input per module.

Figure 8. Typical layouts for gas-fired systems

## VENTING A GAS-FIRED SYSTEM

A boiler venting system provides an escape path for the products of combustion. There are three major components for venting a gas-fired Caravan: a draft hood for each module, a breeching manifold and a chimney.

### Draft Hood

The draft hood is part of each boiler module, although shipped in a separate carton. It compensates for excessive draft that can be caused by the venturi effect of winds passing over the top of the chimney. The dimensional relationships between the draft hood, the boiler and surface on which the boiler is mounted, are critical. These factors are all interdependent in allowing the draft hood to function without moving parts. Attempts to alter these dimensions can result in unsafe operating conditions.

**Note:** When mounting the modules on a raised platform, be certain the platform extends past the edge of the modules at least 3 inches on all sides.

### Breeching

Breeching is a term used to describe a manifold(s) that connects individual boiler modules to a chimney. Breeching is usually constructed of sheet metal having a smooth interior surface with all joints made tight against leakage. Pitch breeching up toward chimney. Horizontal breeching size should be maintained for the total length. Any transitions should be made after 4 modules. Connection should be made at a 45° angle in the direction of the chimney. See figure 10.

**Table 2. Breeching dimensions for gas-fired systems GGT and GGHT series: hot water boilers.**

Model No.	Consists of		Chimney Height*			
	No. of Modules	Module No.	20 Feet	25 Feet	30 Feet	50 Feet
GGT-400E	2	GG-200EC	9"	9"	8"	8"
GGT-500E	2	GG-250EC	10"	9"	9"	8"
GGT-600E	2	GG-300EC	12"	10"	10"	9"
GGHT-700E	2	GG-350HEC	12"	12"	10"	10"
GGHT-750E	2	GG-375HEC	12"	12"	12"	10"
GGHT-800E	2	GG-399HEC	12"	12"	12"	10"
GGT-900E	3	GG-300EC	14"	12"	12"	12"
GGHT-1050E	3	GG-350HEC	14"	14"	14"	12"
GGHT-1125E	3	GG-375HEC	14"	14"	14"	12"
GGHT-1200E	3	GG-399HEC	16"	14"	14"	12"
GGT-1200E	4	GG-300EC	16"	14"	14"	12"
GGHT-1400E	4	GG-350HEC	16"	16"	16"	14"
GGHT-1500E	4	GG-375HEC	16"	16"	16"	14"
GGT-1500E	5	GG-300EC	16"	16"	16"	14"
GGHT-1600E	4	GG-399HEC	18"	16"	16"	14"
GGHT-1750E	5	GG-350HEC	18"	18"	16"	14"
GGHT-1875E	5	GG-375HEC	18"	18"	18"	16"
GGHT-2000E	5	GG-399HEC	20"	18"	18"	16"
GGHT-2100E	6	GG-350HEC	20"	18"	18"	16"
GGHT-2250E	6	GG-375HEC	20"	20"	18"	16"
GGHT-2400E	6	GG-399HEC	20"	20"	20"	18"
GGHT-2450E	7	GG-350HEC	20"	20"	20"	18"
GGHT-2625E	7	GG-375HEC	22"	20"	20"	18"
GGHT-2800E	7	GG-399HEC	22"	22"	20"	18"
GGHT-2800E	8	GG-350HEC	22"	22"	20"	18"
GGHT-3000E	8	GG-375HEC	24"	22"	22"	20"
GGHT-3150E	9	GG-350HEC	24"	22"	22"	20"
GGHT-3200E	8	GG-399HEC	24"	22"	22"	20"
GGHT-3375E	9	GG-375HEC	24"	24"	22"	20"
GGHT-3500E	10	GG-350HEC	24"	24"	22"	20"
GGHT-3600E	9	GG-399HEC	26"	24"	24"	20"
GGHT-3750E	10	GG-375HEC	26"	24"	24"	22"
GGHT-4000E	10	GG-399HEC	26"	26"	24"	22"

Based on single row of modules with no elbows.

\* Height measured from top of draft hood to top of chimney.

NOTE: For conditions other than those shown, consult factory, or National Fuel Gas Code NFPA 54

Run breeching as high as clearance permits to obtain maximum vertical rise of individual boiler vents. Note that this does not alter chimney height (the height from hood skirt to chimney top). The portion of chimney height rising directly above each hood is most effective in preventing spillage. When the boiler room is in unheated space, insulate vent pipe and breeching to maintain flue gas temperature and good chimney operation. **It is not permitted to lower draft hood skirt height to achieve pitch, or to compensate for low ceilings.** For some combinations of low chimneys, ceilings and long breeching, a draft inducer may be needed. Inducers when required are locally specified and warranted. The breeching should extend into, but not beyond, the chimney liner.

### Chimney

Caravan gas-fired modular boilers operate efficiently with masonry or prefabricated chimneys as well as with "Type B" or double-walled metal vent pipe. This latter type of chimney construction is generally the least expensive. Chimney height is usually governed by the building height and the size of the boilers (see Table 1). However, the chimney should be high enough to minimize the effects of turbulent winds and pressure common near roof-top obstruction. A vent cap should be used where permitted for additional protection against adverse wind conditions and precipitation. The National Board of Fire Underwriters recommend that the chimney should extend at least 3 feet above the roof and be 2 feet higher than any obstruction within 10 feet.

### Sizing Horizontal Breeching Connectors and Chimneys for Gas-Fired Systems

Horizontal breeching connectors shall be constant sized. The chimney and the horizontal breeching connector are sized using Table 2.

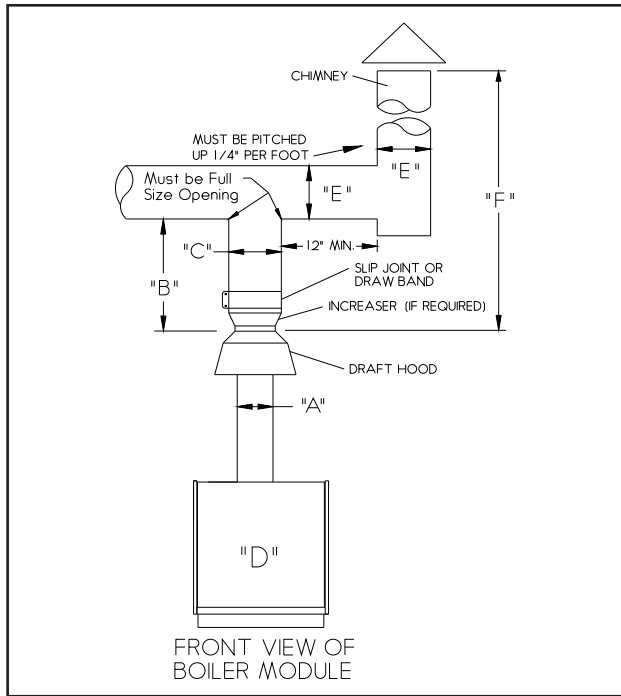
When there are multiple banks of boilers, the horizontal breeching connector for each bank is sized using Table 2. To size the common horizontal breeching connector, add up the total input and refer to Table 2 to size.

The minimum chimney opening will be equal to the size of the largest horizontal breeching section connected to it.

### Horizontal Breeching Connector Length

The **MAXIMUM** length of the horizontal breeching connector length between the chimney and the closest boiler shall **NOT** be longer than 12 inches per inch of horizontal breeching connector diameter, i.e. if the horizontal breeching connector is 16" D., the **MAXIMUM** length from the chimney to the first boiler would be 16" x 12" or 192 inches. The **MINIMUM** length shall be 12 inches regardless of the horizontal breeching connector diameter. See figure 9.





**Connector Rise:** Connector rise is the length of the pipe connecting the top of the draft hood to the system breaching above. The diameter of this pipe varies depending upon BTU input, chimney height and the length of the connector. Fig.9 (Dim. "B") shows the location of this pipe in a typical application. Table 2a depicts the proper diameter (Dim. "C") of the connector rise depending upon its total length (top of the draft hoods to the breaching above).

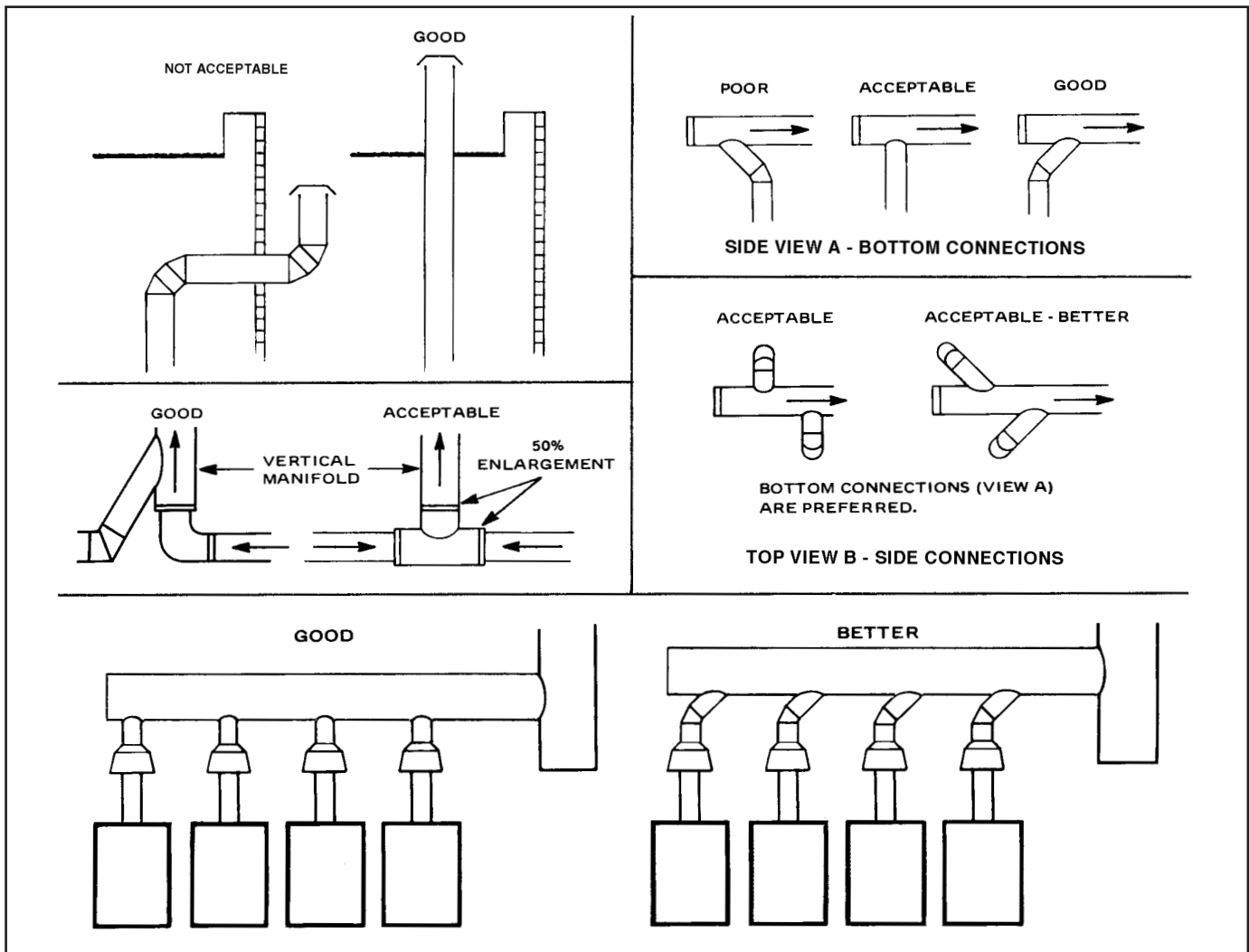
**Vent Connector Diameters (20' chimney\*)**

Model	Flue Outlet Size	Connector		
		3' High	2' High	1' High
GG-200C	7"	7"	7"	8"
GG-250C	8"	8"	8"	10"
GG-300C	8"	8"	10"	10"
GG-350H	9"	9"	10"	12"
GG-375-HC	10"	10"	10"	12"
GG-399-HC	10"	10"	12"	12"

Based on single row of modules with no elbows.

NOTE: For conditions other than those shown, consult factory, or National Fuel Gas Code NFPA 54

**Figure 9. Connector rise**



**Figure 10. Suggested venting system constructions**

# GAS PIPING

This section contains sizing and construction recommendations for fuel supply piping to Caravan gas-fired modular boiler systems. Gas-fired equipment must conform not only to codes of local regulatory agencies, but also to additional specifications that may be imposed by the utility or gas supplier. Therefore, the following information should be considered only as a guideline.

Figure 11 illustrates a typical gas supply line installation. It consists of a main between the utility's meter box and the boiler system, a main shut-off valve sediment trap, gas header pipe and drip legs on individual boilers.

Individual gas lines to individual boiler modules should be 3/4" diameter. Size of gas main and header pipes depends on volume of gas required and acceptable pressure drop between meter and modules' gas regulator valves. Minimum pressure required at each valve is 5 inches of water column for natural gas and 11 inches for propane gas, measured while all boilers and other gas-fired equipment on the same meter are firing. Small variations in gas flow can be compensated for by adjusting gas regulator valves. However, final pressure of gas header must vary no more than + 0.3 in. of water column.

**Table 3: Gas consumption rate hot water boilers only**

Model No.	Gas Consumption In CFH
GGT-400E	400
GGT-500E	500
GGT-600E	600
GGHT-700E	700
GGHT-750E	750
GGHT-800E	798
GGT-900E	900
GGHT-1050E	1050
GGHT-1125E	1125
GGHT-1200E	1197
GGT-1200E	1200
GGHT-1400E	1400
GGHT-1500E	1500
GGT-1500E	1500
GGHT-1600E	1596
GGHT-1750E	1750
GGHT-1875E	1875
GGHT-2000E	1995
GGHT-2100E	2100
GGHT-2250E	2250
GGHT-2400E	2394
GGHT-2450E	2450
GGHT-2625E	2625
GGHT-2800E	2793
GGHT-2800E	2800
GGHT-3000E	3000
GGHT-3150E	3150
GGHT-3200E	3192
GGHT-3375E	3375
GGHT-3500E	3500
GGHT-3600E	3591
GGHT-3750E	3750
GGHT-4000E	3990

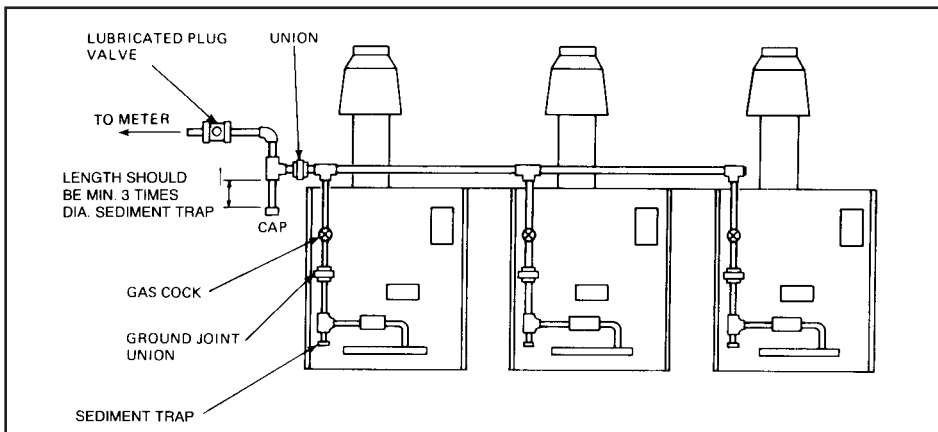
## Gas Main Sizing

To determine the correct pipe diameter for the gas main serving a specific Caravan system, proceed as follows:

- Follow the building plans, find total length of straight pipe between supply from gas meter and boiler gas header.
- Using data in Table 4, calculate equivalent linear length of screw pipe fittings used in fabrications of main. Add this to figure from step (a) to obtain equivalent total length.
- Find Caravan gas consumption in cubic feet per hour from Table 3 in hot water systems.
- Multiply the system total hourly gas consumption by flow correction value from Table 5.
- Locate system's total equivalent pipe length in right column of Table 6.
- Move vertically to the system's corrected flow rate calculated in step (c). If this value falls between two of those listed, select larger value.
- From this point move horizontally to the left column and read suggested pipe diameter for gas main.

**Table 4: Equivalent linear length in feet of standard iron pipe fittings for natural gas**

Pipe Size Inches	Elbow			Valve			Return Bend	Side Outlet Tee
	Standard	Medium Sweep	Long Sweep	Gate	Globe	Angle		
1/2	0.84	0.52	0.41	0.031	2.50	1.12	1.25	1.66
3/4	1.17	0.73	0.57	0.044	3.50	1.84	1.75	2.33
1	1.57	0.98	0.77	0.057	4.68	2.11	2.34	3.11
1-1/4	2.19	1.37	1.07	0.082	6.54	2.94	3.27	4.35
1-1/2	2.63	1.64	1.29	0.098	7.84	3.52	3.92	5.21
2	3.55	2.23	1.74	1.320	10.60	4.77	5.30	7.05
3	5.72	3.59	2.81	2.130	17.08	7.69	8.84	11.40



**Figure 11. Typical gas supply line installation**

**Table 5. Characteristics of various fuel gases**

Type of Gas	Heating Valve*†	Flow Correction Factor
Natural	1000 Btu	1.00
Propane	2500 Btu	1.10

\* per cubic foot

† Consult fuel supplier for actual BTU value.

*Maximum capacity of pipe in cubic feet of gas per hour for gas pressures of 0.5 psig or less and a pressure drop of 0.3 inch water column (based on a 0.60 specific gravity gas).*

**Table 6. Gas main sizing guide**

Nominal Iron Pipe Size Inches	Internal Diameter Inches	Equivalent Length of Pipe, Feet							
		10	20	30	40	50	60	70	
1/4	.364	32	22	18	15	14	12	11	
3/8	.493	72	49	40	34	30	27	25	
1/2	.622	132	92	73	63	56	50	46	
3/4	.824	278	190	152	130	115	105	96	
1	1.049	520	350	285	245	215	195	180	
1 1/4	1.380	1,050	730	590	500	440	400	370	
1 1/2	1.610	1,600	1,100	890	760	670	610	560	
2	2.067	3,050	2,100	1,650	1,450	1,270	1,150	1,050	
2 1/2	2.469	4,800	3,300	2,700	2,300	2,000	1,850	1,700	
3	3.068	8,500	5,900	4,700	4,100	3,600	3,250	3,000	
4	4.026	17,500	12,000	9,700	8,300	7,400	6,800	6,200	
		<b>80</b>	<b>90</b>	<b>100</b>	<b>125</b>	<b>150</b>	<b>175</b>	<b>200</b>	
1/4	.364	11	10	9	8	8	7	6	
3/8	.493	23	22	21	18	17	15	14	
1/2	.622	43	40	38	34	31	28	26	
3/4	.824	90	84	79	72	64	59	55	
1	1.049	170	160	150	130	120	110	100	
1 1/4	1.380	350	320	305	275	250	225	210	
1 1/2	1.610	530	490	460	410	380	350	320	
2	2.067	990	930	870	780	710	650	610	
2 1/2	2.469	1,600	1,500	1,400	1,250	1,130	1,050	980	
3	3.068	2,800	2,600	2,500	2,200	2,000	1,850	1,700	
4	4.026	5,800	5,400	5,100	4,500	4,100	3,800	3,500	

## CONTROLS

### THE BOILER STAGING CONCEPT

The heart of the Caravan boiler plant is a temperature-actuated control system that automatically stages only those boiler modules needed to meet the heating demand in a given period, thereby conserving fuel.

In a staging control system, each stage ordinarily activates one boiler module. With appropriate wiring, multiple modules can be grouped within a stage.

During a fluctuation in heating requirements, a large central boiler cycles on and off to match heat output to building demand. A staged modular boiler system, on the other hand, will energize only as many modules as the system load requires. Only one stage cycles at a time. The other stages remain off or operate continuously, thereby performing at peak efficiency. For example, in a 10 module boiler system, with the heating load at 61% of capacity, six of the modules operate continuously at peak efficiency. Fractional heating requirements are supplied by the seventh "cycling" module, while the remaining three modules are "off." This is in contrast to a single large central boiler that simply cycles on and off, resulting in lower efficiency.

Over-sizing is a major factor in poor system efficiency. Most of the time a single central boiler is oversized. Historical data shows that many single central boilers are considerably oversized even at the outdoor temperature for which they were designed. Modular boiler systems are not oversized by more than a portion of one module, regardless of the load.

The Caravan control system automatically compensates for seasonal temperature changes. It energizes more or fewer modules depending on changes of outside temperature, system water temperature, or both. Modules save energy by operating in long cycles at full-rated output and maximum efficiency.

### CONTROL SYSTEM SELECTION

Slant/Fin offers two controls to step fire a hot water Caravan system. The SC-3 and SC-9 controls fulfill a wide range of applications. They control the boiler system and are not intended to be the sole building temperature control. They do not replace zoning the system or the thermostats that control these zones.

#### SC-3 Control

The SC-3 control allows up to 3 stages in a Caravan system. Generally each stage controls 1 module. However, it is possible to have more than 1 module activated with each stage.

**Standard programmable features include:** system activation or de-activation based on outdoor temperature; minimum target supply water temperature; adjustable design target supply water temperature; adjustable delay between stages; adjustable outdoor temperature and indoor design temperatures.

The view menu on the control includes error messages, actual outdoor air temperature, actual supply water temperature, target supply water temperature and running time for each stage.

### **This control can be programmed as follows:**

1. **Outdoor reset:** The supply water temperature is automatically adjusted up or down based on outdoor temperature. The control automatically controls the number of modules required to maintain required supply water temperature.
2. **Setpoint temperature:** The control can be programmed to maintain a set supply water temperature. The control automatically controls the number of modules activated to maintain the setpoint temperature.

### **SC-9 Control**

The SC-9 control allows up to 9 stages of operation for space heating, domestic water or combination, in a Caravan system. Generally each stage controls 1 module. However, it is possible to have more than one module activated with each stage.

**Standard programmable features include:** system activation or de-activation based on outdoor temperature; minimum target supply water temperature; adjustable design target supply water temperature; adjustable delay between stages; adjustable outdoor and indoor design temperatures; delay to allow combustion air damper to open; ability to provide equal run time rotation of boiler modules; fixed lead of a module when Caravan system activates; first on/last off or first on/first off for modules; control of primary circulator and periodic exercising of primary circulator when system is inactive.

The view menu on the control includes error messages, actual outdoor air temperature, actual supply water temperature, target water temperature, running time for each stage and the difference between supply water and return water temperatures.

### **The SC-9 can be programmed as follows:**

1. **Outdoor reset:** The supply water temperature is automatically increased as outdoor temperature decreases and decreased as outdoor temperature increases. The control activates only the number of stages required to maintain the required supply water temperature.
2. **Setpoint temperature:** The control maintains a set supply water temperature. The control activates only the number of stages required to maintain the setpoint temperature. Setpoint temperature may be used for a Caravan system that is dedicated for use as volume water heating.
3. **Domestic hot water:** The domestic hot water controls override the SC-9 control for only those modules used to heat the domestic hot water. The modules for domestic hot water are isolated from space heating system until demand for domestic hot water is satisfied. The modules not used for domestic hot water heating remain under control of SC-9 control.

Slant/Fin offers domestic hot water control packages and external tankless heaters as options for use with the SC-9 control.

## **BILL OF MATERIALS FOR SC SERIES CONTROLLERS**

### **Material List for SC-3**

- SC-3 modular boiler control (part# 435-084)
- 1 Outdoor sensor (part # 339-070)
- 1 Universal sensor to be used as supply water sensor (part # 339-071)
- 1 Plastic tie strap

### **Material List for SC-9**

- 1 SC-9 modular boiler control (part # 435-085)
- 1 Outdoor sensor (part # 339-070)
- 2 Universal sensors (part # 339-071)
  - 1 to be used as supply water sensor
  - 1 can be used as return water sensor
- 2 Plastic tie straps

### **Other Options include:**

- Immersion well for supply water sensor: to be installed in control header supplied with Caravan
- High Limit (manual reset) and Immersion Well: to be installed in control header supplied with Caravan
- Low Water Cut-Off (manual reset): to be installed in modular boiler headers above modules cast iron heat exchanger
- Domestic Hot Water Control Packages: components include EMV valve; setpoint aquastat L6006A with immersion well. This is to be used with external heat exchanger such as Caravan BP series brazed plate heat exchangers.

Circulators, switches, wiring and other relays are provided by contractor.

## FIELD WIRING AT MODULES

Figure C1 GAS STANDING PILOT WITH OR WITHOUT VENT DAMPER

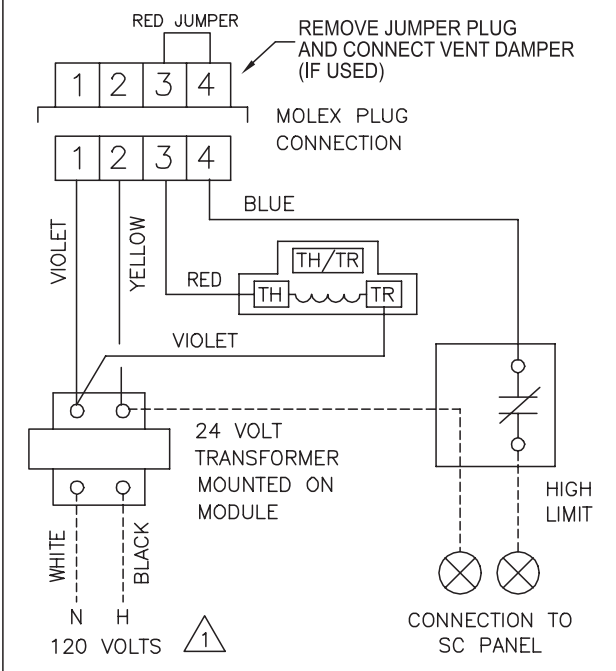


Figure C2 GAS INTERMITTENT IGNITION WITH OR WITHOUT VENT DAMPER

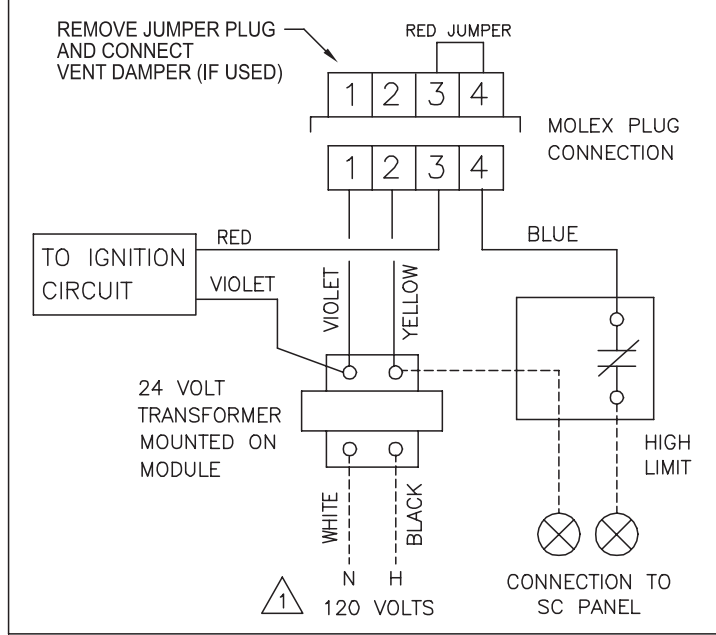


Figure C3 MULTIPLE MANUAL RESET HIGH LIMIT WIRING (IF USED)

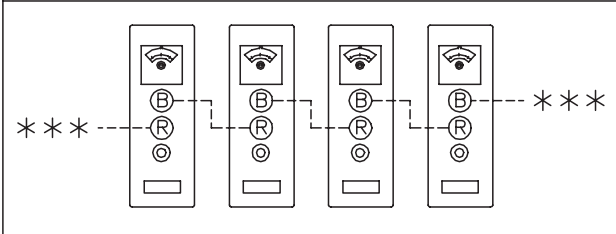


Figure C4 MULTIPLE HYDROLEVEL 550 L.W.C.O. WIRING (IF USED)

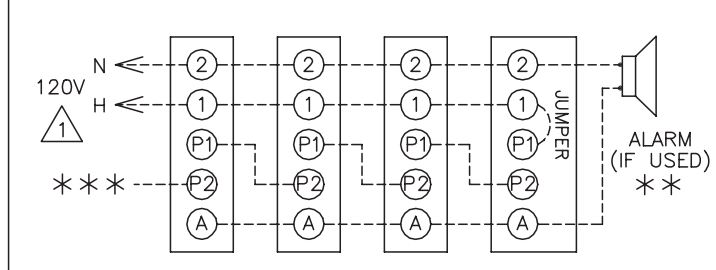


Figure C5 MM 750P-MT-120 L.W.C.O. ALTERNATE WIRING (IF USED)

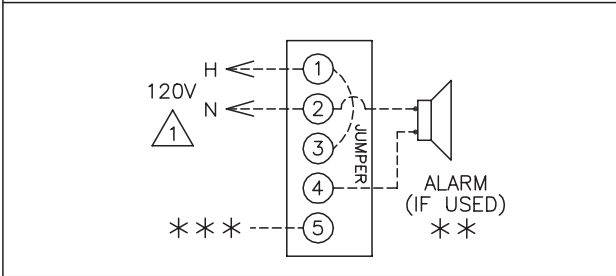
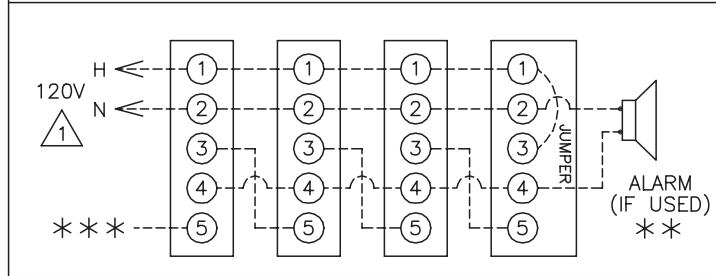


Figure C6 MULTIPLE MM 750P-MT-120 L.W.C.O. WIRING (IF USED)

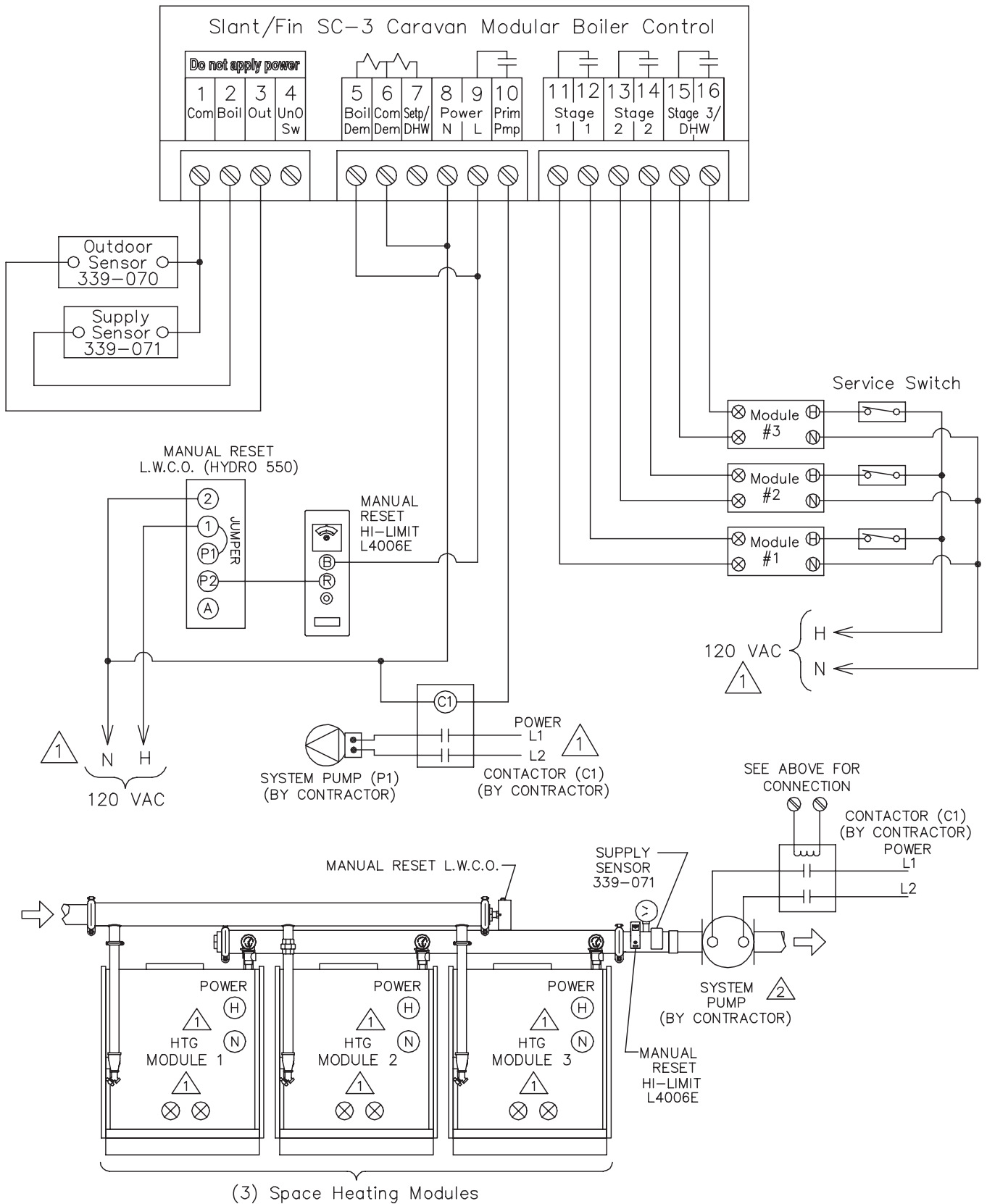


**LEGEND:**

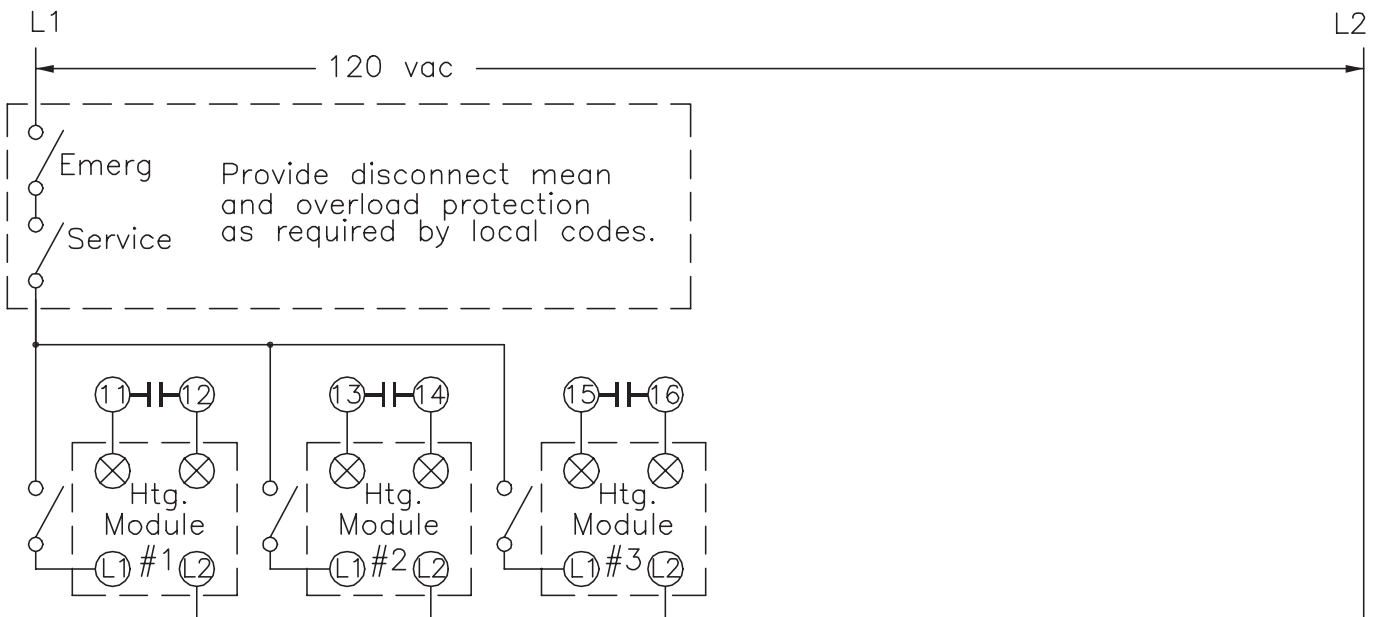
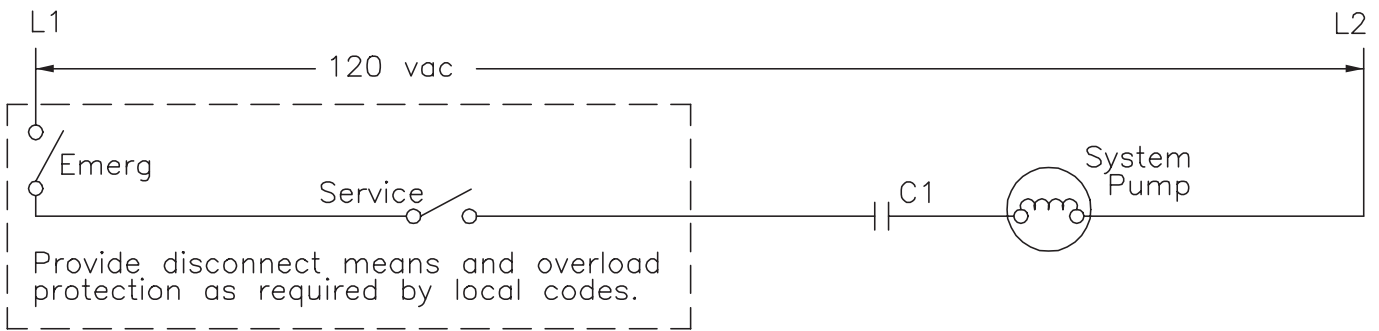
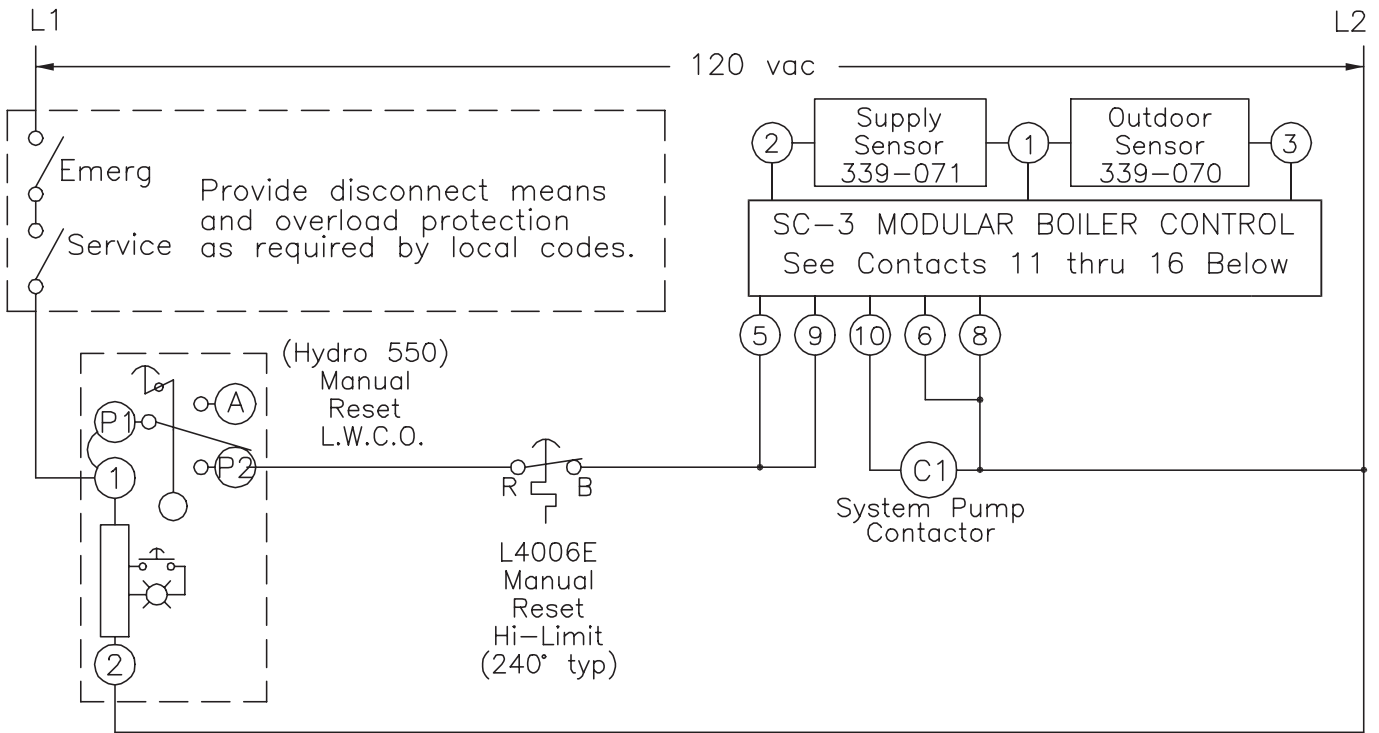
- FIELD WIRING
- FACTORY WIRING

- ⚠ — PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED BY LOCAL CODE.
- \*\* — OPTIONAL ALARM CIRCUIT BY CONTRACTOR.
- \*\*\* — REFER TO SC-3 OR SC-9 WIRING DIAGRAM FOR PROPER WIRE CONNECTION.

# SC-3 SYSTEM WIRING DIAGRAM

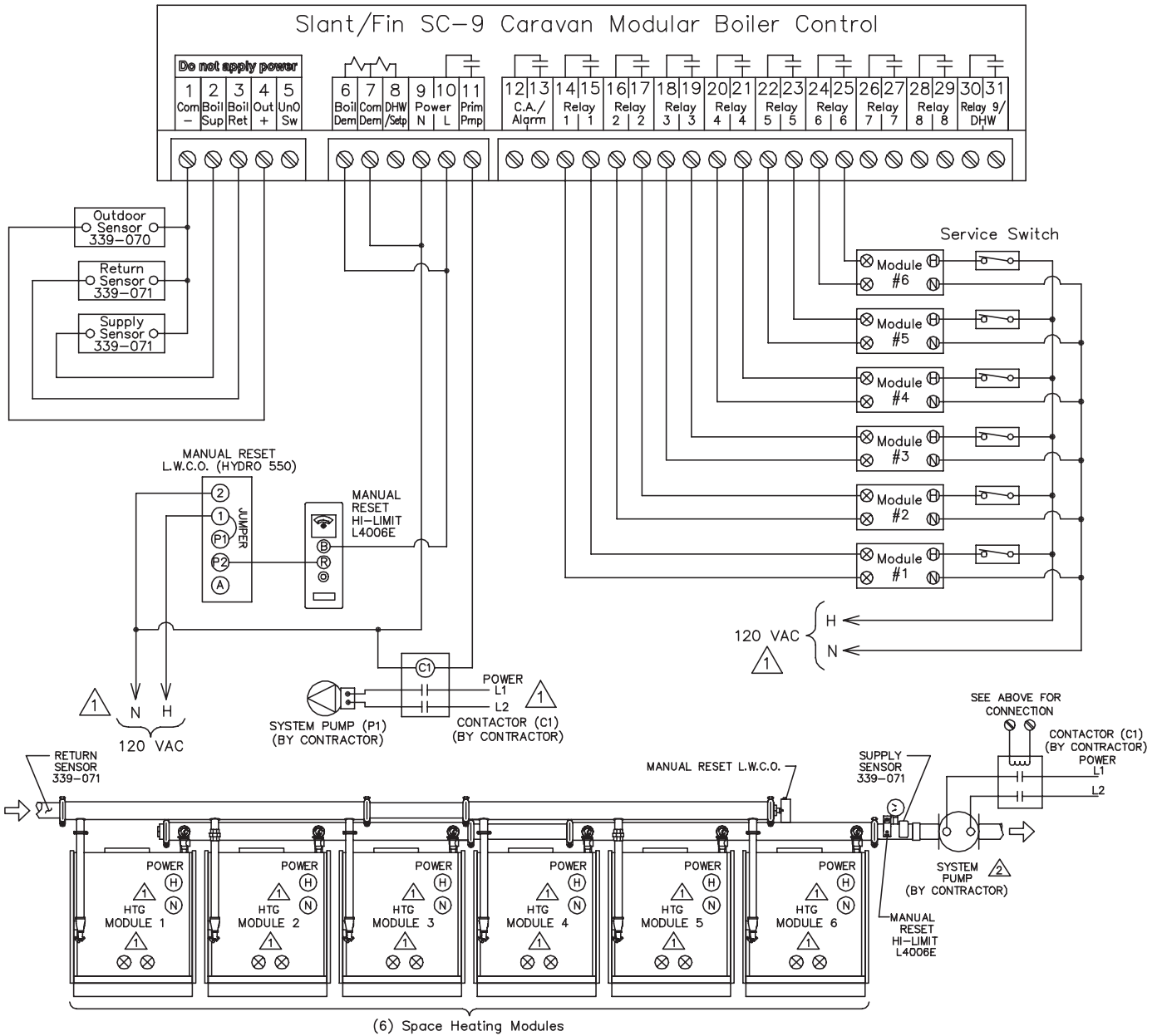


### SC-3 LADDER WIRING DIAGRAM



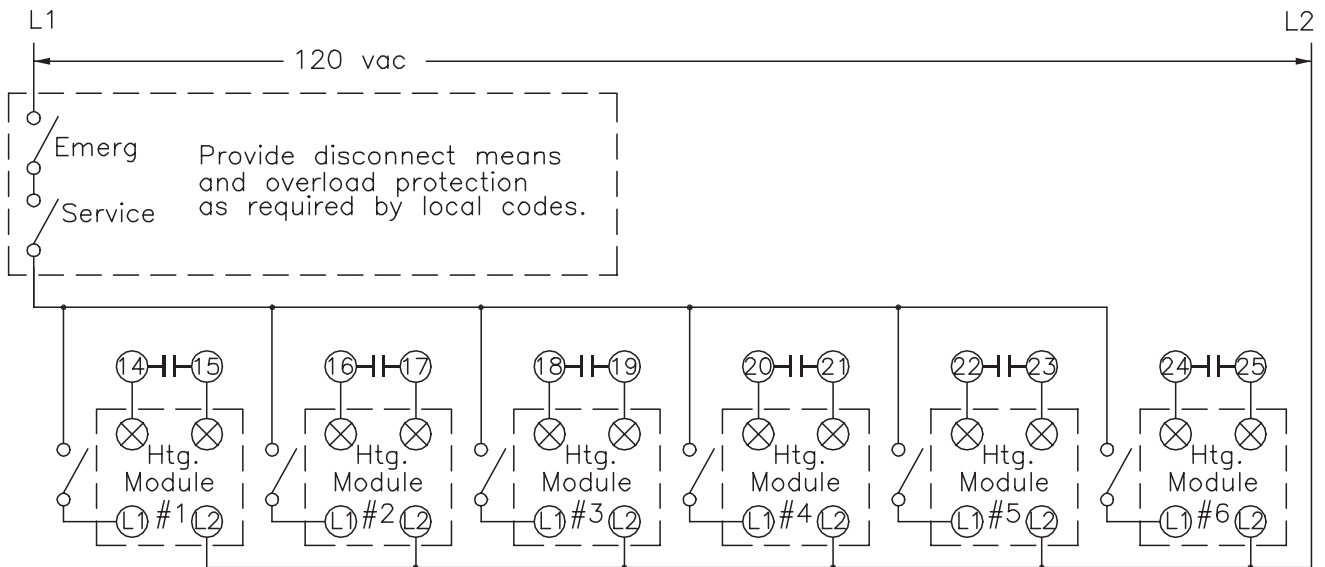
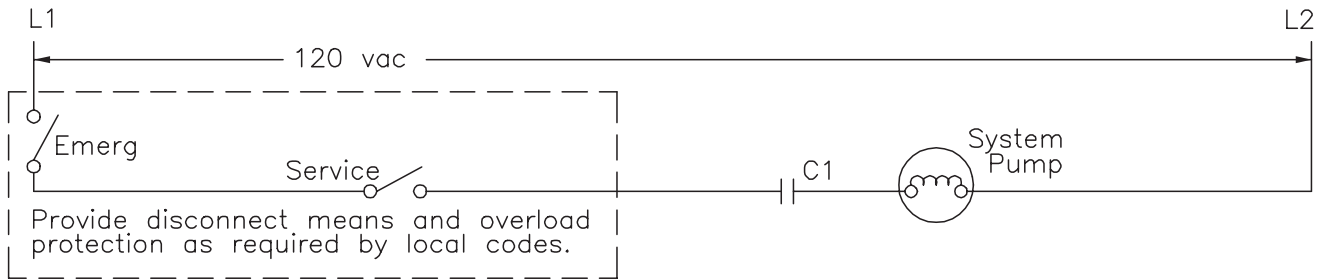
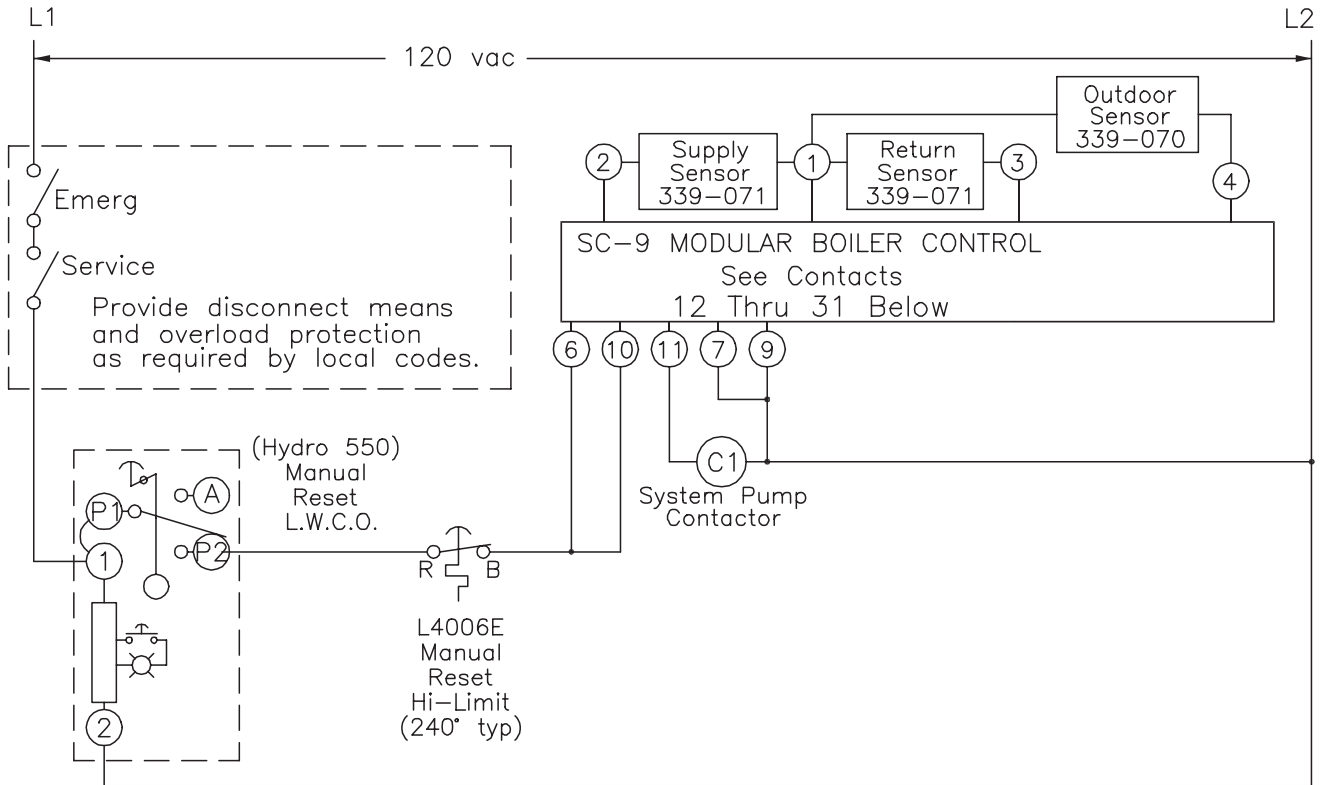
⊗ - SEE FIG. C1 THROUGH C3 FOR CONNECTION AT MODULE.

# SC-9 SPACE HEATING WIRING DIAGRAM



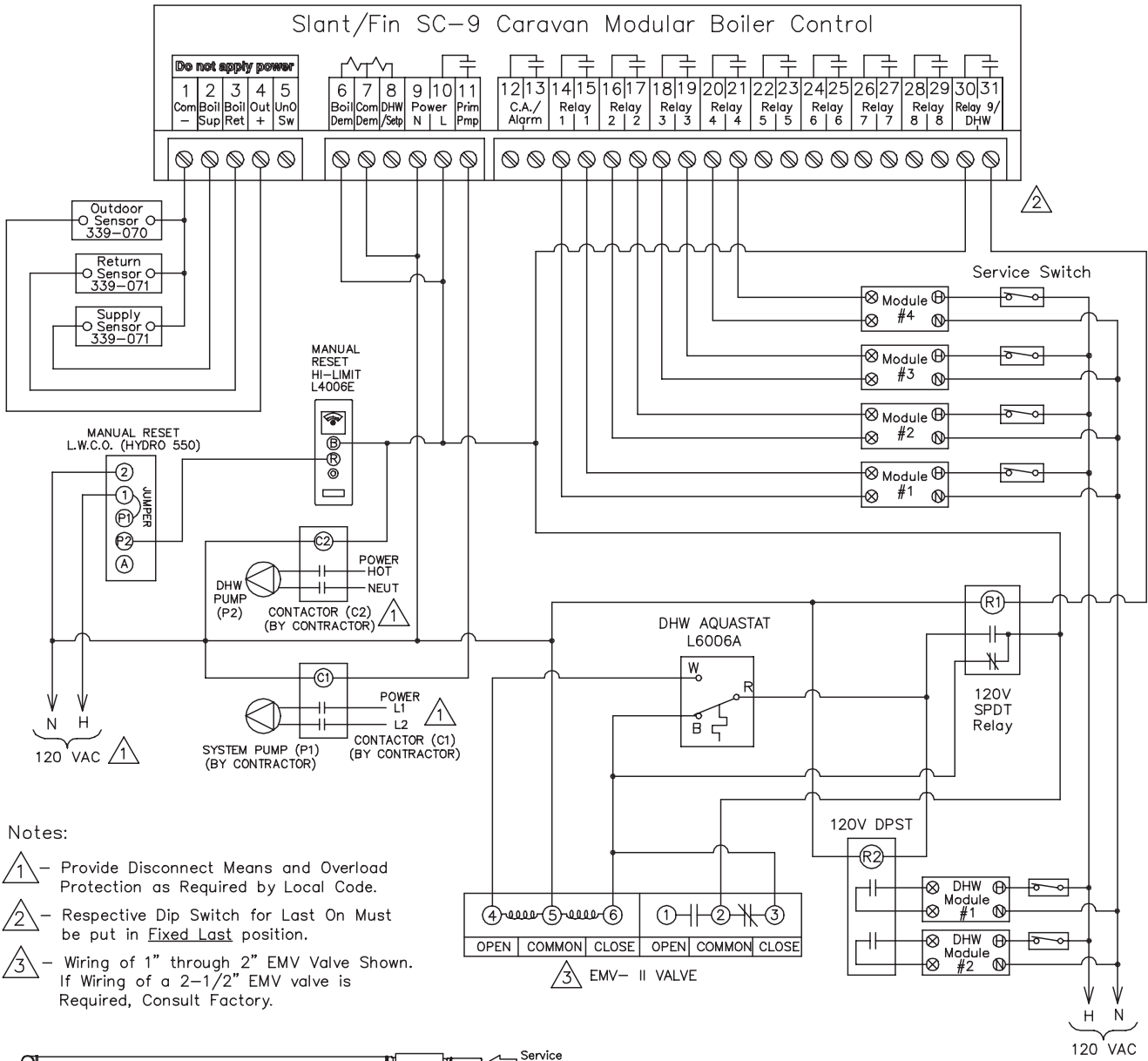


# SC-9 SPACE HEATING LADDER WIRING DIAGRAM



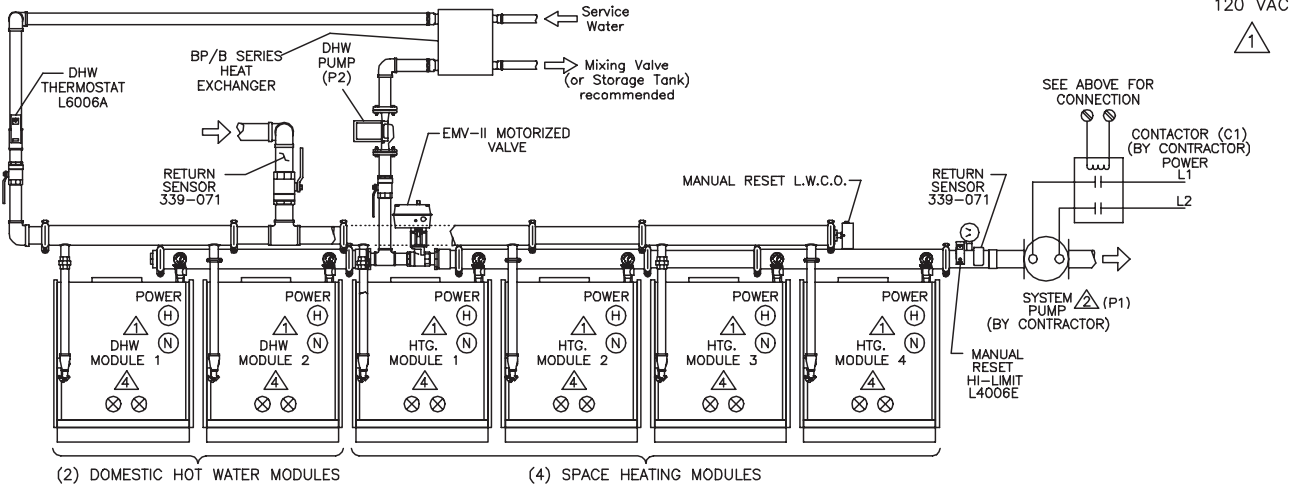
⊗ - SEE FIG. C1 THROUGH C3 FOR CONNECTION AT MODULE.

# SC-9 SPACE AND DOMESTIC HOT WATER WIRING DIAGRAM

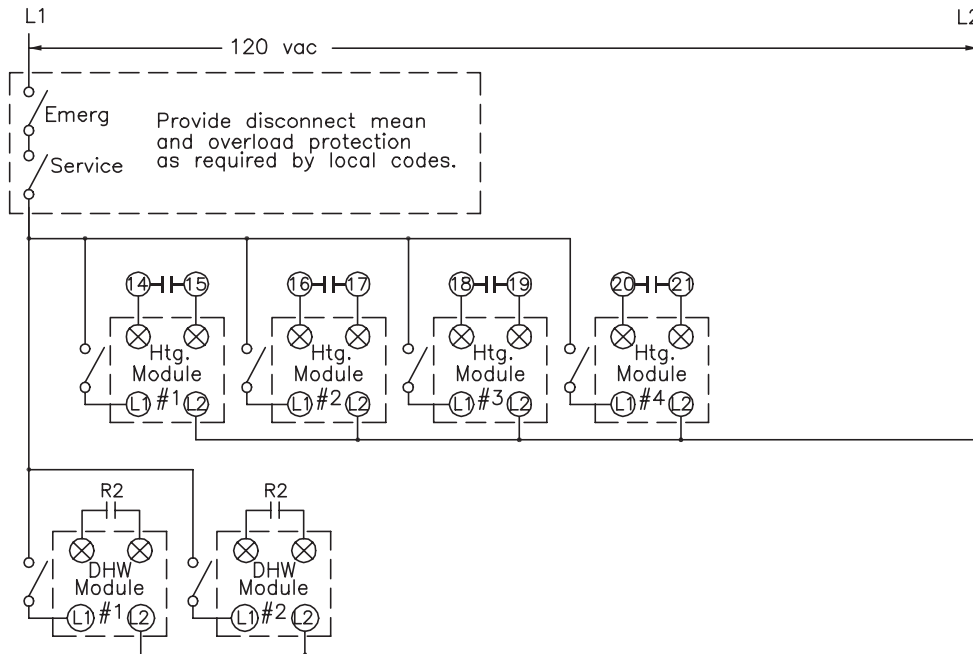
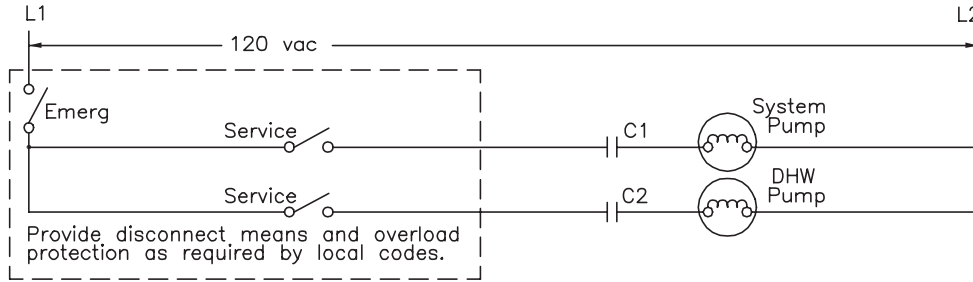
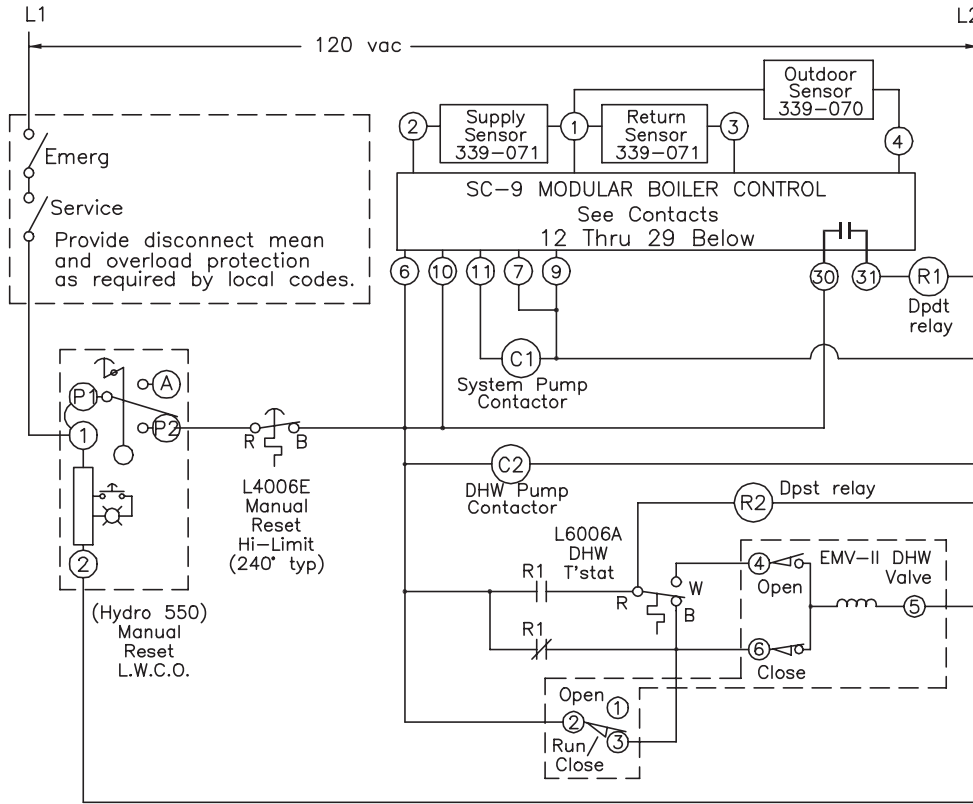


**Notes:**

- ① - Provide Disconnect Means and Overload Protection as Required by Local Code.
- ② - Respective Dip Switch for Last On Must be put in **Fixed Last** position.
- ③ - Wiring of 1" through 2" EMV Valve Shown. If Wiring of a 2-1/2" EMV valve is Required, Consult Factory.



# SC-9 SPACE AND DOMESTIC HOT WATER LADDER WIRING DIAGRAM



⊗ - SEE FIG. C1 THROUGH C3 FOR CONNECTION AT MODULE.

# Slant/Fin Limited Five-Year Warranty

for Caravan Modular and Individual Commercial Application  
Cast-iron Hot Water Boilers in Space Heating Applications.

## WARRANTY INCLUDES:

**FIRST YEAR:** Repair or replacement in accordance with warranty service procedure, for a period of one year after original installation, of all parts found to be defectively manufactured.

## WARRANTY INCLUDES:

**SECOND THROUGH FIFTH YEAR:** Repair or replacement for the second through fifth year after original installation, of cast iron heat exchanger found to be defectively manufactured, at no cost for the replacement part. The repaired or exchanged part will be warranted for only the unexpired portion of the original warranty.

**This warranty extends only to boilers in space heating applications.**

Warranty extends only to boilers which have been properly installed, operated and maintained in accordance with Slant/Fin installation instructions and all applicable codes. Warranty applies only if the boiler has remained at all times in the location at which it was originally installed. Slant/Fin makes no express warranties other than the warranties contained herein.

## WARRANTY EXCLUDES:

All labor charges incurred by any person in connection with the examination, removal, and repair of parts claimed to be defective and the installation of replacement parts.

The part claimed to be defective shall be returned to Slant/Fin. The cost of shipment to Slant/Fin is borne by the consumer.

Damage caused by water that contains excessive lime, calcium, or other contaminants.

Boilers operated with combustion air that may be contaminated by chemicals or improper fuel additives.

Improper burner adjustments, control settings or maintenance procedures.

**NOTE:** Boilers are to be used in closed systems. Any application that causes significant quantities of fresh make up water to enter the system is not permitted. Such applications can be met with a heat exchanger that will maintain the boilers in a closed system.

## AFTER FIRST YEAR, WARRANTY EXCLUDES:

All boiler components other than a cast-iron heat exchanger, such as, sheet metal base, jacket, insulation, combustion chamber, tankless heater exhaust and air inlet piping, burner enclosure, mixing elbow, gas and air orifice, blower assembly, air filter and electrical and mechanical components furnished to Slant/Fin by other manufacturers, such as pumps, relays, controls, gauges, etc.

## PROCEDURE FOR WARRANTY SERVICE:

For warranty service, provide the person who installed your Slant/Fin boiler with the following information: boiler model number and serial number (from the boiler rating plate) and the date of installation. That person will notify the Slant/Fin wholesaler from whom the boiler was purchased.

Part(s) claimed to be defective must be returned through trade channels and replacement part(s) will, if warranty conditions are met, be provided by Slant/Fin through the wholesaler.

If there are any questions about the coverage of this warranty, please contact Slant/Fin at the address shown below.

## LIMITATIONS ON IMPLIED WARRANTIES AND DAMAGES:

Slant/Fin assumes no liability for damages or unsatisfactory performance of any kind which is a result of improper installation.

Slant/Fin's sole obligation in the event of a breach of any implied warranty (including, but not limited to, implied warranties of merchantability and fitness for a particular purpose) is limited to repair or replacement, and all such warranties are limited in duration to the period of time after the date of original installation as stated above.

This warranty does not cover claims for incidental or consequential damages resulting from a breach of any express or implied warranty or any other reason.

Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages. So the above limitation or exclusion may not apply to you.

**THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.**

Technical Service Department

**Slant/Fin**<sup>®</sup>

Slant/Fin Corporation, 100 Forest Drive at East Hills, Greenvale, N. Y. 11548 • (516) 484-2600

# NOTES

# NOTES

## CARAVAN SYSTEM RATING PLATE

System rating plate format for Caravan modular boiler system.  
System rating plates are available upon request using the form on the back cover.



**Slant/Fin** CORP. GREENVALE, NEW YORK 11548



### CARAVAN LOW PRESSURE BOILERS GAS FIRED CAST IRON BOILER SYSTEM

ANS. Z21.13-2000 • CSA 4.9

CARAVAN SYSTEM SERIAL NO.:

FOR INSTALLATION ON NONCOMBUSTIBLE FLOOR ONLY. FOR INSTALLATION ON  
COMBUSTIBLE FLOORING ONLY WITH KIT NO. QTY. KITS REQUIRED:

CARAVAN MODEL NO.

CONSISTING OF MODEL BOILER MODULES  
INDIVIDUAL BOILER MODULE SERIAL NUMBERS:

	CARAVAN SYSTEM	INDIVIDUAL BOILER MODULE
<b>MODEL NO.</b>		
<b>GAS ONLY FOR USE WITH</b>		
A.G.A. INPUT BTU/HR.:		
A.G.A. OUTPUT BTU/HR.:		
D.O.E. CAPACITY BTU/HR.		
NET I.B.R. WATER BTU/HR.		
NET I.B.R. STEAM SQ. FT.:		



**CERTIFIED BY SLANT/FIN CORP.  
MAXIMUM WORKING PRESSURE**

SYSTEM	INDIVIDUAL BOILER MODULE
MAWP, WATER <input type="text"/> PSI	MAWP, WATER <input type="text"/> PSI
MAWP, STEAM <input type="text"/> PSI	MAWP, STEAM <input type="text"/> PSI
MAXIMUM WATER TEMP. _____ F	MAXIMUM WATER TEMP. _____ F
TOTAL SYSTEM MINIMUM RELIEF VALVE CAPACITY <input type="text"/> LBS./HR. SEE INDIVIDUAL BOILER MODULE CAPACITY	MINIMUM RELIEF VALVE CAPACITY <input type="text"/> LBS./HR. FOR INDIVIDUAL BOILER MODULES

FOR GAS SUPPLY AND MANIFOLD PRESSURES, ELECTRICAL RATINGS AND LIGHTING INSTRUCTIONS SEE INDIVIDUAL BOILER MODULE RATING PLATE.

caravan.btw



# REQUEST FOR CARAVAN SYSTEM RATING PLATE

Each individual Caravan module is shipped with a rating plate bearing the model, serial number, capacities and certifications for that module. A modular boiler system is a single boiler. To meet local requirements, a system rating plate will be issued by Slant/Fin upon request. Just provide the information indicated on this page.

<b>Slant/Fin Tech Service</b>	<b>FAX THIS REQUEST TO:</b> 516-484-6958
	<b>PHONE:</b> 516-484-2600

Requested by: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone: \_\_\_\_\_  
*Required*

Mail to: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone: \_\_\_\_\_  
*Required*

**NOTE:**

**INDICATE ACCURATELY**  
Some model numbers are similar, such as GGT-600 and GGT-600E etc.

**PLEASE USE CARE TO MAKE SURE THE PROPER SYSTEM MODEL IS INDICATED COMPLETE WITH LETTER SUFFIX.**

**BE ACCURATE!**  
**INCLUDE ALL LETTERS AND ZEROS, ENTER ALL INFORMATION ASKED FOR!**

**USE A SEPARATE FORM FOR EACH SYSTEM**

**Type of System:**

- |                                |                                      |
|--------------------------------|--------------------------------------|
| <input type="checkbox"/> Gas   | <input type="checkbox"/> Natural Gas |
| <input type="checkbox"/> Oil   | <input type="checkbox"/> Propane     |
| <input type="checkbox"/> Water | <input type="checkbox"/> Dual Fuel   |
| <input type="checkbox"/> Steam |                                      |

**INDICATE SYSTEM MODEL NUMBER BELOW:**

\_\_\_\_\_

**INDICATE SERIAL NUMBERS OF INDIVIDUAL MODULES** (Please write legibly)

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

-----  
**DO NOT WRITE BELOW THIS LINE FOR SLANT/FIN USE ONLY**

System serial number assigned \_\_\_\_\_ Done by \_\_\_\_\_

