



# 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)**

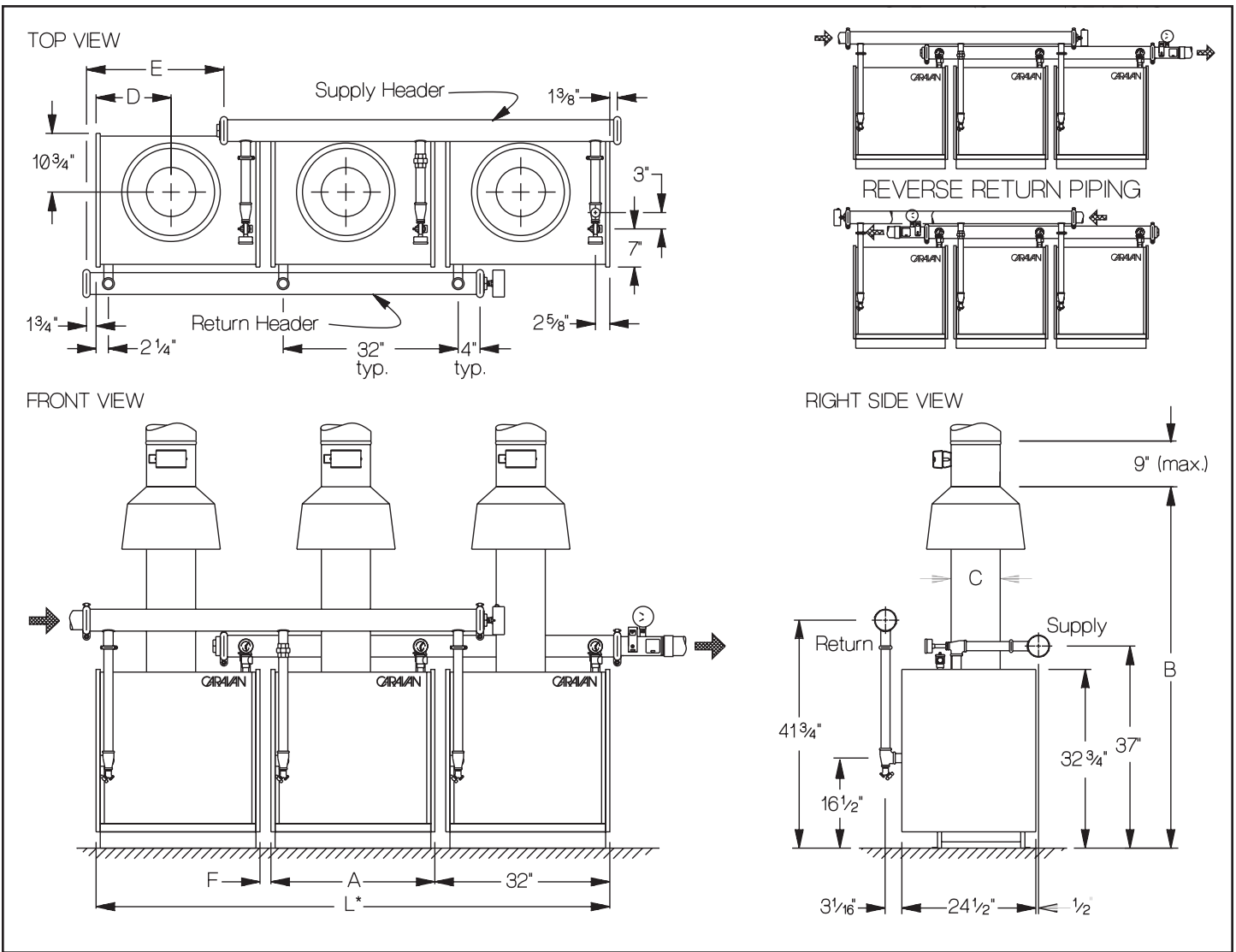
Model No.	Consists of		Ratings				Boiler Horse-power	Thermal EFF. %	Water Content (gal.)	Ship Wt.	Jkt. Width A\$	Draft Hood Ht. B\$	Flue Collar C\$	Draft Hood Ht. D\$	Header to Header E\$	Space Btwn. Mods. F\$	Length with Header L\$	Min. Header Size††
	No. of Htg. Mod.	Module Model Number	CSA Input	Gross Output	EDR Water‡ (Sq. Ft.)	AHRI Net Output†												
GGT-600E	2	GG-300ES	600	486	2814	422	14.5	81.10	18.4	1080	26 <sup>1</sup> / <sub>16</sub>	59%	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-700E	2	GG-350HES	700	570	3306	496	17.0	81.40	20.6	1230	30 <sup>3</sup> / <sub>16</sub>	67%	9	13 <sup>3</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	5'2"	2"
GGHT-750E	2	GG-375HES	750	606	3506	526	18.1	80.90	20.6	1230	30 <sup>3</sup> / <sub>16</sub>	59%	10	13 <sup>3</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-399HES	798	644	3734	560	19.2	80.60	20.6	1230	30 <sup>3</sup> / <sub>16</sub>	66%	10	13 <sup>3</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-300ES	900	729	4221	633	21.8	81.10	27.6	1590	26 <sup>1</sup> / <sub>16</sub>	59%	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-1050E	3	GG-350HES	1050	855	4959	744	25.5	81.40	30.9	1830	30 <sup>3</sup> / <sub>16</sub>	67%	9	13 <sup>3</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	7'10"	2"
GGHT-1125E	3	GG-375HES	1125	909	5259	789	27.2	80.90	30.9	1830	30 <sup>3</sup> / <sub>16</sub>	59%	10	13 <sup>3</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-399HES	1197	966	5601	840	28.9	80.60	30.9	1830	30 <sup>3</sup> / <sub>16</sub>	66%	10	13 <sup>3</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-300ES	1200	972	5628	844	29.0	81.10	36.8	2140	26 <sup>1</sup> / <sub>16</sub>	59%	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-1400E	4	GG-350HES	1400	1140	6612	992	34.1	81.40	41.2	2440	30 <sup>3</sup> / <sub>16</sub>	67%	9	13 <sup>3</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	10'6"	3"
GGHT-1500E	4	GG-375HES	1500	1212	7012	1052	36.2	80.90	41.2	2440	30 <sup>3</sup> / <sub>16</sub>	59%	10	13 <sup>3</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-300ES	1500	1215	7035	1055	36.3	81.10	46.0	2675	26 <sup>1</sup> / <sub>16</sub>	59%	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-399HES	1596	1288	7468	1120	38.5	80.60	41.2	2440	30 <sup>3</sup> / <sub>16</sub>	66%	10	13 <sup>3</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-350HES	1750	1425	8265	1240	42.6	81.40	51.5	3050	30 <sup>3</sup> / <sub>16</sub>	67%	9	13 <sup>3</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	13'2"	3"
GGHT-1875E	5	GG-375HES	1875	1515	8765	1315	45.3	80.90	51.5	3050	30 <sup>3</sup> / <sub>16</sub>	59%	10	13 <sup>3</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-399HES	1995	1610	9333	1400	48.1	80.60	51.5	3050	30 <sup>3</sup> / <sub>16</sub>	66%	10	13 <sup>3</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-350HES	2100	1710	9918	1488	51.1	81.40	61.8	3660	30 <sup>3</sup> / <sub>16</sub>	67%	9	13 <sup>3</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	15'10"	3"
GGHT-2250E	6	GG-375HES	2250	1818	10518	1578	54.3	80.90	61.8	3660	30 <sup>3</sup> / <sub>16</sub>	59%	10	13 <sup>3</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-399HES	2394	1932	11202	1680	57.7	80.60	61.8	3660	30 <sup>3</sup> / <sub>16</sub>	66%	10	13 <sup>3</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-350HES	2450	1995	11571	1736	59.6	81.40	72.1	4270	30 <sup>3</sup> / <sub>16</sub>	67%	9	13 <sup>3</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	18'6"	3"
GGHT-2625E	7	GG-375HES	2625	2121	12271	1841	63.4	80.90	72.1	4270	30 <sup>3</sup> / <sub>16</sub>	59%	10	13 <sup>3</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-399HES	2793	2254	13069	1960	67.3	80.60	72.1	4270	30 <sup>3</sup> / <sub>16</sub>	66%	10	13 <sup>3</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	18'6"	3"
GGHT-2800AE	8	GG-350HES	2800	2280	13224	1984	68.1	81.40	82.4	4880	30 <sup>3</sup> / <sub>16</sub>	67%	9	13 <sup>3</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	21'2"	3"
GGHT-3000E	8	GG-375HES	3000	2424	14024	2104	72.4	80.90	82.4	4880	30 <sup>3</sup> / <sub>16</sub>	59%	10	13 <sup>3</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-350HES	3150	2565	14877	2232	76.6	81.40	82.4	5490	30 <sup>3</sup> / <sub>16</sub>	67%	9	13 <sup>3</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	23'10"	3"
GGHT-3200E	8	GG-399HES	3192	2576	14936	2240	77.0	80.60	82.4	4880	30 <sup>3</sup> / <sub>16</sub>	66%	10	13 <sup>3</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-375HES	3375	2727	15777	2367	81.5	80.90	92.7	5490	30 <sup>3</sup> / <sub>16</sub>	59%	10	13 <sup>3</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-350HES	3500	2850	16530	2480	85.1	81.40	92.7	6100	30 <sup>3</sup> / <sub>16</sub>	67%	9	13 <sup>3</sup> / <sub>32</sub>	25 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	26'6"	3"
GGHT-3600E	9	GG-399HES	3591	2898	16800	2520	86.6	80.60	92.7	5490	30 <sup>3</sup> / <sub>16</sub>	66%	10	13 <sup>3</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-375HES	3750	3030	17530	2630	90.5	80.90	103.0	6100	30 <sup>3</sup> / <sub>16</sub>	59%	10	13 <sup>3</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-399HES	3990	3220	18670	2800	96.2	80.60	103.0	6100	30 <sup>3</sup> / <sub>16</sub>	66%	10	13 <sup>3</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**

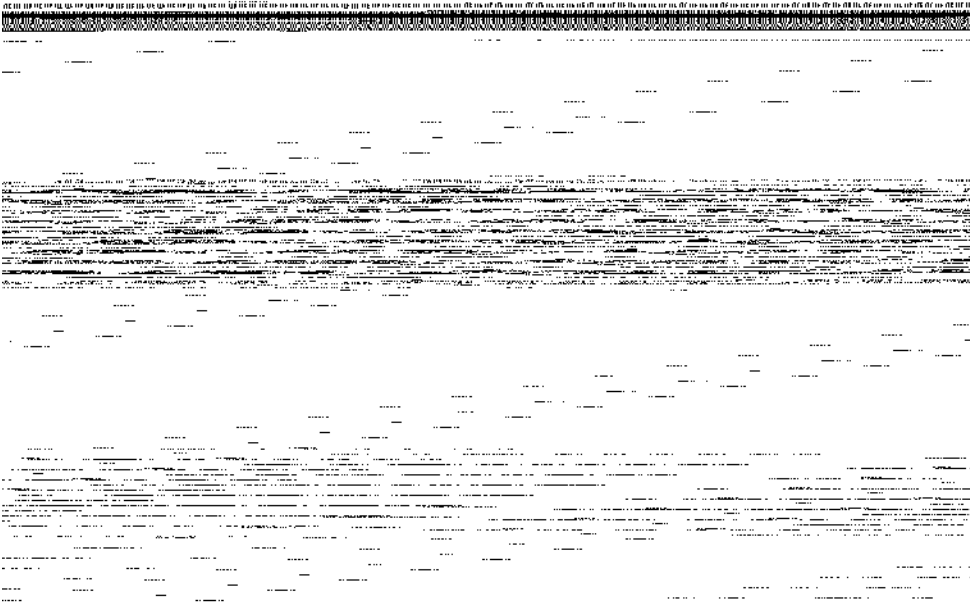


**Design Data**

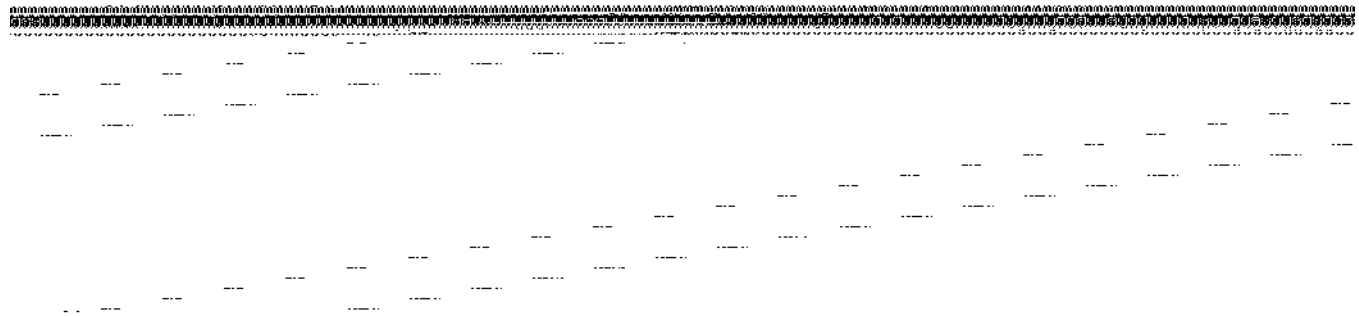
Max. ASME Working Pressure: 100 psi

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

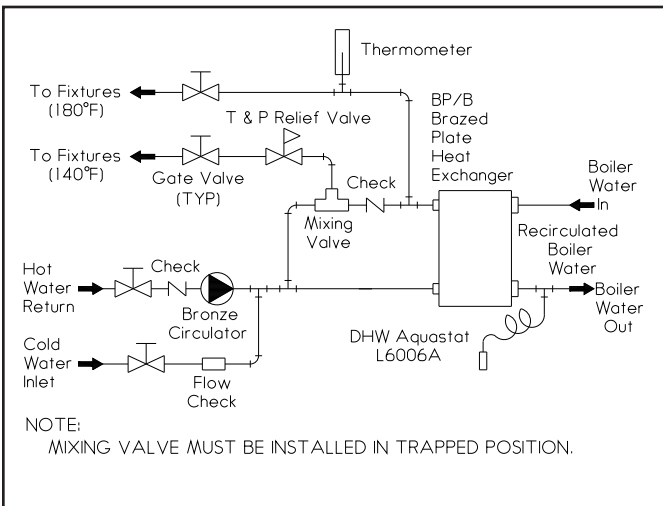
# RECOMMENDED PIPING



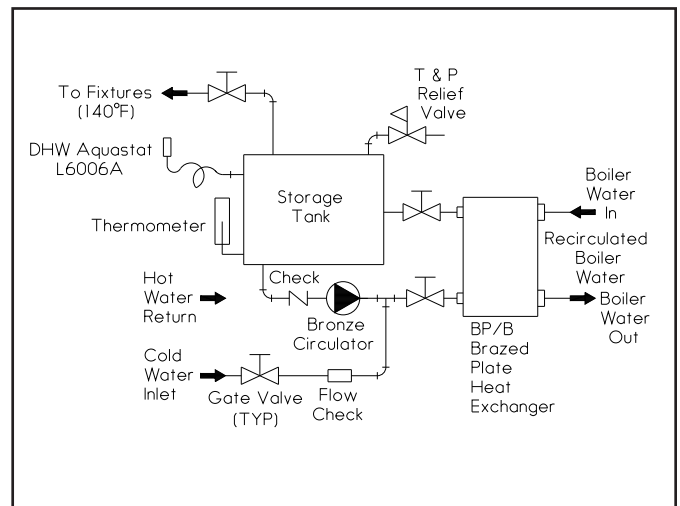
**Figure 2. Recommended boiler piping for variable circulation**



**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.
- 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.

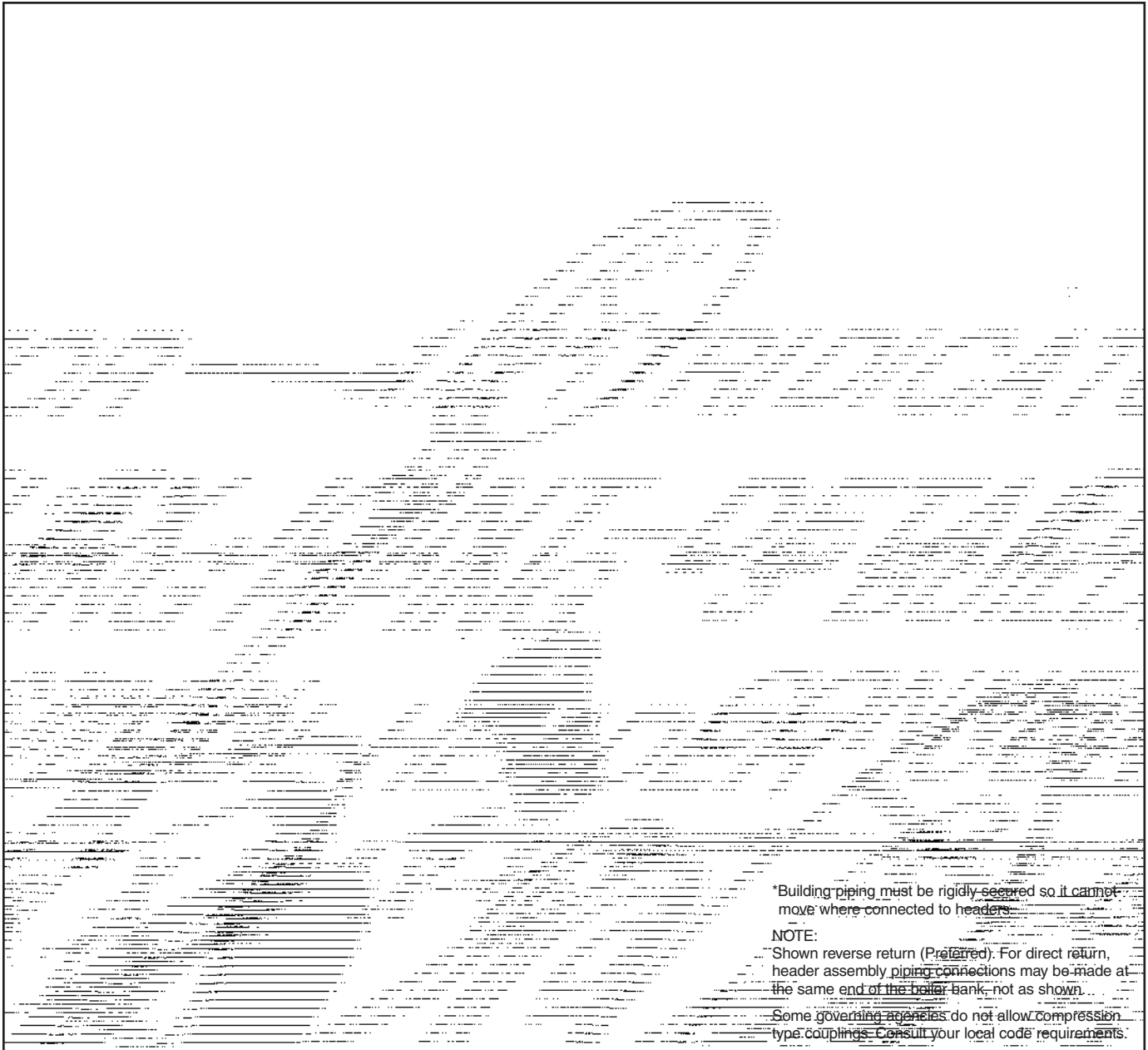


Figure 6. Gas Caravan—optional header assembly for all models GGT hot water Caravan systems

## 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.

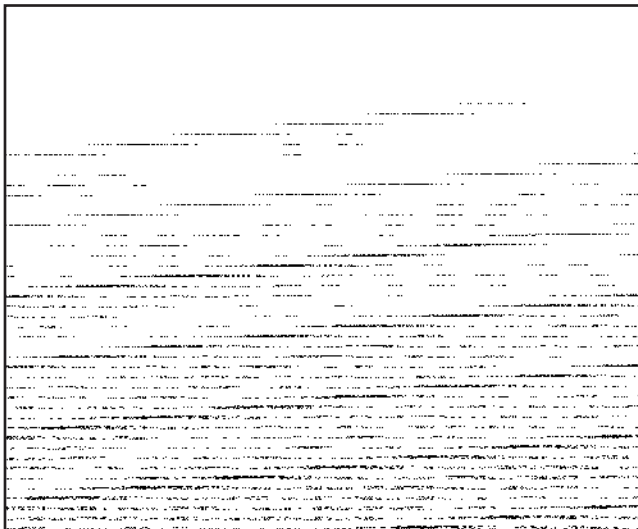


Figure 7: Correct location of combustion-air supply ducts

## 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:

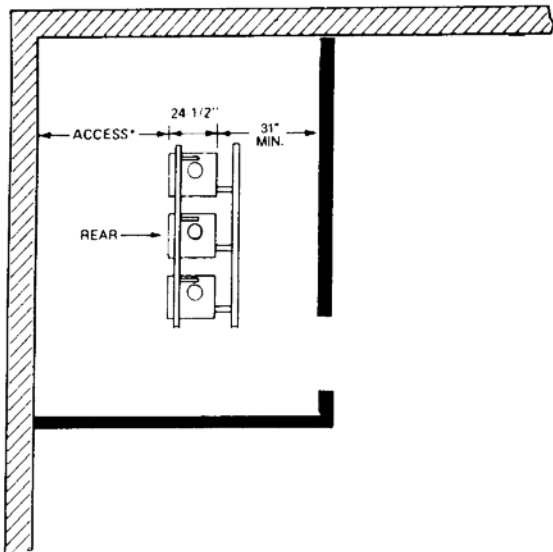
1. **Air drawn horizontally from outdoors DIRECTLY through an outside wall;** one louvered opening near the floor (below burner air inlet) and one louvered opening near the ceiling (above the highest draft regulator), each opening with a minimum FREE air passage area of **1 square inch per 4000 BTUH** 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.

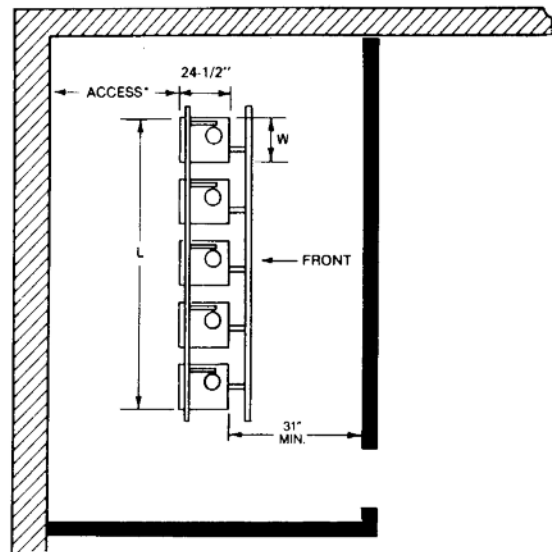
UNLESS PROPERLY CONTROLLED, AVOID THE USE OF FORCED VENTILATION, SINCE IT CAN CREATE AN UNDESIRABLE PRESSURE DIFFERENTIAL BETWEEN BOILER ROOM AND AIR SOURCE.

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

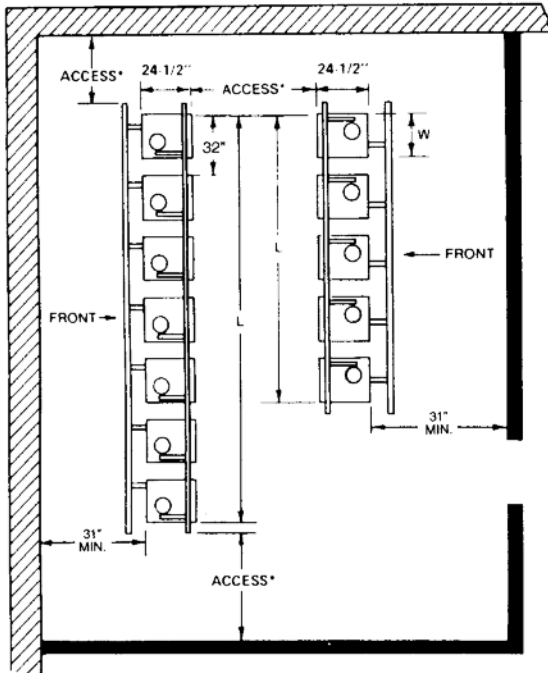
header piping extends over the left and right ends of the boiler bank.



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

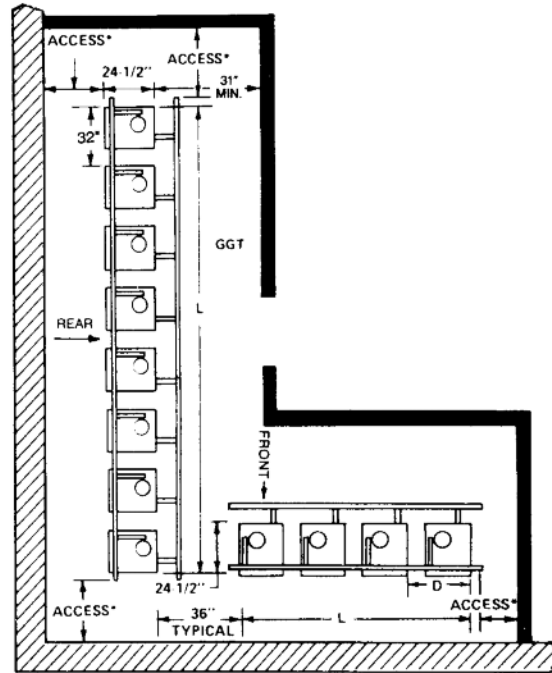


One battery of Model GGT-1875 hot water boilers with 375 MBh input per module.



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-600E	2	GG-300ES	12"	10"	10"	9"
GGHT-700E	2	GG-350HES	12"	12"	10"	10"
GGHT-750E	2	GG-375HES	12"	12"	12"	10"
GGHT-800E	2	GG-399HES	12"	12"	12"	10"
GGT-900E	3	GG-300ES	14"	12"	12"	12"
GGHT-1050E	3	GG-350HES	14"	14"	14"	12"
GGHT-1125E	3	GG-375HES	14"	14"	14"	12"
GGHT-1200E	3	GG-399HES	16"	14"	14"	12"
GGT-1200E	4	GG-300ES	16"	14"	14"	12"
GGHT-1400E	4	GG-350HES	16"	16"	16"	14"
GGHT-1500E	4	GG-375HES	16"	16"	16"	14"
GGT-1500E	5	GG-300ES	16"	16"	16"	14"
GGHT-1600E	4	GG-399HES	18"	16"	16"	14"
GGHT-1750E	5	GG-350HES	18"	18"	16"	14"
GGHT-1875E	5	GG-375HES	18"	18"	18"	16"
GGHT-2000E	5	GG-399HES	20"	18"	18"	16"
GGHT-2100E	6	GG-350HES	20"	18"	18"	16"
GGHT-2250E	6	GG-375HES	20"	20"	18"	16"
GGHT-2400E	6	GG-399HES	20"	20"	20"	18"
GGHT-2450E	7	GG-350HES	20"	20"	20"	18"
GGHT-2625E	7	GG-375HES	22"	20"	20"	18"
GGHT-2800E	7	GG-399HES	22"	22"	20"	18"
GGHT-2800AE	8	GG-350HES	22"	22"	20"	18"
GGHT-3000E	8	GG-375HES	24"	22"	22"	20"
GGHT-3150E	9	GG-350HES	24"	22"	22"	20"
GGHT-3200E	8	GG-399HES	24"	22"	22"	20"
GGHT-3375E	9	GG-375HES	24"	24"	22"	20"
GGHT-3500E	10	GG-350HES	24"	24"	22"	20"
GGHT-3600E	9	GG-399HES	26"	24"	24"	20"
GGHT-3750E	10	GG-375HES	26"	24"	24"	22"
GGHT-4000E	10	GG-399HES	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.

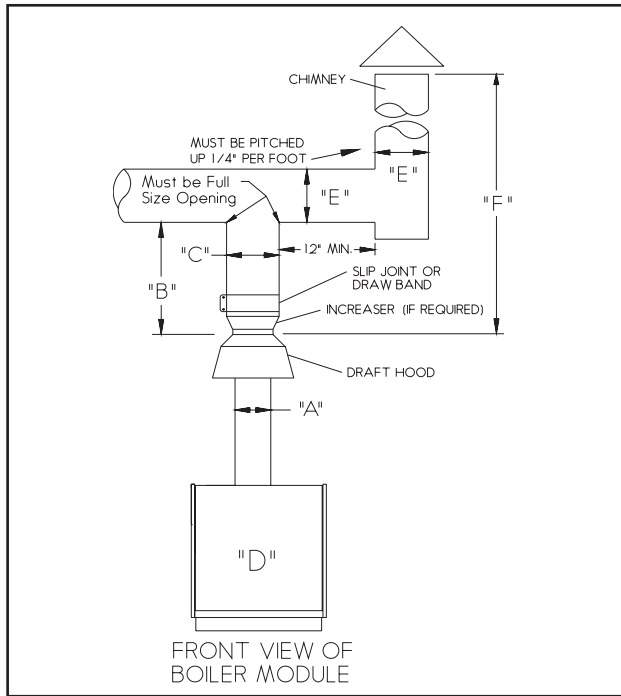
When there are multiple banks of boilers, the horizontal breeching connector for each bank is sized using Table 2. To size the common horizontal breeching connector, add up the total input and refer to Table 2 to size.

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).

**Table 2A.**  
**Vent Connector Diameters (20 ft. chimney "F" dim)**

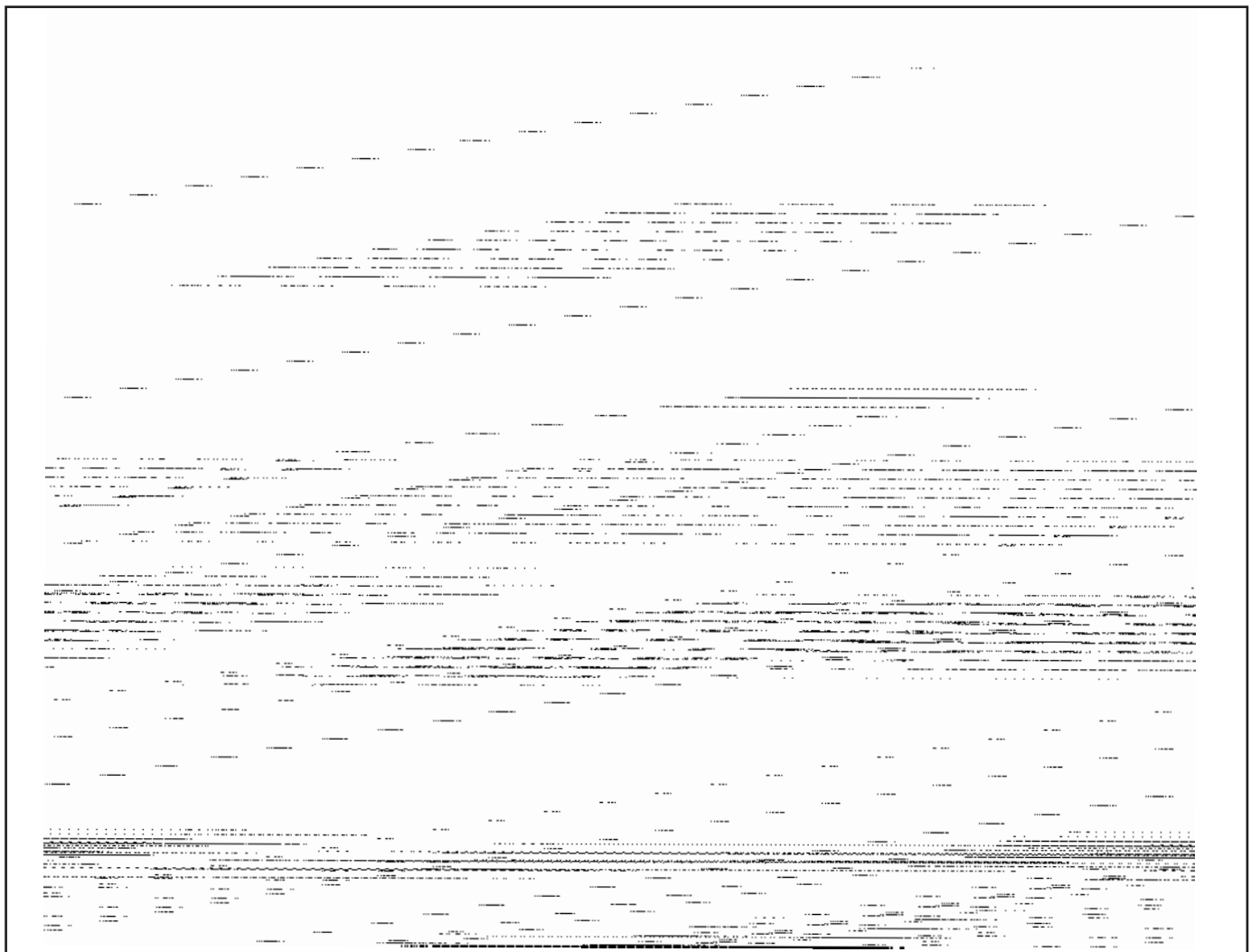
Model	Flue Outlet Size "A"	Connector Rise "B"		
		3' High "C"	2' High "C"	1' High "C"
GG300ES	8"	8"	10"	10"
GG350HES	9"	9"	10"	12"
GG375HES	10"	10"	10"	12"
GG399HES	10"	10"	12"	12"

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.

NOTE: "E" dimensions (from table 2), when designing breaching dia. is the same as chimney dia.

**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-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-2800AE	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**

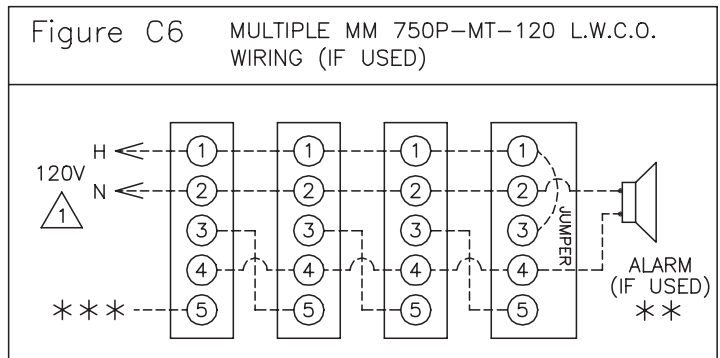
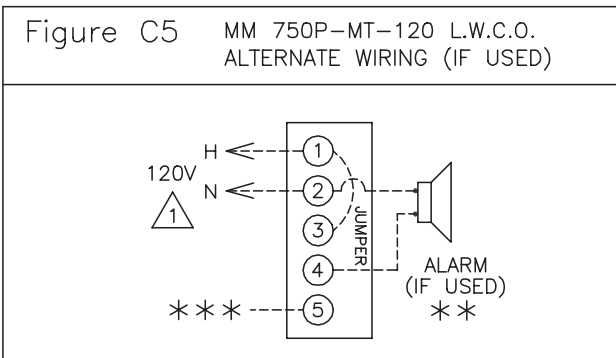
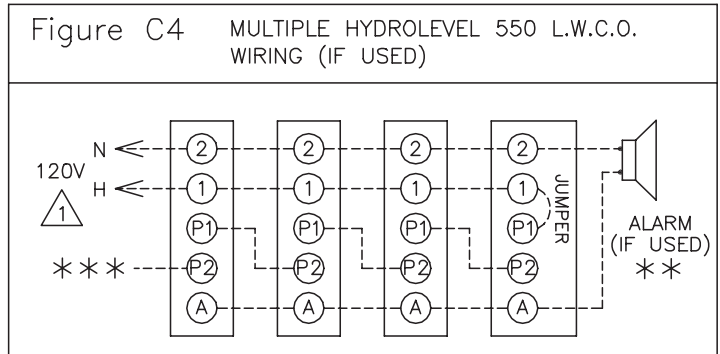
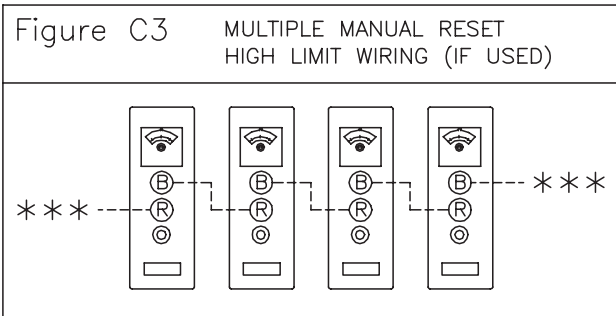
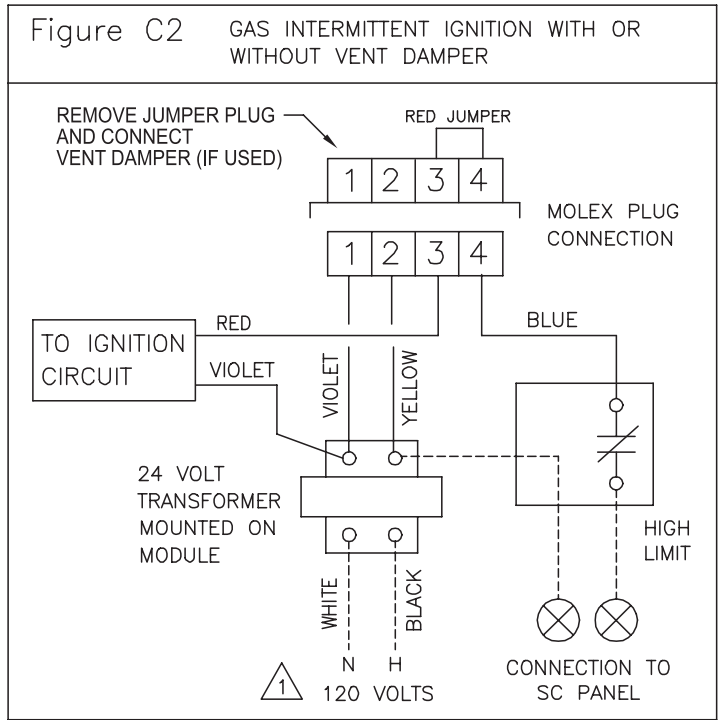
- 1 SC-9 modular boiler control (part # 435-085)
- 1 Outdoor sensor (part # 339-070)
- 2 Universal sensors (part # 339-071)
  - 1 to be used as supply water sensor
  - 1 can be used as return water sensor
- 2 Plastic tie straps

### **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



**LEGEND:**

----- FIELD WIRING

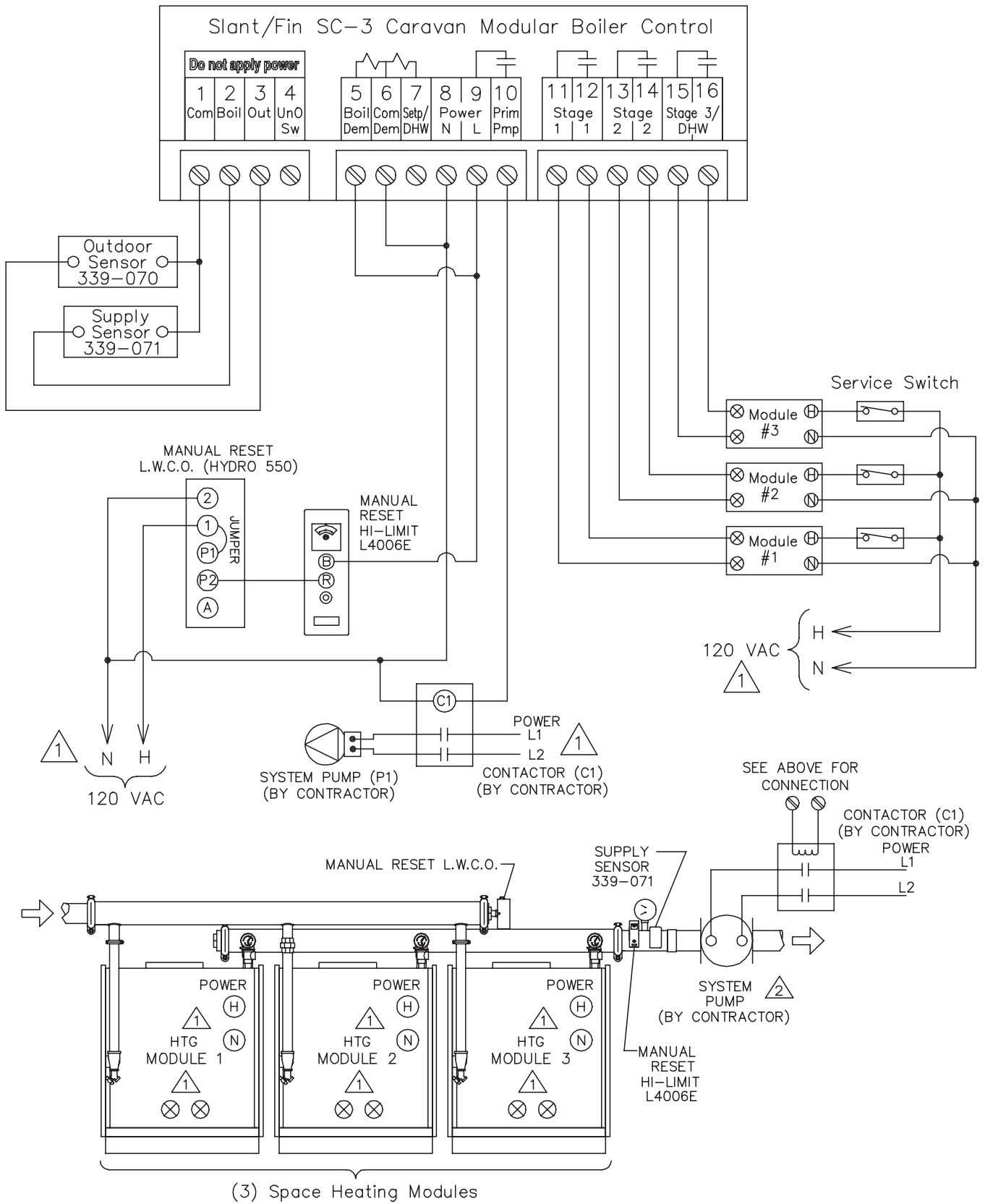
———— FACTORY WIRING

1 — PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED BY LOCAL CODE.

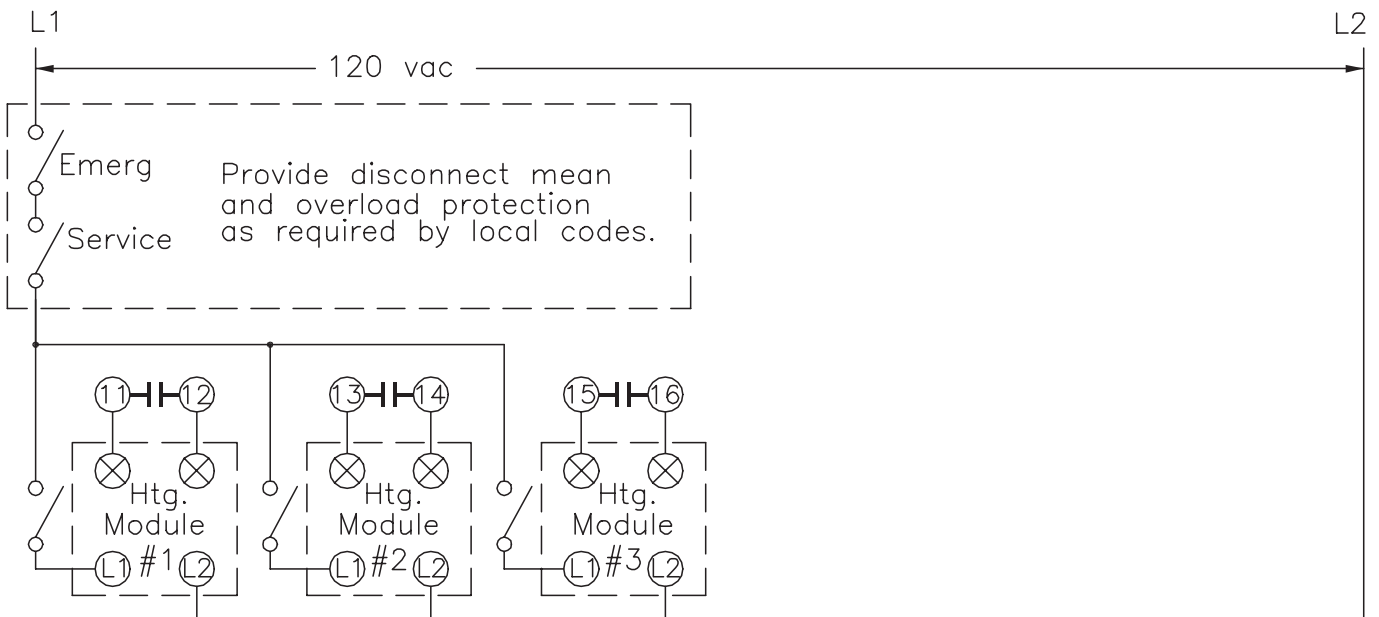
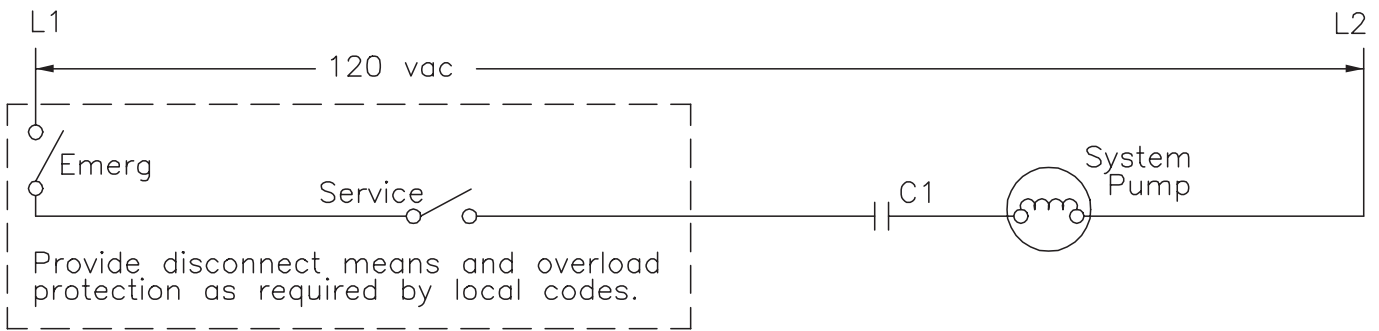
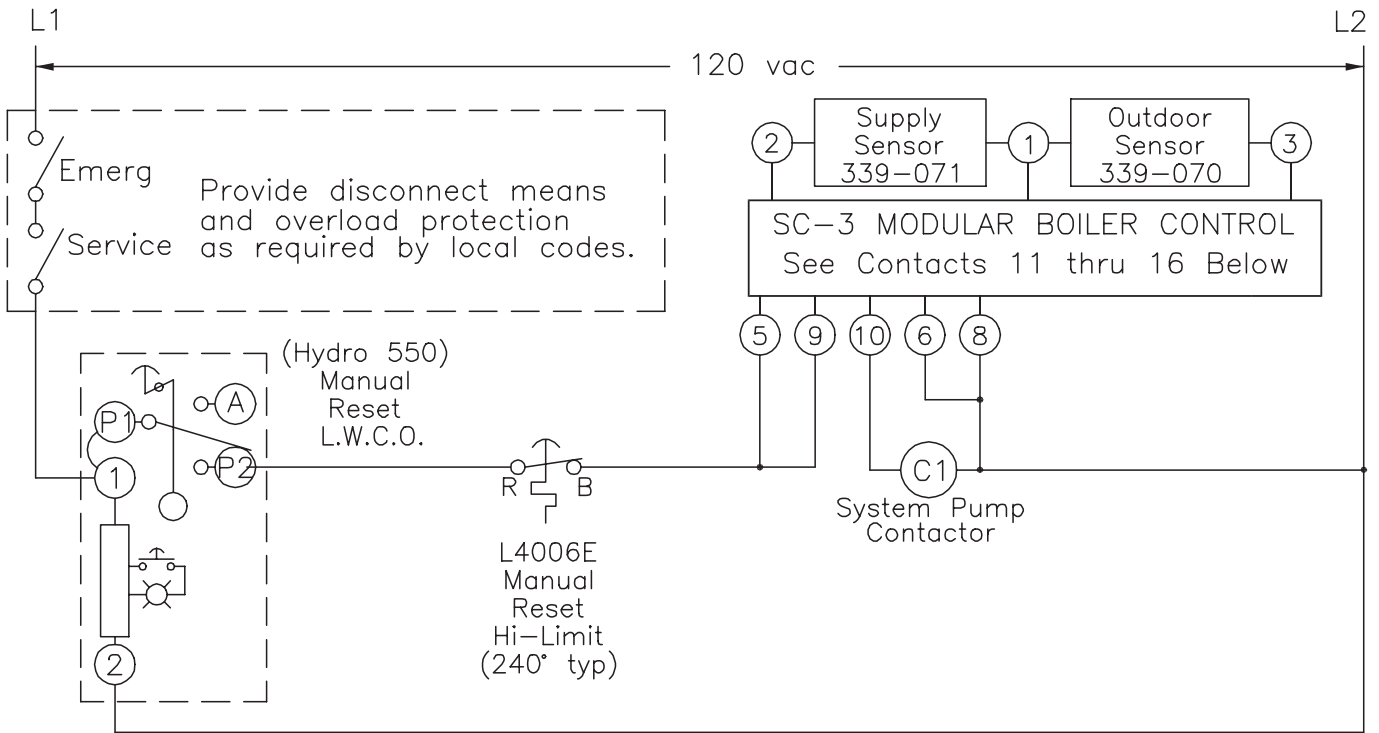
\*\* — OPTIONAL ALARM CIRCUIT BY CONTRACTOR.

\*\*\* — REFER TO SC-3 OR SC-9 WIRING DIAGRAM FOR PROPER WIRE CONNECTION.

# SC-3 SYSTEM WIRING DIAGRAM

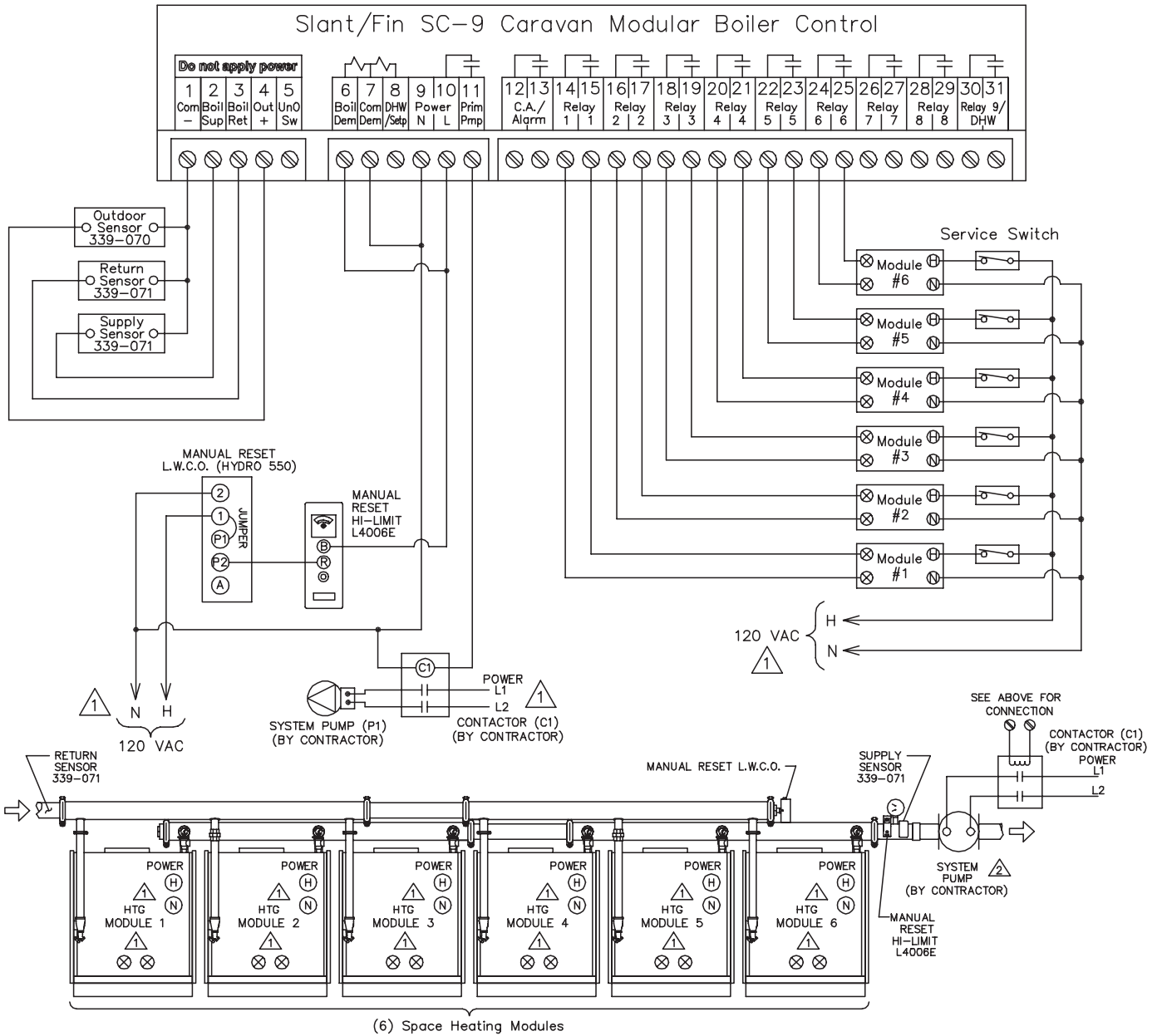


### SC-3 LADDER WIRING DIAGRAM



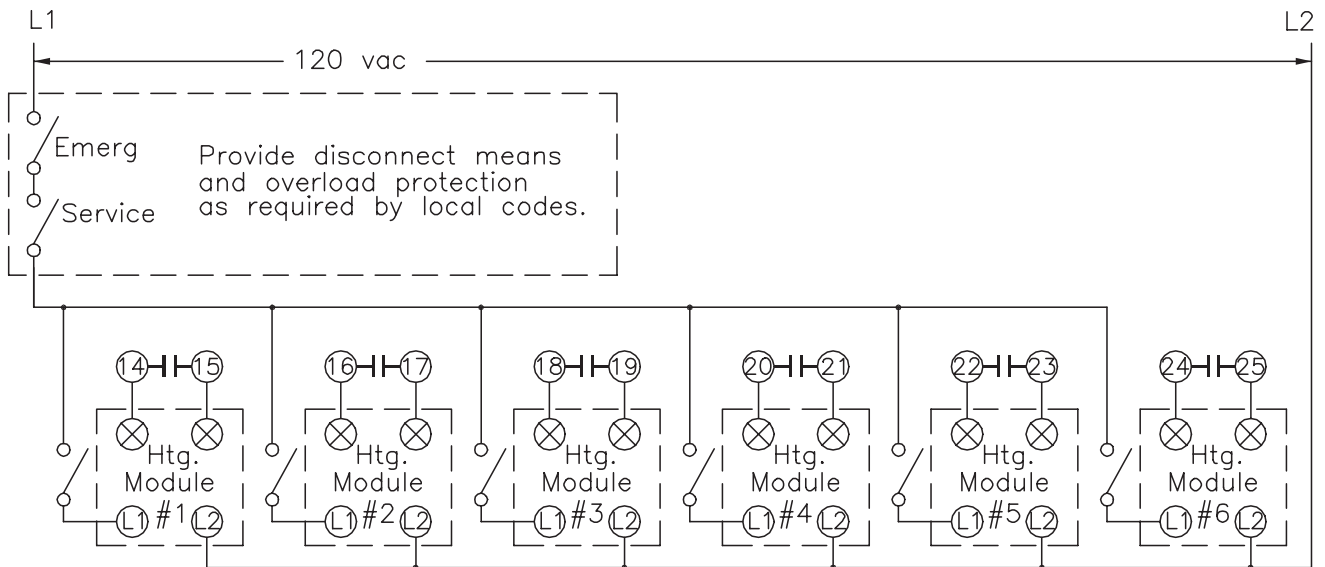
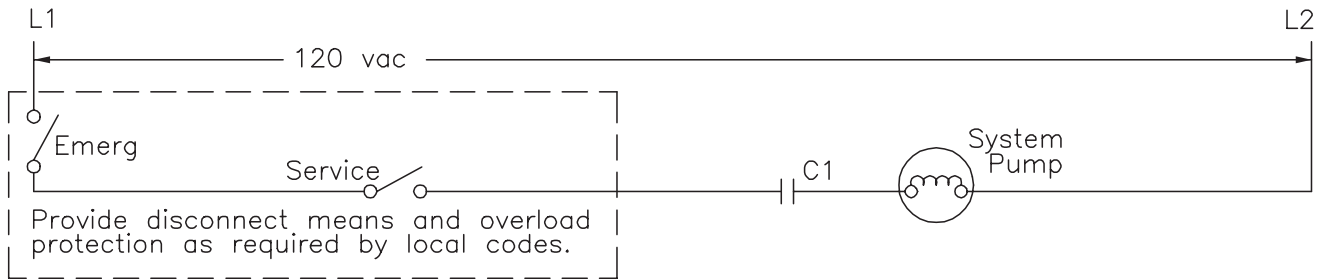
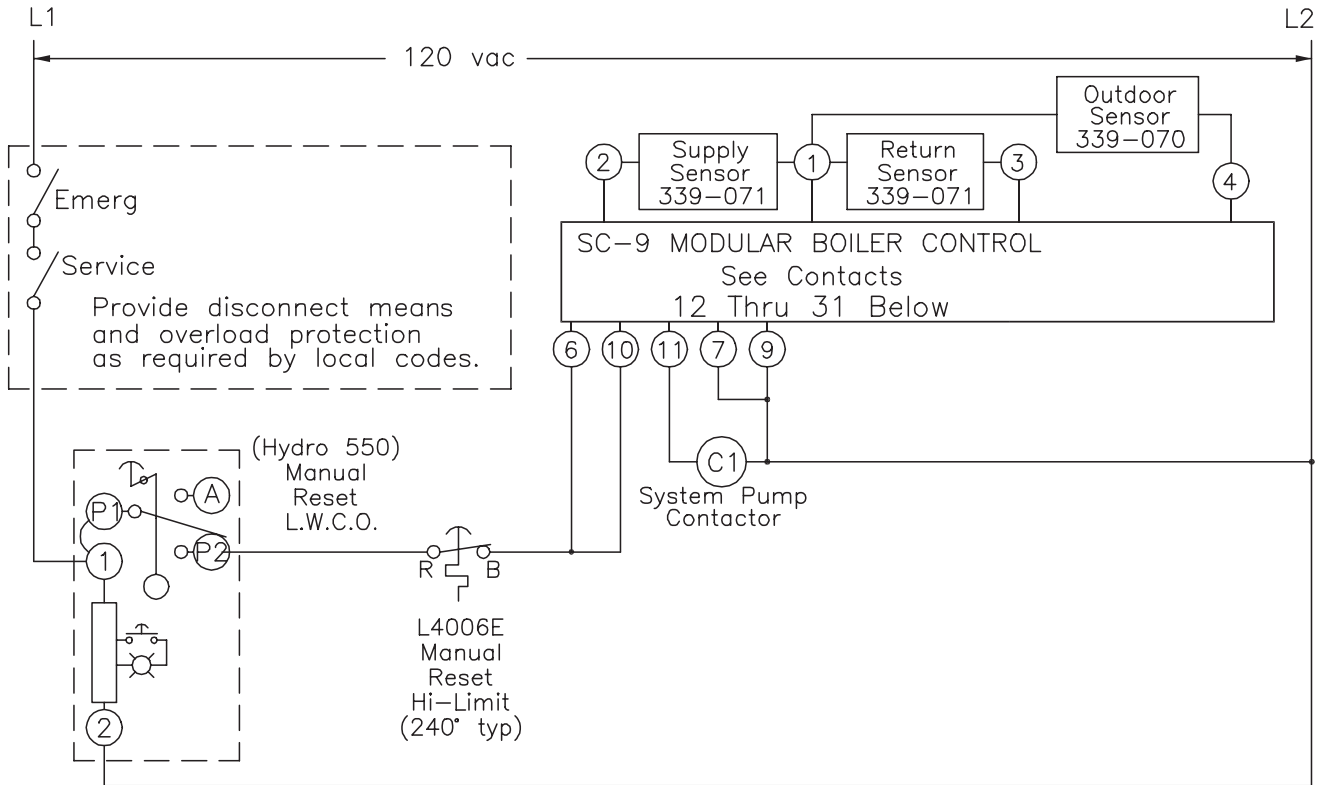
⊗ - SEE FIG. C1 THROUGH C3 FOR CONNECTION AT MODULE.

# SC-9 SPACE HEATING WIRING DIAGRAM



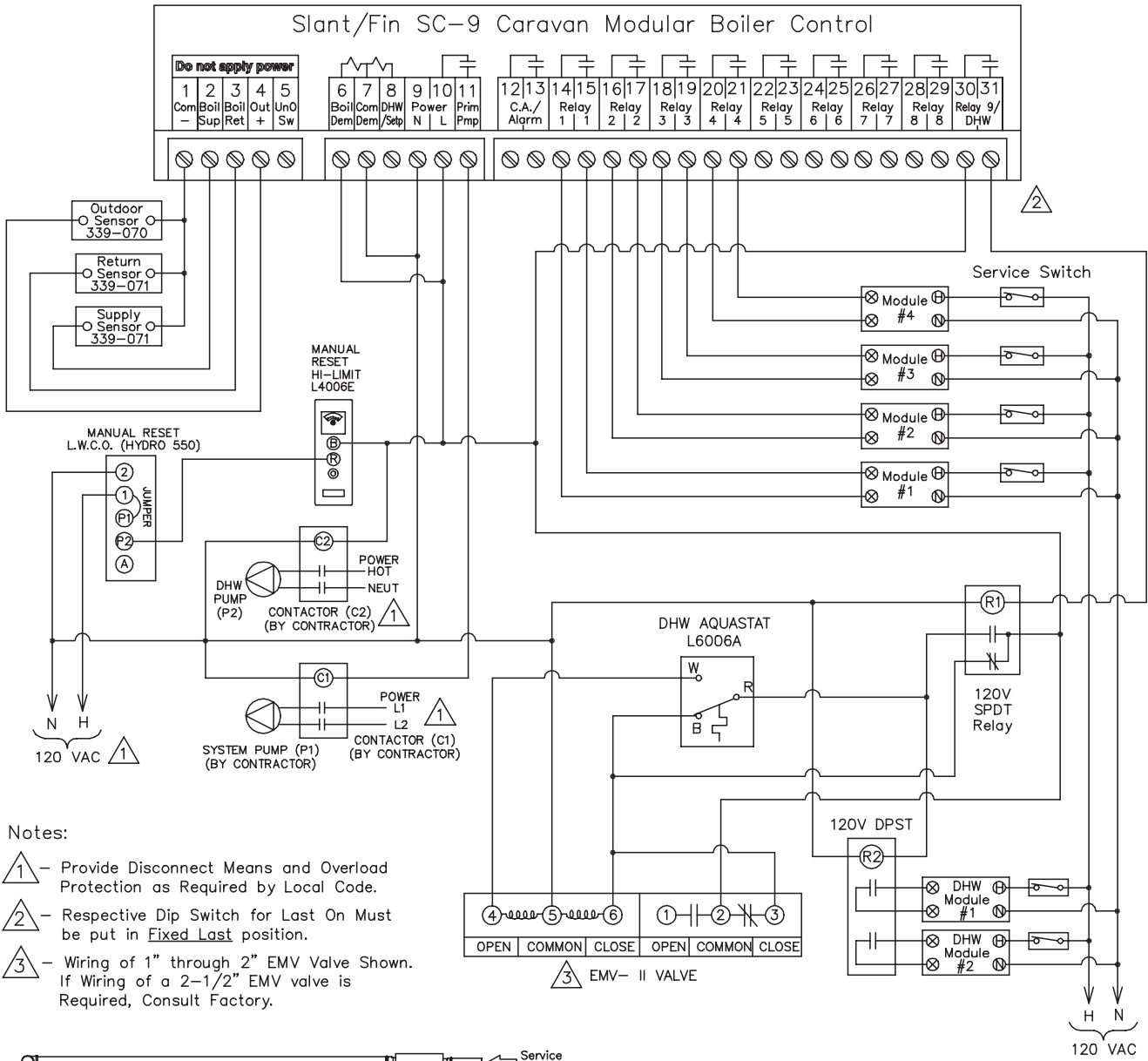


# SC-9 SPACE HEATING LADDER WIRING DIAGRAM



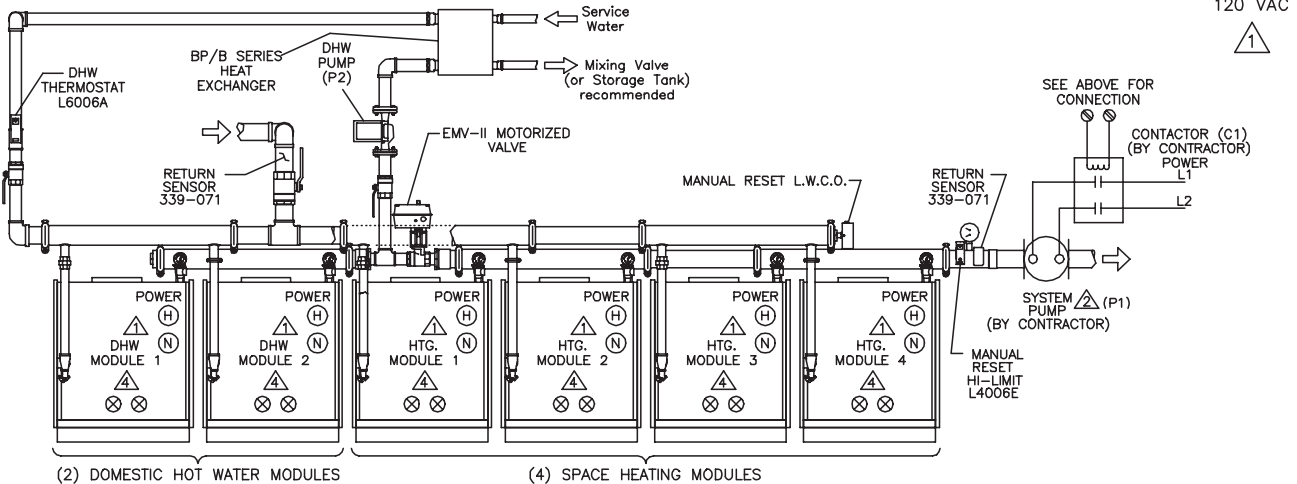
⊗ - SEE FIG. C1 THROUGH C3 FOR CONNECTION AT MODULE.

# SC-9 SPACE AND DOMESTIC HOT WATER WIRING DIAGRAM

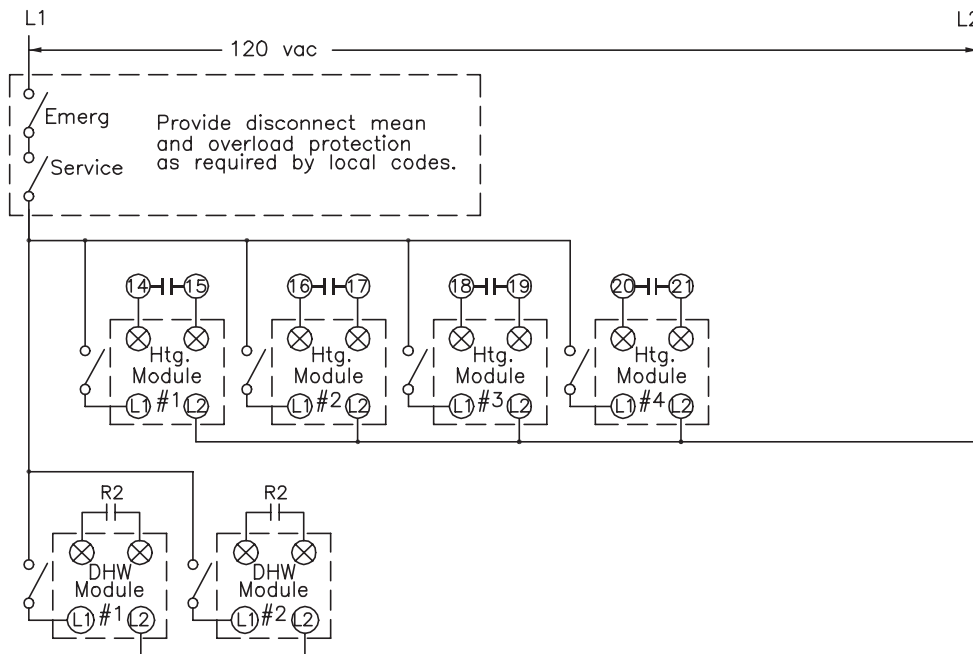
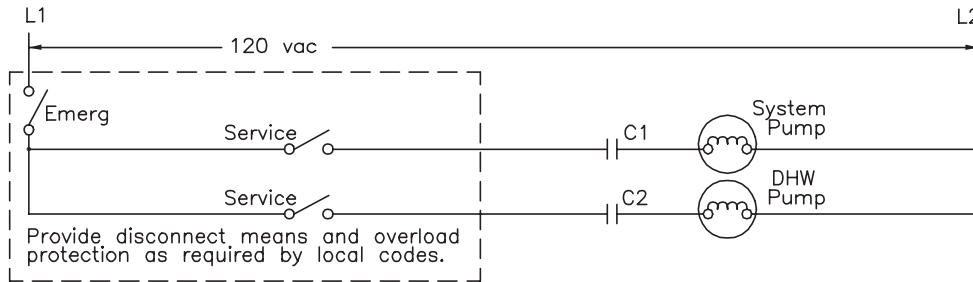
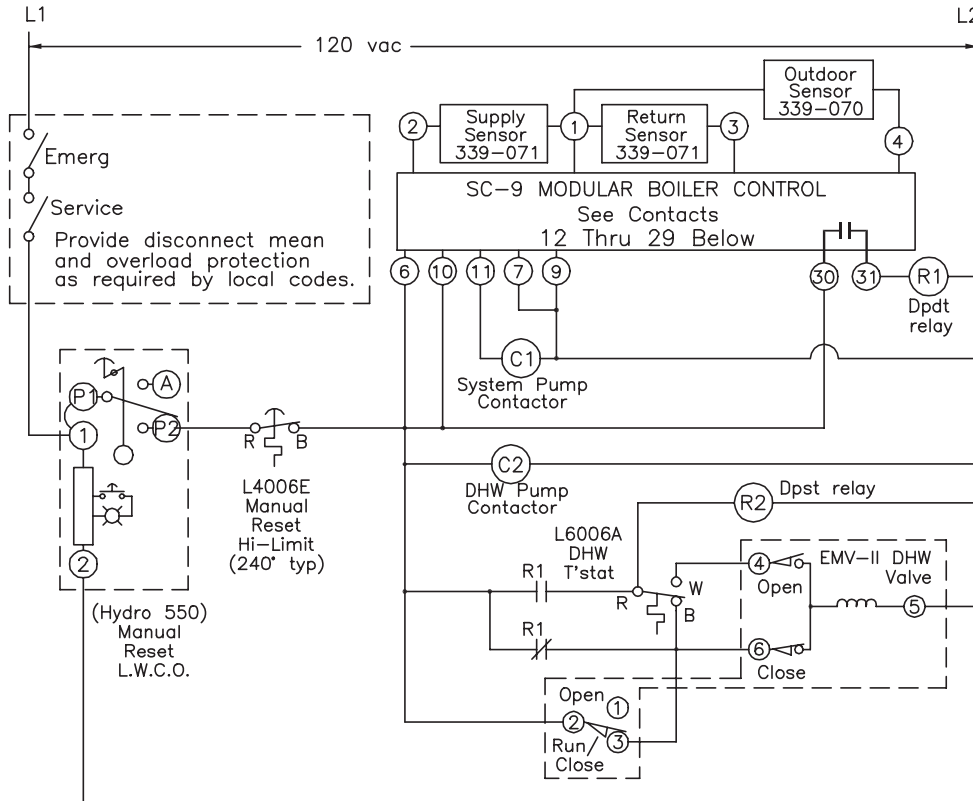


**Notes:**

- 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.



# BOILER WARRANTIES

## Lifetime Limited Warranty for Residential Cast-iron Hot Water Boilers in Household Use

**Gas Models:** Sentinel, Sentry, Galaxy and Victory

**Oil Models:** Intrepid, Liberty, Liberty II, XL-2000, EC Series

**Electric Models:** Monitron

### FIRST-YEAR WARRANTY INCLUDES:

Repair or replacement for a period of one year after original installation of all parts found to be defectively manufactured.

**LIFETIME LIMITED WARRANTY OF CAST-IRON SECTIONS** is effective for as long as the boiler is owned by the original purchaser or for 25 years, whichever time period is longer. The warranty includes repair or replacement of cast iron sections found to be defectively manufactured, at a cost to consumer equal to the percentage indicated below of the manufacturer's then list price for the replacement parts:

Year of	Percentage paid by consumer (of list price at time of claim)	Year of	Percentage paid by consumer (of list price at time of claim)
2 thru 10	0%	18	40%
11	5%	19	45%
12	10%	20	50%
13	15%	21	55%
14	20%	22	60%
15	25%	23	65%
16	30%	24	70%
17	35%	25 & after	75%

This warranty extends only to boilers in household use. See "Additional Warranty Terms" section for more details.

## Limited Ten-Year Warranty for Residential Application Cast-iron Steam Boilers

This warranty extends only to steam boilers and Jaguars in household use in buildings with one or two family dwelling units and which have been properly installed by a qualified heating contractor whose principal occupation is in the installation of heating equipment. Also, this warranty applies only to the first retail purchaser and only if the boiler has remained at all times in the location at which it was originally installed.

### FIRST-YEAR LIMITED WARRANTY FOR RESIDENTIAL STEAM BOILERS:

Slant/Fin warrants its residential steam boilers to be free from defects in material and workmanship for one year from date of original installation. If any parts are found to be defective in material or workmanship, Slant/Fin will repair or replace the defective parts.

### SECOND THROUGH TENTH YEAR LIMITED WARRANTY FOR CAST-IRON SECTION ASSEMBLY OF RESIDENTIAL STEAM BOILERS:

Slant/Fin warrants the cast-iron section assembly of its residential steam boilers to be free of defects in material and workmanship for the second through the tenth year following the date of original installation. If any sections are found to be defective during this period, Slant/Fin will repair or replace the section or, at its option, the entire heat exchanger.

See "Additional Warranty Terms" section for more details.

## Limited Ten-Year Warranty for Caravan Modular, Jaguar and Commercial Application of Individual Cast-Iron Boilers in Hot Water and Steam 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.

**SECOND THROUGH TENTH YEAR:** Repair or replace for the second through tenth year after original installation, of the cast iron or cast aluminum heat exchanger found to be defectively manufactured, at no cost for the replacement heat exchanger. Second through tenth year warranty is for the heat exchanger only.

This warranty extends only to boilers installed in closed loop space heating applications and domestic hot water applications. A properly sized heat exchanger must be used to heat the domestic water. See "Additional Warranty Terms" section for more details.

# Additional Warranty Terms

## All Boiler Models

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. Corrosion of cast iron heat exchanger caused by low operating water temperature.

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

Boilers operated with water additives or water/system conditions that may cause heat exchanger failure.

Boilers that have failed or malfunctioned due to improper or negligent operation, abuse, misuse, freezing, natural disaster, unauthorized alteration, improper installation or improper repair.

Improper burner adjustments, control settings or maintenance procedures.

Boiler warranty is void if purchased on the Internet.

**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 or cast-aluminum heat exchanger, such as, sheet metal base, jacket, insulation, combustion chamber, tankless heater exhaust and air inlet pip-

ing, 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 Corporation, 100 Forest Drive, Greenvale, N.Y. 11548 • (516) 484-2600  
[techservice@slantfin.com](mailto:techservice@slantfin.com)

Effective October 2010



## 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</b>	<b>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. bhw

# 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 \_\_\_\_\_

