Installation Instructions Boiler Burner Unit

Model VT 700 E
(For Hot Water Heating Systems)

MODEL	NOZZLE SIZE GPH + TYPE	HEATING CAPACITY BTUH	NET OUTPUT BTUH	NET OUTPUT SQ. FT.	BECKETT BURNER	WATER CAPACITY GAL.	SMOKE OUTLET SIZE	CHIMNEY SIZE	SHIPPING WEIGHT POUNDS
VT 700 E	1.00 - 80 H	114000	100000	664	AFG56XN	9	6	8x8x15	315
	0.85 - 80 H	98000	86000	570					
	0.75 - 80 H	88000	77000	510					
	0.65 - 80 H	77000	67000	444					

Specifications

These installation instructions provide information for the installation and adjustment for the proper operation of the VT 700 Oil Fired Boiler units. Be sure to follow these instructions carefully when making the installation. Before proceeding with the installation, be sure to check local ordinance requirements. Installation must be made in accordance with local ordinances which may differ from these installation instructions.

The unit is subject to shipping damage during transit or can be shipped with missing parts. Upon receipt, examine carton and boiler unit for possible missing parts or damage. If unit is damaged, notify carrier immediately. If parts are missing, notify factory as soon as possible.

The boiler is shipped completely assembled except for the circulator and drain cock which are furnished but shipped loose.

The VT 700 boiler is designed for use with a circulating hot water heating system (30 PSI Max.).

Do not use or store flammable liquids, especially gasoline in the vicinity of the boiler.

Setting Boiler

Make sure that foundation for boiler is level and adequate to support unit weight (approximately 315 pounds).

Locate boiler close to chimney with adequate clearance around unit for service. See Figure 1 for installation dimensions.

Chimney

The chimney should be masonry with tile lining (8″×8″×15′ high) or metal insulated, with a stainless steel internal surface such as the tradename "Metalbestos" (6″ dia. inside × 15′ high).

The chimney should provide a minimum of .03 draft at the boiler flue outlet, although it is preferable to have .05 draft. The draft loss through the boiler is as follows:

MODEL	FIRING RATE	DRAFT LOSS
VT 700 E	0.65 GPH	.002
	0.75 GPH	.005
	0.85 GPH	.015
	1.00 GPH	.020

Air For Combustion And Ventilation

Be certain adequate facilities are available to provide air for satisfactory combustion and ventilation.

Open basements without storm windows or tight fitting doors will generally permit adequate air infiltration. If the boiler is located in a separate room with a tight door, ventilation must be provided to an open area within the building or to the outside. If the building is of tight construction or with exhaust fans, an outside air supply that is ducted into the Boiler Room may be required.

For installation in confined areas provide two openings, one near the floor and one near the ceiling. Each opening to interior space must have a minimum free area of 150 square inches per gallon firing rate.

Each opening to outdoors must have a minimum free area of 50 square inches per gallon firing rate.

Piping Boiler To System

Refer to Figure 1 for location of piping connections on boiler. Refer to Figures 5 and 6 for piping diagrams.

Pipe boiler to heating system in accordance with recommended practices in order to assure satisfactory heating performance.

Electrical Installation

All wiring must be in accordance with local codes or in the absence of a local code must comply with the National Electric Code.

Refer to the appropriate wiring diagram. Figure 2 for a single zone, Figure 3 for a multi-zone with circulators and Figure 4 for a multi-zone with zone valves.

Provide a separate branch circuit with a fused disconnect switch to the boiler. The VT 700 operates on 120 vac 60 HZ with a power draw of 5 amps. or less with one circulator.

The unit, as shipped, is furnished with the wiring between the aquastat and the oil burner installed. Balance of wiring must be furnished by the installer.

Oil Line Installation

The burner on the VT 700 is furnished with a Sundstrand Model A, single stage, 3450 RPM pump as standard equipment.

One pipe installations must be absolutely air tight or loss of prime may result. Maximum lift on a one-pipe installation is 8 feet.

On a two pipe installation, the by-pass plug (furnished with pump-in plastic bag) must be inserted in the bottom return port. The lift on a 2 pipe installation depends on size and length of the tubing. With 52 feet of ½ inch tubing, the lift is 10 feet.

Install a shutoff valve and oil filter in the oil supply line. Locate shutoff valve close to tank with oil filter between valve and burner.

Vent Connection

The flue pipe must be 6" nominal dia. galvanized steel. The flue pipe should be short as possible (while maintaining service clearance behind unit), with a minimum of elbows and must pitch upward to the chimney connection. Maintain 18 inches clearance (minimum) between stack and combustible material. Secure each flue pipe joint and boiler flue outlet connection with sheet metal screws. Seal opening at chimney connection.

Install barometric draft control (furnished with unit) in the flue pipe to reduce fluctuating draft conditions.

Starting And Adjustment Procedure

Refer to burner manufacturers instructions furnished with this unit.

The VT 700 boiler is shipped with a .85 GPH 80° hollow spray nozzle as standard equipment. Check burner to be sure proper nozzle is installed. Change nozzle size if desired. See specifications on Page 1. Do not fire units under or above ratings shown.

These units should be set up with an .01 WC. over fire draft. Refer to section under "chimney" for draft loss through boiler at various firing rates. Adjust barometric draft control accordingly.

The combustion air should be adjusted to secure a 12 to 13% CO_2. The smoke must be between a trace to No. 1 smoke maximum.

The gross stack temperature at the specified firing rates will vary between 400°F. to 530°F.

With these low stack temperatures, steady state output efficiencies in excess of 85% can be achieved.

Maintenance And Service

Refer to burner manufacturers instructions furnished with this unit.

To clean boiler heating surfaces:

Remove top cabinet panel.

Remove flue collector.

Remove turbulators.

Remove all scale and soot from surfaces by means of brush and vacuum cleaning. Precautions should be taken not to damage combustion chamber or insulation.

Clean flue pipe and collector.

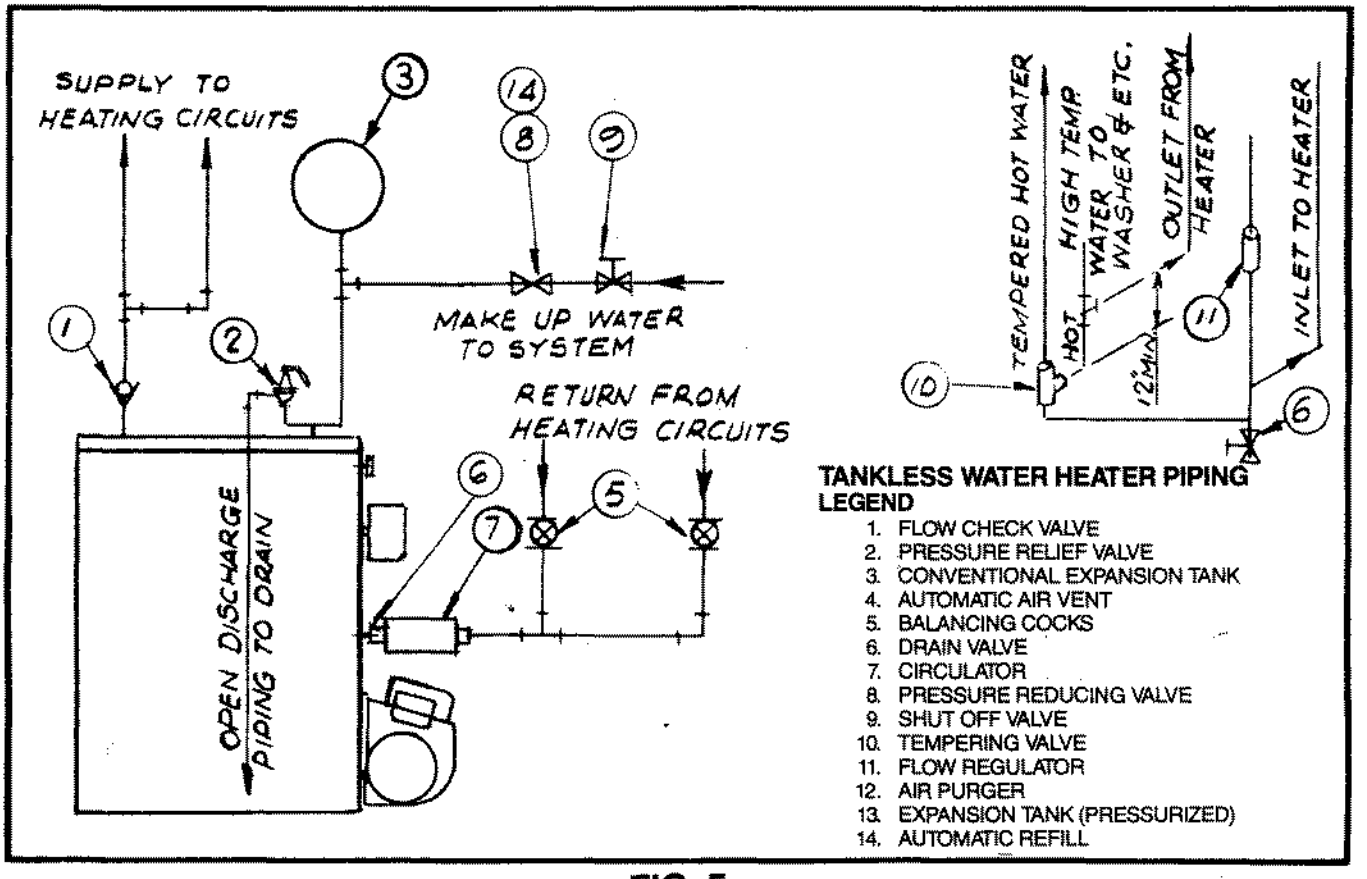
Replace all parts and clean cabinet surface and area around boiler.

It is recommended that the boiler be cleaned and inspected annually.

Instructing The Homeowner

The operation and care of the heating system should be explained to the homeowner, including the simple checks to make before calling for service if the burner fails to operate automatically.

PIPING DIAGRAM



TANKLESS WATER HEATER PIPING LEGEND

1. FLOW CHECK VALVE
2. PRESSURE RELIEF VALVE
3. CONVENTIONAL EXPANSION TANK
4. AUTOMATIC AIR VENT
5. BALANCING COCKS
6. DRAIN VALVE
7. CIRCULATOR
8. PRESSURE REDUCING VALVE
9. SHUT OFF VALVE
10. TEMPERING VALVE
11. FLOW REGULATOR
12. AIR PURGER
13. EXPANSION TANK (PRESSURIZED)
14. AUTOMATIC REFILL

FIG. 5

ALTERNATE PIPING DIAGRAM

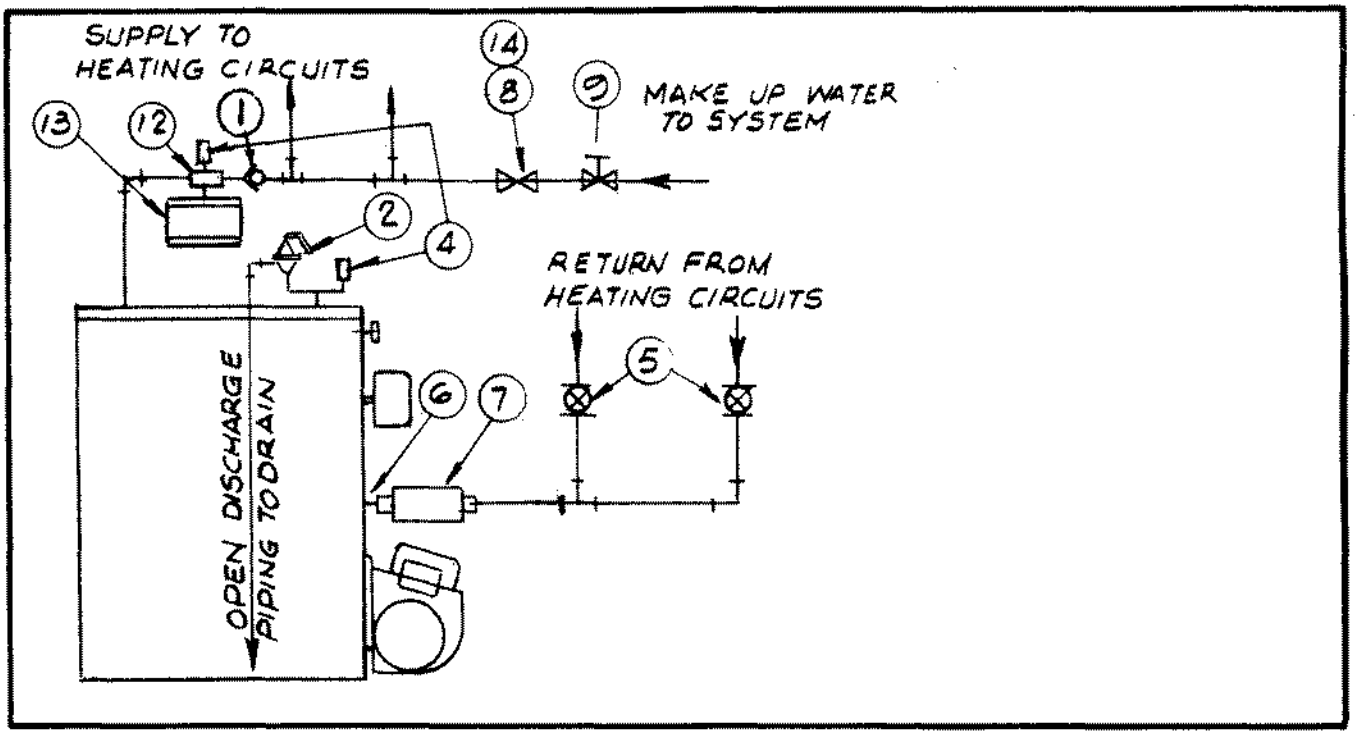


FIG. 6

INSTALLATION DIMENSIONS

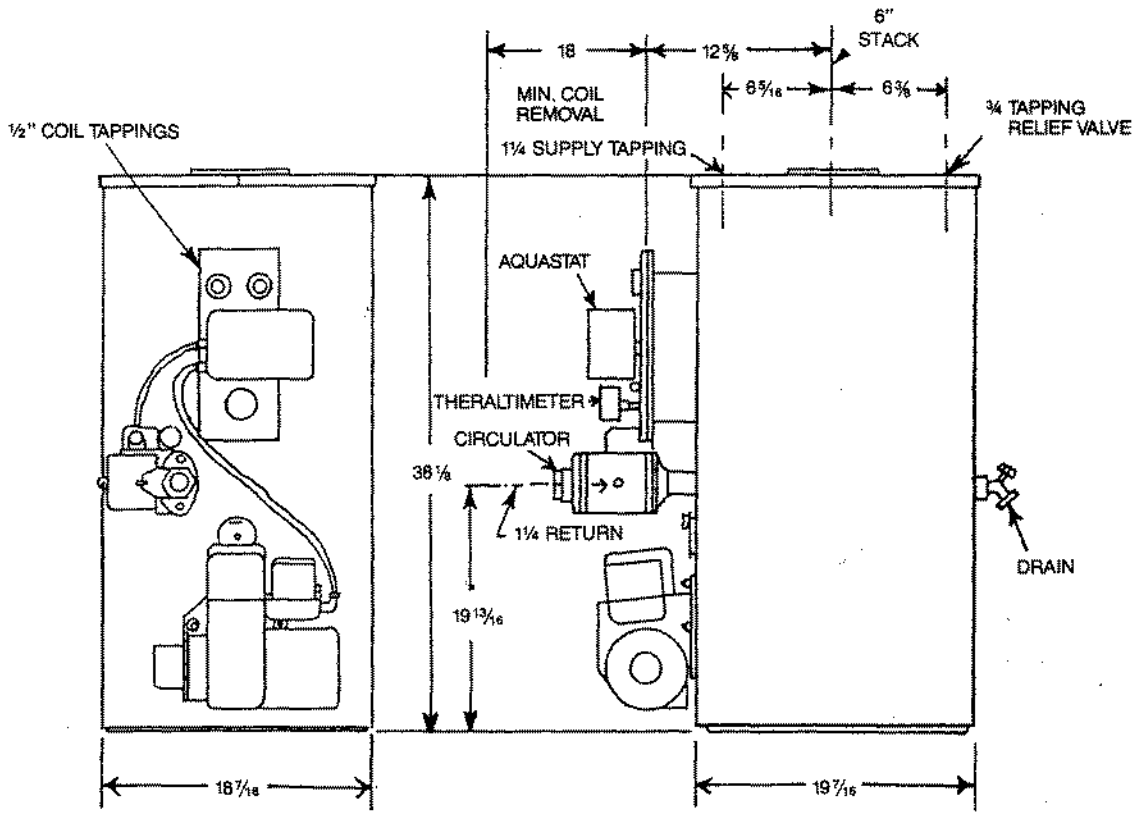
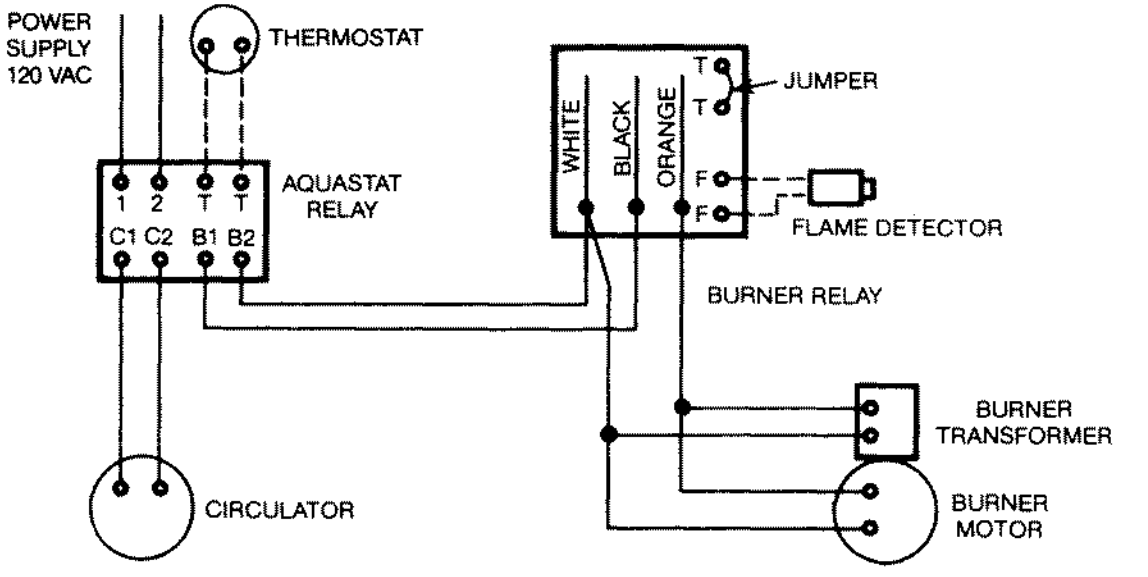


FIG. 1

WIRING DIAGRAM
SINGLE ZONE



WIRING DIAGRAM
MULTI-ZONE WITH CIRCULATORS

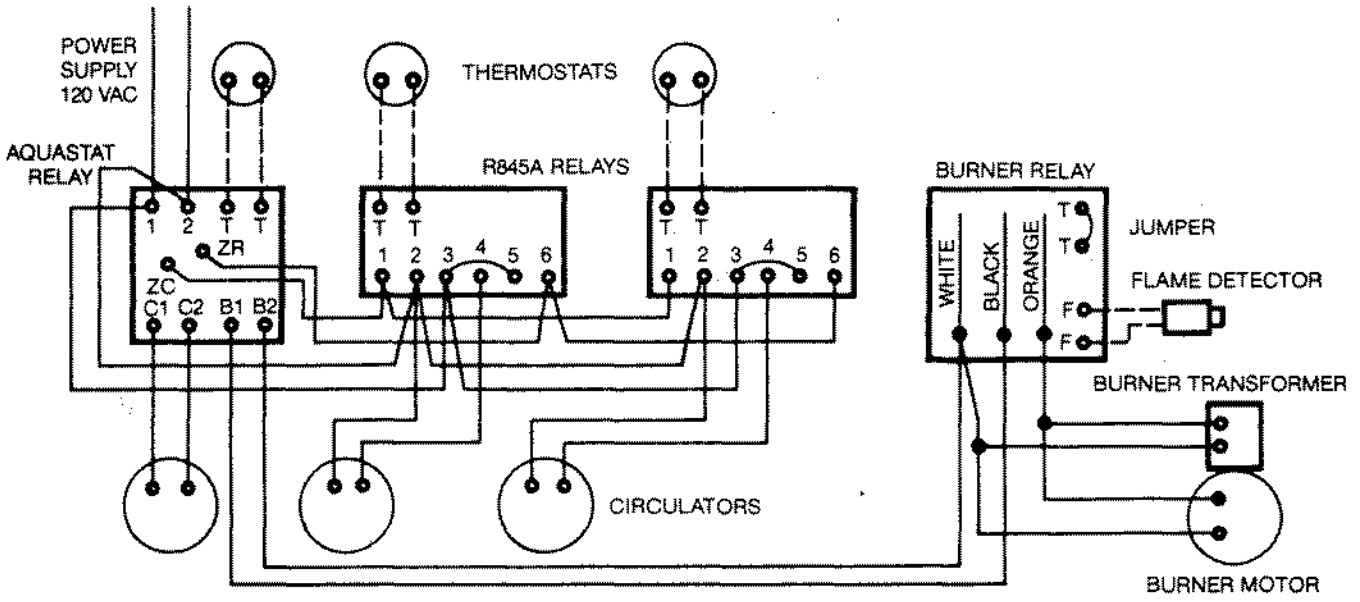


FIG. 3

WIRING DIAGRAM
MULTI-ZONE WITH ZONE VALVES

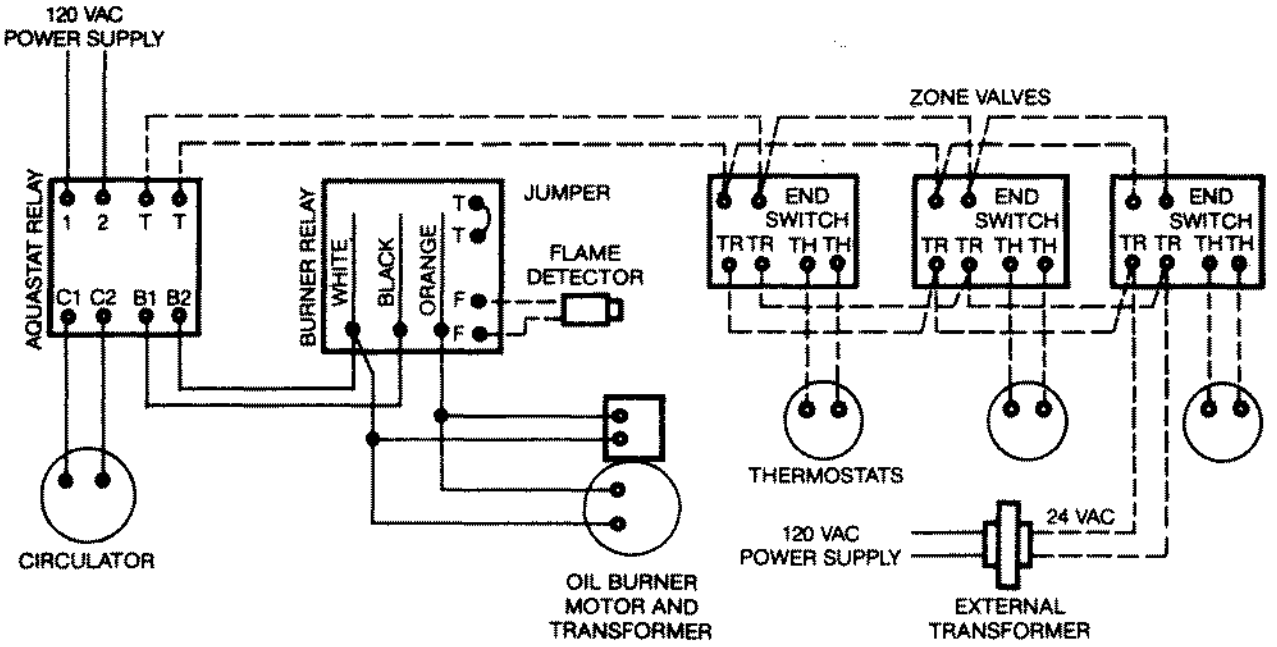


FIG. 4

ENERGYGUIDE

ELECTRIC FURNACE MAN DIV. **GENERAL MACHINE CORP.**

WATER BOILER
MODEL: VT 700 E @ 0.65 GPH
CAPACITY: 77,000 BTUH

EFFICIENCY RATING

LEAST THIS MODEL MOST

77.8 81.10 88.1

Only models with 77,000 to 93,000 BTU/HR capacities are used in the scale.

COMPARATIVE NATIONAL AVERAGE YEARLY COST ($)					
Cost per gallon of oil (cents)	BTU/HR HEAT LOSS OF HOME (1,000's)				
	40	45	50	60	
76	444	500	556	667	
79	461	518	576	691	
82	477	537	596	716	
85	494	555	617	740	
88	510	574	637	765	
91	526	592	658	790	
94	543	611	678	814	
97	559	629	699	839	
100	576	647	719	863	

WATER BOILER
MODEL: VT 700 E @ 0.75 GPH
CAPACITY: 88,000 BTUH

EFFICIENCY RATING

LEAST THIS MODEL MOST

77.8 81.80 88.1

Only models with 77,000 to 93,000 BTU/HR capacities are used in the scale.

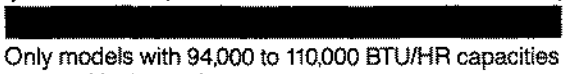
COMPARATIVE NATIONAL AVERAGE YEARLY COST ($)					
Cost per gallon of oil (cents)	BTU/HR HEAT LOSS OF HOME (1,000's)				
	40	45	50	60	
76	444	500	556	667	
79	461	518	576	691	
82	477	537	596	716	
85	494	555	617	740	
88	510	574	637	765	
91	526	592	658	790	
94	543	611	678	814	
97	559	629	699	839	
100	576	647	719	863	

WATER BOILER
MODEL: VT 700 E @ 0.85 GPH
CAPACITY: 98,000 BTUH

EFFICIENCY RATING

LEAST THIS MODEL MOST

78.1 81.33 88.7



Only models with 94,000 to 110,000 BTU/HR capacities are used in the scale.

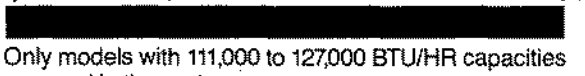
COMPARATIVE NATIONAL AVERAGE YEARLY COST ($)					
Cost per gallon of oil (cents)	BTU/HR HEAT LOSS OF HOME (1,000's)				
	50	60	70	80	
76	556	650	758	867	
79	576	674	787	899	
82	596	698	815	931	
85	617	723	843	964	
88	637	747	871	996	
91	658	771	900	1028	
94	678	795	928	1060	
97	699	819	956	1093	
100	719	844	984	1125	

WATER BOILER
MODEL: VT 700 E @ 1.00 GPH
CAPACITY: 114,000 BTUH

EFFICIENCY RATING

LEAST THIS MODEL MOST

75.4 80.26 87.5



Only models with 111,000 to 127,000 BTU/HR capacities are used in the scale.

COMPARATIVE NATIONAL AVERAGE YEARLY COST ($)					
Cost per gallon of oil (cents)	BTU/HR HEAT LOSS OF HOME (1,000's)				
	60	70	80	90	
76	650	758	867	975	
79	674	787	899	1011	
82	698	815	931	1048	
85	723	843	964	1084	
88	747	871	996	1120	
91	771	900	1028	1157	
94	795	928	1060	1193	
97	819	956	1093	1229	
100	844	984	1125	1265	

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ENERGY COSTS AND ENERGY EFFICIENCY RATINGS ARE BASED ON U.S. GOVERNMENT STANDARD TESTS

Efficiency rating shown is "Annual Fuel Utilization Efficiency" and should not be confused with "Steady State Efficiency" which is a higher value. Energy Costs are average for the nation. Your cost may vary due to location, climate or living habits.