



# Installation Instructions Boiler Burner Unit

MODELS PK500T PK750T K950T K1200T  
(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
PK500T	1.00-70-S	119000	103500	690	AFG56XN	25	7	8 x 8 x 15	600
PK750T	1.35-70-S	161000	140000	930	AFG56YB	24	7	8 x 8 x 15	640
K950T	1.75-70-S	210000	182600	1220	AFG56XO	37	8	8 x 8 x 15	815
K1200T	2.25-70-S	252000	219130	1460	AFG56XP	36	8	8 x 8 x 20	815

## Specifications

These installation instructions provide information for the installation and adjustment for the proper operation of the PK and K 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 PK Boilers are shipped completely assembled except for the circulator and drain cock which are furnished, but shipped loose. K Boilers are shipped unassembled.

The PK and K Boilers are designed for use with a circulating hot water 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.

Locate boiler close to chimney with adequate clearance around unit for service. See Figure 1 for installation dimensions. Keep in mind that the tube turbulators must be removed for proper cleaning of the tubes. Inspect turbulators for proper location in fire tubes. Turbulators should be inserted from end opposite burner with tab on end of turbulator toward left (except 2 end tubes on left side where tab is at bottom).

## Chimney

The chimney should be masonry with tile lining or metal insulated, with a stainless steel internal surface such as the tradename "Metalbestos".

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
PK500T	1.00 GPH	.01
PK750T	1.35 GPH	.01
K950T	1.75 GPH	.02
K1200T	2.25 GPH	.025

## 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 filtration. 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**

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Refer to Figure 1 for location of piping connections on boiler. Refer to Figure 3 for piping diagram for single zone, Figure 5 for multi-zone with circulators and Figure 7 for multi-zone valves.

Pipe boiler to heating system in accordance with recommended practices in order to assure satisfactory heating performance. Connect domestic hot water lines to coil tapings on top front of boiler. Refer to Figure 9 for piping diagram.

If local ordinances require a low water cut-off, use an external mounted cut-off. Refer to Figure 10.

## **Electrical Installation**

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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 4 for a single zone, Figure 6 for a multi-zone with circulators and Figure 8 for a multi-zone with zone valves.

Provide a separate branch circuit with a fused disconnect switch to the boiler. These boilers operate 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**

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The burner on the PK and K Boilers is furnished with a Sunstrand 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 1/2 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**

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The flue pipe must be 7" or 8" nominal dia. galvanized steel. See chart on page 1. The flue pipe should be as 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**

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Refer to burner manufacturer's instructions furnished with this unit.

Check burner to be sure proper nozzle is installed.

Check electrode settings for proper location and spacings.

These units should be set up with an .02 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<sub>2</sub>. The smoke must be between a trace to No. 1 smoke maximum.

The gross stack temperature at the specified firing rates will vary between 325° F. to 350° F.

With these low stack temperatures, steady state output efficiencies in excess of 87% can be achieved. However, in some instances it is possible to encounter chimney condensation. If condensation develops, it may be necessary to remove flue tube turbulators to elevate the stack temperature until the condition is corrected.

## **Maintenance And Service**

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Refer to burner manufacturer's instructions furnished with this unit.

To clean boiler heating surfaces:

Remove rear cabinet panel.

Remove rear hot head,

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.

Remove flue collector and clean flue pipe and collector.

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

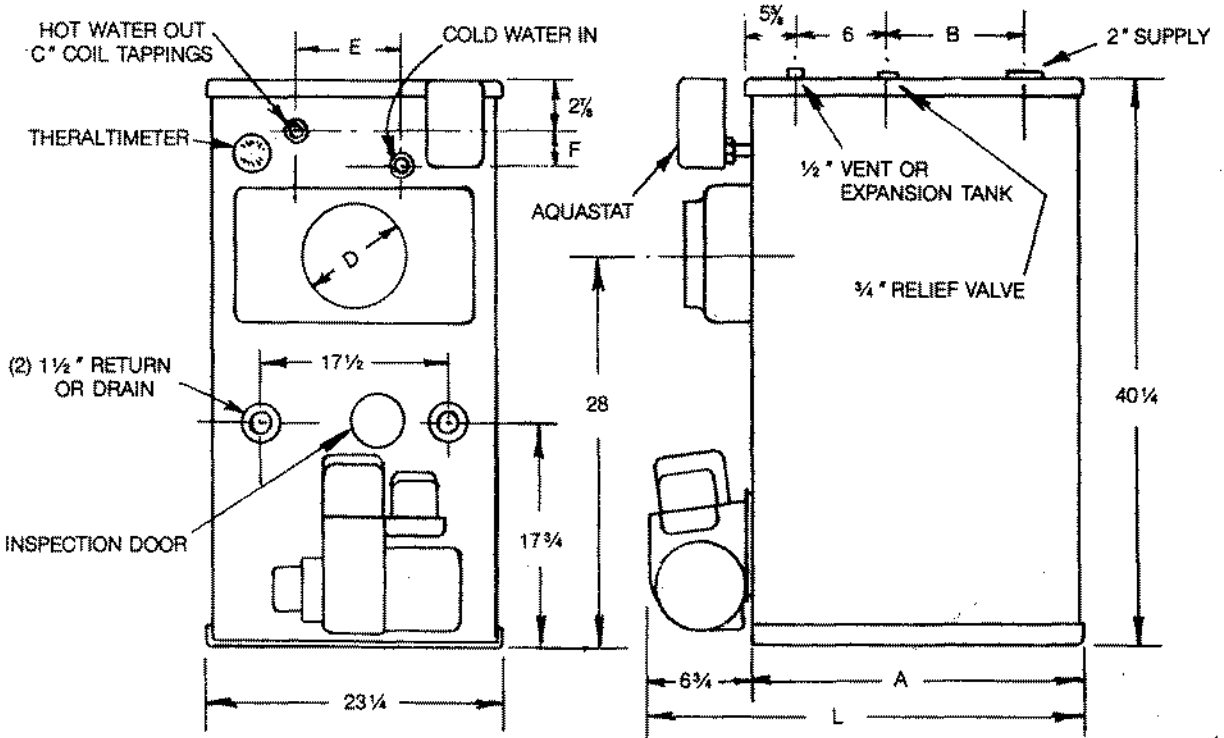
When replacing turbulators, refer to instructions under "Setting Boiler" above.

## **Instructing The Homeowner**

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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.

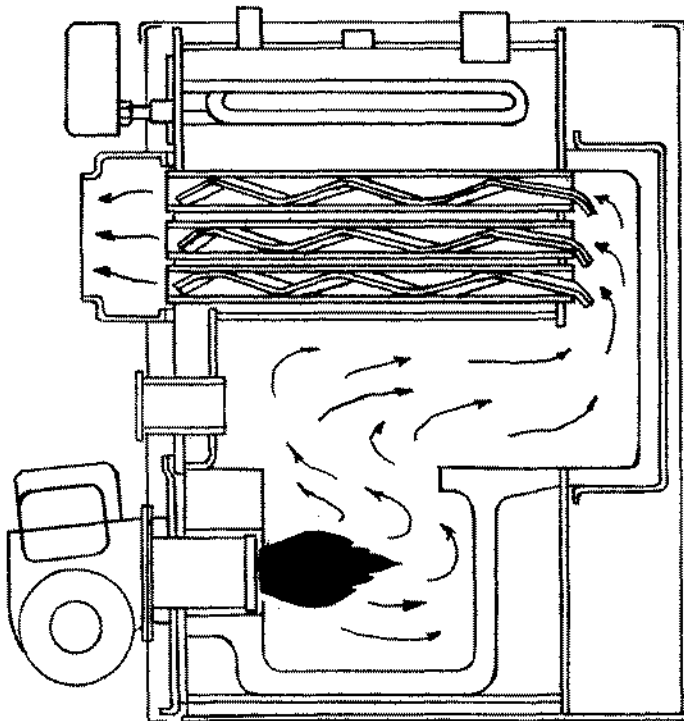
# INSTALLATION DIMENSIONS



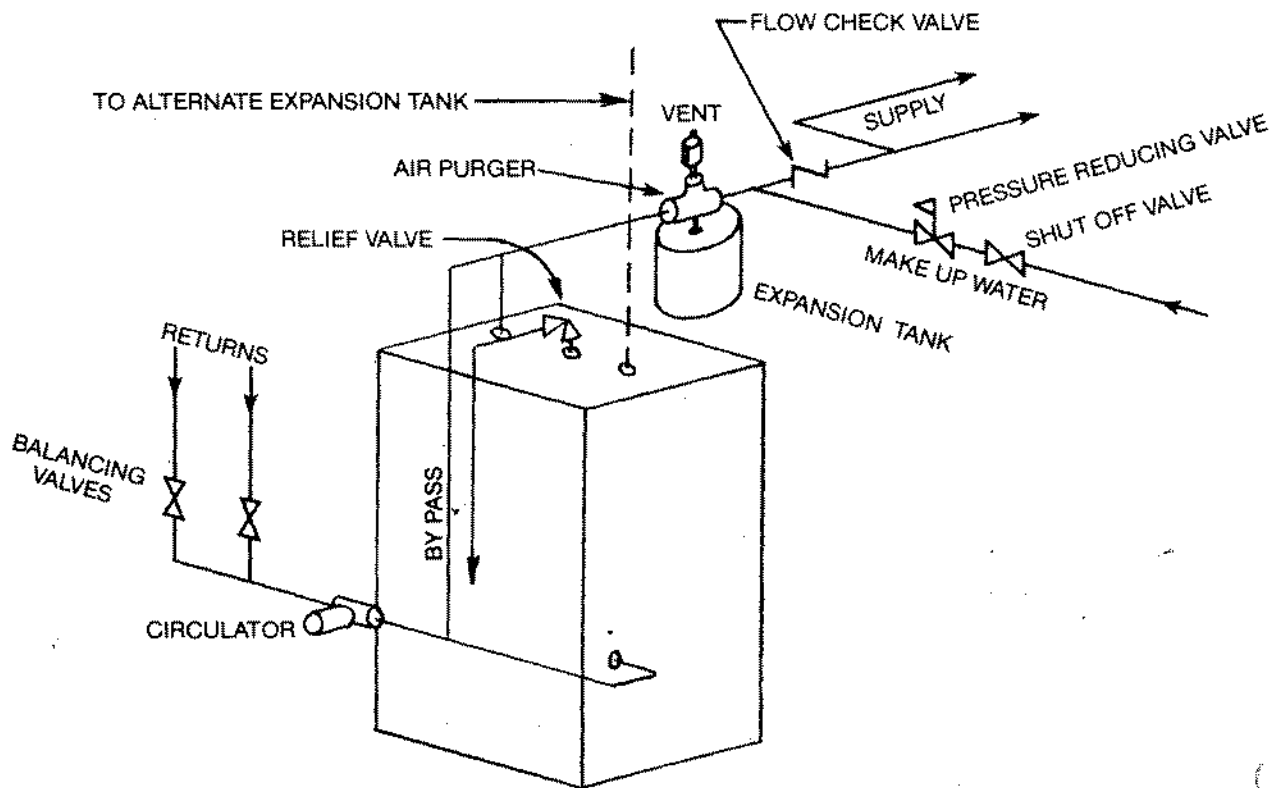
**FIG. 1**

MODEL	A	B	C	D	E	F	L
PK500-750	29	7	1/2	7	7	2 3/8	35 3/4
K950-1200	41	19	3/4	8	6 3/8	2	47 3/4

## CROSS SECTION OF UNIT

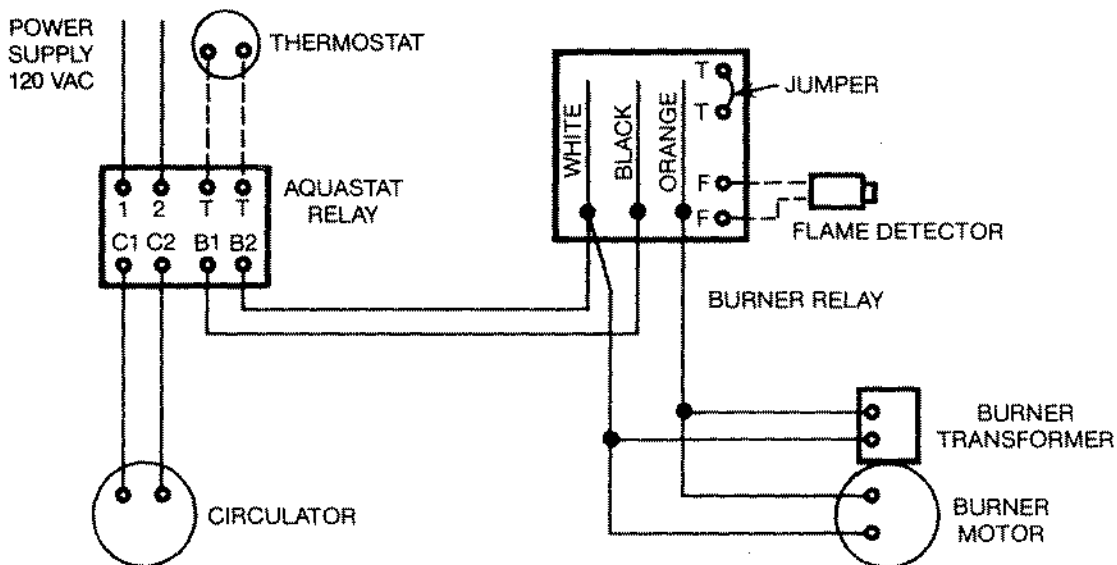


## PIPING DIAGRAM SINGLE ZONE

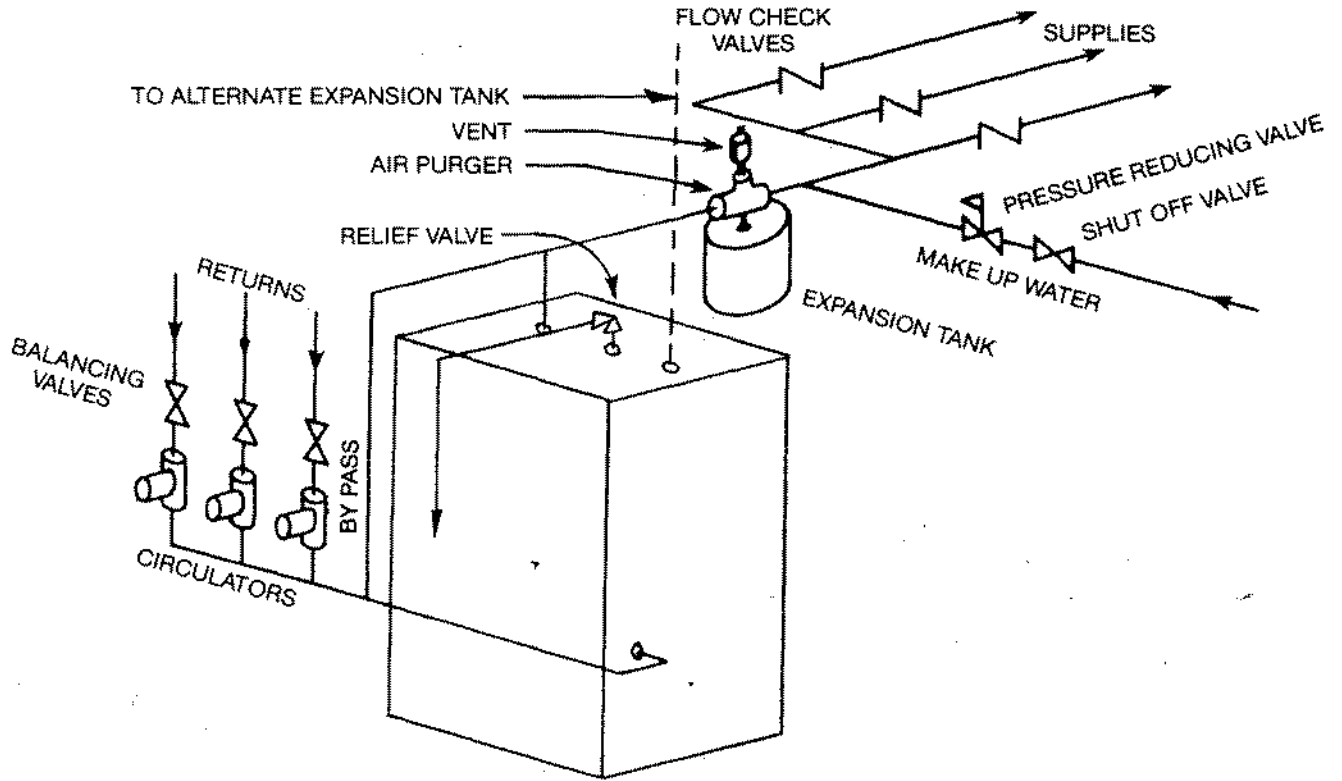


**FIG. 3**

## WIRING DIAGRAM SINGLE ZONE

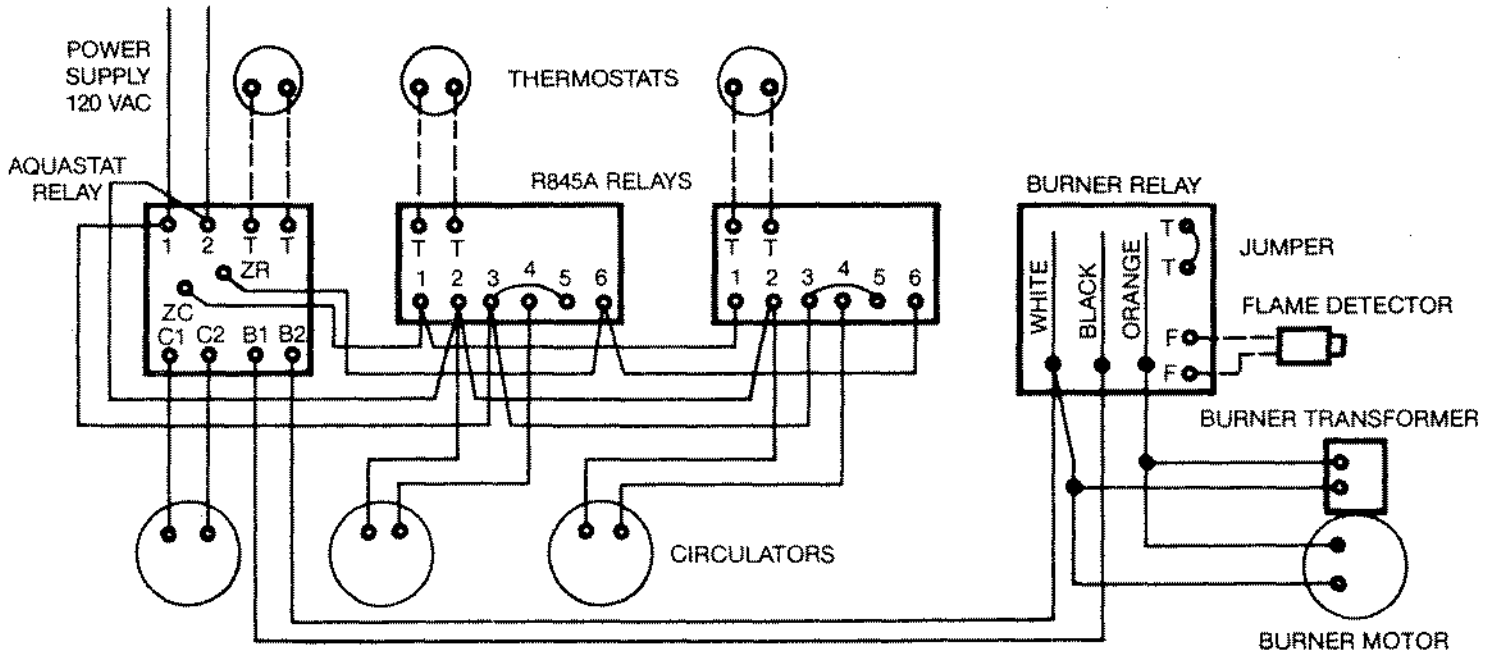


## PIPING DIAGRAM MULTI-ZONE WITH CIRCULATORS

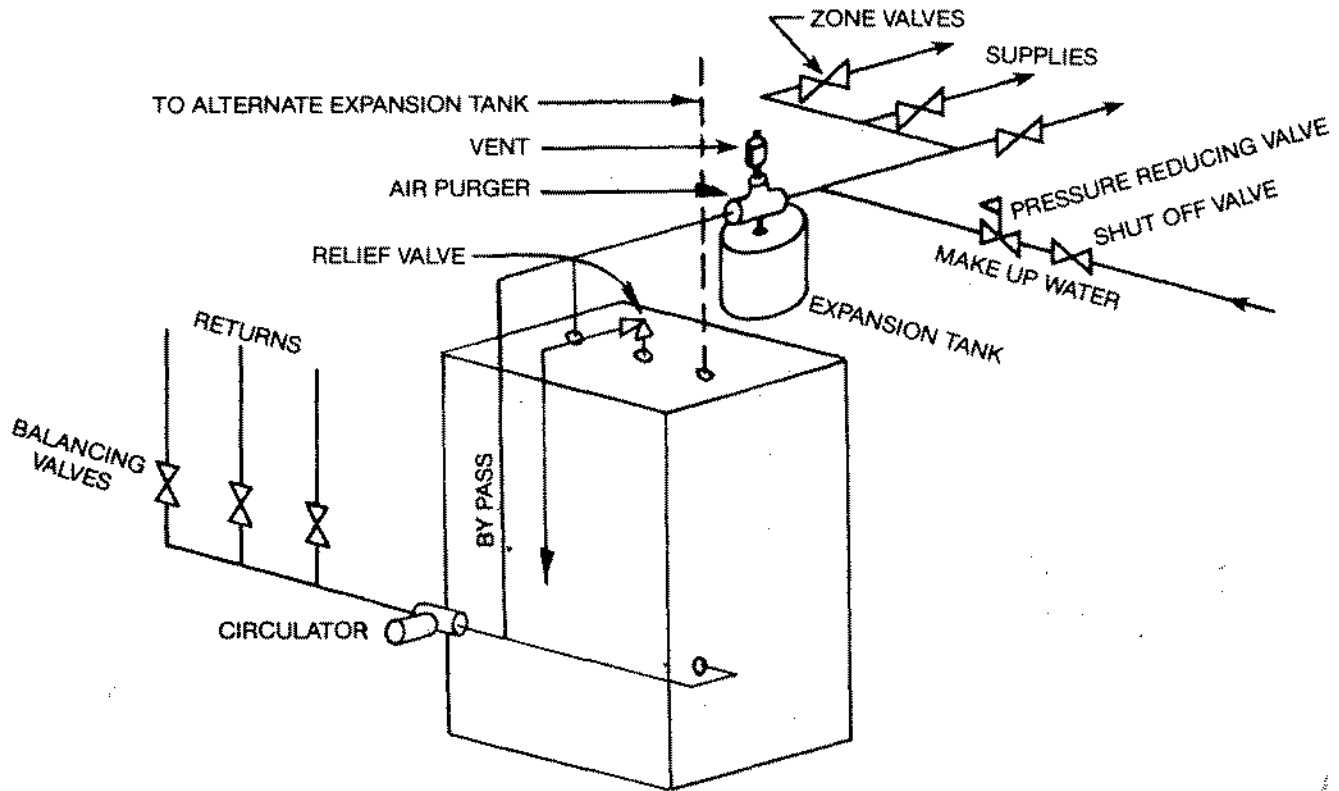


**FIG. 5**

## WIRING DIAGRAM MULTI-ZONE WITH CIRCULATORS

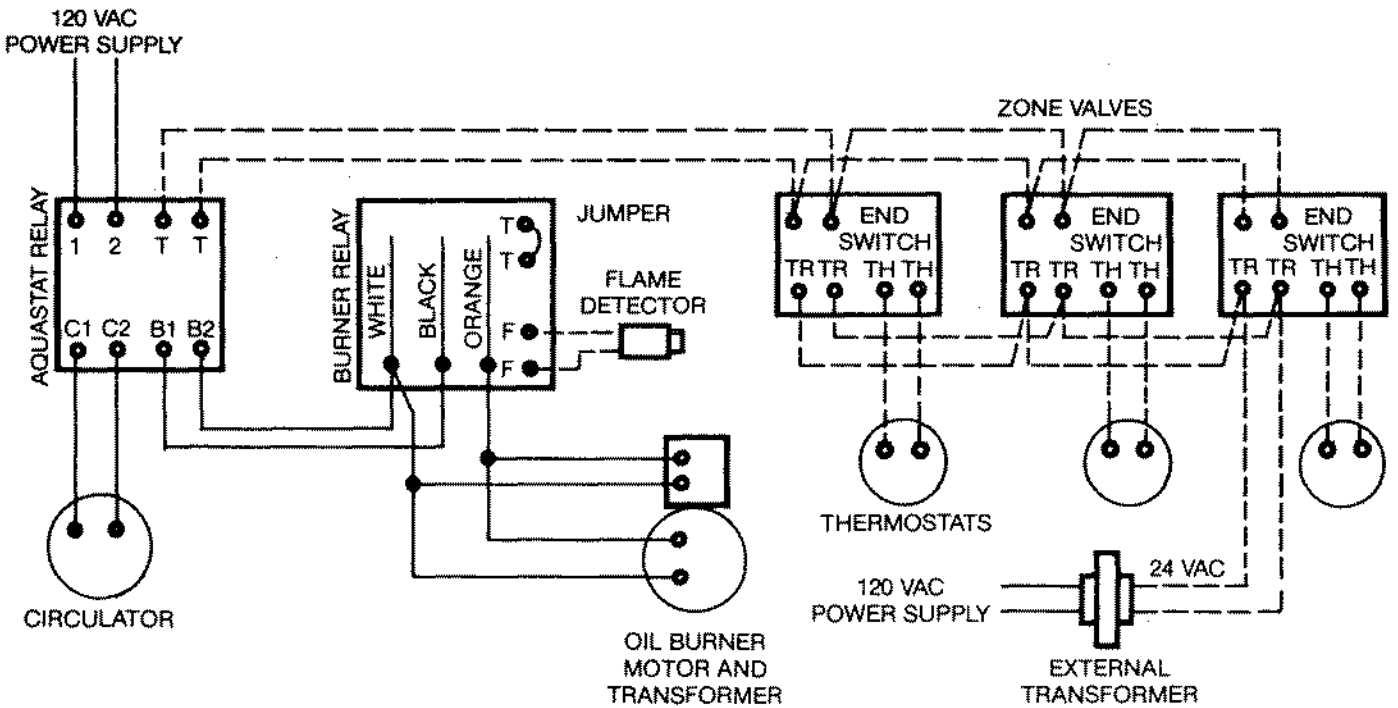


# PIPING DIAGRAM MULTI-ZONE WITH ZONE VALVES



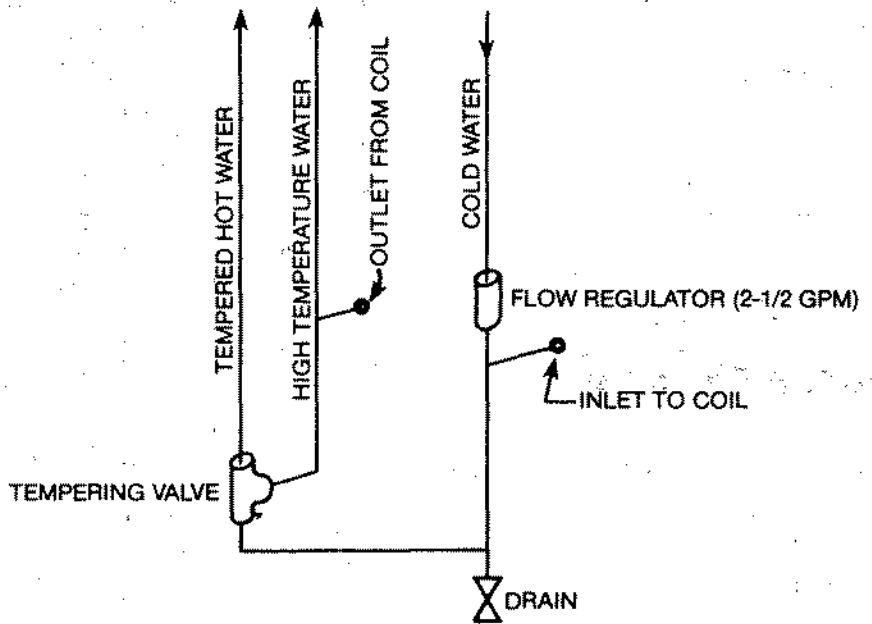
**FIG. 7**

# WIRING DIAGRAM MULTI-ZONE WITH ZONE VALVES



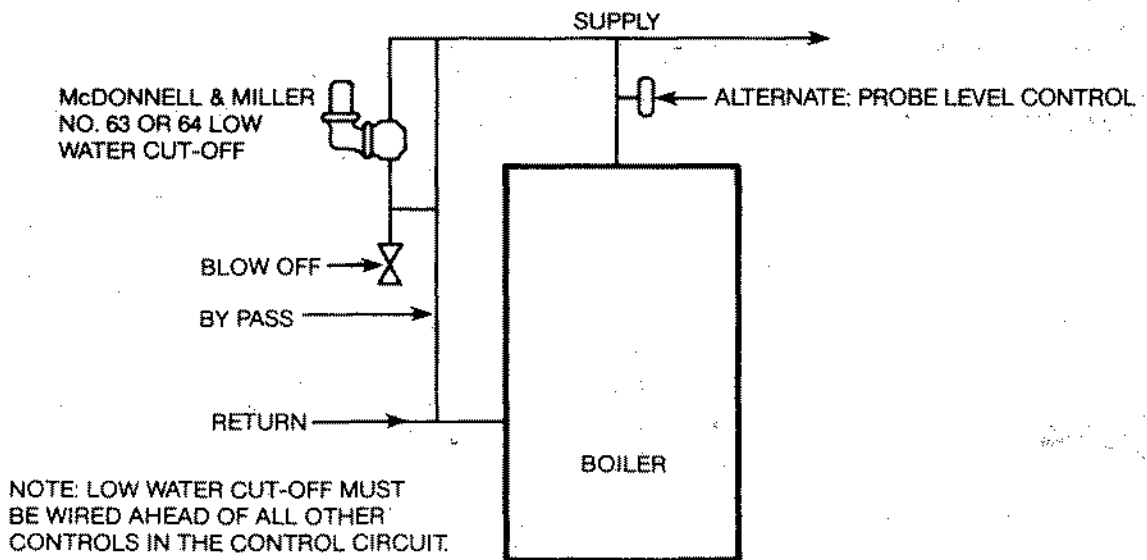
**FIG. 8**

## PIPING DIAGRAM DOMESTIC HOT WATER



**FIG. 9**

## PIPING DIAGRAM LOW WATER CUT-OFF



# ENERGYGUIDE

ELECTRIC FURNACE MAN DIV.

GENERAL MACHINE CORP.

WATER BOILER  
MODEL: PK 500T  
CAPACITY: 119,000 BTU/HR

**EFFICIENCY RATING**



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	657	767	876	986	
79	682	796	909	1023	
82	707	825	943	1061	
85	732	854	976	1098	
88	757	883	1010	1136	
91	782	913	1043	1173	
94	807	942	1076	1211	
97	832	971	1110	1249	
100	857	1000	1143	1286	

WATER BOILER  
MODEL: PK750T  
CAPACITY: 161,000 BTU/HR

**EFFICIENCY RATING**



Only models with 145,000 to 161,000 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)				
	80	90	100	110	120
76	870	979	1087	1196	1305
79	903	1016	1129	1242	1355
82	937	1054	1171	1288	1405
85	970	1091	1213	1334	1455
88	1004	1129	1255	1380	1506
91	1037	1167	1296	1426	1556
94	1071	1204	1338	1472	1606
97	1104	1242	1380	1518	1656
100	1138	1280	1422	1564	1706

WATER BOILER  
MODEL: K 950T  
CAPACITY: 210,000 BTU/HR

**EFFICIENCY RATING**



Only models with 196,000 and over 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)				
	120	130	140	150	160
76	1294	1402	1510	1618	1726
79	1344	1457	1569	1681	1793
82	1395	1511	1627	1743	1859
85	1445	1565	1685	1806	1926
88	1495	1619	1744	1868	1993
91	1545	1674	1802	1931	2060
94	1595	1728	1861	1994	2127
97	1645	1782	1919	2056	2193
100	1695	1836	1978	2119	2260

**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.

**ELECTRIC FURNACE-MAN, EMMAUS, PA.**

DIVISION OF GENERAL MACHINE CORPORATION