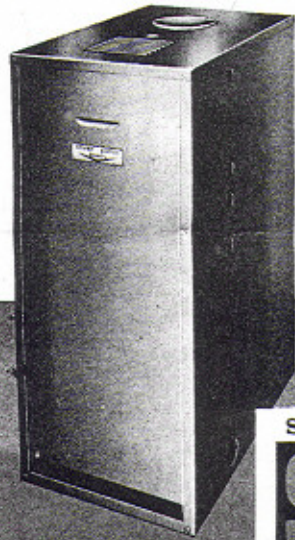
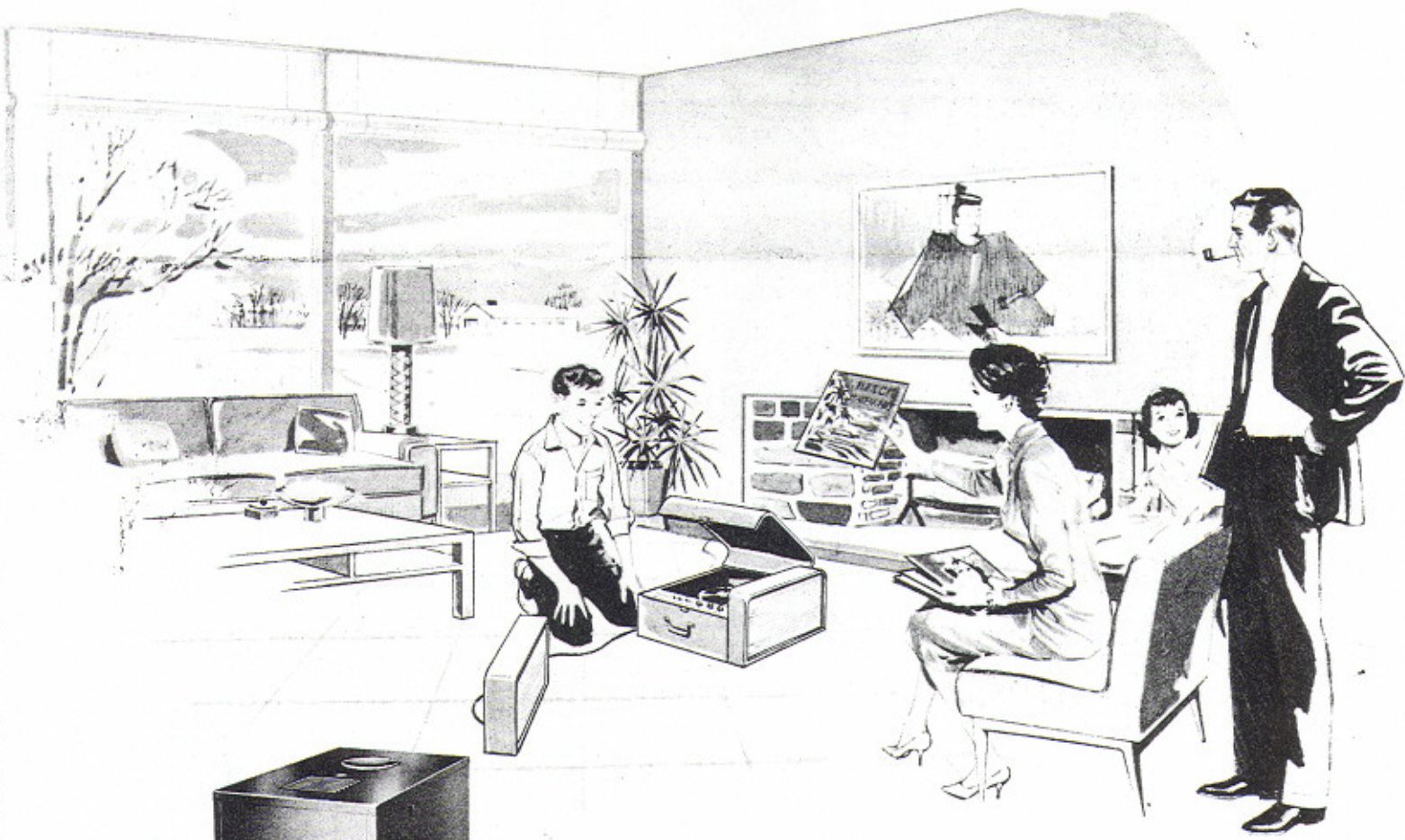
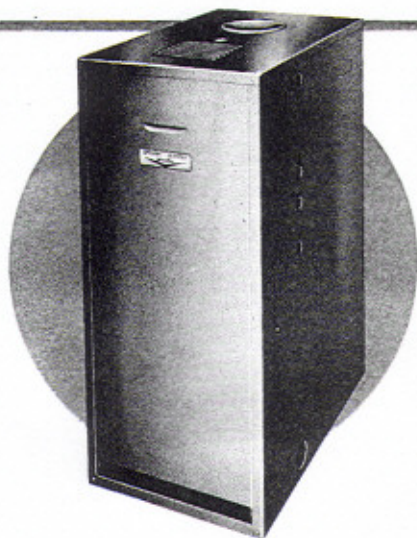


...a "package" of winter comfort



**STEWART-WARDNER**  
OIL-FIRED  
**"REVERSE FLOW" BOILER**

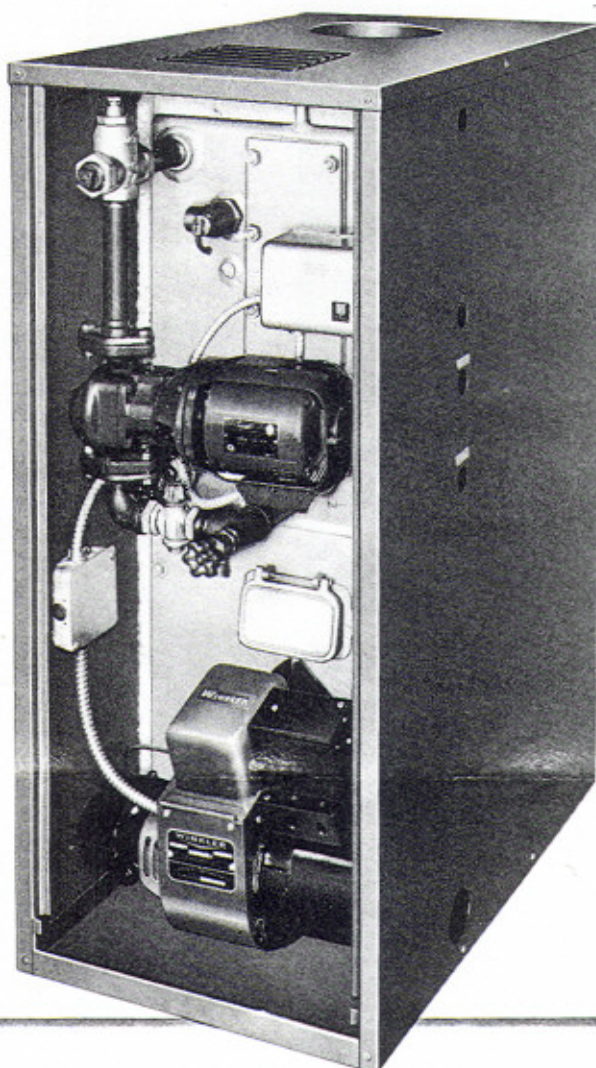
# 18 FEATURES FOR SUPERIOR PERFORMANCE



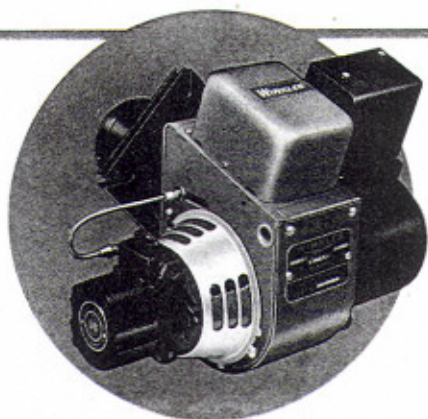
Here is a completely assembled and packaged forced hot water boiler—built for new homes in any price range and for replacement of old, worn-out, or inefficient boilers. It is built to comply with the ASME Code and presents numerous design and construction features found nowhere else!

This boiler establishes an entirely new conception of boiler operation. It eliminates many past causes of faulty performance because of its many unique and exclusive features. It offers genuine Stewart-Warner quality at a strictly competitive price.

- ① Delivered ready to connect to pipe lines—completely enclosed in de luxe steel jacket.
- ② Every boiler bears ASME label—all components are either ASME or U.L. tested and are of the highest quality obtainable.
- ③ Reverse boiler water flow to radiation prevents air from entering radiation system—eliminates vents—all air forced to enter expansion tank.
- ④ Reverse flow through boiler eliminates by-pass system, while retaining all of its advantages.
- ⑤ Reverse flow modulates temperature of water entering radiation system, eliminating pounding and pipe noises.
- ⑥ Additional supply and return tapings at rear of boiler permit an additional circulating system to be installed.
- ⑦ The domestic hot water system is, in effect, two systems. It will supply water at any desired temperature for showers, shaving, baths and at a higher temperature for dish and clothes washers.
- ⑧ Stand-by loss held at minimum.
- ⑨ Special burner flange mounting permits easy removal for service or cleaning.
- ⑩ Special insulation is used in addition to glass wool on cabinet for minimum heat loss.
- ⑪ Rapid Glow factory built-in combustion chamber assures highest efficiency from the start.



- ⑫ Compact design saves space.
- ⑬ Easily removable smoke hood makes cleaning easy.
- ⑭ Heavy steel combustion chamber shell is formed of one piece of steel and securely welded to the heavy bottom pan—a sturdy foundation for the complete assembly. Two  $\frac{3}{8}$ " steel skids are welded to pan base to keep the unit clear of the floor—jacket is bolted to pan. Shipment is made in a specially designed crate which assures safe handling.
- ⑮ Heavy relief and fire inspection door gives added convenience and safety.
- ⑯ Winkler HP Oil Burner has a new Stewart-Warner designed "Electro-Photic" primary control—a more dependable control than the conventional stack switch it replaces. A Cadmium-Sulfide Cell responds instantly to either flame ignition or extinction to control burner operation. The installer has only to connect the service line and low voltage thermostat to the 3-way control.
- ⑰ Both boiler and domestic hot water system are hydrostatically tested and ASME labelled. The burner is actually fired to be sure that all controls and the burner are functioning properly.
- ⑱ Guarantee: This ASME boiler is guaranteed against defects in manufacture for a period of ten years from date of delivery. All component parts are guaranteed by the various manufacturers under their respective standard guarantees.



## EQUIPPED WITH WINKLER HP OIL BURNER

Never before have so many features for better performance been incorporated in an oil burner! New designs and materials make this Stewart-Warner product the standard of comparison for quality, economy and dependability.

Several component parts such as the cad-cell primary control and the fuel unit have

been designed and manufactured by Stewart-Warner along new and revolutionary lines to assure smoother, more efficient functioning at all times.

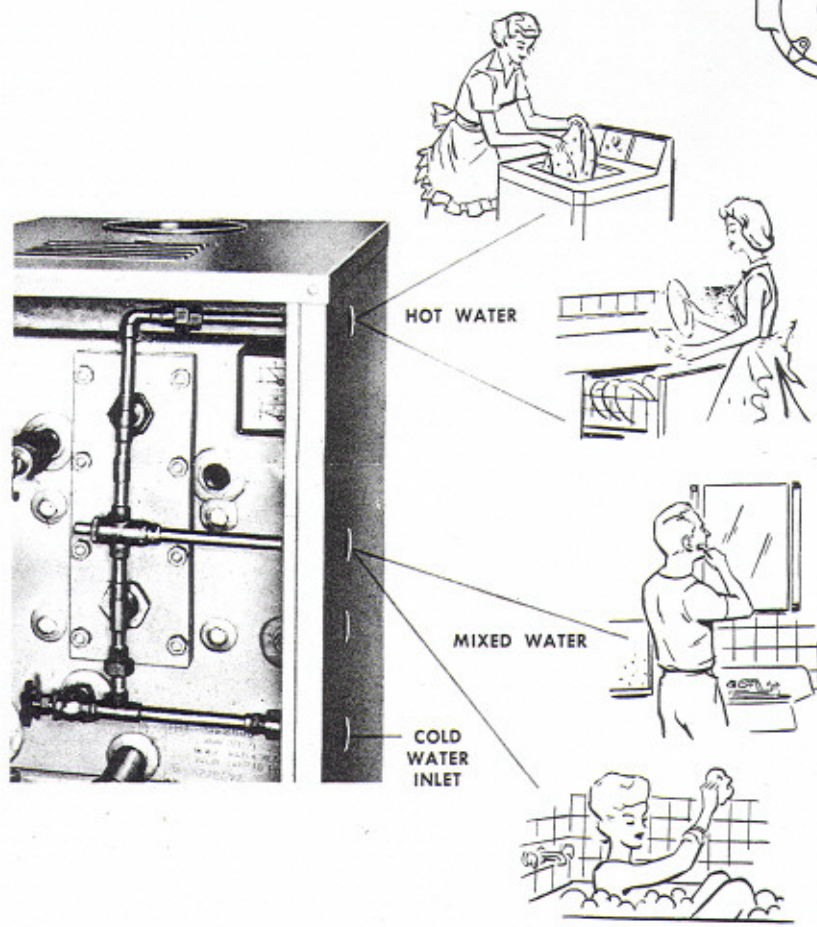
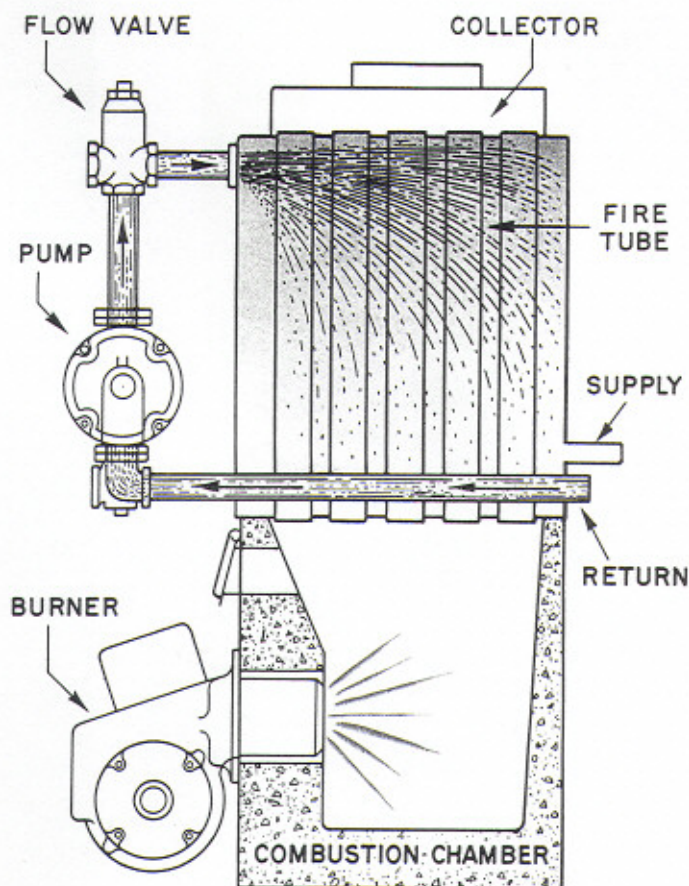
Other refinements of design include a heavy welded steel housing which provides a smooth inside surface for better control of the combustion air and quiet operation.

## PRINCIPLE OF "REVERSE FLOW" OPERATION

The Stewart-Warner "Reverse Flow" Boiler is unlike any hot water heating boiler on the market today. By reversing the normal direction of water flowing through the boiler, a temperature modulating effect is obtained. This eliminates pipe pounding and radiation noises, and also eliminates the need for a by-pass system, while retaining all of its advantages. Reverse flow also prevents air from entering the piping system and therefore ends the need for many air vents and other air removing devices.

As shown in the diagram, the cooled water returning from the system enters a steel pipe which runs from the rear to the front of the boiler. It then passes through the square head control cock and is pumped up by the Reverse Flow Circulator into the top of the boiler. The square head cock is used to regulate the flow through the system as required by the individual job and the flow control valve prevents any back circulation.

The cool return water thus mingles with the hottest water at the top of the boiler, modulating the temperature of the water before it enters the supply line at the bottom of the boiler.



## DOMESTIC HOT WATER AVAILABLE AT TWO TEMPERATURES

Of all modern conveniences none is more essential or more appreciated by every member of the family than an ever-ready supply of domestic hot water.

The Stewart-Warner "Reverse Flow" Boiler is equipped with a tankless heater which supplies hot water in ample quantities. As a special feature, an automatic, adjustable mixing valve is installed which is normally set to deliver mixed water at a temperature of 140°. It can be adjusted, however, to a higher or lower temperature by simply turning a dial.

In addition, there is a second outlet for *unmixed* hot water which permits delivery of water at a much higher temperature for use in clothes or dish washing machines. Water at both temperatures can be obtained simultaneously.

There is also a restricting valve installed in the cold water line which provides a regulated flow of water through the heater, regardless of the water pressure from the supply main.

# RATINGS... DIMENSIONS... EQUIPMENT

## RATINGS AND SPECIFICATIONS

MODEL NO.		SP2016T*	SP2020T*	SP2422T*	SP2428T*
Gross Output	BTU/HR	115,000	144,000	198,000	252,000
Net Rating	BTU/HR	87,000	108,000	149,000	189,000
Net Hot Water Rad.	Sq. Ft.	580	720	990	1260
Oil Firing Rate	GPH	1.00	1.35	1.75	2.25
Heating Surface	Sq. Ft.	17.8	21.13	28.	34.3
Tankless Water Heater Coil		4 GPM ▲	4 GPM ▲	5 GPM ▲	5 GPM ▲
Number of 2 inch Tubes		16	20	22	28
Flue Diam. (C)	In.	7	7	9	9
Supply Tappings	In.	1½	1½	1½	1½
Return Tappings	In.	1	1	1¼	1¼
<b>JACKET DIMENSIONS</b>					
Width	In.	19	19	19	19
Height (B)	In.	44	44	50	50
Length (A)	In.	30	30	36	36
Shipping Weight Approx.	Lbs.	600	625	725	775

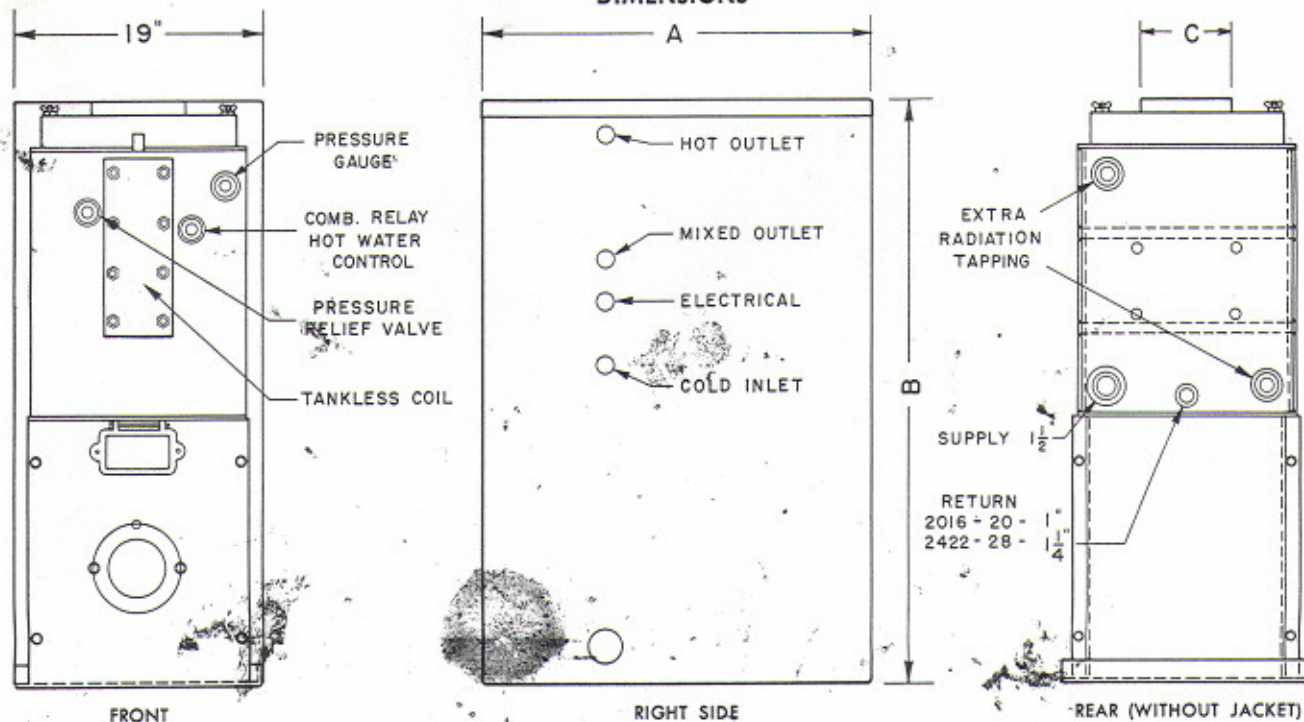
\*Substitute letters "NC" for "T" if tankless water heater and manifold are not wanted. Water feed valve and fittings, however, will be included.

▲Capacity dependent on oil burner firing rate. SP2016-SP2020 use 3 GPM Flow Valve, SP2422-SP2428 use 4 GPM Flow Valve.

## STANDARD EQUIPMENT

Fully enclosing de luxe insulated jacket  
 Oversize tankless coil  
 D.H.W. mixing valve  
 Combination altitude and pressure gauge  
 Dole domestic hot water restricting valve  
 ASME 30 lb. brass relief valve  
 Brass square head circulator control valve  
 Circulating flow control valve  
 Brass angle boiler feed valve  
 Brass boiler drain valve  
 Winkler Burner with built-in safety control  
 Low voltage thermostat  
 Three-way boiler temperature control and relay  
 B&G circulator

## DIMENSIONS



**STEWART-WARNER CORPORATION • Heating and Air Conditioning Division • Lebanon, Indiana**



LOOK TO STEWART-WARNER FOR THESE FINE PRODUCTS: STEWART-WARNER, WINKLER and SAF-AIRE Heating and Air Conditioning Equipment; ALEMITE Lubrication Equipment, Lubricants and Oils; STEWART-WARNER Speedometers and Instruments; BASSICK Casters, Wheels and Materials Handling Devices; SOUTH WIND Heat Exchanger Products and Automotive Heaters; STEWART-WARNER Electronics Devices; HOBBS Clock-Type Hour Meters and Automotive Accessories; STEWART Die Castings; BASSICK-SACK Furniture Hardware and Giftware.

# SPECIFIC MANUAL FOR STEWART-WARNER— WINKLER HIGH PRESSURE OIL BURNERS

FOR USE IN DESIGN UNITS

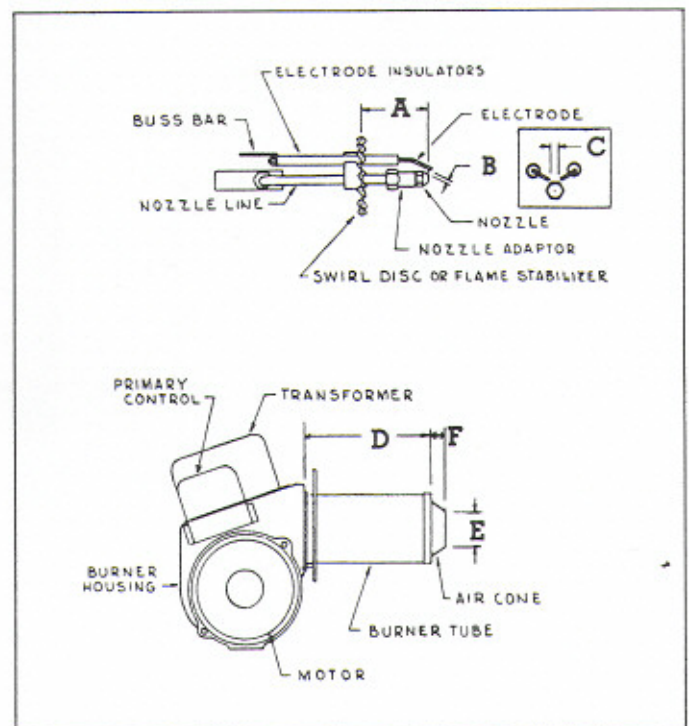
THESE BURNERS ARE FOR USE WITH NO. 2 FUEL OIL

## STEWART-WARNER CORPORATION

HEATING AND AIR CONDITIONING DIVISION • LEBANON, INDIANA

Burner Model	Burner Package Part No.	Equipment Used On	Nozzle	Actual Burner Tube Length
<b>V-Series</b>				
HP-V-100	170697	VO, VO-A	.65, 90°B	5"
<b>100 Series</b>				
HP-67	188056	MB-V, MB-C	.65, 90°B	5"
HP-CO-85	170640	CO-U, CO-C, CO-B	.75, 90°B	5"
HP-M-85-H	281252	MY-H	.75, 90°B	5"
HP-85	281244-1	GO-V, GO-C	.75, 90°B	6"
HP-112	281243-1	GO-V, GO-C	1.00, 90°B	6"
HP-85	180500-1	GO-B	.75, 90°B	6"
HP-112	180499-1	GO-B	1.00, 90°B	6"
HP-125	180498-1	WB-125	1.10, 90°B	6"
HP-100-CF	170689	GO-H	1.00, 90°B	6"
HP-100-WHF-30	55107	WHF-30	.75, 90°B	8"
<b>250 Series</b>				
HP-250-WHF-50	55108	WHF-50	1.20, 80°B	8"
HP-250-WHF-70	55109	WHF-70	1.35, 80°B	8"
HP-250-CF	180508-125	WB-140	1.25, 80°B	8"
HP-250-CF	180508-150	WB-170	1.50, 80°B	8"
HP-250-CF	190158-100	CIC-3	1.00, 80°B	6"
HP-250-CF	190158-150	CIC-4	1.50, 80°B	6"
HP-250-CF	190158-200	CIC-5	2.00, 60°A	6"
HP-250-CF	190158-250	CIC-6	2.50, 60°A	6"
HP-250-CF	190192	Boiler 2016	1.10, 80°B	6"
HP-250-CF	190193	Boiler 2020	1.35, 80°B	6"
HP-250-CF	190152-175	Boiler 2422	1.75, 80°B	6"
HP-250-CF	190153	Boiler 2428	2.25, 80°B	6"
HP-250-F	170735-100	CP-4-W	1.00, 80°B	6"
HP-250-F	170735-120	CP-5-W	1.20, 80°B	6"
HP-250-F	170735-150	CP-6-W	1.50, 80°B	6"
HP-250-F	170735-165	CP-7-W	1.65, 80°B	6"
HP-250-F	170735-175	CP-8-W	1.75, 80°B	6"
HP-250-F	170735-200	CP-9-W	2.00, 80°B	6"

NOTICE: All oil fired heating equipment must be installed in accordance with the rules of the National Board of Fire Underwriters and local codes.



Letter	A	B	C	D	E	F
V-Series	3 1/2	1/4	5/32	*	1 3/4	1 19/64
100 Series	3 1/2	1/4	5/32	*	1 3/4	51/64
250 Series	3 1/2	1/4	5/32	*	2 7/16	1 3/16

\*See Spec. Chart.

Dimensions are in inches.

### LUBRICATION

Once each heating season place 10 drops of No. 10 weight oil in each oil port of the burner motor.

### NOZZLE TUBE AND ELECTRODE ASSEMBLY

The nozzle tube and electrode assembly must be properly positioned in the burner tube. In every case set the nozzle line in a position where the best performance is obtained and where there is no fuel impingement on the air cone.

HANG THIS MANUAL IN THE VICINITY OF THE BURNER



## CAD CELL PRIMARY CONTROLS

### Manufacturers Designation

### Stewart-Warner

#### Part No.

Honeywell Cell and Receptacle—C-554-A.....	20642
W.R. Cell and Receptacle—956-52.....	20838
Honeywell Relay R-8185-D Intermittent Ign.....	20679
Honeywell Relay R-8184-B Constant Ign.....	20680
W.R. Relay 669-14 Intermittent Ign.....	20839
W.R. Relay 668-14 Constant Ign.....	20834

## NOZZLE COMPARISON CHART

This chart lists nozzles which could be substituted for nozzles shipped as original equipment.

Mfg.	Type	Angle	Firing Rates
Delavan Delavan	B W	80° 60° or 70°	.50 to 1.50 1.50 to 2.50
Monarch Monarch	AR AR	90° 70° or 80°	.50 to 1.50 1.50 to 2.50
Eddington Eddington	S SH	80° 60° or 70°	.50 to 1.50 1.50 to 2.50
Hago Hago	P ES	80° 60° or 70°	.50 to 1.50 1.50 to 2.50
Steinen Steinen	SS Q	80° 60° or 70°	.50 to 1.50 1.50 to 2.50

## SPACER CHART

Three sets of spacers are used between the mounting flange and burner housing on some burner models in order to establish the proper burner tube insertion in the furnace. These spacers are shown in this chart.

Burner Model	Equipment Model	Spacer No.	Length
HP-85/112	GO-V, GO-C, GO-B	(2) 70395-500 Upper (1) 70395-625 Lower	$\frac{1}{2}$ " $\frac{5}{8}$ "
HP-100-CF	GO-H	(3) 70395-875	$\frac{7}{8}$ "
HP-125	WB-125	(2) 70395-500 Upper (1) 70395-625 Lower	$\frac{1}{2}$ " $\frac{5}{8}$ "
HP-250-CF	WB-140, WB-170	(3) 70395-1000	1"
HP-250-CF	CIC Boiler	(3) 70395-2875	2- $\frac{7}{8}$ "
HP-250-CF	SP Boiler 2016, 2020	(3) 70395-1250	1- $\frac{1}{4}$ "
HP-250-CF	SP Boiler 2422, 2428	(3) 70395-1250	1- $\frac{1}{4}$ "
HP-250-F	CP Boiler	(3) 70395-1500	1- $\frac{1}{2}$ "
HP-100-WHF-30	WHF-30	(2) 70395-1750 Upper (1) 70395-1875 Lower	1- $\frac{3}{4}$ " 1- $\frac{7}{8}$ "
HP-250-WHF-50	WHF-50	(2) 70395-2375 Upper (1) 70395-2500 Lower	2- $\frac{3}{8}$ " 2- $\frac{1}{2}$ "
HP-250-WHF-70	WHF-70	(2) 70395-1375 Upper (1) 70395-1500 Lower	1- $\frac{3}{8}$ " 1- $\frac{1}{2}$ "

# INSTALLATION MANUAL

## STEWART-WARNER STEEL BOILER

### MODELS

*With Tankless Heaters*

- PS-2016-T
- PS-2020-T
- PS-2422-T
- PS-2428-T

*Without Tankless Heaters*

- PS-2016-NC
- PS-2020-NC
- PS-2422-NC
- PS-2428-NC

SPECIFICATIONS	MODELS			
	PS-2016-T*	PS-2020-T*	PS-2422-T*	PS-2428-T*
Gross Output Btu/Hr.....	115,000	144,000	198,000	252,000
Net Output Btu/Hr.....	87,000	108,000	149,000	189,000
Net Hot Water Rad. Sq. Ft.....	580	720	990	1260
Firing Rate GPH.....	1.10	1.35	1.75	2.25
Heating Surfaces Sq. Ft.....	17.8	21.13	28	34.3
Tankless Water Heater Coil**.....	4 GPM**	4 GPM**	5 GPM**	5 GPM**
Number of 2 inch Tubes.....	16	20	22	28
Flue Diameter Inches.....	7	7	9	9
Supply Tappings Inches.....	1½	1½	1½	1½
Return Tappings Inches.....	1	1	1¼	1¼
Jacket Dimensions:				
Width Inches.....	19	19	19	19
Height Inches.....	44	44	50	50
Length Inches.....	30	30	36	36
Approximate Shipping Weight Lbs.....	600	625	725	775

\*The letter "T" indicates a tankless heater is included in the boiler. If no tankless heater is used substitute the letters "NC" for the "T".

\*\*Capacity dependent on oil burner firing rate. PS-2016 and PS-2020 use a 3 GPM flow valve. Models PS-2422 and PS-2428 use a 4 GPM flow valve.

### INSTALLATION:

The boiler has been tested for operation at the factory and the only adjustment necessary is the air adjustment on the burner. The burner is set up for one pipe gravity oil feed. If an underground tank is used it will be necessary to use a suction and return line to and from the oil tank. These openings for oil lines are marked on the jacket for burner connections. Be sure to insert plug in by-pass of burner if underground tank is used. This plug is in a bag attached to the burner.

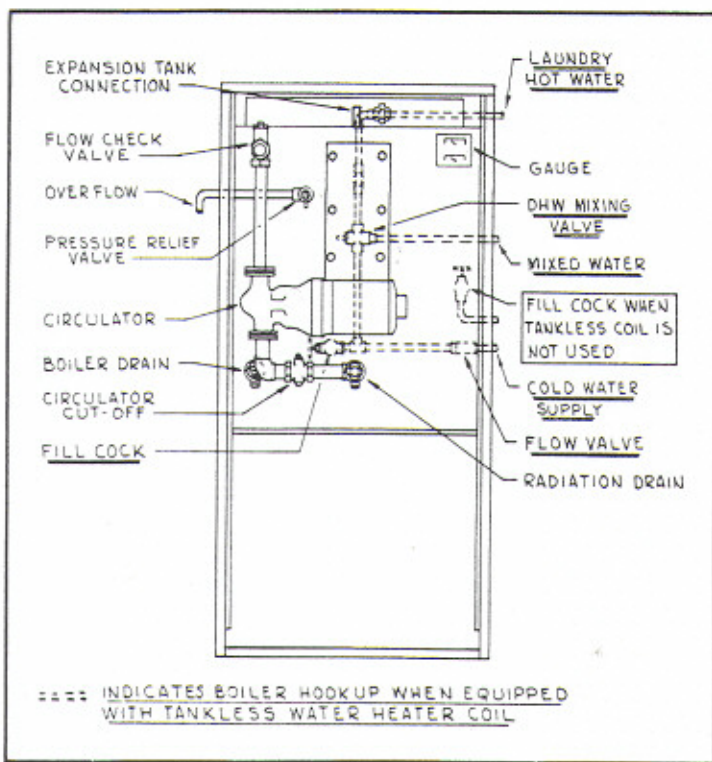
The center opening in the rear of the jacket is for the return piping from radiation and the one in the rear to the left is for the supply to radiation, and these openings are so stamped. Flow control valve above the circulator at the front of the boiler is completely installed ready for use.

Note carefully on diagram method of connecting expansion tank on top of boiler.

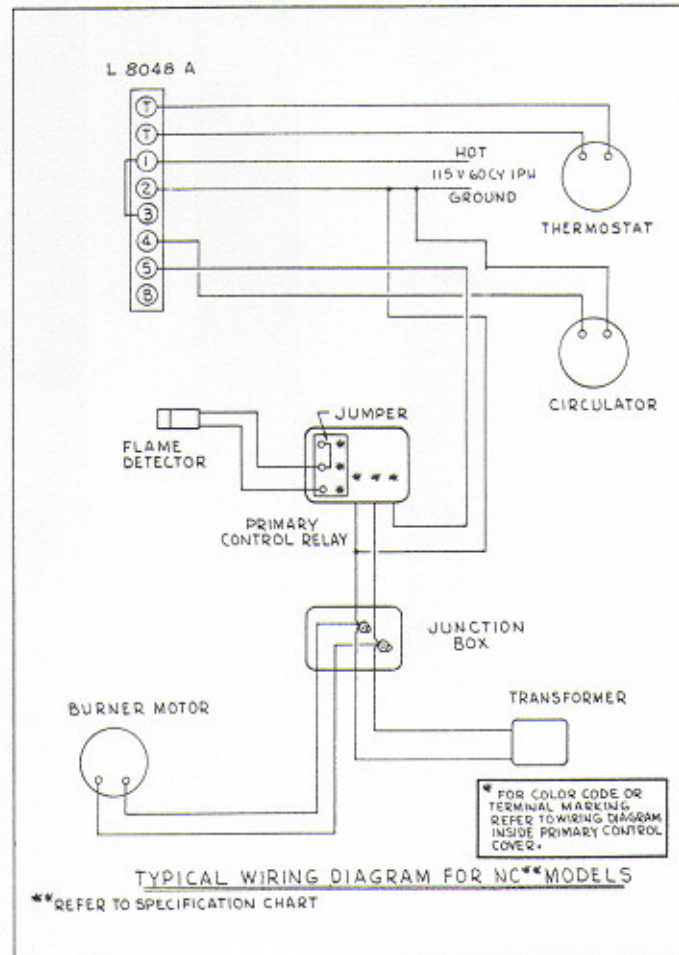
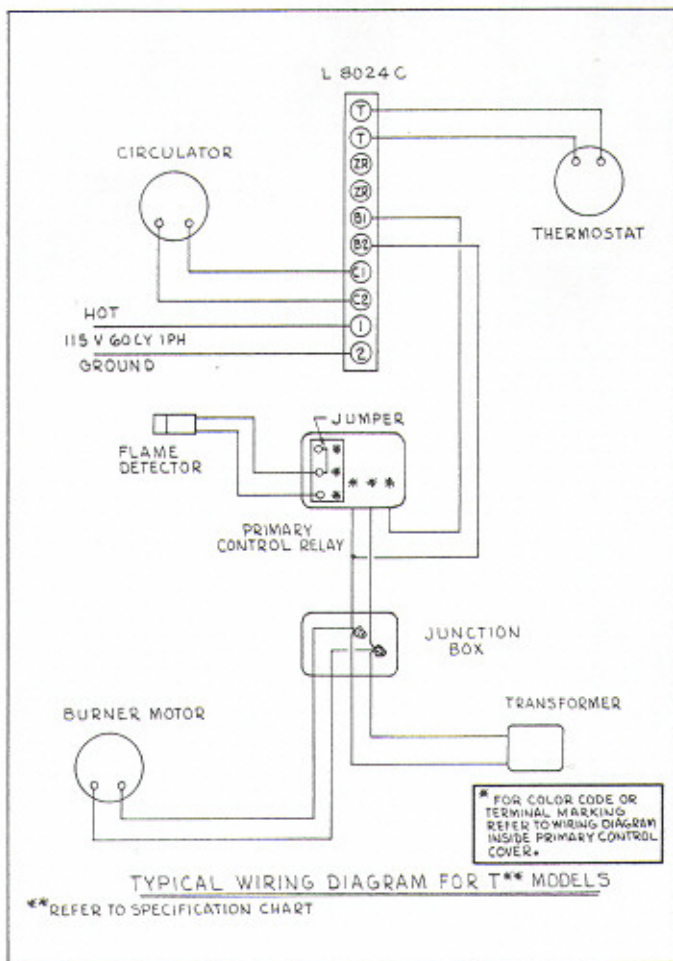
The cold water supply and mixed water to fixtures are on the right side of the jacket and are properly stamped. Hot water for washing machine, dishwasher, etc., may be taken from marked opening on right side near the top of jacket.

Electrical connections should be made in strict accordance with local Code and diagram on back of door.

CAUTION—Any change in factory piping or wiring on this boiler will void the guarantee.







This boiler is for Hot Water heat only and is not to be used for steam.

Study the piping diagram carefully before filling the boiler, radiation system and firing. Be sure that the pressure gauge is not more than 5 pounds at the time the boiler is fired. When the high limit shuts off the burner adjust the pressure in the system to approximately 12 pounds with the boiler water at not less than 190°F.

The ASME relief valve is set at 30 pounds and should be piped straight out the jacket to rear floor to a drain or outside.

#### ADJUSTMENT:

Check the Aquastat control to make sure it is set properly. Adjust the high limit to 210°F. and the low limit to 190°F.

The burner must be adjusted to give the highest CO<sub>2</sub> and still maintain a clean burning fire.

#### CLEANING:

For periodical cleaning remove smoke pipe and jacket top, remove insulation from smoke hood; remove four wing nuts and lift off smoke hood. Remove turbulators from each tube and with a suitable brush clean all tubes and turbulators letting soot fall into combustion chamber where it will burn when boiler is again fired. Reverse above operation to assemble after cleaning.

#### TO FILL BOILER:

Upon completing the installation close all valves.

1. Turn on water service to the boiler.
2. Open the fill cock on the boiler and the valve on the expansion tank.
3. When water drips from expansion tank valve, close the valve.
4. Close boiler fill cock if the boiler is not equipped with a reducing valve in the water supply line.

#### TO FILL AND PURGE RADIATION:

1. Open the fill cock and open the radiation drain.
2. Purge until the water from the radiation drain is free from air, then close the radiation drain. When boiler pressure reaches 5 pounds (cold) close the fill cock. (Unless boiler is equipped with a reducing valve.)

#### TO FIRE THE BOILER:

1. Open the circulator cut-off valve. Open the valve on the expansion tank, when water drips, close the valve.
2. Place the burner in operation. When the limit control stops the burner at 200°F. adjust boiler pressure to 12 pounds. Adjust the fill cock to raise pressure and boiler drain to lower pressure. If boiler is equipped with a reducing valve in water supply line follow valve manufacturer's instructions.