

AMERICAN
STANDARD

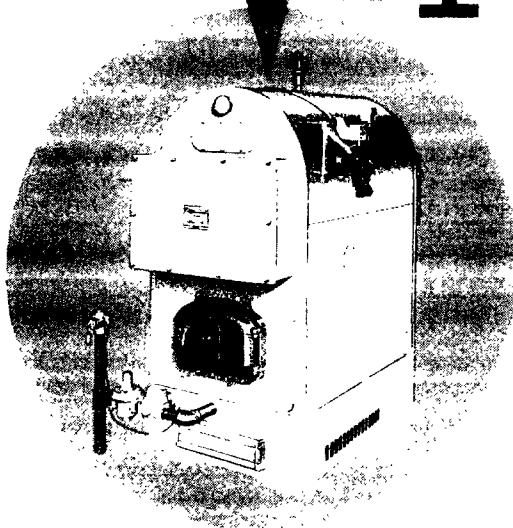
PLAINTIFF'S EXHIBIT

ASI-1198

featuring
**'WHISPERING
QUIET'**
blue-flame
heating

KEWANEE
SQUARE-
HEAT
GAS
BOILER

type **'r'** series

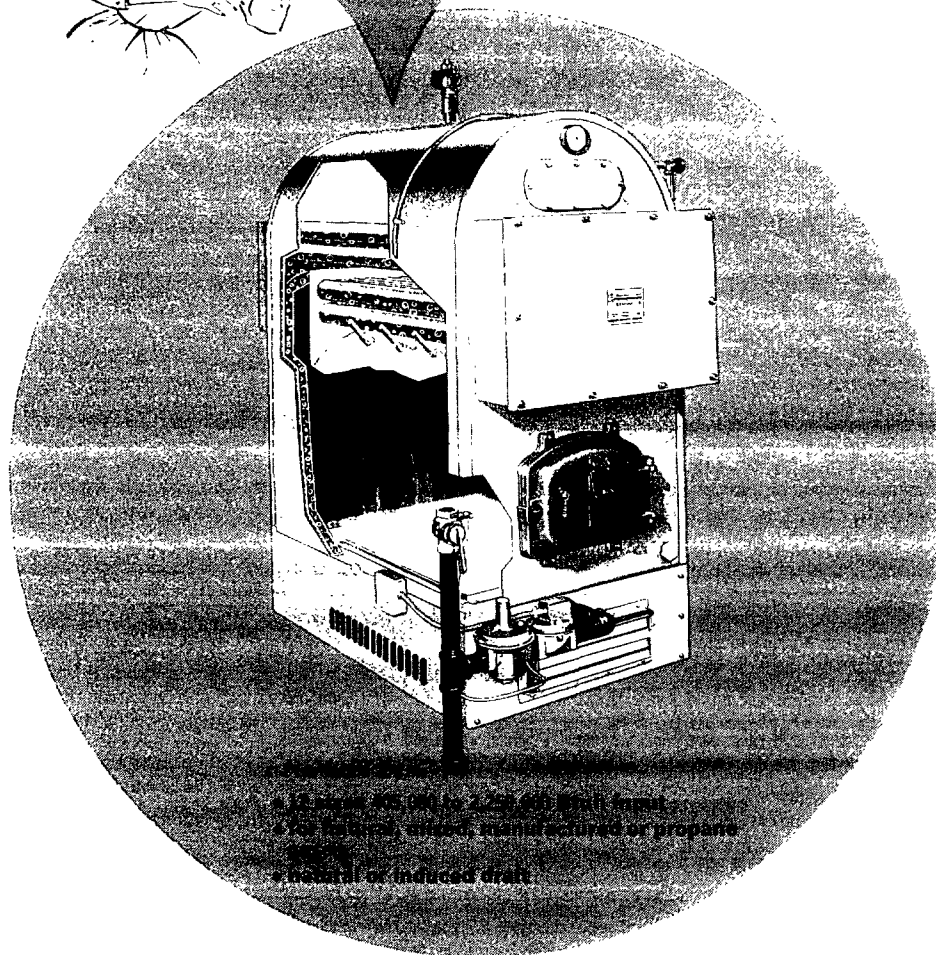


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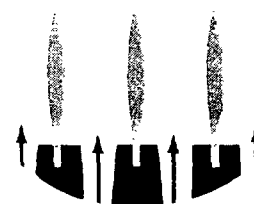
bulletin 96-16-96G
Supersedes Bulletin 96-8-96G



type
R
series



Available in 150,000 Btu/hr. and 225,000 Btu/hr. models.
For natural, manufactured or propane gas.
Standard or induced draft.



Secondary air on each side of burner port



PROVED DESIGN AND PERFORMANCE

The dependable performance, durability and efficiency of the Square-Heat boiler design has been proved by thousands of installations. Now an improved Kewanee gas package incorporating all the well known features of compact firebox boiler design . . . available for natural or induced draft operation.

THREE-PASS CONSTRUCTION

The large firebox with arched upright crown sheet provides the first pass and assures ample volume for complete and quiet combustion and an unusually large proportion of direct or primary heating surface. The second pass is from rear to front in the direct fire tubes. The third pass is from front to rear in the return fire tubes. This longer gas travel—with no refractory baffles to burn out or short circuit gases—gives the Square-Heat Gas Boiler exceptionally high operating efficiency.

TUBES

All tubes in Square-Heat Gas Boilers are 3" O.D., secured to the tube sheets by roller expander—no tubes are welded to the tube sheets. Spinner blades in return tubes swirl the hot gases against the tube surfaces for longer gas travel and maximum heat transfer.

COMPACT DESIGN

The Kewanee three-pass design requires only minimum boiler room dimensions for installation and accessibility. Low height teamed with a rear smoke outlet makes it a perfect application for compact boiler rooms.

LARGE STEAM SPACE

An unbroken disengaging area and ample water content assures steady water line and an adequate reserve of dry steam at all times.

INSULATED STEEL JACKET

Heavy gauge steel jacket with attractive smooth enamel finish and glass or

mineral fiber insulation . . . reduces heat loss and is quickly and easily installed.

WATER HEATING COILS

Standard Kewanee "KI" (instantaneous) and "KT" (tank) coils can be provided for all units. Coil opening at front of boiler eliminates any interference with controls, wiring, or breeching.

EASY ASSEMBLY AND INSTALLATION

The Square-Heat Type R Gas Boiler is shipped ready for field assembly and installation. Simply set the boiler shell on the gas burner (which serves as the boiler base), slip on the insulated jacket—and the boiler unit is ready for trim, controls and piping. No sections to handle . . . no tie rods, push nipples, or refractory to install. Assembly and installation costs are reduced to an absolute minimum.

VERSATILE

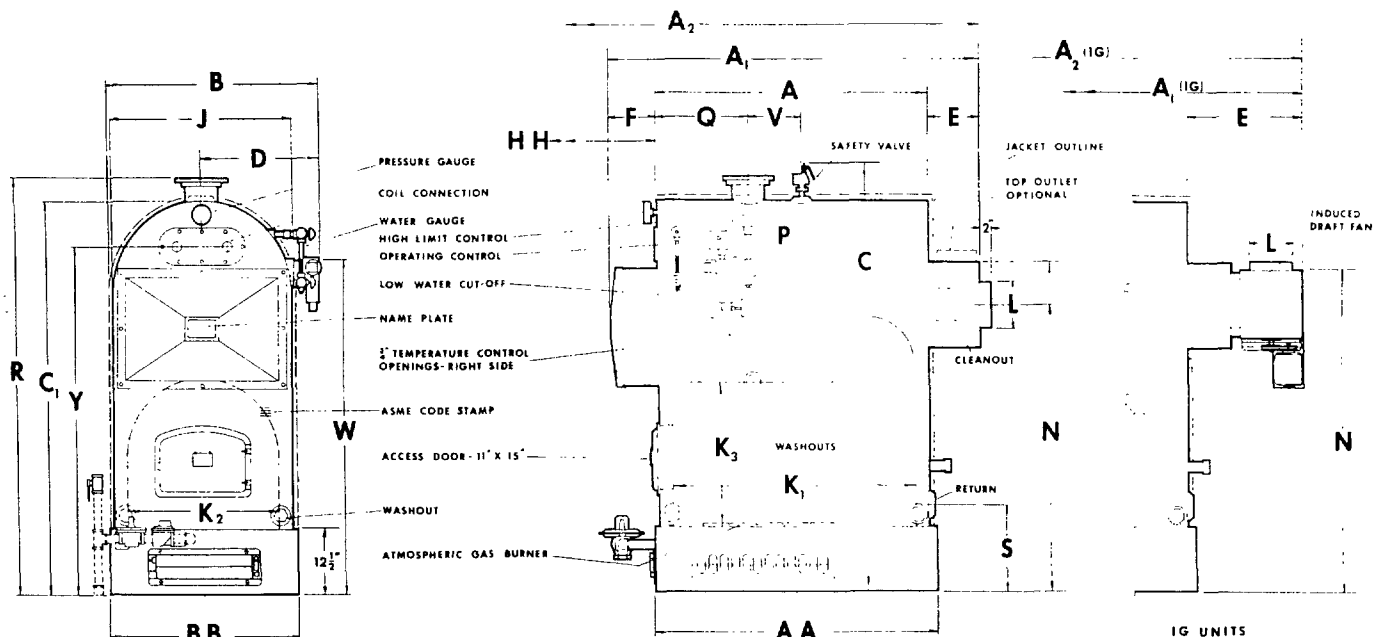
Available for all types of commercial gases—natural, manufactured, or propane. AG units are designed for installation with natural draft stacks. IG units are designed with an induced draft fan for installation with stub vents.

Flexibility of installation with various stack or draft conditions makes the Square-Heat Gas Boiler ideal for both new construction and modernization of existing buildings.

ASME Boiler Construction Code requirements have been followed to the last detail. But more than that, the Square-Heat Gas Boiler gives performance well above and beyond any boiler code requirements.

WELDED SHELL

Flange quality plate . . . gas-tight construction throughout . . . easy access to flues for cleaning . . . heavy cast iron front fire door for access to gas burner . . . integral in design and construction . . . thoroughly tested.



ratings and data

BOILER NUMBER (—AG or —IG Suffix)	3R1	3R2	3R3	3R4	3R5	3R6	3R7	3R8	3R9	3R10	3R11	3R12
Rating—MBh	324	396	468	540	648	792	936	1080	1260	1440	1620	1800
—horsepower	10	12	14	16	19	24	28	32	38	43	48	54
—steam per hour 212° F	334	408	482	557	668	816	965	1113	1299	1484	1670	1855
—steam (gross)	sq ft 1350	1650	1950	2250	2700	3300	3900	4500	5250	6000	6750	7500
—steam (MCA net)	sq ft 1013	1238	1463	1688	2026	2476	2926	3376	3941	4559	5188	5809
Input—gas	MBh 405	495	585	675	810	990	1170	1350	1575	1800	2025	2250
Heating surface—total	sq ft 53	65	77	88	106	129	153	177	206	236	265	294
—primary	sq ft 20.5	22.8	25.2	27.5	33.0	36.6	40.4	44.5	49.5	54.1	58.4	62.6
Furnace volume—net	cu ft 8.8	10.4	12.0	13.5	17.2	20.1	23.0	26.3	32.6	37.0	41.1	45.3
Safety valve capacity—steam per hour	lbs 324	396	468	540	648	792	936	1080	1260	1440	1620	1800
Approximate dry weight—(AG)	lbs 1700	1875	2050	2225	2600	2925	3200	3550	3975	4475	4625	5000
—(IG)	lbs 1800	1975	2150	2325	2700	3025	3300	3850	4275	4775	4925	5300

dimensions—(inches)

BOILER NUMBER (—AG or —IG Suffix)	3R1	3R2	3R3	3R4	3R5	3R6	3R7	3R8	3R9	3R10	3R11	3R12
A —Boiler length	30½	36½	42½	48½	42½	50½	58	67	56½	64½	72	79½
A ₁ —Overall length—(AG)*	46½	52½	58½	64½	59½	67½	75	84	75½	83½	91	98½
—(IG)	62	68	74	80	75	83	90½	106	97½	105½	113	120½
A ₂ —Overall length including tube removal												
—(AG)*	70	82	94	106	94	110	125	143	123	139	154	169
—(IG)	85	97	109	121	109	125	140	165	145	161	176	191
B —Boiler width	37½	37½	37½	37½	42	42	42	42	49	49	49	49
C —Overall height	68½	68½	69	69	76½	76½	76½	76½	85½	85½	85½	85½
C ₁ —Shell height	64½	64½	64½	64½	71½	71½	71½	71½	80½	80½	80½	80½
D —Boiler center line to greatest width	21½	21½	21½	21½	23½	23½	23½	23½	27	27	27	27
E —Rear smokebox depth												
—rear smoke outlet (AG)	8	8	8	8	8	8	8	8	9	9	9	9
—top smoke outlet (AG) (oval)	12½	12½	12½	12½	14½	14½	14½	14½	16½	16½	16½	16½
—top smoke outlet (IG)	23½	23½	23½	23½	23½	23½	23½	30	31	31	31	31
F —Front smokebox depth	8	8	8	8	9	9	9	9	10	10	10	10
J —Boiler shell width—inside	28½	28½	28½	28½	32½	32½	32½	32½	39½	39½	39½	39½
K ₁ —Firebox—length	25½	31½	37½	43½	37½	45	53	62	51	59	66½	74
K ₂ —width	24	24	24	24	28	28	28	28	35	35	35	35
K ₃ —height	21½	21½	21½	21½	26	26	26	26	31	31	31	31
L —Smoke outlet size—(AG)	12	12	12	12	15	15	15	15	18	18	18	18
—(IG)	10	10	10	10	10	10	10	14	14	14	14	14
N —Smoke outlet height—(AG)	45	45	45	45	50	50	50	50	56½	56½	56½	56½
—(AG) top smoke outlet	51½	51½	51½	51½	58½	58½	58½	58½	66½	66½	66½	66½
—(IG)	53	53	53	53	58	58	58	60½	67½	67½	67½	67½
P —Supply size	4	4	4	4	4	4	4	4	6**	6**	6**	6**
Q —Supply location	10	12	14	16	14	17	19	22	16	18	20	24
R —Supply height	65	65	65	65	72	72	72	72	84½	84½	84½	84½
S —Return location	16	16	16	16	16½	16½	16½	16½	16½	16½	16½	16½
—Return size	3	3	3	3	4	4	4	4	4	4	4	4
V —Safety valve location	8	8	8	8	8	10	10	10	12	12	12	12
W —Normal waterline	54	54	54	54	61	61	61	61	69	69	69	69
Y —Coil connection height	56	56	56	56	63	63	63	63	71	71	71	71
AA —Base width	31½	31½	31½	31½	35½	35½	35½	35½	43	43	43	43
BB —Base length	32½	38½	44½	50½	44½	52½	60½	69	58½	66½	74	81½
HH —Tube removal space	31½	37½	43½	49½	43½	51½	59	68	57½	65½	73	80½
Stack size (AG) one boiler—diameter	10	10	12	12	14	14	14	16	16	16	18	18
—height	360	420	420	420	360	420	480	480	480	480	540	600

*Add for increased length if top outlet used. See Dimension E.

**150 lb. American Standard Flange.

†Square outlet.

standard and optional equipment



all units

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| <ol style="list-style-type: none"> 1 Three-Pass ASME Code Boiler 2 Gas Tight Insulated Front Smokebox 3 Gas Tight Rear Smokebox 4 Cast Iron Front Firedoor 5 3" Firetubes with Spinner Blades in Return Tubes 6 Wrap-around Insulated Steel Jacket 7 Flue Cleaner with Handle 8 Washout Plug Socket Wrench 9 Operating Limit Control 10 Safety High Limit Control 11 Gas Burner Assembly including: 12½" Boiler Base; Gas Manifold; Orifices; Slotted Port Premix Type Cast Iron Burner Heads; Adjustable Secondary Air Inlet Louver; and Primary Air Inlet Dampers 12 Thermocouple Flame Safeguard with Constant Pilot including: Thermocouple; Pilot Safety Relay; Pilot Valve for 100% Safety Shutoff; and Pilot Burner with Shield and Mounting Bracket 13 Gas Control Group including: Automatic Diaphragm Gas Valve; Main Gas Pressure Regulator (Omit for propane gas); Manual Gas Cock; Pilot Cock with Tubing; and Pilot Gas Pressure Regulator 14 Standard Voltage—115 V, 60 cy., 1 ph. 15 Barometric Draft Regulator 16 Necessary Insulation and Compound for Air-Tight Seal between Boiler and Burner-Base Assembly 17 Boiler Shell; Insulated Jacket; Trim and Controls; and Burner-Base Assembly Shipped Ready for Field Installation | <ol style="list-style-type: none"> 1 Flue Gas Temperature Gauge 2 Pyrex Observation Port 3 Instantaneous or Tank-Type Hot Water Coils 4 Room Thermostat Control 5 Electronic Flame Safeguard with Gas-Electric Ignition Assembly for Intermittent Pilot 6 Electronic Flame Safeguard with Gas-Electric Ignition Assembly for Constant Pilot including: Control Cabinet with Indicating Lights, Switches, Component Check Relay and Mounting Bracket 7 Automatic Motorized Gas Valve with Damper Arm and Linkage for Operation of Secondary Air Inlet Louver 8 Safety Solenoid Gas Valve in addition to Standard Automatic Valve 9 Gas Controls to Meet FM Requirements 10 Gas Controls to Meet Local or Utility Requirements 11 Gas Controls for Other Than Standard Inlet Pressure 12 Starting Service 13 One Year Service |
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steam units

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| <ol style="list-style-type: none"> 1 No. 767 Low Water Cut-Off 2 Safety Valve 3 Compound Steam and Vacuum Gauge 4 Water Gauge and Glass | <ol style="list-style-type: none"> 1 Combination Low Water Cut-Off and Pump Control 2 Combination Low Water Cut-Off and Water Feeder 3 Second Low Water Cut-Off |
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hot water units

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| <ol style="list-style-type: none"> 1 No. 764 Low Water Cut-Off 2 Relief Valve 3 Combination Altitude Gauge and Thermometer | <ol style="list-style-type: none"> 1 Combination Low Water Cut-Off and Water Feeder |
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natural draft (agi) units

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| <ol style="list-style-type: none"> 1 Horizontal Discharge (Rear) Vent for Natural Draft Stack Application | <ol style="list-style-type: none"> 1 Vertical Discharge (Top) Vent for Natural Draft Stack Application |
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induced draft (ig) units

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|--|---|
| <ol style="list-style-type: none"> 1 Induced Draft Fan including: 115 V, 60 cy., 1 ph. Constant Speed Motor with Adjustable Pitch Sheave; Boiler Mounting Brackets; and Vertical Discharge (Top) Vent for Stub Stack Application 2 Draft Safety Switch | <ol style="list-style-type: none"> 1 Pre-Purge Relay 2 Pre-Purge and Post-Purge Relay |
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Combustion noise is "whispering quiet" . . . The intense blue flame produced by the precision built cast iron burner heads is both efficient and quiet . . . Makes this boiler unit ideal for office and store buildings, schools, hospitals, apartments, and other medium size buildings where exceptionally quiet boiler operation is desired.

The Kewanee atmospheric premix gas burner is actually the boiler base . . . compact, easy to handle and install. Accurately machined deep slotted ports in the cast iron burner heads provide high capacity, prevent flash back, and insure smooth light-off from a single pilot.

The individually spaced cast fins on the burner heads permit a continuous flow of secondary air between and over each fin . . . cooling and adding years of life to the burner heads. Secondary air surrounds both sides of the flame thoroughly mixing gas and air for rapid, quiet combustion . . . producing a short flame height without excess air . . . maximum burner efficiency from a quiet hot blue flame.

Primary air supply and secondary air supply are separately controlled . . . permits flame adjustment for all types of gases under varying draft and operating conditions.

Various control and safety combinations are available, all with 100% safety shut off...thermocouple pilot and safety relay with automatic diaphragm gas valve is standard. Electronic safety relay . . . electronic safety relay with automatic electric ignition . . . motorized gas valve with linkage to operate secondary air inlet louvers . . . automatic safety gas valve in addition to standard operating gas valve. All these, plus other control options are available to meet specific job and local code requirements.

burner data

Unit —AG or —IG	Input MBh	Number of Burner Heads Natural Gas	Dimensions—Inches			Gas Controls		IG Units	
			Burner (Boiler Base)			Natural Gas*		Induced Draft Fan Data**	
			Width	Length	Height	Size	Required Inlet Pressure	Size	HP
3R1	405	4	31½	32½	12½	1"	6" w.c.	10 DI—¼	
3R2	495	4	31½	38½	12½	1"	6" w.c.	10 DI—¼	
3R3	585	4	31½	44½	12½	1¼"	6" w.c.	10 DI—¼	
3R4	675	6	31½	50½	12½	1¼"	6" w.c.	10 DI—¼	
3R5	810	6	35½	44½	12½	1¼"	6" w.c.	10 DI—¼	
3R6	990	8	35½	52½	12½	1½"	6" w.c.	10 DI—¼	
3R7	1170	8	35½	60½	12½	1½"	6" w.c.	10 DI—¼	
3R8	1350	10	35½	69	12½	1½"	6" w.c.	14 DL—¼ C	
3R9	1575	12	43	58½	12½	1½"	6" w.c.	14 DL—¼ C	
3R10	1800	15	43	66½	12½	2"	6" w.c.	14 DL—¼ C	
3R11	2025	15	43	74	12½	2"	6" w.c.	14 DL—¼ C	
3R12	2250	18	43	81½	12½	2"	6" w.c.	14 D—¼ C	

Model No.

cubic feet of

Boiler(s) shall be provided with a wrap-around steel jacket with 1" mineral fiber insulation and smooth enamel finish.

NOTE: Strike out clauses in parenthesis which are not applicable.

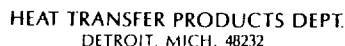
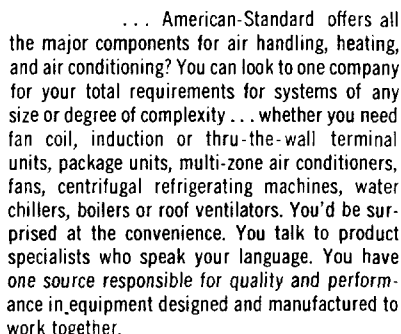
Electrical characteristics shall be 115 volt, 60 cycle, single phase.

Automatic gas valves shall be of the rising stem type with linkage for control of gas supply. They shall have an additional automatic safety solenoid valve.

Boiler mounted controls shall consist of safety limit switch, operating limit switch, low water cutoff, and safety valves or relief valves for 150 pounds or greater pressure.

NOTE: Specify starting and ending dates. The equipment must be supplied by an authorized distributor or the original equipment manufacturer.

Owner's representative shall be responsible for the care and maintenance of the equipment from the time it is started.



SALES OFFICES IN ALL
PRINCIPAL CITIES

In Canada:
1201 Dupont St., Toronto 4, Ontario
For Export:
40 West 40th St., New York, N. Y. 10018

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