

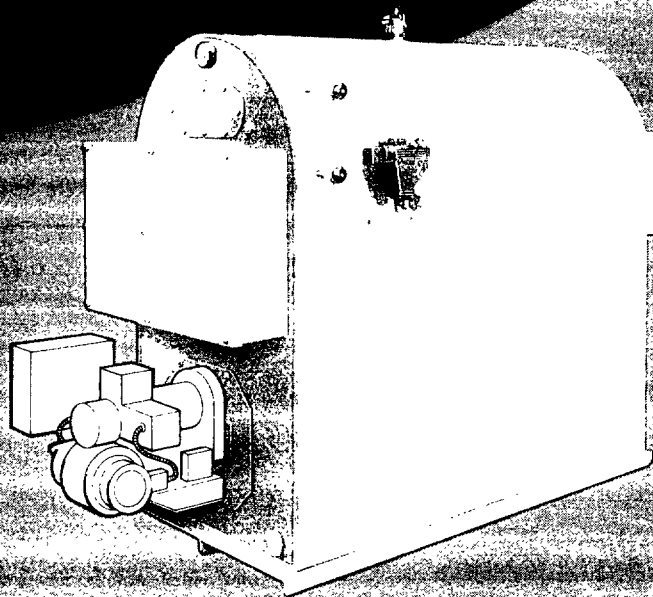
PLAINTIFF'S EXHIBIT

ASI-1196

type
TR

for forced or mechanical draft burner

12 SIZES
304,000
to 1,800,000 Btu/h
low pressure steam
or hot water



28519

AMERICAN STANDARD

NEW YORK, N.Y. 10017

KEWANEE[®]

SQUARE HEAT BOILER UNITS

type

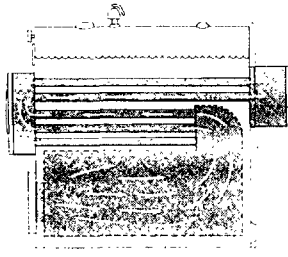
a truly versatile boiler unit . . .

Kewanee's famous "Square-Heat" boilers for heating and low pressure process applications have earned the respect of architects, engineers, contractors and owners everywhere in every conceivable type of installation—industrial buildings, offices, schools, motels, churches, stores and institutions. Compact—yet effective three pass, wet back, firebox design offers generous amounts of heating surface and combustion volume . . . economical operation with minimum attention and care.

The "Square-Heat" Boiler Unit features gas-tight construction and is furnished complete with refractory filled, skid-type base; steam or water trim; insulated, enameled steel jacket. All components are assembled and shipped as a single unit for field mounting of fuel burning equipment of your choice.

The Kewanee Square-Heat Boiler Unit is ideally adaptable to a wide range of burners . . . gas or oil, forced or mechanical draft. The unit will easily operate at and maintain 80% efficiency when fired at recommended rates, and will carry peak loads without wear or strain and constant burner adjustment . . . with real fuel saving economy.

MORE "ALL-AROUND" QUALITY FEATURES



THREE PASS DESIGN

Efficient three pass design provides maximum heat transfer with low stack temperature . . . highest operating efficiency. Large firebox with arched upright crown sheet allows thorough mixing of fuel and air . . . complete combustion before hot gases enter fire tubes. The second pass is rear to front through direct fire tubes . . . the third from front to rear in return tubes. Gas travel is longer and there are no refractory baffles to burn out causing the short circuiting of gases.

1. COMPLETELY ASSEMBLED—base and refractory, insulated jacket, trim (for steam or water) is completely assembled and mounted on the unit. Only burner mounting plate, burner and required service connections are needed to put the unit in operation.

2. WATER HEATING COILS—standard Kewanee "KI" (instantaneous) and "KT" (tank) coils available for all units. Coil opening at front of boiler avoids interference with controls, wiring or breaching.

3. AMPLE STEAM SPACE AND WATER CONTENT—large steam space, unbroken disengaging area, ample water content assures steady water line and a plentiful reserve of dry steam.

4. TUBES ROLLER EXPANDED—all tubes are secured to tube sheets by roller expander . . . none are welded to tube sheets.

5. EASY ACCESS TO TUBES—steel flue access cover with insulation securely keyed in place provides quick access to flues without disturbing fuel burning equipment.

6. INSULATED STEEL JACKET—heavy gauge,

steel jacket with attractive, smooth enamel finish. Glass of mineral fiber insulation minimizes heat loss.

7. GAS TIGHT CONSTRUCTION—flange quality plate. All welded construction for strength and durability. Gas tight throughout.

8. HIGH EFFICIENCY HEATING SURFACE—the ratio of effective primary heating surface (exposed directly to the flame) to secondary heating surface (exposed to hot gases) is nearly 50% greater than in many competitive units.

9. LARGE FURNACE VOLUME—for complete combustion with smooth starts . . . clean firing . . . unrestricted gas flow . . . quiet operation.

10. SKID TYPE BASE, REFRACTORY FILLED—provides ventilation under the unit and distributes weight evenly. Floor of the combustion chamber is poured, insulating-type refractory, installed at the factory for durability and low maintenance cost.

ASME Boiler Construction Code requirements have been followed in every detail . . . and the Kewanee name assures design and performance beyond any code requirements.

1. COMPLETELY ASSEMBLED

2. WATER HEATING COILS

3. AMPLE STEAM SPACE AND WATER CONTENT

4. TUBES ROLLER EXPANDED

5. EASY ACCESS TO TUBES

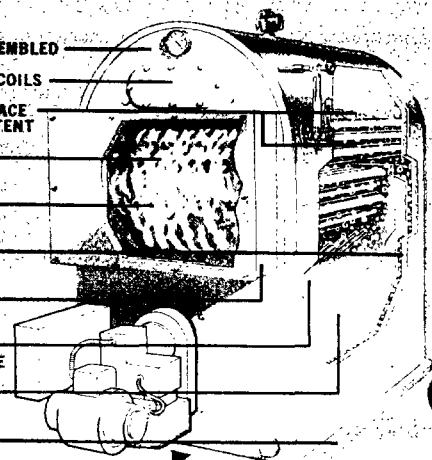
6. INSULATED STEEL JACKET

7. GAS TIGHT CONSTRUCTION

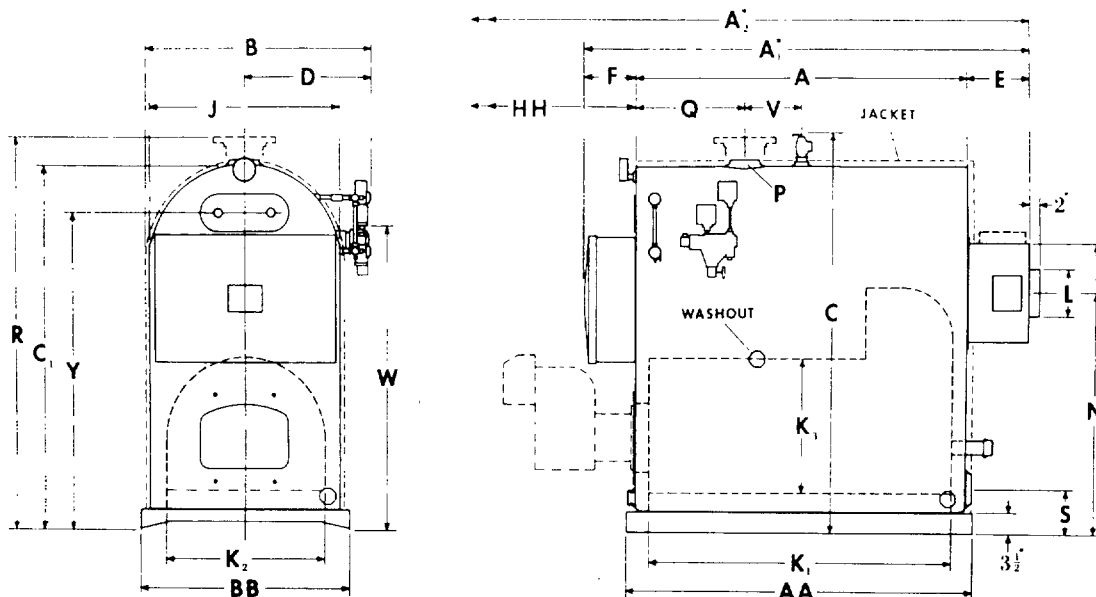
8. HIGH EFFICIENCY HEATING SURFACE

9. LARGE FURNACE VOLUME

10. SKID TYPE BASE



28520



KEWANEE SQUARE-HEAT BOILER UNITS

Ratings and Data—forced-draft—oil, gas

UNIT NUMBER		3R1-F	3R2-F	3R3-F	3R4-F	3R5-F	3R6-F	3R7-F	3R8-F	3R9-F	3R10-F	3R11-F	3R12-F
SBI gross output	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.	lbs.	334	408	482	557	668	816	965	1113	1299	1484	1670	1855
steam	sq. ft.	1350	1650	1950	2250	2700	3300	3900	4500	5250	6000	6750	7500
SBI net rating—steam	sq. ft.	1010	1240	1460	1690	2020	2480	2930	3380	3940	4500	5060	5620
Firing rate—gas 1000 Btu/cu. ft.		405	495	585	675	810	990	1170	1350	1575	1800	2025	2250
oil 140,000 Btu/gal.		2.9	3.5	4.2	4.8	5.8	7.1	8.4	9.6	11.2	12.9	14.5	16.1
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 vol. net	cu. ft.	7.8	9.1	10.5	11.7	15.4	17.9	20.4	23.3	29.5	33.4	37.1	40.8
Safety valve capacity steam per hour	lbs.	424	520	616	704	848	1032	1224	1416	1648	1888	2120	2352
Approximate dry weight	lbs.	1650	1800	1950	2100	2350	2700	3000	3300	3700	4150	4500	4900
Vent diameter—forced draft	in.	6	6	6	6	8	8	8	8	10	10	10	10
Stack diameter—natural draft	in.	12	12	12	12	15	15	15	15	18	18	18	18
Stack height—natural draft	ft.	30	35	35	40	35	40	40	45	35	40	45	50

Dimensions (Inches)

A — Boiler length	30½	36½	42½	48½	42½	50½	58	67	56½	64½	72	79½
A1 — Overall length	46½	52½	58½	64½	59½	67½	75	84	75½	83½	91	98½
A2 — Overall length including tube removal	70	82	94	106	94	110	125	143	123	139	154	169
B — Overall width	37½	37½	37½	37½	42	42	42	42	49	49	49	49
C — Overall height	59	59	59½	59½	67	67	67	67	76½	76½	76½	76½
C1 — Shell height	55	55	55	55	62	62	62	62	71	71	71	71
D — Boiler centerline to greatest width	21½	21½	21½	21½	23½	23½	23½	23½	27	27	27	27
E — Rear smokebox depth												
—Standard rear outlet	8	8	8	8	8	8	8	8	9	9	9	9
—Top outlet forced draft	8½	8½	8½	8½	10½	10½	10½	10½	12½	12½	12½	12½
—Top outlet natural draft	12½	12½	12½	12½	14½	14½	14½	14½	16½	16½	16½	16½
F — Front smokebox	8	8	8	8	9	9	9	9	10	10	10	10
J — Boiler shell width	28½	28½	28½	28½	32½	32½	32½	32½	39½	39½	39½	39½
K1 — Firebox length	25½	31½	37½	43½	37½	45	53	62	51	59	66½	74
K2 — Width	24	24	24	24	28	28	28	28	35	35	35	35
K3 — Height	18½	18½	18½	18½	23	23	23	23	28	28	28	28
L — Smoke outlet diameter—forced draft	6	6	6	6	8	8	8	8	10	10	10	10
—natural draft	12	12	12	12	15	15	15	15	18	18	18	18
N — Smoke outlet height—rear outlet	36	36	36	36	41	41	41	41	47½	47½	47½	47½
—top outlet	42¼	42¼	42¼	42¼	49¼	49¼	49¼	49¼	57½	57½	57½	57½
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	56	56	56	56	63	63	63	63	75½	75½	75½	75½
S — Return location	7	7	7	7	7½	7½	7½	7½	7½	7½	7½	7½
—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	46	46	46	46	53	53	53	61	61	61	61	61
Y — Coil connection height	47	47	47	47	54	54	54	54	62	62	62	62
AA — Base length	33½	39½	45½	51½	45½	53½	61½	70	59½	67½	75	82½
BB — Base width	32½	32½	32½	32½	37	37	37	37	44	44	44	44
HH — Tube removal space	31½	37½	43½	49½	43½	51½	59	68	57½	65½	73	80½

*Add for increased length if top smoke outlet is used. See dimension E.

**150 lb. American Standard flange—eight ¾ in. bolts—9½ in. bolt circle.

optional equipment

1. Three-pass ASME Code Boiler
2. Refractory Filled Skid Type Base
3. Gas-Tight, Insulated Front Smokebox
4. Rear Pyrex Observation Port
5. 3" Firetubes—Roller Expanded—with Spinner Blades in Direct Tubes
6. Gas-Tight Rear Smokebox with Rear Vent for Forced Draft Firing
7. Wrap-around Insulated Steel Jacket
8. Washout Plug Socket Wrench
9. Flue Cleaner with Handle
10. Listed Standard and Selected Optional Equipment—assembled and mounted, ready for burner installation and connection to water and steam. (Exceptions: Items shipped separately to prevent shipping damage.)

1. Relief Door
2. Top Vent
3. Operating Limit Control
4. Safety Limit Control
5. Control Wiring Harness
6. Instantaneous or Tank Type Hot Water Coils
7. Flue Gas Temperature Gauge
8. Burner Mounting Plate—adaptable to most burners. Blank plate with retaining ring for refractory to fit boiler opening.
9. Factory Burner Mounting

1. No. 767 Low Water Cut-off
2. Safety Valve
3. Compound Steam and Vacuum Gauge
4. Water Gauge and Glass

1. Combination Low Water Cut-Off and Pump Control
2. Combination Water Feeder, Low Water Cut-off and Alarm Switch
3. Second Low water Cut-off
4. Surface Blow-off

1. No. 764 Low Water Cut-off
2. Relief Valve
3. Combination Altitude Gauge and Thermometer

- ### 1. Combination Water Feeder, Low Water Cut-off and Alarm Switch

details—burner opening

The contractor shall furnish and install _____ Model No. _____ Square-Head Boiler Unit(s) for (oil), (gas), (combination gas-oil) firing. The units shall be three-pass compact firebox design with arched upright crown sheet and two passes of firetubes, and constructed in accordance with the ASME Code for (15 lbs. steam), (30 lbs. water).

Unit(s) shall have not less than _____ total square feet of waterside heating surface including a minimum of _____ square feet of primary or direct heating surface.

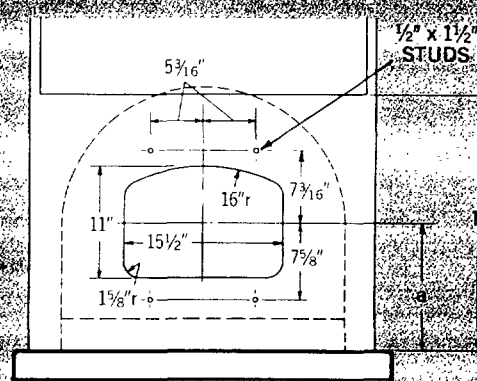
Unit(s) shall contain not less than _____ cubic feet of furnace volume and shall have a gross output rating of not less than _____ MBH. Heat release shall not exceed 50,000 Btu per cubic foot of furnace volume.

Normal water line of ducts) shall not exceed _____ inches. A pyrex observation port shall be provided at the rear of the firebox. Front flue access cover, with refractory securely keyed in place and of a size permitting easy access to all flue pipes, shall be mounted on a gas tight insulated front smokebox. Gas tight rear smokebox shall be provided with a (rear) (top) outlet

Unit(s) shall be provided with a steel jacket with glass or mineral fiber insulation and smooth exterior finish. All tubes shall be set with a rigid expander at each end. No welding of tubes to the floor shall be permitted. No use of bolting to provide the second or third pass will be permitted. Spinner plates shall be provided in the first pass of tubes.

burners) shall be assembled with iron insulated steel jacket, and refractory lined skid type base installed at the factory, ready for final reassembly at the fuel burning equipment specified below.

Note: Specify fuel burning equipment according to burner manufacturer's recommendations.



dimensions—inches

Unit	a	b
3R1- 4F	11	20½
3R5- 8F	12½	25
3R9-12F	13½	30½

