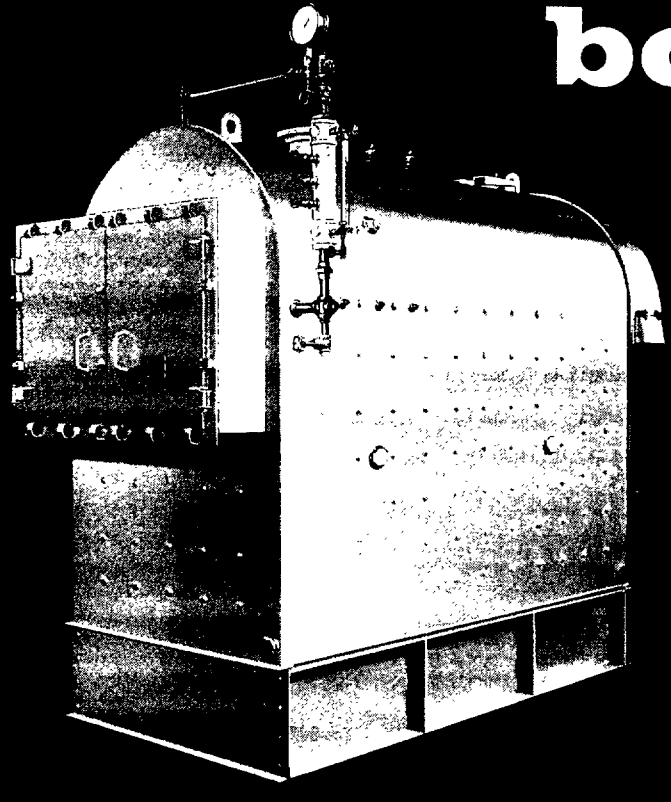
AMERICAN-STANDARD

TYPE

PLAINTIFF'S EXHIBIT

ASI-1226

KEWANEE® boilers

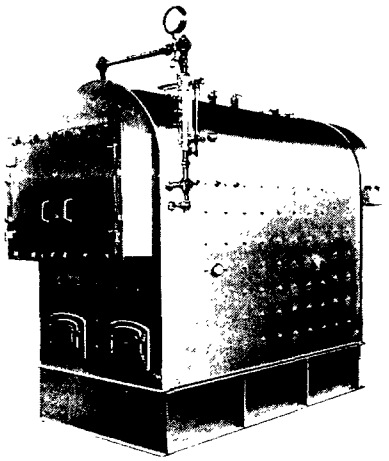


7L200 SERIES

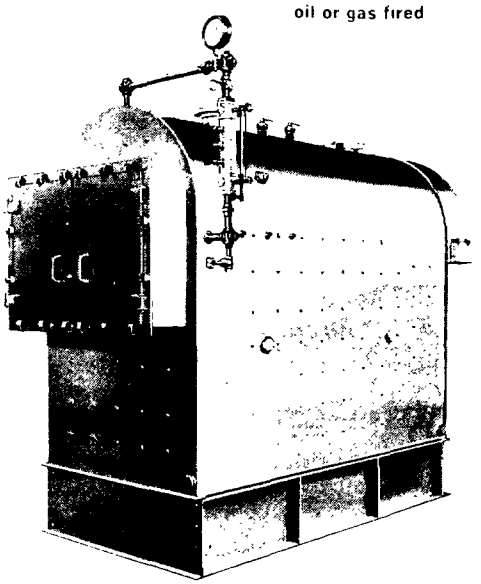
15 psig steam
30 psig water
250° F

28782

bulletin 88-1-49B
SUPERSEDES 649-B



type C boiler
stoker fired



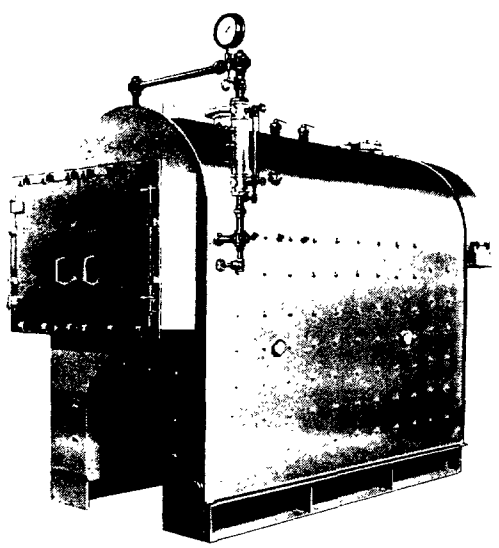
type C boiler
oil or gas fired

If any heating boiler has ever earned and won the right to become known as "the standard of the industry," the now familiar and popular Kewanee Type "C" Boiler, first introduced into the market in 1928, has been accorded this recognition by engineers everywhere. Unmatched for its dependability and efficient service, these compact boilers provide reliable heating for many years with minimum service or attention. Simplified three-pass design extracts maximum heat from the gases . . . assures highest operating efficiency . . . low stack temperatures. Large firebox with self-cleaning, arched, upright crown sheet allows thorough mixing of fuel and air . . . complete combustion before hot gases enter the fire tubes. Second pass is rear to front through direct fire tubes . . . the third from front to rear in return tubes. There are no refractory baffles to burn out causing the short circuiting of gases . . . water content is ample . . . and steam space is proportioned for plenty of dry steam. That's why over-all efficiencies of 80% and more are not uncommon with the Kewanee Type "C," and are maintained continuously in actual practice.

AMERICAN-STANDARD

KEWANEE® Boilers

. . . a standard of the industry
. . . first choice of experienced engineers



type C boiler
with front head opening

Low-Set Design is VERSATILE

Where minimum head room is an important factor, the Kewanee Low-Set Type "C" Boiler is the ideal answer. The same dependable features that are characteristic of the standard Type "C" Series are incorporated into this compact, low design, further extending the versatility of this popular boiler model. An opening in the front head, as illustrated at the left, is provided to accommodate a burner and secondary windbox of your choice. This feature together with the Type "C"'s generous firebox eliminates the necessity of high settings . . . provides proper combustion volume to completely burn all grades of oil and gas.

The Type "C" 7L200 Series is constructed in accordance with the ASME Low Pressure Boiler Code. Twelve sizes range in gross outputs from 2,160,000 to 14,400,000 Btuh or 64 to 430 hp.

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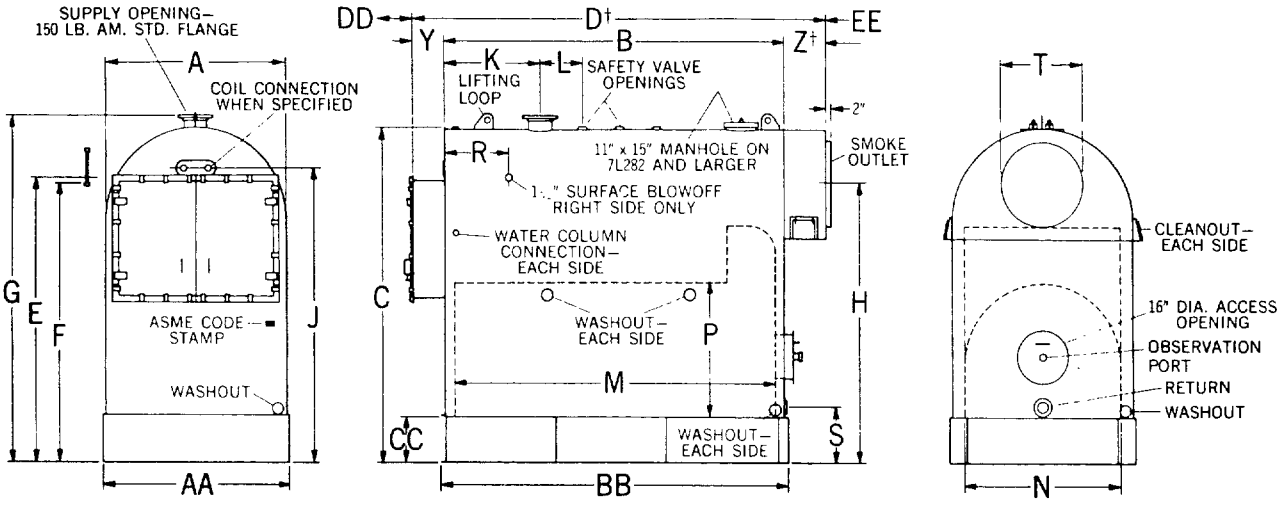


ratings—mechanically fired—oil, gas or stoker

BOILER NUMBER		7L280	7L281	7L282	7L283	7L284	7L285	7L286	7L287	7L288	7L289	7L290	7L291
SBI gross output—steam	sq. ft.	9000	10500	12750	15000	18750	22500	26250	30000	37500	45000	52500	60000
—water	sq. ft.	14400	16800	20400	24000	30000	36000	42000	48000	60000	72000	84000	96000
—	MBh.	2160	2520	3060	3600	4500	5400	6300	7200	9000	10800	12600	14400
Steam per hour—212°F	lb.	2208	2588	3140	3726	4623	5555	6486	7418	9281	11109	12972	14835
SBI net rating—steam	sq. ft.	6760	7880	9580	11260	14060	16880	19690	22510	28130	33750	39370	45000
—water	sq. ft.	10820	12610	15330	18020	22500	27010	31500	36020	45010	54000	62990	72000
—	MBh.	1620	1890	2300	2700	3370	4050	4720	5400	6750	8100	9460	10790
Certified output—	hp.	78	92	111	131	164	195	228	261	326	392	456	521
—	MBh.	2625	3060	3718	4374	5464	6559	7650	8745	10929	13114	15300	17485
Firing rate—150,000 Btu oil	gph.	22	26	31	37	46	54	64	73	91	110	127	146
—gas	MBh.	3280	3830	4650	5460	6840	8200	9560	10920	13670	16400	19120	21900
Heating surface—waterside	sq. ft.	429	500	608	715	893	1072	1250	1429	1786	2143	2500	2857
—fireside	sq. ft.	397	463	563	662	827	993	1157	1323	1654	1985	2315	2645
Furnace volume—SBI minimum	cu. ft.	52.1	60.8	73.8	86.8	108.5	130.2	151.8	173.5	216 9	260.3	303.6	346.9
—net	cu. ft.	65.7	75.2	91.0	104.8	130.6	154.2	189.3	214.4	256.1	303.4	379.5	429.8
Water content—steam boiler	lb.	3655	4265	5130	6020	7240	8640	9155	10835	12730	15470	17625	20360
—water boiler	lb.	5055	5880	7030	8230	9490	11310	12480	14610	17145	20735	23610	27155
Safety valve cap.	lb. steam per hr.	2625	3060	3718	4374	5464	6559	7650	8745	10929	13114	15300	17485

equipment available on TYPE KEWANEE boilers

ALL UNITS

1. Three-Pass ASME Code Boiler
2. 3" Firetubes
3. Steel Bases
   14" 7L280 thru 7L283
   17" 7L284 thru 7L289
   21" 7L290 thru 7L291
4. Rear Smoke Outlet with Cleanout Openings
5. Gas-Tight Front Flue Door Extension
6. Gasketed and Insulated Front Flue Doors
7. Two Firedoors (Stoker Fired Boilers Only)
8. Rear 16" Diameter Access Opening
9. Rear Pyrex Observation Port
10. Lifting Loops
11. Flue Cleaner and Handle
12. Washout Plug Socket Wrench
13. Manhole 7L282 thru 7L291

1. Additional Base Height
2. Structural Steel Supports
3. Bearing Plate Brackets
4. Top or Side Smoke Outlets
5. Insulation Retaining Bars
6. Firedoors for Oil or Gas Fired Boilers
7. Damper Assemblies
8. Special Openings
9. Instantaneous or Tank Type Water Heating Coils
10. Low-Set Application for Natural or Induced Draft
11. 60 PSI Water Working Pressure
12. Insulated Steel Jacket
13. Wing Induced Draft Fan
14. Boiler Feed Units

STEAM TRIMMINGS *(Not Mounted)*

1. Safety Valve(s)
2. Steam Gauge with Syphon and Cock
3. Kewanee Water Column
4. Water Gauges and Try Cocks
   Wheel Handle Type 7L280 thru 7L285
   Chain Operated Type 7L286 thru 7L291

1. No. 58 Reliance High & Low Alarm Water Column
2. M.M. 157 Combination Water Column, Pump Control and Low Water Cut-Off
3. Chain Operated Water Gauge and Try Cocks
   7L280 thru 7L285

WATER TRIMMINGS *(Not Mounted)*

1. Relief Valves

1. M.M. 51-2 Combination Water Feeder and Low Water Cut-Off
2. M.M. 63 Low Water Cut-Off
3. M.M. 150 Low Water Cut-Off
4. Dial Type Pressure Gauge
5. Dial Type Thermometer

BOILER NUMBER	7L280	7L281	7L282	7L283	7L284	7L285	7L286	7L287	7L288	7L289	7L290	7L291
Shell Diameter—Inside	48"	48"	54"	54"	60"	60"	66"	66"	78"	78"	84"	84"
A—Boiler—width	49½	49½	55½	55½	61½	61½	67½	67½	79½	79½	86	86
B— —length	87	100½	93½	109	109	129½	128	145	130	154½	144½	164
C— —height	91½	91½	103	103	113½	113½	122	122	136	142	161½	167½
D— —length overall	113	126½	120½	136	137	157½	156	173	164	188½	178½	198
E—Water line height	77	77	86½	86½	97½	97½	104	104	115½	121½	138½	144½
F—Water column height	75	75	84½	84½	95½	95½	102	102	113½	119½	136½	142½
G—Steam supply height	96½	96½	108	108	118½	118½	127	127	142	148	167	173
H—Smoke outlet height	75½	75½	85	85	94½	94½	101	101	113½	119½	136	142
J—Coil connection height	80½	80½	90	90	101	101	107	107	119	125	142	148
K—Steam supply	36	36	36	36	36	36	36	36	36	36	36	36
L—Safety valve***	14	18	18	18	14	16	16	16	16	16	16	16
M—Firebox—length	80½	94	87	102½	101½	122	120	137½	122	147	136½	156
N— —width	42½	42½	48½	48½	53½	53½	59	59	71	71	77	77
P— —height	34	34	37½	37½	43	43	48¾	48¾	54½	60½	66	71¾
R—Surface blow-off	12	12	24	24	24	24	24	24	24	24	24	24
S—Return height	18	18	18	18	21	21	21	21	23	23	27	27
T—Smoke outlet dia.	24	24	28	28	30	30	31	31	39	39	43	43
Y—Smokebox depth—front	11	11	12	12	12	12	12	12	14	14	14	14
Z— —rear	15	15	15	15	16	16	16	16	20	20	20	20
AA—Base—width	52	52	58	58	64	64	70	70	82	82	88	88
BB— —length	90½	104	97	112½	112½	133	131½	148½	133½	158	148	167½
CC— —height	14	14	14	14	17	17	17	17	17	17	21	21
DD—Tube replacement space—front	77	90½	82½	98	98	118½	117	134	117	141½	131½	151
EE— —rear	73	86½	79½	95	94	114½	113	130	111	135½	125½	145
Steam supply size*	8	8	8	8	8	8	8	8	10	10	10	12
Return size	4	4	4	4	4	4	4	4	6*	6*	6*	6*
Outside surface to cover** sq. ft.	145	162	182	205	227	255	275	310	355	405	460	490
Approximate dry weight lbs.	6600	7300	8500	9500	11400	13000	15800	17400	21100	24700	29700	33800
Breeching diameter—one boiler	24	24	28	28	30	31	35	35	39	41	43	46
Stack—diameter	21	22	24	26	28	29	31	33	36	38	40	42
—height ft.	50	60	55	65	65	70	65	75	90	80	100	100
Breeching diameter—two boilers	30	31	34	36	40	41	44	47	50	54	56	60
Stack—diameter	28	29	32	34	37	38	41	44	47	50	52	56
—height ft.	60	70	65	75	75	80	75	85	100	90	110	110

*150 lb. American-Standard flange **Includes front head and smokebox ***One or more valves furnished depending on required capacity †Add 3" for top flue gas outlet.



The contractor shall furnish and install ..... No. 7L2..... Kewanee Type C Boiler(s) for (oil) (gas) (stoker) firing. Boiler(s) shall contain not less than ..... sq. feet of heating surface and have a gross SBI output of ..... Btuh and shall be equipped with ..... in. high steel base.

NOTE: When Low-Set Type C 7L-200 Series is specified, delete above paragraph and insert:

The contractor shall furnish and install ..... No. 7L2..... Kewanee Low-Set Type C Boiler(s) for (oil) (gas) firing. Boiler(s) shall contain not less than ..... sq. ft. of heating surface and have a gross SBI output of ..... Btuh. Boiler(s) shall be equipped with ..... in. high channel base and provided with (circular) (arched) burner opening in front water leg.

Boiler shall have minimum of ..... cu. ft. of firebox volume above the bottom of the water leg. Boiler shall have arched crown sheet, shall be of three pass firebox design, and constructed in accordance with the A.S.M.E. code for (15 lb. steam) (30 lb. water). Boiler shall be inspected during construction by an authorized inspector and after completion shall be subjected to a 60 lb. hydrostatic test and stamped with all identifying markings and symbols as required by the latest edition of the A.S.M.E. code.

Boiler to be furnished with gas tight front flue doors of size permitting easy access to all tubes and lined with refractory securely keyed in place. Rear smoke box shall have cleanout openings on both sides with smoke outlet at (rear) (top) (r.h. side) (l.h. side) of smokebox. 16" Dia. rear access plate, refractory lined, with observation port in rear water leg.

Boiler trimmings shall consist of the following:

FOR STEAM: Safety valve(s), steam gauge with siphon and cock, Kewanee water column with hand operated water gauge and try cock assembly—chain operated on 7L-286 and larger.

FOR WATER: Relief valve(s) as required by A.S.M.E. code for low pressure boilers.

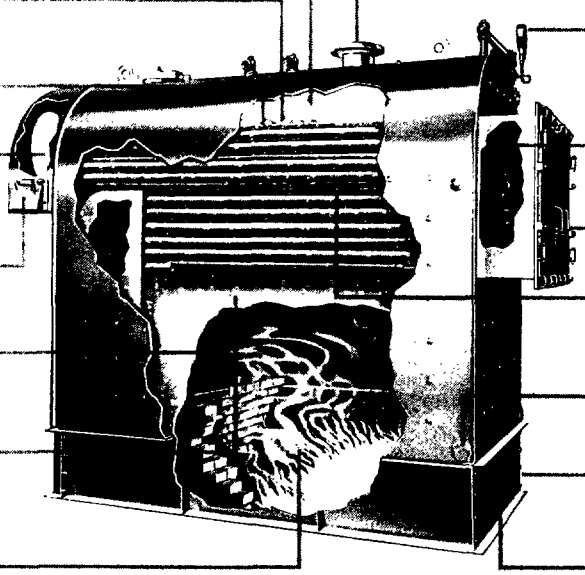
NOTE: When a high setting and independent supporting structure is desired, use either of the following options:

Not applicable to Low-Set Boilers.

Structural Steel Supports: Boiler(s) shall be furnished less steel base(s) but with structural steel supports for setting boiler(s) independently of masonry base(s). Distance from boiler room floor to bottom of water leg to be .....". Structural supports to consist of four H-columns with base plates, one pair each side of boiler and eight pairs of steel brackets securely fastened to the boiler to provide lateral stability according to A.S.M.E. code construction. Each H-column shall be securely bolted to two pairs of boiler brackets.

Bearing Plate Brackets: Boiler(s) shall be furnished less steel bases but with bearing plate brackets for supporting boiler on masonry base(s). Bearing brackets to consist of two pairs of steel bearing plates, each with necessary gussets, welded to the boiler at the bottom of water leg. Each gusset to have a ½ in. hole for wiring insulation to the boiler.

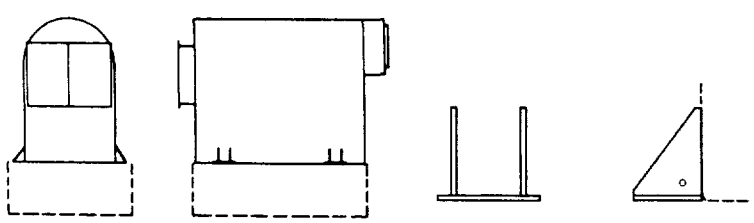
built-in features that make TYPE C KEWANEE better



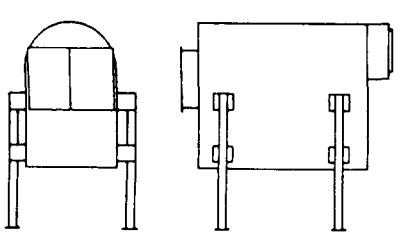
1. 150 pound American-Standard flange—accepts flanged piping and fittings.
2. Generous steam space—provides ample storage for dry steam.
3. Extensive unbroken steam disengaging area—assures steady water line and prevents priming.
4. Water line—well above top row of firetubes.
5. Smoke outlet—rear outlet standard. Top, right or left hand outlet available as optional equipment.
6. Clean out doors—one on each side of smoke box.
7. Wide water legs—progressively wider at top—permitting free and rapid circulation.
8. Arched crown sheet—fully effective combustion space on fireside—self cleaning and draining on water side.
9. Large furnace volume—Extremely low heat release assures quiet and complete combustion.
10. Kewanee water column—hand operated gage and try cocks. Chain operated on 7L-286 and larger.
11. Three inch firetubes—rolled and flared for tight, permanent fit—No welded tube ends.
12. Insulated flue doors provide ready access to all fire tubes.
13. Large water content—guarantees adequate reserve for fluctuating loads—steam or hot water.
14. Washout plugs—Hollow brass with rubber gaskets.
15. Steel base—flanged and reinforced bolted panel construction.
16. Base Flange—with holes on 9″ centers for securing insulation covering.

BOILER SUPPORTING BRACKETS AND SUPPORTING COLUMNS

Bearing brackets support the boiler on a masonry base. Structural steel columns furnish support independent of masonry furnace base. Illustrations show methods of application only. Specific details are available from your American-Standard Sales Office.



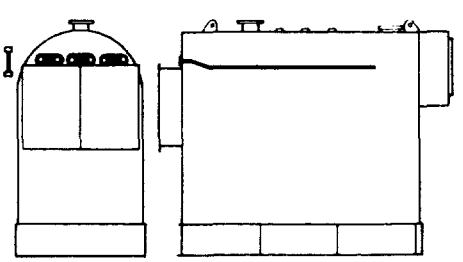
The bearing brackets consist of two pairs of steel bearing plates, each with necessary gussets, welded to the boiler at the bottom of the water leg. Each gusset has ½ inch hole for securing insulation to the boiler.



Supporting columns consist of four steel H-columns with base plates, one pair for each side of the boiler and eight pairs of steel brackets securely fastened to the boiler to provide for lateral stability according to ASME code construction. Each H-column shall be securely bolted to two pairs of boiler brackets. All column plates have bolt holes for anchoring to the foundation.

WATER HEATING COILS

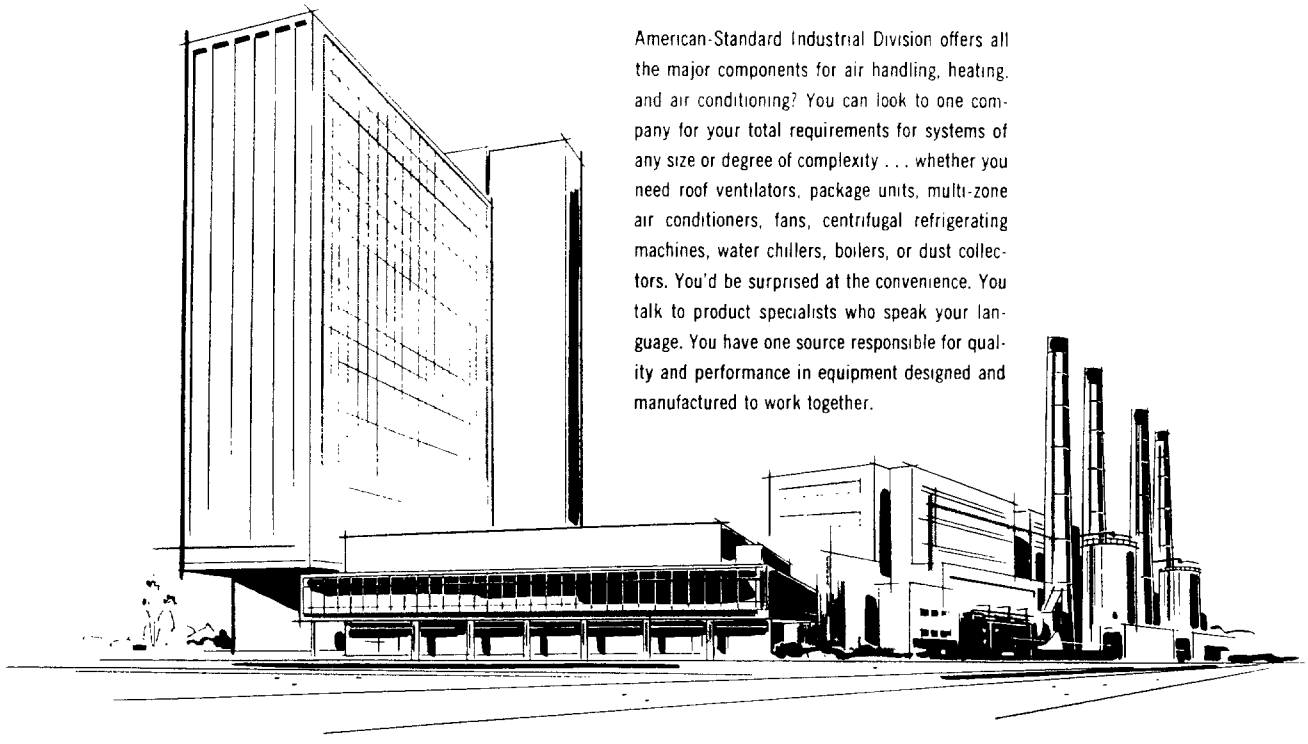
The Kewanee Type C Boiler is built to accommodate indirect hot water heating coils . . . either instantaneous (tankless) or tank (storage) type.



Quality copper tubing is used exclusively in the construction of Kewanee coils . . . brazed into bronze fittings. Terminal ends with standard pipe threads . . . lock-nuts and ring gaskets . . . mounted in front head to avoid interference with breeching, flue doors, piping or controls.

Did you know . . .

American-Standard Industrial Division offers all the major components for air handling, heating, and air conditioning? You can look to one company for your total requirements for systems of any size or degree of complexity . . . whether you need roof ventilators, package units, multi-zone air conditioners, fans, centrifugal refrigerating machines, water chillers, boilers, or dust collectors. You'd be surprised at the convenience. You talk to product specialists who speak your language. You have one source responsible for quality and performance in equipment designed and manufactured to work together.



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