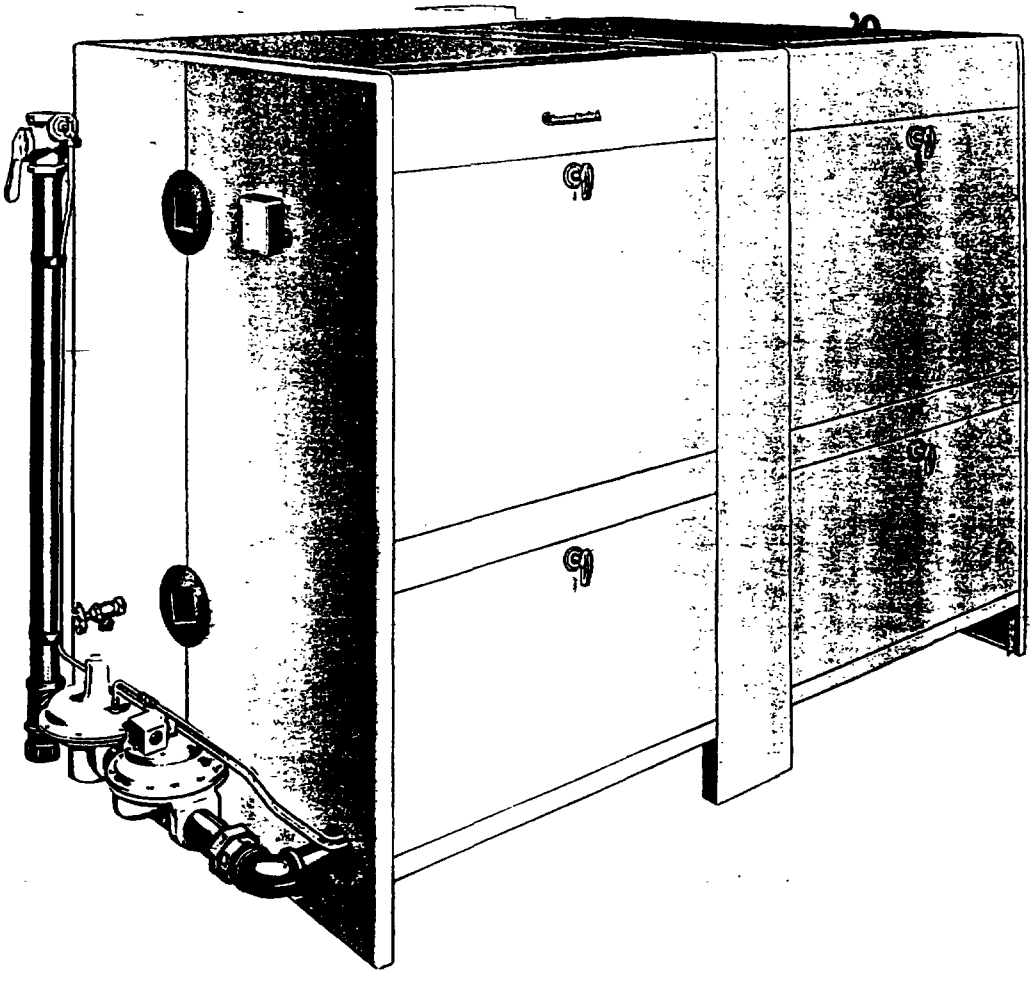
AMERICAN-Standard

G-60

gas fired boilers

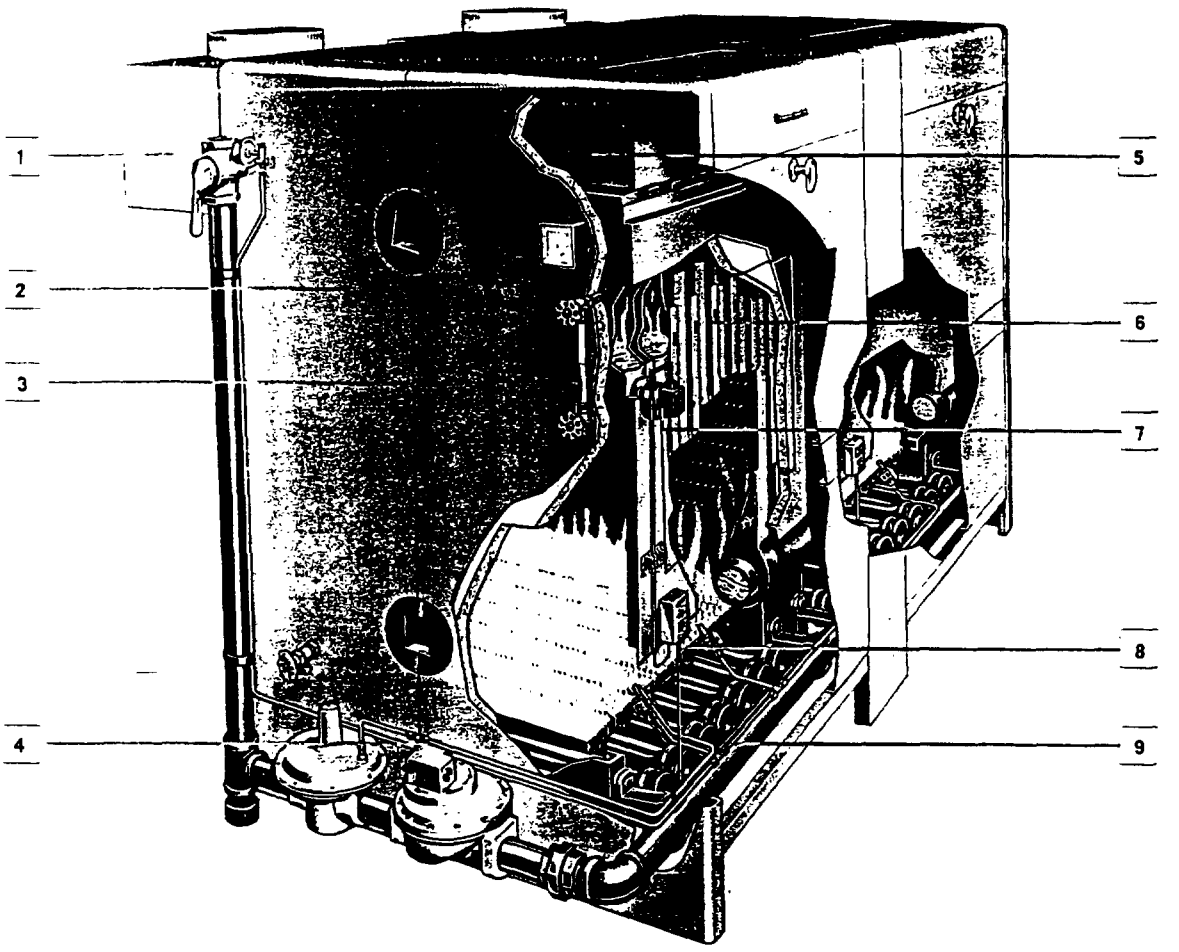


April, 1963

12358

PLAINTIFF'S EXHIBIT

ASI-1135



1— [illegible]—prevents excessive downdrafts from affecting proper combustion. Located at rear of jacket on all models to provide low over-all height of 66⅛".

2— [illegible]—sturdy steel with smart gray finish, modern radius corners. Inner surfaces protected with heavy glass fiber insulation—prevents wasteful heat loss, keeps jacket cool.

3— [illegible]—left hand end steam trim is standard equipment. Right hand end steam trim available on order.

4— [illegible]—A.G.A. approved, electrically operated, automatic diaphragm type valve. Can be manually operated in case of current interruptions.

5— [illegible]—forms gas-tight connections between boiler flue passages and drafthood. Canopy completely enclosed by boiler jacket.

6—Cast iron sections—multiple pin-like projections for maximum heat extraction. Tested for 50 psi water working pressure; 80 psi water working pressure available on special order.

7—[illegible]esetting low water cut-off (steam boilers)—located within jacket enclosure. Electrically shuts off main gas supply to burners if boiler water reaches low point. Optional external types available.

8—[illegible]urners—precision made and factory tested to assure quiet, efficient operation with all gases. Cast iron, drilled port burners supplied for natural and mixed gases. Cleanable ribbon burners standard for all other gases and dual gas equipment.

9—Factory assembled manifold and controls—only requires attachment to boiler. Special manifolds for dual gas equipment and FIA and FM installations available.

G-60 ratings (all gases)

boiler number	for installations from sea level to 2000 ft ■ A.G.A. ratings input Btu/hr	A.G.A. ratings output Btu/hr	net I=B=R ratings ▲ steam sq. ft.	net I=B=R ratings ▲ water & steam Btu/hr	chimney size inches	chimney height feet
natural, mixed and manufactured gases						
G-606	725,000	580,000	1813	435,100	11	20
G-607	870,000	696,000	2176	522,100	12	20
G-608	1,015,000	812,000	2538	609,200	13	20
G-609	1,160,000	928,000	2901	696,200	13	20
G-6010	1,305,000	1,044,000	3263	783,200	14	20
G-6011	1,450,000	1,160,000	3626	870,200	15	20
G-6013	1,740,000	1,392,000	4394	1,054,500	15	20
G-6015	2,030,000	1,624,000	5201	1,248,300	16	20
G-6017	2,320,000	1,856,000	5995	1,438,800	16	30
G-6019	2,610,000	2,088,000	6755	1,621,100	17	30
G-6021	2,900,000	2,320,000	7505	1,801,200	18	30
G-6022	3,045,000	2,436,000	7880	1,891,300	19	30
G-6025	3,480,000	2,784,000	9006	2,161,500	20	30
G-6028	3,915,000	3,132,000	10126	2,430,100	21	30
G-6031	4,350,000	3,480,000	11258	2,701,900	22	30
G-6033	4,640,000	3,712,000	12002	2,880,400	24	30
G-6037	5,220,000	4,176,000	13522	3,245,300	26	30
G-6041	5,800,000	4,640,000	15010	3,602,500	26	30
LP and LP-air						
G-606	650,000	520,000	1625	390,100	11	20
G-607	780,000	624,000	1950	468,100	12	20
G-608	910,000	728,000	2276	546,100	13	20
G-609	1,040,000	832,000	2601	624,200	13	20
G-6010	1,170,000	936,000	2926	702,200	14	20
G-6011	1,300,000	1,040,000	3251	780,200	15	20
G-6013	1,560,000	1,248,000	3901	936,200	15	20
G-6015	1,820,000	1,456,000	4617	1,108,100	16	20
G-6017	2,080,000	1,664,000	5342	1,282,000	16	30
G-6019	2,340,000	1,872,000	6051	1,452,300	17	30
G-6021	2,600,000	2,080,000	6729	1,614,900	18	30
G-6022	2,730,000	2,184,000	7065	1,695,700	19	30
G-6025	3,120,000	2,496,000	8075	1,937,900	20	30
G-6028	3,510,000	2,808,000	9084	2,180,100	21	30
G-6031	3,900,000	3,120,000	10093	2,422,400	22	30
G-6033	4,160,000	3,328,000	10773	2,585,400	24	30
G-6037	4,680,000	3,744,000	12099	2,903,700	26	30
G-6041	5,200,000	4,160,000	13458	3,229,800	26	30
dual gas natural and propane						
G-606	650,000	520,000	1625	390,100	11	20
G-607	780,000	624,000	1950	468,100	12	20
G-608	910,000	728,000	2276	546,100	13	20
G-609	1,040,000	832,000	2601	624,200	13	20
G-6010	1,170,000	936,000	2926	702,200	14	20
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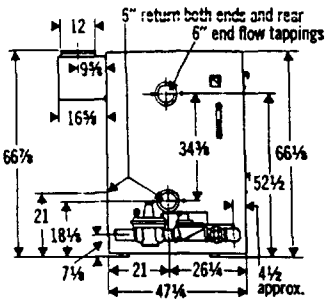
G-6031	3,900,000	3,120,000	10093	2,422,400	22	30
G-6033	4,160,000	3,328,000	10773	2,585,400	24	30
G-6037	4,680,000	3,744,000	12099	2,903,700	26	30
G-6041	5,200,000	4,160,000	13458	3,229,800	26	30

■ For altitudes above 2000 ft., ratings should be reduced at the rate of 4% for each 1000 ft. above sea level.

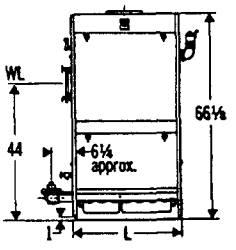
▲ The ratings of these boilers represent the maximum net loads that may be connected to the boilers. Allowances have been made for normal piping and pick-up loads.

G-60 gas boilers by American-Standard have ratings approved by the Institute of Boiler and Radiator Manufacturers. The boilers are constructed to the specifications of the American Society of Mechanical Engineers and are approved by the American Gas Association for all gases. The G-60 bears the I=B=R, A.S.M.E. and A.G.A. symbols. All sizes of the G-60 are available in models for forced and gravity hot water and steam systems.

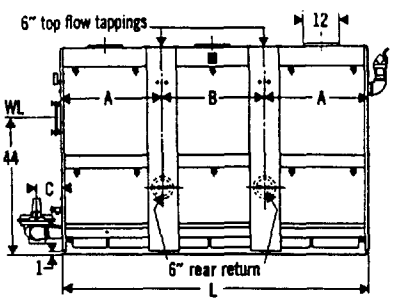
dimensions for inlets and outlets



end view
(same for all sizes)



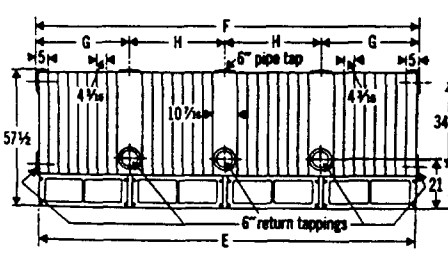
front view
(6-11 section boilers)



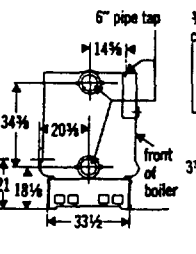
front view
(13-41 section boilers)

boiler number	size gas connections — inches — IPS		dimensions — inches								no. of burners	no. of draft hoods	no. of flue outlets
	natural & LP gases	mxd, mfd & LP-air gas (525-1400 Btu)	A	B	C approx.	L	E	F	G	H			
G-606	1¼	2	—	—	—	27⅛	25¾	26⅛	—	—	5	1	1
G-607	1¼	2	—	—	—	31¼	29½	31	—	—	6	1	1
G-608	1¼	2	—	—	—	35⅜	33⅛	35⅛	—	—	7	1	1
G-609	1¼	2	—	—	—	39½	37⅞	39⅜	—	—	8	1	2
G-6010	1½	2	—	—	—	43⅝	42⅛	43⅛	—	—	9	1	2
G-6011	1½	2½	—	—	—	47¾	46¼	47¾	—	—	10	1	2
G-6013	2	2½	31⅜	—	6½	62¾	60⅞	62⅜	31⅛	—	12	2	2
G-6015	2	2½	35½	—	to	71	69¼	70¾	35⅜	—	14	2	2
G-6017	2	3	39⅜	—	8⅜	79¼	77⅜	79⅛	39⅝	—	16	2	4
G-6019	2½	3	43¾	—	8⅜	87½	86	87½	43¾	—	18	2	4
G-6021	2½	3	47⅞	—	8⅜	95¾	94⅜	95⅞	47⅞	—	20	2	4
G-6022	2½	3	35½	35⅛	8⅜	106⅜	104⅛	106⅛	35⅜	35⅛	21	3	3
G-6025	2½	3	39⅜	39¾	8⅜	119	117⅜	118⅞	39⅝	39¾	24	3	6
G-6028	3	(2)-2½	43¾	43⅞	8⅜	131⅜	129⅞	131⅛	43¾	43⅞	27	3	6
G-6031	3	(2)-3	47⅞	48⅛	8⅜	143¾	142½	144	47⅞	48⅛	30	3	6
G-6033	3	(2)-3	39⅜	39¾	8⅜	158¾	157⅛	158⅜	39⅝	39¾	32	4	8
G-6037	3	(2)-3	43⅞	43⅞	8⅜	175¼	173⅞	175⅜	43¾	43⅞	36	4	8
G-6041	3	(2)-3	47¾	48⅛	8⅜	191¾	190⅝	192⅛	47⅞	48⅛	40	4	8

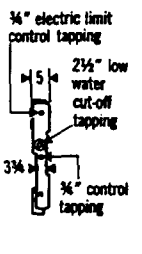
assemblage of sections
control tappings



layout of flow and return tappings
(back view)



layout of flow and return tappings
(both ends)

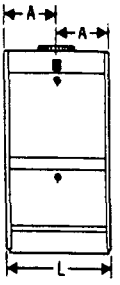


left hand end section
(front view)

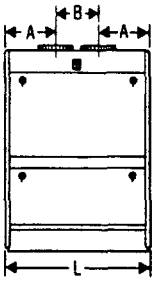
boiler number	no. of sections			no. of flow tappings		no. of return tappings	
	end	intermediate	center	top	end	back	end
G-606	2	0	4	0	2	0	2
G-607	2	0	5	0	2	0	2
G-608	2	0	6	0	2	0	2
G-609	2	0	7	0	2	0	2
G-6010	2	0	8	0	2	0	2
G-6011	2	0	9	0	2	0	2
G-6013	2	1	10	1	2	1	2
G-6015	2	1	12	1	2	1	2
G-6017	2	1	14	1	2	1	2
G-6019	2	1	16	1	2	1	2
G-6021	2	1	18	1	2	1	2
G-6022	2	2	18	2	2	2	2
G-6025	2	2	21	2	2	2	2
G-6028	2	2	24	2	2	2	2
G-6031	2	2	27	2	2	2	2
G-6033	2	3	28	3	2	3	2
G-6037	2	3	32	3	2	3	2
G-6041	2	3	36	3	2	3	2

drafthood outlets — dimensions (inches)

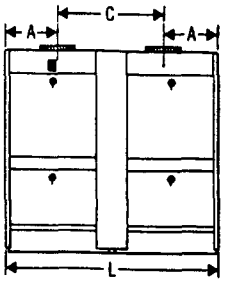
6-7-8 sections



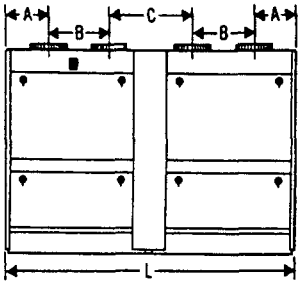
9-10-11 sections



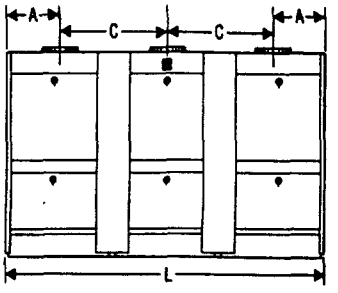
13-15 sections



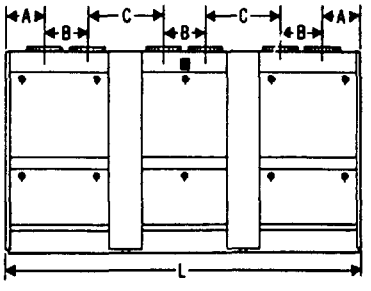
17-19-21 sections



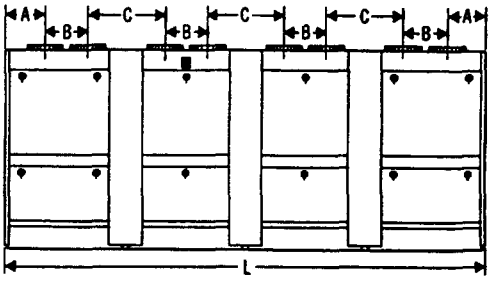
22 sections



25-28-31 sections



33-37-41 sections

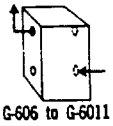


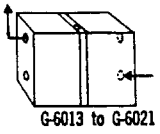
boiler number	no. of sections	no. of flue outlets	A	B	C	L	minimum equivalent diameter of flue header
G-606	6	1	13¾	—	—	27⅛	12
G-607	7	1	15⅝	—	—	31¼	12
G-608	8	1	17⅞	—	—	35⅜	12
G-609	9	2	12½	14½	—	39½	14
G-6010	10	2	13¾	16½	—	43⅝	16
G-6011	11	2	13⅜	20½	—	47¾	16
G-6013	13	2	15⅞	—	31⅜	62¾	18
G-6015	15	2	17¾	—	35½	71	18
G-6017	17	4	12½	14½	25¼	79¼	20
G-6019	19	4	13½	16½	27½	87½	20
G-6021	21	4	13¾	20½	27⅝	95¾	22
G-6022	22	3	17¾	—	35¾	106⅝	22
G-6025	25	6	12½	14½	25¼	119	24
G-6028	28	6	13½	16½	27¾	131⅜	24
G-6031	31	6	13½	20½	27⅝	143¾	26
G-6033	33	8	12½	14½	25¼	158¾	26
G-6037	37	8	13⅜	16½	27½	175¼	30
G-6041	41	8	13¾	20½	27⅝	191¾	30

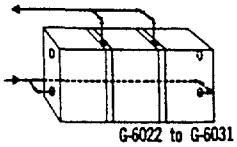
minimum piping recommendations

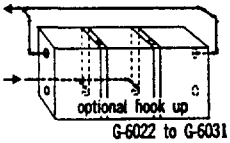
hot water
(forced water circulation only)

boiler number	pipe sizes (inches)		
	riser	return	header
G-606	2½	2½	—
G-607	3	3	—
G-608	3	3	—
G-609	3	3	—
G-6010	4	4	—
G-6011	4	4	—
G-6013	4	4	—
G-6015	5	5	—
G-6017	5	5	—
G-6019	5	5	—
G-6021	5	5	—
G-6022	(2)-4	(2)-4	6
G-6025	(2)-4	(2)-4	6
G-6028	(2)-4	(2)-4	6
G-6031	(2)-5	(2)-5	6
G-6033	(3)-4	(2)-5	8
G-6037	(3)-4	(2)-5	8
G-6041	(3)-4	(2)-5	8

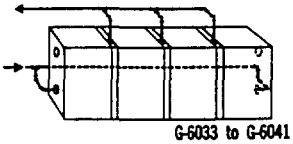

G-606 to G-6011


G-6013 to G-6021


G-6022 to G-6031



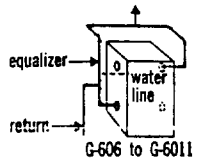
G-6022 to G-6031


G-6033 to G-6041

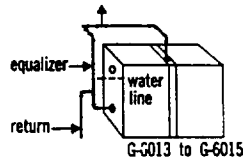
steam

boiler number	pipe sizes (inches)			
	riser	return	header	equalizer
G-606	4	1½	4	2
G-607	4	1½	4	2
G-608	5	1½	5	2½
G-609	5	2	5	2½
G-6010	5	2	5	2½
G-6011	5	2	5	2½
G-6013	6	3	6	2½
G-6015	6	3	6	4
G-6017	(2)-6	4	8	4
G-6019	(2)-6	4	8	4
G-6021	(2)-6	4	8	4
G-6022	(2)-6	4	8	4
G-6025	(2)-6	4	8	4
G-6028	(2)-6	4	8	4
G-6031	(2)-6	4	8	4
G-6033	(3)-6	4	10	4
G-6037	(3)-6	4	10	4
G-6041	(3)-6	4	10	4

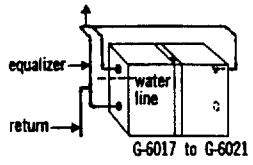
NOTE: Return connection to equalizer should be 2" from water line to top of fitting.



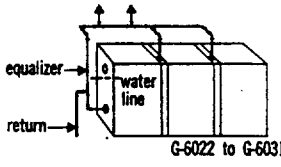
G-606 to G-6011



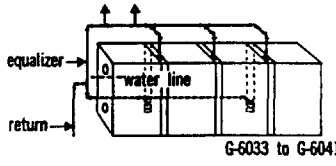
G-6013 to G-6015



G-6017 to G-6021



G-6022 to G-6031



G-6033 to G-6041

gas control and connection sizes; pertinent data

boiler number	water content (pounds)		shipping weight (pounds)		size of manifold (inches)		pressure regulators (inches)		size of manual shut-off and main gas valve (inches)			
					natural & LP gases	mxd, mfd & LP-air gases (525-1400 Btu)	natural gas	mxd, mfd & LP-air gases (525-1400 Btu)	natural & LP gases	mxd, mfd & LP-air gases (525-1400 Btu)	dual gas	
	water	steam	water	steam							natural	propane●
G-606	762	504	2741	2751	2	2	1¼	2	1¼	2	1¼	1¼
G-607	877	581	3141	3151	2	2	1¼	2	1¼	2	1¼	1¼
G-608	991	658	3527	3537	2	2	1¼	2	1¼	2	1¼	1¼
G-609	1106	753	3923	3934	2	2	1¼	2	1¼	2	1¼	1¼
G-6010	1221	813	4335	4346	2	2	1½	2	1½	2	1½	1½
G-6011	1335	890	4728	4739	2	2½	1½	2½	1½	2½	1½	1½
G-6013	1877	1252	6049	6069	2	2½	2	2½	2	2½	2	2
G-6015	2106	1406	6835	6855	2	2½	2	2½	2	2½	2	2
G-6017	2335	1561	7620	7640	2	3	2	3	2	3	2	2
G-6019	2564	1715	8503	8523	2½	3	2½	3	2½	3	2½	2½
G-6021	2793	1870	9292	9312	2½	3	2½	3	2½	3	2½	2½
G-6022	3220	2154	10139	10154	2½	3	2½	3	2½	3	2½	2½
G-6025	3564	2386	11334	11361	2½	3	2½	(2)-2½	2½	3	2½	2½
G-6028	3908	2618	12616	12648	3	(2)-2½	3	(2)-2½	3	(2)-2½	3	3
G-6031	4252	2850	13809	13841	3	(2)-3	3	(2)-3	3	(2)-3	3	3
G-6033	4793	3211	15036	15068	3	(2)-3	3	(2)-3	3	(2)-3	3	3
G-6037	5252	3521	16690	16720	3	(2)-3	3	(2)-3	3	(2)-3	3	3
G-6041	5710	3820	18316	18346	3	(2)-3	3	(2)-3	3	(2)-3	3	3

■Pressure regulator not furnished for LP gases ●Indicates manual shut-off size only

G-60

gas fired boilers

orifice drill sizes—main burner spuds

manufactured and mixed gases — ribbon burners
natural gas — drill port burners

input per orifice Btuh	specific gravity of gas	530 ■ Btu/cu. ft.	550 Btu/cu. ft.	800 Btu/cu. ft.	1000 Btu/cu. ft.	1050 Btu/cu. ft.	1100 Btu/cu. ft.	1200 Btu/cu. ft.
145,000	0.40	5/16	N	—	—	—	—	—
145,000	0.50	—	P	—	—	—	—	—
145,000	0.60	—	R	F	A	1	2	4
145,000	0.65	S	—	—	B	A	—	—
145,000	0.70	—	S	H	C	B	1	2

■ Both 0.40 and 0.65 gases are required by supplementary utility requirements.

LP and LP-air gases at sea level

input per orifice Btuh	heating value of gas Btu/cu. ft.	specific gravity of gas		orifice drill size	
		butane and butane-air	propane and propane-air	butane and butane-air	propane and propane-air
130,000	525	1.16	1.11	S	11/32
130,000	600	1.18	1.13	21/64	P
130,000	700	1.21	1.15	N	N
130,000	800	1.24	1.17	L	9/32
130,000	900	1.27	1.19	I	H
130,000	1000	1.30	1.21	G	F
130,000	1100	1.33	1.24	¼	D
130,000	1200	1.36	1.26	C	15/64
130,000	1300	1.39	1.28	A	1
130,000	1400	1.42	1.30	2	7/32
130,000	2500	—	1.53	—	29
130,000	3300	2.00	—	⅛	—

natural gas — ribbon burners

input per orifice Btuh	specific gravity of gas	800 Btu/cu. ft.	1000 Btu/cu. ft.	1050 Btu/cu. ft.	1100 Btu/cu. ft.	1200 Btu/cu. ft.
130,000	.60	D	7/32	3	4	7
130,000	.65	—	2	7/32	—	—
130,000	.70	F	1	2	7/32	4

NOTE: Table shows orifice sizes by either numbered, lettered or fractional drill sizes. Sea level ratings are to be used for elevations between 0 and 2000 ft. For altitudes above 2000 ft., sea level ratings should be reduced at the rate of 4% for each 1000 ft. above sea level.

orifice pressure table based on following chart:

gas	heating value ■	manifold pressure in. H_2O
city	525—550	2.5
city	800—1200	3.5
LP	2500 & 3300	11.0
LP-air	525—1400	4.0

■ Heating value of gas at sea level (60°F and 30 in. Hg).

sample specification for G-60

Contractor shall furnish and install, as indicated on plans, ... gas fired boiler(s), having an input of ..... Btuh and a gross output of ..... Btuh when fired with ..... gas. Boiler(s) shall be constructed of cast iron in accordance with A.S.M.E. requirements for low pressure heating boilers and bear the A.S.M.E. symbol. Boiler(s) shall be A.G.A. approved and have I=B=R ratings. Boiler(s) shall be composed of cast iron sections with vertical flues and furnished with one atmospheric drill port or removable ribbon burner per flueway. Boiler(s) shall be supplied by manufacturer with main automatic diaphragm gas valve, safety pilot with thermocouple and additional lighting pilots as required, gas pressure regulator (except for L.P. gas), high limit control, and integral canopy and drafthood. Water or steam trim as required. (NOTE: Hereinafter, include specifications for dual gas, FM and FIA equipment, and electronic control systems.)

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