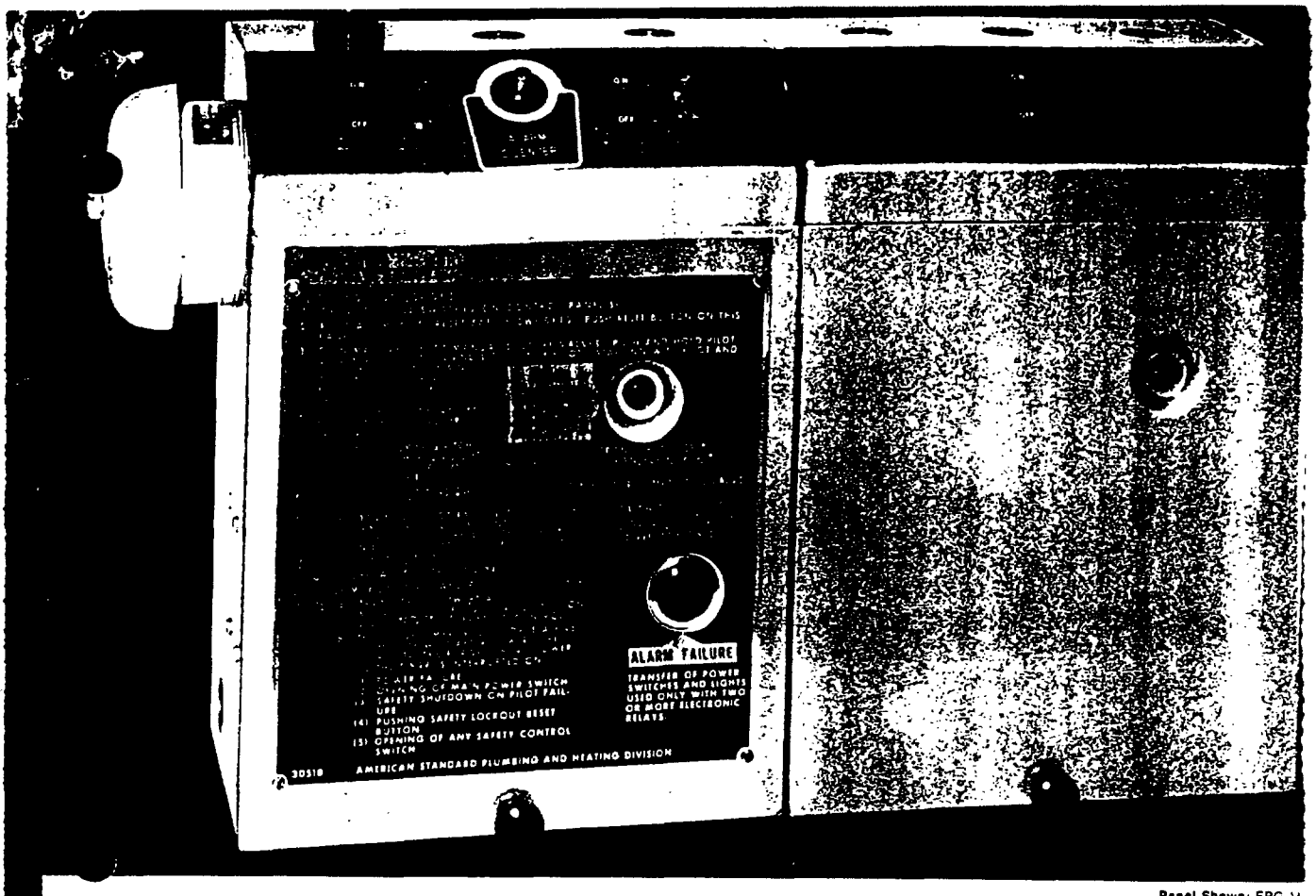


Panel Shown: EPG-M

American-Standard Electronic Panel Systems

made exclusively for G-10 and G-40 gas boilers

Now . . . a gas boiler electronic control system completely enclosed in an attractive, space-saving panel! It provides a centrally located control center with factory-wired switches and indicator lights with terminal for connection of all operating controls, limit controls, automatic valves, and ignition components. All features of the combustion safeguard are utilized in various systems. Extra relays are mounted in a matching auxiliary control panel, which is fastened and wired to the basic panel at the factory.

Compact • Space-saving • Versatile • Attractive

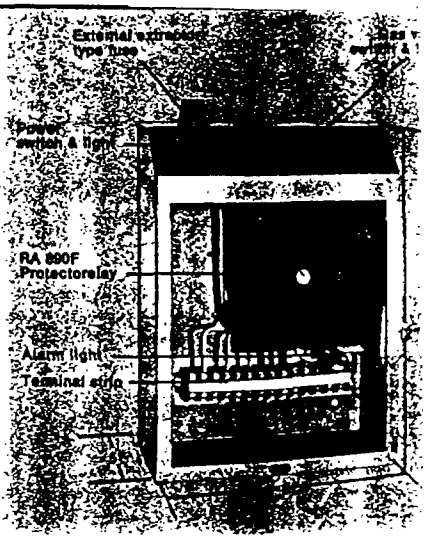
SPECIAL FEATURES

Main Panel Systems Provide:

- 100% Safety Shut-off
- RA890F Relays factory installed
- 15-second Safety Lockout timing
- Factory assembled and wired panels
- Alarm contacts and light
- Main power disconnect switch and light
- Main gas valve switch and light
- Clamp-type wiring terminals
- Convenient conduit knockouts
- Spare fuse packed in every panel
- Three feet of flame rod (where involved, ignition cable) furnished for each electronic pilot.

Matching Auxiliary Panels

- factory wired and assembled to main panel when furnished
- only available with pilot on-off switch and indicator light.
- heavy gauge steel construction with spot-welded corners.
- dimensions and wiring to numbered terminal strips same as control panel.



Panel Shown: EPG-M, E, ES

PLAINTIFF'S EXHIBIT
ASI 849

15578

Electronic Panel Systems Available

All systems include one main control with one or more auxiliary panels, factory assembled and wired to the main panel as required. Each system includes one or more RA890 relays with 2-4 seconds flame failure response timing with alarm contacts.

(FOR 115 VOLT, 60 CYCLE 1 PHASE POWER ONLY)

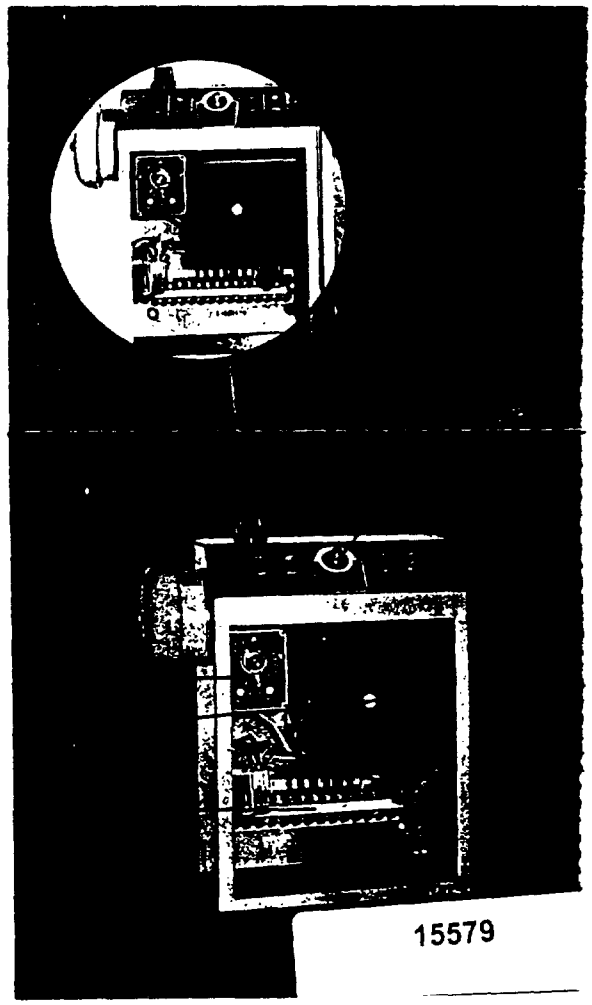
Panel System EPG-M: Provides manual ignition, 100% safety shut-off with electronic supervision of pilots (1 to 3.) Main burners and pilots are turned off on pilot failure. Continuous flame pilot operation. Equipment includes: one panel for each electronic pilot (Main panel plus 1 or 2 auxiliary panels) prewired and factory assembled; Baso valves and thermocouples and Q-179B electronic flame rod and pilot; RA890F protectorelay installed on panel; 3 ft. flame rod wire per pilot.

Panel Section EPG-ES: Provides electronic supervision of each pilot (1 to 3) and interrupted continuous burning pilot electronically turned off and electrically relighted on every cycle to achieve positive component check of relays and pilot system. Complete automatic operation of boiler. 100% safety shut-off. Equipment includes: one panel for each electronic pilot (Main panel plus 1 or 2 auxiliary panels) prewir and factory assembled; Q179A flame rod and electric ignition pilots; igniti transformer; V4046C pilot solenoid valves; RA890F protectorelay install in panels with 2-4 seconds response timing and alarm contacts; minim of 3 ft. of flame rod wire and 3 ft. of ignition cable per pilot.

Panel System EPG-E: Provides electronic supervision of each pilot (1 to and intermittent electric ignition of all pilots. Complete automatic operat of boiler. 100% safety shut-off. Equipment includes: one panel for ea electronic pilot (Main panel plus 1 or 2 auxiliary panels) prewired and f tory assembled; Q179-A flame rod and electric ignition pilots; ignition tra former; V4046C pilot solenoid valves; RA890F protectorelay installed panel with 2-4 seconds response timing and alarm contacts; minimum 3 ft. of flame rod wire and 3 ft. of ignition cable per pilot.

The EPG-M(FIA) Panel System is designed to be used with special F.I.A. Gas Trains available. Both the panel system and gas trains were designed in cooperation with the F.I.A. and meet their *minimum* requirements.

Panel System EPG-M(FIA): Specifically designed to meet F.I.A. requirements. Provides constant burning manually lighted electronically supervised pilots (1 to 3). 100% safety shut-off. Equipment includes: one panel for each electronic pilot (Main panel plus 1 or 2 auxiliary panels) prewired and factory assembled; alarm bell, alarm silencing switch; purge timer, all factory assembled in master panel; RA 890F protectorelay installed in panel; Baso valves and thermocouples and Q-179B electronic flame rod pilot; 3 ft. flame rod wire per pilot.



The following coding was established to provide a quick descriptive identification of the available Electronic Panel Systems. For more detailed descriptions, refer to the information above.	
EPG	indicates Electronic Panel system for Gas Boilers
-M	indicates Manually lighted constant burning pilots
-E	indicates automatic Electrically lighted pilots
-ES	indicates automatic Electrically lighted Standing (constant burning) pilots
-M(FIA)	indicates a special -M system, with a special panel designed to meet F.I.A. specifications.
The suffix digits – 1, 2 or 3 – indicate the quantity of Electronic Panels and Pilots furnished and required for the boiler size involved.	

The type of electronic panel system desired should be specified when the boiler order is entered. The following chart indicates systems application to particular boiler models.

Boiler No.	System number			
G-403 thru G-4010	EPG-M1	EPG-ES1	EPG-E1	EPG-M1(FIA)
G-105 thru G-1012	EPG-M1	EPG-ES1	EPG-E1	EPG-M1(FIA)
G-1013 thru G-1023	EPG-M2	EPG-ES2	EPG-E2	EPG-M2(FIA)
G-1024 thru G-1033	EPG-M3	EPG-ES3	EPG-E3	EPG-M3(FIA)

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PLUMBING / HEATIN
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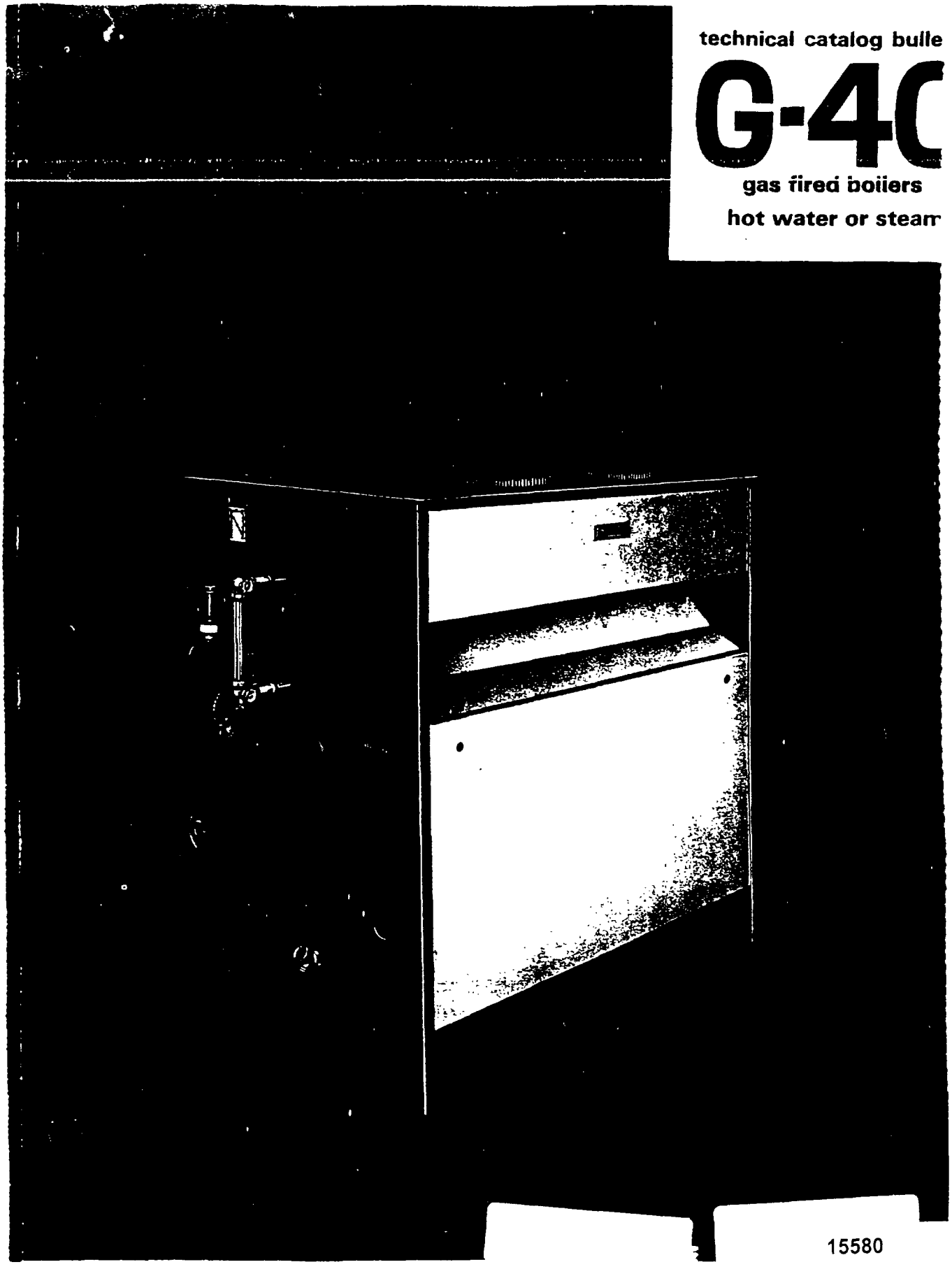
technical catalog bulle

G-4C

gas fired boilers

hot water or steam



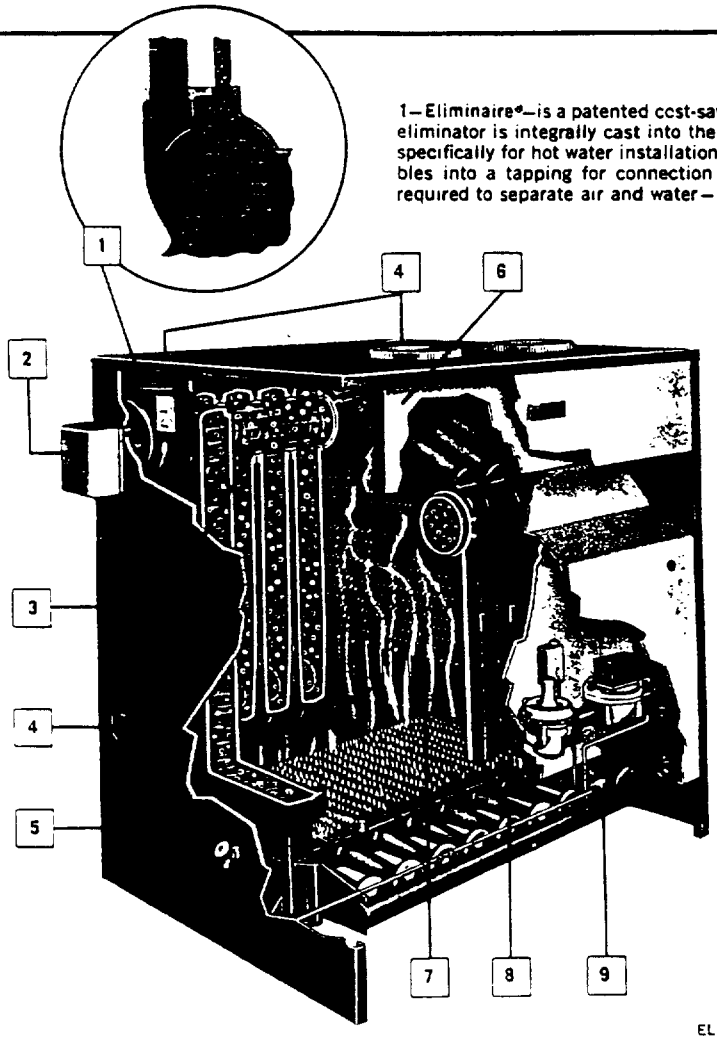
15580

new G-40 gas boiler—reduces costs and installation time

The new G-40 gas boiler by American-Standard is suitable for installation in larger residences and small apartment and commercial buildings. Designed for both hot water and steam installations, it can be furnished with a tankless type, internal, domestic water heater for either application. An attractive two-tone boiler jacket gives the G-40 a clean, streamlined appearance.

Ruggedly constructed of durable cast iron, the new G-40 is available in 3 to 14 section sizes with A.G.A. design certified outputs from 120,000 to 780,000 btu/hr. All sections are tested for 50 psi water working pressure. On-site assembling time can be decreased by ordering up to 14 sections pre-assembled, with or without factory-installed tankless heater. An exclusive built-in air eliminator—the ELIMINAIRE—is furnished on all boilers, specifically for hot water installations, saving the additional expense of an external device.

The G-40 is provided with two 3" top flow tappings and two 3" return flow tappings to allow flexibility in designing system piping when the G-40 is installed in confined areas. For further convenience, complete manifold and all controls are shipped factory assembled. Self-energizing controls and electronic controls are available as options.



1—Eliminaire®—is a patented cost-saving feature of the G-40. This unique built-in air eliminator is integrally cast into the left hand end section. Furnished in all boilers, specifically for hot water installations, the ELIMINAIRE baffle diverts rising air bubbles into a tapping for connection to the expansion tank. No external device is required to separate air and water—thus reducing both costs and installation time.

2—controls—mounted on front and left side of boiler for easy adjustment and maintenance. Optional electronic controls and self-energizing controls available.

3—water heater—large, finned copper coil tankless type available for steam or water installations. Inserted where hottest water is in contact with heater coil.

4—tappings—two 3" supply (top) and two 3" return tappings (side) simplify piping hook-up.

5—jacket—sturdy steel with smart beige and brown finish, modern square corners. Inner surfaces protected with heavy glass fiber insulation—prevents wasteful heat loss, keeps jacket cool.

6—built-in draft hood—completely enclosed in jacket; eliminates unsightly protrusion in rear of boiler.

7—cast iron sections—multiple pin-like projections for maximum heat extraction. Tested for 50 psi water working pressure. End sections designed with extended legs to eliminate need for separate base.

8—burners—precision made and factory tested to assure quiet, efficient operation with all gases. Cast iron, drilled port burners supplied for natural gas. Cleanable ribbon burners standard for propane gas.

9—factory assembled manifold and controls—only requires attachment to boiler. Completely enclosed by jacket.

ELIMINAIRE® is a trademark of AMERICAN STANDARD Inc.

G-40 ratings (natural and propane gases)

boiler number	no. of sections	no. of burners	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▲ water (Btu/hr)	net I=B=R ratings▲ steam (sq. ft.)	net I=B=R ratings▲ steam (Btu/hr)	chimney diameter (inches)	chimney height (feet)
G-403	3	2	150,000	120,000	104,300	375	90,000	8	15
G-404	4	3	225,000	180,000	156,500	563	135,000	8	15
G-405	5	4	300,000	240,000	208,700	750	180,000	8	15
G-406	6	5	375,000	300,000	260,900	938	225,100	10	15
G-407	7	6	450,000	360,000	313,000	1125	270,100	10	15
G-408	8	7	525,000	420,000	365,200	1313	315,100	10	15
G-409	9	8	600,000	480,000	417,400	1500	360,100	10	15
G-4010	10	9	675,000	540,000	469,600	1688	405,100	12	15
G-4011	11	10	750,000	600,000	521,800	1875	450,000	12	15
G-4012	12	11	825,000	660,000	574,000	2063	495,200	12	15
G-4013	13	12	900,000	720,000	626,200	2250	540,000	12	15
G-4014	14	13	975,000	780,000	678,400	2438	585,100	15	15

■ For altitudes above 2000 ft., ratings should be reduced at the rate of 4% for each 1000 ft. above sea level.
▲ Net I = B = R ratings shown are based on a piping and pick up allowance of 1.333 for steam and 1.15 for water. American-Standard should be consulted before selecting a boiler for installations having unusual piping and pick up requirements.

G-40 tankless heater ratings

boiler number	100°F rise in temperature with 200°F boiler water temperature (gallons per minute) heater no. 218 water	heater no. 218 steam	heater no. 222 water	heater no. 222 steam	heater no. 226 water	heater no. 226 steam	heater no. 232 water	heater no. 232 steam	heater no. 445 water	heater no. 445 steam	heater no. 460 water	heater no. 460 steam
G-403	4	3	—	—	—	—	—	—	—	—	—	—
G-404	4	3½	4½	4	—	—	—	—	—	—	—	—
G-405	4		4½	4	6	5½	—	—	—	—	—	—
G-406	4		4½		6	5½	—	—	—	—	—	—
G-407	4		4½		6½		7½	7	—	—	—	—
G-408	4		4½		6½		8	7½	9	8½	—	—
G-409	4		4½		6½		8		9	8½	—	—
G-4010	4		4½		6½		8		9		—	—
G-4011	4		4½		6½		8		9		12	11
G-4012	4		4½		6½		8		9		13	12
G-4013	4		4½		6½		8		9		14½	
G-4014	4		4½		6½		8		9		15½	

NOTE: For Steam boiler-heater combinations shown shaded, extra aquastat in right end section is recommended.

G-40 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 design certified by the American Gas Association. The G-40 bears the I=B=R, A.S.M.E. and A.G.A. symbols. All sizes of the G-40 are available in models for forced and gravity hot water, and steam systems.

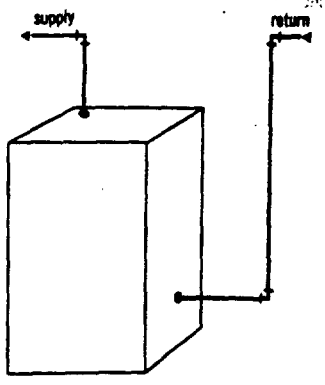
sample specification for G-40

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. design certified and have I=B=R approved ratings. Boiler(s) shall be furnished with an air elimination device integrally cast into the left hand end supply tapping. 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 one main automatic diaphragm gas valve, safety pilot with thermocouple and additional lighting pilots as required, one gas pressure regulator (except for propane gas), high limit control, and integral canopy and drafthood. Water or steam trim as required.

Boiler(s) shall be supplied with internal type tankless heater capable of supplying.....gallons per minute at a 100°F rise in temperature.

minimum piping recommendations

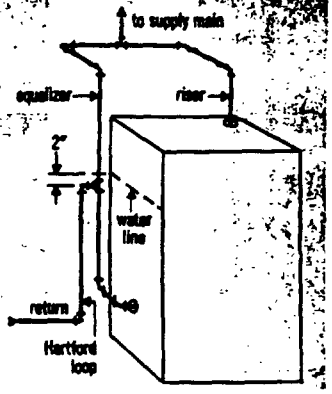
hot water - steam



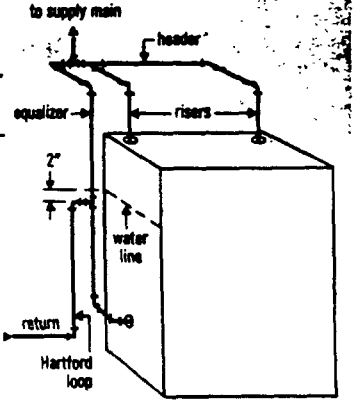
boiler number	gravity		forced	
	supply (in.)	return (in.)	supply (in.)	return (in.)
G-403	2	2	1¼	1¼
G-404	2	2	1½	1½
G-405	2½	2½	2	2
G-406	(2)-2	(2)-2	2	2
G-407	(2)-2	(2)-2	2	2
G-408	(2)-2	(2)-2	2½	2½
G-409	(2)-2½	(2)-2½	2½	2½
G-4010	(2)-2½	(2)-2½	2½	2½
G-4011	(2)-3	(2)-2½	3	3
G-4012	(2)-3	(2)-2½	3	3
G-4013	(2)-3	(2)-2½	3	3
G-4014	(2)-3	(2)-2½	3	3

NOTE: Left hand supply connection featuring the ELIMINAIRE is used on water boilers. Limit control should also be placed in the left hand section. Where both outlets and return are used on gravity systems, make respective supply and return connection at opposite ends of the boiler.

boiler number	riser (in.)	return (in.)	equalizer (in.)
G-403	2	1	1½
G-404	2½	1	1½
G-405	2½	1	1½
G-406	3	1¼	1½
G-407	3	1¼	1½



boiler number	riser (in.)	return (in.)	header (in.)	equalizer (in.)
G-408	(2)-2	1½	4	1½
G-409	(2)-2	1½	4	2
G-4010	(2)-3	1½	4	2
G-4011	(2)-3	1½	4	2
G-4012	(2)-3	1½	4	2
G-4013	(2)-3	1½	4	2
G-4014	(2)-3	1½	4	2



gas control and connection sizes; pertinent data

boiler number	water content (pounds)		approx. weight (pounds)	size of manifold (inches)	pressure regulators (inches)	automatic gas valve, gas connections and manual shutoff valve sizes (inches)	
	water	steam		nat. & propane gases	nat.	nat.	propane
G-403	220.8	164.4	858	1¼	½	½	½
G-404	281.0	209.9	1027	1¼	¾	¾	½
G-405	341.2	255.4	1195	1¼	1	1	½
G-406	401.4	300.9	1370	1¼	1	1	¾
G-407	461.6	346.4	1544	1¼	1	1	¾
G-408	521.8	391.9	1713	1¼	1	1	¾
G-409	582.0	437.4	1880	1¼	1¼	1¼	1
G-4010	642.2	482.9	2050	1¼	1¼	1¼	1
G-4011	722.4	528.4	2219	1½	1¼	1¼	1
G-4012	782.6	573.9	2388	1½	1¼	1¼	1
G-4013	842.8	619.4	2557	1½	1¼	1¼	1
G-4014	903.0	664.9	2726	1½	1¼	1¼	1

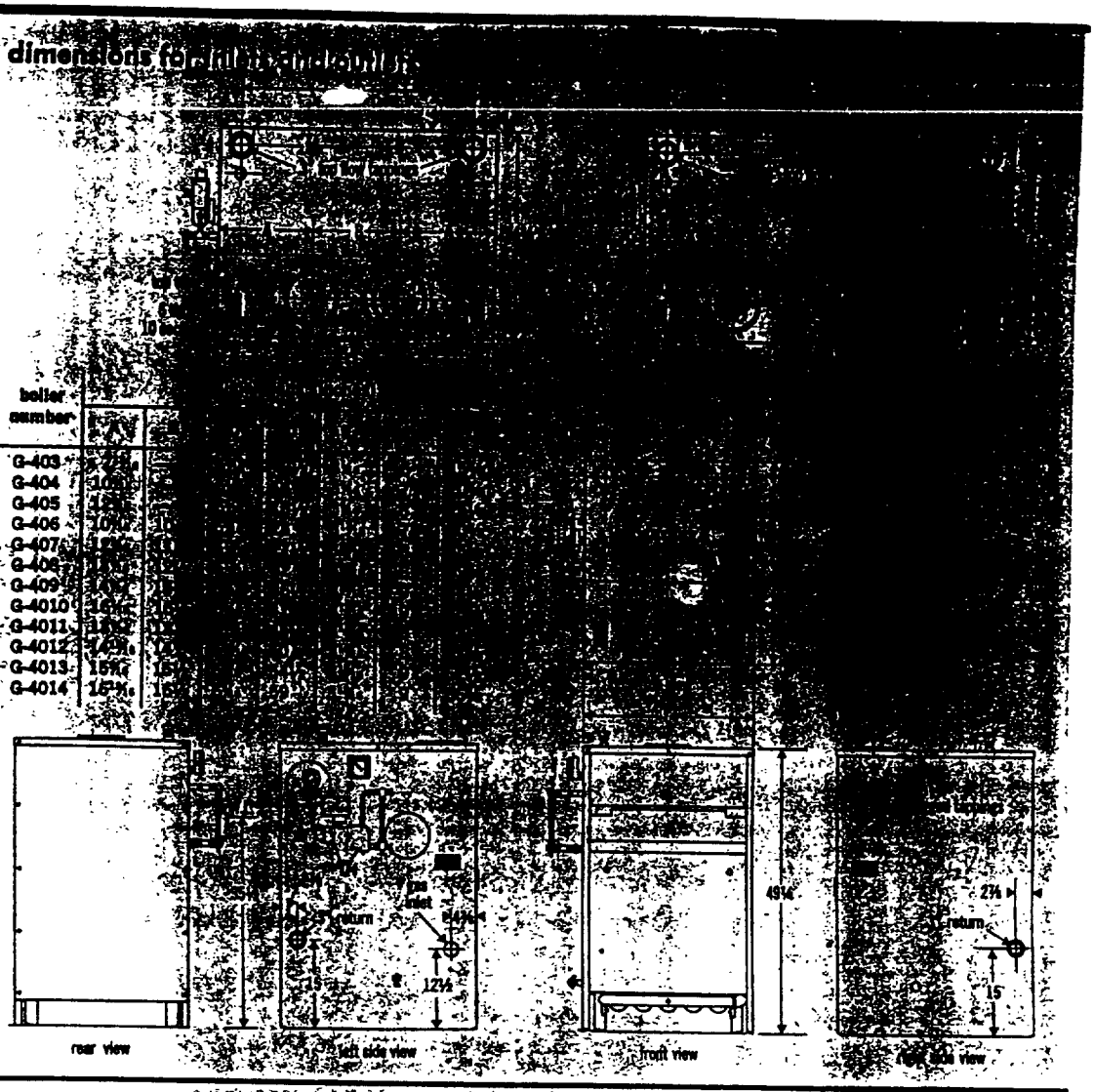
■ Pressure regulator not furnished for Propane gas.

AMERICAN STANDARD

G-40

gas fired boilers

dimensions for [illegible]



orifice drill sizes—main burner spuds (at sea level)

Input per burner (Btuh)	specific gravity of gas	natural gas 600 Btu cu. ft.	900 Btu cu. ft.	1000 Btu cu. ft.	1100 Btu cu. ft.	1200 Btu cu. ft.	sewage gases 600 Btu cu. ft.	650 Btu cu. ft.	700 Btu cu. ft.	750 Btu cu. ft.	800 Btu cu. ft.	propane gas 2500 Btu cu. ft.
75,000	0.60	¾	16	19	21	24	—	—	—	—	—	—
75,000	0.65	11	15	18	20	—	—	—	—	—	—	—
75,000	0.70	10	14	17	19	21	A	2	3	4	7	—
75,000	0.80	—	—	—	—	—	C	1	2	3	4	—
75,000	0.90	—	—	—	—	—	D	B	1	2	3	—
75,000	1.53	—	—	—	—	—	—	—	—	—	—	41

NOTE: Sea level ratings are to be used for elevations between 0 and 2,000 ft. For altitudes above 2,000 ft., sea level ratings should be reduced at the rate of 4% for each 1,000 ft. above sea level.

manifold pressure table

gas	heating values*	manifold pressure (in. H_2O)
natural	800—1200	3.5
propane	2500	11.0
sewage gas	600—800	3.0

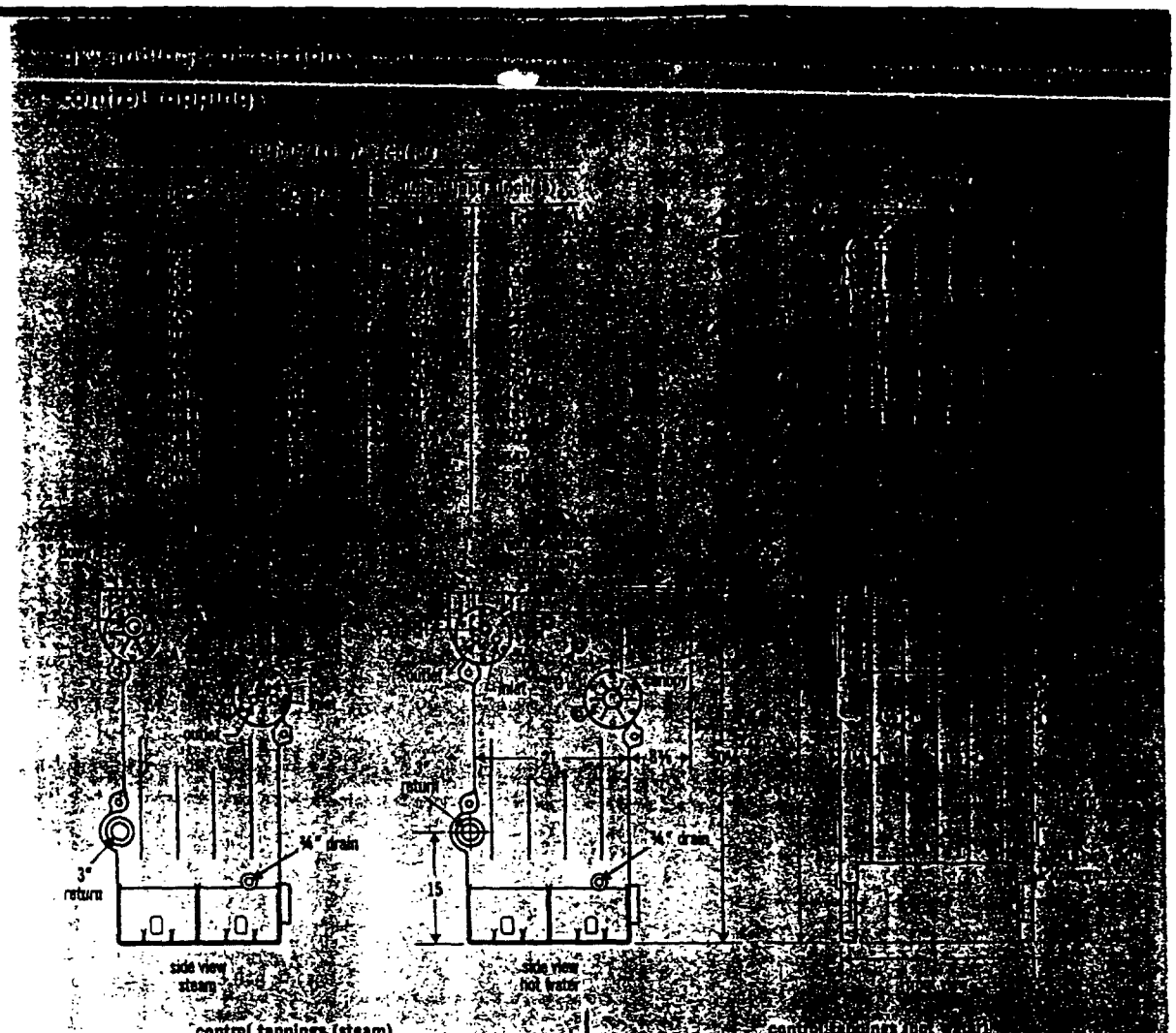
*heating value of gas at sea level (60°F and 30 in. Hg.)

AMERICAN STANDARD

15584

G-40

gas fired boilers



control tappings (steam)

location	size of tappings (in.)	control used
A	½	pressure gauge
B	1½	blow-off ■
C	¾	tankless heater control
D	1	safety valve
E	½	gauge glass and low water cut-off

■When required, auxiliary pressure limit control is to be installed in blow-off piping.

control tappings (hot water)

location	size of tappings (in.)	control used
F	[illegible]	[illegible]
G	[illegible]	[illegible]
H	¾	combination [illegible] and low [illegible] control (for installation with tankless water heater)
		limit control (for installation without tankless water heater)
J	[illegible]	[illegible]

AMERICAN STANDARD

PLUMBING / HEATING

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15585