

**LGB - Commercial Gas Boiler
Weil-McLain**



Gas
Water or Steam
MBH: 400-2,860
Combustion Eff.: 81%

Net Load Range
Hot Water
282,000 to 2,014,000 BTU/Hr.
Steam
1,013 to 7,496 Sq. Ft.

➤ **Versatile Combustion Control Systems**

➤ **Made with Weil-McLain Quality**

➤ **Applications:**

**Apartment Buildings
Commercial Buildings
Schools and Other Institutions
Multiple Boilers
Indirect-Fired Water Heating
... And Much More**



 **WEIL-McLAIN**
www.weil-mclain.com

MADE IN THE
USA

Cast Iron Sections

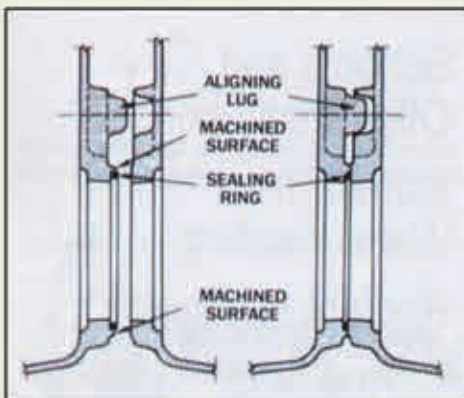
LGB sections are made of durable cast iron for long life. It's not uncommon for Weil-McLain cast iron boilers to last 35 years or more.

Sections are not face ground; the tough outer skin is retained to protect against corrosion.

The sections are studded with heat pins that cause the hot gases to swirl about, scrubbing the entire surface for greater heat transfer and maximum operating efficiency.

Sealing Rope

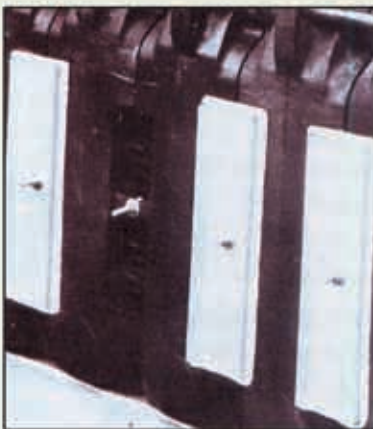
Sealing rope between the sections assures a permanent, gastight seal. When installed, the rope is visible between sections so the boiler can be checked for tightness. Sealing rope - a standard feature of Weil-McLain commercial boilers - allows for expansion and contraction of the sections, is impervious to heat and moisture, will not crack and will last the life of the boiler.



Section Seal

Modern elastomer sealing rings in the port openings assure a watertight seal. Because of the elasticity of the seals (unlike metal push nipples), they fill any gap caused by imperfections in the port openings, misalignment of sections or expansion and contraction.

Combined with short draw rods, sealing rings also permit faster section assembly. Lugs and sockets assure proper section alignment during assembly; the machined surfaces of the port openings control the compression ratio of the rings.



Rear Cleaning

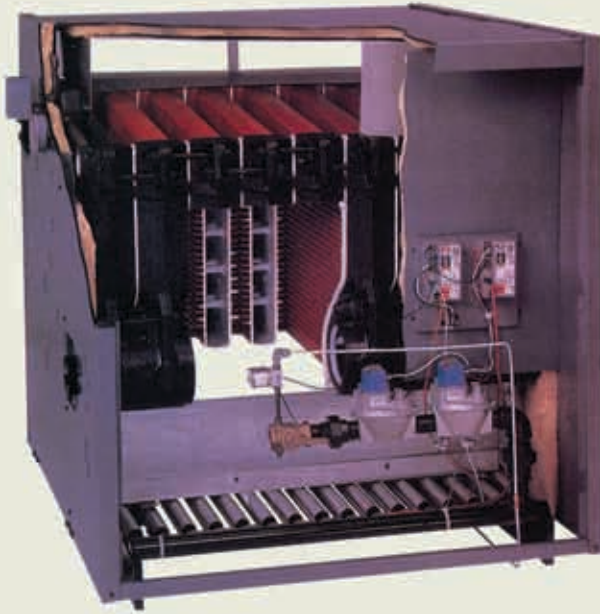
Removing the rear jacket panel and steel cleanout plates expose the flue passages for inspection and cleaning.



Factory-Assembled Base and Burners

The insulated, galvanized steel base houses the gas manifold and one-piece, high temperature aluminized steel burners. These burners feature efficient performance, excellent flame characteristics, and quiet ignition and extinction. Burners provide fixed primary air - no adjustment required for approved gases.

One burner/base assembly and one gas train are furnished for the LGB-4 through 12 and two each for the LGB-13 through 23.



Features...Advantages...Benefits

- 81% Operating efficiency saves energy. The LGB is the highest efficiency cast iron atmospheric gas boiler available. Exceeds efficiency requirements of ASHRAE 90.1.
- Cast iron sections for corrosion resistance and long life.
- Compact design saves valuable space... only 50-3/8" high, allowing more headroom for piping and venting.
- Patented section sealing method, short draw rods and sealing rope speed section assembly to reduce installation time.
- Extra-large 9" top port opening forms an internal header for better water circulation. Large steaming area assures rapid generation of dry steam.
- AGA design certified for natural and propane gas. Ratings approved by The Hydronics Institute Division of GAMA (I=B=R) for natural and propane gas.
- Factory-assembled gas train located within the boiler jacket. (Except for all IRI boilers and LGB-21 through 23 boilers with CSD-1/FM.) All LGB-6 through 23 boilers are capable of low-high-low or staged firing with an additional operating limit control.
- Factory-assembled base and burners reduce installation time.
- Simplified piping. The largest LGB steam boiler requires only two risers.
- Built-in air separator in water boilers. Air is diverted to the expansion tank through a 1" tapping next to supply outlet.
- Steel jackets with durable powdercoat finish in Weil-McLain blue... completely insulated... designed for fast installation.
- 10 Year Limited Warranty. Covers cast iron sections.



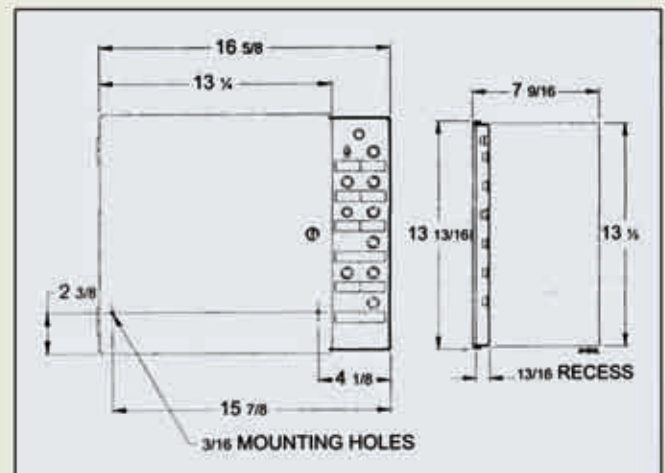
Description of Major Components	LGB 4-5 A.G.A. & FM	LGB 6-12 A.G.A. & FM	LGB 13-20 A.G.A. & FM	LGB 21-23 A.G.A.	LGB 5 CSD-1	LGB 6-12 CSD-1	LGB 13-20 CSD-1	LGB 21-23 CSD-1 & FM	LGB 5-12 IRI	LGB 13-23 IRI
Manual Main Shutoff Valve	-	1	2	2	-	1	2	1	1	1
Diaphragm Gas Valve w/Reg. & Pilot Takeoff	1	-	-	-	1	-	-	-	-	-
Diaphragm Gas Valve	-	1	2	2	-	1	2	-	-	-
Diaphragm Gas Valve - 2 Stage w/Regulator	-	1	2	2	-	1	2	1	1	1
Motorized Gas Valve w/Actuator (On/Off)	-	-	-	-	-	-	-	2	2	2
Low Gas Pressure Switch	-	-	-	-	-	-	-	1	1	1
High Gas Pressure Switch	-	-	-	2	-	-	-	1	1	1
Normally Open Solenoid Vent Valve	-	-	-	-	-	-	-	-	1	1
Manual Leak Checking Gas Valve	-	-	-	-	1	1	1	1	1	1
Leak Test Cock	-	-	-	-	2	2	4	3	1	1
Pilot Shutoff Cock	-	1	2	2	1	1	2	2	1	2
Pilot Solenoid Valve	-	1	2	2	1	1	2	2	1	2
Pilot Regulator	-	-	-	-	1	1	2	2	1	2
UCS Control Module	1	-	-	-	-	-	-	-	-	-
Flame Guardian® Control System	-	1	2	2	-	-	-	-	-	-
CSD-1 Control Panel	-	-	-	-	1	1	2	-	-	-
WMBC-1A Control Panel	-	-	-	-	-	-	-	-	1	-
WMBC-2A Control Panel	-	-	-	-	-	-	-	1	-	1
Detailed Information	Page 5				Page 6				Page 7	

Optional WFFP Control Panel for Standard (A.G.A.) and CSD-1 Systems for LGB 6-23



Panel Features

- Main flame failure lockout.
- 4 indicator lamps: call for heat, pilot proven, main flame proven, and flame failure (8 lamps on WFFP-2 panel).
- Isolated alarm contact to indicate flame failure.
- Power-on switch, fuse(s), and terminal strip.
- Optional flame failure alarm bell.



Standard Combustion Control Systems

Standard (A.G.A.) and FM Control Systems of LGB 4-5

Universal Control System Features:

One Weil-McLain UCS ignition control module and wire harness are furnished as standard equipment with each base assembly.

On a call for heat, the UCS produces a spark to ignite the pilot. When the pilot flame is proven, the main gas valve opens with a built-in, slow opening soft ignition.

In the event the pilot is not proven during a timed trial for ignition, the UCS control system will provide 100% shutoff. After a timed 5-minute delay, another ignition sequence will automatically be initiated.

The control system has been certified by A.G.A. and all components are UL Listed.

Factory-Assembled Gas Train:

The gas train allows for fast and easy installation. A slow-opening, soft ignition, high capacity, combination gas valve is used on the LGB 4-5 boilers.



Standard (A.G.A.) Control Systems for LGB 6-23 and FM Control Systems for LGB 6-20

WFG Flame Guardian® Control System Features:

A pre-wired WFG control system consisting of a mounting plate, two Weil-McLain UCS control modules and terminal block are furnished as standard equipment with each base assembly.

On a call for heat, the pilot proving control module provides a spark to ignite the pilot. When the pilot flame is proven, the first stage of the two-stage gas valve opens and all burners light on low fire. When the main flame sensor proves carryover, the second stage of the gas valve opens and the burners go to high fire.

In the event the pilot or main flame is not proven during a timed trial for ignition, the WFG control system will provide 100% shutoff. After a timed 5-minute delay, another ignition sequence will automatically be initiated. The control system provides multiple ignition trials.

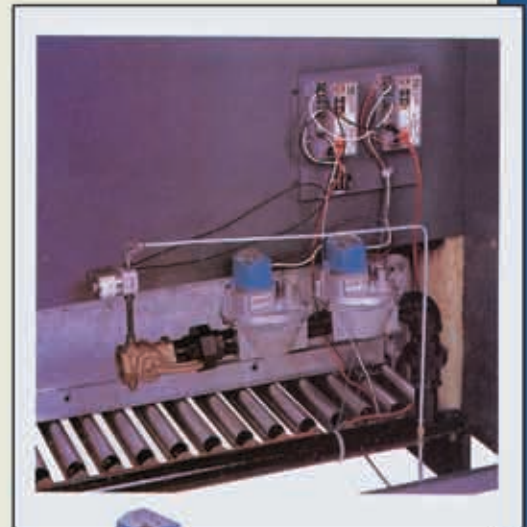
The control system has been design certified by A.G.A. and all components are UL Listed.

Low-High-Low Firing:

LGB 6-23 boilers can provide low-high-low firing with the addition of a water temperature or steam pressure control.

Factory-Assembled Gas Train:

The gas train allows for fast and easy installation. A dual gas valve train has an on/off diaphragm valve and a low-high-low regulated gas valve.



Additional Combustion Control Systems

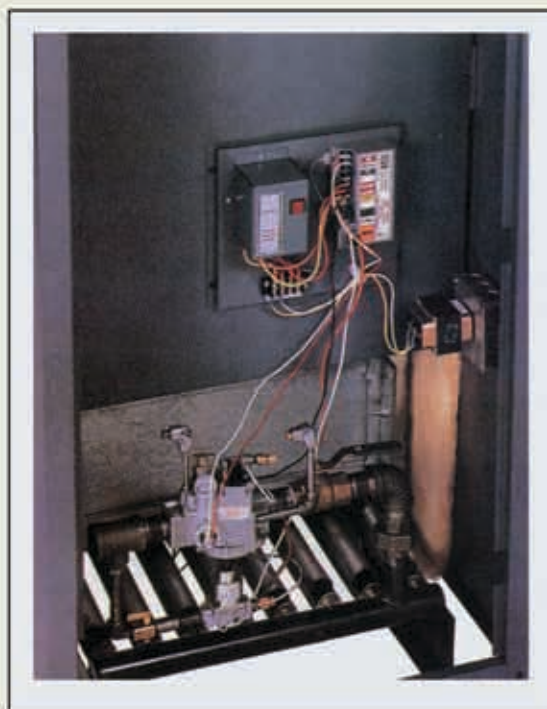
CSD-1 Systems for LGB 5

Control System Features

A pre-wired control panel with one ignition control module, a manual reset relay with indicator light and a terminal block are furnished as standard equipment with each base assembly.

On a call for heat, the control module produces a spark to ignite the pilot. When the pilot flame is proven, the combination gas valve opens with a built-in, slow opening soft ignition.

Upon two consecutive pilot flame failures, the control module will trip the manual reset relay and illuminate the red lockout light. The lockout condition(s) should be corrected before pressing the red reset button to reset the boiler. The control system has been certified by A.G.A. and all components are UL Listed.



CSD-1 Systems for LGB 6-20

Control System Features

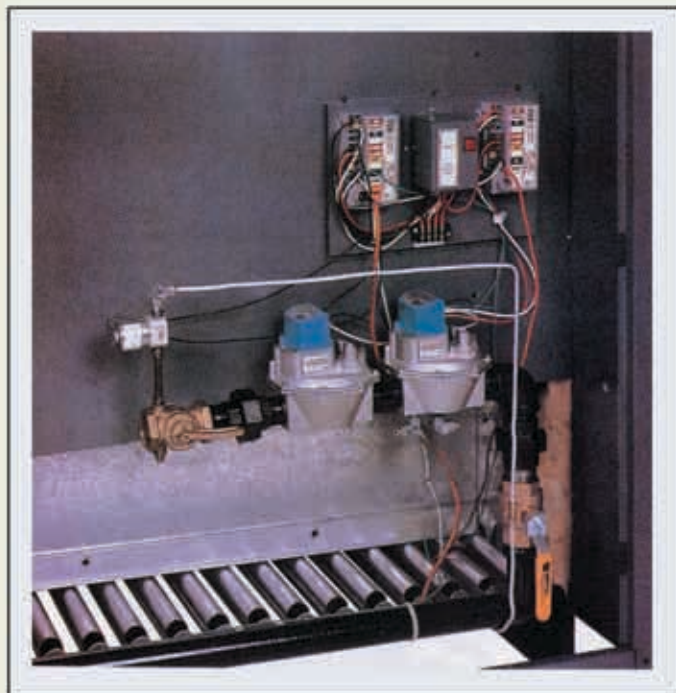
A pre-wired control panel with one pilot-proving module, one main flame proving module, a manual reset relay with indicator light and a terminal block are furnished as standard equipment with each LGB 6-12 boilers. For LGB 13-20, two pre-wired control panels are provided, one for each base.

On a call for heat, the pilot proving control module produces a spark to ignite the pilot. When the pilot flame is proven the first stage of the two-stage gas valve opens. All burners light on low fire. When the main flame sensor proves carryover, the second stage of the gas valve opens and the burners go to high fire.

Upon two consecutive pilot flame failures or on failure to sense main flame, the control module will trip the manual reset relay and illuminate the red lockout light. The lockout condition(s) should be corrected before pressing the red reset button to reset the boiler.

For LGB 13-20, the control systems for each base will operate independently of each other.

The control system has been certified by A.G.A. and all components are UL Listed.



CSD-1 & FM Control Systems for LGB 21-23 and IRI Control Systems for LGB 5-23

Control System Features:

A pre-wired WMBC control panel is furnished as standard equipment. The gas train is located outside the boiler jacket.

On a call for heat, the pilot control circuit produces a spark and opens the pilot solenoid allowing the pilot to ignite. For LGB 13-23, the universal ignition control then produces a spark to ignite the pilot on the second base. After the pilot(s) has been proven, the flame safeguard control energizes the main flame circuit allowing the main burners to ignite at low fire. The main pilot is the de-energized and the main flame sensor proves the main burner operation at low fire. For LGB 13-23, the pilot on the second base continues to burn during the boiler "on" cycle. The flame safeguard control then energizes the downstream gas valve allowing the boiler to fire at high fire.

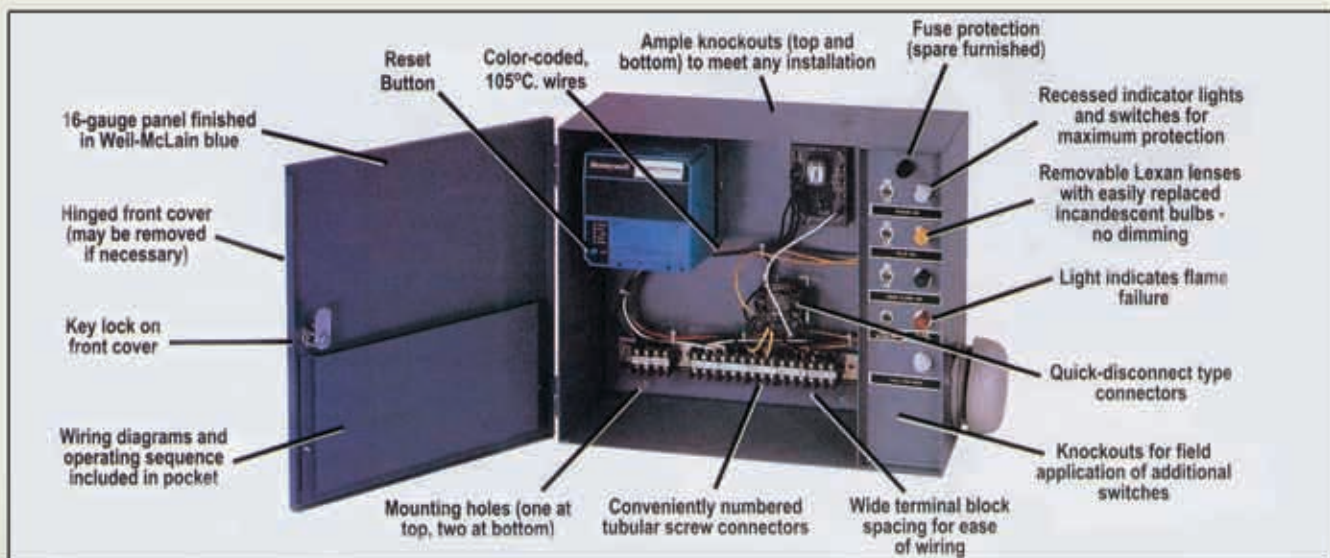
If the pilot or main flame are not proven during the start-up sequence, then the flame safeguard control will lockout on safety. A red indicator light and alarm bell will energize. The lockout condition(s) should be corrected. Then press red reset button on flame safeguard to reset control and start automatic 5-minute delay. The control system will permit a normal start-up.

The control system has been certified by A.G.A. and all components are UL Listed.

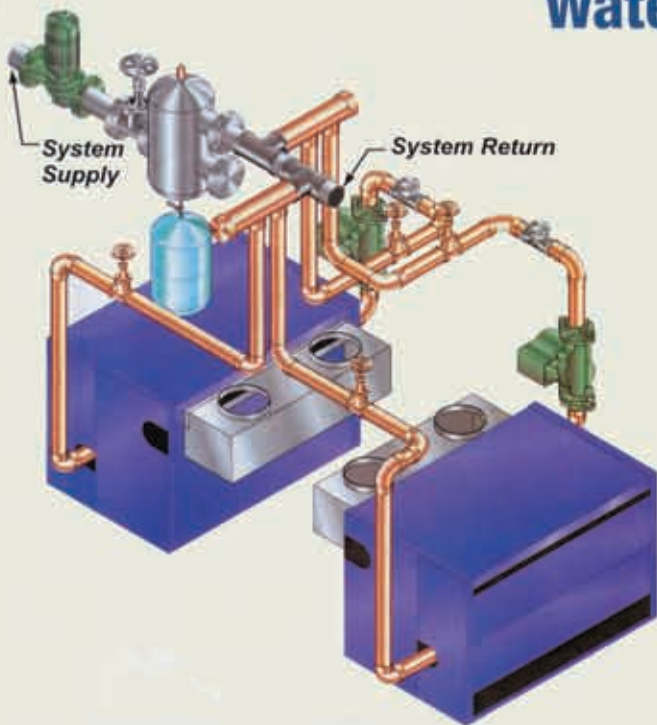


WMBC Control Panel Features:

- Proven main flame with interrupted pilot for main base; pilot is extinguished after 10-second trial for ignition. For two-base boilers, the second base has an intermittent pilot; the pilot on second base continues to burn during boiler "on" cycle.
- Pre-purge timer to provide 5-minute enforced wait after flame failure.
- Flame failure alarm bell.
- Five indicator lamps: power on, call for heat, pilot on, main flame on, and flame failure.
- High-low fire control terminals. Low-high-low fire may be provided with a water temperature or steam pressure control.
- Flame safeguard primary control.
- Power-on switch, pilot-on switch, main-flame-on switch, alarm silencer switch, fuse and terminal strip.



Water Boilers-Recommended Piping



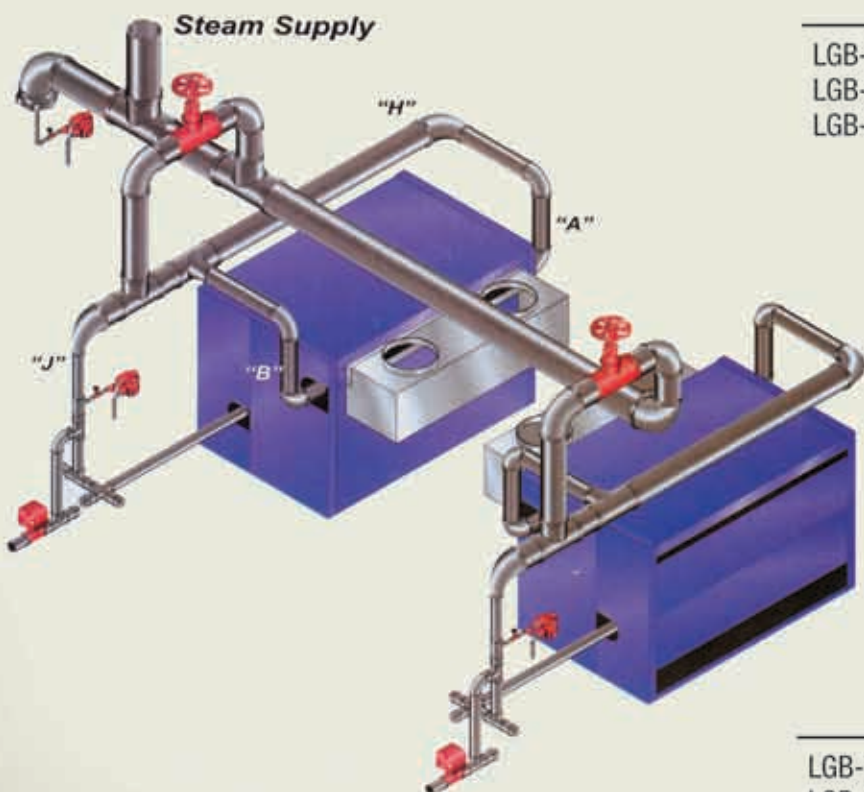
Piping Notes:

- Alternate Piping - for LGB-4 through 12 only:
If desired, all three piping connections (supply, return and expansion tank) can be taken off same end of boiler.
- Supply and return sizes in table below for water boilers refer to minimum size of pipe connected to boiler for 20° or higher temperature drop between supply and return.

Recommended Minimum Pipe Sizes
(20° Rise Through Boiler)

Boiler Model	Pipe Size Supply and Return
LGB-4	2"
LGB-5	2-1/2"
LGB-6 through 8	3"
LGB-9 through 16	4"
LGB-17 through 23	5"

Steam Boilers



Recommended Minimum Pipe Sizes
For Single Risers

Boiler Model	Riser A	Header H	Equalizer J
LGB-4 through 8	4"	4"	2"
LGB-9 through 11	5"	5"	2-1/2"
LGB-12	6"	6"	2-1/2"



Recommended Minimum Pipe Sizes
For Dual Risers

Boiler Model	Riser A	Riser B	Header H	Equalizer J
LGB-13 through 15	4"	4"	6"	2"
LGB-16 through 19	5"	5"	6"	2-1/2"
LGB-20 through 23	6"	6"	8"	2-1/2"

Standard, Additional and Optional Equipment

Standard Equipment, All units:

Cast Iron Sections
Insulated Extended Jacket
Aluminized Steel Collector Hood(s)
And Draft Hood(s)
Control Transformer (120/24v)
Factory-Assembled Burner And Base Unit(s)
One-Piece Aluminized Steel Burners
Gas Manifold
Aluminized Steel Base Panels
Hi-Temp Insulated Board
Wiring Harness: Junction Box And
Pre-Wired Flexible Conduit

Standard Equipment, LGB-4 And 5:

Intermittent Electronic Ignition System (UCS):
Intermittent Ignition Control Module
Electronically Supervised Pilot Burner
With Ignition Electrode And Flame Rod
Wire Harness

Standard Equipment, LGB-6 Thru 23:

Flame Guardian® Panel With Flame
Rectification Electronic Control System For
Each Base Assembly
Pre-Wired Control Panel
Terminal Block
Two Ignition Control Modules Having
Integral Spark Generators
Intermittent Electronic Ignition Pilot System
Electronically Supervised Pilot Burner
With Ignition Electrode And Flame Rod
Main Flame Sensor Rod

Standard Equipment, Water Boilers:

Combination Operating And High Limit
Temperature Control (LGB-4 Thru 20 Only)
Operating Temperature Control (LGB-21 Thru 23 Only)
High Limit Temperature Control (LGB-21 Thru 23 Only)
Combination Pressure Temperature Gauge
30 PSI ASME Relief Valve-Side Outlet
Built-In Air Eliminator In End Sections
Probe -Type Low Water Cutoff, PS-851-120 (Packaged Only)

Standard Equipment, Steam Boilers:

Operating Pressure Control
High Limit Pressure Control
Compound Pressure-Vacuum Gauge
Gauge Cocks, Glass And Guards
15 PSI ASME Relief Valve-Side Outlet
Float-Type Low Water Cutoff, MM No. 61 LWCO

Additional Equipment:

WFFP Control Panels (LGB-6 Thru 23)
WMBC Control Panels (LGB-5 Thru 23)
Probe -Type Low Water Cutoff, PS-851-120
(Non-Packaged Water Only)
Factory-Assembled Sections (LGB-4 Thru 14 Only)
Fire-Tested Packaged Unit (LGB-4 Thru 14 Only)
1-1/2" Inspection Tappings With Brass Plugs-
Two For Each Section
80 PSI Working Pressure Test Of Sections
Water Level Controls And Low Water Cutoffs
Low-High-Low Firing (LGB-6 Thru 12 Only)
Stage Firing (LGB-13 Thru 23 Only)
Energy Management Control Systems (BCP Panels)
IRI, FM And CSD-1 Control Systems
Natural Gas To Propane Gas Conversion Kit
W-M and PLUS Indirect-Fired
Water Heaters
W-M Maxiflo® Pool Heaters
W-M Brazed Plate Heat Exchangers

WFFP Control Panel Equipment:

Standard:

WFFP-1 Panel (LGB-6 Thru 12)
WFFP-2 Panel (LGB-13 Thru 23)
30-second Time Delay Relay (two on WFFP-2)
Two 24-volt DPDT relays (four on WFFP-2)
Terminal Block
Fuse (two on WFFP-2)
Toggle Switch
Four Indicator Lamps (eight on WFFP-2)

Additional:

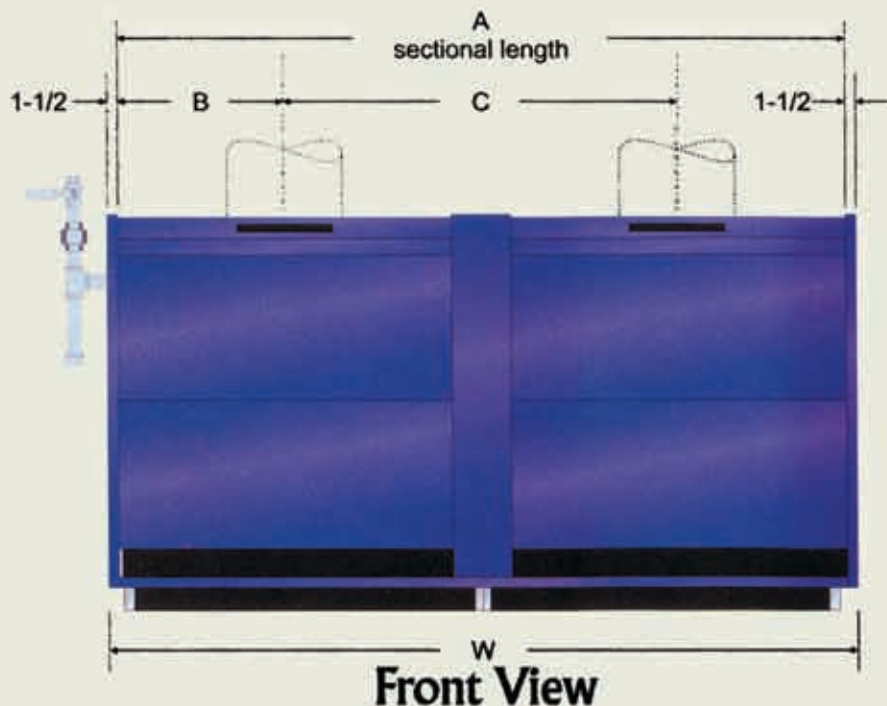
Alarm Bell and Transformer for Remote Indication of Flame Failure
Alarm Bell — Panel-Mounted

WMBC Control Panel Equipment:

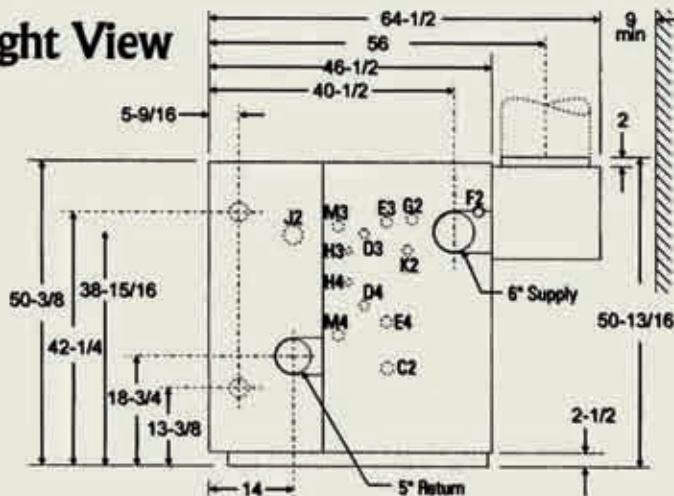
Standard:

WMBC-1A Panel (LGB-5 Thru 12)
WMBC-2A Panel (LGB-13 Thru 23)
Motorized Gas Train
Interruptible Pilot (Intermittent Pilot for
Adjacent Base and Additional Control Module)
Pre-Wired Control Panel:
Flame Safeguard Primary Control
Pre-purge Control Timer
Relay(s)
Terminal Block
Fuse (two on WMBC-2A)
Four Toggle Switches
Five Indicator Lamps
Alarm Bell





Right View



Control Tapping Table

Location		Size	Steam	Water (Note 4)
Left End	Right End			
C1	C2	1-1/4"	Boiler Drain	Boiler Drain
D1 & D2	D3 & D4	1/2"	Gauge Glass (Note 3)	—
E1 & E2	E3 & E4	1"	Low Water Cutoff (Note 3)	Optional Low Water Cutoff
E1	E3	1"	Pressure Operating & Limit Controls & Pressure Gauge	Limit Control (Note 2)
F1	F2	1"	—	To Expansion Tank or Automatic Air Vent (Note 2)
G1	G2	3/4"	—	Operating Control (Note 2)
H1 & H2 (Note 1)	H3 & H4 (Note 1)	3/8"	Tri-cock	—
J1	J2	2"	Steam Relief Valve & Skim Tapping	Water Relief Valve and Skim Tapping
K1	K2	1/2"	—	Combination Pressure & Temperature Gauge (Note 2)
M1 & M2	M3 & M4	1"	Optional Low Water Cutoff (Note 3)	Optional Low Water Cutoff
M1	M3	1"	Firing Rate Control (when used)	Firing Rate Control (When Used) or Probe Low Water Cutoff

NOTES:

1. Available on special request only.
2. Must be on same side as supply to system.
3. Must be on same side as steam equalizer piping.
4. Additional controls for water boilers may be placed in supply piping.

Boiler Model	No. of Gas Trains	Standard A.G.A.		No. of Gas Trains	CSD-1 & FM		No. of Gas Trains	IRI	
		5" W.C.	7" W.C.		5" W.C.	7" W.C.		5.5" W.C.	7" W.C.
LGB-4	1	1"	1"	-	-	-	-	-	-
LGB-5	1	1"	1"	1	1"	1"	1	1-1/4"	1"
LGB-6	1	1-1/4"	1"	1	1-1/4"	1"	1	1-1/4"	1"
LGB-7	1	1-1/4"	1"	1	1-1/4"	1"	1	1-1/4"	1"
LGB-8	1	1-1/4"	1"	1	1-1/4"	1"	1	1-1/2"	1-1/4"
LGB-9	1	1-1/4"	1"	1	1-1/4"	1"	1	2"	1-1/4"
LGB-10	1	1-1/2"	1-1/4"	1	1-1/2"	1-1/4"	1	2"	1-1/4"
LGB-11	1	2"	1-1/4"	1	2"	1-1/4"	1	2"	1-1/2"
LGB-12	1	2"	1-1/4"	1	2"	1-1/4"	1	2"	1-1/2"
LGB-13	2	1-1/4"	1"	2	1-1/4"	1"	1	2"	1-1/2"
LGB-14	2	1-1/4"	1"	2	1-1/4"	1"	1	2"	1-1/2"
LGB-15	2	1-1/4"	1"	2	1-1/4"	1"	1	2"	1-1/2"
LGB-16	2	1-1/4"	1"	2	1-1/4"	1"	1	2"	1-1/2"
LGB-17	2	1-1/4"	1"	2	1-1/4"	1"	1	2"	1-1/2"
LGB-18	2	1-1/2" / 1-1/4"	1-1/4" / 1"	2	1-1/2" / 1-1/4"	1-1/4" / 1"	1	2-1/2"	1-1/2"
LGB-19	2	1-1/2"	1-1/4"	2	1-1/2"	1-1/4"	1	2-1/2"	2"
LGB-20	2	1-1/2" / 2"	1-1/4"	2	1-1/2" / 2"	2"	1	2-1/2"	2"
LGB-21	2	2"	1-1/4"	1	3"	2"	1	3"	2"
LGB-22	2	2"	1-1/4"	1	3"	2"	1	3"	2"
LGB-23	2	2"	1-1/4"	1	3"	2"	1	3"	2"

NOTES: 1. Rated pressure for LGB 21-23 CSD-1 & FM is 5.5" W.C.

Model (Note 1)	A.G.A. Input MBH (2)	A.G.A. Gross Output MBH (2)	Net I=B=R Ratings (3)			Boiler Water Content Gallons				
			Steam MBH (2)	Steam Sq. Ft.	Water MBH (2)	Boiler H.P.	Steam (to Waterline)	Water	Approx. Shipping Weight (Lbs)	Vent Breeching Inches I.D. Chimney Diameter or Equivalent (4)
LGB-4	400	324	243	1,013	282	9.7	23.2	36.5	1,185	10
LGB-5	520	421	316	1,317	366	12.6	28.9	45.6	1,455	12
LGB-6	650	527	395	1,645	458	15.7	34.6	54.7	1,725	12
LGB-7	780	632	474	1,975	549	18.9	40.3	63.9	2,005	12
LGB-8	910	737	553	2,304	641	22	46.0	73.0	2,290	14
LGB-9	1,040	842	632	2,633	733	25.2	51.9	82.1	2,560	14
LGB-10	1,170	948	711	2,965	824	28.3	57.6	91.2	2,800	16
LGB-11	1,300	1,053	790	3,292	916	31.5	63.4	100.4	3,105	16
LGB-12	1,430	1,158	869	3,621	1,007	34.6	69.1	109.5	3,365	16
LGB-13	1,560	1,264	949	3,954	1,099	37.8	74.9	118.6	3,785	16
LGB-14	1,690	1,369	1,035	4,313	1,190	40.9	80.7	127.7	4,085	16
LGB-15	1,820	1,474	1,123	4,679	1,282	44	86.4	136.9	4,355	16
LGB-16	1,950	1,580	1,211	5,046	1,373	47.2	92.2	146.0	4,725	17
LGB-17	2,080	1,685	1,298	5,408	1,465	50.3	98.0	155.1	4,975	17
LGB-18	2,210	1,790	1,386	5,775	1,557	53.5	103.6	164.2	5,270	18
LGB-19	2,340	1,895	1,470	6,125	1,648	56.6	109.5	173.4	5,540	18
LGB-20	2,470	2,001	1,553	6,471	1,740	59.8	115.3	182.5	5,820	19
LGB-21	2,600	2,106	1,635	6,813	1,831	62.9	121.0	191.6	6,080	19
LGB-22	2,730	2,211	1,717	7,155	1,923	66.1	126.8	201.2	6,365	19
LGB-23	2,860	2,317	1,799	7,496	2,014	69.2	132.5	209.8	6,625	20

Notes:

(1) Add to boiler model "-S" for Steam, "-W" for Water.

For LGB 4-14 only: add prefix "A-" to designator for factory-assembled sections (example: A-LGB-4). Add prefix "P-" to designator for fire-tested packaged unit (example: P-LGB-4). Note: IRI gas trains for LGB 5-14 are removed for shipping.

(2) MBH refers to thousands of Btu per hour.

(3) Net I=B=R ratings are based on net installed radiation of sufficient quantity for the requirement of the building and nothing need be added for normal piping and pick-up. Water ratings are based on a piping and pick-up allowance of 115. Steam ratings based on the following allowances: LGB 4 - 12 - 133; LGB-13 - 1332; LGB-14 - 1322; LGB-15 - 1312; LGB-16 - 1304; LGB-17 - 1297; LGB-18 - 1292; LGB-19 - 1289; LGB 20-23 - 1288. An additional allowance should be made for gravity hot water systems or unusual piping and pick-up loads. Ratings shown are for elevations up to 2,000 feet. For elevations above 2,000 feet, reduce ratings at the rate of 4% for each 1,000 feet above sea level.

(4) 20' chimney height may be used based on using a 6' length of connector for breeching of the size shown from the nearest draft hood outlet to the chimney or vent with not more than one standard sloping-type 90° elbow. If individual vertical vents are to be used, each vent diameter should be the same size as the respective draft hood outlet and the height may be reduced to 5 ft. measured above the draft hood outlet.

NOTE: Water boilers tested at 80 psi working pressure.

In the interest of continual improvements in product and performance, Weil-McLain reserves the right to change specifications without notice.

