

To the Installer:

Please attach these instructions next to the water heater.

To the Consumer:

Please read these and all component instructions and keep for future reference.



Power Gas Instruction Manual

Warranty, Registration Card and Parts List are included.
Homeowner: Please remember to return the Registration Card!

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause serious injury or property damage. Refer to this manual. For assistance or additional information, consult a qualified installer or service agency.

WARNING

If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury or death.

WARNING

Do not install on combustible flooring. Install in accordance with all local codes. In the absence of local codes, refer to NFPA 54.

CAUTION

The recommended temperature for normal residential use is 120°F. The dial on the aquastat does not always reflect the out-coming water temperature and it could occasionally exceed 120°F. Variation in out-coming temperature could be based on factors including but not limited to usage patterns and type of installation. Test water at the tap nearest to the water heater. (See page 8 for measuring the out-coming water temperature.)

WARNING

Hotter water increases the risk of scald injury. Before adjusting the water temperature setting, read this instruction manual. Temperatures at which injury occurs vary with the person's age and the length of exposure. The slower reaction time of children, elderly or physically or mentally challenged persons increases the scalding hazard to them. It is recommended that lower water temperatures be used where these exposure hazards exist. Households with small children or invalids may require a temperature setting less than 120°F to prevent accidental contact with hot water. **To produce less than 120°F, use point-of-use temperature limiting devices.**

If higher water temperature is needed in part of the water system, automatic temperature limiting devices must be used on all lines to water taps.

WARNING

Flammable vapors may be drawn to this water heater from other areas of the structure by air currents. Do not store or use any flammable liquids in the vicinity of this heater.

WARNING

Water heater blankets may restrict air flow to the water heater and cause fire, asphyxiation, personal injury or death.

THIS MANUAL HAS BEEN PREPARED TO ACQUAINT YOU WITH THE INSTALLATION, OPERATION, AND MAINTENANCE OF YOUR WATER HEATER AND TO PROVIDE IMPORTANT SAFETY INFORMATION.

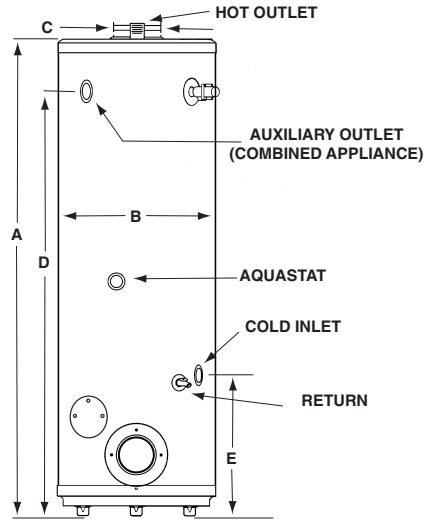
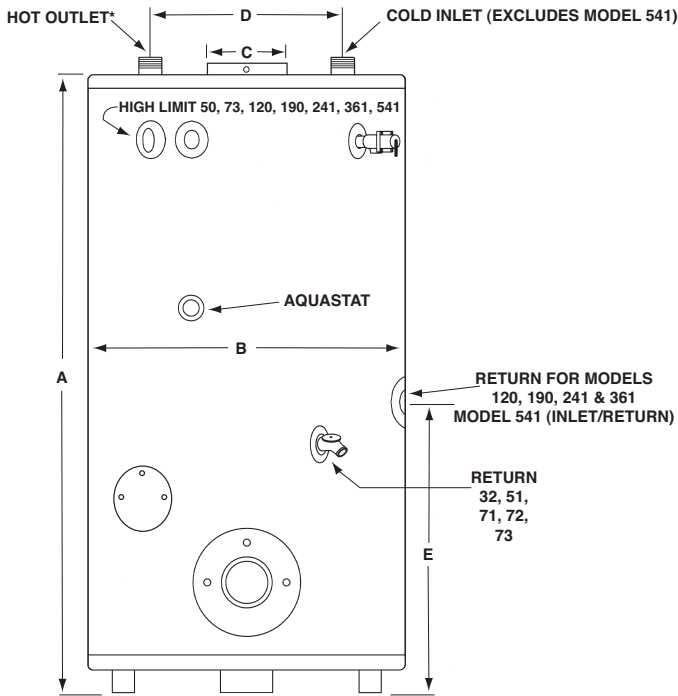
Read all instructions thoroughly before attempting installation or operation of your water heater. Keep these instructions for future reference.

Local plumbing and electrical codes must be followed in the installation of this water heater. In the absence of a local code use the UNIFORM PLUMBING CODE and the NFPA Code. Local codes may supersede instructions in this installation manual.

These instructions are a guide for the correct installation of the water heater. The manufacturer will not be liable for damages caused by failure to comply with the installation and operating instructions outlined on the following pages.

If you lack the necessary skills required or have difficulty following the directions, seek help from a qualified person for that part of the installation you do not understand.

FAILURE TO FOLLOW THESE INSTRUCTIONS OR ALL APPLICABLE BUILDING CODES AND REGULATIONS VOIDS THE WARRANTY ON THIS WATER HEATER.



*nipples not supplied on all models

32, 50, 51, 71, 72, 73, 120, 190, 241, 361, 541 PG

33, 40 PG

BOCK[®]
WATER HEATERS

POWER GAS

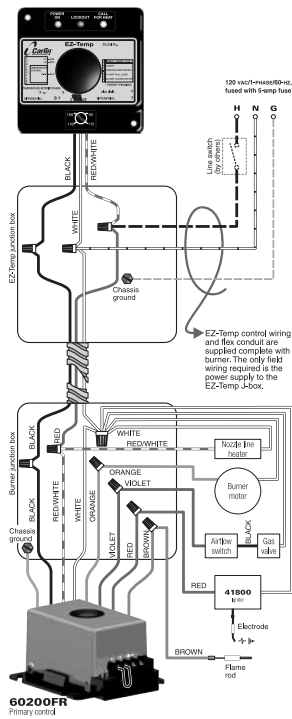
Instruction Manual

	Storage Capacity (gal.)	BTUH (Thousands)	Minimum Gas Connection	Cold Inlet	Hot Outlet	Return	Temperature Rise (F)	Recovery (GPH)	Dimensions					Voltage (V/Hz)	Weight (lbs.) (Non ASME) (inc. burner and controls)
									A	B	C	D	E		
32 PG	32	104	1/2	3/4"	3/4"	3/4"	90°	110	51"	20"	6"	11"	17"	120/60	260
33 PG	33	104	1/2	3/4"	3/4"	3/4"	90°	109	43 1/4"	24"	6"	N/A	17 1/4"	120/60	270
40 PG	40	126	1/2	3/4"	3/4"	1"	90°	134	61"	20"	6"	54"	18"	120/60	295
50 ESPG	50	140	1/2	1"	1 1/2"	1 1/2"	90°	142	52"	26"	6"	13 1/2"	18 1/2"	120/60	345
51 PG	50	152	1/2	1"	1"	3/4"	90°	159	59"	24"	6"	11"	18"	120/60	330
71 PG	68	173	1/2	1"	1 1/2"	1 1/2"	90°	170	66"	26"	6"	13 1/2"	22"	120/60	395
72 PG	67	199	1/2	1"	1 1/2"	1 1/2"	90°	204	58"	28"	8"	16"	19"	120/60	560
73 PG	67	242	3/4	1"	1 1/2"	1 1/2"	90°	247	58"	28"	8"	16"	19"	120/60	560
120 PG	113	155	1/2	1"	2"	2"	90°	160	67"	31 1/2"	6"	19"	22"	120/60	700
190 PG	113	190	1/2	1"	2"	2"	90°	191	67"	31 1/2"	6"	19"	22"	120/60	700
241 PG	109	277	3/4	1"	2"	2"	90°	283	67"	31 1/2"	8"	19"	22"	120/60	935
361 PG	91	385	3/4	1"	2"	2"	90°	435	67"	31 1/2"	9"	23"	26"	120/60	1110
541 PG	83	623	1"	2"	2"	2"	90°	627	66"	34"	10"	N/A	30 1/2"	120/60	1350

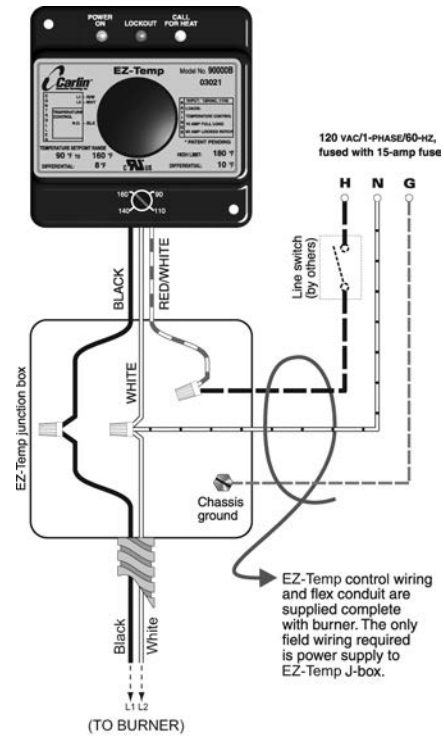
WHEN YOU RECEIVE YOUR NEW WATER HEATER

Check the new equipment to see if all components are in good condition. The water heater and burner may be shipped as separate units. The aquastat and immersion well are packed with the burner. If damage is observed or parts appear to be missing, contact your wholesaler. A burner installation and setup manual is also packed with the burner.

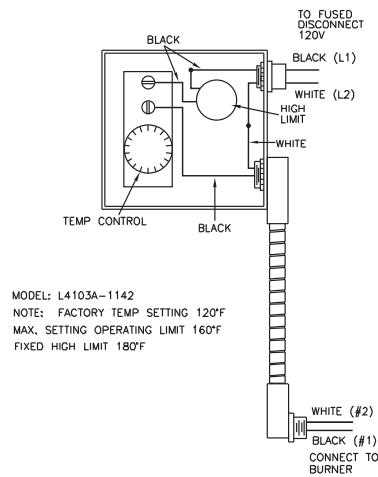
BURNER WIRE DIAGRAM



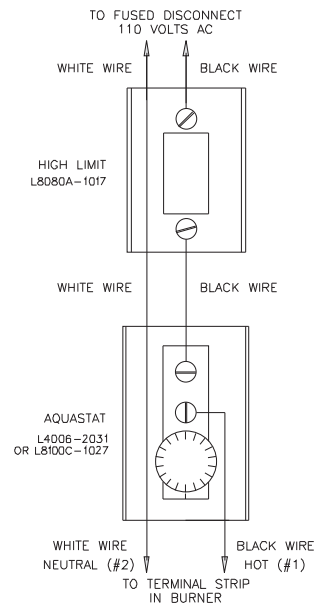
Carlin burner w/ Carlin EZ-Temp
Models 32, 33, 40, 50, 51, 71, 72, 73, 120, 190PG



Midco burner w/ Carlin EZ-Temp (all models)
Power Flame burner w/ Carlin EZ-Temp (only 541 PG)



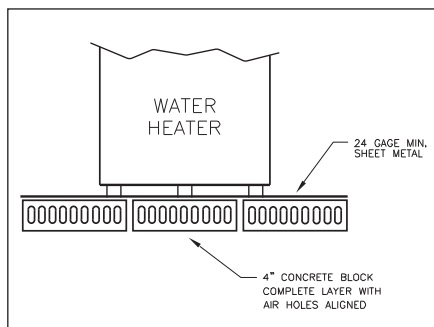
Honeywell 4103A-1142
Models 32,33,40,51,71,72PG



Honeywell L4006-2031, L8100C-1027
Models 50,73,120,190,241,361,541PG

WATER HEATER PLACEMENT

NOTE: Locate the heater so it is not subject to physical damage from moving vehicles or flooding. Do not locate the water heater in a room where swimming pool chemicals or large quantities of water softener salt are kept. Installing a water heater in this environment will result in premature failure of tank and burner components due to corrosion caused by these elements diffusing into the air.



DO NOT INSTALL THE WATER HEATER ON COMBUSTIBLE FLOORING. Place on noncombustible flooring and maintain clearances prescribed by this manufacturer and per code NFPA 54. If the water heater must be located on combustible flooring it must be raised off the floor with a layer of 4" concrete block laid so the air holes are aligned as shown in the drawing at left. Consult with local code officials before using this method. Do not use on 541 PG.

Please consult local codes, NFPA 54 and/or contact Bock Water Heaters with questions concerning proper flooring materials. Leave adequate room for periodic maintenance of heater and burner. The water heater should be placed as near to the chimney as practical in order to keep vent connector length to a minimum. Consult National Fuel Gas Code for proper vent configuration.

Minimum clearance to combustible construction is: SIDES 6"; BACK 6"; FRONT 24"; BAROMETRIC DRAFT REGULATOR, 18". The installation of this water heater must conform with local codes and ordinances. In the absence of local codes, the installation must comply with the National Fire Protection Association (NFPA 54) Code.

COMBUSTION AND VENTILATION AIR

The water heater must be installed in a location with an adequate air supply for combustion, ventilation and draft control. Lack of an adequate air supply will result in poor burner/water heater performance and nuisance lock outs. Unsafe levels of carbon monoxide (CO), condensation and sooting may result if the room does not have an adequate air supply. See "National Fuel Gas Code (NFPA 54)" or the discussions of "Unconfined Space" and "Confined Space" below. Poor ventilation will also result in hot spots around the heater. Temperatures over 90° near the water heater generally indicate a lack of ventilation.

UNCONFINED SPACE

Unconfined space is defined by NFPA 54 as a space with a volume greater than 50 cubic feet (during typical use) per 1000 BTUH of the total combined input of all fuel burning appliances in the space. Rooms leading directly to the installation space through doors that cannot be closed can be considered part of the space. **Exception:** Buildings with full vapor barriers, tight doors and windows or air infiltration rates of less than 0.35 air changes per hour will be considered a confined space and require additional air supplies.

CONFINED SPACE

Confined space is defined by NFPA 54 as a space with a volume less than 50 cubic feet (during typical use) per 1000 BTUH of the total combined input of all fuel burning appliances in the space. Buildings or rooms of unusually tight construction are also considered a confined space. See "**Unconfined Space: Exception**".

When installing fuel burning appliances in a confined space, air must be supplied to that space from either inside or outside of the building as conditions allow.

A. Inside Air Supply: A confined space shall be provided with two permanent openings; one within 12 inches of the top and one within 12 inches of the bottom of the enclosure. These openings shall lead directly to room(s) of sufficient volume so that the combined volume of all the space meets the criteria for unconfined space. Each opening shall have a minimum free area of 1 square inch per 1000 Btu/hr of the combined total input of all fuel burning

appliances in the space. Each opening shall have an area of not less than 100 square inches or a minimum dimension of not less than 3 inches.

B. Outside Air Supply: Confined spaces shall be provided with two permanent openings; one within 12 inches of the top and one within 12 inches of the bottom of the enclosure. These openings shall communicate directly, or by ducts, with the outdoors or spaces that communicate with the outdoors.

- 1. Leading directly to the outside or through vertical ducts:** Each opening shall have a minimum free area of one square inch per 4000 Btu/hr of total input rating of all equipment in the enclosure.
- 2. Leading to outside through horizontal ducts:** Each opening shall have a minimum free area of one square inch per 2000 Btu/hr of total input rating of all equipment in the enclosure. **Note:** All ducts shall have the same cross sectional area as the free area of each opening to which they connect. The minimum dimensions of all ducts shall not be less than three inches. Powered combustion air supplies are also commercially available and may be used.

LOUVERS & GRILLES

In calculating the free area of an opening, consideration must be given to the blocking effects of louvers or grilles protecting the opening. Any screens used must be no finer than $\frac{1}{4}$ inch mesh. If the free area of a louver or grille is known, this should be used in calculating the size of opening required. If free area is unknown, it may be assumed that wood louvers will have 20 to 25% free area and metal louvers and grilles will have 60 to 75% free area. Louvers and grilles should be fixed in the open position or interlocked with the equipment so that they open automatically during equipment operation.

VENTING

The water heater shall be located as close to the chimney as practical. Long lateral runs will result in intermittent combustion problems and unsafe operating conditions. Total vent height should be a minimum of 6 feet. Shorter vent heights could result in unstable draft and nuisance lock outs.

The venting system should be sized according to National Fuel Gas Code: NFPA 54/ANSI Z223.1 (most recent edition) using the "Fan Min, Max" columns. If you do not have a copy of this code one can be obtained at www.NFPA.org for a nominal fee. Copies of the NFPA venting tables are also reprinted in the Bock Engineering Manual available from your Bock Representative or download from www.bockwaterheaters.com. **Note:** Do not reduce vent size more than one size smaller than the vent connector supplied with the heater. B vent, L vent or multi-fuel chimneys may be used. Single wall vent connectors may also be used.

When connecting to an existing vent system, examine the piping and system for condition. Replace any sections that show signs of significant corrosion or have become perforated. Also verify that the system is of the correct type and sized properly for the water heater and any other appliances that are connected to it. Correct any discrepancies found between the existing system and current NFPA 54 code.

Draft must be controlled with a barometric damper or draft regulator approved for gas appliances, normally supplied with each complete Bock Water Heater. *(This device differs from a vent/flue damper in that it precisely regulates the amount of room air entering the vent to control draft. A vent/flue damper shuts off the vent during stand by periods to reduce losses and has no effect of draft.)* The draft regulator may be installed in a tee on top of the water heater and must be adjusted while the water is running to regulate draft to a minimum of -0.02 inches water column (WC) and a maximum of -0.05 " WC. Draft over the fire should be slightly negative. Draft is normally adjusted by hanging washers (supplied with the draft regulator) on the draft regulator chain. Follow the instruction supplied with the draft regulator for proper location and draft adjustment procedures. **Note:** Failure to install the barometric damper or adjust draft properly will result in unsafe operating conditions and nuisance burner lock outs.

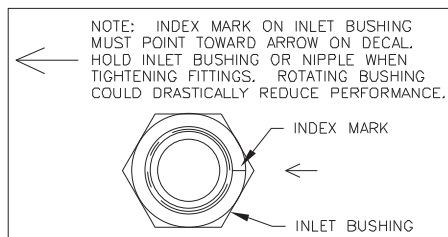
If draft of $-0.02''$ WC cannot be produced with an existing vent system, a draft inducer may be required. Installations common vented with large vent hood equipped appliances such as heating boilers may require vent dampers on the heating boiler connectors for proper vent operation during summer months.

Check the building for items that can cause severe negative pressure problems such as large exhaust fans. If these devices are installed in the same building check for their effect on draft and combustion. All fuel burning appliances must be isolated from the effects of these devices to operate properly. Failure to address this issue will result in unsafe operation and shorten appliance life spans.

Your Bock Water Heater may also be operated with a power venter. The power venter must be properly sized and adjusted to provide proper draft. Power venter wiring must turn on the power venter on a call for heat and must prove venter operation before allowing the burner to start. Refer to the power venter instructions for proper wiring and adjustment procedures.

CONNECT WATER PIPING

Connect cold inlet and hot outlet to fittings on top of water heater except models 33PG and 40PG. These models have cold water inlets located on the side of the tank. See drawing and note below. Be careful not to apply any heat to the water heater nipples. Install dielectric unions and shut off valves on both hot and cold water lines. Models 72PG through 541PG have larger fittings located on the side of the tank or under the drain valve for use as recirculation/return connections. Larger return fittings are optional on smaller models. Alternatively recirculation/return lines can be plumbed to the cold water inlet.



33PG and 40PG models are equipped with a brass inlet bushing installed in the tank. Heaters equipped with this bushing are marked next to the inlet by the decal shown on the left. The purpose of this bushing is to help keep the tank bottom free of sediment by aiding tank flushing. This bushing must be located as shown on the decal to function properly. Do not allow the bushing to rotate out of position when tightening the inlet fittings.

An approved pressure and temperature relief valve is factory installed in the opening provided in the upper right-hand side of the water heater. Pipe the T&P valve outlet to within 6" of the floor or to a floor drain with a free flowing drain pipe.

CAUTION: Scalding injury and/or water damage can occur from either the manual lifting of the lever or the normal operation of the T&P valve if it is not piped to a proper drain. If the valve fails to flow water or reseal, call your plumber.

Check incoming water line for backflow preventers or water pressure reducing valves, as these may cause pressure to build up in the water heater and result in tank failure. If this water heater is installed in a closed system or if backflow preventers and pressure regulators are installed, a properly sized expansion tank must be installed.

Note: Do not try to heat hard water as this will drastically reduce heater life. Install a water softener or other scale reducing water treatment system if the water heater is being installed in a hard water area (water hardness higher than seven grains).

BURNER AND AQUASTAT INSTALLATION

Remove the cardboard core from the burner opening in the water heater. Inspect the burner opening in the water heater and verify that the chamber is aligned with the burner opening and has not shifted in shipment. Also verify that the chamber and insulation has not been damaged in shipment. Some burner models are equipped with adjustable mounting flanges. When installing these burner models measure the distance from the inside bottom edge of the combustion chamber to the burner mounting bracket on the water heater jacket. Subtract $\frac{1}{8}''$ from this measurement and locate the burner mounting flange that distance from the end of

the burner tube. Secure the burner to the water heater with the bolts or nuts provided. When retrofitting an existing burner to your Bock Power Gas heater, check the chart on page 12 for proper settings and configuration. If the burner being installed is not on this list check with your Bock representative to verify the appropriate application before installing.

The aquastat, high limit (if applicable) and well(s) are packed with the burner. In most cases the wire harness will be pre-wired to the burner. If the harness is not wired to the burner refer to the wire diagrams on page 3. Coat the threads of the well(s) with a suitable pipe thread sealant and install the wells into the tank. Insert the sensing bulb(s) of the temperature control into the well verifying that the bulb is fully inserted into the well. Fasten the temperature control to the well.

CONNECT THE ELECTRICITY

Refer to the appropriate wire diagrams (page 3) and burner manual. All wiring must comply with applicable codes and ordinances. Connect the power supply to the aquastat. Power should run through a fused disconnect switch near the heater. See the burner manual for correct wire and fuse sizes. This switch may be screwed to the water heater jacket if desired. For Carlin EZ-Temp aquastats, attach the black (hot) wire to the red/white wire and the white (neutral) wire to the white wire inside the EZ-Temp junction box. The harness from the EZ-Temp to the burner will have three wires (red, black, white) for use with Carlin burners and two wires (black, white) for use with Midco burners.

CONNECT THE GAS LINE

A manual gas valve, a union, and a sediment trap should all be provided in front of the gas valve. All gas piping must conform to local codes and/or the National Fuel Gas Code; ANSI 223.1/NFPA 54 (Latest Edition). For LP installations refer to NFPA 58 (latest edition) for proper gas piping.

Supply piping should be sized according to the charts found in the National Fuel Gas Code for natural gas applications. Refer to NFPA 58 (latest edition) for pipe sizing recommendations for LP installations. Also refer to the burner installation manual for gas line sizing recommendations.

Note: When sizing the gas piping to the heater, make sure that the pressure at the valve is sufficient when all other appliances are operating. Be sure that the gas service and meter are sized properly. Undersized gas piping will reduce water heater performance and life as well as result in nuisance lock outs.

Gas piping should be carried oversize, i.e.: $\frac{3}{4}$ inch or 1 inch for $\frac{1}{2}$ inch valve to within 2 feet of the valve itself. This sustains pressure at the valve during start-up to prevent flashbacks caused by momentary pressure loss. For Carlin burners with natural gas or LP, 5" WC pressure must be maintained upstream of the gas valve during operation. For Midco burners with natural gas, 6" WC pressure (EC 200/300) or 7" WC pressure (RE4400, RE4700) must be maintained upstream of the gas valve. For Midco burners with LP, 6" WC pressure (EC 200/300) or 5" WC pressure (RE4400, RE4700) must be maintained upstream. A $\frac{1}{8}$ inch NPT pipe connection should be installed upstream of the manual valve to check incoming gas pressure.

During pressure testing of the gas supply piping, close the manual gas shut-off valve to the burner. **Test pressure shall not exceed $\frac{1}{2}$ PSIG (14" WC).** The gas valve is only rated for $\frac{1}{2}$ PSIG. To test at pressure greater than $\frac{1}{2}$ PSIG, close the manual shut-off valve and disconnect the gas operating valve.

Turn on gas and inspect piping for leaks by "painting" each joint with soap and checking for bubbles. Do not use open flame. The pipe thread compound that is used on gas piping must be of the type resistant to propane gas. Do not use teflon tape on gas piping.

PLACE WATER SYSTEM IN OPERATION

Partially open all hot water faucets. Open cold water inlet valve to the water heater. Close hot water faucets as they deliver water that is free of air. Start at lowest point and work upwards. Inspect for leaks.

PLACE THE GAS SYSTEM IN OPERATION AND START THE BURNER

Turn off all electrical power to the water heater. Verify that the gas main is open and gas pressure does not exceed 14" WC in the gas line. Gas pressures over 14" WC will damage the gas valve. If gas pressure is under 14" WC open the gas cock and bleed the gas lines until all air is purged from the line. Make certain the area is well ventilated while performing this step. Check for any gas leaks on the burner piping. Verify that combustion air settings are at recommended initial settings. Initial burner air settings and gas pressures may be found in the chart on page 12.

After allowing any gas that accumulated during bleeding the gas lines to clear, turn on the electrical power and place the burner in operation following the instructions supplied with the burner. **Note:** Carlin burners and Midco RE4400DS burners are equipped with pre purge controls using 10 to 30 second purge timers. The pre purge times are marked on the burner controls. The gas valve will not open until the blower has operated for this length of time. With the burner operating and lit, check the gas pressure at the gas valve inlet and verify that it is at least 5" WC (11" WC for Midco DS 45 used on LP). Also check the gas manifold pressure and verify that it is set to the values shown in the chart on page 12.

ADJUST PRIMARY AIR SUPPLY TO BURNER

Adjust the burner air settings according to the burner manufacturer's instructions. Always use instruments to check the CO and CO₂ or O₂. CO should be less than 100 ppm, 0 preferred. O₂ should be between 3% and 6%, 3.5% is preferred for Carlin and Midco burners (see burner manual for more detail). **Note:** Your Bock Power Gas Water Heater system may produce 80 to 120 ppm CO and smoke on initial start-up. This is caused by oils on the steel and other internal components and is normal. These oils will burn off in the first hour of operation. Recheck draft as discussed in "Venting" and adjust as required. After final draft adjustment, recheck combustion as described above and lock down combustion air band or damper as required.

INSPECT THE INSTALLATION AND ADJUST THE CONTROLS

The thermostat has been adjusted to 120°F at the factory. Wait until thermostat has shut off gas to the main burner. Wait 30 seconds following shut-off of gas, then set thermostat to the highest temperature. The main burner should relight. Set thermostat to the lowest temperature; the main burner should go out. The thermostat should be adjusted to the minimum setting that will meet the hot water needs of the homeowner or commercial application.

CAUTION: There is a scald potential if the thermostat is set too high. The recommended temperature setting for normal domestic use is 120°F. If higher temperature settings are needed for combined appliance applications or commercial use, an automatic tempering valve must be installed on all domestic hot water lines. Should overheating occur, or the gas supply fail to shut off, turn off the electricity to the water heater.

MEASURING THE OUTCOMING WATER TEMPERATURE

The thermostat is factory set at 120°F for domestic use. (See the caution above regarding temperature variations.) It is the responsibility of the building owner and installer to verify that the installer follows the recommended quantitative testing for measuring the out-coming water temperature. To make sure that the system works properly after installation and in the future, it is recommended that the heater's performance be measured and monitored. Run

water out of the tap nearest the heater until it comes out warm. Using a calibrated thermometer, take a measurement. If the water is not at a suitable temperature for the installation, have a qualified service person adjust the aquastat. Contact Bock for further information if needed.

This log (or a similar one) should be filled out as follows:

Date	Time	Person running test	Set temp °F	Outlet temp °F

WARNING: Hydrogen gas can be produced in a hot water system served by a heater that has not been used for a long period of time (generally two weeks or more). Hydrogen gas is extremely flammable. To reduce the risk of injury, open the hot water faucet at the highest location in the house for several minutes before using any electrical appliance connected to the hot water system. If hydrogen is present, there may be an unusual sound similar to air escaping through the pipe as the water begins to flow. Do not smoke or allow an open flame near the faucet at the time it is open.

OWNER MAINTENANCE

Lime and Sediment: A program of regular maintenance should be established to keep your water heater operating at peak efficiency. **Important: The tank can fail prematurely from an accumulation of lime and sediment in the bottom, excessive pressure and/or corrosion.** Prevention of these damaging factors will extend the life of your water heater appreciably.

All Power Gas models, except the 32PG, 33PG, 40PG and the 51PG, have hand holes that permit the visual inspection of the tank interior for lime. The hand hole is large enough to reach in and loosen such deposits by brushing or scraping. A commercial lime dissolving chemical can also be employed. The loosened residue can be flushed away through the hand hole or drain.

These accumulations can be controlled to an extent by softening the water or using other water treatment systems. The tank should be inspected every six months: Drain, remove the hand hole cover and make a visual check of the tank interior. If lime (or sediment) has accumulated, remove with a commercial lime dissolving chemical or scrape loose the deposit and flush it away through the hand hole or drain.

Excessive pressure is controlled by the pressure relief valve. Water expands when heated and the extra volume must have a place to go. If water cannot expand into the cold water line because of a check valve or pressure regulator, pressure builds as the water heats. The pressure relief valve opens and dumps the extra water. If the relief valve is faulty, or none has been installed, the tank can fail due to excessive pressure. Open the relief valve at least once a year to make sure the seat is not stuck.

Caution: Before opening the relief valve, be certain that the discharge line directs the flow of water to the drain. Stand away from the outlet to avoid contact with the water.

Anode rods are installed in the head of the tank to help prevent corrosion. When inspecting the tank interior for lime or sediment accumulations, also inspect the condition of the anode rods. When the diameter of either rod has eroded to about $\frac{1}{3}$ of its original diameter, it should be replaced.

Electrolysis can be reduced by installing a copper wire between the hot and cold piping. Dielectric connections will also help reduce electrolysis.

Hydrogen gas can be produced in a hot water system that has not been used for an extended period (two weeks or longer). **Hydrogen gas is extremely flammable.** To prevent possible injury, we recommend that a hot water faucet be wide open for several minutes before using

ANY electrical appliance connected to the hot water system. If hydrogen gas is present, an unusual sound, such as air escaping, will come from the open faucet as the hot water begins to flow. **There must be no open flame near this open faucet.**

The vent system should be checked at least once a year for damage and/or blockage. Also check for correct draft and damper operation.

If the water heater is to be shut off during cold weather, the tank and water lines should be drained to prevent freezing.

The water heater warranty will be invalid if the tank fails due to excessive pressure, the accumulation of lime or sediment, corrosion, or freezing. The warranty explicitly documents further causes of invalidation.

If necessary, the burner and combustion chamber may be cleaned with a brush or a vacuum cleaner. Before proceeding:

- Turn the gas valve to OFF.
- Wait at least 5 minutes for the combustion chamber to cool.
- Use a brush or vacuum cleaner to clean the burner and combustion chamber. This can be done through the inspection door. It is not necessary to remove the burner.

Inspecting the burner flame. This should be visually inspected at least once a year to determine if the flame has altered in appearance in any way. Such a change can indicate the need for service.

Products of combustion should also be tested. Instruments will give best performance results. Tests should include CO and CO₂ or O₂. Refer to “Adjust Primary Air Supply to Burner” on page 8 of this manual. Also refer to the burner manual.

BURNER AND CONTROLS

Any burner and/or controls used on a Bock water heater other than the ones recommended by Bock Water Heaters, **and listed by Underwriters Laboratories, Inc., will void the water heater warranty.** Bock Water Heaters specifies burners and controls on the basis of safety, reliability and performance. The burners listed in the chart on page 12 are the burners currently approved for use by Bock Water Heaters and Underwriters Laboratories. If the burner being installed is not on this list check with your Bock representative to verify the appropriate application before installing.

Temperature controls approved for use are:

- Models 32 PG-72PG: Honeywell L4103A-1142, Carlin EZ-Temp 90000B
- Models 50,73-361PG: Honeywell L4006-2031 w/ Honeywell L8080A-1017,
Carlin EZ-Temp 90000C, Carlin EZ-Temp 90300B
- Models 190, 541PG: Honeywell L8100C-1027 w/ Honeywell L8080A-1017,
Carlin EZ-Temp 90300B

They are the only controls acceptable for use with these models.

LIMITED WARRANTY FOR GAS-FIRED WATER HEATER

Bock Water Heaters, Inc.
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Madison, WI 53703
Phone: 608-257-2225

WHAT DOES THIS LIMITED WARRANTY COVER?

This limited warranty applies only to the original consumer purchaser.

General Defects and Malfunctions: This warranty covers defections and malfunctions in your new water heater for a period of one year from the original installation date. We will repair or replace, at our option, any defective or malfunctioning component of the water heater. This limited warranty will terminate if you sell or otherwise transfer the water heater, or the water heater is installed at a location different from its original installation location.

Tank and Heat Exchanger: We also warrant that the tank and heat exchanger will not leak due to defective materials or workmanship for five years from the date of original installation or from date of manufacture in the event the Limited Warranty Registration Card was not completed and returned to manufacturer. If the tank and heat exchanger is leaking and we have verified that the leak is due to a defect in materials and workmanship, we will replace the tank with a tank that is the nearest Bock model available at the time of replacement. If a replacement tank is provided, it will remain warranted under this section as if it were the original tank. For example, if we send you a replacement tank under this limited warranty two years after the original installation date, then the replacement tank will remain warranted for the remaining three years after the original installation date.

HOW DO YOU GET SERVICE UNDER THE LIMITED WARRANTY?

In order for the warranty period to begin on the date of installation, you must return the warranty registration card attached below within 30 days of purchasing the water heater. You may also register your water heater online at www.bockwaterheaters.com. You must have a copy of the original sales receipt at the time you request service. Failure to return the warranty registration card and provide a copy of the sales receipt will result in the warranty period beginning from the date of manufacture.

To get service under this limited warranty you should contact either the dealer or installer. If dealer or installer is unknown you can contact us via e-mail at warranty@bockwaterheaters.com or call us Monday through Friday between the hours of 8 o'clock a.m. to 5 o'clock p.m. Central Time at the following number: 1-608-257-2225.

You can also write us at the following address:

Bock Water Heaters, Inc.
Warranty Support Group
110 S. Dickinson Street
Madison, WI 53703

We will respond not later than ten days after we have received your request for service.

WHAT DOES THIS LIMITED WARRANTY NOT COVER?

This limited warranty does not cover storage tanks that are or were:

- Incorrectly installed, especially where the installation violates state or local plumbing, housing or building codes.
- Operated at inappropriate settings, excessive pressures or temperatures.
- Exposed to adverse local conditions and specifically sediment or lime precipitation in the tank or corrosive elements in the atmosphere or unacceptable water quality.
- Installed outside the United States or Canada.
- Accidentally damaged.

Also, we will not cover the following charges, costs and losses:

- Any freight or delivery charges.
- Any removal or installation charges.
- Charges to return the water heater or part to the manufacturer.
- Water damage, loss or damage to property, inconvenience or loss of use.

WHAT WILL VOID THE LIMITED WARRANTY?

If you do any of the following, you will void this limited warranty:

- Fail to retain an original copy of your sales receipt.
- Fail to retain the actual rating plate from the water heater
- Alter or remove the serial number.
- Transfer or sell the water heater.
- Remove the water heater from its original location and install it somewhere else.
- Fail to follow the care and maintenance instructions provided with the water heater
- Remove the anode rods.
- Fail to inspect and replace the anode rods (you must retain and present your paid receipts as proof of anode rod replacement).
- The use of any burner and/or controls other than the ones specified for the water heater by Bock Water Heaters Inc.

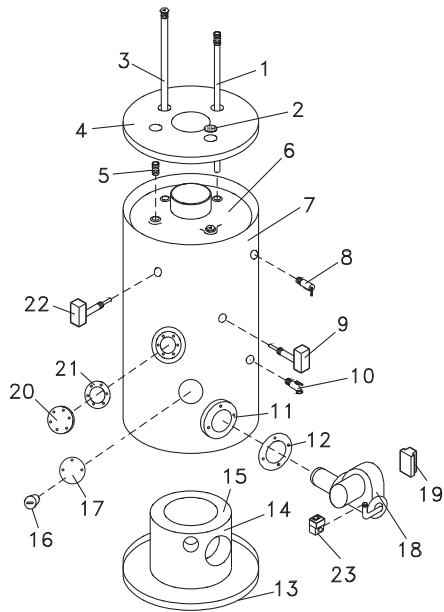
HOW DOES STATE LAW RELATE TO THIS LIMITED WARRANTY?

This is a limited warranty. WE MAKE NO OTHER EXPRESS WARRANTIES WITH RESPECT TO THIS WATER HEATER. We will not assume, nor authorize any person to assume for us any other liability in connection with the sale or operation of this water heater. ANY IMPLIED WARRANTIES, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR APPLICATION, IMPOSED ON THIS SALE UNDER THE LAWS OF THE STATE OF SALE ARE LIMITED TO ONE YEAR. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

WE WILL NOT BE RESPONSIBLE FOR WATER DAMAGE, LOSS OF USE OF THE UNIT, INCONVENIENCE, LOSS OR DAMAGE TO PERSONAL PROPERTY, WHETHER DIRECT OR INDIRECT, AND WHETHER ARISING IN CONTACT OR TORT. Some states do not allow the exclusion of incidental or consequential damages, so the above exclusion may not apply to you.

Bock Water Heaters, Inc. • 110 South Dickinson Street • Madison, WI 53703
Telephone 608 -257-2225 • Fax 608 -257- 5304
www.bockwaterheaters.com

BOCK POWER GAS WATER HEATER



Bock Tank Assembly Parts List

When ordering repair parts, always give the part name, model number, size and serial number.

ITEM	DESCRIPTION	ITEM	DESCRIPTION
1.	Cold Water Inlet Dip Tube <i>(not used on 33PG, 40PG and 541PG)</i>	14.	Combustion Chamber Sleeve
2.	Plastic Cap	15.	Combustion Chamber
3.	Magnesium Rod	16.	Chamber Plug
4.	Top Pan	17.	Inspection Door
5.	Hot Out Nipple <i>(available for models 32PG, 33PG, 40PG and 51PG only)</i>	18.	Burner
6.	Tank	19.	Burner Control <i>(specify burner make and model)</i>
7.	Heater Jacket	20.	Hand Hole Cover <i>(not used on 32PG, 33PG, 40PG and 51PG)</i>
8.	Temperature & Pressure Relief Valve	21.	Hand Hole Gasket <i>(not used on 32PG, 33PG, 40PG and 51PG)</i>
9.	Immersion Well & Aquastat	22.	High Limit Control <i>(not used on 32PG, 33PG, 40PG, 51PG, 71PG and 72PG)</i>
10.	Drain Valve	23.	Gas Valve <i>(specify burner make and model)</i>
11.	Burner Mounting Bracket <i>(32PG, 33PG, 40PG and 51PG)</i>	24.	Brass Inlet Bushing <i>(not shown—33PG and 40PG only)</i>
12.	Mounting Bracket Gasket		
13.	Bottom Pan		

MIDCO BURNERS

Bock Water Heater Model	Fire Rate # (Btu/hr)	Burner Model	Air Setting* (initial)	Orifice # (nat. gas)	Manifold Gas Pressure (nat. gas)	Orifice # (LP gas)	Manifold Gas Pressure (LP gas)
32PG, 33PG	104,000	EC200	2	#7	3.5" WC	#25	3.5" WC
40PG	126,000	EC200	5	H	3.5" WC	#19	3.5" WC
50PG	140,000	EC200	6	L	3.5" WC	#17	3.5" WC
51PG	152,000	EC200	7.5	19/64	3.5" WC	#7	3.5" WC
120PG	155,000	EC200	7.5	19/64	3.5" WC	#7	3.5" WC
71PG	173,000	EC200	9	NONE	3.5" WC	#3	3.5" WC
190PG	190,000	EC300	3.5	5/16	3.5" WC	#2	3.5" WC
72PG	199,000	EC300	4.5	P	3.5" WC	#1	3.5" WC
73PG	242,000	EC300	5	W	3.5" WC	G	3.5" WC
241PG	277,000	RE4400DS	1/2 OPEN	3/8	3.5" WC	M	3.5" WC
361PG	385,000	RE4400DS	3/4 OPEN	NONE	4.2" WC	N	3.5" WC
541PG	623,000	RE4700BA	1/2 OPEN	9/16	3.5" WC	23/64	3.5" WC

CARLIN BURNERS

Bock Water Heater Model	Fire Rate # (Btu/hr)	Burner Model	Air Setting* (initial)	Orifice # (nat. gas)	Gas Pressure (nat. gas)	Orifice # (LP gas)	Gas Pressure (LP gas)
32 PG, 33 PG	104,000	Carlin EZ-GAS	25%	#2	3.5" WC	#18	3.5" WC
40 PG	126,000	Carlin EZ-GAS	45%	D	3.5" WC	#12	3.5" WC
50 ESPG	140,000	Carlin EZ-GAS	55%	F	3.5" WC	#5	3.5" WC
51 PG	152,000	Carlin EZ-GAS	60%	I	3.5" WC	#7 ₃₂	3.5" WC
120 PG	155,000	Carlin EZ-GAS	60%	I	3.5" WC	#7 ₃₂	3.5" WC
71 PG	173,000	Carlin EZ-GAS	30%	N	3.5" WC	#1	3.5" WC
190 PG	190,000	Carlin EZ-GAS	35%	P	3.5" WC	1/4"	3.5" WC
72 PG	199,000	Carlin EZ-GAS	50%	O	3.5" WC	F	3.5" WC
73 PG	242,000	Carlin EZ-GAS	85%	23/64"	3.5" WC	19/64"	3.5" WC

*Products of combustion must be checked and air settings adjusted to give clean combustion. Typical O2 levels for Midco and Carlin burners are ~3.5%. CO content must be under 100 ppm (OSHA), preferably zero.

#Contact Bock for high altitude applications.