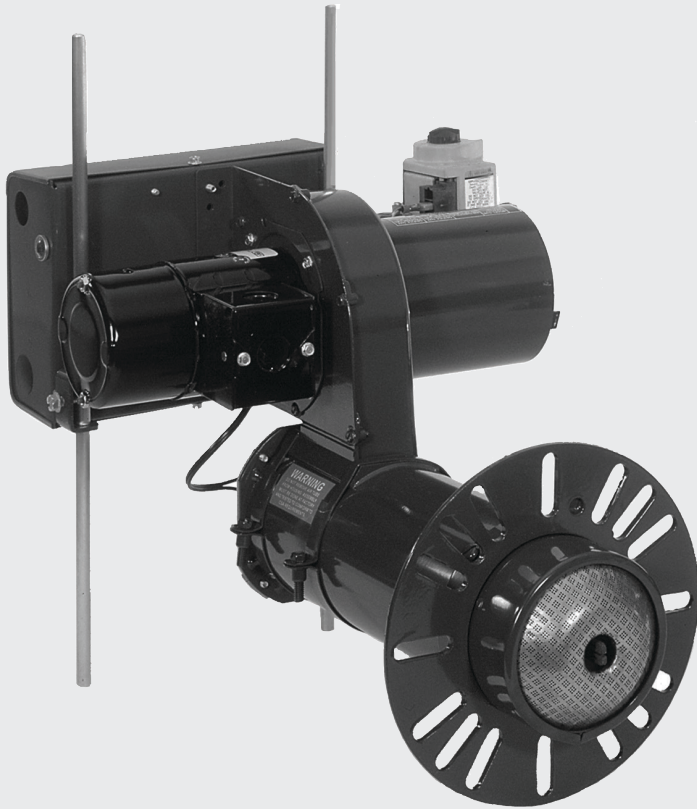


Instruction Manual



Ratings

Input: 60,000 to 180,000 BTUH
Fuels: Natural gas or propane gas
	Max. supply pressure..... 14 INCHES W.C.
	Min. supply pressure..... 5 INCHES W.C.
	Manifold pressure 3.5 INCHES W.C.
Electrical:	Power..... 120v/60HZ/1-PHASE, 8 AMPS
	Motor..... 1/50 HP, 3450 RPM
Ignition: Norton hot surface ignitor, 120v
Control: Honeywell S89C primary control
Agencies: CSA certified, U. S.



The G3B burner has been assigned
U. S. Patent No. 4397631

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WARNING **Installer/servicer** — Except where specifically stated otherwise, this manual must be used only by a *qualified service technician*. In the state of MA, this product must be installed by a licensed plumber or gas fitter. Failure to comply with this or other requirements in this manual could result in severe personal injury, death or substantial property damage.

CAUTION **Handling** — Handle burner (and hot surface ignitor) carefully to avoid cracking or breaking the ceramic ignitor. Ignitor protrudes slightly beyond burner head. Do not set burner on its end.

WARNING **User** — Refer only to User's Information manual for information regarding operation of this burner. The remainder of this manual is intended only for your service technician. The burner and heat exchanger must be inspected and started at least annually by your service technician.

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PLEASE read this first . . .

Special attention flags

Please pay particular attention to the following when you see them throughout this manual.

DANGER Notifies you of hazards that **WILL** cause severe personal injury, death or substantial property damage.

WARNING Notifies you of hazards that **CAN** cause severe personal injury, death or substantial property damage.

CAUTION Notifies you of hazards that **WILL or CAN** cause minor personal injury or property damage.

NOTICE Notifies you of special instructions on installation, operation or maintenance that are important, but are not normally related to injury or property damage hazards.

General information

Burner applications

Follow all instructions in this manual and the appliance manual. Where appliance instructions differ from this manual, follow the appliance instructions. Read the label attached to the burner air tube to verify the burner is correct for the appliance being used. See pages 6 and 7 for procedures.

Damage or shortage claims

The consignee of the shipment must file damage or shortage claims immediately against the transportation company.

When calling or writing about the burner . . .

Please provide us with the burner serial number and burner model number to assist us in locating information. Enter this information on the Installation Certificate in this manual. The certificate information can be helpful when troubleshooting or obtaining replacement parts.

Codes and standards

NOTICE The installer/servicer is solely responsible for compliance with all applicable codes and standards.

Burner listings/approvals

Carlin G3B gas burners are CSA certified for use with natural gas or propane gas, United States installations only.

Burners are NYC/MEA approved. MEA-369-89-E.

WARNING Follow the guidelines below to avoid potential severe personal injury, death or substantial property damage.

Installer/service technician . . .

- Read all instructions before proceeding. Perform all procedures, and in the order given to avoid potential of severe personal injury, death or substantial property damage.
- Before leaving the site after startup or service, review the User's information manual with the user. Make the user aware of all potential hazards and perform the training outlined below.

Train the user . . .

- To properly operate the burner/appliance per this manual, the appliance instructions and the **User's information manual**.
- To keep this manual at or near the burner/appliance for ready access by the user and service technician.
- To contact the service technician, gas supplier or fire department should the user smell gas.
- To keep the appliance space **free of flammable liquids or vapors and other combustible materials**.
- Do not use laundry products, paints, varnishes or other chemicals in the room occupied by the burner/appliance.
- To contact the service technician at least annually for startup and burner/appliance service.

When servicing the burner . . .

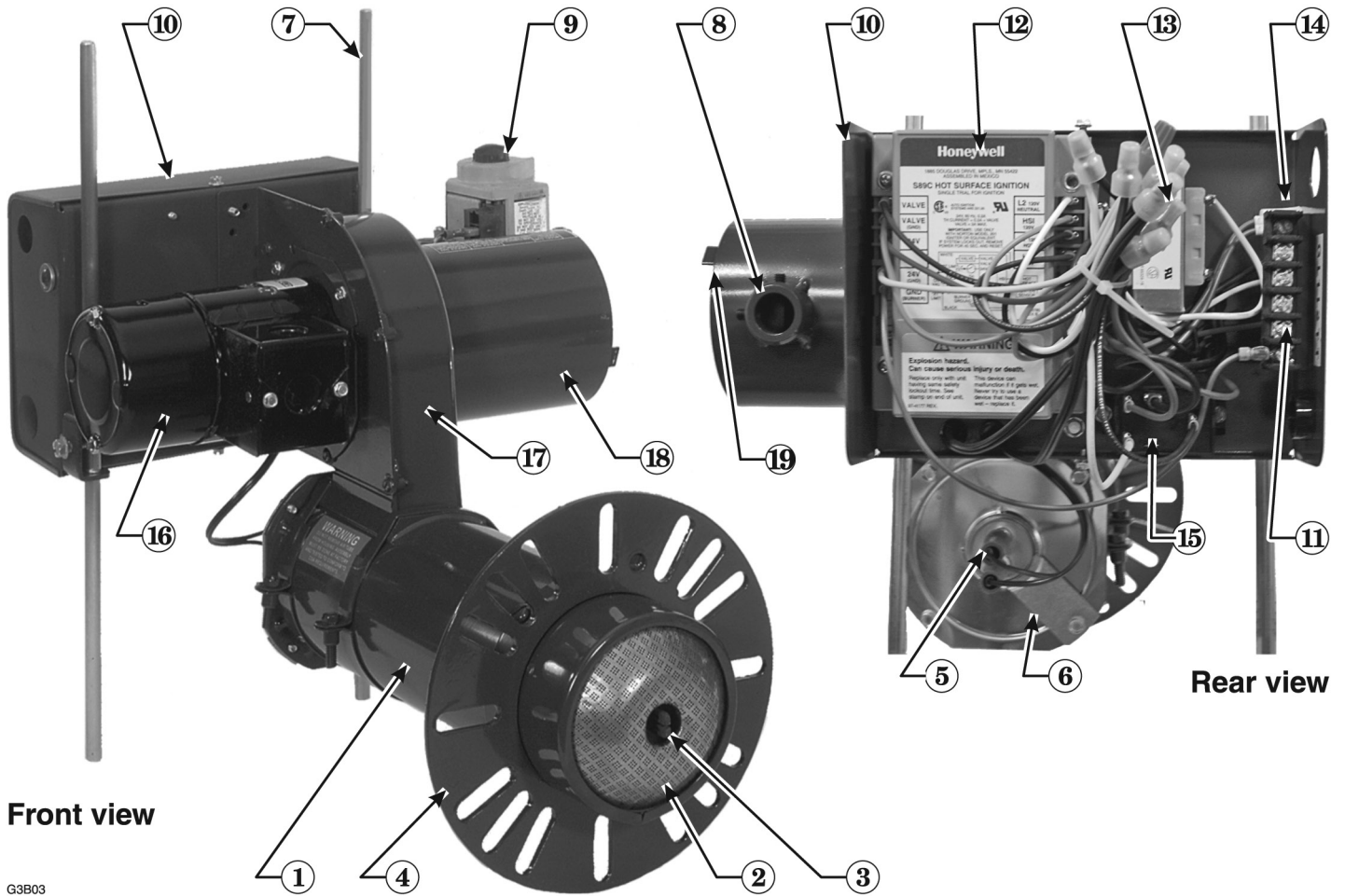
- **Disconnect electrical supply** to burner before attempting to service to avoid electrical shock or possible injury from moving parts.
- Burner and appliance components can be extremely hot. **Allow all parts to cool** before attempting to handle or service to avoid potential of severe burns.
- Handle the ceramic ignitor with care to avoid breaking or cracking the ignitor. Do not handle ignitor when it is hot. **NEVER** touch the surface of the ignitor with bare fingers. Body oils can cause damage.

Installation:

Burner/appliance installations must comply with the latest editions of:

- "Installation of Domestic Gas Conversion Burners," ANSI Z21.8.
- National Fuel Gas Code, ANSI Z223.1/NFPA 54.
- National Electrical Code, ANSI/NFPA 70.
- All additional applicable national, state and local codes.

G3B Gas Burner At-a-Glance



Front view

Rear view

G3B03

- | | |
|---|---|
| <p>1 Air tube, with powder coat paint finish</p> <p>2 Flameholder</p> <p>3 Hot surface ignitor</p> <p>4 Adjustable flange</p> <p>5 Rear ignitor assembly with terminal boots</p> <p>6 Ignition tube assembly mounting plate</p> <p>7 Pedestal legs</p> <p>8 Burner gas inlet connection (see page 8)</p> <p>9 Combination gas valve (with integral gas pressure regulation — set for 3½" w.c. outlet pressure)</p> <p>10 Control panel</p> <p>11 Terminal strip</p> | <p>12 Primary control (Honeywell Model S89C primary control, for use with flame rectification)</p> <p>13 Control transformer, 120 VAC / 24 VAC, 40 VA</p> <p>14 Gas valve on indicator light</p> <p>15 Motor relay</p> <p>16 High-efficiency motor</p> <p>17 Blower housing (cast aluminum), with powder coat paint finish</p> <p>18 Air inlet tube assembly</p> <p>19 Air throttle indicator — Only a single adjustment required for setting combustion air; see page 8 for starting setting based on appliance model and input)</p> |
|---|---|

1. Prepare Site • Prepare Burner • Mount Burner

Inspect installation site

Inspect, repair and/or replace vent system

WARNING Do not install this burner unless you have verified the entire vent system and the appliance are in good condition and comply with all applicable codes. And . . .

The vent and chimney must be sized and constructed in accordance with all applicable codes. If intended for use with an oil burner as well, the vent system must comply with relevant codes for both gas and oil firing.

The vent system must not be pressurized unless the vent piping and vent system are designed accordingly. The vent must provide draft at all times (negative pressure in vent).

Do not install or use an existing manual damper in the vent connector or vent.

Do not connect the appliance vent connector to a chimney or vent serving a fireplace, incinerator or solid-fuel-burning apparatus.

In a cold climate, do not vent into a masonry chimney that has one or more sides exposed to the outside. Install a listed stainless steel liner to vent the flue products.

A defective vent system could result in severe personal injury, death or substantial property damage.

Vent/chimney sizing

- Follow all local codes when sizing the vent and chimney
- Refer to the appliance manufacturer's manual, when available, for venting recommendations

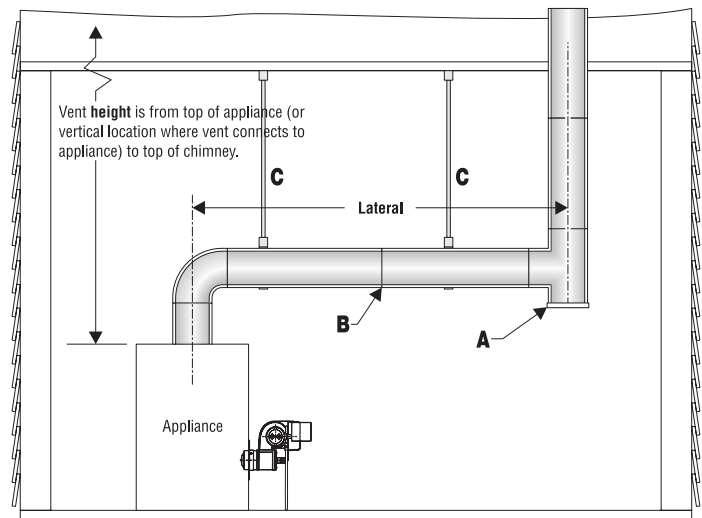
Prepare vent/chimney

- Secure all metal vent joints with screws, following the vent manufacturer's instructions. Seal all joints in the vent system and chimney. Repair masonry chimney lining and repair all mortar joints as needed.
- Install a double-acting barometric draft regulator in the vent piping. (The damper must be located in the same space as the appliance.) Install a manual reset spill switch in the top of the draft regulator outlet. Wire the switch into the appliance limit circuit to shut off the appliance/burner if sustained downdraft should occur.
- Provide support for the vent piping. Do not rest the weight of any of the vent piping on the appliance flue outlet.

Verify clearances

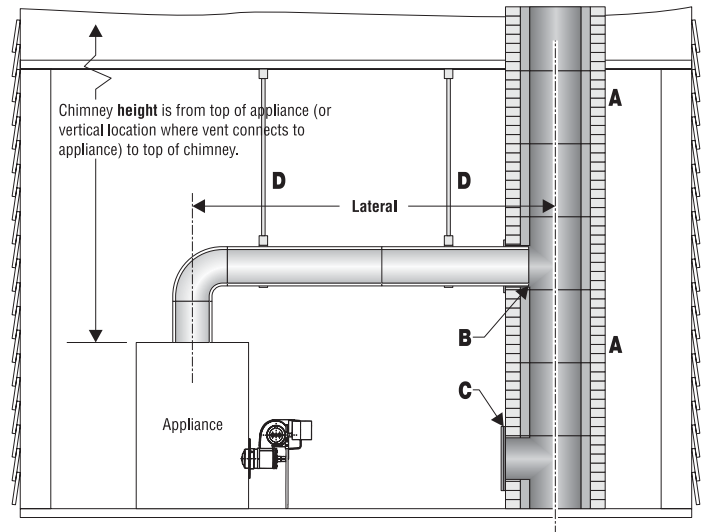
- Verify that clearances required for service/maintenance comply with the appliance manual and applicable codes. Provide at least 6 inches around burner and 24 inches in front of burner panel for service access.

Figure 1 Vent and vent connector installation



Metal vent application

- A** Connect to vertical with tee, if possible, to provide inspection/cleanout opening in vent.
- B** Seal all joints and access openings tightly to prevent draft loss.
- C** Support vent pipe so no weight of vent connector rests on appliance.



Masonry chimney application

- A** Tile-lined interior masonry chimney only; with all tile and joints in good condition.
- B** Vent pipe should be almost flush, but **not extending into**, inside surface of liner.
- C** Seal all access openings tightly to prevent draft loss.
- D** Support vent pipe so no weight of vent connector rests on appliance.

G3B03

1. Prepare Site • Prepare Burner • Mount Burner *(continued)*

Inspect installation site

Combustion/ventilation air openings

WARNING Installing the burner/appliance in a space that does not provide enough air for combustion and ventilation can result in severe personal injury, death or substantial property damage. Follow all applicable codes and guidelines below to ensure space has sufficient air openings.

Large spaces

For appliances located in basements, ventilated crawl spaces or other large areas, no additional air openings should be necessary.

Exception: If the building construction is unusually tight (see National Fuel Gas Code or CSA B149.1 or .2 for definition), you will need to provide air openings into the building if appliance air comes from inside. Provide one opening within 12 inches of the ceiling, and one opening within 12 inches of the floor. Size each opening to provide free area (after deduction for louvers) of 1 square inch per 1,000 Btuh input of all fuel-burning appliances in the building.

Confined spaces — air from inside building

If air openings connect to areas inside the building, provide two openings, one within 12 inches of the ceiling, the other within 12 inches of the floor. Each opening must have a free area (after deduction for louvers) of 1 square inch per 1,000 Btuh of all appliances in the space. If the building construction is unusually tight (see National Fuel Gas Code or CSA B149.1 or .2 for definition), you will need to provide air openings into the building. Provide two openings sized and located as for the openings into the boiler space.

Confined spaces — air from outside

If air openings connect directly to outside, provide two openings, one within 12 inches of the ceiling, the other within 12 inches of the floor. Each opening must have a free area (after louver deduction) of:

- If directly through side wall: 1 square inch for each 4,000 Btuh of all appliances in the space.
- If through vertical ducts: 1 square inch for each 4,000 Btuh of all appliances in the space.
- If through horizontal ducts: 1 square inch for each 2,000 Btuh of all appliances in the space.

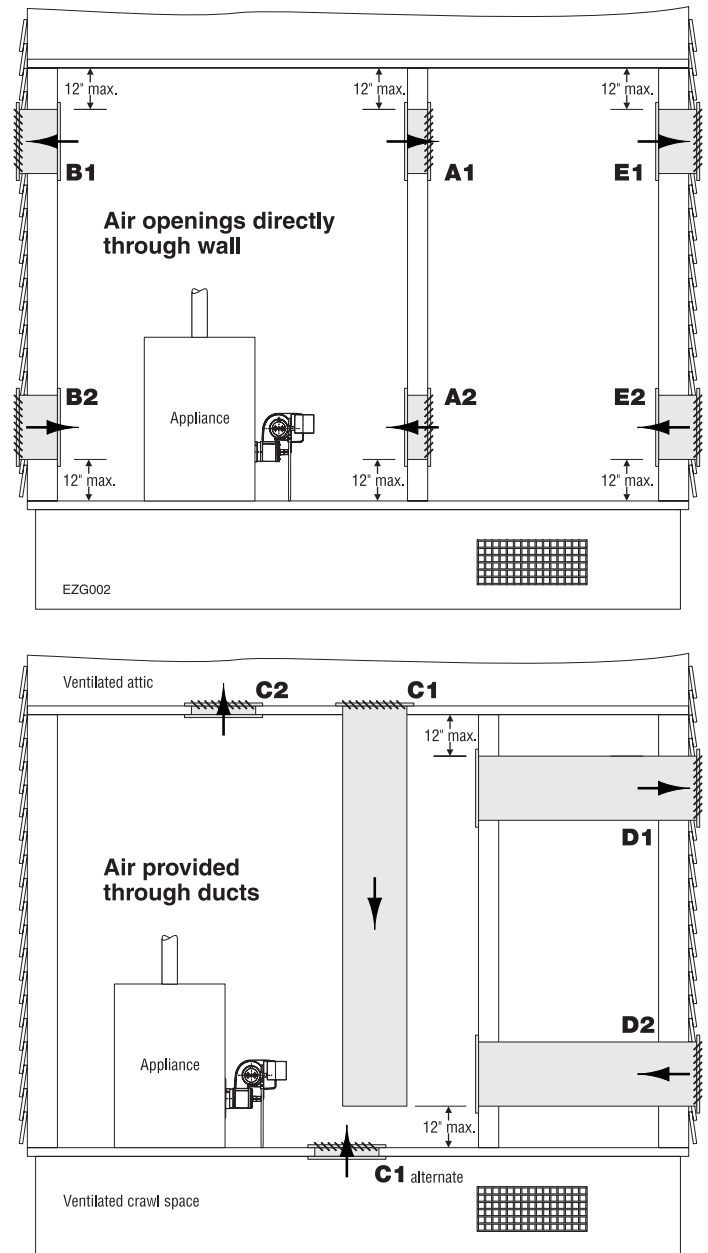
Verify openings

WARNING When sizing air openings for combustion and ventilation, include air required for exhaust fans and other appliances, such as clothes driers, that require air for operation.

Check appliance manual and applicable codes for required sizing of combustion and ventilation air openings.

- Verify that openings are unobstructed.
- Verify that appliance space and air source spaces are free of:
 - gasoline or other flammable liquids or vapors.
 - combustible materials.
 - air contaminants, such as laundry products, paint, thinner, varnish, etc.
- Confirm with user that the area will be kept free of these materials at all times.

Figure 2 Locating & sizing air openings



Minimum grille free area per 1,000 Btuh input of all appliances in space

A1 & 2 Two openings through interior wall	1 sq. in.
B1 & 2 Two openings through outside wall	0.25 sq. in.
C1 & 2 Two vertical ducts (to attic and crawl space)	0.25 sq. in.
D1 & 2 Two horizontal ducts from outside	0.50 sq. in.
E1 & 2 If building construction is unusually tight, provide two air openings as shown if appliance air comes from inside.	1 sq. in.

Example A space contains two fuel-burning appliances. The combined input is 120,000 Btuh. Air comes in through horizontal ducts from outside. This is case **D**. So multiply 0.25 sq. in. times 120 to get 30 sq. in. free area per opening. If louvers reduce free area to 70%, then divide minimum free area by 0.7 for actual grille area, or $30 \div 0.7 = 42.9$ sq. in.

1. Prepare Site • Prepare Burner • Mount Burner (continued)

Prepare the appliance

WARNING Burner input: Install a gas burner sized for the normal input rating of the appliance. Do not install a burner with a higher firing rate than the appliance rating. Do not install a burner with a firing rate more than 10% lower than the appliance rating. The appliance and vent system could be damaged due to condensation.

Seal the appliance: Seal all flue-gas containing joints. Seal all connections to the vent piping or breeching.

Clean and check the appliance: Clean the appliance thoroughly. Test all electrical components and verify the relief valve works (boilers only).

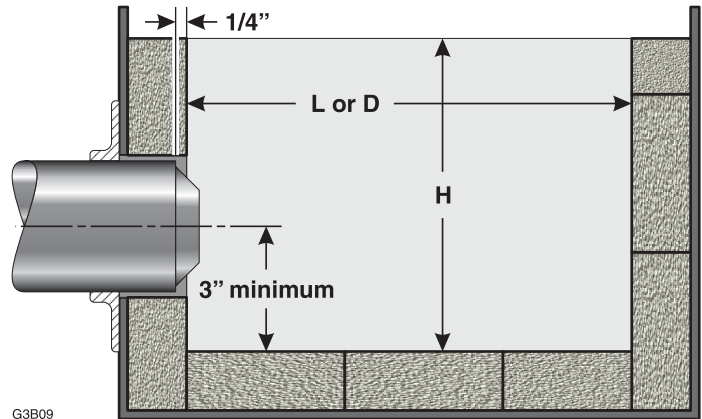
Verify combustion chamber dimensions comply with the minimum dimensions shown in Figure 3. Install or replace combustion chamber liner if required by the appliance manufacturer. The burner air tube must not extend into the combustion chamber. The end of the burner air tube must be within 1/4" of the inside face of the combustion chamber. If the space around the burner air tube is more than 1/4", wrap the burner air tube with minimum 2300-°F-rated ceramic fiber blanket to seal off the gap. Notice that the flameholder may extend slightly into chamber as shown in Figure 3.

Repair or replace damaged appliance components. Inspect the appliance thoroughly. Follow appliance manufacturer's guidelines for repair or replacement of any component found defective.

When cleaning the appliance or working with ceramic fiber refractories or fiberglass insulation, see WARNING on page 7.

Failure to comply with the above could result in severe personal injury, death or substantial property damage.

Figure 3 Minimum combustion chamber dimensions



G3B09

Input Btuh	Minimum chamber dimensions, Inches (Note 1) (Using 2300°F or higher refractories)	
	Square L x W x H	Vertical cylinder Diameter x H
60,000	7 x 7 x 9	8 x 9
70,000	7½ x 7½ x 9	8½ x 9
100,000	8 x 8 x 9	9 x 9
120,000	9 x 9 x 9	10 x 9
140,000	10 x 10 x 9	11 x 9
160,000	11 x 11 x 9	12 x 9
180,000	12 x 12 x 9	13 x 9

Note 1: Rectangular chambers of similar floor area are equally acceptable, but the L/W ratio should not exceed 2 and the width should be at least 5 inches.

1. Prepare Site • Prepare Burner • Mount Burner *(continued)*

Inspect burner and components

WARNING Do not install or operate the burner if any component is damaged or if burner does not comply with the specifications and guidelines in this manual and the appliance manual.

Air tube insertion length (UTL)

- Usable air tube length (UTL) is the distance from mounting flange to end of air tube.
- Verify that the end of the air tube will be flush with, or no more than ¼ inch short of, the inside of the appliance combustion chamber front wall when the burner is mounted. See Figure 3, page 6.
- Minimum UTL is 1¾ inches. Maximum UTL is tube length less 1¾ inches. Tubes are available in 6-inch, 9-inch and 12-inch lengths.
- Notice that the flameholder may extend slightly into chamber as shown.

Prepare appliance for burner mounting

WARNING The universal flange supplied with G3B Gas burners is intended only for firing chambers with negative overfire pressure. The G3B burner must not be installed on a product that operates with a pressurized combustion chamber. Failure to comply could result in severe personal injury, death or substantial property damage.

- See page 21 for required dimensions and bolt locations.

Ceramic fiber or Fiberglass insulation

WARNING Ceramic fiber materials, such as chamber liners, may contain carcinogenic particles (chrysothalites) after exposure to heat. Airborne particles from fiberglass or ceramic fiber components have been listed as potentially carcinogenic by the State of California. Take the following precautions when removing, replacing and handling these items.

Avoid breathing dust and avoid contact with skin or eyes. Wear long-sleeved, loose-fitting clothing, gloves and eye protection. Use a NIOSH N95 certified respirator. This respirator meets requirements for protection from chrysothalites. Actual job requirements or NIOSH regulations may require other or additional protection. For information, refer to the NIOSH website, <http://www.cdc.gov/niosh/homepage.html>.

Ceramic fiber removal: To prevent airborne dust, thoroughly wet ceramic fiber with water before handling. Place ceramic fiber materials in a plastic bag and seal to dispose.

Avoid blowing, tearing, sawing or spraying fiberglass or ceramic fiber materials. If such operations are necessary, wear extra protection to prevent breathing dust.

Wash work clothes separately from other laundry. Rinse clothes washer thoroughly afterwards to prevent contamination of other clothing.

NIOSH First aid procedures:

Eye exposure — irrigate immediately

Breathing — fresh air.

1. Prepare Site • Prepare Burner • Mount Burner *(continued)*

Inspect burner and components

Drill or ream gas orifice to size (initial installation)

WARNING You must disconnect power to burner and close main manual gas valve before proceeding. Failure to do so could result in severe personal injury, death or substantial property damage.

WARNING You must drill or ream the burner orifice to the size given in Figure 4. The orifice is shipped with a pilot hole only. Firing the burner with the orifice as shipped can result in damage to the burner. Never fire the G3B burner below 60,000 Btuh input. The flameholder can overheat, resulting in potential severe personal injury, death or substantial property damage.

1. After drilling or reaming orifice to correct size, thread orifice fitting into orifice nipple as shown in Figure 4.

Install gas valve on burner

1. Read WARNING's on page 9 before installing gas valve.
2. Apply a small amount of pipe dope (suitable for propane gas) to gas valve outlet connection, gas line elbow and orifice nipple. Assemble elbow and orifice nipple to gas valve.

WARNING To avoid damage to gas valve, do not hold valve with a pipe wrench or over-tighten. Use only a crescent wrench or other means. Failure to comply could result in severe personal injury, death or substantial property damage.

3. Insert orifice nipple into burner gas connection and secure in place using the two Allen screws.
4. Connect gas valve wires to gas valve.

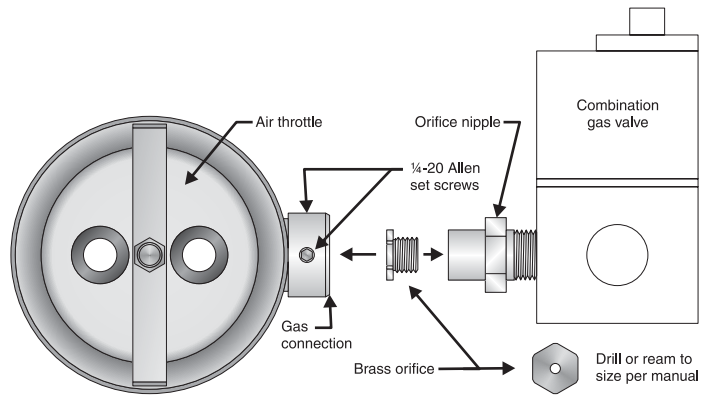
Inspect/redrill gas orifice when required

1. Turn off power to the burner/appliance before proceeding.
2. Close main manual gas valve in gas line to burner. Then disconnect the ground joint union to allow rotating burner combination gas valve.

WARNING You must disconnect power to burner and close main manual gas valve before proceeding. Failure to do so could result in severe personal injury, death or substantial property damage.

3. Loosen Allen screws securing gas line to burner gas connection.
4. Remove combination gas valve (item 9, page 3) and gas piping to burner gas connection (item 8, page 3) on burner air tube.
5. Read correct orifice drill size from Figure 4. Then check actual orifice size using that size twist drill bit.
 - **If gas orifice is smaller than required**, redrill orifice to correct size, if necessary. Replace gas valve and piping, using only pipe dope listed for use with liquefied petroleum gases.
 - **If gas orifice is larger than required**, obtain a replacement gas orifice fitting. Drill orifice hole in replacement orifice fitting.

Figure 4 Orifice and gas valve installation



Input Btuh	Burner orifice drill size Diameter, inches		Air throttle turns (appr.)
	Natural Gas	Propane Gas	
Note 1			Notes 1 & 2
60,000	#28 (0.141)	#33 (0.113)	0
70,000	#24 (0.152)	1/8 (0.125)	1/2
80,000	#20 (0.161)	#30 (0.129)	3/4
90,000	#17 (0.173)	#28 (0.141)	1
100,000	#14 (0.182)	#25 (0.150)	1 1/2
110,000	#11 (0.191)	#22 (0.157)	1 3/4
120,000	#7 (0.201)	#20 (0.161)	2 1/4
140,000	#3 (0.213)	#16 (0.177)	3
160,000	A (0.234)	#12 (0.189)	4 1/4
180,000	D (0.246)	#7 (0.201)	9

Note 1: High altitude applications: The maximum burner input at sea level is 180,000 Btuh. Reduce this capacity by 4% per 1,000 feet above sea level. Example — max. capacity at 5,000 feet is 144,000 Btuh (20% reduction).

Note 2: Use this as the starting setting only. Adjust air throttle, if necessary, after performing combustion testing (see page 14).

Hot surface ignitor

- Inspect the burner from air tube end. The hot surface ignitor must extend slightly past the end of the burner.
- Carefully inspect the ignitor, ensuring it is intact, with no cracks or visual signs of degradation.
- Do not touch the ignitor with bare hands. Body oils can cause deterioration of the silicon carbide.
- Replace ignitor if there are any signs of damage.

WARNING You must allow ignitor to cool before attempting to handle. Failure to do so could result in severe personal injury or damage to the ignitor.

Inspect components and wiring

- Visually inspect all burner components and wiring.
- Verify that wiring is intact and leads are securely connected.
- Verify that all burner components are in good condition.

Mount burner in appliance

- Verify appliance burner front plate dimensions per page 21.
- Slide gasket supplied with burner over end of air tube.
- Insert burner into appliance opening and bolt in place.

2. Install Gas Piping from Meter to Combination Gas Valve

Code compliance

The burner/appliance installation must comply with codes listed on page 2 and any other locally applicable codes.

Piping from meter to burner

WARNING Connect from the gas supply to the burner combination gas valve inlet using new, clean black iron pipe and malleable iron fittings only. Do not use copper, brass, cast iron or galvanized pipe or fittings.

Provide support for gas piping. Do not rest weight of piping on burner gas valve.

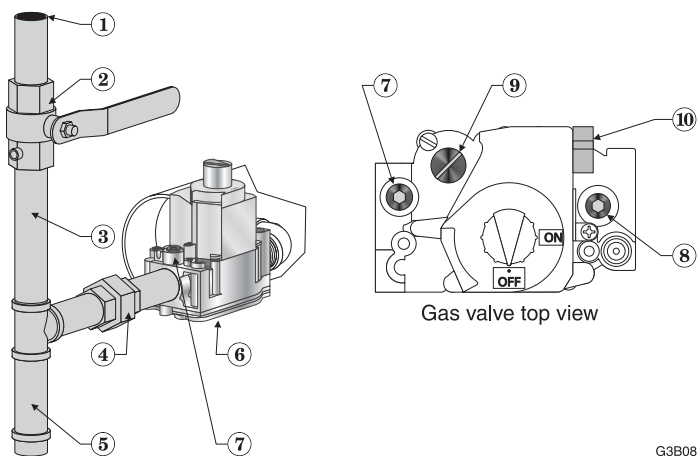
Apply pipe dope sparingly at all joints. Use only pipe dope listed for use with propane gas. Do not use pipe sealing tape.

Do not hold gas valve with pipe wrench. Use crescent wrench or other smooth-jawed device. Do not over-tighten.

Failure to comply with above could result in severe personal injury, death or substantial property damage.

1. If possible, install a new gas line directly from the gas meter. If you are using an existing gas line, verify it is clean and in good condition, and verify it is large enough to handle the load of all connected appliances.
2. When branching from a common gas line, do not tap off from the bottom of horizontal sections — only from the side or top.
3. Install a main manual shutoff valve, sediment trap and ground joint union near the burner combination gas valve connection as shown in Figure 5.
4. If the burner is installed inside the appliance jacket, install the main manual gas valve and sediment trap external to the jacket.
5. Size piping (or verify size) using Table 2. You will find additional information on gas line sizing in the National Fuel Gas Code, ANSI Z223.1.

Figure 5 Connecting gas supply piping to burner



- | | |
|---|---------------------------------------|
| 1 Pipe to meter or branch | 5 Sediment leg |
| 2 Main manual gas shutoff valve (must be 'T' handle in state of MA) | 6 Burner combination gas valve |
| 3 Use clean, burr-free black iron pipe and malleable iron fittings | 7 Upstream pressure tap, 1/8" NPT |
| 4 Ground joint union | 8 Outlet pressure tap, 1/8" NPT |
| | 9 Gas pressure regulator access screw |
| | 10 Gas valve wire terminal strip |

Gas supply pressure — natural or propane

- Maximum supply pressure: 14 inches w.c.
- Minimum supply pressure: 5 inches w.c.

WARNING Do not expose the combination gas valve to gas pressure in excess of 14 inches water column. Higher pressure could damage the valve seat, resulting in potentially hazardous condition. When pressure testing piping at higher pressures, disconnect burner from gas line before testing.

If the gas supply pressure can exceed 14 inches water column at any time, you must install a lockup type gas pressure regulator in the gas supply piping, ahead of the main manual gas valve installed at the burner.

Test and purge gas line

Read WARNING above.

Pressure test and purge the line. Pressure testing should be done by the gas supplier or utility, following all applicable codes.

Table 2 Capacities of black iron pipe, cubic feet gas/hour

Capacities in cubic feet per hour for pipe carrying natural gas or propane					
Pipe size (inches)	Total length of gas piping, from meter to burner connection (feet)				
	20	40	60	80	100
Natural gas @ .60 specific gravity, pressure drop 0.3 in. w.c. (note 1)					
1/2	92	63	50	43	38
3/4	190	130	105	90	79
1	350	245	195	170	150
1 1/4	730	500	400	350	305
Natural gas @ .60 specific gravity, pressure drop 0.5 in. w.c. (note 1)					
1/2	120	82	66	57	50
3/4	250	170	138	118	103
1	465	320	260	220	195
1 1/4	950	660	530	460	400
Propane gas @ 1.55 specific gravity, pressure drop 0.3 in. w.c.					
1/2	57	39	31	27	24
3/4	118	81	65	56	49
1	217	152	121	105	93
Propane gas @ 1.55 specific gravity, pressure drop 0.5 in. w.c.					
1/2	74	51	41	35	31
3/4	155	105	86	73	64
1	288	198	161	136	121
Note 1	For natural gas with specific gravity other than 0.60, consult National Fuel Gas Code for correction factor.				

3. Wire Burner

Code compliance

The burner/appliance installation must comply with codes listed on page 2 and any other locally applicable codes.

General wiring requirements

WARNING Read and follow the guidelines in this manual. Failure to comply could result in severe personal injury, death or substantial property damage.

Electrical shock hazard— Disconnect electrical supply to the burner before attempting to service. Failure to comply could result in severe personal injury, death or substantial property damage.

WARNING *Electrically ground burner*— The burner must be grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code, ANSI/NFPA 70 (in Canada, the Canadian Electrical Code Part 1, C.S.A. Standard C22.1.)

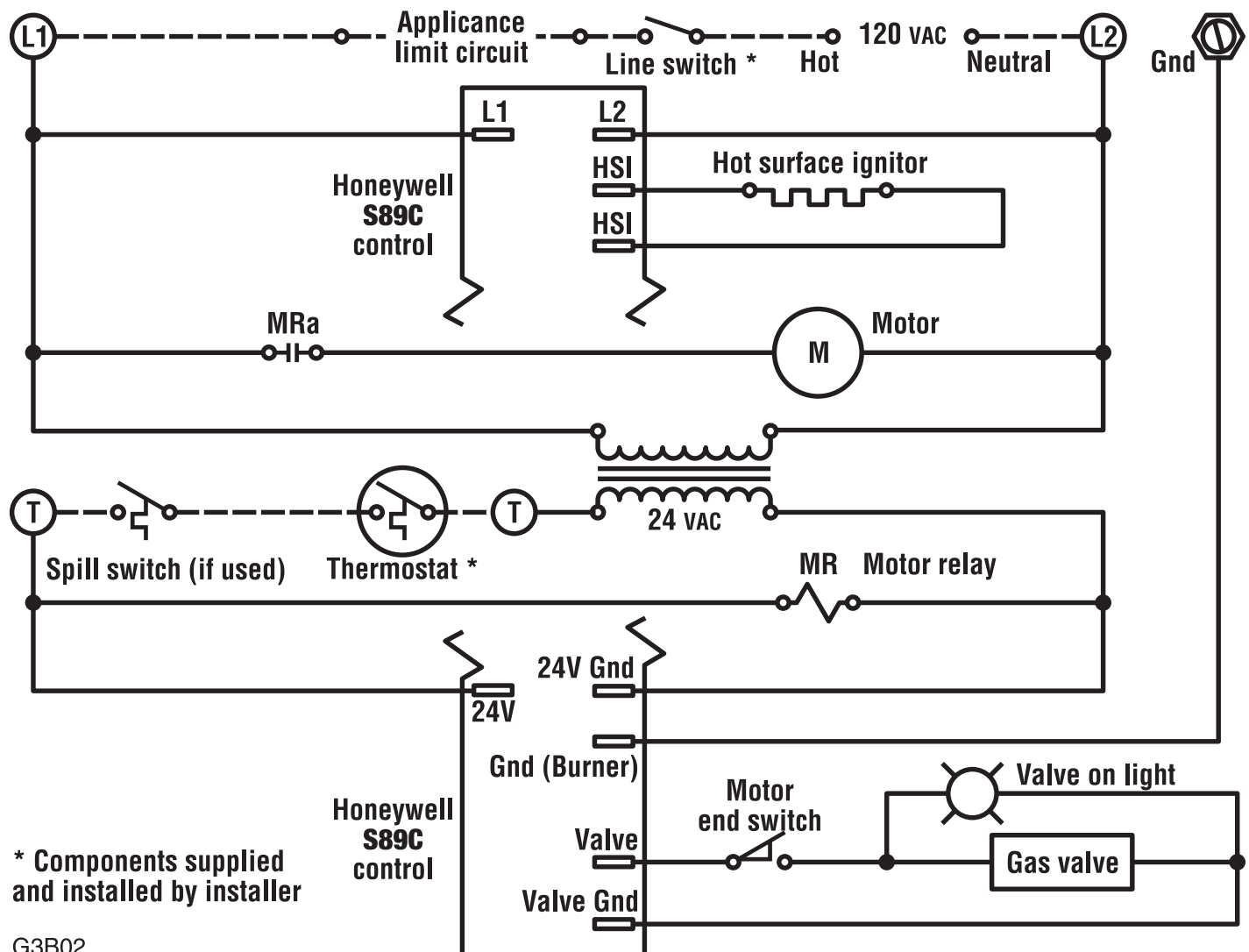
Label all wires before removing for servicing. Wiring errors could result in unsafe appliance/burner operation.

NOTICE Read appliance manufacturer's instructions completely before wiring burner.

Check polarity carefully. If hot and neutral wires are reversed at appliance power source, the control will not operate.

If replacing any of the wire supplied with the burner, use minimum #14 AWG 125°C or better.

Figure 6 Ladder wiring diagram



* Components supplied and installed by installer

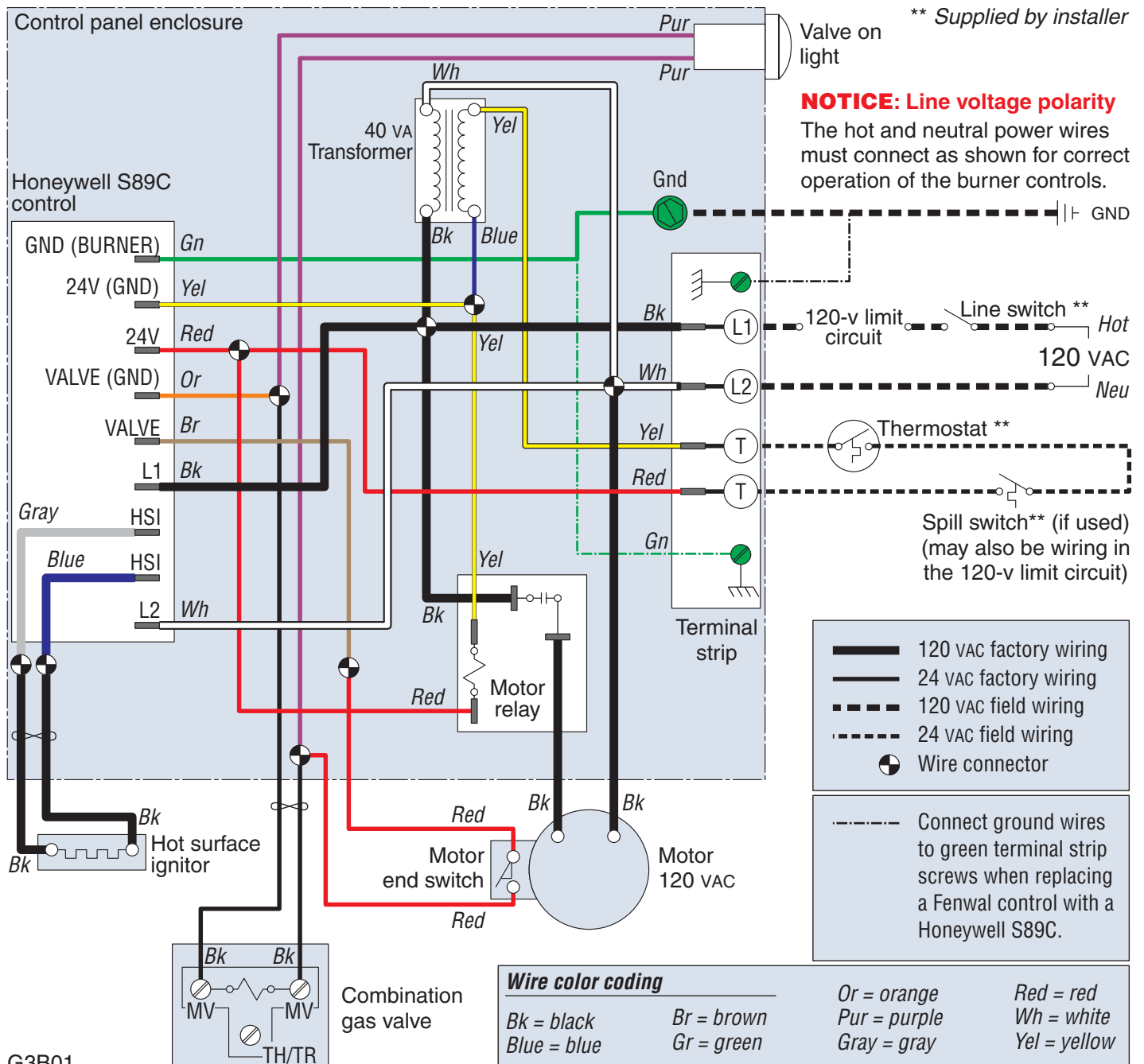
3. Wire Burner *(continued)*

Verify power supply

1. The burner requires a 120VAC/60HZ/single-phase power supply. The current draw will be approximately 8.0 amps. Protect line with a 10-amp or 15-amp fuse or breaker.

- The 120 VAC power connections to the burner must be connected as shown in Figure 7. The control is polarity-sensitive, and will not work if the hot and neutral lines are reversed.
- Verify that the power supply to the burner is no less than 102 VAC nor more than 132 VAC.

Figure 7 Wiring diagram — wire routing



G3B01

4. Check System • Start-up Burner/Appliance

Inspect/check system

Before starting the burner and appliance, verify the system has been installed as directed by this manual and the appliance instructions.

Check gas piping for leaks

WARNING Disconnect the burner from the gas supply line if gas line test pressure will exceed 14 inches w.c. Exposing the burner combination gas valve to pressure higher than 14 inches w.c. can damage the valve seat, resulting in potentially unsafe operation.

You can usually test the gas piping by allowing the line to fill with gas to main regulator outlet pressure.

1. Shut off gas flow to all appliances connected to the meter.
2. If test pressure will be less than 14 inches w.c., turn the burner combination gas valve knob to OFF. **If test pressure will be higher than 14 inches, disconnect the burner from the gas line** by shutting off the main manual gas valve installed near the burner (per Figure 5, page 9) and disconnecting the ground joint union. See warning above.
3. Watch the gas meter dial. For a one half cubic foot per revolution dial, there should be no movement of the dial for at least 5 minutes. For larger volumes per revolution, increase this time proportionately.
4. If you detect a gas leak, locate the leak with a soap suds mixture and repair it. Then test the system for leaks again.

WARNING Do not test for leaks with an open flame. And do not use oxygen as a test gas. Either of these could cause an explosion, resulting in severe personal injury, death or substantial property damage.

Bleed gas line

Purge all air from the gas line. Purge to outside of the building, NEVER into the appliance or burner.

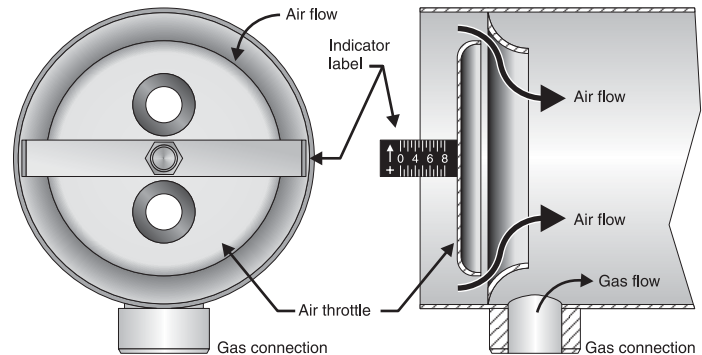
Leak test near-burner gas piping

If piping near burner has not already been pressure tested, open main manual gas valve on supply to burner and smell around area for any signs of gas. Apply a soap suds mixture to all gas piping joints near burner and check for any leaks. If any leaks appear, repair before proceeding and retest.

Set air throttle

1. See Figure 8. Loosen air throttle locking nut.
2. Rotate the air throttle plate clockwise to the closed position.
3. Check the air throttle indicator. The “0” position of the indicator should be even with the end of the air inlet tube. If not, bend the arm slightly until the indicator reads zero.
4. Rotate air throttle until indicator points to setting given in Figure 4, page 8.
5. Tighten air throttle locking nut.

Figure 8 Air throttle adjustment



6. The Figure 4 setting will probably be satisfactory without change. If the combustion test indicates a need for more or less air, however, you will have to adjust the throttle accordingly.

Check burner and Honeywell S89C control

Inspect burner thoroughly. Verify all components are secure and burner is in good condition. Verify all wiring is in place and all components are secure and in position.

Verify flame failure lockout of Honeywell control

1. Install a hose barb fitting in the combination gas valve outlet pressure tap and connect with a hose to a U-tube manometer.
2. Close the main manual gas valve and turn the combination gas valve knob to ON.
3. Turn on power to appliance and set appliance limit(s) to call for heat.
4. Burner motor will start. The Honeywell S89C control will run the blower for 34 seconds (pre-purge and ignitor warm-up). Then the combination gas valve will open and the “Valve on” light will light. (The manometer should show almost no pressure, because the main manual gas valve is closed.)
5. After 6 seconds, the S89C will lockout. The ignitor will shut off and the gas valve will close. Turn off power or interrupt thermostat circuit for 45 seconds. The control should reset. Turn off power and set controls to stop call for heat.
6. If lockout does not occur, replace the S89C control.

WARNING Do not start the burner if you smell gas or if there may be gas present in the appliance combustion chamber, heat exchanger or the vent system. An explosion could occur, causing severe personal injury, death or substantial property damage.

WARNING During initial start-up, you must be constantly alert for emergency conditions such as fuel leaks, electrical malfunctions, etc. Familiarize yourself with the location of manual shutoff valves and switches so you can quickly use them if needed.

WARNING If the burner fails to ignite, NEVER attempt to manually bypass the normal sequence of the control, which provides purging of the combustion chamber.

4. Check System • Start-up Burner/Appliance *(continued)*

Installer/servicer

WARNING

Should overheating or an emergency occur, immediately:

- Shut off main manual gas valve.
- Shut off power to burner.

NOTICE: Under some circumstances power should remain on for water pumps or circulating blowers. Determine proper response before attempting start-up.

If burner fails ignition on several attempts, close gas valve and use burner blower to purge appliance before restart.

Before starting burner, verify:

- Burner/appliance installed per appliance instruction manual?
- Burner orifice size and air throttle verified against Figure 4, page 8?
- Burner/appliance installed per all applicable codes?
- Installation site has adequate ventilation openings and vent system?
- Gas supply line in good condition and sized correctly?
- All gas line joints sealed with pipe dope listed for use with liquefied petroleum gases?
- Gas supply pressure to combination gas valve checked?
- Regulator installed if pressure can exceed 14 inches w.c.?
- Air purged from gas line?
- Gas piping checked for leaks?
- Wiring installed per burner and appliance instruction manuals?

Ignition and flame sensing

Ignition The G3B burner uses a silicon carbide hot surface ignitor for ignition. The Honeywell S89C primary control feeds 120 VAC power to the ignitor and allows time for the ignitor to warm up to ignition temperature during the burner pre-purge period.

Sensing The S89C primary control uses flame rectification to detect flame, with the hot surface ignitor acting as the “flame rod.”

Start-up & operation

WARNING

Do not start the burner if the combustion chamber contains residual gas. Allow gas to disperse. Failure to comply could result in severe personal injury, death or substantial property damage.

- Power ON** Open all manual gas line valves. Turn burner combination gas valve knob to “ON.” Close the line switch. (If burner does not follow sequence below, see troubleshooting suggestions on pages 19 and 20.)
- Stand-by** (No call for heat) Control waits for heat call.
- Call for heat** Set operating control and all limit controls to call for heat. The thermostat circuit must be closed and power coming to control panel L1 and L2 terminals
- Burner on** The *motor* starts. The hot surface *ignitor* starts. The motor centrifugal switch makes.
- Pre-purge** The primary control allows 34 seconds for pre-purge and ignitor warm-up.
- Gas valve on** After the pre-purge/ignitor warm-up period, the primary control activates the *gas valve* (if motor centrifugal switch is closed). The green “Gas valve on” light turns on.
- TFI** The primary control turns off the ignitor within 2 to 6 seconds after gas valve activation. When the control deactivates the ignitor, it begins checking for flame signal. If flame is not detected within 6 seconds after gas valve activation, the primary control will **lockout** with continuous purge (see following).
- Run period** The burner continues firing during call for heat if the flame rod (hot surface ignitor) senses flame. The green “Gas valve on” light remains on during normal running, indicating gas valve is energized.
- Shutdown** When the call for heat ends, the primary control immediately deactivates the gas valve and blower. The burner returns to stand-by.
- Flame failure** If the primary control loses flame signal during a run period, it deactivates the gas valve within 2 seconds. The control restarts the heating cycle, beginning with a 34-second pre-purge/ignitor warm-up period, then a 6-second trial for ignition. If ignition/flame sensing is successful, the burner returns to normal operation. If the attempt is not successful, the primary control will **lockout**.
- Lockout** If the primary control does not sense flame within the TFI time limit after gas valve activation (6 seconds), **lockout** occurs. The control deactivates the gas valve. The blower motor continues to run, providing a post-purge of the burner and appliance.
- Reset** To reset after a **lockout**, turn off power to burner or interrupt the thermostat circuit for at least 45 seconds. Then restore power (or thermostat circuit). Burner should restart.

5. Perform Checkout Procedures • Fill Out Certificate

Make final burner adjustments

Check for leaks in gas piping

- Smell around burner to make sure there is no gas leak in near-burner piping. Verify integrity of gas line joints between combination gas valve and burner gas inlet tapping using soap suds mixture. Verify gas piping is fully supported, independently of burner.

Check for leaks from burner components

- Smell around burner to make sure there is no leakage from the burner inlet air tube, blower housing or air tube. Verify burner is properly supported and flange is securely tightened.

WARNING

If you detect leakage from any burner component, immediately close the main manual gas valve. Use a soap suds mixture to determine leakage location. Replace burner if leakage cannot be corrected by properly securing components. You may have to restart the burner several times during leakage testing since the control will lockout when flame is not detected. Failure to correct leakage problems could result in severe personal injury, death or substantial property damage.

Make final burner adjustments *(continued)*

Check/adjust gas valve outlet pressure

- With burner running, check manometer reading for combination gas valve outlet pressure. Adjust valve regulator if necessary so the reading is 3.5 inches w.c. for either natural gas or propane gas.

Inspect flame

- Look at flame through appliance observation port. The flame should be a soft blue with well-defined orange and yellow tips for natural gas, or well-defined yellow tips for propane gas. (If you make air or gas pressure changes later, inspect the flame again.)

Check the firing rate

- Natural gas only — Turn off all other gas appliances connected to the gas meter. Use a stopwatch to time the number of seconds for a flow of one cubic foot of gas (two revolutions for a one half cubic foot per revolution dial, for example). You will also need to know the gas heat content in Btu per cubic foot. Determine the actual input from: $INPUT = (3600 \times \text{Btu per cubic foot}) \div (\text{number of seconds for one cubic foot})$, for firing rate in Btuh. For example, for 1050 Btu per cubic foot natural gas, with meter timed at 30.2 seconds for one cubic foot of gas: $INPUT \text{ example} = (3600 \times 1050) \div (30.2) = 125,200 \text{ Btuh}$. Firing rate should be within $\pm 5\%$ of rated input for the appliance. Adjust the combination gas valve pressure regulator if necessary to obtain the correct firing rate. Valve outlet pressure must not be lower than 3.2 inches w.c. nor higher than 3.8 inches w.c.
- For propane gas, contact your propane supply for procedure to verify firing rate.

5. Perform Checkout Procedures • Fill Out Certificate *(continued)*

Make final burner adjustments *(continued)*

Check combustion using instruments

WARNING You must use combustion test instruments. Failure to properly verify/adjust combustion could allow unsafe operation of the burner, resulting in severe personal injury, death or substantial property damage.

Fuel	CO ₂		O ₂	
	Minimum	Maximum	Maximum	Minimum
Natural Gas	9.6%	10.8%	4.0%	2.0%
Propane Gas	11.0%	12.5%	4.0%	2.0%

- Insert test probe into vent above appliance to sample flue products. The results should show CO₂ or O₂ as follows:
- If the combustion results are outside the range above, and the firing rate of the burner is within 5% of rated input, open or close the air throttle until the CO₂ (or O₂) are acceptable.

WARNING After CO₂ (O₂) tests are completed satisfactorily, measure flue products for carbon monoxide (CO) concentration. The CO must not exceed 50 ppm adjust to “air free”, or other if specified by local codes.

- Adjust the draft in the appliance so the draft overfire is about -0.01 inch w.c. and take a flue gas sample from the combustion chamber. If CO₂ is noticeably lower overfire than in the vent, the appliance has leaks that must be repaired.

Make final burner adjustments *(continued)*

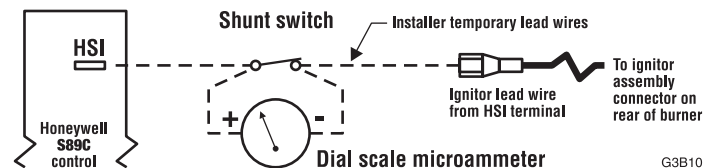
Check flame signal

WARNING Electrical shock hazard — Turn off power to burner before proceeding with setup for flame signal measurement.

- (See Figure 9.) The HSI is powered with 120 VAC during pre-purge so a microammeter with a shunt switch must be used to test flame signal or the meter will be destroyed. USE ONLY needle movement-type meters, not digital meters.
- Remove the ignitor lead wire from HSI terminal of the S89C primary control. Connect a shunt switch and DC microammeter between HSI terminal and the ignitor lead wire. Make sure shunt switch is **closed**. Then turn on power to the burner. After the burner flame starts, wait at least 15 seconds, then open shunt switch and read DC amps (must be at least 0.8 microamps DC).

CAUTION DO NOT start the burner or adjust the air throttle with the shunt switch open. The 120 V supply to the HSI will destroy the microammeter.

Figure 9 Flame signal measurement connections



G3B10

5. Perform Checkout Procedures • Fill Out Certificate *(continued)*

Verify burner/appliance operation

Check burner/appliance/controls operation

- Test operating and limit controls on appliance as specified in appliance instruction manual.
- Check operation of the S89C primary control, forcing lockout by closing the main manual gas cock and cycling the burner. See page 13 for procedure to reset the control.

Verify burner operation

- Start and stop the burner several times, allowing the primary control to sequence through normal operation. Verify correct operation of burner and control throughout. See page 13 for burner sequence of operation.

Verify vent system operation

- Verify vent is operating correctly and flue products are properly exhausted from building.
- Check operation of barometric damper and spill switch.
- If the building contains any exhaust fans or conditions that could affect vent performance, check burner/appliance/vent operation with exhaust fans (or other conditions) operating.

Prepare burner for normal operation

- Cycle burner off with appliance controls. Then turn off power to the appliance.
- Close the main manual gas valve.
- Remove the U-tube manometer line from the combination gas valve outlet pressure tap hose barb. Remove hose barb and replace 1/8" NPT pipe plug in tapping.
- Verify all components and wires are in place and burner is ready for operation.

Train the user

- Train the user to operate the burner and appliance under normal conditions. Explain procedure to shut down burner/appliance when required.
- Review the user information section of this manual (and the appliance manual) with the user.
- Verify the user is aware of all procedures specified in the manual.
- Verify user will not store or use combustible liquids or materials or contaminants in the vicinity of the burner/appliance.

6. Maintenance and Service Procedures

Annual start-up & service

WARNING This burner should be started and serviced at least annually by a qualified service technician. Failure to properly maintain and service the burner could result in severe personal injury, death or substantial property damage.

WARNING Turn off power to appliance and close main manual gas valve when servicing burner. See WARNINGS on page 2 and elsewhere in this manual regarding correct procedures. Failure to comply could result in severe personal injury, death or substantial property damage.

- Discuss burner/appliance operation with user to determine any problems that may have occurred during the previous season and to verify user is aware of proper operation and care of the burner/appliance.
- Turn off power to appliance and close main manual gas valve.
- Remove burner from appliance and inspect flame holder, hot surface ignitor and burner components.
- Inspect ignitor and ignition tube assembly.
 1. The hot surface ignitor (HSI) is a silicon carbide element that performs dual functions of ignition and flame detection. On a call for heat, the ignitor is powered with 120 vac and is electrically heated to about 2600°F. This ignites the gas/air mixture when the primary control energizes the gas valve.
 2. The primary control then switches the HSI to the flame detector circuit, using flame rectification to monitor the flame.
 3. The ignitor is positioned in the ignition tube assembly against a factory-set non-adjustable stop ring for proper ignition and flame sensing.
 4. To inspect the HSI, first be sure the 120 vac power supply to burner is disconnected. Then slide the two silicone insulating boots off of the insulators.
 5. Pull off the quick-disconnect terminals.
 6. Remove the four #8-32 screws securing the air tube back plate.

Annual start-up & service *(continued)*

7. Swing the hold-on bracket away and carefully pull out the ignition tube assembly.

CAUTION As the white ceramic is exposed, support it using a rag. It could be HOT. Do not let the hot surface ignitor element bump into anything. Do not drop the assembly or ignitor element. The element is very fragile. Even a small hairline fracture will destroy the HSI.

8. If the ignitor element is damaged in any way, replace it with a new one.
 9. If replacing the ignition tube assembly in the burner, replace the back plate gasket with a new one. Replace the hold-on bracket and screws. Ensure the back plate gasket is sealed gas-tight to the burner air tube.
- Inspect and clean flameholder.
 1. Remove the ignition tube assembly from the burner as described in the steps for inspecting the hot surface ignitor.
 2. Reach in and, with one finger through the center hole of the flameholder, pull the flameholder out of the burner air tube.
 3. Use a small brush to remove dirt and lint from the inside surface of the flameholder. All holes must be clean and unobstructed.
 4. If the flameholder is damaged, dented or defective in any way, replace it with a new one.
 5. Replace the flameholder in the air tube.
 6. Replace the ignition tube assembly as described in the steps for inspecting the hot surface ignitor. Be sure to install a new back plate gasket and seal assembly to air tube gas-tight.
 7. Follow the instructions on page 8 to inspect the hot surface ignitor.
- NOTICE** If the inside surface of the air tube needs to be cleaned, clean with a vacuum cleaner with brush attachment while the ignition tube assembly is out of the burner.
- Check the burner flange gasket. It must be in good condition. Replace gasket on burner flange and mount burner in appliance, securing to mounting studs.
 - Perform the complete checkout procedures of pages 12 through 17, including system inspection and checks.

6. Maintenance and Service Procedures *(continued)*

Maintenance/service procedures

Cleaning blower wheel

- Periodically inspect and clean the blower housing and wheel.
 1. The best time to clean the blower housing and blower wheel is while the ignition tube assembly is out of the air tube (see “Inspect ignitor and ignition tube assembly”).
 2. Remove the four #8-32 slotted screws in the motor mounting plate.
 3. By pulling about 1” of slack in the motor wires from the control box, the motor blower/wheel assembly can be pulled out and rotated to a good position for cleaning the blower wheel.
 4. With a small brush or pipe cleaner, remove all dirt from the blades in the wheel.
 5. With a clean rag, wipe out all the dirt from inside the blower housing.
 6. Dirt that drops into the burner tube must be removed while the ignition tube is out.
 7. Replace the motor plate gasket with a new one.
 8. Replace the motor blower wheel assembly, being very careful that the gasket on the motor mounting plate makes a gas-tight seal against the blower housing cover.

Maintenance/service procedures *(continued)*

Replacing blower motor or wheel

Follow this procedure to replace motor or wheel.

1. Remove the four #8-32 screws in the motor mounting plate.
2. Pull about 1” of slack in the motor wires from the control box. Then pull out and rotate the motor/blower wheel assembly.
3. Loosen Allen set screw in blower wheel hub and take the wheel off the motor shaft.
4. Remove four #8-32 nuts holding motor to mounting plate. Be sure to take the four nylon washer seals from the motor studs and save for the new motor. Also remove the nylon motor bushing. Save the motor bushing for use with the new motor.
5. Disconnect the motor wires from their wire nuts in the control panel, keeping track of their locations.
6. Connect the new motor wires to their proper terminals.
7. Place the four nylon washer seals on the new motor studs and assemble the motor plate to the motor using the four nuts.
8. Replace the blower wheel with about 1/16” of shaft protruding beyond the hub.
9. Replace the motor plate gasket with a new one.
10. Replace the entire assembly, making sure that the gasket on the motor plate makes a gas-tight seal against the blower housing cover.

7. Troubleshooting

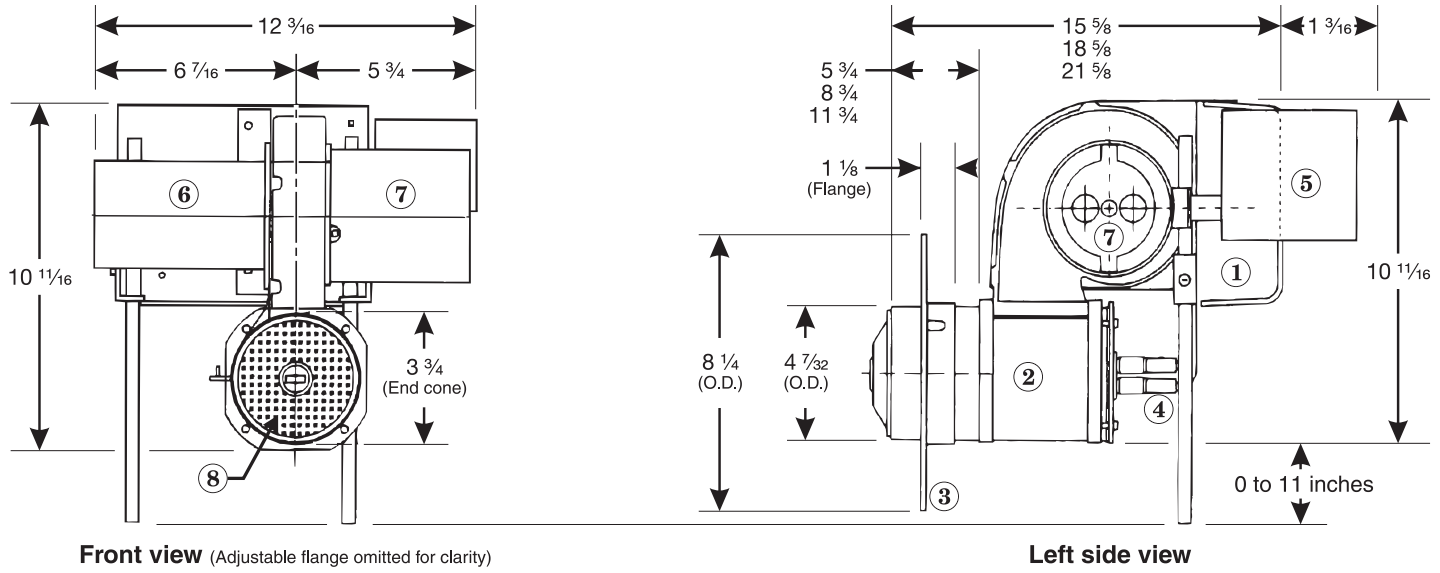
Problem	Possible cause	Corrective action
WARNING		These procedures must only be performed by a qualified service technician. Use care when performing tests on electrically or mechanically live parts. Disconnect power to burner/appliance and close main manual gas valve when removing components for service. Failure to comply could result in severe personal injury, death or substantial property damage.
Burner motor will not start	120 V power	Check 120 V at terminal strip. L1 - L2
		Check limit/operative circuit.
	24 V circuit	Check that 24 V thermostat/circuit is calling for heat.
		Check transformer output. Each "T" on terminal strip should read approx. 24 volts to "G" ground.
	Incorrect wiring	Check all field and factory wiring.
	Bad motor relay	Check 24 V at motor relay. Relay should click (pull-in) on call for heat.
		Check continuity across contacts (N.O.) or each side of contact to L2 on terminal strip should read 120 volts.
Bad motor	If motor relay is good (see above) and wiring is correct, disconnect the motor leads and power the motor directly with 120 V to check motor operation.	
Bad primary control	If all above tests prove negative replace control.	
Burner pre-purges for 34 seconds but does not light (continued on next page)	Incorrect air setting	For initial light-off set air throttle according to desired input.
	Wrong orifice size	Check orifice drill size.
	Manual gas shut-off valve closed	Check supply line gas cock and manual shut-off valve on combination gas valve.
	Manifold pressure	Adjust regulator to 3.5 W.C. for natural gas and propane.
	Gas valve not opening	Check for 24 V valve coil during TFI. Indicator light should also be on.
		Line pressure in excess of 14.0 W.C. can damage valve.
	Motor end switch not making	Check motor end switch.
		Disconnect the two red leads in the panel coming from the motor end bell. Check continuity during pre-purge. End switch will not activate if motor is not running up to speed.
	Hot surface ignition element damaged	Element normally glows red within 20 seconds during pre-purge. Use flame mirror to visually inspect.
		Check for 120 V at rear of ignitor assembly during pre-purge.
If visual inspection cannot be done, remove element and power directly with 120 V. Replace element if it does not glow red within 45 seconds.		

7. Troubleshooting *(continued)*

Problem	Possible cause	Corrective action
WARNING		These procedures must only be performed by a qualified service technician. Use care when performing tests on electrically or mechanically live parts. Disconnect power to burner/appliance and close main manual gas valve when removing components for service. Failure to comply could result in severe personal injury, death or substantial property damage.
Burner pre-purges for 34 seconds but does not light (continued)	Bad primary control	Check for 24 V on valve lead on control during TFI.
		Check for 120 V on HSI lead on control during pre-purge.
		Replace primary control if either above tests show negative.
Burner lights but primary control locks out after TFI	Incorrect air setting	For initial light-off, set air throttle according to desired input.
	Wrong orifice size	Check orifice drill size.
	Manifold pressure	Adjust regulator to 3.5 W.C. for natural gas or propane.
	Inadequate gas supply	Line pressure requirements are: 5.0 W.C. for both natural and propane fuels.
		Line pressure in excess of 14.0 W.C. could damage combination gas valve.
		Watch line pressure gauge during TFI. If pressure drops below minimum required when gas valve is energized look for partially closed gas cocks in line, other appliances using the same supply or improperly adjusted intermediate regulators.
		If other appliances are on the same supply line and piping will not sustain adequate pressure for all units on that piping, then it is undersized. Check with gas utility.
	Insufficient flame signal	Check flame signal. Minimum signal 0.8 DC microamps.
Improper draft	Improperly adjusted air throttle setting for the fuel input.	
	Over-fire draft is normally -0.01 W.C. Refer to boiler/furnace manufacturer's recommendations for specially packaged units.	
Polarity	Check 120 V at L1 on terminal strip.	

8. Dimensions and mounting information

Figure 10 Dimensional data

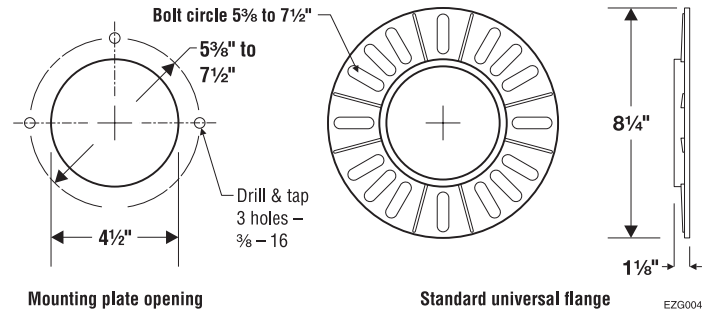


Mounting burner to appliance

WARNING The universal flange supplied with G3B Gas burners is intended only for firing chambers with negative overfire pressure. The G3B burner must not be installed on a product that operates with a pressurized combustion chamber. Failure to comply could result in severe personal injury, death or substantial property damage.

Prepare the burner opening on the front of the appliance as shown in Figure 11. See page 6 to determine the location of the flange on the burner air tube. Tighten the flange locking screws firmly.

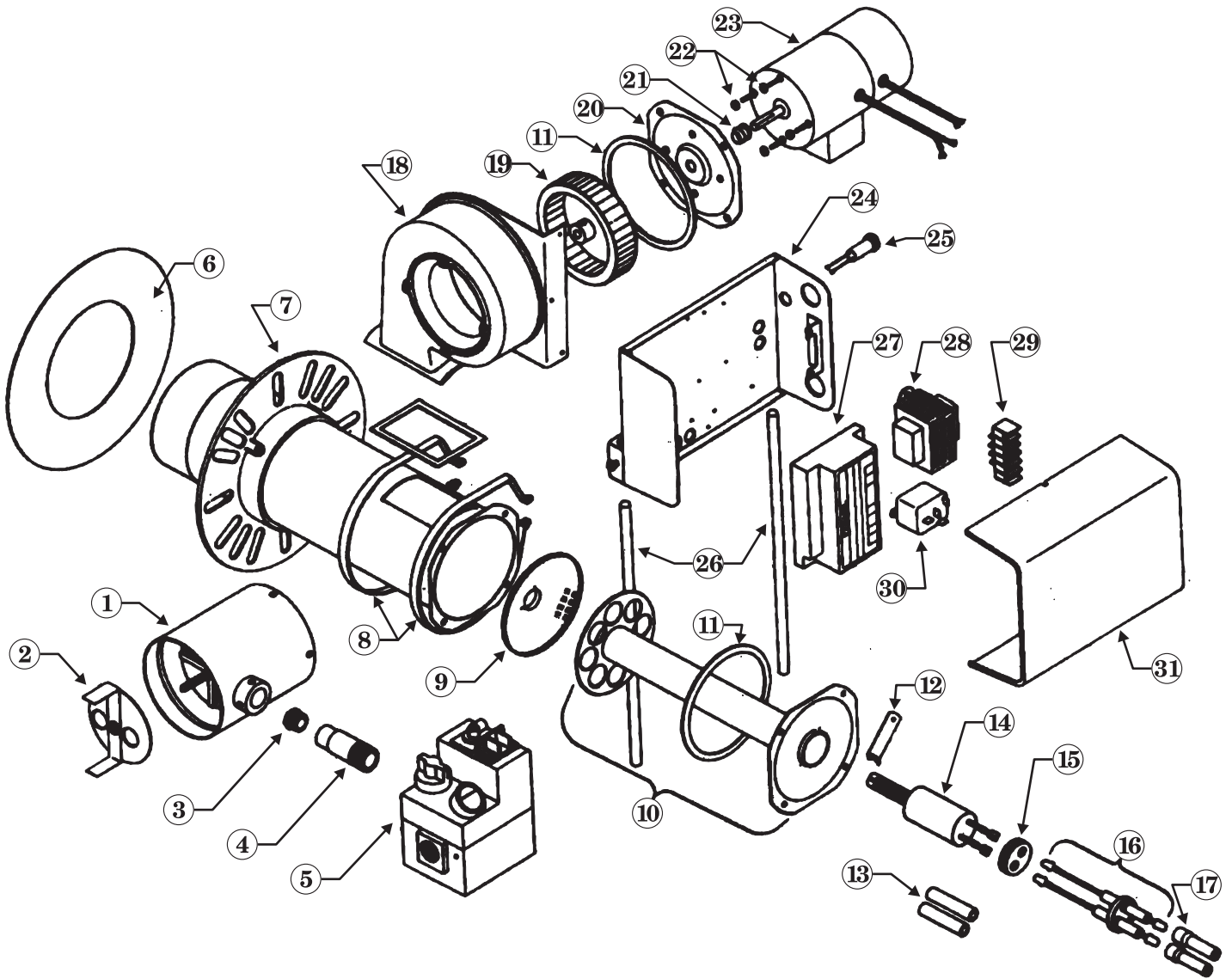
Figure 11 Universal flange mounting



9. Replacement parts

Item number	Description	Part number	
1	Air Inlet Tube Assembly	50823	
2	Air Throttle	50757	
3	G3B Orifice, No. 33 drill (.113 dia.), Propane 60,000 BTUH, drill open for other rates	60582	
4	Orifice Nipple	61663	
5	Gas Valve, dual, 24-volt (1/2" X 1/2" LH-outlet)	41053	
6	Gasket, mounting flange	40287	
7	Air Tube/Flange Assembly, 3-3/4 ID Flame Ring	G3B 6", overall length approx. 9-7/8" G3B 9", overall length approx. 12-7/8" G3B 12", overall length approx. 15-7/8"	Not Field Replaceable
8	Air Tube Housing Clamp (2 required)	50807	
9	Flameholder	57117	
10	Ignition Tube Assembly with gasket	6", overall length approx. 10-9/16" 9", overall length approx. 13-9/16" 12", overall length approx. 16-9/16"	97875 97876 97877
11	Gasket, motor mounting ring & air tube back plate (2 required)	40402	
12	Electrode Hold-in	54858	
13	Insulator Tube (2 required)	74617	
14	Hot Surface Ignitor, NORTON 120-volt, 5-3/8" OAL	87197S	
15	Gasket, ignitor assembly	40360	
16	Rear Ignitor Assembly	6", overall length 7-1/2" 9", overall length 10-1/2" 12", overall length 13-1/2"	46631 46656 46615
17	Ignition Terminal boot (2 required)	9788401	
18	Housing and cover plate (with liquid gasket)	45856	
19	Blower Wheel, 4" OD x 1" wide, 5/16" bore, CCW rotation facing open end	28613	
20	Motor Mounting Ring	51060	
21	Bushing, motor shaft, nylon	34686	
22	Washer, motor stud, nylon (4 required)	30577	
23	Burner Motor, 1/50 hp, 3300 rpm, 115-volt, 60-hz, permanent split capacitor with centrifugal switch, CCW rotation facing shaft	27789S	
24	Control Panel Base	61028	
25	Indicator Light, 24-volt	33936	
26	Pedestal Legs, 3/8" OD x 12" long (2 required)	61036	
27	Control, Honeywell No. S89C hot surface ignition primary control, with 6 sec. TFI	99564	
28	Transformer, 40-VA rating, 115-volt primary, 24-volt secondary	24315S	
29	Terminal Block	33944	
30	Motor Relay, 24-volt coil, SPST	35782	
31	Control Panel Cover less nameplate	61150	

9. Replacement parts (continued)



Installation/Service Certificate

Installation data

Burner model	Serial number	Measured firing rate, Btuh	Gas orifice drill size	Manifold gas pressure, IWC	Inlet gas pressure, IWC
O ₂ %	CO ₂ %	CO PPM	Flame Signal	Fuel (natural or propane)	Were controls tested?

Comments about installation/start-up:

Installer's name:	Company name:	Company address:	Phone:
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Service history

Date	Technician	Company/address	Describe work performed