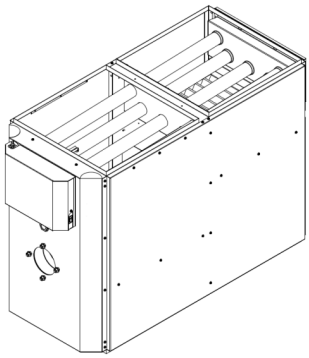
Installation, Operation and Service Manual

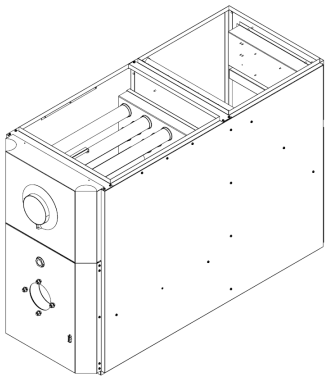
KLR / KLF series

80% + EFFICIENCY
GAS FIRED CATEGORY
LOWBOY FURNACE

KLR-100 GAS
KLR-200 GAS
KLF-200 GAS



KLR-100
Illustration



KLF-200

INSTALLATIONS MUST MEET ALL LOCAL AND FEDERAL CODES THAT MAY DIFFER FROM THIS MANUAL

Please read the manual in its entirety before beginning installation. This manual must be kept with the furnace for future reference.

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2020-07-16 **G2014-E1G Rev.B**

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KLR-KLF
Gas

WARNING: If the information in this manual is not followed exactly, a fire or explosion may result, causing property damage, personal injury or death.

- **Do not store or use gasoline or other flammable vapors or liquid in the vicinity of this or any other appliance.**
- **WHAT TO DO IF YOU SMELL GAS**
  - **Do not try to light the appliance,**
  - **Do not touch any electrical switch; do not use any phone in your building,**
  - **Immediately call your gas supplier from an outside phone. Follow the gas supplier's instructions,**
  - **If you cannot reach your gas supplier, call the fire department.**
- **Installation and service must be performed by a qualified installer, service agency or the gas supplier.**

NOTE: THE BURNER INSTRUCTION MANUAL AND THE BURNER USER'S INFORMATION MANUAL ARE CONSIDERED PART OF THIS MANUAL AND THEIR INSTRUCTIONS MUST BE FOLLOWED EXCEPT WHEN SPECIFICALLY MENTIONNED IN THIS MANUAL.

1.0 IMPORTANT SAFETY ADVICE

Pleas read and understand this manual before installing, operating or servicing the furnace. To ensure you have a clear understanding of the operating procedures of the unit please take the time to read the **IMPORTANT SAFETY ADVICE section** of this manual.

- **Use only with Natural gas or Propane gas. Refer to the furnace rating plate.**
- **Install this furnace only in a location and position as specified in Section 3 of these instructions.**
- **Provide adequate combustion and ventilation air to the furnace space as specified in Section 3 of these instructions.**

  WARNING
  FIRE OR EXPLOSION HAZARD
  Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections, as specified in Section 5 of these instructions.

- **Always install furnace to operate within the furnace's intended temperature-rise range with a duct system that has an external static pressure within the allowable range, as specified in Section 5 of these instructions. See furnace rating plate.**
- **When a furnace is installed so that supply ducts carry air circulated by the furnace to areas outside the space containing the furnace, the return air shall also be handled by duct(s) sealed to the furnace casing and terminating outside the space containing the furnace.**
- **This gas-fired furnace is not intended for installation in a residential garage.**
- **This furnace is not factory approved for installation at altitude higher than 2000 feet.**
- **Excessive exposure to contaminated combustion air will result in safety and performance related problems.**

    - **Sample List of Contaminants to be Avoided**
        - **The recommended source of combustion air is to use the outdoor air supply. However, the use of indoor air in most applications is acceptable except as follows:**
            - **1. If the furnace is installed in a confined space it is recommended that the necessary combustion air come from the outdoors by way of attic, crawl space, air duct, or direct opening.**
            - **2. If outdoor combustion air is used, there must be no exposure to the installations or substances listed in "3" below.**
            - **3. The following types of installation may require OUTDOOR AIR for combustion, due to chemical exposures:**
                - **- Commercial buildings**
                - **- Buildings with indoor pools**
                - **- Furnaces installed in laundry rooms**

- **- Furnaces installed in hobby or craft rooms**
- **- Furnaces installed near chemical storage areas**
- **Exposure to the following substances in the combustion air supply may also require OUTDOOR AIR for combustion:**
  - **- Permanent wave solutions**
  - **- Chlorinated waxes and cleaners**
  - **- Chlorine based swimming pool chemicals**
  - **- Water softening chemicals**
  - **- De-icing salts or chemicals**
  - **- Carbon tetrachloride**
  - **- Halogen type refrigerants**
  - **- Cleaning solvents (such as perchloroethylene)**
  - **- Printing inks, paint removers, varnishes, etc.**
  - **- Hydrochloric acid**
  - **- Cements and glues**
  - **- Antistatic fabric softeners for clothes dryers**
  - **- Masonry acid washing materials**

WARNINGS

NEVER burn garbage or paper in the unit.
NEVER store combustible material around it.

CAUTION

DO NOT START THE BURNER UNTIL ALL FITTINGS, COVERS AND DOORS ARE IN PLACE. **DO NOT** TAMPER WITH THE FURNACE OR CONTROLS, CALL A QUALIFIED BURNER TECHNICIAN. **DO NOT** STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPOURS AND LIQUIDS IN THE VICINITY OF THIS UNIT OR ANY OTHER APPLIANCE.

DANGER

Do not use this furnace as a construction heater. Use of this furnace as a construction heater exposes it to abnormal conditions, contaminated combustion air and lack of air filtering. Failure to follow this warning can lead to premature furnace failure which could result in a fire hazard and/or bodily harm and/or material damage.

IMPORTANT

This manual contains instructional and operational information for the KLR / KLF GAS-FIRED FURNACE. Read the instructions thoroughly before installing furnace or starting the burner. Consult local authorities about your local FIRE SAFETY REGULATIONS. All installations must be in accordance with local state or provincial codes. Improper installation will result in voiding of warranty.

THE INSTALLATION OF YOUR GAS-FIRED FURNACE MUST CONFORM TO THE REQUIREMENT OF THE AUTHORITY HAVING JURISDICTION OR IN THE ABSENCE OF SUCH REQUIREMENTS, TO THE NATIONAL FUEL GAS CODE ANDSI Z223.1/NFPA 54 AND/OR NATIONAL GAS AND PROPANE INSTALLATION CODE CAN/CSA B149.1.

2.0 PRODUCT INFORMATION

CLEARANCE (minimum) TO COMBUSTIBLES

Top of Supply Plenum	1”	(25 mm)
Front (Maintenance)	24”	(610 mm)
Rear (Maintenance)	24”	(610 mm)
Side – Non-Access	1”	(25 mm)
Side – Access maintenance	24”	(610 mm)
Flue Pipe	9”	(229 mm)

Floor (Can be installed directly on combustible or non-combustible)

Furnaces for indoor installation on combustible flooring shall not be installed directly on carpeting, tile or other combustible material other than wood flooring.

DRAFT PRESSURE

Breech draft pressure	-0.01” wc minimum

AIR/BLOWER DATA

Maximum external static pressure	0.5” wc
Maximum cooling unit capacity	3.0 tons... KLR-100
	5.0 tons… KLR-200
	5.0 tons… KLF-200
Maximum air temperature rise	75 Degrees F
High Limit temperature	185°F
Thermostat anticipator	0.2 Amps

MOTOR/BLOWER

KLR-100: 1/2 hp 4 Speed / G10-8 DD or 1/2 hp ECM / G10-8
KLR-200: 3/4 hp 4 Speed / GT12-10DD or 3/4 hp ECM / GT12-10
KLF-200: 3/4 hp 4 Speed / GT12-10DD or 3/4 hp ECM / GT12-10

FAN/HIGH LIMIT CONTROL

Honeywell ST9103A1028 Fan Center & Thermo-Disk (7” stem)

FUEL

Natural gas or Propane gas

ELECTRICAL – 120 Volts, 60 Hz

Canada	Less than 12 amps, circuit protection 15 amps.
USA	13.3 amps, circuit protection 20 amps.

FLUE-PIPE CONNECTION
5” Chimney

CLEANOUTS
Rear Cover (KLR)
Front cover (KLF)
& Burner Opening

AIR FILTERS

KLR-100	20” x 20” x 2” non pleated UL approved
KLR-200	15” x 20” x 2” & 20” x 20” x 2” Pleated (500FPM) UL approved
KLF-200	15” x 20” x 2” (2X) Pleated (500 FPM) UL approved

PLENUM DIMENSIONS (KLR-100)

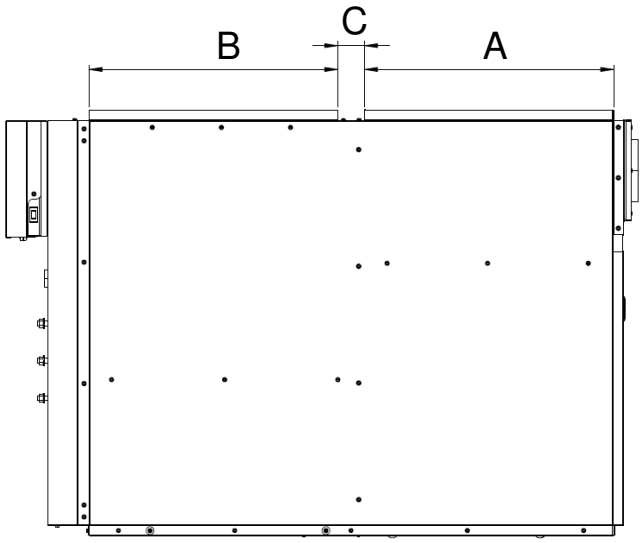
Cold air return	(A)	20” x 20”	(508 x 508 mm)
Hot air supply	(B)	20” x 20”	(508 x 508 mm)
Plenum spacing	(C)	2-1/8”	(54 mm)

PLENUM DIMENSIONS (KLR-200)

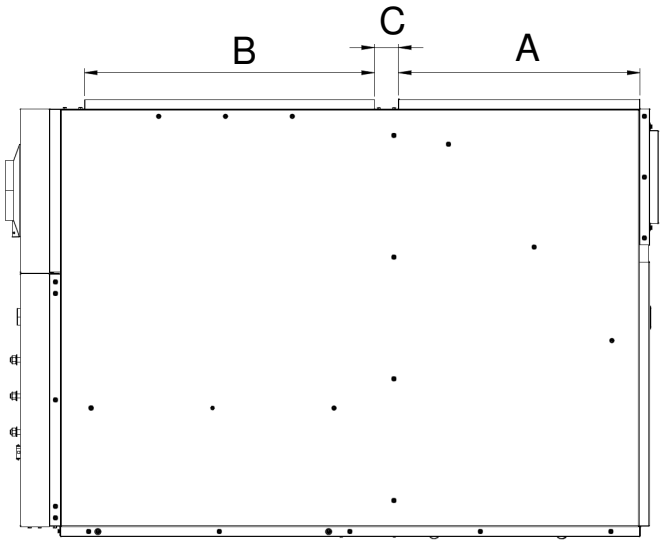
Cold air return	(A)	20” x 22”	(508 x 559 mm)
Hot air supply	(B)	20” x 24”	(508 x 610 mm)
Plenum spacing	(C)	2-1/8”	(54 mm)

PLENUM DIMENSIONS (KLF-200)

Cold air return	(A)	20” x 20”	(508 x 508 mm)
Hot air supply	(B)	20” x 24”	(508 x 610 mm)
Plenum spacing	(C)	2”	(51 mm)



KLR



KLF

DIMENSIONS (KLR-100)

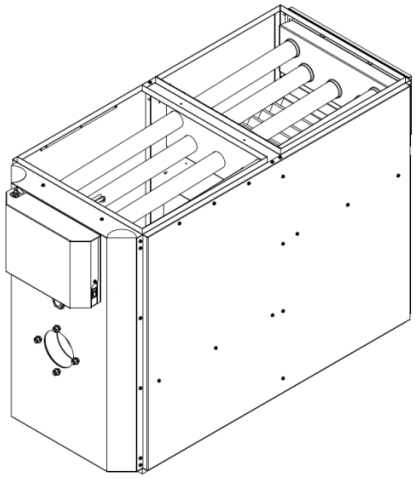
Depth	49-1/8”	(1248 mm)
Height	33”	(838 mm)
Width	21-1/2”	(546 mm)

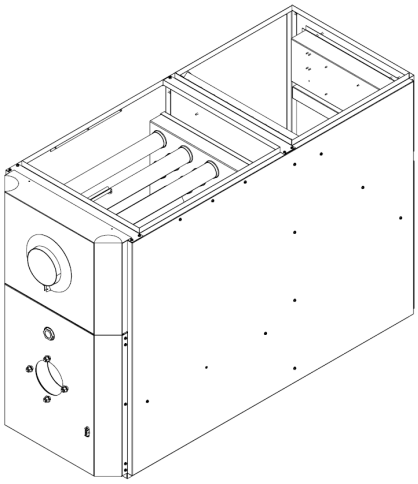
DIMENSIONS (KLR-200)

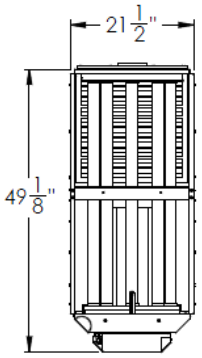
Depth	55-1/8”	(1400 mm)
Height	33”	(838 mm)
Width	21-1/2”	(546 mm)

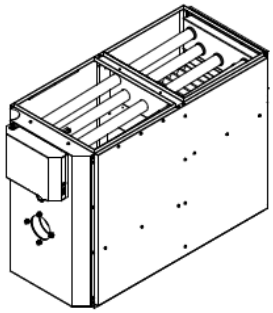
DIMENSIONS (KLF-200)

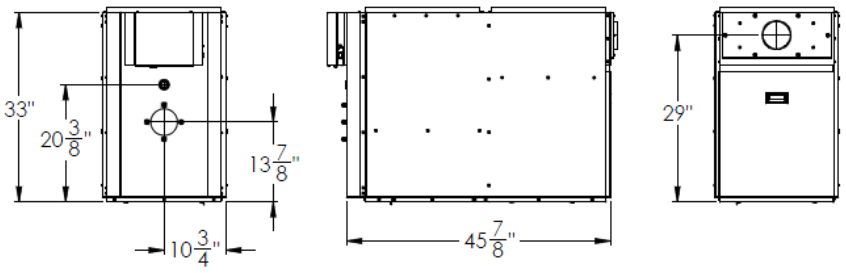
Depth	52-5/8”	(1337 mm)
Height	35-1/8”	(892 mm)
Width	21-1/2”	(546 mm)





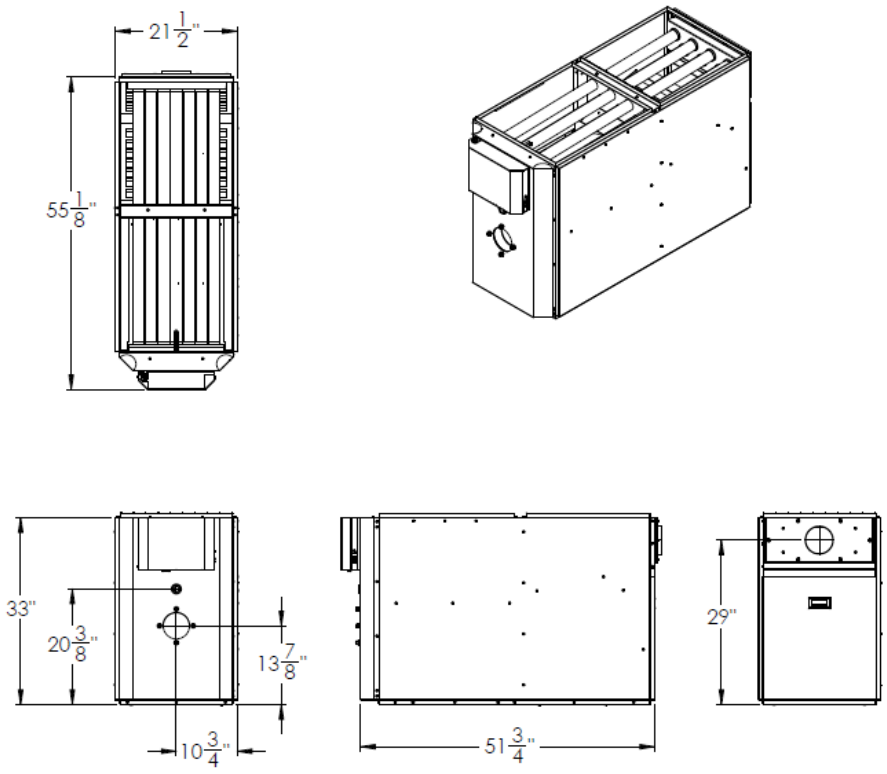






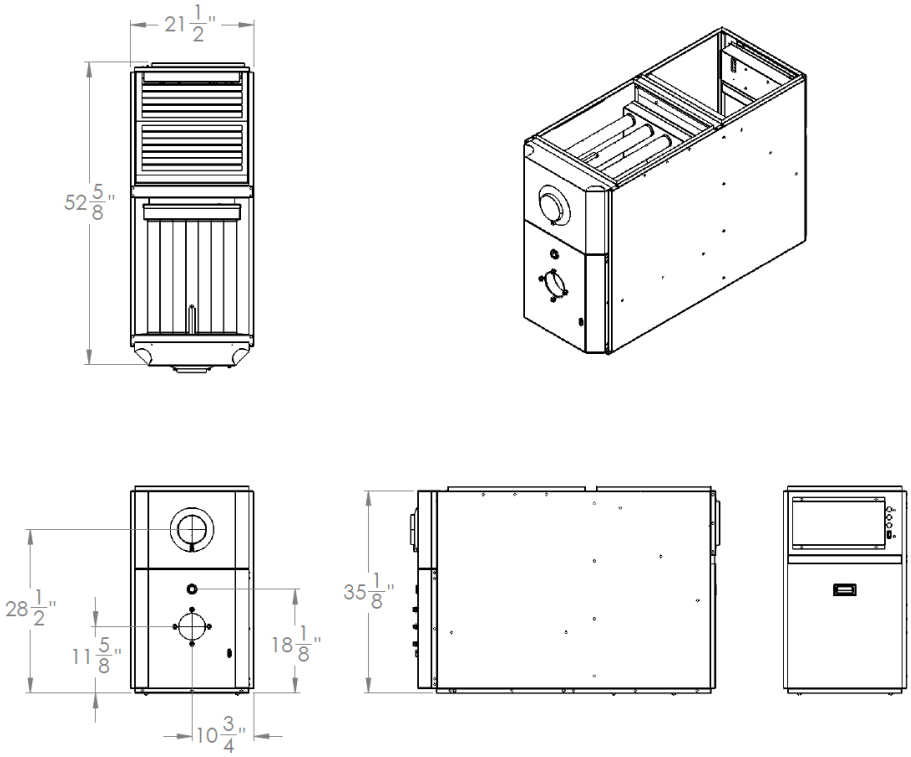
KLR-100 - DIMENSIONS

Dimensions are in inches



KLR-200 – DIMENSIONS

Dimensions are in inches



KLF-200 – DIMENSIONS

Dimensions are in inches

3.0 FURNACE INSTALLATION

GAS PIPING

Gas piping must conform to local requirements.

Install according to the applicable code such as **NATIONAL FUEL GAS CODE ANDSI Z223.1/NFPA 54 AND/OR NATIONAL GAS AND PROPANE INSTALLATION CODE CAN/CSA B149.1.**

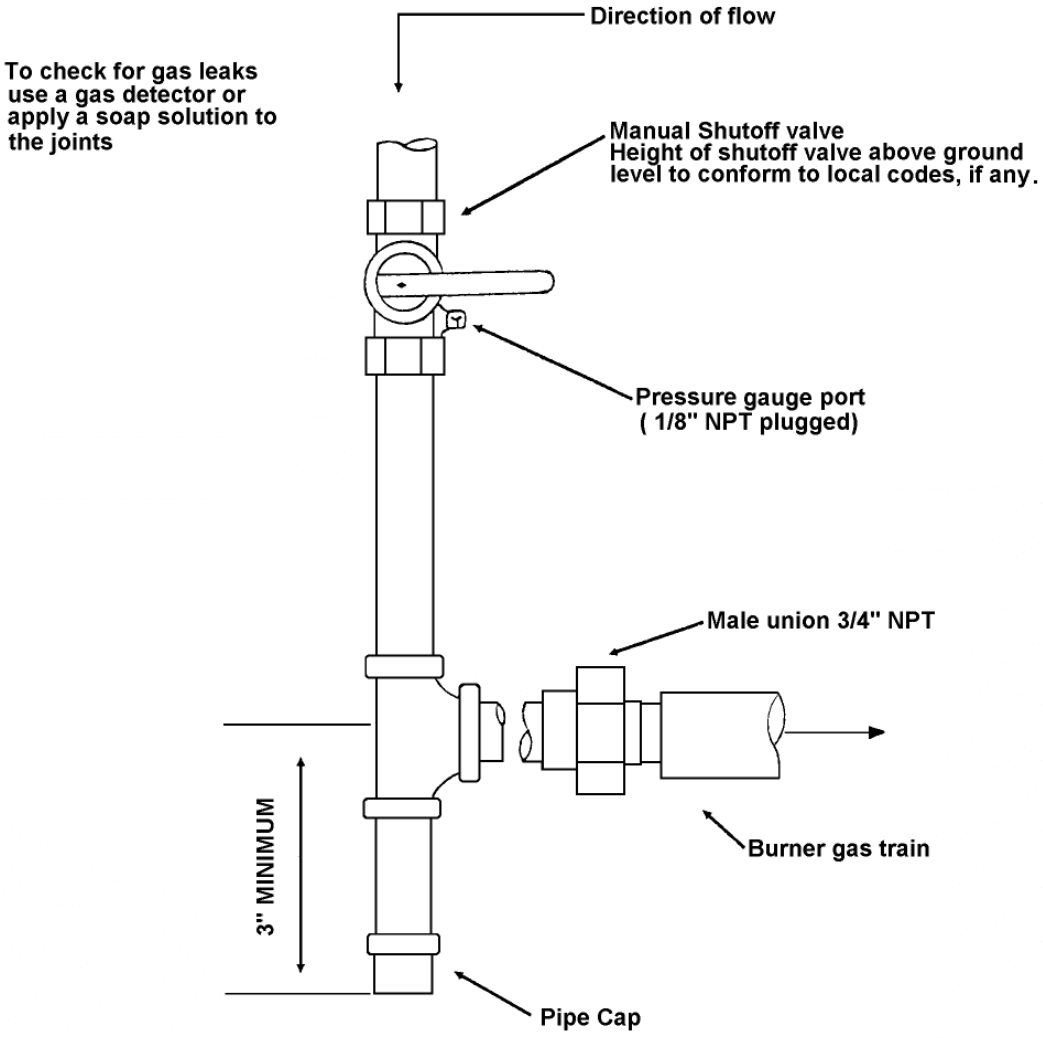
The gas piping must be installed between the gas meter and the combination gas valve (located upstream of the Riello gas burner on the furnace. The gas valve has a knob acting as a shut-off valve to stop gas flow. It is recommended to install a manual shut-off valve upstream of the gas valve to facilitate service of the gas valve. The gas valve also has pressure tapping for inlet pressure as well as outlet pressure. The outlet pressure of the gas valve is also referred as manifold pressure in this manual.

If local codes allow the use of a flexible gas appliance connector, always use a new listed connector. Do not use a connector which has previously serviced another gas appliance

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. In doubt consult CSA B149.1 or NFPA 54 or the authorities having jurisdiction.
- Do not hold gas valve with a 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. See the table below for guidance on pipe sizes.
2. When branching from a common gas line, do not tap from the bottom or 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 below.



GAS SUPPLY PRESSURE

- Maximum supply pressure: 13 inches W.C.
- Minimum supply pressure: 7” inches W.C.
-

WARNING:

- Do not expose the combination gas valve to gas pressures in excess of 14” W.C. The valve has a safety mechanism that interrupt the flow of gas over 14” W.C. In any event higher pressure could damage the valve seat, resulting in potentially hazardous conditions. When pressure testing at higher pressures, disconnect burner from gas line before testing.

- If the gas supply pressure can exceed 14 inches of 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 on the burner.
- The furnace and its gas connections must be leak tested before placing the boiler in operation.
- Enough combustion air should be provided to the gas-fired furnace in accordance with the section “Air for combustion and ventilation” of the National Fuel Gas Code ANSI Z223.1/NFPA 54 or clause 8,2, 8,3 or 8.4 of Natural gas and Propane installation code CAN/CSA B149.1, or applicable provisions of the local building codes.
-

TEST AND PURGE GAS LINE

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

Capacities thousand BTU/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 @ 0.60 specific gravity with a pressure drop of 0.3" W.C.					
0.50	92	63	50	43	38
0.75	190	130	105	90	79
1.00	350	245	195	170	150
1.25	730	500	400	350	305
Natural gas @ 0.60 specific gravity with a pressure drop of 0.5" W.C.					
0.50	120	82	66	57	50
0.75	250	170	138	118	103
1.00	465	320	260	220	195
1.25	950	660	530	460	400
Propane gas @ 1.55 specific gravity with a pressure drop of 0.3" W.C.					
0.50	142.5	97.5	77.5	67.5	60
0.75	295	202.5	162.5	140	122.5
1.00	542.5	380	302.5	262.5	232.5
Propane gas @ 1.55 specific gravity with a pressure drop of 0.5" W.C.					
0.50	185	127.5	102.5	87.5	77.5
0.75	387.5	262.5	215	182.5	160
1.00	720	495	402.5	340	302.5

PLACEMENT & VENTING

THE INSTALLATION OF YOUR GAS-FIRED FURNACE MUST CONFORM TO THE REQUIREMENT OF THE AUTHORITY HAVING JURISDICTION OR IN THE ABSENCE OF SUCH REQUIREMENTS, TO THE NATIONAL FUEL GAS CODE ANDSI Z223.1/NFPA 54 AND/OR NATIONAL GAS AND PROPANE INSTALLATION CODE CAN/CSA B149.1.

FLOOR SUPPORT COMBUSTIBLE – If required, support furnace on five (5) concrete blocks. Make sure the center of the furnace base is supported. For a furnace installed on a combustible floor, consult the applicable code and authorities having jurisdiction on this application. The floor must support the weight.

CHIMNEY/VENT Breech is certified for 5" vent pipe. Keep vent/flue pipe as short as possible with min. 1/4" per foot upward slope. Vent/flue pipes MUST NOT pass through a ceiling. Maximum flue gas temperature is 480°F.

ADDITIONAL CHIMNEY INFORMATIONS

WARNING

CARBON MONOXIDE POISONING HAZARD

Failure to follow the steps outlined below for each appliance connected to the venting system being placed into operation could result in carbon monoxide poisoning or death.

When an existing furnace is removed from a common venting system, the common venting system is likely to be too large for proper venting of the appliances connected to it. At the time of removal of the existing furnace, the following steps shall be followed with EACH appliance remaining connected to the common venting system, while the other appliances remaining connected to the common venting system are not in operation:

1. Seal any unused openings in the venting system.
2. Visually inspect the venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion and other deficiencies which could cause an unsafe operation.
3. Insofar as is practical, close all building doors and windows and all doors between the space in which the appliances remaining connected to the common venting system are located and other spaces of the building. Turn on clothes dryer and any appliance not connected to the common venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.
4. Place in operation the appliance being inspected. Follow the lighting instructions. Adjust thermostat operation so appliance will operate continuously.

5. Test for spillage at the draft regulator outlet / draft hood opening after 5 minutes of main burner operation. Use the flame of a match or candle, or smoke from a cigarette, cigar, or pipe.
6. After it has been determined that each appliance remaining connected to the common venting system properly vents when tested as outlined above, return doors, windows exhaust fans, fireplace dampers and any other gas-burning appliance to their previous condition of use.
7. Any improper operation of the common venting system should be corrected so the installation conforms with the National fuel gas code ANSI Z223.1/NFPA 54 and/or the Natural gas and propane installation code CAN/CSA B149.1. When resizing any portion of the common venting system, the common venting system should be resized to approach the minimum size as determined by the appropriate tables in chapter 13 of the National fuel gas code ANSI Z223.1/NFPA 54 and/or the Natural gas and propane installation code CAN/CSA B149.1.

- **Vent installations shall be in accordance with Part 10, Venting of Equipment, and Part 13, Sizing of Category I Venting Systems, CSA B199.1, of the National Fuel Gas Code, ANSI Z223.1/NFPA 54 , and/or Section 7, Venting Systems and Air Supply for Appliances, and Appendix C, Vent Sizing Tables for Category I Natural Gas and Propane Appliances, of the Natural Gas and Propane Installation Code, CSA B149.1, the local building codes, furnace and the vent manufacturer's instructions.**
- **Multistory common venting is not permitted for the KLR/KLF gas fired furnaces.**
- **KLR/KLF gas fired furnaces MUST be vented vertically.**
- **The furnace shall be connected to a factory built chimney or vent complying with a recognized standard, or a masonry or concrete chimney lined with a lining material acceptable to the authority having jurisdiction. Venting into an unlined masonry chimney or concrete chimney is prohibited.**

For furnaces for connection to gas vent or chimneys such as the KLR/KLF furnace, vent installation must be in accordance with "Venting of equipment" of the National fuel gas code ANSI Z223.1/NFPA 54 or "Venting systems and air supply for appliances" of the Natural gas and propane installation code CAN/CSA B149.1, or applicable provisions of the local building codes.

Vent connectors serving appliances vented by natural draft shall not be connected into any portion of mechanical draft system operating under positive pressure.

Use of cellular core PVC (ASTM F*891), cellular core CPVC or Radel (Polyphenolsulfone) in venting systems shall be prohibited. Connecting non-metallic vent pipe and fittings with thermal insulation shall be prohibited.

Horizontal portions of the venting system shall be supported to prevent sagging by installing support every 36 inches. The horizontal runs must be sloping upwards not less than ¼ inch per foot from the boiler to the chimney connector.

A furnace shall not be connected to a chimney flue serving a separate appliance designed to burn solid fuel.

Provisions for adequate combustion and ventilation air shall be in accordance with one of the following:

1. Section 5.3, Air for Combustion and Ventilation, of the National Fuel Gas Code, ANSI Z223.1/NFPA 54 ,

2. Sections 7.2, 7.3 or 7.4 of Natural Gas and Propane Installation Code, CSA B149.1 ,

3. Applicable provisions of the local building code.

CONDENSATION **If you have condensation in your chimney, make sure that the chimney size is according to the tables in THE NATIONAL FUEL GAS CODE ANDSI Z223.1/NFPA 54 AND/OR NATIONAL GAS AND PROPANE INSTALLATION CODE CAN/CSA B149.1. The temperature at the entrance of the chimney can be increased by insulating the flue-pipe between the furnace and the chimney base. If this is not sufficient, consider cutting or removing some flue baffles in the furnace.**

CHIMNEY/VENT Furnace is approved for factory built chimney type “L” vents. Breech is certified for 5” vent pipe. Keep vent/flue pipe as short as possible with min. 1/4” per foot upward slope. Vent/flue pipes MUST NOT pass through a ceiling. Maximum flue gas temperature is 575°F.

COMBUSTION & VENTILATION AIR Install openings and ductwork to the furnace room providing fresh outside combustion and circulation air for cooling the furnace casing, as installation code requires. If installed in a closed room, provide two free air ventilation openings of at least 8” x 12” (96 sq. in.) free flow area near ceiling and floor. Gas burners must have sufficient air to allow vent systems to operate properly.

DRAFT Use approved **DOUBLE ACTING** draft control supplied for 5” pipe. Set specified draft minimum pressure of -0.01” wc. **THE CHIMNEY MUST BE EQUIPPED WITH A DOUBLE ACTING DRAFT REGULATOR. FAILURE TO COMPLY WITH THIS MAY RESULT IN IMPROPER OPERATION LEADING TO POTENTIAL DANGEROUS OPERATION OF UNIT AND INJURIES TO PERSON AND LOSS OF LIFE.**

ELECTRICAL

Wire according to the National Electrical Code (Canadian Electrical Code in Canada) or local codes. Use a separately fused #12 electrical line directly from the service panel to the furnace junction box. Install a manual shut-off switch at the door or stairway to furnace room so furnace can be shut off remotely.

The furnace must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code, ANSI/NFPA 70, and/or the Canadian Electrical Code , CSA C22.1, Part 1, if an external electrical source is utilized

The wiring shall conform with the temperature limitations of 63°F (35°C) rise.

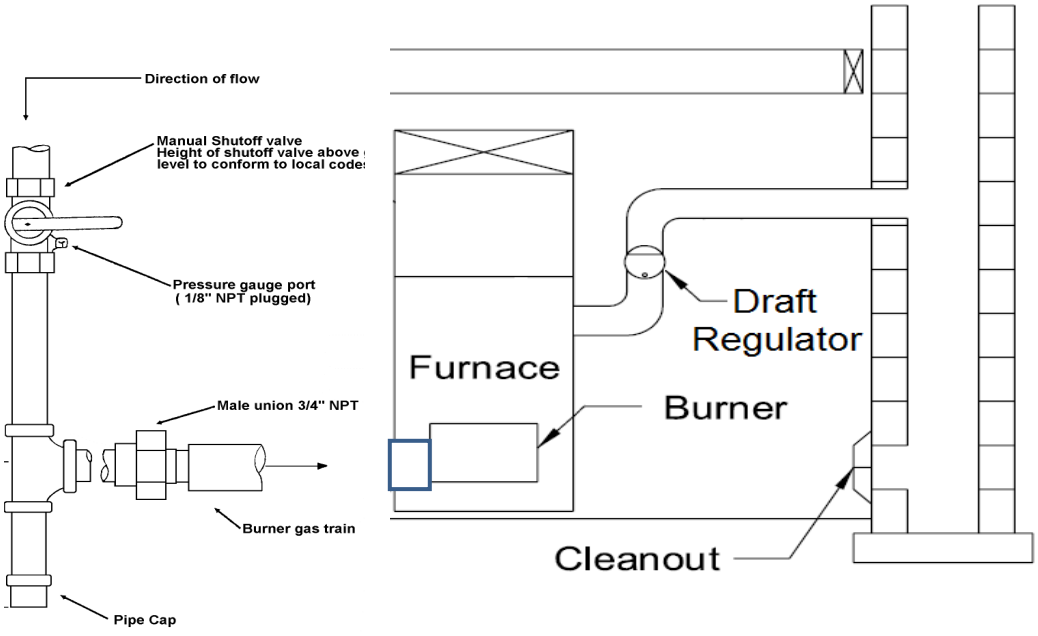
The furnace shall be installed so the electrical components are protected from water.

CLEARANCES

Before placing unit, review installation clearances as shown on furnace operating decal or section **PRODUCT INFORMATION**.

LOCATION

Install the furnace close to chimney and central to ductwork.



4.0 ACCESSORIES INSTALLATION

BLOCKED VENT SWITCH (BVSO) FOR CANADIAN APPLICATION ONLY

This gas fired appliance MUST be installed with a blocked vent switch system on the chimney. A safety switch is included with the furnace to perform this function. It is the installer's responsibility to install the switch in accordance with the instructions provided. Not applicable for Direct Vent systems. **Field Controls Model: WMO-1 (Manual Reset)**

Switch Operation
Blocked vent switches are flue gas safety devices for detecting spillage of flue gases due to a blocked flue or inadequate draft. After detecting a problem, the switch de-energizes the system's burner control.
NEVER reset the switch unless the cause of the blockage has been corrected.

Installation

1) Drill a 5/8" hole in to the flue vent pipe near the appliance breech connection.
2) This hole must be before the draft regulator, vertically or horizontally.
3) Remove one of the securing nuts from the threaded tube of the safety switch.
4) Tighten the other securing nut onto the pipe as far as possible (Figure 1).
5) Insert the threaded tube end into the pierced hole of the flue vent pipe.
6) Install the securing nut on the safety switch tube, which protrudes into the flue vent pipe. Tighten the nut securely (Figure 1).

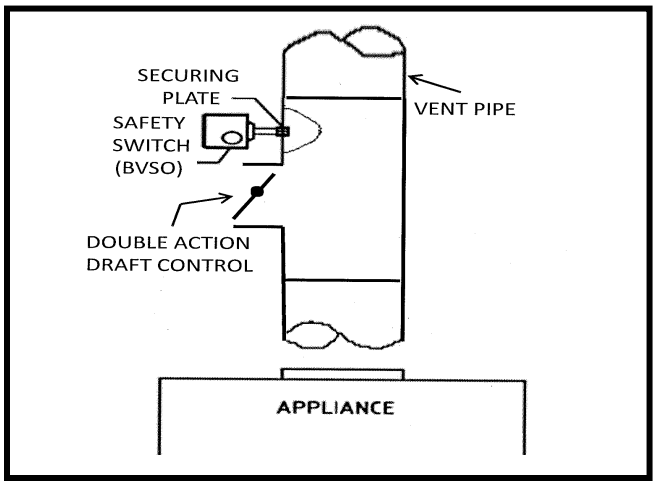


Figure 1 - Illustration Granby Industries

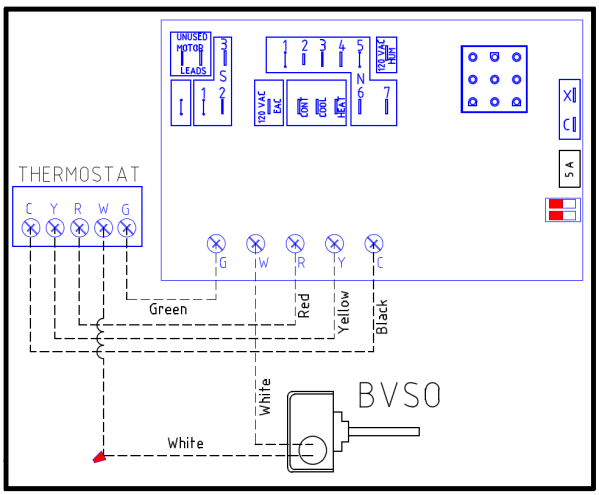


Figure 2 - BVSO wiring diagram

Wiring Instructions (BVSO)
Caution: Disconnect the electrical power when wiring the unit.

Wire the blocked vent switch in accordance with The National Electrical Code and applicable local codes. Wire the safety switch (BVSO) in series with the thermostat and the fan timer relay control (Figure 2).

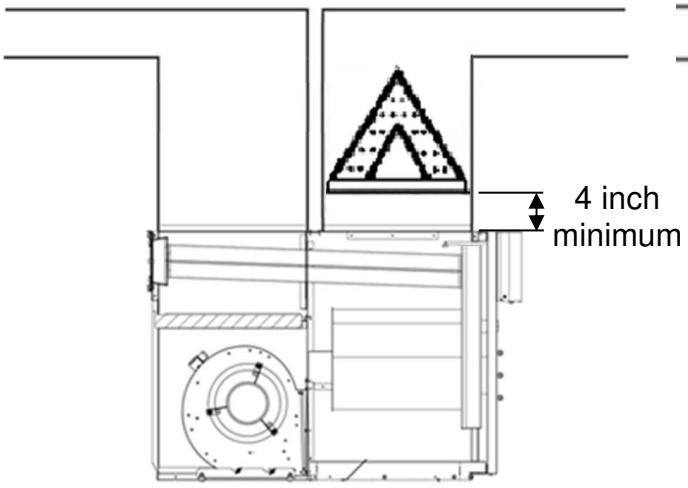
System Test Procedure (BVSO)

1) With the power re-established, block the chimney or vent pipe downstream of the switch.
2) Adjust the thermostat to call for heat.
3) Once the heating system has started the blocked vent switch should shut down the burner within 10 minutes or sooner.
4) Once the system has cooled, the blocked vent switch can manually be reset.
5) This procedure should be tested a second time.
6) After testing the blocked vent switch the chimney should be cleared of obstruction and the heating system should be tested over a long run cycle.

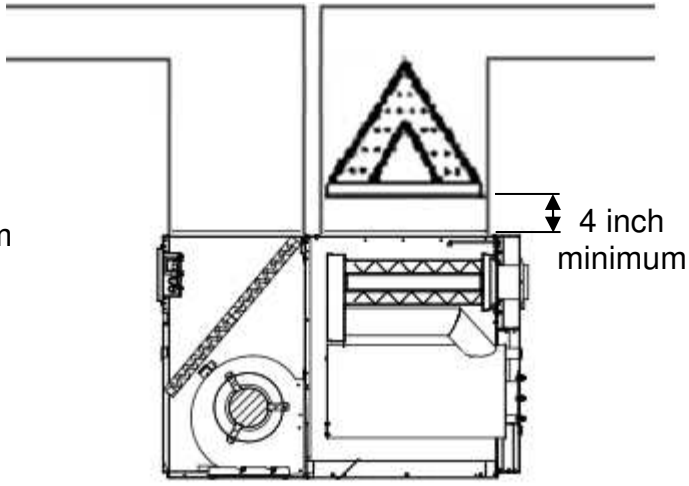
If the block vent switch shuts down the system, check to ensure there is enough draft in the chimney and venting pipes.

AIR CONDITIONING

An air conditioning coil may be installed on the supply side **only**. Coils installed on the return side will cause condensation on the heat exchanger; this will shorten the heat exchanger life and may cause products of combustion to enter the house. Wire as per wiring label and diagram. **Height of the coil above the unit supply shall be at least 4" (102 mm).**



KLR



KLF

See A/C coil Manufacturers Requirements.
To check the AC coil total air flow resistance, see procedure at page 38.

HUMIDIFIER

If a humidifier is installed ensure that no water can drip or run from it into the furnace. This would cause deterioration and void the furnace warranty.

5.0 BURNER INSTALLATION AND SPECIFICATIONS

5.1 ASSEMBLY & INSTALLATION OF BURNER

CONSULT THE BURNER INSTRUCTION MANUAL THAT IS INCLUDED IN THE BURNER BOX. In case of differences between the instructions on the burner instruction manual and this manual, the furnace instruction manual (this manual) must be followed. The instructions in the gas burner instruction manuals are detailed mounting, wiring, adjusting, testing and maintenance instructions that are specific to the burner used (Riello or Carlin). The specific adjustments for the furnace are detailed in the following pages. As a general guideline:

1) **Use the burner instruction manual for general instructions.**
2) **Use this manual for specific instructions (such as for example, the initial air gate adjustment for a specific size of furnace with a specific burner).**

- **RIELLO GAS BURNERS**
  - In the Section "Setting the burner", disregard the table and use the initial adjustments detailed for the appropriate unit with Riello burner in the section 5.2 of this manual below.
  - In the section "Air gate adjustment", disregard the table and use the information in section 5.2 below.
  - In the section "Combustion head settings", disregard the table and use the information in section 5.2 below.
  - In the section "Manifold pressures", disregard the table and use the information in section 5.2 below.
  - Disregard the "Pressure working chart" and the "Combustion chamber size" sections as those sections apply only for conversion burners.

COMBUSTION CHECKS
All combustion checks must be performed with an instrument capable of reading at least CO2, CO and temperature.

- **RIELLO GAS BURNERS**
  - Natural Gas Maximum CO2 is 10%
  - Propane Gas Maximum CO2 is 12%
  - Maximum Air free PPM reading of CO is 200.
  - If any of these readings exceed the values above, adjust the air gate to increase the air intake to the burner.

AFTER PLACING THE FURNACE IN OPERATION, THE IGNITION SYSTEM MUST BE TESTED. THE METHOD OF TESTING IS AS FOLLOWS:

- Place the furnace in operation, by raising the thermostat, and observe a normal ignition of the burner.
- Lower the thermostat. This should shut off the burner.
- Close the manual shut-off gas valve that is upstream of the gas control.
- Place the furnace in operation again, by raising the thermostat.
- After a trial for ignition period, the burner control should go in lockout mode. A light on the red button on the burner ignition control will indicate this.

- To restart the furnace, open again the manual gas shut-off valve that you closed a few steps back..
- Press the red button on the ignition control. The burner should then retry its ignition and light the burner. **If this sequence is not respected, consult the burner manual**

5.2 GAS FIRED FURNACE INSTRUCTIONS

FOR YOUR SAFETY READ BEFORE OPERATING

WARNING: If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.

B. **BEFORE OPERATING** smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

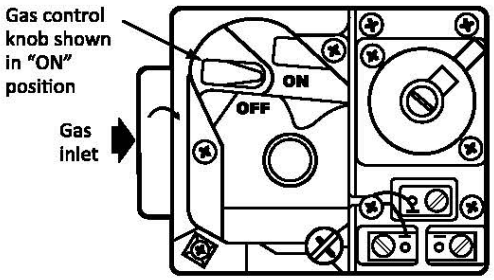
WHAT TO DO IF YOU SMELL GAS
- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

C. Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above on this label.
2. Set the thermostat to lowest setting.
3. Turn off all electric power to the appliance.
4. This appliance is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
5. Remove control access panel.



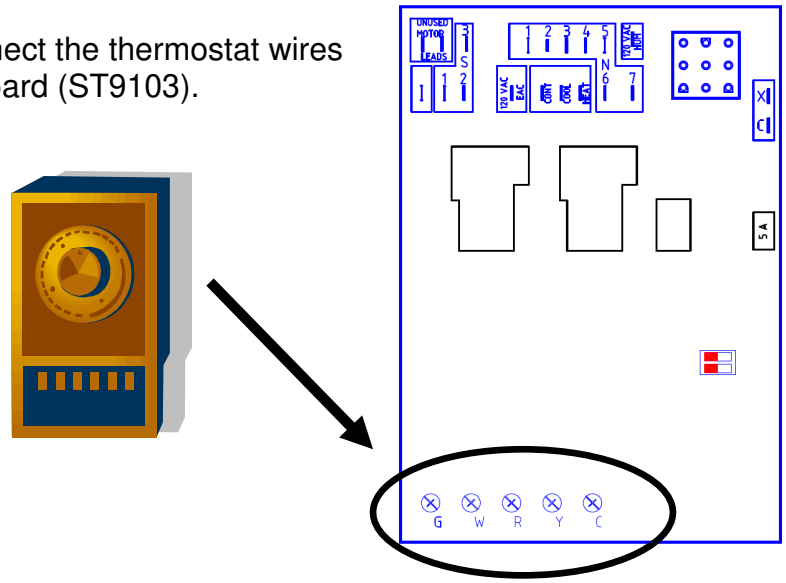
6. Push in gas control knob slightly and turn clockwise ↷ to "OFF."

   NOTE: Knob cannot be turned to "OFF" unless knob is pushed in slightly. Do not force.
7. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "B" in the safety information above on this label. If you don't smell gas, go to the next step.
8. Turn gas control knob counterclockwise ↶ to "ON."
9. Replace control access panel.
10. Turn on all electric power to the appliance.
11. Set thermostat to desired setting.
12. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.

TO TURN OFF GAS TO APPLIANCE

1. Set the thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Remove control access panel.
4. Push in gas control knob slightly and turn clockwise ↷ to "OFF." Do not force.
5. Replace control access panel.

THERMOSTAT Connect the thermostat wires to the fan timer control board (ST9103).



5.3 TECHNICAL INFORMATION

KLR Series	KLR-100	KLR-200
Riello Burner	**G-120 Gas**	**G-200 Gas**
Unit Model	KLR-R1-*087-03 (N/P)	KLR-R2-*131-05 (N/P)
Input (BTU/h)	105,000	155,000
Output (BTU/h)	87,000	131,000
Manifold Pressure	3.7'' W.C. Natural / 4.0'' W.C. Propane	4.5'' W.C. Natural / 3.8'' W.C. Propane
Orifice size	B5 Natural / B16 Propane	B5 Natural / B16 Propane
Max. Inlet Pressure	11'' W.C. Natural / 13'' W.C. Propane	11'' W.C. Natural / 13'' W.C. Propane
Min. Inlet Pressure	7'' W.C.	7'' W.C.
Comb. Head Setting	3.0	3.0
Air Gate Adjustment	2.5	2.5
Desired CO2 (%)	9.3% Natural / 11.0% Propane	9.8% Natural / 11.6% Propane
Efficiency (%)	83.50	83.50

General Information

Motor info

Temperature Rise (°F)	75 (Max. 0.5'' W.C. Static Pressure)	75 (Max. 0.5'' W.C. Static Pressure)

Static Pressure at 0.2" WC / 0.5" WC

Blower Speed	PSC 1/2 hp		PSC 3/4 hp	
	0.2" wc	0.5" wc	0.2" wc	0.5" wc
HI	1375	1275	2120	2030
MHI	1250	1170	1940	1875
MED	---	---	---	---
MLO	1100	1075	1710	1650
LO	875	850	1150	1050

Blower Speed	ECM 1/2 hp		ECM 3/4 hp	
	0.2" wc	0.5" wc	0.2" wc	0.5" wc
HI	1300	1230	2000	1910
MHI	1225	1160	1900	1835
MED	1140	1050	1690	1660
MLO	1025	980	1610	1575
LO	775	750	1060	1010

(*) In the Unit Model number, is specific information of the product for administration only.

NOTE: When checking input rate, TAKE INTO ACCOUNT THE PRESSURE AT THE GAS METER AND APPLY THE APPROPRIATE CORRECTION FACTOR IF THE GAS METER PRESSURE IS HIGHER THAN 7'' W.C.

5.4 KLF TECHNICAL INFORMATION

KLF Series	KLF-200
Riello Burner	**G-200 Gas**
Unit Model	KLF-R2-*131-05 (N/P)
Input (BTU/h)	155,000
Output (BTU/h)	131,000
Manifold Pressure	4.5'' W.C. Natural / 3.8'' W.C. Propane
Orifice size	B5 Natural / B16 Propane
Max. Inlet Pressure	11'' W.C. Natural / 13'' W.C. Propane
Min. Inlet Pressure	7'' W.C.
Comb. Head Setting	3.0
Air Gate Adjustment	2.5
Desired CO2 (%)	9.8% Natural / 11.6% Propane
Efficiency (%)	83.50

General Information

PSC motor info

Temperature Rise (°F)	75 (Max. 0.5'' W.C. Static Pressure)

See 5.2 for static pressure information

6.0 FURNACE OPERATION AND SETTINGS

SHUTTING FURNACE DOWN

POWER OFF Turn off main power breaker or disconnect.

FUEL OFF Shut off manual gas supply valve.

Always keep manual gas supply valve shut off if the burner is shut down for an extended period of time.

RESTARTING FURNACE

Follow this procedure before restarting a unit that has been shut down for an extended period of time.

INSPECTION Have the furnace/system serviced and inspected by a **qualified technician**.

FUEL Turn on gas supply and check that there are no leaks.

POWER Turn on power and check that the furnace starts and operates as usual.

OPERATION If the furnace/system fails to operate or operates in an unusual manner, call your service technician. If the burner fails to operate at any time, call a qualified burner technician.

6.1 BLOWER SETTING

Ensure power is off when adjusting blower setting. For heating, use the blower speeds to obtain a temperature rise of 75 degrees F. The Lo blower speed can be used for air circulation when neither heating nor cooling are required. Set blower speeds to match the installation requirements.

FAN & LIMIT CONTROL

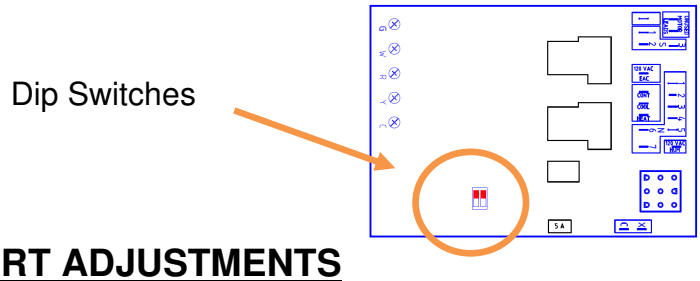
Limit	185°F – Factory set
Fan On	45 seconds after the burner starts
Fan Off	Adjustable on board

THERMOSTAT ANTICIPATOR SETTING

Adjust to thermostat manufacturer's instruction.

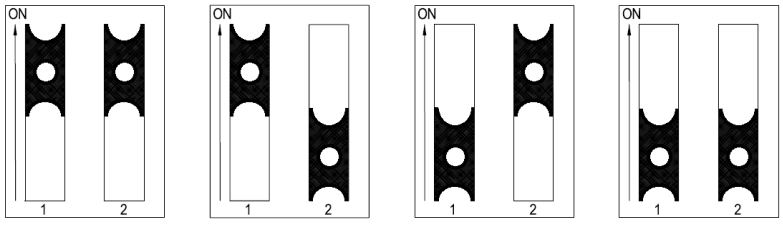
6.2 FAN TIMER CONTROL BOARD (ST9103A 1028)

- "FAN OFF" Dip Switches adjustment



COMFORT ADJUSTMENTS

- Outlet air consistently too warm or too cold - change the blower motor speed to give the specified air temperature rise.
- Outlet air gets too warm and burner shuts down - increase air by changing the blower motor speed to give the specified temperature rise.
- Outlet air is too cold or too warm at the end of the heating cycle after the burner has turned off - adjust the "FAN OFF" dip switch on fan timer control board. Refer to the next figure.



FAN OFF" Dip Switch

OFF CYCLE AIR CIRCULATION (Factory settings)

LO SPEED All **KLR** / **KLF** models have the Lo speed switch for optional constant air circulation during the furnace off cycle.

"FAN ON" When "FAN ON" is selected on the thermostat, the blower will run constantly at the blower speed selected on the cooling terminal. This is the equivalent of jumping terminals R and G on the ST9103 board.

6.3 ST9103A 1028 CONTROL BOARD SEQUENCE

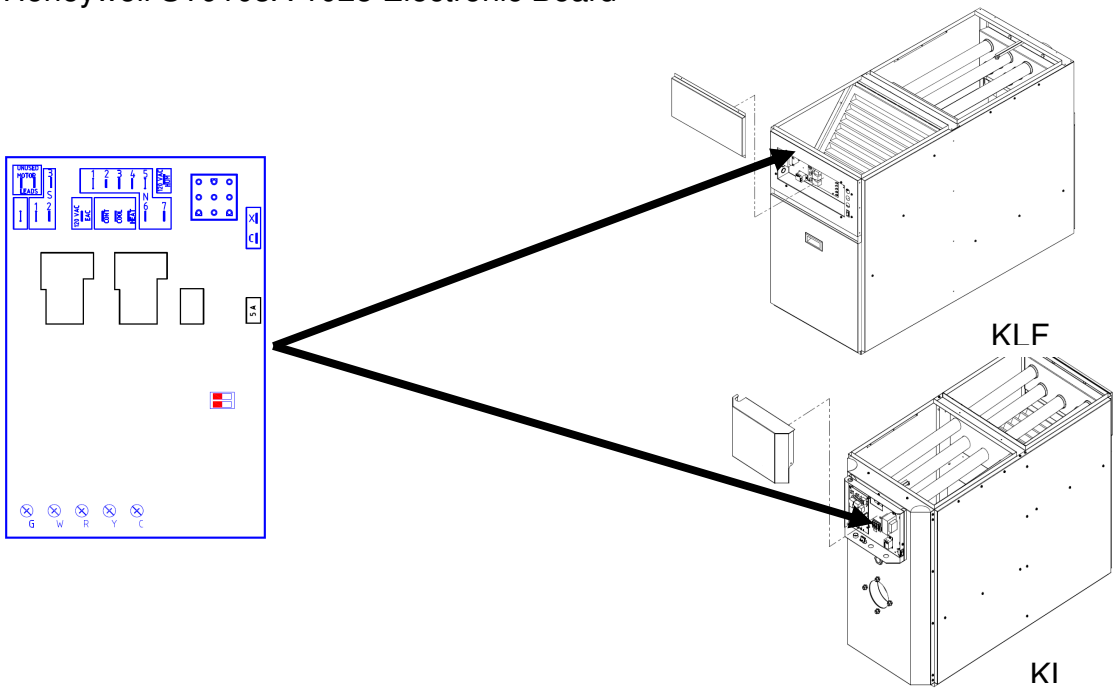
ST9103 Heating Sequence

1) Thermostat calls for Heat.
2) Burner starts
3) Blower starts after **45** seconds
4) Burner shuts down after call for heat is satisfied
5) Blower stops according to adjusted (FAN OFF) Dip switch selection

ST9103 Cooling Sequence

1) Thermostat calls for cooling
2) Blower starts immediately
3) Cooling unit starts
4) Blower stops immediately after cooling demand is satisfied
5) Cooling unit stops

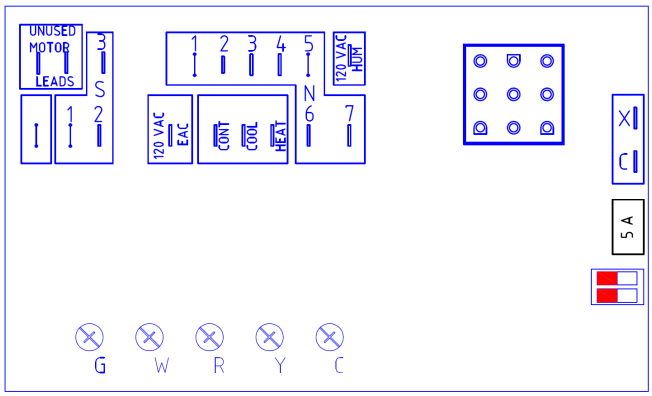
Honeywell ST9103A 1028 Electronic Board



6.4 Servicing - Fan Timer ST9103A 1028

Trouble shooting the Honeywell electronic board ST9103

Before trouble shooting the board, check for the 5 amp. fuse



For accurate trouble shooting, follow step by step the Trouble Shooting Chart.

Step	Possible Cause	Check-out procedure	Corrective action
		No Heat	
1	Incoming supply	Check for 120 Volts between terminal S2 and 3 on electronic fan control	**Yes - Move to next step** No - Check breaker main power switch
2	Transformer	Check for 120 Volts between terminal S3 and 4 on electronic fan control. Check for 24 Volts between terminal X and C on electronic fan control	**Yes - Move to next step** No - Check for bad connection **Yes - Move to next step** No - Change Transformer
3	Electronic Fan control	Check for 24 Volts between R and C Check for 24 Volts between terminal W and C	**Yes - Move to next step** No - Change the electronic board **Yes - Move to next step** No - Check thermostat and wiring
4	**Warning: Make sure the quick connect cable is fully inserted on the board**		
	Limit Control	Check for 120 Volts on each terminal of the high limit Check for 120 Volts coming from the main plug-in of the electronic fan control to the limit control Check for 120 Volts coming out of the limit control	**Yes - Move to step # 5** No - Move to next step **Yes - Move to next step** No - Change the electronic fan control **Yes - Move to step # 5** No - Failure on the limit control circuit . Temperature too high . Bad limit control

Step	Possible Cause	Check-out procedure	Corrective action
No Heat			
5	Riello burner application	Check for 120 Volts on the black wire, contact (COM) on the burner activation relay Check if primary control is on reset Check for continuity between the two wires yellow and violet on the burner activation relay Check for 120 Volts on the contact (No) of the burner activation relay Check for 120 volts on the orange wire coming to the burner (L)	**Yes - Move to next step** No - Back to step # 4 or check for bad connection **Yes - Press reset button** No - Move to the next step **Yes - Move to next step** No - Change the electronic fan control **Yes - Move to next step** No - Change the burner activation relay **Yes - Failure on the burner** No - Change the electronic fan control
6	Blower . Low speed Check if the constant low speed switch is **ON**	Check for 120 Volts at the "CONT" terminal on the electronic fan control Check for 120 Volts on both side of the constant low speed switch	**Yes - Move to next step** No - Change the electronic fan control **Yes - Check "LOW" speed on the blower motor** No - Change the switch

Step	Possible Cause	Check-out procedure	Corrective action
(No) Cooling /Heating			
7	Blower . High speed Cooling Speed Heating Speed (45 sec. delay)	Check for 24 Volts between G and C on electronic fan control Check for 120 Volts at the "COOL" terminal of the electronic fan control Check for 120 Volts at the "HEAT" terminal of the electronic fan control	**Yes - Move to next step** No - Check thermostat and wiring; if it's OK, then change the electronic fan control **Yes - Check "COOL" speed on the blower motor** No - Change the electronic fan control **Yes - Check "HEAT" speed on the blower motor** No - Change the electronic fan control

Step	Possible Cause	Check-out procedure	Corrective action
Electronic air filter and Humidifier			
8	Condensing unit	Check for 24 volts between terminal Y and C on the electronic fan control	**Yes - Compressor ON** No - Check thermostat and wiring
9	Electronic air filter	Check for 120 Volts on terminal "EAC" of the electronic fan control (thermostat must call a Heat, Cool or Fan ON demand	**Yes - Electronic filter failure** No - Change the electronic fan control
10	Humidifier	Check for 120 Volts on terminal "HUM" of the electronic fan control (burner must be energized)	**Yes - Humidifier failure** No - Change the electronic fan control

7.0 SERVICE

WARNING

ELECTRICAL SHOCK, FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly could result in dangerous operation, serious injury, death or property damage.

Improper servicing could result in dangerous operation, serious injury, death or property damage.

- **Before servicing, disconnect all electrical power to furnace.**
- **When servicing controls, label all wires prior to disconnecting.**

Reconnect wires correctly.
- **Verify proper operation after servicing.**

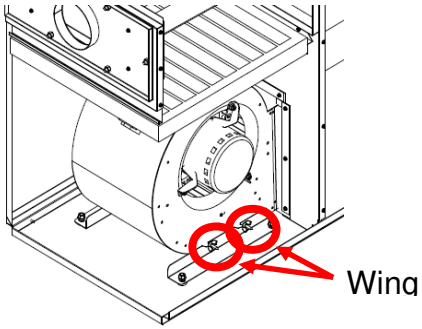
REGULAR MAINTENANCE

Check complete operation **at least once a year**. Clean flue pipes on a regular basis. Replace flue pipes if there is any sign of corrosion or other problems. Gaskets should be checked and may have to be replaced.

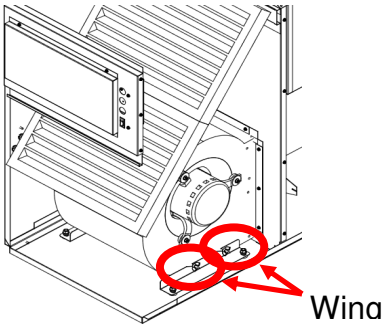
BLOWER REMOVAL

This furnace has a blower sealing system, which is designed to be tight and rattle free. Refer to the instructions and pictures below.

1) Shut off oil and power to furnace.
2) Open blower compartment.
3) For KLF furnace only, remove air filter.
4) Disconnect the wiring to the blower motor.
5) Remove the four (4) wing nuts securing the blower side to the base panel bracket.

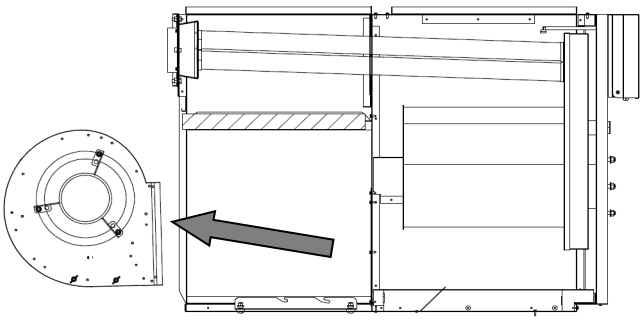


KLR



KLF

6) Slide the blower toward you and then lift the blower straight up. Shift the blower out of the furnace.



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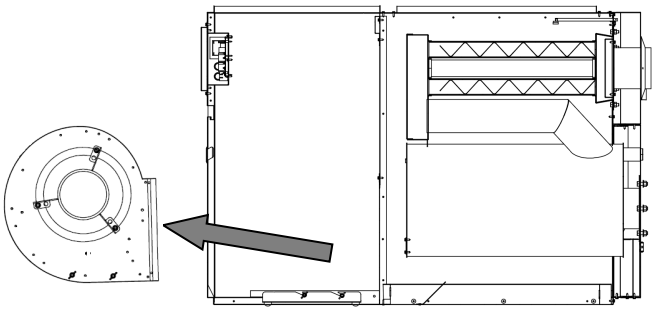


KLF

Put back the blower assembly using the reverse procedure. Ensure wiring and ground wires are correctly reconnected.

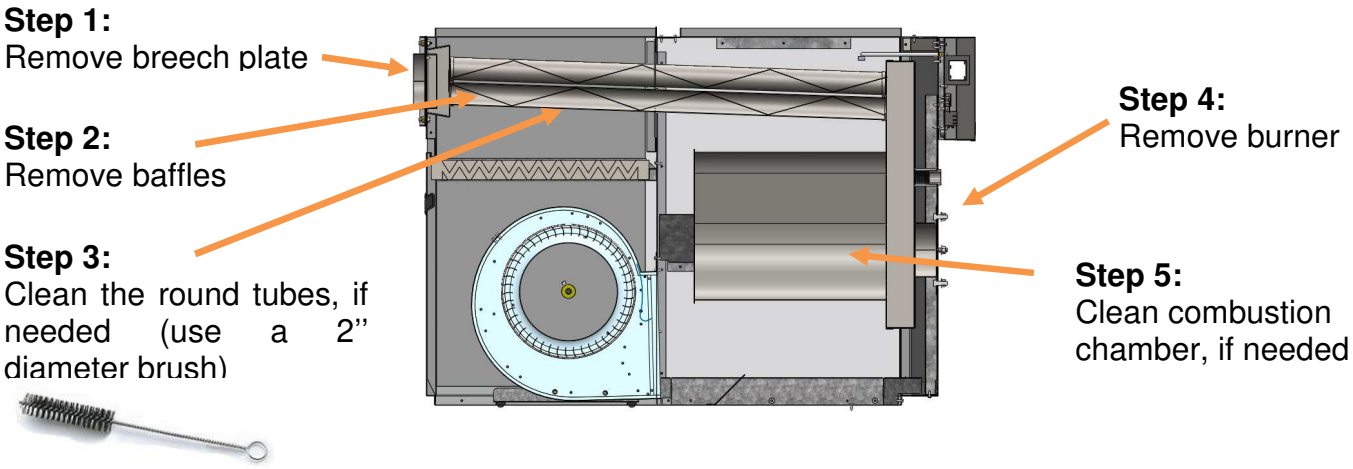
AIR FILTERS

To maintain furnace performance and safety, replace dirty filters at least once every heating season or as required. Use new approved disposable filters of the same size and type. Dirty, clogged or wrong sized filters will impair the furnace performance and may cause the furnace to shut down or overheat.

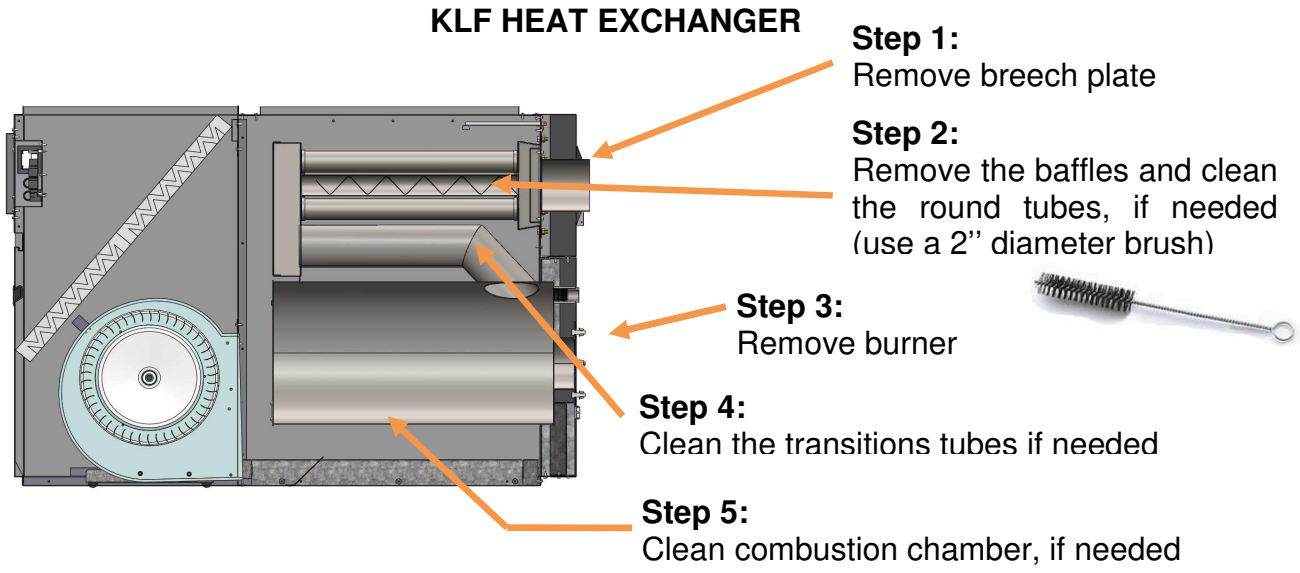
CLEANING HEAT EXCHANGER

Heat exchanger must be inspected every heating season. Refer to instructions and pictures below.

KLR HEAT EXCHANGER



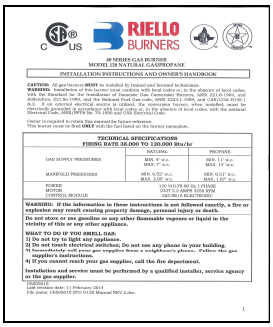
KLF HEAT EXCHANGER



7.1 BURNER CLEANING NOTES

Your burner manufacturer has supplied instructions for servicing and maintenance should be performed as instructed.

Riello 40 G120 Gas Burner


RIELLO BURNERS

40 SERIES GAS BURNER
MODEL 120 NATURAL GAS/PROPANE

INSTALLATION INSTRUCTIONS AND OWNER'S HANDBOOK

CAUTION: All gas burners **MUST** be installed by trained and licensed technicians.
WARNING: Installation of this burner must conform with local codes or, in the absence of local codes, with the Standard for the Installation of Oil-burning Equipment, CSA B139, and/or the Installation Code for Gas Burning Appliances and Equipment, CSA B149.1, or the applicable sections of the B149.2. If an external electrical source is utilized, the conversion burner, when installed, must be electrically grounded in accordance with local codes or, in the absence of local codes, with the current Electrical Code, ANSI/NFPA No. 70-1990 and CSA Electrical Code.

Owner is required to retain this manual for future reference.
This burner must be fired **ONLY** with the fuel listed on the burner nameplate.

TECHNICAL SPECIFICATIONS
FIRING RATE 50,000 TO 120,000 Btu/hr

	NATURAL	PROPANE
GAS SUPPLY PRESSURE	MIN. 4" w.c. MAX. 7" w.c.	MIN. 11" w.c. MAX. 14" w.c.
MANIFOLD PRESSURE	MIN. 0.53" w.c. MAX. 3.09" w.c.	MIN. 0.53" w.c. MAX. 1.87" w.c.
POWER MOTOR CONTROL MODULE	120 VOLTS 60 Hz 1 PHASE 1/2HP 3.1 AMPS 3250 RPM SQUIRREL CAGE TYPE SAE J90 LX ELECTRONIC	

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

Do not store or use gasoline or any other flammable vapours or liquid in the vicinity of this or any other appliance.

WHAT TO DO IF YOU SMELL GAS:
1) Do not try to light any appliance.
2) Do not touch electrical switches; Do not use any phone in your building.
3) Immediately call your gas supplier from a neighbour's phone. Follow the gas supplier's instructions.
4) If you cannot reach your gas supplier, call the fire department.

Installation and service must be performed by a qualified installer, service agency or the gas supplier.

Carlin EZGas PRO Burner Burner


Carlin Combustion Technology, Inc.

MODEL EZGas Pro
Gas burner

Instruction manual

Ratings

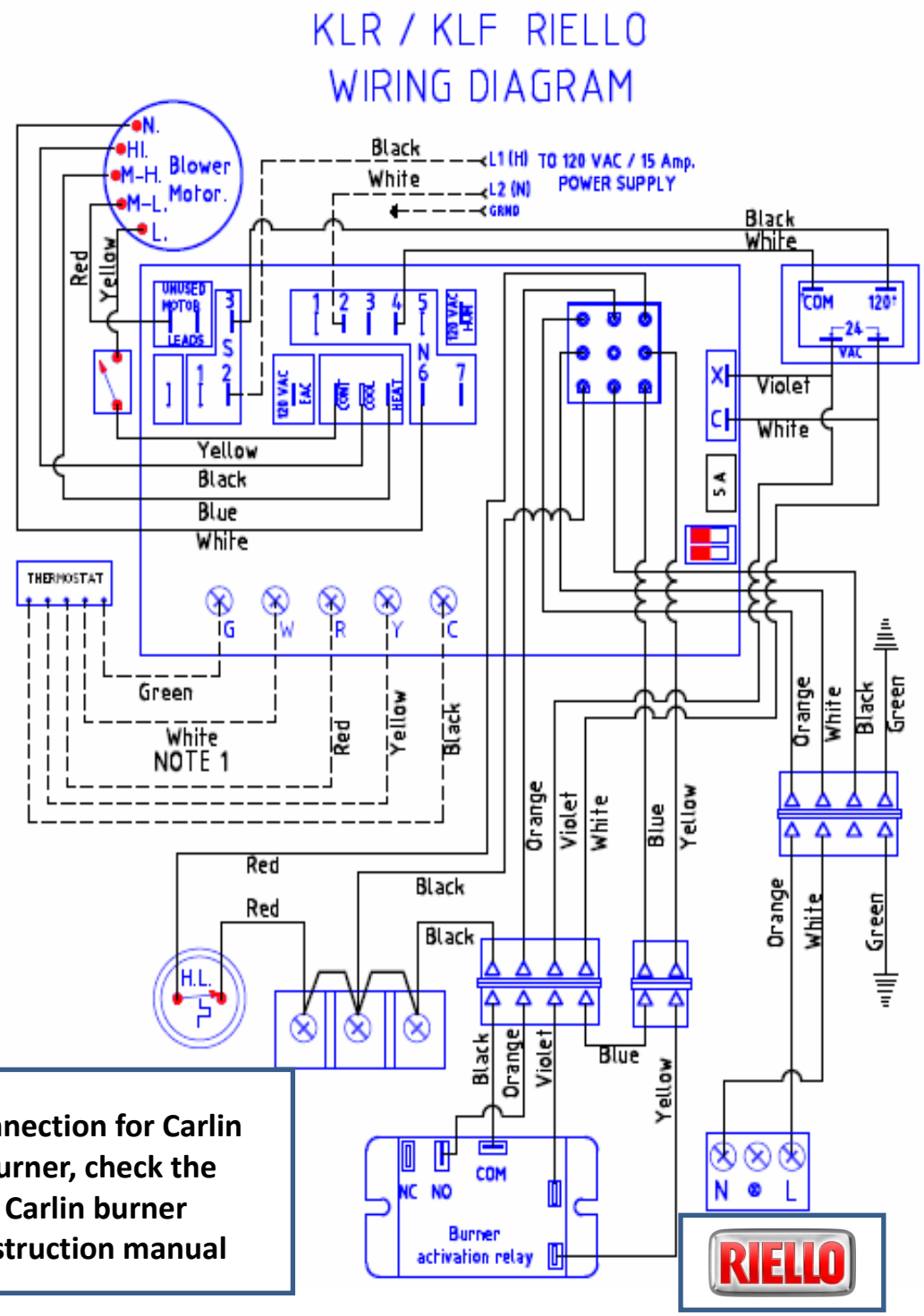
Contents

PERFORM COMBUSTION TEST

Perform an annual combustion check on the gas burner.

8.0 ELECTRICAL / WIRING DIAGRAMS

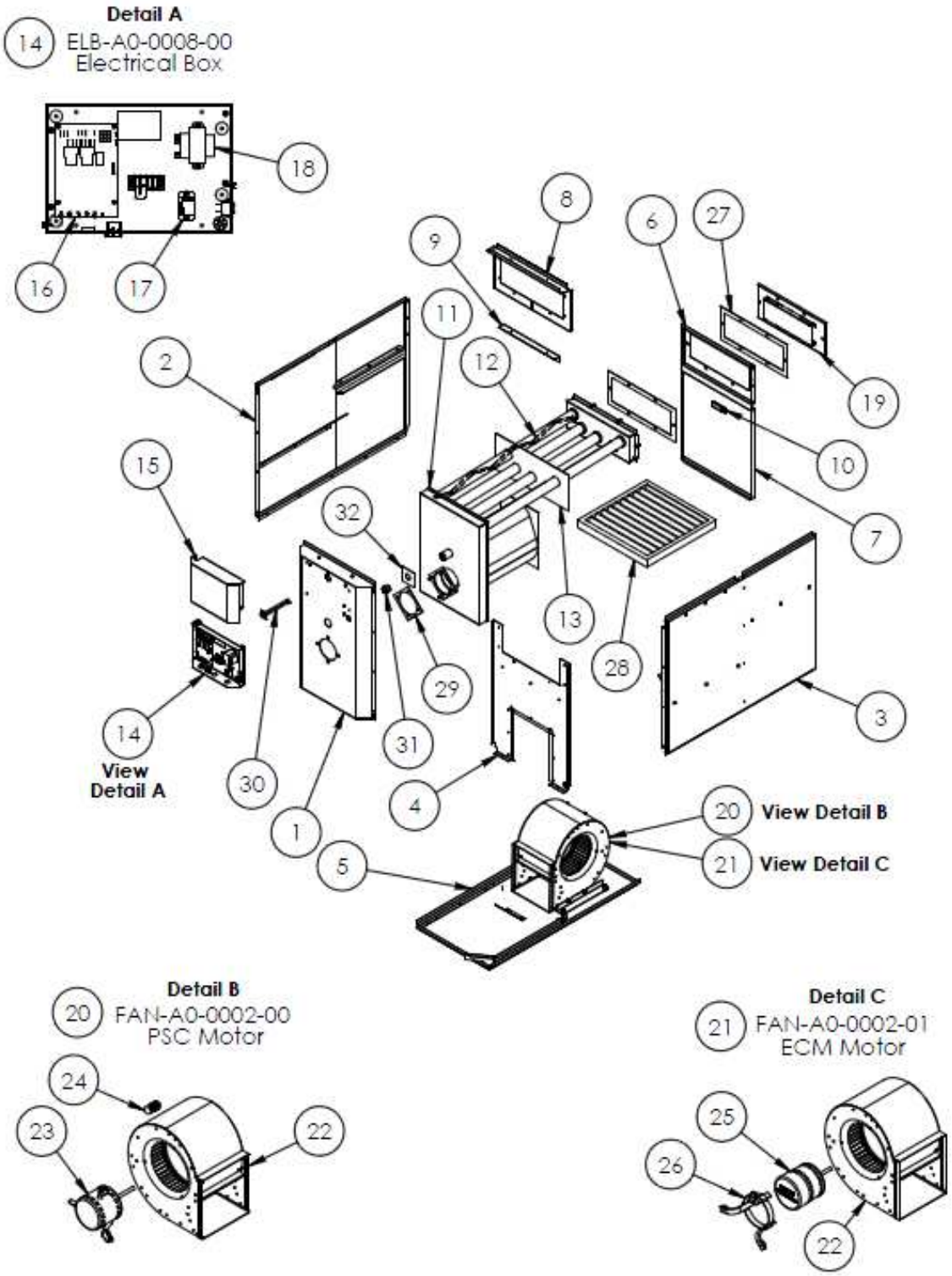
HEATING & COOLING



Connection for Carlin Burner, check the Carlin burner instruction manual

9.0 EXPLODED PARTS VIEW

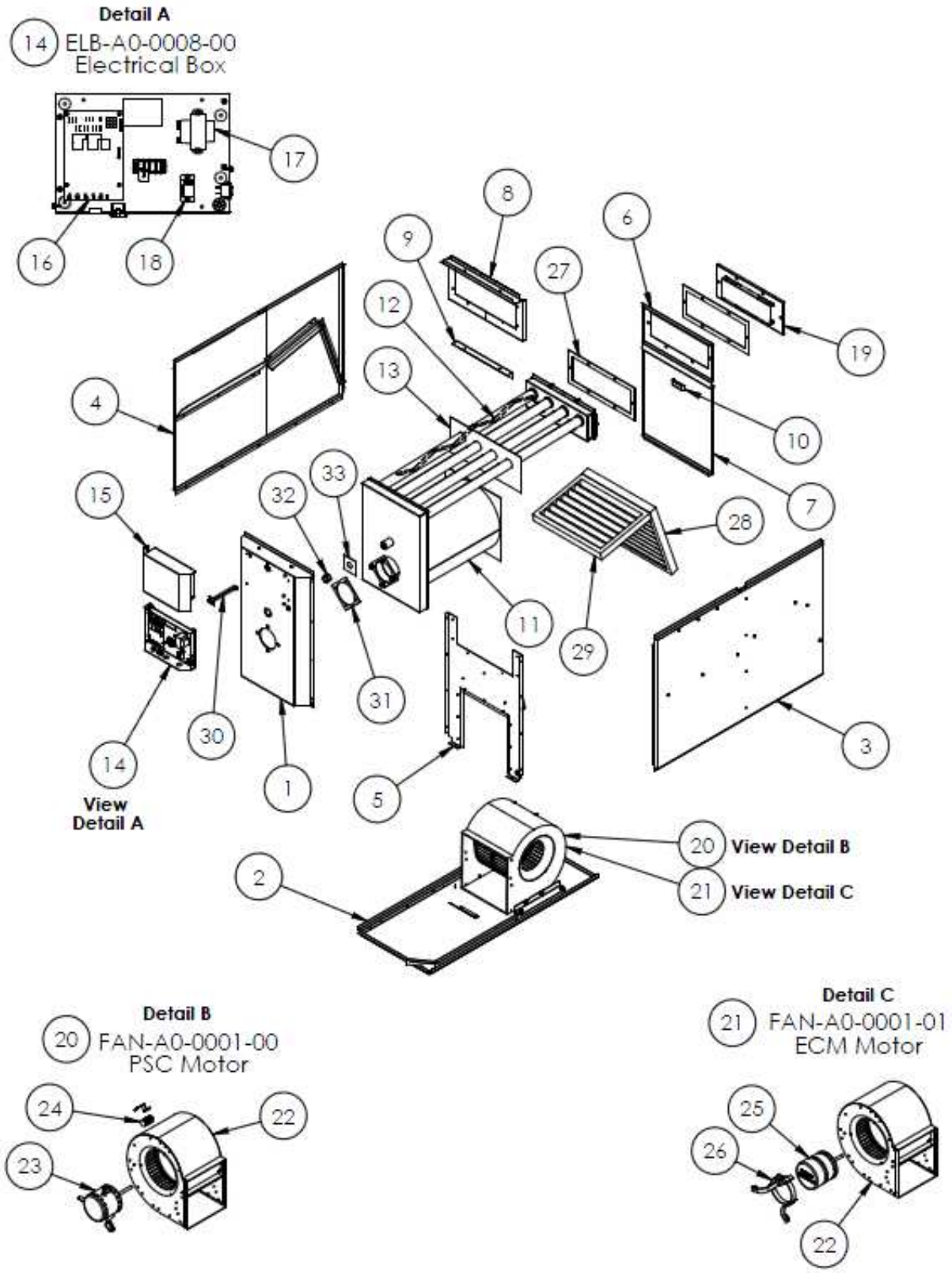
KLR-100 – Exploded Parts View



KLR-100 – Part List

ITEM	PART NUMBER	DESCRIPTION	QTY
1	CAB-A0-0007-00	Front Panel Assembly	1
2	CAB-A0-0005-00	Right Panel Assembly	1
3	CAB-A0-0004-00	Left Panel Assembly	1
4	CAB-A0-0006-00	Divider Panel Assembly	1
5	CAB-A0-0011-00	Base Panel Assembly	1
6	CAB-P0-0080-00	Top Rear Panel	1
7	CAB-P0-0013-00	Blower Door Panel	1
8	CAB-P0-0014-00	Upper Divider	1
9	CAB-P0-0015-00	Divider's Filler Gasket Bracket	1
10	3HN-00-PULL-00	Handle Flush Pocket Pull	1
11	HEX-A0-0001-00	Heat Exchanger Assembly	1
12	HEX-P0-0053-00	Pipe Baffle Low-Boy	5
13	INS-P0-0001-00	Divider Filler Gasket - 5 Holes	1
14	ELB-A0-0008-00	Electrical Assembly - Low-Boy Model	1
15	ELB-P0-0018-00	Cover Electrical Box - Low-Boy Model	1
16	4CB-00-FAN0-00	ST9103A1028 Electronic Board	1
17	4TF-00-40VA-00	Transformer HTC-01A0BB01 40VA	1
18	4RY-00-24V0-00	Relay AE04001 24VAC Form C SPDT 24V	1
19	HEX-A0-0012-00	Rear Collector Assembly	1
20	FAN-A0-0002-00	Fan Motor Assembly KLR-100 PSC Motor	1
21	FAN-A0-0002-01	Fan Motor Assembly KLR-100 ECM Motor	1
22	3BU-10-08DD-00	Blower 10" x 8" Direct Drive (G10-8DD)	1
23	3BM-50-4SDD-01	Motor Blower 1/2 HP Direct Drive 4SP EMERSON	1
24	4CA-00-705M-00	Capacitor 7.5 µF 370VAC 70C 60 Hz	1
25	3BM-50-ECM0-02	Motor Blower 1/2 HP ECM Ecotech EMERSON	1
26	1SB-00-BUMR-00	Bracket Motor Mounting Direct Drive Blower	1
27	INS-P0-0015-00	Low-Boy Rear Insulation	2
28	3AF-02-2020-01	Filter Air 20" x 20" x 2" Non-Pleated (Strata Type)	1
29	INS-P0-0017-00	Burner's Flange Insulation	1
30	4SD-00-0185-00	Control Limit Snap Disc (185°) Auto Reset (L185-30F)	1
31	3SG-0P-1030-5A	Glass Sight Clear 1" NPT Hex With THD Seal	1
32	INS-P0-0018-00	Sight Glass Insulation	1

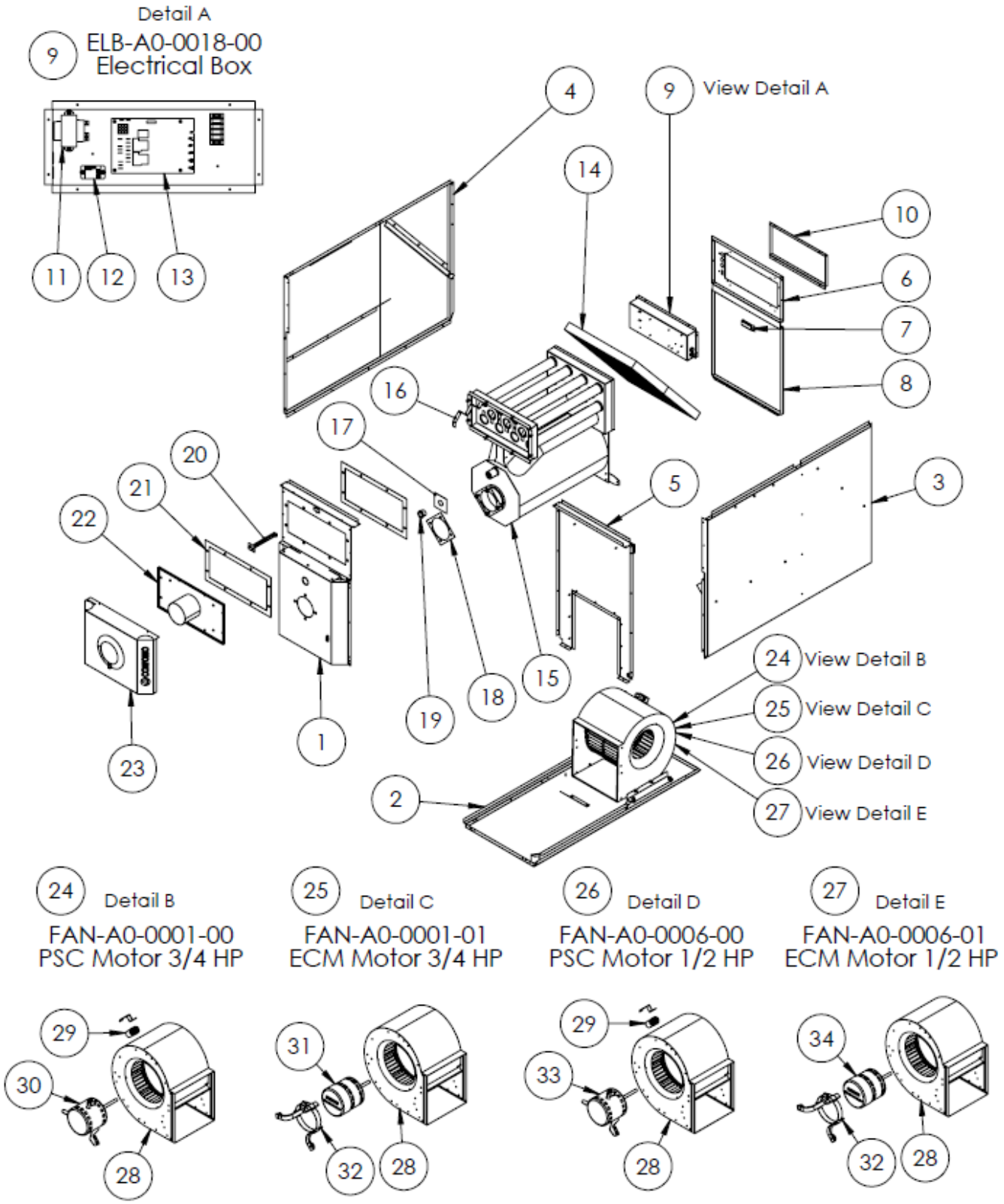
KLR-200 – Exploded Parts View



KLR-200 – Part List

ITEM	PART NUMBER	DESCRIPTION	QTY
1	CAB-A0-0007-00	Front Panel Assembly	1
2	CAB-A0-0012-00	Base Panel Assembly	1
3	CAB-A0-0009-00	Right Panel Assembly	1
4	CAB-A0-0008-00	Left Panel Assembly	1
5	CAB-A0-0010-00	Divider Panel Assembly	1
6	CAB-P0-0080-00	Top Rear Panel	1
7	CAB-P0-0013-00	Blower Door Panel	1
8	CAB-P0-0014-00	Upper Divider	1
9	CAB-P0-0015-00	Divider's Filler Gasket Bracket	1
10	3HN-00-PULL-00	Handle Flush Pocket Pull	1
11	HEX-A0-0003-00	Heat Exchanger Assembly	1
12	HEX-P0-0053-00	Pipe Baffle Low-Boy	7
13	INS-P0-0008-00	Divider Filler Gasket - 7 Holes	1
14	ELB-A0-0008-00	Electrical Assembly - Low-Boy Model	1
15	ELB-P0-0018-00	Cover Electrical Box - Low-Boy Model	1
16	4CB-00-FAN0-00	ST9103A1028 Electronic Board	1
17	4TF-00-40VA-00	Transformer HTC-01A0BB01 40VA	1
18	4RY-00-24V0-00	Relay AE04001 24VAC Form C SPDT 24V	1
19	HEX-A0-0012-00	Rear Collector Assembly	1
20	FAN-A0-0001-00	Fan Motor Assembly KLR-200 PSC Motor	1
21	FAN-A0-0001-01	Fan Motor Assembly KLR-200 ECM Motor	1
22	3BU-12-00DD-00	Blower 12" Direct Drive (GT12-10DD)	1
23	3BM-75-4SDD-01	Motor Blower 3/4 HP Direct Drive 4SP EMERSON	1
24	4CA-00-156M-2B	Capacitor 15 µF 370VAC 70C 60 Hz	1
25	3BM-75-4SDD-02	Motor Blower 3/4 HP ECM Ecotech EMERSON	1
26	1SB-00-BUMR-00	Bracket Motor Mounting Direct Drive Blower	1
27	INS-P0-0015-00	Low-Boy Rear Insulation	2
28	3AF-02-2020-01	Filter Air 20" x 20" x 2" Non-Pleated (Strata Type)	1
29	3AF-02-1520-01	Filter Air 15" x 20" x 2" Non-Pleated (Strata Type)	1
30	4SD-00-0185-00	Control Limit Snap Disc (185°) Auto Reset (L185-30F)	1
31	INS-P0-0017-00	Burner's Flange Insulation	1
32	3SG-0P-1030-5A	Glass Sight Clear 1" NPT Hex With THD Seal	1
33	INS-P0-0018-00	Sight Glass Insulation	1

KLF-200 – Exploded Parts View



KLF-200 – Part List

ITEM	PART NUMBER	DESCRIPTION	QTY
1	CAB-A0-0049-00	Front Panel Assembly	1
2	CAB-A0-0052-00	Base Panel Assembly	1
3	CAB-A0-0051-00	Right Panel Assembly	1
4	CAB-A0-0050-00	Left Panel Assembly	1
5	CAB-A0-0053-00	Divider Panel Assembly	1
6	CAB-P0-0164-00	Top Rear Panel	1
7	3HN-00-PULL-00	Handle Flush Pocket Pull	1
8	CAB-P0-0013-00	Blower Door Panel	1
9	ELB-A0-0018-00	Electrical Box Assembly	1
10	CAB-P0-0128-00	Cover Electrical Box	1
11	4TF-00-40VA-00	Transformer HTC-01A0BB01 40VA	1
12	4RY-00-24V0-00	Relay AE04001 24VAC Form C SPDT 24V	1
13	4CB-00-FAN0-00	ST9103A1028 Electronic Board	1
14	3AF-02-1520-01	Filter Air 15" x 20" x 2" Non-Pleated (Strata Type)	2
15	HEX-A0-0011-00	Heat Exchanger Assembly	1
16	HEX-P0-0064-00	Pipe Baffle Hi-Boy	11
17	INS-P0-0018-00	Sight Glass Insulation	1
18	INS-P0-0017-00	Burner's Flange Insulation	1
19	3SG-0P-1030-5A	Glass Sight Clear 1" NPT Hex With THD Seal	1
20	4SD-00-0185-00	Control Limit Snap Disc (185°) Auto Reset (L185-30F)	1
21	INS-P0-0020-00	Hi-Boy Front Insulation	2
22	HEX-A0-0010-00	Front Collector Assembly	1
23	CAB-P0-0156-00	Front Door Panel	1
24	FAN-A0-0001-00	Fan Motor Assembly KLR-200 PSC Motor	1
25	FAN-A0-0001-01	Fan Motor Assembly KLR-200 ECM Motor	1
26	FAN-A0-0006-00	Fan Motor Assembly KLF-200 PSC Motor	1
27	FAN-A0-0006-01	Fan Motor Assembly KLF-200 ECM Motor	1
28	3BU-12-00DD-00	Blower 12" Direct Drive (GT12-10DD)	1
29	4CA-00-156M-2B	Capacitor 15 µF 370VAC 70C 60 Hz	1
30	3BM-75-4SDD-01	Motor Blower 3/4 HP Direct Drive 4SP EMERSON	1
31	3BM-75-4SDD-02	Motor Blower 3/4 HP ECM Ecotech EMERSON	1
32	1SB-00-BUMR-00	Bracket Motor Mounting Direct Drive Blower	1
33	3BM-50-4SDD-01	Motor Blower 1/2 HP Direct Drive 4SP EMERSON	1
34	3BM-50-ECM0-02	Motor Blower 1/2 HP ECM Ecotech EMERSON	1

10. START-UP TEST RESULTS

Model**:** _____ Serial Number: _____

Lowboy KLR_____ Lowboy KLF_____

Date of installation: _____

Installer (name & address): _____

_____

_____

START-UP TEST RESULTS

Size of unit (Btu/h): _____

Input: _____ Manifold Pressure: _____

Chimney_____ DVSystem_____

Combustion Results: _____ CO_2 %

Chimney draft: _____ " W.C.

Ambient temperature: _____ °F

Gross flue temperature: _____ °F

Temperature rise: _____ °F (see page 38)

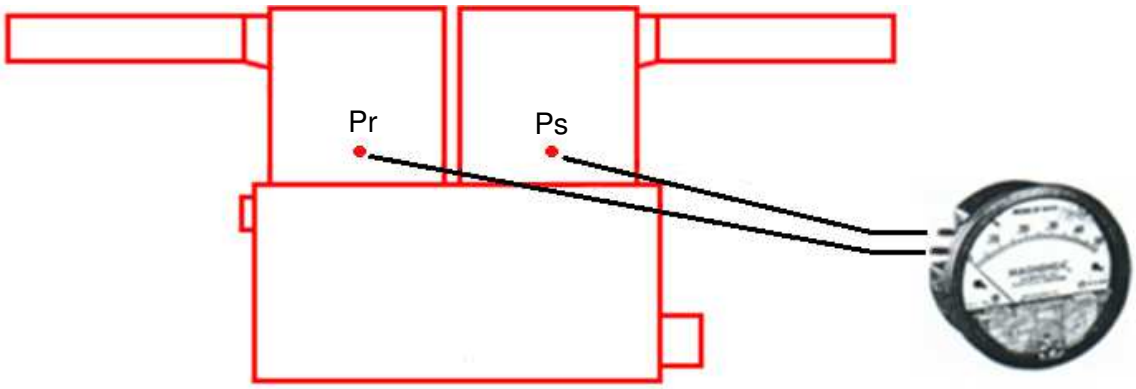
External total static pressure: _____ " W.C. (see page 38)

A/C Coil total resistance: _____ " W.C. (see page 38)

TEST PROCEDURES

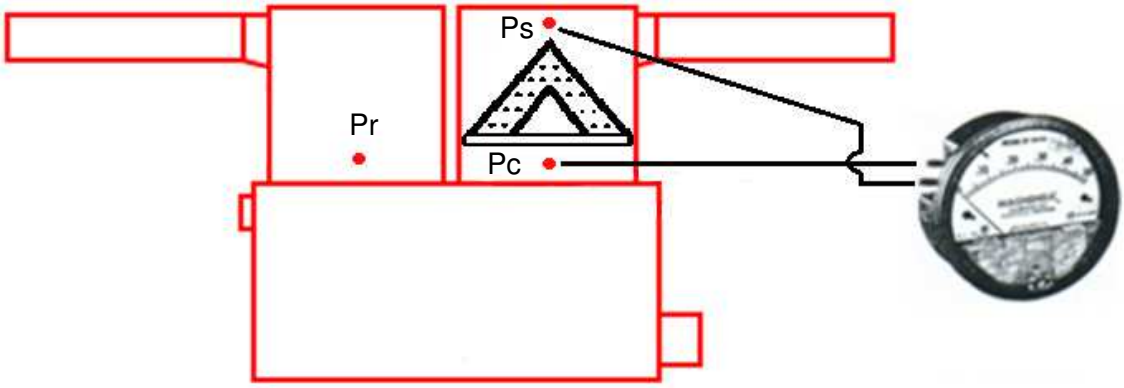
External Total Static Pressure Reading

Total Static Pressure = Supply Pressure (Ps) + Return Pressure (Pr)



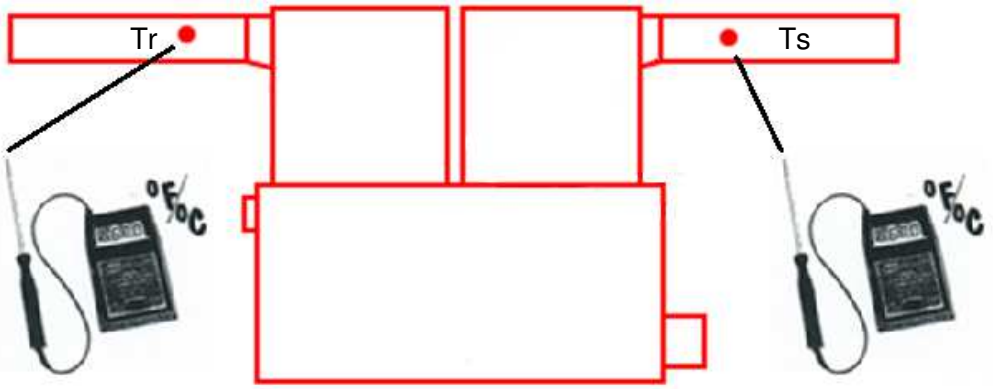
A/C Coil Total Resistance Reading

A/C coil total resistance = Coil Pressure (Pc) - Supply Pressure (Ps)



Temperature Rise Reading ***

Temperature rise = Supply Temp. (Ts) - Return Temp. (Tr)



*** Probe must not be in direct sight of heat exchanger.

Granby Furnaces Inc. manufactures a full line of Gas-fired furnaces in its 70,000 square feet facility. Granby products are sold across Canada and the United States through a distribution network.

Our team of engineers, designers and technicians continually research and develop products to go beyond the demanding specifications of today's certifications.

Thank you for choosing Granby