Single stage operation forced draught natural gas/propane burner

The following pages contain information, descriptions and diagrams for the proper installation and wiring of the burner. Please read carefully before attempting final installation.

This manual is to remain with the final installation designation. It is the installer's responsibility to ensure that the burner installation and operation instructions mentioned in this manual are followed and operated within local code authority limits.

RIELLO 40

CODE	MODEL	TYPE
3757425	G750	579T

2903340 (3) - 11/2010

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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 requirements or, in the absence of local codes, with the Standard: National Fuel Gas code ANSI Z223.1-1984, and CAN/CGA B149.1 & 2 AND UL 795. 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 national Electrical Code, ANSI/ NFPA No. 70-1990 and CSA Electrical Code C22.2 No.0 M1982 & C22.2 No 3. 1988.

Authorities having jurisdiction should be consulted before installations are made. The owner is required to retain this manual for future reference.

TECHNICAL SPECIFICATIONS FIRING RATE 250,000 TO 750,000 Btu/hr		
	NATURAL GAS	**PROPANE**
GAS SUPPLY PRESSURES	MIN. 7" wc MAX. 14" wc	MIN. 8" wc MAX. 14" wc
MANIFOLD PRESSURES	MIN. 1.4" wc MAX. 2.1" wc	MIN. 1.0" wc MAX. 3.0" wc
POWER MOTOR CONTROL MODULE	120 Volts 60 Hz 1 phase 233T 4.3 Amps 3250 rpm 325 rad/s. RMG 88.62	

⚠ **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.

GENERAL INFORMATION

Your Riello gas burner comes to you completely assembled and factory wired, ready for installation.
Models equipped with the short combustion head have a fixed flange, which bolts directly to the front of the appliance. When equipped with the long combustion head, the burner comes with a universal flange, which when bolted to the appliance, allows the burner to be adjusted for exact positioning in the combustion zone.

STEP-BY-STEP PROCEDURE

1) Remove the burner from the carton, taking care not to lose any of the supplied accessories.
   Check for signs of physical damage.
2) Bolt the combustion head and burner to the appliance. Be sure to install the supplied mounting gasket.
   Ensure that the burner is level (we suggest using a spirit level) and that the combustion head is centred in the appliance port. Refer to page 7 for positioning of combustion head relative to the chamber.
3) Check that all gas train connections are tight and make your connections to the incoming gas supply.
   a) A sediment trap must be provided.
   b) If not already installed, a manual shutoff valve must be supplied. This valve must be upstream of the burner gas train supply connection.
   c) A $^{1}/_{8}$" NPT plugged tapping must be installed immediately upstream of the burner gas train supply connection and must be accessible for a test gauge.
   d) If required by local codes, provide gas vent lines at the gas regulators and valve (Riello gas trains are equipped with vent limiting diaphragms).
   e) Perform required gas pressure test on incoming gas supply lines.

NOTE: Details of sediment trap, manual gas valve and test point can be found in installation of sediment trap and burner supply section.

4) Remove the red protective cover by removing the three screws. Make your adjustment of stop gate, (refer to firing rate specifications and settings charts for details). Replace and secure the air cover plate.
5) Electrical hookup: 120Volt 60 Hz incoming power lines should be connected to Terminals 1 and 2 on burner terminal block. A manual disconnect switch must be installed in the incoming power lines. Incoming power lines must be rigid conduit or flexible approved cable.

⚠ **CAUTION:**
The hot wire must be connected to the black lead of the relay: neutral to the white lead.
Do not reverse the polarity.
The burner will not operate with the Phase/Neutral reversed, and the control box may be damaged.
Proper earth ground should be connected to the terminal block mounting plate which should be a solid green wire to Earth Ground.

6) Start and check the burner functions as follows:
   a) Make a final check on both the gas and electrical connections.
   b) Check that all adjustments have been completed.
   c) Loosen the screw in the manifold gas test point and install a manometer.
   d) Switch on power.
   e) Set the thermostat at its highest setting and press the burner reset button. Allow the burner to run through a complete cycle to check control functions.
   f) Turn on the manual gas valve and reset the safety. At this stage, the burner will open the air shutter and once it is open, the burner will prepurge for aprox. 25 seconds.
   Allow about 66 seconds for the control module to check all the operating circuits.

It may be necessary to repeat the starting cycle several times to free the gas train of entrapped air. If the burner goes to lockout, reset the safety button.

7) With the burner running and flame established, check the manifold gas pressure. Adjust manifold pressure to the correct value for the selected firing rate specified in the FIRING RATE SPECIFICATIONS AND SETTINGS chart. After completing the setting, remove the manometer and tighten the screws.

NOTE: Do not assume the burner is operating at optimum performance.

8) Make your final combustion efficiency test and fine tune the fan air damper as necessary.
   Replace the red protective cover and secure with three screws.
9) If the burner is installed on a central warm air furnace, affix the supplied warning labels to the furnace fan cover door (inside and outside).

10) Always do a final set up by checking the gas flow rate by clocking the meter. Do a complete combustion check with proper test equipment to obtain the best and safe CO , O , and CO results. This test must be done by a qualified technician. The maximum CO level for Natural Gas is 10%.

The maximum CO level for Propane Gas is 12%. The recommended flue gas temperature is from 350 degrees Fahrenheit to 550 degrees Fahrenheit.

Fill out the installation data on the label described below and explain the burner's essential functions (starting and stopping) to the owner.

Do not forget to give the dealer or service company's name and address.

ADJUSTMENT DATA TAG ANSI Z21-17b-1994		
INPUT C.F.H.		
MANIFOLD PRES.		
AIR DAMPER		
AIR/GAS RATIO No.		
FLUE GAS TEMP.		
O2 LEVEL %		
CO2 LEVEL %		
CO LEVEL P.P.M		
DATE :		
COMPLETED BY		
INSTALATION CONTRACTOR		

INSTALLATION DATA

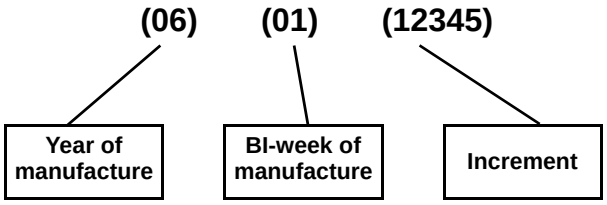
Note: This label is supplied in the package with the burner and should be filled out and affixed to the appliance when the conversion burner is installed.

SERIAL NUMBER IDENTIFICATION

Your Riello burner may have been manufactured in more than one location and therefore there are two possible serial number identification.

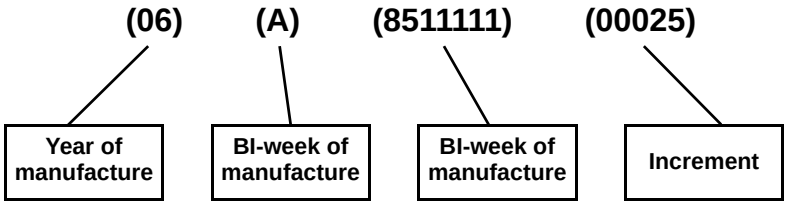
The Riello 9 character serial number, example,
06 01 12345, is identified as follows:

06 = Last two digits of the year of manufacture;
01 = Week of manufacture;
12345 = Increment of 1 for each burner produced – specific to product code – reset to zero each January 1st.



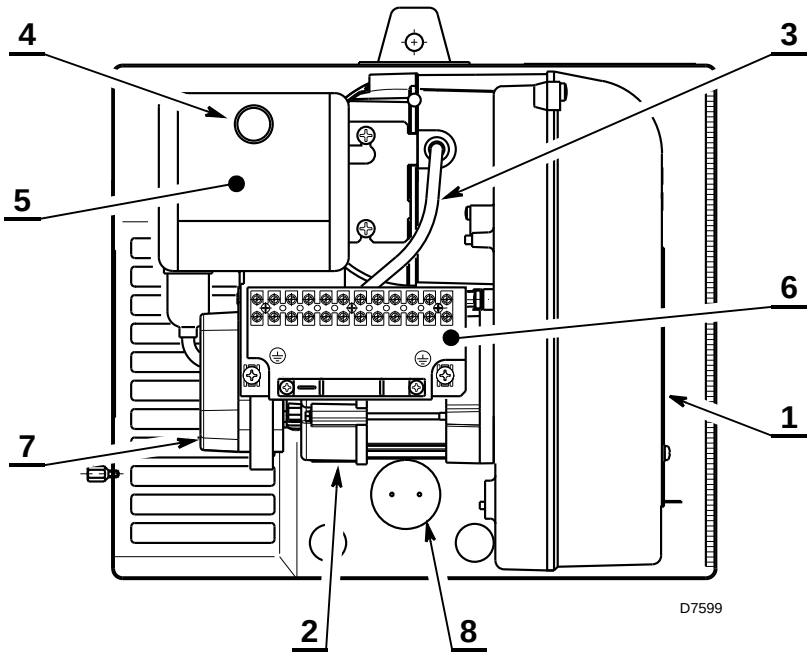
The Riello 15 character serial number, example,
06 A 8511111 00025, is identified as follows:

06 = Last two digits of the year of manufacture;
A = BI-week of manufacture;
8511111 = Burner product code;
00025 = Increment of 1 for each burner produced – specific to product code – reset to zero each January 1st.

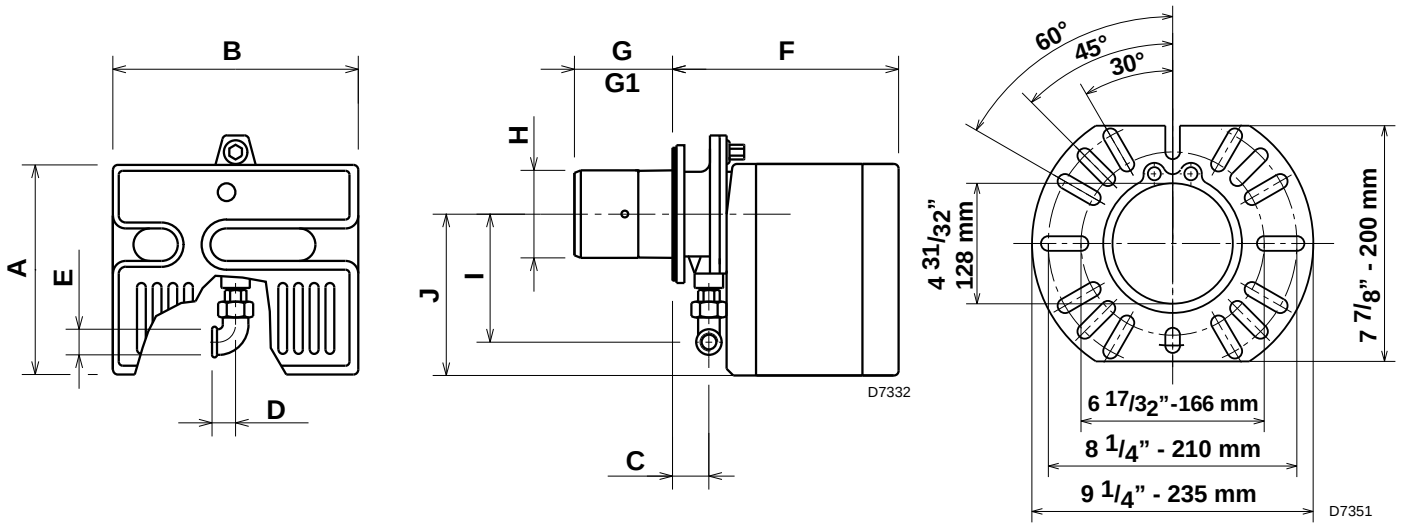


BURNER COMPONENTS IDENTIFICATION

1 Air damper
2 Motor
3 Ignition transformer connection
4 Reset button with lock-out lamp
5 Control box RMG 88.62
6 Wiring terminal block
7 Air pressure switch
8 Capacitor



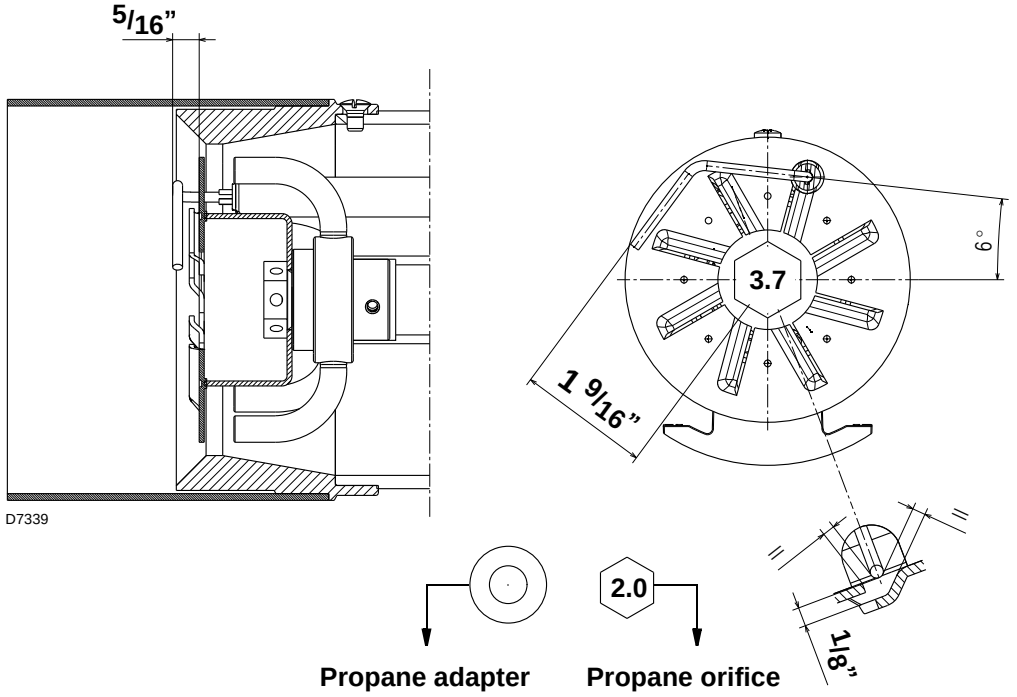
BURNER DIMENSIONS



Model 750	A	B	C	D	E	F	G	G1	H	I	J
inches	11 47/64	13 25/32	2 41/64	1 19/64	3/4	15 23/64	4 23/32	10 5/8	4 59/64	5 63/64	9 1/16
mm	298	350	67	33	19	389	120	270	125	152	230

NOTE: Actual available insertion length must be measured from tip of end cone to face of mounting gasket.

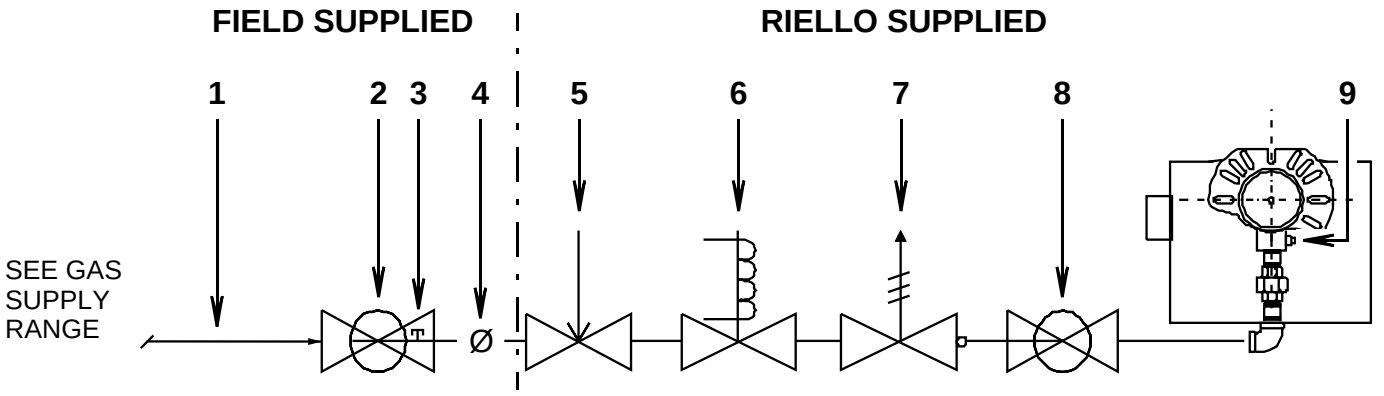
ELECTRODE AND FLAME PROBE ADJUSTMENTS



WARNING:
Do not turn the ignition electrode. Leave it as shown in the drawing.
If the ignition electrode is put near the ionization probe, the amplifier of the control box may be damaged.

TYPICAL GAS TRAIN LAYOUT

This gas train scope of supply meets the minimum controls requirements according to CGA and AGA regulations. Any additional requirements needed to meet local codes are the responsibility of others.



NOTE: ITEMS 5, 6 & 7 COMBINATION GAS VALVE(S) ASSEMBLIES MAY BE UTILIZED WHERE APPROVED

GAS TRAIN LEGEND

1 - GAS SUPPLY & FLOW DIRECTION OF GAS

2 - GAS SUPPLY MAIN SHUTOFF MANUAL VALVE (FIELD SUPPLIED)

3 - GAS SUPPLY PRESSURE TEST POINT (FIELD SUPPLIED)

4 - GAS TRAIN PIPE DIAMETER SIZE(S): BURNER G750 1" NPT (REDUCED AT COMBUSTION HEAD TO 3/4")

5 - GAS APPLANCE PRESSURE REGULATOR

6 - SAFETY SHUTOFF GAS VALVE (VS) 120V OPERATED

7 - MAIN GAS VALVE 120V OPERATED BURNER G750 = SINGLE STAGE V1 ONLY

8 - FIRING VALVE MANUAL SHUTOFF

9 - GAS BURNER MANIFOLD TEST POINT

GAS SUPPLY PRESSURE RANGES:

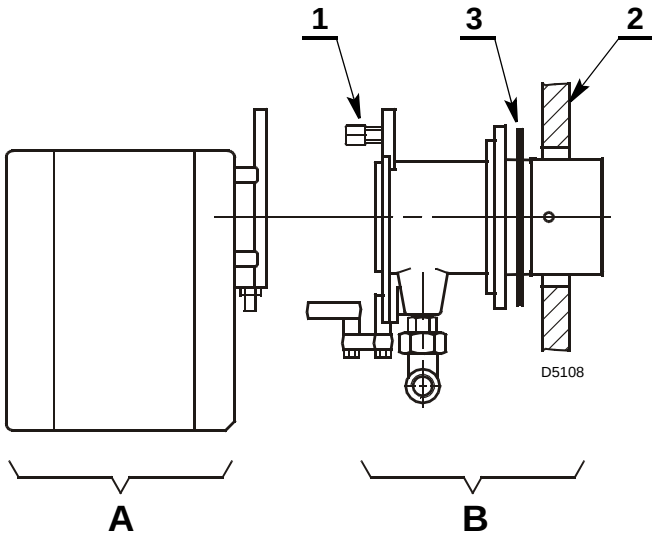
NATURAL GAS PRESSURE:
min. 7" wc - max. 14" wc

LP PROPANE GAS PRESSURE:
min. 8" wc - max. 13" wc

INSTALLING THE BURNER

A) Burner chassis
B) Combustion head assembly
1) Locking nut
2) Mounting plate surface
3) Insulation gasket

Separate the combustion head of the burner from the chassis (**A**) by removing the locknut (**1**). Install the combustion head into the boiler.
Typical insertion depth, the front edge of the combustion head is flush with the inside surface of the appliance mounting surface (**2**).



Use this checklist prior to installation:

1) Check the input/output requirements of the boiler/furnace.
2) Check the physical size of the combustion chamber against the thermal requirements of the application and relate this to the sizing charts.
3) Check that there is sufficient air for proper combustion and adequate ventilation.
   Local codes should be followed. Check that you have adequate space for servicing the equipment.
   Riello Burner requires a minimum of 13 inches clear space behind the red cover.
   This is required to allow easy removal of the cover for servicing and periodic maintenance.
4) Check that the chimney is of sufficient area to handle the exhaust gases.
   Make sure that the chimney is clear and there are not obstructions.
   Barometric draft regulators, when used, should be of the double acting type, and must be installed in accordance with the draft regulator Manufacturer's instructions. Single acting barometric dampers are not permitted.
5) Affix the supplied operating instructions label to the burner. This label reads as follows:

TO START THE BURNER:
Switch on power, open manual gas cocks, set the thermostat above ambient temperature. If the burner does not start, press the illuminated re-set button on the burner safety control.

TO SHUT DOWN BURNER:
Switch off power supply. If burner is switched off for extended periods, close manual gas cocks.

⚠ **IMPORTANT:**
A vent shutoff system shall be applied to a barometric damper installed in the venting system at the time of conversion of the appliance.
This will electrically disconnect the burner should there be a blockage in the vent (chimney).

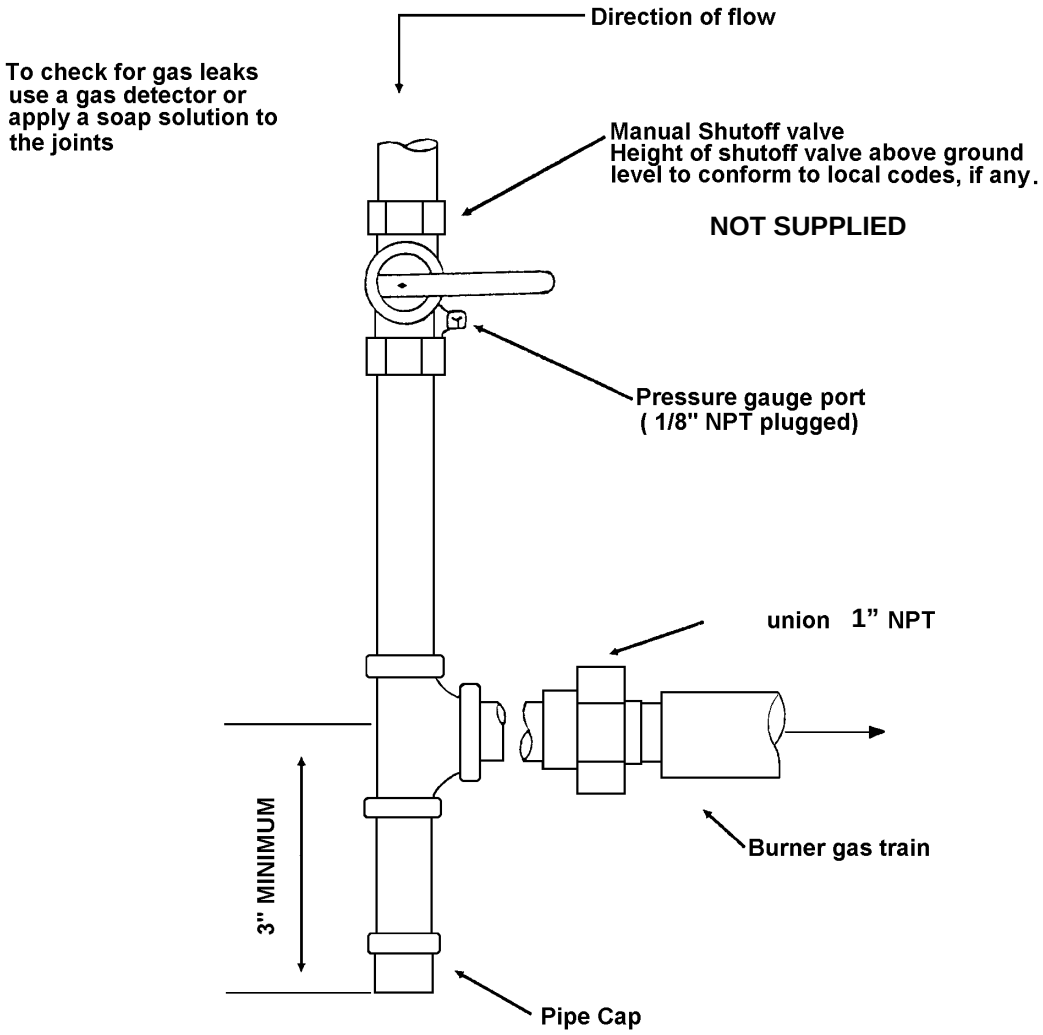
The installer must identify the main electrical power switch and manual gas shut off valve, for emergency conditions. The burner cover must be in place and secured before the burner is placed in operation.

INSTALLATION OF SEDIMENT TRAP AND BURNER SUPPLY

Gas piping to the burner must be $^1/_2$-inch minimum. Install only a full-ported shutoff valve. The valve must be located outside the appliance jacket, and the pressure gauge port must be accessible.

PRESSURE TEST-OVER $^1/_2$ PSIG.
The appliance and its individual shutoff valve must be disconnected from the gas supply piping system during any pressure testing of the system at a test pressure in excess of $^1/_2$ PSIG.

PRESSURE TEST-$^1/_2$ PSIG OR LESS
The appliance must be isolated from the gas supply piping system by closing its individual manual shutoff valve during any testing of the gas supply piping system at test pressures equal to or less than $^1/_2$ PSIG.



FACTORY WIRING DIAGRAM

CONTROL CIRCUITS

Burner operation may be controlled by either 120V or 24V control systems.
The required controls must be connected to the burner as described on the following.

120V CONTROL SYSTEM

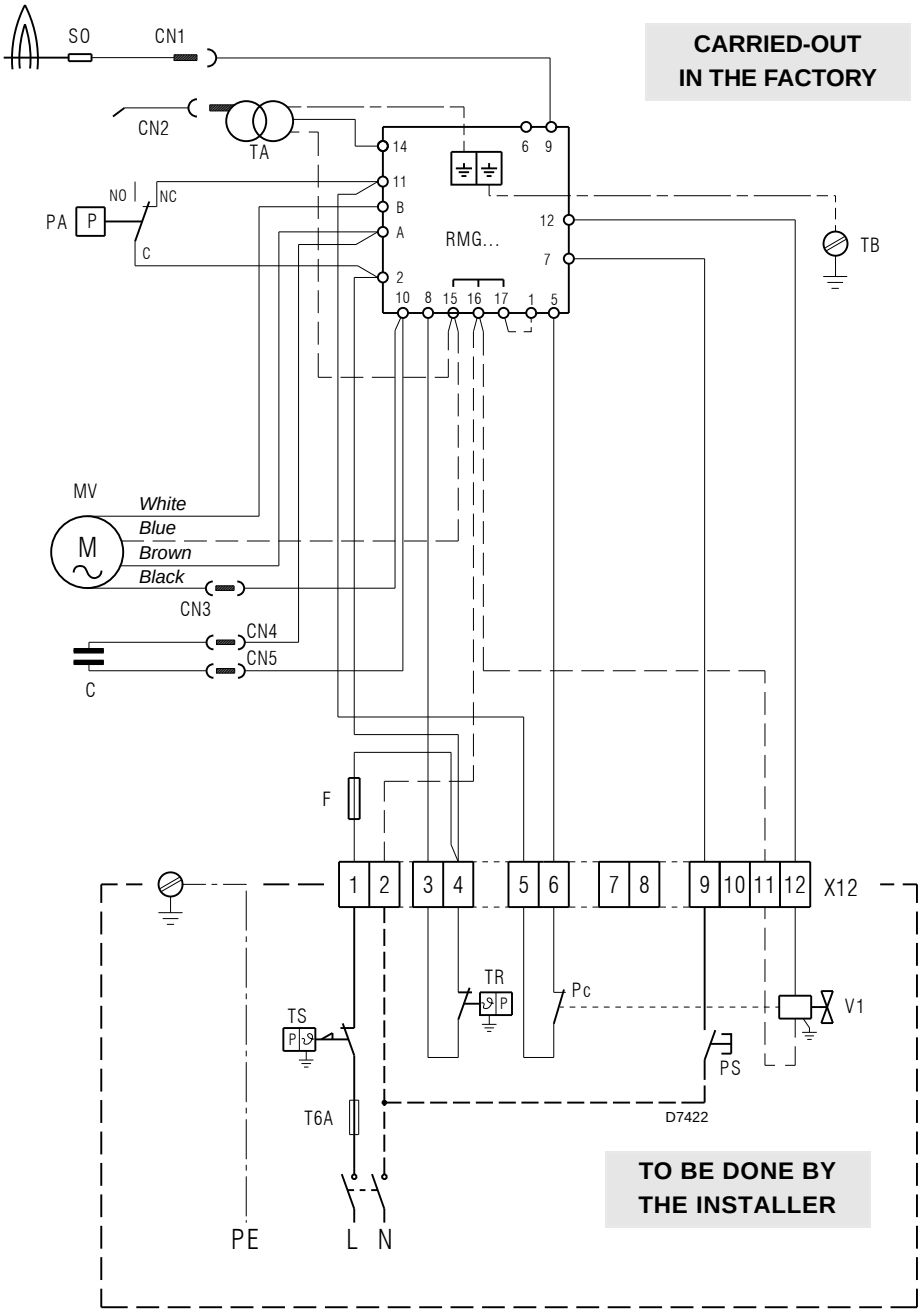
The burner provides it own power supply for the control circuits that is switched internal from terminal 1(L) & 2 (N), do not apply power on any other terminal or damaged to the control could occur.
The factory-installed jumper can be removed if a P.O.C device is desired.

24V CONTROL SYSTEM

If firing is to be controlled by a 24V operating system a 24V switching relay wired as shown in the diagram is required (not supplied – sold separately).
The required 24V operating controls must be wired between the thermostat terminals on the 24V-switching relay.
The factory-installed jumper can be removed if a P.O.C device is desired.

NOTE

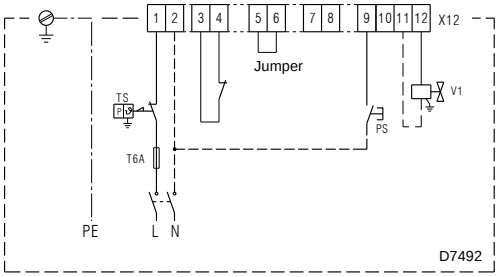
If an external electrical source is utilized, the conversion burner, when installed, must be electrically grounded with a solid green wire to Earth Ground, in accordance with local codes or, in the absence of local codes, with the National Electrical Code ANSI/NFPA 70-1990 and the CSA Electrical Code.



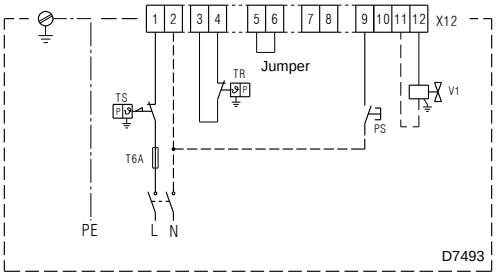
Wiring legend

- **C** - Capacitor MV
- **F** - Fuse 6.25A
- **CN...** - Connectors
- **MV** - Motor
- **PA** - Air pressure switch
- **Pc** - Valve source interlock
- **PS** - Remote lock-out signal
- **SO** - Ionization probe
- **TA** - Ignition transformer
- **TB** - Burner earth
- **TR** - Limit thermostat
- **TS** - Safety thermostat
- **T6A** - Fuse
- **V1** - Gas valve
- **X12** - Terminal board 12 pole

120V CONTROL SYSTEM

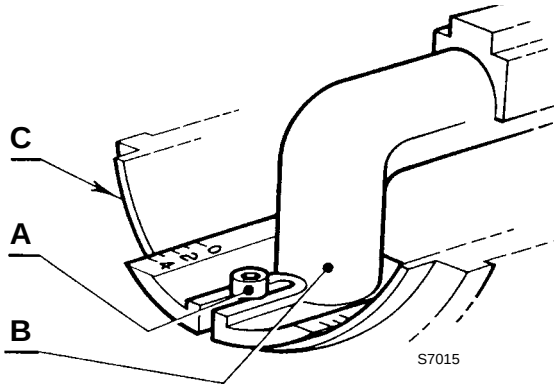


24V CONTROL SYSTEM



COMBUSTION HEAD SETTING

To set combustion head, loosen the Allen screw (**A**) and move the elbow (**B**) so that the rear edge of the air tube (**C**) coincides with the set point number.
See firing rate chart for set points.
Retighten the Allen screw (**A**).



⚠ **Make sure you are using the correct table for either Natural gas or Propane gas.**

BURNER SETUP CHART

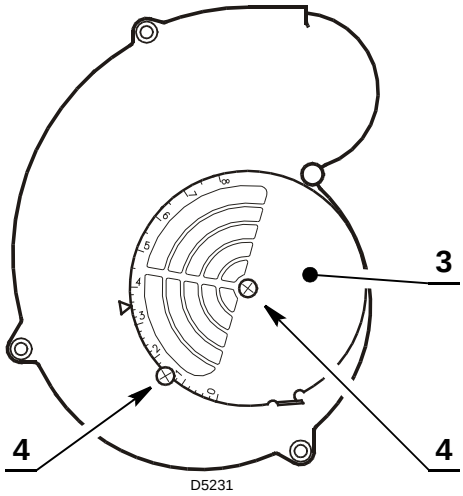
	BTU Input	Air Gate	Stop Gate	Manifold Pressure	Line Pressure
NATUARAL GAS	250,000	1.7	0.0	1.4” w.c.	8.0” w.c.
	350,000	1.6	0.0	1.6” w.c.	8.0” w.c.
	450,000	1.8	1.0	1.5” w.c.	8.0” w.c.
	550,000	2.2	2.0	1.4” w.c.	8.0” w.c.
	650,000	2.8	3.0	1.8” w.c.	10.0” w.c.
	750,000	3.5	4.0	2.1” w.c.	12.0” w.c.
PROPANE	250,000	2.0	0.0	1.0” w.c.	11.0” w.c.
	350,000	2.1	0.0	1.4” w.c.	11.0” w.c.
	450,000	3.0	1.0	1.5” w.c.	11.0” w.c.
	550,000	3.2	2.0	2.1” w.c.	11.0” w.c.
	650,000	3.7	3.0	2.6” w.c.	11.0” w.c.
	750,000	4.1	4.0	3.0” w.c.	11.0” w.c.

Line pressure measured at gas valve with burner firing.

NOTE:
The above settings are a starting point for adjustments ONLY; a qualified gas technician using proper test equipment must do the final adjustments.
Proper CO , 0 , and CO readings must be taken and be within regulating code requirements.
All the settings above are based on zero (0) over fire-draft.
If positive or negative chamber conditions exist some settings changes made be required.
For any referral to valve setting, please check the attached manufacturer valve specification.

AIR GATE ADJUSTMENT

To regulate the combustion air, adjust the manual air gate (3), by loosening the locking screws (4).
Once the optimal adjustment is reached, tighten the locking screws (4).



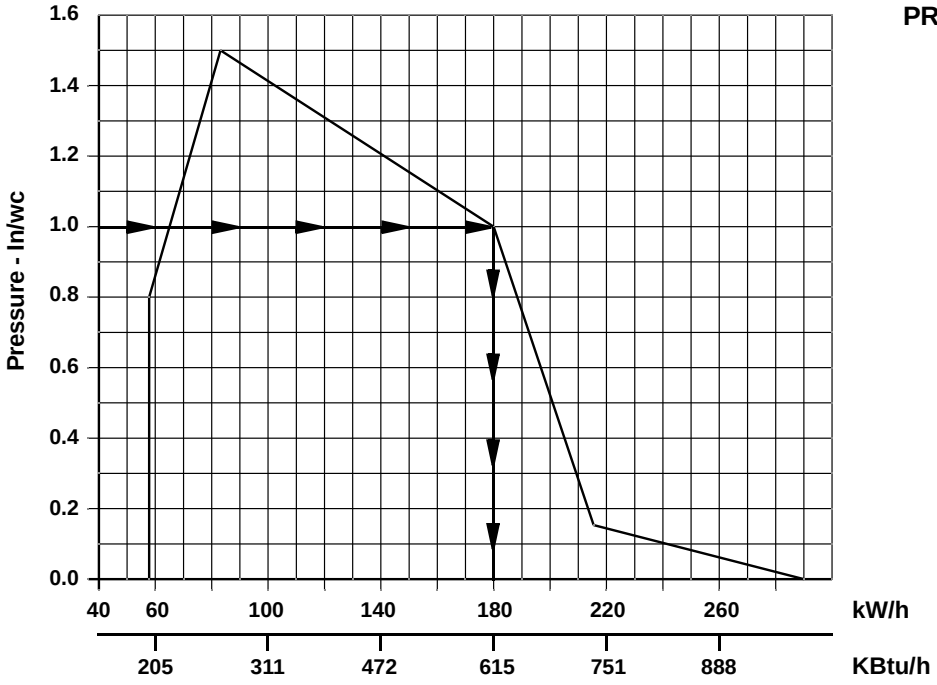
EXAMPLE SETTING - (for natural gas)
To set the air intake for a desired burner output of 450,000 Btu/hr, use **TABLE** to determine the correct air gate setting.
In this case, the setting would be 1.8 for natural gas.
Turn the manual air gate (3) until the arrow points to 1.8 on the scale.
Tighten locking screws (4).

All settings in **TABLE** are obtained with zero (0) pressure in the combustion zone and at normal operating temperatures. i.e., steady state hot conditions.

Note: Burner must be fired **ONLY** with fuel that is listed on the burner serial label.

PRESSURE WORKING CHART

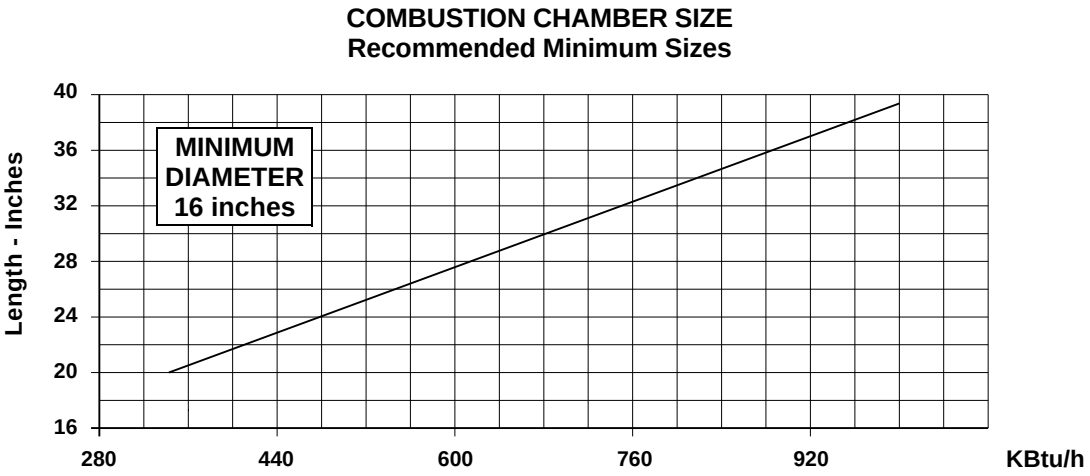
The chart below shows effects of pressure in the combustion zone on the minimum/maximum burner outputs.
In this example, with a maximum operating pressure of 1.0 inches water column in the combustion zone, you will be able to obtain a maximum of 615 KBtu/h burner output.



PRESSURE WORKING CHART
Natural and Propane Gas

Any change from zero (0) pressure in the combustion zone will affect the KBtu output of the burner. To supply the required input to the appliance, manifold pressure will have to be adjusted to compensate for this condition.

COMBUSTION CHAMBER SIZE



NOTES:

1) Sizes shown above are for cylindrical or wet base boilers, or air cooled heat exchangers.
2) To size the chamber in applications other than wet base boilers, you must calculate area in square inches of the combustion zone required to give you a grate area or floor area to match the BTU inputs according to local authority.
3) Recommended firebrick or cerafelt material has a continuous run limited to 2400 degrees Fahrenheit and a melting point of 3000 degrees Fahrenheit.

COMBUSTION CHECKS

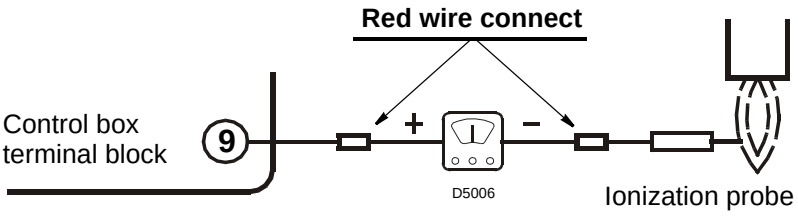
CO_2 It is advisable not to exceed a measured reading of 10% CO for Natural Gas or 12% CO for Propane Gas taken with the burner cover in place, to avoid the risk of the formation of CO due to minor changes in wind/draft conditions which may occur.

CO For safety reasons, the value of .02% (200ppm) free air sample must not be exceeded.

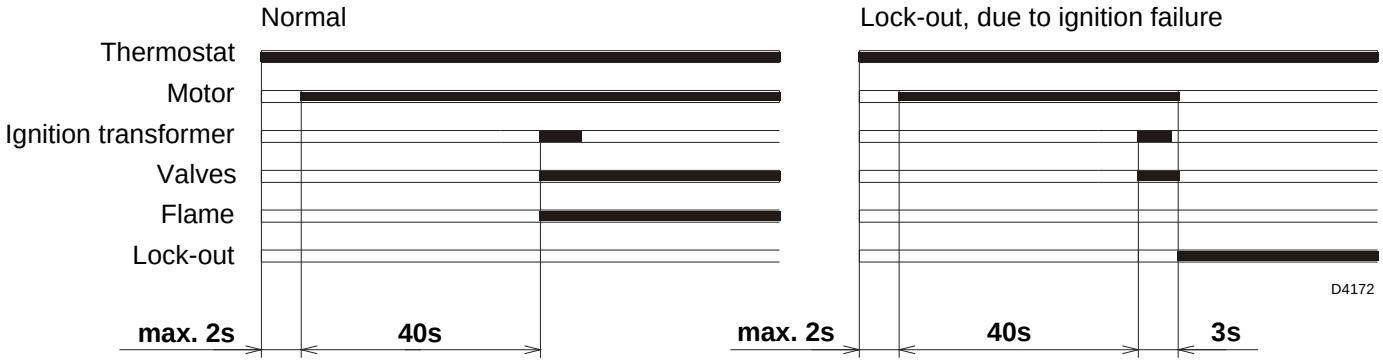
IONIZATION CURRENT

The minimum amount of current necessary for the control box to operate properly is 5 micro Amps DC.

To measure the ionization current, disconnect the red wire connector and insert a DC micrometer in series with control box terminal 9 and the ionization probe, which senses the flame.



BURNER START-UP CYCLE



START-UP CYCLE DIAGNOSTICS

During start-up, indication is according to the following table:

COLOUR CODE TABLE	
Sequences	**Colour code**
Pre-purging	●●●●●●●●●
Firing phase	●○●○●○●○●
Operation, flame ok	□□□□□□□□□
Operating with weak flame signal	□○□○□○□○□
Electrical supply lower than ~ 170V	●▲●▲●▲●▲●
Lockout	▲▲▲▲▲▲▲▲▲
Extraneous light	▲□▲□▲□▲□▲
Key to layout: ○ Off ● Yellow □ Green ▲ Red	

RESETTING THE CONTROL BOX AND USING DIAGNOSTICS

The control box features a diagnostics function through which any causes of malfunctioning are easily identified (indicator: **RED LED**). To use this function, you must wait at least 10 seconds once it has entered the safety condition (**lockout**), and then press the reset button.
The control box generates a sequence of pulses (1 second apart), which is repeated at constant 3-second intervals. Once you have seen how many times the light pulses and identified the possible cause, the system must be reset by holding the button down for between 1 and 3 seconds.

RED LED on wait at least 10s	Lockout	Press reset for > 3s	Pulses	Interval 3s	Pulses
			●●●●		●●●●

The methods that can be used to reset the control box and use diagnostics are given below.

RESETTING THE CONTROL BOX

To reset the control box, proceed as follows:
- Hold the button down for between 1 and 3 seconds.
  The burner restarts after a 2-second pause once the button is released.
  If the burner does not restart, you must make sure the limit thermostat is closed.

VISUAL DIAGNOSTICS

Indicates the type of burner malfunction causing lockout.
To view diagnostics, proceed as follows:
- Hold the button down for more than 3 seconds once the red LED (burner lockout) remains steadily lit.
  A yellow light pulses to tell you the operation is done.
  Release the button once the light pulses. The number of times it pulses tells you the cause of the malfunction, according to the coding system indicated in the table on page 10.

SOFTWARE DIAGNOSTICS

Reports burner life by means of an optical link with the PC, indicating hours of operation, number and type of lockouts, serial number of control box etc ...
To view diagnostics, proceed as follows:
- Hold the button down for more than 3 seconds once the red LED (burner lockout) remains steadily lit.
  A yellow light pulses to tell you the operation is done.
  Release the button for 1 second and then press again for over 3 seconds until the yellow light pulses again.
  Once the button is released, the red LED will flash intermittently with a higher frequency: only now can the optical link be activated.

Once the operations are done, the control box's initial state must be restored using the resetting procedure described above.

BUTTON PRESSED FOR	CONTROL BOX STATUS
Between 1 and 3 seconds	Control box reset without viewing visual diagnostics.
More than 3 seconds	Visual diagnostics of lockout condition: (LED pulses at 1-second intervals).
More than 3 seconds starting from the visual diagnostics condition	Software diagnostics by means of optical interface and PC (hours of operation, malfunctions etc. can be viewed)

The sequence of pulses issued by the control box identifies the possible types of malfunction, which are listed in the table below.

Signal	Problem	Possible cause	Recommended remedy
2 blinks ● ●	Once the pre-purging phase and safety time have passed, the burner goes into lockout without the appearance of the flame	The operation solenoid lets little gas through	Increase
		One of the two solenoid valves does not open.	Replace
		Gas pressure too low	Increase pressure at governor
		Ignition electrode incorrectly adjusted	Adjust
		Electrode grounded due to broken insulation	Replace
		High voltage cable defective	Replace
		High voltage cable deformed by high temperature	Replace and protect
		Ignition transformer defective	Replace
		Incorrect valve or transformer electrical wiring	Check
		Defective control box	Replace
		A closed valve upline the gas train	Open
		Air in pipework	Bleed air
		Gas valves unconnected or with interrupted coil	Check connections or replace coil
3 blinks ● ● ●	The burner does not switch on, and the lockout appears	Air pressure switch in operating position	Adjust or replace
	The burner switches on, but then stops in lockout	- Air pressure switch inoperative due to insufficient air pressure:	
		Air pressure switch incorrectly adjusted.	Adjust or replace
		Pressure switch pressure test point pipe blocked	Clean
		Poorly adjusted head	Adjust
		High pressure in the furnace	Connect air pressure switch to fan suction line
	Lockout during pre-purging phase	Defective motor control contactor (only three-phase version)	Replace
		Defective electrical motor	Replace
		Motor lockout (defective electrical motor)	Replace

Signal	Problem	Possible cause	Recommended remedy
4 blinks ● ● ● ●	The burner switches on, but then stops in lockout	Flame simulation	Replace the control box
	Lockout when burner stops	Permanent flame in the combustion head or flame simulation	Eliminate persistence of flame or replace control box
6 blinks ● ● ● ● ● ●	The burner switches on, but then stops in lockout	Defective or incorrectly adjusted servomotor	Adjust or replace
7 blinks ● ● ● ● ● ● ●	The burner goes into lockout immediately following the appearance of the flame	The operation solenoid lets little gas through	Increase
		Ionisation probe incorrectly adjusted	Adjust
		Insufficient ionisation (less than 5 A)	Check probe position
		Earth probe	Withdraw or replace cable
		Burner poorly grounded	Check grounding
		Phase and neutral connections inverted	Invert them
		Defective flame detection circuit	Replace the control box
	Burner lockout moving between 1st and 2nd stages, or between 2nd and 1st stages	Too much air or too little gas	Adjust air and gas
	Burner goes into lockout during operation	Probe or ionisation cable grounded	Replace worn parts
10 blinks ● ● ● ● ● ● ● ● ● ●	The burner does not switch on, and the lockout appears	Incorrect electrical wiring	Check
	The burner goes into lockout	Defective control box	Replace
		Presence of electromagnetic disturbances in the thermostat lines Presence of electromagnetic disturbance	Filter or eliminate Use the radio disturbance protection kit
No blink	The burner does not start	No electrical power supply	Close all switches - Check connections
		A limiter or safety control device is open	Adjust or replace
		Line fuse blocked	Replace
		Defective control box	Replace
		No gas supply	Open the manual valves between contactor and train
		Mains gas pressure insufficient	Contact your GAS COMPANY
		Minimum gas pressure switch fails to close	Adjust or replace
		Servomotor fails to move to min. ignition position	Replace

Signal	Problem	Possible cause	Recommended remedy
No blink	The burner continues to repeat the start-up cycle, without lockout	The gas pressure in the gas mains lies very close to the value to which the minimum gas pressure switch has been set. The sudden drop in pressure after valve opening causes temporary opening of the pressure switch itself, the valve immediately closes and the burner comes to a halt. Pressure increases again, the pressure switch closes again and the ignition cycle is repeated. And so on	Reduce the minimum gas pressure switch intervention pressure. Replace the gas filter cartridge.
	Ignition with pulsations	Poorly adjusted head	Adjust
		Ignition electrode incorrectly adjusted	Adjust
		Incorrectly adjusted fan air damper: too much air	Adjust
		Output during ignition phase is too high	Reduce
	The burner does not move into the 2nd stage	Remote control device TR fails to close	Adjust or replace
		Defective control box	Replace
		Defective servomotor	Replace
	Burner stops with air damper open	Defective servomotor	Replace

NORMAL OPERATION / FLAME DETECTION TIME

The control box has a further function to guarantee the correct burner operation (signal: **GREEN LED** permanently on). To use this function, wait at least ten seconds from the burner ignition and then press the control box button for a minimum of 3 seconds. After releasing the button, the GREEN LED starts flashing as shown in the figure below.

GREEN LED on wait at least 10s	Press reset for > 3s	Pulses	Interval 3s	Pulses
		●●●●		●●●●

The pulses of the LED constitute a signal spaced by approximately 3 seconds.

The number of pulses will measure the probe DETECTION TIME since the opening of gas valves, according to the following table:

SIGNAL	FLAME DETECTION TIME
1 blink ●	0.4s
2 blinks ● ●	0.8s
6 blinks ● ● ● ● ● ●	2.8s

This is updated in every burner start-up. Once read, the burner repeats the start-up cycle by briefly pressing the control box button.

WARNING

If the result is > 2s, ignition will be retarded. Check the adjustment of the hydraulic brake of the gas valve, the air damper and the combustion head adjustment.

OWNER INFORMATION AND ROUTINE MAINTENANCE

SAFETY LOCKOUT

This burner is equipped with multiple interlocking safety devices. In the event of a failure in the flame, or any blockage of the combustion air supply, the burner will “lock out” in a safety condition. In such an event, an illuminated red button will show on the front of the red cover.
To restart the burner, press the button once only. Should the burner return to the lock out condition, call a qualified service technician or your gas company for assistance. In the case of loss of pressure in the gas supply line, the burner will go off on safety. If supplied with an optional gas pressure switch (or field installed), the burner will simply switch off on low gas pressure, and start up again when the gas pressure returns to normal.

NOTE: Keep the area around the burner free and clear of all combustible materials, gasoline and other flammable vapours and liquids. Do not allow any obstructions, which may prevent the free, flow of air to the burner.

MAINTENANCE

Like all precision equipment, your burner will require periodic maintenance. At an interval of 2 months, you should:

1) If your boiler/furnace has an observation port, visually check the flame.
2) Check and clean the air intake louver to remove any buildup of fluff, dust, pet hair, etc.

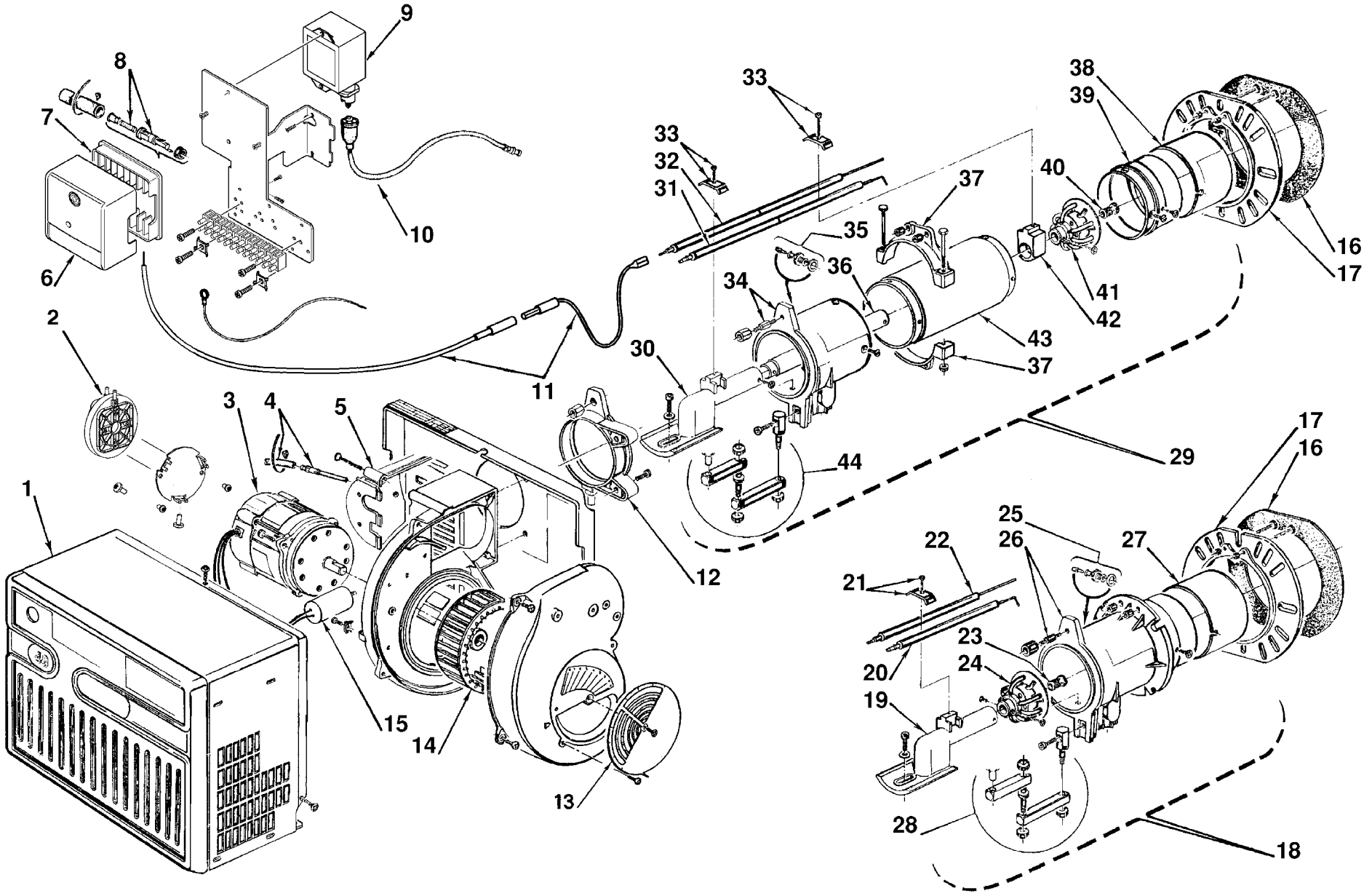
For any maintenance or repairs over and above those listed, contact your service technician or gas company. **THERE ARE NO OWNER SERVICEABLE PARTS INSIDE THE BURNER COVER.**

Once a year, you should have the burner checked as indicated below, by your local authorized Riello dealer.

1) Check burner distributor head and mixing plates. Clean if necessary.
2) Check ignition electrode. Clean, adjust, or replace as necessary.
3) Check the flame sensor rod (ionization rod) for dirt or carbon build up. Clean, adjust, or replace as necessary.
4) Check manifold gas pressure.
5) Check all burner adjustments.
6) Generally clean all exposed parts and components.
7) Repeat combustion tests.

Your Riello 40 gas burner is only part of your heating system.
Once every year you should have your heating appliance serviced by a qualified service technician.
You should also have the chimney checked, and cleaned if necessary.

EXPLODED SPARE PARTS



SPARE PARTS LIST

No.	CODE	DESCRIPTION	No.	CODE	DESCRIPTION
1	**3007246**	Burner back cover	18	**3950471**	**Short combustion head (280T1)**
2	**3020314**	Air pressure switch	19	**3006697**	Drawer assembly elbow
3	**3005845**	Burner motor	20	**3006706**	Electrode assembly
4	**3007288**	Air switch tube and connector	21	**3003409**	Electrode & ionization clamp
5	**3007294**	Air plate cover	22	**3020209**	Ionization assembly
6	**3013072**	Primary control box	23	**3006703**	Natural gas diaphragm
7	**3003784**	Primary control sub-base	24	**3006700**	Distributor head and mixing plate
8	**3006804**	Fuse 6.25A	25	**3005447**	Gas test point
9	**3002462**	Transformer - Ignition	26	**3007525**	Manifold
10	**3002461**	High voltage lead	27	**3006694**	End cone
11	**3007310**	Ionization lead	28	**3000870**	Hinge assembly
12	**3006689**	Chassis mounting collar			
13	**3007206**	Air gate			
14	**3005799**	Fan	29	**3950472**	**Long combustion head (280T2)**
15	**3007307**	Capacitor 20 μF	30	**3006697**	Drawer assembly elbow
16	**3005852**	Mounting gasket	31	**3006962**	Electrode assembly
17	**3005851**	Universal mounting flange	32	**3020210**	Ionization assembly
			33	**3003409**	Electrode & ionization clamp
			34	**3007526**	Manifold
			35	**3005447**	Gas test point
			36	**3007313**	Natural gas tube
			37	**3005849**	Semi flange 2 required
			38	**3006694**	End cone
			39	**3007283**	Combustion head connector
			40	**3006703**	Natural gas diaphragm
			41	**3006700**	Distributor head and mixing plate
			42	**3007314**	Electrode support
			43	**3007286**	Air tube-long
			44	**3000870**	Hinge assembly

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Hingham, MA 02043
Phone: 781-749-8292
Toll Free: 800-992-7637
Fax: 781-740-2069

2165 Meadowpine Blvd.
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Phone: 905-542-0303
Toll Free: 800-387-3898
Fax: 905-542-1525

BURNER START- UP FORM *

Burner S/N. or Model: _____ Appliance: _____

Installer name: _____

Company: _____ Installation date: _____

Address: _____

Phone: _____ Fax: _____

Owner Name: _____

Address: _____

Phone: _____ E-mail: _____

Burner Start-up Info

Gas supply pressure: _____ Manifold pressure: _____

Air setting: _____ Turbolator setting: _____

Draft overfire: _____ Draft breech: _____

CO_2: _____ CO: _____ O_2: _____ Smoke density: _____ (Bacharach) _____

Ionization reading μAdc: _____ Input BTU/hr: _____

* This form was designed and provided in the installation manual for reference and also for providing technical information which can be faxed or mailed to our technical hot-line coordinator when technical assistance is required. Please complete this form, fax it or mail it at the address/fax above, or send an e-mail with the information listed below to: **techservices@riellocanada.com**

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Subject to modifications