# 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 |
|---|---|---|
| 3757025 | G120 | 570T |

2903332 (6) - 03/2011

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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 or, in the absence of local codes, with the Standard for the Installation of Domestic Gas Conversion Burners, ANSI Z21.8-1984, and Addendum, Z21.8a-1989, and the National Fuel Gas code, ANSI Z223.1-1984, and CAN/CGA B149.1 &.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 national Electrical Code, ANSI/NFPA No. 70-1990 and CSA Electrical Code.**

Owner is required to retain this manual for future reference.

| TECHNICAL SPECIFICATIONS<br>FIRING RATE 38,000 TO 120,000 Btu/hr | | |
|---|---|---|
| | **NATURAL GAS** | **PROPANE** |
| GAS SUPPLY PRESSURES | MIN. 5" wc<br>MAX. 7" wc | MIN. 12" wc<br>MAX. 14" wc |
| MANIFOLD PRESSURES | MIN. 3" wc<br>MAX. 5" wc | MIN. 3" wc<br>MAX. 5" wc |
| POWER<br>MOTOR<br>CONTROL MODULE | 120 Volts 60 Hz 1 phase<br>232T 2.2 Amps 3250 rpm<br>525 SE/A 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.**

## 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. See page 8.
   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 pressure test point, and line pressure test point can be found on page 8.

4) To make electrical connections, refer to field wiring diagram on page 9. A manual disconnect switch must be installed in the incoming lines. Wiring to the low voltage-switching relay, if used, (Honeywell R8038A) must be rigid conduit or flexible approved cable.

⚠ **CAUTION:**
**Label all wires prior to disconnection when servicing controls.**
**Wiring errors can cause improper and dangerous operation.**
**Verify proper operation after servicing. (Step 5 e below.)**

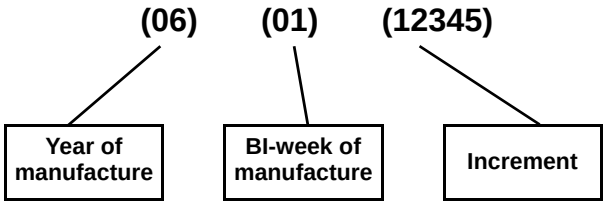
⚠ **CAUTION:**
**The phase (HOT) wire must be connected to the black lead of the 24v relay if used; neutral to the white lead. Do not reverse the polarity.**
**The burner will not operate with the Phase/Neutral reversed, and the control box may be damaged.**

5) Check the burner functions as follows:
   a) Make a final check on both the gas and electrical connections.
   b) Loosen the screw in the manifold gas test point and install an appropriate manometer.
   c) Set the thermostat at its highest setting.
   d) Switch on power.
   e) With the manual gas valve turned off, press the burner reset button (9, page 4), and allow the burner to run through a complete cycle to ensure that the sequence of operations is correct. A full starting cycle should take approximately 40 seconds from a no power condition until burner lockout; refer to the start-up cycle chart found on page 14.
   f) Once burner is operational (up and running) a final gas leak check must be completed on the gas train.
6) If the burner is installed on a central warm air furnace, affix the mandatory warning labels to the furnace fan cover door (inside and outside).

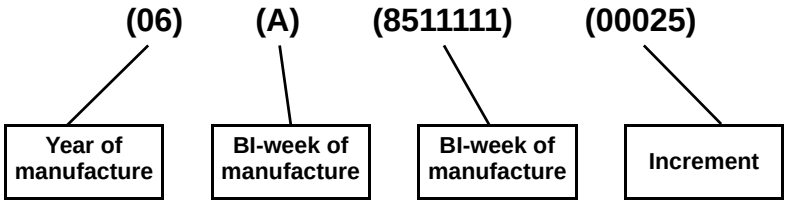
## SERIAL NUMBER IDENTIFICATION

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.

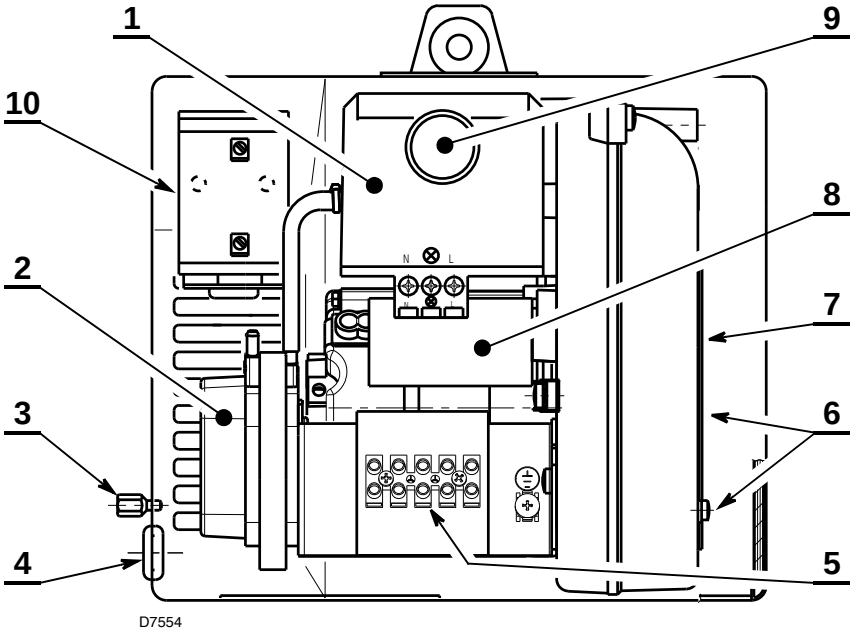



The Riello 15 character serial number, example,
**06 A 8511111 00025**, is identified as follows:
**06** = Last two digits of the year of manufacture;
**A** = BI-week of manufacture;
**8511111** = Burner product code;
**00025** = Increment of 1 for each burner produced – specific to product code – reset to zero each January 1st.

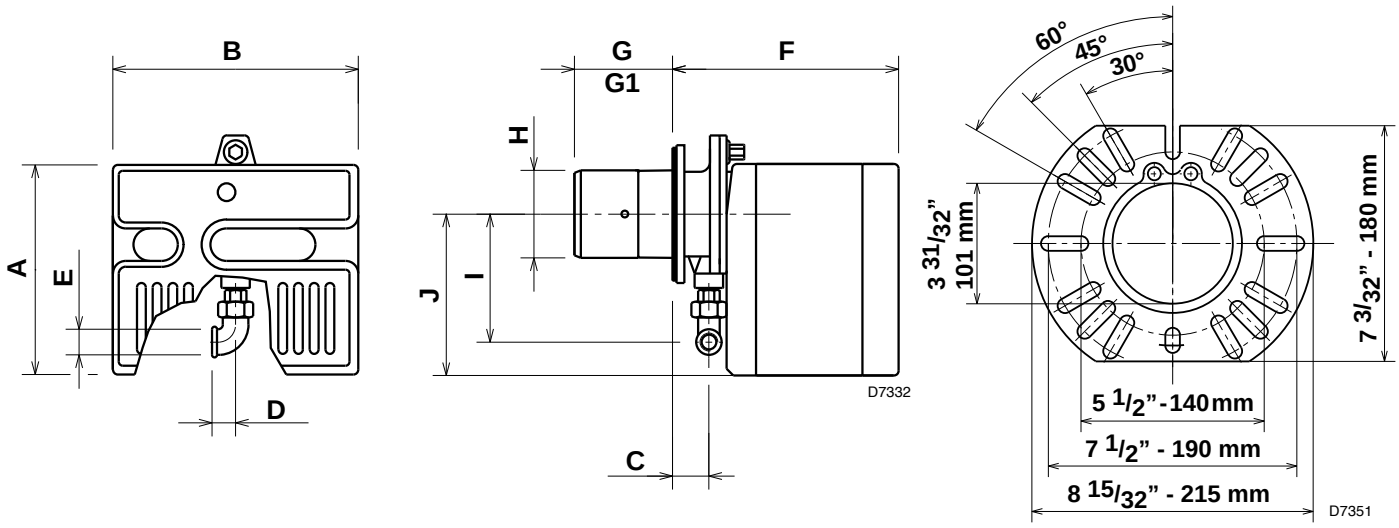



## BURNER COMPONENTS IDENTIFICATION

**1** – Control box
**2** – Air pressure switch
**3** – Screw for fixing the cover
**4** – Cable grommet
**5** – Wiring terminal block
**6** – Screws for fixing the air-damper
**7** – Air damper
**8** – Capacitor
**9** – Reset button with lock-out lamp
**10** – Gas valve transformer 120V / 24V



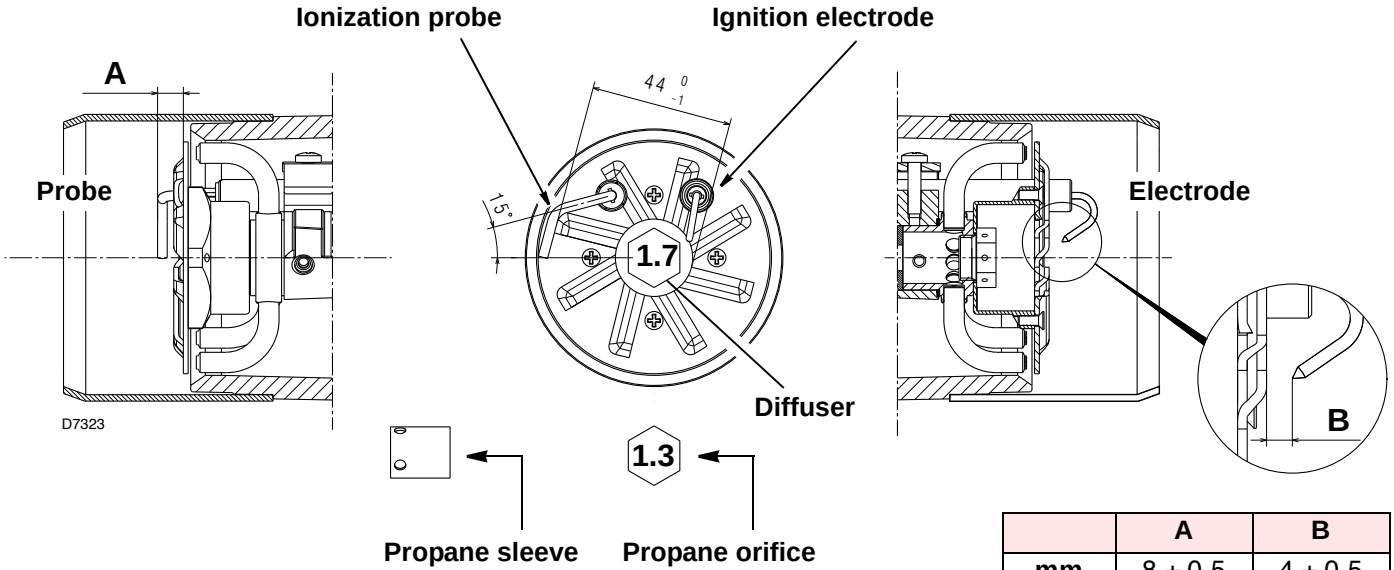
## BURNER DIMENSIONS




| Model G120 | A | B | C | D | E | F | G | G1 | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Inches | 8 7/16 | 9 7/8 | 1 7/16 | 15/16 | 1/2 | 9 | 3 15/16 | 10 3/4 | 3 9/16 | 5 3/16 | 6 1/2 |
| mm | 215 | 252 | 37 | 25 | 13 | 230 | 100 | 273 | 91 | 132 | 165 |

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

## ELECTRODE AND FLAME PROBE ADJUSTMENTS



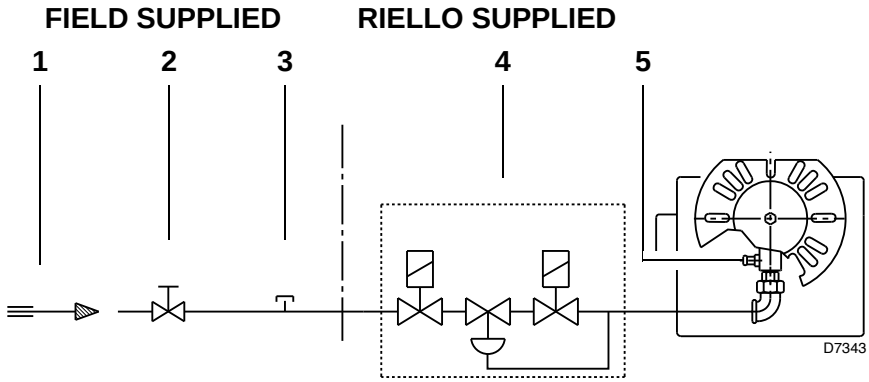

| | A | B |
|---|---|---|
| mm | 8 ± 0.5 | 4 ± 0.5 |
| inch | 5/16" | 5/32" |

**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

⚠ **THE GAS TRAIN LEAVES THE FACTORY SET AT 3.5” wc.**

**ATTENTION**
**This gas train scope of supply meets the minimum controls requirements according to CSA Canada and USA regulations. Any additional requirements needed to meet local codes are the responsibility of others.**



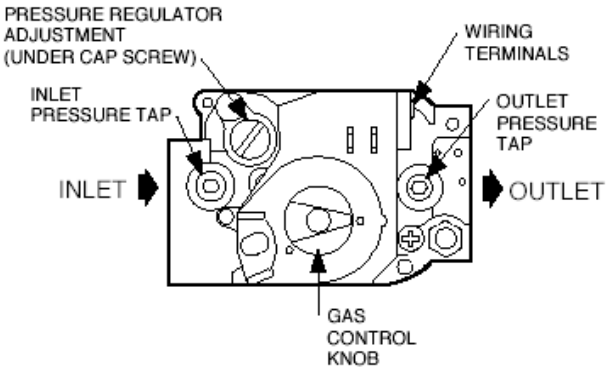
**VALVE LEGEND**
**1** - Gas supply & flow direction of gas
**2** - Gas supply main shtoff manual valve (field supplied)
**3** - Gas supply pressure test point (field supplied)
**4** - Valve
**5** - Gas burner manifold test point

**GAS SUPPLY PRESSURE RANGES:**

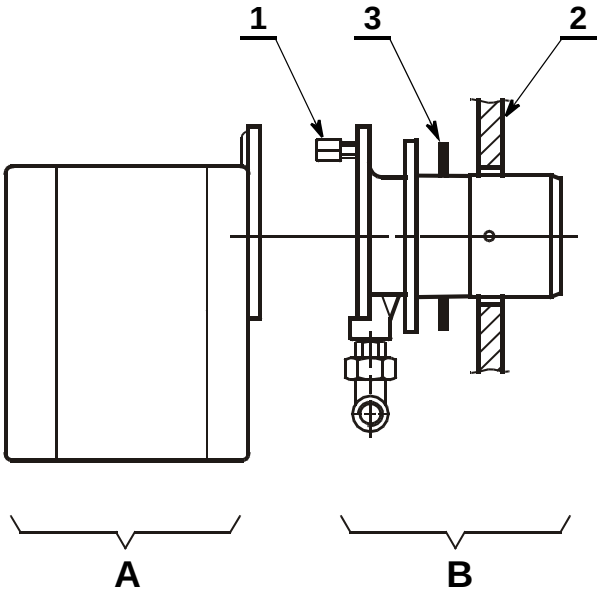
**NATURAL GAS PRESSURE:**
**min. 5” wc - max. 7” wc**

**LP PROPANE GAS PRESSURE**
**min. 12” wc - max. 14” wc**

**TOP VIEW OF GAS CONTROL**



## 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 appliance. We suggest that the appliance output should be approximately 85% of input (85% efficiency).
2) Check the dimensions of the combustion chamber for correct sizing against the input requirements of the application.
3) Check that there is sufficient air for proper combustion and adequate ventilation.
   Local codes should be followed. In the absence of local codes, refer to the NFPA Manual No. 31, CAN/CGA B149.1 &. 2, ANSI Z223.1-1984 and Addendum 221.8A 1989.
4) Check that you have adequate space for servicing the equipment.
   The 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.
5) Check that the chimney is of sufficient area to handle the exhaust gases.
   Make sure the chimney is clear and there are no obstructions.
6) Barometric draft regulators must 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.

   For further clarification, refer to ANSI Z21.8-1984 and Z21.17A-1993.

⚠ **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).**

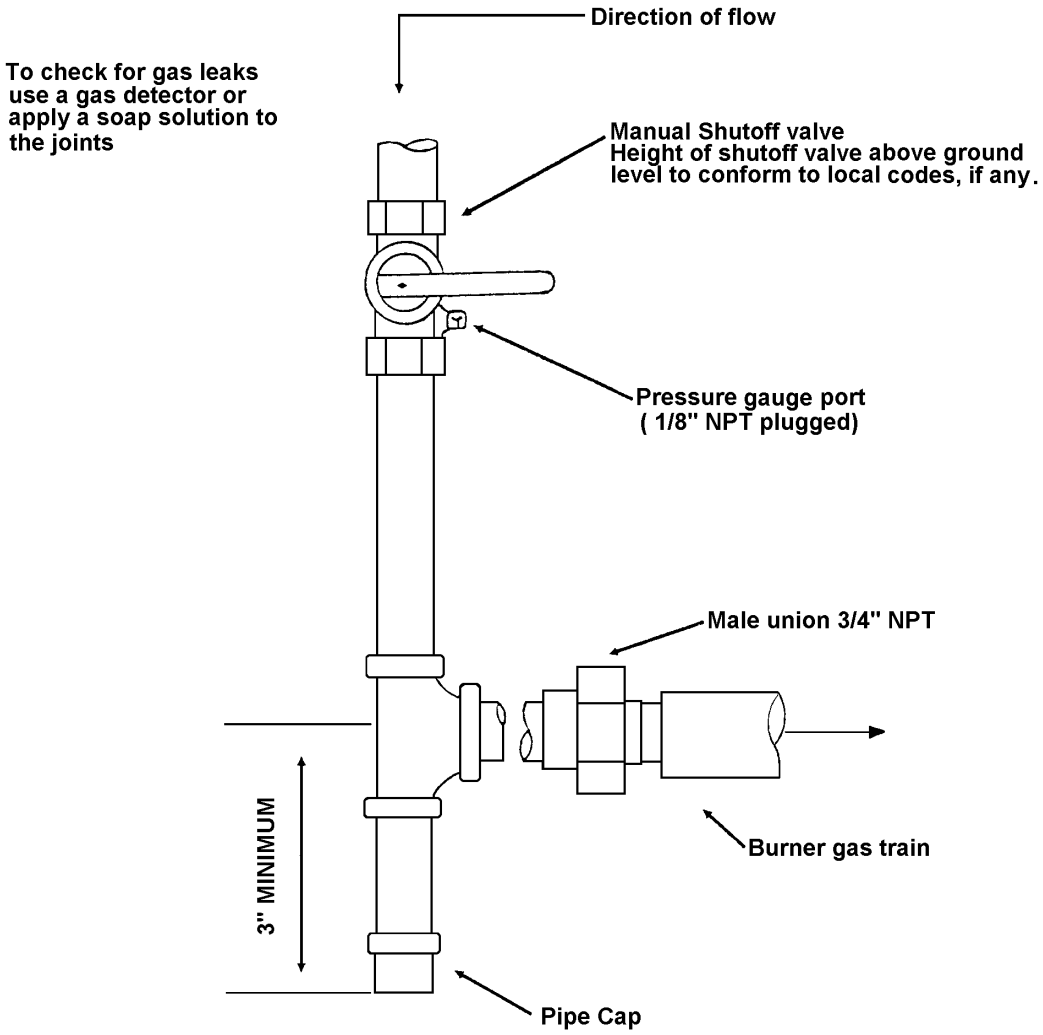
**The installer must identify the main electrical power switch and manual gas shut off valve, for emergency conditions. The burner cover must be in place and secured before the burner is placed in operation.**

## 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.

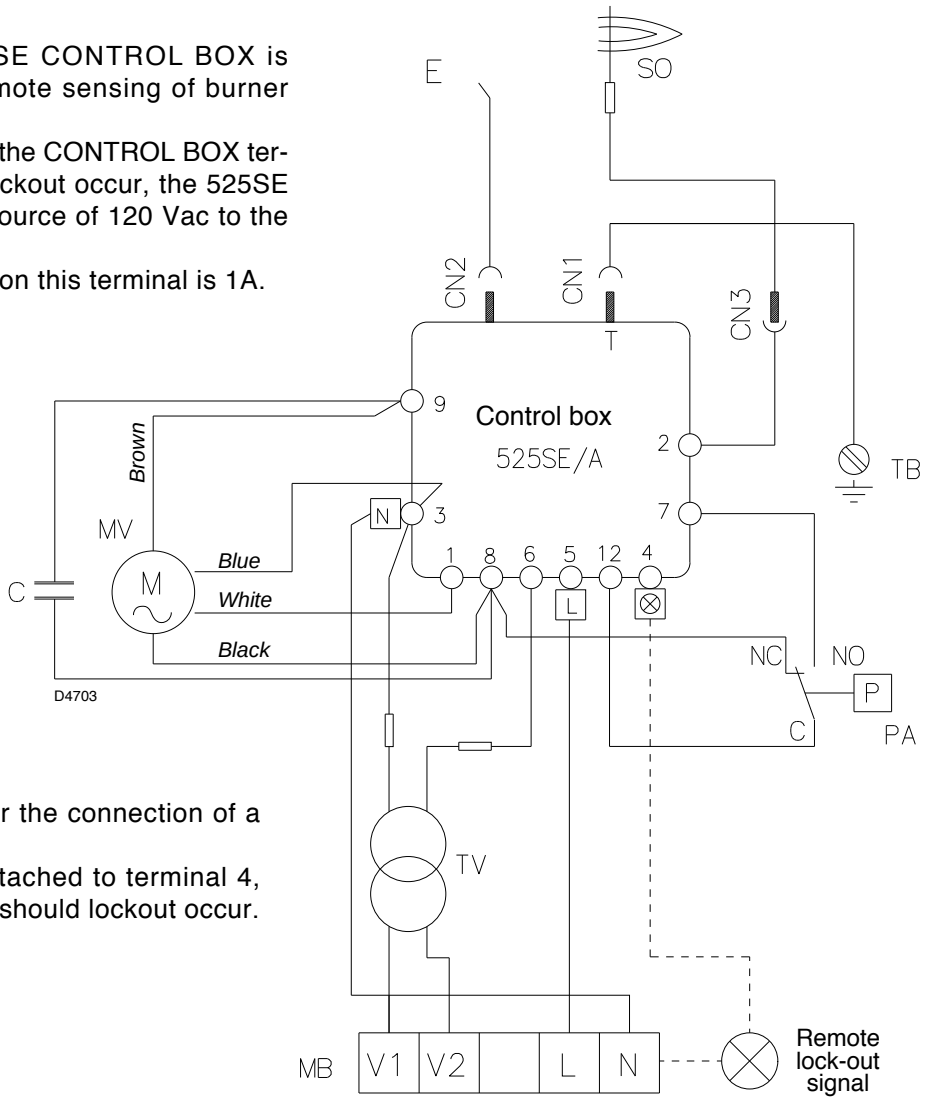
**PRESSURE TEST-OVER $^1/_2$ PSIG.**
The appliance and its individual shutoff valve must be disconnected from the gas supply piping system during any pressure testing of the system at a test pressure in excess of $^1/_2$ PSIG.

**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.



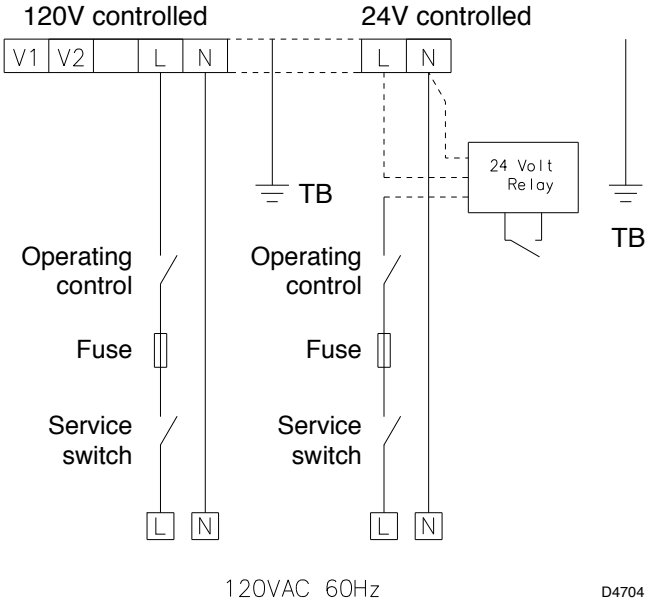
## FACTORY WIRING DIAGRAM

**NOTE:**
The SAFETY SWITCH on the 525SE CONTROL BOX is equipped with a contact allowing remote sensing of burner lockout.
The electrical connection is located on the CONTROL BOX terminal 4 as indicated. Should burner lockout occur, the 525SE CONTROL BOX will supply a power source of 120 Vac to the connection terminal.
The maximum allowable current draw on this terminal is 1A.




**IMPORTANT:**
Terminal 4 is to be used only for the connection of a remote sensing device.
If a neutral or ground lead is attached to terminal 4, the control box will be damaged should lockout occur.

## FIELD WIRING DIAGRAM




**LEGEND**

| | | |
|---|---|---|
| **C** | - | Capacitor |
| **CN...** | - | Connectors |
| **E** | - | Ignition electrode |
| **MB** | - | Terminal board |
| **MV** | - | Motor |
| **PA** | - | Air pressure switch |
| **SO** | - | Ionization probe |
| **TB** | - | Burner earth |
| **TV** | - | Transformer 24V |

## SETTING UP THE BURNER

After burner output has been determined, use **TABLE 1** below **AS AN INITIAL GUIDE** for burner settings.

All settings in this table were obtained under the following conditions.

- 0 (zero) draft in the combustion zone;
- Inlet gas pressure range as in table 1;
- Standard lab test boiler;
- Steady state (HOT) operating conditions.

| | Gas inlet pressure range | Diaphragm | Manifold gas pressure | Burner output | Head setting | Air gate setting |
|---|---|---|---|---|---|---|
| | "wc | Marking | "wc | Btu/hr | Nocth | Notch |
| NATURAL GAS | 5.0 - 7.0 | A1 | 3.5 | 38,000 | 0 | 0.6 |
| | | A2 | | 43,138 | 0 | 0.8 |
| | | A3 | | 53,922 | 1 | 0.9 |
| | | A4 | | 60,616 | 2 | 1.1 |
| | | A5 | | 73,260 | 2 | 1.4 |
| | | A6 | | 92,598 | 3 | 1.9 |
| | | A7 | | 120,000 | 3 | 2.7 |

Burner input decreases with increasing the combustion chamber pressure.
Once installed, a higher or lower burner input can be achieved by raising or lowering the manifold pressure from - 0.5" wc. to +1.5" wc. Pressure changes can only be made when the burner is running. The typical working manifold pressure is 3.5" wc. (both for natuaral gas and propane).

## STEP BY STEP PROCEDURE

1) Set air gate. See **AIR GATE ADJUSTMENT** on page 11.
2) Set gas diaphragm and combustion head.
   See **DIAPHRAGM INSTALLATION AND COMBUSTION HEAD SETTING** on page 12.
3) Set the manifold pressure using the following method.
   a) In order to determine existing manifold pressure, start the burner.
      At the end of the prepurge cycle (approx. 30s), the gas valve is energized.
      During the 5 sec. trial for ignition, note the observed manifold pressure. If the burner lights and continues to run, go to step (d).
   b) Compare the observed manifold pressure from step (a) to the required value from **TABLE 1**.
   c) Repeat step (a), making adjustments to the gas valve, until flame is established.
   d) Once flame has been established, set your manifold pressure to the desired value from **TABLE 1**.
4) Check combustion gases using proper combustion analysis equipment to ensure safe levels of $CO_2$ and CO during appliance heat up.
   The gas valve should be used to make any necessary adjustments to ensure safe combustion.
   At this point do not adjust the air or head settings unless absolutely necessary.
5) Allow burner to run until normal operating temperatures and conditions have been achieved.
6) a) Clock the gas meter to determine actual burner output.
   b) Set the manifold pressure, by adjusting the gas valve, to achieve desired output.
   c) Check combustion gases once again to ensure safe operation.
      Make sure the burner cover is in place and air gate locking screws are secure for all combustion analysis.
      Adjust air gate if necessary (refer to page 11). A qualified technician must do this test.
      The maximum recommended $CO_2$ level for natural gas is 10%; the maximum recommended level for propane gas is 12%. The recommended flue gas temperature is from 350°F to 550°F.
7) After completing the adjustments, remove the manometer and tighten the screw inside the manifold test point. Replace the regulator cap on the gas valve.
8) Complete the adjustment data tag, described on page 15.
   Explain the burners essential functions (starting and stopping) to the owner.
   Do not forget to give the dealer or service company's name and address.
   Please see page 15 for information on burner maintenance procedures.

⚠ **NOTE:** Do not assume the heating system is operating at optimum performance.

## THERE IS NO SUBSTITUTE FOR PROPER COMBUSTION TESTING!
## OPERATING FAULTS

The integrated control system is self-checking.
The cycle from start up to flame establishment, takes approximately 70 seconds.

The burner will go into lockout under the following circumstances:
a) Burner fails to ignite;
b) The ionization probe is grounded;
c) Opening of the air pressure switch or the normally open contacts of the air pressure switch not making.

Should overheating of the appliance occur, shut off the manual gas valve to the burner.
Do **NOT** shut off the switch to the circulating pump or blower fan.

### SHUT DOWN PROCEDURE

Switch off electrical power to the unit. Close the manual supply gas valve.

### START UP PROCEDURE

See page 7.

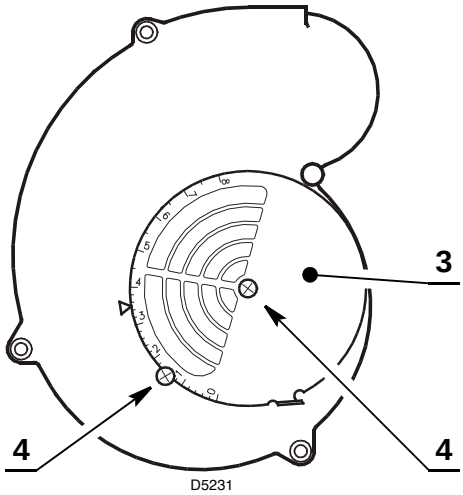
⚠ **NOTE:**
If an external electrical source is utilized, the conversion burner, when installed, must be electrically grounded in accordance with local codes.
In the absence of local codes, refer to the National Electrical Code, ANSI/NFPA 70-1990.
In Canada follow the Canadian Electrical Code Part 1 CSA C22.1.

## 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 93,000 Btu/hr, use **TABLE 1** to determine the correct air gate setting.
In this case, the setting would be 1.9 for natural gas.
Turn the manual air gate (3) until the arrow points to 1.9 on the scale.
Tighten locking screws (4).

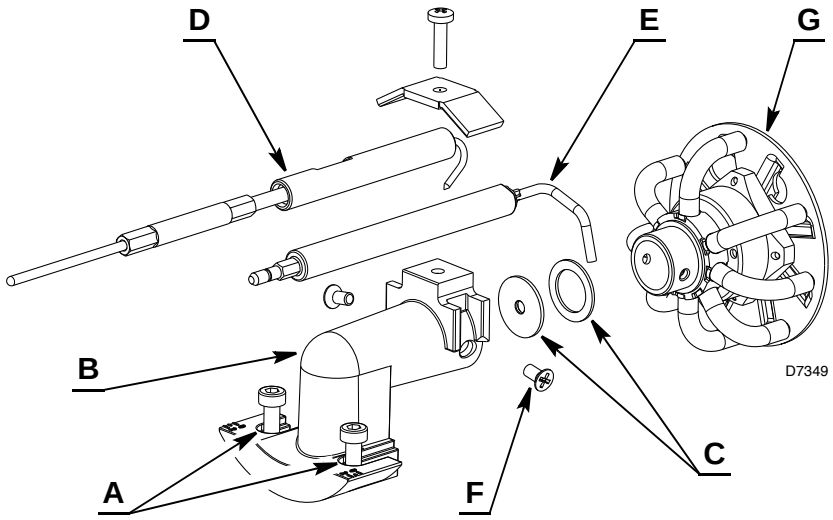
All settings in **TABLE 1** are obtained with zero (0) pressure in the combustion zone and at normal operating temperatures. i.e., steady state hot conditions.




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

## DIAPHRAGM INSTALLATION AND COMBUSTION HEAD SETTING

A proper diaphragm (C) has to be installed in the combustion head gas line, according to **TABLE 1**. A complete set of gas diaphragms is delivered with the burner packaging as equipment. The burner leaves the factory with the **A7** diaphragm already installed. In case another diaphragm has to be installed, following the instructions below.




To remove the drawer assembly from the manifold (B), follow the procedure below:

1) Disconnect 24v leads at the gas valve.
2) Separate the burner chassis from the combustion head by removing the locknut.
3) Loosen the two Allen screws (A) without taking them out.
4) Withdraw the head, turning it 180 degrees.
5) Pull out head, leaning it towards the bottom.
6) Remove the ignition electrode (D) and the ionization probe (E).
7) Unscrew the screw (F) and remove the gas diffuser (G).
8) Install the proper diaphragm (C) and seal according to **TABLE 1**.
9) Refit following the above procedure in the reverse order (verify the ignition electrode and the ionization probe positions according to page 5).

Slide the elbow (B) so that the number on the indicator scale aligns with the back edge of the air tube.
See **TABLE 1** for set points. Tighten the two Allen screws (A).

**Example (for natural gas):**

For a desired burner output of 93,000 Btu/hr, the diaphragm would be A5 and the combustion head setting would be 2.0.
All settings in TABLE 1 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.

## MANIFOLD PRESSURES

Manifold gas pressure for various firing rates should be set by adjusting the gas regulator of the gas valve, (see figure at page 6). To check manifold gas pressure, attach a manometer to the manifold test point, shown on typical gas train layout. Approximate manifold pressure settings are indicated in **TABLE 1**.

**Example (for natural gas):**

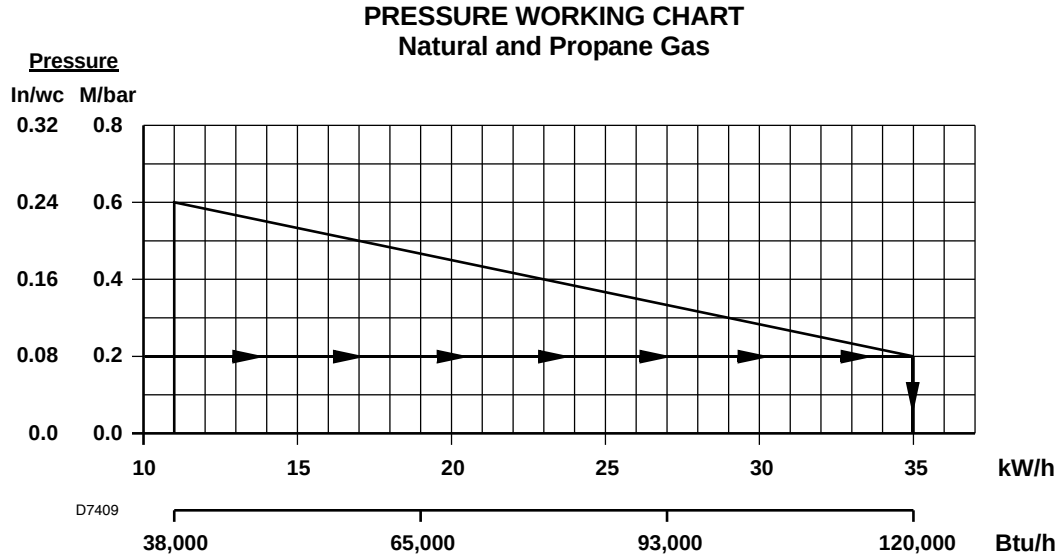
For a burner to be fired at 93,000 Btu/hr, the manifold pressure would be approximately 3.5" wc.
In case of lower or higher manifold pressure, install an diaphragm with a respectively smaller or bigger hole.
All settings in **TABLE 1** are obtained with zero (0) pressure in the combustion zone and at 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.

### HIGH ALTITUDE SETTINGS

It should be noted that for higher altitudes more air for combustion is required.
All settings in this manual have been obtained at approximately sea level. Special attention should be paid to air for combustion for elevations above sea level. If an increase in combustion air is insufficient, the burner must then be de-rated by approximately 4% for every 1000 feet above sea level.

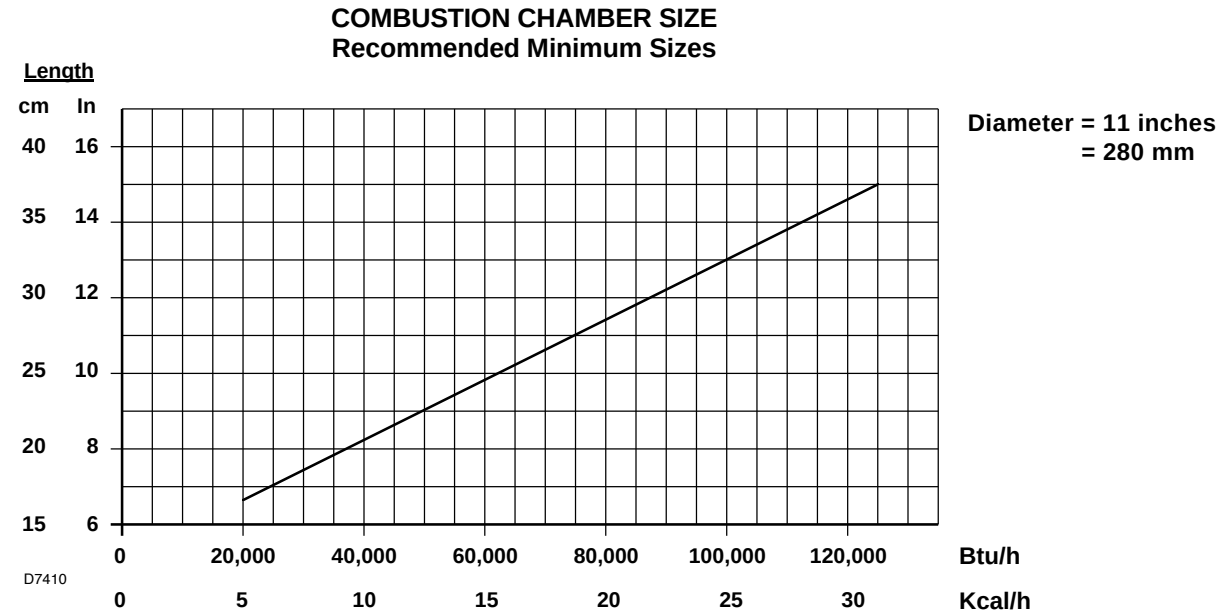
## PRESSURE WORKING CHART

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 0.08 inches water column in the combustion zone, you will be able to obtain a maximum of 120,000 Btu/h burner output.




Any change from zero (0) pressure in the combustion zone will affect the Btu 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, refer to the authority having jurisdiction. Refer to CAN/CGA B149.1 &. 2, ANSI Z21.8-1984, and ANSI Z223-1-1984.
3) Fire brick or cerafelt chamber materials should have a continuous run temperature rating of 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% $CO_2$ for Natural Gas or 12% $CO_2$ for Propane Gas.

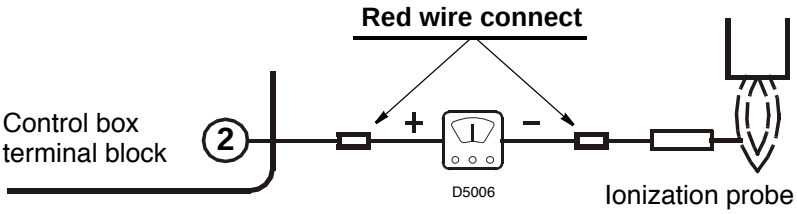
**CO**

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

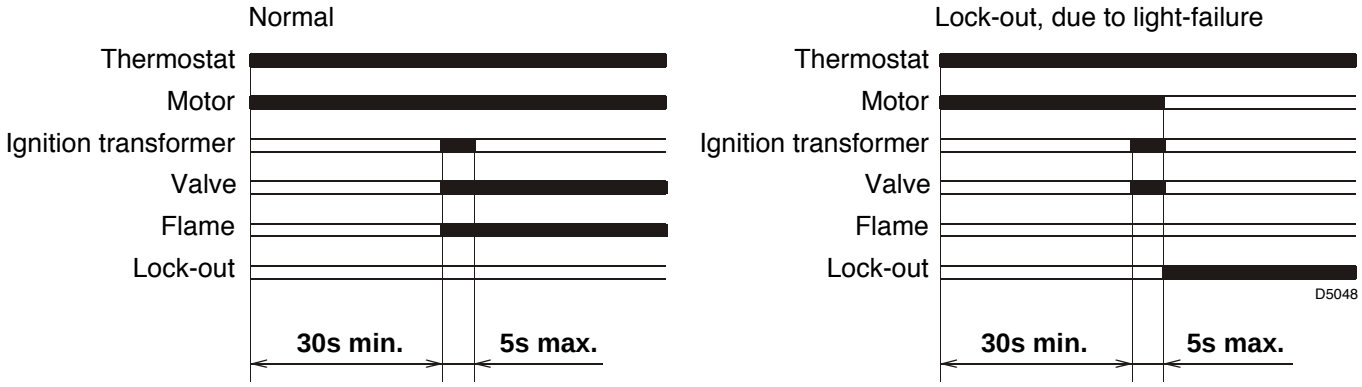
**IONIZATION CURRENT**

The minimum amount of current necessary for the control box to operate properly is 3 micro Amps DC.

To measure the ionization current, disconnect the red wire connector and insert a DC micrometer in series with control box terminal 2 and the ionization probe, which senses the flame. Refer to the diagram below.




## BURNER START-UP CYCLE




## PROBLEM SOLVING GUIDE

**Burner starting difficulties and their causes:**

1) The burner goes through the prepurge period normally. The flame ignites, but the burner goes to lockout within five seconds.
   a) The phase/neutral lines are reversed.
   b) The wiring to ground is absent or ineffective.
   c) The ionization probe is grounded, or not in contact with the flame, or the circuit to the control box is broken.
   d) The spark interferes with the flame signal due to incorrect setting of the electrode.

2) The burner goes to lockout after the prepurge period because the flame does not ignite.
   a) Air has not been fully bled from the gas lines.
   b) The gas valve is passing too little gas.
   c) The spark is irregular or not present.

3) The burner does not start when the thermostat calls for heat.
   a) The gas pressure switch (if supplied) does not close contact due to low gas pressure.
   b) The 24 volt switching relay is defective.
   c) The line switch is off.
   d) There is a blown fuse in the panel.
   e) Terminals on the control module are bent or loose
   f) The motor is defective.
   g) The capacitor is defective.
   h) The end switch on the air damper is defective.
   i) The control box is defective.
   j) The air pressure switch is not in the normally closed position.

4) The burner continues to repeat the starting cycle without going into lockout.
This is a very specific situation caused when gas pressure in the gas main lines is *very close* to the value at which the gas pressure switch has been set. This can be corrected by resetting the gas pressure switch to a lower level. The gas pressure switch, if required, may be supplied, or may have to be field installed.

5) The burner does not go through prepurge, and the control module goes to lockout. The air pressure switch does not change over from normally closed to normally open contacts.

This condition exists because there is insufficient air pressure in the combustion head.

## 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 centre 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.

**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) Visually check the flame if your heating appliance has an observation port.
2) Check and clean the air intake louver to remove any builds up of fluff, dust, pet hair etc.
3) The motor is permanently lubricated and does not need oiling.

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 serviced as indicated below. This service should be performed 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) Do a complete combustion test with the burner cover in place and the air gate locking screws secure.

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.

| 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 | | |

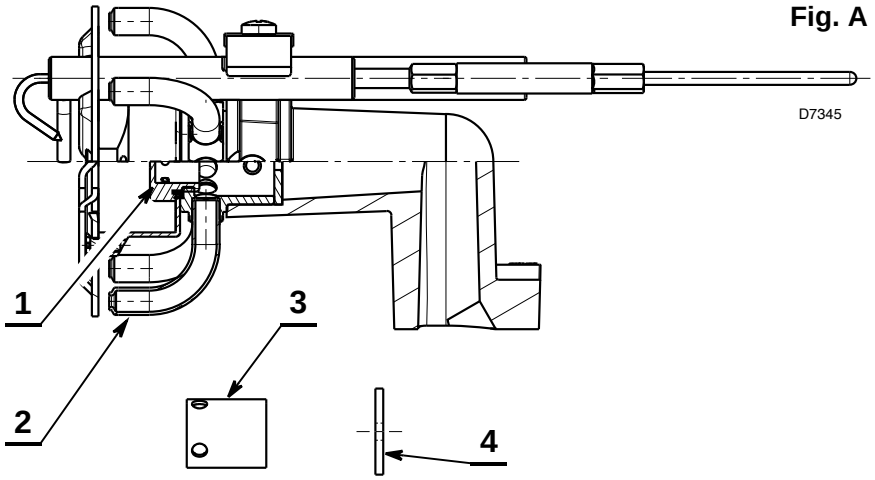
## INSTALLATION DATA

**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.

## PROPANE BURNER APPLICATION

The burner leaves the factory to run on natural gas. It is available a kit, on request, that allows the burner to run on propane.

**Fig. A**




### TECHNICAL FEATURES

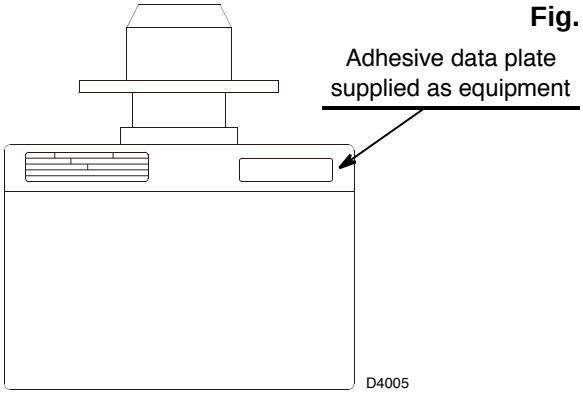
The thermal output and operating range of burners converted to use propane are the same as for burners running on natural gas.

**GAS Family 3:**
Net calorific value: 24 - 34 kWh/$m^3$
21,000 ÷ 29,300 kcal/$m^3$
Min. pressure 25 - max. 50 mbar.

### LIST OF KIT'S COMPONENTS

| Quantity | Component |
|---|---|
| 1 | Reducer |
| 1 | Diffuser 1,3 |
| 1 | Adhesive label |
| 1 | Instructions |
| 6 | Diaphragm |

**Fig. B**




### CONVERSION

On the combustion head of the burners, diaphragm (4) should be replaced, and natural gas nozzle (1) replaced with the one used for propane, and a reducer (3) should be added.

**Proceed as follows, (fig. A):**

- ➤ Disassemble the ignition electrode and the ionisation probe.
- ➤ Replace diaphragm (4) and replace natural gas nozzle (1) (marked 1.7) with the one supplied used for propane (marked 1.3).
- ➤ Remove the distributor - diffuser disc once the screws have been removed.
- ➤ Insert reducer (3), refit the distributor-diffuser disc and then tighten the fastening screws.
- ➤ Reassemble the electrode and the ionisation probe in the position foreseen in the instructions for the natural gas.
- ➤ Affix the adhesive label as illustrated in fig. B.

**SETTING UP THE BURNER**

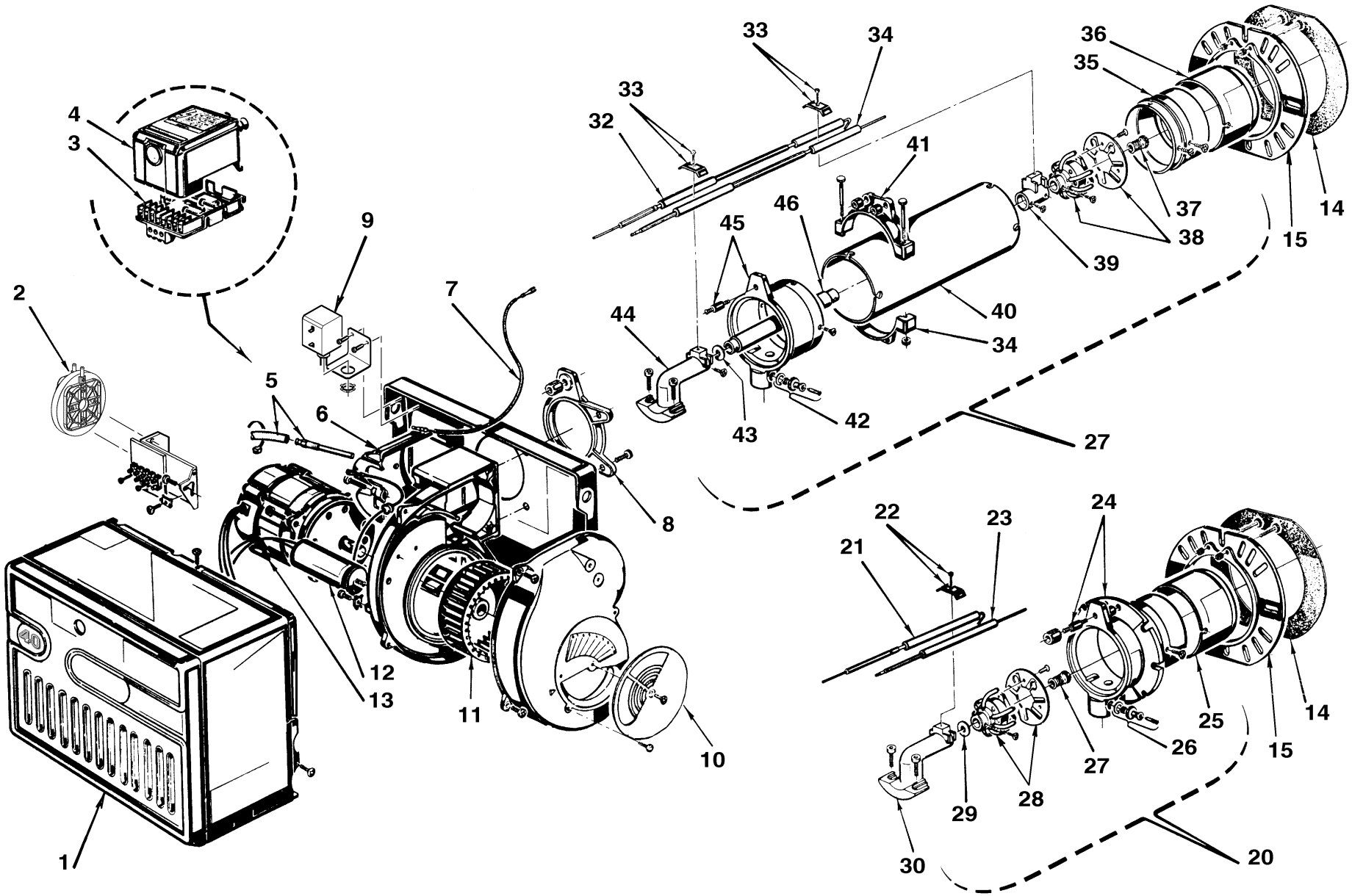
After burner output has been determined, use **TABLE** below **AS AN INITIAL GUIDE** for burner settings.

All settings in this table were obtained under the following conditions.

- 0 (zero) draft in the combustion zone;
- Inlet gas pressure range as in table;
- Standard lab test boiler;
- Steady state (HOT) operating conditions.

| | Gas inlet pressure range | Diaphragm | Manifold gas pressure | Burner output | Head setting | Air gate setting |
|---|---|---|---|---|---|---|
| | “wc | Marking | “wc | Btu/hr | Nocth | Notch |
| PROPANE | 12.0 - 14.0 | A11 | 3.5 | 38,000 | 0 | 0.6 |
| | | A12 | | 45,501 | 0 | 1 |
| | | A13 | | 60,708 | 0 | 1.5 |
| | | A14 | | 68,180 | 1 | 1.7 |
| | | A15 | | 95,265 | 2 | 2 |
| | | A16 | | 120,000 | 3 | 2.8 |

## EXPLODED SPARE PARTS LIST



## SPARE PARTS LIST

| No. | CODE | DESCRIPTION | No. | CODE | DESCRIPTION |
|---|---|---|---|---|---|
| 1 | **3007232** | Burner back cover | 20 | **3950171** | **Short combustion head (277T1)** |
| 2 | **3020321** | Air pressure switch | 21 | **3007270** | Electrode assembly |
| 3 | **3002307** | Primary control sub-base | 22 | **3007265** | Electrode & ionization clamp |
| 4 | **3001162** | Primary control box 525 SE/A | 23 | **3006907** | Ionization assembly |
| 5 | **3007287** | Air switch tube and connector | 24 | **3007296** | Manifold |
| 6 | **3007291** | Air tube cover plate | 25 | **3006394** | End cone |
| 7 | **3007310** | Ionization lead | 26 | **3005447** | Gas test point |
| 8 | **3006903** | Chassis mounting collar | 27 | **3006701** | Natural gas diaphragm |
| 9 | **3007305** | 120/24 Volt transformer | 28 | **3006698** | Distributor head and mixing plate |
| 10 | **3007204** | Manual air shutter (air gate) | 29 | **3020226** | Drawer assembly diaphragm |
| 11 | **3005708** | Fan | 30 | **3006905** | Drawer assembly elbow |
| 12 | **3005834** | Capacitor 10$\mu$F | | | |
| 13 | **3005843** | Burner motor | 31 | **3950172** | **Long combustion head (277T2)** |
| 14 | **3005856** | Mounting gasket | 32 | **3007271** | Electrode assembly |
| 15 | **3005855** | Universal mounting flange | 33 | **3007265** | Electrode & ionization clamp |
| | | | 34 | **3007272** | Ionization assembly |
| | | | 35 | **3007280** | End cone adapter |
| | | | 36 | **3006394** | End cone |
| | | | 37 | **3006701** | Natural gas diaphragm |
| | | | 38 | **3006698** | Distributor head and mixing plate |
| | | | 39 | **3007303** | Electrode support |
| | | | 40 | **3007284** | Air tube -long |
| **ACCESSORIES AND GAS TRAIN** | | | 41 | **3005854** | Semi flange 2 required |
| | C7010003 | Mounting bracket transformer | 42 | **3005447** | Gas test point |
| | | Honeywell VR8205M1130 solenoid | 43 | **3020226** | Drawer assembly diaphragm |
| | | | 44 | **3006905** | Drawer assembly elbow |
| | | | 45 | **3007295** | Manifold |

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

RIELLO BURNERS

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Mississauga,On L5H 3R2
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 $\mu$Adc: _____ 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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