

RIELLO BURNER SYSTEM MANUAL

RIELLO BURNER SYSTEM mectron 3M TYPE 215

OWNER MANUAL INSTALLATION INSTRUCTIONS

We are delighted that you have chosen the Riello burner. It is modern, clean, efficient and like any quality product, must be professionally installed and maintained to run correctly and at peak performance.

Should the burner lock-out on safety, a light will come on behind the re-set button (see figure 2). All you need to do is press the re-set button and the burner will restart. Should the burner lock-out again, call your Authorized RIELLO Dealer for assistance. There are no customer serviceable parts inside the red cover.

You should have the installer fully explain to you the operation of your new RIELLO burner as well as your total heating system.

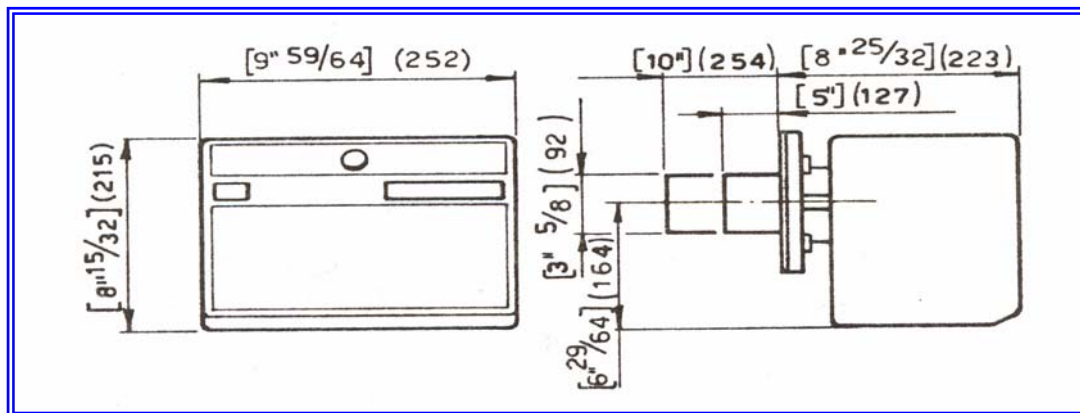
Your RIELLO burner should be serviced once a year by your Authorized RIELLO Dealer to insure many years of trouble free operation.

CAUTION
All burners should be
installed by trained and
licensed service technicians.

SPECIFICATIONS

Firing Rate: 0.50 to 0.95 GPH (1.6 to 3 kg/h)
70,000 to 133,000 BTU/h 17,640 to 33,520 kcal/h)
Fuel: No.2 Fuel oil
Power: 120 VOLts/60 Hz. Single Phase
Requirements: 155 Watts (Maximum)
DIMENSIONS [in.] (mm)

FIGURE 1



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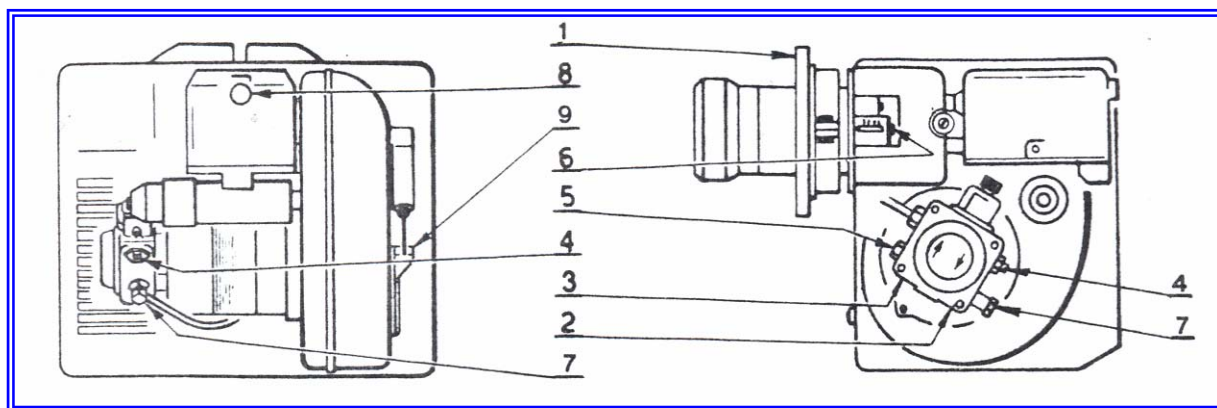


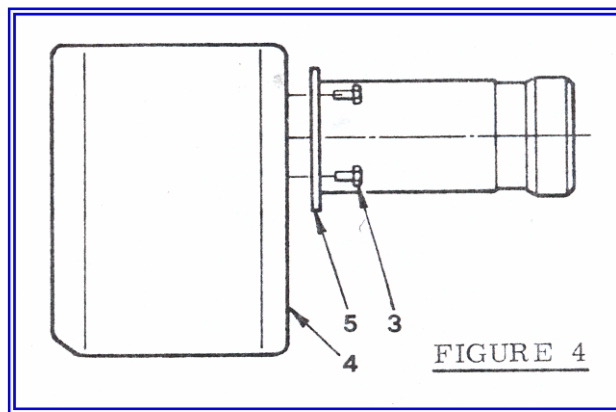
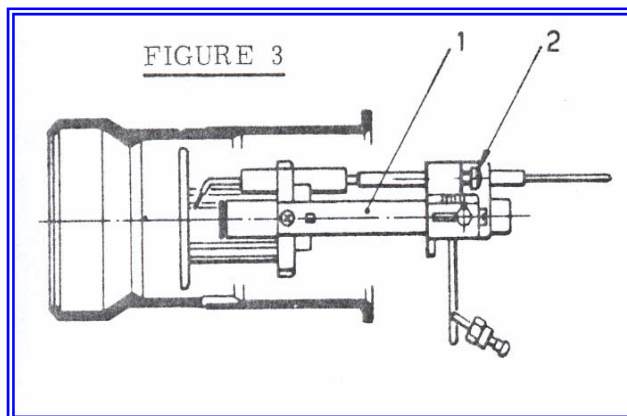
FIGURE 2

- | | |
|------------------------------|---|
| 1. Flange | 6. Turbulator Adjustment Screw |
| 2. Fuel Line Return Port | 7. Pressure Gauge Fixing Point |
| 3. Fuel Line Inlet Port | 8. Lock-out Indicator light and Re-set Button |
| 4. Pump Pressure Regulator | 9. Air Shutter |
| 5. Vacuum Gauge Fixing Point | |

ASSEMBLY OF BLAST TUBE TO BURNER CHASSIS (see figures 3 & 4)

The blast tube and drawer assembly are shipped in a carton separate from the burner chassis. Choose the proper blast tube length for the installation.

- A) Remove the blast tube and burner chassis from their respective cartons.
- B) Remove the drawer assembly, 1, from inside the blast tube by undoing the screw, 2. Carefully pull the drawer assembly out of the blast tube and set aside.
- C) Remove the two bolts, 3, from the front plate, 4, of the burner chassis. Align the two holes on the blast tube holding plate, 5, with the two holes left open where the bolts, 3, were removed. Replace the bolts and tighten firmly.



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MOUNTING THE BURNER TO THE BOILER/FURNACE UNIT. (see Figure 5)

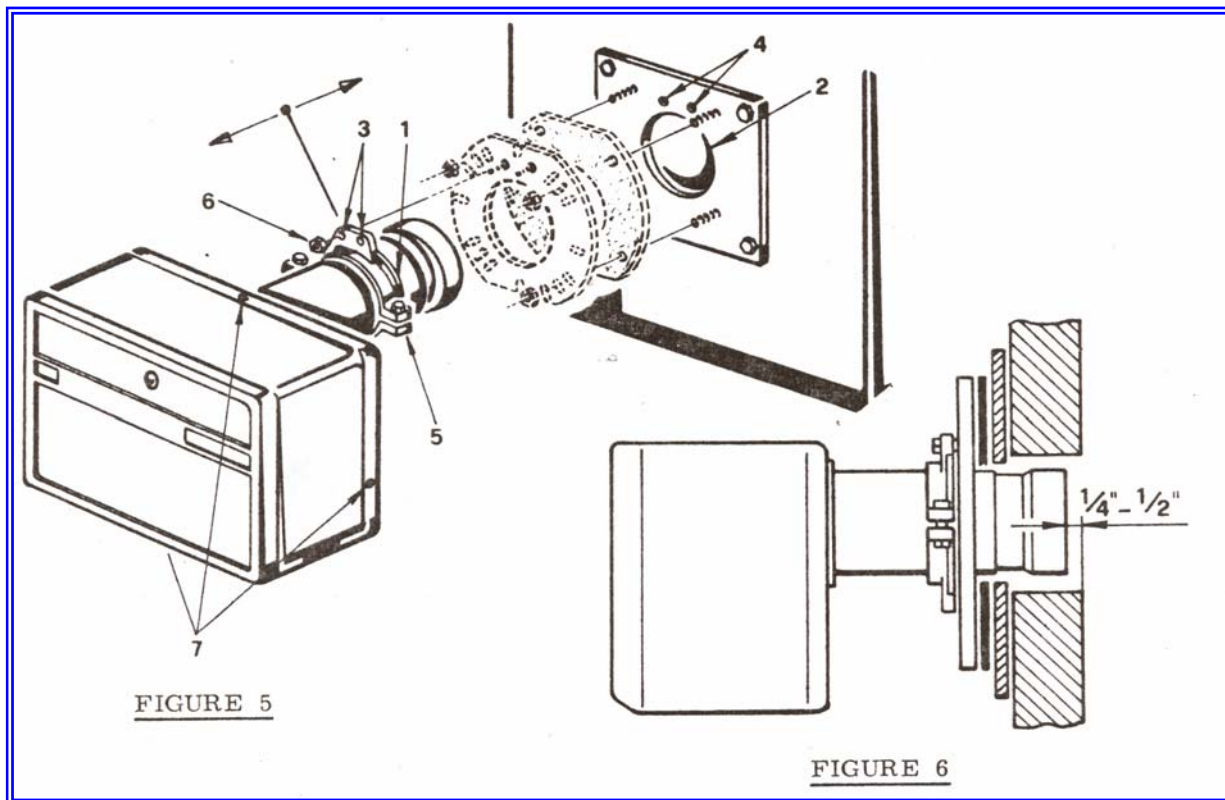
The burner is mounted on to the burner/furnace unit by means of the two semi flanges supplied in the burner chassis carton. Optional universal flange and/or pedestal mount are available.

A) Using the semi-flange assembly, 1, as a template, align the assembly so that it is centered on the burner access hole, 2, of the boiler/furnace unit. Mark the center of the two holes, 3. Be sure they are facing up. Drill 1/4" (6.5mm) holes, through the front plate; install and secure at, 4, the two bolts with the special nuts (supplied).

B) Secure the 2 halves of the mounting flange, 1, to the blast tube using the two bolts, 5. Be sure that the flange is properly positioned so that the end cone is at least 1/4" (6.5 mm) back from the inside wall of the refractory of the combustion chamber. (see figure 6)

C) Insert the blast tube into the boiler/furnace unit making sure the studs, 4, line up with the holes, 3, in the flange. Secure the burner using the two bolts 6 (supplied).

D) The optional universal mounting flange could be used in place of steps A and B.



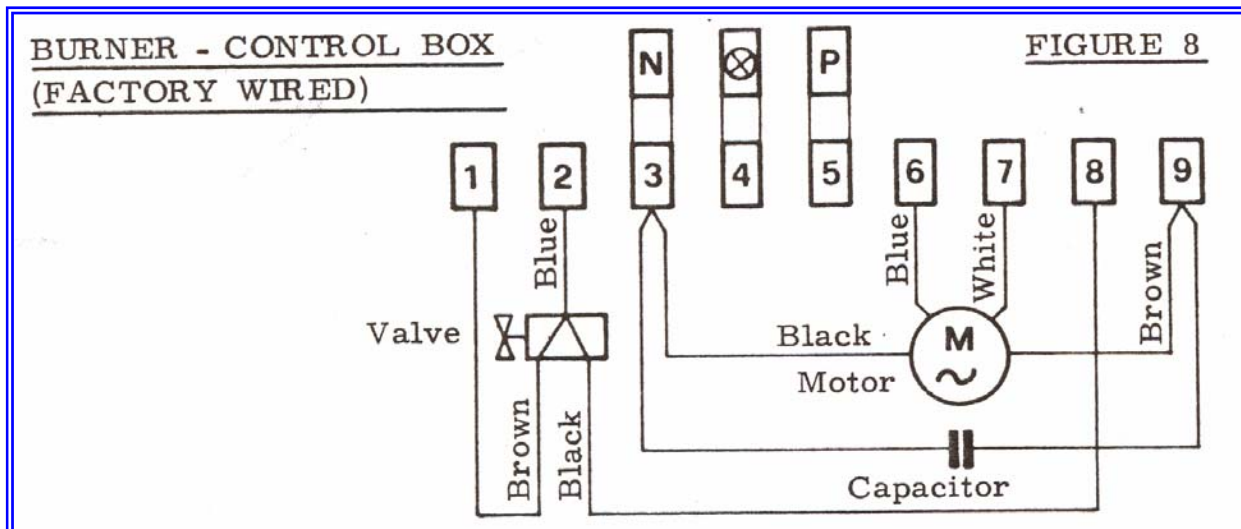
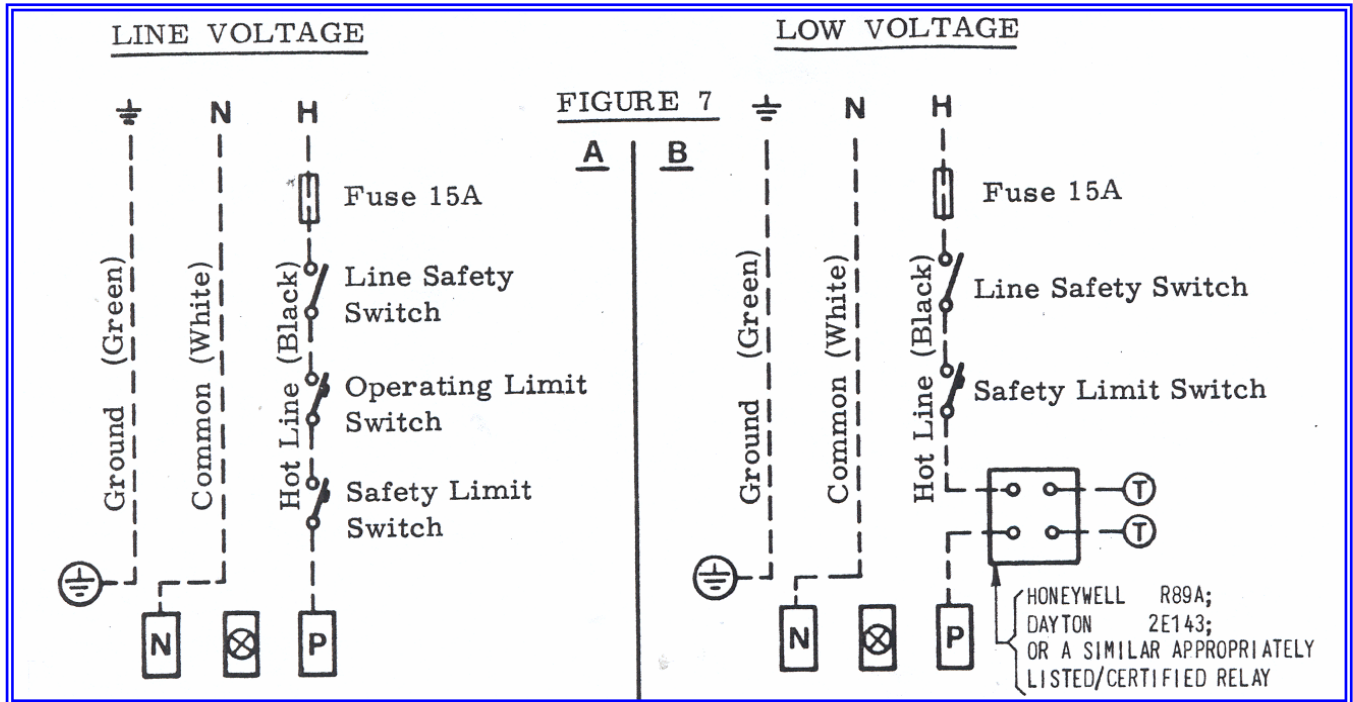
MAKING THE BURNER CONNECTIONS

WARNING

When the combustion chamber is lined with a refractory material, it is imperative that the end cone not protrude into the chamber area as excessive heat at burner shut-down will cause damage to the end cone.

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- A) Remove the burner cover by loosening the three fixing screws, 7. (see figure 5)
- B) Wire as shown in figure 7 (A or B). All wiring must be done in accordance with existing electrical codes, both national and local.

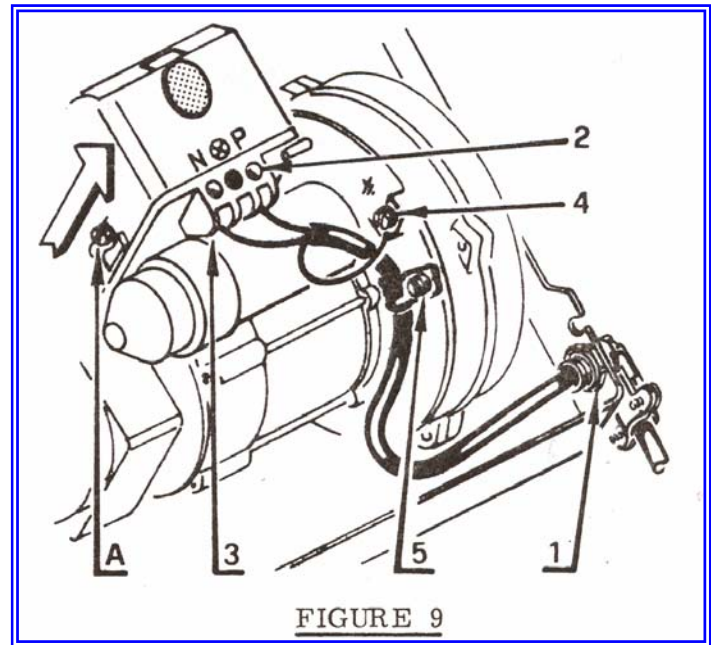


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- 1) Wire access hole
- 2) Hot Conductor (Black Wire) Terminal
- 3) Common Conductor (White Wire) Terminal
- 4) Ground Conductor (Green Wire) Terminal
- 5) Strain Relief

WARNING

The hot (Black) wire must be connected to the P terminal and the common (White) wire must be connected to the N terminal or damage will occur to the primary safety control.



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OIL LINE CONNECTIONS (see figure 10)

The burner is shipped with the pump set up for a two pipe system; 2 pipe connectors, 3, are supplied with the burner for connection to either a single or two pipe system. Pump is factory preset at 146 PSI (10 bar).

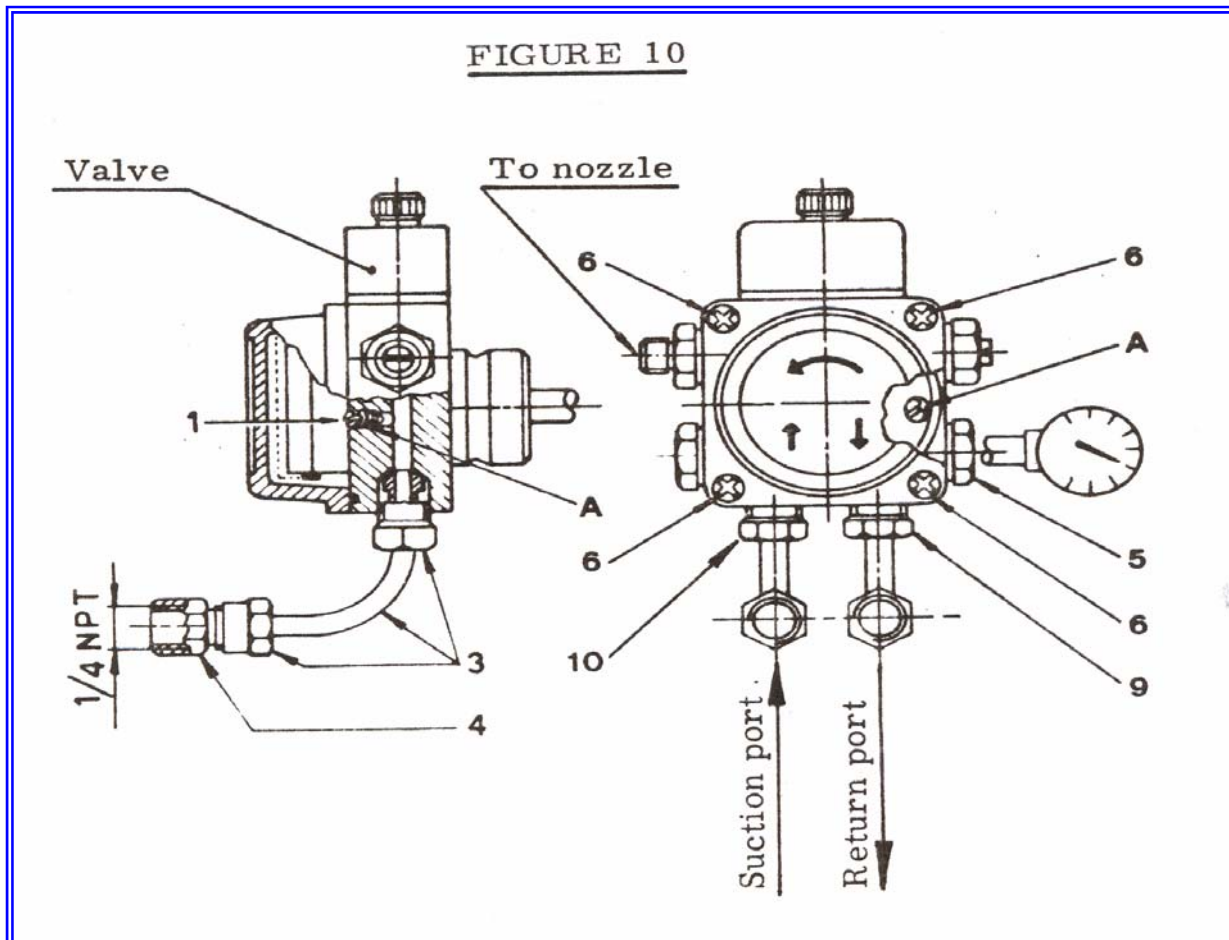
1a) LIFT (2 pipe) SYSTEM – The burner is shipped for installation in a two pipe system. See Table A for pipe lengths. Be sure that there are no air leaks or blockages in the piping system. DO NOT USE COMPRESSION FITTINGS. Suction and return lines should be the same size and both should extend to the same depth inside the fuel tank. Do not exceed the runs as shown in Table A.

1b) Attach the two pipe connectors to the pump suction and return ports, 9 & 10. Attach the required piping to these two pipe connectors.

2a) GRAVITY FEED SYSTEM – Convert the pump to a single line, gravity feed system by removing the BY -PASS plug, (see page 6).

2b) Connect one of the pipe connectors to the suction port, 10, of the pump. Attach the required piping to this pipe connectors. Be sure that the plug in the return port is tightened securely.

NOTE: A pressure gauge can be attached to pressure port, 5, for eventual pressure readings.

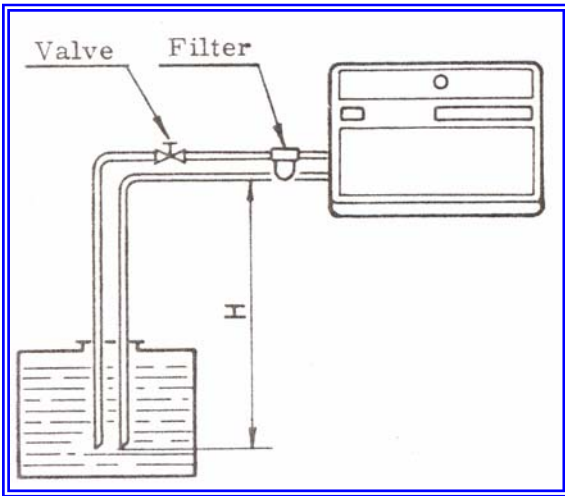


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Removal of BY PASS plug (see figure 10)

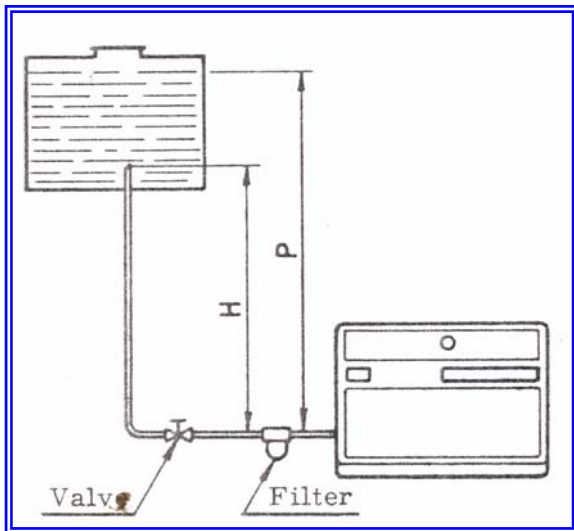
- 1) Remove the pump cover by undoing the four retaining screws, 6.
- 2) Remove the pump strainer, unscrew and remove the BY -PASS plug, 1, from port A.
- 3) Replace the strainer and pump cover. Tighten the 4 screws, 6, securely.

NOTE: Be sure that the a-ring is properly seated prior to tightening the pump cover screws.



WARNING
Burner is shipped from the factory set up for a two pipe system.

Figure 11



| PIPE LENGTHS | | | | | | | | | |
|--------------|-----|-------------------------|----|---------|-----|----------------------|----|---------|-----|
| H | | One Pipe Gravity System | | | | Two Pipe Lift System | | | |
| | | 3/8" OD | | 1/2" OD | | 3/8" OD | | 1/2" OD | |
| ft | cm | ft | m | ft | m | ft | m | ft | m |
| 0 | 0 | | | | | 115 | 35 | | |
| 1 1/2 | 50 | 33 | 10 | 65 | 20 | 100 | 30 | 330 | 100 |
| 3 | 100 | 65 | 20 | 130 | 40 | 80 | 25 | | |
| 5 | 150 | 130 | 40 | 260 | 80 | 65 | 20 | 295 | 90 |
| 6 1/2 | 200 | 195 | 60 | 325 | 100 | 50 | 15 | 230 | 70 |
| 9 1/2 | 300 | TABLE A | | | | 25 | 8 | 100 | 30 |
| 11 | 350 | | | | | 20 | 6 | 65 | 20 |

WARNING
The height "p" should not exceed 13 feet (4 m)

Warning
The vacuum must not exceed 11.44 Hg. (11.44 inches of Mercury).

IMPORTANT
An external appropriately listed/ certified filter must be placed in the fuel line between the fuel tank and the burner pump.

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NOZZLE PLACEMENT (See figure 12)

- A) Determine the proper firing rate for the boiler/furnace unit, then use Table **B**, page 9, to select proper nozzle size for the burner.
- B) Remove the nozzle adapter, 2, from the drawer assembly by loosening screw, 1.
- C) Insert the proper nozzle into the nozzle adapter, tighten securely.
- D) Replace adapter, with nozzle installed, into drawer assembly and secure with screw, 1

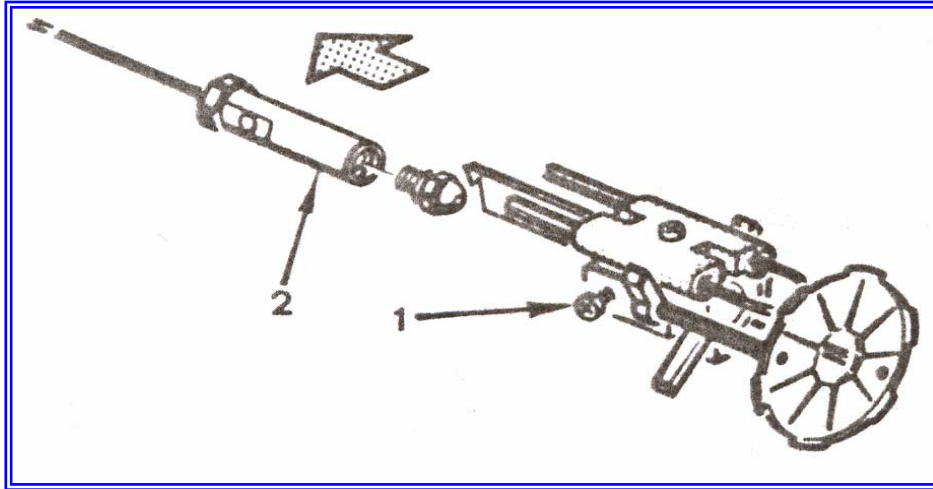


FIGURE 12

INSERTION OF DRAWER ASSEMBLY (see figure 13)

- A) Loosen the screw 3, then unplug the control box, 4, by pulling it up and back at the same time.
- B) Remove the air tube cover plate, 5, by loosening the retaining screw, 6.
- C) Slide the complete drawer assembly into the combustion head, as shown, and secure it in place with screw, 7. Attach the fuel line to the pump.
- E) Replace the air tube cover plate, 5, and carefully plug in the control box, 4, reversing step A.
- D) Securely tighten all screws.

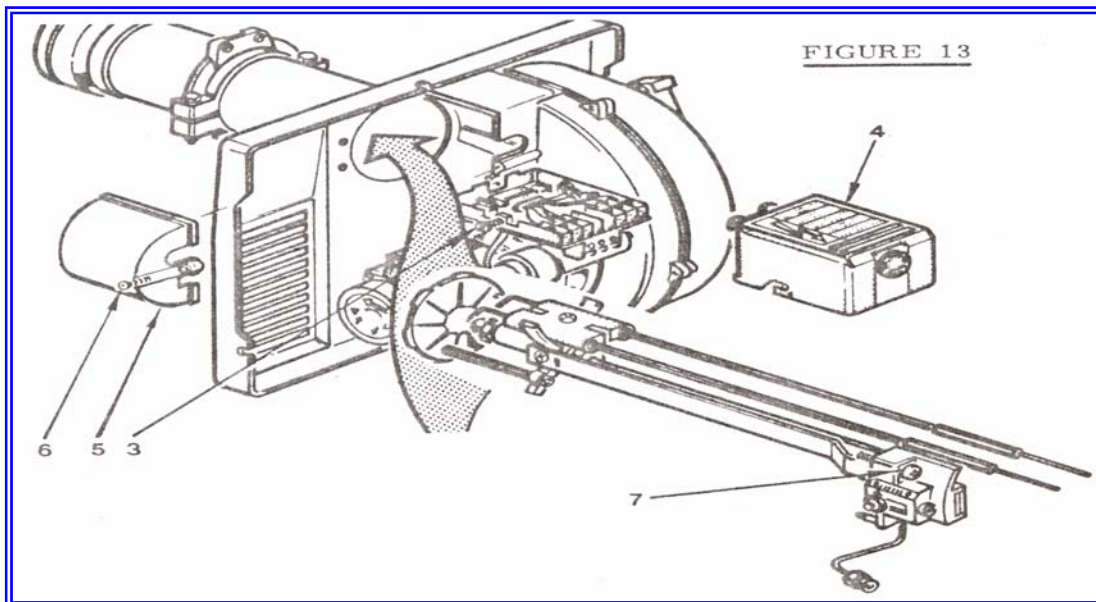
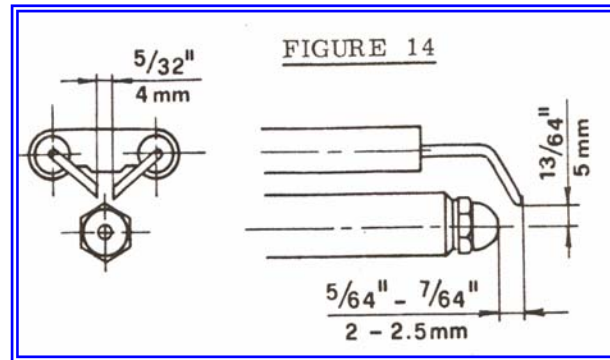


FIGURE 13

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ELECTRODE SETTING

IMPORTANT
THESE DIMENSIONS
MUST BE OBSERVED
AND VERIFIED



NOTE: ELECTRODES ARE PRESET AT THE FACTORY PUMP PURGE (see figure 10)

- A) **Gravity System.** Remove the plug 7 and wait for the fuel oil to flow from the tank.
- B) **Lift System.** Start the burner and wait for IGNITION. Should lock-out occur, wait at least 20 seconds, then re-set primary control. Repeat this operation until the pump is primed.
- C) **Either System** (preferred manner):
Turn off the main power to burner and remove the control unit. Using a short jumper cable, connect pin 5 and pin 6 of the control plug-in socket. Return the power to the burner. When the pump is sufficiently purged, the automatic air shutter will activate. Once the burner is purged, turn off all power to the burner, remove the jumper cable and replace the control unit.
Return power to the burner. The burner is now ready to operate.

ATTENTION
It is important that the fuel line be completely sealed and free from air leaks or any internal blockages.

WARNING
WHEN THE BY-PASS PLUG IS INSTALLED, A TWO PIPE SYSTEM MUST BE USED.

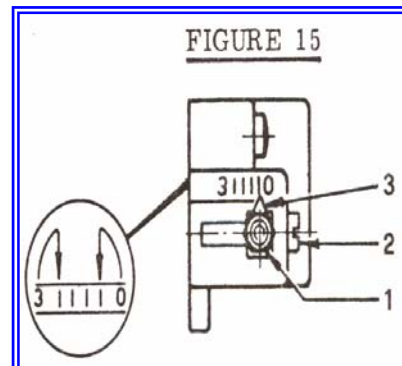
REGULATION OF THE TURBULATOR AND AIR SHUTTER FOR PROPER COMBUSTION

A) TURBULATOR SETTING (see figure 15)

- 1) Loosen nut, 1, then turn the screw, 2, until the index marker, 3, is aligned with the correct index number as per Table B, column 4.
- 2) Retighten the retaining nut, 1.

B) AIR SHUTTER SETTING (see figure 16)

- 1) Loosen the retaining nut, B; turn the bolt, A, in a counter-clockwise direction until about one inch of thread is visible. Using the setting taken from Table B, column 5, position the air shutter so that the top of the shutter is aligned with the proper index line indicated on the air intake side of the burner housing. Holding the shutter in this position, turn the adjusting bolt, A, in a clockwise direction until resistance is met. Release the air shutter, it should return to the full closed position.



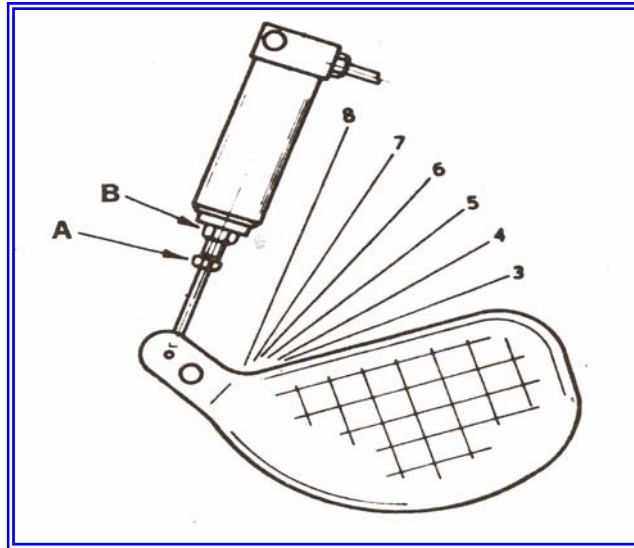
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2) Apply power to the burner, the shutter should open automatically to the preset position. Make proper adjustments for optimum efficiency.

3) The final position of the air shutter will vary on each installation. Use instruments to establish the proper settings for maximum CO₂ and a smoke reading of "zero".

Note: Be sure that the burner cover is in place when making the final instrument . readings as it may cause variations in these results.

FIGURE 16

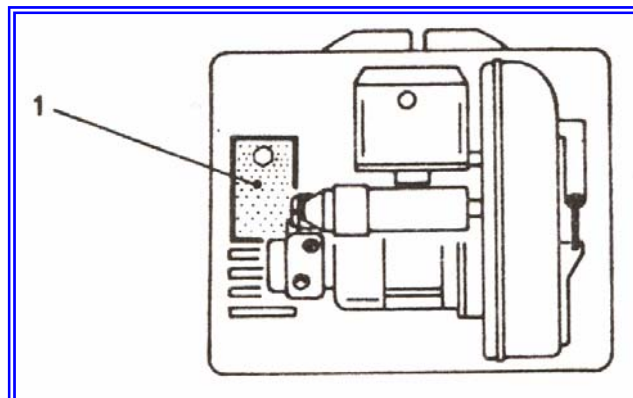


NOISE REDUCING PLATE (see figure 17)

Should it be desired to reduce burner noise further, the cover plate, 1 (supplied with burner), can be positioned, as in figure 17, over the combustion air inlet louvers on the burner front panel.

NOTE: If plate is used, all combustion tests should be done with the cover and plate in place. It must be remembered that the fan capacity with this plate in place, is greatly altered and should not be used at the burner's higher firing rates.

Figure 17



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TABLE B

| 1 | | 2 | 3 | | 4 | 5 |
|-------------------------------|------|----------------|---------------|-----|--------------------|--------------------|
| Actual Firing Rate $\pm 10\%$ | | Nozzle Size | Pump Pressure | | Turbulator Setting | Air Damper Setting |
| GPH | kg/h | GPH | PSI | bar | | |
| 0.50 | 1.59 | 0.40 - 80° | 160 | 11 | 0 | 3.2 |
| 0.60 | 1.90 | 0.50 - 60°/80° | 145 | 10 | 1 | 3.8 |
| 0.75 | 2.28 | 0.60 - 60°/80° | 145 | 10 | 2 | 4.5 |
| 0.80 | 2.46 | 0.65 - 60°/80° | 145 | 10 | 2.5 | 5 |
| 0.95 | 2.98 | 0.75 - 60° | 160 | 11 | 3 | 7 |

NOZZLES: Monarch NS; Delavan A - E - W; Steinen H - Q; Danfoss H - B.

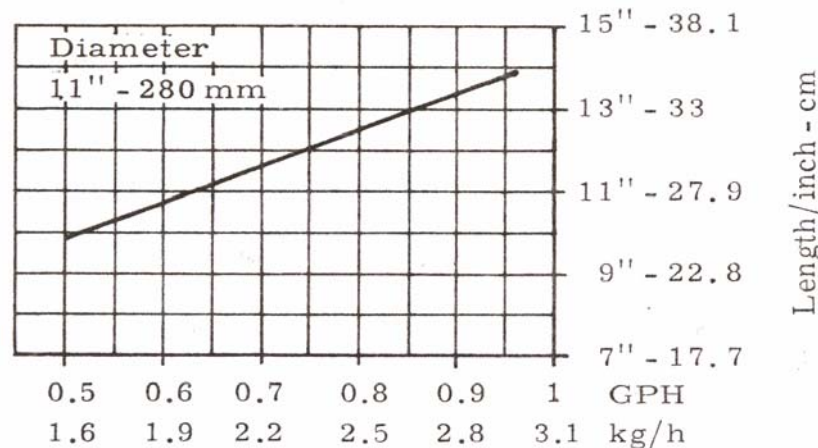
Angle: 60 degrees in most cases.

80 degrees in cases of flame detachment, during ignitions at low ambient temperatures.

COMBUSTION CHAMBER

Follow the instructions furnished by the boiler/furnace manufacturer. No refractory is required. A target wall at the far end of the combustion chamber is useful, but not necessary. The combustion chamber dimensions listed in Table C are minimums. The center line of the combustion head should be placed along the center line of the chamber area.

TABLE C



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FOR CANADA

PRECAUTIONS

Air for combustion:

Do not install burner in room with insufficient air for combustion. It might be necessary to create a window to permit sufficient air to enter the boiler!.; furnace room. The installer must follow local ordinances in this regard.: Should local ordinances be lacking it is suggested the installer follows installation code for oil burning equipment, CSA standard B 139.

Chimney:

Be sure chimney is sufficient to handle the exhaust gases. It is recommended that only the burner be connected to the chimney. Be sure that it is clean and clear of obstructions.

Filter:

An external filter is REQUIRED even though there is an internal strainer in the pump. The filter should be replaced at least once a 'year and the filter container should be thoroughly cleaned prior to installing a new filter cartridge.

Draft:

Follow the instructions furnished with the heating appliance. The pressure in the combustion area should be kept as close to zero as possible. The burner will operate with a slight draft or pressure in the chamber.

Electrical Connections:

All electrical connections should be done in accordance with the C. E. C. point I and all local codes. The system should be grounded.

Control Burner Operation:

Check out the burner and explain its operation to the homeowner.

Attention:

Be sure there is an adequate air supply for combustion if the boiler furnace room is enclosed.

Fire Extinguisher:

If required by local codes, install an approved fire extinguisher.