

Installation Instructions

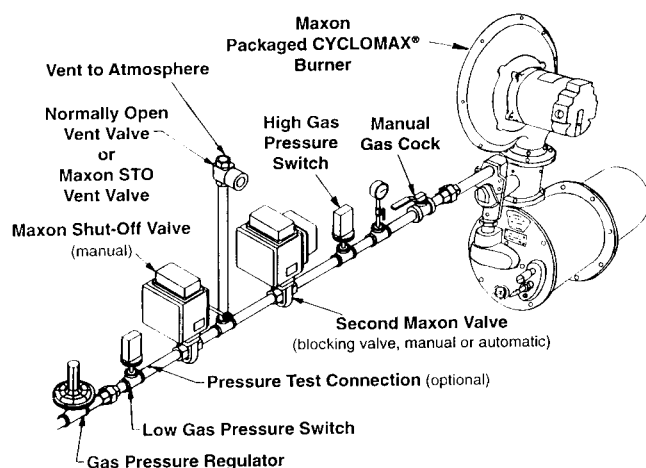
Packaged Versions

Please read all installation and start-up instructions before working with the burner.

IMPORTANT: Do not discard packing material until all loose items are accounted for.

Some components may be shipped separately from your Packaged CYCLOMAX® Burner to prevent damage in transit. Do not discard packing until you have accounted for all loose items.

The burner is only a part of your complete combustion system. Additional pipe train accessories and control components will be required for a complete system installation. The sketch below shows a typical gas train as might be used with the burner.



Packaged CYCLOMAX® Burner comes complete with its own combustion air blower. The burner also provides fuel flow control and a fuel/air mixing device.

The Packaged CYCLOMAX® Burner should not be exposed to direct radiant heat or positioned where it might draw in inert gases. If such conditions exist, consider filters, relocation, and/or use of the EBMRV CYCLOMAX® Burner with an external air supply.

CAUTION: Installation should be undertaken only by trained personnel familiar with combustion systems, with control/safety circuitry, and with knowledge of the overall installation. Instructions provided by the company or individuals responsible for the manufacture and overall installation of the complete system incorporating Maxon burners take precedence over these provided by Maxon. If there are any conflicts in these instructions, contact Maxon before proceeding.

Electrical service must match the voltage, phase and cycle of all electrical system components and be compatible with burner nameplate ratings.

Gas and air supply piping must be large enough to provide for the full flow and pressures shown in the catalog for your particular burner when it is operating at its full-rated capacity.

Clean fuel lines are essential to preventing the blockage of burner gas ports and pipe train components. Dirty fuel lines may require special filters.

Main shut-off cock should be upstream of both the main gas regulator and pilot take-off line.

Main gas regulator is essential to maintaining a uniform system supply pressure. If one pipe train supplies multiple burners, provide a separate regulator in the branch leading to each burner system.

Size the regulator for full system capacity at the required pressure, carefully considering pipe train losses. If the regulator has more than 3" wc (7.5 mbar) of droop*, two-stage regulation is recommended. Follow the instructions attached to the regulator and be sure to remove any shipping pin or block.

*Droop is defined as the increase in gas pressure (due to imperfections in a gas pressure regulator) as the burner is throttled from high fire where the desired gas pressure is set.

Pilot take-off should be upstream of the main gas regulator, but downstream of the main gas shut-off cock. It normally includes its own pilot gas regulator, a solenoid valve and shut-off cock. A pilot adjustable orifice at the pilot inlet simplifies adjustment. The pilot must be interrupted in order to obtain low emission levels. Continuous pilot is not recommended.

NOTE: The 0.4m size burner is lit on main gas. It does not have a separate pilot.

Plumbing and electrical wiring must allow the pilot to be interrupted. Pilot take-off should be upstream of the main gas regulator.

Pilot piping must be large enough to provide for the full flow and pressures shown in the catalog for your particular burner size.

External support of the gas piping is recommended.

Fuel shut-off valves (when properly connected to a control system) shut the fuel supply off when a hazardous operating condition is sensed. **Manual reset valves** require operator attendance each time the system is started up (or restarted after a trip-out). **Motorized shut-off valves** permit automatic start-restart when used with an appropriate control system.

Installation Instructions Packaged Versions

Test connections are essential for proper burner adjustment and operation and are included in the Packaged CYCLOMAX® Burner. **Test connections must be plugged except when readings are being taken.**

Burner mounting requires a stud pattern on a flat surface that matches the mounting holes on the main housing of the CYCLOMAX® Burner (see dimension drawing on page 2809). After placing the burner in position, add lock washers and nuts. Tighten securely. Connect the gas supply to the burner at the threaded inlet on the gas valve body. Recommended gas pressure at the burner is shown below for each burner size.

Recommended Gas Pressure "wc

Burner Size		0.4M	0.8M	1.6M	2.7M	3.7M
Natural Gas	60 Hz	15.5	11.5	14.2	11.0	10.0
	50 Hz	9.9	8.0	8.5	7.0	6.4

Recommended Gas Pressure mbar

Burner Size		0.4M	0.8M	1.6M	2.7M	3.7M
Natural Gas	60 Hz	38.6	28.6	35.4	27.4	24.9
	50 Hz	23.2	19.9	21.2	17.4	15.9

The Packaged CYCLOMAX® Burner can be mounted in several positions. Some accessories, such as control motors, can limit the mounting options. Burners are typically installed through an insulated wall that could be several inches thick. The mounting hole diameter should be approximately 1 to 1-1/2 inches (25,4 to 38,1 mm) larger than Dimension "R" on page 2809.

If the combustion air fan is supplied with a filter, the filter must be kept clean. A dirty air filter can result in inadequate combustion air flow to the burner and higher emissions. Decreased air pressure could indicate that the filter is becoming plugged.

NOTE: To make the burner lighter and easier to handle, the blower can be removed before the burner is mounted.

A 5000-volt full-sine-wave spark ignition transformer should be used. Make sure the spark ignitor is in the proper position by loosening the ignitor nut and pushing the ceramic insulator as far in as possible. Hold the insulator in place as the nut is retightened. Improper positioning of the ignitor will result in difficulty in lighting the burner.

Connect all remaining electrical and mechanical components.

Maintenance Instructions

If it is ever necessary to remove the fuel shaft from the burner, be sure to use anti-seize lube or a light grease on the fuel shaft during reassembly.

Apply the grease to the O-rings only – do not apply it to the cutout area. Too much grease can plug the area in the fuel shaft that affects the gas flow.



Maxon practices a policy of continuous product improvement. It reserves the right to alter specifications without prior notice.

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INDUSTRIAL COMBUSTION EQUIPMENT AND VALVES

Start-up Instructions Packaged Versions

Read all instructions before proceeding and familiarize yourself with the system's components. Verify that your equipment has been correctly installed.

CAUTION: Initial adjustment and light-off should be undertaken only by trained personnel familiar with combustion systems, with control/safety circuitry, and with knowledge of the overall installation. Instructions provided by the company or individuals responsible for the manufacture and overall installation of a complete system incorporating Maxon burners take precedence over these provided by Maxon. If Maxon instructions conflict with any rules or regulations, contact Maxon before attempting start-up.

The integral air-fuel shaft keeps the air-fuel ratio in the proper range throughout the firing range.

Proper air-fuel ratio control depends on a constant pressure upstream of the shaft. Regulators with less than 3" wc (7.5 mbar) droop should be used.

A pneumatic or electric control motor can be mounted to the air-fuel shaft and establish firing rates according to system demands.

Gas pressure test connections are essential for burner adjustment and are provided in the burner. Do not attempt to use test connections in pipe elbows or tees, as internal turbulence can give erroneous readings. Test connections not being used must be plugged.

For initial system start-up

1. **Close all burner fuel valves and/or cocks.**
Make preliminary adjustments to regulators. Remove pilot regulator adjusting screw cover and turn screw down to near mid-range condition. Close pilot gas adjustable orifice screw by turning it clockwise until it stops, and then back it out (counterclockwise) 2 to 3 turns.
2. **Check all electric circuitry** and verify that all safety devices and interlocks are functioning within their respective settings/ranges. Marginally-set pressure switches can result in numerous nuisance trips and can delay start-up. Be sure all manifolds are tightly sealed and that test ports are plugged if not being used.
3. **Check that all duct and chamber dampers are properly positioned** and locked into operating positions.
4. **Start all system related fans and blowers.**
Check for proper motor rotation and impeller direction. Verify that all safety interlocks are working. Allow air handling equipment to run for an adequate purge of manifolds and combustion chamber plenums.
5. **Initial start-up adjustment can more easily be accomplished in a manual control mode.**
Disconnect the automatic control motor's linkage from the burner's control valve by loosening the control motor's connecting rod from the valve's toggle linkage.
6. Once the burner is installed and all safety devices are in place, the burner is ready to be fired. Position the burner at its minimum firing rate. Do not exceed minimum (overtravel), as the gas and air valves will start to re-open. The 0.4M size does not have a pilot; it is lit on main gas. For other sizes, pilot pressure can be as low as 6 to 12" wc (14.9 to 29.9 mbar) under ideal conditions, but a higher pilot pressure will facilitate start-up under stubborn lighting conditions. Maxon recommends that the pilot take-off be upstream of the main gas regulator. Ideal pilot flow ranges from about 70 SCFH (0.02 m³/min) on the 800,000 Btu/hr (117 kW) size to about 120 SCFH (0.06 m³/min) on the largest size (for natural gas).
7. **If the burner fails to light**, it could be due to trapped air in the gas line. Keep trying until the gas purges the air. If the burner fails to light after repeated attempts, check to see if the spark ignitor is pushed all the way in. For the 0.4M burner, adjust the gas bypass until a stable minimum flame at a gas pressure close to (or slightly higher than) what is desired at high fire is achieved. If working with a 0.4M burner and it is lit and stable on main gas at minimum, proceed to Step 10.
8. **Confirm that the pilot is lit** before proceeding to the next step.

Start-up Instructions Packaged Versions

9. **With burner at minimum position, turn on the main gas.** The 0.4M and 0.8M sizes have a gas bypass with an adjustable orifice which can be adjusted to allow more gas to flow around the fuel shaft at minimum. Shut off the pilot and confirm that the burner is still lit. Adjust the main gas regulator to 3" wc (7.5 mbar) more than the recommended value.
10. **Slowly increase the firing rate.** As firing rate increases, the pressure upstream of the burner may decrease somewhat because of regulator droop.
11. **Bring the burner up to high fire,** increasing regulator pressure if necessary.
12. **Readjust the regulator** to the recommended gas pressure upstream of the burner (see page 2800-S-2).

NOTE: Do not overtravel when going up to high fire.

13. **Once the burner is lit and has been fired throughout the range,** slowly bring it down to minimum and verify that the gas pressure does not increase by more than 3" wc (7.5 mbar) as the burner is throttled down. High suction applications can require higher gas pressures to the burner because more air is pulled through the system. High back pressure conditions can require that the gas pressure be set lower than the values listed on page 2800-S-2.



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Installation Instructions EBMRV Versions

Please read all installation and start-up instructions before working with the burner.

IMPORTANT: Do not discard packing material until all loose items are accounted for.

Some components may be shipped separately from your EBMRV CYCLOMAX® Burner to prevent damage in transit. Do not discard packing until you have accounted for all loose items.

The burner is only a part of your complete combustion system. Additional pipe train accessories and control components will be required for a complete system installation. MICRO-RATIO® Control Valve (Style "P" gas valve and M- style butterfly air valve) and FG Blower must be ordered separately. See CYCLOMAX® (section 2800) and FG Blower (section 9250) catalog literature for selection guidelines for choosing the appropriate blower for your burner and capacity requirements.

Do not position the EBMRV CYCLOMAX® Burner or the FG Blower where they will be exposed to direct radiant heat or the blower could draw in inert gases. If such conditions exist, consider filters or relocation.

CAUTION: Installation should be undertaken only by trained personnel familiar with combustion systems, with control/safety circuitry, and with knowledge of the overall installation. Instructions provided by the company or individuals responsible for the manufacture and overall installation of a complete system incorporating Maxon burners take precedence over these provided by Maxon. If there are any conflicts in these instructions, contact Maxon before proceeding.

Electrical service must match the voltage, phase and cycle of all electrical system components and must be compatible with burner nameplate ratings.

Gas and air supply piping must be large enough to provide for the full flow and pressures shown in the catalog for your particular burner when it is operating at its full rated capacity.

Attempt to minimize the pressure drop from the blower to the burner. If air supply piping is unusually long and/or incorporates many fittings through which large pressure drops could occur, choose a higher capacity blower. Do not use air piping smaller than 3" (76 mm) on the EB2MRV 4" (102 mm) on EB3MRV, or 6" (152 mm) on the EB4MRV and EB5MRV. Testing

has shown that with three 90° elbows and 10 feet (3048 mm) of straight pipe, rated capacities can be obtained with these sizes.

Gas supply piping should be the same size (or larger) than the size of the poppet gas valve:

1" (25.4 mm) for EB2MRV

1.5" (38 mm) for EB3MRV

2.5" (63 mm) for EB4MRV and EB5MRV

Pipe/duct the MICRO-RATIO® Valve to the air inlet and attach the gas line from the MICRO-RATIO® Valve to the threaded gas inlet on the burner back plate. Smaller gas piping can be used, but will require higher gas pressure to compensate for the additional pressure drop.

Clean fuel lines are essential to prevent the blockage of burner gas ports and pipe train components. Dirty fuel lines may require special filters. If an uneven flame is observed (dark spots on the sleeve, no flame in a particular region, etc.), one or more of the gas ports may be plugged. An uneven flame will cause higher emissions. Good flame uniformity allows for optimum performance of the burner.

Main shut-off cock should be upstream of the main gas regulator and the pilot line take-off.

Main gas regulator is essential to keep the pressure upstream of the MICRO-RATIO® Valve constant once the burner is set to the recommended gas pressure versus air pressure curve. If one pipe train supplies multiple burners, provide a separate regulator to the MICRO-RATIO® Valve of each burner system. Size the regulator for full system capacity at the required pressure upstream of the MICRO-RATIO® Valve. Pressure to the MICRO-RATIO® Valve should be 1 psi (69 mbar) higher than the high fire gas pressure at the burner. Follow the instructions attached to the regulator and be sure to remove any shipping pin or block.

Pilot take-off should be upstream of the main gas regulator but downstream of the main gas shut-off cock. It normally includes a pilot gas regulator, solenoid valve, and shut-off cock. A pilot adjustable orifice at the pilot inlet simplifies adjustment.

Plumbing and electrical wiring must allow the pilot to be interrupted.

Installation Instructions

EBMRV Versions

Pilot piping must be large enough to provide the full flow and pressures required for lighting the burner. Pilots will light over a wide range of pressures. Compensate for higher pressures by closing the adjustable orifice. Unless available pilot pressure is significantly higher than the burner operating pressure, use the following guidelines for sizing the pilot gas piping:

- EB2MRV & EB3MRV – use at least 1/2" (12.7 mm) dia. pilot piping
- EB4MRV & EB5MRV – use at least 3/4" (19 mm) dia. pilot piping

External support of both the air and gas piping is recommended.

Fuel shut-off valves (when properly connected to a control system) shut the fuel supply off when a hazardous operating condition is sensed. **Manual reset valves** require operator attendance each time the system is started up (or restarted after a trip-out). **Motorized shut-off valves** permit automatic start-restart when used with an appropriate control system.

The control valves which may be used with the EBMRV CYCLOMAX® Burner are not intended for tight shut-off.

Flame sensing can be accomplished only with a UV scanner. Cooling air to the UV scanner should not be required.

Test connections are essential for proper set-up of the EBMRV CYCLOMAX® Burners. The two test connections for the EBMRV version are located on the burner back plate (gas pressure) and on the circumference of the burner main housing (air pressure). Test connections must be plugged except when readings are being taken.

Include observation ports in the combustion chamber design to provide a view of the flame. This will simplify start-up and adjustment procedures.

Burner mounting requires a stud pattern on a flat surface that matches the mounting holes on the main housing of the CYCLOMAX® Burner (see dimensional drawings on pages 2809 and 2810). Place the burner in position and add lock washers and nuts. Tighten securely.

Connect the air valve of the MICRO-RATIO® Valve assembly to the threaded inlet of the EBMRV adapter on the burner. Connect the gas valve of the MICRO-RATIO® Valve assembly to the threaded inlet on the back plate of the burner. Adjust the linkage of the MICRO-RATIO® Valve to achieve reliable light-off and adequate air to support both the pilot and main flames.

The air valve should be set at 5 to 10 degrees open when the gas valve is at minimum to get reliable lighting.

Connect the FG Blower to the inlet of the MICRO-RATIO® air valve. Minimize the piping between the blower, valve and burner to reduce pressure drop.

The EBMRV CYCLOMAX® Burner can be mounted in a variety of positions, but is most conveniently mounted with both inlets facing upward on the side of an oven. Downfiring is permitted. Burners are typically installed through an insulated wall. The mounting hole diameter should be approximately 1 to 1-1/2 inches (25,4 to 38,1 mm) larger than Dimension "R" on page 2809.

If using a filter with the FG Blower, check periodically to see if the filter is becoming plugged. If a drop in air pressure or change in flame appearance is observed, the filter may be plugged. Inadequate air flow to the burner can result in higher emissions.

A 5000 volt, full-wave spark ignition transformer should be used. Verify that the spark ignitor is in the proper position by loosening the ignitor nut and pushing the ceramic in as far as possible. Keep forward pressure on the ceramic as the nut is being re-tightened. Improper positioning of the ignitor will cause difficulty in lighting the burner. Connect all remaining electrical and mechanical components.



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Start-up Instructions EBMRV Versions

Read all instructions before proceeding and familiarize yourself with the system's components. Verify that the equipment has been correctly installed.

CAUTION: Initial adjustment and light-off should be undertaken only by trained personnel familiar with combustion systems, with control/safety circuitry, and with knowledge of the overall installation. Instructions provided by the company or individuals responsible for the manufacture and overall installation of a complete system incorporating Maxon burners take precedence over these provided by Maxon. If Maxon instructions conflict with any rules or regulations, contact Maxon before attempting start-up.

Gas and air pressure test connections are essential for proper burner adjustment. Test connections must be plugged except when readings are being taken.

For initial system start-up:

1. **Close all burner fuel valves and/or cocks.**
Make preliminary adjustments to regulators. Remove pilot regulator adjusting screw cover and turn screw down to near mid-range position. Turn pilot gas adjustable orifice screw clockwise until it closes, then turn screw counter-clockwise two or three turns.
2. **Check all electric circuitry.** Verify that all safety devices and interlocks are operable and functioning within their respective ranges. Be sure all manifolds are tight and verify that test connections are plugged if not being used.
3. **Check that all duct and chamber dampers are properly positioned** and locked into operating positions.
4. **Start all system-related fans and blowers.** Check for proper motor rotation and impeller direction. Verify that all safety interlocks are working. Allow air handling equipment to run for a sufficient purge time.
5. **Initial start-up adjustment should only be done in a manual control mode.** Disconnect any control motors from the MICRO-RATIO® Valve linkage using an allen wrench to disconnect the control motor's connecting rod from the valve's toggle linkage.

NOTE: The EBMRV CYCLOMAX® Burners are designed to be used with Maxon MICRO-RATIO® Valves. The gas valve has a multiple screw adjusting cam which is used to adjust the gas pressure at each setting to correspond with the appropriate air pressure for each position. The numbers on the external position indicating strip correspond to a series of adjusting screws which should be initially set to give the desired contour to the cam.

Control valves are easily adapted to automatic operation with an electric or pneumatic control motor.

Maxon offers a broad range of CB & L (connecting bracket and linkage) assemblies to properly position and align the control motors when used with Maxon control valves. **Maxon CB & L assemblies are designed to position the control operator, not to support its weight.** User must provide auxiliary support in the form of wall brackets, floor stands, turnbuckle hangers, etc., to support the weight and size of the operator.
6. **Measure air pressure** by connecting a manometer to the air pressure test connection which is located on the burner's main housing approximately 4" (102 mm) back from the burner mounting flange.
7. **Measure gas pressure** by connecting a manometer to the gas pressure test connection on the back plate of the burner.

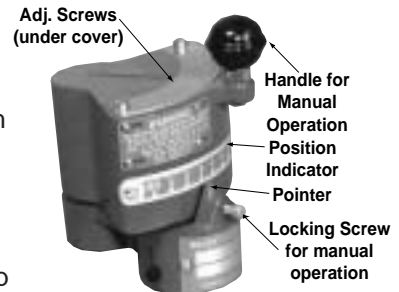
NOTE: Maxon offers a test connection kit which provides a convenient means of connecting plastic tubing to the burner test port connections. Kit should be removed after initial start-up and the test ports should be plugged for normal operations.
8. **Open the MICRO-RATIO® air valve** slightly to provide enough air to support reliable light-off.

Start-up Instructions EBMRV Versions

9. **Establish the maximum combustion air pressure** by moving the air valve crank assembly toward the higher positions until the desired air pressure is reached. This occurs around 90 degrees, unless the burner and/or blower are greatly oversized.
10. **Reconnect the fuel valve to the air valve.** Having marked the minimum and maximum settings, adjust the linkage and travel of the stroke. Set the air and gas pressures throughout the entire range.
11. **Re-check and verify that air handling devices are still operating.**

CAUTION: If flame is extinguished any time during steps 12 through 18, immediately shut-off gas and return MICRO-RATIO® Valve to minimum position. Allow adequate purge time for safety reasons. Re-light the pilot (if necessary) and reopen gas valve and turn screw last adjusted in slightly further before returning to that firing position. Refine adjustment if necessary.

12. **Light the pilot.** With pilot gas solenoid (or manual cock) closed, open the main fuel supply valve(s). Energize spark ignitor and open pilot gas solenoid (or manual cock). Observe ignition of pilot. Pilot should be set at the minimum gas flow which will support reliable ignition. Adjust pilot using adjustable orifice and/or pilot gas regulator.
13. **Shut off the spark ignition and pilot and confirm easy re-ignition several times.**
14. **With pilot gas on and spark ignition off,** turn on the main gas. With the main gas flowing, verify that flame is visible all around the burner nozzle. If not, adjust the minimum adjusting screw of the MICRO-RATIO® Valve until flame appears stable. Shut off pilot.
15. With the burner still set at minimum, adjust all other screws on the cam to form a smooth ramp.
NOTE: A preliminary setting can be established with all the remaining adjusting screws. Generally, each succeeding screw needs to be screwed in approximately one full turn deeper than its preceding screw. A smooth "stair-step" gradient pre-set at this point from low to high will simplify the remaining adjustment steps.
16. **Slowly move the MICRO-RATIO® Valve to next position.** Adjust as necessary to maintain ignition and the type of flame desired. Flame should be a steady blue color and should only fill approximately 25% of the can at lower firing rates. Observe the air pressure and adjust gas pressure to appropriate value shown in charts/graphs.
17. **Repeat Step 16 with the remaining adjustment screws** until high fire position is reached. If a flameout occurs, allow purge time and return to Step 12 in the adjustment procedure. At each setting, use the adjustment screw to set the gas pressure to the appropriate value corresponding to air pressure reading. Refer to charts and graphs in this catalog section.
18. **Cycle the burner to verify that pressures are within the recommended ranges.** The position of each screw on the MICRO-RATIO® Valve affects the adjacent screws. It can take two or three passes through the ranges to get the burner gas pressures set to the desired values with repeatability. When high fire position is reached with the MICRO-RATIO® Valve, slowly move the valve to the position immediately below high fire, read the air pressure, observe the gas pressure, and adjust the appropriate screw if necessary. Move the valve down to the next setting and repeat this procedure with each of the remaining adjustment screws until minimum fire is reached.



After the initial adjustment pass, adjust only the screw corresponding to the actual position of the MICRO-RATIO® Valve and the NEXT adjacent screw to be adjusted (either up or down the ramp). If possible, do not adjust the previous screw. Two passes through the firing range is enough. Some sensitive applications may require three passes with adjustments to get the ramp smooth enough to produce repeatable gas pressures at each setting.



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INDUSTRIAL COMBUSTION EQUIPMENT AND VALVES

Start-up Instructions EBMRV Versions

CAUTION: If high temperature limit trips before adjustment is complete, cycle burner back to minimum and allow the system to cool down before attempting to make any further adjustment.

19. **Observe the gas supply pressure during adjustment.** As firing rate is increased, the gas supply pressure will drop off and could go below recommended levels. It may be necessary to adjust the regulator. If so, all positions on the screw carrier of the MICRO-RATIO® Valve will need to be re-adjusted.

Flame Appearance: While increasing the burner setting, continue to make adjustments to keep the flame stable. A flame that is too lean will be transparent and will lift away from the nozzle. A flame that is too rich will be yellow and will burn on the outside of the can. A rich flame looks lazy. It will be darker than a lean flame and appear purple in color. When adjusted properly, the flame will appear bright blue in color. At low oven temperatures, the can color should be visible as a slight glowing effect. At moderate to high oven temperatures, the can should appear as a uniform medium red in color. Generally, a too lean flame condition creates high CO and low NOx, and a too rich flame condition will create lower CO but higher NOx. The best reference for CO and NOx levels is the charts on pages 2803 and 2804. The optimum pressures can vary according to the characteristics of the natural gas used as well as furnace back pressure or suction conditions.

20. **When all screws have been adjusted and initial repeatability is verified,** re-check pressures with unit at operating temperature. Refine settings if outside of the recommended ranges shown on the graphs.

21. **System should have an interrupted pilot.** Verify that pilot is shut-off. Operation with the pilot on causes flame non-uniformity, significantly higher emissions and can shorten can life.
22. **When burner performance is satisfactory,** reconnect the linkage from the control motor to the MICRO-RATIO® gas valve.
23. **Check out overall system operation** by cycling the burner, observing the air and gas pressures, re-igniting the burner, etc. Recheck all safety interlocks for proper setting and operation. After air and gas pressures have been verified and are within recommended ranges, shut the burner down, remove all fittings and tubing from the test connections and plug the test ports with pipe plugs.

CAUTION: Test every UV installation for dangerous spark excitation from ignitors, other burners, and direct or reflected UV radiation.

24. **Shut system down** and close all fuel valves. Allow an approved post-purge period before shutting down all fans. Replace all equipment covers and caps and tighten all linkage set screws.
25. **Instruct operating personnel** on proper start-up, operation and shut-down of system. Establish written instructions for reference.

NOTE: It is good practice to check the air and gas pressures regularly. If the gas supply to the MICRO-RATIO® Valve changes significantly, the adjusting screws will need to be re-adjusted. If a filter is becoming plugged, a routine check of the air and gas pressures can uncover problems before they become serious. Poor burner performance will result if pressures are set incorrectly.

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Notes



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