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GAS BURNER INSTALLATION INSTRUCTIONS

IMPORTANT NOTE: Although this quick guide is designed to answer questions you may have about installing or using a gas heat source for black oxide tanks, it is not meant to replace installation of your line by a professional. Local codes vary considerably and gas should always be installed by a licensed professional.

HINTS FOR INSTALLING AND OPERATING BLACK OXIDE TANK GAS BURNERS.

Before installing atmospheric burners, it is important to ensure several basic, important considerations are met. These include the following:

1. The orifice is the proper size for the type of supplied gas (LP or Natural) and the gas supply piping is of sufficient capacity to run the burners at their designed maximum BTU's.
2. The set-up must provide an unrestricted air supply, plus sufficient secondary air completely surrounding the burner.
3. There must be adequate head space between the top of the burner and the bottom of the tank to allow complete combustion.
4. Burned gas and products of combustion must have an unrestricted travel upwards to a high flue opening of the proper size.

GAS SUPPLY:

Although various factors, such as distance, elbows and rises from meter or gas supply may vary, small burners generally can be supplied by a half length of pipe that is the same size as burner inlet.

Larger BTU inputs and longer inlet runs may require larger pipe diameters. A pressure regulator may be necessary to maintain constant pressure.

AIR SUPPLY:

Clean primary air, entering through the air shutter to the venturi (air mixer) must be unrestricted.

Tank legs should be tall enough to ensure an adequate flow of secondary air to pass around, under and through the burner head. Restrictions of secondary air will result in incomplete combustion.

BURNER PLACEMENT:

Head space will allow secondary air to circulate and surround each individual flame. If the burners are too close to the tank, numerous problems can result, including poor efficiency, partially burned gas, odor, premature burner head failure and others.

Insufficient head space is usually evidenced by individual burner flames at the center of the burner pipe appearing

out. When the burner pipe is lowered, these ports will show a flame.

Ring burners should have a head space approximately three quarters of the burner outside diameter. For example, a 12" diameter burner would be 8-10" from tank bottom. Pipe burners are spaced twice the diameter of the burner, i.e. 2" pipe burner would be installed 4" from the top of the burner to the bottom of the tank.

FLUE:

Hot products of combustion must be removed from the top-most point of the heating chamber (see Diagram C). A properly designed flue vent will not have any obstructions to slow the direct flow of hot gases upward to the flue hole. Improper venting or restricted entry of secondary air can cause a potential hazard.

PILOTS FOR GAS INSTALLATION:

All burners should have a fixed manual pilot mounted close to the main flame, where the pilot flame will lick across several ports to give accurate ignition.

ANSWERS TO COMMONLY ASKED QUESTIONS REGARDING BURNER INSTALLATIONS:

- 1. *What is the proper gas pressure for gas burners?***
Propane (LP Gas) - 11" water column pressure, Natural gas - 5-6" water column pressure.
- 2. *What color flame indicated proper efficiency?***
An efficient flame will have a light blue core, surrounded by darker blue. A candle yellow tip usually indicates insufficient air present and orange/reddish flames usually mean dirty air supply (possibility of paint spray, welding gases present in atmosphere).
- 3. *Burner has small flames. What's wrong?*** Check orifice size, you may be using natural gas through an orifice meant for LP gas. The Gunsmith black oxide set-up comes with 1-1/2" diameter pipe burners and requires a #49 drill size for LP gas and a 7/64" orifice size for natural gas. Also check to make sure the gas supply line is of adequate size and the gas pressure is high enough.
- 4. *What type of pipe and compound should be used for gas installations?***
Black iron pipe is best. Do not use galvanized pipe. Flared fittings are used, with paste type joint compound.
- 5. *How do I know what size or type regulator to use?***
The best advice is to consult your gas supplier. Most LP firms can provide the correct regulator. Natural gas companies can either supply the proper regulator or tell you where to buy it.
- 6. *What size pipe should be used for hooking up my burners from the supply?***
Try to use the same diameter pipe as that coming into the back of the burner. Consult your installer to ensure sufficient pipe diameter.
- 7. *I have soot on the bottom of my tanks. What's happening?***
This is carbon being deposited because burners are too close to tank or there is insufficient air for the gas to burn completely. Check for proper burner head space and make sure there is adequate secondary air supply. Soot is usually caused by yellow flame. Adjust air mixture to get blue/blue flame.
- 8. *Flames keep blowing out. What's wrong?***
Check to make sure pressure to burners is not too great. Flames may also snuff out from improper venting. Make certain flue gases exit from around the tank easily.
- 9. *Is there a proper flame length?***
The flame length varies with burner size, type of gas and pressure. Color of flame is a better gauge of efficiency. Remember head space may have to be adjusted up or down to achieve best efficiency.
- 10. *Are additional safety controls available for gas installations?***
A gas throttling valve can be used in conjunction with a black oxide tank Partlow Controller. By setting the throttling valve approximately 10% above the Partlow setting, the gas would be automatically cut back if the tank solution temperature rose too high.
- 11. *Where should I locate my pilot?***
For positive ignition, the pilot should be placed over the first few holes in the burner, closest to the incoming supply.

12. *Is any special maintenance required for gas installations?*

Since there are almost no moving parts, gas requires no routine maintenance. Burners that rust during storage or non-use should be wire brushed before relighting. Also insects and spiders may crawl into unused burners, causing popping and yellow bursts when burners are relit.

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