

Foundry, forge or kiln propane burner Instructions

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This item is not for sale to minors. Using a gas burner involves danger from extreme heat. This burner produces flames and high temperatures which could result in injury, loss of life or property damage. Burns and unwanted fires may result especially from careless usage. **Safety precautions should ALWAYS be followed.** You are responsible for using this item safely and keeping the item in safe working order. Use of this item is at your own risk. Neither the manufacturer, the seller nor anyone affiliated with the manufacturer or the seller is responsible for any damage or injuries, no matter how minor or major that may result from the proper or improper use of this item. By purchasing this item the buyer agrees to the above terms and to be solely responsible for his or her usage and the usage of anyone who uses this item with or without the buyer's consent. If you do not agree to these terms DO NOT buy this item. Propane gas can accumulate and ignite explosively when used incorrectly. Propane fumes can cause suffocation from inhaling them. If you have any questions about properly using or storing propane or other fuel gasses contact your nearest gas distributor. **Safety should ALWAYS come first!**

Setting up the components

Setting up the propane components is fairly basic. The components necessary are; the propane tank, regulator, propane hose, attachment fittings and an optional attachment is a propane pressure gauge.

Most hobbyists use the propane tank size designated as the 20-pound tank. These are commonly used for gas barbecue grills. One of these tanks can be expected to give about 6 hours worth of melting time. But that is an approximation since several variables effect the time. Such as burner size, pressure setting, etc. Larger propane tanks can be used as well.

The propane regulator is essential for safely using the “self-aspirated” burner design. Self-aspirated simply means that the burner provides it’s own combustion air as compared to a “forced-air” burner which requires an air blower. Another name for the self-aspirated burner is “atmospheric burner” because atmospheric pressure pushes air into the burner as a result of the vacuum effect created by the gas jet.

Only high pressure regulators will work with self-aspirated burners. And the regulator needs to be adjustable. The small regulator used on most gas grills will not work because they provide the propane at a low pressure (about 5 ounces). The pressures needed for these burners range from about 5 to 25 pounds (PSI).



Here is a propane tank and an adjustable high pressure regulator is screwed into the valve with the propane hose extending to the left.

There are several sources for these regulators. Plumbing and welding supply stores will most likely have them but at a high price. However they will probably be high quality units and possibly contain a built in pressure gauge.

Lower cost high pressure regulators may be available from restaurant supply stores or camping catalogs. Some high output gas appliances such as cook stoves and turkey fryers require them. If you have trouble locating them locally there are sources for them on the internet and some are listed in the “suppliers” section of this manual.

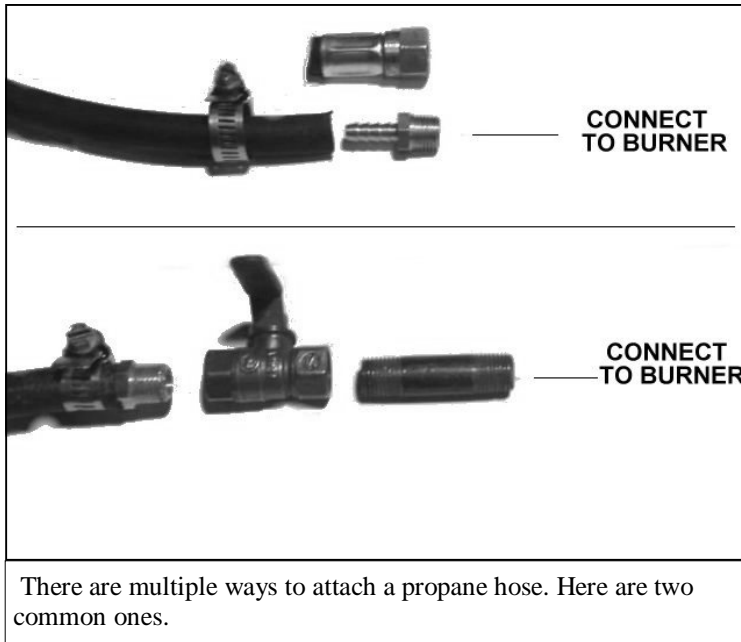
The propane hose should be 10 feet long for safety. The black rubber propane hoses should be available at a fairly low cost. Custom lengths can often be fabricated by the seller. Since propane dissolves some types of rubber it is not safe to use hoses designed for other gasses such as natural gas or acetylene.

Only hoses specifically labeled for propane should be used. The ends of the hose should have brass fittings that match common pipe sizes. 1/4" nominal pipe (NPT) size threads are very convenient. Sources for

hose are also listed in the suppliers section.

A propane pressure gauge is convenient for when you want to know exactly what pressure your burner is running at. However it is not necessary.

The attachment fittings used will vary depending on the way you choose to attach the burner to the propane hose. Two methods are illustrated below.



Both methods begin the same. The adjustable high pressure propane regulator is screwed into the valve of the propane tank. The gas outlet of the regulator is where the pressure gauge will be installed (if you choose to use one). If not the propane hose will screw into this spot.

The way the hose attaches to the burner is where the two methods differ. In the first method the propane hose has the end fitting (usually a 3/8" attachment) cut off and replaced with a brass hose barb that matches the inner diameter of the hose. It's secured with a stainless steel hose clamp. 1/4" male threads are on the fitting. If your hose already comes with 1/4" male threads on each end then the hose barb is not necessary. These threads screw into the 1/4" x 1/8" reducer on the burner's fuel jet pipe.

The second method uses the hose barb (already installed) to screw into a ball valve which is used for a quick shut off. The valve screws onto a short section of pipe called a "nipple." The nipple then screws into the 1/4" to 1/8" reducer coupling on the burner.

The convenient thing about having the ball valve at the burner is that you can open the propane tank's valve and keep the ball valve shut. Then when you're ready to fire up the furnace you can slowly open this ball valve to release the gas while keeping the propane tank safely away from the furnace.

A third way to attach the burner that I have had success with is to use a quick coupler attachment. These couplers are designed for air tools but I've found them to work well for the propane burners. However as a precaution, it is necessary to check that any rubber seals in them do not degrade and leak from the propane.

To use the quick coupler, the hose barb (attached to the hose as described previously) is screwed into the female half of the quick coupler unit. The male coupler fitting, which is the smaller part is screwed into the burner's reducer fitting. This is illustrated in the next photo.



Igniting the furnace, forge or kiln

With the lid raised prepare to light the furnace. An easy way to do this is to crumple a piece of newspaper and drop it into the furnace in front of the burner. With the lid still up off the furnace slowly open the gas valve allowing gas to enter the burner. The flames should ignite the gas. Turn gas valve as needed for proper burner functioning.

A quick coupler is very convenient to attaching and detaching the burner from the propane hose.

CAUTION: Igniting the burner with a crumpled wad of newspaper may result in burning pieces of paper floating out the furnace.

Once the burner is running properly lower the lid into position. If the burner did not ignite before the paper burned out allow the furnace to air out the gas fumes then repeat the procedure. If the flame extinguishes **CLOSE THE GAS VALVE IMMEDIATELY**. Let the furnace air out and then relight it.

If the burner will not stay lit the gas pressure at the regulator may be too high. Turn it down and retry the burner. On cold or windy days it may be difficult to ignite the burner reliably. In this situation you can soak a piece of charcoal in charcoal lighter fluid and ignite it in front of the burner. This burning charcoal should keep the flame burning until the furnace is warmed up. Let the burner run at a lower flame setting for 2 minutes to heat the furnace before turning it up to full operating flame.

If the burner produces a pulsating, “woopf...woopf...woopf...” type of sound there may be too much back-pressure in the furnace. Back-pressure is the pressure created from the burning gas as it expands and leaves the furnace as exhaust. Try sliding the burner backward away from the chamber. If that does not solve the problem the gas pressure may be incorrect. The burner sound should be like a smooth sound of “rushing wind” or like a large plumber’s soldering torch.

Once the furnace is warmed up turn the burner up as needed and allow the metal in the crucible to begin melting. At this point any other metal to be added to the crucible must be preheated by setting it on the furnace lid near the vent hole. Do not obscure the vent hole as this can cause excessive back pressure in the furnace and blow out the burner’s flame.

Propane safety rules

Check all connections for leaks with leak detector or soapy water. If a leak is detected tighten the fittings. Teflon tape designed for gas fittings should be applied to all threads. If the leak can not be corrected do not use the system. Check burner for obstructions such as dirt, rust, metal splatter etc. Clear them away if present. Examine the propane hose for cracks or other damage. Replace the hose if necessary. For safety, replace the hose every two years.

Always use caution when igniting the burner. Keep all body parts as far away as possible and wear appropriate safety gear. Keep the propane tank as far from the furnace as possible. The propane tank should be down wind of the furnace. This will blow any leaking propane away from the flame if a leak occurred. Always keep the propane tank in an upright position.

Never use a flame to check for gas leaks, keep children and pets safely away from the hot furnace or operating burner. Do not use the furnace without a regulator or with an improper regulator. Keep the propane tank’s valve closed when not in use. And comply with all local, state, and federal regulations when operating this equipment.

Suppliers

Propane components

To properly use this burner the following propane components are required; An adjustable HIGH pressure propane regulator, propane hose (10 feet is recommended) and a POL fitting which attaches the hose to the propane tank. The following companies sell these items as a combo. Since links change I’ll only provide the main homepage address.

The Cajun Shoppe — Here is a source for high pressure adjustable propane regulators and propane hose. They sell several combos of hose and regulator. However the company specializes in southern Louisiana style cooking and cooking utensils. Their website is www.cajunshoppe.com

Tejas Smokers — Here is another company that sells propane regulators and hose combinations. Their specialty is barbecue grill apparatus.
Their website is <http://www.tejassmokers.com/>