Installation Instructions

The burner is normally only a part of your complete combustion system. Additional pipe train accessories and control components will be required for a complete system installation.

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

To prevent damage in transit, the burner insert and mounting gaskets may be packed separately and shipped loose.

OXY-THERM® Burners can fire in all directions except downward. Avoid orientations which might permit an idle burner to collect debris.

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

Burner block failure could result from external stresses and strains transmitted to the burner through the piping. Flexible connections are recommended in all piping to reduce piping stresses and alignment/ shifting problems. Installation of such connectors at certain key spots in the oxygen or gas manifolding can prevent damage to the burners from uneven thermal expansion.

Burner Mounting

The sketches at right show two possible methods of mounting and holding an OXY-THERM® Burner block and frame assembly in place. Alternate support methods are possible.

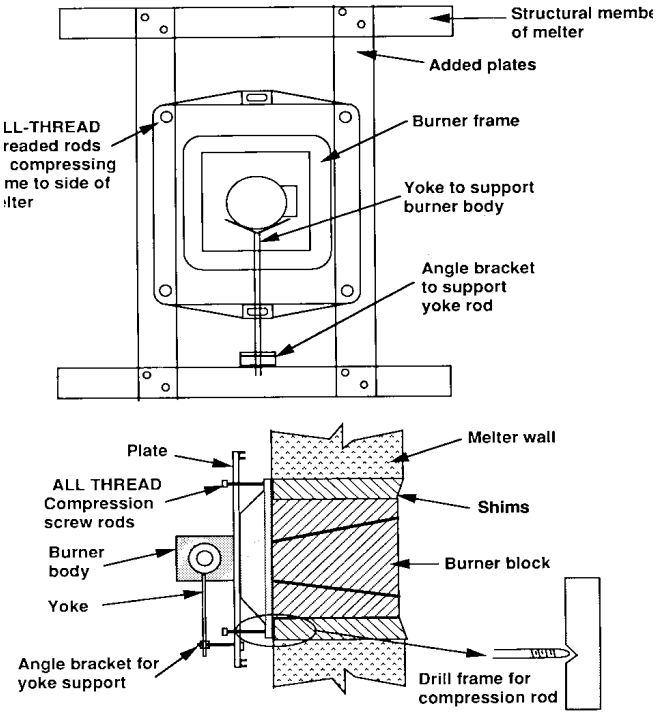
The primary focus is to compress the frame against the wall of the melter and to support the weight of any system piping.

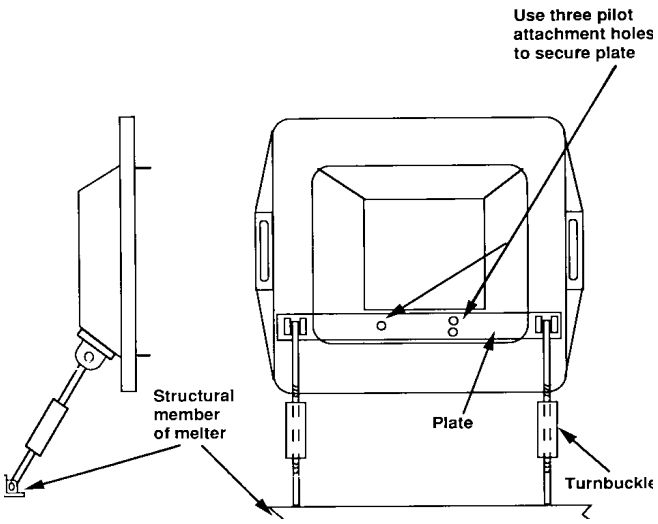
The burner block sits on the sill or wall. The burner block and frame weight should be supported and equally distributed. If burner port holes are too large, shims may be used to align the burner.

The opening in the furnace shell should normally provide 1/16" clearance on all sides. High temperature furnace sealant or gasketing should be used between burner mounting flange and furnace shell.

For maximum burner life, burner frame and furnace shell must be protected from hot gas flows.

Possible Burner Mounting Configurations





Contact Esys for more information about this product:
Esys® The Energy Control Company™
4520 Stine Road, Ste 7
Bakersfield, CA 93313
(661) 833-1902
email: esys@esys.us
website: http://www.esys.us

Installation Instructions

Hot Installation Procedure for Zedmul 20-C Burner Blocks

Over the last 20 years, the following procedure has been used to install Zedmul 20-C burner blocks "on the fly" in glass operations. Most of the experience has been in float and container glass operations with hot face temperatures between 1425°C (2600°F) and 1675°C (3050°F).

1. All moisture within the burner block should be removed before starting installation. This is accomplished by placing the burner on the crown of the furnace or under the port area for a day.
2. Where the new block will contact older, hot materials, Fiberfrax paper should be used as a thermal buffer.
3. Remove the old block and clean the opening.
4. Insert the new block into the furnace.
5. Permit the new block to heat-up to near ambient temperatures (usually about one half to three quarters of an hour).
6. Resume normal operations.

Burner Adjustment and Control

Oxygen-fuel burners require accurate control of both fuel and oxygen for optimum performance. Piping to individual burners should include control valves for both oxygen and fuel. In addition, flow meters for oxygen and fuel capable of local or remote readout are required for proper burner adjustment.

Flame sensing may be accomplished by UV scanner. Burner design can incorporate a UV scanner port suitable for supervision of both pilot and main flames. UV scanner, if used, should be kept as close to burner as feasible. Heat block, if used, may affect signal strength with some brands of UV scanners.

Electrical service must match the voltage, phase and cycle of all electrical system components and be compatible with nameplate ratings. Ensure that all normal control safeguards are satisfied.

CAUTION: Oxygen should only be used with approved materials, properly cleaned pipe and equipment, and specially designed systems. Ordinary materials can be extremely flammable in the presence of oxygen and air enriched with oxygen.

All organic and many inorganic materials will react with gaseous oxygen at particular temperature and pressure conditions. Fire and/or an explosion may result from this reaction.

Materials commonly used in valves and burners for ordinary service have ignition temperatures in gaseous oxygen that are **above** normal flowing temperatures. These may include organic materials such as Neoprene, Viton, Teflon, lubricants and sealing compounds. Therefore, the danger of combustion exists in materials being ignited not by the normal flowing temperatures, but rather by localized higher temperatures resulting from such conditions as:

1. **Adiabatic Compression**
   Rapidly opening a valve may result in an abnormally high gas temperature caused by adiabatic compression of a low pressure gas at the valve outlet.
2. **Dirt or Foreign Particle Impingement**
   A foreign particle that is being carried in a high velocity gas stream and which strikes the burner or a valve body wall may transform its kinetic energy into heat sufficient to raise the impinging particle or the material it strikes to its respective ignition temperature.
3. **Ignition by Stray Static Electricity Sparks**
   A valve, for example, that has already been heated up by friction may transmit sufficient heat to ignite other surrounding metallic materials from static electricity sparks.
4. **Excessive Friction**
   Heat generated by friction between two surfaces may raise the temperature of one or both of the surfaces to the ignition point of a substance within an oxygen atmosphere.

Organic materials have ignition temperatures below that of metals. Therefore, use of organic materials in contact with oxygen should be avoided as much as possible. The best material is one with the highest ignition temperature and lowest specific heat that possesses the necessary mechanical properties for the application.

Lubricants and sealing compounds should be used sparingly and should be a material that is suitable for oxygen service. Common petroleum lubricants are not satisfactory and are particularly hazardous because of their high heat of combustion and high rate of reaction.

O-rings should be lubricated with Series 25-10M Halocarbon or Fluoramics Lox 8 grease or equal. Pipe threads should be sealed with Fluoramics Lox 8 pipe joint paste or equal.

Installation Instructions

Other Materials and Precautions

- Brass or copper pipe should be used in any pipe carrying oxygen.
- Do **not** use Buna-N in any equipment that contacts oxygen.
- Packings, such as for valves, should be Viton or Teflon.
- **All accessory and pipe train components** such as regulators, solenoid valves, gauges, pressure switches, etc., **must be oxygen service compatible.**

Fuel supply piping must be large enough to maintain the required fuel pressures cataloged for the particular burner size used with burner operating at full rated capacity.

Anything more than minimal distance or piping turns may necessitate oversizing piping runs to keep pressure drops within acceptable ranges.

If multiple burners are fed from a single fuel train, care should be taken to minimize pressure drop and give maximum uniformity.

Clean atomizing oxygen/air lines are essential to prevent plugging of critical atomizing ports in the oil insert.

Clean fuel lines are essential to prevent blockage of pipe train components or burner fuel ports.

Fuel and oxygen piping should be located reasonably close to the burner and sized for the pressure and volume requirements of the burner.

Main shut-off cock should be upstream of the main fuel regulator and pilot (if supplied) line take-off. Use it to shut off fuel during shut-down periods of more than a few hours.

A fuel throttling control valve is not intended for tight shut-off.

Main fuel regulator is essential to maintain a uniform system supply pressure.

Size the regulator for full system capacity at the required pressure, carefully considering pipe train losses. Follow the instructions attached to the regulator during installation.

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

Pilots do not use oxygen.

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

Fuel shut-off valves (when properly connected to a control system) **are designed to shut the fuel supply off with a loss of electrical power. Manual reset valves** require operator attendance each time the system is started up (or restarted after a shut-down). **Motorized shut-off valves** permit automatic start-restart when used with an appropriate control system.

Any test connections must be plugged except when readings are being taken.

Control systems should provide all normally recommended interlocks (including operation of fuel shut-off valves). Sequencing control systems are available from Maxon that include provision for post-purge pilots during all but emergency shut-downs.

Control system's circuitry must not allow main fuel shut-off valve to be opened unless oxygen is on, and must de-energize valve upon loss of oxygen pressure, along with the other usual system interlocks.

Start-up Instructions

Start-up instructions are specific to each application. Contact your Maxon representative for instructions for your particular application.