

Installation Instructions

Pipe sizing should be selected on the basis of maximum pump capacity, not projected usage rate. While suction and discharge connections are sized to give velocities within "standard practice" limits, long pipe runs to or from the supply unit may necessitate larger field piping.

Piping should be sized in accordance with Maxon recommendations on page 9403 and a union installed at each of the three piping connections to the Light Oil Supply Unit.

Return piping should be run back to the storage tank, not just to pump inlet. Do not install valves or any other restriction in the return line. Pressure losses should not be permitted to exceed 5 to 10% of desired system pressure as determined by back pressure regulator valve. Remember that losses include any elevation difference between the supply unit and oil source.

Suction piping must be air tight. Since this run is under negative pressure, oil will not leak out, but air could leak in and become a continual source of operating difficulty and even hazardous conditions. A Check Valve is recommended just above tank connections if the pump is located *above* supply.

Suction lift (plus pressure drop) should not exceed 10-15 feet for oil at 70°F or less. This is not due to pump design but is a function of oil vapor pressure and frictional losses in the suction line. Where practical, the pump should be located *below* supply oil level. Under ideal conditions, as much as a 19-foot suction lift is possible, but *extreme* care should be taken in designing to this limit.

The **circulating loop** should include a return from the most remote point of the burner distribution for steadiest supply pressure and easier purge and control of air problems in the oil piping.

The **Back Pressure Reducing Valve** (BPRV) furnished as part of each Model LO Light Oil Supply Unit does not give the ideal circulating loop as shipped, and in all but the simplest systems should be relocated to a point beyond the furthest burner take-off, a suitable cap or plug installed in the opening left by its removal, and return loop run from that point back to the supply tank.

Slope piping wherever possible so that BPRV is located at the highest point of the supply leg, since oil, like water, always has some air entrapped or dissolved in it that is released whenever pressure is reduced and/or temperature is raised.

Oil heating may be necessary to prevent congealing in supply, return and distribution piping if those are exposed to sub-freezing temperatures. Critical combustion applications in particular benefit from the consistent viscosity supplied by controlled heating.

Overall installation must comply with any applicable codes and standards including, but not limited to, NFPA 30 (flammable and combustible liquids code), NFPA 31 (oil-burning equipment) and the National Electrical Code. Your local fire marshal and oil supplier can often help.

Supply Unit location should be cool, clean, dry and readily accessible for maintenance. As outlined in the suction lift section above, it should, wherever possible, be lower than the lowest normal oil supply level.

Burner system take-off should usually be from the bottom of oil supply line to avoid air trapping and the operating difficulties it can cause.

Check valves are required on duplex pump systems, but are normally not required on single pump systems except where priming becomes a problem.

Protect oil piping from possible physical damage from either humans or mechanical equipment.

Optional items which may be desirable in your system include the following:

- *Low oil pressure limit switch* (manual reset) to interlock with signaling device and/or pump motor to break motor circuitry whenever discharge pressure falls below a predetermined setting. Must be wired to allow override during system start-up.
- *High oil pressure limit switch* which may back up or take over before the operation of the pump's integral safety relief valve.
- *Remote Stop push buttons* to permit stopping the pump from other desirable locations.
- *Accumulators* to reduce piping stresses due to expansion of trapped oil.

Start-up Instructions

Read and understand the following thoroughly before beginning start-up, then:

1. Manually rotate pump shaft to provide a simple mechanical check against pump damage.
2. Open suction valve and, if Back Pressure Reducing Valve (BPRV) has been relocated downstream of the supply unit's discharge valve, open that discharge valve to provide a flow path to the BPRV.
3. If suction lift is high, break tubing connection just downstream of suction filter and pour about 1/2 pint of lubricating oil into the pump body, then replace fittings and tighten firmly.
4. Open small valves in gauge supply lines. (They should normally be closed to protect gauges from prolonged exposure to the continuous pressure pulses which can greatly shorten operating life.)
5. Start pump motor and watch for discharge pressure gauge to rise to BPRV setpoint as air is bled off through BPRV and oil is drawn through the pump. If this does not occur within one minute, shut off pump and allow a short cooling-off period before trying again. If repeated attempts do not result in suitable discharge pressures, see pump set instructions for troubleshooting.
6. Refine BPRV adjustment to give the desired supply loop pressure. Do not exceed the pump's rated maximum.
7. Allow unit to operate for 5 to 10 minutes without attempting operation of any burner system, then begin systematic purging of all dead end piping such as individual burner system supply lines.
8. Proceed with individual burner system start-up as outlined in appropriate instructions.



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