Liquid Refrigerant Pumps

PRACTICAL APPLICATIONS FOR LIQUID REFRIGERANT PUMPS

Recovery - system to cylinder transfer:
Fast, safe and portable liquid refrigerant removal without venting. Saves wear and tear on vapor recovery units. Liquid pump and small vapor recovery unit does the job of a large recovery machine at a fraction of the cost. Upgrading unsealed recovery systems to sealed units. Permanent recovery pump installations

Charging - cylinder to system transfer:
Fast, safe and portable filling systems, on production line or in the field. Charging system to 300 PSI differential.

Consolidation - cylinder to large cylinder transfer:
Permits emptying of small cylinders on the spot and reusing or returning to the customer. When the cylinder will be reused for the same refrigerant, the residual vapors (4% of cylinder capacity) can be left behind. Reduces number of cylinders required in inventory. Reduces freight and paperwork for reclaim programs.

Distribution - large cylinder to service cylinder transfer:
Economic purchase of refrigerant. Simplifies handling and storage for service fleet. Fill cylinder(s) in refrigerant processing plants.

Filtration - refrigerant or oil in cylinders or systems:
Circulate through filter/drier to clean liquids. Reduce down time by filtering with system on line. Extend service intervals and reduce maintenance.


LP11

LP11

This fast and trouble free 1/2 HP self-priming pump has a flow rate of 30 pounds of R11 per minute. It is well suited for large commercial applications that have a charge of several hundred pounds to sometimes more than 1000 pounds of R11 or R113.

The LP11 pump should never be run with vapors or the seals will be damaged. The LP11 pump has BUNA-N seals and a maximum discharge pressure of 40 PSI.

The LP11 must not be used with R12 or other high pressure refrigerants.

For best results use NRP Hose Kit Model HK11 and place the pump at a lower elevation than the chiller.

Not for use with R123 which will damage the BUNA-N seals.


LP12

LP12

This 1/3 HP, maintenance free, self-lubricating vane pump has a flow rate of approximately 16 pounds of R12 per minute. The LP12 has a working pressure of 200 PSI and should not be used to transfer R22 or R502.


LP22/LPO

LP22

The LP22 is a gear pump with neoprene seals and a MOP of 300 PSI with a DWP of 150 PSI. This self-lubricated pump has a flow rate of approximately 20 pounds per minute and is supplied with a 1/2 HP motor.

3/8" or 1/2" hoses are required.

LPO

The LPO is a gear pump which works like our LP22 model. It has a MOP of 200 PSI and a differential pressure of 100 PSI. It is supplied with a 1/2 HP motor. Transfers refrigeration oil.

Part No.	Capacity	Power	Dimensions (In.)	Connections (In.)	Use with Refrigerants	Weight (Lbs)
LP11	30 Lbs/Min	1/2 HP, 115 V, 60 Hz	10 L x 6 W x 8 H	3/4 Male Hose	R11, R113	12.5
LP12	16 Lbs/Min	1/3 HP, 115 V, 60 Hz	12 L x 6 W x 8 H	1/2 FPT	R12	18.5
LP22	20 Lbs/Min	1/2 HP, 115 V, 60 Hz	12 L x 10 W x 8 H	3/8 FPT	R11, R12, R22, R113, R123, R500, R502, R134a & Blends*	33
LP22E		1/2 HP, 220 V, 50 Hz				33
LPO	1.2 Gal/Min	1/2 HP, 115 V, 60 Hz	12 L x 10 W x 8 H	3/8 FPT	Transfers Refrigeration Oil	31
LPOE		1/2 HP, 220 V, 50 Hz				31

** May not be available for all refrigerant blends. Consult factory for proper application.*

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Flow Ratings

Liquid pumps are typically rated in gallons/min. and their capacity is determined by measurements made on water or light oils. To convert from gpm to lbs./min. multiply the gpm rating by the density (lb/gal) of the refrigerant (chart below). Since vapor is almost always present, the actual flow is often quite a lot lower. Tests have indicated that a refrigerant pump capacity is reduced by 5 to 40% due to vapor displacing the liquid in actual field conditions where restrictions have been minimized. A sub cooler on the suction side reduces vapor formation and is an effective way of increasing flow rate.

Refrigerant No.	114	12	502	113	500	11	22	121	123	134a	404	507
Density Lb./Gal.	12.0	10.8	10.2	13.0	9.5	12.2	9.8	N/A	12.3	10.2	8.9	8.9

Maximizing Capacity

Using a larger pump often will not yield higher flow rates because a larger pump merely creates more vapor that displaces the liquid. The following chart can be used as a guide to determine the maximum practical pump size to install.

Diameter of Smallest Passage On Inlet Side of the Pump (Inches)	Hose Size I.D. (Inches)	Rated Flow Lbs./Min. Ideal Conditions[1]	Approx. Flow Lbs./Min. With Equalizer Line[2]	Approx. Flow Lbs./Min. Without Equalizer Line[3]
0.22	3/8	38	20	10 - 15
0.22	1/2	38	24	12 - 18
0.62	5/8	130	40	20 - 30
0.75	3/4	130	90	45 - 60

[1] *Rated flow is with a vapor pressure equalizer line and no vaporization present*
[2] *Typical flow for average hook up using a vapor pressure equalizer line*
[3] *Without a vapor pressure equalizer line, flow will also be dependent on discharge pressure and can be less than half of rated flow.*

Special pumps are available.
If an equalizer cannot be used, keep flow rates per minute to less than 2.5% of the tank's capacity. For example a 1,000 lb. cylinder can handle up to 25 lbs./min. without excessive cavitation, depending on temperature and inlet line restrictions.

Extended Life

Larger motors are available for higher pressure operation, but the best method is an efficient one that reduces the line restrictions to minimize load on the pump and motor and maximizes net flow rate.

Refrigerants can be void of lubricants and provide very little lubrication to the pump. Modular Products Inc. liquid refrigerant pumps are designed and constructed such that the wearing components minimize the need for lubrication.

Cavitation is inevitable when pumping low boiling point liquids and some pump damage may occur. Cavitation damage looks like pitting erosion of the parts on the inlet side of the pump, especially on sharp edges. Many Modular Products, Inc. liquid refrigerant gear pumps that have been in service for extended periods of time show no evidence of such damage when used properly.

Chemical attack of components is possible. Elastomers must be compatible with the refrigerant being pumped and compressor oils. Acids such as HF and HCL form when water is present. Decomposition can form dangerous by-products (mostly acids) and is generally due to exposing the refrigerant to high temperatures from flames, heater or motor burnouts. The pump should be cleaned thoroughly if exposed to acids to reduce corrosion damage. If in process the pump will continuously be exposed to high concentrations of acids, consider using a Modular Products, Inc. stainless steel pump configured for liquid refrigerant pumping.

Solids such as rust, welding debris, dirt, wood chips etc. are an invitation to pump seizure, use a 40 mesh strainer on the inlet to protect the pump.

Storage: Always add some compressor oil to pump and seal and/or cap all ports and lines from atmosphere to reduce rust and corrosion between use.