

Buffalopumps

C-O-M "R"™

Sealless Design
Refrigerant Pumps

Ammonia

R-22

CO₂

Brines



CE

ISO 9001 Certified

Bulletin 988

Refrigerant pumping applications demand pumps that provide reliability and extended service life with a minimum of maintenance. The typical refrigerant pump must also exhibit low NPSH characteristics and be able to withstand system upset conditions common in refrigeration applications. The C-O-M "R" family of pumps is designed specifically with these requirements in mind.

The C-O-M "R" is a hermetically sealed, zero leakage pump that eliminates the inherent maintenance and leakage problems associated with mechanically sealed pumps. It utilizes an ANSI standard pump end and a liquid cooled motor with unique, conical, self-lubricating, spring loaded bearings that are self-compensating for wear. During operation, axial and radial thrust loads are balanced by Buffalo's exclusive Thrust-O-Matic® device. Buffalo's patented conical bearing design compensates for wear in an axial direction. This prevents radial movement of the rotating assembly, keeping it centered and away from the stator can. This is a major advantage that the conical bearing design has over sleeve bearing designs. Sleeve bearings produce an elliptical wear pattern, allowing radial movement of the rotating assembly towards the stator can.

Buffalo Pumps is backed by over 40 years of field-proven experience in designing hermetically sealed pumps to handle most refrigerants. This experience also provides flexibility in assisting OEMs, contractors and end-users in designing a sound installation that ensures maximum life.

DESIGN FEATURES

Impellers for the C-O-M "R" were designed specifically to provide low NPSH required characteristics. An extremely wide range of performance requirements can be met within 1 meter or less of NPSH available.

The combination of specialized bearing designs with balanced axial and radial thrust loads results in bearing life of up to 50,000 hours.

C-O-M "R" pumps utilize a back pull-out design allowing removal of the motor and impeller without affecting system piping.

C-O-M "R" pumps have a vertical centerline discharge with self-venting characteristics.

C-O-M "R" pumps are thoroughly tested before shipment. Each pump is given a hydrostatic test at 150% of the rated working pressure, a running test to ensure hydraulic balance over the complete performance range and a halogen or mass spectrometer test to ensure the complete unit is hermetically sealed.

ENGINEERING ASSISTANCE

Buffalo Pumps' Sales Engineers have the engineering training and practical field experience necessary for the correct selection and application of C-O-M "R" pumps. In addition, they have the full support of Buffalo Pumps' home office research and engineering personnel. This in-depth engineering service is invaluable in ensuring proper pump application and installation.

AVAILABILITY

Buffalo Pumps maintains extensive stock for C-O-M "R" pumps and is committed to servicing the market delivery demands. In addition, a complete repair parts department stands ready to service your ordinary maintenance and emergency breakdown needs.

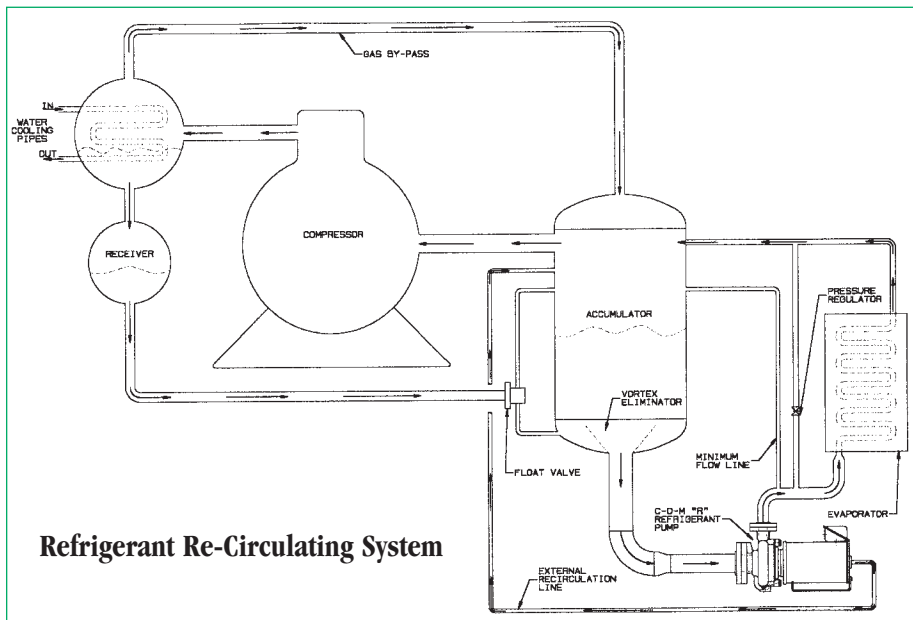
GENERAL SPECIFICATIONS

Capacity to 200 m³/hr.

Head to 100 meters

RPM 1450 & 2900

- Working pressures as standard to 17 bar and up to 20 bar for higher applications.
- Temperature range from -50°C to 40°C with standard product. Through the use of special materials of construction, the C-O-M "R" can be applied down to -70°C.
Note: Buffalo Pumps has additional sealless pumps that are available for capacities up to 200 m³/hr., head to 200 m, temperatures ranging from -100°C to 200°C and working pressures up to 40 bar. Contact the Buffalo Pumps factory for further information.
- Standard materials of construction include a low temperature ductile iron casing, cast iron impeller, carbon graphite bearings and all wetted motor parts of 316 stainless steel.

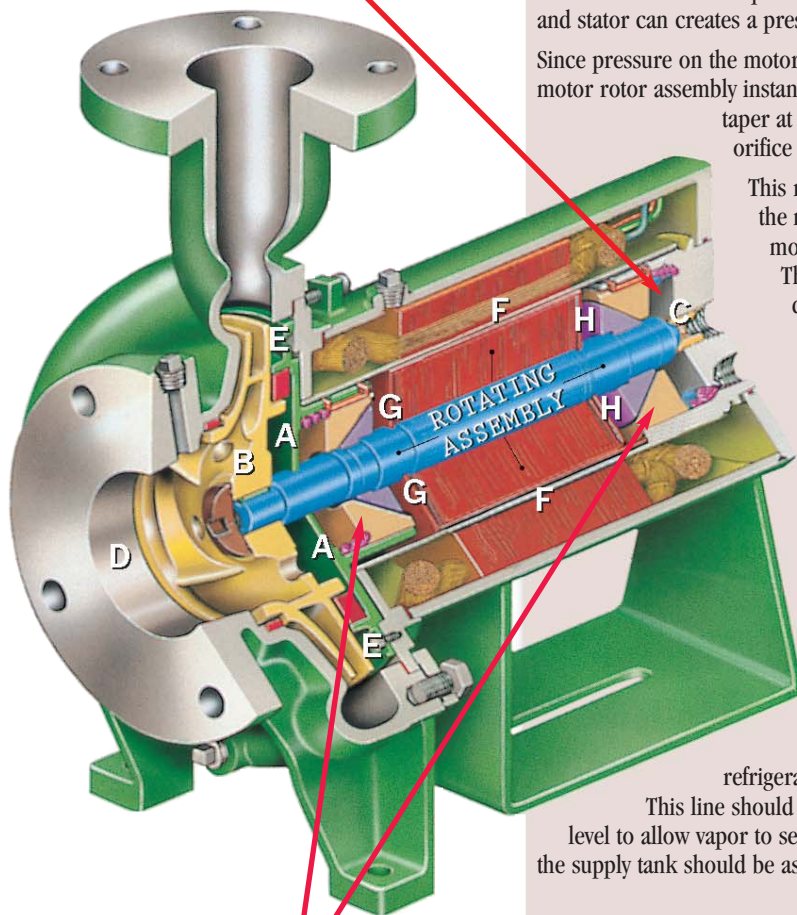


Refrigerant Re-Circulating System

THE C-O-M "R"™ CONCEPT

BALANCED AXIAL THRUST

Buffalo's exclusive "Thrust-O-Matic" device combines with the impeller balance chamber to control the axial thrust forces of the rotating assembly. This results in extremely long bearing life and trouble-free operation under varying system flow demands.



Buffalo's C-O-M "R" pump controls internal axial thrust forces by hydraulically balancing the rotating assembly. This hydraulic balance is maintained even under varying system loads by the utilization of our Thrust-O-Matic technology. The Thrust-O-Matic consists of an orifice and a specially tapered shaft. Our conical bearings have a 50,000 hour design life because of our ability to maintain control of these axial forces. In operation, this works as follows: when the pump is started, the rotating assembly (impeller & motor rotor) moves toward the pump suction (D). This is caused by the discharge pressure acting on the back shroud (E) of the impeller. At this point, the Thrust-O-Matic orifice (C) is at its maximum opening.

The resultant flow of liquid through the small annular space (F) between the rotor and stator can create a pressure drop across the motor rotor.

Since pressure on the motor rotor at point (G) is greater than at point (H), the motor rotor assembly instantly moves toward the Thrust-O-Matic orifice (C). The taper at the end of the motor shaft enters in the Thrust-O-Matic orifice reducing its opening.

This reduces the potential for flow of pumped liquid across the motor rotor, reducing pressure drop across the rotor, moving the rotating assembly toward the suction end (D). The process repeats with increasingly smaller pressure differentials and rotating assembly movement until equilibrium of the rotating assembly is attained.

The balancing holes in the impeller (B) serve as an orifice between pump discharge pressure at (E) and pump suction pressure at (D). The balancing holes (B) and balancing chamber (A) control the axial thrust created by the impeller. This aids in the balancing of the rotating assembly.

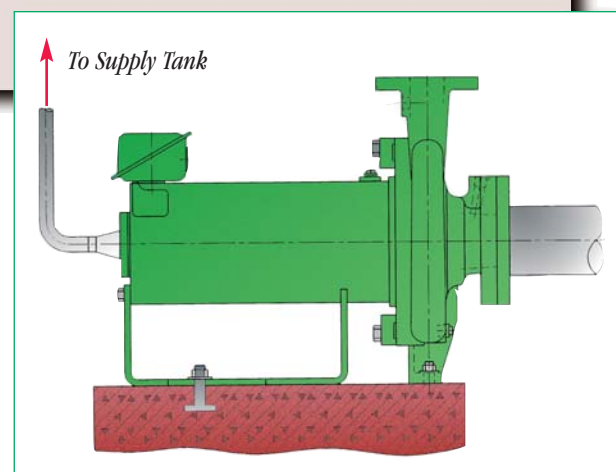
Flow passages around the impeller, the size of the balance chamber, balance holes through the impeller, groove size in the bearings, orifice opening and shaft taper have all been designed to provide maximum reliability for extended maintenance-free service.

An external re-circulation line is required to allow refrigerant to exit the motor and return to the supply tank.

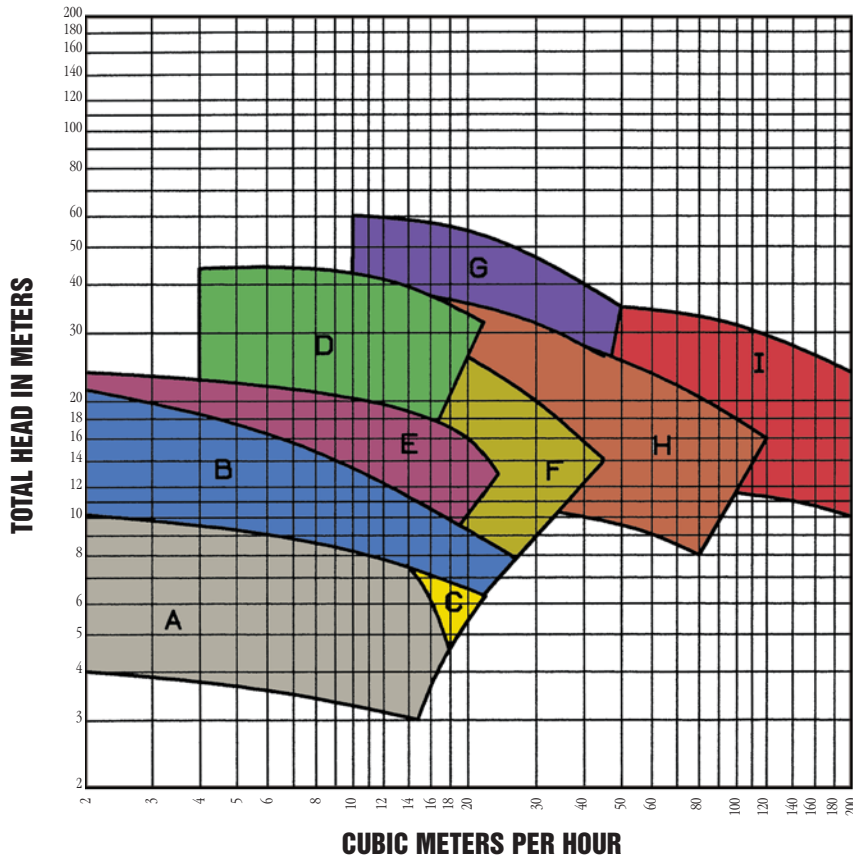
This line should connect to the supply tank above the maximum liquid level to allow vapor to separate from the liquid. The piping from the motor to the supply tank should be as direct as possible to minimize friction losses.

CONICAL BEARING DESIGN

The rotating assembly is reliably supported by Buffalo's conical bearing system. These carbon graphite conical bearings are self-lubricating and held to the journal by spring pressure. This maintains concentricity of the rotating assembly throughout changing system conditions. Any wear that may occur is automatically compensated for by the spring pressure and occurs in an axial direction. This keeps the rotating assembly centered and away from the stator can.

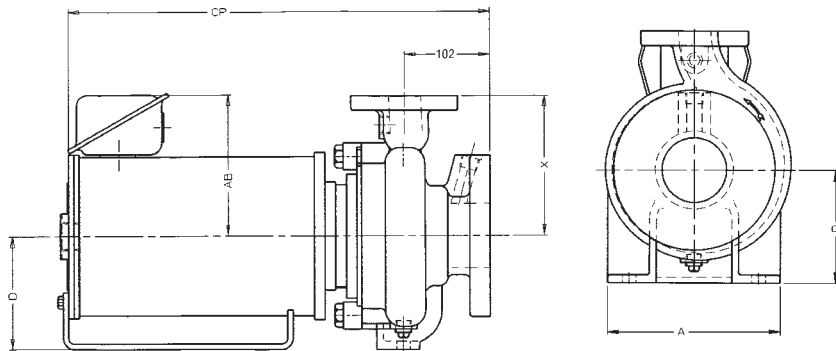


PERFORMANCE DATA:



PERFORMANCE DATA C-O-M "R" REFRIGERANT PUMP			
Performance	KW	RPM	Pump Sizes
A	1.1	1450	509
B	2.2	2900	509
C	3.7	1450	509
D	5.5	2900	509
E	3.7	1450	2013
F	7.5	1450	3013
G	11	2900	709
H	15	1450	4013
I	22	1450	8013

DIMENSIONS:



Pump Model	KW	RPM	A	D	X	AB	CP
509	1.1	1450	298	210	216	140	457
509	2.2	2900	298	210	216	140	457
509	3.7	1450	298	210	216	175	460
509	5.5	2900	298	210	216	175	537
2013	3.7	1450	298	254	267	175	460
3013	7.5	1450	298	254	292	276	511
709	11	2900	298	210	279	225	546
4013	15	1450	298	254	318	225	613
8013	22	1450	356	254	343	300	724

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CERTIFICATION

