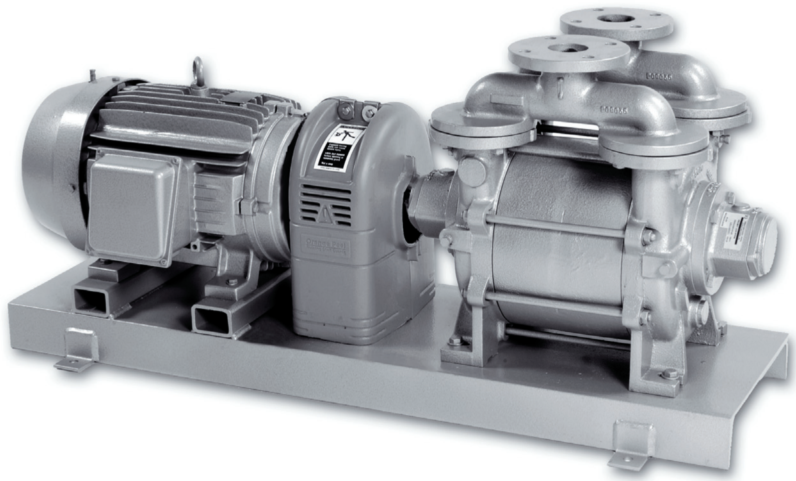
Liquid Ring Vacuum Pump

Dolphin
LA 0053 - LA 5109



LA 0435

Description

Our Dolphin LA range of liquid ring vacuum pumps are well suited for wet and corrosive applications. They combine the benefits of high efficiency from a compact rugged machine, and reduced running cost from a competitive product.

Features

- Suction capacity from 35 cfm to over 3000 cfm
- Ultimate pressure to 100 torr (26 HgV)
- Available in a wide range of materials
- Minimal moving/contacting parts allowing ease of service and maintenance
- Single mechanical seals standard
- Low vibration and noise level
- Reliability
- ANSI flanges and NEMA motors
- Some models are directly interchangeable with other brands
- Low heat emission
- Oil free discharge

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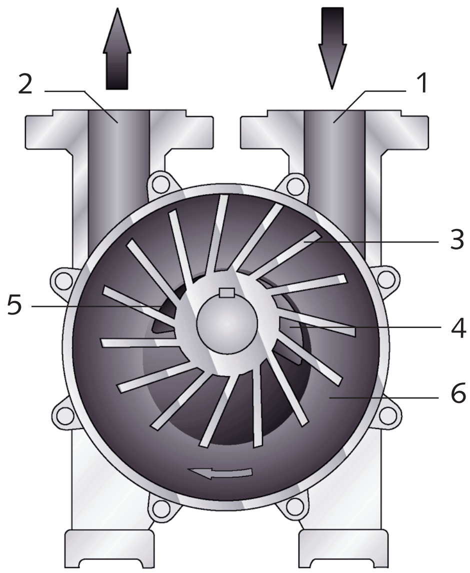
Operating Principle



1. Inlet
2. Outlet
3. Impeller
4. Inlet Port
5. Outlet Port
6. Liquid Ring

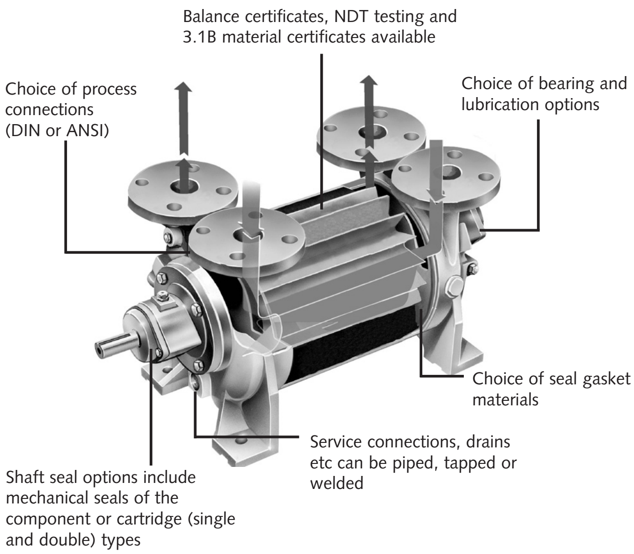
Operating Principle

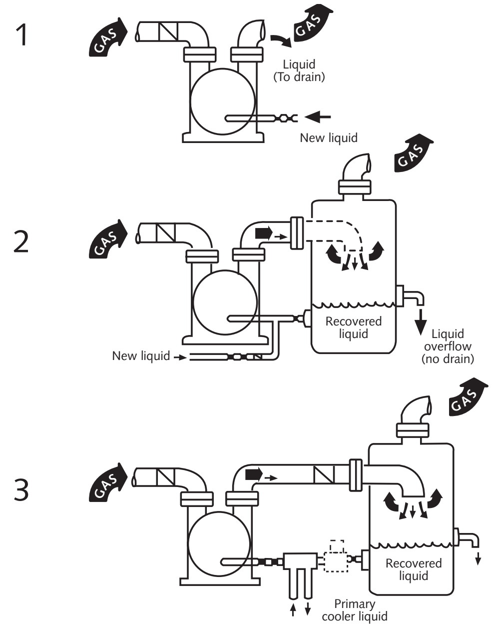
Liquid ring pumps operate with only one moving part, the impeller shaft assembly. The impeller is mounted eccentrically relative to it's casing. The liquid ring is formed by the service liquid (normally water) rotating concentrically in it's casing. Process gas enters through the suction port, travels between the impeller blades and is compressed prior to exhausting through the discharge port along with a quantity of service liquid.

Areas of Application

- Autoclaves
- Automotive
- Chemical Processing
- Concentration
- De-gassing
- Distillation
- Drying
- Evaporation
- Filtration
- Food Processing
- Hospitals
- Impregnation
- Milking
- Molding
- Paints
- Packaging
- Paper
- Paper, Envelopes, Converting
- Plastics
- Pharmaceutical Processing
- Power Generation
- Solvent Recovery
- Soaps
- Tobacco
- Timber Treatment
- Textiles

Features, Options, and Configurations

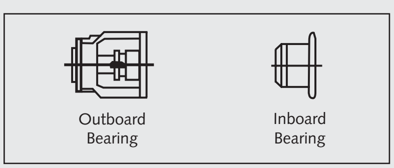




Available Options

- Various materials of construction including 316 stainless steel, bronze, etc...
- Base plate or pedestal mounting configurations
- IEC motors
- Metric connections
- System configurations (once through, partial recovery, and total recovery)
- Outboard bearing in place of standard inboard bearing
- Packed gland seal or double mechanical seal

Bearing Types



Contact Busch, Inc. Application Engineering Department for assistance in selecting and configuring a pump suited for your needs.

System Configurations

1. Once Through System - No Recovery

The service liquid comes from a fresh supply, passes only once through the pump and is discharged to an open drain.

2. Partial Recovery System

Within this system the service liquid is discharged to a vessel which allows separation of the gas and liquid. A portion of the discharged liquid is returned to the pump's service fluid inlet together with a fresh liquid supply. This reduces the amount of fresh liquid required.

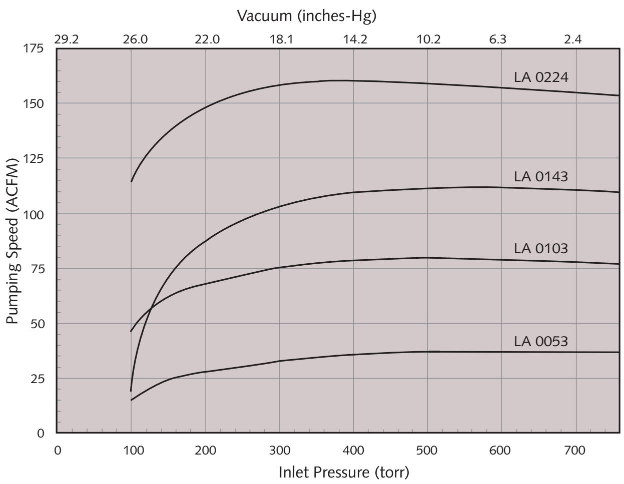
3. Total Recovery System

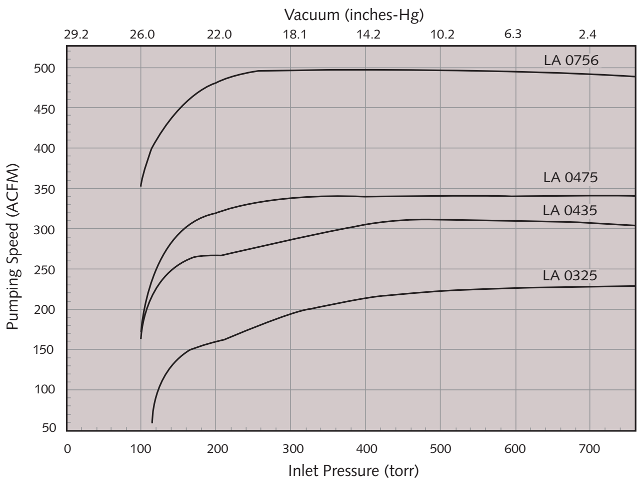
This system provides for total recirculation of the service liquid and is preferable when liquid is in short supply or where there is a risk of contamination. A heat exchanger is added to the system to remove the heat of compression prior to re-use of the service liquid.

Liquid Ring Vacuum Pump

Technical Data Dolphin LA 0053 - 0756

Pumping Speed vs. Inlet Pressure





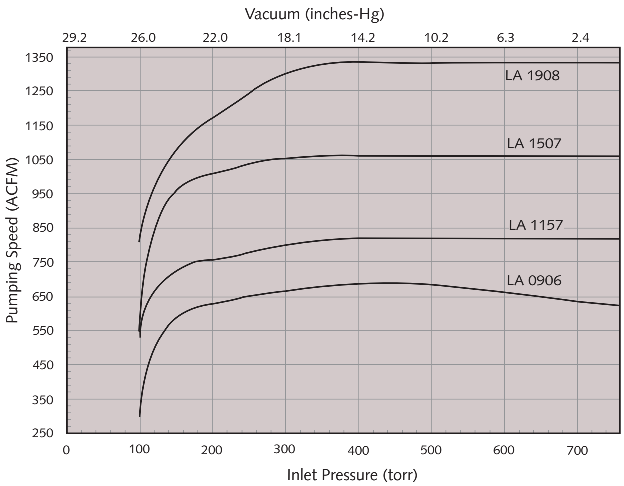
All data based on dry air @ 68°F, and water as sealing fluid with 59°F ring temperature.

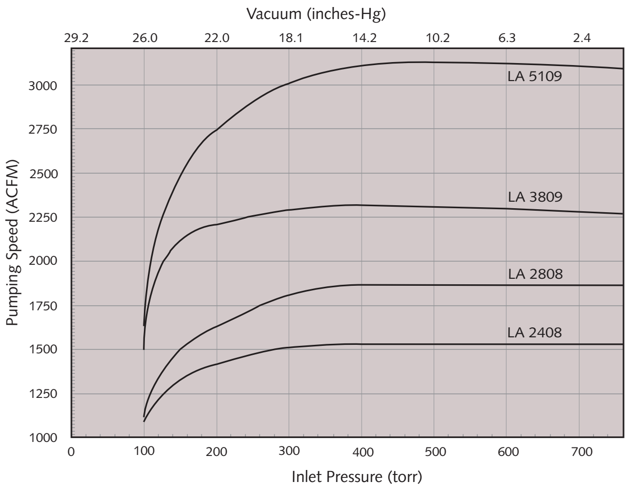
Technical Data		LA 0053	LA 0103	LA 0143	LA 0224	LA 0325	LA 0435	LA 0475	LA 0756
Nominal pumping speed	ACFM	35	79	112	159	206	294	335	494
Ultimate pressure	Torr	100	100	100	100	115	100	100	100
Motor size	HP	3	5	5	10	20	20	30	40
Nominal motor speed	RPM	1750	1750	1750	1750	1750	1750	1750	1750
Typical service liquid flow	GPM	3.5	3.5	3.5	6	12	13	14	26.5
Max. gas inlet temperature	°F	176	176	176	176	176	176	176	176
Approximate weight (bare shaft module)	Lbs.	97	106	115	194	331	408	463	639
Sound level rating*	dB(A)	72	72	72	72	75	75	75	75

Performance data based on ambient conditions of 14.7 PSIA and 70° F, and have a tolerance of +/- 10%.
*DIN EN ISO 2151

Technical Data Dolphin LA 0906 - 5109

Pumping Speed vs. Inlet Pressure





All data based on dry air @ 68°F, and water as sealing fluid with 59°F ring temperature.

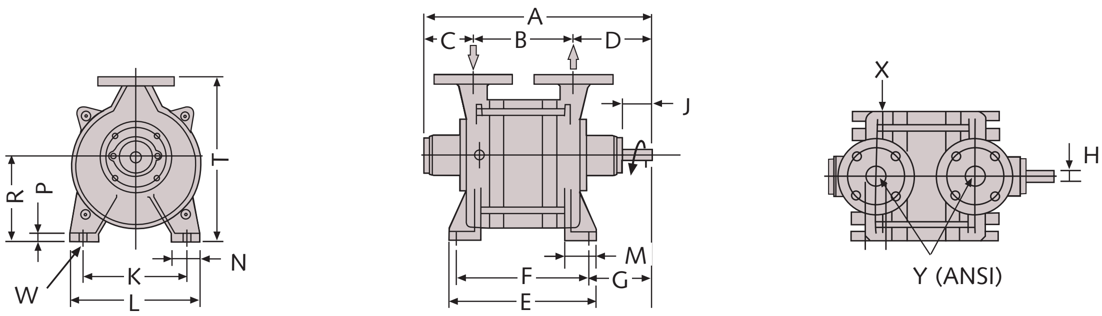
Technical Data		LA 0906	LA 1157	LA 1507	LA 1908	LA 2408	LA 2808	LA 3809	LA 5109
Nominal pumping speed	ACFM	647	812	1059	1324	1530	1854	2237	3002
Ultimate pressure	Torr	100	100	100	100	100	100	100	100
Motor size	HP	50	60	75	125	150	200	200	200
Nominal motor speed	RPM	1750	1150	1150	880	880	880	700	700
Typical service liquid flow	GPM	26.5	26.5	35	57	57	60	57	57
Max. gas inlet temperature	°F	176	176	176	176	176	176	176	176
Approximate weight (bare shaft module)	Lbs.	705	1190	1323	3086	3417	3748	4299	4519
Sound level rating*	dB(A)	75	77	77	79	79	79	85	85

Performance data based on ambient conditions of 14.7 PSIA and 70° F, and have a tolerance of +/- 10%.

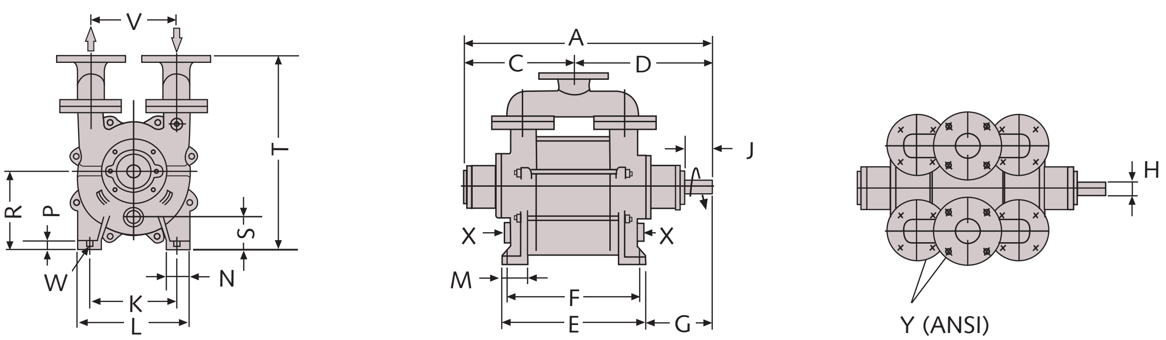
*DIN EN ISO 2151

Liquid Ring Vacuum Pump

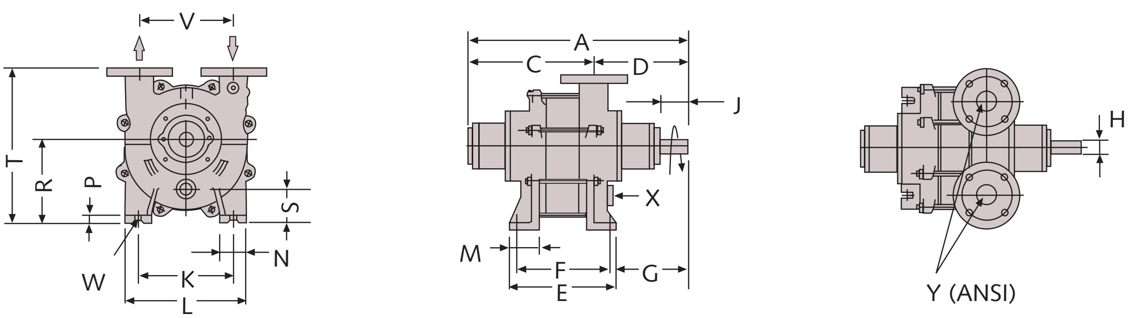
Dimensions



Dimensions	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	V	W	X	Y
LA 0053	15 11/16	6	3 3/4	9 3/8	9 5/8	8 7/16	8 1/8	7/8	1 15/16	7 7/8	9 13/16	2 3/8	2 3/16	5/8	6 1/2	-	-	-	9/16	1/2″NPT	1 1/2
LA 0103	17 5/16	7 9/16	3 3/4	9 3/8	11 3/16	10 1/16	8 1/8	7/8	1 15/16	7 7/8	9 13/16	2 3/8	2 3/16	5/8	6 1/2	-	12 5/8	-	9/16	1/2″NPT	1 1/2
LA 0143	18 7/8	9 1/8	3 3/4	9 3/8	12 3/4	11 5/8	8 1/8	7/8	1 15/16	7 7/8	9 13/16	2 3/8	2 3/16	5/8	6 1/2	-	12 5/8	-	9/16	1/2″NPT	1 1/2



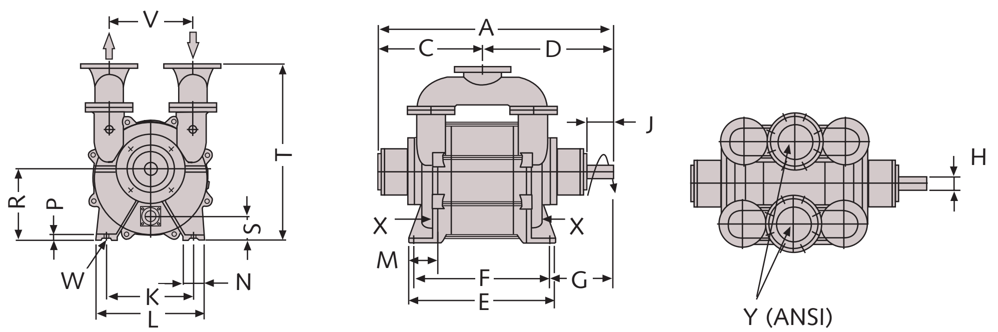
Dimensions	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	V	W	X	Y
LA 0224	21 9/16	-	9 5/8	11 7/8	13 9/16	12 3/8	5 3/4	1	2 3/16	8 1/4	10 5/8	2 3/4	2 1/2	11/16	6 7/8	2 9/16	17 11/16	6 5/16	9/16	3/4″NPT	2
LA 0435	26 1/4	-	11 5/8	14 5/8	15 1/4	13 15/16	7 5/8	1 3/8	2 3/4	9 1/4	11 13/16	2 15/16	2 9/16	13/16	8 1/4	3 3/8	20 1/2	9 1/16	11/16	1″NPT	2 1/2
LA 0475	31 3/8	-	14 3/16	17 3/16	20 3/8	19 1/8	7 5/8	1 3/8	2 3/4	9 1/4	11 13/16	2 15/16	2 9/16	13/16	8 1/4	3 3/8	20 1/2	9 1/16	11/16	1″NPT	2 1/2



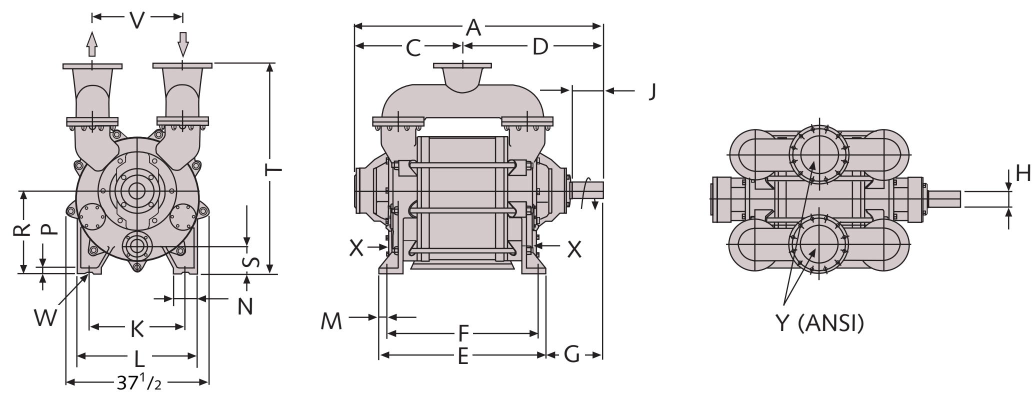
Dimensions	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	V	W	X	Y
LA 0325	24 5/8	-	15 7/16	9 3/16	13 9/16	12 3/16	7 5/8	1 3/8	2 3/4	9 1/4	11 13/16	2 15/16	2 9/16	13/16	8 1/4	3 3/8	15 1/4	9 1/16	11/16	1″NPT	2

All dimensions in inches unless otherwise noted.

Dimensions



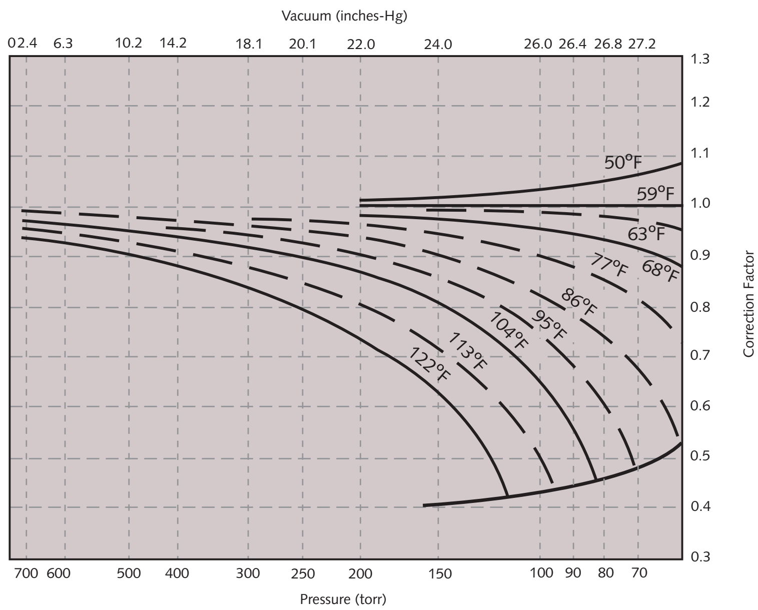
Dimensions	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	V	W	X	Y
LA 0756	33 1/16	-	14 5/8	18 7/16	20 3/4	19 9/16	8 11/16	1 3/4	3 3/8	12 5/8	15 3/4	3 1/8	3 1/4	11/16	9 13/16	3 3/4	24 13/16	11 7/16	13/16	1 1/4" NPT	4
LA 0906	36 1/4	-	16 3/16	20 1/16	23 7/8	22 11/16	8 11/16	1 3/4	3 3/8	12 5/8	15 3/4	3 1/8	3 1/4	11/16	9 13/16	3 3/4	24 13/16	11 7/16	13/16	1 1/4" NPT	4
LA 1157	41 3/16	-	6 7/16	23 1/16	25 13/16	24	11 1/8	2 3/8	4 3/4	15 3/4	18 7/8	4 5/16	3 15/16	1	12 5/8	3 9/16	31 1/2	14 9/16	7/8	1 1/2" NPT	5
LA 1507	45 1/8	-	20 1/8	25	29 3/4	27 15/16	11 1/8	2 3/8	4 3/4	15 3/4	18 7/8	4 5/16	3 15/16	1	12 5/8	3 9/16	31 1/2	14 9/16	7/8	1 1/2" NPT	5
LA 1807	49 1/16	-	22 1/16	26 15/16	33 11/16	31 7/8	11 1/8	2 9/16	4 3/4	15 3/4	18 7/8	4 5/16	3 15/16	1	12 5/8	3 9/16	31 1/2	14 9/16	7/8	1 1/2" NPT	5
LA 1908	55 13/16	-	24 3/4	31 1/8	34 5/8	32 5/16	14 15/16	3 1/8	6 5/16	20 1/2	25 9/16	6 3/4	5 1/8	1 3/16	16 15/16	5 5/8	41 3/4	19 11/16	15/16	2 1/2" NPT	8
LA 2408	59 3/4	-	26 11/16	33 1/16	38 9/16	36 1/4	14 15/16	3 1/8	6 5/16	20 1/2	25 9/16	6 3/4	5 1/8	1 3/16	16 15/16	5 5/8	41 3/4	19 11/16	15/16	2 1/2" NPT	8
LA 2808	63 11/16	-	28 11/16	35 1/16	42 1/2	40 3/16	14 15/16	3 1/8	6 5/16	20 1/2	25 9/16	6 3/4	5 1/8	1 3/16	16 15/16	5 5/8	41 3/4	19 11/16	15/16	2 1/2" NPT	8



Dimensions	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	V	W	X	Y
LA 3809	65 9/16	-	28 9/16	37	44	39 5/8	17 3/16	4 5/16	8 1/4	25 3/16	31 1/2	6 5/16	6 5/16	1 9/16	21 5/8	7 3/16	55 1/8	23 5/8	1 3/8	3" NPT	10
LA 5109	70 1/2	-	31	39 7/16	48 7/8	44 9/16	17 3/16	4 5/16	8 1/4	25 3/16	31 1/2	6 5/16	6 5/16	1 9/16	21 5/8	7 3/16	55 1/8	23 5/8	1 3/8	3" NPT	10

All dimensions in inches unless otherwise noted.

Effect of Service Liquid Temperature



This graph is applicable when water is the service fluid. A different correction must be made for different fluids.

Capacity at 59°F x Factor = Capacity at actual seal water temperature.

Capacity Corrections

The actual capacity of a liquid ring vacuum pump is dependent upon, and therefore must be corrected for a variety of variables. The advertised capacity is only valid for the specific conditions shown with the curve. Variables affecting capacity include the type and temperature of the service fluid along with the conditions of the incoming gas load.

Service Fluid Affects

Service fluid vapor pressure effects: As a dry gas load enters the pump, the service fluid will vaporize and saturate the dry gas load. This has the effect of reducing the dry gas capacity of the pump. The advertised capacity is accounting for this already at a service fluid temperature of 59°F. If the service fluid temperature is different than 59°F, a correction must be made and the above graph can be used to make this correction when using water as a service fluid. Fluids with a lower vapor pressure than water will have the effect of increasing the capacity and fluids with a higher vapor pressure than water will have the effect of decreasing the capacity vs. water.

Service fluid density effects: Service fluids of higher density than water will have the effect of reducing the pumps capacity.

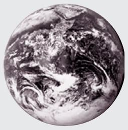
Service fluid viscosity effects: Service fluids of higher viscosity than water will have the effect of reducing a pumps capacity.

Pumped Gas Affects

Condensable loads: If the incoming gas load includes vapors that will condense at the service fluid temperature, this will have the effect of increasing the pumps capacity.

Solubility of gas loads: Gases that are soluble in the service fluid will dissolve into the service fluid near the pump discharge and revaporize near the inlet side. This will have the effect of decreasing the capacity of the pump.

Contact Busch Engineering for assistance in determining the above and additional affects.



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