We make things MOVE®

Vacuum
Resource Guide

Bimba is part of
IMI Precision Engineering

We Make Things Move®

A forward-thinking innovator, Bimba provides industry-leading pneumatic, hydraulic, electric, and vacuum motion solutions that are easy-to-use, reliable and ready for your engineering challenges.

Doing whatever it takes to help you get the job done is what the Bimba companies do best. With an extensive line of industry-leading air cylinders, rotary actuators, linear thrusters, rodless cylinders, NFPA, hydraulics, flow controls, position-sensing cylinders, valves, switches and air preparation equipment, the people of Bimba are ready to tackle your toughest applications.

Bimba is part of IMI Precision Engineering, a world leader in motion and fluid control technologies. Wherever precision, speed and engineering reliability are essential, we deliver exceptional solutions which improve the productivity and efficiency of customers' equipment.

Our range of high-performance products, such as actuators, valves, valve islands, pressure monitoring controls and air preparation products together with trusted products brands including IMI Norgren, IMI Buschjost, IMI FAS, IMI Herion and IMI Maxseal underpin our position as a leading global supplier.

Part of IMI plc, we have a sales and service network in 75 countries, as well as manufacturing capability in the USA, Germany, China, UK, Switzerland.

Contents

It's Easier than Ever to Work with Bimba for Vacuum Products

We've made important changes to our catalog and website so you can find, configure, and purchase products faster and easier than ever.

1. Select a Pump / Need a Crossover?

Extensive product offering means the right product for the job. Comprehensive print catalog and website with integrated digital catalog improves searching and is available 24/7.

2. Configure It:

Exploded views show options available for each product on one page. Build your pump online with either our CAD or online store configurator – get 2D/3D CAD models, images, part numbers and pricing for your exact configuration.

Don't see what you need? Contact vaccon-engineering@imi-precision.com

3. Buy It:

- Contact your local **distributor**
- Online store @ **www.bimba.com**
- Contact Bimba at **508-359-7200, 1-800-848-8788** (U.S. Only) or by Fax to **508-359-0177**

If you are like us…once you have found the product you need – you want it, now! We understand the on-demand world and maintain a large inventory to ship same day for in stock products.

Technical Support:

Our vacuum experts are proven problem solvers with years of practical, hands-on experience. Contact us by phone, email, online chat or visit our website. Unsure which product or combination of products will work best in your application? Send your product to Bimba for evaluation and product recommendation. We will test your product, take photos, video and email you the results.

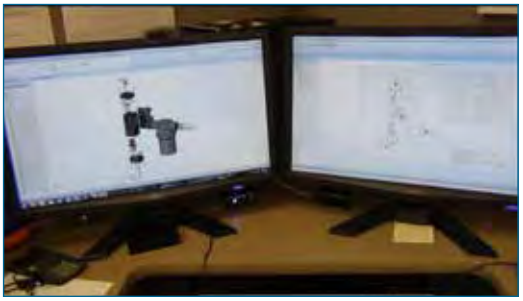
Technical Support & Application Assistance

Call 508-359-7200 (800-848-8788 US Only)

With Bimba's expert team of engineers for immediate face-to-face collaboration:

- David Haynes: David.Haynes@imi-precision.com
- Ken Martin: Ken.Martin@imi-precision.com
- Brandon Schmutzler: Brandon.Schmutzler@imi-precision.com

Design Assistance



Get the answers you need - quickly and accurately:

- Is vacuum an option for my application?
- How do I pick up odd-shaped items?
- How fast can I transfer parts/powders?
- How do I test my vacuum lines?
- Which pumps work best in a dirty environment?
- Do I need 28" Hg/ 948 mbar?
- Can Bimba crossover a competitors vacuum pump?

Technical Support

Unsure which product or combination of products will work best in your application? Bimba offers:

In-House Test Facility:

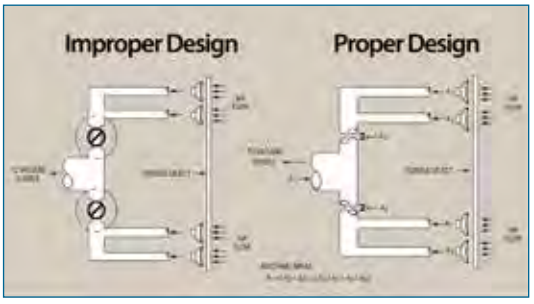
- Our vacuum experts are proven problem solvers with years of practical, hands-on experience.
- Send your product to Bimba for evaluation and product recommendation.

Photos & Videos:

- Bimba will test your product, take photos and videos and email you the results.

Contact us by phone, email, online chat or visit our website at www.bimba.com.

Troubleshooting



Industries Using Vacuum Technology

Industries Using Vacuum Technology	
Aerospace / Aviation	Labeling
Agriculture	Leak Testing
Appliances	Liquid Transfer / Blending / Mixing / Dilution
Assembly	Marine
Automotive	Masonry, Stone, Brick, Concrete
Bakery	Material Transfer
Beverage	Medical
Biology	Military
Biotechnology	Molding
Blister Packaging	NASA
Bottling	OEM - Original Equipment Manufacturer's
Bulk Material Transfer	Packaging
Carton Erecting	Palletizing
Ceramics	Paper
Chemical	Personal Care
Chromatography	Pharmaceutical
Composites	Plastics
Confectionary	Powder & Bulk Solids
Construction & Building Materials	Printing
Corrugated Sheet/Boxes	Prosthetics
Dairy Industry	Robotics / End-of-Arm-Tooling
Degassing	Semiconductor
Diagnostic Equipment	Solar
Electronics	Sporting Goods
End of Arm Tooling	Stamping
Flexible Manufacturing	Textile
Food Processing	Thermoforming
Foundries/Refractories	Trains / Railcars
Fruit & Vegetable Handling	Utilities
Fuel Cell	Vacuum Bagging
Fume Extraction	Vacuum Clamping / Chucking
Furniture	Vacuum Filling
Gas Sampling & Analysis	Vacuum Forming
Glass Handling	Vacuum Sealing
HVAC	Veneering
Industrial Automation	Vessel Evacuation
Inflation & Deflation	Waste Collection & Clean-up
Injection Molding	Welding
Laboratory	Wood, Paper, Pulp

Features & Benefits

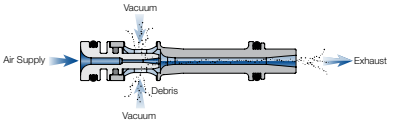
Bimba Pumps - Flap Free/Myth of Multi-Stage

Designed for Dirt – Bimba pumps don't lose suction or require maintenance

Vacuum pumps, by their nature, use available atmospheric air. Whatever debris, dirt and/or dust are in the air will be drawn into the pump. Whether your application is carton erecting, pet food bagging or feeding die-slick coated sheet metal into a press, Bimba pumps operate continuously without maintenance or vacuum filters that can clog, degrade performance, cause downtime and increase costs.

Bimba Venturi Cartridges – The Indestructible Vacuum Engine

- ***Non-clogging - no maintenance - no downtime due to cleaning - increased production - increased savings (time & money)***
  Bimba's advanced venturi design generates high internal velocities that carry dirt through and out of the pump. With no obstacles to impede flow or trap dirt, Bimba pumps never lose suction or require maintenance. It's that simple.



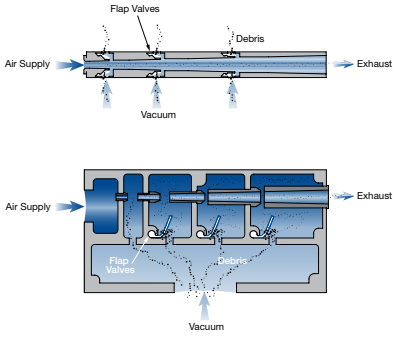
- ***High flow - high reliability - high performance - secure holding power***
  Knowing that the majority of work is done above 9"Hg [305mbar], Bimba specifically designed its single stage venturi's to provide higher flows at the upper levels of vacuum. In most cases, our vacuum flow rates at the upper levels exceed multi-stage pumps by a factor of 2 to 7 times.

- ***Compact - close***
  Since 1972, Bimba's design philosophy has been KISS - "Keep it simple and small." Our compact, single stage venturi's require little installation space and can be positioned close to the vacuum point for faster response and increased productivity.
- ***Streamlined design and quick assembly***
  Now, Bimba pumps can be mounted to T-slot extrusions making design and assembly quick and easy.

Multi-Stage Design Flaw-Flap Valves

- Flap valves get stuck open from ingested debris
- To protect these flap valves, an intake filter is required
- Intake filters get clogged and cause loss of suction
- Loss of suction causes production to stop until maintenance is performed and/or replacement of the intake filter and/or the flap valves occurs

Result: Multi-stage pump flap valves cause downtime, increase operating expenses - maintenance and replacement costs.



RTM replaces clogged in-line multi-stage pump

When Comparing Bimba Venturi Vacuum Pumps to Our Competitors

Compare vacuum flows in the working range (12"Hg - 27"Hg) where work is actually accomplished. Comparing vacuum flow at 0"Hg is like comparing the output of a compressor at 0 PSI. High flow at 0"Hg is meaningless… no work is done at 0"Hg. Consider the analogy of an air compressor to a vacuum pump…

Suppose a compressor dealer claims a compressor generates 100,000 CFM at 0 PSI (exaggeration) but only 1 CFM at 80 PSI… Is the 0 PSI flow rate meaningful? The same holds true for a vacuum pump flow rating at 0"Hg.

1st - Compare Max. Vacuum Level
2nd - Compare Air Consumption (Operating Pressure is not important)
3rd - Compare Vacuum Flow in the working range

Model Number	Air Consumption SCFM	Imperial – Vacuum Flow (SCFM) vs. Vacuum Level ("Hg)										
		0"Hg	3"Hg	6"Hg	9"Hg	12"Hg	15"Hg	18"Hg	21"Hg	24"Hg	27"Hg	28"Hg
VP80-200H	7.80	5.40	4.70	3.85	3.30	3.00	2.60	2.10	1.60	1.20	0.60	0.00
						Working Range						

Need to Crossover a competitor's vacuum pump? Contact vaccon-engineering@imi-precision.com or 800-848-8788

Features & Benefits

Problem: Customer transferring abrasive materials, even stainless steel pumps wear out.

Solution: Bimba modified a standard DF material transfer pump so that instead of replacing the entire pump, the customer simply slips out the old body and replaces it with a new one. Quickly and easily, saving time and money.

Bimba Vacuum Products – Accelerating Automation

Streamlined Designs - High Performance – Low Maintenance

Whether your product changes as it goes through the production process or your production process changes to handle new products – Bimba pumps, cups, accessories and End-of-Arm Tooling are flexible and versatile to keep your production productive.

Having the right pump for your manufacturing equipment reduces changeover times between products and processes. Bimba offers an extensive inventory of over 500 dirt tolerant vacuum pumps and accessories to meet your application needs.

With over 40 years of vacuum application and engineering experience, Bimba appreciates working with creative engineers to design and manufacture efficient, innovative and reliable vacuum automation solutions.

Vacuum Pumps

Bimba's extensive line of venturi vacuum pumps include miniature pumps, optional single or dual controlled solenoid valves, Air Saver pumps (green technology), pneumatic blow-offs, Multi-port pumps, high vacuum pumps, variable vacuum/variable flow vacuum pumps, material conveying vacuum pumps, air amplifiers/blowers, air-piloted vacuum pumps, apple core style mounts, manifolds and more.

Accessories

Our complete line of accessories include vacuum cups, spring levelers, vacuum cup fittings, silencers, vacuum check valves, filters, vacuum and pressure digital, mechanical and adjustable switches and sensors, vacuum gauges, quick disconnects, ultra mini cups, probes, vacuum pencils and more.

End-of-Arm Tooling

It's your choice….order a single component or a complete system, Bimba's EOAT product line offers light duty and heavy duty spring levelers and brackets, fixed extension shafts and brackets, vacuum cup swivel joints, universal mounting brackets, manifold block/cup mounts, extrusions, push-to-connect fittings and more.

Problems are opportunities that are looking for a solution. We can help.

Custom Products

At Bimba, our entrepreneurial spirit loves a challenge. If it doesn't defy the laws of physics, (and sometimes even if it does), we'll try just about anything. We like to think of ourselves as a friend to the OEM - Original Equipment Manufacturers. Custom Products are Standard at Bimba.

Modified Products

When off-the-shelf doesn't work, Bimba's engineering, application, and manufacturing capabilities can provide unique solutions to your specifications. Whether it's as simple as modifying a standard product or more complex requiring a new design, shape, performance levels or specialty materials we can help you.

Min Series Pumps

Performance Data "M" - Medium Vacuum Applications

M is for "Medium" vacuum levels up to 20"Hg [677 mbar] for applications involving porous materials (cardboard, wood, masonry, baked goods, textiles).

Model #	Air Consumption SCFM	Imperial - Vacuum Flow (SCFM) vs. Vacuum Level ("Hg)							
		0"Hg	3"Hg	6"Hg	9"Hg	12"Hg	15"Hg	18"Hg	20"Hg
		0.50	0.40	0.30	0.22	0.15	0.08	0.03	0.00
60M	0.50	Evacuation Time in Seconds based on 1 Cu. Ft. Volume/"Hg							
		0"Hg	3"Hg	6"Hg	9"Hg	12"Hg	15"Hg	18"Hg	20"Hg
		0.00	12.50	25.10	43.90	68.60	99.30	153.70	227.00

Performance Data "H" - High Vacuum Applications

H is for "High" vacuum levels up to 28"Hg [948mbar] for applications involving non-porous materials (steel, plastic, glass, etc.)

Model #	Air Consumption SCFM	Imperial - Vacuum Flow (SCFM) vs. Vacuum Level ("Hg)										
		0"Hg	3"Hg	6"Hg	9"Hg	12"Hg	15"Hg	18"Hg	21"Hg	24"Hg	27"Hg	28"Hg
		0.50	0.38	0.32	0.30	0.27	0.23	0.20	0.13	0.05	0.02	0.00
60H	0.80	Evacuation Time in Seconds based on 1 Cu. Ft. Volume/"Hg										
		0"Hg	3"Hg	6"Hg	9"Hg	12"Hg	15"Hg	18"Hg	21"Hg	24"Hg	27"Hg	28"Hg
		0.00	15.00	29.80	50.60	74.50	102.80	135.90	182.20	245.90	410.20	790.80

Note 1: *Standard operating pressure for Vaccon Series pumps is 80 PSI [5.5 bar]. Pumps can be factory modified to run at other operating pressures i.e. 60 PSI [4 bar] etc. The values shown in the performance chart will remain the same for all operating pressures.*

Note 2: *Evacuation speed is linear with volume, a two cu. ft. volume will take twice as long to evacuate as a one cu. ft. volume.*

Bimba Vacuum Pumps Come In 3 Standard Vacuum Levels

J Series			VP Series		
"F"	"D"	"S"	"L"	"M"	"H"
10"Hg	20"Hg	28"Hg	10"Hg	20"Hg	28"Hg

Mid Series Pumps

Performance Data "L" - Low Vacuum Applications

Model #	Air	Imperial - Vacuum Flow (SCFM) vs. Vacuum Level ("Hg) @ 80 psi				
		0"Hg	3"Hg	6"Hg	9"Hg	10"Hg
90L	0.50	1.30	1.10	0.70	0.20	0.00
100L	1.40	2.10	1.60	1.10	0.50	0.00
150L	1.80	3.50	2.50	1.90	0.70	0.00

Model #		Evacuation Time in Seconds based on 1 Cubic Foot Volume/"Hg				
		0"Hg	3"Hg	6"Hg	9"Hg	10"Hg
90L		0.00	3.26	7.93	18.65	39.63
100L		0.00	2.33	4.66	10.88	24.00
150L		0.00	1.54	4.36	10.77	22.83

Performance Data "M" - Medium Vacuum Applications

Model #	Air Consumption SCFM	Imperial - Vacuum Flow (SCFM) vs. Vacuum Level ("Hg) @ 80 psi							
		0"Hg	3"Hg	6"Hg	9"Hg	12"Hg	15"Hg	18"Hg	20"Hg
60M	0.50	0.50	0.40	0.30	0.22	0.15	0.08	0.03	0.00
90M	1.40	1.40	1.25	1.20	1.05	0.85	0.65	0.25	0.00
100M	1.80	2.10	2.00	1.85	1.75	1.60	1.25	0.80	0.00
150M	2.80	3.50	3.20	2.95	2.75	2.50	1.80	0.95	0.00

Model #		Evacuation Time in Seconds based on 1 Cubic Foot Volume/"Hg							
		0"Hg	3"Hg	6"Hg	9"Hg	12"Hg	15"Hg	18"Hg	20"Hg
60M		0.00	12.50	25.10	43.90	68.60	99.30	153.70	227.00
90M		0.00	3.75	7.20	12.40	19.10	29.90	52.00	104.00
100M		0.00	2.65	5.80	9.90	16.20	22.90	36.20	56.60
150M		0.00	1.35	3.20	5.20	7.70	11.80	23.40	52.00

Performance Data "H" - High Vacuum Applications

Model #	Air	Imperial - Vacuum Flow (SCFM) vs. Vacuum Level ("Hg) @ 80 psi										
		0"Hg	3"Hg	6"Hg	9"Hg	12"Hg	15"Hg	18"Hg	21"Hg	24"Hg	27"Hg	28"Hg
60H	0.80	0.50	0.38	0.32	0.30	0.27	0.23	0.20	0.13	0.05	0.02	0.00
90H	1.80	1.20	1.00	0.95	0.90	0.85	0.75	0.70	0.52	0.47	0.20	0.00
100H	2.80	2.00	1.85	1.75	1.57	1.40	1.25	1.05	0.84	0.70	0.35	0.00
150H	4.80	3.20	2.80	2.50	2.30	2.00	1.60	1.40	1.20	0.80	0.50	0.00

Model #		Evacuation Time in Seconds based on 1 Cubic Foot Volume/"Hg										
		0"Hg	3"Hg	6"Hg	9"Hg	12"Hg	15"Hg	18"Hg	21"Hg	24"Hg	27"Hg	28"Hg
60H		0.00	15.00	29.80	50.60	74.50	102.80	135.90	183.20	245.90	410.20	790.80
90H		0.00	6.50	12.30	18.90	32.50	47.00	65.40	92.20	130.00	222.20	281.30
100H		0.00	2.70	6.50	11.20	17.50	25.80	38.40	55.20	79.20	166.70	251.80
150H		0.00	2.30	3.80	6.50	10.20	14.20	21.30	44.90	55.00	81.00	125.00

Max Series Pumps

Performance Data “L” - Low Vacuum Applications

Model #	Air Consumption SCFM	Imperial - Vacuum Flow (SCFM) vs. Vacuum Level ("Hg) @ 80 psi				
		0”Hg	3”Hg	6”Hg	9”Hg	10”Hg
200L	2.80	6.00	5.80	4.30	1.70	0.00
250L	4.80	9.50	7.90	5.70	2.20	0.00
300L	7.80	20.00	14.00	9.50	3.50	0.00
350L	12.50	28.00	18.00	12.30	4.50	0.00

Model #		Evacuation Time in Seconds based on 1 Cubic Foot Volume/"Hg				
		0”Hg	3”Hg	6”Hg	9”Hg	10”Hg
200L		0.00	0.77	2.05	4.62	13.34
250L		0.00	0.52	1.28	3.08	7.95
300L		0.00	0.26	0.77	1.80	4.10
350L		0.00	0.00	0.52	1.28	2.82

Performance Data “M” - Medium Vacuum Applications

Model #	Air Consumption SCFM	Imperial - Vacuum Flow (SCFM) vs. Vacuum Level ("Hg) @ 80 psi							
		0”Hg	3”Hg	6”Hg	9”Hg	12”Hg	15”Hg	18”Hg	20”Hg
200M	4.80	6.00	5.30	4.90	4.00	3.50	2.50	1.10	0.00
250M	7.80	9.50	9.20	8.30	7.00	4.70	3.40	2.20	0.00
300M	12.50	20.00	19.00	16.30	13.80	8.10	5.50	3.30	0.00
350M	22.00	28.00	24.00	19.40	16.80	14.50	11.20	4.80	0.00

Model #		Evacuation Time in Seconds based on 1 Cubic Foot Volume/"Hg							
		0”Hg	3”Hg	6”Hg	9”Hg	12”Hg	15”Hg	18”Hg	20”Hg
200M		0.00	0.75	1.90	3.20	5.30	8.70	17.10	42.60
250M		0.00	0.45	1.10	2.40	3.80	6.00	9.70	15.40
300M		0.00	0.00	0.00	1.10	1.80	2.70	4.60	8.70
350M		0.00	0.00	0.00	1.00	1.50	2.10	4.30	8.40

Performance Data “H” - High Vacuum Applications

Model #	Air	Imperial - Vacuum Flow (SCFM) vs. Vacuum Level ("Hg) @ 80 psi										
		0”Hg	3”Hg	6”Hg	9”Hg	12”Hg	15”Hg	18”Hg	21”Hg	24”Hg	27”Hg	28”Hg
200H	7.80	5.40	4.70	3.85	3.30	3.00	2.60	2.10	1.60	1.20	0.60	0.00
250H	12.50	9.00	8.50	7.85	7.00	6.50	5.30	3.90	2.50	1.80	0.90	0.00
300H	22.00	20.00	17.00	14.00	12.70	12.00	10.00	7.40	4.90	2.70	1.30	0.00
350H	28.00	28.00	22.00	18.70	15.90	14.50	11.80	8.10	5.70	4.50	2.25	0.00

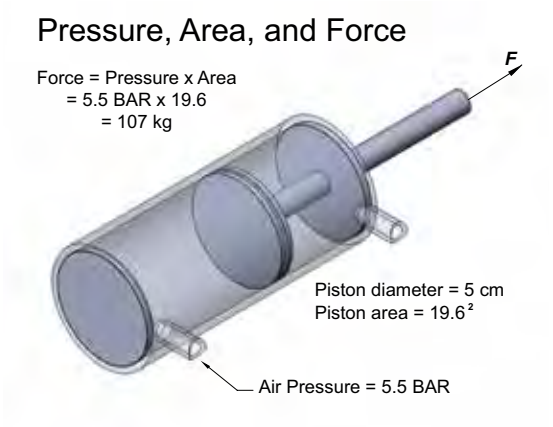
Model #		Evacuation Time in Seconds based on 1 Cubic Foot Volume/"Hg										
		0”Hg	3”Hg	6”Hg	9”Hg	12”Hg	15”Hg	18”Hg	21”Hg	24”Hg	27”Hg	28”Hg
200H		0.00	1.20	2.10	3.40	5.20	7.70	11.50	20.00	33.50	62.60	98.10
250H		0.00	0.75	1.30	2.20	3.50	5.60	9.10	17.40	30.10	56.00	76.00
300H		0.00	0.00	0.80	1.20	2.00	2.80	3.90	5.90	11.10	32.70	60.00
350H		0.00	0.00	0.00	1.20	1.90	2.30	3.40	5.30	8.80	26.00	44.00

Understanding Vacuum Technology

Vacuum technology is one of the most misunderstood, underused; yet, cost effective power sources in automation industries. Selecting the right vacuum pump and suction cups for each application is the key to economic and efficient system design.

The concept of applying pressure to the piston of a pneumatic cylinder, and the resulting force at the piston rod, is universally understood throughout automation industries. It's all based on Force = Pressure X Area. This concept also applies to the sizing of a vacuum system, and the selection of a vacuum pump and suction cups for an application.

Every vacuum application has similar variables that need to be considered. It is understanding how the combination of air consumption, vacuum level, force, flow, and cycle times interact to achieve the desired results.



As with a pneumatic cylinder, the force available from a vacuum cup is determined by the area of the cup multiplied by the vacuum level of the pump expressed in PSI.

Note: *Inches of Hg ÷ 2 = PSI --* ***Example:*** *28"Hg ÷ 2 = 14 PSI*

Using the formula F = P X A, and a 2" diameter vacuum cup that has an area of 3.14 sq. in., the following is true: If the vacuum pump produces 28"Hg (or 14 PSI), the holding force of the vacuum cup would be F = 14 PSI X 3.14, therefore F = 43.96 lbs of holding force. In this case, for practical purposes, 44 pounds of force can be assumed.

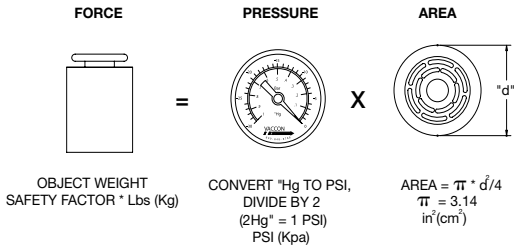
Vacuum Pump Selection Guide

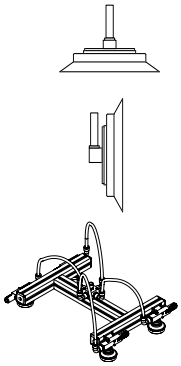
Pick & Place / Material Handling

Pick & Place/Material Handling refers to lifting, gripping, rotating and positioning of an object through the use of a vacuum pump with a Vacuum Cup.

Use the Equation: *Force = Pressure X Area to determine:*

- Lifting capacity of the pump and cup
- Required vacuum area, i.e. diameter of the cup – see cup section for a more detailed explanation
- Required vacuum level of vacuum pump





Safety Factors

Horizontal lift = 2

Safety factor of 2 is recommended when cup face is in horizontal position.

Vertical lift = 4

Safety factor of 4 is recommended when cup face is in vertical position.

Increase safety, reliability and speed by using one pump and one cup at each location. Should one cup fail the others will maintain their grip.

Force = Pressure x Area where

F = the weight of the objects in lbs [kg] multiplied by the safety factor above
P = the expected vacuum level in PSI [Kpa], remember to convert "Hg to PSI by dividing by 2
A = the area of the Vacuum Cup measured in square inches. Use the equation A = pd2

3 Vacuum Level Ranges

- "L" or "F" Series 0-10"Hg, [0 to 339mbar] for low vacuum / high flow applications
- "M" or "D" Series 0-20"Hg, [0 to 677mbar] for medium vacuum / high flow applications
- "H" or "S" Series 0-28"Hg, [0 to 948mbar] for high vacuum / standard flow applications

3 Types of Material

- Non-porous materials: steel, glass laminated chipboard, rigid plastic, semiconductors, etc.
- Porous materials: corrugated, wood, foam, felt, woven materials, objects with extremely rough or uneven surfaces
- Flexible materials: plastic films, baked good, IV bags, paper bags – things that wrinkle

Inexact Science

When handling porous materials such as corrugated or heavy fabric, it may be hard to choose the exact pump required because the leakage rate is not normally known. It is best to run a trial to test the ability of the pump to overcome the leakage. For existing systems, consult Vaccon for the equivalent pump size.

System Speed

Cycle rate of the pump/cup system is determined by the evacuation speed of the venturi. See Vessel Evacuation.

Vessel Evacuation

In many process applications it is necessary to evacuate a vessel for the purpose of purging gases, leak testing and degassing viscous fluids. It may also be simply the length of tubing between the pump and cup that needs to be evacuated.

Knowing the pump's evacuation speed will help determine process completion time or the production rate of a pick & place system. To find the speed, use the evacuation charts listed in the performance data for each venturi pump. Note that the charts are based on a volume of one cubic foot or one liter of volume to a given vacuum level in "Hg or mbar.

1. Determine the total volume to be evacuated – vessel and/or vacuum lines (cu. ft.), 1728 cu. in = 1 cu. ft.
2. Desired vacuum level Hg [mbar] is determined by customer
3. Time to reach vacuum level (seconds) – determined by customer

Product Application Guide

The following chart is a quick reference guide to some of the hundreds of applications for Bimba products.
Please contact our Tech Support Department to find the right product for your application requirements.

Application Criteria: High, medium or low vacuum levels, high, medium or low vacuum flow, evacuation speed, air consumption, porous, non-porous or flexible materials, high speed valves, air saving technology, multi-port, adjustable blow-off, all pneumatic, pilot-controlled & more.

	Bimba Vacuum Pumps						
	J Series	**VP Series**	**VDF Series**	**CDF Series**	**DF Series**	**EAOT**	**Cups**
	Cylindrical Seal-less	**Modular w/optional valves, sensors, & Air Saving Technology, Multi-port, Blow-off**	**Dirt Defying Field-Adjustable High Flow and High Vacuum in One**	**Air Amplifiers / Blowers High Flow / Low Vacuum**	**Material Transfer & Conveying Pumps**	**End of Arm Tooling for Robots & Factory Automation**	**Bellows, Flat, Universal, Deep, Egg, Dual Durometer, Silicone, Vinyl, Neoprene, Polyurethane**
Air Bearing				X			
Air Blower / Dryer / Cooling				X			
Air Wiper				X	X		
Assembly	X	X	X	X		X	X
Bag/Box Opening	X	X	X	X		X	X
Chip Removal				X	X		
Circuit Board Testing	X	X				X	X
Degassing	X	X	X				
Dirt, Dust & Debris Tolerant	X	X	X	X	X	X	X
Evacuation of Molds	X	X	X				X
Fume / Dust / Chip Removal			X	X	X		
Gas Sampling & Analysis	X	X					
Inflation / Deflation				X			
Labeling	X	X	X			X	X
Loading / Unloading Hoppers / Feeders					X		
Mandrel Collection				X	X		
Material Transfer			X		X	X	
Small Parts			X		X	X	
Pellets					X	X	
Powders			X		X	X	
Medical / Laboatory Suction	X	X	X				
Paper Feeding / Printing	X	X	X	X		X	X
Pick & Place:	X	X	X	X		X	X
Corrugated Sheet / Box's	X	X	X			X	X
Electronic Components	X	X	X	X			X
Fragile Items	X	X	X	X		X	X
Flexible Materials	X	X	X	X			X
Glass	X	X	X	X		X	X
Metals	X	X	X			X	X
Plastics	X	X	X	X		X	X
Stone Brick Concrete	X	X	X			X	X
Pneumatic Conveying	X	X	X	X	X	X	
Thermoforming	X	X	X		X	X	X
Trim, Selvedge & Fiber Collection			X	X	X		
Vacuum Chuck	X	X	X				
Vacuum Clamping	X	X	X				
Vacuum Filling	X	X	X		X		
Liquids / Creams	X	X	X				
Powders	X	X	X		X		
Vacuum Impregnation	X	X	X				
Vacuum Molding	X	X	X				
Vacuum Packaging	X	X	X	X		X	X
Vacuum Toilets	X	X	X				
Veneering	X	X	X				
Waste & Spill Clean-ups	X	X	X		X		
Custom Sizes, Shapes, Threads & Specialty Materials available	X	X	X	X	X	X	X

Flow of Air Through Orifices Under Vacuum (SCFM)

	Orifice Diameter									
"Hg	.0625	.125	.1875	.250	.3125	.375	.4375	.500	.625	.750
0.5	0.2	0.6	1.4	2.3	3.5	5.0	7.5	10.0	15.0	22.0
1.0	0.2	0.8	1.9	3.0	4.8	7.5	10.0	13.5	21.0	28.0
2.0	0.3	1.2	2.4	4.2	7.3	10.5	13.0	17.0	27.0	38.0
3.0	0.4	1.3	2.6	5.3	8.3	11.5	16.0	21.0	33.0	41.0
4.0	0.5	1.6	3.0	6.4	10.0	14.0	18.5	24.0	38.0	56.0
5.0	0.5	1.7	3.3	6.8	11.0	15.0	21.0	27.0	43.0	62.0
6.0	0.5	1.8	3.6	7.5	11.5	16.5	23.0	30.0	46.0	68.0
7.0	0.6	2.0	3.9	8.0	13.0	18.0	25.0	32.0	50.0	72.0
8.0	0.6	2.3	4.2	9.3	13.5	19.0	26.0	34.0	52.5	77.0
9.0	0.6	2.3	4.4	9.0	14.0	20.5	28.0	36.0	55.0	82.0
10.0	0.7	2.4	4.6	9.6	15.0	22.0	29.0	39.0	59.0	86.0
11.0	0.7	2.5	4.8	10.0	16.0	23.0	31.0	40.0	63.0	90.0
12.0	0.7	2.6	5.0	10.5	16.5	23.8	32.0	42.0	65.0	95.0
13.0	0.7	2.8	5.3	11.0	17.0	24.6	33.5	43.0	68.0	100.0
14.0	0.8	2.9	5.5	11.3	17.7	25.5	34.8	45.0	71.0	103.0
15.0	0.8	3.0	5.7	11.6	18.5	26.5	36.0	47.5	74.0	106.0
16.0	0.8	3.1	5.8	12.0	19.0	27.0	37.0	48.5	75.0	109.0
17.0	0.9	3.2	6.0	12.5	19.5	28.0	38.0	50.0	78.0	113.0
18.0	0.9	3.3	6.2	12.8	20.0	29.0	39.5	52.0	80.0	116.0
19.0	0.9	3.4	6.5	13.2	20.7	30.0	40.5	53.0	83.0	120.0
20.0	0.9	3.5	6.6	13.5	21.3	30.5	42.0	55.0	85.0	123.0
21.0	1.0	3.6	6.8	13.9	21.8	31.4	42.5	56.0	87.0	126.0
22.0	1.0	3.7	6.9	14.2	22.3	32.0	43.5	57.0	89.0	129.0
23.0	1.0	3.8	7.0	14.6	23.0	32.7	44.7	58.0	91.0	131.0
24.0	1.2	3.9	7.2	15.0	23.5	33.5	45.5	60.0	93.0	134.0
25.0	1.4	4.0	7.4	15.3	24.0	34.0	46.7	61.0	95.0	137.0
26.0	1.6	4.1	7.7	15.6	24.3	35.0	47.7	62.0	97.0	140.0

Flow of Air Through Orifices Under Pressure (SCFM)

	Orifice Diameter								
psi	**0.063**	**0.125**	**0.25**	**0.375**	**0.5**	**0.625**	**0.75**	**0.875**	**1**
1	0.5	1.8	7.2	16.2	28.7	45	64.7	88.1	115
2	0.6	2.5	10.1	22.8	40.5	63.3	91.2	124	162
3	0.8	3.1	12.4	27.8	49.5	77.5	111	152	198
4	0.9	3.6	14.3	32.1	57	89.2	128	175	228
5	1	4	15.9	35.7	63.5	99.3	143	195	254
6	1.1	4.3	17.4	39.1	69.5	109	156	213	278
7	1.2	4.7	18.7	42.2	75	117	168	230	300
9	1.3	5.3	21.2	47.7	84.7	132	191	260	339
12	1.5	6.1	24.3	54.6	97	152	218	297	388
15	1.7	6.7	26.9	60.5	108	168	242	329	430
20	2	7.9	31.4	70.7	126	196	283	385	503
25	2.3	9	35.9	80.9	144	225	323	44	575
30	2.5	10.1	40.5	91.1	162	253	365	496	648
35	2.8	11.3	45	101	180	281	405	551	720
40	3.1	12.4	49.6	112	198	310	446	607	793
45	3.4	13.5	54.1	122	216	338	487	662	865
50	3.7	14.7	58.6	132	235	366	528	718	938
60	4.2	16.9	67.6	152	271	423	609	828	1082
70	4.8	19.2	76.7	173	307	479	690	393	1227
80	5.4	21.4	85.7	193	343	536	771	1050	1371
90	5.9	23.7	94.8	213	379	592	853	1161	1516
100	6.5	26	104	234	415	649	934	1272	1661
110	7.1	28.2	113	254	452	705	1016	1383	1806
120	7.6	30.5	122	274	488	762	1097	1494	1951
125	7.9	31.6	126	284	506	790	1138	1549	2023
150	9.5	37.5	150	338	600	910	1315	1789	2338
200	12.4	49	196	441	784	1225	1764	2401	3136
250	15.2	60.3	241	542	964	1508	2169	2952	3856
300	18.1	71.8	287	646	1148	1795	2583	3515	4592
400	23.8	94.5	378	8510	1512	2360	3402	4630	6048
500	29.6	117.3	469	1055	1876	2930	4221	5745	7504
750	43.9	174	696	1566	2784	4350	6264	8525	11136
1000	58.2	231	924	2079	3696	5790	8316	11318	14784

Rule of thumb: *Every 4 SCFM use approximately 1hp of compressed air.*

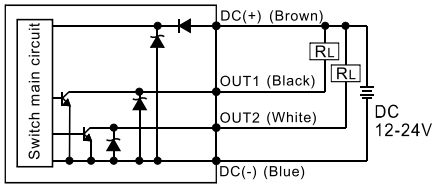
Questions to Ask When Sizing a Vacuum System

Vacuum technology is the quickest, safest and most efficient method of moving products from point A to B. When designing a system, knowing the size, weight, porosity, texture and other physical features of the product is critical to selecting the right pump/cup combination to meet your cycle times, performance requirements or evacuation speeds. Below is a simple checklist to help you gather the pertinent information to begin the design process.

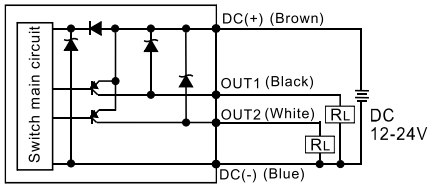
- ☐ Weight? _____
- ☐ What is the material to be held, lifted, rotated, etc.? _____
- ☐ Overall Dimensions? _____
- ☐ Surface Conditions (Rough, Smooth, Curved)? _____
- ☐ Temperature of Product? _____
- ☐ Porosity (Example: Corrugated cardboard vs. Steel, Glass)? _____
- ☐ Available surface to grip with vacuum cups or other device? _____
- ☐ Overall Cycle Time? _____
- ☐ Percent of cycle that vacuum is used? _____
- ☐ How is vacuum released (Compressed air through an air valve, or vented)? _____
- ☐ What size vacuum line (Inside diameter & length)? _____
- ☐ Is a surge tank used to store vacuum? _____
- ☐ What pressure is available (80 PSI, 5.5 bar, etc.)? _____
- ☐ What vacuum level is desired? _____
- ☐ If an existing application, what vacuum level is being achieved? _____
- ☐ What is being used now to generate vacuum (electric or air powered pump)? _____
- ☐ Customer complaints? (Expensive, noisy, high temperature, maintenance, etc.)? _____
- ☐ Model Number of existing pump? _____
- ☐ If suction cups are used, what size (Outside Diameter)? _____
- ☐ What style of suction cup (Flat, Bellows, Oval, Cleated, etc.)? _____
- ☐ How many suction cups are connected to one pump? _____
- ☐ What vacuum level is necessary to perform the task? _____

Vacumm Switches & Their Simplified Operation

NPN OUTPUT



PNP OUTPUT



Sourcing - PNP is often referred to as Sourcing because the switch closes and provides the source voltage to the load.

Sinking - NPN is often referred to as Sinking because the switch closes and sinks the current to ground.

Normally Open - Does not pass signal until the setpoint is reached.

Normally Closed - Passes up to the setpoint but not beyond.

FS or Full Scale - The maximum set unit minus the minimum set unit.

Linearity - The nearness with which the plot of a signal, or variable, plotted against a prescribed linear scale approximates a straight line. Output error to reference value.

Repeatability - The ability of the instrument to provide the same output every time for the same input - usually given as a % of the FS value.

Sensitivity - Often described as the minimum change of input to which the system is capable of responding - usually expressed in % of Full Scale.

Hysteresis - The difference in output when the measured value is first approached with increasing and then decreasing values - expressed in % of Full Scale.

Impedance - Resistance of a load that hinders the flow.

Current Consumption - The amount of current needed for normal operation - does not include load current.

Watts (W) and Volt Amps (VA) - Both of these units are used to express electrical power - Watts is for DC voltage and Volt Amps is for AC voltage.

Auto Switches

Reed Switches: A thin metal contact is drawn closed by the magnetic field of the piston magnet. Since this is a mechanical switch it will wear out over time and is susceptible to vibration and shock. Their advantage is that they are inexpensive and can be used with AC voltages.

Solid-State Switches: The magnetic field generated by the piston magnet causes a current to flow inside the switch. Since there are no moving parts, the switch life is much longer than a reed switch and they are less prone to vibration and shock. They are more expensive, can only be used with DC voltages and you need to know whether you need a sinking or sourcing switch.

Current Sinking (NPN): The switch sensor “sinks” current from the load through the sensor to ground. The load is connected between positive voltage supply and the output lead of the sensor.

Current Sourcing (PNP): The switch sensor “sources” current through load to ground. The load is connected between the output lead of the sensor and the negative “ground” lead of the supply.

Three wire DC sensors include one wire that provides voltage to the sensor, an output signal wire and a ground wire. Most electro-mechanical loads (relays, counters, solenoids, etc.) can use either a sink or source type switch provided it is wired properly. The proper sensor type must be chosen when used with solid-state load and programmable controllers due to the fact that some of these loads must be grounded.

Wire Colors: Bimba switch and sensor wire colors conform to European standards.

Positive - Brown
Negative - Blue
Output - Black

Comparison Chart for Electronic Switches/Sensors

Model #	Display Type	Setpoint Mechanism	Hysteresis Adjustment	# and Type of Outputs	Operating Range	Quick Disconnect
VTMV-QD-6	N/A	N/A	N/A	1 1-5VDC	0 ~ 29.9"Hg (0 ~ -101.3kPa)	M8-3 on 6" pigtail
VSMN-QD-6	LED	Trimmer	NONE	1 NPN	0 ~ 29.9"Hg (0 ~ -101.3kPa)	M8-3 on 6" pigtail
VSMP-QD-6	LED	Trimmer	NONE	1 PNP	0 ~ 29.9"Hg (0 ~ -101.3kPa)	M8-3 on 6" pigtail
VXXN-QD-6	LED	Trimmer	YES	1 NPN	0 ~ 29.9"Hg (0 ~ -101.3kPa)	M8-3 on 6" pigtail
VXXP-QD-6	LED	Trimmer	YES	1 PNP	0 ~ 29.9"Hg (0 ~ -101.3kPa)	M8-3 on 6" pigtail
VDXN-QD-6	3 Digit Digital	Programmable	YES	2 NPN	0 ~ 29.9"Hg (0 ~ -101.3kPa)	M8-4 on 6" pigtail
VDXP-QD-6	3 Digit Digital	Programmable	YES	2 PNP	0 ~ 29.9"Hg (0 ~ -101.3kPa)	M8-4 on 6" pigtail
VDMN-QD-6	3-color/ 3-section Digital	Programmable	YES	2 NPN	0 ~ 29.9"Hg (0 ~ -101.3kPa)	M8-4 on 6" pigtail
VDMP-QD-6	3-color/ 3-section Digital	Programmable	YES	2 PNP	0 ~ 29.9"Hg (0 ~ -101.3kPa)	M8-4 on 6" pigtail
VDSN-QD-6	3-1/2 Digit LED Display	Programmable	YES	2 NPN & 1 1-5VDC	0 ~ 29.9"Hg (0 ~ -101.3kPa)	M12-5 on 6" pigtail
VDSP-QD-6	3-1/2 Digit LED Display	Programmable	YES	2 PNP & 1 1-5VDC	0 ~ 29.9"Hg (0 ~ -101.3kPa)	M12-5 on 6" pigtail

Fractional/Decimal/Millimeter Conversion Chart

Inch	Decimal	mm	Inch	Decimal	mm	Inch	Decimal	mm
1/64	0.016	0.397	11/32	0.344	8.731	43/64	0.672	17.066
1/32	0.031	0.794	23/64	0.359	9.128	11/16	0.688	17.463
3/64	0.047	1.191	3*8	0.375	9.525	45/64	0.703	17.859
1/16	0.063	1.588	25/64	0.391	9.922	23/32	0.719	18.256
5/64	0.078	1.984	13/32	0.406	10.319	47/64	0.734	18.653
3/32	0.094	2.381	27/64	0.422	10.713	3/4	0.75	19.05
7/64	0.109	2.778	7/16	0.438	11.113	49/64	0.766	19.447
1/8	0.125	3.175	29/64	0.453	11.509	25/32	0.781	19.844
9/64	0.141	3.572	15/32	0.469	11.906	51/64	0.797	20.241
5/32	0.156	3.969	31/64	0.484	12.303	13/16	0.813	20.638
11/64	0.172	4.366	1/2	0.5	12.7	53/64	0.828	21.034
3/16	0.188	4.763	33/64	0.516	13.097	27/32	0.844	21.431
13/64	0.203	5.159	17/32	0.531	13.494	55/64	0.859	21.828
7/32	0.219	5.556	35/64	0.547	13.891	7/8	0.875	22.225
15/64	0.234	5.953	9/16	0.563	14.288	57/64	0.891	22.622
1/4	0.25	6.35	37/64	0.578	14.684	29/32	0.906	23.019
17/64	0.266	6.747	19/32	0.594	15.081	59/64	0.922	23.416
9/32	0.281	7.144	39/64	0.609	15.478	15/16	0.938	23.813
19/64	0.297	7.514	5/8	0.625	15.875	61/64	0.953	24.209
5/16	0.313	7.938	41/64	0.641	16.272	31/32	0.969	24.606
21/64	0.328	8.334	21/32	0.656	16.669	63/64	0.984	25.003

mm	Inch	mm	Inch
0.1	0.0039	9	0.3543
0.2	0.0079	10	0.3937
0.3	0.0118	11	0.4331
0.4	0.0157	12	0.4724
0.5	0.0197	13	0.5118
0.6	0.0236	14	0.5512
0.7	0.0276	15	0.5906
0.8	0.0315	16	0.6299
0.9	0.0354	17	0.6693
1	0.0394	18	0.7087
2	0.0787	19	0.7480
3	0.1181	20	0.7874
4	0.1575	21	0.8268
5	0.1969	22	0.8661
6	0.2362	23	0.9055
7	0.2756	24	0.9449
8	0.3150	25	0.9843

Unit Conversion

Metric to English			English to Metric		
Multiply	**By**	**To Obtain**	**Multiply**	**By**	**To Obtain**
Length			**Length**		
mm	0.0394	in	in	25.4	mm
cm	0.3937	in	in	2.54	cm
m	3.2810	ft	ft	0.3048	m
Area			**Area**		
mm^2	0.0016	in^2	in^2	645.16	mm^2
cm^2	0.1550	in^2	in^2	6.4516	cm^2
m^2	10.764	ft^2	ft^2	0.0929	m^2
Volume			**Volume**		
mm^3	$6.10x10^{-5}$	in^3	in^3	16387	mm^3
cm^3	0.0610	in^3	in^3	16.387	cm^3
m^3	35.314	ft^3	ft^3	0.0283	m^3
l	0.0353	ft^3	ft^3	28.329	l
l	0.2642	gal (US)	gal (US)	3.785	l
Weight			**Weight**		
g	0.0353	oz	oz	28.349	g
kg	2.2046	lb	lb	0.4536	kg
Force			**Force**		
gf	$2.205x10^{-3}$	lbf	lbf	453.6	gf
kgf	2.2046	lbf	lbf	0.4536	kgf
N	0.2248	lbf	lbf	4.4482	N
Torque			**Torque**		
N*m	0.7375	ft*lb	ft*lb	1.3559	N*m
kg*m	7.223	ft*lb	ft*lb	0.1383	kg*m
Pressure			**Pressure**		
mm (H2O)	0.00142	psi	in (H2O)	0.00254	kgf/cm^2
mm (Hg)	0.0193	psi	in (Hg)	0.03518	kgf/cm^2
torr	0.0193	psi	psi	6.8947	kPa
kPa	0.145	psi	psi	0.06894	bar
bar	14.5	psi	psi	0.0703	kgf/cm^2
kgf/cm^2	14.224	psi	psi	0.00689	MPa
MPa	145.0	psi			
Energy			**Energy**		
N*m	0.7375	ft*lb	ft*lb	1.356	N*m
J	0.7375	ft*lb	ft*lb	1.356	J
MJ	0.2778	kWh	kWh	3.6	MJ
Power			**Power**		
W	0.7376	ft*lb/s	ft*lb/s	1.356	W
kW	1.341	hp	hp	0.7457	kW
Flow Rate			**Flow Rate**		
Nl/min	0.035	SCFM	SCFM	28.31685	Nl/min
Flow Coefficient			**Flow Coefficient**		
mm^2	0.0556	Cv	Cv	18	mm^2
Temperature: °F = (1.8 x °C) + 32			Temperature: °C = 5/9(°F - 32)		

NEMA Ratings (Electrical Enclosures)

An enclosure is a surrounding case constructed to provide a degree of protection to personnel against accidental contact with the enclosed equipment and to provide a degree of protection to the enclosed equipment against specified environmental conditions. These are the more common classifications as they pertain to pneumatic components such as valves.

NEMA 1: Intended for indoor use primarily to provide a degree of protection against contact with enclosed equipment.

NEMA 2: Intended for indoor use to provide a degree of protection against limited amounts of falling water and dirt.

NEMA 3: Intended for outdoor use to provide a degree of protection against windblown dust, rain, sleet and external ice formation.

NEMA 3R: Intended for outdoor use to provide a degree of protection against falling rain, sleet and external ice formation.

NEMA 3S: Intended for outdoor use to provide a degree of protection against windblown dust, rain, sleet and priovide for operation of external mechanisms when ice laden.

NEMA 4: Intended for indoor and outdoor use primarily to provide a degree of protection against windblown dust and rain, splashing water and hose directed water.

NEMA 4X: Intended for indoor and outdoor use to provide a degree of protection against corrosion, windblown dust and rain, splashing water and hose directed water.

NEMA 6: Intended for indoor and outdoor use primarily to provide a degree of protection against entry of water during occasional submersion to a limited depth.

IP Ratings (Electrical Enclosures)

1st Numeral: Degree of protection with respect to persons and solid objects		2nd Numeral: Degree of protection with respect to harmful ingress of water								
		Non Protected	Dripping Water	Dripping Water +/-15°F	Dripping Water +/-60°F	Splashing Water 360°	Water Jets	Heavy Seas	Immersion	Submersion
Not Protected	0	IP00	IP01	IP02						
Solid Objects > ø50mm	1	IP10	IP11	IP12	IP13					
Solid Objects > ø12mm	2	IP20	IP21	IP22	IP23					
Solid Objects > ø2.5mm	3	IP30	IP31	IP32	IP33	IP34				
Solid Objects > ø1.0mm	4	IP40	IP41	IP42	IP43	IP44	IP45	IP46		
Dust Protected	5					IP54	IP55	IP56		
Dust Tight	6						IP65	IP66	IP67	IP68

Pipe Thread Quick Reference

Tapered pipe threads seal at the points where the crest of the threads meet the roots of the mating threads.

Standard pipe threads, NPT, PT, and BSPT require sealant to prevent the development of a spiral leak path.

NPTF threads are designed to crush the points of the crests into the roots of the mating threads to achieve the same purpose, however, use of a lubricant or sealant to prevent galling of the threads is preferred where not functionally prohibited.

BSPT *– British Standard Taper Pipe Threads*

PT *– Japanese Industrial Standard Taper Pipe Threads*

{R(PT) *– Taper external threads}*

{Rc (PT) *– Taper Internal Threads}*

NPT *– American National Standard Taper Pipe Threads*

**All of the above are designed to be used with sealant to provide tight joint*

NPTF *– American National Standard Dryseal Pipe Thread*

**Designed to provide a pressure tight joint without the use of sealant*

PF *– Japanese Industrial Standard Parallel Pipe Threads*

**Straight threads use a gasket or O-ring to produce a pressure tight joint*

Port Size	PT & BSPT				NPT & NPTF			
	Threads per Inch	Pitch	Major Diameter	Thread Form Angle	Threads per Inch	Pitch	Major Diameter	Thread Form Angle
1/16	28	.03571	.304	55°	27	.030704	.313	60°
1/8	28	.03571	.383	55°	27	.030704	.404	60°
1/4	19	.05262	.518	55°	18	.05556	.540	60°
3/8	19	.05262	.656	55°	18	.05556	.675	60°
1/2	14	.07142	.825	55°	14	.07143	.840	60°
3/4	14	.07142	1.041	55°	14	.07143	1.050	60°

Compatibility between the above male and female is outlined below.

		Female								
		Parallel				Taper			American	
		BSP	Rp	PF	G	BSPT	Rc	PT	NPT	NPTF
Male	BSP	Y	Y	Y	Y	N	N	N	N	N
	BSPT	Y	Y	Y	Y	Y	Y	Y	N	N
	G	Y	Y	Y	Y	N	N	N	N	N
	NPT	N	N	N	N	N	N	N	Y	Y
	NPTF	N	N	N	N	N	N	N	N	N
	PF	Y	Y	Y	Y	N	N	N	N	N
	PT	Y	Y	Y	Y	Y	Y	Y	N	N
	R	Y	Y	Y	Y	Y	Y	Y	N	N
	UNI	Y	Y	Y	Y	Y	Y	Y	Y	Y

Note: *10-32 male will fit into an M5 female; M5 male will NOT fit into a 10/32 female. Both of these threads use a gasket to produce a pressure tight fit.*

Troubleshooting

What To Do When It Doesn't Work

There are times when a Bimba pump is installed and the user reports that "It didn't work" or "It doesn't work anymore". The following are some common causes that can be addressed by the operator before calling Bimba.

Check the Following

1. Was the pump installed?
   We have had customers tell us that "It looked so small. It couldn't possibly work". Therefore, it was never installed.
2. Be sure the supply pressure to the pump is the recommended 80 or 60 PSI. In addition, measure the pressure just before the pump. Sometimes the pressure line may be feeding other pneumatic devices causing pressure drops.
3. Was the input line large enough to deliver the necessary SCFM? Small lines starve the pump.
4. Was the fitting the type that reduced the ID of the input air line? Some compression type fittings severely reduce the ID, thus causing problems as described above.
5. Quick disconnects reduce air flow drastically. Be cautious of their use. (Push-to-Connect recommended)
6. Is there a restriction in the vacuum cup fixture?
7. Is the air line connected to the Air Supply port?
8. Is the vacuum line connected to the vacuum port?
9. Does the system have leaks? This is very basic and sometimes overlooked.
10. Was a Bimba recommended muffler used? If performance has deteriorated, one cause could be that the exhaust muffler is dirty. Other mufflers such as sintered bronze and Porex filters get clogged quickly and may cause back pressure.
11. If the pump doesn't function at all - examine the interior to confirm clear passage.
12. Measure the vacuum level at the cup, not the pump since this will indicate the true reading.
13. Was the correct/best pump selected in the first place? **A.** Depending on your application, it may take trying several pumps to find the best fit. **B.** Sometimes competitors products were not specified correctly to start.
14. Bimba offers drawings, installation instructions, operating instructions and the Master Catalog online. Call 800-848-8788 or email vaccon-engineering@imi-precision.com for assistance. Assemble as many facts as possible and then call Bimba for support at: 800-848-8788 (US Only) M-F 8AM - 5PM EST.

Vacuum gauges are the simplest, quickest and most cost efficient tool to monitor, diagnose & troubleshoot automation systems.

VG-150 Vacuum Gauge
Confirms & Maintains Performance

Terms & Definitions

Air Consumption:
The volume of air required to power the vacuum pump. Air consumption is dependent upon the air pressure and the diameter of the orifice through which it flows. Air consumption is based on individual pump.

Example: *1 pump uses 4.8 SCFM*
5 pumps use 24 SCFM

Atmospheric Pressure:
The atmosphere that surrounds the earth can be considered a reservoir of low pressure air. It's weight exerts a pressure that varies with temperature, humidity and altitude.

Barometer:
A device, usually filled with mercury, that measures atmospheric pressure.

Standard Atmospheric Pressure At Sea Level -
1 ATM = 14.7 PSI = 29.92"Hg = 760mm Hg = 1 Bar

Vacuum Flow:
The volume of free air induced by the vacuum pump per unit of time (l/m or SCFM).

Vacuum Force:
Force equals the vacuum level times the area of the vacuum surface, i.e., the holding area of a vacuum cup.

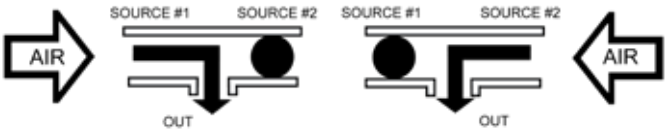
Example: *Lbs. of Force = (vacuum level in "Hg/2) x Area where 1 PSI = 2"Hg*

Vacuum Level:
The magnitude of suction created by vacuum pump. The unit of measure is typically "Hg. or mm Hg.

Venturi's/Ejectors:
Air powered vacuum pumps.

SCFM:
SCFM means Standard Cubic Feet per Minute. "Standard" is air at sea level and at 70° F.

Shuttle Valves:
A shuttle valve will direct air coming from either of two sources to a single destination.



Notes

Notes

IMI Precision Engineering operates four global centres of technical excellence and a sales and service network in 75 countries, as well as manufacturing capability in the USA, Germany, China, UK, Switzerland, Czech Republic, Mexico and Brazil.

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