swam

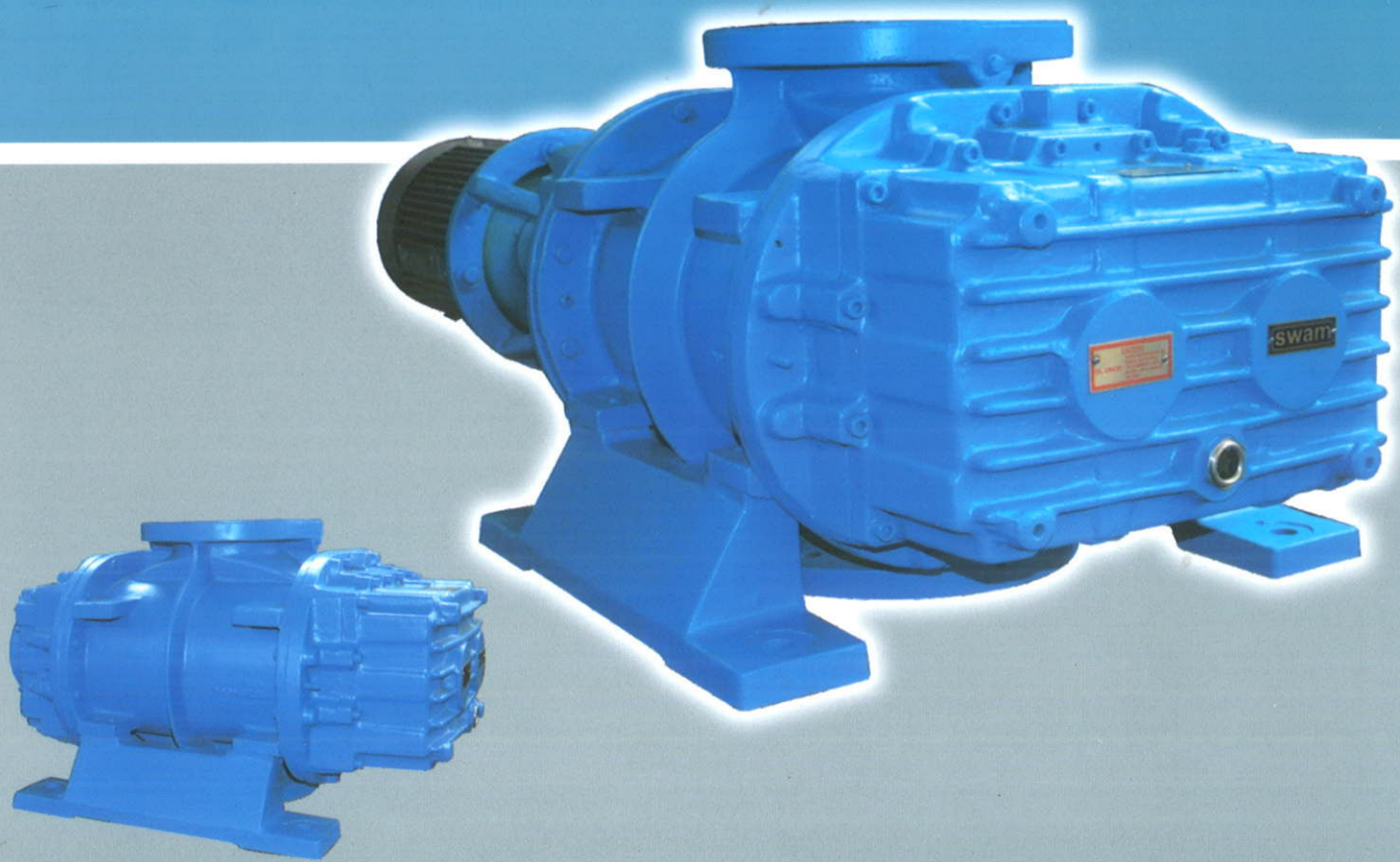
•Technology •Innovation •Excellence

CIN No. U74899DL1978PTC008921

Mechanical Vacuum Booster

FOR HIGH VACUUM SYSTEMS & APPLICATIONS

Latest Axcel Series



Unmatched Technology, Superior Performance, Trouble Free Operation

Bulletin No. 026

swam

• Technology • Innovation • Excellence

Mechanical Vacuum Boo

Swam, a group committed for technological innovation and excellence, have over a period of three decades, offered superior technology products & today are the leaders in Rotary Blowers & Vacuum pump technology and related products. The company has extensive experience in the Vacuum technology applications and have supplied thousands of units.

With over three decades of experience the company has adequately matured to execute different projects & is today represented in over 15 countries. Our quality system has been accredited with ISO-9001 quality standards and procedures. The company's head office and works are located at Noida near New Delhi, the capital city of India. The company has FOUR manufacturing plants equipped with CNC Machines and in-house testing facility upto 1000 kw.

There are many high vacuum applications, which cannot be ordinarily and economically performed by the use of conventional Mechanical Vacuum Pumps. The Vacuum Boosters in such cases help pumps perform better.

The Vacuum Boosters do not and should not be used to discharge direct into atmosphere and must be combined with suitable back-up pump. It is thus an auxiliary equipment designed to improve the performance of backing pump both in terms of increased capacity and reduced pumping down time.

The performance of combined unit Booster and Vacuum Pump is determined by the performance characteristic of the later as the Booster mainly acts as a pre-compressor. The ultimate vacuum capability of the combined unit is definitely much better than of Vacuum Pump alone.

DESIGN & CONSTRUCTION

The Vacuum Boosters are of state of the art design with many unique features ensuring complete vacuum tightness and leak proof construction. The boosters are provided with highly reliable sealing system consisting of piston ring type labyringth seals along with rotary seal between the conveying and bearing chambers along with a neutral chamber. The drive end shaft is provided with double acting rotary seal and are properly sealed with 'O' ring seals.

The lubrication on both ends is by splash oil and the drive arrangement is either direct coupled or V-belts depending on the model and the operating condition.

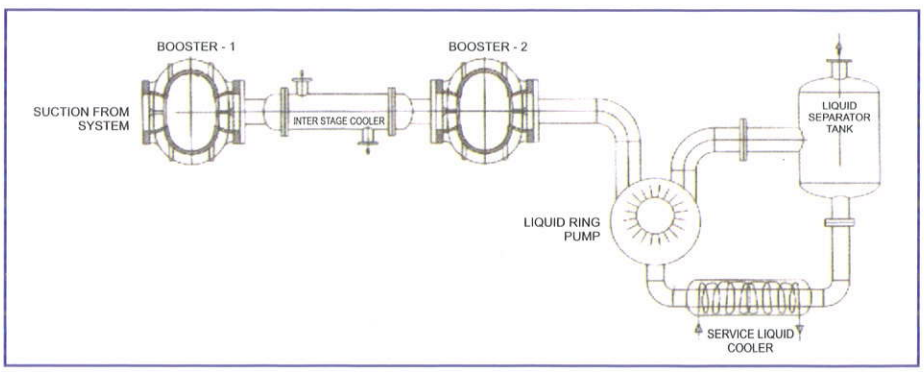
MATERIAL OF CONSTRUCTION

Standard and special models are available suiting specific application. The standard construction is out of high quality cast iron inoculated for vacuum duty. Optionally it can be out of stainless steel, ductile iron with or with special coating of nickel/teflon etc.

SALIENT FEATURES OF THE BOOSTERS

- Compact design, robust construction and suitable for continuous duty.
- Can be used with all types of backing pumps.
- Flexible choice of flows — horizontal and vertical.
- A large number of models and capacity to choose from: 150 m^3/hr to 52,000 m^3/hr.
- Compatible to be coupled to flanged motor or V-belt drive or Gear box drive.
- High quality and reliability of operation.
- Unique advance technology sealing system ideally suited for high vacuum application.

The aforesaid features ensure flexibility of installation, efficient and reliable operation and requiring very less maintenance, in addition to energy efficient operation.



Schematic layout of vacuum boosters with backing pump for a typical chemical process application

PERFORMANCE

The flow rating of few of the standard models are listed in the performance table along with the motor speed & other technical details. The booster can be operated with standard 4 pole or 2 pole motors.

The suggested motor ratings are suitable for pressure differential as indicated in mbar. But should higher differential be higher, than indicated, the motor of higher K.W. would be required to drive the booster. For data of other models contact H. Q.

PERFORMANCE TABLE

Data at suction conditions

BOOSTER MODEL	VBS-91	VBS-101	VBS-102	VBS-135	VBS-141	VBS-142	VBS-171	VBS-172	VBS-211	VBS-212	VBS-271	VBS-272
Pumping capacity – 1500 RPM (m^3/hr)	220	280	360	590	770	890	1485	1970	3150	4400	7950	10,800
– 3000 RPM	370	490	650	1070	1360	1560	3070	3890	6150	8300		
Motor Power – 1500 RPM (KW)	1.5	2.2	2.2	3.7	3.7	5.5	7.5	7.5	11.0	15	30.0	37.0
– 3000 RPM	2.2	3.7	3.7	5.5	5.5	7.5	9.3	11.0	15.0	22	22	30.0
Weight of bare shaft unit (kgs.) (approx)	135	165	190	285	335	390	560	625	750	950	1200	1500
Weight of unit with Motor (kgs. (approx) – 1500 RPM	163	199	222	325	375	465	630	710	880	1100	1350	1700
– 3000 RPM	197	205	230	355	406	465	690	760	880	1100	1350	1700
Oil charge (vertical flow) – ltrs.	1.2	1.2	1.2	2.5	2.5	2.5	3.2	3.2	6.5	6.5	8.3	8.3
Max.△P with (mbar)	150	150	110	95	95	95	75	70	70	70	75	75

- The pumping capacities as speeds other than indicated may ne obtained from the manufacturer.
- The drive motor rating would depend on booster △P & on its operating speed.

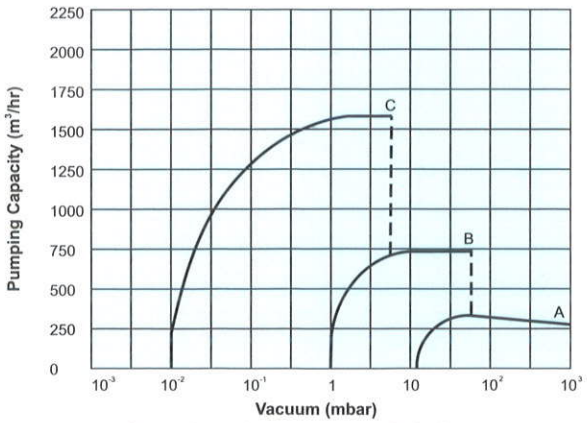
Performance and operating range of SWAM VACUUM BOOSTERS

MODELS	Capacity (m^3/hr)	Operating Speed RPM (approx)
VBS-91	220 370	1500 3000
VBS-101	280 490	1500 3000
VBS-102	360 650	1500 3000
VBS-135	590 1070	1500 3000
VBS-141	770 1360	1500 3000
VBS-142	890 1560	1500 3000

MODELS	Capacity (m^3/hr)	Operating Speed RPM (approx)
VBS-171	1485 3070	1500 3000
VBS-172	1970 3890	1500 3000
VBS-211	3150 6150	1500 3000
VBS-212	4400 8300	1500 3000
VBS-271	7950 6500	1500 1000
VBS-272	10,800 7600	1500 1000

MODELS	Capacity (m^3/hr)	Operating Speed RPM (approx)
VBS-311	10,600 15,900	1000 1500
VBS-312	14,600 20,850	1000 1500
VBS-421	16,500 23,900	1000 1500
VBS-422	20,700 29,600	1000 1500
VBS-501	19,500 28,900	750 1000
VBS-502	29,700 36,500	750 1000
VBS-611	51,600	750

Note: The speeds specified is considering a motor of 50 Hz frequency and speeds would change for 60 Hz frequency.



A. 350 M^3hr. Two Stage Liquid Ring Pump

B. First Stage Vacuum Booster VBS-102

C. Second Stage Vacuum Booster VBS-142

PERFORMANCE CHARACTERISTIC OF VACUUM BOOSTER with backing pump for a Typical Chemical Process Application

ADVANTAGE OF SWAM BOOSTER

The Vacuum Boosters are mainly used to lower the vacuum of the system with the following advantages:

- Reduction in evacuation time.
- Increase in pumping capacity.
- Reduced backing pump size and extension of operation into the pressure range that primary pump can not reach.

The booster have an added advantage of multi-staging. This would provide high capability of low vacuum whilst giving a further reduction in backing pump size.

APPLICATIONS

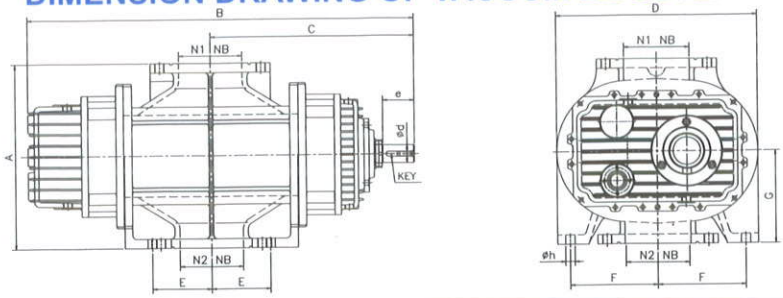
The above characteristics of boosters, especially of high displacement at low differential, enables its use in the wide range of medium & high vacuum for carrying out a large number of modern vacuum applications in chemical, process, food, petrochemical plants etc.

The following are some of the common applications:

- Gas and moisture extraction
- Vacuum drying
- Food preservation and packing
- Chemical & Process technology
- Central Vacuum Plants
- Vacuum leakage detection
- Vacuum coating and metalizing
- Vacuum distillation and degassing
- Semiconductor processing
- Packaging Industry
- Metallurgical Plants, Lamp & Tube Industries

The boosters can also be used for upgrading the existing vacuum system for accelerating evacuation and there by reducing time and increasing output.

DIMENSION DRAWING OF VACUUM BOOSTERS



BOOSTER MODEL	A	B	C	D	E	F	G	øh	N1-NB	N2-NB	e	Ød	KEY
VBS-91	315	657	336	375	53	154	155	14	80	80	55	36	10x8x50
VBS-101	330	730	372.5	375	82.5	154	165	14	100	100	55	36	10x8x50
VBS-102	330	805	410	375	115	154	165	14	100	100	55	36	10x8x50
VBS-135	434	725	387.5	476	162.5	190	217	22	100	100	75	42	12x8x60
VBS-141	430	867	457.5	476	115	208	215	22	125	125	75	42	12x8x60
VBS-142	440	917	482.5	476	140	208	220	22	150	150	75	42	12x8x60
VBS-171	520	1020	531	575	145	245	260	22	150	150	90	55	16x10x75
VBS-172	520	1100	571	575	177.5	235	260	26	150	150	90	55	16x10x75
VBS-211	580	1140	610.5	646	172.5	280	290	26	200	200	110	65	18x11x100
VBS-212	580	1285	673	646	227.5	280	290	26	250	250	110	65	18x11x100
VBS-271	800	1433	753	810	235	330	440	26	250	250	131	80	22x14x120
VBS-272	820	1643	858	810	315	330	450	26	300	300	131	80	22x14x120
VBS-311	910	1410	899	962	290	405	475	32	350	350	165	100	28x16x150
VBS-312	960	1690	1059	962	410	405	500	32	400	400	165	100	28x16x150

For dimensions of other models contact **SWAM HQ**

Dimensions in mm - approx.

SWAM PNEUMATICS PVT. LTD.

(ISO-9001:2008 Quality Certified)

Corporate Head Office & Plant-I :
C-2, Sector-3, Noida-201301, Gautam Budh Nagar (INDIA)
Tel : +91-120-4696222, Fax : +91-120-2443283, 4696200
E-mail : sales@swamatics.com

Plant-II : B-9, Sector-57, Noida-201301 (INDIA)
Plant-III : B-111, Sector-67, Noida-201307 (INDIA)
Plant-IV : C-52, Sector-57, Noida-201301 (INDIA)
Website : www.swamatics.com

For details of our local contact office in your region, contact H.O. or log on to website

Leader in : Air-Gas Conveying, Boosting & Vacuum Technology