



KLHVP SERIES



High Performance Sliding Vane Vacuum Pumps

Product Catalogue & Technical Reference



KHVPC-30 to KHVPC-60



KHVP/S-2 to KHVPC/S-16



KHVP/S-2 to KHVP/S-60

High Performance Single Stage Rotary Vane Vacuum Pumps

KHVPS Series

Key Features

- › Lower ultimate pressure
- › High water vapor tolerance
- › Wide range of pumping speeds
- › Direct coupled drive option of single and three phase motors
- › Three phase motor with built in unidirectional rotation device
- › Built in automatic anti suck back valve for vacuum system isolation and air admittance
- › Easily replaceable inner module – 100% interchangeability on all components
- › Noiseless, vibration free performance
- › Self availability of common spares

KHVP Series Rotary Vane Vacuum Pumps have world class performance characteristics. The manufacturing of pump components on Computerised Numerically Controlled Machines ensures stringent tolerance, thereby ensuring excellent trouble free performance, precise and vibration free running of pumps throughout its life. Lower ultimate pressure ensures not only better performance but also better control over various process parameters in industrial applications.

PRECISE VACUUM rotary vane pumps have a large number of important features in common:

Compact Construction

The exceptionally high efficiency of KHVP Series pumps and the flanged-on motor permit the combination of compact design and high pumping speed. Standard KF small flanges to PNEUROP acceptance standard. KHVP Series intake and outlet ports are fitted with small flanges meeting the international standard.

Negligible Environmental Pollution

The built-in oil-mist filter prevents excessive oil loss in the high pressure region. The trapped oil is filtered and returned to the oil reservoir.

Portable

All pumps from KHVPC/S-2 to KHVPC/S-16 have a carrying handle for easy transport.

Long Periods Between Servicing

Due to a large oil reserve and low oil consumption.

Versatile

All KHVP Series models from KHVPC/S-2 to KHVPC/S-16 are available with a.c. single-phase or three-phase motors. They can be supplied for special voltages or frequencies and in explosion-proof construction etc.

Design Features

KHVP Series pumps are oil-sealed rotary-vane vacuum pumps. The rotor is mounted eccentrically in the pump cylinder. The three radially sliding vanes divide the pump chamber into separate chambers. Due to the rapid rotation of the rotor, the vanes are forced to slide against the cylinder wall without springs, merely by means of centrifugal force. The pumping is brought about by alternately increasing and decreasing the volume of the working space, which is of crescent-shaped cross section. The component parts of the pump body are sealed by O-rings. All parts are pinned to ensure easy disassembling and reassembling.

Coupling and Motor

Pump and motor shaft are connected to one another by a flexible coupling. Special construction of this coupling and the use of specially selected materials ensure smooth and quiet running of the pump. The drive motor, a flange-mounted motor of B5 design, is directly connected by means of 4 screws onto the coupling housing of the pump. Three phase motors supplied along with KHVP Series pumps are non-standard high torque motors, which are fitted with a unidirectional rotational device.

Quiet Operation

NC automatic machine tools in our factory allow optimization of tolerances, reproducibility and surface finish of the component parts. The low noise level of KHVP Series pumps is a result of modern manufacturing techniques and years of experience in pump production. The bearings are oil-lubricated journal bearings. Due to these constructional features, KHVP Series pumps are so quiet that we had to apply special criteria to the selection of low noise drive motors.

Surface Corrosion

Wherever necessary, all component parts are protected against surface corrosion. For instance, the pump cylinder and intermediate plates are dip-coated. Oil reservoir casting, intake- and outlet port tubulations are made of aluminium and the screws, bolts and nuts are subjected to protective surface treatment. The gaskets are solvent-resistant.

Airing/Isolation Valve (No Oil Suck Back)

This safety valve is incorporated into the intake section of KHVP Series pumps. Controlled via a centrifugal switch, it immediately closes the intake port when the pump stops (for instance due to power failure), thus preventing pressure rise in the vacuum chamber or system. At the same time the KHVP Series pump is vented. The leak rate of the safety valve is $< 3 \times 10^{-5}$ mbar Ltr/Sec. The system is still isolated when the pump is switched off with the gas ballast valve open. Any suck-back of pump oil into the vacuum system is thus prevented.

Easy to Service

By exchanging the complete inner pump body, without special tools, in a few minutes, you need not be an expert.

Gas Ballast, Silencing, Water-Vapour Tolerance & Maintenance

Gas Ballast Valve

The gas ballast valve is opened or closed by turning the sealing cap when water or other vapours are to be pumped. By admitting an exact dosage amount of secondary air, the so-called gas ballast, condensation of vapours in the pump chamber is avoided. The gas ballast device also allows a "self-purification" of the pump, which means the elimination of condensates from the pump oil.

Silencing

Every KHVP Series pump is equipped with a silencer. By admitting a very small amount of gas to the pump chamber, the "slap" noise of the oil in the pump which usually occurs at ultimate pressure is prevented. The gas used for silencing is taken from the discharge side of the pump.

Water-Vapour Tolerance

When operated with gas ballast, KHVP Series rotary vane pumps attain high water vapour tolerance. This term is defined as the maximum inlet pressure at which a rotary gas ballast pump, under normal ambient conditions, can continuously pump water vapour without condensation occurring in the pump. The water vapour tolerance of KHVP Series rotary vane pumps is up to 65 mbar (see details in technical information).

Maintenance

A large oil sight glass, oil filling and oil drain plugs are fitted on one side of the pump to allow easy inspection and maintenance. This is of particular importance where space is restricted, such as in packaged pump sets, enclosed systems and narrow frames.

Modular System

KHVP Series pump models are subdivided into three production series: KHVPS2/KHVPC2, KHVPS4/KHVPC4; KHVPS8/KHVPC8, KHVPS16/KHVPC16; KHVPS30/KHVPC30, KHVPS60/KHVPC60. This makes it possible to use, within one series, many identical components such as pump cylinders, rotors, vanes, gas ballast valves, oil filters, intake- and exhaust tubulations and safety valves. This also applies to coupling housings, couplings, centrifugal switches, oil sight glass etc. The same set of gaskets is used for all pump models in the same production series. This design principle allows economical production and simplifies the stocking of spare parts for our customers and for ourselves, even more so as our designers took care to minimize the number of component parts used in the assembly of each pump.

Standard Specification

KLHVP Series pumps have KF small flange connections on inlet and outlet ports, including centering rings, O-ring gaskets and clamping rings, so that vacuum components with KF small flanges can be directly connected. A dirt filter is fitted into the intake port of each pump. In addition, an adapting centering ring and an adapting centering ring with dirt filter for the intake port are supplied with each pump. Adapting centering rings are used to connect components with different nominal bores. All pumps up to the KHVPC16 are provided with a carrying handle for easy transport. KHVP Series pumps with AC single-phase motors and on-off switch are supplied ready to operate with mains cable.

LABWAN Provides Unmatched After-Sales Service & Spares:

Oils for Vacuum Pumps

All vacuum pumps must be essentially used with special oils for the overall maintenance of pump performance. Some of the prime requirements of the oil are low vapour pressure, excellent lubrication at all operating temperatures and negligibly low water absorption. These oils have been specially developed for all types of vacuum pumps. Available in 5, 20 & 200 Ltr. containers.

Accessories for Pump Protection and Process Improvement

It is of importance to note that when the pump is used for pumping in a chemical & dusty environment, sufficient care should be taken to ensure that suction and discharge lines of the pumps are protected from condensing/accumulating dust/chemical fumes/other environment. It is thus recommended to use various accessories along with the pump.

Vacuum Oil Filtration Units

The On Line Filtration Systems are extensively utilized for purification of contaminated oils of vacuum pumps. The system can be used even when the vacuum pump is being used in process. Useful for all types of vacuum pump sizes/models.

Condensate Trap

Depending upon application, the condensate trap can be used on inlet or exhaust lines. Its function is to eliminate condensate from being allowed to enter the pump or from being injected into the atmosphere. Available for all types of vacuum pump sizes/models.

Exhaust Filters

The oil and other exhaust fumes are separated out before being exhausted from the pump, to ensure cleaner environments. The filter element is replaceable. The filter elements are manufactured from borosilicate glass fibre elements and remove 99.97% aerosol of 0.3 to 0.6 micron size. They are also offered for other types & makes of vacuum pumps.

Dust and Chemical Filters

For reliable blocking of dirt and dust from entering the pump, dust filters are used. The same filter is also used to block other chemical fumes by providing a proper adsorbing surface. Though these filters do drop the pumping speed to some extent, they greatly enhance the pump and oil life. Periodic replacement of chemicals is however essential.

Spares, Repairs & Rebuilding of Old Imported Vacuum Pumps

In order to offer a reliable and highly economical alternative to the spares from original manufacturers, we, through our international sourcing, can offer equivalent spare parts of Roots, Piston and Vane type vacuum pumps for Alcatel, Varian, Busch-100/300, LH-SV 100/200/300, LH D2A/C 060A/C, Edwards, Leybold, Sargent Welch & Stokes. Several worn out or unserviceable components can also be repaired and restored to original specifications.

Technical Specifications

Measured according to PNEUROP Standards.

KHVPC Series – Two Stage Pump

Parameter	KHVPC-2	KHVPC-4	KHVPC-8	KHVPC-16	KHVPC-30	KHVPC-60	KHVPC-90
Nominal Speed (m ³ /hr)	3.2	6.4	10	20	38	76	91.2
Pumping Speed (m ³ /hr)	2.5	4.7	7.6	15.2	30	60	72
Water Vapour Tolerance (mbar)	40	20	40	20	40	33	33
Ultimate Partial Pressure (mbar) - Without Gas Ballast	2.5×10 ⁻⁴	2.5×10 ⁻⁴	2.5×10 ⁻⁴	2.5×10 ⁻⁴	2.5×10 ⁻⁴	2.5×10 ⁻⁴	2.5×10 ⁻⁴
Ultimate Total Pressure (mbar) - With Gas Ballast	1.3×10 ⁻²	1.3×10 ⁻²	1.3×10 ⁻²	6.5×10 ⁻³	6.5×10 ⁻³	6.5×10 ⁻³	6.5×10 ⁻³
Oil Fill (Maximum, Ltr)	0.6	0.7	1.1	1.3	3.4	4.1	4.1
Motor Power (kW) 50Hz, 1Ph/3Ph	0.25/0.2 5	0.25/0.2 5	0.75/0.3 7	0.75/0.5 5	-/1.1	-/2.2	-/2.2 (60Hz)
Motor Speed (RPM)	1500	1500	1500	1500	1500	1500	1800 (60Hz)
Weight 1Ph/3Ph (Kgs)	18/15	20/17	36/26	38/28	--/75	-/90	-/90
Dimension (mm) L×W×H	400×135 ×215	430×135 ×215	440×172 ×247	480×172 ×247	600×242 ×350	740×242 ×350	740×240 ×350
Intake/Exhaust Port (mm)	16 KF	16 KF	25 KF	25 KF	40 KF	40 KF	40 KF

KHVPS Series – Single Stage Pump

Parameter	KHVPS-2	KHVPS-4	KHVPS-8	KHVPS-16	KHVPS-30	KHVPS-60	KHVPS-90
Nominal Speed (m ³ /hr)	3.2	6.4	10	20	38	76	91.2
Pumping Speed (m ³ /hr)	2.5	4.7	7.6	15.2	30	60	72
Water Vapour Tolerance (mbar)	33	33	40	40	40	65	65
Ultimate Partial Pressure (mbar) – Without Gas Ballast	4.0×10^{-2}	4.0×10^{-2}	4.0×10^{-2}	4.0×10^{-2}	4.0×10^{-2}	2.5×10^{-2}	2.5×10^{-2}
Ultimate Total Pressure (mbar) – With Gas Ballast	1.0×10^0	8.0×10^{-1}	8.0×10^{-1}	8.0×10^{-1}	6.5×10^{-1}	6.5×10^{-1}	6.5×10^{-1}
Oil Fill (Maximum, Ltr)	0.32	0.5	0.8	1.2	2.3	3.1	3.1
Motor Power (kW) 50Hz, 1Ph/3Ph	0.18/0.1 8	0.25/0.2 5	0.55/0.3 7	0.55/0.5 5	-/1.1	-/2.2	-/2.2 (60Hz)
Motor Speed (RPM)	1500	1500	1500	1500	1500	1500	1800 (60Hz)
Weight 1Ph/3Ph (Kgs)	13/11	18/14	27/20	35/28	--/62	-/77	-/77
Dimension (mm) L×W×H	310×135 ×215	380×135 ×215	360×172 ×247	450×172 ×247	500×242 ×350	630×242 ×350	630×242 ×350
Intake/Exhaust Port (mm)	16 KF	16 KF	25 KF	25 KF	40 KF	40 KF	40 KF

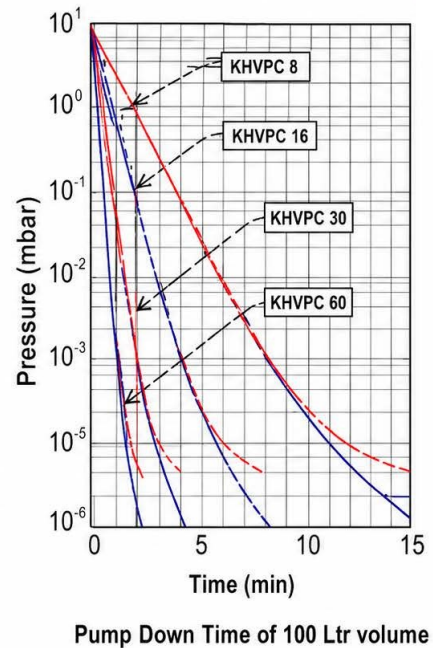
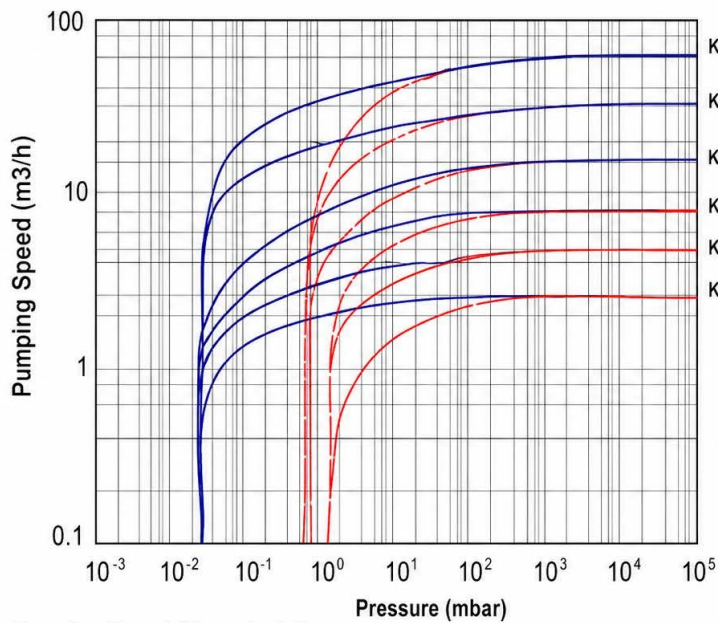


Table 1 – Laboratory & Research Applications

Application Area	Recommended Model(s)	Suitable Practical Applications
Laboratory deep vacuum applications	KHVPC-4 / KHVPC-8	Schlenk line, vacuum manifold, laboratory degassing, small vacuum desiccator, solvent drying, moisture removal, sample preparation, small vacuum oven, research lab vacuum systems
Rotary evaporator applications	KHVPC-4 / KHVPC-8 / KHVPS-8	Rotary evaporator for ethanol, methanol, acetone, chloroform, water mixture evaporation, solvent recovery, small chemical synthesis labs, pilot lab evaporation
Vacuum oven / laboratory drying	KHVPC-8 / KHVPC-16 / KHVPS-16	Drying of powders, glassware drying, moisture removal from samples, pharmaceutical sample drying, polymer drying, resin drying, drying of heat-sensitive materials
Freeze dryer / lyophilizer	KHVPC-8 / KHVPC-16 / KHVPC-30 / KHVPC-60	Laboratory freeze dryer, pilot-scale lyophilizer, pharmaceutical freeze drying, biological sample drying, food sample lyophilization, herbal extract drying, diagnostic reagent drying
Vacuum filtration / rough laboratory vacuum	KHVPS-4 / KHVPS-8 / KHVPS-16	Buchner funnel filtration, membrane filtration, solvent filtration, microbiology filtration, filtration manifold, vacuum aspiration, laboratory suction systems
Resin degassing / silicone degassing / moulding applications	KHVPS-8 / KHVPS-16 / KHVPC-8 / KHVPC-16	Resin bubble removal, silicone rubber degassing, epoxy degassing, composite moulding, casting resin degassing, vacuum potting
Vacuum packaging	KHVPS-30 / KHVPS-60 / KHVPS-90	Food packaging, pouch packaging, chamber vacuum packaging, industrial packing, moisture-sensitive product packaging, electronic component packing
Thermoforming / vacuum forming	KHVPS-30 / KHVPS-60 / KHVPS-90	Plastic sheet forming, blister forming, tray forming, acrylic sheet forming, packaging tray forming, mould forming
CNC vacuum holding / vacuum clamping	KHVPS-30 / KHVPS-60 / KHVPS-90	CNC router table holding, MDF spoilboard vacuum, wood panel holding, acrylic sheet holding, gasketed fixture holding, vacuum clamping jigs
Transformer oil dehydration / oil purification	KHVPC-16 / KHVPC-30 / KHVPC-60	Transformer oil filtration plant, oil dehydration skid, dissolved gas removal, moisture removal from insulating oil, vacuum oil purifier
Vacuum impregnation	KHVPC-16 / KHVPC-30 / KHVPC-60	Motor winding impregnation, transformer coil impregnation, varnish impregnation, resin impregnation, porous material impregnation, electrical insulation processing

Application Area	Recommended Model(s)	Suitable Practical Applications
Vacuum furnace / heat treatment roughing	KHVPC-30 / KHVPC-60 / KHVPC-90	Vacuum furnace roughing, brazing furnace, heat treatment furnace, sintering furnace, annealing furnace, high-temperature chamber evacuation
Vacuum metallurgy / vacuum coating / metallizing	KHVPC-30 / KHVPC-60 / KHVPC-90	Vacuum coating pre-evacuation, metallizing chamber roughing, vacuum melting roughing, degassing of metals, backing for high-vacuum systems
GC-MS / analytical instrument backing	KHVPC-4 / KHVPC-8 / KHVPC-16	GC-MS backing pump, mass spectrometer backing, small turbo pump backing, analytical vacuum system backing
SEM / electron microscopy roughing and backing	KHVPC-8 / KHVPC-16 / KHVPC-30	SEM roughing pump, electron microscope backing, coating unit roughing, vacuum chamber pre-evacuation
Central rough vacuum system	KHVPS-30 / KHVPS-60 / KHVPS-90	Central vacuum line, multi-user lab vacuum, industrial suction system, packaging area vacuum supply, vacuum distribution manifold
Central deep vacuum system	KHVPC-30 / KHVPC-60 / KHVPC-90	Central deep vacuum for laboratories, pilot plant vacuum, vacuum drying network, multi-chamber evacuation system
Wet vapour / moisture-heavy process	KHVPS-60 / KHVPS-90 / KHVPC-8 with trap / KHVPC-30 with trap	Wet drying, moisture removal, evaporation processes, humid gas evacuation, water vapour pumping
Chemical vapour service	Conditional: KHVPC or KHVPS with accessories only	Solvent vapour pumping, chemical lab vacuum, process vapour evacuation, pharma solvent drying
Semiconductor clean process	Not recommended; suggest dry scroll / dry screw pump	Semiconductor process vacuum, cleanroom process exhaust, plasma process support, oil-free wafer processing
Oil-free laboratory vacuum requirement	Not recommended; suggest dry scroll / diaphragm pump	Oil-free filtration, clean analytical vacuum, solvent-resistant oil-free lab systems, clean gas handling
Corrosive gas / reactive gas pumping	Not recommended without special protection	Acid vapour pumping, halogen gas, ammonia-heavy vapour, reactive chemical exhaust

Vacuum Pump — Frequently Asked Questions

Guidance on selecting the right vacuum pump for common laboratory and industrial applications.

#	Question	Answer
1	Which vacuum pump is best for a rotary evaporator?	A two stage rotary vane vacuum pump is generally preferred for rotary evaporators where better vacuum control and lower boiling temperature are required. For simple rough evaporation, a single stage pump may also be used depending on solvent type and process requirement.
2	Which vacuum pump is suitable for a freeze dryer?	Freeze dryers require deep vacuum for sublimation. A two stage high vacuum rotary vane pump is recommended for laboratory, pilot-scale, and pharmaceutical freeze drying applications.
3	Which vacuum pump is suitable for vacuum filtration?	For vacuum filtration, a single stage rotary vane vacuum pump is usually sufficient because filtration requires rough vacuum and good pumping capacity rather than very deep final pressure.
4	Which vacuum pump is suitable for vacuum oven drying?	For deep drying and moisture-sensitive materials, a two stage high vacuum pump is recommended. For general drying where very low pressure is not required, a single stage pump may be suitable.
5	Can rotary vane vacuum pumps be used for corrosive vapours?	Oil-sealed rotary vane vacuum pumps should be used carefully for corrosive vapours. Suitable inlet traps, cold traps, chemical filters, and exhaust filters are recommended. For aggressive chemical vapours, chemical-duty dry pumps may be preferred.
6	Are oil-sealed rotary vane pumps suitable for semiconductor clean processes?	Oil-sealed rotary vane pumps are generally not the first choice for clean semiconductor process applications because oil contamination may affect process cleanliness. Dry scroll or dry screw vacuum pumps are usually recommended for clean process vacuum.

How to Select the Right Vacuum Pump

For **deep vacuum applications** such as freeze drying, vacuum ovens, rotary evaporators, analytical backing, transformer oil dehydration, vacuum impregnation and vacuum furnace roughing, a **two stage high vacuum rotary vane pump** is recommended.

For **rough vacuum and high-flow applications** such as filtration, packaging, thermoforming, CNC vacuum holding, resin degassing and central rough vacuum systems, a **single stage rotary vane vacuum pump** is recommended.

For **clean, oil-free, corrosive, semiconductor or highly sensitive applications**, oil-sealed rotary vane pumps may not be the best choice. In such cases, dry scroll pumps, dry screw pumps, diaphragm pumps or chemical-duty dry vacuum pumps may be more suitable.



Precise Genuine Spares



Oil less dry vane vacuum pump available in 70lpm to 500lpm