

oerlikon
leybold vacuum

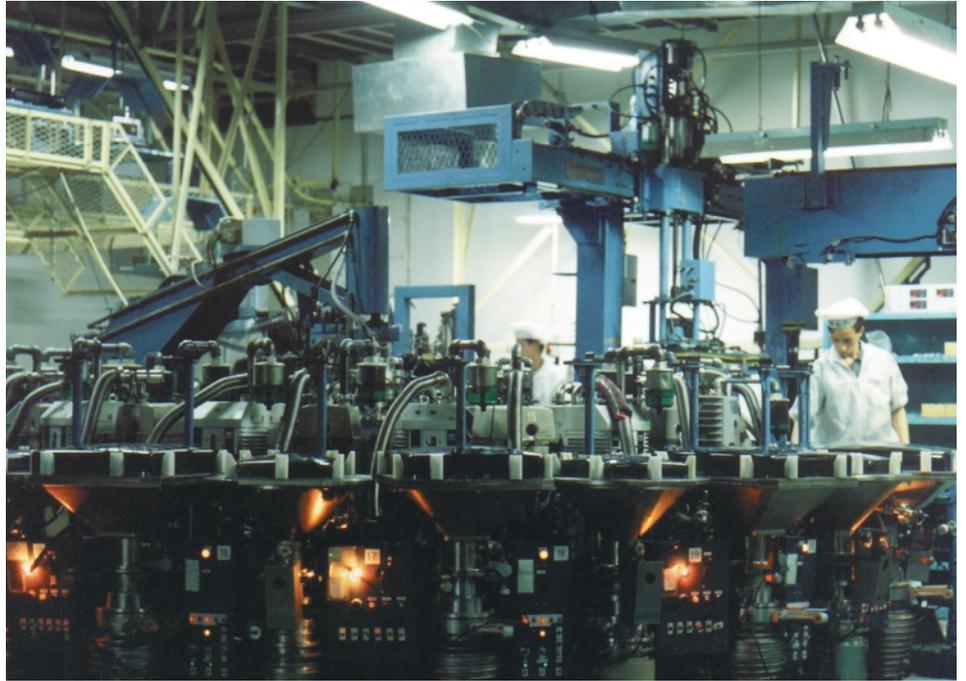
Rotary Vane Vacuum Pumps TRIVAC B A proven concept.

Technical Information 171.83.02



TRIVAC B

For Vacuum Work in Industry and Research.



Applications

Oil sealed rotary vane vacuum pumps are used in all areas of vacuum technology and are particularly well-suited to many applications in production and research.

They are also used to produce rough medium vacuum pressures, or as backing pumps in combination with roots, diffusion, turbomolecular or cryopumps.

Applications	TRIVAC	D4B	D8B	D16B	D25B	D40B	D65B
Vacuum coating			■	■	■	■	
Research and development		■	■	■	■		
Chemistry/pharmaceuticals		■	■	■	■	■	■
Metallurgy/furnaces						■	■
Lamps and tubes manufacture		■	■	■		■	■
Automotive industry			■	■			
Space simulation						■	■
Analytical engineering		■	■	■	■		
Environment engineering		■	■	■	■	■	■
Cooling and air-conditioning		■	■	■	■	■	■
Electrical engineering		■	■	■	■	■	■
Mechanical engineering		■	■	■	■	■	■
Medicine technology		■	■	■	■	■	■
Vacuum drying cabinets		■	■	■	■		
Chemistry and research labs		■	■	■	■		
Freeze-drying systems		■	■	■	■	■	■
High vacuum pump systems		■	■	■	■	■	■

Standard Accessories

Modular, functional and optimally designed.



Pump system with TRIVAC D 65 BCS PFPE

Accessories	TRIVAC	D4B	D8B	D16B	D25B	D40B	D65B
AK condensate traps		■	■	■	■	■	■
AF exhaust filters		■	■	■	■	■	■
Oil drain taps		■	■	■	■	■	■
Oil drain kit		■	■	■	■	■	■
AS dust separators			■	■	■	■	■
MF molecular filters		■	■	■	■	■	■
FA fine vacuum adsorption traps		■	■	■	■	■	■
FS dust filters		■	■	■	■	■	■
TK cold trap		■	■				
AR exhaust filters with lubricant return		■	■	■	■	■	■
OF mechanical oil filters		■	■	■	■	■	■
CF chemical oil filters		■	■	■	■	■	■
Roots pump adapters						■	■
Valves, flange components		■	■	■	■	■	■
Oils		■	■	■	■	■	■

Accessories

OF, CF - Mechanical and chemical oil filters

Since each TRIVAC B contains a forced lubrication system with an oil circulation pump, it is possible to connect the main flow oil filters to this pump. The different oil filters match the different types of pump and are available as version OF for mechanical filtering and CF for chemical filtering.

Advantages:

- Extended service of the oil (depending on the application)
- Easy installation on the TRIVAC B
- Hose connections are not required
- Easily exchangeable filters
- Low oil loss when exchanging the filter
- Expanded range of applications to meet special requirements
- Prevention of mechanical damage to the pump
- Identical housing for the OF and CF series
- Maintenance indicator for exceptional reliability

The OF and CF models are main flow oil filters with an interchangeable cartridge. They come as a kit for fitting to the oil filter connection present on each TRIVAC B pump. The OF oil filter employs mechanical means to separate particles between 5mm and 10mm. When the maximum permissible flow resistance of 2.5 bar is exceeded, the built-in bypass valve opens automatically to ensure that a correct oil flow is always maintained.

Roots pump adapter

The Roots pump adapter permits direct installation of a Roots pump RUVAC WA/U 251 or WS/U 251 on top of a TRIVAC D 40/65 B. This makes it easy to build a small pump system using a TRIVAC as a backing pump and a Roots pump as the medium vacuum pump.

Advantages:

- Compact, space-saving assembly of a pump system
- Short and direct connection between the various stages of the pump system
- Low loss levels of conductance
- Easy installation

AK condensate traps

Condensate traps with small flange connections have a shape similar to that of the TRIVAC B pumps. In operation, they protect the pumps against the accumulation of condensate and backstreaming of fluids.

Advantages:

- Easy installation without the use of additional accessories
 - For use either on the intake or exhaust side
 - Solvent-resistant
 - Drain via drain screw or drain tap
- Under certain circumstances liquid may accumulate in the intake line when pumping vapors. In such cases, it is advisable to install a condensate trap on the intake side of the TRIVAC B. Its use is also recommended in situations where it is awkward to run the exhaust line and where the exhaust line may drain back to the pump. For your convenience, a viewing glass is provided to make it easy to see when it is necessary to empty the condensate trap. A drain screw is also provided on the condensate trap for draining off the accumulated condensate.

Dual stage rotary vane vacuum pumps

TRIVAC B

TRIVAC B series pumps are oil sealed vacuum pumps based on the rotary vane principle. The oil injected into the pump chamber is used for sealing, lubrication and cooling purposes. The body of the pump is made of separate components with no additional sealing elements. The components are fitted with dowels to ensure easy disassembly and re-assembly.



TRIVAC D 16 B ATEX, Cat. 1 inside and 2 outside

Special features

- Environment-friendly
 - Low noise
 - Low vibration
- Energy saving
 - Low power consumption
 - Low thermal losses
- Modern vacuum technology
 - High pumping speed right down to the ultimate pressure
 - Low ultimate pressure, even with gas ballast
 - High water vapor tolerance
 - Continuous operation right up to 1000 mbar
 - Built-in oil pump, force-feed lubrication sliding bearing
 - Minimal inherent air intake
- Well-proven design
 - Compact, air cooled
 - Handy, retractable handle
 - All controls and oil level check on the front side
 - Either horizontal or vertical intake and exhaust port
 - Service-friendly
 - Exchangeable inner section
 - Pressure-controlled anti-suckback valve, no backstreaming of oil under any operation conditions
 - Installation of mechanical and chemical/mechanical full flow oil filters possible
 - Shaft seals and O-rings are all made of elastomer FPM
 - Pumps are free of non-ferrous metals
 - Motor protection IP 54

Design Features

Coupling and motor

The pumping section of the TRIVAC B is directly linked to the motor via an elastic coupling element to ensure that the pump runs evenly and smoothly. Type B 14 flanged motors are screwed to the housing of the coupling.

Gas ballast valve

The gas ballast valve is opened and closed by means of a short lever. By admitting a well controlled amount of air - the gas ballast - it is possible to prevent a certain degree of vapor condensation within the pump.

Exchangeable inner section

The inner section of the pump may be exchanged without special tools or any special knowledge. It consists of all components vital to the operation of the pump. Exchanging the inner section makes the TRIVAC B as good as new again.

1000 mbar intake pressure

Trouble-free operation even at 1000 mbar intake pressure is ensured by a built-in oil pump, providing force-feed lubrication of the bearings from where a minimum amount of lubricant is fed to the compression and expansion chambers to ensure lubrication of the sliding vanes.

ATEX

All TRIVAC B basic models (1~ and 3~ motor) are certified in accordance with 94/9/EG (ATEX), Cat. 3 inside.

Additionally there is one pump in every pumping speed class available certified in accordance with 94/9/EG (ATEX), Cat. 3 inside and 3 outside.

For special explosion resistant applications two different TRIVAC D 16 B pump models are available for pumping explosive atmospheres out of zone 0. Both models are certified according to 94/9/EG (ATEX) - EC type exam.cert. IBExU03ATEX1017 X and IBExU03ATEX1016 X - Cat. 1 inside and 2 outside.

Surface corrosion

All components are protected against surface corrosion. Non-ferrous metals are not used. The oil box, intake and exhaust line are made of aluminum and only solvent-resistant sealing materials are employed.

Flexible

All pumps from the D 4 B to the D 25 B are available with either a single-phase or a three-phase AC motor. Other pumps and motors are available upon request.

Anti-suckback valve

An oil pressure-controlled anti-suckback valve is built into the intake of the TRIVAC B. During stand-still (as a result of a power failure, for example), the anti-suckback valve blocks the intake to prevent a pressure rise in the connected vacuum system. At the same time, the inner pump body of the TRIVAC is vented. The blocking process will also work correctly when operating the pump with an opened gas ballast valve.

As a result, the backstreaming of any oil from the pump into the vacuum system is effectively prevented. The leak rate of the anti-suckback valve is 3×10^{-5} mbar/l s^{-1} .

Standard Accessories

Useful and rather indispensable.



TRIVAC D 16 B
with translucent plastic AF exhaust filter and
AK condensate trap



Accessories for TRIVAC B pumps:

- ① OF oil filter
- ② Roots pump adaptor
- ③ AF exhaust filter
- ④ AK condensate trap

AF Exhaust filters

These exhaust filters are matched to the pumping speed ranges of TRIVAC B pumps. They retain oil mists, aerosols and harmful substances. The exhaust filters are used to further improve the already good oil separation characteristics of the TRIVAC B pumps.

Advantages:

- Retains dirt and cracked products
- Built-in overpressure relief valve
- Separation efficiency over 99%
- Oil level viewing glass for checking the quantity of collected oil
- Exchangeable filter inserts
- Solvent-resistant
- Easy to use and to clean

Filter elements retain the small oil droplets and dirt particles entrained in the gases. Separated oil collects in the filter pot where its level can be checked through the viewing glass on the exhaust filter. A pressure relief valve (switching threshold 1.5 bar) built into the exhaust filter prevents the pump from being damaged by excessive overpressures.

AR Exhaust filters with lubricant return

This combination of an exhaust filter and a float-controlled valve considerably extends the maintenance intervals of the TRIVAC B. As a result, oil consumption is lowered to negligible levels.

Advantages:

- Filtering the exhaust air of entrained lubricant particles
- Lubricant return with the aid of a float-controlled valve
- No operation costs caused by lost lubricant
- Standard filter element
- Built-in overpressure relief valve
- Hardly any oil consumption
- All seals made of FPM material
- The intake port may be easily exchanged (either vertical or horizontal orientation)

The AR is connected to the exhaust port of the TRIVAC B and the return line is connected to the intermediate flange under the intake line. Any lubricant entrained in the exhaust gas is separated by a highly effective filter element.

This lubricant is collected within the housing of the exhaust filter. At a defined level, the rising float provides a suction opening. The lubricant is then returned to the oil circuit of the TRIVAC B via the connection line from the suction opening to the intake line under the intake valve. When connecting the exhaust filter and anti-suckback valve, either a horizontal or vertical intake is retained.

Since volatile substances or scents may pass through the filter, a built-in overpressure relief valve has been included.

Depending on the properties of the pumped medium, we recommend connecting an exhaust line to the exhaust filter - particularly when pumping hazardous substances.

Technical Data

Ordering Information

TRIVAC B		D 4 B	D 8 B	D 16 B	D 25 B	D 40 B	D 65 B
Nominal pumping speed ¹⁾	m ³ /h	4.8	9.7	18.9	29.5	46.0	75.0
Pumping speed ¹⁾	m ³ /h	4.2	8.5	16.5	25.7	40.0	65.0
Ultim. partial pressure ¹⁾ without gas ballast	mbar	< 1 · 10 ⁻⁴					
Ultim. total pressure ¹⁾ with gas ballast	mbar	< 5 · 10 ⁻³					
Water vapor tolerance	g/h	93	157	305	476	1184	1952
Oil filling min./max.	l	0.3 / 0.8	0.3 / 0.9	0.45 / 1	0.6 / 1.4	1.7 / 2.6	2.0 / 3.3
Motor power	W	370	370	550 / 750	750	2200	2200
Rotational speed of the pump	U/min.	1500	1500	1500	1500	1500	1500
Connection ports	DN	16KF	16KF	25KF	25KF	40KF	40KF
Weight	kg	18	19	27	30	67	83

¹⁾ according to ISO/R 1000, DIN 28 400, and other German and international vacuum technology standards

Ordering information		D 4 B	D 8 B	D 16 B	D 25 B	D 40 B	D 65 B
TRIVAC B rotary vane vacuum pumps, dual stage							
with single phase motor	230 V, 50 Hz	112 45 ²⁾	112 55 ²⁾	112 65 ²⁾	112 75 ²⁾	—	—
	230 V, 50/60 Hz ¹⁾	—	—	113 25 ²⁾	113 35 ²⁾	—	—
	100-120 V, 200-240 V, 50/60 Hz	140 081**	140 082**	—	—	—	—
	115 V, 50/60 Hz, NEMA plug*	912 45-1	912 55-1	912 65-1	—	—	—
	208-230 V, 50/60 Hz, NEMA plug*	912 45-2	912 55-2	912 65-2	912 75-2	—	—
with three-phase motor	230/400 V, 50 Hz; 250/440 V, 60 Hz	112 46 ²⁾	112 56 ²⁾	112 66 ²⁾	112 76 ²⁾	112 86 ²⁾	112 96 ²⁾
	230 V / 400 V, 50 Hz	140 140 ³⁾	140 150 ³⁾	140 160 ³⁾	140 170 ³⁾	140 180 ³⁾	140 190 ³⁾
	200-220/380 V, 50 Hz; 208-230/460 V, 60 Hz*	912 46-2	912 56-2	912 66-2	912 76-2	912 86-2	912 96-2

Accessories:

Roots pump adapter		—	—	—	—	168 30	168 30
Condensate trap	AK	188 06	188 06	188 11	188 11	188 16	188 16
Exhaust filter	AF	189 06	189 06	189 11	189 11	189 16	189 16
Condensate trap	AK 8 / AK 25	190 60	190 60	190 63	190 63	—	—
Exhaust filter	AF 8 / AF 25	190 50	190 50	190 53	190 63	—	—
Exhaust filter with lubricant return	AR	189 20	189 20	189 21	189 21	189 22	189 22

¹⁾ 208-252 V

* Version for the North and South American Continent

** with dual voltage motor, without cable

²⁾ Certification after 94/9/EG (ATEX), Category 3 inside. Inside: II (I) 3G IIC T4 (50 Hz), T3 (60 Hz).

³⁾ Certification after 94/9/EG (ATEX), Category 3 inside and 3 outside. Inside: II (I) 3G IIC T4 (50 Hz). Outside: II (0) 3G IIC T3 (50 Hz).

The pumps and accessories described in this folder are a just a selection out of our program range. Additional motors and oils upon request.

For further information please refer to our main Oerlikon Leybold Vacuum catalog, chapter rotary vane vacuum pumps.

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