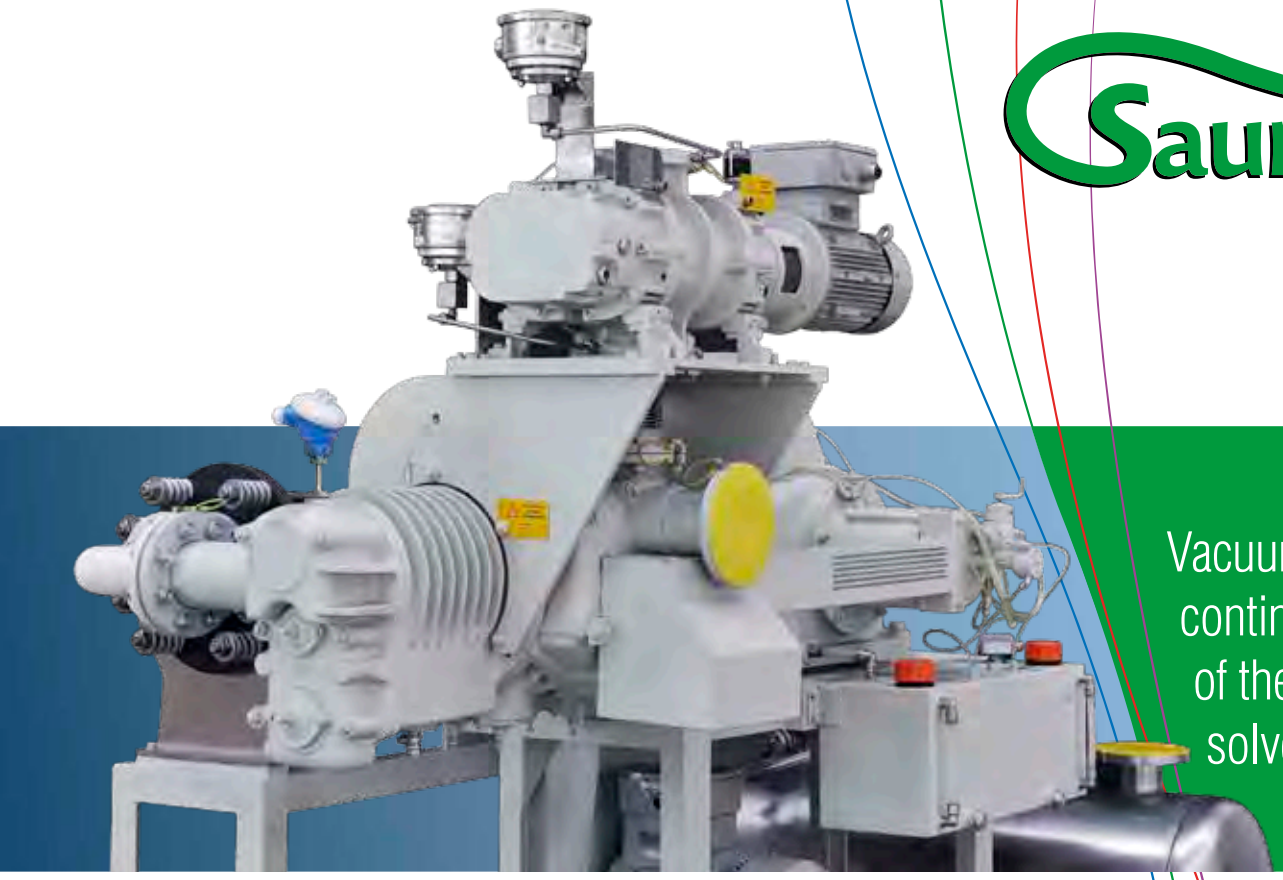
Saurus 939



Vacuum pumps with continuous recovery of the extracted solvents

italvacuum

Saurus939

When others stop, Saurus939 carries on.

The vacuum pump unique in reliability, performance and consumption.

Saurus939 has all the **Italvacuum** experience, a vacuum pump that guarantees **unrivalled performance** in all the main chemical and pharmaceutical processes, ensuring total recovery of extracted solvents, even in severe operating conditions.

A simply designed machine, that combines traditional robustness and reliability with the most evolved technology.

Saurus939 has always been the core business of **Italvacuum**, one of the leading manufacturers of vacuum pumps as well as a worldwide reference point in the design and manufacture of vacuum dryers.

Resistance, strength and consumption of oil virtually eliminated thanks to the **innovative LubriZero® system**, designed for double stage models. A solution which guarantees perfect operation and optimum results with total respect for the environment.

Saurus939 has no fear of aggressive and corrosive solvents, powders and condensates, nor distillation by-products. But above all it does not fear confrontation because it is designed and manufactured to work 24 hours a day with a constant excellent performance and **minimum operating costs**, thanks to a low-energy motor, negligible oil consumption and easy, immediate maintenance.

Powerful, efficient, but absolutely safe: Saurus939 guarantees optimum safety through the whole process and complete purity of the final product. In other words, ensures an **uncontaminated vacuum**.

Perfected every year since

Integrated quality
Italvacuum has implemented a Quality Management System with **ISO 9001** certification covering from design to production of every single component, from end product sale to plant installation and technical assistance. In addition, acknowledging the importance of the welding process in the qualitative result and the reliability of the end product, Italvacuum has considered to certify its own processes and personnel complying to **ISO 3834-2** norms.

Strengths

All the quality of special machinery

1. Complete robustness in any work environment
2. High resistance against corrosion
3. High resistance against powder, condensates and distillation by-products
4. Continuous recovery of the extracted solvents
5. Unlimited use over the entire vacuum range
6. Uncontaminated vacuum and complete purity of final product
7. Lower operating costs than any other vacuum technology
    a. *LubriZero® system with negligible oil consumption*
    b. *Extremely limited environmental costs*
    c. *Low-energy motors*
    d. *Easy and economical maintenance*
8. Absence of warm-up cycles and waiting times
9. Physical separation between process and mechanical parts
10. Low noise (<70db) and low operating speed (250 rpm)
11. Low average working temperatures
12. ATEX certification up to zone 0.

Applications

Best performance in all sectors

The Saurus939 vacuum pump has a vast range of uses, as it can be used in the following sectors:

- Chemicals
- Pharmaceuticals
- Cosmetics
- Oil & gas
- Plastic & rubber
- Bio-science
- Waste management.

Processes: vacuum drying, reaction, distillation, crystallization, filtration, evaporation and polymerization.

Saurus939

Features

Designed for around the clock use

The design is simple and traditional, but it is not the appearance that counts. The great added value is Italvacuum's consolidated experience, that year after year has perfected, innovated and improved the Saurus939 vacuum pump, guaranteeing optimum operation in all chemical and pharmaceutical processes, such as drying, distillation, reaction and crystallization.

Saurus939 can intake both the vapours of **common solvents** (methyl alcohol, ethylic alcohol, chloroform, acetone, ethyl acetate, methyl chloride, benzene, toluene, isopropyl alcohol, ethyl ether, heptane) as well as those of **more aggressive solvents** (hydrochloric acid, acetic acid, chlorobenzene, dimethylformamide, acrylonitrile, dichloroethane, cyclohexane, pyridine, dimethyl sulfoxide, dichloromethane).

Construction details

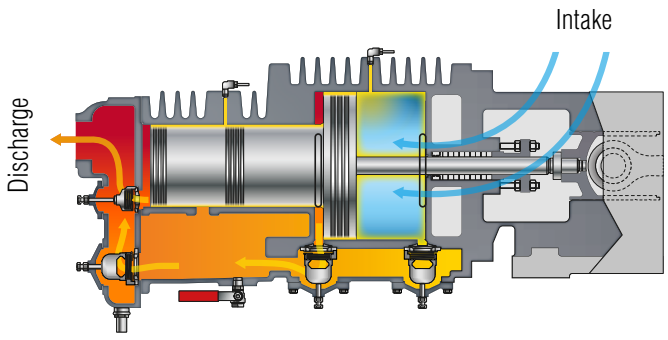
A new level of robustness

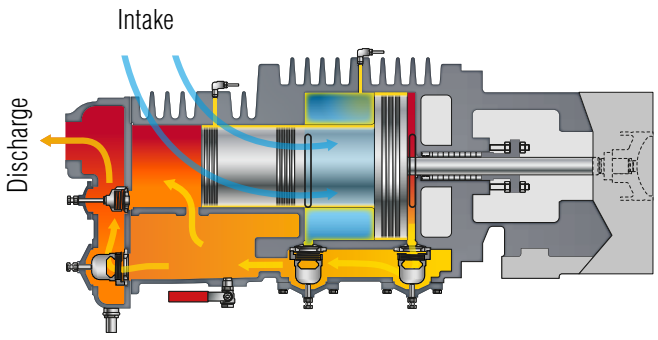
Cylinder, piston, piston rings and head are made of special anti-acid cast iron. The other components are made of cast iron, special steel and PTFE with special charges. The pump is completely sealed: a characteristic that makes it extremely reliable and efficient for a long time, even in damp and dusty environments. The discharge valves have automatic openings and are available in different materials, including Hastelloy.

Cooling is by air. Saurus939 has two completely separate, independent lubrication circuits:

- one circuit for the process part, with metered injection of fresh oil, thanks to the LubriZero® system
- one circuit for the mechanical part with recirculated oil.

Operation principle





LubriZero® System

An injection of value, with negligible consumption

Saurus939 is equipped with the exclusive **LubriZero® system** that ensures best possible performance with truly negligible oil consumption, completely compatible with the environment.

The **LubriZero® system**, mounted on double stage models, combines the metered injection of oil with a kit of new materials in PTFE with special charges that are not only resistant to corrosion, but require virtually no lubrication. This also allows for the use of synthetic FDA approved oils.

The metered flow of a few drops of fresh oil (about 10 g/h) guarantees an effective barrier from even the most aggressive solvents, considerably increasing the duration of the perfect cylinder-piston coupling and hence the working life of the vacuum pump.

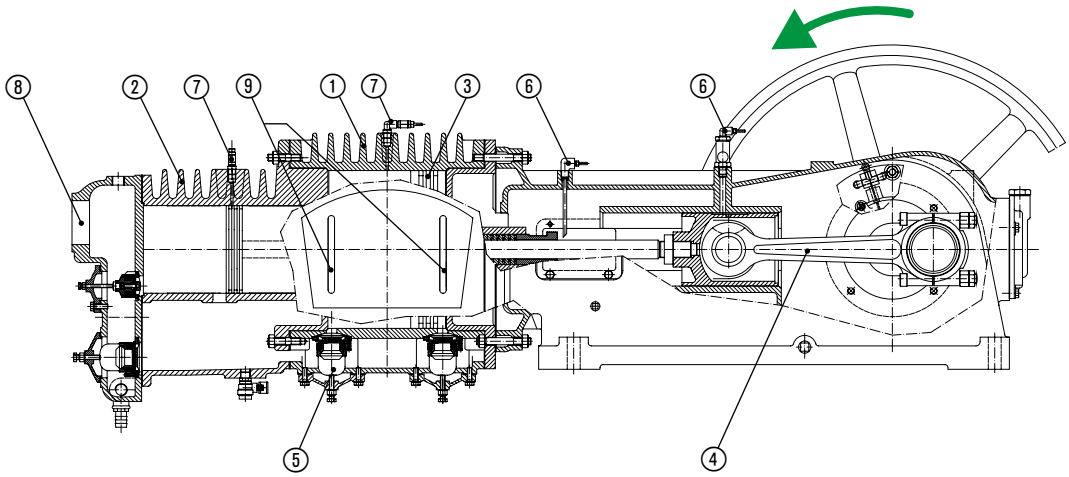
Uncontaminated vacuum

A guarantee of purity for the final product

Powerful, resistant, efficient, but also **completely safe**: Saurus939 guarantees maximum safety throughout the whole process and complete purity of the final product. In other words, guarantees uncontaminated vacuum.

In fact, during the entire work cycle, not even one molecule of oil reaches the processed product. This is certified by the Department of Material Science and Chemical Engineering at the Politecnico of Torino, as part of specific research carried out on a complete process of vacuum drying.

The results leave no space for doubt: the **final product is absolutely pure** with no risk of oil contamination in the process.

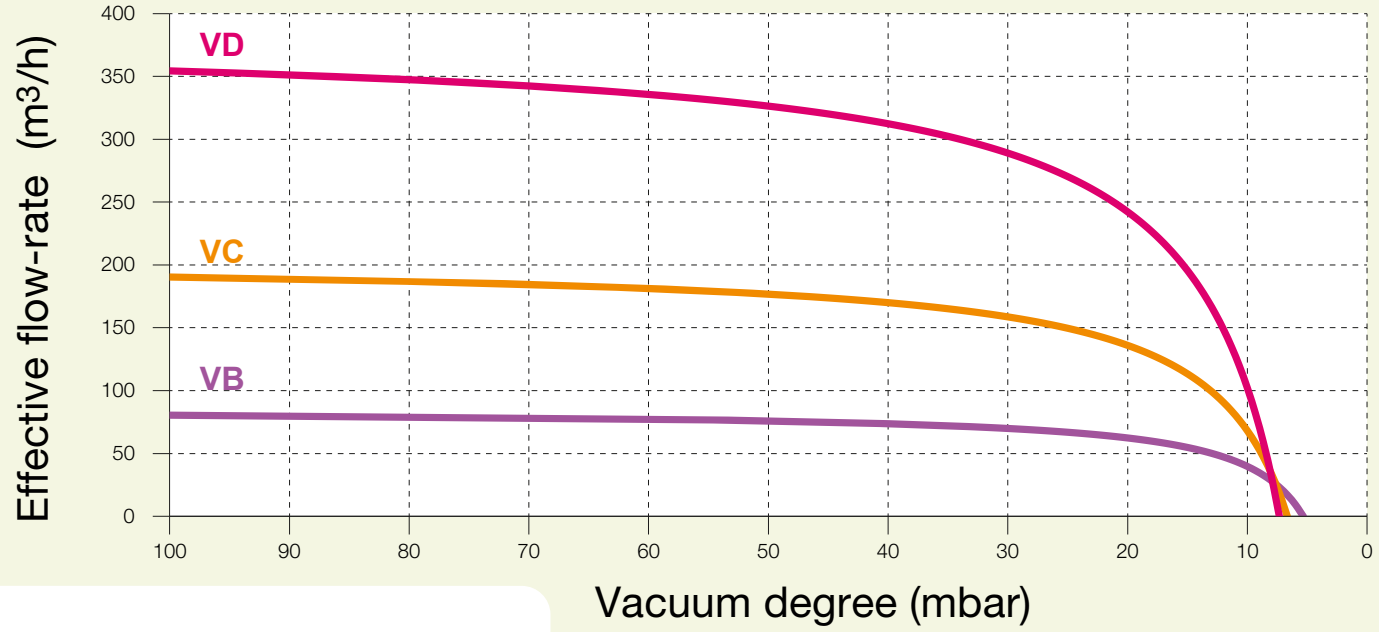


1. Barrel - 1st stage
2. Barrel - 2nd stage
3. Piston
4. Rod
5. Discharge valves
6. Oil-feeder for the injection of non-reusable oil
7. Oil-feeder for recirculated oil
8. Discharge
9. Intake

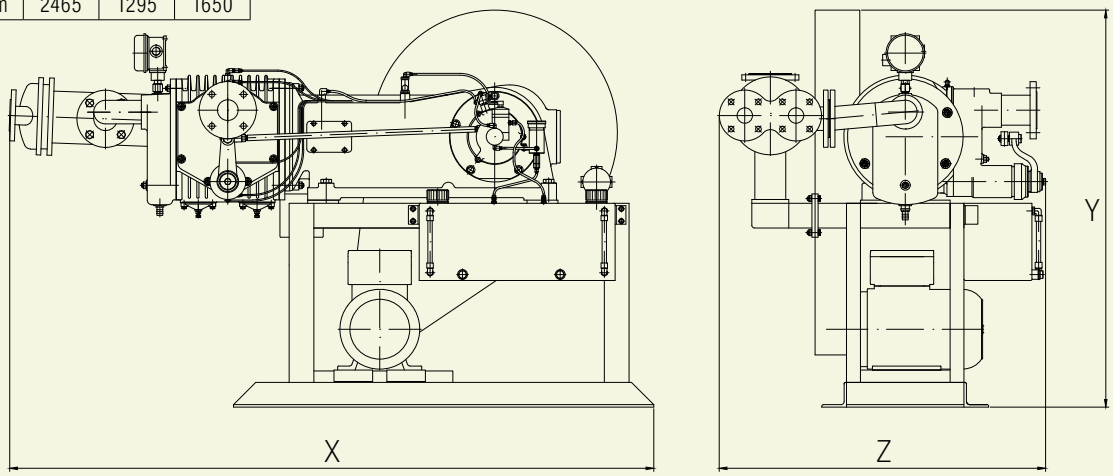
Saurus939

Single stage

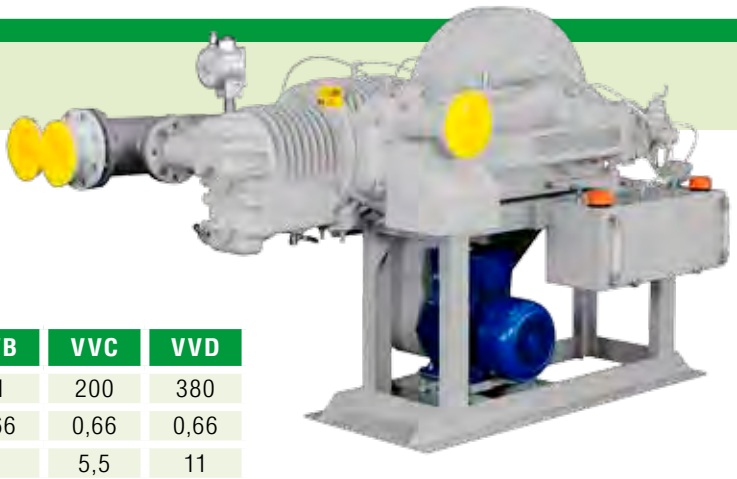
		VB	VC	VD
Nominal flow-rate (at 1000 mbar)	m^3/h	100	240	450
Vacuum (taken with inlet closed)	mbar	5,3	6,6	7
Motor power	kW	3	5,5	11
Pump rotation speed	rpm	250	250	250



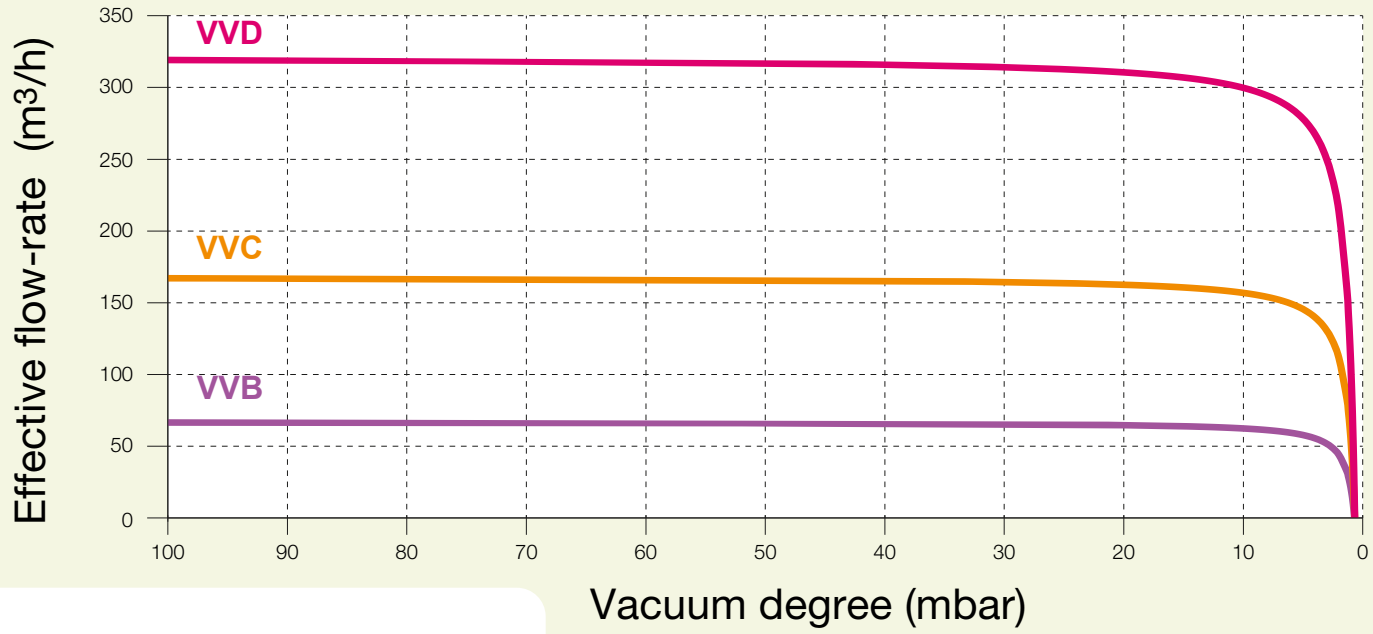
		X	Z	Y
VB	mm	1600	935	980
VC	mm	2085	1095	1260
VD	mm	2465	1295	1650



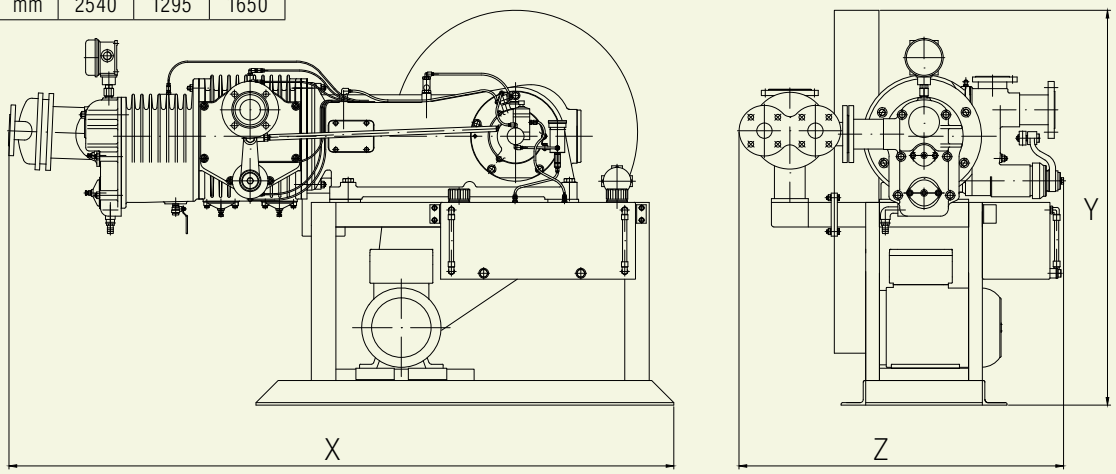
Double stage



		VVB	VVC	VVD
Nominal flow-rate (at 1000 mbar)	m^3/h	81	200	380
Vacuum (taken with inlet closed)	mbar	0,66	0,66	0,66
Motor power	kW	3	5,5	11
Pump rotation speed	rpm	250	250	250

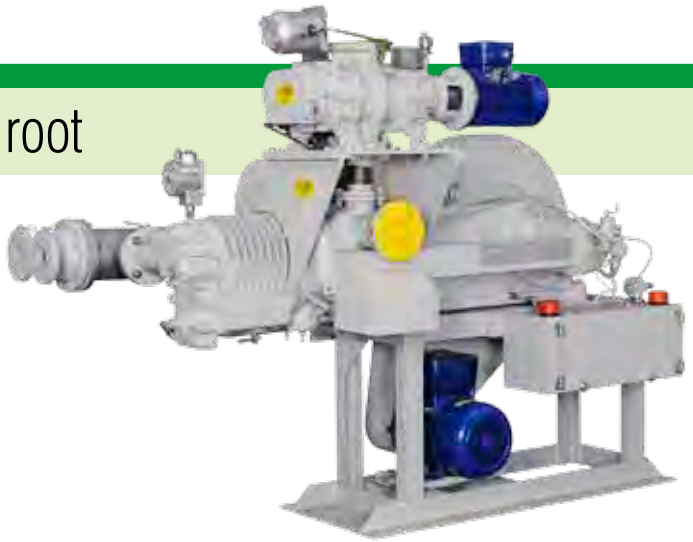


		X	Z	Y
VVB	mm	1620	935	980
VVC	mm	2165	1095	1260
VVD	mm	2540	1295	1650



Saurus939

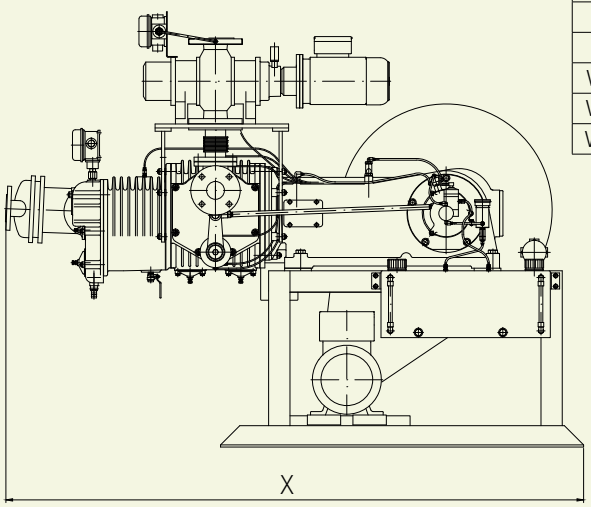
Double stage + 1 root



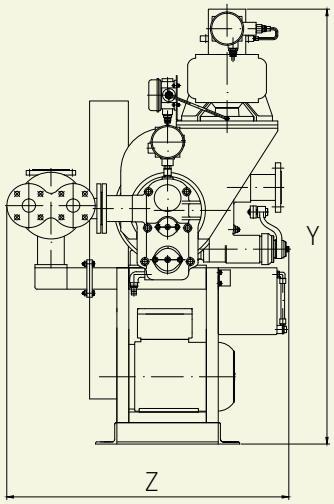
		VVB + RO300		VVB + RO500	
Nominal flow-rate (at 1000 mbar)	m^3/h	81	300	81	500
Vacuum (taken with inlet closed)	mbar	0,08		0,08	
Motor power	kW	3	1,5	3	2,2
Pump rotation speed	rpm	250	3000	250	3000

		VVC + RO500		VVC + RO1000	
Nominal flow-rate (at 1000 mbar)	m^3/h	200	500	200	1000
Vacuum (taken with inlet closed)	mbar	0,08		0,08	
Motor power	kW	5,5	2,2	5,5	4
Pump rotation speed	rpm	250	3000	250	3000

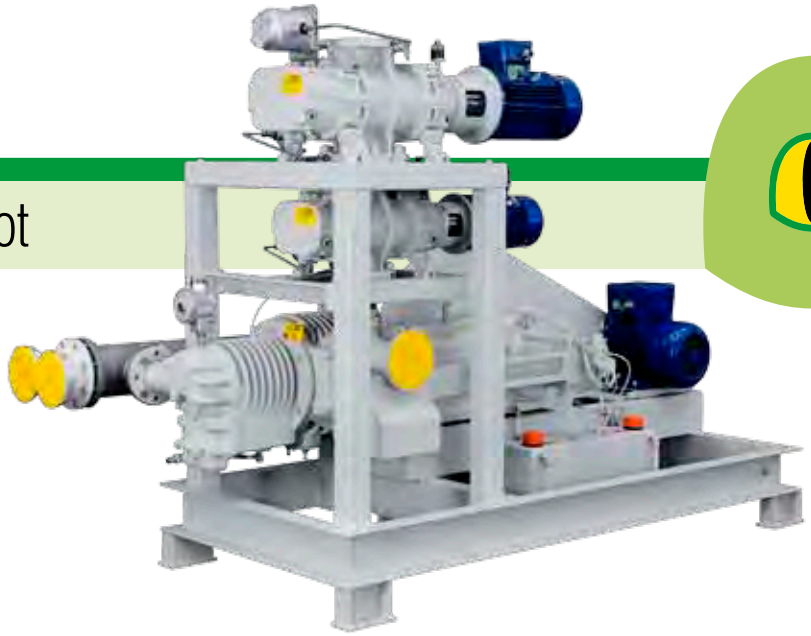
		VVD + RO1000		VVD + RO2000	
Nominal flow-rate (at 1000 mbar)	m^3/h	380	1000	380	2000
Vacuum (taken with inlet closed)	mbar	0,08		0,08	
Motor power	kW	11	4	11	5,5
Pump rotation speed	rpm	250	3000	250	3000



		X	Z	Y
VVB + RO300	mm	1620	935	1350
VVB + RO500	mm	1620	935	1350
VVC + RO500	mm	2165	1095	1630
VVC + RO1000	mm	2125	1165	1675
VVD + RO1000	mm	2540	1295	2010
VVD + RO2000	mm	2540	1295	2075



Double stage + 2 root

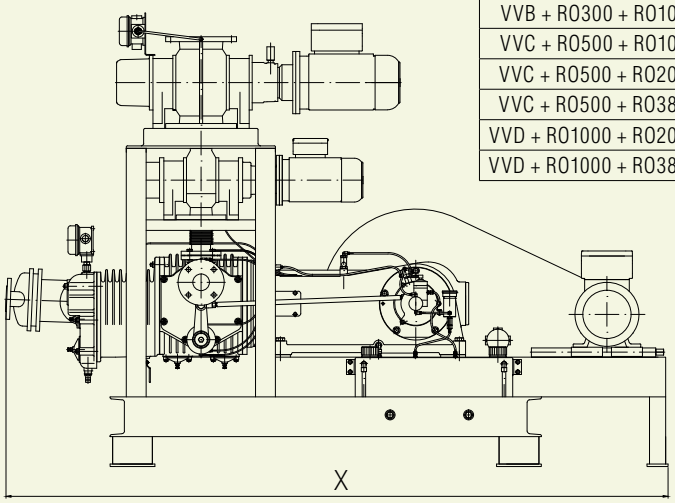


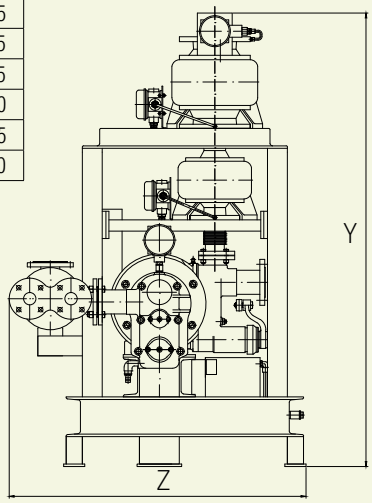
		VVB + RO300 + RO500			VVB + RO300 + RO1000		
Nominal flow-rate (at 1000 mbar)	m^3/h	81	300	500	81	300	1000
Vacuum (taken with inlet closed)	mbar		0,03			0,03	
Motor power	kW	3	1,5	2,2	3	1,5	4
Pump rotation speed	rpm	250	3000	3000	250	3000	3000

		VVC + RO500 + RO1000			VVC + RO500 + RO2000			VVC + RO500 + RO3800		
Nominal flow-rate (at 1000 mbar)	m^3/h	200	500	1000	200	500	2000	200	500	3800
Vacuum (taken with inlet closed)	mbar		0,03			0,03			0,03	
Motor power	kW	5,5	2,2	4	5,5	2,2	5,5	5,5	2,2	7,5
Pump rotation speed	rpm	250	3000	3000	250	3000	3000	250	3000	3000

		VVD + RO1000 + RO2000			VVD + RO1000 + RO3800		
Nominal flow-rate (at 1000 mbar)	m^3/h	380	1000	2000	380	1000	3800
Vacuum (taken with inlet closed)	mbar		0,03			0,03	
Motor power	kW	11	4	5,5	11	4	7,5
Pump rotation speed	rpm	250	3000	3000	250	3000	3000

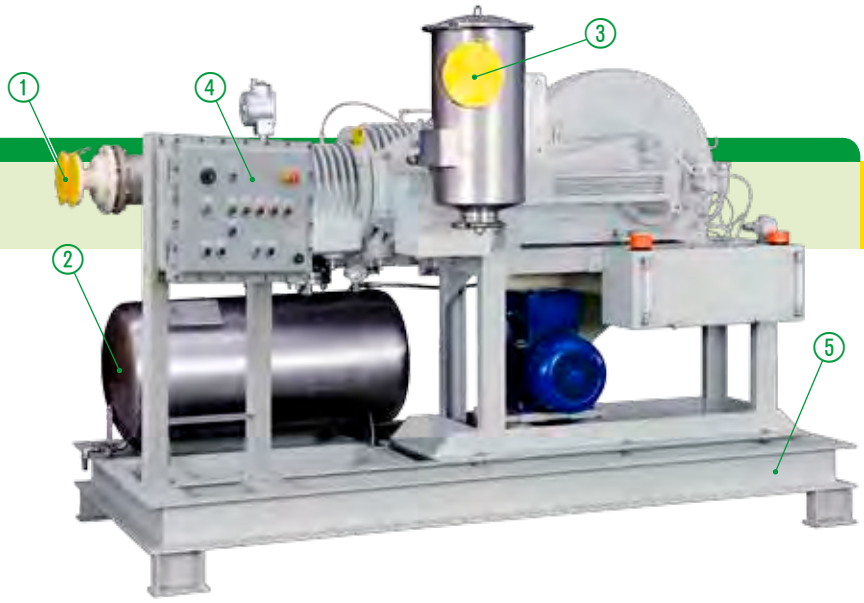
		X	Z	Y
VVB + RO300 + RO500	mm	2000	1030	1620
VVB + RO300 + RO1000	mm	2000	1030	1665
VVC + RO500 + RO1000	mm	2570	1230	1825
VVC + RO500 + RO2000	mm	2570	1230	1895
VVC + RO500 + RO3800	mm	2570	1230	1960
VVD + RO1000 + RO2000	mm	3060	1480	2065
VVD + RO1000 + RO3800	mm	3060	1480	2130





Saurus939

Accessories



A winning choice for complete installations

The high quality of Saurus939, not only in the unquestionable reliability of the vacuum pump, but also the wide range of accessories, allows for turn-key installation of the entire vacuum group:

1. Atmospheric post-condenser for the recovery of solvents from the pump outlet
2. Condensate recovery tank from the post-condenser outlet
3. Pump suction filter with particle centrifuge separation and metal filtering cartridge
4. Control panel board, also available in compliance with ATEX DIRECTIVE 94/9/EC
5. Support base for easy, fast installation.

Certifications

Excellence is a recognized value

Saurus939 complies with the requirements of the most demanding European Directives:

- MACHINERY DIRECTIVE 2006/42/EC
- ELECTROMAGNETIC COMPATIBILITY DIRECTIVE 2004/108/EC
- ATEX DIRECTIVE 94/9/EC.

The standard version, CE εx II 2G T4/T3, is suitable for installation in an area classified as ZONE 1-GAS and temperature class T4 (135°C).

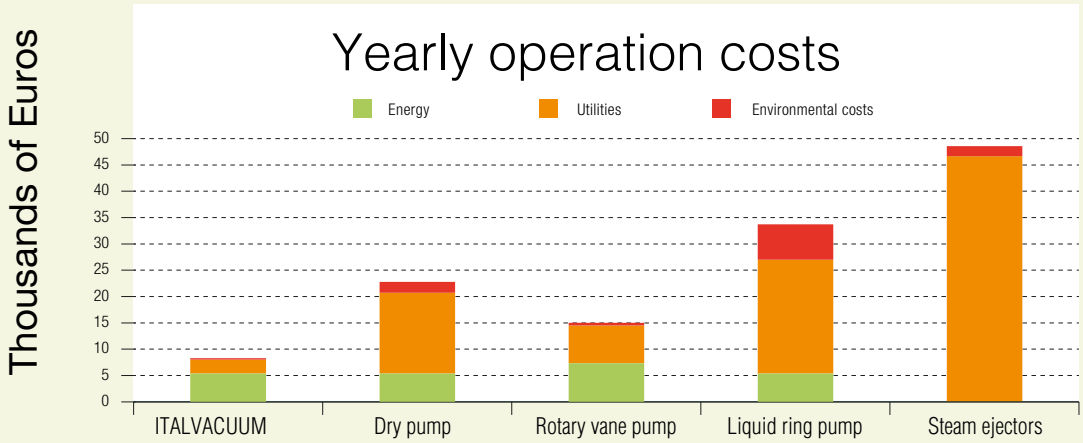
The Saurus939 special version can be supplied with **ATEX certification up to ZONE 0-GAS** (internal pump), ZONE 1-GAS (external pump) with three different classes of temperature T4 / T150°C / T3.

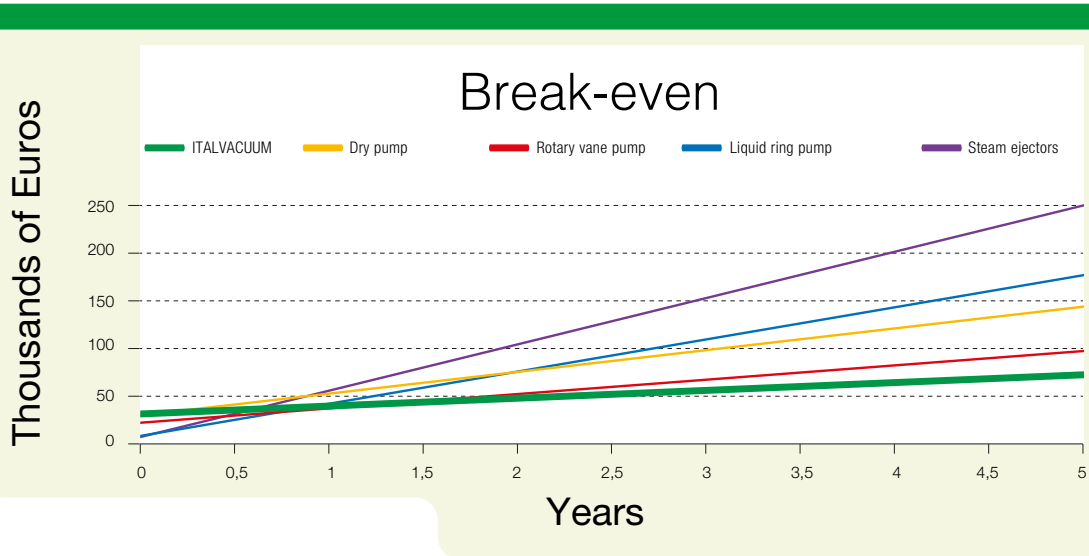
Best results

Always at the top of the sector

Better quality is never an expense: it's an investment. And investment is always rewarded with good results. Over time the Saurus939 vacuum pump, achieves more, lasts longer and has **lower running costs** with respect to other main technologies for vacuum systems.

The use of oil not only avoids any contamination in the process, but also improves performance and increases pump life, reducing maintenance costs, even in the presence of very aggressive solvents. The choice of materials, technology employed and the appropriate solutions taken by Italvacuum in every design detail make Saurus939 the best in the sector. With reliability and results beyond comparison.





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