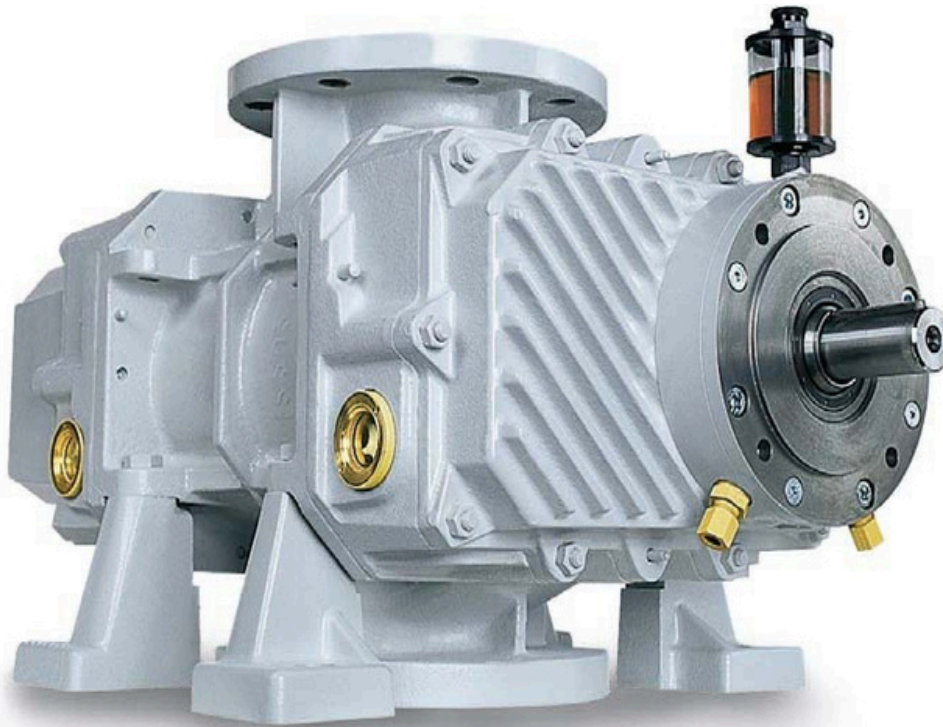


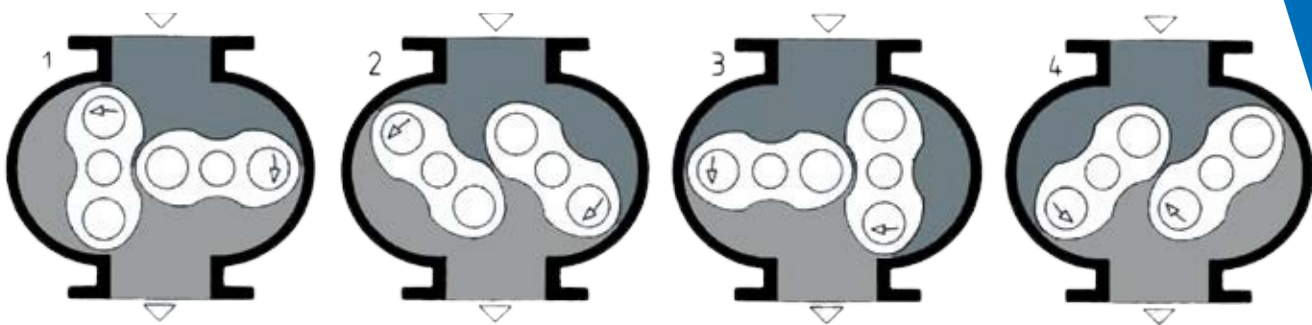
ROOTS VACUUM PUMP



Perfection by Design

GENERAL DETAILS ON THE ROOTS - TYPE VACUUM PUMPS

The Roots-type pumps belong to the group of positive displacement delivery pumps. Two symmetrical pistons having an eight feature, housed in the pump body, rotate in opposite directions with no contact neither between each other nor with the pump body, meshing continuously. The pistons are driven by a set of gears with synchronised rotation, which guarantees frictionfree movement.



During rotation, a progressively growing space is created which corresponds to the suction stage: phases 1 and 2, being gradually decreased phases 3 and 4, compressing the volume of gas. This cycle is repeated four times per each complete rotation of the drive shaft.

NEW RVR with built-in BY-PASS

Reliable frequent stops and starts

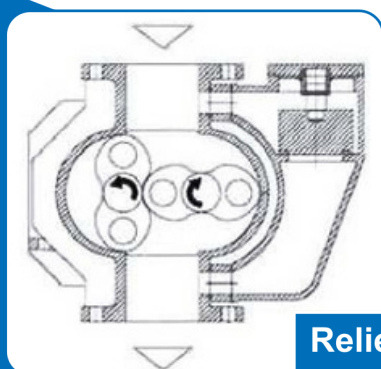
GENERAL INFORMATION

Roots pumps belong to the group of expulsion pumps with positive displacement. Two symmetrical lobes with figure-of-eight cross-sections rotate with no contact between them or with the body, in opposite directions to each other, regularly engaged and housed inside the pump body. The lobes are activated by means of a pair of gears that synchronise their rotations movement and ensure that there is no friction. A bypass conduit, regulated by the relief valve, connects the suction and the exhaust of the pump.

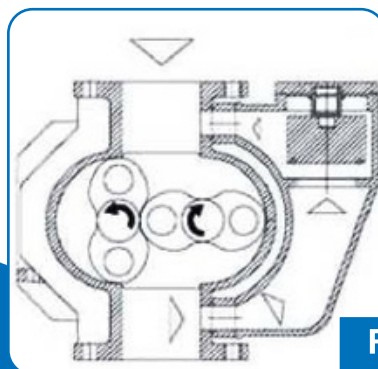
OPERATING PRINCIPLE

Roots pumps are used preferably in combination with former pumps. With a suitable ratio between the primary pump and various stages, large pumping capacities are reached with very low vacuum. The applications of Roots pumps, forming groups with the primary pumps, are very varied and extensive, and they are recommended where high pumping speeds are required at low pressure. The RVR vacuum pump with recirculation is especially designed for applications in which the vacuum needs to be interrupted constantly, for instance, vacuum packaging of food. In order to protect the pump from these working conditions, it is provided with the recirculation by-pass conduit, regulated by a relief valve. This pump is very well suited for applications in which a frequency controller cannot be used due to the fact that constant changes in the working conditions end up damaging the electrical motor. Since this pump is provided with the by-pass, it is possible to simultaneously start the roots pump and the former pump, because the machine is able to work temporarily without a prior high vacuum. It is advisable not to work within a range of pressures that can result in permanent opening of the by-pass conduit, since the gas will continue to heat up until it reaches the thermal limit of the machine.

Throughout the rotation, a gradually increasing space is created, which corresponds to the suction phase. If the vacuum made in the suction area is too high, the relief valve is activated, the piston rises up causing the air to reirculate, preventing extreme pressure differences in the pump. In this way, two operating states of the same pump can be obtained without the need to change its speed of rotation.



Relief Valve Closed



Relief Valve Open

RVR BY-PASS / TECHNICAL DATA

TECHNICAL DATA RVRB				
Size		21.20	22.20	23.20
Nominal suction flow	m ³ /mm.	500	1000	2000
Motor speed	rpm.	2850	2895	2910
Max. difference in continuous operating pressure	mbar	60	60	60
Motor power	kW	2.2	4	5.5
Oil capacity in oil casing A/B	ltr.	1.1/1.6	1.6/2.5	3.1/4.8
Oil capacity shaft passage seal	ltr.	0.07	0.08	0.1
Weight of pump(free shaft) w/o motor	kg.	141	228	360

* Water cooling required if ambient temperature is 50°C and above

MATERIAL OF CONSTRUCTION

Body	Cast iron GG-20
By-pass	
Intermediate sides	
Oil casing	
Lobe-shaft	Forged steel CK-45
Gears	Steel Din 18 Cr Mo4



APPLICATIONS

- ◆ Food industry
- ◆ Electrical industry
- ◆ Pharmaceutical industry
- ◆ Toy industry
- ◆ Mechanical industry
- ◆ Optical industry
- ◆ Metallizing industry
- ◆ Plastic industry
- ◆ Chemical industry
- ◆ Metallurgical industry

ROOTS PUMPS RVB TYPE

The RVB pumps are used in combination with a previous series of pumps and can also be used with condensers arranged in series connection.

CONSTRUCTION CHARACTERISTICS

The Roots-type pump drive shaft is directly driven by the motor shaft by means of an elastic coupling. The shaft passage is closed off by seals with an oil chamber, the oil being used as a sealing fluid. A cooling chamber is included for the shaft passage to eliminate the heat produced by the seal. The seals and the rest of the elastomers are made of VITON fluorinated elastomer.

The RVB type is supplied with an AC, three-phase motor and standardized flanges, in accordance with IEC standards.

TECHNICAL DATA RVB								
Size		20.20	21.20	21.30	22.20	22.30	23.20	23.30
Rated suction flow	m ³ /h.	280	500	740	1000	1430	2000	2880
Rotation speed	min.	2850	2860	2860	2895	2895	2910	2910
Maximum pressure difference with continuous operation	mbar.	80	80	80	80	66	50	40
Motor power	kW	1.1	2.2	3.0	4.0	4.0	5.5	7.5
Oil capacity in oil casing A/B	ltr.	0.7/1.0	1.1/1.6	1.1/1.6	1.6/2.5	1.6/2.5	3.1/4.8	3.1/4.8
Oil capacity shaft passage seal	ltr.	0.06	0.07	0.07	0.08	0.08	0.1	0.1
Weight of pump (free shaft) w/o motor	kg.	76	115	135	208	245	320	360

* Water cooling required if ambient temperature is 50°C and above

Also available from TOSHNIWAL VACUUM

Centralised vacuum systems, Oil lubricated vacuum pumps, Oil immersed vacuum pumps, Roots pumps, Vacuum pumping systems, Vacuum impregnation plants, Epoxy resin mixing & Casting plants, Dry vacuum pump, Ultra high vacuum pumps.

* Dimension / Weight and technical data subject to change without notice