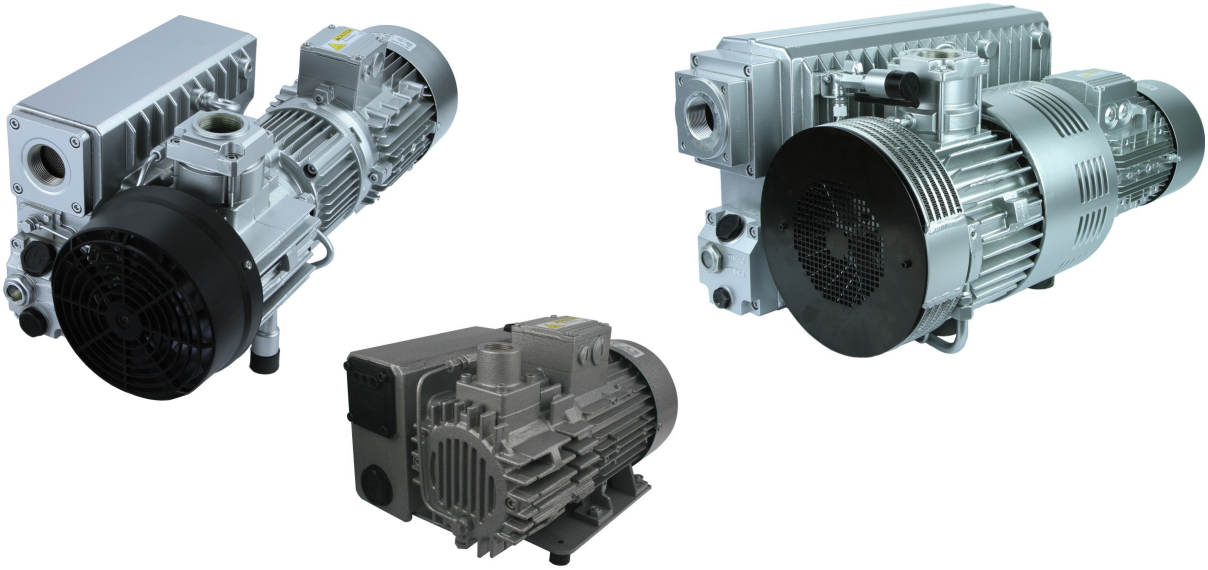
Side channel blowers
Rotary vane pumps

SKV-tec
High quality at fair prices

Rotary vane vacuum pumps (oil lubricated)



Series SKV-RVP

Model SKV-RVP-O-20-0020
Models SKV-RVP-O-05-0040 up to -0300

High quality – Fair prices

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Status: 10/2020

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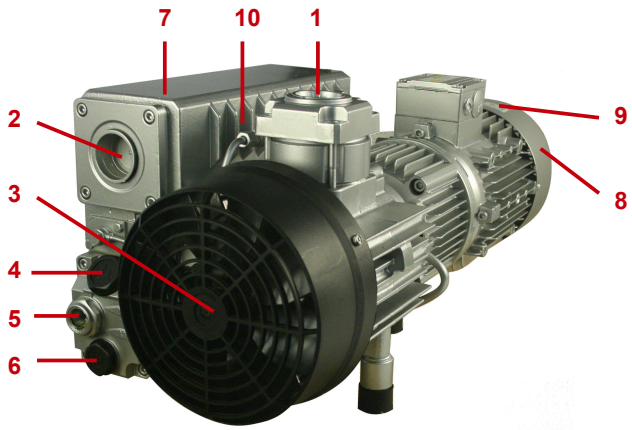
Notes

1.1 Model type (Coding)

SKV	-	RVP	-	O	-	05	-	0040

Company	
Type of pump	
Type of lubrication	
End pressure (abs.)	
Model size	

- Type of pump: RVP = **R**otary **V**ane Vacuum **P**ump
- Type of lubrication:
  - O = oil lubricated
  - D = dry running (not yet availlable)
- End pressure: achievable abs. end pressure (without gas ballast)
  - -05- = 0,5 mbar (abs.)
  - -20- = 2,0 mbar (abs.)
- Model size: Value specifies the maximum airflow (in m³/h) in pressureless operation



Schema of a rotary vane vacuum pump

Pos.	Description	Pos.	Description
1	Suction side (gas inlet)	6	Oil drain plug
2	Pressure side (gas outlet)	7	Oil seperator
3	Axial fan	8	External motor fan
4	Oil filler plug	9	Nameplate (motor)
5	Oil service window	10	Gas ballast valve

1.2 Description and design

The rotary vane pumps of the RVP series are 1-stage vacuum pumps for vacuuming of air. The RVP-O series has 3 rotary vanes and an oil bath lubrication with oil return.

For the rotary vane pumps with an airflow up to 20 m³/h the electric motor is modularly screwed with the pump unit. The sealing of the driving shaft is ensured by a mechanical shaft seal.

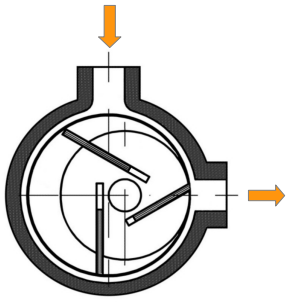
The rotary vane pumps with an airflow of 40 - 300 m³/h are driven by a standard electric motor which are connected by a flexible coupling sleeve to the pump unit. These models are also equipped with an integrated check valve, which maintains the vacuum for some time even when the pump is at standstill.

The cooling of the unit is ensured by radiation and forced surface cooling by an external airflow. For this purpose a motor-side fan is mounted on the drive shaft of the motor. The models with a flow rate ≥ 40 m³/h are additionally equipped with an axial or radial fan mounted on the pump shaft. Some models also have a tube coil oil cooler. That way the flowing oil is further cooled by the external air stream.

An oil recovery tank with built-in oil seperator elements is mounted on the pressure nozzle. These filter elements made of microfibre perform the task of an oil vapor separator and a silencer. This way the separated oil is returned to the oil circuit. Thus the recovered oil is available again for the lubrication, the cooling and the sealing of the rotating as well as the rigid parts.

All models of rotary vane pumps are prepared for the installation of a gas ballast valve, which allows the steam to be supplied with water vapor. The rotary vane pumps with a flow rate ≥ 160 m³/h are equipped with a gas ballast valve by default.

1.3 Operating mode of the unit

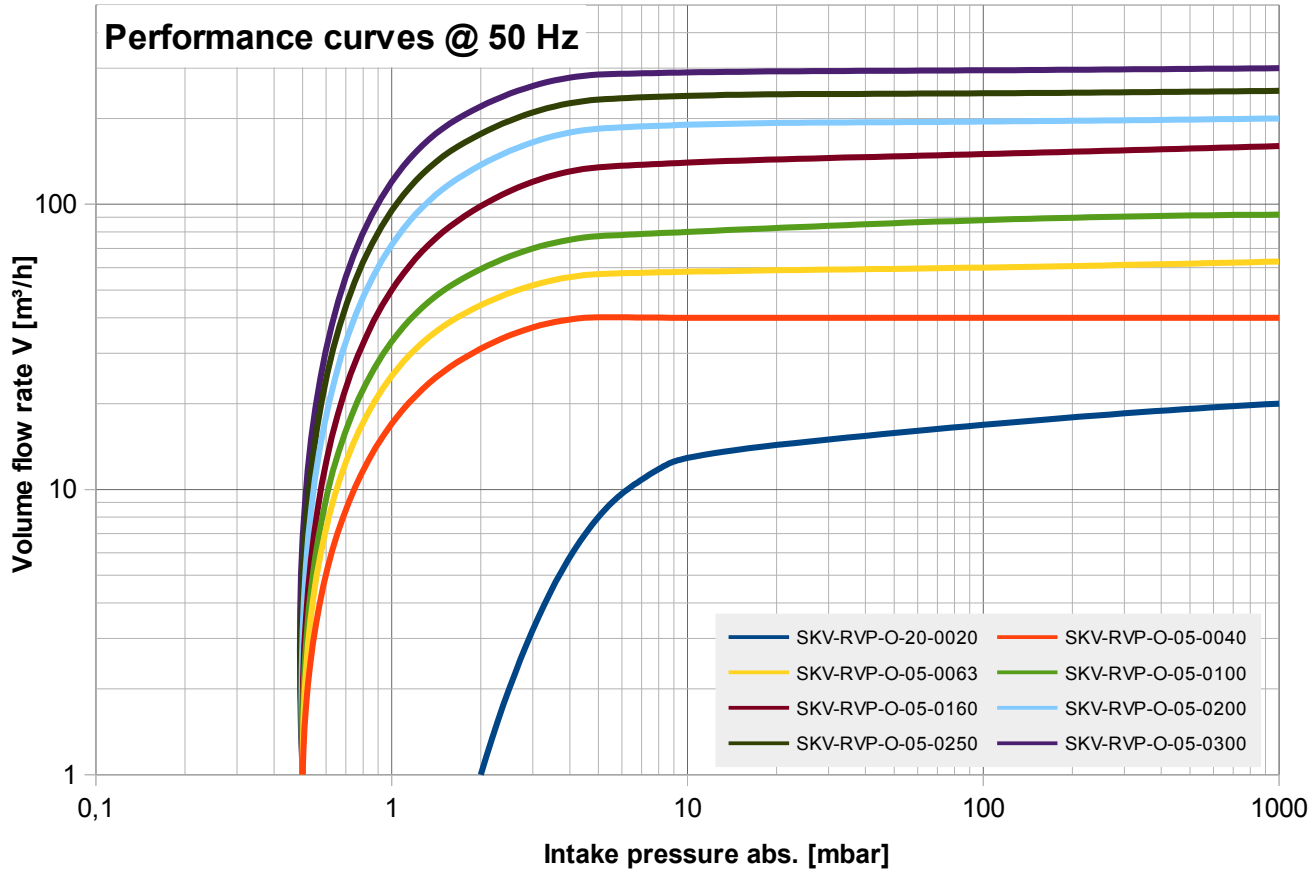


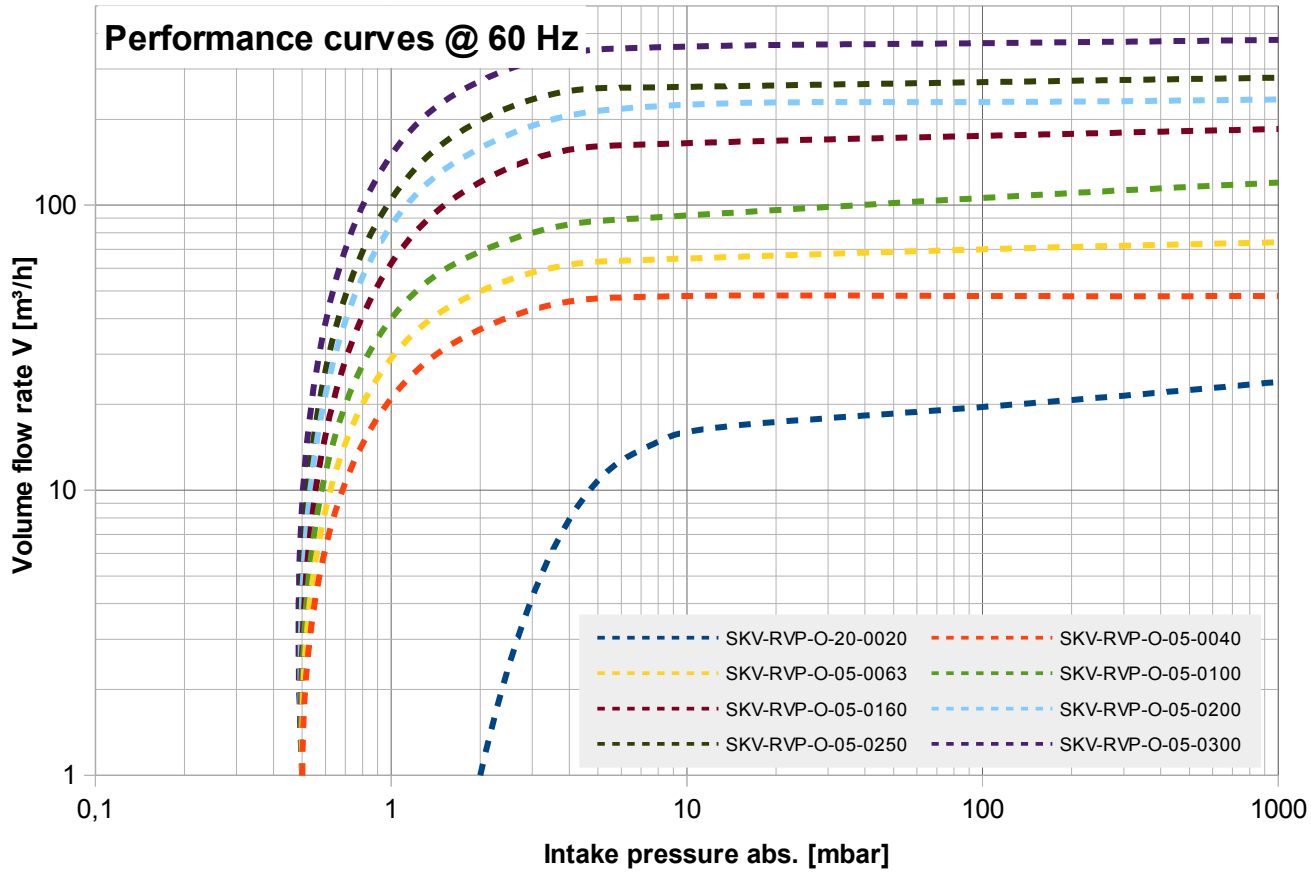
The rotary vane vacuum pump operates according to the displacement principle. A rotor, equipped with three rotary vanes, rotates eccentrically inside a stator. The rotary vanes which are guided freely in the rotor are pressed against the stator wall by the centrifugal force and thus form a corresponding number of chambers. Due to the eccentric arrangement the volume of these chambers varies depending on the angle of rotation. During the suction phase a vacuum is generated by the increase in chamber volume. On the other hand in the outlet phase the chamber volume decreases, the air is compressed and discharged into the oil collecting tank via the discharge valve. The oil transported with the air stream is separated in the oil separator via the oil separator elements made of microfibre and thus returns to the oil circuit. The cleaned air leaves the unit at the pressure side (gas outlet) of the oil separator.

Our oil-lubricated rotary vane pumps can only be used to generate a vacuum. The maximum end pressure of the unit depends on whether it is operated with gas ballast.

Advantages of our rotary vane vacuum pumps:

- robust and compact design
- easy to maintain, long service life
- reliable in operation and economical
- excellent oil separation
- Continuous operation even under difficult conditions





The performance curves are based on air at a temperature of 20°C and an atmospheric pressure of 1013 mbar (tolerance ±10%).

Technische Daten – Technical data – Spécifications techniques:

Modell Model Modéle	Enddruck (abs.) Ultimate pressure Pression finale	Frequenz Frequency Fréquence	Max. Luftmenge Max. air flow Débit max.	Motornennleistung motor rated power Puisance finale	Strom / Spannung Current / voltage Courant / voltage	Motornenndrehzahl Nominal engine speed Vitesse de rotation nominale	Wasserdampfkapazität Water vapor capacity La capacité de la vapeur	Ölfüllung Oil filling Quantité d'huile	Betriebstemperatur Operating temperature Température de fonctionnement	Schalldruckpegel dB (A)	Gewicht Weight Poids
	mbar	Hz	m³/h	kW	A	min^{-1}	l/h	l	°C		kg
SKV-RVP-O-20-0020 [3]	2,0	50	20	0,75	2,94 Δ / 1,7 Y [2]	2850	n.v.	0,45	85	68	23
		60	24	0,86	1,67 Y [2]	3450			90	70	
SKV-RVP-O-05-0040	0,5	50	40	1,4	5,2 Δ / 3,0 Y [2]	1450	1,1 [1]	1,0	82	63	38
		60	48	1,7	3,0 Y [2]	1740			90	66	
SKV-RVP-O-05-0063	0,5	50	63	2,0	7,0 Δ / 4,0 Y [2]	1450	1,8 [1]	2,0	84	64	52
		60	76	2,4	3,9 Y [2]	1740			92	66	
SKV-RVP-O-05-0100	0,5	50	100	2,7	9,3 Δ / 5,4 Y [2]	1450	2,8 [1]	2,0	84	65	70
		60	120	3,4	5,5 Y [2]	1740			93	68	
SKV-RVP-O-05-0160	0,5	50	160	4,0	8,0 Δ / 4,6 Y [2]	1450	2,5 [1]	5,0	64	70	140
		60	190	6,6	11,0 Δ [2]	1740			66	72	
SKV-RVP-O-05-0200	0,5	50	200	4,0	8,0 Δ / 4,6 Y [2]	1450	4,0 [1]	5,0	71	72	140
		60	240	6,6	11,0 Δ [2]	1740			78	74	
SKV-RVP-O-05-0250	0,5	50	250	5,5	10,6 Δ / 6,2 Y [2]	1450	4,5 [1]	6,5	80	72	190
		60	300	9,2	14,4 Δ [2]	1740			81	74	
SKV-RVP-O-05-0300	0,5	50	300	7,5	14,3 Δ / 8,3 Y [2]	1450	5,0 [1]	6,5	82	74	190
		60	360	9,2	14,4 Δ [2]	1740			85	76	

[1] at 150 hPa (mbar) and 85 °C
[2] 50 Hz: 230V Δ / 400V Y | 60 Hz: 277V Δ / 480V Y
[3] also available as 1-phase (1~) model: 230V fixed voltage with 5,2 A at 50 Hz

Die SKV-RVP Drehschieber können als Vakuumerzeuger gemäß der Kennlinien (gelten für Luft von 20°C / Toleranz: ±10 %) betrieben werden.

Die Motoren der SKV-RVP entsprechen DIN EN 60 034 / IEC 34-1, Isolierstoffklasse F und Schutzart IP55.

Die Toleranzen der Motoren betragen für die Spannung ±5 % und die Frequenz ±2 %.

Die maximale Wasserdampfverträglichkeit bei 85°C beträgt 40 mbar.

Der Schalldruckpegel wurde nach EN ISO 1680 bestimmt, gemessen in 1m Abstand bei mittlerer Drosselung, angeschlossenen Leitungen, Toleranz ±3 dB(A).

The SKV-RVP rotary vane pumps can be used as vacuum pump in accordance with the characteristic curves (valid for air at 20°C / Tolerance: ±10 %).

The engines of the SKV-RVP are designed according to DIN EN 60 034 / IEC 34-1, insulation class F and protection IP55.

The tolerances of the motors are for the voltage ±5 % and the frequency ±2 %.

The maximum water vapor tolerance at 85°C is 40 mbar.

Surface sound pressure level is measured acc. to EN ISO 1680 at a distance of 1 m. The pump is throttled to an average suction pressure, connected hose, tolerance ±3 dB(A).

Chaque modèle de SKV-RVP étant disponible en vide conformément à la courbe caractéristique (données pour de l'air à 20°C / Tolérance: ±10 %).

Les moteurs de la SKV-RVP selon norme DIN EN 60 034 / IEC 34-1, classe d'insulation F et la protection IP55.

Les tolérances des moteurs soit pour une tension de ±5 % et la fréquence ±2 %.

La tolérance maximale de vapeur à 85°C est 40 mbar.

Le niveau de pression acoustique a été déterminée selon la norme EN ISO 1680, mesurée à une distance de 1 m au moyen d'étranglement, les tuyaux connectées, tolérance ±3 dB(A).

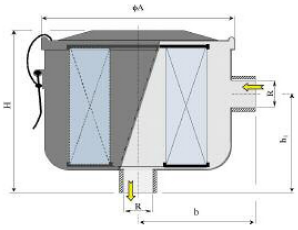
Vacuum filter with paper / polyester filter cartridge (high grade of filtration)

In order to protect the oil-lubricated rotary vane vacuum pumps from contamination (very dusty environment) in the sucked-in air the use of an inline filter (figure on page 7, part number 7) is obligatory. This reduces the wear of the vacuum pump and increases the service life of the equipment. Depending on the operating mode the following filter cartridges can be selected:

- **Paper cartridge**: pleated surface (larger surface), double-walled perforated steel sheathing, degree of separation 5 µm → Use **not** suitable in the presence of water, condensates or oil vapor in the flow
- **Polyester cartridge**: pleated surface (larger surface), double-walled perforated steel sheathing, degree of separation 3 µm → Use suitable in the presence of water, condensates or oil vapor in the flow

The following inline filters are supplied without fastening and connecting material. They can be extended by mounting parts (see page 8 / reductions, double nipples, pipe bends, etc.).

fits for	max. flow-rate	Dimension	Article-No.			
			Model with paper cartridge		Model with polyester cartridge	
	[m³/h]	R	Housing + Filter	Replace-ment filter	Housing + Filter	Replace-ment filter
SKV-RVP-O-20-0020	84	1¼“ → ¾“	140200-34C	140200C	140200-34P	140200P
SKV-RVP-O-05-0040 SKV-RVP-O-05-0063		**1¼“**	140200		140200-2	
SKV-RVP-O-05-0100	192	1½“ → 1¼“	140210-1	140210C	140210-3	140210P
SKV-RVP-O-05-0160 SKV-RVP-O-05-0200 SKV-RVP-O-05-0250 SKV-RVP-O-05-0300	300	**2“**	140220	140220C	140220-2	140220P



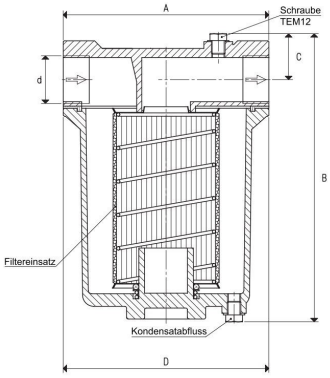
The respective dimensions of the individual filter models can be found in the corresponding data sheet.

Vacuum filter with Inox cartridge (moderate grade of filtration)

The vacuum filter with inox cartridge is also easy to open and the cartridge can be cleaned quickly.
The cartridges are made of stainless, corrugated steel which can be cleaned easily.
They have a degree of separation of 44 µm, but are also available on request in 100 µm and 300 µm.

The following inline filters are supplied without fastening and connecting material. They can be extended by mounting parts (see page 8 / reductions, double nipples, pipe bends, etc.).

fits for	max. flow-rate	Dimension	Article-No.	
			Model with Inox cartridge	
	[m³/h]	R	Housing + Filter	Replace-ment filter
SKV-RVP-O-20-0020	40	¾“	140310	140310I
SKV-RVP-O-05-0040 SKV-RVP-O-05-0063 SKV-RVP-O-05-0100	150	1¼“	140330	140330I
SKV-RVP-O-05-0160 SKV-RVP-O-05-0200 SKV-RVP-O-05-0250 SKV-RVP-O-05-0300	300	2“	140350	140350I



The respective dimensions of the individual filter models can be found in the corresponding data sheet.

Vacuum control valve and vacuum manometer

The **vacuum control valves** (figure on page 7, part number 3) are used to regulate the vacuum circuit at a constant operating vacuum. The valves reach the adjustable degree of vacuum (external leakage) by feeding ambient air.

The degree of vacuum is adjusted by rotating a knurled screw in both directions. The control range is -330 to -999 mbar. The fine thread allows precise adjustment. The functional principle is realized by a spring-loaded mechanical valve opening.

fits for	max. flow-rate	Dimension	Article-No.
	[m³/h]	R	
	4	⅛“	151000-018
	20	½“	151000-012
SKV-RVP-O-20-0020	40	¾“	151000-034
SKV-RVP-O-05-0040 SKV-RVP-O-05-0063 SKV-RVP-O-05-0100	70	1“	151000-100
		1¼“ (1“)	151000-114

Figure of a control valve:
(Model size 1“ with max. 70 m³/h)

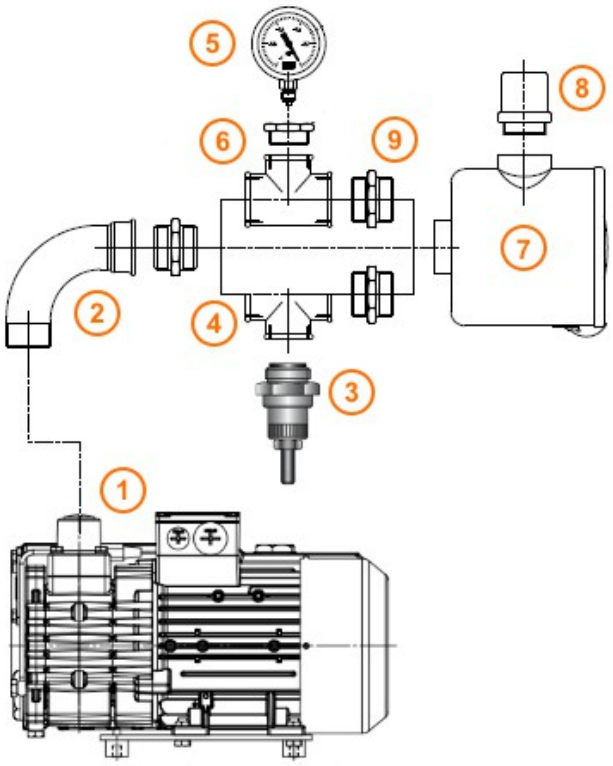


Figure 1: Accessories for RVPs

The **vacuum manometers** (figure on page 7, part number 5) are used for monitoring as well as setting the desired degree of vacuum. The pressure version can also be used as a monitoring element for the oil separator elements.

The offered models are available in various designs (vertical, horizontal), display sizes (50 – 100 mm) and both undamped and glycerin-damped.

Design	Display range (rel):	Ø Display [mm]	Scale division	Type of damping	Class of accuracy	Dimension of connection	Degree of protection	Material (housing)	Material (metering)	Article-No.			
										Master No.	Master-Extension + adapter fits for SKV-RVP-O		
										without mounting parts	-20-0020	-05-0040 up to -05-0100	-05-0160 up to -05-0300
vertival	(-1) – 0 bar	63	0,05	-	2.5	G ¼“	IP 42	PVC	brass	151063-S	-034 (G ¾“)	-114 (G 1¼“)	-200 (G 2“)
				Glycerin	1.5	G ¼“	IP 65	CrNi		151063-SG			
		100	0,02	-	2.5	G ½“	IP 42	PVC		151100-S			
				Glycerin	1.5	G ½“	IP 65	CrNi		151100-SG			
horizontal	(-1) – 0 bar	63	0,05	-	2.5	G ¼“	IP 42	PVC		151063-W			
				Glycerin	1.5	G ¼“	IP 65	CrNi		151063-WG			
		100	0,02	-	2.5	G ¼“	IP 42	PVC		151100-W			
				Glycerin	1.5	G ½“	IP 65	CrNi		151100-WG			
	0 – 0,6	50	0,02	-	1.6	G ¼“	IP 42	steel		151050-W	-034 (G ¾“)		

Figure of a manometer:
(Design vertical)

Figure of a manometer:
(Design horizontal)

Nonreturn valve

The nonreturn valves prevent a return flow when the vacuum pump or the compressor is at standstill and thus the loss of the built-up vacuum / pressure. The offered nonreturn valves are suitable for vacuum, are made of brass and have an NBR seal. They can only be operated without errors in vertical installation.

fits for	Dimension		Article-No.
	Thread	PN	
	⅜“	25 bar	151001
	½“	25 bar	151002
SKV-RVP-O-20-0020	¾“	25 bar	151003
	1“	25 bar	151004
SKV-RVP-O-05-0040 up to -0100	1¼“	18 bar	151005
	1½“	18 bar	151006
SKV-RVP-O-05-0160 up to -0300	2“	18 bar	151007

Hose connector

With these **hose connectors** (figure on page 7, part number 8) the rotary vane vacuum pumps can be connected to a variety of different hose diameters. The connectors are suitable for connecting smooth as well as reinforced hoses. They are made entirely of brass. On request similar dimensions are also available in nickel-plated brass.

fits for	Dimension		Article-No.
	thread side	hose side	
	⅜“	13 mm	151030-038
	½“	16 mm	151030-012
SKV-RVP-O-20-0020	¾“	19 mm	151030-034
	1“	25 mm	151030-100
SKV-RVP-O-05-0040 up to -0100	1¼“	32 mm	151030-114
	1½“	38 mm	151030-112
SKV-RVP-O-05-0160 up to -0300	2“	50 mm	151030-200

Mounting parts and connection material

Various **mounting parts** for the filter, control valve and manometer can be necessary depending on the configuration.
The following parts are made of die-cast and are normally on stock:

fits for	Dimension	Article-No.				
	R	elbow (AG – IG) ②	T-neck (AG – 2x IG) ⑥	Cross piece (AG – 3x IG) ④	Double nipple (AG – AG) ⑨	Pipe nipple (AG – AG)
SKV-RVP-O-20-0020	¾“	140202I-2	151020	151010	990107-G	
SKV-RVP-O-05-0040 up to -0100	1¼“	140202I	151021	151011	990100-G	140201 (L = 100 mm)
SKV-RVP-O-05-0160 up to -0300	2“	140222I	151022	151012	990102-G	140221 (L = 150 mm)

On request most of these components are also available in brass / red brass!

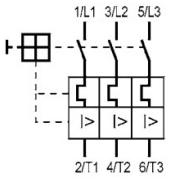
Motor protection switch

According to standard DIN EN 60204-1 motors with a rating of more than 0.5 kW must be protected against unacceptable heating. This applies to all our rotary vane vacuum pumps. A **motor protection switch** ensures both overload protection and short-circuit protection for the cables and lines. If an unacceptable current increase, e.g. by overloading or blocking the motor, the motor protection switch interrupts all active conductors. An overheat protection as well as phase failure protection can not be provided by a motor protection switch. For this purpose, further actions must be taken.

All motor protection switches are also available with the following options:

-G Motor protection switch with plastic housing (IP 55), but without cabling

-GK Motor protection switch with plastic housing (IP 55), ready for connection with connection cable for motor and mains cable



Description	Rated current [A]	No. phases / Article-No.		Option	
		1-phase (230 V)	3-phase (400 V)	-G	-GK
Motor protection switch – 1,6 A	1,0 – 1,6	120007-1P	120007	X	X
Motor protection switch – 2,5 A	1,6 – 2,5		120006	X	X
Motor protection switch – 4,0 A	2,5 – 4,0	120003-1P	120003	X	X
Motor protection switch – 6,3 A	4,0 – 6,3	120002-1P	120002	X	X
Motor protection switch – 10 A	6,3 – 10	120004-1P	120004	X	X
Motor protection switch – 16 A	10 – 16		120005	X	X

Vacuum oil

The vacuum pump oils are optimally alloyed, have a high performance level and a wide range of applications. They are distinguished by a good viscosity-temperature behavior, high aging resistance and reliable corrosion protection. This makes them particularly suitable for the lubrication of vacuum pumps, especially for our rotary vane vacuum pumps.

Characteristics :

- High performance level
- Very good viscosity-temperature behavior
- High aging resistance
- Excellent wear protection
- Reliable corrosion protection
- Very good oxidation stability (V-M 068 and V-M 100)
- Very good de-emulsification (V-M 068 and V-M 100)
- Excellent air separation capacity which largely prevents foam formation (V-M 068 and V-M 100)
- Low pour point (V-M 068 and V-M 100)
- Neutral against sealing materials

Vacuum pump oils	Method of manufacture	Viscosity at 40°C	Ambient temperature	Package size	Article-No.
V-M 032	mineral	32,7 mm²/s	< 5°C	5 L	1040-VM032-5
				20 L	1040-VM032-20 [1)]
V-M 046		46,0 mm²/s	< 10°C	5 L	1040-VM046-5
V-M 068		68,0 mm²/s	5 - 20°C	5 L	1040-VM068-5
				20 L	1040-VM068-20
V-M 100		100,0 mm²/s	12 - 30°C	5 L	1040-VM100-5
				20 L	1040-VM100-20
V-S 100	synthetic	100,0 mm²/s	12 - 50°C	5 L	1040-VS100-5 [1)]
				20 L	1040-VS100-20 [1)]

[1)] Package type / size normally not in stock but orderable

Gasket set / Servicing kit / Overhaul kit

90400	05	0040	-	DS
Spare part base number				
End pressure (05 = 0,5mbar)				
Model size (0040 = 40 m³/h)				
Set code: **DS** : Gasket set / **WS** : Servicing kit / **VS** : Overhaul set				

Format Spare part article number

e.g. Overhaul set for SKV-RVP-O-05-0100 → 90400 05 0100-VS (see symbolic picture)

Teilenr. No **)	Bezeichnung des Teils	Description	SKV-RVP-O-								
			-20-0020			-05-0040 bis -05-0100			-05-0160 bis -05-0300		
			DS	WS	VS	DS	WS	VS	DS	WS	VS
022	Schieber	Vane			3			3			3
030	Nadellager	Needle bearing			1			2			2
035	Wellendichtring	Shaft seal			1			2			4
050	O-Ring (Zylinder)	O-ring (cylinder)	2			2			2		
084	Dichtung (Sichtglas)	Seal (oil window)	1								
086	Dichtung (Verschr. vorne & hinten)	Seal (plug front & rear)	1								
089	Dichtung (Verschr. oben)	Seal (plug top)	1								
096	Dichtung (Öldrainage)	Seal (oil drainage)	1								
100	Ölfilter	Oil filter					1			1	
106	Dichtung (Abluft hinten)	Seal (exhaust back)							1		
120	Luftentölelement	Exhaust filter		1			1 / 2 *)			2 / 3 *)	
136	Dichtung (Servicedeckel)	Seal (service cover)				1					
141	Dichtung (Abluft)	Seal (exhaust)	1			1			1		
151	Sieb (rund, grob)	Screen rough						1			
152	Sieb (rund, fein)	Screen fine						1			
162	Dichtung (Servicedeckel)	Seal (service cover)							1		
185	Abscheiderdichtung	Separator gasket	1			1			1		
206	Dichtung (seitlicher Deckel)	Seal (side cover)							1		
255	Dichtung/O-Ring (Saugflansch)	Seal/O-ring (suction side)	1			1			1		
261	Saugsieb	Inlet screen			1			1			1
312	Kupplungshülse	Coupling sleeve						1			1

*) Number of parts depends on the model series

**) Part numbers can be found in the exploded drawing in the respective operating instruction

not included in this kit

not installed/existent in this model series