

oerlikon
leybold vacuum

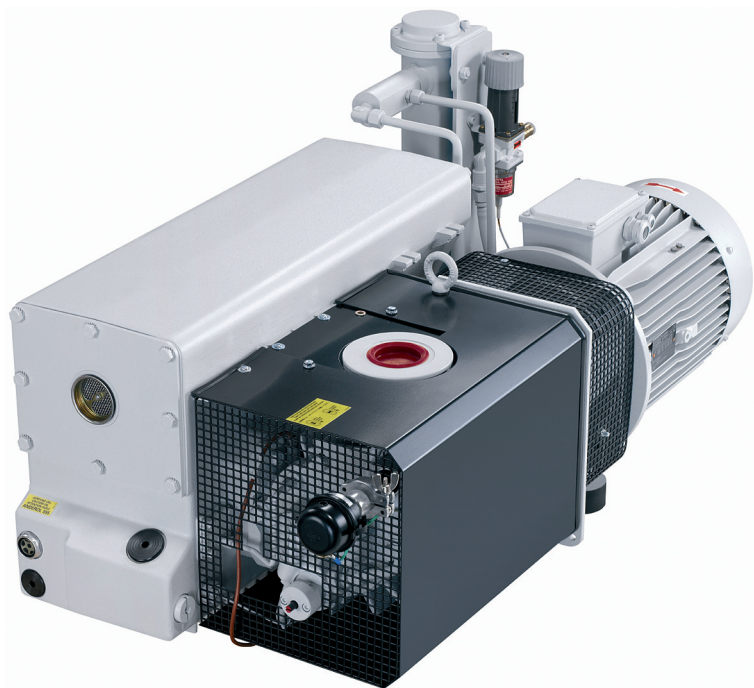
Sogevac®

SV200 - SV300 BR2

Single-stage, oil-sealed rotary vane pump

Operating instructions GAET02307_002_10

Ref.:
10926 / 10927
10930 / 10931
95526 / 95527
95536 / 95537
95027
95031



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Safety Information

Important Safety Information

Indicates procedures that must be strictly observed to prevent hazards to persons.

Indicates procedures that must be strictly observed to prevent damage to, or destruction of the product.

Emphasises additional application information and other useful information provided within these Operating Instructions.

The CERlikon Leybold Vacuum Sogevac® SV200 - SV300 BR2 has been designed for safe and efficient operation when used properly and in accordance with these Operating Instructions. It is the responsibility of the user to carefully read and strictly observe all safety precautions described in this section and throughout the Operating Instructions. The Sogevac® SV200 and SV300 **must only be operated in the proper condition and under the conditions described in the Operating Instructions.** It must be operated and maintained by trained personnel only. Consult local, state, and national agencies regarding specific requirements and regulations. Address any further safety, operation and/or maintenance questions to our nearest office.

Failure to observe the following precautions could result in serious personal injury!

Sogevac® pumps are not designed:

- for pumping of dusty, aggressive, corrosive, flammable or explosive gases or gases mixtures,
- for pumping of oxygen or other highly reactive gases with a greater concentration than atmospheric concentration (>20%),
- for working in flammable, explosive or dusty environment.

For all these cases, special materials must be used. In case of doubt, please contact CERlikon Leybold Vacuum.

See also the limits of use indicated in the CE declaration of conformity.

Never expose part of the body to the vacuum. There is a danger of injury. Never operate the pump with an open and thus accessible inlet. Vacuum connections as well as oil filling and oil draining openings must not be open during operation of the pump.

When operating pump is hot and some surfaces could reach a temperature higher than 80 °C (176 °F). There is a risk of burn by touching.

Depending on the process involved, dangerous substances and oil may escape from the pump. Take the necessary safety precautions!

When working on the pump system always observe the Operating Instructions.

Warning

Caution

Note

Warning



Safety Information

Warning



Disconnect the unit from the power supply before starting any work.

Warning



Take appropriate precautions to insure that the pump cannot start.

If the pump has pumped hazardous gases it will be absolutely necessary to determine the nature of the hazard involved and take the appropriate safety precautions.

Observe all safety regulations!

Take adequate safety precautions prior to opening the intake or exhaust port.

Caution

Failure to observe the following precautions could result in damage to the equipment!

Liquid and solid particles must not enter the pump. Install the adequate filters, separators and/or condensers. In case of doubt consult CERlikon Leybold Vacuum.

The intake line of the pump must never be connected to a device with over atmospheric pressure. Design the exhaust line so that no pressure higher than 1,15 bar abs. (0,15 bar rel.) can occur.

Operating of the pump without oil or operating with incorrect direction of rotation can destroy the pump.

Note

Never use discarded seals. Always assemble using new seals.

Respect the instructions concerning environment protection when discarding used oil or exhaust filters!

The pump must be packaged in such a way that it will not be damaged during shipping, and so that no harmful substances can escape from the package.

The references to figures, e. g. (2/10) consist of the Fig. No. and the item No. in that order.

This Manual is valid for standard products. If the delivered pump is a special version, then the pump will be delivered with an additive document which is to be understood as a part of the Instruction Manual.

We reserve the right to alter the design or any data given in these Operating Instructions. The illustrations are not binding.

1 Description

Sogevac® pumps are designed for pumping of inert gases in the range of rough vacuum, between atmospheric pressure and ultimate pressure of the pump.

When removing condensable vapours, a gas ballast valve must be installed.

1.1 Principle of operation

The Sogevac® pumps SV200 and SV300 BR2 are single-stage oil-sealed rotary vane vacuum pumps.

The anti-suckback valve, gas ballast valve (optional), exhaust filter, oil return circuit and oil cooling oil are integrated functional elements. The pumps are driven by a directly flanged motor.

The rotor (7/88), mounted eccentrically in the pump cylinder (7/83), has three vanes which divide the pump chamber into several compartments. The volume of each changes periodically with the rotation of the rotor.

As the rotor rotates, the intake portion of the pumping chamber expands and sucks gas thru the intake port. The gas passes through the dirt trap and the open anti-suckback valve (7/54) and enters the pump chamber. As the rotor rotates further, the vane separates part of the pump chamber from the intake port. This part of the pump chamber is reduced, and the gas is compressed. At slightly above atmospheric pressure the gas is expelled from the chamber via the exhaust valve (6/28).

Oil injected into the pump chamber serves to seal, lubricate and cool the pump.

The oil entrained with the compressed gas is coarsely trapped in the oil case (6/27) by deflection. Then fine filtering occurs in the exhaust filter elements (6/29). The proportion of oil in the exhaust gas is thus reduced below the visibility threshold (over 99.9 % entrapment rate).

Oil trapped in the exhaust filters is returned to the inlet chamber via an oil return line (6/11).

To prevent gas flowing at atmospheric pressure from the oil reservoir into the intake port, the oil return line is controlled by a float valve.

The oil cycle is maintained by the pressure difference existing between the oil case (pressure above or equal atmospheric pressure) and the intake port (pressure below atmospheric pressure). One part of the oil is taken from the oil reservoir (6/27) and flows via the oil filter (6/25) to the bearing points of the rotor and to the pump chamber. The other part of oil injected in the pump does not run through the oil filter. So, if the oil filter is accidentally completely clogged, lubrication will be assured through the second circuit with enough quantity of oil to guarantee the good mechanical running of the pump.

Description

However, in that case, the pump will not reach anymore its specific end pressure. That will often indicate that oil is polluted and/or oil filter is clogged.

A fan running on the motor shaft generates the necessary cooling air.

The oil is also fed, thru a cooling coil.

Upon request, water cooled with heat exchanger and thermostatic valve can be delivered. Those pumps are delivered with a dedicated instruction manual adder.

Pump can be ordered with gas ballast device, on request (6/14). By opening the gas ballast valve, a controlled amount of air so called "gas ballast" - is admitted into the pump chamber.

This gas ballast prevents condensation (up to the limit of water vapor tolerance specified in the Technical Data) when pumping condensable gases or vapours.

There are different types of gas ballast:

- standard gas ballast < 7 Nm³/h,
- large gas ballast 18 Nm³/h,
- gas ballast with electromagnetical valve 24 VDC, 18W, 7 Nm³/h.

The operational limits of gas ballast are defined in § 4.1.

On pumps supplied without gas ballast valve, the valve can be retrofitted (see § 1.4 and 4.4).

Unintentional venting of the vacuum chamber as well as oil suckback when shutting down the pump are prevented by the integrated antisuckback valve (7/54), see also § 4.2.

1.2 Technical characteristics

Pump technical data like e.g. ultimate pressure & noise level are only valid for standard pumps operating with the mentioned mineral oil. The use of other oils may have consequences on these values.

Note

SV200

Technical Data		50 Hz	60 Hz
Nominal speed ¹⁾	m ³ .h ⁻¹	180	220
Pumping speed ¹⁾	m ³ .h ⁻¹	170	200
Ultimate partial pressure without gas ballast ¹⁾	mbar	≤ 8.10 ⁻²	≤ 8.10 ⁻²
Ultimate total pressure with gas ballast standard ¹⁾	mbar	≤ 0.7	≤ 0.7
Water vapour tolerance :			
■ with gas ballast standard ¹⁾ or EM	mbar	40	50
■ with big gas ballast	mbar	50	60
Water vapour tolerable load:			
■ with gas ballast standard ¹⁾ or EM	kg.h ⁻¹	3.4	5.4
■ with big gas ballast	kg.h ⁻¹	N/A	N/A
Noise level ²⁾	dB (A)	69	73
Leak rate	mbar.l.s ⁻¹	≤ 1.10 ⁻³	≤ 1.10 ⁻³
Mains voltage (Standard) For other voltages ³⁾	V	230 / 400	460 ⁴⁾
Motor power	kW	4	4,6
Type of protection		IP 55	IP 55 ³⁾
Rated rotational speed	min. ⁻¹	1450	1750
Oil capacity (min./max.)	l	5/9	5/9
Intake connection		G2	G2 NPT 2 ³⁾
Exhaust connection		G2	G2 NPT 2 ³⁾

1) to DIN 28400 and following numbers, with standard gas ballast

2) operated at the ultimate pressure without gas ballast, free-field measurement at a distance of 1 m

3) please contact CERlikon Leybold Vacuum

4) CEI: 460 V / NEMA: 200 - 300 / 460 V

Description

SV300

Technical Data		50 Hz	60 Hz
Nominal speed ¹⁾	m ³ .h ⁻¹	280	340
Pumping speed ¹⁾	m ³ .h ⁻¹	240	290
Ultimate partial pressure without gas ballast ¹⁾	mbar	≤ 8.10 ⁻²	≤ 8.10 ⁻²
Ultimate total pressure with gas ballast standard ¹⁾	mbar	≤ 0,7	≤ 0,7
Water vapour tolerance :			
■ with gas ballast standard ¹⁾ or EM	mbar	30	40
■ with big gas ballast ¹⁾	mbar	60	70
Water vapour tolerable load :			
■ with gas ballast ¹⁾ or EM	kg.h ⁻¹	5.4	7.4
■ with big gas ballast ¹⁾	kg.h ⁻¹	10	12.5
Noise level ²⁾	dB (A)	70	74
Leak rate	mbar.l.s ⁻¹	≤ 1.10 ⁻³	≤ 1.10 ⁻³
Mains voltage (Standard) For other voltages please contact CERlikon Leybold Vacuum	V	230 / 400	460 ⁴⁾
Motor power	kW	5.5	6.3
Type of protection		IP 55	IP 55 ³⁾
Rated rotational speed	min. ⁻¹	1450	1750
Oil capacity (min./max.)	l	8.5/11.5	8.5/11.5
Intake connection		G2	G2 NPT 2 ³⁾
Exhaust connection		G2	G2 NPT 2 ³⁾

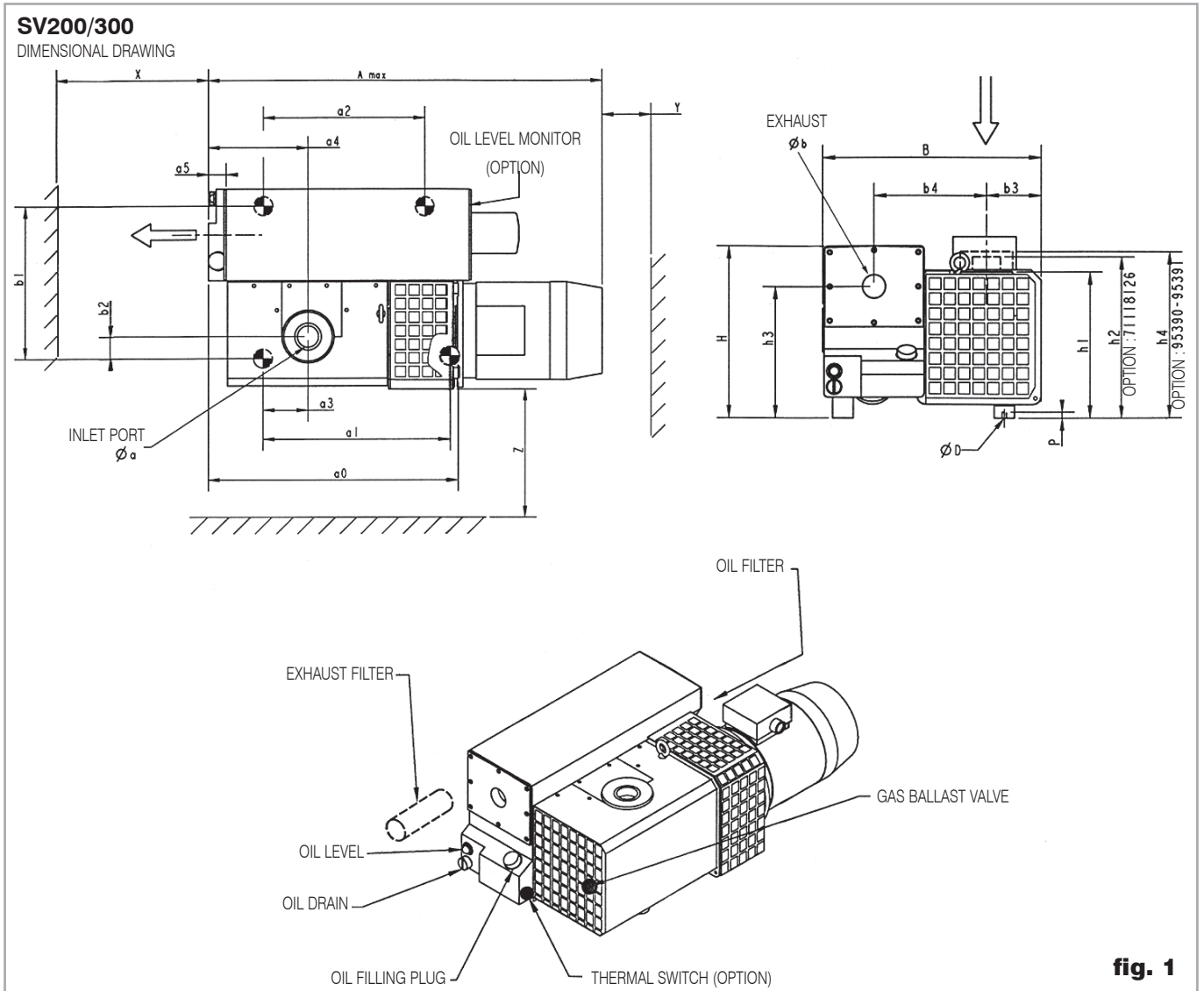
1) to DIN 28400 and following numbers, with standard gas ballast

2) operated at the ultimate pressure without gas ballast, free-field measurement at a distance of 1 m

3) please contact CERlikon Leybold Vacuum

4) CEI: 460 V / NEMA: 200 - 300 / 460 V

Description



Dimension in mm

Type	Øa	Øb	Amax.	a0	a1	a2	a3	a4	a5	B	b1	b2	b3	b4	ØD/P	H	h1	h2	h3	h4	X	Y	Z	Weight kg
109 26 109 27	G2	G2	890	548	390	252	62	214	40	535	394	50	140	269	M10/10	425	352	392	318	399	350	150	300	170
955 27			945	557																				
109 30 109 31	G2	G2	1080	657	378	313	0	264	40	535	394	50	140	269	M10/10	425	352	392	318	399	350	150	300	210
955 37			1080																					

Description

US versions.

Dimension in inches

Type	Øa	Øb	Amax.	a0	a1	a2	a3	a4	a5	B	b1	b2	b3	b4	ØD/P	H	h1	h2	h3	h4	X	Y	Z	Weight kg	
950 27	2"	2"	960	557	390	252	62	214	40	535	394	50	140	269	M10/10	425	352	392	318	399	350	150	300	170	
			38"	21"	15"	9"	2"	8"	1"	21"	15"	1"	5"	10"	M10/	16"	13"	15"	12"	15"	14"	6"	12"		
			15/16	5/16	59/64	7/16	7/16	9/16	1/16	1/2	31/32	1/2	19/32	25/64	47/64	55/64	7/16	33/64	45/64						
950 31	2"	2"	1090	657	378	313	0	264	40	535	394	50	140	269	M10/10	425	352	392	318	399	350	150	300	210	
			43"	25"	14"	12"	0	10"	1"	21"	15"	1"	5"	10"	M10/	16"	13"	15"	12"	15"	14"	6"	6"		
			7/8	7/8	5/16			25/64	9/16	1/16	1/2	31/32	1/2	19/32	25/64	47/64	55/64	7/16	33/64	45/64					

Conversion factors

Different pressure units

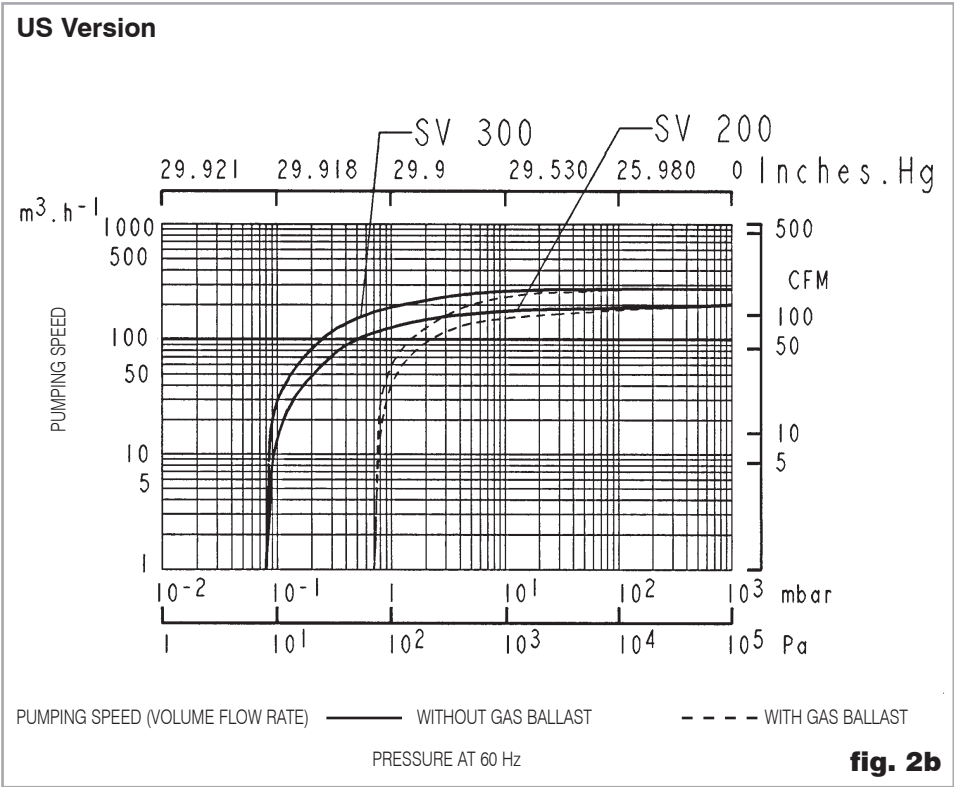
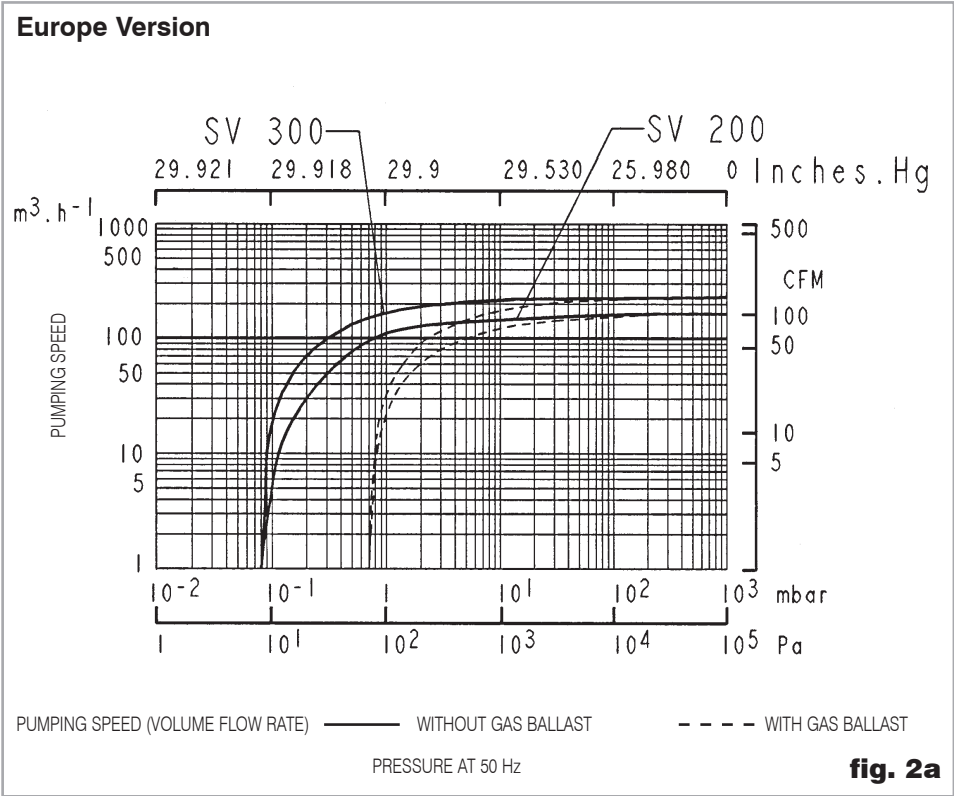
Different pumping speed units

	mbar (millibar)	torr	inches Hg vacuum		m ³ . h ⁻¹	l.s ⁻¹	cfm
1 lb = 0.453 kg 1 qt = 0.946 l	1013 400	760 300	0 18.12	m³. h⁻¹ = m³/h	1	0.278	0.589
1 hp = 0.735 kW 1 r.p.m. = 1 min ⁻¹	133 4	100 3	25.98 29.80	l.s⁻¹ = l/s	3.60	1	2.12
1 inch = 25.4 mm	1 0.1	0.75 0.75	29.89 29.92	cfm (cubic feet per minute)	1.699	0.472	1
1 atm (atmosphere) = 1013 mbar 1 Pa (pascal) = 0.01 mbar = 10 ⁻² mbar 1 bar = 1000 mbar 1 torr = 1.33 mbar				Example : 1 m ³ .H-1 = 0.589 cfm Note : the nominal pumping speed of a pump at 60 Hz is 20 % higher than at 50 Hz			

Technical Data	SV200		SV300	
	60 Hz		60 Hz	
Nominal speed ¹⁾	cfm	130	340	
Pumping speed ¹⁾	cfm	118	290	
Ultimate partial pressure without gas ballast ¹⁾	Torr	6.10 ⁻²	6.10 ⁻²	
Ultimate total pressure with gas ballast standard ¹⁾	Torr	0,5	0,5	
Water vapour tolerance with standard gas ballast ¹⁾ or EM	Torr	≤ 30	≤ 30	
Motor power	hp	7,5	10,5	
Rated rotational speed	rpm	1750	1750	
Oil filling (min./max.)	qt	5,3/9,5	9/12,2	
Weight	lb	342	430	
Inlet flange NPT (F)	inches	NPT 2	NPT 2	
Exhaust flange NPT (F)	inches	NPT 2	NPT 2	

¹⁾ to DIN 28400 and following numbers, with standard gas ballast.

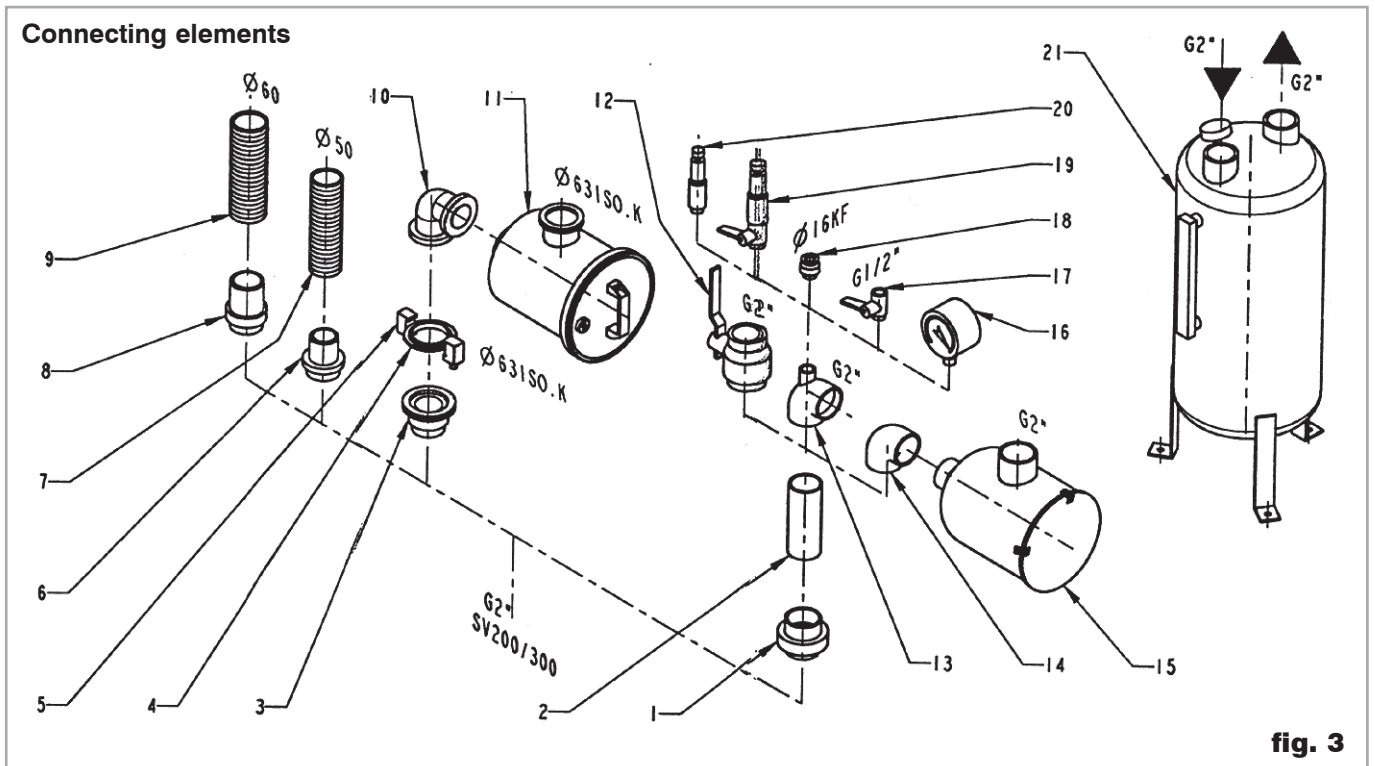
Description



Description

1.3 Connection Fittings

Description		Size SV200 + SV300	Cat. Nr. SV200	Cat. Nr. SV300
1	Union coupling + seal	G2 F/M	711 18 025	711 18 025
2	Nipple	G2 M/M - 150 mm long	711 18 035	711 18 035
3	Threaded flange adapter	G2 M - DN 63 ISO-K NPT2 M - DN 63 ISO-K	711 18 126 721 03 040	711 18 126 721 03 040
4	Centering ring	63 ISO-K AL/NBR	268 07	268 07
5	Set of 4 clamps for ISO-K flanges	M10 x 24	267 01	267 01
6	Adapter for tubing	G2 DN 50	711 18 015	711 18 015
7	PVC tubing	50 mm, 1 m long	711 18 325	711 18 325
8	Adapter for tubing	G2 DN 60	711 18 016	711 18 016
9	PVC tubing	60 mm, 1 m long	711 18 326	711 18 326
10	Right-angle bend 90°	63 ISO K	887 25	887 25
11	Dust filter, paper	63 ISO K	951 68	951 68
	Dust filter, charcoal		711 27 125	711 27 125
	Dust filter, metal		711 27 126	711 27 126
	Inlet filter, polyester		711 27 127	711 27 127
12	Ball valve	G2 F/F	711 30 107	711 30 107
13	Tee reducer bush	G2-G2-G1/2 F/F/F	711 18 265	711 18 265
14	Elbow 90°	G2 F/F	711 18 215	711 18 215
15	Dust filter, paper	G2 M/F	915 65	915 65
	Dust filter, charcoal		711 27 122	711 27 122
	Dust filter, metal		711 27 123	711 27 123
	Inlet filter, polyester		711 27 124	711 27 124
16	Vacuum gauge	G1/2 M	951 92	951 92
17	Ball valve	G1/2 M/F	711 30 113	711 30 113
18	Threaded flange adapter	G1/2 M - DN 16 KF	711 18 120	711 18 120
19	Regulation valve with isolation valve	G1/2 M	951 87	951 87
20	Regulation valve	G1/2 M	951 86	951 86
21	Condensate Trap	G2 F - G2 F	951 44	951 44



1.4 Ordering informations

Ordering data Ref. No	SV200	SV300
Pump with three-phase motor without gas ballast 230 V/400 V, 50 Hz 460 V, 60 Hz	109 26	109 30
Pump with three-phase motor and integrated gas ballast valve 230 V/400 V, 50 Hz 460 V, 60 Hz	109 27	109 31
Pump with three-phase motor without gas ballast 200 V, 50/60 Hz	955 26	955 36
Pump with three-phase motor and integrated gas ballast valve 200 V, 50/60 Hz	955 27	955 37
Version US - Description	SV200	SV300
Pump with three-phase motor and integrated gas ballast valve 200 - 230 / 460 VAC 60 Hz 3-phase (+ 400 V 50 Hz)	950.27	950.31

Description

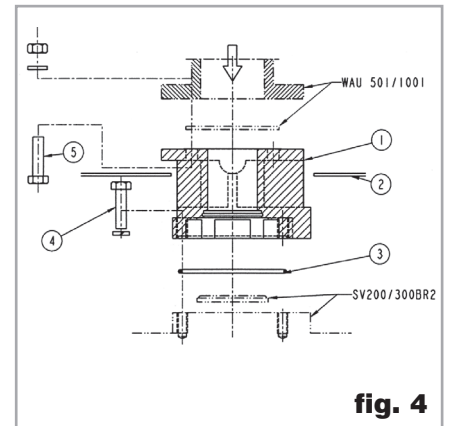
1.5 Accessories

Description	Size SV200 + SV300	Cat. Nr. SV200	Cat. Nr. SV300
Oil sight glass (glass/metal) (Europe version)		712 19 488	712 19 488
Oilfilter by-pass		712 30 573	712 30 573
Gitter		712 14 053	712 14 053
Oil drain tap	G 3/4	711 30 114	711 30 114
Interchangeability Kit SV 180/280		714 01 930	714 01 930
Gas ballast standard 7 Nm ³ /h		951 29	951 29
Gas ballast big flow 18 Nm ³ /h		951 30	951 30
Gas ballast standard with EM valve 24 V DC (KIT) 7 Nm ³ /h		951 31	951 31
Exhaust filter gauge		951 94	951 94
Exhaust filter over-pressure switch		712 22 360	712 22 360
Oil level monitor		953 96	953 96
Thermal switch		951 36	951 36
Adapter Roots 500		953 90	953 90
Adapter Roots 1000		953 91	953 91
Base frame		711 19 208	711 19 208
Base frame for possibility for adaptation Roots		711 19 209	711 19 209
Simple water cooling without thermostatic valve		upon request	9 714 51 270
Separator SEP 63	DN 63 ISO K	953 56	953 56
Separator-Condenser SEPC 63	DN 63 ISO K	953 66	953 66
Threaded flange adapter	G 2" F - DN 63 ISO K	711 18 113	711 18 113

Stability of pump is insured with accessories of CErlikon Leybold Vacuum; mounting of any other accessory will engage the responsibility of user concerning stability of pump.

1.6 SV + WAU Combination Direct connected

Pos	Qty	Designation	SV200/300 BR2 + WAU 501+ WAU 1001	SV200/300 BR2
	1	Adaptation kit Including :	953 90	953 91
1	1	• flange	714 36 401	714 36 401
2	1	• intake flange housing	714 36 221	714 36 221
3	1	• o-ring	714 36 222 (Ø 117.07 x 3.53 FPM)	714 36 222 (Ø 117.07 x 3.53 FPM)
4	4	• screw	HM10 x 40 Q6.8	HM10 x 40 Q6.8
	4	• washer	W10	W10
5	4	• screw	M12-35/30J=18 Q 6.8	M16-65/30J=24 Q 6.8
	4	• washer	MN12	MN16
	4	• nut	H M12	H M16



1.7 Spare parts

Description	Size for SV200 + SV300	Cat. Nr. SV200	Cat. Nr. SV300
Oil filter standard		710 18 850	710 18 850
Metal oil filter		711 19 121	711 19 121
Exhaust filter		710 64 763	710 64 773
Set of seals standard	NBR / FKM	971 97 552	971 97 652
Set of seals	FKM	714 36 730	714 36 740
Repair set		714 36 190	714 36 200
Module kit		714 36 170	714 36 180
Oil GS77 (5 l)		711 17 774	711 17 774
Oil GS77 (25 l)		711 17 776	711 17 776
Inlet filter element F 200/300			
• paper		712 13 293	712 13 293
• metal		712 13 334	712 13 334
• charcoal		712 13 314	712 13 314
• polyester		712 61 318	712 61 318

Description

1.8 Lubricants

Except differently specified on the pump, we recommend to run the Sogevac pumps with GS77 from CERlikon Leybold Vacuum or an equivalent oil which meets following requirements:

- low vapor pressure, even at high temperatures;
- flat viscosity curve;
- minimum water content and absorption;
- good lubricating properties;
- resistant to aging under mechanical strain.

Pump oil GS77	Conditioning	Ref. No.
	5 liters	711 17 774
	25 liters	711 17 776
	200 liters	711 17 779

Use of other special-grade lubricants for specific applications is possible. Please consult us.

Only use lubricants which have been fully qualified by CERlikon Leybold Vacuum.

Transport and Storing

2 Transport and Storing

2.1 Transport and packaging

Sogevac® vacuum pumps pass a rigorous operating test in our factory and are packaged to avoid transport damages.

Please check packaging on delivery for transport damages.

Packing materials should be disposed off according to environmental laws or re-cycled.

These operating instructions are part of the consignment.

The connection ports are blanked off by plastic protective caps or self-adhesives. Take these caps or self-adhesives away before turning on the pump.

For SV200 and SV300, the pump is supplied with drive motor in ready to use condition ; it is supplied with GS77 (on equivalent) oil.

2.2 Mounting orientation

See required space on drawings in paragraph 1.2.

Pumps which have been filled with oil must only be moved in the upright position (horizontally). Otherwise oil may escape. The angle of slope may not be over 10° max. Avoid any other orientations while moving the pump.

Only use the lifting lugs which are provided on the pump to lift the pump with the specified lifting devices.

Make sure that these have been installed safety. Use suitable lifting equipment. Make sure that all safety regulations are observed.

Check the pump for the presence of any oil leaks, because there is the danger that someone may slip on the oil which has leaked from the pump.

2.3 Storing

If the pump is to be shut down for an extended period or if the pump has to be stored, proceed as follows :

When pumping harmful substances, take adequate safety precautions.

Drain the oil (see § 5.4-C).

Pour in clean oil up to the bottom edge of the oil-level glass (see § 5.4-C) and let the pump run for a few minutes.

Then drain the oil and pour in clean oil up to the top edge of the oil-level glass (see § 5.4-C).

Seal the connection ports. Special preservation or slushing oils are not necessary.

Warning



Caution



Installation

Warning



3 Installation

It is essential to observe the following instructions step by step to ensure a safe start-up. Start-up may only be conducted by trained specialists.

The standard pump is not suitable for installation in explosion hazard areas ATEX. Please contact us, if you are planning such an application. Before installing the pump you must reliably disconnect it from the electrical power supply and prevent the pump from running up inadvertently.

Observe all safety regulations.

3.1 Setting up

The pump can be set up on any flat, horizontal surface. Under the four feet, there are metric threaded holes for securing the pump.

The oil level cannot be read properly if the pump is tilted. Pump risk to run dry and oil level switch may not react correctly.

The Sogevac® pump can pump gases and vapours, provided that the gas ballast valve is installed and open and the pump has reached its operating temperature.

Pump in operation is hot and some surfaces could reach a temperature higher than 80°C (176°F). There is a risk of burn by touching. Take note of warning labels on the pump.

Observe the safety regulations.

Warning



Inlet connection

See safety instructions page 3.

The pump has an internally-threaded intake flange. Using suitable connecting elements (see § 1.3), the pump can be connected to the vacuum system.

The cross-section of the intake line should be at least the same as the intake port. If the intake line is too narrow, it reduces the pumping speed. We recommend applying either LOCTITE or TEFLON tape to the screwed unions so that they are vacuum-tight (especially when gases are dangerous).

■ Pump should be connected to inlet line without any tension. Use flex lines or pipe unions in your inlet and exhaust lines so that they can be easily removed for pump maintenance.

■ The maximum pressure at the inlet may not exceed atmospheric pressure (about 1013 mbar). Never operate the pump in the presence of over pressures at its intake.

■ Type of materials used for mounting of canalisations should take care of pumped gases. It is the same for its tightness.

■ The inlet pipe should be installed with a rising slope towards the pump to avoid condensates flowing into the pump.

If the process gas contains dust, it is absolutely essential to install a dust filter in addition to the dust trap supplied (see § 1.3).

We recommend to install the dust filter horizontally using the T-piece (3/13) or the elbow (3/14). This ensures that when removing the filter no particles fall into the intake port.

When pumping vapours, we recommend installing condensate traps on the intake and exhaust sides (see § 1.3).

By pumping of dangerous gases, inlet line must be tight.

No particles or liquids may enter in the pump.

Exhaust Side

The Sogevac® pumps have integrated exhaust filters which, even at a high gas throughput, trap the oil mist and guarantee exhaust gas free of oil mist. If the exhaust filters are clogged, pressure relief valves open and the filters are bypassed. As a result, the proportion of oil in the exhaust gas as well as the pump oil consumption rise.

This situation must be resolved by changing the exhaust filters. It is under user's responsibility to assure maintenance on materiel to avoid any trespassement of the limits autorised by regulations.

Check in the individual case whether an exhaust line is necessary and/or prescribed. Volatile substances can pass through the filter. Depending on the process gas, we recommend connecting an exhaust line; this is always necessary when the exhaust gases are dangerous.

Observe the safety precautions that apply to your application and process gases. The pump's exhaust port also has an internal thread . A hose can be connected via a suitable screwing nipple (see § 1.3).

The cross-section of the exhaust line should be at least the same as the pump's exhaust port. If the exhaust line is too narrow, overpressure may occur in the pump.

Install the exhaust line with a downward slope to prevent condensate from flowing back into the pump. If this is not possible, we strongly recommend installing a condensate trap (see § 1.3). if several pumps are connected to one exhaust line, ensure an adequate cross-section and a non-return valve at the exhaust of each pump.

Never operate the pump with a blocked or restricted exhaust line. Before start-up, ensure that any blinds or similar shut-off devices in the exhaust line on the pressure side are open and that the exhaust line is not obstructed.

By pumping of dangerous gases, exhaust line must be tight.

The maximum exhaust pressure must not exceed 1,15 bar (absolute). Also reliably prevent the occurrence of any blockage in the exhaust line. Exhaust filter, accessories and the tubing must be rated according to the maximum throughput. The maximum throughput is equivalent to the pumping speed of the pump.

Should a forced ventilation extraction be installed, the pressure in the exhaust pipe shall not be lower than atm.pressure minus 50 mbar.

Warning



Warning



Installation

Warning



Caution

3.2 Electrical Connections

Ensure that incoming power to the pump is off before wiring the motor or altering the wiring. Electrical connections must be done by a qualified electrician in accordance with the applicable safety regulations.

Wire the motor for the correct supply voltage via connections in the junction box. See the wiring diagram on the motor or in the junction box.

For proper connection, a suitable motor protection switch must be used. Set the switch in accordance with the rating on the motor nameplate.

After connecting the motor and after every time you alter the wiring, check the direction of rotation. Observe the direction arrow on the motor hood. When checking, the intake port should be open. If the direction of rotation is wrong, oil may be ejected out the intake port. The vacuum system may be pressurised.

Don't use the motor fan for checking the rotation direction. The motor fan rotates too fast to clearly check during operation; when it slows during shutdown, it reserves its direction.

Briefly switch ON the pump, check if you can feel suction at the inlet port, and immediately turn off the pump. When the pump is rotating correctly, you should feel suction at the inlet port.

Turn off the power supply, and interchange two phases of the connection, if you need to correct the direction of rotation.

We recommend checking the direction of rotation with a phase-sequence indicator.

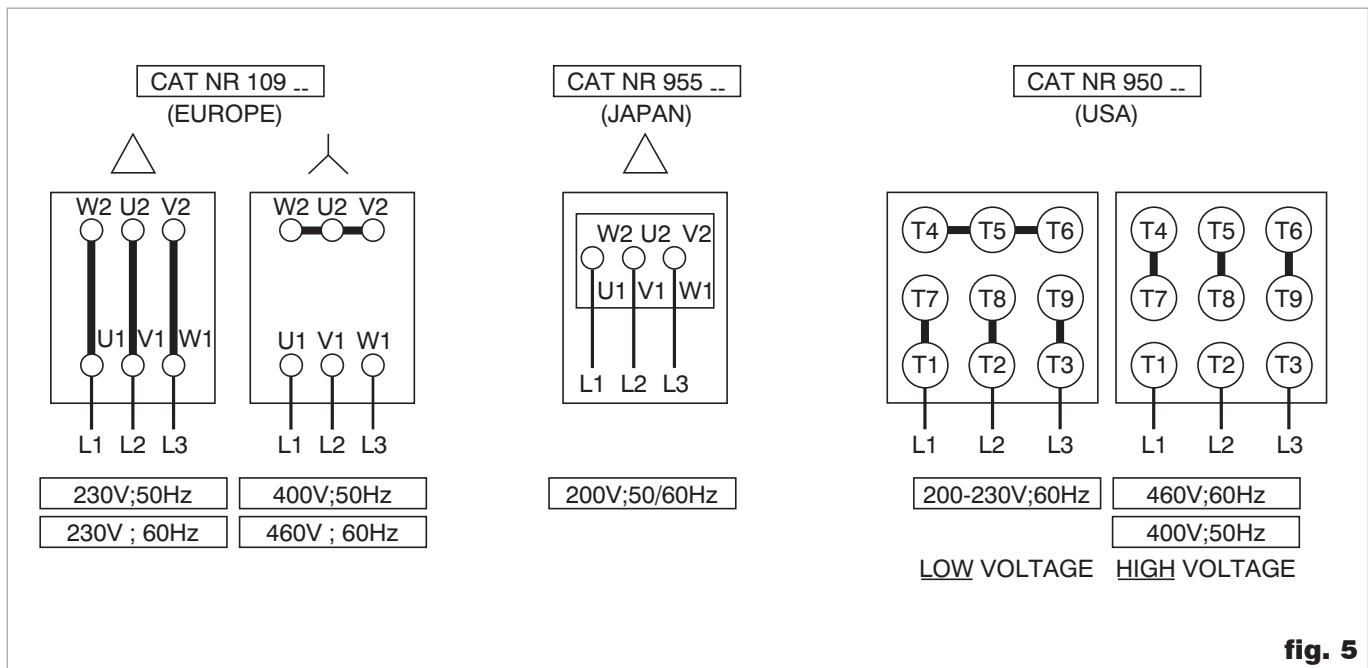


fig. 5

Prolonged running of the motor in the wrong direction of rotation will damage the pump!

If any security switch or electrical defect cuts out the pump, re-start-up of the pump must only be possible by handaction.

Motorization

European versions:

A 50/60 Hz motor is mounted in standard on the SV200 and SV300 BR2

Voltages:

230-400 V \pm 10% at 50 Hz

460 V \pm 10% at 60 Hz

US versions:

A 50/60Hz motor (NEMA) is mounted in standard on the SV200 and SV300 BR2

Voltage:

400 V \pm 10% at 50 Hz

200-230 V/460 V 60 Hz 3-phase (+400 V 50 Hz)

Warning



Installation

Caution

Warning



3.3 Start-up

The pumps are supplied with the necessary oil filling in ready-to-use condition. Always verify proper oil level before operating the pump.

The normal oil level is in the middle of sight glass.

If oil has to be added, unscrew the oil-fill plug, add oil and screw the plug firmly back in.

The Sogevac® pump is designed for normal startup at temperatures over 12°C (54°F) (as per PNEUROPE). With adequate oils, cold starts are possible above 0°C (32°F).

- Before starting the pump ensure that the attached accessories meet the requirements of your application and that safe operation is ensured.
- Never expose part of the body to the vacuum. There is a danger of injury. Never operate the pump with an open and thus accessible inlet. Vacuum connections as well as oil filling and oil draining openings must not be open during operation of the pump.
- The safety regulations which apply to the specific application in each case must be observed. This applies in particular to installation, operation and maintenance (servicing) as well as waste disposal and transportation.

Do not lay the hand on the intake to check suction.

Exposure of a part of the body to the vacuum results in a rush of blood in the exposed part.

4 Operation

4.1 Operation

To avoid overloading the motor, do not start the pump more than six times within one hour.

If frequent starts are needed, the pump should run continuously and be linked to the vacuum vessel by means of a valve. In that case, regulation will be made by the valve and not by start/stop of the pump. With the valve closed, the pump consumes little energy.

The Sogevac® pump can pump gases and vapours, provided that the gas ballast valve is installed and open and the pump has reached its operating temperature.

Pump in operation is hot and some surfaces could reach a temperature higher than 80°C (176°F).

There is a risk of burn by touching. Take note of warning labels on the pump.

Warning



Pumping of non-condensable gases

If the process contains mainly permanent gases, the SOGEVACs can be operated without gas ballast, provided that the saturation vapor pressure at operating temperature is not exceeded during compression.

If you do not know the composition of the gases to be pumped, and if you can't rule out the possibility of condensation, run the pump with gas ballast valve open in accordance below.

Pumping of condensable gases and vapours - Using gas ballast

The pumps with gas ballast valves are delivered with the gas ballast valve open.

The Sogevac® SV200 and SV300 can be equipped with 3 types of gas ballasts.

Standard gas ballast (Cat. No. 951 29) 7 Nm³/h

(originally mounted on Cat. No. 109 27, 950 27, 955 27, 109 31, 950 31, 955 37).

This gas ballast correspond to the most important part of applications; it authorizes a water vapor tolerance of:

30 mbar at 50 Hz

40 mbar at 60 Hz

Gas ballast "Big Flow" 18 Nm³/h as a variant or accessory (Cat. No. 951 30).

This kit is intended for the applications where more vapours of condensable gases could come into the pump. It brings the water vapor tolerance above 50 mbar. (Mounting instructions attached to the kit).

Standard gasballast with E.M. valve (Cat. No. 951 31).

This kit is intended for being mounted on pumps on which the gas ballast can be driven by an electromagnetic valve applied at 24 VDC 18 W.

Caution

Operation

With the gas ballast valve open and at operating temperature, the Sogevac® pump can pump pure water vapor up to the water vapor tolerance indicated in the Technical Data. The pump's water vapor tolerance can be increased by raising the operating temperature.

Use a screwdriver to open the gas ballast valve. The running noise of the pump is slightly louder when the gas ballast valve is open. Before opening the pump to vapours, ensure that the gas ballast valve is open and that the pump has been warmed up for about 30 minutes with closed intake line.

Caution

Do not open the pump to condensable vapours until it has warmed to operating temperature ; pumping process gas with a cold pump results in vapours condensing in the oil.

For processes with a high proportion of condensable vapours, slowly open the intake line after reaching the operating temperature to prevent excessive quantities of vapor entering the pump.

One sign of condensation of vapours in the pump is a rise in the oil level during operation of the pump.

During pumping, vapours may dissolve in the oil. This changes the oil properties and causes a risk of corrosion in the pump. Therefore, do not switch off the pump immediately after completion of the process. Instead, allow the pump to continue operating with the gas ballast valve open and the intake line closed until the oil is free of condensed vapours. We strongly recommend operating the pump in this mode for about 30 minutes after completion of the process.

Note

In cyclic process operation, the pump should not be switched off during the intervals between the individual working phases, but should continue to run with gas ballast valve open and intake port closed (if possible via a valve). Power consumption is minimal when the pump is operating at ultimate pressure.

Once all vapours have been pumped off from a process (e.g. during drying), the gas ballast valve can be closed to improve the ultimate pressure.

4.2 Switching off / Shutdown

Under normal circumstances, all that you need to do is to switch off the pump.

The intake port of the Sogevac® pumps contains an anti-suckback valve which closes the intake port when the pump is switched off, thus maintaining the vacuum in the connected apparatus and preventing oil from being sucked back into the apparatus. The valve's functioning is not impaired by gas ballast operation.

Nevertheless, the anti suck-back valve is not a safety valve and operates correctly only if clean and undamaged. A valve must be installed if oil back streaming is to be avoided by all means.

When pumping condensable media, let the pump continue to operate with the gas ballast valve open and the intake line closed before switching off (see § 4.1).

When the pump has been switched off due to over heating, initiated by the motor or its temperature detector, the pump must be cooled down to the ambient temperature, and must only be switched on again manually after having eliminated the cause.

Caution

In order to prevent the pump from running up unexpectedly after a mains power failure, the pump must be integrated into the control system in such a way that the pump can only be started by a manually operated switch. This applies equally to emergency cut-off switches.

In case of switching processes in connection with a pump which has warmed up under operating conditions, the pump must then not be directly switched on again.

4.3 Ultimate Pump Pressure

If the system cannot produce the pressures specified in the technical data, measure the ultimate pressure directly at the pump's intake port after disconnecting the pump from the system.

The ultimate pressure of non-condensable gases (partial pressure of air) can only be measured with a compression vacuum gauge or a partial pressure gauge. Precise measurements can only be obtained with calibrated instruments.

Upon initial start-up, after prolonged idle periods or after an oil change, it takes a while until the pump reaches the specified ultimate pressure. The pump has to attain its operating temperature, and the pump oil has to be degassed. We recommend operating the pump initially with the gas ballast valve open.

The ultimate pressure depends on the pump temperature and the pump oil used. The best ultimate pressures can be obtained at a low pump temperature and by using the recommended oil types.

4.4 Installing the Optional Gas Ballast Valve

The Sogevac® pump SV200-300 are supplied on request either with or without a gas ballast valve. The valve can also be retrofitted (see § 4.1 for choose of gas ballast).

Remove the fastening screws at the top of the pump cyclinder cover (7/51a-52a), loosen the pump foot at the bottom of the cover (7/94) and take off the cover.

Drain the oil (see 5.4.C).

Remove the screw (6/13) with gasket.

Install the chosen gas ballast valve (6/14) with its banjo bolt and gasket.

Reinstall the cover and fill in oil.

Maintenance

Warning

Caution

5 Maintenance

5.1 Safety Information

Observe all safety regulations.

All work must be done by suitably trained personnel. Maintenance or repairs carried out incorrectly will affect the life and performance of the pump and may cause problems when filling warranty claims and depends heavily of the applications.

5.2 Maintenance Intervals

The intervals stated in the maintenance schedule are approximate values for normal pump operation. Unfavourable ambient conditions and/or aggressive media may significantly reduce the maintenance intervals.

Maintenance job	Frequency	Section
Check the oil level	daily	A
Check the oil condition	Depends on process	B
1st oil change	After 150 h of operation	C
Subsequent oil changes	Every 2000 h of operation or 6 months (depending on application)	C
Replace the oil filter	At each oil change	C
Replace the exhaust filter	If oil mist at exhaust or annually	D
Clean the ballast	monthly	E
Clean the dirt trap	monthly	F
Check the anti-suckback valve	annually	G
Checking the float valve	At each exhaust filter change or annually	H
Replacing the exhaust valve	upon need	I
Replacing the Pump Module	upon need	J
Disassembling and Reassembling the Pump Module	upon need	K
Disassembly of electrical motor	upon need	L
Cooling coil cleaning	annually	M

To simplify the maintenance work we recommend combining several jobs.

5.3 CErlikon Leybold Vacuum Service

Whenever you send us in equipment, indicate whether the equipment is contaminated or is free of substances which could pose a health hazard. If it is contaminated, specify exactly which substances are involved. You must use the form we have prepared for this purpose.

A copy of the form has been reproduced at the end of these Operating Instructions: "Declaration of Contamination for Compressors, Vacuum Pumps and Components". Another suitable form is available from www.oerlikon.com → CErlikon Leybold Vacuum Systems → Documentation → Download Documents.

Attach the form to the equipment or enclose it with the equipment.

This statement detailing the type of contamination is required to satisfy legal requirements and for the protection of our employees.

We must return to the sender any equipment which is not accompanied by a contamination statement.

The pump must be packaged in such a way that it will not be damaged during shipping, and so that no harmful substances can escape from the package.

When disposing of used oil, please observe the relevant environmental regulations.

5.4 Maintenance Work

Checking the oil

A. Oil level

The pump oil level during operation must always be between the middle and top edge of the oil-level glass (6/4).

When necessary, switch off the pump and add the correct quantity of oil. Overfilling leads to oil losses at high intake pressures.

High oil consumption often indicates that exhaust filters are clogged.

Stop the pump for filling oil.

The oil level should be checked at least once a day.

B. Oil Condition GS77

Normally the oil is clear and transparent. If the oil darkens, it should be changed.

If gases or liquids dissolved in the oil result in deterioration of the ultimate pressure, oil can be degassed by allowing the pump to run for about 30 min. with the intake port closed and the gas ballast valve open.

The amount of oil required for an oil check should be drained via the oil-drain lug (6/5) into a beaker or similar container with the pump switched off but still at operating temperature.

Observe the safety regulations!

Contamination

Formulaire

Caution

Warning



Maintenance

C. Oil Change, Replacing the Oil Filter

Tool required :

oil filter key (710 73 532)

Always change the oil when the pump is switched off but still at working temperature.

If there is a risk of the oil being polymerized by the connected process, change the oil immediately after operation of the pump.

Pump in operation is hot and some surfaces could reach a temperature higher than 80 °C (176 °F).

There is a risk of burn by touching.

Warning



Unscrew the oil-drain plug (6/5) and let the used oil drain into a suitable container.

Observe the safety regulations!

When the flow of oil slows down, screw the oil drain plug back in, briefly switch on the pump (max. 10s) and switch it off.

Remove the oil drain plug again and drain the remaining oil.

Unscrew the oil filter. Take a new oil filter, moisten its gasket with oil and screw it in manually.

Unscrew the oil-fill plug and fill the pump should be flushed by filling it with fresh oil up to the bottom edge of the oil-level glass, run it for a short time and then change the oil again.

Use suitable oil only (see point 1.8).

Depending on the process involved, dangerous substances may escape from the pump and oil. Take the appropriate precautions.

Observe the safety regulations!

Warning



Caution

Note

Never mount used seals; always mount new seals.

When disposing of used oil please observe the relevant environmental regulations !

D. Replacing the Exhaust Filters and Checking the Pressure Relief Valve

When the exhaust filter elements are clogged, the valves open and the filters are bypassed. Oil mist at the exhaust, and/or high oil consumption are signs that the exhaust filters are clogged.

The exhaust filters must be replaced more frequently if subject to increased oil cracking products at high operating temperatures and/or aggressive media.

Remove the exhaust flange (6/2) with gasket (6/3). Unscrew the lock nut (6/31) and remove spring between its both washers : take out the exhaust filter element(s) (6/29).

Take out the pressure relief valves and check that they move freely, and seal properly.

Reassemble in the reverse sequence. Ensure that the exhaust filter elements are properly centered and positioned. Install spring between its both washers, and tighten stop nut (6/31), fully home with the 10 mm box wrench.

Observe the safety regulations!

E. Cleaning the Intake Filter

Tools required :

Open-jaw or box wrenches 10 mm, 17 mm.

Remove the fastening screws at the top of the pump-cylinder cover (7/51a-52a), loosen the pump foot (7/94a) at the bottom of the cover and take off the cover.

Release the clips on the gas ballast filter.

Clean the filter using a suitable solvent. Then dry it. Reassemble in the reverse sequence.

F. Cleaning the Dirt Trap

Tools required : open-jaw or box wrenches 10 mm, 17 mm.

A dirt trap for coarse particles is located in the intake flange of the pump (7/57). It should be kept clean to avoid reduction of the pumping speed.

The dirt trap consists of two wire-mesh screens. The outer one is accessible by removing the intake line. If it is only slightly dirty, just wipe off the screen from the outside. If it is very dirty, disassemble the intake flange.

To do so, remove the fastening screws at the top of the pump-cylinder cover (7/51a-52a), loosen the pump foot (7/94a) at the bottom of the cover and take off the cover.

Remove four screws and take off the intake flange (7/57) and gasket (7/55).

Remove the retaining ring from inside the intake flange (7/57). Take out both wire-mesh screens and clean them using a suitable solvent.

Reassemble in the reverse sequence. We recommend replacing the gasket (7/55) with a new one.

Observe the safety regulations!

G. Checking the Anti-Suckback Valve

Tools required :

open-jaw or box wrenches 10 mm, 17 mm.

Adjusting ring: 710 72 333

Keep the anti-suckback valve clean to ensure proper operation of the pump. If the pump is exposed to large amounts of dust or dirt, we strongly recommend installing a dust filter upstream.

First disconnect the intake line.

Then remove the fastening screws at the top of the pump-cylinder cover (7/51a-52a), loosen the pump foot (7/94a) at the bottom of the cover and take off the cover.

Maintenance

Remove four screws and take off the intake flange (7/57) and gasket (7/55).

Remove the spring and anti-suckback valve, and replace them if required.

If the anti-suckback valve closes too soon, carefully compress the spring slightly. The top edge of the valve should be about 1-2 mm away from the bottom side of the intake port.

Reassemble the spring with the correct orientation : small diameter to the top. Do not screw the spring into the generator suction hole !

Reassemble the intake port. We recommend replacing the gasket (7/55) with a new one.

The plane side of the anti-suckback valve faces downward.

Observe the safety regulations!

H. Checking the Float Valve

Tools required :

Open-jaw or box wrenches 10 mm, 13 mm, 17 mm.

If the pressure does not fall below approx. 5 mbar during pump operation, check the tightness of the float valve and return line.

Remove the fastening screws at the top the of the pump-cylinder cover (7/51a-52a), loosen the pump foot (7/94a) at the bottom of the cover and take off the cover.

Take off the oil return line (6/11).

Remove the four screws (6/12) and pull the float valve assembly (6/10a) out of the float chamber. Take off the gasket (6/9).

Clean the nozzle. Check the tightness of the float valve.

Check all gaskets and replace them with new ones if necessary.

Reassemble the float valve in the reverse sequence.

Observe the safety regulations!

I. Replacing the Exhaust Valve

Tools required :

Open-jaw or box wrenches 10 mm, 17 mm.

Drain the oil (6/5).

Remove the fastening screws at the top of the pump-cylinder cover (7/51a-52a), loosen the pump foot (7/94) at the bottom of the cover and take off the cover.

Disconnect the oil lines (6/11, 6/15 and 6/18).

Unscrew the nuts (6/19) and pull off the exhaust box.

Remove the gasket (6/22). Remove the screws and take off the valve stop (6/21) and exhaust valve (6/20).

Reassemble in the reverse sequence.

Position the exhaust valve, so that its fingers bend toward the pumping module.

Observe the safety regulations!

J. Replacing the Pump Module

Fully assembled pump modules are available under Ref. Nos. :

SV200 : 714 36 770

SV 300 : 714 36 780

Tools required : SV200/300 :

open-jaw or box wrenches 10 mm, 17 mm, 27 mm.

We recommend using a new module/oil casing flat gasket and new flat gaskets for the oil flow tubes and gas ballast valve.

Drain the oil.

Remove the pump-cylinder cover, oil lines, oil case and exhaust valve (see point I).

Take off the intake flange, anti-suckback valve (see point G) and spring.

Remove the gas ballast valve (6/14).

Loosen the screws and pull the pump module (7/96).

Take off the coupling element (7/60). Loosen the screw and pull off the coupling (7/59).

Remove the key (7/86).

Install the new or the repaired pump module in the reverse sequence.

Adjust the coupling on the motor shaft so that there is a gap between the motor-side of the radial bladed fan and the inside wall of the coupling housing. Then adjust the pump coupling so that there is a gap between the coupling halves. The correct gaps are listed below :

■ Gap between Fan & coupling housing : 3 mm

■ Gap between coupling halves : 3 mm

Secure the coupling setscrews with Loctite.

Observe the safety regulations!

K. Disassembling and Reassembling the Pump Module

Remove the pump module (see point I).

Remove the screws with washers and take off the rear end plate (7/89) and front end plate (7/80) with O-rings (7/81). Take out the centering pins.

Pull the rotor (7/88) with vanes (7/87) out of the pump module (7.83).

Pull the vanes out of the rotor.

Take the radial shaft seal (7/79) out of the front end plate.

Reassemble the pump module in the reverse sequence.

Make sure that the vanes are correctly positioned.

To reassemble the pump module, place the exhaust box on its side and put the pump module on the exhaust box, with its exhaust downward.

Observe the safety regulations!

Maintenance

In case of necessity to replace bearing plates, it will be necessary to adjust locating pins. Please call CERlikon Leybold Vacuum (operating instructions on request).

L. Disassembly of electrical motor

Disconnect the power before disassembling the pump. Make absolutely sure that the pump cannot be accidentally started.

Disassemble subassembly (7/61, 64, 66, 67) from pumping module, by unscrewing the 3 securing screws (7/91a).

Loosen the screw, positioning and securing the fan turbine on motor shaft end.

With the help of an extractor puller, take off the fan turbine from motor shaft end.

■ On the SV200 (Non USA), take off, in motor shaft end fitted M10 screw, so as the LN12 washer and circlips.

To disassemble motor from coupling housing, unscrew the 4 hexagonal head screws (7/68a).

The reassembly is carried out in the reverse sequence, by taking care that the gaps mentioned under I are respected.

Check direction of rotation.

Observe the safety regulations!

M. Cooling coil cleaning

Please keep the oil cooler (7/66) clean to have an efficient cooling. For that, clean it with compressed air and then degrease it.

Troubleshooting

6 Troubleshooting

Fault	Possible cause	Remedy	Reference section *
Pump does not start.	Pump is connected incorrectly.	Connect the pump correctly.	3.3
	Motor protection switch incorrectly set.	Set motor protection switch properly.	3.3
	Operating voltage does not match motor.	Replace the motor.	
	Motor is malfunctioning.	Replace the motor.	
	Oil temperature is below 12 °C (54 °F).	Heat the pump and pump oil or use different oil.	1.8
	Oil is too viscous.	Use appropriate oil grade.	5.4-B
	Exhaust filter / exhaust line is clogged.	Replace the filter or clean the exhaust line.	5.4-D
Pump does not reach ultimate pressure.	Pump is seized up. (Sign : pump is jammed).	Repair the pump.	5.4-J/5.4-K
	Measuring technique or gauge is unsuitable.	Use correct measuring technique and gauge.	4.3
	External leak ¹⁾ .	Repair the pump.	
	Float valve does not close.	Repair the valve.	5.4-H
	Anti-suckback valve is malfunctioning.	Repair the valve.	5.4-G
	Exhaust valve is malfunctioning.	Repair the valve.	5.4-I
	Inadequate lubrication due to:		
	■ unsuitable or contaminated oil,	Change the oil (degas it, if necessary).	5.4-C
	■ clogged oil filter,	Replace the oil filter.	5.4-C
	■ clogged oil lines.	Clean the oil casing.	
	Vacuum lines are dirty.	Clean vacuum lines.	
Pump is too small.	Check the process date; replace the pump, if necessary.		
Pumping speed is too low.	Dirt trap in the intake port is clogged.	Clean the dirt trap; Precaution: install a dust filter in intake line.	5.4-F/1.4
	Exhaust filter is clogged.	Install new filter elements.	5.4-D
	Connecting lines are too narrow or too long.	Use adequately wide and short connecting lines.	3.1
	Anti-suckback valve is hard to open.	Check spring free length.	
After switching off pump under vacuum, pressure in system rises too fast.	System has a leak.	Check the system.	
	Anti-suckback is malfunctioning.	Repair the valve.	5.4-G
Pump gets too hot.	Cooling air supply is obstructed.	Set pump up correctly.	3.1
	Cooler is dirty.	Clean the cooler.	
	Ambient temperature is too high.	Set pump up correctly.	3.1
	Process gas is too hot.	Change the process.	
	Oil level is too low.	Add oil to reach the correct oil level.	5.4-A
	Oil is unsuitable.	Change the oil.	5.4-C
	Oil cycle is obstructed.	Clean or repair the oil lines.	
	Exhaust filter / exhaust line is obstructed.	Replace the exhaust filter, clean the exhaust line.	5.4-D
	Exhaust valve is malfunctioning.	Repair the valve.	5.4-I
Pump module is no longer usable.	Replace the pump module	5.4-J.	

Troubleshooting

Fault	Possible cause	Remedy	Reference section *
Oil in intake line or in vacuum vessel.	Oil comes from the vacuum system.	Check the vacuum system.	
	Anti-suckback valve is obstructed.	Clean or repair the valve.	5.4-G
	Sealing surfaces of anti-suckback valve are damaged or dirty.	Clean or repair the intake port and valve.	5.4-G
	Oil level is too high.	Drain the excess oil.	5.4-B
Pump's oil consumption too high, oil mist at exhaust.	Exhaust filters are clogged or damaged.	Replace the filters.	5.4-C
	Nozzle of float valve is clogged.	Check the valve, clean the nozzle.	5.4-I
	Oil level is too high.	Drain the excess oil.	5.4-B
Oil is turbid.	Condensation.	Degas the oil or change the oil and clean the pump.	4.1/5.4-B
		Precaution: open the gas ballast valve or insert a condensate trap.	
		Clean the gas ballast intake filter.	5.4-G
Pump is excessively noisy.	Oil level is very low (oil is no longer visible).	Add oil.	5.4-B
	Oil filter is clogged.	Change the oil and filter.	5.4-B
	Coupling elements worn	Install new coupling element	5.4-J
	Large vacuum leak in system.	Repair vacuum leak.	5.4-J/K

* Reference section: This column refers to the section in the Operating Instructions that contains the applicable repair information.

1) Bubble test : Let the pump run at operating temperature with degassed oil, without gas ballast and with closed intake port.

Immerse the exhaust line in a bucket of water. If a steady stream of bubbles appear, the pump has an external leak.

NB: For any other operation as described before, return the pump to a CERlikon Leybold Vacuum service center.

Never mount used seals. Always mount new seals.

7 Spare parts

To guarantee safe operation of the CERlikon Leybold Vacuum vacuum pump, only original spare parts and accessories should be used. When ordering spare parts and accessories, always state pump type and serial number. You can find part numbers in the spare parts list.

Consumables and main spare parts kits for Sogevac® pumps are usually available on stock at CERlikon Leybold Vacuum's service centers. The list of these parts is given here after and in the spare parts table where the contents of each kits is detailed.

- Oil filter (on some models)
- Exhaust demisters
- Oil GS 77 (Special oils please refer to the specific notice of the pump or contact CERlikon Leybold Vacuum)
- Service kit
- Set of seals
- Repair kit
- Vacuum generator without GB
- Vacuum generator with GB

We recommend to use these kits which have been defined to allow an optimal maintenance or repair. Individual spare parts may need longer delivery time.

Spare parts

SV200, SV300 (similar)

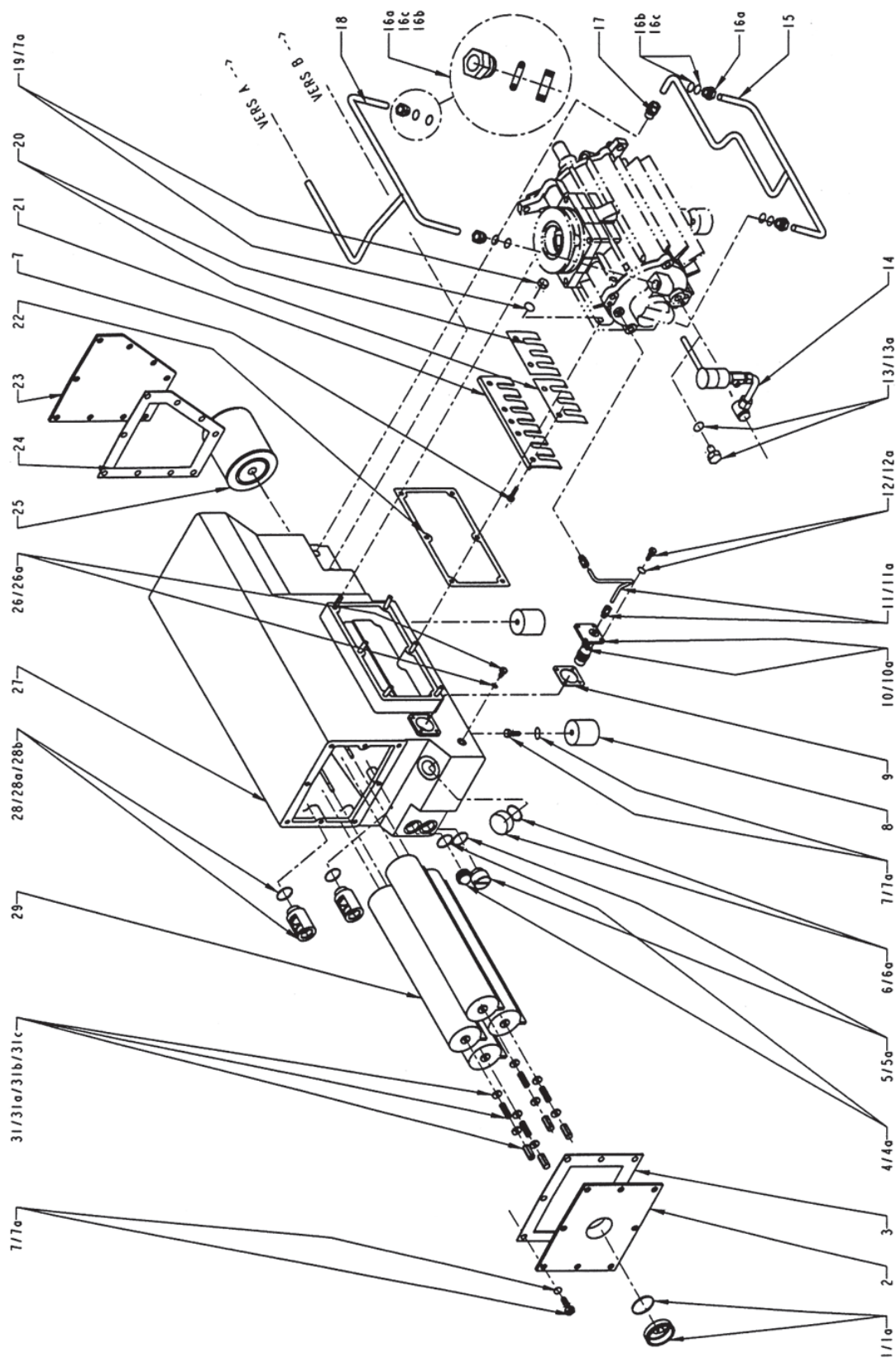


fig. 6

Spare parts

Pos.	Quantity		Specification	Dimensions (mm)		Ref. No.	Ref. No. (USA)	Notes	971 97 552	714 36 730	971 97 652	714 36 740	714 36 170	714 36 180	714 36 190	714 36 200
	SV200	SV300														
1	1	1	Exhaust plug	2"		712 13 233	ID.	incl. 1a								
1a	1	1	Gasket	Ø 57 x Ø 52 x 2	NBR				•	•	•	•				
2	1	1	Exhaust-Flange			710 60 844	710 60 854		•	•	•	•				
3	1	1	Flat gasket	238 x 193 x 2	FKM (c)	712 37 044	ID.		•	•	•	•				
4	1	1	Oil level glass	3/4"		712 19 480	712 19 480	incl. 4a								
4a	1	1	Flat gasket	Ø 34 x Ø 26,5 x 2												
5	1	1	Oil drain screw	3/4"		710 45 403	ID.	incl. 5a								
5a	1	1	O-Ring	Ø 27 x 2,5	FKM (c)	712 17 582	ID.		•	•	•	•				
6	1	1	Oil filling plug	1"		710 73 048	ID.	incl. 6a								
6a	1	1	O-Ring	Ø 32 x 3,5	FKM (c)	712 17 412	ID.		•	•	•	•				
7	19	23	Screw	M 10 x 20												
7a	21	23	Washer	MN10												
8	2	2	Rubber mount	Ø 50 H50		712 13 258	ID.									
9	1	1	Flat gasket	50 x 1,5	NEBAR				•	•	•	•				
10	1	1	Flange float			712 12 510	ID.	incl. 9, 10a								
10a	1	1	Oil return valve seal	10 x 9 x 9	FKM				•	•	•	•				
11	1	1	Oil return tube			714 00 651	ID.									
11a	2	2	Connection element			714 00 908	ID.									
12	4	4	Screw	HM6 x 16												
12a	4	4	Washer	W6												
13	1	1	Plug	M16 x 150		712 18 652	ID.									
13a	1	1	Flat gasket	Ø 22 x Ø 16 x 2					•	•	•	•				
14	1	1	Gas ballast valve			951 29	ID.									
15	1	1	Oil tube			714 01 201	ID.									
15	1	1	Oil tube			714 00 601	ID.									
16a	4	4	Screw	M20 x 150		9 714 66 220	ID.									
16b	4	4	Flat gasket													
16c	4	4	Flat gasket													
17	1	1	Connection element			714 01 438	ID.									
18	1	1	Oil tube			714 01 211	ID.									
18	1	1	Oil tube			714 00 591	ID.									
19	4	6	Nut	M10												
20	1	1	Valve			712 35 521	ID.	6 fingers							•	•
20	1	1	Valve plate set			712 18 554	ID.	2x4 fingers							•	•
21	1	1	Valve stop			712 31 364	ID.								•	•
21	1	1	Valve stop			712 18 544	ID.								•	•
22	1	1	Flat gasket	182 x 186 x 0,4					•	•	•	•				
22	1	1	Flat gasket	151 x 276 x 0,4					•	•	•	•				
23	1	1	Cover			714 00 611	ID.									
24	1	1	Flat gasket	190 x 236 x 0,4			ID.		•	•	•	•	•	•	•	•
25	1	1	Oil filter			710 18 858	ID.									
26	1	1	Plug	G1/2"		712 31 810	ID.	incl. 26								
26a	1	1	O-Ring	Ø 22 x 3	FKM		ID.	incl. 4, 17, 62								
27	1	1	Oil casing			714 36 670	ID.									
27	1	1	Oil casing			714 36 680	ID.									
28	2	2	Pressure valve	Ø 39 x 68		710 17 933	ID.									
28a	2	2	Relief valve seal	Ø 31,5 x 45	FKM				•	•	•	•				
28b	2	2	O-Ring	Ø 28 x 3	NBR				•	•	•	•				
29	4	4	Exhaust filter	Ø 65 x 230		710 64 763	ID.						•	•	•	•
29	4	4	Exhaust filter	Ø 65 x 400		710 64 773	ID.						•	•	•	•
31	4	4	Spring unit			714 36 210	ID.	incl. 31a, b, c								
31a	4	4	Washer	LL6N												
31b	4	4	Spring													
31c	4	4	Nut													

a) Seal's material delivered as spare part

b) In case of replacement of these parts, new adjustment with locating pins is required (instructions delivered with the parts).

Spare parts

SV200, SV300 (similar)

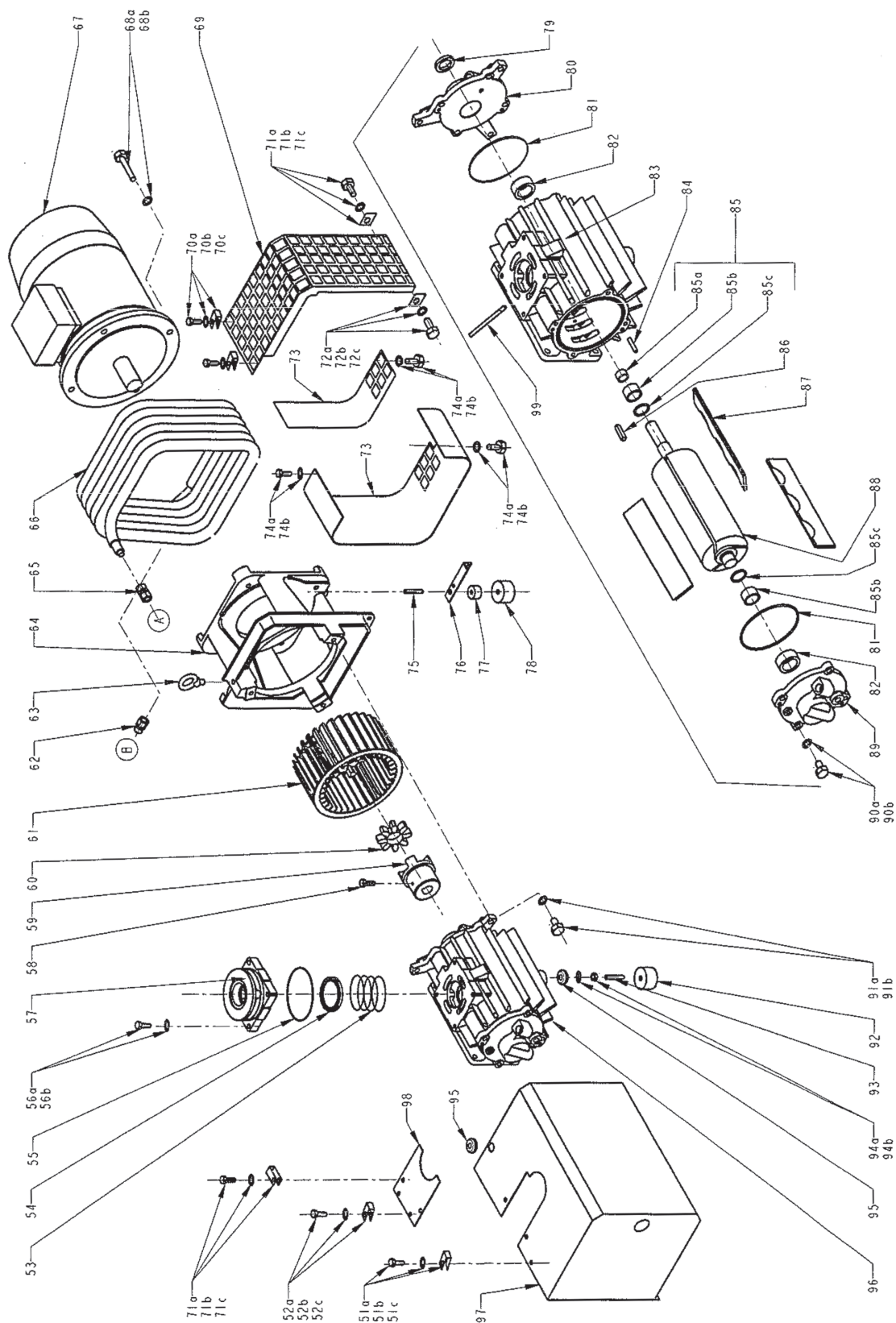


fig. 7

Spare parts

Pos.	Quantity		Specification	Dimensions (mm)	Ref. No.	Ref. No. (USA)	Notes	971 97 552	714 36 730	971 97 652	714 36 740	714 36 170	714 36 180	714 36 190	714 36 200
	SV200	SV300						Material							
51a	3	3	Screw	N°10 LG. 25 type P											
51b	3	3	Washer	L5N AC ZN											
51c	3	3	Nut	N° 10 Ø 4,8 x 7											
52a	2	2	Screw	N°10 LG 25 type P											
52b	2	2	Washer	L5N AC ZN											
52c	2	2	Nut	N°10 Ø 4,8 x 1,5											
53	1	1	Spring	Ø 63/67 x 43 x 1,5	712 13 260	ID.									
54	1	1	Intake valve	Ø 79 x 9 FKM	710 15 473	ID.									
55	1	1	O-Ring	Ø 117,07 x 3,53 FKM (c)			incl. in 57								
56a	4	4	Screw	HM 10 x 50 Q6.8											
56b	4	4	Washer	MN 10 Z											
57	1	1	Intake flange	135 x 135 x 53 - G2	714 36 750	714 36 760	Ø 2" NPT/USA								
58	2	2	Screw		712 26 063	ID.									
59	1	1	Half coupling	Ø 80 x 66	714 00 771	ID.									
60	1	1	Toothed ring	Ø 80 x 18 VULKOLLAN	710 17 722	ID.									
61	1	1	Turbine	Ø 222 x 28 x 120 PLASTIC	710 76 180	712 16 170	*(EUR/JPN)								
61	1	1	Turbine	Ø 222 x 38 x 120 PLASTIC	710 76 170	712 16 170									
62	1	1	Connection element	Ø 12 x 3/8"	714 01 438	ID.									
63	1	1	Lifting lug	M12	712 33 728	ID.									
64	1	1	Coupling housing		714 00 981 (EUR)	714 00 931									
64	1	1	Coupling housing		714 00 541	714 00 931									
64	1	1	Coupling housing		714 00 541 (JPN)										
65	1	1	Connection element	Ø 12 x 12	714 01 398	ID.									
66	1	1	Oil cooler		714 36 161	ID.									
66	1	1	Oil cooler		714 00 471	ID.									
67	1	1	Motor	230/400V ; 4KW ; 50 HZ	710 02 038										
67	1	1	Motor	460V ; 6,5HP ; 60 HZ	710 02 038										
67	1	1	Motor	230/400V ; 5,5KW ; 50 HZ	710 60 638										
67	1	1	Motor	460V ; 9 HP ; 60 HZ	710 60 638										
67	1	1	Motor	208/230-440/460V ; 7,5HP ; 60 HZ		712 16 228	NEMA								
67	1	1	Motor	208/230-440/460V ; 10HP ; 60 HZ		712 16 238	NEMA								
67	1	1	Motor	200V ; 5,5KW ; 50/60 HZ	712 49 028		JIS								
67	1	1	Motor	200V ; 7,5KW ; 50/60 HZ	712 49 038		JIS								
68a	4	4	Screw	HM 12 x 30 Q6.8											
68b	4	4	Washer	MN 12 Z											
68a	4	4	Screw	CHc1/2" x1" 1/4											
69	1	1	Turbine housing		714 01 631	ID.									
70a	2	2	Screw	N°10 LG.19 Type P											
70b	2	2	Washer	L5N AC ZN											
70c	2	2	Nut	N°10 Ø 4,8 x 7											
71a	1	1	Screw	HM 6 x 12 Q6.8											
71b	1	1	Washer	MN 6 Z											
71c	1	1	Nut	M6 x 1,5											
72a	1	1	Screw	HM 6 x 16 Q6.8											
72b	1	1	Washer	MN 6 Z											
72c	1	1	Nut	M6 x 1,5											
73	1	1	Turbine housing		714 07 021	ID.									
73	1	1	Turbine housing		714 02 091	ID.									
74a	1	2	Screw	HM 6 x 12 Q6.8											
74b	1	2	Washer	MN 6 Z											
75	1	1	Threaded pin	M10 x 45/15 J15											
76	1	1	Support		714 01 681	ID.									
77	1	1	Spacer		714 00 911	ID.									
78	1	1	Rubber mount	Ø 50 x 30	710 24 228	ID.									
79	1	1	Radial shaft seal	Ø 32 x 47 x 7	FKM	712 23 182	ID.								
80	1	1	Rear bearing flange		714 01 360	ID.	b)								
80	1	1	Rear bearing flange		714 00 550	ID.	b)								
81	2	2	O-Ring	Ø 148,83 x 3,53	NBR		ID.								
82	2	2	Needle bearing (outer)	Ø 37 x 52 x 22		710 31 562	ID.								

a) Seal's material delivered as spare part

b) In case of replacement of these parts, new adjustment with locating pins is required (instructions delivered with the parts)

Spare parts

SV200, SV300 (similar)

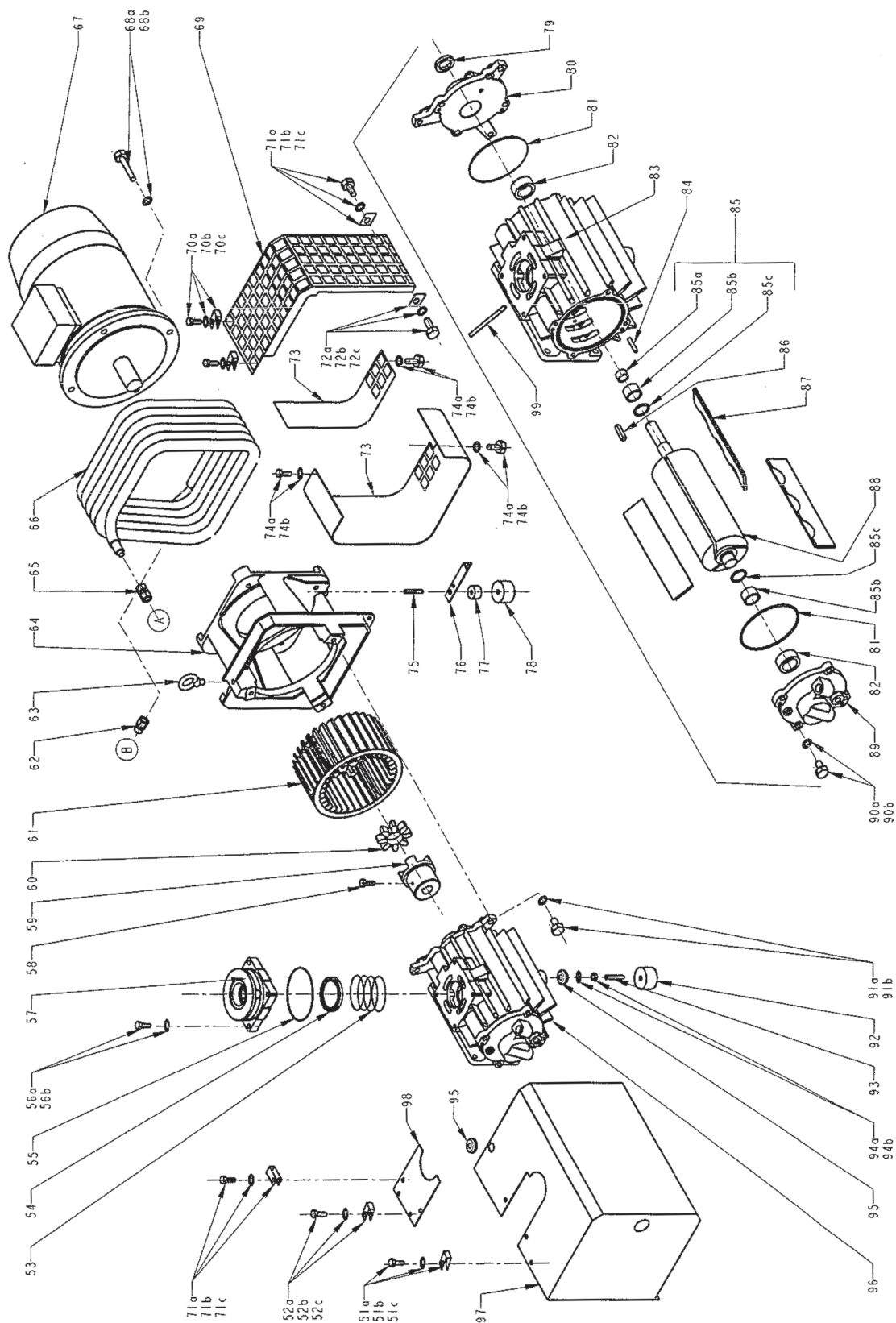


fig. 7

Spare parts

Pos.	Quantity		Specification	Dimensions (mm)	Ref. No.	Ref. No. (USA)	Notes	971 97 552	714 36 730	971 97 652	714 36 740	714 36 170	714 36 180	714 36 190	714 36 200
	SV200	SV300													
83	1		Pump cylinder		714 36 580	ID.	b)								
83		1	Pump cylinder		714 36 570	ID.	b)								
84	4	4	Centering pin A-8-60	NFE 27-482 / DIN 7977	714 00 878	ID.	b)								
85	1	1	Set of rotor rings		714 07 070	ID.	incl. 85a, b, c				•	•			
85a	1	1	Shaft seal ring	Ø 28 x Ø 32 x 20											
85b	2	2	Inner race bushing	Ø 30 x Ø 37 x 22											
85c	2	2	Washer	Ø 30 x Ø 38 x 2											
86	1	1	Key	8 x 7 x 45	710 01 588	ID.									
87	1		Vane (set of 3)	56 x 182 x 5,8	Ferrozell	714 12 000	ID.				•	•			
87		1	Vane (set of 3)	58 x 282 x 5,8	Ferrozell	714 12 010	ID.				•	•			
88	1		Rotor with rings		714 00 990		b)								
88		1	Rotor with rings		714 00 890		b)								
89	1		Front end plate		714 01 350		b)								
89		1	Front end plate		714 00 450		b)								
90a	8	8	Screw	HM 10 x 40 Q6.8 Z											
90b	8	8	Washer	DE 10 Z											
91a	3	3	Screw	HM 12 x 40 Q6.8 PH											
91b	3	3	Washer	W 12											
92	1	1	Rubber mounted	Ø 50 H 30	710 24 228	ID.									
93	1	1	Theaded pin	HC 10 x 50 Q88											
94a	1	1	Nut	HM 10 Q6 Z											
94b	1	1	Washer	MN 10 Z											
95	1	1	Washer	Ø 40 x 6 x 2	NBR										
96	1		Vacuum generator		714 36 770	ID.	incl. 20, 21, 79 à 90								
96		1	Vacuum generator		714 36 780	ID.	incl. 20, 21, 79 à 90								
97	1		Pump housing		714 36 621	ID.									
97		1	Pump housing		714 36 631	ID.									
98	1		Intake flange housing		714 36 641	ID.									
99	1		Tube	D6 x 1 - M6	9 712 68 720	ID.	c)								
	1		Set of seals NBR		971 97 552	ID.		▲				•	•	•	•
	1		Set of seals FKM		714 36 730	ID.		▲	▲						
		1	Set of seals NBR		971 97 652	ID.			▲			•	•	•	•
		1	Set of seals FKM		714 36 740	ID.				▲					
	1		Module kit		714 36 170						▲				
		1	Module kit		714 36 180							▲			
	1		Repair set		714 36 190								▲		
		1	Repair set		714 36 200									▲	
	1	1	Set of covers screw		9 714 56 480	ID.	incl. 51a, b, c incl. 52a, b, c incl. 70a, b, c incl. 71a, b, c								▲

a) Contains all parts marked

b) In case of replacement of these parts, new adjustment with locating pins is required (instructions delivered with the parts)

c) Since S/N 30000 509 483

EC Conformance Declaration



We, the Oerlikon Leybold Vacuum France, declare herewith that the products listed below, in the embodiment which we have placed on the market, comply with the applicable EC guidelines.

This declaration becomes invalid if modifications are made to the product without prior consultation with use.

Maintaining the EMC guideline assumes an EMC compliant installation of the component within the plant or machine.

Product type: SÓGEVAC

Model designation: SV16, SV25, SV40, SV65, SV10B, SV16B, SV16BI, SV28BI, SV40BI, SV25B, SV40B, SV65B, SV100B, SV100, SV200, SV300, SV500, SV630, SV750, SV1200, SV630B, SV750B
and their variants, excepted the pumps delivered without motor and the pumps delivered with EEx... motors

The products comply to the following guidelines :

- EC Directive on machines (98/37/EC)
- EC Low-Voltage Equipment Guidelines (73/23/EMG)+(98/68/EC)
- EC Directive on Electromagnetic Compatibility (89/336/EEC)

Related, harmonized standards:

- EN 1012, 1996
Compressors and vacuum pumps, safety requirements
Part 2: Vacuum pumps
- EN 60204-1, 1997
Safety of machinery - Electrical equipment of machines
Part 1: General requirements

Limits of use:

- The pump and its accessories are not designed for pumping aggressive, flammable, explosive gases or vapors or substances, pyrophoric gases or oxidizing agents.
- The pump and its accessories are not designed for working in aggressive, flammable, or explosive ambiance.
- For pumping oxygen in concentrations greater than atmospheric concentration (>20%) or other highly reactive gases, a special pump must be used. This pump must be modified and an inert oil (such as PFPE) must be used.

Contact Oerlikon Leybold Vacuum France for important safety precautions relative to these applications.

Other safety precautions and restrictions:

Refer to the manual delivered with the pumps. In any case, take adequate safety precautions.

Valence, January 12th 2007

Joseph Schott
Plant Manager

Valence, January 12th 2007

Jean-Luc Abraham
Vane pumps R&D Manager

Oerlikon Leybold Vacuum France
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Fax: +33-(0)4.75.82.92.69

www.oerlikon.com

Declaration of Contamination of Compressors, Vacuum Pumps and Components

The repair and / or servicing of compressors, vacuum pumps and components will be carried out only if a correctly completed declaration has been submitted. **Non-completion will result in delay.** The manufacturer can refuse to accept any equipment without a declaration.

A separate declaration has to be completed for each single component.

This declaration may be completed and signed only by authorised and qualified staff.

Customer/Dep./Institute: _____ Address: _____ Person to contact: _____ Phone: _____ Fax: _____ End user: _____	Reason for return <input checked="" type="checkbox"/> applicable please mark <input type="checkbox"/> Repair <input type="checkbox"/> chargeable <input type="checkbox"/> warranty <input type="checkbox"/> Exchange <input type="checkbox"/> chargeable <input type="checkbox"/> warranty <input type="checkbox"/> exchange already arranged / received Return only: <input type="checkbox"/> rent <input type="checkbox"/> loan <input type="checkbox"/> for credit Calibration: <input type="checkbox"/> DKD <input type="checkbox"/> Factory calibration <input type="checkbox"/> Quality test certificate DIN 55350-18-4.2.1
--	--

A. Description of the œrlikon Leybold Vacuum product Material description: _____ Catalog number: _____ Serial number: _____ Type of oil (Forevacuum pumps): _____	Failure description: _____ Additional parts: _____ Application Tool: _____ Application Process: _____
--	--

B. Condition of the equipment																																																																
1. Has the equipment been used ¹⁾ <input type="checkbox"/> 2. Drained (Product/service fluid) <input type="checkbox"/> 3. All openings sealed airtight <input type="checkbox"/> 4. Purged <input type="checkbox"/> If yes which cleaning agent: _____ and which method of cleaning: _____ 1) if answered with "No" go to D.	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 10%; text-align: center;">No¹⁾</th> <th style="width: 10%; text-align: center;">Yes</th> <th style="width: 10%; text-align: center;">No</th> <th style="width: 20%;"></th> <th style="width: 10%; text-align: center;">No¹⁾</th> <th style="width: 10%; text-align: center;">Yes</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">↓</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">→</td> <td>Contamination:</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>oxic</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>corrosive</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>flammable</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>explosive²⁾</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>radioactive²⁾</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>microbiological²⁾</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>other harmful substances</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </tbody> </table>		No ¹⁾	Yes	No		No ¹⁾	Yes	<input type="checkbox"/>	↓	<input type="checkbox"/>	→	Contamination:	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	oxic	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	corrosive	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	flammable	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	explosive ²⁾	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	radioactive ²⁾	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	microbiological ²⁾	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	other harmful substances	<input type="checkbox"/>	<input type="checkbox"/>
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		<input type="checkbox"/>	<input type="checkbox"/>	other harmful substances	<input type="checkbox"/>	<input type="checkbox"/>																																																										

C. Description of processed substances (Please fill in absolutely)	
1. What substances have come into contact with the equipment: Trade name and / or chemical term of service fluids and substances processed, properties of the substances; According to safety data sheet (e.g. toxic, inflammable, corrosive, radioactive)	
Tradename: _____ a) _____ b) _____ c) _____ d) _____	Chemical name: _____ No Yes 2. Are these substances harmful? <input type="checkbox"/> <input type="checkbox"/> 3. Dangerous decomposition products when heated? <input type="checkbox"/> <input type="checkbox"/> If yes, which? _____

²⁾ Components contaminated by microbiological, explosive or radioactive products/substances will not be accepted without written evidence of decontamination.

D. Legally binding declaration

I / we hereby declare that the information supplied on this form is accurate and sufficient to judge any contamination level.

Name of authorised person (block letters): _____ Date _____ Signatur of authorised person _____	<div style="border: 1px dashed black; width: 100%; height: 100%;"></div> firm stamp
--	---

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