



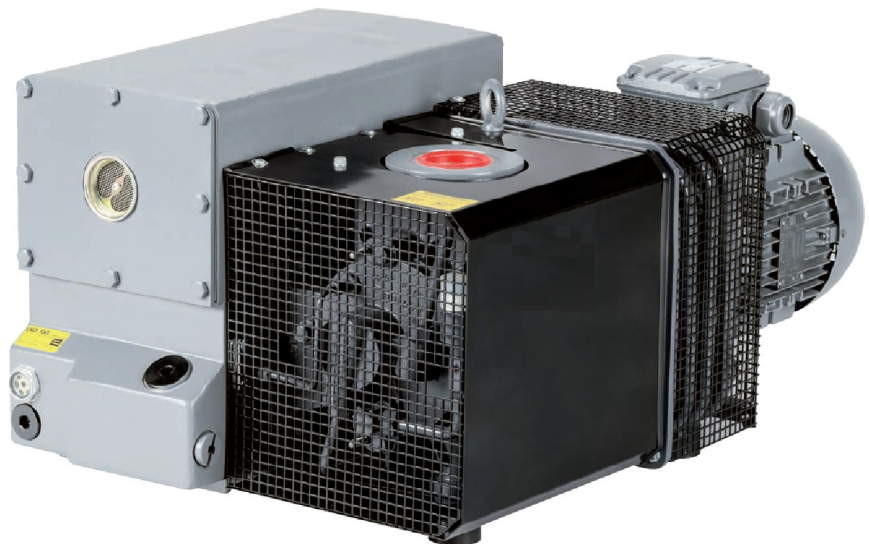
# SOGEVAC<sup>®</sup>

SV200 FP

Single-stage, oil-sealed rotary vane pump

Original Operating Instructions 300419814\_002\_C2  
and spare parts list

Ref:  
10927FP  
1092791FP  
95027FP



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# Safety Information

## Obligation to Provide Information

Before installing and commissioning the pumps, carefully read these Operating Instructions and follow the information so as to ensure optimum and safe working right from the start.

The Leybold SOGEVAC<sup>®</sup> 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<sup>®</sup> 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.

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE is used to notify users of installation, operation, programming or maintenance information that is important, but not hazard related.

We reserve the right to modify the design and the specified data. The illustrations are not binding.

Retain the Operating Instructions for further use.

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.

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## NOTICE



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## DANGER



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## WARNING



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## CAUTION



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## NOTICE



# Safety Information

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## 0 Important Safety Information

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### WARNING



#### 0.1 Mechanical Hazards

- 1 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 opened during operation of the pump.

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### DANGER



#### 0.2 Electrical Hazards

- 1 The electrical connection must only be provided by a trained person. Please observe the national regulations in the country of use like EN 50110-1 for Europe, for example.
- 2 Disconnect the unit from the power supply before starting any work.

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### CAUTION



#### 0.3 Thermal Hazards

- 1 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.

---

### DANGER



#### 0.4 Hazards Caused by Materials and Substances

- 1 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 pumping liquids;
    - for working in flammable, explosive or dusty environment. In case of doubt, please contact Leybold.See also the lists of use indicated in the CE declaration of conformity.
  - 2 Depending on the process involved, dangerous substances and oil may escape from the pump. Take the necessary safety precautions!
  - 3 Take appropriate precautions to insure that the pump cannot start.
  - 4 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.
  - 5 Observe all safety regulations!
  - 6 Take adequate safety precautions prior to opening the intake or exhaust port.
  - 7 Respect the instructions concerning environment protection when discarding used oil or exhaust filters!
-

# Safety Information

## 0.5 Danger of Pump Damage

- 1 Liquid and solid particles must not enter the pump. Install the adequate filters, separators and/or condensers. In case of doubt consult Leybold.
- 2 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. Never work with closed or restricted pump exhaust.
- 3 Operating of the pump without oil or operating with incorrect direction of rotation can destroy the pump or lead to oil backstreaming.
- 4 Never use discarded seals. Always assemble using new seals.
- 5 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.

---

### NOTICE



# Description

## 1 Description

SOGEVAC<sup>®</sup> 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<sup>®</sup> pumps SV200 FP is single-stage oil-sealed rotary vane vacuum pump.

The anti-suck back 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-suck back 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.

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.

# Description

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

The pumps have a gas ballast device. 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 vapors.

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

Unintentional venting of the vacuum chamber as well as oil suckback when shutting down the pump are prevented by the integrated anti-suckback 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.

### SV200 FP

Technical Data		50Hz	60Hz
Nominal speed <sup>1)</sup>	m <sup>3</sup> /h	180	220
Pumping speed <sup>1)</sup>	m <sup>3</sup> /h	170	200
Ultimate partial pressure without gas ballast <sup>1)</sup>	mbar	≤8.10 <sup>-2</sup>	≤8.10 <sup>-2</sup>
Ultimate total pressure mbar with gas ballast standard <sup>1)</sup>	mbar	≤0.7	≤0.7
Water vapour tolerance	mbar	40	50
Water vapour tolerable load	kg/h	3.4	5.4
Noise level <sup>2)</sup>	dB(A)	69	73
Leak rate	mbar.l.s <sup>-1</sup>	≤1.10 <sup>-3</sup>	≤1.10 <sup>-3</sup>
Mains voltage (Standard) For other voltage <sup>3)</sup>	V	230/400	460 <sup>4)</sup>
Motor power	kw	4	4.6
Type of protection		IP55	IP55
Rated rotational speed	min <sup>-1</sup>	1450	1750
Oil capacity (min./max.)	L	5/9	5/9
Intake connection		G2	G2 NPT <sup>2)</sup>
Exhaust connection		G2	G2 NPT <sup>2)</sup>

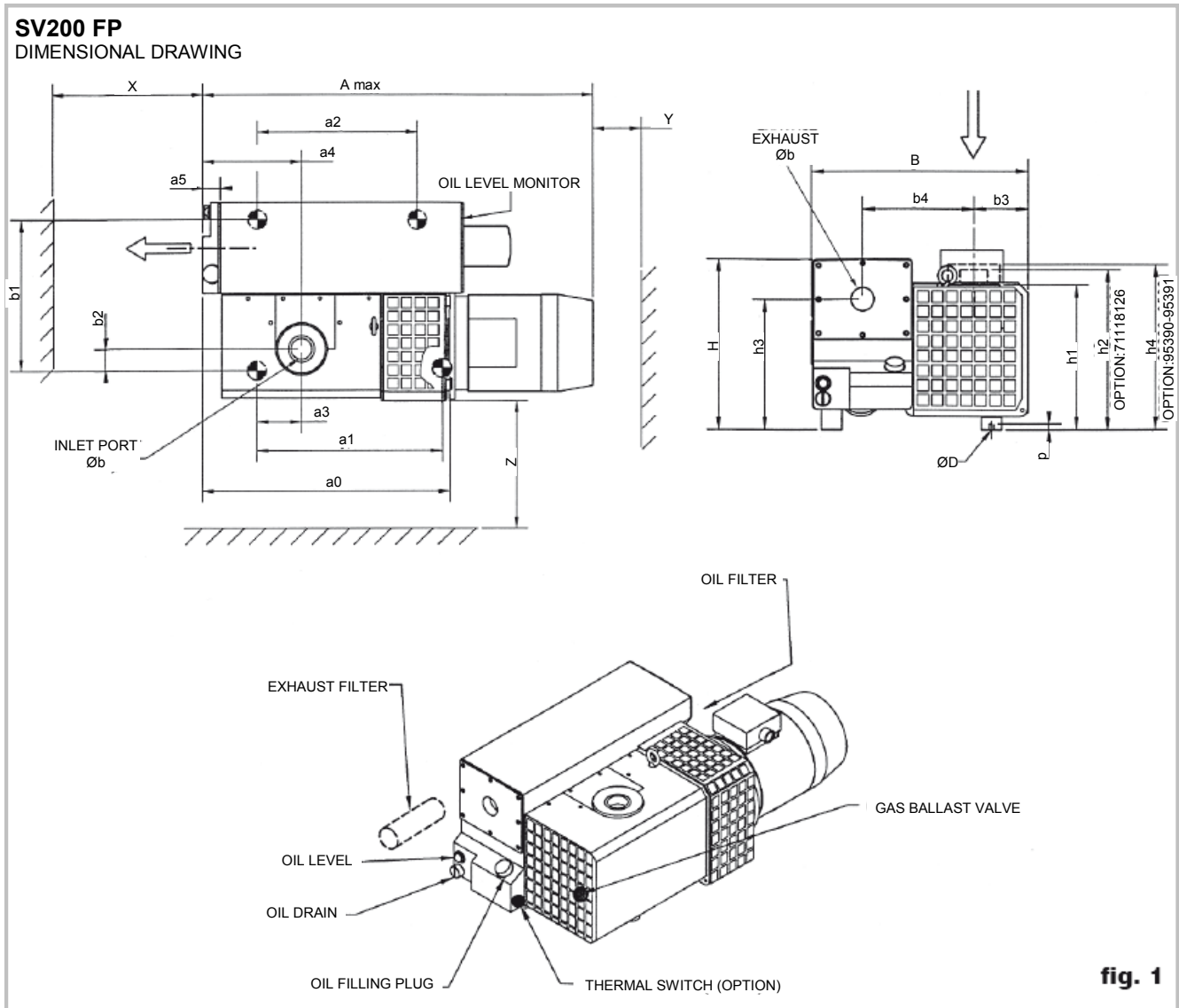
1) to DIN 28400 and following numbers, with standard gas ballast

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

3) please contact Leybold

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

# Description



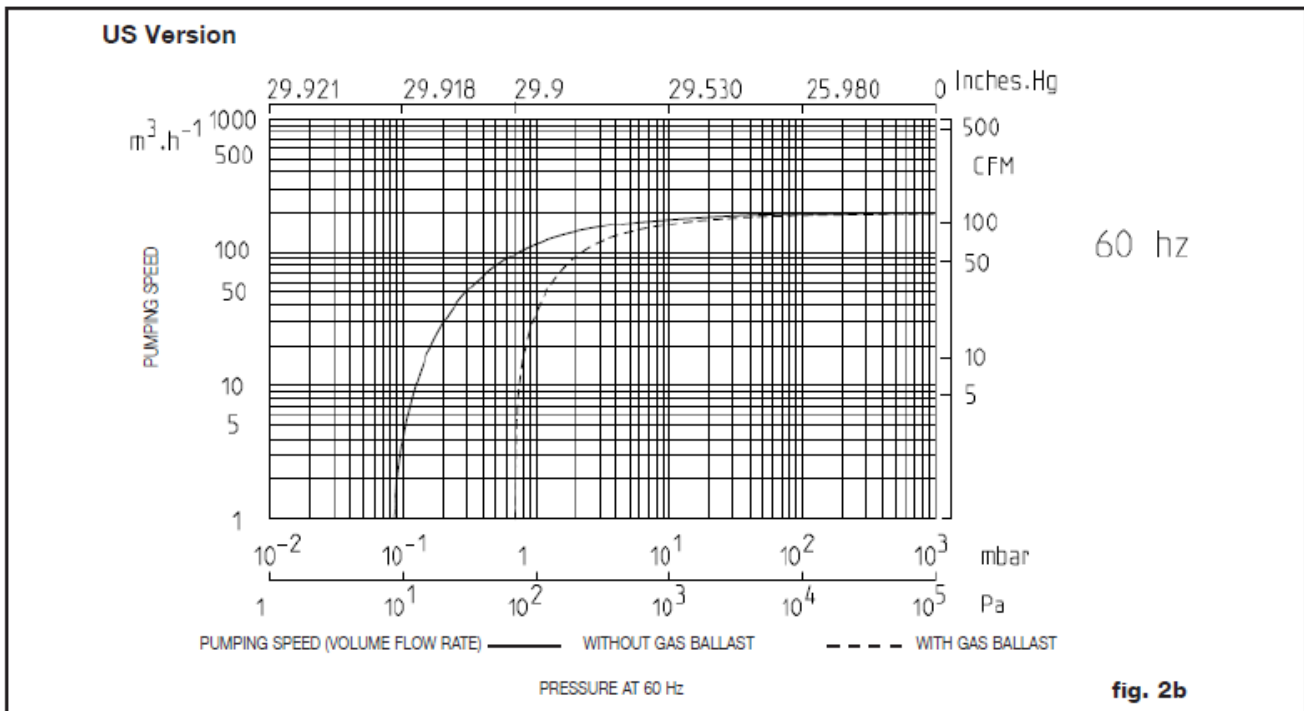
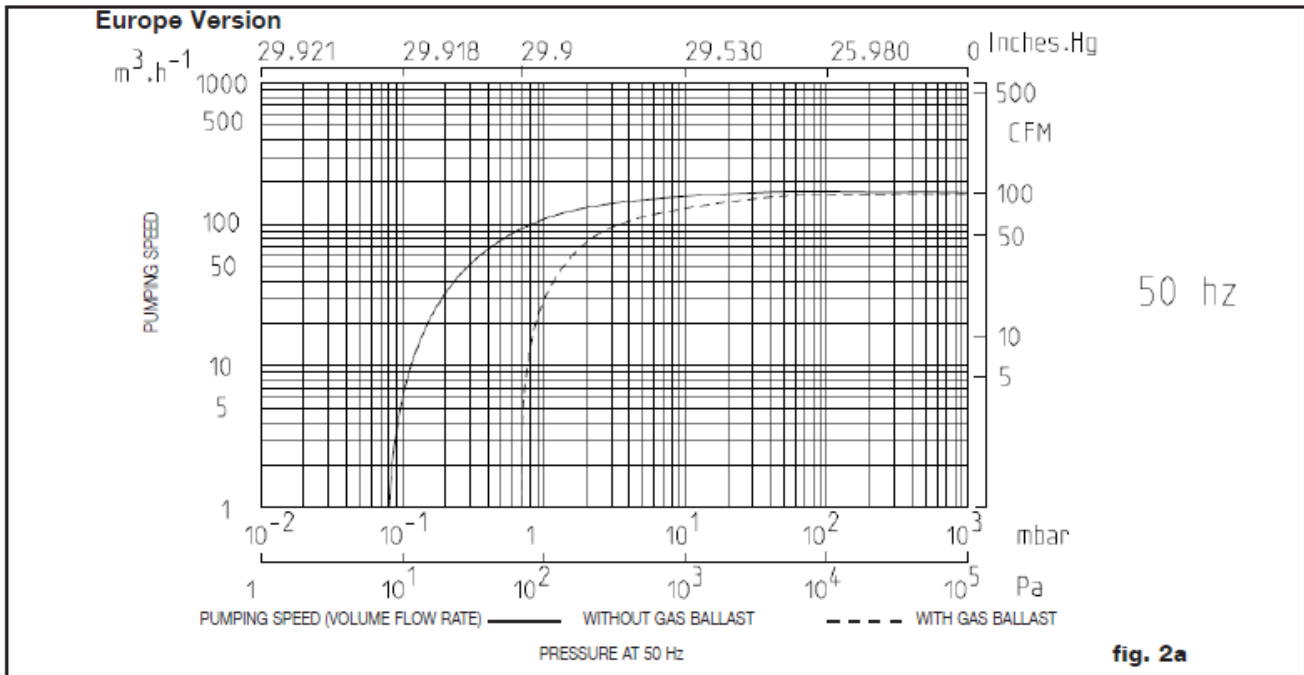
## Dimension in mm

Type	$\varnothing a$	$\varnothing b$	Amax.	a0	a1	a2	a3	a4	a5	B	b1	b2	b3	b4	$\varnothing D/P$	H	h1	h2	h3	h4	X	Y	Z	Weight kg
109 27FP	G2	G2	970	548	390	252	62	214	40	535	394	50	140	269	M10/10	425	352	392	318	399	350	150	300	190
1092791FP			960																					
95027 FP			960																					

# Description

Conversion factors	Different pressure units			Different pumping speed unit		
	mbar (millibar)	torr	Inches Hg vacuum	$\text{m}^3 \cdot \text{h}^{-1}$	$\text{l} \cdot \text{s}^{-1}$	cfm
1 lb = 0.453 kg 1 qt = 0.946 l	1013 400	760 300	0 18.12	$\text{m}^3 \cdot \text{h}^{-1} = \text{m}^3/\text{h}$	1	0.278 0.589
1 hp = 0.735 kw 1 r.p.m = 1 $\text{min}^{-1}$	133 4	100 3	25.98 29.8	$\text{l} \cdot \text{s}^{-1} = \text{l/s}$	3.6	1 2.12
1 inch = 25.4 mm	1 0.1	0.75 0.75	29.89 29.92	<b>cfm (cubic feet per minute)</b>	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: $1 \text{ m}^3 \cdot \text{h}^{-1} = 0.589 \text{ cfm}$ Note: the nominal pumping speed of a pump at 60Hz is 20% higher than that at 50Hz		

# Description

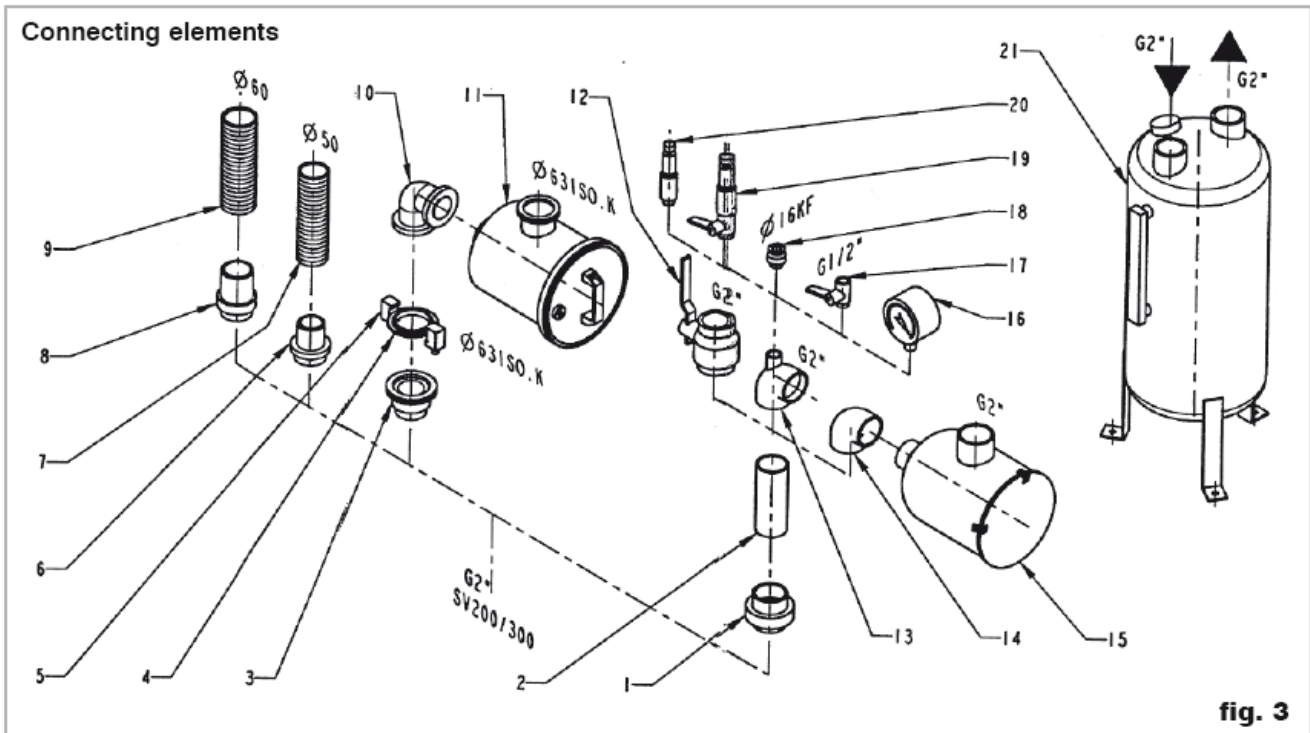


# Description

## 1.3 Connection Fittings

Description	Size	Part. No.
1 Union coupling + Seal	G2 F/M	711 18 025
2 Nipple	G2 M/M - 50mm long	711 18 035
3 Threaded flange adapter	G2 M - DN63 ISO-K	711 18 126
	NPT2 M - DN63 ISO-K	721 03 040
4 Centering ring	DN 63 ISO-K AL/NBR	268 07
5 Set of 4 clamps for ISO-KM10X24 flanges		267 01
6 Adapter for tubing	G2 DN50	711 18 015
7 PVC tubing	50mm, 1m long	711 18 325
8 Adapter for tubing	G2 DN60	711 18 016
9 PVC tubing	60mm, 1m long	711 18 326
10 Right-angle bend 90°	63 ISO-K	887 25
11 Dust filter, metal	63 ISO-K	711 27 126
Dust filter, polyester		711 27 127
12 Ball valve	G2 F/F	711 30 107
13 Tee reducer bush	G2-G2-G1/2 F/F/F	711 18 265
14 Elbow 90°	G2 F/F	711 18 215
15 Dust filter, metal	G2 M/F	711 27 123
Dust filter, polyester		711 27 124
16 Vacuum gauge	G1/2 M	951 92
17 Ball valve	G1/2 M/F	711 30 113
18 Threaded flange adapter	G1/2 M - DN16 KF	711 18 120
19 Regulation valve with isolation valve	G1/2 M	951 87
20 Regulation valve	G1/2 M	951 86
21 Condensate trap	G2 F-G2F	951 44

# Description



## 1.4 Ordering in formations

### Part No.SV200 FP

Pump with three-phase motor and integrated gas ballast valve  
 230 V/400 V, 50Hz  
 460 V, 60Hz

109 27 FP

Pump with three-phase motor and integrated gas ballast valve  
 200-240V / 380-415 V, 50Hz  
 200-230V / 380-460 V, 60Hz

1092791 FP

### US Version

Pump with three-phase (NEMA ) motor and integrated gas ballast valve  
 208/230/460V 60Hz 3-phase (+400 V 50Hz)

950 27 FP

# Description

## 1.5 Accessories

Description	Size	Part. No.
Oil sight glass (glass/metal) (Europe version)		712 19 480
Oil filter by-pass		712 30 570
Oil drain tap	G 3/4	711 30 114
Interchangeability kit SV180/280		714 01 930
Gas ballast standard 7Nm <sup>3</sup> /h		951 29
Gas ballast big flow 18Nm <sup>3</sup> /h		951 30
Gas ballast standard with EM valve 24 V DC (KIT) 7Nm <sup>3</sup> /h		951 31
Exhaust filter gauge		951 94
Exhaust filter over pressure switch		712 22 360
Oil level monitor		953 96
Thermal switch		951 36
Adapter Roots 500		953 90
Adapter Roots 1000		953 91
Base frame		711 19 208
Base frame for possibility for adaptation Roots		711 19 209
Separator SEP 63	DN 63 ISO-K	953 56
Separator-Condenser SEPC 63	DN 63 ISO-K	953 66
Threaded flange adapter	G 2'F-DN 63 ISO K	711 18 113

Stability of pump is insured with accessories of Leybold; 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	SV200FP + WAU 501	+ WAU 1001
	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 (Ø117.07x3.53FPM)	714 36 222 (Ø 117.07x3.53FPM)
4	4	screw	HM10x40 Q6.8	HM10x40 Q6.8
	4	washer	W10	W10
5	4	screw	M12-35/30J=18 Q6.8	M16-65/30J=24 Q6.8
	4	washer	MN12	MN16
	4	nut	H M12	H M16

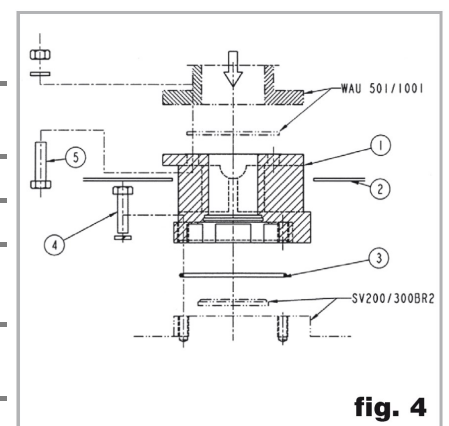


fig. 4

# Description

## 1.7 Spare parts

Description	Size	Part. No.
Oil filter standard		710 18 850
Exhaust filter		EK 6520366
Set of seals	FKM	714 36 730
Repair set		714 36 190
Module kit		714 36 170
Inlet filter element F200/300 FP		
• metal		7121 3 334
• polyester		712 61 318

## 1.8 Lubricants

Except differently specified on the pump, we recommend to run the SOGEVAC® pumps with LVO150 from Leybold 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.

LVO 150 OIL:	Conditioning	Reference
	1L	L15001
	2L	L15002
	20L	L15020

LVO150 is a food grade oil, H1 certificated by the NSF for incidental contact with food products.

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

Only use lubricants which have been fully qualified by Leybold.

# 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.

The pump is supplied with drive motor in ready to use condition; it is supplied with LVO150 (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.

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#### WARNING



### 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.

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#### DANGER



# Installation

Until the pump is put back in to service again, the pump should be stored in a dry place, preferably at room temperature (20 °C) but not below 0°C.

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## 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.

---

## CAUTION



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.

The pump must be kept clean (not dust deposit).

#### 3.2 Conforming use

The SOGEVAC pumps are intended to be used on clean processes, at low inlet pressure.

In normal operation, the SOGEVAC pumps operated typically below 10 mbar inlet pressure or at ultimate pressure with open gas ballast. Continuous duty is possible.

In the below listed abnormal conditions (but not limited to) the pump may stop due to overheating of the power electronics or motor.

- Continuous operation at high inlet pressure
- Restricted, clogged or blocked exhaust filter or exhaust line
- Out of tolerance supply voltage
- Unsuitable, polluted or too old oil
- Too low oil level
- Too high ambient temperature
- Clogged fan hoods or impeded fresh air circulation

# Installation

## 3.3 Connection to system

Note the safety information in Section 0.

### Inlet connection

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

When pumping dangerous gases, the inlet line must be tight.

No particles or liquids may enter in the pump.

---

**WARNING**



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**DANGER**



# Installation

## 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 material to avoid any trespassment of the limits authorized 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.

The choice of materials for the pipelines must take into account the pumped medium.

When 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.

# Installation

## 3.4 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.

**DANGER**



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 pressurized.

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.

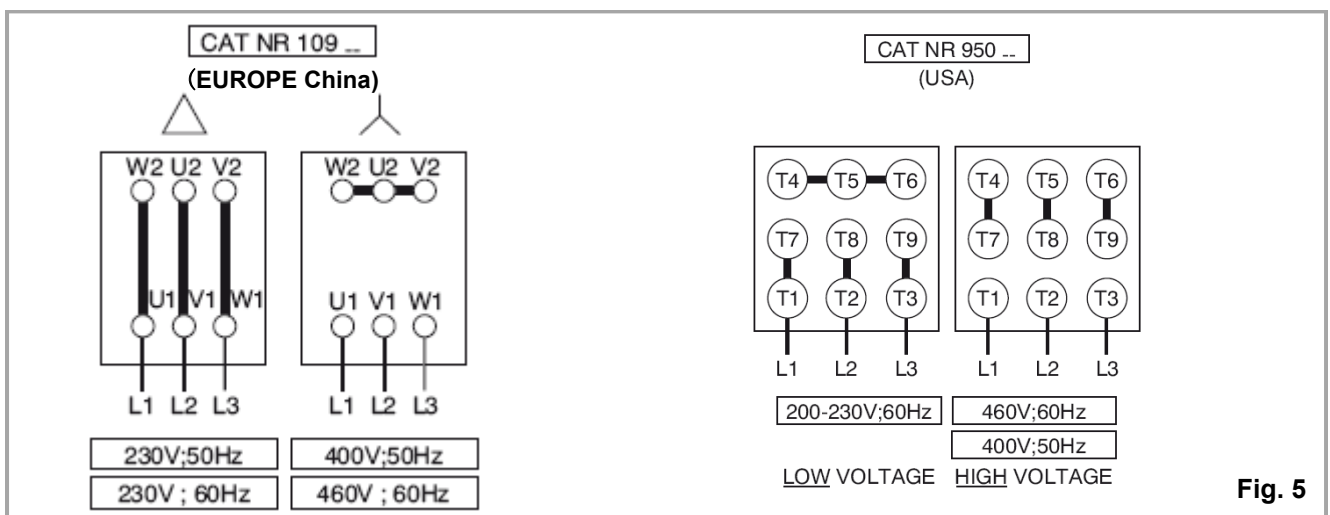


Fig. 5

# Installation

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**NOTICE**

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 FP -P/N 10927FP

Voltages:

230-400 V  $\pm 10\%$  at 50 Hz

460 V  $\pm 10\%$  at 60 Hz

---

US versions:

---

A 50/60 Hz motor (NEMA) is mounted in standard on the SV200 FP - P/N 95027FP

Voltages:

400 V  $\pm 10\%$  at 50 Hz

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

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Wide range version:

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A wide range motor is mounted in standard on the SV200 FP - P/N 1092791FP

Voltages:

200 - 240 / 380 - 415 V  $\pm 10\%$ , 50 Hz

200-230 V / 380 - 460 V  $\pm 10\%$ , 60 Hz

---

**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<sup>®</sup> pump is designed for normal startup at temperatures over 12°C (54°F) (as per PNEUROP). With adequate oils, cold starts are possible above 0°C (32°F).

---

**CAUTION**

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.

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.

Use ear protection in case of operation at high inlet pressures.

---

**CAUTION**

### 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.

### Standard gas ballast (Cat. No. 951 29) 7 Nm<sup>3</sup>/h (originally mounted).

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 Nm<sup>3</sup>/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).

# 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.

---

## NOTICE



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.

---

## NOTICE



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.

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-suck back 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.

---

**NOTICE**

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.

# Maintenance

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## DANGER




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## CAUTION




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## NOTICE



## 5 Maintenance

### 5.1 Safety Information

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

Observe the safety regulations.

When disposing of used oil please observe the relevant environmental 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 filing warranty claims.

Never mount used seals ; always mount new seals.

### 5.2 Maintenance Intervals

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

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

To simplify the maintenance work we recommend combining several jobs.

## 5.3 Leybold 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.leybold.com](http://www.leybold.com) → Downloads → Download Documents → Declaration of Contamination.

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 LVO150

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.

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**Contamination**

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**Form**

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**CAUTION**



# 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.

A oil quality label stuck to the pump helps user judge if oil should be changed or not.

When oil color reaches "CHANGE" shade, it is a signal to change oil.

oil change frequency given by oil label is just informative, the real oil life time depends on chemical characteristics.

- If the viscosity at 25 °C exceeds 0.3 Pa s, the oil should be changed.
- The neutralization value is determined according to DIN51558. If it reaches 2, the oil should be changed.

User can decide a postponement of oil change based on their experience and professional management. In case of doubt, don't risk operation with used oil, it's preferable to replace oil.

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

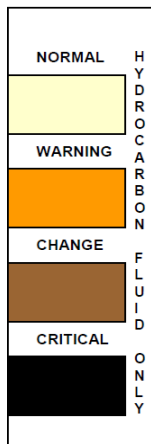


fig.6 Oil quality label

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### CAUTION



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.

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

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

Refasten the oil-drain plug (check the O-ring, replace if required).

Unscrew the oil-fill plug and fill in fresh oil and refasten the oil fill plug.

The pump should be flushed if there is considerable pollution. To flush the pump, fill clean 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).

# Maintenance

## **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.

# Maintenance

## **E. Cleaning the Gas Ballast 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.

## **G. Checking the Anti-Suck back Valve**

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

Adjusting ring: 710 72 333

Keep the anti-suck back 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.

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

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

If the anti-suck back 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 !

# Maintenance

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

The plane side of the anti-suck back valve faces downward.

## 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.

## 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.

# Maintenance

## J. Replacing the Pump Module

Fully assembled pump modules are available under Ref. Nos. :  
SV200 FP: 714 36 770

Tools required : SV200  
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-suck back 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.

## 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.

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

# Maintenance

## **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 FP (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.

## **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 1.8 oil.	
	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 is seized up. (Sign : pump is jammed).		Repair the pump.	5.4-J/5.4-K
Pump does not reach ultimate pressure.	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-suck back 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-suck back 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.	5.4-G
	Anti-suck back is malfunctioning.	Repair the valve.	
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.	Exhaust valve is malfunctioning.	5.4-I
	Pump module is no longer usable.	Replace the pump module	5.4-J.

# Troubleshooting

<b>Fault</b>	<b>Possible cause</b>	<b>Remedy</b>	<b>Reference Section *</b>
Oil in intake line or in vacuum vessel.	Oil comes from the vacuum system.	Check the vacuum system.	
	Anti-suck back valve is obstructed.	Clean or repair the valve.	5.4-G
	Sealing surfaces of anti-suck back 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. Precaution: open the gas ballast valve or insert a condensate trap. Clean the gas ballast intake filter.	4.1/5.4-B  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.	Oil filter is clogged.	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 Leybold service center.

Never mount used seals. Always mount new seals.

# Spare parts

## 7 Spare parts

To guarantee safe operation of the Leybold 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 Leybold'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
- Exhaust demisters
- Oil LVO150 (Special oils please refer to the specific notice of the pump or contact Leybold)
- 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 FP

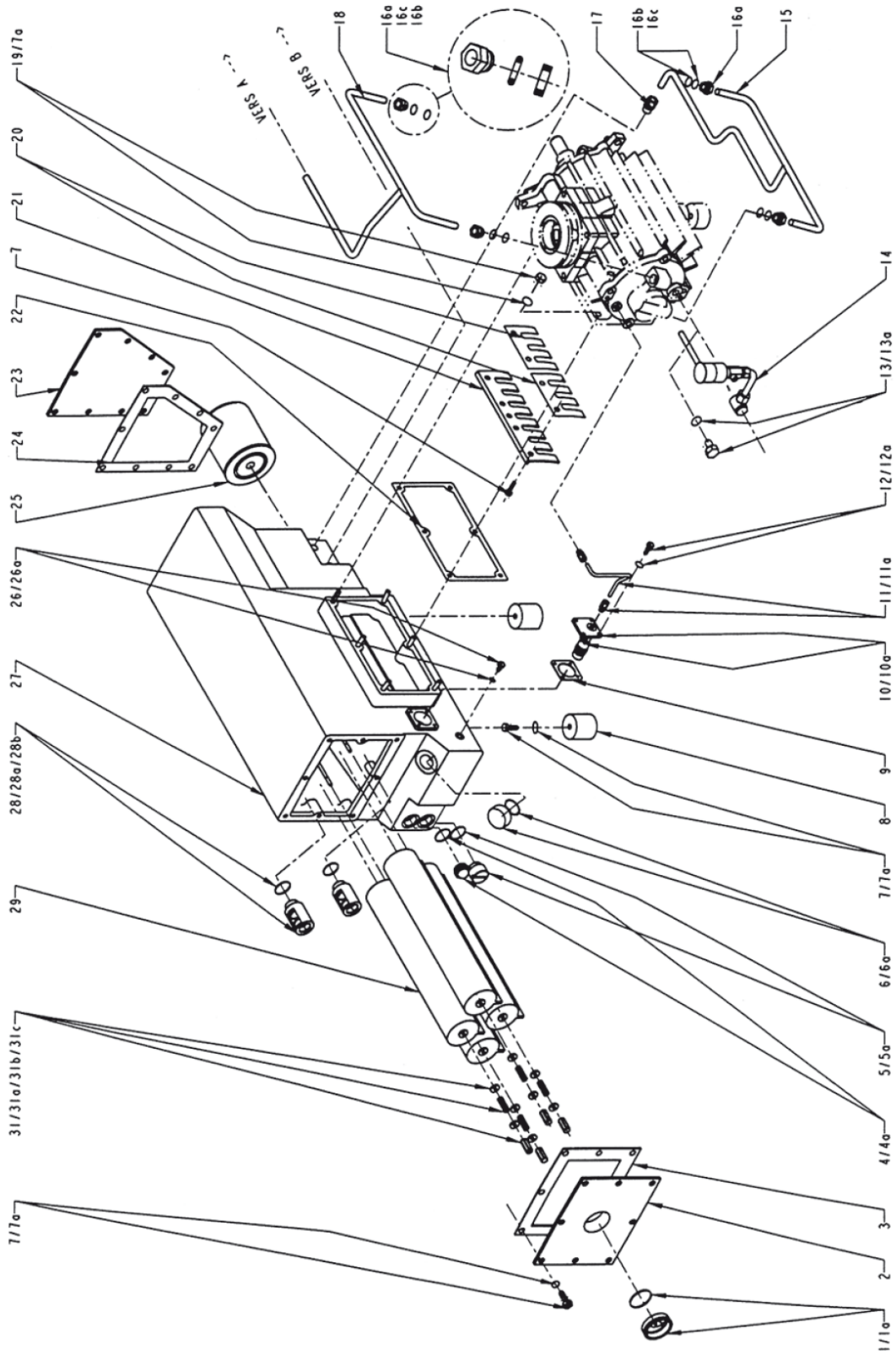


fig. 6

# Spare parts

Pos.	Qty.	Specification	Dimensions (mm)	Ref. No.	Ref. No. (USA)	Notes	971 97 552	714 36 730	714 36 170	714 36 190
1	1	Exhaust plug	2"	712 13 233	ID.	incl. 1a				
1a	1	Gasket	Ø57 x Ø52 x 2 NBR				•	•		
2	1	Exhaust flange		710 60 844	710 60 854					
3	1	Flat gasket	238 x 193 x 2 FKM (c)	712 37 044	ID.		•	•		
4	1	Oil level glass	3/4"	712 19 480	712 19 480	incl. 4a				
4a		Flat gasket	Ø34 x Ø26.5 x 2							
5	1	Oil drain screw	3/4"	710 45 403	ID.	incl. 5a				
5a	1	O-ring	Ø27 x 2.5 FKM (c)	712 17 582	ID.		•	•		
6	1	Oil filling plug	1"	710 73 048	ID.	incl. 6a				
6a	1	O-ring	Ø32 x 3.5 FKM (c)	712 17 412	ID.		•	•		
7	19	Screw	M10 x 20							
7a	21	Washer	MN10							
8	2	Rubber mount	Ø50 H50	712 13 258	ID.					
9	1	Flat gasket	50 x 1.5 NEBAR				•	•		
10	1	Flange float		712 12 510	ID.	incl. 9, 10a				
10a	1	Oil return valve seal	10 x 9 x 9 FKM				•	•		
11	1	Oil return tube		714 00 651	ID.					
11a	2	Connection element		714 00 908	ID.					
12	4	Screw	HM6 x 16							
12a	4	Washer	W6							
13	1	Plug	M16 x 150	712 18 652	ID.					
13a	1	Flat gasket	Ø22 x Ø16 x 2				•	•		
14	1	Gas ballast valve		951 29	ID.					
15	1	Oil tube		714 01 201	ID.					
16a	4	Fitting DN12	M20 x 150	9 714 66 220	ID.					
16b	4	Olive DN12								
16c	4	Male screw								
17	1	Connecting element	Ø22 x 3/8"	714 01 438	ID.					
18	1	Oil tube		714 01 211	ID.					
19	4	Nut	M10							
20	1	Valve		712 35 521	ID.	6 fingers				•
21	1	Valve stop		712 31 364	ID.					•
22	1	Flat gasket	182 x 186 x 0.4				•	•		
23	1	Cover		714 00 611	ID.					
24	1	Flat gasket	19 x 236 x 0.4				•	•	•	•
25	1	Oil filter		710 18 858	ID.					
26	1	Plug	G1/2"	712 31 810	ID.	incl. 26a				
26a	1	O-ring	Ø22 x 3 FKM							
27	1	Oil casing		714 36 670	ID.	incl. 4, 17, 62				
28	2	Pressure valve	Ø39 x 68	710 17 933	ID.					
28a	2	Relief valve seal	Ø31.5 x 45 FKM				•	•		
28b	2	O-ring	Ø28 x 3 NBR				•	•		
29	4	Exhaust filter	Ø65 x 230	EK 6520366	ID.					•
31	4	Spring unit		714 36 210	ID.	incl. 31a, b, c				
31a	4	Washer	LL6N							
31b	4	Spring								
31c	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

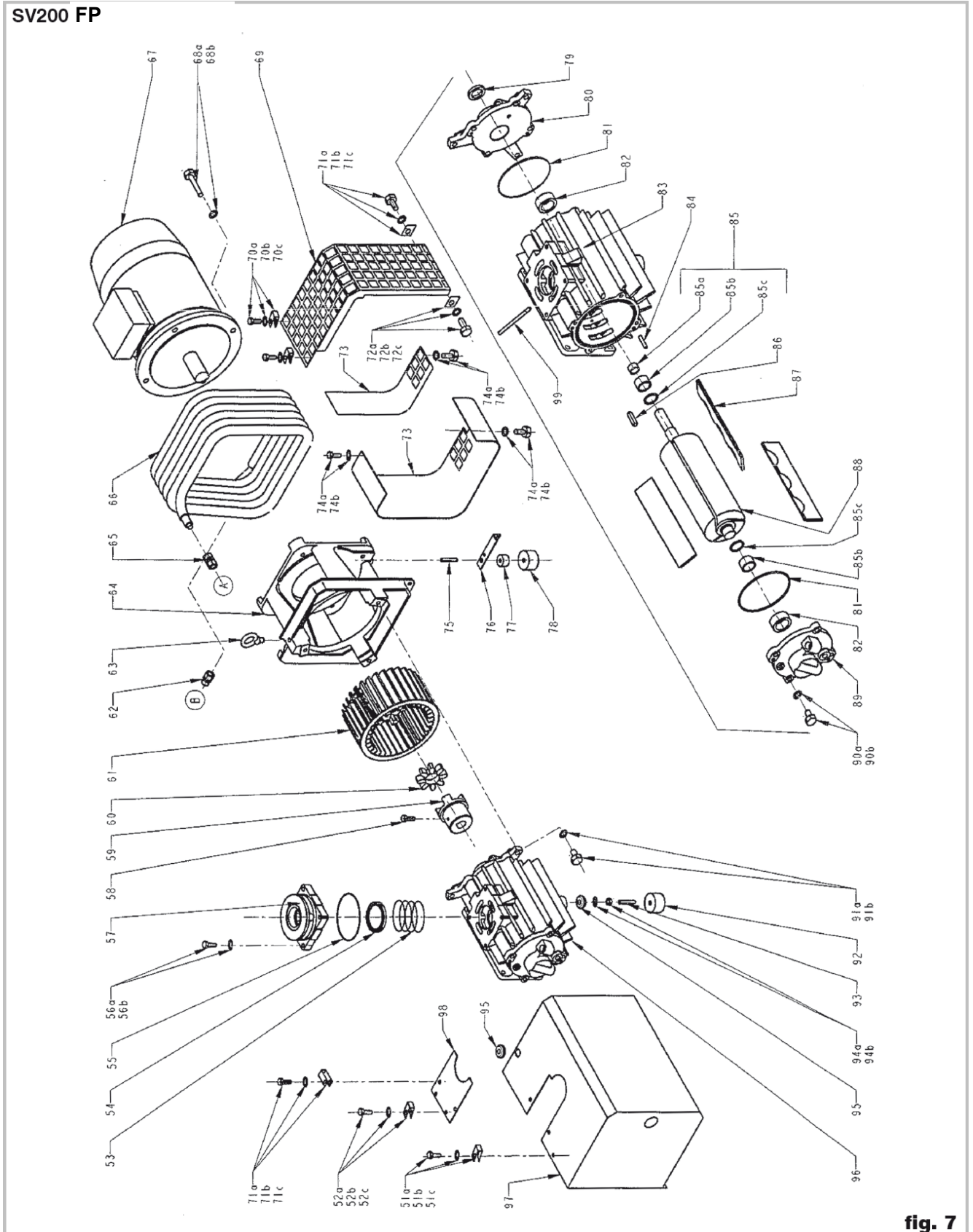


fig. 7

# Spare parts

Pos.	Qty.	Specification	Dimensions (mm)	Ref. No.	Ref. No. (USA)	Notes	971 97 552	714 36 730	714 36 170	714 36 190
51a	3	Screw	N°10 LG. 25 type P							
51b	3	Washer	L5N AC ZN							
51c	3	Nut	N° 10 Ø 4.8 x 7							
52a	2	Screw	N°10 LG 25 type P							
52b	2	Washer	L5N AC ZN							
52c	2	Nut	N°10 Ø 4.8 x 1.5							
53	1	Spring	Ø 63/67 x 43 x 1.5	712 13 260	ID.					
54	1	Intake valve	Ø 79 x 9 FKM	710 15 473	ID.		•	•		
55	1	O-ring	Ø117.07x3.53 FKM (c)			incl. in 57	•	•		
56a	4	Screw	HM10 x 50 Q6.8							
56b	4	Washer	MN 10 Z							
57	1	Intake flange	135 x 135 x 53 - G2	714 36 750	714 36 760	Ø 2" NPT/USA				
58	2	Screw		712 26 063	ID.					
59	1	Half coupling	Ø80 x 66	714 00 771	ID.					
60	1	Toothed ring	Ø80 x 18 VULKOLLAN	710 17 722	ID.				•	•
61	1	Turbine	Ø222 x 38 x 120 PLASTIC	710 76 170	712 16 170					
62	1	Connection element	Ø 12 x 3/8"	714 01 438	ID.					
63	1	Lifting lug	M12	712 33 728	ID.					
64	1	Coupling housing		714 00 541	714 00 931					
65	1	Connection element	Ø 12 x 12	714 01 398	ID.					
66	1	Oil cooler		EK6507189	ID.					
67	1	Motor	230/400V;4KW;50 Hz	EK6518692						
67			460V ; 6,5HP ; 60 HZ							
67	1	Motor	208/230-440/460V ;	EK6509614		NEMA				
67			7,5HP ; 60 HZ							
67	1	Motor	4,5kW 200V;220/380V 230/400V;240/415V 5.5kW 200V;220/380V	EK6519349						
68a	4	Screw	HM12 x 30 Q6.8							
68b	4	Washer	MN 12 Z							
69	1	Turbine housing		714 01 631	ID.					
70a	2	Screw	N°10 LG.19 type P							
70b	2	Washer	L5N AC ZN							
70c	2	Nut	N°10 Ø 4.8 x 7							
71a	1	Screw	HM6 x12 Q6.8							
71b	1	Washer	MN 6 Z							
71c	1	Nut	M6 x 1.5							
72a	1	Screw	HM6 x 16 Q6.8							
72b	1	Washer	MN 6 Z							
72c	1	Nut	M6 x 1.5							
73	1	Turbine housing		714 07 021	ID.					
74a	1	Screw	HM6 x 12 Q6.8							
74b	1	Washer	MN 6Z							
75	1	Threaded pin	M10 x 45/15 J15							
76	1	Support		714 01 681	ID.					
77	1	Spacer		9 714 41 431	ID.					
78	1	Rubber mount	Ø 70 x 35	9 714 32 228	ID.					
79	1	Radial shaft seal	Ø 32 x 47 x 7 FKM	712 23 182	ID.		•	•		
80	1	Rear bearing flange		714 01 360	ID.	b)				
81	2	O-ring	Ø 148.83 x 3.53 NBR		ID.		•	•		
82	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 FP

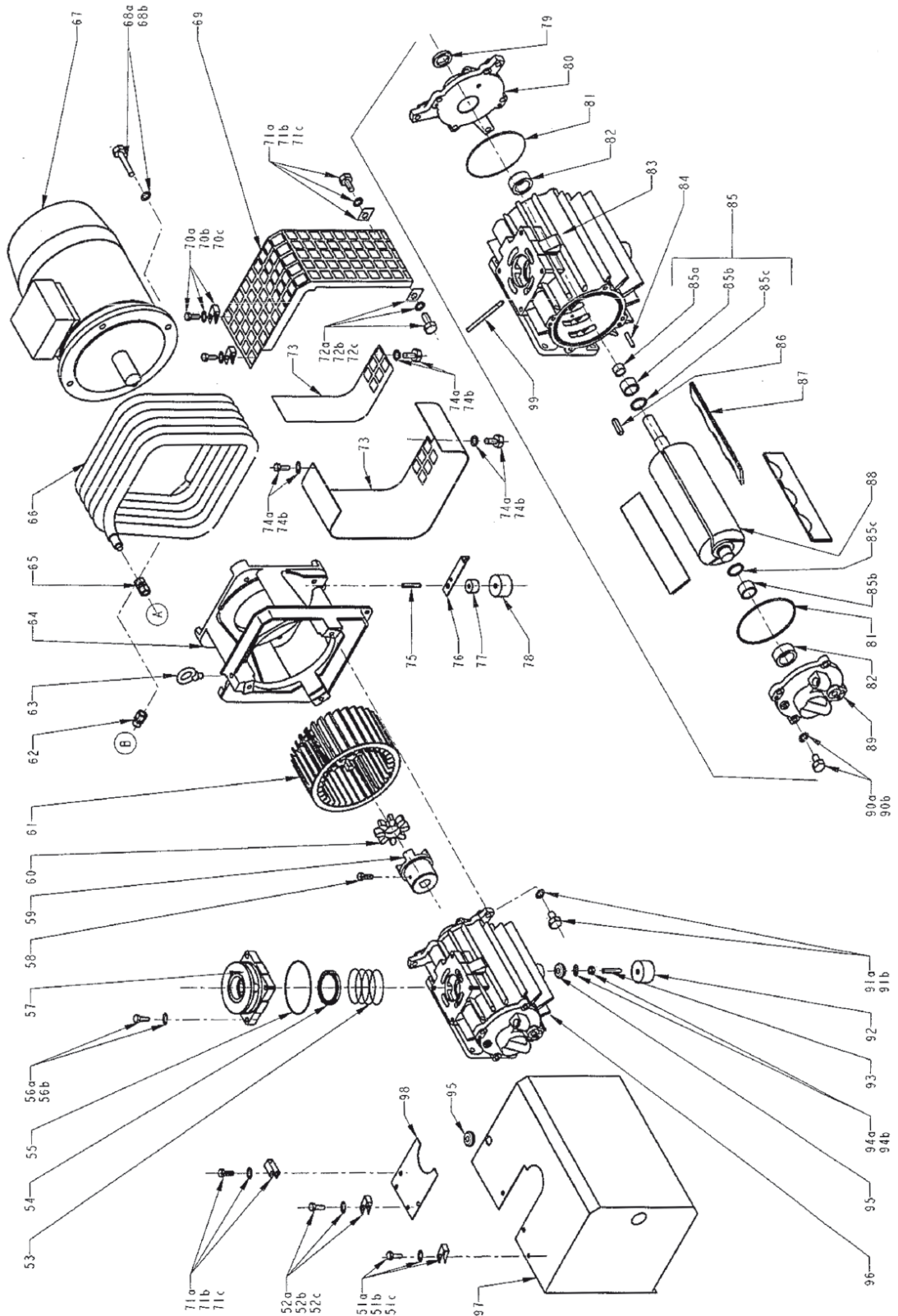


fig. 7

# Spare parts

Pos.	Qty.	Specification	Dimensions (mm)	Ref. No.	Ref. No. (USA)	Notes	971 97 552	714 36 730	714 36 170	714 36 190
83	1	Pump cylinder		714 36 580	ID.	b)				
84	4	Centering pin A-8-60	NFE 27-482 / DIN 7977	714 00 878	ID.	b)				
85	1	Set of rotor rings		714 07 070	ID.	incl. 85a, b, c				•
85a	1	Shaft seal ring	Ø 28 x Ø 32 x 20							
85b	2	Inner race bushing	Ø 30 x Ø 37 x 22							
85c	2	Washer	Ø 30 x Ø 38 x 2							
86	1	Key	8 x 7 x 45	710 01 588	ID.					
87	1	Vane (set of 3)	56 x 182 x 5.8	714 12 000	ID.					•
88	1	Rotor with rings		714 00 990		b)				
89	1	Front end plate		714 01 350		b)				
90a	8	Screw	HM10 x 40 Q6.8 Z							
90b	8	Washer	DE 10 Z							
91a	3	Screw	HM12 x40 Q6.8 PH							
91b	3	Washer	W 12							
92	1	Rubber mount	Ø 50 H 30	710 24 228	ID.					
93	1	Threaded pin	HC10x 50 Q8.8							
94a	1	Nut	HM10 Q6 Z							
94b	1	Washer	MN 10 Z							
95	1	Washer	Ø 40 x 6 x 2 NBR							
96	1	Vacuum generator		714 36 770	ID.	incl. 20, 21, 79, 90				
97	1	Pump housing		714 36 621	ID.					
	1	Set of seals NBR		971 97 552	ID.		▲			• •
	1	Set of seals FKM		714 36 730	ID.		▲			
	1	Module kit		714 36 170				▲		
	1	Repair set		714 36 190					▲	
	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				

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

## 8 Waste Disposal

The equipment may have been contaminated by the process or by environmental influences. In this case the equipment must be decontaminated in accordance with the relevant regulations. We offer this service at fixed prices. Further details are available on request.

Contaminated parts can be detrimental to health and environment. Before beginning with any work, first find out whether any parts are contaminated. Adhere to the relevant regulations and take the necessary precautions when handling contaminated parts.

Separate clean components according to their materials, and dispose of these accordingly. We offer this service. Further details are available on request.

When sending us any equipment, observe the regulations given in Section "5.3 Leybold service".

### Disposal of Waste Oil

Owners of waste oil are entirely self-responsible for proper disposal of this waste.

Waste oil from vacuum pumps must not be mixed with other substances or materials.

Waste oil from vacuum pumps (Leybold oils which are based on mineral oils) which are subject to normal wear and which are contaminated due to the influence of oxygen in the air, high temperatures or mechanical wear must be disposed of through the locally available waste oil disposal system.

Waste oil from vacuum pumps which is contaminated with other substances must be marked and stored in such a way that the type of contamination is apparent. This waste must be disposed of as special waste.

European, national and regional regulations concerning waste disposal need to be observed. Waste must only be transported and disposed of by an approved waste disposal vendor.

## Contamination

---

### WARNING



## EU Declaration of Conformity

(Translation of original Declaration of Conformity)

**The manufacturer:** Leybold Equipment (Tianjin) Co., Ltd.  
No.8 Shuangchenxi Rd.  
Beichen Economic Development Area (BEDA)  
Tianjin, 300400, PR China

herewith declares that the products specified and listed below which we have placed on the market, comply with the applicable EU Council Directives. This declaration becomes invalid if modifications are made to the product without agreement of Leybold.

**Product designation:** SOGEVAC  
**Type:** SV10B, SV16B, SV25B, SV40B, SV65B, SV100B, SV200, SV300B, SV630B(F), SV750B(F), SV10FP, SV16FP, SV25FP, SV45FP, SV70FP, SV105FP, SV200FP and SV300FP, and their variants, excepted pumps delivered without motor

**The products complies to the following European Council Directives:**

Machinery Directive (2006/42/EC)

The safety objectives of the Low Voltage Directive 2014/35/EU were complied with in accordance with Appendix 1 No. 1.5.1 of Machinery Directive 2006/42/EC.

Electromagnetic Compatibility (2014/30/EU)

RoHS Directive (2011/65/EU) & (2015/863/EU)


**The following harmonized standards have been applied:**

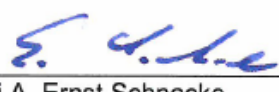
EN 1012-2:1996+A1:2009	Compressors and vacuum pumps — Safety requirements — Part 2: Vacuum pumps
EN 60204-1:2006/A1:2009	Safety of machinery — Electrical equipment of machines — Part 1: General requirements
EN 61000-6-2:2005/AC:2005	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-6-4:2007/A1:2011	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments

**Documentation officer:** Herbert Etges  
Leybold GmbH, Bonner Str. 498, D-50968 Köln  
T: +49(0)221 347 0  
F: +49(0)221 347 1250  
documentation@leybold.com

Cologne, April 26, 2017

Cologne, April 26, 2017

  
\_\_\_\_\_  
ppa. Andries Desiron  
VP Engineering  
Industrial Vacuum Division

  
\_\_\_\_\_  
i.A. Ernst Schnacke  
Head of Quality Assurance Methods  
& Technical Standards

## 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 authorized and qualified staff.

Customer/Dep./Institute : _____ Address : _____ _____ Person to contact: _____ Phone : _____ Fax: _____ End user: _____	Reason for return: <input checked="" type="checkbox"/> applicable please mark <b>Repair:</b> <input type="checkbox"/> chargeable <input type="checkbox"/> warranty <b>Exchange:</b> <input type="checkbox"/> chargeable <input type="checkbox"/> warranty <input type="checkbox"/> Exchange already arranged / received <b>Return only:</b> <input type="checkbox"/> rent <input type="checkbox"/> loan <input type="checkbox"/> for credit <b>Calibration:</b> <input type="checkbox"/> DKD <input type="checkbox"/> Factory-calibr. <input type="checkbox"/> Quality test certificate DIN 55350-1&-4.2.1																																																																
<b>A. Description of the Leybold product:</b> _____ <b>Failure description:</b> _____ Material description : _____ Catalog number: _____ <b>Additional parts:</b> _____ Serial number: _____ <b>Application-Tool:</b> _____ Type of oil (ForeVacuum-Pumps) : _____ <b>Application- Process:</b> _____																																																																	
<b>B. Condition of the equipment</b> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="width: 10%; text-align: center;">No<sup>1)</sup></th> <th style="width: 10%; text-align: center;">Yes</th> <th style="width: 10%; text-align: center;">No</th> <th style="width: 10%;"></th> </tr> </thead> <tbody> <tr> <td>1. Has the equipment been used</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">→</td> </tr> <tr> <td>2. Drained (Product/service fluid)</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> </tr> <tr> <td>3. All openings sealed airtight</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> </tr> <tr> <td>4. Purged</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> </tr> <tr> <td colspan="5">If yes, which cleaning agent _____</td> </tr> <tr> <td colspan="5">and which method of cleaning _____</td> </tr> <tr> <td colspan="5"><sup>1)</sup> If answered with "No", go to D. ←</td> </tr> </tbody> </table> <table style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 60%;"></th> <th style="width: 10%; text-align: center;">No<sup>1)</sup></th> <th style="width: 10%; text-align: center;">Yes</th> </tr> </thead> <tbody> <tr> <td><b>Contamination :</b> toxic</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>corrosive</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>flammable</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>explosive <sup>2)</sup></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>radioactive <sup>2)</sup></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>microbiological <sup>2)</sup></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <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 <sup>1)</sup>	Yes	No		1. Has the equipment been used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	→	2. Drained (Product/service fluid)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		3. All openings sealed airtight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		4. Purged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		If yes, which cleaning agent _____					and which method of cleaning _____					<sup>1)</sup> If answered with "No", go to D. ←						No <sup>1)</sup>	Yes	<b>Contamination :</b> toxic	<input type="checkbox"/>	<input type="checkbox"/>	corrosive	<input type="checkbox"/>	<input type="checkbox"/>	flammable	<input type="checkbox"/>	<input type="checkbox"/>	explosive <sup>2)</sup>	<input type="checkbox"/>	<input type="checkbox"/>	radioactive <sup>2)</sup>	<input type="checkbox"/>	<input type="checkbox"/>	microbiological <sup>2)</sup>	<input type="checkbox"/>	<input type="checkbox"/>	other harmful substances	<input type="checkbox"/>	<input type="checkbox"/>
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<b>C. Description of processed substances (Please fill in absolutely)</b> 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) <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 10%; text-align: center;">X</th> <th style="width: 40%;">Tradename:</th> <th style="width: 50%;">Chemical name:</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">a)</td><td> </td><td> </td></tr> <tr><td style="text-align: center;">b)</td><td> </td><td> </td></tr> <tr><td style="text-align: center;">c)</td><td> </td><td> </td></tr> <tr><td style="text-align: center;">d)</td><td> </td><td> </td></tr> </tbody> </table> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="width: 10%; text-align: center;">No</th> <th style="width: 10%; text-align: center;">Yes</th> </tr> </thead> <tbody> <tr> <td>2. Are these substances harmful ?</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>3. Dangerous decomposition products when heated ?</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td colspan="3">If yes, which ? _____</td> </tr> </tbody> </table> <sup>2)</sup> Components contaminated by microbiological, explosive or radioactive products/substances will not be accepted without written evidence of decontamination.		X	Tradename:	Chemical name:	a)			b)			c)			d)				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 ? _____																																							
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If yes, which ? _____																																																																	

### 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 authorized person (block letters) : _____ _____ Date _____	_____ signature of authorized person	firm stamp
--	---	------------

# Sales and Service

## Germany

### Leybold GmbH

Sales, Service, Support Center (3SC)  
Bonner Strasse 498  
D-50968 Cologne  
T: +49-(0)221-347 1234  
F: +49-(0)221-347 31234  
sales@leybold.com  
www.leybold.com

### Leybold GmbH

**Sales Area North**  
Branch Office Berlin  
Industriestrasse 10b  
D-12099 Berlin  
T: +49-(0)30-435 609 0  
F: +49-(0)30-435 609 10  
sales.bn@leybold.com

### Leybold GmbH

**Sales Office South**  
Branch Office Munich  
Karl-Hammerschmidt-Strasse 34  
D-85609 Aschheim-Dornach  
T: +49-(0)89-357 33 9-10  
F: +49-(0)89-357 33 9-33  
sales.mn@leybold.com  
service.mn@leybold.com

### Leybold Dresden GmbH

**Service Competence Center**  
Zur Wetterwarte 50, Haus 304  
D-01109 Dresden  
Service:  
T: +49-(0)351-88 55 00  
F: +49-(0)351-88 55 041  
info.dr@leybold.com

## Europe

### Belgium

### Leybold Nederland B.V.

**Belgisch bijkantoor**  
Leuvensesteenweg 542-9A  
B-1930 Zaventem  
Sales:  
T: +32-2-711 00 83  
F: +32-2-720 83 38  
sales.zv@leybold.com  
Service:  
T: +32-2-711 00 82  
F: +32-2-720 83 38  
service.zv@leybold.com

### France

### Leybold France S.A.S.

Parc du Technopolis, Bâtiment Beta  
3, Avenue du Canada  
F-91940 Les Ulis cedex  
Sales and Service:  
T: +33-1-69 82 48 00  
F: +33-1-69 07 57 38  
info.ctb@leybold.com  
sales.ctb@leybold.com

### Leybold France S.A.S.

Valence Factory  
640, Rue A. Bergès  
B.P. 107  
F-26501 Bourg-lès-Valence Cedex  
T: +33-4-75 82 33 00  
F: +33-4-75 82 92 69  
marketing.vc@leybold.com

## Great Britain

### Leybold UK LTD.

Unit 9  
Silverglade Business Park  
Leatherhead Road  
Cheshington  
Surrey (London)  
KT9 2QL  
Sales:  
T: +44-13-7273 7300  
F: +44-13-7273 7301  
sales.ln@leybold.com  
Service:  
T: +44-13-7273 7320  
F: +44-13-7273 7303  
service.ln@leybold.com

## Italy

### Leybold Italia S.r.l.

Via Filippo Brunelleschi 2  
I-20093 Cologno Monzese  
Sales:  
T: +39-02-27 22 31  
F: +39-02-27 20 96 41  
sales.mi@leybold.com  
Service:  
T: +39-02-27 22 31  
F: +39-02-27 22 32 17  
service.mi@leybold.com

## Netherlands

### Leybold Nederland B.V.

Floridadreef 102  
NL-3565 AM Utrecht  
Sales and Service:  
T: +31-(30) 242 63 30  
F: +31-(30) 242 63 31  
sales.ut@leybold.com  
service.ut@leybold.com

## Switzerland

### Leybold Schweiz AG, Pfäffikon

Hinterbergstrasse 56  
CH-6312 Steinhausen  
Warehouse and shipping address:  
Riedthofstrasse 214  
CH-8105 Regensdorf  
Sales:  
T: +41-44-308 40 50  
F: +41-44-302 43 73  
sales.zh@leybold.com  
Service:  
T: +41-44-308 40 62  
F: +41-44-308 40 60  
service.zh@leybold.com

## Spain

### Leybold Spain, S.A.

C/. Huelva, 7  
E-08940 Cornellà de Llobregat  
(Barcelona)  
Sales:  
T: +34-93-666 43 11  
F: +34-93-666 43 70  
sales.ba@leybold.com  
Service:  
T: +34-93-666 46 11  
F: +34-93-685 43 70  
service.ba@leybold.com

## America

### USA

### Leybold USA Inc.

5700 Mellon Road  
USA-Export, PA 15632  
T: +1-724-327-5700  
F: +1-724-325-3577  
info.ex@leybold.com  
Sales:  
T: +1-724-327-5700  
F: +1-724-333-1217  
Service:  
T: +1-724-327-5700  
F: +1-724-325-3577

## Brazil

### Leybold do Brasil

Rod. Vice-Prefeito Hermenegildo Tonolli,  
No. 4413 - 6B  
Distrito Industrial  
Jundiaí - SP  
CEP 13.213-086  
Sales and Service:  
T: +55 11 3395 3180  
F: +55 11 99467 5934  
sales.ju@leybold.com  
service.ju@leybold.com

## Asia

### P. R. China

### Leybold (Tianjin) International Trade Co. Ltd.

Beichen Economic  
Development Area (BEDA),  
No. 8 Western Shuangchen Road  
Tianjin 300400  
China  
Sales and Service:  
T: +86-400 038 8989  
T: +86-800 818 0033  
F: +86-22-2697 4061  
F: +86-22-2697 2017  
sales.tj@leybold.com  
service.tj@leybold.com

## India

### Leybold India Pvt Ltd.

T-97/2, MIDC Bhosari  
Pune-411 026  
India  
Sales and Service:  
T: +91-80-2783 9925  
F: +91-80-2783 9926  
sales.bgl@leybold.com  
service.bgl@leybold.com

## Japan

### Leybold Japan Co., Ltd.

Headquarter  
Shin-Yokohama A.K.Bldg., 4th Floor  
3-23-3, Shin-Yokohama  
Kohoku-ku, Yokohama-shi  
Kanagawa 222-0033  
Japan  
Sales:  
T: +81-45-471-3330  
F: +81-45-471-3323  
sales.yh@leybold.com

### Leybold Japan Co., Ltd.

Tsukuba Technical Service Center  
1959, Kami-yokoba  
Tsukuba-shi, Ibaraki-shi 305-0854  
Japan  
Service:  
T: +81-29 839 5480  
F: +81-29 839 5485  
service.iik@leybold.com

## Malaysia

### Leybold Malaysia

### Leybold Singapore Pte Ltd.

No. 1 Jalan Hi-Tech 2/6  
Kulim Hi-Tech Park  
Kulim, Kedah Darul  
Aman 09000  
Malaysia  
Sales and Service:  
T: +604 4020 222  
F: +604 4020 221  
sales.ku@leybold.com  
service.ku@leybold.com

## South Korea

### Leybold Korea Ltd.

3F. Jellzone 2 Tower  
Jeongja-dong 159-4  
Bundang-gu Sungnam-si  
Gyeonggi-do  
Bundang 463-384, Korea  
Sales:  
T: +82-31 785 1367  
F: +82-31 785 1359  
sales.bd@leybold.com  
Service:  
623-7, Upsung-Dong  
Cheonan-Si  
Chungcheongnam-Do  
Korea 330-290  
T: +82-41 589 3035  
F: +82-41 588 0166  
service.cn@leybold.com

## Singapore

### Leybold Singapore Pte Ltd.

42 Loyang Drive  
Loyang Industrial Estate  
Singapore 508962  
Singapore  
Sales and Service:  
T: +65-6303 7030  
F: +65-6773 0039  
sales.sg@leybold.com  
service.sg@leybold.com

## Taiwan

### Leybold Taiwan Ltd.

10F., No. 32, Chenggong 12th St.,  
Zhubei City, Hsinchu Country 302  
Taiwan, R.O.C.  
Sales and Service:  
T: +886-3-500 1688  
F: +886-3-583 3999  
sales.hc@leybold.com  
service.hc@leybold.com

## Headquarter

### Leybold GmbH

Bonner Strasse 498  
D-50968 Koeln  
T: +49-(0)221-347 0  
F: +49-(0)221-347 1250  
info@leybold.com



www.leybold.com