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Leybold

# SOGEVAC®

# SV40 BI

Single-stage, oil-sealed rotary vane pump

**Operating instructions 300270034_002_C0**

Waters Corporation

Ref.:
960331V3007



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## Important Safety Information

**Warning**

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

**Caution**

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

**Note**

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

The Leybold Sogevac® SV40 BI 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® SV40 BI **must only be operated indoor in the proper condition and under the conditions described in the Operating Instructions**. If not, the protection provided by the equipment may be impaired. 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.

**Warning**

**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 Leybold.

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 !

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

**Warning**



Pump must not be operated above 2000 m sea level.

These installation and operating instructions are valid for Waters use of the

# Safety Information

**Warning**



Sogevac® pumps, model SV40 BI.
The Sogevac® vacuum pumps have been manufactured according to the latest technical standards and safety regulations. If not installed properly or not used as directed, dangerous situations or damages could occur.

It is mandatory that these operating instructions be read and understood prior to vacuum pump installation and start-up.

The pump complies to the standard EN 61010-1-2004.

**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 Leybold.

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.

Never use discarded seals. Always assemble using new seals.

**Note**

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.

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

**Caution**



Caution : hot surface ! In normal operation, the pump surface temperature can exceed 80°C. There is a risk of burning. Switch off the pump and let it cool down before any intervention or take appropriate precautions.

## 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 vapors, periodic opening of the gas ballast valve is required.

### 1.1 Principle of operation

The Sogevac® pumps SV40 BI are single-stage oil-sealed rotary vane vacuum pumps.

The rotor, having three slots in which the vanes are sliding, is eccentrically installed in a pump cylinder (stator).

The vanes separate the interior space into 3 chambers. The volume of these chambers varies with the rotation of the rotor.

The gas sucked into the inlet chamber is compressed and then pushed out at the exhaust valve.

The oil injected in the inlet chamber guarantees the air-tightness, the lubrication and cooling of the pump. It is dragged off by the compressed gases and roughly separated by gravity when entering in the oil sump. A fine separation is then operated in the exhaust filter. An internal transfer pushes the collected oil back into the vacuum generator, the transfer is operated by a float valve to avoid atmospheric air coming from the oil casing to the inlet of the pump when no oil is present in the recovery system.

The oil circulation functions by differential pressures.

The pumps are equipped with a gas ballast valve for pumping condensable vapors.

The anti suckback valve at the inlet flange avoids oil coming back into the inlet line when the pump is stopped. This is valid for working pressures below 100 mbar and under the condition that the valve is kept clean and in good condition. The anti suck

back valve is not a safety valve. If oil back flowing is to be avoided by all means, it is necessary to mount a separate safety valve on the pump inlet.

# Description

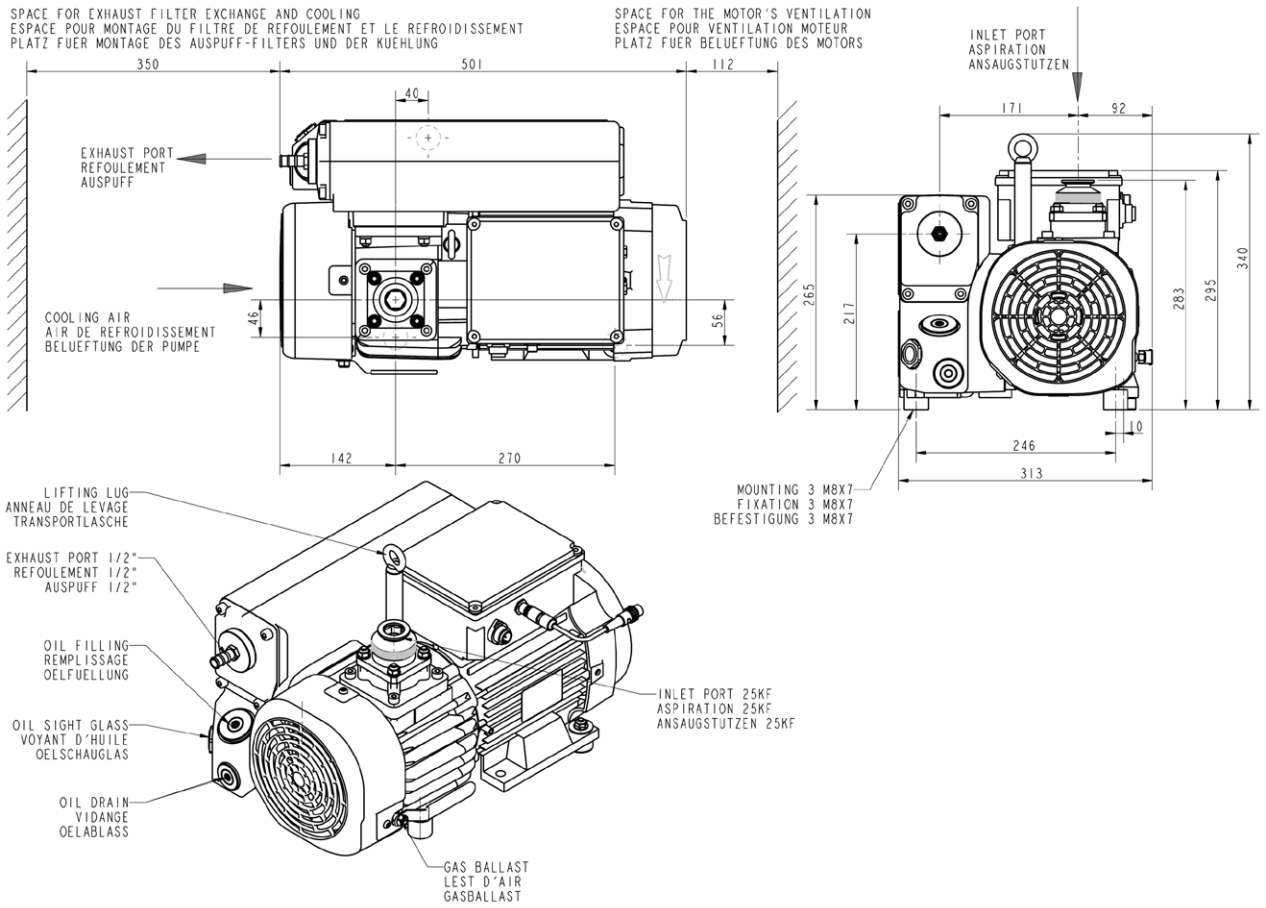
## 1.2 Technical characteristics

### SV40 B

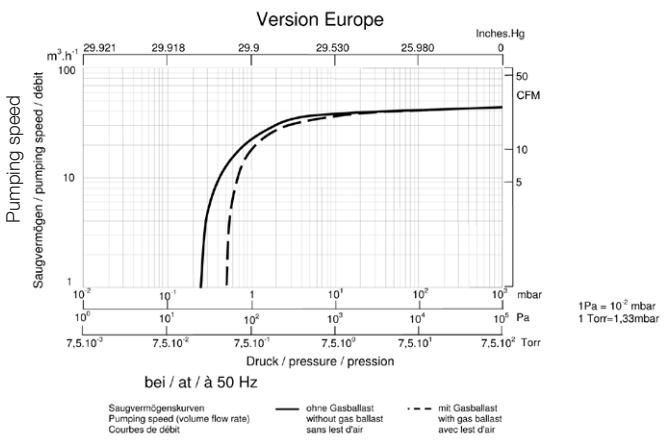
| Technical data | | 50 Hz | 60 Hz |
|---|---|---|---|
| Nominal pumping speed | $m^3/h$ | 42 | 50 |
| Pumping speed (according to PNEUROP) | $m^3/h$ at 2 mbar | > 35 | > 45 |
| Ultimate partial pressure without gas ballast | mbar | ≤ 0,25 | ≤ 0,25 |
| Ultimate total pressure with small gas ballast | mbar | ≤ 0,8 | ≤ 0,8 |
| Water vapor tolerance:<br>▪ with small gas ballast | mbar | 10 | 10 |
| Water vapor tolerable load:<br>▪ with small gas ballast | $kg.h^{-1}$ | 0,28 | 0,34 |
| Noise level (according to DIN 46 635) | dB (A) | 60 (1φ) | 63 (1φ) |
| Motor power - Rated rotational speed | kW - $min^{-1}$ | 1,6-1500 (1φ) | 1,9-1800 (1φ) |
| Mains voltage (+/- 10 %) AC ~ | V | 200 | 240 |
| Protection - Insulation | | IP 55 - F | IP 55 - F |
| Leak rate | $mbar.l.s^{-1}$ | $<1 \times 10^{-3}$ | $<1 \times 10^{-3}$ |
| Oil type / Capacity | l | | LV0110 / 2x1 |
| Intake connection | | | 25KF |
| Exhaust connection | | | Barbed fitting 0.5" ID tubing |

See pump nameplate for further data.

**SV40 BI**




**Pumping speeds curves SV40 BI**



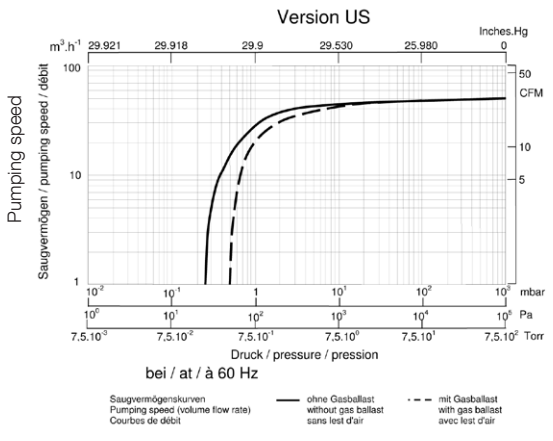




**fig. 1**

## 1.3 Accessories

### SV40 BI

| Specification | Cat. Nr. |
|---|---|
| Oil level switch | 711 19 110 |
| Temperature switch | 9 714 32 820 |
| Exhaust filter over pressure switch | 9 714 25 890 |
| Exhaust filter over pressure manometer | 951 94 |
| Oil drain tap | 711 30 114 |

## 1.4 Lubricants

The Sogevac® SV40 BI pump should be run with a synthetic oil for vacuum pumps with low viscosity according to ISO category VG32. The Leybold oil LV0110 corresponds to these prescriptions.

| LV0110 oil: | Conditioning | Reference |
|---|---|---|
| | 1 l | 9 714 50 502 |

Use only oil LV0110.

## 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.

The outer package bears a shock indicator, turning red at 50 g. Should the shock indicator have reacted, a transportation damage may have occurred and the freight forwarder must be advised.

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 necessary oil is supplied in cans beside the pump.

### 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.

### 2.3 Storing

Before stocking the pump for a long time put it back in its original condition (blank off inlet and exhaust ports with the shipping seals, drain the oil) and store the pump in a dry place at room temperature.

Storage temperature: - 15°C to + 50°C.

**Caution**

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 - 168 °F). Before taking the pump out of service, it should be properly disconnected from the vacuum system, purged with dry nitrogen and the oil should be exchanged too. The gas ballast must be closed and if the pump is to be shelved for a longer period of time it should be sealed in a plastic bag together with a desiccant (Silicagel).

If the pump has been shelved for over one year, standard maintenance must be done and the oil must be exchanged too before the pump is put in to service once more.

We recommend that you contact the service from Leybold.

# Installation

**Warning**



## 3 Installation

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

The standard pump is not suitable for installation in explosion hazard ATEX areas. 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 form running up inadvertently.

Observe all safety regulations.

### 3.1 Setting up

The pump must be set up or mounted horizontally on a flat surface. Special mounting is not required.

The pump must be levelled within a tolerance of ± 2 degrees.

The following ambient operating environment must be observed:

- Pollution degree CSA 2
- Ambient temperature: 12 °C to 40 °C (54 °F to 104 °F),
- Ambient pressure = Atmospheric pressure.
- Rel. humidity ≤ 95 % without condensation

In order to avoid over-heating of the pump, an undisturbed fresh airflow to the pump is necessary.

Additional warning note : consider changes in ambient temperatures that might occur when air conditioning is turned down, such as nights and week-ends.

**Caution**

**Inlet connection**

See safety instructions page 3.

- The inlet flange can be connected with a vacuum-tight flexible hose and/or pipe.
- The pipes should cause no stresses on the pump's flanges. If necessary, compensators must be open.
- Restriction of the pipes must be avoided in order not to decrease the pumping speed of the pump. The nominal diameter of the pipes has to be at least the same as the diameter of pump's inlet flange.
- When removing condensable vapors, a gas ballast valve must be open periodically to avoid solvent build up in the oil.
- Additional warning note: additional air flow may be needed during ballast, as this increases pump temperature.

**Warning**



- The inlet pressure must not be above atm. pressure.

See also indications on the CSA pump nameplate.

### Connection to exhaust side

■ No valve or restricting devices should be installed in the exhaust line of the pump. If an exhaust line is installed, it must at least have the same diameter as the exhaust flange. It should be installed in a manner so that no condensate can enter the pump (siphon, slope).

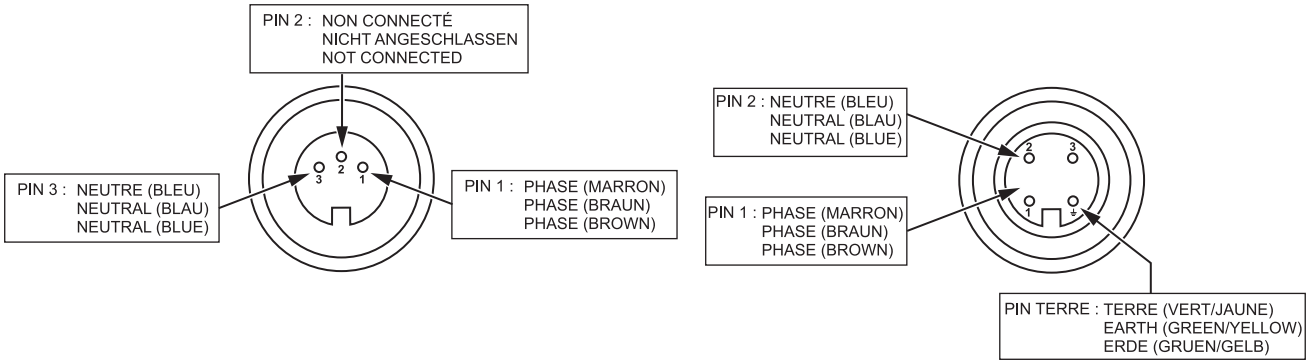
The maximum exhaust pressure must neither exceed 1.15 bar absolute (0.15 bar relative), nor fall under atmosphere pressure minus 15 mbar.

**Warning**



## 3.2 Electrical connections

Ensure that incoming power to the pump is off before wiring the motor or altering the wiring.




*Stecker des Schalterkabels.*
*Connection plug of relay cable.*
*Prise de connexion câble relais.*

*Leistungschluss am Motorschaltkasten.*
*Power socket on motor connection box.*
*Prise de puissance sur boîtier de connexion moteur.*

**fig. 2**

**Warning**



The electrical installation may only be conducted by a specialist. Local regulations have to be followed.

Electrical connection work must only be carried out by a qualified electrician in accordance with the applicable safety rules, see IEC 60204-1.

The motor must be protected by magnetic thermo breaker type GV2 ME14 adjustable from 6 to 10 A from Schneider Electric or similar.
For an operation at 50 Hz the breaker must be set at 8.5 A. For an operation at 60 Hz the breaker must be set at 10 A.

Therefore, even if the pump is not operating, live voltage is present in the motor connection box !

Voltage and frequency mentioned on the pump nameplate must agree with the supply voltage.

.

The motor connection box integrates an ON/OFF 24 VDC relay. The pump operation is commanded with a 24 VDC signal lead through a dedicated cable.

The final end product must provide a 24 VDC signal (protected by a 3 A fuse) for the remote control power relay coil. This 24 VDC signal shall be generated by a power supply complying to IEC 61010-1: 2001 (2nd Edition) double or reinforced insulation requirements (equivalent standards requirements like IEC60950-1) are acceptable.

**Caution**

### 3.3 Oil filling

For SV40 BI, the necessary oil is supplied in cans beside the pump.

To fill in the oil, unscrew the oil fill plug (58) and fill in until the oil level reaches the “MAX” mark beside the oil sight glass. Typically the whole 1 l oil can is used

# 4 Operation

## 4.1 Operation

To avoid overloading the motor, do not start the pump more than 6 times within one hour. If more than 6 starts per hour are necessary keep the pump running and mount a valve which opens and closes into the intake line.

Take note of warning labels on the pump.

**Warning**



### Pumping of non-condensable gases

If the pump system contains mainly non condensable gases, the pumps should be operated without gas ballast.

If the composition of the gases to be pumped is not known and if condensation in the pump cannot be ruled out, run the pump with gas ballast valve open in accordance with section below.

### Pumping of condensable gases and vapors

With the gas ballast valve open and at operating temperature, the Sogevac® pumps can pump pure water vapor up to the values indicated in the Technical Data.

**Caution**

The gas ballast valve is open by a hand lever. The running noise of the pump is slightly louder if the gas ballast valve is open. Before pumping vapors ensure that the pump has warmed up for approx. 30 min. with closed intake line and with open gas ballast valve.

Don't open the pump to condensable vapors until it has warmed to operating temperature (approximately); pumping process gas with a cold pump results in vapors condensing in the oil.

**Caution**

For processes with a high proportion of condensable vapors, the intake line should be open only slowly after reaching the operating temperature.

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

When vapors are pumped, the pump must not be switched off immediately after completion of the process because the condensate dissolved in the pump oil may cause changes or corrosion. To prevent this, the pump must continue to operate with open gas ballast valve and closed intake port until the oil is free of condensate. We recommend operating the pump in this mode for at least 30 min. after completion of the process.

**Note**

Daily ballasting is recommended when continuously pumping larger volumes of condensable vapors.

In cycle operation, the pump should not be switched off between the cycles 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 vapors have been pumped off from a process (e. g. during drying), the gas ballast valve can be closed in order to improve the ultimate pressure.

# Operation

### 4.2 Working in cycles in / out

We recommend strongly to limit starting of the pump to 5 or 6 per hour. If the process need it, we recommend utilization of a pneumatic or electromagnetic valve and to let the pump run continously.

### 4.3 Switching off / Shutdown

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.

If the pump has to be shutdown, drain the oil flush out the pump with fresh oil and fill in the required amount of clean oil (see § 5.4). Close the connection ports. Special preservation or flushing oils do not need to be used.

**Caution**

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.

In order to prevent the pump from running up unexpectedly after a mains power failure, the pump must be integrated into the control sytem 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 operation conditons, the pump must then not be directly switched on again.

# 5 Maintenance

## 5.1 Safety Information

Observe all safety regulations.

**Warning**



**Caution**

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.

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. Unfavourable ambient conditions and/or aggressive media may significantly reduce the maintenance intervals.

| Maintenance job | Frequency | Section |
|---|---|---|
| Check the oil level | Daily | **A** |
| 1st oil change | After one year of operation | **B** |
| Subsequent oil changes | After one year of operation | **B** |
| Exhaust filter replacement | Annually | **C** |
| Gas ballast valve | Monthly checking | **D** |
| Inlet flange sifter cleaning | Annually | **E** |
| Anti-suck back valve checking | Annually | **F** |
| Fan cover cleaning | Annually | **G** |
| Electrical connection checking (only by a specialist) | Annually | |

In order to simplify the maintenance work we recommend to combine several jobs.

# Maintenance

## 5.3 Leybold Service

**Contamination**

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.

**Formulaire**

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 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.

**Caution**

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 oil level shall be checked at least once a day and must be, while the pump is in operation, close to the MAX marks. Should the oil level be below the MIN mark switch off the pump, check it (see chapter 4) and add the required amount of oil.
Oil level may drop when pump is operating due to oil distribution in the pump.

#### B. Oil Change

Oil must be changed after the first year of service. Further oil changes must be done annually. If there is considerable pollution, it could be necessary to change the oil more frequently.

Oil changing must be done with a switched off and still warm pump. Open the oil drain plug and let the used oil run out into an appropriate container. Refasten the oil drain plug when oil runs slowly. Switch ON the pump briefly (5 sec. max.) and switch OFF immediately. Reopen the oil drain plug and drain the rest of the oil.

Additional warning note: more frequent oil changes may be necessary if the ambient temperature is above 30 °C.

Before refastening the oil drain plug, inspect the o-ring and verify that it is free of particulate and is seated properly. Replace if necessary.

The pump should be "flushed" if there is considerable pollution.

To flush the pump, for clean oil up to the minimum level, let the pump run for a few minutes and drain the oil. Install a full charge of oil, 1 liter.

### C. Replacing the exhaust filters

Oil mist escaping from the exhaust during operation indicates that the filter is probably clogged. Increased energy intake by the motor could also be the result of a soiled exhaust filter. Open the exhaust hood, take out the filter and replace it. Also check the gasket of the exhaut flange and change it if necessary.

### D. Gas ballast valve cleaning

To clean the gas ballast valve, disassemble the fan cover and the fan. Unscrew the lateral pressure screw, remove the plug and the gas ballast valve by using an appropriate M10 screw screwed in the valve by pulling on the screw.

Clean the membrane, the seat and the RILSAN tube.

Reassemble in the reverse sequence.

### E. Inlet flange sifter cleaning

To clean the inlet flange sifter, disconnect the inlet flange and clean the sifter with blast air or an appropriate solvent.

### F. Anti-suck back valve checking

The anti-suck back valve should be checked at the same time as the inlet flange sifter and if dirty, be cleaned with an appropriate solvent.

Also check, if there is no damage on the sealing part of the valve.

### G. Fan cover cleaning

Soiling of the fan cover may lead to overheating of the motor and the pump.

Put off the cover and clean it with blast air.

Before starting the pump again, be sure that the cover has been reassembled.

### H. Checking the float valve

When replacing the exhaust filter, check the cleanliness and the proper operation of the float valve. After having disassembled the exhaust flange and oil casing, remove screw (pos. 57d), pull on the float valve (pos. 57), clean the nozzle and check that the float itself oscillates free around its axle and that the valve is tight. Clean the float chamber of the oil casing. Reassemble in the reverse sequence.

# 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. | 1.4 |
| | 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. | External leak | Repair the pump. | |
| | Float valve does not close. | Repair the valve. | 5.4-H |
| | Anti-suckback valve is malfunctioning. | Repair the valve. | 5.4-F |
| | 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-E/1.2/3.2 |
| | 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. | 3.2 |
| | 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-F |
| 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-C |
| | 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 |
| | Pump module is no longer usable. | Replace the pump module. | 5.4-K |

| 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-F |
| | Sealing surfaces of anti-suckback valve are damaged or dirty. | Clean or repair the intake port and valve. | 5.4-F |
| | 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 |
| | 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.<br>Precaution : open the gas ballast valve or insert a condensate trap. | 4.1/5.4-B |
| | | 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 |
| | Large vacuum leak in system. | Repair vacuum leak.<br>Contact Leybold. | |

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

Never mount used seals. Always mount new seals.

## 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 hereafter and in the spare parts table where the contents of each kit is detailed.

- Exhaust demisters
- Oil
- Service kit
- Set of seals
- Repair kit

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.

**SV40 BI**

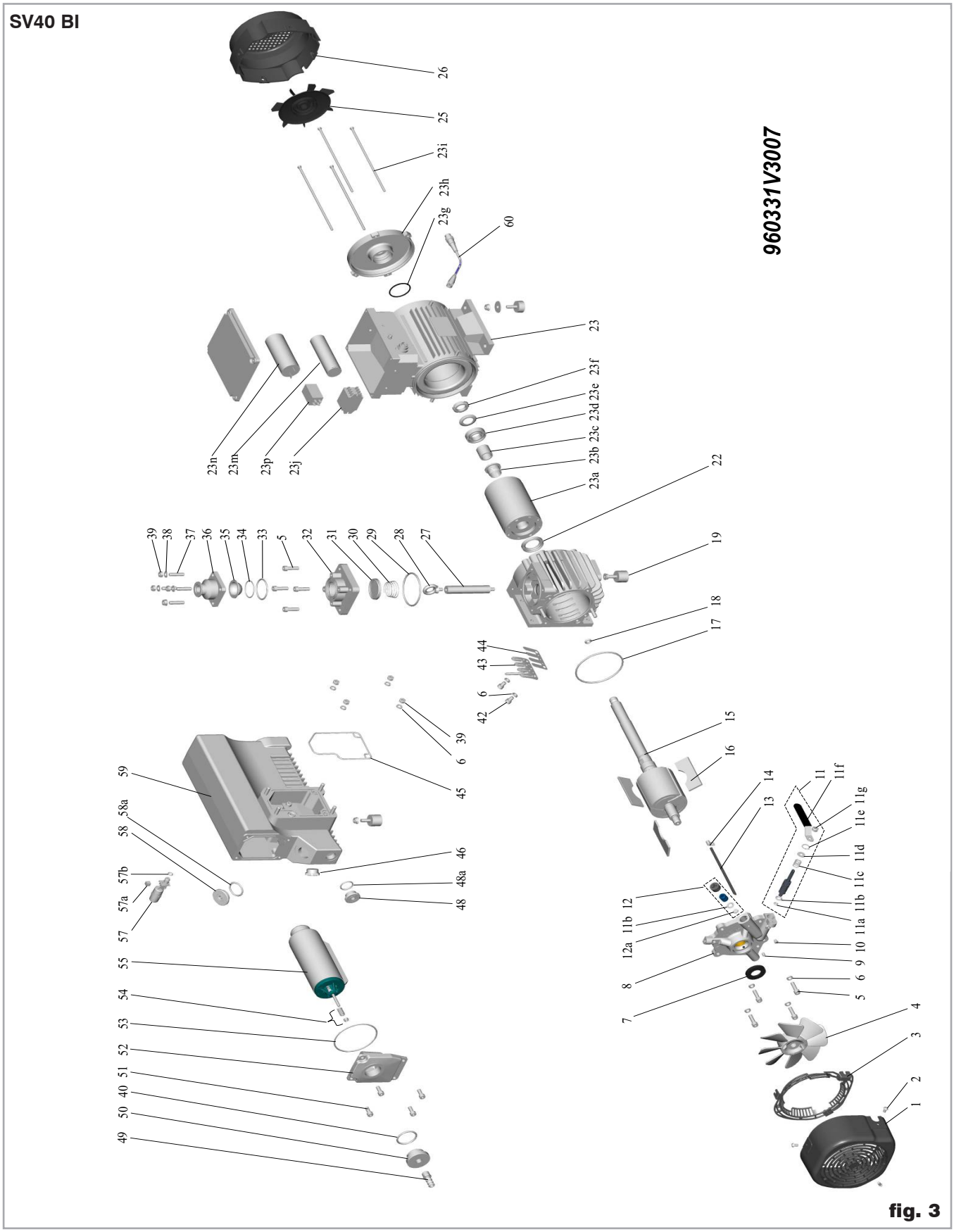

960331V3007
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48a
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**fig. 3**

# Spare parts

| Pos. | Stück. Qty Qté | BENENNUNG | SPECIFICATION | DESIGNATION | Abmessungen (mm) Dimensions (mm) Dimensions (mm) | Bestell-Nr Ref, No, N° de réf | Bemerkungen Notes Remarques | 971452150 | 971443150 | 971454600 | 971427660 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | GEHÄUSEDECKEL | MODULE COVER | CAPOT POMPE | | 971424850 | | | | | |
| 2 | 3 | SCHRAUBE | SCREW | VIS BOMBEE PLATE | HC M6X12 | | | | | | |
| 3 | 1 | SCHUTZBLECH | PROTECTIVE COVER | GRILLE PROTECTION POMPE | | 971424860 | | | | | |
| 4 | 1 | LUEFTER | COOLING FAN | HELICE DE REFROIDISSEMENT | | 971424870 | | | | | |
| 5 | 8 | SCHRAUBE | SCREW | VIS | CHC M8 X 30 Q8.8 | | | | | ● | |
| 6 | 10 | UNTERLEGSCHEIBE | WASHER | RONDELLE | W8 | | | | | ● | |
| 7 | 1 | RADIAL-DICHTRING | RADIAL SHAFT SEAL | JOINT A LEVRE | D25/D47X6 | 71421000 | | ● | | ● | |
| 8 | 1 | LAGERDECKEL MIT GB | END PLATE WITH GB | FLASQUE BAGUE AVEC L.A | | 971454590 | Incl.7,11,12,13,14, 17,18 | | | ● | |
| 9 | 1 | SCHRAUBE | SCREW | VIS BOUT CONIQUE | HC M6X10 Q8.8 | | | | | | |
| 10 | 1 | SCHRAUBE | SCREW | VIS INDEXAGE | M6 | 971424710 | | | | | |
| 11 | 1 | GASBALLASTVENTIL6WELLE | GAS BALLAST VALVE SHAFT | COMMANDE LEST D AIR | | 971454560 | Incl. 10,11a,b,c,d,e,f,g | | | | |
| 11a | 1 | O-RING | O-RING | JOINT TOR | D4.42 | | | ● | | | |
| 11b | 2 | O-RING | O-RING | JOINT TOR | D10.77 | | | ● | | | |
| 11c | 1 | FEDER | SPRING | RESSORT | | | | | | | |
| 11d | 1 | UNTERLEGSCHEIBE | WASHER | RONDELLE | M8 | | | | | | |
| 11e | 1 | SICHERUNGSRING | LOCKING RING | CIRCLIPS | D18 type 7000 | | | | | | |
| 11f | 1 | GRIFF | HANDLE | POIGNEE | | | | | | | |
| 11g | 1 | MUTTER NYLSTOP | BLOCKING NUT | ECROU FREIN | M8 | | | | | | |
| 12 | 1 | GASBALLAST | GAS BALLAST | LEST AIR | | 971450810 | Incl. 9,11b,12a | | | | |
| 12a | 1 | MEMBRANE | MEMBRANE | MEMBRANE | D12 X 2 70SH | | | ● | | | |
| 13 | 1 | RILSAN LEITUNG | RILSAN TUBE | TUBE RILSAN | D4/6 LG165 | | | | | ● | |
| 14 | 1 | SPANNRING | CLAMPING RING | COLLIER DE FIXATION | DN8 | | | | | ● | |
| 15 | 1 | ANKER MIT RINGEN | ROTOR WITH RINGS | ROTOR BAGUE | | 971442640 | Incl. 23b,c,d,e,f,g | | | ● | |
| 16 | 1 | SCHIEBER SATZ VON 3 | VANES SET OF 3 | JEU DE 3 PALETTES | | 971429680 | | | ● | ● | |
| 17 | 2 | O-RING | O-RING | JOINT TOR | D9.12 | | | ● | | ● | |
| 18 | 1 | O-RING | O-RING | JOINT TOR | D110.72 | | | ● | | ● | |
| 19 | 3 | GUMMIFUSS | RUBBER MOUNT | AMORTISSEUR | DN30 H25 | 71212640 | | | | | |
| 22 | 1 | RADIAL-DICHTRING | RADIAL SHAFT SEAL | JOINT A LEVRE | D35/D52X6 | 71420820 | | ● | | ● | |
| 23 | 1 | MOTOR | MOTOR | MOTEUR | 1.5/1.8KW 50/60HZ 230V | 971455010 | Incl.23a,b,c,d,e,f,g,h ,i,j,m,n,p,25,26 | | | | |
| 23a | 1 | ELEKTRISCHER ROTOR | ELECTRICAL ROTOR | ROTOR ELECTRIQUE | | | | | | | |
| 23b | 1 | MOTOR RING | MOTOR RING | BAGUE ROTOR ELEC. | | | | | | | |
| 23c | 1 | HEBEOESE VERLAENGERUNG | LIFTING LUG EXTENSION | ENTRETOISE MOTEUR | | | | | | | |
| 23d | 1 | KUGELLAGER MOTOR | BALL BEARING MOTOR | ROULEMENT BILLES | D25XD47X12 | | | | | | |
| 23e | 1 | UNTERLEGSCHEIBE | STOP WASHER | RONDELLE FREIN | MB 5 | | | | | | |
| 23f | 1 | MUTTER | NUT | ECROU A ENCOCHES KM5 | M25X1.5 | | | | | | |
| 23g | 1 | O-RING | O-RING | JOINT TOR | D47.29 | | | | | | |
| 23h | 1 | HINTERE LAGERDECKEL MOTOR | REAR END PLATE MOTOR | FLASQUE ARRIERE MOTEUR | | | | | | | |
| 23i | 1 | STIFTSCHRAUBEN (SATZ VON 4) | TIE ROD (SET OF 4) | TIRANT MOTEUR (JEU DE 4) | | | | | | | |
| 23j | 1 | SCHALTER 24VDC | POWER RELAY 24VDC | RELAIS DE PUISSANCE 24VDC | | 971455850 | | | | | |
| 23m | 1 | ANLAUF KONDENSATOR | STARTING CONDENSER | CONDENSATEUR DE DEMARRAGE | 120µf | 971452700 | | | | | |
| 23n | 1 | PERMANENT KONDENSATOR | PERMANENT CONDENSER | CONDENSATEUR PERMANENT | 40µf | 971458950 | | | | | |
| 23p | 1 | ANLAUF RELAIS | STARTING RELAY | RELAIS DE DEMARRAGE | | 71414220 | | | | | |
| 25 | 1 | MOTOR LÜFTER | MOTOR FAN | VENTILATEUR MOTEUR | | 971442850 | | | | | |
| 26 | 1 | MOTOR LÜFTERHAUBE | MOTOR FAN COVER | CAPOT MOTEUR | | 71421910 | | | | | |
| 27 | 1 | HEBEOESE VERLAENGERUNG | LIFTING LUG EXTENSION | REHAUSSE ANNEAU DE LEVAGE | H110 | | | | | | |
| 28 | 1 | HEBEOESE | LIFTING LUG | ANNEAU DE LEVAGE | M8 | | | | | ● | |
| 29 | 1 | O-RING | O-RING | JOINT TOR | D82.14 | | | ● | | | |
| 30 | 1 | FEDER | SPRING | RESSORT CLAPET ASPIRATION | | 71212400 | | | | | |
| 31 | 1 | ANSAUGVENTIL | INTAKE VALVE | CLAPET ASPI. | | 71015460 | | ● | | | |
| 32 | 1 | ANSAUGFLANSCH | INTAKE FLANGE | BRIDE ASPI. EMB. | | | | | | | |
| 33 | 1 | O-RING | O-RING | JOINT TOR | D50 | | | ● | | | |
| 34 | 1 | O-RING | O-RING | JOINT TOR | D42 | | | ● | | | |
| 35 | 1 | FILTER | FILTER | FILTRE EMBOUTI | DN45 | 71407290 | | | | | |
| 36 | 1 | ANSAUGFLANSCH | INTAKE FLANGE | BRIDE DE RACCORDEMENT | 25KF | 971461420 | | | | | |
| 37 | 4 | BOLZEN | STUD | GOUJON | M8-25/15J=12 Q6.8 | | | | | | |
| 38 | 4 | UNTERLEG SCHEIBE | WASHER | RONDELLE | Z8 | | | | | | |

| Pos. | Stück. Qty Qté | BENENNUNG | SPECIFICATION | DESIGNATION | Abmessungen (mm) Dimensions (mm) Dimensions (mm) | Bestell-Nr Ref, No, N° de réf | Bemerkungen Notes Remarques | 971452150 | 971443150 | 971454600 | 971427660 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 39 | 8 | MUTTER | NUT | ECROU | H M8 Q6 | | | | | | |
| 40 | 1 | O-RING | O-RING | JOINT TOR | D42.86 | | | ● | | | |
| 42 | 4 | SCHRAUBE | SCREW | VIS | CHC M8X12 Q8.8 | | | | ● | ● | |
| 43 | 1 | VENTILANSCHLAG | VALVE STOP | CONTRE LAME | | | | | ● | ● | |
| 44 | 1 | VENTILPLATTE | VALVE | LAME | | | | | ● | ● | |
| 45 | 1 | O-RING | O-RING | JOINT DE FORME | | | | ● | | | |
| 46 | 1 | ÖLSCHAUGLAS | OIL LEVEL GLASS | VOYANT HUILE | G3/4 | 71219480 | | | ● | | |
| 48 | 1 | STOPFEN + O-RING | PLUG + O-RING | BOUCHON | G3/4 | 971448930 | Incl. 48a | | | | |
| 48a | 1 | O-RING | O-RING | JOINT TOR | D27 | | | ● | | | ● |
| 49 | 1 | SCHLAUCHANSCHLUSS | HOSE CONNECTION | DOUILLE CANNELEE | DN13 - 3/8 | | | | | | |
| 50 | 1 | STOPFEN + O-RING | PLUG + O-RING | BOUCHON | G1 1/4 M - 3/8 F | 971444130 | Incl.40, 49 | | | | |
| 51 | 4 | SCHRAUBE | SCREW | VIS | CHC M8X20 | | | | | | |
| 52 | 1 | AUSPUFFFLANSCH | EXHAUST FLANGE | BRIDE REFOULEMENT | G1 1/4 | 971453750 | Incl. 51,53 | | | | |
| 53 | 1 | O-RING | O-RING | JOINT TOR BRIDE REFOULEMENT | D108 | | | ● | | | ● |
| 54 | 1 | FEDER KOMPLETT | SPRING UNIT | RESSORT DE COMPRESSION ENS. | | 71420370 | | | ● | | ● |
| 55 | 1 | AUSPUFF-FILTER MIT BYPASS | EXHAUST FILTER WITH BYPASS | CARTOUCHE REFOUL. AVEC BY-PASS | | 971471470 | Incl. 53 | | ● | | ● |
| 57 | 1 | SCHWIMMER KOMPLETT | FLOAT COMPL. | FLOTTEUR | | | | | | | |
| 57a | 1 | ÖLRÜCKFÜHRVENTILKLAPPE | OIL RETURN VALVE SEAL | CLAPET RECUPERATION HUILE | | | | ● | | | |
| 57b | 1 | O-RING | O-RING | JOINT TOR | D8 | | | ● | | | |
| 58 | 1 | STOPFEN + O-RING | PLUG + O-RING | BOUCHON AVEC JOINT | G 1 | 971448940 | Incl. 58a | | | | |
| 58a | 1 | O-RING | O-RING | JOINT TOR | D33 | | | ● | | | ● |
| 59 | 1 | ÖLKASTEN OHNE ÖLFILTER | OIL CASING WITHOUT OIL FILTER | CARTER SANS FILTRE A HUILE EQ. | | 971443290 | Incl. 45 | | | | |
| 60 | 1 | SCHALTERKABEL 24 V DC 3 m | RELAIS CABLE 24 V DC 3 m | CABLE RELAIS 24 VDC 3 m | | 971455450 | | | | | |
| | | | | | | | | | | | |
| | | DICHTUNGSSATZ | SET OF SEALS | JEU DE JOINTS | | 971452150 | | | ● | | |
| | | | | | | | | | | | |
| | | REPARATUR KIT | REPAIR KIT | KIT REPARATION | | 971452300 | | | | | |
| | | PUMPENTEIL KOMPL. MIT GB | VACUUM GENERATOR WITH GB | GENERATEUR DE VIDE LA | | 971454600 | | | | | |
| | | WARTUNGSSATZ | SERVICE KIT | KIT DE MAINTENANCE | | 971427660 | | | | | |

Leybold

CE

# EU Declaration of Conformity

*(Translation of original Declaration of Conformity)*

**The manufacturer**:

Leybold GmbH
Bonner Strasse 498
D-50968 Köln
Germany

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 GmbH.

**Product designation:** SOGEVAC

**Type designation:** SV16, SV25, SV16D, SV25D, SV200, SV1200, SV16B, SV25B, SV40B, SV65B, SV100B, SV120B (I FC), SV300B, SV470B, SV500B, SV570B, SV630B, SV750B, SV28BI (FC), SV40BI (FC), SV65BI (FC), 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 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 |

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Cologne, November 14, 2016

ppa. Martin Tollner
Head of Product Lines

Cologne, November 14, 2016

ppa. Dr. Monika Mattern-Klosson
Head of Quality & Business Process Management

Leybold

# Declaration of Contamination of Compressors, Vacuum Pumps and Components

The repair and / or servicing of compressors, va cuum 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: ☒ applicable please mark

**Repair**: ☐ chargeable ☐ warranty

**Exchange**: ☐ chargeable ☐ warranty

☐ Exchange already arranged / received

**Return only:** ☐ rent ☐ loan ☐ for credit

**Calibration**: ☐ DKD ☐ Factory-calibr.

☐ Quality test certificate DIN 55350-18-4.2.1

## A. Description of the Leybold 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

| | No [1] | Yes | No |
|---|---|---|---|
| 1. Has the equipment been used | ☐ | ☐ → | |
| 2. Drained (Product/service fluid) | ↓ | ☐ | ☐ |
| 3. All openings sealed airtight | | ☐ | |
| 4. Purged | | ☐ | ☐ |
| If yes, which cleaning agent | | | |
| and which method of cleaning | | | |

[1] If answered with "No", go to **D**. ←

| Contamination : | No [1] | Yes |
|---|---|---|
| toxic | ☐ | ☐ |
| corrosive | ☐ | ☐ |
| flammable | ☐ | ☐ |
| explosive [2] | ☐ | ☐ |
| radioactive [2] | ☐ | ☐ |
| microbiological [2] | ☐ | ☐ |
| other harmful substances | ☐ | ☐ |

↓

## 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)

| X | Tradename: | Chemical name: |
|---|---|---|
| a) | | |
| b) | | |
| c) | | |
| d) | | |

| | No | Yes |
|---|---|---|
| 2. **Are these substances harmful ?** | ☐ | ☐ ← |
| 3. **Dangerous decomposition products when heated ?** | ☐ | ☐ |

**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 authorized person (block letters) :

Date

signature of authorized person

firm stamp

17200001_002_C0 © Leybold

# Notes

# Notes

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