



SOGEVAC[®] SV40 B / SV65 B / SV100 B / SV120 B ATEX Cat 2

Single-stage, oil sealed rotary vane pump.

Operating Instructions 130001815_002_C0



II (i) 2G b IIB+H2 T3 / (o) 2G IIC T4 (10°C <Ta< 40°C) X

Part Numbers

960305A22
960405A22
960505A22

and their variants.



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Important Safety Information

Important Safety Information

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

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

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

Warning

Caution

Note

The Leybold SOGEVAC® SV40 B – SV65 B – SV 100 B – SV120 B ATEX Cat 2 have 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 B – SV65 B – SV 100 B ATEX Cat 2 **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 ATEX 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.

The SOGEVAC® SV40 B – SV65 B – SV 100 B – SV120 B ATEX Cat 2 vacuum pumps have been specifically designed and manufactured to meet the requirements for Equipment-group II Category 2 of the "ATEX" Directive" i.e. Directive 2014/34/EU concerning equipment and protective systems intended for use in potentially explosive atmospheres.

Warning



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

SOGEVAC® pumps are not designed:

- for pumping of aggressive, corrosive gases or gases mixtures ;
- for pumping of oxygen or other highly reactive gases with a greater concentration than atmospheric concentration (>20%) ;

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 opened 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.

Caution



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

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

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

Important Safety Information

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.

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

Liquid and solid particles or dust must not enter into 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. The pressure regulation device is to be installed by the end-user. We recommend also to collect the pump exhaust and to treat the gases in function of their nature.

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.

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.

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

The SOGEVAC[®] vacuum pumps have been manufactured according to the newest technical standards and safety regulations. If not installed properly or not used as directed, dangerous situations or damage might occur. Under certain operating conditions, dangerous situations may occur when running the vacuum pump. If this happens, please contact our local office.

Warning



Caution

Note

1. Description

SOGEVAC® pumps are designed for pumping of inert gases in the range of rough vacuum, between atmospheric pressure and end pressure of the pump. When removing condensable vapours, a gas ballast valve must be installed.

1.1 Principle of operation

The SOGEVAC® SV40 B – SV65 B – SV 100 B – SV120 B ATEX Cat 2 are single- stage, oil-sealed rotary vane pumps. The anti-suckback valve, gas ballast valve, exhaust filter, oil return circuit and oil cooling oil are integrated functional elements. The pumps are driven by a directly flanged motor. The rotor mounted eccentrically in the pump cylinder has three vanes which divide the pump chamber into several compartments. The volume of each changes periodically with the rotation of the rotor. As the rotor rotates, the intake portion of the pumping chamber expands and sucks gas thru the intake port. The gas passes through the dirt trap and the open anti-suckback valve 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.

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 by deflection. Then fine filtering occurs in the exhaust filter elements. The proportion of oil in the exhaust gas is thus reduced below the visibility threshold (over 99 % entrapment rate).

Oil trapped in the exhaust filters is returned to the inlet chamber via an oil return line.

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 casing (pressure above or equal atmospheric pressure) and the intake port (pressure below atmospheric pressure). On part of the oil is taken from the oil casing and flows via the oil filter bypass 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 bypass.

A fan running on the motor shaft generates the necessary cooling air. The oil is also fed, thru a cooling coil, or in case of water cooled pumps, flows through a water oil heat exchanger controlled by a thermostatic valve.

All SOGEVAC® SV40 B – SV65 B – SV 100 B - SV120 B ATEX Cat 2 pumps are fitted with:

- PT100 temperature sensor
- Oil level switch
- Oil casing pressure transmitter

Pumps depending of their P/N are equipped with a gas ballast device. If opened, 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 vapour tolerance specified in the Technical Data) when pumping condensable gases or vapours. There are different types of gas ballast :

- standard manual gas ballast,
- large gas ballast (10 %), available upon request,
- permanent, available upon request, allowing temperature class T4 inside.

The pump temperature class may vary depending of the GB type. Please check the pump marking !

Note

Warning



Description

Unintentional venting of the vacuum chamber as well as oil suck back when shutting down the pump are prevented by the integrated anti suck back valve. This valve is not a safety device and its correct operation & tightness can only be assured if the valve plate & sealing zone are kept clean and in good condition.

If all returns are to be avoided by all means, it is required to install a vacuum safety valve on the pump suction flange. Please consult us.

Warning



Inside the pump (process gas)

The inside (process gas side) of this vacuum pump is so designed and constructed so as not to present an ignition source in cases of expected malfunction. It is therefore suitable for use in situations in which explosive atmospheres caused by gases, vapours, mists may occur occasionally in normal operation (i.e. Zone 1).

The pump and its accessories are not designed for pumping dust, liquids, or reactive, aggressive or corrosive gases and vapours, explosive or instable substances, pyrophoric gases, oxidising agents or oxygen enriched atmospheres (where the concentration of oxygen is greater than 21 vol. %).

Outside the pump

The outside of this vacuum pump is also so designed and constructed so as not to present an ignition source in cases of expected malfunction. It is therefore suitable for use in situations in which explosive atmospheres caused by gases, vapours, mists may occur occasionally in normal operation (i.e. Zone 1).

Additionally, the outside of this vacuum pump is so designed and constructed as to prevent foreseeable ignition sources which can occur during normal operation and are capable of igniting potentially explosive dust clouds. As such, when operated within the parameters specified within this instruction manual, the pump will provide a normal level of protection against the ignition of potentially explosive dust clouds. It is therefore also suitable for use in situations in which explosive atmospheres caused by or dust in air are unlikely to occur or, if they do occur, are likely to do so only infrequently and for a short period only (i.e. Zone 22).

Places where explosive atmospheres in air may occur are classified in terms of three zones on the basis of the frequency and duration of the occurrence of an explosive atmosphere. These are designated Zone 0, 1, 2 where gases, vapours or mists and Zone 20, 21, 22 where the explosive atmosphere is caused by dusts. The definitions for these Zones are given in Annex I of the "ATEX-Directive for users" i.e. Directive 99/92/EC on minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres.

Guidance on how to classify a hazardous area is provided in Directive 99/92/EC and its accompanying Guide (COM (2003)515) together with the European Standard EN 60079-10 (EN 60079-10 Electrical apparatus for explosive gas atmospheres Part 10 Classification of hazardous areas). In addition the Directive 99/92/EC and its Guide provide further information on explosion prevention and protection. They can be downloaded from the EU web site: www.europa.eu.int under:

Description

www.europa.eu.int/comm/employment_social/health_safety/publicat/com_1999_92_ce_en.pdf

www.europa.eu.int/comm/employment_social/health_safety/publicat/com_1999_92_ce_de.pdf

www.europa.eu.int/comm/employment_social/health_safety/publicat/com_1999_92_ce_fr.pdf

Ignition temperatures of gases / vapours that may be present:

The pump is only suitable for use in situations in which potentially explosive gas or vapour atmospheres have an ignition temperature greater than 200°C. Ignition temperatures of gases and vapours can be obtained from the MSDS (Material Safety Data Sheet).

Ignition temperatures of dusts that may be present:

Dusts that may be present outside the pump must have a cloud ignition temperature greater than 202,5°C and a layer ignition temperature (5 mm thick) greater than 210°C The pump shall not be used in areas where deposits of dusts can be formed. Cloud and layer ignition temperatures of dusts can be obtained from the MSDS (Material Safety Data Sheet).

Potential Ignition Sources

An Ignition hazard assessment has been carried out according to the European Standard EN 13463-1. (EN 13463-1 Non-electrical equipment for potentially explosive atmospheres — Part 1: Basic method and requirements) This has identified that the following ignition sources may occur during operation of the pump:

Potential Ignition Sources	Comments
Hot surfaces	Inside and Outside due to: <ul style="list-style-type: none">• Gas compression, vane friction etc.• Deposits on Stator/ Rotor slots• Ingress of particles
Hot gases	Produced inside pump and released at the exhaust
Mechanical sparks	Will not occur in normal operation - surfaces covered with oil inside the pump, sufficient clearance outside the pump
Electrical sparks	Motor, Accessories
Static electricity	Possible if conducting parts of pump are not earthed (Vaness, Lipseal, Exhaust filter, float valve)
Chemical reaction	Possible with process fluid/gas

Description

Protective measures

Warning

Hot surfaces

The compression of gas which occurs during normal operation of a vacuum pump results in heating and hot surfaces. The SOGEVAC ATEX Cat.2 vacuum pump has been specially modified and tests have shown that when operated under the conditions specified in this manual, the internal parts of the pump which could come into contact with a potentially explosive atmosphere could reach a maximum temperature of 130°C. The maximum temperature is reached after continuously operating the pump with an inlet pressure of between 300 mbar and 400 mbar. The actual temperature reached depends on the inlet pressure. Similarly the outside of the pump could reach a maximum surface temperature of 130°C (These temperatures include the safety allowances specified in EN13463-1).



The SOGEVAC ATEX Cat.2 vacuum pumps are fitted with a thermal sensor (PT100) at the pump stator. This must be connected so that the pump is automatically switched off if the temperature rises above 115°C which can happen under mal-operations, e.g. due to blocked oil filters. This should activate before the pump reaches this maximum temperature and if installed correctly will automatically stop the pump. The control system should be configured such that the pump does not automatically restart as the temperature decreases but should require a manual restart.

NOTE: Higher maximum surface temperatures will occur if the pump is filled and used with oils other than Leybold type LVO 210. This is caused by the poorer lubricating and cooling characteristics of other oils in particular PFPE oils.

Hot gases

Hot gases are produced inside the pump due to compression of the gas in normal operation and are released at the exhaust. These should be ducted to a safe place.

Mechanical sparks

Mechanical sparks will not occur in normal operation as the internal pump surfaces are covered with oil. The external cooling fan is designed and constructed with sufficient clearance to prevent contact and frictional rubbing.

NOTE: Ingress of particles into the pump must be avoided to prevent formation of hot spots due to rubbing or friction, where necessary a suitable ATEX filter should be used.

Electrical sparks

The motor and accessories supplied with this pump are certified to the same classification as the outside of the pump. These should be installed and used in accordance with the manufacturer's instructions attached to this manual.

Description

Static electricity

The pump should be adequately earthed to prevent the accumulation of static electricity. This will be achieved if the electrical earth cable to the motor is properly connected. No hazardous charge generation will occur on the plastic cooling fan and cowl or on the plastic coupling sleeve in normal operation. (For further information on hazards from static electricity see CENELEC report CLC/TR 50404:2003 Electrostatics - Code of practice for the avoidance of hazards due to static electricity.)

NOTE: Only original Leybold replacement exhaust gas filter cartridges and gas inlet filter cartridges should be used as these have a special construction to ensure earthing.

Chemical reactions

The pump should not be used with reactive gases that could produce a exothermic chemical reaction.

Description

1.2 Technical characteristics SV40 B

		SV40 B	
		50 Hz	60 Hz
Nominal speed ¹⁾	m ³ . h ⁻¹	44	53
Pumping speed ¹⁾	m ³ . h ⁻¹	38.5	47
Ultimate partial pressure without gas ballast ¹⁾	mbar	≤ 0.5	≤ 0.5
Ultimate total pressure with standard gas ballast ¹⁾	mbar	d 1.5	d 1.5
Ambient temperature		10 ... 40 °C	
Inlet gas temperature		≤ 60°C if inlet pressure is ≤ 200 mbar, and ≤ 40°C above 200 mbar	
Water vapour tolerance with standard gas ballast ¹⁾	mbar	30	30
Water vapour tolerance with standard gas ballast	kg.h ⁻¹	0.76	0.90
Noise level ²⁾	dB (A)	58	60
Leak rate	mbar.l.s ⁻¹	d1.10 ⁻³	d1.10 ⁻³
Motor voltage	V	230/400 V ± 10 %	460 V ± 10 %
Motor power	kW	1.5	1.8
Type of protection		IP55	
Rated rotational speed	min. -1	1500	1800
Net weight (with oil filling)	kg	70	70
Oil capacity	l	1	
Intake connection		G1 1/4"	
Exhaust connection		G1 1/4"	

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

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

These values are valid for the standard variants and with the use of the recommended oils acc. § 1.8.

Description

1.2 Technical characteristics SV65 B

		SV65 B	
		50 Hz	60 Hz
Nominal speed ¹⁾	m ³ . h ⁻¹	59	71
Pumping speed ¹⁾	m ³ . h ⁻¹	54	64
Ultimate partial pressure without gas ballast ¹⁾	mbar	≤ 0.5	≤ 0.5
Ultimate total pressure with standard gas ballast ¹⁾	mbar	d 1.5	d 1.5
Ambient temperature		10 ... 40 °C	
Inlet gas temperature		≤ 60°C if inlet pressure is ≤ 200 mbar, and ≤ 40°C above 200 mbar	
Water vapour tolerance with standard gas ballast ¹⁾	mbar	30	30
Water vapour tolerance with standard gas ballast	kg.h ⁻¹	1.0	1.2
Noise level ²⁾	dB (A)	60	64
Leak rate	mbar.l.s ⁻¹	d1.10 ⁻³	d1.10 ⁻³
Motor voltage	V	230/400 V ± 10 %	460 V ± 10 %
Motor power	kW	2.2	2.5
Type of protection		IP55	
Rated rotational speed	min. -1	1500	1800
Net weight (with oil filling)	kg	83	83
Oil capacity	l	2	
Intake connection		G1 1/4"	
Exhaust connection		G1 1/4"	

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

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

These values are valid for the standard variants and with the use of the recommended oils acc. § 1.8.

Description

1.2 Technical characteristics SV100 B

		SV100 B	
		50 Hz	60 Hz
Nominal speed ¹⁾	m ³ . h ⁻¹	97.5	117
Pumping speed ¹⁾	m ³ . h ⁻¹	87.5	105
Ultimate partial pressure without gas ballast ¹⁾	mbar	≤ 0.5	≤ 0.5
Ultimate total pressure with standard gas ballast ¹⁾	mbar	d 1.5	d 1.5
Ambient temperature		10 ... 40 °C	
Inlet gas temperature		≤ 60°C if inlet pressure is ≤ 200 mbar, and ≤ 40°C above 200 mbar	
Water vapour tolerance with standard gas ballast ¹⁾	mbar	30	30
Water vapour tolerance with standard gas ballast	kg.h ⁻¹	1.6	1.7
Noise level ²⁾	dB (A)	61	64
Leak rate	mbar.l.s ⁻¹	d1.10 ⁻³	d1.10 ⁻³
Motor voltage	V	230/400 V ± 10 %	460 V ± 10 %
Motor power	kW	3.0	3.6
Type of protection		IP55	
Rated rotational speed	min. -1	1450	1750
Net weight (with oil filling)	kg	102	102
Oil capacity	l	2	
Intake connection		G1 1/4"	
Exhaust connection		G1 1/4"	

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

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

These values are valid for the standard variants and with the use of the recommended oils acc. § 1.8.

Description

1.2 Technical characteristics SV120 B

		SV120 B	
		50 Hz	60 Hz
Nominal speed ¹⁾	m ³ . h ⁻¹	130	147
Pumping speed ¹⁾	m ³ . h ⁻¹	110	122
Ultimate partial pressure without gas ballast ¹⁾	mbar	≤ 0.5	≤ 0.5
Ultimate total pressure with standard gas ballast ¹⁾	mbar	d 1.5	d 1.5
Ambient temperature		10 ... 40 °C	
Inlet gas temperature		≤ 60°C if inlet pressure is ≤ 200 mbar, and ≤ 40°C above 200 mbar	
Water vapour tolerance with standard gas ballast ¹⁾	mbar	30	30
Water vapour tolerance with standard gas ballast	kg.h ⁻¹	1.6	1.7
Noise level ²⁾	dB (A)	61	64
Leak rate	mbar.l.s ⁻¹	d1.10 ⁻³	d1.10 ⁻³
Motor voltage	V	230/400 V ± 10 %	460 V ± 10 %
Motor power	kW	3.0	3.6
Type of protection		IP55	
Rated rotational speed	min. -1	1450	1750
Net weight (with oil filling)	kg	102	102
Oil capacity	l	2	
Intake connection		G1 1/4"	
Exhaust connection		G1 1/4"	

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

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

These values are valid for the standard variants and with the use of the recommended oils acc. § 1.8.

Description

Dimensional drawing SV40 B

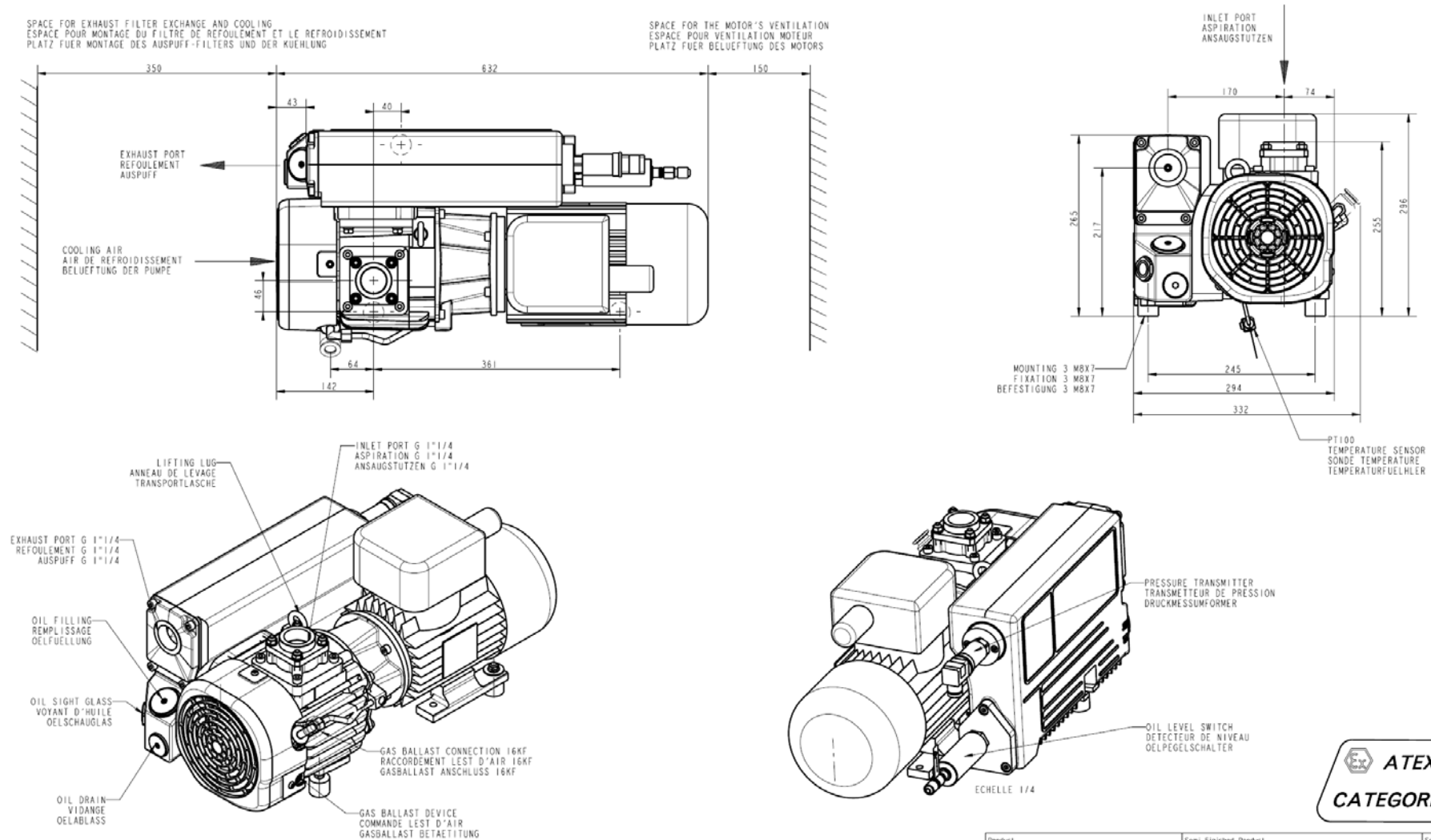


Fig 1.1

Dimensional drawing SV65 B

Description

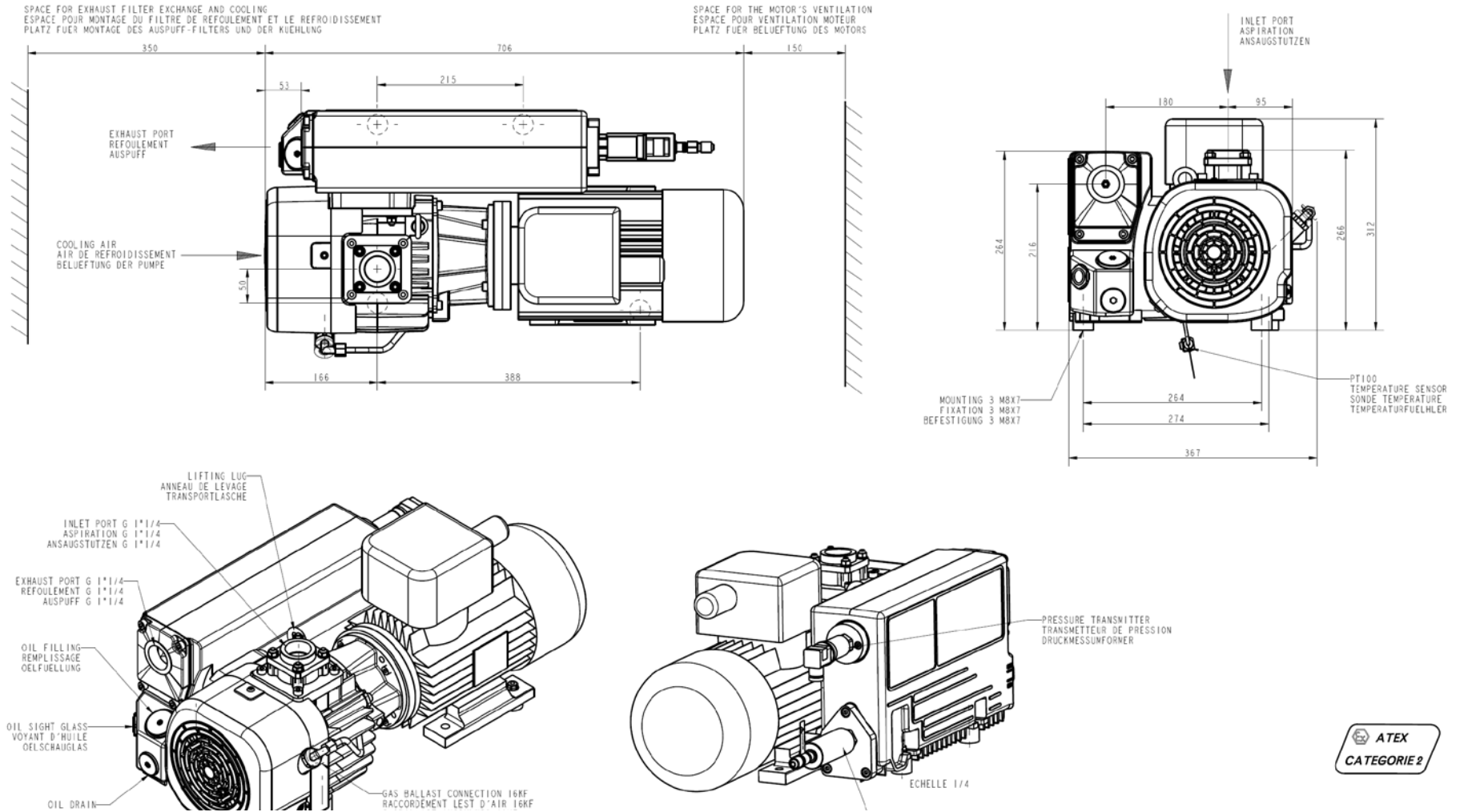


Fig 1.2



Description

Dimensional drawing SV100 B & SV120 B

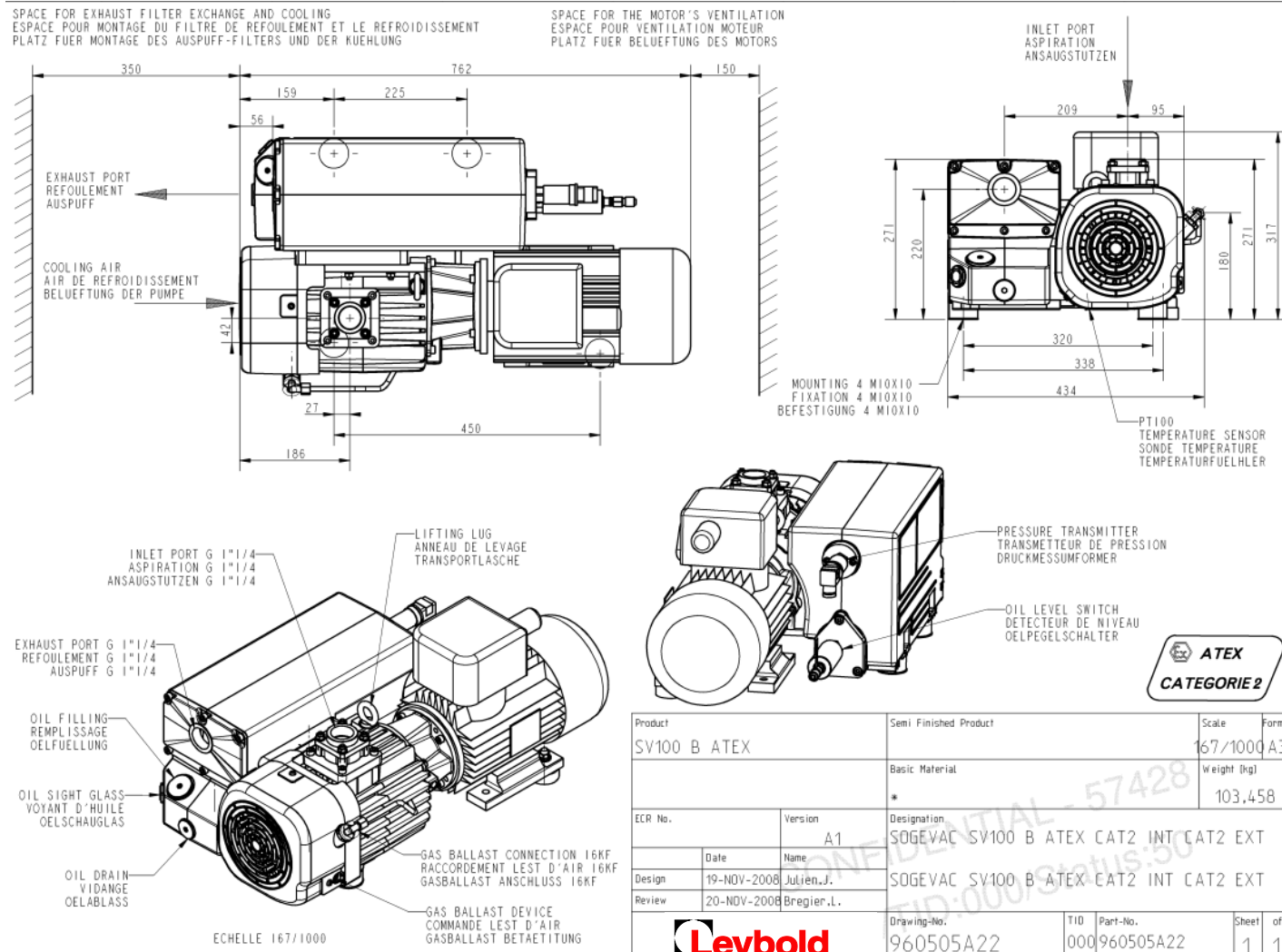
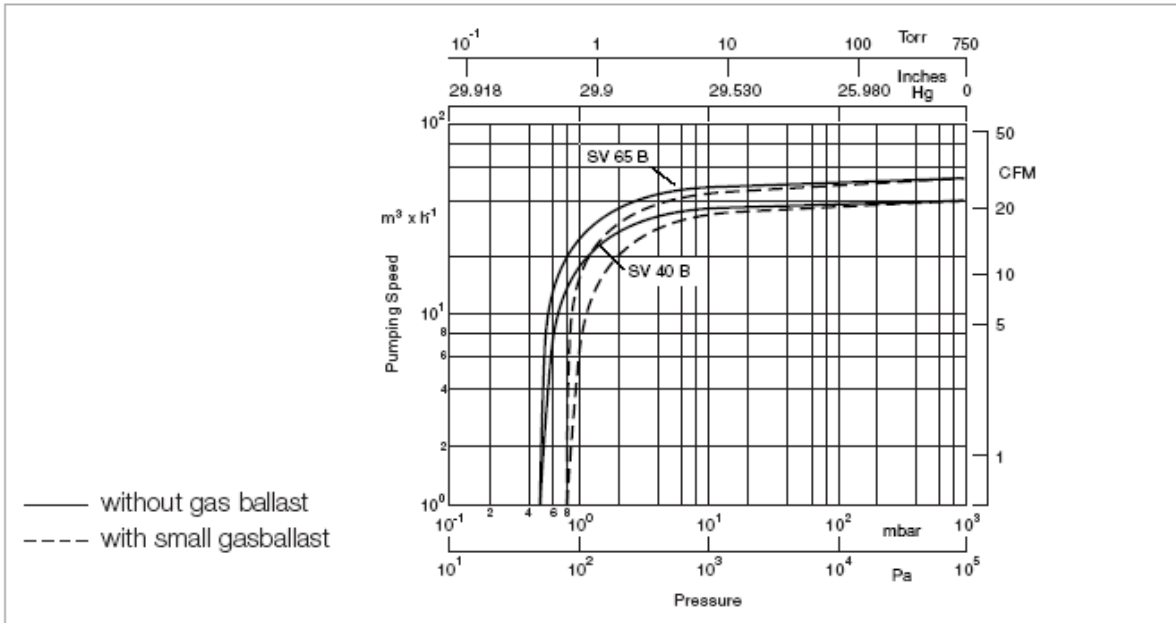


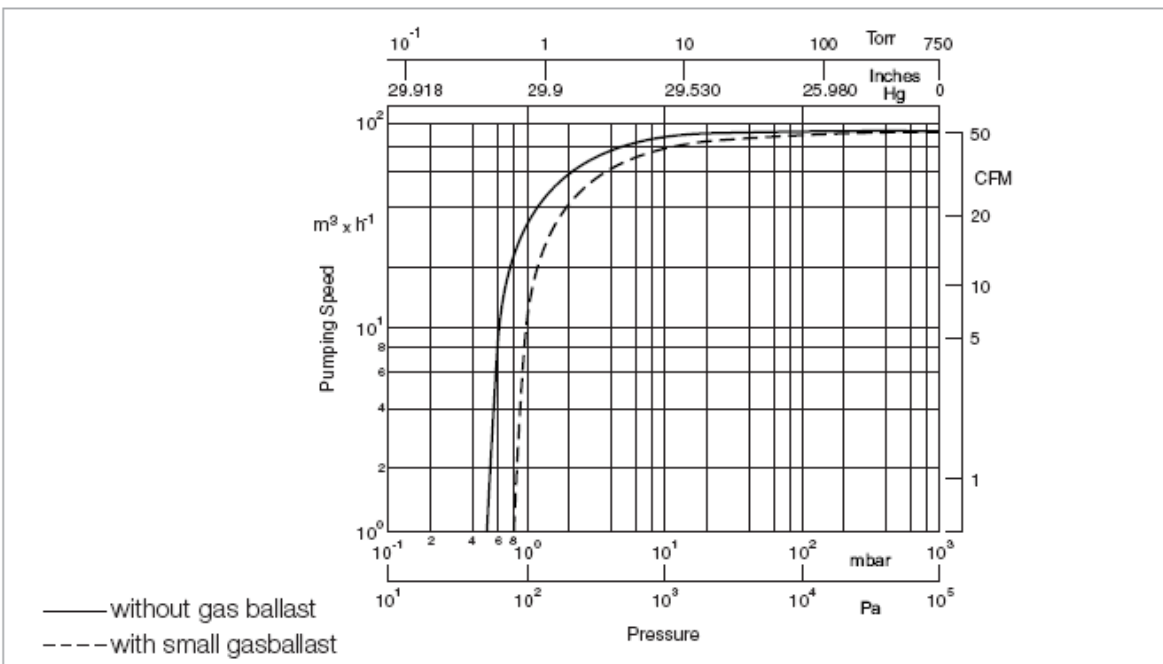
Fig 1.3

Description

Pumping speed curves 50 Hz



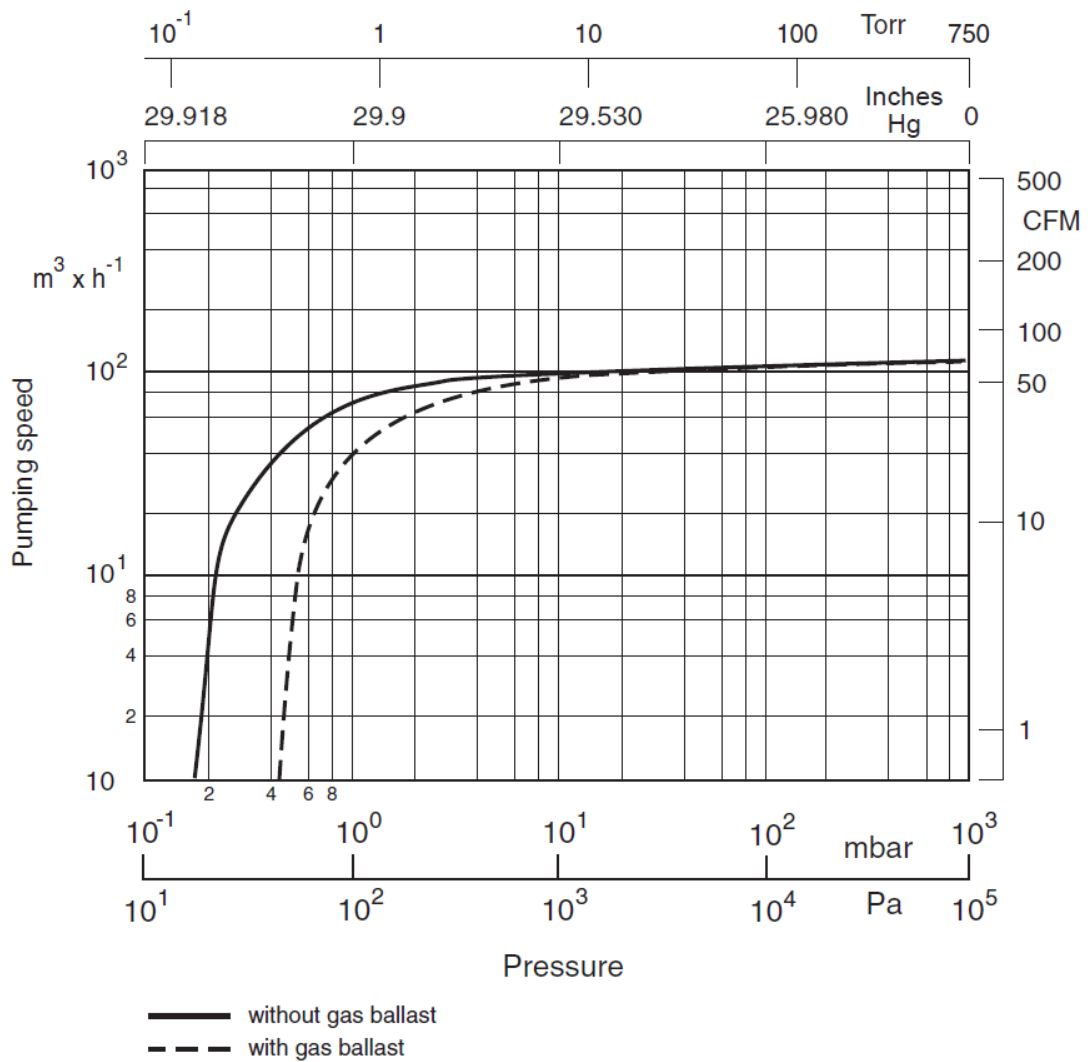
SV40 B & SV65 B



SV100 B

Description

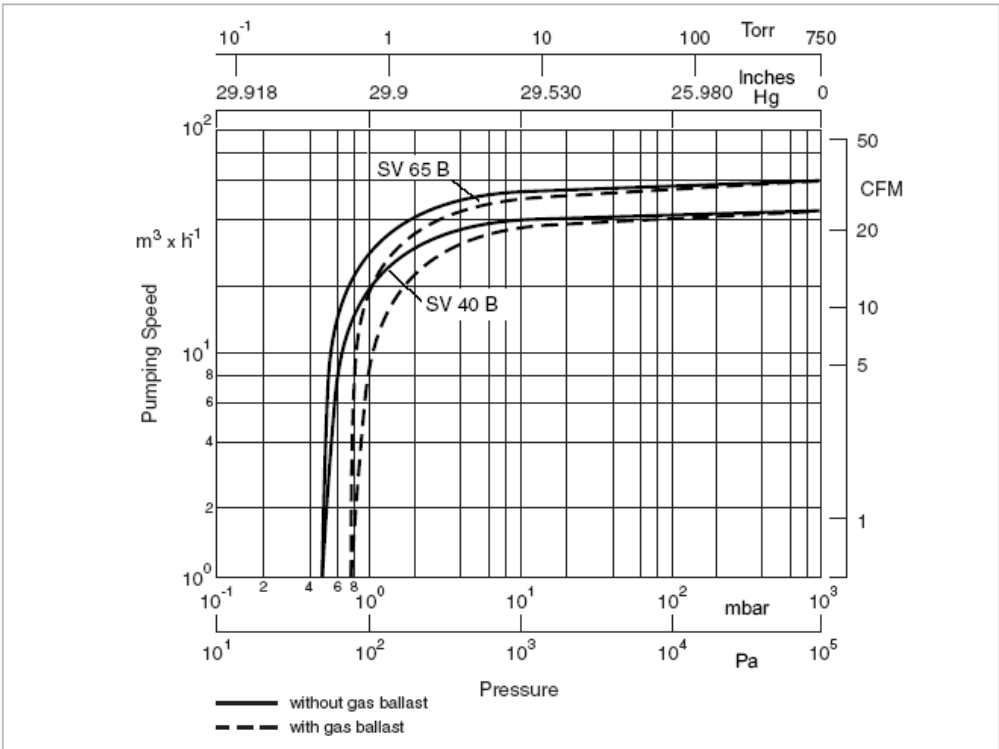
Pumping speed curves 50 Hz



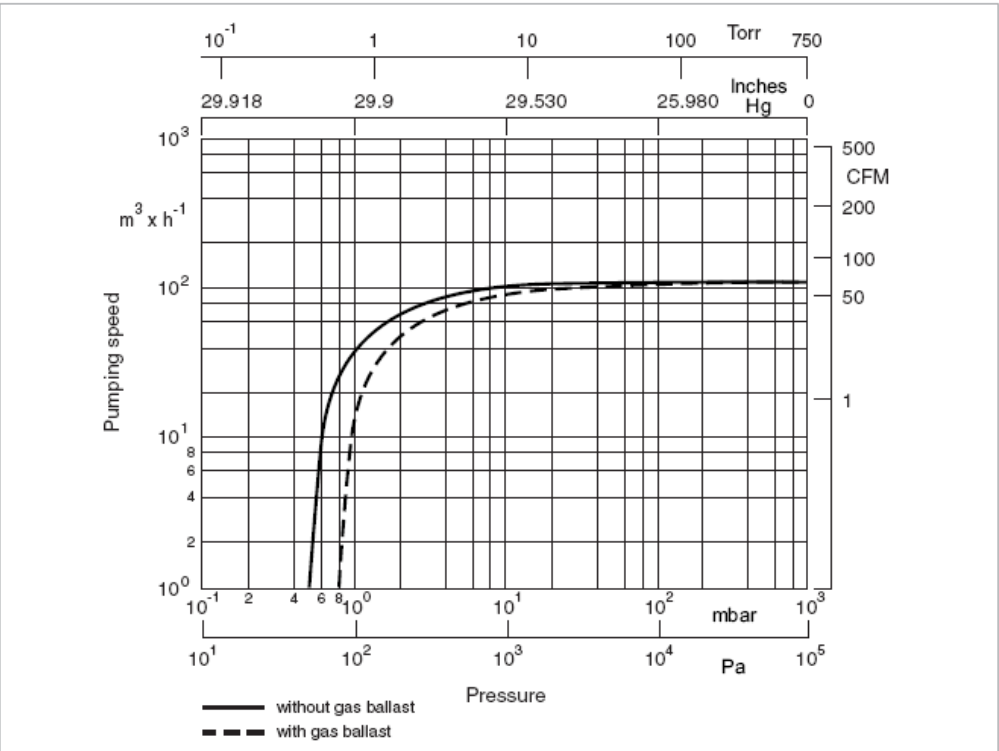
SV120 B

Description

Pumping speed curves 60 Hz



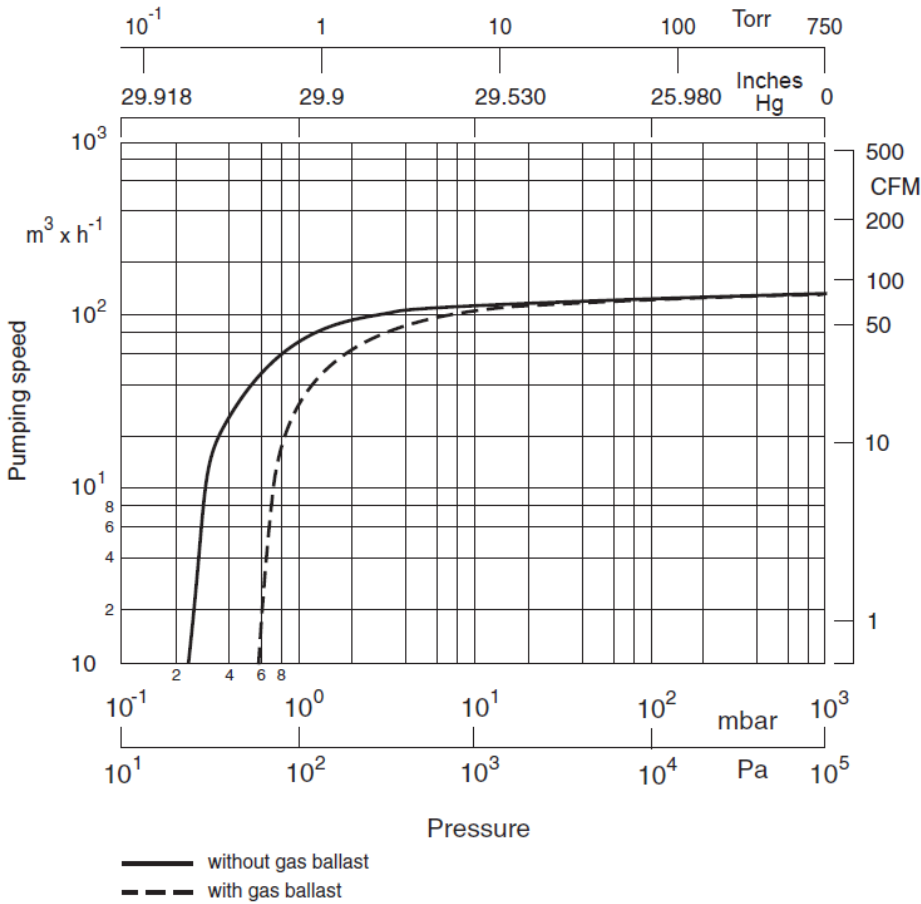
SV40 B & SV65 B



SV100 B

Description


Pumping speed curves 60 Hz



SV120 B

Description

1.3 Ordering Information

Size	Part-Nr.	Inside temp. class	Outside temp. class	Inside gas group	Outside gas group	ATEX Marking 
SV40 B	960305A22	T3*	T4	IIB & H2	IIC	II (i) 2G b IIB+H2 T3 / (o) 2G IIC T4 (10°C <Ta< 40°C) X
SV65 B	960405A22	T3*	T4	IIB & H2	IIC	II (i) 2G b IIB+H2 T3 / (o) 2G IIC T4 (10°C <Ta< 40°C) X
SV100 B	960505A22	T3*	T4	IIB & H2	IIC	II (i) 2G b IIB+H2 T3 / (o) 2G IIC T4 (10°C <Ta< 40°C) X
SV120 B	960555A20 V3001	T3*	T4	IIB & H2	IIC	II (i) 2G b IIB+H2 T3 / (o) 2G IIC T4 (10°C <Ta< 40°C) X

***SV40 B to 120 B with manual GB are T3 inside. Pumps with permanent GB are T4 inside.**

Explanation of Symbols

- II Equipment group II refers to equipment intended for use in places other than mines likely to be endangered by explosive atmospheres.
- (i)/(o) Specifies the category / conditions for which the inside (i) (i.e. the parts of the apparatus in contact with the process gas stream) and the outside (o) of the apparatus are certified when different.
- 2 Category 2 comprises products designed to be capable of remaining within their operational parameters, stated by the manufacturer, and based on a high level of protection for their intended use, in areas in which explosive atmospheres caused by mixtures of air and gases, vapours, mists or air/dust mixtures are likely to occur. The explosion protection relating to this Category must function in such a way as to provide a sufficient level of safety even in the event of equipment with operating faults or in dangerous operating conditions which normally have to be taken into account.
- G Explosive atmosphere is caused solely by gases, vapours or mists in air
- b Protection by control of ignition source, to prevent potential ignition source becoming effective (EN 13463-6).
- II, IIA, IIB, IIB+H2 or IIC Explosion groups: These are subdivisions of equipment of Group II used for some specific types of protection. This classification is based on the maximum experimental safe gap and the minimum ignition current of the explosive mixture. See Annex A of the European standard EN 50014. (EN 50014 Electrical apparatus for potentially explosive atmospheres - General Requirements)
NOTE: Equipment marked IIB is suitable for applications requiring IIA equipment. Similarly, equipment marked IIC is suitable for applications requiring IIA or IIB equipment. Equipment suitable for all applications may also be marked II or not marked.
IIB+H2 means that the pump is suitable for pumping gases of the explosion group IIB plus hydrogen.
NOTE For pumping atmospheres containing Acetylene or other reactive gases special precautions are required.

Description

T3 & T4 Temperature Class: Classification of equipment into classes depending on their maximum surface temperature according to the following table:

Temperature class	Maximum surface temperature (°C)
T1	450
T2	300
T3	200
T4	135
T5	100
T6	85

Gases and vapours used with these pumps should have an ignition temperature greater than 200°C.

NOTE. The Temperature Class and the actual maximum surface temperature of the equipment includes the safety margin to the minimum ignition temperature of the potentially explosive atmosphere as required in EN 1127-1

Ta Allowable ambient temperature for use of the pump $10^{\circ}\text{C} < T_a < 40^{\circ}\text{C}$

X Special operating conditions for safe use apply - see information given in this manual

Description

Connections

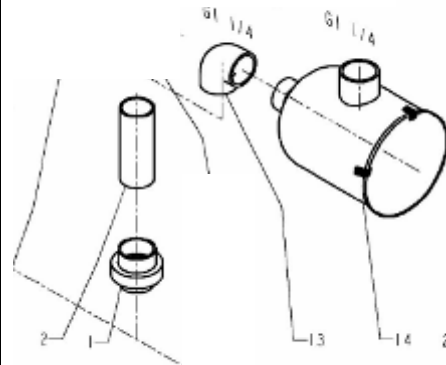
Pump	SV40 B - SV65 B - SV100 B – SV120 B
Intake connection	G1 1/4"
Exhaust connection	G1 1/4"
Rubber feet connection	M8 female thread for SV40 B & SV65 B M10 female thread for SV100 B & SV120 B
Gas ballast connection	Air taken in coupling housing or DN 16 ISO-KF for inert gas connection. See § 4.1.
Gas ballast type	Manual, other types available upon request in specific P/N
Anti suck back valve	Standard, spring operated
Mains voltage	230/400 V ± 10 %, 50 Hz 460 V ± 10 %, 60 Hz
CTP thermistors	Wires in motor connection box
Oil type	LVO 210

PT 100 connection	See specification at the end of the document.
Oil level switch connection	See specification at the end of the document. NAMUR output.
Oil casing pressure transmitter connection	See specification at the end of the document. 4 – 20 mA output.
Motor connection	<p>1 cable gland M25 for power cable.</p> <ul style="list-style-type: none"> - Non-screened cable outer diam. 10.5 to 13 mm - Screened cable outer diam. 15 to 20 mm <p>1 cable gland M20 for CTP thermistors cable.</p> <ul style="list-style-type: none"> - Non-screened cable outer diam. 5.5 to 8 mm - Screened cable outer diam. 10 to 15 mm <p>See specification at the end of the document.</p>

Description

1.4 Connection fittings pump intake

Item	Description	Part-Nr.
1	Union coupling + seal	711 18 023
2	Nipple	711 18 033
13	Elbow 90°	711 18 213
14	Dust filter with polyester cartridge SV40 B & SV65 B	9714 57 120
	Replacement polyester cartridge SV40 B & SV65 B	9714 57 180
14	Dust filter with polyester cartridge SV100 B & SV120 B	9714 57 130
	Replacement polyester cartridge SV100 B & SV120 B	9714 57 190

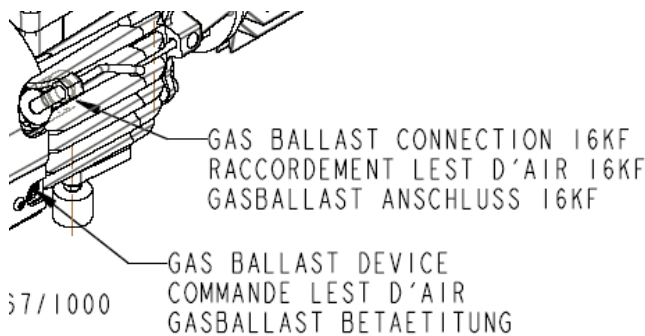


Only these above listed elements are allowed on ATEX CAT 2 pumps. All elements must be properly grounded or it must be checked that the earthing continuity to the pump grounding is granted. For carrying out the earthing continuity test, please refer to § 5.4.D.

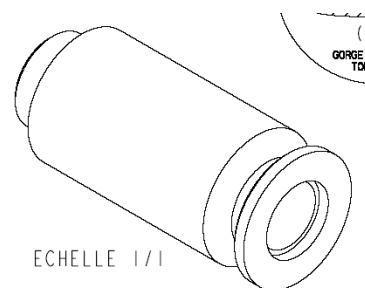
Warning



1.5 Connection fittings pump gas ballast



Item	Description	Part-Nr.
1	GB connection adapter 16 KF for inert gas connection. Delivered with the pump.	971440880



Description

1.6 Accessories & Roots combinations for SV100 B & 120 B

Description	Part-Nr.
Oil drain tap	711 30 114
Gas ballast big flow (10%) KIT	Upon request
Adapter Roots WAWAU 251 & WAWAU 501. Only for SV100 B & SV120 B	9714 48 740
Base frame for Roots direct mounting. Only for SV100 B & SV120 B	9714 48 830

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

Caution

In case a direct Roots pump coupling is used, it is important to check the gas temperature due to the Roots compression.

Warning

Only these above listed elements are allowed on ATEX CAT 2 pumps. All elements must be properly grounded or it must be checked that the earthing continuity to the pump grounding is granted. For carrying out the earthing continuity test, please refer to § 5.4.D.



1.7 Spare parts

Description	P/N SV40 B	P/N SV65 B	P/N SV100 B	P/N SV120 B
Set of gaskets	971464780	971464760	971463660	EK97146366DS
Exhaust filter	9714 44 220	9714 44 230	9714 44 230	9714 44 230
Maintenance kit	9714 64 100	9714 63 990	9714 63 640	9714 63 640
Repair kit	9714 64 110	9714 64 000	9714 63 650	EK9714636REP
Generator kit with standard manual gas ballast	9714 64 030	9714 63 940	9714 63 590	EK971445101
Polyester inlet filter element	9714 57 180	9714 57 180	9714 57 190	9714 57 190

Only original Leybold parts are to be used in the pumps. A non respect of this will entail a loss of the pump's ATEX certification.

Warning



Description

1.8 Lubricants

The Leybold LVO 210 oil is an ester oil particularly suited for the SV40 B – 65 B - 100 B & 120 B ATEX pumps. Only original Leybold LVO 210 oil is to be used in the pumps. A non respect of this will entail a loss of the pump's ATEX certification.

Warning



Oil volume	Part-Nr.
2 l	9714 30 531 & L21002
5 l	200 10 891 & L21005
20 l	200 00 193 & L21020
200 l	200 03 257 & L21099

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 stickers.

Take these caps or self-adhesives away before turning on the pump.

The SV40 B & 65 B pumps have the LVO 210 oil delivered separately.

The SV100 B pumps have the LVO 210 oil filled in.

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. 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. 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 safely. Use suitable lifting equipment. Make sure that all safety regulations are observed. Use only lifting devices appropriated to the pump weight. Check name plate. Do not use other pump elements than the lifting lugs as handles.

Caution

2.3 Storage

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.

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 exchange too. The inlet and exhaust ports of the pump must be blanked off using the shipping seals which are included upon delivery of the pump. Drain the water from the cooling circuit (See § 3.2). The gas ballast must be closed and if the pump is to be shelved for a longer period of time is 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.

Caution

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 ATEX specialists.

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. The pump is only ATEX if it is controlled by a suitable control system, if all sensors and switches are connected & integrated into the controls algorithms.

Furthermore, we recommend that a pilot valve is installed on the pump inlet to allow a pump warming before the process start & oil degassing after the process. The valve is not part of the pump scope of delivery. Please note that the gas temperature must be measured.

Do not stand on the pump and do not place objects on the pump as these can cause deformation of the fan housing and possible frictional rubbing.

Warning



3.1 Installation

The SOGEVAC® can be set up on any flat, horizontal surface. Under the four feet, there are metric threaded holes (M8 or M10, see § 1.3 Connection) for securing the pump.

The oil level cannot be read properly if the pump is tilted and lubrication may be affected. The max. slope angle is $\pm 1^\circ$.

The pump's ambient temperature must be between 12°C (55°F) and 40°C (104°F).

To ensure adequate cooling of the pump, leave enough space at the air intake and exhaust points, and for access and maintenance (see Fig. 1.1 to 1.4). Make sure to keep the fans, hoods, cooling coils & air intake of the motor clean.

The pump is to be installed such that the oil level sight-glass can be both easily read and so that it will not be broken.

Warning



3.2 Connection to the system

Intake Side

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 pipings should take care of pumped gases & ATEX regulations. It is the same for its tightness. Using suitable connecting elements (see § 1.4) the pump can be connected to the vacuum system.

The cross-section of the intake line should be at least the same as the one for the intake port. If the intake line is too narrow, it reduces the pumping speed. If the process gas contains dust, it is absolutely essential to install a dust filter in addition to the dirt trap supplied (see §1.4).

We recommend installing the dust filter horizontally. This ensures that when removing the filter no particles fall into the intake port.

When pumping vapours, we recommend installing condensate traps on the intake and exhaust sides.

The intake must be installed in such a way to avoid condensates flowing into the pump.

Caution

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, the by pass opens at 1.5 bar, (absolute pressure), and the filters are bypassed. As a result, the proportion of oil in the exhaust gas as well as the pump's oil consumption will rise. Installing new exhaust filters will correct this problem. (See § 5.4.D).

Check in the individual case whether a line is necessary and/or prescribed. Volatile substances will 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.

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

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 or overheating may occur in the pump.

Before installing the exhaust line, remove the exhaust-flange plate and ensure that the exhaust demister(s) are secured tightly in place. They sometimes loosen during shipping and installation. A loose demister results in exhaust smoke during start-up and operation. 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.

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 opened and that the exhaust line is not obstructed. Exhaust pipe material must be resistant to pumped gases.

Any pump or accessory modification and the use of non Leybold approved pump condition sensors are prohibited without our written consent. Otherwise, the CE Declaration & ATEX certification become void.

Caution

Warning



Warning



Installation

3.3 Electrical connections

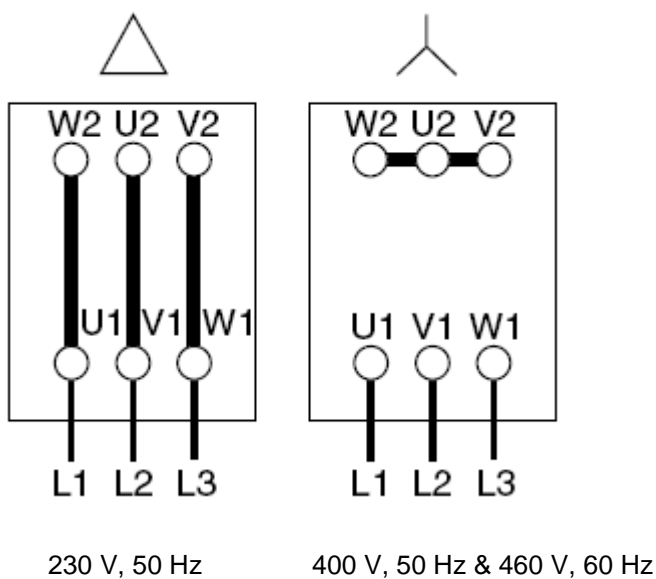
Ensure that incoming power to the pump is off before wiring the motor or altering the wiring. The specific wiring and instructions for installation in potentially explosive atmospheres given in the manual for the electric motor must be followed. Additional information can be found in the European Standard EN 60079-14 Electrical apparatus for explosive gas atmospheres Part 14 Equipment for use in potentially explosive gas atmospheres and EN 60079-17 Electrical apparatus for explosive gas atmospheres Part 17.

Warning



The use of frequency converters to control the SOGEVAC ATEX Cat. 2 pumps is not allowed.

The pump shall be adequately earthed to prevent the accumulation of static electricity. The electrical junction box should only be opened and electrical connections made when no explosive atmosphere is present.



Electrical connection work must only be carried out by a qualified electrician in accordance with the applicable safety rules, see IEC 60204-1 & 61010-1. Connect the pump's motor to the right supply voltage via the connections in the junction box (see fig. 6). The relevant safety rules require the use of a suitable motor protection switch. Set the switch in accordance with the rating on the motor nameplate.

If any security switch or electrical defect cuts out the pump, re-start-up of the pump has to be possible only manually.

The pump is designed for direct starting even under load conditions, i.e. the pump can be switched on against vacuum in the intake port.

After connecting the motor and after every time you alter the wiring, check the direction of rotation. Refer to the marking on the motor. During the check, the intake port should be open. If the direction of rotation is wrong, oil may be ejected out the intake port. (The vacuum system may be pressurised). For the check, switch on the motor briefly. If it starts up with the wrong direction of rotation, switch it off immediately and interchange two phases of the connection. It is recommendable to check the direction of rotation with a phase sequence indicator.

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

Installation

Motor protection device (on given variants only)

To protect the motor windings against a variety of operational malfunctions, the motor is fitted with protection device, which must be connected. PTC thermistors acc. to IEC 60034-1 and DIN 44081/440823 are temperature dependent, semi-conductor devices embedded in the motor windings.

Temperature Sensor PT100

A temperature sensor type PT100 is placed on the vacuum generator close to the exhaust valves. The temperature sensor monitors the pump temperature. The PT100 manual is attached at the end of the instruction manual.

See next page for threshold values.

Oil level Switch (on given variants only)

The manual is attached at the end of the instruction manual. The pump must be switched off and the pump and oil level checked immediately if the oil level is too low.

To avoid false alarms it is recommended to use a timer of 20 seconds on the switch output. If the default remains longer than 20 seconds, the pump must be switched off.

Over pressure sensor

The manual is attached at the end of the instruction manual. The pump must be switched off and the pump, exhaust line and exhaust filters checked immediately if the pressure in the oil casing is too high. The sensor delivers a 4 – 20 mA signal.

See next page for threshold values.

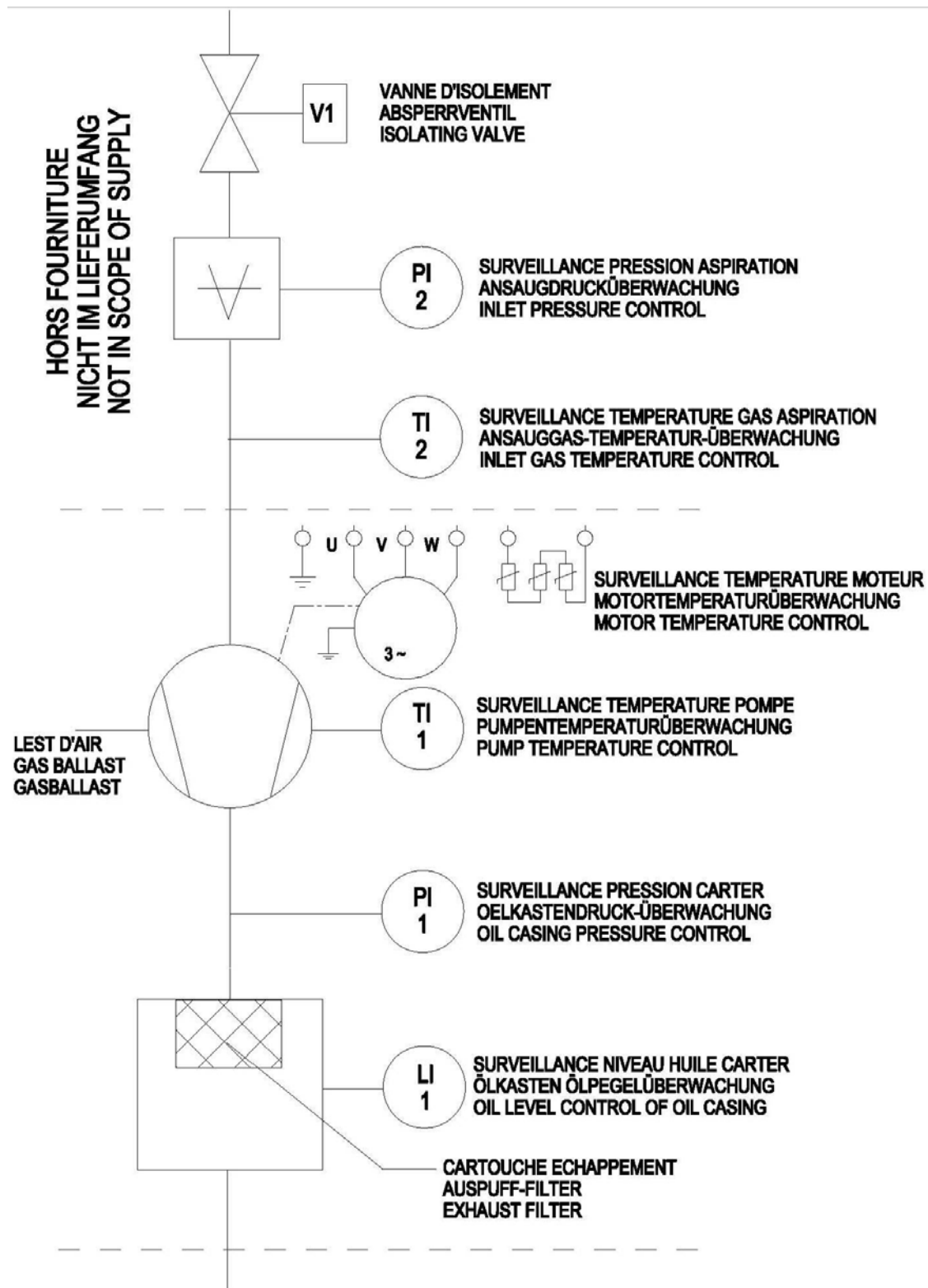
Associated Electrical equipment

The electrical equipment supplied with this pump e.g. motor, valves, sensors etc. are also suitable for use in potentially explosive gas / dust atmospheres under the same conditions as those for the pump. The instructions given in the electrical motor manufacturer's Information for Use attached to this manual must be complied with. The electrical motor and accessories meet the IP65 enclosure requirements or their equivalent.

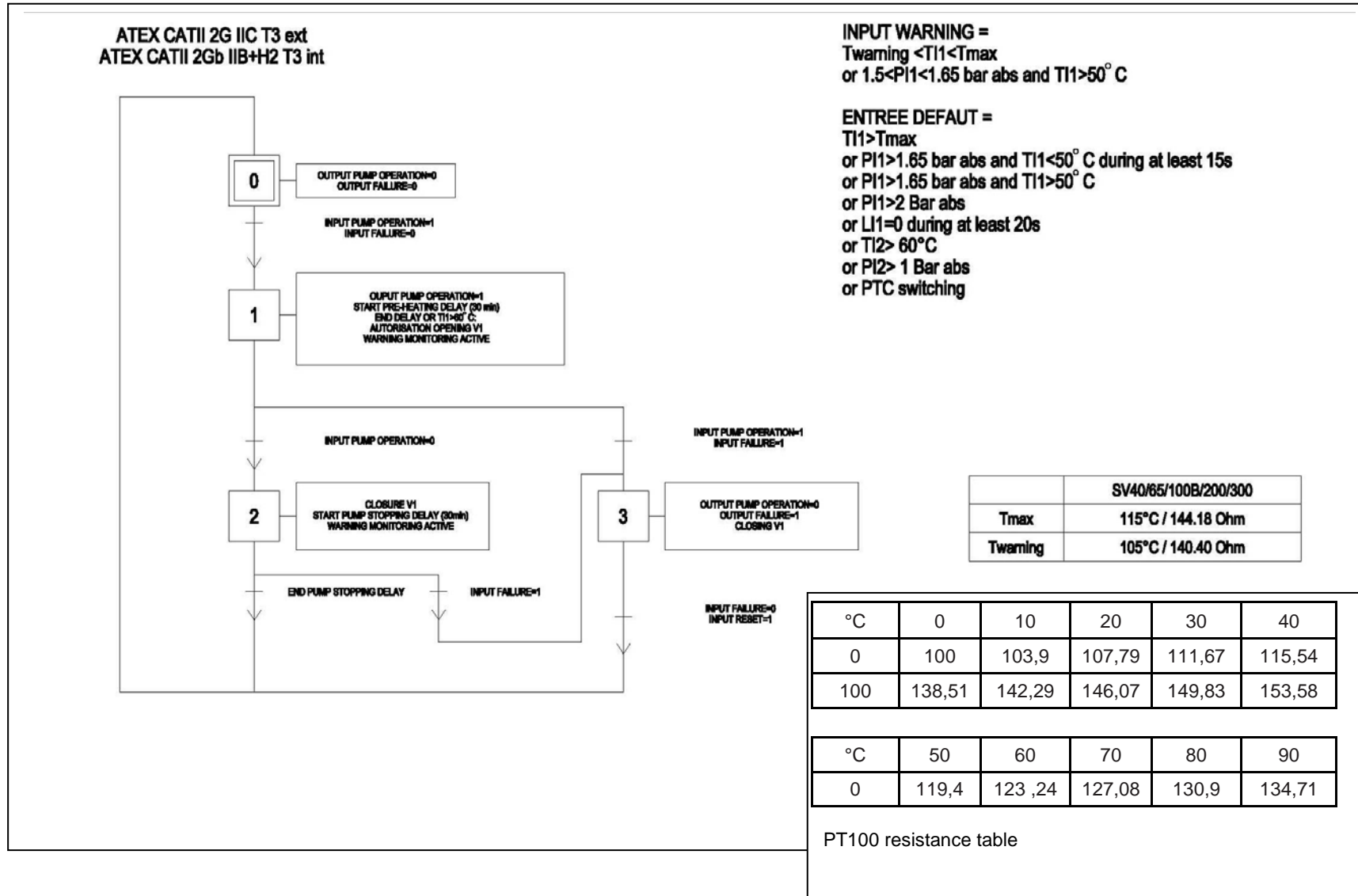
The ignition protection sensors (over-temperature, outlet-pressure, oil-level) must be used to protect the pump against critical operational parameters and must be configured to cause shut of the pump if the values go outside of the allowable range. Additionally the Temperature and pressure measurements should be configured to be fail safe i.e. loss of signal from the sensor should cause the pump to shut down.

Restart should not be possible without re-setting of the ignition preventing system. The system should meet requirements of IPL1 (EN13463-6) equivalent to SIL1 (EN 61508) or EN 954-1.

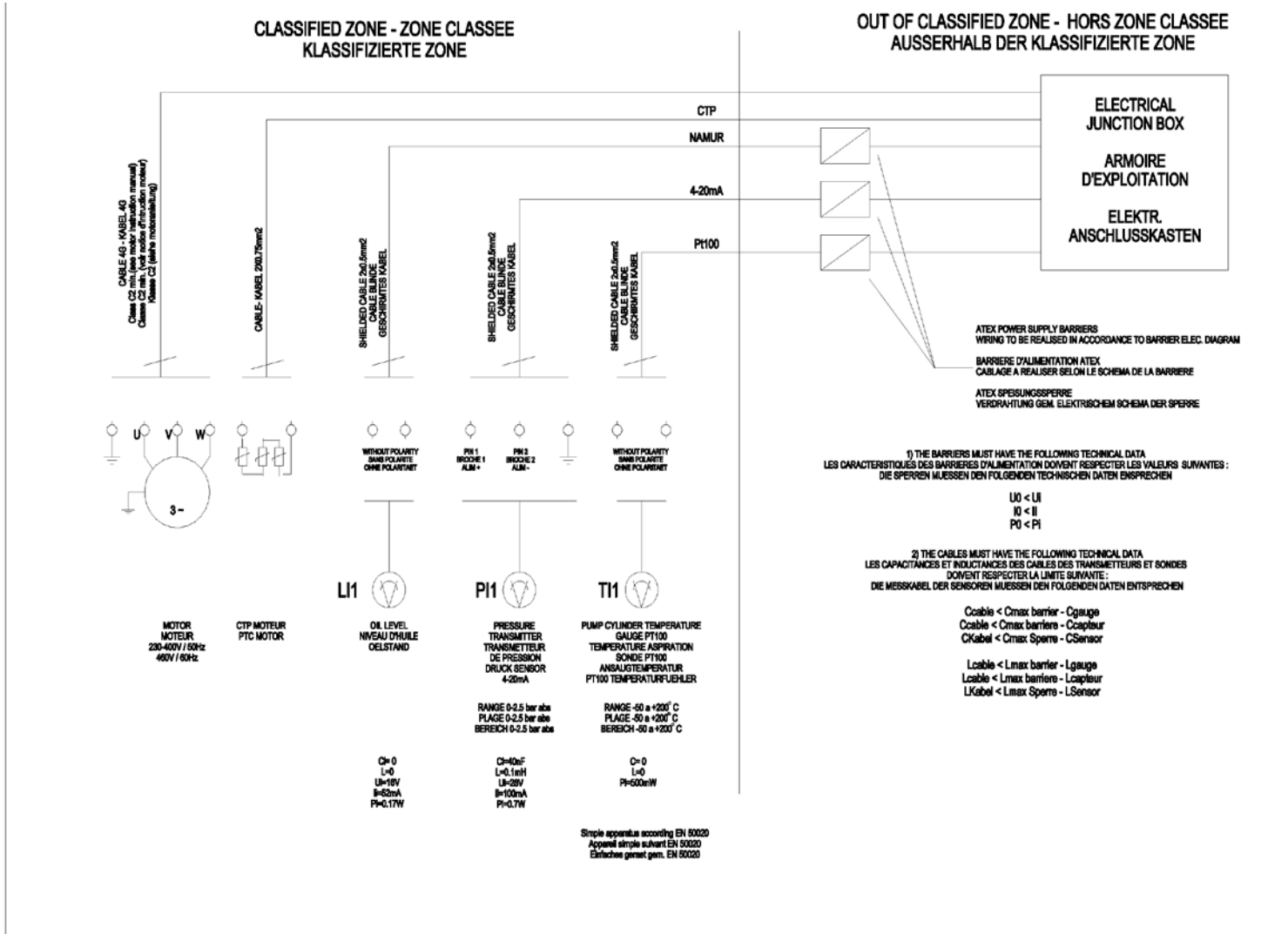
Pump System Overview (Example)



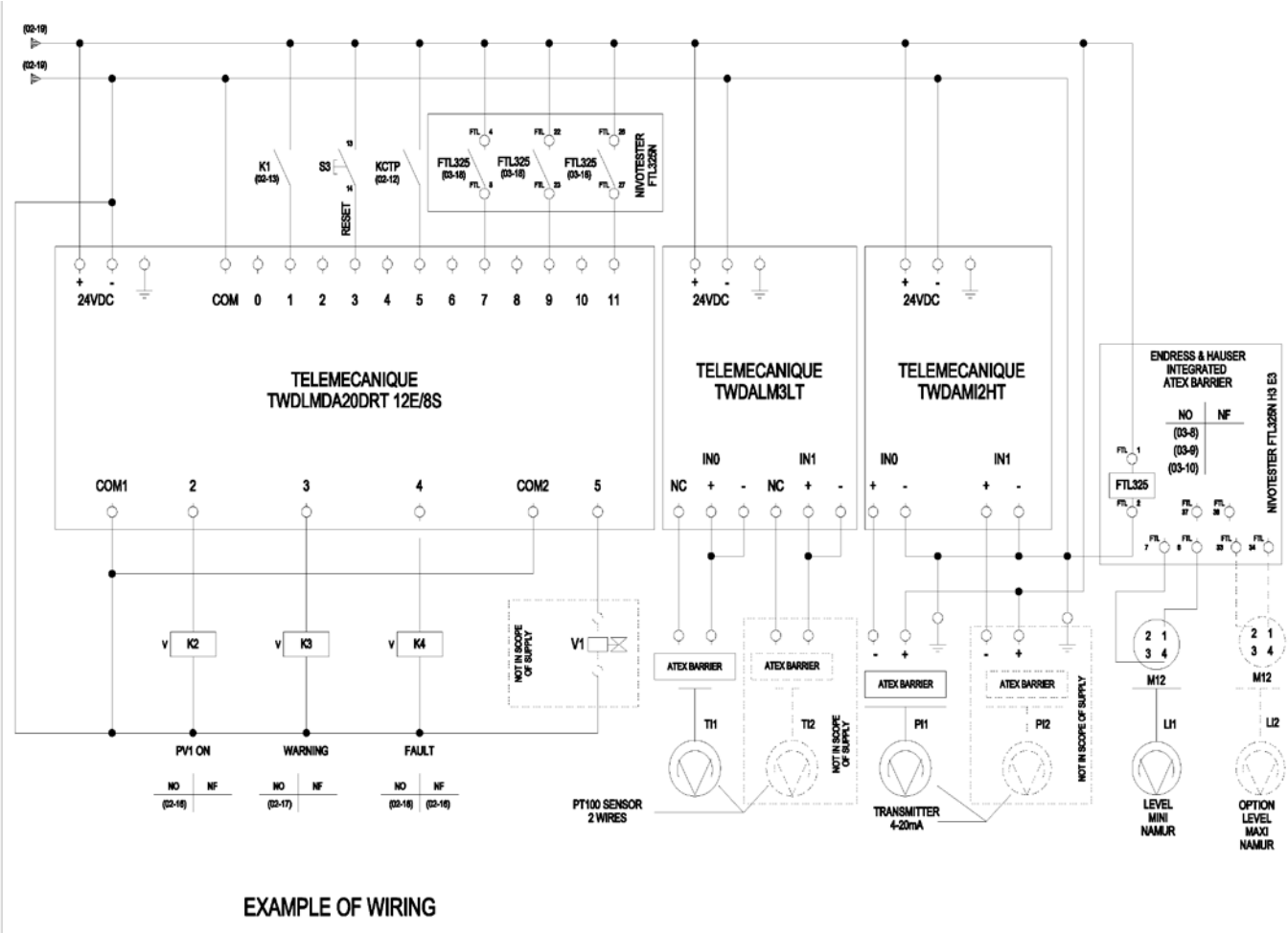
Decision Diagram



Wiring diagram (Example)

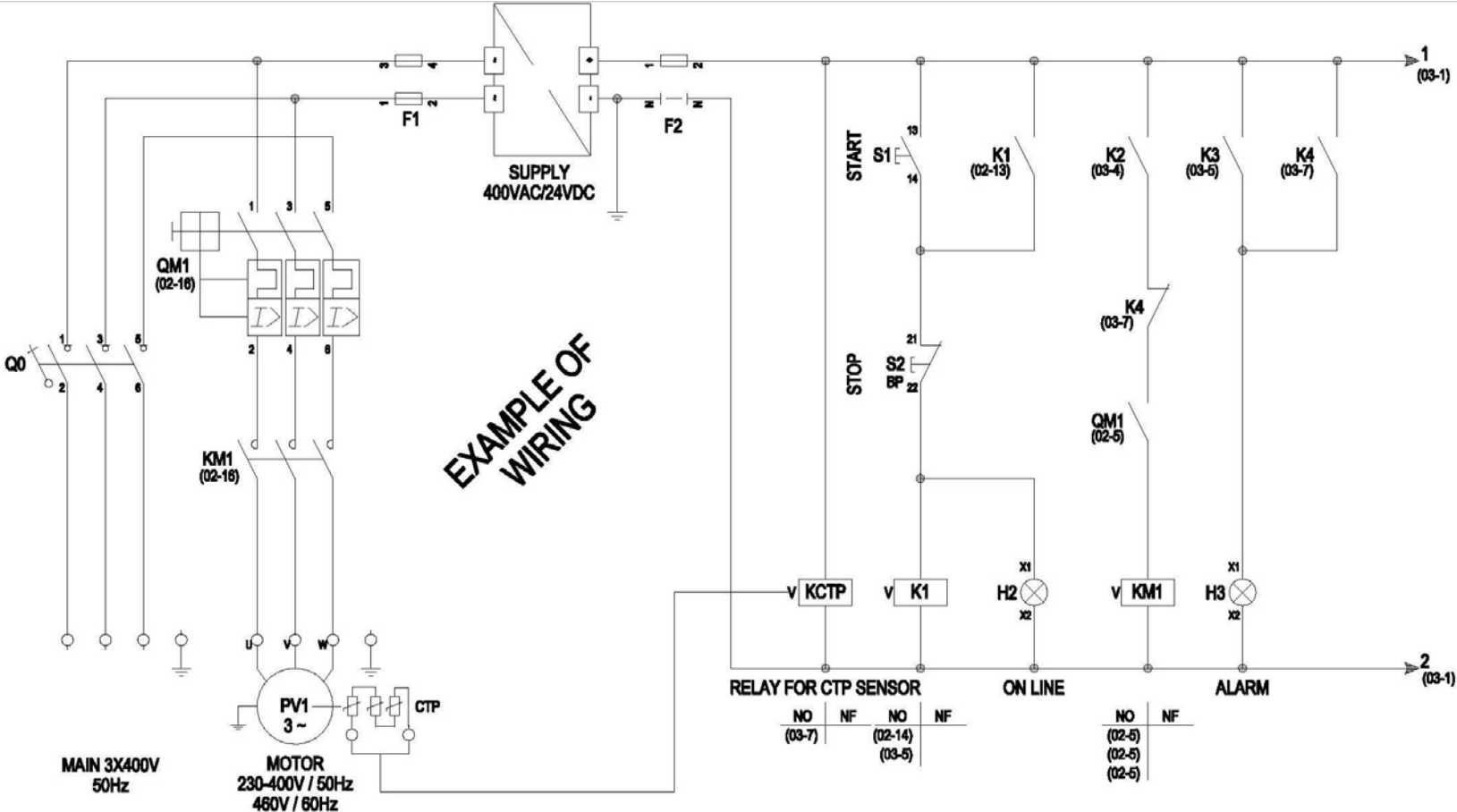


Electrical diagram (Example)



EXAMPLE OF WIRING

Electrical diagram (Example)



Installation

3.4 Start-up

Control Parameters for the Ignition Prevention System

Caution

	Temperature Sensor PT100	Oil Casing Pressure Sensor	Oil Level Sensor
Alarm Value	105 °C (140.38 Ohm)	500 mbar rel. (7.2 mA)	N/A
Pump Stop Value and Timer	115 °C (144.16 Ohm) Immediately	650 mbar rel.* (8.16 mA). After 15 s or 1000 mbar rel.* (10.4 mA). Immediately	At switching to low level. After 20 s
Accuracy	± 1 °C	± 15 mbar	N/A

*During cold start up the pressure in the oil casing can rise momentarily to above 650 mbar due to the oil filters being temporally blocked by oil. In order to prevent an inadvertent shut-off of the pump the pressure sensor control system should include a delay such that the pressure must be above 650 mbar for 15 s before the pump is switched off.

If the pressure in the oil casing rises above 1 bar overpressure the pump should be immediately switched off as this indicated that the outlet is blocked.

The oil for the first filling is supplied with the pump. Before switching on, always make sure that the pump contains enough oil. 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[®] is designed for normal start-up at temperatures over 12°C (54°F) (as per PNEUROP). The used oils allow pump start above 0°C (32°F).

Before starting the pump ensure that the attached accessories meet the requirements of your application and that safe operation is ensured. Never expose part of the body to the vacuum. Do not lay the hand on the intake to check suction. Exposure of a part of the body to the vacuum result in a rush of blood in the exposed part.

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.

The safety regulations which apply to the specific application in each case must be observed. This applies in particular to installation, operation and maintenance (servicing) as well as waste disposal and transportation.

Caution

Warning



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

Warning



Pump in function 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.

Wear ear protection in case of operation at high inlet pressure !

Pumping of non-condensable gases

If the pump system contains mainly non condensable gases, the pump 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 vapours

If ATEX gases are pumped, it is mandatory to use an inert GB gas supply through the DN16 KF connection. The GB air filter is to be used only if no ATEX gases are pumped. With the gas ballast valve open and at operating temperature, the SOGEVAC[®] can pump pure water vapour up to the values indicated in the Technical Data.

The gas ballast valve is opened by a screwdriver. The running noise of the pump is slightly louder if the gas ballast valve is open. Before pumping vapours 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 vapours until it has warmed to operating temperature: pumping process gas with a cold pump results in vapours condensing in the oil.

Caution

For processes with a high proportion of condensable vapours, the intake line should be opened only slowly after reaching the operating temperature. One sign of condensation of vapours in the pump is a rise of the oil level during operation of the pump.

When vapours 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.

Caution

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 vapours 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

The SOGEVAC® SV40 B – 65 B - SV100 B – SV120 B can be equipped with different types of gas ballasts, as defined by their cat-nr. Changing the type of GB can change the ATEX temperature class ! Consult us before any GB retrofit is undertaken ! Such a modification must be done by Leybold Service only, and the pump will bear a new P/N. The GB flow is valid for a pump operating at ultimate pressure (inlet closed) and for a GB gas supply of 1 bar abs. GB gas supply pressure max. 1 bar abs.

Warning



Standard gas ballast

This gas ballast corresponds to the most important part of applications.

Gas ballast "Big Flow"

This kit is intended for the applications where more vapours of condensable gases could come into the pump. Changing the type of GB can change the ATEX temperature class ! Consult us before any GB retrofit is undertaken ! Such a modification must be done by Leybold Service only, and the pump will bear a new P/N.

On application where vapours are always present, the use of a **permanent GB** is recommended. In this case a lower ATEX temperature class can be reached.

All gas-ballasts can be connected on a DN 16 ISO-KF connection to an inert gas supply. If gas supply piping and valves are fitted to the gas ballast it must be ensured that a continuous flow of gas through the gas ballast is present when the pump gas ballast valve is open (for example by use of a suitable flow meter or suitable pressure measurement). This is to ensure that no adiabatic compression occurs in the gas ballast pipe which could lead to a high temperature. Gas supply for gas ballast must come from safe area.

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 vapour entering the pump.

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

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

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.

Warning



4.2 Shutdown

Under normal circumstances, all that you need do is to switch off the pump. The intake port of the SOGEVAC® contains an anti-suck back valve, which closes the intake port when the pump is shut down, to avoid the pump oil being sucked back into the vacuum chamber. The valve's functioning is not impaired by gas ballasting. The anti-suck back valve is not a safety vacuum valve. When pumping condensable media, let the pump continue to operate with the gas ballast valve open and the intake line closed before switching off.

Warning



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 Section 5.4).

Pour in clean oil up to the bottom edge of the oil-level glass (see Section 5.4) 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 Section 5.4).

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

When the pump has been switched off due to over-heating, initiated by the motor or its protection, 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 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.

Warning



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.

5 Maintenance

5.1 Safety Information

Observe all safety regulations.

All work must be done by suitably trained ATEX personnel. Maintenance or repairs carried out incorrectly will affect the life and performance of the pump, may change its ATEX ratings and may cause problems when filing warranty claims or free Leybold from any responsibility. Before any maintenance operations are carried out on the pump it should be ensured that the pump and its surroundings are free from flammable atmospheres and dust deposits.

Where dust can be deposited on the pump or motor surfaces, provision should be made to ensure that these are removed regularly. The pump must remain clean & dust-free. **The cleaning must be done with cloths / products avoiding static charges.**

Never mount used seals; always mount new seals. Only the use of genuine Leybold parts is allowed ! Any integration of non Leybold parts or non authorized repairs will cancel the pump ATEX certification and will waive all Leybold ATEX responsibilities.

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

If the pump has pumped harmful substances, ascertain the nature of the hazard and take adequate safety measures. Observe all safety regulations. The equipment must be maintained in such a way that the safety of the system is not impaired in any way. A detailed ATEX inspection scheme is applied to all ATEX pumps repaired by Leybold, it involves inspecting all flame paths and ensuring the correct assembly of the product.

The system instruction manual details the routine maintenance tasks that are necessary to maintain ATEX compliance. Where the customer wishes to conduct more complex maintenance / overhaul tasks it is necessary for them to be trained by Leybold and supplied with the correct maintenance / inspection tooling. If a customer conducts this work without the correct training, the ATEX certification will be invalid.

Spare parts:

ATEX certified components must be replaced with compatible components having the same level of ATEX certification. They will undergo an ATEX component inspection by Leybold at the point of build into an ATEX certified pump. Components supplied directly to customers cannot be pre-inspected due to the potential for damage prior to build.

Where a customer buys a service module with the intention of creating an ATEX approved pumping package, it becomes their responsibility to fulfill their duties under the ATEX directives. Leybold is not in a position to assist customers to achieve their own third party ATEX approval.

The serial number of re-manufactured modules will be retained on a service database in order to ensure traceability.

In addition to the maintenance operations given in the manual, a complete overhaul of the pump including the replacement of the bearings should be carried out every 15'000 h of operation or every 3 years whichever is the sooner.

Warning



Maintenance

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.

Warning



Maintenance job	Frequency	Section
Checking the oil level	Daily.	5.4.A
Checking the oil condition	Depends of process, at least weekly.	5.4.B
First oil change	After 150 hours of operation.	5.4.C
Following oil changes	Depends of process.	5.4.C
Changing the exhaust filters	If oil mist at exhaust or at indication of exhaust filter pressure sensor. At least annually.	5.4.D
Checking the float valve	At each exhaust filter change or at least yearly.	5.4.E
Cleaning the intake port dirt trap	Depends of process, at least monthly.	5.4.F
Checking the anti suck back valve	Depends of process, at least yearly.	5.4.F
Cooling coil cleaning	Depends of ambient conditions, at least yearly.	5.4.G
Replacing the Pump Module	In case of specific pump servicing.	5.4.H
Replacement of electrical motor	In case of specific pump servicing.	5.4.I
Procedure for Checking the Ignition Prevention System	At every maintenance operation or at least once a year.	5.4.J

To simplify the maintenance work we recommend combining several jobs.

Maintenance

5.3 Service at Leybold facilities

If you send a pump to us, indicate whether the pump is free of substances damaging to health or whether it is contaminated. If it is contaminated also indicate the nature of hazard. For this you must use the form we have prepared and which will be provided upon request.

A copy of this form, "Declaration of Contamination of Vacuum Instruments and Components" is reproduced at the end of the Operating Instructions.

Another suitable form is available from www.leybold.com ' Documentation ' Download Documents.

Please attach this form to the pump, or enclose it with it. This statement detailing the type of contamination is required to satisfy legal requirements and for the protection of our employees.

We will return any pump received without a "Declaration of Contamination" to the sender's address.

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. If you open a pump at your own works also observe a potential contamination.

When disposing of used oil, please observe the relevant environmental regulations. Due to the design concept, SOGEVAC[®] pumps require very little maintenance under normal operating conditions. The work required is described in the sections below.

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.

Also incorrect maintenance can cause a pump temperature increase, which can influence the pump ATEX temperature rating !

In connection with this, you may be interested in the Leybold practical seminars, in which maintenance, repair and testing information for the Sogevac[®] pumps is conveyed by qualified trainers. In addition to the technical seminars, we recommend our additional ATEX seminar that covers the ATEX basics as well as ATEX topics concerning the Sogevac[®] pumps. Information on these seminars will be mailed to you upon request.

Warning



Warning



5.4 Maintenance Work

5.4.A Checking the oil level

The pump's oil level during operation must always be between the middle and top edge of the oil-level glass. 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 (See 5.4.D).

The oil level should be checked at least once a day. Stop the pump for filling oil.

5.4.B Checking the oil condition

Normally the oil is clear and transparent. If the oil darkens, it is an indication that the oil must be checked.

The oil must be changed if:

- Its viscosity increases by 20 % compared to new oil.
- Its Total Acid Index exceeds given limits, depending of oil type. Please consult us.

If gases or liquids dissolved in the oil result in deterioration of the ultimate pressure, the oil can be degassed by letting the pump running 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 plug into a beaker or similar container with the pump switched off but still at operating temperature.

Bad oil quality can cause a pump temperature increase, which can influence the pump ATEX temperature rating !

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

Observe the safety regulations.

Check to be carried out, depending of process, at least weekly.

Warning



5.4.C Oil change

Tool required : oil filter key (710 73 532)

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

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

Pump in function 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 and let the used oil drain into a suitable container.

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!

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

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

Use suitable oil only (see Section 1.9).

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

Never mount used seals; always mount new seals.

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

Warning



Warning



5.4.D Replacing the Exhaust Filters

Tools required :

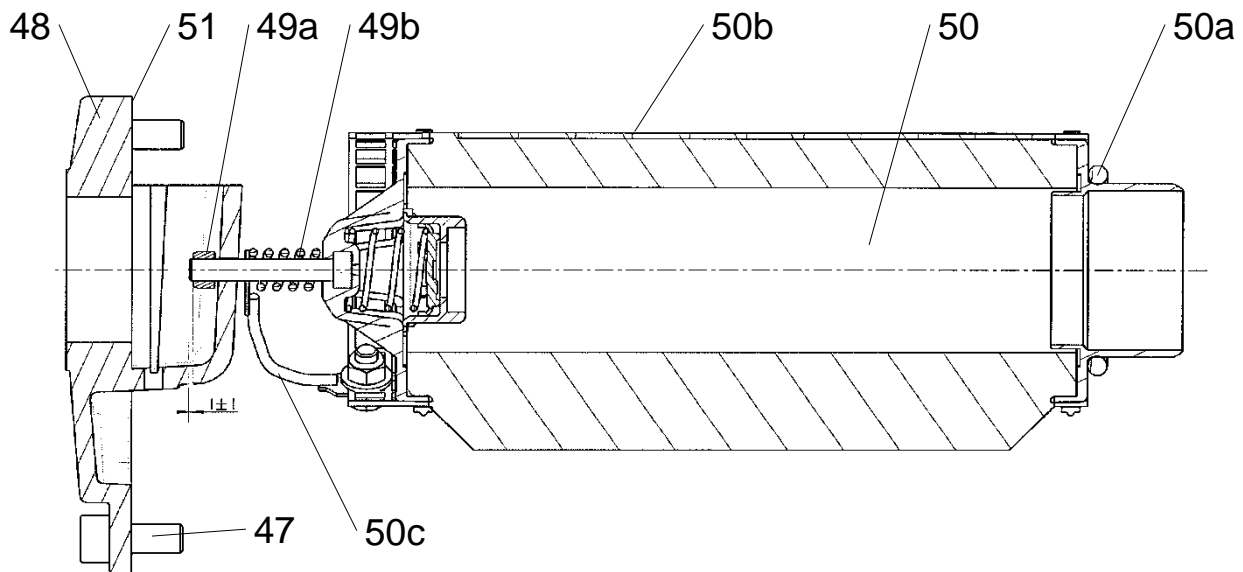
- Allen key 6 mm.
- Box wrench 10 mm.

When the exhaust filter elements are clogged, the over pressure (bypass) 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 over pressure sensor indicates the exhaust filter clogging state. The exhaust filters must be changed at least annually.

Warning



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



- Disassemble the exhaust filter cover pos. 48 (4 screws 47) and remove the whole assembly from the oil casing.
- Unscrew nut pos.49a to remove the ExF which needs to be replaced. Keep spring 49b.
- Check presence of gasket, pos. 50a.
- Reassemble the ExF as shown in below drawing and make sure that the cable shoe of the earthing lid is pos.50c is between the spring pos.49b and the cover 48.
- Screw the nut pos.49a. (Respect dimension 1 +/- 1 mm).
- Check the earth continuity between the mesh 50b and the internal non painted side of the flange 48. : the measured value shall be lower than 0,1 Ohm under an AC current of around 10 Ampere, the no load voltage shouldn't exceed 12 Volt.
- Assemble the flat gasket 51.
- Assemble the whole exhaust filter unit in the oil casing, torque of the 4 screws : 23 N.m.
- Check the earth continuity between the nut 49a and the motor ground connection.

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

Observe the safety regulations.

Important

When disposing of used exhaust filters please observe the relevant environmental regulations!

Never mount used seals; always mount new seals.

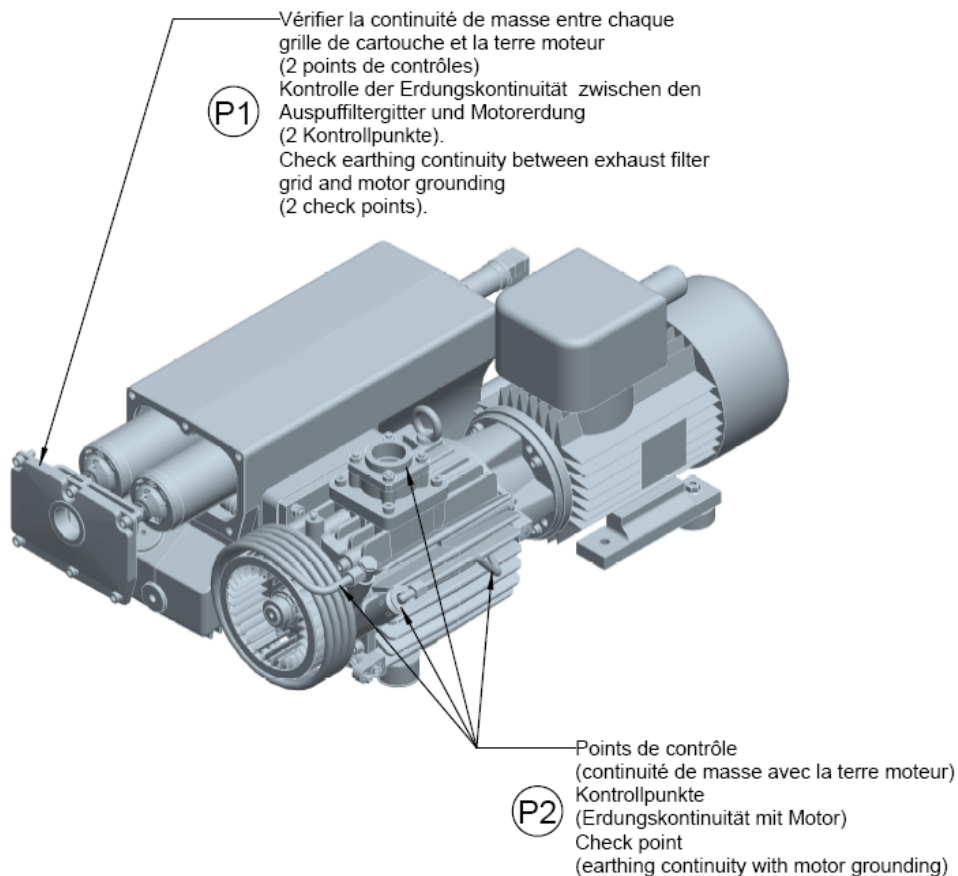
CONTROLE CONTINUITE DE MASSE
KONTROLLE DER ERDUNGSKONTINUITÄT
CHECK OF THE GROUNDING CONTINUITY
SV40B ATEX CAT 2 - SV65B ATEX CAT 2 - SV100B ATEX CAT
REFROIDIE AIR / AIR COOLING / LUFTGEKÜHLT

(P) Point de contrôle
Kontrollpunkt
Check point



La résistance mesurée devra être inférieure à 0.1 Ohm sous un courant alternatif d'environ 10 ampères, la tension à vide ne dépassant pas 12 Volts
The measured value shall be lower than 0.1 Ohm under a AC current of around 10 the no-load voltage shouldn't exceed 12 Volt.
Der gemessene Widerstand darf nicht höher als 0.1 Ohm unter circa 10 Ampere Wechselstrom sein, die Spannung darf im Leerlauf 12 Volt nicht überschreiten.

Ampere,



5.4.E Checking the float valve

Tools required : Allen Key 6 mm

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

Remove the exhaust filter (ExF) with the exhaust flange.

Remove the pin (54) and pull the float valve assembly out of the float chamber.

Take off the gasket.

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.

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

Never mount used seals; always mount new seals.

To be done at each exhaust filter change or at least yearly.

Warning



Caution

5.4.F Cleaning the intake port dirt trap and Checking the anti suck back valve

Cleaning the intake port dirt trap

Tools required : open-jaw or box wrench 13 mm. Allen key 6 mm

A dirt trap for coarse particles is located in the intake flange of the pump. It shall be kept clean to avoid reduction of the pumping speed.

The dirt trap consists of a wire-mesh screen.

Disassemble the intake flange.

Remove four screws and take off the intake flange and gasket.

Remove the retaining ring from inside the intake flange. Take out the wire-mesh screen and clean them using a suitable solvent.

Reassemble in the reverse sequence. We recommend replacing the gasket with a new one.

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

Never mount used seals; always mount new seals.

Depends of process, but to be done at least monthly.

Warning



Checking the Anti-Suck back Valve

Tools required :

- Allen key 6 mm
- Adjusting ring: 710 72 283

Keep the anti-suck back valve clean to ensure proper operation of the pump. In any application we strongly recommend installing an ATEX polyester dust filter upstream (see Section 1.4).

First disconnect the intake line.

Remove four screws and take off the intake flange and gasket.

Remove the spring and anti-suck back valve.

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. Do not screw the spring into the vacuum generator opening ! This can lead to pump destruction.

Warning



Reassemble the intake port. We recommend replacing the gasket with a new one.

The end of the spring with the larger diameter faces down and the end with the smaller diameter faces up against the flat side of the anti suck back valve. The side of the anti-suck back valve with the rounded sealing ridge faces up.

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

Observe the safety regulations.

Never mount used seals; always mount new seals.

Depends of process, but to be done at least yearly.

Caution

5.4.G Cooling coil cleaning (air cooled pumps)

Keep the oil cooler coil, fans, hoods, etc clean to have an efficient cooling. For that clean it with compressed air and then degreased it.

A clogged cooling coil or hoods can cause a pump temperature increase, which can influence the pump ATEX temperature rating !

Caution

Cleaning interval depends of ambient quality, to be checked at least yearly.

Maintenance

5.4.H Replacing the Pump Module

Fully assembled ATEX pump modules are available under Ref. Nr:

SV40 B : 9714 64 030
SV65 B : 9714 63 940
SV100 B : 9714 63 590
SV120 B: EK971445101

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

See Instructions delivered with the spare Pump Module.

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!

Never mount used seals; always mount new seals.

To be done in case of specific pump servicing.

5.4.I Replacement of electrical motor

Please consult Leybold for specific maintenance works to be carried e.g. bearing replacement.

The motor can only be exchange with an identical one for the same manufacturer and ATEX marking.

In case other motors are used, the pump loses its ATEX certification.

Warning



Caution



Warning

Maintenance

Warning



5.4.K Procedure for Checking the Ignition Prevention System

A complete functionality test of the ignition prevention system has to be carried before the pump is brought into service and after each maintenance operation at the pump or at least once a year.

If necessary the over temperature sensor should be re-calibrated.

Warning! All tests have to be carried out with air or inert gases only! Before starting tests the pump should be purged with air or inert gases for at least 15 minutes.

Check of the temperature measuring chain

Remove the temperature sensor body from the pump and put it into a reference temperature chamber (e.g. small oven with independent temperature measurement). Heat up the oven. The control system should cause an alarm at 105°C and should switch off the pump when the temperature reaches 115°C.

Check of the pressure measuring chain

The pressure sensor should be calibrated once per year and the functionality of the over-pressure control system should be checked yearly i.e. that an over-pressure of 500 mbar causes an alarm and that an over-pressure of 650 mbar for 20 seconds or an over-pressure of more than 1 bar causes the pump to be switched off.

Check of the oil level measuring chain

This test can be done while changing the pump oil.

Take care that the pump is still warm (not hot) when starting this test. Warning, hot oil can cause injuries (burns).

Depending on the process involved, the oil may contain dangerous substances. Take appropriate precautions. (see Operating Instructions)

Open the oil drain tap while checking the oil level glass. Drain the oil, the oil sensor should cause the pump to be switched off when the oil sink below the bottom of the oil level sight glass.

General Remarks

We reserve the right to alter the design or any data given in these Operating Instructions. The illustrations are not binding.
Never mount used seals; always mount new seals.

Trouble shooting

6 Trouble shooting

Fault	Possible cause	Remedy
Pump does not start.	<p>Pump is connected incorrectly. Motor protection switch incorrectly set. Operating voltage does not match motor. Motor is malfunctioning. Oil temperature is below 12°C (54°F).</p> <p>Oil is too viscous. Exhaust filter / exhaust line is clogged. Power transmission by V-belts is impaired. Pump is seized up</p>	<p>Connect the pump correctly. Set motor protection switch properly. Replace the motor. Replace the motor. Heat the pump and pump oil or use different oil. Use appropriate oil grade. Replace the filter or clean the exhaust line. Tighten or replace the V-belts. Repair the pump.</p>
Pump does not reach ultimate pressure.	<p>Measuring technique or gauge is unsuitable. External leak Float valve does not close. Anti-suckback valve is malfunctioning. Inadequate lubrication due to:</p> <ul style="list-style-type: none"> ■ unsuitable or contaminated oil, ■ clogged oil filter, ■ clogged oil lines. <p>Vacuum lines are dirty. Pump is too small.</p>	<p>Use correct measuring technique and gauge. Repair the pump. Repair the valve. Repair the valve.</p> <p>Change the oil (degas it, if necessary). Replace the oil filter. Clean the oil casing. Clean vacuum lines. Check the process date; replace the pump, if necessary.</p>
Pumping speed is too low.	<p>Dirt trap in the intake port is clogged.</p> <p>Exhaust filter is clogged. Connecting lines are too narrow or too long. Anti-suckback valve is hard to open.</p>	<p>Clean the dirt trap ; Precaution : install a dust filter in intake line. Install new filter elements. Use adequately wide and short connecting lines. Check spring free length.</p>
After switching off pump under vacuum, pressure in system rises too fast.	<p>System has a leak. Anti-suckback is malfunctioning.</p>	<p>Check the system. Repair the valve.</p>
Pump gets too hot	<p>Cooling air supply is obstructed. Cooler is dirty. Ambient temperature is too high. Process gas is too hot. Oil level is too low. Oil is unsuitable. Oil cycle is obstructed. Exhaust filter / exhaust line is obstructed.</p> <p>Pump module is no longer usable.</p>	<p>Set pump up correctly. Clean the cooler. Set pump up correctly. Change the process. Add oil to reach the correct oil level. Change the oil. Clean or repair the oil lines. Replace the exhaust filter, clean the exhaust line. Replace the pump module.</p>

Trouble shooting

Fault	Possible cause	Remedy
Oil in intake line or in vacuum vessel.	Oil comes from the vacuum system. Anti-suckback valve is obstructed. Sealing surfaces of anti-suckback valve are damaged or dirty. Oil level is too high.	Check the vacuum system. Clean or repair the valve. Clean or repair the intake port and valve. Drain the excess oil.
Pump's oil consumption too high, oil mist at exhaust.	Exhaust filters are clogged or damaged. Nozzle of float valve is clogged. Oil level is too high.	Replace the filters. Check the valve, clean the nozzle. Drain the excess oil.
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.
Pump is excessively noisy.	Oil level is very low (oil is no longer visible). Oil filter is clogged. Large vacuum leak in system. Power transmission by V-belts is impaired.	Add oil. Change the oil and filter. Repair vacuum leak. Tighten or replace the V-belts.

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

7 Spare parts

To guarantee safe operation of the Leybold pump, only original & genuine 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.

The pump loses its ATEX certification if non genuine Leybold parts are used.

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

Exhaust demisters

Oils (Special oils please refer to the specific notice of the pump or contact Leybold).

Maintenance kit

Repair kit

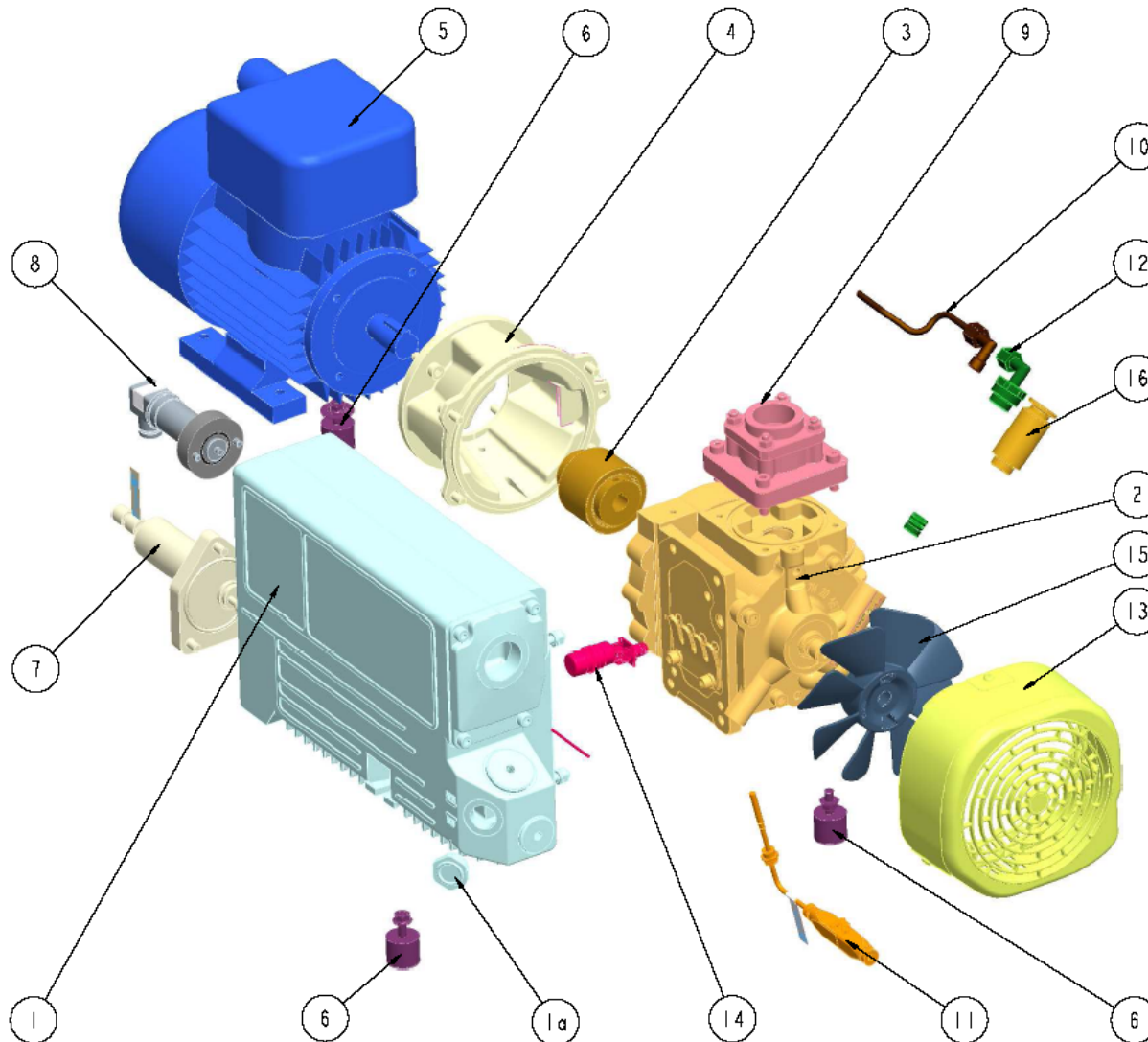
We recommend using these kits which have been defined to allow an optimal maintenance or repair. Individual spare parts may need longer delivery time.

Warning



Spare parts

SV40 B ATEX CAT 2



Spare parts

SV40 B ATEX CAT 2

Item Pos.	Designation	Beschreibung	Désignation	Part-Nr. Sach-Nr Référence
1	OIL CASING	OELKASTEN	CARTER	971464040
1a	GLASS OIL SIGHT GLASS	GLASS OELSCHAUGLASS	VOYANT D'HUILE 3/4 BSP VERRE	71219480
2	KIT GENERATOR LEST AIR	GENERATOR GASBALLAST KIT	GENERATEUR GAS BALLAST KIT	971464030
3	COUPLING ATEX CAT2	KUPPLUNG ATEX CAT2	ACCOUPEMENT ATEX CAT2	971466090
4	COUPLING HOUSING ATEX CAT 2	KUPPLUNGSGEHÄUSE ATEX CAT 2	CLOCHE ATEX CAT2	971464060
5	MOTOR 1.5 kW 230/400 V, 50 Hz & 460 V, 60 Hz IICT4	MOTOR 1.5 kW 230/400 V, 50 Hz & 460 V, 60 Hz IICT4	MOTEUR 1.5 kW 230/400 V, 50 Hz & 460 V, 60 Hz IICT4	971461710
6	RUBBER FEET KIT ATEX CAT 2	GUMMI DAEMPFER KIT ATEX CAT2	KIT PIEDS ATEX CAT 2	971464090
7	OIL LEVEL SENSOR ATEX CAT 2	OELPEGELSENSOR ATEX CAT 2	CONTROLEUR DE NIVEAU ATEX CAT 2	971455690
8	PRESSURE SENSOR ATEX CAT 2	DRUCKSENSOR ATEX CAT 2	TRANSMETTEUR DE PRESSION ATEX CAT 2	971455790
9	SUCTION FLANGE G1 1/4"	SAUGSTUTZEN G1 1/4"	BRIDE ASPIRATION G1 1/4"	971463840
10	PIPE GB STEEL	STAHL GB LEITUNG	TUBE LA ACIER	971461070
11	PROBE PT100	SONDE PT100	SONDE PT100	971267430
12	GAS BALLAST ATEX CAT 2	GASBALLAST ATEX CAT 2	LEST AIR ATEX CAT 2	971464050
13	COVER ATEX CAT 2	HAUBE ATEX CAT 2	CAPOTAGE ATEX CAT 2	971464070
14	FLOAT VALVE ATEX CAT 2	SCHWIMMERVERTIL ATEX CAT 2	FLOTTEUR ATEX CAT 2	971433220
15	FAN ATEX CAT 2	LUEFTER ATEX CAT 2	HELICE ATEX CAT2	971424870
16	ADAPTER 16 KF G1/2 M	ADAPTER 16 KF G1/2 M	ADAPTATEUR 16 KF G1/2 M	971440880
	MAINTENANCE KIT	WARTUNGSKIT	KIT MAINTENANCE	971464100
	REPAIR KIT	REPARATURSKIT	KIT REPARATION	971464110

Spare parts

SV40 B ATEX CAT 2

**MAINTENANCE KIT REFERENCE 971464100 INCLUDES:
WARTUNGS KIT SACH-NR. 971464100 ENTHAELT:
KIT MAINTENANCE REFERENCE 971464100 COMPREND:**

Quantity. Anzahl Quantité	Designation	Beschreibung	Désignation
2	Protection cover	Schutzdeckel	Cape de protection
1	Sticker	Aufkleber	Etiquette
1	Exhaust flange gasket	Auslassdeckel-Dichtung	Joint bride refoulement
1	O-ring	O-Ring	Joint torique
1	Plug G 1"	Stopfen G 1"	Bouchon G 1"
1	Plug G 3/4"	Stopfen G 3/4"	Bouchon G 3/4"
1	O-ring	O-Ring	Joint torique
1	Sticker	Aufkleber	Etiquette
1	Exhaust filter	Auspufffilter	Cartouche anti-aérosols
1	Spring for Exhaust filter in stainless steel.	Feder für Auspufffilter aus Edelstahl	Ressort compression inox

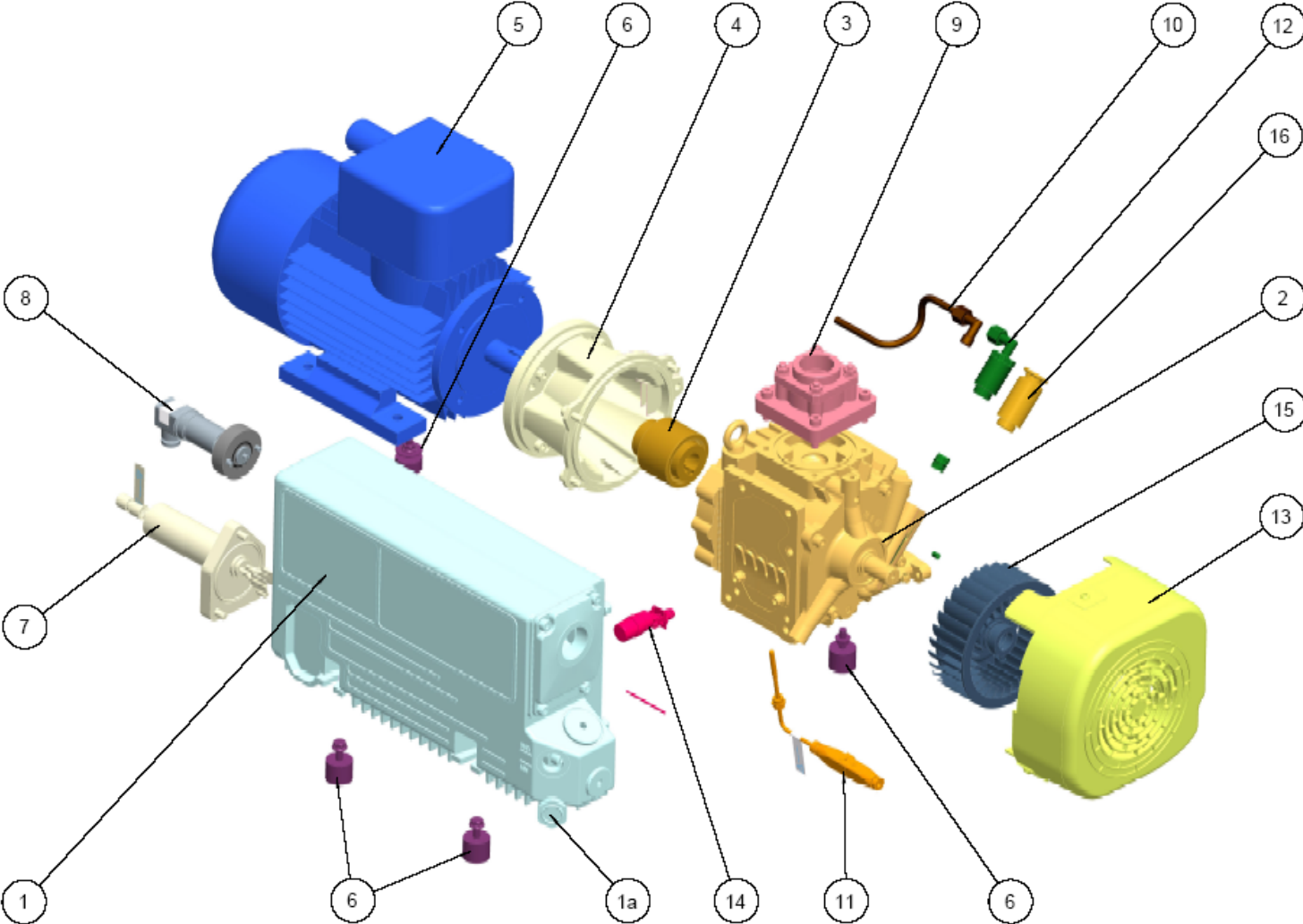
Spare parts

SV40 B ATEX CAT 2

**REPAIR KIT REFERENCE 971464110 INCLUDES:
REPARATUR KIT SACH-NR. 971464110 ENTHAELT:
KIT REPARATION REFERENCE 971464110 COMPREND:**

Quantity. Anzahl Quantité	Designation	Beschreibung	Désignation
1	Exhaust valve	Auslassventil	Lame échapp.
1	Valve stop	Auslassventil- Anschlag	Contre lame
1	Mounting instructions valves	Montageanleitung Auslassventile	Notice montage lames
1	Set of 3 vanes	Satz von 3 Schiebern	Jeu de 3 palettes
1	Sticker	Aufkleber	Etiquette
2	Screw	Schraube	Vis
1	Sticker	Aufkleber	Etiquette
1	Coupling sleeve	Kupplungs- Manschette	Anneau accouplement
1	Spring for Exhaust filter in stainless steel.	Feder für Auspuffilter aus Edelstahl	Ressort de compression cartouche inox
2	Washers	Unterlegscheiben	Rondelles
1	Rotor sleeve 30/35X17	Rotorring 30/35X17	Bague rotor 30/35X17
1	Rotor sleeve 20/25X38.5	Rotorring 20/25X38.5	Bague rotor 20/25X38.5
1	Inner sleeve DN32/37X20	Innerer Ring DN32/37X20	Bague intérieure DN32/37X20
1	Sleeve mounting instructions	Montageanleitung Ringe	Notice de montage bagues
1	Exhaust filter	Auspuffilter	Cartouche anti- aérosols
1	Set of gaskets	Dichtungssatz	Jeu de joints
1	Glass oil sight glass	Glass Ölschauglass	Voyant d'huile verre
1	GAET ATEX Cat 2	GAET ATEX Cat 2	GAET ATEX Cat 2

SV65 B ATEX CAT 2



Spare parts

SV65 B ATEX CAT 2

Item Pos.	Designation	Beschreibung	Désignation	Part-Nr. Sach-Nr Référence
1	OIL CASING	OELKASTEN	CARTER	971463910
1a	GLASS OIL SIGHT GLASS	GLASS OELSCHAUGLASS	VOYANT D'HUILE 3/4 BSP VERRE	71219480
2	KIT GENERATOR LEST AIR	GENERATOR GASBALLAST KIT	GENERATEUR GAS BALLAST KIT	971463940
3	COUPLING ATEX CAT2	KUPPLUNG ATEX CAT2	ACCOUPEMENT ATEX CAT2	971460900
4	COUPLING HOUSING ATEX CAT 2	KUPPLUNGSGEHÄUSE ATEX CAT 2	CLOCHE ATEX CAT2	971463950
5	MOTOR 2.2 kW 230/400 V, 50 Hz & 460 V, 60 Hz IICT4	MOTOR 2.2 kW 230/400 V, 50 Hz & 460 V, 60 Hz IICT4	MOTEUR 2.2 kW 230/400 V, 50 Hz & 460 V, 60 Hz IICT4	971461720
6	RUBBER FEET KIT ATEX CAT 2	GUMMI DAEMPFER KIT ATEX CAT2	KIT PIEDS ATEX CAT 2	971463980
7	OIL LEVEL SENSOR ATEX CAT 2	OELPEGELSENSOR ATEX CAT 2	CONTROLEUR DE NIVEAU ATEX CAT 2	971460980
8	PRESSURE SENSOR ATEX CAT 2	DRUCKSENSOR ATEX CAT 2	TRANSMETTEUR DE PRESSION ATEX CAT 2	971455790
9	SUCTION FLANGE G1 1/4"	SAUGSTUTZEN G1 1/4"	BRIDE ASPIRATION G1 1/4"	971463840
10	PIPE GB STEEL	STAHL GB LEITUNG	TUBE LA ACIER	971461020
11	PROBE PT100	SONDE PT100	SONDE PT100	971267430
12	GAS BALLAST ATEX CAT 2	GASBALLAST ATEX CAT 2	LEST AIR ATEX CAT 2	971463620
13	COVER ATEX CAT 2	HAUBE ATEX CAT 2	CAPOTAGE ATEX CAT 2	971463630
14	FLOAT VALVE ATEX CAT 2	SCHWIMMERVERTIL ATEX CAT 2	FLOTTEUR ATEX CAT 2	971433220
15	FAN ATEX CAT 2	LUEFTER ATEX CAT 2	HELICE ATEX CAT2	71419810
16	ADAPTER 16 KF G1/2 M	ADAPTER 16 KF G1/2 M	ADAPTATEUR 16 KF G1/2 M	971440880
	MAINTENANCE KIT	WARTUNGSKIT	KIT MAINTENANCE	971463990
	REPAIR KIT	REPARATURSKIT	KIT REPARATION	971464000

Spare parts

SV65 B ATEX CAT 2

**MAINTENANCE KIT REFERENCE 971463990 INCLUDES:
WARTUNGS KIT SACH-NR. 971463990 ENTHAELT:
KIT MAINTENANCE REFERENCE 971463990 COMPREND:**

Quantity. Anzahl Quantité	Designation	Beschreibung	Désignation
2	Protection cover	Schutzdeckel	Cape de protection
1	Sticker	Aufkleber	Etiquette
1	Exhaust flange gasket	Auslassdeckel-Dichtung	Joint bride refoulement
1	O-ring	O-Ring	Joint torique
1	Plug G 1"	Stopfen G 1"	Bouchon G 1"
1	Plug G 3/4"	Stopfen G 3/4"	Bouchon G 3/4"
1	O-ring	O-Ring	Joint torique
1	Sticker	Aufkleber	Etiquette
1	Exhaust filter	Auspuffilter	Cartouche anti-aérosols
1	Spring for Exhaust filter in stainless steel.	Feder für Auspuffilter aus Edelstahl	Ressort compression inox

Spare parts

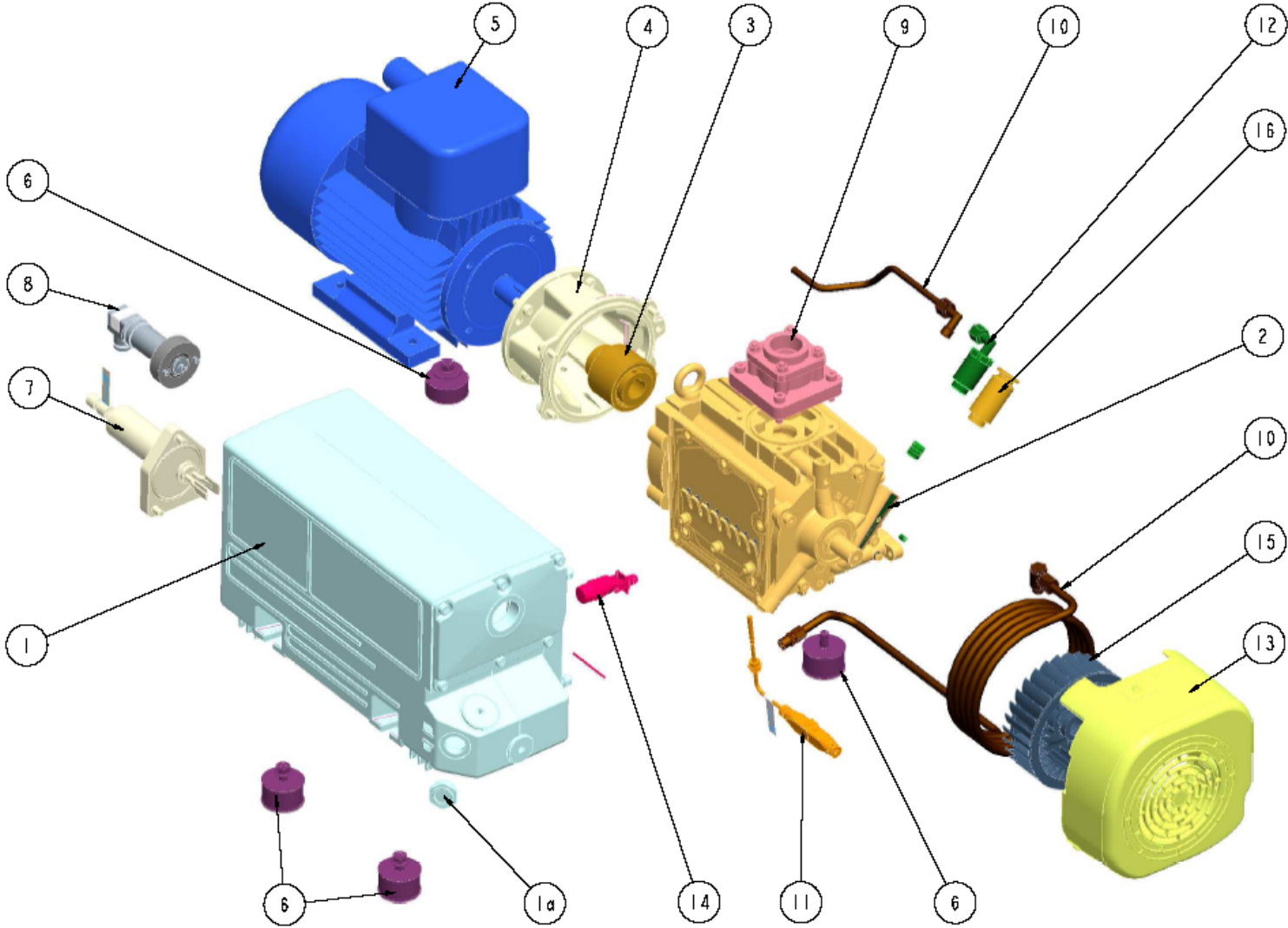
SV65 B ATEX CAT 2

**REPAIR KIT REFERENCE 971464000 INCLUDES:
REPARATUR KIT SACH-NR. 971464000 ENTHAELT:
KIT REPARATION REFERENCE 971464000 COMPREND:**

Quantity. Anzahl Quantité	Designation	Beschreibung	Désignation
1	Exhaust valve	Auslassventil	Lame échapp.
1	Valve stop	Auslassventil- Anschlag	Contre lame
1	Mounting instructions valves	Montageanleitung Auslassventile	Notice montage lames
1	Set of 3 vanes	Satz von 3 Schiebern	Jeu de 3 palettes
1	Sticker	Aufkleber	Etiquette
2	Screw	Schraube	Vis
1	Sticker	Aufkleber	Etiquette
1	Coupling sleeve	Kupplungs- Manschette	Anneau accouplement
1	Spring for Exhaust filter in stainless steel.	Feder für Auspuffilter aus Edelstahl	Ressort de compression cartouche inox
2	Washers	Unterlegscheiben	Rondelles
1	Rotor sleeve DN35/40X17	Rotorring DN35/40X17	Bague rotor DN35/40X17
1	Rotor sleeve DN25/30X38.5	Rotorring DN25/30X38.5	Bague rotor DN25/30X38.5
1	Inner sleeve DN35/42X36	Innerer Ring DN35/42X36	Bague intérieure DN35/42X36
1	Sleeve mounting instructions	Montageanleitung Ringe	Notice de montage bagues
1	Exhaust filter	Auspuffilter	Cartouche anti- aérosols
1	Set of gaskets	Dichtungssatz	Jeu de joints
1	Glass oil sight glass	Glass Ölschauglass	Voyant d'huile verre
1	GAET ATEX Cat 2	GAET ATEX Cat 2	GAET ATEX Cat 2

Spare parts

SV100 B ATEX CAT 2



Spare parts

SV100 B ATEX CAT 2

Item Pos.	Designation	Beschreibung	Désignation	Part-Nr. Sach-Nr Référence
1	OIL CASING	OELKASTEN	CARTER	971463580
1a	GLASS OIL SIGHT GLASS	GLASS OELSCHAUGLASS	VOYANT D'HUILE 3/4 BSP VERRE	71219480
2	KIT GENERATOR LEST AIR	GENERATOR GASBALLAST KIT	GENERATEUR GAS BALLAST KIT	971463590
3	COUPLING ATEX CAT2	KUPPLUNG ATEX CAT2	ACCOUPEMENT ATEX CAT2	971460900
4	COUPLING HOUSING ATEX CAT 2	KUPPLUNGSGEHÄUSE ATEX CAT 2	CLOCHE ATEX CAT2	971463600
5	MOTOR 3 kW 230/400 V, 50 Hz & 460 V, 60 Hz IICT4	MOTOR 3 kW 230/400 V, 50 Hz & 460 V, 60 Hz IICT4	MOTEUR 3 kW 230/400 V, 50 Hz & 460 V, 60 Hz IICT4	971461730
6	RUBBER FEET KIT ATEX CAT 2	GUMMI DAEMPFER KIT ATEX CAT2	KIT PIEDS ATEX CAT 2	971463870
7	OIL LEVEL SENSOR ATEX CAT 2	OELPEGELSENSOR ATEX CAT 2	CONTROLEUR DE NIVEAU ATEX CAT 2	971455690
8	PRESSURE SENSOR ATEX CAT 2	DRUCKSENSOR ATEX CAT 2	TRANSMETTEUR DE PRESSION ATEX CAT 2	971455790
9	SUCTION FLANGE G1 1/4"	SAUGSTUTZEN G1 1/4"	BRIDE ASPIRATION G1 1/4"	971463840
10	PIPE KIT	LEITUNGSKIT	KIT CANALISATIONS	971463610
11	PROBE PT100	SONDE PT100	SONDE PT100	971267430
12	GAS BALLAST ATEX CAT 2	GASBALLAST ATEX CAT 2	LEST AIR ATEX CAT 2	971463620
13	COVER ATEX CAT 2	HAUBE ATEX CAT 2	CAPOTAGE ATEX CAT 2	971463630
14	FLOAT VALVE ATEX CAT 2	SCHWIMMERVERTIL ATEX CAT 2	FLOTTEUR ATEX CAT 2	971433220
15	FAN ATEX CAT 2	LUEFTER ATEX CAT 2	HELICE ATEX CAT2	71419810
16	ADAPTER 16 KF G1/2 M	ADAPTER 16 KF G1/2 M	ADAPTATEUR 16 KF G1/2 M	971440880
	MAINTENANCE KIT	WARTUNGSKIT	KIT MAINTENANCE	971463640
	REPAIR KIT	REPARATURSKIT	KIT REPARATION	971463650

Spare parts

SV100 B ATEX CAT 2

**MAINTENANCE KIT REFERENCE 971463640 INCLUDES:
WARTUNGS KIT SACH-NR. 971463640 ENTHAELT:
KIT MAINTENANCE REFERENCE 971463640 COMPREND:**

Quantity. Anzahl Quantité	Designation	Beschreibung	Désignation
2	Protection cover	Schutzdeckel	Cape de protection
1	Sticker	Aufkleber	Etiquette
1	Exhaust flange gasket	Auslassdeckel-Dichtung	Joint bride refoulement
1	O-ring	O-Ring	Joint torique
1	Plug G 1"	Stopfen G 1"	Bouchon G 1"
1	Plug G 3/4"	Stopfen G 3/4"	Bouchon G 3/4"
1	O-ring	O-Ring	Joint torique
1	Sticker	Aufkleber	Etiquette
2	Exhaust filter	Auspuffilter	Cartouche anti-aérosols
2	Spring for Exhaust filter in stainless steel.	Feder für Auspuffilter aus Edelstahl	Ressort compression inox

Spare parts

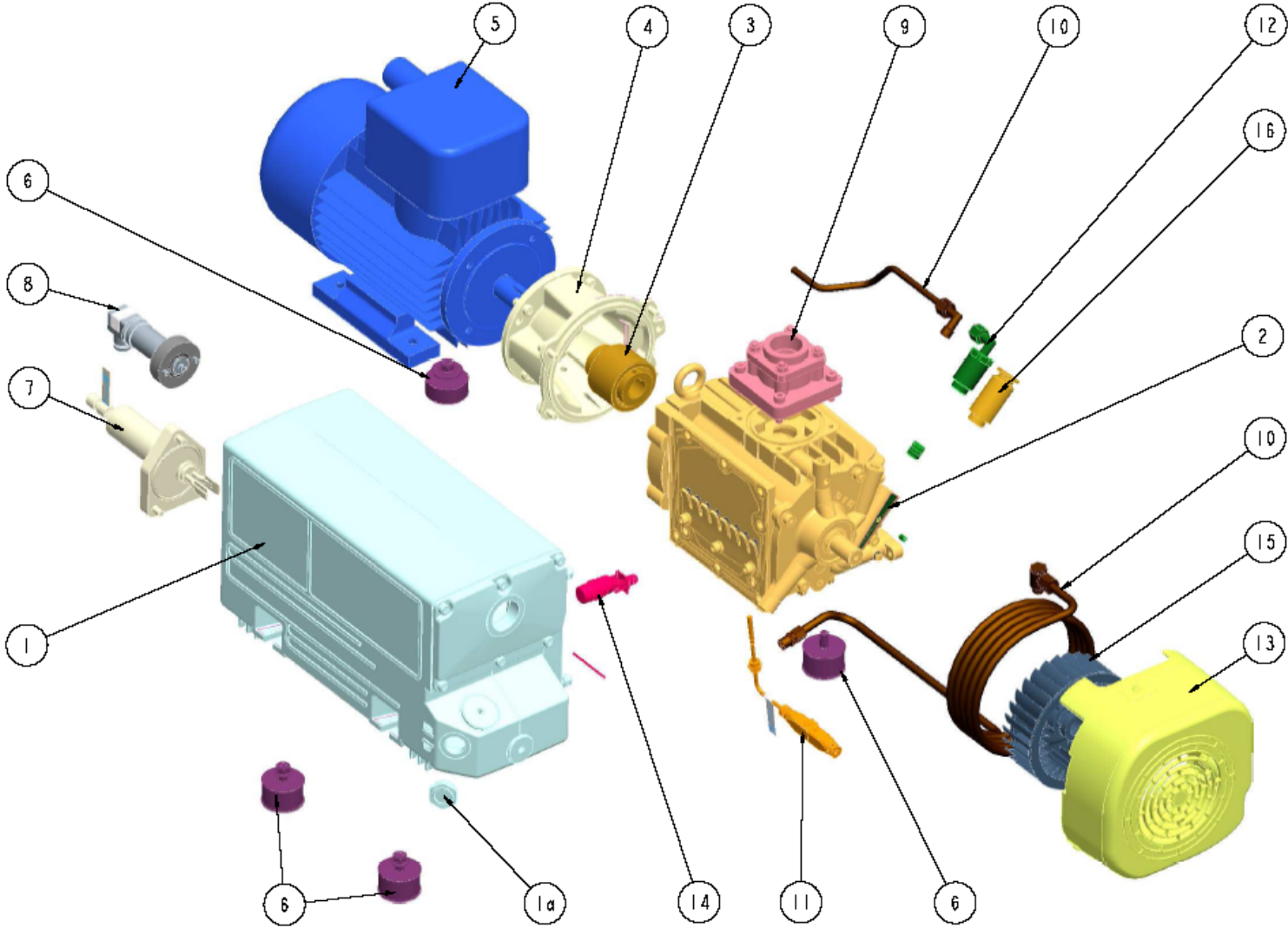
SV100 B ATEX CAT 2

**REPAIR KIT REFERENCE 971463650 INCLUDES:
REPARATUR KIT SACH-NR. 971463650 ENTHAELT:
KIT REPARATION REFERENCE 971463650 COMPREND:**

Quantity. Anzahl Quantité	Designation	Beschreibung	Désignation
1	Exhaust valve	Auslassventil	Lame échapp.
1	Valve stop	Auslassventil- Anschlag	Contre lame
1	Mounting instructions valves	Montageanleitung Auslassventile	Notice montage lames
1	Set of 3 vanes	Satz von 3 Schiebern	Jeu de 3 palettes
1	Sticker	Aufkleber	Etiquette
3	Screw	Schraube	Vis
1	Sticker	Aufkleber	Etiquette
1	Coupling sleeve	Kupplungs- Manschette	Anneau accouplement
2	Spring for Exhaust filter in stainless steel.	Feder für Auspuffilter aus Edelstahl	Ressort de compression cartouche inox
2	Washers	Unterlegscheiben	Rondelles
2	Rotor sleeve DN25/30X38.5	Rotorring DN25/30X38.5	Bague rotor DN25/30X38.5
1	Sleeve mounting instructions	Montageanleitung Ringe	Notice de montage bagues
2	Exhaust filter	Auspuffilter	Cartouche anti- aérosols
1	Set of gaskets	Dichtungssatz	Jeu de joints
1	Glass oil sight glass	Glass Ölschauglass	Voyant d'huile verre
1	GAET ATEX Cat 2	GAET ATEX Cat 2	GAET ATEX Cat 2

SV120 B ATEX CAT 2

Spare parts



Spare parts

SV120 B ATEX CAT 2

Item Pos.	Designation	Beschreibung	Désignation	Part-Nr. Sach-Nr Référence
1	OIL CASING	OELKASTEN	CARTER	971463580
1a	GLASS OIL SIGHT GLASS	GLASS OELSCHAUGLASS	VOYANT D'HUILE 3/4 BSP VERRE	71219480
2	GENERATOR KIT w BIG GASBALLAST	GENERATOR KIT m. GROSSEM GASBALLAST	KIT GENERATEUR avec GROS LA	EK971455591
3	COUPLING ATEX CAT2	KUPPLUNG ATEX CAT2	ACCOUPEMENT ATEX CAT2	971460900
4	COUPLING HOUSING ATEX CAT 2	KUPPLUNGSGEHÄUSE ATEX CAT 2	CLOCHE ATEX CAT2	971463600
5	MOTOR 3 kW 230/400 V, 50 Hz & 460 V, 60 Hz IICT4	MOTOR 3 kW 230/400 V, 50 Hz & 460 V, 60 Hz IICT4	MOTEUR 3 kW 230/400 V, 50 Hz & 460 V, 60 Hz IICT4	971461730
6	RUBBER FEET KIT ATEX CAT 2	GUMMI DAEMPFER KIT ATEX CAT2	KIT PIEDS ATEX CAT 2	971463870
7	OIL LEVEL SENSOR ATEX CAT 2	OELPEGELSENSOR ATEX CAT 2	CONTROLEUR DE NIVEAU ATEX CAT 2	971455690
8	PRESSURE SENSOR ATEX CAT 2	DRUCKSENSOR ATEX CAT 2	TRANSMETTEUR DE PRESSION ATEX CAT 2	971455790
9	SUCTION FLANGE G1 1/4"	SAUGSTUTZEN G1 1/4"	BRIDE ASPIRATION G1 1/4"	971463840
10	PIPE KIT	LEITUNGSKIT	KIT CANALISATIONS	971463610
11	PROBE PT100	SONDE PT100	SONDE PT100	971267430
12	GAS BALLAST ATEX CAT 2	GASBALLAST ATEX CAT 2	LEST AIR ATEX CAT 2	971463620
13	COVER ATEX CAT 2	HAUBE ATEX CAT 2	CAPOTAGE ATEX CAT 2	971463630
14	FLOAT VALVE ATEX CAT 2	SCHWIMMERVERTIL ATEX CAT 2	FLOTTEUR ATEX CAT 2	971433220
15	FAN ATEX CAT 2	LUEFTER ATEX CAT 2	HELICE ATEX CAT2	71419810
16	ADAPTER 16 KF G1/2 M	ADAPTER 16 KF G1/2 M	ADAPTATEUR 16 KF G1/2 M	971440880
	MAINTENANCE KIT	WARTUNGSKIT	KIT MAINTENANCE	971463640
	REPAIR KIT	REPARATURSKIT	KIT REPARATION	EK9714636REP

Spare parts

SV120 B ATEX CAT 2

**MAINTENANCE KIT REFERENCE 971463640 INCLUDES:
WARTUNGS KIT SACH-NR. 971463640 ENTHAELT:
KIT MAINTENANCE REFERENCE 971463640 COMPREND:**

Quantity. Anzahl Quantité	Designation	Beschreibung	Désignation
2	Protection cover	Schutzdeckel	Cape de protection
1	Sticker	Aufkleber	Etiquette
1	Exhaust flange gasket	Auslassdeckel-Dichtung	Joint bride refoulement
1	O-ring	O-Ring	Joint torique
1	Plug G 1"	Stopfen G 1"	Bouchon G 1"
1	Plug G 3/4"	Stopfen G 3/4"	Bouchon G 3/4"
1	O-ring	O-Ring	Joint torique
1	Sticker	Aufkleber	Etiquette
2	Exhaust filter	Auspuffilter	Cartouche anti-aérosols
2	Spring for Exhaust filter in stainless steel.	Feder für Auspuffilter aus Edelstahl	Ressort compression inox

Spare parts

SV120 B ATEX CAT 2

REPAIR KIT REFERENCE EK9714636REP INCLUDES:

REPARATUR KIT SACH-NR. EK9714636REP ENTHAELT:

KIT REPARATION REFERENCE EK9714636REP COMPREND:

Quantity. Anzahl Quantité	Designation	Beschreibung	Désignation
1	Exhaust valve	Auslassventil	Lame échapp.
1	Valve stop	Auslassventil- Anschlag	Contre lame
1	Mounting instructions valves	Montageanleitung Auslassventile	Notice montage lames
1	Set of 3 vanes	Satz von 3 Schiebern	Jeu de 3 palettes
1	Sticker	Aufkleber	Etiquette
3	Screw	Schraube	Vis
1	Sticker	Aufkleber	Etiquette
1	Coupling sleeve	Kupplungs- Manschette	Anneau accouplement
2	Spring for Exhaust filter in stainless steel.	Feder für Auspuffilter aus Edelstahl	Ressort de compression cartouche inox
2	Washers	Unterlegscheiben	Rondelles
2	Rotor sleeve DN25/30X38.5	Rotorring DN25/30X38.5	Bague rotor DN25/30X38.5
1	Sleeve mounting instructions	Montageanleitung Ringe	Notice de montage bagues
2	Exhaust filter	Auspuffilter	Cartouche anti- aérosols
1	Set of gaskets	Dichtungssatz	Jeu de joints
1	Glass oil sight glass	Glass Ölschauglass	Voyant d'huile verre
1	GAET ATEX Cat 2	GAET ATEX Cat 2	GAET ATEX Cat 2



EU Declaration of Conformity

(Translation of original Declaration of Conformity)

The manufacturer: Leybold GmbH
Bonner Strasse 49B
D-50868 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 ATEX CAT2
Type designation: SV40 B ATEX CAT2 / SV65 B ATEX CAT2 / SV100 B ATEX CAT2 /
SV120 B ATEX CAT2 / SV200 ATEX CAT2 / SV300 B ATEX CAT2 /
SV630 B(F) ATEX CAT2

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)

ATEX Directive (2014/34/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 13463-1:2009	Non-electrical equipment for use in potentially explosive atmospheres — Part 1: Basic method and requirements
EN 13463-6:2005	Non-electrical equipment for use in potentially explosive atmospheres - Part 6: Protection by control of ignition source "b"

Documentation off car: Herbert Etges
T: +49(0)221 347 0
F: +49(0)221 347 1250
documentation@leybold.com

Cologne, November 14, 2016

Cologne, November 14, 2016


ppa. Martin Tolner
Head of Product Lines


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

Declaration of Contamination



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 Repair: <input type="checkbox"/> chargeable <input type="checkbox"/> warranty Exchange: <input type="checkbox"/> chargeable <input type="checkbox"/> warranty <input type="checkbox"/> Exchange already arranged / received Return only: <input type="checkbox"/> rent <input type="checkbox"/> loan <input type="checkbox"/> for credit Calibration: <input type="checkbox"/> DKD <input type="checkbox"/> Factory-calibr. <input type="checkbox"/> 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																
1. Has the equipment been used <input type="checkbox"/> No ¹⁾ <input type="checkbox"/> Yes <input type="checkbox"/> No 2. Drained (Product/service fluid) <input type="checkbox"/> No <input type="checkbox"/> Yes 3. All openings sealed airtight <input type="checkbox"/> No <input type="checkbox"/> Yes 4. Purged <input type="checkbox"/> No <input type="checkbox"/> Yes If yes, which cleaning agent _____ and which method of cleaning _____ ¹⁾ If answered with "No", go to D.	Contamination : <input type="checkbox"/> No ¹⁾ <input type="checkbox"/> Yes toxic <input type="checkbox"/> No <input type="checkbox"/> Yes corrosive <input type="checkbox"/> No <input type="checkbox"/> Yes flammable <input type="checkbox"/> No <input type="checkbox"/> Yes explosive ²⁾ <input type="checkbox"/> No <input type="checkbox"/> Yes radioactive ²⁾ <input type="checkbox"/> No <input type="checkbox"/> Yes microbiological ²⁾ <input type="checkbox"/> No <input type="checkbox"/> Yes other harmful substances <input type="checkbox"/> No <input type="checkbox"/> Yes															
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)																
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">X</td> <td style="width: 30%;">Trade name:</td> <td style="width: 65%;">Chemical name:</td> </tr> <tr> <td>a)</td> <td></td> <td></td> </tr> <tr> <td>b)</td> <td></td> <td></td> </tr> <tr> <td>c)</td> <td></td> <td></td> </tr> <tr> <td>d)</td> <td></td> <td></td> </tr> </table>		X	Trade name:	Chemical name:	a)			b)			c)			d)		
X	Trade name:	Chemical name:														
a)																
b)																
c)																
d)																
2. Are these substances harmful ? <input type="checkbox"/> No <input type="checkbox"/> Yes 3. Dangerous decomposition products when heated ? <input type="checkbox"/> No <input type="checkbox"/> Yes 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



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