Leybold

SOGEVAC®

SV630 B (F) - SV750 B (F)

Single-stage, oil sealed rotary vane pump

Instruction manual

Operating instructions 300270020_002_C3

Part numbers:

960862

960863

960865

960866

960867

960869

960875

960877 and their variants

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Product warranty and limit of liability are dealt with in our standard terms and conditions of sale or negotiated contract under which this document is supplied.

You must use this product as described in this manual. Read the manual before you install, operate, or maintain the product. For manual enquiries, email *documentation@leybold.com*.

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1 Safety and compliance

For safe operation from the start, read these instructions carefully before you install or commission the equipment and keep them safe for future use. Read all the safety instructions in this section and the rest of this manual carefully and make sure that you obey these instructions.

The instruction manual is an important safety document that we often deliver digitally. It is your responsibility to keep the instruction manual available and visible while working with the equipment. Please download the digital version of the instruction manual for use on your device or print it if a device will not be available.

1.1 Definition of Warnings and Cautions

Important safety information is highlighted as warning and caution instructions which are defined as follows. Different symbols are used according to the type of hazard.

WARNING:

If you do not obey a warning, there is a risk of injury or death.

CAUTION:

If you do not obey a caution, there is a risk of minor injury, damage to equipment, related equipment or process.

NOTICE:

Information about properties or instructions for an action which, if ignored, will cause damage to the equipment.

We reserve the right to change the design and the stated data. The illustrations are not binding.

1.2 Trained personnel

For the operation of this equipment “trained personnel” are:

- skilled workers with knowledge in the fields of mechanics, electrical engineering, pollution abatement and vacuum technology and
- personnel specially trained for the operation of vacuum pumps

1.3 Safety symbols

The safety symbols on the products show the areas where care and attention is necessary.

The safety symbols that we use on the product or in the product documentation have the following meanings:

	**Warning/Caution** Risk of injury and/or damage to equipment. An appropriate safety instruction must be followed or a potential hazard exists.
	**Warning - Automatic start up** Risk of injury. The equipment can be started remotely and without warning.
	**Warning - Corrosive substances** Risk of injury or damage to equipment. Identifies the presence of corrosive gases, liquids or materials.
	**Warning - Dangerous voltage** Risk of injury. Identifies possible sources of hazardous electrical shock.
	**Warning - Environmental hazard** Risk of damage to the environment. Identifies the presence of toxic or damaging gases, liquids or materials.
	**Warning - Flammable material** Risk of fire. Identifies possible sources of flammable gases, liquids or materials.
	**Warning - Hot surfaces** Risk of injury. Identifies a surface capable of inflicting burns through contact.
	Warning - Overhead or Suspended load Do not stand below the suspended load.
	**Warning - Noise hazard** Risk of injury. Identifies a possible source of noise above the recommended safe level.
	**Warning - Overpressure** Risk of increased pressure beyond permissible limit.
	**Warning - Risk of explosion** Risk of injury or damage to equipment. Identifies a situation that could result in an explosion.

Safety and compliance

	**Warning - Toxic material** Risk of injury or damage to the environment. Identifies a source of toxic gases, liquid or material.
	**Warning - Trip hazard** Risk of injury. Identifies spilled liquids, trailing cords, pipes and other low-lying objects that may result in slipping, tripping or falling.
	**Warning - Use protective equipment** Risk of injury. Use appropriate Personal Protective Equipment (PPE) when performing the task.

2 Important safety information

2.1 Mechanical hazards

CAUTION: MECHANICAL HAZARDS

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.

2.2 Electrical hazards

CAUTION: ELECTRICAL HAZARDS

The electrical connection must only be provided by a trained person. Please observe the national regulations in the country of use, for example EN 50110-1 for Europe.

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

2.3 Thermal hazards

CAUTION: THERMAL HAZARDS

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.

Important safety information

2.4 Hazards caused by materials and substances

WARNING: TOXIC MATERIALS AND SUBSTANCES

SOGEVAC® pumps are not designed:

- for pumping of aggressive, corrosive, flammable or explosive gases or gases mixtures;

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

- for working in flammable or explosive environment.

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

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

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

Take adequate safety precautions prior to opening the intake or exhaust port. Take appropriate precautions to make sure 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 the instructions concerning environment protection when discarding used oil or exhaust filters.

Observe all safety regulations.

2.5 Risk of pump damage

CAUTION: PUMP DAMAGE

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

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 absolute (0.15 bar relative) can occur. Do not work with closed or restricted pump exhaust.

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

Never use discarded seals. Always assemble using new seals.

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.

3 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 (or 2) must be installed or opened.

3.1 Principle of operation

The SOGEVAC® is a single-stage, oil-sealed rotary vane pump.

The anti-suckback valve, gas ballast valve, exhaust filters, oil feedback circuit, oil cooler and thermal switch are integrated functional elements. The pump is driven by a foot-mounted motor via four V-belts.

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 a result of enlargement of the pump chamber that is open in the direction of the intake port, gas is sucked in. 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 valves.

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 bottom part of the oil casing. Then fine filtering occurs in the 8 integrated exhaust filter elements.

The proportion of oil in the exhaust gas is thus reduced below the visibility threshold (over 99 % entrapment rate).

The oil trapped in the exhaust filters is returned to the stator 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 of the pumps is maintained by the pressure difference existing between the oil casing (pressure above atmospheric pressure) and the intake port (pressure below atmospheric pressure).

Unintentional venting of the vacuum chamber as well as oil suckback when switching off the pump are prevented by the built-in anti-suckback valve. Nevertheless, the anti-suckback valve does not guarantee the same safety as a valve.

As an additional fail-safe device a thermal switch is incorporated; it measures the temperature of the vacuum generator exhaust.

4 Technical data

4.1 Pumping speed curves

Figure 1. Pumping speeds - SV630 B - SV750 B

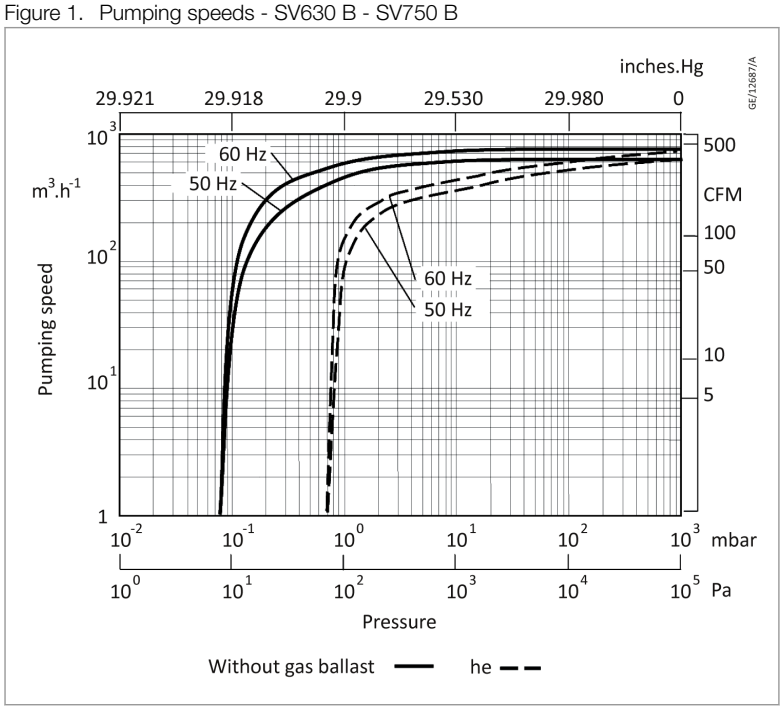
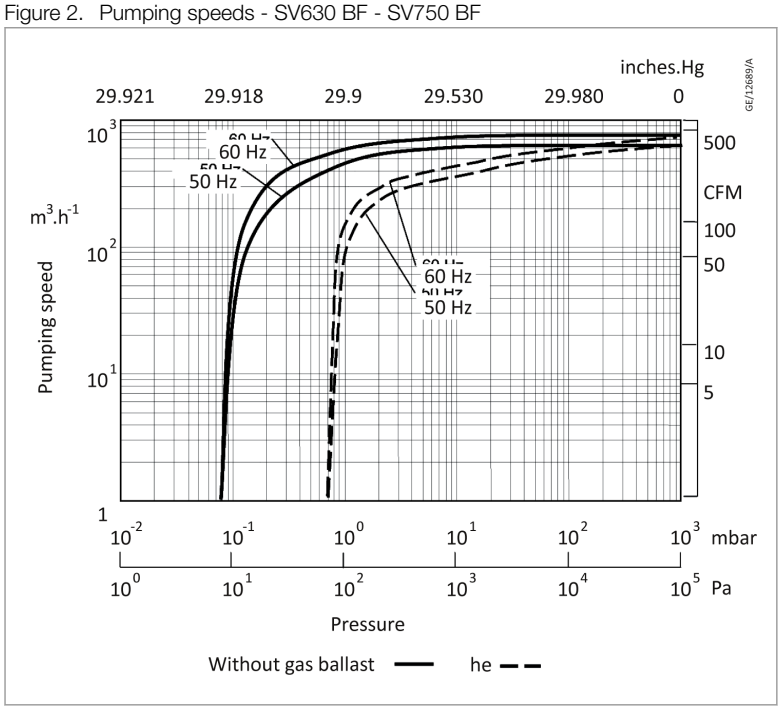
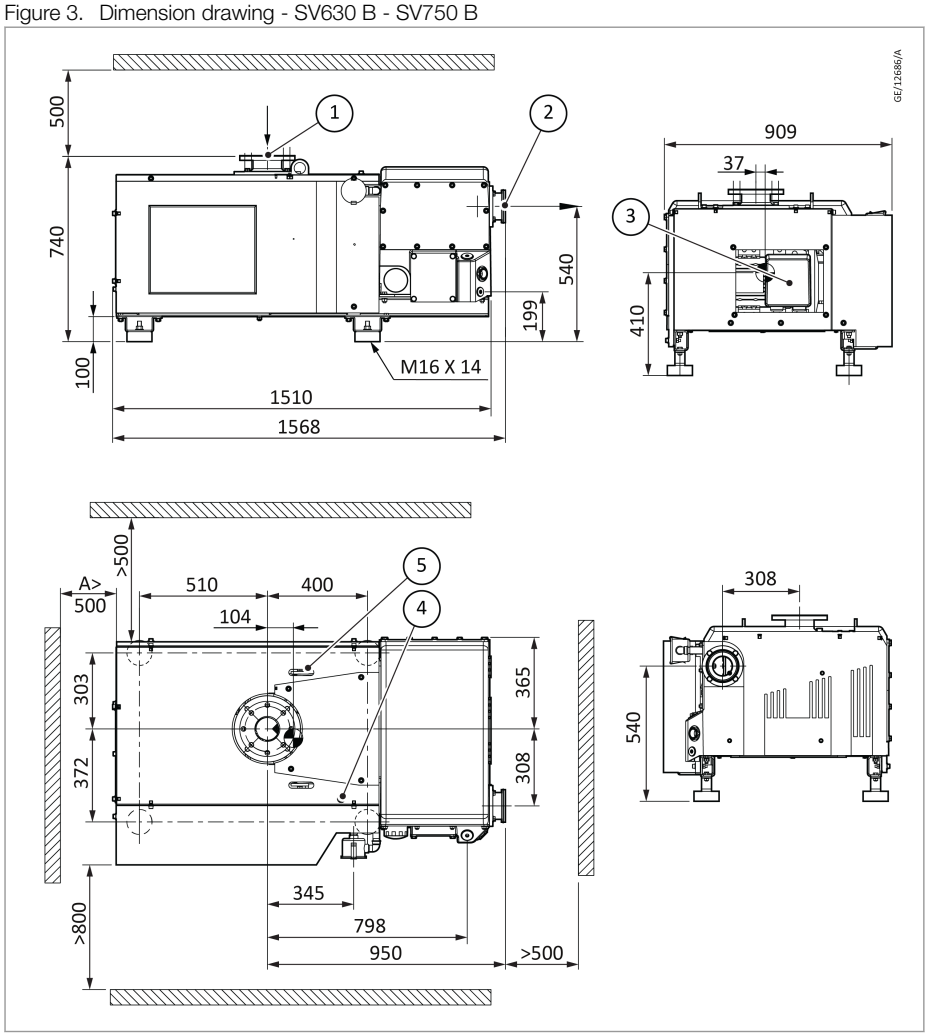


Figure 2. Pumping speeds - SV630 BF - SV750 BF



4.2 Dimension drawings

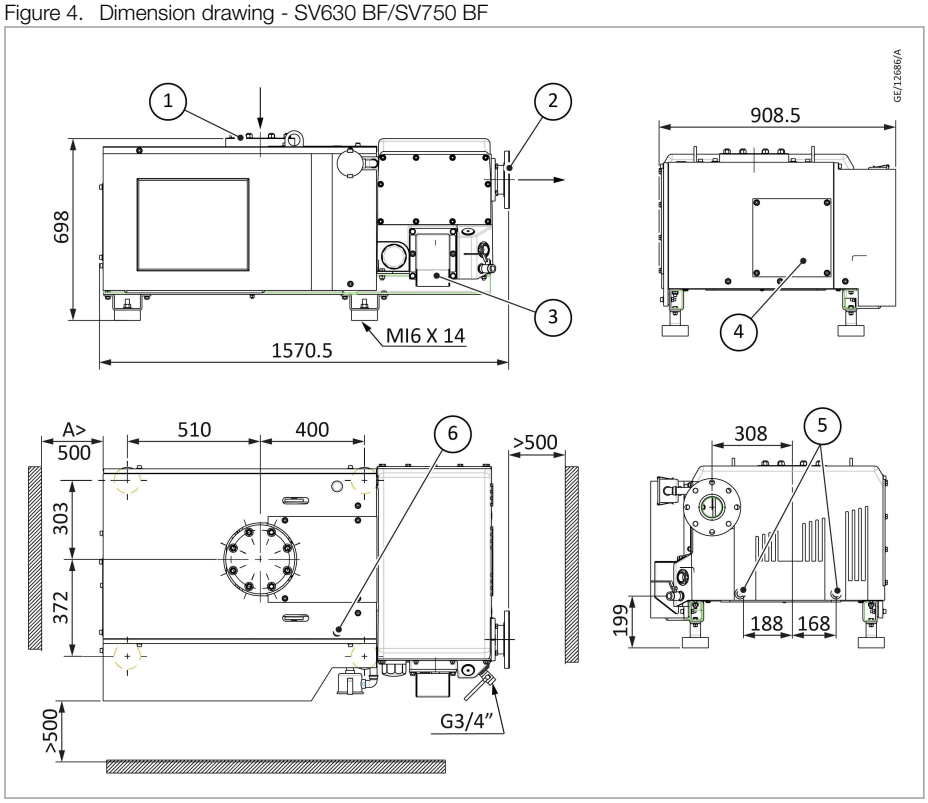
Figure 3. Dimension drawing - SV630 B - SV750 B



1. *Inlet port*
2. *Exhaust port*
3. *Motor connection*
4. *Gas ballast*
5. *Lifting lug*

Technical data

Figure 4. Dimension drawing - SV630 BF/SV750 BF



1. *Inlet port*
2. *Exhaust port*
3. *Oil level monitor*
4. *Motor connection*
5. *Plugs for connection of external filtration device*
6. *Gas ballast valve*

4.3 Technical characteristics

Table 1. Technical data - SV630 B AIR

Parameter	50 Hz	60 Hz	Units
Pumping speed [1]	640	755	$m^3 h^{-1}$
Ultimate total pressure			
without gas ballast [1]	$\leq 8.10^{-2}$	$\leq 8.10^{-2}$	mbar
with 1 gas ballast [1]	≤ 0.7	≤ 0.7	
with 2 gas ballasts [1] [4]	≤ 2	≤ 2	
Water vapour tolerance			
without gas ballast	-	-	mbar
with 1 gas ballast [1] [3]	40	50	
with 2 gas ballasts [1] [3] [4]	60	70	
Water vapour capacity			
without gas ballast	-	-	$kg h^{-1}$
with 1 gas ballast [1] [3]	17	24	
with 2 gas ballasts [1] [3] [4]	26	34	
Noise level [2]	72	75	dB (A)

Parameter	50 Hz	60 Hz	Units
Type of protection/Isolation	IP 54/F	IP 54/F	
Rated rotational speed pump	820	1000	min $^{-1}$
Weight (with oil filling)	730	730	kg
Oil capacity minimum/maximum	20/23	20/23	l
Intake connection	DN100 PN10	100 ISO-K	-
Exhaust connection	Optional	Optional	-
Thermal switch (pump)	YES	YES	-

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

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

3) Contact us

4) Optional

Table 2. Technical data - SV630 BF WATER

Parameter	50 Hz	60 Hz	Units
Pumping speed [1]	640	755	m ^{3} h $^{-1}$
Ultimate total pressure			
without gas ballast [1]	≤ 8.10 $^{-2}$	≤ 8.10 $^{-2}$	mbar
with 1 gas ballast EM 24 V d.c. [1]	≤ 0.7	≤ 0.7	
with 2 gas ballasts EM 24 V d.c. [2] [4]	≤ 2	≤ 2	
Anti-suckback valve 24 V d.c.	YES	YES	-
Water vapour tolerance			
without gas ballast	-	-	mbar
with 1 gas ballast [3]	25	30	
with 2 gas ballasts [1] [4]	35	40	
Water vapour capacity			
without gas ballast	-	-	kg h $^{-1}$
with 1 gas ballast [1] [3]	11	14	
with 2 gas ballasts [1] [3] [4]	15	19	
Cooling	H_2O	H_2O	-
Thermostatic valve	YES	YES	-
Water quality	4 – 8	4 – 8	TH (°F)
Water pressure minimum/maximum refer to *Water quality* on page 30	2/8	2/8	bar
Noise level [2]	72	72	dB (A)
Type of protection/Isolation	IP 54/F	IP 54/F	
Rated rotational speed pump	820	1000	min $^{-1}$
Weight (with oil filling)	730	730	kg
Oil capacity minimum/maximum	20/23	20/23	l
Intake connection 2001	DIN 160 Roots adapter		-

Technical data

Parameter	50 Hz	60 Hz	Units
Exhaust connection	DIN 100 ISO K		-
Thermal switch (pump)	YES	YES	-
Thermal switch (motor)	YES	YES	-

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

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

3) Contact us

4) Optional

Table 3. Technical data - SV750 B AIR

Parameter	50 Hz	Units
Pumping speed [1]	755	$m^3 h^{-1}$
Ultimate total pressure		
without gas ballast [1]	$\leq 8.10^{-2}$	mbar
with 1 gas ballast [1]	≤ 0.7	
with 2 gas ballasts [1] [4]	≤ 2	
Water vapour tolerance		
without gas ballast	-	mbar
with 1 gas ballast [1] [3]	50	
with 2 gas ballasts [1] [3] [4]	70	
Water vapour capacity		
without gas ballast	-	$kg h^{-1}$
with 1 gas ballast [1] [3]	24	
with 2 gas ballasts [1] [3] [4]	34	
Noise level [2]	75	dB (A)
Type of protection/Isolation	IP 54/F	
Rated rotational speed pump	1000	min^{-1}
Weight (with oil filling)	750	kg
Oil capacity minimum/maximum	20/23	l
Intake connection	DN100 PN10 100 ISO K	-
Exhaust connection	Optional	-
Oil cooler	-	-
Thermal switch (pump)	YES	-
Thermal sensors (motor)	YES	-

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

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

3) Contact us

4) Optional

Table 4. Technical data - SV750 BF WATER

Parameter	50 Hz	Units
Pumping speed [1]	755	$m^3 h^{-1}$
Ultimate total pressure		
without gas ballast [1]	≤ 8.10^{-2}	mbar
with 1 gas ballast EM 24 V d.c. [1]	≤ 0.7	
with 2 gas ballasts EM 24 V d.c. [1] [4]	≤ 2	
Anti-suckback valve 24 V d.c.	YES	-
Water vapour tolerance		
without gas ballast	-	mbar
with 1 gas ballast [3]	30	
with 2 gas ballasts [3] [4]	40	
Water vapour capacity		
without gas ballast	-	kg h^{-1}
with 1 gas ballast [1] [3]	14	
with 2 gas ballasts [1] [3] [4]	19	
Cooling	H_2O	-
Thermostatic valve	YES	-
Water quality	4 – 8	-
Water pressure minimum/maximum refer to *Water quality* on page 30	2/8	bar
Noise level [2]	75	dB (A)
Type of protection/Isolation	IP 54/F	-
Rated rotational speed pump	1000	min^{-1}
Weight (with oil filling)	750	kg
Oil capacity minimum/maximum	20/23	l
Intake connection	Din 160 Roots adapter 2001	-
Exhaust connection	DIN 100 ISO K	-
Thermal switch (pump)	YES	-
Thermal sensors (motor)	YES	-

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

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

3) Contact us

4) Optional

Table 5. Technical data - SV630 B US/AIR (60 Hz)

Parameter	60 Hz	Units
Pumping speed [1]	444	cfm
Ultimate total pressure		
without gas ballast [1]	≤ 0.06	Torr

Technical data

Parameter	60 Hz	Units
with 1 gas ballast [1]	≤ 0.5	
with 2 gas ballasts [1] [4]	≤ 1.5	
Water vapour tolerance		
without gas ballast	-	
with 1 gas ballast [1]	37	Torr
with 2 gas ballasts [1] [4]	52	
Water vapour capacity		
without gas ballast	-	
with 1 gas ballast [1] [3]	25	qt h^{-1}
with 2 gas ballasts [1] [3] [4]	35	
Noise level [2]	75	dB (A)
Motor power	25	hp
Type of protection/Isolation	TEFC/F	-
Rated rotational speed pump	1000	rpm
Weight (with oil filling)	1678	lb
Oil capacity minimum/maximum	21/24	qt
Intake connection	4" ASA 150/100 ISO-K	-
Exhaust connection	4" ASA 150/100 ISO-K	-
Thermal switch (pump)	YES	-
Thermal switch (motor)	YES	-

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

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

3) Contact us

4) Optional

Table 6. Technical data - SV630 BF US WATER (60 Hz)

Parameter	60 Hz	Units
Pumping speed [1]	444	cfm
Ultimate total pressure		
without gas ballast [1]	≤ 0.06	
with 1 gas ballast EM 24 V d.c. [1]	≤ 0.5	Torr
with 2 gas ballasts EM 24 V d.c. [1] [4]	≤ 1.5	
Anti-suckback valve 24 V d.c.	OUI	-
Water vapour tolerance		
without gas ballast	-	
with 1 gas ballast [3]	22.5	Torr
with 2 gas ballasts [3] [4]	30	
Water vapour capacity		

Parameter	60 Hz	Units
without gas ballast	-	qt h^{-1}
with 1 gas ballast [1) 3)]	15	
with 2 gas ballasts [1) 3) 4)]	20	
Cooling	H_2O	-
Thermostatic valve	YES	-
Water quality	4 – 8	TH (°F)
Water pressure minimum/maximum	29/114	PSI
Noise level [2)]	72	dB (A)
Motor power	25	hp
Type of protection/Isolation	TEFC/F	-
Rated rotational speed pump	1000	rpm
Weight (with oil filling)	1678	lb
Oil capacity minimum/maximum	21/24	qt
Intake connection	DIN 160 Roots adapter 2001	-
Exhaust connection	DN 100 ISO-K	-
Thermal switch (pump)	YES	-
Thermal switch (motor)	YES	-

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

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

3) Contact us

4) Optional

Table 7 Units conversion

Conversion factors	Different pressure units				Different pumping speed units		
	Mbar (milibar)	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	0.278	0.589
1 qt = 0.946 l	400	300	18.12				
1 hp = 0.735 kW	133	100	25.98	$l\ s^{-1} = l/s$	3.60	1	2.12
1 rpm = 1 min^{-1}	4	3	29.80				
1 pounce = 25.4 mm	1	0.75	29.89	cfm (cubic feet per minute)	1.699	0.472	1
	0	0	29.92				
1 atm (atmosphere) = 1013 mbar				Example: 1 $m^3 h^{-1}$ = 0.589 cfm			
1 Pa (pascal) = 0-01 mbar = 10^{-2} mbar							
1 bar = 1000 mbar							
1 torr = 1.33 mbar							

Technical data

4.4 Ordering information

Table 8. SV630 B

Options	960862	960863	960865
Intake connection	DN 100 PN10	DN 100 PN10	4” ASA 150 /
	DN 100 ISO-K	DN 100 ISO-K	DN 100 ISO-K
Exhaust connection	Optional	Optional	4” ASA 150/100 ISO-K
Gas ballast	Manual	Manual	Manual
Anti-suckback valve	Standard	Standard	Standard
Mains voltage	200 V ± 10%, 50 Hz	380 V ± 10%, 50 Hz	400 V ± 10%, 50 Hz
	18.5 kW	400 V ± 10%, 50 Hz	25 hp
	JIS	690 V ± 10%, 50 Hz	NEMA
		415 V ± 10%, 50 Hz	PREMIUM
		15 kW	
	200 V ± 10%, 60 Hz	440 V ± 10%, 60 Hz	230 V ± 10%, 60 Hz
	18.5 kW	460 V ± 10%, 60 Hz	460 V ± 10%, 60 Hz
		17 kW	25 hp
PTC thermistors	YES	YES	YES

Table 9. SV630 BF

Options	960866	960867	960869
Intake connection	DIN 160 Roots adapter 2001		
Exhaust connection	DIN 100 ISO-K	DN 100 ISO-K	DN 100 ISO-K
Gas ballast	24 V d.c.	24 V d.c.	24 V d.c.
Anti-suckback valve	24 V d.c.	24 V d.c.	24 V d.c.
Mains voltage	200 V ± 10%, 50 Hz	380 V ± 10%, 50 Hz	400 V ± 10%, 50 Hz
	18.5 kW	400 V ± 10%, 50 Hz	25 hp
	JIS	690 V ± 10%, 50 Hz	NEMA
		415 V ± 10%, 50 Hz	PREMIUM
	200 V ± 10%, 60 Hz	440 V ± 10%, 60 Hz	230 V ± 10%, 60 Hz
	18.5 kW	460 V ± 10%, 60 Hz	460 V ± 10%, 60 Hz
		17 kW	25 hp
PTC thermistors	YES	YES	YES

Table 10. SV750 B (F)

Options	960875	960877
Intake connection	DN 100 PN10	DIN 160 Roots adapter 2001
	DN 100 ISO-K	
Exhaust connection	Optional	DN 100 ISO-K
Gas ballast	Manual	24 V d.c.

Anti-suckback valve	Standard	24 V d.c.
Mains voltage	380 V ± 10%, 50 Hz	380 V ± 10%, 50 Hz
	400 V ± 10%, 50 Hz	400 V ± 10%, 50 Hz
	690 V ± 10%, 50 Hz	690 V ± 10%, 50 Hz
	415 V ± 10%, 50 Hz	415 V ± 10%, 50 Hz
	18.5 kW	18.5 kW
PTC thermistors	YES	YES

4.5 Connection fittings

Table 11. Connection fittings

Reference	Specification	Size	Part number
1	PVC tube	Ø 90	71118329
2	Adapter for tube	DN 90 - 100 PN 10	71118362
3	Elastic coupling	Ø 100 - PN 10	71118342
4	Adapter flange	DN 100 PN 10-4" BSP	71118372
5	Adapter flange	DN 100 PN 10-3" BSP	71118370
6	Adapter flange	4" BSP M/DN 90	71118017
7	Roots Adapter	Roots 1001	971432340
8	Roots Adapter	Roots 2001	971432350
9	Adapter (not represented)	DN100 PN10 100 ISO K	71118336
10	Screws-set*	-	71412440
11	O-ring (NBR)	DN 110x5	71242882
12	Centering Ring + O-ring (NBR)	100 ISO K, 100 PN 10	71118391
13	Elbow 90°	DN 100 PN 10	71118284
14	Filter (Paper)	F 400 - 630 P	95171
15	Filter (Metal)	F 400 - 630 M	71127163
16	Filter (Activated charcoal)	F 400 - 630 CA	71127162
17	Filter (Polyester)	F 400 - 630	71127164
18	Hand valve	DN 100	71130116
19	EP valve	DN 100	Optional**
20	Adapter flange	Ø 100 PN 10 - NFE 29222	71118351
21	Adapter flange	DN 100 PN 10 - 100 ISO K	71118383
22	Ball valve	1/2" BSP M/F	71130113
23	Manometer	Ø 1/2" BSP M	95192
24	Elbow 90°	100 ISO K	88726
25	Set of 4 clamps for ISO K flanges	M10 x 24	26701
26	Centering ring	100 ISO K AL/NBR	26808
27	Filter (Paper)	100 ISO K	95172
28	Filter (Metal)	100 ISO K	71127167

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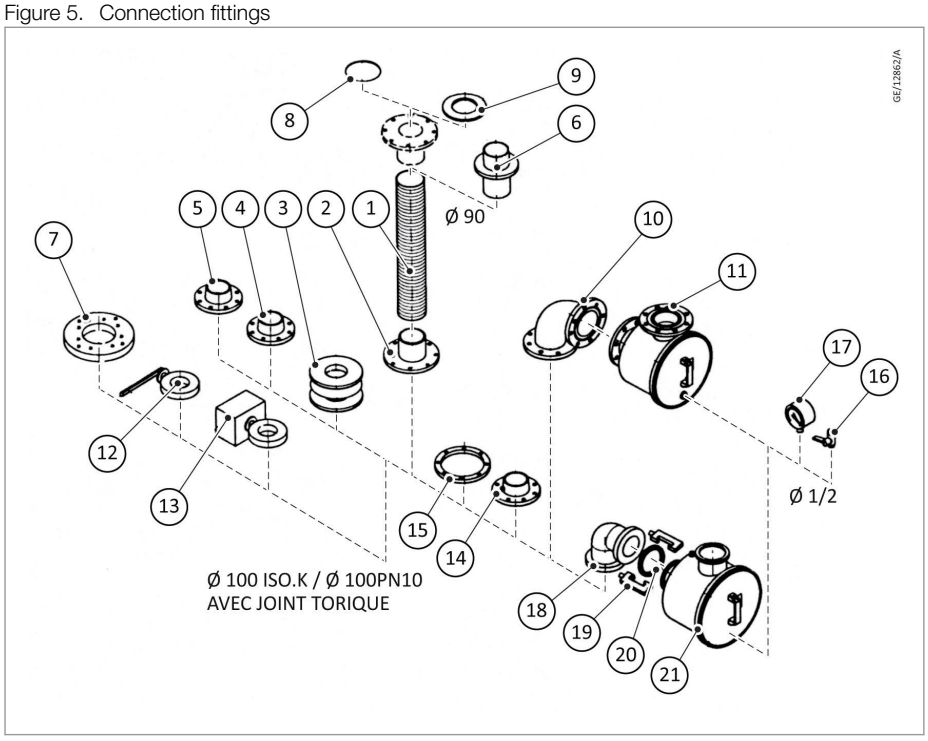
29	Filter (Activated charcoal)	100 ISO K	71127166
30	Filter (Polyester)	100 ISO K	71127168

** 8 Screws and nuts for DN100 PN10 connection fittings*

*** Contact us*

Figure 5. Connection fittings



4.6 Accessories

Table 12. Accessories

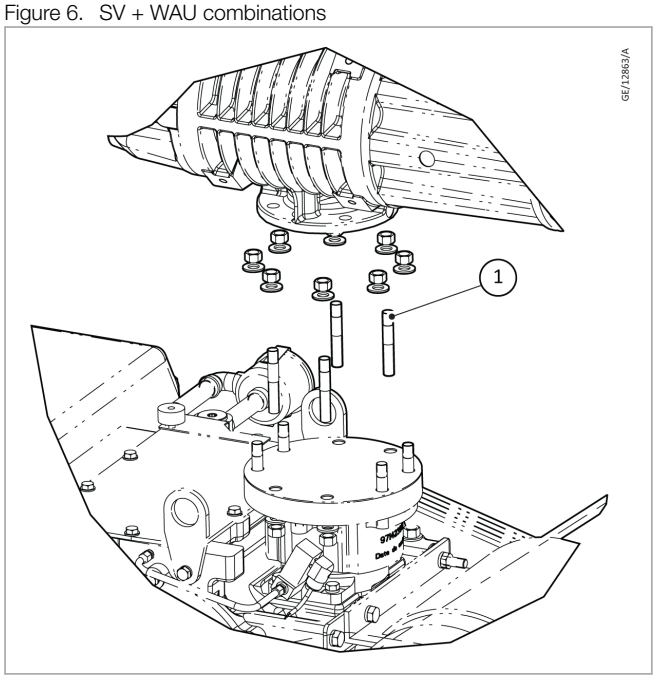
		SV630 B - SV750 B	SV630 BF - SV750 BF
Specification	**Size**	**Part number**	
Oil drain tap		71130114	Standard
EM gas ballast kit	24 V d.c	971438170	971438170
Gas ballast standard (manual)		971446490	971446490
2 EM gas ballasts	24 V d.c.	-	971438160
2 Gas ballasts (manual)		971438340	971438340
Exhaust filter gauge (manometer)		95194	95194
Oil level monitor		971425760	971425760
Thermal switch 115° C		Standard 971430630	971440000
Inlet kit 100 ISO-K		Standard	971430550
Water cooling with thermostatic valve		On request	Standard
Oil filter by-pass		71236390	71236390
Exhaust filter over pressure switch		71222360	71222360

Operation of pump is insured with our accessories: mounting any other accessory will engage the responsibility of user concerning operation of pump.

4.7 SV + WAU combinations

		SV630 B - SV750 B	SV630 BF - SV750 BF
Specification	Size	Part number	Part number
Adapter Roots 1001		971432340	971432340
Adapter Roots 2001		971432350	Standard
Adapter Roots 4400		97143WH4400	97143WH4400

Figure 6. SV + WAU combinations



4.8 Lubricants

The pumps should be run with mineral oils for vacuum pumps with low viscosity according to ISO category VG77. Our oil meets the below specifications.

	Conditioning	Reference
LVO130 Oil	2 l	L13002
	5 l	L13005
	20 l	L13020
	200 l	L13099

You may use other Leybold lubricants adapted to the applications. Please consult us.

The use of non Leybold oils can change the pump performance and may cause damage or reduce the maintenance intervals.

If non Leybold oils are used during the warranty period, we may reject any warranty claim,

5 Transportation

The 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 pump is delivered enclosed in a plastic foil with 5 dessicant bags inside.

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

The pumps have the oil filled in.

5.1 Mounting orientation

Refer to required space on drawings in *Dimension drawings* on page 15.

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° maximum. Avoid any other orientations while moving the pump.

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

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

Use only lifting devices appropriated to the pump weight. Check name plate. Do not use other pump elements than the lifting lugs as handles.

6 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. Drain the water from the cooling circuit (refer to *Connection to system* on page 28). 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 our service.

7 Installation

CAUTION:INSTALLATION HAZARDS

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

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

Observe all safety regulations.

The pumps can be set up on any flat, horizontal surface. Under the four feet, there are metric threaded holes (M16 x 1.4) for securing the pump.

The pump's ambient temperature should be between 12 °C (55 °F) and 40 °C (104 °F). By modifying the pump or changing the oil type, the pump can be run at a other ambient temperature. Please consult us.

To make sure adequate cooling of the pump, leave enough space at the air intake and exhaust points, and for access and maintenance (refer to *Dimension drawings* on page 15).

Make sure to keep the pump and air intake of the motor clean.

Note:
The oil level cannot be read properly if the pump is tilted and lubrication may be affected.

7.1 Connection to system

The standard pump is not suitable for installation in explosion hazard areas ATEX. Please contact us, when you are planning such an application.

7.1.1 Intake side

The pump is equipped with an inlet flange 100 ISO K/DN 100 PN 10 (SV630 B / SV750 B) or DIN 160 roots adapter (SV630 BF/SV750 BF). Using suitable connecting elements (refer to *Connection fittings* on page 23) 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 (refer to *Connection fittings* on page 23).

We recommend to install 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.

Note:

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 piping should take care of pumped gases. It is the same for its tightness.

7.1.2 Exhaust side

The 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, (refer to *Replace the exhaust filters and check the by-pass* on page 44).

heck in the individual case whether an 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.

Corresponding pressure regulating devices to be installed by the user.

Note:

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

7.1.3 Exhaust flanges

- The SV630 B (Euro-version) and the SV750 B are not equipped with outlet flange (only hole Ø 80). An outlet pipe can be connected through accessory : Exhaust kit DN 100 PN10, 100 ISO-K : Part number - 971438540.
- SV630 BF / SV750 BF is in standard equipped with outlet flange DN 100 ISO-K.

The diameter of the exhaust line should be at least Ø 100 mm. 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.

Exhaust pipe material must be resistant to pumped gases.

Note:

Do not operate the pump with a blocked or restricted exhaust line. Before start-up, make sure 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.

7.1.4 Water cooling

The pumps are equipped, in standard for the SV630 BF & SV750 BF and as an option for the SV630 B/SV750 B, with a water cooling system and a thermostatic valve. Depending on the local regulations, the cooling water

needed may not be taken from the drinking water mains and maximum water temperatures must be observed. The water cooling connection is made by an ARGUS type 1/2 x M22 - 150 adapter delivered separately or by a female G 1/2 connection.

The thermostatic valve regulates the cooling water throughput, and so the pump temperature. The valve is set in standard on position 1. Rated pump performance is achieved on position 1 or 2. On higher positions, ultimate pressure may degrade.

Normally, the thermostatic valve should be set somewhere in the range from 1 to 3. Thermostat setting 1 (valve fully open) produces a low operating temperature of the pump, and setting 3 a high one.

Pumping on vapours requires setting on position 3. Do not use positions 4 and 5.

Figure 7. Water cooling - SV630 B 50 Hz

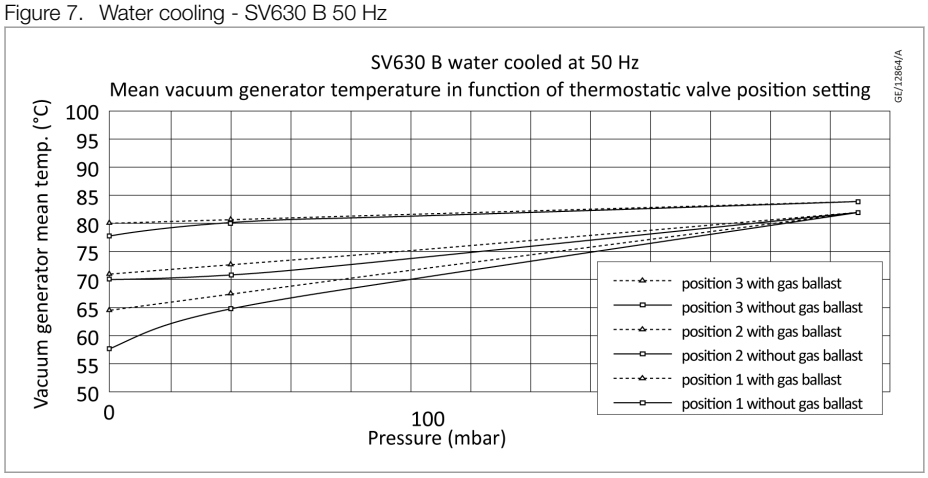
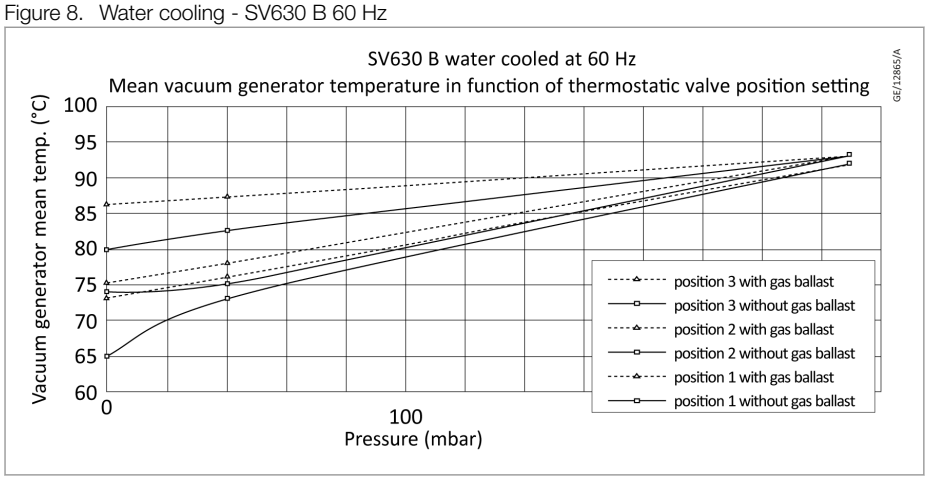


Figure 8. Water cooling - SV630 B 60 Hz



7.1.5 Water quality

In order to make sure long trouble-free operation the cooling water must not contain any oils, greases and suspended solids. Moreover, we recommend compliance with the following limit values:

Table 13 Water quality

		50 Hz			
Position thermostatic valve		**Ultimate pressure**	**40 mbar**	**Ultimate pressure and gas ballast**	**250 mbar and gas ballast**
1	ΔT water (°C)	7	10	9	13
	δ H2O (l/h)	643	667	668	656
	P (kW)	6	7	7	10
2	ΔT water (°C)	52	17	18	12
	δ H2O (l/h)	99	307	292	726
	P (kW)	4	6	6	10
3	ΔT water (°C)	45	32	35	17
	δ H2O (l/h)	78	158	139	462
	P (kW)	4	6	6	9
		60 Hz			
1	ΔT water (°C)	8	11	11	15
	δ H2O (l/h)	690	668	676	685
	P (kW)	7	9	8	12
2	ΔT water (°C)	27	14	10	14
	δ H2O (l/h)	181	511	718	730
	P (kW)	6	8	8	12
3	ΔT water (°C)	38	23	34	14
	δ H2O (l/h)	129	276	185	703
	P (kW)	6	7	7	11

Maximum cooling water temperature : 30°C (86°F)

ΔT water (°C) : Cooling water temperature increase

δ H_2O (l/h) : Cooling water flow

P (kW) : Absorbed power by cooling water

Water cooling	**TH (°F)**	**0°**		**4°**		**8°**		**12°**		**20°**
			Corrosion (water too soft)		Service area				Incrusting water (deposit of scale)	
Water quality	**PPm**	**0**		**30**		**90**		**160**		**300**
			Corrosion (water too soft)		Service area		Incrusting water		Very incrusting water	
Carbonat content	**PH**	**0**		**5**		**7.5**				
			Corrosion (water too soft)		Service area		Incrusting water			

Water temperature at inlet	Maximum 30 °C (86 °F)
Appearance	Clear, free of oils and greases
Suspended matter	< 250 mg/l
Particle size	< 150 µm
Electrical conductivity	< 700 µS/cm
Aggressive carbon dioxide	None, not detectable
Chloride	< 100 mg/l
Sulphate	< 150 mg/l
Nitrate	≤ 50 mg/l
Iron	< 0.2 mg/l
Manganese	< 0.1 mg/l
Ammonium	< 1.0 mg/l
Free chlorine	< 0.2 mg/l

If there is the danger of frost, you may use a water glycol mixture of up to 30 %

Do not use de-ionised cooling water.

To clean the heat exchanger:

WARNING: TOXIC MATERIALS

Proceed in an open and well ventilated place.

Observe the safety regulations given by the manufacturer of the product you are using.

Observe the regulations for the treatment and the disposal of chemical products.

Observe the relevant environmental regulations.

It is recommended to clean at least twice a year the water circuit.

For that, dismantle the exchanger from the pump. Chemical cleaning is the most efficient, with dilute hydrochloric acid solution (5 to 10%) then neutralise with hexamethylethyrene tetramine at 0.2 %. For a 1 mm coat of scale, leave acting the acid during about 30 min.

The system must be open during the operations, so the product gases can escape. Rinse copiously with water after neutralization.

Draining of the water-cooling circuit (before transport, long time storage, winter time)

Remove the cover and place a water recovery pan under the heat exchanger and unscrew the plug.

The heat exchanger water will drain.

To drain the heat exchanger completely:

1. Remove the water outlet hose and close the water outlet with a plug.
2. Remove the water inlet hose.
3. Connect a compressed air supply in place of plug and blow.

Note:
Water will be evacuated through the water inlet connection.

Reassemble in the reverse sequence.

7.2 Electrical connections

WARNING: HIGH VOLTAGE

Risk of electric shock. Make sure that incoming power to the pump is off before wiring the motor or altering the wiring.

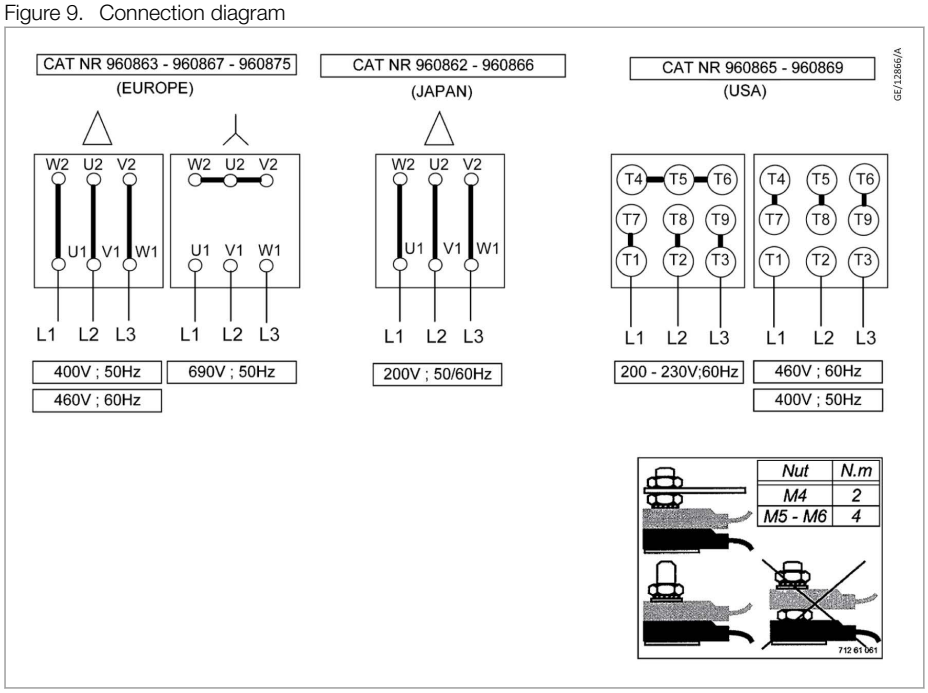
CAUTION: NO AUTOMATIC START-UP

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

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 (refer to *Figure: Connection diagram*). 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.

Figure 9. Connection diagram



7.2.1 Motor protection device

To protect the motor windings against a variety of operational malfunctions, the motor of the SV630 BF is fitted with protection devices.

PTC thermistors to IEC 60034-1 and DIN 44081/440823 are temperature - dependent, semi-conductor devices embedded in the motor windings.

7.2.2 Working principle

CAUTION: WRONG DIRECTION OF MOTOR ROTATION

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

Non-linear variable resistors. It is recommended to connect them to the control circuit. PTC thermistors ensure a good protection against the overheating of the motor.

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).

or 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.

7.2.3 Oil thermal switch

Connection has to be made in the junction box (refer to *Figure: Junction box connections*). Breaking power on resistive circuit 25 V a.c. or 60 V d.c. maximum.

To be serial wired with the coil of motor's contactor. Use an auxiliary relay.

The pump is switched off once a certain oil temperature (115 °C/239 °F) is exceeded. It is also possible to connect an alarm system. (refer to *Figure: Junction box connections*).

7.2.4 Motorization

European versions:

A 50/60 Hz motor is mounted in standard on the SV630 B and SV630 BF.

Voltage:

- 400 V ± 10% at 50 Hz
- 460 V ± 10% at 60 Hz

A motor working only at 50 Hz is mounted in standard on the SV750 B.

Voltage:

- 400 V ± 10% at 50 Hz

Japan versions:

A JIS 50/60Hz motor is mounted in standard on the SV630 B and SV630 BF. With PTC sensors.

Voltage:

- 200 V ± 10% at 50 Hz and 60 Hz

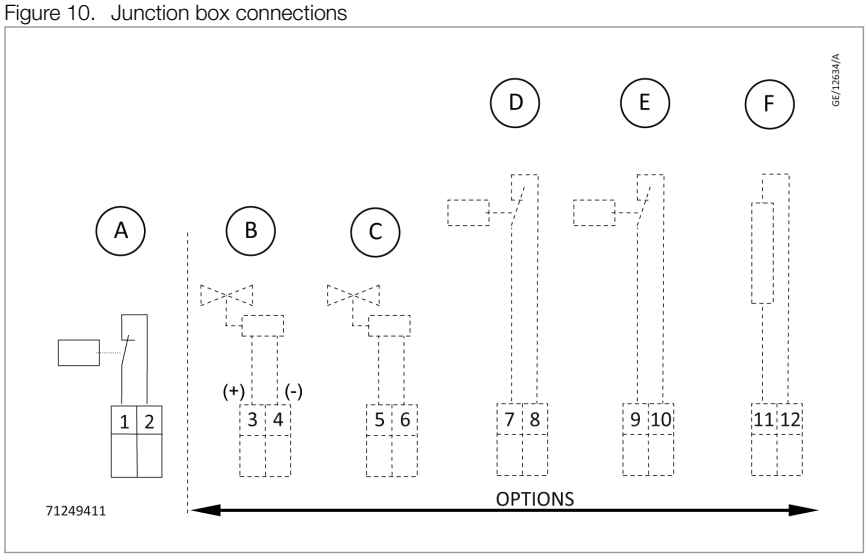
US versions:

A NEMA motor is mounted in standard on the SV630 B and SV630 BF. With PTC sensors.

Voltage:

- 400 V ± 10% at 50 Hz
- 230 V/460 V ± 10% at 60 Hz

Figure 10. Junction box connections



*A. Thermal switch**
B. Gas ballast 24 V d.c.
C. Monitored anti-suckback valve 24 V d.c.
*D. Oil level monitor**
E. Pressure switch or option*
F. Pt 100 sensor or option*

Power supply (maximum)	25 V a.c.
	60 V d.c.

7.2.5 Particularities SV630 BF/SV750 BF

The pump is in standard equipped with options which have to be connected before starting up the pump:

7.2.6 Gas Ballast (EM Valve)

- Normally closed (Power supply 24 V d.c. ± 10%)

To be wired in connection box (refer to *Figure: Junction box connections*). Polarity must be respected.

7.2.7 Electromagnetic valve (anti-suckback valve)

- Normally open

To be supplied in 24 V d.c. as soon as the pump starts. Shut down power supply as the pump stops.

If several pumps with EM anti-suckback valves are operated in parallel, there is a risk in case of V-belt failure that the pump oil is sucked out. This can be prevented by using a valve on the intake port controlled by a motor cos phi controlling device.

The rotation detector Part number - 971448780 can be used as well as a retrofit or on new pumps.

The electrical options installed on the pump are wired and have their respective connection terminals installed in the connection box.

7.2.8 Option : Oil level monitor

Reed contact	Power supply (maximum)	Breaking power on resistive circuit
a.c. 0.5 A	25 V	50 VA
d.c. 1.0 A	60 V	50 W

To be serial wired with the coil of motor's contactor (the pump stops in case of missing oil).

You must use imperatively an auxiliary relay.

8 Operation

WARNING: NOISE HAZARD

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

CAUTION: PUMP WARNING LABELS

Risk of motor damage. Obey warning labels on the pump.

To avoid overloading the motor, do not start the pump more than 6 times within one hour.

If more than 6 starts per hour are necessary keep the pump running and mount a valve which opens and closes into the intake line.

8.1 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 *Pumping of condensable gases and vapours* on page 37.

8.2 Pumping of condensable gases and vapours

With the gas ballast valve open and at operating temperature, the pumps 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 make sure that the pump has warmed up for approximately 30 min. with closed intake line and with open gas ballast valve.

Note:

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, 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.

Note:

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.

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 (for example, during drying), the gas ballast valve can be closed in order to improve the ultimate pressure.

8.3 Start-up

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

The pump is designed for fail-safe start-up at temperatures over 12°C (55°F) (as per PNEUROP).

If local regulations provide a WYE-DELTA starting connect the pump to the system so that it can start load free, i.e. at atmospheric pressure in the intake port. If the vacuum system is not to be vented further measures will be necessary, e.g. a starting valve can be mounted. Please contact us in this case.

SV630 BF / SV750 BF is equipped with :

- Electromagnetic gas ballast valve 24 V DC. Connection has to be made on junction box (refer to *Figure: Electrical connections of options*).
- Anti-suckback valve driven by EM valve DC. Connection has to be made on junction box (refer to *Figure: Electrical connections of options*).

Note:

The signals of the oil level switch and exhaust filter over pressure switch must be delayed (timer) on the pump switch-on for approximately. 1 minute.

8.4 Shutdown

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

If the pump has to be shutdown, drain the oil flush out the pump with fresh oil and fill in the required amount of clean oil (refer to *Check the oil* on page 41). Close the connection ports. Special preservation or flushing oils do not need to be used.

Note:

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

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

8.5 Ultimate pump pressure

If the values specified in the Technical Data are not reached in the apparatus, measure the ultimate pressure directly at the pump's intake port after disconnecting the pump from the apparatus.

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.

9 Maintenance

9.1 Safety information

WARNING: TOXIC MATERIALS

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

Observe the safety regulations.

WARNING: ENVIRONMENTAL HAZARD

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

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

Never mount used seals; always mount new seals.

9.2 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.

Table 14. Maintenance intervals

Maintenance	Interval	Reference
Check the oil level	Daily	*Oil level* on page 41
Check the oil condition	Depends on process	*Oil condition* on page 42
1 st oil change	After 150 h of operation	*Oil change, replace the oil filter (if installed)* on page 42
Subsequent oil changes	Every 2000 h or 6 months (depending on application)	
Replace the oil filter	At each oil change	
Replace the exhaust filter	If oil mist at exhaust or annually	*Replace the exhaust filters and check the by-pass* on page 44
Clean the dirt trap	Monthly	*Clean the dirt trap* on page 45
Check the anti-suckback valve	Annually	*Check the anti-suckback valve* on page 46
Clean oil cooler	Annually	-
Clean filter of gas ballast	Monthly	*Clean the gas ballast intake filter* on page 47

Checking the float valve	When changing the exhaust filters	*Check the float valve* on page 48
Replacing the exhaust valves	*	*Replace the exhaust valves* on page 48
Replacing the pump module	*	*Replace the pump module* on page 49
Control belts	6 months	*Check the tightness of the V-belts* on page 49

** In case of specific pump servicing*

To simplify the maintenance work we recommend combining several jobs.

9.3 Maintenance work

9.3.1 Check the oil

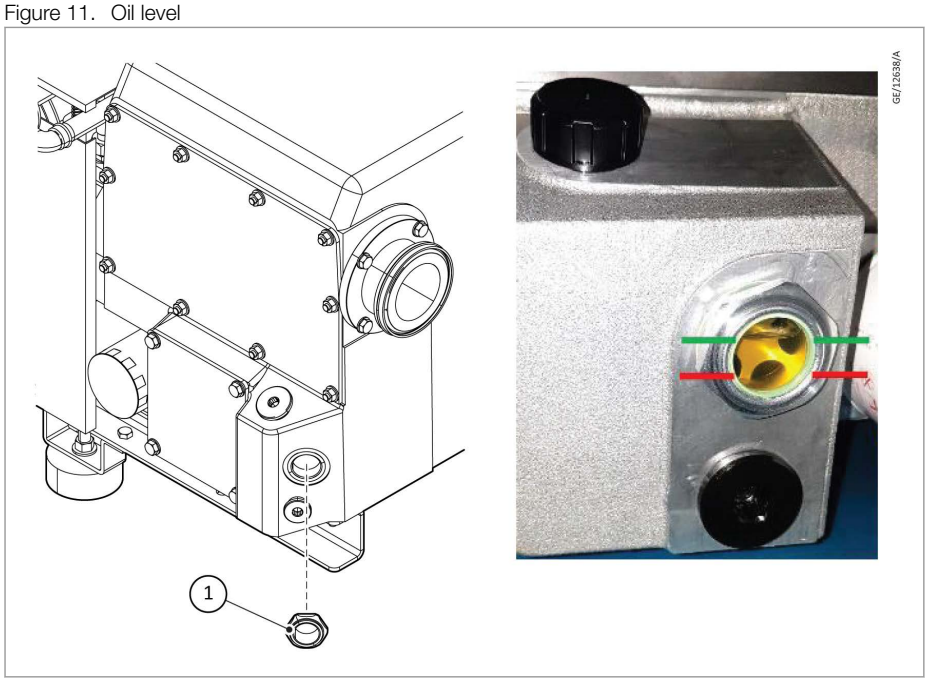
Oil level

The pumps 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.

High oil consumption often indicates that exhaust filters are clogged, (refer to *Figure: Exhaust filters*).

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

Figure 11. Oil level



1. *Oil sight glass*

Maintenance

Oil condition

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

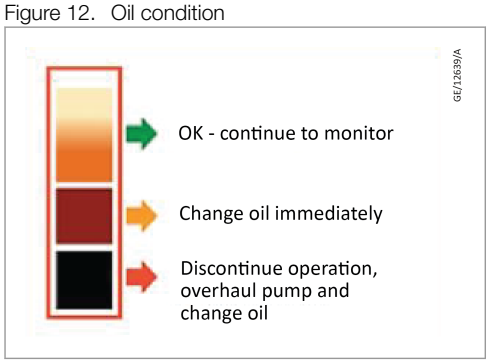
If gases or liquids are dissolved in the oil, the result is a deterioration of the ultimate pressure, the oil can be degassed by allowing the pump to run for about 30 min. with the intake port closed and the gas ballast valve open.

To check if oil should be changed, drain some oil via the oil-drain plug into a beaker or similar container with the pump switched off but still at operating temperature.

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

Observe the safety regulations.

Figure 12. Oil condition



Oil change, replace the oil filter (if installed)

WARNING: HOT SURFACES

Risk of burns. Pump when operating is hot and some surfaces could reach a temperature higher than 80° C (176 °F). Observe the warning labels on the pump.

WARNING: SLIPPERY SURFACES

Risk of slipping. Clean any oil which is on the floor. Check regularly that no oil is on the floor.

Tool required:

- Oil filter key (71073532)

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.

Unscrew the oil-drain plug and let the used oil drain into a suitable container (refer to *Figure: Oil change*). If the pump is equipped with oil drain valve, open the valve and drain the oil into a suitable container (refer to *Figure: Oil drain valve*).

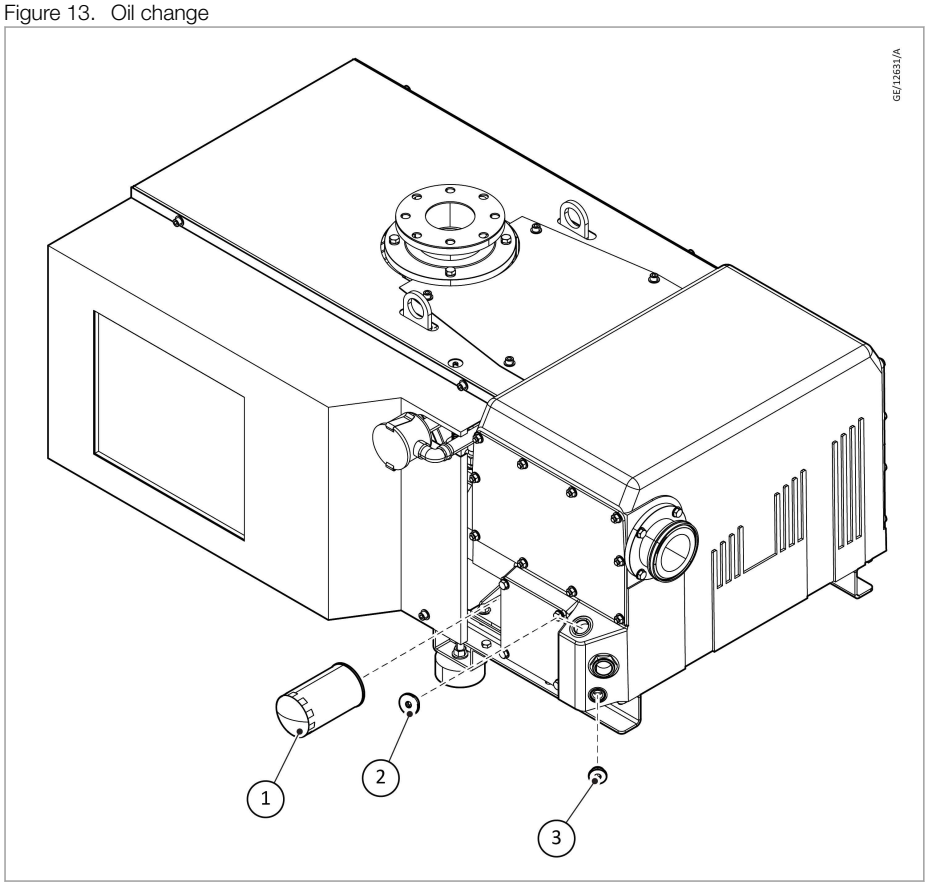
When the flow of oil slows down, screw the oil drain plug back in or close the oil drain valve, briefly switch on the pump (maximum 10 s) and switch if off. Remove the oil drain plug again and drain the remaining oil.

Unscrew the oil filter. Take a new oil filter, moisten its gasket with oil and screw it in manually, (refer to *Figure: Exhaust filters*).

Reinsert the oil-drain plug.

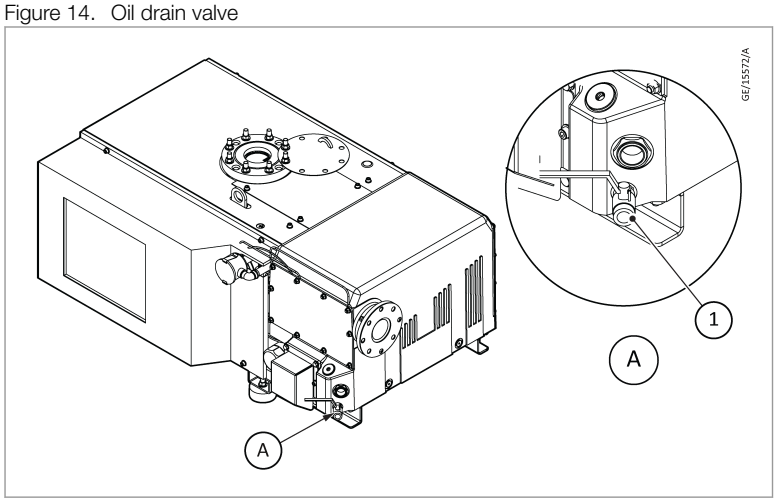
Use suitable oil only (refer to *Lubricants* on page 25).

Figure 13. Oil change



1. *Oil filter*
2. *Oil fill plug*
3. *Oil drain plug*

Figure 14. Oil drain valve



1. *Oil drain valve*

9.3.2 Replace the exhaust filters and check the by-pass

Tools required:

- Tubular box wrench 16 mm

When the exhaust filter elements are clogged, the integrated by-pass opens and the filters are bypassed. Oil mist at the exhaust, and/or high oil consumption are signs that the exhaust filters are clogged.

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

Remove the cover with gasket. Remove the exhaust deflector by unscrewing the bolt.

Remove both demister support units by unscrewing the nuts . The exhaust filters can be removed individually.

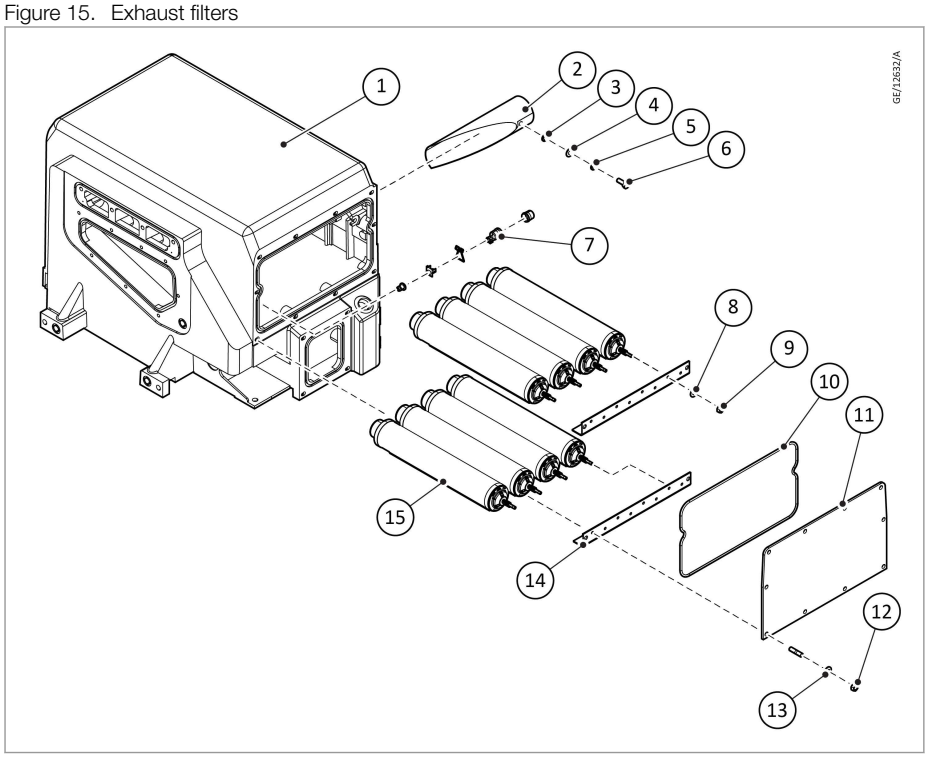
Check also the float valve (refer to *Figure: Exhaust float valve*).

Plug new exhaust filters into the oil casing.

Insert carefully the demister support units over new exhaust filters threaded bars (M6) and compress slightly the demister springs.

Tighten the demister support units and the exhaust deflector. If necessary mount a new seal and mount the cover.

Figure 15. Exhaust filters



1. *Oil casing*
2. *Exhaust deflector*
3. *Nut*
4. *Washer*
5. *Washer*
6. *Screw*
7. *Float valve*
8. *Washer*
9. *Nut*
10. *O-ring*
11. *Cover front oil casing*
12. *Washer*
13. *Nut*
14. *Demister support unit*
15. *Exhaust cartridge by-pass*

9.3.3 Clean the dirt trap

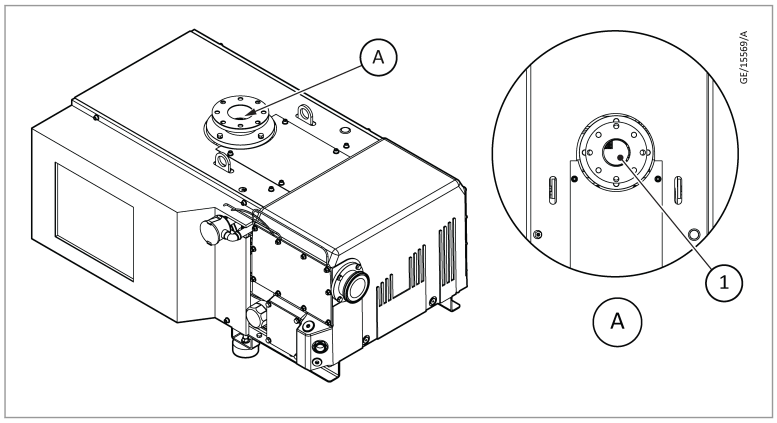
Tools required:

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

A wire-mesh filter is located in the pump's intake port to act as a dirt trap for impurities (refer to *Figure: Dirt trap*). It should be kept clean at all times in order to avoid reduction of the pumping capacity.

For this purpose, disconnect the intake line, remove the dirt trap from the intake port and rinse it in a suitable vessel using a solvent. Then dry it with compressed air. If the dirt trap is defective, replace it.

The cleaning intervals depend on requirements. If large amounts of abrasive materials occur, a dust filter should be fitted into the intake line (refer to *Connection fittings* on page 23).



1. *Dirt trap*

9.3.4 Check the anti-suckback valve

SV630 B Standard version - SV750 B

Tools required:

- Tubular box wrench 19 mm

First remove the intake line and the intake flange. Remove the 4 screws and take off the intake port, (refer to *Figure: Intake port*).

Remove the anti-suckback valve, the spring and the gasket. Clean all parts and check that they are in perfect condition; if not, replace them.

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

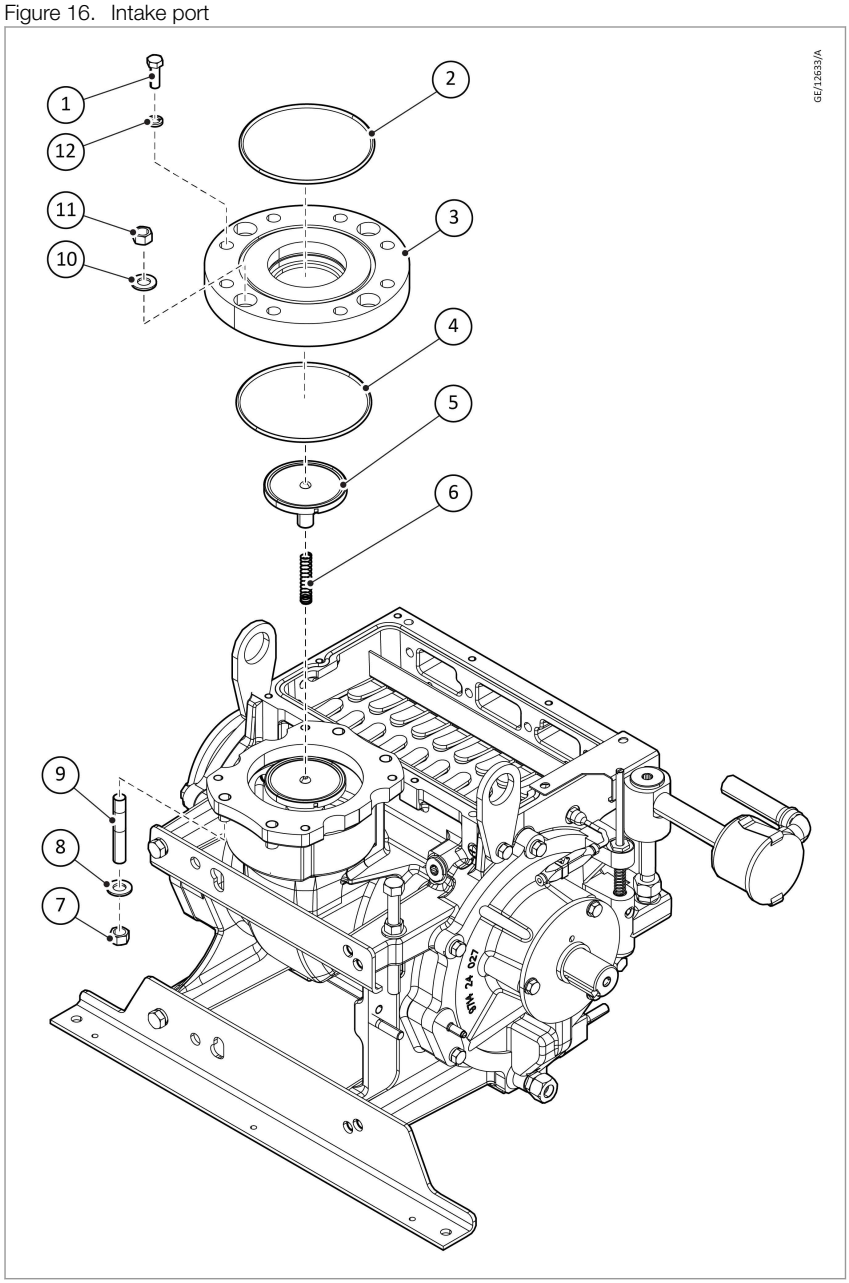
Reassemble in the reverse order.

Verify the position of anti-suckback valve using the tool E6538292.

SV 630 BF - SV 750 BF

Anti-suckback valve is driven by a EM Valve 24 V d.c.

Figure 16. Intake port



1. *Screw*
2. *O-ring*
3. *Rootsadapter 2000*
4. *O-ring*
5. *Anti-suckback valve*
6. *Spring*
7. *Nut*
8. *Washer*
9. *Pin*
10. *Washer*
11. *Nut*
12. *Washer*

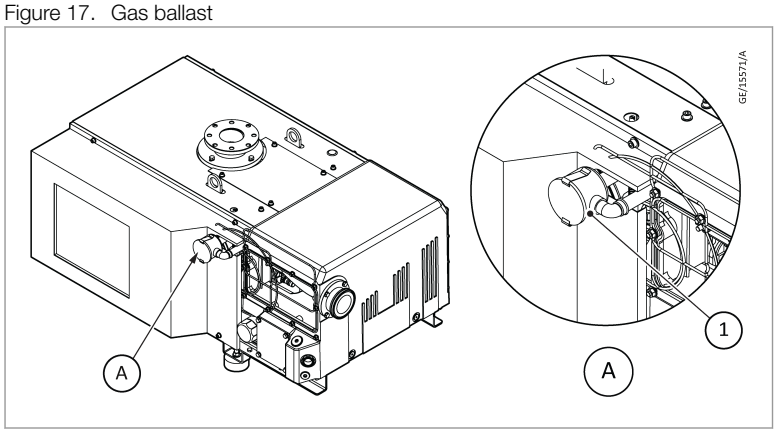
9.3.5 Clean the gas ballast intake filter

When the pump operates with open gas ballast valve, clean the filter once a month.

Release the clips on the gas ballast filter. Clean the filter using a suitable solvent. Then dry it. Reassemble in the reverse sequence.

The inlet filter must be changed when the gas ballast flow decreases.

Figure 17. Gas ballast



1. *Gas ballast*

9.3.6 Check the float valve

Tools required:

- Tubular box wrench SW16
- Allen keys 4.6

If the pressure does not fall below approximately 5 mbar (4 Torr) during pump operation, check the tightness of the float valve (refer to *Figure: Exhaust filters*).

Remove the cover by unscrewing the nuts and remove the seal.

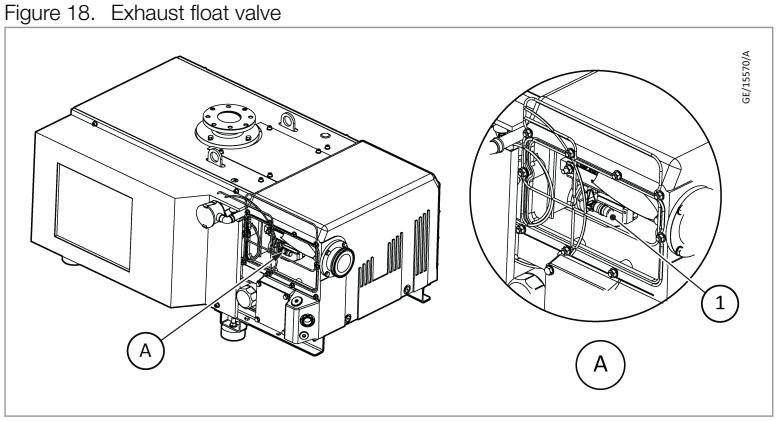
Remove the exhaust deflector by unscrewing the bolt. Remove the clip and pull out the float valve using the tool EK971474180.

Take off the gasket, clean the nozzle, check the tightness of the float valve. Check the gaskets of the float-valve and replace them if required.

Reassemble the float-valve in reverse sequence.

Tighten the demister support units and the exhaust deflector. If necessary mount a new seal and mount the cover.

Figure 18. Exhaust float valve



1. *Float valve*

9.3.7 Replace the exhaust valves

Consult us.

9.3.8 Replace the pump module

Consult us.

9.3.9 Check the tightness of the V-belts

Tools required:

- Key 19 and 24

Take off the hood (refer to *Figure: Hood*).

Loosen the nuts and x 2. Loosen the push rod (refer to *Figure: Push rod*).

Remove the V-belts.

Reassemble in reverse sequence.

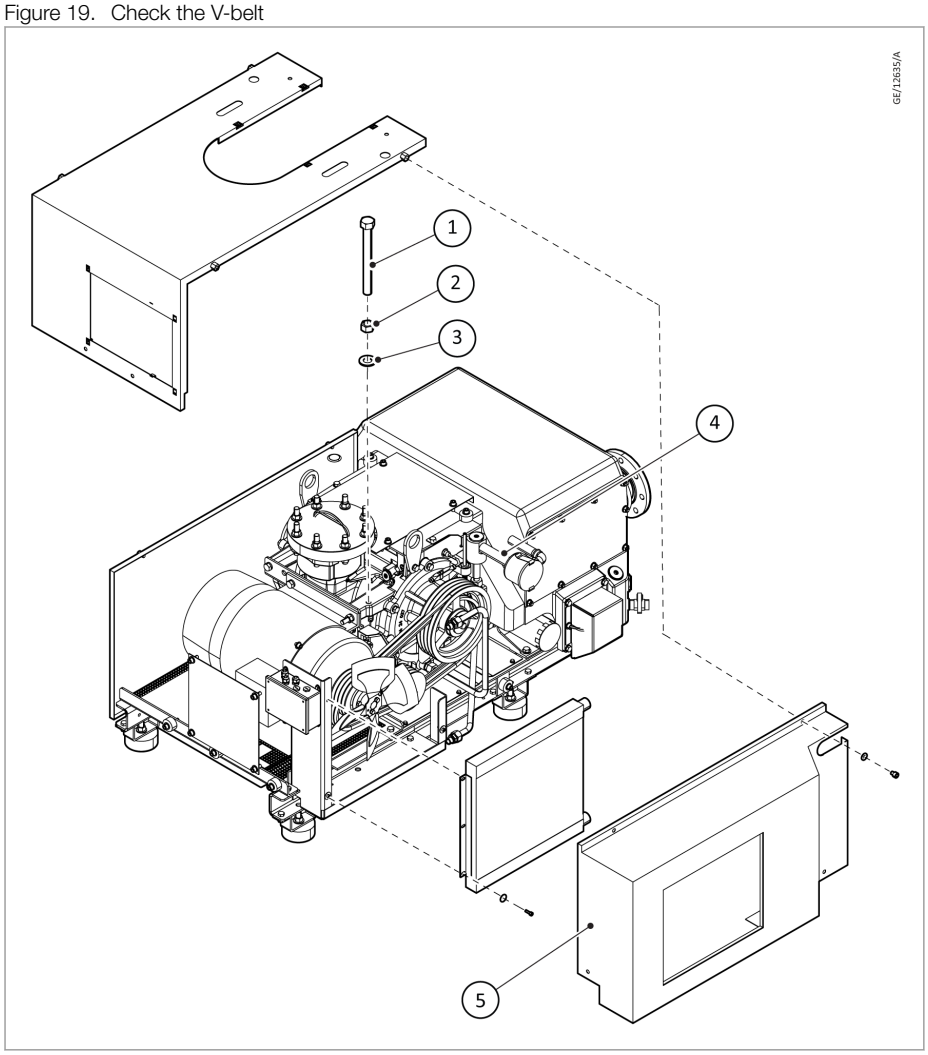
Stretch the V-belts with the following method:

V-belt tension meter

This tension meter (971437840) is a tool designed to check and re-tighten the V-belts.

It is made of two sliding pipes with a graded spring inside.

Figure 19. Check the V-belt



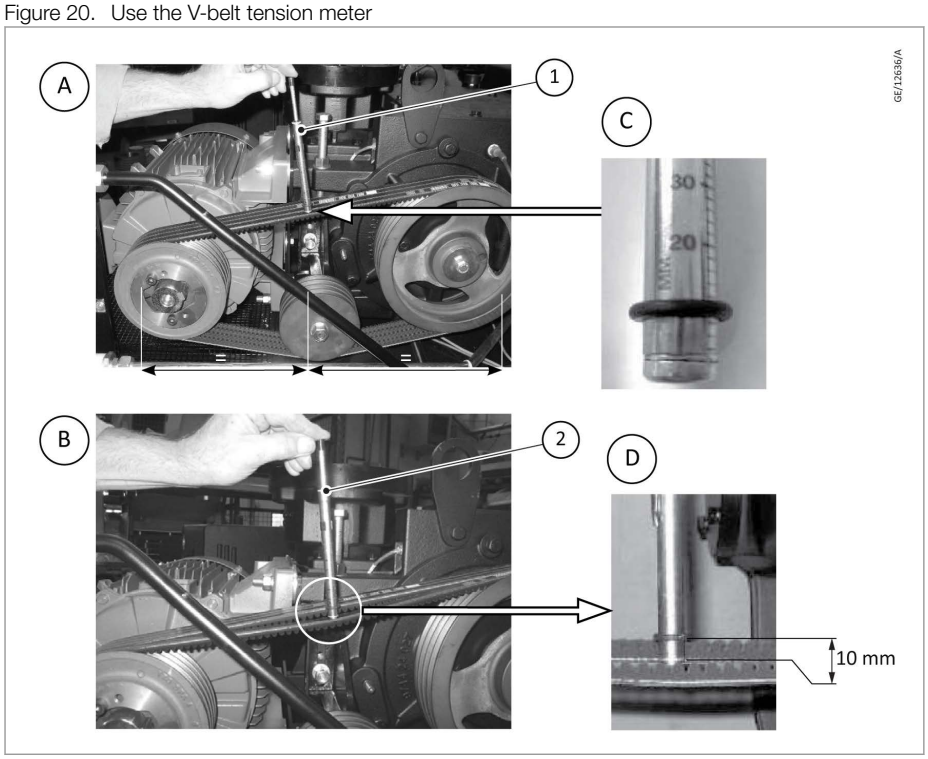
1. *Push rod*
2. *Nut*
3. *Washer*
4. *Gas ballast*
5. *Hood*

Use the V-belt tension meter:

Refer to *Figure: Use the V-belt tension meter*, to follow the instructions below;

1. Set the first O-ring at 10 mm (PIX) on the millimetre scale (C) or 25 Inches of Span (Goodyear), and the other O-ring on position 0 N on the Newton scale.
2. Install the tension meter in the middle (A), half-way between the V-belt contacts point of the V-belt and the two pulleys.
3. Push the Newton scale's black rubber down in order to reach a 10 mm bending of the V-belt (B,D).
4. Check the result of your measurement. Tighten the belt tightener to reach the value given in *Table: Tightening value of V-belt*.

Figure 20. Use the V-belt tension meter



A. Position of the tool on the longest V-belt in the centre and mark the belt
B. Push the tool down until you reach a 10 mm bending
C. O-ring is set on position 10 mm
D. Align the O-ring

1. O-ring set on initial position 0 N
2. The result of the measurement has to be between 35 N to 58 N

Table 15. Tightening value of V-belt

Belt L (mm)	1 st tightening for new belts only	After 6 months		
	Frequency (Hz)	Stress		Frequency (Hz)
		F (N)	F (kg)	
1500	105	45 ± 1.5	4.5 ± 0.15	Minimum 60
1532				
1582				
1632				Maximum 82

Note:
Belt tension measurement using a frequency meter gives more accurate results compared to dynamometers.
If the continental device is used, the value read on the device must be multiplied by 1.2 (for example, 87.5 Hz (continental) = 105 Hz (real valve)).

9.3.10 Lubricate the bearings

The pumps are equipped with separate grease-lubricated bearings. In normal operation the permanent-lubricated bearings are provided for 30000 h of maintenance free operation.

Maintenance

With increased thermal load, i. e. continuous operation at high intake pressures, gas ballast operation, it is advisable to check the bearings at shorter intervals. To do so, remove the rear and front covers.

Test the bearing grease. If the grease is degraded, clean the bearings and change the grease.

Use our special high temperature grease included in our repair kits and sets.

Grease quantity per bearing:

- Ball Bearing (D100) - 14 cm^3 or 12 g
- Ball Bearing (D120) - 20 cm^3 or 18 g

The motor bearings must be changed every 20000 h.

Please check the instruction manual of the motor, also available on Internet. Clean the motor and remove its condensate plugs once a year at least.

For all maintenance works, use only our genuine parts.

If non genuine parts are used during warranty period, we reserve the right to reject any claim.

10 Fault finding

Table 16. Fault finding

Fault	Pump does not start
Cause	**Pump is connected incorrectly**
Remedy	Connect the pump correctly.
Cause	**Motor protection switch incorrectly set**
Remedy	Set motor protection switch properly.
Cause	**Operating voltage does not match motor**
Remedy	Replace the motor.
Cause	**Motor is malfunctioning**
Remedy	Replace the motor.
Cause	**Oil temperature is below 12 °C (54 °F)**
Remedy	Heat the pump and pump oil or use different oil.
Cause	**Oil is too viscous**
Remedy	Use appropriate oil grade.
Cause	**Exhaust filter/exhaust line is clogged**
Remedy	Replace the filter or clean the exhaust line.
Cause	**Power transmission by V-belts is impaired**
Remedy	Tighten or replace the V-belts.
Cause	**Pump is seized up**
Remedy	Repair the pump.

Fault finding

Fault	Pump does not reach ultimate pressure
Cause	**Measuring technique or gauge is unsuitable**
Remedy	Use correct measuring technique and gauge.
Cause	**External leak**
Remedy	Repair the pump.
Cause	**Float valve does not close**
Remedy	Repair the valve.
Cause	**Anti-suckback valve is malfunctioning**
Remedy	Repair the valve.
Cause	**Inadequate lubrication due to: unsuitable or contaminated oil**
Remedy	Change the oil (degas it, if necessary).
Cause	**Inadequate lubrication due to: clogged oil filter**
Remedy	Replace the oil filter.
Cause	**Inadequate lubrication due to: clogged oil lines**
Remedy	Clean the oil casing.
Cause	**Vacuum lines are dirty**
Remedy	Clean vacuum lines.
Cause	**Pump is too small**
Remedy	Check the process date; replace the pump, if necessary.

Fault	Pumping speed is too slow
Cause	**Dirt trap in the intake port is clogged**
Remedy	Clean the dirt trap; Precaution : Install a dust filter in intake line.
Cause	**Exhaust filter is clogged**
Remedy	Install new filter elements.
Cause	**Connecting lines are too narrow or too long**
Remedy	Use adequately wide and short connecting lines.
Cause	**Anti-suckback valve is hard to open**
Remedy	Check spring free length.

Fault	After switching off pump under vacuum, pressure in system rises too fast
Cause	**System has a leak**
Remedy	Check the system.

Cause	**Anti-suckback is malfunctioning**
Remedy	Repair the valve.

Fault	**Pump gets too hot**
Cause	**Cooling air supply is obstructed**
Remedy	Set pump up correctly.
Cause	**Cooler is dirty**
Remedy	Clean the cooler.
Cause	**Ambient temperature is too high**
Remedy	Set pump up correctly.
Cause	**Process gas is too hot**
Remedy	Change the process.
Cause	**Oil level is too low**
Remedy	Add oil to reach the correct oil level.
Cause	**Oil is unsuitable**
Remedy	Change the oil.
Cause	**Oil cycle is obstructed**
Remedy	Clean or repair the oil lines.
Cause	**Exhaust filter/exhaust line is obstructed**
Remedy	Replace the exhaust filter, clean the exhaust line.
Cause	**Pump module is no longer usable**
Remedy	Replace the pump module.

Fault	**Oil in intake line or in vacuum vessel**
Cause	**Oil comes from the vacuum system**
Remedy	Check the vacuum system.
Cause	**Anti-suckback valve is obstructed**
Remedy	Clean or repair the valve.
Cause	**Sealing surfaces of anti-suckback valve are damaged or dirty**
Remedy	Clean or repair the intake port and valve.
Cause	**Oil level is too high**
Remedy	Drain the excess oil.

Fault finding

Fault	Pump's oil consumption too high, oil mist at exhaust
Cause	**Exhaust filters are clogged or damaged**
Remedy	Replace the filter.
Cause	**Nozzle of float valve is clogged**
Remedy	Check the valve, clean the nozzle.
Cause	**Oil level is too high**
Remedy	Drain the excess oil.

Fault	Oil is turbid
Cause	**Condensation**
Remedy	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.

Fault	Pump is excessively noisy
Cause	**Oil level is very low (oil is no longer visible)**
Remedy	Add oil.
Cause	**Oil filter is clogged**
Remedy	Change the oil and filter.
Cause	**Large vacuum leak in system**
Remedy	Repair vacuum leak.
Cause	**Power transmission by V-belts is impaired**
Remedy	Tighten or replace the V-belts.

11 Disposal

WARNING: CONTAMINATION

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

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

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

When sending us any equipment, observe the regulations given in *Service* on page 58.

11.1 Disposal of waste oil

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

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

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

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

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

12 Service

12.1 Return the equipment or components for service

Before you send your equipment to us for service or for any other reason, you must complete a Declaration of Contamination Form. The form tells us if any substances found in the equipment are hazardous, which is important for the safety of our employees and all other people involved in the service of your equipment. The hazard information also lets us select the correct procedures to service your equipment.

If you are returning equipment note the following:

- If the equipment is configured to suit the application, make a record of the configuration before returning it. All replacement equipment will be supplied with default factory settings.
- Do not return equipment with accessories fitted. Remove all accessories and retain them for future use.
- The instruction in the returns procedure to drain all fluids does not apply to the lubricant in pump oil reservoirs.

Download the latest documents from *leybold.com/en/downloads/download-documents/declaration-of-contamination/*, follow the procedure in HS1, fill in the electronic HS2 form, print it, sign it, and return the signed copy to us.

NOTICE:

If we do not receive a completed form, your equipment cannot be serviced.

13 Spare parts

To guarantee safe operation of the vacuum pump, only original spare parts and accessories should be used. When ordering spare parts and accessories, always state pump type and serial number.

Consumables and maintenance kits for pumps are usually available on stock at our service centres. The list of these parts and kits is given here:

- Oil filter (on some models)
- Exhaust filter
- Maintenance kits

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

For all maintenance works, use only genuine parts. If non genuine parts are used during warranty period, we reserve the right to reject any claim.

Table 17. Spare parts

Oil filter	EK96008
Exhaust filter	971431120
Exhaust filter ATEX	E6529954
Exhaust filter PFPE	971472600
G+ belt V630B LG1500 (Set 4)	GM6546394
G+ belt V630B LG1532 (Set 4)	GM6546395
G+ belt V750B LG1582 (Set 4)	GM6546396

Table 18. Inlet filter element

	SV630 B	SV630 BF	SV750 B
Inlet filter element	**Part numbers**		
Paper	71035242	71035242	71035242
Metal	71037734	71037734	71037734
Charcoal	71037724	71037724	71037724
Polyester	71261508	71261508	71261508

Table 19. Tools list

Oil filter key	71073532
Anti-suckback valve tool	E6538292
V-belt tension meter	971437840

Table 20. Maintenance kits

Minor maintenance kit	EK9608M
Minor maintenance kit- ATEX	EK9608AM
Minor maintenance kit- PFPE	EK9608PM
Major maintenance kit- DSS	EK9608001
Major maintenance kit- ATEX	EK9608A1

Spare parts

Major maintenance kit- ATEX, PTFE	EK9608A2
Major maintenance kit- PFPE	EK9608P1
Major maintenance kit- Helium	EK9608HE
DSS Shaft seal kit	GK9608DS1
DSS Shaft seal kit PFPE/O2	GK9608DS2
PTFE Shaft seal kit Helium/ATEX	GK9608PTFE1
PTFE Shaft seal kit OEM	GK9608PTFE2

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P20050139A

EU Declaration of Conformity

This declaration of conformity is issued under the sole responsibility of the manufacturer:

Leybold GmbH
Bonner Strasse 498
D-50968 Köln
Germany

Documentation Officer
T: +49(0) 221 347 0
documentation@leybold.com

The product specified and listed below

- **Product:** SOGEVAC, Single Stage Rotary Vane pumps, with motor
- **Models:** SV630-750B(F)
- **Pump family codes:**
  SV630 B(F) 960862Vxxxx to 960869Vxxxx and 10330650Vxx
  SV750 B(F) 960875Vxxxx to 960877Vxxxx and 10330750Vxx

  xx or xxxx are chronologically numbered customer variants
  SV630 B & SV750 B are air cooled
  SV630 BF & SV750 BF are water cooled

Is in conformity with the relevant Union harmonisation legislation:

2006/42/EC	Machinery directive *Note: The safety objectives of the Low Voltage Directive 2014/35/EU were complied with in accordance with Annex 1 No. 1.5.1 of this directive.*
2011/65/EU	Restriction of certain hazardous substances (RoHS) directive as amended by Delegated Directive (EU) 2015/863

Based on the requirements of relevant harmonised standards and technical documentation:

EN 1012-2:1996 +A1:2009	Compressors and vacuum pumps. Safety requirements. Vacuum pumps
EN 60204-1:2018	Safety of machinery. Electrical equipment of machines. General requirements

This declaration, based on the requirements of the listed Directives and EN ISO/IEC 17050-1, covers all product serial numbers from this date on: *2022-12-07*

You must retain the signed legal declaration for future reference
This declaration becomes invalid if modifications are made to the product without prior agreement.

Andries de BOCK
VP Engineering
Industrial Vacuum Division

François BOUILLOT
General Manager
Leybold Valence

P20050139A

Declaration of Conformity

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Leybold GmbH
Bonner Strasse 498
D-50968 Köln
Germany

Documentation Officer
Innovation Drive
Burgess Hill
West Sussex
RH15 9TW
documentation@leybold.com

The product specified and listed below

- **Product:** SOGEVAC, Single Stage Rotary Vane pumps, with motor
- **Models:** SV630-750B(F)
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  SV750 B(F) 960875Vxxxx to 960877Vxxxx and 10330750Vxx

  xx or xxxx are chronologically numbered customer variants
  SV630 B & SV750 B are air cooled
  SV630 BF & SV750 BF are water cooled

The object of the declaration described above is in conformity with relevant statutory requirements:

Supply of Machinery (Safety) Regulations 2008
The objectives of the Electrical Equipment (Safety) Regulations 2016 are governed by Annex 1 1.5.1 of this regulation.

Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Based on the relevant requirements of harmonised standards:

EN 1012-2:1996 +A1:2009	Compressors and vacuum pumps. Safety requirements. Vacuum pumps
EN 60204-1:2018	Safety of machinery. Electrical equipment of machines. General requirements

This declaration, based on the requirements of the listed Statutory Instruments and EN ISO/IEC 17050-1, covers all product serial numbers from this date on:*2022-12-07*

You must retain the signed legal declaration for future reference
This declaration becomes invalid if modifications are made to the product without prior agreement.

Signed for and on behalf of / Leybold GmbH

Andries de BOCK
VP Engineering
Industrial Vacuum Division

François BOUILLOT
General Manager
Leybold Valence

ADDITIONAL LEGISLATION AND COMPLIANCE INFORMATION

EMC (EU, UK): Class A/B Industrial equipment

Caution: This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.

RoHS (EU, UK): Material Exemption Information

This product is compliant with the following Exemptions
Annex III:

- 6(a) **Lead** as an alloying element in steel for machining purposes and in galvanised steel containing up to 0.35 % lead by weight
- 6(b) **Lead** as an alloying element in aluminium containing up to 0.4% by weight
- 6(c) Copper alloy containing up to 4% **lead** by weight

REACH (EU, UK)

This product is a complex article which is not designed for intentional substance release. To the best of our knowledge the materials used comply with the requirements of REACH. The product manual provides information and instruction to ensure the safe storage, use, maintenance and disposal of the product including any substance based requirements.

Article 33.1 Declaration (EU, UK)

This product contains Candidate List Substances of Very High Concern above 0.1%ww by article as clarified under the 2015 European Court of Justice ruling in case C-106/14.

- Lead (Pb)
  This substance is present in certain steel / aluminium / brass components.

Compliance Information – incorporated products and assemblies

Motors	Regulation (EU) No 2019/1781 electric motors and variable speed drives *Basedoin the requirements of harmonised standard:* EN 60034-30:2009: Rotating electrical machines -- Part 30: Efficiency classes of single-speed, three-phase, cage-induction motors (IE-code)
Fans	2009/125/EC Ecodesign directive requirements for energy-related products Regulation (EU) No 327/2011: Industrial fans driven by motors

Additional Applicable Requirements

The product is in scope for and complies with the requirements of the following:

2012/19/EU	Directive on waste electrical and electronic equipment (WEEE)

材料成分声明
China Material Content Declaration

	有害物质 Hazardous Substances					
部件名称 Part name	铅 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr VI)	多溴联苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
铸铝及铝合金制品 Aluminium alloys	X	O	O	O	O	O
o钢合金制品 Steel alloys	X	O	O	O	O	O
铜管管件 Brass pipe fitting	X	O	O	O	O	O
铜接头 Brass connectors	X	O	O	O	O	O
铜衬套轴承 Brass bush bearing	X	O	O	O	O	O

O: 表示该有害物质在该部件的所有均质材料中的含量低于 GB/T 26572 标准规定的限量要求。
O: Indicates that the hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in GB/T 26572.

X: 表示该有害物质在该部件的至少一种均质材料中的含量超出 GB/T26572 标准规定的限量要求。
X: Indicates that the hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T26572.

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Leybold

Pioneering products. Passionately applied.

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