

# Vacuum Unit SVAGG

## Assembly and Operating manual



## Imprint

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### Technical changes:

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Kindest Regards

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# 1 General

## 1.1 About this manual

This manual contains important information for a safe and appropriate use of the product.

This manual is an integral part of the product and must be kept accessible for the personnel at all times.





Before starting work, the personnel must have read and understood this operating manual. Prerequisite for safe working is the observance of all safety instructions in this manual.

Illustrations in this manual are provided for basic understanding and may differ from the actual product design.

In addition to these instructions, the documents listed under [\(☞ 1.1.2, Page 6\)](#) are applicable.

### 1.1.1 Presentation of Warning Labels

To make risks clear, the following signal words and symbols are used for safety notes.

	<p><b>! DANGER</b></p> <p><b>Danger for persons!</b> Non-observance will inevitably cause irreversible injury or death.</p>
	<p><b>! WARNING</b></p> <p><b>Dangers for persons!</b> Non-observance can lead to irreversible injury and even death.</p>
	<p><b>! CAUTION</b></p> <p><b>Dangers for persons!</b> Non-observance can cause minor injuries.</p>
	<p><b>NOTICE</b></p> <p><b>Material damage!</b> Information about avoiding material damage.</p>

### 1.1.2 Applicable documents

- General terms of business \*
- Catalog data sheet of the purchased product \*
- Vacuum pump operating manual:  
ID number for type SVAGG 06: TDS 30.30.01.00401  
ID number for type SVAGG 18: TDS 30.30.01.00402  
ID number for type SVAGG 40: TDS 30.30.01.00002  
ID number for type SVAGG 63: TDS 30.30.01.00003

The documents marked with an asterisk (\*) can be downloaded on our homepage [www.schunk.com](http://www.schunk.com).

### 1.1.3 Variants

This operating manual applies to the following variations:

- SVAGG6-L Basic
- SVAGG18-L Basic
- SVAGG40-L Basic
- SVAGG63-L Basic

## 1.2 Warranty

If the product is used as intended, the warranty is valid for 24 months from the ex-works delivery date under the following conditions:

- Observe the applicable documents ([👉 1.1.2, Page 6](#))
- Observance of the specified care and maintenance instructions ([👉 9, Page 42](#))
- Damage resulting from operation of the vacuum unit with the incorrect direction of rotation is not covered by the warranty.

## 1.3 Scope of delivery

The scope of delivery includes

- Vacuum Unit SVAGG
- 2 m vacuum hose

## 2 Basic safety notes

### 2.1 Intended use

The vacuum unit serves to control and provide a particular type of vacuum and as a suction accumulator for evacuated liquid media.

It was developed for use in combination with vacuum clamping devices. With the aid of the operating vacuum produced, suitable workpieces can be fixed onto a CNC machining center vacuum clamping device intended for this purpose.

The vacuum unit is specially suited and designed for evacuating media containing liquids. It can therefore also be used for CNC machining centers which work with coolants and lubricants.

Using suitable safety precautions on equipment and devices used in conjunction with the vacuum unit, danger to people and property damage must be prevented in the case of a loss of operating vacuum. A prerequisite for the use of the vacuum unit is a machine or system in accordance with the Machine Directive 2006/42/EC with corresponding safety installations.

The product is designed for industrial use.

To use this unit as intended, it is also essential to observe the technical data and installation and operation notes in this manual and to comply with the maintenance intervals.

### 2.2 Not intended use

The vacuum unit is not suitable for picking up body parts and living things. Evacuating objects which have a danger of imploding or other non-permitted media is strictly forbidden. The vacuum unit is not designed for all types of mechanical loads.

For safety reasons, the vacuum unit may not be modified or changed without approval.

A not intended use is not permitted and can result in hazardous situations!

## 2.3 Constructional changes

### Implementation of structural changes

By conversions, changes, and reworking, e.g. additional threads, holes, or safety devices can impair the functioning or safety of the product or damage it.

- Structural changes should only be made with the written approval of SCHUNK.

## 2.4 Spare parts

### Use of unauthorised spare parts

Using unauthorised spare parts can endanger personnel and damage the product or cause it to malfunction.

- Use only original spare parts or spares authorised by SCHUNK.

## 2.5 Environmental and operating conditions

### Required ambient conditions and operating conditions

Incorrect ambient and operating conditions can make the product unsafe, leading to the risk of serious injuries, considerable material damage and/or a significant reduction to the product's life span.

- Make sure that the product is used only in the context of its defined application parameters, ([☞ 3, Page 18](#)).
- Make sure that the product is a sufficient size for the application.
- Make sure that the product's range of application is outside the explosive area. Excepted are products which were designed for explosive areas.
- Observe maintenance and lubrication intervals, ([☞ 9, Page 42](#)).
- Make sure that the environment is free from splash water and vapors as well as from abrasion or processing dust. Exceptions are products that are designed especially for contaminated environments.

## 2.6 Obligations of the operator

The vacuum unit was designed and built whilst taking into account a risk assessment and after carefully selecting the harmonized standards which had to be adhered to as well as other technical specifications. This corresponds to the state of the art and guarantees the highest level of safety.

This safety can however only be achieved in operation if all measures required for this are met. It lies in the vacuum unit operator's duty of care to plan these measures and monitor their execution.

The operator must particularly ensure that:

- the vacuum unit is only used as intended
- the vacuum unit is only operated in an impeccable, functional condition and particularly the safety equipment is regularly inspected to make sure they are working properly
- the operating manual is always available in a legible condition and in its entirety at the machine's application location
- only sufficiently qualified and authorized personnel operate, maintain and repair the vacuum unit
- this personnel is regularly trained in all relevant questions relating to operational safety and environmental protection, and is familiar with the operating manual, particularly the safety information contained therein.

Furthermore, the operator must make sure that

- in a risk assessment (as per operational safety and health act § 5), all other dangers are identified which may result from the specific operating conditions at the application location and the integration of the vacuum unit into a machine in accordance with Machine Directive 2006/42/EC.

## 2.7 Personnel qualification

### Inadequate qualifications of the personnel

If the personnel working with the product is not sufficiently qualified, the result may be serious injuries and significant property damage.

- All work may only be performed by qualified personnel.
- Before working with the product, the personnel must have read and understood the complete assembly and operating manual.
- Observe the national safety regulations and rules and general safety instructions.

The following personal qualifications are necessary for the various activities related to the product:

- Trained electrician** Due to their technical training, knowledge and experience, trained electricians are able to work on electrical systems, recognize and avoid possible dangers and know the relevant standards and regulations.
- Pneumatics specialist** Pneumatics specialists have been trained for this particular area of responsibility and know the relevant standards and regulations.
- Hydraulic specialist** Hydraulic specialists have been trained for this particular area of responsibility and knows the relevant standards and regulations.
- Qualified personnel** Due to its technical training, knowledge and experience, qualified personnel is able to perform the delegated tasks, recognize and avoid possible dangers and knows the relevant standards and regulations.
- Instructed person** Instructed persons were instructed by the operator about the delegated tasks and possible dangers due to improper behaviour.
- Service personnel of the manufacturer** Due to its technical training, knowledge and experience, service personnel of the manufacturer is able to perform the delegated tasks and to recognize and avoid possible dangers.

## 2.8 Personal protective equipment

### Using personal protective equipment

Not wearing personal protective equipment while working with the product, may result in dangers that impact the personnel's safety and health.

- While working with the product, observe the health and safety regulations and wear the required personal safety equipment.
- Observe the valid safety and accident prevention regulations.
- In case of sharp edges and corners and rough surfaces, wear protection gloves.
- In case of hot surfaces, wear heat-resistant protection gloves.
- When dealing with hazardous substances, wear protection gloves and goggles.
- In case of moving parts, wear tight protection clothes.

## 2.9 Notes on safe operation

### Incorrect handling of the personnel

Incorrect handling and assembly may impair the product's safety and cause serious injuries and considerable material damage.

- Avoid any manner of working that may interfere with the function and operational safety of the product.
- Use the product as intended.
- Observe the safety notes and assembly instructions.
- Do not expose the product to any corrosive media. This does not apply to products that are designed for special environments.
- Eliminate any malfunction immediately.
- Observe the care and maintenance instructions.
- Observe the current safety, accident prevention and environmental protection regulations regarding the product's application field.

## 2.10 Transport

### Handling during transport

Incorrect handling during transport may impair the product's safety and cause serious injuries and considerable material damage.

- When handling heavy weights, use lifting equipment to lift the product and transport it by appropriate means.
- Secure the product against falling during transportation and handling.
- Stand clear of suspended loads.

## 2.11 Malfunctions

### Behavior in case of malfunctions

- Immediately remove the product from operation and report the malfunction to the responsible departments/persons.
- Order appropriately trained personnel to rectify the malfunction.
- Do not recommission the product until the malfunction has been rectified.
- Test the product after a malfunction to establish whether it still functions properly and no increased risks have arisen.

## 2.12 Disposal

### Handling of disposal

The incorrect handling of disposal may impair the product's safety and cause serious injuries as well as considerable material and environmental harm.

- Follow local regulations on dispatching product components for recycling or proper disposal.

## 2.13 Fundamental dangers

### General

- Observe safety distances.
- Never deactivate safety devices.
- Before commissioning the product, take appropriate protective measures to secure the danger zone.
- Disconnect power sources before installation, modification, maintenance, or calibration. Ensure that no residual energy remains in the system.
- If the energy supply is connected, do not move any parts by hand.
- Do not reach into the open mechanism or movement area of the product during operation.

### 2.13.1 Protection during handling and assembly

#### Incorrect handling and assembly

Incorrect handling and assembly may impair the product's safety and cause serious injuries and considerable material damage.

- Have all work carried out by appropriately qualified personnel.
- For all work, secure the product against accidental operation.
- Observe the relevant accident prevention rules.
- Use suitable assembly and transport equipment and take precautions to prevent jamming and crushing.

#### Incorrect lifting of loads

Falling loads may cause serious injuries and even death.

- Stand clear of suspended loads and do not step into their swiveling range.
- Never move loads without supervision.
- Do not leave suspended loads unattended.

### 2.13.2 Protection during commissioning and operation

#### Falling or violently ejected components

Falling and violently ejected components can cause serious injuries and even death.

- Take appropriate protective measures to secure the danger zone.
- Never step into the danger zone during operation.

### 2.13.3 Protection against electric shock

#### Work on electric equipment

Touching live parts can result in death.

- Work on electrical installations must be performed only by electricians in accordance with the electrical regulations.
- Observe the general installation and safety regulations concerning work on high-voltage systems.
- Lay electrical cables correctly, e.g. in a cable duct or cable protector. Observe standards.
- Before connecting or disconnecting electric cables, switch off the power supply and check that lines are dead. Secure power supply against reactivation.
- Before switching on the product, check whether the protective conductor on all electrical components has been installed correctly according to the connection diagram.
- Check whether covers and safety equipment to prevent contact with live components have been installed.
- Do not touch the connecting elements of the product when the power supply is switched on.

### **Possible electrostatic energy**

Components or assembly groups may become electrostatically charged. When the electrostatic charge is touched, the discharge may trigger a shock reaction leading to injuries.

- The operator must ensure that all components and assembly groups are included in the local potential equalisation in accordance with the applicable regulations.
- While paying attention to the actual conditions of the working environment, the potential equalisation must be implemented by a specialist electrician according to the applicable regulations.
- The effectiveness of the potential equalisation must be verified by executing regular safety measurements.

## **2.14 Notes on particular risks**

Before beginning all work, please make yourself sufficiently acquainted with:

- 1 the details of the vacuum unit
- 2 the machine's equipment
- 3 the way the vacuum unit works
- 4 the immediate vicinity of the vacuum unit and the machine or equipment with which the vacuum unit is used
- 5 the safety functions of the machine
- 6 the measures required in case of emergency.

Before each start, perform the following activities:

- 1 Check and ensure that all safety equipment is fitted and working properly.
- 2 Check the vacuum unit for visible damage and immediately eliminate or report any deficiencies to the supervisory staff.
- 3 Only operate the vacuum unit and the machine in flawless condition.
- 4 Check and ensure that only authorized personnel enter the working area of the machine or system, and that no other people are endangered by the machine being switched on.



**⚠ DANGER**

**Risk of fatal injury due to electric current!**

Touching live parts poses an immediate risk of fatal injury by electrocution.

- Only allow a qualified electrician to perform work on electrical components.
- Prior to commencing work on electric components, restore to a de-energized state.
- In the event of damage to the isolation power supply, shut off immediately and arrange for a repair.
- Keep humidity away from live parts.



**⚠ WARNING**

**Risk of injury due to extreme vacuum and high volumetric flow!**

Hair, skin, body parts and items of clothing can be drawn in and cause severe injuries.

- Wear a hair net, close-fitting clothing and protective goggles.
- Do not look or reach into the suction unit connection.
- Do not bring the suction opening near to body orifices.



**⚠ WARNING**

**Risk of burns through contact with hot surfaces!**

Surfaces of components can heat up severely during operation. Skin contact with hot surfaces causes severe injuries to the skin.

- For all work in the vicinity of hot surfaces, always wear protective gloves or wait until the surfaces have cooled down to the ambient temperature.

**⚠ CAUTION****Risk of injury due to particles flying around in the exhaust air!**

The exhaust air produced by the vacuum generator – depending on the purity of the surrounding air – may contain particles which escape from the air outlet at high speed and cause injuries to the face and eyes.

- Do not look into the exhaust air.
- Wear protective goggles.

**⚠ CAUTION****Risk of injury due to aerosols!**

When outgassing the vacuum pump, aerosols (air-particle mixtures) may be formed, which may cause injuries to the eyes and airways.

- Wear face mask/mask.
- Wear protective goggles.

**⚠ CAUTION****Risk of injury due to malfunctions!**

Failure of the power or pump or a line breakage may cause the workpiece being processed to move or become loose on the machine table or in the system, leading to injury and property damage.

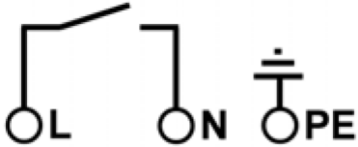
- After a failure or malfunction of the vacuum supply system, perform the clamping process of the workpiece again from the beginning.
- Re-establish the vacuum supply and check the system for any remaining software errors (switching functions of the machine control system).

### 3 Technical data

#### 3.1 Basic data

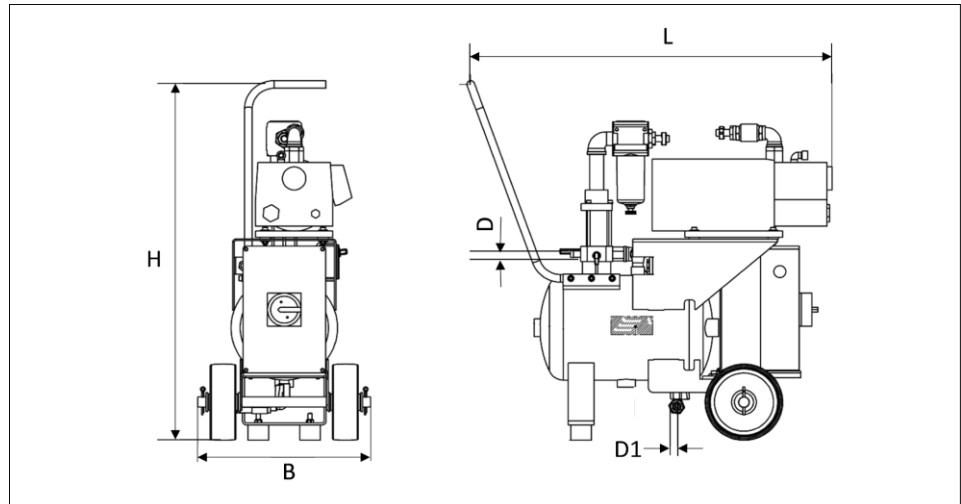
Designation	SVAGG			
	6-L Basic	18-L Basic	40-L Basic	63-L Basic
Pump type	EVE-OG 6	EVE-OG 18	EVE-OG 40	EVE-OG 63
Max. vacuum [mbar]	930			
Storage volume [L]	10	30	80	80
Suction capacity at 50 Hz [m <sup>3</sup> /h]	6	18	40	63
Voltage at 50 Hz [V]	175-260/ 300-450	190-260/ 300-450	200-240/ 345-420	200-240/ 345-420
Output at 50 Hz [kW]	0.25	0.55	1.1	1.5
Sound level at 50 Hz [db/A]	48	63	64	65
Weight [kg]	30	60	100	105
Oil quantity [l]	0.8	1.0	1.6	1.9

#### Electrical output for machine release

Max. switching voltage	Max. switching current	Connector assignment
24 V DC	1 A	

## 3.2 Dimensions

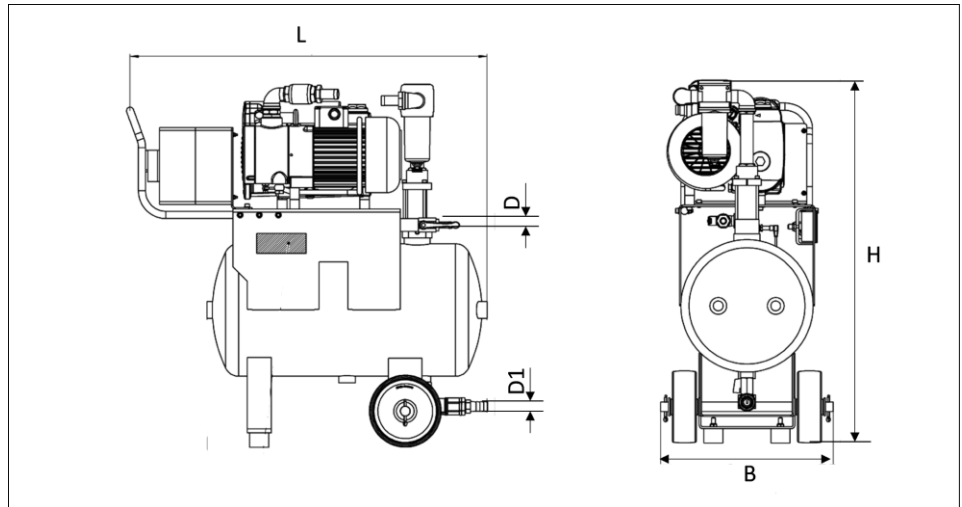
### 3.2.1 SVAGG 6



Dimensions SVAGG 6

Designation	SVAGG 6-L Basic
L [mm]	715
W [mm]	335
H [mm]	700
D [mm]	12
D1 [mm]	25

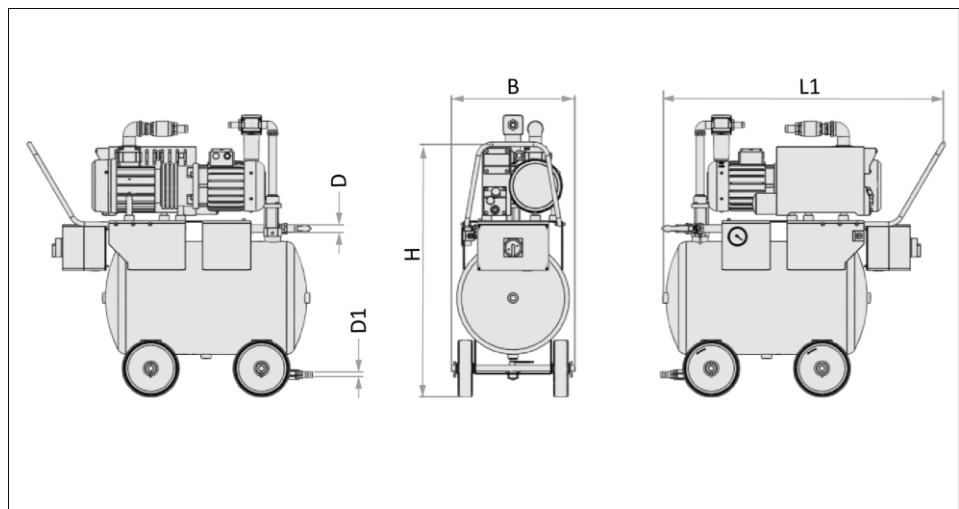
### 3.2.2 SVAGG 18



Dimensions SVAGG 18

Designation	SVAGG 18-L Basic
L [mm]	742
W [mm]	314
H [mm]	767
D [mm]	12
D1 [mm]	25

### 3.2.3 SVAGG 40, 63



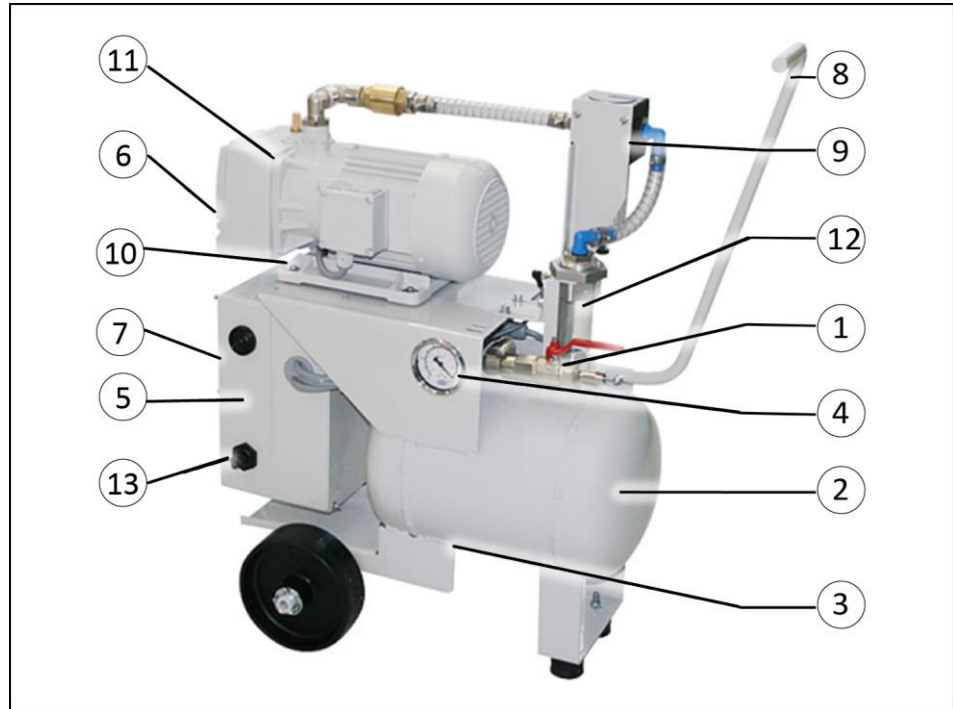
Dimensions SVAGG 40, 63

Designation	SVAGG	
	40-L Basic	63-L Basic
L [mm]	1016	1016
W [mm]	435	435
H [mm]	965	965
D [mm]	25	25
D1 [mm]	25	25

## 4 Design and description

### 4.1 Design

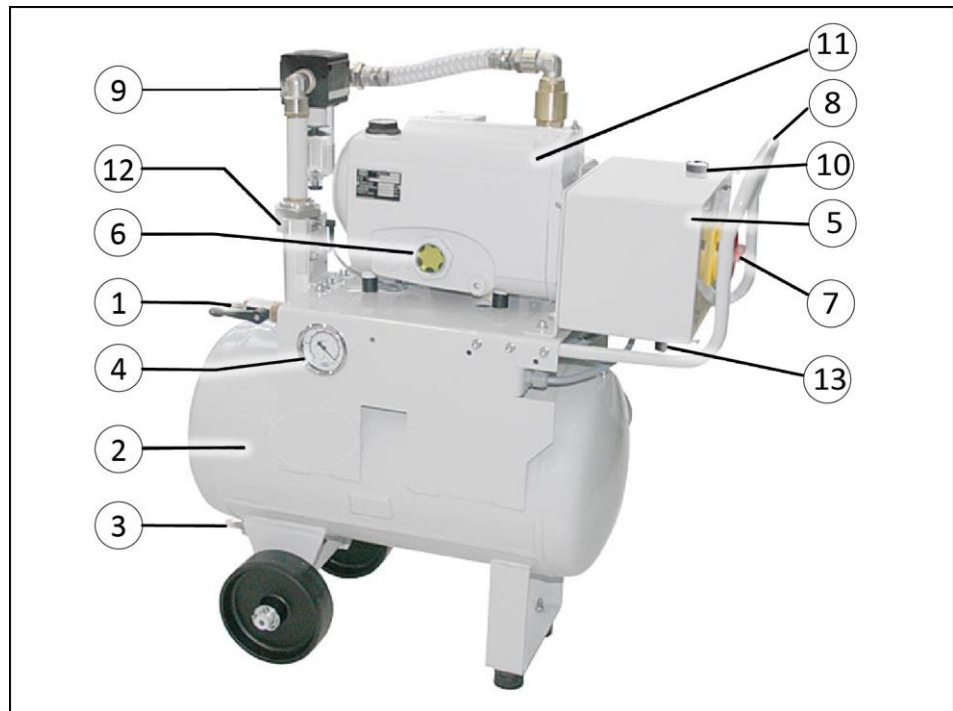
#### 4.1.1 SVAGG 6



Overview SVAGG 6

1	Manual hand lever valve (vacuum ON/OFF) with hose dip	8	Handle
2	Vacuum containers/ suction accumulator	9	Droplet separator
3	Manual exhaust valve with hose nozzle	10	Pressure switch energy-saving function
4	Vacuum pressure gauge	11	Vacuum pump
5	Electrical switch box	12	Sight glass with float gauge
6	Oil sight glass	13	Interface to the machine
7	Power switch		

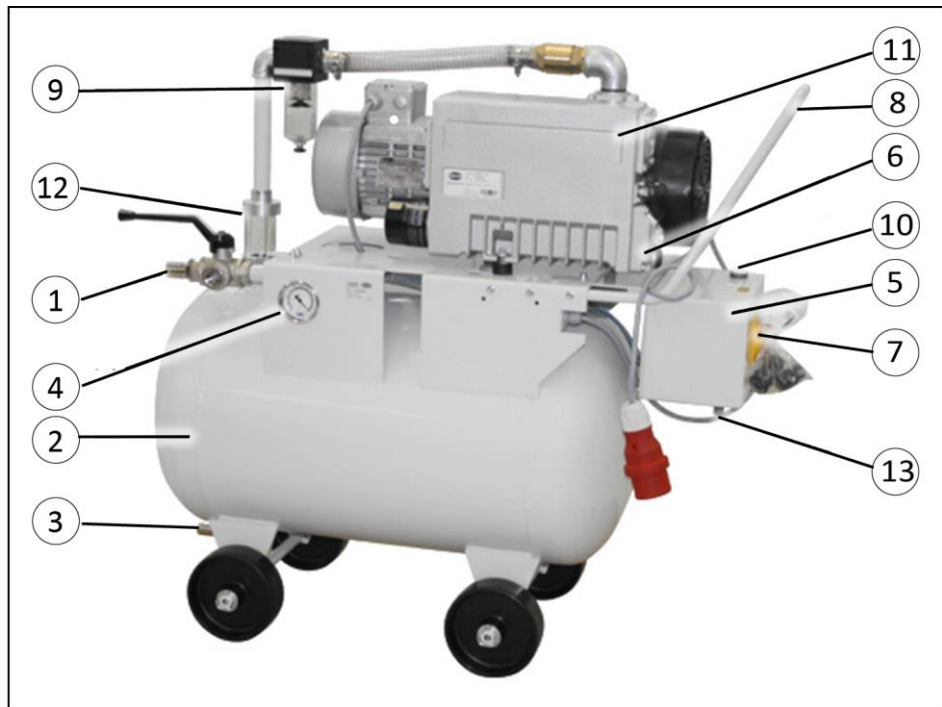
## 4.1.2 SVAGG 18



Overview SVAGG 18

1	Manual hand lever valve (vacuum ON/OFF) with hose dip	8	Handle
2	Vacuum containers/ suction accumulator	9	Droplet separator
3	Manual exhaust valve with hose nozzle	10	Pressure switch energy-saving function
4	Vacuum pressure gauge	11	Vacuum pump
5	Electrical switch box	12	Sight glass with float gauge
6	Oil sight glass	13	Interface to the machine
7	Power switch		

### 4.1.3 SVAGG 40, 63



Overview SVAGG 40, 63

1	Manual hand lever valve (vacuum ON/OFF) with hose dip	8	Handle
2	Vacuum containers/suction accumulator	9	Droplet separator
3	Manual exhaust valve with hose nozzle	10	Pressure switch energy-saving function
4	Vacuum pressure gauge	11	Vacuum pump
5	Electrical switch box	12	Sight glass with float gauge
6	Oil sight glass	13	Interface to the machine
7	Power switch		

## 4.2 Description

The vacuum unit serves to control and provide a particular type of operating vacuum and as a suction accumulator for evacuated liquid media. It was specially developed for use in combination with vacuum clamping devices, and may only be used for this purpose. ([↗ 2.1, Page 7](#)). The vacuum unit represents the interface between the machine and the clamping device.

The integrated vacuum pump achieves a maximum vacuum of approx. -0.93 bar and runs in continuous operation as standard. Depending on the conditions, for instance, the workpiece material, the condition of the seals, etc. a permanent vacuum is set to between -0.6 and -0.93 bar.

Using the machine's interface (13), the states of the vacuum and the fill level of the liquid in the vacuum container (2) are monitored. When the limits are reached, electrical signals are output or interrupted.

The evacuated media are guided away from the clamping device using the vacuum unit. The liquid contained is separated by the vacuum unit and remains in the vacuum container (2). The increasing liquid level is indicated visually by a float gauge (5). If the level reaches a critical range in the vacuum container (2), this is indicated by the float gauge (5) being in the red area and an acoustic warning signal. Simultaneously, the machine release of the potential-free contact is interrupted.

The liquid collected in the vacuum container can be drained manually using the drain valve (1). Here, the vacuum unit must be switched off (for more information on draining, [↗ 7.2, Page 35](#)).

**Energy-saving mode** The vacuum unit is equipped with an energy-saving function. This function is activated by actuating a pressure switch (10) and regulated by an integrated vacuum sensor. Here, the vacuum pump is switched off when it reaches approx. -0.8 bar. If the vacuum falls below a pressure of -0.7 bar due to leaks in the vacuum system, the vacuum pump is automatically switched on.

Operation in energy-saving mode is permitted with a starting frequency  $\leq 12$  starts/hour. With a higher starting frequency, the vacuum unit must be operated continuously.

## 5 Transport and storage

### 5.1 Transport

#### Delivery

- Check the delivery is complete using the enclosed delivery paperwork.
- Report any damage caused by deficient packaging or during transport to the delivery company and SCHUNK GmbH.

#### Packaging

The vacuum unit is dispatched from the factory upright, tied down on a pallet.



#### **NOTICE**

##### **Property damage caused by sharp objects!**

When opening the packaging using knives or other sharp objects, hoses and cables may be damaged.

- Carefully remove the packaging.
- Remove film, cardboard, straps and packaging wood. Carefully unpack vacuum unit. Remove labeled transport aids and safety devices.
- Dispose of packaging material in accordance with country-specific laws and regulations.
- For transport, the vacuum unit is fitted with rollers and a handle, meaning it can be flexibly moved to the respective area of application. Always transport the vacuum unit upright, as otherwise oil may escape from the pump.


### 5.2 Storage


Store the product in a clean, dry environment.

Ambient temperature: 10 – 40°C.

No condensation permitted!


## 6 Commissioning

	<b>⚠ CAUTION</b>
	<p><b>Risk of injury and damage to property due to incorrect installation!</b></p> <ul style="list-style-type: none"> <li>• Before commissioning, the vacuum unit must be inspected for visible damage.</li> <li>• Place the vacuum unit on firm and even ground so that it cannot tip over.</li> </ul>

	<b>NOTICE</b>
	<p><b>Property damage due to lack of oil!</b></p> <ul style="list-style-type: none"> <li>• Before commissioning and operating the vacuum unit, check the oil level of the vacuum pump using the oil sight glass (6).</li> </ul>

### 6.1 Electrical connection

Position of the position numbers ([↔ 4, Page 22](#)):

	<b>⚠ DANGER</b>
	<p><b>Risk of fatal injury due to electric current!</b></p> <p>Touching live parts poses an immediate risk of fatal injury by electrocution.</p> <ul style="list-style-type: none"> <li>• Only allow a qualified electrician to perform work on electrical components.</li> <li>• Prior to commencing work on electric components, restore to a de-energized state.</li> <li>• In the event of damage to the isolation power supply, shut off immediately and arrange for a repair.</li> <li>• Keep humidity away from live parts.</li> </ul>

- 1 Electrical performance data can be found on the name plate of the pump motor.
- 2 Lay power cables and other energy supply lines so that they do not pose a risk of tripping and are protected from mechanical damage. SCHUNK recommends laying cables in a closed conduit.
- 3 It is connected using a CEE plug with 5 pins (400 V, 16 A).

**Check direction of rotation of the vacuum pump****NOTICE****Property damage caused by incorrect direction of rotation!**

If the motor rotates in the wrong direction, this can damage the vacuum pump.

- Make sure that the fan blades rotate in the direction of the arrow.
- If the direction of rotation is incorrect, reverse the polarity of the supply lines.

Direction of rotation  
arrow



Fan blades

- 1 Switch on vacuum unit. To do so, switch on the power switch (7) on the electrical switch box (5).
- 2 Observe the direction of rotation of the fan blades on the vacuum pump (14).  
The specified direction of rotation is shown by the arrow on the motor housing. The device is supplied with a "clockwise rotating field".
- 3 If the vacuum unit is rotated in the wrong direction, switch it off immediately and reverse the polarity of the power plug connection.
- 4 Recheck direction of rotation.

## 6.2 Vacuum connection

Position of the position numbers ([↩ 4, Page 22](#)):

Connect the vacuum unit to the clamping device using the vacuum connection (1) and a suitable vacuum hose (included in the scope of delivery):

- Connecting hose clamping device/vacuum unit for SVAGG-6/18 =  $\varnothing$ 12 mm
- Connecting hose clamping device/ vacuum unit for SVAGG-40/63 =  $\varnothing$ 25 mm

## 6.3 Connect electric signal line

Position of the position numbers ([↩ 4, Page 22](#)):

Connecting the vacuum unit to the machine's control acts as an additional safety device. With the connection plug included in the scope of delivery, the vacuum unit must be connected to the control unit of the entire machine.

Using the machine's interface (13), the states of the vacuum and the fill level of the liquid in the vacuum container (2) can be monitored. When the limits are reached, electrical signals are output or interrupted.



### **⚠ DANGER**

#### **Risk of fatal injury due to electric current!**

Touching live parts poses an immediate risk of fatal injury by electrocution.

- Only allow a qualified electrician to perform work on electrical components.
- Prior to commencing work on electric components, restore to a de-energized state.
- In the event of damage to the isolation power supply, shut off immediately and arrange for a repair.
- Keep humidity away from live parts.

The connection of the potential-free contacts (opener) is on the electrical switch box (5).

The vacuum unit's circuit diagram is in the electrical switch box (5).

- 1 Connect a three-wire cable to the supplied connection plug (connection L, connection N and protective conductor).
- 2 Check switching procedure with a continuity tester (between L and N) by activating and deactivating the vacuum supply.
- 3 Integrate signal into the machine control system, so that the workpiece can be processed if the corresponding signal is emitted from the vacuum unit and/or the ongoing operation is suspended if the signal is interrupted.

### 6.4 Check operating vacuum

Position of the position numbers ([👉 4, Page 22](#)):

- 1 Close exhaust valve (3) and hand lever valve (1) for suction unit connection.
- 2 Switch on vacuum unit at the power switch (7).  
⇒ An acoustic warning signal sounds.
- 3 Observe the build-up of the operating vacuum on the pressure gauge (4).  
⇒ After reaching the operating vacuum of -0.6 bar, the acoustic warning signal stops.  
The vacuum unit runs in continuous operation and it builds up a maximum, constant vacuum of around -0.93 bar.
- 4 Continue to observe operating vacuum on pressure gauge (4).  
**NOTICE! The vacuum pressure reached may fall to a maximum of 0.1 bar in the next 20 minutes.**

## 6.5 Check the function of the acoustic warning device

Position of the position numbers ([↩ 4, Page 22](#)):

- 1 Close exhaust valve (3) and hand lever valve (1) for suction unit connection.
- 2 Switch on vacuum unit at the power switch (7).
  - ⇒ An acoustic warning signal sounds.
- 3 Observe the build-up of the operating vacuum on the pressure gauge (4).
  - ⇒ The acoustic warning signal must sound until the operating vacuum of -0.6 bar has been built up. The output for the machine release is interrupted.
  - ⇒ From -0.6 bar, the warning signal stops and the output for the machine release is signaled (electrical signal "1").
  - ⇒ The vacuum unit remains in continuous operation and increases the vacuum until it reaches a constant vacuum level of approx -0.93 bar.
  - ⇒ The vacuum usually decreases when working on a clamping device with open vacuum connection.
  - ⇒ If the operating vacuum falls below -0.6 bar, the warning signal sounds again and the machine release is interrupted again.

## 6.6 Check that the fill level monitoring is functioning properly

Position of the position numbers ([↩ 4, Page 22](#)):

- 1 Close exhaust valve (3) and hand lever valve (1) for suction unit connection.
- 2 Switch on vacuum unit at the power switch (7).
- 3 After reaching the operating vacuum, connect the supplied vacuum hose with the suction connection (1) and dip it into a container with coolant.
- 4 Carefully open the suction connection (1) and take up the coolant.
- 5 Observe visual fill level display (12).
  - ⇒ The dipstick rises. The critical fill level is shown in red on the dipstick.
  - ⇒ When the critical fill level is reached, the acoustic warning signal sounds. The output for the machine release is interrupted.
- 6 Close suction connection (1).
- 7 Switch off vacuum unit.
- 8 Ventilate the system by opening the suction connection (1) to the atmosphere.
- 9 Wait until the operating vacuum pressure has been completely released.
- 10 Open drain valve (3) and drain liquid reservoir.

## 6.7 Activate energy-saving function

Position of the position numbers ([↗ 4, Page 22](#)):

Position of the position numbers ([↗ 4.2, Page 25](#)): --- FEHLENDER LINK ---

The vacuum unit is equipped with an energy-saving function. This function is activated by actuating a pressure switch and regulated by the integrated vacuum sensor.



### NOTICE

#### Property damage caused by the starting frequency being set too high!

If the starting frequency is set too high, the vacuum pump may be destroyed.

- Operation in energy-saving mode is only permitted up to a frequency of 10 starts per hour.
- With a higher starting frequency, the vacuum unit must be operated continuously.



Energy-saving function, push button (10)

After activating the energy-saving function, the vacuum pump is switched off when a vacuum of approx -0.8 bar is reached (energy-saving function).

If the vacuum falls below a pressure of approx. -0.7 bar due to leaks in the vacuum system, the vacuum pump is automatically switched on.

## 7 Operation

Perform the following activities each time before starting the vacuum:

- 1 Check and ensure that all safety equipment is fitted and working properly.
- 2 Check the vacuum unit for visible damage and immediately eliminate or report any deficiencies to the supervisory staff.
- 3 Only operate vacuum unit and the machine in flawless condition.
- 4 Check and ensure that only authorized personnel enter the working area of the machine or system, and that no other people are endangered by the machine being switched on.

Note: for processing workpieces on CNC machining centers, an operating vacuum of at least -0.6 bar must be reached. The vacuum is monitored by an integrated vacuum sensor and displayed visually on the pressure gauge.

### 7.1 Connect clamping device

Position of the position numbers ([↩ 4, Page 22](#)):

- 1 Connect the vacuum hose ( $\varnothing 12$  mm) included in the scope of delivery to the suction connection (1).  
Connect the other end to the vacuum clamping device.
- 2 Close valves (1 and 3).
- 3 Make sure that the electrical supply and the incorporation of safety equipment is ensured in the machine control.
- 4 Switch on vacuum unit at the power switch (7).
- 5 Observe the build-up of the operating vacuum on the pressure gauge (4).
- 6 After a constant operating vacuum of -0.6 bar has been established, open the suction connection (1) (vacuum ON).  
⇒ The vacuum clamping device is now supplied with vacuum and monitored by the safety functions of the vacuum unit, suctioned liquids are separated and collected in the storage container (2).  
⇒ A workpiece positioned on the vacuum clamping device is held/clamped by the vacuum created.

## 7.2 Drain liquid reservoir

Position of the position numbers ([↩ 4, Page 22](#)):

Regularly monitor the fill level in the liquid reservoir (2). Before starting processing, the reservoir should be empty.

Once the storage container (2) has reached the critical fill level, an acoustic warning sounds and the storage container must be drained immediately.



### NOTICE

#### Property damage by ignoring the acoustic liquid warning!

If the storage container is full, the separated liquid will be sucked into the vacuum pump, damaging the vacuum pump.

- When the liquid warning is triggered, stop operations immediately.
- Empty storage container.

- 1 Switch off vacuum unit and ventilate the system by opening the suction connection (1).
  - ⇒ The vacuum in the container is offset and atmospheric pressure is now prevalent in the entire system.
- 2 Place suitable containers next to or beneath the exhaust valve (3) for collecting the liquid. A small piece of vacuum hose with inner diameter  $\varnothing 12$  mm makes this work easier.



### NOTICE



#### Property damage caused by opening the drain valve (3) if there is a vacuum!

If the drain valve (3) is opened long enough for there to be vacuum pressure in the storage container (2), the liquid separated there is sucked into the vacuum pump, damaging the vacuum pump.

- Before every ventilation procedure, make sure that the power switch (7) is set to "OFF" and the hand lever (1) is open.

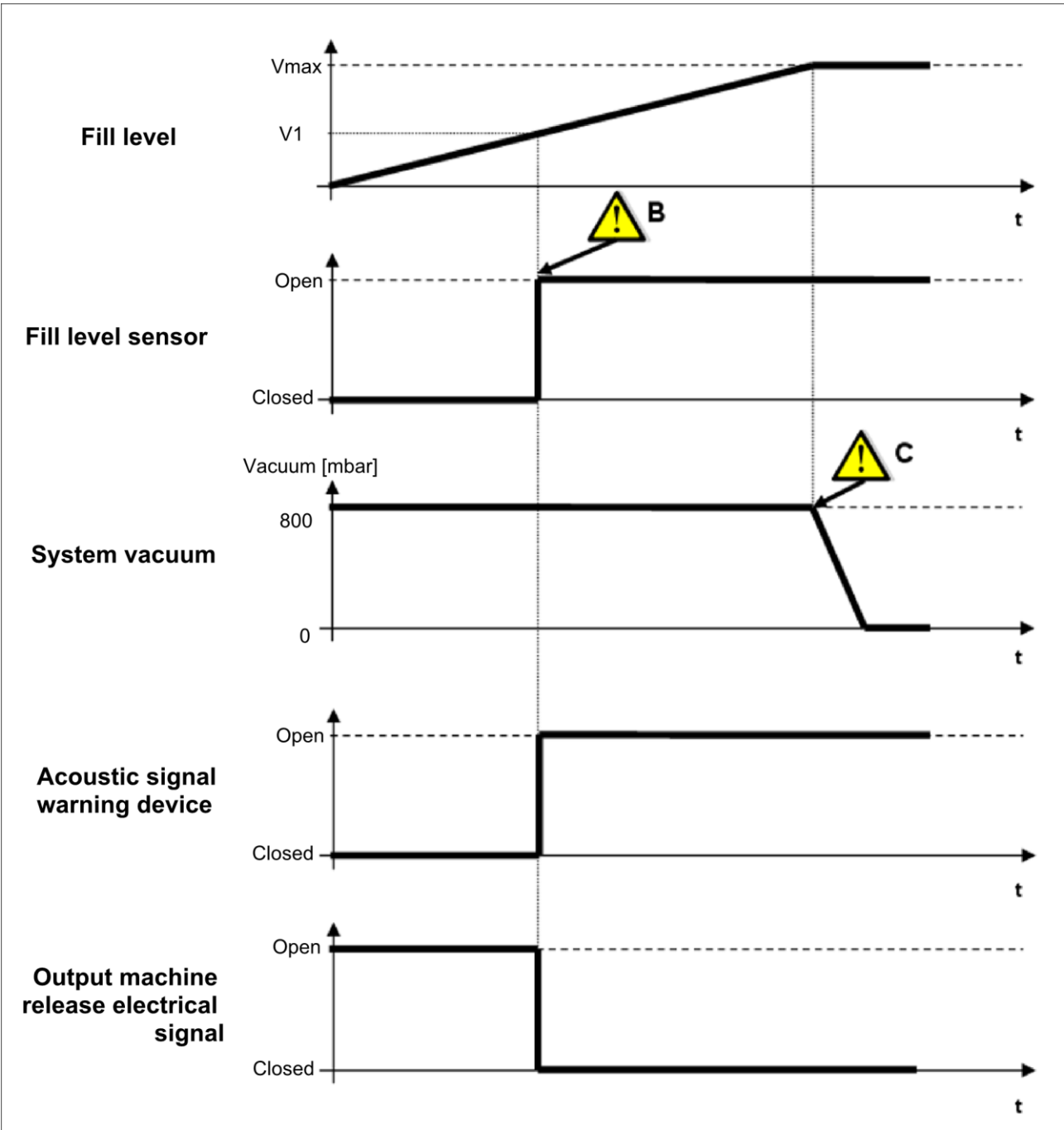
- 3 Carefully open drain valve (3) and drain fluid in the container.

### 7.3 Procedure description

	 <b>WARNING</b>
	<p><b>Risk of injury due to loss of workpiece!</b>                  If the critical vacuum level is undershot, suctioned workpieces can no longer be firmly gripped.</p> <ul style="list-style-type: none"> <li>• Interrupt operation immediately.</li> </ul>

The vacuum unit is operated in continuous operation as standard. In continuous operation, the vacuum pump builds up a vacuum of up to approx. -0.93 bar. After opening the valve (1), the vacuum drops slightly. This is dependent on the operating conditions, e.g. the workpiece material, the condition of the seals of the vacuum system etc.

**Vacuum monitoring** The generated operating vacuum is monitored using an integrated vacuum sensor. When the critical vacuum level of approx. -0.6 bar is undershot, (position A in the process diagram), the acoustic warning device sounds and the output for the machine release is interrupted.



Process diagram, vacuum creation and monitoring

**Fill level monitoring of the suction accumulator** Position of the position numbers ([↗ 4, Page 22](#)):

Liquids contained in suctioned media are collected in the suction accumulator (2).

The fluid level can be read off the visual fill level display (12).

When reaching the critical fill level V1, the warning device (B) is activated by the fill level sensor and the output for the machine release is interrupted.

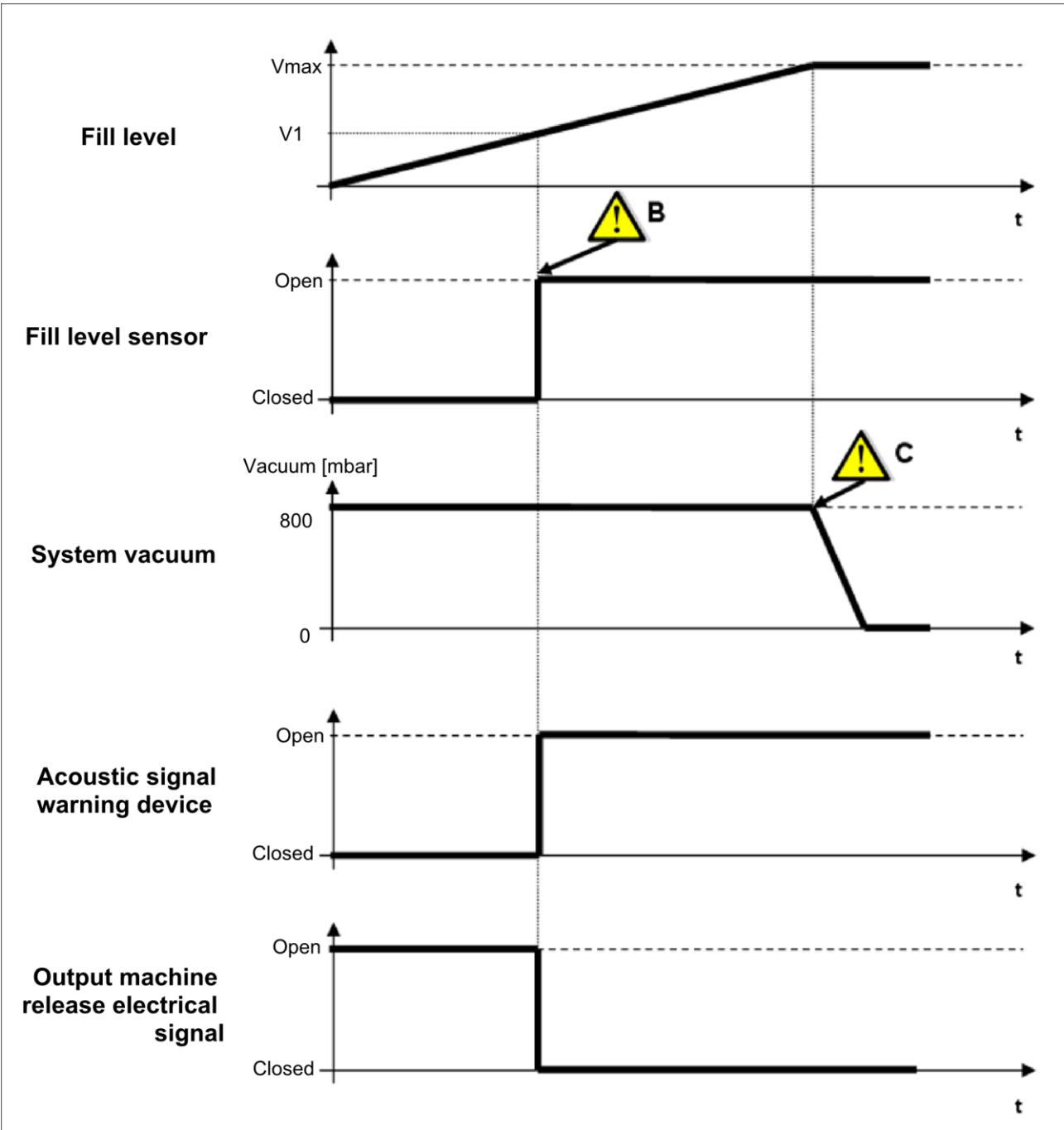
The machine must now be switched off and the storage container (2) emptied using the exhaust valve (3) ([↗ 7.2, Page 35](#)). If the fill level rises again, the protection valve prevents the pump from becoming damaged and closes the vacuum circuit.



**⚠ CAUTION**

**If the fill level rises again (C), the system vacuum suddenly collapses.**



- Switch off the machine immediately!



Procedure diagram, fill level monitoring

## 8 Troubleshooting

### 8.1 Pump does not run

	 <b>DANGER</b>
	<p><b>Risk of fatal injury due to electric current!</b>                      Touching live parts poses an immediate risk of fatal injury by electrocution.</p> <ul style="list-style-type: none"> <li>Only allow a qualified electrician to perform work on electrical components.</li> <li>Prior to commencing work on electric components, restore to a de-energized state.</li> <li>In the event of damage to the isolation power supply, shut off immediately and arrange for a repair.</li> <li>Keep humidity away from live parts.</li> </ul>

Possible cause	Corrective action
Electrical connection incorrect or faulty	Check electrical connection.
Motor protection switch has been triggered	Check that the motor is not overloaded or faulty. Allow the motor to cool down. Correct motor protection switch if necessary and switch on motor protection switch.
Voltage only to two phases	Check fuses and connections
Interrupt power supply	Inspect main power supply line

## 8.2 Pump is running, but vacuum of 0.6 bar is not achieved

Position of the position numbers ([↩ 4, Page 22](#)):

Possible cause	Corrective action
Direction of rotation of motor incorrect	Reverse polarity of connection lines
Leaks in the system too big	Inspect vacuum unit and clamping system for leaks, ( <a href="#">↩ 9, Page 42</a> )
Drain valve (3) is still open	Close drain valve (3)

## 8.3 No suction, despite presence of vacuum

Possible cause	Corrective action
Contamination of the lines or cross-section reduction due to dirt	Clean lines
Contaminated vacuum openings on the clamping system	Clean vacuum openings
Vacuum hose kinked	Lay vacuum hose without any kinks

## 8.4 No acoustic alarm

Possible cause	Corrective action
Vacuum sensor does not react	Contact the SCHUNK contact person.
Fill level sensor does not react	Contact the SCHUNK contact person.
Float does not move, despite rising fill level	Contact the SCHUNK contact person.

## 8.5 Liquid in pump oil

Possible cause	Corrective action
Droplet separator (9) is full	Empty and clean droplet separator (9)
Liquid entering the vacuum pump has not been pumped out	Clean oil (see operating manual of the vacuum pump)
Gas ballast valve on the vacuum pump faulty	Replace gas ballast valves

## 9 Maintenance



### **DANGER**

#### **Risk of fatal injury due to electric current!**

Touching live parts poses an immediate risk of fatal injury by electrocution.

- Only allow a qualified electrician to perform work on electrical components.
- Prior to commencing work on electric components, restore to a de-energized state.
- In the event of damage to the isolation power supply, shut off immediately and arrange for a repair.
- Keep humidity away from live parts.



### **WARNING**

#### **Risk of burns through contact with hot surfaces!**

The product can heat up considerably during operation. Touching hot surfaces can cause burns.

- Do not touch hot surfaces.
- Let them cool down before working on the product.
- Wear appropriate safety equipment.



### **WARNING**

#### **Risk of injury and damage to property due to untrained personnel!**

- Only have the product system maintained by trained personnel who have read and understood these instructions.
- Before all repair and maintenance work, switch off the vacuum generator (ejector, fan, pump).
- Check safety equipment following all repair and maintenance work.

## 9.1 Maintenance intervals

Maintenance interval	Maintenance work
Daily	Inspect pump oil for any remaining condensates; if required, separate oil from condensate, <a href="#">(☞ 9.2, Page 44)</a> .
	Check oil fill level, <a href="#">(☞ 9.3, Page 45)</a> .
after 100 operating hours	Perform first oil change and Change oil filter, <a href="#">(☞ 9.3, Page 45)</a> .
every 100 to 1000 operating hours, at least every six months	Perform oil change and Change oil filter, <a href="#">(☞ 9.3, Page 45)</a> .

## 9.2 Separate condensed liquid from pump oil



### NOTICE

#### **Damage to property caused by insufficient maintenance!**

If the oil of the vacuum pump is not maintained in the specified manner, the oil loses its lubricating effect due to the emulsion which forms.

The pump becomes damaged. A sudden total failure of the vacuum unit is the immediate consequence.

- Separate oil from condensed liquids at the prescribed maintenance intervals.

Position of the position numbers ([☞ 4, Page 22](#)):

The duration of this maintenance is approx. 20 min.

In order to separate the oil in the vacuum pump from condensed liquids, the oil must be maintained at regular intervals. It can be ascertained through the oil sight glass (6) whether liquid has penetrated into the oil.

The gas ballast valve helps to counteract the build-up of condensates from the process gas in the vacuum pump. Existing condensates can be separated from the oil again and transported out of the pump:

- 1 Check that the storage container (2) is empty and doesn't contain any more liquid.
  - 2 Close hand lever valve (1) in order to separate vacuum unit from the vacuum circuit.
  - 3 Close drain valve (3).
  - 4 Switch on power switch (7) and operate vacuum unit in continuous operation.
  - 5 Make sure that the energy-saving function is deactivated, ([☞ 6.7, Page 33](#)).
- ⇒ The vacuum unit now generates a vacuum.
- 6 Allow the pump to run for approx. 20 mins.

### 9.3 Oil quantity and oil change



#### NOTICE

**Danger to the environment due to incorrect handling of environmentally-hazardous materials!**

Oil contains toxic substances. If handled incorrectly, particularly when being disposed of, significant damage to the environment may result.

- Properly collect spilled or leaking oil immediately.
- Dispose of old oil in accordance with the country-specific stipulations.

Position of the position numbers ([↩ 4, Page 22](#)):

The specified maintenance intervals are heavily dependent on the individual operating conditions. Operation under adverse conditions, for instance such as high dust pollution in the surroundings or impurities or material in the gas to be conveyed, may necessitate shorter maintenance intervals.

- 1 Monitor fill level and coloration of the oil daily when the pump is switched off.
  - ⇒ The oil level should not drop below the middle of the oil sight glass (6).
- 2 Change oil and oil filter.
- 3 Also observe the maintenance specifications in the corresponding operating manual of the vacuum pump.

## 10 Spare and Wearing parts

The most important replacement and wearing parts are listed in the following list.

Type	Designation	ID number
SVAGG 6	Vacuum pump EVE-OG 6 AC3	0425115 10.03.02.00069
SVAGG 18	Vacuum pump EVE-OG 18 AC3	0425116 10.03.02.00070
SVAGG 40	Vacuum pump EVE-OG 40 AC3	0425117 10.03.02.00072
SVAGG 63	Vacuum pump EVE-OG 63 AC3	0425118 10.03.02.00073
SVAGG 6 ... 63	Droplet separator filter WAS-ABS G3/4-IG 69x69.6	0425129 10.07.01.00303
SVAGG 40	Vacuum pump wearing part set	10.03.02.00060
SVAGG 63	Vacuum pump wearing part set	10.03.02.00055
	Pressure gauge VAM 67 V H-SE	0425130
	Replacement oil for vacuum pump (oil bottle 1.00 l plastic)	0425131
	Vacuum hose VSL 21-12 PVC-G	0425107
	Vacuum hose VSL 34-25 PVC-DS	0425108

## 11 Translation of declaration of conformity

in terms of the Directive 2006/42/EC, Annex II, Part 1.A of the European Parliament and of the Council on machinery.

Manufacturer/ Distributor H.-D. SCHUNK GmbH & Co. Spanntechnik KG  
Lothringer Str. 23  
D-88512 Mengen

We hereby declare that on the date of the declaration the following incomplete machine complied with all basic safety and health regulations found in the directive 2006/42/EC of the European Parliament and of the Council on machinery. The declaration is rendered invalid if modifications are made to the product.

The product also complies with the regulations found in directive 2014/30/EC from the European Parliament and the Council on electromagnetic compatibility.

Product designation Vacuum Unit / SVAGG  
ID number 0425050, 0425051, 0425052, 0425053

Applied harmonized standards, especially:

DIN EN ISO 12100:2011-03	Safety of machinery - General principles for design - Risk assessment and risk reduction
DIN EN ISO 13849-1:2008-12	Safety of machines - Safety-relevant parts of control systems - Part 1: General design approaches
EN 60204-1: 2006	Safety of machinery – Electrical equipment of machines, Part 1: General requirements
DIN EN ISO 13857:2008-06	Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs (IEC 13857:2008)
EN 61000-6-4:2007 + A1:2011	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments (IEC 61000-6-4:2006 + A1:2010)
EN 61000-6-3:2007/A1:2011	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments (IEC 61000-6-3:2006)
EN 61000-6-2: 2005	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments (IEC 61000-6-2:2005)
DIN EN 1012-1:2011-02	Compressors and vacuum pumps - Safety requirements - Part 1: Air compressors
DIN EN ISO 2151:2009-01	Acoustics - sound measurement standard for compressors and vacuum pumps - procedure of the accuracy class 2

Person authorized to compile the technical documentation:

Alexander Koch, Address: see manufacturer's address

*Signature: see original declaration*

Mengen, November 2016

p.p. Philipp Schröder; Head of Engineering Design

