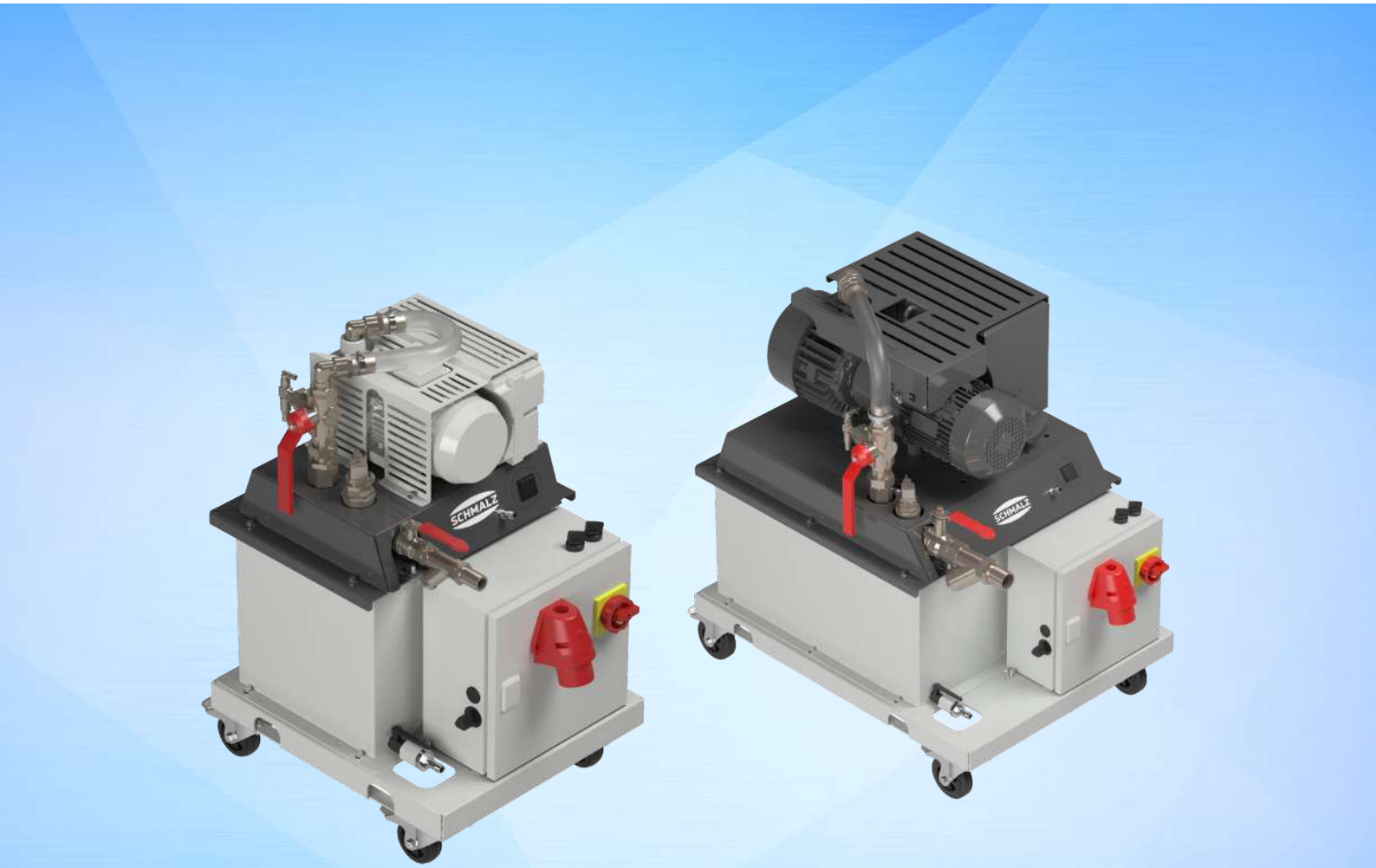


Operating instructions

Vacuum Hub VH-OG-LS

WWW.SCHMALZ.COM

EN-US · 30.30.01.05000 · 01 · 05/26

Translation of the original operating instructions

Note

The Operating instructions were originally written in German. Store in a safe place for future reference. Subject to technical changes without notice. No responsibility is taken for printing or other types of errors.

Published by

Contact

J. Schmalz GmbH

Johannes-Schmalz-Str. 1

72293 Glatten, Germany

T: +49 (0) 7443 2403-0

schmalz@schmalz.de

www.schmalz.com

Contact information for Schmalz companies and trade partners worldwide can be found at:

www.schmalz.com/salesnetwork

Contents

1 Important Information

1.1 The technical documentation is part of the product

1. For problem-free and safe operation, follow the instructions in the documents.
2. Keep the technical documentation in close proximity to the product. The documentation must be accessible to personnel at all times.
3. Pass on the technical documentation to subsequent users.

⇨ Failure to follow the instructions in these Operating instructions may result in life-threatening injuries!

⇨ Schmalz is not liable for damage or malfunctions that result from failure to heed these instructions.

If you still have questions after reading the technical documentation, contact Schmalz Service at:

www.schmalz.com/services

1.2 Note on Using this Document

J. Schmalz GmbH is generally referred to as Schmalz in this document.

The document contains important notes and information about the different operating phases of the product:

- Transport, storage, start of operations and decommissioning
- Safe operation, required maintenance, rectification of any faults

The document describes the product at the time of delivery by Schmalz and is intended for:

- Operating personnel trained in the operation of the product
- Installers who are trained in handling the product and can operate and install it
- Technically trained service personnel performing the maintenance work
- Technically trained persons who work on electrical equipment

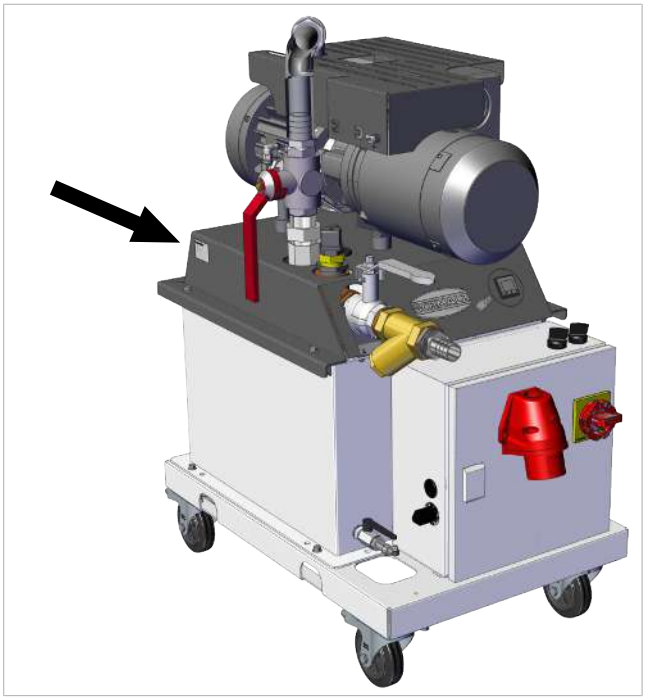
The displayed figures are only examples. Depending on the particular design, they can differ from the product.

1.3 Other Applicable Documents

These operating instructions are only valid together with the operating instructions for the corresponding vacuum pump in accordance with the following table:

Vacuum Hub	Part no.	Vacuum generator	Vacuum switch
VH-OG LS 10 30 MD	10.01.55.00025	30.30.01.03682	30.30.01.04786
VH-OG LS 21 30 MD	10.01.55.00026	30.30.01.03682	
VH-OG LS 40 50 MD	10.01.55.00027	30.30.01.00002	
VH-OG LS 63 100 MD	10.01.55.00028	30.30.01.00002	
VH-OG LS 100 100 MD	10.01.55.00029	30.30.01.00002	

1.4 Type Plate



The type plate is permanently attached to the product and must always be clearly legible.
It contains product identification data and important technical information.

The QR code enables access to the digital technical documentation for the product.

- For spare parts orders, warranty claims or other inquiries, have the information on the type plate on hand.

1.5 Symbols

This symbol indicates useful and important information.

✓ This symbol represents a prerequisite that must be met before an action is performed.

- This symbol represents an action to be performed.

⇨ This symbol represents the result of an action.

Actions that consist of more than one step are numbered:

1. First action to be performed.
2. Second action to be performed.

2 Fundamental Safety Instructions

2.1 Intended Use

The Vacuum Hub is used to generate and provide a process vacuum in automated handling processes or to hold objects in place in machining processes, for example.

The Vacuum Hub also serves as a liquid separator.
It is specially designed for the evacuation of media containing liquids and can therefore be used to generate vacuum for machines in wet processing.
Chippings or other small solids contained in the separated liquid are also separated from the evacuated medium and have no effect on function in small quantities. The water content of the liquid must not fall below 70%.

The integration of the product into the complete machine is the responsibility of the manufacturer of the complete machine.

Appropriate safety measures on systems and devices that are used in connection with the product must be implemented in order to avoid danger to persons, animals, or property caused by a loss of the operating vacuum.

The product is built in accordance with the latest standards of technology and is delivered in a safe operating condition; however, hazards may arise during use.

The product is intended for industrial use.

Intended use includes observing the technical data and the installation and operating instructions in this manual.

Any other use is considered improper by the manufacturer and is deemed as contrary to the designated use.

2.2 Non-Intended Use

Schmalz accepts no liability for damages caused by the use of the product for purposes other than those described under “Intended Use.”
In particular, the following are considered non-intended use:

- Suction of body parts
- Use as a climbing aid
- Use of the product as a base, support or comparable aid
- Evacuation of objects that are in danger of imploding
- Use of the product in combination with easily flammable or potentially explosive materials such as acids or alkalis
- Unauthorized modifications or changes
- Pumping or recirculation of coolants/lubricants or other liquids, e.g. from a container
- Use as wet/dry vacuum

2.3 Personnel Qualifications

Unqualified personnel cannot recognize dangers and are therefore exposed to higher risks!

The system integrator must ensure the following points:

- The personnel must be commissioned for the activities described in these instructions.
- The staff must be at least 18 years of age and physically and mentally capable.
- The product must be operated only by persons who have undergone appropriate training.
- Personnel must receive regular safety briefings (frequency as per country-specific regulations).
- The product must be installed and maintained only by qualified electrical, pneumatic and mechanical specialists.

The operator of the system must comply with country-specific regulations regarding the age, ability and training of the personnel.

Applicable for Germany:

A qualified employee is defined as an employee who has received technical training and has the knowledge and experience – including knowledge of applicable regulations – necessary to enable him or her to recognize possible dangers and implement the appropriate safety measures while performing tasks. Qualified employees must observe the relevant industry-specific rules and regulations.

2.4 Warnings in This Document

Warnings warn against hazards that may occur when handling the product. The signal word indicates the level of danger.

Signal word	Meaning
⚠ DANGER	Indicates a high-risk hazard that will result in death or serious injury if not avoided.
⚠ WARNING	Indicates a medium-risk hazard that could result in death or serious injury if not avoided.
⚠ CAUTION	Indicates a low-risk hazard that could result in minor or moderate injury if not avoided.
NOTE	Indicates a danger that leads to property damage.

2.5 Residual Risks

⚠ DANGER

Electric shock from touching live electrical components

Serious injury or death!

- ▸ Make sure that the electrical components are not live before installation, maintenance and troubleshooting.
- ▸ De-energize the system.

⚠ WARNING

Extraction of hazardous media, liquids or bulk material

Personal injury or damage to property!

- Do not extract harmful media such as dust, oil mists, vapors, aerosols etc.
- Do not extract aggressive gases or media such as acids, acid fumes, bases, biocides, disinfectants or detergents.
- Do not extract liquids or bulk materials, e.g. granulates.

⚠ WARNING

A powerful vacuum flow creates a strong suction effect

Risk of injury to eyes or other body parts

- Wear eye protection.
- Do not look or reach into the vacuum opening.
- When the vacuum generator is switched on, maintain a safe distance from the vacuum opening.

⚠ CAUTION

Noise pollution caused by exhaust air or leakage during operation

Hearing damage!

- In the event of leakage, check connections and lines and remedy leakages.
- Wear ear protection.

⚠ CAUTION

Noise pollution caused by machine during operation

Danger of hearing damage

- If you spend longer periods of time in the immediate vicinity of the machine when it is not soundproofed: Wear ear protectors.

⚠ WARNING

Workpiece released due to insufficient vacuum

Serious injury or death!

✓ Check and observe the vacuum display regularly.

- Observe the maximum permissible holding force for each application.
- Before activating the application (e.g. machining the workpiece), ensure that the vacuum display shows the required vacuum at minimum.

⚠ CAUTION

Touching hot surfaces

Touching hot surfaces may cause injury from burns.

- Wear work gloves.
- Do not touch components during operation.
- Allow the components to cool down before commencing work on the product.

2.6 Responsibility of the Integrator

The system integrator must carry out a risk assessment of the entire system for all operating modes and define the danger zone precisely. In doing so, country-specific provisions and regulations must be observed.

- Ensure that the device cannot be started up by unauthorized persons.
- Ensure that the device cannot be operated during maintenance or repair work.
- Clearly define the responsibilities for the various activities performed with the gripper.
- Ensure that these responsibilities are observed.

To avoid injury, always use appropriate protective equipment that is suitable for the situation. The protective equipment must meet the following standards:

- Protective work shoes in safety class S1 or higher
- Ear protection class L or higher
- Sturdy work gloves in safety category 2231 or higher
- Eye protection class F

2.7 Technical Condition / Manufacturer's Liability

If the product is operated while in a defective state, safety and function will be impaired.

- If the operating behavior changes, check the product for faults. Rectify faults immediately!
  If the fault cannot be rectified immediately, shut down the product and mark it as faulty.

Schmalz assumes no liability for consequences if the following points have not been complied with:

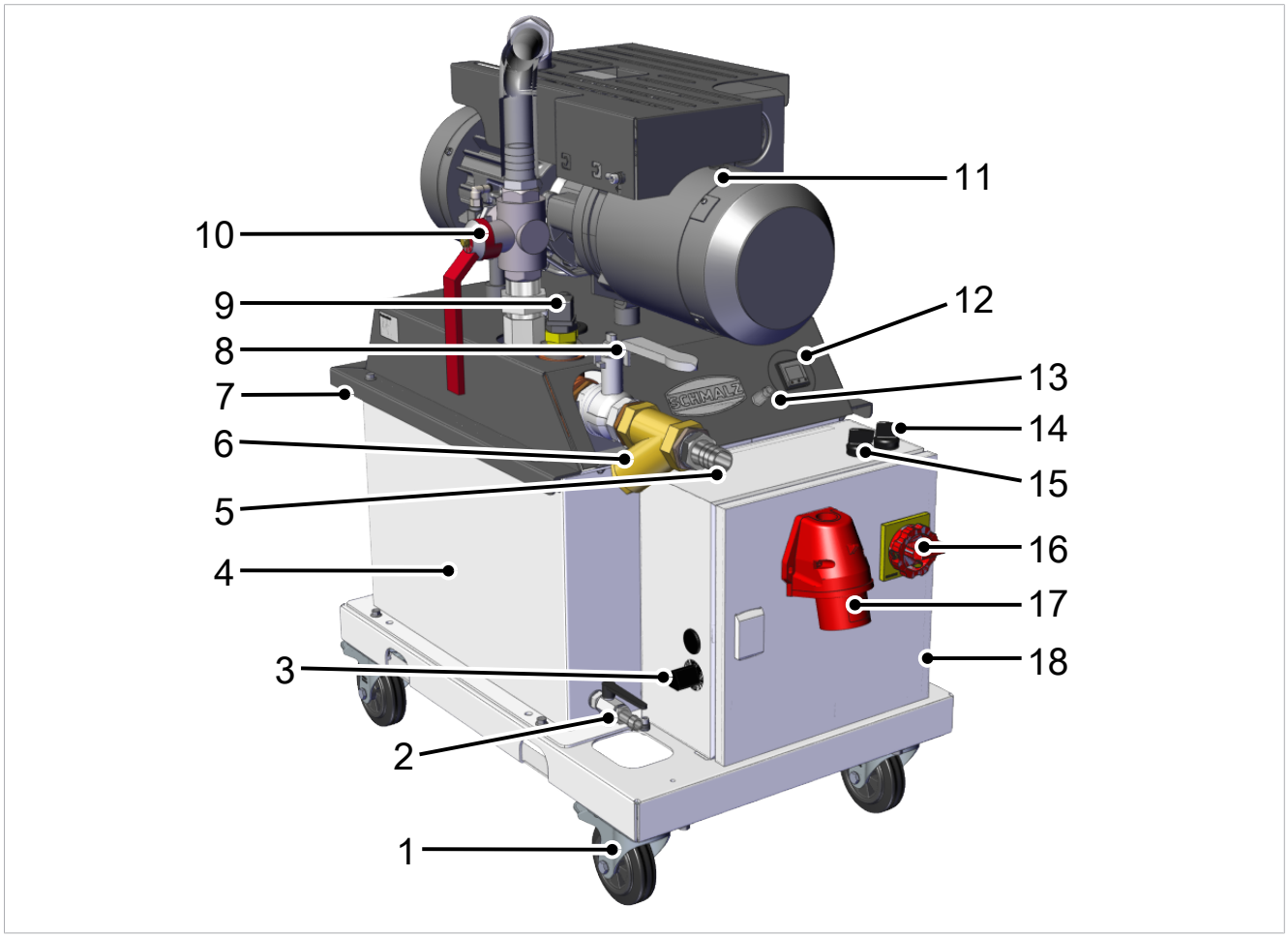
- The product must only be operated when in perfect technical working order – i.e., in its original condition.
- Follow the maintenance schedule (> See ch. 10 Maintenance and Cleaning, p. 30).
- Only use original Schmalz spare parts and accessories.
- Unauthorized conversion or modification of the product is prohibited.
- Safety features must not be disabled under any circumstances.

See also

Maintenance and Cleaning [▸ 30]

3 Product Description

3.1 Design



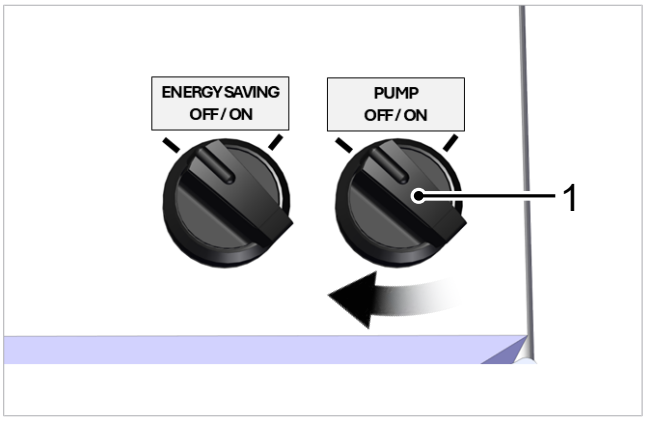
1	Wheels with brake	10	Manual lever valve
2	Manual drain valve with hose sleeve, hose connection dia. 13 mm	11	Vacuum pump
3	Electrical interface; potential-free contact for interface to machine	12	Vacuum switch with digital display
4	Vacuum reservoir/liquid separator	13	Compressed air connection, push-in, NW 7.2 to 7.8 mm
5	Vacuum connection	14	“PUMP OFF / ON” switch
6	Filter	15	“ENERGY SAVING OFF / ON ” switch
7	LED status indicator	16	Main switch
8	Manual lever valve (vacuum ON/OFF) with hose sleeve	17	Electrical connection, connection socket
9	Liquid fill level sensor	18	Loudspeaker

3.2 Functional Description

Switching On the Device

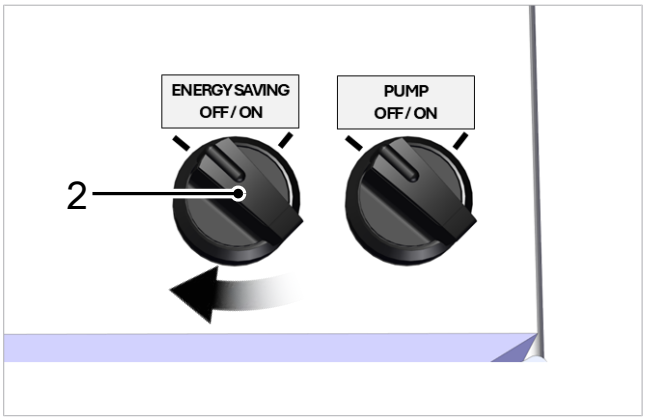
After you switch on the Vacuum Hub at the **main switch**, the device starts up and is ready for operation after the horn sounds briefly.

To generate the vacuum, switch on the “PUMP OFF/ON” switch (1).
The pump runs in continuous operation and generates the maximum vacuum.



Energy-Saving Function

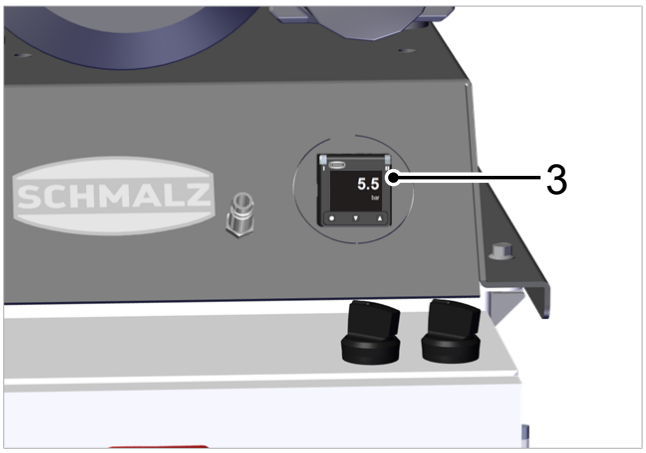
For airtight applications, we recommend activating the energy-saving function using the “ENERGY SAVING OFF/ON” switch (2).
When the energy-saving function is switched on, the vacuum pump evacuates the vacuum reservoir until the vacuum reaches a preset switching point (factory setting: -800 mbar) and automatically switches off to save energy.
If the vacuum in the vacuum reservoir drops below a preset switching point (factory setting: -700 mbar) due to leakage, the vacuum pump switches on again automatically.

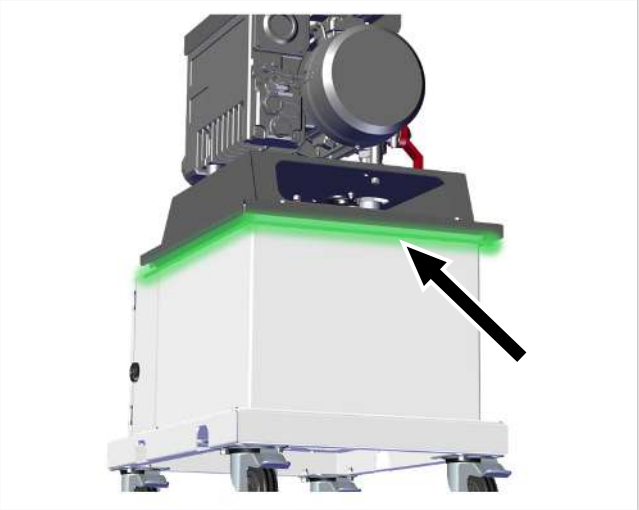


Digital vacuum display and parameter setting

The vacuum in the vacuum reservoir is shown by the digital display on the vacuum switch (3). This lets you check the vacuum level in the vacuum circuit required for the work process.

The parameters are set using the vacuum switch (3). The current system status and the settings are shown on the digital display on the vacuum switch. You can find more detailed information in the vacuum switch operating instructions.





LED Status Indicator

The LED status indicator provides device status information about the vacuum in the reservoir and the liquid fill level.

Signal Transmission to the Higher-Level Machine

The enable signal for processing can be queried via the interface to the machine.
If the main switch is switched on and the vacuum level is at least -600 mbar (lower switching point), the enable signal is present at the potential-free contact.
If the vacuum level falls below this level, the horn sounds and the enable signal to the machine is interrupted.
The interface to the machine has a single-channel design.

Liquid Separator

The medium evacuated using vacuum generation is guided away from the vacuum consumer (e.g. clamping device) by the Vacuum Hub. Liquids contained in the evacuated medium are separated from the Vacuum Hub and collected in the storage reservoir. This protects the vacuum pump against the entry of liquids.

The fill level in the reservoir is monitored by a sensor.
The LED status indicator lights up yellow if the fill level rises above the critical level of 60% of the reservoir volume.
From a fill level of 80%, the display changes to red and the vacuum pump is switched off to prevent damage caused by the liquid that has been sucked in.
The enable signal is maintained until the vacuum value drops below the vacuum level of -600 mbar, where applicable.

Liquids entering the device can damage or even destroy the vacuum pump.

The liquid collected in the storage reservoir is drained manually via the drain valve. The process can be accelerated through the application of compressed air.

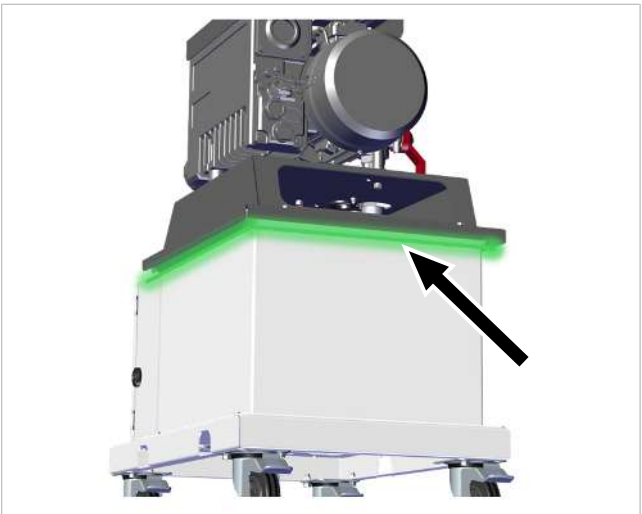
1. The device must be switched off.
2. The connection to the vacuum pump must be disconnected using the manual lever valve.

Filter

The filter prevents dirt from entering into the vacuum reservoir or reaching the vacuum generator. The device must not be operated without the filter insert. The manual lever valve between the Vacuum Hub and vacuum consumer is used to open and close the vacuum circuit.

3.3 LED Status Indicator

The LED strip installed in the highlighted area indicates the current process status of the device.



The table below explains the meaning of the colors and the display types for indicating the status:

LED Color		Behavior	Status
—	None	Off	No supply voltage / the device is inactive
	Green	Continuous light	Vacuum greater than -600 mbar / fill level less than 30%
	Green	Flashing	Vacuum higher than -600 mbar / fill level between 30% and 60%
	Yellow	Flashing	Vacuum higher than -600 mbar / **critical fill level** between 60% and 80%
	Red	Flashing	Vacuum higher than -600 mbar / fill level higher than or equal to 80%
	Red	Continuous light	Vacuum less than -600 mbar
	Blue	Continuous light	Service / atypical order / VS defective / cable breakage ...

4 Technical Data

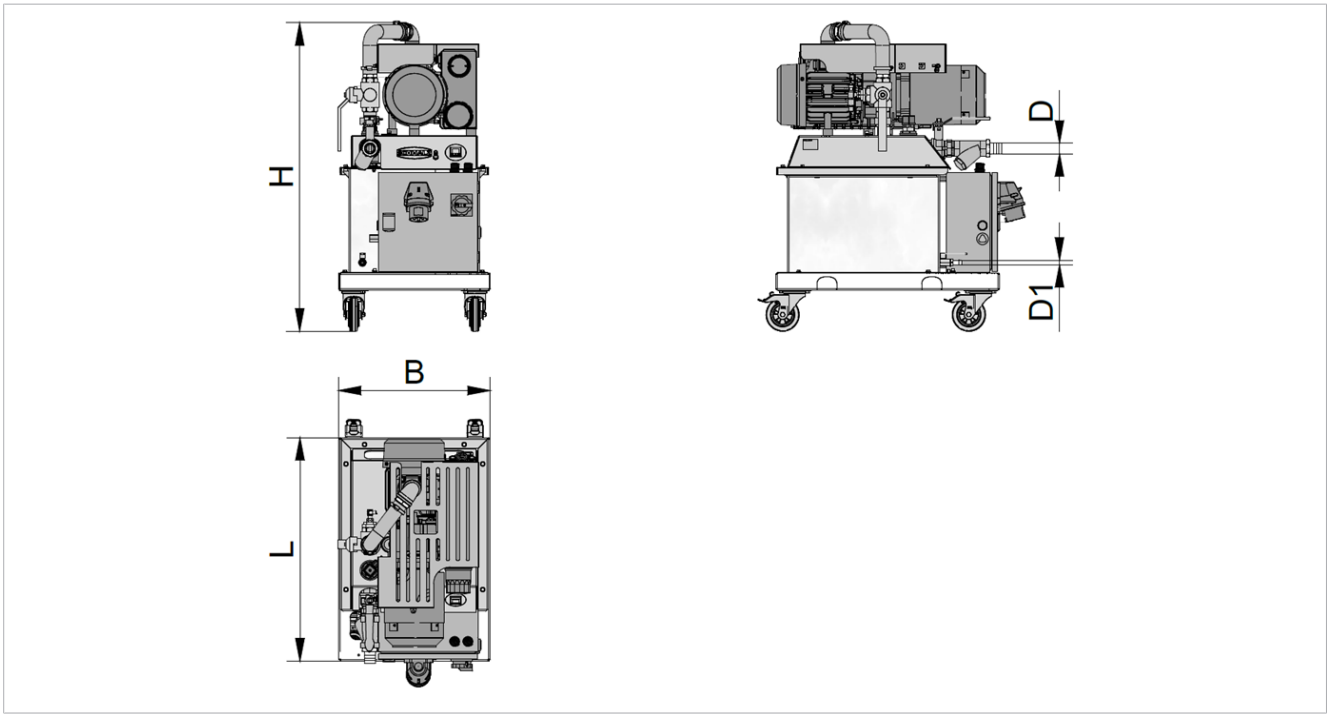
4.1 Technical Data

The technical data for the components specified in the other applicable documents is also relevant.

Parameter	Description	Value
Temperature range		+5 °C to +40 °C
Humidity	No condensation	85% rel.
Installation position	Standing upright	+/-5 °

Type	VH-OG 10	VH-OG 21	VH-OG 40	VH-OG 63	VH-OG 100
Pump type	EVE-OG 10	EVE-OG 21	EVE-OG 40	EVE-OG 63	EVE-OG 100
Suction rate	10 m^3/h	21 m^3/h	40 m^3/h	63 m^3/h	100 m^3/h
Reservoir volume	30 l		50 l	100 l	
Max. vacuum	-980 mbar				
Voltage	230/400 V AC3				
Grid frequency	50 Hz / 60 Hz				
Motor power	0.37 kW / 0.45 kW	0.75 kW / 0.9 kW	1.1 kW / 1.5 kW	1.5 kW / 2.2 kW	2.2 kW / 3.0 kW
Sound pressure level	58.5 dB	64 dB	64 dB	64 dB	65 dB
Weight	45 kg	48 kg	55.4 kg	98.4 kg	116.4 kg

4.2 Dimensions



Type	L	B	H	D	D1
VH-OG 10	521 mm	457 mm	796 mm	13 mm	13 mm
VH-OG 21	521 mm	457 mm	796 mm	13 mm	13 mm
VH-OG 40	673 mm	457 mm	929 mm	25 mm	13 mm
VH-OG 63	823 mm	617 mm	957 mm	25 mm	13 mm
VH-OG 100	823 mm	617 mm	959 mm	38 mm	13 mm

5 Transportation and Storage

5.1 Checking the Delivery

The scope of delivery can be found in the order confirmation. The weights and dimensions are listed in the delivery notes.

A plug for connecting the electrical signal cable is included in delivery.

1. Compare the entire delivery with the supplied delivery notes to make sure nothing is missing.
2. Report possible damage caused by faulty packaging or transport immediately to the carrier and Schmalz.

5.2 Transport

⚠ WARNING

Lifting the device using the supplied motor eye bolt

Risk of serious injury!

- Do not lift the device using the motor eye bolt.
- Install the eye bolt only to replace the pump.

The transport route, the dimensions of the goods and the consignment weight determine the type of packaging.
The Vacuum Hub is shipped from the factory standing upright, tied down on a pallet.

Carefully unpack the shipment, remove plastic films, cardboard boxes, straps and packing material.

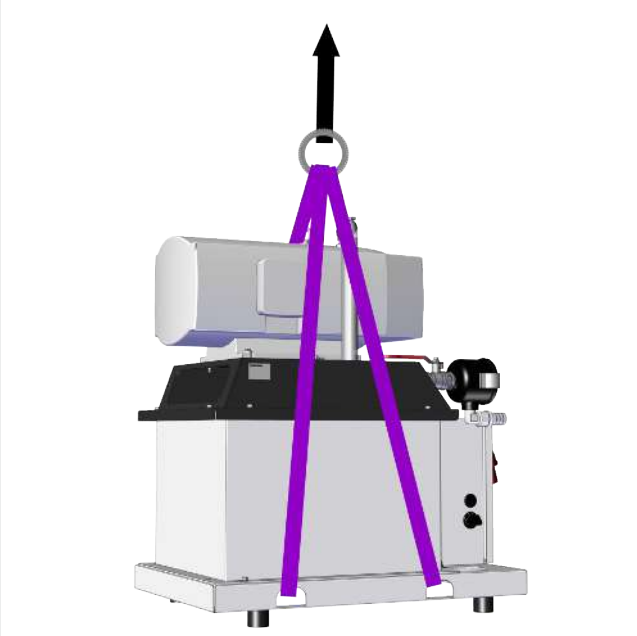
The device must always be transported in an upright position (even inside the factory); otherwise, the oil in the vacuum pump may leak out.

Internal Transportation

The displayed figures are only examples. Depending on the particular design, they can differ from the product.

The device is designed with wheels for short transportation on level and smooth surfaces.

For transport over longer distances, the device can be transported or set up with the aid of a suitable lifting crane and suitable lifting slings (note the maximum lift capacity of the lifting device).
For the safe use of transport belts, appropriate recesses are provided on the lower edge of the device.



5.3 Storage

During storage, the following storage location requirements must be observed to keep the device in a proper condition over a longer period of time.
Failure to observe the following requirements may cause damage to the pump.

The storage location must be:

- dry and clean
- level
- protected against sudden changes in temperature and humidity
- protected from salt mist, industrial gases, corrosive liquids, rodents and fungal infestation

If the device is to be stored for a longer period (of more than 2 months) after use, you must follow the steps below.

1. Make sure that the pump is free of water or steam.
2. Close the intake opening.
3. Run the pump for 30 minutes after reaching its operating temperature. Suck in only a small amount of dry ambient air.
4. Place silica gel packets inside the filter housing. Attach warning labels so that the packets are removed again before the start of operations.

If the pump was used to convey air with a high moisture content before the downtime, we recommend taking the steps above even for shorter storage periods.

6 Installation and Start of Operations

6.1 Installation Instructions

⚠ DANGER

Electric shock from touching live electrical components

Serious injury or death!

- Make sure that the electrical components are not live before installation, maintenance and troubleshooting.
- De-energize the system.

The product must be installed only by qualified specialist electricians and mechanics.

Personnel must have read and understood the instructions.

Before the start of operations, the device must be inspected for possible damage (visual inspection).
If there are any defects on the electrical installation, disconnect the device from the power supply system and secure it against reactivation.

Ensure that the device is positioned on a solid, level surface.

For safe installation, the following instructions must be observed:

- Use only the connectors, mounting holes and attachment materials that have been provided.
- Mounting and removal must be performed only when the device is depressurized and disconnected from the power supply.
- Pneumatic and electrical line connections must be securely connected and attached to the product.

6.2 Installation Site

⚠ DANGER

Risk of fire and explosion due to components that are not explosion-proof

Serious injury or death!

- Do not use the product in environments where there is a risk of explosion!

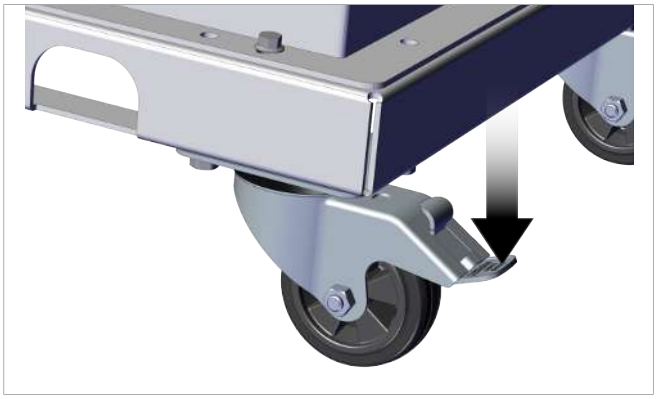
The device must be installed only by qualified personnel. The device must only be installed on flat surfaces.
The device may tip over when moved without care. Accidental collisions between the device and persons or objects may cause it to tip over.

Set up the Vacuum Hub as close as possible to the clamping device or gripper, because the vacuum power is reduced with the length of the vacuum line.

The ambient temperature must be between +5 °C and +40 °C. (Consult with Schmalz beforehand if exceeded.)

Provide internal instructions and perform checks to ensure that the area of the workplace is always clean and tidy.

The device is equipped with four wheels as standard.



- At the installation site, secure the Vacuum Hub by engaging at least two wheel brakes.

When the device is active, it must not be transported or moved.

6.3 Checking the Oil Level

For oil-lubricated pumps, the oil level must be checked in the sight glass before the start of operations; see the pump instruction manual.

6.4 Fluid Connections

⚠ CAUTION

Compressed air or vacuum in direct contact with the eye

Severe eye injury

- Wear eye protection
- Do not look into compressed air openings
- Do not look into the silencer air stream
- Do not look into vacuum openings such as suction cups, suction lines and hoses.

⚠ CAUTION

Noise pollution due to incorrect installation of the pressure and vacuum connections

Hearing damage!

- Correct installation.
- Wear ear protectors.

6.4.1 Vacuum Connection

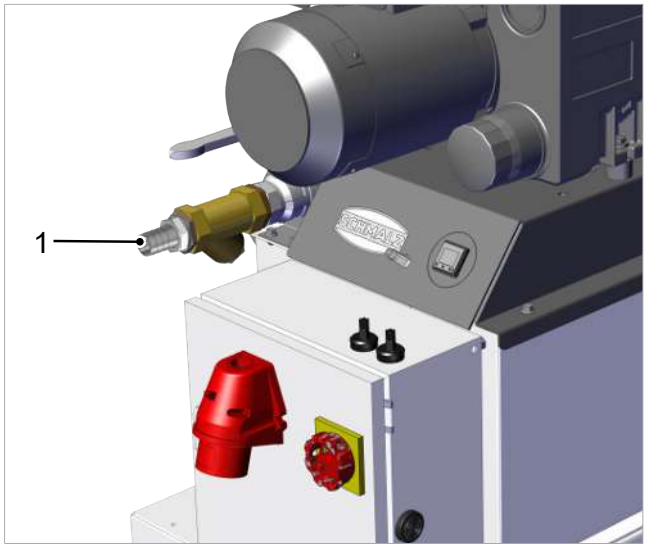
⚠ CAUTION

Vacuum close to the eye

Severe eye injury!

- Wear protective glasses during troubleshooting.
- Do not look in the suction openings.

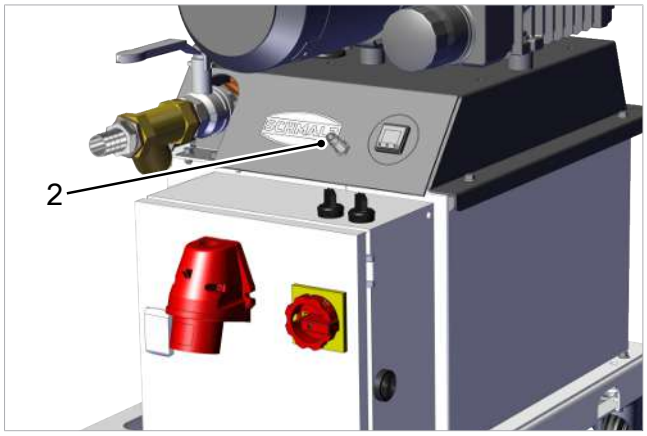
The Vacuum Hub is connected to the vacuum consumer or clamping equipment via the vacuum connection (1).



6.4.2 Compressed Air Connection

To speed up the draining process, compressed air can be applied to the reservoir.

To do so, connect compressed air to the connection (2).



6.5 Electrical Connection

⚠ DANGER

Electrocution by live components or wires

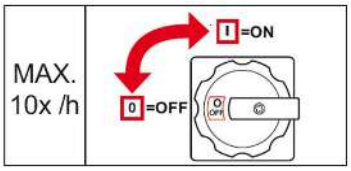
Serious injury or death!

- Electrical installation work may only be carried out by qualified personnel.
- Make sure that the electrical components are not live before installation, maintenance and troubleshooting.
- Switch off the mains switch and secure against unauthorized restart.

The electrical performance data can be found on the pump motor type plate.

The connection is made using a 5-pin CEE plug (400 V, 16 A).

- The pump must be operated with a maximum of 10 start/stop cycles per hour.



At a higher switch-off/switch-on frequency, the device must be run in continuous operation.

6.5.1 Checking the Direction of Rotation

⚠ DANGER

Electric shock from touching live electrical components

Serious injury or death!

- Make sure that the electrical components are not live before installation, maintenance and troubleshooting.
- Switch off the mains switch and secure against unauthorized restart.

NOTE

Electric motor running in the wrong direction

Damage to the motor

- Reverse the rotational direction by reversing the polarity in the supply line.

For the electrical connection, the sequence of the phases is particularly important because it determines the direction of rotation of the electric motor. This direction is indicated by the arrow on the cover of the fan for the electric motor. Rotating the electric motor shaft in the opposite direction may cause the device to fail.

For three-phase A.C. motors, check the direction of rotation of the motor as follows:

1. Switch the device on and switch it off again immediately.
2. Watch the motor's fan blade. It must rotate in the direction shown by the arrow on the motor housing.
3. The device is delivered with a clockwise rotation field. If the direction of rotation is incorrect, reverse the connection in the supply line.

4. Check the direction of rotation once again.

Damage or destruction of the device resulting from operation with the incorrect rotational direction is not covered by the warranty.

6.5.2 Connecting the Signal-emitting Electrical Line

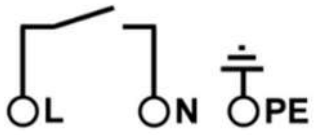
The device has a plug connector with a potential-free contact. This gives the customer the enable signal for processing. This plug connector must be integrated into the higher-level control.
The potential-free contact is only closed if the following conditions are present:

- The connector -XD1 is plugged in
- The main switch -QB1 is switched on
- The vacuum level is above the lower limit value (adjustable).

The contact is interrupted as soon as the vacuum level falls below the lower limit value (adjustable).

If the enable signal is interrupted during operation, processing must be interrupted as soon as possible since the workpiece may no longer be clamped reliably.

Connection



1. Connect the supplied mating connector to a three-wire
cable (L connection, N connection and protective ground).

2. Check the switching process with a continuity tester (between L and N) by activating and deactivating the vacuum supply.

3. Integrate the signal into the machine controller so that when the signal is interrupted ...
   ⇨ processing is stopped and
   ⇨ the operator is notified of the error message and interrupts processing at the next possible time.

6.6 Starting Up the Device

⚠ DANGER

Falling objects due to insufficient vacuum supply to the system

Risk of severe injury or death as the lifted load is no longer safely held.

- Standing or sitting under the lifted load is prohibited!
- Complete the work step as safely as possible
- Shut down supply
- Check device for leaks

Applicable local safety regulations must be observed.

The operator of the device must take internal measures to ensure that:

- The users of the device are trained
- They have read and understood the operating instructions
- The operating instructions are accessible to them at all times

The responsibilities for the various tasks to be carried out on the device must be clearly specified and adhered to. It is important to ensure that they have the appropriate qualifications and skills.

The following note is a supplement to the applicable local safety regulations:

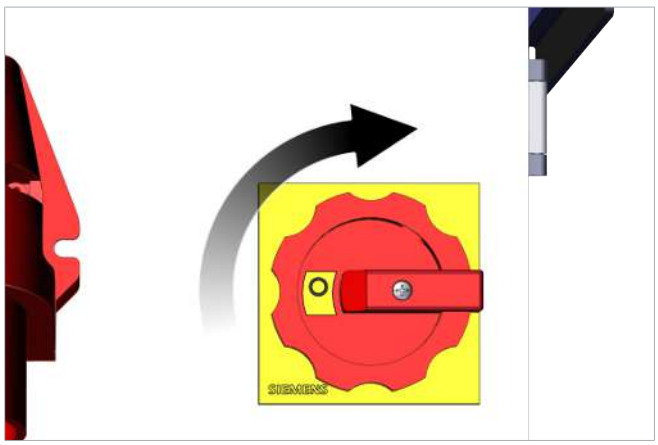
1. Regularly check the vacuum display.
   ⇨ If the vacuum falls below -0.6 bar, there is a risk that the suction systems supplied by the vacuum generator no longer reach the forces necessary for the requirements.
2. Check device for leaks.

For devices with a motor-protection switch, this also serves as a power switch for switching the device on and off.

Switch on the device by following the steps below:

- ✓ The plug for the power supply is plugged in correctly.
- ✓ We recommend connecting the potential-free contact to the higher-level machine.
- ✓ The vacuum hose is attached to the vacuum connection.
- ✓ The manual lever valve is closed.
- ✓ Both switches (ENERGY SAVING and PUMP) are in the OFF position.

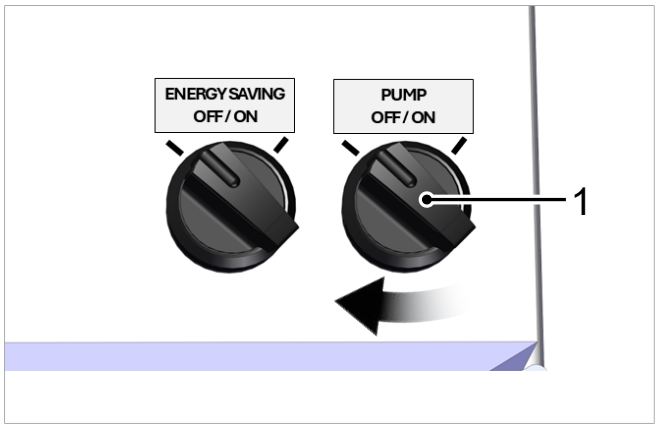
1. Switch on the main switch.



⇨ A short warning tone sounds and the control unit starts up.

⇨ Start-up is complete when the digital display shows a vacuum value.

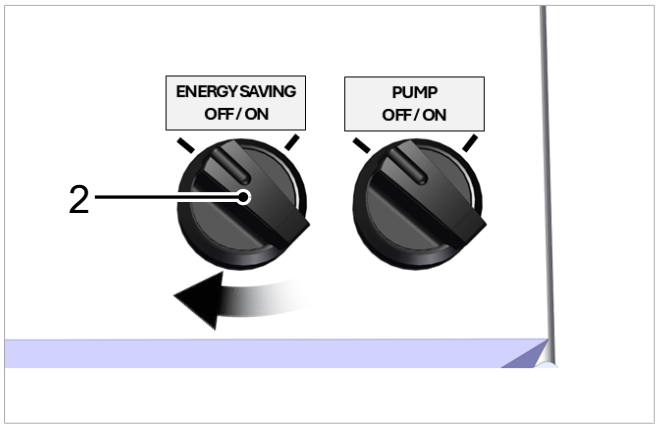
2. Switch on the vacuum pump by turning the switch (1) to ON.



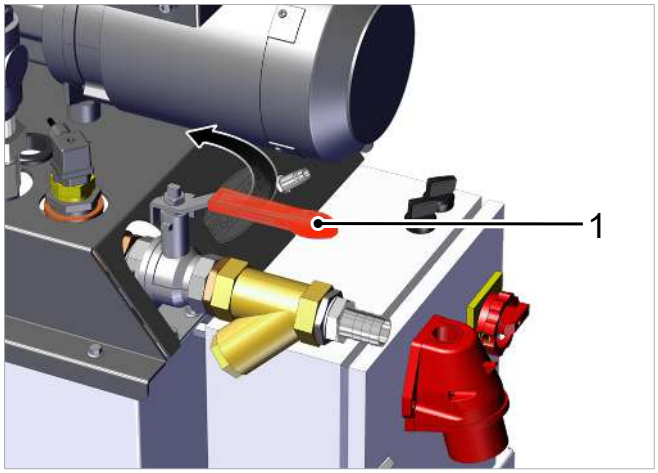
⇨ The vacuum reservoir is evacuated and the horn sounds until the lower vacuum limit value (adjustable value; factory setting: -600 mbar) is exceeded.

⇨ When the vacuum limit value is reached, the signal for enabling the machine is sent.

3. The energy-saving function can be switched on by turning the switch (2) to ON.
The limit values required to control the energy-saving function are adjustable (for more detailed information about the configuration, see the vacuum switch operating instructions).



4. Open the vacuum connection in the direction of the vacuum consumer by actuating the manual lever valve (lever direction is parallel to the line).



7 Safety Feature

The device has a safety feature with a vacuum switch and an audible warning device.

Check the safety features at the start of every shift (if the unit is not operated continuously) or once a week (if operated continuously).

7.1 Checking the Vacuum Reservoir

The device is subjected to a functional test for vacuum generation and leaks as described below:

1. Suction connection on the filter, e.g. with rubber sheet, vacuum-tight.
2. Switch on the vacuum pump and wait until the max. vacuum is reached.
3. Switch off the vacuum pump and watch the vacuum display on the vacuum switch.
   Depending on the reservoir volume, the vacuum is permitted to drop by max. 20 mbar:
   In 6 minutes with the 100 l reservoir
   In 3 minutes with the 50 l reservoir
   In 2 minutes with the 30 l reservoir
   In 1 minutes with the 10 l reservoir

Rectify faults before the device is put into operation. Should faults occur during operation, switch off the device and rectify the faults.

7.2 Checking the Audible Warning Device/Output for Enabling the Machine

Check the function of the audible warning device and the machine enable output:

✓ The integrated energy-saving function (variant-specific) is switched off.

1. Close the manual lever valve for the vacuum connection.
2. Switch off the device using the main switch/power switch. An audible warning signal sounds.
3. Monitor the build-up of the operating vacuum on the integrated vacuum display. The warning signal must sound until the operating vacuum of the lower switching point (adjustable) is built up. The output for enabling the machine is interrupted (no electrical signal “0”).
4. If the operating vacuum is above the value of the lower switching point, the warning signal stops and the signal output for enabling the machine is activated (electrical signal “1”).

⇨ The device remains in continuous operation and increases the vacuum until a constant, maximum vacuum level is reached.

⇨ During operation, the vacuum usually falls when the vacuum connection is open.

⇨ If the operating vacuum falls below the lower switching point, the warning signal sounds again and the machine enable is interrupted again.

8 Emptying the Reservoir

NOTE

Opening the drain valve when there is a vacuum in the storage reservoir Ignoring the visual fluid level warning

Separated liquid is drawn into the vacuum pump and leads to the destruction of the pump motor.

- Make sure that the power plug is OFF before each drainage process.
- Make sure that the manual lever valve is open before each drainage process.
- When the visual liquid warning is triggered, stop processing immediately.

For clamping applications where liquid coolant is used, for example, the reservoir fills up with liquid.

A sensor in the reservoir continuously monitors the fill level.

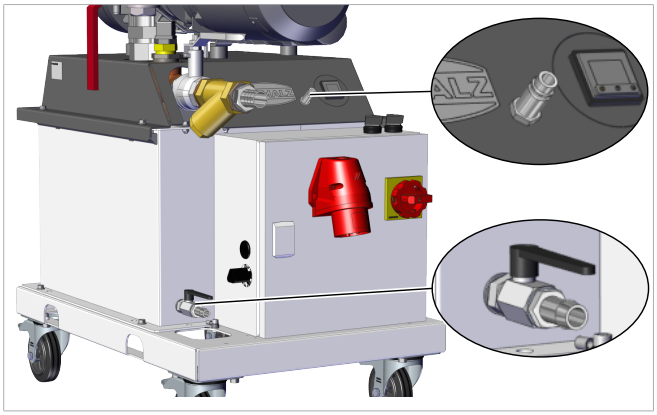
The fill level is reported by the LED status indicator:

- From a critical fill level of 60%, the LED status indicator flashes yellow.
- From a fill level of 80%, the LED status indicator flashes red.

The reservoir should be regularly checked with regard to the fill level of the separated liquid. It should be sufficiently empty before starting processing.

The reservoir must be emptied immediately as described below when it has reached the critical fill level of 60%:

1. Switch off the device and vent the reservoir by opening the manual lever valve on the vacuum connection.
   ⇨ The vacuum in the reservoir is regulated and the entire system is subjected to ambient pressure.



2. To accelerate the draining process, compressed air can be supplied at the compressed air connection. If compressed air > 0.5 bar is supplied, this is automatically regulated to 0.5 bar. (When the process is assisted with compressed air, close the manual lever valve on the vacuum connection.)
3. Install a small section of hose on the drain valve to make it easier to drain the liquid in a targeted way.
4. Position a suitable container for collecting the liquid next to or below the drain valve.
5. Drain the fluid in the reservoir by slowly and carefully opening the drain valve.

When compressed air is used to empty the container, a height difference of up to 4 m can be overcome during emptying, allowing the liquid to be pumped off into a reservoir at a higher level.

9 Troubleshooting

This device must only be installed and maintained by qualified specialist personnel. Check the safety features after repair or maintenance work is performed.

Fault	Possible cause	Solution
Vacuum pump does not run.	Electrical connection incorrect or faulty	▸ Check and adjust electrical connection.
	For versions with a motor-protection switch: Motor-protection switch triggered	1. Check whether the motor is overloaded or defective. 2. Clean the dust filter 3. Let the motor cool down 4. If necessary, adjust current of motor-protection switch 5. Switch on the motor-protection switch
	With a three-phase A.C. motor: Voltage only on two phases	▸ Check connection and fuses.
	Check connection and fuses.	▸ Check the power supply line.
	Vacuum pump is faulty	▸ Contact Schmalz service.
Pump runs, but vacuum does not reach -0.6 bar.	With a three-phase A.C. motor: Motor's direction of rotation reversed	▸ Reverse polarity of connection line.
	Filter cover leaking	▸ Check the filter cover for leaks.
	Blind plug leaking at the reservoir	▸ Tighten blind plug, replace sealing ring.
	Screw unions not tight	▸ Check screw unions, retighten and, if necessary, replace sealing rings.

10 Maintenance and Cleaning

10.1 Safety

Maintenance work may only be carried out by qualified personnel.

⚠ WARNING

Risk of injury due to incorrect maintenance or troubleshooting

- Check the proper functioning of the product, especially the safety features, after every maintenance or troubleshooting operation.

⚠ CAUTION

Improper installation or maintenance

Personal injury or damage to property

- Prior to installation and before maintenance work, the product must be disconnected from the power supply, depressurized (vented to the atmosphere) and secured against unauthorized restart.

⚠ CAUTION

Touching hot surfaces

Touching hot surfaces may cause injury from burns.

- Wear work gloves.
- Do not touch components during operation.
- Allow the components to cool down before commencing work on the product.

10.2 Cleaning the Product

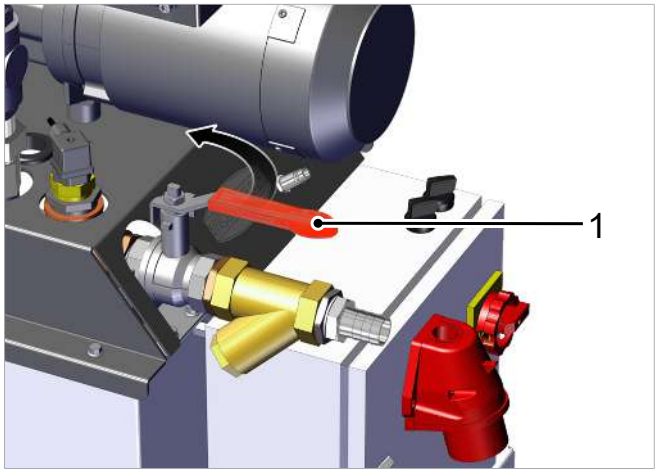
1. For cleaning, do not use aggressive cleaning agents such as industrial alcohol, white spirit or thinners. Only use cleaning agents with a pH between 7 and 12.
2. Remove dirt on the exterior of the device with a soft cloth and soap suds at a maximum temperature of 60° C.

10.3 Checking and Cleaning the Filter Screen

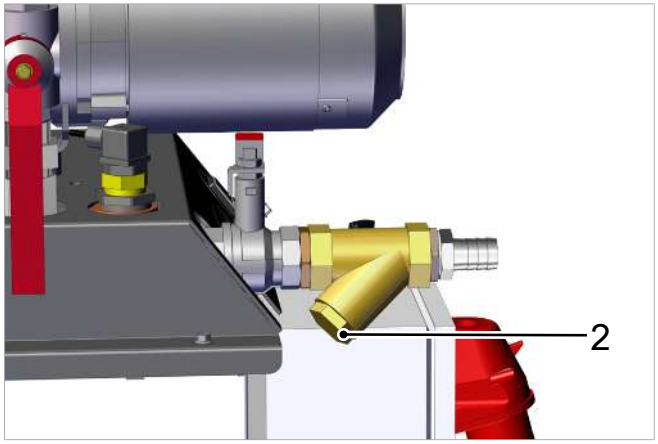
A heavily soiled screen impairs the function of the device and/or the vacuum flow.

The level of dirt on the screen depends on the process conditions and should be checked at regular intervals.

1. Close the manual lever valve (1) at the vacuum connection (the lever is perpendicular to the direction of the line).



2. Vent the vacuum line to the atmosphere to equalize the pressure.



3. Remove the filter housing cover (2).
4. Remove the filter insert.
5. Check the filter insert and clean or replace it if necessary!

10.4 Vacuum Pumps

See the vacuum pump operating instructions

10.5 Replacing the Vacuum Generator

If the vacuum generator is faulty, contact Schmalz service.

11 Spare and Wearing Parts

Maintenance work may only be carried out by qualified personnel.

The spare and wearing parts for the product are listed on the homepage or available by request.

12 Disposal

Recover the disassembled parts for recycling or reuse (provided no agreement on return or disposal has been made).

1. Dispose of the product properly after replacement or decommissioning.
2. Observe the country-specific guidelines and legal obligations for waste prevention and disposal.

For proper disposal, please contact a company specializing in the disposal of technical goods and instruct the company to observe the applicable disposal and environmental regulations. Schmalz is happy to assist you in finding a suitable company.

13 EU Declaration of Conformity

The manufacturer Schmalz confirms that the product described in these instructions fulfills the following applicable EU directives:

2006/42/EC	Machinery Directive
2014/30/EU	Electromagnetic Compatibility
2011/65/EU	RoHS Directive

The following harmonized standards were applied:

EN ISO 12100	Safety of machinery — General principles for design — Risk assessment and risk reduction
EN ISO 13849-1	Safety of machinery - Safety-related parts of control systems - Part 1 General principles for design
EN ISO 4414	Pneumatic fluid power – General rules and safety requirements for systems and their components
EN 1012-2: 2011-12	Compressors and Vacuum Pumps - Safety requirements - Part 2: Vacuum pumps
EN 60204-1, 32	Safety of machinery – Electrical equipment of machines
EN 61000-6-2+AC	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-6-3+A1+AC	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments

Additional technical standards and specifications were applied:

EN ISO 13732-1:2008-12	Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces

The EU Declaration of Conformity valid at the time of product delivery is delivered with product or made available online. The standards and directives cited here reflect the status at the time of publication of the operating and assembly instructions.

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J. Schmalz GmbH
Johannes-Schmalz-Str. 1
72293 Glatten, Germany
T: +49 (0) 7443 2403-0
schmalz@schmalz.de
WWW.SCHMALZ.COM