

# Mounting instructions

## VacuStar L400



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**Prior to installing the VacuStar L400 and putting it into operation you must have read and understood these instructions. These instructions are only valid together with the operating instructions, they do not replace them!**

# Translation of the Original Assembly Instructions

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# 1 General

## 1.1 Information on the assembly instructions

These assembly instructions provide important information about installation and start-up of the VacuStar L400. A precondition for safe operation is the observance of all specified safety and handling instructions.

Furthermore, all local accident prevention regulations and general safety regulations valid for the application area of the VacuStar L400 must be observed.

You must have read and understood the mounting instructions before you start installing the machine and put it into operation! It is a product component and must be kept in direct proximity of the VacuStar L400, well accessible to the personnel at all times. All safety instructions of the operating instructions must additionally be observed.

## General

### 1.2 Pictogram explanation

#### Warning notes

Warning notes are characterised by pictograms in these mounting instructions. The warning notes are marked by signal words expressing the extent of the hazard.

It is absolutely essential to observe the notes and to proceed with caution in order to prevent accidents as well as bodily injuries and property damage.



#### **DANGER!**

points to an immediately dangerous situation, which can lead to death or serious injuries if it is not avoided.



#### **WARNING!**

... points to an immediately dangerous situation, which can lead to death or serious injuries if it is not avoided.



#### **CAUTION!**

... points to a potentially dangerous situation, which can lead to minor or light injuries if it is not avoided.



#### **ATTENTION!**

... points to a potentially dangerous situation, which may lead to property damage if it is not avoided.

#### Hints and recommendations



#### **NOTE!**

... highlights useful hints and recommendations as well as information for an efficient and trouble-free operation.

### **1.3 Limitation of Liability**

Information regarding the limitation of liability can be found in the operating instructions "VacuStar L400".

### **1.4 Copyright protection**

Information regarding the copyright protection can be found in the operating instructions "VacuStar L400".

### **1.5 Spare parts**

Information regarding the copyright protection can be found in the operating instructions "VacuStar L400".

### **1.6 Warranty conditions**

The warranty conditions are included in the sales documentation as a separate document.

### **1.7 Customer Service**

Our customer service can be contacted for any technical advice. Information about the responsible contact person can be retrieved by telephone, fax, E-mail or via the Internet at any time, refer to manufacturer's address on page 2.

### **1.8 Declaration of Incorporation**

Declaration of incorporation (pursuant to EC Machinery Directive 2006/42/EC and "The supply of Machinery (Safety) Regulations 2008") see page 33.

## Safety

## 2 Safety

### 2.1 Intended use

The compressor vacuum pump series VacuStar L400 is intended for the installation in a superordinate system. The manufacturer of the overall system must assess the new risks resulting from the installation. These risks must be included in the operating instructions of the system.

The VacuStar L400 is intended exclusively for the compression or suctioning of filtered air.

### 2.2 Acceptance and monitoring

The VacuStar L400 itself is not subject to any acceptance and monitoring obligation.

### 2.3 Operator's responsibility

See operating instructions "VacuStar L400" for information about the responsibility of the operating company.

### 2.4 Requirements placed upon the specialised staff

The mounting instructions specify the following qualification requirements for the different fields of activity:

- **Specialists**  
are due to their technical training, knowledge and experience and their knowledge of the pertinent regulations able to carry out the work assigned to them and to independently recognize potential hazards.
- **Electrical specialists**  
are, due to their technical training, knowledge and experiences and their knowledge of the relevant standards and regulations, able to work on electrical systems and to independently recognize possible hazards.

### 2.5 Personal protective equipment

Information regarding the personal protection can be found in the operating instructions "VacuStar L400".

### 2.6 Occupational safety and special risks

Please observe all safety instructions as per the operating instructions "VacuStar L400", chapter "Occupational safety and special danger".



### 3 Technical data

#### 3.1 Dimensions

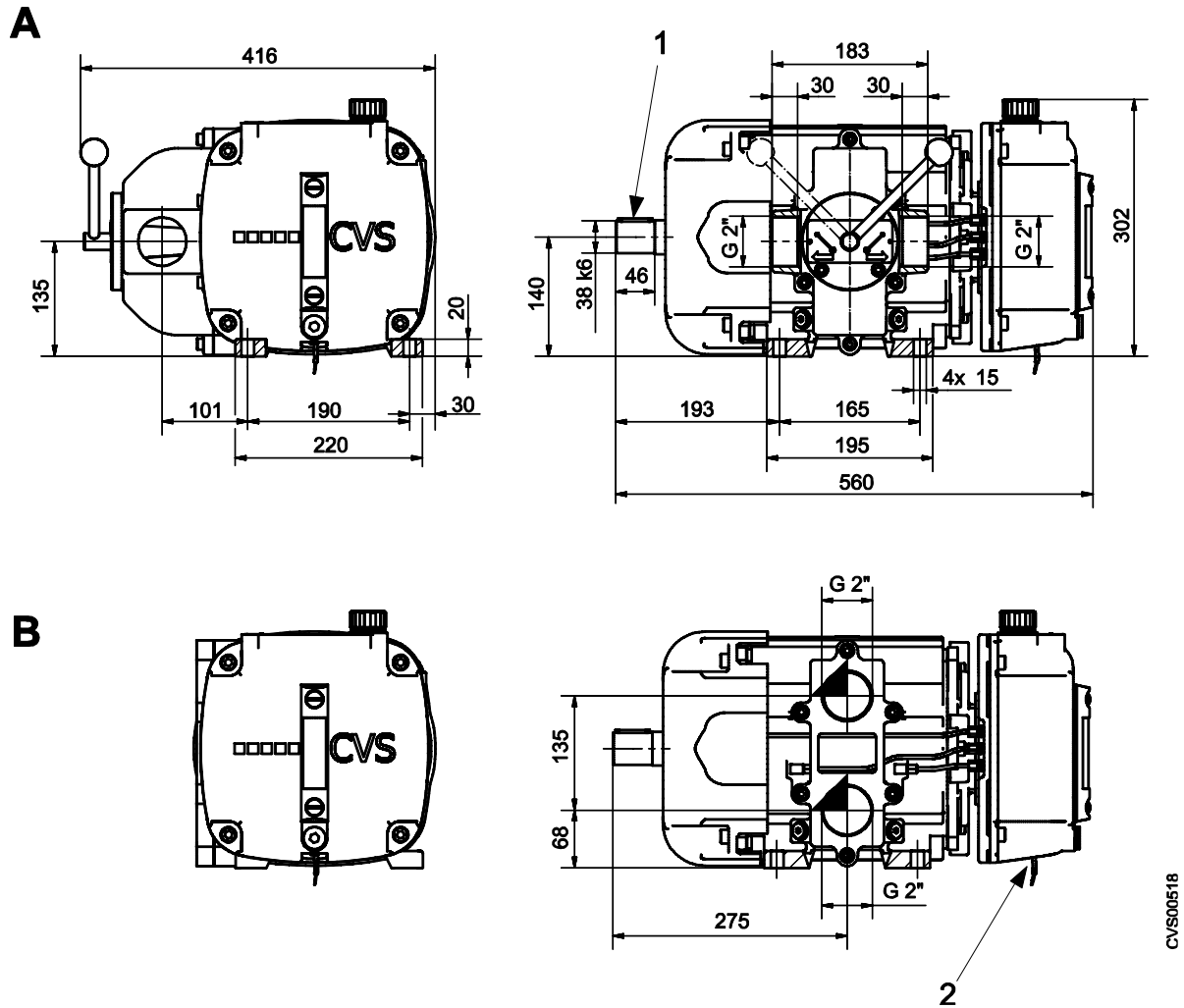


Fig. 1: Dimensions of VacuStar L400

A: Pressure vacuum design with four-way switching valve (can be switched between suction and pressure operation)

B: Pressure or vacuum design

- 1 Feather key DIN 6885 A10x8x40
- 2 Oil level switch, option

## Technical data

### 3.2 Technical data

General data	Unit	VacuStar L400
Angular momentum on the drive shaft	[kgm <sup>2</sup> ]	0.074
Rated speed / Speed range	[1/min]	1500 / 1000 to 1500
Suction temperature	[°C]	-20...+40
Geodetic height	[m]	0...1000
Content of oil container	[Litres]	4.6
Lubricating oil consumption	[ml/h]	85
Weight VacuStar L400 without accessories	[kg]	76

Tab. 1: General data

Operating data during compressor vacuum pump operation at rated speed	Unit	VacuStar L400
Vacuum without cell venting / with cell venting <sup>1)</sup>	[mbar]	200 / 100
Final overpressure at the pressure flange <sup>2)</sup>	[bar]	0 to 0.5
Intake volume flow at 400 / 1000 mbar	[m <sup>3</sup> /h]	320 / 345
Power requirement at 400 mbar / 0.5 bar excess pressure	[kW]	7.4 / 10
Sound pressure level (at 7 m distance) at 200 mbar / 0.5 bar excess pressure	[dB]	70 / 78
Weight VacuStar L400 with a four-way switching valve	[kg]	85

1) Final excess pressure at the pressure flange = 0 bar, suction and ambient temperature = 20 °C

2) Intake pressure at the suction flange = 1 bar, suction and ambient temperature = 20 °C

Tab. 2: Operating data VacuStar L400 during compressor vacuum pump operation at rated speed

Operating data during compressor operation at rated speed	Unit	VacuStar L400
Intake pressure	[mbar]	1000
Final overpressure at the pressure flange <sup>1) 3)</sup>	[bar]	0 to 2.0
Intake pressure at 0 / 2.0 bar excess pressure <sup>2)</sup>	[m <sup>3</sup> /h]	345 / 305
Power requirement at 0 / 2.0 bar excess pressure <sup>2)</sup>	[kW]	8 / 19.0
Sound pressure level (at 7 m distance) at 2.0 bar excess pressure <sup>2)</sup>	[dB]	77
Weight VacuStar L400 with mounting flange for suction and pressure line	[kg]	79

1) Suction and ambient temperature = 20 °C

2) at rated speed

3) Protection via a safety valve

Tab. 3: Operating data VacuStar L400 during compressor operation at rated speed

**Lubricating oil**

Only single grade oils with the following specification are permitted for operation:

Specification	Value
API	CF/CF4 or higher
ACEA	E2 or higher
Viscosity:	Suction temperature > 10 °C: SAE 40 Suction temperature < 10 °C: SAE 30

*Tab. 4: Lubricating oils*

**Lubricating oil types**

Recommended oil types

Brand	Suction temp. > 10 °C	Suction temp. < 10 °C
CVS	CVS Lube 4000	CVS Lube 3000

Other oil types on request.

*Tab. 5: Lubricating oil types*

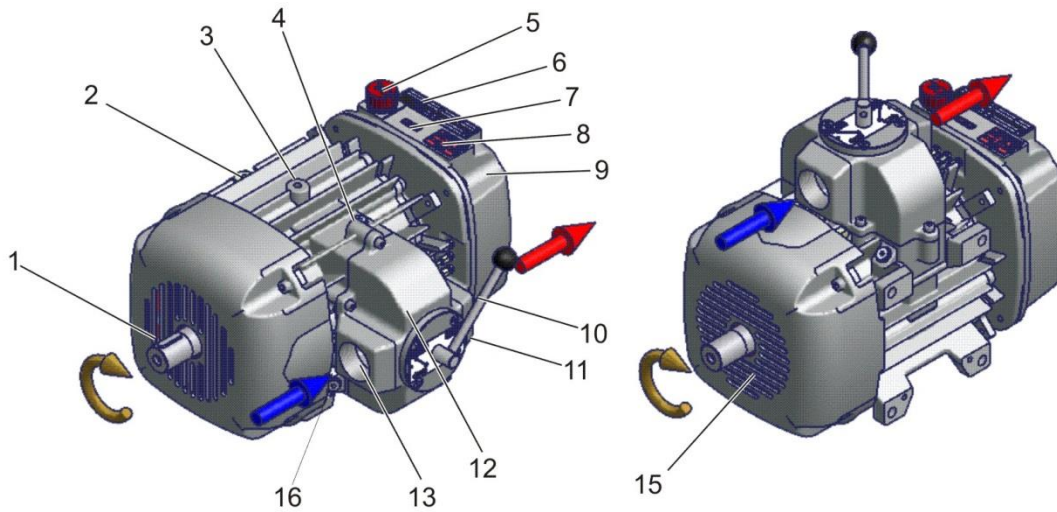

**ATTENTION!**

Do not use any synthetic lubricants!

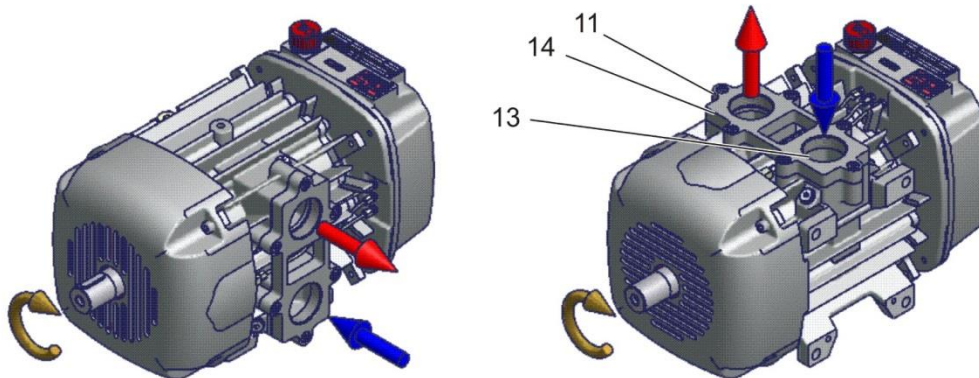
**Design**

**4 Design**

A:



B:



CVS00522a

Fig. 2: Design VacuStar L400 with and without a four-way switching valve

A: Compressor vacuum pump operation with four-way switching valve

The air feed direction (suction or pressure) is selected by the position of the switching lever.

B: Compressor or vacuum pump operation with mounting flange for suction and pressure line

- |  |   |
|--|---|
| 1 Drive shaft                              | 10 Switching lever  |
| 2 Cell ventilation connection              | 11 Pressure connection<br>(for illustrated lever setting) |
| 3 Thread for eye bolt                      | 12 Four-way switching valve                               |
| 4 Temperature and pressure measuring point | 13 Suction connection<br>(for illustrated lever setting)  |
| 5 Oil filling                              | 14 Mounting flange for lines                              |
| 6 Rating plate of VacuStar L400            | 15 Suction opening for cooling air                        |
| 7 Rotation arrow                           | 16 Connection for measuring control line                  |
| 8 Rating plate oil                         |   |
| 9 Oil reservoir                            |   |

## 4.1 Function

### Functional principle

Sliding vane compressor vacuum pumps work according to the displacement principle.

Due to the rotor's eccentric arrangement inside the casing, limited, crescent-shaped working chambers are created by means of the rotor vanes, which are enlarged or reduced with every turn of the rotor.

Cleaned air is drawn in via the suction connection (pos. 13) and reaches the pressure line after being compressed via the pressure connection (pos. 11).

### Lubrication

The VacuStar L400 is lubricated by means of an oil pump. Oil is pumped from the oil reservoir via the oil lines to the VacuStar L400's lubricating points.

### Cooling

The VacuStar L400 is air-cooled. Heat removal is performed by casing ribs on the lid and casing surface with targeted cooling air guidance, via a ventilation wheel on the drive shaft.

### Drives

The VacuStar L400 can be powered via:

- Articulated shaft
- V-belt
- Flexible coupling

See chapter 6.9, page 27.

## 4.2 Sense of rotation

The VacuStar L400 must only be operated in the indicated rotational direction. The rotational direction is determined by the customer in the order.

## Transport and storage

# 5 Transport and storage

## 5.1 Safety notes for transport

### Improper transport



#### **DANGER!**

#### **Danger by falling down or tilting of the VacuStar L400!**

The weight of the VacuStar L400 may injure a person and cause serious bruising!

Therefore:

- Use a pallet on which the VacuStar L400 can be moved by means of a fork lift.
- For lifting the VacuStar L400, use suitable lifting gear (slings, etc.) that is designed for the weight of the VacuStar L400.
- When putting the slings in position, take care to avoid putting stress on individual components.
- Only use the provided attachment points with eye bolts.

Please also observe the safety notes in the operating instructions "VacuStar L400"!

## 5.2 Transport

The VacuStar L400 fastened on a pallet must be transported by means of a fork lift or suitable lifting gear. The lifting gear must be designed for the weight of the VacuStar L400.

#### **For future transports:**

- Seal all open connections with protective caps (prevents penetration of dirt and water)
- Secure against vibrations
- Securely fasten the VacuStar L400 prior to transport (e.g. screw it onto a pallet)
- Transport and put down the VacuStar L400 with a fork lift or secure with straps and lift with suitable lifting gear.

## 5.3 Storage

### Storage of packages

Store packages under the following conditions:

- Do not store outdoors.
- Store dry and dust free.
- Do not expose to aggressive media.
- Protect against solar irradiation.
- Avoid mechanical vibrations.
- Storage temperature:  $-10 \dots +60$  °C
- Relative humidity: max. 95%, non-condensing
- If storage lasts longer than 3 months, regularly check the general condition of all parts and of the packaging. If necessary, brush up or recondition the preservation.
- In case of extended storage or extended downtimes, one desiccant bag each should be inserted in the inlets and outlets. The bags must be removed again before the VacuStar L400 is started.

## Installation and assembly

# 6 Installation and assembly

## 6.1 Safety

### Electrical system



**DANGER!**  
**Mortal danger due to electric current!**

There is mortal danger in case of contact with live components.

Activated electrically driven components can start to move uncontrolled and cause severest injuries. Therefore:

- Switch off the electric power supply before commencing any work and secure against restarting.
- Only skilled electricians are allowed to carry out any work on the electric systems, on electric components and connections.

### Dirt and lying about items



**CAUTION!**  
**Risk of tripping from dirt and objects lying around!**

Contamination and discarded items can lead to slipping and tripping, resulting in substantial injuries.

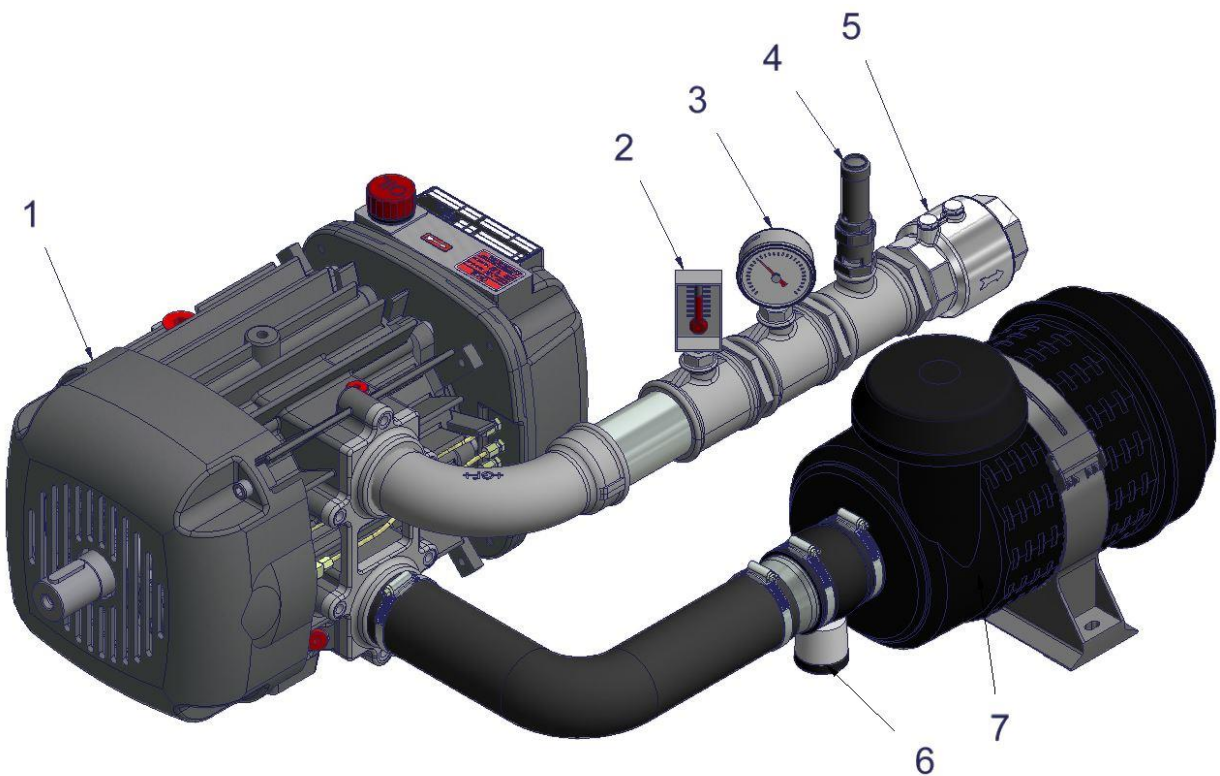
Therefore:

- Always keep the working area clean.
- Remove objects that are not required.
- Mark tripping points with yellow-and-black tape.

Please observe all safety instructions as per the operating instructions "VacuStar L400", chapter Occupational safety



## 6.2 Setup example for VacuStar L400 in compressor operation



*Fig. 3: Setup example for VacuStar L400 in compressor operation*

- |   |                                      |   |                  |   |                    |
|---|--------------------------------------|---|------------------|---|--------------------|
| 1 | VacuStar L400 (compressor operation) | 3 | Pressure gauge   | 6 | Vacuum display     |
| 2 | Thermometer                          | 4 | Safety valve     | 7 | Suction air filter |
|   |                                      | 5 | Non-return valve |   |                    |

## Installation and assembly

### 6.3 Setup example for VacuStar L400 in compressor vacuum pump operation

The illustration shows an example of a system with an installed VacuStar L400 in compressor vacuum pump operation.

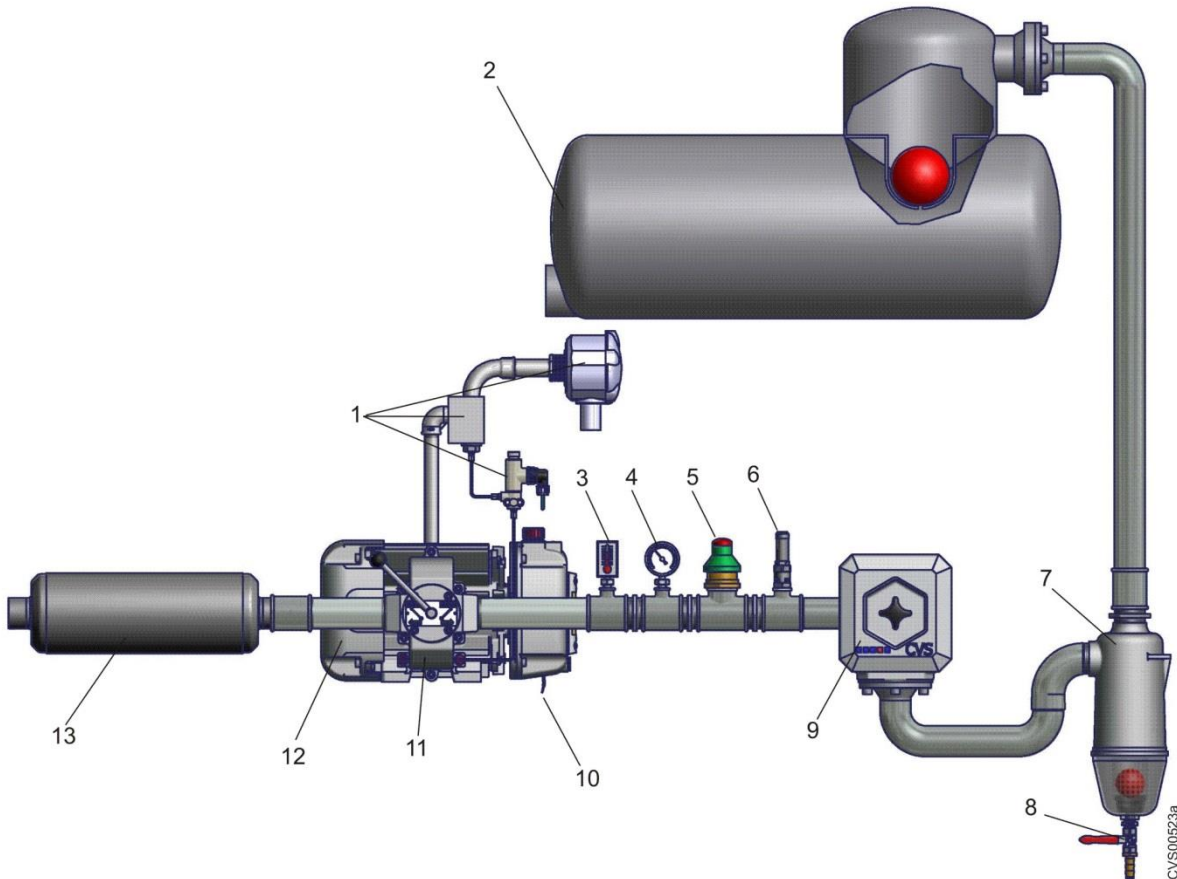


Fig. 4: Setup example for VacuStar L400 in compressor vacuum pump operation

1	Cell ventilation unit	6	Safety valve	11	Four-way switching valve with hand lever
2	Vehicle tank	7	Safety tank	12	VacuStar L400 (compressor vacuum pump operation)
3	Thermometer	8	Drain tap	13	Muffler
4	Pressure gauge	9	Vacuum suction filter		
5	Ventilating valve	10	Oil level switch		

### 6.4 Necessary work

The following work is necessary to install the VacuStar L400:

- Connecting the VacuStar L400 with suction and pressure lines.
- Installing safety and monitoring equipment.
- Installing accessories.
- Connecting the drive with VacuStar L400. Here, observe the correct sense of rotation (rotation direction arrow) and the speed range.

## 6.5 Sound insulation

### Measures for sound insulation

You can avoid or reduce the triggering of adjacent vehicle components by body sound or media sound as follows:

- Downstream installation of a muffler
- Compensators in the suction and pressure lines

## 6.6 Attachment and installation space

### Requirements placed upon installation point and attachment

- The attachment points on the vehicle must feature a sufficient load capacity and rigidity.
- The attachment points must be on the same level.
- The fastening screws must feature a sufficient clamping length.

### Requirements on the installation location

The installation location must fulfil the following requirements:

- Protect from dirt, falling rocks and spray water.
- Offer sufficient space for accidental contact protection.
- Offer sufficient space for the connections of the suction and pressure lines.
- Ensure good legibility of the instruments.
- Be accessible for maintenance and repair work e.g. for replacing the air filter cartridge, or for checking the safety and non-return valve.
- The VacuStar L400 must not be installed on a closed ground plate. There must be sufficient free space for discharge of cooling air.

### Assembly

Attach the VacuStar L400 with screws as per Tab. 6 without tension.

Use the following screws for securing the VacuStar L400:

Screw	Solidity	Torque
M12	8.8	80 Nm

Tab. 6: Fastening screws

## Installation and assembly

### 6.7 Suction and pressure lines

#### Assembly

- Connect suction and pressure pipe at the 2" thread
- Observe that pipes connected to the connection flange do not protrude over the sealing face to the VacuStar L400. Max. screw-in depth: 19 mm.

#### Requirements

- Corrosion-proof
- Pressure and temperature resistance (up to 240 °C)
- Rated diameter DN 50 (2")

#### Installation

Install the lines as follows:

- The connected lines must not have any reaction force on the VacuStar L400. Support the lines, if necessary.
- Place suction lines rising towards the VacuStar L400; place pressure line falling away from the VacuStar L400. The condensate must be able to be drained.
- Remove dirt, welding residues and rust, if necessary, before commissioning.
- If intake-side initial contamination is expected from the intake line, install a corresponding filter.
- Check the lines for leaks.

### 6.8 Safety equipment

The following safety equipment must be installed:

- Safety valve
- Non-return valve
- Monitoring the compression end temperature
- Protection against contact
- Ventilation valve <sup>1)</sup>
- Vacuum suction filter <sup>1)</sup>
- Cell ventilation valve if needed <sup>1)</sup>
- Shut-off valve in the control line <sup>1)</sup>
- Safety tank <sup>1)</sup>
- Air filter <sup>2)</sup>

1) *Operation as compressor vacuum pump*

2) *Operation as compressor*

## 6.8.1 Safety valve

### Risk of explosions



**DANGER!**  
**Risk of injury by explosions!**

Explosions can cause severe injuries!

Therefore:

- Install the safety valve as instructed. Observe the manufacturer's instructions.
- Only use the safety valve for its intended purpose.
- Never block the safety valve.

The German accident prevention regulations require a non-lockable safety valve to be installed after the VacuStar L400 at the pressure side. This valve must be selected such that it prevents the pressure to exceed the highest permissible operating pressure by more than 10 %. It must be identified with a TÜV component test number and be equipped with a manual venting element.



**ATTENTION!**

The safety valve (overpressure protection) must be chosen to match the maximum permitted operating pressure, the volume flow and the temperature range.

### Assembly

- Install the safety valve directly downstream of the VacuStar L400.
- The nominal opening pressure may not exceed the maximum permissible final overpressure of the VacuStar L400 (refer to Tab. 3) or the permissible system pressure, provided the latter is lower.
- Protect the settings against unauthorised or erroneous changes.

## 6.8.2 Ventilation valve

### Risk of explosions



**DANGER**  
**Risk of injury by explosions!**

Explosions can cause severe injuries!

Therefore:

- Properly install the ventilation valve. Observe the manufacturer's instructions.

Do not manipulate the ventilation valve.

## Installation and assembly

The ventilation valve is used to regulate the system and as a safety feature in the suction line. When the set vacuum is reached, the ventilating valve opens and admits atmospheric auxiliary air into the system.



### ATTENTION!

The safety valve (vacuum protection) must be chosen to match the maximum permitted operating pressure, the volume flow and the temperature range.

### Assembly

1. Install the ventilation valve on the suction side of the VacuStar L400.
2. Set minimum permissible vacuum:
  - for system without cell ventilation: 200...1000 mbar
  - for system with cell ventilation: 100...1000 mbar.



### NOTE!

*The ventilation valve can be procured from CVS!*

### 6.8.3 Non-return valve

The non-return valve prevents a backflow of air from the pressure line into the VacuStar L400 when the VacuStar L400 is stopped.

### Assembly

- Install the non-return valve (min. DN 50) after the safety valve.  
Note: For compressor vacuum pump operation the non-return valve is already integrated in the four-way switching valve)

### 6.8.4 Vacuum suction filter

Liquids and solids must not be sucked in.

#### Requirements for VacuStar L400 in compressor operation

- Provide combination filter with integrated cyclone
- Filter mesh < 5 Micron
- Filter resistance when it is new < 15 mbar
- Use filter with dust extraction valve, control flap and maintenance display.

#### Requirements for VacuStar L400 in vacuum pump operation

- The filter casing must be vacuum-resistant.

**Requirements for VacuStar L400 in compressor vacuum pump operation**

- The filter casing must be pressure and vacuum-resistant.
- A filter mesh of less than 0.1 mm must be provided for the setup with suction vehicles.

**Installation**

- Connect filter via stiff line or hose at the inlet.
- Protect the filter from spray water, e.g. from wheels, exhaust gases and heat.
- Observe the flow direction.
- Mount the filter horizontally.
- Provide removal space for filter insert.

**6.8.5 Protection against contact**

Rotating or hot parts of the system must be equipped with a protection against contact.

Please note that the German accident prevention regulations do not allow a maximum surface temperature of 80 °C to be exceeded.

Observe DIN EN ISO 13857, for example, for the distances and the layout of the protective grid.

## Installation and assembly

### 6.8.6 Cell ventilation valve

#### Assembly

The VacuStar L400 has been prepared for operation with cell ventilation.

The cell ventilation connection is located opposite of the pressure and suction connection.

Observe the following points during installation:

1. Install fresh air line (6) between the cell ventilation connection at the compressor (Fig. 2, pos. 2) and cell ventilation valve (4).
2. Install cell ventilation valve (4) vertically.
3. Install fresh air line (3) between the cell ventilation valve and suction air filter (1).
4. Install control line between the connection at the inlet (Fig. 2, pos. 16) and the connection (8) at the cell ventilation valve.

The cell ventilation valve is set fixed ex works (opening starts at approx. 350 mbar, full opening at 200 mbar) and cannot be changed.

Reverse rotation of the machine when standing still is prevented by the following measures:

- Operation with a four-way switching valve (Fig. 2 - A):  
The control line (8) must be closed right when shutting down the machine with a valve (9) (e.g. electric or solenoid valve).
- In operation as a pure vacuum pump (Fig. 2 - B), the shut-off valve (9) can be dispensed with when a 2" non-return valve is installed in the vacuum pump suction line.

The cell ventilation valve and the suction filter can be procured from CVS!



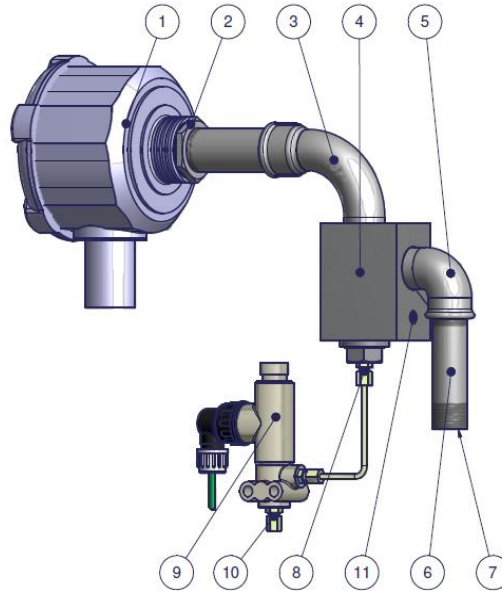


Fig. 5: Setup compressor or vacuum pump

- 1 Air filter (suction opening downwards)
- 2 Reducer nipple 1 1/4" - 1"
- 3 Connection line 1" (length max. 500 mm)
- 4 Cell ventilation valve (installed vertically as illustrated)
- 5 Reducer nipple 1" - 3/4"
- 6 Connection line 3/4" to VacuStar L400 (length max. 200 mm)
- 7 Connection to VacuStar L400 3/4"
- 8 Control line with connection (G1/8) to shut-off valve (pipe diameter 8 x 1 mm)
- 9 Solenoid or pneumatics shut-off valve
- 10 Connection control line to VacuStar, screw-connection (G1/8, pipe diameter 8 x 1 mm)
- 11 Bore M12 for additional attachment

### 6.8.7 Safety tank

#### Requirements

The safety tank (min. 2.5 litre) protects the VacuStar L400 from sucking in liquids. It must comply with the following requirements:

- Incoming air must not contact the liquid directly
- Sufficiently large settlement room
- Drain tap at the lowest possible level.

#### Assembly

Install the safety tank at the deepest point of the system.

## Installation and assembly

### Functional check

The functional check of the safety tank must satisfy the following requirements:

- Sucked-in liquid is separated and remains in the safety tank.
- In vacuum mode, the suctioned liquid must remain in the safety container.
- With atmospheric suction (pressure operation) no more than 1 l of liquid must be suctioned into the VacuStar L400 per hour.
- When the liquid volume in the container is reached, the line to the VacuStar L400 must close.

### 6.8.8 Display and monitoring equipment

Pressure gauge, maintenance display and thermometer must be provided to ensure smooth and trouble-free operation.

We also recommend the installation of a speed counter.

Designation	Monitoring parameters	Place of installation (s. Fig. 4)	Measuring range
Vacuum meter	Operating vacuum	intended site VacuStar L400 (at the inlet)	0...1000 mbars
Pressure gauge	Positive working pressure	Pressure line, right after outlet	According to the operating pressure to be ensured
Maintenance display	Degree of contamination of the suction filter	Between suction filter and VacuStar L400	0...65 mbars
Temperature sensor	Compression end temperature	Pressure line, right after outlet	0...250 °C
Speed counter (option)	Speed	Drive shaft	1000...1500 min <sup>-1</sup>
Oil shortage fuse (optional) <sup>1)</sup>	Oil level	Oil reservoir	

<sup>1)</sup> It is recommended to install a monitoring switch. If no monitoring switch is installed, the minimum oil level must be verified visually by the operator.

Tab. 6: Display and monitoring equipment

## 6.9 Drive



### ATTENTION!

- Selection and design are within the responsibility of the system builder.
- Do not route axial forces into the VacuStar L400 shaft when installing drive components.
- Do not tap couplings or other connection components onto the shaft, but slide them on.
- Always slide additional components such as V belt pulleys as far onto the shaft of the VacuStar L400 as possible.
- Check the torque and the sense of rotation.

The VacuStar L400 is driven via:

- V-belt
- Articulated shaft
- Flexible coupling

where drives such as lorry P.T.O, electric motors, hydraulic motors or diesel engine are possible.

## Installation and assembly

### 6.9.1 V belt drive



**ATTENTION!**

The maximum permissible belt tensile force must not exceed 2,500 N.  
Observe the design, installation and inspection instructions of the manufacturer.

**Assembly**

- Select V-belt drive according to Tab. 7.
- Align the V belt pulleys accurately to each other.
- Install V-belt pulley (e.g. with Taper-Lock clamping bushes) and V-belt with pretension according to the manufacturer specifications.
- To ensure sufficient air supply for the ventilator, observe a minimum distance of  $A = 11 \text{ mm}$  to the V belt pulley.

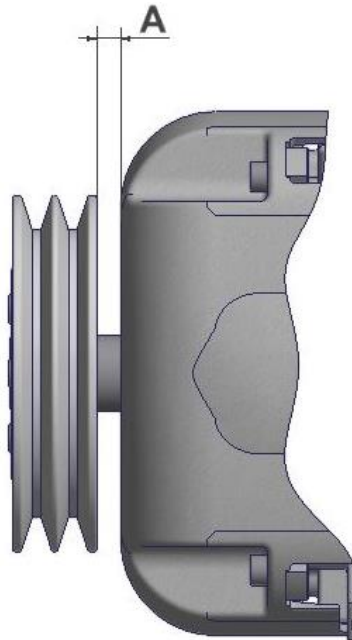


Fig. 6: Minimum distance V-belt pulley

**Belt pulleys**

Belt pulleys	Unit	Data
Smallest pulley diameter	[mm]	180
Belt profile	–	XPB
Number of belts	–	2

Tab. 7: Belt pulleys

## 6.9.2 Articulated shaft drive



### ATTENTION!

Observe the design, installation and inspection instructions of the manufacturer.

#### Requirement articulated shaft

- Select the bending angle of the joint shaft at max. 15°.
- Articulated shaft must be a spline shaft and balanced.
- The central axles of the articulated shafts must be parallel to each other.

#### Installing the articulated shaft flange

1. Coat all threads with anti-fretting paste.
2. Install articulated shaft flange with attachment screw M8 - 8.8 with a tightening torque of 23 Nm.

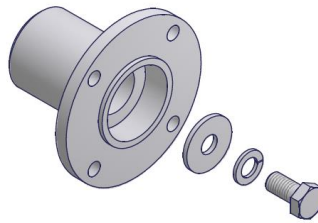


Fig. 7: Installing the articulated shaft flange

## 6.9.3 Drive via flexible coupling and hydraulic motor



### ATTENTION!

Observe the ratings, installation instructions and inspection intervals from the manufacturer.

The hydraulic motor is installed to the VacuStar L400 via an intermediate flange. The power is transmitted via a flexible coupling.

Components that match the VacuStar L400 can be ordered from CVS.

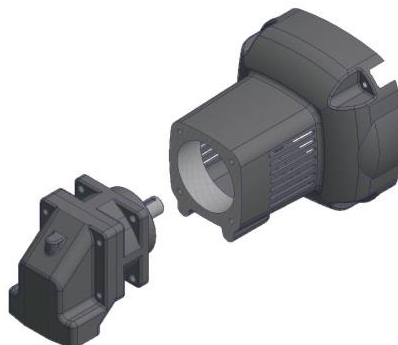


Fig. 8: Installing the hydraulic motor

## Start-up

# 7 Start-up

## 7.1 Safety notes for start-up

### Start-up, operation



#### **WARNING!**

#### **Risk of injury due to improper start-up and operation**

Improper start-up and operation can lead to serious bodily injuries or property damage.

Therefore:

- Have all work during initial operation exclusively performed by the manufacturer's employees or by his authorised representatives or by trained personnel.
- Start-up and operation may only be performed by adequately qualified personnel that has been authorised and instructed by the operator.
- Before the start of any work, ensure that all covers and protective devices are correctly installed and function correctly.
- Never override any protective equipment during operation.
- Pay attention to tidiness and cleanliness in the working area! Loosely stacked or scattered components and tools are accident sources.

Please observe all safety instructions as per the operating instructions "VacuStar L400", chapter "Occupational safety and special danger".

## 7.2 Start-up

### Inspection prior to initial start-up

The following points must be checked prior to initial start-up:

- Inspect the VacuStar L400 and the entire system
- Check the pipes for leaks, continuity and residues
- Check the operating data on the rating plate.
- Check whether the rotor shaft can be rotated by hand.
- Top up lubricating oil according to lubricating oil schedule (Tab. 4, Tab. 5).
- All oil lines in the oil supply tank (Fig. 2, pos. 9) must be filled with oil<sup>1)</sup>. (Control of the oil filling opening (Fig. 2, pos. 5) with the empty oil tank)
- Oil level in the oil supply tank at least to the middle of the oil sight glass
- Check the sense of rotation (switch briefly on/off). Observe the rotation direction arrow on the casing.
- Check the installation direction and the positioning of the non-return valve (see page 22, chapter 6.8.3).
- Check the function of the safety valve and the ventilation valve (see page 21 ff, chapter 6.8.1 and 6.8.2).
- Check function of the cell ventilation valve if necessary. (see page 24, chapter 0.)
- Check the attachment screws. (see page 19, chapter 6.6.)

### Start-up

Proceed as follows during start-up:

- Pay attention to permissible inclination of the VacuStar L400
- Open shut-off devices (if available)
- Start the VacuStar L400 drive (engage gently).
- Check operating data
- Check the function of the installed cell ventilation.

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<sup>1)</sup> The oil lines are usually filled with oil in machines ex works. When replacing the oil pumps, the approx. 100 ml oil must be added on the intake side across a period of about 0.5 h until oil is transported by the oil pump with the machine running; e.g. via the connection (fig. 2, pos. 13). During this time, the machine must not be operated with vacuum or pressure.

## Start-up

### Inspections during operation

The following inspections have to be carried out during operation:

- Prior to every start-up and during operation, the oil level must be checked and topped up if necessary.
- Open shut-off devices. Always turn the four-way cock until it hits the stop. Intermediate positions are not permitted
- Switch on drive and check whether pressure or vacuum are created.
- Pay attention to abnormal noises and leaks during operation. If necessary, switch off VacuStar L400.
- Drain condensate at the condensate and safety traps. Vessel may not be in a state of vacuum when condensate is drained.

Checking the operating data:

- The speed must be between 1000...1,500 min<sup>-1</sup>.
- Check positive working pressure at the pressure gauge (permissible pressure refer to rating plate).
- Check the operating vacuum at the vacuum meter (permissible vacuum refer to rating plate).
- The compression end temperature at 20 °C suction temperature may not exceed the following values:
  - 140 °C at 400 mbar operating vacuum
  - 120 °C at 0.5 mbar excess pressure

### 7.3 Switching off

Switching of the VacuStar L400:

- Switch off drive for the VacuStar L400.
- Close the shut-off valves (if installed)
- Drain the safety tank. Tank may not be under pressure then.



## 8 Declaration of Incorporation

**Einbauerklärung im Sinne der Maschinenrichtlinie  
2006/42/EG Anhang II 1B - Originaleinbauerklärung  
Declaration of Incorporation according to the  
EC Machinery Directive 2006/42/EC Annex II 1B  
– Original Declaration of Incorporation**

**Hersteller /  
Manufacturer**

CVS engineering GmbH  
Großmattstraße 14  
D-79618 Rheinfelden

**Bevollmächtigter für die Zusammenstellung der  
relevanten technischen Unterlagen /  
Authorised person for compilation of the  
relevant technical documents:**

Fabian Blum  
Großmattstraße 14  
D-79618 Rheinfelden

**Kurzbeschreibung &  
Produkt**

Flüssigkeitsring-Kompressor-Vakuumpumpe für Druck- und Vakuumbetrieb  
Liquid-ring compressor vacuum pump for pressure and vacuum operation  
VacuStar WR 2500\*, WR 3100\*, WR 4000

Schraubenkompressor für den Druckbetrieb  
Screw compressor for pressure operation  
SKL 700, SKL 1100, SKL 700 LS, SKL 1100 LS, SKL 1200 C, SKL 1500

**Short description &  
Products:**

Drehschieberkompressor für Druck- und Vakuumbetrieb  
Rotary vane compressor for pressure and vacuum operation  
VacuStar W900\*, W1300\*, W1600\*

Drehschieberkompressor für Druckbetrieb  
Rotary vane compressor for pressure operation  
RKL 160

Drehschieberkompressor für Druck- und Vakuumbetrieb  
Rotary vane compressor for pressure and vacuum operation  
VacuStar L400

**Seriennummer/  
Serial number**

siehe Typenschild / see type plate

Der Hersteller erklärt, dass das oben genannte Produkt eine unvollständige Maschine im Sinne der Maschinenrichtlinie ist. Das Produkt ist ausschließlich zum Einbau in eine Maschine oder unvollständige Maschine vorgesehen und entspricht daher noch nicht allen Anforderungen der Maschinenrichtlinie. Folgende grundlegenden Anforderungen der Maschinenrichtlinie für dieses Produkt sind angewandt und eingehalten: 1.1.2, 1.1.3, 1.1.5, 1.3.1, 1.3.2, 1.3.4, 1.3.7, 1.5.5, 1.5.7, 1.5.8, 1.5.9, 1.6.1, 1.7.1, 1.7.2, 1.7.3, 1.7.4 Die speziellen technischen Unterlagen gemäß Anhang VII Teil B wurden erstellt. Der Bevollmächtigte für das Zusammenstellen der technischen Unterlagen verpflichtet sich, die Unterlagen auf begründetes Verlangen an die einzelstaatlichen Stellen zu übermitteln. Die Übermittlung erfolgt postalisch in Papierform oder in elektronischer Form. Die Inbetriebnahme des Produkts ist so lange untersagt, bis festgestellt wurde, dass die Maschine, in die das oben genannte Produkt eingebaut wird, allen grundlegenden Anforderungen der Maschinenrichtlinie entspricht. Die oben mit "\*" markierten Produkte erfüllen die Anforderungen der folgenden einschlägigen Richtlinien:

- ATEX-Richtlinie 2014/34/EU des Europäischen Parlaments und Rates

Rheinfelden, 10.02.2023



Fabian Blum

The manufacturer declares that the above product is an incomplete machine in the meaning of the machinery directive. The product is only intended for installation in a machine or an incomplete machine and therefore does not meet all requirements of the machinery directive yet. The following basic requirements of the machinery directive for this product have been applied and complied with: 1.1.2, 1.1.3, 1.1.5, 1.3.1, 1.3.2, 1.3.4, 1.3.7, 1.5.5, 1.5.7, 1.5.8, 1.5.9, 1.6.1, 1.7.1, 1.7.2, 1.7.3, 1.7.4

The special technical documents have been created according to Annex VII, part B. The person authorised to compile the technical documents commits to submitting the documents to the national offices upon justified request. The submission shall take place on paper in the email or on electronic data carrier.

Commissioning of the product is forbidden until it has been determined that the machine into which the above product is installed meets all basic requirements of the machinery directive.

The products marked with "\*" comply with the requirements of the following directives:

ATEX directive 2014/34/EU of the European parliament and council

Leiter Konstruktion & Entwicklung  
Head of Design & Engineering

## Declaration of Incorporation

### Declaration of Incorporation according to The Supply of Machinery (Safety) Regulations 2008 Annex II 1B - Original Declaration of Incorporation

<b>Manufacturer:</b>	CVS engineering GmbH Großmattstraße 14 D-79618 Rheinfelden
<b>Importer:</b>	CompVac Ltd. Mr. Lee Benton 25, Wharfedale Road Euroway Industrial Estate BD4 6SG Bradford
<b>Authorised person for compilation of the relevant technical documents:</b>	Fabian Blum Großmattstraße 14 D-79618 Rheinfelden
<b>Short description &amp; Products:</b>	Liquid-ring compressor vacuum pump for pressure and vacuum operation VacuStar WR 2500*, WR 3100*, WR 4000*  Screw compressor for pressure operation SKL 700, SKL 1100, SKL 700 LS, SKL 1100 LS, SKL 1200 C, SKL 1500  Rotary vane compressor for pressure and vacuum operation VacuStar W900*, W1300*, W1600*  Rotary vane compressor for pressure operation RKL 160  Rotary vane compressor for pressure and vacuum operation VacuStar L400
<b>Serial numbers:</b>	See type plate

The manufacturer declares that the above product is an incomplete machine in the meaning of 'The Supply of Machinery (Safety) Regulations 2008'. The product is only intended for installation in a machine or an incomplete machine and therefore does not meet all requirements of 'The Supply of Machinery (Safety) Regulations 2008' yet.

The following basic requirements of 'The Supply of Machinery (Safety) Regulations 2008' for this product have been applied and complied with: 1.1.2, 1.1.3, 1.1.5, 1.3.1, 1.3.2, 1.3.4, 1.3.7, 1.5.5, 1.5.7, 1.5.8, 1.5.9, 1.6.1, 1.7.1, 1.7.2, 1.7.3, 1.7.4

The special technical documents have been created according to Annex VII, part B. The person authorised to compile the technical documents commits to submitting the documents to the national offices upon justified request. The submission shall take place on paper in the email or on electronic data carrier.

Commissioning of the product is forbidden until it has been determined that the machine into which the above product is installed meets all basic requirements of 'The Supply of Machinery (Safety) Regulations 2008'.

The products marked with “\*” comply with the requirements of the following directives:

- Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016

Rheinfelden, 10.02.2023



Fabian Blum  
Head of Design & Engineering  
CVS engineering GmbH

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