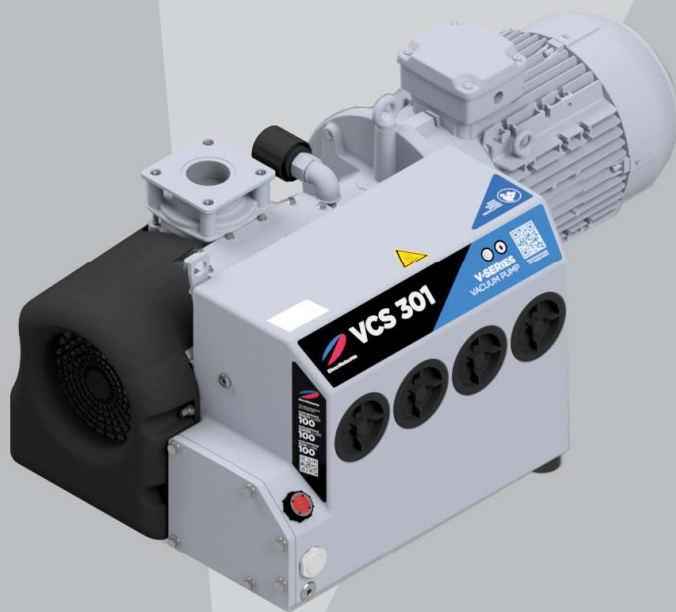


Operating Instructions

V-VCS 201 | 301 and V-VCX 201 | 301

Vacuum pump



V Serie
V Series
Drehschieber
Rotary Vane



7.2 Maintenance table

Interval (Operating hours)	Maintenance activities	Chapter
daily	Check the oil level	Chapter 6.2.1
Depending on the degree of pollution	Clean vacuum pump	Chapter 7.4
At least 1 x per month	Check the pipes and screws for leaks and ensure their tight fit and if necessary re-seal or re-tighten.	—
	Check the terminal box and cable inlet holes for leaks and if necessary re-seal.	—
	Clean the ventilation slots on the machine and the motor cooling ribs.	—
	Cleaning the oil cooler	Chapter 7.8
	Clean the fan and check it for material fatigue	Chapter 7.8
Depending on how dirty the sucked in medium is	Clean the mesh filter in the inlet connection	Chapter 7.5.1
or	Clean the filter cartridge in the gas ballast valve	Chapter 7.5.2
At least 1 x per month		
500 h	First oil change	Chapter 7.6.2
500 - 2000 h 500 - 3,000 h if Super-Lube is used or at least 1 x per year	Oil change	Chapter 7.6.2
2000 h or Filter resistance of 700 mbar reached (accessories pressure monitoring system) or at least 1 x per year	Change the oil separator elements	Chapter 7.7
at least 1 x per year	Check couplings for wear	Chapter 7.9.2
As per manufacturer's instructions	Motor (maintenance, lubrication and cleaning)	Chapter 7.9.1

Tab. 1 Maintenance table

7.3 Preparing maintenance works

- Switch the plant off electrically and secure it against unexpected restart.
- Vent the vacuum pump with atmospheric air; for this purpose open the shut-off valve on the inlet side.
Exception: Clean the outside of the vacuum pump
- Allow the vacuum pump to fully cool down.
Exception: Oil change, here the pump shall be still warm, because oil can then flow off better.
- Post the warning sign "Caution, maintenance works!".

7.4 Clean vacuum pump

The vacuum pump must regularly be checked for dust deposits and cleaned, if necessary. The cleaning interval depends on the operational requirements.

- Clean the vacuum pump with a damp cloth or using a vacuum cleaner. Remove dust deposits:
 - Between the cooling ribs of the motor
 - On the hood
 - Oil separator housing

Cleaning can also take place in connection with the cleaning of the oil cooler. See chapter 7.8.

7.5 Cleaning of filter

CAUTION



Danger of injury when dealing with compressed air!

When the filter is blown off with compressed air, loose solid particles or powder dust swirling around may cause injury to the eyes. Inhaling can damage lungs.

- Wear protective glasses and dust mask when cleaning the filter with compressed air.

NOTICE

Property damage due to insufficient maintenance of the air filter!

Performance of the machine is reduced by a polluted air filter and insufficient maintenance. This can cause damage of the machine.

- Regularly clean the mesh filter.
- Replace highly polluted or damaged mesh filters.
- During disassembly/assembly of the inlet flange make sure that not parts fall into the inlet flange.

7.5.1 Clean the mesh filter in the suction flange

Depending on the pollution of the inlet medium, the mesh filter (Fig. 6/f₁) has to be cleaned more or less by washing or blowing off or it must be replaced.

- Depending on the installation type, disassemble the pipeline at the suction flange.
- Take off the suction flange (Fig. 6/D) after releasing the screws (Fig. 6/s₁).
- Clean the mesh filter (Fig. 6/f₁).
- Check the non-return valve for contamination.
- Put on the suction flange (Fig. 6/D) and secure it with the bolts (Fig. 6/s₁). Tightening torque: 25 Nm
- Check the function of the non-return valve. For this purpose, fit a cut-off device to the suction side (enclosed volume of at least 1 litre) and briefly start the vacuum pump. The vacuum reached must then remain constant.

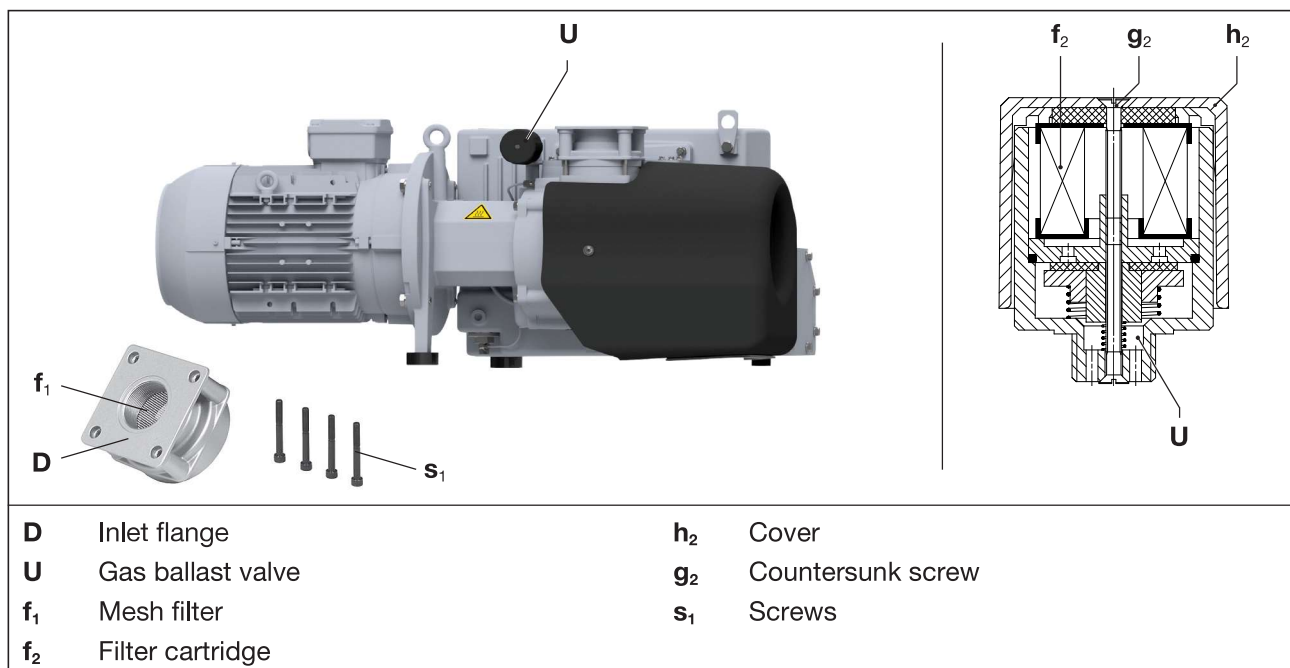


Fig. 6 Mesh filter and gas ballast valve

7.5.2 Clean the filter cartridge of the gas ballast valve

The pumps work with a gas ballast valve (Fig. 6/U). The inbuilt filter cartridge (Fig. 6/f₂) must be cleaned more or less often depending on how dirty the medium flowing through is.

- By undoing the countersunk screw (Fig. 6/g₂) and removing the plastic cover (Fig. 6/h₂), the filter parts can be removed for cleaning.
- Clean the filter cartridge (Fig. 6/f₂) by purging or replace it.
- Insert the filter cartridge (Fig. 6/f₂) into the valve, put on the plastic hood (Fig. 6/h₂) and secure with the countersink screws (Fig. 6/g₂). Tighten the screw by hand.

7.6 Lubricating Oil

CAUTION



Risk of burns on hot equipment!

There is the risk of burning on hot equipment when changing oil.

- Allow the machine to cool down to approx. 40 °C (lukewarm).
- Avoid contact with the hot oil because the oil temperature can be higher than the ambient external temperature of machine.
- Wear suitable protective gloves, if necessary.

CAUTION



Risk of injury due to slipping and falling!

The floor can be slippery due to leaked oil and cause slipping, tripping or falling.

- For oil change wear non-slip shoes.
- Remove leaked oil immediately.



Always change the oil when the machine is at operating temperature and in an atmospherically ventilated area. If it is not completely emptied, the refilling quantity is reduced.

If you change the type of oil, empty the oil tank completely.



The waste oil must be disposed of in compliance with the local environmental protection regulations.

As operating agent, we recommend **Elmo Rietschle** oils, see oil recommendation plate (Fig. 7/M) as well as Tab. 3 on page 32:

- MULTI-LUBE 100
- SUPER-LUBE 100
- ECO-LUBE 100

The viscosity of the oil used must comply with ISO VG 100 as per DIN ISO 3448. Also consider the safety data sheet of the oil type used.

If you want to change the oil type, please contact us.

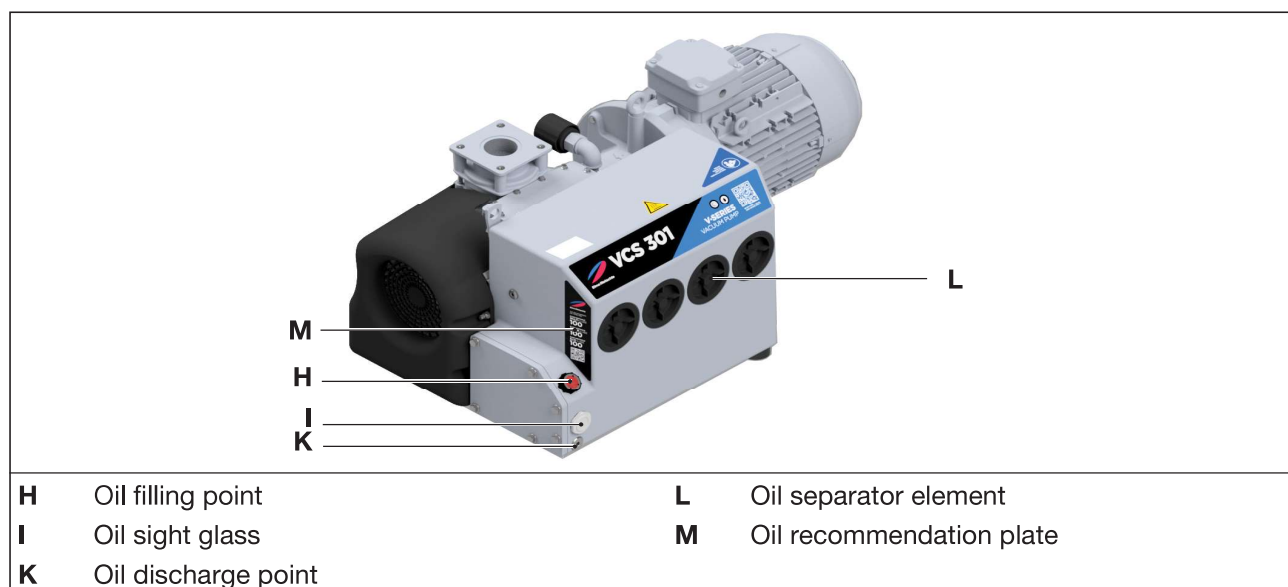


Fig. 7 Oil change and de-oiling

7.6.1 Refilling of oil

- a) Switch the machine off, secure it against accidental switching on and vent to atmospheric pressure.
- b) Open the cap of the oil filling point (Fig. 7/H) and refill oil until it reaches the upper edge of the sight glass (Fig. 7/I).
- c) Reclose the oil filling point.

7.6.2 Oil change

carry out the first oil change after 500 operating hours, further oil changes each after 500 to 2,000 operating hours. Reduce the change intervals accordingly depending on how contaminated the discharged medium is.

- a) Switch the machine off, secure it against accidental switching on and vent to atmospheric pressure. Let the pump cool down.
- b) Open the catch of the oil filling point (Fig. 7/H), open the oil discharge point (Fig. 7/K) and completely discharge the used oil.
- c) Close the oil discharge point (Fig. 7/K) and fill in new oil through the oil filling point (Fig. 7/H).
- d) Check the oil level in the sight glasses (Fig. 7/I).

7.7 Oil separator elements

NOTICE



Property damage due to insufficient maintenance!

If the oil separator elements are strongly polluted, their functioning will be reduced, which can cause machine failures.

- Check oil separator elements for soiling at regular intervals.
- Replace oil separator elements after 2,000 operating hours at the latest, or if the filter resistance exceeds 700 mbar (see pressure gauge → accessories, check with short-time atmospheric intake).
- Do not clean the oil separator elements.
- Always replace the oil separator elements by new ones.



For monitoring the level of soiling of the oil separator elements, we recommend using a pressure gauge (ZDM). This enables a check of the filter resistance with temporary atmospheric suction.

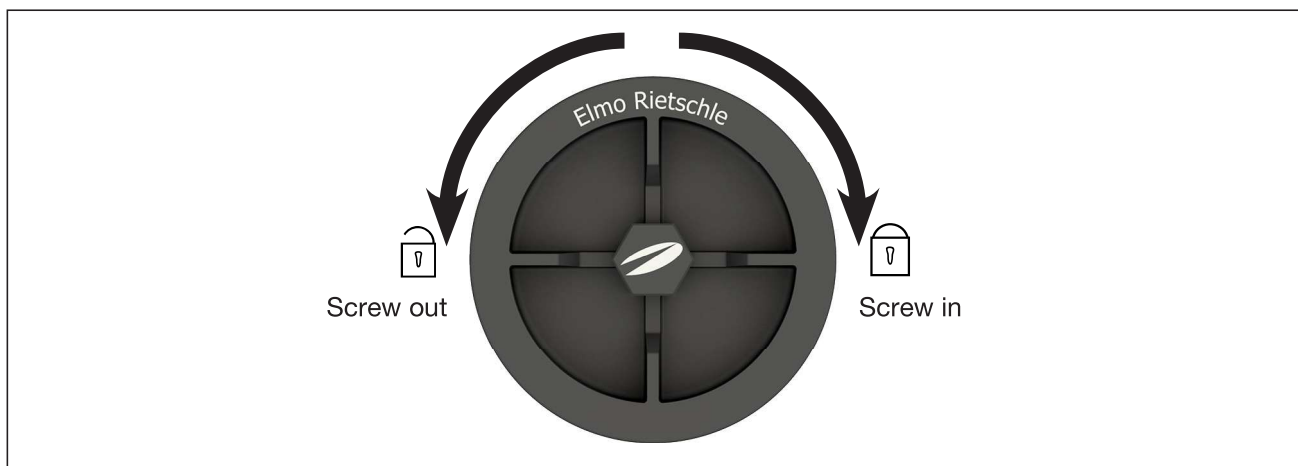


Fig. 8 Oil separator element

The oil separator elements (4x) may be contaminated with particles of dirt when the machine has been running for a long time (power consumption and pump temperature increase).

Reduce the change intervals accordingly depending on how contaminated the discharged medium is.

- a) Switch the machine off, secure it against accidental switching on and vent to atmospheric pressure. Let the pump cool down.
- b) Unscrew oil separator elements (Fig. 7/L) with a ring spanner (width across flats 19 mm) counter-clockwise.
- c) Push in the new oil separator elements and screw in clockwise. Tightening torque: max. 15 Nm
The oil separator elements shall be flush with the oil separator housing.



CAUTION

Risk of injuries due to improper installation!

Oil separator elements that have not been installed properly can cause injuries during operation if the pressure in the machine becomes higher than allowed.

- Make sure that the oil separator elements are screwed in tightly again after being replaced.

7.8 Oil cooler and fan

CAUTION



Danger of injury when dealing with compressed air!

When the cooler is blown off with compressed air, loose solid particles or powder dust swirling around may cause injury to the eyes. Inhaling can damage lungs.

- Wear protective glasses and dust mask when cleaning the cooler with compressed air.

NOTICE

Property damage due to insufficient maintenance of the oil cooler!

Due to soiled cooling ribs of the oil cooler (e.g. From dust) and insufficient maintenance, the cooling capacity of the machine is reduced. This can cause damage of the machine.

- Clean the oil cooler at regular intervals.

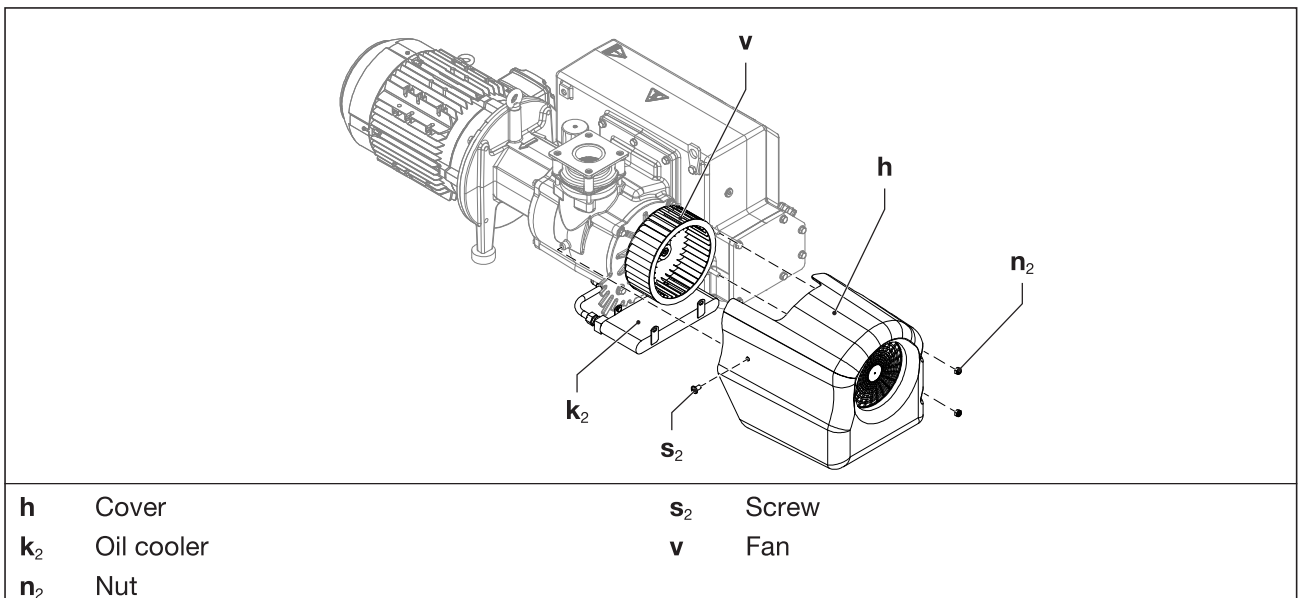


Fig. 9 Oil cooler

- a) Switch the machine off, secure it against accidental switching on and vent to atmospheric pressure. Let the pump cool down.
- b) Release a screw (Fig. 9/s₂) and two nuts (Fig. 9/n₂) on the hood.
- c) Remove the hood (Fig. 9/h) from the pump.
- d) Blow-off the oil cooler (Fig. 9/k₂) and clean from the outside (wipe with a moist cloth).
- e) Clean / blow off the fan (Fig. 9/v) and check it for damages. Operate the fan only if it is in good order and condition.
- f) Clean / blow-off the ventilation slots on the hood (Fig. 9/h).
- g) Push the hood back onto the pump and fix it using the screw (Fig. 9/s₂) and nuts (Fig. 9/n₂). Tightening torque: 5 Nm

7.9 Motor and coupling

7.9.1 Motor



Perform the maintenance of the motor in accordance with the manufacturer's operating and maintenance instructions. For this, contact our service people.

7.9.2 Coupling

NOTICE

Property damage due to defective coupling sleeve!

Defective sleeves can cause breaking of the rotor shaft and blackout failure of the machine.

- Regularly check the coupling sleeve for wear.

NOTICE

Property damage due to frequent starting and high ambient temperature!

Frequent starting and high ambient temperature reduces the lifetime of the sleeve.

- Regularly check the coupling sleeve for wear.

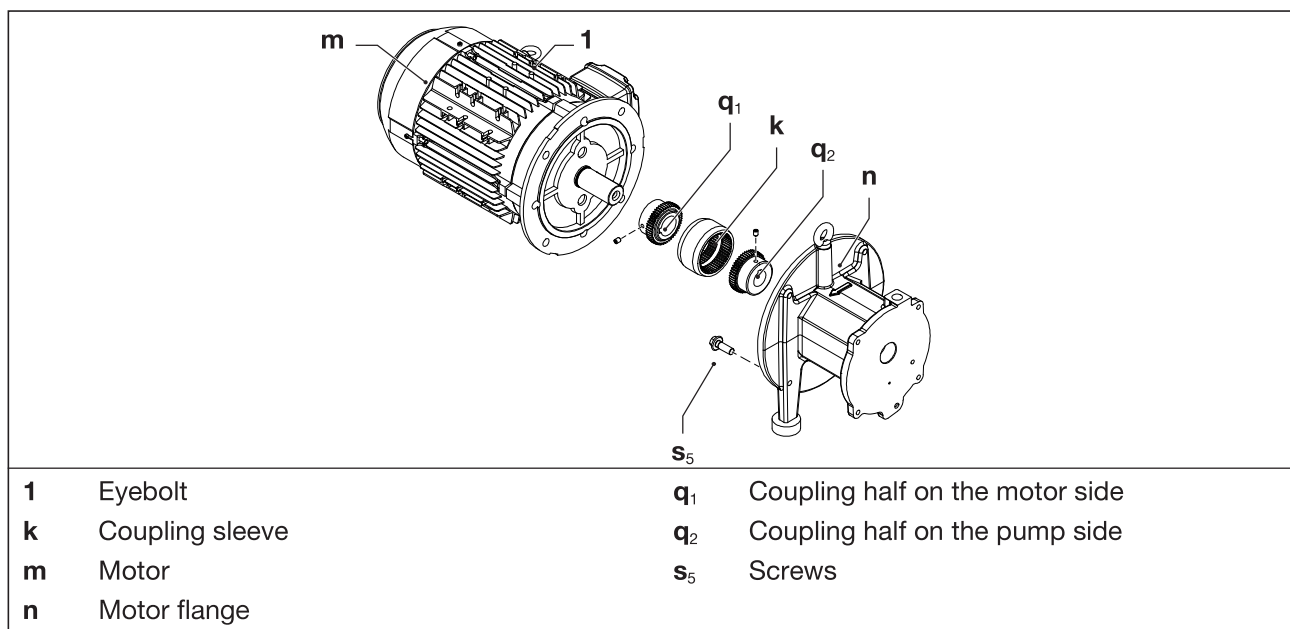


Fig. 10 Coupling

The coupling sleeve (Fig. 10/k) is subject to wear and must be checked regularly (at least 1 x per year).

- a) To check the coupling, switch off the motor (Fig. 10/m) and ensure that it cannot be switched on again.
- b) Tighten the eyebolt on the motor (Fig. 10/1) firmly.
- c) Secure the lifting gear on the ring bolt of the motor.
- d) Undo the screws (Fig. 10/s₅) on the motor flange (Fig. 10/n).
- e) Remove the motor axially with the coupling half (Fig. 10/q₁) on the motor side from the motor flange (Fig. 10/n) and suspend with the lifting gear.
- f) Check the sleeve (Fig. 10/k) for damage and replace if necessary.
- g) Push the sleeve and motor with coupling half on the motor side again axially and using bolts (Fig. 10/s₅) fix to the motor flange (Fig. 10/n). Tightening torque: 90 Nm
- h) Remove the lifting gear from the motor.

7.10 Repair / service

For repairs contact the manufacturer, its branch offices or authorised dealers.
Please contact the manufacturer for the address of the authorized service centre (see manufacturer's address at the rear side).



WARNING

Risk of injury due to substances hazardous to health!

Due to contamination with hazardous substances and operating agents during operation, there is a high health risk for the repair personnel.

- For each machine that is sent to an **Elmo Rietschle** Service centre for inspection, maintenance or repair, a fully completed, signed declaration of harmlessness must be enclosed.
The declaration of harmlessness is part of the supplier's documentation.
- Before returning, properly clean the machine.

After a repair or re-commissioning, the actions listed in chapter 5 "Installation" and chapter 6 "Commissioning and decommissioning" are to be performed as in the first commissioning.

7.11 Spare parts

NOTICE

Property damage due to wrong or defective spare parts!

Wrong or defective spare parts can cause malfunctions or blackout failure of the machine.

- Only use original spare parts or parts approved by the manufacturer.
- The use of other parts may revoke liability or guarantee for any resulting consequences.

Order spare parts according to:

- **List of spare parts: E 239** → V-VCS/VCX 201-301
 - Download the PDF file: <http://www.elmorietschle.com>
→ Downloads

Wearing parts and sealings are separately listed. For ordering spare parts, please contact the **Elmo Rietschle** Service (address on the back of the page).

For a simple and fast maintenance we are offering several service kits for our vacuum pumps. They include all wearing parts and sealings that are required for the respective maintenance works.

These service kits and oil types can directly be ordered from our **Elmo Rietschle** Service with quotation of the material numbers.

Service kits	Material number	Description
Standard maintenance kit 500 - 2,000 h	1029870102	Includes*: 4x oil separator elements, 1x sealing oil eye, 1x sealing oil filler
Extended service kit ab 6,000 h	1029870104	Includes*: 4x oil separator elements, 1x sealing oil filler, 1x coupling sleeve, 1x O-ring, 1x filter disc, 1x locking ring, 1x non-return valve, 1x filter cartridge, 1x oil sight glass, 1x metal float

Tab. 2 Service kits

* Please find the exact positions in the service drawing E239 .

Service kits	Material number	Description
General overhaul		
Set of wearing parts		
VCS	1029870103	Includes all wearing parts.
VCX	1029880103	
Set of sealings	1029870101	Includes all sealings.

Tab. 2 Service-kits (continued)

Oil	Trading units	Material number	Description
Multi-Lube 100 500 - 2,000 h	Canister, 20 l	7204866000	Standard oil based on mineral oil
	Canister, 5 l	7202096000	
	Canister, 1 l	7202126000	
Super-Lube 100 500 - 3,000 h	Canister, 20 l	7204876000	Synthetic oil, for longer oil change intervals at high thermal load of oil, e.g. ambient or intake temperatures above 30 °C, insufficient cooling, 60 Hz-operation.
	Canister, 5 l	7201466000	
	Canister, 1 l	7201586000	
ECO-Lube 100 500 - 2,000 h	Canister, 5 l	7201486000	Synthetic oil for the food and pharmaceutical industry with H1 certificate

Tab. 3 Oils