Edition: 3.11.2016 · BA 880-EN

Original Operating Instructions
C-VLR 60 | 100 | 150 | 251

Vacuum pump

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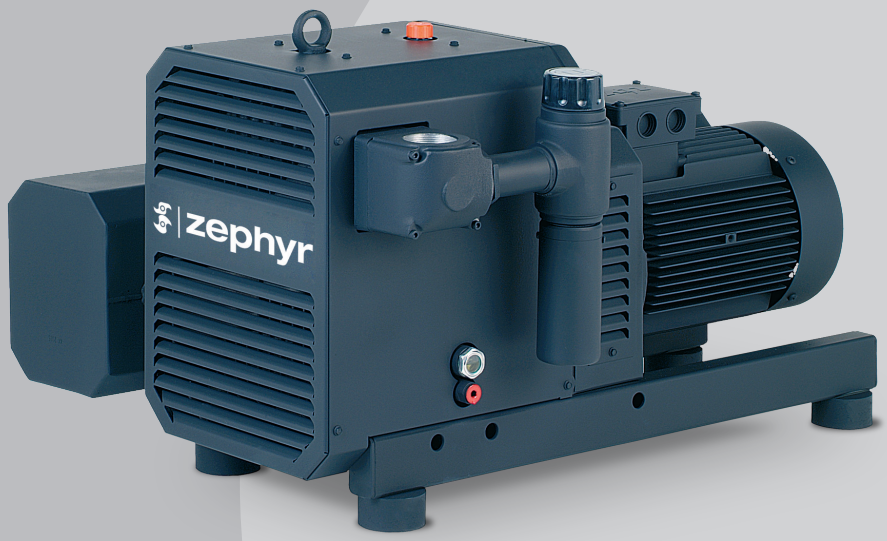
by Gardner Denver



C-Series
C-Series
Claw

Contents

1 Foreword

1.1 Principles

These operating instructions:

- Are part of the following contact free running claw vacuum pumps of type C-VLR 60, C-VLR 100, C-VLR 150, and C-VLR 251.
- describe how to use them safely and properly in all life phases.
- must be available where the equipment is used.

1.2 Target group

The target group for these instructions is technically trained specialists.

1.3 Supplier documentation and accompanying documents

Document	Contents	No.
Supplier documentation	Operating Instructions	BA 880-EN
	Declaration of Conformity	C 0080-EN
	Declaration of harmlessness	7.7025.003.17
Spare parts' list	Spare parts document	E 880
Data sheet	Technical data and characteristics	D 880 / D 880-31
Info sheet	Storage guidelines for machines	I 150
Manufacturer’s declaration	EU Directive 2011/65/EU (RoHS II)	—

1.4 Abbreviations

Fig.	Figure
C-VLR	Vacuum pump
m^3/h	Suction capacity
mbar (abs.)	Final vacuum, operating vacuum
*	Picture shows possibly optional asseccories

1.5 Directives, standards, laws

See Conformity Declaration

1.6 Symbols and meaning

Symbol	Explanation
▷	Condition, pre-requisite
####	Instructions, action
a), b),...	Instructions in several steps
⇨	Results
[-> 14]	Cross reference with page number
	Information, note
	Safety symbol Warns of potential risk of injury Obey all the safety instructions with this symbol in order to avoid injury and death.

1.7 Technical terms and meaning

Term	Explanation
Machines	Pump and motor combination ready to be connected
Motor	Pump drive motor
Vacuum pump	Machine to create a vacuum
Claw	Machine's design or active principle
Suction capacity	Vacuum pump volume flow related to the condition in the suction connection
Final pressure (abs.)	The maximum vacuum that a pump reaches when the suction opening is closed. Given as absolute pressure
Permanent vacuum	The vacuum or the suction range at which the pump operates permanently. The permanent vacuum or intake pressure is ≥ than the final vacuum and < than the atmospheric pressure.
Noise emission	The noise emitted at a specific loading given as a figure, sound pressure level dB(A) as per EN ISO 3744.

1.8 Copyright

2 Safety

The manufacturer is not responsible for damage due to nonobservance of the whole documentation.

2.1 Warning instruction markings

Warning	Danger level	Consequences if not obeyed
DANGER	Immediately imminent danger	Death, severe bodily injury
WARNING	Possible imminent danger	Death, severe bodily injury
CAUTION	Possible hazardous situation	Slight bodily injury
NOTICE	Possible hazardous situation	Material damage

2.2 General

These operating instructions contain basic instructions for installation, commissioning, maintenance and inspection work which must be obeyed to ensure the safe operation of the machine and prevent physical and material damage.
Observe the safety instructions in all chapters.
The operating instructions must be read by the responsible technical personnel/ operator before installing and commissioning/and must be fully understood. The contents of the operating instructions must always be available on site for the technical personnel / operator. Instructions fixed directly onto the machine must be obeyed and must always remain legible. This applies for example to:

- Symbols for connections
- Data and motor data plate
- Instruction and warning plates

The operator is responsible for observing local regulations.

2.3 Designated use

The machine must only be operated in such areas as are described in the operating instructions:

- only operate the machine in a technically perfect condition
- do not operate the machine when it is only partially assembled
- the machine must only be operated at an ambient temperature and suction temperature of between 5 and 40°C.
  Please contact us for temperatures outside this range.
- the machine may convey, compress or extract the following media:
  - All non-explosive, non-inflammable, non-aggressive and non-poisonous dry gases and gas air mixtures

2.4 Unacceptable operating modes

- extracting, conveying and compressing of explosive, inflammable, aggressive or poisonous media, e.g. dust as per ATEX zone 20-22, solvents as well as gaseous oxygen and other oxidation agents, water vapour, liquids or solids
- Using the machine in non-commercial plants if the necessary precautions and protective measures have not been taken in the plant
- installing in environments that are at risk of explosions
- Using the machine in areas with ionising radiation
- Modifications to the machine and accessories

2.5 Personal qualifications and training

- Ensure that people entrusted with working on the machine have read and understood these operating instructions before starting work, particularly the safety instructions for installation, commissioning, maintenance and inspection work
- Manage the responsibilities, competence and monitoring of staff
- All work must only be carried out by technical specialists:
  - Installation, commissioning, maintenance and inspection work
  - Working with electricity
- Personnel being trained to work on the machine must be supervised by technical specialists only

2.6 Safety-conscious work

The following safety regulations apply in addition to the safety instructions and intended use listed in these instructions:

- Accident prevention regulations, safety and operating regulations
- Standards and laws in force

2.7 Safety notes for the operator

- Hot parts of the machine must not be accessible during operation or must be fitted with a guard
- People must not be endangered by the free extraction or discharge of pumped media
- Risks arising from electrical energy must be eliminated
- The machine may not get in contact with flammable materials.
  Risk of fire due to hot surfaces, output of hot pumped media or cooling air

2.8 Safety instructions for installing, commissioning and maintenance

- The operator will ensure that any installation, commissioning and maintenance work is carried out by authorised, qualified specialists who have gained sufficient information by an in-depth study of the operating instructions.
- Only work on the machine when it stands still and is secured against accidental switching on
- Strictly observe the procedure for decommissioning of the machine described in the operating instructions
- Fit or start up safety and protective devices again immediately after finishing work. Before recommissioning, follow the instructions listed for commissioning
- Alteration works or modifications to the machine are only permissible with the manufacturer's consent
- Only use original parts or parts approved by the manufacturer. The use of other parts can void liability for any consequences arising
- Keep unauthorised people away from the machine

2.9 Guarantee conditions

The manufacturer's guarantee or warranty will no longer apply in the following cases:

- Improper use
- Not complying with these instructions
- Operation by insufficiently qualified staff
- using spare parts that have not been approved by **Gardner Denver Schopfheim GmbH**
- Unauthorised modifications to the machine or the accessories supplied by **Gardner Denver Schopfheim GmbH**

3 Transport, storage and disposal

3.1 Transportation

3.1.1 Unpack and check the delivery condition

a) Unpack the machine on receipt and check for transport damage.
b) Notify the manufacturer of transport damage immediately.
c) Dispose of the packaging in accordance with the local regulations in force.

3.1.2 Lifting and transporting

WARNING

Death or limbs crushed as a result of the items being transported falling or tipping over!

▷ When transporting with the lifting device remember:
a) Select the lifting device suitable for the total weight to be transported.
b) That the machine is secured against tipping and falling.
c) Do not stop under a suspended load.
d) Put the goods to be conveyed on a horizontal base.

Lifting device/ Transporting with a crane

WARNING

Bodily injury resulting from improper operation
a) Loads crosswise to the ring level are not permitted.
b) Avoid impact stress.

a) Tighten the eyebolt (Fig. 1/1) firmly.
b) The machine must be suspended on the eyebolt using the lifting device for lifting and transporting.

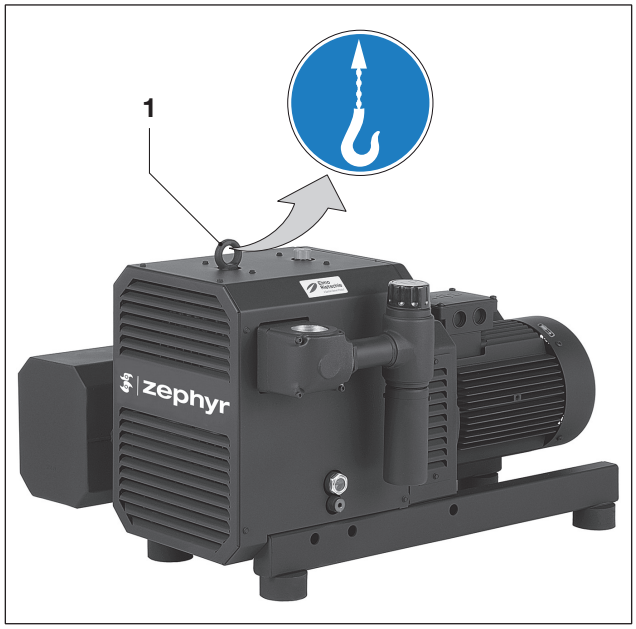


Fig. 1 Lift and transport

1 Eyebolt

3.2 Storage

NOTICE

Material damage caused by improper storage

▷ Ensure that the storage area meets the following conditions:

a) Dust-free

b) Vibration-free

3.2.1 Ambient conditions for storage

Ambient conditions	Value
Relative humidity	0 % to 80 %
Storage temperature	-10 °C to +60 °C

The machine must be stored in a dry environment with normal air humidity. It should not be stored for more than 6 months.

See Info “Machine storage guidelines”, Page 4

3.3 Disposal

WARNING

Danger due to flammable, corrosive or poisonous substances!
Machines that come into contact with hazardous substances must be decontaminated before disposal!

▷ When disposing of ensure the following:

a) Collect oils and grease separately and dispose of in accordance with the local regulations in force.

b) Do not mix solvents, lime-scale removers and paint residues.

c) Remove components and dispose of them in accordance with the local regulations in force.

d) Dispose of the machine in accordance with the national and local regulations in force.

e) Parts subject to wear and tear (marked as such in the spare parts list) are special waste and must be disposed of in accordance with the national and local waste laws.

4 Set up and operation

4.1 Setup

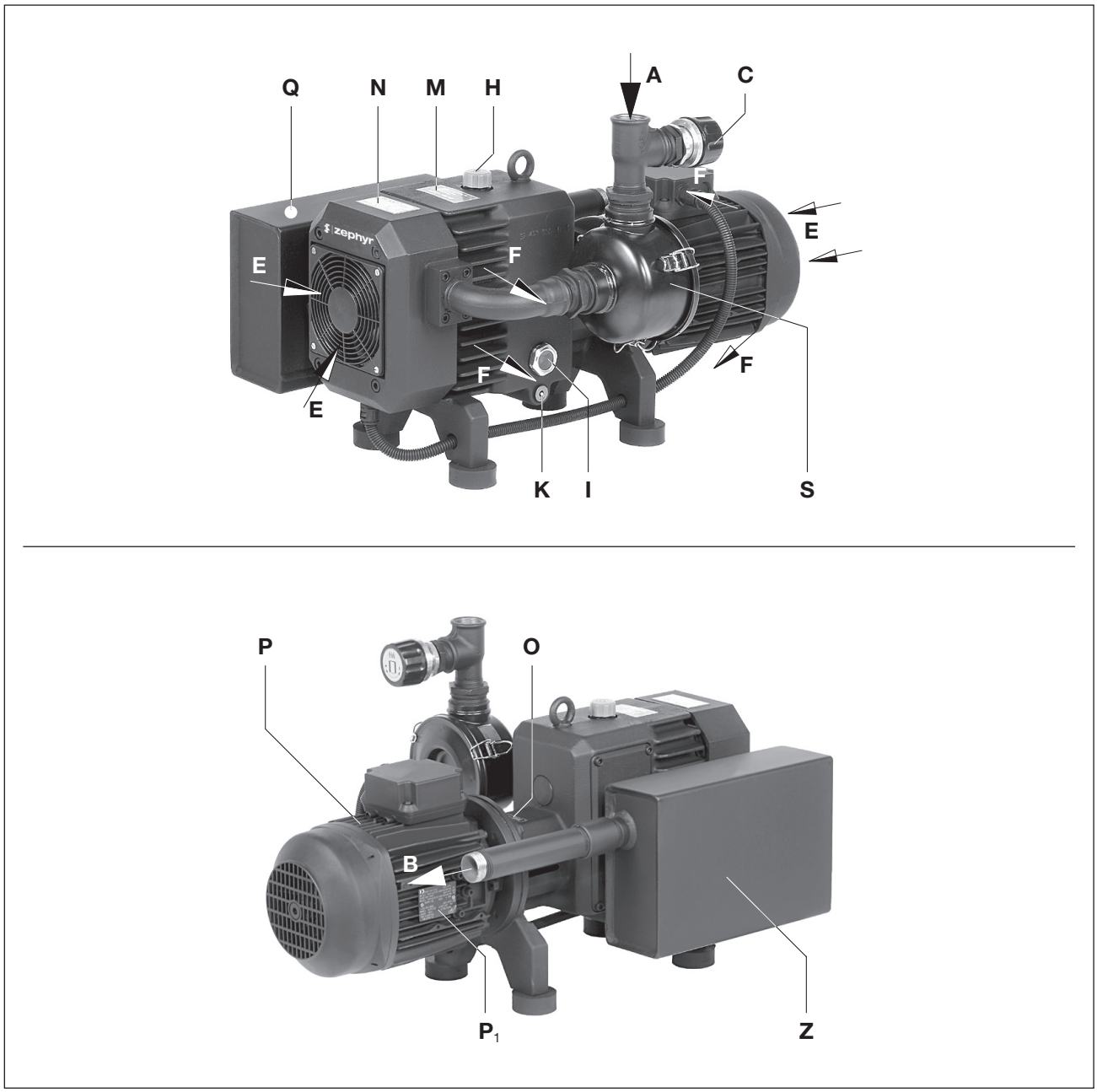


Fig. 2 Vacuum pump C-VLR 60

A	Vacuum connection	**M**	Oil recommendation plate
B	Exhaust air-outlet	**N**	Data plate
C	Vacuum regulating valve / limitation valve*	**O**	Rotation direction plate
E	Cooling air-inlet	**P**	Drive motor
F	Cooling air outlet	**P_1**	Motor data plate
H	Oil filling point	**Q**	Hot surfaces > 70 °C
I	Oil sight glass	**S**	Intake filter
K	Oil discharge point	**Z**	Exhaust silencer

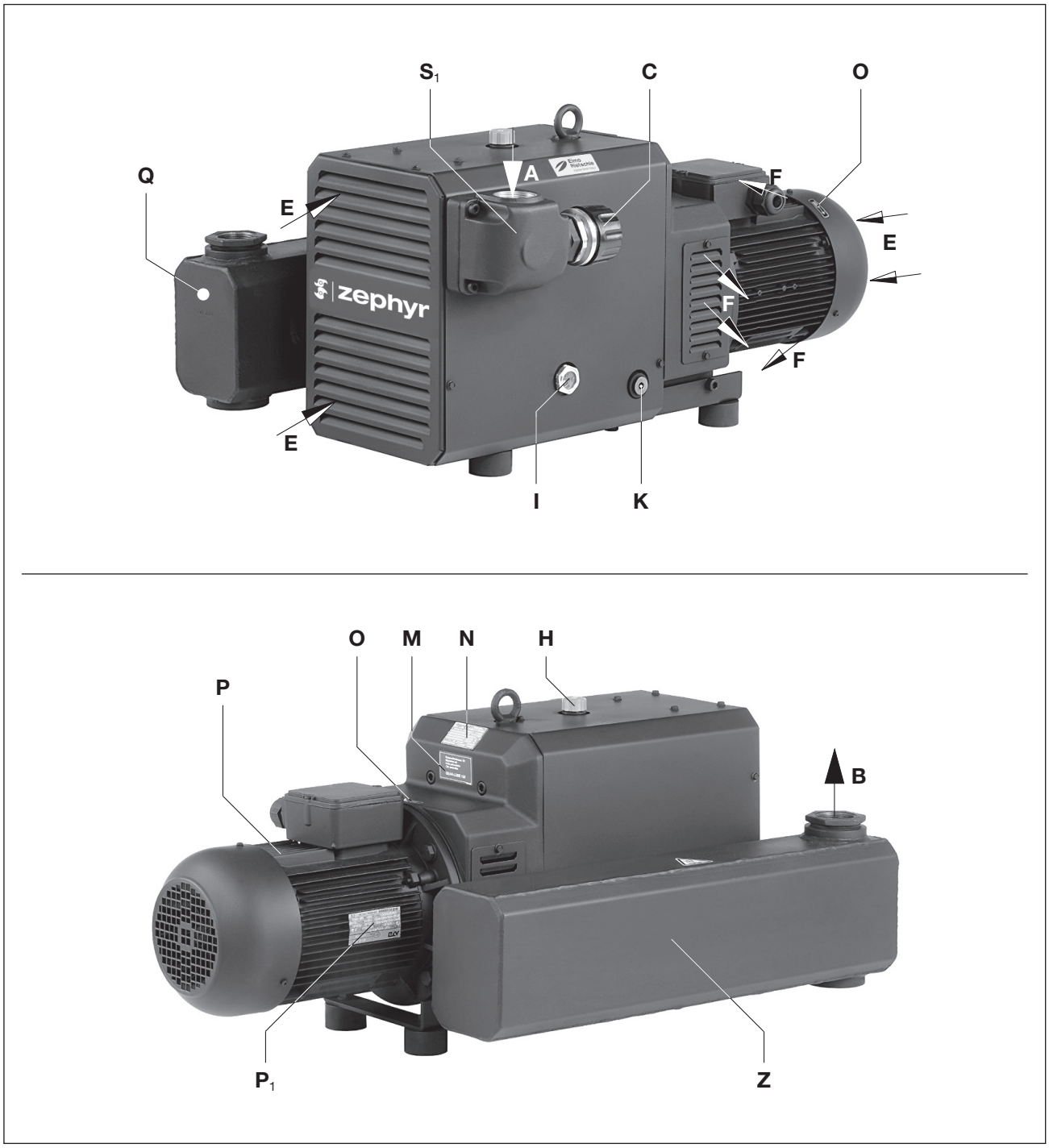


Fig. 3 Vacuum pump C-VLR 150

A	Vacuum connection	**M**	Oil recommendation plate
B	Exhaust air-outlet	**N**	Data plate
C	Vacuum regulating valve / limitation valve*	**O**	Rotation direction plate
E	Cooling air-inlet	**P**	Drive motor
F	Cooling air outlet	**P_1**	Motor data plate
H	Oil filling point	**Q**	Hot surfaces > 70 °C
I	Oil sight glass	**S_1**	Terminal box
K	Oil discharge point	**Z**	Exhaust silencer

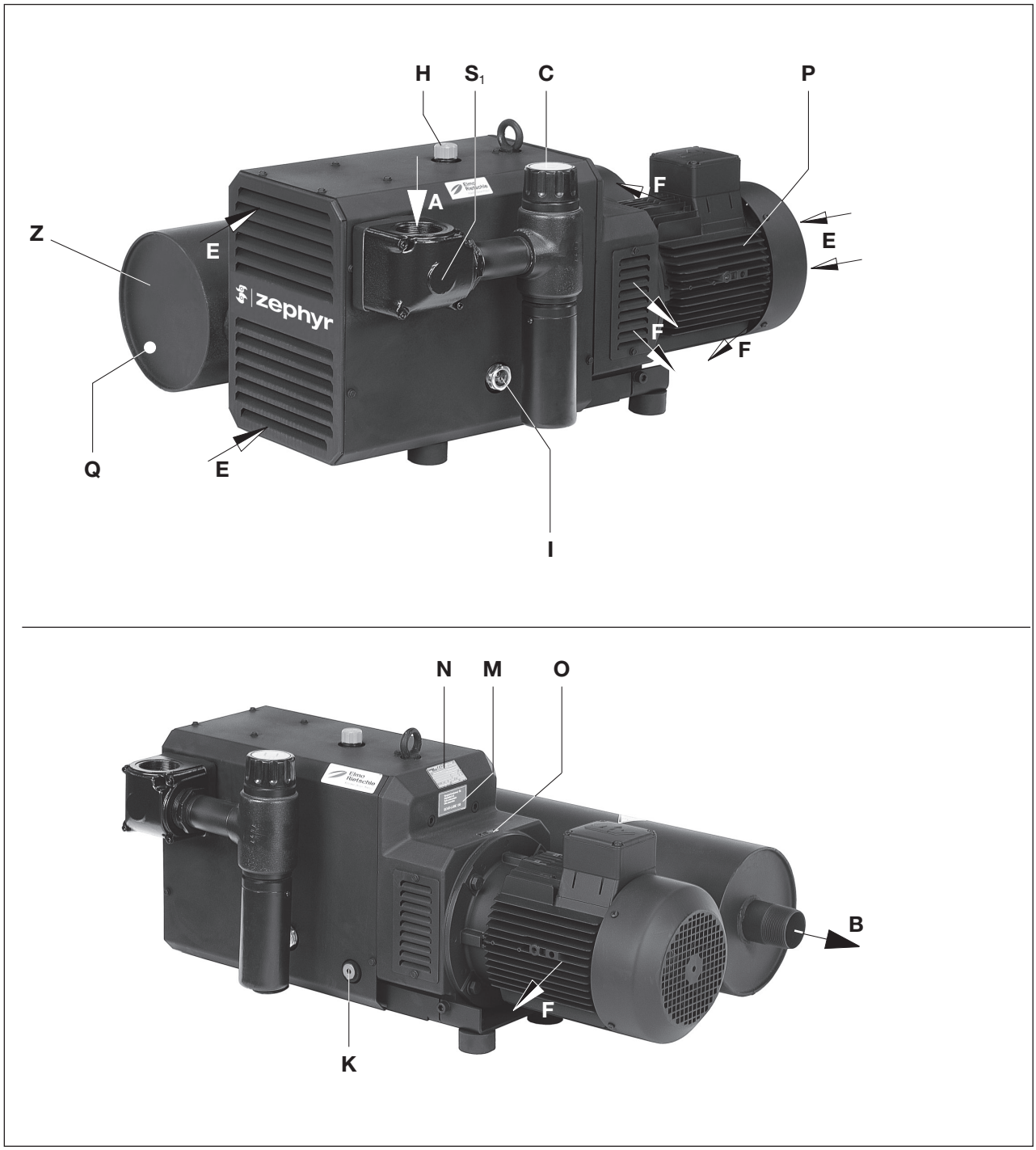
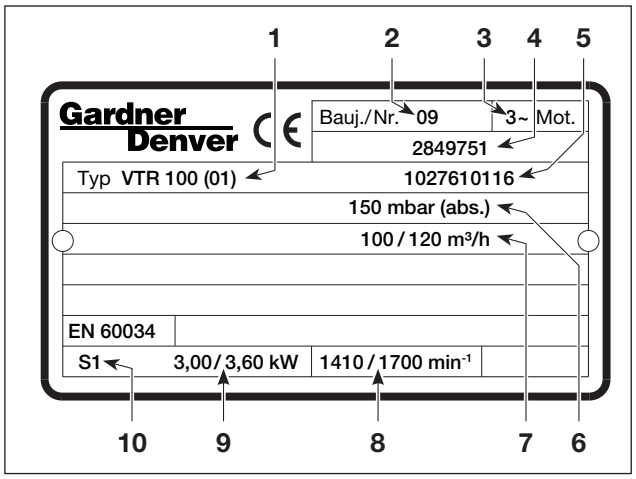


Fig. 4 Vacuum pump C-VLR 251

A	Vacuum connection	**M**	Oil recommendation plate
B	Exhaust air-outlet	**N**	Data plate
C	Vacuum regulating valve	**O**	Rotation direction plate
E	Cooling air-inlet	**P**	Drive motor
F	Cooling air outlet	**Q**	Hot surfaces > 70 °C
H	Oil filling point	**S_1**	Terminal box
I	Oil sight glass	**Z**	Exhaust silencer
K	Oil discharge point		

4.1.1 Data plate



1	Type / Size (mechanical version)
2	Year of construction
3	Motor design
4	Serial number
5	Item-No.
6	Final pressure (abs.)
7	Suction capacity 50 Hz/60 Hz
8	Speed 50 Hz/60 Hz
9	Motor output 50 Hz/60 Hz
10	Operating mode

Fig. 5 Data plate (example)

4.2 Description

The C-VTR model range has a connecting thread on the suction side and an exhaust silencer on the pressure side. With the C-VLR 60 the incoming air is cleaned by a filter cartridge. C-VLR 100-251 have a micro filter on the suction side.
The ZEPHYR C-VLR is a double shaft rotary piston vacuum pump in which the claws roll off against each other contact free and dry. The counter-rotating claw rotors are synchronised by a gear pair in the gearbox. The synchronous gearbox gear wheels and the bearing on the motor side are lubricated with oil. These components are in a gearbox that also contains the oil supply. Oil conveying devices always ensure that the bearings and the gear wheels are sufficiently supplied with oil at all permissible speeds. The feed chamber has no sealants or lubricants.
The gearbox and the compression chamber are separated from each other by special seals. The gearbox is sealed from the outside with piston sealing rings and O rings, the compressor chamber with piston rings. Between the two there is also another atmospherically ventilated area that can be loaded with sealing gas (special version).
The C-VLR 100-251 is enclosed in an insulation hood.
In order to dissipate compression heat, the cooling air is sucked through between the machine and the hood using drum fan that sucks in the fresh cooling air (Fig. 3/E) and discharges the heated air out of the cooling air outlet (Fig. 3/F).
The C-VLR is driven by standard flanged three phase motors via a clutch (with an elastomer component).
A vacuum control valve (Fig. 3/C) allows setting of the desired vacuum.

4.3 Areas of application

These contact-free running claw vacuum pumps, the C-VLR, can be operated constantly at any pressure between atmosphere and an inlet pressure of

60 mbar (abs.) → C-VLR 60 (31+32)/100 (31)/150 (31)
100 mbar (abs.) → C-VLR 60/150
150 mbar (abs.) → C-VLR 100
200 mbar (abs.) → C-VLR 251

The suction capacity with unrestricted suction is 60, 100, 150 and 215 m^3/h at 50 Hz. Data sheet D-880 or D 880-31 shows the dependency of the suction capacity on the intake pressure.

If the unit is switched on more frequently (at regular intervals of about 12 times an hour (C-VLR 60 – 150) or 10 times an hour (C-VLR 251)) at higher ambient temperatures and intake temperatures, the excess temperature limit of the motor winding and the bearings may be exceeded.
For such operating conditions contact the manufacturer.

If it is installed in the open air the unit must be protected from environmental influences, (e.g. by a protective roof).

5 Installation

5.1 Preparing for installation

Check the following points:

- Machine freely accessible from all sides
- Do not close ventilation grids and holes
- Sufficient room for installing and removing pipes and for maintenance work, particularly for installing and dismantling the machine
- No external vibration effects
- Do not suck any hot exhaust air from other machines into the cooling system

Oil filling point (Fig. 2/H... Fig. 4/H), oil inspection glasses (Fig. 2/I... Fig. 4/I) and oil outlets (Fig. 2/K... Fig. 4/K) must be readily accessible.
The cooling air inlets (Fig. 2/E... Fig. 4/E) and the cooling air outlets (Fig. 2/F... Fig. 4/F) must be placed in distance of at least 30 cm to the adjacent walls. Cooling air coming out must not be sucked in again.

For maintenance work, before the intake filter (Fig. 2/S) and the intake silencer (Fig. 3/S_1, Fig. 4/S_1) a minimum distance of 40 cm must be ensured.

5.2 Installation

NOTICE

The machine may only be operated when it is set up horizontally.

Material damage resulting from the machine tipping over and falling.

When installed at more than 1000 m above sea level a reduction in power is noticeable. In this case, please contact us.

Polluted intake air
To protect the machine, the user shall install the appropriate filters on the intake side.

Ensure that the foundation complies with the following conditions:

- Even and level
- The bearing surface must be designed to be able to carry the weight of the machine

It is possible to install the machine on a firm base without anchoring. When installing on a substructure we recommend fixing with flexible buffers.

5.3 Connecting pipes

a) Vacuum connection at (Fig. 2/A... 4/A).

NOTICE

Material damage resulting from the forces and torques of the pipes acting on the unit being too high
Only screw pipes in by hand.

The suction capacity of the vacuum pump is reduced if the suction pipe is too narrow and/ or too long.

b) The extracted air can be blown off through the exhaust silencer (ZSZ) at (Fig. 2/Z... 4/Z) or can led out through a hose or tube line.

NOTICE

Length of the connection pipes
With connection pipes that have the same pipe cross section as the machine connection and are more than 3 m long, a non-return valve especially for the purpose must be installed in order to avoid reverse operation when the machine has stopped.

Exhaust air may not be reduced
It is not allowed to install shut-off components in the exhaust lines (max. pressure difference 30 mbar). With the exhaust line connected, it must be checked regularly for pollution.

5.4 Control and relief valve

The vacuum can be set by turning the control knob (Fig.. 2/C... 4/C) as shown on the symbol fitted to the button.

NOTICE

Do not operate without the standard control and relief valve
If the permissible vacuum is exceeded (see data plate) the machine may be damaged.

5.5 Filling with lubricating oil

a) Fill the lubricating oil (for suitable types see "Maintenance") for the gear wheels and oil filling point (Fig. 3/H) up to the middle of the sight glasses (Fig. 3/I).

b) Close the oil filling point.

5.6 Connecting the motor

DANGER

Danger of to life if the electrical installation has not been done professionally!
The electrical installation must only be done by a qualified electrician observing EN 60204. The operating company has to provide the main switch.

a) The electrical motor data is given on the data plate (Fig. 3/N, Fig. 5) or on the motor data plate (Fig. 3/P_1). The motors comply with DIN EN 60034 and are in protection class IP 55 and insulation class F. The appropriate connection diagram is located in the motor's terminal box (not for the plug connection version). Compare the motor data with the data of the existing mains network (current type, voltage, network frequency, permitted current value).

b) Connect the motor via the plug connection or the motor protection circuit breaker (for safety reasons, a motor protection circuit breaker is required and the connecting cable must be installed via a cable fitting to provide strain relief). We recommend using motor protection circuit breakers with delayed switch off, depending on a possible excess current. Temporary excess current can occur when the machine is started under cold conditions.

NOTICE

Power supply
The conditions at the place of installation must meet the technical details on the motor type plate. Without derating the following conditions are permissible:

- ± 5 % voltage deviation
- ± 2 % frequency deviation

6 Commissioning and decommissioning

6.1 Commissioning

WARNING

Improper use
May lead to severe or fatal injuries. Therefore strictly observe the safety instructions!

CAUTION

Hot surfaces
When the machine is at operating temperature the surface temperatures on the components (Fig. 2/Q ...Fig. 4/Q) may go above 70 °C.
Do not touch hot surfaces (marked with warning signs)!

CAUTION

Noise emission
The highest noise pressure levels measured as per EN ISO 3744 are given in Section 9.
When spending a long time in the vicinity of the running machine use ear protectors to avoid permanent damage to your hearing!

NOTICE

Wait until the machine stops
The machine must only be switched on again after it stops.

6.1.1 Checking the rotation direction

▷ The intended direction of rotation of the drive shaft is shown by the rotary direction arrow (Fig. 2/O... Fig. 4/O) on the motor flange.

A) Start the motor briefly (max. two seconds) to check the direction of rotation. When looking at the motor blower, it must rotate counter-clockwise.

NOTICE

Incorrect direction of rotation
Running in reverse for a long time may damage the machine.
Use a phase sequence indicator to check the direction of rotation (**clockwise**).

6.2 Decommissioning/ storing

Stop the machine

a) Switch the machine off.

b) If available close the cut off device in the suction and pressure pipe.

c) Disconnect the machine from the electricity source.

d) Depressurise the machine:
Open the pipes slowly.
⇨ The pressure reduces slowly.

e) Remove the pipes and hoses.

F) Seal the connections for suction and pressure nozzles using adhesive foil.

See also Section 3.2.1, Page 11

6.3 Re-commissioning

a) Check the condition of the machine (cleanliness, cabling etc.).

For installation see Section 5, Page 17

For commissioning see Section 6.1, Page 20

7 Maintenance and repair

DANGER

Danger of death from touching live parts!
Before maintenance work disconnect the machine by pressing the main switch or unplugging it and ensure that it cannot be turned on again.

WARNING

Hot surfaces
During maintenance work there is the danger of getting burnt on hot components (Fig. 2/Q... 4/Q) of the machine.
Wait for the machine to cool down.

7.1 Ensuring operational safety

Regular maintenance work must be carried out in order to ensure operational safety.

Maintenance intervals also depend on the operational demands on the machine.

With any work observe the safety instructions described in Section 2.8 "Safety notes for installation, commissioning and maintenance".

The whole plant should always be kept in a clean condition.

7.2 Maintenance work

Interval	Maintenance activities	Section
Monthly	Check the pipes and screws for leaks and to ensure they are seated properly and if necessary seal again or tighten up.	—
Monthly	Check the terminal box and cable inlet holes for leaks and if necessary re-seal.	—
Monthly	Clean the control valve and ventilation slots on the machine and the motor cooling ribs.	—
Monthly	Check the oil level	7.2.1
5,000 h	Change the oil	
Monthly/ every 6 months	C-VLR 60: Clean or replace filter cartridge	7.2.2
Depending on how dirty the discharged medium is	C-VLR 100 - 251: Clean micro filter	
At least once a year	Check for clutch wear	7.2.3

7.2.1 Changing the oil

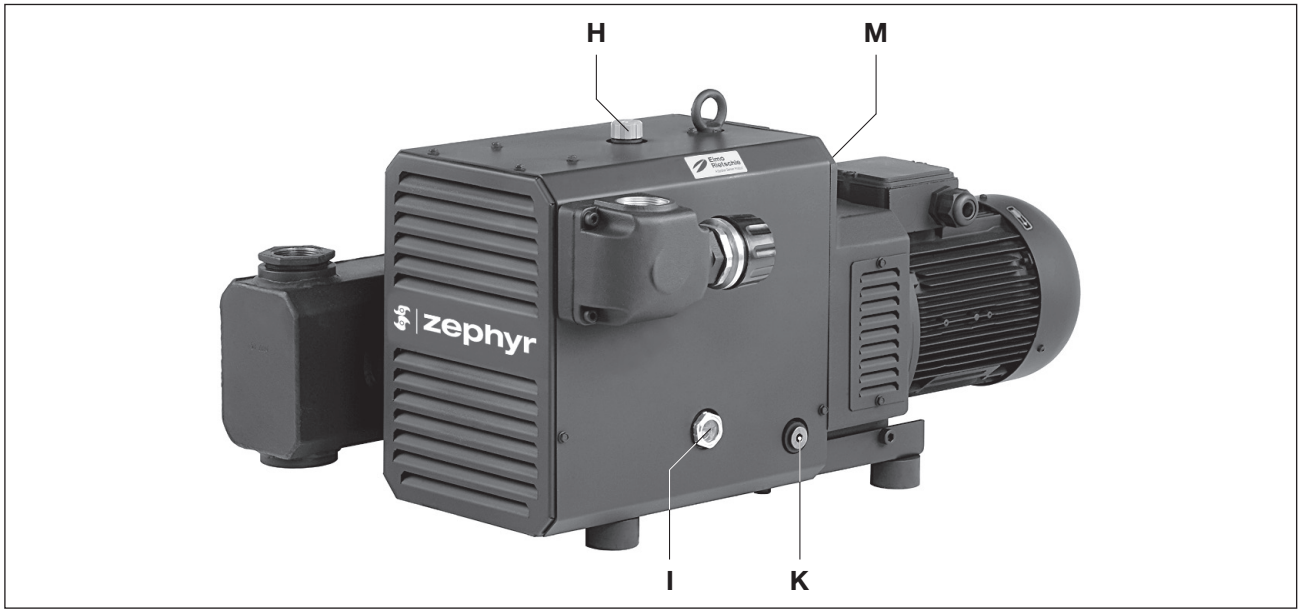


Fig. 6 Change the oil

H Oil filling point with vent screw

I Oil sight glass

K Oil discharge point

M Oil recommendation plate

Change the oil:

NOTICE

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 will be reduced.

The waste oil must be disposed of in compliance with the local environmental protection regulations.
If you change the type of oil, empty the oil tank completely.
A minimum oil quantity can get out of the oil filling point by pressure compensation.
If larger quantities of oil escape, wash the internal filter of the vent screw.

The oil levels in the sight glasses (Fig. 6/I) must be checked every month.
To refill the oil level, it is required to switch off the machine and to bleed it to atmospheric pressure.
Oil change has to be done after 5,000 operating hours.
The oil viscosity must comply with ISO-VG 150 or 220 as per ISO 3448.
Designation as per DIN 51502: CLP HC 150.
We recommend the following brands of oil: GEAR-LUBE 150 or GEAR-LUBE 220 (Variant 31+32) or equivalent oil of other manufacturers (see also oil recommendation plate (Fig. 6/M)).

7.2.2 Air filtering

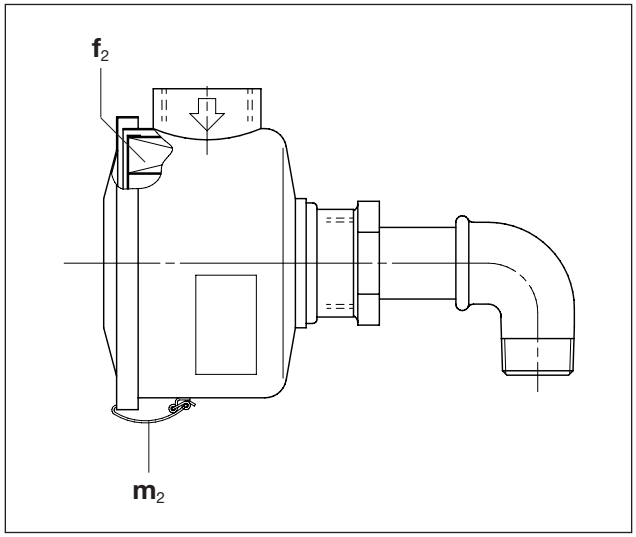


Fig. 7 Vacuum compressor intake filter

f_2 Filter cartridge

m_2 Bracket

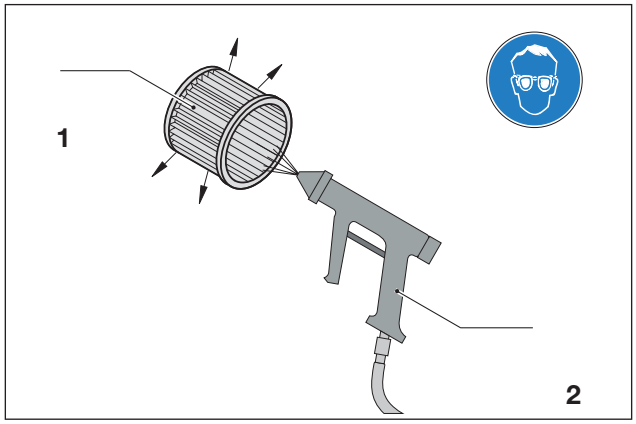


Fig. 8 Purging filter cartridge

1 Filter cartridge

2 Compressed air

NOTICE

Insufficient maintenance on the air filter
The power of the machine lessens and damage may occur to the machine.

Vacuum compressor intake filter (C-VLR 60)

The filter cartridges (Fig. 7/f_2) for the intake filter (Fig. 2/S) must be cleaned monthly or more often depending on the level of contamination by purging from the inside outwards. In spite of cleaning the filter its separation efficiency will continue to deteriorate. Therefore the filter should be replaced every six months.

Filter cartridge can be removed (Fig. 7/f_2) after releasing the brackets (Fig. 7/m_2).

NOTICE

Do not damage the filter cartridges when cleaning them.

Micro filter (C-VLR 100 - 251)

The micro filter inbuilt in the intake silencer (Fig. 3/S_1, Fig. 4/S_1) must be cleaned or replaced more or less often depending on how dirty the medium in it is by washing or blowing through.

WARNING

Danger of injury when dealing with compressed air
When blowing through with compressed air, solid particles may be carried along or powder dust swirling around may cause injury to the eyes.
Therefore, when cleaning with compressed air always wear goggles and a dust mask.

7.2.3 Clutch

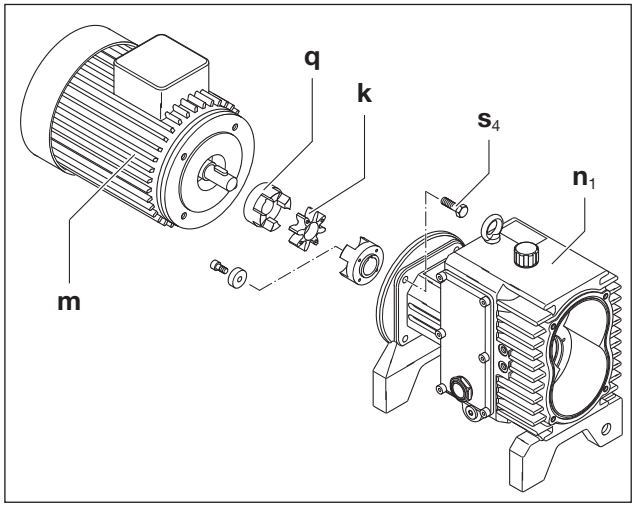


Fig. 9 Coupling C-VLR 60

k Clutch sprocket

m Motor

n_1 Housing

q Clutch half on the motor side

s_4 Screws

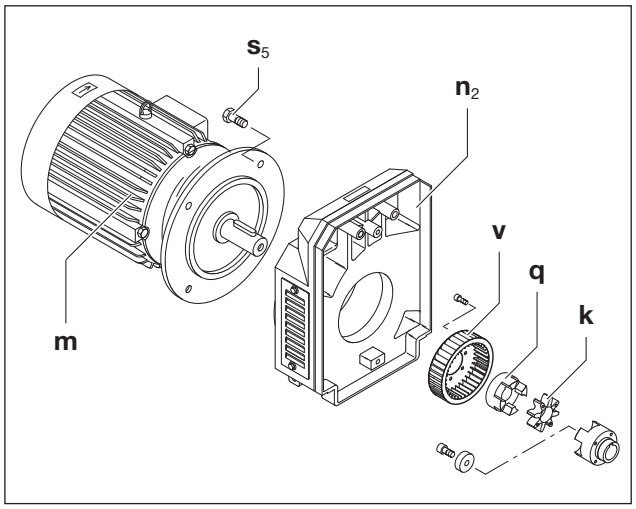


Fig. 10 Coupling C-VLR 100 - 251

k Clutch sprocket

m Motor

n_2 Fan housing

q Clutch half on the motor side

s_5 Screws

v Fan

The clutch sprocket (Fig. 9/k, 10/k)) is subject to wear and must be checked regularly (at least once a year).

CAUTION

Defective clutch sprocket
Defective sprockets may lead to the rotor shaft breaking.

To check the clutch switch the motor (Fig. 9/m, Fig. 10/m) off and ensure that it cannot be switched on again.

C-VLR 60
Undo the screws (Fig. 9/s_4) on the housing flange (Fig. 9/n_1). Remove the motor axially with the half of the clutch on the motor side (Fig. 9/q) and suspend with the lifting device. If the sprocket (Fig. 9/k) is damaged or worn, then replace it.

C-VLR 100 - 251
Undo the screws (Fig. 10/s_5) on the motor flange. Remove motor and the clutch half (Fig. 10/q) from the valve housing (Fig. 10/n_2) axially and suspend with a lifting device. If the sprocket (Fig. 10/k) is damaged or worn, then replace it. The fan (Fig. 10/v) should also be checked for damage from time to time and replaced if necessary.

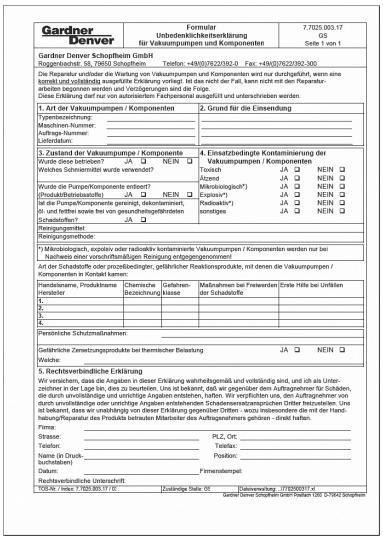
NOTICE

Frequent starting up and high ambient temperature
The service life of the sprocket (Fig. 9/k, Fig. 10/k) is reduced as a result of this.

Re-assemble in reverse order.

7.3 Repair/ Service

a) For on-site repair work the motor must be disconnected from the mains by a qualified electrician so that it cannot be started up again accidentally. For repairs use the manufacturer, its branch offices or authorised dealers. Please contact the manufacturer for the address of the authorized service centre (see manufacturer's address).



Gardner Denver

Formular
Unbedenklichkeitserklärung
für Vakuumpumpen und Komponenten

7.7025.003.17
GS
Seite 1 von 1

Gardner Denver Schopfheim GmbH
Roggenbachstr. 58, 79650 Schopfheim Telefon: +49(0)7622/392-0 Fax: +49(0)7622/392-300

Die Reparatur und/oder die Wartung von Vakuumpumpen und Komponenten wird nur durchgeführt, wenn eine korrekt und vollständig ausgefüllte Erklärung vorliegt. Ist das nicht der Fall, kann nicht mit den Reparaturarbeiten begonnen werden und Verzögerungen sind die Folge.
Diese Erklärung darf nur von autorisiertem Fachpersonal ausgefüllt und unterschrieben werden.

1. Art der Vakuumpumpen / Komponenten
Typenbezeichnung:
Maschinen-Nummer:
Auftrags-Nummer:
Lieferdatum:

2. Grund für die Einsendung

3. Zustand der Vakuumpumpe / Komponente
Wurde diese betrieben? JA ❑ NEIN ❑
Welches Schmiermittel wurde verwendet?
Wurde die Pumpe/Komponente entleert? (Produkt/Betriebsstoffe) JA ❑ NEIN ❑
Ist die Pumpe/Komponente gereinigt, dekontaminiert, d.- und fettfrei sowie frei von gesundheitsgefährdeten Schadstoffen? JA ❑
Reinigungsmittel:
Reinigungsmethode:

4. Einsatzbedingte Kontaminierung der Vakuumpumpen / Komponenten

Toxisch	JA ❑	NEIN ❑
Ätzend	JA ❑	NEIN ❑
Mikrobiologisch*)	JA ❑	NEIN ❑
Explosiv*)	JA ❑	NEIN ❑
Radioaktiv*)	JA ❑	NEIN ❑
sonstiges	JA ❑	NEIN ❑

*) Mikrobiologisch, explosiv oder radioaktiv kontaminierte Vakuumpumpen / Komponenten werden nur bei Nachweis einer vorschriftsmäßigen Reinigung entgegengenommen!

Art der Schadstoffe oder prozeßbedingter, gefährlicher Reaktionsprodukte, mit denen die Vakuumpumpen / Komponenten in Kontakt kamen:

Handelsname, Produktname Hersteller	Chemische Bezeichnung	Gefahren-klasse	Maßnahmen bei Freiwerden der Schadstoffe	Erste Hilfe bei Unfällen
1.				
2.				
3.				
4.				

Persönliche Schutzmaßnahmen:

Gefährliche Zersetzungsprodukte bei thermischer Belastung JA ❑ NEIN ❑
Welche:

5. Rechtsverbindliche Erklärung
Wir versichern, dass die Angaben in dieser Erklärung wahrheitsgemäß und vollständig sind, und ich als Unterzeichner in der Lage bin, dies zu beurteilen. Uns ist bekannt, daß wir gegenüber dem Auftragnehmer für Schäden, die durch unvollständige und unrichtige Angaben entstehen, haften. Wir verpflichten uns, den Auftragnehmer von durch unvollständige oder unrichtige Angaben entstehenden Schadensersatzansprüchen Dritter freizustellen. Uns ist bekannt, dass wir unabhängig von dieser Erklärung gegenüber Dritten - wozu insbesondere die mit der Handhabung/Reparatur des Produkts betrauten Mitarbeiter des Auftragnehmers gehören - direkt haften.

Firma:
Strasse: PLZ, Ort:
Telefon: Telefax:
Name (in Druckbuchstaben): Position:
Datum: Firmenstempel:
Rechtsverbindliche Unterschrift:

TOS Nr. / Index 7.7025.003.17 / 00 Zuständige Stelle: GS Dokumentverwaltung ...\7725003\7.x\

Gardner Denver Schopfheim GmbH Postfach 1250 D-79642 Schopfheim

Fig. 11 Declaration of harmlessness 7.7025.003.17

NOTICE

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.

b) After a repair or re-commissioning, the actions listed under "Installation" and "Commissioning" must be carried out as for initial commissioning.

7.4 Spare parts

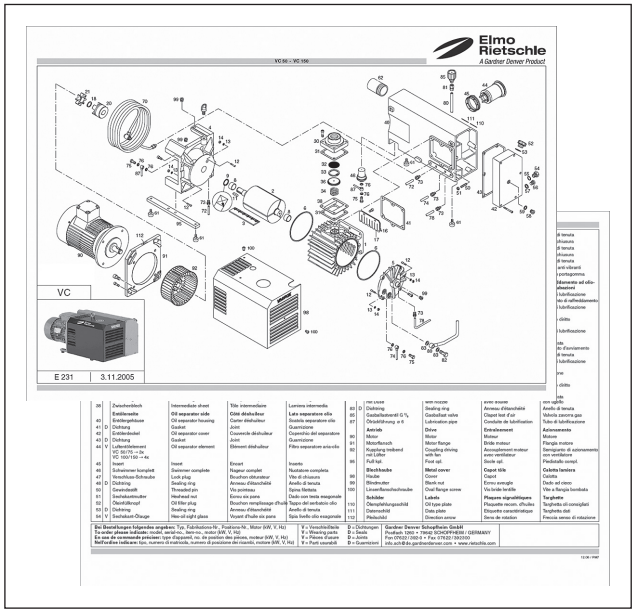


Fig. 12 Spare parts list (example)

Fig. 13 Website
http://www.service-er.de

Order spare parts in accordance with the:

- **Spare parts list:**
  E 880/1 → C-VLR 100
  E 880/3 → C-VLR 60
  E 880/4 → C-VLR 150
  E 880/5 → C-VLR 251 (01)
  - Download the PDF file:
    http://www.gd-elmorietschle.com
    → Downloads
    → Product Documents
    → C-Series → Spare Parts
  - Parts subject to wear and gaskets are indicated separately on the list.
- **Website:**
  http://www.service-er.de
  - Select the type, size and design.

NOTICE

Only use original spare parts or parts approved by the manufacturer. The use of other parts may lead to malfunctions and invalidate liability or the guarantee for any consequences arising.

8 Malfunctions: Causes and elimination

Error	Cause	Troubleshooting	Important
Machine is switched off by the motor protection switch	Mains voltage/ Frequency does not correspond with the motor data	Check by qualified electrician	Section 5.6
	Connection to motor terminal board is not correct		
	Motor protection switch is not set correctly		
	Motor protection switch is triggered too quickly	Use a motor protection switch with an overload-dependent delayed switch off that takes into consideration the short term excess current at start up (version with short circuit and overload trigger as per VDE 0660 Part 2 or IEC 947-4)	
	The control valve is dirty so that the permissible vacuum value is exceeded	Clean or replace the control valve	Section 7.2 Section 7.4
Suction capacity is insufficient	The intake filter is dirty	Clean or replace the intake filter	Section 7.2.2 Section 7.4
	The suction pipe is too long or too narrow	Check the hose or the pipe	Section 5.3
	Machine or system leaking	Check the pipework and screw connections for leaks check for tight fitting	Section 7.2
Final pressure (max. vacuum) is not reached	Machine or system leaking	Check the pipework and screw connections for leaks check for tight fitting	Section 7.2
Machine gets too hot	Ambient or intake temperature is too high	Ensure it is being used properly	Section 2.3
	Cooling air supply is obstructed	Check ambient conditions	Section 5.1
		Clean ventilation slots	Section 7.2
	The control valve is dirty so that the permissible vacuum value is exceeded	Clean or replace the control valve	Section 7.2 Section 7.4
The machine makes a funny noise	Deposits on the rotary piston	Clean the working space and the rotary piston	Elmo Rietschle Service
	The control valve is vibrating	Replace the valve	Section 7.4
Please contact Elmo Rietschle Service for other malfunctions or those that cannot be eliminated.			

9 Technical Data

C-VLR			60	100	150	251
Sound pressure level (max.) EN ISO 3744 Tolerance± 3 dB(A)	dB(A)	50 Hz	82	81	85	81
		60 Hz	84	84	88	84
Sound power level	dB(A)	50 Hz	93	93	97	92
		60 Hz	96	96	101	97
Weight*	kg		51	119	133	151
Length*	mm		662	730	846	1060
Width	mm		434	540	537	635
Height	mm		295	360	375	375
Vacuum connection			G 1	G 1 1/2	G 1 1/2	G 2
Exhaust air-outlet			G 1	G 1 1/2	G 1 1/2	G 2
Oil fill quantity	l		0.4	0.55	0.6	0.6

* The length and the weight may differ from the information listed here depending on the motor manufacturer.

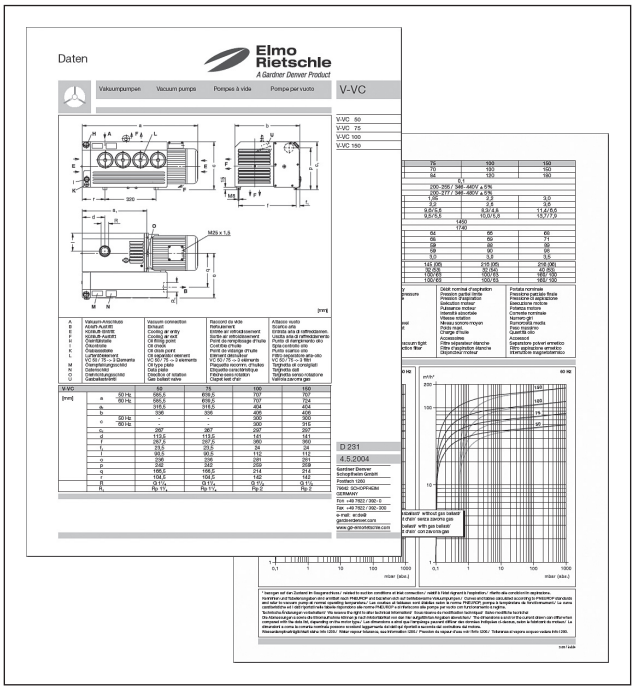


Fig. 14 Data sheet (example)

Please will find more technical data on the data sheets **D 880** and **D 880-31**

- Download the PDF file:
  D 880 → C-VLR 60, 100, 150, 251
  D 880-31 → C-VLR 60 (31), 100 (31), 150 (31)
  - Download the PDF file:
    http://www.gd-elmorietschle.com
    → Downloads
    → Product Documents
    → C-Series → Data Sheets

NOTICE

Subject to technical changes!

Elmo Rietschle
by Gardner Denver

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Gardner Denver

EC - declaration of conformity 2006/42/EC

Hereby the manufacturer confirms:	Gardner Denver Schopfheim GmbH Postfach 1260 D-79642 Schopfheim	
that the machine:	vacuum pump	
of the:	Series:	C-VLR
	Type:	C-VLR 60, C-VLR 100, C-VLR 120, C-VLR 150, C-VLR 250, C-VLR 251, C-VLR 300, C-VLR 400, C-VLR 500, C-VLR 301, C-VLR 401, C-VLR 501, C-VLR 1000

is conform to the regulations of the guideline indicated above.

The following harmonized and national standards and specifications are applied:

EN 1012-2:1996+A1:2009	Compressors and vacuum pumps — Safety requirements — Part 2: Vacuum pumps

These declarations of conformity are invalid when the machine has been modified without prior approval by us and the approval has been documented in writing.

Name and address of the EC person in charge for documentation	Gardner Denver Schopfheim GmbH Postfach 1260 D-79642 Schopfheim

Gardner Denver Schopfheim GmbH

Schopfheim, 1.3.2015

Dr. Friedrich Justen, Director Engineering

C_0080_EN

Gardner Denver	**Safety declaration form for vacuum pumps and components**	7.7025.003.17 Page 1 of 1

Gardner Denver Schopfheim GmbH
Roggenbachstr. 58, 79650 Schopfheim Phone: +49/(0)7622/392-0 Fax: +49/(0)7622/392-300

Repairs and/or maintenance of vacuum pumps and components will only be carried out if a declaration has been filled in correctly and completely.
If not, the repair work cannot be started and delays will result.
This declaration must only be filled in and signed by authorised qualified staff.

1. Type of vacuum pumps/ components		**2. Reason for the submission**
Type description:	_____	_____
Machine number	_____	_____
Order number:	_____	_____
Delivery date:	_____	_____

3. Condition of vacuum pumps/ components	**4. Contamination of the vacuum pumps/ components when in use**			
Was this being operated? YES ❑ NO ❑	Toxic	YES ❑	NO ❑
Which lubrication was used?	Corrosive	YES ❑	NO ❑
Was the pump/ component emptied? (Product/Consumables) YES ❑ NO ❑	Microbiological*)	YES ❑	NO ❑
	Explosive*)	YES ❑	NO ❑
Has the pump/ component been cleaned and de-contaminated and is it free of oil and grease and toxic substances that are harmful to health? YES ❑	Radioactive*)	YES ❑	NO ❑
	other	YES ❑	NO ❑
Cleaning agent:			
Cleaning method:			

*) Microbiological, explosive or radioactively contaminated vacuum pumps/ components will only be accepted with proof that they have been cleaned properly.

Type of toxic substance or process-related, dangerous reaction products with which the vacuum pumps/ components came into contact:

Trade name, manufacturer's product name	Chemical name	Hazard class	Action to be taken if toxic substances are released	First aid in the event of accidents
1				
2				
3				
4				

Personal protection measures: _____

Hazardous decomposition products when subjected to thermal load YES ❑ NO ❑

Which? _____

5. Legally binding declaration

We swear that the information in this declaration is accurate and complete and that I, the undersigned, am in a position to judge this. We are aware that we are liable to the contractor for damage caused by incomplete and inaccurate information. We undertake to release the contractor from any damage claims from third parties arising from incomplete or incorrect information. We are aware that, regardless of this declaration, we are directly liable to third parties including in particular the contractor's staff entrusted with handling or repairing the product.

Company: _____

Street: _____ Post code/ Town: _____

Phone: _____ Fax: _____

Name (in capitals) _____ Position: _____

Date: _____ Company stamp:

Legally binding signature: