

Original Operating Instructions

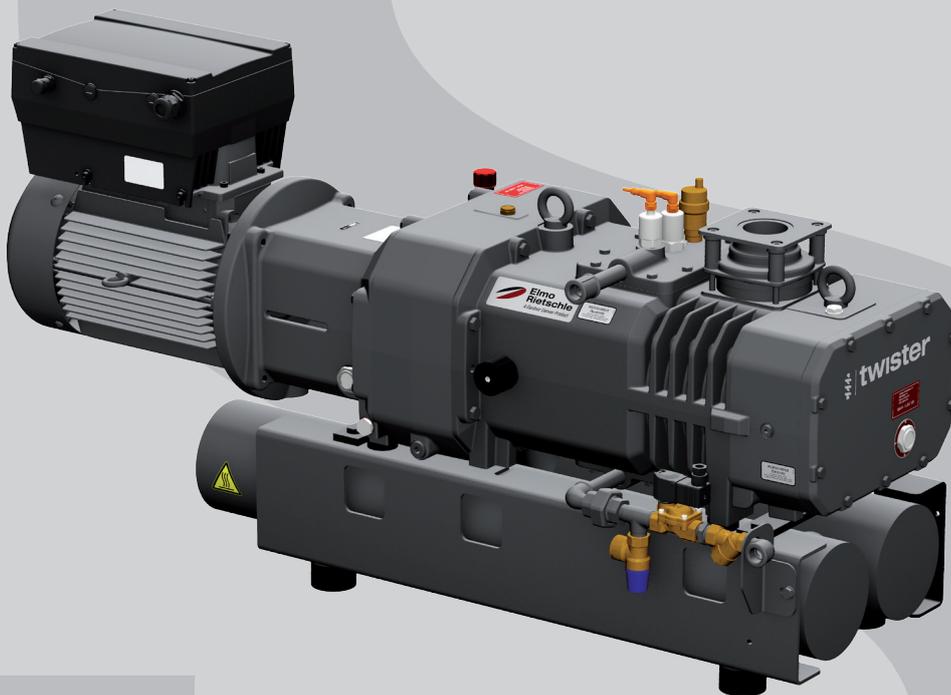
S-VSI 300 (42) FU

Vacuum pump



**Elmo
Rietschle**

by Gardner Denver



**S-Serie
S Series**

Schraube
Screw



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Preface

1 Foreword

1.1 Principles

These operating instructions:

- are a part of the following screw vacuum pumps of the types S-VSI 300 (42) FU.
- 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 are technically trained specialists.

1.3 Supplier documentation and accompanying documents

Document	Contents	No.
Supplier documentation	Operating instructions	BA 832-42-FU-EN
	Declaration of Conformity	C 0084-EN
	Declaration of no objection	7.7025.003.17
	Operating instructions of the frequency converter	610.00260.01.000
Spare parts list	Spare parts document	E 832
Data sheet	Technical data and characteristics	D 832/42 FU
Info sheet	Storage guideline for machines	I 150-EN
Info sheet	Recommended water quality	I 832-EN
Manufacturer's declaration	EU Directive 2011/65/EU (RoHS II)	—

1.4 Abbreviations

Fig.	Figure
S-VSI	Vacuum pump
m ³ /h	Suction capacity
mbar (abs.)	Final vacuum, operating vacuum

1.5 Directives, standards, laws

See Declaration of Conformity

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 safety instructions with this symbol in order to avoid injury and death.

1.7 Technical terms and meaning

Term	Explanation
Machine	Pump and motor combination ready for connection
Motor	Pump drive motor
Vacuum pump	Machine for creating a vacuum
Screw	Machine's design or operating principle
Suction capacity	Vacuum pump volume flow based on the condition in the suction connection
Final pressure (abs.)	The maximum vacuum a pump reaches when the suction opening is closed, indicated as absolute pressure
Permanent vacuum	The vacuum or the suction range at which the pump operates in continuous operation. The permanent vacuum or intake pressure is \geq the final vacuum and $<$ the atmospheric pressure.
Noise emission	The noise emitted at a specific loading state indicated as a numeric value, sound pressure level dB(A) as per EN ISO 3744.

1.8 Copyright

Passing on or copying this document, using and providing information on its contents are prohibited unless expressly permitted. Contraventions will lead to claims for damages.

2 Safety

The manufacturer is not responsible for damage due to non-observance of the whole documentation.

2.1 Warning instruction identification

Warning	Danger level	Consequences of non-observance
 DANGER	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 information

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 installation 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 attached directly to the machine must be obeyed and must always remain legible. This applies for example to:

- Symbols for connections
- Data plate and motor data plate
- Information signs 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 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-combustible, non-aggressive and non-poisonous dry gases and gas-air mixtures
 - also to feed in extremely damp gases. The water vapour compatibility is very high.
- The machine may be operated in the speed and frequency ranges according to the data plate (fig. 2/N1)

2.4 Unacceptable operating modes

- Extracting, conveying and compressing explosive, inflammable, aggressive or poisonous media, e.g. dust as per ATEX zone 20-22, solvents as well as gaseous oxygen and other oxidising agents, liquids or solids
- Using the machine in non-commercial plants unless the necessary precautions and protective measures are taken in the plant
- Installation in potentially explosive environments
- Using the machine in areas with ionising radiation
- Back pressures on the outlet side:
S-VSI (42) 9.0 kW > +0.2 bar
- Modifications to the machine, the basic settings of the frequency converter and the accessories

2.5 Personnel qualification and training

- Ensure that persons 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, competences and monitoring of personnel
- All work must only be carried out by technical specialists:
 - Installation, commissioning, maintenance and inspection work
 - Work on the electrical system
- Personnel being trained to work on the machine must be supervised by technical specialists when working on the machine

2.6 Safety-conscious working

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

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

2.7 Safety instructions for the operator

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

2.8 Safety instructions for installation, commissioning and maintenance

- The operator ensures 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 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 work 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 may void the liability for any resulting consequences
- Keep unauthorised persons away from the machine

2.9 Guarantee conditions

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

- Improper use
- Non-observance of these instructions and the operating instructions of the frequency converter
- 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 Unpacking and checking the delivery condition

- a) Unpack the machine upon 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 crushed limbs due to the items being transported falling or tipping over!

- ▷ When transporting with the lifting device, remember:
 - a) Select the lifting device according to the total weight to be transported.
 - b) Secure the machine against tipping and falling.
 - c) Do not stand underneath a suspended load.
 - d) Place the goods to be conveyed on a horizontal base.

Lifting device/ transport with a crane



WARNING

Bodily injury resulting from improper operation!

- a) Loads diagonally to the bolt level are not permitted.
 - b) Avoid impact stress.
- a) Tighten the eyebolts (fig. 1/1) firmly.
 - b) For lifting and transporting the machine, it must be suspended on the eyebolts using the lifting device.

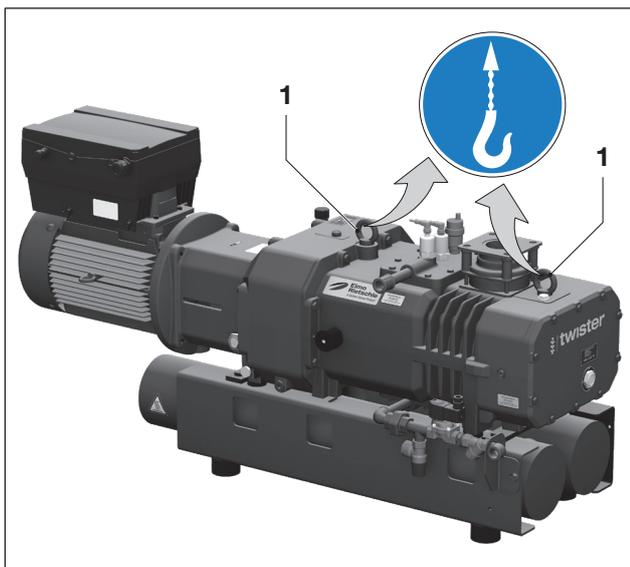


Fig. 1 Lifting and transporting

1 Eyebolts

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 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, cold cleaning agent 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 Setup and operation

4.1 Setup

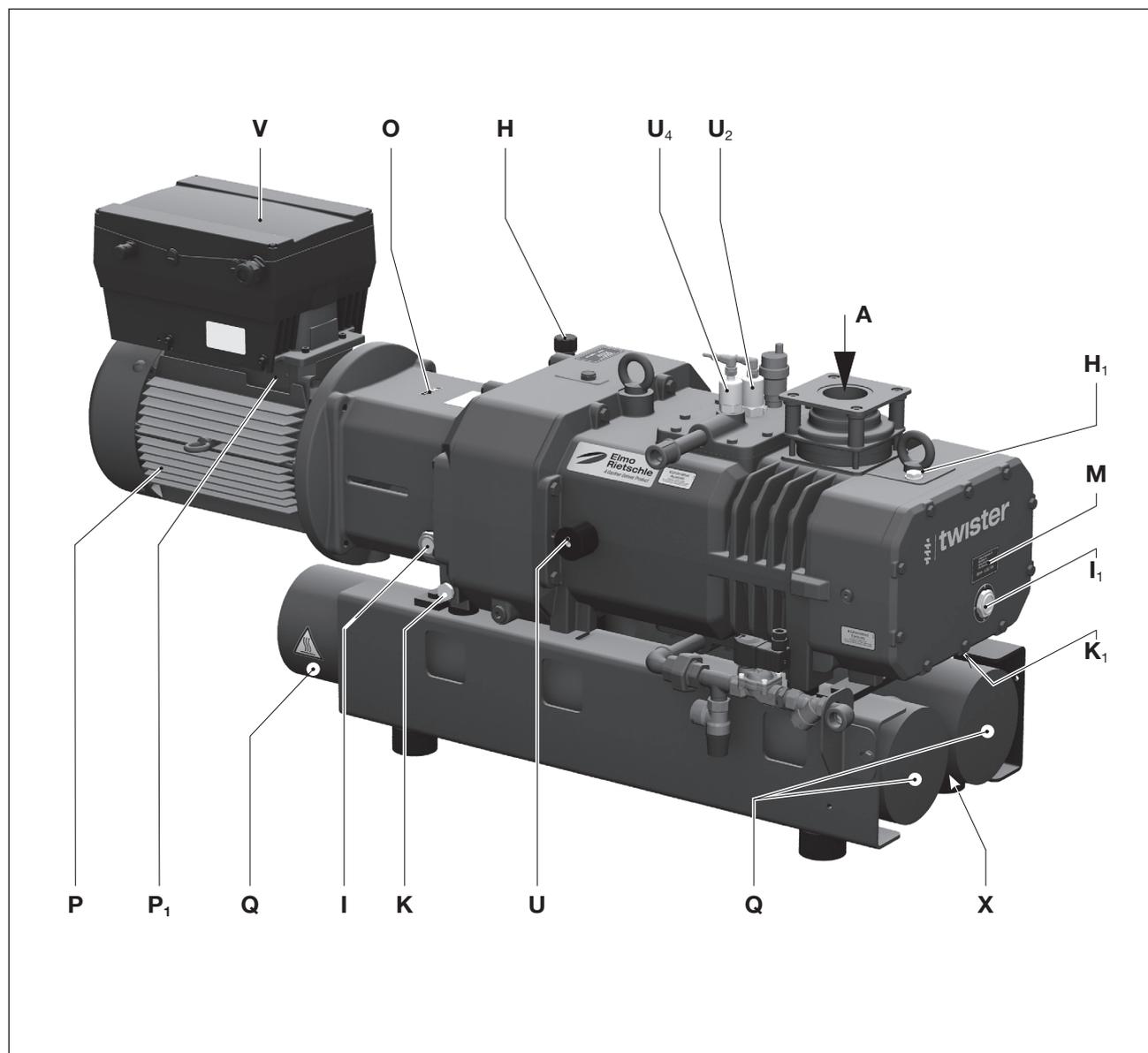


Fig. 2 Vacuum pump S-VSI 300 (42) FU

A	Vacuum connection	P₁	Motor data plate
H, H₁	Oil filling point	Q	Hot surfaces > 70°C
I, I₁	Oil sight glass	U	Gas ballast valve
K, K₁	Oil discharge point	U₂	Temperature control
M	Oil recommendation plate	U₄	Liquid level monitor
O	Rotation direction plate	V	Frequency converter
P	Drive motor	X	Condensate drain G ¹ / ₂

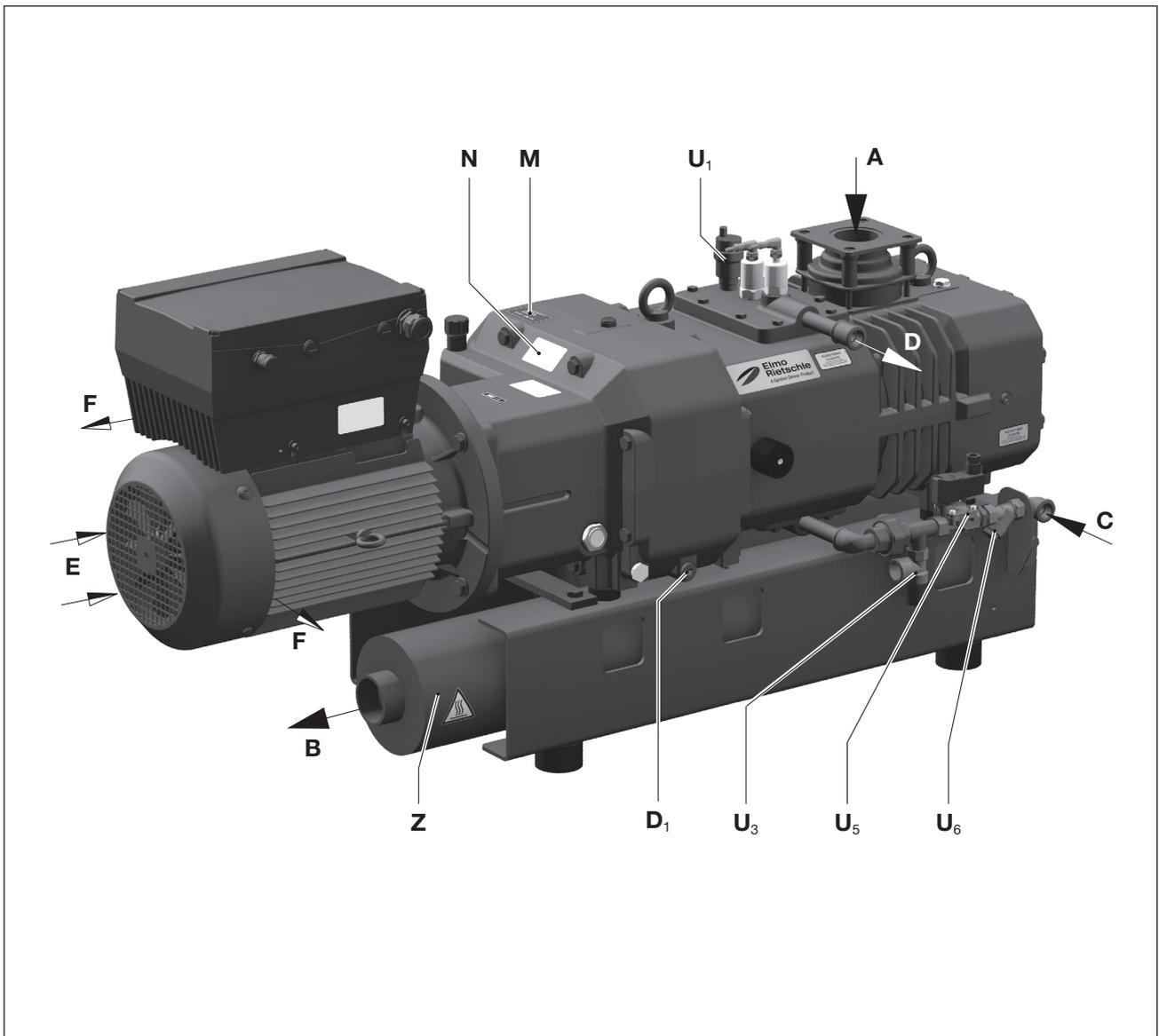


Fig. 3 Vacuum pump S-VSI 300 (42) FU

- | | | | |
|----------------------|--------------------------------------|----------------------|--------------------------|
| A | Vacuum connection | M | Oil recommendation plate |
| B | Exhaust air outlet | N | Data plate |
| C | Cooling water inlet G $\frac{1}{2}$ | U₁ | Vent valve |
| D | Cooling water outlet G $\frac{1}{2}$ | U₃ | Safety valve |
| D₁ | Cooling water drain | U₅ | Solenoid valve |
| E | Cooling air inlet | U₆ | Dirt trap |
| F | Cooling air outlet | Z | Exhaust silencer |

Setup and operation

4.1.1 Data plate

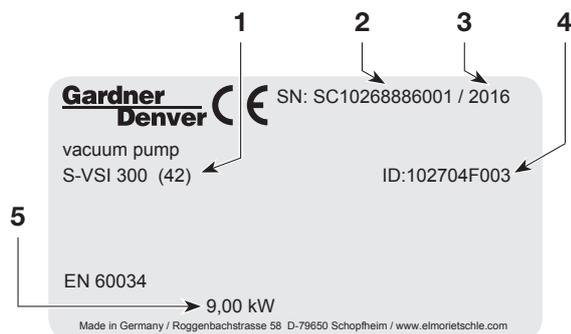


Fig. 4 Data plate of the machine

- 1 Type / size (mechanical version)
- 2 Serial number
- 3 Year of construction
- 4 Item No.
- 5 Motor output

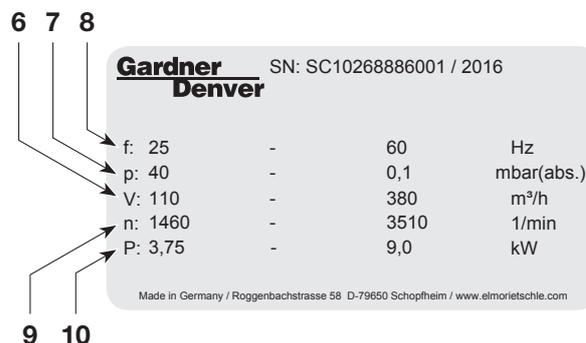


Fig. 5 Data plate of the frequency converter

- 6 Suction capacity
- 7 Final pressure (abs.)
- 8 Frequency range
- 9 Speed range
- 10 Motor output

4.2 Description

The S-VSI FU model range has a connection thread on the suction side and an exhaust silencer with connection thread on the pressure side.

The TWISTER S-VSI is a twin-screw vacuum pump in which two parallel screw rotors roll off against each other contactless and dry. The gas to be fed in is hereby enclosed in the pump's suction chamber and compressed by the rotary movement of the screw rotors in the direction of the outlet. The gas sucked in is gradually compressed to atmospheric pressure. The counter-rotating screw rotors are synchronised by a gear pair in the gearbox. The gears of the synchronized gearbox and the bearings 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 gears are sufficiently supplied with oil at all permissible speeds.

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 three-phase motor with integrated frequency converter (fig. 2/V) enables the continuous control of the speed.

4.3. Areas of application

The screw vacuum pumps are suitable for the evacuation of closed systems or for a continuous vacuum within the following intake pressure ranges: 0.1 to 1000 mbar (abs.)

They are also particularly suited for feeding in extremely damp gases. The water vapour compatibility is very high.

Data sheet D 832 - 42 - FU shows the dependency of the suction capacity on the intake pressure.

4.4 Cooling the machine

4.4.1 Continuous flow cooling (standard version)

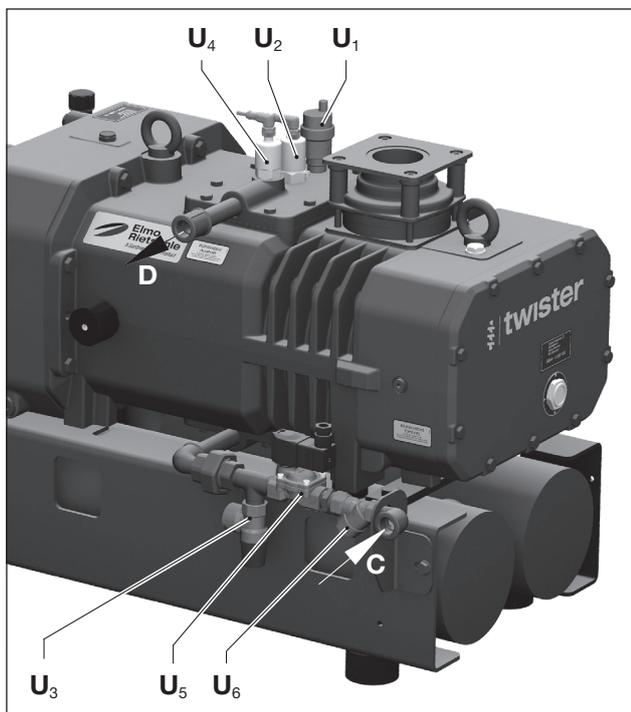


Fig. 6 Continuous flow cooling

- C** Cooling water inlet G $\frac{1}{2}$
- D** Cooling water outlet G $\frac{1}{2}$
- U₁** Vent valve
- U₂** Temperature control
- U₃** Safety valve
- U₄** Liquid level monitor
- U₅** Solenoid valve
- U₆** Dirt trap

4.4.2 Control unit (optional)

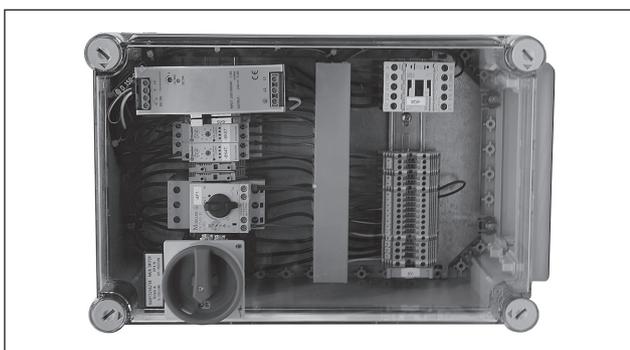


Fig. 7 Control unit (optional)

With fresh water cooling, water flows continuously through the cavity of the double walled compressor housing.

For safety reasons, the cooling system is fitted with a solenoid valve, a temperature monitor and a safety valve.

A special control unit and a thermostatic water valve are available optionally.

Temperature control

Monitors the temperature of the cooling water.
Factory-provided adjustment: $T_{\max} = 60^{\circ}\text{C}$

Safety valve

Protects from an incorrect operating pressure of the cooling water of >6 bar.

Solenoid valve

Regulates the cooling system.
Control voltage: 24 V DC

Dirt trap

Protects the armatures and the cooling circuit from impurities in the incoming cooling liquid.

Thermostatic water valve (optional)

Continuous flow cooling control
Factory-provided adjustment: $T_{\max} = 55^{\circ}\text{C}$

📄 The operating instructions for the monitoring elements is enclosed with the machine.

Control unit (optional)

Evaluates the signals of the monitoring elements
Controls both motor and solenoid valve.

4.4.3 Circulation cooling (optional)

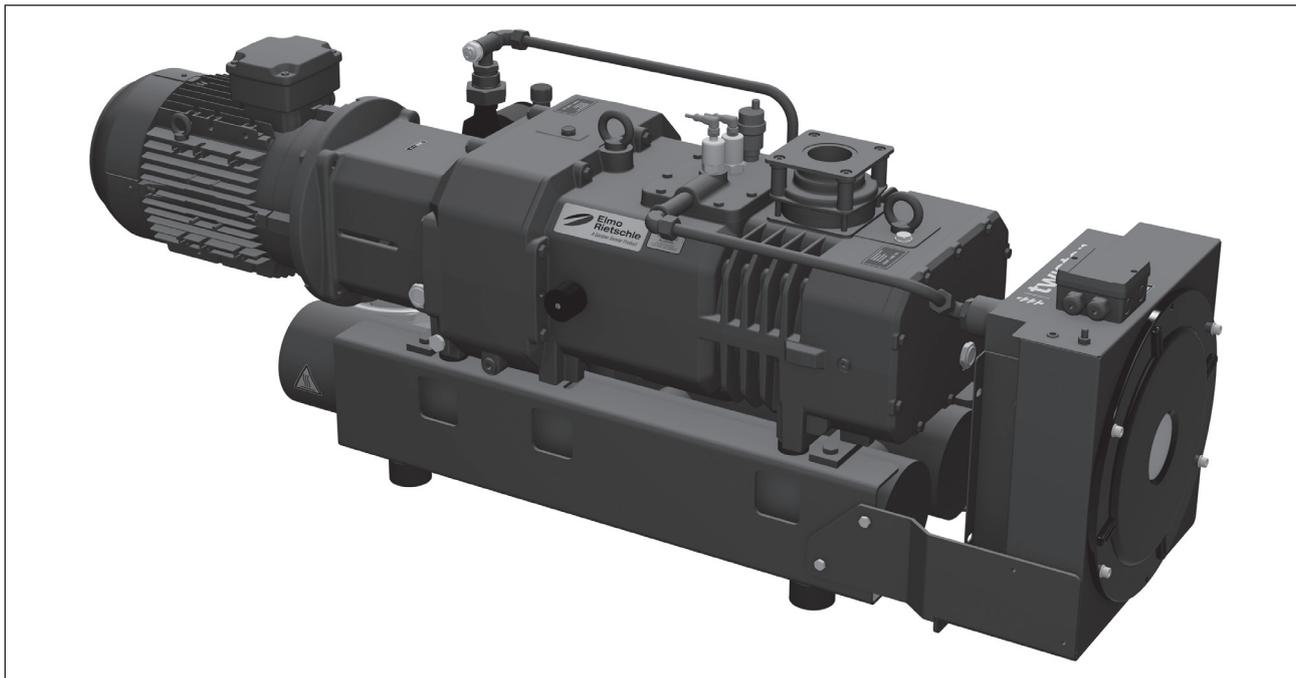


Fig. 8 Circulation water cooling (optional)

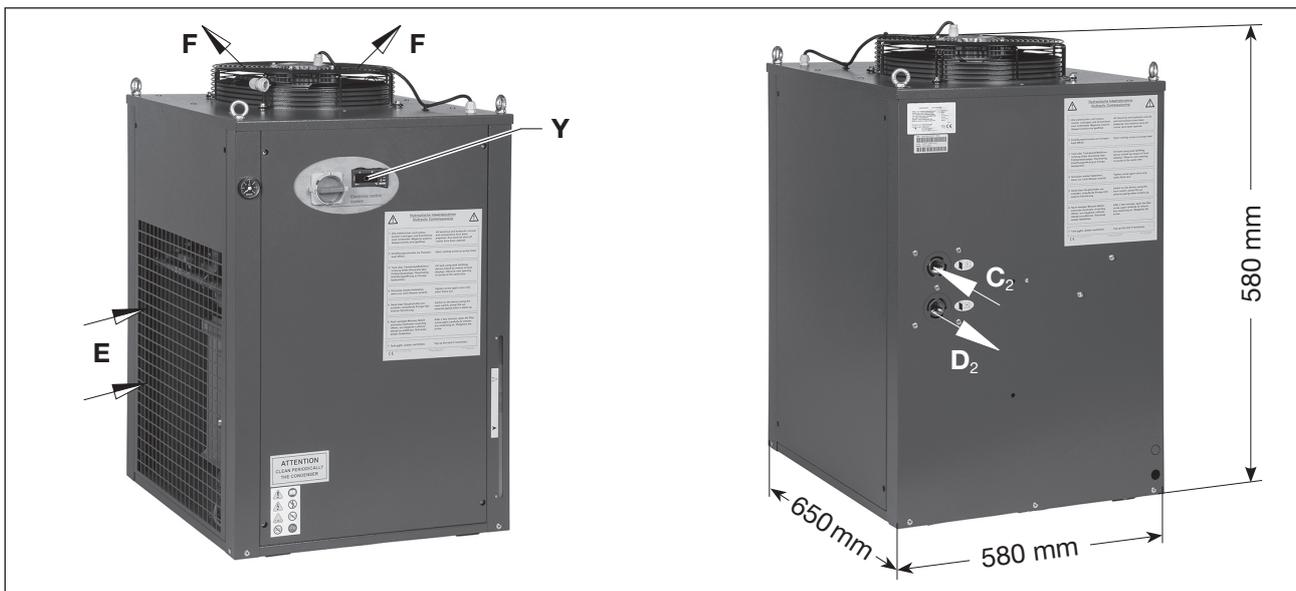


Fig. 9 Circulation cooling system (optional)

- C₂** Cooling water inlet G^{3/4}
- D₂** Cooling water outlet G^{3/4}
- E** Cooling air inlet
- F** Cooling air outlet
- Y** Display

Weight / operating weight	101 / 131 kg
Tank capacity	30 l

The cooling system has a thermostatically controlled three way valve. This enables the water to bypass the heat exchanger during the pump start-up phase. When the pump is operating, a temperature switch controls the water temperature while a flow switch controls the flow rate.

- 📄 Additional detailed technical data upon request
- 📄 The operating instructions for this cooling system are enclosed with the equipment.

5 Installation

5.1 Preparing the 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 removing the machine
- No external vibration effects
- Do not suck any hot exhaust air from other machines into the cooling system



The oil filling point (fig. 2/H, H₁), oil sight glasses (fig. 2/I, I₁) and oil drains (fig. 2/K, K₁), the cooling water inlet (fig. 3/C) and cooling water outlet (fig. 3/D) have to be easily accessible. The cooling air inlets (fig. 3/E) and the cooling air outlets (fig. 3/F) have to be at least 30 cm from the next walls. Cooling air coming out must not be sucked in again.

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.

An output reduction is noticeable when installed at more than 1000 m above sea level. In this case, please contact us.

Contamination in the intake air.

To protect the machine the operator should install appropriate filters on the suction side.

Check for oil leakage.

Risk of falling on oil spills!

Ensure that the foundation complies with the following conditions:

- Plane and even
- 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 foundation without anchoring. When installing on a substructure we recommend fastening it with flexible buffers. If it is installed in the open air the unit must be protected from environmental influences (e.g. by a protective roof).

5.3 Connecting the pipes

- a) Connect the suction pipe (fig. 2/A, 3/A).

NOTICE

Material damage resulting from the forces and torques of the pipes acting on the unit that are too high!

Only screw in pipes by hand.

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

- b) The discharged air can be blown out through the exhaust silencer (fig. 3/B) or conducted away using a hose or a pipe.

NOTICE

The air vent (fig. 3/B) must not be closed or restricted.

Counter pressures on the outlet side are only permissible:

S-VSI (42) 9.0 kW < +0.2 bar

Prevent liquids from accumulating in the exhaust line.

5.4 Connecting the cooling water pipe

NOTICE

Cooling water control

The vacuum pump must not be operated without cooling water control.

Risk of pump failure

Make sure that the cooling water flow is not interrupted.

- a) Connect the cooling water pipe to the cooling water inlet (fig. 3/C) and the cooling water discharge pipe to the cooling water outlet (fig. 3/D).

NOTICE

Only use pH-neutral, clean and filtered water for cooling.

Dirt particles and aggressive water may lead to malfunctions or to premature wear in the cooling system.



Suitable cooling water

See info "Recommended water quality", page 4

NOTICE

The cooling water operating pressure must not exceed 6 bar.

The cooling water temperature must be between 15 and 50 °C.

- b) When connecting a circulating cooling system to an external cooling system, it must be filled with cooling liquid.

NOTICE

Rinse the pipe network on the customer side before connecting it.

A filter element must be installed in the pipe network to prevent foreign matter from getting into the heat exchanger.

Risk of frost damage in the cooling system!

Freezing cooling water may lead to extensive damage to the machine. Therefore mix the cooling water with at least 20 % of anti-freeze. The amount of anti-freeze used must be adjusted to the ambient climatic conditions.

Handling anti-freeze

Anti-freeze may contain harmful ingredients, such as ethylene glycol, that could damage your health, especially if swallowed.

5.5 Filling the lubricating oil

- a) Fill up the lubricating oil (for suitable types see "Maintenance") for the gears and the bearings at the oil filling points (fig. 2/H, 2/H₁) up to the middle of the sight glasses (fig. 2/I, 2/I₁).
- b) Close the oil filling points.

5.6 Connecting the drive


! DANGER
Danger to life if the electrical installation has not been carried out professionally!

The electrical installation must only be carried out by a qualified electrician observing EN 60204. The operating company has to provide the main switch. Observe the operating instructions of the manufacturer of the frequency converter when operating the frequency converter.

- a) The drive consists of engine and frequency converter. The mechanical and electrical connection between engine and frequency converter has already been established at the time of delivery. The frequency converter is parameterized with the basic settings.
- b) Connect the frequency converter (fig. 2/V) according to the operating instructions 610.00260.01.000-DE or the enclosed pin configuration. Use suitable cable fittings or fasteners for compliance with the protection type (IP55). The electrical power supply values are indicated on the type plate of the frequency converter.

NOTICE
Power supply

The electrical supply of the frequency converter has to correspond to the following values:

- Input voltage 3 AC 400 V -15 %
to 480 V +10 %
- Input frequency 47 to 63 Hz ±0 %
- Suitable network
configuration TN / TT

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) may rise to 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 indicated in chapter 9. When spending a long time in the vicinity of the running machine use ear protection devices to avoid permanent damage to your hearing!

CAUTION

Do not put your hands onto the suction connection to check the suction

NOTICE

Do not operate without water cooling with a sufficient amount of cooling water!

The machine output is reduced and damage may occur to the machine.

6.1.1 Checking the rotation direction

- ▷ The intended drive shaft direction of rotation is indicated by the rotation direction arrow (fig. 2/O) on the motor flange.
- a) Start the motor briefly (max. two seconds) to check the direction of rotation. When looking at the motor fan, it must rotate 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 (anti-clockwise).

6.1.2 Overrun

In order to remove moisture and contamination from the pump, the vacuum pump should overrun at least 10 minutes with dry air at 50 - 100 mbar (abs.) before a standstill of >2 hours.

CAUTION

Condensate formation and impurities

Due to increased condensate formation and impurities, deposits may adhere to the rotors and the compressor casing after switching off the machine, preventing the start-up when restarting it.

Drain the condensate from the silencer (fig. 2/X) regularly and depending on the application. Do not drain when machine is at operating temperature!



Depending on the use case, we recommend overrunning the vacuum pump with scavenging gas. Contact the manufacturer regarding such operating conditions.

6.2 Decommissioning/ storing

Decommissioning the machine

- a) Switch off the machine.
 - b) If available, close the cut-off device in the suction and pressure pipes.
 - 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.
 - g) Drain the cooling water (fig. 3/D₁).
 - h) Drain the condensate (fig. 2/X).
- 📄 See also chapter 3.2.1, page 11

6.3 Re-commissioning

- a) Check the condition of the machine (cleanliness, cabling etc.).
- 📄 For installation see chapter 5, page 18
- 📄 For commissioning see chapter 6.1, page 23

7 Maintenance and repair



DANGER

Danger of death from touching live parts!

Before starting any maintenance work, disconnect the machine by pressing the main switch or unplugging it and ensure that it cannot be turned on again.

Observe the operating instructions of the manufacturer of the frequency converter when operating the frequency converter.



WARNING

Hot surfaces!

Risk of burning during maintenance on hot components (fig. 2/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.

Observe the safety instructions described in chapter 2.8 "Safety instructions for installation, commissioning and maintenance" during all work.

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

7.2 Maintenance tasks

Interval	Maintenance activities	Chapter
Monthly	Check the pipes and screws for leaks and ensure their tight fit and if necessary re-seal or re-tighten.	—
Monthly	Check the terminal box and cable inlet holes for leaks and if necessary re-seal.	—
Monthly	Clean the cooling ribs on the machine and the motor.	—
Depending on condensation	Drain condensate (fig. 2/X)	—
Monthly	Check the oil level	7.2.1
7,500 h	Oil change	
Depending on how dirty the discharged medium is	Clean intake air filter Clean gas ballast valve filter	7.2.2
At least once a year	Check for coupling wear	7.2.3
Monthly	Check the cooling water system and the pipes	7.2.4
Depending on the contamination of the coolant	Clean the dirt trap	
—	Integrated frequency converter	7.2.5

7.2.1 Oil change

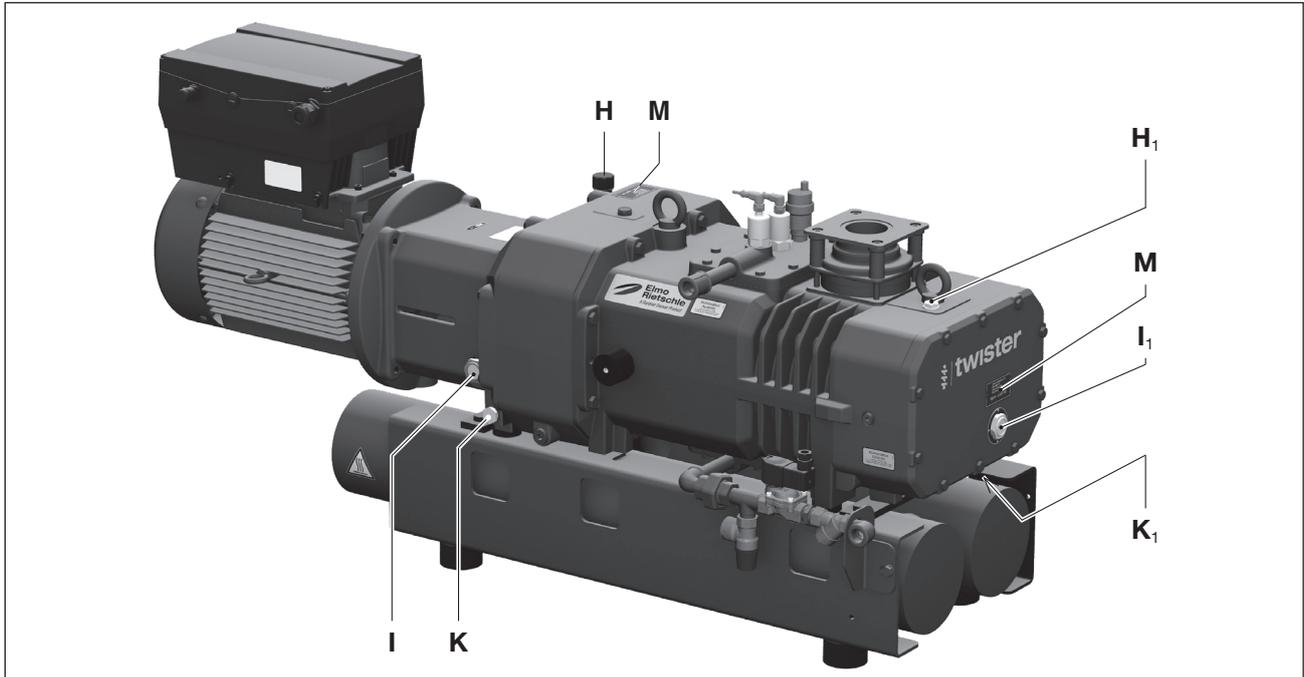


Fig. 10 Oil change

H, H₁ Oil filling point with vent screw

I, I₁ Oil sight glass

K, K₁ Oil discharge point

M Oil recommendation plate

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 is 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 may escape from the vent screw due to pressure compensation.

If larger quantities of oil escape, wash the internal filter of the vent screw.

The oil level in the sight glasses (fig. 10/I, I₁) must be checked every month.

To refill the oil, switch off the machine and bleed to atmospheric pressure.

The oil has to be changed after every 7,500 operating hours.

The oil viscosity must comply with ISO VG 150 as per DIN 51519.

Designation as per DIN 51502: CLP HC 150.

We recommend the following brands of oil: GEAR-LUBE 150 or equivalent oils by other manufacturers (see also oil recommendation plate (fig. 10/M)).

7.2.2 Air filtering

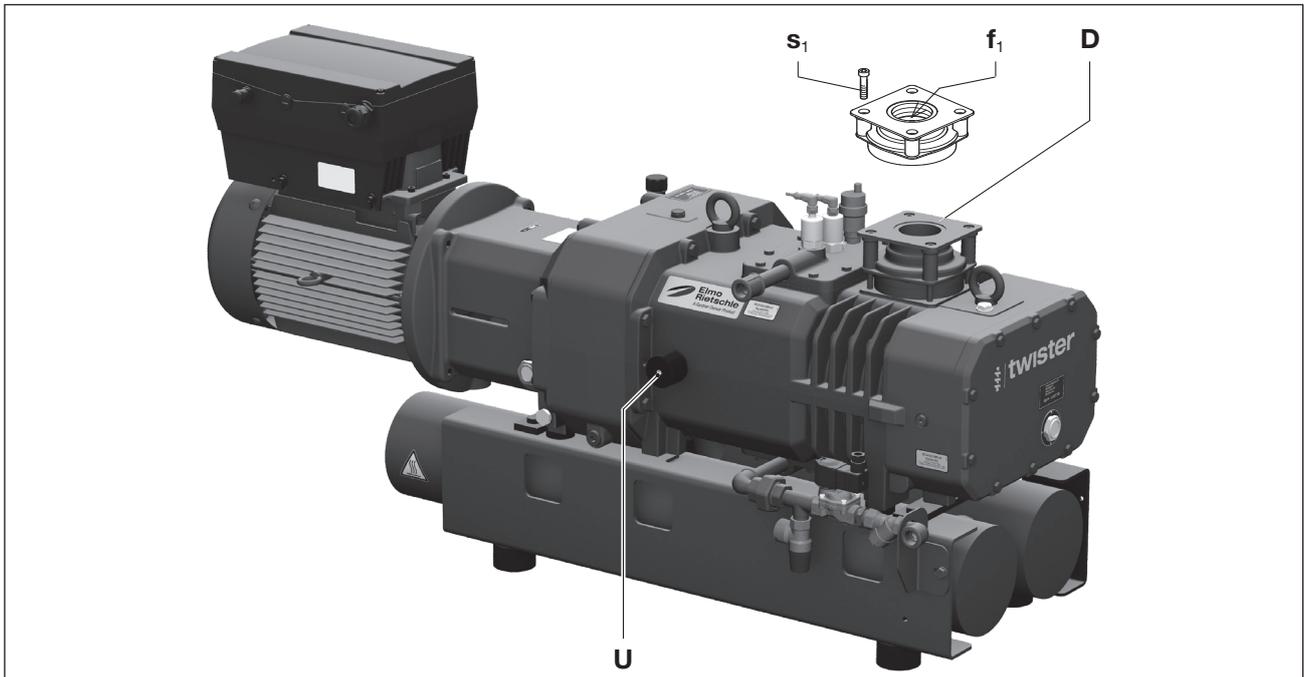


Fig. 11 Air filtering

- D** Suction flange
- f₁** Mesh filter
- s₁** Screws
- U** Gas ballast valve

NOTICE**Insufficient maintenance of the air filter**

The machine output is reduced and damage may occur to the machine.

Intake air filter:

The mesh filter (fig. 11/f₁) must be cleaned by rinsing out or purging or replaced more or less often depending on how dirty the discharged medium is. Remove the suction flange (fig. 11/D) after undoing the screws (fig. 11/s₁).

Also check the valve seat for contamination.

Re-assemble in reverse order.

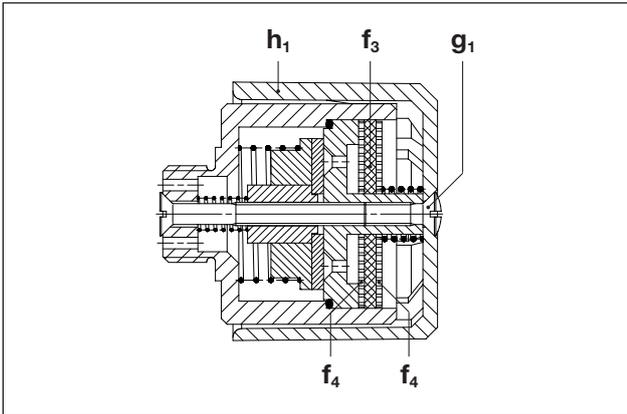


Fig. 12 Gas ballast valve

- h₁** Cover
- f₃** Filter disc
- g₁** Countersunk screw
- f₄** Micro filter discs

Gas ballast valve filter:

The pumps work with a gas ballast valve (fig. 11/U). The built-in filter disc (fig. 12/f₃) and micro filter discs (fig. 12/f₄) must be cleaned more or less often by purging depending on how dirty the medium flowing through is. By undoing the countersunk screw (fig. 12/g₁) and removing the plastic cover (fig. 12/h₁), the filter parts can be removed for cleaning. Re-assemble in reverse order.

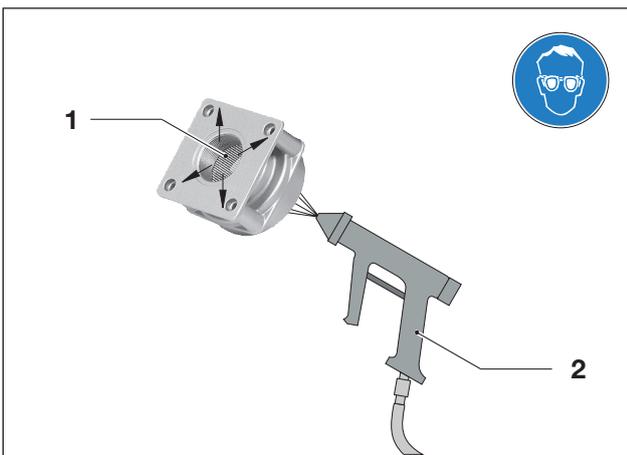


Fig. 13 Blowing out the mesh filter

- 1** Mesh filter
- 2** Compressed air

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, always wear goggles and a dust mask when cleaning with compressed air.

7.2.3 Coupling

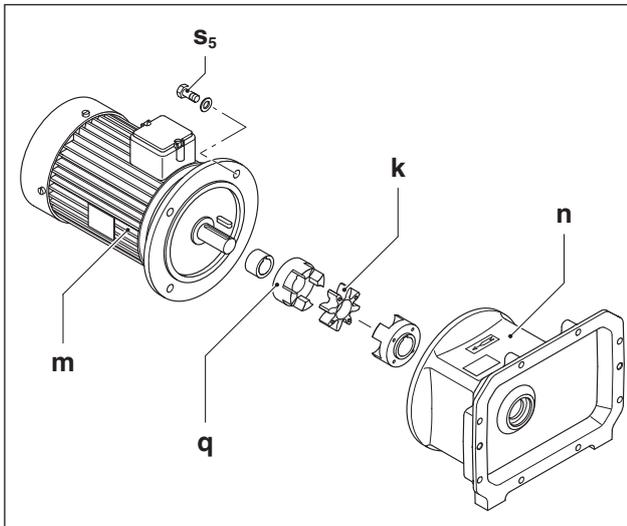


Fig. 14 Coupling

- k** Coupling sprocket
- m** Motor
- n** Motor flange housing
- q** Coupling half on the motor side
- s₅** Screws

The coupling sprocket (fig. 14/k) is subject to wear and must be checked regularly (at least once a year).

CAUTION

Defective coupling sprocket

Defective sprockets may lead to the rotor shaft breaking.

To check the coupling, switch off the motor and ensure that it cannot be switched on again. Suspend the motor (fig. 14/m) on the eyebolts using lifting device.

Undo the screws (fig. 14/s₅) on the motor flange. Remove the motor with its half of the coupling (fig. 14/q) endwise from the motor flange housing (fig. 14/n). If the sprocket (fig. 14/k) is damaged or worn, replace it.

NOTICE

Frequent starting up and high ambient temperature

This reduces the service life of the sprocket (fig. 14/k).

Re-assemble in reverse order.

7.2.4 Cooling

Check the cooling water system and the pipes every month.

Continuous flow cooling

Depending on the contamination of the cooling liquid, the dirt trap (fig. 6/U₆) has to be serviced after appropriate periods. Open the screw plug and clean the built-in micro filter.

Circulation cooling

- 📄 For maintenance see the operating instructions enclosed with the cooling system

7.2.5 Integrated frequency converter

- 📄 For maintenance of the integrated frequency converter (fig. 2/V) see the enclosed operating instructions 610.00260.01.000-DE chapter 3.2.5

7.3 Repair/ service

- a) For on-site repair work, the frequency converter must be disconnected from the mains by a qualified electrician so that it cannot be started up again accidentally. For repairs retain the services of the manufacturer, his branch offices or contracting firms. Please contact the manufacturer for the address of the competent service centre (see manufacturer's address).

The form is titled 'Gardner Denver' and 'Unbedenklichkeitsklärung für Vakuumpumpen und Komponenten'. It includes the following sections:

- 1. Art der Vakuumpumpen / Komponenten**: Grund für die Einsendung, Typbezeichnung, Maschinen-Nummer, Auftrags-Nummer, Lieferdatum.
- 2. Grund für die Einsendung**: (Blank space for text)
- 3. Zustand der Vakuumpumpe / Komponente**:
 - Wurde dies betriebsbereit? JA NEIN
 - Welches Schmiermittel wurde verwendet?

Toluol	JA <input type="checkbox"/>	NEIN <input type="checkbox"/>
Äthanol	JA <input type="checkbox"/>	NEIN <input type="checkbox"/>
Mikrobiologisch*	JA <input type="checkbox"/>	NEIN <input type="checkbox"/>
Epoxid*	JA <input type="checkbox"/>	NEIN <input type="checkbox"/>
Redoxaktiv*	JA <input type="checkbox"/>	NEIN <input type="checkbox"/>
Sonstige	JA <input type="checkbox"/>	NEIN <input type="checkbox"/>
 - Wurde die Pumpe/Komponente entleert? (Mikrobiologisch*) JA NEIN
 - Wurde die Pumpe/Komponente gereinigt, dekontaminiert, (Redoxaktiv*) JA NEIN
 - Ist und behält diese bei van geschichtsbegünstigten korrosiven Schadstoffen? JA NEIN
- 4. Einsatzbedingte Kontamination der Vakuumpumpen / Komponenten**: (Blank space for text)
- 5. Nachweis einer spezifischen Reinigungsmittelbelastung**: (Blank space for text)
- 6. Persönliche Schutzmaßnahmen**:

Handschuhe, Produktname	Chemische Reizschutzhandschuhe	Gefährliche Reizschutzhandschuhe	Maßnahmen bei Freisetzen (Frage Hilfe bei Unfällen der Schwachstelle)
1.			
2.			
3.			
4.			
- 7. Gefährliche Zersetzungspunkte bei normalem Betrieb**: JA NEIN
- 8. Rechtserklärende Erklärung**:

Wir versichern, dass die Angaben in dieser Erklärung wahrheitsgemäß und vollständig sind, und ich als Unterzeichner in der Lage bin, dies zu bezeugen. Eine falsche Angabe ist ein Verstoß gegen die Bestimmungen der Schaden-, die durch unvollständige und unrichtige Angaben entstehen, haben. Wir verpflichten uns, den Auftragnehmer von durch unvollständige oder unrichtige Angaben entstehenden Schadenrisikopräventionen Dritter freizustellen. Eine falsche Angabe ist ein Verstoß gegen die Bestimmungen der Schaden-, was insbesondere die mit der Handhabung/Reparatur des Produkts verbundenen Maßnahmen des Auftragnehmers betrifft - direkt befallen.
- 9. Firmen- und Kontaktinformationen**:

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

Fig. 14 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 and signed declaration of harmlessness must be enclosed. The declaration of harmlessness is part of the supplier's documentation.

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

7.4. Spare parts

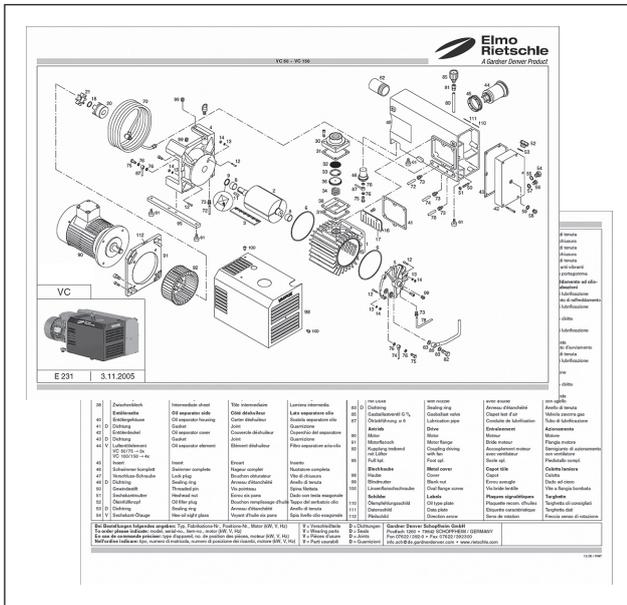


Fig. 15 Spare parts list (example)

Order spare parts according to:

- **Spare parts list:**
E 832/4 → S-VSI 300 (42)
 - Download of the PDF file:
<http://www.gd-elmorietschle.com>
 → Downloads
 → Product Documents
 → S-Series → Spare Parts
 - Wearparts and gaskets are indicated separately on the list.
- **Website:**
<http://www.service-er.de>
 - Select model, 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 may void the liability or the guarantee for any resulting consequences.

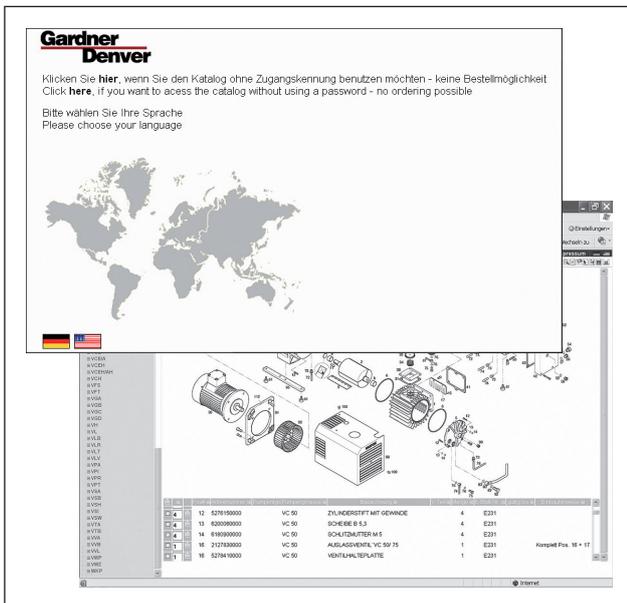


Fig. 16 Website
<http://www.service-er.de>

8 Malfunctions: Causes and elimination

Fault	Cause	Elimination	Note
Machine does not start or the frequency converter displays an error message	Faults in the integrated frequency converter	see the enclosed operating instructions 610.00260.01.000-DE chapter 8	–
Suction capacity is insufficient	The mesh filter is dirty	Clean / replace the mesh filter	Chapter 7.2.2 Chapter 7.4
	The suction pipe is too long or too narrow	Check the hose and/or the pipe	Chapter 5.3
	Machine or system leaking	Check the pipework and screw connections for leaks and check for tight fit	Chapter 7.2
Final pressure (max. vacuum) is not reached	Machine or system leaking	Check the pipework and screw connections for leaks and check for tight fit	Chapter 7.2
	Not enough cooling water	Observe cooling water consumption	Chapter 9
	The mesh filter is dirty	Clean / replace the mesh filter	Chapter 7.2.2 Chapter 7.4
Machine gets too hot	Ambient or intake temperatures too high	Ensure proper use	Chapter 2.3
	Cooling air supply is obstructed	Check ambient conditions	Chapter 5.1
		Clean the cooling ribs	Chapter 7.2
	The cooling water system is obstructed	Check the cooling water system and the lead-in pipes	Chapter 7.2
	Not enough cooling water	Observe cooling water consumption	Chapter 9
Cooling water inflow is too hot	Observe the max. intake temperature	Chapter 9	
The machine makes a strange noise	Deposits on the rotors	Clean the working space and the rotors	Elmo Rietschle Service
Please contact Elmo Rietschle Service for other faults or those that cannot be eliminated.			

9 Technical Data

S-VSI			300 (42) FU
Sound pressure level (max.) 200 mbar (abs.) → 0.1 mbar (abs.) EN ISO 3744 Tolerance ±3 dB(A)	dB(A)	60 Hz	83
Sound power level	dB(A)	60 Hz	89
Weight *	kg		348
Length *	mm		1297
Width	mm		455
Height	mm		663
Vacuum connection			G 2
Oil fill quantity	l		1.9 (1.1 → H + 0.8 → H ₁)
Cooling water consumption max. flow temperature: 50°C	l/min		6.7
Cooling water pressure	bar		max. 6

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

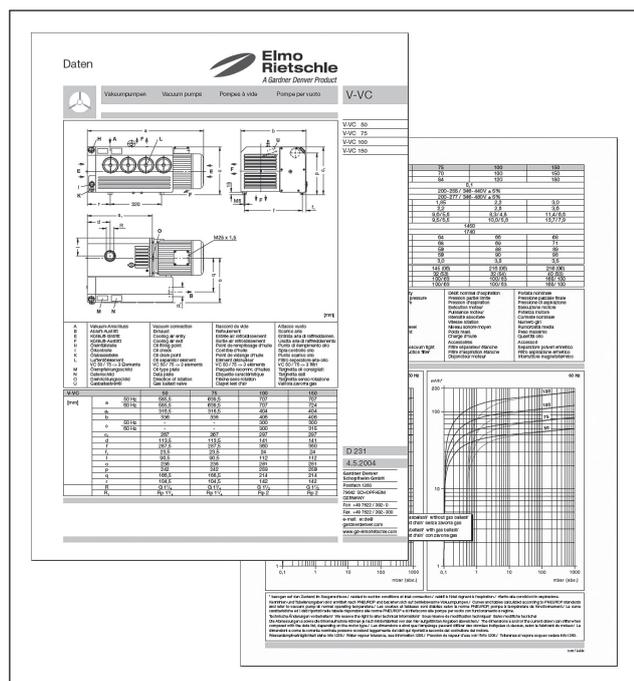


Fig. 17 Data sheet (example)

You can find additional technical data on the data sheet **D 832/42 FU**

- Download of the PDF file:
D 832/42 FU → S-VSI 300 (42) FU
- Download of the PDF file:
<http://www.gd-elmorietschle.com>
→ Downloads
→ Product Documents
→ S-Series → Data Sheets

NOTICE

Subject to technical changes!



**Elmo
Rietschle**

by Gardner Denver

Gardner

Denver

Elmo Rietschle is a brand of
Gardner Denver's Industrial Products
Division and part of Blower Operations.

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: S-VSI
Type:

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, 01.03.2015



Dr. Friedrich Justen, Director Engineering

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 <input type="checkbox"/> NO <input type="checkbox"/>	Toxic YES <input type="checkbox"/> NO <input type="checkbox"/>
Which lubrication was used? _____	Corrosive YES <input type="checkbox"/> NO <input type="checkbox"/>
Was the pump/ component emptied? (Product/Consumables) YES <input type="checkbox"/> NO <input type="checkbox"/>	Microbiological*) YES <input type="checkbox"/> NO <input type="checkbox"/>
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 <input type="checkbox"/>	Explosive*) YES <input type="checkbox"/> NO <input type="checkbox"/>
Cleaning agent: _____	Radioactive*) YES <input type="checkbox"/> NO <input type="checkbox"/>
Cleaning method: _____	other YES <input type="checkbox"/> NO <input type="checkbox"/>

*) 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: _____