TOPAS

D004 V – D041 V

Oil flooded rotary vane vacuum pump

Translation of the operating manual

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Contents

2 Introduction

2.1 Information relating to the operating instructions

This manual provides information on how to work with the TOPAS rotary vane vacuum pumps in the series:

TOPAS D004 V - D041 V

A condition for secure operation is adherence to all safety and operating instructions.

Read the operating instructions!

The operating instructions must be carefully read through before commencement of any operation! They are an integral part of the equipment and must at all times be kept in close proximity to the machinery for immediate use by the operating and maintenance personnel.

Observe the operating instructions!

The company "briwatec GmbH" will not be held liable for workplace accidents, damage to the equipment, production losses or completion disorders that occur as a result of non-observance of the operating instructions.

Furthermore, the local accident-avoidance directions and general safety regulations in respect of the operation of machinery will apply.

The figures serve for a general understanding of the machinery and may differ somewhat from the actual construction thereof.

Components produced by other suppliers have their own safety instructions and guidelines. These must also be observed.

2.2 Limitation of liability

All data and directions in this introduction have been assembled with due consideration of the corresponding norms and regulations of the state of the art as well as of our own knowledge and experience.

The company "briwatec GmbH" will not be held liable for damages due to:

- Non-observance of the operating directions
- Misuse of equipment
- Employment of unqualified personnel
- Use of spare parts that have not been provided by the company "briwatec GmbH"
- Arbitrary alteration of machinery components or of accessories (supply list from the company "briwatec GmbH")

The responsibilities agreed in the supply contract, the general commercial conditions as well as the conditions of supply by the company "briwatec GmbH" and the regulations current at the time of signing of the contract will apply.

We reserve the right to make technical changes with a view to improving the operating conditions and further development.

2.3 Copyright

The transfer of the operating instructions to third parties without the written permission of the company "briwatec GmbH" is prohibited.

NOTICE!

All data contained herein, texts, drawings, pictures and other illustrations are protected by copyright and are subject to commercial patent rights.

All misuse thereof is liable to prosecution!

Duplication in any type or form - even extracts - as well as the utilisation and/or communication of the contents hereof are not permitted without written authorisation by the company "briwatec GmbH".

2.4 Spare parts

The company "briwatec GmbH" recommends the use of original spare parts. Original spare parts conform to particular quality criteria and provide reliable and safe functionality;

- Development of the special use of the equipment
- Manufacture in high quality and value
- Warranty period of 12 months after installation or shipping (excluding wearing parts) or other agreements made.

NOTICE!

The use of non-original spare parts can alter the properties of the equipment and put its safety at risk!

The company "briwatec GmbH" is absolved of any liability for damage that results therefrom.

DISPOSAL!

Worn-out components (indicated in the spare parts list) are waste products.

After exchange, the worn-out components should be disposed of in accordance with the national regulations.

2.5 Service

For servicing queries, the company "briwatec GmbH" can be contacted as follows:

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Schönauer Str. 62
79669 Zell i. W.
Germany

Phone. +49 (0) 7625 918 868-0
Fax. +49 (0) 7625 918 868 -33
info@briwatec.de
www.briwatec.de

For faster response to your queries, please have available the following data and information:

- Serial number
- Which activity has already been undertaken?

Service work: Prior to service works on-site, the motor has to be disconnected from the circuit by a qualified electrician so that an unforeseen start does not occur.

For servicing work, we recommend that the manufacturer or its local branch or sub-contractor be engaged, especially where possible repairs under warranty are involved.

The address of the servicing station appropriate for yourselves can be obtained from the manufacturer (see the manufacturer's address). Following a repair or prior to re-start-up, the jobs indicated under "Installation" and "Start-up" must be carried out as for the initial start-up procedure.

2.6 CE-Declaration of Conformity

briwatec GmbH
Schönauer Str. 62
79669 Zell im Wiesental / Germany

Konformitätserklärung
EC declaration of conformity

im Sinne der EG-Maschinenrichtlinie 2006/42/EG
as defined by machinery directive 2006/42/EG

Hiermit erklären wir, dass die **Drehschieber-Vakuumpumpen (TOPAS D)**
Herewith we declare that the **rotary vane vacuum pumps (TOPAS D)**

TOPAS D004 V, TOPAS D006 V, TOPAS D008 V, TOPAS D012 V, TOPAS D020 V, TOPAS D026 V, TOPAS D041 V

folgenden einschlägigen Bestimmungen entsprechen:
the following special regulations correspond to them:

- Maschinenrichtlinie 2006/42/EG i.d. aktuellen Fassung/ in the actual version
- Niederspannungsrichtlinie 2014/35/EU i.d. aktuellen Fassung/in the actual version

Angewendete harmonisierte Normen, insbesondere:
Applied harmonized standards, in particular:

- DIN EN 1012-1:2010, DIN EN 1012-2:2011
- DIN EN ISO 12100-1, DIN EN ISO 12100-2

Diese Konformitätserklärung verliert ihre Gültigkeit, wenn an der Maschine Änderungen vorgenommen werden, die nicht vorher mit uns abgestimmt und schriftlich genehmigt wurde.
If some changes on the machine will be done without approval by supplier, this EC declaration of conformity will loose it's validity.

Dokumentations-bevollmächtigter Markus Britsche
Schönauer Str. 62
79669 Zell im Wiesental/Germany

Zell i.W., den 19. April 2017
(Ort, Datum der Ausstellung/date)

Markus Britsche (Geschäftsführer/Managing Director)
(Unterschrift/signature)*

* rechtsverbindlich; mit Angaben zum Unterzeichner / legally binding; with declaration to the signer

K_0012 Rev.4

Fig. 1 CE-Declaration

3 Safety

3.1 General

The TOPAS rotary vane vacuum pump has been constructed, completed and tested in accordance with the safety guidelines of the latest state of the art, and has been released in a technically safe and impeccable condition. Nevertheless, dangers can occur with use of the machinery, for persons and objects, if it is used in an improper manner.

The operating instructions must be read comprehensively and the safety directions must be adhered to.

The operating directions that are attached to the machinery must be followed and must be kept in a readily readable condition. This relates, for example, to:

- Connection indicator
- Data and motor identification plate
- Instructions and warning plates

In the event of non-conforming operation, all liabilities and warranties on the part of the company "briwatec GmbH" are rescinded.

3.2 Description of safety instructions

Safety instructions refer to particular dangers. These are indicated in this guide book by way of symbols.

SAFE refers to 4 basics in the description of the safety instructions:

- **S**everity of danger (Signal word)
- **T**ype and origin of the danger (description)
- **C**onsequence of non-observance
- **A**voidance (measures to avoid a danger)

The corresponding warning symbol serves to identify the point of danger.

Model construction of safety directions:

DANGER!

DESCRIPTION OF THE TYPE AND ORIGIN OF THE DANGER!

Description of the consequences of ignoring the danger.

- Measures taken to avoid the danger

3.3 General safety advice

The following general safety instructions are used according to the type of danger:

DANGER!

Refers to an immediate, dangerous situation that results in death or serious injury if not avoided.

WARNING!

Refers to a possibly dangerous situation that could lead to death or serious injury, if not avoided.

CAUTION!

Refers to a possibly dangerous situation that could lead to slight or minor injury or to damage of objects if not avoided.

The following indicators are used in this guidebook:

NOTICE!

This symbol refers to an important state of affairs.

Relevant instructions for the installation, operation or maintenance are provided.

RECYCLING!

This symbol refers to relevant instructions for disposal. Materials must be separated and disposed of individually.

Similarly, the instructions for the disposal of lubricants (oils and greases) as well as of additives must be observed!

3.4 Safety and information signs on the machine

The symbols placed on the machine refer to the risks and prohibitions explained below. The safety information and recommendations must always be followed and you must act prudently to prevent accidents involving personal injury and property damage!

WARNING!

Danger of death due to electricity!

Indicates a potentially hazardous situation which can result in death or serious injury from electrical shock, if not avoided!

HOT SURFACE!

Indicates a potentially hazardous situation which can result in death or serious injury from burns on hot surfaces, if not avoided!

3.5 Personnel requirements

WARNING!

Danger from inadequately qualified personnel

Inappropriate actions can lead to serious personnel injury and material damage. Therefore:

- All activities must only be carried out by qualified personnel.

Electrical equipment

Work with electrical installations may only be undertaken by expert electricians in accordance with electro-technical regulations.

This refers to work on the installation, operation, repair to and maintenance of electrical equipment.

Operation of the machine

The operation of the machine must only be performed by trained or skilled personnel. The operator must be conversant with the basic directions regarding safety at work and accident avoidance, and must have been trained in the management of the machinery. The operator must have read and understood the operating instructions prior to start-up of the machinery.

3.6 Definition of terms

Trained persons/ operators

… Trained Personnel/Operators have been trained by the operator in regard to the tasks given to him and the possible dangers from inappropriate actions.

Skilled personnel

… Qualified Personnel because of their technical training, knowledge and experience as well as their knowledge of the appropriate directions, are capable of carrying out the tasks given to them and able to identify dangers and how to avoid them.

Machinery

… Pre-wired combination of pump and motor.

Motor

… Drive motor of the pump.

Vacuum pump

… Machine for generating an underpressure (vacuum).

Rotary vane

… Construction and operating principle of the machine.

Suction power

… Volume flow of a vacuum pump in relation to the condition in the suction connection.

Final pressure (absolute)

… The maximum vacuum that a pump achieves with a closed suction opening, indicated as absolute pressure.

Permanent vacuum

… The vacuum or suction pressure area, which operates the pump in continuous operation. The permanent vacuum and suction pressure is ≥ than the final vacuum and < than atmospheric pressure.

Noise emission

… The given noise at any particular load condition as numerical value, the noise level in dB(A) in accordance with EN ISO 3744.

3.7 Use in accordance with regulations

The machine is conceived and designed exclusively for the purpose described herein.

The machine may only be operated in use areas that are described in the instructions for use:

- Only when the machine is operated in a technically faultless condition
- When the machine is not in a partially assembled condition
- The machine may only be operated in an ambient temperature between 12° and 40°C and an inlet temperature between 5° and 40°C. At temperatures outside this range please refer to the supplier.
- Counterpressures on the outlet side are only permitted up to + 0.1 bar.

The machine may be used to convey, compress or suction the following media:

- Air,
- The suctioned air may contain water vapour, but no water or other fluids.
- All non-explosive, non-flammable, non corrosive and non-toxic dry gas and gas-air mixtures.

WARNING!

Danger when used in non-prescribed manner!

Any use of the machinery that is outside and/or alternative to the prescribed manner can lead to dangerous situations.

- TOPAS rotary vane vacuum pumps must only be used as intended.
- All instructions in the operating manual should be strictly adhered to.

Claims of any kind in respect of damage due to non-prescribed use are not permitted. The operator alone is liable for damage due to non-prescribed use.

3.8 Improper operation

Mis-usage can result from the following methods of operation:

- Suctioning, conveying and compressing explosive, combustible, aggressive or toxic media, e.g. dust according to ATEX zones 20-22, solvents and gaseous oxygen and other oxidants.
- The use of the machine in non-industrial establishments, in which the necessary precautions and safety measures have not been undertaken.
- The installation in explosion-prone environments.
- The use of the machine in areas with ionising radiation.
- Counterpressures on the outlet side exceeding + 0.1 bar.
- Alterations to the machinery and its component accessories.

3.9 Protective measures by the operator/user

The machine is operated in commercial/industrial situations. The operator of the machine is, therefore, subject to the legal requirements in respect of working safety. In addition to the safety regulations stated in this operating manual, the applicable safety-, accident- and environmental protection regulations must be adhered to for operation of this machinery.

In this regard, it should be specially noted that:

- Hot parts of the machine must not be accessible or be provided with protective contact means.
- Personnel should not be placed in danger from free suction or expulsion of medium substances.
- Danger from electrical energy should be prevented.
- The operator must be conversant with the relevant protection-at-work regulations and must ascertain any situation judged to comprise dangerous conditions when the work place of the machinery will have special safety regulations. These should be available to him as operating instructions for using the machinery.
- The operator must undertake tests throughout the operation of the machinery to check whether the operating instruction being followed by him actually conform to the prescribed instructions for operating the machinery and, if necessary, modify accordingly.
- The operator must clearly regulate and establish the adequacy of the installation, operation, fault removal and maintenance.
- The operator must ensure that all co-workers involved in operation of the machinery have read and understand these operating instructions. In addition, he or she must subject the personnel to training sessions at regular intervals and keep them informed about dangers.

DANGER!

Safe access to the operating components!

If operating components are displaced and unreachable, there is the risk of injury and life-threatening injury.

- Operating components should not be displaced and safe access should be available.

In addition, the operator is responsible for ensuring that the machinery is permanently in a faultless technical condition.

4 Technical specifications

4.1 Type / name plate

The model plate contains the relevant technical information about the machine.

In the event of technical service queries the model references, date of manufacture and serial number must be available.

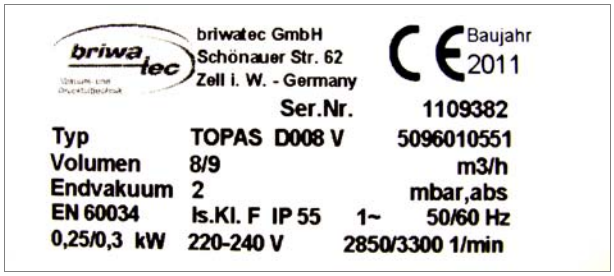

Fig. 2 Type plate (example)

4.2 Technical Information

The following technical details and noise emissions apply to the TOPAS series:

TOPAS		D004 V	D006 V	D008 V	D012 V	D020 V	D026 V	D041 V
Noise pressure level	50 Hz	57	58	58	62	64	57	64
(max.) dB(A)	60 Hz	59	60	60	64	67	59	68
Weight	3 ~	5,4	9,0	9,0	14,0	17,0	25	42
(max.) kg	1 ~	5,4	10,0	10,0	14,0	19,0	26	46,5
Length mm		250	290	295	340	355	357	490
Width mm		140	170	170	180	230	275	310
Height mm		140	135	135	170	175	212	296
Oil filling quantity	l	0,1	0,2	0,2	0,4	0,5	1	1,5

Fig. 3 TOPAS series, Technical Information

The suction power at free intake amounts to 4, 6, 8, 12 ,20, 25 and 40 m³/h at 50 Hz. The dependence of the pumping capacity of the inlet pressure is shown on the corresponding data sheets.

The sound pressure levels or sound power level according to EN ISO 3744, measured at 1 m distance in an operating point at about 2 / 3 of the permissible total differential pressure and connected lines without vacuum reduction, tolerance ± 3 dB (A), are indicated in the table, Fig. 3

Ear protectors! To prevent hearing damage through lengthy presence in the vicinity of an operating machine, the use of hearing protection means is recommended.

5 Functional description

5.1 Conditions of use

The vacuum pumps TOPAS D004 V - D041 V are designed for use in the commercial sector, i.e. the safety equipment corresponds to DIN EN ISO 13857 table 4 for people aged over 14 years.

The TOPAS D004 V - D041 V is suitable for the evacuation of closed systems or for a permanent vacuum in the following suction pressure ranges:

- TOPAS D004 V - D008 V: 2 to 200 mbar (abs.)
- TOPAS D012 V - D020 V: 2 to 400 mbar (abs.)
- TOPAS D026 V - D041 V: 0,5 to 400 mbar (abs.)

For continuous operation outside of these ranges, there is a risk of oil loss through the outlet opening. For evacuation of closed systems, the volume to be evacuated may only be such that the maximum intake pressure can be achieved in a few seconds.

Suction power, suction pressure

The dependency of the suction power on the suction pressure is type-specific and can be taken from the corresponding datasheets:

Data page No.	Construction series
D161	TOPAS D004 V
D177	TOPAS D008 V
D178	TOPAS D012 V
D205	TOPAS D006 V
D270	TOPAS D020 V
D316	TOPAS D041 V
D317	TOPAS D026 V

Extracted substances:

The suctioned air may contain water vapour, but no water or other fluids. Aggressive or combustible gases and vapours may not be suctioned. No hazardous additives (e.g. combustible or explosive gases or vapours) or aggressive gases may be suctioned.

Operation in rooms with an explosion risk is not permitted.

The ambient temperature must be between 12°C and 40°C, and the suction temperature must be between 5°C and 40°C. For temperatures outside of this range, the manufacturer should be consulted.

Counterpressures on the outlet side are only permitted up to + 0.1 bar.

NOTICE!

In application cases in which an unplanned shutdown or failure of the vacuum pump can cause harm to persons or equipment, appropriate safety measures must be taken on the equipment side.

5.2 Construction

The TOPAS rotary vane vacuum pump consists of the following major components:

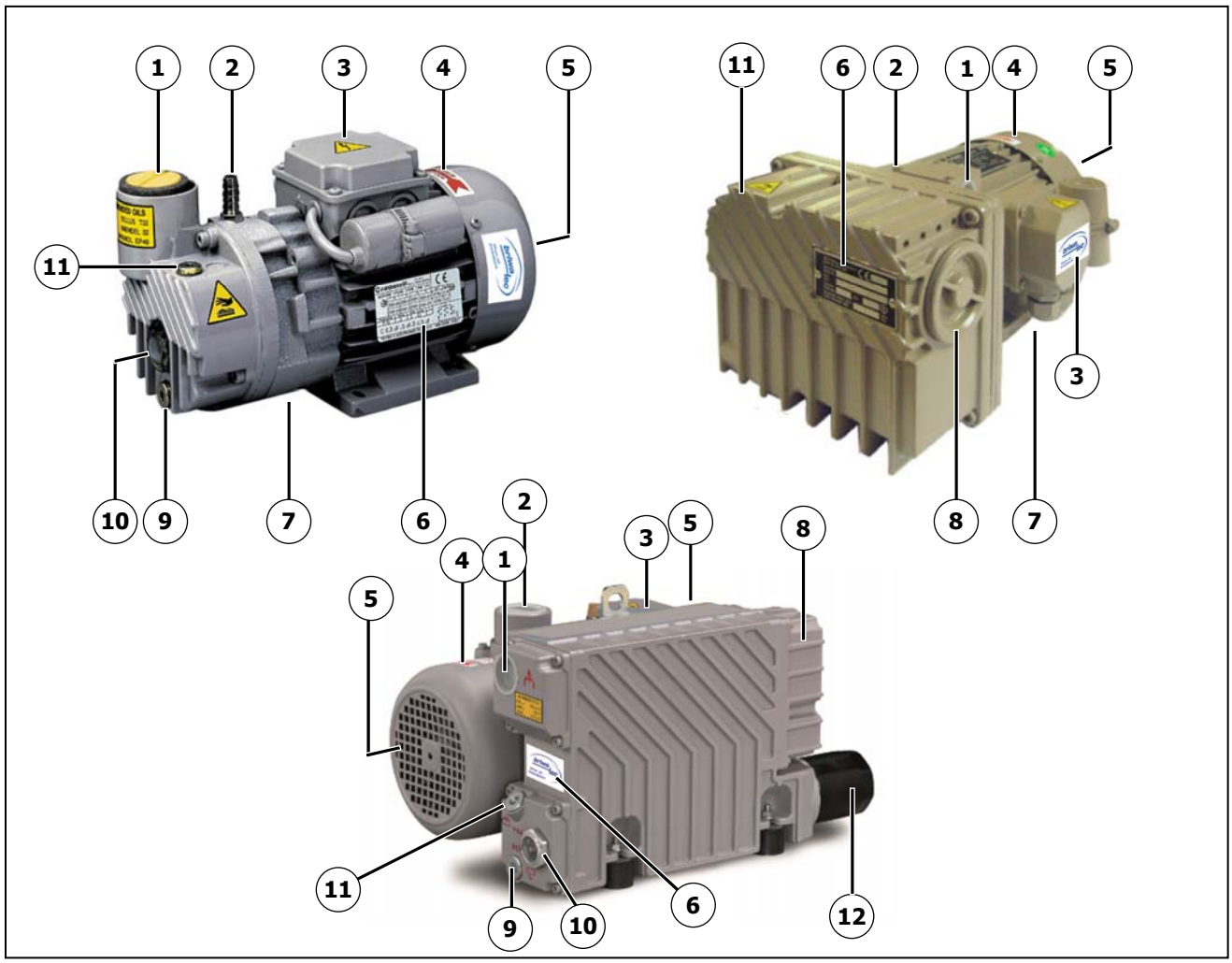

Fig. 4 TOPAS major components

1. Exhaust air opening with air deoil element
2. Suction line connection
3. Terminal box
4. Motor directional arrow
5. Cooling air inlet
6. Name plate
7. Cooling air outlet
8. Filter cover
9. Oil drain plug
10. Oil sight glass
11. Oil filling point
12. Oil filter

5.3 Function

The pumps of the **TOPAS D004 V - D041 V** series are oil flooded rotary vane vacuum pumps. You have an oil mist filter on the outlet side. The motor ventilator provides cooling for the motor and pump housing. The motor and pump have a common shaft.

Equipment: When necessary, a vacuum regulating valve, additional check valve, vacuum-tight suction filter, fluid separator, tube connection and motor circuit breaker.

Mode of operation: The suctioned medium (air) flows through the suction filter (optional). The medium fills the suction area of the pump (1). Through rotation of the rotor, the sliders are pushed through centrifugal force against the internal wall of the housing, thus forming three chambers with a consequence of different volumes, which permit the generation of an underpressure and a flow rate.

The medium is de-oiled by the filter element and then flows out of the pump. An oil back-suction sucks the oil separated through the filter element back into the pump body.

6 Transport Storage

6.1 Precautions for transportation

DANGER!

Danger from suspended load

Risk of injury or death due to falling loads!

- Never stand under suspended loads.
- Maintain adequate distance to suspended loads.
- Ensure stable centre of gravity.

Observe the accident prevention regulations!

When lifting and transporting the machine, the safety regulations and general accident prevention regulations and the recognized technical rules must be observed.

6.2 Machine lifting and transportation

The machine may only be lifted via the provided lifting eye.

The machine can swing out. When lifting pay special attention to the centre of gravity, readjust the lifting gear!

Packaging

The machinery must be properly packed in its original packaging before being transported to the destination. The packaging should be attached to a European pallet or similar so that the machine cannot topple over.

The packaging should protect the individual components up to their assembly, from transportation damage, corrosion and other damage. Therefore, the packaging must not be disturbed and only removed shortly before assembly.

Before each long transportation, remove the oil from the pump.

ENVIRONMENTAL DAMAGE THROUGH DISPOSAL!

Packaging material is a valuable product and can, in many cases, be re-used or carefully prepared and re-used. Therefore:

- The packaging material must be disposed of in an environmentally friendly manner
- Observe the local waste disposal regulations; if necessary, use the services of a specialist disposal company.

6.3 Storage

If the vacuum pump is shut down for a longer period of time (over 3 months) or the commissioning is delayed, the following measures must be performed:

- Dump the pump,
- Fill up corrosion protection oil, allow the pump to run for 10 minutes and then drain off the corrosion protection oil again,
- Seal all of the openings with adhesive tape.
- Store the pump in a dry location; do not use any rooms that contain humidity or strong temperature fluctuations.

7 Commissioning

7.1 Setup

The oil filling point, oil sight class and oil outlet must be easily accessible. The cooling air inlet and the cooling air outlet must have a distance of at least 15 cm from the adjacent walls. Emerging cooling air must not be sucked back in again. For the components, Fig. 4 page 13.

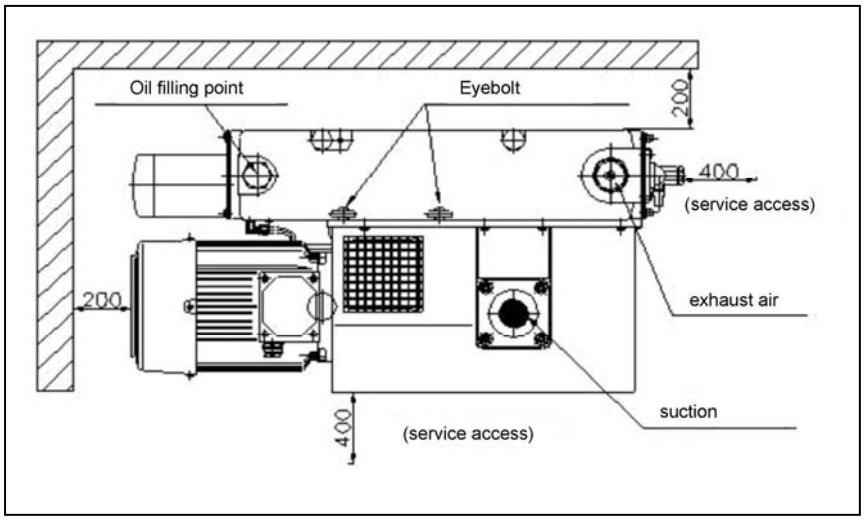

Fig. 5 installation example

For maintenance work, a minimum distance of 0.3 m must be observed in front of the oil filter and the oil reservoir cover.

Installation location

The **TOPAS D004 V** – **D041 V** can only be operated error-free in a horizontal setup location. The pumps must not be tilted. The setup of the vacuum pump on solid ground is possible without anchorage. The vibrations from these rotary vane vacuum pumps are very slight.

Anchorage

In the case of setup on a lower construction, we recommend anchorage via elastic buffer elements.

We recommend using the threaded holes for anchoring the pump to a base frame.

NOTICE!

For assembly at levels greater than 1000 metres above sea level, reduced output is noticeable.

In this case, we advise prior advice from the manufacturer.

7.2 Installation

WARNING!

Mortal danger from electrical shocks!

Non-professional handling of electrical components can lead to life-threatening electric shocks, if undertaken with insufficient experience.

- Electrical installations should only be undertaken by qualified personnel
- Fused security for the construction should be carried out via the main junction box.

1. Connection of suction line, item 2 page 13. The suctioned-out air can be blown out through the ventilation opening via the air de-oiling element.

NOTICE!

With too narrow and / or too long lines, the performance of the vacuum pump is reduced.

The exhaust air opening must not be blocked or obstructed.

Before start the plug in exhaust air opening has to be removed!

2. Fill in lubrication oil (for oil quantity, see Chap. 9.1 Page 20) Fill in lubrication oil (item 11) at the oil filling point of the oil reservoir; filling height: middle of oil sight glass (item 10), then close the oil filling point.

3. The electrical motor data is indicated on the type plate, chap. 4.1, page 11 and on the motor data plate. The motors comply with DIN EN 60034 and are in safety class IP 55 and insulation class F. The corresponding connection diagram is located in the motor terminal box (not needed for the version with a plug connection). The motor data should be compared with the existing grid (current type, tension, grid frequency and permitted current strength).

4. The motor and motor protection switch (for security a motor protection switch and for draught exclusion of the connecting cable a cable threading are provided). We recommend the use of circuit breakers with delayed switch-off according to over-current conditions. Overcurrent time delay occurs. Momentary overcurrent can occur during cold start of the blower.

Single-phase alternating current:

Single-phase AC is an alternating current that flows through a two-strand cable.

From the three-phase alternating current of low voltage single-phase network obtained has an outer conductor.

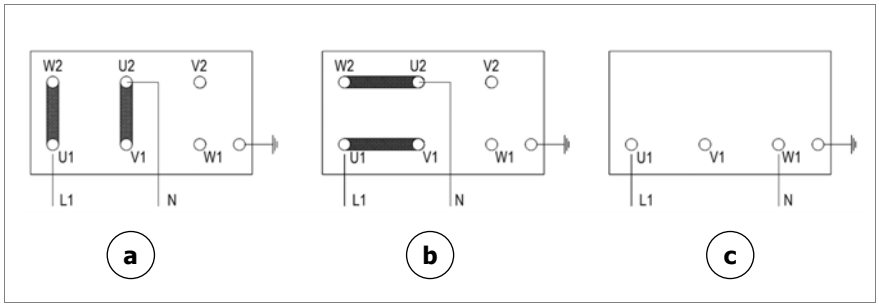

Fig. 6 Connections for single phase alternating current

a. 6-pin terminal board, clockwise rotation
b. 6-pin terminal board, anticlockwise rotation
c. 3-pole terminal board

Triple-phase alternating current:

With triple-phase alternating current three alternating tensions are carried that have a timed relationship to one another, a so-called phased relationship.

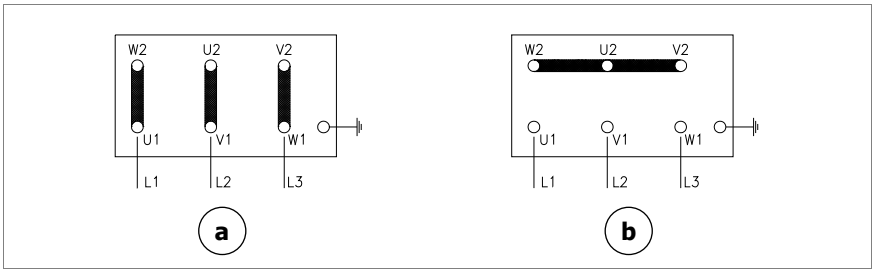

Fig. 7 Connection of three-phase electrical power

a. Δ - connection (triangular), lower tension (example: 230 V)
b. Y - connection (star), upper voltage (example: 400 V)

7.3 Commissioning

1. Briefly start the motor to check the direction of rotation (direction of rotation arrow, page 13).
2. After possibly correcting the direction of rotation, restart the motor and stop it again after approx. 2 minutes to refill missing oil according to the oil level in the sight glass on the filling point.

NOTICE!

The filling point must not be opened when the pump is running!

3. Connection of suction line.
4. Vacuum-regulating valve (option):
   The setting of the vacuum can be done by turning the control according to the symbol attached to the rotary knob.

8 Operation

The average sound pressure level, measured at 50 or 60 Hz operation, is given in Section 4.2 page 11.

Noise emission: We recommend wearing ear protection when working permanently in the vicinity of the operating pump to prevent damage to hearing.

Oil aerosols in exhaust air: Despite the most thorough oil mist separation by the air de-oiling element, the exhaust air still contains small residues of oil aerosols which can be detected by their odour. Long-term breathing of these aerosols could be hazardous to health. Therefore, you must ensure good ventilation of the installation room.

HOT SURFACE!

Surface temperatures in excess of 70°C!

At hot operating temperatures the surface temperatures of components can rise above 70°C. Risk of burns!

- Avoid touching the components.
- Wear protective gloves.

Before start-up of the operation, the correct set up for the machine, the installation and start-up (trial run) should be organised.
See chapter 7 „Commissioning " page 16.

The machine should be checked prior to start-up in respect of observance of the service measures! See chapter 9.5 „Maintenance intervals", page 24.

9 Maintenance

DANGER!

Before undertaking maintenance works:

For maintenance work, the vacuum pump must be disconnected from the electrical network by unplugging the power cord or by pressing the main switch and securing it against restarting.

Do not perform maintenance on a pump that is still warm after operating (risk of injury from hot machine parts or hot lubrication oil)!

9.1 Oil change

The first oil change is carried out after 500 hours of operation.

All other oil changes are as follows:

- every 500 - 2000 operating hours for TOPAS D004 V – TOPAS D020 V
- every 500 – 3000 operating hours for TOPAS D026 V / D041 V

In the case of severe dirt contamination, the oil change intervals must be reduced accordingly.

NOTICE!

The indicated oil change intervals are practically calculated values based on experience.

Depending on the application, the oil will become less or more contaminated; adjust the frequency of the oil change and the type of oil selected.

TOPAS D004 V to TOPAS D020 V

Recommendation oil type:

- special vacuum pump oil BV32

Oil specification:

- Only lubricating oils according to DIN 51 506 group VC/VCL or an oil recommended by the company "briwatec" may be used. The viscosity of the oil must conform to ISO VG 32 according to DIN 51 519.

TOPAS D026 V to TOPAS D041 V

Recommendation oil type:

- special vacuum pump oil BW100S

Oil specification:

- Only lubricating oils according to DIN 51 506 group VC/VCL or an oil recommended by the company "briwatec" may be used. The viscosity of the oil must conform to ISO-VG 100 according to DIN 51 519.
- General characteristics: corrosion-inhibiting, oxidation-inhibiting, extremely pressure-resistant, foam-inhibiting.
- Auto-ignition point: 240°C.

NOTICE!

Depending on the application, other viscosities may be more suitable, e.g. Vacuum pump oil MV46S (ISO VG 46). In such cases please consult the manufacturer.

CAUTION!

Pump damage!

The use of unsuitable oil can lead to the destruction of the pump. You and/or your supplier bears the responsibility for any use of unsuitable oils.

- Only use the oil listed here with the indicated specification!

Performing the oil change TOPAS D004 V – D041 V:

Switch off the pump and leave it to cool down.

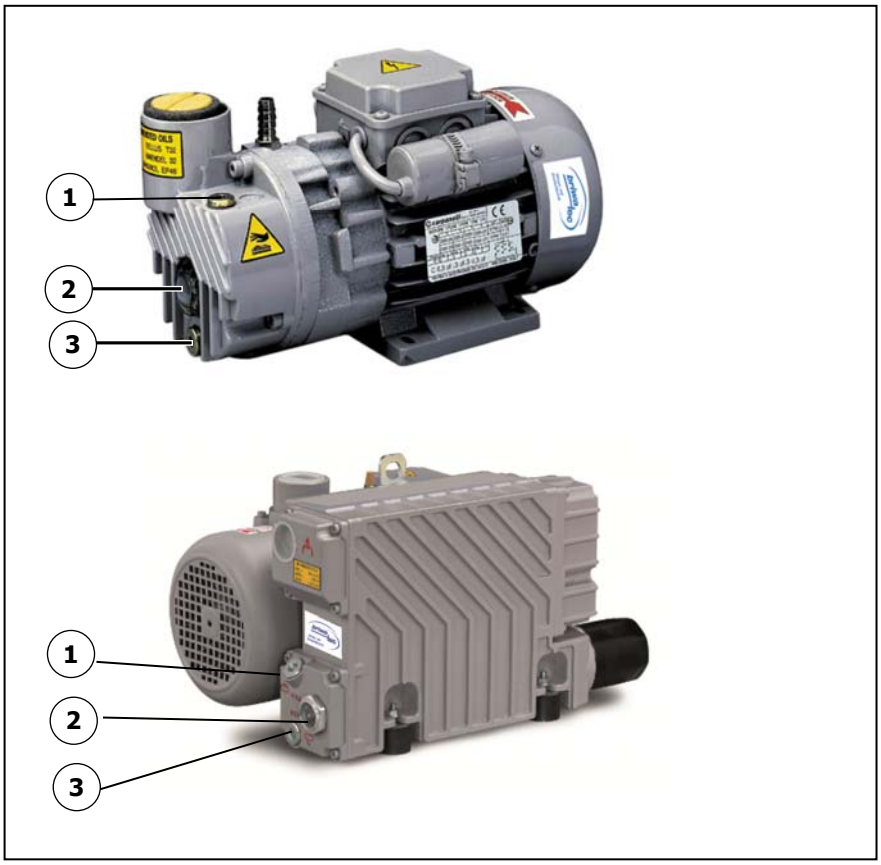

Fig. 8 Oil change

1. Oil filling port
2. Oil sight glass
3. Oil drain plug

Unscrew the oil drain plug (3) and the filler plug (1) and let oil flow out of the pump. Lift up the pump (tilt it) a little on the motor side to speed up the drainage process.

Then screw the oil drain plug (3) back in again and tighten. Fill up the emptied pump with new oil via the oil filling opening (1) up to the middle of the oil sight glass (2). Then reclose the oil filling opening with the screw cap.

After startup, check the oil level again and fill up higher if necessary.

DISPOSAL OF OLD OIL!

Oils and greases must not get into the environment! Adhere to the regulations on the disposal of lubricants.

9.2 Change of oil filter on TOPAS D041 V

Change the oil filter only when the pump is emptied.

To do this, unscrew the old oil filter (item 12, fig. 4 page 13) and install new oil filter. The oil filter must be replaced every time you change the oil.

9.3 Filter element / air de-oiling element

The filter element is contaminated more or less rapidly depending on the degree of soiling of the sucked-in medium.

The filter element can not be reused. It is recommended to change the filter element every time you change the oil.

HINWEIS!

Excessive contamination of the filter element leads to pressure loss.

The pump power is reduced, the current consumption of the motor and the pump temperature increase. The filter element can thereby be damaged. Result: Smoke formation on the discharge side!

CAUTION!

Fire hazard!

A heavily fouled air de-oiling element leads to excessive pumping temperatures and can in extreme circumstances cause a spontaneous combustion of the lubrication oil!

Filter replacement is carried out in the following manner:

- Loosen filter element (1) or slacken off the filter cover (2),
- Replace Element; Reuse the O-ring,
- Reassemble in reverse order.

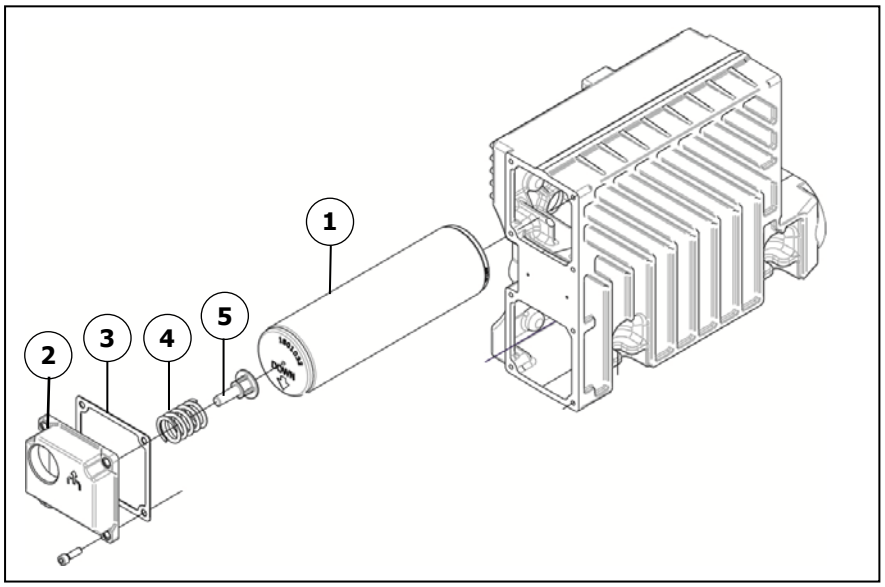

Fig. 9 Replace the air de-oiling element

1. Filter element
2. Filter cover
3. Lid seal
4. Spring
5. Pressure pin

9.4 Air Filter (optional)

In the case of insufficient maintenance of the optional air filter, the power of the vacuum pump is reduced.

The filter cartridge must be cleaned or replaced, depending on the contamination of the suctioned medium.

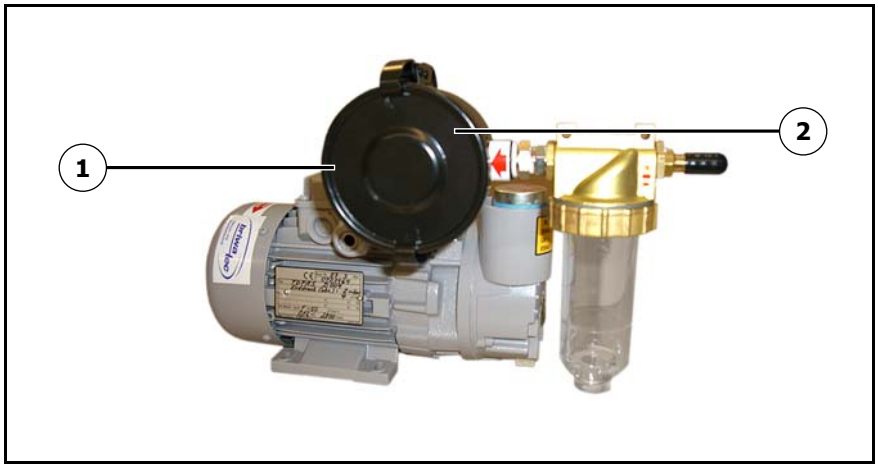

Fig. 10 Option air filter

1. Filtercover
2. Filters in the filter housing

9.5 Maintenance intervals

Daily maintenance:

- Checking of the oil level; see Fig. 9.1 page 21.

Monthly maintenance:

- Check the pipelines and screw fitting for leaks and solid attachment, and re-seal/retighten if necessary.
- Check the terminal boxes and cable insertion opening for leaks and reseal if necessary.
- Clean the ventilation slits of the machine and the cooling fins of the motor.

Maintenance depending on level of contamination:

- Optional air filters, see Chapter 9.4 page 23.

Maintenance after 500-2000 hours of operation: TOPAS D004 V-TOPAS D020 V
Maintenance after 500-3000 hours of operation: TOPAS D026 V-TOPAS D041 V

- Oil change, see Chapter 9.1 page 20.
- Air de-oiling element, see Chapter 9.3 page 22.

10 Fault diagnosis

1. Vacuum pump is turned off by circuit breaker:

Cause	Remedy
The grid tension/frequency does not conform to the motor data	Adjust the mains network.
Check the connections and/or plug	Check the connection or plug connection.
The motor protection switch is incorrectly set	Check the setting of the motor protection switch
The motor protection switch turns off too quickly	Use a motor circuit breaker with a load-dependent switch-on delay time that takes into account the short-time overcurrent at startup (version with short-circuit and overload trigger in accordance with VDE 0660 Part 2 and IEC 947-4).
Vacuum pump or its oil is too cold.	Check it again at operating temperature.
The lubrication oil has too high viscosity.	Change the lubrication oil.
The air de-oiling element is contaminated.	Replace the air de-oiling element.
The counterpressure for conveying away the vacuum exhaust air is too high.	Optimize the air removal.

2. Pumping speed is insufficient:

Cause	Remedy
The inlet filter is dirty	Clean the inlet filter or change it
The suction pipe is too long or too narrow.	Provide a larger diameter conduit, clear the restriction sites.
Leak in the pump or in the system.	Check the pump and the pipes for pressure loss.

3. Final pressure (max. vacuum) is not reached:

Cause	Remedy
Leakage on the suction side of the vacuum pump or in the system.	Check the pump and the pipes for pressure loss.
Incorrect oil viscosity.	Change the oil.

4. Vacuum pump is too hot:

Cause	Remedy
Obtain repairs from the manufacturer or contract workshop	The ambient temperature must reach at least 12 ° C and not exceed max. 40 ° C, the intake temperature must be between 5 ° C and 40 ° C.
Cooling airflow is impeded.	The cold air inlet and cold air outlet must be at least 10 cm distant from the nearest wall (exhaust cool air cannot be re-sucked in).
The lubrication oil has too high viscosity.	Change the lubrication oil.
The air de-oiling element is contaminated.	Replace the air de-oiling element.

Cause	Remedy
The counterpressure for conveying away the vacuum exhaust air is too high.	Optimize the air removal.

5. Exhaust contains visible oil mist:

Cause	Remedy
An unsuitable oil is being used.	Check the oil viscosity and type.
The air de-oiling element is contaminated.	Replace the air de-oiling element.
The counterpressure for conveying away the vacuum exhaust air is too high.	Optimize the air removal.
Obtain repairs from the manufacturer or contract work-shop	The ambient temperature must reach at least 12 ° C and not exceed max. 40 ° C, the intake temperature must be between 5 ° C and 40 ° C.
The cool air flow is impeded.	The cold air inlet and cold air outlet must be at least 10 cm distant from the nearest wall (exhaust cool air can-not be re-sucked in).
The air de-oiling element is broken.	Replace the air de-oiling element.
The air de-oiling element is leaking.	Check the O-ring.

6. Vacuum pump makes unusual noise:

Cause	Remedy
The pump housing is worn out (chatter marks).	Repair to be performed exclusively by manufacturer or authorized repair shop.
The vacuum regulation valve "vibrates" (if present).	Replace the valve.
The discs are damaged	The cool air flow is hindered
Vacuum pump or its oil is too cold.	Check it again at operating temperature.
The lubrication oil has too high viscosity.	Change the lubrication oil.

7. Water in lubricating oil:

Cause	Remedy
The pump sucks in water/fluid.	Install a water separator in front of the pump.
The pump sucks in more water vapour than its water vapour tolerance allows.	
The pump runs only for a short time and therefore does not reach its normal operating temperature.	After suctioning off the water vapour, allow the pump to continue to run with the suction side closed until the water is evaporated from the oil.

11 List of Figures