

en

TRANSLATION OF THE OPERATING INSTRUCTIONS

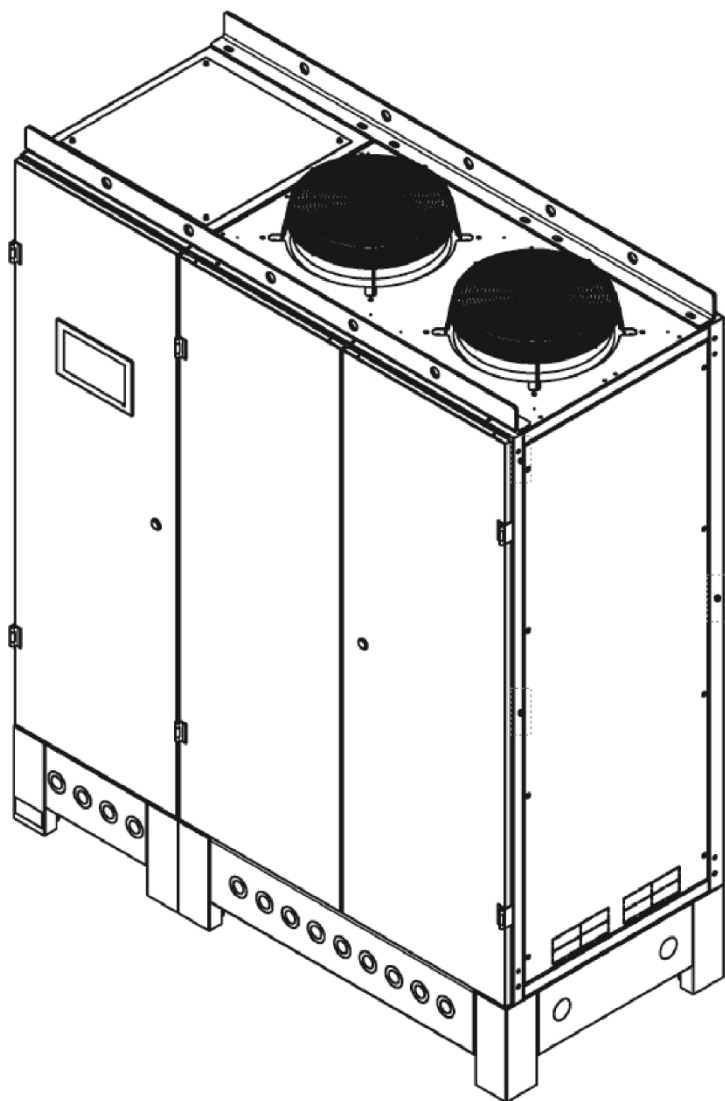
VARIAIR CENTRAL SYSTEM

VACS 0030.00X0X.NG VC+

VACS 0040.00X0X.NG VC+

VACS 0080.00X0.NG VC+

MAKE IT BECKER.



Important information for the user of the operating instructions

We reserve the right to make technical changes and additions to the operating instructions.

No liability is assumed for the content, in particular for damage caused by existing, non-existent or incorrect information.

The distribution of these operating instructions is not permitted unless expressly authorised.

Operating instructions valid for:

General designation	Air blast cabinet system with vacuum pump units
Product type	Variair Central System, hereinafter referred to as VACS
Models	VACS 0030.0020X.NG VC+, VACS 0030.0030X.NG VC+, VACS 0030.0040X.NG VC+, VACS 0030.0050X.NG VC+, VACS 0030.0060X.NG VC+, VACS 0040.0020X.NG VC+, VACS 0040.0030X.NG VC+, VACS 0040.0040X.NG VC+, VACS 0040.0050X.NG VC+, VACS 0040.0060X.NG VC+, VACS 0080.0020.NG VC+, VACS 0080.0030.NG VC+, VACS 0080.0040.NG VC+, VACS 0080.0050.NG VC+, VACS 0080.0060.NG VC+
Manufacturer	Gebr. Becker GmbH Hölker Feld 29-31 42279 Wuppertal

CONTENTS

1	TO THE OPERATING INSTRUCTIONS	4
1.1	GENERAL	4
1.2	STRUCTURE OF THE SAFETY INSTRUCTIONS	4
1.3	SAFETY SYMBOLS	4
1.4	ADDITIONAL DOCUMENTATION	5
1.5	WARRANTY AND LIABILITY	5
1.6	MODIFICATIONS AND CONVERSIONS	5
2	BASIC SAFETY INSTRUCTIONS	6
2.1	PREPARATION	6
2.2	OBLIGATIONS OF THE OPERATOR	6
2.3	OBLIGATIONS OF THE STAFF	6
2.4	QUALIFICATION PERSONNEL	7
2.5	INTENDED USE	7
2.6	UNAUTHORISED USE	7
2.7	PROTECTIVE MEASURES FOR USERS	7
2.8	INFORMATION ON RESIDUAL RISKS	8
2.9	SAFETY INSTRUCTIONS	8
2.10	BEHAVIOUR IN THE EVENT OF DANGER AND ACCIDENTS	10
2.11	STABILITY REQUIREMENTS	10
2.12	OCCUPATIONAL PROTECTION	10
2.13	AIRBORNE NOISE EMISSIONS	11
3	OPERATING CONDITIONS	11
4	MACHINE DESCRIPTION	12
4.1	GENERAL DESCRIPTION OF THE VAC	12
4.2	VARIANTS	13
4.3	COMPONENTS	14
4.4	DISPLAY ELEMENTS	15
4.5	SAFETY AND PROTECTIVE EQUIPMENT	16
4.6	TESTING OF SAFETY AND PROTECTIVE DEVICES	17
4.7	VACS / ELECTRIC MOUNTING PLATE	17
4.8	OPERATING MATERIALS AND CHEMICALS	17
5	TRANSPORT	18
5.1	GENERAL	18

5.2	GOODS RECEIPT AND UNPACKING	18
5.3	UNLOAD	18
5.4	STORAGE	19
5.5	TRANSPORT WAY	19
6	INSTALLATION AND COMMISSIONING	21
6.1	GENERAL REQUIREMENTS	21
6.2	CONNECTING THE SYSTEM	22
6.3	ELECTRICAL INSTALLATION	23
6.3.1	ELECTRICAL CONNECTION	24
6.4	SWITCH ON VACS	24
6.5	SWITCH OFF VACS	25
6.6	RECOMMISSIONING	25
7	NORMAL OPERATION	25
8	TROUBLESHOOTING / ERROR CORRECTION	26
8.1	FAULT TABLES	27
9	MAINTENANCE, SERVICING AND DISMANTLING	28
9.1	MAINTENANCE AND SERVICING	28
9.2	PREPARATIONS	28
9.3	MAINTENANCE INTERVALS	29
9.4	MAINTENANCE ACTIVITIES	29
9.4.1	MAINTENANCE OF INDIVIDUAL APPLIANCES - KVT/KVX 3.140	30
9.4.2	MAINTENANCE OF INDIVIDUAL DEVICES - VTLE/VXLF 2.250	31
9.4.3	MAINTENANCE OF INDIVIDUAL DEVICES - BCV 300	31
9.5	MEDIA LINES	32
9.6	CONDITIONS FOR SWITCHING ON AGAIN	32
9.7	SPARE AND WEAR PARTS	32
9.8	TEMPORARY DECOMMISSIONING	33
9.9	CLEANING	33
9.10	ASSEMBLY AND DISASSEMBLY OF THE DEVICES	34
9.10.1	INSTALLATION KVT 3.140 WITH SWIVEL BASE IN CABINET HOUSING	34
9.10.2	REMOVAL KVT/KVX 3.140 WITH SWIVEL BASE IN ENCLOSURE HOUSING	36
9.10.3	INSTALLATION VTLE 2.250 IN 1800 MM WIDE CABINET HOUSING	36
9.10.4	REMOVAL OF VTLE 2.250 FROM 1800 MM WIDE ENCLOSURE	37
9.10.5	INSTALLATION BCV 300 IN CABINET HOUSING	37
9.11	REMOVING THE BCV 300 FROM THE CABINET HOUSING	38
9.12	DISASSEMBLY AND DECOMMISSIONING OF THE VAC	38
9.13	STORAGE	39
9.14	DISPOSAL	39
10	PRODUCT DATA SHEET	40
10.1	PRODUCT OVERVIEW	40
10.2	OPERATING PARAMETERS	40
10.3	TECHNICAL DATA FAN BLOWER CABINET	41
10.4	TECHNICAL DATA OF THE INDIVIDUAL APPLIANCES	42

1 TO THE OPERATING INSTRUCTIONS

1.1 GENERAL

These operating instructions are an integral part of the VACS and contain the necessary information and important instructions for operating the pump safely and properly. Observing them will help:

- Avoid dangers
- Reduce repair costs and downtime
- increase the reliability and service life of the product

It is the responsibility of the operator to ensure the availability of this document. This applies in particular if the document is lost.

All persons working on the VACS must have read and understood the operating manual and these operating instructions.



Pay particular attention to chap. 2 "Basic safety instructions".

1.2 STRUCTURE OF THE SAFETY INSTRUCTIONS

Safety instructions are identified by a pictogram and a signal word. The following signal words are used to indicate dangers, prohibitions and important information:



DANGER

This signal word indicates an imminent danger that could result in serious injury or even death.



WARNING

This signal word indicates a potentially imminent danger that could result in serious injury or even death.



CAUTION

This signal word indicates a potentially imminent danger that could result in minor or serious injuries.



Attention

This signal word indicates a potentially imminent danger that could result in material damage.



NOTE

This symbol indicates tips, recommendations and further information.

1.3 SAFETY SYMBOLS

The following **warning signs** are used in these operating instructions:



General warning sign



Warning of hot surface



Warning of electrical voltage



Warning of automatic start-up



Fire hazard



Risk of slipping



Tripping hazard

Table 1.1: Warning signs

The following **symbols for hazardous substances** are used in these operating instructions:



Attention, environmentally hazardous

Table 1.2: Hazardous substances

The following **mandatory symbols** are used in these operating instructions:

	Use hearing protection
	Use hand protection
	Use foot protection
	Use eye protection
	Use respiratory protection

Table 1.3: Command signs

1.4 ADDITIONAL DOCUMENTATION

In addition to these operating instructions, the following documents and instructions must be observed:

- Safety symbols according to chapter 1.3 on the VACS and on hazardous material containers
- Regulations on accident prevention, occupational safety and environmental protection
- The operating instructions for the individual appliances.
- Spare parts lists for the individual devices.



NOTE

Operating instructions and **spare parts lists** for the individual appliances can be found on our homepage under the following link:

www.becker-international.com/download



1.5 WARRANTY AND LIABILITY

Warranty and liability claims for personal injury or damage to property are invalid if

- Failure to observe the instructions for transport and installation;
- improper use (misuse) or improper operation;
- Failure to observe the operating instructions and the instructions contained therein;
- improper or non-executed maintenance and servicing work;
- incorrect installation, commissioning, maintenance, servicing and cleaning;
- Use of unauthorised operating materials, lubricants or spare parts;
- defective, incorrectly installed or dismantled protective devices;
- inappropriate monitoring of machine parts subject to wear;
- Use of externally procured equipment that has not been approved by the manufacturer;
- improper disassembly;

1.6 MODIFICATIONS AND CONVERSIONS

Modifications or conversions are not permitted without written authorisation.



Description of the safety instructions → Chapter 2.9

2 BASIC SAFETY INSTRUCTIONS

These operating instructions serve as a basis for the safe use and operation of the VACS. The operating instructions, in particular the safety instructions and the rules and regulations applicable to the place of use, must be observed by all persons working on or with the VACS.

Furthermore, the generally applicable legal and other rules and regulations for accident prevention (e.g. personal protective equipment) and environmental protection must be observed.



NOTE

Some activities on the VACS require compliance with special safety regulations. These safety regulations can be found in the respective chapters of these operating instructions.



NOTE

The operating instructions must always be kept at the place of use and be freely accessible to all persons working with the VACS.

The instructions of the occupational safety specialist and the instructions from the briefings must be followed at all times.

The VACS is only intended for the intended use described in chapter 2.6. Use of the VACS outside the intended use is prohibited.

All work on the VACS may only be carried out by qualified and trained personnel (see chapter 2.4 "Personnel qualifications").

The safety instructions specified in chapter 2.9 must be observed for all work on the VACS.

2.1 PREPARATION

The VACS is an assembly of machines within the meaning of Machinery Directive 2006/42/EC Art. 2a. The VACS conforms to the health and safety requirements of the Machinery Directive 2006/42/EC.

The VACS may only be used once the operator has determined that the use of the VACS is installed in accordance with the state of the art.

This is fulfilled if, among other things, the operating conditions listed in these operating instructions in accordance with Directive 2006/42/EC Annex 1 Para. 1.7.4.2.i have been fully implemented.

2.2 OBLIGATIONS OF THE OPERATOR

The operator undertakes to only allow persons to work on the VACS who

- are familiar with the basic occupational safety and accident prevention regulations;
- have been instructed for the activities on the VACS;
- have read and understood these operating instructions before carrying out any work on the VACS;
- have reached the legal minimum age;
- are fit for use;
- are rested and not under the influence of drugs or medication;
- reliably fulfil the work assigned.

In addition, the operator must train staff at regular intervals and inform them about the dangers.

The personnel of the operating company must be permanently committed to safe working practices and informed about the hazards and risks of the VACS. This applies in particular to the safety instructions.

The operator must provide the personnel with the necessary protective equipment.

2.3 OBLIGATIONS OF THE STAFF

All persons who are commissioned to work on the VACS undertake, before starting work, to

- to observe the basic regulations on occupational safety and accident prevention and
- to read and observe these operating instructions.



NOTE

Only persons who have read and understood these operating instructions may carry out work on and with the VACS!

2.4 QUALIFICATION STAFF

Certain activities require the personnel carrying out the work to have certain qualifications. The following table summarises these qualifications:

Activity	Persons	
	Instructed operating personnel	Instructed persons with specialised training
Commissioning		x
Operation	x	
Maintenance & servicing		x
Dismantling		x
Symbol "x" authorised personnel		

Table 2.4: Minimum qualification of personnel

2.5 INTENDED USE

The operational safety of the VACS is only guaranteed if it is used as intended. Intended use also includes observing the operating instructions for this product and any components, as well as carrying out all maintenance and service work.

The VACS may only be used as intended in accordance with the machine description and the technical data.

The intended use is summarised below:

- The VACS evacuates air up to a vacuum in accordance with chapter 9.2 (operating parameters).
- Conveying any other gases, in particular hazardous substances, is not permitted and prohibited.
- The permissible technical parameters according to the product data sheet (chapter 9.2) must be observed.
- The VACS must not be operated in potentially explosive atmospheres.
- The VACS must be protected from the weather.
- The manufacturer must be consulted for any operation outside the technical parameters specified in the product data sheet.



Attention

Only use the VACS as intended and in a technically safe condition! This is the only way to ensure the operational safety of the VACS!

2.6 UNAUTHORISED USE

- the evacuation of hazardous substances, in particular flammable, explosive or toxic gases
- use in potentially explosive environments (explosive gas/vapour/mist/air mixtures or dust/air mixtures or hybrid mixtures of air and flammable substances)
- the use of the VACS in non-commercial applications
- operation of the VACS in an incompletely assembled state

2.7 PROTECTIVE MEASURES FOR USERS



Attention

Personal protective equipment (PPE) must always be worn during installation, maintenance and service work on the air supply system.



WARNING



Risk of injury to hands due to crushing, cutting and high temperatures

During all work on the VACS, Category II hand protection - for medium risks, in accordance with EN388:2016 performance level 4542C, must be worn.

WARNING



Risk of injury to feet from crushing and falling objects



Foot protection in accordance with EN ISO 20345 Class S1 must be worn during all activities on the VACS.



WARNING

Hearing damage due to high volume

The sound pressure level of some systems is below 80dB/A. Nevertheless, hearing protection is recommended if you are in the immediate vicinity of the running system for long periods of time. Wear hearing protection in accordance with EN352.



WARNING

Eye injuries due to flying particles

Wear safety goggles in accordance with EN166 when changing or cleaning filter cartridges. Full-vision safety goggles for application areas 4+5 Code letters F



WARNING

Health damage to the respiratory tract due to pollutants

Use respiratory protection in accordance with EN143 (particle filter) when changing or cleaning filter cartridges. Filter class FFP3

In addition to PPE: **heat protection**

Please observe the warnings on the vacuum pumps that are attached to hot surfaces.

2.8 INFORMATION ON RESIDUAL RISKS

The VACS is built in accordance with the current state of the art and recognised safety regulations. When using the VACS, health hazards for persons working directly with the VACS and third parties cannot be ruled out.

2.9 SAFETY INSTRUCTIONS

The hazards and risks in the respective life phases of the VACS are described below. The following hazard warnings must be observed.



DANGER

Danger to life due to electric shock

Personnel qualification

Work and tasks on the electrical system may only be carried out by qualified electricians who can demonstrate that they have successfully completed and recognised training in the relevant specialist area and have been instructed in the special technical features of the VACS.

The performance of electrical work, including the simplest auxiliary activities, is prohibited without exception for persons who do not fulfil the above conditions.

To carry out tasks and activities on the electrical system of the VACS, work must be carried out in accordance with the five safety regulations as per DIN VDE 0105.



DANGER

Danger to life due to electric shock

Measures in the event of damage to the electrical installation

Damage to the electrical installation and contact with live parts can be life-threatening.

The following measures are therefore mandatory:

- If the electrical installation is damaged, switch off the VACS immediately and inform the responsible organisation.
- Repairs must be carried out by a qualified electrician.



DANGER

Danger to life due to unexpected start-up Countermeasures

The following steps must be followed when preparing for servicing and maintenance work:

1. Switch off the VACS and all attached assemblies.
2. Disconnect the VACS from the supply voltage and proceed in accordance with the five safety rules (VDE105).
3. Disconnect the VACS from the air supply.

**DANGER****Fire and danger to life due to insufficient distance to neighbouring parts**

If the VACS is enclosed, minimum distances to the product must be maintained to prevent potential fires. Information on minimum distances can be found in chapter 6 "Installation and commissioning".

**DANGER****Danger to life due to arcing and creepage distance when disconnecting plug connections**

Always switch off the power supply before disconnecting plug connections.

**DANGER****Danger to life due to defective, dismantled and manipulated protective devices**

The VACS may only be operated if all safety and protective equipment is complete and functional! Faulty safety and protective equipment can lead to dangerous situations! For this reason:

1. Switch off the VACS immediately,
2. Secure against restarting and
3. Disconnect from air supply and electrical power!

**WARNING****Risk of injury! Risk of crushing in the hand and arm area due to product assembly**

If assembly work is carried out, the employee must be trained in the use of lifting equipment and have provided proof of this. Use suitable protective equipment!

**WARNING****Risk of injury due to incorrect lifting conditions**

If assembly work is carried out, the employee must be trained in the use of lifting equipment and have provided proof of this.

The VACS may only be lifted in accordance with the specifications (see chapter 5 "Transport").

**WARNING****Shutting down the VACS when leaving the operating parameters**

Safe operation of the VACS can no longer be guaranteed outside the authorised operating parameters. The limits of the permissible operating parameters are shown in chapter 9.2.

**WARNING****Safety risk due to spare parts not approved by the manufacturer**

Becker spare parts have been checked by us for their technical requirements and safety. Non-approved spare parts can pose a risk to people and VACS.

**WARNING****Danger from hot components and equipment**

Media and pump parts can reach high temperatures during operation. Before any manual intervention in the cabinet system/installation, it is therefore necessary to wait until it has cooled down so that it is safe to work with protective gloves to avoid burns and scalds.

**WARNING****Risk of injury due to stored residual energy**

The occurrence of residual mechanical, pneumatic and electrical energy on the VACS after actuating the control element for shutting down in an emergency or after switching off the VACS must be observed!

**WARNING****Risk of injury due to slipping, tripping and falling**

The operator of the VASC is responsible for traffic safety. If operating fluids escape from the VACS, the areas must be cordoned off and labelled accordingly and suitable measures must be taken.

**WARNING****Environmental hazards due to hazardous substances**

The operating materials (especially oils) must not be disposed of in the environment. Disposal must comply with the requirements for the disposal of hazardous substances and the Waste Oil Ordinance (AltöIV).

**CAUTION****Contamination and damage to the environment due to operating materials**

The operating materials used for the proper functioning of the VACS and water contaminated with these operating materials can pose a risk to the environment.

Suitable absorbents must always be kept ready to ensure the rapid absorption of leaked operating materials and contaminated water.

Used absorbents must always be disposed of in accordance with the prescribed procedures.

All environmental protection regulations must always be observed when handling and disposing of operating materials.

Operating materials and contaminated water must be disposed of in accordance with local environmental protection regulations.

**NOTE****Wear safety shoes**

Foot protection must be worn during all work on the VACS.

**NOTE****Wear protective gloves**

The VACS must cool down until it is safe to carry out work with protective gloves.

If this time cannot be guaranteed, protective gloves with adequate heat protection must be used. The exact model can be found in the operator's glove plan.

**NOTE****Wear chemical protective gloves**

Caution: With some VACS (with BCV pumps) there is a risk of scalding from hot oil!

2.10 BEHAVIOUR IN THE EVENT OF DANGER AND ACCIDENTS

The protective measures to be taken and the responsibility for drawing up an occupational safety concept lie with the operator of the workplace.

The operator must ensure safe use through the "Operating conditions" described in chapter 3.

2.11 REQUIREMENTS FOR STABILITY

The VACS is stable up to a tilt angle of 10°.

The VACS can be installed without a foundation on a firm, level surface. When installing on building ceilings, the load-bearing capacity of the ceiling must be taken into account.

The weight of the VACS can be found in chapter 10.2 "Operating parameters".

2.12 OCCUPATIONAL PROTECTION

The VACS has been set up in accordance with the Machinery Directive 2006/42/EC and the relevant health and safety and accident prevention regulations.

Before starting repair work, the VACS must be de-energised and depressurised to prevent accidents. Previously removed protective devices must be refitted before commissioning.

Legislation assigns responsibility for occupational safety to the operator.

2.13 AIRBORNE NOISE EMISSIONS

According to Directive 2006/42/EC, information on the airborne noise emission of the VACS must be provided. Detailed information can be found in the Machinery Directive under point 1.7.4.2.

Relevant information on the VACS can be found in chapter 10.2 "Operating parameters".

3 OPERATING CONDITIONS

The CE conformity of the product only becomes legally valid when all product safety requirements of the "operating conditions" formulated in this chapter within the meaning of Directive 2006/42/EC Annex I 1.7.4.2.i have been fully realised by the operator. Only in this case is CE conformity valid and the VACS may be operated.

Operating condition 1: Safety instructions for maintenance work

1. Standalone products - not implemented in the operator's control system

Shutting down the VACS during maintenance

If maintenance is required, work must be carried out with the protective devices removed. This work may only be carried out when the VACS is switched off. To ensure the safe shutdown of the VACS, the VACS must be disconnected from the power supply and the five safety rules in accordance with DIN VDE 0105 must be observed.

2. Implemented products - product is controlled via the operator's control system

If the VACS is implemented in a control system by the operator, the following conditions apply for the "Maintenance" operating mode:

- The drive must be de-energised
- Or, in the case of a shutdown stored in the control system, meet the requirements of DIN EN 61800- 1:2018-11.

Operating condition 2: Ventilation of the operating room

The operator must ensure that the operating room of the VACS is sufficiently ventilated.

Operating condition 3: Authorised fuels

The authorised operating materials are listed in chapter 9.3.

Operating condition 4: Electrical protection of the motors

The motors must be protected in accordance with the state of the art. As a minimum, they must be protected by a suitable protective device in accordance with DIN EN 60204-1.

The maximum permissible operating temperature may be exceeded due to a failure of the motor ventilation, soiling or other environmental influences.

Operating condition 5: Ensuring cooling

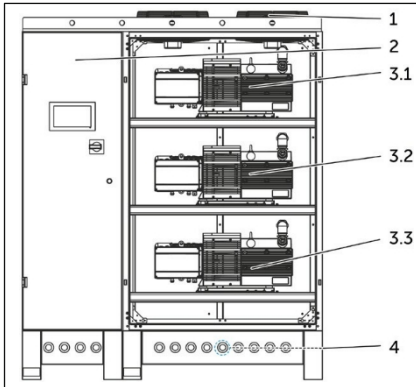
The unobstructed cooling air inlet on the intake side and the unobstructed cooling air outlet on the exhaust air side must be guaranteed.

4 MACHINE DESCRIPTION

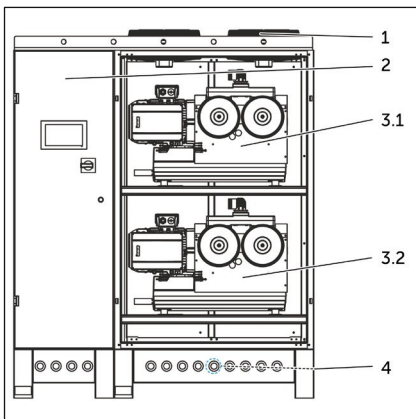
This chapter explains the assemblies and components of the VACS and how they work.

The following information is intended to help you understand the operation of the VACS. This information can help to avoid dangers and errors due to incorrect operation.

4.1 GENERAL DESCRIPTION OF THE VACS



Example: VACS 0030.0030X.NG VC+



Example: VACS 0080.0020.NG VC+

1. The entire mass flow is distributed to the individual vacuum pumps in the enclosure system via the central pipe connection (4) at the rear of the enclosure (here $3.1+3.2+(3.3)$). Depending on the system and variant, up to 6 vacuum pumps can be used in 2 or 3 interconnected ovens.
2. The units are switched on and off as required via the PLC (type VACON+) installed in the electrical power and control cabinet (2). The system pressure is measured as a parameter for determining the suction air requirement. A corresponding pressure sensor is installed in the suction-side collector (4).
3. The vacuum pumps (3.1, 3.2, ... 3.X) generate the vacuum required during production.
4. The air flow required to cool the vacuum pumps is generated by the two ceiling fans (1). The fans convey the air vertically upwards out of the enclosure housing via the open enclosure plinth.



Attention

The exact description of the installed individual devices can be found in the operating instructions for the respective individual device. These can be found under the link: www.becker-international.com/de/de/6/download.htm

4.2 VARIANTS

The VACS is available in the following configurations:

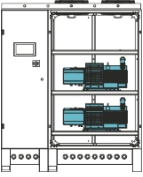
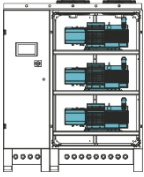
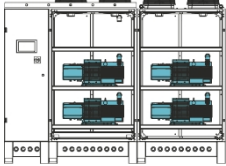
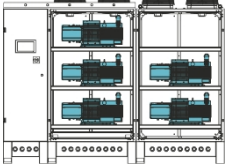
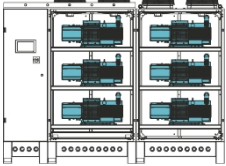
Variants VACS 0030.00X0X.NG		
VACS 0030.0020X.NG VC+	VACS 0030.0030X.NG VC+	
		
VACS 0030.0040X.NG VC+	VACS 0030.0050X.NG VC+	VACS 0030.0060X.NG VC+
		

Table 4.2.1: Variants VACS 0030.00X0X.NG VC+

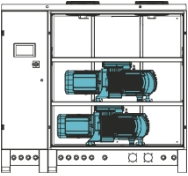
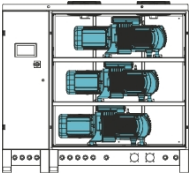
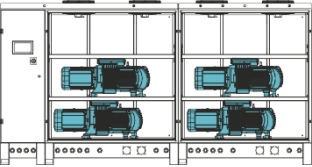
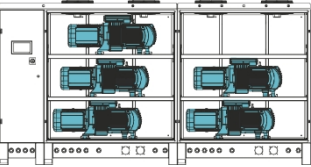
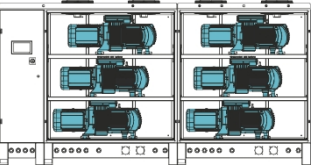
Variants - VACS 0040.00X0X.NG		
VACS 0040.0020X.NG VC+	VACS 0040.0030X.NG VC+	
		
VACS 0040.0040X.NG VC+	VACS 0040.0050X.NG VC+	VACS 0040.0060X.NG VC+
		

Table 4.2.2: Variants VACS 0040.00X0X.NG VC+

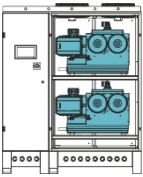
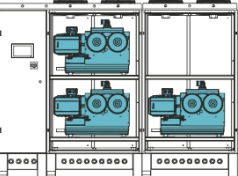
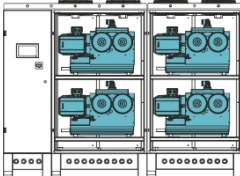
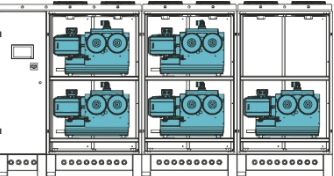
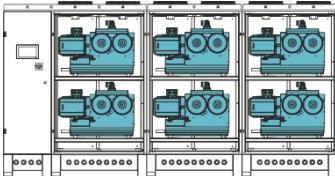
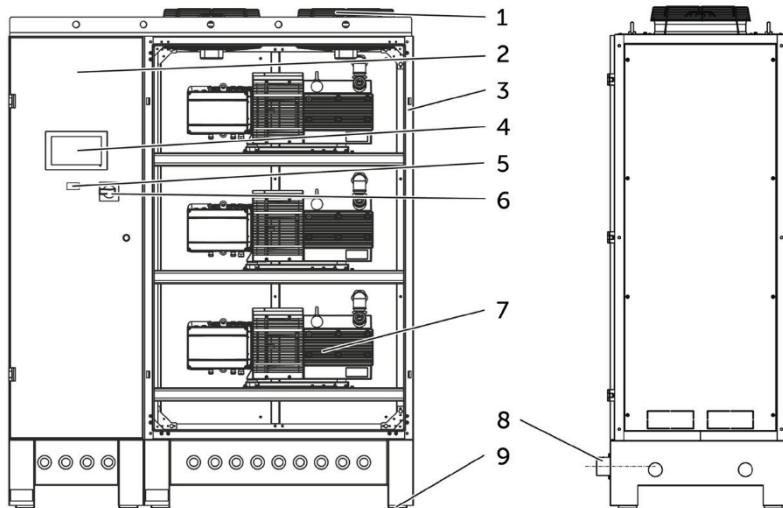
Variants - VACS 0080.00X0.NG	
VACS 00800.0020.NG VC+	
	
VACS 00800.0030.NG VC+	VACS 00800.0040.NG VC+
	
VACS 00800.0050.NG VC+	VACS 00800.0060.NG VC+
	

Table 4.2.3: Variants VACS 0080.00X0.NG VC+

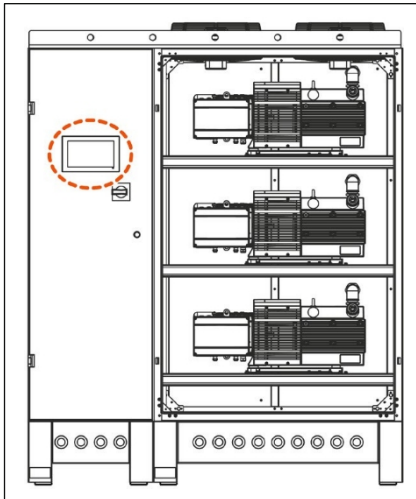
4.3 COMPONENTS



Position	Component	Function
1	Ceiling fans	Ventilation of the appliance cabinet
2	Electrical cabinet	Includes electrical mounting plate and PLC incl. complete fuse protection and control of all installed electrical consumers as well as the main feed-in terminals for the customer
3	Equipment cabinet	Supporting frame for the mechanical components
4	PLC display	Display for showing and operating the entire enclosure system
5	Type plate	Conformity markings and technical data - Enclosure system
6	Main switch	for de-energising and switching on the entire system
7	Vacuum pump with frequency inverter	Provision of the operating vacuum for the customer application Frequency inverter for start/stop operation and speed control of the vacuum pumps
8	Suction-side collector	Central oven connection for the customer's vacuum line with distribution to the integrated vacuum pumps System with KVT/KVX 3.140 - 2½" internal thread System with VTLF/VXLF 2.250 or BCV 300 - 3" internal thread
9	Machine levelling foot	for aligning the entire enclosure system on uneven surfaces

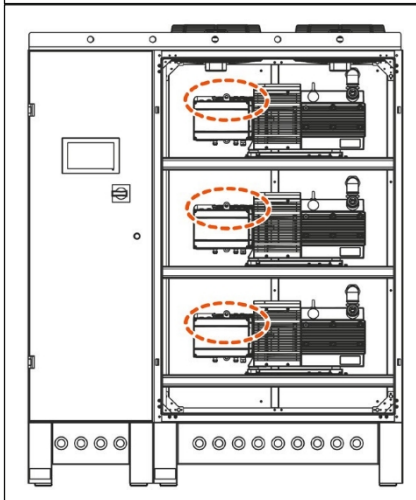
Table 4.3: Components

4.4 DISPLAY ELEMENTS



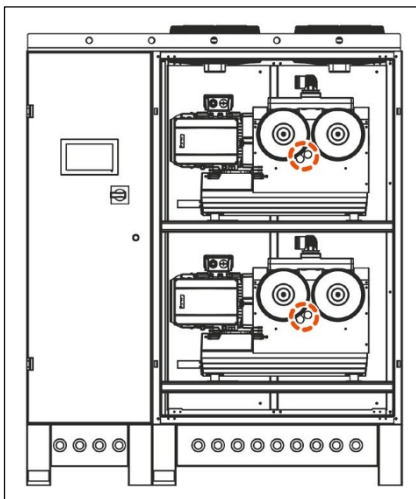
Display element PLC display of the VACS

The control unit display is located on the front door of the power and control cabinet. All statuses of the installed electrical components can be read there. Information on the operating mode is also provided.



Display element LEDs Frequency inverter

The frequency converters are located on the vacuum pump. The LEDs for operation and fault can be read when the appliance cabinet doors are open.



Oil sight glass display element (only for VACS with BCV 300)

The oil sight glass indicates the exact oil level when the pump is switched off. There is a scale in the oil sight glass that indicates the ideal level. During operation, the display does not provide a verifiable value due to the oil turbulence.

Each of the vacuum pumps has its own oil sight glass.

4.5 SAFETY AND PROTECTIVE DEVICES



DANGER

Danger to life due to defective, dismantled and manipulated protective devices



Description of the safety instructions → Chapter 2.9

The protective devices of the VACS must not be dismantled, modified or put out of operation. The VACS must be shut down and secured immediately if the protective devices are dismantled, modified or taken out of operation.

Defects in protective devices must be rectified immediately. All protective devices must be undamaged, fully installed and functional. Warning and information signs must be clearly visible.

All protective devices must be checked for functionality, damage and completeness after each maintenance of the VACS.

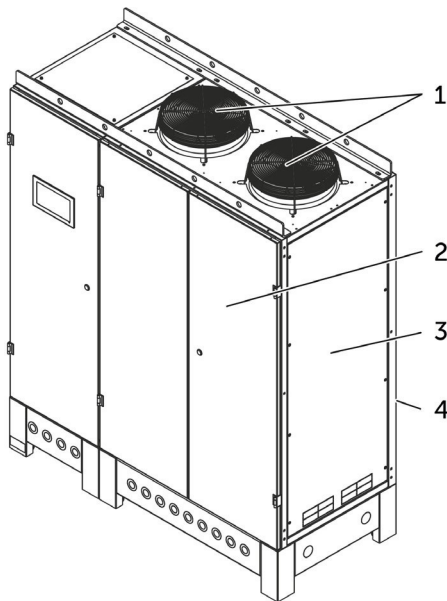
If maintenance work requires the dismantling of protective devices, these may only be dismantled for the duration of the maintenance work. Immediately after completion of the maintenance work, all protective devices must be fully installed at the intended location and checked for functionality.

The prescribed inspection intervals for protective devices must be observed and complied with. Protective devices may only be maintained, replaced and serviced by trained, instructed and authorised specialist personnel.

Unauthorised tampering and manipulation of the safety-related parts of the VACS is strictly prohibited and must be reported immediately to the responsible body.

All safety and accident prevention equipment, such as warning and information signs, covers, protective panelling, etc., must be in place. The removal or modification of these devices is prohibited. Damaged equipment must be repaired immediately.

An overview of the VACS with the designations of the protective devices is shown below.



Position	Safety and protective equipment	Location
1	Intervention protection ceiling fan	Top of the appliance cabinet
2	Noise protection, cupboard doors	Front of the appliance cabinet
3	Noise protection, side wall	Side of the appliance cabinet
4	Noise protection, rear wall	Rear of the appliance cabinet
2-4	In the case of VACS with BCVs, these parts also provide intervention and heat protection	

Table 4.5: Safety and protective devices

4.6 TESTING THE SAFETY AND PROTECTIVE DEVICES



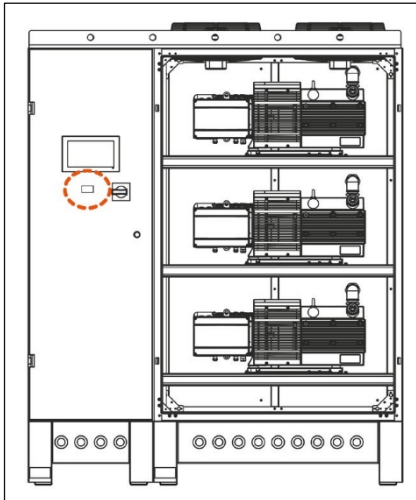
NOTE

All safety and protective equipment must be checked regularly.

The condition and function of safety and protective equipment must be checked if:

- modifications and repairs have been carried out on the VACS
- Damage has occurred to the VACS
- service and maintenance intervals are to be carried out

4.7 VACS / ELECTRIC MOUNTING PLATE

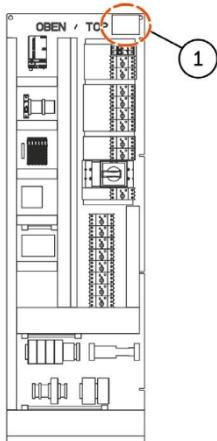


Technical data of the VACS

The characteristics of the entire system can be found on the type plate of the VACS. This is located on the door of the power and control cabinet in which the PLC display is also installed.

Technical data of the electrical mounting plate

The identification data of the electrical mounting plate can be found on the type plate (1) of the electrical mounting plate. To do this, the door of the power and control cabinet must be opened.



All work on the electrical system may only be carried out by trained specialists. The information for work on the load and control electrics can be found in the circuit diagram located in the switch cabinet door.

4.8 OPERATING MATERIALS AND CHEMICALS



CAUTION

Contamination and damage to the environment due to operating materials



Description of the safety instructions → Chapter 2.9

5 TRANSPORT



WARNING

Risk of injury due to incorrect lifting conditions

- Load-carrying equipment may only be attached at the points intended for this purpose, e.g. inserted beams must be secured against slipping.
- Ropes, chains or other load handling equipment must be fitted with safety hooks.
- A suitable lifting beam must be used for craning.
- No torn or chafed ropes may be used.
- Ropes and chains must not be knotted.
- Ropes and chains must not rest against sharp edges.
- Attachment devices of individual system parts must not be used to transport other parts.
- Only use ropes and chains with sufficient load-bearing capacity.
- Only use lifting gear with sufficient load-bearing capacity.
- Never lift loads over people.



Safety instructions and the accident prevention regulations applicable in the respective country must be observed!

Unloading may only be carried out by experienced persons who are familiar with the lifting gear and any auxiliary equipment required.

The weight details can be found in the delivery documents.



NOTE

Wear suitable PPE



Detailed description of the safety instructions → Chapter 2.9

5.1 GENERAL

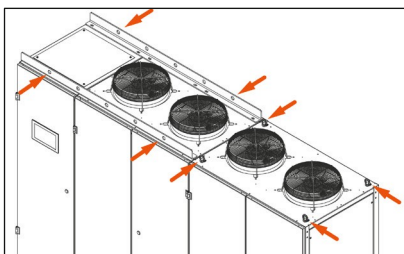
The respective transport company is responsible for transport to the place of delivery and/or installation.

5.2 GOODS RECEIPT AND UNPACKING

Please check whether there is any transport damage when the modules are delivered:

- Externally recognisable damage must be certified by the driver on the freight document,
- Concealed damage can only be detected after removing the packaging.
- For insurance reasons, damage must be reported in writing to the delivering carrier within 7 days.
- Check that the VACS has been delivered in full. The identification number can be found on the type plate.

5.3 UNLOAD



During transport by crane, the load slinging equipment is attached to the individual modules either on the eyebolts or on the roof beams, depending on the module weight.

5.4 STORAGE



Notes on proper storage → Chapter 9.12

After unloading, the packages must be stored until installation. Packed modules must not be unpacked for longer storage periods.

5.5 TRANSPORTWAY

Please note when determining the entire transport route:

Floor load capacity

- Floor load capacity sufficient.
- Weight of the transport vehicle

Floor surface

- Even floor surface,
- no channels, separating joints etc.

Passage width

- at least 1000 mm.

Drive-through height

- at least 2500 mm (with forklift truck),
- Cable ducts, pipes and air conditioning ducts, etc...

Bends

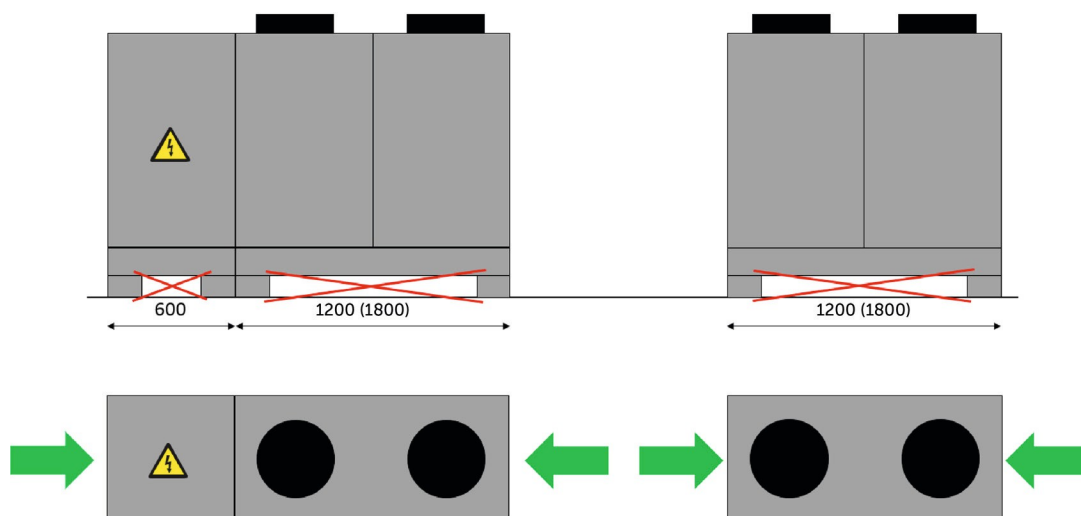
- Sufficient space for manoeuvring.

Gradients

- maximum 5% (1 m per 20 m).

Transport direction**Note longitudinal transport**

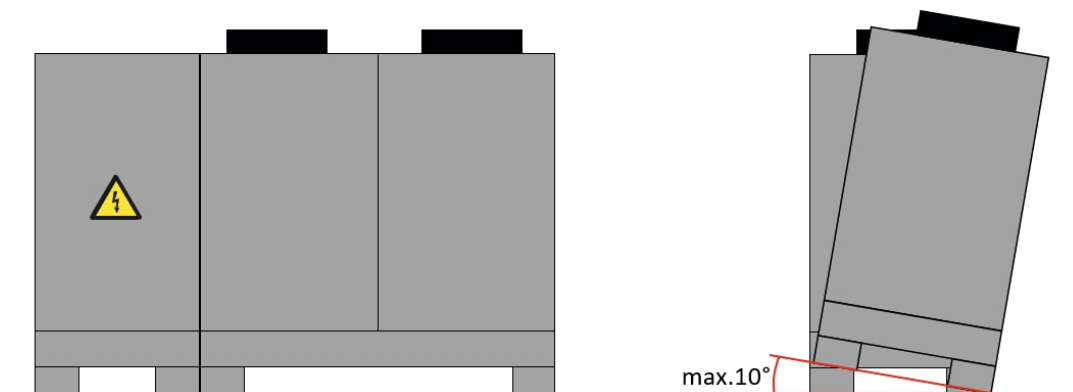
The cabinets may only be moved lengthways and not crossways.

**NOTE**

If the number of appliances cannot be accommodated in one cabinet, further cabinets are used as additional packages.

Stability**Note the tilt angle**

The enclosure systems are stable up to a tilt angle of 10°.



6 INSTALLATION AND COMMISSIONING

6.1 GENERAL REQUIREMENTS

We recommend setting up the VACS so that maintenance work can be carried out easily.

The following points must be observed when installing components and assemblies in order to avoid injury and damage to the VACS:

- Components from third-party manufacturers may only be installed if they have been approved by the manufacturer and comply with the directives and laws applicable in the country of use.
- Loose and foreign parts must be removed from the vicinity of the VACS after installation.
- Protruding parts (pipes, cables, etc.) must be properly installed, laid and labelled.
- Contact points of components must be clean and intact.



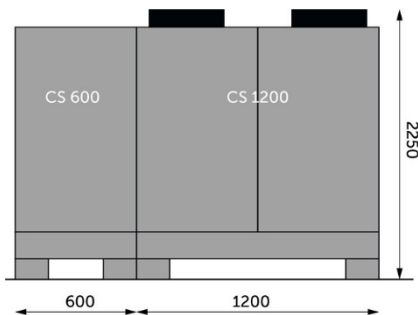
Attention

Safe operation of the VACS can no longer be guaranteed outside the permitted operating parameters (for permitted operating parameters, see chapter 9.2).

The minimum distance between the VACS and all neighbouring parts must be at least 250 mm. Failure to observe the minimum distances can lead to a fire risk due to the high level of heat emitted.

Space requirement

Passageways and door openings must be wide enough to ensure that the modules can be inserted (if necessary, take suitable measures such as openings).



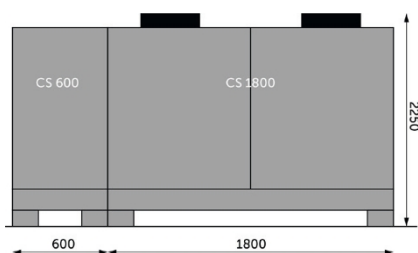
Dimensions 1, see illustration on the left.

Valid for:

- VACS 0030.0020.NG VC+, VACS 0030.0030.NG VC+
- VACS 0080.0020.NG VC+

The following variants require a larger installation area, as one or two additional appliance cabinets (width 1200 mm) are added:

- VACS 0030.0040.NG VC+, VACS 0030.0050.NG VC+, VACS 0030.0060.NG VC+
- VACS 0080.0030.NG VC+, VACS 0080.0040.NG VC+
- (+ 2 cabinets) - VACS 0080.0050.NG VC+, VACS 0080.0060.NG VC+



Dimensions 2, see illustration on the left.

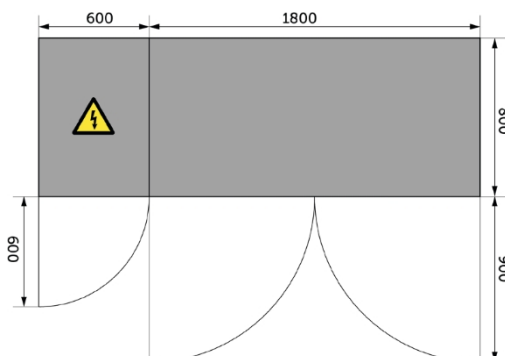
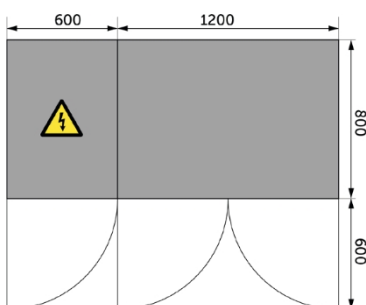
Valid for:

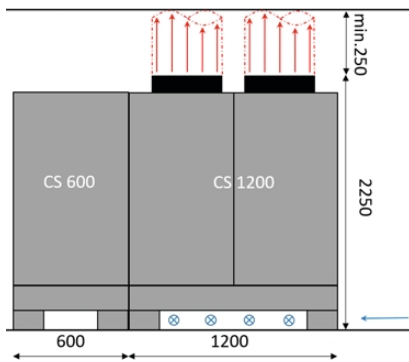
- VACS 0040.0020.NG VC+, VACS 0040.0030.NG VC+

The following variants require a larger installation area, as an additional appliance cabinet (width 1800 mm) is added:

- VACS 0040.0040.NG VC+, VACS 0040.0050.NG VC+, VACS 0040.0060.NG VC+

When installing the VACS, minimum distances to walls and other systems / machines etc. must be maintained so that the cabinet doors can be opened by at least 90°.





Observe the following distance from the ceiling when routing the exhaust air via the built-in ceiling fans.

At least 3 sides of the cabinet must be freely accessible for routing the supply air.

Floor load

The VACS can be installed without a foundation on a firm, level surface. When installing on building ceilings, the load-bearing capacity of the ceiling must be taken into account.

The exact weight of the VACS is shown on the product data sheet in chapter 10.2.

Ambient temperature and cooling air

In order to dissipate the heat generated, sufficient ventilation of the installation room must be ensured, whereby the permissible ambient temperature (chapter 10.2) must be observed.

Cooling cells must be used if the ambient temperature is higher than permitted. The use of cold rooms is also recommended for air-conditioned or very small rooms.

Max. Heat quantities of individual enclosure systems can be obtained from the manufacturer.

6.2 CONNECTING THE SYSTEM

Screw connections

The VACS is connected to the customer's pipework on the suction side. To ensure safe use and tightness, the connecting elements must be as follows:

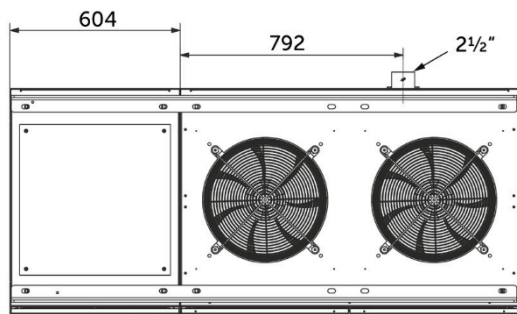
- Free from dust and contamination
- At right angles to the flange surface
- All screw connections must be sufficiently tight.

Media lines

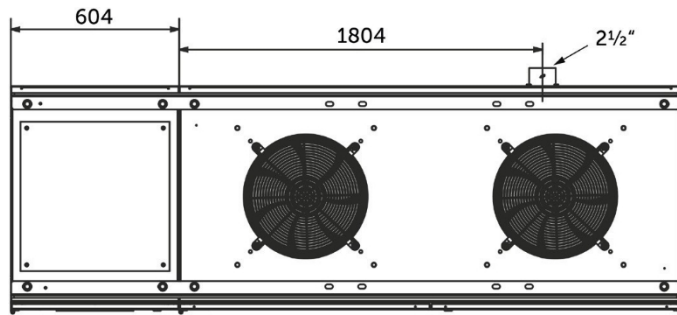
Central vacuum connection (inlet)

Each appliance cabinet has a central pipe connection at the rear, in the plinth at floor level. The suction connection must be connected by the customer.

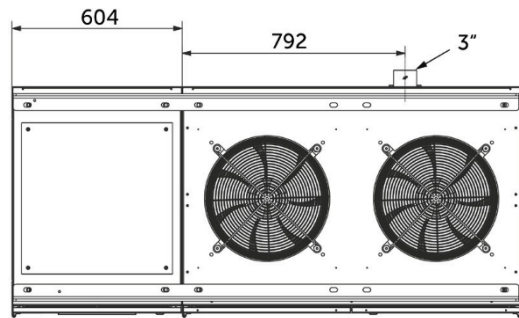
The exhaust air is discharged via the ceiling fans.



VACS 0030.00X0(X) VC+



VACS 0040.00X0(X) VC+



VACS 0080.00X0(X) VC+

6.3 ELECTRICAL INSTALLATION



DANGER

Danger to life due to electric shock - **Personnel qualification**



DANGER

Danger to life due to defective, dismantled and manipulated protective devices



DANGER

Danger to life due to unexpected start-up



Description of the safety instructions → Chapter 2.9



Specification residual current circuit-breaker

If the regulations of the local power supply company permit, the connection for the VACS must always be made without a residual current circuit breaker.

If a residual current circuit breaker is mandatory, it must fulfil the following specification:

- All-current sensitive residual current circuit-breaker
- Suitable for protecting devices with a direct current (DC) component in the leakage current and therefore suitable for 3-phase rectifier bridges
- Suitable for switching on with pulsed, short-term leakage currents
- Suitable for a leakage current of 500 mA (minimum 300 mA)

The electrical installation of the VACS must comply with the requirements of Directive 2006/42/EC and EN 60204:2019.

The following points in particular must be observed when installing the VACS:

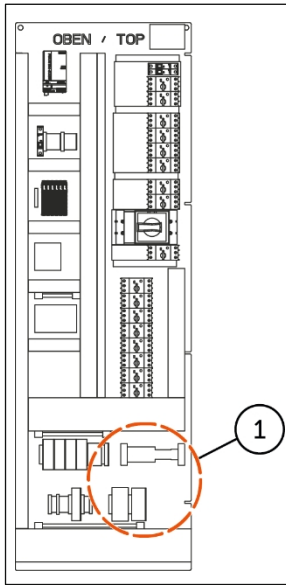
- Before commissioning, all connection terminals in the switch cabinet must be checked and tightened if necessary.
- The connection to the electrical network and the protective measures must be carried out in accordance with EN regulations and the regulations of the respective power supply company.
- Check whether the specified operating voltage is identical to the mains voltage. If the mains voltage differs, a series transformer must be provided on site.
- The supply line of the VACS must meet the minimum requirements of the state of the art For

integration into the control system, the following requirements must be met:

- The VACS must not restart automatically after an unintentional voltage drop. The measures

against unexpected start-up in accordance with DIN EN ISO 14118:201807. This also applies after a shutdown following an emergency stop.

6.3.1 ELECTRICAL CONNECTION



Installing the load electrics

The load electrics must be connected as follows

1. Opening the door of the power and control cabinet
2. The main power supply terminals (1) are located on the electrical mounting plate behind it. These can be found at the bottom right.
3. The cross-section of the supply line is dimensioned by the operator of the VACS with the aid of the connection data of the system and the circuit diagram and connected to the supply terminals.

6.4 SWITCH ON VACS



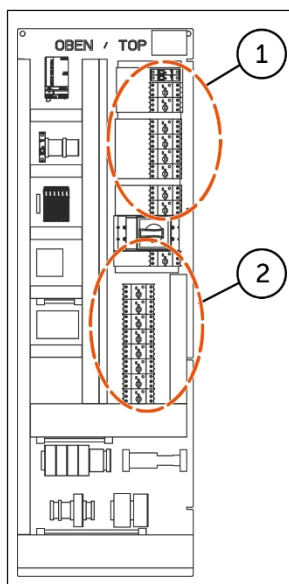
Warning

The VACS may only be commissioned by Gebr. Becker GmbH or the supplier of the complete production system.

The VACS may only be switched on when it has been set up properly, the electrical installation has been installed correctly and the media lines have been connected.

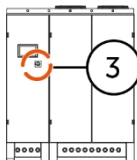
In the case of an external electrical supply, suitable protective devices must be provided that correspond to the electrical connection data of the system or the individual drives.

The loop impedance of the air supply system must be checked in the connected state with the intended power supply by means of a subsequent measurement.



Switch-on procedure of the VACS

1. The power and control cabinet is open.
2. The motor protection switches for the appliances and power supply unit (1) and the motor protection switches for the ceiling fans (2) are switched on.
3. The door of the power and control cabinet is closed.
4. Now switch on the main switch (3).



5. When the PLC has started up, the display is used to check whether the system is fault-free.
6. The system can then be started in either manual or automatic mode in accordance with the VACON + operating instructions.



Attention

The direction of rotation of the ceiling fans must be checked!

Conveying direction: "from the inside of the cabinet to the outside".

6.5 SWITCH OFF VACS

To switch off, the VACS must be shut down and secured against being switched on again. A warning sign must also be attached to the mains disconnection device.

All electrical equipment must be disconnected individually. Maintenance during operation or when switched on is strictly prohibited.

6.6 RECOMMISSIONING

After the storage and shutdown period, the VACS must be checked to ensure that it is operational. If it is not operational, appropriate maintenance and servicing measures must be carried out to restore its operational capability.

The following points must be worked through in the specified order to enable safe recommissioning of the VACS:

1. If the VACS has been dismantled, it may only be reassembled by personnel authorised and trained by the manufacturer.
2. The VACS must be serviced, cleaned and, if necessary, repaired in accordance with the chapters "Servicing and maintenance" and "Cleaning".
3. Electrical components must be recommissioned in accordance with the installation instructions and the manufacturer's documentation. The power supply must not yet be restored.
4. All safety devices must be fitted and checked for functionality and effectiveness. Damaged parts must be replaced immediately.

7 NORMAL OPERATION



Instructions for controlling the VACS → Appendix, VACON+ control unit

8 TROUBLESHOOTING / TROUBLESHOOTING



DANGER

Danger to life due to electric shock - Personnel qualification



DANGER

Danger to life due to defective, dismantled and manipulated protective devices



DANGER

Danger to life due to unexpected start-up



WARNING

Risk of injury due to slipping, tripping



Description of the safety instructions → Chapter 2.9

If troubleshooting is carried out immediately after operation, the cool-down time must be observed.

Troubleshooting on the VACS is only permitted under the following conditions:

For troubleshooting, the VACS must be shut down and secured against being switched on again. A warning sign must also be attached to the mains isolating device.

If the motors installed in the system are supplied via an external power supply, they must be enabled individually.

If safety devices have to be dismantled or modified for troubleshooting purposes, they must be refitted, adjusted and tested immediately after completion of the maintenance and servicing work and before the VACS is started.

After this, a verifiably qualified electrician may carry out activities on the VACS, taking into account the 5 safety rules.

Once the work has been completed, the VACS may be put back into operation after a visual inspection.



NOTE

Visual inspection: The VACS is free of foreign objects. After an initial inspection, the machine is in a damage-free condition. This also includes checking the electrical and pneumatic components and connections.

- Expel unauthorised persons from the VACS.
- Unlock all devices for emergency shutdown.

If defects and hazards become apparent during the test, the VACS must be shut down immediately and secured against being switched on again. The VACS may only be put into operation if it is in perfect condition.

The "Maintenance" chapter must be followed.

8.1 FAULT TABLES

The following tables describe possible causes of faults and the activities required to rectify them. In the event of faults that cannot be rectified using the following instructions, the manufacturer of the VACS must be contacted.

Error	Cause	Troubleshooting
System does not work	No power supply	Switch on the power supply
	Electrical supply line defective	Check electrical power cable
	Electrical protective device has tripped	Identified fault rectified by a qualified electrician
	Electrical grid failed	Contact energy supplier Notify service
Temperature warning Blower cabinet	Ambient temperature too high	Ensure better room cooling
	Defective blast air hose	Replace hose
	Defective exhaust air hose	Replace hose
	Ceiling fans defective or rotating in the wrong direction	Checking the function of the ceiling fans
	Thermostat defective or incorrectly set	Check the function of the thermostat
Pump mechanically blocked	Mechanical damage to the compressor	Contact BECKER Service
	Mechanical damage to the engine	Contact BECKER Service

Table 8.1: Fault table

9 MAINTENANCE, SERVICING AND DISMANTLING



DANGER

Danger to life due to electric shock - Personnel qualification



DANGER

Danger to life due to defective, dismantled and manipulated protective devices



WARNING

Danger from hot components and equipment



CAUTION

Contamination and damage to the environment due to operating materials



NOTE

Wear suitable PPE



Description of the safety instructions → Chapter 2.9

If maintenance work requires the dismantling of protective devices, these may only be dismantled for the duration of the maintenance work. Immediately after completion of the maintenance work, all protective devices must be fully installed in the designated position and checked for proper functioning. The prescribed inspection intervals for protective devices must be observed and complied with. Protective devices may only be maintained, replaced and serviced by professionally trained, instructed and authorised specialist personnel.

Safety-related parts of the VACS could be damaged or disabled by unauthorised tampering and manipulation. Unauthorised tampering and manipulation of the safety-related parts of the VACS, adjustable components, is strictly prohibited and must be reported immediately to the responsible body.

9.1 MAINTENANCE AND MAINTENANCE

As a prerequisite for safe and proper operation, it is essential that the VACS is serviced and maintained by suitably qualified personnel at regular intervals. Regular servicing and maintenance also increases the availability and extends the service life of the VACS. The recommended service and maintenance intervals are listed in this chapter.

9.2 PREPARATIONS

The responsibilities for installation, operation, maintenance and cleaning must be clearly regulated and defined.

For maintenance and servicing measures, it must be ensured that sufficient space is available for all work. The maintenance area must be secured.

The following steps must be observed when preparing for servicing and maintenance work:

1. All existing electrical equipment must be individually disconnected. Maintenance during operation or when the VACS is switched on is strictly prohibited.
 2. If safety equipment has to be dismantled or modified, it must be refitted, adjusted and tested immediately after completion of the maintenance and servicing work and before the VACS is started.
 3. After this, a verifiably qualified electrician may carry out activities on the VACS, taking into account the 5 safety rules.
- Once the work has been completed, the VACS may be put back into operation after a visual inspection.

9.3 MAINTENANCE INTERVALS

The maintenance intervals for the VACS are shown in the following overview:

VACS	Interval time				
	Time 1	Time 2	Time 3	Time 4	Time n
Ceiling fan	check, clean			change	
Protective devices		Visual inspection			
Circuit breakers			check		

Table 8.3.1: Maintenance intervals



Attention

Observe the maintenance intervals of the installed pumps!

For maintenance instructions regarding the installed pumps, please refer to the device-specific operating instructions. The operating instructions can be found at

www.becker-international.com/download



9.4 MAINTENANCE ACTIVITIES



DANGER

Danger to life due to defective, dismantled and manipulated protective devices



WARNING

Danger from hot components and equipment



NOTE

Wear suitable PPE



Detailed description of the safety instructions → Chapter 2.9



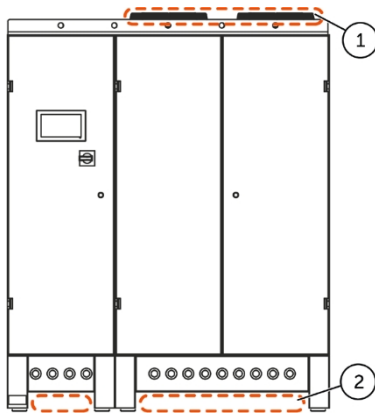
For maintenance instructions regarding the installed pumps, please refer to the respective device-specific operating instructions. The operating instructions for all our products can be found at:

www.becker-international.com/download

The safety instructions must always be observed:

- Use suitable tools and handle with care.
- Personal protective equipment must be used to prevent injuries caused by tools or components.
- The maintenance area must be kept clean and tidy. Objects lying around can pose a tripping hazard.
- If anything is unclear, the responsible body or the manufacturer should be consulted.

The maintenance plan provides for the following activities:

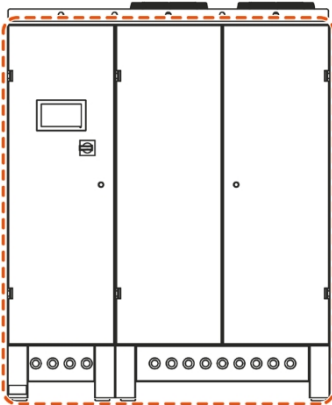


Ceiling fans

The grilles of the cooling air fans (1) must be checked regularly and cleaned if they are dirty. This ensures sufficient cooling of the pumps inside the cabinet.

Inlet areas in the plinth

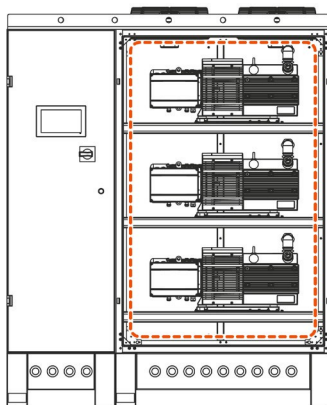
The required inlet areas of the cabinet plinth (2) for the cooling air supply shown in chapter 5 must also be completely free of foreign objects.



Clean the surface of the VACS with compressed air

The entire surface of the VACS must be cleaned regularly. The interval depends on the degree of soiling on the housing.

Protective goggles and an FFP2 mask in accordance with EN 149:2008 must be worn during cleaning.



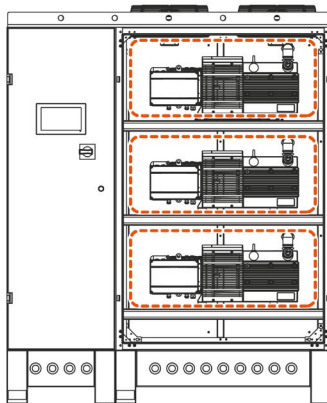
Clean the interior of the VACS appliance cabinet with compressed air

The interior of the VACS appliance cabinet must be cleaned of dirt at regular intervals using compressed air. This ensures a loss-free flow of cooling air through the inside of the cabinet.

Furthermore, no flammable foreign bodies can be deposited on the hot surfaces.

Protective goggles and an FFP2 mask in accordance with EN 149:2008 must be worn during cleaning.

9.4.1 MAINTENANCE OF INDIVIDUAL APPLIANCES - KVT/KVX 3.140



The individual devices installed must also be serviced at regular intervals. The main maintenance activities are

- Clean/replace filter
- Measure/replace slider
- Regrease bearing

More detailed information on this can be found in the device-specific operating instructions, which can be found under the following link:

www.becker-international.com/download

The devices (KVT/KVX 3.140) are generally installed in the 1200 mm wide cabinet housings. The devices are mounted on bogies so that when they are swivelled out, maintenance on the front of the slides and relubrication of the bearings can be carried out without having to remove the devices.



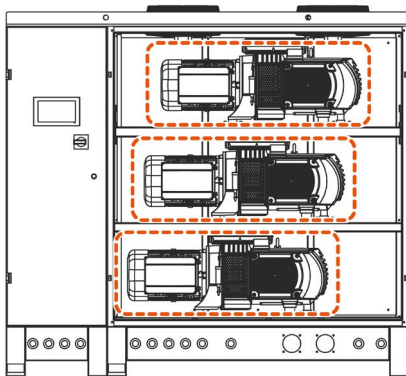
Firstly, loosen the locking mechanism on the swivel base. The corresponding screw is located on the rear right-hand side at the height of the appliance strut.



After loosening the screw, the device can be swivelled out by gripping the seal housing.

Assembly is carried out in reverse order

9.4.2 MAINTENANCE OF INDIVIDUAL DEVICES - VTLF/VXLF 2.250



The individual devices installed must also be serviced at regular intervals. The main maintenance activities are

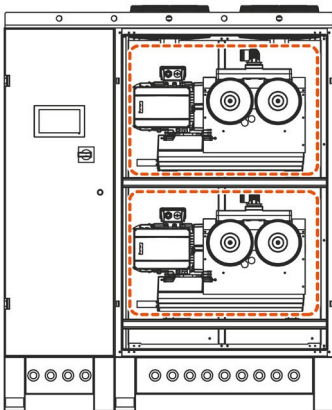
- Clean/replace filter
- Measure/replace slider
- Regrease bearing

More detailed information on this can be found in the device-specific operating instructions, which can be found under the following link:

www.becker-international.com/download

The devices (VTLF/VXLF 2.250) are generally installed in the largest cabinet housings with a width of 1800 mm. The devices are always installed in such a way that frontal maintenance of the valves and relubrication of the bearings can be carried out without removing the devices.

9.4.3 MAINTENANCE OF INDIVIDUAL DEVICES - BCV 300



The individual devices installed must also be serviced at regular intervals. The main maintenance activities are

- Clean/replace filter
- Check oil level/change oil

More detailed information on this can be found in the device-specific operating instructions, which can be found under the following link:

www.becker-international.com/download

The appliances (BCV 300) are always installed in the 1200 mm wide cabinet housings. The appliances are always installed in such a way that filter maintenance and oil changes can be carried out without removing the appliances.

9.5 MEDIA LINES



WARNING

Risk of injury due to stored residual energy

Lines, hoses, pipes, valves and connections must be checked for damage (leaks) at regular intervals.

The following instructions must be observed when carrying out maintenance and repair work on media lines:

- Before starting work on the media lines, the cabinet system must be depressurised and secured against being switched on again. Residual energy must be dissipated or discharged. Residual liquids in media lines must be drained off.

9.6 CONDITIONS FOR SWITCHING ON AGAIN

The following points must be observed before restarting after maintenance and servicing work:

- Unauthorised persons must be expelled from the VACS.
- The proper connection between the VACS and the media lines must be checked.
- The media lines must be checked for leaks and damage.
- The power supply must be checked for damage and proper functioning.
- All protective devices must be present, functional and tested.

9.7 SPARE PARTS AND WEAR PARTS



Warning

Safety risk due to spare parts not approved by the manufacturer. Only BECKER spare parts may be used.

Spare parts overview - VACS 0030.00X0X.NG

Designation	Drawing number	Part number
Mechanics		
BG cabinet	GS1200 2T R7035 LK20	56360033120
BG roof traverse	DT-GS1200	55580033121
BG swivel base	#DVT	51510033100
BG eyebolt	Deltalock	55580033151
Vacuum hose	PU-FLEX-S DN40 (1m)	74264500009
BG Collector	VACS-0-741 21/2"	52160133911
Electrics		
BG electrical cabinet	ES600 1T R7035	56360133110
PLC	VACON+ IO block 11122	56360350109
Display	CPUPP 10" 485 4PPC70.101G-23B	76930350102
Pressure sensor	0-1bar abs. WN258.0-1.0	76930242090
Ceiling fan, CE version	FN040-VDQ.0F.A7P2	00230529100
Ceiling fan, UL version	FN040-VDQ.0F.A7P2 UL	00230629100

Spare parts overview - VACS 0040.00X0(X)

Designation	Drawing number	Part number
Mechanics		
BG cabinet	GS1800 2T R7035 LK20	56360033130
BG roof traverse	DT-GS1800	55580033131
BG roof traverse	DT-GS2400	55580033141
BG Strut	GS-TLF600-1800	52890033715
Vacuum hose	PU-FLEX-S DN60 (1m)	74264200009
BG Collector	VACS-0-740 3"	52160133910

Designation	Drawing number	Part number
Electrics		
BG electrical cabinet	ES600 1T R7035	56360133110
PLC	VACON+ IO block 11122	56360350109
Display	CPUPP 10" 485 4PPC70.101G-23B	76930350102
Pressure sensor	0-1bar abs. WN258.0-1.0	76930242090
Ceiling fan, CE version	FN040-VDQ.0F.A7P2	00230529100
Ceiling fan, UL version	FN040-VDQ.0F.A7P2 UL	00230629100

Spare parts overview - VACS 0080.00X0(X)

Designation	Drawing number	Part number
Mechanics		
BG SCHRANK	GS1200 2T 2F R7035 LK20	56360033140
BG roof traverse	DT-GS1200	55580033121
BG roof traverse	DT-GS1800	55580033131
Vacuum hose	PU-FLEX-S DN60 (1m)	74264200009
BG Collector	VACS-0-740 3"	52160133910
Electrics		
BG electrical cabinet	ES600 1T R7035	56360133110
PLC	VACON+ IO block 11122	56360350109
Display	CPUPP 10" 485 4PPC70.101G-23B	76930350102
Pressure sensor	0-1bar abs. WN258.0-1.0	76930242090
Ceiling fan, CE version	FN040-VDQ.0F.A7P2	00230529100
Ceiling fan, UL version	FN040-VDQ.0F.A7P2 UL	00230629100

Spare parts overview - Pumps

Comprehensive spare parts lists with all spare and wear parts for the pumps installed can be found on our homepage under the following link:

www.becker-international-shop.com



9.8 TEMPORARY DECOMMISSIONING

The following steps must be observed during a temporary shutdown:

1. Shutdown
2. To switch off, the VACS must be shut down and secured against being switched on again. A warning sign must also be attached to the mains disconnection device.
3. All existing electrical equipment must be individually disconnected.
4. Disconnection from the power supply
5. After completion of the decommissioning, the activities under "Recommissioning" must be followed.

9.9 CLEANING



DANGER

Danger to life due to unexpected start-up



DANGER

Danger to life due to defective, dismantled and manipulated protective devices

**WARNING**

Risk of injury due to slipping, tripping and falling

**WARNING**

Danger from hot components and equipment

**CAUTION**

Contamination and damage to the environment due to operating materials

**NOTE**

Wear suitable PPE

Description of the safety instructions → Chapter 2.9

**Attention**

Incorrect cleaning and the use of incorrect cleaning agents or cleaning devices (e.g. high-pressure cleaners) can damage the VACS.

The entire pump must be cleaned at regular intervals depending on the amount of dust. This includes cleaning all surfaces of the VACS with a compressed air gun and moistened cleaning cloth.

The cleaning instructions of the manufacturers of components and assemblies must be observed.

The use of solvents or cleaning agents containing solvents is prohibited.

The use of cleaning agents that are highly flammable or generally flammable is prohibited! The statutory environmental protection regulations must be observed when cleaning.

The VACS may only be switched on again if there is no damage to the VACS and no person is exposed to danger.

9.10 ASSEMBLY AND DISASSEMBLY OF THE DEVICES

9.10.1 INSTALLATION KVT 3.140 WITH SWIVEL BASE IN CABINET HOUSING

**NOTE**

It is generally important to ensure that the filter and separator housing are aligned with the door side of the cabinet housing so that maintenance is possible without removing the appliance.

The respective operating instructions for the individual appliances must also be observed.

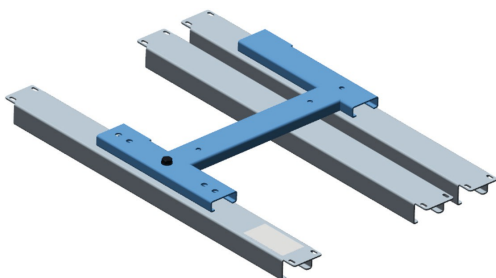
The named devices may only be mounted on the following bogie for reasons of statics and load-bearing capacity:

Drawing number: BG swivel foot

DVT part number: 51510033110

(For installation in the 1200 mm wide appliance cabinet)

If the swivel base is required for appliance maintenance, it is advisable to first mount the actual blue swivel base under the appliance.



First lift the appliance at the load attachment points.

Screw a stud bolt into the centre of the vibration damper under the appliance and insert two hexagon head screws through the two screw-on points on the motor side. Now fit the swivel frame under the appliance and secure the screw connections on the underside with nuts.

This pre-assembled unit is then lifted into the cabinet.



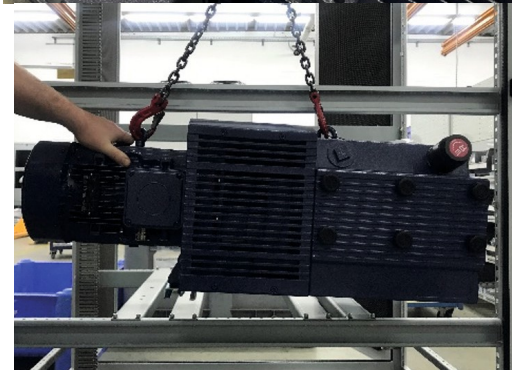
The mounting accessories are included in the assembly 52161033100.



The vacuum pump is fixed and lifted with the crane using the two eyebolts. In this case too, avoid contact between the enclosure housing and chains.

The chain angle must not be less than 90°.

The turntable is then screwed to the three attachment points of the appliance as described in the previous chapter.

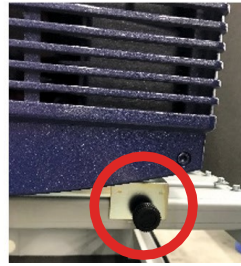


The pre-assembled unit is now lifted onto the three appliance struts pre-assembled in the cabinet.

When setting down, ensure that the pivot and fixing point of the bogie is aligned with the through-hole drilled in the centre of the strut.



Now attach the base to the strut (accessory of the level) from above.



The pump is also attached to a strut using the stud bolt and knurled nut. The stud bolt can be unscrewed again to allow maintenance to be carried out on the sliders. This allows the pump to be easily swivelled out of the CS cabinet.

9.10.2 REMOVAL KVT/KVX 3.140 WITH SWIVEL BASE IN ENCLOSURE HOUSING

The removal works in reverse order.

Firstly, completely remove the knurled screw to secure the appliance. Then loosen the nut below the hexagon head screw that marks the pivot point.

Then fix the appliance with the mounted bogie to the load attachment points using suitable lifting gear and lift it out.



Attention

When replacing the appliance, first unscrew the bogie at the three fixing points. Before setting the appliance down, make sure that there is no longer a stud bolt in the centre of the vibration damper under the appliance.

9.10.3 INSTALLATION VTLF 2.250 IN 1800 MM WIDE CABINET HOUSING

Rotary vane vacuum pump VTLF 2.250

Due to the length of the devices, they can only be installed in a 1800 mm wide enclosure.

The named appliances may only be mounted on the following appliance strut for reasons of statics and load-bearing capacity:

Drawing number: BG Strut GS-TLF600-1800

Part number: 52890033715

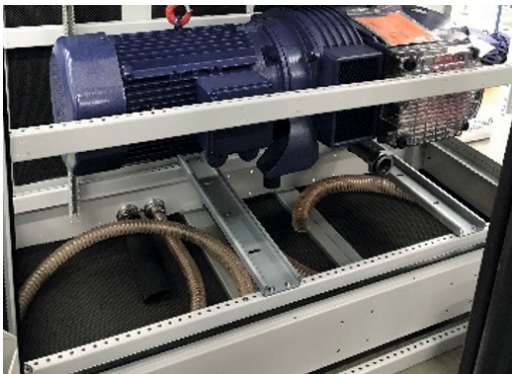


Load slingers are attached to the two ring screws of the drive motor and compressor housing.

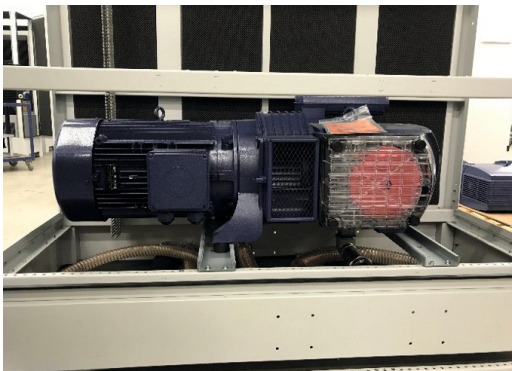
If possible, the chains should hang vertically. Otherwise, the angle between the two must not be greater than 90°!



The stud bolts of the mounting assembly 52161033700 are then screwed into the vibration dampers from below.



The appliance can now be lowered onto the pre-assembled appliance struts using the stud bolts in the holes. The stud bolts are then secured from the underside with nuts.



Mounting the device:

- on the motor side at two points
- on the compressor side at a point located under the centre of the appliance

9.10.4 REMOVAL OF VTLF 2.250 FROM 1800 MM WIDE CABINET HOUSING

The removal works in reverse order.

Firstly, loosen the screw connections by unscrewing the nuts on the underside of the strut. Then fix the appliance at the load attachment points using suitable lifting gear and lift it out.

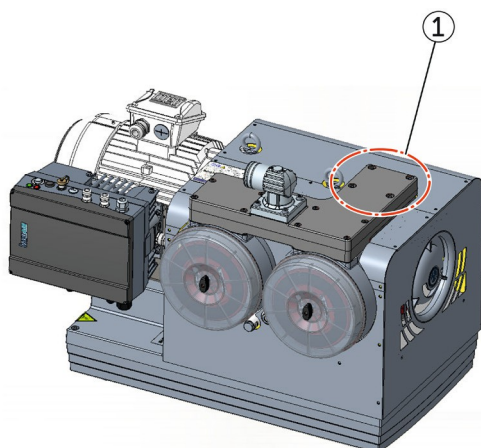
Note: Before setting the appliance down, remove the stud bolts from the vibration dampers so that they can be reused.

9.10.5 INSTALLATION BCV 300 IN CABINET HOUSING

Claw vacuum pump BCV 300

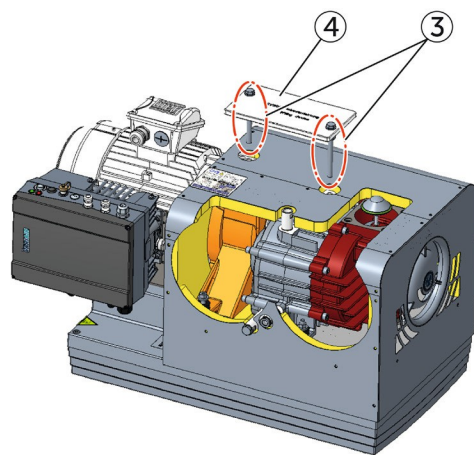
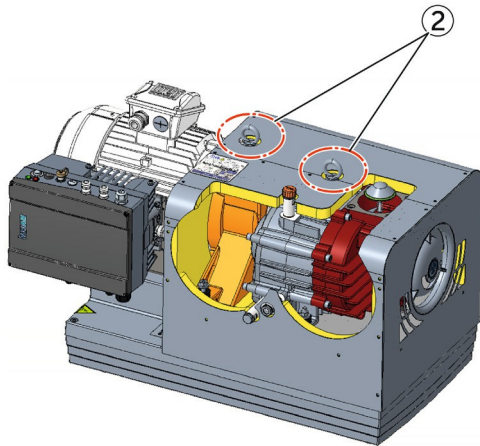
The named appliances may only be lifted for installation and removal using the "BCV300 lifting device".

Part number: 52164633700



Firstly, the filter assembly is dismantled. To do this, loosen and remove the four cylinder screws (1) of the suction flange at the positions shown.

The two eyebolts (2) are then loosened and removed.



Insert the two hexagon head screws (3) of the lifting device into the holes in the eyebolts that have become free.

(4) so deep that the forklift fork can be pushed through between the sound cover of the appliance and the lower edge of the flat bar.

Now the lifting device can be driven under with a fork of a low-floor vehicle, carefully lifted and lifted into the cabinet.

Then screw the pumps to the struts.

9.11 REMOVAL OF THE BCV 300 FROM THE ENCLOSURE

The removal works in reverse order.

First convert the vacuum pump as described above.

Then loosen the screw connections by unscrewing the nuts on the underside and lift out with a fork from a low-floor vehicle.



Attention

The appliance must be set down on a pallet so that it can be transported further if necessary. Transport with the lifting device is not permitted!

9.12 DISASSEMBLY AND DECOMMISSIONING OF THE VACS



DANGER

Danger to life due to unexpected start-up



DANGER

Danger to life due to electric shock - Personnel qualification



WARNING

Risk of injury due to slipping, tripping and falling



WARNING

Danger from hot components and equipment



NOTE

Wear suitable PPE

Description of the safety instructions → Chapter 2.9



The following steps must be observed during dismantling and decommissioning:

1. Switch off the VACS and enable the drive.
2. Switch off the power supply and secure it against unintentional restarting.
3. Shut off the supply line of the VACS and discharge pressure differences if necessary.
4. Disconnect the media lines from the VACS.
5. Clean the machine thoroughly.
6. Dismantle the machine in reverse order of assembly or according to the separate dismantling instructions. Loose parts must be secured to prevent them from tipping over or falling.
7. Protect the VACS from further contamination.

9.13 STORAGE

The following requirements for the storage location must be observed in order to store the unused VACS in a proper condition over a longer period of time.



Attention

The following regulations generally apply to storage:

- Store in a dry place. It must be ensured that the modules are not stored outdoors. It must also be ensured that the floor of the storage room is dry during storage.
- Protect from direct sunlight and sudden changes in temperature and humidity.
- Be protected from salt spray, industrial gases, corrosive liquids, rodents and fungal attack.
- Cover all ventilation openings in the side walls and roof.
- Avoid mechanical shocks and damage.

9.14 DISPOSAL



CAUTION

Contamination and damage to the environment due to operating materials



Description of the safety instructions → Chapter 2.9

The VACS is disposed of in a dismantled state. See chapter 9.12.

When disposing of the VACS, the relevant local environmental regulations must be observed.

10 PRODUCT DATA SHEET

10.1 PRODUCT OVERVIEW



NOTE

Presentation of the product variants → Chapter 4.2

10.2 OPERATING PARAMETERS

Operating parameters - VACS 0030.00X0X.NG	Number of pumps (KVT/KVX 3.140)				
	2	3	4	5	6
Maximum nominal suction capacity [m3/h]	308	462	616	770	924
Maximum absolute vacuum [mbar]	200				
Total weight [kg]	760	920	1280	1450	1610
Emission sound pressure level 60 Hz [dB(A)] ¹⁾	72	72	73	73	73
Permissible ambient temperature [°C]	5-45				
Intake temperature [°C]	5-45				
Maximum exhaust air temperature 50/60 Hz [°C] ²⁾	68/76				
Maximum installation height [m above sea level] ³⁾	800				
Maximum humidity of the intake air	90 %				
¹⁾ According to DIN EN ISO 11203 and DIN EN ISO 3744 (KpA= 3 dB(A))					
²⁾ at 20 °C intake air					
³⁾ For installation heights above 800 m, please consult Gebr.					

Table 10.2.1: Operating parameters VACS 0030.00X0X.NG

Operating parameters - VACS 0040.00X0X.NG	Number of pumps (VTLF/VXLF 2,250)				
	2	3	4	5	6
Maximum nominal suction capacity [m3/h]	572	858	1144	1430	1716
Maximum absolute vacuum [mbar]	250				
Total weight [kg]	1140	1380	1980	2220	2470
Emission sound pressure level 60 Hz [dB(A)] ¹⁾	72	74	74	75	75
Permissible ambient temperature [°C]	5-45				
Intake temperature [°C]	5-45				
Maximum exhaust air temperature 50/60 Hz [°C] ²⁾	138/145				
Maximum installation height [m above sea level] ³⁾	800				
Maximum humidity of the intake air	90 %				
¹⁾ According to DIN EN ISO 11203 and DIN EN ISO 3744 (KpA= 3 dB(A))					
²⁾ at 20 °C intake air					
³⁾ For installation heights above 800 m, please consult Gebr.					

Table 10.2.2: Operating parameters VACS 0040.00X0X.NG

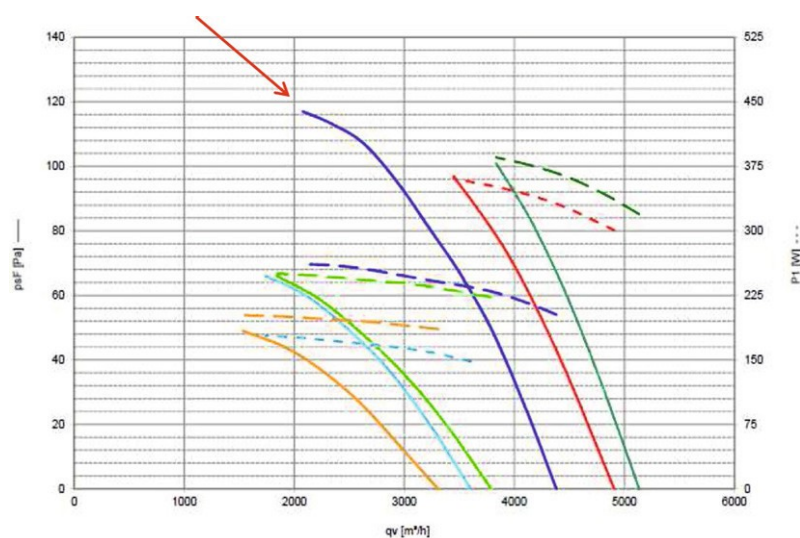
Operating parameters - VACS 0080.00X0.NG	Number of pumps (BCV 300)				
	2	3	4	5	6
Maximum nominal suction capacity [m3/h]	650	975	1300	1625	1950
Maximum absolute vacuum [mbar]	200				
Total weight [kg]	1200	1790	2100	2700	3010
Emission sound pressure level 60 Hz [dB(A)] ¹⁾	76	78	79	80	80
Permissible ambient temperature [°C]	0-40				
Intake temperature [°C]	0-40				
Maximum exhaust air temperature 50/60 Hz [°C] ²⁾	72/86				
Maximum installation height [m above sea level] ³⁾	800				
Maximum humidity of the intake air	90 %				
¹⁾ According to DIN EN ISO 11203 and DIN EN ISO 3744 (KpA= 3 dB(A))					
²⁾ at 20 °C intake air					
³⁾ For installation heights above 800 m, please consult Gebr.					

Table 10.2.3: Operating parameters VACS 0080.00X0.NG

10.3 TECHNICAL DATA FAN BLOWER CABINET

Type	FN040-VDQ.0F.A7P2		
50 Hz	3~ 400V +/-10% D/Y cos φ 0.77 0.26/0.18 kW Rec. 0.50/0.29 A 1340/1020 1/min		
60 Hz	3~ 400V +/-10% D/Y cos φ 0.88 0.36/0.20 kW Rec. 0.59/0.32 A 1470/940 1/min		
60 Hz	3~ 460V +/-10% D/Y cos φ 0.84 0.39/0.24 kW Rec. 0.58/0.34 A 1560/1090 1/min IP 54, THCL 155		

Fan characteristic curve



ensure the highest possible air flow rate in the enclosure, the axial fans must always be arranged in a **triangle**, which corresponds to the blue characteristic curve in the diagram above.

The direction of rotation is marked with an arrow on the terminal box and on the fan blades.

10.4 TECHNICAL DATA OF THE INDIVIDUAL DEVICES

Technical data sheets for the pumps can be found on our homepage under the following link: www.becker-international.com/download





MAKE IT BECKER.