

INSTRUCTION MANUAL FORCE-LIFT®



Machine type: FORCE-LIFT® Vacuum Lifter

Version: 02/2021

Built in: 2022

Application: For the horizontal transport of airtight and porous materials. Load capacity up to 75kg depending on the configuration



Carefully read and observe the instruction manual!
Keep the manual readily available for future reference!

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The vacuum lifter complies with CE guidelines in accordance with the applicable regulations and directives. The applied standards and guidelines are listed in the declaration of conformity.

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LIST OF CONTENTS

1	Safety	3
1.1	Target group	3
1.2	Abbreviations and definitions	4
1.3	Type label and nomenclature	4
1.4	Further applicable documents	4
1.5	Explanation of safety instructions	5
1.5.1	Explanation of symbols	5
1.6	Remaining risks in case of use	7
1.7	Operator obligations and liability	9
1.8	General safety instructions	10
1.9	Intended use	10
1.10	Foreseeable misuse	10
2	Structure and function	11
2.1	Technical specifications	11
2.2	Functional Description	12
2.3	Operator controls	13
2.4	Safety devices	14
2.5	Components	15
2.5.1	Vacuum pump	15
2.5.2	Vacuum blower	15
2.5.3	Lift tube	16
2.6	Suction feet (options)	16
2.6.1	Double rectangular suction foot	16
2.6.2	Round suction foot	16
2.6.3	Bag suction foot	17
2.6.4	Suction foot and load capacity	18
3	Installation	19
3.1	Installing the vacuum lifter	19
3.2	Electrical connection	20
4	Handling and operation	21
4.1	Transporting the product with the vacuum tube lifter	21
4.2	Fastening/changing the suction foot	23
5	Options, spare and wear parts	25
5.1	Replacement seal	25
5.2	Further spare parts	26
5.3	AERO-LIFT Service	26
6	Maintenance, inspection and repairs	27
6.1	Inspection intervals	28
6.2	Maintenance and repairs	29
6.2.1	Clean/replace the prefilters	29
6.2.2	Clean/replace the vacuum filter	29
6.2.3	Replace lift tube	31
7	Transport, setup and storage	32
8	Disassembly and disposal	33
9	EU Declaration of Conformity	34
10	Annex	35
	Vacuum pump operating instructions	Fehler! Textmarke nicht definiert.

1 Safety

1.1 Target group

These operating instructions have been written for persons, who as a result of their professional training, work experience and their current work activity have adequate technical knowledge to safely and competently use the vacuum lifting unit and who are able to read and understand the instructions.

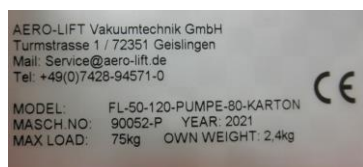
1.2 Abbreviations and definitions

Abbreviation	Definitions	Explanation
UVV	Accident prevention regulations	Maintenance service for accident prevention
VUSS	Vacuum Unit Sensing System	Flow valves integrated in the suction feet, which turn on and off automatically
AL	AERO-LIFT	

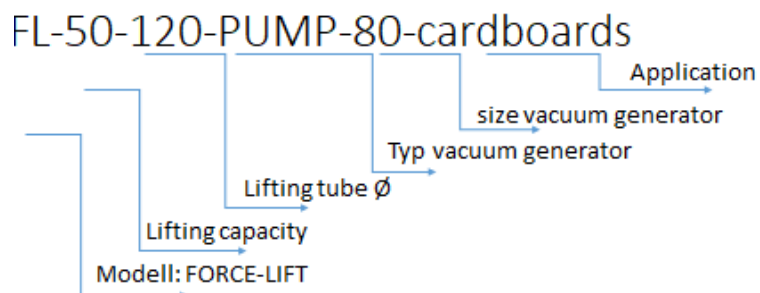
1.3 Type label and nomenclature

The machine number, year of manufacture and model designation are given on the type label for identification. We ask you to provide this information in a service case.

The type label is attached to the rear of the control head. It is structured as follows:



The specified model name can be deciphered as follows:



1.4 Further applicable documents

Appendix No.	Document	Manufacturer
1	Operating instructions, spare parts list and instructions for sound-proofing box of the vacuum pump	AERO-LIFT Vakuumtechnik GmbH

LIST OF CONTENTS

1.5 Explanation of safety instructions

Safety instructions are always provided with a signal word and a warning. All persons who work with the machine must observe and adhere to the safety instructions. The safety instructions are arranged as follows:

(1) SIGNAL WORD



(5)

(2) Signal word classifies the danger

(3) Note text: type and source of danger + possible consequences

✓ (4) Measures to be taken or prohibitions to be imposed

(5) Symbol: supporting graphic representation of the hazard

Categorization Warnings:

DANGER!

Indicates an immediate or impending danger. If appropriate measures are not taken, it will lead to serious injury or death.

WARNING!

Warns of a potentially dangerous situation. If appropriate measures are not taken, it may lead to serious injury or death.

CAUTION!

Warns of a potentially dangerous situation. If appropriate measures are not taken, it may lead to minor or moderate injuries.

NOTE

Indicates possible damage to property and provides specific information

1.5.1 Explanation of symbols

Warning signs:



Warns or indicates a hazardous area. Different symbols in the warning triangle explain a danger in more detail



Warns of tipping over and serious injury due to crushing



Warns of dangers due to electrical voltage



Warns of a suspended load



Warns of serious injuries due to crushing of limbs



Warns of falling objects

Bid signs:



Instructs personnel to unplug the power cord



Instructs personnel to wear protective shoes



Instructs personnel to wear protective clothing



Instructs personnel to wear protective gloves

1.6 Remaining risks in case of use

DANGER!



Electrical Voltage!

Contact with live parts is life-threatening! Live parts, damaged electrical lines and electric shock as a result of faulty or defective parts, or using water to clean may lead to lethal injuries, burns and property damage.



- ✓ Switch off the power supply prior to carrying out any work on the electrical system or cleaning.
- ✓ Pull the vacuum power supply plug (disconnect from power supply)!
- ✓ Cleaning may only be carried out by trained personnel.
- ✓ Maintenance of the electrical system may only be carried out by a qualified electrician.
- ✓ Regular visual inspection of energy chains and electrical lines for any damage.

DANGER!



Suspended loads!

Risk of crushing, shearing and other injuries due to falling or moving parts during transport of the machine or machine parts and during operation.

Risk when moving loads!



- ✓ Do NOT stand under suspended loads and do not climb on suspended loads!
- ✓ Use suitable lifting gear and load handling attachments that are approved for transport and the weight!
- ✓ Wear personal protective equipment.
- ✓ Move goods carefully and pick up load at its center of gravity.
- ✓ Persons may NOT stay in the transport area.

WARNING!



Moving parts!

Crushing of fingers / hands when moving or adjusting the position of the suction plates, during mounting or operation may lead to injuries.



- ✓ Do NOT touch or reach between individual suction plates (double-rectangular suction foot), quick-changing coupling and suction foot or between other components!
- ✓ Carefully install the vacuum lifter.
- ✓ Do not remove the protective covers.
- ✓ When moving, keep the one hand on the control head and the other hand on the product being transported.
- ✓ Always wear personal protective equipment when installing and making adjustments!

WARNING!

**Falling loads!**

Incorrect pick-up and/or premature release of loads before they are fully resting can cause severe injuries due to possible crushing, shearing or impact. Danger due to loads falling!



- ✓ When operating the vacuum lifter, exercise caution!
- ✓ Pick up load only in center.
- ✓ Only release load when it is fully resting.
- ✓ After changing the suction plates/bases, check whether the connection has been inserted correctly.
- ✓ Persons may NOT stay in the transport area.
- ✓ Always wear personal protective equipment when working on or with the machine!

WARNING!**Manual swivelling / turning of suction foot**

Risk of injury due to crushing, shearing or impact involving suction foot and/or product being transported when manually turning and swivelling of the suction foot.



- ✓ Exercise caution when swivelling and turning the suction foot.
- ✓ When swivelling, keep the one hand on the control head and the other hand on the product being transported.
- ✓ Always wear personal protective equipment when working on or with the machine!

WARNING!**Danger of being drawn in**

Risk of injury from being drawing in, caught or severing during cleaning and maintenance work. Danger posed by moving and rotating parts.



- ✓ Shutdown the system for maintenance and cleaning work.
- ✓ Always wear personal protective equipment when working on or with the device!

CAUTION!**Risk of crushing when operating the device**

Crushing of fingers/ hands at the device or between the component and device can lead to injuries.

- ✓ When operating the device, exercise extreme caution!
- ✓ Always wear personal protective equipment when working on or with the device!

1.7 Operator obligations and liability

- These original operating instructions, in particular the safety instructions, must be observed by all persons who work with the machine.
- The laws, regulations and rules on occupational safety, accident prevention, fire prevention and environmental protection which apply for the place of use must be observed (e.g., in Germany: BGR500)!
- Constructive or functional changes to the machine are only permitted with the manufacturer's written approval.
- Unless contractually agreed otherwise, spare parts and wearing parts and recommended accessories may only be obtained from the manufacturer.
- The machine may only be used as intended.
- The machine must be in a sound state of repair.
- The machine must undergo regular inspections and maintenance in accordance with these operating instructions.
- The machine may only be transported, set up and stored by qualified specialists.
- There must be enough space around the machine for the operating personnel to ensure that the machine may be operated without any obstructions.
- Persons may NOT stay in the transport area.
- The machine may only be used and checked by adequately qualified personnel. The personnel must fulfill the following conditions:
 - The personnel must have sufficient technical knowledge for safe and professional handling of the machine as a result of their professional training, work experience and up-to-date professional activities.
 - The personnel have been instructed and briefed in the operation.
 - The entrusted personnel must have read and understood the operating instructions.
 - Personnel must comply with their duty to supervise during operation.
 - Personnel must be at least 18 years old
- The machine must be secured against any unauthorized use if it is not used for a long period of time.
- Only AL technicians and experienced system technicians may be employed for installation, assembly and start-up.
- Work on the pneumatic system and vacuum equipment may only be carried out by a specialist.
- Cleaning may only be carried out by trained personnel. Upon completion of cleaning activities, all lines are to be checked for leaks, loosened connections, chafe marks and signs of damage! Promptly remedy any identified deficiencies.
- Maintenance and repair activities may only be carried out by qualified personnel.
- Maintenance of the electrical equipment may only be carried out by a qualified electrician.
- Warranty and liability claims for personal injuries and property damage are excluded when one or more of the aforementioned requirements have been disregarded.

1.8 General safety instructions

The machine is designed and constructed in accordance with the current state of technology and the generally accepted safety regulations. Nonetheless, its use may pose a hazard to life or limb of the user or a third party or adversely affect the machine and other material property.

- Only operate the machine as intended!
- Refrain from any form of work that adversely affects safety!
- Only operate the machine when it is in a sound state of repair!
- Check functionality and for freedom from any deficiencies prior to starting work!
- Do not circumvent or bypass the safety functions!
- Immediately remedy or eliminate any faults that could have an adverse effect on safety!
- Observe and follow the safety instructions contained in this instruction manual!

1.9 Intended use

The FORCE-LIFT[®] vacuum lifter (vacuum tube lifter) is used for lifting and subsequently setting down various goods from a wide variety of industries. In conjunction with exchangeable types of suction feet, it is possible to move and handle vacuum-tight and porous loads of max. 75 kg.

The control head of the vacuum lifter and the suction heads are part of a complete system comprising a vacuum pump or blower, filter unit, supply line, swivel joint and vacuum lift tube. The vacuum lifter is attached to a pillar-mounted slewing crane with a jib, a (rigid) wall-mounted jib or a rail system. Control head and suction feet as well as vacuum lift tube can be swivelled using swivel joints; the suction foot can be swivelled up to 90°.

At the time the FORCE-LIFT vacuum lifter was placed on the market, it is designed/suited for the following variations of suction feet:

- Adaptable double-rectangular suction foot for transport goods surfaces that are not inherently stable with flexible bearing system for handling cardboard boxes, steel plates or similar (box lifter)
- Suction foot for drums or barrels and other inherently stable or smooth transport goods surfaces (drum lifter)
- Suction foot for handling sacks, bags and similar transport goods that are not inherently stable and which do not have smooth surfaces (bag lifter)
- VUSS suction foot as special solution for transport goods with cut-outs and porous material (option)

The respective suction foot can be used for the corresponding transport goods.

The vacuum lifter may only be used from the front by one person. These must be qualified specialists.

The vacuum lifter is intended for use in halls and outdoors when milder ambient weather conditions prevail.

The vacuum lifter may only be operated if all safety devices are fully installed and functional. Intended use also includes observing this instruction manual as well as carrying out the necessary Foreseeable misuse

1.10 Foreseeable misuse

The machine is NOT intended for the following applications:

- Handling of other components or variations than those approved by the manufacturer.
- Overstepping of maximum load capacity.
- Shutting off the suction plates that fall below the load capacity.

- Load picked up out of center.
- Product to be transported is approached at an angle when being picked up.
- Storage of suction foot with suction foot facing down.
- Use in closed rooms with particular dangers (e.g. risk of explosion).
- Working in storms, inclement weather or heavy rain.
- Picking up loads with snow or ice-covered surfaces.
- Operation by untrained personnel.

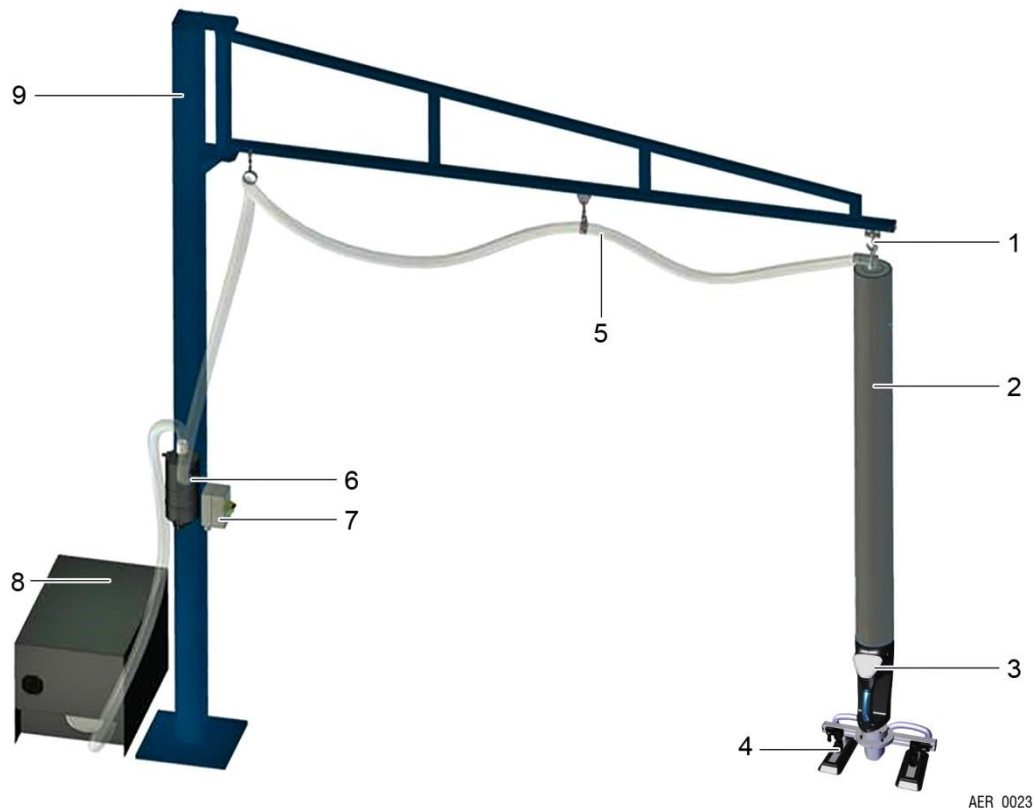
2 Structure and function

2.1 Technical specifications

Operating data	Nominal size	Unit
Own weight of control head	2,3	kg
Working load maximum:	75	kg
Possible goods to be transported:	Boxes, sacks, buckets, canisters, drums, etc...	
Lift tube diameter	ø 100, 120, 160	mm
Max. number of load cycles	20,000	
Ambient temperature (operation)	+ 5 to + 45	°C
Ambient temperature (storage):	+15 to + 25	°C
Rel. air humidity (operation and storage)	max. 80 %	
Vacuum pump: 230V/400V, 2,4KW Vacuum blower: 400V, 3KW	Pump: VAL 50T, 80T, Blower: SV400/2	
Noise level	Pump: 56 Blower: 71	dB(A)

2.2 Functional Description

The vacuum lifter consists of the following main components:



- | | |
|--|------------------------|
| (1) Swivel joints with eyelet | (2) Lift tube |
| (3) Control head | (4) Suction foot |
| (5) Supply line | (6) Filter unit |
| (7) Motor protection | (8) Vacuum pump/blower |
| (9) Pillar-mounted slewing crane + jib | |

Functional description

The vacuum generator (8), pump or blower depending on the use, generates the air flow volume and provides the vacuum. The vacuum or the generated air flow reaches the product to be transported through the filter unit (6), via the supply line (5), the lift tube (2), the control head (3) and then the suction foot (4).

If the suction foot is placed on the product to be transported, e.g. a cardboard box, the device attaches itself. The external air, which previously streamed in through the suction foot, is decreased or stops completely which in turn increases the vacuum in the entire system. With the rapidly increasing vacuum, the previously untensioned lift tube starts to tighten. A spring is integrated in the lift tube to ensure, among other things, that the lift tube does not implode due to the vacuum. As soon as the lifting force (negative pressure x lift tube cross-section area) is greater than the weight of the product to be transported, the product can be lifted.

Regulating the external air in the control head either raises or decreases the vacuum in the entire system. Adding external air reduces the

vacuum and thus causes the lift tube to expand lengthwise and the control head with the suction foot and the product being transported to be lowered. Conversely, the vacuum increases with the reduction of external air, which in turn causes the lift tube to be tensioned and contract in terms of length - the control head with the suction foot and the product to be transported raises up. Consequently, the product being transported can be held suspended in the air by stopping the addition of external air to a certain extent.

Quick-change coupling, swivelling and rotating function

A quick-change coupling is available to ensure that the operator can change the suction foot in seconds. The suction foot can also be swivelled manually by 90°.

There is also a 360° rotating function for turning the product being transported. This allows the product to be rotated continuously.

2.3 Operator controls



The FORCE-LIFT® is operated with only one hand with the control head.

The load is lifted up using the “Lift/Lower” button (6). If it is released slowly, the load moves downward again. The unlock button (2) must be pressed to unlock. It is used as a safety lock mechanism for the lowering function. If it is released suddenly, the load stays at the selected height.

The release button (1) is used to quickly and easily release the load from the suction foot (quick release).



With the regulating screw for the transport goods (3) it is possible to regulate whether air-tight or porous materials are suctioned. If it is closed, it is possible to lift air-tight transport goods. To lift heavy cardboard boxes, the screw has to be unscrewed some, while to lift sacks or bags it has to be unscrewed completely.



With the regulating screw for the transport goods (3) it is possible to regulate whether air-tight or porous materials are suctioned. If it is closed, it is possible to lift air-tight transport goods. To lift heavy cardboard boxes, the screw has to be unscrewed some, while to lift sacks or bags it has to be unscrewed completely.

The product to be transported can be rotated continuously using the 360° rotating function (5).

By actuating the 90° unlock button (6), the suction foot can be swivelled manually by 90°. This means that cardboard boxes can be easily stacked, for instance.

Vacuum pump or blower is switched on and off using the power switch (not shown). Optionally, the vacuum generators can be switched on and off via a remote control.

2.4 Safety devices

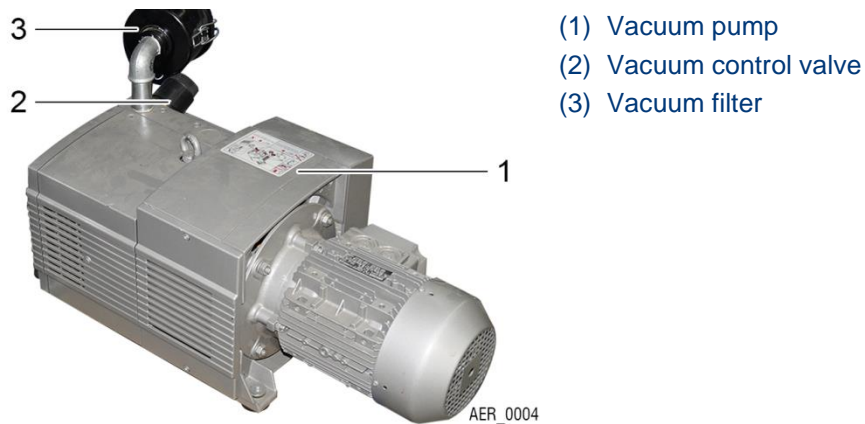
The release button (1) is protected against inadvertent actuation as a result of its position, the required actuation force and the length of actuation.

The spring-return unlock button (2) must be pressed in order to actuate the button (7). When actuating the button (7), the vacuum increases; while it decreases when the button is released, provided that the unlock button (2) is pressed. If the control head is released suddenly, the unlock button (2) closes very quickly, ensuring that the vacuum remains and that the vacuum lifter holds the load at a constant height. This prevents the load from causing any personal injuries or property damage when the control head is released.

A safety non-return valve (not shown) prevents a rapid drop in the vacuum in case of a power failure and thus the load from falling. In case of a power failure, the vacuum is decreased and the lift tube is slowly lowered.

2.5 Components

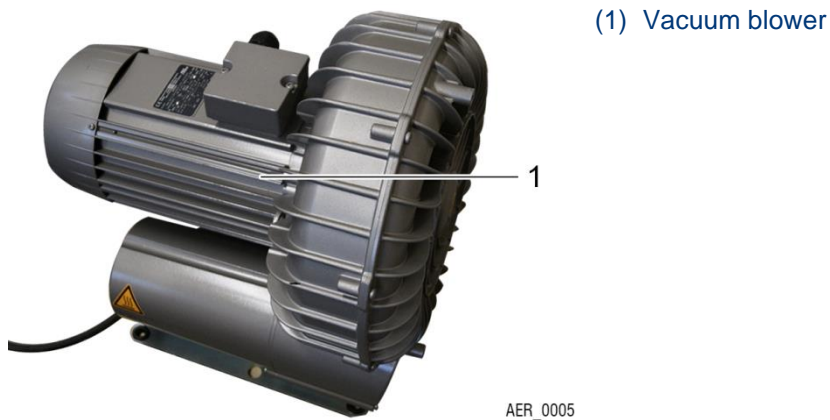
2.5.1 Vacuum pump



The vacuum for the vacuum lifter is generated using the vacuum pump. The pump consists of a vacuum pump (1) with rotation control (2) and an upstream vacuum filter (3). It is switched on and off using a power switch (not shown).

The selection of the pump depends on the application. Pumps from 40 to 80 m³/h can be used.
See further applicable documents.

2.5.2 Vacuum blower



The vacuum for the vacuum lifter is generated using the vacuum blower (1). The powerful blower can be switched on and off using the power switch or a radio control.

See further applicable documents.

2.5.3 Lift tube



- (1) Lift tube
- (2) Clamp for fastening
- (3) Control head

The lift tube (1) is used to raise, hold and lower the product to be transported. The lift tube is suspended from a swivel joint with an eyelet on the crane. It is fastened to the control head (3) with a clamp (2) on the bottom.

The lift tube rises when the vacuum is generated or increases and lowers when the vacuum decreases. If the vacuum supply stops or the blower fails, it sinks slowly downward with the product to be transported.

2.6 Suction feet (options)

2.6.1 Double rectangular suction foot



- (1) Cardboard suction foot
- (2) Suction plate
- (3) Adjustment of suction foot

The cardboard suction foot is an adjustable double-rectangular suction foot for transport goods surfaces that are not inherently stable. It is mounted so that it can tilt and is specially designed for handling boxes or steel plates and similar.

It consists of two suction plates (2). They can be adjusted in width with the adjustment (3) to adapt to the width of the products to be transported.

2.6.2 Round suction foot



- (1) Base plate
- (2) Seal

The barrels lifter is a suction foot for drums or barrels and other inherently stable or smooth transport goods surfaces. It consists of a base plate (1) and a seal (2) that can be changed in just a few seconds.

The suction cup-shaped design of the seal ensures an airtight seal with the surface of the product to be transported.

2.6.3 Bag suction foot

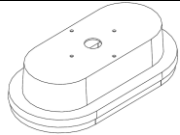
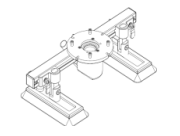
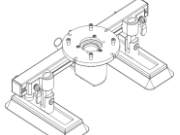

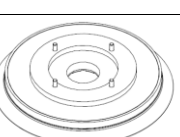
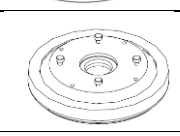
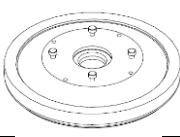
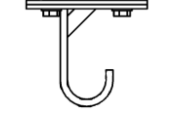
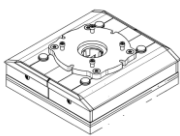


- (1) Basic housing
- (2) Seal

The bag suction foot is designed for handling bags and similar transport goods that are not inherently stable and which do not have smooth surfaces. The bag suction foot consists of a basic housing (1) and the circumferential seal (2).

The sponge-like design of the lower seal can compensate for unevenness in the surface of the product to be transported.

2.6.4 Suction foot and load capacity

Lifting tube:			Ø100	Ø120			Ø160
description	Article-number	picture	VAL50T	SV400/2	VAL50T	VAL80T	SV400/2
bag suction food 395x210mm	3080509		✗	✓ max. 25kg at 25%	✗	✗	✓ max. 50kg at 30%
Double rectangular suction foot 2x85x200mm	3089858		✓ max. 20kg at ca. 30%	✓ max. 45kg at 45%	✓ max. 20kg at 25%	✓ max. 50kg at 50%	✗
Double rectangular suction foot 2x110x300mm	3089900		✗	✓ max. 45kg at 45%	✗	✓ max. 50kg at 50%	✓ max. 75kg bei 60%
Round suction food Ø210R	3089973		✓ max. 40kg at 60%	✓ max. 60kg at 60%	✓ max. 60kg at 60%	✓ max. 60kg at 60%	✗
Round suction food Ø270R	3089972		✓ max. 40kg at 60%	✓ max. 60kg at 60%	✓ max. 60kg at 60%	✓ max. 60kg at 60%	✓ max. 75kg at 60%
Barrel suction food Ø180T	3090113		✓ max. 40kg at 60%	✓ max. 60kg at 60%	✓ max. 60kg at 60%	✓ max. 60kg at 60%	✗
Barrel suction food Ø220	3090109		✓ max. 40kg at 60%	✓ max. 60kg at 60%	✓ max. 60kg at 60%	✓ max. 60kg at 60%	✓ max. 75kg at 60%
Hook suction food	3080511		✓ max. 40kg at 60%	✓ max. 60kg at 60%	✓ max. 60kg at 60%	✓ max. 60kg at 60%	✓ max. 75kg at 60%
VUSS 200x200mm	3014143		✓ max. 20kg at 30%	✓ max. 45kg at 45%	✓ max. 20kg at 30%	✓ max. 45kg at 45%	✗

3 Installation

3.1 Installing the vacuum lifter

WARNING!



Moving parts!

Crushing of fingers / hands when moving or adjusting the position of the suction plates, during maintenance work and mounting may lead to injuries.

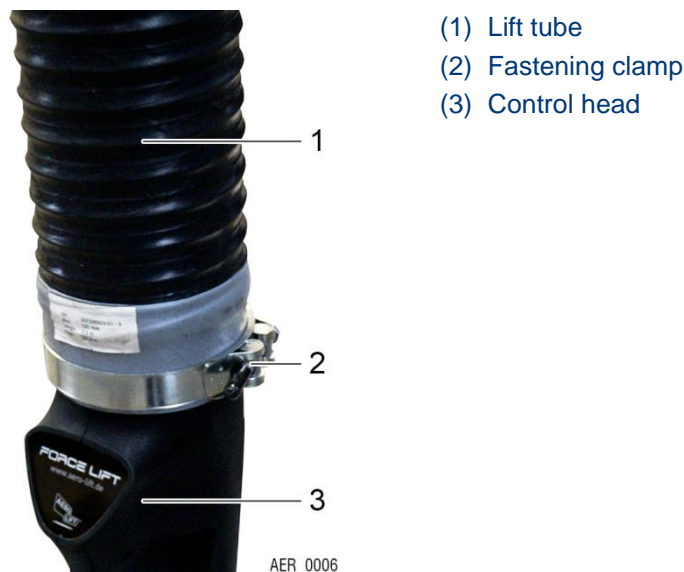
- ✓ Do NOT touch or reach between individual suction plates (double-rectangular suction foot), quick-changing coupling and suction foot or between other components!
- ✓ Carefully install the vacuum lifter.
- ✓ Do not remove the protective covers.
- ✓ Always wear personal protective equipment when installing and making adjustments!

NOTE

Placement of suction feet

Do not store or lay down the suction feet with the seal facing downwards! Placing the suction feet with the seal facing down can damage the seals.

1. Unpack components of the vacuum lifter.
2. If necessary, mount on the crane to be used. Secure the vacuum lifter at the ends of the crossbeam with safety screws, spring retaining pins or locking pins
3. Attach the vacuum supply line to the used crane or jib and connect to the vacuum pump or blower via the filter unit. Do not yet connect the vacuum pump/ blower to the mains! Make sure that the supply system eyelets have been fastened securely.



4. Fasten lift tube (1) to the control head (3) using a hose clamp (2). To do so, pull the lift tube over the upper end of the control head (3). Make sure that the closure is airtight!
5. Fasten the lift tube (1) to the cup with the ball bearing on top (suspension) in a positive-fit manner. In this case, screw the wire spiral onto the groove. Make sure that the closure is airtight!

6. Attach the desired suction foot to the control head. See section "Fastening/changing suction foot".
7. Connect the vacuum pump/blower to the mains and start up the vacuum lifter. Use sound insulation if necessary. See further applicable documents.

→ Vacuum lifter was mounted.

NOTE

Vacuum pump/blower

For the start-up of the vacuum pump or blower, observe the information provided in the further applicable documents!

3.2 Electrical connection

NOTE

Vacuum blower

When using an vacuum blower as a vacuum generator, the electrical fuse protection must be a C16 fuse.

4 Handling and operation

4.1 Transporting the product with the vacuum tube lifter

WARNING!



Danger due to loads falling

Incorrect pick-up and/or premature release of loads before they are fully resting can cause severe injuries due to possible crushing, shearing or impact. Danger due to loads falling!

- ✓ When operating the vacuum lifter, exercise caution!
- ✓ Pick up load only in center.
- ✓ Only release load when it is fully resting.
- ✓ After changing the suction plates/bases, check whether the connection has been inserted correctly.
- ✓ Persons may NOT stay in the transport area.
- ✓ Always wear personal protective equipment when working on or with the device!

NOTE

Aligning the vacuum lifter

Lift tube and control head are mounted so that they can rotate. This means that the vacuum lifter can be rotated to the desired position. If the vacuum lifter is to be mounted on a pillar-mounted slewing crane, it is necessary to observe its working radius and reach.

NOTE

Daily functional check

Check the lift tube and the entire system for any damage every day prior to starting work!

Requirements

The vacuum lifter is mounted, a suitable suction foot is attached and adapted using the regulating screw to the material of the product to be transported (3)

Vacuum pump or blower connected to the mains and switched on

1. The vacuum lifter can be raised or lowered by pressing the release button (2) and button (4) together.



- (1) Quick release button
- (2) Automatic unlock and suspend function
- (3) Regulating screw for transport goods
- (4) Lift/lower control button

2. Position the vacuum lifter precisely above the product to be transported (7) and lower.



- (6) Suction foot
- (7) Product to be transported

3. Position the suction foot (6) centrally on the surface of the product to be transported. Pivot at the joint if necessary.



- (6) Suction foot

4. When using the box lifter, adjust the suction foot (6) to the width of the product to be transported by adjusting the two suction plates. After moving the suction plates, the retaining screws are to be retightened again.

WARNING!



Moving parts!

Crushing of fingers/ hands can lead to injuries when moving or adjusting the suction plate position.

- ✓ Do NOT touch or reach between individual suction plates (double-rectangular suction foot), quick-changing coupling and suction foot or between other components!
- ✓ When moving, keep the one hand on the control head and the other hand on the product being transported.
- ✓ Always wear personal protective equipment when installing and making adjustments!

1. Raise the vacuum lifter with the product being transported (7) by pressing the unlock button (2) and the button (4).
2. Position the product being transported (7) over the spot where it is to be put down.
3. Slowly release the button (4) to lower the product being transported (7) to the desired position.
4. Use the release button (1) in order to release the product being transported (7) from the vacuum lifter.

→ The product to be transported was transported using the vacuum tube lifter.

4.2 Fastening/changing the suction foot

WARNING!



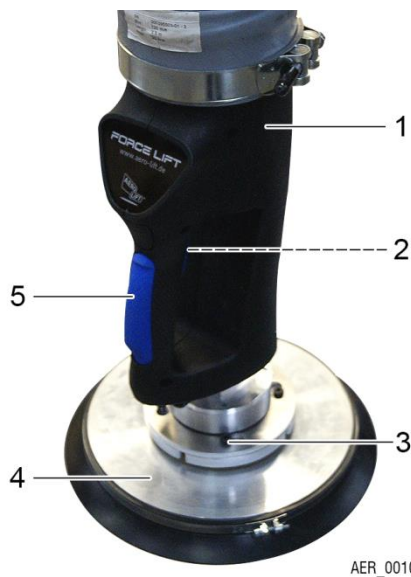
Moving parts!

Crushing of fingers / hands when moving or adjusting the position of the suction plates, during maintenance, mounting or operation may lead to injuries.

- ✓ Do NOT touch or reach between individual suction feet (double-rectangular suction foot), quick-changing coupling and suction foot or between other components!
- ✓ Carefully install the vacuum lifter.
- ✓ When moving, keep the one hand on the control head and the other hand on the product being transported.
- ✓ Always wear personal protective equipment when installing and making adjustments!

Requirements

1. Vacuum lifter mounted and suspended
2. Suction foot to be changed is available, functional and placed on a base
3. Raise the vacuum lifter (1) by pressing the unlock button (4) and the button (2). Release the unlock button (2) at the required height.



- (1) Vacuum lifter
- (2) Lift/lower control button
- (3) Quick-change coupling
- (4) Suction foot
- (5) Automatic unlock and suspend function

1. Move the vacuum lifter (1) to the desired position.
2. If necessary, detach the suction foot (4) to be changed from the vacuum lifter (1). To do so, pull up the index pins (6), turn the quick-change coupling (3) clockwise, remove the suction foot (4) to be changed downwards.



- (3) Quick-change coupling
- (4) Index pin

1. Attach the new suction foot. To do so, pull up the index pins (6), turn the quick-change coupling (3) counter-clockwise, and press the new suction foot into the holder from below.
 2. Lock the quick-change coupling (3) back into place.
- Suction foot was fastened or replaced.

NOTE

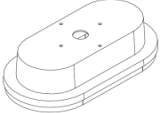
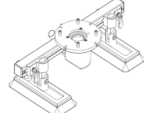
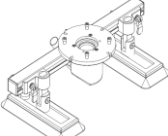
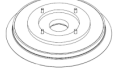
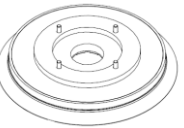
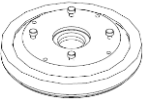
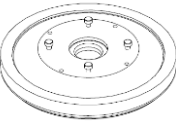
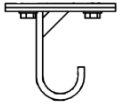
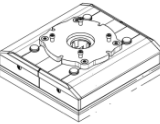
Placement of suction feet

Do not store or place the suction feet with the seal facing down! Placing the suction feet with the seal facing down can damage the seals.

5 Options, spare and wear parts

Pos.	Stk.	Bezeichnung
1	1	Control head
2	1	Lift tube
3	1	Supply line
4	1	Box lifter (Suction foot)
5	1	Sack lifter (Suction foot)
6	1	Drum lifter (Suction foot)
7	1	Prefilter for suction foot
8	1	Lift tube cover

5.1 Replacement seal

description	Article-number complete	picture	Article-number seal
bag suction food 395x210mm	3080509		3033331/ 3083736 (Vorfilter)
Double rectangular suction food 2x85x200mm	3089858		2033352
Double rectangular suction food 2x110x300mm	3089900		2033337
Round suction food Ø210R	3089973		2031214
Round suction food Ø270R	3089972		2031211
Barrel suction food Ø180T	3090113		3020675
Barrel suction food Ø220	3090109		3020670
Hook suction food	3080511		
Vuss 200x200mm	3014143		2014805

5.2 Further spare parts

Lifting tube:	Ø100	Ø120			Ø160
Vacuum generator:	VAL50T	SV400/2	VAL50T	VAL80T	SV400/2
Pump without attachment parts	2010579	2010530	2010579	2010580	2010530
Rotorvanes	2010609	-	2010609	2010058	-
Filter	2020096	2080530	2020096	2020936	2080530
Filter insert	2020095	2033336	2020095	2021002	2033336
Gasket for filter	-	2020895	-	-	2020895
Supply Vacuum tube	2020155	2020050	2020155	2020159	2020050
Hose clip for supply Vacuum tube	2020203	2020695	2020203	2020505	2020695
Lifting tube L=2300	2085614	2085559	2085559	2085559	2085610
Hose clip for lifting tube	2080688	2080684	2080684	2080684	2080536
control head	3082886	3082883	3082884	3082884	3082885
Motor protection switch	3080455	3080454	3080455	3080455	3080454
Note: Your lifting tube diameter and the vacuum generator used can be read from the type label in the model designation.					

5.3 AERO-LIFT Service

If you need help with repair or replacement of spare parts, contact AERO-LIFT Service directly at:

AERO-LIFT Vakuumtechnik GmbH

Turmstraße 1

D-72351 Geislingen

Tel: +49 (0) 7428 94514-0

E-Mail: info@aero-lift.de, service@aero-lift.de

NOTE

Maintenance Service

For our UVV maintenance service (UVV accident prevention regulations), contact our AERO-LIFT Service (see the section "AERO-LIFT Service").

6 Maintenance, inspection and repairs

WARNING!



Moving parts!

Crushing of fingers / hands when moving or adjusting the position of the suction plates, during mounting, maintenance or operation may lead to injuries.

- ✓ Do NOT touch or reach between individual suction plates (double-rectangular suction foot), quick-changing coupling and suction foot or between other components!
- ✓ Carefully install the vacuum lifter.
- ✓ Do not remove the protective covers.
- ✓ Always wear personal protective equipment when installing and making adjustments!

WARNING!



Danger of being drawn in

Risk of injury from being drawing in, caught or severing during cleaning and maintenance work. Danger posed by moving and rotating parts.

- ✓ Shutdown the system for maintenance and cleaning work.
- ✓ Always wear personal protective equipment when working on or with the device!

NOTE

Vacuum pump/blower

For maintenance, inspection and repair of the vacuum pump or blower, observe the information provided in the further applicable documents!

6.1 Inspection intervals

Inspection period	Scope of test/inspection	Inspector
Prior to initial start-up	Visual inspection and functional test	Qualified person ¹
As needed ³	Visual inspection and functional test of vacuum generator. Check for defective bearings, worn coupling, seized rotor blades.	Qualified person ¹
Daily	Visual inspection and functional test (This includes, e.g., deformations, cracks, breaks, wear)	Competent person ²
Daily	Visual inspection of lift tube and vacuum supply for damage	Competent person ²
Weekly to monthly ⁴	Visual inspection of lift tube and vacuum supply for damage	Qualified person ¹
Monthly	Visual inspection of the energy chains and power lines	Qualified person ¹
At least every 6 months	Functional check of corrosion prevention	Competent person ²
At least once a year More often when operated under conditions that may cause damage (e.g. heat)	Visual inspection and functional test	Qualified person ¹
Check/ test after - exceptional occurrences (e.g. accidents, changes to the machine, natural events, prolonged period of non-use) - Repair work	Depending on the type and scope of the damage, the occurrence or repair.	Qualified person ¹

1. Qualified person: possesses as a result of his/her professional training and experience sufficient knowledge of vacuum lifters and is familiar with the relevant national on-the-job safety regulations, accident prevention regulations and generally accepted rules of good practices (e.g. BG rules (mutual indemnity association), DIN standards) to the extent that he or she is able to assess vacuum lifters for safe working conditions.
2. Competent person: possesses as a result of his/her vocational training and work experience and recent professional activities the necessary technical knowledge to check and inspect vacuum lifters.
3. See notes relating inspection intervals in further applicable documents.
4. Inspection intervals depend on the degree of air pollution and the environment. If the lifter is used to transport, e.g., wood, the filters must be checked every week and cleaned if necessary.

6.2 Maintenance and repairs

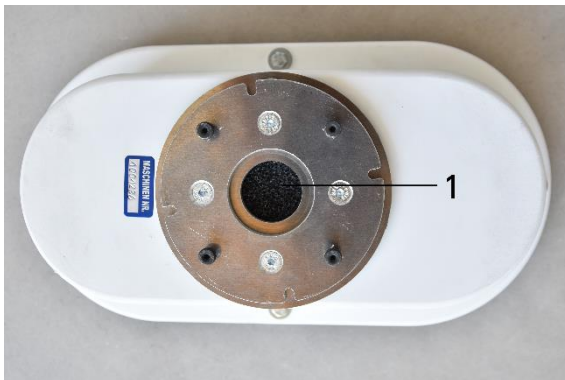
Maintenance and repairs may only be carried out by qualified personnel. Constructive or functional changes or additions are only permitted with the manufacturer's written approval.

6.2.1 Clean/replace the prefilters

Requirements

Vacuum lifter switched off

1. Detach suction foot from the control head. See section „Fastening/changing suction foot“.



(1) Prefilter

2. Remove and clean prefilter (1). This depends on the type of dirt (wood chips, dust, etc.) Thoroughly clean the prefilter (1) with a small compressor, flushing medium or air filter cleaner.
3. Replace prefilter (1) if very dirty.
→ Prefilter was cleaned or replaced.

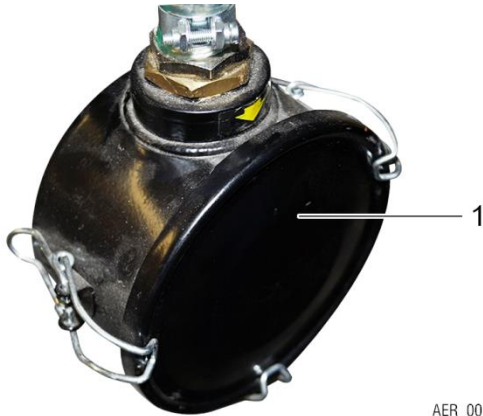
6.2.2 Clean/replace the vacuum filter

Requirements

Vacuum pump/blower switched off

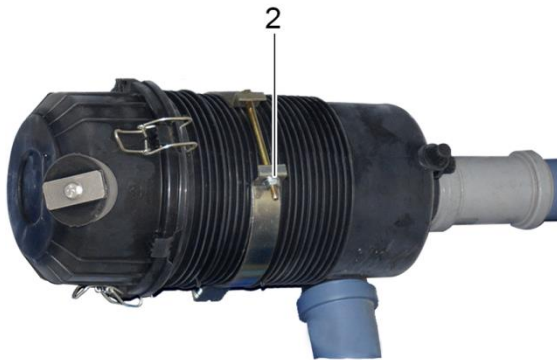
1. Open vacuum filter of the blower (2) or the vacuum pump (1).

(1) Vacuum filter of vacuum pump



AER_0017

(2) Vacuum filter of blower



AER_0018

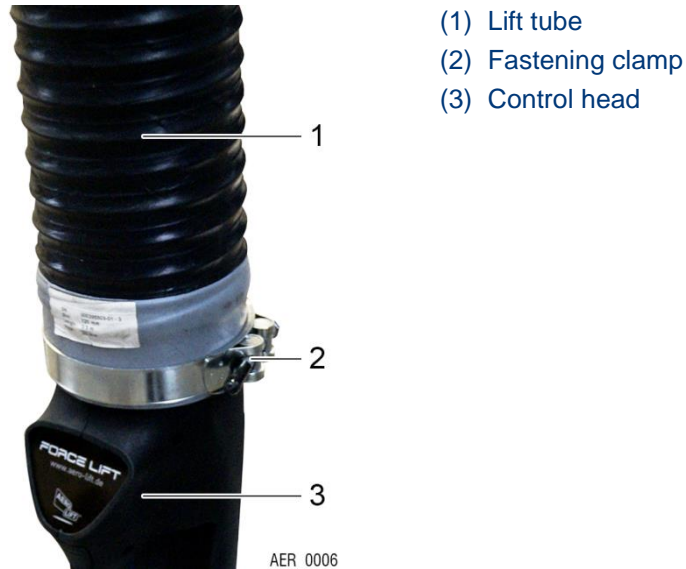
2. Remove filter insert and clean. This depends on the type of dirt (wood chips, dust, etc.) Thoroughly clean the vacuum filter (1,2) with a small compressor, flushing medium or air filter cleaner.
3. Replace the vacuum filter (1,2) if very contaminated.
→ Vacuum filter was cleaned or replaced.

6.2.3 Replace lift tube

Requirements

Vacuum lifter switched off

1. Loosen fastening clamp (2) at the bottom and put down the control head (3).



2. Remove spiral wire from the lift tube (1) at the cup with the ball bearing on top (suspension).
3. Put down the old lift tube (1).
4. Fasten the new lift tube to the cup with the ball bearing on top (suspension) in a positive-fit manner. In this case, screw the wire spiral onto the groove. Make sure that the closure is airtight!
5. Fasten the new lift tube to the control head (3) with the clamp (2). To do so, pull the lift tube over the control head. Make sure that the closure is airtight!

→ Lift tube was replaced.

WARNING!



Moving parts!

Crushing of fingers / hands when moving or adjusting the position of the suction plates, during mounting or operation may lead to injuries.



- ✓ Do NOT touch or reach between individual suction plates (double-rectangular suction foot), quick-changing coupling and suction foot or between other components!
- ✓ Carefully install the vacuum lifter.
- ✓ Always wear personal protective equipment when installing and making adjustments!

7 Transport, setup and storage

DANGER!



Suspended loads!

Risk of crushing, shearing and other injuries due to falling or moving parts during transport of the machine or machine parts and during operation.

Risk when moving loads!



- ✓ Do NOT stand under suspended loads and do not climb on suspended loads!
- ✓ Use suitable lifting gear and load handling attachments that are approved for transport and the weight!
- ✓ Wear personal protective equipment.
- ✓ Move goods carefully and pick up load at its center of gravity.
- ✓ Persons may NOT stay in the transport area.

Transport

The device can be transported manually (weight approx. 2.4 kg). Only use the original packaging for transport. Carefully raise the vacuum tube lifter and transport! Exercise care when transporting vacuum pump/vacuum blower and other heavy machine parts.

Start-up

Start up the machine at a clean and dry location. Maintain the permissible ambient temperature!

Storage

In case of prolonged non-use, store the device in a clean and dry location. Protect the device from the effects of weather, chemical substances (e.g. acids, bases) and vapors.

For storage, let the vacuum lifter to hang or attach it to the edge of the used crane or jib (1).

(1) Vacuum lifter



Suction feet

Carefully put the suction feet down. Place in storage at a temperature of 15 to 25° C and keep away from direct heat sources.

NOTE

Placement of suction feet

Do not store or place the suction feet with the seal facing down! Placing the suction feet with seal facing down can damage the seals.

8 Disassembly and disposal

The legal regulations that apply for waste disposal at the site of use must be observed.

10 Annex

Appendix No.	Document	Manufacturer
1	Operating instructions of vacuum generator	AERO-LIFT Vakuumtechnik GmbH

Vacuum pump operationg instructions

Betriebsanleitung
Operating Instructions
Instructions de service
Istruzioni d'uso
Handleiding
Instrucciones para el manejo
Manual de instruções
Naudojimosi instrukcija
Kasutusjuhend
Lietošanas instrukcija
Driftsinstruks
Driftsinstruktioner
Käyttöohje
Driftsvejledning
Instrukcja obsługi

Kezelési útmutató
Návod k obsluze
Navodilo za uporabo
Návod na obsluhu
Upute za rad
Manual de operatii
Treoracha Oibriúcháin
Οδηγίες χρήσης
El Kitabi
Инструкции за експлоатация
Инструкция по эксплуатации
取扱説明書
사용설명서
使用说明书


VAL 50T

2006/42/EG




 	 		 MAX. VACUUM	 mbar
 AIR	 	 	 MAX. V	 m³/h $L_{pA} = 67 \text{ dB(A)} - 50\text{Hz}$ $L_{pA} = 72 \text{ dB(A)} - 60\text{Hz}$ $K_{pA} = 3 \text{ dB(A)}$
			DIN EN ISO 3744	

		$A > 100\text{mm}$ $A > 4"$	 $> 5^\circ\text{C}/41^\circ\text{F}$ $< 45^\circ\text{C}/113^\circ\text{F}$	 max. 90%	 max. 800m
 1 39 kg 85 lbs		 2			



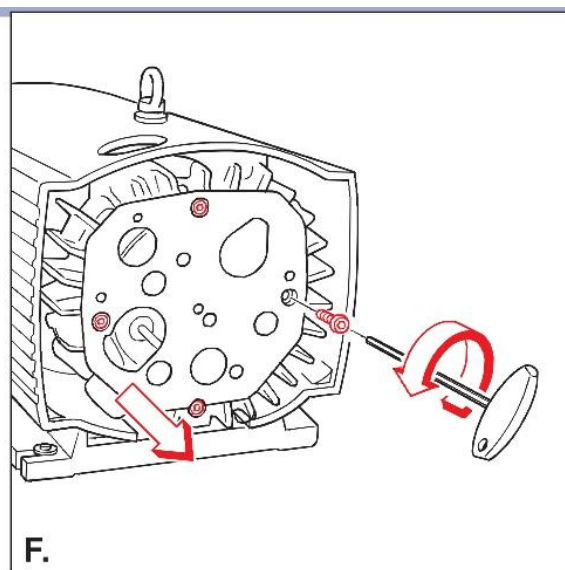

F1: D: 64 mm
H: 70 mm

No.: _____

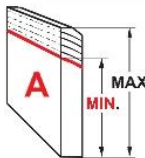


EN149 - FFP3
42 CFR 84 - N100


E.

3000 h



Standard
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VT 4.40/0-90
A_{MIN} = 33mm

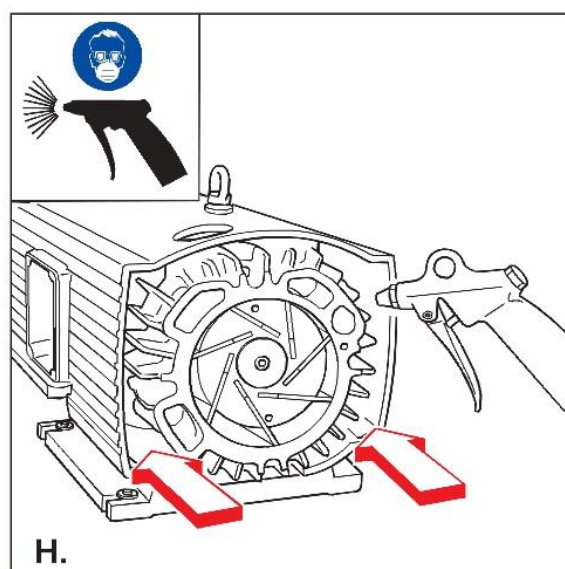


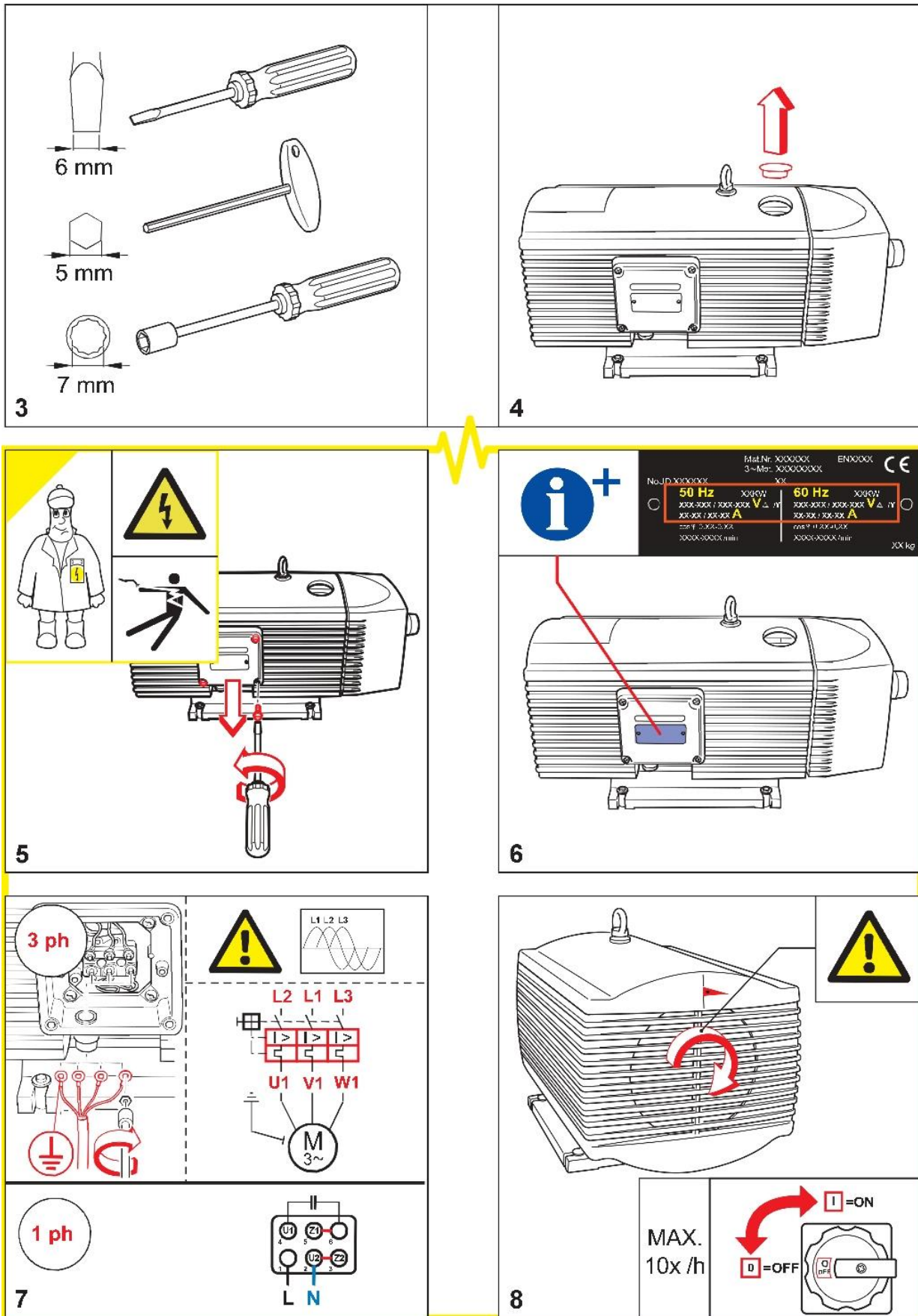
A < A_{MIN}

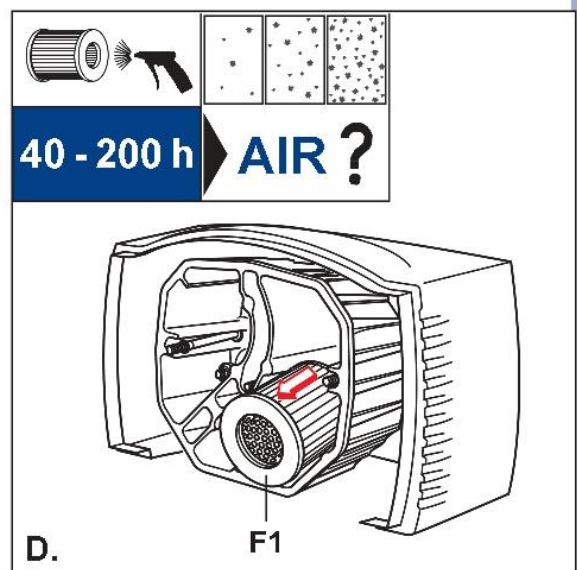
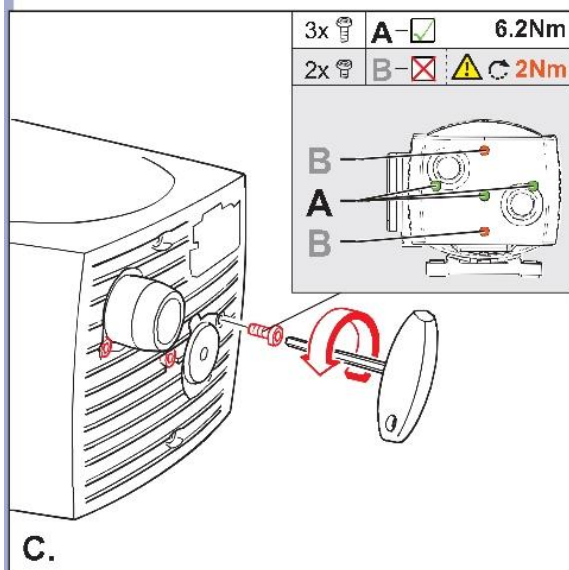
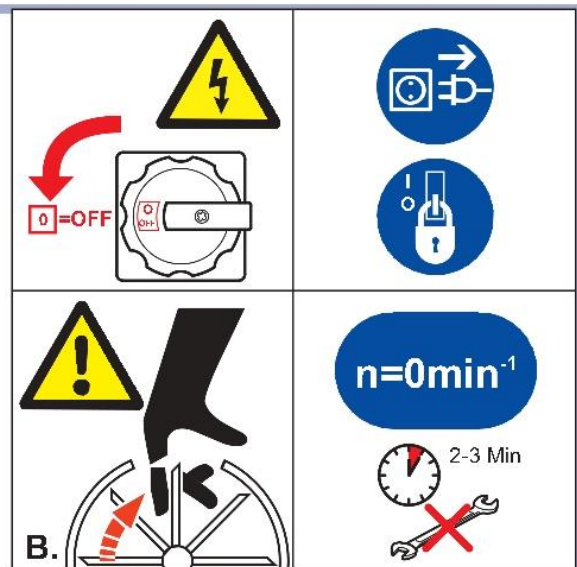
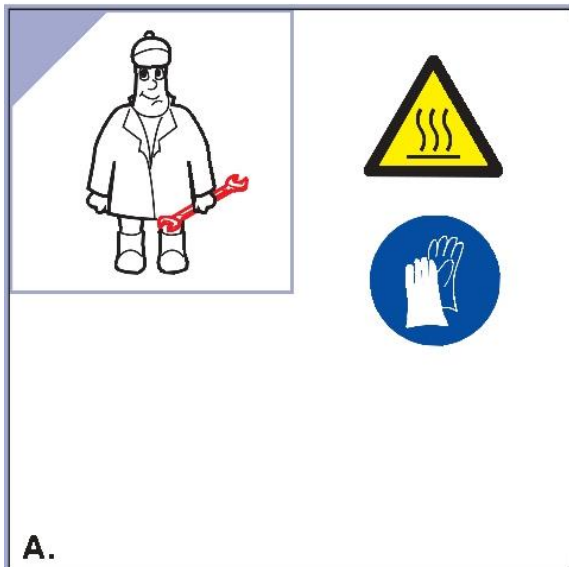
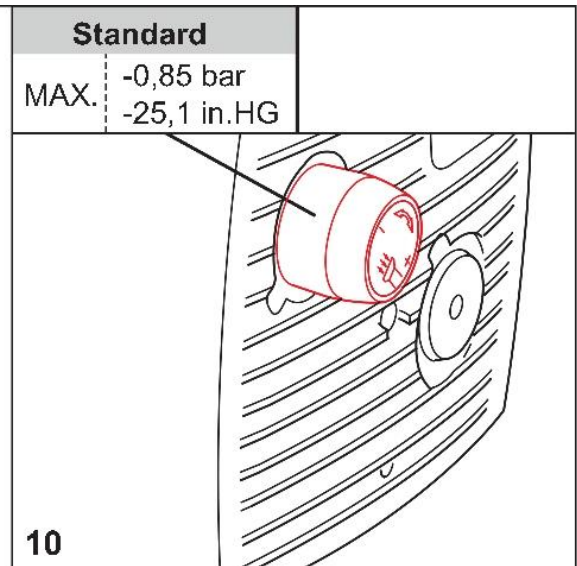
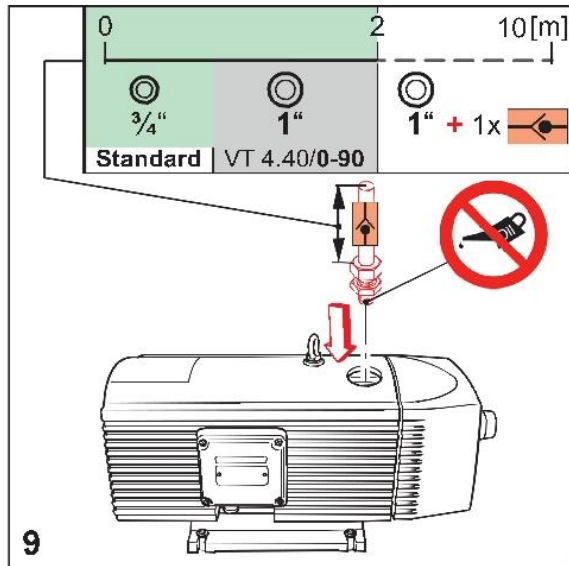
Standard → No. (SET)

VT 4.40/0-90
(Index B) → No. 90139700007 (SET)

G.







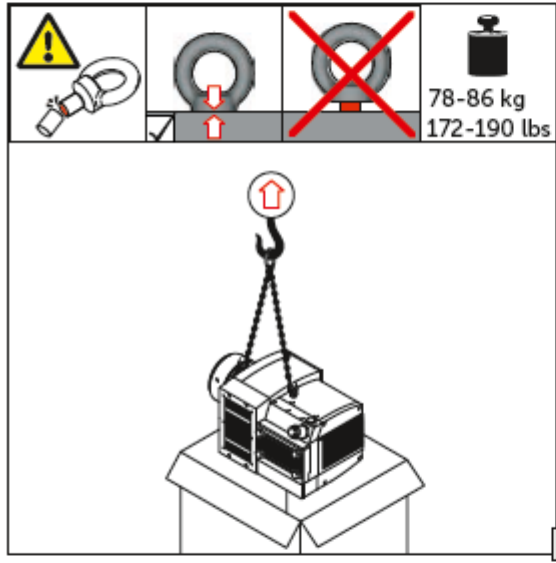
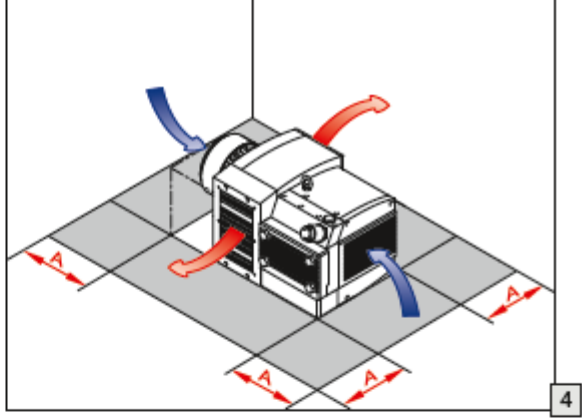
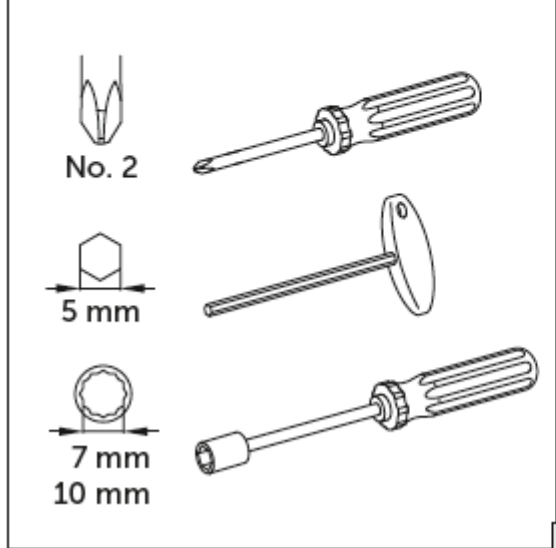
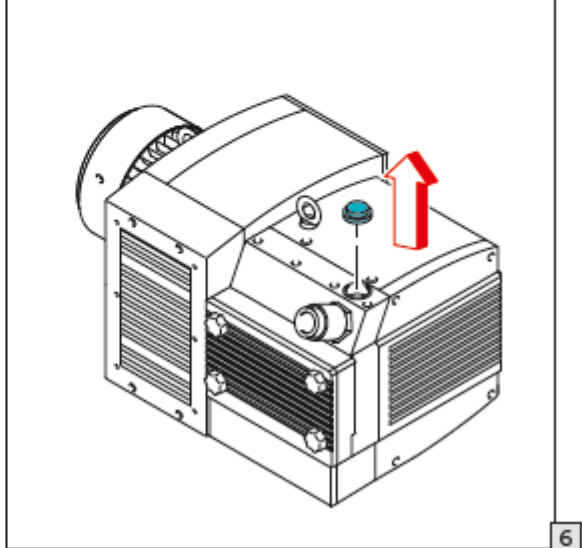


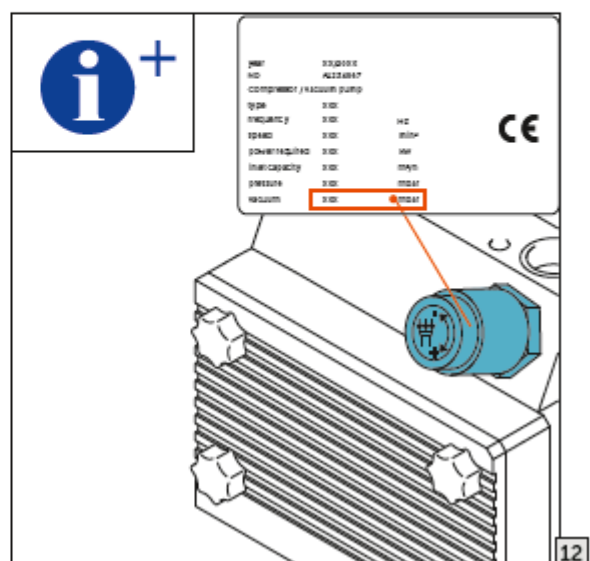
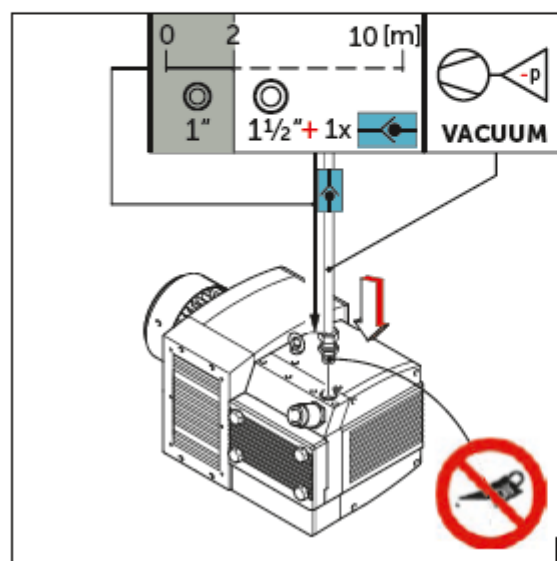
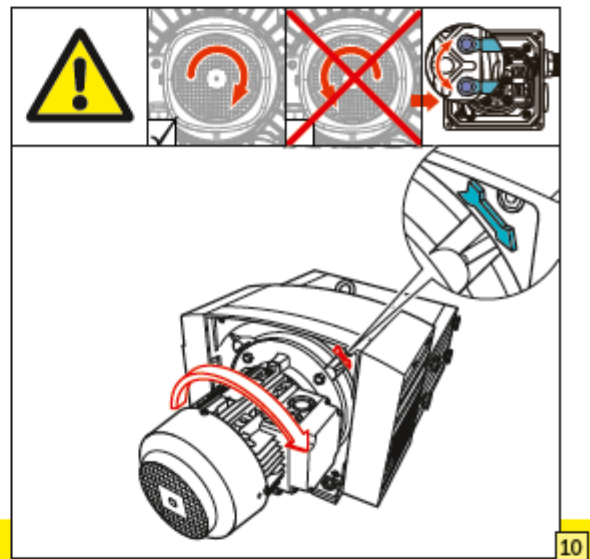
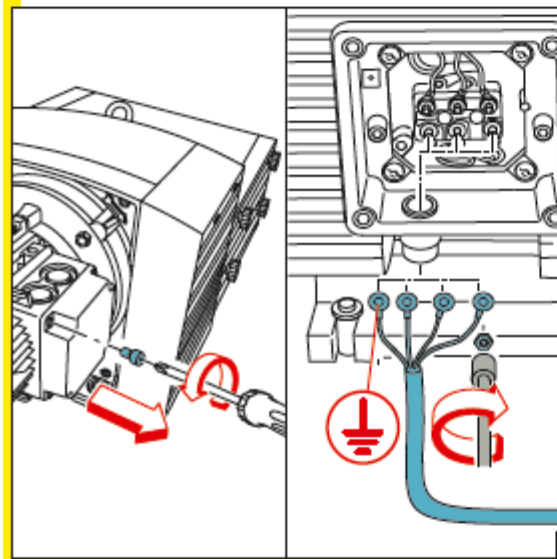
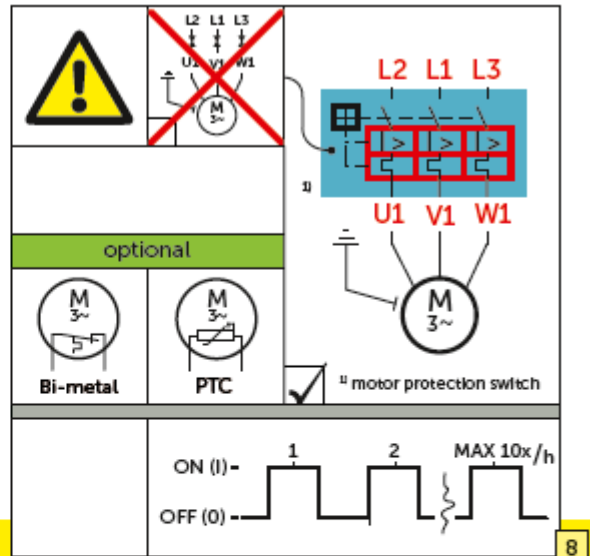
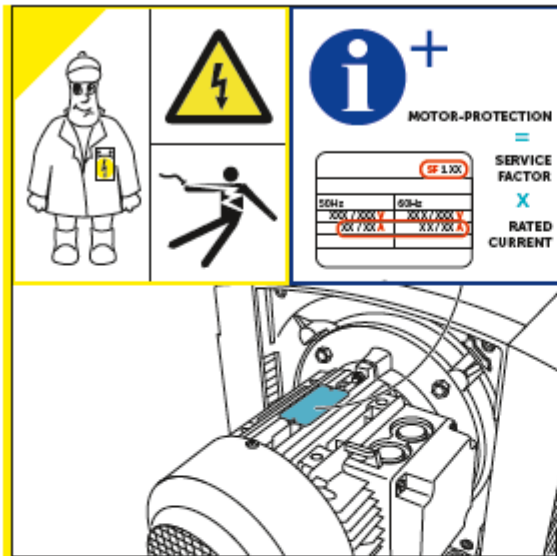
**BETRIEBSANLEITUNG
OPERATING INSTRUCTIONS
INSTRUCTIONS DE SERVICE
ISTRUZIONI D'USO
HANDLEIDING
INSTRUCCIONES PARA EL MANEJO
MANUAL DE INSTRUÇÕES
NAUDOJIMOSI INSTRUKCIJA
KASUTUSJUHEND
LIETOŠANAS INSTRUKCIJA
DRIFTSINSTRUKS
DRIFTSINSTRUKTIONER
DRIFTSVEJLEDNING
INSTRUKCJA OBSŁUGI**














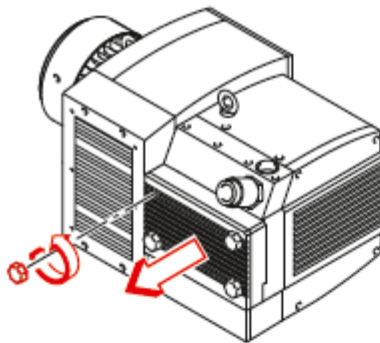
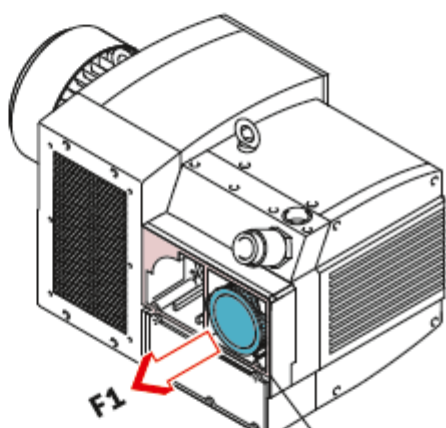

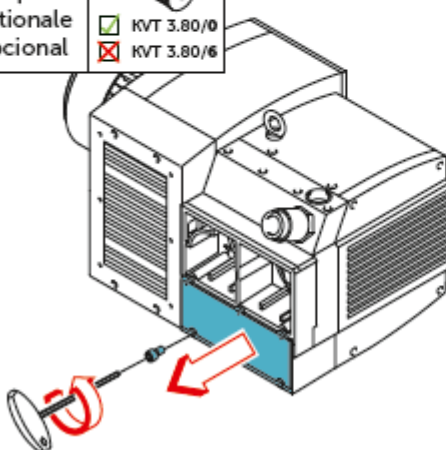
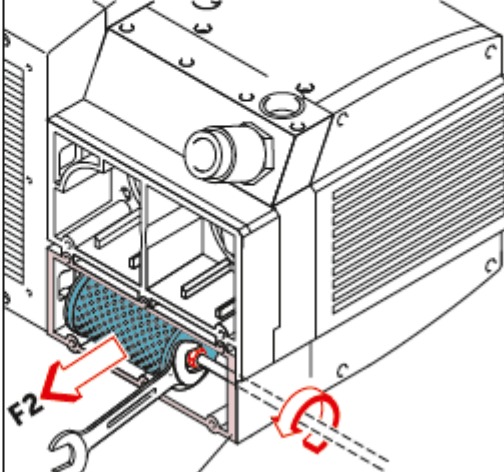


VAL 80T

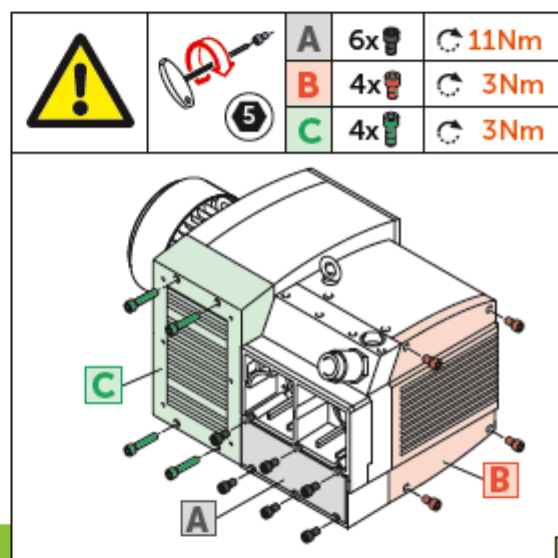
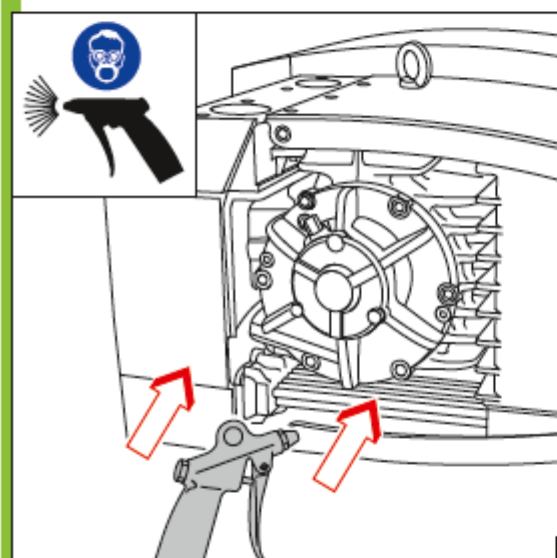
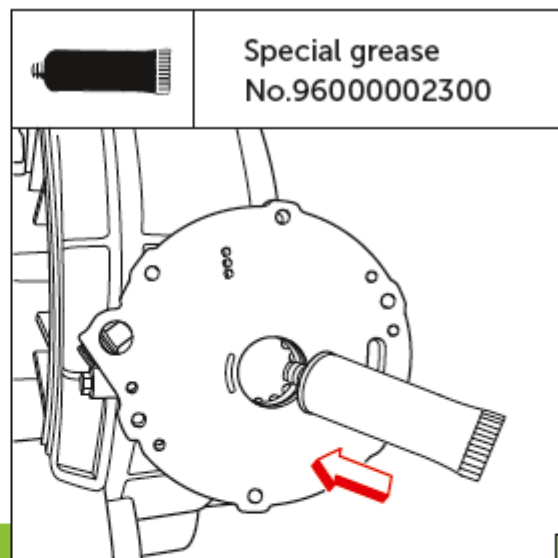
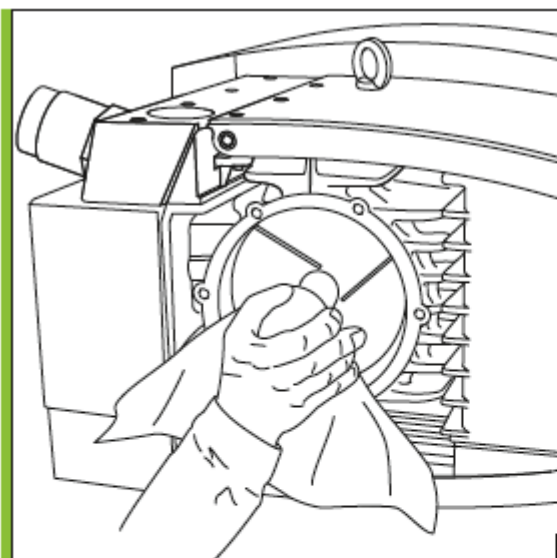


	<p>MAX. VACUUM</p>  <p>L_{pA}))) DIN EN ISO 11203 Accuracy Class 2 K_{pA} = 3 dB(A) 14-1m</p> <p>L_{pA} = 72 dB(A) - 50Hz L_{pA} = 75 dB(A) - 60Hz</p> <p>MAX. VACUUM mbar</p> <p>MAX. V m³/h</p>
	<p>A > 100mm A > 4"</p> <p>> 5°C/41°F < 45°C/113°F</p> <p>max. 90%</p> <p>max. 800m</p> 
	



<p>Maintenance</p> 	 	 	 	
	 	<p>n=0min⁻¹</p> 	13	14
<div data-bbox="234 866 383 1008">  <p>CLEANING INTERVAL</p> </div> <div data-bbox="394 866 622 1008"> <p>SUCTION AIR</p>  <p>40h ↕ 200h</p> </div> <div data-bbox="633 866 777 1008">  <p>EN149 - FFP3 42 CFR 84 - N100</p> </div> 	 <p>D1 (Pos. 75)</p>	15	16	
<p>optional en option optionale opcional</p> <div data-bbox="394 1456 505 1583">  <p>✓ KVT 3.80/0 ✗ KVT 3.80/6</p> </div> 	 <p>D2 (Pos. 104)</p>	17	18	

F1 (standard)	F1* (polyester) KVT 3.80/6 F2 (standard)	
	Satz / Kit Pos.: 20, 24, 62, 75, 76, 85, 104, 125, 126, 146, 288	





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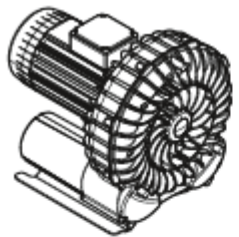


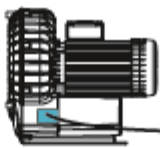
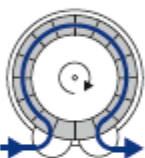




HEBEN
FIXIEREN BEWEGEN
VAKUUMHEBETECHNIK




**BETRIEBSANLEITUNG
OPERATING INSTRUCTIONS
INSTRUCTIONS DE SERVICE
ISTRUZIONI D'USO
HANDLEIDING
INSTRUCCIONES PARA EL MANEJO
MANUAL DE INSTRUÇÕES
NAUDOJIMOSI INSTRUKCIJA
KASUTUSJUHEND
LIETOŠANAS INSTRUKCIJA
DRIFTSINSTRUKS
DRIFTSINSTRUKTIONER
DRIFTSVEJLEDNING
INSTRUKCJA OBSŁUGI**

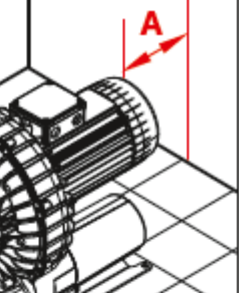


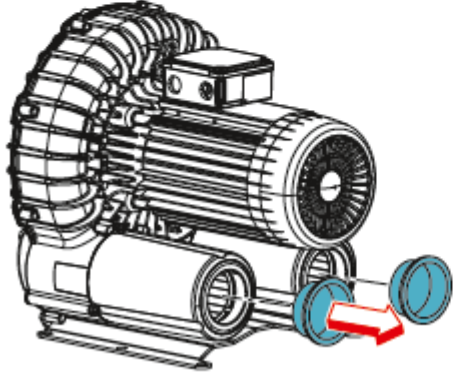
AL SV400/2

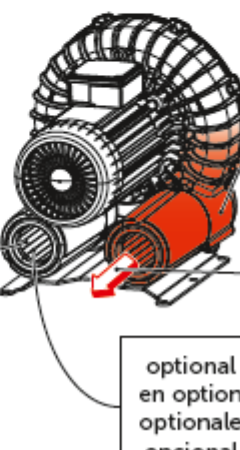






 	 	 <table border="1" data-bbox="997 302 1244 448"> <tr> <th colspan="2">NO</th> <th colspan="2">YES</th> </tr> <tr> <td>CE</td> <td>mark</td> <td>mark</td> <td>mark</td> </tr> <tr> <td>type</td> <td>mark</td> <td>mark</td> <td>mark</td> </tr> <tr> <td>serial number</td> <td>mark</td> <td>mark</td> <td>mark</td> </tr> <tr> <td>year of manufacture</td> <td>mark</td> <td>mark</td> <td>mark</td> </tr> <tr> <td>pressure</td> <td>mark</td> <td>mark</td> <td>mark</td> </tr> <tr> <td>vacuum</td> <td>mark</td> <td>mark</td> <td>mark</td> </tr> </table>	NO		YES		CE	mark	mark	mark	type	mark	mark	mark	serial number	mark	mark	mark	year of manufacture	mark	mark	mark	pressure	mark	mark	mark	vacuum	mark	mark	mark
NO		YES																												
CE	mark	mark	mark																											
type	mark	mark	mark																											
serial number	mark	mark	mark																											
year of manufacture	mark	mark	mark																											
pressure	mark	mark	mark																											
vacuum	mark	mark	mark																											
 <p>AIR</p>	   	<p>DIN EN ISO 11203 Accuracy Class 2 $K_{pA} = 3 \text{ dB(A)}$ $r \leftarrow 1\text{m}$</p> <p>SV 400/1 (Pressure) ▶ 50/60 Hz, +267/+250 mbar $L_{pA} = 76.8/76.1 \text{ dB(A)}$</p> <p>SV 400/1 (Vacuum) ▶ 50/60 Hz, -200/-200 mbar $L_{pA} = 74.5/74.0 \text{ dB(A)}$</p> <p>SV 400/2 (Pressure) ▶ 50/60 Hz, +360/+330 mbar $L_{pA} = 73.1/75.1 \text{ dB(A)}$</p> <p>SV 400/2 (Vacuum) ▶ 50/60 Hz, -260/-260 mbar $L_{pA} = 71.1/73.0 \text{ dB(A)}$</p>																												

<p>static inst. ①-③</p>	<p>dynamic installation Gebr. BECKER</p>
	
<p>The pump must be securely mounted at the place of installation. Physikal tension on the blower housing must be avoided.</p>	 <p>44-57 kg 97-126 lbs</p>

<p>40°C/104°F -10°C/14°F</p> <p>INLET AIR</p> <p>40°C/104°F 0°C/32°F</p>	<p>optional en option optionale optional + Filter</p> <p>A > 100mm A > 4"</p> <p>B > 295mm B > 11½"</p>
<p>max. 800m</p> <p>max. 90%</p>	



<p>VACUUM</p>		<p>PRESSURE</p>
	 <p>AIR</p> <p>>100°C >212°F</p> <p>optional en option optionale optional</p>	




i+


Frequency > 60Hz
Please consult


GENERAL

ADDITIONAL $M_{3\sim} \geq 5.5 \text{ kW}$




RECOMMENDATION

A  Softstart

B 

OPTIONAL

PTC 

GENERAL

ADDITIONAL

RECOMMENDATION

OPTIONAL

GENERAL

ADDITIONAL

RECOMMENDATION

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RECOMMENDATION





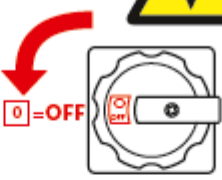









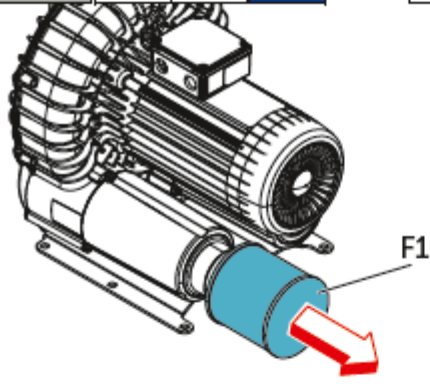
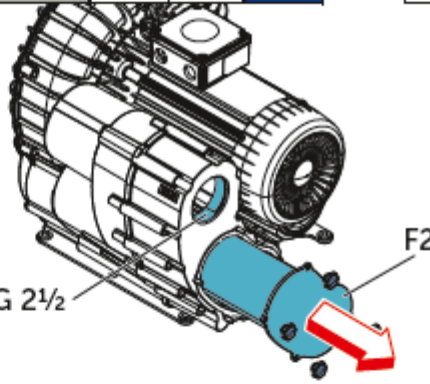





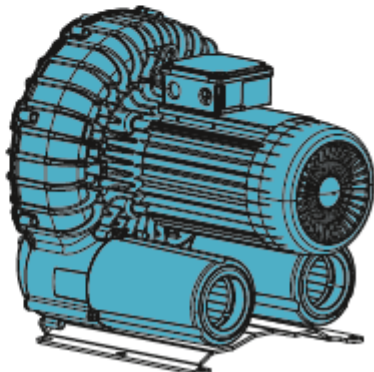
OPTIONAL

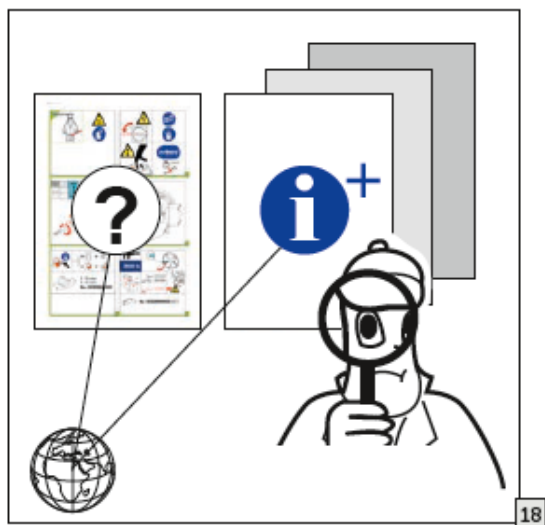
GENERAL

ADDITIONAL

RECOMMENDATION

The diagram illustrates a vacuum pump system. A central manifold, labeled **G 3**, is connected to two vacuum pumps. The left pump is associated with a **PRESSURE** symbol (a circle with a triangle and a plus sign), and the right pump is associated with a **VACUUM** symbol (a circle with a triangle and a minus sign). Red arrows indicate the flow direction from the manifold to the pumps. Safety symbols (no fire, no open flame) are shown above the manifold.

<p>Maintenance</p> 	 	 	 		
		 	<p>n=0min⁻¹</p> 		
12	13				
 <p>CLEANING INTERVAL</p>	<p>SUCTION AIR</p>  <p>40h ↑↓ 200h</p>	<p>PRESSURE</p> <p>optional en option optional optional</p>	 <p>CLEANING INTERVAL</p>	<p>SUCTION AIR</p>  <p>40h ↑↓ 200h</p>	<p>VACUUM PRESSURE</p> <p>optional en option optional optional</p>
 <p>F1</p>	14	 <p>F2</p> <p>G 2½</p>	15		
 <p>F1: PRESSURE</p> <p>F2: VACUUM</p> <hr/> <p>+ PRESSURE</p> <hr/>  <p>EN149 - FFP3 42 CFR 84 - N100</p>	16	   	17		



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