

Instruction Manual

SECO

Dry-running Rotary Vane Vacuum Pumps

SV 1010 C, SV 1016 C, SV 1025 C, SV 1040 C

SD 1010 C, SD 1016 C, SD 1025 C, SD 1040 C

DC 0025 C, DC 0040 C



Busch Vyroba CZ s.r.o.
Svárovská 620, CZ 460 01, Liberec 11
Czech Republic

Get technical data,
instruction manuals,
service kits



VACUUM APP

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1 Safety

Prior to handling the machine, this instruction manual should be read and understood. If anything needs to be clarified, please contact your Busch representative.

Read this manual carefully before use and keep for future reference.

This instruction manual remains valid as long as the customer does not change anything on the product.

The machine is intended for industrial use. It must be handled only by technically trained personnel.

Always wear appropriate personal protective equipment in accordance with the local regulations.

The machine has been designed and manufactured according to state-of-the-art methods. Nevertheless, residual risks may remain. This instruction manual highlights potential hazards where appropriate. Safety notes and warning messages are tagged with one of the keywords DANGER, WARNING, CAUTION, NOTICE and NOTE as follows:

DANGER

... indicates an imminent dangerous situation that will result in death or serious injuries if not prevented.

WARNING

... indicates a potentially dangerous situation that could result in death or serious injuries.

CAUTION

... indicates a potentially dangerous situation that could result in minor injuries.

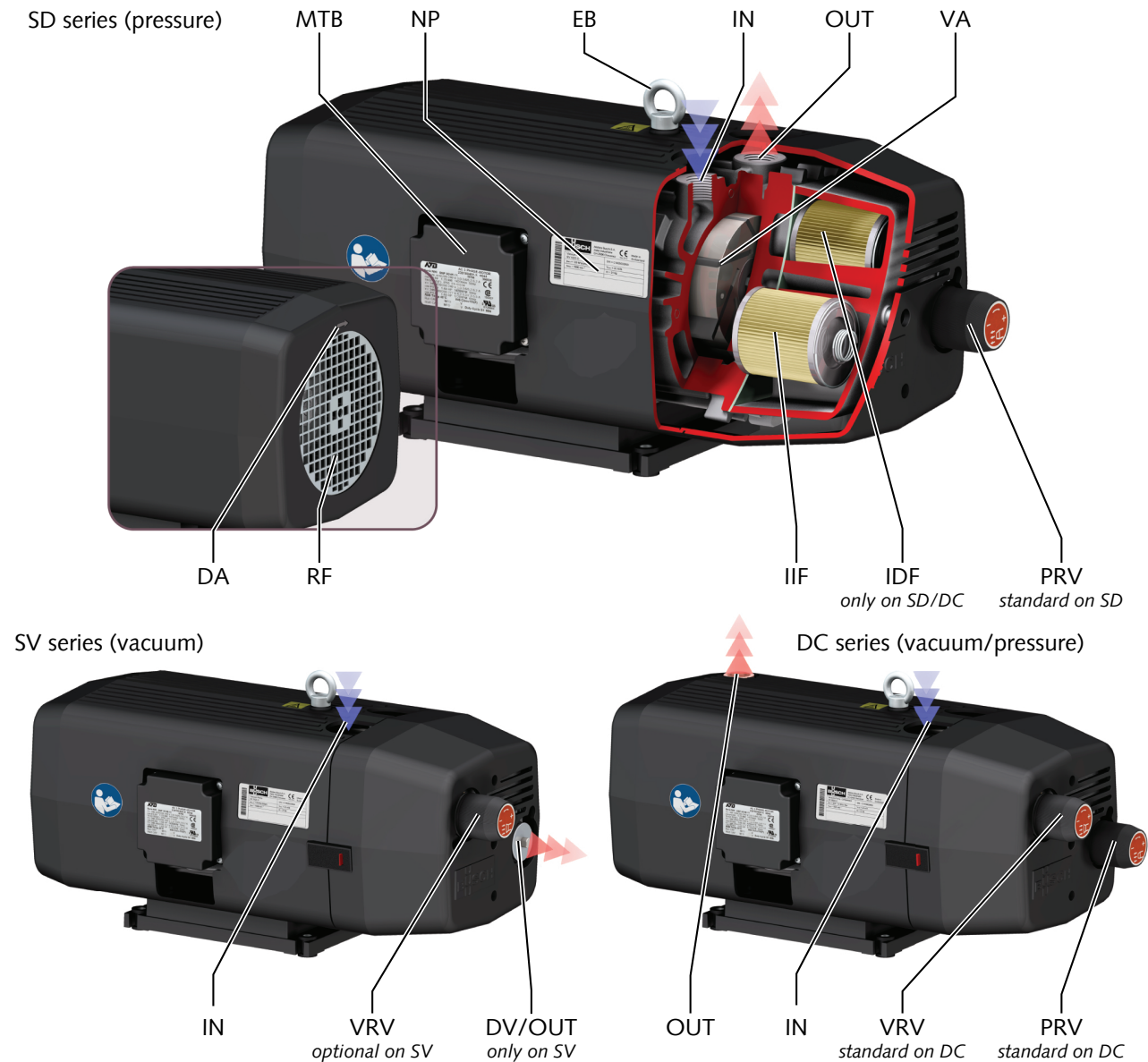
NOTICE

... indicates a potentially dangerous situation that could result in damage to property.

NOTE

... indicates helpful tips and recommendations, as well as information for efficient and trouble-free operation.

2 Product Description



IN	Suction connection	MTB	Motor terminal box
OUT	Discharge connection	DA	Directional arrow
VA	Vane	NP	Nameplate
IIF	Internal inlet filter	VRV	Vacuum regulating valve
IDF	Internal discharge filter	PRV	Pressure regulating valve
EB	Eye bolt	DV	Discharge valve
RF	Radial fan		

NOTE

Technical term.

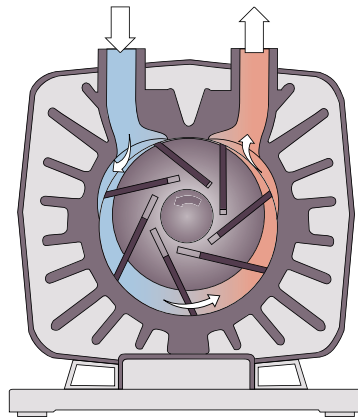
In this instruction manual, we consider that the term 'machine' refers to the 'vacuum pump' or 'compressor'.

NOTE

Illustrations

In this instruction manual the illustrations may differ from the machine appearance.

2.1 Operating Principle



The machine works on the rotary vane principle.

The compression is made without the use of any lubrication whatsoever.

NOTICE

Lubricating a dry running machine (compression chamber).

Risk of damage to the machine!

- Do not lubricate the compression chamber of the machine with oil or grease.

2.2 Application

Conveying of other media leads to an increased thermal and/or mechanical load on the machine and is permissible only after a consultation with Busch.

The machine is intended for the placement in a non-potentially explosive environment.

The machine is capable of maintaining ultimate pressure, see Technical Data [► 22].

The machine is suitable for continuous operation.

Permitted environmental conditions, see Technical Data [► 22].

For heavy duty operation, see Vacuum Regulating Valve [► 5].

2.3 Standard Accessories

2.3.1 Vacuum Regulating Valve

The vacuum regulating valve (VRV) controls inlet pressure when the machine is used on vacuum duties (standard for DC series, optional for SV series and not available for SD series).

For SV 1025 C and SV 1040 C heavy duty operation where machine runs against a closed inlet for a longer time (for example pick & place), we propose to configure the machine with EK 60 vanes together with the vacuum regulation valve (VRV), which should not be fully closed.

2.3.2 Pressure Regulating Valve

The pressure regulating valve (PRV) controls pressure when the machine is used on over-pressure duties (standard for SD and DC series, not available for SV series).

2.4 Optional Accessories

2.4.1 Non-return Valve

A non-return valve, fitted to either the inlet or the discharge line, protects the system against ingress of air or depressurization, should the machine stop for any reason. The installation of non-return valves is recommended if the lines of more than 5 meters are used.

2.4.2 Inlet Filter

The inlet filter protects the machine against dust and other solids in the process gas. The inlet filter is available with a paper or polyester cartridge.

2.4.3 Hose Nipple

A hose nipple, depending on the version, could be fitted to the inlet and/or the discharge line. It allows an easy connection to the machine with a flexible hose.

3 Transport

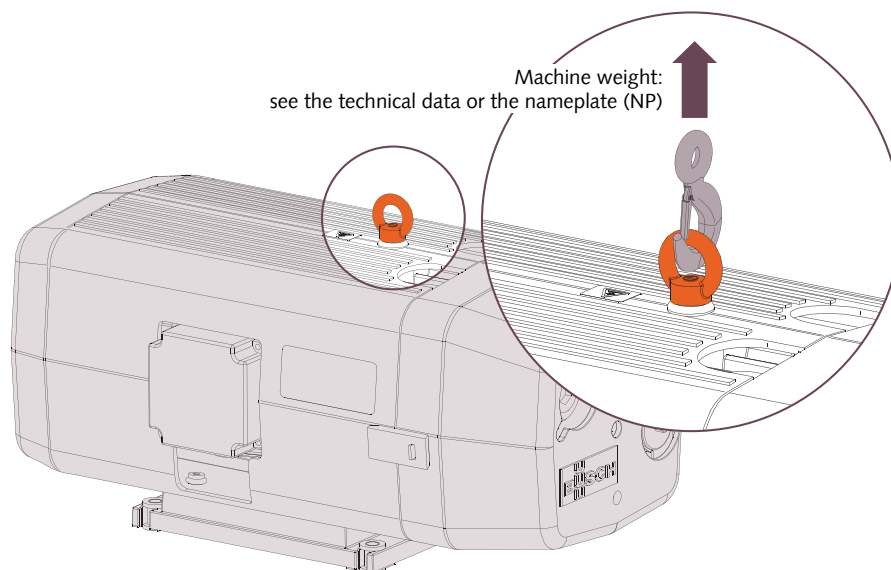


WARNING

Suspended load.

Risk of severe injury!

- Do not walk, stand or work under suspended loads.
- Make sure that the eyebolt(s) (EB) is/are in faultless condition, fully screwed in and tightened by hand.



- Check the machine for transport damage.

If the machine is secured to a base plate:

- Remove the machine from the base plate.

4 Storage

- Seal all apertures with adhesive tape or reuse provided caps.

If the machine is to be stored for more than 3 months:

- Wrap the machine in a corrosion inhibiting film.
- Store the machine indoors, dry, dust free and if possible in original packaging preferably at temperatures between 0 ... 40 °C.

5 Installation

5.1 Installation Conditions



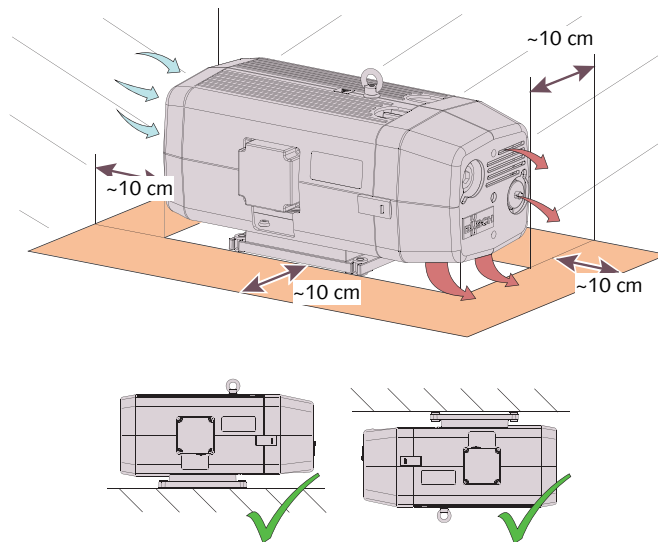
NOTICE

Use of the machine outside of the permitted installation conditions.

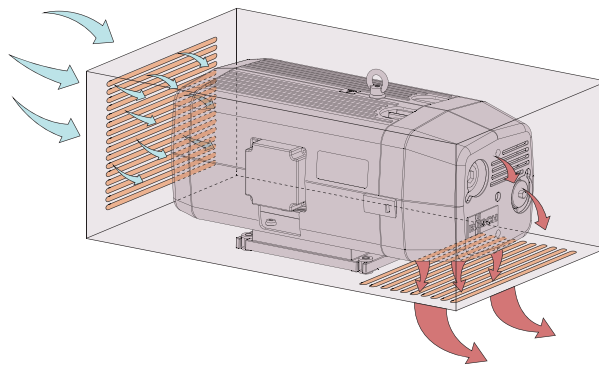
Risk of premature failure!

Loss of efficiency!

- Take care that the installation conditions are fully complied with.



Cabinet design recommendation



- Make sure that the environment of the machine is not potentially explosive.
- Make sure that the ambient conditions comply with the Technical Data [► 22].
- Make sure that the environmental conditions comply with the protection class of the motor and the electrical instruments.
- Make sure that the installation space or location is vented such that sufficient cooling of the machine is provided.
- Make sure that cooling air inlets and outlets are not covered or obstructed and that the cooling air flow is not affected adversely in any other way.
- Make sure that enough space remains for maintenance work.
- Make sure that all provided covers, guards, hoods, etc. are mounted.

If the machine is installed at an altitude greater than 1000 meters above sea level:

- Contact your Busch representative, the motor should be derated or the ambient temperature limited.

5.2 Connecting Lines / Pipes

- Remove all protective covers before installation.
- Make sure that the connection lines cause no stress on the machine's connection; if necessary use flexible joints.
- Make sure that the line size of the connection lines over the entire length is at least as large as the connections of the machine.

In case of long connection lines it is advisable to use larger line sizes in order to avoid a loss of efficiency. Seek advice from your Busch representative.

5.2.1 Suction Connection

NOTICE

Ingress of foreign objects or liquids.

Risk of damage to the machine!

If the inlet gas contains dust or other foreign solid particles:

- Install a suitable filter (5 micron or less) upstream from the machine.

Connection size(s):

- G1/2 for SV/SD 1010-1016 C
- G3/4 for SV/SD 1025-1040 C and DC 0025-0040 C

Depending on the specific order, other connection dimensions may apply.

5.2.2 Discharge Connection

Connection size(s):

- G1/2 for SD 1010-1016 C
- G3/4 for SD 1025-1040 C and DC 0025-0040 C
- No dimension for SV 1010-1040 C ► discharge valve (DV)

Depending on the specific order, other connection dimensions may apply.

- Make sure that the discharged gas will flow without obstruction. Do not shut off or throttle the discharge line.

5.3 Electrical Connection

DANGER

Live wires.

Risk of electrical shock.

- Electrical installation work must only be executed by qualified personnel.
- Make sure that the power supply for the motor is compatible with the data on the nameplate of the motor.
- The electrical installation must comply with applicable national and international standards.
- Provide a lockable disconnect switch on the power line so that the machine is completely secured during maintenance tasks.
- Provide an overload protection according to EN 60204-1 for the motor.
- Make sure that the motor of the machine will not be affected by electric or electromagnetic disturbance from the mains; if necessary seek advice from Busch.
- Connect the protective earth conductor.
- Electrically connect the motor.

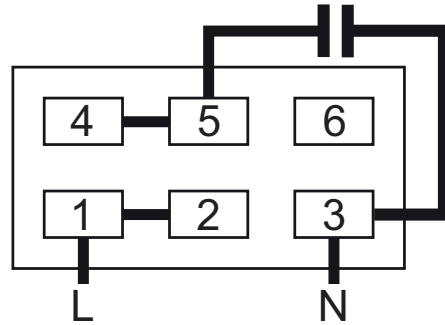
NOTICE

Incorrect connection.

Risk of damage to the motor!

- The wiring diagrams given below are typical. Check the inside of the terminal box for motor connection instructions/diagrams.

5.3.1 Wiring Diagram Single-Phase Motor



5.3.2 Wiring Diagram Three-Phase Motor

! NOTICE

Incorrect direction of rotation.

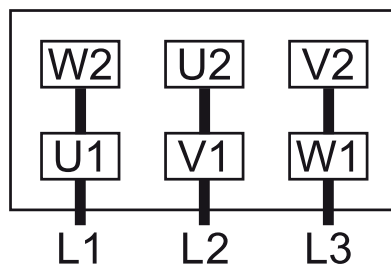
Risk of damage to the machine!

- Operation in the wrong direction of rotation can destroy the machine in a short time! Prior to start-up, ensure that the machine is operated in the right direction.
- Determine the intended direction of rotation with the arrow (stuck on or cast).
- Jog the motor briefly.
- Watch the fan wheel of the motor and determine the direction of rotation just before the fan wheel stops.

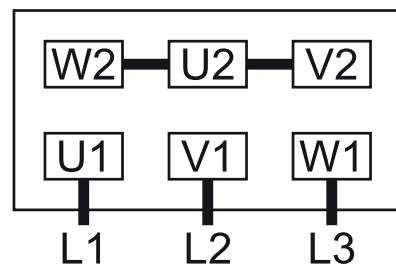
If the rotation of the motor must be changed:

- Switch any two of the motor phase wires.

Delta connection (low voltage):



Star connection (high voltage):



6 Commissioning

NOTICE

Lubricating a dry running machine (compression chamber).

Risk of damage to the machine!

- Do not lubricate the compression chamber of the machine with oil or grease.

CAUTION

During operation the surface of the machine may reach temperatures of more than 70°C.

Risk of burns!

- Avoid contact with the machine during and directly after operation.



CAUTION

Noise of running machine.

Risk of damage to hearing!

If persons are present in the vicinity of a non noise insulated machine over extended periods:

- Make sure that ear protection is being used.
- Make sure that the installation conditions (see Installation Conditions [► 7]) are met.
- Switch on the machine.
- Make sure that the maximum permissible number of starts does not exceed 12 starts per hour. Those starts should be spread within the hour.
- Make sure that the operating conditions comply with the Technical Data [► 22].

As soon as the machine is operated under normal operating conditions:

- Measure the motor current and record it as reference for future maintenance and troubleshooting work.

7 Maintenance



WARNING

Machines contaminated with hazardous material.

Risk of poisoning!

Risk of infection!

If the machine is contaminated with hazardous material:

- Wear appropriate personal protective equipment.

CAUTION

Hot surface.

Risk of burns!

- Prior to any action requiring touching the machine, let the machine cool down first.

NOTICE

Using inappropriate cleaners.

Risk of removing safety stickers and protective paint!

- Do not use incompatible solvents to clean the machine.

CAUTION

Failing to properly maintain the machine.

Risk of injuries!

Risk of premature failure and loss of efficiency!

- Respect the maintenance intervals or ask your Busch representative for service.
- Shut down the machine and lock against inadvertent start up.
- Vent the connected lines to atmospheric pressure.

If necessary:

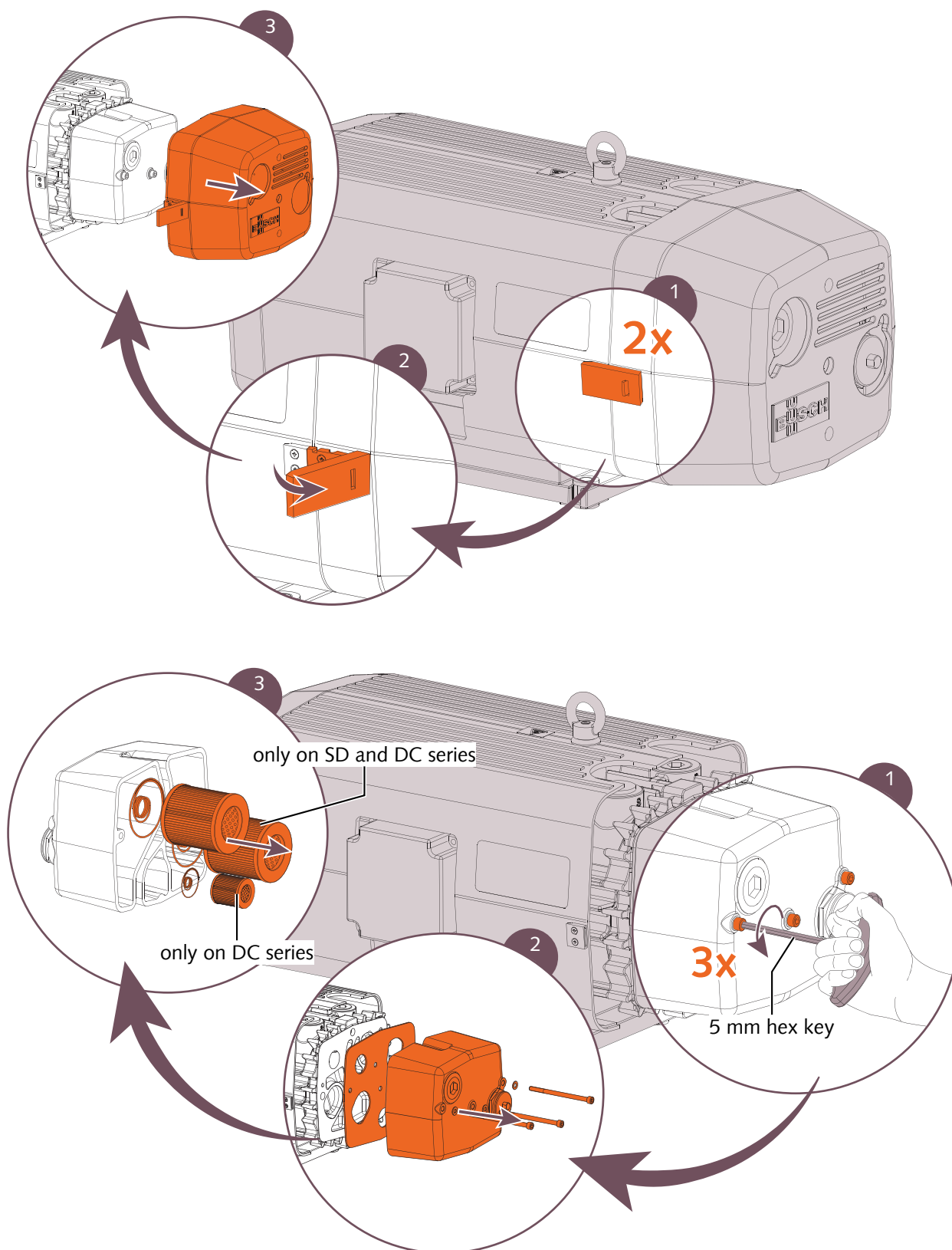
- Disconnect all connections.

7.1 Maintenance Schedule

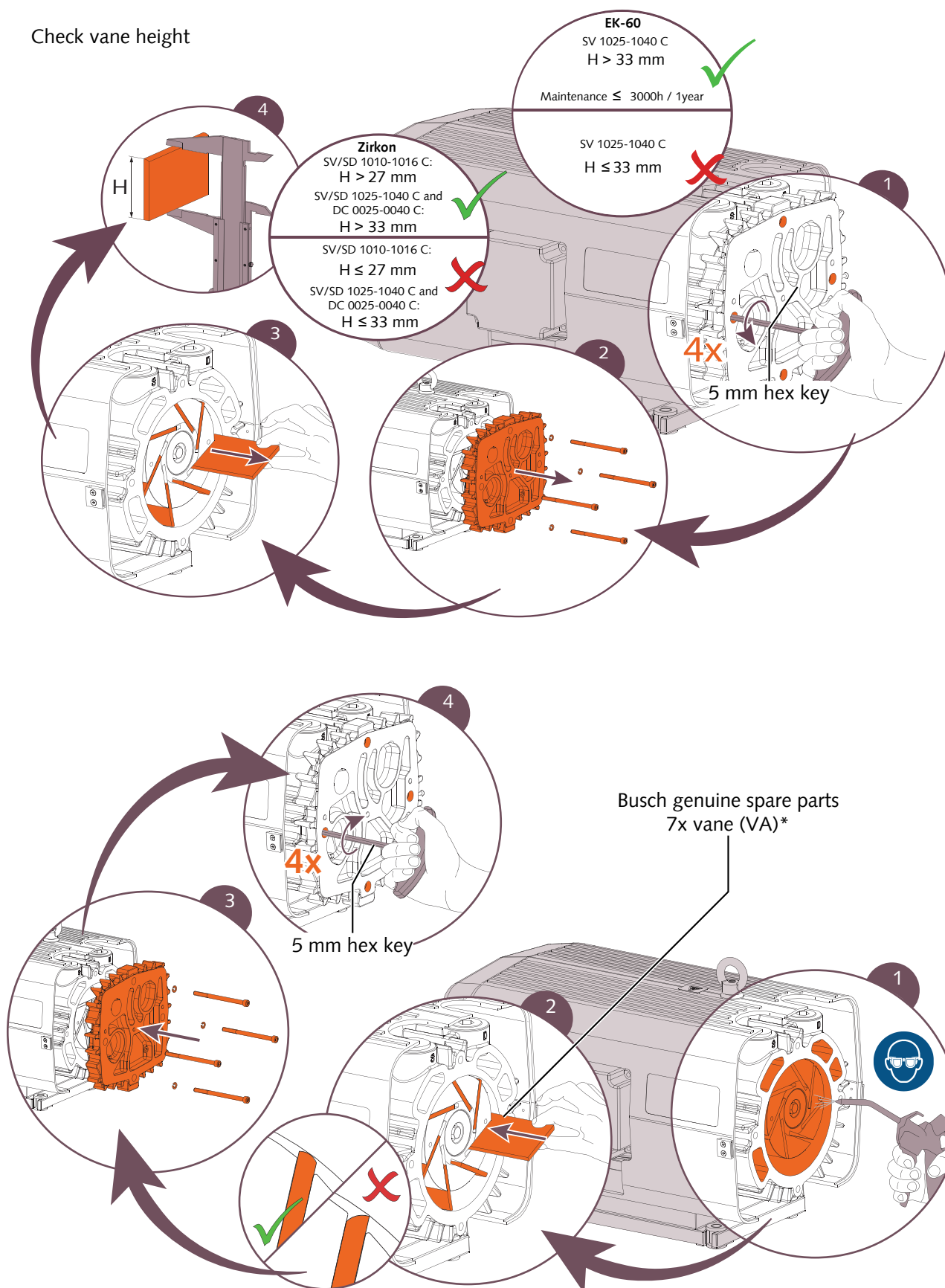
The maintenance intervals depend very much on the individual operating conditions. The intervals given below are considered as starting values which should be shortened or extended as appropriate. Particularly harsh applications or heavy duty operation, such as high dust loads in the environment or in the process gas, other contamination or ingress of process material, can make it necessary to shorten the maintenance intervals significantly.

Material of Vanes	Interval	Maintenance work
Zirkon	Monthly	<ul style="list-style-type: none"> • Clean the machine from dust and dirt. In case of an inlet filter being installed: <ul style="list-style-type: none"> • Check the inlet filter cartridge, replace if necessary.
EK-60		
Zirkon	Every 8000 hours, at the least once a year	<ul style="list-style-type: none"> • Check the vanes (VA) and change them if necessary. • Change the internal filters (IIF / IDF) • Change the felt washer (FW) of the discharge valve (DV) (only on SV series)
EK-60	Every 3000 hours, at the least once a year	

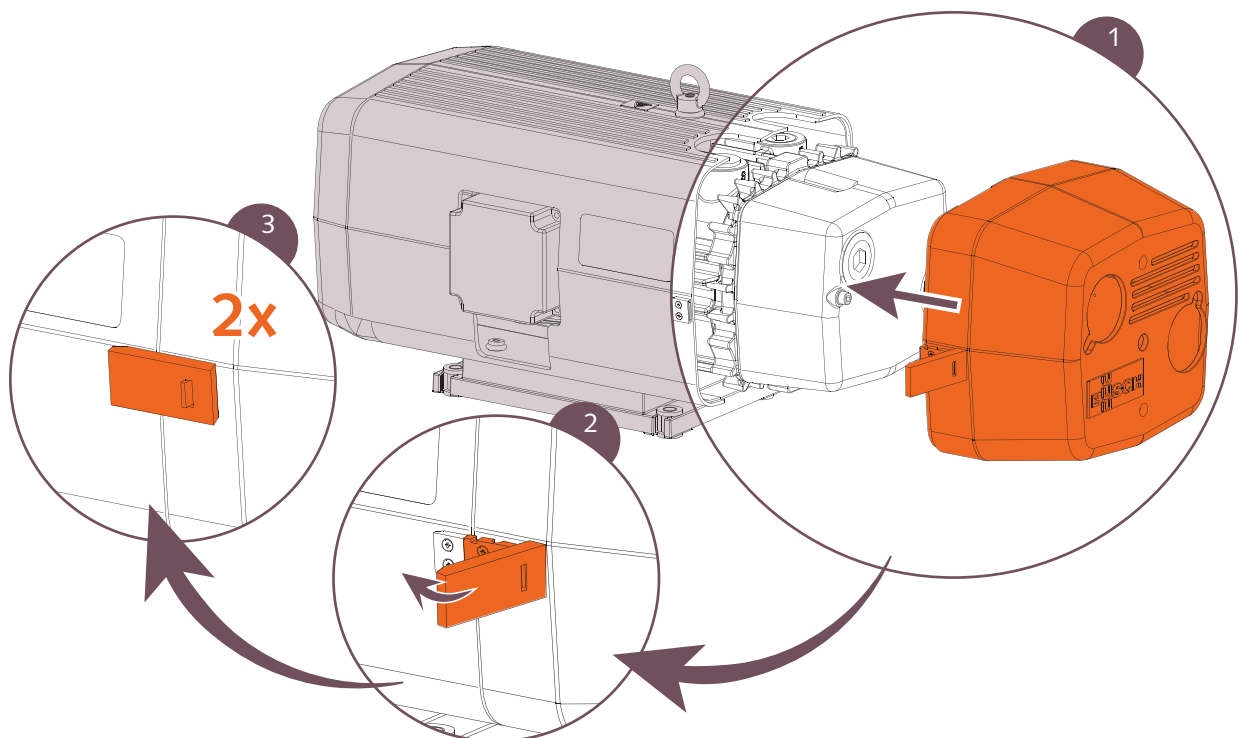
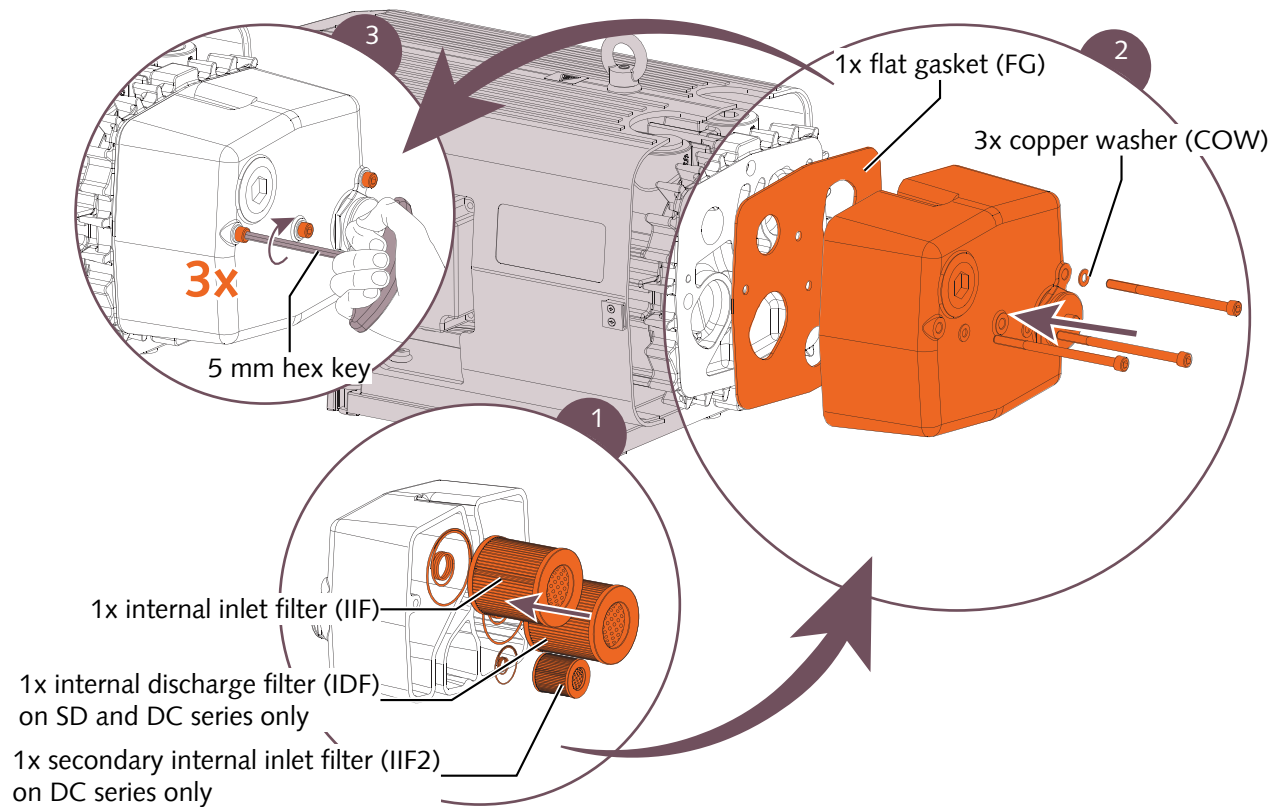
7.2 Change Vanes and Internal Filters



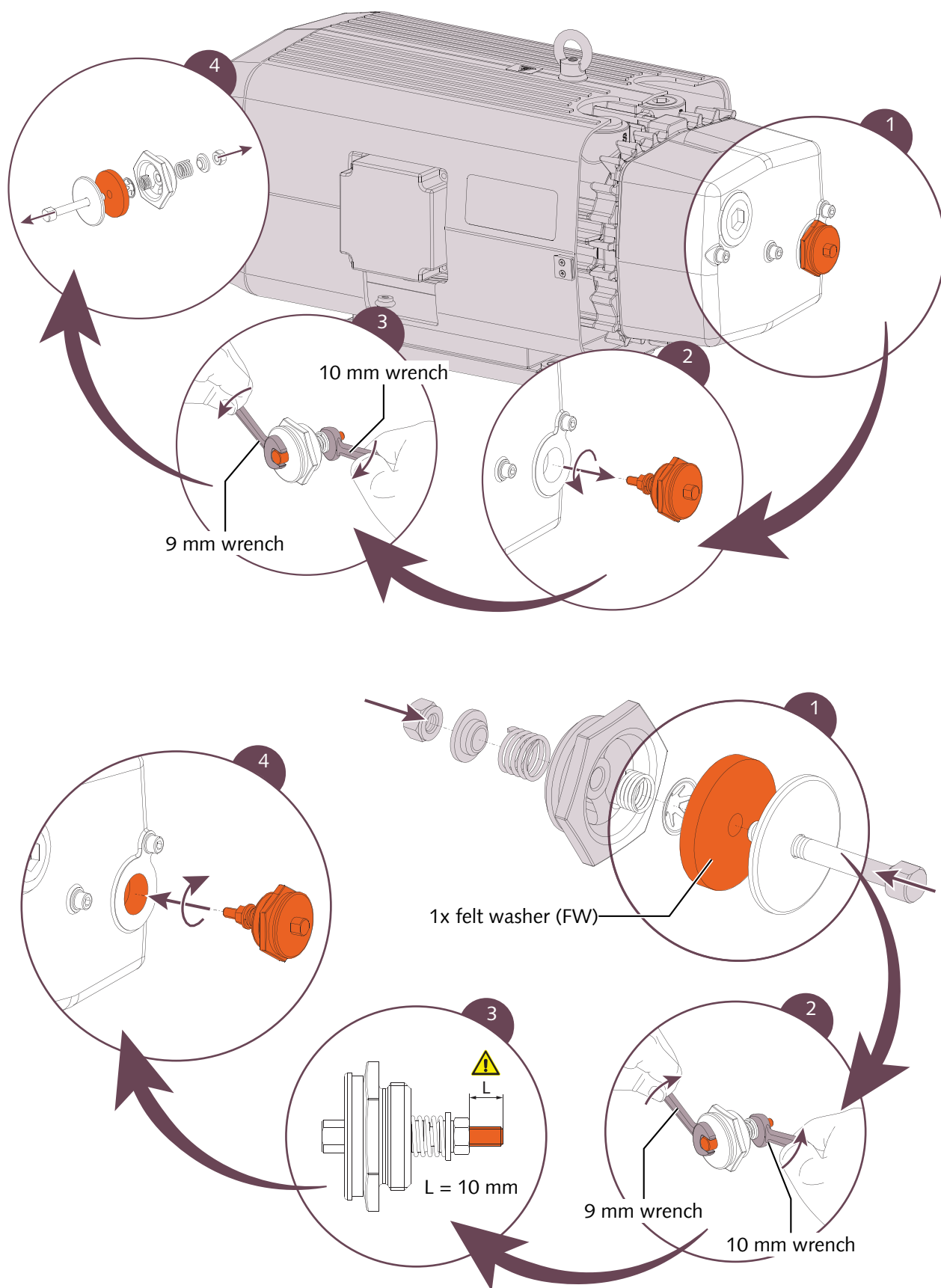
Check vane height



* The vane type acc. to the specification (only for the SV 1025/1040 C)



7.3 Discharge Valve Maintenance (SV version only)



8 Overhaul



WARNING

Machines contaminated with hazardous material.

Risk of poisoning!

Risk of infection!

If the machine is contaminated with hazardous material:

- Wear appropriate personal protective equipment.

NOTICE

Improper assembly.

Risk of premature failure!

Loss of efficiency!

- It is highly recommended that any dismantling of the machine that goes beyond anything that is described in this manual should be done through Busch.

In case of the machine having conveyed gas that was contaminated with foreign materials which are dangerous to health:

- Decontaminate the machine as much as possible and state the contamination status in a 'Declaration of Contamination'.

Busch will only accept machines that come with a completely filled in and legally binding signed 'Declaration of Contamination' (form downloadable from www.buschvacuum.com).

9 Decommissioning

- Shut down the machine and lock against inadvertent start up.
- Vent the connected lines to atmospheric pressure.
- Disconnect all connections.

If the machine is going to be stored:

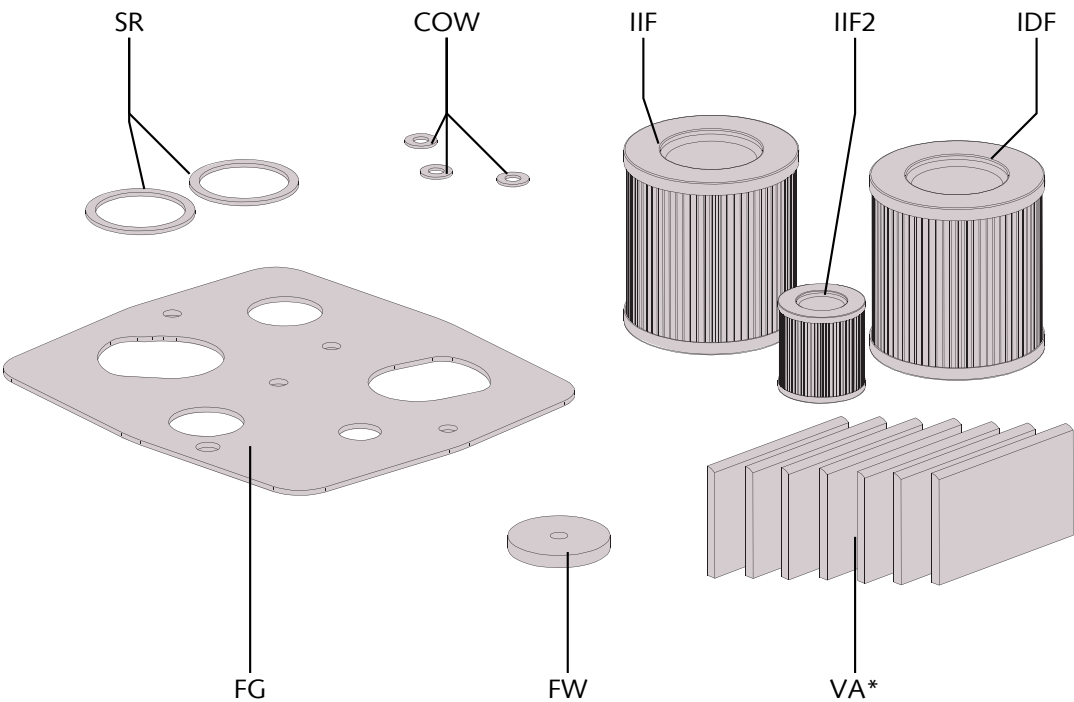
- See Storage [► 7].

9.1 Dismantling and Disposal

- Separate special waste from the machine.
- Dispose of special waste in compliance with applicable regulations.
- Dispose of the machine as scrap metal.

10 Spare Parts

10.1 Overview



COW	Copper washer	FG	Flat gasket
FW	Felt washer	IDF	Internal discharge filter
IIF	Internal inlet filter	IIF2	Secondary internal inlet filter
SR	Sealing ring	VA*	Vane

Refer to the following table (see Available Kits [► 19]) to know the corresponding kit content to your product configuration.

* The vane type acc. to the specification (only for the SV 1025/1040 C)

10.2 Available Kits

Spare parts kit	Description	Part no.
Service kit (SV 1010 C)	Includes: 3x (COW) / 1x (FG) / 1x (FW) / 1x (IIF) / 7x (VA)	0994 567 109
Service kit (SD 1010 C)	Includes: 3x (COW) / 1x (FG) / 1x (IDF) / 1x (IIF) / 1x (SR) / 7x (VA)	0994 567 110
Service kit (SV 1016 C)	Includes: 3x (COW) / 1x (FG) / 1x (FW) / 1x (IIF) / 7x (VA)	0994 567 111
Service kit (SD 1016 C)	Includes: 3x (COW) / 1x (FG) / 1x (IDF) / 1x (IIF) / 1x (SR) / 7x (VA)	0994 567 112
Service kit (SV 1025 C) With Zirkon vanes	Includes: 3x (COW) / 1x (FG) / 1x (FW) / 1x (IIF) / 7x (VA)	0994 567 101
Service kit (SV 1025 C) With EK-60 vanes	Includes: 3x (COW) / 1x (FG) / 1x (FW) / 1x (IIF) / 7x (VA)	0994528979
Service kit (SD 1025 C)	Includes: 3x (COW) / 1x (FG) / 1x (IDF) / 1x (IIF) / 1x (SR) / 7x (VA)	0994 567 102
Service kit (DC 0025 C)	Includes: 3x (COW) / 1x (FG) / 1x (IDF) / 1x (IIF) / 1x (IIF2) / 2x (SR) / 7x (VA)	0994 567 105
Service kit (SV 1040 C) With Zirkon vanes	Includes: 3x (COW) / 1x (FG) / 1x (FW) / 1x (IIF) / 7x (VA)	0994 567 103
Service kit (SV 1040 C) With EK-60 vanes	Includes: 3x (COW) / 1x (FG) / 1x (FW) / 1x (IIF) / 7x (VA)	0994528981
Service kit (SD 1040 C)	Includes: 3x (COW) / 1x (FG) / 1x (IDF) / 1x (IIF) / 1x (SR) / 7x (VA)	0994 567 104
Service kit (DC 0040 C)	Includes: 3x (COW) / 1x (FG) / 1x (IDF) / 1x (IIF) / 1x (IIF2) / 2x (SR) / 7x (VA)	0994 567 106

If other parts are required:

- Contact your Busch representative for the detailed spare parts list.

11 Troubleshooting

DANGER

Live wires.

Risk of electrical shock.

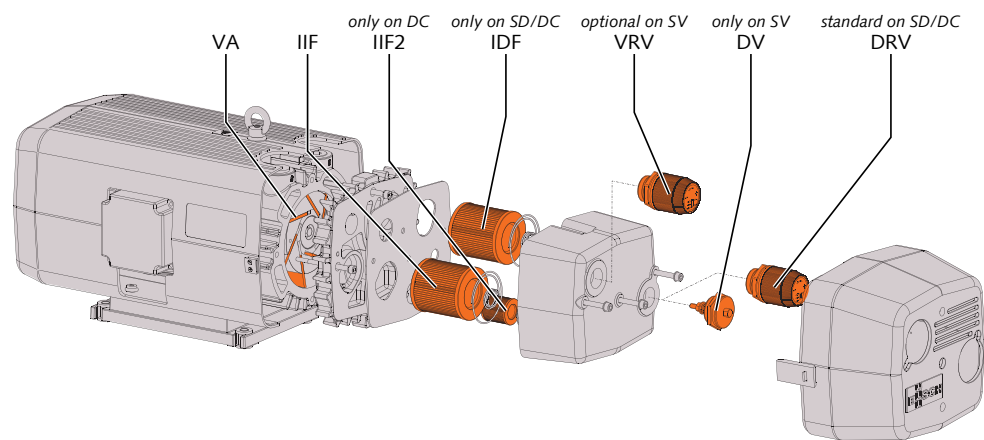
- Electrical installation work must only be executed by qualified personnel.

CAUTION

Hot surface.

Risk of burns!

- Prior to any action requiring touching the machine, let the machine cool down first.



Problem	Possible Cause	Remedy
The machine does not start.	The motor is not supplied with the correct voltage.	• Check the power supply.
	The motor is defective.	• Repair the machine (contact Busch).
The machine does not reach the usual pressure.	The internal filters (IIF, IDF) are partially clogged.	• Replace the filter cartridge.
	The inlet filter cartridge (optional) is partially clogged.	• Replace the inlet filter cartridge.
	One of the regulating valves (VRV, PRV) is jammed in an open position	• Dismantle, clean, check and reassemble the regulating valve (contact Busch).
	Stuck vanes.	• Free the vanes or replace them.
	The vanes (VA)* are worn	• Replace the vanes.*
	The felt washer of the discharge valve (DV) is partially clogged (SV version only).	• Dismantle the discharge valve and change the felt washer.
The machine runs very noisily.	The machine runs in the wrong direction	• Check the direction of rotation.
	Defective bearings.	• Repair the machine (contact Busch).
The machine runs too hot.	Insufficient cooling.	• Remove dust and dirt from the machine.
	Ambient temperature too high.	• Observe the permitted ambient temperature.
	The internal filters (IIF, IDF) are partially clogged.	• Replace the filter cartridge.
	The inlet filter (optional) is partially clogged.	• Replace the filter cartridge.

For the solution of problems not mentioned in the troubleshooting chart contact your Busch representative.

* The vane type acc. to the specification (only for the SV 1025/1040 C)

12 Technical Data

		SV 1010 C	SV 1016 C	SV 1025 C	SV 1040 C
Nominal pumping speed (50Hz / 60Hz)	m³/h	10 / 12	16 / 19	25 / 30	40 / 48
Ultimate pressure	hPa (mbar) abs.	150		120	
Nominal motor rating (50Hz / 60Hz)	kW	0.37 / 0.37	0.55 / 0.55	0.9 / 0.9	1.25 / 1.25
Nominal motor speed (50Hz / 60Hz)	min ⁻¹	1500 / 1800			
Noise level (EN ISO 2151) (50Hz / 60Hz)	dB(A)	60 / 62	61 / 63	62 / 66	66 / 70
Ambient temperature range	°C	0 ... 40			
Ambient pressure		Atmospheric pressure			
Weight approx.	kg	21	25	31	38

		SD 1010 C	SD 1016 C	SD 1025 C	SD 1040 C
Nominal pumping speed (50Hz / 60Hz)	m³/h	10 / 12	16 / 19	25 / 30	40 / 48
Overpressure	hPa (mbar) abs.	1600		1600 (2000)*	
Nominal motor rating (50Hz / 60Hz)	kW	0.37 / 0.37	0.55 / 0.55	0.9 / 0.9	1.25 / 1.25
Nominal motor speed (50Hz / 60Hz)	min ⁻¹	1500 / 1800			
Noise level (EN ISO 2151) (50Hz / 60Hz)	dB(A)	60 / 62	61 / 63	62 / 66	66 / 70
Ambient temperature range	°C	0 ... 40			
Ambient pressure		Atmospheric pressure			
Weight approx.	kg	21	25	31	38

* Specific SD 1 bar(g) version

		DC 0025	DC 0040 C
Nominal pumping speed (50Hz / 60Hz)	m³/h	25 / 30	40 / 48
Ultimate pressure	hPa (mbar) abs.	400	
Overpressure	hPa (mbar) abs.	1600	
Nominal motor rating (50Hz / 60Hz)	kW	1.1 / 1.1	1.5 / 1.5
Nominal motor speed (50Hz / 60Hz)	min ⁻¹	1500 / 1800	
Noise level (EN ISO 2151) (50Hz / 60Hz)	dB(A)	66 / 67	67 / 68
Ambient temperature range	°C	12 ... 30	
Ambient pressure		Atmospheric pressure	
Weight approx.	kg	33	40

Note: Relative humidity (30-60)%

13 EU Declaration of Conformity

This Declaration of Conformity and the CE-mark affixed to the nameplate are valid for the machine within the Busch scope of delivery. This Declaration of Conformity is issued under the sole responsibility of the manufacturer. When this machine is integrated into a superordinate machinery the manufacturer of the superordinate machinery (this can be the operating company, too) must conduct the conformity assessment process for the superordinate machine or plant, issue the Declaration of Conformity for it and affix the CE-mark.

The manufacturer

Busch Výroba CZ s.r.o.
Svárovská 620
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declares that the machine(s): **SECO SV 1010-1040 C; SD 1010-1040 C; DC 0025-0040 C**

has (have) been manufactured in accordance with the European Directives:

- 'Machinery' 2006/42/EC
- 'Electromagnetic Compatibility' 2014/30/EU
- 'RoHS' 2011/65/EU

and the following standards:

Standard	Title of the Standard
EN ISO 12100 : 2010	Safety of machinery - Basic concepts, general principles of design
EN ISO 13857 : 2019	Safety of machinery - Safety distances to prevent hazard zones being reached by the upper and lower limbs
EN 1012-1 : 2010 EN 1012-2 : 1996 + A1 : 2009	Compressors and vacuum pumps - Safety requirements - Part 1 and Part 2
EN ISO 2151 : 2008	Acoustics - Noise test code for compressors and vacuum pumps - Engineering method (grade 2)
IEC 60204-1 : 2016	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
IEC 61000-6-2 : 2016	Electromagnetic compatibility (EMC) - Generic standards. Immunity for industrial environments
IEC 61000-6-4 : 2018	Electromagnetic compatibility (EMC) - Generic standards. Emission standard for industrial environments
EN ISO 13849-1 : 2015 ⁽¹⁾	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design

⁽¹⁾ In case control systems are integrated.

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