

R5

Rotary Vane Vacuum Pumps
RU 0050 B, RU 0070 B

Instruction Manual



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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 using under monitored laboratory conditions. 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, as described in the following chapters and in accordance with the chapter *Intended Use* [→ 5]. 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

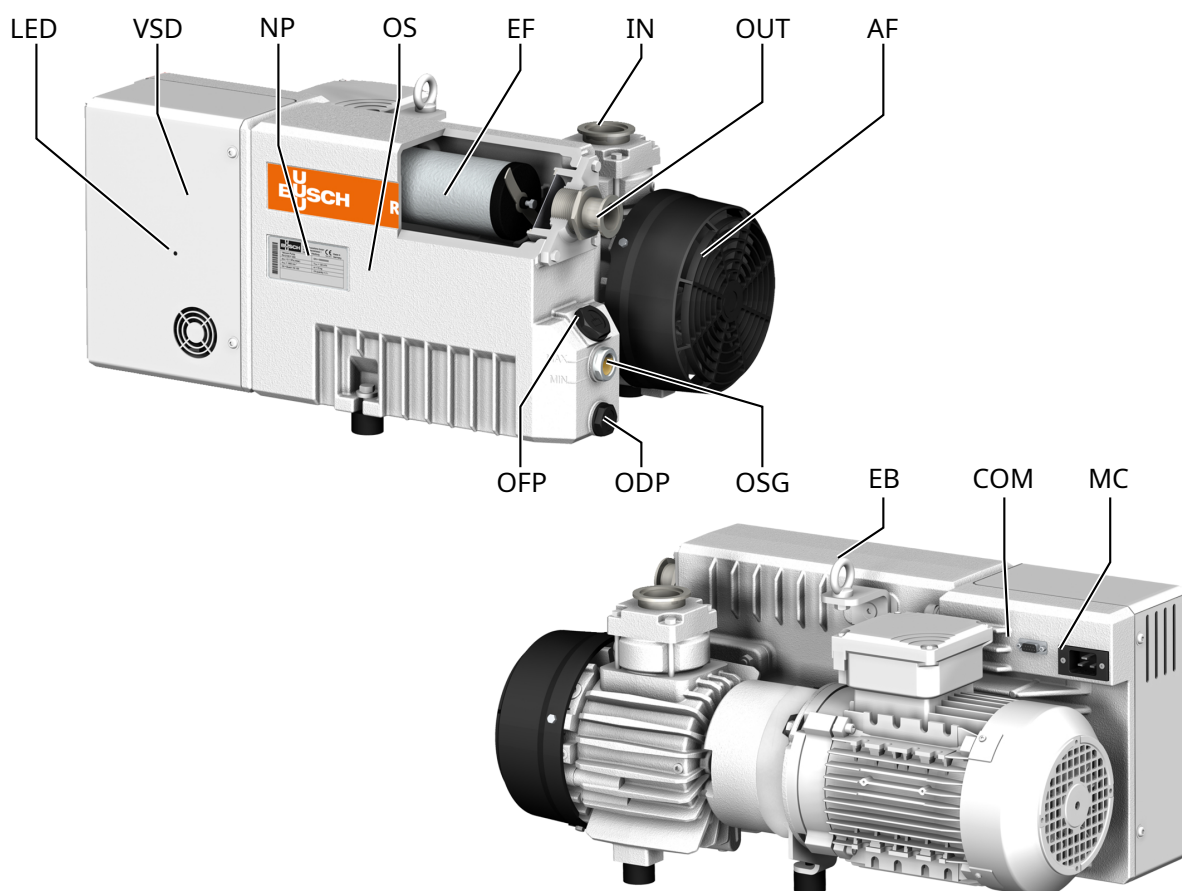
... indicates a potentially dangerous situation that could result in damage to property.



NOTE

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

2 Product Description



Description

LED	LED-display (A1 only)	VSD	Variable speed drive
NP	Nameplate	OS	Oil separator
EF	Exhaust filter	IN	Suction connection
OUT	Discharge connection	AF	Axial fan
OFP	Oil fill plug	ODP	Oil drain plug
OSG	Oil sight glass	EB	Eye bolt
COM	I/O and communication port	MC	Mains connection



NOTE

Technical term.

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

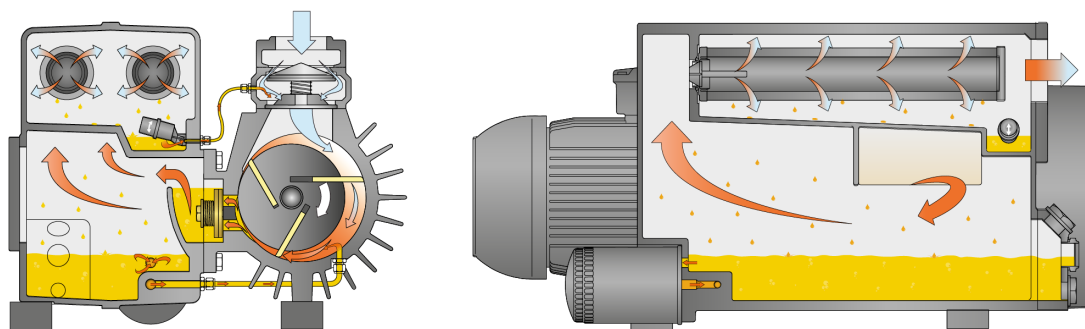


NOTE

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 oil seals the gaps, lubricates the vanes and takes away compression heat.

Exhaust filters separate the oil from the discharged gas.

2.2 Intended Use



WARNING

In case of foreseeable misuse outside the intended use of the machine.

Risk of injuries!

Risk of damages to the machine!

Risk of damages to the environment!

- Make sure to follow all instructions described in this manual.

The machine is intended for the suction of air and other dry, non-aggressive, non-toxic and non-explosive gases.

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 designed for indoor installation, in case of outdoor installation, ask your Busch representative in order to take specific precautions.

The machine is capable of maintaining ultimate pressure, see *Technical Data* [→ 29].

The machine is suitable for continuous operation under certain conditions, see *Continuous Operation* [→ 16].

Permitted environmental conditions, see *Technical Data* [→ 29].

2.3 Standard Features

2.3.1 Variable Speed Drive

The machine is equipped in standard with a variable speed drive.

2.3.2 LED-Display

The LED-Display (LED) indicates the status of the machine.

LED	Description
A1	Red = Fault (see chapter <i>Fault Reset</i> [→ 17]) Green = Healthy
A2	Flashing = RJ45 Communication healthy (just visible with demounted hood)

2.3.3 I/O and Communication Port

The D-Sub 9 supports maintained dry contact remote control and monitoring of the machine.

2.4 Optional Accessories

2.4.1 PC-Software

For parameter settings with personal computers a PC-software and appropriate connection cable can be provided.

2.4.2 Manual Control Unit

Control panel can be used for simply controlling the machine and parameter setting in the field.

3 Transport



WARNING

Suspended load.

Risk of severe injury!

- Do not walk, stand or work under suspended loads.



WARNING

Lifting the machine using the motor eye bolt.

Risk of severe injury!

- Do not lift the machine using the eye bolt fitted to the motor. Only lift the machine as shown.

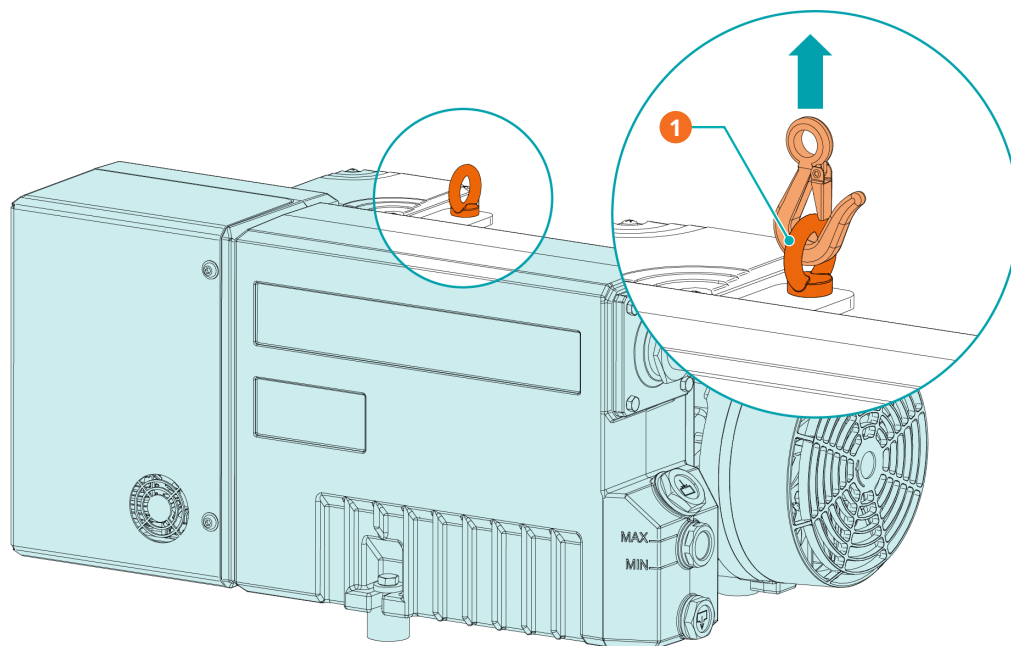


NOTICE

In case the machine is already filled with oil.

Tilting a machine that is already filled with oil can cause large quantities of oil to ingress into the cylinder. Starting the machine with excessive quantities of oil in the cylinder will immediately break the vanes and ruin the machine!

- Drain the oil prior to every transport or always horizontally transport the machine.
- To find out the weight of the machine, refer to the chapter *Technical Data* [→ 29] or the nameplate (NP).
- Make sure that the eye bolt(s) (EB) is/are in faultless condition, fully screwed in and tightened by hand.

**Description**

1	Use the transport lug (TL) to lift the machine!		
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- 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.



NOTICE

Long storage time.

Risk of damage to the machine!

- Due to a long storage time the capacitors of the variable speed drive can lose efficiency because of electrochemical processes. In the worst case, it can lead to a short-circuit and therefore to a damage to the variable speed drive of the machine.
- Connect the machine every 18 months for 30 minutes to the mains.

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

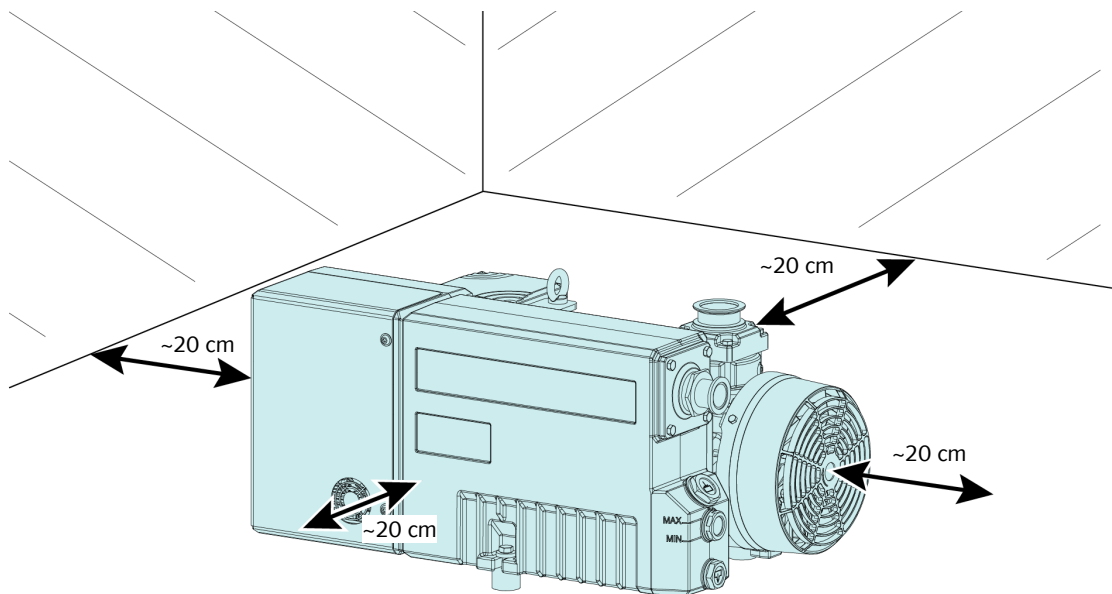
NOTICE

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.



- Make sure that the environment of the machine is not potentially explosive.
- Make sure that the ambient conditions comply with the *Technical Data* [→ 29].
- Make sure that the environmental conditions comply with the protection class of the variable speed drive, see *Technical Data* [→ 29].
- Make sure that the installation space or location is protected from weather and lightning.
- Make sure that the installation space or location is vented such that sufficient cooling of the machine is provided.
- Make sure that the oil sight glass (OSG) remains easily visible.
- Make sure that enough space remains for maintenance work.
- Make sure not to put any pressure on the machine, e.g. by standing on it or storing objects on it.
- Make sure that the machine is placed or mounted horizontally, a maximum deviation of 1° in any direction is acceptable.
- Check the oil level, see *Oil Level Inspection* [→ 20].
- 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 connection of the machine; 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



WARNING

Unprotected suction connection.

Risk of severe injury!

- Keep long hair, loose articles of clothing, etc. away from 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):

- ISO-KF 40

5.2.2 Discharge Connection



CAUTION

The discharge gas contains small quantities of oil.

Risk to health!

If air is discharged into rooms where persons are present:

- Make sure that sufficient ventilation is provided.



NOTICE

Discharge gas flow obstructed.

Risk of damage to the machine!

- Make sure that the discharged gas will flow without obstruction. Do not shut off or throttle the discharge line or use it as a pressurized air source.

Connection size(s):

- ISO-KF 25

Unless the aspirated air is discharged to the environment right at the machine:

- Make sure that the discharge line either slopes away from the machine or provide a liquid separator or a siphon with a drain cock, so that no liquids can flow back into the machine.

5.3 Filling Oil

! NOTICE

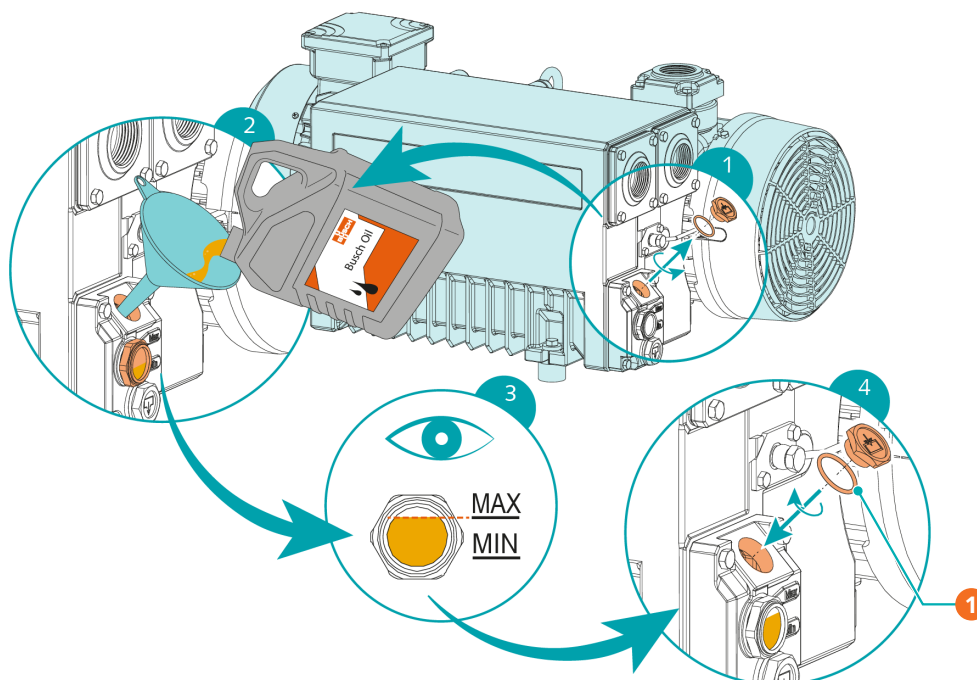
Use of an inappropriate oil.

Risk of premature failure!

Loss of efficiency!

- Only use an oil type which has previously been approved and recommended by Busch.

For oil type and oil capacity see *Technical Data* [→ 29] and *Oil* [→ 30].



Description

1	1x o-ring, part no.: 0486 000 590		
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6 Electrical Connection



DANGER

Live wires.

Risk of electrical shock.

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

CURRENT PROTECTION OF THE CUSTOMER INSTALLATION:



DANGER

Missing current protection.

Risk of electrical shock.

- Current protection according to EN 60204-1 must be insured by the customer on its installation.
- The electrical installation must comply with the applicable national and international standards.



NOTICE

Electromagnetic compatibility.

- 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.
- Make sure that the EMC of the machine is compliant with the requirements of your supply network system, if necessary provide further interference suppression (EMC of the machine, see *EU Declaration of Conformity* [→ 31] or *UK Declaration of Conformity* [→ 32]).

6.1 Machine delivered with a Variable Speed Drive



DANGER

Live wires. Carry out any work on the variable speed drive and motor.

Risk of electrical shock!

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



DANGER

Maintenance work without disconnecting the variable speed drive.

Risk of electrical shock.

- Disconnect and isolate the variable speed drive before attempting any work on it. High voltages are present at the terminals and within the variable speed drive for up to 10 minutes after disconnection of the electrical supply.
- Always ensure by using a suitable multimeter that no voltage is present on any drive power terminals prior to commencing any work.

- If the machine is equipped with a power connector, install a residual current protective device to protect persons in case of a defective insulation.
 - Busch recommends installing a type B residual protective device suitable for the electrical installation.
- If the variable speed drive is not equipped with a lockable disconnect switch, provide it on the power line so that the machine is completely secured during maintenance tasks.
- Provide an overload protection according to EN 60204-1.
- Connect the protective earth conductor.

! NOTICE

Incorrect connection.

Risk of damage to the variable speed drive!

- The wiring diagrams given below are typical. Check the connection instructions/diagrams.



! NOTICE

Perform any flash test or voltage withstand test on the variable speed drive.

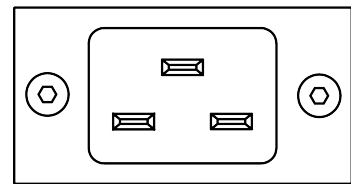
Risk of damage.

- Any electrical measurements required should be carried out with the variable speed drive disconnected.
- Do not use power cables with a length of more than 3 meters. Further be sure that the power cables and power network are equipped with a protective earth connection.
- Mains connection of the machine is also used as a disconnection device, make sure that mains connection is easily accessible.

In case of using a residual current protective device:

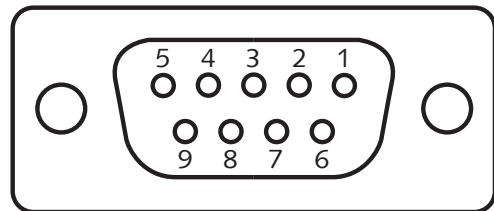
- Use an all-current sensitive residual current protective device (type B).
- Electrically connect the machine directly to the mains connection (MC).

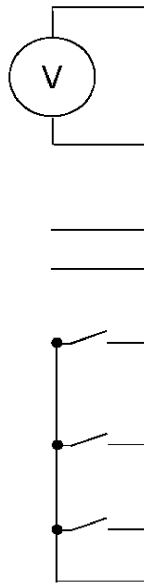
Connector: EN 60320-C20



6.2 I/O and Communication Port Schematic

Connector: D-Sub9, 9-pin, female





Pin Nr.	Description	Signal
1	Digital Output	Status: 0/24 V (max. 20 mA) Drive healthy. Logic 1 when power is applied to the drive and no fault exists.
2	0 V / Ground	Ground
3	-	N/A
4	RS485, D-	For reading status values (current, voltage, operating hours, etc...) or parameters.
5	RS485, D+	
6	Digital Input 4*	Preset speed DI2 / DI4 0 / 0 : speed 1 = 1800 rpm 1 / 0 : speed 2 = 1600 rpm
7	Digital Input 2*	0 / 1 : speed 3 = 1350 rpm 1 / 1 : speed 4 = 1150 rpm
8	Digital Input 1	Open: Stop Closed: Start
9	24 V Out	Power supply (max. 100 mA)

* "Logic 0" : input voltage = 0 ... 4 VDC
 "Logic 1" : input voltage = 8 ... 30 VDC

Communication port via Modbus (RS485):

Ask your Busch representative for more information.

7 Commissioning

NOTICE

The machine can be shipped without oil.

Operation without oil will ruin the machine in short time!

- Prior to commissioning, the machine must be filled with oil, see *Filling Oil* [→ 12].



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.
- Make sure that the *Installation Conditions* [→ 10] are met.
- Start the machine.

NOTICE

Frequent starts and stops by connecting and disconnecting from the power supply.

Risk of damage to the machine!

Starting the machine by connecting and disconnecting the power supply is permitted max. 1x per minute. Between disconnecting and connecting at least 10 seconds must have been passed. If the process requires more frequent starts/stops of the machine:

- Use the digital start signal.
- Maximum permissible number of starts by using the digital signal: unlimited

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

- Measure the mains current or read it via PC-Software or controller.

7.1 Continuous Operation

NOTICE

Working at a suction pressure higher than 20 hPa in continuous operation.

Oil will gush out from the exhaust and the machine will run out of oil very quickly!

Operation without oil will ruin the machine in short time!

- Limit the suction pressure in continuous operation.

The operating time in continuous operation is not limited below a suction pressure of 20 hPa abs. (mbar).

7.2 Fault Reset

A fault is indicated by red lighting of the LED 'A1' and if connected by the not existing ready for operation signal (terminal 1 of the D-SUB9 connector).

- Prior to reset a fault find out the possible cause and remedy the fault.



CAUTION

The machine will start immediately when power is supplied.

Risk of inadvertent start-up!

- Make sure that a start-up will not lead to a dangerous situation.
- Reset the fault by disconnecting and reconnecting the power supply for at least 30 seconds.



NOTE

The variable speed drive can automatically reset 6 times with an interval of 20 seconds between each reset.

8 Maintenance



DANGER

Live wires.

Risk of electrical shock.

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



DANGER

The STOP function does not remove potentially lethal high voltages.

Risk of electrical shock.

- Wait 10 minutes before starting any work on it. Never carry out any work on the variable speed drive, motor or motor cable whilst the input power is still applied.



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.



CAUTION

Failing to properly maintain the machine.

Risk of injuries!

Risk of premature failure and loss of efficiency!

- Maintenance work must only be executed by qualified personnel.
- Respect the maintenance intervals or ask your Busch representative for service.



NOTICE

Variable speed drive maintenance.

Risk of damage to the variable speed drive!

- Maintenance and adjustment must only be executed by qualified personnel.



NOTICE

Using inappropriate cleaners.

Risk of removing safety stickers and protective paint!

- Do not use incompatible solvents to clean the machine.

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

If necessary:

- Disconnect all connections.



DANGER

Live wires. Carry out any work on the variable speed drive and motor.

Risk of electrical shock!

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



DANGER

Maintenance work without disconnecting the variable speed drive.

Risk of electrical shock.

- Disconnect and isolate the variable speed drive before attempting any work on it.
High voltages are present at the terminals and within the variable speed drive for up to 10 minutes after disconnection of the electrical supply.
- Always ensure by using a suitable multimeter that no voltage is present on any drive power terminals prior to commencing any work.

8.1 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.

Interval	Maintenance work
Weekly	<ul style="list-style-type: none"> • Check the oil level, see <i>Oil Level Inspection</i> [→ 20]. • Check the machine for oil leaks - in case of leaks have the machine repaired (contact Busch).
Every 6 months	<ul style="list-style-type: none"> • Clean the machine from dust and dirt. • Make sure that the electronic components and the cooling fan are free from dust.
Yearly	<ul style="list-style-type: none"> • Change the exhaust filters (EF), see <i>Exhaust Filter Change</i> [→ 21].
Every 8000 hours	<ul style="list-style-type: none"> • Change the oil, see <i>Oil Change</i> [→ 20].

8.2 Oil Level Inspection

- Shut down the machine.
- When the machine is stopped, wait 1 minute before checking the oil level.



- Fill up if necessary, see *Oil Filling* [→ 12].

8.3 Oil Change

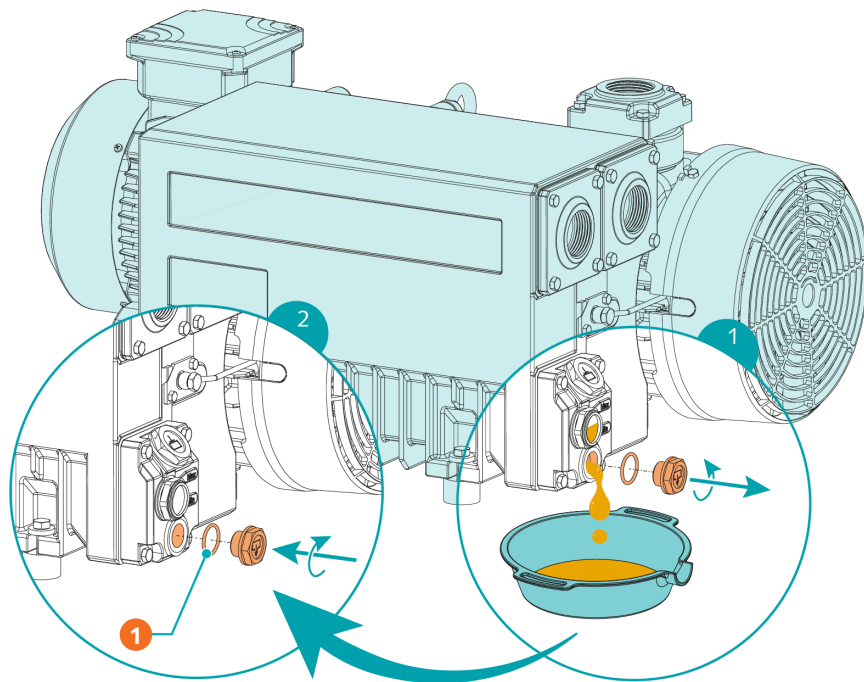
! NOTICE

Use of an inappropriate oil.

Risk of premature failure!

Loss of efficiency!

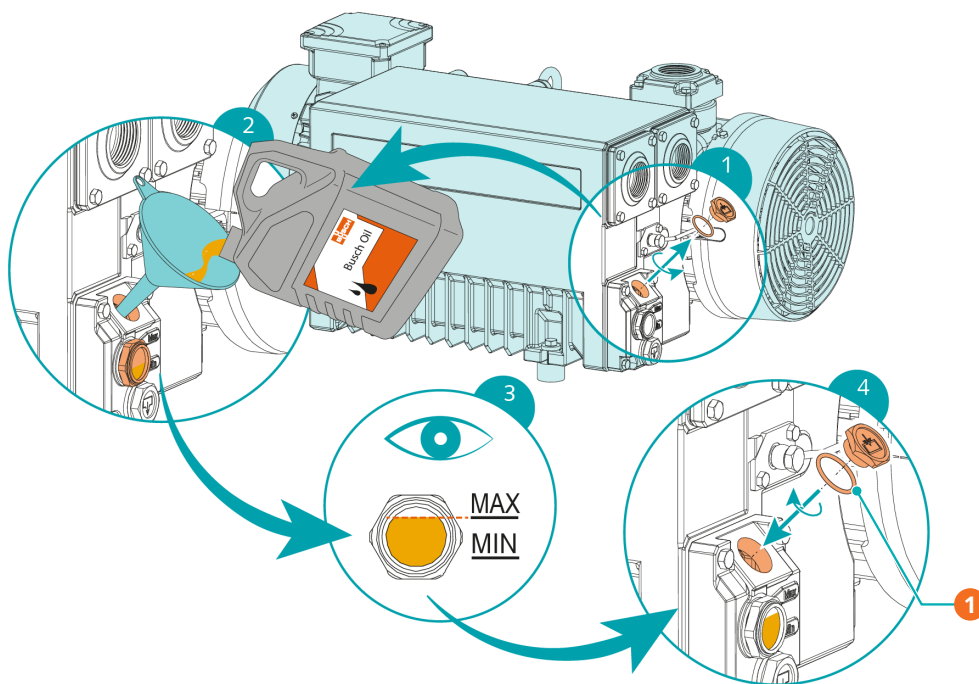
- Only use an oil type which has previously been approved and recommended by Busch.



Description

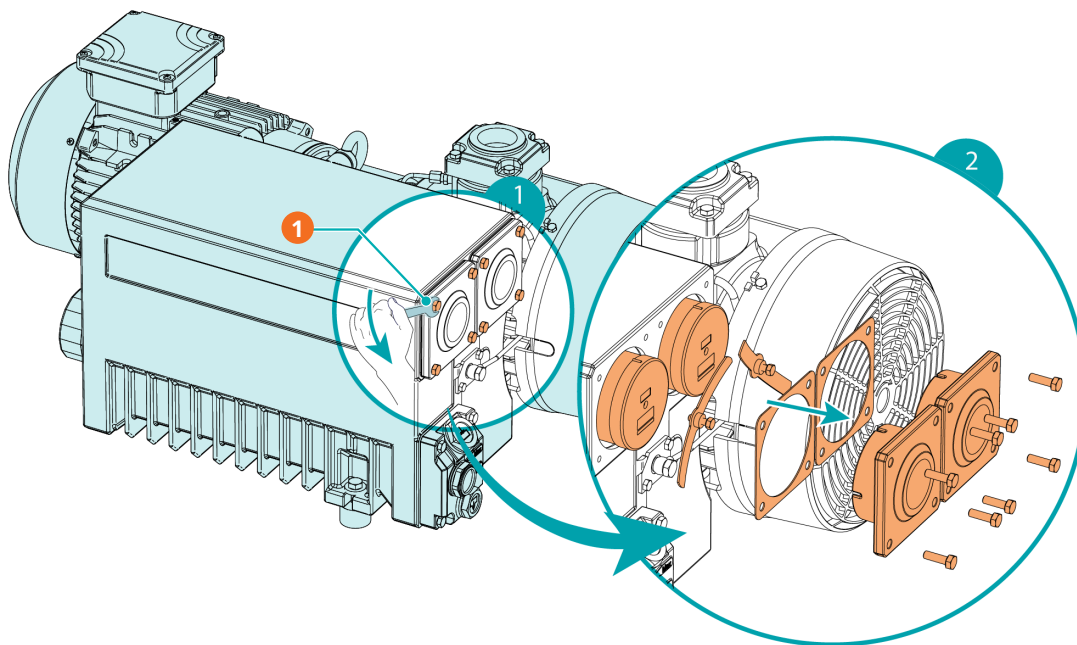
1	1x o-ring, part no.: 0486 000 505
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For oil type and oil capacity see *Technical Data* [→ 29] and *Oil* [→ 30].

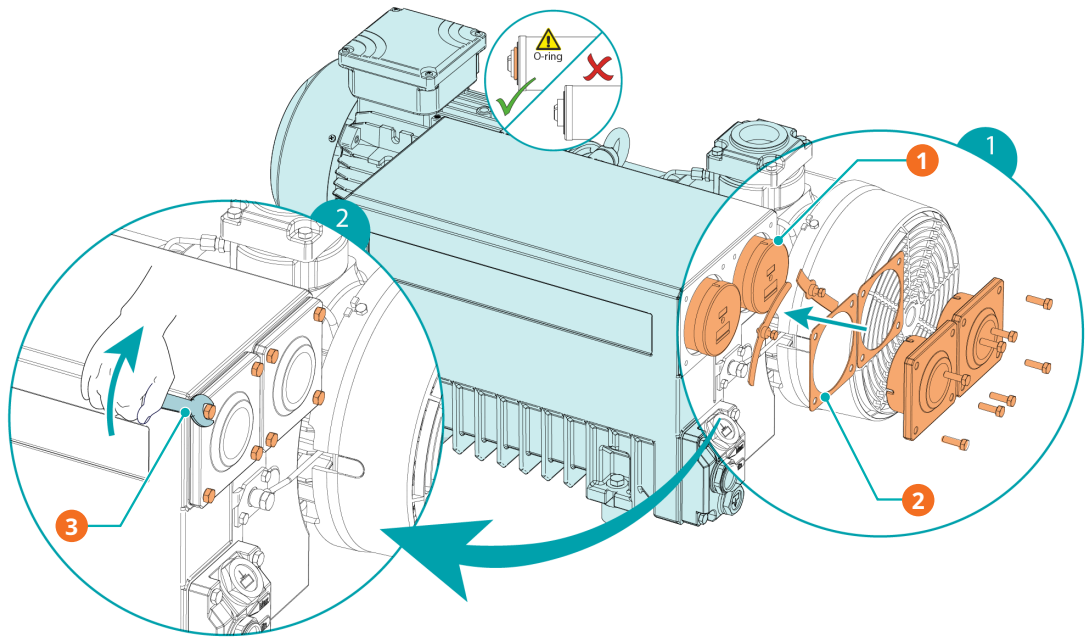


Description	
1	1x o-ring, part no.: 0486 000 590

8.4 Exhaust Filter Change



Description	
1	10 mm wrench



Description

1	Busch genuine spare parts: 1x Exhaust filter (EF),, part no.: 0532 140 156	2	1x flat gasket, : part no.: 0480 000 112
3	10 mm wrench		

9 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!

- Any dismantling of the machine that goes beyond anything that is described in this manual should be done by Busch authorized technicians.

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).

10 Decommissioning



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.

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

If the machine is going to be stored:

- See *Storage* [→ 9].

10.1 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.

11 Spare Parts



NOTICE

Use of non-Busch genuine spare parts.

Risk of premature failure!

Loss of efficiency!

- The exclusive use of Busch genuine spare parts and consumables is recommended for the correct functioning of the machine and to validate the warranty.

Spare parts kit	Description	Part no.
Service kit (RU 0050-0070 B)	Includes all the necessary parts for maintenance.	0992 239 323

If other parts are required:

- Contact your Busch representative.

12 Troubleshooting



DANGER

Live wires.

Risk of electrical shock.

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



DANGER

Live wires. Carry out any work on the variable speed drive and motor.

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.



NOTICE

Variable speed drive maintenance.

Risk of damage to the variable speed drive!

- Maintenance and adjustment must only be executed by qualified personnel.

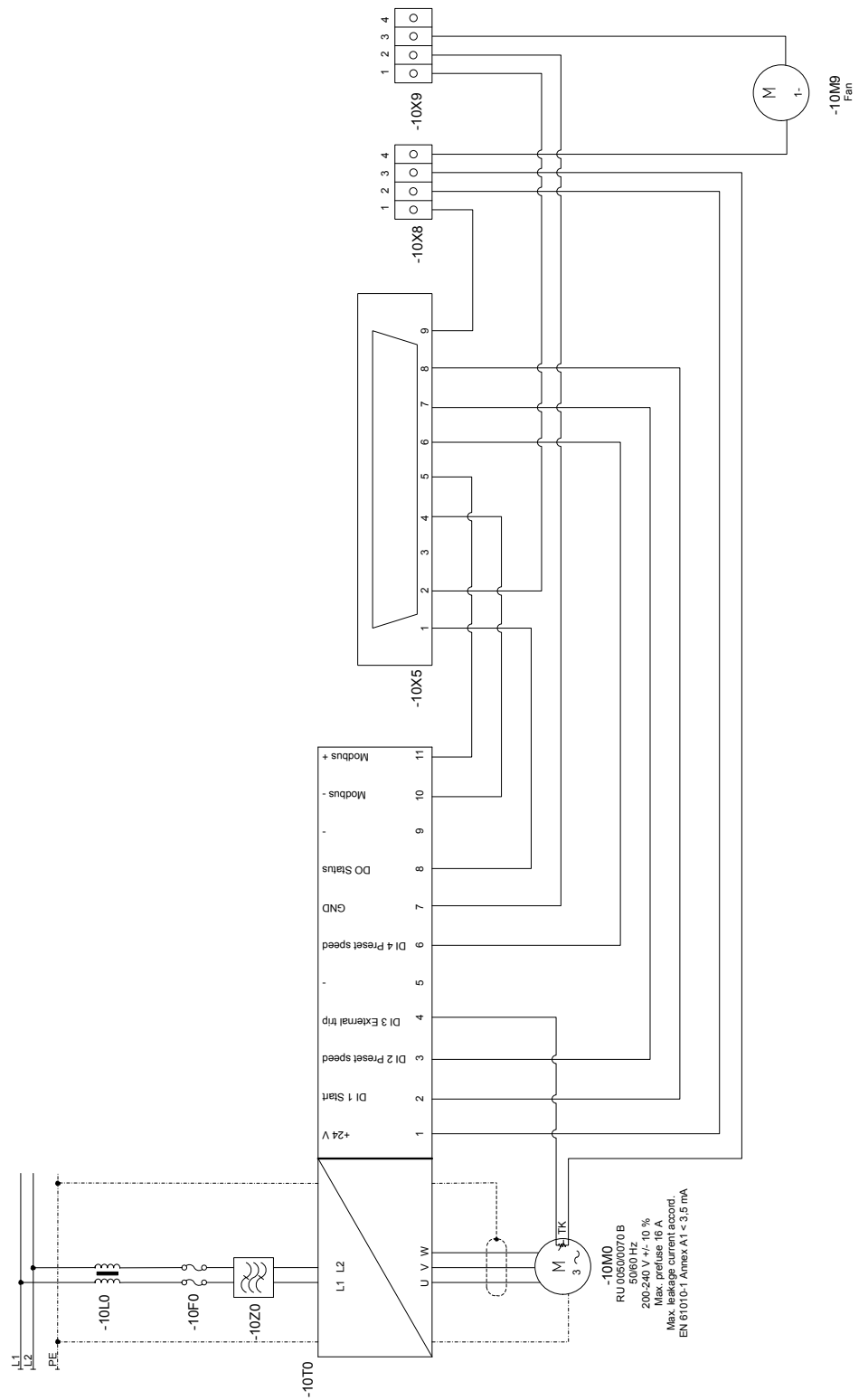
Illustration showing parts that may be involved during troubleshooting:

Problem	Possible Cause	Remedy
The machine does not start.	The variable speed drive (VSD) is not supplied with the correct voltage.	<ul style="list-style-type: none"> • Check the power supply.
	No start signal.	<ul style="list-style-type: none"> • Check the connection.
	The motor or the variable speed drive (VSD) is defective.	<ul style="list-style-type: none"> • Check the LED on the variable speed drive display, if red, it is faulty (contact Busch or read error with software).
	The coupling (CPL) is defective.	<ul style="list-style-type: none"> • Replace the coupling (CPL).
The machine does not reach the usual pressure on the suction connection.	Oil level too low.	<ul style="list-style-type: none"> • Top up oil.
	The inlet screen (IS) is partially clogged.	<ul style="list-style-type: none"> • Clean the inlet screen (IS).
	Internal parts are worn or damaged.	<ul style="list-style-type: none"> • Repair the machine (contact Busch).

Problem	Possible Cause	Remedy
The machine runs very noisily.	Worn coupling (CPL).	<ul style="list-style-type: none"> • Replace the coupling (CPL).
	Stuck vanes.	<ul style="list-style-type: none"> • Repair the machine (contact Busch).
	Defective bearings.	<ul style="list-style-type: none"> • Repair the machine (contact Busch).
The oil is black.	Oil change intervals are too long.	<ul style="list-style-type: none"> • Drain the oil and fill in new oil, see Oil Change.
	The machine runs too hot.	<ul style="list-style-type: none"> • See problem "The machine runs too hot".
The oil is emulsified.	The machine sucked in liquids or significant amounts of vapor.	<ul style="list-style-type: none"> • Flush the machine (contact Busch).

For resolution of problems not listed in the troubleshooting table, please contact your Busch representative.

13 Circuit Diagram



14 Technical Data

		RU 0050 B	RU 0070 B
Nominal pumping speed (60Hz)	m ³ /h	50	70
Ultimate pressure	hPa (mbar) abs.	0.05	
Nominal motor rating (60Hz)	kW	1.2	1.2
Nominal current for 1~ 200-240 V ±10%	A	9	9
Internal main fuse (TT type)	A	10	
Max. leakage current acc. to EN 61010-1 Annex A1	A	< 3.5	
Supply frequency	Hz	50/60	
Permitted speed range (38 ... 60 Hz)	min ⁻¹	1150 ... 1800	
Noise level (EN ISO 2151) (60Hz)	dB(A)	57 (at 3 mbar)	
Ambient temperature range	°C	12 ... 40*	
Gas inlet temperature range	°C	12 ... 40*	
Ambient temperature range without TÜV Süd NRTL mark and CB-certificate	°C	12 ... 50	
Max. allowed pressure for permanent operation	hPa (mbar) abs.	20	
Ambient pressure		Atmospheric pressure	
Relative humidity		80% up to a temperature of 31°C	
Installation altitude	m	Max. 2000 (above sea level)	
Installation altitude without TÜV Süd NRTL mark and CB-certificate	m	Max. 4000 (above sea level)	
Protection class		IP20	
Oil capacity	l	1.7	1.7
Weight approx.	kg	56	56

* In case of higher or lower temperatures, please consult your Busch representative.

Certifications

TÜV Süd NRTL mark (cTÜVus)	UL 61010-1 CAN/CSA C22.2 No. 61010-1
TÜV Süd CB-certificate and report	IEC 61010-1 with all national deviations

15 Oil

VSI 100	
ISO-VG	100
Part number 1 L packaging	0831 203 754

To know which oil has been filled in the machine, please refer to the nameplate (NP).

16 EU Declaration of Conformity

This Declaration of Conformity and the CE-markings 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-marking.

The manufacturer

Busch Produktions GmbH
Schauinslandstr. 1
DE-79689 Maulburg

declares that the machine: R5 RU 0050 B; R5 RU 0070 B

fulfill(s) all the relevant provisions from EU directives:

- 'Machinery' 2006/42/EC
- 'Electromagnetic Compatibility' (EMC) 2014/30/EU
- 'RoHS' 2011/65/EU Restriction of the use of certain hazardous substances in electrical and electronic equipment (incl. all related applicable amendments)

and comply(-ies) with the following harmonized standards that have been used to fulfill those provisions:

Standards	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 1012-2 : 1996 + A1 : 2009	Vacuum pumps - Safety requirements - Part 2
EN ISO 2151 : 2008	Acoustics - Noise test code for compressors and vacuum pumps - Engineering method (grade 2)
EN 55011 : 2016 + A1 : 2017 Class A (industry)	Industrial, scientific and medical equipment. Radio-frequency disturbance characteristics. Limits and methods of measurement
CISPR 11 : 2015 / AMD2 : 2019 Class A (industry)	Industrial, scientific and medical equipment. Radio-frequency disturbance characteristics. Limits and methods of measurement
CFR 47 FCC Part 15; Class A (industry)	The FCC 47 CFR Part 15 from the Federal Communications Commission: rules and regulations for EMC.
EN 60204-1 : 2018	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
ICES-001	Industrial scientific and medical (ism) radio frequency generators
EN IEC 61000-6-2 : 2019	Electromagnetic compatibility (EMC) - Generic standards. Immunity for industrial environments
EN IEC 61000-6-4 : 2019	Electromagnetic compatibility (EMC) - Generic standards. Emission standard for industrial environments
EN 61326-1 : 2013 Table 2	Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements
EN 61000-3-2 : 2019 Class A (industry)	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
EN 61000-3-3 : 2013 + A1 : 2019	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection.
EN 61010-1 : 2010 + A1 : 2019 + A1 : 2019 / AC : 2019	Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements

Legal person authorized to compile the technical file and authorized representative in the EU (if the manufacturer is not located in the EU):

Busch Dienste GmbH
 Schauinslandstr. 1
 DE-79689 Maulburg

Maulburg, 18.08.2021



Dr. Martin Gutmann
General Manager
Busch Produktions GmbH

17 UK Declaration of Conformity

This Declaration of Conformity and the UKCA-markings 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 UKCA-marking.

The manufacturer

Busch Produktions GmbH
Schauinslandstr. 1
DE-79689 Maulburg

declares that the machine: R5 RU 0050 B; R5 RU 0070 B

fulfill(s) all the relevant provisions from UK legislations:

- Supply of Machinery (Safety) Regulations 2008
- Electromagnetic Compatibility Regulations 2016
- Restriction of the use of certain hazardous substances in Electrical and Electronic Equipment Regulations 2021

and comply(-ies) with the following designated standards that have been used to fulfill those provisions:

Standards	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 1012-2 : 1996 + A1 : 2009	Vacuum pumps - Safety requirements - Part 2
EN ISO 2151 : 2008	Acoustics - Noise test code for compressors and vacuum pumps - Engineering method (grade 2)
EN 55011 : 2016 + A1 : 2017 Class A (industry)	Industrial, scientific and medical equipment. Radio-frequency disturbance characteristics. Limits and methods of measurement
CISPR 11 : 2015 / AMD2 : 2019 Class A (industry)	Industrial, scientific and medical equipment. Radio-frequency disturbance characteristics. Limits and methods of measurement
CFR 47 FCC Part 15; Class A (industry)	The FCC 47 CFR Part 15 from the Federal Communications Commission: rules and regulations for EMC.
EN 60204-1 : 2018	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
ICES-001	Industrial scientific and medical (ism) radio frequency generators
EN IEC 61000-6-2 : 2019	Electromagnetic compatibility (EMC) - Generic standards. Immunity for industrial environments
EN IEC 61000-6-4 : 2019	Electromagnetic compatibility (EMC) - Generic standards. Emission standard for industrial environments
EN 61326-1 : 2013 Table 2	Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements
EN 61000-3-2 : 2019 Class A (industry)	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
EN 61000-3-3 : 2013 + A1 : 2019	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection.
EN 61010-1 : 2010 + A1 : 2019 + A1 : 2019 / AC : 2019	Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements

Legal person authorized to compile the technical file and importer in the UK
 (if the manufacturer is not located in the UK):

Busch (UK) Ltd
 30 Hortonwood
 Telford - UK

Maulburg, 18.08.2021



Dr. Martin Gutmann
General Manager
Busch Produktions GmbH

Notes

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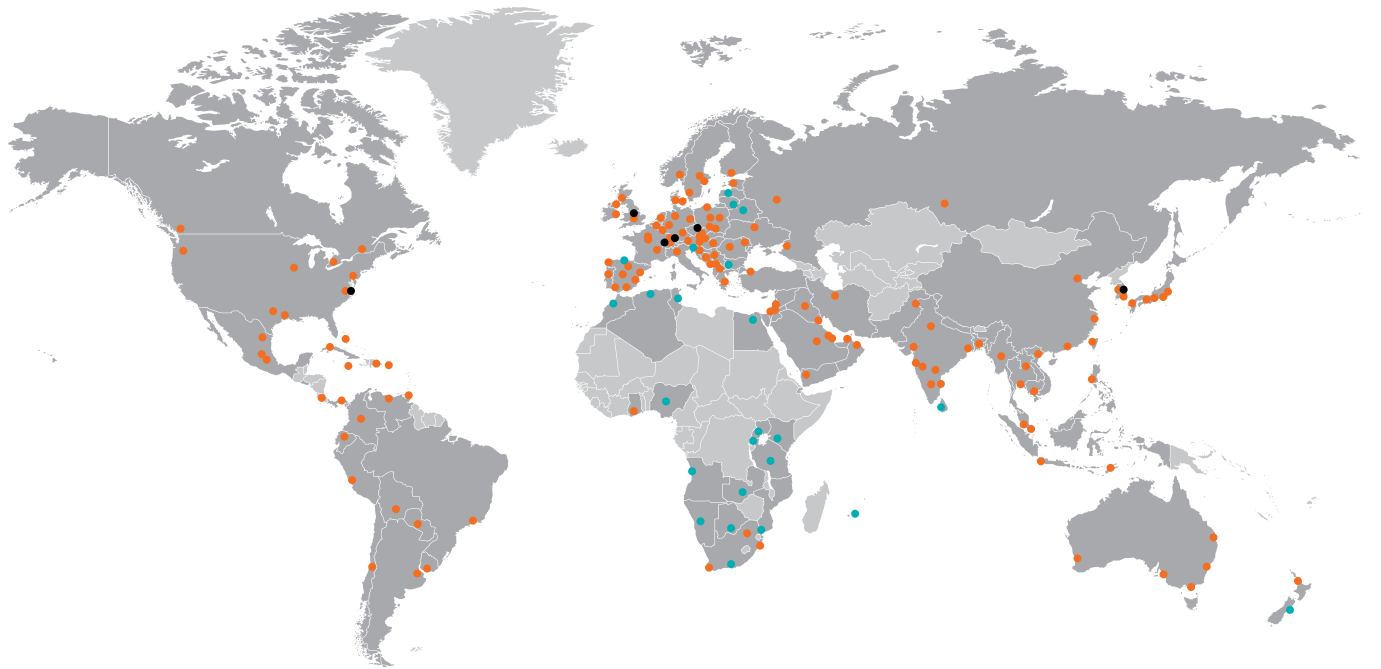
A large grid of small dots, arranged in approximately 30 columns and 40 rows, covering the majority of the page. This grid is intended for users to take handwritten notes.

A large grid of small dots for taking notes, covering most of the page. The dots are arranged in a regular pattern, forming a grid that is approximately 30 columns wide and 40 rows high.

Busch

Vacuum Solutions

With a network of over 60 companies in more than 40 countries and agencies worldwide, Busch has a global presence. In every country, highly competent local personnel delivers custom-tailored support backed by a global network of expertise. Wherever you are. Whatever your business. We are there for you.



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