VACUUM SOLUTIONS

COBRA

Dry Screw Vacuum Pumps
BA 0100 C

Instruction Manual

Get technical data, instruction manuals, service kits

VACUUM APP

CE UK CA

0870211637 | -0007_en-US | Original instructions

4/30/2024

Table of Contents

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 in accordance with the 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.

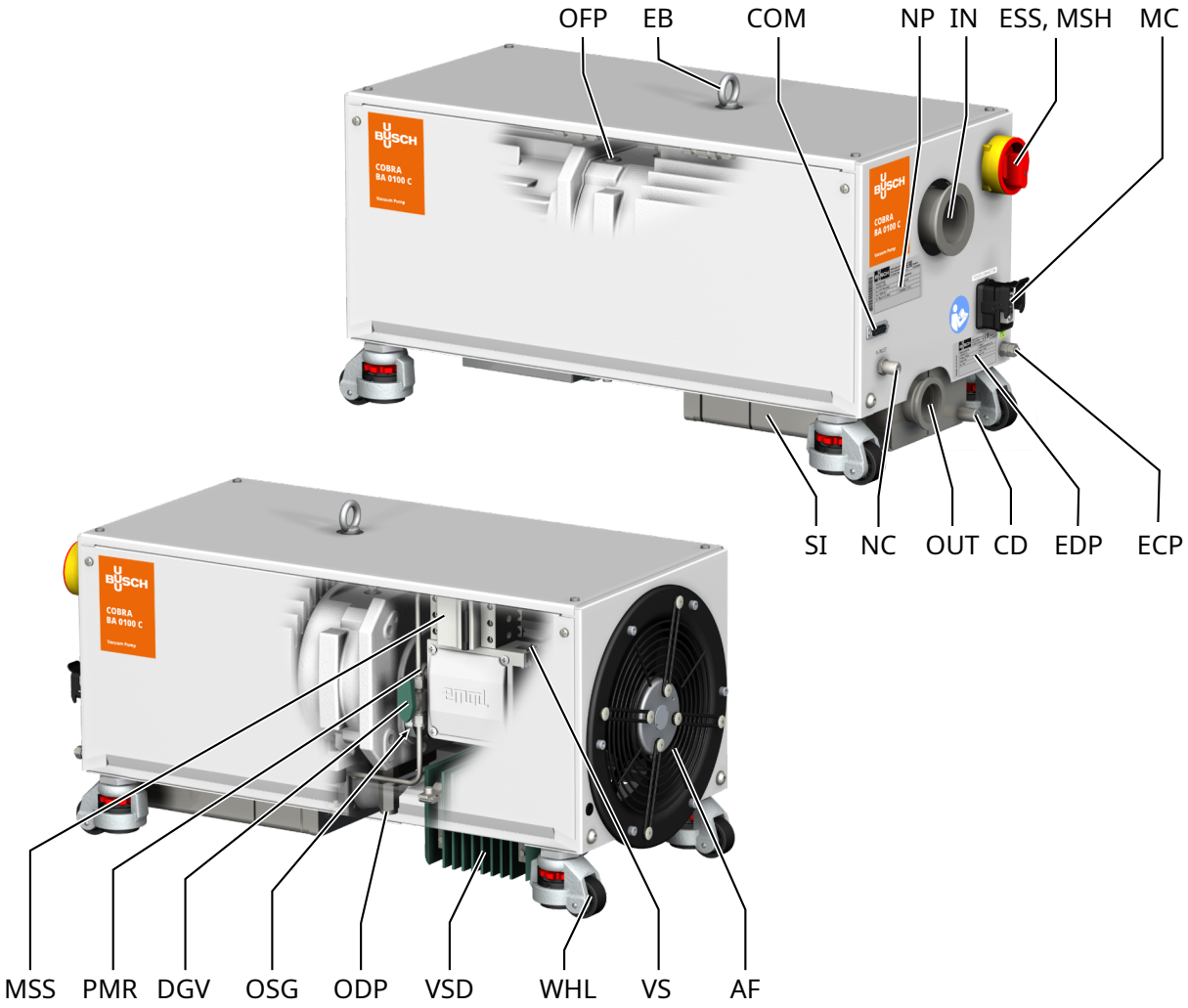
NOTICE

... 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			
IN	Suction connection (Inlet)	OUT	Discharge connection (Outlet)
AF	Axial fan	CD	Condensate drain
COM	I/O and communication port (with VSD only)	DGV	Dilution gas valve (Optional)
EB	Eye bolt	ECP	Earth connection (Machine)
EDP	Electrical data plate	ESS	Emergency stop switch
MC	Mains connection	MSH	Main switch
MSS	Motor safety switch	NC	Nitrogen connection (Optional)
NP	Nameplate	OFP	Oil fill plug
ODP	Oil drain plug	OSG	Oil sight glass
PMR	Plug for manual rotation of rotors	SI	Silencer
VSD	Variable speed drive (Optional)	VS	Voltage switch (with VSD only)
WHL	Wheels		

NOTE

Technical term.

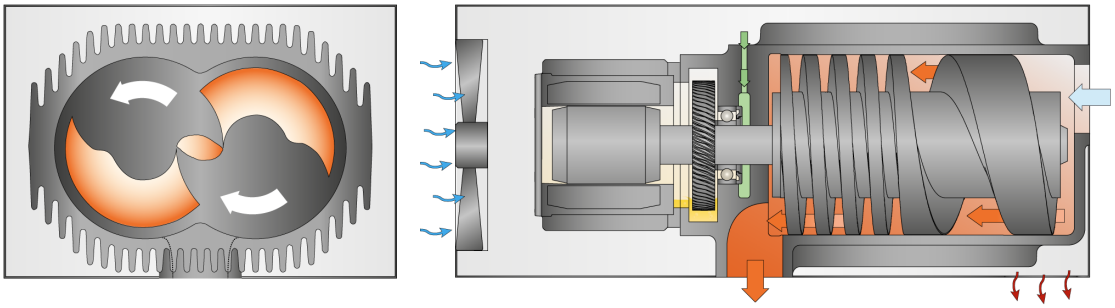
In this instruction manual, we consider that the term 'machine' refers to the 'vacuum pump'.

NOTE

Illustrations.

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

2.1 Operating Principle



The machine works on the one-stage, twin-screw pump principle.

Two screw rotors rotate inside the cylinder. The pumped medium is trapped between the cylinder and screw chambers, compressed, and transported to the gas outlet. During the compression process, the two screw rotors do not come into contact with each other or with the cylinder. There is no need for a lubrication or an operating fluid in the compression chamber.

The COBRA BA is fully air-cooled by a fan built into the protective cover.

2.2 Intended Use

WARNING

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

Risk of injuries!

Risk of damage to the machine!

Risk of damage 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, toxic, non-aggressive, non-ignitable 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 indoor placement in a non-potentially explosive environment.

The machine is suitable for continuous operation but limited to a suction pressure ≤150 hPa (mbar) abs.

The machine is allowed to operate at ≥150 hPa (mbar) abs. for up to 5 minutes.

Guideline for maximum recommended chamber size to be evacuated from atmospheric pressure to <100 mbar.

Pump drive	Maximum chamber size (liters)
Machine without VSD (Variable Speed Drive) Direct drive 50 or 60Hz	300
Machine with VSD, voltage supply 200-240V	1000
Machine with VSD, voltage supply 380-480V	2000

How to identify a machine with VSD?

- Check if the machine is equipped with a Communication port (COM) or a Variable Speed Drive (VSD), see *Product Description* [➔ 4].

Permitted environmental conditions, see Technical Data.

2.3 Drive Variants

The machine can be equipped with either a direct drive or a variable speed drive (option).

2.4 Standard Features

2.4.1 Wheels

Four wheels are fitted to the bottom of the machine to facilitate transportation and installation.

2.4.2 Emergency Stop Switch

The machine is equipped in standard with an emergency stop switch (ESS).

2.4.3 I/O and Communication Port (only with VSD)

The D-Sub 15 supports maintained dry contact remote control and monitoring of the machine.

2.4.4 Silencer

A silencer is fitted as standard at the discharge connection (OUT) to reduce exhaust noise.

2.5 Optional Accessories

2.5.1 Nitrogen System

The nitrogen connection (NC) supplies nitrogen or clean dry compressed air for:

- The barrier gas system (gas sealing between the compression chamber and gears/bearing housing).
- The dilution gas system.

3 Transport

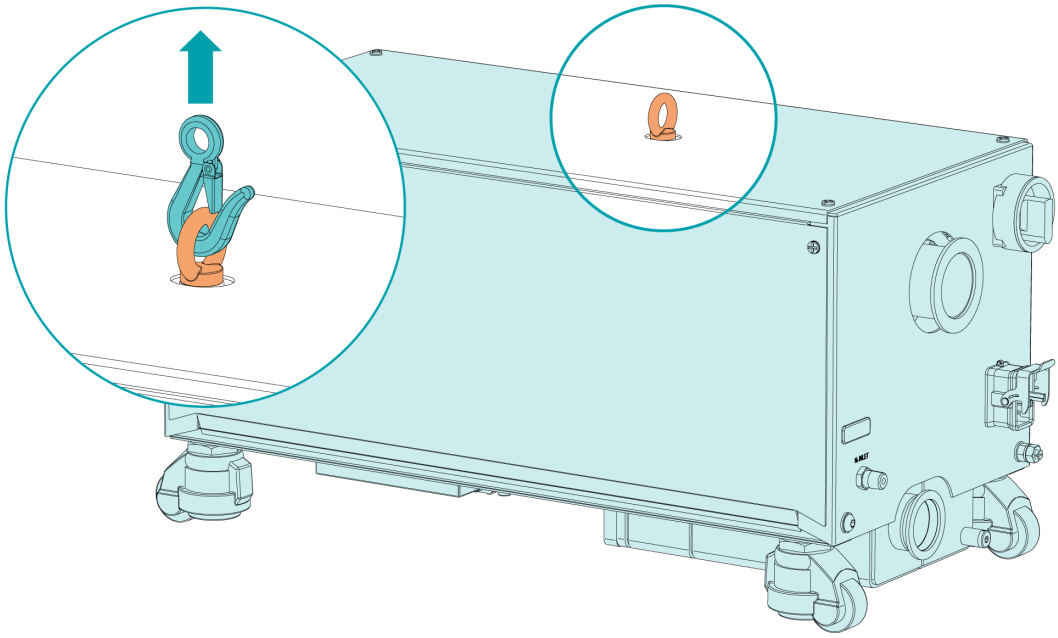
WARNING

Suspended load.

Risk of severe injury!

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

- To find out the weight of the machine, refer to the chapter Technical Data or the nameplate (NP).
- Make sure that the eye bolt(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 hermetically all apertures with the caps provided with the machine, or with adhesive tape if the caps are no longer available.
- Store the machine indoors, in a dry place, away from dust and vibrations and if possible, in original packaging, preferably at temperatures between -20 ... 60 °C.

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

- Seal hermetically all apertures with the caps provided with the machine, or with adhesive tape if the caps are no longer available.
- Wrap the machine in a corrosion inhibitor film.
- Store the machine indoors, in a dry place, away from dust and vibrations and if possible, in original packaging, preferably at temperatures between -20 ... 60 °C.

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.

5 Installation

5.1 Installation Conditions

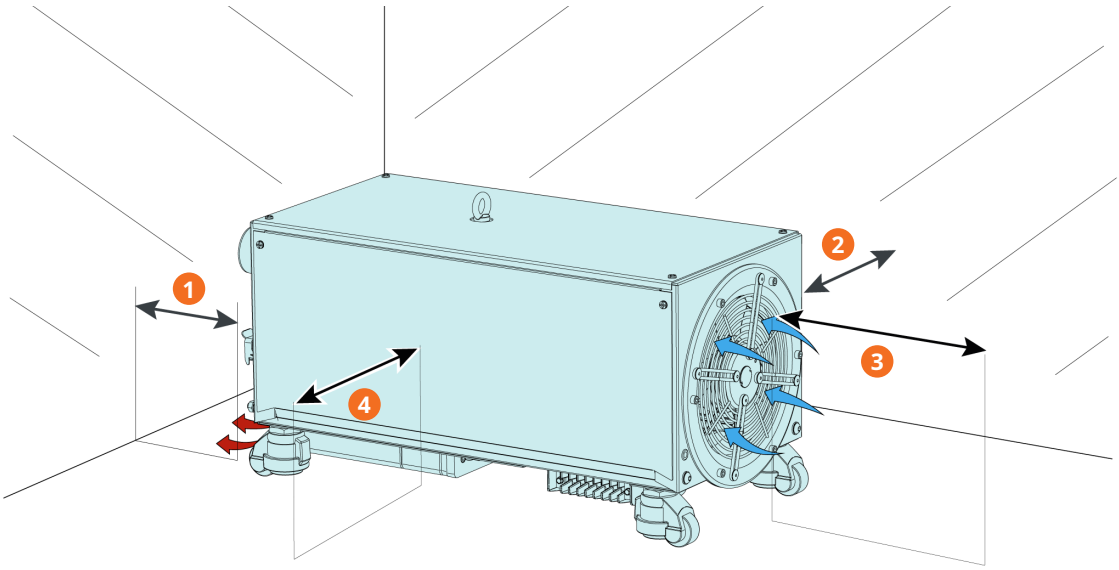
NOTICE

Use of the machine outside of the permitted installation conditions.

Risk of premature failure!

Loss of efficiency!

- Make sure that the installation conditions are fully respected.



Description			
1	~20 cm	2	~20 cm
3	~50 cm	4	~20 cm

- Make sure that the environment of the machine is not potentially explosive.
- Make sure that the ambient conditions comply with the Technical Data.
- 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 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* [➔ 25].
- 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 must 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 connections of the machine. Therefore, we recommend installing flexible lines on the suction and discharge connections.
- Make sure that the diameter 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:

- Use larger diameters to avoid a loss of efficiency.
- Contact your Busch representative for more information.

5.2.1 Suction Connection

WARNING

Unprotected suction connection.

Risk of severe injury!

- Keep long hair, loose clothing, etc. away from the 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 50

If the machine is used as part of a vacuum system:

- Busch recommends the installation of an isolation valve in order to prevent the machine from turning backwards.
- Make sure that the connection lines cause no stress on the connections of the machine. Therefore, we recommend installing flexible lines on the suction and discharge connections.

5.2.2 Discharge Connection

NOTICE

Discharge gas flow obstructed.

Risk of damage to the machine!

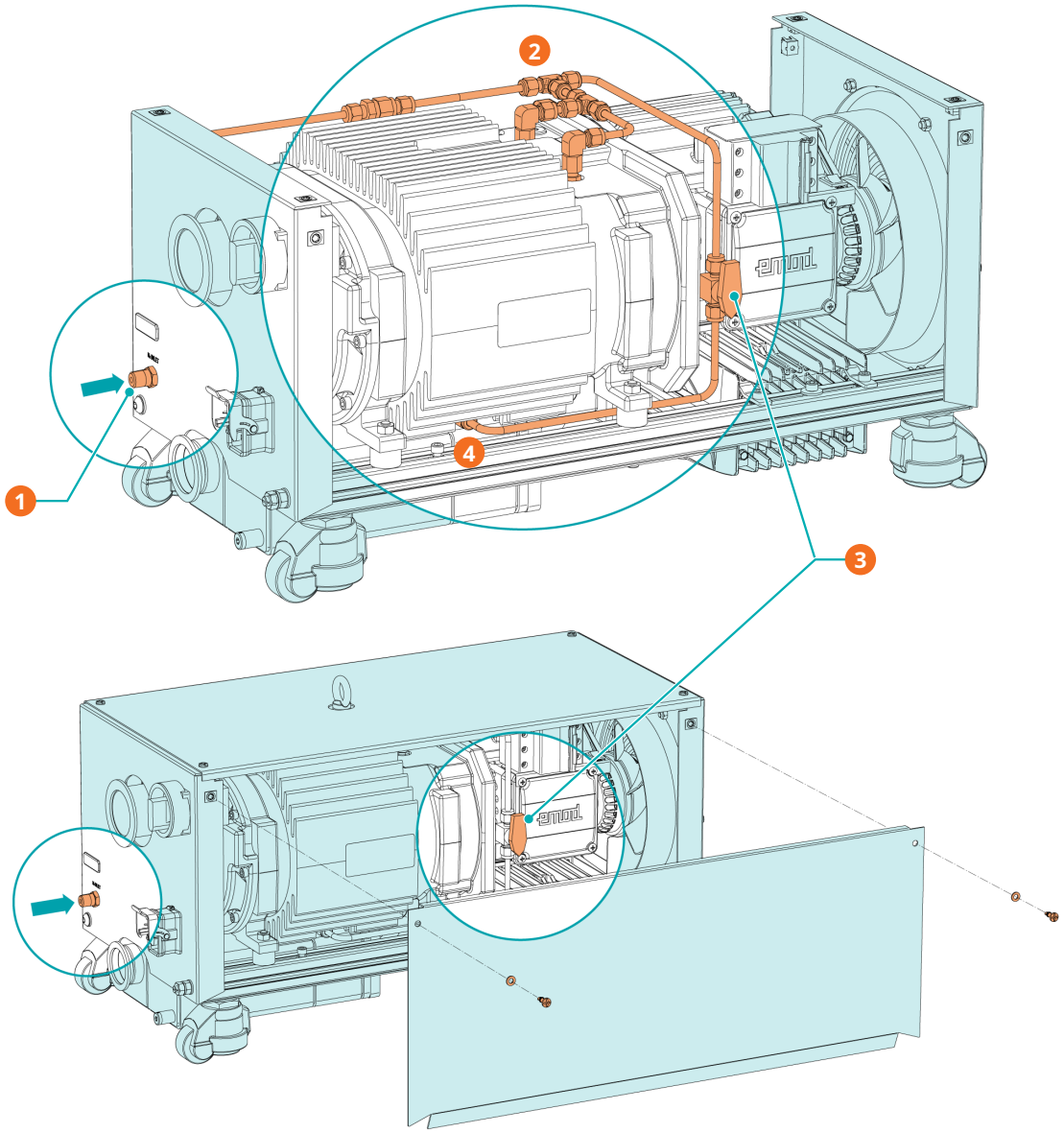
- Make sure that the discharged gas will flow without obstruction. Do not shut off or throttle the discharge line or use it as a pressurized air source.

Connection size(s):

– ISO-KF 40

- Make sure that the connection lines cause no stress on the connections of the machine. Therefore, we recommend installing flexible lines on the suction and discharge connections.
- Make sure that the counter pressure (also called “back pressure”) at the discharge connection (OUT) does not exceed the maximum allowable discharge pressure, see Technical Data.

5.2.3 Nitrogen System Connection (Optional)



Description			
1	Nitrogen connection (NC)	2	Barrier gas system
3	Dilution gas valve (DGV)	4	Dilution gas system

- Connect the nitrogen connection (NC) to the gas supply.

Connection size:

– G1/4, NPT (NC) + 2 adapters for pipe diameter 6,15 and 6,5 mm are supplied loose.

To access the dilution gas valve (DGV):

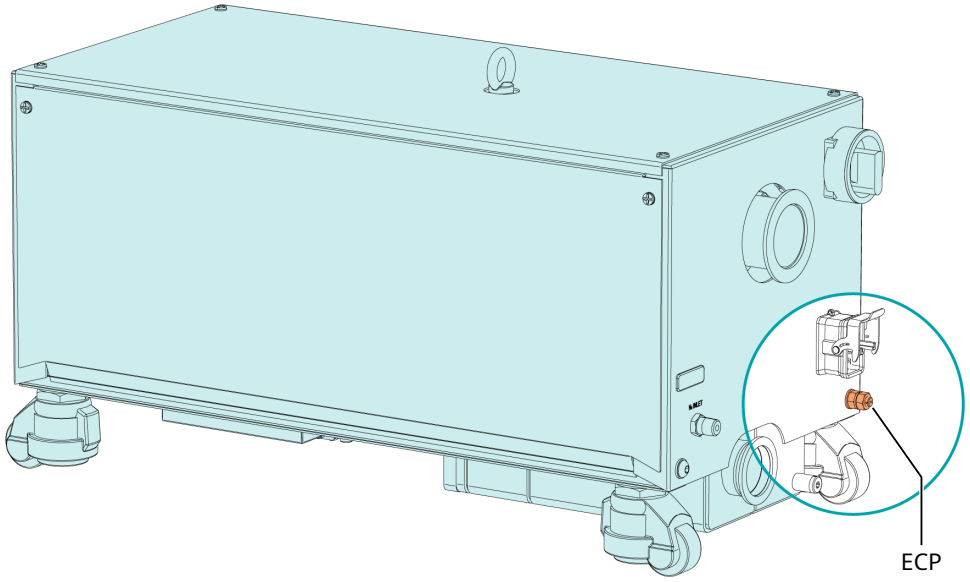
- Remove the two Phillips-head screws in the upper corners of the side cover.
- Lift the side cover to remove it from the frame.

- Make sure that the gas complies with the following requirements:

Gas type	Dry nitrogen or air	
Gas temperature	°C	0 ... 60
Maximum gas supply pressure	bar (g)	6
Minimum gas supply pressure	bar (g)	2.7
Filtration	µm	5
Barrier gas flow rate (DGV closed):	SLM (standard liter per minute)	19 ... 33
Barrier and dilution gas flow rate (DGV open):	SLM (standard liter per minute)	25 ... 51
Air quality (only for air)	Acc. to ISO 8573-1	Class 5.4.4

5.3 Earth Connection

- Connect the earth connection of the machine (ECP).



5.4 Filling Oil

NOTICE

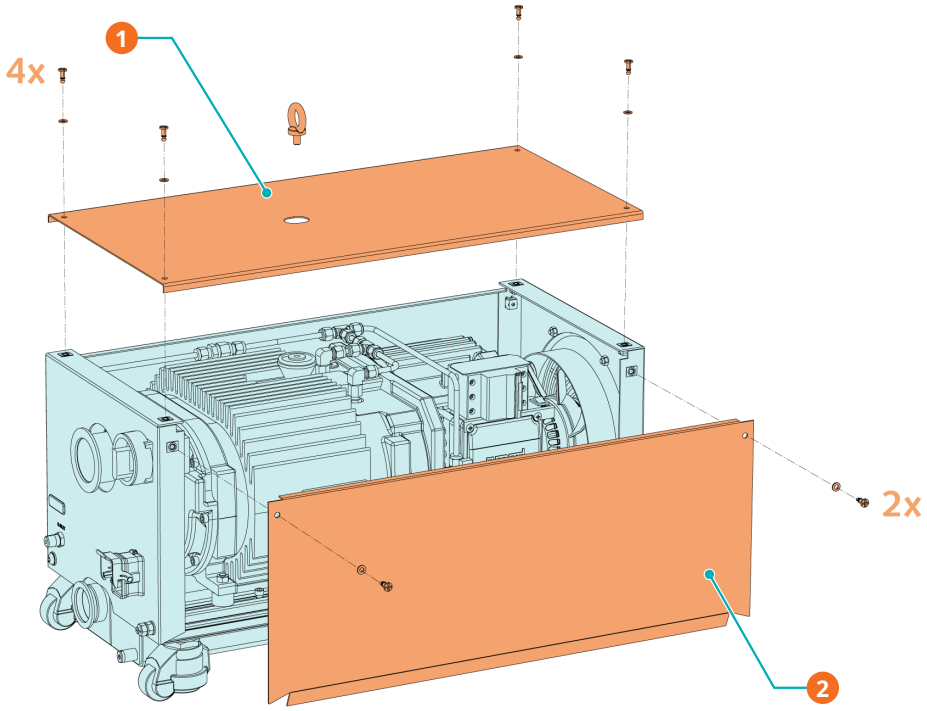
Use of an inappropriate oil.

Risk of premature failure!

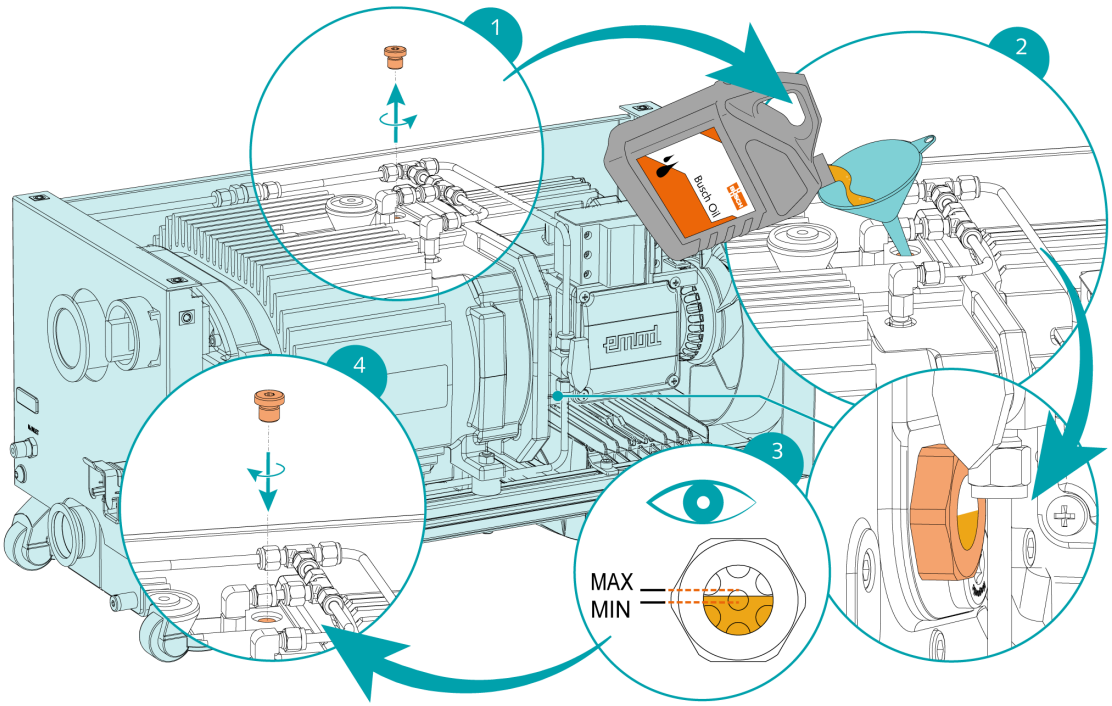
Loss of efficiency!

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

For oil type and oil capacity see Technical Data and *Oil* [➔ 33].

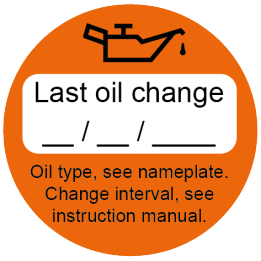


Description			
1	Use a Phillips-head screwdriver to remove the 4 screws and washers. Unscrew the eye bolt. Remove the top cover.	2	Use a Phillips-head screwdriver to remove the 2 screws and washers. Remove the side cover.



When the oil filling is achieved:

- Write down the oil change date on the sticker.



If there is no sticker (part no. 0565 568 959) on the machine:

- Order it from your Busch representative.

6 Electrical Connection

DANGER

Live wires.

Risk of electrical shock!

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

INSTALLATION(S) CURRENT PROTECTION:

DANGER

Missing current protection.

Risk of electrical shock!

- Provide current protection in accordance with EN 60204-1 on your installation(s).
- The electrical installation must comply with the applicable national and international standards.

NOTICE

Electromagnetic compatibility.

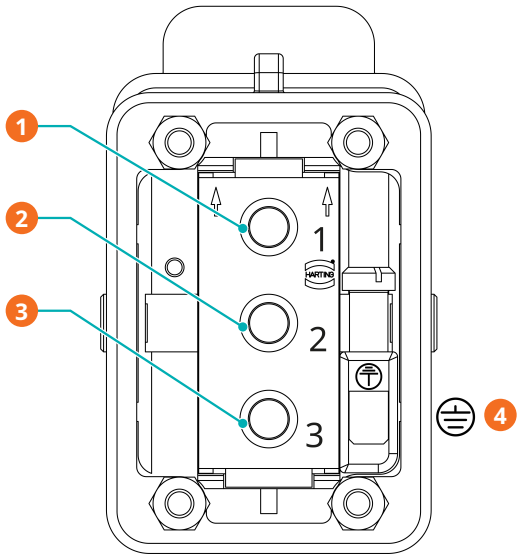
- Make sure that the motor of the machine will not be affected by electric or electromagnetic disturbance from the mains. If necessary:

➔ Provide additional interference suppression in accordance with the requirements of your supply network system.

➔ Contact your Busch representative for more information.

- Wire the mating connector (delivered loose) according to the wiring illustration below:

Mains connection (MC) - 4-pin connector



Description			
1	Phase 1 (L1)	2	Phase 2 (L2)
3	Phase 3 (L3)	4	Earth

- Electrically connect the machine directly to the mains connection (MC).

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.

- With a phase rotation tester, check if the wiring corresponds to the correct direction of rotation.
- Jog the motor briefly.
- Make sure that the machine is drawing air.

If the rotation of the motor must be changed:

- Switch any two of the motor phase wires.

6.1 Machine delivered without Variable Speed Drive

DANGER

Live wires.

Risk of electrical shock!

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

NOTE

The operation with variable speed, i.e. with a variable speed drive, is allowed as long as the motor is capable and the permitted motor speed range is respected (see Technical Data).

Contact your Busch representative for further advice and information.

- Make sure that the power supply for the motor is compatible with the data on the nameplate of the motor.
- 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.
- Provide a lockable disconnect switch or an emergency stop switch on the power line so that the machine is completely secured in case of an emergency situation.
- 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.
- 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.

6.2 Machine delivered with a Variable Speed Drive (Option)

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.

- Make sure that the power supply for the drive is compatible with the data on the nameplate of the variable speed drive.
- 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.
  - Busch recommends installing a C-curve circuit breaker.
- Connect the protective earth conductor.
- Electrically connect the Variable Speed Drive (VSD).

NOTICE

The admissible motor speed exceeds the recommendation.

Risk of damage to the machine!

- Check the admissible motor speed range, see Technical Data.

NOTICE

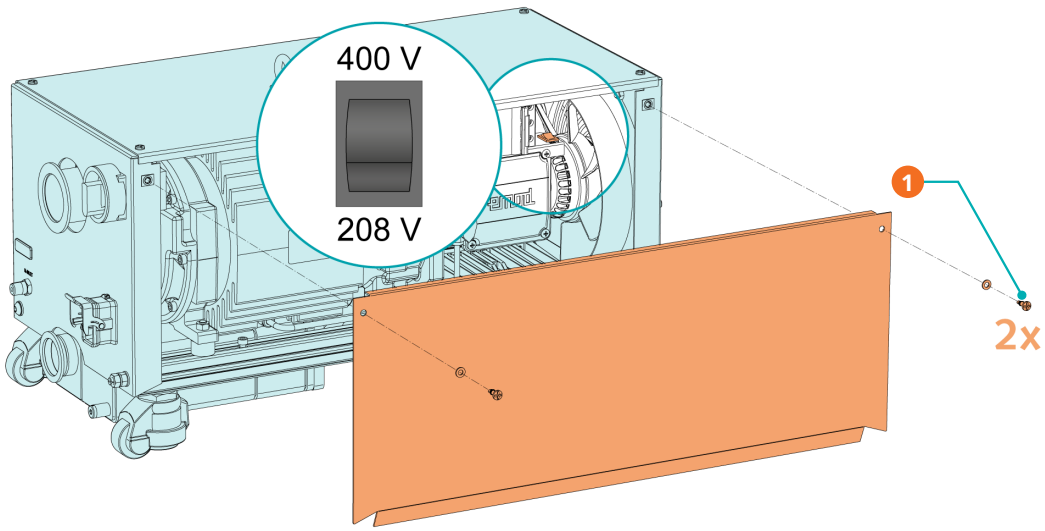
Incorrect connection.

Risk of damage to the variable speed drive!

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

6.3 Voltage Switch 208-400V (Only with VSD)

- Make sure the main switch (MSH) is in the "OFF" position.



Description			
1	Use a Phillips-head screwdriver to remove the 2 screws and washers. Remove the side cover.		

- Select the required voltage using the voltage switch (VS). Factory default setting is 400V.

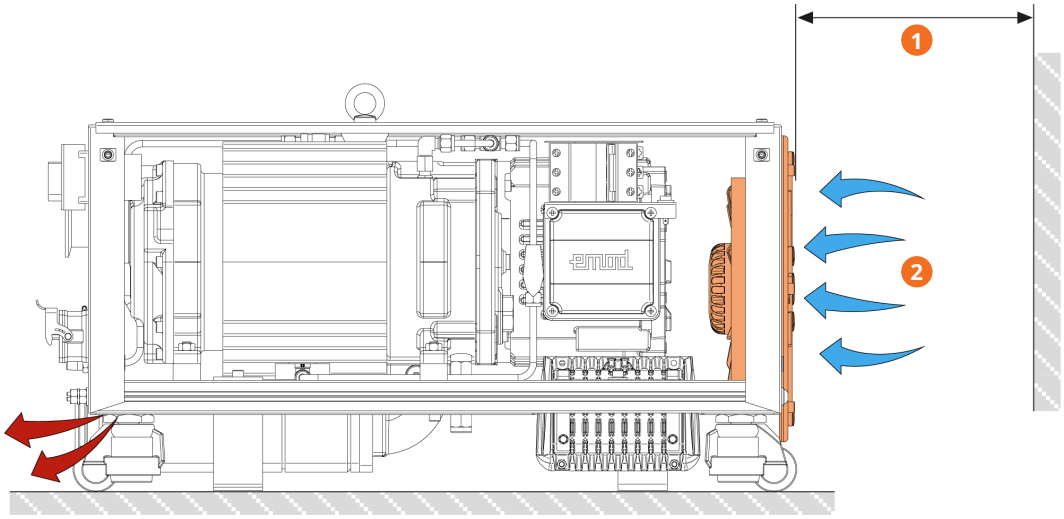
Positions and use of the voltage switch (VS)	
Position	**Use**
208V	For 200-240VAC
400V	For 380-480VAC

6.4 Direction of Rotation of the Fan Wheel

- Watch the fan wheel rotation and determine the intended direction of rotation with the arrow (stuck on).
- Jog the motor briefly.
- Make sure the fan wheel draws air into and through the machine.

If the rotation must be changed:

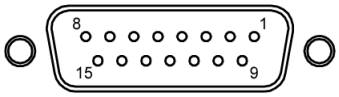
- Switch any two of the phase wires.

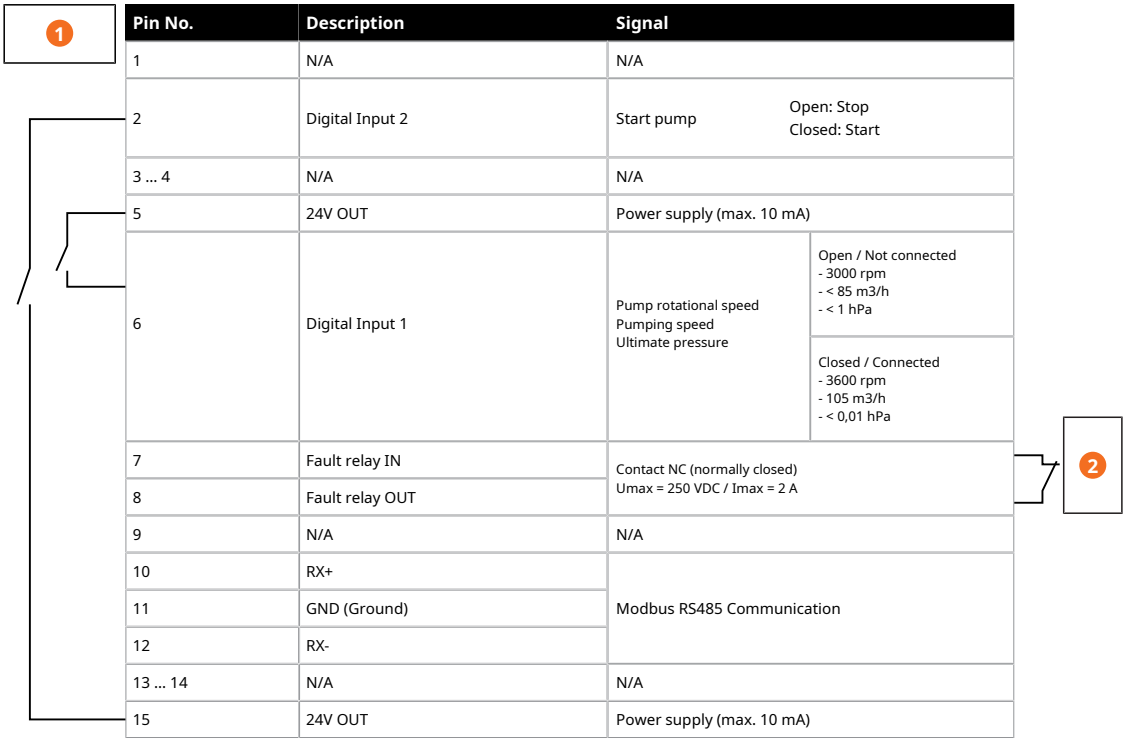


Description			
1	Minimum 50 cm	2	Cooling air

6.5 I/O and Communication Port Schematic (only with VSD)

Connector: D-Sub15, 15-pin, female





Pin No.	Description	Signal	
1	N/A	N/A	
2	Digital Input 2	Start pump	Open: Stop Closed: Start
3 ... 4	N/A	N/A	
5	24V OUT	Power supply (max. 10 mA)	
6	Digital Input 1	Pump rotational speed Pumping speed Ultimate pressure	Open / Not connected - 3000 rpm - < 85 m3/h - < 1 hPa
			Closed / Connected - 3600 rpm - 105 m3/h - < 0,01 hPa
7	Fault relay IN	Contact NC (normally closed) Umax = 250 VDC / Imax = 2 A	
8	Fault relay OUT		
9	N/A	N/A	
10	RX+	Modbus RS485 Communication	
11	GND (Ground)		
12	RX-		
13 ... 14	N/A	N/A	
15	24V OUT	Power supply (max. 10 mA)	

Description			
1	User side - Male Connector	2	Relay of VSD

Included in standard scope of delivery:

- Male connector with bridge for Pins No. 2-15 and Pins No. 5-6 (automatic start at 60 Hz).

7 Commissioning

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 people are present in the vicinity of a machine that is not insulated from noise for extended periods of time:

- Make sure to wear hearing protection.

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.

NOTICE

Running without air-cooled system.

Risk of damage to the machine!

- Make sure the fan (AF) is running when the machine is in operation.

- Make sure that the *Installation Conditions* [➔ 9] are met.

If the machine is equipped with a nitrogen system:

  - Turn on the nitrogen supply.

- Start the machine.
- Make sure that the maximum permissible number of starts does not exceed 6 starts per hour. Those starts should be spread within the hour.
- Make sure that the operating conditions comply with the Technical Data.
- After a few minutes of operation, perform an *Oil Level Inspection* [➔ 25].

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.

7.1 Conveying Condensable Vapors

CAUTION

Draining the condensate while operating and/or venting the machine.

The discharged gases and/or liquids may reach temperatures above 70°C!

Risk of burns!

- Avoid direct contact with the flow of gases and/or liquids.

The machine is equipped with a gas dilution system and is suitable for conveying condensable vapors in the gas stream.

START

- Open the dilution gas valve (DGV).
- Start the machine and warm it up for 30 minutes.
- Open the inlet valve.
- Perform the process.
- Close the inlet valve.
- Wait 30 minutes.
- Close the dilution gas valve (DGV).
- Stop the machine.

END

7.2 Restart Procedure

If the machine has stopped unintentionally:

- Find out why the machine has stopped and solve the problem, see *Troubleshooting* [➔ 31].
- Let the machine cool down (approx. 1 hour).
- Switch on the motor safety switch (MSS).
- Start the machine again with the main switch (MSH).

8 Maintenance

DANGER

Live wires.

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.

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.

WARNING

The machine is 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!

- Before doing anything that requires touching the machine, let it 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

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.

If the machine is equipped with a barrier gas system:

- Close the barrier gas supply.

- Vent the connected lines to atmospheric pressure.

If necessary:

- Disconnect all connections.

8.1 Maintenance Schedule

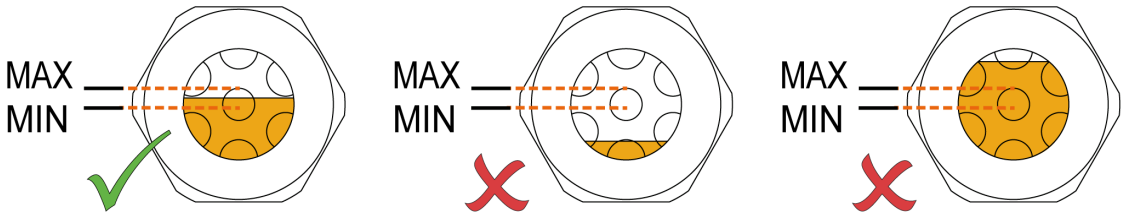
The maintenance intervals depend very much on the individual operating conditions. The intervals given below are considered as starting values which should be individually shortened or extended as appropriate.

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
Yearly	• Check the oil level, see *Oil Level Inspection* [➔ 25]. • Check the oil color, see *Oil Color Inspection* [➔ 25]. • Carry out a visual inspection and clean the machine from dust and dirt • Check the electrical connections and the monitoring devices.
Every 16000 hours (Can be shortened or extended depending on the application)	• Change the oil of the gear and bearings, see *Oil Change* [➔ 25]. • If necessary, have a major overhaul on the machine (Contact Busch).

8.2 Oil Level Inspection

- Stop the machine.
- Wait 1 minute.
- Check the oil level.



- Fill up if necessary, see *Oil Filling* [➔ 13].

8.3 Oil Color Inspection

WARNING

Oil "YLC 250 B" contaminated chemically or by foreign bodies.

Risk of explosion!

If the oil becomes dark:

- Contact your Busch representative without delay.

- Make sure that the oil is always transparent.

If the oil becomes dark, white or looks different from the initial color:

- Change the oil immediately, see *Oil Change* [➔ 25].
- Contact your Busch representative to find out why the oil color has changed.

8.4 Oil Change

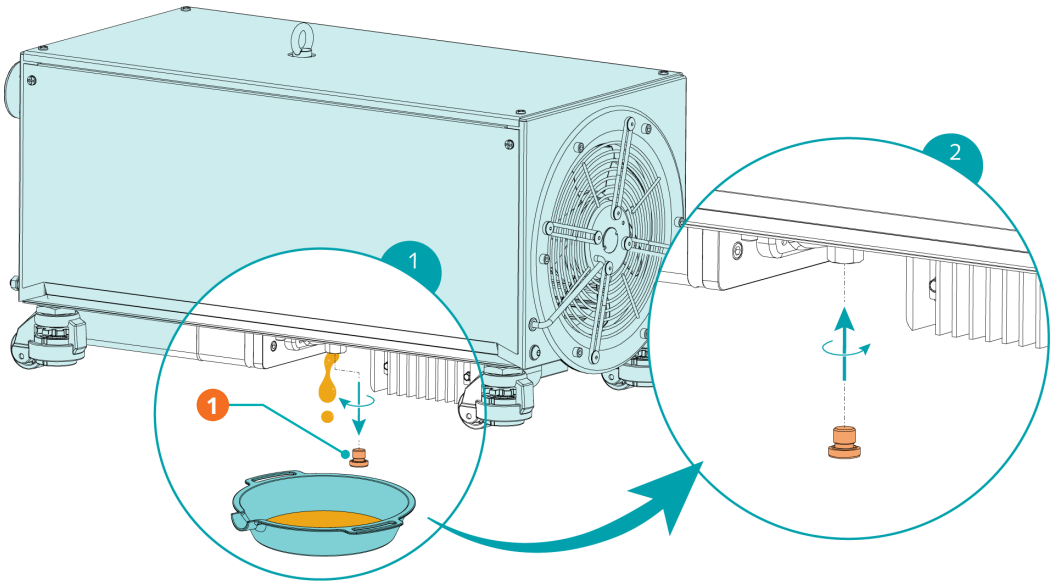
NOTICE

Use of an inappropriate oil.

Risk of premature failure!

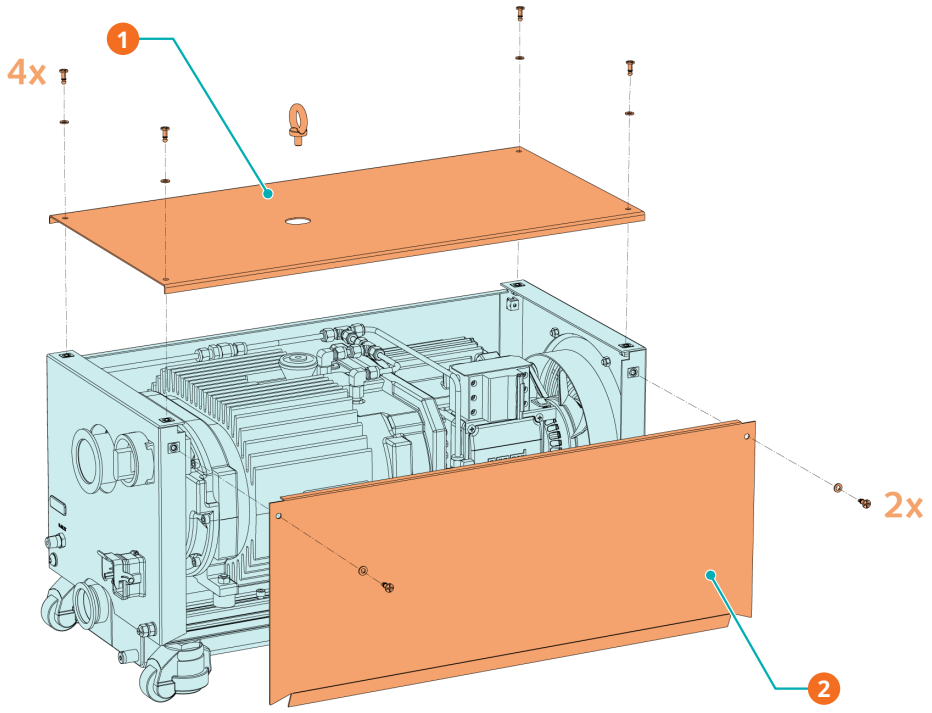
Loss of efficiency!

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

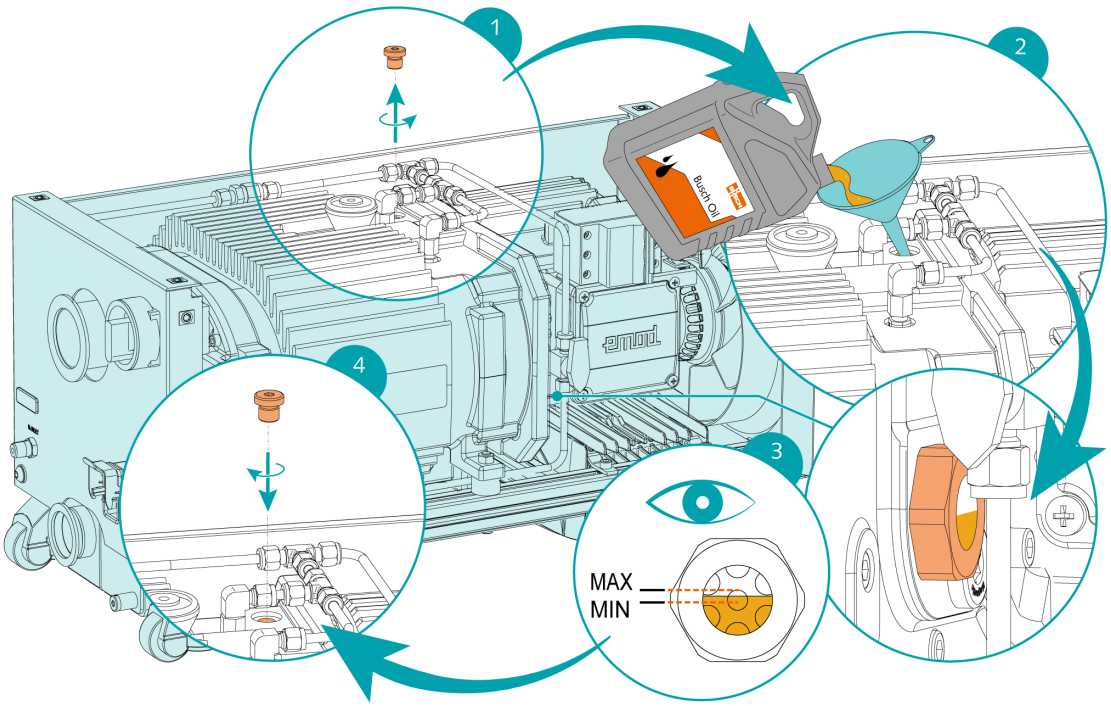


Description			
1	Oil drain plug (ODP)		

For oil type and oil capacity see Technical Data and *Oil* [➔ 33].

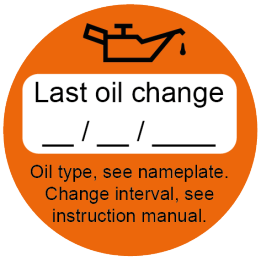


Description			
1	Use a Phillips-head screwdriver to remove the 4 screws and washers. Unscrew the eye bolt. Remove the top cover.	2	Use a Phillips-head screwdriver to remove the 2 screws and washers. Remove the side cover.



When the oil filling is achieved:

- Write down the oil change date on the sticker.



If there is no sticker (part no. 0565 568 959) on the machine:

- Order it from your Busch representative.

9 Overhaul

WARNING

The machine is 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.

If the machine has conveyed gas contaminated with foreign materials which are hazardous to health:

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

Busch will only accept machine accompanied by a signed, fully completed and legally binding "declaration of contamination", downloadable from the following link: *buschvacuum.com/declaration-of-contamination*.

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!

- Before doing anything that requires touching the machine, let it cool down first.

- Shut down the machine and lock against inadvertent start up.
- Disconnect the power supply.

If the machine is equipped with a barrier gas system:

- Close the barrier gas supply.

- Vent the connected lines to atmospheric pressure.
- Disconnect all connections.

If the machine is to be stored:

- See *Storage* [➔ 8].

10.1 Dismantling and Disposal

- Drain and collect the oil.
- Make sure that no oil drips onto the floor.
- 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 original spare parts.

Risk of premature failure!

Loss of efficiency!

- Use only original Busch spare parts, consumables and supplies to ensure correct operation of the machine and to validate the warranty.

There are no standard spare parts kits available for this product.

For original Busch spare parts:

- Contact your Busch representative.

12 Troubleshooting

Problem	Possible Cause	Remedy
The machine does not start.	The machine is not supplied with the correct voltage.	• Check the power supply.
	Internal parts are worn or damaged	• Repair the machine (contact Busch).
	The motor safety switch (MSS) has tripped.	• Check the electrical installation. • Turn on the motor safety switch.
	The motor is defective.	• Repair the machine (contact Busch).
The machine does not reach the usual pressure on the suction connection.	Suction lines are too long or section diameter is too small.	• Use larger diameter or shorter lines. • Seek advice from your local Busch representative.
	Measurement method or reading is false.	• Check the gauge, check ultimate pressure directly at isolated inlet connection.
	Excessive counter pressure	• Make sure internal or external check valve is not stuck.
	Leak in the system.	• Repair leak.
	Internal parts are worn or damaged.	• Repair the machine (contact Busch).
The machine runs too hot.	Ambient temperature too high.	• Observe the permitted ambient temperature, see Technical Data.
	The fan inlet (AF) is dirty or obstructed.	• Clean it and make sure that the air flow path is clear of all obstacles.
	Temperature of the process gases at the inlet too high.	• Observe the permitted gas inlet temperature, see Technical Data.
The machine runs very noisily.	Wrong oil quantity or unsuitable oil type.	• Use one of the recommended oils in the correct quantity, see *Oil* [➔ 33].
	Defective gears, bearings or coupling element.	• Repair machine (contact Busch).
The oil is no longer transparent	Oil change intervals are too long.	• Drain the oil and fill in new oil, see *Oil Change* [➔ 25].
	The machine runs too hot.	• See problem "The machine runs too hot".
	The oil is emulsified due to contamination by the process.	• Drain the oil and fill in new oil, see *Oil Change* [➔ 25].

13 Technical Data

		BA 0100 C
Nominal pumping speed (50 / 60 Hz)	m^3/h	85 / 105 105 *
Ultimate pressure	hPa (mbar) abs.	0.01
	TORR	0.0075
Power consumption at ultimate pressure (50 / 60 Hz)	kW	1.1 / 1.25 1.3 *
Nominal motor rating (50 / 60 Hz)	kW	1.5 / 1.8
Nominal system rating *	kW	2.2
Nominal motor speed (50 / 60 Hz)	min^{-1}	3000 / 3600 3600 *
Sound pressure level (ISO 2151) KpA = 3 dB (50 / 60 Hz)	dB(A)	58
Ambient temperature range	°C	0 ... 40
	°F	32 ... 104
Maximum allowable counter pressure at discharge	hPa (mbar) rel.	200
	PSIG	2.9
Maximum allowable gas inlet temperature according to the inlet pressure	°C	≤ 50 hPa (mbar) abs. : 200
		> 50 hPa (mbar) abs. : 80
Maximum continuous suction pressure	hPa (mbar) abs.	150
	TORR	112.5
Operating voltage (50 / 60 Hz)	V	380-415 / 200-240
Operating voltage * (50 / 60 Hz)	V	208-240 / 380-480
Leak rate (Helium)	$mbar \cdot L/s^{-1}$	$\leq 1.0 \times 10^{-6}$
Water vapor capacity	kg/h	1.0
Oil capacity	l	0.12
Dimensions (L x W x H)	mm	634 x 304 x 338
Weight approx.	kg	120
Protection class		IP 20

* With integrated variable speed drive

14 Oil

	YLC 250 B
ISO-VG	250
Oil Type	Synthetic
Part number 0.5 L packaging	0831 131 400
Part number 1 L packaging	0831 108 878
Part number 5 L packaging	0831 108 879

15 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

Ateliers Busch S.A.
Zone Industrielle
CH-2906 Chevenez

declares that the machine: COBRA BA 0100 C

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

– 'Machinery' 2006/42/EC
– '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:

Standard	Title of the Standard
EN ISO 12100 : 2010	Safety of machinery - Basic concepts, general principles of design
EN 1012-2 : 1996 + A1 : 2009	Vacuum pumps - Safety requirements - Part 2
EN 60204-1 : 2018	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
EN ISO 13857 : 2019	Safety of machinery - Safety distances to prevent hazard zones being reached by the upper and lower limbs
EN ISO 2151 : 2008	Acoustics - Noise test code for compressors and vacuum pumps - Engineering method (grade 2)

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

Chevenez, 01.03.2023

Christian Hoffmann, General Manager

16 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

Ateliers Busch S.A.
Zone Industrielle
CH-2906 Chevenez

declares that the machine: COBRA BA 0100 C

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

– Supply of Machinery (Safety) Regulations 2008
– Restriction of the use of certain hazardous substances in Electrical and Electronic Equipment Regulations 2012

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

Standard	Title of the Standard
EN ISO 12100 : 2010	Safety of machinery - Basic concepts, general principles of design
EN 1012-2 : 1996 + A1 : 2009	Vacuum pumps - Safety requirements - Part 2
EN 60204-1 : 2018	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
EN ISO 13857 : 2019	Safety of machinery - Safety distances to prevent hazard zones being reached by the upper and lower limbs
EN ISO 2151 : 2008	Acoustics - Noise test code for compressors and vacuum pumps - Engineering method (grade 2)

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

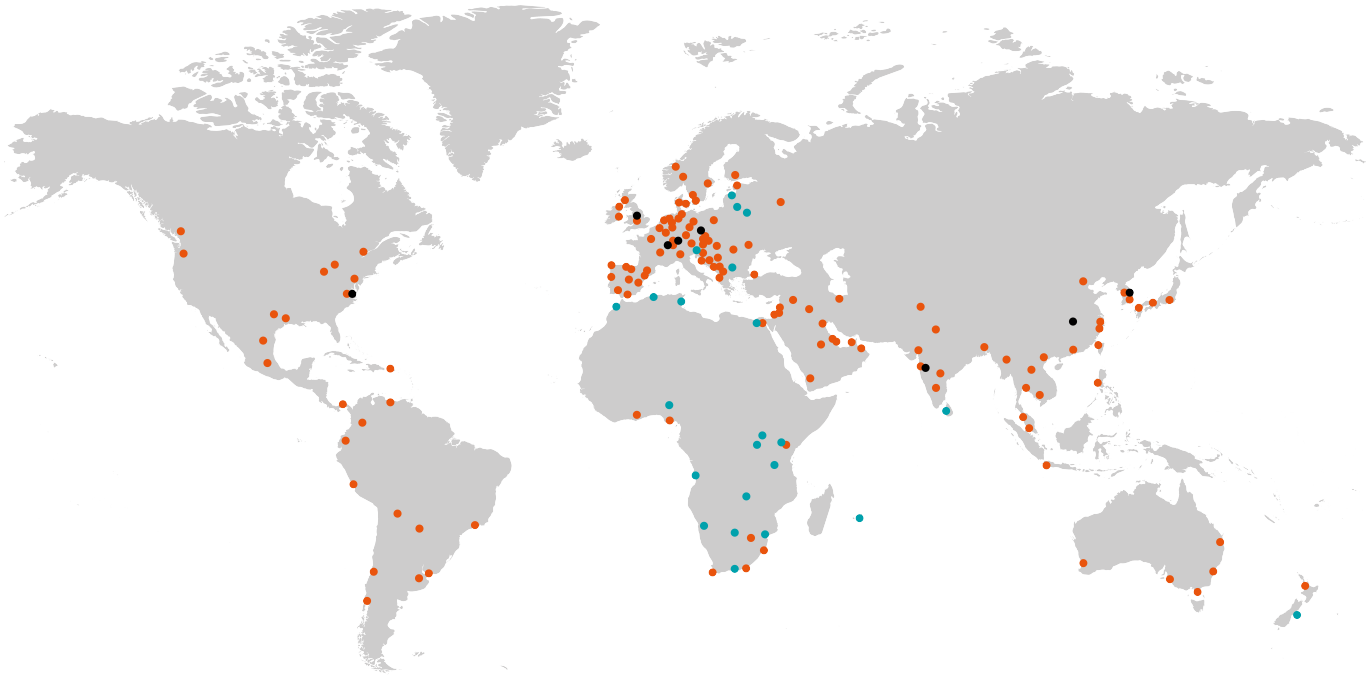
Busch (UK) Ltd
30 Hortonwood
Telford – UK

Chevenez, 01.03.2023

Christian Hoffmann, General Manager

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.



Busch companies and Busch employees Local representatives and distributors Busch production site

www.buschvacuum.com

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