VACUUM SOLUTIONS

Part of the BUSCH GROUP

TYR

Rotary Lobe Blowers and Vacuum Pumps
WT 0100 / 0150 / 0280 / 0390 / 0600 / 0730 CV
WT 0100 / 0150 / 0280 / 0390 / 0600 / 0730 CP

Instruction Manual

SERVICE
AND SPARE PARTS, INSTRUCTION MANUALS ...
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VACUUM APP

CE UK CA

0870231979 | B0_en-US | Original instructions

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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 manufacturer representative.

Read this instruction 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* [➔ 7].

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

NOTE

Technical term.

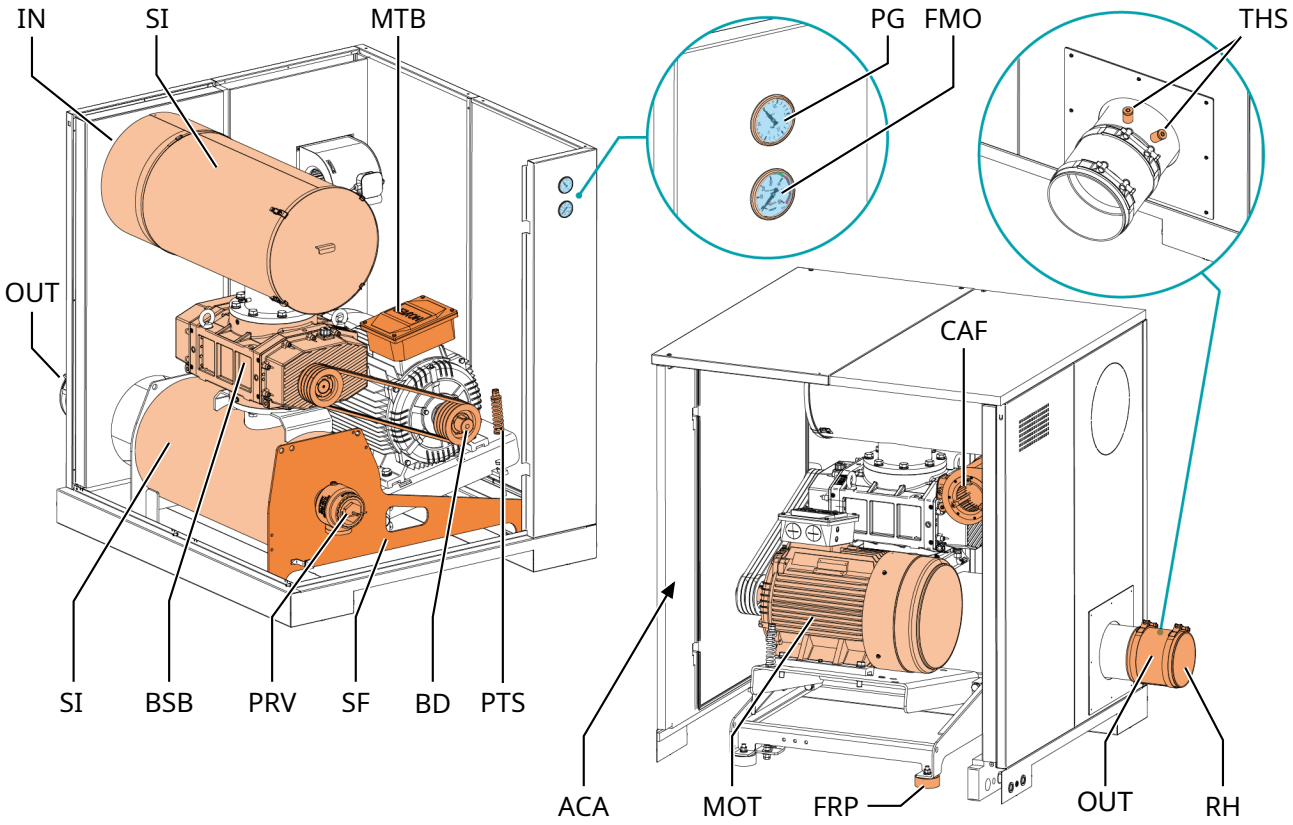
In this instruction manual, we consider that the term ‘machine’ refers to the ‘rotary lobe blower package for overpressure or vacuum operation’.

NOTE

Illustrations.

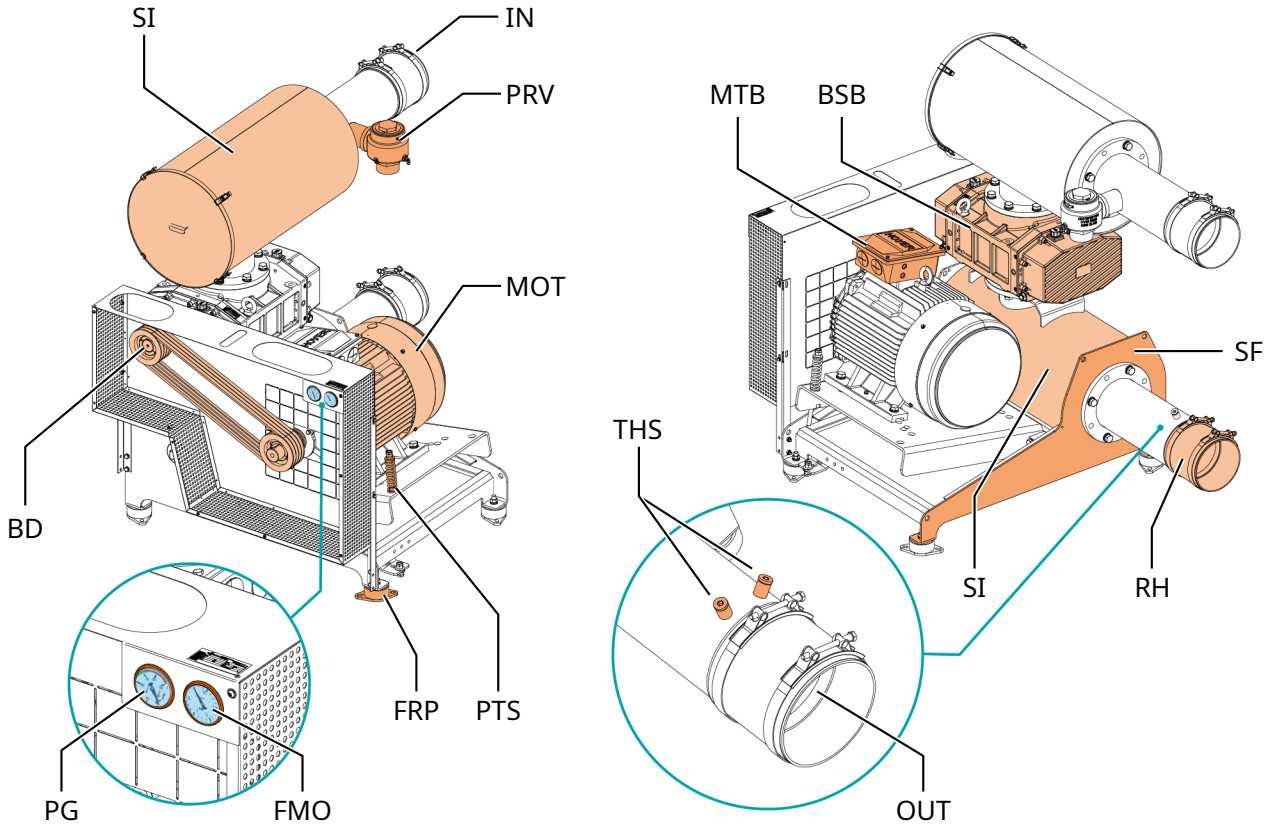
In this instruction manual, the illustrations may differ from the appearance of the machine.

Blower Package with Cabinet



Description			
IN	Blower inlet	OUT	Blower outlet
ACA	Acoustic cabinet	BD	Belt drive
BSB	Bare shaft blower	CAF	Cabinet fan
FMO	Filter monitoring	FRP	Feet with rubber pads
MOT	Motor	MTB	Motor terminal box
PG	Pressure gauge	PRV	Pressure relief valve (Safety valve)
PTS	Pre-tensioning system	RH	Rubber hose
SF	Supporting frame	SI	Silencer
THS	Thermoswitch		

Vacuum Pump without Cabinet



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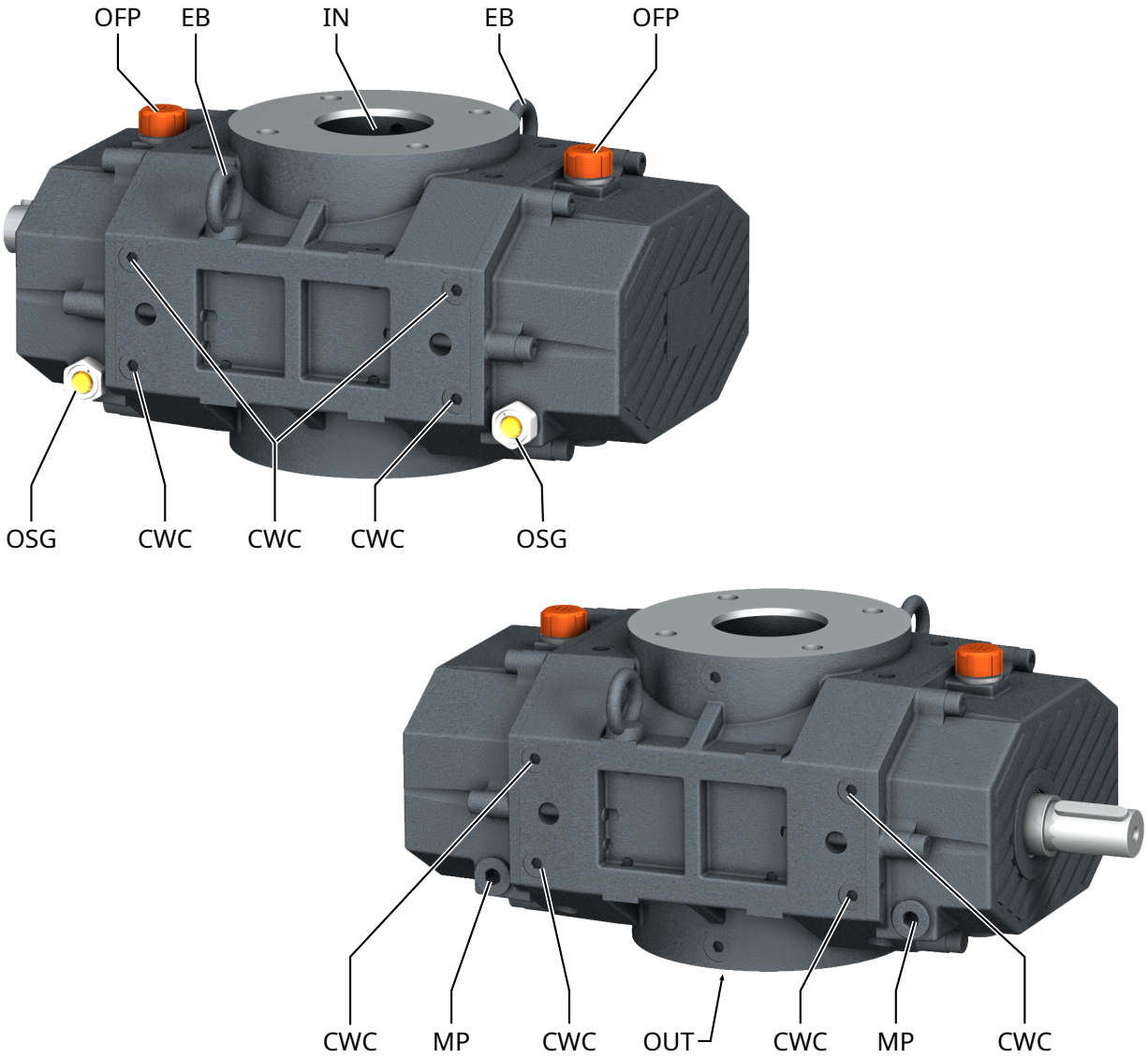
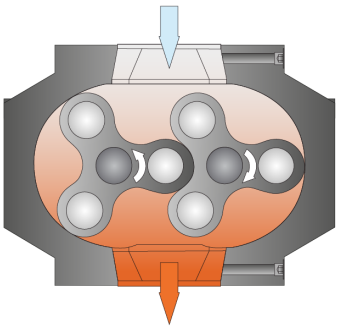
Module



Description			
IN	Blower inlet connection	OUT	Blower outlet connection
CWC	Cooling water connection	EB	Eye bolt
MP	Magnetic plug	OFP	Oil fill plug
OSG	Oil sight glass		

2.1 Operating Principle



The machine with tri-lobe rotors works on the principle of oil-free gas transport.

Two identical lobes rotate in opposite direction in the casing, transporting fixed volume of air with each turn. There is no contact between the rotors and also between rotor and casing, therefore process does not require oil in the working area. The machine transports the gas without increasing the pressure.

Gas is compressed in the machine outlet by the gas that has been already transported (blowers with external compression).

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 transport of air and other dry, non-aggressive, non-toxic, non-ignitable and non-explosive gases.

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

The machine is suitable for continuous and intermittent operation.

Permitted environmental conditions, see Technical Data.

NOTICE

Chemical compatibility of the process gases with the machine component materials.

Risk of corrosion inside the blower working area which can reduce performance and its lifetime!

- Check if the process gases are compatible with those following materials:
  - Cast iron
  - Steel
  - Aluminum
  - Fluor elastomer (FKM/FPM)
- Contact your Busch representative for further advice and information.

2.3 Optional Accessories

2.3.1 OTTO IoT Box

The machine can be equipped with the OTTO IoT Box.

It allows the rotary lobe blower package for overpressure or vacuum operation to be connected to the Busch Cloud and collect live measured data during its operation.

For the activation and setup of this optional function, please contact your Busch representative.

For any additional information, refer to the specific document “OTTO IoT Box User's Manual, art. no. 0870236702” or contact your Busch representative.

3 Transport and Handling

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.

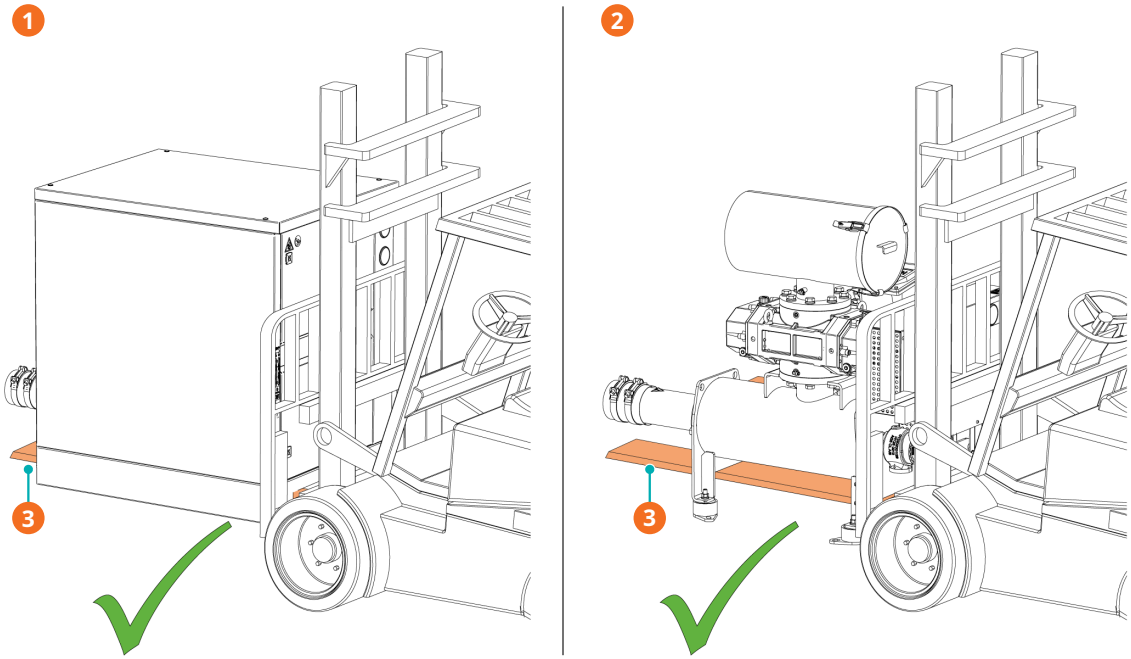
Tilting a machine that is already filled with oil can cause large quantities of oil to ingress into the casing.

- Drain the oil prior to every transport or always horizontally transport the machine.

- Check that the machine has not been damaged during transport.

If the machine is mounted and secured on a transport support (pallet):

- Remove the machine from the transport support before installation.



Description			
1	Blower package with cabinet	2	Vacuum pump without cabinet
3	WARNING! Make sure both forks protrude from the opposite side before lifting the machine.		

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 0 ... 20 °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 0 ... 20 °C.
- Rotate the blower shaft by hand to renew the lubrication traces.

WARNING

Blower shaft.

- Rotate the blower shaft by hand at least during installation, just before starting the machine.

NOTICE

Long storage time (over 6 months).

Risk of damage to the machine!

- The blower shaft must be rotated by hand periodically, at least once every three months, to renew the grease on the bearing rings. This procedure must also be recorded in a periodic register.
- In the event of prolonged storage or storage in a warehouse subject to significant temperature fluctuations and/or an aggressive atmosphere, the rotary lobe blower must be prepared according to a special Busch Vyroba CZ s.r.o. procedure (depending on the information provided by the customer when preparing the order).
- All specific preparations and procedures must always be retained during storage.
- The rotary lobe blower must be wrapped in special VCI film for the duration of storage.

➔ Failure to follow these procedures may invalidate the product warranty.

5 Installation

5.1 Installation Conditions

WARNING

Blower shaft.

- Rotate the blower shaft by hand at least during installation, just before starting the machine.

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.

- 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 environmental conditions comply with the protection class of the motor and the electrical elements.
- 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 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.
- Check the oil level, see *Oil Level Inspection* [➔ 27].
- Make sure that all provided covers, guards, hoods, etc. are mounted.
- Make sure that the machine is secured against movement.

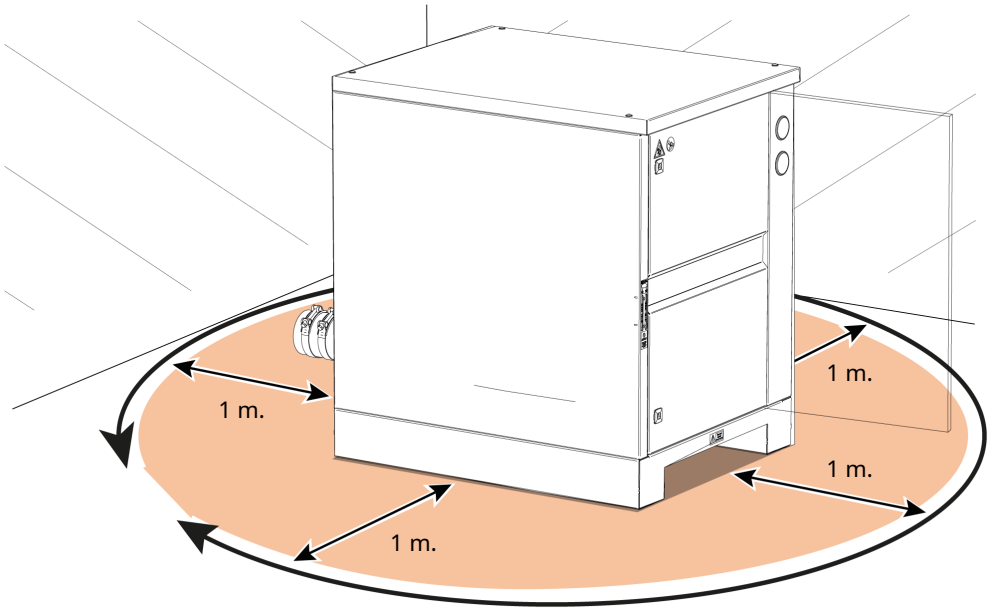
5.2 Blower Unit Installation

The machine must be installed horizontally on a flat surface.

The maximum permissible irregularity of the machine base/inclination can be expressed as follows:

- From left to right and front to back: maximum 0.5° inclination.

- Keep 1 meter space around the machine for the maintenance work.



- Make sure the machine is secured to the concrete base using anchors (see *Securing the Machine to the Floor* [➔ 13].)

5.2.1 Securing the Machine to the Floor

WARNING

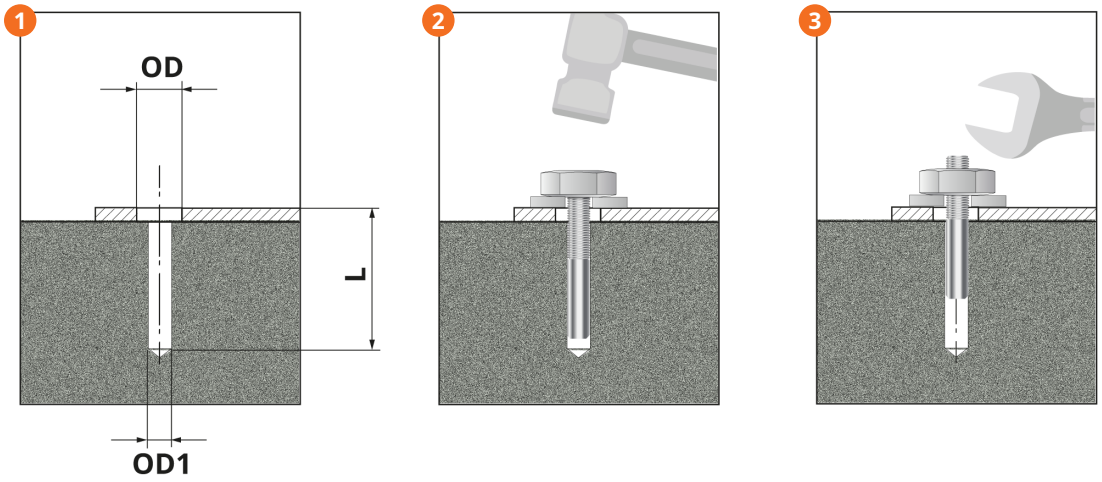
After installation, the machine must be anchored to the floor.

Risk of spontaneous movement!

Risk of damage to the machine!

- Refer to the dimensional drawing for position of mounting holes.

Anchoring Procedure



Description			
1	Drill a hole and clean it	2	Stick the anchor into the hole
3	Tighten the nut		

5.3 Connecting Lines / Pipes

WARNING

Connection lines can accumulate an electrostatic charge

Risk of severe injury!

Risk of damage to the machine!

- Connection lines must be made of conductive material, or measures must be taken to prevent electrostatic charging.
- Exhaust connection lines must be made of heat-resistant material.

- 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 at the inlet and exhaust connections.
- Make sure that the diameter of the connecting lines over the entire length is at least as large as the connections of the machine.

In case of long connecting lines:

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

5.3.1 Inlet Connection

WARNING

Unprotected inlet connection.

Risk of severe injury!

- Do not put hand or fingers in the inlet 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) at the inlet of the machine.

Connection size(s):

– Ø 114 mm for WT 0100 CV/CP and WT 0150 CV/CP

– Ø 159 mm for WT 0280 CV/CP and WT 0390 CV/CP

– Ø 219 mm for WT 0600 CV/CP and WT 0730 CV/CP

Depending on the specific configuration ordered, other connection dimensions may apply.

- Make sure that the connection lines cause no stress on the connections of the machine. Therefore, we recommend installing flexible lines at the inlet and exhaust connections.

5.3.2 Exhaust Connection

NOTICE

Exhaust gas flow obstructed.

Risk of damage to the machine!

- Make sure that the exhaust gas will flow without obstruction.

Connection size(s):

– Ø 114 mm for WT 0100 CV/CP and WT 0150 CV/CP

– Ø 159 mm for WT 0280 CV/CP and WT 0390 CV/CP

– Ø 219 mm for WT 0600 CV/CP and WT 0730 CV/CP

Depending on the specific configuration ordered, other connection dimensions may apply.

- Make sure that the connection lines cause no stress on the connections of the machine. Therefore, we recommend installing flexible lines at the inlet and exhaust connections.

5.4 Filling Oil

NOTICE

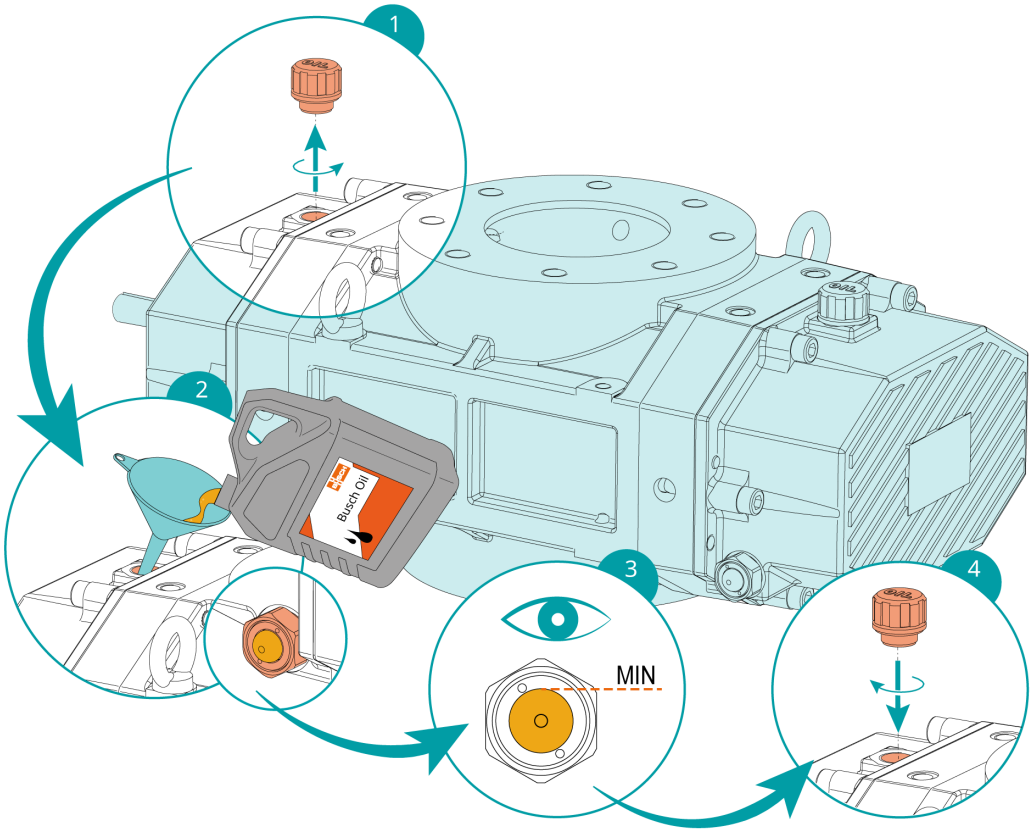
Use of inappropriate oil.

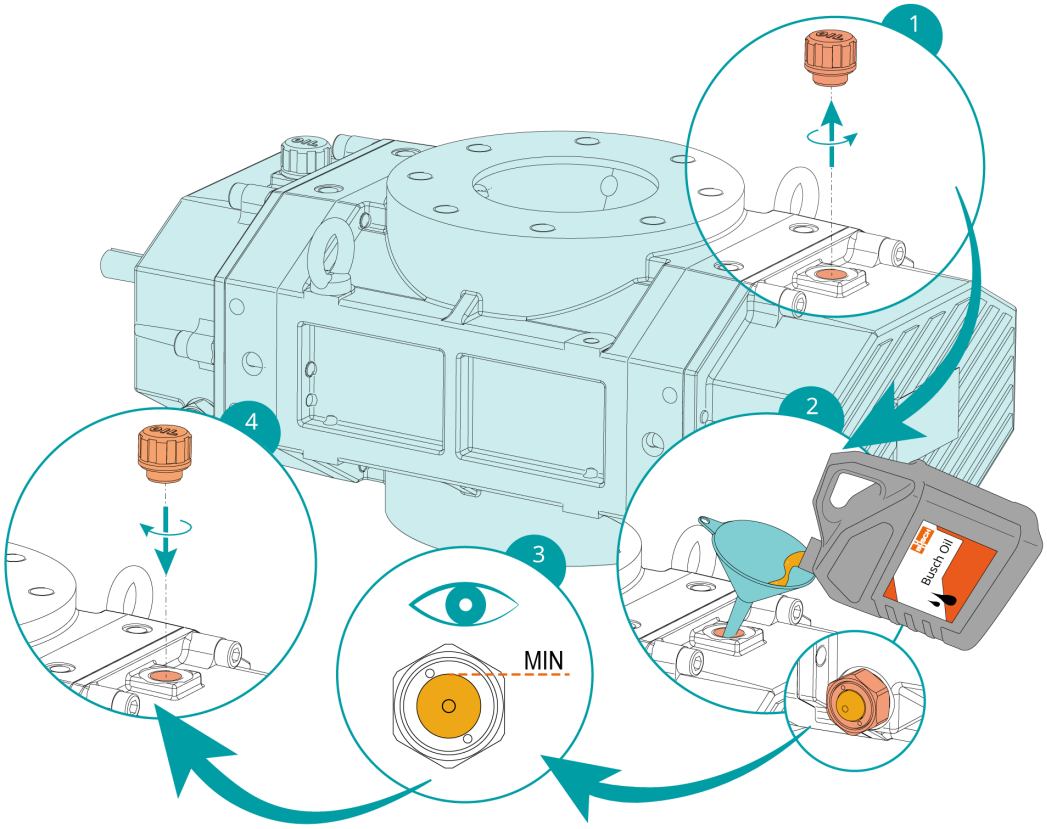
Risk of premature failure!

Loss of efficiency!

- Use only a type of oil previously approved and recommended by the manufacturer.

- For information on oil type and filling capacities, see the Technical Data and *Oil* [➔ 41] chapters.





When oil filling is complete:

- Note the date of the oil change on the sticker.

If there is no sticker on the machine:

- Order it from your Busch representative (article number 0565 568 959).

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, contact your Busch representative for more information.
- 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* [➔ 42] or *UK Declaration of Conformity* [➔ 43]).

NOTICE

The motor frequency is below 20 Hz.

Risk of damage to the machine!

6.1 Machine delivered without Control Box or Variable Speed Drive (VSD)

DANGER

Live wires.

Risk of electrical shock!

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

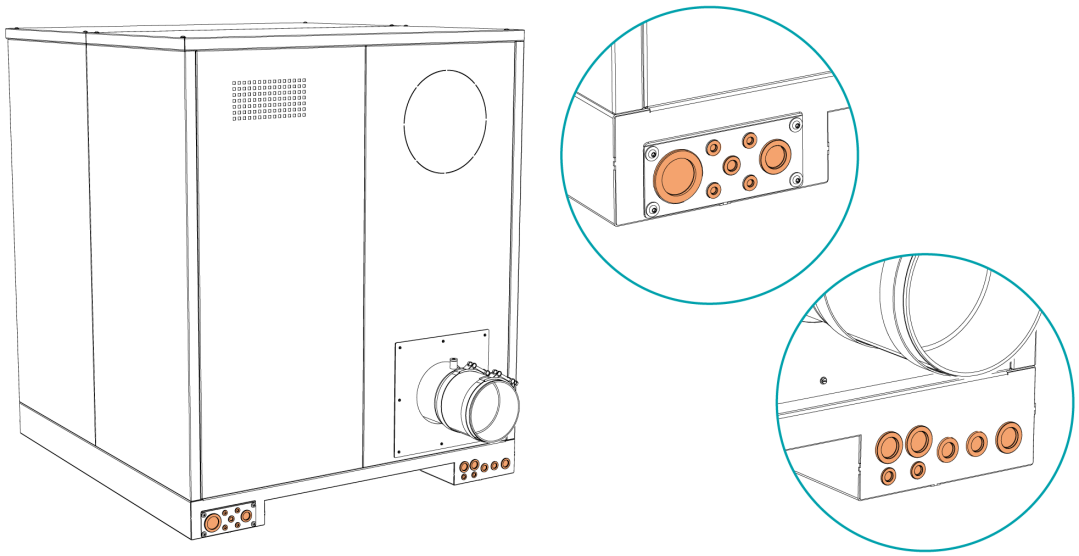
- Make sure that the power supply for the motor is compatible with the data on the name plate of the motor.
- If the machine is equipped with a power connector, install a residual current protective device to protect persons in case of a defective insulation.
  - Busch recommends installing a type B 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

Electrical connections for cabinet fan and main motor.

Cables must be routed through the cable entries at the bottom of the rear side of the support frame, as shown in the illustration below.

- Cut the rubber membranes and insert the cables into the cabinet (the size and number of cable entries may vary depending on the cabinet variant).



NOTE

After the machine has been switched off, the cabinet fan must continue to run for a further 30 minutes to dissipate the accumulated heat properly.

NOTICE

Incorrect connection.

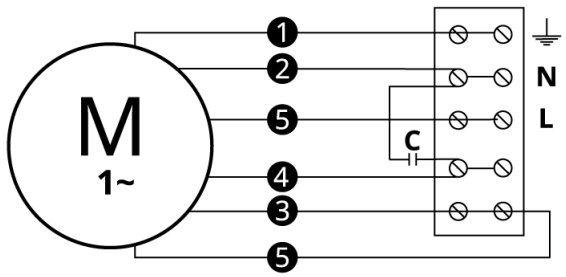
Risk of damage to the motor!

- The wiring diagrams below are examples only. See inside the terminal box for motor connection instructions and diagrams.

6.2 Wiring Diagram Single-Phase Motor

For optional cabinet fans with different voltages, the electrical connection may vary.

Electrical data:
U = 230 VDC; P = 290 W; C = 1.3 A
R.p.m. = 1950; F = 50 Hz; Cap. = 10 µF



$M_{1~}$ = Standard single-phase motor; C = Permanent capacitor

6.3 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.

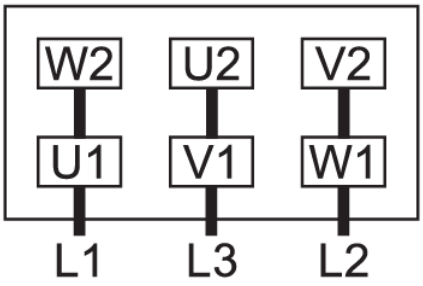
The intended rotation direction of the motor is defined by the specific instruction label stuck on the machine.

- Jog the motor briefly.
- Watch the fan wheel of the motor and determine the direction of rotation just before the fan wheel stops.

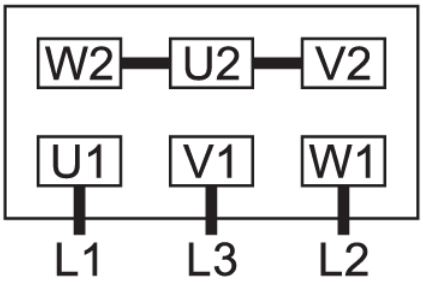
If the rotation of the motor must be changed:

- Switch any two of the motor phase wires.

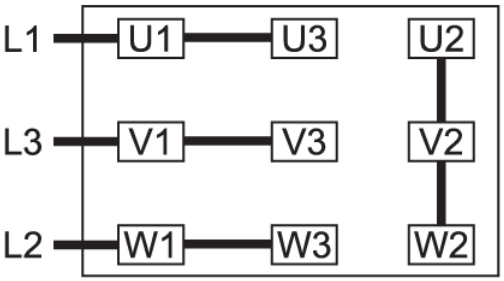
Delta connection (low voltage):



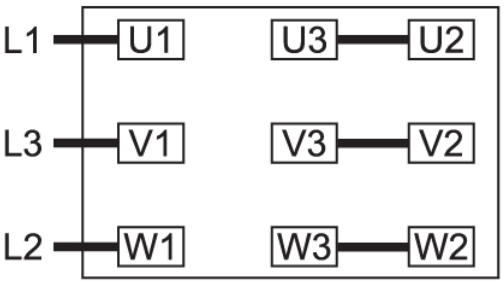
Star connection (high voltage):



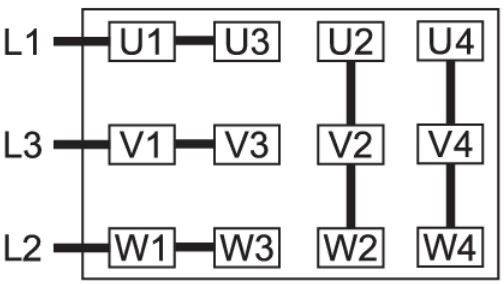
Double star connection, multi-voltage motor with 9 pins (low voltage):



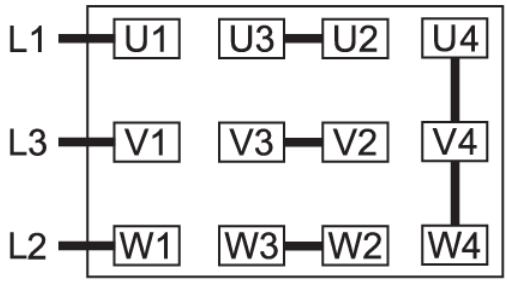
Star connection, multi-voltage motor with 9 pins (high voltage):



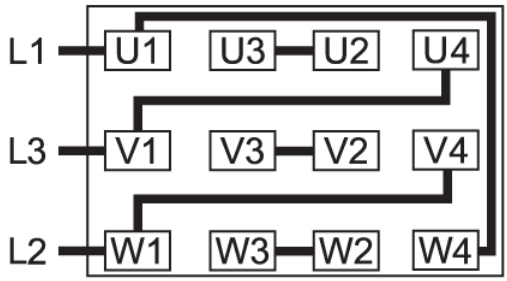
Double star connection, multi-voltage motor with 12 pins (low voltage):



Star connection, multi-voltage motor with 12 pins (high voltage):



Delta connection, multi-voltage motor with 12 pins (middle voltage):



7 Commissioning

CAUTION

In operation, the surface of the machine may reach temperatures over 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.

- Make sure that the *Installation Conditions* [➔ 11] are met.
- Start the machine.
- Make sure that the maximum permissible number of starts does not exceed the following recommendations:

From 3 kW to 11 kW	12 starts per hour
From 15 kW to 90 kW	6 starts per hour

- Make sure that the operating conditions comply with the Technical Data.
- After a few minutes of operation, perform an *Oil Level Inspection* [➔ 27].

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

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

NOTICE

The machine is normally shipped with oil.

Before commissioning:

- Check the oil level, see *Oil Level Inspection* [➔ 27].
- Fill up if necessary, see *Filling Oil* [➔ 15].

8 Maintenance

DANGER

Live wires.

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

Hot liquids.

Risk of burns!

- Before draining liquids, 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

Using inappropriate cleaners.

Risk of removing safety stickers and protective paint!

- Do not use incompatible solvents to clean the machine.

- Stop the machine and lock it to prevent accidental start-up.
- 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.

DANGER

Accidental restart.

Risk of injuries!

- The machine must be de-energized (switched off) at the service circuit breaker and protected against accidental restart during all maintenance work.

Interval	Maintenance work
Every 6 months	• Carry out a visual inspection and clean the machine from dust and dirt. • Check the electrical connections and the monitoring devices.
Every 32000 hours	• Bare shaft blower overhaul or replacement is recommended.
According to the motor manual	• Check the motor. • Lubricate the motor if necessary.

8.2 Inlet Filter Maintenance

The inlet filter must be cleaned regularly. The frequency depends on the application, but the filter should be cleaned at least once every six months.

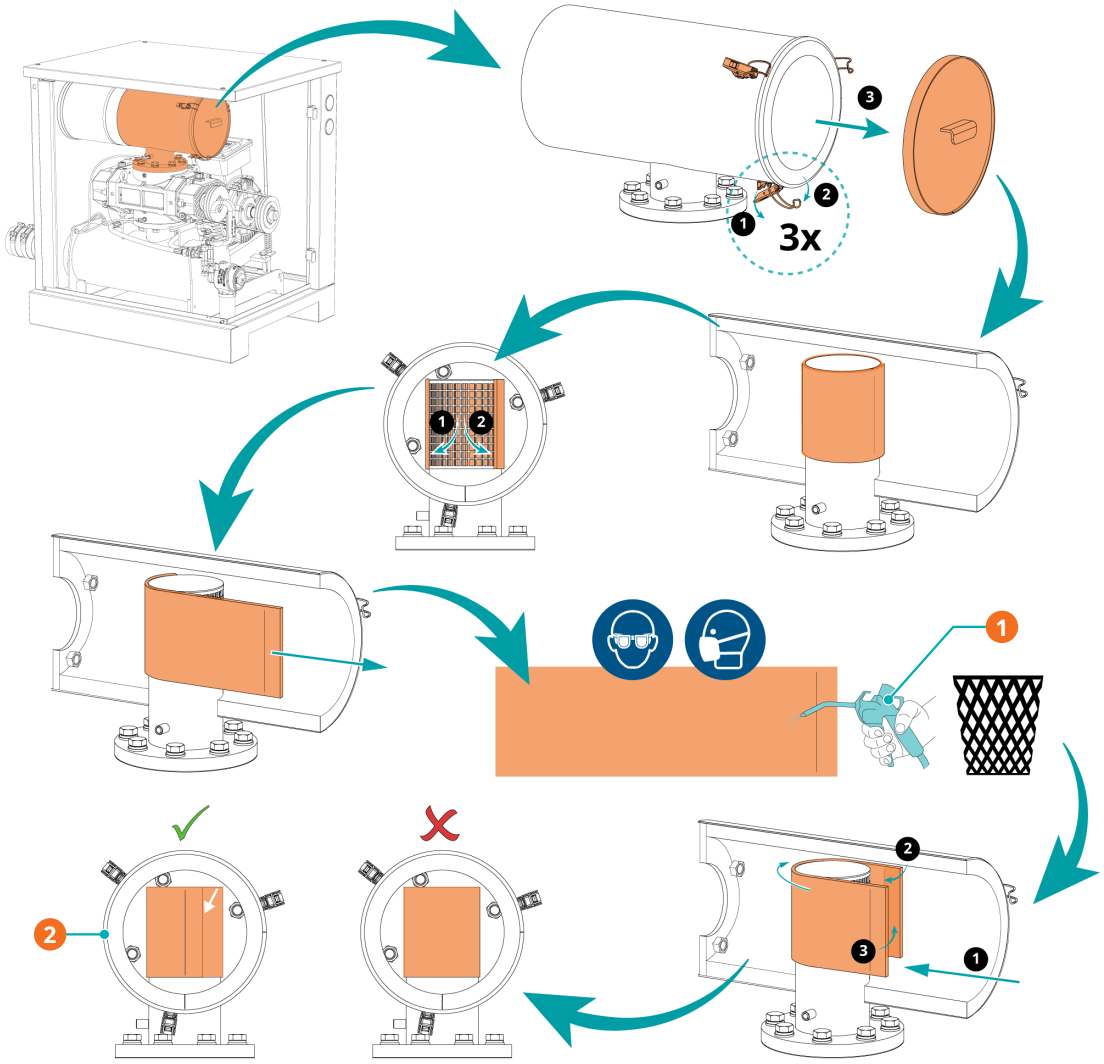
The filter must not be washed.

The clogging of dirt in the filter is checked by the filter gauge supplied, which is integrated into the belt cover or cabinet front.

Cleaning with compressed air does not guarantee 100% cleanliness of the filter. It is therefore recommended to replace it with a new one.

Interval	Maintenance work
After 10 to 20 hours of operation	• Check the inlet filter and clean it if necessary, see *Cleaning or Replacing the Inlet Filter* [➔ 25].
Monthly (or more often, depending on application)	
Every 6 months	• Replace the inlet filter (or more often depending on application), see *Cleaning or Replacing the Inlet Filter* [➔ 25].
Yearly	

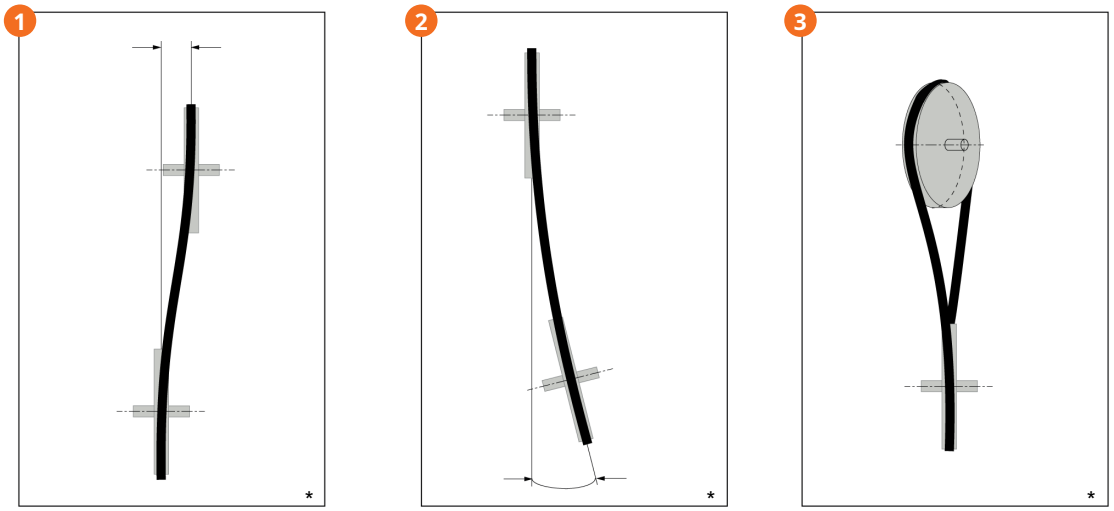
8.2.1 Cleaning or Replacing the Inlet Filter



Description			
1	Clean or discard	2	Make sure the filter is correctly positioned and put the cover back on

8.3 Belt Maintenance and Pulley Alignment

Interval	Maintenance work
After 10 to 20 hours of operation	• Check the belt tension. • Check the pulley alignments.
Every 6 months (or more often, depending on application)	• Check the belt tension. • Check the pulley alignments.
Yearly	• Replace the belts. • Belt change intervals for higher loads and ambient temperatures (over +40°C) range from 4000 to max. 8000 hours.



* Product: Belts and multiple ribbed belts

Description			
1	- Parallel offset: max. 1% of center distance for belts - Permissible parallel offset of two pulleys: 10 mm per 1000 mm of strand length	2	- Angular offset of two pulleys: max. 0.5° for belts - Permissible angular offset of two pulleys: 0.5°
3	- Axial twist of pulleys: max. 0.25° for belts - Permissible axial twist of pulleys: 0.25°		

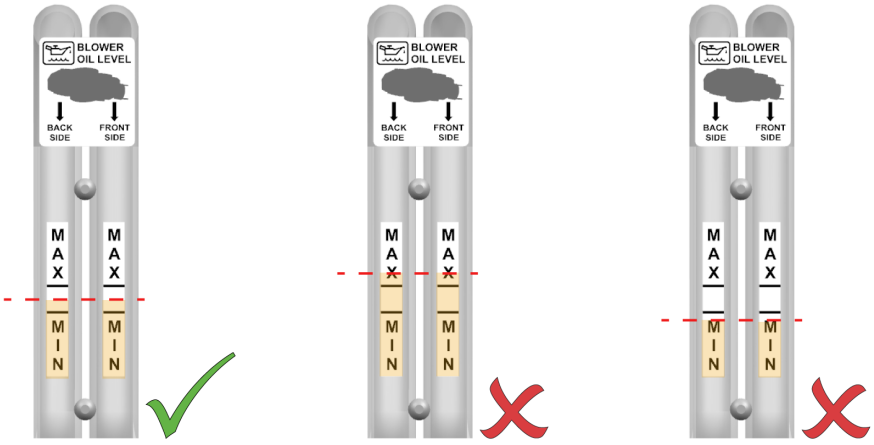
8.4 Oil Maintenance

Interval	Maintenance work
After 10 to 20 hours of operation	• Check the oil level, see *Oil Level Inspection* [➔ 27].
Weekly	
After 500 hours of operation	• Change for a newly commissioned blower.
Every 8000 hours or minimum once a year	• Change the oil, see *Oil Change* [➔ 28].

8.5 Oil Level Inspection

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

With cabinet



Without cabinet

- Fill up if necessary, see *Filling Oil* [➔ 15].

WARNING

Oil overfilling.

Risk of increased operating temperature and increased absorbed power!

Risk of damage to the machine!

- Make sure to always fill the correct amount of oil.

8.6 Oil Change

NOTICE

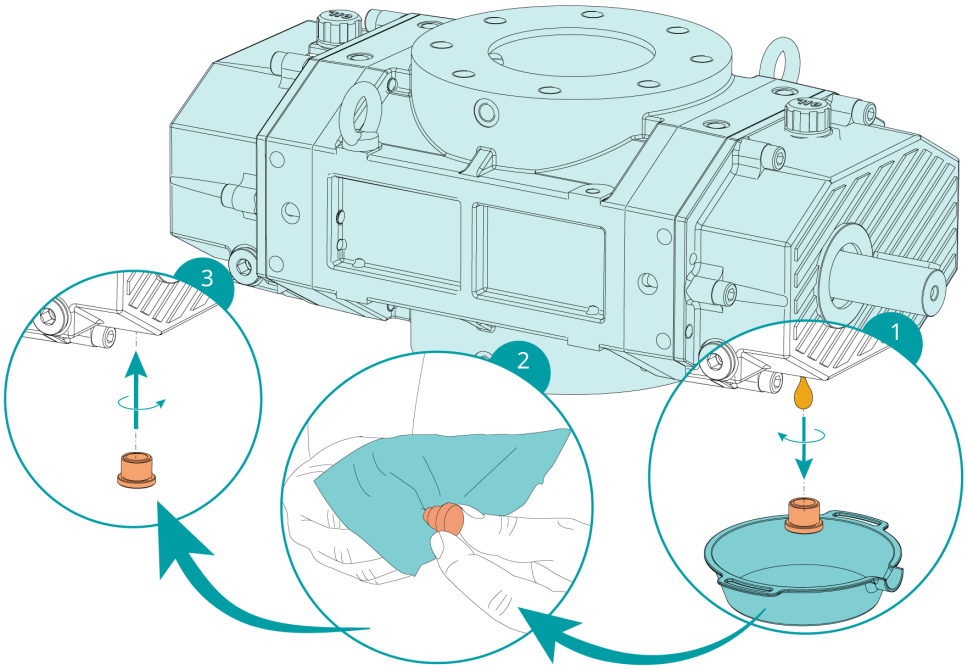
Use of inappropriate oil.

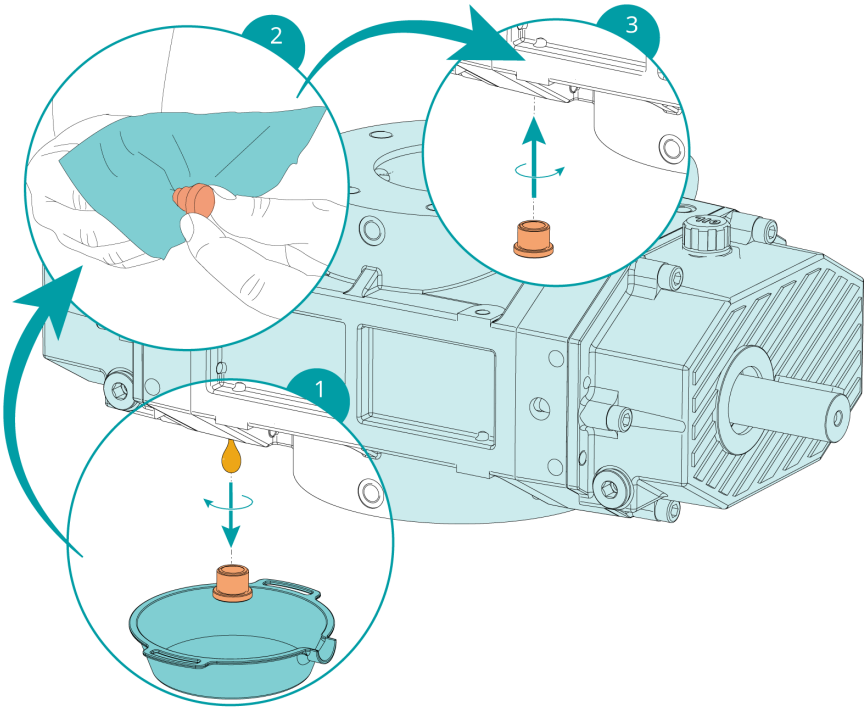
Risk of premature failure!

Loss of efficiency!

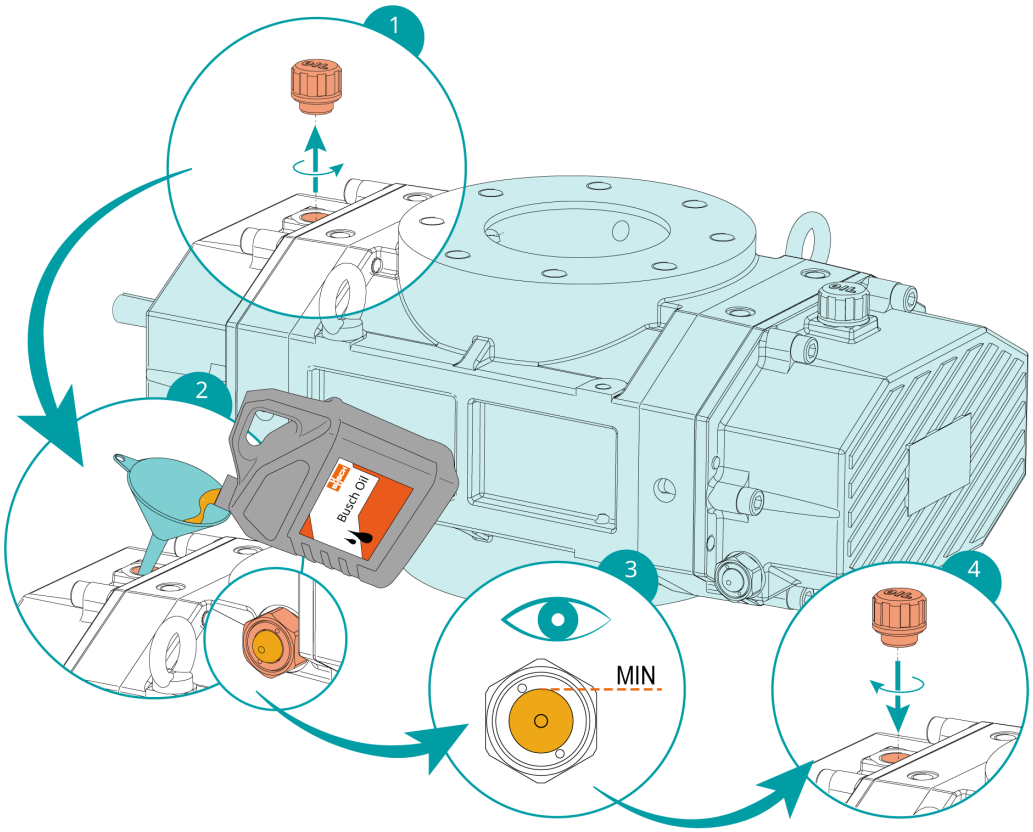
- Use only a type of oil previously approved and recommended by the manufacturer.

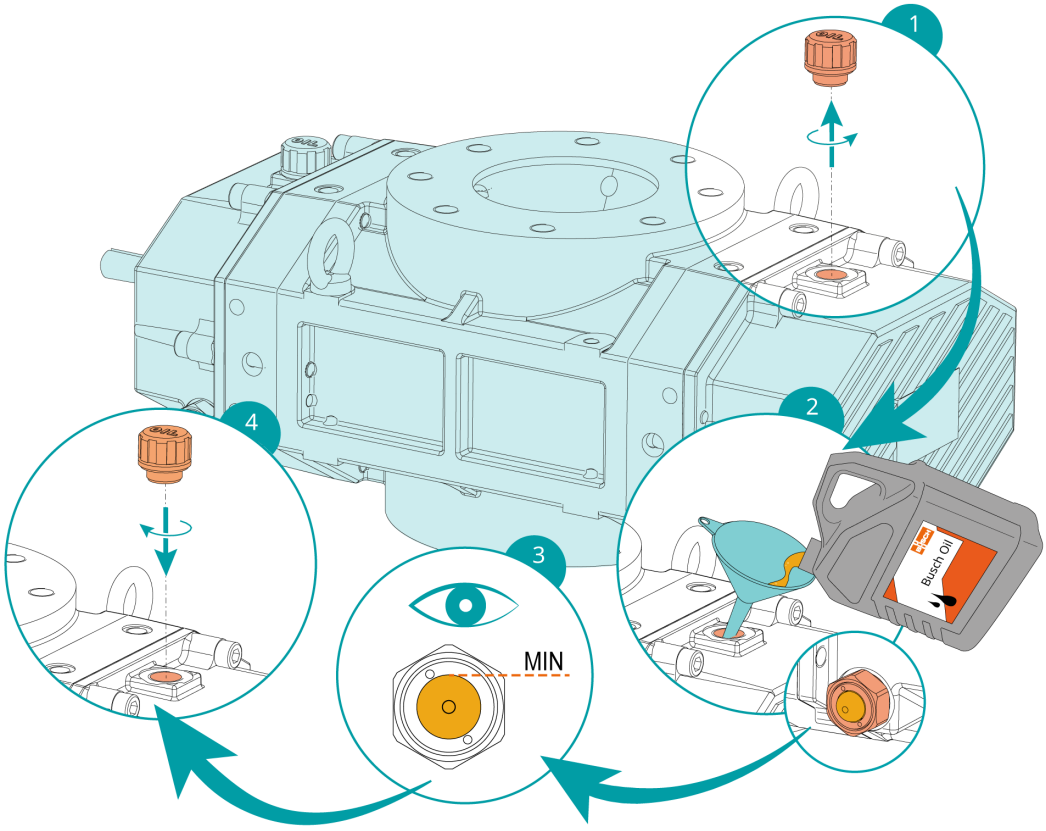
- For more information about oil, see Oil chapter.





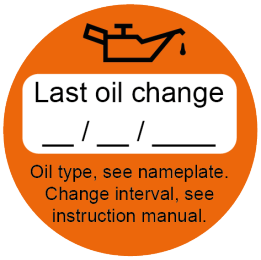
For oil type and oil capacity see Technical Data and Oil chapters.





When oil filling is complete:

- Note the date of the oil change on the sticker.



If there is no sticker on the machine:

- Order it from your Busch representative (article number 0565 568 959).

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

Incorrect assembly.

Risk of premature failure!

Loss of efficiency!

- Any disassembly of the machine beyond that described in this manual must be carried out by technicians approved by Busch.

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’.

The manufacturer 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.

CAUTION

Hot liquids.

Risk of burns!

- Before draining liquids, let the machine cool down first.

- Stop the machine and lock it to prevent accidental start-up.
- Disconnect the power supply.
- Vent the connected lines to atmospheric pressure.
- Disconnect all connections.

If the machine is to be stored:

- See *Storage* [➔ 10].

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 genuine spare parts.

Risk of premature failure!

Loss of efficiency!

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

To order spare parts for basic maintenance:

- Contact your Busch representative and inform him of the serial number of your machine.

12 Troubleshooting

DANGER

Live wires.

Risk of electrical shock!

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

CAUTION

Hot surface during operation (up to over 70°C).

Risk of burns!

- Let the machine cool down first or wear heat-protection gloves.

CAUTION

Hot surface.

Risk of burns!

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

CAUTION

Hot liquids.

Risk of burns!

- Before draining liquids, let the machine cool down first.

Problem	Possible Cause	Remedy
The blower is not running, and the blower shaft can be turned in both directions.	Broken belts.	• Fit new belts.
	Motor failure.	• Repair and replace the motor (contact Busch).
The blower is not running, and the blower shaft cannot be turned manually.	The lobes are in contact with the cylinder or the end covers.	• Check the blower for signs of overheating / overloading and carry out any necessary repairs. • Check the lobes for signs of corrosion and dissolve with oil.
	There are foreign bodies in the cylinder.	• Carry out any necessary repairs.

Problem	Possible Cause	Remedy
Abnormal sounds or vibrations. **STOP THE MACHINE IMMEDIATELY!**	The pulleys are in the wrong position. They are either parallel-displaced or angle-displaced.	• Place the pulleys correctly.
	Damaged bearings.	• Repair with bearing replacement.
	Lack of oil or dazed oil.	• Top up or change oil.
	Too much oil in oil box.	• Drain the oil and regulate the oil level.
	Unstable foundation.	• Ensure stable foundation.
	Resonance in pipe system.	• Pipe system must be connected to blower with flexible connections and supported if necessary.
	Differential pressure too high.	• Check for causes of increased differential pressure, e.g. blockage or damage. Check also for control system-based causes. Repair.
	Air leakage.	• Find the leakage spots and repair.
	The lobes are in contact with the cylinder or the end covers.	• Repair in workshop.
	There are foreign bodies in the cylinder.	• Repair in workshop.
	Damaged check valve.	• Replace check valve.

Problem	Possible Cause	Remedy
Abnormal heat development. **STOP THE MACHINE IMMEDIATELY!**	Abnormal increase in exhaust temperature.	• See causes marked with an asterisk (*).
	Rpm too low on blower (and/or motor with frequency regulation)	• Check the minimum allowed rpm. • Correct the rpm setting.
	Oil level too high.	• The oil level must be at the top of the level indicator when the blower is not running.
	Under-pressure in the machine room.	• Check the ventilation system and correct the ventilation amount or air lock sizes to avoid under-pressure in the room.
	Differential pressure too high. (*)	• Check, clean and replace the inlet filter. • Check pipes and process system (on both sides of the blower) for blockages, obstructions, both mechanical and control system related. • Repair the blower.
	Abnormal wear on the lobes after strain from solid media (e.g. dust from operation without inlet filter, CIP cleaning of the blower during operation with aggressive cleaning fluids or stress from aggressive gases).	• Install inlet filter to protect the blower
Oil leakage.	Oil level too high (above maximum on level indicator in cabinet)	• The oil level must be between MIN and MAX on level indicator on cabinet front.
	Leaking or damaged shaft seals.	• Repair in workshop.
	Blower has been tilted or is not mounted horizontally.	• Place on horizontal foundation.
	Differential pressure too high.	• Check, clean and replace the inlet filter. • Check pipes and process system (on both sides of the unit) for blockages, obstructions, both mechanical and control system related.

Problem	Possible Cause	Remedy
Loss of capacity.	Leak in the system.	• Find the leaks and fix them.
	Activated safety valve.	• Check differential pressure and see causes marked with an asterisk (*). Possibly set the safety valve opening pressure.
	Dirty inlet filter or blocked pipes.	• Clean and possibly replace filters and pipes.
	Loose belts.	• Replace belts.
	Differential pressure too high. (*)	• See symptoms and causes marked with an asterisk (*).
Continuously activated safety valve.	Rpm too high and thereby too high amount of air (concerns VSD controlled blowers).	• Reduce the rpm.
	Differential pressure too high. (*)	• Find the cause of the increased differential pressure and fix it.
	The valve setting is below the actual operating point.	• Adjust the maximum limits of the valve within the blower. • Monitor the absorbed power and make sure that the setting does not allow any overloading of the unit.
Abnormally high differential pressure. (*) **STOP THE MACHINE IMMEDIATELY!**	Safety valves do not open despite too high differential pressure.	• Disassemble and clean the valve. Possibly readjust.
	Blockages on inlet side or outlet side of the blower.	• Clean the pipe system, and check for mechanical or control system related blockages or obstructions, that can lead to an increased loss of pressure.
	Fault on check valve.	• Replace check valve.
The motor is rotating in the wrong direction.	Wrong power supply.	• Switch two phases to reverse the direction of rotation.

Problem	Possible Cause	Remedy
Abnormal motor temperature.	Defective motor or motor bearings.	• Repair and replace the motor.
	The motor is not wired correctly.	• Check and wire correctly.
	Overloading.	• Check for causes of increased differential pressure in the system and fix them.
	Wrong power supply.	• The power supply must comply with the motor name plate data.
	Ambient temperature too high (+40°C).	• Improve ventilation in the machine room.
	Defective motor fan.	• Replace the motor fan.

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

13 Technical Data

		WT 0100 CP	WT 0150 CP	WT 0280 CP
Volume flow (50 Hz)	m^3/h	152 – 535	480 – 808	698 – 1355
Nominal motor rating (50 Hz)	kW	18.5	30.0	45.0
Max. differential pressure	hPa (mbar) abs.	+1000	+1000	+1000
Blower speed (50 Hz)	min^{-1}	4700	4700	4100
Ambient temperature	°C	-15 ... 45		
Maximum allowable air inlet temperature	°C	60		
Relative humidity	at 30°C	90 %		
Weight pump stage approx.	kg	75	92	167
Weight approx. without cabinet	kg	180	197	346
Weight approx. with cabinet	kg	295	312	535

		WT 0390 CP	WT 0600 CP	WT 0730 CP
Volume flow (50 Hz)	m^3/h	1258 – 1793	1791 – 2973	2650 – 3972
Nominal motor rating (50 Hz)	kW	55.0	90.0	90.0
Max. differential pressure	hPa (mbar) abs.	+1000	+1000	+1000
Blower speed (50 Hz)	min^{-1}	4100	3500	3500
Ambient temperature	°C	-15 ... 45		
Maximum allowable air inlet temperature	°C	60		
Relative humidity	at 30°C	90 %		
Weight pump stage approx.	kg	193	336	375
Weight approx. without cabinet	kg	372	711	750
Weight approx. with cabinet	kg	561	1014	1053

		WT 0100 CV	WT 0150 CV	WT 0280 CV
Volume flow (50 Hz)	m^3/h	152 – 538	480 – 822	698 – 1330
Nominal motor rating (50 Hz)	kW	11.0	18.5	30.0
Max. differential pressure	hPa (mbar) abs.	-500	-500	-500
Blower speed (50 Hz)	min^{-1}	4700	4700	4100
Ambient temperature	°C	-15 ... 45		
Maximum allowable air inlet temperature	°C	60		
Relative humidity	at 30°C	90 %		
Weight pump stage approx.	kg	75	92	167
Weight approx. without cabinet	kg	180	197	346
Weight approx. with cabinet	kg	295	312	535

		WT 0390 CV	WT 0600 CV	WT 0730 CV
Volume flow (50 Hz)	m^3/h	1258 – 1907	1791 – 3097	2650 – 3992
Nominal motor rating (50 Hz)	kW	37.0	55.0	75.0
Nominal motor rating	hPa (mbar) abs.	-500	-500	-500
Blower speed (50 Hz)	min^{-1}	4100	3500	3500
Ambient temperature	°C	-15 ... 45		
Maximum allowable air inlet temperature	°C	60		
Relative humidity	at 30°C	90 %		
Weight pump stage approx.	kg	193	336	375
Weight approx. without cabinet	kg	372	711	750
Weight approx. with cabinet	kg	561	1014	1053

14 Oil

Name	ISO-VG	Oil type	1 L packing	5 L packing	10 L packing	20 L packing
ANDEROL 6220	220	Synthetic	0831 300 009	0831 300 011	-	0831 300 012
VS 220	220	Synthetic	0831 217 852	0831 217 853	-	0831 217 855

Oil capacity in liters	WT 0100 CP/CV	WT 0150 CP/CV	WT 0280 CP/CV
Motor side − with cabinet	0.4	0.4	0.7
Motor side − without cabinet	0.3	0.3	0.6
Gear side − with cabinet	0.4	0.4	0.7
Gear side − without cabinet	0.3	0.3	0.6

Oil capacity in liters	WT 0390 CP/CV	WT 0600 CP/CV	WT 0730 CP/CV
Motor side − with cabinet	0.7	1.1	1.1
Motor side − without cabinet	0.6	1.0	1.0
Gear side − with cabinet	0.7	1.1	1.1
Gear side − without cabinet	0.6	1.0	1.0

To find out which oil needs to be filled into the machine, refer to the name plate (NP).

Oil suitability

- **Oil VS 220**: Suitable for standard applications.
- **Anderol 6220:** Food grade gear oil

15 EU Declaration of Conformity

This Declaration of Conformity and the CE-markings affixed to the name plate 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 Výroba CZ s.r.o.
Svárovská 620
CZ 460 01, Liberec 11

declares that the machine: rotary lobe blower package for overpressure or vacuum operation TYR WT 0100 C; TYR WT 0150 C; TYR WT 0280 C; TYR WT 0390 C; TYR WT 0600 C; TYR WT 0730 C

with the serial number(s):

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

- 'Machinery Directive' 2006/42/EC, if the serial number is less than or equal to CZM126999999
- 'Machinery Regulation' (EU) 2023/1230, if the serial number is greater than or equal to CZM127000000
- '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:

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)
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

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

Liberec, 2025.04.07

Michael Dostalek, General Manager

Busch Výroba CZ s.r.o.

16 UK Declaration of Conformity

This Declaration of Conformity and the UKCA-markings affixed to the name plate 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 Výroba CZ s.r.o.
Svárovská 620
CZ 460 01, Liberec 11

declares that the machine: rotary lobe blower package for overpressure or vacuum operation TYR WT 0100 C; TYR WT 0150 C; TYR WT 0280 C; TYR WT 0390 C; TYR WT 0600 C; TYR WT 0730 C

with the serial number(s):

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 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)
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

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

Liberec, 2025.04.07

Michael Dostalek, General Manager

Busch Výroba CZ s.r.o.

BUSCH GROUP

The Busch Group is one of the world's largest manufacturers of vacuum pumps, vacuum systems, blowers, compressors and gas abatement systems. Under its umbrella, the group houses two well-known brands: Busch Vacuum Solutions and Pfeiffer Vacuum+Fab Solutions. Together, they offer solutions to a wide range of industries. A global network of highly competent local teams in 44 countries ensures that expert, tailor-made support is always available near you. Wherever you are. Whatever your business.

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