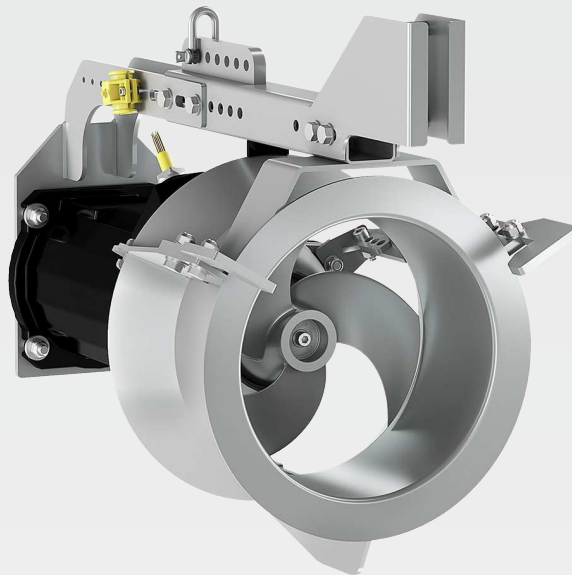


Wilo-Flumen OPTI-RZP 20-1 ... 40-1 **Wilo-Flumen EXCEL-RZPE 20-1 ... 40-1**



en Installation and operating instructions



Table of contents

1	General information	4
1.1	About these instructions	4
1.2	Digital instructions.....	4
2	Transportation and storage	4
2.1	Attach lifting equipment: Wilo-Flumen OPTI-RZP/EXCEL-RZPE 20-1	4
2.2	Attach lifting equipment: Wilo-Flumen OPTI-RZP/EXCEL-RZPE 25-3 ... 40-1	4
3	Application/use	4
3.1	Intended use	5
4	Product description	5
4.1	Construction	5
4.2	Materials	6
4.3	Monitoring devices	6
4.4	Operation in an explosive atmosphere	7
4.5	Type key	7
4.6	Scope of delivery	8
4.7	Accessories	8
5	Installation	8
5.1	Installation types.....	8
5.2	Installation	8
6	Commissioning	13
6.1	Frequency converter operation	13
7	Maintenance and repair.....	13
7.1	Screw plugs and fill quantities	14

1 General information

1.1 About these instructions

These installation and operating instructions extend the current instructions for submersible mixers with the RZP series. Read these instructions before commencing work. Keep the instructions in an accessible place at all times. Adherence to all instructions is a requirement for the intended use and correct operation of the recirculation pump. All specifications and markings on the product must be observed.

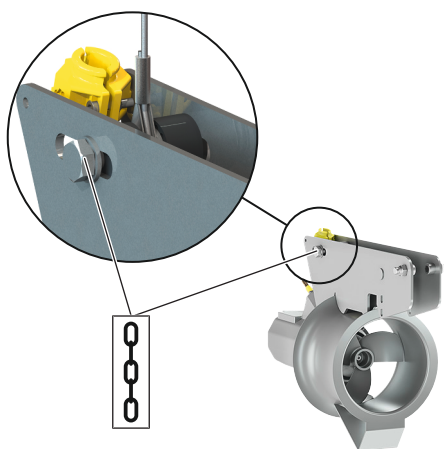
The language of the original operating instructions is German. All other languages of these instructions are translations of the original operating instructions.

1.2 Digital instructions

The digital version of the instructions is available on the following product page: Flumen OPTI-RZP: <https://qr.wilo.com/923>, Flumen EXCEL-RZPE: <https://qr.wilo.com/924>

2 Transportation and storage

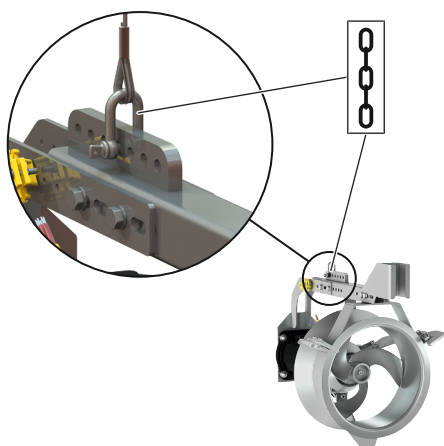
2.1 Attach lifting equipment: Wilo-Flumen OPTI-RZP/EXCEL-RZPE 20-1



- ✓ Attach lifting equipment directly to the bolt.
- ✓ Lifting equipment must have a rope thimble. **NOTICE! Do not use shackles!**
- ✓ Use the oblong hole to adjust the centre of gravity. Inclination angle of the recirculation pump: approx. 5° downward.
 1. Loosen the hexagon nut at the bolt.
 2. Pull out the bolt and remove the plastic sleeve.
 3. Attach the lifting equipment to the bolt.
 4. Fit the plastic sleeve.
 - ⇒ Lifting equipment attached at the bolt between two plastic sleeves.
 5. Insert bolt into the hole and tighten with the hexagon nut.
- Lifting equipment is attached.

Fig. 1: Flumen attachment point OPTI-RZP/EXCEL-RZPE 20-1

2.2 Attach lifting equipment: Wilo-Flumen OPTI-RZP/EXCEL-RZPE 25-3 ... 40-1



- ✓ Attach lifting equipment directly to the frame.
- ✓ Lifting equipment must have a rope thimble.
- ✓ Use the holes to adjust the centre of gravity. Inclination angle of the recirculation pump: approx. 5° downward.
 1. Remove the shackle from the frame.
 2. Insert the shackle into the rope thimble.
 3. Insert the shackle into the matching hole on the frame and attach it.
- Lifting equipment is attached.

Fig. 2: Flumen attachment point OPTI-RZP/EXCEL-RZPE 25-3 ... 40-1

3 Application/use

3.1 Intended use

For pumping in commercial areas of:

- Sewage containing faeces
- Return activated sludge
- Process water

4 Product description

4.1 Construction

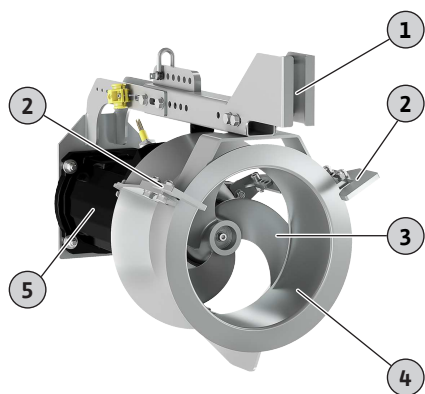


Fig. 3: Flumen overview OPTI-RZP/EXCEL-RZPE

Recirculation pump: Submersible mixer, directly driven with attached flow housing.

1	Guide claw
2	Flange claw
3	Propeller
4	Flow housing
5	Motor

Motor (Flumen OPTI-RZP)

Surface-cooled submersible motor in three-phase current design with permanently lubricated and large-size rolling bearings. The motor winding is equipped with temperature monitoring. The motor heat is given off directly to the surrounding fluid via the motor housing. The connection cable is designed for heavy mechanical loads, sealed water pressure-tight against the fluid and is sealed longitudinally watertight. The connection cable has bare cable ends and is 10 m (33 ft) long as standard.

Motor (Flumen EXCEL-RZPE)

Surface-cooled submersible motor in three-phase current design with permanently lubricated and large-size rolling bearings. The motor winding is equipped with temperature monitoring. The motor heat is given off directly to the surrounding fluid via the motor housing. The connection cable is designed for heavy mechanical loads, sealed water pressure-tight against the fluid and is sealed longitudinally watertight. The connection cable has bare cable ends and is 10 m (33 ft) long as standard.

The submersible motor meets the IE3 motor efficiency class (according to IEC 60034-30).

Seal

Large-volume sealing chamber with double shaft sealing. The sealing chamber is filled with white oil and absorbs the leakage from the seal on the fluid side. A corrosion- and wear-resistant mechanical seal is used on the fluid side. The seal on the motor side involves either a rotary shaft seal or a mechanical seal.

Hydraulics

Propeller made of solid material with clogging-free propeller geometry. Pump in non-clog design flow housing with guide claw and two flange claws. The guide claw ensures smooth function when lifting and lowering the recirculation pump. The flange claws can be readjusted, ensure optimum centring on the discharge pipe and stabilise the recirculation pump at high operating pressure.

Alternative version with flange connection for direct screwing to the discharge pipe.

	OPTI-RZP 20-1 ...	EXCEL-RZPE 20-1 ...	OPTI-RZP 25-3 ...	EXCEL-RZPE 25-3 ...	OPTI-RZP 30 ...	EXCEL-RZPE 30 ...	OPTI-RZP 40-1 ...	EXCEL-RZPE 40-1 ...
Propeller nominal diameter in mm (in)	200 (8)	200 (8)	250 (10)	250 (10)	300 (11.5)	300 (11.5)	400 (16)	400 (16)
Connection size	DN 200 DN 250	DN 200 DN 250	DN 250	DN 250	DN 300	DN 300	DN 400	DN 400
Standard version	•	•	•	•	•	•	•	•
Version with flange connection	•	•	•	•	•	•	•	•

• = available , – = not available

4.2 Materials

	OPTI-RZP 20-1 ...	EXCEL-RZPE 20-1 ...	OPTI-RZP 25-3 ...	EXCEL-RZPE 25-3 ...	OPTI-RZP 30 ...	EXCEL-RZPE 30 ...	OPTI-RZP 40-1 ...	EXCEL-RZPE 40-1 ...
Motor housing								
EN-GJL-250 (ASTM A48 Class 35/40B)	–	–	•	•	•	•	•	•
1.4408 (ASTM A 351)	•	•	–	–	–	–	–	–
Seal housing								
1.4408 (ASTM A 351)	•	•	•	•	•	•	•	•
Seal, on the fluid side								
SiC/SiC	•	•	•	•	•	•	•	•
Seal, on the motor side								
NBR (nitrile)	–	–	•	•	•	•	•	•
SiC/SiC	•	•	–	–	–	–	–	–
Propeller								
1.4408 (ASTM A 351)	•	•	•	•	•	•	•	•
Flow housing								
1.4571 (AISI 316Ti)	•	•	•	•	•	•	•	•

• = standard, – = not available

4.3 Monitoring devices

Overview of possible monitoring devices for recirculation pumps **without Ex rating**:

	OPTI-RZP 20-1 ...	EXCEL-RZPE 20-1 ...	OPTI-RZP 25-3 ...	EXCEL-RZPE 25-3 ...	OPTI-RZP 30 ...	EXCEL-RZPE 30 ...	OPTI-RZP 40-1 ...	EXCEL-RZPE 40-1 ...
Motor compartment	o	o	–	–	–	–	–	–
Motor compartment/sealing chamber	–	–	o	o	o	o	o	o
Sealing chamber (external pencil electrode)	o	o	o	o	o	o	o	o
Motor winding: Temperature limiter	•	•	•	•	•	•	•	•
Motor winding: Temperature controller and limiter	o	o	o	o	o	o	o	o

Key

– = not possible, o = optional, • = standard

Overview of possible monitoring devices for recirculation pumps **with Ex rating**:

	OPTI-RZP 20-1 ...	EXCEL-RZPE 20-1 ...	OPTI-RZP 25-3 ...	EXCEL-RZPE 25-3 ...	OPTI-RZP 30 ...	EXCEL-RZPE 30 ...	OPTI-RZP 40-1 ...	EXCEL-RZPE 40-1 ...
Motor compartment	o	o	–	–	–	–	–	–
Sealing chamber (external pencil electrode)	o	o	o	o	o	o	o	o

	OPTI-RZP 20-1 ...	EXCEL-RZPE 20-1 ...	OPTI-RZP 25-3 ...	EXCEL-RZPE 25-3 ...	OPTI-RZP 30 ...	EXCEL-RZPE 30 ...	OPTI-RZP 40-1 ...	EXCEL-RZPE 40-1 ...
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With ATEX approval

Motor winding: Temperature limiter	o	o	o	o	o	o	o	o
Motor winding: Temperature controller and limiter	•	•	•	•	•	•	•	•

With FM-/CSA-Ex rating

Motor winding: Temperature limiter	•	•	•	•	•	•	•	•
Motor winding: Temperature controller and limiter	o	o	o	o	o	o	o	o

Key

– = not possible, o = optional, • = standard

4.4 Operation in an explosive atmosphere

Approval according to	OPTI-RZP 20-1 ...	EXCEL-RZPE 20-1 ...	OPTI-RZP 25-3 ...	EXCEL-RZPE 25-3 ...	OPTI-RZP 30 ...	EXCEL-RZPE 30 ...	OPTI-RZP 40-1 ...	EXCEL-RZPE 40-1 ...
ATEX	o	o	o	o	o	o	o	o
FM	o	o	o	o	o	o	o	o
CSA-Ex	–	–	–	–	–	–	–	–

Key

– = not possible, o = optional, • = standard

4.5 Type key

Wilo-Flumen OPTI-RZP ...

Example: **Wilo-Flumen OPTI-RZP 40-1.95-6/24Ex S8**

Flumen	Submersible mixer, horizontal
OPTI-RZP	Series: Recirculation pump with standard asynchronous motor
40	x10 = nominal propeller diameter in mm
1	Model
95	Rated propeller speed in rpm
6	Number of poles
24	x10 = stator pack length in mm
Ex	Ex-rated
S8	Propeller code for special propeller (omitted for standard propeller)

Wilo-Flumen EXCEL-RZPE ...

Example: **Wilo-Flumen EXCEL-RZPE 40-1.95-6/24Ex S8**

Flumen	Submersible mixer, horizontal
EXCEL-RZPE	Series: Recirculation pump with IE3 asynchronous motor
40	x10 = nominal propeller diameter in mm
1	Model
95	Rated propeller speed in rpm

6	Number of poles
24	x10 = stator pack length in mm
Ex	Ex-rated
S8	Propeller code for special propeller (omitted for standard propeller)

4.6 Scope of delivery

- Recirculation pump with attached flow housing and connection cable
- Installation and operating instructions

4.7 Accessories

- Lowering device
- Auxiliary lifting device
- Cable bollard to secure the hoist cable
- Additional rope anchoring
- Fixation sets with anchor bolts

5 Installation

5.1 Installation types

- Screwed to the discharge pipe
- Docked to the discharge pipe by means of the lowering device

5.2 Installation



DANGER

Danger due to fluids hazardous to health during installation!

Ensure that the installation site is clean and disinfected during installation. If contact with fluids that are hazardous to health is possible, observe the following points:

- Wear protective equipment:
 - ⇒ sealed safety goggles
 - ⇒ mouth protection
 - ⇒ protective gloves
- Wipe up drips immediately.
- Observe the specifications of the work regulations.

**DANGER****Risk of fatal injury due to dangerous lone working practices!**

Work in chambers and narrow rooms as well as work involving risk of falling are dangerous work. Such work may not be carried out autonomously!

- Only carry out work with another person!

- Wear protective equipment! Observe the work regulations.
 - Protective gloves: 4X42C (uvex C500)
 - Safety shoes: Protection class S1 (uvex 1 sport S1)
 - Wear a safety harness.
 - Safety helmet: EN 397 Conforms to standards, protection against lateral deformation (uvex pheos)
(When using lifting equipment)
- Prepare the installation site:
 - Clean, free of coarse solids
 - Dry
 - Frost-free
 - Disinfected
- Work must always be carried out by two persons.
- Demarcate the working area.
- Keep unauthorised persons away from the working area.
- From a working height of more than 1 m (3 ft) above the ground, use scaffolding with a safety harness.
- Toxic or asphyxiating gases may build up during work:
 - Observe protective measures in accordance with work regulations (gas measurement, carry a gas detector with you).
 - Ensure adequate ventilation.
 - If toxic or asphyxiating gases accumulate, leave the workplace immediately!
- Install lifting equipment: even surface, clean, firm base. Warehouse and installation location must be easily accessible.
- Do not stay within the swivel range of the hoisting gear.

5.2.1 Minimum clearance to the wall and aeration

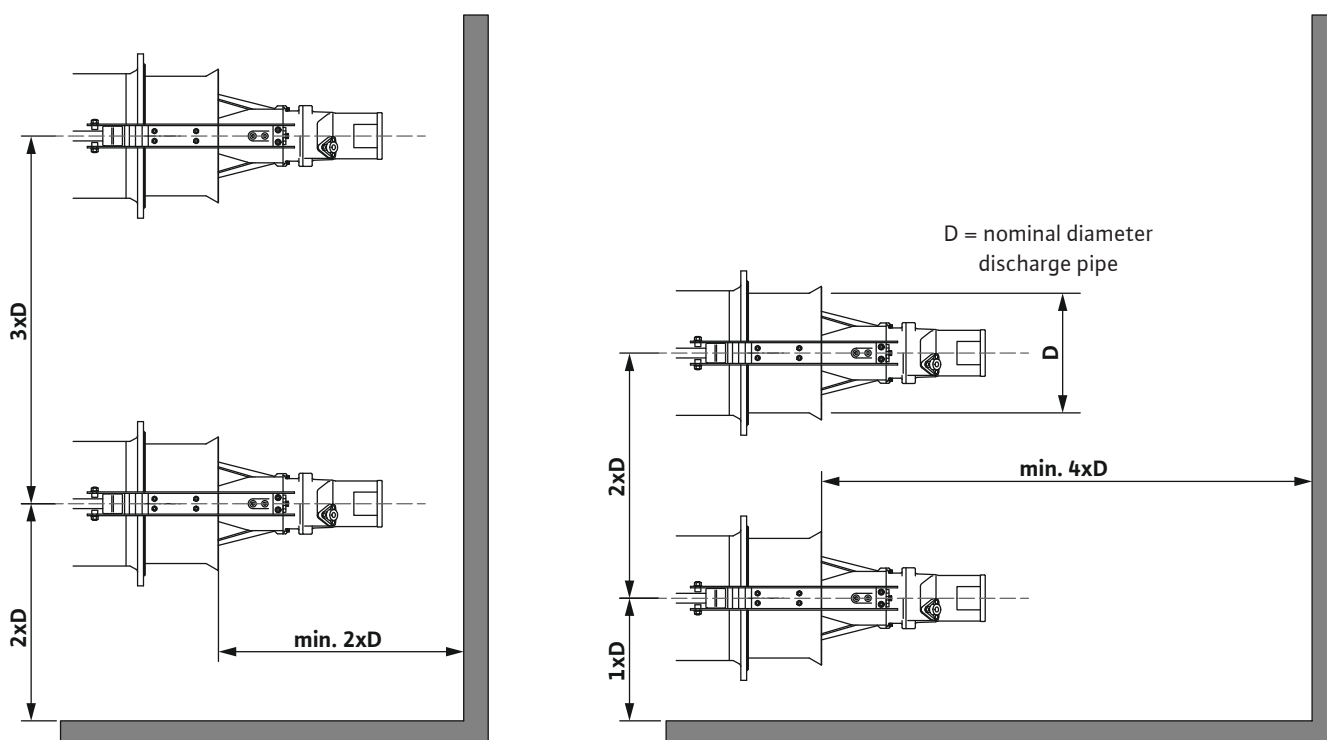


Fig. 4: Observe minimum clearance to walls and fixtures

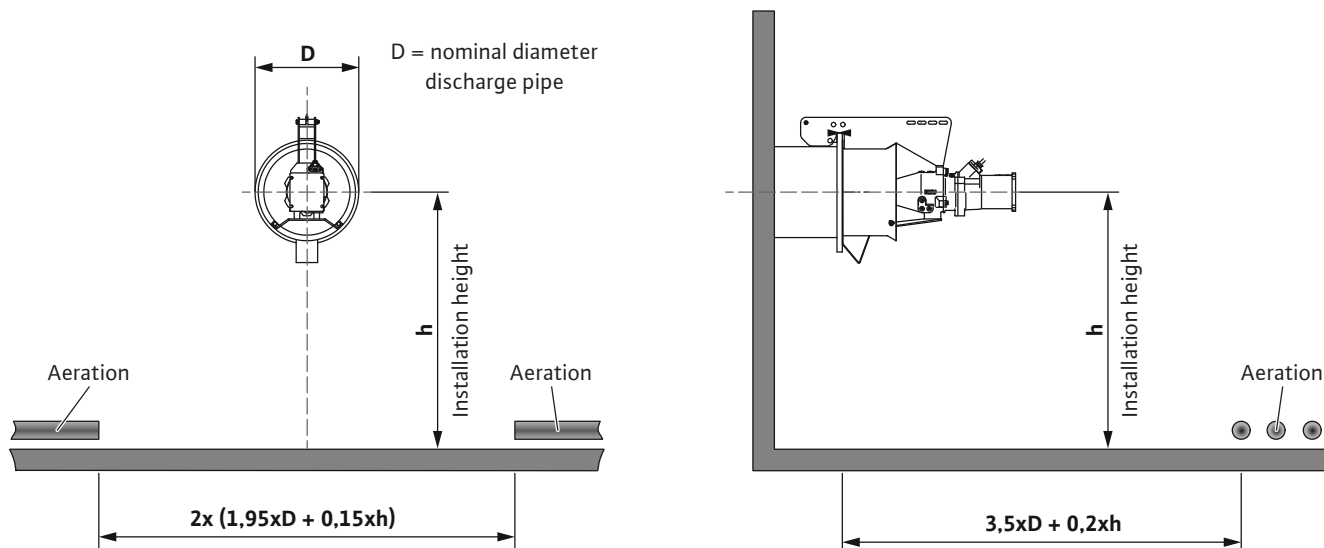


Fig. 5: Minimum clearance to aeration

5.2.2 Docked to the discharge pipe by means of the lowering device



Fig. 6: Installation with lowering device

The recirculation pump is guided to the discharge pipe via a lowering device and docked to the discharge pipe. The guide claw on the flow housing ensures the correct guidance to the discharge pipe. For safe docking of the recirculation pump to the discharge pipe, the flange claws enclose the flange on the discharge pipe. Please observe the following points for installation:

→ Installation can be performed with empty and full basin.

Initial installation: It is recommended to drain the basin. The docking and undocking process as well as adjustment of the flange claws can be checked when the basin is empty.

→ The recirculation pump may not be operated at different heights.

Installation is generally performed in the same manner as installation of a submersible mixer:

- ✓ Initial installation: Basin is drained.
 - ✓ Hoisting gear attached, tilt angle of the recirculation pump approx. 5° downward.
 - ✓ Connection cable laid out.
 - ✓ Cable routing available.
1. Lift recirculation pump.
 2. Swivel the recirculation pump over the basin.
 3. Align the guide claw with the lowering device.
 4. Slowly drain the recirculation pump and insert the lowering device into the guide claw.
 5. Drain the recirculation pump down to the discharge pipe.
- CAUTION! Keep the connection cable slightly taut while draining.**
6. Repeat docking and undocking process several times:
 - The flow housing must fully rest against the discharge pipe.
 - The guide claws must enclose the flange on the discharge pipe.
 - The recirculation pump must loosely detach from the flange during lifting.
 If the docking and undocking process does not run smoothly, readjust the flange claws (see following chapter).

7. Guide the connection cable out of the basin, keeping it slightly taut, via a cable guide provided by the customer.

CAUTION! Catch the connection cable at the edge of the basin and protect it against damage (crushing, abrasions).

- Recirculation pump installed.

5.2.3 Adjust the guide claw und flange claws

Following installation, perform a function test. The function test checks whether the recirculation pump fully rests against the discharge pipe (docks) and simply detaches again (undocks):

- If the flow ring does not fully rest against the discharge pipe, the duty point is not reached.
- If the recirculation pump does not detach from the discharge pipe, the recirculation pump cannot be pulled from the basin.

To ensure smooth docking to and undocking from the discharge pipe, adjust the following settings:

- Readjust the guide claw: Set the clearance between flow housing and discharge pipe.
- Readjust the flange claws: Adjust the clearance of the flange claws to the discharge pipe flange.

5.2.3.1 Readjust the guide claw

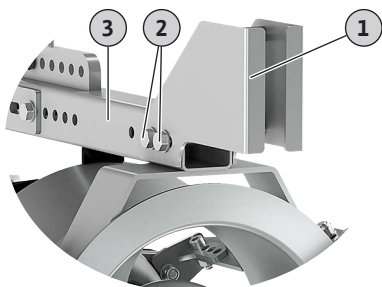


Fig. 7: Readjust guide claw

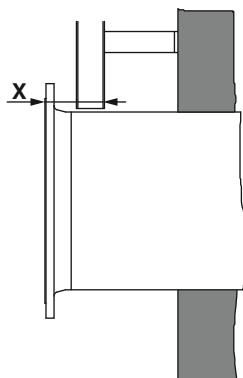


Fig. 8: Clearance "X"

1	Guide claw
2	Fastening screws
3	Frame

- ✓ Recirculation pump placed on a level work surface.
- ✓ 2x ring wrench
- ✓ Torque wrench
- ✓ Liquid thread-locking fluid, e.g. Loctite 243
- ✓ Clearance "X"

1. Loosen both fastening screws.
2. Set clearance: Clearance "X" + 5 mm.
3. Tighten both fastening screws by hand.

CAUTION! The guide claw must always rest against the frame with the fastening screws.

4. Check the docking and undocking process.
 - ⇒ The docking and undocking process does not run smoothly: Repeat the adjustment process.
 - ⇒ The docking and undocking process runs smoothly: continue with step 5.
 5. Wet the fastening screw with thread-locking fluid (see manufacturer's instructions for use).
 6. Tighten both fastening screws with the tightening torque according to the table.
- Guide claw set.

5.2.3.2 Readjust the flange claws

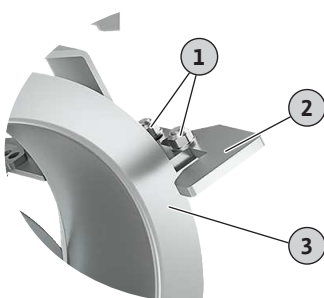


Fig. 9: Readjust the flange claw

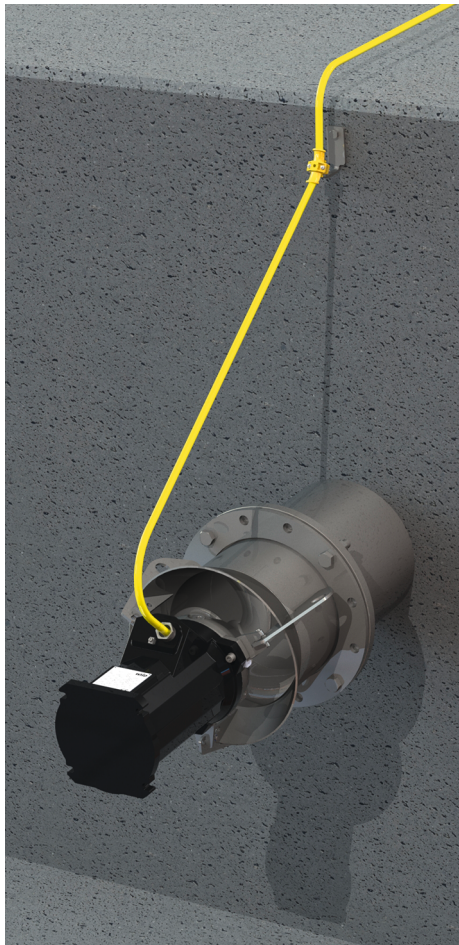
1	Fastening screws
2	Flange claw
3	Flange area flow housing

- ✓ Recirculation pump placed on a level work surface.
- ✓ 2x ring wrench
- ✓ Torque wrench
- ✓ Liquid thread-locking fluid, e.g. Loctite 243
- ✓ Flange thickness discharge pipe.

1. Loosen both fastening screws.

2. Set the clearance between flow housing flange surface and flange claw inner edge:
Flange thickness discharge pipe = 5 mm.
 3. Tighten both fastening screws by hand.
 4. Repeat the process on the second flange claw.
 5. Check the docking and undocking process.
 - ⇒ The docking and undocking process does not run smoothly: Repeat the adjustment process.
 - ⇒ The docking and undocking process runs smoothly: continue with step 6.
 6. Wet the fastening screw with thread-locking fluid (see manufacturer's instructions for use).
 7. Tighten all fastening screws with the tightening torque according to the table.
- Flange claws set.

5.2.4 Screwed to the discharge pipe



The flow ring is fitted with a flange to screw the recirculation pump to the discharge pipe. Screw the recirculation pump to the discharge pipe using technically approved screws. Installation may **only** be performed when the basin is empty.

- ✓ Basin is drained.
 - ✓ Work area cleaned and disinfected.
 - ✓ Hoisting gear
 - ✓ Transport space for aligning and lifting the recirculation pump
 - ✓ Scaffolding
 - ✓ Fixation material
1. Position the recirculation pump horizontally on the transport space.
 2. Secure the recirculation pump against slipping and falling over.
 3. Lift the transport space and align the flange with the discharge pipe.
 4. Screw the recirculation pump to the discharge pipe.
NOTICE! Make sure the screws are tight!
 5. Guide the connection cable out of the basin, keeping it slightly taut.
CAUTION! Catch the connection cable at the edge of the basin and protect it against damage (crushing, abrasions).
- Recirculation pump installed.

Fig. 10: Recirculation pump with flange connection

5.2.5 Tightening torques

Rust-free screws A2/A4			
Threaded	Tightening torque		
	Nm	kp m	ft·lb
M5	5.5	0.56	4
M6	7.5	0.76	5.5
M8	18.5	1.89	13.5
M10	37	3.77	27.5
M12	57	5.81	42
M16	135	13.77	100

Rust-free screws A2/A4			
Threaded	Tightening torque		
	Nm	kp m	ft·lb
M20	230	23.45	170
M24	285	29.06	210
M27	415	42.31	306
M30	565	57.61	417

If a Nord-Lock screw locking device is used, increase the tightening torque by 10 %!

6 Commissioning

6.1 Frequency converter operation

The motor in series design (confirming to IEC 60034-17) can be operated with a frequency converter. Contact customer service if the rated voltage is above 415 V/50 Hz or 480 V/60 Hz. Because of the additional heating caused by harmonics, the rated power of the motor should be around 10 % more than the power requirement of the mixer. For frequency converters with a low-harmonic output, it is possible to reduce the 10 % power reserve. Harmonic waves are reduced by means of output filters. Synchronise the frequency converter and the filter with each other!

The configuration of the frequency converter depends on the rated motor current. Make sure that the mixer operates across the entire control range without jerking or vibrating (without vibrations, resonance, oscillation). Otherwise, the mechanical seals may leak or be damaged. Increased motor noise caused by the harmonics of the power supply is normal.

During parameterisation of the frequency converter, observe the setting of the quadratic characteristic curve (U/f characteristic curve) for submersible motors! The U/f characteristic curve ensures that the output voltage at frequencies less than the rated frequency (50 Hz or 60 Hz) is adjusted to the power requirement of the mixer. More recent frequency converters feature an automatic power optimisation function – this automation achieves the same effect. For the frequency converter setting, refer to its installation and operating instructions.

Motor monitoring faults may occur if the motor is operated with a frequency converter. The following measures can reduce or avoid these faults:

- Keeping within the limit values stated in IEC 60034-25 for overvoltage and rise speed. If necessary, install output filters.
- Vary the pulse frequency of the frequency converter.
- In the event of a fault in the internal sealing chamber monitoring, use the external double-rod electrode.

The following construction measures can help to reduce or prevent faults:

- Separate connection cables for the main and control cable (depending on the motor size).
- Keep an adequate distance between main and control cable during routing.
- Use shielded connection cables.

Summary

- Min./max. frequency during continuous duty:
 - Asynchronous motors: 30 Hz up to rated frequency (50 Hz or 60 Hz)
 - Permanent magnet motors: 30 Hz up to the stated maximum frequency as per rating plate
- NOTICE! Higher frequencies are possible following consultation with customer service!**
- Observe additional measures with regard to EMC regulations (choice of frequency converter, using filters, etc.).
- Do not exceed the rated current or rated speed of the motor.
- Connection for bimetallic strip or PTC sensor.

7 Maintenance and repair

7.1 Screw plugs and fill quantities

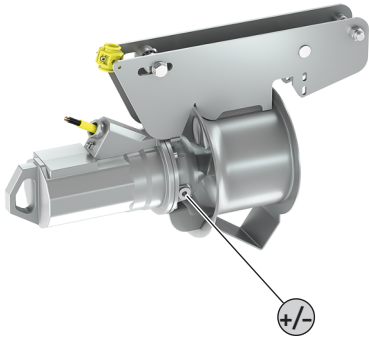


Fig. 11: Flumen screw plugs OPTI-RZP/EXCEL-RZPE 20-1

Flumen OPTI-RZP/EXCEL-RZPE 20-1

→ +/-: Drain/fill seal housing oil

→ **Fill quantity:**

- Flumen OPTI-RZP 20-1: 0.4 l (13.5 US.fl.oz.)
- Flumen EXCEL-RZPE 20-1: 0.4 l (13.5 US.fl.oz.)

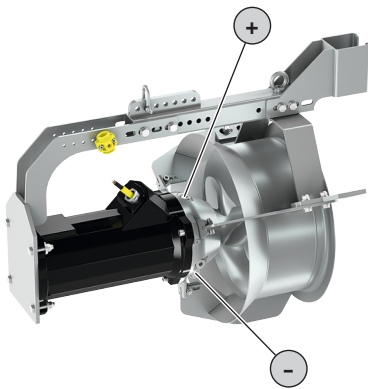


Fig. 12: Flumen screw plugs OPTI-RZP/EXCEL-RZPE 25-3/30-1/40-1

Flumen OPTI-RZP/EXCEL-RZPE 25-3/30-1/40-1

→ +: Fill oil into the seal housing.

→ -: Drain oil from the seal housing.

→ **Fill quantities:**

- Flumen OPTI-RZP 25-3: 1.2 l (40.5 US.fl.oz.)
- Flumen OPTI-RZP 30-1: 1.2 l (40.5 US.fl.oz.)
- Flumen OPTI-RZP 40-1: 1.2 l (40.5 US.fl.oz.)
- Flumen EXCEL-RZPE 25-3: 1.2 l (40.5 US.fl.oz.)
- Flumen EXCEL-RZPE 30-1: 1.2 l (40.5 US.fl.oz.)
- Flumen EXCEL-RZPE 40-1: 1.2 l (40.5 US.fl.oz.)





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