

Alfa Laval LeviMag® – Alfa Laval LeviMag® UltraPure

Tank mixers



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Instruction Manual

Published by
Alfa Laval Kolding A/S
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The original instructions are in English

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1 Declarations of Conformity


1.1 EU Declaration of Conformity

The designated company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00

Company name, address and phone number

Hereby declare that

Designation	ATEX marking options	Serial no(s)
LeviMag® LeviMag UltraPure®	 II -/2G Ex h IIC T4-/Gb	10.000 - 100.000
WP[1]-[2]-[3] - Qdoc [4]-[5]-[6]-[7]-[8]-[9]	[1] WP size = 50, 81 [2] Impeller size = 100, 150, 200, 250, 300 [3] Material = 316L, EN 1.4529, EN 2.4602 [4] Qdoc = S (surface roughness), W (weld log), SW [5] Motor = IE5, PREM, N56C, IECB5, ATEX, ExUS [6] Motor surface = Blue, Cl. room (clean room) [7] Angle = 0-22°, 23°-45° [8] Console height = S (standard), E (extended) [9] Prepared for Sensor = I (yes), Blank (no)	Type variation
Type	Type variation	

is in conformity with the following directives with amendments:

- Machinery Directive 2006/42/EC
- RoHS Directive 2011/65/EU and amendments
- ATEX Directive 2014/34/EU

The following harmonised standards and regulations have been applied for non-electrical equipment for ATEX:

- EN ISO 80079-36: 2016 Basic method and requirements
- EN ISO 80079-37: 2016 Protection by constructional safety 'c' and control of ignition source 'b'

The technical files for the mixer are stored at: Teknologisk Institut, Kongvang Allé 29, 8000 Århus C, Denmark.

Certification body no.: 0396. Archive no.: 2020-1-0338A.

The person authorised to compile the technical file is the signer of this document.

Vice President BU Hygienic Fluid Handling
Head of Product Management

Title

Mikkel Nordkvist

Name

Kolding, Denmark

Place

2025-06-26

Date (YYYY-MM-DD)



Signature

DoC Revison_ 02_062025



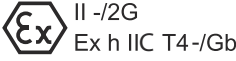
1.2 UK Declaration of Conformity

The designated company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00

Company name, address and phone number

Hereby declare that

LeviMag® LeviMag UltraPure®		10.000 - 100.000
Designation	ATEX marking options	Serial no(s)
WP[1]-[2]-[3] - Qdoc [4]-[5]-[6]-[7]-[8]-[9]	[1] WP size = 50, 81 [2] Impeller size = 100, 150, 200, 250, 300 [3] Material = 316L, EN 1.4529, EN 2.4602 [4] Qdoc = S (surface roughness), W (weld log), SW [5] Motor = IE5, PREM, N56C, IECB5, ATEX, ExUS [6] Motor surface = Blue, Cl. room (clean room) [7] Angle = 0-22°, 23°-45° [8] Console height = S (standard), E (extended) [9] Prepared for Sensor = I (yes), Blank (no)	
Type	Type variation	

is in conformity with the following directives with amendments:

- The Supply of Machinery (Safety) Regulations 2008
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012
- The Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016

The following harmonised standards and regulations have been applied for non-electrical equipment for ATEX:

- EN ISO 80079-36: 2016 Basic method and requirements
- EN ISO 80079-37: 2016 Protection by constructional safety 'c' and control of ignition source 'b'

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Signed on behalf of: Alfa Laval Kolding A/S.

Vice President BU Hygienic Fluid Handling

Head of Product Management

Title

Mikkel Nordkvist

Name

Kolding, Denmark

Place

2025-06-26

Date (YYYY-MM-DD)





Signature

DoC Revison_ 03_062025



2 Safety and Information

 	<p>Unsafe practices and other important information are emphasised in this Instruction Manual.</p> <p>Warnings are emphasised by means of special signs.</p> <p>Always read the manual before using the mixer!</p> <p>This instruction manual is the primary document for safety, installation, operation and maintenance of the Alfa Laval LeviMag®.</p> <p>This document does not contain the welding guide for the weld plate.</p> <p>For this information read the "Alfa Laval LeviMag® Welding Guidelines" available on www.alfalaval.com: LeviMag® aseptic magnetic mixer Alfa Laval.</p> <p>This Instruction manual is designed to provide the user with the information to perform tasks safely for all phases in the lifetime of the product supplied.</p> <p>The user shall always read the safety section first. Hereafter the user can skip to the relevant section for the task to be carried out or for the information needed.</p> <p>This is the complete manual for the supplied product.</p>
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NOTE

The illustrations and specifications in this Instruction Manual were effective at the date of printing. However, as continuous improvements are our policy, we reserve the right to alter or modify the Instruction Manual without prior notice or any obligation.

The English version of the Instruction Manual is the original manual. Alfa Laval cannot be held responsible for incorrect translations. In case of doubt, the English version applies.

2.1 Warning Signs in Text

The following safety terminology is used to indicate the hazard level:

WARNING

Indicates that special procedures must be followed to avoid serious personal injury.

CAUTION

Indicates that special procedures must be followed to avoid damage to the mixer.





NOTE

Indicates important information to simplify or clarify procedures.







2.2 Safety Signs

The following safety symbols are used to indicate the hazards level.


Mandatory Action Signs

	General mandatory action sign.
	Refer to instruction manual.
	Wear protective gloves.
	Wear eye protection.

Warning Signs

	General warning.
	Electricity. Dangerous electrical voltage.
	Corrosive substance. Caustic agent.
	Magnetic field. Strong magnetic fields hazard.
	Crushing of hands.
	Explosive atmosphere, ATEX.

Prohibition Signs


	No access for people with active implanted cardiac devices. Hazard for wearers of electrically controlled medical devices: (e.g. cardiac pacemaker)
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2.3 Safety Precautions





All warnings in the Instruction Manual are summarised on these pages.

Pay special attention to the instructions below so that severe personal injury and/or damage to the mixer are avoided.

General

	<p>Always ensure that personnel must have experience with lifting operations.</p> <p>Always ensure the lifting point to be in line with centre of gravity. Adjust lifting point if necessary.</p> <p>Always keep an eye on the load and stay clear during the lifting operation.</p> <p>Always ensure that the lifting equipment is suitable for the specific supplied product.</p> <p>Always use appropriate lifting equipment for heavy parts when relevant. Use lifting logs when available.</p>
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Installation

	<p>Always follow this Instruction Manual thoroughly.</p> <p>Never expose the mixer to undue vibrations or shocks.</p> <p>Never start the mixer in the wrong rotation direction - see Directions of Rotation Verification on page 31.</p> <p>Ensure that the tank media is not corrosive to the mixer.</p> <p>Only install the mixer in environments within temperature limit: -20 °C and +40 °C.</p> <p>Only install the mixer in altitudes less than 1000 m above sea level.</p>
	<p>Always have the mixer electrically connected by authorized personnel.</p> <p>Always ensure that the mixer has sufficient cooling around the flange, may not be wrapped with isolating materials.</p> <p>Ensure that installation is in accordance with EN 60079-14.</p> <p>Beware of ignition temperature can be decreased when enclosed by the equipment/tank (see EN 14522).</p>
	<p>Beware of risk of crushing fingers due to the strong magnetic forces between the drive unit and the impeller.</p>
	<p>Always keep electrically controlled medical devices away from mixing unit. (e.g. cardiac pacemaker).</p>


Operation

	<p>Always read this manual thoroughly.</p> <p>Ensure that gear motor oil does not reach temperatures higher than 105 °C during operation, CIP or SIP.</p> <p>Always make sure that the mixer corresponds to the category marked on the name plate:</p> <p>Gas atmosphere:</p> <p> II -/2G Ex h IIC T4-/Gb</p>
	<p>Always ensure the mixer is submerged when operating in ATEX - see chapter <i>ATEX Specific Conditions for Safe Use</i> on page 55.</p> <p>Never use the mixer for hybrid mixture and dust environment.</p> <p>Beware of temperature limitations.</p>
	<p>Never touch the moving parts while the mixer is connected to the power supply.</p> <p>Beware of static electricity risk when the media conductivity is below 1000 pS/m. See CLC/TR 50404 or IEC/TS 60079-32.</p>
  	<p>Always handle CIP and SIP lye and acids with great care.</p>
	<p>Always handle hot gear motor with care – use gloves to protect hands.</p>


Maintenance

	Always read this manual thoroughly.
	Ensure that maintenance is in accordance with relevant standards EN 60079-17 and EN 60079-19. Ensure no explosive atmospheres are present during maintenance.
	Always disconnect the power supply when servicing the mixer.
	Always keep electrically controlled medical devices away from mixing unit. (e.g. cardiac pacemaker)

Transportation

	<p>Always ensure that no leakage of lubricants can occur.</p> <p>Always ensure that the unit is securely fixed during transportation.</p> <p>Always use original packaging or similar during transportation.</p> <p>Avoid drive unit to be attached to weld plate during transportation – if necessary avoid undue vibrations or shocks.</p> <p>Avoid mixing head and drive rotor to be exposed to magnetic particles as they will stick to the parts and will require manual removal.</p>
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Safety check

	<p>A visual inspection of any protective device (shield, guard, cover or other) on the supplied Alfa Laval product shall be carried out at least every 12 months. If the protective device is lost or damaged, especially when this leads to deterioration of safety performance, it shall be replaced. The fixing of the protective device should only be replaced with fixings of the same or an equivalent type.</p> <p>Inspection acceptance criteria:</p> <ul style="list-style-type: none"> • It should not be possible to reach moving parts originally protected by a protective device • The protective device must be securely mounted • Ensure that screws for the protective device are securely tightened <p>Procedure in case of non-acceptance:</p> <ul style="list-style-type: none"> • Fix and/or replace the protective device
---	--

 **NOTE**

Incorrect installation, mounting and use, removal of security elements, lack of inspections, lack of maintenance and improper connections may cause severe personal injury or property damage. Therefore, it is important that the mixer is being transported, handled, installed, started, controlled, serviced and repaired correctly exclusively by qualified personnel.

2.4 Intended Use

1. The Alfa Laval LeviMag[®] is only for mixing/stirring of liquids in a tank.
2. The mixer is only for mounting positions/angles as specified on the name plate and in *Mounting Angle* on page 77.
3. The different duties and operation like pressure, speed and media temperature which the mixer is designed for must be followed, see the section *Speed* on page 34 and *Temperature* on page 34.
4. If the mixer is installed in pressurized tanks, local regulations and legislations must be met.

2.5 Unpacking/Delivery

NOTE

The instruction manual is part of the delivery.
Study the instructions thoroughly.

WARNING

Always use adequate lifting equipment when handling the mixer.

CAUTION

Alfa Laval cannot be held responsible for incorrect unpacking.

Step 1

Inspect the delivery for visible transportation damages - all issues to be reported to carrier.

Inspect for oil leaks from gear motor caused by leaking vent valve protection (see [Start-up](#) on page 32) – if leakage is observed - oil level in gear motor must be verified (total oil amount in gear motor to be found on gear motor name plate).

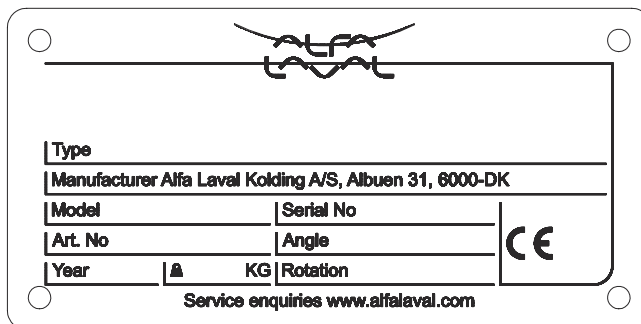
Step 2

Check the delivery for:

1. Complete mixer
2. Name plate designations
3. Delivery note



Always make sure that the ATEX category stated on the name plate corresponds with the environment it is installed in.



Step 3 – Lifting instructions

⚠ WARNING

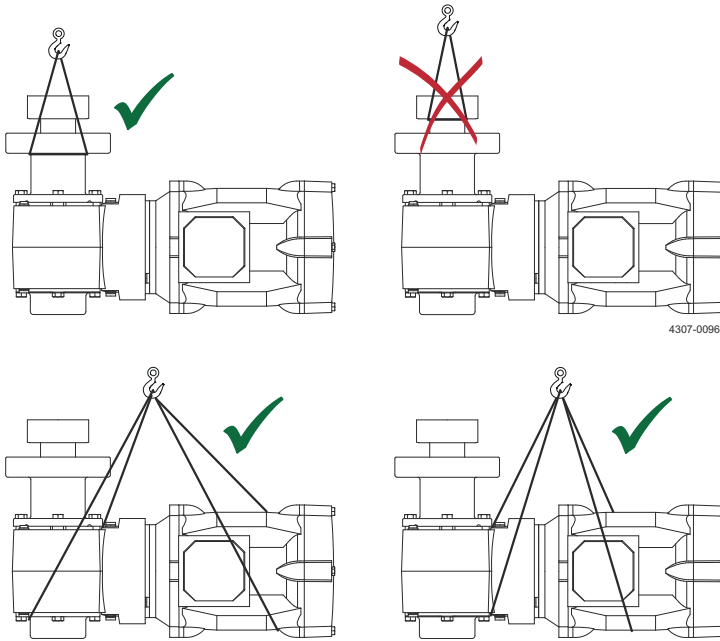
Always use adequate lifting equipment (see mixer weight on name plate).

Locate centre of gravity before moving the mixer.

⚠ CAUTION

Alfa Laval recommends **NOT** to use shaft and drive rotor as lifting point.

Gear motor may be used for lifting the assembled drive unit.



⚠ WARNING

Always keep electrically controlled devices away from mixing unit.



Step 4 – During transportation



Always protect shaft and the drive rotor. Foreign magnetic particles can be attracted by the drive rotor due to the magnetic field.

Never expose the mixer to undue vibrations or shocks.

Inspect for oil leakage on gear's with vent screw – if leakage due to incorrect position/angle of gear motor, oil level must be verified - total oil quantity in gear motor is to be found on gear motor name plate.



2.6 Requirements of Personnel

Operators

The operators shall read and understand this Instruction Manual.

Maintenance personnel

The maintenance personnel shall read and understand this Instruction Manual. The maintenance personnel or technicians shall be skilled within the field required to carry out the maintenance work safely.

Trainees

Trainees can perform tasks under the supervision of an experienced employee.

People in general

The public shall not have access to the supplied Alfa Laval product.

In some cases, specially skilled personnel may need to be hired (i.e. electricians, welders). In some cases the personnel has to be certified according to local regulations with experience of similar types of work.

2.7 Recycling Information

Unpacking

Packing material may consist of wood, plastics, cardboard boxes and in some cases metal straps.



- Wood and cardboard boxes can be reused, recycled or used for energy recovery
- Plastics should be recycled or burnt at a licensed waste incineration plant
- Metal straps should be sent for material recycling

Maintenance

During maintenance, oil (if used) and wear parts in the supplied Alfa Laval product should be replaced.

- Oil and all non-metal wear parts must be disposed of in accordance with local regulations
- Rubber and plastics should be burnt at a licensed waste incineration plant. If not available they should be disposed of in accordance with local regulations
- Bearings and other metal parts should be sent to a licensed handler for material recycling
- Seal rings and friction linings should be disposed of to a licensed land fill site. Check your local regulations
- All metal parts should be sent for material recycling
- Worn out or defected electronic parts should be sent to a licensed handler for material recycling

Scrapping

At end of use, the equipment must be recycled in accordance with the relevant local regulations. Besides the equipment itself, any hazardous residues from the process liquid must be considered and dealt with in a proper manner. When in doubt, or in the absence of local regulations, please contact your local Alfa Laval sales company.

How to contact Alfa Laval

Contact details for all countries are continually updated on our website.

Please visit www.alfalaval.com to access the information directly.

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3 Installation

NOTE

The instruction Manual is part of the delivery.

Study the instructions carefully and pay special attention to the warnings!

The mixer is for permanent fastening.

Make sure that the motor corresponds to the environment.

WARNING

Always read the manual thoroughly.

Install this mixer in mounting angles according to the nameplate, see [Unpacking/Delivery, Step 2](#) on page 15.

Always use lifting equipment when handling the mixer - see [Unpacking/Delivery](#) on page 15.

Always have safety elements removed by authorized personnel.

Never cover or remove the name plate.

WARNING

Never connect to power supply during installation or service.

Always have the mixer connected to power supply by authorized personnel.



Install the mixer in following order of assembly:

Step 1

Weld plate

See [Weld Plate](#) on page 22.

Step 2

Male bearing

see [Male Bearing](#) on page 23.

Step 3

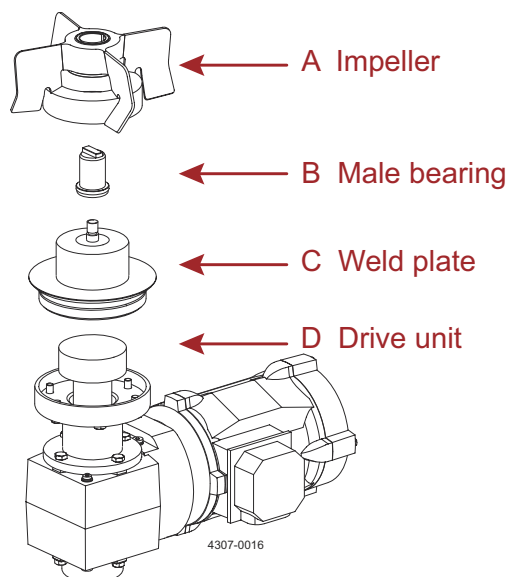
Impeller

see [Impeller](#) on page 24.

Step 4

Drive Unit

see [Drive Unit - WP50](#) on page 26 and [Drive Unit - WP81](#) on page 28.



NOTE

Before installing any parts, make sure the tank is clean – rinse thoroughly with clean water and secure that no particles are magnetized onto any surfaces.

Tools used in the sections are optionally available - see [Tools](#) on page 90.

Spare Parts and tools for Alfa Laval LeviMag® can also be found in the spare part catalogue at <https://hygienicfluidhandling-catalogue.alfalaval.com>.

3.1 Weld Plate

Follow the guide in "Alfa Laval LeviMag® Welding Guidelines" for welding of the weld plate into the tank available on www.alfalaval.com: [LeviMag® aseptic magnetic mixer | Alfa Laval](#)



Only use authorized personnel to weld in the weld plate.

Alfa Laval cannot be held responsible for incorrect installation.

3.2 Male Bearing

It is assumed that the weld plate is installed in the tank – if not, follow the guide in "Alfa Laval LeviMag® Welding Guidelines" available on www.alfalaval.com: [LeviMag® aseptic magnetic mixer | Alfa Laval](#).

CAUTION

Protect the bearing surface from physical damage and keep it free from particles.

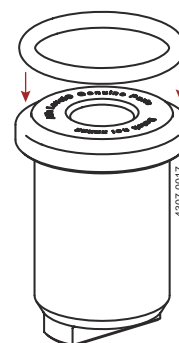
Do not use grip tools on the bearing surfaces.

Handle the male bearing with care - Alfa Laval highly recommend use of service tool for the male bearing.

- 1 Place the O-ring on the male bearing.

For minimal friction, lubricate the O-ring with a small amount of water.

Ensure the bearing surface is clean.

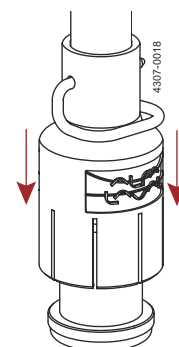


- 2 (Optional)

Place the male bearing with O-ring in the male bearing tool – rotate the bearing slightly by hand enabling it to go completely into the socket with the O-ring in place.

NOTE

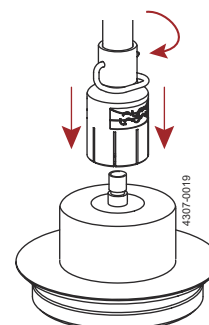
For large tanks, lifting rod may be needed to perform the installation.



- 3 Using the male bearing tool (optional with rod), place the male bearing female thread on the weld plate male thread and turn clockwise to install.

CAUTION

Ensure that the thread connection on the weld plate and the male bearing are clean, dry and free from foreign material.

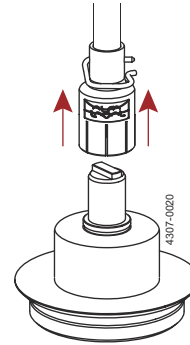


- 4 Tighten the bearing to a full stop applying torque seen in *Tightening Torque for Screwed Connections* on page 78.



Do not over-tighten.

- 5 (Optional)
Remove the male bearing tool from the bearing by pulling it upwards.



3.3 Impeller



It is important that the impeller is mounted **before** installing the drive unit.

Always keep electrically controlled medical devices away from mixing unit (e.g. cardiac pacemaker).

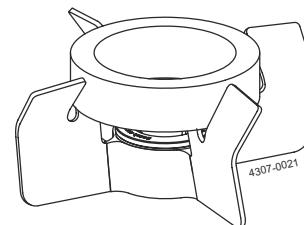


Always be sure that the weld plate is correctly installed in the tank and that it has not been deformed during the welding process. See guide in "Alfa Laval LeviMag® Welding Guidelines" available on www.alfalaval.com: *LeviMag® aseptic magnetic mixer | Alfa Laval*.

- 1 Remove foreign magnetic particles from the mixing head (can be time consuming or difficult if mixing head has been exposed to magnetic particles which must be removed mechanically and manually).



If the mixing head must be placed on a table, place the magnets upward to prevent magnetic particles to stick to the magnetic surface of the mixing head.



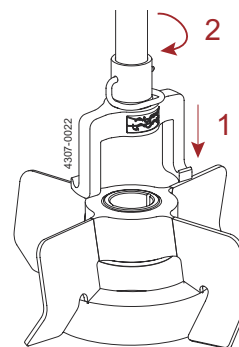
2 (Optional)

Use the impeller lifting device to install the impeller in the tank.

Lift the impeller carefully with the impeller lifting device.

NOTE

If needed - mount the impeller lifting device to the lifting rod.



3

Place the impeller carefully on the male bearing.

Rotate the impeller slowly 360 degrees (one rotation) ensuring that there is no collision between the mixing head and tank bottom/weld plate.

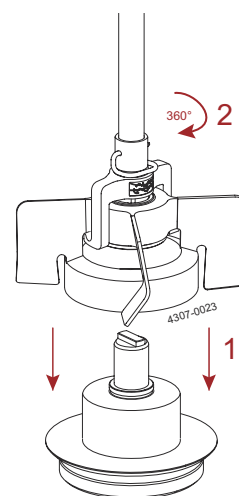
Remove the impeller lifting device by rotating fast 45 degrees in the opposite direction, freeing the arms from the impeller wings.

NOTE

Make sure the female/impeller bearing is fully set onto the male bearing.

WARNING

The impeller must be mounted before installing the drive unit.



3.4 Drive Unit - WP50

CAUTION

Always be sure that the weld plate is correctly installed in the tank and that it has not changed shape during welding – see "Alfa Laval LeviMag® Welding Guidelines" available on www.alfalaval.com: [LeviMag® aseptic magnetic mixer | Alfa Laval](#).

WARNING

It is critical for the impeller to be mounted **before** installing the drive unit.



- 1 Ensure the total run-out on the magnetic drive rotor is maximum 0.2 mm. See [Measuring of Total Run-Out](#) on page 79.

WARNING

Protect the magnetic drive rotor on the drive unit from collecting particles.



- 2 Ensure the bearing and impeller (1) is mounted before mounting the drive unit (2).

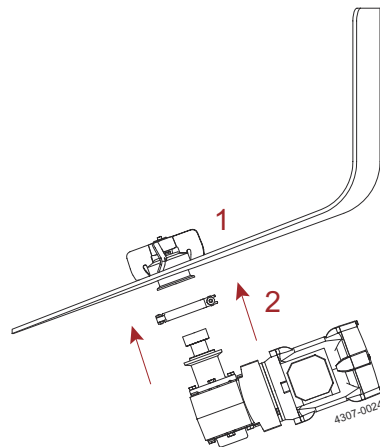
WARNING

Beware of risk of crushing fingers due to the strong magnetic forces between the drive unit and the impeller.



NOTE

During the installation, be sure that the drive unit is supported to avoid tipping over or dropping to the floor.



- 3 Hold the drive unit firmly and align the drive unit with the weld plate. Apply the clamp ring without tightening it fully. The motor must always be pointing upwards.
- 4 Adjust gear motor orientation in order for this to clear tank legs and according to [Mounting Angle](#) on page 77. The motor must always be pointing upwards. Tighten clamp ring according to [Tightening Torque for Screwed Connections](#) on page 78.
- 5 Ensure the upper part of the flange is flush with the lower side of the weld plate.

6



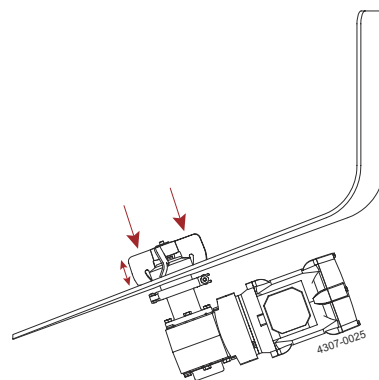
Check for levitation!

Push the impeller downwards against the weld plate – possibly using the lifting rod tool – the impeller should travel axially minimum 0.5 mm – otherwise it is not levitated correctly.

If not, ensure both bearings are installed correctly, flange is flush against the bottom of the weld plate. Lubricate the bearings with e.g. water and recheck levitation.



For programming and installation of frequency converter see [Connection to Frequency Converter](#) on page 79.



3.5 Drive Unit - WP81

CAUTION

Always be sure that the weld plate is correctly installed in the tank and that it has not changed shape during welding – see "Alfa Laval LeviMag® Welding Guidelines" available on www.alfalaval.com: [LeviMag® aseptic magnetic mixer | Alfa Laval](#).

WARNING

It is critical for the impeller to be mounted **before** installing the drive unit.



- 1 Ensure the total run-out on the magnetic drive rotor is maximum 0.2 mm. See section [Measuring of Total Run-Out](#) on page 79.

WARNING

Protect the magnetic drive rotor on the drive unit from collecting particles.



- 2 Ensure the bearing and impeller (1) is mounted before mounting the drive unit (2).

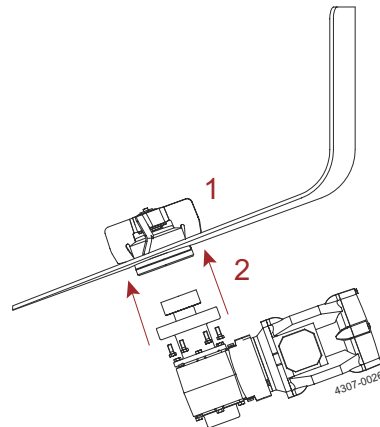
WARNING

Beware of risk of crushing fingers due to the strong magnetic forces between the drive unit and the impeller.



NOTE

During the installation, be sure that the drive unit is supported to avoid tipping over or dropping to the floor.



- 3 Hold the drive unit firmly and align the drive unit with the weld plate. Adjust gear motor orientation in order for this to clear tank legs and according to [Mounting Angle](#) on page 77. The motor must always be pointing upwards.
- 4 Apply mounting screws without tightening these fully.
- 5 Make certain the weld plate and drive unit flange are completely flush, tighten the mounting screws according to [Tightening Torque for Screwed Connections](#) on page 78.

- 6

 **CAUTION**

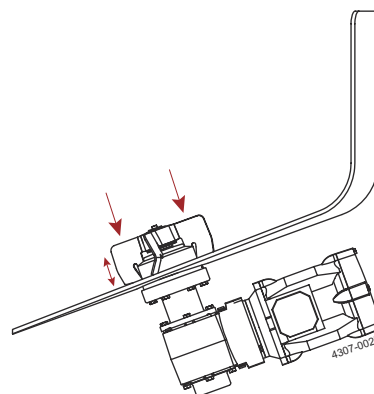
Check for levitation!

Push the impeller downwards against the weld plate – possibly using the lifting rod tool – the impeller should travel axially minimum 0.5 mm – otherwise it is not levitated correctly.

If not, ensure both bearings are installed correctly, flange is flush against the bottom of the weld plate. Lubricate the bearings with e.g. water and recheck levitation.

 **NOTE**

For programming and installation of frequency converter see [Connection to Frequency Converter](#) on page 79.



3.6 Speed Sensor (accessory)

NOTE

The Speed Sensor only works properly if the used impeller is prepared for sensor (see name plate designation in [Unpacking/Delivery](#) on page 15).

The position and dimension of the mounted Speed Sensor can be seen on below illustration – it must be ensured that the Speed Sensor can be positioned without colliding with the tank wall and other strong magnetic fields.

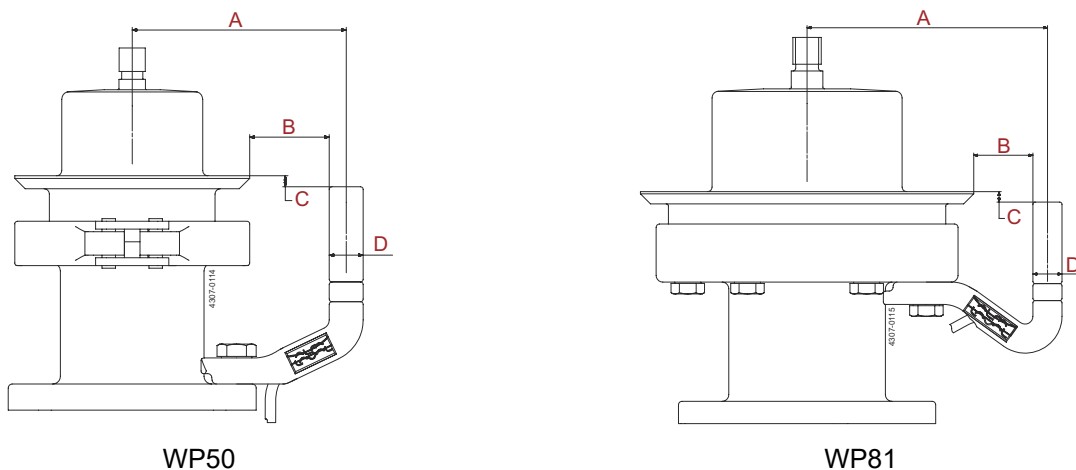
Drive unit – WP50

The Speed Sensor must be mounted on one of the four screws (free of choice) fastening the console to the gear motor shown in [Drive Unit - WP50](#) on page 85 and on below illustration.

Drive unit – WP81

The Speed Sensor must be mounted on one of the six screws (free of choice) fastening the console to the Weld Plate shown in [Drive Unit - WP81](#) on page 87 and on below illustration.

- 1 Remove the desired screw on the Drive Unit.
- 2 Mount the Speed Sensor to the Drive Unit with the longer screw that comes with the Speed Sensor.
- 3 Tighten the screw according to [Tightening Torque for Screwed Connections](#) on page 78.
- 4 Ensure that cabling from the Speed Sensor is fastened properly and connected as described in [Connection of Speed Sensor](#) on page 80.



	WP50	WP81
Designation	Dimensions	Dimensions
A	82.0 mm	107.5 mm
B	30.5 mm	26.5 mm
C	4.0 mm	4.7 mm
D	Ø13.0 mm	Ø13.0 mm

3.7 Directions of Rotation Verification

It is recommended that the customer install an emergency stopping device and a circuit breaker for their full tank/mixer processing system.

- 1 After confirming the impeller is levitated, connect motor according to [Connection of Motor](#) on page 78 and frequency converter according to [Connection to Frequency Converter](#) on page 79.

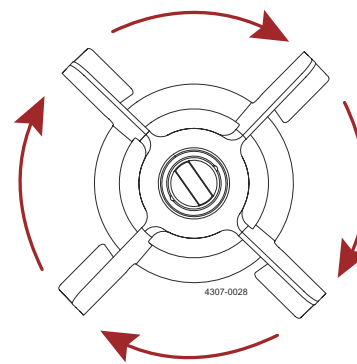
WARNING

Ensure the correct power is used for the frequency converter. Incorrect power supply can permanently damage components.

- 2 Start up the mixer running slowly below 5 RPM and verify the impeller is rotating clockwise.

CAUTION

If the impeller is rotating counter-clockwise, the frequency converter must be reprogrammed reversing direction of rotation.



NOISE OR VIBRATION:

If there is excessive noise or vibration, please ensure:

- impeller is levitated
- male bearing is seated correctly
- female bearing is seated correctly
- drive unit is seated completely and flush with the weld plate
- impeller is rotating clockwise
- there is no contact between tank bottom and impeller
- one of the bearings have not come loose during counterclockwise rotation

If the noise or vibration persists, please contact your Alfa Laval representative.

CAUTION

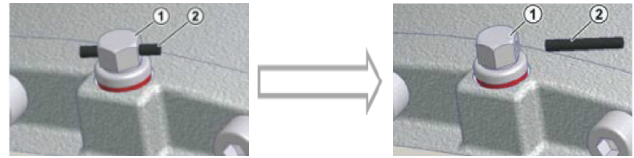
Always disconnect drive unit before working with the impeller or bearing.

3.8 Start-up

1



Remove the rubber plug in the gear.



4307-0118

1) Standard vent plug

2) Transport securing device to be removed

2

Alfa Laval require that a frequency converter is used running the mixer – please see [Connection to Frequency Converter](#) on page 79.

3

1. Always allow at least a 10 sec. ramping up to set speed.
2. Always allow at least a 10 sec. ramping down to full stop.



The maximum impeller speed – please see [Speed](#) on page 34 and [Technical data](#) on page 65.

4

Go through the chapter [Checklists](#) on page 47.

5

Your Alfa Laval LeviMag® is now ready for operation.

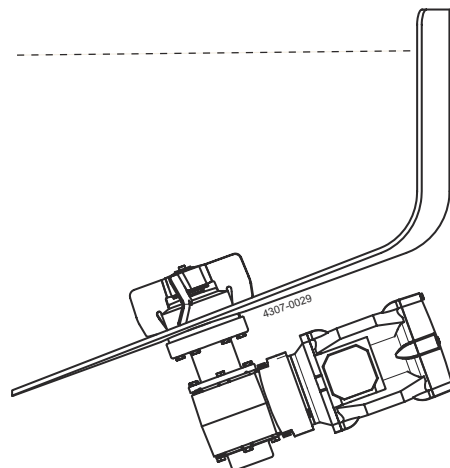
4 Operation

! NOTE

The mixer should only be operated when mounted in a tank.
Never place objects or tools inside the tank when operating the mixer.

4.1 Mixing

- 1 Fill the tank with the desired amount and type of media.



- 2 Start up the mixer according to your specific mixing requirements.

! NOTE

For ATEX - please see *ATEX Specific Conditions for Safe Use* on page 55.



4.2 Speed

The allowable maximum speed for the impeller depends on several factors such as fluid viscosity, tank dimensions, tank and baffle design and geometry.

The recommended maximum speeds in a fully baffled tank - mixing products with water like viscosity – can be found in [Technical Data, LeviMag® UltraPure](#) on page 65 and [Technical Data, LeviMag®](#) on page 66.



CAUTION

Below does **NOT** apply when having an explosive atmosphere above liquid level.

Please see [ATEX Specific Conditions for Safe Use](#) on page 55 if there is an explosive atmosphere.



Alfa Laval LeviMag® can run dry once it has been submerged, however it is not recommended to run dry above 50 RPM. Dry-running below 50 RPM is safe during a complete draining as well as during CIP.

To avoid damage to the bearings when running dry, please do not exceed speeds of 50 RPM.

4.3 Temperature

During operation:	max. 90 °C and ensure that the media is not boiling
During operation:	min. -10 °C (as long as the product is in a liquid state)
Using non-lubricating media (e.g. WFI) up to:	max. 90 °C and ensure that the media is not boiling
During CIP (max. 50 RPM):	max. 95 °C
During SIP (max. 10 RPM):	max. 125 °C
During SIP (at 0 RPM):	max. 150 °C
Allowable ambient temperature:	max. 40 °C



CAUTION

The mixer may not run when an ATEX zone is present.



4.4 Cleaning

For optimal performance and service life of the mixer, proper CIP and SIP procedures should be followed.

The mixer is designed for use with CIP, please study the instructions carefully and pay special attention to warnings!

WARNING Caustic hazard!

Always handle CIP and SIP lye and acids with great care.

Always use rubber gloves!

Always use protective goggles!



The mixer can run at 50 RPM or less during cleaning processes.

Do not run the mixer during SIP if the temperature is above 125 °C.

If the temperature is below 125 °C during SIP, the mixer can be operated up to max. 10 RPM.

NOTE

If CIP or SIP temperatures are more than 150 °C, it is important to remove the impeller including the female bearing. The male bearing and elastomers can handle temperatures up to 200 °C.

Ensure that gear motor oil does not reach temperatures higher than 105 °C during CIP and SIP.

If higher than above stated temperatures are needed, please remove drive unit.

Ensure that the impeller is not exposed to temperature shocks.

CAUTION

The mixer may not run when an ATEX zone is present.



See [Maintenance](#) on page 37 for instructions regarding maintenance.

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5 Maintenance

NOTE

It is important that the drive unit is dismantled before removing the impeller.

The maintenance interval for the mixer depends on the application - shorter or longer service interval may appear.

Handle the mixer with care and follow the recommended inspection to prevent unnecessary damage.

5.1 General Maintenance

Before performing any service and maintenance, read and understand below warnings:

WARNING

Maintenance of the mixer should only be performed by authorised personnel.

Ensure totally clean surfaces before and during maintenance.

Ensure the tank is fully vented from any gases, depressurized and cooled to a temperature which allows acceptable working conditions.

Always use proper tools.

Always replace sealing elements, if necessary, before reassembling.

For maintenance instructions from suppliers see [Drive Unit Instructions](#) on page 95.

All scrap must be stored/disposed of in accordance with current rules/directives.

Always use genuine Alfa Laval spare parts.

WARNING

Always disconnect the power supply when servicing the mixer.

For lifting instructions please refer to [Unpacking/Delivery](#) on page 15.

Be careful, impeller and drive unit include very strong magnets.

Ensure nonexplosive atmosphere during maintenance.



WARNING

Follow the dismantling and assembly instructions to the letter. Ensure the mixer is in a safe state before any service and maintenance. After maintenance, the section [Start-up](#) on page 32 must be read thoroughly before operation.

5.1.1 Preventive Maintenance

To ensure that your Alfa Laval LeviMag® operates efficiently, it is essential to follow a simple preventive maintenance program, which will keep your




machine in good working conditions. Good maintenance requires careful attention at regular intervals!

The following recommended preventive maintenance procedures are based on the average operating conditions of most Alfa Laval machines. A mixer which is subject to abrasive fluids, will need more frequent attention than one working in ideal conditions. The maintenance program should be adjusted to meet the demands of your normal operating condition.

- Alfa Laval recommend that O-rings are replaced every 12th month
- Alfa Laval recommend that bearings are replaced every 20,000 operating hours

NOTE

The gear can have a shorter lifetime than the mixer. Please pay special attention to the stated maintenance interval of the gearbox.

		Getriebebau NORD GmbH & Co. KG 22939 Bargteheide/GERMANY			
Typ					
No.					
n_2	$\text{min}^{-1} n_1$	$\text{min}^{-1} IM$	i_{ges}		
M_2	N_m	P_1	kW	B_j	
F_{R2}	kN	F_{R1}	kN	T_u	
F_{A2}	kN	\blacksquare	kg	x_{R2}	mm
Oil					h
					S

085 22550

5.2 Inspection

After 25 hours of operation, listen for abnormal sounds. If any, dismount the mixer and check all parts for scratches and dents.

CAUTION

ATEX zone must only be present after the 25 hours run-in period. For ATEX all parts must be checked for scratches and dents after the 25 hours run-in.

Beware of special maintenance interval for ATEX option see [Additional Maintenance for ATEX](#) on page 62.



Alfa Laval recommend:

- that the bearings and O-rings should be checked for cleanability and wear after one month of operation. If there is abnormal wear on either component, contact Alfa Laval for further instructions
- After each CIP sequence, check that the mixer and parts are clean. Also, look for wear, check the gaskets to ensure that they are without tears or cracks
- Regular inspections should be performed at least every 6th months or in accordance with local Preventative Maintenance plans

- If any component is found damaged during inspection, please contact Alfa Laval for repair and/or replacement parts
- All wear parts or damaged parts should be replaced only with genuine Alfa Laval components

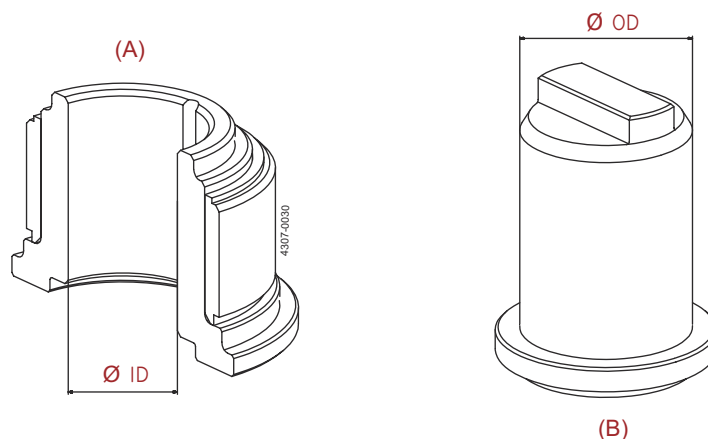
Possible damages on the parts are listed below:

No	Component	Check zone	Description	Control method	Action
1	Impeller	Surfaces and edges	<ul style="list-style-type: none"> • scratches • foreign particles • tolerance on bearing surface 	<ul style="list-style-type: none"> • visual • visual • measuring 	<ul style="list-style-type: none"> • re-polish, if possible • cleaning • change bearing
2	Female bearing	Surfaces and edges	<ul style="list-style-type: none"> • scratches 	<ul style="list-style-type: none"> • visual 	<ul style="list-style-type: none"> • change bearing
		Thread	<ul style="list-style-type: none"> • tolerance on surface • damage on thread 	<ul style="list-style-type: none"> • measuring 	
3	Male bearing	Surfaces and edges	<ul style="list-style-type: none"> • scratches 	<ul style="list-style-type: none"> • visual 	<ul style="list-style-type: none"> • change bearing
		Thread	<ul style="list-style-type: none"> • tolerance on surface • damage on thread 	<ul style="list-style-type: none"> • measuring 	
4	O-rings	Surface	<ul style="list-style-type: none"> • deformed • cracks 	<ul style="list-style-type: none"> • visual 	<ul style="list-style-type: none"> • change O-rings
5	Weld Plate	Surfaces and edges	<ul style="list-style-type: none"> • damage on thread 	<ul style="list-style-type: none"> • visual 	<ul style="list-style-type: none"> • re-thread, if possible
		Thread	<ul style="list-style-type: none"> • damage on outer OD 	<ul style="list-style-type: none"> • measuring 	<ul style="list-style-type: none"> • re-polish, if possible
6	Drive Unit	Drive Rotor	<ul style="list-style-type: none"> • foreign particles on parts 	<ul style="list-style-type: none"> • visual 	<ul style="list-style-type: none"> • cleaning
		Gear motor	<ul style="list-style-type: none"> • leaks or noises 	<ul style="list-style-type: none"> • audible 	<ul style="list-style-type: none"> • change gear motor
		Motor	<ul style="list-style-type: none"> • cable failure 		<ul style="list-style-type: none"> • repair gear motor
7	Drive Rotor	Run-out	<ul style="list-style-type: none"> • out of balance 	<ul style="list-style-type: none"> • measuring 	<ul style="list-style-type: none"> • align so run-out is maximum 0.2 mm, see Measuring of Total Run-Out on page 79

The clearance between female and male bearing should not exceed 0.15 mm. If the value exceeds – Alfa Laval recommend changing both bearings.

A: Female bearing

B: Male bearing



Calculation of clearance

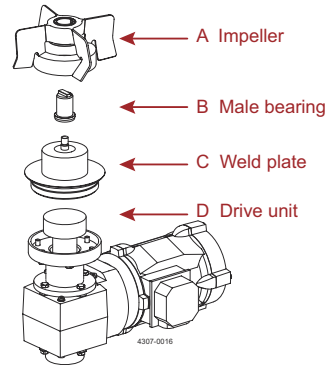
female bearing, inner diameter (ID) – male bearing, outer diameter (OD) = clearance.

The highest wear is normally found at the upper and lower inner surface of the female bearing.

Each of the inspection components requires disassembling of the mixer.

The disassembling must be carried out as listed in the order:

1. Dismount the drive unit, see [Dismounting of the Drive Unit](#) on page 41.
2. Dismount the impeller and female bearing, see [Dismounting of the Impeller](#) on page 43 and [Replacement of the Female Bearing](#) on page 45.
3. Dismount the male bearing, see [Replacement of the Male Bearing](#) on page 43.

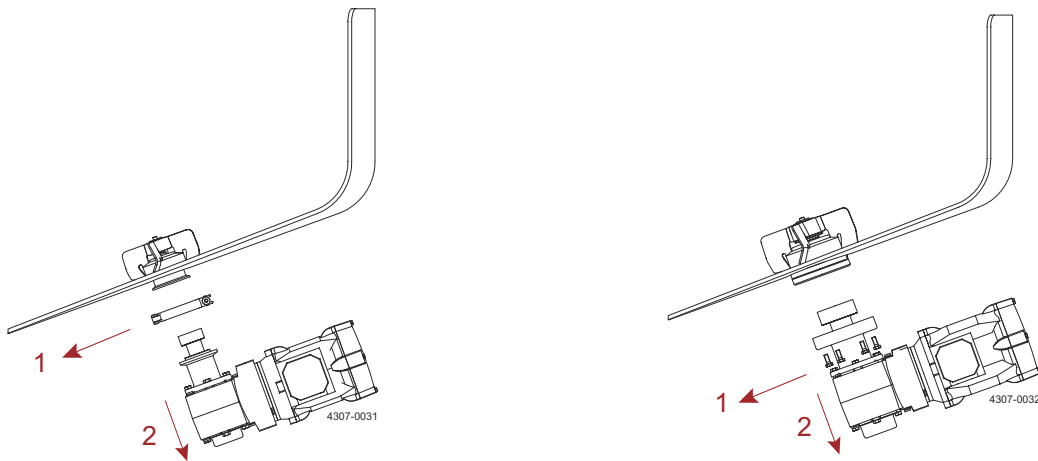


5.3 Dismounting of the Drive Unit

- 1 Before maintenance, ensure the main power switch is off and power is disconnected.
- 2 WP 50: Loosen the clamp ring (1) - do not remove.
WP 81: Loosen the mounting screws (1) - do not remove.
- 3 Make preparations for supporting the drive unit and remove clamp ring/screws completely.

CAUTION

The drive unit may be heavier than expected. When it becomes loose (2), be careful not to let it fall, since it may very well become damaged. The magnets will in most cases keep the drive unit in place and forces must be used to pull it down.



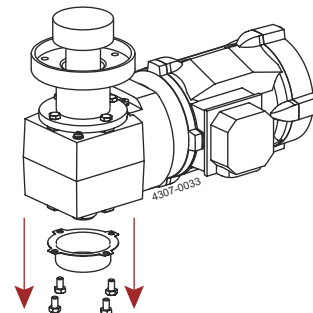
5.4 Disassembly of the Drive Unit

NOTE

Assembly drawings with position numbers (#) can be found in [Drive Unit - WP50](#) on page 85 and in [Drive Unit - WP81](#) on page 87.

Tightening torques can be found in [Tightening Torque for Screwed Connections](#) on page 78.

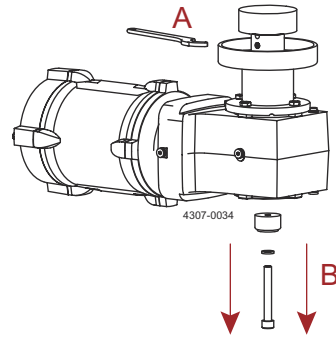
- 1 Unscrew the four screws (8.3).
Remove the protection cap (8.2).



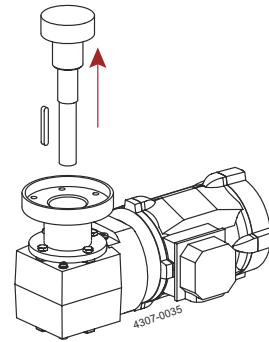
- 2 Fasten the Drive Rotor with a hook wrench (A) and unscrew the screw (10) and remove washer (9) and Fastening element (8.1) (B).

NOTE

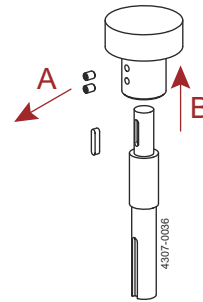
The Drive Rotor (1) can be fastened for rotation using a hook wrench that is inserted into the hole ($\varnothing 6$ for Size WP50 and $\varnothing 7$ for Size WP81) above the two screws (2).



- 3 Pull out the shaft (6) - including keys (5) and (7) - and Drive Rotor (1) with screws (2).



- 4 Unscrew the screws (2) (A) and pull of the Drive Rotor (1) (B).



NOTE

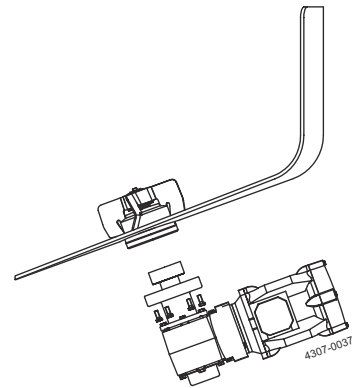
Assemble reverse as dismantling.

Ensure clean surfaces during assembly and lubricate shaft fits (gear motor and Drive Rotor) with anti-corrosion grease.

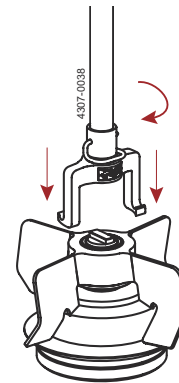
Ensure magnetic drive rotor run-out is maximum 0.2 mm.

5.5 Dismounting of the Impeller

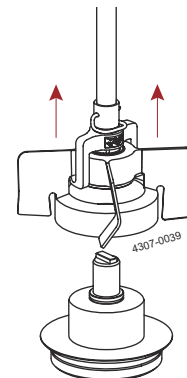
- 1 Ensure that the drive unit is removed.



- 2 Remove the impeller with the optional lifting device.
Ensure the tool arms are catching a wing on both sides by rotating the tool.

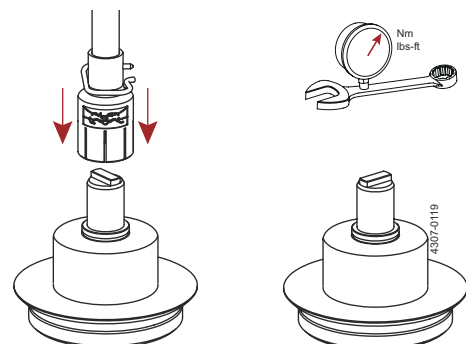


- 3 Carefully lift the impeller up and out of the tank.

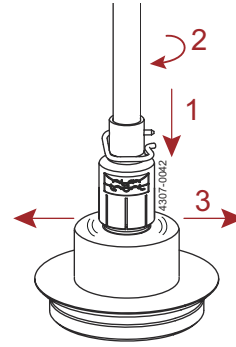


5.6 Replacement of the Male Bearing

- 1 Optionally use the male bearing tool with a lifting rod to remove the male bearing and O-ring in one step.
Or use a standard (adjustable) spanner to loosen the male bearing by turning it anticlockwise.



- 2 Press the tool down (1) and rotate (2) until the groove inside the tool fits onto the bearing key (flat section on upper part of bearing) and press firmly down until the tool-arms click-out partly (3).

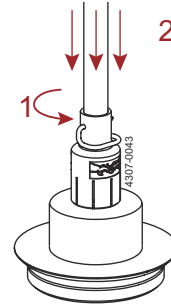


- 3 Turn the male bearing tool anticlockwise a 1/4 rotation loosening the bearing part and press down. Continuing rotating the tool enabling the tool-arms to catch the O-ring.

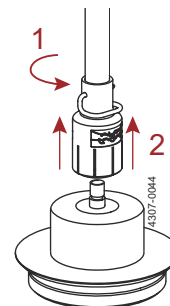
The tool has a limited torque capacity and it is not designed for everyday use – therefore it is always a part of the male bearing spare part kit.

If the male bearing somehow has been tightened too hard during abnormal use or other, there is a possibility that the tool cannot handle the torque without damaging the tool.

In these cases a standard (adjustable) spanner must therefore be used instead.



- 4 Continue turning anticlockwise (1) to dismount the male bearing and O-ring and lift it up (2) from the tank.



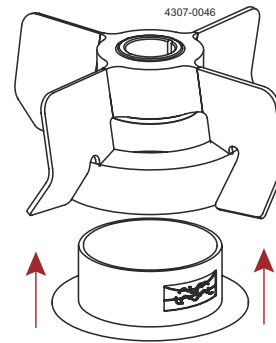
- 5 Push the male bearing and O-ring free from the top of the tool with a round stud.



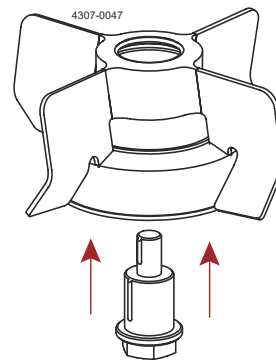
- 6 Follow [Male Bearing](#) on page 23 for installation of the male bearing.

5.7 Replacement of the Female Bearing

- 1 Mount the protection shield to protect the impeller surface from possible scratches from the magnetic stainless-steel part on the female bearing. The stainless-steel part on the female bearing catches the magnetic impeller easily.

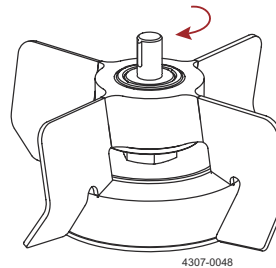


- 2 Use the female bearing tool to loosen the female bearing and O-rings from the impeller.

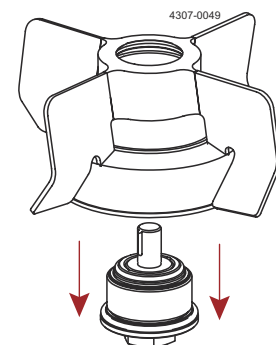


- 3 Apply torque to the female bearing tool to loosen as shown on illustration.

The thread between the female bearing and the impeller is a normal right handed thread - ie. the tool and female bearing must be rotated in the direction of the red arrow to be unscrewed.



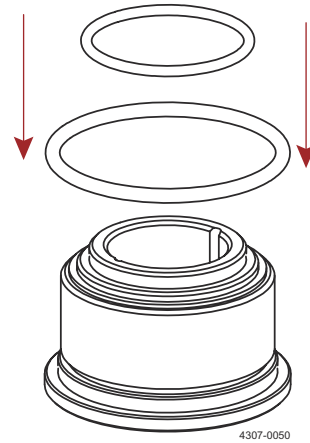
- 4 Unscrew the female bearing completely and remove from impeller.



- 5 Mount the new O-rings on the new female bearing.

NOTE

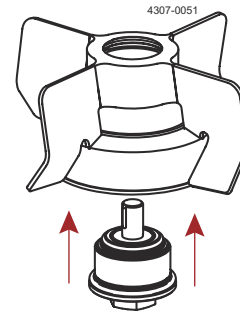
Be careful not to scratch the lower O-ring when moving it over threads on the bearing – the O-ring can be extended a little by pulling in it (max. 5%) before moving it over the threads.



4307-0050

- 6 **NOTE**
Ensure the protection shield is mounted onto the impeller.

Place the female bearing from the downside into the impeller using the female bearing tool.



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- 7 Tighten the female bearing to a full stop by applying the recommended torque according to [Tightening Torque for Screwed Connections](#) on page 78.

CAUTION

Do not over-tighten

- 8 Remove the female bearing tool and the protection shield.

- 9 Follow [Impeller](#) on page 24 for installation of the impeller.

CAUTION

Ensure to place the impeller in the tank on the male bearing before mounting the drive unit.

6 Checklists

! NOTE

To ensure correct installation, before using the Alfa Laval LeviMag[®], make sure to complete each step in the checklists below.

Beware of additional checklist for ATEX option see [Additional Maintenance for ATEX](#) on page 62.

6.1 Unpacking/Delivery

1	Read and understand the Instruction Manual thoroughly.	Checked <input type="checkbox"/>
2	Inspect the delivery for visible transportation damages.	Checked <input type="checkbox"/>
3	Checklist for "Alfa Laval LeviMag [®] Welding Guidelines" done.	Checked <input type="checkbox"/>
4	Check name plates for data.	Checked <input type="checkbox"/>

6.2 Installation

1	Ensure all parts are clean, dry and free from foreign material.	
	a) Weld plate and thread connection.	Checked <input type="checkbox"/>
	b) Male bearing and O-ring.	Checked <input type="checkbox"/>
	c) Impeller.	Checked <input type="checkbox"/>

2 Install the male bearing and O-ring.

- | | |
|--|-------------------------------------|
| a) Lubricate the O-ring with purified water – mount on the male bearing. | Checked
<input type="checkbox"/> |
| b) Place the male bearing on the tool. | Checked
<input type="checkbox"/> |
| c) Tighten the bearing to metal-to-metal contact. | Checked
<input type="checkbox"/> |
| d) Tighten according to the specified torque – see Tightening Torque for Screwed Connections on page 78. | Checked
<input type="checkbox"/> |
-

3 Install the impeller including female bearing.

- | | |
|--|-------------------------------------|
| a) Mount the impeller on the male bearing. | Checked
<input type="checkbox"/> |
| b) Ensure the impeller rotates smoothly. | Checked
<input type="checkbox"/> |
-

4 Install the drive unit.

- | | |
|---|-------------------------------------|
| a) Ensure all incoming power is connected with an emergency stop or an on/off switch. | Checked
<input type="checkbox"/> |
| b) Install the frequency converter – see Connection to Frequency Converter on page 79. | Checked
<input type="checkbox"/> |
| c) Program frequency converter ensuring that maximum speed can never be exceeded - see Technical data on page 65. | Checked
<input type="checkbox"/> |
| d) Ensure cables are long enough and shield motor cables. | Checked
<input type="checkbox"/> |
| e) Ensure that the drive rotor rotates in a clockwise direction as seen from above. | Checked
<input type="checkbox"/> |
| f) Ensure the magnetic drive rotor run-out is maximum 0.2 mm. | Checked
<input type="checkbox"/> |

5	Mount the drive unit including the magnetic drive rotor into the weld plate.	
a)	Tighten the screws (WP81) or clamp (WP50) according to the specified torque – see Tightening Torque for Screwed Connections on page 78.	Checked <input type="checkbox"/>
6	Check the impeller for levitation after installing the drive unit into the weld plate.	Checked <input type="checkbox"/>
7	Verify the impeller is rotation clockwise.	
a)	Turn on the motor and verify that the impeller rotates smoothly clockwise.	Checked <input type="checkbox"/>
8	Verify that the Speed Sensor is detecting impeller rotation.	
a)	Rotate the impeller slowly and verify that one short flash is seen for each rotation of the impeller.	Checked <input type="checkbox"/>

6.3 Operation

1	Fill the tank with preferred liquid media.	Checked <input type="checkbox"/>
2	Start the mixer acc. to your specific mixing requirements	Checked <input type="checkbox"/>

6.4 Qualification

NOTE

Ensure that all important information has been noted for future use.
Use this checklist for each tank and mixer to ensure correct installation qualification.

6.4.1 General Information

Name	
Tank number	
Tank type	
Tank manufacturer	
Country	
Site location	
LeviMag® type	
Alfa Laval representative	

6.4.2 Alfa Laval LeviMag® Information

Name	Serial/cert./ batch number	Item no.	Notes
Weld plate			
Drive unit			
Impeller			
Male bearing			
Female bearing			
O-rings			

6.4.3 Check List – Frequency Converter Settings

NOTE

Ensure that all motor data from Table 1 in *Connection of Motor* on page 78 is programmed correctly into the frequency converter.

Parameter	Original value	New value	Notes
Min. frequency (Hz)			
Max. frequency (Hz)			
Acceleration time (sec.)			
Deceleration time (sec.)			

Inspected by

Print name

Signature

Date Inspection completed

6.5 Maintenance

NOTE

The maintenance interval for the mixer depends on the application - shorter or longer service interval may appear.

Handle the mixer with care and follow the recommended inspection to prevent unnecessary damage.

All wear parts or damaged parts should be replaced only with genuine Alfa Laval components.

1 Drive unit

- | | |
|---|--------------------------|
| a) Damage on cables | Checked |
| | <input type="checkbox"/> |
| b) Leakage from the gear motor | Checked |
| | <input type="checkbox"/> |
| c) Noise from the gear motor | Checked |
| | <input type="checkbox"/> |
| d) Damage on shaft and drive rotor | Checked |
| | <input type="checkbox"/> |
| e) Damage on flange and screws | Checked |
| | <input type="checkbox"/> |
| f) Check the magnetic drive rotor run-out to maximum 0.2 mm | Checked |
| | <input type="checkbox"/> |

2 Impeller including female bearing

- | | |
|---|--------------------------|
| a) Check the impeller for easy rotation, noise and damage on surfaces | Checked |
| | <input type="checkbox"/> |
| b) Check wings and bottom of the impeller | Checked |
| | <input type="checkbox"/> |
| c) Check the magnetic rotor for particles | Checked |
| | <input type="checkbox"/> |
| d) Damage on female bearing | Checked |
| | <input type="checkbox"/> |
| e) Thread deformation on impeller and female bearing | Checked |
| | <input type="checkbox"/> |

3 Male bearing

a) Check male bearing for scratches

Checked

b) Thread deformation

Checked

4 Weld Plate

a) Contact mark, scratches or damages on the weld plate surfaces

Checked

b) Thread deformation

Checked

5 Measure clearance between female and male bearing (should not exceed 0.15 mm)

Checked

Inspected by

Print name

Signature

Date Inspection completed

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7 ATEX Specific Conditions for Safe Use

7.1 Recommendation

Alfa Laval recommend while operating with ATEX to use an inert gas in the vapor space in the tank to eliminate all possible ignition hazards. The installation must be according to the requirements for safety use of an inert gas.

7.2 Requirements

If it is not possible to use an inert gas as recommended - the following requirements must be met before using the mixer in an ATEX classified zone:

- A. The impeller must always be **submerged** during operation since dry running will result in a temperature increase in the bearing surfaces and potential ignition source can become effective. With the impeller submerged, the mixer is not subjected to any gas inside the tank and is therefore outside any classification zone – even though the inside of the tank can be ATEX classified to a zone.

To prevent dry running, a level switch must be installed to shut down the mixer.

Follow [Positioning of Level Switch](#) on page 58 to install the equipment.

Ensure the liquid level during operation is always above the impeller to prevent dry running.

- B. **The properties of the fluid and the speed of the mixer** are limited to prevent the mixer from losing the magnetic coupling – if the limitations are not followed a potential ignition source can become effective.

The properties of the liquid are limited by the following:

- fluid must be Newtonian
- maximum density: 1.1 g/cm³
- maximum viscosity: 50 cP

Ensure that there is enough conductivity in the liquid to avoid the risk of electrostatic charging and an ignition hazard.

With the above fluid restrictions, the following maximum speed limits must be respected and must not be exceeded in relation to the selected impeller diameter:

Weld plate	Impeller	Maximum speed
50	100	800 RPM (80,8 Hz)
50	150	436 RPM (44,1 Hz)
81	200	446 RPM (76,9 Hz)
81	250	230 RPM (39,6 Hz)
81	300	182 RPM (31,3 Hz)

Ensure the mixer cannot generate mechanical sparks in an ATEX classified zone by hitting the tank wall or other equipment in the tank.

- C. To prevent developing a **vortex** which reaches the impeller when there is an ATEX zone above the media level, the maximum speed must be evaluated depending on the specific tank dimension.

To prevent the mixer operating with a higher speed than specified according to [Positioning of Level Switch](#) on page 58 make sure to follow [Monitoring the Frequency Converter](#) on page 57.

NOTE

If the operating limits are to be exceeded it can lead to an ignition source coming affective, **either** by the mixer loses the magnetic coupling, resulting in mechanical contact to the wall, **otherwise** through a vortex or dry-running heat can buildup in the bearing surfaces, resulting in exceeding the assigned temperature class of the product.

7.3 Equipment Protection Level and Safety Devices

The Equipment Protection Level (EPL) must be realized and integrated completely in the ignition protection system according to the directives 2014/34/EU, EN ISO 80079-36 and EN ISO 80079-37 §6.

The functions of these ignition protective systems must be checked before start-up according to the manual from the manufacturer of the system.

The EPL for the monitoring must meet the demands of EN ISO 80079-37 §6. The functions of these systems must be checked regularly by the user, according to the manual from the manufacturer of the system.

The reaction time of the ignition protection system must not exceed 0.5 seconds. The reaction time is the period between reaching the shutdown value and until the power is shutoff the machine.

Ensure all electrical installations design in any classification zone are according to EN 60079-14.

7.4 Monitoring the Frequency Converter

The motor is controlled by a frequency converter. The manual from the motor manufacturer and the information in the certificate for the motor shall be followed.

Temperature monitoring devices must meet the requirements in the directive 2014/34/EU and EN1127-1.

In addition to the speed of the mixer, **the operating limits according to below scheme must not be exceeded.**

If the operating limits are to be exceeded it can lead to an ignition source coming effective, **either** by the mixer losing the magnetic coupling, resulting in mechanical contact to the wall, **otherwise** through a vortex or dry-running heat that can buildup in the sealing surfaces, resulting in exceeding the assigned temperature class of the product.

NOTE

The mixer can only operate with a frequency converter and therefore the speed of the mixer must be monitored, see [Speed Sensor \(accessory\)](#) on page 30.

Required measures of the end user to eliminate ignition hazards



Zone 0 inside and zone 1 outside the tank

The speed of the mixer must be monitored with an EPL, corresponding to b2 or to b1 according to EN ISO 80079-37 §6.

Zone 1 inside and outside the tank

The speed of the mixer must be monitored with an EPL, corresponding to b1 according to EN ISO 80079-37 §6.

Zone 2 inside and outside the tank

No further measures need to be taken.

NOTE

Ensure the frequency converter is installed according to EN 60079-14 §11.2.

By monitoring the frequency applied to the motor, the speed of the mixer can be ensured.

7.5 Positioning of Level Switch

To prevent dry running, a level switch must be installed to shut down the mixer and depending on the ATEX zone classification inside the tank, the level switch must correspond to different safety levels inside the tank:

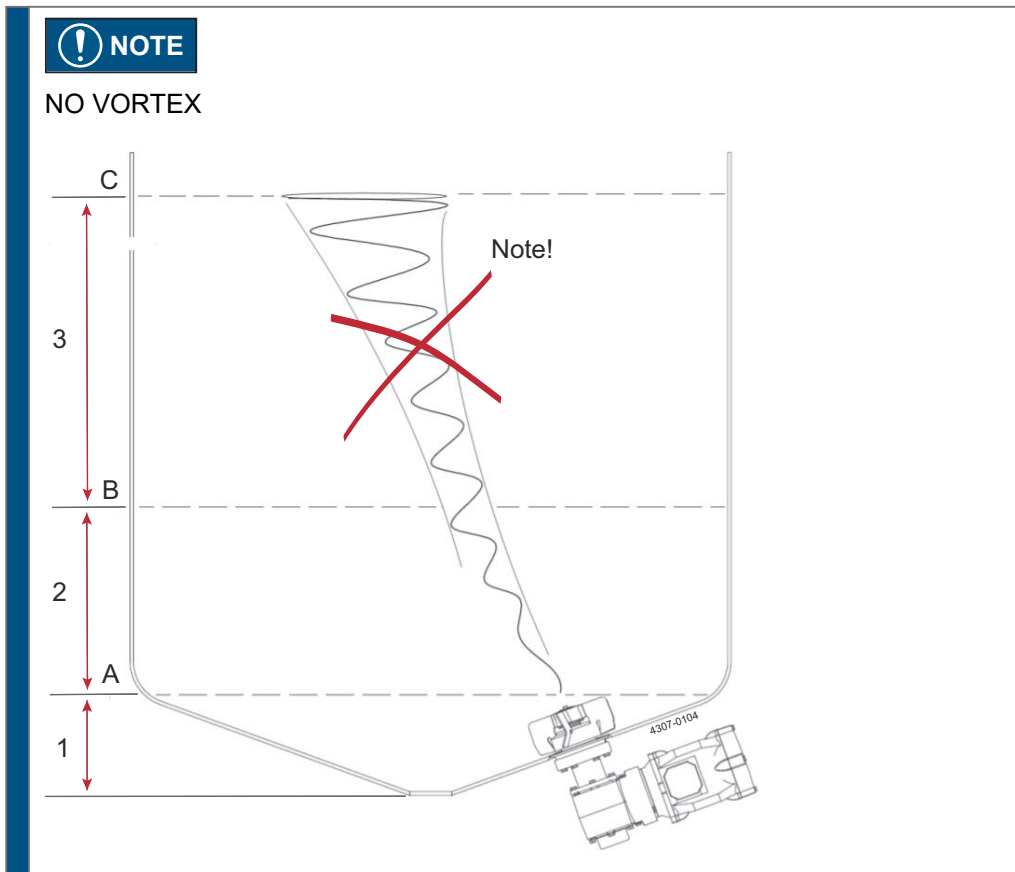
- Zone 0 - the level switch must correspond to b2 according to EN 80079-37.
- Zone 1 - the level switch must correspond to b1 according to EN 80079-37.
- Zone 2 - the level switch does not need to correspond to a specific safety integrity level.

Ensure the liquid level during operation is always above the impeller to prevent dry running.

Tank size, media properties and operating mode have an influence on the operating limits and must not be changed without a new evaluation.

Operating with variable speed please pay special attention to [Requirements](#) on page 55, [Monitoring the Frequency Converter](#) on page 57 and [Connection to Frequency Converter](#) on page 79.

Media level	A	B (Option)	C
State	Minimum media	"Midway"	Full tank
Level switch requirement	Yes	Yes	Option
Media level on illustration	1	1+2	1+2+3
Media level measured			
Speed Level	Off	Moderate	High
Maximum speed in Hz	0 Hz		



7.6 Additional Checklist for ATEX

NOTE

To ensure correct installation, before using the Alfa Laval LeviMag®, make sure to complete each step in the chapter [Checklists](#) on page 47 and below as additional for ATEX options.

7.6.1 Unpacking/Delivery

1 Check ATEX marking on below parts:

- | | |
|-----------|-------------------------------------|
| a) Motor | Checked
<input type="checkbox"/> |
| b) Gear | Checked
<input type="checkbox"/> |
| c) Flange | Checked
<input type="checkbox"/> |

7.6.2 Installation

- | | |
|--|-------------------------------------|
| 1 The oil level in the gear is adjusted to the mixers mounting angle. Ensure the mixer is mounted according to Mounting Angle on page 77. | Checked
<input type="checkbox"/> |
| 2 Ensure monitoring of the frequency converter is installed according to the specified ATEX zone. | Checked
<input type="checkbox"/> |
| 3 Ensure positioning of the level switch is installed according to Positioning of Level Switch on page 58. | Checked
<input type="checkbox"/> |
| 4 Ensure the total run-out is measured according to Measuring of Total Run-Out on page 79. | Checked
<input type="checkbox"/> |
| 5 Ensure the mixer has passed the run-in period for at least 25 hours of operation after each installation, maintenance and service see Inspection on page 38. | Checked
<input type="checkbox"/> |
| 6 Check Impeller and drive rotor for scratches. | Checked
<input type="checkbox"/> |

7.6.3 Operation

1	Fill the tank with preferred liquid media.	Checked <input type="checkbox"/>
2	Start the mixer according to your specific mixing requirements.	Checked <input type="checkbox"/>
3	Pay attention to the additional maintenance interval for ATEX option.	Checked <input type="checkbox"/>

7.7 Additional Maintenance for ATEX

NOTE

It is important that the drive unit is dismantled before removing the impeller.

The maintenance interval for the mixer depends on the application - shorter or longer service interval may appear.

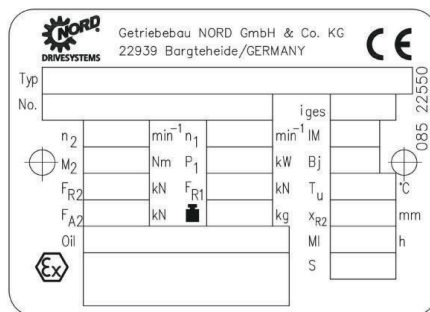
Handle the mixer with care and follow the recommended inspection to prevent unnecessary damage.

Make sure to follow *Inspection* on page 38 and below as additional maintenance for ATEX options.

	Inspect/clean/lubricate	
	Supplier instruction	Weekly/ after each 100 hours of operating
Drive rotor		
Before each mounting of drive unit: Check total run-out before every mounting		
Gear	X	
Clean vent screw		X
Check for oil leakage		X
Check temperature sticker		X
Motor	X	
Clean surface to avoid overheating		X

NOTE

Please pay special attention to the stated maintenance interval (MI) of the gearbox. The gear can have a shorter lifetime than the mixer.



NOTE

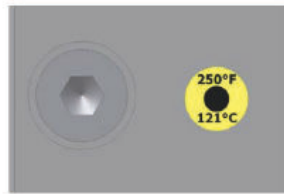
Beware of the color change in the temperature sticker on the gear box.

If the surface temperature gets too high, the sticker will change color to black in the middle.

Stop the gear immediately if the sticker is black in the middle.

 **CAUTION**

The mixer must **NOT** resume operation before cause of overheating has been investigated and found.



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8 Technical data

8.1 Technical Data, LeviMag® UltraPure

Internals	
Product wetted parts, surface finish	Ra < 0.38 µm, mechanical & electropolished
Working pressure	-1 to 7 bar(g)
Impeller diameters	100, 150, 200, 250 & 300 mm

Weld plate	
For impeller size 100 & 150 mm	WP50 (clamp connection)
For impeller size 200, 250 & 300 mm	WP81 (flange-screw connection)

Materials	
Impeller & weld plate	AISI316L (UNS S31603)
Drive rotor, shaft & console	AISI304 (UNS S30400)
Bearing, male	Zirconia YTZP
Bearing, female	Silicium carbide (EN 12756)
Seals	EPDM/FPM/FFKM

Temperatures	
During product mixing, media	max. 90 °C and ensure that the media is not boiling
During product mixing, WFI	max. 90 °C and ensure that the media is not boiling
During CIP (max. 50 RPM)	max. 95 °C
During SIP (0 RPM)	max. 150 °C

Maximum speed, IE2/IE3/Premium	
Impeller size 100	800 RPM (80.8 Hz)
Impeller size 150	480 RPM (48.5 Hz)
Impeller size 200	480 RPM (82.7 Hz)
Impeller size 250	230 RPM (39.6 Hz)
Impeller size 300	200 RPM (34.5 Hz)

Maximum speed, IE5	
Impeller size 100	800 RPM (161.6 Hz)
Impeller size 150	480 RPM (97 Hz)
Impeller size 200	480 RPM (148.8 Hz)
Impeller size 250	230 RPM (71.3 Hz)
Impeller size 300	200 RPM (62 Hz)

8.2 Technical Data, LeviMag®

Internals	
Product wetted parts, surface finish	Ra < 0.8 µm, mechanical polished
Working pressure	-1 to 7 bar(g)
Impeller diameters	100, 150, 200, 250 & 300 mm

Weld plate	
For impeller size 100 & 150 mm	WP50 (clamp connection)
For impeller size 200, 250 & 300 mm	WP81 (flange-screw connection)

Materials	
Impeller & weld plate	AISI316L (UNS S31603)
Drive rotor, shaft & console	AISI304 (UNS S30400)
Bearing, male	Zirconia YTZP
Bearing, female	Silicium carbide (EN 12756)
Seals	EPDM/FPM/FFKM


Temperatures	
During product mixing, media	max. 90 °C and ensure that the media is not boiling
During product mixing, WFI	max. 90 °C and ensure that the media is not boiling
During CIP (max. 50 RPM)	max. 95 °C
During SIP (0 RPM)	max. 150 °C

Maximum speed, IE2/IE3/Premium	
Impeller size 100	800 RPM (80.8 Hz)
Impeller size 150	480 RPM (48.5 Hz)
Impeller size 200	480 RPM (82.7 Hz)
Impeller size 250	230 RPM (39.6 Hz)
Impeller size 300	200 RPM (34.5 Hz)

Maximum speed, IE5	
Impeller size 100	800 RPM (161.6 Hz)
Impeller size 150	480 RPM (97 Hz)
Impeller size 200	480 RPM (148.8 Hz)
Impeller size 250	230 RPM (71.3 Hz)
Impeller size 300	200 RPM (62 Hz)

8.3 Drive Unit Data


8.3.1 Drive Unit Data – IE5 Standard Blue (Synchronous Motor)

Gear motor	
Gear	High efficiency helical bevel right angle gear motor
Surface finish	Paint coat 3.0 standard RAL 5010 Gentian blue
Maximum mounting angle	$\alpha = 0^\circ\text{-}22^\circ$ or $\alpha = 23^\circ\text{-}45^\circ$ Angle intervals based on configuration See Mounting Angle on page 77  NOTE Motor may not point downwards
Lubricant	Food compatible oil
Gear motor oil	USDA H1

Motor	
Efficiency class	IE5
Enclosure/motor protection	IP66
Country code	All (one type covers all)
Motor type	Integrated Permanent Magnet Synchron Motor
Motor data	See table 1. Motor data in Connection of Motor on page 78

Frequency converter:	
Integrated Permanent Magnet Synchron Motor (IPMSM) which must be operated with a frequency converter for IE5 motors.	
The frequency converter (not Alfa Laval supply) must be ordered for the voltage available at the location of operation.	
Supply from frequency converter to motor, WP50:	
220V	203 VAC, 3.75 A
400V	343 VAC, 2.24 A
Supply from frequency converter to motor, WP81:	
220V	205 VAC, 9.7 A
400V	338 VAC, 5.9 A


8.3.2 Drive Unit Data – IE5 Clean Room (Synchronous Motor)

Gear motor	
Gear	High efficiency helical bevel right angle gear motor
Surface finish	NSD TupH Advanced
Maximum mounting angle	$\alpha = 0^{\circ}$ - 22° or $\alpha = 23^{\circ}$ - 45° Angle intervals based on configuration See Mounting Angle on page 77  NOTE Motor may not point downwards
Lubricant	Food compatible oil
Gear motor oil	USDA H1

Motor	
Efficiency class	IE5
Enclosure/motor protection	IP66
Country code	All (one type covers all)
Motor type	Integrated Permanent Magnet Synchron Motor
Motor data	See table 1. Motor data in Connection of Motor on page 78

Frequency converter:	
Integrated Permanent Magnet Synchron Motor (IPMSM) which must be operated with a frequency converter for IE5 motors.	
The frequency converter (not Alfa Laval supply) must be ordered for the voltage available at the location of operation.	
Supply from frequency converter to motor, WP50:	
220V	N/A
400V	N/A
Supply from frequency converter to motor, WP81:	
220V	N/A
400V	N/A


8.3.3 Drive Unit Data – CUS Premium Standard Blue (Synchronous Motor)

Gear motor	
Gear	High efficiency helical bevel right angle gear motor
Surface finish	Paint coat 3.0 standard RAL 5010 Gentian blue
Maximum mounting angle	$\alpha = 0^\circ\text{-}22^\circ$ or $\alpha = 23^\circ\text{-}45^\circ$ Angle intervals based on configuration See Mounting Angle on page 77  NOTE Motor may not point downwards
Lubricant	Food compatible oil
Gear motor oil	USDA H1

Motor, WP50	
Frequency, nominal	60 Hz
Power, nominal	0.37 kW
Voltage, nominal	265 V
Current, nominal	1.40 A
Efficiency class	Premium
Enclosure/motor protection	IP66

Motor, WP81	
Frequency, nominal	60 Hz
Power, nominal	0.75 kW
Voltage, nominal	265 V
Current, nominal	2.72 A
Efficiency class	Premium
Enclosure/motor protection	IP66

8.3.4 Drive Unit Data – ATEX Conform 2G (Asynchronous Motor)

Gear WP50 & WP81	
Gear	High efficiency helical bevel right angle gear motor
Surface finish	Paint coat 3.0 standard RAL 5010 Gentian blue
Maximum mounting angle	$\alpha = 0^\circ - 22^\circ$ or $\alpha = 23^\circ - 45^\circ$ Angle intervals based on configuration See Mounting Angle on page 77  NOTE Motor may not point downwards
Lubricant	Food compatible oil
Gear motor oil	USDA H1
ATEX	II 2G Ex h IIC T4 Gb X

Motor, WP50	
Frequency, nominal	50 Hz
Power, nominal	0.25 kW
Voltage, nominal	230 V
Current, nominal	1.30 A
Efficiency class	IE2 (IE3 for China)
Enclosure/motor protection	IP66
ATEX	Ex db eb IIC T4 Gb

Motor, WP81	
Frequency, nominal	50 Hz
Power, nominal	0.75 kW
Voltage, nominal	230 V
Current, nominal	2.94 A
Efficiency class	IE3
Enclosure/motor protection	IP66
ATEX	Ex db eb IIC T4 Gb

Frequency converter
The frequency converter must be set up to nominal data specified above. The frequency converter must also be able to deliver enough power at increased required frequency found in Speed on page 34 or Requirements on page 55 (ATEX).

8.3.5 Drive Unit Data – Class1 Div1 Group D (Asynchronous Motor)

Gear WP50 & WP81	
Gear	High efficiency helical bevel right angle gear motor
Surface finish	Paint coat 3.0 standard RAL 5010 Gentian blue
Maximum mounting angle	$\alpha = 0^\circ\text{-}22^\circ$ or $\alpha = 23^\circ\text{-}45^\circ$ Angle intervals based on configuration See Mounting Angle on page 77 NOTE Motor may not point downwards
Lubricant	Food compatible oil
Gear motor oil	USDA H1
Safety class	Class1 Div1 Group D

Motor, WP50	
Frequency, nominal	60 Hz
Power, nominal	0.36 kW
Voltage, nominal	208-230 V/460 V
Current, nominal	2.1-2.0 A/1.0 A
Enclosure/motor protection	IP66
Safety class	LV Explosion Proof Motor

Motor, WP81	
Frequency, nominal	60 Hz
Power, nominal	1.1 kW
Voltage, nominal	230 V/460 V
Current, nominal	4.4 A/2.2 A
Enclosure/motor protection	IP66
Safety class	LV Explosion Proof Motor

Frequency converter	
The frequency converter must be set up to nominal data specified above.	
The frequency converter must also be able to deliver enough power at increased required frequency found in Speed on page 34 or Requirements on page 55 (ATEX).	

8.4 Motor Parameters

NOTE

These motor parameters are specifically for a IE5 NORD gearmotor and NORD frequency converter combo.

However this can provide a basis for using other brands of frequency converters. See [Connection of Motor](#) on page 78.

8.4.1 Motor data, IE5 – WP50, 230V

Size	WP50	
	Blue RAL 5010	Clean Room
Motor surface		
Motor type	71 F1/8	71 N2/8
Parameter PXXX (Nord parameter number)		
P201 Nominal frequency	160 Hz	
P202 Nominal speed	2400 RPM	
P203 Nominal current	1.88 A	
P204 Nominal voltage	203 V	
P205 Nominal power	0.50 kW	
P206 Cos phi	0.83	
P207 Connection	STAR	
P208 Stator resistance	4.35 Ω	
P209 No load current	0.06 A	
P240 EMF voltage PMSM	182 V	
P241[1] Inductivity Ld PMSM	21.6 mH	
P241[2] Inductivity Lq PMSM	30.1 mH	
P243 Reluctance angle, IPMSM	24°	
P244 Peak current	3.75 A	

8.4.2 Motor data, IE5 – WP50, 400V

Size	WP50	
Motor surface	Blue RAL 5010	Clean Room
Motor type	71 F1/8	71 N2/8
Parameter PXXX (Nord parameter number)		
P201 Nominal frequency	160 Hz	
P202 Nominal speed	2400 RPM	
P203 Nominal current	1.12 A	
P204 Nominal voltage	343 V	
P205 Nominal power	0.5 kW	
P206 Cos phi	0.89	
P207 Connection	STAR	
P208 Stator resistance	10.3 Ω	
P209 No load current	0.13 A	
P240 EMF voltage PMSM	300 V	
P241[1] Inductivity Ld PMSM	58.9 mH	
P241[2] Inductivity Lq PMSM	82.0 mH	
P243 Reluctance angle, IPMSM	24°	
P244 Peak current	2.24 A	

8.4.3 Motor data, IE5 – WP81, 230V

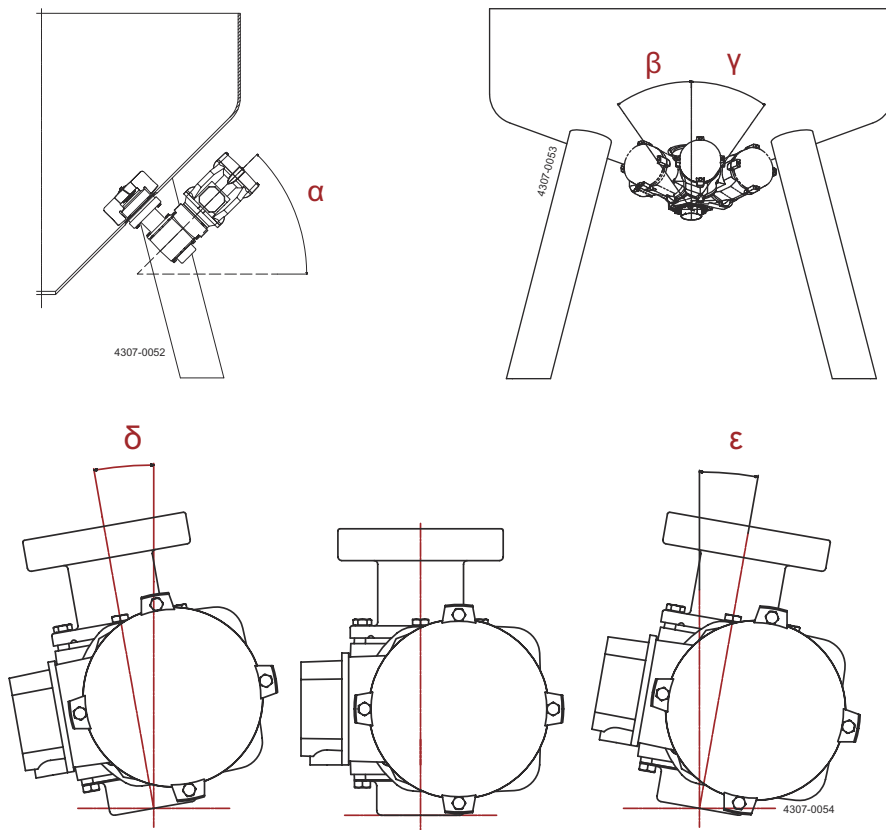
Size	WP81	
	Blue RAL 5010	Clean Room
Motor surface		
Motor type	90 F1/8	90 N2/8
Parameter PXXX (Nord parameter number)		
P201 Nominal frequency	160 Hz	
P202 Nominal speed	2400 RPM	
P203 Nominal current	4.87 A	
P204 Nominal voltage	205V	
P205 Nominal power	1.50 kW	
P206 Cos phi	0.89	
P207 Connection	STAR	
P208 Stator resistance	0.54 Ω	
P209 No load current	0.09 A	
P240 EMF voltage PMSM	182 V	
P241[1] Inductivity Ld PMSM	7.9 mH	
P241[2] Inductivity Lq PMSM	11.3 mH	
P243 Reluctance angle, IPMSM	24°	
P244 Peak current	9.74 A	

8.4.4 Motor data, IE5 – WP81, 400V

Size	WP81	
Motor surface	Blue RAL 5010	Clean Room
Motor type	90 F1/8	90 N2/8
Parameter PXXX (Nord parameter number)		
P201 Nominal frequency	160 Hz	
P202 Nominal speed	2400 RPM	
P203 Nominal current	2.95 A	
P204 Nominal voltage	338 V	
P205 Nominal power	1.5 kW	
P206 Cos phi	0.92	
P207 Connection	STAR	
P208 Stator resistance	1.38 Ω	
P209 No load current	0.09 A	
P240 EMF voltage PMSM	312 V	
P241[1] Inductivity Ld PMSM	22.1 mH	
P241[2] Inductivity Lq PMSM	31.6 mH	
P243 Reluctance angle, IPMSM	24°	
P244 Peak current	5.90 A	

8.5 Mounting Angle

The gear motor is filled with oil that enables it to be mounted as described below – please ensure that the position of the weld plate lives up to the requirements below.



The gear motor (position 8 in [Drive Unit - WP50](#) on page 85 and [Drive Unit - WP81](#) on page 87) can be selected in different configurations - and regarding mounting angles in two different configurations for α .

The gear motor should be mounted with the motor pointing upwards ($\beta = 0$ and $\gamma = 0$).

If the gear motor has to be positioned slightly to the right or left ($\beta \neq 0$ or $\gamma \neq 0$) to avoid interference with tank legs or other obstructions, angle α together with β or γ will result in that the gear motor is rotated slightly to the right (ϵ) or to the left (δ).

The allowable angles for ϵ and δ are:

Designation	Angle	
α	0°-22°	23°-45°
δ	max. 5°	max. 5°
ϵ	max. 5°	max. 5°

8.6 Tightening Torque for Screwed Connections

**CAUTION**

Do **NOT** use air powered tools.

M4	M8	M10	Clamp
A2/A4-70	A2/A4-70	A2/A4-70	WP50
3Nm	26Nm	51Nm	20Nm

Female Bearing		Male Bearing	
WP50	WP81	WP50	WP81
10Nm	30Nm	5Nm	10Nm

8.7 Connection of Motor

**CAUTION**

The motor is for converter duty only.

The motor must be connected in STAR to the converter.

The motor may not be started or operated with the mains supply, but may only be operated with a frequency converter.

All NORD frequency converters can operate the motors.

The motors can be operated with converter from other manufacturers. Several devices from other suppliers have been successfully tested with the motors. The user is responsible for the success of commissioning. Also, the performance of the motor, or the achievement of efficiencies which correspond to the classification depends on the converter and its function and settings.

All motor data for IE5 motors is to be found in the tables in the sections [Motor data, IE5 – WP50, 230V](#) on page 73 and [Motor data, IE5 – WP81, 230V](#) on page 75.

**CAUTION**

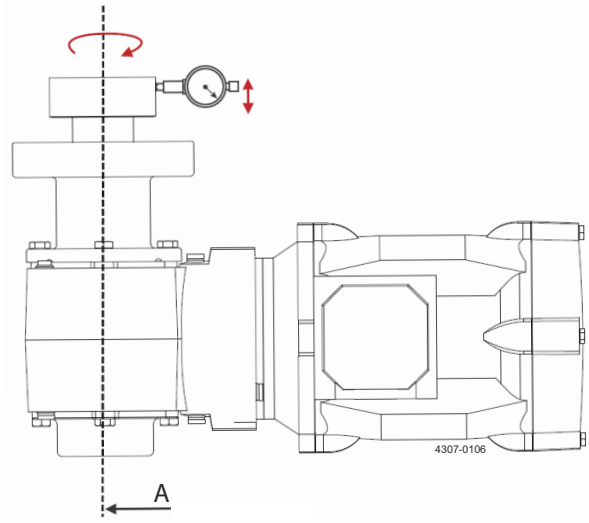
The synchronous motor is for converter duty only as they are designed with permanent magnets in the rotor package.

The motor can only be operated by converters made for operating a IE5 motor.

8.8 Measuring of Total Run-Out

Before every mounting of the drive unit, installation and maintenance, the total run-out on the drive rotor (position 1 on the drive unit) has to be measured.

Make sure the total run-out of the drive rotor surface in the radial direction is less than 0.2 mm at any point on the surface. The indicator must be moved parallel to the datum axis A as the drive rotor is rotated.



A: Datum axis A

8.9 Connection to Frequency Converter

For programming of frequency converter please follow the converter's manual.

All required data for programming the converter can be found on the name plate of the motor or in [Drive Unit Data – IE5 Standard Blue \(Synchronous Motor\)](#) on page 67.- [Drive Unit Data – Class1 Div1 Group D \(Asynchronous Motor\)](#) on page 71 and in Table 1 (in [Connection of Motor](#) on page 78).

NOTE

For ATEX option ensure the frequency converter is installed ATEX approved according to EN 60079-14 §11.2.

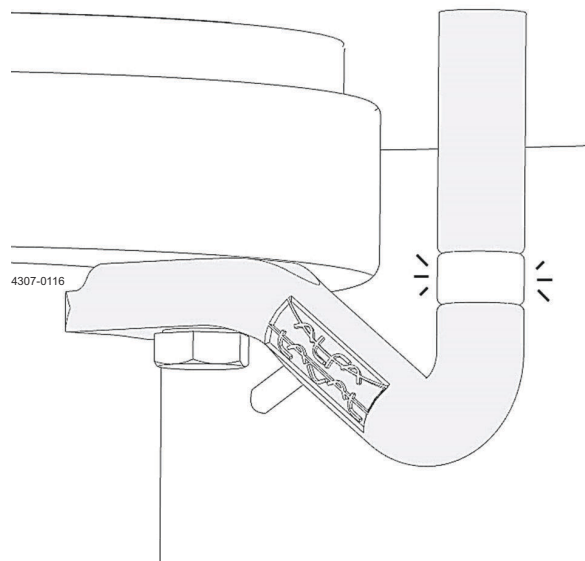
8.10 Connection of Speed Sensor

The Speed Sensor is a magnetic inductive proximity sensor which is actuated by magnetic fields and can detect the permanent magnet in the impeller through non-magnetic tank material.

The impeller "prepared for sensor" has an extra permanent sensor magnet built into it.

NOTE

The Speed Sensor must be connected to an isolating switching amplifier of a type e.g. like the one shown in the datasheet in [Speed Sensor Instructions](#) on page 95. When connected, the Speed Sensor's transparent part (white area) will flash shortly for every full rotation done by the impeller.



- 1 Mount the Speed Sensor as described in [Speed Sensor \(accessory\)](#) on page 30.

If required, the cabling must be extended, enabling the Speed Sensor to be connected to the isolating switching amplifier.
- 2 Connect the Speed Sensor to the isolating switching amplifier according to the instruction by the supplier.
- 3 A counter device must be connected to the isolating switching amplifier to measure the precise speed of the impeller.

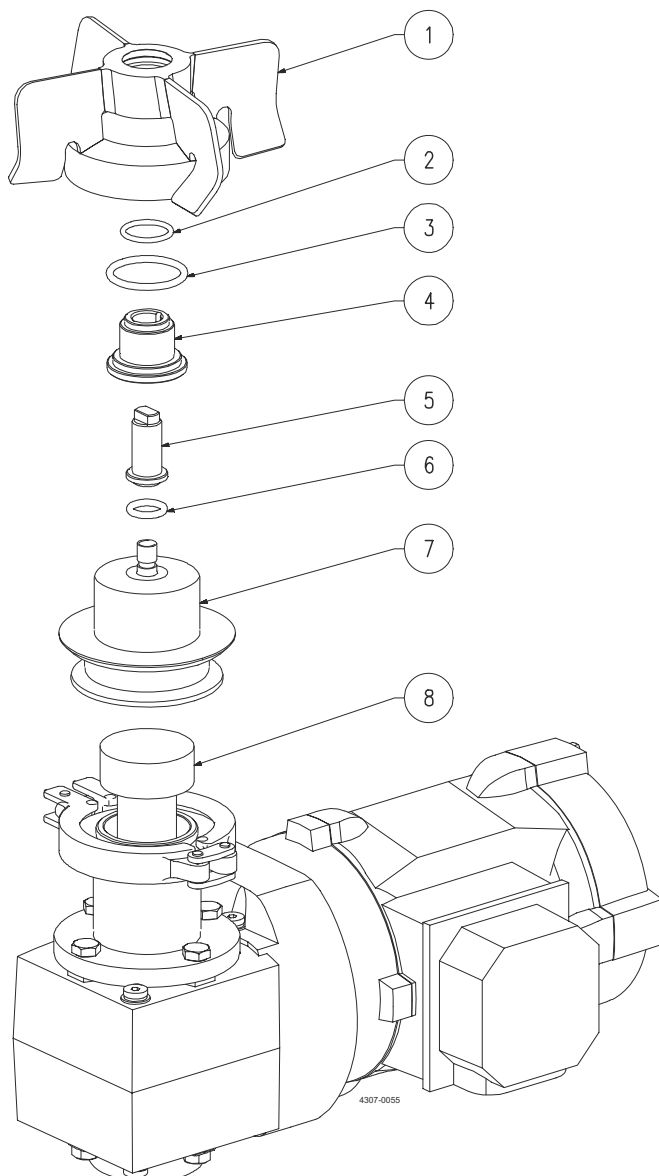
9 Troubleshooting

No	Fault	Possible Causes	Action
1	The mixer does not start	Fault in power supply	Check power supply
2	The impeller does not rotate	Male bearing or magnetic drive not mounted	Dismount the drive unit, detach the impeller and mount the male bearing, impeller, magnetic drive and drive unit
3	Poor motor effect	Motor incorrectly connected Incorrect power is connected	Check the motor connections and that the correct power is being used Incorrect connections and power can cause damage the motor
4	Poor mixing	Impeller rotating in wrong direction	Check the installation Check that the impeller rotates clockwise when seen from above.
5	Noise from mixer	Incorrect installation of mixer Worn bearings or bearings not tightened correctly to full stop	<ol style="list-style-type: none"> 1. Check that the impeller is levitated. 2. Check that the male bearing is seated correctly 3. Check that the motor flange is seated completely and flush to the bottom of the weld plate 4. Check that the impeller is rotating clockwise
6	Noise from mixer	Squeaking noise from bearing	<ol style="list-style-type: none"> 1. Lower the speed 2. Lower the temperature 3. Check bearings for wear
7	Noise from drive unit	Humming sounds and a high pitch sound from the motor is normal	If there are any clinking, ticking or rattling sounds, change gear motor
8	Magnetic coupling disconnected	<ol style="list-style-type: none"> 1. Mixer accelerating too quickly 2. Speed too high for the current application 	<ol style="list-style-type: none"> 1. Check start up (Start-up on page 32) 2. Reduce maximum speed (see Speed on page 34)
9	Particles seated on the impeller	Magnetic particles from associated media	Check and take action with regard to the presence of particles or contents of associated media and raw materials. Magnetic particles are not removed during normal cleaning. The impeller must be removed and cleaned manually and separately.
10	Insufficient cleaning of the impeller	<ol style="list-style-type: none"> 1. Due to low fluid level 2. Due to low speed 3. Too high speed 	<ol style="list-style-type: none"> 1. Increase the fluid level 2. Increase RPM 3. Reduce RPM to prevent vortex

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10 Parts Lists and Exploded Views

10.1 Product Overview – WP50

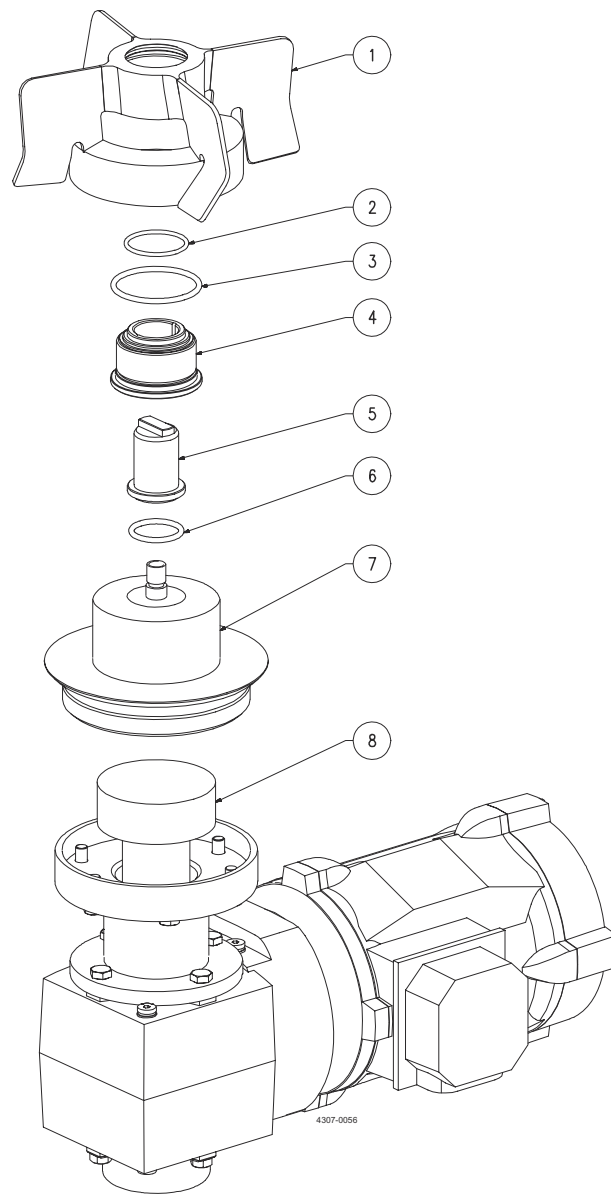


Pos.	Qty.	Denomination
1	1	Impeller
2	1	O-ring
3	1	O-ring
4	1	Female Bearing

Pos.	Qty.	Denomination
5	1	Male Bearing
6	1	O-ring
7	1	Weld Plate
8	1	Drive Unit

NOTE For information on item numbers, please refer to the Spare part manual, available from the online Alfa Laval product catalogue Anytime or the Close at hand spare part catalogue.

10.2 Product Overview – WP81

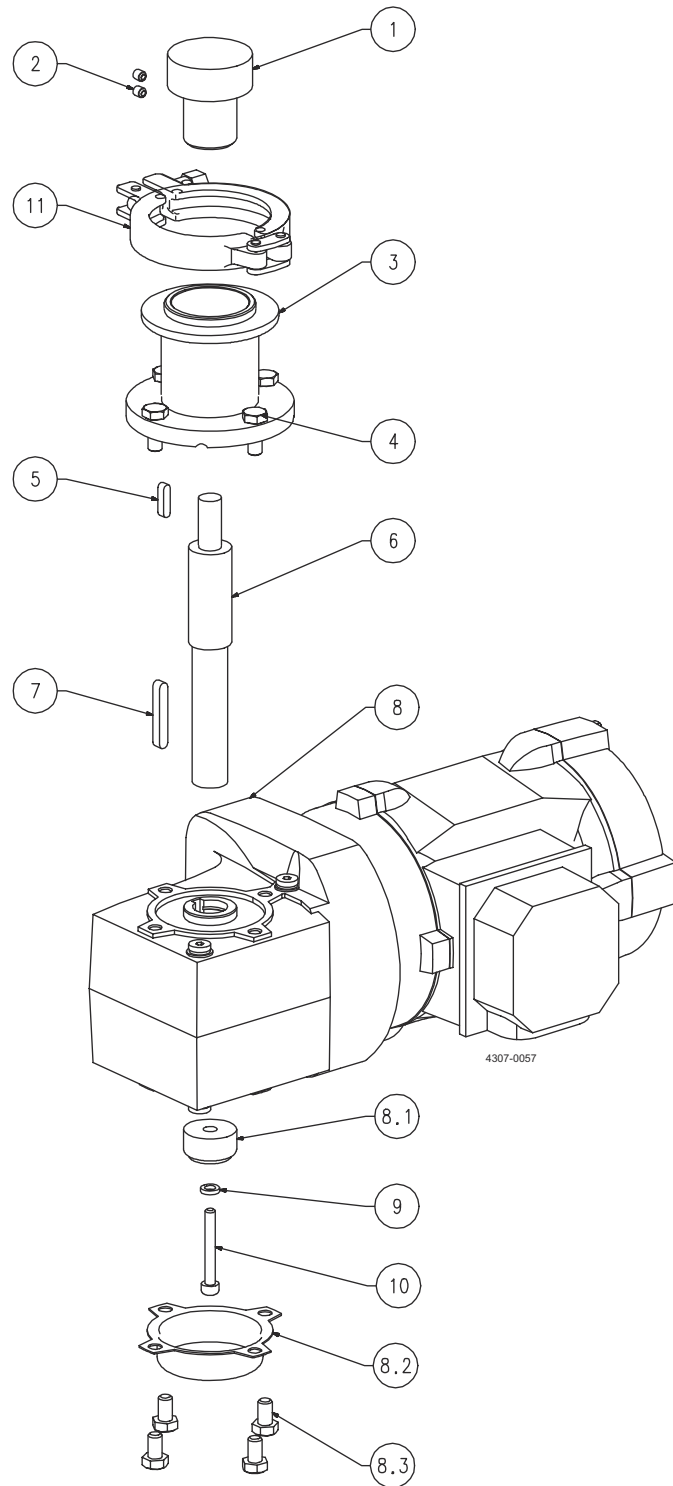


Pos.	Qty.	Denomination
1	1	Impeller
2	1	O-ring
3	1	O-ring
4	1	Female Bearing

Pos.	Qty.	Denomination
5	1	Male Bearing
6	1	O-ring
7	1	Weld Plate
8	1	Drive Unit

NOTE For information on item numbers, please refer to the Spare part manual, available from the online Alfa Laval product catalogue Anytime or the Close at hand spare part catalogue.

10.3 Drive Unit - WP50



Pos.	Qty.	Denomination
1	1	Drive Rotor
2	2	Screw
3	1	Flange
4	4	Screw
5	1	Parallel Key
6	1	Shaft
7	1	Parallel Key

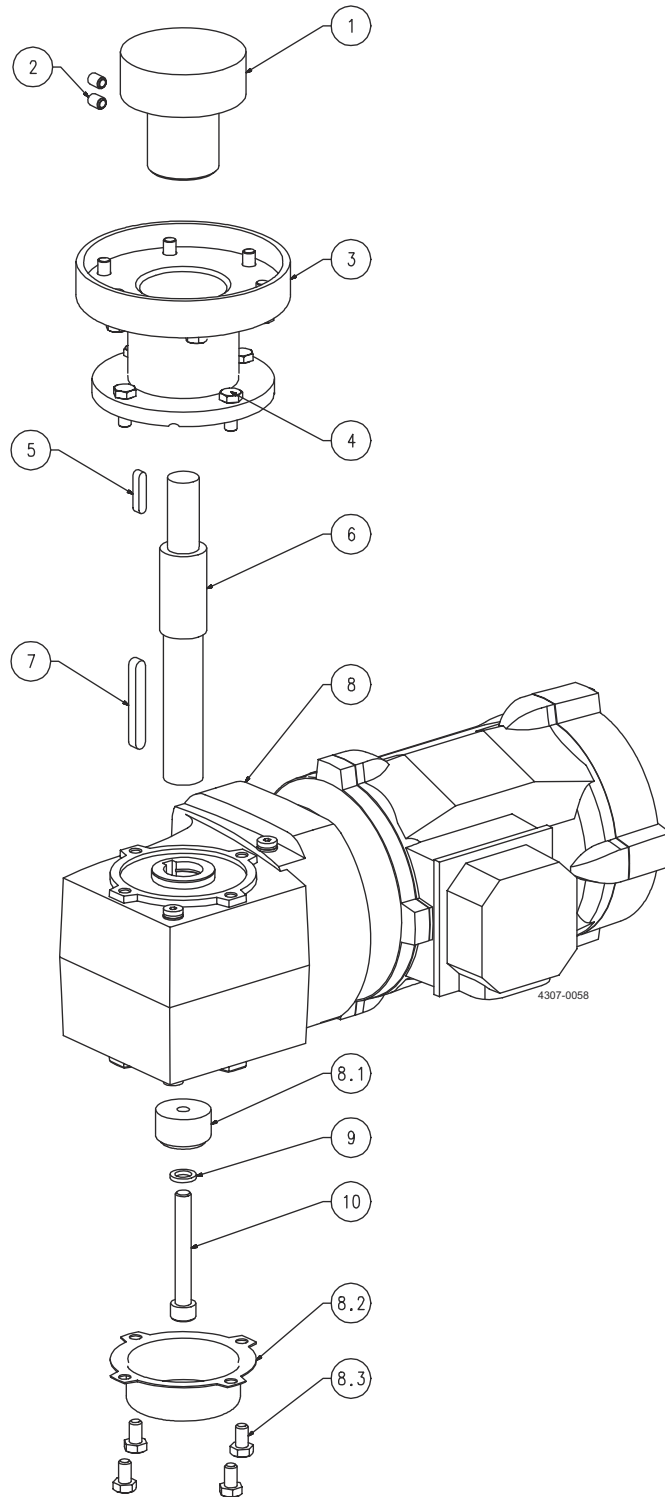
Pos.	Qty.	Denomination
8	1	Gear Motor ¹
8.1	1	Fastening Element ²
8.2	1	Cover ²
8.3	4	Screw ²
9	1	Washer
10	1	Screw
11	1	Clamp

¹ See [Mounting Angle](#) on page 77

² Parts are included in the Gear Motor

NOTE For information on item numbers, please refer to the Spare part manual, available from the online Alfa Laval product catalogue Anytime or the Close at hand spare part catalogue.

10.4 Drive Unit - WP81



Pos.	Qty.	Denomination
1	1	Drive Rotor
2	2	Screw
3	1	Flange
4	10	Screw
5	1	Parallel Key
6	1	Shaft
7	1	Parallel Key

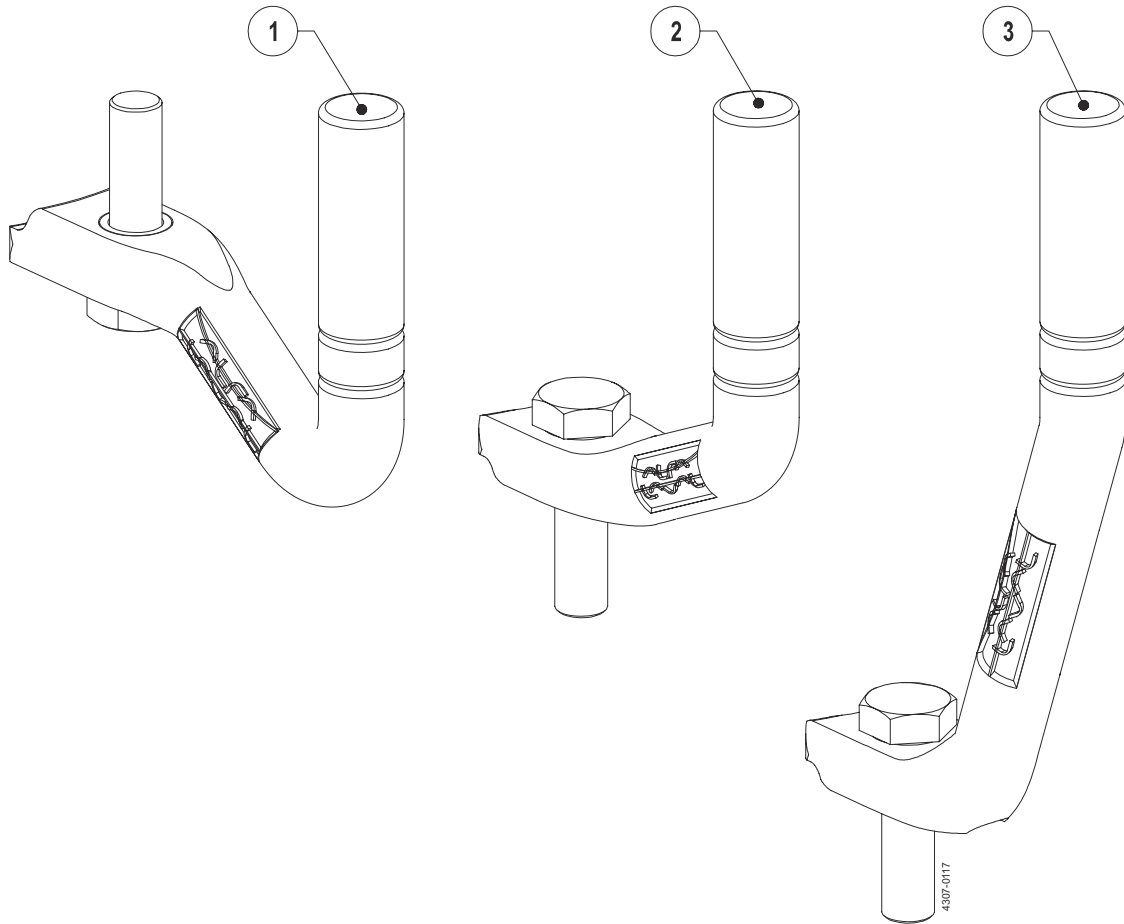
Pos.	Qty.	Denomination
8	1	Gear Motor ¹
8.1	1	Fastening Element ²
8.2	1	Cover ²
8.3	4	Screw ²
9	1	Washer
10	1	Screw

¹ See [Mounting Angle](#) on page 77

² Parts are included in the Gear Motor

NOTE For information on item numbers, please refer to the Spare part manual, available from the online Alfa Laval product catalogue Anytime or the Close at hand spare part catalogue.

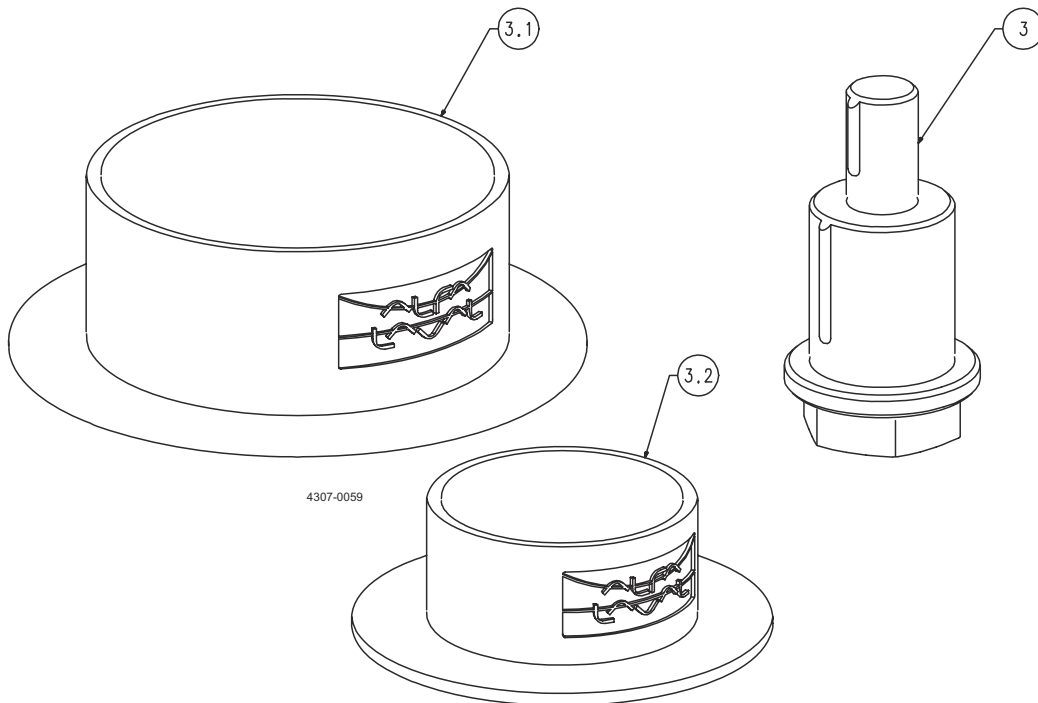
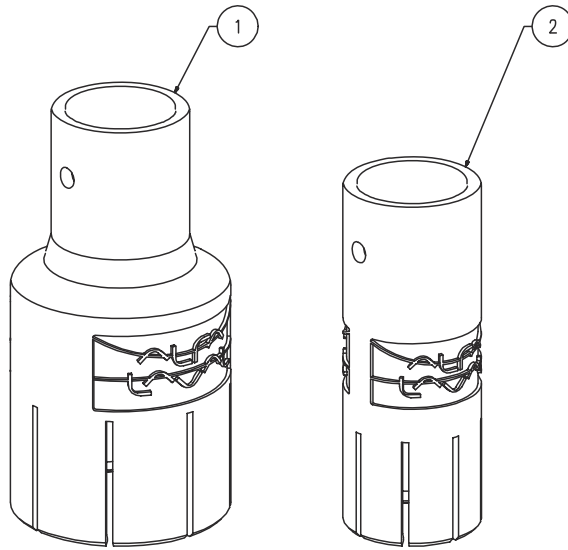
10.5 Speed Sensor Variants



Pos.	Qty.	Denomination
1	1	Speed Sensor WP81
2	1	Speed Sensor WP50, Standard Console height

Pos.	Qty.	Denomination
3	1	Speed Sensor WP50, Extended Console height

10.6 Tools

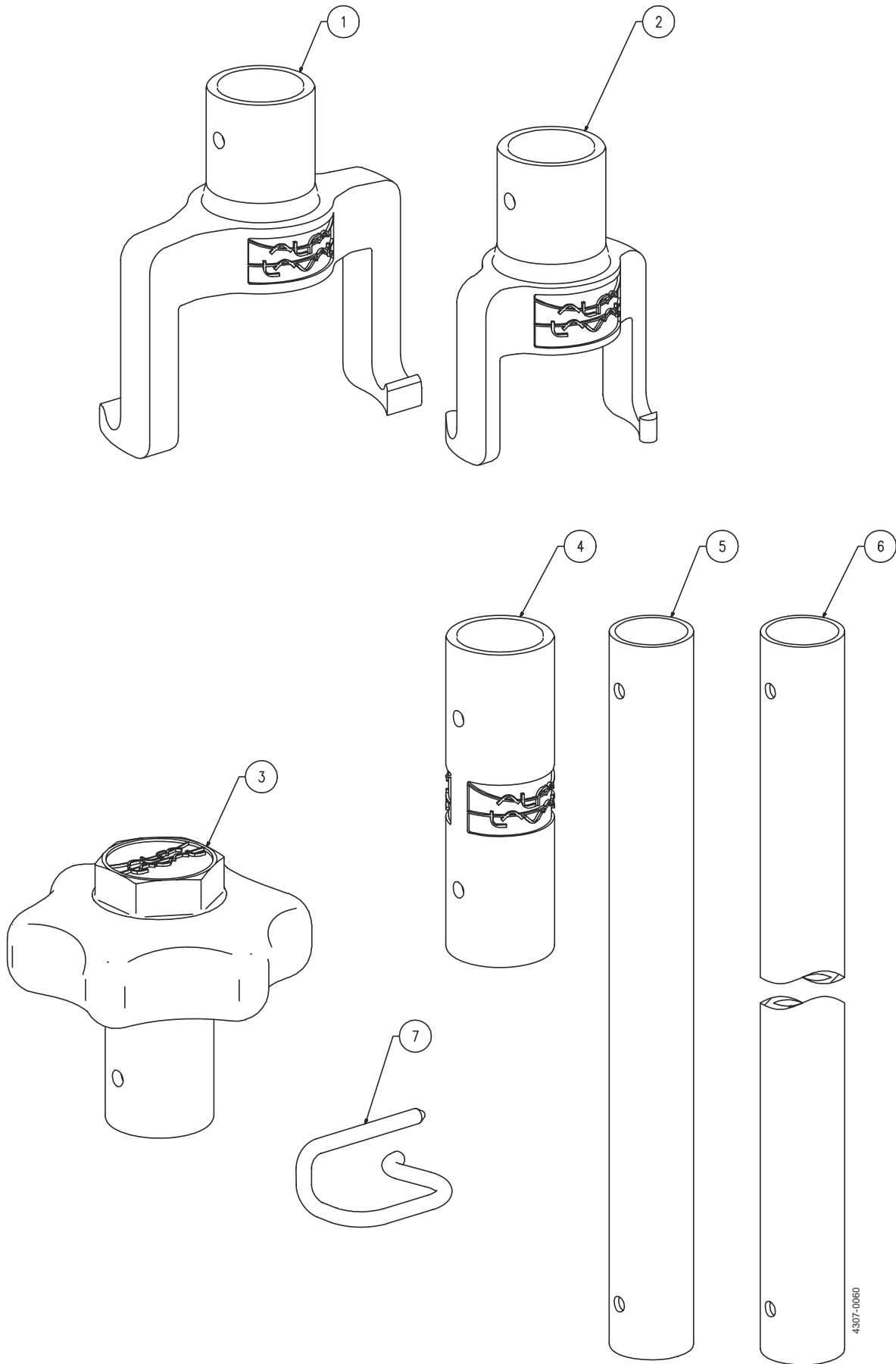


Pos.	Qty.	Denomination
1	1	Male Bearing Tool — WP81 ¹
2	1	Male Bearing Tool — WP50 ¹

Pos.	Qty.	Denomination
		Female Bearing Tool kit — WP81 ¹ consisting of:
3	1	Female Bearing tool
3.1	1	Protection Shield Female Bearing – WP81

Pos.	Qty.	Denomination
		Female Bearing Tool kit — WP50 ¹ consisting of:
3	1	Female Bearing Tool ¹
3.2	1	Protection Shield Female Bearing – WP50

¹ Tools are included when ordering Bearing Service Kits



4307-0060

Pos.	Qty.	Denomination
1	1	Impeller Lifting Device WP81
2	1	Impeller Lifting Device WP50

Pos.	Qty.	Denomination
		Lifting Rod Handle kit consisting of:
3	1	Lifting Rod Handle
5	1	Lifting Rod 200 mm
7	2	Clip

Pos.	Qty.	Denomination
		Lifting Rod Kit, 700 mm, consisting of:
4	1	Lifting Rod Connection Piece
6	1	Lifting Rod 700 mm
7	2	Clip

Pos.	Qty.	Denomination
		Lifting Rod Kit, 200 mm, consisting of:
4	1	Lifting Rod Connection Piece
5	1	Lifting Rod 200 mm
7	2	Clip

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11 Appendix

11.1 Drive Unit Instructions

The drive unit is supplied by sub supplier and all-important installation requirement is transferred to this manual.

For further information regarding maintenance and storage of the drive unit please find the drive unit instruction manual by below link:

https://www.nord.com/cms/en/documentation/manuals/details_1139/detail_42075.jsp

11.2 Speed Sensor Instructions

Inside the Speed Sensor is a magnetic inductive proximity sensor supplied by sub supplier - information in data sheets, ATEX Certificates, SIL declarations and Safety instructions for the magnetic inductive proximity sensor can be found in below link:

<https://www.turck.de/en/product/0000000000001b590003003a>