Instruction Manual

Alfa Laval IsoMix External Drive (IMXD)

100000727-EN4 2022-11

Original manual

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The information herein is correct at the time of issue but may be subject to change without prior notice

1 Declarations of Conformity

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

Rotary Jet Mixer
Designation

IsoMix External Drive
Type

Serial number from 2018-0001 to 2030-99999

is in conformity with the following directives with amendments:
- Machinery Directive 2006/42/EC
- RoHS Directive 2011/65/EU and amendments

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

Global Product Quality Manager		Lars Kruse Andersen
Title		Name
Kolding, Denmark	2022–11–07	
Place	Date (YYYY-MM-DD)	Signature

This Declaration of Conformity replaces Declaration of Conformity dated 2018-09-01

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

Rotary Jet Mixer
Designation

IsoMix External Drive
Type

Serial number from 2018-0001 to 2030-99999

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

Signed on behalf of: Alfa Laval Kolding A/S

Global Product Quality Manager		Lars Kruse Andersen
Title		Name
Kolding, Denmark	2022–11–07	
Place	Date (YYYY-MM-DD)	Signature

DoC Revison_01_112022

2 Safety

Unsafe practices and other important information are emphasised in this manual.
Warnings are emphasised by means of special signs.
Always read the manual before using the machine!

2.1 Important information

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

CAUTION
Indicates that special procedures must be followed to avoid damage to the machine!

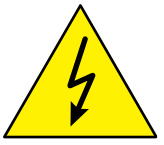
NOTE
Indicates important information to simplify or clarify procedures.

2.2 Warning signs

General warning:

Caustic agents:

Dangerous electrical voltage:



2.3 Intended use

The Alfa Laval IsoMix External Drive (IMXD) is only for mixing of products in a tank.

The tank cleaning machine is intended for use in closed tank, vessel or container.

Unsafe practices and other important information are emphasised in this manual.
Warnings are emphasised by means of special signs.
Always read the manual before using the machine!

2.4 Safety precautions

INSTALLATION:

Always read the technical data thoroughly (see chapter 7 Technical data).
Always follow installation instructions thoroughly (see chapter 4 Installation).
Never expose the machine to undue vibrations or shocks.
Never start the machine in the wrong rotation direction.
Ensure that the tank media is not corrosive to the machine.
Only install the machine in environments within temperature limit: -5°C and +40°C.
Only install the machine in altitudes lower than 1000 m above sea level. For installation in altitudes higher than 1000 m above sea level, please contact Alfa Laval.

Only use authorized personnel when electrical equipment is connected.

OPERATION:

Always read the technical data thoroughly (see chapter 7 Technical data).
Always read gear motor supplier instructions thoroughly (see chapter 9.3 Drive unit instructions).
Never start the machine in the wrong rotation direction.
Beware of machine in operation can produce sound levels in excess of 85dB(A).
Always rinse well with clean water after cleaning.
Never run the machine motor without liquid recirculation through the machine with a differential pressure of at least 1 bar

Always handle lye and acid with great care.

The machine is intended for use inside a tank only. As peak velocity of main jets reaches 40 m/sec., the Alfa Laval IsoMix External Drive (IMXD) must not be operated in open air or when tank is open.

WARNING
Hot chemicals and steam under pressure may be used for cleaning and sterilising. Protect against scalding and burning. Never tamper with or try to open clamps or other connections while system is in operation. Make sure that system is depressurised and drained before disassembly.

MAINTENANCE:

Always follow the maintenance instruction thoroughly (see chapter 6 Maintenance).
Always follow the maintenance instruction for gear motor thoroughly (see chapter 9.3 Drive unit instructions).
Always study the parts list and assembly drawing carefully (see chapter 8 Parts lists and drawings, service kits and tools).
Never service the machine or tank with product or cleaning liquid in the tank.

Never touch the moving parts while the machine is connected to the power supply.
Always disconnect the power supply while servicing the machine.

Ensure correct rotation direction of drive shaft before startup and after any maintenance that might have impact on the direction.

2 Safety

Unsafe practices and other important information are emphasised in this manual.
Warnings are emphasised by means of special signs.
Always read the manual before using the machine!

TRANSPOR TATION:

Always transport the machine in original packaging.
Always support the shaft adequately, to protect shaft and bearings.
Never expose the machine to undue vibrations or shocks.
Control for oil leakage on gears with vent screw.

3.1 Introduction

The Alfa Laval IsoMix External Drive (IMXD) is an externally driven version of the Rotary Jet Mixer which is particularly suited for mixing applications in fluids containing particulates, such as dry-hopping of beer in medium to large tanks.

This manual has been prepared as a guide for installing, operating and maintaining your Alfa Laval Rotary Jet Mixer. Should you require further assistance, our Technical Sales Support department and worldwide net of sales offices are pleased to help you. Please quote the type, article and serial numbers with all of your enquiries; this helps us to help you. The type and serial number are placed on the body of the Alfa Laval Rotary Jet Mixer.

Warning: 

Before installing the machine and setting it into operation, carefully read the General safety and installation instructions chapter 2 Safety (page 6) and chapter 4 Installation (page 10) and take all necessary precautions according to your application and local regulations.

NOTE
The illustrations and specifications contained in this manual were effective at the date of printing. However, as continuous improvements are our policy, we reserve the right to alter or modify any unit specification on any product without prior notice or any obligation.

The English version of the instruction manual is the original manual. We make reservations in regard to possible mistranslations in language versions of the instruction manual. In case of doubt, the English version of the instruction manual applies.

3.2 Quality system

The Alfa Laval IsoMix External Drive (IMXD) is designed in accordance with the EHEDG design guidelines for sanitary design of processing equipment. It is produced according to Alfa Laval Kolding's ISO-9001 international Standard certified quality system. All parts are made from certified material and all non-metal parts are made from FDA compliant materials.

4 Installation

The instruction manual is part of the delivery – study the instructions carefully. The machine is for permanent installation. Make sure the motor specifications corresponds to the environment (chapter 9.3 Drive unit instructions). Check the direction of rotation before operation (chapter 4.6 Installation, electrically).

4.1 General description

The Alfa Laval IsoMix External Drive (IMXD) is an externally driven version of the Rotary Jet Mixer which is particularly suited for mixing applications in fluids containing particulates, such as dry-hopping of beer in medium to large tanks. The IMXD system can also be utilized for optimization of the fermentation and cooling processes, as it will also maintain the yeast in suspension during the fermentation process, thereby providing optimal contact between yeast and fermentable sugars, and preventing yeast settling in the cone during fermentation.

4.2 Functioning

Rotation is powered by an external motor connected to an internal shaft. As such, there is no contact between the circulating fluid and the gear motor, which allows the system to handle high concentrations of solid matter, such as hop particles, in the circulating fluid.

The Alfa Laval IsoMix External Drive (IMXD) mixer is typically located low in the tank, allowing the mixer to be operated during the filling and emptying of the tank. For the dry-hopping process, this configuration enables the mixer to maintain the hops in homogeneous suspension during transfer from the tank to downstream centrifugation, thereby maintaining a constant load to the centrifuge, and therefore optimal separation efficiency and performance.

4.3 Unpacking/Delivery

Always use lifting equipment when handling the drive unit.
Alfa Laval cannot be held responsible for incorrect unpacking.

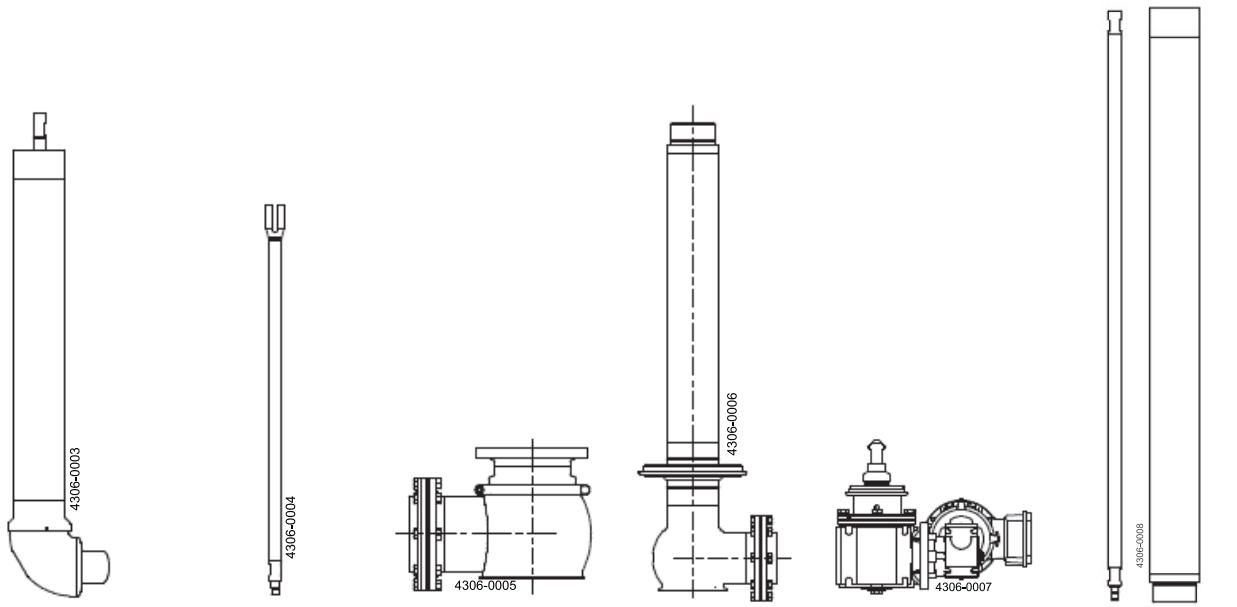
Step 1
Inspect the delivery for visible transportation damages (crates and packaging) - all issues to be reported to carrier.

Step 2
Check that deliveries are according to delivery notes.
The crate contains subassemblies and parts appropriate for installation through the swing cone.

1. Spray section
2. Drive shaft
3. DN125 valve body w. flanges
4. DN80 valve section w. up-pipe and flange
5. Drive unit w. gear motor (see chapter 9.3 Drive unit instructions) with (item numbers 9690012101..02..03..04) or without (item numbers 9690012105..06..07..08) attached pre-programmed Frequency converter (see chapter 9.4 Frequency converter instructions)
6. Middle section (only for item numbers 9690012103 and 9690012104)
7. Blind Cap for DN80 w. O-ring (not part of installation, but for used in case of failure)
8. Bag of installation material (O-rings, gaskets and clamps)
    A. 1x DN80 Clamp ring
    B. 2x DN125 Clamp ring
    C. 1x Flange gasket DN125
    D. 1x or 2x O-ring Ø17x2 (2 for item numbers 9690012103 and 9690012104)
    E. 1x or 2x O-ring Ø55.56x3.53 (2 for item numbers 9690012103 and 9690012104)
    F. 1x or 2x O-ring Ø55.56x3.53 (2 for item numbers 9690012103 and 9690012104)

Nozzles (2 psc) are delivered in separate bag.

The instruction manual is part of the delivery – study the instructions carefully. The machine is for permanent installation. Make sure the motor specifications corresponds to the environment (chapter 9.3 Drive unit instructions). Check the direction of rotation before operation (chapter 4.6 Installation, electrically).



1	2	3	4	5	6
Spray section	*Drive shaft*	*Valve body*	*Valve section*	*Drive unit*	*Middle section**

** Only for item# 9690012103 and 9690012104*

Step 3
Inspect machine parts for visible transport damage.

Step 4
During lifting:
- Be careful not to damage shaft-ends with threads.
- Never expose the machine to undue vibrations or shocks.
- Control for oil leakage on gears – leave vent plugs in gear until gear is installed and in correct position (see Figure 1).

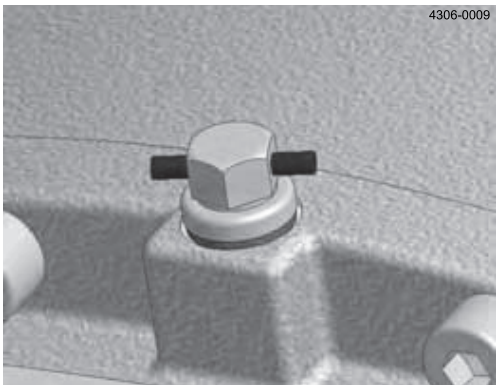


Figure 1. Un-activated vent plug - remove before operation

4 Installation

The instruction manual is part of the delivery – study the instructions carefully. The machine is for permanent installation. Make sure the motor specifications corresponds to the environment (chapter 9.3 Drive unit instructions). Check the direction of rotation before operation (chapter 4.6 Installation, electrically).

4.4 Requirement for installation, personnel

Installers:
- Experience from similar types of installation.
- Proven skills in reading installation guidelines and drawings ensuring that the installation is carried out safely for personnel and property.

Electrician:
- Certified according to local regulations and experience from similar types of installation.
- Proven skills in reading installation guidelines and drawings ensuring that the installation is carried out safely for personnel and property.

All position numbers and item numbers refer to the drawings shown and specified in chapter 8.1 IMXD without middle section and 8.2 IMXD with middle section.

4.5 Installation, mechanically

Requirements for installation

This work should be carried out by at least two persons.
During installation ensure to use sufficient lighting.

Ensure that the tank does not contain liquid or gas.
Always have safety elements removed by authorized personnel.
Never cover or remove nameplates.
Always use lifting equipment when handling heavy parts of the machine.

Never connect to power during installation.
Always have the machine connected to power supply by authorized personnel.
For more information on the gear motor go to chapter 9.3 Drive unit instructions and Frequency converter chapter 9.4 Frequency converter instructions (for item numbers 9690012101..02..03..04).

NOTE
The frequency converter offered together with the IMXD is pre-programmed with defined parameters to ensure that the gear motor maintains a defined operating range giving a safe and consistent operation of the IMXD, and in case of seizure, ensures the safe shut-down of the system.
These parameters are as follows:
1. Acceleration: 8 sec. (soft start)
2. Deceleration: 8 sec. (soft shut-down)
3. Torque current limit: 100%
4. Min. frequency for gear motor: 20 Hz
5. Max. frequency for gear motor: 40 Hz
6. Automatic shut-down and error: Frequency for gear motor < 5 Hz for > 30 sec.

In case the user chooses to use alternative frequency converter it shall be setup with the parameters and functionality listed above. NOTE: Make sure the soft start/shut-down of 8 sec. is for 0-20 Hz.

Please note that deviations from these operating guidelines can compromise the performance of the IMXD system(s), and in case of unforeseen machine seizure, could lead to serious damage to the unit internals requiring replacement of some mechanical components.
The equipment warranty covered in section 8.1 of the IMXD technical proposal is also conditional on the operation of the units according to the above frequency converter settings.

4 Installation

All position numbers and item numbers refer to the drawings shown and specified in chapter 8.1 IMXD without middle section and 8.2 IMXD with middle section.

During electrical installation:

1. Electronically connect motor by authorized personnel
2. Check direction of rotation
   A. Ensure the rotation direction is **counter-clockwise**, when viewed from the bottom of the motor. **Momentarily start and stop the motor (max 1 sec.)** to verify direction of rotation.
3. For more information on the electrical installation see section 4.6 Installation, electrically.

Tools for installation

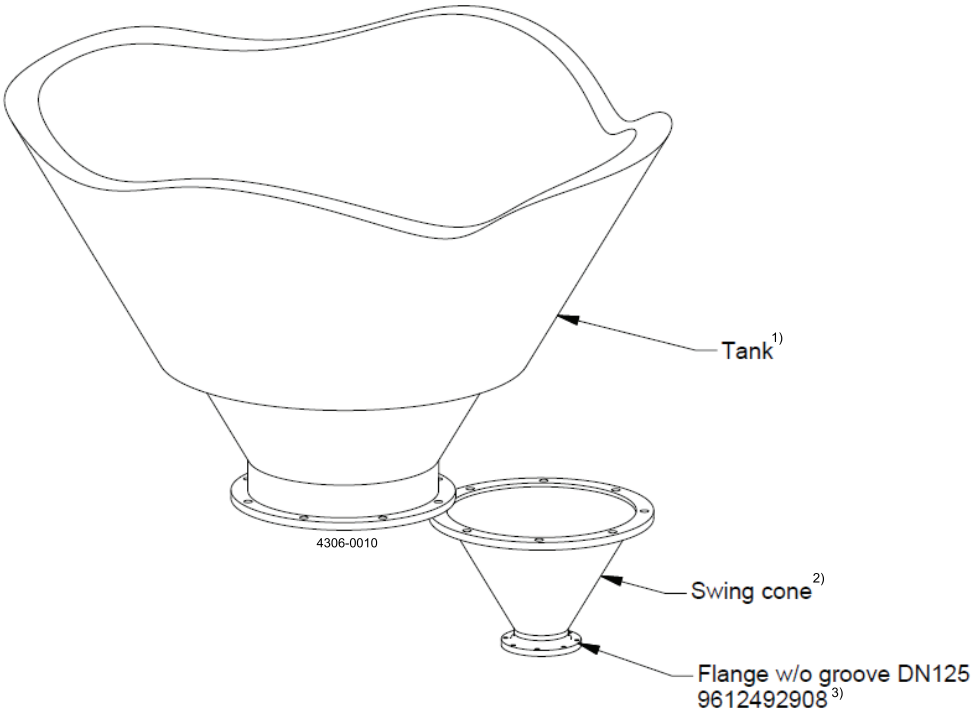
- 2x strap wrench f. OD Ø85
- 10 mm socket w. rachet (or 10 mm fork key spanner)
- 2x 17 mm fork key
- 13 mm socket w. rachet (or 13 mm fork key spanner)
- Flat headed screw driver

All position numbers and item numbers refer to the drawings shown and specified in chapter 8.1 IMXD without middle section and 8.2 IMXD with middle section.

Step 1

Prior to installation: Weld flange w/o groove DN125 (not part of the machine) onto the swing cone. This is the process connection between the (IMXD) and the tank.

1) Tank
2) Swing cone
3) Flange w/o groove DN125 - 9612492908



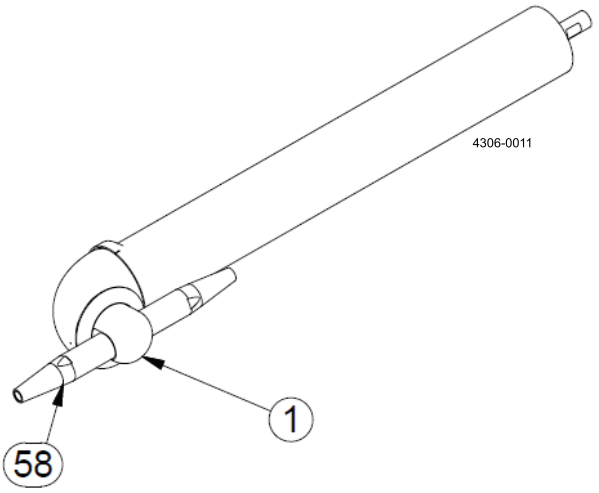
Step 2

1. Unscrew the bolts (29 and 31) that attach the flanges (28 and 32) to the DN125 valve body (25) and the DN80 valve body (19).
2. Weld the flanges (28 and 32) to the piping leading to the DN125 valve body (25) and DN80 valve body (19).

All position numbers and item numbers refer to the drawings shown and specified in chapter 8.1 IMXD without middle section and 8.2 IMXD with middle section.

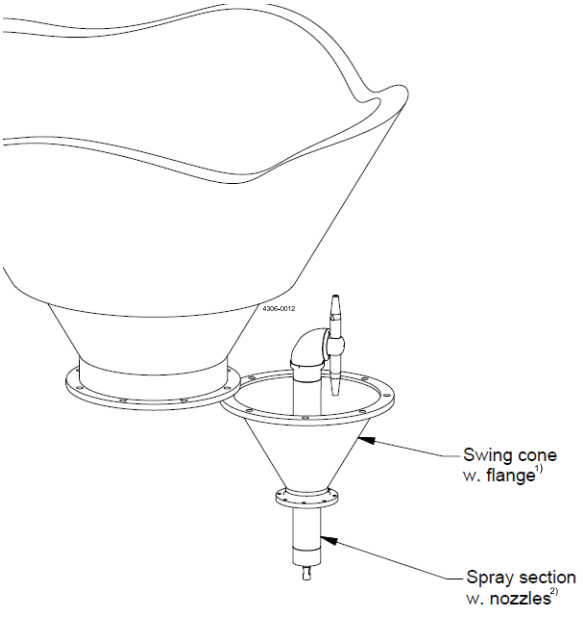
Step 3

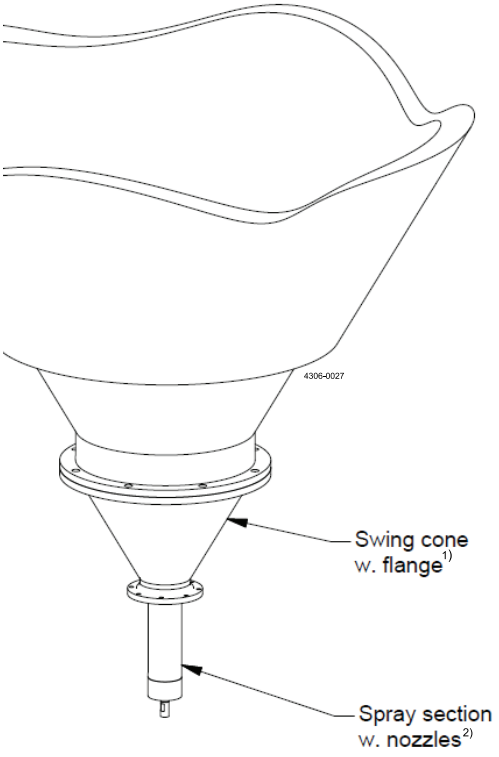
1. Attach the two nozzles (58) to the threaded connections in the hub (1).
2. Tighten to a torque of min. 50 Nm.



Step 4

Lift spray section into the open swing cone and lower the spray section through the opening of the flange on the swing cone. The spray section is larger than the flange inner diameter. Hence, it must be lifted manually into the open swing cone while inserting the pipe of the spray section down through the outlet flange of the swing cone. Close the swing cone once done and secure the swing cone to the tank.





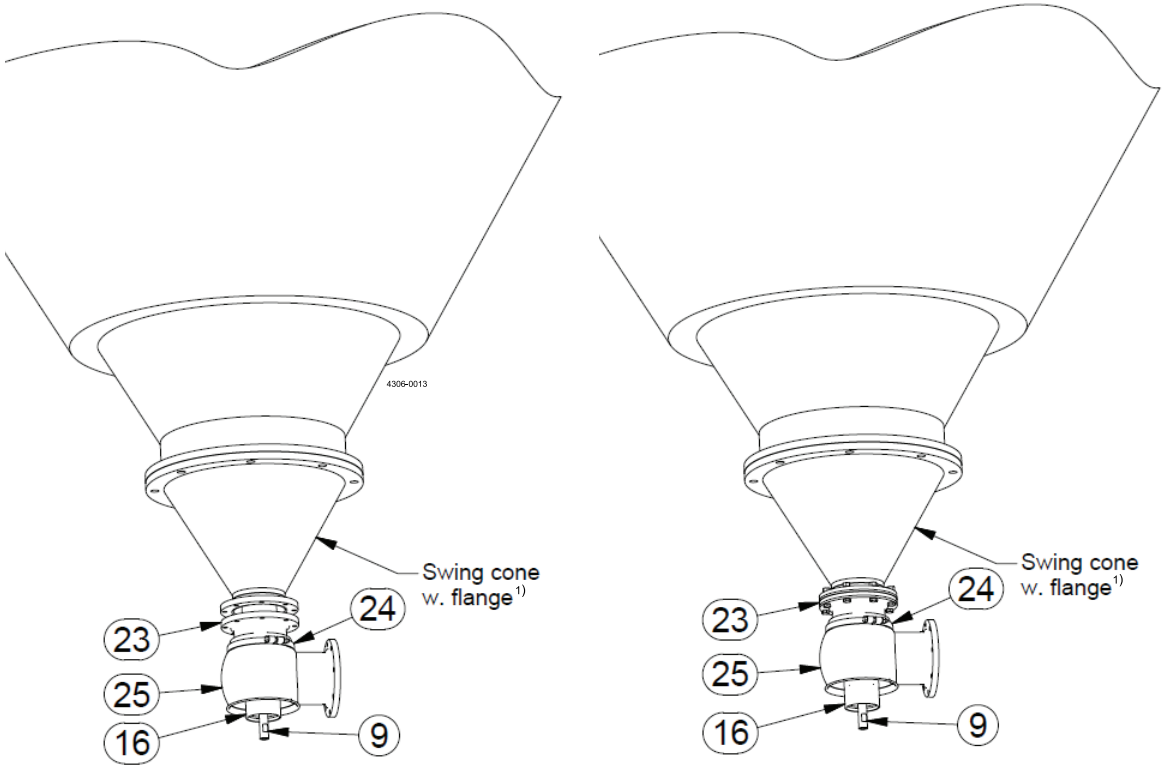
All position numbers and item numbers refer to the drawings shown and specified in chapter 8.1 IMXD without middle section and 8.2 IMXD with middle section.

Step 5

1. Position the assembly of the DN125 valve body w. flange (25) and stub flange w. DN125 flange (23) so that the DN125 flange on the stub flange (23) is upwards.
2. Lift the assembly of the DN125 valve body w. flange (25) and stub flange w. DN125 flange (23) up, so the downpipe of the spray section (16), that sticks out of the swing cone, is inserted through the DN125 valve body (25).
3. Slide the assembly of the DN125 valve body w. flange (25) and the stub flange w. DN125 flange (23) up to the counter flange attached to the swing cone.
4. Attach the flange of the to the counter flange using 8xM10x40 screws and matching nuts (not part of the machine – AL item no.: 9612499303).

NOTE

Ensure that the side port of the DN 125 valve body is oriented in the right direction (fine adjustment can be made by loosening the clamp (24) enough to be able to turn the DN125 valve body (25)).



IMPORTANT

If a middle section has to be installed, follow step 6 and 7 for middle section drive shaft (57) and middle section downpipe (56) installation (where middle section downpipe acts as the valve section in Step 6). And then continue with step 6 and onwards for attaching the valve section to the now-attached middle section.

1) Swing cone with flange

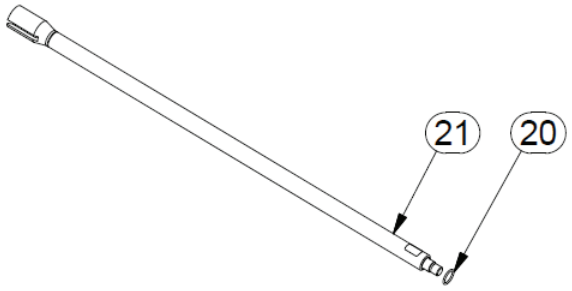
2) Spray section with nozzles

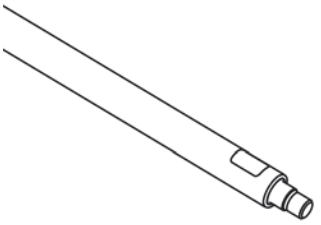
4 Installation

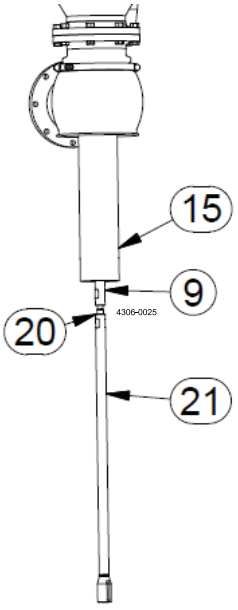
All position numbers and item numbers refer to the drawings shown and specified in chapter 8.1 IMXD without middle section and 8.2 IMXD with middle section.

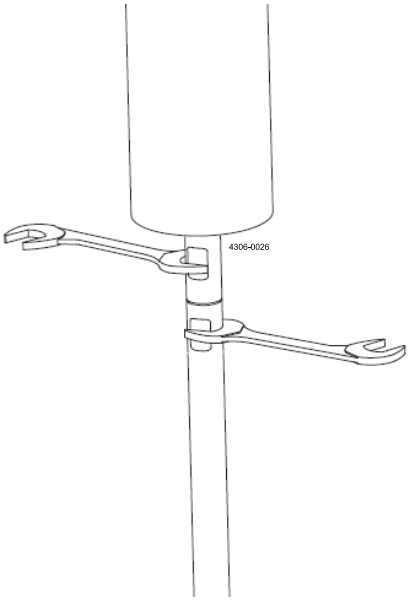
Step 6

1. Mount O-ring (20) into the groove at the end of the drive shaft (21).
2. Lightly grease the thread – NB: Use food compliant lubricant.
3. Carefully screw the drive shaft (21) onto the drive shaft (9) that sticks out of the spray section – **NOTE: Left hand thread!!**
4. Tighten using two 17 mm fork-keys, until metal-to-metal contact.





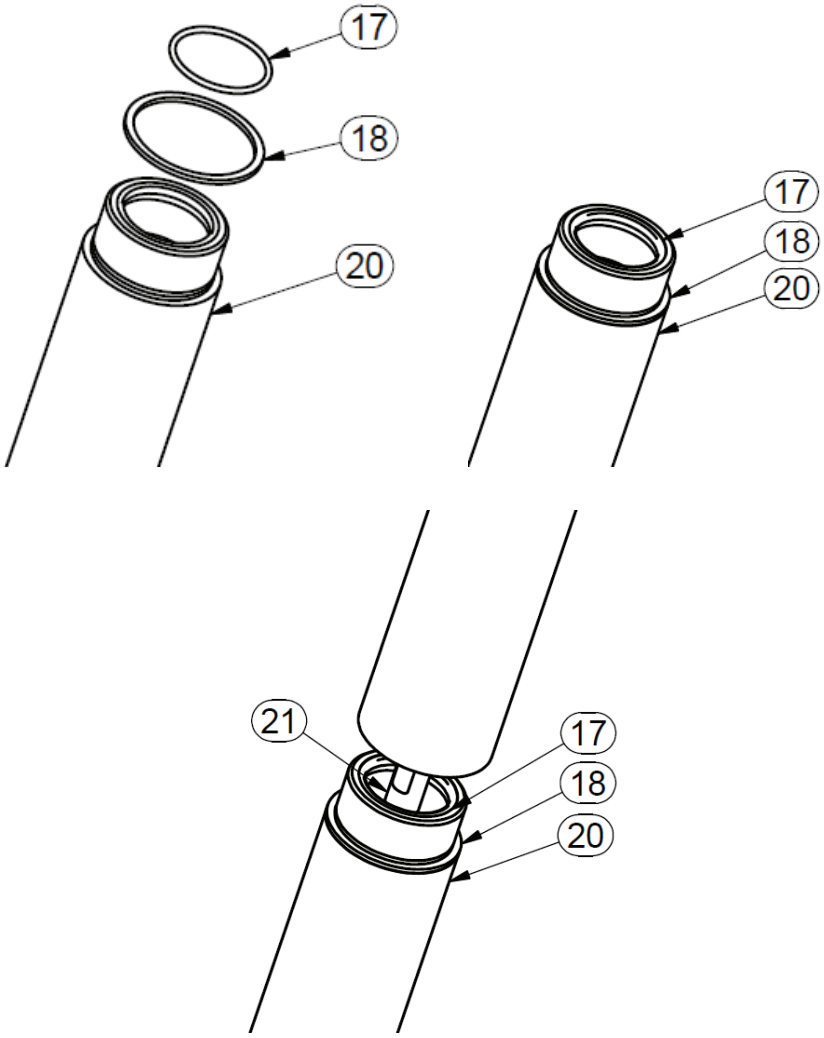




All position numbers and item numbers refer to the drawings shown and specified in chapter 8.1 IMXD without middle section and 8.2 IMXD with middle section.

Step 7

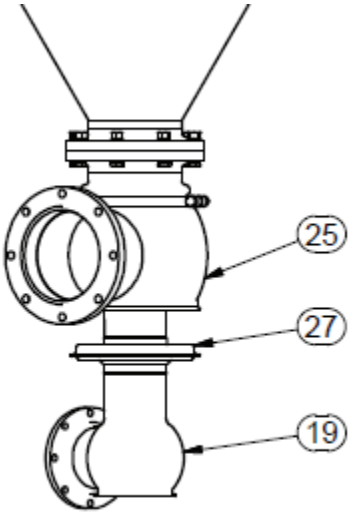
1. Insert EPDM O-ring (17) and Teflon gasket (18) at the end of the DN80 valve section (19).
2. Slide the DN80 valve section (19) carefully over the drive shaft (21) and bring the threaded coupling ends of the DN 80 valve section (19) and the downpipe of the spray section (16) together.
3. Carefully screw the ends together (right-hand thread). Tighten with strap wrenches to metal-to-metal to ensure complete sealing.

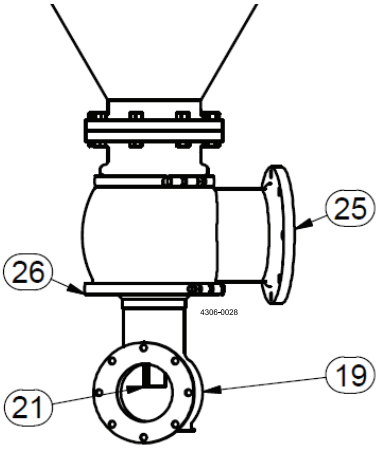


All position numbers and item numbers refer to the drawings shown and specified in chapter 8.1 IMXD without middle section and 8.2 IMXD with middle section.

Step 8

1. Carefully lift the DN80 valve section (19), so the bonnet of the DN80 valve section (19) slides into the DN125 valve body (25). Secure with clamp ring (26). NB: Before fastening the clamp ensure correct orientation of the side port of the DN80 valve section (19).
2. The end of the drive shaft (21) should be visible through the side port of the DN80 valve section (19).

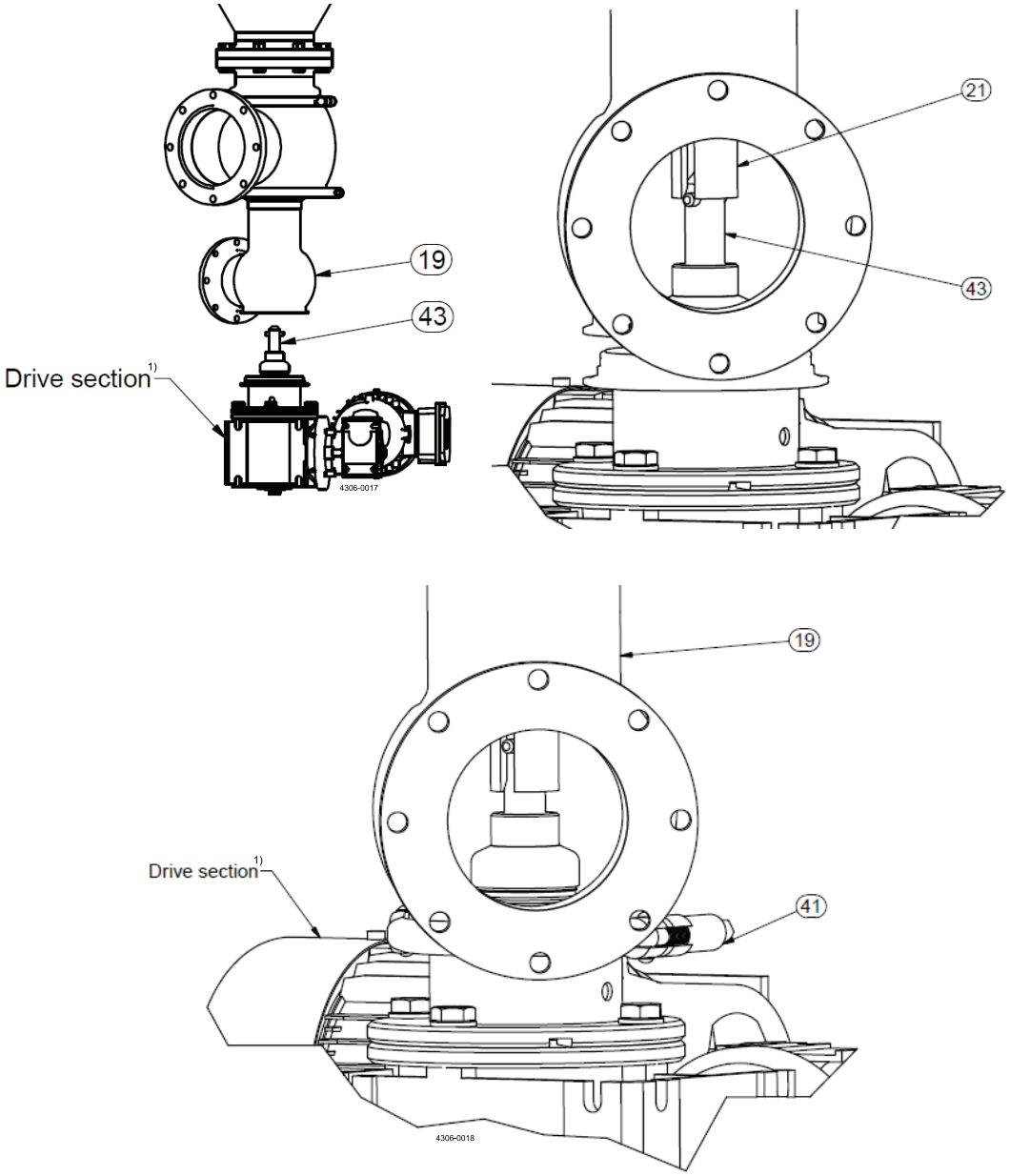




All position numbers and item numbers refer to the drawings shown and specified in chapter 8.1 IMXD without middle section and 8.2 IMXD with middle section.

Step 9

1. Lift the drive section so the drive shaft (43) of the drive section is inserted into the bottom of the DN80 valve section (19).
2. When the two drive shafts (21 and 43) meet, turn the drive section until the two drive shafts slide together (can be seen through the side port of the DN80 valve section (19)).
3. Slide the bonnet of the drive section into the DN80 valve section (19). Motor part of the drive section shall not be located above the flange of the DN80 valve section (19). (NB: If a certain orientation of the electrical motor is needed, it can now be turned into that orientation) and secure with Clamp ring (41).

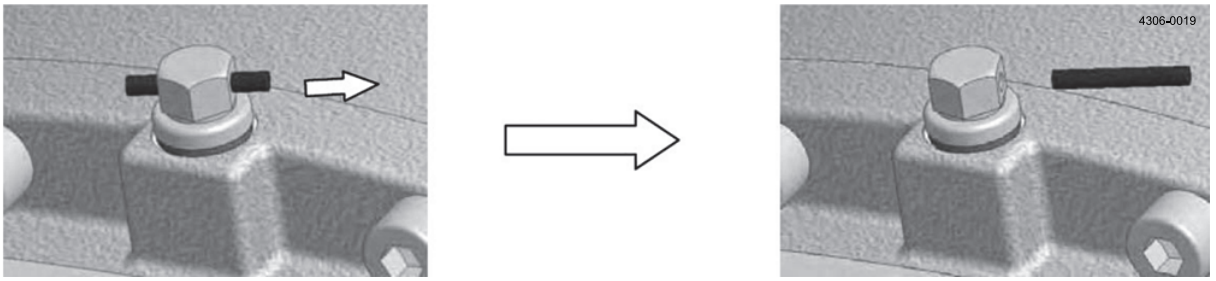


1) Drive section

All position numbers and item numbers refer to the drawings shown and specified in chapter 8.1 IMXD without middle section and 8.2 IMXD with middle section.

Step 10

1. The oil vent plugs are removed on the gear motor (see chapter 9.3 Drive unit instructions).



Step 11

Attach electrical motor to frequency converter (see chapter 9.3 Drive unit instructions for connection of cables to the electrical motor).

NOTE

Installation of the (IMXD) is completed by attaching the supply lines to the flange connections of the DN125 and DN80 valve body.

If an alternative frequency converter is used, see NOTE page 13 section 4.5 Installation, mechanically.

4.6 Installation, electrically

- Operation by unauthorized personnel may endanger personnel and property.
- Treat all electrical equipment as powered.
- Switch off the power before maintenance and repair.
- The electrician must be certified according to local regulations and with at least 3 years' experience from similar types of installations.
- The electrician must have proven skills in reading and working from drawings and cable lists.
- The electrician must have knowledge of local safety regulations for power and automation and furthermore making sure that any work carried out is safe for personnel and property before the equipment is put back into operation.

If you need assistance or have questions – please contact Alfa Laval.

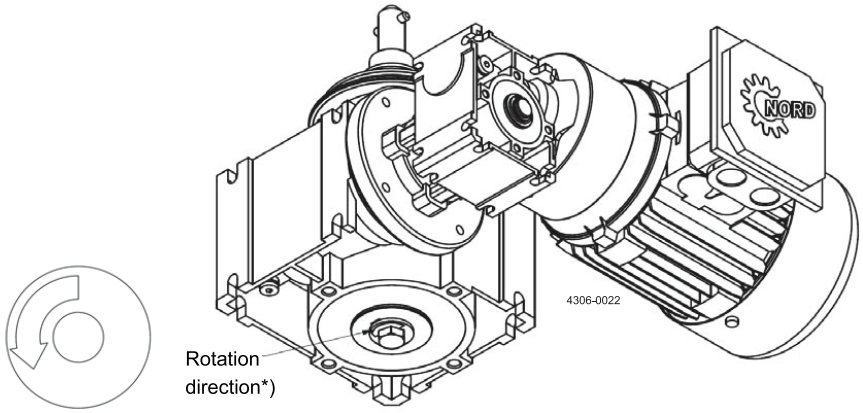
- The Alfa Laval IsoMix External Drive (IMXD) comes with (item numbers 9690012101..02..03..04) or without (item numbers 9690012105..06..07..08) a pre-programmed frequency converter that is cabled to the gear motor.
- The frequency converter requires a power supply as indicated on the nameplate.
- We recommend installation of a service switch at the machine to secure the personnel during service work.
- We recommend connecting the PTC thermistor to the Frequency converter.
- Perform a visual inspection of the direction of rotation. The direction required is indicated on the washer attached to the drive shaft (underneath the motor).

If the pre-programmed frequency converter is **NOT** used, see NOTE page 13 section 4.5 Installation, mechanically.

NOTE: We recommend installation of safety switches on all hatches to the tank, that ensures that the IMXD and supply pumps stops if a hatch is opened.

- Rotation of machine must be **counter -clockwise** looking from the tank bottom and up. Otherwise the machine may unscrew itself.
- To check direction of rotation start gear motor for short period of time (max 1 sec.).

**) Rotation direction*



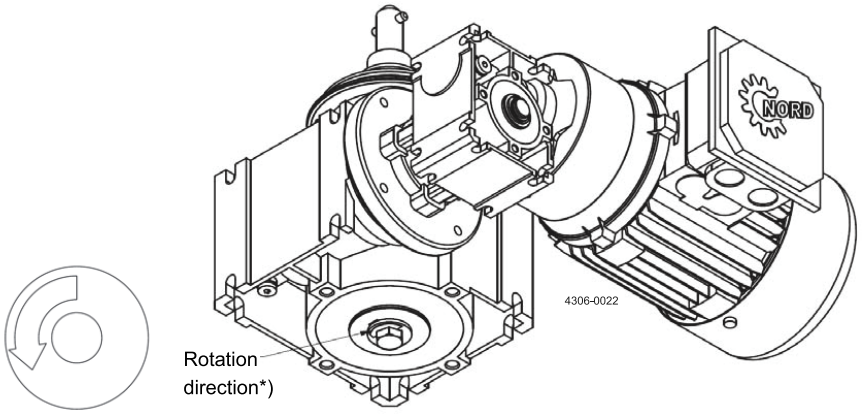
5 Operation

Study the instructions carefully and pay special attention to warnings! Always check the machine before operation. Alfa Laval recommends a soft starter for the machine to reduce the load on tank and machine. For operation instructions from motor supplier see chapter 9.3 Drive unit instructions.

5.1 General information

All position numbers and item numbers refer to the drawings shown and specified in chapter 8.1 IMXD without middle section and 8.2 IMXD with middle section.

Rotation of machine must always be counter-clockwise.



**) Rotation direction*

Use of gear motor covers is not permitted due to risk of reduced cooling on motor.

Gear motor shall not be started unless liquid is pumped through the DN80 inlet of the Alfa Laval IsoMix External Drive (IMXD) at a differential pressure of minimum 1 bar.

Study the instructions carefully and pay special attention to warnings! Always check the machine before operation. Alfa Laval recommends a soft starter for the machine to reduce the load on tank and machine. For operation instructions from motor supplier see chapter 9.3 Drive unit instructions.

5.2 Specifications and limitations for use of IMXD in dry-hopping

For best dry hopping results with Alfa Laval IsoMix External Drive (IMXD), the following procedures are advised:

- Complete pre-slurrying in an external tank is best practice, as it ensures that the hops are completely disaggregated before dosing into the tank.
- In pre-slurrying, agitator design must be optimized to ensure fast disaggregation and consistent homogeneity of the hop slurry during transfer from the slurry tank to the IMXD system. Multiple impellers are recommended, with the lowest impeller submerged at a tank volume of 10% of the tank capacity.
- IMXD circulation shall be initiated before hop dosing begins.
- For pre-slurried hop dosing, solids content in the slurry should not exceed 10%, and slurry addition rate to the IMXD should not exceed 50% of the IMXD circulation rate.
- For direct introduction of hops into the tank through the IMXD, the solids concentration in the hops inlet flow should not exceed 5%.
- IMXD circulation shall be maintained until hops are fully disaggregated.
- IMXD circulation shall be maintained during the entire dry hopping process, through to transfer from tank until the minimum level for mixer operation is reached.
- CIP should be started as soon as possible after the tank is emptied, while the surfaces of the tank and inside the IMXD are still wet.
- CIP must include caustic wash. Hot caustic would be preferred if possible.
- Minimum CIP duration for IMXD loop is 5 minutes per stage. Flow rate as per Alfa Laval recommendations.

Please note that deviations from these operating guidelines can compromise the performance of the IMXD system(s), and in case of unforeseen machine seizure, could lead to serious damage to the unit internals requiring replacement of some mechanical components.

Power Outage

In case of power loss for more than one hour once hops have been introduced to the tank, special care must be taken in connection with restarting the system. This is to prevent plugging of the IMXD with hop solids that have accumulated at the bottom of the tank during the power outage.

The following measures can be used to mitigate this risk:

1. Push liquid (beer or DAW) into the tank through the normal tank inlet for 5-10 min. to move the solids up and away from the tank outlet, and restart the IMXD circulation pump towards the end of this step.
2. If it is not possible to add liquid to the tank, or if the hop solids have a high risk of further expansion and plugging, ensure the possibility to drain the hop solids out of the tank as a contingency plan following an extended power outage.

5 Operation

Study the instructions carefully and pay special attention to warnings! Always check the machine before operation. Alfa Laval recommends a soft starter for the machine to reduce the load on tank and machine. For operation instructions from motor supplier see chapter 9.3 Drive unit instructions.

5.3 Inspection

Part	Inspection interval
Gear motor	
- Clean surfaces to avoid overheating	Monthly
- Check for oil leakages	Monthly
Sealing	
- Verify that the seals are not leaking	Monthly

Study the instructions carefully and pay special attention to warnings! Always check the machine before operation. Alfa Laval recommends a soft starter for the machine to reduce the load on tank and machine. For operation instructions from motor supplier see chapter 9.3 Drive unit instructions.

5.4 Troubleshooting

Problem	Cause/result	Remedy
Not starting		
Gear motor	- Defect	- Dismantle gear motor, check for correct rotation - Replace gear motor
	- Fault at power supply	- Check power supply connection - Check voltage and frequency correspond with motor nameplate - Check frequency converter adjustment correspond with motor nameplate
	- Mixer section stuck	- Withdraw the IMXD from the tank and check if the mixer section is completely stuck – for remedy see below
Mixer section	- Obstructed	- Check that mixer head can rotate freely without striking anything - Turn hub and check unrestricted rotation. Remove stem and hub. Remove foreign materials/material build-up on stem, hub and inside nut. Clean ball races and ball retainer w. balls. Reassemble machine
	- Mechanical defects	- Hold body so stem part is downward and rotate to check that bevel gears work together. Inspect teeth on stem and hub for deformation - If hard particles get stuck between stem nut and stem or hub and hub nut, the particles may damage the parts
Vibrations		
Shaft	- Damaged	- Contact Alfa Laval
Unusual sounds		
	- Find root cause of sound	- Change and/or repair parts
Leakage		
Gear motor	- Oil leakage	- Repair or replace gear motor
Performance		
No or insufficient liquid flow	- Deviation from normal operation	- Operation must be according to specification
	- Upstream errors	- Check if supply valve is fully open - Check if inlet pressure to machine is correct
	- Clogging	- Check supply line for restrictions - Remove nozzles and check for clogging
Motor stops/12 red flashes on frequency converter	- Clogging - Jamming of rotating parts	- Turn off power supply to frequency converter until red light stops flashing. Turn on power again - Remove IMXD from tank. - Dismantle spray section and remove objects that jam the rotating parts.

5 Operation

Study the instructions carefully and pay special attention to warnings! Always check the machine before operation. Alfa Laval recommends a soft starter for the machine to reduce the load on tank and machine. For operation instructions from motor supplier see chapter 9.3 Drive unit instructions.

5.5 Cleaning

All position numbers and item numbers refer to the drawings shown and specified in chapter 8.1 IMXD without middle section and 8.2 IMXD with middle section.

General information

The Alfa Laval IsoMix External Drive (IMXD) does not require a special cleaning procedure but the process should be integrated in the usual tank cleaning concept. However, caustic cleaning is always recommended.

The Alfa Laval IsoMix External Drive (IMXD) must not be run at temperatures above 90° C.
Ensure that all surfaces in contact with product are totally clean so product is not contaminated and that the machine itself is not exposed to corrosion.

Pay special attention to:
- Surfaces around sealing and bushings.
- Surfaces around weldings.
- Surface at ball bearings.

Cleaning example

- CIP fluids to be performed in the same loop and flow direction as for operation. I.e. CIP liquid enters the DN80 valve section (19) side port and exits through the DN125 valve body (25) side port.
- Prerinse with cold water for approximately 3-5 minutes.
- The caustic cleaning step should be made with caustic 30 - 45 minutes.
- For each step of the tank CIP, fluid should be built up into the cone and circulated through the Alfa Laval IsoMix External Drive (IMXD) for approximately 5 minutes at a flow corresponding to 3.5-4 bar pressure at the IMXD inlet.
- The cleaning should be made as soon as possible after emptying the tank, while the inside surfaces are still wet.
- Final-rinse with water for 5 minutes or until last rinsing water is free from chemicals.

Ensure totally clean surfaces during mounting. Always use original Alfa Laval parts.
If product wetted parts are soiled during decommissioning or installation, these must be manually cleaned prior to commissioning of the equipment.

6.1 General maintenance

- Maintenance of the machine should only be performed by authorized personnel.
- For maintenance instructions of gear motor please see chapter 9.3 Drive unit instructions.
- Ensure totally clean surfaces during maintenance.
- For lifting instruction please see chapter 4 Installation.
- Always disconnect the power supply when servicing the machine.
- Always use proper tools.
- Always replace worn sealing elements before reassembling.
- Follow the dismantling and assembly instructions to the letter.
- All scrap must be stored/disposed of in accordance with current rules and directives.
- Always use original Alfa Laval spare parts.

Part	Replace every
Sealing (mechanical, PTFE and O-rings)	When machine is disassembled for inspection and/or maintenance
Ball race, hub nut and stem nut	Every 2nd year
Bevel gears	When appropriate

Chapter 6.3 Disassembly into major parts

Chapter 6.4 Replace drive unit

Chapter 6.5 Replace shaft seal

Chapter 6.6 Replace ball bearings, ball retainer w. balls, stem and hub

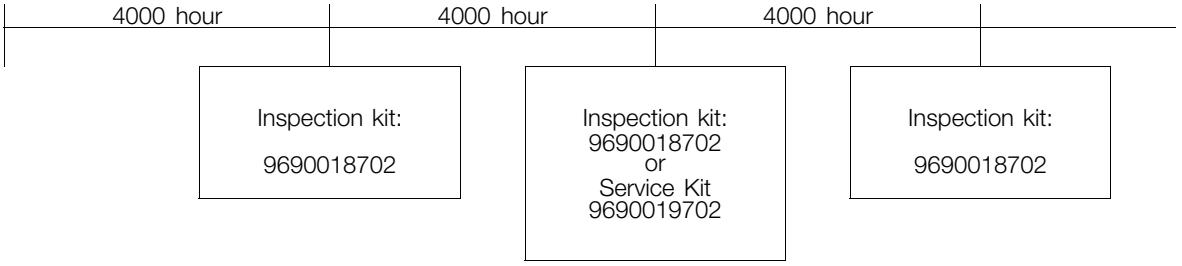
6 Maintenance

Ensure totally clean surfaces during mounting. Always use original Alfa Laval parts.
If product wetted parts are soiled during decommissioning or installation, these must be manually cleaned prior to commissioning of the equipment.

6.2 Maintenance intervals and Service kits

It is recommended that the wear parts are check every 4000 working hours for machine working under normal conditions. There is a Inspection kit and a Service kit for the Alfa Laval IsoMix External Drive (IMXD) (see part lists and drawings page 40 ff).

Service intervals



Every 500 working hours:

1. Disassemble machine as described on the following pages.
2. Clean material build-up and deposits from internal parts with Scotch-brite, S-Ultra-fine, eventually chemical media and fine abrasive cloth.
3. Check unrestricted rotation of Ball bearings. Inspect for build-up of foreign material on Stem nut (12) and Hub nut (3), in Ball retainers (10) and Ball races.
4. If Ball races (5) on Stem and Hub as well as Stem nut (12) and Hub nut (3) are heavily worn, they should be replaced. Also the Ball retainer w. balls (4) should be replaced if heavily worn.
5. Inspect the nozzle vanes for foreign objects (e.g. product pulp, threads, etc.) and if necessary clean with care – damaging nozzles (or fouled nozzles) will decrease the throw length of the machine. Clean using compressed air or tweezers.
6. Assemble machines as described in the following pages.

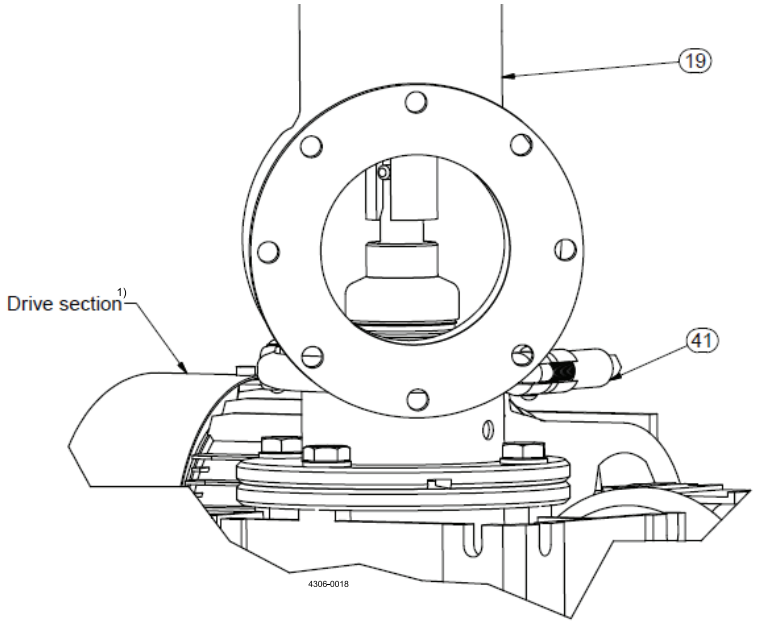
Apart from the parts specifically mentioned above, all the remaining wear parts should regularly be inspected for wear. Which parts that are wear parts appear from the part lists and drawings (page 40 ff), available from the on-line Alfa Laval product catalogue Anytime or the Close at hand spare part catalogue.

All position numbers and item numbers refer to the drawings shown and specified in chapter 8.1 IMXD without middle section and 8.2 IMXD with middle section.

6.3 Disassembly into major parts

Step 1

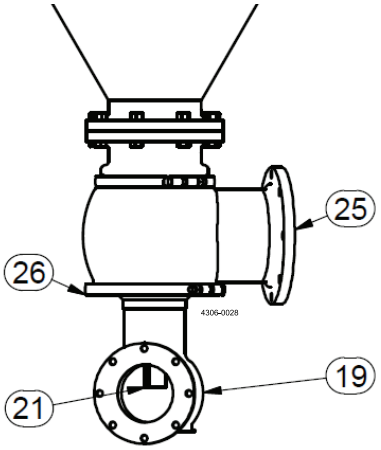
1. Dismantle IMXD at flange (Clamp (41)) between the DN80 valve section (19) and the drive section.
2. Lower the drive section including lantern (34) from the DN 80 valve section (19).

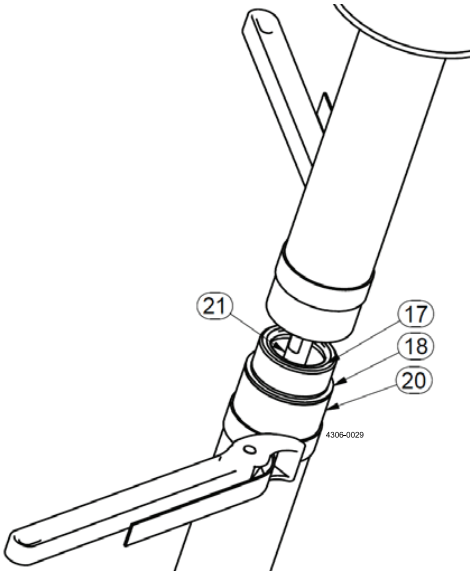


!) Drive section

Step 2

1. Dismantle the IMXD at flange (Clamp (26)) between the DN80 valve section (19) and the DN125 valve body (25).
2. Lower the DN80 valve section (19) to at least when the connection between the DN80 valve section (19) and the up-pipe (either from the spray section (16) or the middle section (56)) is visible.
3. Dismantle the up-pipe using two strap wrenches.



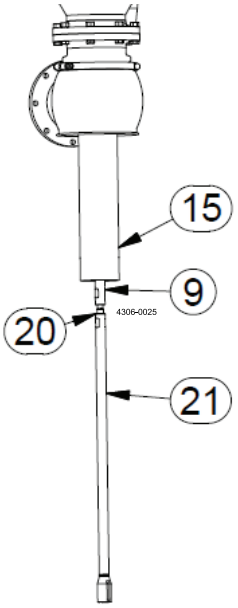


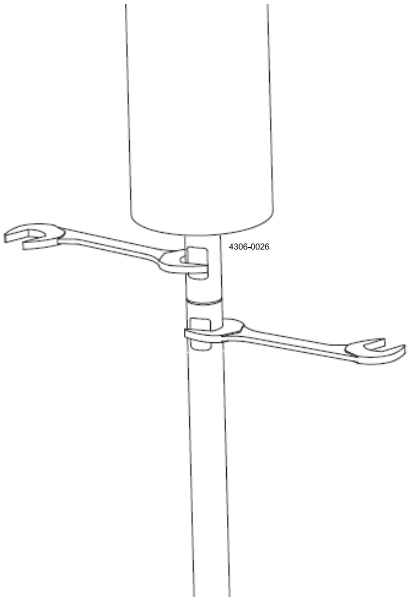
6 Maintenance

All position numbers and item numbers refer to the drawings shown and specified in chapter 8.1 IMXD without middle section and 8.2 IMXD with middle section.

Step 3

1. Unscrew the lower drive shaft (21) from the upper drive shaft (9) shaft using NV17 fork key.





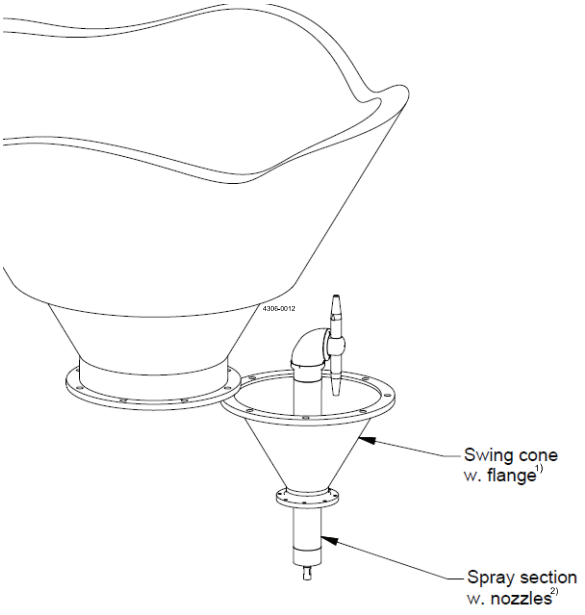
NOTE

If middle section is used, repeat step 2 and 3 to remove the middle section up-pipe (56) and middle section drive shaft (57).

Step 4

1. Open swing cone.
2. Lift the spray section out of the swing cone.

1) Swing cone w. flange
2) Spray section w. nozzles



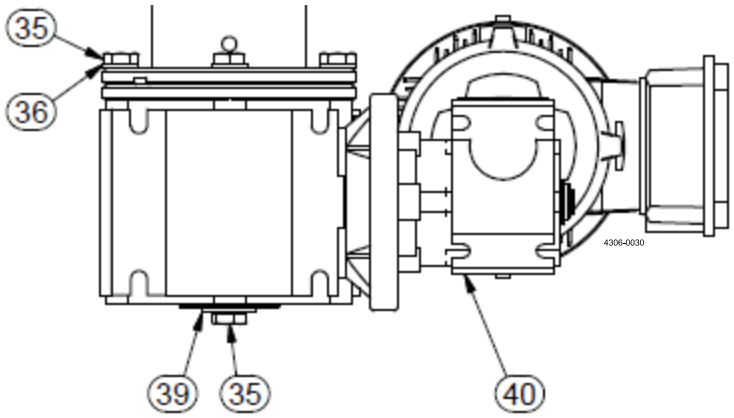
All position numbers and item numbers refer to the drawings shown and specified in chapter 8.1 IMXD without middle section and 8.2 IMXD with middle section.

6.4 Replace drive unit

Step 1

1. Unscrew the bolt (35) attached to the drive shaft and remove bolt (35) and washer w. arrow (39).
2. Unscrew the four bolts (35) and remove the washers (36).

3. **WARNING:** Heavy – Drive unit weighs approx. 20 kg and is unsupported when the four bolts (36) have been unscrewed.



Step 2

1. Lower the gear motor (40) from the IMXD.
2. Replace gear motor (key on drive shaft shall fit into the key slot of the motor) and attached with washer (39) and bolt (35).
3. Assemble reverse of dismantling (see chapter 4.5 Installation, mechanically, Step 9).

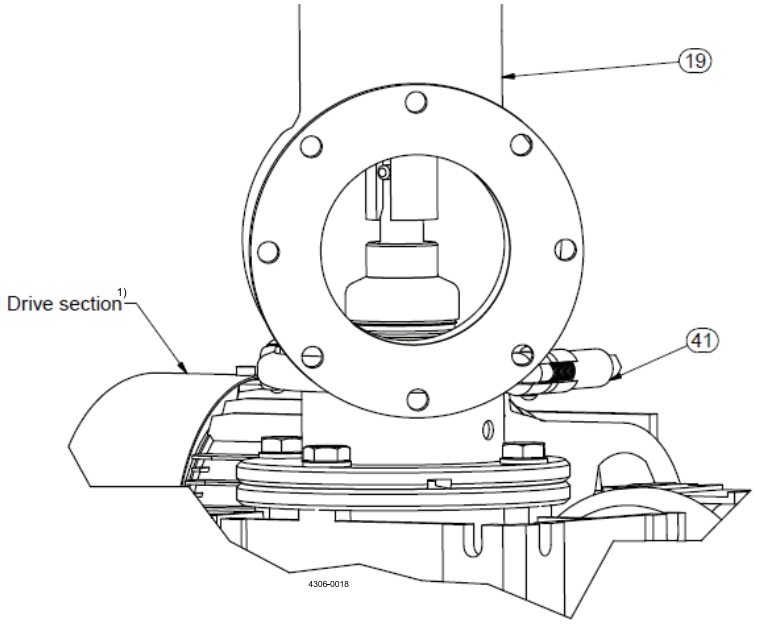
6 Maintenance

All position numbers and item numbers refer to the drawings shown and specified in chapter 8.1 IMXD without middle section and 8.2 IMXD with middle section.

6.5 Replace shaft seal

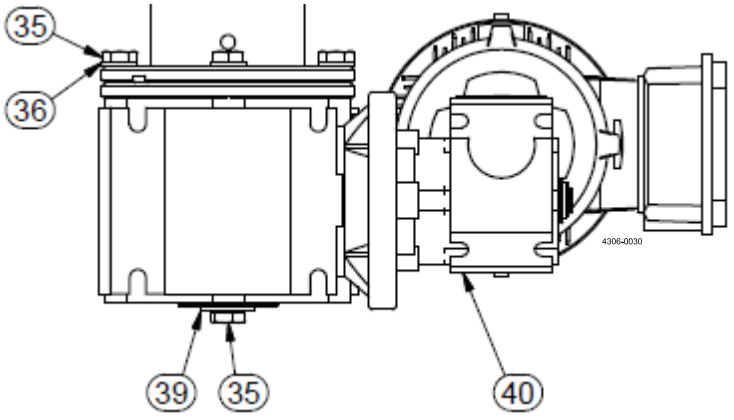
NOTE
To replace seals easier, use detergent.
Subsequent to seal replacement, ensure that all seal faces are totally clean, using alcohol.

Step 1
1. Dismantle IMXD at flange (Clamp (41)) between the DN80 valve section (19) and the drive section.
2. Lower the drive section including lantern (34) from the DN 80 valve section (19).



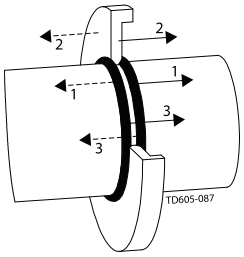
!) Drive section

Step 2
Unscrew the four bolt (35) and the bolt (35) at the end of the drive shaft and remove gear motor (40).



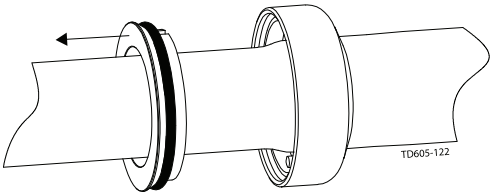
All position numbers and item numbers refer to the drawings shown and specified in chapter 8.1 IMXD without middle section and 8.2 IMXD with middle section.

Step 3
Remove oil trap ring (46) and o-rings (47) along the drive shaft (43).

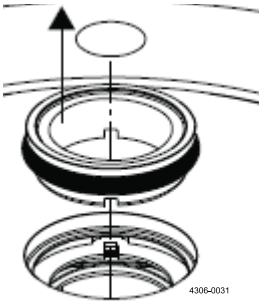


Step 4
Carefully pull the drive shaft (43) out of the lantern (34).

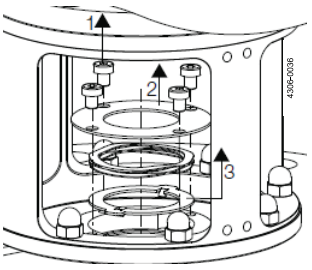
Step 5
Remove the rotary seal part (54) and O-ring (55) from the drive shaft (43).



Step 6
Remove stationary seal part (53) and o-ring (52) from lantern (34).



Step 7
1. Remove screws (49).
2. Remove retainer ring (48).
3. Remove spring (50) and stationary drive ring (51).



Step 8
1. Replace all seal parts (reverse of the above). **NB: Moisten the O-rings before assembly.**
2. Assemble IMXD reverse of dismantling (see 4.5 Installation, mechanically, Step 9).

6 Maintenance

All position numbers and item numbers refer to the drawings shown and specified in chapter 8.1 IMXD without middle section and 8.2 IMXD with middle section.

6.6 Replace ball bearings, ball retainer w. balls, stem and hub

NOTE
Requires that the Alfa Laval IsoMix External Drive (IMXD) has been disassembled into major parts (see chapter 6.3 Disassembly into major parts).

Step 1
Remove the two nozzles (58) from the hub (1) on the mixer section using a fork key NV30.

Step 2
1. Fasten the machine in a bench vice using the surfaces where the nozzles were attached to the machine.
2. Rotate drive shaft (9) until the machine is more-or-less in vertical position (by hand, support the body of the machine to aid the rotation).
3. Loosen and remove the up-pipe w. cone (16) using a strap wrench.

Step 3
1. Remove O-ring from stem (14).
2. Remove O-ring from stem (13).

Step 4
1. Loosen stem nut (12) using nut tool or 5 mm caliper. If needed use rubber hammer on caliper.
2. Remove stem (11) along with ball retainer w. balls (4) and stem nut (12) from the machine.
   A. Remove stem nut (12) from stem (11).
   B. Remove ball retainer w. balls (4) from stem (11) .
   C. If worn, remove ball race (5) from stem (11) using pin punch to pry is loose.
   D. Replace ball race (5) on stem (11) using support ring – press together in bench vise.

Step 5
1. Loosen the 3 screws (10) attaching the clutch and drive shaft assembly (7-9) to the body (6).
2. Remove the clutch and drive shaft assembly (7-9).

Step 6
1. Remove the machine from the bench vise.
2. Hold body (6) against table and loosen hub nut (3) using nut tool or 5 mm caliper. If needed use rubber hammer on caliper.
   NOTE: Left hand thread.

NB: Body (6) can also be fixed in bench vise, but care should be taken a) not to damage the outside surface finish and b) not to apply too much pressure from the jaws to the body as this can deform the body.

3. Remove hub (1) along with ball retainer w. balls (4) and hub nut (3) from the body (6).
   A. Remove hub nut (3) from the hub (1).
   B. Remove ball retainer w. balls (4) from the hub (1).
   C. If worn, remove ball race (5) from stem (11) using pin punch to pry is loose.
   D. Replace ball race (5) on hub (1) using support ring - press together in bench vice.

Assemble Alfa Laval IsoMix External Drive (IMXD) reverse of dismantling.

NOTE
Moisten the O-rings before assembly.

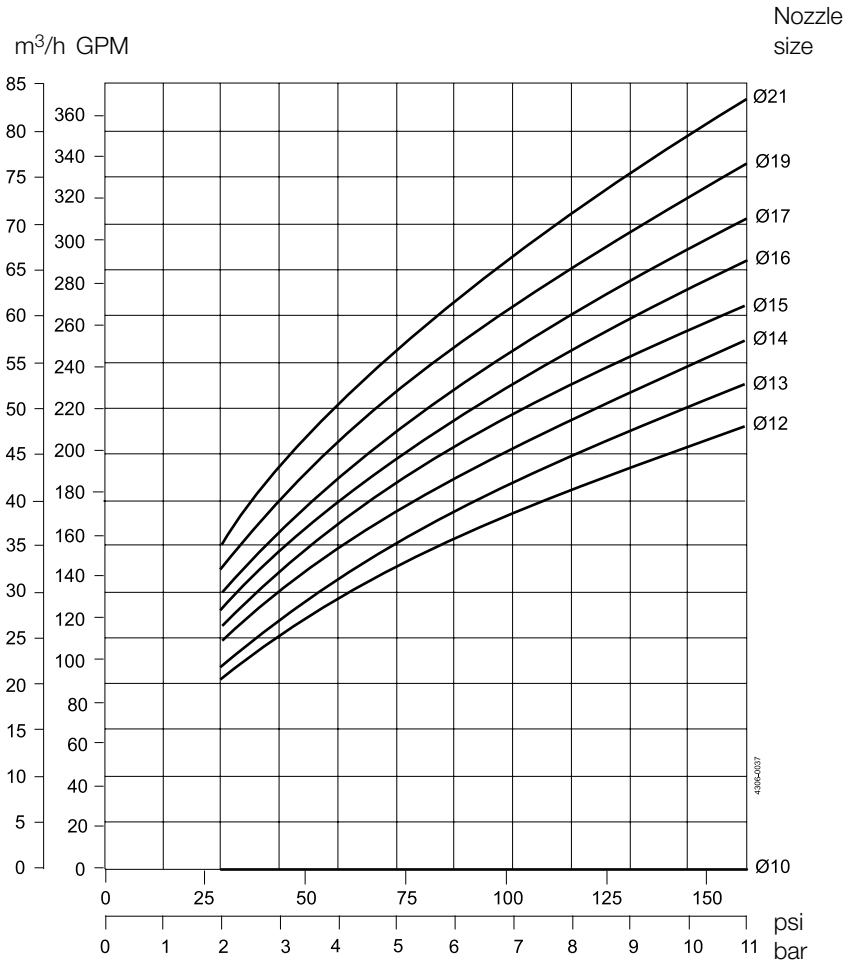
NOTE
Food-grade anti-seize grease may be used on threads on stem and the 3 screws for attaching the clutch and drive assembly to the body. for all other threads, use of food-grade anti-seize grease has to evaluated by the end-user.

7 Technical data

7.1 Alfa Laval IsoMix External Drive (IMXD)

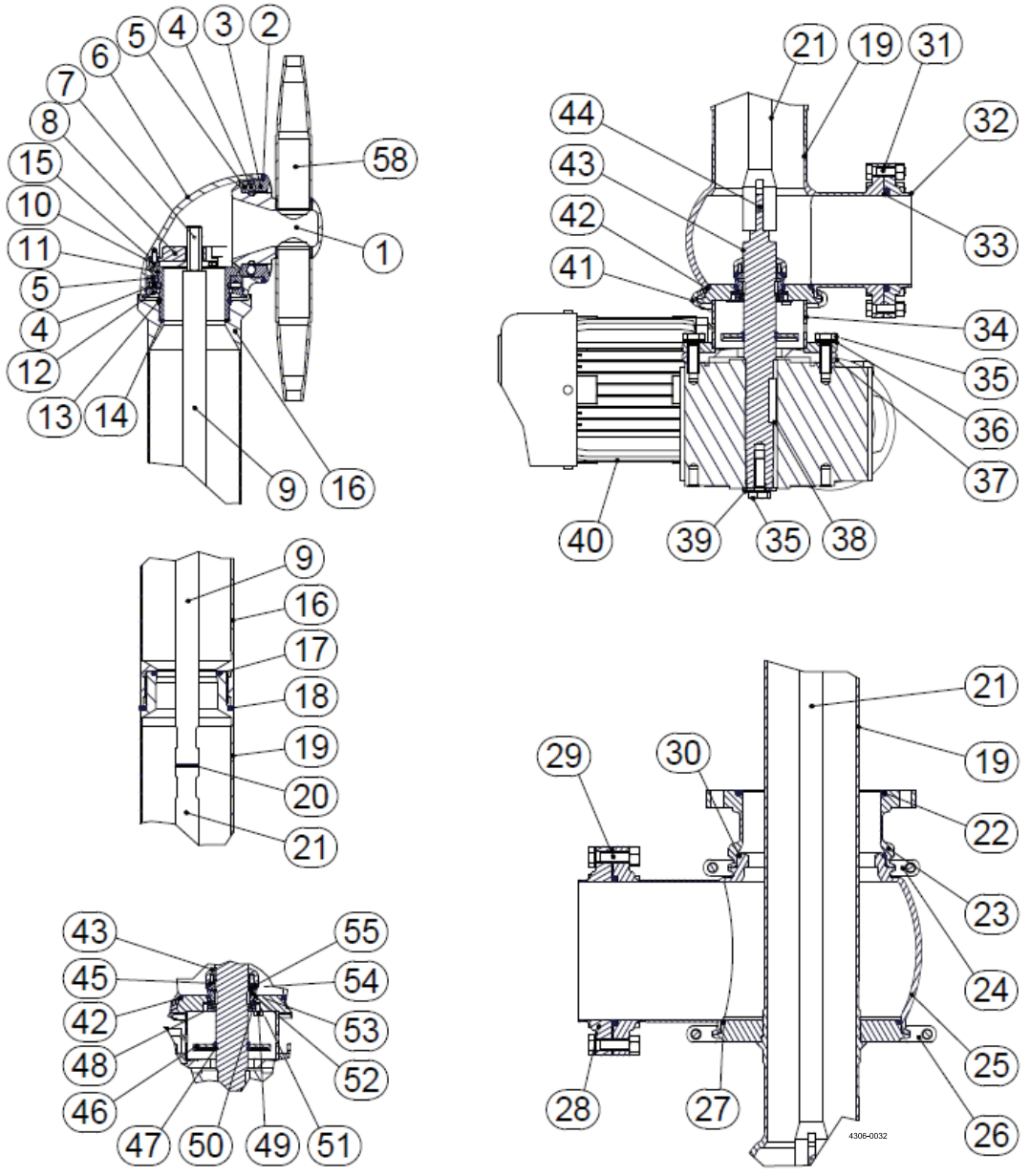
Environmental requirements	
Temperature:	-5°C - 40°C
Relative humidity:	20% - 80%
Size / weight (ex. freq. conv.)	
9690012101	1630 mm / 55 kg
9690012102	2430 mm / 59.5 kg
9690012103	2630 mm / 61.5 kg
9690012104	3430 mm / 66 kg
Power supply	
Data to be found in chapter 9.3 Drive unit instructions	
Flow rate data	
Temperature:	< 90°C, recommended about 65°C
Pressure:	1-10 bar
Flow rate:	See curves below
Detergent:	Suitable for: steel EN 1.4404, PTFE, Silicon carbide, Carbon graphite and EPDM
Flow rate data	
Product contact:	Stainless steel AISI 316/316L, SAF 2205, PFA HP, EPDM, Silicon carbide, Carbon graphite
Non-product contact:	Stainless steel AISI 304/316/316L, EPDM, FPM For motor see chapter 9.3 Drive unit instructions – Manual for electrical motor
Frequency converter (for item number 9690012101..02..03..04)	
For Frequency converter see chapter 9.4 Frequency converter instructions - Manual for frequency converter	

Flow rate


m3/h GPM
Nozzle size
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Ø21
Ø19
Ø17
Ø16
Ø15
Ø14
Ø13
Ø12
Ø10
0
25
50
75
100
125
150
psi
0
1
2
3
4
5
6
7
8
9
10
11
bar
4399-0037

8.1 IMXD without middle section

Drawing (item number 9690012101..02..05..06)



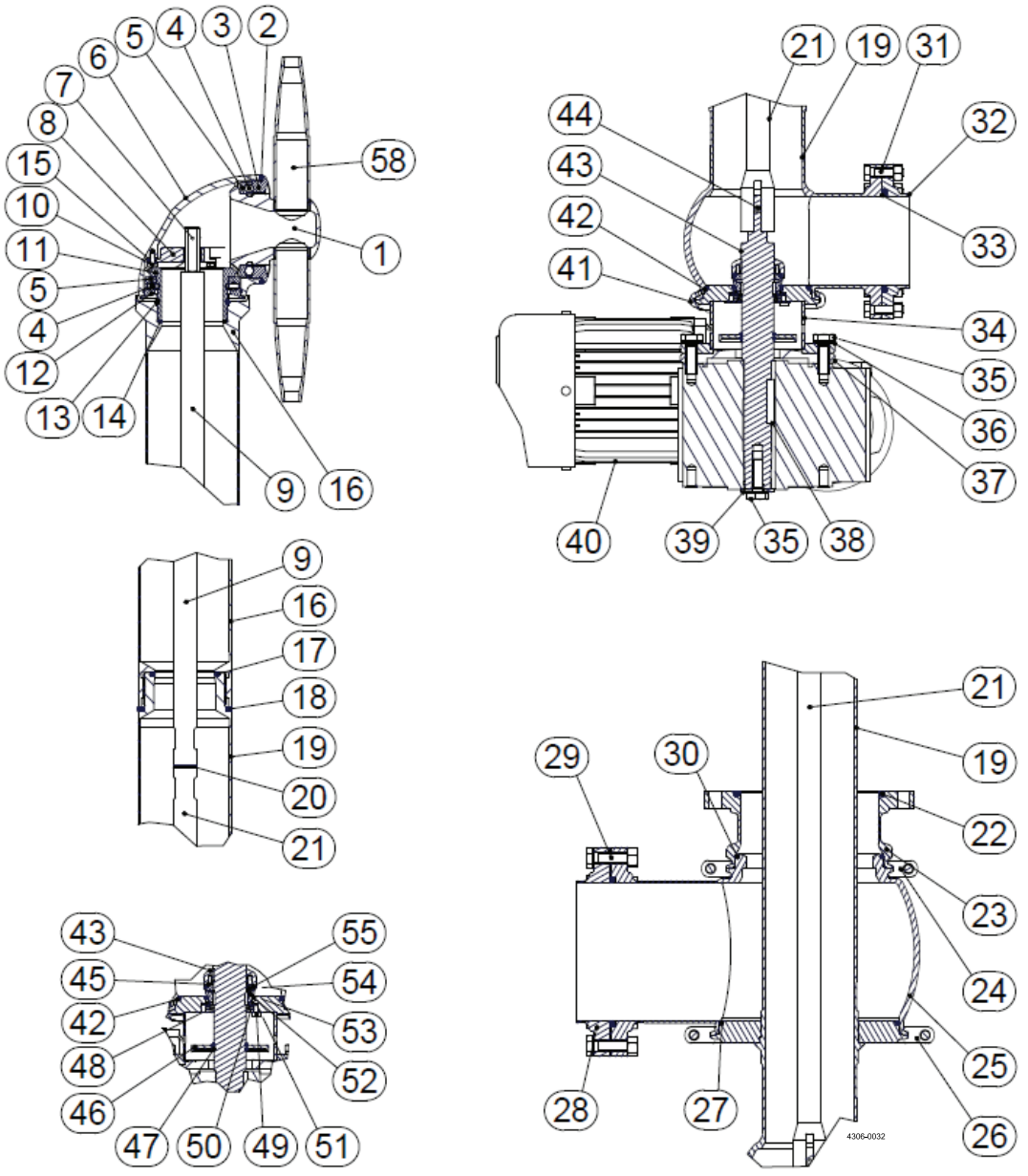
Alfa Laval IsoMix External Drive (IMXD) without middle section
Drawing (item number 9690012101..02..05..06)

Part list (item number 9690012101)

Pos.	Qty.	Denomination	Item no.	Material	Remark
1	1	Hub	9690013301	AISI 316L	Spare part
2	1	O-ring	9690003801	EPDM	Wear part
3	1	Hub nut	9690000702	SAF 2205	Wear part
4	2	Ball retainer w. balls	8010001753	PTFE/AISI 316	Wear part
5	2	Ball race	8010001752	SAF 2205	Wear part
6	1	Body	9690000501	AISI 316L	Spare part
7-9	1	Drive shaft – spray part – 0.7 m	9690012001	AISI 316L	Spare part
10	3	Screw f. body	TE20J550	1.4462	Spare part
11	1	Stem	9690013201	AISI 316L	Spare part
12	1	Stem nut	9690001302	SAF 2205	Wear part
13	1	O-ring	9690020601	FKM	Wear part
14	1	O-ring	9690005602	FEP/Sil	Wear part
15	6	Seal ring	TE20J509	PEEK	Wear part
16	1	Downpipe – spay part – 0.7 m	9690013501	AISI 316L	Spare part
17	1	O-ring	9690018801	EPDM	Wear part
18	1	Seal	9690018901	PTFE	Wear part
19	1	Valve section DN80	9690012301	AISI 316L	Spare part
20	1	O-ring	9690014701	EPDM	Wear part
21	1	Drive shaft – lower part	9690015301	AISI 316L	Spare part
22	2	Flange seal DN125	9612402608	EPDM	Wear part
23	1	Stub flange w. DN125 flange	9690016301	AISI 316L	Spare part
24	1	Clamp DN100-150 Unique	9613018002	AISI 304	Spare part
25	1	DN125 valve w. DN125 flange	9690016401	AISI 316L	Spare part
26	1	Clamp DN125-150 Mixproof	9613018102	AISI 304	Spare part
27	1	O-ring	9611993644	EPDM	Wear part
28	1	Flange w/o groove DN125	9612492908	1.4404	Spare part
29	8	Screws and nut M10x40	9612499303	AISI 304	Spare part
30	1	O-ring	9611993640	EPDM	Wear part
31	8	Screws and nut M8x30	9612499302	AISI 304	Spare part
32	1	Flange w/o groove DN80	9612492906	1.4404	Spare part
33	1	Flange seal DN80	9612402606	EPDM	Wear part
34	1	Lantern	9690015401	AISI 316L	Spare part
35	5	Screw M10x30	9690016201	A4	Spare part
36	4	Washer	TE51B054	A4	Spare part
37	1	Gearmotor flange	9690015801	AISI 316L	Spare part
38	1	Parallel key	9690012501	1.4571	Spare part
39	1	Washer – marked w. rotation	9690019901	A4	Spare part
40	1	Gear motor	9690016701		Spare part
41	1	Clamp DN80 Unique	9612939306	AISI 304	Spare part
42	1	O-ring	9611994294	EPDM	Wear part
43	1	Drive shaft - motor	9690017401	AISI 316L/SAF 2205	Spare part
44	1	Pin	TE52C232	A4	Spare part
45	2	Pin	TE2601000350	A2	Spare part
46	1	Trap	TE2604026690	AISI 304	Spare part
47	2	O-ring	TE2601000287	FPM	Wear part
48	1	Retainer ring	TE2604037030	AISI 304	Spare part
49	4	Screw M5x6	TE2601000031	A2	Spare part
50-55	1	Shaft seal comp.	TE2608041570		Wear part
58	2	Nozzle Ø12	TE50C512	AISI 316L	Spare part
58	2	Nozzle Ø13	TE50C513	AISI 316L	Spare part
58	2	Nozzle Ø14	TE50C514	AISI 316L	Spare part
58	2	Nozzle Ø15	TE50C515	AISI 316L	Spare part
58	2	Nozzle Ø17	TE50C517	AISI 316L	Spare part
58	2	Nozzle Ø19	TE50C519	AISI 316L	Spare part
58	2	Nozzle Ø21	TE50C521	AISI 316L	Spare part
59	1	Frequency converter	9690016601		Spare part

Alfa Laval IsoMix External Drive (IMXD) without middle section
Drawing (item number 9690012101..02..05..06)

Drawing (item number 9690012101..02..05..06)



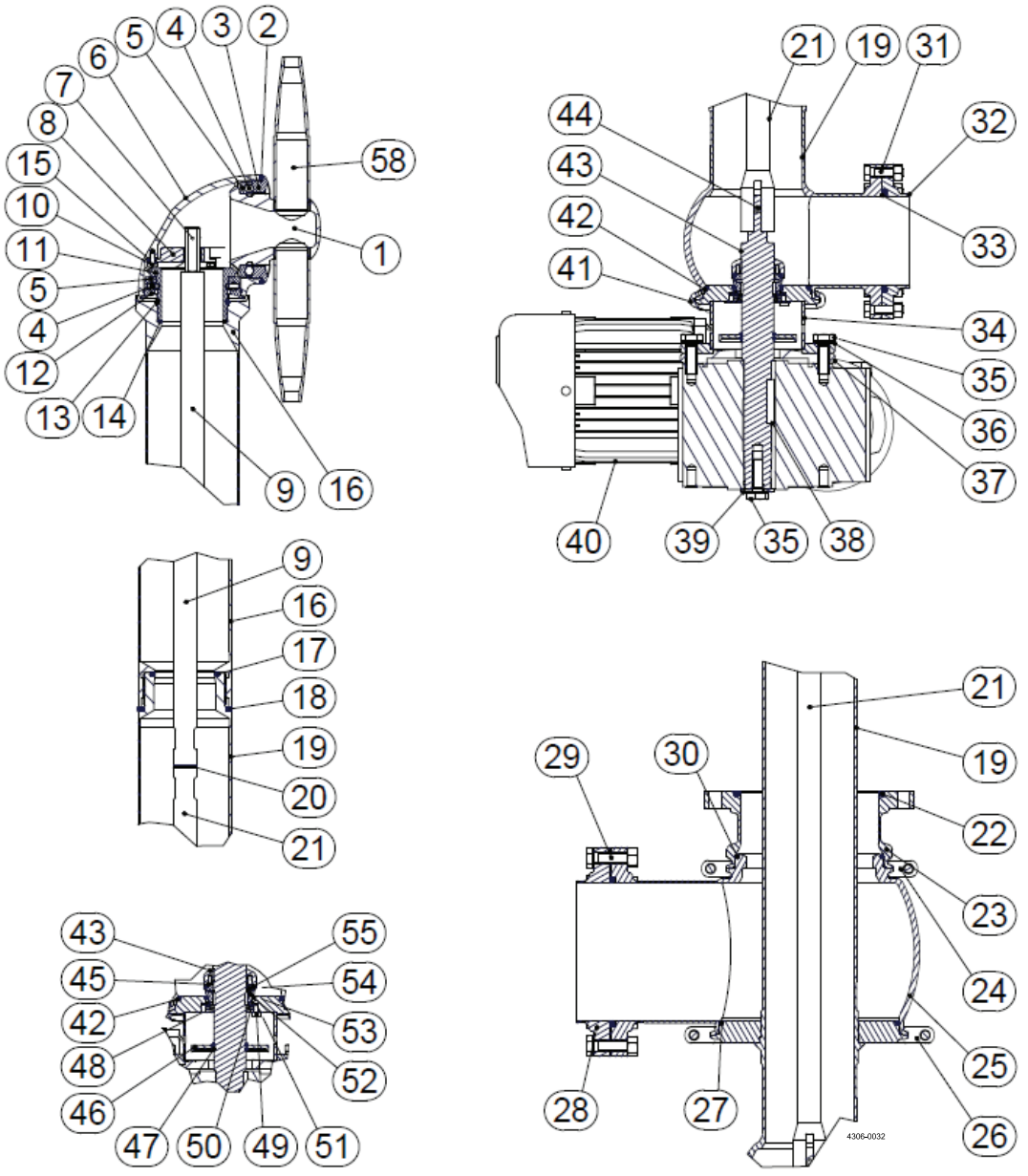
Alfa Laval IsoMix External Drive (IMXD) without middle section
Drawing (item number 9690012101..02..05..06)

Part list (item number 9690012102)

Pos.	Qty.	Denomination	Item no.	Material	Remark
1	1	Hub	9690013301	AISI 316L	Spare part
2	1	O-ring	9690003801	EPDM	Wear part
3	1	Hub nut	9690000702	SAF 2205	Wear part
4	2	Ball retainer w. balls	8010001753	PTFE/AISI 316	Wear part
5	2	Ball race	8010001752	SAF 2205	Wear part
6	1	Body	9690000501	AISI 316L	Spare part
7-9	1	Drive shaft – spray part – 1.5 m	9690012002	AISI 316L	Spare part
10	3	Screw f. body	TE20J550	1.4462	Spare part
11	1	Stem	9690013201	AISI 316L	Spare part
12	1	Stem nut	9690001302	SAF 2205	Wear part
13	1	O-ring	9690020601	FKM	Wear part
14	1	O-ring	9690005602	FEP/Sil	Wear part
15	6	Seal ring	TE20J509	PEEK	Wear part
16	1	Downpipe – spay part – 1.5 m	9690013502	AISI 316L	Spare part
17	1	O-ring	9690018801	EPDM	Wear part
18	1	Seal	9690018901	PTFE	Wear part
19	1	Valve section DN80	9690012301	AISI 316L	Spare part
20	1	O-ring	9690014701	EPDM	Wear part
21	1	Drive shaft – lower part	9690015301	AISI 316L	Spare part
22	2	Flange seal DN125	9612402608	EPDM	Wear part
23	1	Stub flange w. DN125 flange	9690016301	AISI 316L	Spare part
24	1	Clamp DN100-150 Unique	9613018002	AISI 304	Spare part
25	1	DN125 valve w. DN125 flange	9690016401	AISI 316L	Spare part
26	1	Clamp DN125-150 Mixproof	9613018102	AISI 304	Spare part
27	1	O-ring	9611993644	EPDM	Wear part
28	1	Flange w/o groove DN125	9612492908	1.4404	Spare part
29	8	Screws and nut M10x40	9612499303	AISI 304	Spare part
30	1	O-ring	9611993640	EPDM	Wear part
31	8	Screws and nut M8x30	9612499302	AISI 304	Spare part
32	1	Flange w/o groove DN80	9612492906	1.4404	Spare part
33	1	Flange seal DN80	9612402606	EPDM	Wear part
34	1	Lantern	9690015401	AISI 316L	Spare part
35	5	Screw M10x30	9690016201	A4	Spare part
36	4	Washer	TE51B054	A4	Spare part
37	1	Gearmotor flange	9690015801	AISI 316L	Spare part
38	1	Parallel key	9690012501	1.4571	Spare part
39	1	Washer – marked w. rotation	9690019901	A4	Spare part
40	1	Gear motor	9690016701		Spare part
41	1	Clamp DN80 Unique	9612939306	AISI 304	Spare part
42	1	O-ring	9611994294	EPDM	Wear part
43	1	Drive shaft - motor	9690017401	AISI 316L/SAF 2205	Spare part
44	1	Pin	TE52C232	A4	Spare part
45	2	Pin	TE2601000350	A2	Spare part
46	1	Trap	TE2604026690	AISI 304	Spare part
47	2	O-ring	TE2601000287	FPM	Wear part
48	1	Retainer ring	TE2604037030	AISI 304	Spare part
49	4	Screw M5x6	TE2601000031	A2	Spare part
50-55	1	Shaft seal comp.	TE2608041570		Wear part
58	2	Nozzle Ø12	TE50C512	AISI 316L	Spare part
58	2	Nozzle Ø13	TE50C513	AISI 316L	Spare part
58	2	Nozzle Ø14	TE50C514	AISI 316L	Spare part
58	2	Nozzle Ø15	TE50C515	AISI 316L	Spare part
58	2	Nozzle Ø17	TE50C517	AISI 316L	Spare part
58	2	Nozzle Ø19	TE50C519	AISI 316L	Spare part
58	2	Nozzle Ø21	TE50C521	AISI 316L	Spare part
59	1	Frequency converter	9690016601		Spare part

Alfa Laval IsoMix External Drive (IMXD) without middle section
Drawing (item number 9690012101..02..05..06)

Drawing (item number 9690012101..02..05..06)



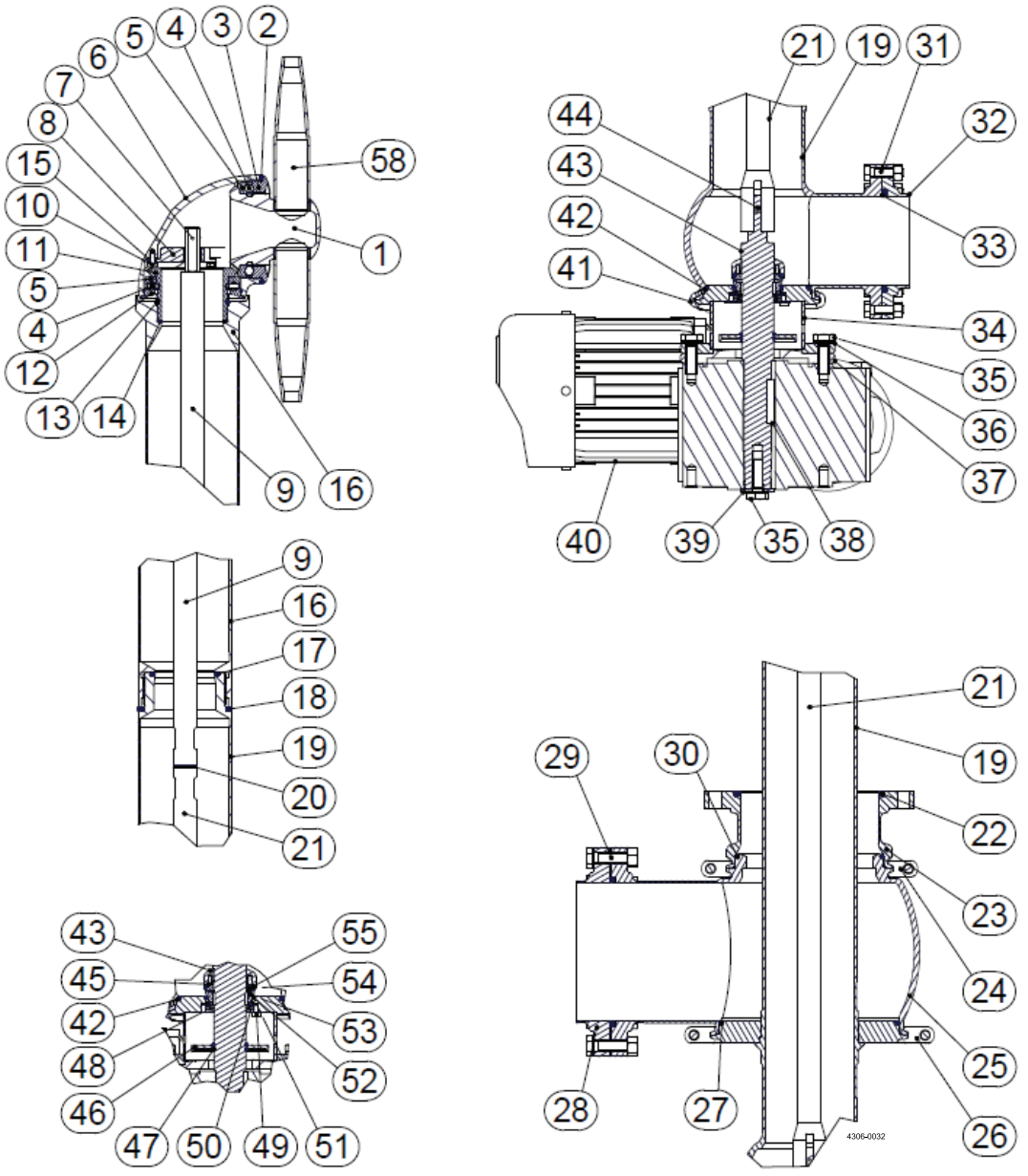
Alfa Laval IsoMix External Drive (IMXD) without middle section
Drawing (item number 9690012101..02..05..06)

Part list (item number 9690012105)

Pos.	Qty.	Denomination	Item no.	Material	Remark
1	1	Hub	9690013301	AISI 316L	Spare part
2	1	O-ring	9690003801	EPDM	Wear part
3	1	Hub nut	9690000702	SAF 2205	Wear part
4	2	Ball retainer w. balls	8010001753	PTFE/AISI 316	Wear part
5	2	Ball race	8010001752	SAF 2205	Wear part
6	1	Body	9690000501	AISI 316L	Spare part
7-9	1	Drive shaft – spray part – 0.7 m	9690012001	AISI 316L	Spare part
10	3	Screw f. body	TE20J550	1.4462	Spare part
11	1	Stem	9690013201	AISI 316L	Spare part
12	1	Stem nut	9690001302	SAF 2205	Wear part
13	1	O-ring	9690020601	FKM	Wear part
14	1	O-ring	9690005602	FEP/Sil	Wear part
15	6	Seal ring	TE20J509	PEEK	Wear part
16	1	Downpipe – spay part – 0.7 m	9690013501	AISI 316L	Spare part
17	1	O-ring	9690018801	EPDM	Wear part
18	1	Seal	9690018901	PTFE	Wear part
19	1	Valve section DN80	9690012301	AISI 316L	Spare part
20	1	O-ring	9690014701	EPDM	Wear part
21	1	Drive shaft – lower part	9690015301	AISI 316L	Spare part
22	2	Flange seal DN125	9612402608	EPDM	Wear part
23	1	Stub flange w. DN125 flange	9690016301	AISI 316L	Spare part
24	1	Clamp DN100-150 Unique	9613018002	AISI 304	Spare part
25	1	DN125 valve w. DN125 flange	9690016401	AISI 316L	Spare part
26	1	Clamp DN125-150 Mixproof	9613018102	AISI 304	Spare part
27	1	O-ring	9611993644	EPDM	Wear part
28	1	Flange w/o groove DN125	9612492908	1.4404	Spare part
29	8	Screws and nut M10x40	9612499303	AISI 304	Spare part
30	1	O-ring	9611993640	EPDM	Wear part
31	8	Screws and nut M8x30	9612499302	AISI 304	Spare part
32	1	Flange w/o groove DN80	9612492906	1.4404	Spare part
33	1	Flange seal DN80	9612402606	EPDM	Wear part
34	1	Lantern	9690015401	AISI 316L	Spare part
35	5	Screw M10x30	9690016201	A4	Spare part
36	4	Washer	TE51B054	A4	Spare part
37	1	Gearmotor flange	9690015801	AISI 316L	Spare part
38	1	Parallel key	9690012501	1.4571	Spare part
39	1	Washer – marked w. rotation	9690019901	A4	Spare part
40	1	Gear motor	9690016701		Spare part
41	1	Clamp DN80 Unique	9612939306	AISI 304	Spare part
42	1	O-ring	9611994294	EPDM	Wear part
43	1	Drive shaft - motor	9690017401	AISI 316L/SAF 2205	Spare part
44	1	Pin	TE52C232	A4	Spare part
45	2	Pin	TE2601000350	A2	Spare part
46	1	Trap	TE2604026690	AISI 304	Spare part
47	2	O-ring	TE2601000287	FPM	Wear part
48	1	Retainer ring	TE2604037030	AISI 304	Spare part
49	4	Screw M5x6	TE2601000031	A2	Spare part
50-55	1	Shaft seal comp.	TE2608041570		Wear part
58	2	Nozzle Ø12	TE50C512	AISI 316L	Spare part
58	2	Nozzle Ø13	TE50C513	AISI 316L	Spare part
58	2	Nozzle Ø14	TE50C514	AISI 316L	Spare part
58	2	Nozzle Ø15	TE50C515	AISI 316L	Spare part
58	2	Nozzle Ø17	TE50C517	AISI 316L	Spare part
58	2	Nozzle Ø19	TE50C519	AISI 316L	Spare part
58	2	Nozzle Ø21	TE50C521	AISI 316L	Spare part

Alfa Laval IsoMix External Drive (IMXD) without middle section
Drawing (item number 9690012101..02..05..06)

Drawing (item number 9690012101..02..05..06)



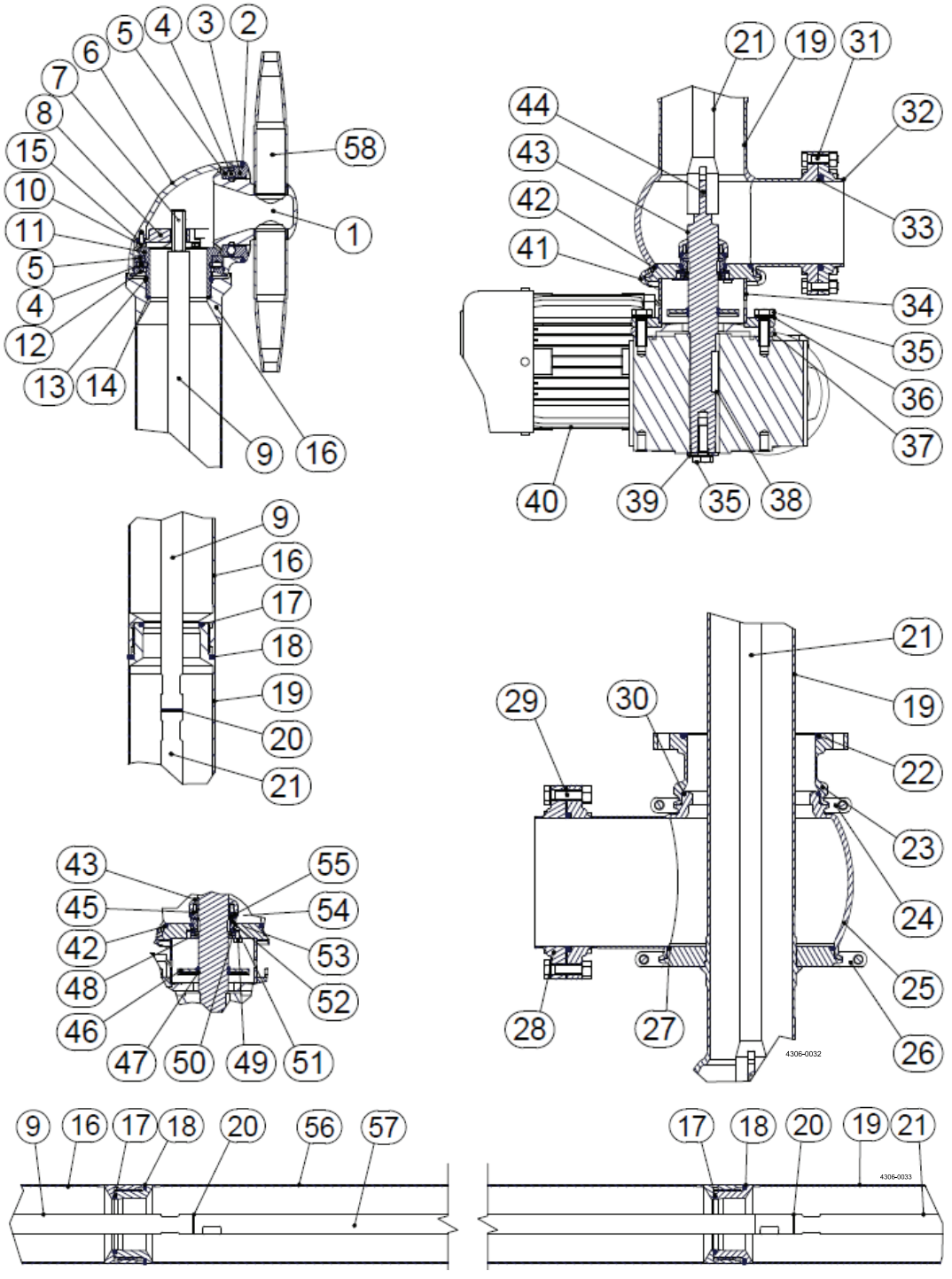
Alfa Laval IsoMix External Drive (IMXD) without middle section
Drawing (item number 9690012101..02..05..06)

Part list (item number 9690012106)

Pos.	Qty.	Denomination	Item no.	Material	Remark
1	1	Hub	9690013301	AISI 316L	Spare part
2	1	O-ring	9690003801	EPDM	Wear part
3	1	Hub nut	9690000702	SAF 2205	Wear part
4	2	Ball retainer w. balls	8010001753	PTFE/AISI 316	Wear part
5	2	Ball race	8010001752	SAF 2205	Wear part
6	1	Body	9690000501	AISI 316L	Spare part
7-9	1	Drive shaft – spray part – 1.5 m	9690012002	AISI 316L	Spare part
10	3	Screw f. body	TE20J550	1.4462	Spare part
11	1	Stem	9690013201	AISI 316L	Spare part
12	1	Stem nut	9690001302	SAF 2205	Wear part
13	1	O-ring	9690020601	FKM	Wear part
14	1	O-ring	9690005602	FEP/Sil	Wear part
15	6	Seal ring	TE20J509	PEEK	Wear part
16	1	Downpipe – spay part – 1.5 m	9690013502	AISI 316L	Spare part
17	1	O-ring	9690018801	EPDM	Wear part
18	1	Seal	9690018901	PTFE	Wear part
19	1	Valve section DN80	9690012301	AISI 316L	Spare part
20	1	O-ring	9690014701	EPDM	Wear part
21	1	Drive shaft – lower part	9690015301	AISI 316L	Spare part
22	2	Flange seal DN125	9612402608	EPDM	Wear part
23	1	Stub flange w. DN125 flange	9690016301	AISI 316L	Spare part
24	1	Clamp DN100-150 Unique	9613018002	AISI 304	Spare part
25	1	DN125 valve w. DN125 flange	9690016401	AISI 316L	Spare part
26	1	Clamp DN125-150 Mixproof	9613018102	AISI 304	Spare part
27	1	O-ring	9611993644	EPDM	Wear part
28	1	Flange w/o groove DN125	9612492908	1.4404	Spare part
29	8	Screws and nut M10x40	9612499303	AISI 304	Spare part
30	1	O-ring	9611993640	EPDM	Wear part
31	8	Screws and nut M8x30	9612499302	AISI 304	Spare part
32	1	Flange w/o groove DN80	9612492906	1.4404	Spare part
33	1	Flange seal DN80	9612402606	EPDM	Wear part
34	1	Lantern	9690015401	AISI 316L	Spare part
35	5	Screw M10x30	9690016201	A4	Spare part
36	4	Washer	TE51B054	A4	Spare part
37	1	Gearmotor flange	9690015801	AISI 316L	Spare part
38	1	Parallel key	9690012501	1.4571	Spare part
39	1	Washer – marked w. rotation	9690019901	A4	Spare part
40	1	Gear motor	9690016701		Spare part
41	1	Clamp DN80 Unique	9612939306	AISI 304	Spare part
42	1	O-ring	9611994294	EPDM	Wear part
43	1	Drive shaft - motor	9690017401	AISI 316L/SAF 2205	Spare part
44	1	Pin	TE52C232	A4	Spare part
45	2	Pin	TE2601000350	A2	Spare part
46	1	Trap	TE2604026690	AISI 304	Spare part
47	2	O-ring	TE2601000287	FPM	Wear part
48	1	Retainer ring	TE2604037030	AISI 304	Spare part
49	4	Screw M5x6	TE2601000031	A2	Spare part
50-55	1	Shaft seal comp.	TE2608041570		Wear part
58	2	Nozzle Ø12	TE50C512	AISI 316L	Spare part
58	2	Nozzle Ø13	TE50C513	AISI 316L	Spare part
58	2	Nozzle Ø14	TE50C514	AISI 316L	Spare part
58	2	Nozzle Ø15	TE50C515	AISI 316L	Spare part
58	2	Nozzle Ø17	TE50C517	AISI 316L	Spare part
58	2	Nozzle Ø19	TE50C519	AISI 316L	Spare part
58	2	Nozzle Ø21	TE50C521	AISI 316L	Spare part

8.2 IMXD with middle section

Drawing (item number 9690012103..04..07..08)



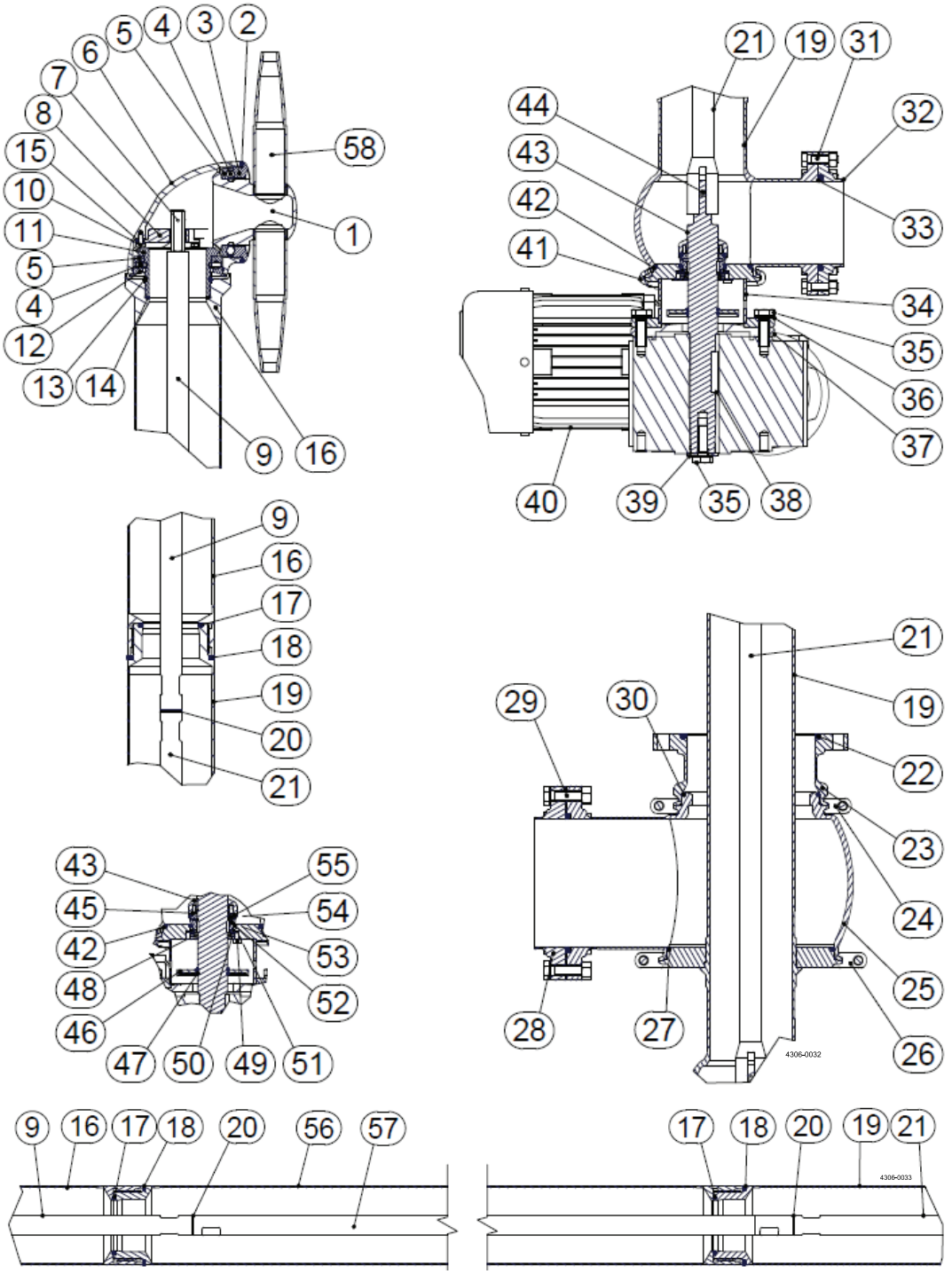
Alfa Laval IsoMix External Drive (IMXD) with middle section
Drawing (item number 9690012103..04..07..08)

Part list (item number 9690012103)

Pos.	Qty.	Denomination	Item no.	Material	Remark
1	1	Hub	9690013301	AISI 316L	Spare part
2	1	O-ring	9690003801	EPDM	Wear part
3	1	Hub nut	9690000702	SAF 2205	Wear part
4	2	Ball retainer w. balls	8010001753	PTFE/AISI 316	Wear part
5	2	Ball race	8010001752	SAF 2205	Wear part
6	1	Body	9690000501	AISI 316L	Spare part
7-9	1	Drive shaft – spray part – 0.7 m	9690012001	AISI 316L	Spare part
10	3	Screw f. body	TE20J550	1.4462	Spare part
11	1	Stem	9690013201	AISI 316L	Spare part
12	1	Stem nut	9690001302	SAF 2205	Wear part
13	1	O-ring	9690020601	FKM	Wear part
14	1	O-ring	9690005602	FEP/Sil	Wear part
15	6	Seal ring	TE20J509	PEEK	Wear part
16	1	Downpipe – spay part – 0.7 m	9690013501	AISI 316L	Spare part
17	1	O-ring	9690018801	EPDM	Wear part
18	1	Seal	9690018901	PTFE	Wear part
19	1	Valve section DN80	9690012301	AISI 316L	Spare part
20	1	O-ring	9690014701	EPDM	Wear part
21	1	Drive shaft – lower part	9690015301	AISI 316L	Spare part
22	2	Flange seal DN125	9612402608	EPDM	Wear part
23	1	Stub flange w. DN125 flange	9690016301	AISI 316L	Spare part
24	1	Clamp DN100-150 Unique	9613018002	AISI 304	Spare part
25	1	DN125 valve w. DN125 flange	9690016401	AISI 316L	Spare part
26	1	Clamp DN125-150 Mixproof	9613018102	AISI 304	Spare part
27	1	O-ring	9611993644	EPDM	Wear part
28	1	Flange w/o groove DN125	9612492908	1.4404	Spare part
29	8	Screws and nut M10x40	9612499303	AISI 304	Spare part
30	1	O-ring	9611993640	EPDM	Wear part
31	8	Screws and nut M8x30	9612499302	AISI 304	Spare part
32	1	Flange w/o groove DN80	9612492906	1.4404	Spare part
33	1	Flange seal DN80	9612402606	EPDM	Wear part
34	1	Lantern	9690015401	AISI 316L	Spare part
35	5	Screw M10x30	9690016201	A4	Spare part
36	4	Washer	TE51B054	A4	Spare part
37	1	Gearmotor flange	9690015801	AISI 316L	Spare part
38	1	Parallel key	9690012501	1.4571	Spare part
39	1	Washer – marked w. rotation	9690019901	A4	Spare part
40	1	Gear motor	9690016701		Spare part
41	1	Clamp DN80 Unique	9612939306	AISI 304	Spare part
42	1	O-ring	9611994294	EPDM	Wear part
43	1	Drive shaft - motor	9690017401	AISI 316L/SAF 2205	Spare part
44	1	Pin	TE52C232	A4	Spare part
45	2	Pin	TE2601000350	A2	Spare part
46	1	Trap	TE2604026690	AISI 304	Spare part
47	2	O-ring	TE2601000287	FPM	Wear part
48	1	Retainer ring	TE2604037030	AISI 304	Spare part
49	4	Screw M5x6	TE2601000031	A2	Spare part
50-55	1	Shaft seal comp.	TE2608041570		Wear part
56	1	Downpipe – middle part	9690014101	AISI 316L	Spare part
57	1	Drive shaft – middle part	9690014301	AISI 316L	Spare part
58	2	Nozzle Ø12	TE50C512	AISI 316L	Spare part
58	2	Nozzle Ø13	TE50C513	AISI 316L	Spare part
58	2	Nozzle Ø14	TE50C514	AISI 316L	Spare part
58	2	Nozzle Ø15	TE50C515	AISI 316L	Spare part
58	2	Nozzle Ø17	TE50C517	AISI 316L	Spare part
58	2	Nozzle Ø19	TE50C519	AISI 316L	Spare part
58	2	Nozzle Ø21	TE50C521	AISI 316L	Spare part
59	1	Frequency converter	9690016601		Spare part

Alfa Laval IsoMix External Drive (IMXD) with middle section
Drawing (item number 9690012103..04..07..08)

Drawing (item number 9690012103..04..07..08)



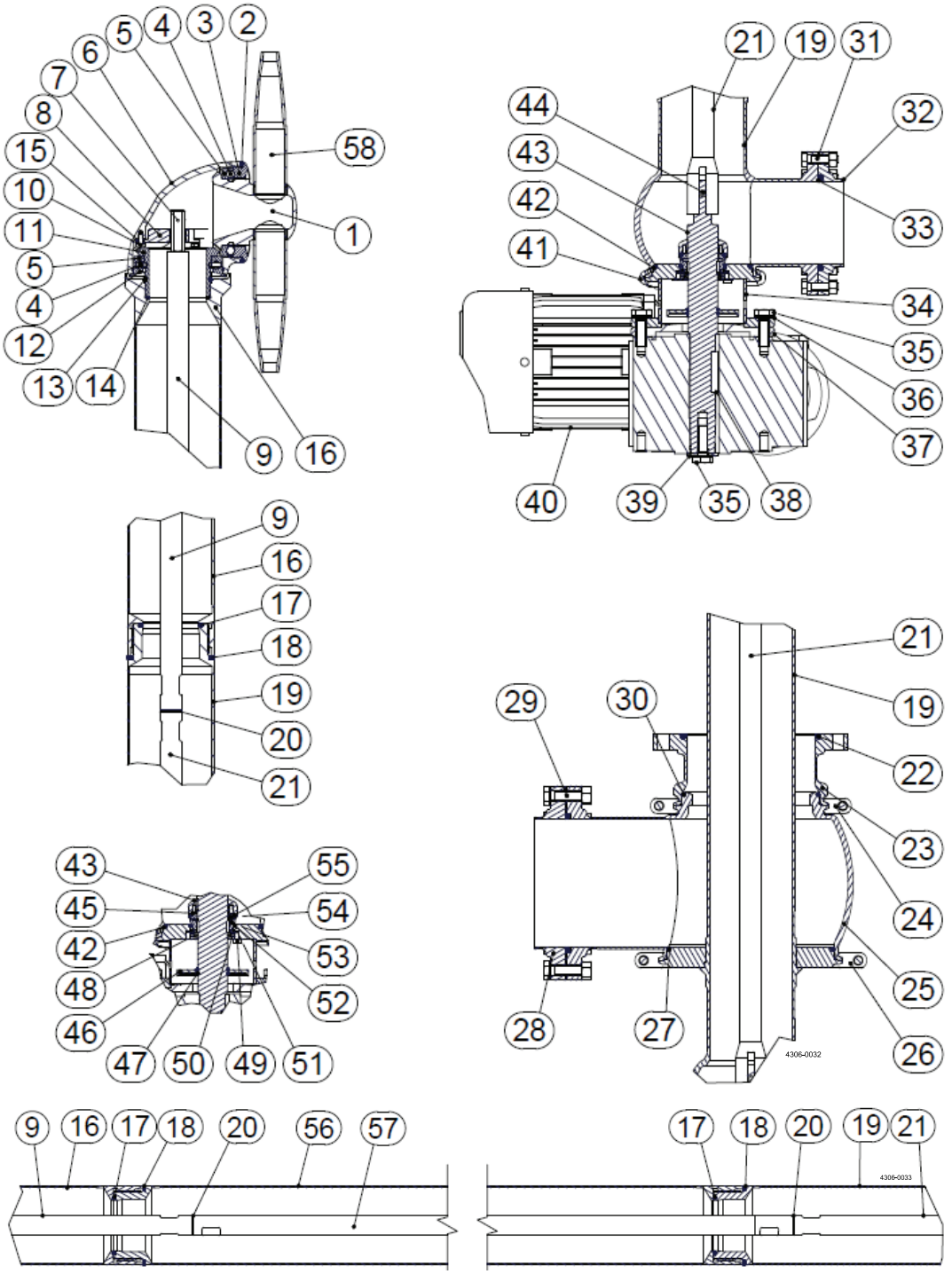
Alfa Laval IsoMix External Drive (IMXD) with middle section
Drawing (item number 9690012103..04..07..08)

Part list (item number 9690012104)

Pos.	Qty.	Denomination	Item no.	Material	Remark
1	1	Hub	9690013301	AISI 316L	Spare part
2	1	O-ring	9690003801	EPDM	Wear part
3	1	Hub nut	9690000702	SAF 2205	Wear part
4	2	Ball retainer w. balls	8010001753	PTFE/AISI 316	Wear part
5	2	Ball race	8010001752	SAF 2205	Wear part
6	1	Body	9690000501	AISI 316L	Spare part
7-9	1	Drive shaft – spray part – 1.5 m	9690012002	AISI 316L	Spare part
10	3	Screw f. body	TE20J550	1.4462	Spare part
11	1	Stem	9690013201	AISI 316L	Spare part
12	1	Stem nut	9690001302	SAF 2205	Wear part
13	1	O-ring	9690020601	FKM	Wear part
14	1	O-ring	9690005602	FEP/Sil	Wear part
15	6	Seal ring	TE20J509	PEEK	Wear part
16	1	Downpipe – spay part – 1.5 m	9690013502	AISI 316L	Spare part
17	1	O-ring	9690018801	EPDM	Wear part
18	1	Seal	9690018901	PTFE	Wear part
19	1	Valve section DN80	9690012301	AISI 316L	Spare part
20	1	O-ring	9690014701	EPDM	Wear part
21	1	Drive shaft – lower part	9690015301	AISI 316L	Spare part
22	2	Flange seal DN125	9612402608	EPDM	Wear part
23	1	Stub flange w. DN125 flange	9690016301	AISI 316L	Spare part
24	1	Clamp DN100-150 Unique	9613018002	AISI 304	Spare part
25	1	DN125 valve w. DN125 flange	9690016401	AISI 316L	Spare part
26	1	Clamp DN125-150 Mixproof	9613018102	AISI 304	Spare part
27	1	O-ring	9611993644	EPDM	Wear part
28	1	Flange w/o groove DN125	9612492908	1.4404	Spare part
29	8	Screws and nut M10x40	9612499303	AISI 304	Spare part
30	1	O-ring	9611993640	EPDM	Wear part
31	8	Screws and nut M8x30	9612499302	AISI 304	Spare part
32	1	Flange w/o groove DN80	9612492906	1.4404	Spare part
33	1	Flange seal DN80	9612402606	EPDM	Wear part
34	1	Lantern	9690015401	AISI 316L	Spare part
35	5	Screw M10x30	9690016201	A4	Spare part
36	4	Washer	TE51B054	A4	Spare part
37	1	Gearmotor flange	9690015801	AISI 316L	Spare part
38	1	Parallel key	9690012501	1.4571	Spare part
39	1	Washer – marked w. rotation	9690019901	A4	Spare part
40	1	Gear motor	9690016701		Spare part
41	1	Clamp DN80 Unique	9612939306	AISI 304	Spare part
42	1	O-ring	9611994294	EPDM	Wear part
43	1	Drive shaft - motor	9690017401	AISI 316L/SAF 2205	Spare part
44	1	Pin	TE52C232	A4	Spare part
45	2	Pin	TE2601000350	A2	Spare part
46	1	Trap	TE2604026690	AISI 304	Spare part
47	2	O-ring	TE2601000287	FPM	Wear part
48	1	Retainer ring	TE2604037030	AISI 304	Spare part
49	4	Screw M5x6	TE2601000031	A2	Spare part
50-55	1	Shaft seal comp.	TE2608041570		Wear part
56	1	Downpipe – middle part	9690014101	AISI 316L	Spare part
57	1	Drive shaft – middle part	9690014301	AISI 316L	Spare part
58	2	Nozzle Ø12	TE50C512	AISI 316L	Spare part
58	2	Nozzle Ø13	TE50C513	AISI 316L	Spare part
58	2	Nozzle Ø14	TE50C514	AISI 316L	Spare part
58	2	Nozzle Ø15	TE50C515	AISI 316L	Spare part
58	2	Nozzle Ø17	TE50C517	AISI 316L	Spare part
58	2	Nozzle Ø19	TE50C519	AISI 316L	Spare part
58	2	Nozzle Ø21	TE50C521	AISI 316L	Spare part
59	1	Frequency converter	9690016601		Spare part

Alfa Laval IsoMix External Drive (IMXD) with middle section
Drawing (item number 9690012103..04..07..08)

Drawing (item number 9690012103..04..07..08)



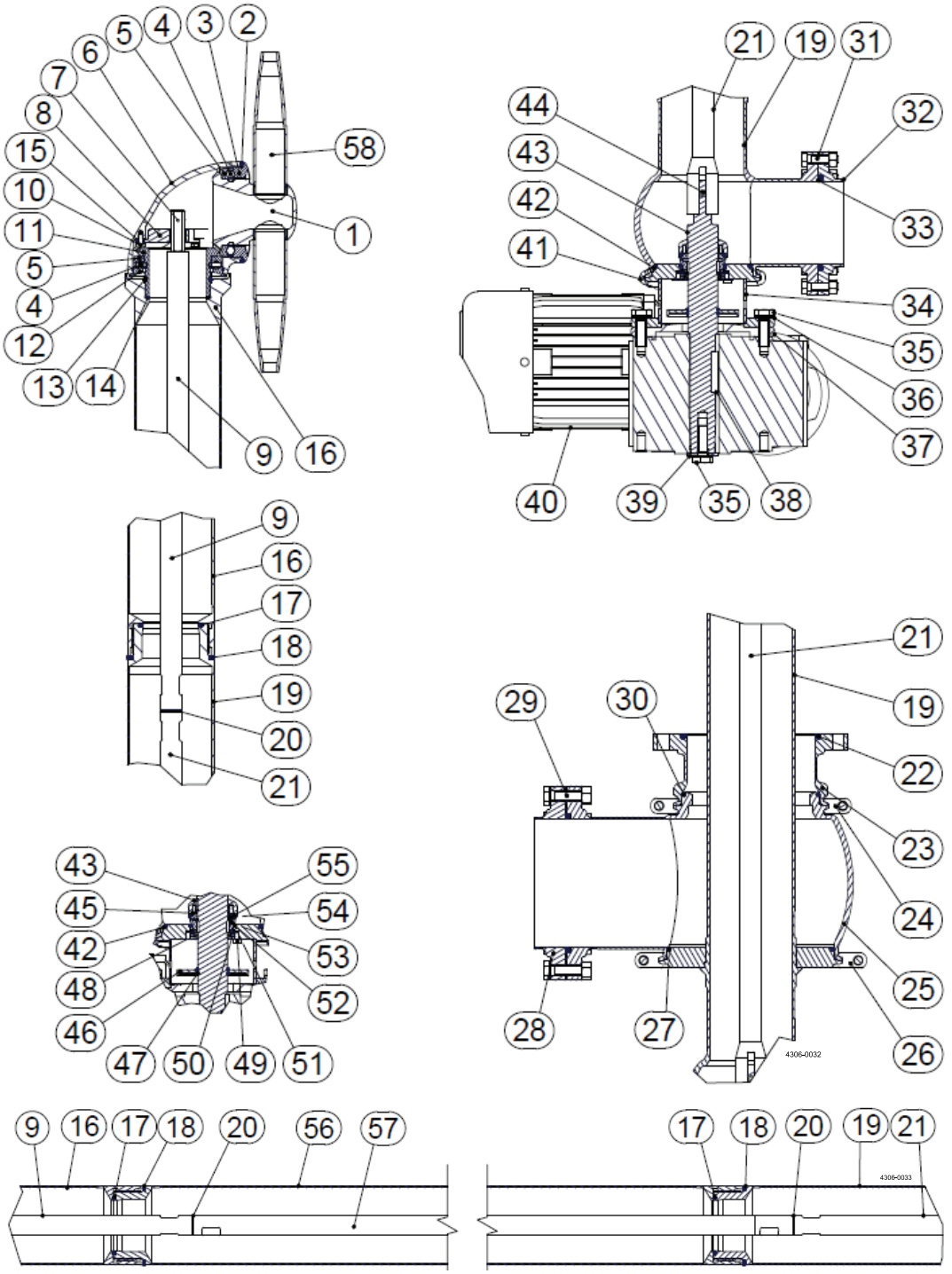
Alfa Laval IsoMix External Drive (IMXD) with middle section
Drawing (item number 9690012103..04..07..08)

Part list (item number 9690012107)

Pos.	Qty.	Denomination	Item no.	Material	Remark
1	1	Hub	9690013301	AISI 316L	Spare part
2	1	O-ring	9690003801	EPDM	Wear part
3	1	Hub nut	9690000702	SAF 2205	Wear part
4	2	Ball retainer w. balls	8010001753	PTFE/AISI 316	Wear part
5	2	Ball race	8010001752	SAF 2205	Wear part
6	1	Body	9690000501	AISI 316L	Spare part
7-9	1	Drive shaft – spray part – 0.7 m	9690012001	AISI 316L	Spare part
10	3	Screw f. body	TE20J550	1.4462	Spare part
11	1	Stem	9690013201	AISI 316L	Spare part
12	1	Stem nut	9690001302	SAF 2205	Wear part
13	1	O-ring	9690020601	FKM	Wear part
14	1	O-ring	9690005602	FEP/Sil	Wear part
15	6	Seal ring	TE20J509	PEEK	Wear part
16	1	Downpipe – spay part – 0.7 m	9690013501	AISI 316L	Spare part
17	1	O-ring	9690018801	EPDM	Wear part
18	1	Seal	9690018901	PTFE	Wear part
19	1	Valve section DN80	9690012301	AISI 316L	Spare part
20	1	O-ring	9690014701	EPDM	Wear part
21	1	Drive shaft – lower part	9690015301	AISI 316L	Spare part
22	2	Flange seal DN125	9612402608	EPDM	Wear part
23	1	Stub flange w. DN125 flange	9690016301	AISI 316L	Spare part
24	1	Clamp DN100-150 Unique	9613018002	AISI 304	Spare part
25	1	DN125 valve w. DN125 flange	9690016401	AISI 316L	Spare part
26	1	Clamp DN125-150 Mixproof	9613018102	AISI 304	Spare part
27	1	O-ring	9611993644	EPDM	Wear part
28	1	Flange w/o groove DN125	9612492908	1.4404	Spare part
29	8	Screws and nut M10x40	9612499303	AISI 304	Spare part
30	1	O-ring	9611993640	EPDM	Wear part
31	8	Screws and nut M8x30	9612499302	AISI 304	Spare part
32	1	Flange w/o groove DN80	9612492906	1.4404	Spare part
33	1	Flange seal DN80	9612402606	EPDM	Wear part
34	1	Lantern	9690015401	AISI 316L	Spare part
35	5	Screw M10x30	9690016201	A4	Spare part
36	4	Washer	TE51B054	A4	Spare part
37	1	Gearmotor flange	9690015801	AISI 316L	Spare part
38	1	Parallel key	9690012501	1.4571	Spare part
39	1	Washer – marked w. rotation	9690019901	A4	Spare part
40	1	Gear motor	9690016701		Spare part
41	1	Clamp DN80 Unique	9612939306	AISI 304	Spare part
42	1	O-ring	9611994294	EPDM	Wear part
43	1	Drive shaft - motor	9690017401	AISI 316L/SAF 2205	Spare part
44	1	Pin	TE52C232	A4	Spare part
45	2	Pin	TE2601000350	A2	Spare part
46	1	Trap	TE2604026690	AISI 304	Spare part
47	2	O-ring	TE2601000287	FPM	Wear part
48	1	Retainer ring	TE2604037030	AISI 304	Spare part
49	4	Screw M5x6	TE2601000031	A2	Spare part
50-55	1	Shaft seal comp.	TE2608041570		Wear part
56	1	Downpipe – middle part	9690014101	AISI 316L	Spare part
57	1	Drive shaft – middle part	9690014301	AISI 316L	Spare part
58	2	Nozzle Ø12	TE50C512	AISI 316L	Spare part
58	2	Nozzle Ø13	TE50C513	AISI 316L	Spare part
58	2	Nozzle Ø14	TE50C514	AISI 316L	Spare part
58	2	Nozzle Ø15	TE50C515	AISI 316L	Spare part
58	2	Nozzle Ø17	TE50C517	AISI 316L	Spare part
58	2	Nozzle Ø19	TE50C519	AISI 316L	Spare part
58	2	Nozzle Ø21	TE50C521	AISI 316L	Spare part

Alfa Laval IsoMix External Drive (IMXD) with middle section
Drawing (item number 9690012103..04..07..08)

Drawing (item number 9690012103..04..07..08)



Alfa Laval IsoMix External Drive (IMXD) with middle section
Drawing (item number 9690012103..04..07..08)

Part list (item number 9690012108)

Pos.	Qty.	Denomination	Item no.	Material	Remark
1	1	Hub	9690013301	AISI 316L	Spare part
2	1	O-ring	9690003801	EPDM	Wear part
3	1	Hub nut	9690000702	SAF 2205	Wear part
4	2	Ball retainer w. balls	8010001753	PTFE/AISI 316	Wear part
5	2	Ball race	8010001752	SAF 2205	Wear part
6	1	Body	9690000501	AISI 316L	Spare part
7-9	1	Drive shaft – spray part – 1.5 m	9690012002	AISI 316L	Spare part
10	3	Screw f. body	TE20J550	1.4462	Spare part
11	1	Stem	9690013201	AISI 316L	Spare part
12	1	Stem nut	9690001302	SAF 2205	Wear part
13	1	O-ring	9690020601	FKM	Wear part
14	1	O-ring	9690005602	FEP/Sil	Wear part
15	6	Seal ring	TE20J509	PEEK	Wear part
16	1	Downpipe – spay part – 1.5 m	9690013502	AISI 316L	Spare part
17	1	O-ring	9690018801	EPDM	Wear part
18	1	Seal	9690018901	PTFE	Wear part
19	1	Valve section DN80	9690012301	AISI 316L	Spare part
20	1	O-ring	9690014701	EPDM	Wear part
21	1	Drive shaft – lower part	9690015301	AISI 316L	Spare part
22	2	Flange seal DN125	9612402608	EPDM	Wear part
23	1	Stub flange w. DN125 flange	9690016301	AISI 316L	Spare part
24	1	Clamp DN100-150 Unique	9613018002	AISI 304	Spare part
25	1	DN125 valve w. DN125 flange	9690016401	AISI 316L	Spare part
26	1	Clamp DN125-150 Mixproof	9613018102	AISI 304	Spare part
27	1	O-ring	9611993644	EPDM	Wear part
28	1	Flange w/o groove DN125	9612492908	1.4404	Spare part
29	8	Screws and nut M10x40	9612499303	AISI 304	Spare part
30	1	O-ring	9611993640	EPDM	Wear part
31	8	Screws and nut M8x30	9612499302	AISI 304	Spare part
32	1	Flange w/o groove DN80	9612492906	1.4404	Spare part
33	1	Flange seal DN80	9612402606	EPDM	Wear part
34	1	Lantern	9690015401	AISI 316L	Spare part
35	5	Screw M10x30	9690016201	A4	Spare part
36	4	Washer	TE51B054	A4	Spare part
37	1	Gearmotor flange	9690015801	AISI 316L	Spare part
38	1	Parallel key	9690012501	1.4571	Spare part
39	1	Washer – marked w. rotation	9690019901	A4	Spare part
40	1	Gear motor	9690016701		Spare part
41	1	Clamp DN80 Unique	9612939306	AISI 304	Spare part
42	1	O-ring	9611994294	EPDM	Wear part
43	1	Drive shaft - motor	9690017401	AISI 316L/SAF 2205	Spare part
44	1	Pin	TE52C232	A4	Spare part
45	2	Pin	TE2601000350	A2	Spare part
46	1	Trap	TE2604026690	AISI 304	Spare part
47	2	O-ring	TE2601000287	FPM	Wear part
48	1	Retainer ring	TE2604037030	AISI 304	Spare part
49	4	Screw M5x6	TE2601000031	A2	Spare part
50-55	1	Shaft seal comp.	TE2608041570		Wear part
56	1	Downpipe – middle part	9690014101	AISI 316L	Spare part
57	1	Drive shaft – middle part	9690014301	AISI 316L	Spare part
58	2	Nozzle Ø12	TE50C512	AISI 316L	Spare part
58	2	Nozzle Ø13	TE50C513	AISI 316L	Spare part
58	2	Nozzle Ø14	TE50C514	AISI 316L	Spare part
58	2	Nozzle Ø15	TE50C515	AISI 316L	Spare part
58	2	Nozzle Ø17	TE50C517	AISI 316L	Spare part
58	2	Nozzle Ø19	TE50C519	AISI 316L	Spare part
58	2	Nozzle Ø21	TE50C521	AISI 316L	Spare part

8.3 IMXD Shaft seal complete

Part list, item no. TE2608041570

Pos.	Qty.	Denomination	Item no.	Material	Remark
50	1	Spring	TE2602037210	AISI 316L	Wear part
51	1	Stationary drive ring, S2	TE260203720A	AISI 316L	Wear part
52	1	O-ring	TE2601000436	AL 133 E12712	Wear part
53	1	Seal	TE2602038220	Carbon graphite	Wear part
54	1	Seal	TE2602037190	Silicon carbide	Wear part
55	1	O-ring	TE2601000235	AL 133 E12712	Wear part

8.4 Nozzle sizes (ordered separately)

Pos	Qty	Item #	ØNozzles / [mm]
58	2	TE50C512	12
58	2	TE50C513	13
58	2	TE50C514	14
58	2	TE50C515	15
58	2	TE50C517	17
58	2	TE50C519	19
58	2	TE50C521	21

8.5 IMXD Gear motor

Part list, item no. 9690016701

Gear motor specification	
Type:	Double helical gear unit
Motor norm:	IE3
Motor protection class:	IP55
Shaft material:	1.4057
Motor temperature protection:	PTC resistor, 3x155°C
Motor Backstop / Freewheel bearing:	No
Lubrication type*	Food-compatible oil ISO VG 680
Lubrication supplier*:	Klüber
Lubrication classification*:	CLP PG H1 680
Lubrication quantity:	0.18 ltr
Surface colour:	RAL 5010
Surface treatment:	Normal
Surface corrosion class:	EN 12944-2, C2
Labelling:	According to legislation

* For more information and certificate, see chapter 9.3 Drive unit instructions

8.6 Frequency converter (9690012101..02..03..04)

Part list, item no. 9690016601

Frequency converter specification	
Inverter protection class:	IP66
Supply phases x voltage (V):	3 x 400
FI - mains voltage connection:	3AC 380-480V, -20%/+10%, 47-63 Hz
Power FI (kW):	0.250
Output current (A):	1.2
Input current (A):	2.0

8.7 Spare part kits

Inspection kit (Item number 9690018702)

Pos.	Qty.	Denomination	Item no.	Material
4	2	Ball retainer w balls	8010001753	PTFE/AISI 316
2	1	O-ring	9690003801	EPDM
15	6	Seal ring	TE20J509	PEEK 450G
14	1	O-ring	9690005602	FEP/SIL
13	1	O-ring	9690020601	FKM
50-55	1	Shaft seal comp	TE2608041570	Sic/Carb
42	1	O-ring	9611994294	EPDM
18	2	Seal	9690018901	PTFE
17	2	O-ring	9690018801	EPDM
27	1	O-ring	9611993644	EPDM
30	1	O-ring	9611993640	EPDM
20	2	O-ring	9690014701	EPDM
47	2	O-ring	TE2601000287	FPM

Service kit (Item number 9690019702)

Pos.	Qty.	Denomination	Item no.	Material
4	2	Ball retainer w balls	8010001753	PTFE/AISI 316
2	1	O-ring	9690003801	EPDM
15	6	Seal ring	TE20J509	PEEK 450G
14	1	O-ring	9690005602	FEP/SIL
13	1	O-ring	9690020601	FKM
50-55	1	Shaft seal comp	TE2608041570	Sic/Carb
42	1	O-ring	9611994294	EPDM
18	2	Seal	9690018901	PTFE
17	2	O-ring	9690018801	EPDM
27	1	O-ring	9611993644	EPDM
30	1	O-ring	9611993640	EPDM
20	2	O-ring	9690014701	EPDM
47	2	O-ring	TE2601000287	FPM
5	2	Ball race	8010001752	SAF 2205
3	1	Hub nut	9690000702	SAF 2205
12	1	Stem nut	9690001302	SAF 2205

Upgrade kit (Item number 8010002068)

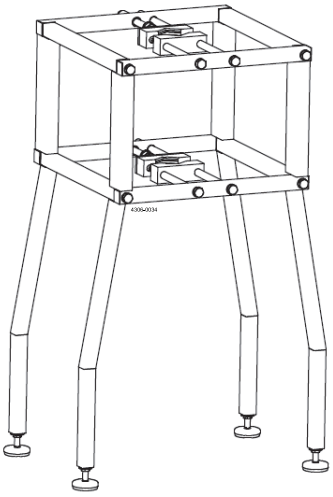
Pos.	Qty.	Denomination	Item no.	Material
4	2	Ball retainer w balls	8010001753	PTFE/AISI 316
5	2	Ball race	8010001752	SAF 2205

8.8 Accessories and tools

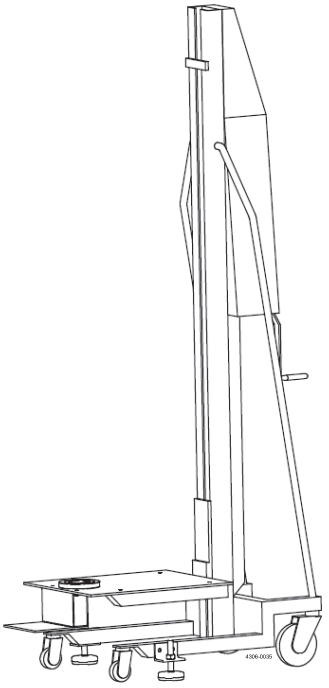
Mounting tool

For tanks with a minimum clearance of 1700 mm to the floor two mounting tools are available:

Qty	Item no.	Material
1	9680214163	Lifting tool
1	9680227383	Lifting device



Lifting tool



Lifting device

Mounting/service Tool, Parts List (Item number 9690020501):

Qty x item no.	Denomination
1 x 9690007801	Ball race tool
1 x 9690007901	Nut tool
2 x 9690020401	Strap wrench, 2-5.5”
2 x TE81B108	Fork key, NV17
1 x TE81B157	NV8 socket long
1 x TE81B156	Torque wrench ¼” 5-25 Nm
1 x 9690020202	NV13 socket
1 x 9690020201	NV10 socket
1 x 9690020301	Fork key, NV30
1 x TE81B148	Pin punch

Special tool for disassembly (also included in above toolkit) ....

1 x 9690007901	Nut tool

Standard tools (not part of tool kit):

Qty	Denomination
1	Hammer
1	Flat headed screwdriver

9.1 Declaration of Compliance

Declaration of Compliance

EU Regulation (EC) 1935/2004
and
US Regulation FDA 21CFR§177

Article Nr: 9690-0121-xx

Product: IMXD

Conformity for products and articles intended to come into contact with food.

We hereby confirm that products and articles stated above are in accordance with EU Regulation (EC) 1935/2004 and EU Regulation (EC) 10/2011 including amendments (on plastic materials and articles intended to come into contact with food) within the period of transition stated in article 22, and EU Regulation (EC) 2023/2006 (GMP: Good Manufacturing Practice for food contact materials and articles).

Finished articles subject to an overall migration limit of 10 mg/dm^2 or 60 mg/kg.
The following substances subject to limitations are used in the above stated article:
SML:

	PFA mg/kg food	PTFE mg/kg food	
TFE	0.05	0.05	
PPVE	0.05		

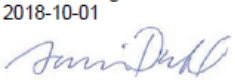
**) This information is provided only under a non-disclosure agreement for the purpose of conformance testing.

Migration from the plastic articles has been investigated by calculations as laid down in paragraph (32) in Regulation (EC) No. 10/2011, to control that the migration limits and other requirements are fulfilled. The articles can be used, within its application area, with all type of foods at batch size above 400 kg*.

*Based on worst case scenario = dissolving 100% of the polymer material in one single batch

We hereby also confirm that products and articles stated above are in accordance to US regulation FDA 21CFR§177.1550 for PFA and PTFE

Name of issuer: Annie Dahl
Title: QHSE Manager
Date (YYYY-MM-DD): 2018-10-01
Sign of issuer



Alfa Laval Kolding A/S
DK-6000 Kolding - Denmark
Visit: 31, Albuen - DK-6000 Kolding - Denmark
Registration number: 30938011
Tel switchboard: +45 79 32 22 00 - Fax switchboard: 45 79 32 25 80
http://www.alfalaval.com - kolding.reception@alfalaval.com

9.2 Drive unit lubrication

NSF International / Nonfood Compounds Registration Program

Nonfood Compounds

September 29, 2017

Ms. Corinna Gienger
Klüber Lubrication München SE & Co. KG
Geisenhausenerstrasse 7
D-81379 Munich
Germany

RE: Klübersynth UH1 6-680
Category Code: H1
NSF Registration No. 124441

Dear Ms. Corinna Gienger:

NSF has processed the application for Registration of **Klübersynth UH1 6-680** to the NSF International Registration Guidelines for Proprietary Substances and Nonfood Compounds (2013), which are available upon request by contacting NonFood@nsf.org. The NSF Nonfood Compounds Registration Program is a continuation of the USDA product approval and listing program, which is based on meeting regulatory requirements including FDA 21 CFR for appropriate use, ingredient and labeling review.

This product is acceptable as a lubricant with incidental food contact (H1) for use in and around food processing areas. Such compounds may be used on food processing equipment as a protective anti-rust film, as a release agent on gaskets or seals of tank closures, and as a lubricant for machine parts and equipment in locations in which there is a potential exposure of the lubricated part to food. The amount used should be the minimum required to accomplish the desired technical effect on the equipment. If used as an anti-rust film, the compound must be removed from the equipment surface by washing or wiping, as required to leave the surface effectively free of any substance which could be transferred to food being processed.

NSF Registration of this product is current when the NSF Registration Mark and Category Code appear on the NSF-approved product label, and the Registered product name is included in the current NSF White Book Listing of Nonfood Compounds at the NSF website (www.nsfwhitebook.org).

NSF Listing of all Registered Nonfood compounds by NSF International is not an endorsement of those compounds, or of any performance or efficacy claims made by the manufacturer.

Registration status may be verified at any time via the NSF website, at www.nsfwhitebook.org. Changes in formulation or label, without the prior written consent of NSF, will void Registration, and will supersede the on-line listing. Please contact your NSF Project Manager or nonfood@nsf.org if you have any questions or concerns pertaining to this letter.

Sincerely,

Carolyn Gillilland
NSF Nonfood Compounds Registration Program

Company No: N04391

Product information

Klübersynth UH1 6 oils

Synthetic gear and high-temperature oils for the food-processing and pharmaceutical industries

Benefits for your application

- **The oils meet the requirements according to DIN 51 517 – 03, CLP**
- **Registered by NSF as H1 lubricants-for use in food-processing and pharmaceutical industries, complies with FDA 21 CFR Sec. 178.3570**
- **ISO 21469 certified – supports the compliance with the hygienic requirements in your production. You will find further information about ISO Standard 21469 on our website www.klueber.com.**
- **Much longer service life than mineral oils due to the excellent ageing and oxidation resistance of the base oil; thus maintenance intervals can be extended and in certain cases even lifetime lubrication is possible**
- **Owing to the wide service temperature range it is possible in many cases to use just one viscosity grade for both low and high temperatures**
- **The optimum friction behavior of the polyglycol base oil reduces power losses and improves efficiency**
- **The good wear protection of both gears and rolling bearings ensure that the service life calculated for the lubricated components is achieved.**
- **The oils' high micropitting resistance offers sufficient protection to gears that are subject to high loads and would normally be susceptible to this type of damage.**
- **The excellent viscosity-temperature behavior supports the formation of a sufficient lubricating film even at elevated and high temperatures.**
- **Seals made of 72 NBR 902, 75 FKM 585 and 75 FKM 170055 are resistant against Klübersynth UH1 6 oils.**
- **Approved by Flender, Siemens Geared Motors, SEW Eurodrive, Getriebebau Nord, Stöber Antriebstechnik, Lenze, ZAE Antriebstechnik Baldor, Boston Gear, Bonfiglioli, Watt Drive etc.**

Description

Klübersynth UH1 6 oils are gear oils on a polyglycol basis. They have a high scuffing load capacity and
micro-pitting resistance. These oils have also proved their good wear protection in rolling bearings on the FAG FE 8 test rig for gear oils.

Klübersynth UH1 6 oils stand out for their excellent ageing and oxidation resistance, good viscosity-temperature behaviour and very good thermal stability.

Application

Klübersynth UH1 6 oils are used for the lubrication of bevel and spur gears, rolling and plain bearings as well as all types of denture clutches, especially when exposed to high temperatures.
Klübersynth UH1 6 oils were especially developed for the lubrication of worm gears with steel/bronze pairings.
The polyglycol base oils and special additives reduce the friction coefficient and provide low wear values, which is a clear advantage in these applications.

Klübersynth UH1 6-100, 150, 220, 320, 460, 680, en
article number: 096094, 096058, 096059, 096063, 096060, 096064

Edition 12.09, replaces edition 07.09
MA-TM/HSi

Product information

Klübersynth UH1 6 oils

Synthetic gear and high-temperature oils for the food-processing and pharmaceutical industries

Klübersynth UH1 6 oils achieve a particularly low wear intensity according to DIN 3996 (calculation of load capacity).
Klübersynth UH1 6 oils can also be used for the lubrication of lifting, drive and transport chains.

Application notes

Klübersynth UH1 6 oils can be applied by immersion, immersion/circulation and injection.

Klübersynth UH1 6 oils are **not** miscible with mineral oils and synthetic hydrocarbons like polyalphaolefins.

Application notes

We recommend cleaning the lubrication points or rinsing gears with the Klübersynth UH1 6 oil which will be used after conversion.

Klübersynth UH1 6 oils are neutral towards ferrous metals and almost all nonferrous metals.

There may be increased wear when the contact surfaces of design elements made of aluminium or aluminium alloys are exposed to dynamic loads. If necessary, preliminary tests should be carried out.

For permanent temperatures up to 80°C seals made of 72 NBR 902 may be used. For higher temperatures, we recommend to use seals made of 75 FKM 585.
It should be noted that elastomers from one or several manufacturers can behave differently.

When applying Klübersynth UH1 6 oils we recommend the use of two-component paints (reaction paints) for interior coating. Oil gauge glasses should preferably be made of natural glass or polyamide materials. Other transparent plastics, e.g. Plexiglas, have a tendency to crack under stress.

The suitability of materials used in contact with Klübersynth UH1 6 oils should be tested, especially prior to series application.

Viscosity selection

When determining the oil viscosity for gears, the manufacturer's instructions take priority. Only in cases where there are no gear manufacturer's instructions, the viscosity can be selected in accordance with the enclosed worksheet "Klübersynth UH1 6 oils – selection of oil viscosity for gears".

To determine the correct oil viscosity for bearings, please observe the bearing manufacturer's instructions.

For determining the existing viscosity, please refer to the enclosed viscosity-temperature diagram indicating the differing viscosity-temperature behavior of Klübersynth UH1 6 oils as compared to mineral oils.

Minimum shelf life

The minimum shelf life is approx. 36 months if the product is stored in its unopened original container in a dry, frost-free place.

Pack sizes

20 l canister
200 l drum

Material Safety Data Sheets

Material safety data sheets can be downloaded or requested via our website www.klueber.com. You may also obtain them through your contact person at Klüber Lubrication.

Klübersynth UH1 6-100, 150, 220, 320, 460, 680, en
article number: 096094, 096058, 096059, 096063, 096060, 096064

Edition 12.09, replaces edition 07.09
MA-TM/HSi

Product information

Klübersynth UH1 6 oils

Synthetic gear and high-temperature oils for the food-processing and pharmaceutical industries

Product data

Klübersynth UH1 6- ...	100	150	220	320	460	680
Marking acc. to DIN 51502	CLP PG 100	CLP PG 150	CLP PG 220	CLP PG 320	CLP PG 460	CLP PG 680
Marking acc. to ISO 12925-1	CKC 100	CKC 150	CKC 220	CKC 320	CKC 460	CKC 680
NSF-H1 registration*, registration no.	137872	124437	124438	124439	124440	124441
ISO VG DIN 51 519	100	150	220	320	460	680
Density, DIN 51 757, at 15 °C, [kg/m³], approx.	1040	1050	1060	1065	1075	1075
Kinematic viscosity, DIN 51 562, pt. 01 at 20 °C, [mm²/s], approx. at 40 °C, [mm²/s], approx. at 100 °C, [mm²/s], approx.	 250 100 19.5	 390 150 28.5	 610 220 41	 840 320 56	 1270 460 78	 1900 680 115
Viscosity index, DIN ISO 2909, approx.	≥ 190	≥ 210	≥ 220	≥ 220	≥ 240	≥ 250
Flash point, DIN ISO 2592, [°C]	≥ 220	≥ 220	≥ 220	≥ 220	≥ 220	≥ 220
Pour point, DIN ISO 3016, [°C]	≤ -45	≤ -35	≤ -35	≤ -30	≤ -30	≤ -25
Foaming characteristics, ASTM D 892, sequence I, II, III [ml]	≤ 100/10					
Copper corrosion, DIN EN 2160, 24 h, corrosion rating	1 - 100					
Corrosion protection on steel, DIN ISO 7120	0 – A					
Ageing characteristics, ASTM D 2893, increase in viscosity, [%]	≤ 6					
FZG gear test rig, A/8.3/90 DIN 14635-1, scuffing load stage	≥ 12					
FZG gear test rig, A/16.9/90 DIN 14635-1. scuffing load stage	≥ 11	≥ 12				
Rolling bearing test rig FE 8, D 7,5/80-80, DIN 51 819-3, wear of rolling elements, [mg]	≤ 30					
Lower service temperature range**, [°C]	-35		-30			-25
Upper service temperature range**, [°C]	160					

* This lubricant is registered as H1, which means that it has been designed for incidental, technically unavoidable food contact. Experience shows that it can be used for equivalent applications in the cosmetic and pharmaceutical industry under the conditions described in the product information leaflet. Specific test results as e.g. biocompatibility, which could be an additional requirement for applications in the pharmaceutical industry, are not available for this product. Therefore, before using the lubricant adequate risk analyses should be performed and, if necessary, suitable measures be taken by the manufacturer and user of installations in order to exclude the risk of health hazards and personal injuries.

** Service temperatures are guide values which depend on the lubricant's composition, the intended use and the application method. Lubricants change their consistency, shear viscosity or viscosity depending on the mechano-dynamical loads, time, pressure and temperature. These changes in product characteristics may affect the function of a component.

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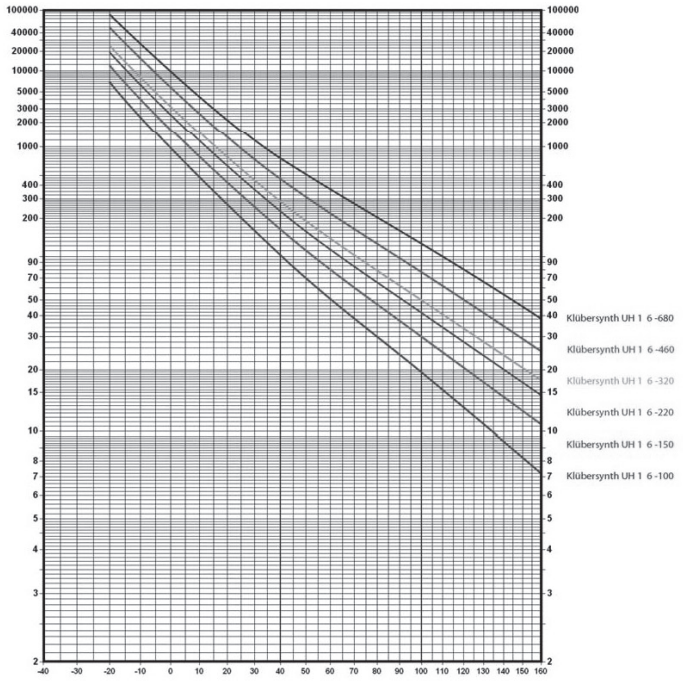
MA-TM/HSi

Product information

Klübersynth UH1 6 oils

Synthetic gear and high-temperature oils for the food-processing and pharmaceutical industries

Viscosity-Temperature Diagram



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9.3 Drive unit instructions

The drive unit is supplied by sub supplier and all important installation requirement is transferred to the Alfa Laval IsoMix External Drive (IMXD) Instruction manual. For further information regarding maintenance and storage of the drive unit please find the drive unit instruction manual by below links:

For the electrical motor part please find the drive unit instruction manual at link below:
https://www.nord.com/cms/en/documentation/manuals/details_1139/detail_42399.jsp

For the gear part please find the drive unit instruction manual at link below:
https://www.nord.com/cms/en/documentation/manuals/details_1139/detail_42075.jsp

9.4 Frequency converter instructions

The frequency converter is supplied by sub supplier and all important installation requirement is transferred to the Alfa Laval IsoMix External Drive (IMXD) Instruction manual.

For further information regarding maintenance and storage of the frequency converter please find the frequency converter instruction manual by below links:

https://www.nord.com/cms/dk/documentation/manuals/details_1139/detail_72640.jsp

If motor stops and the frequency converter starts with a series of 12 red flashes, see section 5.4 Troubleshooting.

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.