Rotary Jet Mixer IM-10

Tank mixers



Lit. Code 200007968-1-EN-GB

Instruction manual

British English

Published by
Alfa Laval Kolding A/S
Albuen 31
DK-6000 Kolding, Denmark
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The original instructions are in English

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Contents

1 Declarations of Conformity 5

2 Safety 9
- 2.1 Safety signs 10
- 2.2 Safety precautions 12
- 2.3 Warning signs in text 16
- 2.4 Requirements of personnel 17
- 2.5 Recycling information 18

3 Introduction 19
- 3.1 Introduction 19
- 3.2 Marking 20
- 3.3 Intended use 21
- 3.4 Patents and trademarks 21
- 3.5 Quality system 21

4 Installation 23
- 4.1 General description 23
- 4.2 Functioning 23
- 4.3 General safety and installation instructions 24
- 4.4 Safety precautions 25

5 Operation 27
- 5.1 Normal operation 27

6 Maintenance 29
- 6.1 Service and repair 29
- 6.2 Preventive maintenance 30
  - 6.2.1 Maintenance product contact parts made of plastic 32
- 6.3 Assembly of turbine and carrier 33
- 6.4 Remaining assemblies 35
- 6.5 Replacement of ball races 37

7 Troubleshooting 39
- 7.1 Trouble shooting guide 39

8 Technical Data 41
- 8.1 Technical data 41
- 8.2 Physical data 41
- 8.3 Dimensions 42
- 8.4 Flow rate 43

8.5 Throw length....43
8.6 Rotation speed....44

9 Product programme....45
9.1 Standard configuration for Alfa Laval Rotary Jet Mixer IM 10....45
9.2 Available add-ons....45

10 Spare parts....47
10.1 Ordering spare parts....47
10.2 Alfa Laval service....47
10.3 Warranty - Definition....48

11 Parts lists and exploded views....49
11.1 Alfa Laval Rotary Jet Mixer IM 10....49

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

IM10

Type

2015-0001 - 2030-99999, AAX000000001-AAX999999999

Serial number

is in conformity with the following directives with amendments:

- Machinery Directive 2006/42/EC

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

Vice President Business Unit Hygienic Fluid Handling and Heat Transfer Technologies, Head of Product Management	Mikkel Nordkvist
Title	Name
Kolding, Denmark	2026-10-01
Place	Date (YYYY-MM-DD)



Signature

DoC Revison_ 01_102026 / This Declaration of Conformity replaces Declaration of Conformity dated 2022-11-08

CE

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

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2015-0001 - 2030-99999, AAX000000001-AAX999999999

Serial number

is in conformity with the following directives with amendments:

- Regulation (EU) 2023/1230 on machinery

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

Vice President Business Unit Hygienic Fluid Handling and Heat Transfer Technologies, Head of Product Management	Mikkel Nordkvist	
Title	Name	
Kolding, Denmark	2027-01-20	
Place	Date (YYYY-MM-DD)	Signature

DoC Revison_02_012027

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

IM10

Type

2015-0001 - 2030-99999, AAX000000001-AAX999999999

Serial number

is in conformity with the following directives with amendments:

- The Supply of Machinery (Safety) Regulations 2008

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

Vice President Business Unit Hygienic Fluid Handling and Heat Transfer Technologies, Head of Product Management	Mikkel Nordkvist	
Title	Name	
Kolding, Denmark	2026-10-01	
Place	Date (YYYY-MM-DD)	Signature

DoC Revison_02_102026

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2 Safety

Read this first





This Instruction Manual is designed for operators and service engineers working with the supplied Alfa Laval product.

Operators must read and understand the ***Safety, Installation and Operating*** instructions of the supplied Alfa Laval product before carrying out any work or before you put the supplied Alfa Laval product into service!

Not following the instructions can result in serious accidents.

This documentation describes the authorized way to use the supplied Alfa Laval product. Alfa Laval will take no responsibility for injury or damage if the equipment is used in any other way.

This Instruction Manual is designed to provide the user with the information to perform tasks safely for all phases in the lifetime of the supplied Alfa Laval product.

The operator shall always read the chapter ***Safety*** first. Hereafter the operator can skip to the relevant section for the task to be carried out or for the information needed.

Always read the chapter ***Technical Data*** thoroughly.

This is the complete Instruction Manual for the supplied Alfa Laval product.

NOTE

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

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

2.1 Safety signs

Mandatory action signs

	General mandatory action sign.
	Refer to instruction manual.
	Use eye protection - safety glasses.
	Use protective hand wear - safety gloves.
	Wear protective equipment - safety helmet.
	Use ear protection in noisy environments - noise protector.
	Wear protective equipment - safety shoes.

Warning Signs

	General warning.
	Corrosive substance.
	Hot surface and burning danger.
	Cutting danger.
	Heavy object lifting.
	Transportation with forklift truck or other industrial vehicles if heavy.
	Electricity.
	Sharp element.
	Crushing of hands.

2.2 Safety precautions

All warnings in the Instruction manual are summarised in this section. Pay special attention to the instructions below so that severe personal injury and/or damage to the supplied Alfa Laval Product is avoided.

Transportation and lifting

 	**Always** ensure that personnel must have experience with lifting operations. **Always** ensure that the personnel use the correct protective equipment.
	**Always** ensure that compressed air is released.
	**Always** ensure that all connections are disconnected before attempting to remove the machine from the installation.
 	**Always** use predesigned lifting points if defined. Ensure that the lifting equipment is suitable for the machine. **Always** ensure the lifting point to be in line with centre of gravity. Adjust lifting point if necessary. **Always** use appropriate lifting equipment for heavy parts when relevant. Use lifting logs when available.
	**Always** keep an eye on the load and stay clear during the lifting operation.
	**Always** drain liquid out of the machine before transportation.
	**Always** ensure sufficient fixing of the machine during transportation - if specially designed packaging material is available, it must be used.
	**Always** use original packaging or similar during transportation.

Installation

	**Always** follow this Instruction manual thoroughly. Before installing the machine and setting it into operation carefully read *Safety* on page 9, *General safety and installation instructions* on page 24 and *Operation* on page 27.
	**Ensure** that the machine is compatible with the product and CIP media.
	**Never** dismantle or touch the machine or pipelines when processing hot fluids or when sterilising.
	**Ensure** that the tank being cleaned does not contain a combustible liquid or vapor having a risk of ignition or explosion. Any tank cleaning machine can develop a static electricity charge while in operation.
	**Always** ensure all pipelines (product, air, and water) are depressurized and emptied before installation, inspection, assembling and disassembling. **Always** assemble the machine completely before start and make sure everything is in place and properly tightened.
	**Ensure** that the tank cleaning device is properly grounded if the tank being cleaned contains a combustible liquid or vapor having a risk of ignition or explosion. Any tank cleaning device can develop a static electricity charge while in operation.

Operation

	**Always** follow this Instruction manual thoroughly. Before installing the machine and setting it into operation carefully read *Safety* on page 9, *General safety and installation instructions* on page 24 and *Operation* on page 27.
	**Ensure** that the machine is compatible with the product and CIP media. **Always** take necessary precautions if leakage occurs as this can lead to hazardous situations. If the liquid or vapor is hot, corrosive, or toxic, a leak would present a serious hazard to any personnel in the immediate vicinity or to any exposed electrical equipment. **Always** rinse well with clean water after cleaning. **Always** handle lye and acid with great care. **Always** follow the instructions in the safety data sheets from the suppliers of cleaning agents, detergents, oils etc.
	**Never** operate the machine unless it is properly mounted or installed.
	**Never** dismantle or touch the machine or pipelines when processing hot fluids or when sterilising.
	**Ensure** every tank opening is covered before operating the tank cleaning device. These covers should be sealed well enough to withstand the full force of the liquid hitting the covers.

Maintenance

	**Always** follow this Instruction manual thoroughly. Before maintaining the machine, carefully read *Maintenance* on page 29.
	**Always** rinse well with clean water prior to maintenance.
	**Always** ensure all pipelines (product, air, and water) are depressurized and emptied before installation, inspection, assembling and disassembling. **Always** assemble the machine completely before start and make sure everything is in place and properly tightened.
	**Never** dismantle or touch the machine or pipelines when processing hot liquids or when sterilising.

Storage

	Alfa Laval recommends: • Store the supplied Alfa Laval product as supplied in original packaging • Port opening(s) should be protected against ingress • Bare steel (not stainless) should be lightly oiled/greased • Store in a clean, dry place without direct sunlight or UV light • Temperature range -5°C to +40°C (23°F - 104°F) • Relative humidity less than 60%
	• No exposure to corrosive substances (including contained air) • Rinse the supplied Alfa Laval product with clean water before storage

Hazards

 	**Burn Hazard** Various surfaces of the supplied Alfa Laval product and CIP supply line can be hot and cause burns. Wear protective gloves.

  	**Corrosive Hazard** **Always** handle cleaning liquids (e.g., lye and acid) with great care and in accordance with separate instructions for those fluids. **Always** follow the general rules and recommendations regarding ventilation, personnel protection etc. when using chemical cleaning agents and lubricants.

Safety check

	A visual inspection of any protective device (shield, guard, cover or other) on the supplied Alfa Laval product shall be carried out at least every 12 months. If the protective device is lost or damaged, especially when this leads to deterioration of safety performance, it shall be replaced. The fixing of the protective device should only be replaced with fixings of the same or an equivalent type. **Inspection acceptance criteria:** • It should not be possible to reach moving parts originally protected by a protective device • The protective device must be securely mounted • Ensure that screws for the protective device are securely tightened **Procedure in case of non-acceptance:** • Fix and/or replace the protective device

2.3 Warning signs in text

Pay attention to the safety instructions in this Instruction manual.

Below are definitions of the three grades of warning signs used in the text where there is a risk for injury to personnel or damage to the supplied Alfa Laval product.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate damage to the supplied Alfa Laval product.

NOTE

Indicates important information to simplify or clarify procedures.

2.4 Requirements of personnel

Operators

The operators shall read and understand this Instruction Manual.

Maintenance personnel

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

Trainees

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

People in general

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

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

2.5 Recycling information

Unpacking

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

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

Maintenance

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

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

Scrapping

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

How to contact Alfa Laval

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

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

3 Introduction

The Alfa Laval IM 10 Rotary Jet Mixer effectively handles liquid mixing, gas dispersion, powder mixing, and tank cleaning while reducing mixing time, energy consumption and costs.

Patented technology based on proven Rotary Jet Head technology, it provides quick, efficient and uniform mixing without any batch rotation or the use of baffles. It also ensures greater process flexibility, making it easy to switch to new product formulations with diverse viscosities, densities and volumes.

3.1 Introduction

This manual has been prepared as a guide for the persons who will be operating and maintaining your Rotary Jet Mixer IM-10. The key to long life for your mixer will always be a system of carefully planned maintenance procedures; you will appreciate that a mixer which has a rough job to do will need more frequent attention than one working in ideal conditions.

NOTE

Get the best and most economical performance from your tank cleaning machine. Insufficient preventive maintenance means poor performance, unscheduled stops, shorter lifetime and extra costs. Good preventive maintenance on the contrary means good performance, no unscheduled stops and superior total economy.

You will find the information contained in this manual simple to follow, but should you require further assistance, our Technical Department will be pleased to help you. Please quote the type and serial number with all your enquiries; this will help us to help you. The type and serial number are placed on the gear house of the mixer.

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.

WARNING

Before installing the machine and setting it into operation carefully read *General safety and installation instructions* on page 24 and *Safety precautions* on page 12 and take all necessary precautions according to your application and local regulations.

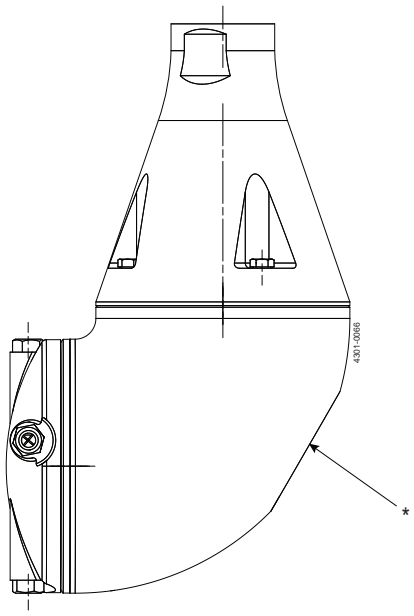
The English version of the instruction manual is the original manual. We make reservations in regard to possible mistranslations in language versions of the instruction manual. In case of doubt, the English version of the instruction manual applies.

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3.2 Marking

Alfa Laval tank cleaning machines are all marked to allow recognition of machine type, machine name, Serial number and manufacturing address. The marking are placed on the gear house of the mixer.



*Marking area



OR



Serial number designation

Machines supplied with standard documentation or with Q-doc:

yyyy-xxxxx: serial number

yyyy: year

xxxxx: 5 digit sequential number

OR

Serial number designation

AAXxxxxxxxxx

(three letters plus up to nine digits)

3.3 Intended use

It is to be verified by the end-user:

- that the rotary jet mixer is in conformity with respect to tank, vessel or container size in which it will be used.
- that the construction materials (both metallic and non-metallic) are compatibility with product, flushing media, cleaning media, temperatures and pressure under the intended use.

The rotary jet mixer is intended for use in closed tank, vessel or container. If used in open environment see *General safety and installation instructions* on page 24.

3.4 Patents and trademarks

This Instruction Manual is published by Alfa Laval Kolding A/S without any warranty. Improvements and changes to this Instruction Manual may at any time be made by Alfa Laval Kolding A/S without prior notice. Such changes will, however, be incorporated in new editions of this Instruction Manual.

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The Alfa Laval logotype is a trademark or a registered trademark of Alfa Laval Corporate AB. Other products or company names mentioned herein may be the trademarks of their respective owners. Any rights not expressly granted herein are reserved.

3.5 Quality system

The Alfa Laval Mixers are produced according to Alfa Laval Kolding´s ISO 9001 international Standard certified quality system.

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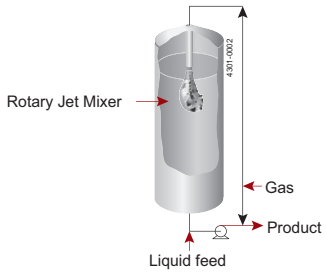
4 Installation

4.1 General description

The Rotary Jet Mixer IM-10 is a media driven and media lubricated tank/reactor mixer. All materials are selected for contact with food, and the machine is self-cleaning i.e. all internal and external surfaces are cleaned.

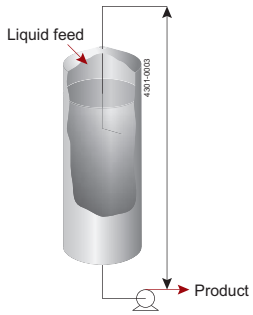
The Rotary Jet

Mixing technology

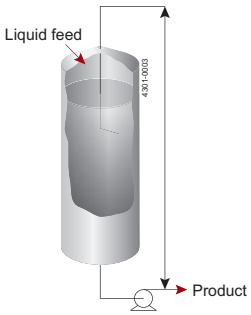


Traditional Mixing technology

Round pumping



Propeller mixing

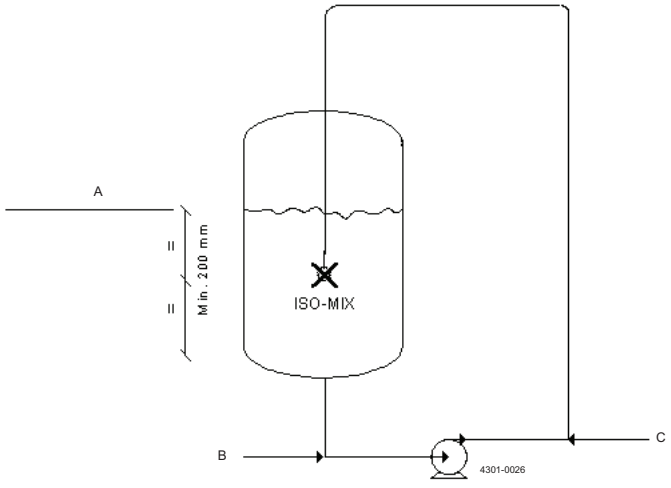


4.2 Functioning

The Alfa Laval Rotary Jet Mixer IM 10 is placed inside the tank/reactor under the liquid surface of the liquid volume to be mixed.

The mixer is combined with an external recirculation loop. The fluid of the tank/reactor is recirculated through this loop and reintroduced in the tank/reactor through the Alfa Laval Rotary Jet Mixer IM 10. The more fluid being recirculated, the more effective mixing is obtained.

The mixer should be placed in the centre of the fluid to be mixed. Minimum 200 mm under the liquid surface.



A: normal liquid level

B: Possible liquid or powder supply

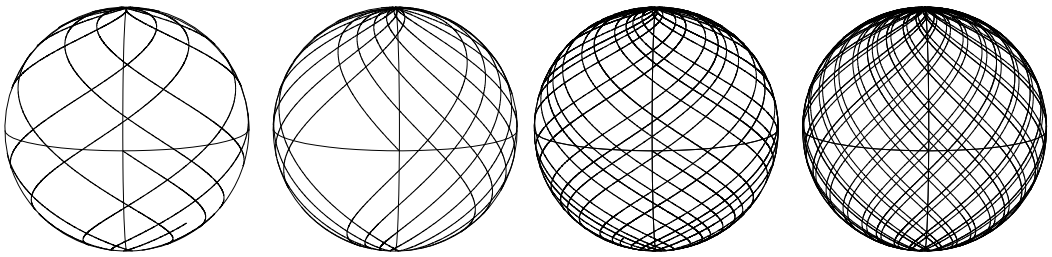
C: Possible gas supply

The flow of fluid to be mixed passes from the tank into the mixer through a turbine, which is set into rotation. The turbine rotation is through a gearbox transformed into a combined horizontal rotation of the mixer body and a vertical rotation of the nozzles.

The combined motion of the mixer body and the nozzles ensures a fully indexed tank mixing. After 55/8 revolutions of the hub cover with nozzles (53/8 revolutions of the mixer body), one coarse cleaning pattern is laid out on the tank surface and the first cycle has been made. During the following cycles, this pattern is repeated 7 times, each of which is displaced, and

the pattern gradually becomes denser. Finally, after 8 cycles - a total of 45 revolutions of the hub cover with nozzles (43 revolutions of the mixer body), a complete mixing pattern has been laid out, and the first pattern is repeated. This feature eliminates "dead zones" in the tank, and makes the Alfa Laval Rotary Jet Mixer IM 10 a very efficient automatic tank cleaning machine, when the tank is empty.

This is illustrated below for spherical tank with the machine placed in the centre:



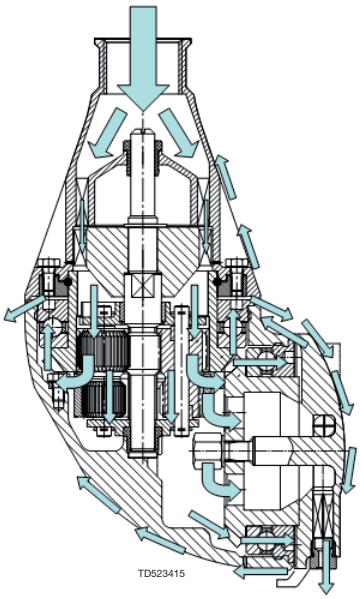
It is possible to ad fluid, gas or solids in the recirculation loop. These ingredients will very effectively be mixed into the entire tank/reactor volume.

When the tank/reactor is empty the Alfa Laval Rotary Jet Mixer IM 10 can be used as a tank cleaning machine.

Apart from the main flow flushing the gear and the hub, and thereafter forming the jets through the nozzles, fluid is flushed through all internal areas, through bevel gear, ball bearings and gabs between moving parts and is finally also used for cleaning of the outside surfaces of the machine.

The areas behind the screws on the cone are cleaned through small spray holes behind the screws.

In the bottom of the body, the machine is equipped with a hole to ensure self-draining. This self-draining is only ensured, if the machine is installed in upright position.



4.3 General safety and installation instructions

The Alfa Laval Rotary Jet Mixer IM 10 should be installed in vertical position (upright or upside down). It is recommended to install a filter in the supply line in order to avoid large particles to clog inside the machine. Before connecting the mixer into the system, all supply lines and valves should be flushed to remove foreign matter.

It is recommended to secure the bolted connection between machine and down pipe against loosening to vibrations. Use locking wire, nabs or equivalent for the actual application.

In general a filter with 3 mm holes is recommended in the supply line. In case of fine solid particles below 500 µm in the cleaning fluid, choose filter size accordingly.

It is recommended that the fluid valve fitted is of a type that prevents hydraulic shocks, which may cause severe damage to the entire installation.

The machine should be screwed tightly onto its supporting supply line using a 36 mm flat jawed spanner (tool no. 81B040) and the flats machined on the inlet cone.

For devices with tapered thread connections to the down pipe, it is recommended that you secure the connection in a manner appropriate for the application. Subject to the intended use environment and any in-house user requirements or policies, an adhesive such as Loctite or equivalent could be used. Other methods could be acceptable and subject to customer preference.

WARNING

If the machine is used in potential explosive atmospheres, tapes or joint sealing compounds which are electrical insulators must not be used on threads or joints, unless an electrical connection is otherwise established to ensure an effective earthing. In addition, connecting pipe work, must be electrically conductive and earthed to the tank structure. The resistance between the nozzles and the tank structure should not exceed 20,000 Ohm. This is essential to avoid the build-up of static electricity on the machine. For further information see IEC/TS 60079-32-1:2013 Safety of Machinery, guidance and recommendations for the avoidance of hazards due to static electricity.

NOTE

The Alfa Laval Rotary Jet Mixer IM 10 shall be installed in accordance with national regulations for safety and other relevant regulations and standards. In EU-countries the complete system must fulfill the EU-Machine Directive and depending of application, the EU-Pressure Equipment Directive, the EU-ATEX Directive and other relevant Directives and shall be CE-marked before it is set into operation.

Check that the mixer is in operating condition by inserting 3/16" Hex Screwdriver (tool no. 134A) in screw in top of turbine shaft and easily turn turbine shaft anti-clockwise. If any resistance is recognised, the mixer should be disassembled in order to localise the cause.

4.4 Safety precautions

WARNING

Precautions shall be made to prevent starting of the cleaning operation, while personnel are inside the tank or otherwise can be hit by jets from the nozzles.

Electrical equipment such as magnetic valves and electric actuators must not be installed in Ex-zones without type approval and marking, corresponding to the EX-class in question.

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5 Operation

5.1 Normal operation

Media to be mixed

Use mixer only in fluids compatible with stainless steel AISI 316L, SAF 2205, PFA, PEEK, PVDF, A4/EPDM and ceramics (Al_2O_3). Furthermore, the fluids to be mixed should not contain abrasive materials and fibrous material and the viscosity should not be above 450 cP. Normal detergents, moderate solutions of acids and alkalics will be acceptable. Aggressive chemicals, excessive concentrations of chemicals at elevated temperatures, as well as certain hydrochlorides should be avoided. If you are in doubt, contact Alfa Laval Kolding A/S.

After-use cleaning

After use flush the mixer with fresh water. Fluids should never be allowed to dry or set-up in the Alfa Laval Rotary Jet Mixer IM 10 due to possible "salting out" or "scaling" of the ingredient.

Pressure

Avoid hydraulic shocks. Increase pressure gradually. Do not exceed 8 bar inlet pressure. Recommended inlet pressure: 5-7 bar. High pressure in combination with high flow rate will create consumption of wear parts. If the pump in the recirculation loop is a positive pump giving pressure fluctuation, it is recommended to install a hydrofor in the pipeline.

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6 Maintenance

6.1 Service and repair

Recommended Service Intervals

Inspection every 1000 working hours. After 4000 working hours: inspection every 500 hours.

A service consists of:

At a pressure of 0.3 bar open a hatch in the tank to verify rotation and liquid fans are emerging from all slots. ATTENTION: Use only pure water at normal temperature for safety reason.

If needed proceed to **1.**

1. Un-install the machine.
2. Visual inspection for foreign objects. Remove any objects and clean before rotation verification.
3. Rotation verification by hand for free rotation.
4. Reinstall machine.
5. Fill in the Service Log

6.2 Preventive maintenance

> **NOTE**
>
> **Always** use only proper tools.
>
> **Always** perform all assembly/disassembly steps in the order described in this manual.
>
> **Never** assemble components without previous cleaning. This is especially important at all mating surfaces. Work in a clear well lighted work area.

In order to keep your Alfa Laval Rotary Jet Mixer IM 10 servicing you as an efficient tool in your mixing operations, it is essential to maintain its high performance by following a simple preventive maintenance programme, which will always keep your mixer in good condition.

Good maintenance is careful and regular attention!

The following recommended preventive maintenance is based on a Alfa Laval Rotary Jet Mixer IM 10 working in average conditions. However, you will appreciate that a mixer, which has a rough and dirty job to do, will need more frequent attention than one working in ideal conditions. We trust that you will adjust your maintenance programme to suit.

Alfa Laval Tank Cleaning Equipment Service Kits contain all you need. They comprise genuine Alfa Laval spare parts, manufactured to the original specifications.

Use standard tool kit for Alfa Laval Rotary Jet Mixer IM 10. If not stated otherwise never use unnecessary force (i.e. hammer or pry) components together or apart.

> **NOTE**
>
> Find unique item numbers and item numbers for Spare part and Service kits in the Spare part manual available from the on-line *Alfa Laval product catalogue Anytime* or in the *Close at hand spare part catalogue*.

> **NOTE**
>
> Get the best and most economical performance from your mixer. Insufficient preventive maintenance means poor performance, unscheduled stops, shorter lifetime and extra costs. Good preventive maintenance on the contrary means good performance, no unscheduled stops and superior total economy.

Every 2500 working hours

1. Disassemble machine as described on the following pages.
2. Clean material build-up and deposits from internal parts with chemical cleaner and/or desired fine abrasive cloth.
3. Check slide bearing (14, see *Remaining assemblies* on page 35) for wear. If end face of slide bearing is worn more than 1 mm into slide bearing, it should be replaced.
4. Check bearings for turbine shaft (3, see *Remaining assemblies* on page 35) and (24, see *Assembly of turbine and carrier* on page 33) in cone and body. If holes are worn oval to a max diameter of more than 10.4 mm, bearings should be replaced. Thickness of collar is to be min. 3.5 mm for bearing in body.

5. Check carrier bearing (15.3, see *Assembly of turbine and carrier* on page 33). If worn oval to a max diameter of more than 15.8 mm, it should be replaced.

> **NOTE**
>
> Timely replacement of bal bearings and collar bushes will prevent costly damage to the gearbox.

6. Check planet wheels (15.4 and 15.5, see *Assembly of turbine and carrier* on page 33) while still mounted in planet gear carrier (15.6, see *Assembly of turbine and carrier* on page 33). They must rotate easily on shafts. If restriction or much clearance on shafts is felt, planet wheels should be dismounted for inspection of bearing bushes and shafts for planet wheel (15.2, see *Assembly of turbine and carrier* on page 33). Max diameter of holes: 6.2 mm. Check tooth wear.If replacement is necessary, planet wheels must be replaced as a pair.

7. Check unrestricted rotation of ball bearings. Inspect for build-up of foreign material in ball retainers (10, see *Remaining assemblies* on page 35) and ball races (16.2 and 17.2, see *Remaining assemblies* on page 35).

8. Assemble machines as described in the following pages.

9. Check that the machine is in operating condition by inserting 3/16" Hex screwdriver (tool no. 134A) in screw in top of turbine shaft, and easily turn turbine shaft anti-clockwise. If any resistance is recognised, the machine should be disassembled in order to localise the cause.

Apart from the parts specifically mentioned above, all the remaining wear parts should regularly be inspected for wear. Wear parts are specified in the .

6.2.1 Maintenance product contact parts made of plastic

These plastic parts are designed for safe contact with food and should only be used as intended, as stated in the product Instruction Manual provided with this product. Using these parts outside their intended purpose (e.g., exposure to excessive heat, harsh chemicals, or incompatible foods) may increase the risk of harmful substances migrating into food. Always use the product as intended to avoid risks.

Normal Usage Changes:

Minor scratches, slight discolouration over time, fading of printed markings, deformation

Changes Affecting Safety:

Cracks or chalkiness, blisters or chips, sticky or tarnished surfaces, unusual odours.

How to Prevent/Slow Down Deterioration:

- Use it within the permitted temperature limits and limits for CIP[1]
- Do not use abrasive cleaners or scouring pads
- Do not use in contact with foods for which it is not intended (See: product Instruction Manual)

Handling, Cleaning, and Storing Instructions

- Follow the recommended cleaning procedure and only use permitted chemicals or detergents in correct concentrations and temperatures
- Store in a cool, dry place, protected from UV-light

When to Replace

Replace the plastic part if you notice:

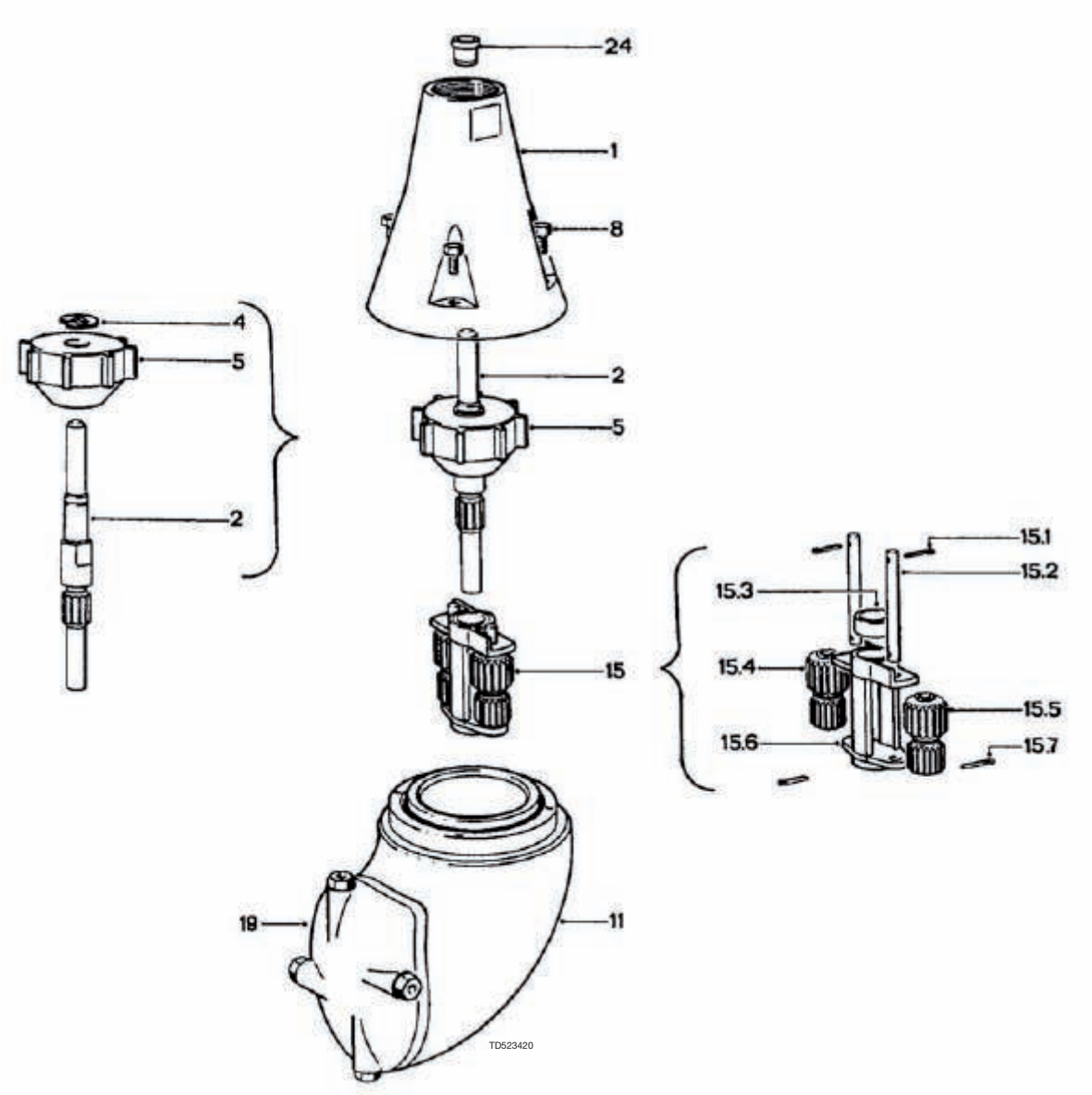
- Cracks, chalkiness, blisters, chips or sticky surface, discolouration (if it does not come from the media itself)
- Any change in appearance that raises doubts about safety

Conditions for Discontinuing Use

- If the part shows any of the safety-related deterioration signs above
- After a recommended period of use (see service interval)
- If the part has been exposed to conditions outside the product's (manufacturer's) instructions (e.g., high heat, harsh chemicals, excessive concentration/temperatures of CIP[1])

[1] Cleaning In Place

6.3 Assembly of turbine and carrier



1 **Disassembly**

a) Remove M5 screws (8). Loosen and unscrew with a socket wrench (tool no. 462A).

b) Lift off cone (1).

c) Withdraw turbine shaft (2) with impeller. If necessary, turn turbine shaft left and right.

d) Remove circlip (4) and pull off impeller (5).

e) Withdraw carrier assembly (15) while turning/rocking carrier left and right.

f) Remove cotter pins (15.7), pull out shafts (15.2) and remove planet wheels (15.4 and 15.5). If necessary, push out carrier bearing (15.3).

g) If necessary, push out bearing for turbine shaft (24) from cone (1).

2 Reassembly

Before reassembly, make sure that all parts are clean without deposits or build-up of foreign matter.

a) Insert bearing (24) in top of cone (1) and push home.

b) Insert carrier bearing (15.3) and push with thumb. Insert planet wheels (15.4 and 15.5) and shafts (15.2) and secure with cotter pins (15.7). Check free rotation of planet wheels.

c) Insert carrier assembly (15), into body: Insert through stem (16, see *Remaining assemblies* on page 35). Hold body in one hand and use the other to turn hub cover (19) left and right with small rocking movements until carrier falls through internal gear (13, see *Remaining assemblies* on page 35). Check that carrier is fully home on bearing for turbine shaft (3) in body: Rotate carrier assembly by hand a few rotations to check correct position and function.

d) Mount impeller (5) on turbine shaft (2) and secure with circlip (4).

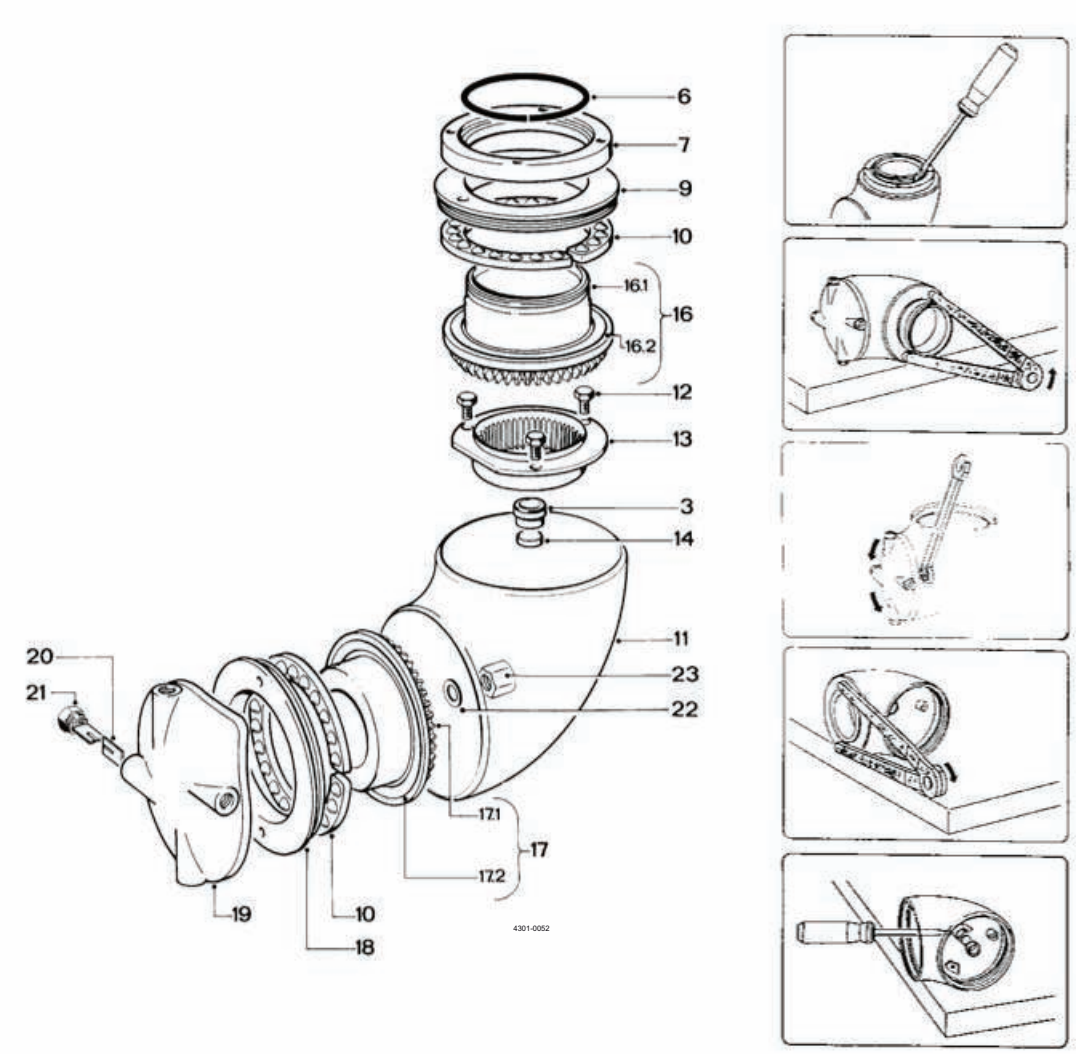
e) Insert turbine shaft with impeller through carrier assembly. Rotate impeller to ensure correct insertion into bearing for turbine shaft (3) in body. Check unrestricted rotation.

f) Mount cone (1) over turbine shaft and retaining ring. Mount and tighten screws (8) with socket wrench (tool no. 462A).

NOTE

The two planet wheels are different: on planet wheel 1, teeth of upper and lower gearing are aligned, while they are displaced ½ tooth on planet wheel 2.

6.4 Remaining assemblies



1 Disassembly

a) Remove retainer spring (6). Use small screwdriver to lift retainer spring out of groove in stem (16). Lift off retaining ring (7).

b) Hold body against table and unscrew stem nut w. ball race (9) with caliper (tool no. 369). Withdraw stem (16) together with ball retainer w. balls (10).

c) Remove M5 screws (12) with a socket wrench (tool no. 462A) and draw out internal gear (13).

d) Insert a 13 mm spanner (tool no. 81B041) into body, hold cap nut (23) and by hand screw off hub cover (19), and remove washer (22).

e) Hold body against table and unscrew hub nut with ball race (18) with caliper (tool no. 369). Withdraw hub (17) together with ball retainer with balls (10).

f) With screwdriver lift slide bearing (14) and bearing for turbine shaft (3) out of body.

g) Unscrew nozzles (21) with 11 mm spanner (tool no. 81B041). Be careful not to damage nozzle vanes (20) as this will severely reduce nozzle performance. Nozzle vanes should not be removed unless they need to be replaced.

h) If ball races (16.2 and 17.2) on stem and hub as well as stem/hub nut with ball race (9 and 18) are heavily worn, they should be replaced as well as ball retainer with balls (10), see *Replacement of ball races* on page 37.

> **NOTE**
>
> Left-hand thread

2 Reassembly

Before reassembly make sure that all parts are clean without deposits or build-up of foreign matter.

a) If necessary insert new nozzle vanes (20). Be careful not to damage nozzle vanes. Mount nozzles (21) and tighten with spanner.

b) Place slide bearing (14) in body and push in bearing for turbine shaft (3) with thumb. Make sure that bearing is fully home.

c) Inset hub (17) together with ball retainer with balls (10). Mount hub nut with ball race (18) with caliper (tool no. 369) and tighten.

d) Place washer (22) on threaded pin on hub cover and mount cap nut (23). Insert spanner (tool no. 81B041) into body, hold cap nut (23) and by hand screw on hub cover (19) and tighten. Check free rotation of hub.

e) Insert internal gear (13), mount screws (12) and tighten with socket wrench (tool no. 462A).

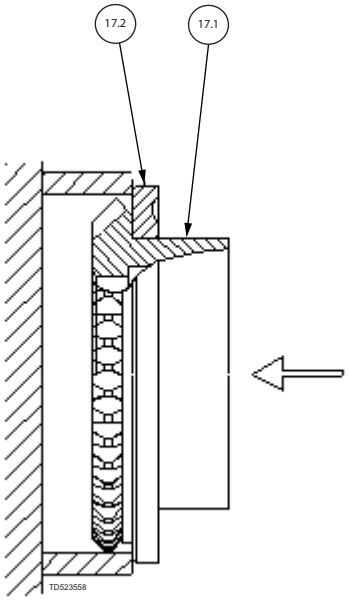
f) Insert stem (16) together with ball retainer with balls (10). Mount stem nut with ball race (9) with caliper (tool no. 369) and tighten. Turn hub cover and check unrestricted rotation.

g) Place retaining ring (7) over stem (16) and push on retainer spring (6) and "click" into groove in stem. Check free rotation.

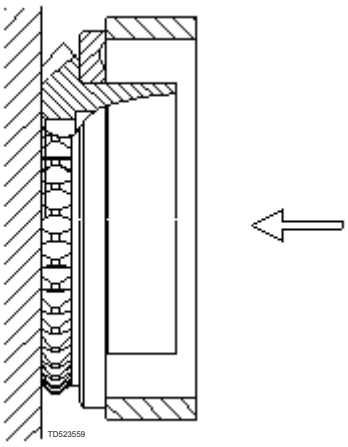
> **NOTE**
>
> Left-hand threat

6.5 Replacement of ball races

1. Place stem or hub complete (16 or 17) in a support ring and press off ball race. Press parallel. Use press or vice. Be careful not to damage teeth and opposite end face of stem.



2. With mandrel press ball race fully home. Press parallel. Use press or vice. Be careful not to damage surface of ball race.



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7 Troubleshooting

7.1 Trouble shooting guide

Symtom: Slow or no rotation of machine

Possible Causes	Fault finding
No or insufficient liquid flow	
	1. Check if supply valve is fully open. **2.** Check if inlet pressure to mixer is correct. **3.** Check supply line/filter for restrictions/clogging. **4.** Remove nozzles and check for clogging. If blocked, carefully clean nozzle without damaging nozzle vanes and nozzle tip. **5.** Remove cone, guide and impeller and check for clogging in impeller area. **6.** If large particles repeatedly get jammed in the mixer, install filter or reduce mesh size of installed filter in supply line.
Foreign material or material build-up	
	Insert Hex screwdriver in screw in top of turbine shaft and easily turn turbine shaft clockwise. If any resistance is recognised, disassemble machine in order to localise the cause.
Impeller jammed	Remove guide and impeller (see *Assembly of turbine and carrier* on page 33) and remove foreign material.
Turbine shaft sluggish in main bush	Remove gland (see *Assembly of turbine and carrier* on page 33) and clean main bush.
Planet gear jammed/sluggish	Remove foreign material from planet wheels and internal gears. Check rotation of planet wheels. If restriction is recognised, dissemble carrier assembly (see *Assembly of turbine and carrier* on page 33) and remove material build up, especially on shafts and bushes in planet wheels.
Stem or hub jammed/sluggish	Remove carrier assembly (see *Assembly of turbine and carrier* on page 33). Turn hub cover and check unrestricted rotation. Remove stem and hub (see *Remaining assemblies* on page 35). Remove foreign material/material build-up on stem, hub and inside nut with ball race. Clean ball races and ball retainer with balls. Assemble stem/hub, ball retainer with balls and stem/hub nut with ball race. Also clean main bush.
Bevel gears jammed	Remove flange/nipple and hub (see *Remaining assemblies* on page 35). Clean teeth on stem and hub.
Wear	
	Insert Hex screwdriver in screw in top of turbine shaft and easily turn turbine shaft clockwise. If any resistance is recognised, disassemble machine in order to localise the cause.
Slide bearings	See *Service and repair* on page 29
Bearing for turbine shaft	See *Service and repair* on page 29
Planet wheels	See *Service and repair* on page 29

Wear	
Shafts for planet wheels	Check clearance of planet wheels on shafts. Transverse movement should not exceed 0.3 mm.
Turbine shaft	Check clearance in carrier bearing and bearing for turbine shaft. Transverse movement should not exceed 0.3 mm. Also inspect teeth for wear.

Mechanical defects	
Planet wheels. Teeth broken	Replace planet wheels.
Planet wheel can not rotate on shafts/shafts bent.	Replace shafts for planet wheels.
Damaged teeth on bevel gear	Inspect teeth on stem and hub for deformation. Mount hub and stem in body (See *Remaining assemblies* on page 35). Hold body in upside down position and rotate Hub to check that bevel gears can work together. If damaged: Replace stem and/or hub.

8 Technical Data

> **NOTE**
>
> Technical data must be observed during installation, operation and maintenance.
>
> All personnel should be informed about the technical data.

8.1 Technical data

Lubricant:	Self-lubricating with the mixing/cleaning fluid
Standard thread:	1" BSP or NPT, female, Top cone 1" BSP with hygienic seal
Min. tank opening:	See dimension drawings

Pressure	
Working pressure:	2-8 bar / 28-114 psi
Recommended pressure during mixing:	2-6 bar / 28-85 psi
Recommended pressure during CIP:	4-8 bar / 72-114 psi

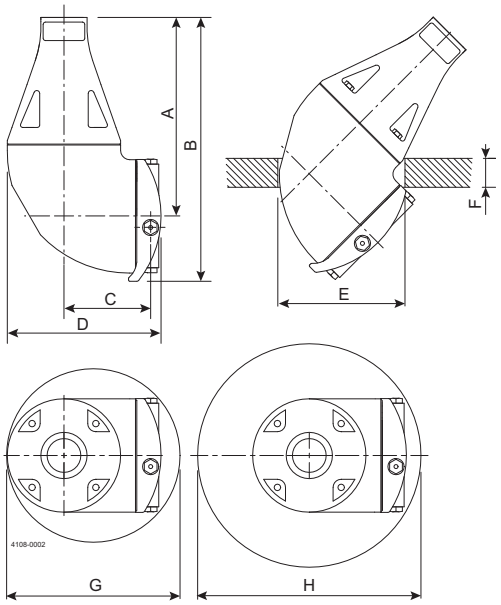
8.2 Physical data

Materials	
Materials:	AISI 316L, AISI 316, SAF 2205 (UNS 31803), EPDM, PEEK, PFA, Ceramics

Weight	
Weight:	5.1 kg / 11.2 lbs

Temperature	
Working temperature max.:	95°C / 203°F
Ambient temperature max.:	140°C / 284°F

8.3 Dimensions

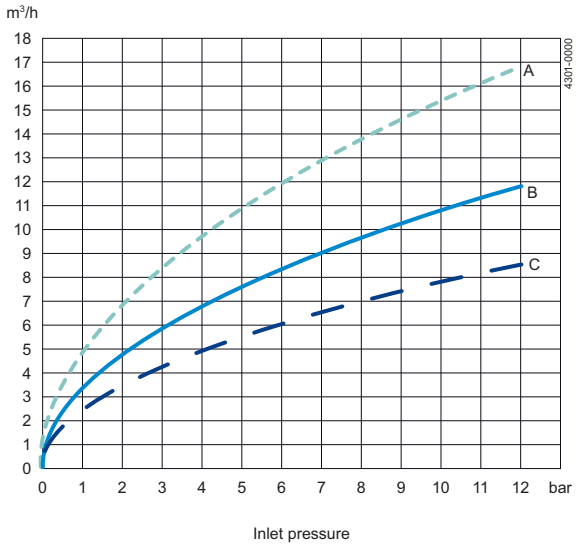


	mm	inch
A	173	6.81
B	230	9.06
C	75	2.95
D	133	5.24
E	Ø110	Ø4.33
F	Max. 25	Max. 0.99
G	Ø150	Ø5.91
H	Ø200	Ø7.87

Passage	
Minimum required passage:	ø110 mm / 74.33 inch at flange thickness 25 mm / 0.98 inch Otherwise ø150 mm / 5.90 inch

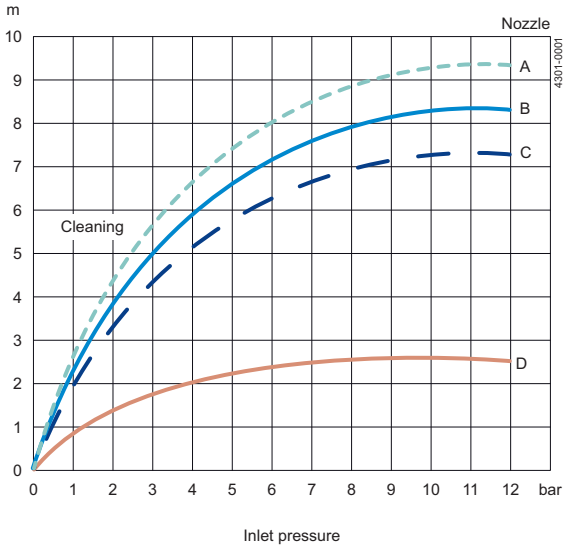
8.4 Flow rate

Relationship between inlet pressure and flow rate for liquids with waterlike properties for the IM 10 Rotary Jet Mixer.



A = Nozzle d = 5.5 mm
B = Nozzle d = 4.6 mm
C = Nozzle d = 3.9 mm

8.5 Throw length



A = d = 5.5 mm
B = d = 4.6 mm
C = d = 3.9 mm
D = Mixing

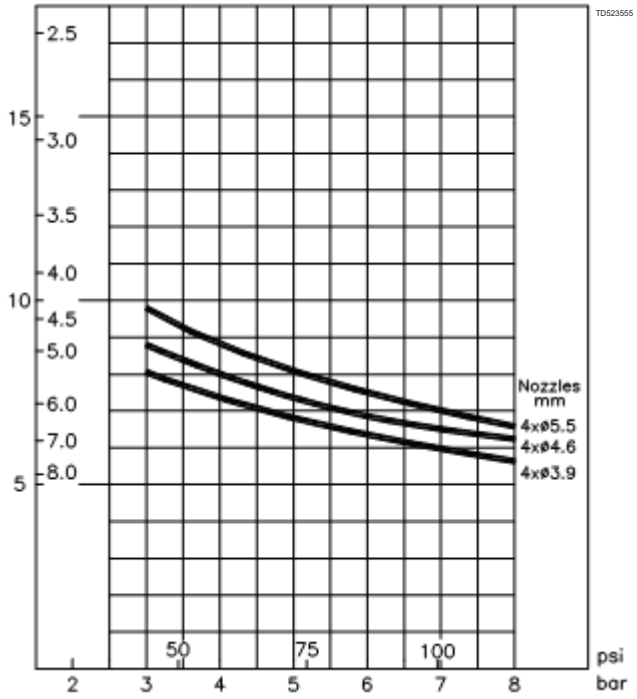
NOTE

The distance (reach) of the jet from the rotary nozzles at which the jets still have a reasonable mixing effect depends i.a. of pressure, the diameter of the nozzles, the viscosity of the fluid, the desired mixing time and various other parameters.

The effective reach of the jets as indicated above is in a fluid with a viscosity of 1 cP.

The pressure is measured at the mixer. This means that due consideration shall be taken to pressure drops in the recirculation line from the pump to the mixer as well as to static pressure differences, when the jet mixing system is being dimensioned.

8.6 Rotation speed



9 Product programme

9.1 Standard configuration for Alfa Laval Rotary Jet Mixer IM 10

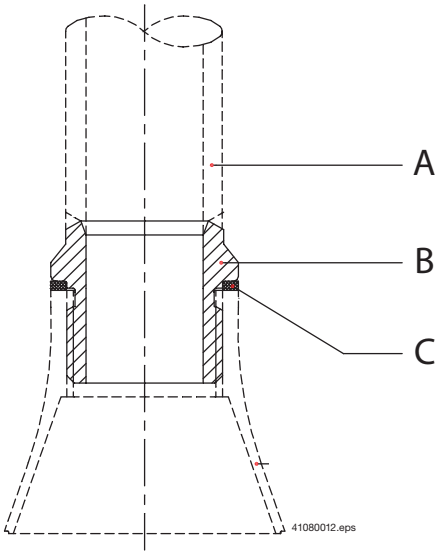
Connection	Nozzles (mm)	Article No.
1" BSP, Female	4 x ø3.9	TE30B030
	4 x ø4.6	TE30B040
	4 x ø5.5	TE30B050
1" NPT, Female	4 x ø3.9	TE30N030
	4 x ø4.6	TE30N040
	4 x ø5.5	TE30N050

9.2 Available add-ons

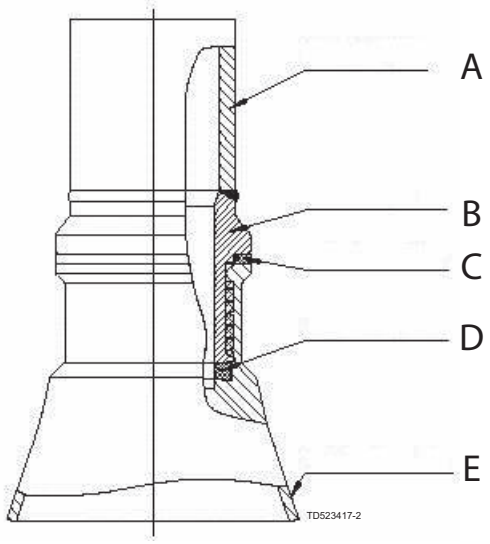
Welding adapter with sealing assembly between down pipe, welding adapter and machine.

Pipe Dimension in mm	Connection thread	Article No.
1" ISO thread pipe: ø33.7 x 3.25	1" BSP	TE52D030
1" ANSI Sch.40S: ø33.4 x 3.38	1" NPT	TE52D031
1½" ISO Dairy pipe: ø38 x 1.2	1" BSP	TE52D032

For devices with tapered thread connections to the down pipe, it is recommended that you secure the connection in a manner appropriate for the application. Subject to the intended use environment and any in-house user requirements or policies, an adhesive such as Loctite or equivalent could be used. Other methods could be acceptable and subject to customer preference.



A: Down pipe
B: Welding adapter
C: Seal PTFE



A: Down pipe
B: Welding adapter
C: Seal PTFE
D: Seal EPDM
E: IM-10

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10 Spare parts

For every delivered Alfa Laval Product, a spare part list is available.

This spare part list contains a range of the most common wear parts for the machinery. If any component not mentioned is required, please contact your local Alfa Laval representative for availability.

You can find our spare part catalogue at *https://hygienicfluidhandling-catalogue.alfalaval.com*.

Always use Alfa Laval genuine spare parts. The warranty of Alfa Laval products is dependent on use of Alfa Laval genuine spare parts.

10.1 Ordering spare parts

When ordering spare parts, please always state:

1. Serial number (if available)
2. Item number/spare part number (if available)
3. Capacity or other relevant identification

10.2 Alfa Laval service

Alfa Laval is represented in all larger countries of the world.

Do not hesitate to contact your local Alfa Laval representative, with any questions or requirement of spare parts for Alfa Laval equipment.

10.3 Warranty - Definition

WARNING

The rules of Intended use are absolute. Use of the supplied Alfa Laval product is allowed only when in compliance with the technical data supplied with the Intended use.

Differing utilisation, other than agreed with Alfa Laval Kolding A/S, exclude any liability and warranty.

No modification or alteration of the supplied Alfa Laval product is allowed, unless explicit permission is granted by Alfa Laval Kolding A/S.



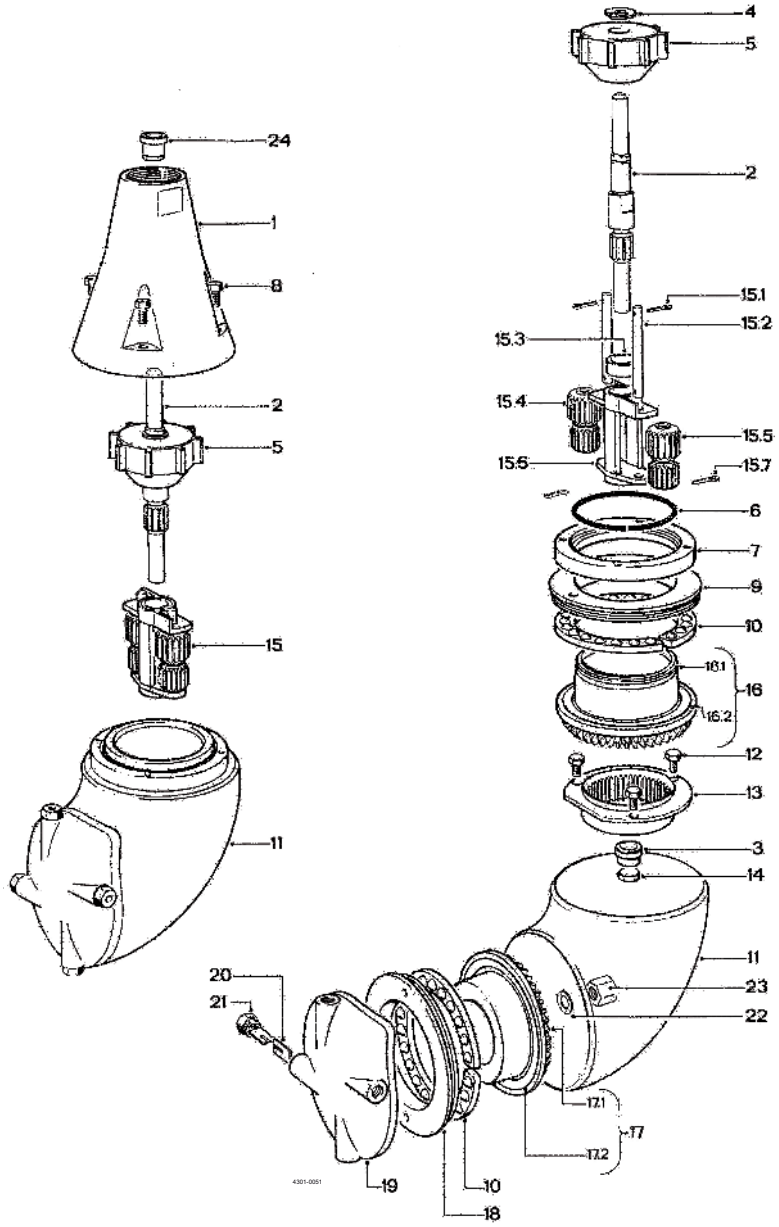
Liability and warranty are excluded:

- If advice and instruction of operating instructions are ignored
- For incorrect operation or for insufficient maintenance of the supplied Alfa Laval product
- For any kind of change of function of the supplied Alfa Laval product without prior written agreement by Alfa Laval Kolding A/S
- If supplied Alfa Laval product is modified by non-authorised persons
- If using the supplied Alfa Laval product without attention of appropriate safety regulations, (see *Safety* on page 9)
- If protection equipment is not used and vessel process / ancillary equipment is not brought to a standstill
- If the supplied Alfa Laval product and ancillary parts are not properly maintained (to be executed in intervals and including fitting of prescribed replacement parts)

When exchanging parts, only original replacement parts, released from the manufacturer, must be used.

11 Parts lists and exploded views

11.1 Alfa Laval Rotary Jet Mixer IM 10



Pos.	Qty.	Denomination
1	1	Cone 1" BSP
2	1	Turbine shaft
3	1	Bearing for turbine shaft (body)
4	1	Circlip RS 10, DIN 6799
5	1	Impeller
6	1	Retainer spring
7	1	Retaining ring
8	4	Screw
9	1	Stem nut with ball race
10	2	Ball retainer with balls
11	1	Body
12	3	Screw
13	1	Internal gear
14	1	Slide bearing
15	1	Planet complete
15.1	2	Cotter pin
15.2	2	Shaft for Planet wheel
15.3	1	Bearing for Planet wheel carrier
15.4	1	Planet wheel I
15.5	1	Planet wheel II
15.6	1	Planet gear carrier
15.7	2	Cotter pin (=15.1)
16	1	Stem complete
16.1	1	Stem
16.2	1	Ball race
17	1	Hub complete
17.1	1	Hub
17.2	1	Ball race (= 16.2)
18	1	Hub nut with ball race
19	1	Hub cover with pin
20	8	Nozzle vane
21	4	Nozzle
22	1	Washer, USIT
23	1	Cap nut
24	1	Bearing for turbine shaft (cone)

NOTE

Find unique item numbers and item numbers for Spare parts, Service kits and Tools in the Spare part manual available from the on-line *Alfa Laval product catalogue Anytime* or in the *Close at hand spare part catalogue*.