



# Instruction Manual

Alfa Laval Toftejorg™ TJ20G



Covering: Standard Machines, Distillery, Secured  
High temperature, Hastelloy  
Q-doc - Equipment Doc (3.1 Inspection Certificate - EN 10204)  
Machines delivered with ATEX Certification in accordance with Directive 94/9/EC valid until 2016-04-19/  
Directive 2014/34/EU valid from 2016-04-20  
TE91A600-EN10, First published: 2000-06

ESE01794-EN10      2016-01

Original manual



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

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# 1 EC/EU Declaration of Conformity

The Designated Company

Alfa Laval Kolding A/S

Company Name

Albuen 31, DK-6000 Kolding, Denmark

Address

+45 79 32 22 00

Phone No.

hereby declare that

Tank Cleaning Machine

Designation

Alfa Laval Toftejorg TJ20G

Type

From serial number 2015-0001 to 2030-99999

is in conformity with the following directive with amendments:

**Machinery Directive 2006/42/EC**

*DS/EN ISO 12100:2011*

**The Pressure Directive 97/23/EC**

*According to its own volume and the rated pressure range, the product is regarded an Article 3, paragraph 3 Equipment*

**FDA 21CFR§177 and 174.6**

**Regulation (EC) 1935/2004**


**Equipment Explosive Atmospheres (ATEX) Directive 94/9/EC, valid until 2016-04-19**


**Equipment Explosive Atmospheres (ATEX) Directive 2014/34/EU, valid from 2016-04-20**

*(Applicable for machine certified as category 1 and 2 component, see machine engraving)*

*DS/EN 13463-1:2009, DS/EN 13463-5:2011, DS/EN ISO/IEC 80079-34:2011, Annex A, paragraph A.5.3 Rotating machines*

*EC Type Examination Certificate no. Baseefa04ATEX0358X*

Marking:  II 1 GD c T140°C


Marking:  II 1 GD c T250°C Tamb 0°C to +200°C

*Baseefa Ltd., Certification body number 1180, Rockhead Business Park  
Staden Lane, Buxton, Derbyshire SK17 9RZ, United Kingdom*

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

Global Product Quality Manager  
Pumps, Valves, Fittings and Tank Equipment  
Title

Lars Kruse Andersen  
Name

  
Signature

ATEX Responsible Engineer  
Title

Denniz Høxbroe  
Name

  
Signature

Kolding      2016-01-01  
Place                      Date

(This Declaration of Conformity replaces Declaration of Conformity dated 2015-06-01)



## 2 Safety

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

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### 2.1 Important information

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#### **WARNING**

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

#### **CAUTION**

Indicates that special procedures must be followed to avoid damage to the tank cleaning machine

#### **NOTE**

Indicates important information to simplify or clarify procedures.

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### 2.2 Warning signs

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General warning:



### 3.1 Introduction

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Based on more than 30 years' experience from practical tank cleaning and production, the Alfa Laval Toftejorg TJ20G has been developed to meet the highest demands for efficiency, reliability and hygiene within food and beverage, pharmaceutical and biochemical industry.

This manual has been prepared as a guide for installing, operating and maintaining your Alfa Laval Toftejorg tank cleaning machine. 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 tank cleaning machine.

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.

If the Alfa Laval Toftejorg TJ20G stops rotating unintentionally within the warranty period, please return the machine to Alfa Laval. Please do not try to fix any mechanical problems before shipping.

**Important information:**



Before installing the machine and setting it into operation, carefully read the General Safety and Installation Instructions (page 12) and the special conditions for safe use in accordance with ATEX Certification Directive 94/9/EC valid until 2016-04-19/Directive 2014/34/EU valid from 2016-04-20 (page 14) 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.

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### 3.2 Intended Use

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The end-user should verify:

- that the tank cleaning machine is in conformity with respect to tank, vessel or container size in which it is 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.
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## 3 Introduction

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### 3.3 Patents and Trademarks

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

Alfa Laval Kolding A/S. All rights reserved.

The Alfa Laval logotype is a trademark or a registered trademark of Alfa Laval Corporate AB. "Toftejorg" is a trademark or registered trademark of Alfa Laval. The Alfa Laval Toftejorg™ TJ20G product has patents in the EPO member states (EP 0 560 778), in the US (5333630) and in other countries and has a new patent pending (PCT/DK/2007/000062). Other products or company names mentioned herein may be the trademarks of their respective owners. Any rights not expressly granted herein are reserved.

### 3.4 Marking

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Alfa Laval tank cleaning machines are all marked to allow for recognition of type of machine, machine name, serial number and manufacturing address.

The marking is placed on the body of the tank cleaning machine.

**Rotary Jet Head**  
**TJ20G**  
**s/n.: yyyy-xxxxx**  
Alfa Laval, DK-6000 Kolding, Albuen 31  
CE TJ20G

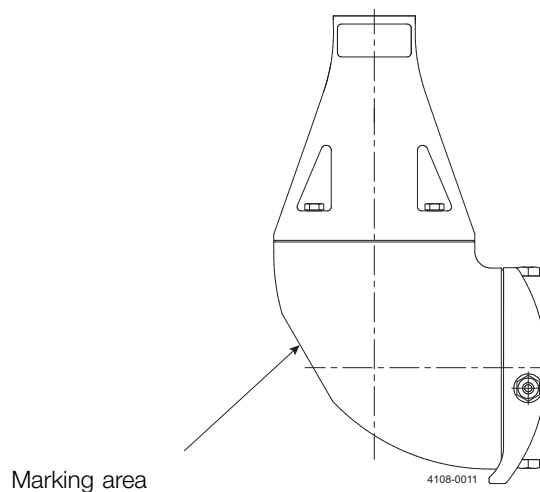
#### Serial number explanation

Machines supplied with or without normal documentation:

yyyy-xxxxx: serial number

yyyy: year

xxxxx: 5 digit sequential number







### 3.5 ATEX Marking

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The Alfa Laval Toftejorg TJ20G is certified as category I component. The certification is carried out by the notified body Baseefa, who has issued the certificate no. 04ATEX0358X. The marking on the ATEX certified Alfa Laval Toftejorg TJ20G is as follows:

**Rotary Jet Head**  
**TJ20G**  
**s/n.: yyyy-xxxxx**

Alfa Laval, DK-6000 Kolding, Albuen 31  
 II 1GD c T140°C  
 1180 Baseefa 04ATEX0358X

TJ20G, ATEX

**Note:**

TE20G016-72, TE20G017-72 and TE20G018-72  
TE20G016-82, TE20G017-82 and TE20G018-82.

These machines has a special ATEX text for the “Ex” line. Next to the “Ex” symbol this text shall be present:

II 1 GD c T250°C Tamb 0°C to +200°C

**Serial number explanation:**

Machines supplied with or without normal documentation:

yyyy-xxxxx: serial number

yyyy: year

xxxxx: 5 digit sequential number

Changes to the machine are not allowed without approval by the person responsible for the ATEX certification at Alfa Laval. If changes are made – or spare parts other than Alfa Laval original spare parts are used - the EC Type Examination certification (the ATEX Directive) is no longer valid.

**Important ATEX information:** Also see page 19 regarding special conditions for repair of ATEX certified machines.



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### 3.6 Quality System

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The Alfa Laval Toftejorg TJ20G 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 complaint materials.

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## 4 Installation

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### 4.1 General Description

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The Alfa Laval Toftejorg TJ20G is a media driven and media lubricated tank cleaning machine. No lubricating substances such as oil, grease etc. are used. All materials are selected for contact with food, and the machine is self-cleaning i.e. all internal and external surfaces are cleaned.

For use in explosive hazard zones the ATEX version can be used, provided it is installed according to safety instructions in local regulations.

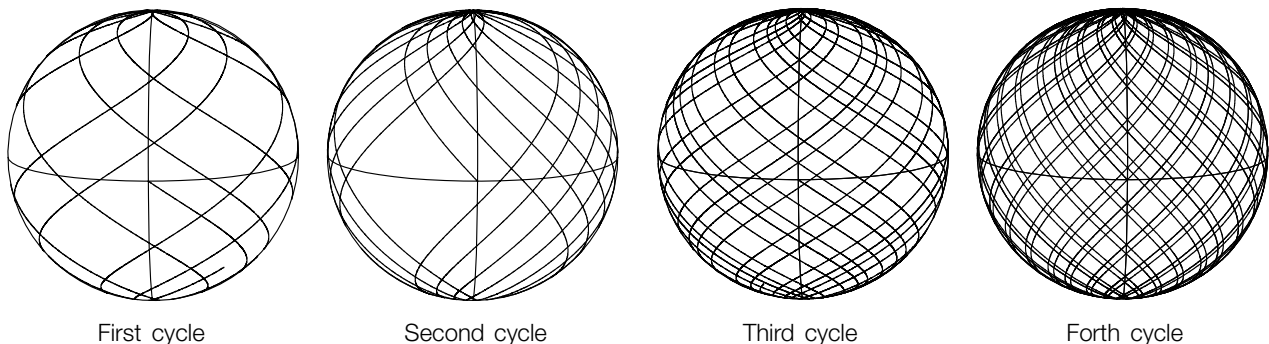
### 4.2 Functioning

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The flow of cleaning fluid into the machine passes through a turbine, which accordingly is set into rotation. Through a gear set and a driver tube, the turbine rotation is transmitted to the Cleaner Head.

The combined motion of the machine Body and the Nozzles ensures a fully indexed tank cleaning coverage. After 55/8 revolutions of the Hub cover with Nozzles (53/8 revolutions of the machine 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 more dense. Finally, after 8 cycles - a total of 45 revolutions of the Hub Cover with Nozzles (43 revolutions of the machine Body), a complete cleaning pattern has been laid out, and the first pattern is repeated.

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

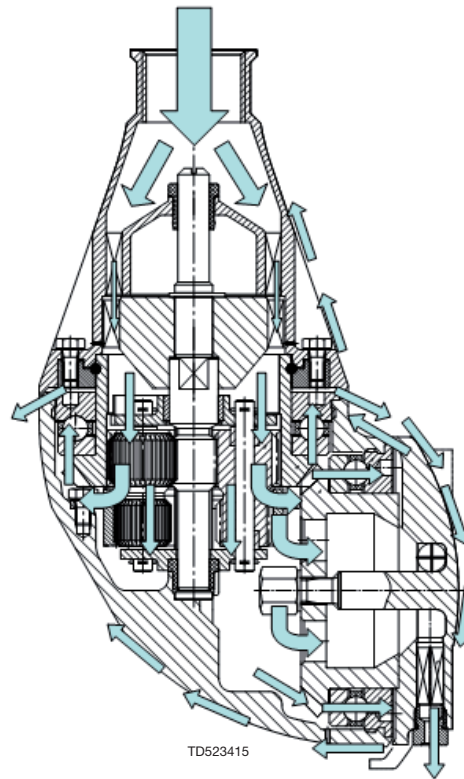


The number of cycles needed to perform a proper cleaning depends on type of soilage, position of the tank cleaning machine, cleaning procedure, cleaning temperature and cleaning agent.

For substances that are easily mobilised, i.e. are easy to remove, one cycle could be sufficient while in cases of more heavy soilage (high viscous, sticky substances, etc.) a more dense pattern/more cycles are needed.

The rotation speed of the turbine depends on the flow rate through the machine. The higher the flow rate, the higher the speed of rotation. In order to control the RPM of the machine for a wide range of flow rates, the machine has different turbines according to the Nozzle size.

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 gaps between moving parts and 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, a drainage hole is present to ensure self-draining. This self-draining is only ensured, if the machine is installed in upright position.

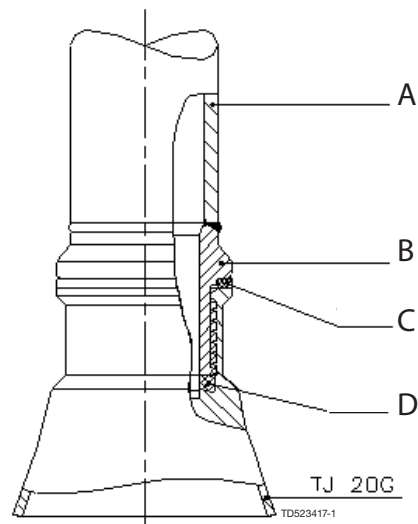


**For sanitary connection version:**

The threaded connection between downpipe and machine is not a product contact surface as it is enclosed using two seals and the welding adaptor. A welding adaptor, depending on downpipe dimensions, is ordered separately (see page 34 ff).

**For all versions:**

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 inhouse user requirements or policies, an adhesive such as Loctite No. 243 or equivalent could be used. Other methods could be acceptable and subject to customer preference.



- A: Down pipe
- B: Welding adaptor
- C: Seal PTFE
- D: Seal EPDM

## 4 Installation

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### 4.3 General Safety and Installation Instructions

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The tank cleaning machine 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, scale etc. to clog inside the machine. It is essential to avoid fine solid particles (e.g. fine sand) in cleaning fluid as they increase wear considerably.

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.

In order to separate the CIP system from the process it is recommended to install a shutoff valve close to the machine inlet. This also prevents back-flow of liquid from the tank through the machine in case the cleaner head is submerged and there is an over-pressure inside the tank. The installation and operation shall be made in such a way that the self-draining of the machine is ensured.

It is recommended that the fluid valve fitted is of a type that prevents hydraulic shocks, which may cause severe damage to the Alfa Laval Toftejorg TJ20G and/or the entire installation. Ideally, a frequency controlled pump with a ramp function for start-up is used for supplying the cleaning liquid.

Before connecting the machine onto the system, all supply lines and valves should be flushed in order to remove foreign particles.

The machine should be screwed tightly onto its supporting supply line using a 36 mm flat jawed spanner (tool No. TE81B040) on the flats machined on the inlet Cone.

During handling and installation handle the machine with care in order not to damage the surface finishes of the machine.

The Alfa Laval Toftejorg TJ20G machine has been tested at the factory before shipping. You can check that the machine is in operating condition by blowing compressed air into the inlet, while holding the machine by the cone and verify that the rest of the machine rotates evenly. If resistance is recognised, the machine should be disassembled in order to localise the cause or returned to the nearest Alfa Laval Service Centre.

Upon arrival check that the machine is in operation condition by inserting a flathead Screwdriver 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.

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 inhouse user requirements or policies, an adhesive such as Loctite No. 243 or equivalent could be used. Other methods could be acceptable and subject to customer preference.

**Note:** Do not try to turn the nozzle head by hand, since this may damage the Gear. The Nozzle head can be turned by blowing compressed air through the inlet connection or using a flathead screwdriver in top of the turbine shaft.

**Note:** The machine shall be installed in accordance with national regulations for safety and other relevant regulations and standards. 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. In EU-countries the complete system must fulfil 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.

**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.

**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, guidance and recommendations for the avoidance of hazards due to static electricity.

## 4 Installation

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### 4.4 Special Conditions for Safe Use in accordance with ATEX Certification

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Directive 94/9/EC valid until 2016-04-19  
Directive 2014/34/EU valid from 2016-04-20

**ATEX Warning:** The unit may be operated, in a hazardous area, only when filled with the process fluid.



**ATEX Warning:** If a medium other than the process fluid is passed through the equipment, the flow must not be high enough to cause the equipment to operate. If this cannot be avoided, the rotor must be removed or secured to prevent rotation.



**ATEX Warning:** The maximum permitted process fluid temperature is 95°C, with an ambient temperature range of 0°C to 140°C.



**Working temperature max.:**

The maximum permitted process fluid temperature and ambient temperature when the machine is operating is 95°C.

**Ambient temperature:**

When the machine is **not** operating, the maximum permitted ambient temperature is 140°C.

**ATEX Warning:** The high temperature version of the Alfa Laval Toftejorg TJ20G machine has a maximum permitted process fluid temperature of 160°C, with an ambient temperature range of 0°C to 200°C.



High temperature machines: TE20G016-72 and TE20G016-82, TE20G017-72 and TE20G017-82 and TE20G018-72 and TE20G018-82

**Working temperature max.:**

The maximum permitted process fluid temperature and ambient temperature when the machine is operating is 160°C.

**Ambient temperature:**

When the machine is **not** operating, the maximum permitted ambient temperature is 200°C.

**ATEX Warning:** The maximum permitted process fluid pressure is 8 bar.



**ATEX Warning:** The unit must **not** be operated in a vessel having an enclosed volume of greater than 100m<sup>3</sup>.



**Tanks larger than 100 m<sup>3</sup>:**

To use Tank Cleaning Machines in tanks larger than 100m<sup>3</sup> is possible under certain conditions.

It is necessary to know the current factors such as tank size, cleaning solvent and product.

Additives can be used in the cleaning solvent, or, for example, the tank can be filled with nitrogen. The basic rules are described in the guide "IEC/TS 60079-32-1:2013".

Following a guidance document such as "IEC/TS 60079-32-1:2013" to establish safe use of machinery and process is the users own responsibility and is not covered by the ATEX certification for this product.

**ATEX Warning:** The unit must be effectively earthed at all times when in use.



**ATEX Warning:** The user must address the electrostatic hazards generated from the process of the equipment in accordance with guidance document IEC/TS 60079-32-1:2013.



In addition to the above mentioned precautions relating to the ATEX guidelines Directive 94/9/EC valid until 2016-04-19/Directive 2014/34/EU valid from 2016-04-20, the Safety Precautions on page 12 must be observed.

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## 5 Operation

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### 5.1 Normal operation

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#### Cleaning Media

Use only media compatible with Stainless Steel AISI 316L, SAF 2205, PVDF or PEEK, PFA HP and EPDM. For more aggressive chemicals, consider using the Hastelloy version. Normal detergents, moderate solutions of acids and alkalis are acceptable. Aggressive chemicals excessive concentrations of chemicals at elevated temperatures, as well as certain hypochlorides should be avoided. If in doubt, contact your local Alfa Laval sales office.

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**Note:** Do not try to turn the nozzle head by hand, since this may damage the Gear. The Nozzle head can be turned by blowing compressed air through the inlet connection.

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**Note:** PEEK is not resistant to concentrated sulphuric acid.

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#### Product

In cases where the machine is submerged in, or in other ways exposed to, product the compatibility between stainless steel AISI 316L, SAF 2205, PVDF or PEEK, PFA and EPDM and the product must be considered carefully. For more aggressive products consider using the Hastelloy version

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**Note:** EPDM swells significantly exposed to fatty materials

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#### 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 increase consumption of wear parts. High pressure also reduces the cleaning effect.

**ATEX Warning:** Steam cleaning pressure:



If steam cleaning is done through the machine, the steam pressure must not cause the machine to rotate.

**ATEX Warning:** Draining:



If the machine is drained using compressed air, then the compressed air pressure must not cause the machine to rotate.

#### Temperature:

##### Standard versions:

The maximum recommended process fluid temperature is 95°C. The recommended ambient temperature range is 0°C to 140°C.

##### No-EPDM version:

The maximum recommended process fluid temperature is 95°C. The recommended ambient temperature range is 0°C to 200°C.

In accordance with the ATEX specifications regarding special conditions for safe use, see page 14.

**ATEX Warning:** Atmosphere/surface temperature:



In potentially explosive atmospheres, the temperature must not exceed the maximum surface temperature according to the temperature class for the combustible gas or liquid.

**ATEX Warning:** Steam cleaning:



Tanks with capacities greater than 100 m<sup>3</sup> that could contain a flammable atmosphere should not be steam cleaned, as steam issuing from a nozzle could contain charged droplets.

Tanks smaller than this may be steam cleaned providing that: the steam nozzles and other metal parts of the system are reliably earthed and grounded to the tank structure.



### After Use Cleaning

After use flush the machine with fresh water. Cleaning media should never allow to dry or settle in the system due to possible "salting out" or "scaling" of the cleaning media. If cleaning media contains volatile chloride solvents, it is recommended **not to flush with water** after use, as this might create hydrochloric acid.

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## 5.2 Safety Precautions

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The machine is intended for use inside a tank only. As peak velocity of main jets reaches 40 m/s, The Alfa Laval Toftejorg TJ20G must not be operated in open air or when tank is open.

**ATEX 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 de-pressurised and drained before disassembly.



The cleaning jets impinging the tank surface are a source of noise. Depending on pressure and distance to the tank walls, noise level may reach up to 85 DB.

**ATEX Warning:** In case potentially explosive liquids are used, precautions should be taken against incidental creation of an explosive mixture with oxygen in the tank atmosphere.



**ATEX Warning:** Tanks may contain poisonous/hazardous products or products which represent an environmental or safety risk. Never open tank and dismount the machine without checking previous tank contents and necessary precautions.



## 6 Maintenance

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### 6.1 Preventive Maintenance

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Following the Alfa Laval Tank Equipment Preventive Maintenance Guidelines and using the Alfa Laval Service Kits ensures the availability of your equipment at all times and enables you to plan your operating budget and your downtime. The risk of unscheduled breakdowns due to component failure is virtually eliminated and in the long term your operating costs are reduced.

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

The recommended preventive maintenance program is based on tank cleaning machines working in average conditions. However, a tank cleaning machine, exposed to heavy soiling and recirculation CIP liquid containing abrasives and/or particulates, needs more frequent attention than one exposed to light/no soiling and recirculation with ordinary CIP liquid. Alfa Laval Kolding A/S recommends you to adjust the maintenance program to suit the cleaning task in hand. Contact your local Alfa Laval sales office for discussion.

For further information regarding Alfa Laval Service Kits and service intervals, see paragraph 6.3 Maintenance Intervals and Service Kits on page 19 of this manual or the Spare Parts Manual.

**Note:** Handle the Alfa Laval Toftejorg TJ20G with care. Take proper action to protect surfaces from being damaged.

Always use only proper tools and the Alfa Laval Toftejorg TJ20G standard tool kit (page 23). Never use force, hammer or pry components together or apart. Always perform all assembly/disassembly steps in the order described in this manual.

Clean all surfaces prior to assembling. Especially take care of the mating surfaces. Work in a clear well-lighted work area.

According to "Regulation (EC) No 1935/2004 - Article 17" effective from 27th of October 2006, producers of food shall ensure traceability of the materials and articles intended to come into contact with foodstuffs. It is recommended that a traceability system is setup for replacement of wear parts and spare parts. This makes it possible to identify into which machine a given wear part or spare part has been inserted.

## 6.2 Service and Repair of ATEX Certified Machines

All service and repair of ATEX certified machines can be performed by Alfa Laval Tank Equipment, Kolding, Denmark or by an Alfa Laval service center approved by Alfa Laval Tank Equipment.

**ATEX Warning:** In order to ensure compliance with the ATEX regulations and keep the machine ATEX certification valid the service or repair must be performed by an authorized person with knowledge of the ATEX requirements and regulations.



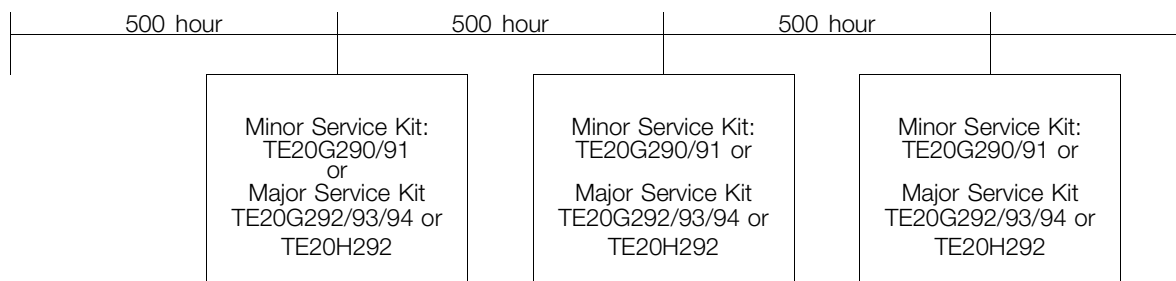
All spare parts must be original Alfa Laval spare parts and the repair or service must be done according to the instructions in the related manual.

If a customer wishes to carry out service or repair himself, it is the responsibility of the repair shop to ensure that the ATEX requirements are met in any way possible. After performing service or repair, the repair shop thus carries the full responsibility for traceability of all relevant documents in order to ensuring the retention of the ATEX certification of the machine.

## 6.3 Maintenance Intervals and Service Kits

It is recommended that the wear parts are check every 500 working hours for machine working under normal conditions. There is a Minor and a Major service kit for the Alfa Laval Toftejorg TJ20G (see the following pages).

### 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 Slide bearing (Pos. 14, page 36) for wear. If end face of Slide bearing is worn more than 1 mm into Slide bearing, it should be replaced.
4. Check bearing for Turbine shaft top (Pos. 24, page 36) 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. If the Bearings are loose in a horizontal direction, the bearings should be replaced.
5. Check Carrier bearing (Pos. 15.3, page 36). If worn oval to a max. diameter of more than 15.8 mm, it should be replaced.

**Note:** Timely replacement of Slide bearings and bearings for Turbine shaft prevents costly damage to the gearbox.

6. Check Planet wheels (Pos. 15.4 and 15.5, page 36) while still mounted in planet gear carrier (Pos.15.6). They must rotate easily on Shafts. If restriction or much clearance on Shafts is felt, Planet wheels should be dismantled for inspection of

## 6 Maintenance

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bearing bushes and Shafts for Planet wheel (Pos. 15.2). 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 on Stem nut (Pos. 9, page 36) and Hub nut (Pos. 18), in Ball retainers (Pos. 10) and Ball races.
8. 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.
9. Replace washer (pos. 22, page 36)
10. Assemble machines as described in the following pages.
11. Check that the machine is in operating condition by inserting flathead Screwdriver 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.
12. If Ball races (Pos. 16.2 and 17.2) on Stem and Hub as well as Stem/Hub nut w. Ball race (Pos. 9 and 18) and Washer (Pos. 22) are heavily worn, they should be replaced. Also the Ball retainer w. balls (Pos. 10, see page 27) should be replaced if heavily worn.

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 Reference Lists of Parts, pages 37 ff .

For all machines with serial number below 0604 xxxx please contact your local Alfa Laval office for correct service kit.

## Minor Service Kits for Alfa Laval Toftejorg TJ20G

Minor Service kit for TJ20G, Article no. TE20G290 - all models except TE20G016\_018 (see below)

Pos. no.	Part no.	Denomination	No.
3	TE20G640	Bearing for Turbine shaft	1 pcs.
14	TE20G641	Slide bearing	1 pcs.
15.3	TE20G642	Bearing for Planet Gear carr.	1 pcs.
15.4	TE20G643	Planet wheel I	1 pcs.
15.5	TE20G644	Planet wheel II	1 pcs.
22	TE20G584*	Washer	1 pcs.
24	TE20G548	Bearing for Turbine shaft top	1 pcs.

*\*For Hastelloy machines (20HXXX), the washer (Pos. 24) in the minor service kit is not used*

Minor Service kit for TJ20G, Article no. TE20G291 - models TE20G016\_018

Pos. no.	Part no.	Denomination	No.
3	TE20G640	Bearing for Turbine shaft	1 pcs.
14	TE20G641	Slide bearing	1 pcs.
15.3	TE20G642	Bearing for Planet Gear carr.	1 pcs.
15.4	TE20G643	Planet wheel I	1 pcs.
15.5	TE20G644	Planet wheel II	1 pcs.
22	TE51B021	Washer	1 pcs.
24	TE20G548	Bearing for Turbine shaft top	1 pcs.

*\*For Hastelloy machines (20HXXX), the washer (Pos. 24) in the minor service kit is not used*

## 6 Maintenance

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### Major Service Kits for Alfa Laval Toftejorg TJ20G

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Major Service kit for TJ20G, Article no. TE20G292 - all models except TE20G016\_018 and TE20G030\_044 (see below)

Pos. no.	Part no.	Denomination	Qty.
3	TE20G640	Bearing for Turbine shaft	1 pcs.
9	TE20G571	Stem nut with ball race	1 pcs.
10	TE20G318	Ball retainer with balls	2 pcs.
14	TE20G641	Slide bearing	1 pcs.
15.1	TE51C102	Cotter pin	2 pcs.
15.3	TE20G642	Bearing for Planet Gear carr.	1 pcs.
15.4	TE20G643	Planet wheel I	1 pcs.
15.5	TE20G644	Planet wheel II	1 pcs.
17.2	TE20G574	Ball race	2 pcs.
18	TE20G573	Hub nut with ball race	1 pcs.
22	TE20G584	Washer	1 pcs.
24	TE20G548	Bearing for Turbine shaft top	1 pcs.

Major Service kit for TJ20G, Article no. TE20G293 - models TE20G016\_018 (no-EPDM version)

Pos. no.	Part no.	Denomination	Qty.
3	TE20G640	Bearing for Turbine shaft	1 pcs.
9	TE20G571	Stem nut with ball race	1 pcs.
10	TE20G318	Ball retainer with balls	2 pcs.
14	TE20G641	Slide bearing	1 pcs.
15.1	TE51C102	Cotter pin	2 pcs.
15.3	TE20G642	Bearing for Planet Gear carr.	1 pcs.
15.4	TE20G643	Planet wheel I	1 pcs.
15.5	TE20G644	Planet wheel II	1 pcs.
17.2	TE20G574	Ball race	2 pcs.
18	TE20G573	Hub nut with ball race	1 pcs.
22	TE51B021	Washer	1 pcs.
24	TE20G548	Bearing for Turbine shaft top	1 pcs.

Major Service kit for TJ20G, Article no. TE20G294 - models TE20G030\_044 (Distillery version)

Pos. no.	Part no.	Denomination	Qty.
3	TE20G640	Bearing for Turbine shaft	1 pcs.
9	TE20G636	Stem nut with ball race	1 pcs.
10	TE20G318	Ball retainer with balls	2 pcs.
14	TE20G641	Slide bearing	1 pcs.
15.1	TE51C102	Cotter pin	2 pcs.
15.3	TE20G642	Bearing for Planet Gear carr.	1 pcs.
15.4	TE20G643	Planet wheel I	1 pcs.
15.5	TE20G644	Planet wheel II	1 pcs.
17.2	TE20G574	Ball race	2 pcs.
18	TE20G633	Hub nut with ball race	1 pcs.
22	TE20G584	Washer	1 pcs.
24	TE20G548	Bearing for Turbine shaft top	1 pcs.

Major Service kit for TJ20G, Article no. TE20H292 - models TE20HXXX (Hastelloy version)

Pos. no.	Part no.	Denomination	Qty.
3	TE20G640	Bearing for Turbine shaft	1 pcs.
9	TE20H571	Stem nut with ball race	1 pcs.
10	TE20H318	Ball retainer with balls	2 pcs.
14	TE20G641	Slide bearing	1 pcs.
15.1	TE20H542	Cotter pin	2 pcs.
15.3	TE20G642	Bearing for Planet Gear carr.	1 pcs.
15.4	TE20G643	Planet wheel I	1 pcs.
15.5	TE20G644	Planet wheel II	1 pcs.
17.2	TE20H574	Ball race	2 pcs.
18	TE20H573	Hub nut with ball race	1 pcs.
24	TE20G548	Bearing for Turbine shaft top	1 pcs.

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## 6.4 Available add-ons for Spare parts

Part no.	Denomination
TE20XXXX-8X TE20XXXX-8X	<ul style="list-style-type: none"> <li>• Declaration of Compliance:               <ul style="list-style-type: none"> <li>- EN 10204 type 3.1 Inspection Certificate</li> <li>- FDA Declaration of Compliance</li> </ul> </li> </ul>

### General recommendations

- Always read the instruction and maintenance manuals carefully before undertaking the service.
- Always replace all parts included in the Service Kit.
- Prior to assembly/disassembly clean all tools and fixtures to ensure that scratches and marks and trace of soil/corrosion from tools are avoided.
- Do not scratch or damage the surfaces of the machine.
  - Always place components on soft material

Check surfaces for product residues and clean all parts before assembly. Assembly of the machine is described on the following pages.

## 6.5 Tools

### Disassembly Tools needed for Maintenance and Repair

Besides the standard toolkit for the Alfa Laval Toftejorg TJ20G and the Torque Wrench toolkit additional tools are needed:

- Flathead screwdriver (size 5/32")
- Slip joint pliers
- Rubber hammer
- Drift punch (size  $\varnothing 5$  mm)
- Bench vice (large enough to secure the body of the TJ20G)
- 11 mm open ended spanner
- Support ring (only for changing Ball races) - e.g. a piece of pipe with an inner diameter of  $\varnothing 84$

### Standard Tool kit, Article No. TE81B085

Tool No.	Description
TE369	Caliper
TE462A	Socket wrench w. pin
TE81B040	Spanner for Alfa Laval Toftejorg TJ20G (flat jawed)
TE81B041	Spanner (13 mm)

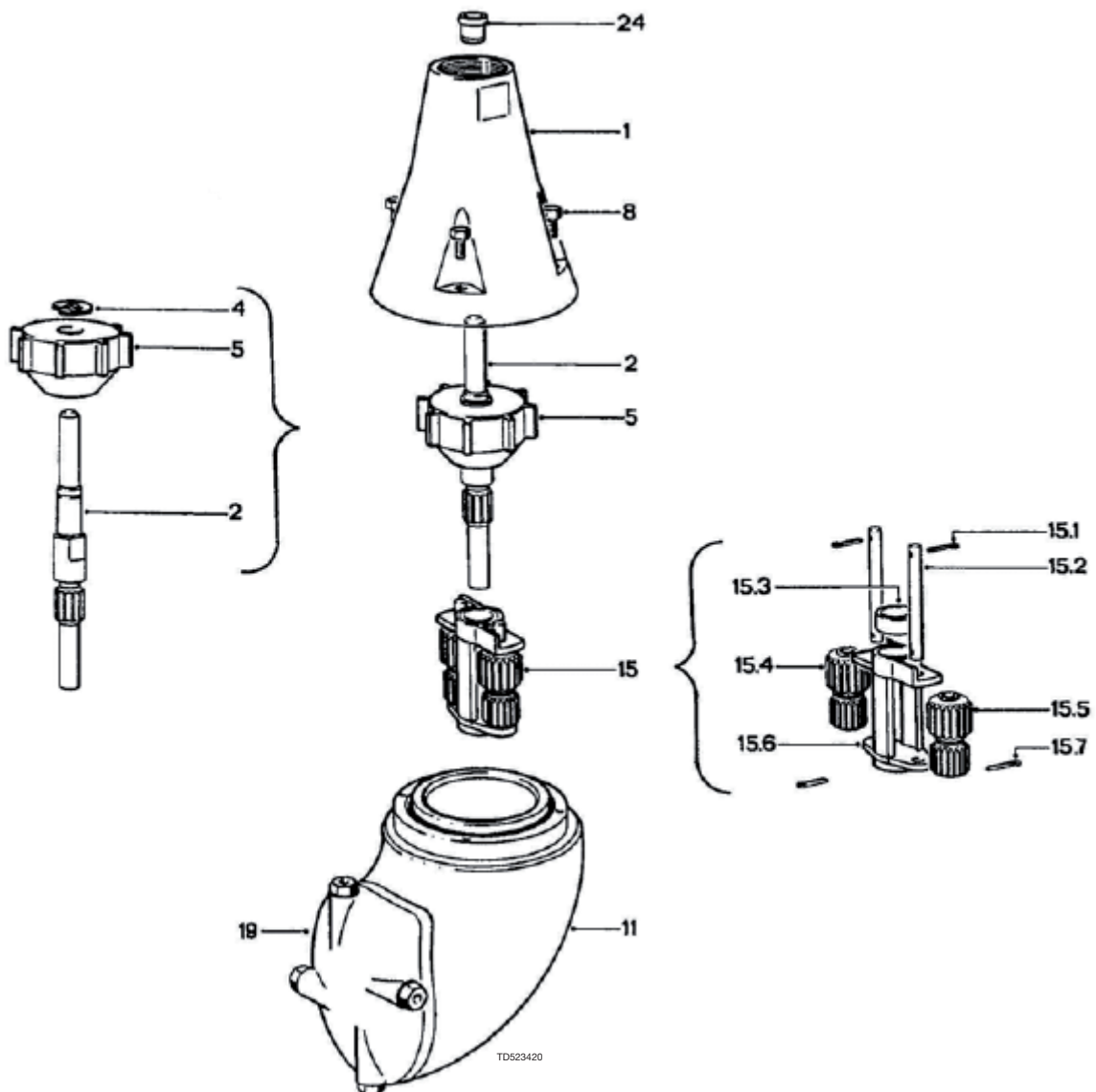
### Torque Wrench Tool Kit, Article No. TE81B087

Tool No.	Description
TE81B088	Torque wrench with interchangeable ratchet head
TE81B089	Ring insert tool for torque wrench

## 6 Maintenance

### 6.6 Disassembly

1. Remove the 4 Screws (Pos. 8) using a socket wrench (tool No. TE462A).
2. Lift off Cone (Pos. 1).
3. Withdraw Turbine shaft (Pos. 2) with Impeller. If necessary, turn Turbine shaft left and right.
4. Remove Circlip (Pos. 4) using a flathead Screwdriver and pull off Impeller (Pos. 5).
5. Withdraw Carrier assembly (Pos. 15) while turning/rocking carrier left and right.
6. Remove Cotter pins (Pos. 15.7) using a slip joint plier, pull out Shafts (Pos. 15.2) and remove Planet wheels (Pos. 15.4 and 15.5). If necessary, push out Carrier bearing (Pos. 15.3)
7. If necessary, push out Bearing for Turbine shaft top (Pos. 24) from Cone (Pos.1) using tool no. TE462A.



8. Remove Retainer spring (Pos. 6) – see page 36. Use flathead Screwdriver to lift Retainer spring out of groove in Stem (Pos. 16). Lift off Retaining ring (Pos. 7).
9. Hold Body against table and unscrew Stem nut w. ball race (Pos. 9) with Caliper (tool No. TE369) – see page 23. If the Stem Nut with Ball Race is difficult to loosen use rubber hammer on Caliper. Withdraw Stem (Pos. 16) together with Ball retainer w. balls (Pos. 10).
10. Remove the 3 Screws (Pos. 12) with a socket wrench (tool No. TE462A) and draw out Internal gear (Pos. 13).
11. Secure the body in Bench vice (NB!!: use cloth between jaws and body to avoid making scratches and imperfections in body surface) so that the hub cover is secured. Insert a 13 mm spanner (tool No. TE81B041) onto cap nut (Pos. 23) and unscrew the Cap nut (Pos. 23) – see page 36. Remove Washer (Pos. 22). **IMPORTANT:** Inserting drift punch into nozzle



(Pos. 21), instead of using the bench vice, to apply resistance for unscrewing Cap nut (Pos. 23), damages the nozzle and the nozzle vane.

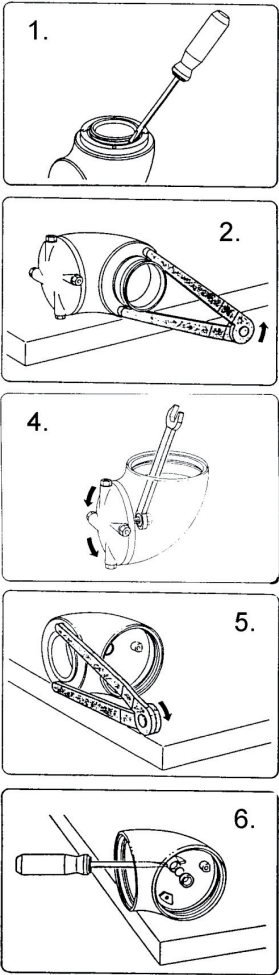
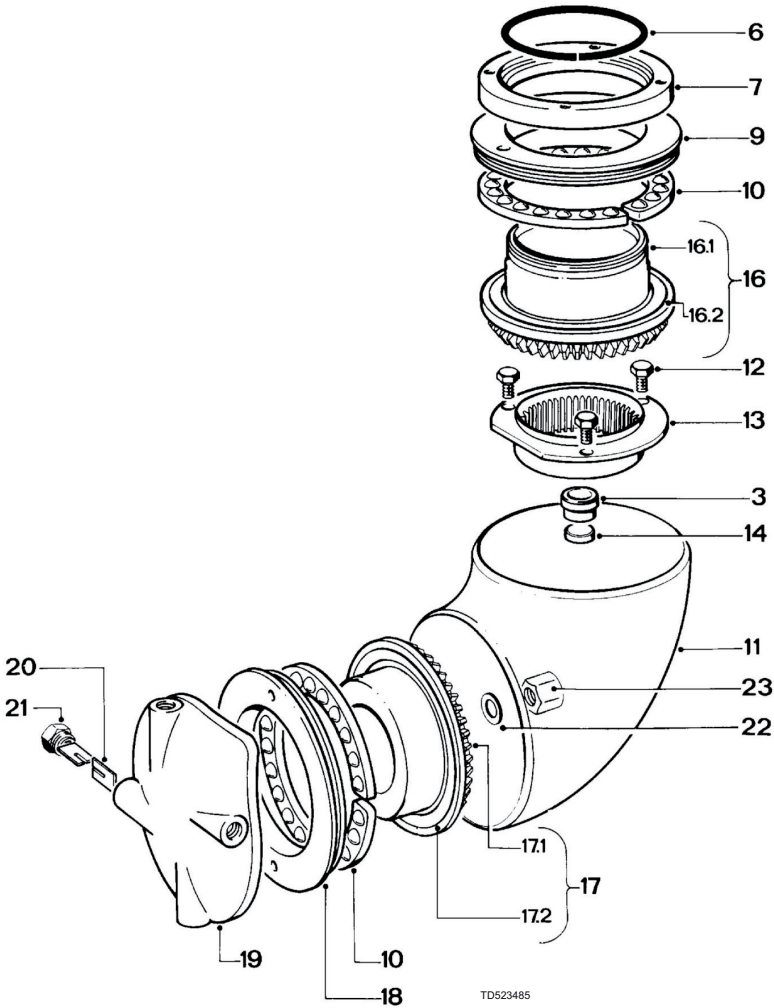
12. Hold Body against table and unscrew Hub nut w. ball race (Pos. 18) with Caliper (tool No. TE369) – see drawing below. If the Stem nut w. Ball race is difficult to loosen use rubber hammer on Caliper.

**Note:** Left-hand thread

Withdraw Hub (Pos. 17) together with Ball retainer w. balls (Pos. 10).

13. With flathead screwdriver lift Slide bearing (Pos. 14) and Bearing for Turbine shaft bottom (Pos. 3) out of Body – see drawing below.

14. Unscrew Nozzles (Pos. 21) with 11 mm spanner. Be careful not to damage Nozzle vanes (Pos. 20) as this will severely reduce Nozzle performance. Nozzle vanes should not be removed unless they need to be replaced.



## 6 Maintenance

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### 6.7 Reassembly

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

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.

1. Insert Bearing for Turbine shaft top (Pos. 24) in top of Cone (Pos. 1). (Use drift punch to align and make the initial pressure-by-hand into the hole for the bearing. Then push it all the way in using the reverse end of the socket wrench (if needed use rubber hammer to apply pressure).

**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.

2. Insert Carrier bearing (Pos. 15.3) and push with thumb. Insert Planet wheels (Pos. 15.4 and 15.5) and Shafts (Pos. 15.2) and secure with Cotter pins (Pos. 15.7) – lock the Cotter pins by bending the ends around the Shafts (Pos. 15.2). Check free rotation of Planet wheels.
3. Insert Carrier Assembly (Pos. 15), into Body: Hold Body in one hand and use the other to turn Hub Cover (Pos. 19) left and right with small rocking movements until carrier falls through Internal gear (Pos. 13, page 36). Check that carrier is fully home on Bearing for Turbine shaft bottom (Pos. 3) in Body: Rotate Carrier Assembly by hand a few rotations to check correct position and function. (Hub cover (pos. 19) is now locked and can only rotate by moving the Carrier assembly).
4. Mount Impeller (Pos. 5) on Turbine shaft (Pos. 2) and secure with Circlip (Pos. 4) using flathead Screwdriver.
5. Insert Turbine shaft with Impeller through Carrier Assembly. Rotate Impeller to ensure correct insertion into Bearing for Turbine shaft (Pos. 3) in Body. Check unrestricted rotation.
6. Mount Cone (Pos. 1) over Turbine shaft and Retaining ring. Mount and tighten the 4 Screws (Pos. 8) with Socket wrench (tool No. TE462A).
7. Place Slide bearing (Pos. 14) in Body and push in Bearing for Turbine shaft (Pos. 3) with thumb (or end of Socket Wrench). Make sure that Bearing is fully home.
8. Insert Hub (Pos. 17) together with Ball retainer w. balls (Pos. 10). Mount Hub nut w. Ball race (Pos. 18) with Caliper (tool No. TE369) and tighten. The Hub nut w. Ball race should be tightened so much that it cannot be loosened by hand (e.g. use rubber hammer a few times on Caliper to increase torque).
9. Insert Hub cover (Pos. 19) into centre hole of Hub (Pos. 17).
10. Place Washer (Pos. 22) on threaded pin on Hub cover (Pos. 19) and mount Cap nut (Pos. 23). Insert spanner (tool No. TE81B041) into Body, hold Cap Nut (Pos. 23) and by hand screw on Hub cover (Pos. 19) and tighten to a torque of 25 Nm using torque wrench toolkit (tool. No. TE81087). Check free rotation of Hub.

**Warning:**

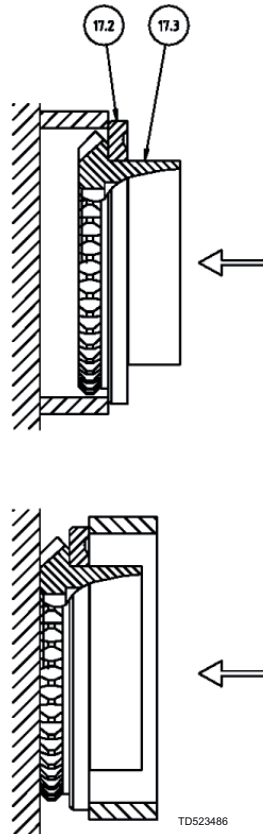


Tightening torque: 25 Nm  
Use torque toolkit or alike

11. Insert Internal gear (Pos. 13), mount Screws (Pos. 12) and tighten with Socket wrench (tool No. TE462A).
  12. Insert Stem (Pos. 16) together with Ball retainer w. balls (Pos. 10). Mount Stem nut w. ball race (Pos. 9) with Caliper (tool No. TE369) and tighten. Turn Hub cover (Pos. 19) and check unrestricted rotation.
  13. Place Retaining ring (Pos. 7) over Stem (Pos. 16) and push on Retainer spring (Pos. 6) and "click" into groove in Stem. Check free rotation.
-

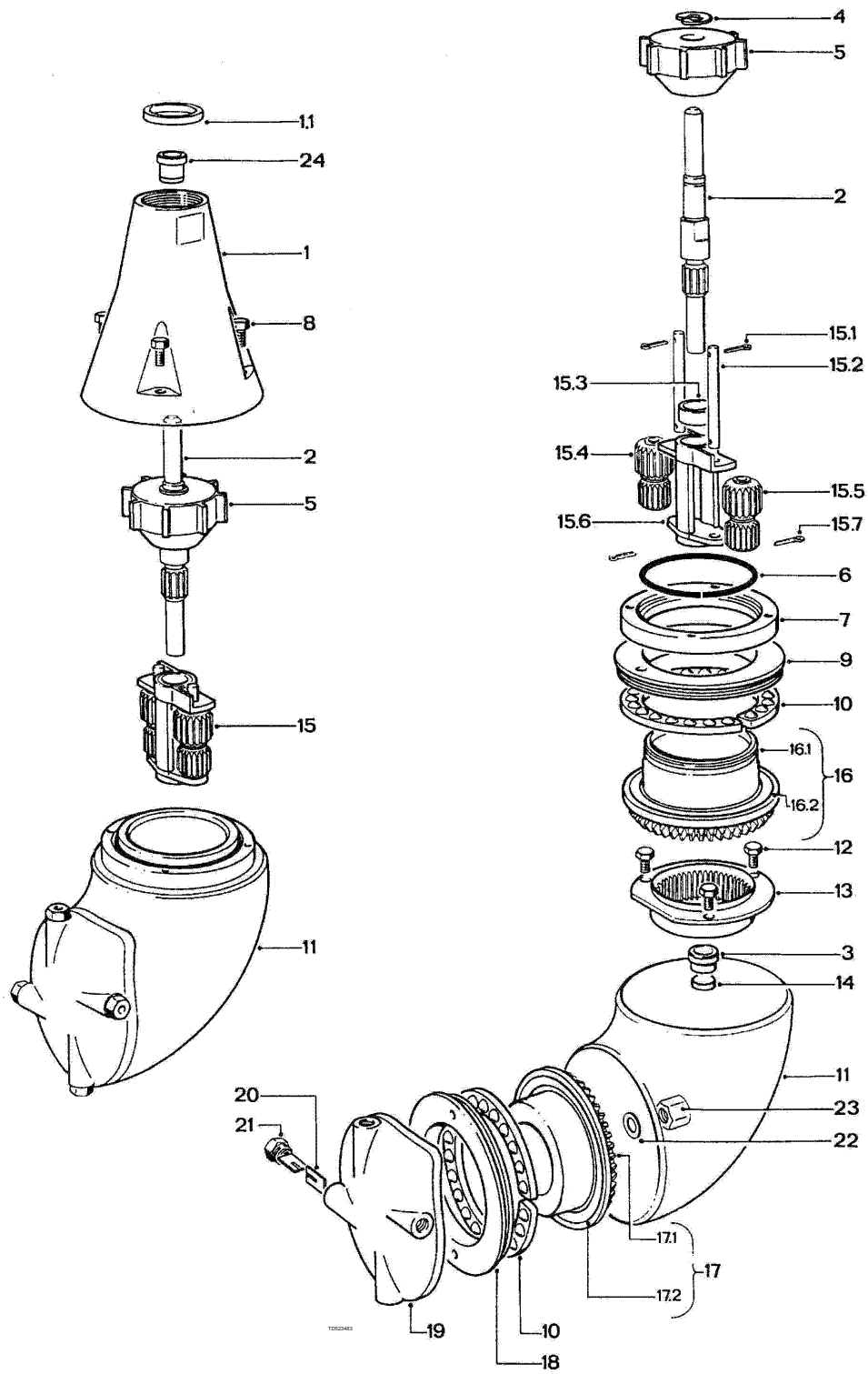
### 6.8 Replacement of Ball Races

1. Place Stem or Hub completely (Pos. 16 or 17 page 36) in a support ring (e.g. a piece of pipe with an inner diameter of  $\varnothing 84$ ) and press off Ball race. Press parallel. Be careful not to damage teeth and opposite end face of Stem.
2. With the support ring (e.g. a piece of pipe with an inner diameter of  $\varnothing 84$ ) press Ball race fully home. Press parallel. Be careful not to damage surface of Ball race.



## 7 Trouble Shooting Guide

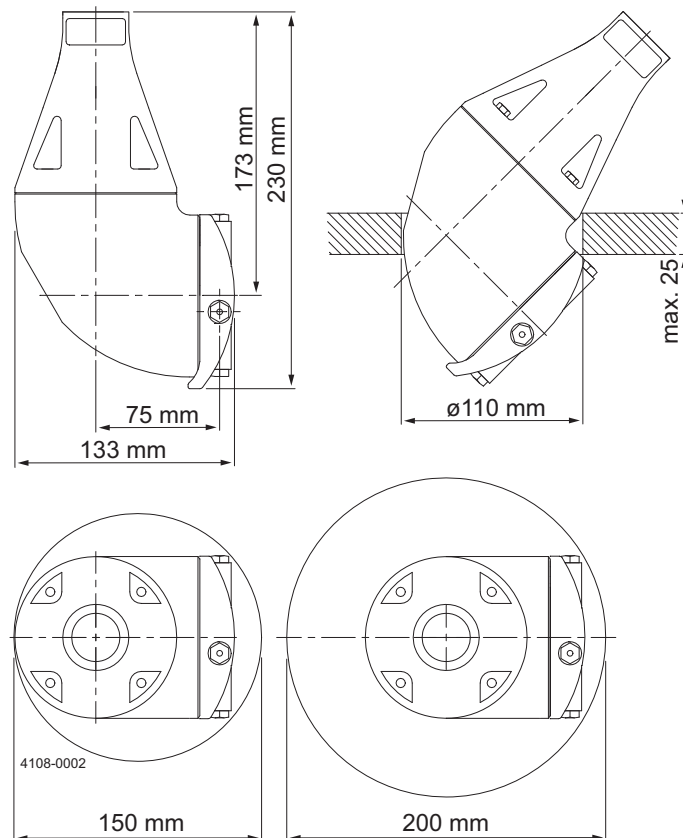
Possible Causes	Fault finding
Loose Cap nut	a) Check that the torque of the Cap nut (Pos. 23) is at least 25 Nm.
Wear	b) Remove Cap nut (Pos. 23) and check Washer (Pos. 22) for wear and signs of corrosion - replace if needed.
<b>Symptom: Slow rotation or failure of the machine to rotate:</b>	
No or insufficient liquid flow	<p>a) Check if supply valve is fully open.            b). Check if inlet pressure to machine is correct.            c). Check supply line/filter for restrictions/clogging.            d). Remove Nozzles and check for clogging. If blocked, carefully clean Nozzle without damaging Nozzles vanes and Nozzle tip.            e). Remove Cone (see page 24) and check for clogging in Impeller of inlet guide inside Cone and in Impeller area.</p> <p>If large particles repeatedly get jammed in the machine, install filter or reduce mesh size of installed filter in supply line.</p>
<b>Foreign material or material build-up</b>	Insert Screwdriver in Screw in top of Turbine shaft and easily turn Turbine shaft clockwise. If any resistance is recognised, disassemble machine to localise cause.
a). Impeller jammed	Remove Turbine shaft with Impeller and Carrier assembly (see page 24) and remove foreign material.
b). Turbine shaft sluggish in Bearing	Remove Turbine shaft with Impeller (see page 24) and clean Bearing.
c). Planet gear jammed/sluggish	Remove foreign material from Planet wheels and internal gears. Check rotation of Planet wheels. If restriction is recognised, disassemble Carrier assembly (see page 24) and remove material build up, especially on Shafts and bushes in Planet wheels.
d). Stem or Hub jammed/sluggish	Remove Carrier assembly (see page 24). Turn Hub cover and check unrestricted rotation. Remove Stem and Hub (see page 24 ff). Remove foreign material/material build-up on Stem, Hub and inside Nut w. ball race. Clean Ball races and Ball retainer with balls. Assemble Stem/Hub, Ball retainer with balls and Stem/Hub nut with ball race.
e). Bevel gears jammed	Remove Stem and Hub (see page 24 ff). Clean teeth on Stem and Hub.
<b>Wear</b>	
a) Slide bearings	See page 19.
b) Bearings for Turbine shaft	See page 19.
c) Planet wheels	See page 19.
d) Shafts for Planet wheels	Check clearance of Planet wheels on Shafts. Transverse movement should not exceed 0.3 mm.
e) 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.
<b>Mechanical defects</b>	
a) Planet wheels. Teeth broken	Replace Planet wheel.
b) Planet wheel can not rotate on Shafts/ Shafts bent	Replace Shafts for Planet wheels.
c) Damaged teeth on Bevel gear	Inspect teeth on Stem and Hub for deformation. Mount Hub and Stem in Body (See page 26). Hold Body in upside down position and rotate Hub to check that bevel gears can work together. If damaged: Replace Stem and/or Hub.
d) Damage on Stem and Hub-nut	If hard particles get stuck between Stem nut and Stem or Hub nut and Hub, the particles will damage the parts. The damaged parts should be replaced.



## 8 Technical Data

Weight of machine:	5.1 kg (11.2 lb)
Working pressure:	3-8 bar (40-115 psi)
Recommended inlet pressure:	5-7 bar (70-100 psi)
Working temperature max.:	95°C (200°F)
Ambient temperature:	0 - 140°C (95°C/200°F - 140°C /284°F when not operated
No-EPDM machines:	0 - 200°C (95°C/200°F - 200°C /392°F when not operated
<i>TE20G016-72/TE20G016-82</i>	
<i>TE20G017-72/TE20G017-82</i>	
<i>TE20G018-72/TE20G018-82</i>	
Materials:	Stainless Steel AISI 316L, SAF 2205, PFA, PEEK, PVDF, A4/EPDM
Materials - Hastelloy:	Hastelloy C22, Hastelloy C276, PEEK, Viton, PFA

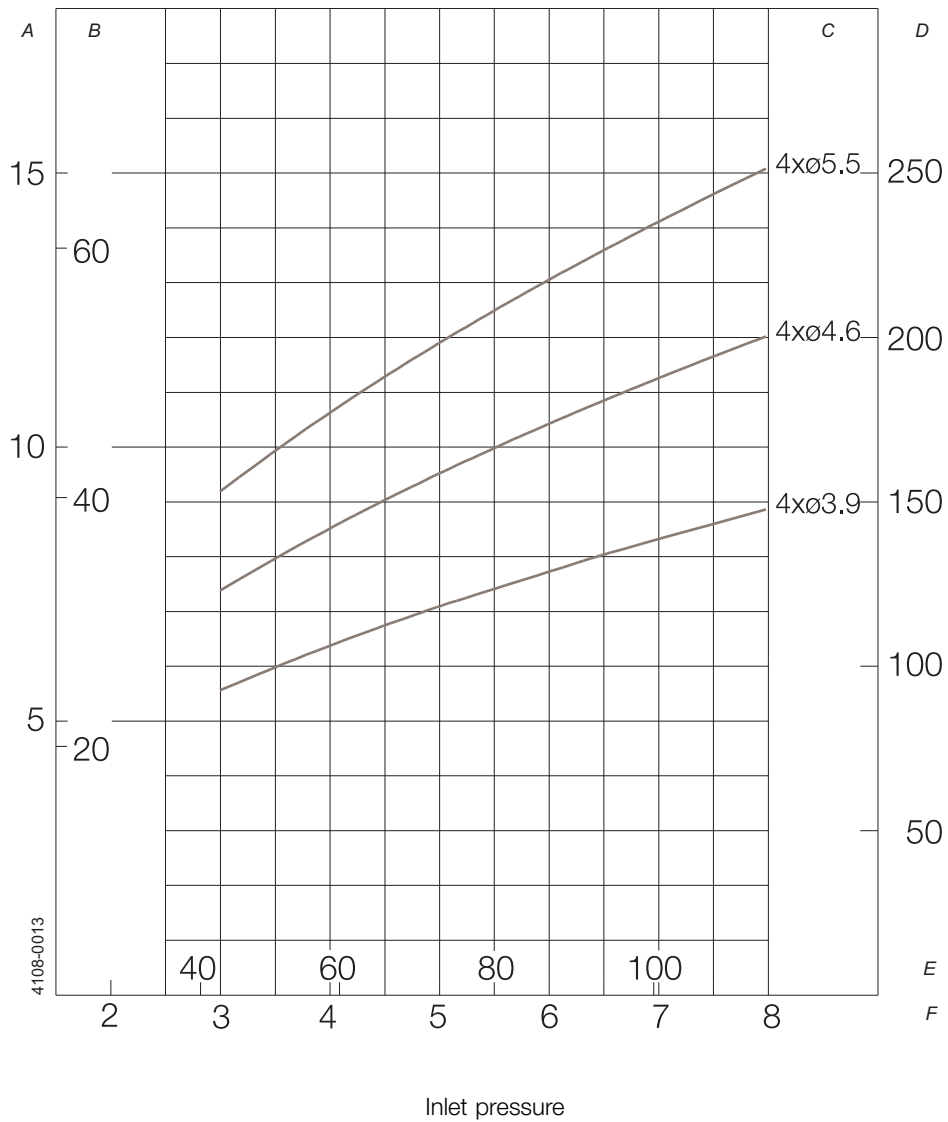
### Principal dimensions in mm



Minimum required passage:  $\varnothing 110$  mm (4.33 inch) at flange thickness 25 mm (0.98 inch). Otherwise  $\varnothing 150$  mm (5.90 inch).

Performance Data:

Flow rate



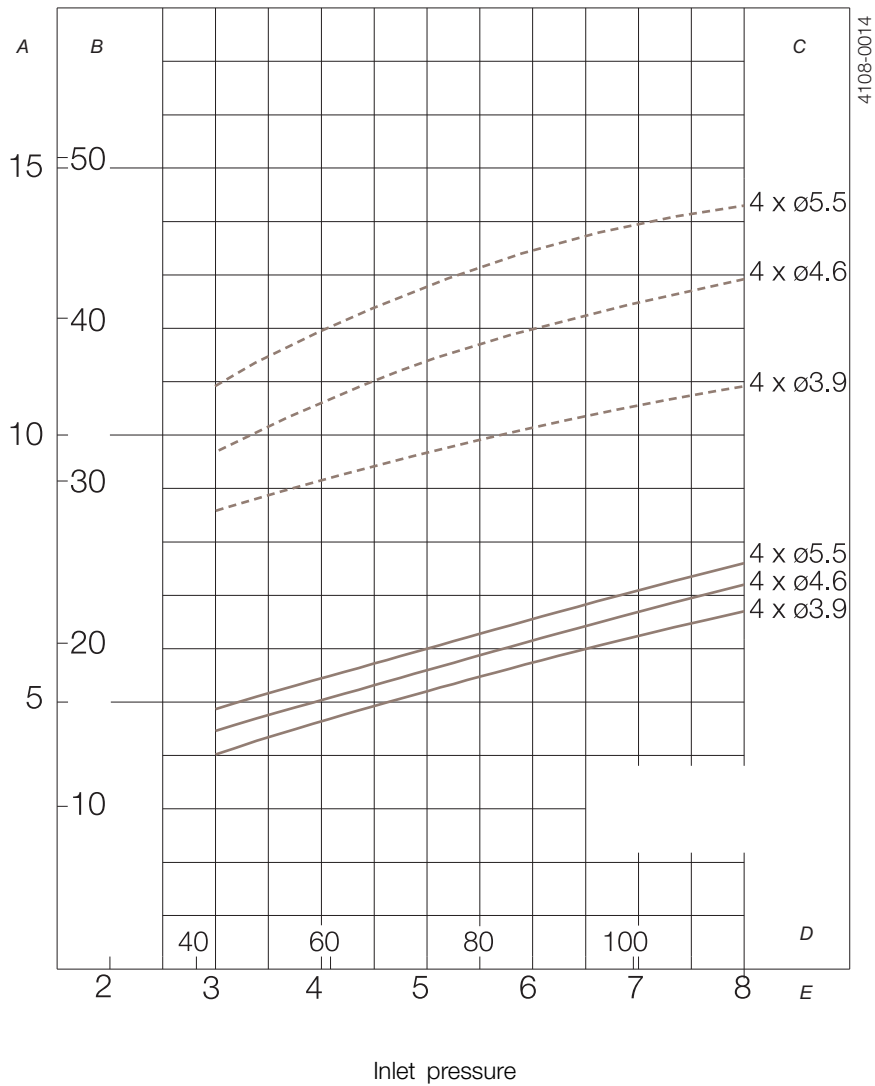
A: m <sup>3</sup> /h	B: USgpm	C: nozzle sizes	D: l/min.	E: psi	F: bar
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# 8 Technical Data

## Performance Data:

### Throw length

Max. static  
 Effective  
TD529321



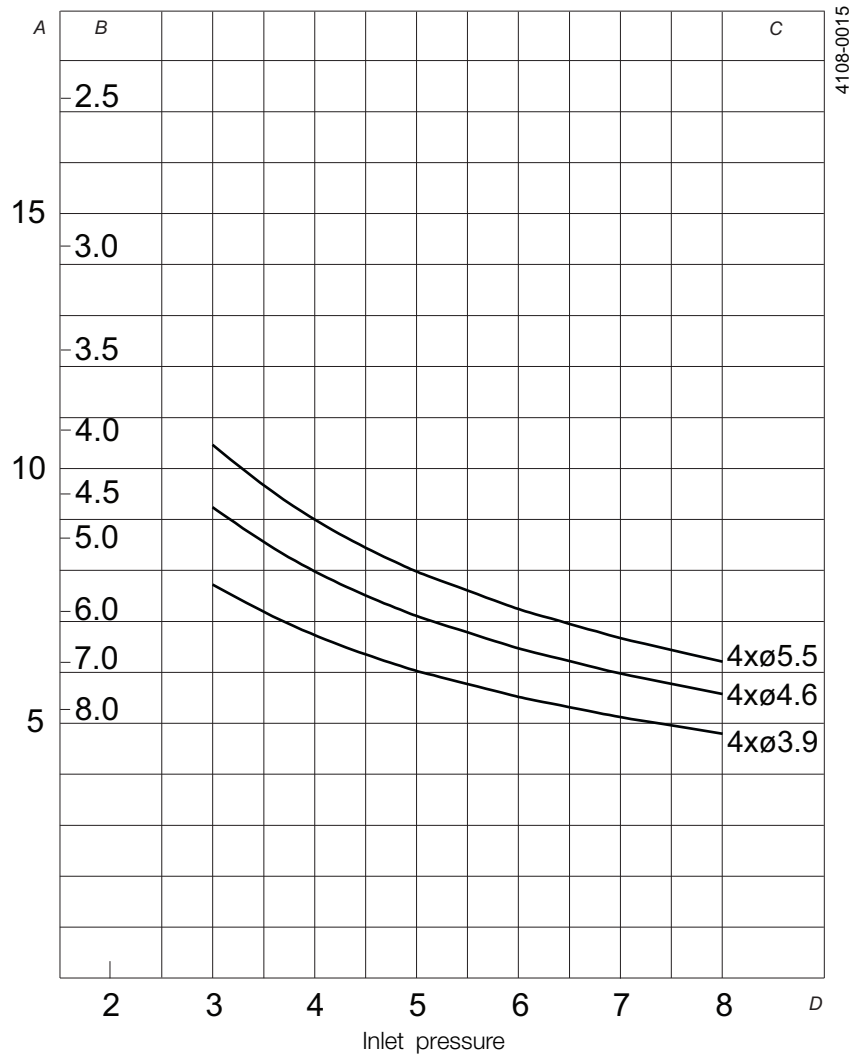
A: m	B: ft	C: nozzle sizes	D: psi	E: bar
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**Note:** Throw lengths are measured as horizontal throw length at static condition. Vertical throw length upwards is approx. 1/3 less. Effective throw length is defined as impact centre of jet 250 mm water column (50 lbs/sq.ft). Effective throw length varies depending on jet transverse speed over surface, substance to be removed, cleaning procedure and agent. The inlet pressure has been taken immediately before the machine inlet. In order to achieve the performance indicated in the curves, the pressure drop in the supply lines between pump and machine must be taken into consideration.



Performance Data:

Cleaning Time, f. complete Pattern (=8 cycles)



A: min.	B: RPM of machine body	C: nozzle sizes	D: bar
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## 9 Product Programme

This manual covers the product program for Alfa Laval Toftejorg TJ20G tank cleaning machine

### 9.1 Standard Configurations

Alfa Laval Toftejorg TJ20G options

Connection	Nozzles (mm) (1/2" thread conn.)	Standard Article No.	Distillery Article No.	Hastelloy Article No.	Secured Article No.	High temp. Article No.	Burst Article No.
1" BSP, Female	4 x ø3.9	TE20G000-xx	TE20G030-xx	TE20H000(-x0)	TE20G010-xx	TE20G016-x2	TE20G060-xx
	4 x ø4.6	TE20G002-xx	TE20G032-xx	TE20H002(-x0)	TE20G012-xx	TE20G017-x2	TE20G061-xx
	4 x ø5.5	TE20G004-xx	TE20G034-xx	TE20H004(-x0)	TE20G014-xx	TE20G018-x2	TE20G062-xx
1" NPT, Female	4 x ø3.9	TE20G020-xx	TE20G040-xx	TE20H020(-x0)			
	4 x ø4.6	TE20G022-xx	TE20G042-xx	TE20H022(-x0)			
	4 x ø5.5	TE20G024-xx	TE20G044-xx	TE20H024(-x0)			
1" BSP, Female Sanitary	4 x ø3.9	TE20G050-xx		TE20H050(-x0)			TE20G063-xx
	4 x ø4.6	TE20G052-xx		TE20H052(-x0)			TE20G064-xx
	4 x ø5.5	TE20G054-xx		TE20H054(-x0)			TE20G065-xx

See page 35 for choices of sanitary welding connectors



#### Index no.:

TE20GXXX (no postfix): version w. PVDF impeller

TE20GXXX-X2: version w. PEEK impeller

TE20HXXX (no postfix): Hastelloy version w. PEEK impeller

### 9.2 Available Add-ons

TE20XXXX-7X:	ATEX	
TE20XXXX-8X:	ATEX + Q-doc.	
TE20XXXX-9X:	Q-doc	
<b>Explanation to Add-on</b>		
Q-doc	Equipment Documentation includes: <ul style="list-style-type: none"> <li>- EN 10204 type 3.1 Material Inspection certificate</li> <li>- USP Class VI certificate</li> <li>- FDA Declaration of Conformity</li> <li>- TSE Declaration</li> <li>- QC Declaration of Conformity</li> </ul>	
ATEX	ATEX includes: For TE20X000_054 except TE20G016_018: ATEX approved machine for use in explosive atmospheres. Category 1 for installation in zone 0/20 in accordance to Directive 94/9/EC. valid until 2016-04-19/Directive 2014/34/EU valid from 2016-04-20. Ex II 1 GD c T140°C  For TE20G016_018: ATEX approved machine for use in explosive atmospheres. Category 1 for installation in zone 0/20 in accordance to Directive 94/9/EC. valid until 2016-04-19/Directive 2014/34/EU valid from 2016-04-20. Ex II 1 GD c T250°C Tamb 0°C to +200°C.	

This manual covers the product program for Alfa Laval Toftejorg TJ20G tank cleaning machine

### 9.3 Available welding connections

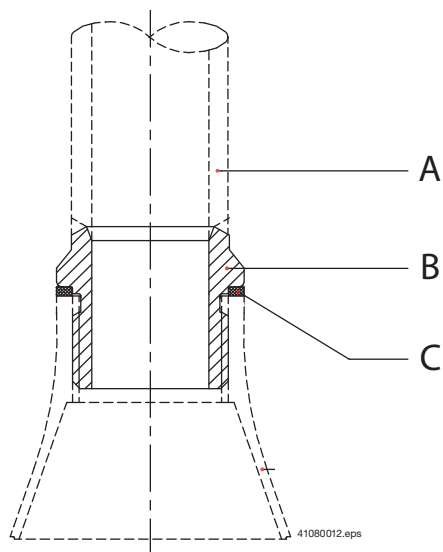
Welding adapter (see right) with sealing assembly between Down pipe, Welding adapter and machine.

Welding connections are ordered separately.

For use with sanitary connection cones use cone with seal (seals are included for machines with sanitary cone).

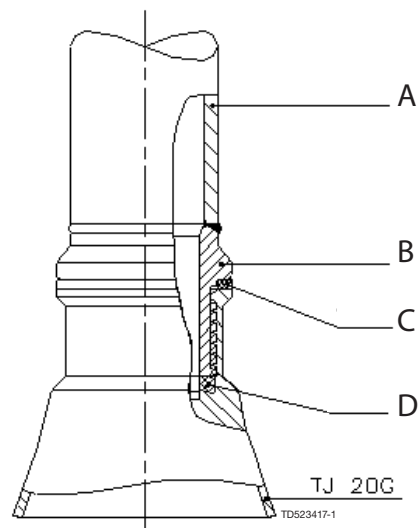
Pipe	Dimensions in mm	Connection thread	Article no.
1" ISO thread pipe:	ø33.7 x 3.25	1" BSP	TE52D030
1" ANSI Sch.40S:	ø33.4 x 3.38	1" NPT	TE52D031
1 ½" ISO Dairy pipe:	ø38 x 1.2	1" BSP	TE52D032
1 ½" SWG pipe:	ø38 x 1.6	1" NPT	TE52D033
1" ANSI Sch.40S:	ø33.4 x 3.38	1" BSP	TE52D034

Standard cone



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

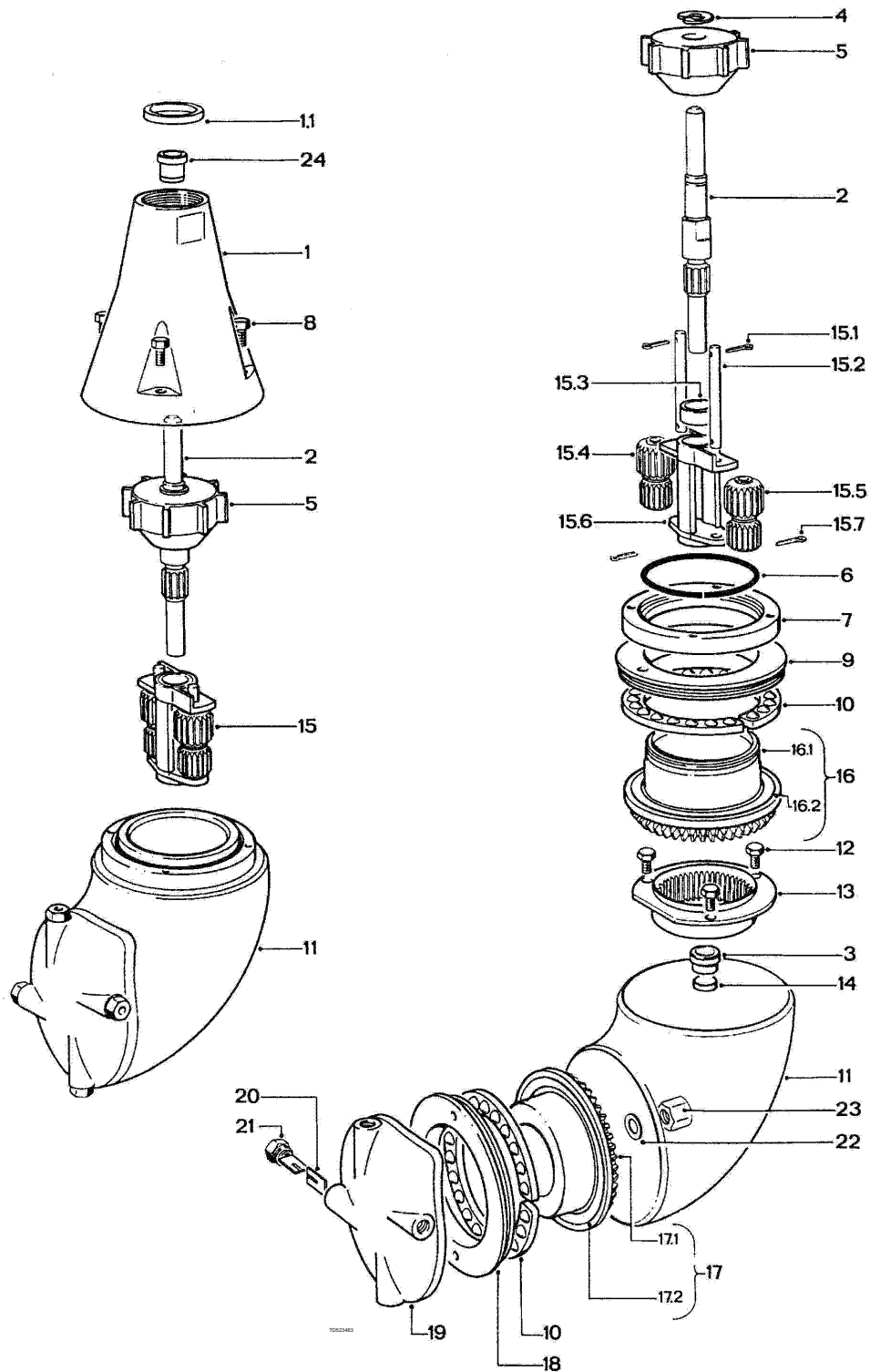
Sanitary connection cone



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

# 10 Parts Lists and Drawing

## 10.1 Assembly Drawing



10.2 Reference Lists of Parts

Alfa Laval Toftejorg TJ20G, TE20G000\_024 + TE20G050\_054 (except TE20G010-TE20G018)

Pos.		Part. no.	Qty.	Denomination	Materials	Remarks
1	#	TE20G508	1	Cone 1" BSP	Stainless steel	Spare part
	#	TE20G517	1	Cone 1" NPT	Stainless steel	Spare part
	#	TE20G518	1	Cone 1" BSP f. sanitary conn.	Stainless steel	Spare part
1.1	#	TE51T212	1	Gasket (only f. TE20G518)	Elastomer	Spare part
2		TE20G550	1	Turbine shaft	Stainless steel	Spare part
3		TE20G640	1	Bearing for Turbine shaft	Polymer	Wear part
4		TE51C201	1	Circlip	Stainless steel	Spare part
5	#	TE20G553	1	Impeller (ø3.5/3.9 mm nozzle)	Polymer (PVDF)	Spare part
	#	TE20G554	1	Impeller (ø4.5/4.6 mm nozzle)	Polymer (PVDF)	Spare part
	#	TE20G555	1	Impeller (ø5.5 mm nozzle)	Polymer (PVDF)	Spare part
	#	TE20G595	1	Impeller (ø3.5/3.9 mm nozzle)	Polymer (PEEK)	Spare part
	#	TE20G596	1	Impeller (ø4.5/4.6 mm nozzle)	Polymer (PEEK)	Spare part
	#	TE20G597	1	Impeller (ø5.5 mm nozzle)	Polymer (PEEK)	Spare part
6		TE20G565	1	Retainer spring	Stainless steel	Spare part
7		TE20G563	1	Retaining ring	Stainless steel	Spare part
8		TE51A172	4	Screw	Stainless steel	Spare part
9		TE20G571	1	Stem nut with ball race	Stainless steel	Wear part
10		TE20G318	2	Ball retainer with balls	Polymer/Stainless steel	Wear part
11		TE20G512	1	Body	Stainless steel	Spare part
12		TE51A170	3	Screw	Stainless steel	Spare part
13		TE20G525	1	Internal gear	Stainless steel	Spare part
14		TE20G641	1	Slide bearing	Polymer	Wear part
15		TE20G340	1	Carrier assembly	Assembly	Spare part
15.1		TE51C102	2	Cotter pin	Stainless steel	Spare part
15.2		TE20G541	2	Shaft for Planet wheel	Stainless steel	Spare part
15.3		TE20G642	1	Bearing for planet gear carrier	Polymer	Wear part
15.4		TE20G643	1	Planet wheel I	Polymer	Wear part
15.5		TE20G644	1	Planet wheel II	Polymer	Wear part
15.6		TE20G530	1	Planet gear carrier	Stainless steel	Spare part
15.7		TE51C102	2	Cotter pin (= pos. 15.1)	Stainless steel	Spare part
16		TE20G319	1	Stem complete	Assembly	Spare part
16.1		TE20G624	(1)	Stem	Stainless steel	Spare part
16.2		TE20G574	(1)	Ball race	Stainless steel	Wear part
17		TE20G320	1	Hub complete	Assembly	Spare part
17.1		TE20G625	(1)	Hub	Stainless steel	Spare part
17.2		TE20G574	(1)	Ball race (= pos. 16.2)	Stainless steel	Wear part
18		TE20G573	1	Hub nut with ball race	Stainless steel	Wear part
19		TE20G620	1	Hub cover	Stainless steel	Spare part
20		TE20G594	8	Nozzle vane	Stainless steel	Spare part
21	#	TE20G608	4	Nozzle ø3.9 mm	Stainless steel	Spare part
	#	TE20G609	4	Nozzle ø4.6 mm	Stainless steel	Spare part
	#	TE20G605	4	Nozzle ø5.5 mm	Stainless steel	Spare part
22		TE20G584	1	Washer	Stainless steel	Wear part
23		TE51A521	1	Cap nut	Stainless steel	Spare part
24		TE20G548	1	Bearing for turbine shaft top	Polymer	Wear part

# Configuration according to delivery note/order confirmation.

## 10 Parts Lists and Drawing

### Alfa Laval Toftejorg TJ20G, TE20G010\_014

Pos.	Part. no.	Qty.	Denomination	Materials	Remarks
1	TE20G503	1	Cone 1" BSP hole f. split	Stainless steel	Spare part
2	TE20G550	1	Turbine shaft	Stainless steel	Spare part
3	TE20G640	1	Bearing for Turbine shaft	Polymer	Wear part
4	TE51C201	1	Circlip	Stainless steel	Spare part
5	# TE20G553	1	Impeller (ø3.5/3.9 mm nozzle)	Polymer (PVDF)	Spare part
	# TE20G554	1	Impeller (ø4.5/4.6 mm nozzle)	Polymer (PVDF)	Spare part
	# TE20G555	1	Impeller (ø5.5 mm nozzle)	Polymer (PVDF)	Spare part
	# TE20G595	1	Impeller (ø3.5/3.9 mm nozzle)	Polymer (PEEK)	Spare part
	# TE20G596	1	Impeller (ø4.5/4.6 mm nozzle)	Polymer (PEEK)	Spare part
	# TE20G597	1	Impeller (ø5.5 mm nozzle)	Polymer (PEEK)	Spare part
6	TE20G565	1	Retainer spring	Stainless steel	Spare part
7	TE20G563	1	Retaining ring	Stainless steel	Spare part
8	TE51A172	4	Screw	Stainless steel	Spare part
9	TE20G571	1	Stem nut with ball race	Stainless steel	Wear part
10	TE20G318	2	Ball retainer with balls	Polymer/Stainless steel	Wear part
11	TE20G512	1	Body	Stainless steel	Spare part
12	TE51A170	3	Screw	Stainless steel	Spare part
13	TE20G525	1	Internal gear	Stainless steel	Spare part
14	TE20G641	1	Slide bearing	Polymer	Wear part
15	TE20G340	1	Carrier assembly	Assembly	Spare part
15.1	TE51C102	2	Cotter pin	Stainless steel	Spare part
15.2	TE20G541	2	Shaft for Planet wheel	Stainless steel	Spare part
15.3	TE20G642	1	Bearing for planet gear carrier	Polymer	Wear part
15.4	TE20G643	1	Planet wheel I	Polymer	Wear part
15.5	TE20G644	1	Planet wheel II	Polymer	Wear part
15.6	TE20G530	1	Planet gear carrier	Stainless steel	Spare part
15.7	TE51C102	2	Cotter pin (= pos. 15.1)	Stainless steel	Spare part
16	TE20G319	1	Stem complete	Assembly	Spare part
16.1	TE20G624	(1)	Stem	Stainless steel	Spare part
16.2	TE20G574	(1)	Ball race	Stainless steel	Wear part
17	TE20G320	1	Hub complete	Assembly	Spare part
17.1	TE20G625	(1)	Hub	Stainless steel	Spare part
17.2	TE20G574	(1)	Ball race (= pos. 16.2)	Stainless steel	Wear part
18	TE20G573	1	Hub nut with ball race	Stainless steel	Wear part
19	TE20G630	1	Hub cover incl. mod cap nut	Stainless steel	Spare part
20	TE20G594	8	Nozzle vane	Stainless steel	Spare part
21	# TE20G608	4	Nozzle ø3.9 mm	Stainless steel	Spare part
	# TE20G609	4	Nozzle ø4.6 mm	Stainless steel	Spare part
	# TE20G605	4	Nozzle ø5.5 mm	Stainless steel	Spare part
22	TE20G584	1	Washer	Stainless steel	Wear part
24	TE20G548	1	Bearing for turbine shaft top	Polymer	Wear part
26	TE51C105	1	Cotter pin	Stainless steel	Spare part
27	TE11B536	1	Lock pin	Stainless steel	Spare part
28	TE52D549	1	Spring pin	Stainless steel	Spare part

# Configuration according to delivery note/order confirmation.

### Alfa Laval Toftejorg TJ20G, TE20G016\_018

Pos.	Part. no.	Qty.	Denomination	Materials	Remarks
1	TE20G508	1	Cone 1" BSP	Stainless steel	Spare part
2	TE20G550	1	Turbine shaft	Stainless steel	Spare part
3	TE20G640	1	Bearing for Turbine shaft	Polymer	Wear part
4	TE51C201	1	Circlip	Stainless steel	Spare part
5	# TE20G553	1	Impeller (ø3.5/3.9 mm nozzle)	Polymer (PVDF)	Spare part
	# TE20G554	1	Impeller (ø4.5/4.6 mm nozzle)	Polymer (PVDF)	Spare part
	# TE20G555	1	Impeller (ø5.5 mm nozzle)	Polymer (PVDF)	Spare part
	# TE20G595	1	Impeller (ø3.5/3.9 mm nozzle)	Polymer (PEEK)	Spare part
	# TE20G596	1	Impeller (ø4.5/4.6 mm nozzle)	Polymer (PEEK)	Spare part
	# TE20G597	1	Impeller (ø5.5 mm nozzle)	Polymer (PEEK)	Spare part
6	TE20G565	1	Retainer spring	Stainless steel	Spare part
7	TE20G563	1	Retaining ring	Stainless steel	Spare part
8	TE51A172	4	Screw	Stainless steel	Spare part
9	TE20G571	1	Stem nut with ball race	Stainless steel	Wear part
10	TE20G318	2	Ball retainer with balls	Polymer/Stainless steel	Wear part
11	TE20G512	1	Body	Stainless steel	Spare part
12	TE51A170	3	Screw	Stainless steel	Spare part
13	TE20G525	1	Internal gear	Stainless steel	Spare part
14	TE20G641	1	Slide bearing	Polymer	Wear part
15	TE20G340	1	Carrier assembly	Assembly	Spare part
15.1	TE51C102	2	Cotter pin	Stainless steel	Spare part
15.2	TE20G541	2	Shaft for Planet wheel	Stainless steel	Spare part
15.3	TE20G642	1	Bearing for planet gear carrier	Polymer	Wear part
15.4	TE20G643	1	Planet wheel I	Polymer	Wear part
15.5	TE20G644	1	Planet wheel II	Polymer	Wear part
15.6	TE20G530	1	Planet gear carrier	Stainless steel	Spare part
15.7	TE51C102	2	Cotter pin (= pos. 15.1)	Stainless steel	Spare part
16	TE20G319	1	Stem complete	Assembly	Spare part
16.1	TE20G624	(1)	Stem	Stainless steel	Spare part
16.2	TE20G574	(1)	Ball race	Stainless steel	Wear part
17	TE20G320	1	Hub complete	Assembly	Spare part
17.1	TE20G625	(1)	Hub	Stainless steel	Spare part
17.2	TE20G574	(1)	Ball race (= pos. 16.2)	Stainless steel	Wear part
18	TE20G573	1	Hub nut with ball race	Stainless steel	Wear part
19	TE20G620	1	Hub cover incl. mod cap nut	Stainless steel	Spare part
20	TE20G594	8	Nozzle vane	Stainless steel	Spare part
21	# TE20G608	4	Nozzle ø3.9 mm	Stainless steel	Spare part
	# TE20G609	4	Nozzle ø4.6 mm	Stainless steel	Spare part
	# TE20G605	4	Nozzle ø5.5 mm	Stainless steel	Spare part
22	TE51B021	1	Washer w/o EPDM	Stainless steel	Wear part
23	TE51B021	1	Cap nut	Stainless steel	Spare part
24	TE20G548	1	Bearing for turbine shaft top	Polymer	Wear part

# Configuration according to delivery note/order confirmation.

## 10 Parts Lists and Drawing

### Alfa Laval Toftejorg TJ20G, TE20G030\_044

Pos.	Part. no.	Qty.	Denomination	Materials	Remarks
1	# TE20G508	1	Cone 1" BSP	Stainless steel	Spare part
	# TE20G517	1	Cone 1" NPT	Stainless steel	Spare part
2	TE20G550	1	Turbine shaft	Stainless steel	Spare part
3	TE20G640	1	Bearing for Turbine shaft	Polymer	Wear part
4	TE51C201	1	Circlip	Stainless steel	Spare part
5	# TE20G553	1	Impeller (ø3.5/3.9 mm nozzle)	Polymer (PVDF)	Spare part
	# TE20G554	1	Impeller (ø4.5/4.6 mm nozzle)	Polymer (PVDF)	Spare part
	# TE20G555	1	Impeller (ø5.5 mm nozzle)	Polymer (PVDF)	Spare part
	# TE20G595	1	Impeller (ø3.5/3.9 mm nozzle)	Polymer (PEEK)	Spare part
	# TE20G596	1	Impeller (ø4.5/4.6 mm nozzle)	Polymer (PEEK)	Spare part
	# TE20G597	1	Impeller (ø5.5 mm nozzle)	Polymer (PEEK)	Spare part
6	TE20G565	1	Retainer spring	Stainless steel	Spare part
7	TE20G563	1	Retaining ring	Stainless steel	Spare part
8	TE51A172	4	Screw	Stainless steel	Spare part
9	TE20G636	1	Stem nut with ball race	Stainless steel	Wear part
10	TE20G318	2	Ball retainer with balls	Polymer/Stainless steel	Wear part
11	TE20G512	1	Body	Stainless steel	Spare part
12	TE51A170	3	Screw	Stainless steel	Spare part
13	TE20G525	1	Internal gear	Stainless steel	Spare part
14	TE20G641	1	Slide bearing	Polymer	Wear part
15	TE20G340	1	Carrier assembly	Assembly	Spare part
15.1	TE51C102	2	Cotter pin	Stainless steel	Spare part
15.2	TE20G541	2	Shaft for Planet wheel	Stainless steel	Spare part
15.3	TE20G642	1	Bearing for planet gear carrier	Polymer	Wear part
15.4	TE20G643	1	Planet wheel I	Polymer	Wear part
15.5	TE20G644	1	Planet wheel II	Polymer	Wear part
15.6	TE20G530	1	Planet gear carrier	Stainless steel	Spare part
15.7	TE51C102	2	Cotter pin (= pos. 15.1)	Stainless steel	Spare part
16	TE20G334	1	Stem complete	Assembly	Spare part
16.1	TE20G634	(1)	Stem	Stainless steel	Spare part
16.2	TE20G574	(1)	Ball race	Stainless steel	Wear part
17	TE20G335	1	Hub complete	Assembly	Spare part
17.1	TE20G635	(1)	Hub	Stainless steel	Spare part
17.2	TE20G574	(1)	Ball race (= pos. 16.2)	Stainless steel	Wear part
18	TE20G633	1	Hub nut with ball race	Stainless steel	Wear part
19	TE20G620	1	Hub cover incl. mod cap nut	Stainless steel	Spare part
20	TE20G594	8	Nozzle vane	Stainless steel	Spare part
21	# TE20G608	4	Nozzle ø3.9 mm	Stainless steel	Spare part
	# TE20G609	4	Nozzle ø4.6 mm	Stainless steel	Spare part
	# TE20G605	4	Nozzle ø5.5 mm	Stainless steel	Spare part
22	TE51B021	1	Washer w/o EPDM	Stainless steel	Wear part
23	TE51A521	1	Cap nut	Stainless steel	Spare part
24	TE20G548	1	Bearing for turbine shaft top	Polymer	Wear part

# Configuration according to delivery note/order confirmation.



### Alfa Laval Tofteborg TJ20G, TE20HXXX

Pos.		Part. no.	Qty.	Denomination	Materials	Remarks
1	#	TE20H508	1	Cone 1" BSP	Hastelloy C22	Spare part
	#	TE20H517	1	Cone 1" NPT	Hastelloy C22	Spare part
	#	TE20H518	1	Cone 1" BSP f. sanitary conn.	Hastelloy C22	Spare part
1.1	#	TE51T220	1	Gasket (only f. TE20G518)	Elastomer	Spare part
2		TE20H550	1	Turbine shaft	Hastelloy C22	Spare part
3		TE20G640	1	Bearing for Turbine shaft	Polymer	Wear part
4		TE20H592	1	Circlip	Hastelloy C22	Spare part
5	#	TE20G595	1	Impeller (ø3.5/3.9 mm nozzle)	Polymer (PEEK)	Spare part
	#	TE20G596	1	Impeller (ø4.5/4.6 mm nozzle)	Polymer (PEEK)	Spare part
	#	TE20G597	1	Impeller (ø5.5 mm nozzle)	Polymer (PEEK)	Spare part
6		TE20H565	1	Retainer spring	Hastelloy C22	Spare part
7		TE20H563	1	Retaining ring	Hastelloy C22	Spare part
8		TE20H591	4	Screw	Hastelloy C22	Spare part
9		TE20H571	1	Stem nut with ball race	Hastelloy C22	Wear part
10		TE20H318	2	Ball retainer with balls	Polymer/Hastelloy C22	Wear part
11		TE20H512	1	Body	Hastelloy C22	Spare part
12		TE20H590	3	Screw	Hastelloy C22	Spare part
13		TE20H525	1	Internal gear	Hastelloy C22	Spare part
14		TE20G641	1	Slide bearing	Polymer	Wear part
15		TE20H340	1	Carrier assembly	Assembly	Spare part
15.1		TE20H542	2	Cotter pin	Hastelloy C22	Spare part
15.2		TE20H541	2	Shaft for Planet wheel	Hastelloy C22	Spare part
15.3		TE20G642	1	Bearing for planet gear carrier	Polymer	Wear part
15.4		TE20G643	1	Planet wheel I	Polymer	Wear part
15.5		TE20G644	1	Planet wheel II	Polymer	Wear part
15.6		TE20H530	1	Planet gear carrier	Hastelloy C22	Spare part
15.7		TE20H542	2	Cotter pin (= pos. 15.1)	Hastelloy C22	Spare part
16		TE20H319	1	Stem complete	Assembly	Spare part
16.1		TE20H624	(1)	Stem	Hastelloy C22	Spare part
16.2		TE20H574	(1)	Ball race	Hastelloy C22	Wear part
17		TE20H320	1	Hub complete	Assembly	Spare part
17.1		TE20H625	(1)	Hub	Hastelloy C22	Spare part
17.2		TE20H574	(1)	Ball race (= pos. 16.2)	Hastelloy C22	Wear part
18		TE20H573	1	Hub nut with ball race	Hastelloy C22	Wear part
19		TE20H620	1	Hub cover	Hastelloy C22	Spare part
20		TE20H594	8	Nozzle vane	Hastelloy C22	Spare part
21	#	TE20H608	4	Nozzle ø3.9 mm	Hastelloy C22	Spare part
	#	TE20H609	4	Nozzle ø4.6 mm	Hastelloy C22	Spare part
	#	TE20H605	4	Nozzle ø5.5 mm	Hastelloy C22	Spare part
22		TE20G584	1	Washer	Hastelloy C22	Wear part
23		TE20H585	1	Cap nut	Hastelloy C22	Spare part
24		TE20H586	1	O-ring	Elastomer	Spare part
25		TE20H587	1	Washer for Cap nut, TJ20G	Hastelloy C22	Spare part

# Configuration according to delivery note/order confirmation.

## 11 General information

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### 11.1 Service and Repair

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Upon every return of a product, no matter if for modifications or repair, it is necessary to contact your local Alfa Laval office to guarantee a quick execution of your request.

You will receive instructions regarding the return procedure from your local Alfa Laval office. Be sure to follow the instructions closely.

### 11.2 How to Order Spare Parts

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On the Cross Sectional Drawings as well as on all instruction drawings, the individual parts have a pos. No., which is the same on all drawings. From the pos. No. the part is easily identified in the Reference Lists of Parts, pages 37 ff.

Individual parts should always be ordered from the Reference Lists of Parts, pages 37 ff. Ref. No. and description should be clearly stated.

Please also quote the type of machine and serial No. This will help us to help you. The type and serial Nos. are stamped on the Body of the tank cleaning machine.

In cases where spare parts are ordered for machines originally delivered with 3.1 certificates, please state this information on your ordering form together with the machine type and serial number. This is to ensure full traceability henceforward.

### 11.3 How to contact Alfa Laval Tank Equipment

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For further information please feel free to contact:

**Alfa Laval Tank Equipment**

**Alfa Laval Kolding A/S**

31, Albuen - DK 6000 Kolding - Denmark

Registration number: 30938011

Tel switchboard: +45 79 32 22 00 - Fax switchboard: +45 79 32 25 80

[www.toftejorg.com](http://www.toftejorg.com), [www.alfalaval.dk](http://www.alfalaval.dk) - [info.dk@alfalaval.com](mailto:info.dk@alfalaval.com)

Contact details for all countries are continually updated on our websites

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## 12.1 Declaration of Conformity, EN 10474, sub clause 2.2 Test Report

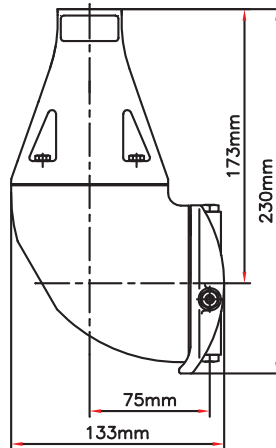


**Declaration Of Conformity  
with  
EN 10204, Sub Clause 2.2 Test Report  
Materials of Construction and Surface Finishes**

Alfa Laval Kolding A/S (supplier)

declare, under our sole responsibility, that the following product:

Description
Alfa Laval Toftejorg TJ20G Rotary Jet Head



has been subjected to non-specific controls for product quality and are found to conform with the following standards and other normative documents:

**Metal Materials**

AISI 316	Werkstoff No. 1.4401
AISI 316L	Werkstoff No. 1.4404
SAF 2205	Werkstoff No. 1.4462
A4	

For Hastelloy machines:

Hastelloy C22	Werkstoff No. 2.4602
Hastelloy C276	Werkstoff No. 2.4819

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This certificate is delivered in compliance with the latest valid design and construction. Alfa Laval Kolding A/S reserve the right to alter or modify any unit specification without notice or any obligation.  
Rev. 2. 20150811

## 12 Miscellaneous

### Non-Metal Materials

21CFR§177.1550 (PTFE)  
21CFR§177.2600 (EPDM)

21CFR§177.2510 (PVDF)  
21CFR§177.2415 (PEEK)

### Surface Finish

All parts are finished with a nominal external roughness Ra = 0.8 µm (30 micro inch).

### Non-Specific Controls on Product Quality "As-Supplied"

All metallic part material certifications are inspected upon receipt before assembly.

Parts inspections are completed according to the approved ISO 9001:2008 standard program. The Quality Control Department only accepts the product in component parts for assembly according to this program if the parts comply with the above material specification documentation.

Product welds are executed, inspected and finished (polished where accessible), according to written, approved procedures.

Parts produced from FDA approved polymers are only sourced from suppliers that have met "pre-qualification" standards established by Alfa Laval Kolding's ISO 9001:2008 program. Materials of construction of component parts are controlled through clear and explicit specifications in purchase orders. These specifications include the materials of construction specified by the parts designers, making them subject to the contractual terms and conditions.

The following item numbers are covered by this certificate:

TE20G000(-xx)	TE20G002(-xx)	TE20G004(-xx)
TE20G010(-xx)	TE20G012(-xx)	TE20G014(-xx)
TE20G016-x2	TE20G017-x2	TE20G018-x2
TE20G020(-xx)	TE20G022(-xx)	TE20G024(-xx)
TE20G030(-xx)	TE20G032(-xx)	TE20G034(-xx)
TE20G040(-xx)	TE20G042(-xx)	TE20G044(-xx)
TE20G050(-xx)	TE20G052(-xx)	TE20G054(-xx)
TE20H000(-xx)	TE20H002(-xx)	TE20H004(-xx)
TE20H020(-xx)	TE20H022(-xx)	TE20H024(-xx)
TE20H050(-xx)	TE20H052(-xx)	TE20H054(-xx)

no postfix: PVDF impeller (PEEK impeller for TE20Hxxx)	-7X: ATEX
-x2: PEEK impeller	-8X: Q-doc + ATEX
	-9X: Q-doc

Copenhagen, Ishoej, on August 11, 2015  
For Alfa Laval Kolding A/S



Annie Dahl  
Quality Manager

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This certificate is delivered in compliance with the latest valid design and construction. Alfa Laval Kolding A/S reserve the right to alter or modify any unit specification without notice or any obligation.  
Rev. 2. 20150811

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## 12.2 ATEX - Special Conditions for Safe Use

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### ATEX CERTIFICATION

EC – Type Examination Certificate Number: Baseefa04ATEX0358X

 II 1GD c T140°C

 II 1GD c T250°C

BASEEFA CUSTOMER REFERENCE No. 5102

PROJECT FILE No. 15/0186

### Special Condition for Safe Use

1. The unit may be operated, in a hazardous area, only when filled with the process fluid.
2. If a medium other than the process fluid is passed through the equipment, the flow must not be high enough to cause the equipment to operate. If this cannot be avoided, the rotor must be removed or secured to prevent rotation.
3. The maximum permitted process fluid temperature is 95°C, with an ambient temperature range of 0°C to 140°C.
4. The high temperature version of the TJ20G machine has a maximum permitted process fluid temperature of 160°C, with an ambient temperature range of 0°C to 200°C.
5. The maximum permitted process fluid pressure is 8 bar.
6. The unit must not be operated in a vessel having an enclosed volume of greater than 100m<sup>3</sup>.
7. The unit must be effectively earthed at all times when in use.
8. The user must address the electrostatic hazards generated from the process of the equipment in accordance with guidance document IEC/TS 60079-32-1:2013.

This product fully complies to ATEX category 1 as long as the 8 special conditions above are adhered to.

Please read the above conditions prior to installation & ensure that all conditions are met.

### Explanation of T (temperature) rating.

The ATEX classification

The standard machine is approved for an ambient temperature range of 0°C to +140°C and is marked

 II 1GD c T140°C

The high temperature version of the machine is approved for an ambient temperature range of 0°C to +200°C and is marked

 II 1GD c T250°C

### 12.3 Declaration of Compliance with 10/2011 – Food contact materials

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#### Declaration of compliance for food contact materials



Article Nr: TE20Gxxx-xx

Product TJ20G

We, Alfa Laval Kolding A/S, hereby certify that the plastic articles intended to come into contact with product included in the article stated above comply with the Regulation (EC) No. 1935/2004 and the Regulation (EC) No. 10/2011 both in their relevant versions on materials and articles intended to come in contact with food.

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

PEEK 450G (PEEK GLD FG 140)  
Diphenylsulphor: 3 mg/kg food  
1,4 Dihydroxybenzol: 0.6 mg/kg food  
4,4' Defluorobenzophenone: 0.05 mg/kg food  
(TFE: 0.05 mg/kg/kg food)

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

PVDF  
VDF: 5 mg/kg food  
Antioxydant: 5 mg/kg food

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 1,500 kg\*.

We also certify that the plastic articles intended to come into contact with product included in the article stated above are also entirely in accordance with the present US regulation FDA CFR 21§ 177.

Ishoj, 10-06-2014

A handwritten signature in blue ink, appearing to read 'Henrik Falster-Hansen', is written over a horizontal line.

Henrik Falster-Hansen,  
R&D Manager  
Alfa Laval Kolding A/S

\*Based on worst case scenario = all of the free monomer in the plastic migrates to one batch.

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**How to contact Alfa Laval**

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