



## **Instruction Manual, Toftejorg Rotary Spray Heads**

**Toftejorg MultiMidget, Toftejorg MultiMagnum**

**Covering   ▪   Standard version**

IM-TE91A748-EN1  
ESE02746EN  
Date of issue: April 29, 2014  
First published: April 29, 2014

Original manual



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## Toftejorg Rotary Spray Heads, Product Program

This manual covers the product programme for Toftejorg MultiMidget and Toftejorg MultiMagnum.

For the different types of Rotary Spray Heads available from Alfa Laval please see:

Page 5 for Toftejorg MultiMidget

Page 5 for Toftejorg MultiMagnum

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## Toftejorg Rotary Spray Heads, Product Program

### Toftejorg MultiMidget, Clip-on

Surface finish: Semi bright

	Clip-on OD25, 1" ISO2037					
Spray pattern	Stainless steel		Stainless steel		Stainless steel	
360°	TE10M106					
180° Down						
270° Up	TE10B136					
220° up low flow						

### Toftejorg MultiMidget, Weld-on

Surface finish: Semi bright

		Weld-on OD25, 1" ISO2037		Weld-on DN25, DIN 11850-R2					
Spray pattern	Height (mm)	Stainless steel		Stainless steel		Stainless steel		Stainless steel	
360°	500	TE10M200		TE10M201					
180° Down	500	TE10M220		TE10M221					
270° Up	500	TE10M230		TE10M231					

### Toftejorg MultiMidget, Thread

Surface finish: Semi bright

	Thread-on ½" BSP		Thread-on ½" NPT		Thread-on ½" BSP		Thread-on ½" NPT	
Spray pattern	Stainless steel		Stainless steel		Stainless steel		Stainless steel	
360°	TE10M000		TE10M002		TE10M001		TE10M003	
180° Down	TE10M020		TE10M022		TE10M021		TE10M023	
270° Up	TE10M030		TE10M032		TE10M031		TE10M033	

## Toftejorg Rotary Spray Heads, Product Program

### Toftejorg MultiMagnum, Weld-on

Surface finish: Semi Bright

Spray pattern	Height (mm)	Weld-on OD38, 1½" ISO2037		Weld-on DN40, DIN 11850-R2					
		Stainless steel		Stainless steel		Stainless steel		Stainless steel	
360°	1000	TE11M200		TE11M201					
180° Down	1000	TE11M220		TE11M221					
270° Up	1000	TE11M230		TE11M231					

### Toftejorg MultiMagnum, Thread

Surface finish: Semi Bright

Spray pattern	Thread-on 1 1/4" BSP		Thread-on 1 1/4" NPT					
	Stainless steel		Stainless steel		Stainless steel		Stainless steel	
360°	TE11M000		TE11M002					
180° Down	TE11M020		TE11M022					
270° Up	TE11M030		TE11M032					

## Introduction

This manual has been prepared as a guide for installing, operating and maintaining your Rotary Spray Head tank cleaning machine. The information in this manual is simple to follow, but should you require further assistance, our Technical Sales Support department and worldwide net of sales offices will be pleased to help you. Please quote the type, article and serial numbers with all of your enquiries; this will help us to help you.

**Warning:**



Before installing the machine and setting it into operation carefully read the General Installation Instructions (page 13) and the Safety Precautions (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.

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## Intended Use

It is to be verified by the end-user:

- that the tank cleaning machine 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.

**Important information:**



Liquid inlet pressure: Max. 3 bar.

Do not steam. Steaming through the Rotary Spray Head may result in excessive high rotation speed of the cleaner and cause severe wear of the ball bearing and/or damage to the cleaner.

See General Installation Instructions on page 13 of this manual for information on recommended installation position.



## **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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## **Quality System**

The Toftejorg Rotary Spray Head is produced according to Alfa Laval Kolding's ISO 9001 international Standard certified quality system. All parts are made from certified material.

## General Description

The Toftejorg Rotary Spray Heads are tank cleaning machines intended for industrial use in tanks, vessels and containers under typical CIP procedures. They have a broad range of application areas within food and chemical industries.

The Toftejorg Rotary Spray Head is a sanitary cleaning device of the rotating fan spray type for permanent installation that provides a cleaning pattern from 180° - 360°C. The machine is designed in such a way that it is completely self-cleaning. If Installed according to drawing on page 13, the Toftejorg Rotary Spray Head is self-draining in the shown positions. All product contact surfaces are AISI 316 stainless steel (or better corrosion vice).

The cleaning device is lubricated by the cleaning media. No oil, grease or other lubricants are used.

The Toftejorg Rotary Spray Head is designed for use in food and dairy processing applications. It may be used in reactors, mixing/processing tanks, spray dryers and other process equipment with a volume from 0.1 – 50 m<sup>3</sup> (22 - 10,998 US gallons) and storage tanks up to 125 m<sup>3</sup> (27496 US gallons). For larger volumes, multiple Toftejorg Rotary Spray Heads may be applied.

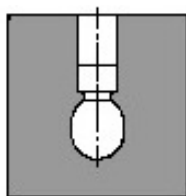
Application assistance and optimal position recommendation is available.

For use in explosive hazard zones all types can be used, provided they are installed according to the safety instructions in local regulations.

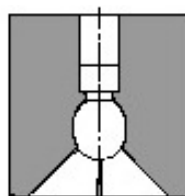
## Functioning

The flow of the cleaning media causes the head of the Toftejorg Rotary Spray Head to rotate, with fans laying out a swirling pattern throughout the vessel. This generates a vibrating impact and cascading flow that covers all internal surfaces of the tank or reactor. The device's self-cleaning feature is achieved by directing the cleaning media through the rotating bearing track and onto the neck of the elongated head. With its double bale race design the MultiMidget and MultiMagnum can be installed in any angle.

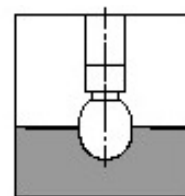
## Spray Pattern



360°



270° U



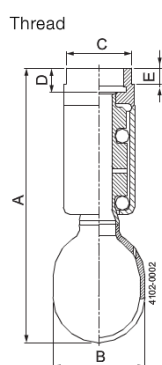
180° D

## Technical Data

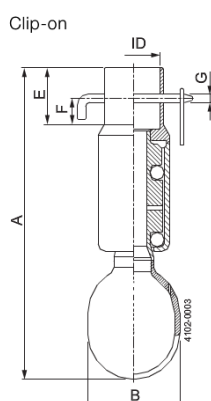
### Toftejorg MultiMidget

Weight of machine	:	Thread and clip-on: 0.50 kg On pipe: 0.90 kg
Working pressure	:	1 – 3 bar
Recommended pressure	:	2 bar
Max. working temperature	:	95°C
Max. ambient temperature	:	140°C
Wetting radius	:	Max. 3 m
Impact cleaning radius	:	Max. effective 1.4 m
Materials: inlet connections	:	1.4401 (316)
bearing race parts	:	SAF 2205 (UNS31803)
balls	:	AISI 316
head	:	1.4404 (AISI 316L)
Lubricant	:	Self-lubricating with the cleaning fluid
Connections	:	1/2" or 3/4" Rp (BSP) or NPT thread Clip-on: 1" ISO2037 Weld-on: 1" ISO2037 or DN25 DIN 11.850-R2

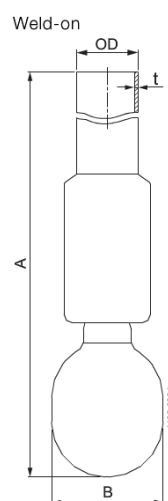
### Standard Configurations



TH  
1/2" Rp (BSP)  
3/4" Rp (BSP)  
1/2" NPT  
3/4" NPT



ID  
ISO :     ø25.3 mm



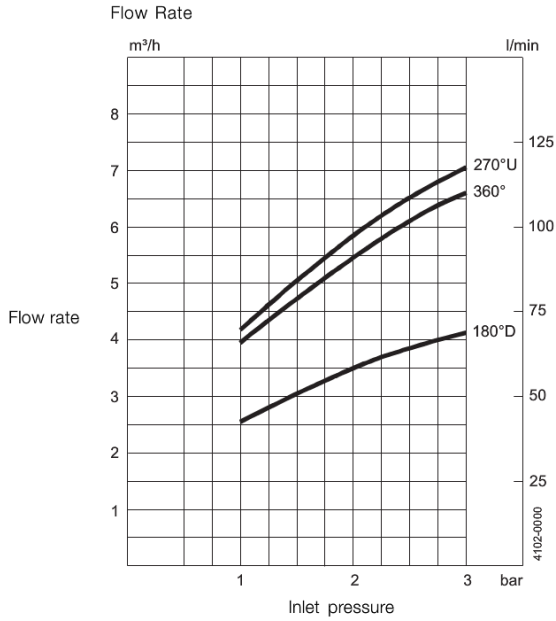
OD x t  
Welded on pipe  
ISO:                     ø25 x 1.6 mm  
DIN Range 2:         ø29 x 1.5 mm

Type	A	B	C	D	E	F	G
Tread	137(BSP), 150(NPT)	ø45	32	12(BSP) 25(NPT)	9(BSP) 22,5(NPT)		
Clip-on	155	ø45				15	ø4.2
Weld-on	500	ø45					

# Technical Data

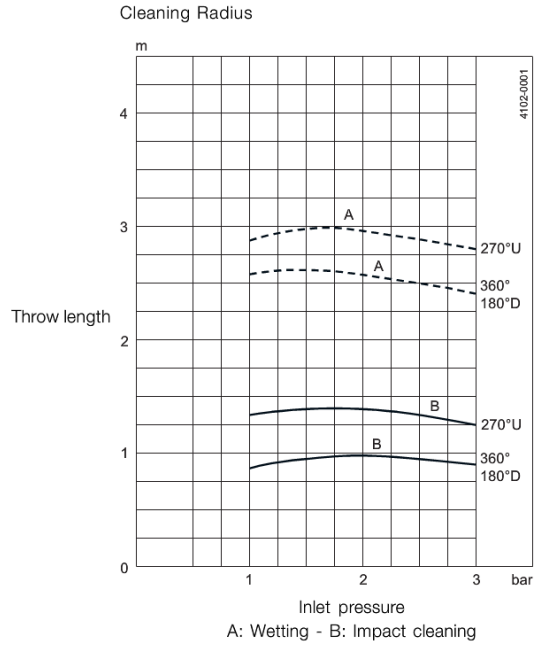
## Toftejorg MultiMidget (continued)

### Performance Data



For clip-on models, the flow rate is increased by approx. 0.5m³/h.

**Flow rate**



**Throw length**

**Note:** 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 in consideration.

## Technical Data (continued)

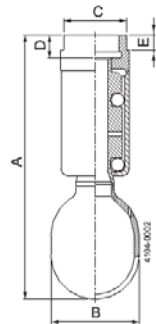
### Toftejorg MultiMagnum

Weight of machine	:	Thread and clip-on: 0.90 kg On pipe: 2.5 kg
Working pressure	:	1 – 3 bar
Recommended pressure	:	2 bar
Max. working temperature	:	95°C
Max. ambient temperature	:	140°C
Wetting radius	:	Max. 3 m
Impact cleaning radius	:	Max. effective 2 m
Materials: inlet connections	:	1.4401 (316)
bearing race parts	:	SAF 2205 (UNS31803)
balls	:	AISI 316
head	:	1.4404 (AISI 316L)
Lubricant	:	Self-lubricating with the cleaning fluid
Connections	:	1 1/4" BSP or NPT thread weld-on: 1 1/2" ISO2037 or DN40 DIN 11.850-R2

### Standard Configurations

Dimensions (mm)

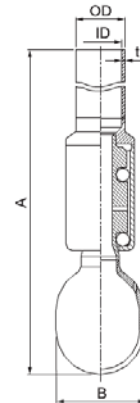
Thread



TH  
1 1/4" Rp (BSP)

1 1/4" NPT

Weld-on



OD x t

Welded on

pipe

ISO: ø38 x 1.6 mm

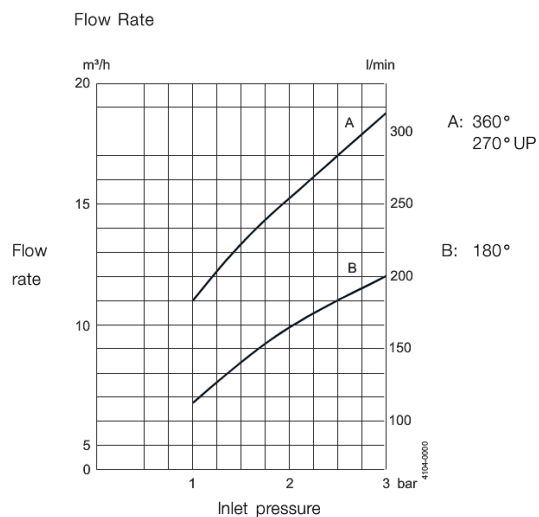
DIN Range 2: ø41 x 1.5 mm

Type	A	B	C	D	E
Thread	183	ø65	46	16	15
Weld-on	1000	ø65			

## Technical Data (continued)

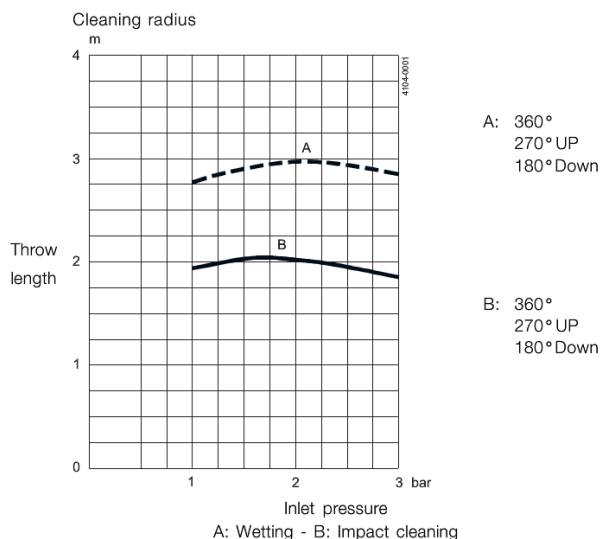
### Toftejorg MultiMagnum (continued)

#### Performance Data



For clip-on models, the flow rate is increased by approx 1.5 m³/h

**Flow rate**



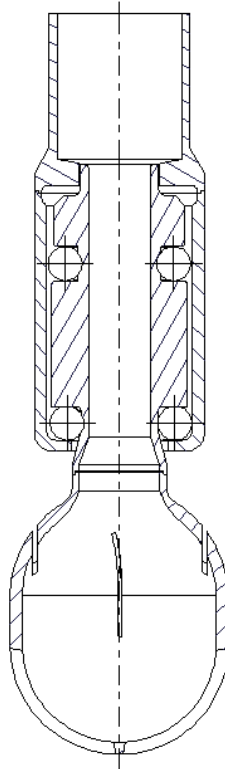
A: Wetting - B: Impact cleaning

**Cleaning radius**

**Note:** 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 in consideration.

# Installation and Normal Operation

## General Installation Instructions



**Self draining position**

**Important information:**



Recommended installation position:

The Rotary Spray Head tank cleaning machine should be installed in vertical position (upright or upside down). If the machine is installed horizontally, the life time may be reduced.

It is recommended to install a filter with mesh size 250  $\mu\text{m}$  (0.01") in the supply line in order to avoid particles, scale etc. from clogging the inside of the Rotary Spray Head.

Before installation, all supply lines and valves must be thoroughly flushed to remove remains from welding, grinding dust, scale and other foreign matter. During handling and installation handle the machine with care in order not to damage the fine surface of the machine.

Note: The machine shall be installed in accordance with national regulations for safety and other relevant regulations and standards. In EU-countries the complete system must fulfil the EU-Machine Directive and depending of application, the EU-Pressure Equipment Directive and other relevant Directives and shall be CE-marked before it is set into operation.

## Installation and Normal Operation (continued)

### General Safety Precautions

The Toftejorg Rotary Spray Head is intended for use inside a tank only, and must not be operated in open air or when the tank is open.

**Warning:** Precautions shall be made to prevent starting of the cleaning operation, while personnel are inside the tank or otherwise can be hit by water jets from the cleaner head.



**Warning:** If the machine is used in potential explosive atmospheres, tapes or joint sealing compounds, which are electrical insulators, must not be used on joints, if this may violate the grounding of the machine to the tank. Resistance between nozzles and tank must not exceed 20.000 Ω. The intended installation with standard clamp connections will ensure this. In addition, connecting pipe work, must be electrically conductive and earthed to the tank structure.



This is essential to avoid the build-up of static electricity on the nozzles and the machine. For further information see CENELEC R044-001 Safety of Machinery, guidance and recommendations for the avoidance of hazards due to static electricity.



## Installation and Normal Operation (continued)


### Normal Operation


#### Cleaning Media

Use only media compatible with Stainless Steel AISI 316/316L and SAF 2205. Normal detergents, moderate solutions of acids and alkalis are acceptable. Aggressive chemicals, excessive concentrations of chemicals at elevated temperatures, as well as certain solvents hydrochlorides should be avoided. If you are in doubt, contact your local Alfa Laval sales office.

#### Pressure

Please make sure that the connections are correctly mounted before opening of the washing valve. Put on pressure gradually in order to avoid hydraulic shocks, which might stress mechanical parts in the Toftejorg Rotary Spray Head cleaner. Max. pressure difference is 3.0 bar.

<b>Recommendation:</b> 	<u>After-Use Cleaning</u> After use flush the machine with fresh water. Cleaning media should never be allowed to dry up in the system.
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<b>Warning:</b> 	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.
--	---

## Service

In case of extensive machine wear, the machine is to be replaced, as it is not possible to repair Rotary Spray Head machines.

### Recommended Service Intervals

Inspection every 500 working hours. After 2000 working hours: inspection every 200 hours.

A service consists of:

0. 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 reasons.*

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

## **Claim Procedure**

In case of failure that needs assistance from your local Alfa Laval sales office, it is essential for our evaluation that the problem, as well as the working conditions of the machine, is described as detailed as possible.

## **How to Contact Alfa Laval Tank Equipment**

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.

# EC Declaration of Conformity

EC Declaration of Conformity



The designated company

Alfa Laval Tank Equipment  
Company name

19, Albuen, DK 6000 Kolding, Denmark  
Address

+45 79 32 22 00  
Phone no.

hereby declare that

Tank Cleaning Machine      Toftejorg MultiMidget and Toftejorg MultiMagnum  
Denomination      Type

Valid from SN: 2014 00001 to 2015 10000

is in conformity with the following regulations and directives with amendments:

- Regulation (EC) No. 1935/2004
- The Machinery Directive 2006/42/EC  
DS/EN ISO 12100:2010
- 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

R&D Manager      Henrik Falster Hansen        
Title      Name      Signature

April 29, 2014      Alfa Laval Kolding A/S  
Date      Company



**How to contact Alfa Laval**

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

Please visit [www.alfalaval.com](http://www.alfalaval.com) to access the information directly.

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