



800.654.5635
www.csidesigns.com

Instruction Manual, Alfa Laval Toftejorg SaniMidget SB

With

- **3-A standard version (clip-on & weld-on)**
- **UltraPure standard version (clip-on & weld-on)**
- **Product Documentation**
- **Qualification Documentation**

IM-TE91A720_EN2

Date of issue: 28 October 2009

Contents

Contents	1
Introduction.....	2
Intended Use	2
Patents and trademarks	3
Quality system	3
General Description.....	4
Functioning	4
Spray Pattern	4
Standard Configurations for SaniMidget SB/3-A	5
Standard Configurations for SaniMidget SB UltraPure.....	5
Standard Options	5
Technical Data.....	7
Dimensions	7
Performance Data for SaniMidget SB	8
Installation and Normal Operation.....	9
General Installation Instructions.....	9
Part lists for SaniMidget SB/3-A.....	10
Part lists for SaniMidget SB UltraPure	10
Installation.....	11
Normal Operation.....	14
General Safety Precautions	14
Maintenance and Repair	15
Recommended Service Intervals	15
Service and Repair of Machines Ordered with Alfa Laval Q-doc.....	15
Disassembly.....	16
Reassembly	16
Claim Procedure.....	17
How to contact Alfa Laval Tank Equipment A/S.....	17
Claim Report Working Conditions	18
Declaration of Conformity with EN10204	20

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.

This manual covers the SaniMidget SB (Slide Bearing) that consists of two main product series; the SaniMidget SB/3-A and the SaniMidget SB UltraPure. Both versions are identical in design. Only difference is in material selection for the rotor. The SaniMidget SB UltraPure is equipped with a rotor made of USP Class VI certified material and the SaniMidget SB/3-A is equipped with a rotor made of material that meets the 3-A Sanitary Standard 20-25. The USP Class VI polymer used has not been part of the Third Party Verification (TPV) and as a consequence the SaniMidget SB UltraPure has not been verified to meet 3-A Sanitary Standards.

Warning:



Before installing the machine and setting it into operation carefully read the General Installation Instructions (page 11) 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.

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 compatible 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 9 of this manual for information on recommended installation position.

Patents and trademarks

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

© Alfa Laval Tank Equipment A/S, 2009. 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 Tank Equipment A/S. The Toftejorg™ SaniMidget SB series product has patent pending (US 12/495,211). Other products or company names mentioned herein may be the trademarks of their respective owners. Any rights not expressly granted herein are reserved.

Quality system

The SaniMidget SB/3-A and SaniMidget SB UltraPure are designed to meet 3-A Sanitary Standards as well as the guidelines of the European Hygienic Design Group (EHEDG) and thus comply with requirements to design, materials, finish and documentation. Third Party Verification (TPV) shows that the SaniMidget SB/3-A meets the requirements of the 3-A Sanitary Standard 78-01. All machines are produced according to Alfa Laval Tank Equipment's ISO 9001 international Standard certified quality system.

General Description

The SaniMidget SB series are tank cleaning machines intended for industrial use in closed tanks, vessels and containers under typical CIP procedures. They have a broad range of application areas within pharmaceutical, food, dairy and chemical industries.

The SaniMidget SB is a sanitary cleaning device of the rotating fan spray type for permanent installation that provides a 270° upward cleaning pattern. The machine is designed in such a way that it is completely self-cleaning. If installed according to the description on page 9, the SaniMidget SB is completely self-draining in the shown position and completely inspectable. All product contact surfaces are AISI 316L stainless steel or FDA conforming materials. For the SaniMidget SB/3-A plastic material that meets the requirements of 3-A Sanitary Standard 20-25 is used. For the SaniMidget SB/UltraPure a USP Class VI plastic material is used.

The unique design is totally free of weldings, threads, screws and press-fits to facilitate self-cleanability. The cleaning device is lubricated by the cleaning media. No oil, grease or other lubricants are used.

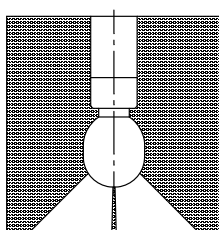
The SaniMidget SB is designed for use in pharmaceutical, biotechnological, food and dairy processing applications. It may be used in reactors, mixing/processing tanks, spray dryers and other process equipment with a volume from 0.1-10 m³ (27-2,700 US gallons). For larger volumes, multiple SaniMidget SB's may be applied.

Application assistance and recommendations for optimal position is available.

Functioning

The flow of cleaning media comes through the down-pipe, flushes the connector and exists through between the bearing surfaces, slots and leakage passages. This causes the head of the SaniMidget SB to rotate, with fans of water laid out in a swirling pattern on the entire perimeter exposed to the spray pattern. This generates a vibrating impact in the 270° upward pattern and a dynamic cascading flow that covers all internal surfaces of the tank, vessel or reactor. The SaniMidget SB is (as the rest of the UltraPure and Sani portfolio) designed according to GMP – safe materials, self cleaning and drainable. The self cleaning feature of the device is due to the unique design that includes cleaning of the down pipe. The device is designed with no hindrance to gravity draining. The patented easy assembly and disassembly of the device allows for only one clip to be used and without any press fits. Upon removing the clip this ensures that no parts can fall into the tank (the SaniMidget SB must be held in one hand and the clip in the other hand).

Spray Pattern



270° upward

Standard Configurations for SaniMidget SB/3-A

Connection	Rotor	Article number
1" Clip-on BPE US/ Weld-on DIN Range 1 (ODø28)	PEEK 450G	16B132-00
1½" Clip-on BPE US	PEEK 450G	16B182-00
1" Weld-on ISO	PEEK 450G	16B232-00
1" Weld-on BPE US	PEEK 450G	16B233-00

Standard Configurations for SaniMidget SB UltraPure

Connection	Rotor	Article number
1" Clip-on BPE US/ Weld-on DIN Range 1 (ODø28)	PEEK MG*	16B132-05
1" Weld-on ISO	PEEK MG*	16B232-05
1" Weld-on BPE US	PEEK MG*	16B233-05

Standard Options

Option	Article number
Qualification Documentation	16Bxxx-5x
Product Documentation	16Bxxx-9x
Ra 0.5, Electropolished	16Fxxx-xx

*PEEK MG (USP Class VI conforming) was not part of the TPV. As a consequence SaniMidget SB UltraPure has not been verified to meet the requirements of 3-A Sanitary Standards.

Q-doc

Alfa Laval has made two levels of documentation for Tank Cleaning Machines, the Product Documentation and the Qualification Documentation.

Product Documentation consist of:

- 3.1 and USP Class VI Certificates
- FDA Declaration of Conformity
- TSE Declaration and QC Declaration of Conformity

The **Qualification Documentation** is designed for the BioPharm and Personal Care industry and contains all necessary documents for qualification of Alfa Laval hygienic Tank Cleaning Machines. All documents are developed in according to the ISPE V-model and GDP, Good Documentation Practice, and includes:

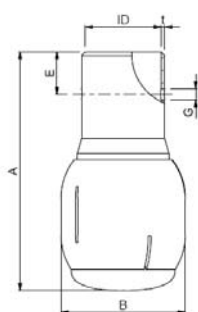
- RS, Requirement Specification.
- DS, Design Specification incl. Traceability Matrix.
- FAT, Factory Acceptance Test incl. IQ & OQ.
- 3.1 and USP Class VI Certificates.
- FDA Declaration of Conformity.
- TSE Declaration and QC Declaration of Conformity.
- SAT, Site Acceptance Test Protocol incl. IQ & OQ for End-User Execution.



Technical Data

Surface finish	:	Ra = 0.8 µm (32 µin)
Optional surface finish	:	Ra = 0.5 µm (20 µin) (electropolished)
Weight of machine	:	1" clip-on: 0.441 lbs (0.20 kg) 1½" clip-on: 0.970 lbs (0.44 kg)
Working pressure	:	1 – 3 bar (14.5 – 44 psi)
Recommended pressure	:	2 bar (29 psi)
Max. working temperature	:	95°C (203°F)
Max. sterilisation temperature	:	121°C (250°F)
Max. ambient temperature	:	150°C (304°F)
Wetting radius	:	3 m (9.8 ft)
Impact cleaning radius	:	1.4 m (4.6 ft)
Materials:	:	AISI 316L PEEK 450G (for 3-A version) PEEK MG (for UltraPure version)
Lubricant	:	Self-lubricating with the cleaning fluid
Steam or gass (air)	:	Not supported (contact AL for recommendations)
Connections	:	Clip-on 1" BPE US Clip-on 1½" BPE US Weld-on 1" BPE US Weld-on 1" ISO Weld-on DIN Range 1 (Ø28)

Dimensions



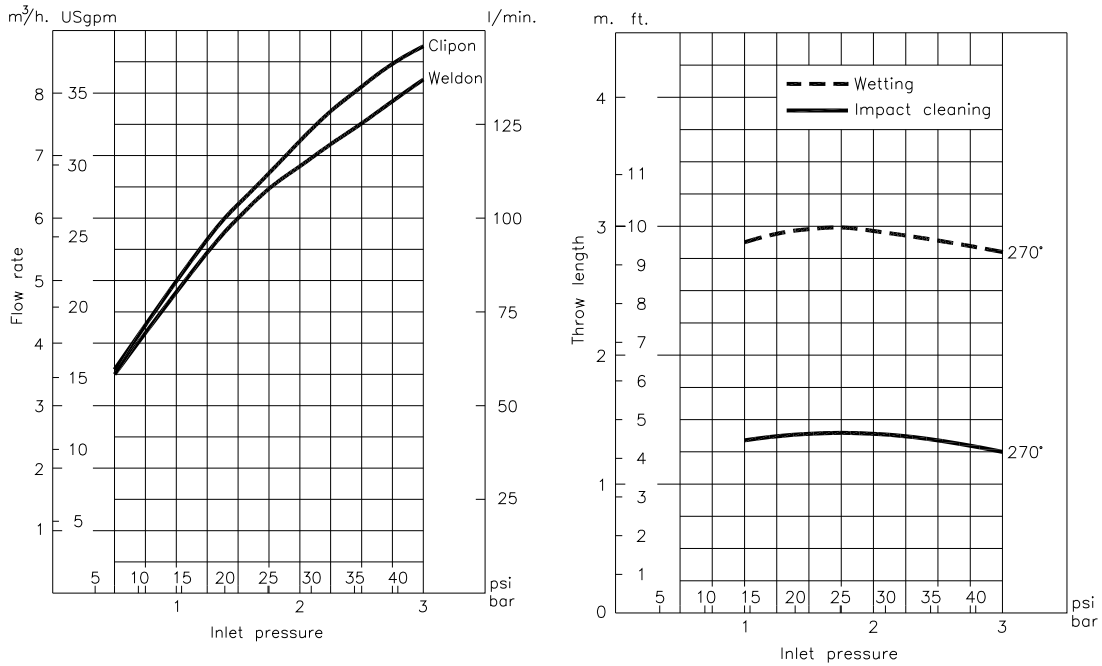
	Clip-on 1" BPE US		Clip-on 1½" BPE US		Weld-on 1" ISO		Weld-on 1" BPE US		Weld-on DIN Range 1 (Ø28)	
	mm	inch	mm	inch	mm	Inch	mm	inch	mm	inch
ID	25.7	1.012	38.4	1.512	22.6	0.890	22.1	0.87	25.7	1.01
t	1.2	0.047	1.2	0.047	1.2	0.047	1.65	0.065	1.2	0.047
B	42.0	1.653	54.7	2.154	42.0	1.653	42.0	1.653	42.0	1.653
A	84.8	3.338	118.3	4.659	104.8	4.126	104.8	4.126	84.8	3.338
Ø-clip	4.0	0.157	4.0	0.157	4.0	0.157	4.0	0.157	4.0	0.157
G	4.1	0.161	4.1	0.161	4.1	0.161	4.1	0.161	4.1	0.161
E	15.0	0.590	25.4	1						

Important information:



The SaniMidget SB/3-A Weld-on versions only continue to meet the requirements of the 3-A Sanitary Standard 78-01, if the installation makes visual inspection of all liquid contacts surfaces possible. See Installation instructions on page 11

Performance Data for SaniMidget SB



NB: The curves show the average value of flow rate and throw length. The Flow rate can vary up to +/- 10%.

Note: The inlet pressure is measured immediately before the inlet to the machine. In order to achieve the performance indicated on the curves, the pressure drop in the supply lines between pump and machine must be taken into consideration. The water temperature during testing was approx. 20°C.

Installation and Normal Operation

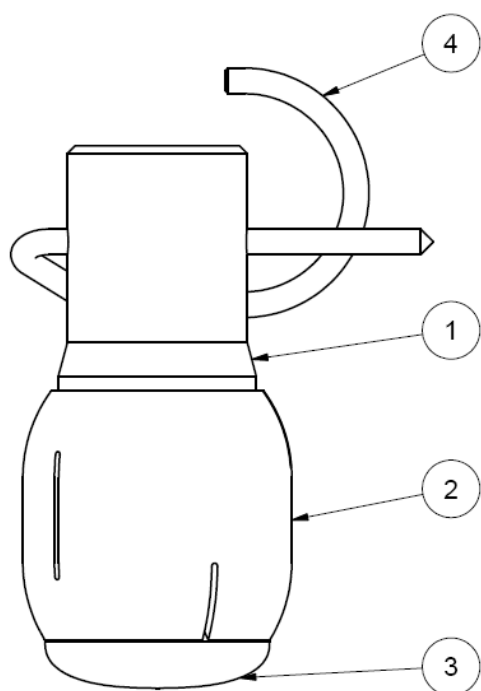
General Installation Instructions

It is recommended to install a filter with mesh size 250 µm (0.01”) in the supply line in order to avoid particles, scale etc. from clogging the inside of the cleaner.

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.

Randomly selected SaniMidget SB machines are tested at the factory before shipping, in accordance with “Test Requirements for SaniMidget SB/3-A”.

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-Machinery Directive and depending of application, the EU-Pressure Equipment Directive, the EU-ATEX Directive and other relevant Directives.



Pos. 1	Connector
Pos. 2	Rotor
Pos. 3	Stator
Pos. 4	Clip

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 in any angle to vertical, the life time may vary. If installing at an angle to vertical, ensure that the clip cannot fall out by gravity. To maintain drainability, the device should not be tilted more than 25° to vertical.

Part lists for SaniMidget SB/3-A

*Wear part

	Pos. 1	Pos. 2	Pos.3	Pos. 4
Item number	AISI 316L	PEEK 450G	AISI 316L	AISI 316L
16B132-x0	16B500	16B540*	16B520	16B560
16B182-x0	16B505	16B550*	16B530	16B561
16B232-x0	16B501	16B540*	16B520	16B560
16B233-x0	16B502	16B540*	16B520	16B560

Part lists for SaniMidget SB UltraPure

*Wear part

	Pos. 1	Pos. 2	Pos.3	Pos. 4
Item number	AISI 316L	PEEK MG	AISI 316L	AISI 316L
16B132-x5	16B510	16B542*	16B520	16B560
16B232-x5	16B511	16B542*	16B520	16B560
16B233-x5	16B512	16B542*	16B520	16B560

Installation

The SaniMidget SB clip-on versions are installed on either a 1" BPE US down pipe (16B132-xx) or a 1½" BPE US down pipe (16B182-xx). The SaniMidget SB weld-on versions are installed on either a 1" BPE US down pipe (16B233-xx), a 1"ISO down pipe (16B232-xx) or a DIN Range 1 Ø28 down pipe (16B132-xx).

Correct down-pipe dimensions are important to ensure volumetric flow rates as provided in this manual. Clip-on hole centre for 1" must be less than 15 mm (0.59") from the bottom end (recommended 13-15 mm – 0.51"-0.59") of the down-pipe and for the 1½" less than 34 mm (1.33") from the bottom end (recommended 30-34 mm – 1.18"-1.33"). For weld-on versions NO clip hole is needed – the connector (containing the clip hole) is welded on the end of the down pipe.

Important information:

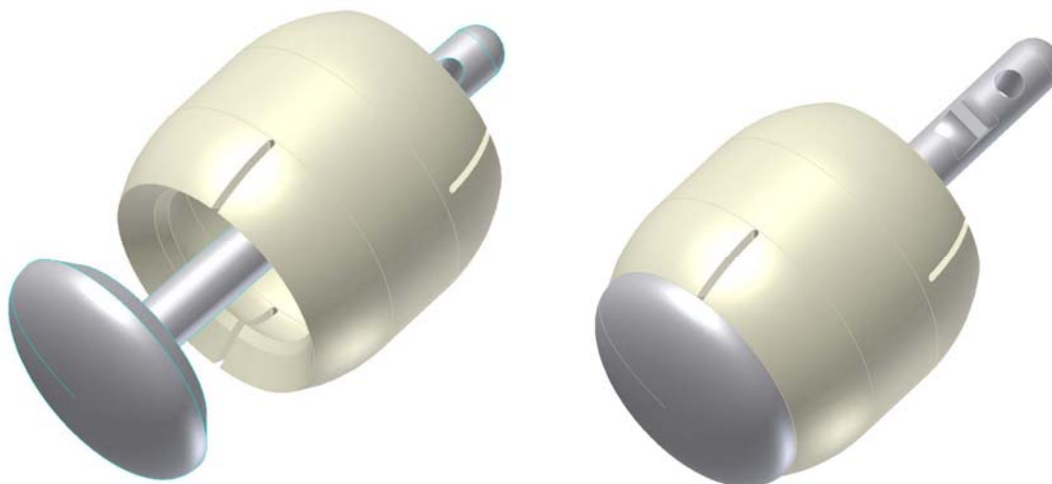


SaniMidget SB/3-A weld-on versions:

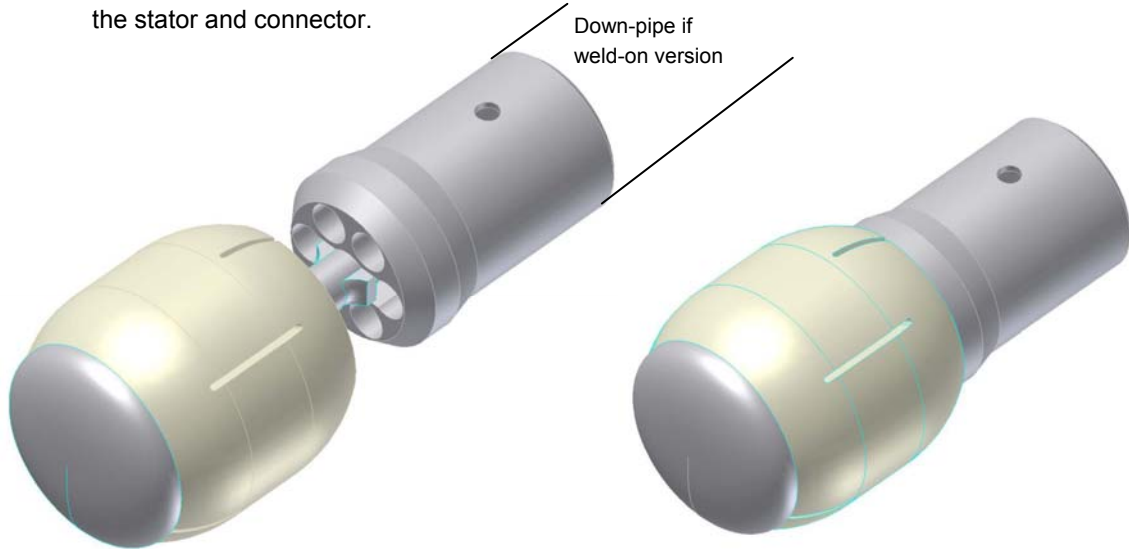
To continue to meet the requirements of the 3-A Sanitary Standard 78-01, the weld-on version shall be welded onto the end of a straight down pipe. This straight down pipe shall be connected to the supply system in a dismantlable manner. This shall allow for easy disassembly and reassembly (e.g. a sanitary clamp coupling) to allow visual inspection (through the down pipe) of the inside of the down pipe and the inside of the connector. Welding must be performed according to relevant 3-A Sanitary Standard.

The SaniMidget SB itself is assembled as follows (for the weld-on version, weld the connector onto the down pipe as explained above):

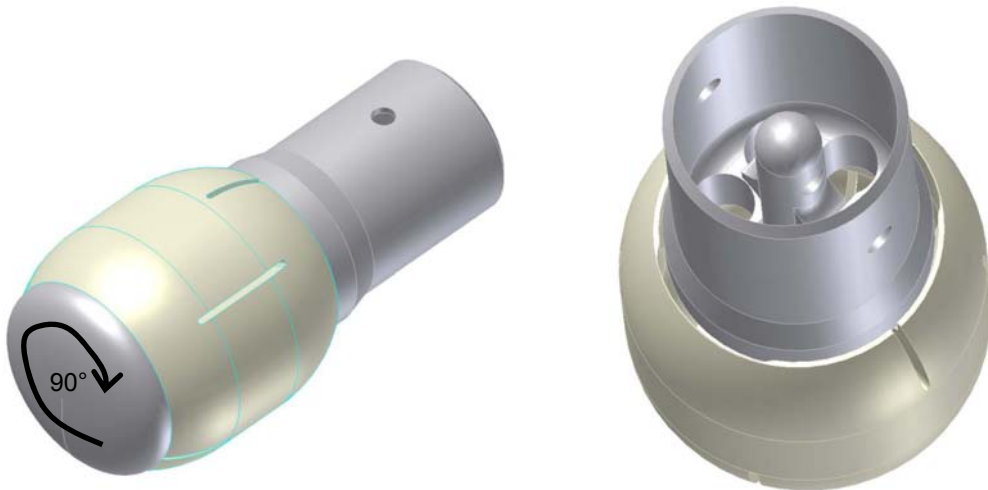
1. Insert the cylindrical end of the stator (Pos. 3) through the Rotor (Pos. 2).



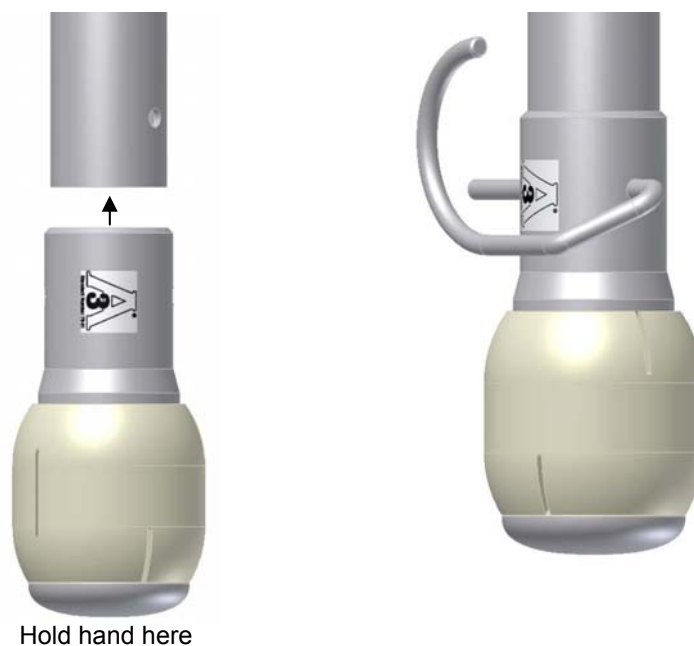
2. The cylindrical end of the stator (Pos. 3) is then inserted into the centre hole of the Connector (Pos. 1). The stator can be inserted to its full extent in one position only. When the stator is fully inserted into the connector, the rotor (Pos. 2) will be fixed between the bearing surface of the stator and connector.



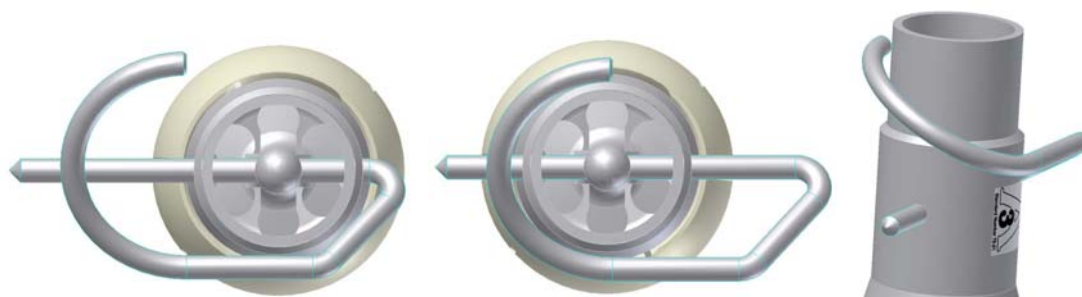
3. Having inserted the stator (Pos. 3) into the connector (Pos. 1) turn the stator 90° to align the hole in the cylindrical end of the stator with the holes in the connector.



4. Weld-on version: Insert the clip (Pos. 4) through the hole in one side of the connector (Pos. 1), through the hole in the stator (Pos. 3) and through the hole on the other side of the connector.
- Clip-on version: Holding the machine in one hand (hand below the stator) slide the SaniMidget SB onto the downpipe. Align the clip holes in the connector (Pos. 1) with the clip holes in the down pipe, while mounting the clip through the hole in the connector, the down pipe, the stator (Pos. 3), the other side of the down pipe and finally out through the other side of the connector.



5. Turn the clip (Pos. 4) upwards until contact with the connector (down-pipe) and pull back into the locked position around the down-pipe.



6. Check that the rotor (Pos. 2) can be rotated freely by turning it with your fingers.

Normal Operation

Cleaning Media

Use only media compatible with Stainless Steel AISI 316L and PEEK.

Note: PEEK is not resistant to concentrated sulphuric acid

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 Tank Equipment sales office.

Temperature

The machine is designed to operate with cleaning media at temperatures up to 95°C (203°F). However, it stands temperatures up to 150°C (304°F) inside the tank.

Pressure

Please make sure that the connections are correctly mounted before opening of the washing valve. Apply pressure gradually in order to avoid hydraulic shocks, which might stress mechanical parts in the SaniMidget SB cleaner. Max. pressure difference is 3.0 bar. Ideally, use a frequency controlled pump with gradually increase of pumping speed.

After-Use Cleaning

After use flush the machine with fresh water. Cleaning media should never be allowed 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

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.



General Safety Precautions

The SaniMidget SB 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 jets from the cleaner head



Maintenance and Repair

In order to keep the tank cleaning machine servicing as an efficient tool in the tank cleaning operations, it is essential to maintain its high performance by following a simple preventive maintenance programme, which will help keep the tank cleaning machine in good condition.

Good maintenance is careful and regular attention!

Recommended Service Intervals

The design of the SaniMidget SB asks for little maintenance, as there are no rotating parts in direct contact with stationary parts. It is recommended that inspection is performed after each 500 running hours.

For continuous surveillance of the SaniMidget SB, monitor and log the volumetric flow rate. If the volumetric flow rate increases or decreases by more than 15% over time this could be a sign of wear or blockage of the flow path in certain parts of the machine and the machine should be inspected.

An inspection 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 (as described on the following pages)
2. Visual inspection for foreign objects. Remove any objects and clean before rotation verification.
3. Visual inspect the bearing surfaces, the holes for the clip-on connection and the width of the slots in the rotor.
4. In case of machine wear, the parts worn down are to be replaced.
5. Look for wear of the slots in the spray head. Recommendation: Replace rotor if slot width exceeds 1.5 mm, as throw length decreases and flow rate increases.
6. Reinstall machine
7. Fill in the Service Log

Lists of parts included in the machines are provided on page 9

Service and Repair of Machines Ordered with Alfa Laval Q-doc

In order to ensure full traceability and to obtain full test documentation (FAT: Factory Acceptance Test), it is necessary to order a new Rotary Spray Head machine with Alfa Laval Q-doc. The new Rotary Spray Head machine will be manufactured and tested (FAT) and shipped to the customer with new Alfa Laval Q-doc for further qualification (SAT: Site Acceptance Test) and validation (PV: Process Validation).

Disassembly

Disassemble machine as described on the following pages.

1. Hold one hand under the stator (Pos. 3) of the SaniMidget SB.



Hold hand here

2. With the other hand unlock the clip (Pos. 4) and withdraw it from the holes to loosen the SaniMidget SB from the down-pipe (for weld-on version: from the connector).
3. Still holding the hand under the stator (Pos. 3), lower the SaniMidget SB free from the down pipe and remove it from the tank together with the clip (Pos. 4).
4. When out of the tank, turn the Stator (Pos. 3) 90° to allow it to be withdrawn from the connector (Pos. 1).

This completes the disassembly and the four parts (stator, rotor, connector and clip) of the SaniMidget SB can be inspected. For the weld-on versions, the connector (Pos. 3) is still on the down pipe and shall be inspected on the inside by looking down through the straight down-pipe.

Reassembly

Reassembly is carried out according to the installation instruction given on page 9.

Claim Procedure

In case of failure that needs assistance from Alfa Laval Tank Equipment A/S, it is essential for our evaluation that the problem, as well as the working conditions of the machine, is described as detailed as possible.

For description of the working conditions, fill in the form “Claim Report - Working Conditions”, which you will find at the back of this manual.

How to contact Alfa Laval Tank Equipment A/S

For further information please feel free to contact:

Alfa Laval Tank Equipment A/S
Baldershoej 19
P.O. Box 1149
2635 Ishoej
Denmark

Phone no.: +45 43 55 86 00
Fax no.: +45 43 55 86 01
www.alfalaval.com
www.toftejorg.com

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

Claim Report Working Conditions

Page 1/2

Ref. Claim Case : _____

Machine/Cleaner Type : _____ Serial No.: _____

Configuration

- Nozzles : _____ x \emptyset _____ mm

- Turbine/Inlet Guide : _____ %

Working Conditions

Inlet pressure at machine/cleaner : _____

Type of Valve in inlet line : _____

Can hydraulic shock be disregarded: : Yes No

Inlet line flushed before installation of tank cleaner? : Yes No

Working hours before failure : _____ hours

Cleaning Programme

Cleaning media and conc.	Temperature	Time	Recirculation?

Is sterilising being used? : Yes No

Procedure (media/temp.)? : _____

Is steam injection being used for heating? : Yes No

Time: _____

Temperature: _____

V. 98.1

Page 2/2

Condition of Cleaning Media

- | | |
|---|---|
| <input type="checkbox"/> Clean | |
| <input type="checkbox"/> Contaminated with (nature and description) | |
| <input type="checkbox"/> Chemicals/Solvents _____ | <input type="checkbox"/> High viscous |
| <input type="checkbox"/> Soluble | <input type="checkbox"/> Sticky/tenacious |
| <input type="checkbox"/> Low viscous | <input type="checkbox"/> Solidifying |
| <input type="checkbox"/> Hard particles/size _____ | <input type="checkbox"/> Crystallising |
| <input type="checkbox"/> Soft particles/size _____ | |

Has filter been installed in inlet line?

- Yes
 Mesh size: _____ mm
 No

Is tank cleaner flushed with clean water after tank cleaning?

- Yes No

Type of Soilage/Tank Contents to be removed

Name, formula/concentration of material to be removed from tank : _____

What is material soluble in : _____

Nature of material:

- | | | |
|---|---|---|
| <input type="checkbox"/> Volatile/explosive | <input type="checkbox"/> Sticky/tenacious | <input type="checkbox"/> Contains soft particles |
| <input type="checkbox"/> Low viscous | <input type="checkbox"/> Solidifying | <input type="checkbox"/> Contains hard particles/fibres |
| <input type="checkbox"/> High viscous | <input type="checkbox"/> Crystallising | |

Is tank cleaner submerged in material?

- Yes No

Other information/Remarks

Date: _____ Sign.: _____

Declaration of Conformity with EN10204

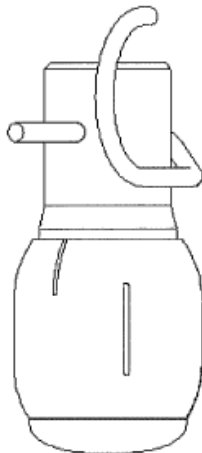


**Declaration Of Conformity
with
EN 10204, Sub Clause 2.2 Test Report
Materials of Construction and Surface Finishes**

Alfa Laval Tank Equipment A/S (supplier)

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

Description:
Alfa Laval SaniMidget SB rotary spray head



have 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 316L

Non-Metal Materials

21CFR§177.2415 (PEEK)

Surface Finish

All parts are finished with a nominal external roughness $R_a = 0,8 \mu\text{m}$ (30 micro inch).

1 of 2

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



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 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 Tank Equipment's ISO 9001 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.

Copenhagen, Ishoej, on September 10, 2009

For Alfa Laval Tank Equipment A/S

A handwritten signature in black ink, appearing to read "JZ Nielsen", written over a horizontal line.

Jacob Zander Nielsen

Purchasing & Quality Manager

2 of 2

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