

4.1 Tank Cleaning Equipment

Alfa Laval's comprehensive range of cleaning devices guarantees impact, making the most economical use of energy, manpower and cleaning solutions.



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4.1 Tank Cleaning Equipment

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Low Flow Saves on Water and Chemicals

Toftejorg SaniMicro Rotary Spray Head

Application

The Toftejorg SaniMicro is a rotary spray head that uses cleaning media to provide coverage and impact. The device represents an effective alternative to traditional static spray balls because it uses low volumes of cleaning fluid at low pressure. The double ball bearing in the Toftejorg SaniMicro's rotating head makes the device suitable for all industrial cleaning applications, including tanks, reactors, vessels and other containers ranging from 0.05 to 1 m³, depending on dimensions and cleaning task.

Working principle

The flow of the cleaning media causes the head of the Toftejorg SaniMicro to rotate, and the fan-shaped jets lay out a swirling pattern throughout the tank or reactor. This generates the impact needed for the efficient removal of residual product; the cascading flow covers all internal surfaces of the vessel.



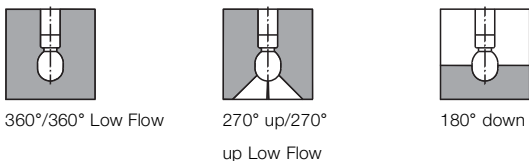
TECHNICAL DATA

Lubricant: Self-lubricating with the cleaning fluid
 Wetting radius Max. 2.5 m
 Impact cleaning radius: Max. effective 0.6 m

Pressure

Working pressure: 1-3 bar
 Recommended pressure: 2 bar

Spray Pattern



Standard Design

As standard documentation, the Toftejorg SaniMicro can be supplied with a "Declaration of Conformity" for material specifications or 3.1 certification for metallic parts. The device is available in an electropolished version as well as in hastelloy C22 (balls in hastelloy C276) with 3.1 certification for metallic parts.

Certificates

2.2 material certificate, Q-doc, Q-doc incl. FAT & SAT and ATEX.

PHYSICAL DATA

Materials

AISI 316L (UNS S31603). PTFE*
 * FDA compliance 21CFR§177.

Min. tank opening: 25 mm diameter (DN25)
 Standard Surface finish: Ra 0.5µm exterior / Ra 0.8µm internal
 Improved Surface finish: Ra 0.5µm exterior / Ra 0.5µm internal + Electro polished

Temperature

Max. working temperature: 95°C
 Max. ambient temperature: 140°C

Weight: 75 g

Connections

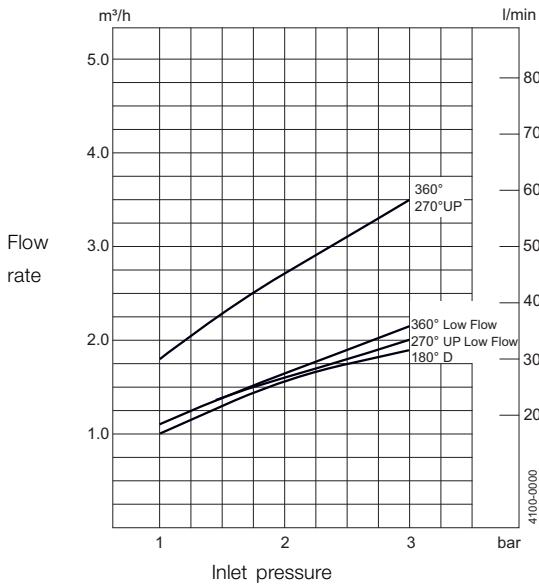
- Thread: 3/8" of Rp (BSP), or 3/8" of NPT
- Weld-on: 3/4" of ISO 2037, or DN15 DIN11850-R1 or R2, or 3/4" of BPE US
- Clip-on: 3/4" of ISO 2037, or DN15 DIN11850-R1 or R2, or 3/4" of BPE US

Qualification Documentation (Q-doc)

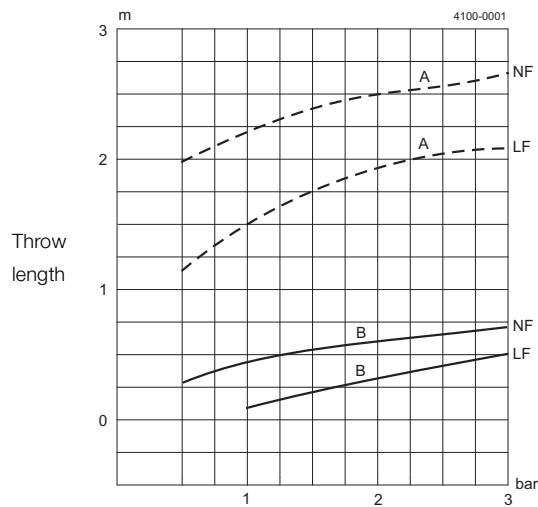
Designed for the BioPharm and Personal Care industry for qualification of hygienic Tank Cleaning Machines. Developed in according to the ISPE V-model and GDP, Good Documentation Practice, and includes: RS (Requirement Specification); DS (Design Specification incl. Traceability Matrix); FAT (Factory Acceptance Test incl. IQ & OQ); 3.1 and USP Class VI Certificates; FDA Declaration of Conformity; TSE Declaration; QC Declaration of Conformity; SAT (Site Acceptance Test Protocol incl. IQ & OQ) for End-User Execution.



Flow Rate



Cleaning Radius



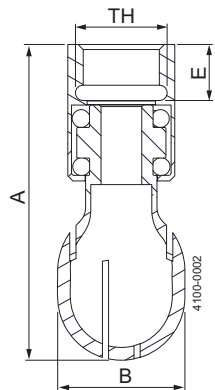
NF= 360°,
270°UP, 180°D
LF= 360° LowFlow,
270°UP LowFlow

NF= 360°,
270°UP, 180°D
LF= 360° LowFlow,
270°UP LowFlow

Inlet pressure
A: Wetting - B: Impact cleaning
For Clip-on models, the flow rate is increased by
approx. 0.2 m³/h

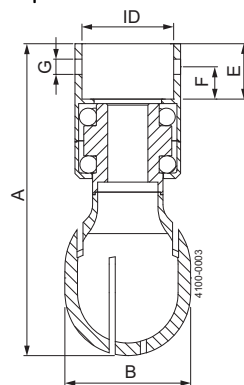
Dimensions (mm)

Thread



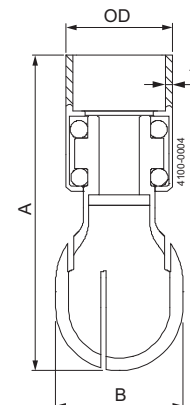
TH
3/8" Rp (BSP)
3/8" NPT

Clip-on



ID
ISO: ø17.4 mm
DIN Range 1: ø18.2 mm
BPE US / DIN Range 2 : ø19.2 mm

Weld-on



OD x t
ISO: ø17.2 x 1 mm
DIN Range 1: ø18 x 1 mm
DIN Range 2: ø19 x 1.5 mm
BPE US: ø19.05 x ø1.65 mm

Type	A	B	E	F	G
Tread	62	ø25	11		
Clip-on	62	ø25	11	5.9	ø3.6
Weld-on	77.500	ø25			

Sanitary, Low-Flow Cleaning

Toftejorg SaniMidget Rotary Spray Head

Application

The Toftejorg SaniMidget is an efficient replacement for traditional static spray balls as it uses low volumes of liquid at low pressure. The device, particularly well-suited to sanitary applications, can be used in tanks ranging from 0.1 to 10 m³.

Working principle

The flow of the cleaning media causes the head of the Toftejorg SaniMidget to rotate, with fan jets 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.



TECHNICAL DATA

Lubricant: Self-lubricating with the cleaning fluid
 Wetting radius: Max. 3 m
 Impact cleaning radius: Max. effective 1.4 m

Pressure

Working pressure: 1-3 bar
 Recommended pressure: 2 bar

Spray Pattern



360°



270° up



180° down

Standard Design

As standard documentation, the Toftejorg SaniMidget can be supplied with a "Declaration of Conformity" for material specifications or 3.1 certification for metallic parts. The device is available in an electro-polished version as well as in hastelloy C22 (balls in hastelloy C276) with 3.1 certification for metallic parts.

Certificates

2.2 material certificate, Q-doc, Q-doc incl. FAT & SAT and ATEX.

PHYSICAL DATA

Materials

Inlet connections: 316L (UNS S31603)
 Bearing race parts: Duplex steel (UNS N31803)
 Balls: 316L (UNS S31603) /PTFE*
 Head: 316L (UNS 31603)
 * FDA compliance 21CFR§177
 Standard Surface finish: Ra 0.5µm exterior/Ra 0.8µm internal
 Improved Surface finish: Ra 0.5µm exterior / Ra 0.5µm internal
 + Electro polished

Temperature

Max. working temperature: . . . 95 °C
 Max. ambient temperature: . . . 140 °C

Weight

Thread and clip-on: 0.30 kg
 On pipe: 0.55/0.90 kg

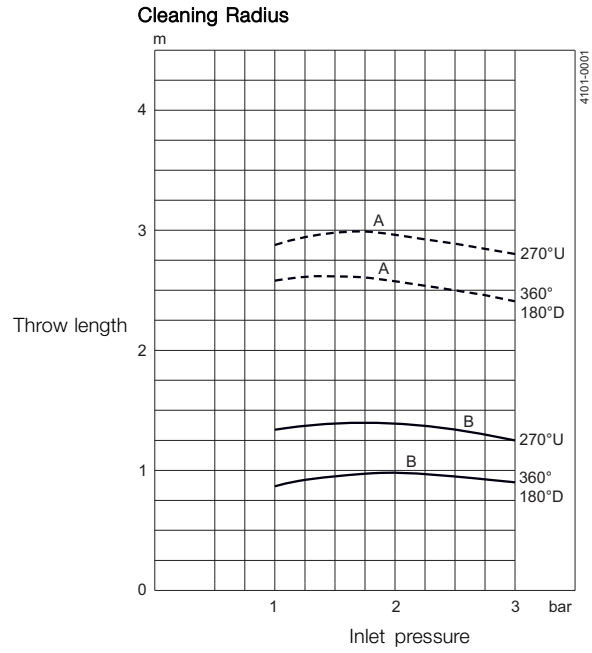
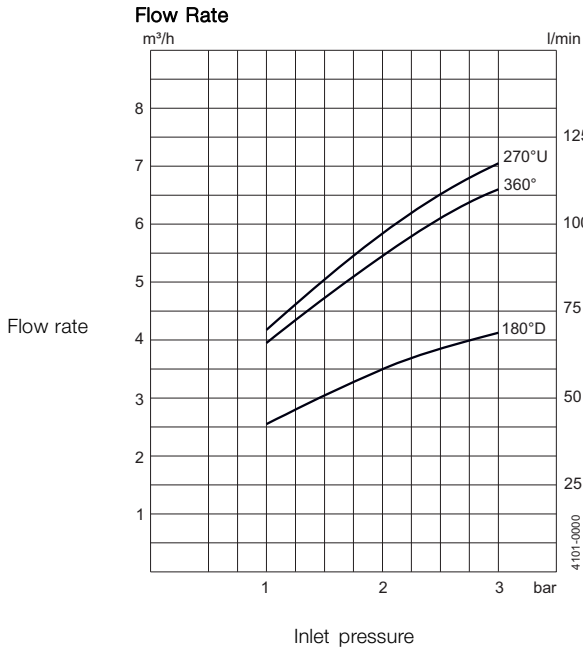
Connections

- Thread: 3/4" of Rp (BSP), or 3/4" or 1/2" of NPT
- Weld-on: 1" of ISO 2037, or DN25 DIN11850-R2, or 1" of BPE US
- Clip-on: 1" of ISO 2037, or DN25 DIN11850-R1 or R2, or 1" of BPE US

Qualification Documentation (Q-doc)

Designed for the BioPharm and Personal Care industry for qualification of hygienic Tank Cleaning Machines. 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; QC Declaration of Conformity; SAT (Site Acceptance Test Protocol incl. IQ & OQ) for End-User Execution.

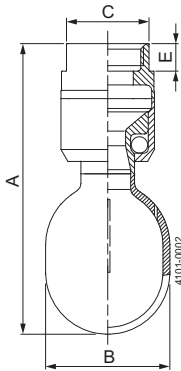




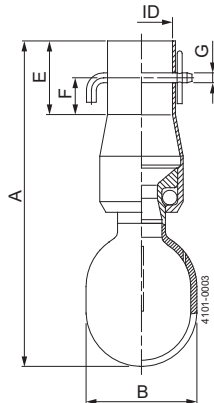
A: Wetting - B: Impact cleaning
 For clip-on models, the flow rate is increased by approx. 0.5 m³/h.

Dimensions (mm)

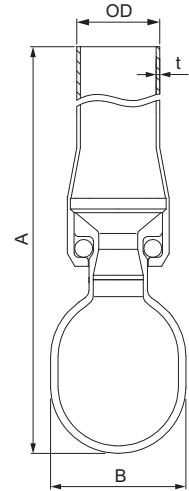
Thread



Clip-on



Weld-on



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

ID
 ISO: ø25.3 mm
 BPE US: ø25.7 mm
 DIN Range 1: ø28.3 mm
 DIN Range 2: ø29.3 mm

OD x t
 ISO: ø25 x 1.2 mm
 BPE US: ø25.4 x 1.65 mm
 DIN Range 1: ø28 x 1 mm
 DIN Range 2: ø29 x 1.5 mm

Type	A	B	C	E	F	G
Thread	102	ø45	30	10		
Clip-on	133.5	ø45		30	15	ø4
Weld-on	120.5, 500, 1000	ø45				

UltraPure, Low-Flow Cleaning

Toftejorg SaniMidget SB UltraPure Rotary Spray Head

Application

The Toftejorg SaniMidget SB UltraPure Rotary Spray Head is with its 3A approval, preliminary designed for the dairy industry with respect to self-cleaning, self-draining and inspectability. Its novel patent pending one-clip assembly offers easy installation, disassembly and inspection without compromising cleanability or drainability. Sizing/selection and installation drawings are available. Contact Alfa Laval for recommendations.

Working Principles

The flow of cleaning media causes the head of the SaniMidget SB UltraPure 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 internal surfaces of the tank, vessel or reactor. The SaniMidget SB UltraPure is designed according to EHEDG and the design meets the requirements of 3-A standards.



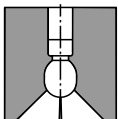
TECHNICAL DATA

Lubricant: Lubrication by rinse/cleaning fluid
 Wetting radius: Max. 3 m
 Impact cleaning radius: Max. effective 1.4 m

Pressure

Working pressure: 1-3 bar
 Recommended pressure: 2 bar

Spray Pattern



270° up

Standard Design

The SaniMidget SB UltraPure can be supplied with 3.1 certificates for metallic parts and FDA conformity and USP Class IV on non-metallic parts.

Certificates

2.2 material certificate, Q-doc, Q-doc incl. FAT & SAT and EHEDG.

PHYSICAL DATA

Materials

Metallic parts: AISI 316L (UNS S31603)
 Non-metallic parts: PEEK MG
 Surface finish Ra < 0.8µm
 Option (EP): Ra < 0.5µm
 Steam or gas (air): Not supported - Contact Alfa Laval

Temperature

Max. working temperature: 95°C
 Max. ambient temperature: 150°C

Weight: 1": 0.20 kg

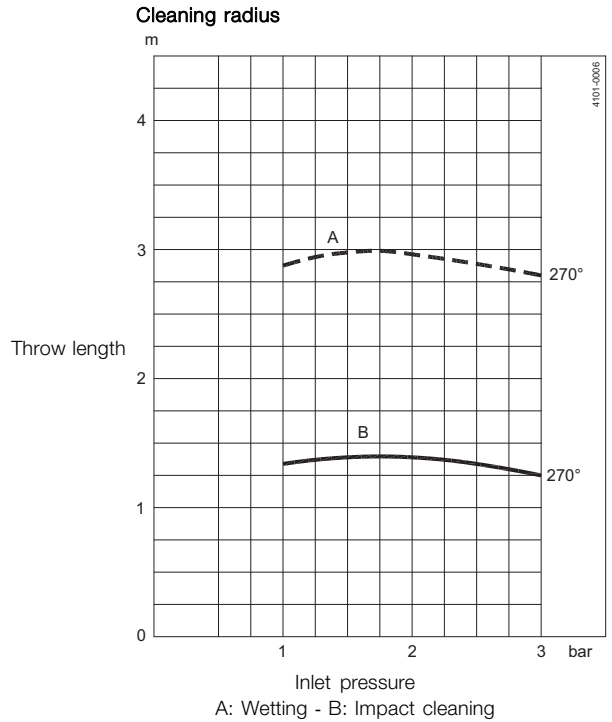
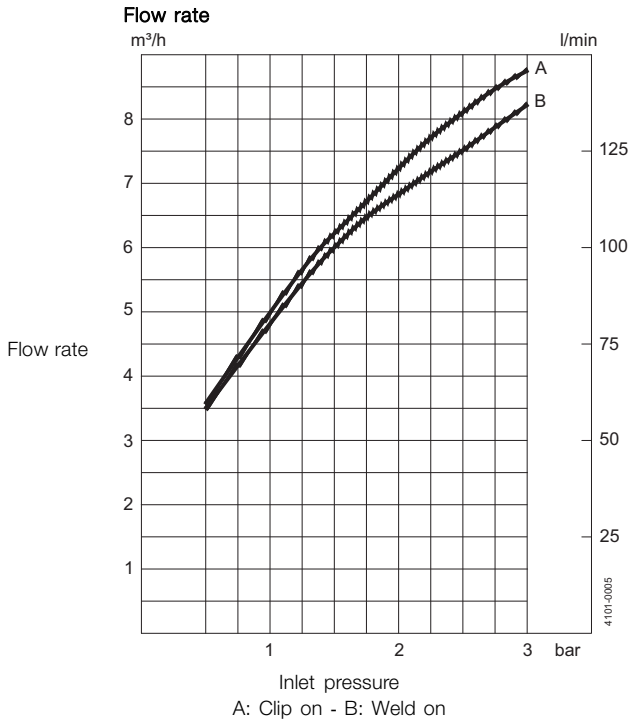
Connections

- Weld-on: 1" of ISO 2037, or DN25 DIN11850-R1, or 1" of BPE US
 - Clip-on: 1" of BPE US

Clip-on options

Easy-on/off clip (ø4.0 mm). (Clip needed for both clip-on and weld-on versions to assemble the machine)

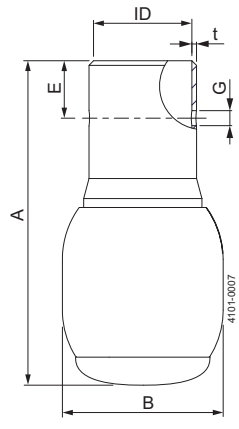




Note:

The inlet pressure has been taken 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 in consideration and the water temperature during testing was approx. 20°C.

Dimensions (mm)



	Clip-on	Weld-on	Weld-on	Weld-on
	1" BPE US	1" ISO 2037	1" BPE US	DN25 DIN R1
	mm	mm	mm	mm
ID	ø25.7	ø22.6	ø22.10	ø25.7
t	1.2	1.2	1.65	1.2
B	ø42.0	ø42.0	ø42.00	ø42.0
A	84.8	104.8	108.80	84.8
ø-clip	ø4.0	ø4.0	ø4.00	ø4.0
G	ø4.1	ø4.1	ø4.10	ø4.1
E	15.0			

Sanitary, low flow cleaning that meets 3-A standards

Toftejorg SaniMidget SB 3-A Rotary Spray Head

Application

The Toftejorg SaniMidget SB 3-A Rotary Spray Head is preliminary designed for the pharmaceutical industry with respect to self-cleaning, self-draining and inspectability. Its novel patent pending one-clip assembly offers easy installation, disassembly and inspection without compromising cleanability or drainability. Sizing/selection and installation drawing are available. Contact Alfa Laval for recommendations.

Working Principles

The flow of cleaning media causes the head of the SaniMidget SB 3-A 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 internal surfaces of the tank, vessel or reactor. The SaniMidget SB 3-A is designed according to EHEDG and GMP Guidelines.



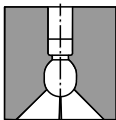
TECHNICAL DATA

Lubricant: Lubrication by rinse/cleaning fluid
 Wetting radius: Max. 3 m
 Impact cleaning radius: Max. effective 1.4 m

Pressure

Working pressure: 1-3 bar
 Recommended pressure: 2 bar

Spray Pattern



270° up

Standard design

The SaniMidget SB 3-A can be supplied with 3.1 certificates for metallic parts and 3-A conformity*** on its plastic part. The SaniMidget SB/UltraPure is also available with Alfa Laval Q-doc.

*** = Implies that the material complies with FDA 21CFR.

Certificates

2.2, 3.1 material certificate, EHEDG and 3-A.

PHYSICAL DATA

Materials

Metallic parts: AISI 316L (UNS S31603)
 Non-metallic parts: PEEK 450G
 Surface finish: Ra < 0.8µm
 Option (EP): Ra < 0.5µm
 Steam or gas (air): Not supported - contact Alfa Laval

Weight: 1" : 0.20 kg / 1½": 0.44 kg

Temperature

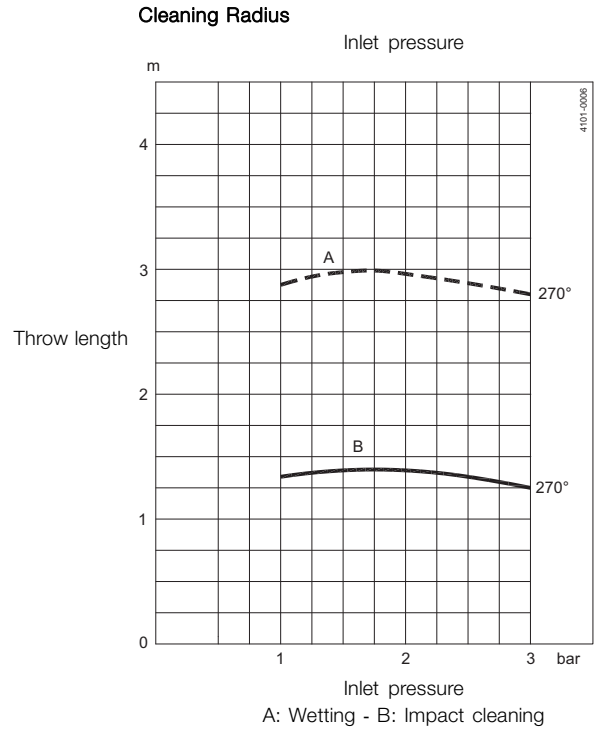
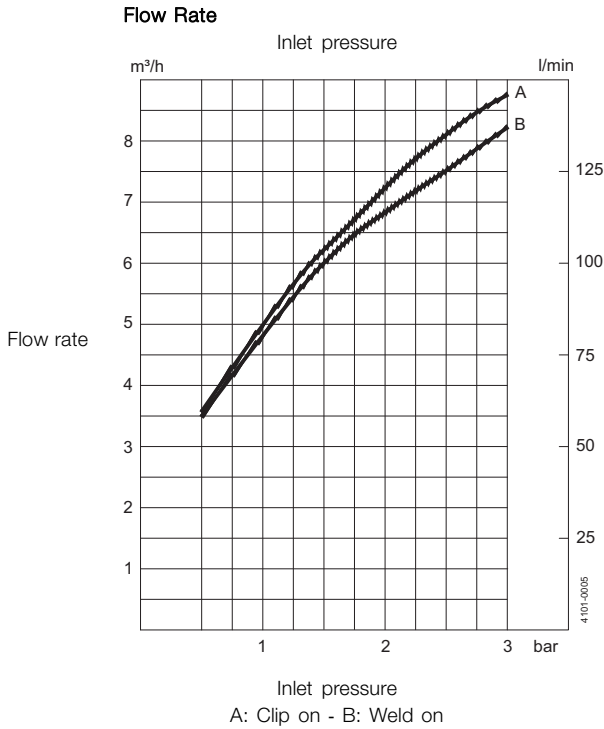
Max. working temperature: . . . 95°C
 Max. ambient temperature: . . . 150°C

Connections

- Weld-on: 1" of ISO 2037, or DN25 DIN11850-R1, or 1" of BPE US
 - Clip-on: 1 1/2" of ISO 2037, or 1" or 1 1/2" of BPE US

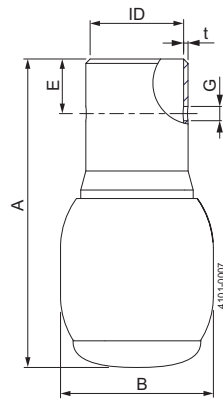
Clip-on options

Easy-on/off clip (ø4.0 mm). Clip needed for both clip-on and weld-on versions to assemble the machine.



Note: The inlet pressure has been taken 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 in consideration and the water temperature during testing was approx. 20°C.

Dimensions (mm)



	Clip-on 1" BPE US	Clip-on 1½" BPE US/1½" ISO 2037	Weld-on* 1" ISO 2037	Weld-on* 1" BPE US	Weld-on* DN25 DIN R1
	mm	mm	mm	mm	mm
ID	ø25.7	ø38.4	ø22.6	ø22.1	ø25.7
t	1.2	1.2	1.2	1.65	1.2
B	ø42.0	ø54.7	ø42.0	ø42.0	ø42.0
A	84.8	118.3	104.8	108.8	84.8
ø-clip	ø4.0	ø4.0	ø4.0	ø4.0	ø4.0
G	ø4.1	ø4.1	ø4.1	ø4.1	ø4.1
E	15.0	25.4			

* Weld-on version only meets the requirements of the 3-A Sanitary Standard 78-01 if installed according to the user manual.

** Third Party Verification shows that this machine meets the requirements of the 3-A Sanitary Standard 78-01.

Low Flow Saves on Water and Chemicals

Toftejorg MultiMidget Rotary Spray Head

Application

The Toftejorg MultiMidget is a rotary spray head that uses cleaning media to provide coverage and impact. The device represents an effective alternative to traditional static spray balls because it uses low volumes of cleaning fluid at low pressure. The double ball bearing in the Toftejorg MultiMidget's rotating head makes the device suitable for all industrial cleaning applications, including tanks, reactors, vessels and other containers ranging from 0.1 m³ to 10 m³, depending on dimensions and cleaning task.

Working principle

The flow of the cleaning media causes the head of the Toftejorg MultiMidget to rotate, and the fan-shaped jets lay out a swirling pattern throughout the tank or reactor. This generates the impact needed for the efficient removal of residual product; the cascading flow covers all internal surfaces of the vessel. The MultiMidget are designed to be installed in any given angle.



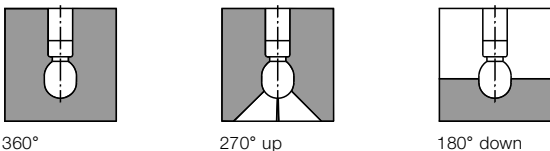
TECHNICAL DATA

Lubricant: Self-lubricating with the cleaning fluid
 Wetting radius: Max. 3 m
 Impact cleaning radius: Max. effective 1.4 m

Pressure

Working pressure: 1-3 bar
 Recommended pressure: 2 bar

Spray Pattern



Standard Design

As standard documentation, the Toftejorg MultiMidget can be supplied with a "Declaration of Conformity" for material specifications.

Certificates

2.1 material certificate.

PHYSICAL DATA

Materials

Inlet connections: 316 (UNS S31600)
 Bearing race parts: Duplex steel (UNS N31803)
 Balls: 316 (UNS S31600)
 Head: 316L (UNS S31603)
 Standard Surface finish: Ra 0.8µm exterior/ Ra 0.8µm internal

Weight

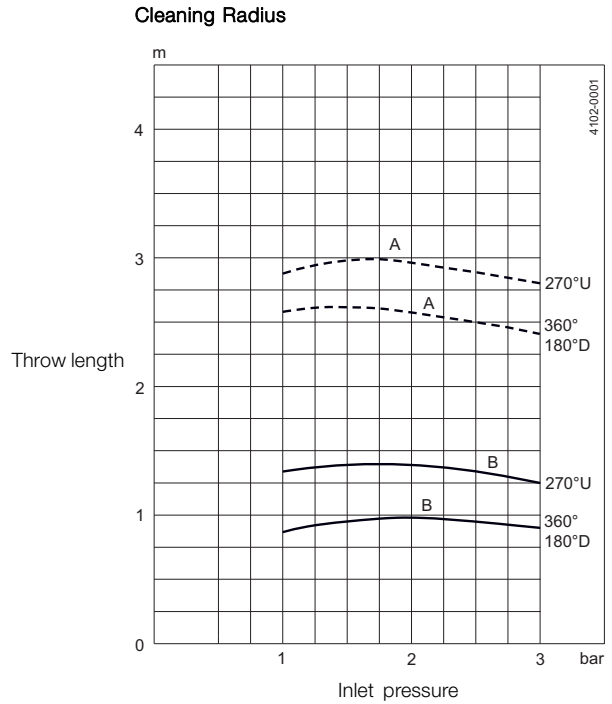
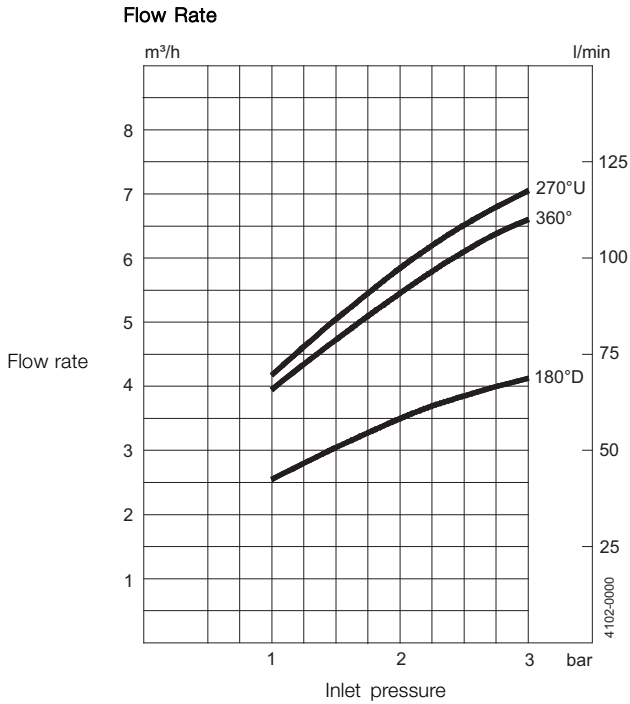
Thread: 0.50 kg
 On pipe: 0.90 kg

Temperature

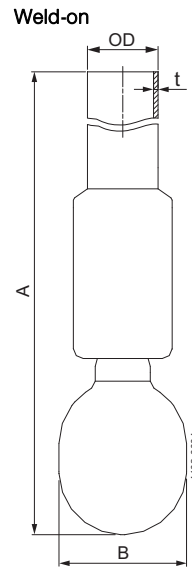
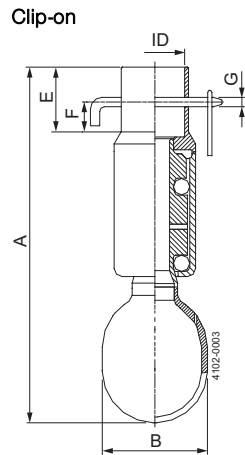
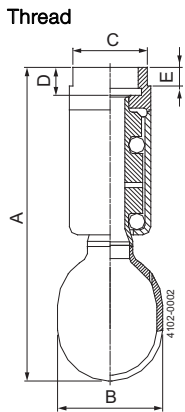
Max. working temperature: . . . 95°C
 Max. ambient temperature: . . . 140°C

Connections

- Thread: 1/2" or 3/4" of Rp (BSP) or NPT
- Weld-on: 1" ISO 2037 or DN25 DIN11850-R2
- Clip-on: 1" ISO 2037



A: Wetting - B: Impact cleaning
 For clip-on models, the flow rate is increased by approx. 0.5m³/h.



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	ø4.5
Weld-on	500	ø45					

Safe production – non intrusive cleaning equipment

Alfa Laval SSB Retractor – A Retractable Targeted Static Spray Ball

Applications

The SSB Retractor is used for cleaning different types of installations from simple tanks and duct work, to complex process applications with agitators where built-in dynamic cleaning heads are impractical to use. Storage tanks, reactors, mixers and spray dryers etc. including surrounding duct work and vent lines are cleaned by SSB Retractor units. The SSB Retractor is widely used in applications within the biopharma, cosmetic, dairy, food and beverage industries.

Working Principle

The unit can be installed in ducts and small tanks, where the process is disturbed by any internal components including fixed cleaning equipment. Three versions available:

- "Air to Spring" where the extension is activated by pneumatic and retraction is spring-activated
- "Air to Air" where both the extension and the retraction are activated by pneumatic
- Alternatively as "media to spring" operated



TECHNICAL DATA

Flow rate: 2.9 m³/hr at 3 bar
Standard strokes: 60 or 120 mm

Pressure

Cleaning fluid pressure: 2-4 bar
Recommended operating pressure: . . . 3 bar
Control air pressure: 3-4 bar

Standard Design

The units are available with two stroke length: 60 mm or 120 mm. The SSB Retractor is available as standard with all wetted stainless steel components manufactured from AISI 316L. Seals are made from EPDM and PTFE / Viton envelope gaskets; both in compliance with FDA regulation and USP Class VI. As standard documentation, the SSB Retractor can be supplied with "Declaration of Conformity" for material specification or 3.1 certification for metallic parts , as well as ATEX certificate.

The Retractor unit is designed with inlet and cleaner head in a telescopic system, which allows for easy installation and ensures effective self draining. Self cleaning is easily done due to the simple design and minimum wetted surface area. After cleaning it is possible to keep the Retractor extended to purge the cleaning system dry. By targeted drilling of the spray ball, the unit can be customized to improve the cleaning efficiency for specific applications.

PHYSICAL DATA

Materials

Components: Stainless steel 316L
Spring: Stainless steel 301S81
Seals: EPDM, carbon filled PTFE
Gaskets: Carbon filled PTFE
Surface finish: Product contact surface:
Ra = 0.5µm

Temperature

Max. cleaning fluid temp.: 95°C
Max. process temp.: 140°C - standard seals

Connections

Air connections: 1/8" BSP parallel - internal thread fitted as standard, including a push fit connector for 6 mm air tube
Cleaning media connection: . . . Flanged/clamped to 1 1/2" ISO 2852, (DIN 32676 DIN 40)
Vessel mounting: Flanged/clamped to 2", ISO 2852, (DIN 32676 DIN 50)

Options - Materials

Wetted components: Hastelloy - C22
Wetted seals: FFKM (perfluoroelastomer)
Max. process temp.: 180°C - special seals
Connections: Special connections can be made for insulated ducts or tanks.
Proximity sensor: For position indication



Special weld in pads

Weld in pads can be delivered tailor-made to the actual duct / vessel shape and size, ensuring a very smooth and hygienic surface internally.

Blanking plugs

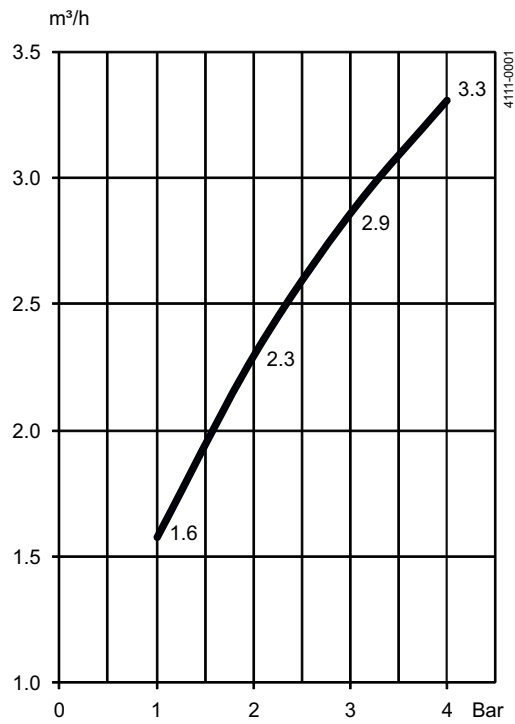
Blanking plugs are used when the unit is taken out for maintenance.

Benefits

- Air operated to allow full draining and purging
- Sealed cleaning house and telescopic air cylinder ensures minimum wetted area and achieves compact length
- Available with different stroke lengths ensuring optimum positioning of the spray ball
- Air cylinder joints fitted with safety clamps
- Air closing versions ensures no leakage in closed position
- Minimum consumption of cleaning media and energy.

The Static Spray Ball Retractor (SSB Retractor) is a pneumatically operated retractable and targeted spray ball that is non-intrusive during production. It is designed in accordance to best practice in order to achieve fast and effective cleaning of equipment used in the production process, especially where access is difficult or where intrusive cleaning equipment interferes with production.

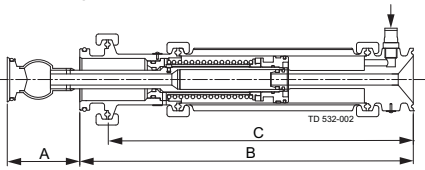
Flow rate



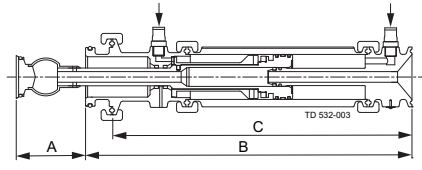
4.1

Dimensions

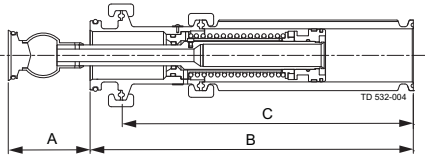
Air-Spring



Air-Air



Media - Spring



	Dimension (mm)		
	A	B	C
21 mm ferrule			
Media/spring	60	231	208
Air/Spring	60	269	246
Air/Air	60	276	253
Media/spring	120	351	328
Air/Spring	120	389	366
Air/Air	120	396	373
98 mm ferrule			
Media/spring	60	308	208
Air/Spring	60	346	246
Air/Air	60	346	246
Media/spring	120	428	328
Air/Spring	120	466	366
Air/Air	120	466	366
218 mm ferrule			
Media/spring	60	428	208
Air/Spring	60	466	246
Air/Air	60	466	246
Media/spring	120	548	328
Air/Spring	120	586	366
Air/Air	120	586	366

Does not interfere with production

Toftejorg SaniMidget Retractor, A Retractable Rotary Spray Head

Application

The Toftejorg SaniMidget Retractor is installed where fully automated and validated cleaning can assure higher productivity due to less cleaning time in e.g. spray drying applications within the food, ingredients and pharmaceutical industry. Larger ducts, channels, cyclones, chambers, complexed reactors, vent lines etc. can therefore be cleaned to the highest standards with no manual or semi automated interference, and avoiding any product carry over or hazardous incidents.

Working principle

The Toftejorg SaniMidget Retractor is available with two styles of retracting mechanisms: Pneumatic Driven, which uses air pressure to extend and retract the cleaning head, and Media Driven, which uses the pressure of the cleaning media to extend the cleaning head and an integrated spring to retract it. This creates a fan of fluid in a swirling pattern. The distribution pattern of the cleaner head generates a vibrating impact as well as cascading flow coverage of all internal surfaces of the tank.



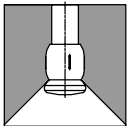
TECHNICAL DATA

- Lubricant: Self-lubricating with the cleaning media
- Wetting radius: Max. 3.5 m
- Impact cleaning radius: Max. effective 1.7 m
- Air quality: Clean, filtered max. 40µm
Dry, dew point max. 10°
- Installation: Please contact Alfa Laval for installation of the tank cleaning machine

Pressure

- Working pressure: 2-5 bar
- Recommended pressure: 3 bar
- Air supply pressure: 2-5 bar

Spray Pattern



270° up

Standard Design

The Toftejorg SaniMidget Retractor is available in three stroke lengths: 100 mm, 150 mm and 250 mm, in either pneumatic- or media-driven versions.

Certificates

2.2 or 3.1 material certificate or ATEX.

PHYSICAL DATA

Materials

- Product area: 316L (UNS S31603), PEEK*
- Non-product area: 304 (UNS S30400), POM
- Sealing: EPDM*

* FDA compliance 21CFR§177

- Surface finish: Product contact surfaces:
Ra 0.8µm

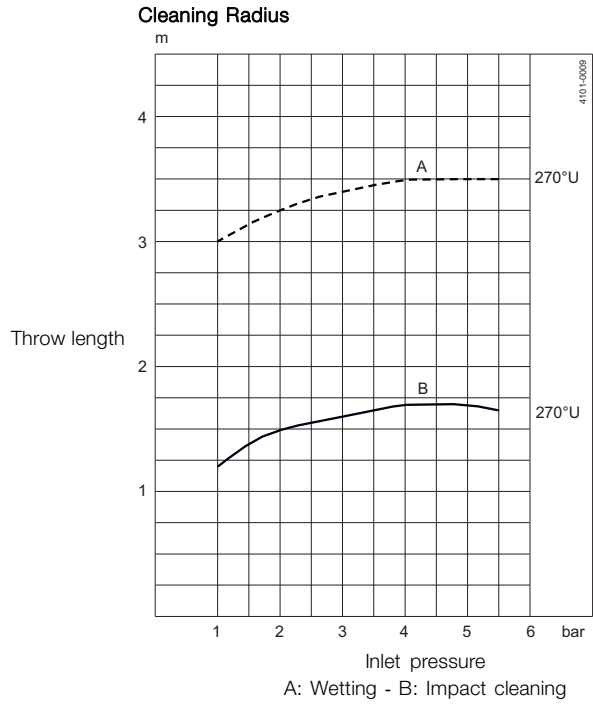
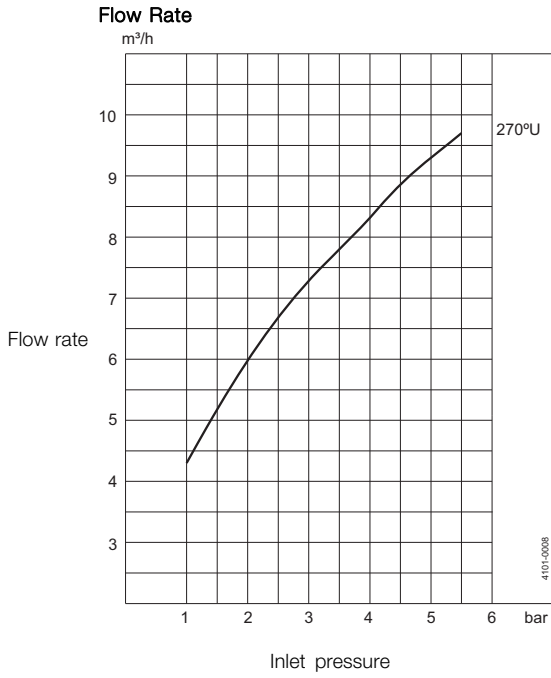
- Standard Surface finish: Product contact parts Ra 0.8µm - Non product contact parts Ra 1.6µm

Temperature

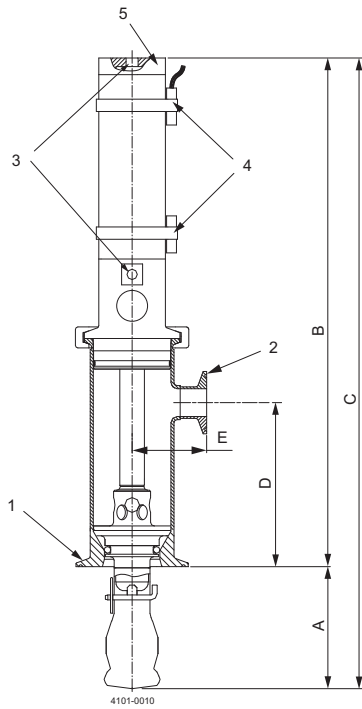
- Max. working temperature: . . . 95°C
- Max. ambient temperature: . . . 150°C

Weight: See reverse page





Dimensions (mm)



Pneumatic version

Dimensions (mm)						
Stroke	A	B	C	D	E	Weight
100	100	410	510	133	58.5	5.0 kg
150	150	510	660	183	58.5	5.5 kg
250	250	710	960	283	58.5	6.4 kg

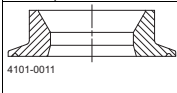
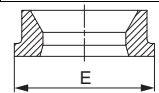
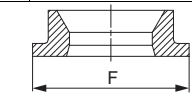
Connections

1. **Tank connections**
2. **Cleaning media**
1" Clamp ISO 2852
3. **Air supply - pneumatic driven only**
ISO 228-G 1/8
4. **Option**
Magnetic sensor
5. **Adjustable valve - media driven only**

Media driven

Dimensions (mm)

Stroke	A	B	C	D	E	F	Weight
100	100	491	591	133	ø76.1	ø85	5.6 kg
150	150	621	771	183	ø76.1	ø85	6.3 kg
250	250	869	1119	283	ø76.1	ø85	7.4 kg

Tank Connection		
Clamp	Welded	Welded
		
3" Clamp ISO 2852	3" ISO 2037/US	DN80 DIN 11.850

Options

- A. Hastelloy C22 in product contact part
- B. Alternative sealing component material, FPM*, FFKM*
- C. Positioning sensors, which generate digital signals at the fully retracted or fully extended positions
- D. 3.1. certificate for metallic parts available upon request

* FDA compliance 21CFR§177

Sanitary, Low-Flow Cleaning

Toftejorg SaniMagnum Rotary Spray Head

Application

The Toftejorg SaniMagnum is an efficient replacement for traditional static spray balls as it uses low volumes of liquid at low pressure. The device, particularly well-suited to sanitary applications, can be used in tanks ranging from 5 m³ to 50 m³.

Working principle

The flow of the cleaning media causes the head of the Toftejorg SaniMagnum to rotate, with fan jets 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.



TECHNICAL DATA

Lubricant: Self-lubricating with the cleaning fluid
 Wetting radius: Max. 3 m
 Impact cleaning radius: Max. effective 2 m

Pressure

Working pressure: 1-3 bar
 Recommended pressure: 2 bar

Spray Pattern



360°/360° Low Flow



270° up/270°
up Low Flow



180° down

Standard Design

As standard documentation, the Toftejorg SaniMagnum can be supplied with a "Declaration of Conformity" for material specifications or 3.1 certification for metallic parts. Conformity of Declaration ATEX directive 94/9/EC available on request. The device is available in hastelloy C22 (balls in hastelloy C276) with 3.1 certification for metallic parts. ATEX approved, Category 1 for installation in zone 0/20.

Certificates

2.2 material certificate, Q-doc, Q-doc incl. FAT & SAT and ATEX.

PHYSICAL DATA

Materials

Inlet connections: 316L (UNS S31603)
 Bearing race parts: Duplex steel (UNS N31803)
 Balls: 316L (UNS S31603) /PTFE*
 Head: 316L (UNS S31603)
 * FDA compliance 21CFR§177
 Standard Surface finish: Ra 0.8µm exterior / Ra 0.8µm internal
 Improved Surface finish: Ra 0.5µm exterior / Ra 0.5µm internal + Electro polished

Temperature

Max. working temperature: 95°C
 Max. ambient temperature: 140°C

Weight

Thread and clip-on: 0.76 kg
 On pipe: 0.97/1.52 kg

Connections

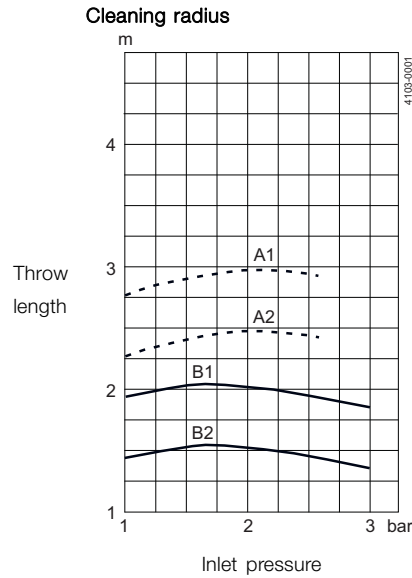
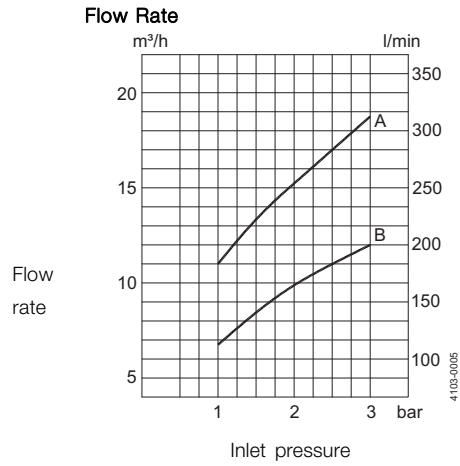
- Thread: 1 1/4" or 1 1/2" of Rp (BSP) or NPT
- Weld-on: 1 1/2" or 2" of ISO 2037, or DN40 DIN11850-R2, or 1 1/2" or 2" of BPE US
- Clip-on: 1 1/2" or 2" of ISO 2037, or DN40 DIN11850-R1 or R2, or 1 1/2" or 2" of BPE US



Qualification Documentation (Q-doc)

Designed for the BioPharm and Personal Care industry for qualification of hygienic Tank Cleaning Machines. 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; QC Declaration of Conformity; SAT (Site Acceptance Test Protocol incl. IQ & OQ) for End-User Execution.

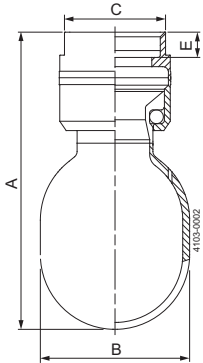


- A: 360°/270° UP
- B: 360° LowFlow/270°UP
LowFlow/180° Down
- A1 360°/270° UP Wetting
180° Down
- A2 270° UP LowFlow Wetting
360° LowFlow
- B1 360°/270° UP Impact
180° Down cleaning
- B2 270° UP LowFlow Impact
360° LowFlow cleaning

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

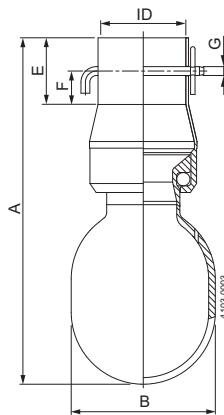
Dimensions (mm)

Thread



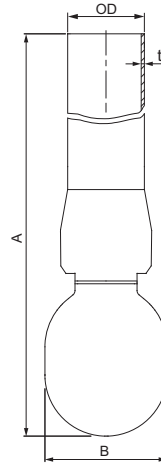
- TH**
- 1 1/4" (BSP)
 - 1 1/4" NPT
 - 1 1/2" (BSP)
 - 1 1/2" NPT

Clip-on



- ID**
- ID 1: 1 1/2" ø38.4 mm
 - ID 2: 2" ø51.3 mm
 - DIN Range 1 ø40.4 mm
 - DIN Range 2 ø41.4 mm

Weld-on



- OD x t**
- ISO ø38 x 1.2 mm
 - BPE US ø38.1 x 1.65 mm
 - BPE US ø50.8 x 1.65 mm
 - DIN Range 1 ø40 x 1 mm
 - DIN Range 2 ø41 x 1.5 mm

Type	A	B	C	E	F	G
Tread	130	ø65	44	10		
Clip-on	157	ø65		30	15	ø4
Weld-on	157, 500, 1000	ø65				

Sanitary, Low-Flow Cleaning that meet 3-A standards

Toftejorg SaniMagnum SB Rotary Spray Head

Application

The Alfa Laval Toftejorg SaniMagnum SB Rotary Spray Head is designed with respect to Self-Cleaning, Self-Draining and Inspectability. Its novel patented One-clip assembly offers easy installation, disassembly and inspection without compromising cleanability and drainability. The Toftejorg SaniMagnum SB is an efficient replacement for the traditional Static Spray Ball as it offers liquid impact on the entire tank wall that lies within the spray pattern – a 270°U or a 360° pattern; both at a lower flow rate at equally low pressure.

Working principle

The flow of cleaning media causes the head of the Toftejorg SaniMagnum SB to rotate on a liquid film (Slide Bearing), with fans of water laid out in a swirling pattern on the entire perimeter within the spray pattern. This generates a vibrating impact in the impact zone and a dynamic cascading flow that covers all internal surfaces of the tank, vessel or reactor. The Self-Cleaning feature is due to the unique design that includes cleaning of the down pipe.



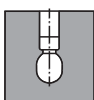
TECHNICAL DATA

Lubricant: Lubrication by rinse/cleaning fluid
 Wetting radius: Max. 4.5 m
 Impact cleaning radius: Max. 2.4 m
 Steam or gas (air): Not supported – contact AL

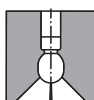
Pressure

Working pressure: 1-3 bar
 Recommended pressure: 2 bar

Spray Pattern



360°



270°

Standard Design

The Toftejorg SaniMagnum SB can be supplied with 3.1 Certificates for metallic parts and 3-A Conformity* on its plastic part.

*Implies that the material complies with FDA 21CFR.

Sizing/selection and installation drawing are available. Contact Alfa Laval for recommendations.

Certificates

2.2 Material Certificate included, 3.1 Material Certification as add-on.

PHYSICAL DATA

Materials

Metalic parts: 316L
 Non-metallic parts: PEEK 450G
 Standard Surface finish: Ra 0.8 µm

Temperature

Max. working temperature: 95°C
 Max. ambient temperature: 150°C

Weight: 0.4 kg

Connections

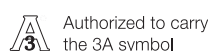
Clip-on: 1½" BPE US, 1½" ISO 2037
 Weld-on: 2" BPE US*

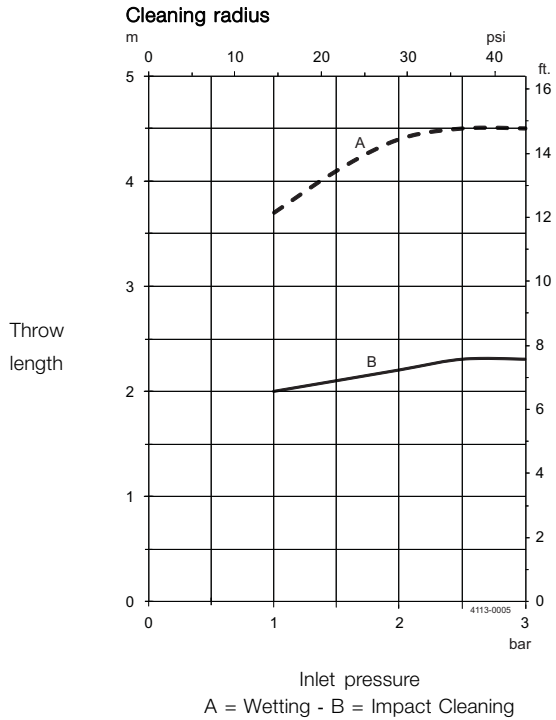
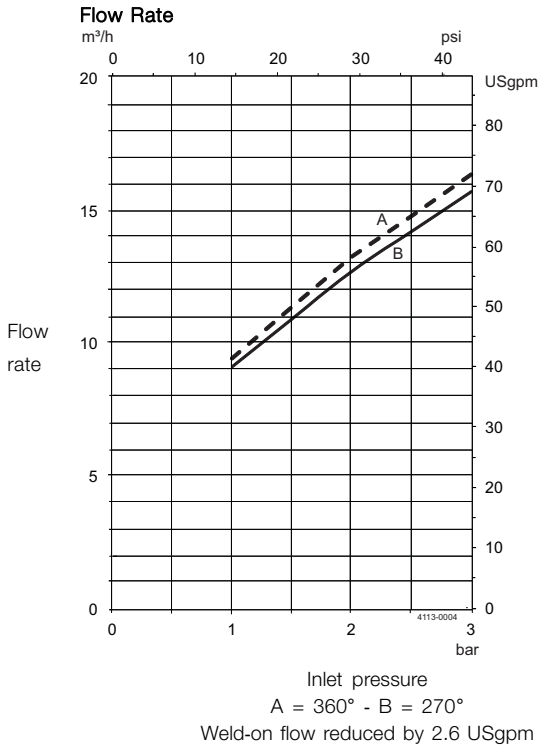
Clip

Easy-on/off clip (ø4.0 mm)

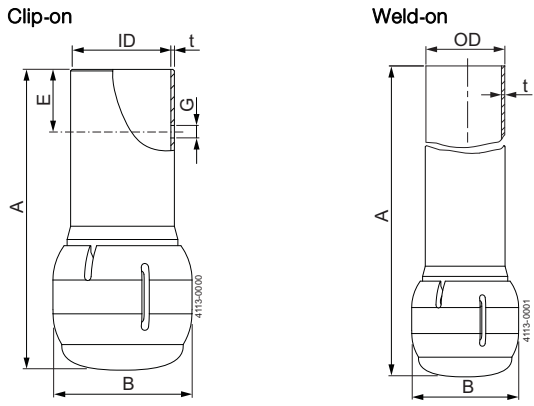
Clip needed for both clip-on and weld-on versions to assemble the machine.

Recommended tank size: 23-68 m³





Note: The inlet pressure has been taken 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 in consideration and the water temperature during testing was approx. 20°C.



Dimensions (mm)

Type	A	B	E	G	ID	OD	t	Clip
Clip-on	118.3	54.7	25.4	ø4.1	ø 38.4			ø4.0
Weld-on**	N/A	54.7				ø38.1	1.2	

** Weld-on version only meets the requirements of the 3-A Sanitary Standard 78-01 if installed according to the user manual.

Low Flow Saves on Water and Chemicals

Toftejorg MultiMagnum Rotary Spray Head

Application

The Toftejorg MultiMagnum is a rotary spray head that uses cleaning media to provide coverage and impact. The device represents an effective alternative to traditional static spray balls because it uses low volumes of cleaning fluid at low pressure. The double ball bearing in the Toftejorg MultiMagnum's rotating head makes the device suitable for all industrial cleaning applications, including tanks, reactors, vessels and other containers ranging from 5 m³ to 50 m³, depending on dimensions and cleaning task.

Working principle

The flow of the cleaning media causes the head of the Toftejorg MultiMagnum to rotate, and the fan-shaped jets lay out a swirling pattern throughout the tank or reactor. This generates the impact needed for the efficient removal of residual product; the cascading flow covers all internal surfaces of the vessel. The MultiMagnum are designed to be installed in any given angle.



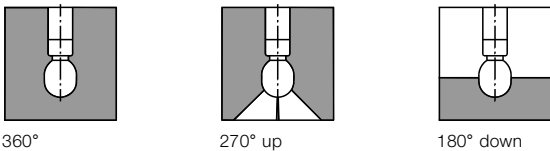
TECHNICAL DATA

Lubricant: Self-lubricating with the cleaning fluid
 Wetting radius: Max. 3 m
 Impact cleaning radius: Max. effective 2 m

Pressure

Working pressure: 1-3 bar
 Recommended pressure: 2 bar

Spray Pattern



Standard Design

As standard documentation, the Toftejorg MultiMagnum can be supplied with a "Declaration of Conformity" for material specifications.

Certificates

2.1 material certificate.

PHYSICAL DATA

Materials

Inlet connections: 316 (UNS S31600)
 Bearing race parts: Duplex steel (UNS N31803)
 Balls: 316 (UNS S31600)
 Head: 316L (UNS S31603)

Standard Surface finish: Ra 0.8µm exterior / Ra 0.8µm internal

Temperature

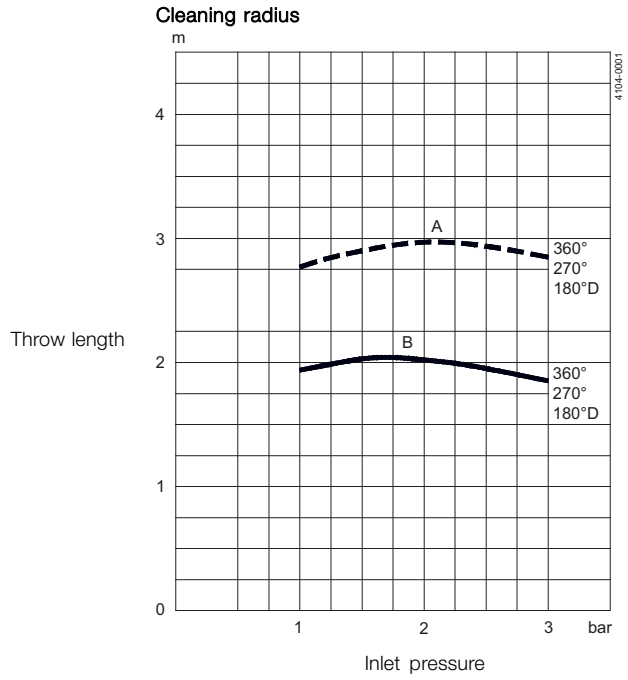
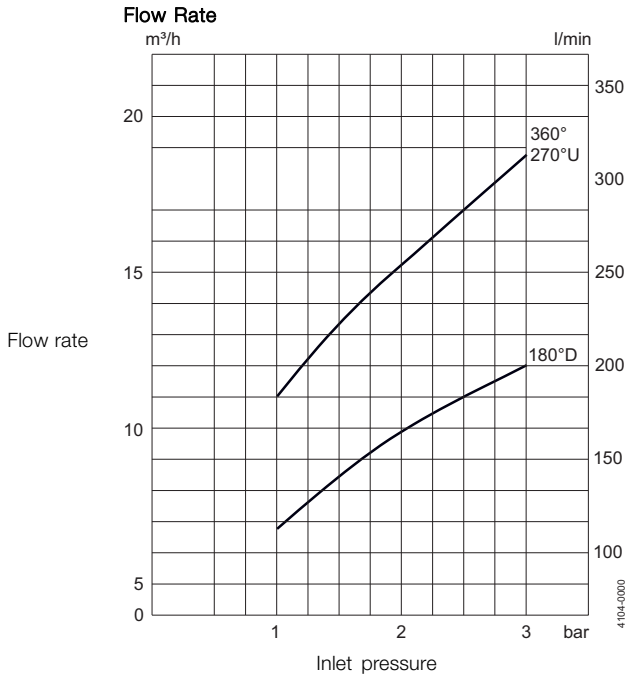
Max. working temperature: 95°C
 Max. ambient temperature: 140°C

Weight

Thread: 0.90 kg
 On pipe: 2.5 kg

Connections

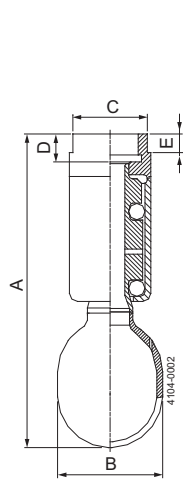
- Thread: 1 1/4" of Rp (BSP) or NPT
- Weld-on: 1 1/2" ISO 2037 or DN40 DIN11850-R2



A: Wetting - B: Impact cleaning
 For clip-on models, the flow rate is increased by approx 1.5 m³/h

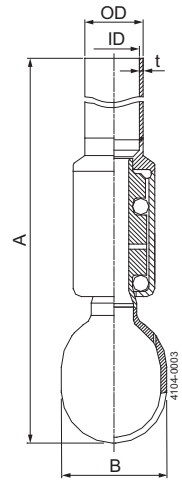
Dimensions (mm)

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			

Fast, Sanitary Cleaning

Toftejorg SaniMega Rotary Spray Head

Application

The Toftejorg SaniMega rotary spray head provides a controlled rotating fan impact cleaning action. It is an automatic device with an optimised design for effective distribution of cleaning media. The Toftejorg SaniMega is suitable in processing and storage tanks ranging from 50 to 350 m³. It is particularly suited to vertical storage tanks in the food, brewing and other beverage industries where a scrubbing effect is needed to clean at the fill level.

Working principle

The flow of the cleaning media causes the gear unit to rotate the body of the cleaning head. The resulting fan impact jet provides a swirling action down the tank wall.



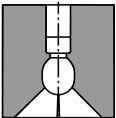
TECHNICAL DATA

Lubricant: Self-lubricating with the cleaning fluid
 Effective cleaning radius: 3 m

Pressure

Working pressure: 2-4 bar
 Recommended pressure: 3 bar

Spray Pattern



270° up

Standard Design

Downpipe length 1,200 mm. Inlet connection as welding end 2" ISO (ø2 x 0.05 inch). Tank inlet as DIN Union DN100. As standard documentation, the Toftejorg SaniMega can be supplied with a "Declaration of Conformity" for material specifications.

Certificates

2.1 material certificate.

PHYSICAL DATA

Materials

316L (UNS S31603), PEEK, EPDM
 Standard connection: Inlet: 2" ISO clamp
 Tank: 3" ISO clamp
 Standard downpipe length: 1,200 mm
 Min. tank opening: ø72.5 mm
 Standard Surface finish: Product contact parts Ra
 0.8µm - Non product contact parts Ra 1.6µm

Temperature

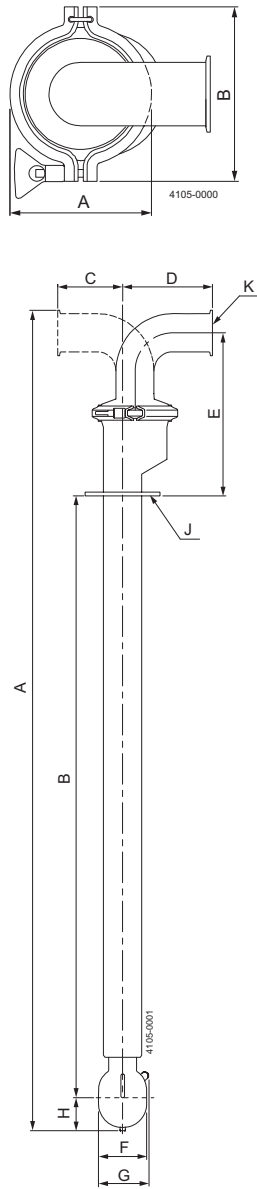
Max. working temperature: 95°C
 Max. sterilisation temperature: 140°C
 Max. ambient temperature: 140°C

Weight: 6 kg

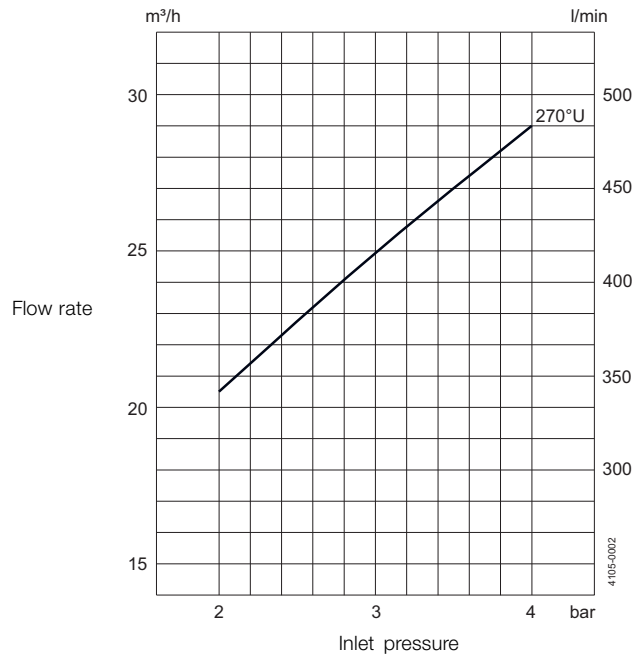
Options

- A. Rotation sensor
- B. Counter parts to the standard clamp connections, including gaskets and clamp rings

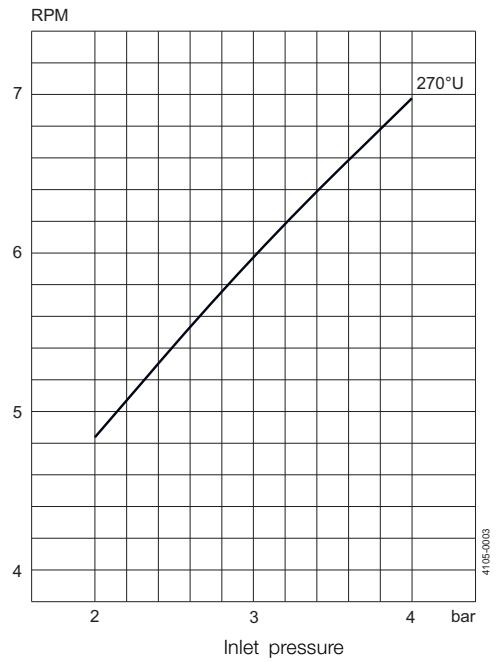
Dimensions (mm)



Flow Rate



Rotating speed



A	B	C	D	E	F	G	H	J	K
116	144								
1505	1200	86.5*	120.5*	220**	∅65	∅72	53	76.2	50.8

* For welding end: 65/99 mm

** For DIN DN100: 234 mm

Sanitary, Low-Flow Cleaning that meets 3-A standards

Toftejorg SaniMega SB Rotary Spray Head

Application

The Alfa Laval Toftejorg SaniMega SB Rotary Spray Head is designed with respect to Self-Cleaning, Self-Draining and Inspectability. Its novel patented One-clip assembly offers easy installation, disassembly and inspection without compromising cleanability and drainability. The Toftejorg SaniMega SB is an efficient replacement for the traditional Static Spray Ball as it offers liquid impact on the entire tank wall that lies within the spray pattern – a 270°U or a 360° pattern; both at a lower flow rate at equally low pressure.

Working principle

The flow of cleaning media causes the spray head of the Toftejorg SaniMega SB to rotate on a liquid film (Slide Bearing), with fans of water laid out in a swirling pattern on the entire perimeter within the spray pattern. This generates a vibrating impact in the impact zone and a dynamic cascading flow that covers all internal surfaces of the tank, vessel or reactor. The Self-Cleaning feature is due to the unique design that includes cleaning of the down pipe.



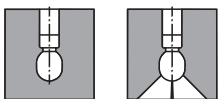
TECHNICAL DATA

Lubricant: Lubrication by rinse/cleaning fluid
 Wetting radius Max. 5.7 m
 Impact cleaning radius: Max. 2.7 m
 Steam or gas (air): Not supported – contact AL

Pressure

Working pressure: 1-4 bar
 Recommended pressure: 3 bar

Spray Pattern



Standard Design

The Toftejorg SaniMega SB can be supplied with 3.1 Certificates for metallic parts and 3-A Conformity* on its plastic part.
 *Implies that the material complies with FDA 21CFR.

Sizing/selection and installation drawing are available. Contact Alfa Laval for recommendations.

Certificates

2.2 Material Certificate included, 3.1 Material Certification as add-on.

PHYSICAL DATA

Materials

Metallic parts: AISI 316L
 Non-metallic parts: PEEK 450G
 Standard Surface finish: Ra 0.8µm

Temperature

Max. working temperature: 95°C
 Max. ambient temperature: 150°C

Weight: 0.61 kg

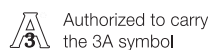
Connections

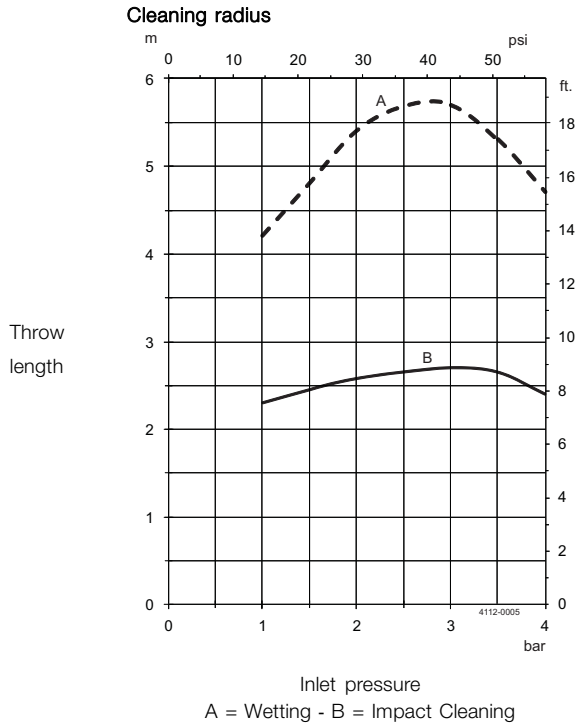
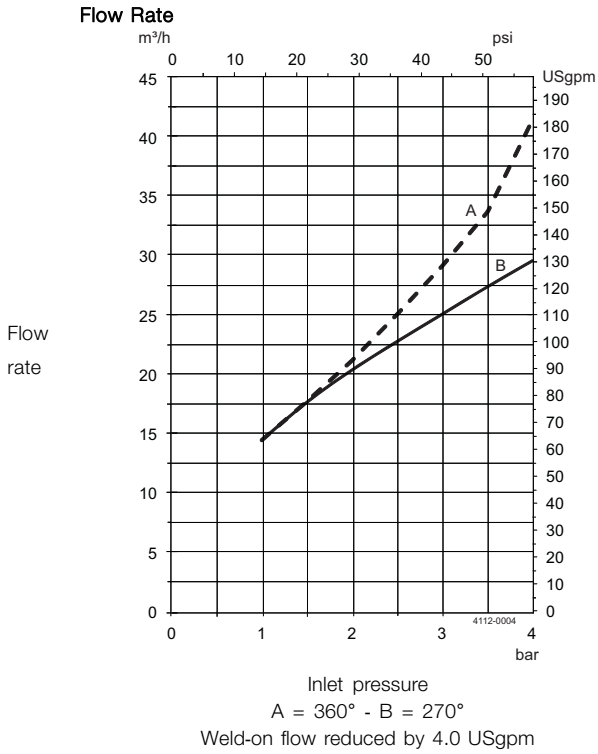
Clip-on: 2" BPE US
 Weld-on: 2" BPE US*

Clip

Easy-on/off clip (ø5.0 mm)
 Clip needed for both clip-on and weld-on versions to assemble the machine.

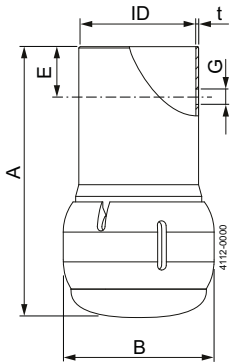
Recommended tank size: 68-227 m³



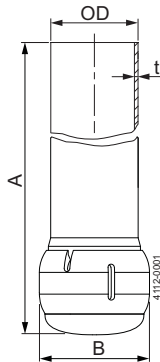


Note: The inlet pressure has been taken immediately before the inlet to the machine. In order to achieve the performance indicated on the curves, the pressure drop in the supply lines between pump and machine must be taken in consideration and the water temperature during testing was approx. 20°C.

Clip-on



Weld-on



Dimensions (mm)

Type	A	B	G	E	ID	OD	t	Clip
Clip-on 2" BPE US	121	ø67.4	ø5.1	25.4	ø51.1			ø5.0
Weld-on** 2" BPE US	N/A	ø67.4				ø50.8	1.2	

** Weld-on version only meets the requirements of the 3-A Sanitary Standard 78-01 if installed according to the user manual.

Low Flow Impact Cleaning

Toftejorg TZ-89 Rotary Jet Head

Application

The Toftejorg TZ-89 rotary jet head provides 3D indexed low flow impact cleaning over a defined time period. It is suitable for processing, storage and transportation tanks and vessels between 0.5 and 50 m3 within e.g. the food, ingredient, health care and pharmaceutical industry.

Working principle

The flow of the cleaning fluid makes the nozzles perform a geared rotation around the vertical and horizontal axes. In the first cycle, the nozzles lay out a coarse pattern on the tank surface. The subsequent cycles gradually make the pattern more dense, until a full pattern is reached after 8 cycles. The drive mechanism is located outside the tank or process equipment, leaving a minimum of parts to be submerged into the product. All product contact surfaces are 1.4404 (316L) stainless steel.



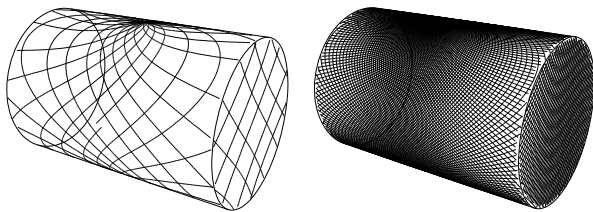
TECHNICAL DATA

Lubricant: Self-lubricating with the cleaning fluid
 Standard Surface finish: Product contact parts Ra 0.8µm
 Max throw length: 4-7 m
 Impact throw length: 2.5-4 m

Pressure

Working pressure: 2-7 bar
 Recommended pressure: 5-6.5 bar

Cleaning Pattern



First cycle

Full pattern

The above drawings show the cleaning pattern achieved on a cylindrical horizontal vessel. The difference between the first cycle and the full pattern represents the number of additional cycles available to increase the density of the cleaning.

Certificates

2.1 material certificate

PHYSICAL DATA

Materials

316L (UNS S61603), Duplex steel (UNS N31803), PTFE, PEEK, FEP/Silicone

Temperature

Max. working temperature: 95°C
 Max. ambient temperature: 140°C

Weight: 5.5 - 8.5 kg

Connections

Inlet connections: Thread: 3/4" Rp (BSP) or NPT, male
 Clamp: 1" ISO 2852
 Tank connection: Flange: 50 ND6 DIN 2501, or 3" ANSI B 16.5
 Clamp: 3" ISO 2852

Options

Electronic rotation sensor to verify 3D coverage.