

4.3 Tank Agitators and Mixers

For mixing or stirring your products.



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Levitated Magnetic Mixer

Alfa Laval MM UltraPure, Magnetic Mixer

Application

Alfa Laval magnetic mixers offer effective mixing for applications with high demands on hygienic and aseptic design.

Working principle

The patented levitated bearing makes the mixer fully drainable and able to run dry without wear or particle generation. The performance ranges from low shear mixing at around 10 rpm to high intensity mixing with vortex at up to 600 rpm. For mixing tasks the range covers from 30 liters to 25000 liters of nominal batch size.

Standard design

The Alfa Laval MM UltraPure mixer consists of a weld plate and a mixer unit incl. gear drive. The weld plate is ordered and delivered separately to enable early preparation of the mixer installation. The mixer must be controlled by a VFD unit matched perfectly with the mixer as available in the ordering leaflet. The VFD is pre-programmed for optimum performance.



TECHNICAL DATA

Product wetted surface finish: Ra <0.5 µm Mech. polish
 Option: Ra <0.5 µm and Electro polished
 Working pressure: -1 to 7 bar (g)

Voltage and frequency

AC motors: 3x205/355V, 50Hz
 AC VFD: 240/120 V, 48-62Hz

Protection class

AC motors: IP66
 AC VFD stand alone: IP66
 AC VFD enclosure unit: IP20

Motor sizes

MM 338-4/6: 0.37 kW
 MM 434-8/10/12: 1.1 kW

Certificates

Standard delivery includes:

- 3.1 Materials Certificates, EN10204 for all product wetted parts
- USP Class VI <88> certificates for Zirconia YTZP and ISOLAST 9501
- FDA Declaration of conformity for elastomers and ceramics
- USDA-H1 conformity statement (FDA) for gear drive oil
- TSE declaration (Transmissible Spongiform Encephalopathy) / ADI declaration (Animal Derived Ingredients)
- USP Class VI <88> certificates on request for Silicon Carbide parts

PHYSICAL DATA

Materials

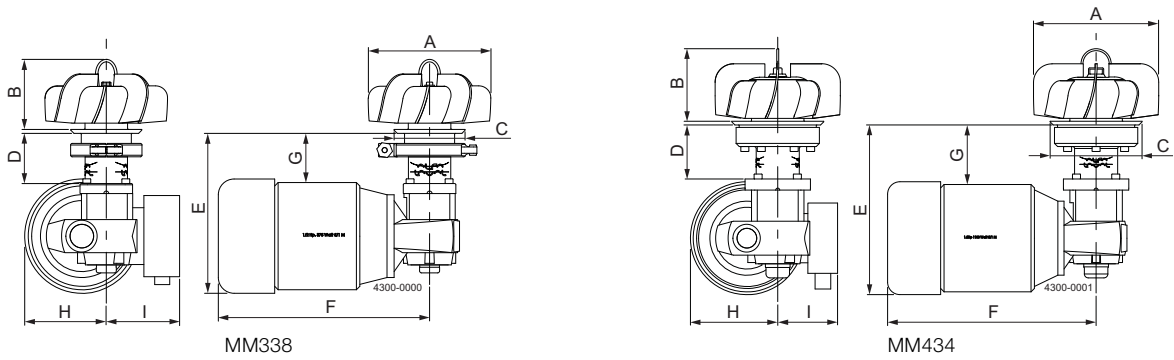
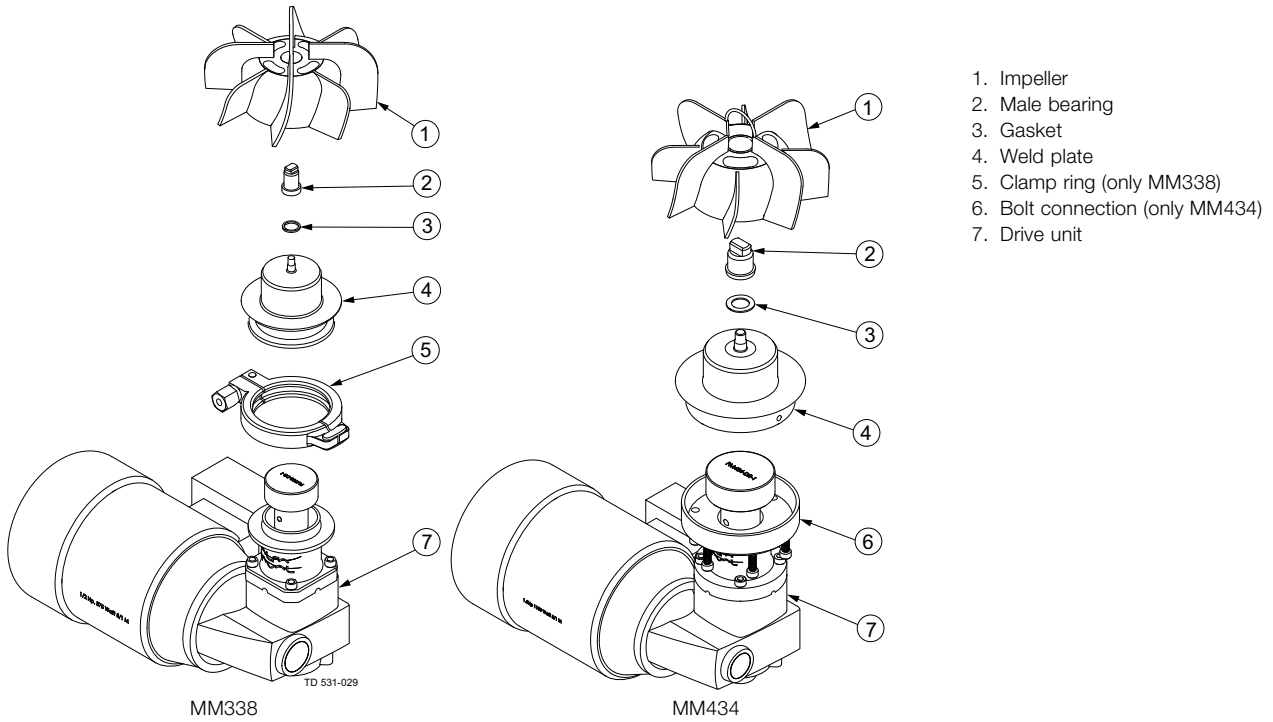
Impeller and Weld Plate: AISI 316L (UNS S31603)
 Drive rotor and distance piece: AISI 316L (UNS S31603)
 Motor and Gearbox: ANSI / NSF 51 compliant paint
 Male Bearing: Zirconia YTZP
 Male Bearing Gasket: ISOLAST 9501 (Perfluoro Elastomer)
 Female Bearing: Silicone Carbide
 Gearbox oil: USDA-H1

Temperature

Product mixing (10 – 600 rpm): max. 90°C
 CIP (max 50 rpm): max. 95°C
 SIP (0 rpm): max. 150°C

Weight

MM 338: 12 kg
 MM 434: 30 kg

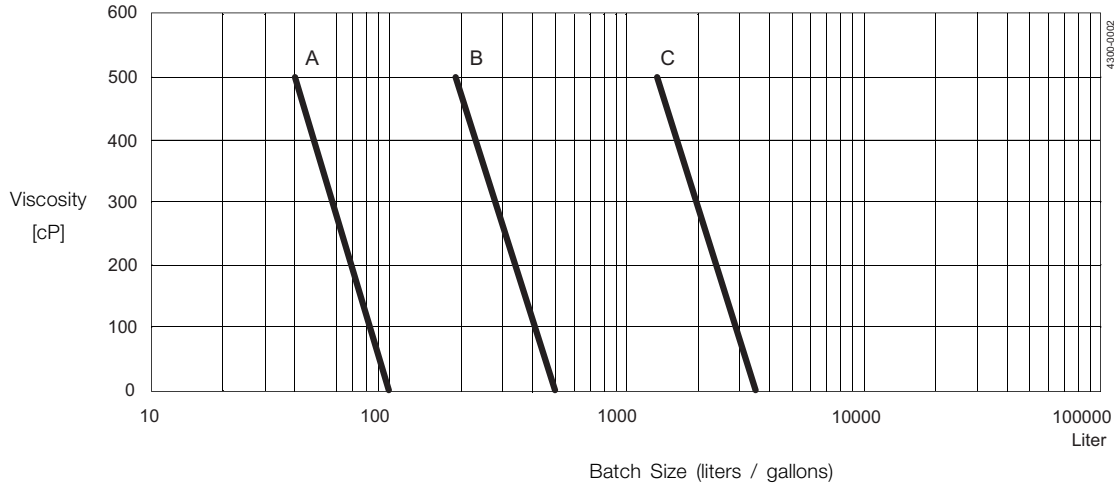


Dimensions (mm)	MM 338-4	MM 338-6	MM 434-8	MM 434-10	MM 434-12
A	102	155	203	254	305
B	89	89	118	183	183
C	90	90	149	149	149
D	64	64	88	88	88
E	203	203	275.1	275.1	275.1
F	268	268	338	338	338
G	62.5	62.5	96.6	96.6	96.6
H	103.5	103.5	141.5	141.5	141.5
I	93	93	97	97	97

Machine Selection

This chart is valid for machine selection under the following conditions:

- Liquid / liquid mixing
- Mixture viscosity less than 500 cP
- Tank height to diameter ratio (h/d) between 1 and 1.5



*Gentle product treatment
 ** Very gentle product treatment

A	B	C
MM 338-4 600 RPM	MM 338-6 550 RPM	MM 434-12 125 RPM
		MM 434-10 185 RPM
		MM 434-8 390 RPM



Efficient Mixing and Agitation

Side mounted agitators Type ALS

Application

Application	Typical examples
Maintain media homogeneous	Milk storage tanks, cream tanks, mixed product tanks, UHT product storage tanks, etc.
Mixing and Solutions (dissolves)	Fluid and fluid mixing, i.e. drinking yoghurt and fruit mix tanks, flavoured milk mix tanks, syrup mix tanks, etc.
Solid Dispersion	Powder protein + oil mix tanks, micro salt + milk product mix tanks, etc.
Suspension	Fluids with particles, i.e. juice tanks, crystallising tanks etc.
Heat transmission	Circulation of media in tanks with dimple jacket (cooling or heating)
Dairy Fermentation (break coagula + mixing)	Yoghurt tanks, cheese culture tanks, crème fraîche, etc.



TECHNICAL DATA

Motor

Motor size and speed as required for duty.
As standard with IEC motor IP55, other types on request. As standard painted RAL5010.

Voltage and frequency

As standard for 3x380 to 420V, 50Hz - 3x440V to 480V, 60Hz
All motor voltages and frequencies are available.

Gears

Different gear types available according to configuration.
As standard filled with normal synthetic or mineral oil, optional: Food approved oil. As standard painted RAL5010.

Ordering

The following information is required to ensure correct sizing and configuration for ordering:

- Tank geometry
- Product properties
- Task of agitator
- Enquiry forms are available

PHYSICAL DATA

Materials

Available materials:

Steel parts: AISI 316L (standard)
 AISI 304
 AISI 904L
 SAF 2205
 Other materials on request.

Seal rubber parts

(O-rings or bellows): EPDM
 FPM/FEP (only for stationary o-rings)
 FPM
 Other materials on request.

Mechanical seal parts:

Carbon
 Carbon (FDA)
 Silicon carbide

Certificates

3.1 Material certificates/FDA conformity statement according to 21 CFR177 on steel/elastomer parts in contact with media

Dimensions

Propeller standard diameter range: \varnothing 125 mm to 1900 mm. Specific dimensions on the drive unit and propeller(s) will depend on the actual configuration selected.



Standard design

The Alfa Laval range of side mounted propeller agitators is designed to meet almost every customer requirement. Due to their modular build, the agitators can be designed for every kind of application within the sanitary industry. The modular construction is designed with the aim to meet both European and American standards and regulations, such as EHEDG, USDA, FDA, 3A etc.

Configurable design

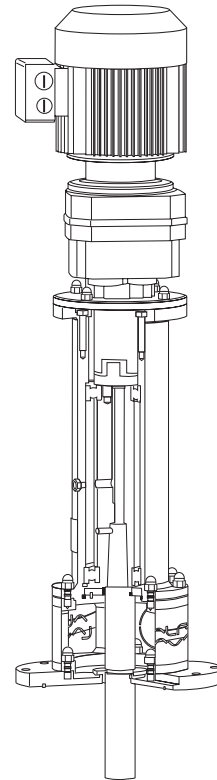
Type ALS agitator design is fully configurable divided in the following elements:

- Drives (drive + shaft support + shaft diameter)
- Seal arrangements (oil trap + shaft seal type)
- Shaft (length)
- Energy Saving Foils (propeller type + surface finish)
- Options

Each element has a broad range of different characteristics which makes it possible to size the agitator for all applications and requirements.

Advantageous and profitable design

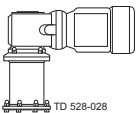
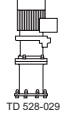
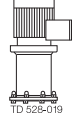
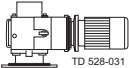
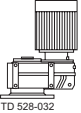

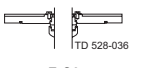
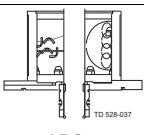
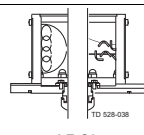
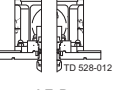
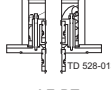
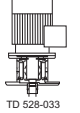


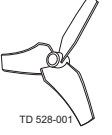




Each configuration offers a number of advantages, which are shown in the examples below:



Operation features	Due to
Low energy consumption	the wide range of high efficiency propellers and drive units makes it possible to design for low operational costs
Gentle product treatment	the wide range of high efficiency propellers makes it possible to design for low shear operation

Sanitary features	Due to
Easy external cleaning	stainless steel bearing frame design with O-ring seal (for wash down)
Connections inside the tank (risk zones) can be avoided	bearing frame drives with drive shaft and special internal shaft connection without having a flange coupling inside the tank
Good drip off properties	no plane surfaces or grooves on internal parts
Easy cleaning	no interior shadow sides between the blades and smooth surfaces

Maintenance features	Due to
All service (replacement of wear parts such as shaft seals, bearings etc.) can be done from outside of the tank	bearing frame drives with detachable shaft which can be dismantled from outside of the tank
Easy dismantling	use of spider type coupling and stainless steel parts (no corrosion)

Type ALS	Configuration						Side mounted agitators
<p>Drives</p> <p>Bearing frame size = xx Shaft diameter = yy (not used if xx = yy)</p> <p>Description (power, speed and shaft diameter depending on application)</p>	 TD 528-028 -ME-GR-Bxx(yy) Stainless steel bearing frame and right angle gearbox	 TD 528-029 -ME-GC-Bxx(yy) Stainless steel bearing frame and coaxial gearbox	 TD 528-019 -ME-Bxx(yy) Stainless steel bearing frame and direct motor drive	 TD 528-031 -ME-GR-yy Right angle gearbox, shaft mounted in hollow shaft of gearbox	 TD 528-032 -ME-GP-yy Parallel shaft gearbox, shaft mounted in hollow shaft of gearbox		
<p>Seal arrangements</p> <p>Description (lower flange and seal material depending on application)</p>	 TD 528-035 F-S1- Seal flange with O-ring seal against tank flange, drain, oil trap (only geared versions) and shaft seal: single mechanical bellow seal	 TD 528-036 F-S2- Seal flange with O-ring seal against tank flange, drain, oil trap (only geared versions) and shaft seal: single mechanical non-bellow seal	 TD 528-037 LF-S1- Lantern (spacer), seal flange with O-ring seal against tank flange, drain, oil trap (only geared versions) and shaft seal: single mechanical bellow seal	 TD 528-038 LF-S2- Lantern (spacer), seal flange with O-ring seal against tank flange, drain, oil trap (only geared versions) and shaft seal: single mechanical non-bellow seal	 TD 528-012 LF-D- Lantern (spacer), seal flange with O-ring seal against tank flange, drain, oil trap and shaft seal: double mechanical seal for high pressure applications and aseptic use	 TD 528-013 LF-DT- Lantern (spacer), seal flange with O-ring seal against tank flange, drain, oil trap and shaft seal: double mechanical seal (tandem) for low pressure applications	 TD 528-033 -ME-yyLF-S1- Direct motor drive, shaft connected directly to motor, lantern (spacer), seal flange with O-ring seal against tank flange, drain and shaft seal: single mechanical bellow seal
<p>Shaft</p> <p>Length = IIII Description (material depending on application)</p>	 TD 528-034 -SIII- SS shaft, length according to application						
<p>Energy Saving Foils</p> <p>Diameter = vv (125 mm to 1900 mm)</p> <p>Description (material depending on application)</p>	 TD 528-001 -PvvvD3P 3 - bladed propeller, finish: polished Standard: Ra < 0.8 µm	 TD 528-001 -PvvvD3PE 3 - bladed propeller, finish: polished and electro polished Standard: Ra < 0.8 µm	 TD 528-001a -PvvvD3G 3 - bladed propeller, finish: shot peened				
<p>Optional</p> <p>Description</p>	 TD 528-005 Welding flange Incl. mounting pin bolts and nuts	 TD 528-006 Blind flange Incl. O-ring seal	 TD 528-007 Cover for Motor / gear motor) Stainless steel cover - comes in different shapes according to drive type	<p>S</p> Spare part kit Standard spare part kit			



Efficient Mixing and Agitation

Top mounted agitators, type ALT

Applications

Application	Typical examples
Maintain Media Homogeneous	Milk storage tanks, cream tanks, mixed product tanks, UHT product storage tanks, etc.
Mixing and Solutions (dissolve)	Fluid and fluid mixing, i.e. drinking yoghurt and fruit mix tanks, flavoured milk mix tanks, syrup mix tanks, etc.
Solid Dispersion	Powder protein + oil mix tanks, micro salt + milk product mix tanks, etc.
Suspension	Fluids with particles, i.e. juice tanks, crystallising tanks etc.
Heat transmission	Circulation of media in tanks with dimple jacket (cooling or heating)
Dairy Fermentation (break coagula + mixing)	Yoghurt tanks, cheese culture tanks, crème fraîche, etc.



TECHNICAL DATA

Motor

Motor size and speed as required for duty.
As standard with IEC motor IP55, other types on request. As standard painted RAL5010.

Voltage and frequency

As standard for 3x380 to 420V, 50Hz - 3x440V to 480V, 60Hz.
All motor voltages and frequencies are available.

Gears

Different gear types available according to configuration.
As standard filled with normal synthetic or mineral oil, optional: Food approved oil. As standard painted RAL5010.

ATEX - option

Agitators can be delivered approved for use in an ATEX environment with declaration of conformity according to directive 94/9/EC.

Ordering

The following information is required to ensure correct sizing and configuration for ordering:

- Tank geometry
- Product properties
- Task of agitator
- Enquiry forms are available

PHYSICAL DATA

Materials

Available materials

Steel parts: AISI 316L (standard)
 AISI 304
 AISI 904L
 SAF 2205
 Other materials on request.

Seal rubber parts

(O-rings or bellows): EPDM
 FPM/FEP (only for stationary o-rings)
 FPM
 Other materials on request.

Mechanical seal parts:

Carbon
 Carbon (FDA)
 Silicon carbide

Material certificate - option

3.1 Material certificates/FDA conformity statement according to 21 CFR177 on steel/elastomer parts in contact with the media

Dimensions

Standard propeller diameter range: \varnothing 125 mm to 1900 mm.
 Specific dimensions on the drive unit and propeller(s) will depend on the actual configuration selected.



Standard design

The Alfa Laval range of top mounted propeller agitators is designed to meet almost every customer requirement. Type ALT agitators are characterized by their free hanging shaft without bottom support. Due to their modular build, the agitators can be designed for every kind of application in sanitary industries. The modular construction is designed with the aim to meet both European and American standards and regulations, such as EHEDG, USDA, FDA, 3A etc. Please note that Alfa Laval also offer other agitator solutions:

- Type ALTB, top mounted agitators with bottom steady bearing
- Type ALS, side mounted agitators
- Type ALB, bottom mounted agitators

For more information please see separate Product Data Sheets.

Advantageous and profitable design

Each configuration offers a number of advantages, which are shown in the examples below:

Operation features	Due to
Low energy consumption	the wide range of high efficiency propellers and drive units makes it possible to design for low operational costs
Gentle product treatment	the wide range of high efficiency propellers makes it possible to design for low shear operation

Sanitary features	Due to
Easy external cleaning	stainless steel bearing frame design with seal O-rings (for wash down)
Connections inside the tank (risk zones) can be avoided	bearing frame drives with drive shaft and special internal shaft connection without having a flange coupling inside the tank
Good drip off properties	no plane surfaces or grooves on internal parts
Easy cleaning	no interior shadow sides between the blades and smooth surfaces

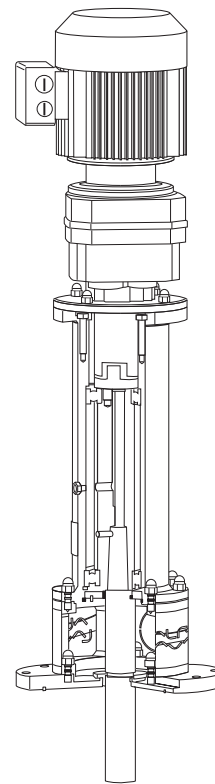
Maintenance features	Due to
All service (replacement of wearing parts such as shaft seals, bearings etc.) can be done from outside the tank	bearing frame drives with detachable shaft which can be dismantled from outside the tank
Easy dismantling	use of spider type coupling and stainless steel parts (no corrosion)

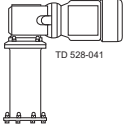
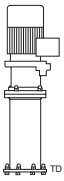
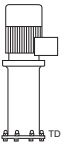
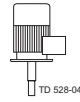
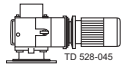
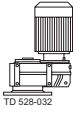

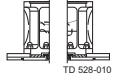
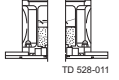
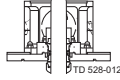
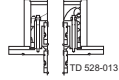




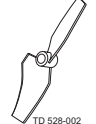
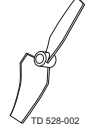
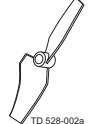



Configurable design

Type ALT agitator design is fully configurable divided in the following elements:

- Drives (drive + shaft support + shaft diameter)
- Seal arrangements (oil trap + shaft seal type)
- Shaft (length)
- Energy Saving Foils (propeller type + surface finish)
- Options

Each element has a broad range of different characteristics which make it possible to size the agitator for all applications and requirements.



Type ALT	Configuration						Top mounted agitators
<p>Drives</p> <p>Bearing frame size = xx Shaft diameter = yy (not used if xx = yy)</p> <p>Description (power, speed and shaft diameter depending on application)</p>	 <p>TD 528-041</p> <p>-ME-GR-Bxx(yy)</p> <p>Stainless steel bearing frame and right angle gearbox (for low head room applications)</p>	 <p>TD 528-042</p> <p>-ME-GC-Bxx(yy)</p> <p>Stainless steel bearing frame and coaxial gearbox</p>	 <p>TD 528-043</p> <p>-ME-Bxx(yy)</p> <p>Stainless steel bearing frame and direct motor drive</p>	 <p>TD 528-044</p> <p>-ME-yy</p> <p>Direct motor drive, shaft connected directly to motor</p>	 <p>TD 528-045</p> <p>-ME-GR-yy -ME-GW-yy</p> <p>Right angle (GR) or worm (GW) gear drive, shaft mounted in hollow shaft of gearbox (for very low head room applications)</p>	 <p>TD 528-032</p> <p>-ME-GP-yy</p> <p>Parallel shaft gearbox, shaft mounted in hollow shaft of gearbox</p>	
<p>Seal arrangements</p> <p>Description (lower flange and seal material depending on application)</p>	 <p>TD 528-009</p> <p>F-R-</p> <p>Seal flange with O-ring seal against tank flange, drain, oil trap (only geared versions) and shaft seal: radial seal for atmospheric tanks</p>	 <p>TD 528-010</p> <p>LF-R-</p> <p>Lantern (spacer), seal flange with O-ring seal against tank flange, drain, oil trap and shaft seal: radial seal for atmospheric tanks</p>	 <p>TD 528-011</p> <p>LF-S-</p> <p>Lantern (spacer), seal flange with O-ring seal against tank flange, drain, oil trap and shaft seal: single mechanical dry running seal for high/low pressure applications</p>	 <p>TD 528-012</p> <p>LF-D-</p> <p>Lantern (spacer), seal flange with O-ring seal against tank flange, drain, oil trap and shaft seal: double mechanical seal for high pressure applications and aseptic use</p>	 <p>TD 528-013</p> <p>LF-DT-</p> <p>Lantern (spacer), seal flange with O-ring seal against tank flange, drain, oil trap and shaft seal: double mechanical seal (tandem) for low pressure applications</p>		
<p>Shaft</p> <p>Length = IIII Description (material depending on application)</p>	 <p>TD 528-009</p> <p>-SIII-</p> <p>SS shaft, length according to application</p>						
<p>Energy Saving Foils</p> <p>Number =n Diameter = vv (125 mm to 1900 mm)</p> <p>Description (material depending on application)</p>	 <p>TD 528-001</p> <p>-nPvvD3P</p> <p>3 - bladed propeller, finish: polished Standard: Ra < 0.8 µm</p>	 <p>TD 528-001</p> <p>-nPvvD3PE</p> <p>3 - bladed propeller, finish: polished and electro polished Standard: Ra < 0.8 µm</p>	 <p>TD 528-001a</p> <p>-nPvvD3G</p> <p>3 - bladed propeller, finish: shot peened</p>	 <p>TD 528-002</p> <p>-nPvvD2P</p> <p>2 - bladed propeller, finish: polished Standard: Ra < 0.8 µm</p>	 <p>TD 528-002</p> <p>-nPvvD2PE</p> <p>2 - bladed propeller, finish: polished and electro polished Standard: Ra < 0.8 µm</p>	 <p>TD 528-002a</p> <p>-nPvvD2G</p> <p>2 - bladed propeller, finish: glass shot peened</p>	
<p>Optional</p> <p>Description</p>	 <p>TD 528-005</p> <p>Welding flange</p> <p>Incl. mounting pin nuts and bolts</p>	 <p>TD 528-006</p> <p>Blind flange</p> <p>Incl. seal O-ring</p>	 <p>TD 528-007</p> <p>Cover for Motor / gear motor</p> <p>Stainless steel cover - comes in different shapes according to drive type</p>	<p>S</p> <p>Spare part kit</p> <p>Standard spare part kit</p>			



Efficient Mixing and Agitation

Top mounted agitators, type ALTB

Applications

Application	Typical examples
Maintain media homogeneous	Milk storage tanks, cream tanks, mixed product tanks, UHT product storage tanks, etc.
Mixing and Solutions (dissolves)	Fluid and fluid mixing, i.e. drinking yoghurt and fruit mix tanks, flavoured milk mix tanks, syrup mix tanks, etc.
Solid Dispersion	Powder protein + oil mix tanks, micro salt + milk product mix tanks, etc.
Suspension	Fluids with particles, i.e. juice tanks, crystallising tanks etc.
Heat transmission	Circulation of media in tanks with dimple jacket (cooling or heating)
Dairy Fermentation (break coagula + mixing)	Yoghurt tanks, cheese culture tanks, crème fraîche, etc.



TECHNICAL DATA

Motor

Motor size and speed as required for duty. As standard with IEC motor IP55, other types on request. As standard painted RAL5010.

Voltage and frequency

As standard for 3x380 to 420V, 50Hz - 3x440V to 480V, 60Hz. All motor voltages and frequencies are available.

Gears

Different gear types available according to configuration.

As standard filled with normal synthetic or mineral oil, optional: Food approved oil. As standard painted RAL5010.

ATEX - option

Agitators can be delivered approved for use in an ATEX environment with declaration of conformity according to directive 94/9/EC.

Ordering

The following information is required to ensure correct sizing and configuration for ordering:

- Tank geometry
- Product properties
- Task of agitator
- Enquiry forms are available

PHYSICAL DESIGN

Materials

Available materials:

Steel parts: AISI 316L (standard)
 AISI 304
 AISI 904L
 SAF 2205
 Other materials on request.

Seal rubber parts

(O-rings or bellows): EPDM
 FPM/FEP (only for stationary o-rings)
 FPM
 Other materials on request.

Mechanical seal parts:

Carbon
 Carbon (FDA)
 Silicon carbide

Wear bushings

(bottom steady bearing): PTFE (BS1P/BS1G)
 PVDF (BS2P)

Material certificate - option

3.1 Material certificates/FDA conformity statement according to 21 CFR177 on steel/elastomer parts in contact with media

Dimensions

Standard propeller diameter range: \varnothing 125 mm to 1900 mm. Specific dimensions on the drive unit and propeller(s) will depend on the actual configuration selected.



Standard design

The Alfa Laval range of top mounted propeller agitators with bottom steady bearing is designed to meet almost every customer requirement. Type ALTB agitators are characterised by having a shaft support inside the tank called a bottom steady bearing. Standard type ALTB agitators are less costly than agitators without internal shaft support. Due to their modular build, the agitators can be designed to suit every kind of application within sanitary industry. The modular construction is designed with the aim to meet both European and American standards and regulations, such as EHEDG, USDA, FDA, 3A etc.

Please note that Alfa Laval also offer other agitator solutions:

- Type ALT, top mounted agitators
- Type ALS, side mounted agitators
- Type ALB, bottom mounted agitators

For more information please see separate Product Data Sheets.

Configurable design

Type ALTB agitator design is fully configurable divided in the following elements:

- Drives (drive + shaft support + shaft diameter)
- Seal arrangements (oil trap + shaft seal type)
- Shaft (length)
- Energy Saving Foils (propeller type + surface finish)
- Bottom steady bearings (type + surface finish)
- Options

Each element has a broad range of different characteristics which make it possible to size the agitator for all applications and requirements. Type ALTB configuration, please see next page.

Advantageous and profitable design

Each configuration offers a number of advantages, which are shown in the examples below:

Operation features	Due to
Low energy consumption	the wide range of high efficiency propellers and drive units makes it possible to design for low operational costs
Gentle product treatment	the wide range of high efficiency propellers makes it possible to design for low shear operation

Sanitary features	Due to
Connections inside the tank (risk zones) can be avoided	propellers can be welded onto the shaft
Good drip off properties	no plane surfaces or grooves on internal parts
Easy cleaning	no interior shadow sides between the blades and smooth surfaces

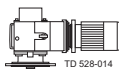
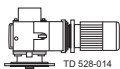
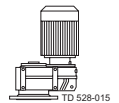

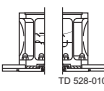
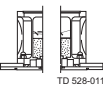
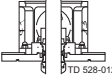
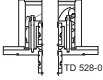




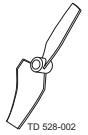
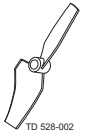







Maintenance features	Due to
Easy bottom bearing replacement	wear bushings can be replaced without dismantling the agitator drive



BS1P



BS2P

Type ALTB	Configuration						Top mounted agitators with bottom steady bearing					
<p>Drives</p> <p>Shaft diameter = yy Description (power, speed and shaft diameter depending on application)</p>	 TD 528-014 <p>-ME-GR-yy Right angle gear drive, shaft mounted in hollow shaft of gearbox (for very low head room applications)</p>	 TD 528-014 <p>-ME-GW-yy Worm gear drive, shaft mounted in hollow shaft of gearbox (for very low head room applications)</p>	 TD 528-015 <p>-ME-GP-yy Parallel shaft gearbox, shaft mounted in hollow shaft of gearbox</p>									
<p>Seal arrangements</p> <p>Description (lower flange and seal material depending on application)</p>	 TD 528-009 <p>F-R- Seal flange with O-ring seal against tank flange, drain, oil trap and shaft seal: radial seal for atmospheric tanks</p>	 TD 528-010 <p>LF-R- Lantern (spacer), seal flange with O-ring seal against tank flange, drain, oil trap and shaft seal: radial seal for atmospheric tanks</p>	 TD 528-011 <p>LF-S- Lantern (spacer), seal flange with O-ring seal against tank flange, drain, oil trap and shaft seal: single mechanical dry running seal for high/low pressure applications</p>	 TD 528-012 <p>LF-D- Lantern (spacer), seal flange with O-ring seal against tank flange, drain, oil trap and shaft seal: double mechanical seal for high pressure applications and aseptic use</p>	 TD 528-013 <p>LF-DT- Lantern (spacer), seal flange with O-ring seal against tank flange, drain, oil trap and shaft seal: double mechanical seal (tandem) for low pressure applications</p>							
<p>Shaft</p> <p>Length = IIII Description (material depending on application)</p>	 TD 528-001 <p>-SIII- SS shaft, length according to application</p>											
<p>Energy Saving Foils</p> <p>Number =n Diameter =vvv (125 mm to 1900 mm)</p> <p>Description (material depending on application)</p>	 TD 528-001 <p>-nPvvvD3P 3 - bladed propeller, finish: polished Standard: Ra < 0.8 µm</p>	 TD 528-001 <p>-nPvvvD3PE 3 - bladed propeller, finish: polished and electro polished Standard: Ra < 0.8 µm</p>	 TD 528-001a <p>-nPvvvD3G 3 - bladed propeller, finish: shot peened</p>	 TD 528-002 <p>-nPvvvD2P 2 - bladed propeller, finish: polished Standard: Ra < 0.8 µm</p>	 TD 528-002 <p>-nPvvvD2PE 2 - bladed propeller, finish: polished and electro polished Standard: Ra < 0.8 µm</p>	 TD 528-002a <p>-nPvvvD2G 2 - bladed propeller, finish: glass shot peened</p>						
<p>Bottom steady bearing</p> <p>Description (material depending on application)</p>	 TD 528-003 <p>-BS1P Bottom steady bearing with PTFE bushing finish: polished Standard: Ra < 0.8 µm</p>	 TD 528-003a <p>-BS1G Bottom steady bearing with PTFE bushing finish: shot peened</p>	 TD 528-004 <p>-BS2P Sanitary bottom steady bearing with PVDF bushings finish: polished Standard: Ra < 0.8 µm</p>									
<p>Optional</p> <p>Description</p>	 TD 528-005 <p>Welding flange Incl. mounting pin nuts and bolts</p>	 TD 528-006 <p>Blind flange Incl. seal O-ring</p>	 TD 528-007 <p>Cover for motor / gear motor Stainless steel cover - comes in different shapes according to drive type</p>	<p>S Spare part kit Standard spare part kit</p>								



Efficient Mixing and Agitation

Bottom mounted agitators Type ALB

Applications

Application	Typical examples
Maintain media homogeneous	Milk storage tanks, mixed product tanks, UHT storage tanks etc.
Mixing and Solutions (dissolves)	Fluid and fluid mixing, i.e. drinking yoghurt and fruit mix tanks, flavoured milk mix tanks, syrup mix tanks, etc.
Solid Dispersion	Powder + fluid mix tanks, etc.
Suspension	Fluids with particles, i.e. juice tanks
Heat transmission	Circulation of media in tanks with dimple jacket (cooling or heating)



TECHNICAL DATA

Motor

Motor size and speed as required for duty.
As standard with IEC motor IP55, other types on request.
As standard painted RAL5010.

Voltage and frequency

As standard for 3x380 to 420V, 50Hz - 3x440V to 480V, 60Hz.
All motor voltages and frequencies are available.

Gears

Different gear types available according to configuration.
As standard filled with normal synthetic or mineral oil, optional: Food approved oil. As standard painted RAL5010.

ATEX - option

Agitators can be delivered approved for use in an ATEX environment with declaration of conformity according to directive 94/9/EC.

Ordering

The following information is required to ensure correct sizing and configuration for ordering:

- Tank geometry
- Product properties
- Task of agitator
- Enquiry forms are available

PHYSICAL DATA

Materials

List the range of materials available for wetted parts:

Steel parts: AISI 316L (standard)
 AISI 304
 AISI 904L
 SAF 2205
 Other materials on request.

Seal rubber parts
 (o-rings or bellows): EPDM
 FPM/FEP (only for stationary o-rings)
 FPM
 Other materials on request.

Specific selection of materials will depend on the actual configuration selected.

Material certificate - option

3.1 Material certificates/FDA conformity statement according to 21 CFR177 on steel/elastomer parts in contact with media

Dimensions

Standard propeller diameter range: \varnothing 125 mm to 1900 mm.
 Specific dimensions on the drive unit and propeller(s) will depend on the actual configuration selected.



Standard design

The Alfa Laval range of bottom mounted propeller agitators is designed to meet almost every customer requirement. Due to their modular build the agitators can be designed for every type of application with the sanitary industry. The modular construction is designed with the aim to meet both European and American standards and regulations, such as EHEDG, USDA, FDA, 3A etc.

Configurable design

Type ALB agitator design is fully configurable divided in the following elements:

- Drives (drive + shaft support + shaft diameter)
- Seal arrangements (oil trap + shaft seal type)
- Shaft (length)
- Energy Saving Foils (propeller type + surface finish)
- Options

Each element has a broad range of different characteristics which makes it possible to size the agitator for all applications and requirements.

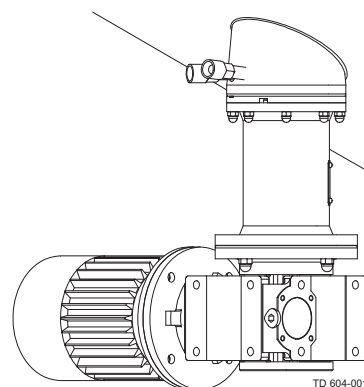
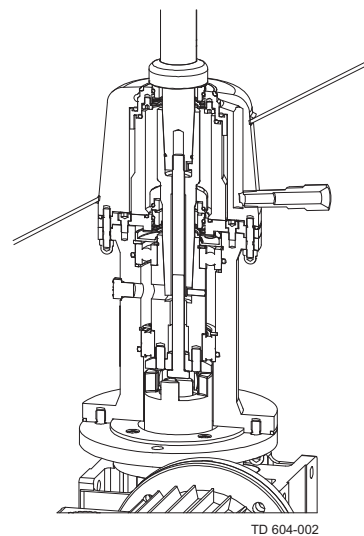
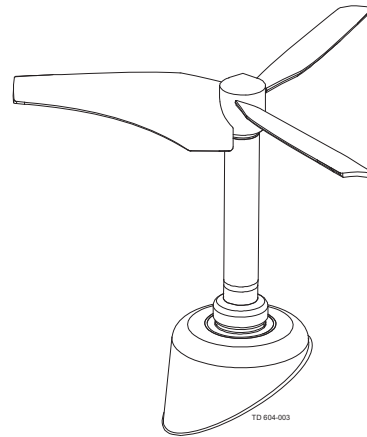
Advantageous and profitable design

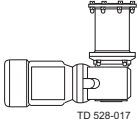

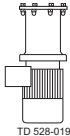
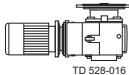
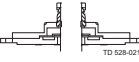
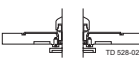
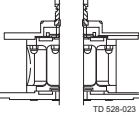
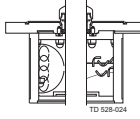
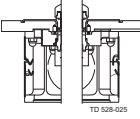
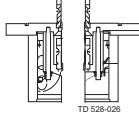
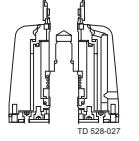







Each configuration offers a number of advantages, which are shown in the examples below:

Operation features	Due to
Low energy consumption	the wide range of high efficiency propellers and drive units makes it possible to design for low operational costs
Gentle product treatment	the wide range of high efficiency propellers makes it possible to design for low shear operation

Sanitary features	Due to
Easy external cleaning	stainless steel bearing frame design with seal O-rings (for washing)
Connections inside the tank (risk zones) can be minimised	bearing frame drives with drive shaft and special internal shaft connection without having a flange coupling inside the tank
All seals both stationary and rotating seals are sterilised during running	the unique cone shaped seal arrangement with flushed sterile seal system
Good drip off properties	no plane surfaces or grooves on internal parts
Easy cleaning	no interior shadow sides between the blades and smooth surfaces

Maintenance features	Due to
All service (replacement of wearing parts such as shaft seals, bearings etc.) can be done from outside the tank	bearing frame drives with detachable shaft which can be dismantled from outside the tank
Easy dismantling	use of spider type coupling and stainless steel parts



Type ALB	Configuration							Bottom mounted agitators
Drives Bearing frame size = xx Shaft diameter = yy (not used if xx = yy) Description (power, speed and shaft diameter depending on application)	 TD 528-017 -ME-GR-Bxx(yy) Right angle gearbox, shaft mounted in hollow shaft of gearbox	 TD 528-018 -ME-GC-Bxx(yy) Stainless steel bearing frame and coaxial gearbox	 TD 528-019 -ME-Bxx(yy) Stainless steel bearing frame and direct motor drive	 TD 528-016 -ME-GR-yy Right angle gearbox, shaft mounted in hollow shaft of gearbox				
Seal arrangements Description (lower flange and seal material depending on application)	 TD 528-021 F-S1- Seal flange with O-ring seal against tank flange, drain, fluid trap and shaft seal: single mechanical bellow seal	 TD 528-022 F-S2- Seal flange with O-ring seal against tank flange, drain, fluid trap and shaft seal: single mechanical non-bellow seal	 TD 528-023 LF-S1- Lantern (spacer), seal flange with O-ring seal against tank flange, drain, fluid trap and shaft seal: single mechanical bellow seal	 TD 528-024 LF-S2- Lantern (spacer), seal flange with O-ring seal against tank flange, drain, fluid trap and shaft seal: single mechanical non-bellow seal	 TD 528-025 LF-D- Lantern (spacer), seal flange with O-ring seal against tank flange, drain, fluid trap and shaft seal: double mechanical seal for high pressure applications and aseptic use	 TD 528-026 LF-DT- Lantern (spacer), seal flange with O-ring seal against tank flange, drain, fluid trap and shaft seal: double mechanical seal (tandem) for low pressure applications	 TD 528-027 C-D- Cone shaped welding flange, flushed O-ring seal between welding flange and agitator seal house, drain, fluid trap and shaft seal: double mechanical sterile seal for high pressure applications and aseptic use	
Shaft Length = IIII Description (material depending on application)	 TD 528-020 -SIII- SS shaft, length according to application							
Energy Saving Foils Diameter = vvv (125 mm to 1900 mm) Description (material depending on application)	 TD 528-001 -PvvU3P 3 - bladed propeller, finish: polished Standard: Ra < 0.8 µm	 TD 528-001 -PvvU3PE 3 - bladed propeller, finish: polished and electro polished Standard: Ra < 0.8 µm	 TD 528-001 -PvvU3G 3 - bladed propeller, finish: shot peened					
Optional Description	 TD 528-005 Welding flange Incl. mounting pin nuts and bolts	 TD 528-006 Blind flange Incl. seal O-ring	 TD 528-007 Cover for Motor / gear motor Stainless steel cover - comes in different shapes according to drive type	S Spare part kit Standard spare part kit				

Superior mixing – Liquid, Gas and Powder

IM 10 Rotary Jet Mixer

The patented IM 10 Rotary Jet Mixer (RJM) does not only mix fast, efficient and uniform but creates also the necessary process flexibility that makes it easy to switch to new product formulations with diverse viscosities, densities and volumes. Besides classic liquid to liquid mixing the RJM is excellent for gas and powder dispersion plus a superb tank cleaning machine.

Applications

Process and storage vessels between 1-10 m³ used in a wide range of industries such as: beer & beverage, food & ingredients, home & personal care, health care, biotech and chemical industry etc.

Operation

Secure that the mixer is positioned in the correct level and submerged into the liquid before round pumping or when adding any additional products from any up-stream pipe works.



TECHNICAL DATA

- Lubricant: Self-lubricating with the mixing/cleaning fluid
- Standard thread: 1" BSP or NPT, female, Top cone 1" BSP with sanitary seal
- Min. tank opening: See dimension drawings
- Pressure**
- Working pressure: 2-8 bar
- Recommended pressure during mixing: 2-6 bar
- Recommended pressure during CIP: 4-8 bar

PHYSICAL DATA

- Materials**
- Materials: AISI 316L, AISI 316, SAF 2205 (UNS 31803), EPDM, PEEK, PVDF, PFA, Ceramics
- Weight:** 5.1 kg
- Temperature**
- Max. working temperature: 95°C
- Max. ambient temperature: 140°C
- Certificates**
- 2.1 material certificate ATEX.

Benefits

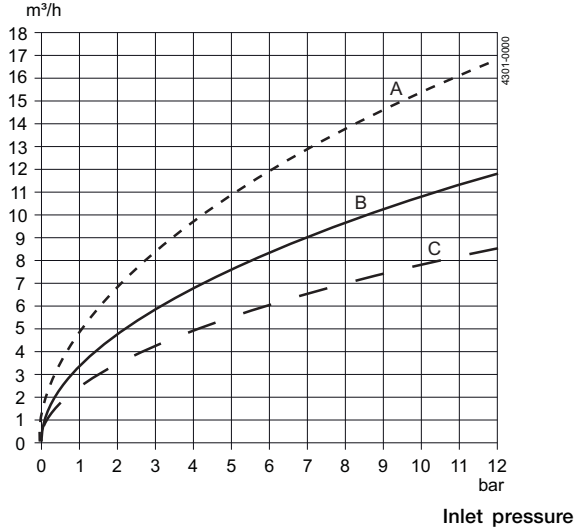
Using the IM 10 Rotary Jet Mixer makes it possible, at a modest investment, to perform fast and efficient mixing in a sanitary system. In traditional systems, using propeller mixers, a rotating shaft penetrates the tank wall, and a mechanical seal and a gear box are installed. With the Rotary Jet Mixer technology the shaft, seal and gearbox are eliminated, and a more sanitary design is obtained. With the Rotary Jet Mixing technology good mixing is achieved without the use of baffles. The Rotary Jet Mixer can also be used for gas dispersion. The IM 10 can furthermore be used for efficient CIP when the tank is empty, saving liquid, chemicals and energy compared to a fixed spray ball CIP system.



Flow rate

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

Volumetric flow rate [m³/h]

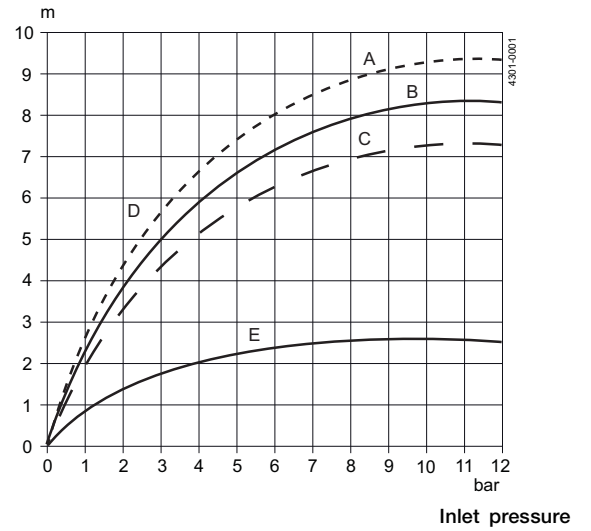


- Nozzles
 A) d = 5.5 mm
 B) d = 4.6 mm
 C) d = 3.9 mm

Reach of jet

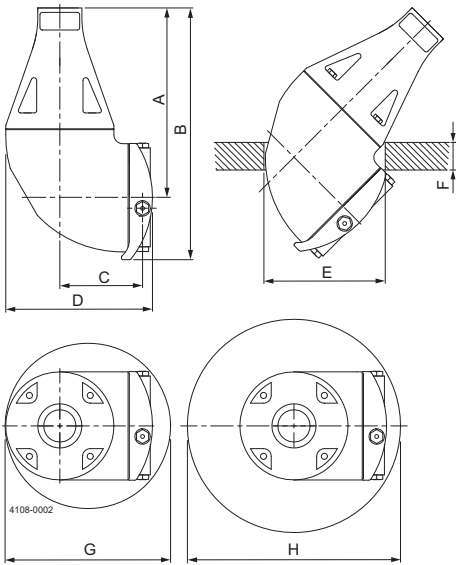
Reach of jet for the IM 10 during cleaning, and indicative reach of jet for mixing of liquids with water-like properties.

Reach of jet [m]

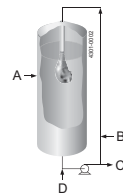


- Nozzles
 A) d = 5.5 mm
 B) d = 4.6 mm
 C) d = 3.9 mm
 D) Cleaning
 E) Mixing

Dimensions (mm)



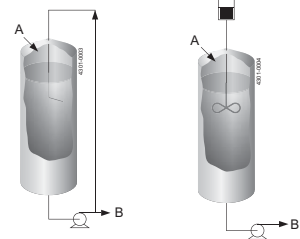
The Rotary Jet Mixing technology



- A = Rotary Jet Mixer
 B = Gas
 C = Product
 D = Liquid feed

Traditional Mixing technology

Round pumping Propeller mixing



- A = Liquid feed
 B = Product

A	B	C	D	E	F	G	H
173	230	75	133	ø110	Max. 25	ø150	ø200

Superior Mixing – Liquid, Gas and Powder

IM 15 Rotary Jet Mixer

The patented IM 15 Rotary Jet Mixer (RJM) does not only mix fast, efficient and uniform but creates also the necessary process flexibility that makes it easy to switch to new product formulations with diverse viscosities, densities and volumes. Besides classic liquid to liquid mixing the RJM is excellent for gas and powder dispersion plus a superb tank cleaning machine.

Applications

Process and storage vessels between 2-100 m³ used in a wide range of industries such as: beer & beverage, food & ingredients, home & personal care, health care, biotech and chemical industry etc.

Operation

Secure that the mixer is positioned in the correct level and submerged into the liquid before round pumping or when adding any additional products from any up-stream pipe works.



TECHNICAL DATA

Lubricant: Self-lubricating with the mixing/cleaning fluid
 Connection: Standard thread 1.5" BSP or NPT, female
 Min. tank opening: See dimension drawings

Pressure

Working pressure: 2-12 bar
 Recommended pressure during mixing: 2-6 bar
 Recommended pressure during CIP: 5-6.5 bar

PHYSICAL DATA

Materials

Materials: AISI 316L, AISI 316, SAF 2205, PTFE, PEEK, Tefzel, Ceramics

Weight: 6.1 kg

Temperature

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

Benefits

Using the IM 15 Rotary Jet Mixer makes it possible, at a modest investment, to perform fast and efficient mixing in a sanitary system. In traditional systems, using propeller mixers, a rotating shaft penetrates the tank wall, and a mechanical seal and a gear box are installed. With the Rotary Jet Mixing technology the shaft, seal and gearbox are eliminated, and a more sanitary design is obtained. With the Rotary Jet Mixing technology good mixing is achieved without the use of baffles. The Rotary Jet Mixer can also be used for gas dispersion and for dispersion and dissolving of powder. The IM 15 can furthermore be used for efficient CIP when the tank is empty, saving liquid, chemicals and energy compared to a fixed spray ball CIP system

