SMD, SMG and SFG mixers and flowmakers

50 Hz

SMD, SMG, SFG, 50Hz
Data booklet
Other languages
http://net.grundfos.com/qr/i/98784711

GRUNDFOS

SMD, SMG and SFG mixers and flowmakers

Table of contents

1. Introduction

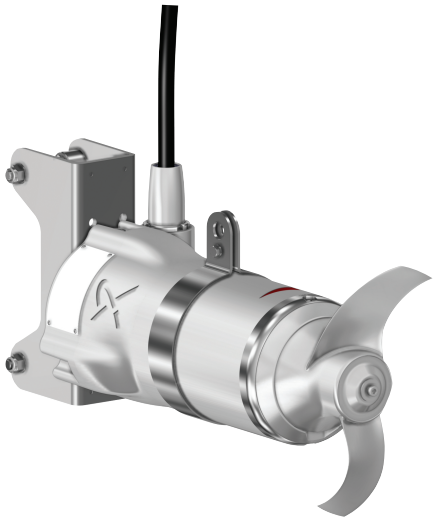
1.1 General description

This data booklet describes Grundfos mixers, types SMD and SMG, and flowmakers, type SFG.

Mixers

TM065441

SMG mixer



TM065440

SMD mixer

The Grundfos range of horizontal SMD and SMG mixers is designed for mixing, i.e. homogenisation and suspension, of liquids of low to medium viscosity.

The range of mixers consists of SMD mixers with direct drive and SMG mixers with planetary gear drive.

Mixers are fitted with motors of 0.9 to 18.5 kW.

Flowmakers

TM063409

TM065275

SFG flowmakers

The Grundfos range of horizontal SFG flowmakers is designed for flowmaking, i.e. keeping the liquid moving, in liquids of low to medium viscosity. The flowmakers are suitable for use in large volumes.

SFG flowmakers have planetary gear drives.

Flowmakers are fitted with motors of 0.7 to 8.0 kW.

1.2 Applications

The mixers and flowmakers are designed for mixing and flowmaking in the applications mentioned below.

Sewage treatment plants

- Pumping stations (stormwater tanks)
- tanks for biological treatment of activated sludge
- tanks for primary wastewater treatment
- tanks for secondary wastewater treatment
- tanks for digested sludge treatment
- sludge storage tanks
- sludge-thickening tanks
- homogenisation tanks
- tanks for digesting processes
- tanks for degassing and lime storage.

Industry

- Pulp and paper industry
- paint and dyestuff industry
- chemical industry
- other industries working with homogenisation processes.

Agriculture

- Slurry tanks
- biogas plants.

Contact Grundfos for information on other applications, such as the mixing of viscous liquids or mixing in explosive environments.

1.3 Constructional features

SMD

- Linear smooth design, preventing solids from sticking
- integrated overload and thermal protection
- plug-in power cable
- double mechanical cartridge shaft seal
- outer parts made of stainless steel
- self cleaning stainless steel propeller.

SMG and SFG

- Strong axial gear in slim design for high hydro-dynamic efficiency
- integrated overload and thermal protection
- integrated leak sensor
- cast-iron housing with epoxy protection
- self-cleaning high-efficiency propeller.

1.4 Operating mode

- Continuous operation when fully submerged
- intermittent operation with maximum 20 starts per hour (SMG and SFG) and maximum 60 starts per hour (SMD).

2. Identification

2.1 Type key

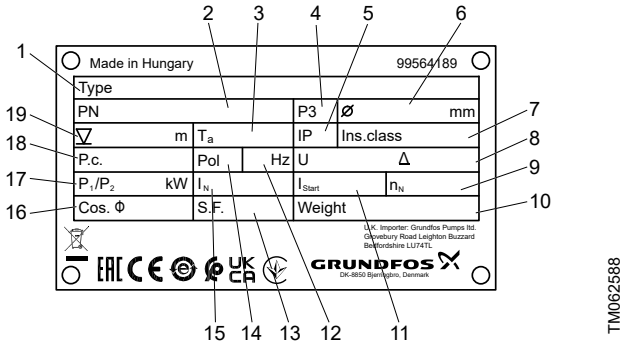
Example: **SMG.30.45.325.5.0B**

Code	Explanation	Designation
S	SMD, SMG, SFG	Type range
M	Mixer	Version
F	Flowmaker	
G	Gear-driven	Drive
D	Direct-driven	
30	Code from type designation/10 30 = 3.0 kW	Motor output power P2
45	45 cm	Propeller diameter [cm]
[ ]	Standard	Application
A	Agriculture	
M	Mud, for high density	
H	Heavy duty, biogas plants	
325	325 rpm	Propeller speed [min^{-1}]
[ ]	Standard	Installation method
T	2" thread connection	
[ ]	Non-explosion-proof	Explosion protection
Ex	Explosion-proof	
5	50 Hz	Frequency [Hz]
6	60 Hz	
0B	3 x 400-415 V, Y	Voltage code and starting method
1B	3 x 400-415 V, D	
0K	3 x 380 V, Y	
1K	3 x 380 V, D	
0P	3 x 440-480 V, Y	
1P	3 x 440-480 V, D	
[ ]	First generation	Generation
A	Second generation	
B	Third generation	
Z	Custom-built product	Customisation

2.2 Nameplate

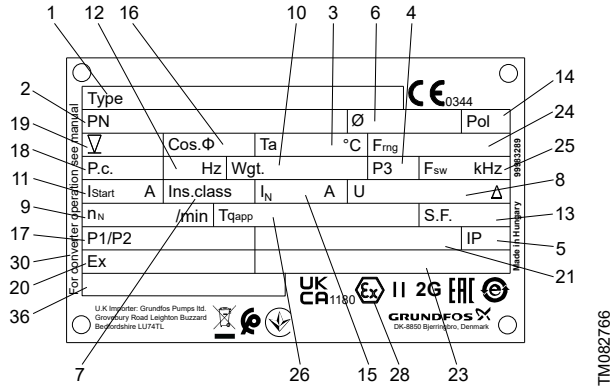
You can identify all mixers and flowmakers by means of the nameplate on the motor housing.

The details on the nameplate are required when ordering spare parts.



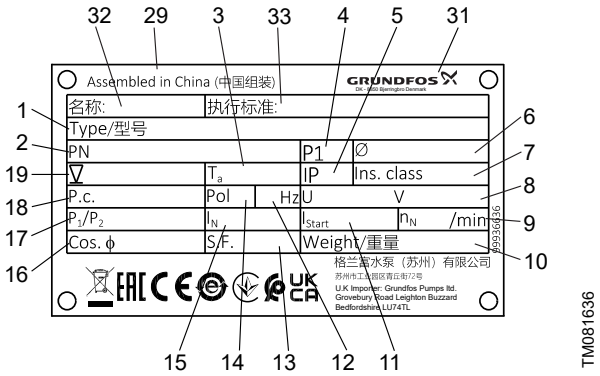
TM062588

Nameplate



TM082766

Nameplate of explosion-proof SMD mixers



TM081636

Nameplate for non-explosion proof products in China

Pos.	Description
1	Type designation
2	Product number and serial number
3	Liquid temperature range
4	Production site
5	Enclosure class according to IEC
6	Propeller diameter
7	Insulation class
8	Rated voltage
9	Rated speed, propeller
10	Weight
11	Starting current
12	Frequency
13	Safety factor
14	Number of poles
15	Rated current
16	Power factor
17	Motor power P1/P2
18	Production code (yyww)
19	Maximum installation depth
20	Ex marking
21	Certificate number ATEX
23	Certificate number IEC Ex
24	Frequency range [1]
25	Switching frequency [1]
26	Torque application [1]
28	Approval mark - ATEX with ATEX equipment category
29	Place of production
30	Reference to requirement of electric machines operated with converter [1]
31	Manufacturer name and address
32	Type: • SMG or SMD: Submersible mixer • SFG: Submersible flowmaker
33	Company standard
36	Certificate number UKEX

1 If a frequency converter is used.

Fix the extra nameplate that is supplied with the product at the installation site or production location, so the data can be checked when necessary. Make sure that the nameplate is visible.

3. Product description

3.1 Features

The below descriptions are related to the main components of the products. Product variants are available. See Variants.

Related information

6. Variants

3.1.1 Motor

The SMD, SMG and SFG motor is an integrated 4- or 6-pole squirrel-cage induction motor. The incorporated electromagnetic components, such as stator windings and rotor, are compliant with the IE3 efficiency level of IEC 60034-30.

The rotor is supported by two ball bearings.

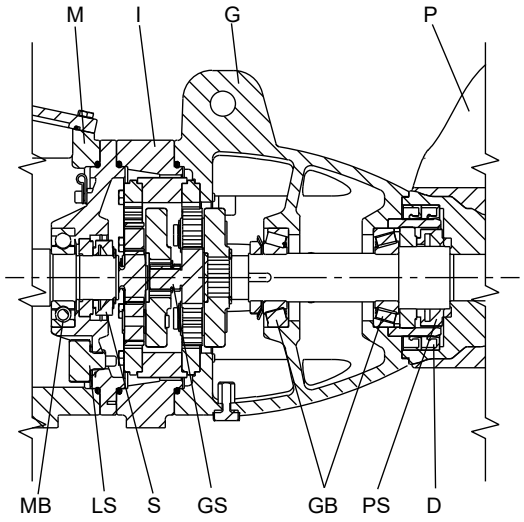
3.1.2 Gearbox

SMG and SFG

A planetary gearbox is positioned between the motor and the propeller. Mixers (SMG) have one gear stage, flowmakers (SFG) have two gear stages. The gearbox shaft is supported by two separated tapered roller bearings. This construction ensures that no axial or radial forces from the propeller can load neither the gear wheels nor the motor bearings.

The gearbox is oil-filled, and the gear wheels are hardened to ensure long life. The gearbox housing has an integrated water-in-oil leakage sensor which can be connected to an external relay to give an alarm or to cut out the motor in case of water ingress.

See the installation and operating instructions for information on oil type, oil quality and oil change intervals.



Gearbox

Pos.	Description
M	Motor
I	Intermediate housing (only SFG)
G	Gearbox
P	Propeller
MB	Motor bearing
LS	Leakage sensor
S	Secondary seal
GS	Gear stages
GB	Gear bearings
PS	Primary shaft seal
D	Double lip seal

3.1.3 Bearings

SMD

Motor: Single- or double-row ball bearing.

SMG and SFG

Motor: Single-row ball bearings.

Gear: Tapered roller bearings.

3.1.4 Sealing system

To prevent ingress of the surrounding liquid, the mixers and flowmakers have a multistage sealing system.

SMD

For SMD direct-drive products, the sealing system consists of a labyrinth with an integrated scraper system to remove solids from the propeller cap. The inner sealing is a mechanical cartridge shaft seal where the primary seal is SiC/SiC and the secondary seal is carbon/ceramics. The pre-sealing of the cartridge lip seal is combined with a wear ring.

Mixer	Sealing against ingress of surrounding liquid	Sealing between shaft seal housing and motor
SMD up to 3.5 kW (standard and Ex)	A lip seal, mechanical shaft seal, SiC/SiC [1]	Mechanical shaft seal, carbon/ceramic

1 SiC: Silicon carbide.

SMG and SFG

For SMG, SFG geared products, the first seal is placed behind the propeller and completely encapsulates the inside of the gearbox including the shaft. This primary seal consists of a labyrinth seal, two lip seals of FKM running on a low-wear ceramic layer and a mechanical shaft seal.

A secondary mechanical shaft seal is located between the gearbox and the motor.

Mixer/flowmaker	Sealing against ingress of surrounding liquid	Sealing between gearbox and motor
SMG.A up to 4.5 kW	Two lip seals and a mechanical shaft seal, SiC/SiC [1]	One lip seal,
SMG.A from 7.5 to 13 kW	Two lip seals and a mechanical shaft seal, tungsten carbide/tungsten carbide	Two lip seals
SMG up to 4.0 kW SFG.xx.130	Two lip seals and a mechanical shaft seal, SiC/SiC [1]	One mechanical shaft seal, carbon/Alox
SMG larger than 4.0 kW SFG.xx.150/180/230/260	Two lip seals and a mechanical shaft seal, tungsten carbide/tungsten carbide	

1 SiC: Silicon carbide.

3.1.5 Propeller

All propellers have two or three twisted, flow-directed and raked blades to achieve a self-cleaning effect. All blades are formed in moulds to achieve a streamlined shape for a high hydrodynamic efficiency.

SMD

The SMD propellers are made of stainless steel, and the fully profiled blades are cast in one piece.

SMG

The SMG propellers are made of stainless steel, and the 3D-formed blades are welded to the hub.

SFG

The SFG propellers are made of polyurethane resin and have profiled blades. For gentle treatment of activated sludge, the SFG propellers have a tip speed which is lower than 6 m/s.

3.1.6 Cable and cable entry

SMD

The cable is connected by means of a stainless steel plug with a union nut. The nut and O-rings provide sealing against liquid penetration. The plug is filled with a polyamide material cast into the plug around the conductors of the cable, to prevent moisture from entering the motor via the cable core.

SMG and SFG

The watertight cable entry prevents moisture ingress down to a depth of 20 metres. The cable entry is sealed by a double set of elastomeric rubber with a clamping ring.

SMG.H and SFG.H are delivered with a casted cable inlet.

Standard cables

The factory-fitted cable has six power wires to allow star-delta starting of the motors.

	Standard cable types	Dimensions	Outer diameter [mm]
SMD	LYNIFLEX 4G1.5 + 3 x 1	4 x 1.5 mm^2 + 3 x 1	15.5
	LYNIFLEX 7G2.5 + 3 x 1	7 x 2.5 mm^2 + 3 x 1	18.5
SMG SFG	S1BN8-F 11G1.5	11 x 1.5 mm^2	17
	S1BN8-F 11G2.5	11 x 2.5 mm^2	21
	TPE/TPE 7G4 + 4 x 1.5	7 x 4 mm^2 + 4 x 1.5 mm^2	21

The cable type required for each product appears from the tables in Technical data.

Related information

10. Technical data

3.1.7 Sensors

Sensor overview

Product	Execution / power	MS	LS	PTC	PTO
SMD	0.9-1.8	o	-	o	●
	1.9-3.5	●	o	o	●
SMG	Standard, H	o	●	o	●
	A	-	-	-	●
SFG	Standard, H	o	●	●	o

● Standard
o Optional
- Not available
MS: Moisture switch
LS: Leakage sensor
PTC: Thermistors
PTO: Thermal switches

Related information

3.4 Moisture switch
3.5 Leakage sensor
6. Variants

3.2 Starting method

3.2.1 SMD

Continuous operation

Direct start is possible throughout the entire power range.

Intermittent operation

For motors of 1.9 kW and higher, we recommend that you use a soft starter or a frequency converter.

3.2.2 SMG

Continuous operation

You can start motors up to 1.6 kW via direct starting. We recommend star-delta starting, soft starter or frequency converter for motors of 2.0 kW and higher.

Intermittent operation

We recommend star-delta starting, soft starter or frequency converter throughout the entire power range.

3.2.3 SFG

Continuous operation

We recommend that you start the flowmakers via star-delta starting, a soft starter or a frequency converter.

Intermittent operation

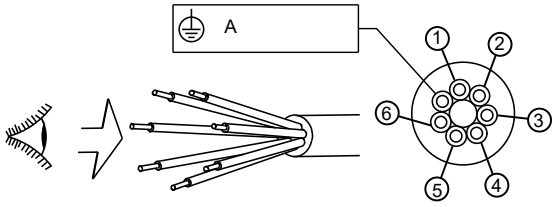
It is mandatory to start the flowmakers via a soft starter or a frequency converter.

3.3 Wiring diagrams

3.3.1 SMD

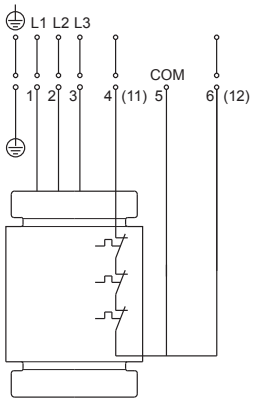
Marking 7-wire / 10-wire		Switch or sensor			Max. load	Connection
Wire 4 / 7	Wire 6 / 9	Thermal switch	Moisture switch (M)	Leakage sensor (LS)		Relay
11	12	PTO	No	No	2.5 A (250 V)	-
31	32	PTC	No	No	2.5 V	Thermistor
11	13	PTO	Yes	No	2.5 A (250 V)	-
31	33	PTC	Yes	No	2.5 V	Thermistor
11	23	PTO	Yes	Yes	12 V - 11 mA	ALR20/A

7-wire cable



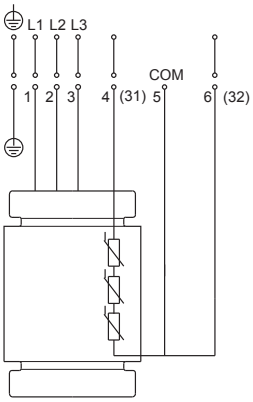
TM065367

Pos.	Description
A	Yellow and green



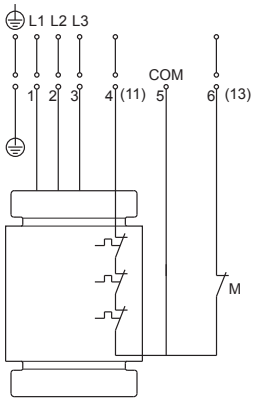
TM065362

3 x PTO (standard)



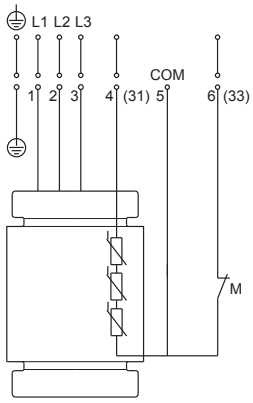
TM065363

3 x PTC



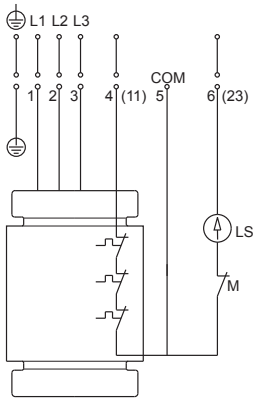
TM065364

3 x PTO + M



TM065365

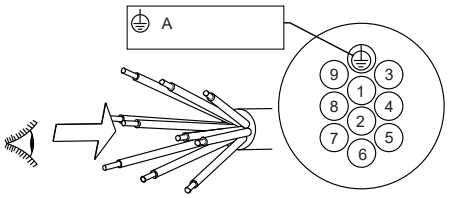
3 x PTC + M



TM065366

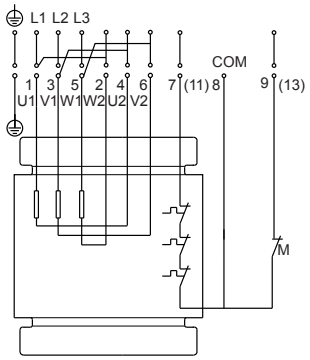
3 x PTO + M + LS

10-wire cable



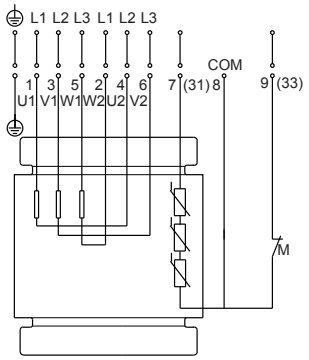
TM065371

Pos.	Description
A	Yellow and green



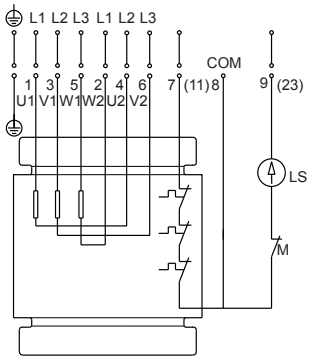
TM065368

3 x PTO + M (standard)



TM065369

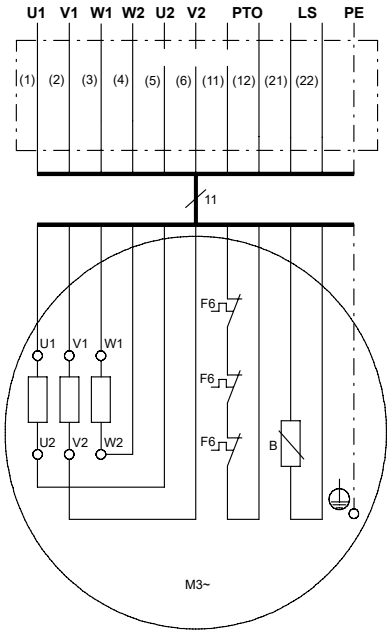
3 x PTC + M



TM065370

3 x PTO + M + LS

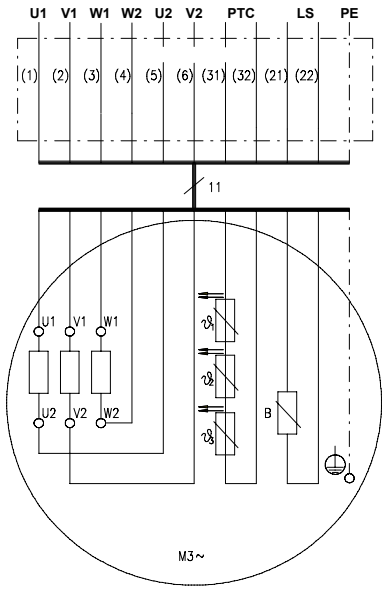
3.3.2 SMG and SFG



TM024940

Three thermal switches (PTO)

Terminals	Description
1, 2, 3, 4, 5, 6	Ends of the three stator windings (U1, U2, V1, V2, W1, W2)
11, 12	Thermal switches (F6)
21, 22	Leakage sensor in gearbox (B).



TM024932

Three thermistors (PTC sensors)

Terminals	Description
1, 2, 3, 4, 5, 6	Ends of the three stator windings (U1, U2, V1, V2, W1, W2)
31, 32	PTC sensors according to DIN 44081 (ϑ1, ϑ2, ϑ3)
21, 22	Leakage sensor in gearbox (B).

Related information

3.4 Moisture switch

3.5 Leakage sensor

3.4 Moisture switch

A moisture switch is available for SMD mixers. From SMD 0.9 to 1.8 kW, the switch is optional. The moisture switch monitors the cable compartment in the non-drive end or the motor housing. If moisture appears, the switch will be triggered, and either the alarm starts or the power to SMD is cut out.

3.5 Leakage sensor

For SMD 1.9 kW and up, the leakage sensor is optional. For SMG and SFG, the leakage sensor is standard, except for SMG.A which is delivered without a leakage sensor.

The gearbox and shaft seal housing is monitored for ingress of water by means of a leakage sensor incorporated in the gearbox or shaft seal housing. Via an external relay, the sensor triggers an alarm signal and/or switches off the motor.

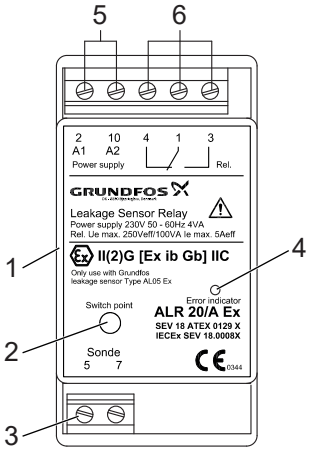
We recommend that you connect the AL-05 leakage sensor to a relay. The relay must be a Grundfos ALR-20/A-Ex relay, supplied as an optional accessory. See Accessories.

Note: As the leakage sensor is an electronic component, do not test it with an ohmmeter or another measuring instrument.

Related information

11. Accessories

3.5.1 ALR-20/A-Ex relay



TM074100

ALR-20/A-Ex relay

Dimensions of the ALR-20/A-Ex relay are shown in Dimensions of accessories.

Settings

The sensitivity of the ALR-20/A-Ex relay can be tested as follows:

1. Turn the adjusting screw (2) until the indicator light (4) of the relay is on. See *ALR-20/A-Ex relay*.
2. Turn the adjusting screw in the opposite direction until the indicator light is off.
3. Turn the adjusting screw another 60 ° in the same direction as under step 2.

Note: The maximum cable length between the relay and the mixer or flowmaker is 50 metres. An external alarm indicator, if installed, must be connected to the potential-free output, terminals 1 and 3 or 4 (6).

Mains supply, terminals 2 and 10	
Rated operating voltage	230 VAC
Permissible voltage tolerance	-15 to +10 %
Frequency	50-60 Hz
Power input	Approximately 3 VA
Power transformer	According to VDE 0551, short-circuit-proof, VDE and SEV mark of conformity

Relay output, terminals 1, 3 and 4	
Maximum switching voltage	250 VAC / 24 VDC
Maximum switching current	5 A
Maximum switching capacity	100 VA / 100 W

For further information, see the data sheet for the ALR-20/A-Ex.

Related information

9.5 Dimensions of accessories

3.6 Characteristics of mixed or moved liquids

	SMD, SMG, SFG	**SMG.H, SFG.H**
pH value	4-10	
Liquid temperature	5-40 °C	5-60 °C
Maximum density	1060 kg/m^3	1100 kg/m^3
Maximum dynamic viscosity	250 mPa·s [1] 500 mPa·s	500-5000 mPa·s
Chloride content	Stainless steel DIN 1.4301: ≤ 200 mg/l	
Chloride content	Stainless steel DIN 1.4404: ≤ 1000 mg/l	

1 For SMD

Mixers are suitable for applications involving sludge with a typical dry solids content (DS) as stated in the table below. Mixers are also suitable for a wide range of other applications involving similar liquids such as slurry and paper pulp.

Activated sludge	0.5 % DS
Selector zones	0.5 % DS
Anoxic zones	0.5 % DS
Bivalent zones	0.5 % DS
Anaerobic zones	0.5 % DS
Primary sludge	≤ 3 % DS
Secondary sludge of SMD	≤ 4 % DS
Secondary sludge of SMG and SFG	≤ 6 % DS
Digested sludge of SMD	≤ 4 % DS
Digested sludge of SMG and SFG	≤ 8 % DS
Collection tank without screen	≤ 2 % DS
Collection tank with sand	≤ 2 % DS

Flowmakers are suitable for activated sludge with a typical dry solids content of 0.5 to 1.0 % and for other liquids with a dry solids content of maximum 1.5 %.

SMG standard is designed for liquids detailed in this section.

SMG.A is designed for the agriculture business for few operating hours per year. For SMG.A, the maximum dry solids content is 8 % DS.

SMG.H and SFG.H is designed for tough applications with more solid content. For SMG.H and SFG.H, the maximum dry solids content is 10 % DS.

3.7 Sound pressure level

The sound pressure level of the mixer or flowmaker is lower than 70 dB(A).

4. Selection of product

4.1 Ordering a mixer or flowmaker

You only need to select a few product numbers to complete your order:

- mixer or flowmaker
- custom-built variant (option)
- accessories for mechanical installation
- adapters that are available as accessories
- electrical accessories and leak detector relay.

4.1.1 Standard product

This is an example of what you get when you order a standard mixer or flowmaker:

- SMG and SFG: mixer or flowmaker containing a motor, gearbox and complete propeller
- SMD: mixer containing a motor and complete propeller
- factory-fitted 10 m power supply cable SMG.H and SFG.H are fitted with 15 or 25 m cable as standard.
- paint:
  - SMD: uncoated stainless steel surface
  - SMG and SFG: black, NCS 9000N, paint grade according to ISO 12944-2: 2017, durability: high, corrosivity category: Im2.
- Thermal protection:
  - SMD and SMG: three thermal switches (PTO), one in each motor winding.
  - SFG: three thermistors (PTC), one in each motor winding.
- SMG and SFG: one leakage sensor incorporated in the gearbox.
- SMD: moisture switch for power sizes of 1.9 kW and up.

Note: To find product data in Grundfos Product Center, enter the product number, for example 98787781. See Grundfos Product Center.

Related information

12. Grundfos Product Center

4.1.2 Explosion-proof variants

Use the explosion-proof SMD mixer in potentially explosive environments. The explosion classification is II 2G Ex db h IIB T4 Gb. In each individual case, the installation must be approved by the local authorities.

For gear-driven products with ATEX approval, see the product ranges of AMG and AFG. More information can be found in the data booklets for AMD, AMG and AFG at www.grundfos.com.

4.1.3 Variants

If a longer cable or an explosion-proof version (for SMG or SFG) is required, it is no longer a standard mixer or flowmaker. A list of variants can be found in Variants.

Related information

6. Variants

4.1.4 Accessories

See Accessories for selection of the correct accessories.

Note: When a suitable motor bracket is ordered together with the mixer or flowmaker, it will be fitted from factory. All the other accessories are not fitted from factory.

Related information

11. Accessories

4.1.5 Relay

The ALR-20/A-Ex leak detector relay can be selected.

4.2 Selecting a mixer or flowmaker

When selecting mixers and flowmakers, you must consider many different parameters. To ensure the optimum selection, contact Grundfos.

For advanced applications, we recommend that you carry out CFD (Computational Fluid Dynamics) simulations. Contact Grundfos.

5. Product range

5.1 SMD standard mixers

Type designation [1]	Permissible motor voltage [V]	Product number
		10 m cable
SMD.09.21.1478.T.5.0B	3 x 400-415 Y	98995949
SMD.11.25.1470.T.5.0B	3 x 400-415 Y	98995950
SMD.14.25.1460.T.5.0B	3 x 400-415 Y	98995951
SMD.18.25.1440.T.5.0B	3 x 400-415 Y	98995952
SMD.09.21.1478.5.0B	3 x 400-415 Y	98995953
SMD.11.25.1470.5.0B	3 x 400-415 Y	98995954
SMD.14.25.1460.5.0B	3 x 400-415 Y	98995955
SMD.18.25.1440.5.0B	3 x 400-415 Y	98995956
SMD.19.32.985.5.1B	3 x 400-415 D	98995957
SMD.23.37.980.5.1B	3 x 400-415 D	98995958
SMD.28.37.975.5.1B	3 x 400-415 D	98995959
SMD.35.37.967.5.1B	3 x 400-415 D	98995960

1 SMD mixers, T-variants are delivered with 2" thread connection for connecting to more accessories. See Accessories. All the mixers require a bracket before installation is possible.

Related information

11. Accessories

5.2 SMD explosion-proof mixers

Type designation [1]	Permissible motor voltage [V]	Product number
		10 m cable
SMD.09.21.1478.T.Ex.5.0B	3 x 400-415 Y	99219124
SMD.11.25.1470.T.Ex.5.0B	3 x 400-415 Y	99219125
SMD.14.25.1460.T.Ex.5.0B	3 x 400-415 Y	99219126
SMD.18.25.1440.T.Ex.5.0B	3 x 400-415 Y	99219127
SMD.09.21.1478.Ex.5.0B	3 x 400-415 Y	99219128
SMD.11.25.1470.Ex.5.0B	3 x 400-415 Y	99219129
SMD.14.25.1460.Ex.5.0B	3 x 400-415 Y	99219130
SMD.18.25.1440.Ex.5.0B	3 x 400-415 Y	99219131
SMD.19.32.985.Ex.5.1B	3 x 400-415 D	99219132
SMD.23.37.980.Ex.5.1B	3 x 400-415 D	99219133
SMD.28.37.975.Ex.5.1B	3 x 400-415 D	99219134
SMD.35.37.967.Ex.5.1B	3 x 400-415 D	99219135

1 SMD mixers, T-variants are delivered with 2" thread connection for connecting to more accessories. See Accessories. All the mixers require a bracket before installation is possible.

Related information

11. Accessories

5.3 SMG mixers

Type designation [1]	Permissible motor voltage [V]	Product number	
		10 m cable 80 × 80 column profile	10 m cable 100 × 100 column profile
SMG.09.55.277.5.0B	3 x 400-415 Y	98787749	
SMG.12.63.275.5.0B	3 x 400-415 Y	98787750	
SMG.16.63.272.5.0B	3 x 400-415 Y	98787781	
SMG.20.71.264.5.1B	3 x 400-415 D	98787782	
SMG.25.71.263.5.1B	3 x 400-415 D	98787783	
SMG.30.71.303.5.1B	3 x 400-415 D	98787784	
SMG.36.71.301.5.1B	3 x 400-415 D	98787785	
SMG.48.73.306.5.1B	3 x 400-415 D		98787786
SMG.56.86.264.5.1B	3 x 400-415 D		98787787
SMG.70.86.263.5.1B	3 x 400-415 D		98787788
SMG.85.86.306.5.1B	3 x 400-415 D		98787789
SMG.110.86.305.5.1B	3 x 400-415 D		98787790
SMG.140.90.325.5.1B	3 x 400-415 D		98787791
SMG.180.90.359.5.1B	3 x 400-415 D		98787792

1 All the mixers require a bracket before installation is possible. See Accessories.

Related information

11. Accessories

5.4 SMG.A mixers

Type designation [1]	Permissible motor voltage [V]	Product number
		10 m cable
SMG.45.71.A.338.5.1B	3 x 400-415 D	99331558
SMG.75.58.A.343.5.1B	3 x 400-415 D	99331562
SMG.80.73.A.343.5.1B	3 x 400-415 D	99331576
SMG.110.65.A.344.5.1B	3 x 400-415 D	99331553
SMG.130.86.A.343.5.1B	3 x 400-415 D	99331555

1 All the mixers require a bracket before installation is possible. See Accessories.

Related information

11. Accessories

5.5 SMG.H mixers

Type designation [1]	Permissible motor voltage [V]	Product number
		15 m cable
SMG.50.65.H.265.5.1B	3 x 400-415 D	99263939
SMG.80.65.H.306.5.1B	3 x 400-415 D	99263940
SMG.110.65.H.344.5.1B	3 x 400-415 D	99263941
SMG.150.78.H.325.5.1B	3 x 400-415 D	99263942
SMG.185.78.H.358.5.1B	3 x 400-415 D	99263953

1 All the mixers require a bracket before installation is possible. See Accessories.

Related information

11. Accessories

5.6 SFG flowmakers

Type designation [1]	Permissible motor voltage [V]	Product number	
		10 m cable 100 × 100 column profile	10 m cable 120 × 120 column profile
SFG.07.130.50.5.0B	3 x 400-415 Y	98787793	
SFG.10.130.57.5.0B	3 x 400-415 Y	98787794	
SFG.14.130.64.5.0B	3 x 400-415 Y	98787795	
SFG.17.130.68.5.1B	3 x 400-415 D	98787796	
SFG.22.130.74.5.1B	3 x 400-415 D	98787797	
SFG.27.130.80.5.1B	3 x 400-415 D	98787798	
SFG.33.130.85.5.1B	3 x 400-415 D	98787799	
SFG.36.130.88.5.1B	3 x 400-415 D	98787800	
SFG.07.180.32.5.0B	3 x 400-415 Y	98787801	
SFG.10.180.36.5.0B	3 x 400-415 Y	98787802	
SFG.14.180.41.5.0B	3 x 400-415 Y	98787803	
SFG.17.180.44.5.1B	3 x 400-415 D	98787804	
SFG.22.180.48.5.1B	3 x 400-415 D	98787805	
SFG.26.180.51.5.1B	3 x 400-415 D	98787806	
SFG.32.180.51.5.1B	3 x 400-415 D	98787807	
SFG.36.180.54.5.1B	3 x 400-415 D	98787808	
SFG.07.230.26.5.0B	3 x 400-415 Y	98787809	
SFG.10.230.29.5.0B	3 x 400-415 Y	98787810	
SFG.12.230.31.5.0B	3 x 400-415 Y	98787811	
SFG.15.230.33.5.0B	3 x 400-415 Y	98787812	
SFG.17.230.39.5.1B	3 x 400-415 D	98787813	
SFG.22.230.39.5.1B	3 x 400-415 D	98787814	
SFG.26.230.40.5.1B	3 x 400-415 D	98787815	
SFG.33.230.43.5.1B	3 x 400-415 D	98787816	
SFG.36.230.45.5.1B	3 x 400-415 D	98787817	
SFG.22.260.30.5.1B	3 x 400-415 D		98787818
SFG.27.260.32.5.1B	3 x 400-415 D		98787819
SFG.32.260.34.5.1B	3 x 400-415 D		98787820
SFG.36.260.35.5.1B	3 x 400-415 D		98787822
SFG.44.260.38.5.1B	3 x 400-415 D		98787823
SFG.48.260.39.5.1B	3 x 400-415 D		98787824
SFG.50.260.35.5.1B	3 x 400-415 D		98787825
SFG.60.260.38.5.1B	3 x 400-415 D		98787826
SFG.66.260.39.5.1B	3 x 400-415 D		98787827
SFG.74.260.41.5.1B	3 x 400-415 D		98787828
SFG.80.260.42.5.1B	3 x 400-415 D		98787829

1 All the flowmakers require a bracket before installation is possible. See Accessories.

Related information

11. Accessories

5.7 SFG.H flowmakers

Type designation	Permissible motor voltage [V]	Product number	
		15 m cable	25 m cable
SFG.110.150.H.91.5.1B	3 x 400-415 D	99263954	
SFG.110.150.H.83.5.1B	3 x 400-415 D	99263955	
SFG.70.260.H.44.5.1B	3 x 400-415 D		99263956
SFG.110.260.H.51.5.1B	3 x 400-415 D		99263957

Note: SFG.xx.260.H variants cannot be used with standard installation equipment. For more information, contact Grundfos.

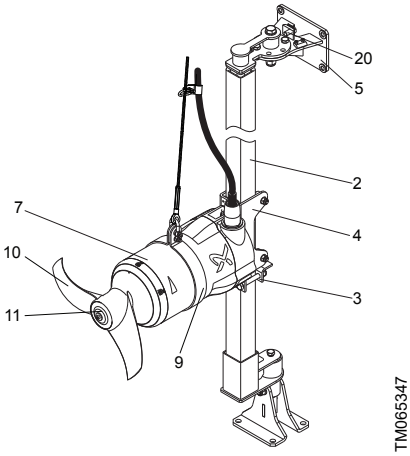
6. Variants

Motor						
Power supply cable	Standard cable, longer than 10 m	4 x 1.5 mm^2 + 3 x 1 mm^2, ∅15.5	LYNIFLEX 4G1.5 + 3 x 1	15 m 25 m 40 m	SMD	Contact Grundfos.
		7 x 2.5 mm^2 + 3 x 1 mm^2, ∅18.5	LYNIFLEX 7G2.5 + 3 x 1	15 m 25 m 40 m	SMD	
		11 x 1.5 mm^2, ∅17	S1BN8-F 11G1.5	15 m 25 m 35 m 50 m	SMG SFG	
		11 x 2.5 mm^2, ∅21	S1BN8-F 11G2.5	15 m 25 m 35 m 50 m	SMG SFG	
		7 x 4 mm^2 + 4 x 1.5 mm^2, ∅21	TPE/TPE 7G4 + 4 x 1.5	15 m 25 m 35 m 50 m	SMG SFG	
Screened power supply cable	Screened cable, complete	3G3GC3G - F3 ∅17	3G3GC3G - F3 x 1AiC + 4G2.5	10 m 15 m 25 m 40 m	SMD	Contact Grundfos
	Screened cable, complete, cast in the cable entry	7 x 4 mm^2 + 4 x 1 mm^2, ∅22.5	S1BC4N8-F 7G4 + 4 x 1	10 m 15 m 25 m 35 m	SMG SFG	Contact Grundfos.
Biogas cable, complete, cast in the cable entry	Power supply cable Lapp Ölflex FD Robust	7 x 4 mm^2 + 4 x 1.5 mm^2, ∅21	TPE/TPE 7G4 + 4 x 1.5	10 m 15 m 25 m 35 m 50 m	SMG SFG	Contact Grundfos.
Sensors	Moisture switch				SMD 0.9 - 1.8	
	Leakage sensor				SMD 1.9 - 3.5	
Thermal protection	Mixers, standard with PTO		PTO or PTC, optional		SMD SMG	
	Flowmakers, standard with PTC				SFG	
Insulation	Insulation class H				SMD 0.9 - 1.8	
Coating						
Product coating	Motor/gear housing		Protection layer, different colours			Contact Grundfos.
Propeller coating	Epoxy or stainless-steel propellers		Protection layer, different colours	300 micron epoxy		
Tests						
Dry-testing motor certificate	Electrical and tightness					Contact Grundfos.
Production certificate	Certificate of compliance with EN 10204 2.1					Contact Grundfos.
Factory test certificate	Inspection and test certificate EN 10204 2.2					Contact Grundfos.
Material						
SMG propellers			Stainless steel	AISI 316		
Others						
Special package	Batch packaging, hard or soft box, etc.					Contact Grundfos.

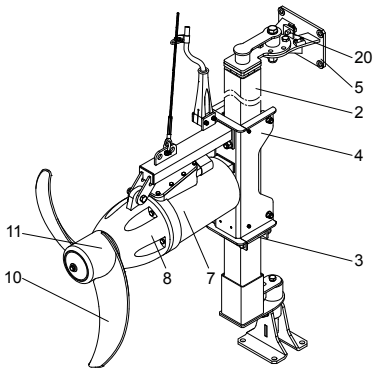
Special nameplate	Contact Grundfos.
Heavy-duty SMG mixers for special applications	Contact Grundfos.
Special brackets for refurbishment 50/50 (60/60) 70/70 (80/80) 100/100	Contact Grundfos.
Sacrificial anodes, different anode material, corrosion-protected	Contact Grundfos.

7. Construction

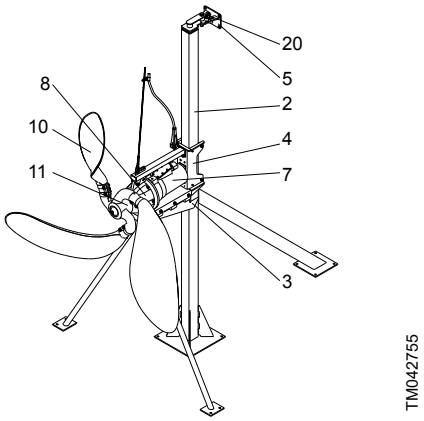
The position numbers in the following figures refer to the Material specification table.



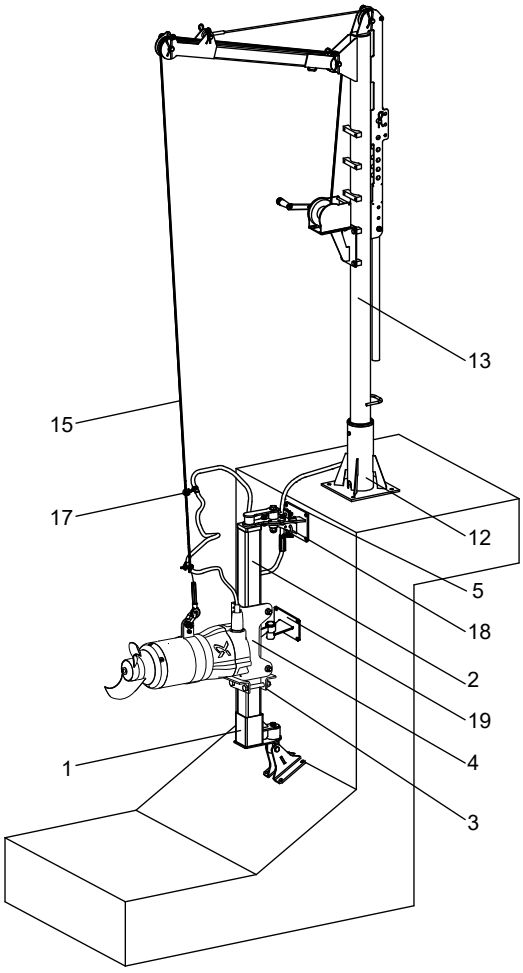
SMD mixer



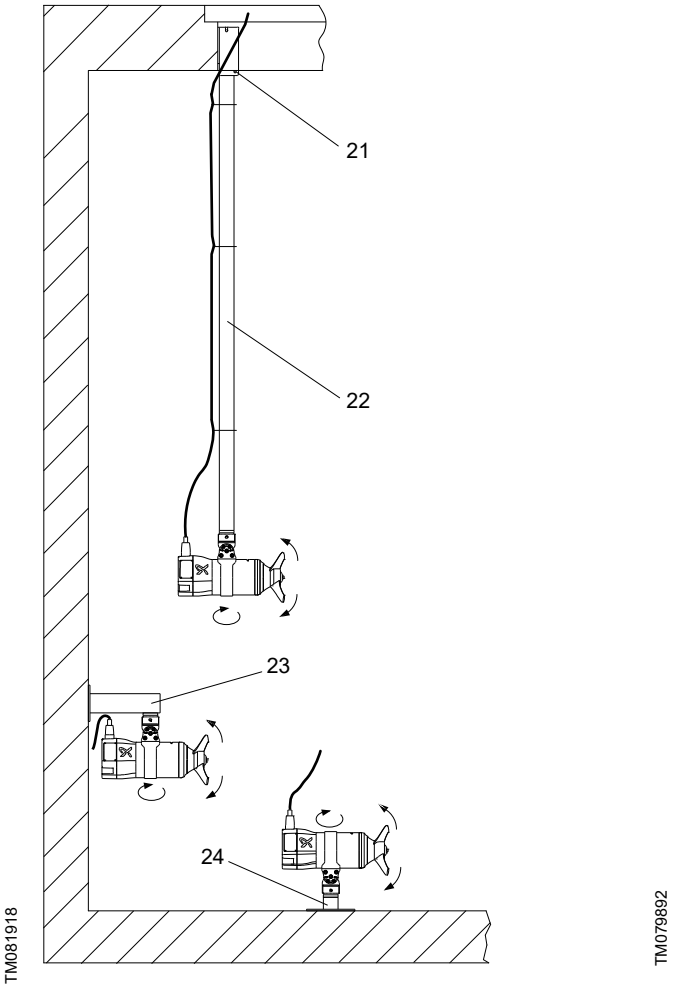
SMG mixer



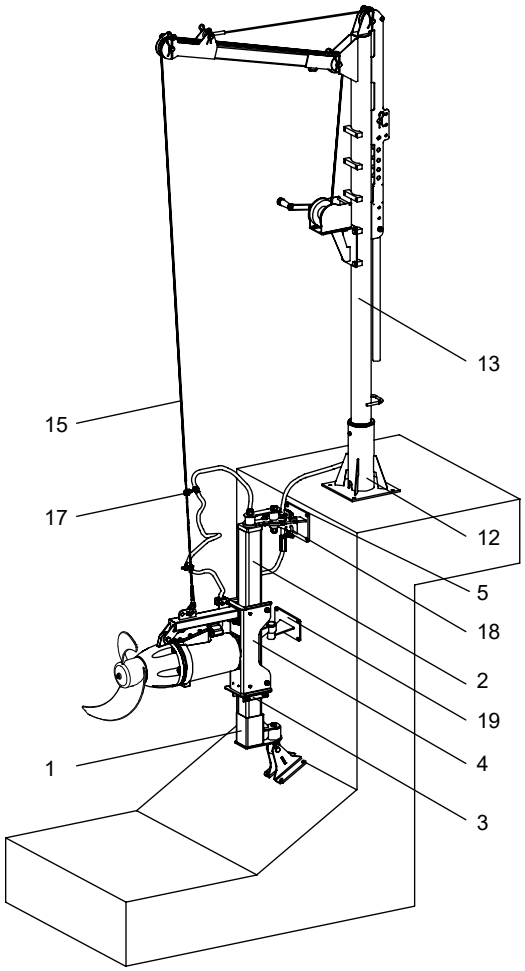
SFG flowmaker



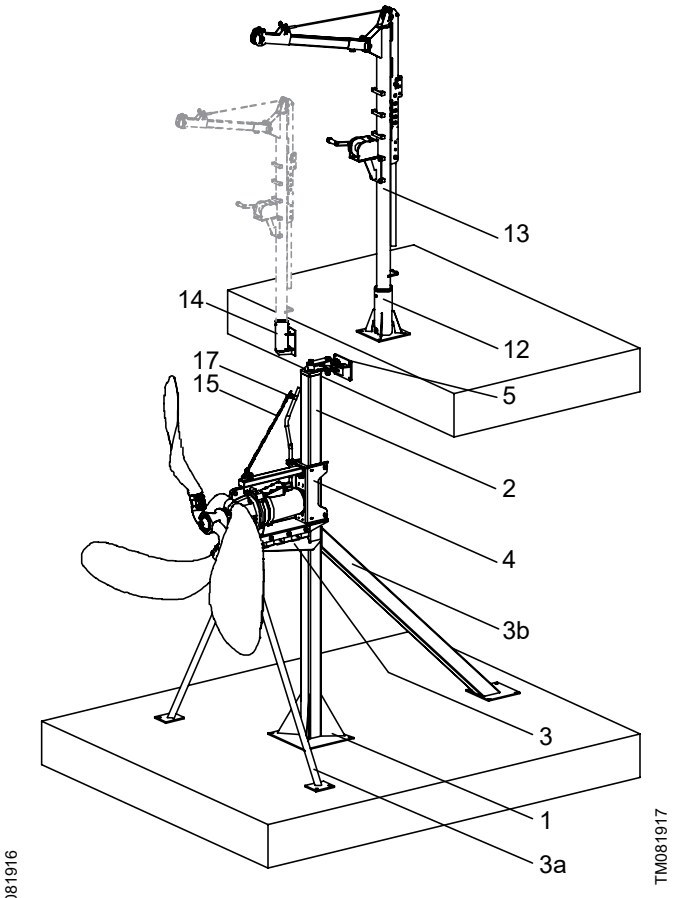
SMD mixer



SMD mixers, suspended, wall and floor mounting. See products with "T" in type description



Installation drawing, SMG mixer



Installation drawing, SFG flowmaker

Related information

7.1 Material specifications

7.1 Material specifications

The position numbers in the following table refer to the figures in Construction.

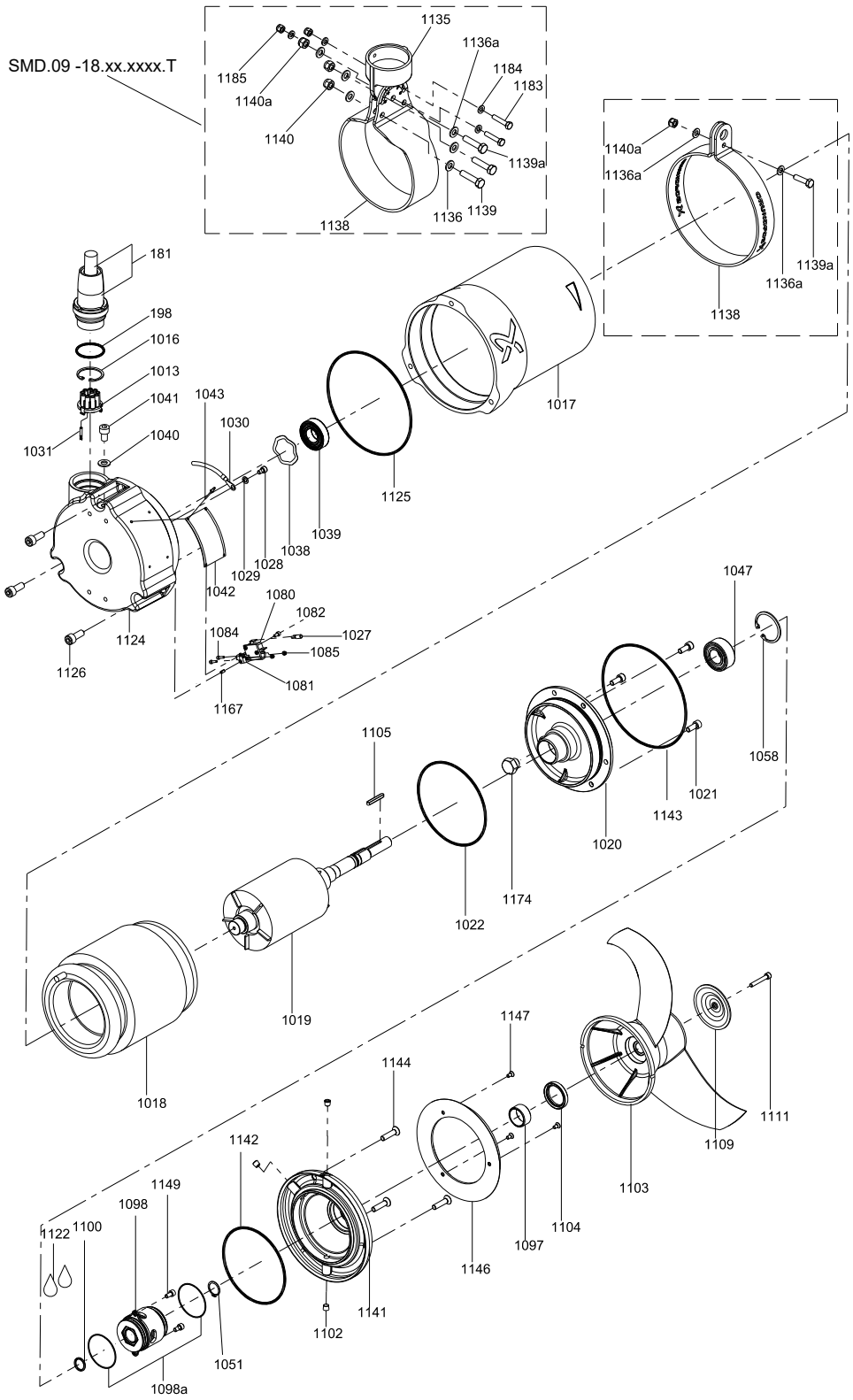
Pos.	Component	Material	DIN/ EN standard	AISI/ ASTM	Mixer/ flowmaker
1	Bottom fixation bracket/plate	Stainless steel	1.4301 1.4404	304 316 L	All types
2	Column profile				
3	Depth blocker				
3a	Front support leg	Stainless steel	1.4301 1.4404	304 316 L	SFG
3b	Back support leg				
4	Motor bracket	Stainless steel	1.4301 1.4404	304 316 L	All types
5	Top fixation bracket including safety wire	Stainless steel	1.4301 1.4404	304 316 L	All types
7	Motor housing	Cast iron, grade 25 (EN-GJL-250)	EN-JL1040		SMG and SFG
		Stainless steel, cast	1.4408	316	SMD
8	Gear housing	Cast iron, grade 25 (EN-GJL-250)	EN-JL1040		SMG and SFG
9	Lifting belt	Stainless steel	1.4404	316 L	SMD
10	Propeller	Stainless steel, propeller blades and hub cast in one piece	1.4408	316	SMD
		Stainless steel	1.4301	304	SMG
		Polyurethane resin with a stainless-steel (1.4301) core			SFG.xx.130.xx
		Polyurethane resin with cast-iron (EN-GJS-400-15) reinforcement	EN-JS1030		SFG.xx.150.xx SFG.xx.180.xx SFG.xx.230.xx SFG.xx.260.xx
11	Hub	Stainless steel, propeller blades and hub cast in one piece	1.4408	316	SMD
		Stainless steel	1.4301	304	SMG SFG.xx.130.xx SFG.xx.150.xx
		Cast iron (EN-GJS-400-15)	EN-JS1030		SFG.xx.180.xx SFG.xx.230.xx SFG.xx.260.xx
12	Crane foot		1.4301	304	All types
			1.4404	316 L	
			Galvanised steel		
13	Crane with winch		1.4301	304	All types
			1.4404	316 L	
			Galvanised steel		
14	Crane foot for vertical installation		1.4301	304	All types
			1.4404	316 L	
			Galvanised steel		
15	Lifting wire including wire clamp		1.4404	316 L	All types
17	Cable clamp		1.4404	316 L	All types
18	Cable sock including shackle	Polypropylene or stainless steel		- / 316 L	All types
19	Intermediate fixation bracket		1.4301 1.4404	304	All types
20	Wire clamp, included in pos. 5, top fixation		1.4301 1.4404	316 L	All types
21	Fixation bracket for suspended mounting	Stainless steel	1.4404	316 L	SMD
22	Tube for suspended mounting	Stainless steel	1.4404	316 L	SMD
23	Fixation bracket for wall mounting, 2"	Stainless steel	1.4404	316 L	SMD
24	Fixation base for floor mounting	Stainless steel	1.4404	316 L	SMD

Related information

7. Construction

7.2 Exploded views

7.2.1 SMD.09.xx to SMD.35.xx

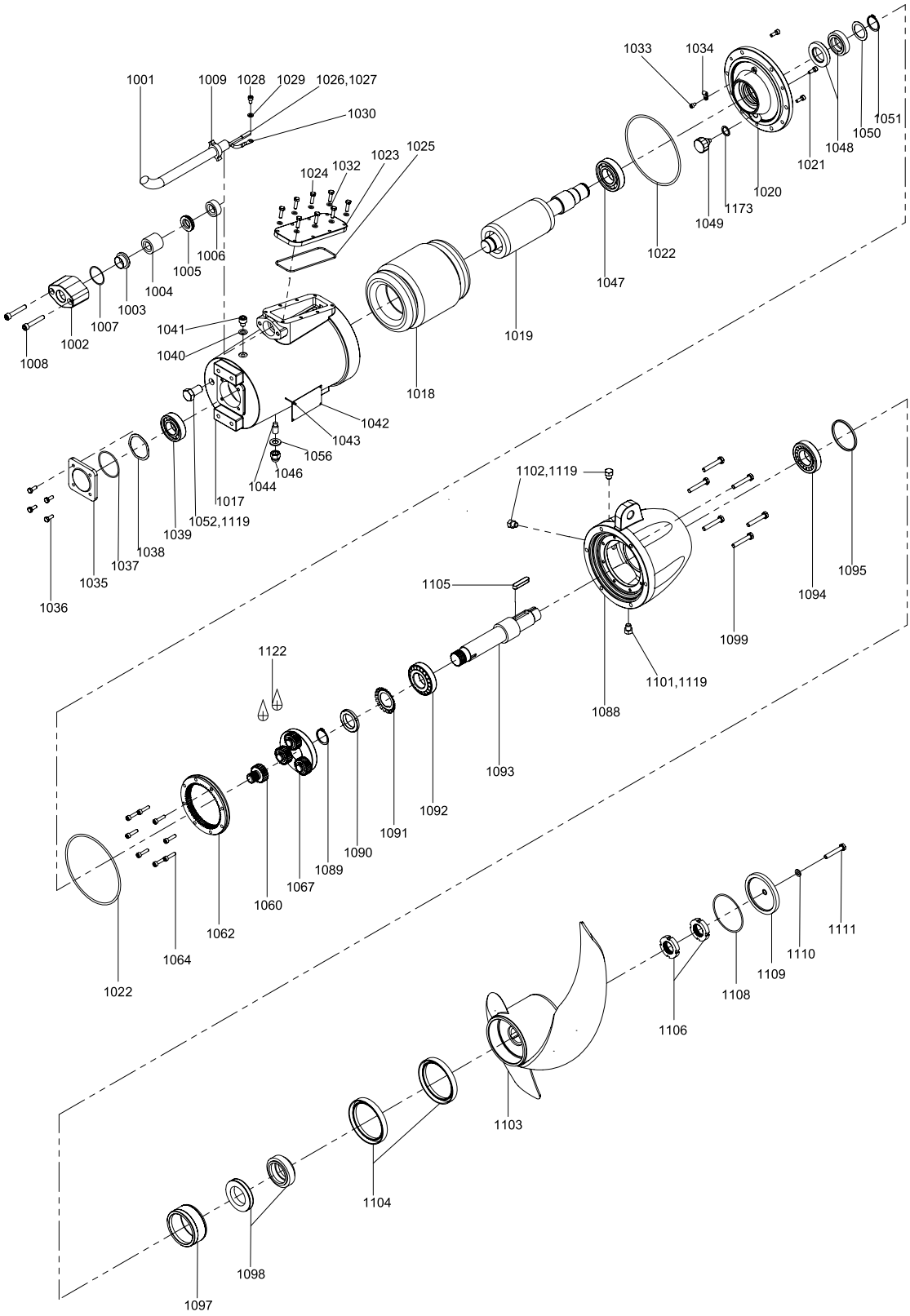


Exploded view, SMD.09.xx to SMD.35.xx

Related information

7.3 Position numbers and material specification

7.2.2 SMG.09.xx to SMG.40.xx

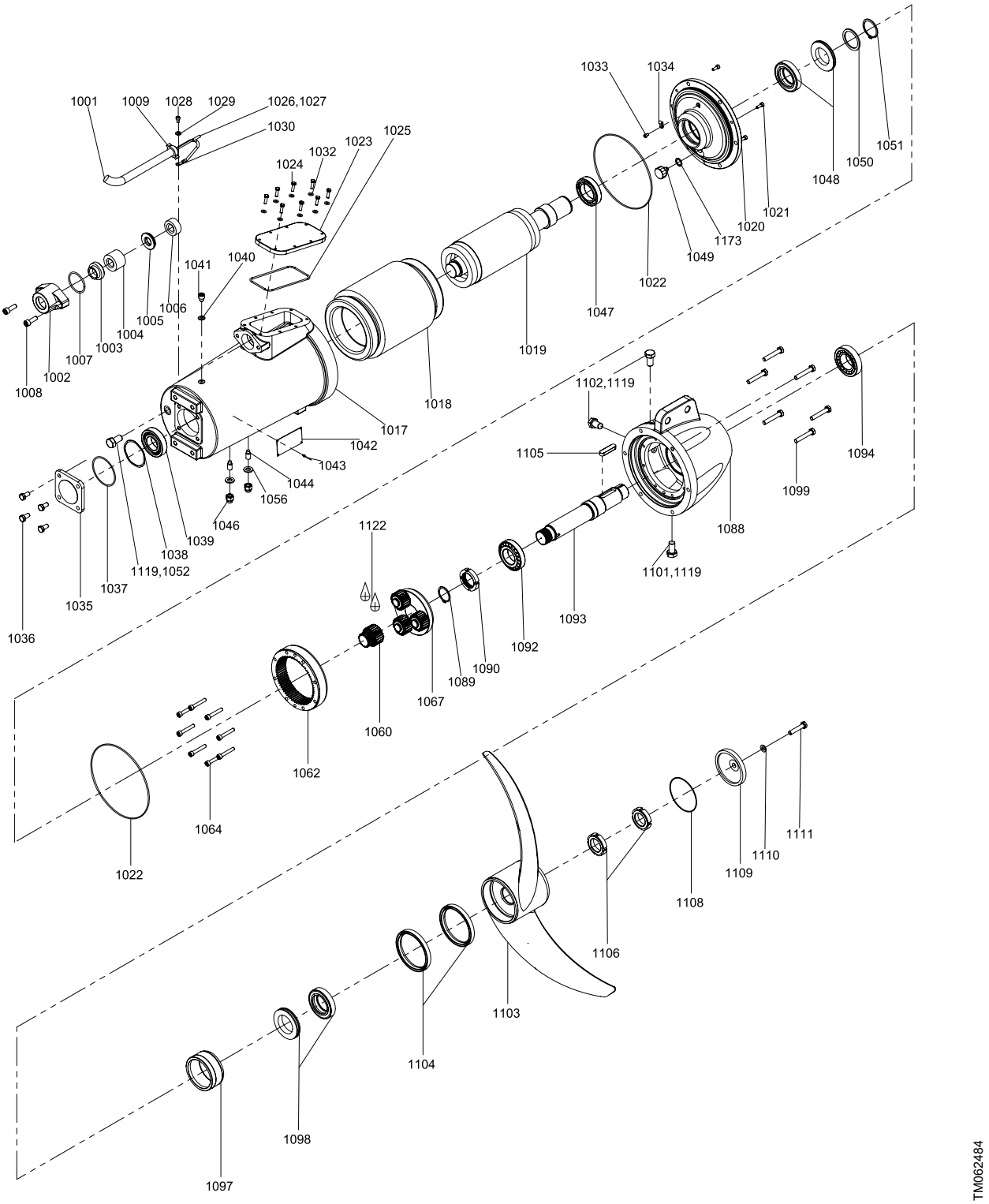


Exploded view, SMG.09.xx to SMG.40.xx

Related information

7.3 Position numbers and material specification

7.2.3 SMG.48.xx to SMG.120.xx

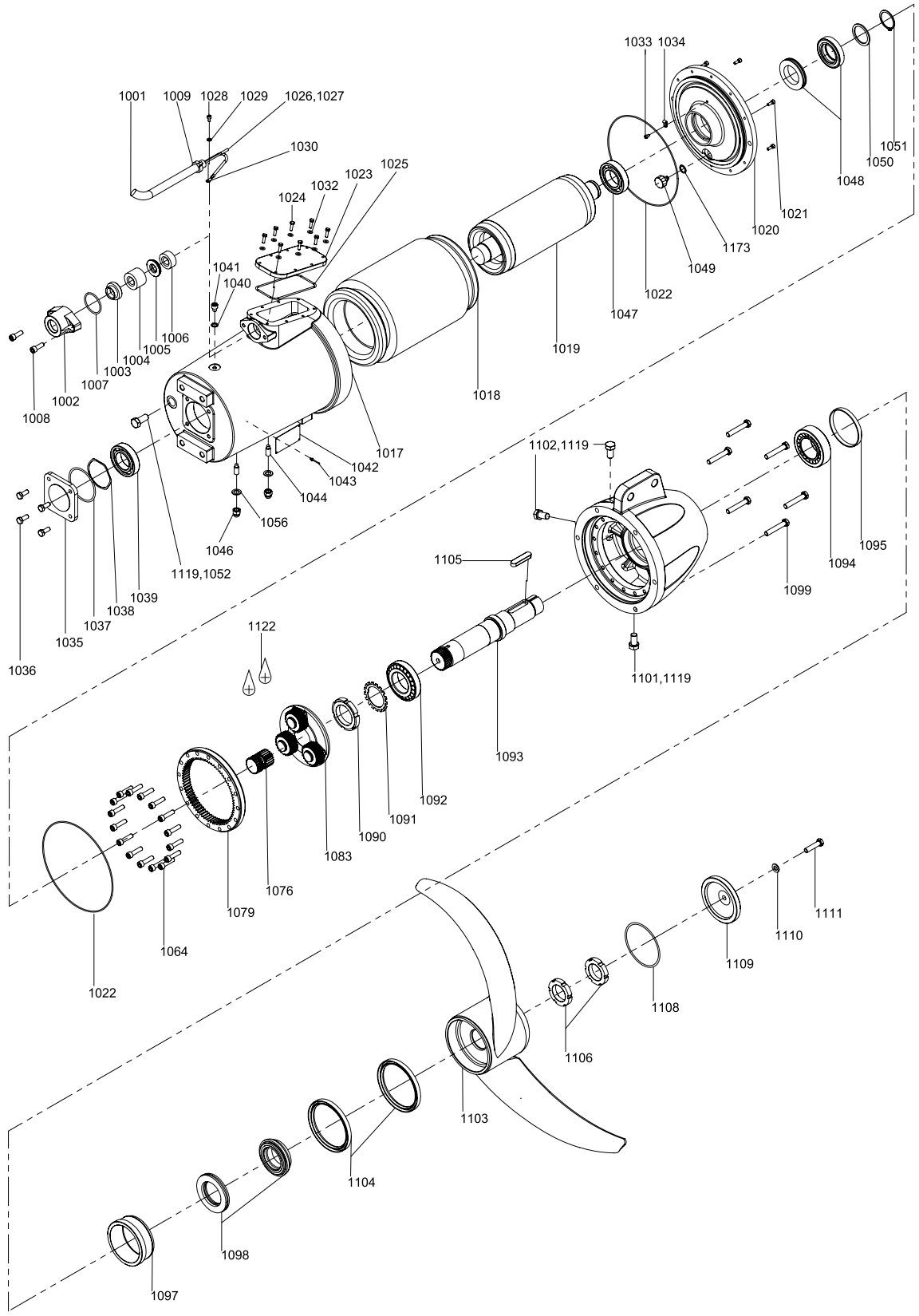


Exploded view, SMG.48.xx to SMG.120.xx

Related information

7.3 Position numbers and material specification

7.2.4 SMG.140.xx to SMG.180.xx

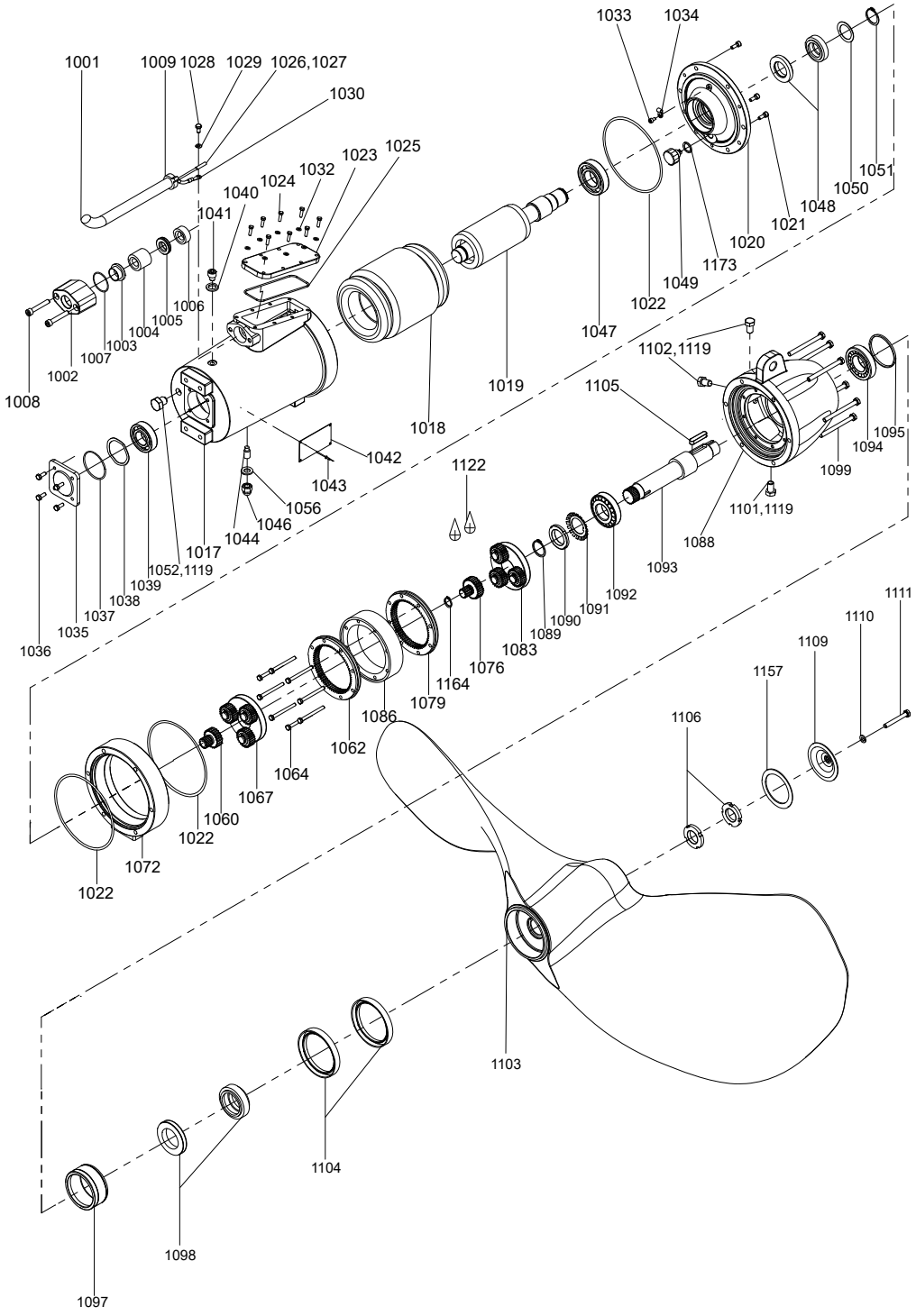


Exploded view, SMG.140.xx to SMG.180.xx

Related information

7.3 Position numbers and material specification

7.2.5 SFG.xx.130.xx

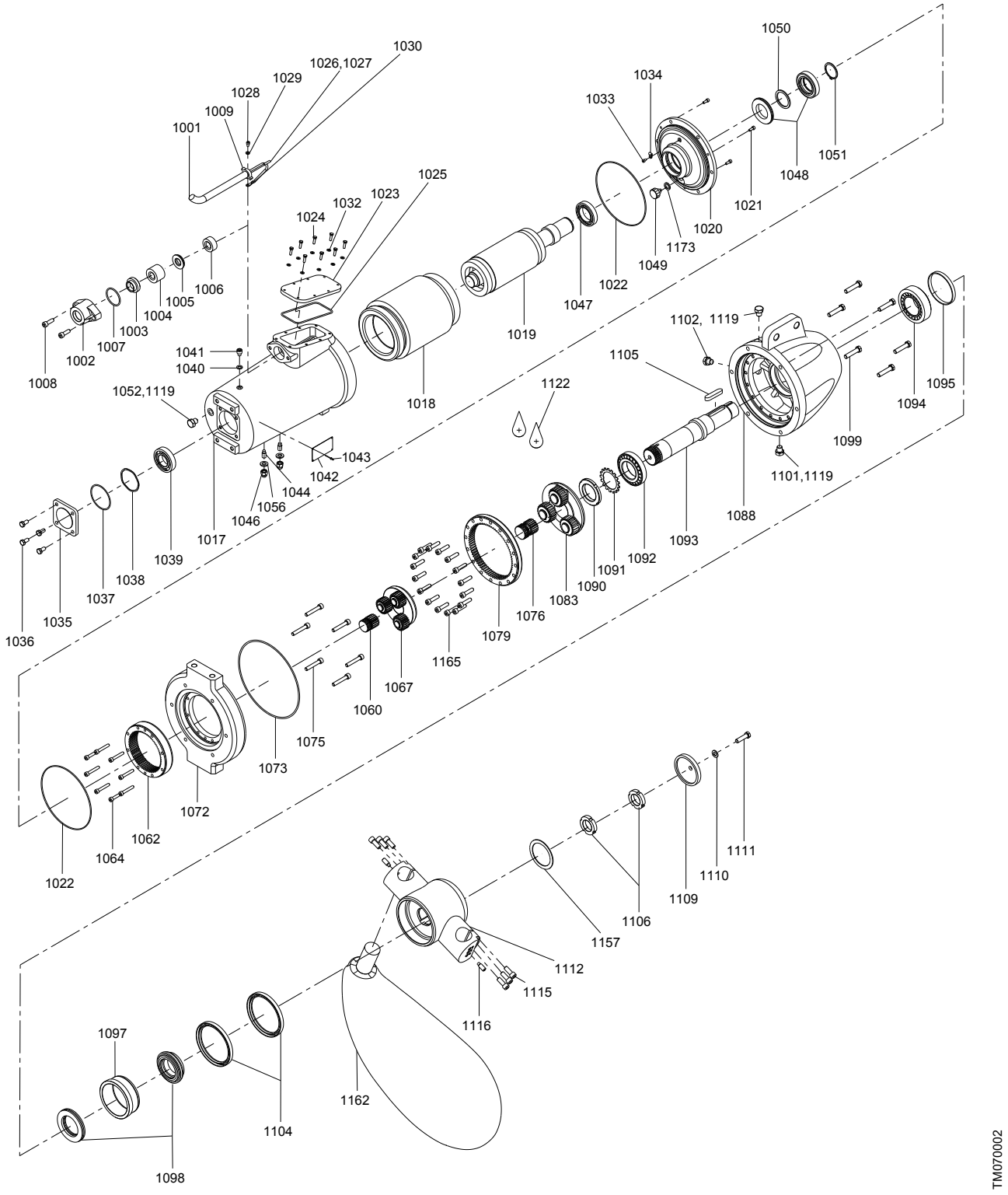


Exploded view, SFG.xx.130.xx

Related information

7.3 Position numbers and material specification

7.2.6 SFG.xx.150.xx

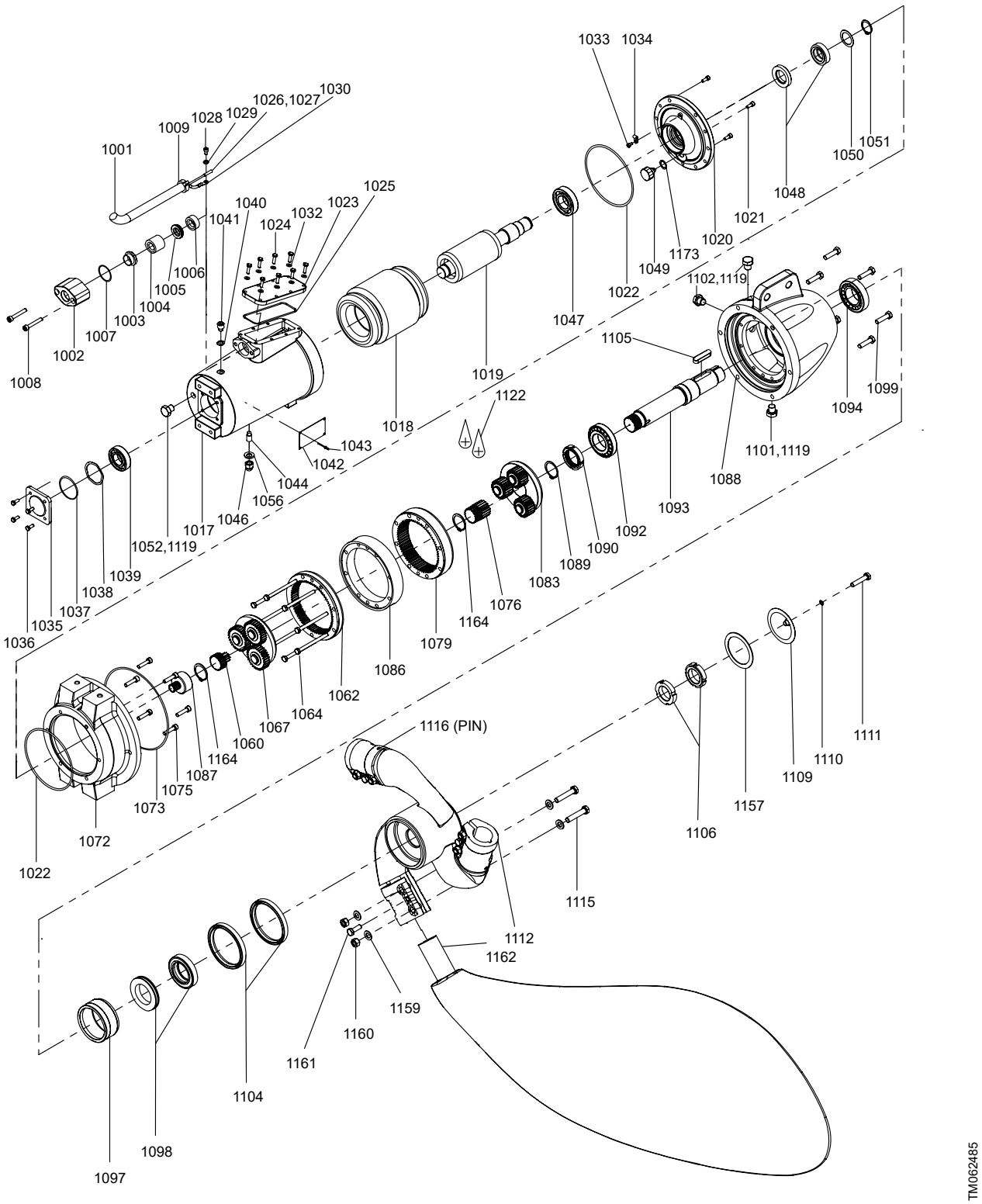


Exploded view, SFG.xx.150.xx

Related information

7.3 Position numbers and material specification

7.2.7 SFG.xx.180.xx and SFG.xx.230.xx

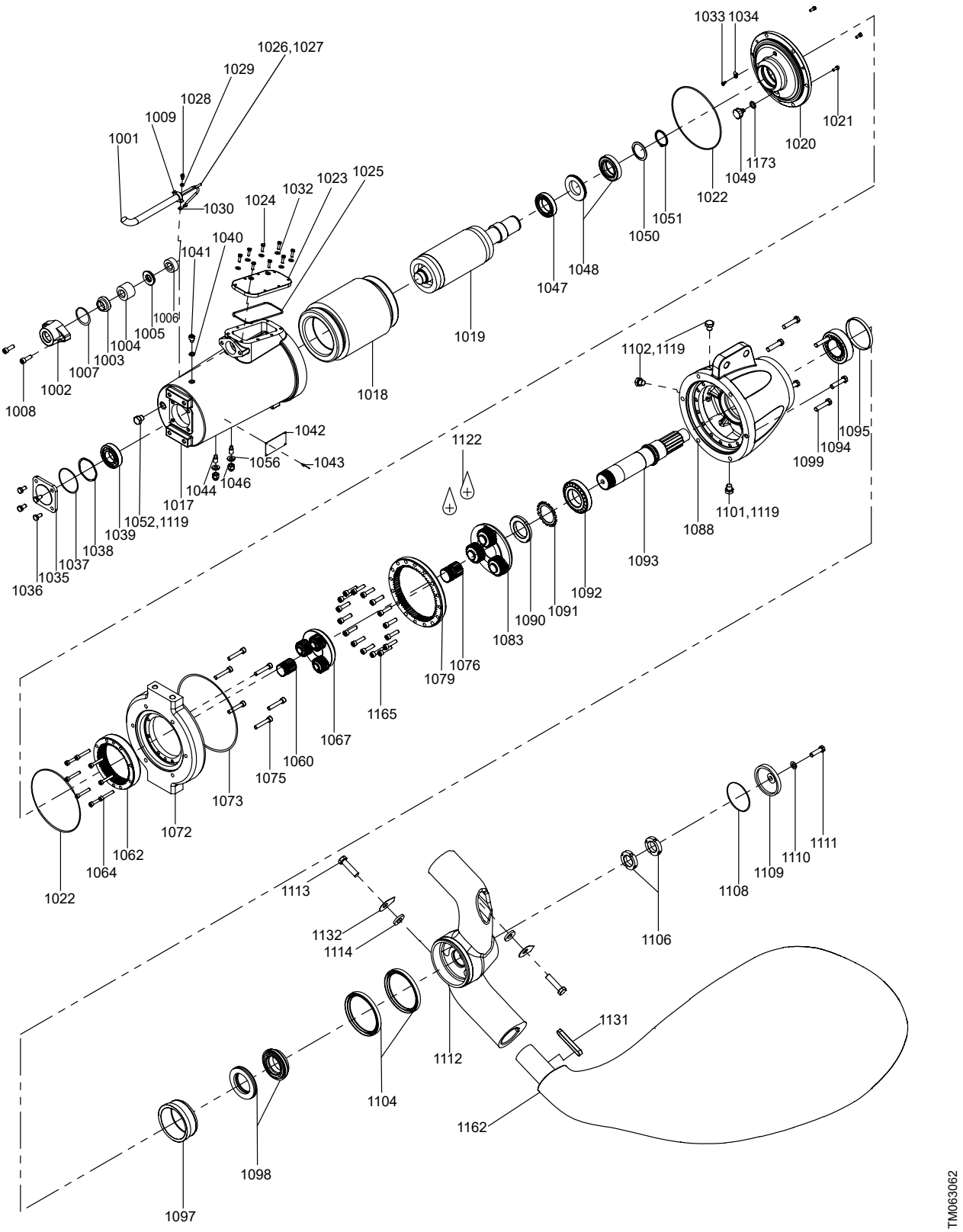


Exploded view, SFG.xx.180.xx and SFG.xx.230.xx

Related information

7.3 Position numbers and material specification

7.2.8 SFG.xx.260.xx



Exploded view, SFG.xx.260.xx

Related information

7.3 Position numbers and material specification

7.3 Position numbers and material specification

The position numbers in the following table refer to the figures Exploded views.

Pos.	Component	Material
181	Cable with female plug connector	-
198	O-ring	NBR
1002	Cable flange	EN-GJL250/DIN 1.4404
1003	Cable guide	DIN 1.4301
1004	Cable seal, large	Elastomer (70 Shore hardness)
1005	Thrust washer	DIN 1.4301
1006	Cable seal, small	Elastomer (70 Shore hardness)
1007	O-ring	NBR
1008	Screw	DIN 1.4301/DIN 1.4401
1009	Cable relief	Zinc-plated steel
1013	Male plug connector	PTE
1016	Circlip	DIN 1.4301
1017	Motor housing	EN-GJL250/DIN 1.4408
1018	Stator	Treated sheet metal/copper
1019	Rotor with shaft	Treated sheet metal/aluminium
1020	Motor flange	EN-GJL250/1.4408
1021	Screw	Zinc-plated steel
1022	O-ring	NBR
1023	Terminal box cover	EN-GJL250
1024	Screw	DIN 1.4301
1025	O-ring	NBR
1026	Cable joint	Tin-plated copper, PA-insulated
1027	Cable joint	Tin-plated copper, PA-insulated
1028	Screw	Zinc-plated steel/DIN 1.4401
1029	Lock washer	Zinc-plated spring steel/DIN 1.4401
1030	Cable shoe	Tin-plated copper
1031	Connector pin	Tin-plated copper
1032	Washer	
1033	Screw	Zinc-plated steel
1034	Cable clamp	
1035	Bearing cover	EN-GJL250
1036	Screw	DIN 1.4301
1037	O-ring	NBR
1038	Compensation disc	DIN 1.0605
1039	Ball bearing	-
1040	U-washer	Copper
1041	Screw	DIN 1.4301
1042	Nameplate	DIN 1.4301
1043	Rivet	DIN 1.4301 (INOX/INOX)
1044	Set screw	Zinc-plated steel/DIN 1.4401
1045	Spring washer	Zinc-plated spring steel
1046	Nut	DIN 1.4301/DIN 1.4401
1047	Ball bearing	-
1048	Mechanical shaft seal	Carbon/Alox/NBR
1049	Water-in-oil sensor	Brass/epoxy resin
1050	Shim	Bright steel
1051	Circlip	Spring steel (DIN 1.7222)
1052	Plug	Brass (DIN 2.0220)
1053	Connection for protective earthing	Nickel-plated brass
1056	Seal washer	Copper
1058	Circlip	DIN 1.4301
1060	Sun wheel	34CrMo4V (DIN 1.7220)
1062	Ring gear	34CrMo4V (DIN 1.7220)
1064	Screw	Zinc-plated steel
1067	Planet gear, complete	Ck45N/34CrMo4V
1068	Planet pin	Ck45N (DIN 1.1191)
1069	Cover	Ck45N (DIN 1.1191)
1071	O-ring	NBR
1072	Housing	EN-GJL250
1073	O-ring	NBR
1075	Screw	Zinc-plated steel
1076	Sun wheel	34CrMo4V (DIN 1.7220)
1079	Ring gear	34CrMo4V (DIN 1.7220)
1080	Moisture switch	
1081	Bracket, moisture switch	DIN 1.4301
1082	Screw	DIN 1.4301
1083	Planet gear, complete	Ck45N/34CrMo4V
1084	Screw	DIN 1.4301
1085	Lock nut	DIN 1.4401
1086	Distance piece	34CrMo4V (DIN 1.7220)
1087	Gear coupling	20MnCr5/18NiCrMo5
1088	Gear housing	EN-GJL250
1089	Circlip	Spring steel (DIN 1.7222)
1090	Slotted nut	Bright steel
1091	Lock washer	Bright steel
1092	Tapered roller bearing	
1093	Gear shaft	16CrNi4 (DIN 1.5713)
1094	Tapered roller bearing	
1095	Intermediate ring	DIN 1.0570
1097	Wear ring	DIN 1.4301/ceramic
1098	Mechanical shaft seal	Tungsten carbide/SiC-SiC
1098a	O-ring	NBR
1099	Screw	DIN 1.4301
1100	O-ring	NBR
1101	Drain plug with magnet	Brass (DIN 2.0220)
1102	Plug	Brass (DIN 2.0220)
1103	Propeller	DIN 1.4301/DIN 1.4404/1.4408/PU
1104	Lip seal	FKM/NBR
1105	Parallel key	Ck45/1.4401
1106	Slotted nut	Bright steel
1108	O-ring	NBR
1109	Hub cover	EN-GJL250/DIN 1.4404/POM
1110	Washer	Brass, DIN 2.0220
1111	Screw	DIN 1.4301/DIN 1.4401
1112	Hub	EN-GJS-400-15
		EN 1.4301 (only for SFG.xx.150)
1113	Screw	DIN 1.4301
1114	Washer	DIN 1.4301
1115	Screw	A4-80 (DIN 1.4404)
1116	Grooved pin	Bright steel
1117	Nut	DIN 1.4401
1118	Lock washer	DIN 1.4401

Pos.	Component	Material
1119	PTFE tape	PTFE
1120	Screw-sealing paste	
1121	Sealing paste, Curil K2	
1122	Gear oil	ISO VG 68/220
1124	End cover	DIN 1.4408
1125	O-ring	NBR
1126	Screw	DIN 1.4404
1131	Fit-in key	Ck45
1132	Blinds	DIN 1.4301
1133	Screw	DIN 1.4401
1135	Mounting device	1.4408
1136	Washer	DIN 1.4401
1136a	Washer	DIN 1.4401
1138	Clamping ring	DIN 1.4401
1139	Screw	DIN 1.4401
1139a	Screw	DIN 1.4401
1140	Lock nut	DIN 1.4401
1140a	Lock nut	DIN 1.4401
1141	Sealing flange	DIN 1.4408
1142	O-ring	NBR
1143	O-ring	NBR
1144	Countersunk screw	DIN 1.4401
1146	Wear ring	DIN 1.4408
1147	Countersunk screw	DIN 1.4401
1149	Screw	DIN 1.4301
1157	Gasket	NBR 70
1158	Nut	Zinc-plated steel
1159	Washer	DIN 1.4401
1160	Nut	DIN 1.4401
1161	Screw	DIN 1.4401
1162	Propeller blade	Polyurethane resin/EN-GJS-400-15
1164	Circlip	Spring steel (DIN 1.7222)
1165	Screw	Zinc-plated steel
1167	Spring pin	DIN 1.4301
1173	Seal washer	Copper
1174	Plug	Brass (DIN 2.0220)
1183	Hexagon head screw	DIN 1.4401
1184	Washer	DIN 1.4401
1185	Locknut	DIN 1.4401

Related information

7.2 Exploded views

8. Positioning

8.1 Introduction

Correct positioning of mixers and flowmakers in the tanks of a wastewater treatment plant is extremely important to ensure high operational efficiency of the treatment process, the best possible equipment performance and long equipment life. The quality of even the best mixer or flowmaker may easily decrease due to wrong positioning. The positioning rules described in this section do not cover all installation possibilities. If you have any questions regarding the positioning of mixers or flowmakers at a specific site, contact Grundfos.

When positioning mixers and flowmakers, observe the rules concerning minimum rear and sidewall clearance and minimum distance from the tank bottom and other obstacles. Otherwise, the mixer, flowmaker or other equipment may be damaged.

8.2 Mixers

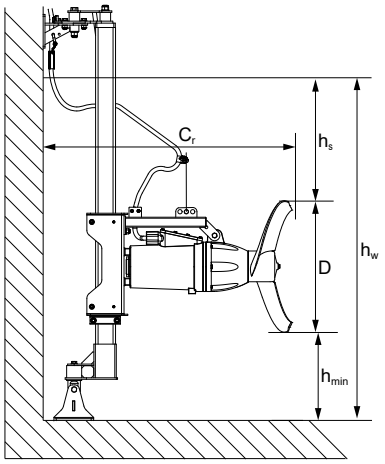
8.2.1 Positioning in general

Figures Schematic drawing of positioning of mixers to Schematic drawing of floor positioning of mixers with vortex shield show the general positioning of mixers. Explanation of variables:

h_{min}:	minimum distance between tank bottom and propeller tip
h_s:	minimum distance between propeller tip and water surface
h_w:	water depth
D:	propeller diameter
C_r:	minimum distance between propeller tip and rear wall
h_v:	minimum distance centre of propeller and water surface

Make sure to fulfil the following requirements:

h_{min}	≥	0.5 x D
	≥	100 mm (SMD with vortex shield)
h_s	≥	1.0 x D (SMG)
	≥	1.5 x D (SMD)
h_w	≥	2.5 x D (SMG)
	≥	3.0 x D (SMD)
C_r	≥	1.4 x D
h_v	≥	200 mm (SMD.09-18)
	≥	300 mm (SMD.19-35)



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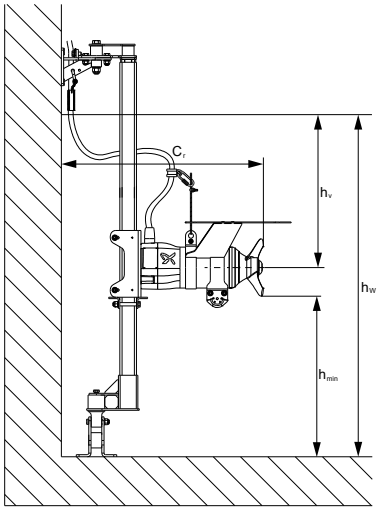
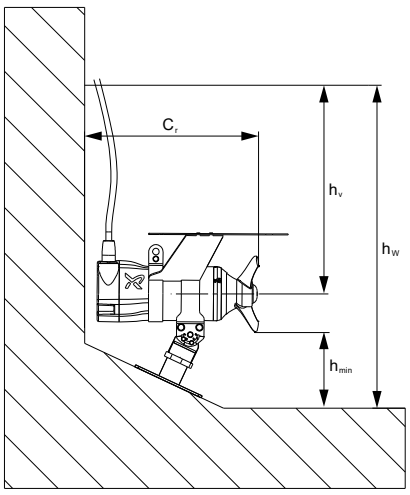
Schematic drawing of positioning of mixers



TM068440

Schematic drawing of column profile positioning of mixers with vortex shield



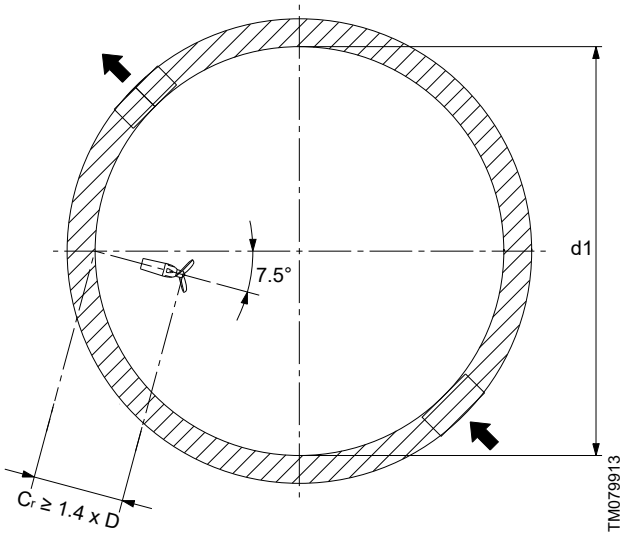
TM068441

Schematic drawing of floor positioning of mixers with vortex shield

8.2.2 Positioning of one mixer in a circular tank

The positioning rules shown in figs Mixing of liquid to prevent solids from settling and Vortex circulation of liquid also apply to flowmakers.

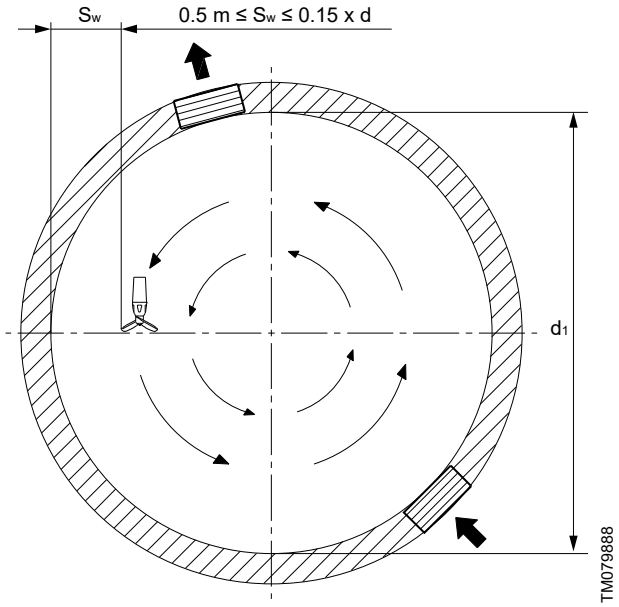
The mixer must be positioned as shown in fig. Mixing of liquid to prevent solids from settling. This is done to ensure full effect and to create velocities that are distributed as evenly as possible. Settling is thus prevented as solids are mixed with the liquid.



Mixing of liquid to prevent solids from settling

If liquid circulation is required, the mixer must be positioned as shown in fig. Vortex circulation of liquid.

Be aware that possible vortex formation at the centre of the tank may cause central bottom settling.



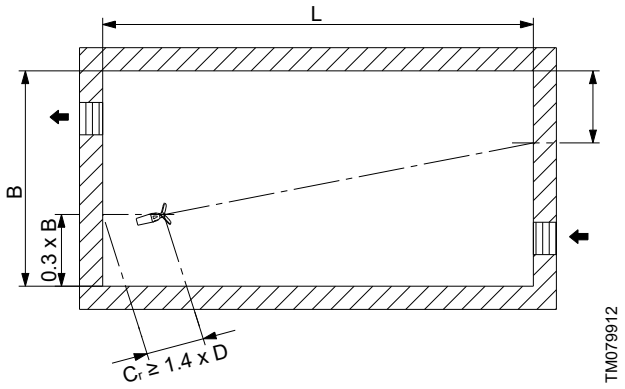
Vortex circulation of liquid

8.2.3 Positioning of one mixer in a rectangular tank

The positioning of a mixer in a rectangular tank depends on the ratio between the length (L) and width (B) of the tank ("tank ratio"). This will ensure full effect and create velocities that are distributed as evenly as possible. Settling is thus prevented as solids are mixed with the liquid.

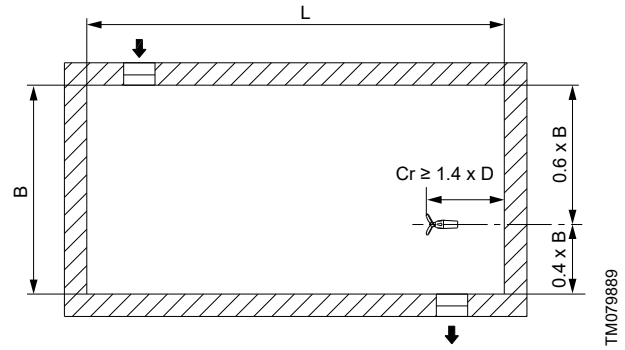
The positioning rules shown in figs Positioning of one mixer if the ratio is 1.5 < L/B ≤ 2.5 and Positioning of one mixer if the ratio is 1 < L/B ≤ 2 also apply to flowmakers.

If the tank ratio is 1.5 < L/B ≤ 2.5, the mixer must be positioned as shown in fig. Positioning of one mixer if the ratio is 1.5 < L/B ≤ 2.5.



Positioning of one mixer if the ratio is 1.5 < L/B ≤ 2.5

If the tank ratio is 1 < L/B ≤ 2, the mixer must be positioned as shown in fig. Positioning of one mixer if the ratio is 1 < L/B ≤ 2.



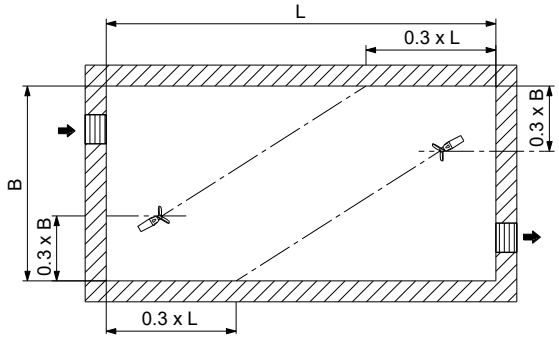
Positioning of one mixer if the ratio is 1 < L/B ≤ 2

8.2.4 Positioning of two mixers in a rectangular tank

Use this method if two mixers are required in an installation.

The positioning rules shown in fig. Positioning of two mixers if tank ratio is 1.5 < L/B ≤ 2.5 also apply to flowmakers.

If the tank ratio is 1.5 < L/B ≤ 2.5, the mixers must be positioned as shown in fig. Positioning of two mixers if tank ratio is 1.5 < L/B ≤ 2.5.

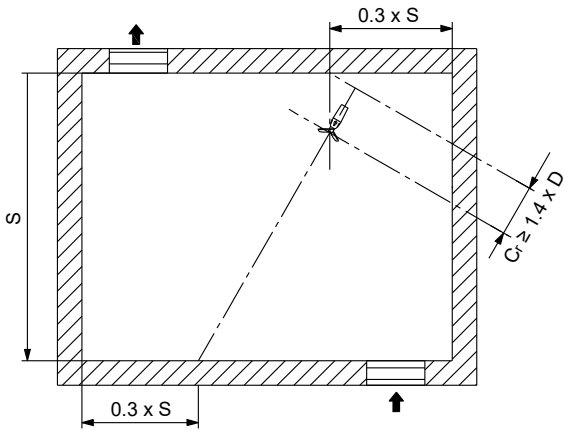


Positioning of two mixers if tank ratio is 1.5 < L/B ≤ 2.5

8.2.5 Positioning of one mixer in a square tank

In square tanks, all four sides (S) have the same length.

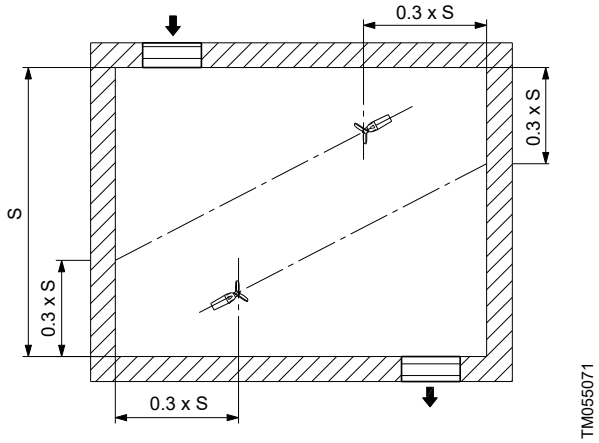
In square tanks, the mixer must be positioned as shown in fig. Positioning of one mixer in a square tank.



Positioning of one mixer in a square tank

8.2.6 Positioning of two mixers in a square tank

In square tanks, the mixers must be positioned as shown in fig. Positioning of two mixers in a square tank.



Positioning of two mixers in a square tank

8.2.7 Positioning of one mixer in a deep tank

30-30 ° adapter

30-30 ° adapters are available for the SMG mixers. Use the adapters to angle the mixer upwards or downwards from -30 to +30 ° in steps of 5 ° for SMG.

Definition of "deep tank"

Circular tank:

- $h_w \geq d$ (tank diameter)

Square tank:

- $h_w \geq S$ (tank side size)

Rectangular tank:

- $h_w \geq L$ (tank length)

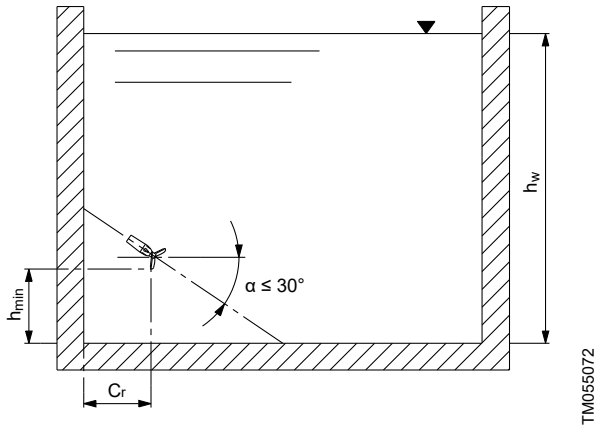
Positioning of one mixer in a deep tank

Mixer pointing downwards, fig. Mixer pointing downwards

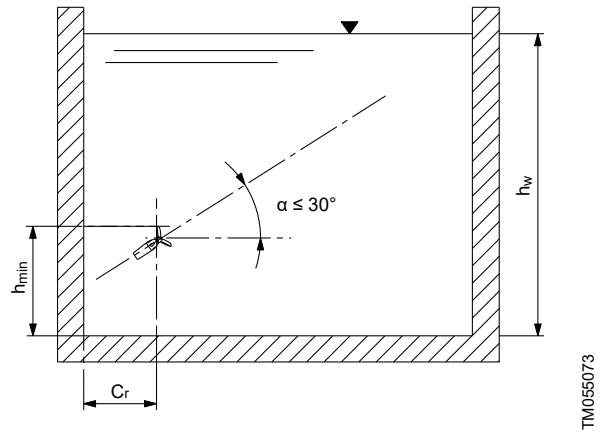
- $0.2 \times h_w \leq h_{min} \leq 0.3 \times h_w$

Mixer pointing upwards, fig. Mixer pointing upwards

- $0.3 \times h_w \leq h_{min} \leq 0.5 \times h_w$.



Mixer pointing downwards



Mixer pointing upwards

8.3 Flowmakers

8.3.1 Positioning in general

Figure Schematic drawing of positioning of flowmakers shows the general positioning of flowmakers.

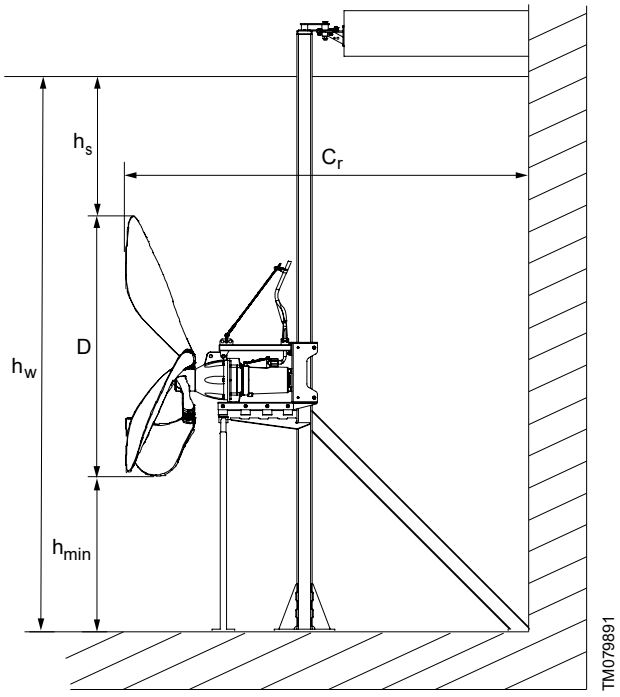
Explanation of variables

h_{min}:	minimum distance between tank bottom and propeller tip
h_s:	minimum distance between propeller tip and water surface
h_w:	water depth
D:	propeller diameter
C_r:	minimum distance between propeller tip and rear wall

Make sure to fulfil the following requirements:

h_{min}	≥	0.5 m
h_s	≥	0.75 x D
h_w	≥	0.5 m + 1.75 x D
C_r	≥	2 x D

Normally, flowmakers must be installed on a bridge or platform to obtain the required distance to the wall, C_r.



Schematic drawing of positioning of flowmakers

For positioning of flowmakers in circular, rectangular and square tanks, see positioning requirements for mixers on figures Positioning of one mixer in a circular tank to Positioning of two mixers in a square tank.

Related information

8.2.2 Positioning of one mixer in a circular tank

8.2.6 Positioning of two mixers in a square tank

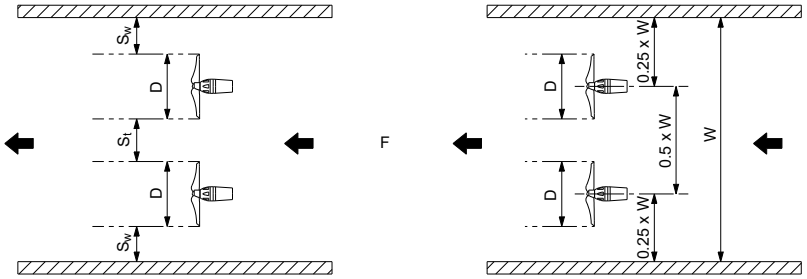
8.3.2 Positioning of two or more flowmakers in parallel in a channel

Positioning must be carried out according to fig. Positioning of two or more flowmakers in parallel in a channel.
Explanation of variables:

- S_w: minimum distance between propeller tip and channel wall
- S_t: minimum distance between contiguous propeller tips

The following requirements must be met:

- $S_w \geq 0.5$ m
- $S_t \geq 0.5 \times D$



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Positioning of two or more flowmakers in parallel in a channel

Pos.	Description
F	Flow direction

8.3.3 Positioning of flowmakers in aerated and non-aerated racetrack tanks

When installing flowmakers in racetrack tanks with channels with or without diffusers, observe the requirements shown in fig. Schematic drawing of positioning of flowmakers in a racetrack tank. This is essential to avoid damage to the flowmakers and installation equipment caused by uneven velocities, turbulence and backflow. Install the flowmakers with sufficient distance from bends and obstacles in the tank.

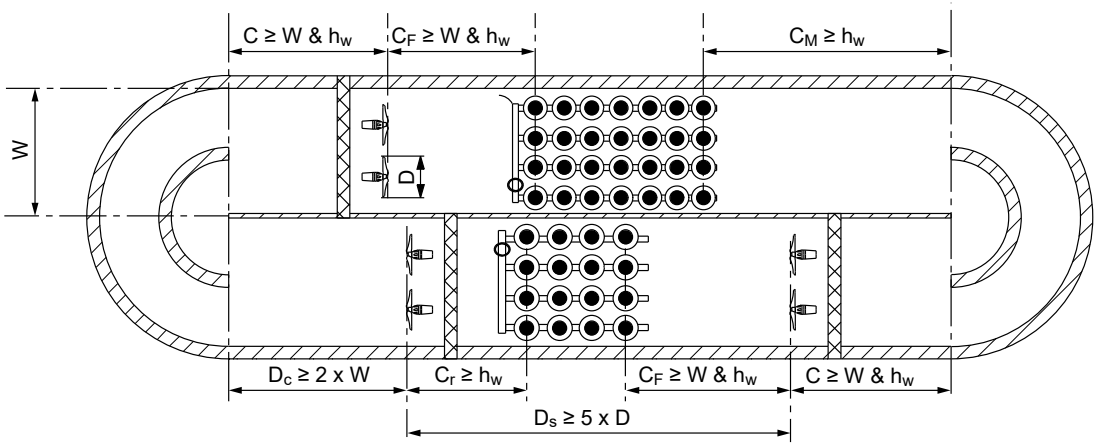
The positioning requirements described for racetrack tanks also apply to serpentine tanks.

The requirements below take the flow direction into account:

- Clearance requirement (C) between flowmakers and the end of the bend: $C \geq W$ or h_w. W is the channel width, and h_w is the water depth. Use the larger value of the two.
- Clearance (C_F) between flowmakers and the first row of diffusers: $C_F \geq W$ or h_w. Use the larger value of the two.
- Minimum applicable distance (C_M) between the last row of diffusers and the beginning of the following bend: $C_M \geq h_w$.
- Clearance requirement (C_r) between flowmakers and the last row of diffusers, if any: $C_r \geq h_w$.

Explanation of variables:

D:	propeller diameter
D_s:	minimum front clearance between propeller tip and the next propeller tip if there are no other obstacles between the propellers
D_c:	minimum clearance between propeller and bend
h_w:	channel depth



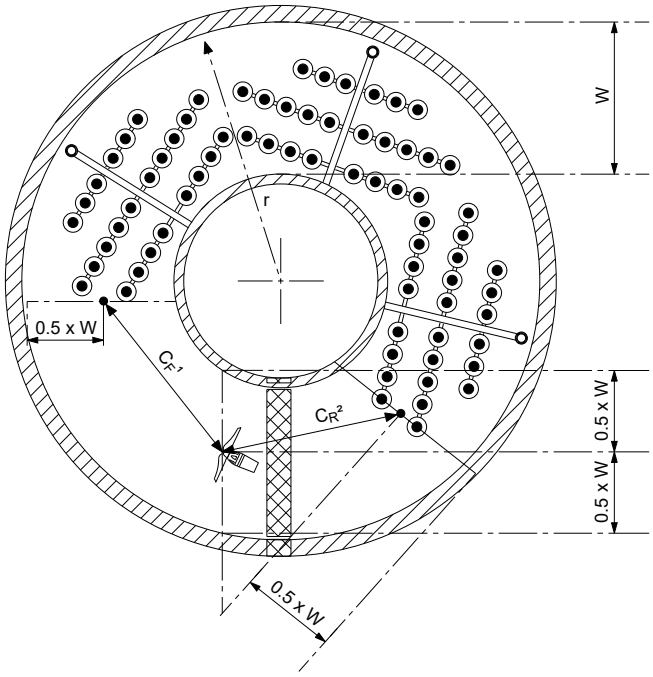
Schematic drawing of positioning of flowmakers in a racetrack tank

8.3.4 Positioning of flowmakers in aerated and non-aerated ring-channel tanks

When installing flowmakers in a ring-channel tank with or without diffusers, observe the requirements shown in figs One flowmaker in a ring-channel tank and Two flowmakers in a ring-channel tank. Take the channel width and ring curvature into account when positioning the flowmaker to obtain satisfactory development of the flow and minimise velocity losses due to impact with the channel walls.

The requirements below take the flow direction into account:

- Clearance (C_F) of the propeller closest to the first row of diffusers, measured as shown in fig. One flowmaker in a ring-channel tank: $C_F \geq W$ or h_w. W is the channel width, and h_w is the water depth. Use the larger value of the two.
- Clearance requirement (C_R) from the propeller closest to the last row of diffusers: $C_R \geq h_w$.
- If only one flowmaker is to be installed (fig. One flowmaker in a ring-channel tank), install it at the centre of the tank width (0.5 x W). The centre line must be inclined towards the centre of the tank at an angle of 7.5 ° - 22.5 °.

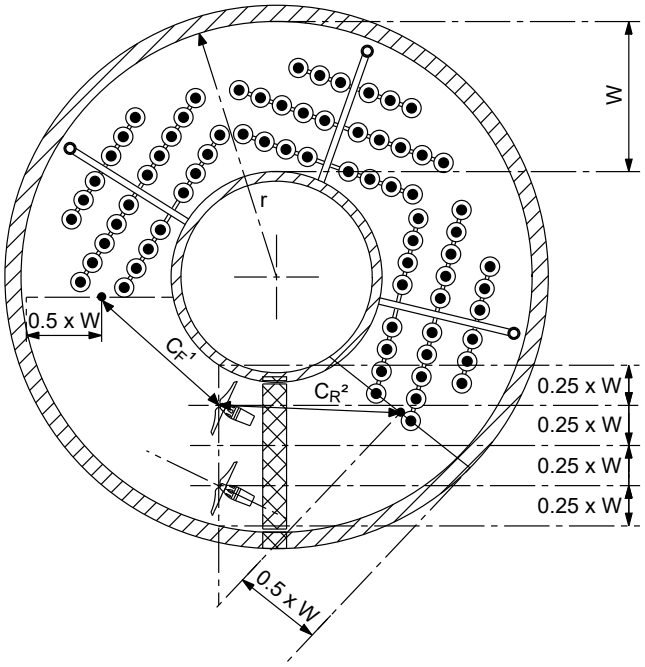


One flowmaker in a ring-channel tank

$C_F{}^1$: $C_F \geq W$ and h_W

C_R2: $C_R \geq h_W$

- If two flowmakers are to be installed (fig. Two flowmakers in a ring-channel tank), divide the tank width in two, and install each flowmaker at the centre of each half of the width (0.25 x W). The centre line must be inclined towards the centre of the tank at an angle of 7.5 ° - 22.5 °.



Two flowmakers in a ring-channel tank

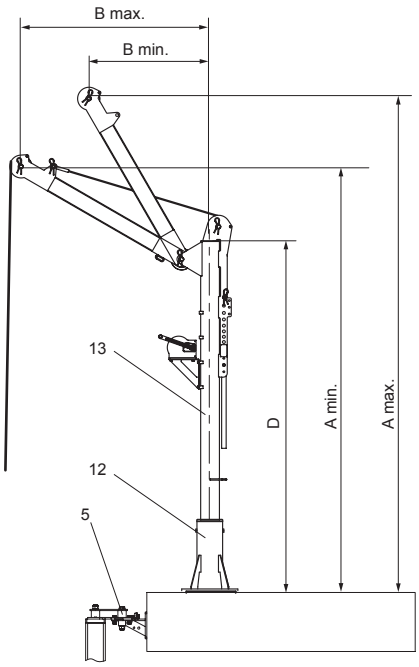
C_F1: $C_F \geq W$ and h_W

C_R2: $C_R \geq h_W$

9. Installation

9.1 Crane

To select the right size of crane for a specific mixer or flowmaker, see Selection guide for accessories. The crane can easily be lifted off the crane foot (12) if it is needed for another mixer or flowmaker installation.



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Crane

Crane type	A min. [mm]	A max. [mm]	B min. [mm]	B max. [mm]	D [mm]
S	2255	2911	405	1005	2130
M	2838	3521	654	1474	2286
L	2838	3521	654	1474	2280

Crane type	S	M	L
Wire	∅4	∅6	∅7
Type of winch	6 AF	8 AF	12 AF
Maximum load [kg]	100	250	500
Total weight [kg]	35	61.2	76.5

The position numbers in the following table refer to fig Crane and figures in Installation drawings.

Pos.	Description
1	Bottom fixation bracket
4	Motor bracket
5	Top fixation bracket
12	Crane foot
13	Crane with winch

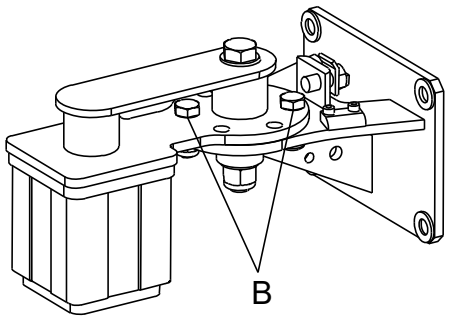
Related information

9.3 Installation drawings

11.1 Selection guide for accessories

9.2 Top fixation bracket

You can adjust the angle of the top fixation bracket in steps of 7.5 ° by means of the two screws (B).



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Top fixation bracket

9.3 Installation drawings

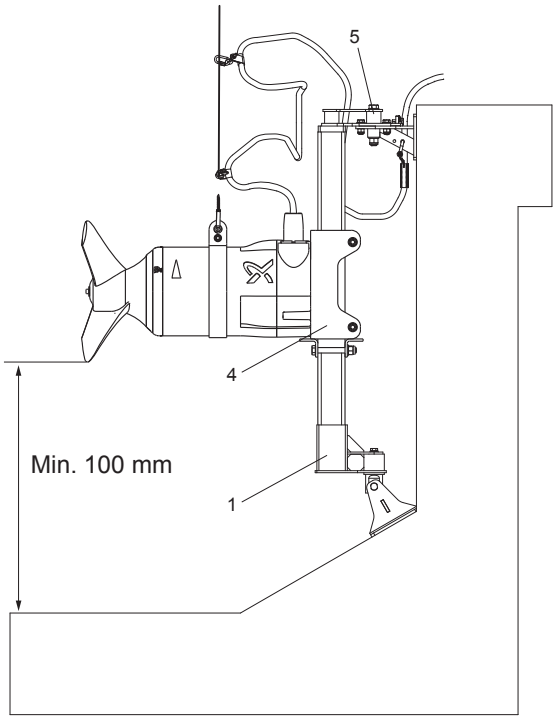
SMD

The SMD mixers are suitable for the following installation methods:

- column profile mounting
- suspended mounting
- wall mounting
- floor mounting, with or without vortex shield.

See figs Column profile mounting, also suitable for mixers with vortex shield and Suspended mounting, wall mounting and floor mounting for SMD.09-18.

For the various types of installation accessories, see Accessories.



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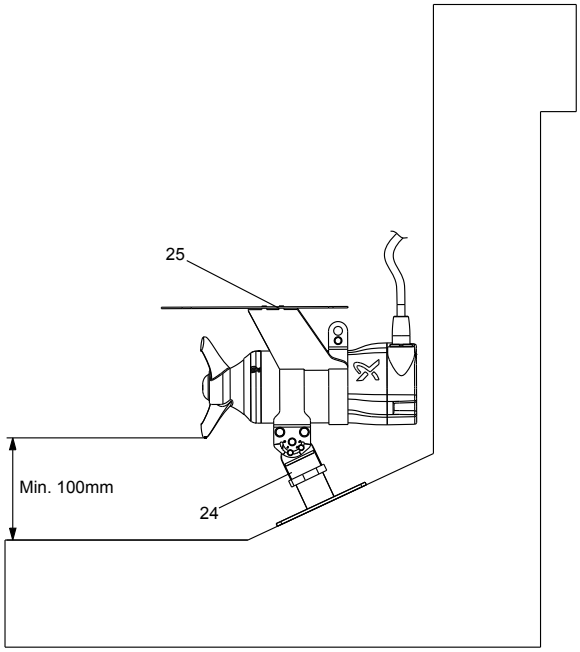
Column profile mounting, also suitable for mixers with vortex shield



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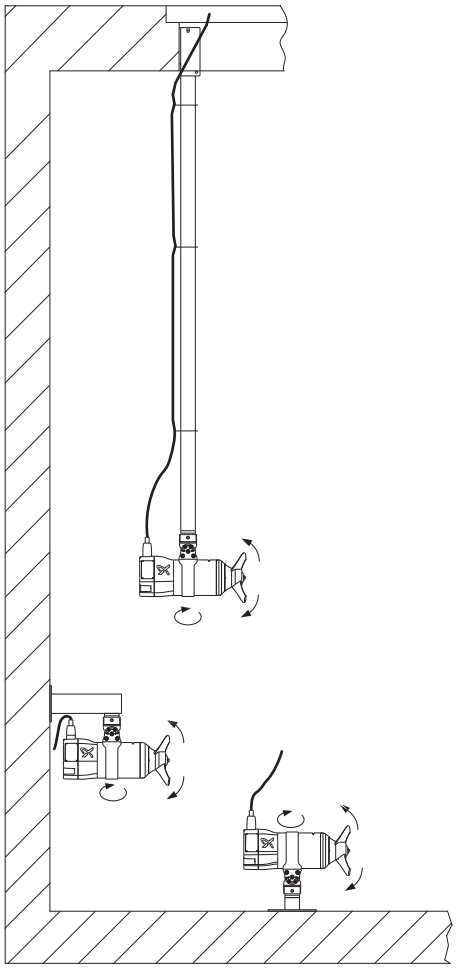
Floor profile mounting, mixers with vortex shield



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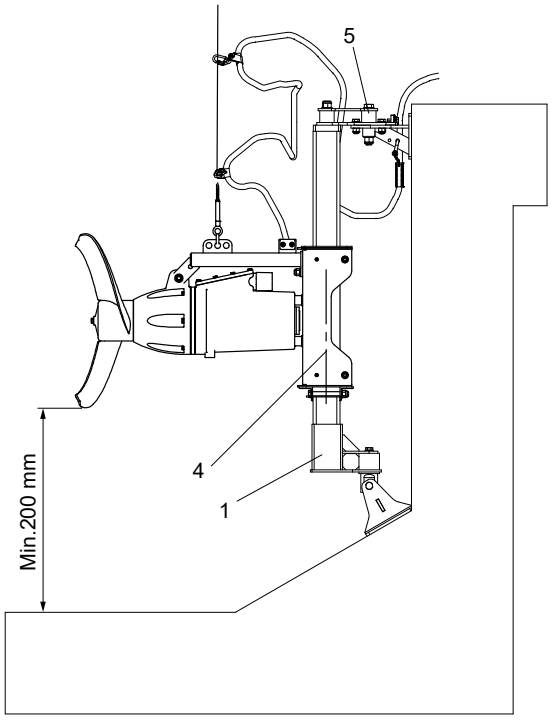
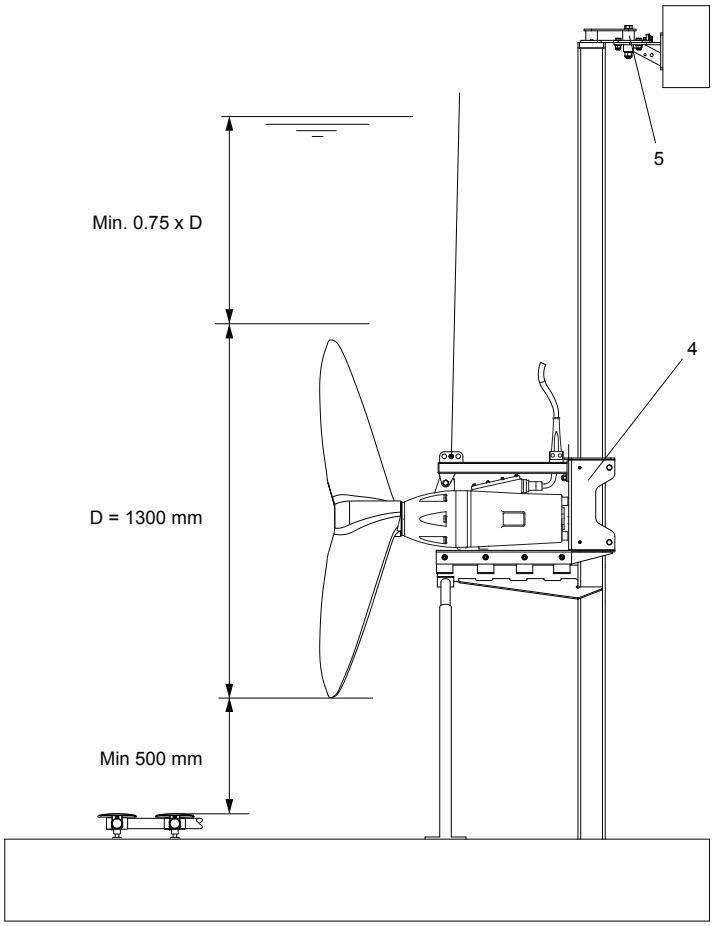
Suspended mounting, wall mounting and floor mounting for SMD.09-18

SMG



Installation of SMG mixers

SFG



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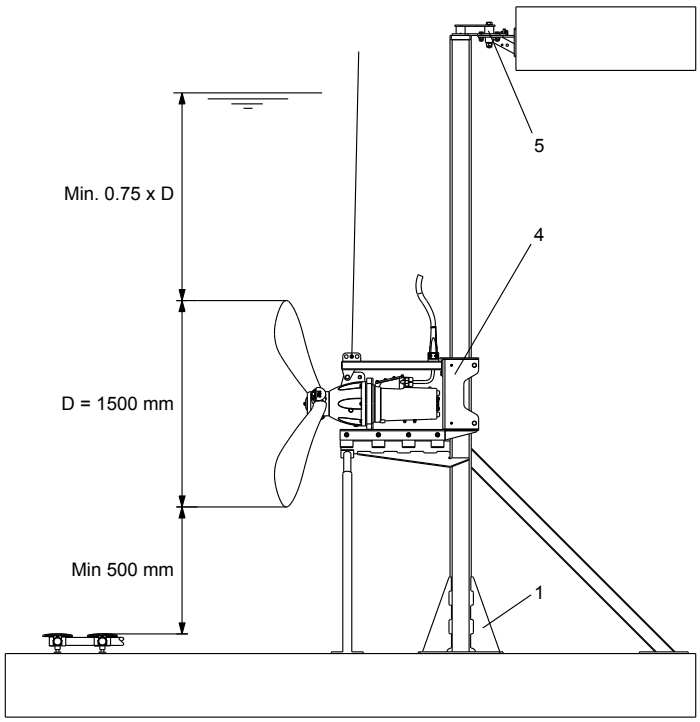
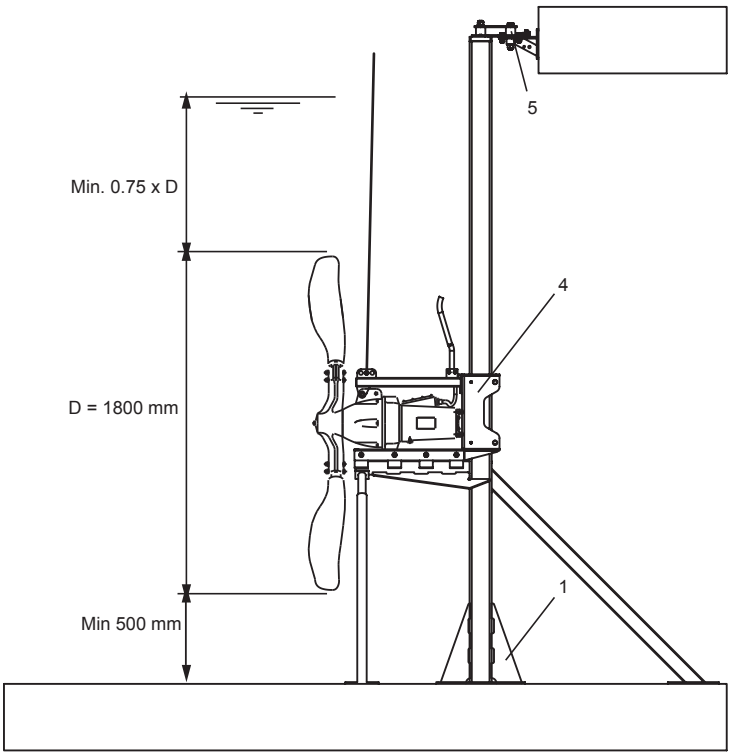


TM070009

SFG.xx.150.xx



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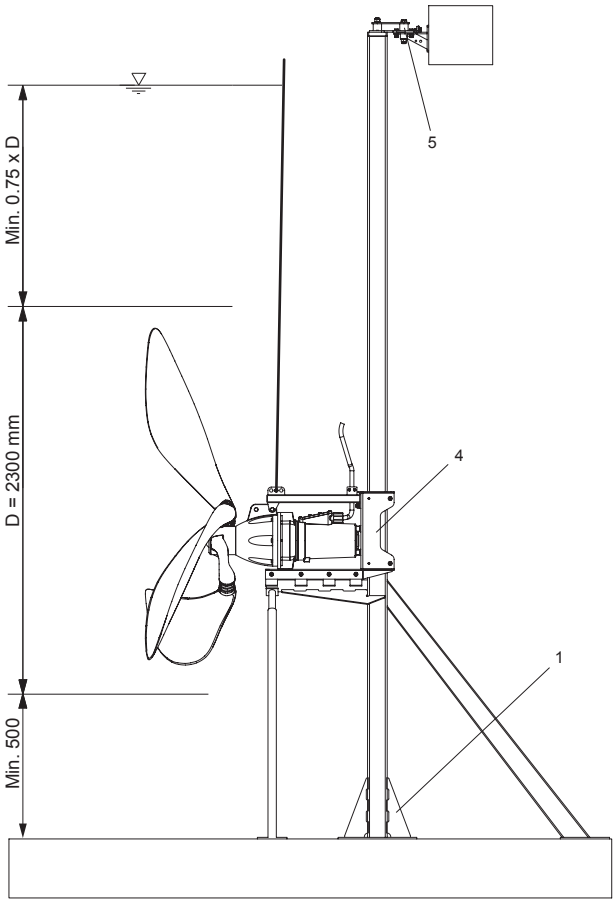
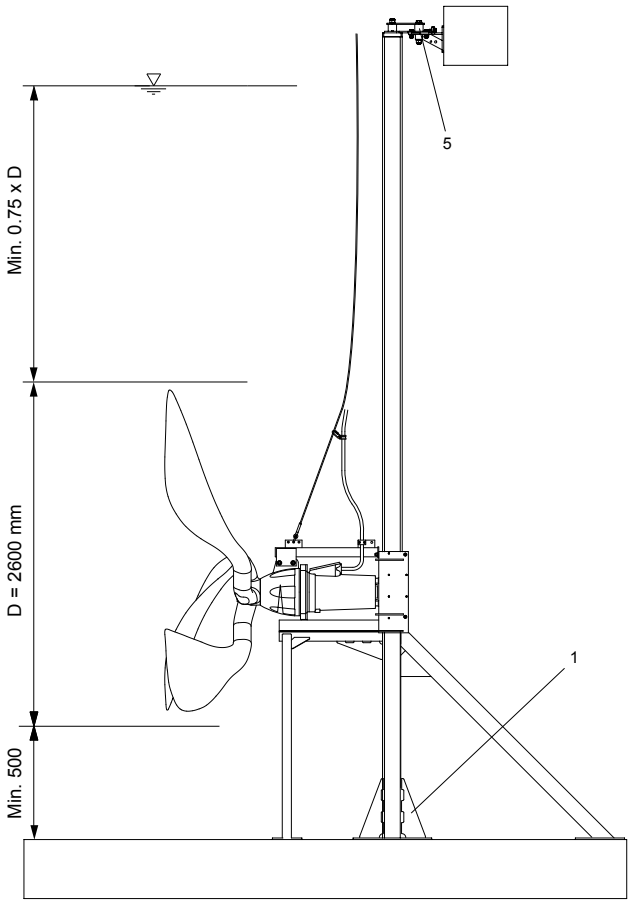
SFG.xx.180.xx



TM043879

SFG.xx.230.xx



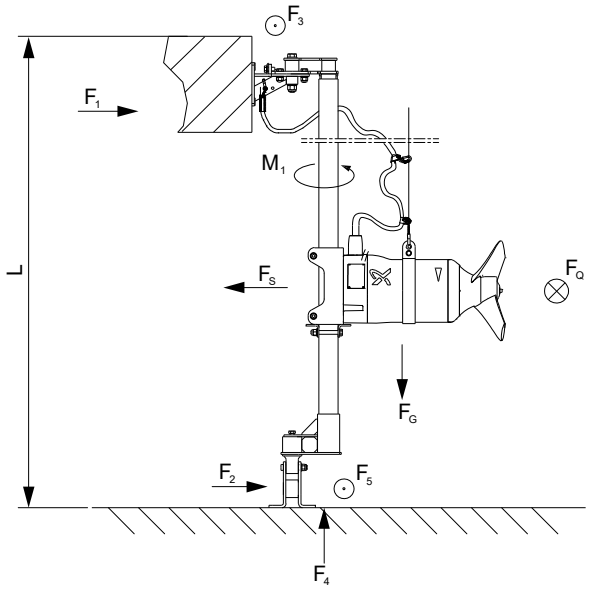
SFG.xx.260.xx

Related information

11. Accessories

9.4 Mechanical loads

9.4.1 SMD

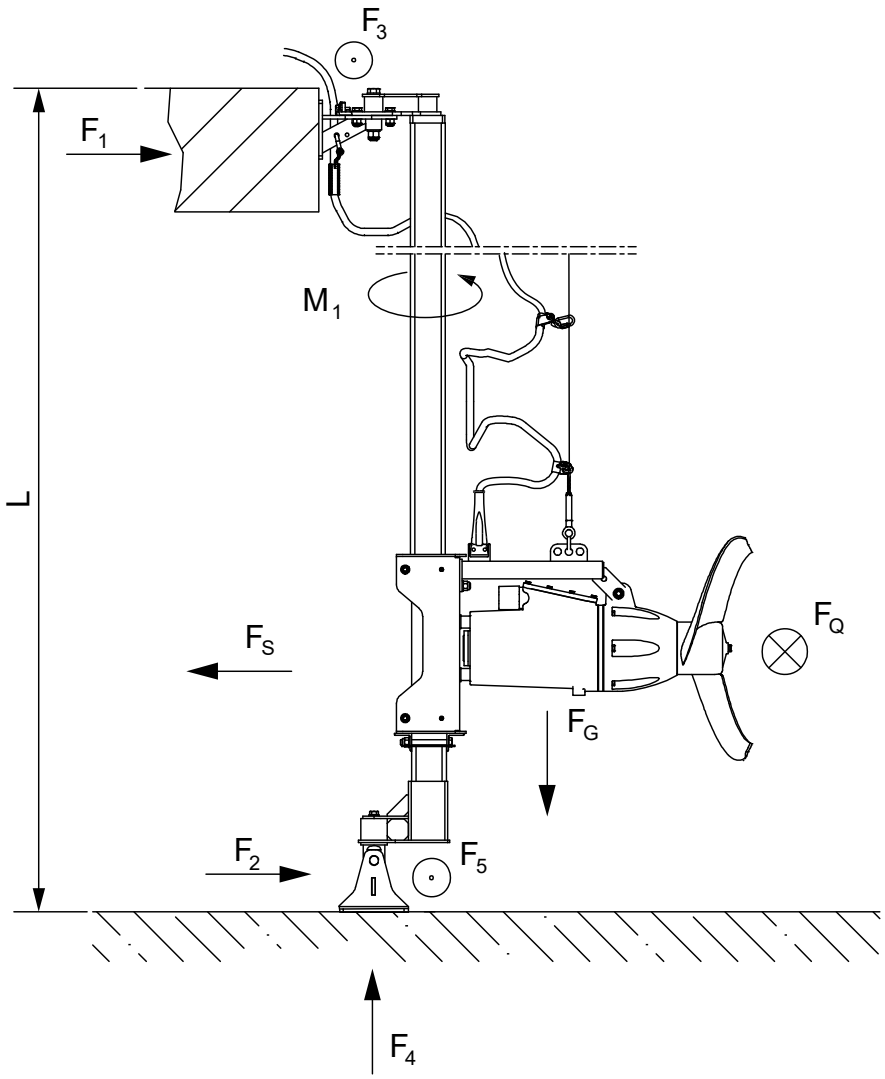


Mechanical loads of SMD mixers

Symbol	Description
L	Total height
F_S	Thrust of the propeller
F_Q	Lateral force
F_G	Gravitational force
$F_1 ... F_5$	Reactive force of the installation
M_1	Torque on the column profile

Mixer	L [m]	F_S [N]	F_Q [N]	F_G [N]	F_1 [N]	F_2 [N]	F_3 [N]	F_4 [N]	F_5 [N]	M_1 [Nm]
SMD.09.21.1478	4	170	43	373	-30	200	2	588	40	26
	6				-22	192	1	696	41	
	8				-18	188	1	804	41	
	10				-16	186	1	911	42	
SMD.11.25.1470	4	240	60	373	-24	264	4	588	56	36
	6				-18	258	3	696	58	
	8				-15	255	2	804	58	
	10				-13	253	2	911	59	
SMD.14.25.1460	4	310	78	373	-19	329	5	588	73	47
	6				-15	325	3	696	74	
	8				-13	313	2	804	75	
	10				-11	321	2	911	76	
SMD.18.25.1440	4	390	98	373	-14	404	6	588	91	58
	6				-12	402	4	696	93	
	8				-10	400	3	804	94	
	10				-9	399	2	911	95	
SMD.19.32.985	4	440	110	657	-31	471	9	873	101	74
	6				-23	463	6	980	104	
	8				-19	459	4	1088	106	
	10				-16	456	4	1196	106	
SMD.23.37.980	4	560	140	657	-14	574	13	873	127	95
	6				-12	572	9	980	131	
	8				-10	570	6	1088	134	
	10				-9	569	5	1196	135	
SMD.28.37.975	4	690	173	657	-2	692	16	873	157	116
	6				-4	694	11	980	162	
	8				-4	694	8	1088	165	
	10				-5	695	6	1196	166	
SMD.35.37.967	4	830	208	657	10	820	19	883	188	138
	6				4	826	13	990	195	
	8				2	828	10	1098	198	
	10				0	830	8	1206	200	

9.4.2 SMG



Mechanical loads of SMG mixers

Symbol	Description
L	Total height
F_S	Thrust of the propeller
F_Q	Lateral force
F_G	Gravitational force
F_1 ... F_5	Reactive force of the installation
M_1	Torque on the column profile

SMG

Mixer	L [m]	F_S [N]	F_Q [N]	F_G [N]	F_1 [N]	F_2 [N]	F_3 [N]	F_4 [N]	F_5 [N]	M_1 [Nm]
SMG.09.55.277	4	360	90	775	-46	406	12	1070	78	81
	6				-34	394	8	1218	82	
	8				-27	387	6	1366	84	
	10				-24	384	5	1514	85	
SMG.12.63.275	4	520	130	775	-13	533	20	1070	110	119
	6				-12	532	14	1218	116	
	8				-11	531	10	1366	120	
	10				-11	531	8	1514	122	
SMG.16.63.272	4	660	165	775	9	651	26	1070	139	151
	6				3	657	17	1218	148	
	8				0	660	13	1366	152	
	10				-2	662	10	1514	155	
SMG.20.71.264	4	870	218	844	52	818	39	1139	179	201
	6				31	839	26	1287	192	
	8				21	849	19	1435	198	
	10				15	855	15	1582	202	
SMG.25.71.263	4	1020	255	844	78	942	45	1139	210	236
	6				49	971	30	1287	225	
	8				35	985	23	1435	232	
	10				26	994	18	1582	237	
SMG.30.71.303	4	1150	288	844	101	1049	51	1139	236	266
	6				64	1086	34	1287	253	
	8				46	1104	26	1435	262	
	10				35	1115	20	1582	267	
SMG.36.71.301	4	1340	335	844	135	1205	59	1139	276	310
	6				87	1253	40	1287	295	
	8				63	1277	30	1435	305	
	10				49	1291	24	1582	311	
SMG.48.73.306	4	1600	400	1687	41	1559	73	2061	327	454
	6				23	1577	49	2248	351	
	8				10	1590	37	2660	364	
	10				5	1595	29	2904	371	
SMG.56.86.264	4	1910	478	1707	157	1753	103	2081	375	566
	6				100	1810	68	2268	409	
	8				68	1842	51	2680	426	
	10				51	1859	41	2923	436	
SMG.70.86.263	4	2260	565	1707	232	2028	121	2081	444	670
	6				151	2109	81	2268	484	
	8				106	2154	61	2680	504	
	10				81	2179	49	2923	516	
SMG.85.86.306	4	2560	640	1864	275	2285	138	2238	502	758
	6				179	2381	92	2425	548	
	8				127	2433	69	2837	571	
	10				98	2462	55	3080	585	
SMG.110.86.305	4	3030	758	1864	376	2654	163	2238	595	898
	6				246	2784	109	2425	649	
	8				178	2852	81	2837	676	
	10				139	2891	65	3080	692	
SMG.140.90.325	4	3580	895	2747	380	3200	201	3233	694	1105
	6				248	3332	134	3477	761	
	8				178	3402	101	3954	794	
	10				138	3442	81	4256	814	

Mixer	L [m]	F_S [N]	F_Q [N]	F_G [N]	F_1 [N]	F_2 [N]	F_3 [N]	F_4 [N]	F_5 [N]	M_1 [Nm]
SMG.180.90.359	4	4360	1090	2747	556	3804	245	3233	845	1346
	6				365	3995	164	3477	927	
	8				266	4094	123	3954	967	
	10				209	4151	98	4256	992	

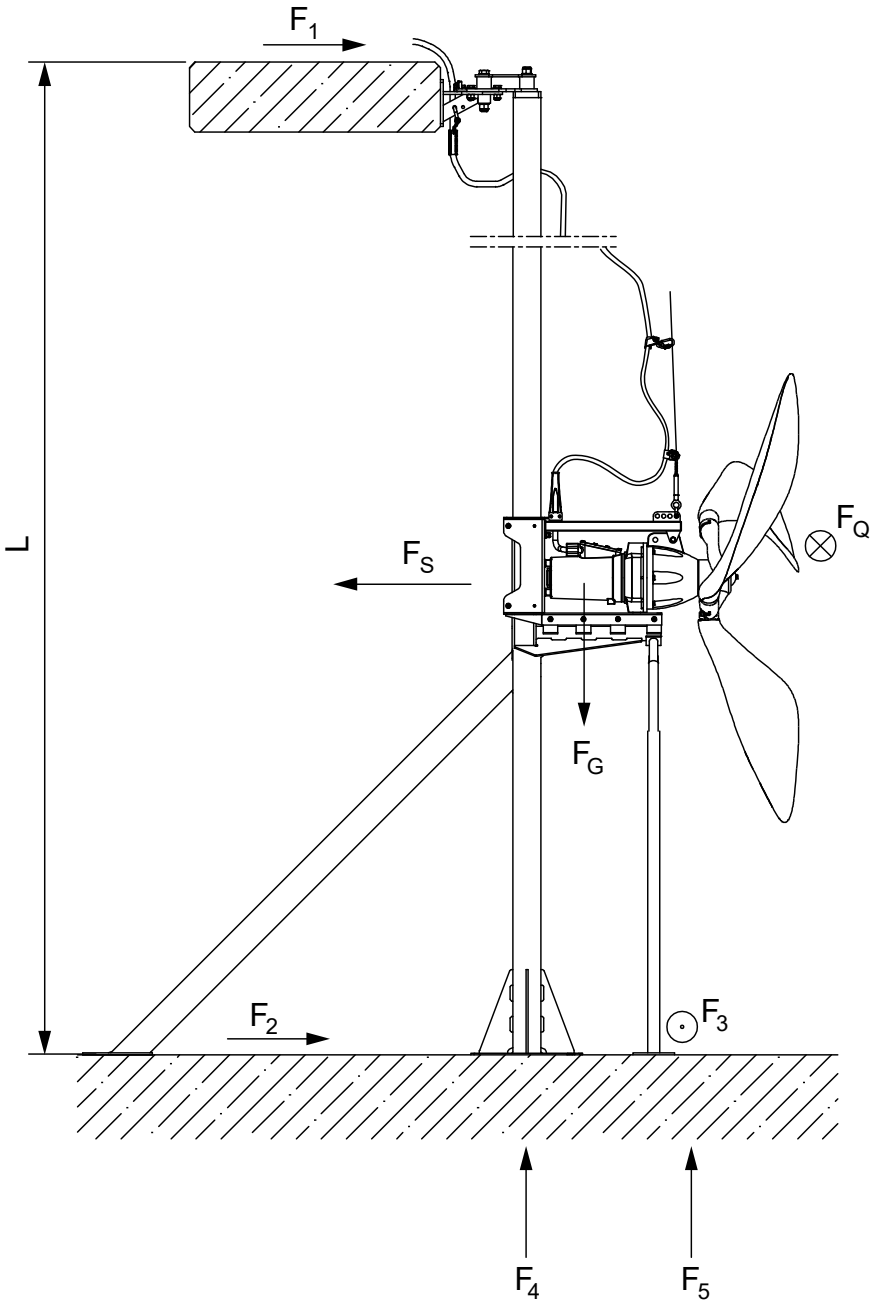
SMG.A

Mixer	L [m]	F_S [N]	F_Q [N]	F_G [N]	F_1 [N]	F_2 [N]	F_3 [N]	F_4 [N]	F_5 [N]	M_1 [Nm]
SMG.45.71.A.338	4	1430	358	3507	151	1279	63	1139	294	330
	6				98	1332	42	1287	315	
	8				71	1359	32	1435	326	
	10				55	1375	25	1582	332	
SMG.75.58.A.343	4	1490	373	3654	-39	1529	54	2091	318	441
	6				-30	1520	36	2278	336	
	8				-30	1520	27	2690	345	
	10				-27	1517	22	2933	351	
SMG.80.73.A.343	4	2010	503	4930	116	1894	92	2061	411	595
	6				73	1937	61	2248	441	
	8				48	1962	46	2660	457	
	10				35	1975	37	2904	466	
SMG.110.65.A.344	4	2160	540	5297	71	2089	88	2267	452	640
	6				43	2117	59	2451	482	
	8				25	2135	44	2866	496	
	10				17	2143	35	3110	505	
SMG.130.86.A.343	4	3220	805	7897	416	2804	173	2238	632	954
	6				273	2947	115	2425	690	
	8				198	3022	87	2837	718	
	10				155	3065	69	3080	736	

SMG.H

Mixer	L [m]	F_S [N]	F_Q [N]	F_G [N]	F_1 [N]	F_2 [N]	F_3 [N]	F_4 [N]	F_5 [N]	M_1 [Nm]
SMG.50.65.H.306	4	1280	320	3139	-50	1330	52	2110	268	379
	6				-37	1317	35	2297	285	
	8				-35	1315	26	2710	294	
	10				-31	1311	21	2953	299	
SMG.80.65.H.306	4	1720	430	4218	-1	1721	70	2267	360	510
	6				-5	1725	47	2454	383	
	8				-10	1730	35	2866	395	
	10				-12	1732	28	3110	402	
SMG.110.65.H.344	4	2160	540	5297	71	2089	88	2267	452	640
	6				43	2117	59	2454	482	
	8				25	2135	44	2866	496	
	10				17	2143	35	3110	505	
SMG.150.78.H.325	4	3360	840	8240	223	3137	164	3282	676	1037
	6				143	3217	109	3526	731	
	8				99	3261	82	4003	758	
	10				75	3285	66	4305	774	
SMG.185.78.H.358	4	4090	1023	10031	365	3725	199	3282	823	1263
	6				238	3852	133	3526	890	
	8				170	3920	100	4003	923	
	10				132	3958	80	4305	943	

9.4.3 Flowmakers



TM062775

Mechanical loads of flowmakers

Symbol	Description
L	Total height
F_S	Thrust of the propeller
F_Q	Lateral force
F_G	Gravitational force
$F_{1 ...}F_5$	Reactive force of the installation

SFG

Flowmaker	L [m]	F_S [N]	F_Q [N]	F_G [N]	F_1 [N]	F_2 [N]	F_3 [N]	F_4 [N]	F_5 [N]
SFG.07.130.50	4	665	166	1109	212	453	166	1143	453
	6				141	524		1386	
	8				106	559		1629	
	10				85	580		1872	
SFG.10.130.57	4	880	220	1109	312	568	220	996	599
	6				208	672		1240	
	8				156	724		1483	
	10				125	755		1726	
SFG.14.130.64	4	1100	275	1109	415	685	275	846	749
	6				277	823		1090	
	8				207	893		1333	
	10				166	934		1576	
SFG.17.130.68	4	1260	315	1158	485	775	315	787	858
	6				323	937		1030	
	8				243	1017		1273	
	10				194	1066		1517	
SFG.22.130.74	4	1480	370	1158	588	892	370	637	1007
	6				392	1088		880	
	8				294	1186		1124	
	10				235	1245		1367	
SFG.27.130.80	4	1730	433	1158	704	1026	433	467	1177
	6				470	1260		710	
	8				352	1378		953	
	10				282	1448		1197	
SFG.33.130.85	4	1950	488	1158	807	1143	488	317	1327
	6				538	1412		560	
	8				403	1547		804	
	10				323	1627		1047	
SFG.36.130.88	4	2080	520	1158	867	1213	520	229	1416
	6				578	1502		472	
	8				434	1646		715	
	10				347	1733		958	
SFG.07.180.32	4	750	188	1913	132	618	188	1809	590
	6				88	662		2053	
	8				66	684		2296	
	10				53	697		2539	
SFG.10.180.36	4	960	240	1913	245	715	240	1644	756
	6				163	797		1887	
	8				122	838		2131	
	10				98	862		2374	
SFG.14.180.41	4	1200	300	1913	374	826	300	1455	944
	6				250	950		1698	
	8				187	1013		1942	
	10				150	1050		2185	
SFG.17.180.44	4	1410	353	1962	481	929	353	1339	1110
	6				320	1090		1582	
	8				240	1170		1825	
	10				192	1218		2069	
SFG.22.180.48	4	1670	418	1962	621	1049	418	1134	1314
	6				414	1256		1378	
	8				310	1360		1621	
	10				248	1422		1864	

Flowmaker	L [m]	F_S [N]	F_Q [N]	F_G [N]	F_1 [N]	F_2 [N]	F_3 [N]	F_4 [N]	F_5 [N]
SFG.26.180.51	4	1880	470	1962	734	1146	470	969	1480
	6				489	1391		1212	
	8				367	1513		1456	
	10				294	1586		1699	
SFG.32.180.51	4	2160	540	2188	853	1307	540	974	1700
	6				569	1591		1217	
	8				426	1734		1461	
	10				341	1819		1704	
SFG.36.180.54	4	2440	610	2188	1004	1436	610	754	1920
	6				669	1771		997	
	8				502	1938		1240	
	10				401	2039		1484	
SFG.07.230.26	4	1030	258	1962	357	673	258	1519	930
	6				238	792		1762	
	8				179	851		2005	
	10				143	887		2249	
SFG.10.230.29	4	1290	323	1962	518	772	323	1284	1165
	6				345	945		1527	
	8				259	1031		1771	
	10				207	1083		2014	
SFG.12.230.31	4	1470	368	1962	629	841	368	1121	1327
	6				420	1050		1365	
	8				315	1155		1608	
	10				252	1218		1851	
SFG.15.230.33	4	1700	425	1962	772	928	425	914	1535
	6				514	1186		1157	
	8				386	1314		1400	
	10				309	1391		1644	
SFG.17.230.35	4	1890	473	2011	882	1008	473	791	1706
	6				588	1302		1035	
	8				441	1449		1278	
	10				353	1537		1521	
SFG.22.230.39	4	2300	575	2011	1136	1164	575	421	2076
	6				757	1543		665	
	8				568	1732		908	
	10				454	1846		1151	
SFG.26.230.40	4	2530	633	2256	1243	1287	633	459	2284
	6				829	1701		702	
	8				622	1908		945	
	10				497	2033		1189	
SFG.33.230.43	4	3040	760	2256	1558	1482	760	-2	2744
	6				1039	2001		242	
	8				779	2261		485	
	10				623	2417		728	
SFG.36.230.45	4	3210	803	2256	1664	1546	803	-155	2898
	6				1109	2101		88	
	8				832	2378		332	
	10				665	2545		575	
SFG.22.260.30	6	2540	635	3532	790	1750	635	2160	2469
	8				593	1947		2527	
	10				474	2066		2893	
SFG.27.260.32	6	2990	748	3532	998	1992	748	1723	2907
	8				749	2241		2089	
	10				599	2391		2455	

Flowmaker	L [m]	F_S [N]	F_Q [N]	F_G [N]	F_1 [N]	F_2 [N]	F_3 [N]	F_4 [N]	F_5 [N]
SFG.32.260.34	6	3370	843	3532	1174	2196	843	1354	3276
	8				880	2490		1720	
	10				704	2666		2086	
SFG.36.260.35	6	3640	910	3532	1298	2342	910	1091	3539
	8				974	2666		1457	
	10				779	2861		1823	
SFG.44.260.38	6	4230	1058	3532	1571	2659	1058	517	4113
	8				1178	3052		884	
	10				943	3287		1250	
SFG.48.260.39	6	4470	1118	3532	1682	2788	1118	284	4346
	8				1261	3209		650	
	10				1009	3461		1016	
SFG.50.260.35	6	4660	1165	4071	1721	2939	1165	574	4595
	8				1291	3369		940	
	10				1033	3627		1306	
SFG.60.260.38	6	5410	1353	4071	2073	3337	1353	-165	5335
	8				1554	3856		201	
	10				1244	4166		567	
SFG.66.260.39	6	5710	1428	4071	2213	3497	1428	-461	5631
	8				1660	4050		-95	
	10				1328	4382		271	
SFG.74.260.41	6	6310	1578	4071	2494	3816	1578	-1053	6222
	8				1871	4439		-687	
	10				1497	4813		-321	
SFG.80.260.42	6	6570	1643	4071	2616	3954	1643	-1309	6479
	8				1962	4608		-943	
	10				1570	5000		-577	

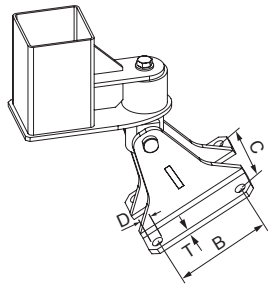
SFG.H

Flowmaker	L [m]	F_S [N]	F_Q [N]	F_G [N]	F_1 [N]	F_2 [N]	F_3 [N]	F_4 [N]	F_5 [N]
SFG.110.150.H.91	4	4180	1228	330	1673	2507	1228	617	3523
	6				1115	3065		980	
	8				836	3344		1343	
	10				669	3511		1706	
SFG.110.150.H.83	4	4500	1228	355	1797	2703	1228	617	3523
	6				1198	3302		980	
	8				989	3602		1343	
	10				719	3781		1706	
SFG.70.260.H.44	6	5600	1400	These products are too strong for the standard installation equipment.					
	8								
	10								
SFG.110.260.H.51	6	7550	1888						
	8								
	10								

9.5 Dimensions of accessories

These dimensions are related to the installation accessories of mixers and flowmakers.

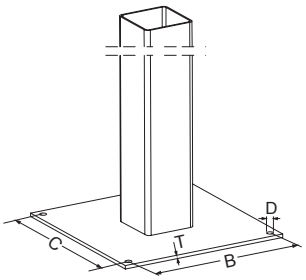
For further information on accessories, see Accessories.



TM043897

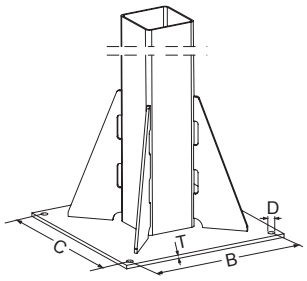
Bottom fixation bracket

Column profile	B [mm]	C [mm]	D [mm]	T [mm]
60 x 60	130	115	15	8
80 x 80				
100 x 100				



TM043928

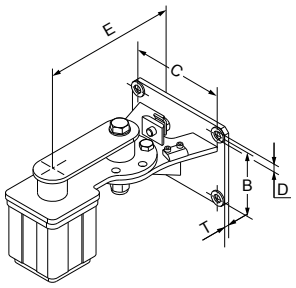
Bottom fixation plate - SFG.xx.130



TM043898

Bottom fixation plate - SFG.xx.180/230/260

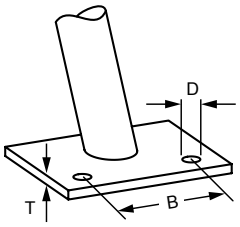
Flowmaker type	B [mm]	C [mm]	D [mm]	T [mm]
SFG.xx.130	210	210	15	8
SFG.xx.180/230/260	360	360	15	8



TM043899

Top fixation bracket

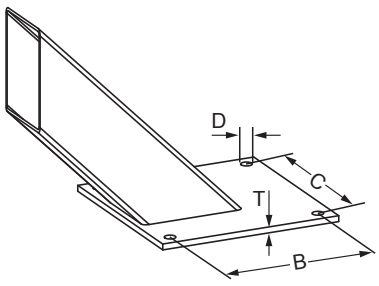
Column profile	B [mm]	C [mm]	D [mm]	E [mm]	T [mm]
60 x 60	110	160	15	240	8
80 x 80				250	
100 x 100				261	
120 x 120				261	



TM043900

Foot for front support leg

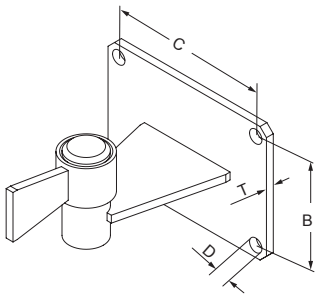
Flowmaker type	B [mm]	D [mm]	T [mm]
SFG.xx.130	100	15	8
SFG.xx.180-230			
SFG.xx.260			



TM043901

Foot for back support leg

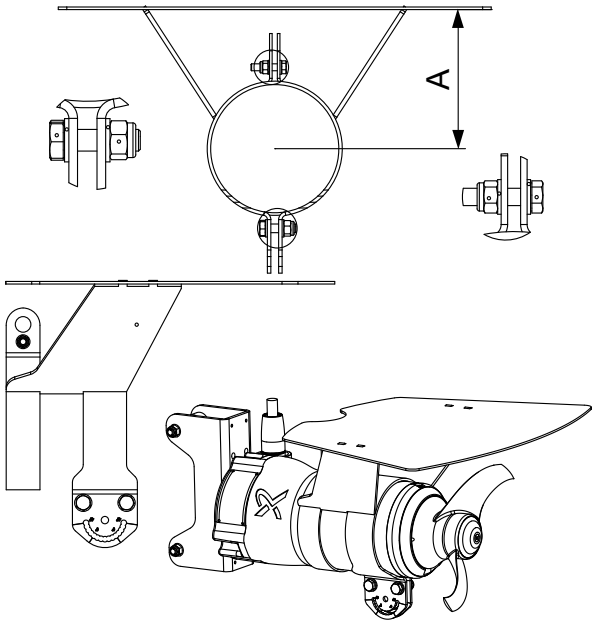
Flowmaker type	B [mm]	C [mm]	D [mm]	T [mm]
SFG.xx.180-230	210	210	15	8
SFG.xx.260				



TM043903

Intermediate fixation bracket

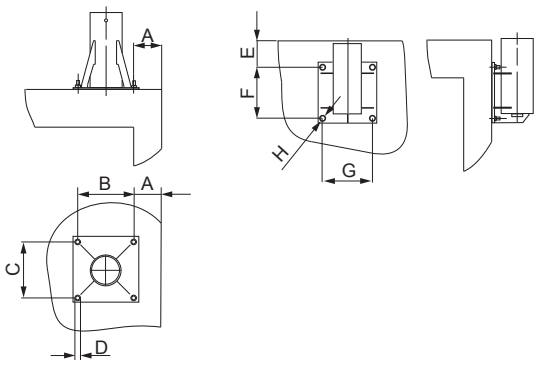
B [mm]	C [mm]	D [mm]	T [mm]
110	160	15	8



TM069916

Vortex shield (SMD, T-version)

Mixer type	A [mm]	Minimum distance between shield and water surface [mm]
SMD.09-18	161	30
SMD.19-35	267	



TM043088

Crane foot dimensions for horizontal and vertical installations

Horizontal fixation, load and dimensions

Maximum load [kg]	Crane type		
	S	M	L
Dimensions	100	250	500
A [mm]	100	150	150
B [mm]	200	300	300
C [mm]	200	300	300
D	M12	M12	M12

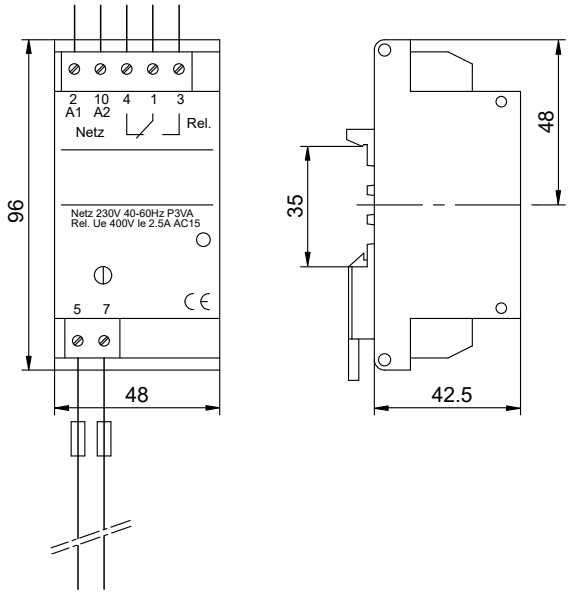
Vertical fixation, load and dimensions

Maximum load [kg]	Crane type		
	S	M	L
Dimensions	100	250	500
E [mm]	150	150	150
F [mm]	200	300	300
G [mm]	200	300	300
H	M12	M16	M16

Related information

11. Accessories

9.5.1 Dimensional sketch of ALR-20/A-Ex relay



TM028867

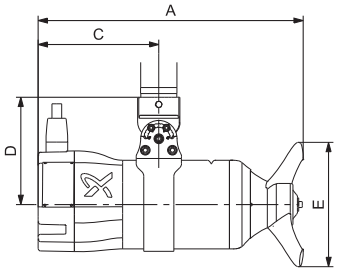
ALR-20/A-Ex relay

Dimensions are in mm.

10. Technical data

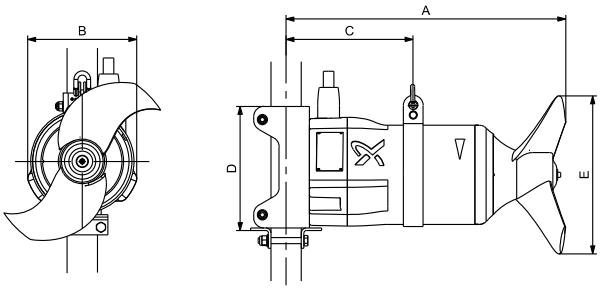
10.1 SMD

10.1.1 Dimensions



TM065319

SMD version T



TM065320

SMD with motor bracket

Type	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Net weight [1] [kg]
SMD.09.21.1478.T.(Ex).5.0B	440	180	195	180	210	36
SMD.11.25.1470.T.(Ex).5.0B	440	180	195	180	250	36
SMD.14.25.1460.T.(Ex).5.0B	440	180	195	180	250	36
SMD.18.25.1440.T.(Ex).5.0B	440	180	195	180	250	36
SMD.09.21.1478.(Ex).5.0B	490 [2]	180	225	240	210	38
SMD.11.25.1470.(Ex).5.0B	490 [2]	180	225	240	250	38
SMD.14.25.1460.(Ex).5.0B	490 [2]	180	225	240	250	38
SMD.18.25.1440.(Ex).5.0B	490 [2]	180	225	240	250	38
SMD.19.32.985.(Ex).5.1B	550 [2]	230	240	240	320	67
SMD.23.37.980.(Ex).5.1B	550 [2]	230	240	240	370	67
SMD.28.37.975.(Ex).5.1B	550 [2]	230	240	240	370	67
SMD.35.37.967.(Ex).5.1B	550 [2]	230	240	240	370	68

1 With motor bracket and 10 m cable. Weight of cable: 0.5 kg/m.

2 With 60 × 60 column profile

10.1.2 Physical data

Type	Speed [min^{-1}]	Axial thrust [N]	Thrust-to-power ratio	Enclosure class	Maximum installation depth [m]	Cable type	Flow rate [m^3/h]	Mean flow velocity [m/s]
SMD.09.21.1478.(T).(Ex).5.0B	1478	170	0.179	IP 68	20	LYNIFLEX 4G1.5 + 3 x 1	195	1.57
SMD.11.25.1470.(T).(Ex).5.0B	1470	240	0.218				276	1.56
SMD.14.25.1460.(T).(Ex).5.0B	1460	310	0.214				314	1.78
SMD.18.25.1440.(T).(Ex).5.0B	1440	390	0.205				352	1.99
SMD.19.32.985.(Ex).5.1B	985	440	0.238			LYNIFLEX 7G2.5 + 3 x 1	479	1.65
SMD.23.37.980.(Ex).5.1B	980	560	0.243				625	1.61
SMD.28.37.975.(Ex).5.1B	975	690	0.238				693	1.79
SMD.35.37.967.(Ex).5.1B	967	830	0.231				760	1.96

10.1.3 Electrical data

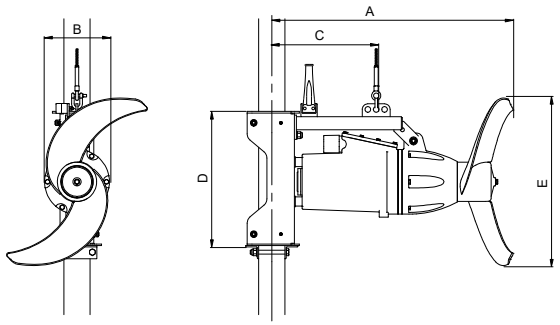
Type	P1 [kW]		P2 [kW]	Number of poles	Motor torque [Nm]	Voltage [V]	Operating mode	I_N [A]	I_{start} [A]	Cos φ 1/1
	Rated	Actual								
SMD.09.21.1478.(T).(Ex).5.0B	1.05	0.95	0.9	4	5.9	3 x 400-415	S1, Star	2.6	23	0.67
SMD.11.25.1470.(T).(Ex).5.0B	1.3	1.10	1.1		7.2			2.8	23	0.73
SMD.14.25.1460.(T).(Ex).5.0B	1.6	1.45	1.4		9.2			3.3	23	0.79
SMD.18.25.1440.(T).(Ex).5.0B	2.1	1.90	1.8		12.0			4.0	23	0.82
SMD.19.32.985.(Ex).5.1B	2.2	1.85	1.9	6	18.5		S1, Delta	5.6	37	0.61
SMD.23.37.980.(Ex).5.1B	2.7	2.30	2.3		22.5			6.1	37	0.67
SMD.28.37.975.(Ex).5.1B	3.3	2.90	2.8		27.6			6.8	37	0.73
SMD.35.37.967.(Ex).5.1B	4.1	3.60	3.5		34.9			8.1	37	0.77

10.1.4 Liquid data

Liquid temperature	pH value	Maximum dynamic viscosity	Maximum density	Maximum dry solids content	Ex classification
5-40 °C	4-10	≤ 250 mPa·s	1060 kg/m^3	Up to 4 %	2G Ex db h IIB T4 Gb

10.2 SMG

10.2.1 Dimensions



TM024944

Type	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Net weight [1] [kg]
SMG.09.55.277.5.0B	780	200	320	410	550	79
SMG.12.63.275.5.0B	790	200	320	410	630	79
SMG.16.63.272.5.0B	790	200	320	410	630	79
SMG.20.71.264.5.1B	800	200	320	410	710	86
SMG.25.71.263.5.1B	800	200	320	410	710	86
SMG.30.71.303.5.1B	800	200	320	410	710	86
SMG.36.71.301.5.1B	800	200	320	410	710	86
SMG.48.73.306.5.1B	1000	260	430	460	730	172
SMG.56.86.264.5.1B	1050	260	430	460	860	174
SMG.70.86.263.5.1B	1050	260	430	460	860	174
SMG.85.86.306.5.1B	1050	260	430	460	860	190
SMG.110.86.305.5.1B	1050	260	430	460	860	190
SMG.140.90.325.5.1B	1100	315	460	460	900	280
SMG.180.90.359.5.1B	1100	315	460	460	900	280

1 With motor bracket and 10 m cable. Weight of cable: 0.5 kg/m.

10.2.2 Physical data

Type	Speed [min^{-1}]	Axial thrust [N]	Thrust-to-power ratio	Enclosure class	Maximum installation depth [m]	Cable type	Flow rate [m^3/h]	Mean flow velocity [m/s]
SMG.09.55.277.5.0B	277	360	0.364	IP68	20	S1BN8-F 11G1.5	744	0.87
SMG.12.63.275.5.0B	275	520	0.403				1025	0.91
SMG.16.63.272.5.0B	272	660	0.384				1155	1.03
SMG.20.71.264.5.1B	264	870	0.426				1494	1.05
SMG.25.71.263.5.1B	263	1020	0.413				1618	1.13
SMG.30.71.303.5.1B	303	1150	0.378				1718	1.21
SMG.36.71.301.5.1B	301	1340	0.360				1854	1.30
SMG.48.73.306.5.1B	306	1600	0.323			S1BN8-F 11G2.5	2083	1.38
SMG.56.86.264.5.1B	264	1910	0.360				2681	1.28
SMG.70.86.263.5.1B	263	2260	0.336				2917	1.39
SMG.85.86.306.5.1B	306	2560	0.318				3104	1.48
SMG.110.86.305.5.1B	305	3030	0.296				3377	1.61
SMG.140.90.325.5.1B	325	3580	0.276			TPE/TPE 7G4 + 4 x 1.5	3842	1.68
SMG.180.90.359.5.1B	359	4360	0.251				4240	1.85

10.2.3 Electrical data

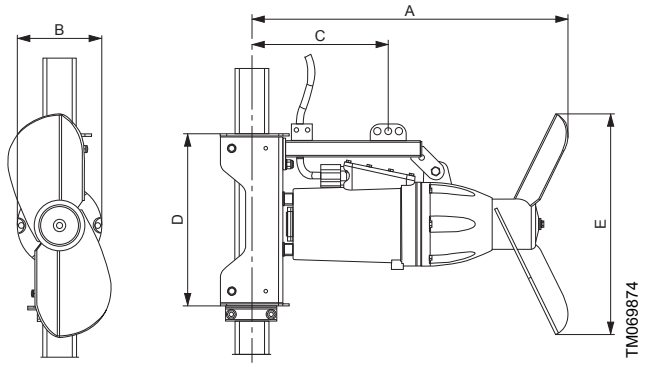
Type	P1 [kW]		P2 [kW]	Number of poles	Motor torque [Nm]	Voltage [V]	Operating mode	I_N [A]	I_{start} [A]	Cos φ 1/1
	Rated	Actual								
SMG.09.55.277.5.0B	1.1	0.99	0.9	6	8.8	3 x 400-415	S1, Y	2.9	22	0.57
SMG.12.63.275.5.0B	1.4	1.29	1.2		11.8			3.3	22	0.67
SMG.16.63.272.5.0B	1.9	1.72	1.6		15.9			3.9	22	0.74
SMG.20.71.264.5.1B	2.3	2.04	2.0	4	13.0		S1, D	4.6	47	0.75
SMG.25.71.263.5.1B	2.8	2.47	2.5		16.3			5.3	47	0.81
SMG.30.71.303.5.1B	3.4	3.04	3.0		19.6			6.2	47	0.84
SMG.36.71.301.5.1B	4.1	3.72	3.6		23.7			7.3	47	0.86
SMG.48.73.306.5.1B	5.3	4.96	4.8		31.0			12.0	109	0.67
SMG.56.86.264.5.1B	6.2	5.31	5.6		36.3			13.0	109	0.72
SMG.70.86.263.5.1B	7.7	6.72	7.0		45.5			14.5	109	0.78
SMG.85.86.306.5.1B	9.3	8.05	8.5		55.0			19.5	165	0.70
SMG.110.86.305.5.1B	12.0	10.23	11.0		71.6			23.0	165	0.77
SMG.140.90.325.5.1B	15.2	12.99	14.0		90.1			30.0	220	0.74
SMG.180.90.359.5.1B	19.4	17.38	18.0		116.3			36.0	220	0.80

10.2.4 Liquid data

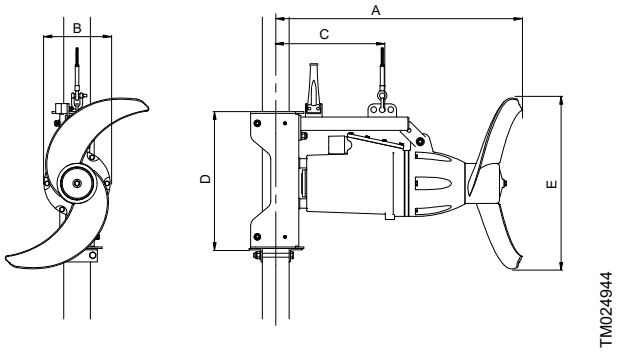
Liquid temperature	pH value	Maximum dynamic viscosity	Maximum density	Maximum dry solids content
5-40 °C	4-10	≤ 500 mPa·s	1060 kg/m^3	Up to 8 %

10.3 SMG.A, mixer for the agriculture business

10.3.1 Dimensions



H - propeller design



S - propeller design

Type	Propeller design	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Net weight [1] [kg]
SMG.45.71.A.338.5.1B	S	800	200	320	410	710	86
SMG.75.58.A.343.5.1B	H	990	260	430	460	580	175
SMG.80.73.A.343.5.1B	S	1000	260	430	460	730	172
SMG.110.65.A.344.5.1B	H	1010	260	430	460	650	193
SMG.130.86.A.343.5.1B	S	1050	260	430	460	860	190

1 With motor bracket and 10 m cable. Weight of cable: 0.5 kg/m.

10.3.2 Physical data

Type	Speed [min^{-1}]	Axial thrust [N]	Thrust-to-power ratio	Enclosure class	Maximum installation depth [m]	Cable type	Flow rate [m^3/h]	Mean flow velocity [m/s]
SMG.45.71.A.338.5.1B	338	1430	0.336	IP68	20	S1BN8-F 11G2.5	1915	1.34
SMG.75.58.A.343.5.1B	343	1490	0.195				1597	1.68
SMG.80.73.A.343.5.1B	343	2010	0.292				2335	1.55
SMG.110.65.A.344.5.1B	344	2160	0.214				2155	1.80
SMG.130.86.A.343.5.1B	343	3220	0.286				3481	1.66

10.3.3 Electrical data

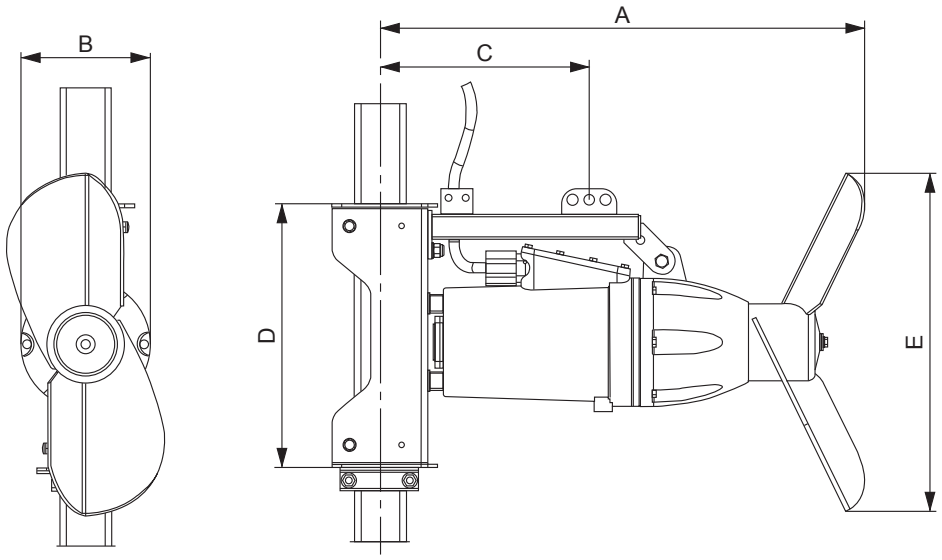
Type	P1 [kW]		P2 [kW]	Number of poles	Motor torque [Nm]	Voltage [V]	Operating mode	I_N [A]	I_{start} [A]	Cos φ 1/1
	Rated	Actual								
SMG.45.71.A.338.5.1B	5.3	4.25	4.5	4	30.0	3 x 400-415	S1, D	9.0	47	0.86
SMG.75.58.A.343.5.1B	8.5	7.66	7.5		48.9			15.5	109	0.80
SMG.80.73.A.343.5.1B	8.9	6.89	8.0		52.3			16.0	109	0.81
SMG.110.65.A.344.5.1B	12.0	10.10	11.0		71.6			23.0	165	0.77
SMG.130.86.A.343.5.1B	14.3	11.26	13.0		85.0			26.0	165	0.80

10.3.4 Liquid data

Liquid temperature	pH value	Maximum dynamic viscosity	Maximum density	Maximum dry solids content	Maximum operating hours per year
5-40 °C	4-10	≤ 500 mPa·s	1060 kg/m^3	Up to 8 %	250

10.4 SMG.H, heavy-duty mixer

10.4.1 Dimensions



Type	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Net weight [1] [kg]
SMG.50.65.H.265.5.1B	1050	260	430	460	650	180
SMG.80.65.H.306.5.1B	1050	260	430	460	650	196
SMG.110.65.H.344.5.1B	1050	260	430	460	650	196
SMG.150.78.H.325.5.1B	1100	315	315	460	780	288
SMG.185.78.H.358.5.1B	1100	315	315	460	780	288

1 With motor bracket and 10 m cable. Weight of cable: 0.5 kg/m.

10.4.2 Physical data

Type	Speed [min^{-1}]	Axial thrust [N]	Thrust-to-power ratio	Enclosure class	Maximum installation depth [m]	Cable type	Flow rate [m^3/h]	Mean flow velocity [m/s]
SMG.50.65.H.265.5.1B	265	1280	0.268	IP68	20	LAPP TPE 7G4 + 4 x 1	1659	1.39
SMG.80.65.H.306.5.1B	306	1720	0.238				1923	1.61
SMG.110.65.H.344.5.1B	344	2160	0.214				2155	1.80
SMG.150.78.H.325.5.1B	235	3360	0.238				3225	1.88
SMG.185.78.H.358.5.1B	358	4090	0.216				3559	2.07

10.4.3 Electrical data

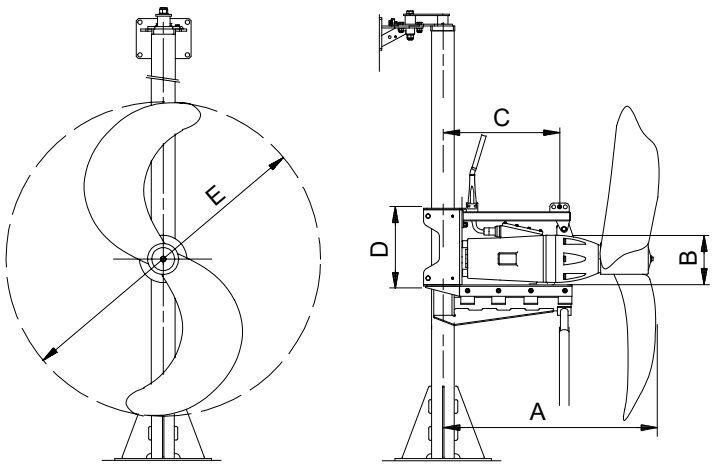
Type	P1 [kW]		P2 [kW]	Number of poles	Motor torque [Nm]	Voltage [V]	Operating mode	I_N [A]	I_{start} [A]	Cos φ 1/1
	Rated	Actual								
SMG.50.65.H.265.5.1B	5.6	4.78	5.0	4	32.3	3 x 400-415	S1, D	12.5	109	0.69
SMG.80.65.H.306.5.1B	8.7	7.24	8.0		51.7			19.0	165	0.68
SMG.110.65.H.344.5.1B	12.0	10.10	11.0		71.6			23.0	165	0.77
SMG.150.78.H.325.5.1B	16.3	14.10	15.0		96.7			31.0	220	0.77
SMG.185.78.H.358.5.1B	20.1	18.90	18.5		119.6			37.0	220	0.81

10.4.4 Liquid data

Liquid temperature	pH value	Maximum dynamic viscosity	Maximum density	Maximum dry solids content
5-60 °C	4-10	≤ 5000 mPa·s	1100 kg/m^3	Up to 10 %

10.5 SFG.xx.130.xx

10.5.1 Dimensions



TM026346

Type	Propeller version	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Net weight [1] [kg]
SFG.07.130.50.5.0B	2-blade	900	200	353	400	1300	113
SFG.10.130.57.5.0B		900	200	353	400	1300	113
SFG.14.130.64.5.0B		900	200	353	400	1300	113
SFG.17.130.68.5.1B		900	200	353	400	1300	118
SFG.22.130.74.5.1B		900	200	353	400	1300	118
SFG.27.130.80.5.1B		900	200	353	400	1300	118
SFG.33.130.85.5.1B		900	200	353	400	1300	118
SFG.36.130.88.5.1B		900	200	353	400	1300	118

1 With motor bracket and 10 m cable. Weight of cable: 0.5 kg/m.

10.5.2 Physical data

Type	Speed [min^{-1}]	Axial thrust [N]	Thrust-to-power ratio	Enclosure class	Maximum installation depth [m]	Cable type	Flow rate [m^3/h]	Mean flow velocity [m/s]
SFG.07.130.50.5.0B	49.6	665	0.875	IP68	20	S1BN8-F 11G1.5	2392	0.50
SFG.10.130.57.5.0B	57.1	880	0.793				2751	0.58
SFG.14.130.64.5.0B	63.8	1100	0.714				3076	0.64
SFG.17.130.68.5.1B	68.2	1260	0.700				3292	0.69
SFG.22.130.74.5.1B	74.0	1480	0.649				3568	0.75
SFG.27.130.80.5.1B	79.8	1730	0.605				3857	0.81
SFG.33.130.85.5.1B	84.9	1950	0.564				4095	0.86
SFG.36.130.88.5.1B	87.6	2080	0.546				4230	0.89

10.5.3 Electrical data

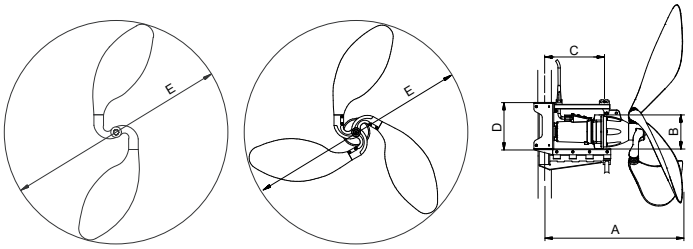
Type	P1 [kW]		P2 [kW]	Number of poles	Motor torque [Nm]	Voltage [V]	Operating mode	I_N [A]	I_{start} [A]	Cos φ 1/1
	Rated	Actual								
SFG.07.130.50.5.0B	0.85	0.76	0.7	6	6.8	3 x 400-415	S1, Y	2.8	22	0.48
SFG.10.130.57.5.0B	1.2	1.11	1.0		9.8			3.1	22	0.61
SFG.14.130.64.5.0B	1.7	1.54	1.4		13.8			3.6	22	0.71
SFG.17.130.68.5.1B	1.9	1.80	1.7	4	11.0		S1, D	4.3	47	0.70
SFG.22.130.74.5.1B	2.5	2.28	2.2		14.3			4.9	47	0.78
SFG.27.130.80.5.1B	3.1	2.86	2.7		17.6			5.7	47	0.82
SFG.33.130.85.5.1B	3.8	3.46	3.3		21.7			6.8	47	0.85
SFG.36.130.88.5.1B	4.1	3.81	3.6		23.7			7.3	47	0.86

10.5.4 Liquid data

Liquid temperature	pH value	Maximum dynamic viscosity	Maximum density	Maximum dry solids content
5-40 °C	4-10	≤ 500 mPa·s	1060 kg/m^3	1.5 %

10.6 SFG.xx.180.xx

10.6.1 Dimensions



TM026345

Type	Propeller version	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Net weight [1] [kg]
SFG.07.180.32.5.0B	2-blade	1200	302	570	400	1800	195
SFG.10.180.36.5.0B		1200	302	570	400	1800	195
SFG.14.180.41.5.0B		1200	302	570	400	1800	195
SFG.17.180.44.5.1B		1200	302	570	400	1800	200
SFG.22.180.48.5.1B		1200	302	570	400	1800	200
SFG.26.180.51.5.1B		1200	302	570	400	1800	200
SFG.32.180.51.5.1B	3-blade	1200	302	570	400	1800	223
SFG.36.180.54.5.1B		1200	302	570	400	1800	223

1 With motor bracket and 10 m cable. Weight of cable: 0.5 kg/m.

10.6.2 Physical data

Type	Speed [min^{-1}]	Axial thrust [N]	Thrust-to-power ratio	Enclosure class	Maximum installation depth [m]	Cable type	Flow rate [m^3/h]	Mean flow velocity [m/s]
SFG.07.180.32.5.0B	32.0	750	0.987	IP68	20	S1BN8-F 11G1.5	3517	0.38
SFG.10.180.36.5.0B	36.3	960	0.897				3979	0.43
SFG.14.180.41.5.0B	40.5	1200	0.811				4448	0.49
SFG.17.180.44.5.1B	44.1	1410	0.775				4822	0.53
SFG.22.180.48.5.1B	47.8	1670	0.723				5248	0.57
SFG.26.180.51.5.1B	50.7	1880	0.681				5568	0.61
SFG.32.180.51.5.1B	50.5	2160	0.653				5968	0.65
SFG.36.180.54.5.1B	53.6	2440	0.608				6343	0.69

10.6.3 Electrical data

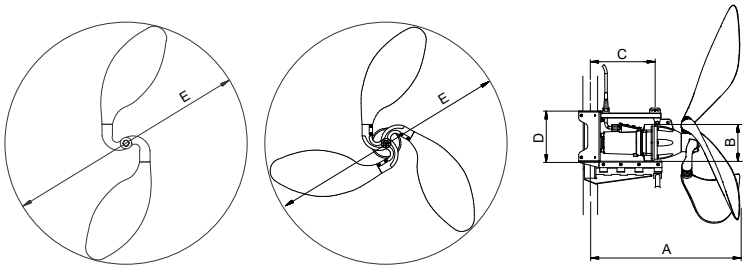
Type	P1 [kW]		P2 [kW]	Number of poles	Motor torque [Nm]	Voltage [V]	Operating mode	I_N [A]	I_{start} [A]	Cos φ 1/1
	Rated	Actual								
SFG.07.180.32.5.0B	0.85	0.76	0.7	6	6.8	3 x 400-415	S1, Y	2.8	22	0.48
SFG.10.180.36.5.0B	1.2	1.07	1.0		9.8			3.1	22	0.61
SFG.14.180.41.5.0B	1.7	1.48	1.4		13.8			3.6	22	0.71
SFG.17.180.44.5.1B	1.9	1.82	1.7	4	11.0		S1, D	4.3	47	0.70
SFG.22.180.48.5.1B	2.5	2.31	2.2		14.3			4.9	47	0.78
SFG.26.180.51.5.1B	3.0	2.76	2.6		16.9			5.5	47	0.82
SFG.32.180.51.5.1B	3.7	3.31	3.2		21.0			6.5	47	0.85
SFG.36.180.54.5.1B	4.1	4.01	3.6		23.7			7.3	47	0.86

10.6.4 Liquid data

Liquid temperature	pH value	Maximum dynamic viscosity	Maximum density	Maximum dry solids content
5-40 °C	4-10	≤ 500 mPa·s	1060 kg/m^3	1.5 %

10.7 SFG.xx.230.xx

10.7.1 Dimensions



TM026345

Type	Propeller version	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Net weight[1] [kg]
SFG.07.230.26.5.0B	2-blade	1200	302	570	400	2300	200
SFG.10.230.29.5.0B		1200	302	570	400	2300	200
SFG.12.230.31.5.0B		1200	302	570	400	2300	200
SFG.15.230.33.5.0B		1200	302	570	400	2300	200
SFG.17.230.35.5.1B		1200	302	570	400	2300	205
SFG.22.230.39.5.1B		1200	302	570	400	2300	205
SFG.26.230.40.5.1B	3-blade	1200	302	570	400	2300	230
SFG.33.230.43.5.1B		1200	302	570	400	2300	230
SFG.36.230.45.5.1B		1200	302	570	400	2300	230

1 With motor bracket and 10 m cable. Weight of cable: 0.5 kg/m.

10.7.2 Physical data

Type	Speed [min^{-1}]	Axial thrust [N]	Thrust-to-power ratio	Enclosure class	Maximum installation depth [m]	Cable type	Flow rate [m^3/h]	Mean flow velocity [m/s]
SFG.07.230.26.5.0B	26.1	1030	1.338	IP68	20	S1BN8-F 11G1.5	5266	0.35
SFG.10.230.29.5.0B	29.2	1290	1.229				5893	0.39
SFG.12.230.31.5.0B	31.2	1470	1.167				6291	0.42
SFG.15.230.33.5.0B	33.5	1700	1.076				6765	0.45
SFG.17.230.35.5.1B	35.3	1890	1.068				7133	0.48
SFG.22.230.39.5.1B	39.0	2300	0.979				7869	0.53
SFG.26.230.40.5.1B	39.5	2530	0.934				8253	0.55
SFG.33.230.43.5.1B	43.4	3040	0.842				9047	0.60
SFG.36.230.45.5.1B	44.5	3210	0.819				9296	0.62

10.7.3 Electrical data

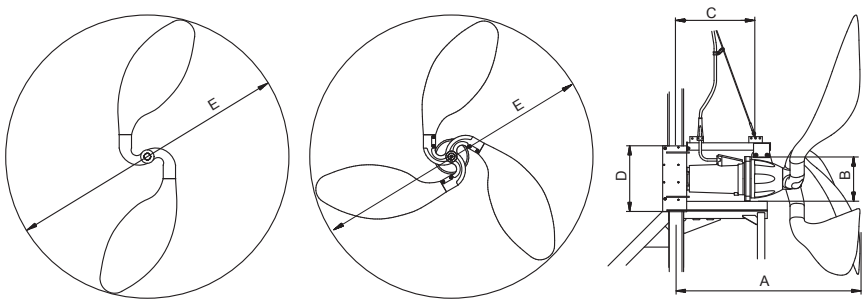
Type	P1 [kW]		P2 [kW]	Number of poles	Motor torque [Nm]	Voltage [V]	Operating mode	I_N [A]	I_{start} [A]	Cos φ 1/1
	Rated	Actual								
SFG.07.230.26.5.0B	0.85	0.77	0.7	6	6.8	3 x 400-415	S1, Y	2.8	22	0.48
SFG.10.230.29.5.0B	1.2	1.05	1.0		9.8			3.1	22	0.61
SFG.12.230.31.5.0B	1.4	1.26	1.2		11.8			3.3	22	0.67
SFG.15.230.33.5.0B	1.8	1.58	1.5		14.8			3.8	22	0.73
SFG.17.230.35.5.1B	1.9	1.77	1.7	4	11.0		S1, D	4.3	47	0.70
SFG.22.230.39.5.1B	2.5	2.35	2.2		14.3			4.9	47	0.78
SFG.26.230.40.5.1B	3.0	2.71	2.6		16.9			5.5	47	0.82
SFG.33.230.43.5.1B	3.8	3.61	3.3		21.7			6.8	47	0.85
SFG.36.230.45.5.1B	4.1	3.92	3.6		23.7			7.3	47	0.86

10.7.4 Liquid data

Liquid temperature	pH value	Maximum dynamic viscosity	Maximum density	Maximum dry solids content
5-40 °C	4-10	≤ 500 mPa·s	1060 kg/m^3	1.5 %

10.8 SFG.xx.260.xx

10.8.1 Dimensions



TM043957

SFG.22-48.260... and SFG.50-80.260...

Type	Propeller version	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Net weight [1] [kg]
SFG.22.260.30.5.1B	2-blade	1500	360	650	585	2600	360
SFG.27.260.32.5.1B		1500	360	650	585	2600	360
SFG.32.260.34.5.1B		1500	360	650	585	2600	360
SFG.36.260.35.5.1B		1500	360	650	585	2600	360
SFG.44.260.38.5.1B		1500	360	650	585	2600	360
SFG.48.260.39.5.1B		1500	360	650	585	2600	360
SFG.50.260.35.5.1B	3-blade	1500	360	680	585	2660	415
SFG.60.260.38.5.1B		1500	360	680	585	2660	415
SFG.66.260.39.5.1B		1500	360	680	585	2660	415
SFG.74.260.41.5.1B		1500	360	680	585	2660	415
SFG.80.260.42.5.1B		1500	360	680	585	2660	415

1 With motor bracket and 10 m cable. Weight of cable: 0.5 kg/m.

10.8.2 Physical data

Type	Speed [min^{-1}]	Axial thrust [N]	Thrust-to-power ratio	Enclosure class	Maximum installation depth [m]	Cable type	Flow rate [m^3/h]	Mean flow velocity [m/s]
SFG.22.260.30.5.1B	29.5	2540	1.090	IP68	20	S1BN8-F 11G2.5	9348	0.49
SFG.27.260.32.5.1B	32.0	2990	1.027				10142	0.53
SFG.32.260.34.5.1B	34.0	3370	0.980				10768	0.56
SFG.36.260.35.5.1B	35.3	3640	0.948				11191	0.59
SFG.44.260.38.5.1B	38.1	4230	0.885				12064	0.63
SFG.48.260.39.5.1B	39.1	4470	0.861				12401	0.65
SFG.50.260.35.5.1B	35.2	4660	0.901				12954	0.65
SFG.60.260.38.5.1B	38.0	5410	0.841				13958	0.70
SFG.66.260.39.5.1B	39.0	5710	0.820				14339	0.72
SFG.74.260.41.5.1B	41.0	6310	0.778				15074	0.75
SFG.80.260.42.5.1B	41.8	6570	0.761				15381	0.77

10.8.3 Electrical data

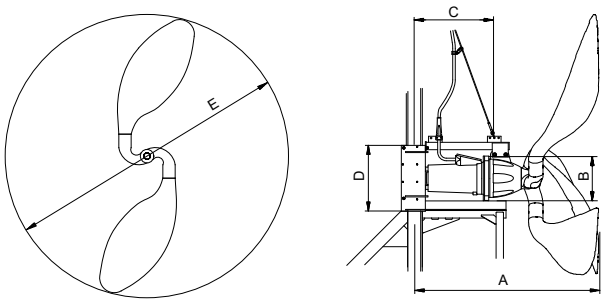
Type	P1 [kW]		P2 [kW]	Number of poles	Motor torque [Nm]	Voltage [V]	Operating mode	I_N [A]	I_{start} [A]	Cos φ 1/1
	Rated	Actual								
SFG.22.260.30.5.1B	2.6	2.33	2.2		21.2			8.0	84	0.50
SFG.27.260.32.5.1B	3.1	2.91	2.7		26.1			8.5	84	0.56
SFG.32.260.34.5.1B	3.7	3.44	3.2		31.1			8.8	84	0.63
SFG.36.260.35.5.1B	4.1	3.84	3.6		35.0			9.4	84	0.67
SFG.44.260.38.5.1B	5.0	4.78	4.4		43.0			10.5	84	0.73
SFG.48.260.39.5.1B	5.5	5.19	4.8	6	47.0	3 x 400-415	S1, D	11.0	84	0.75
SFG.50.260.35.5.1B	5.7	5.17	5.0		48.8			12.0	133	0.71
SFG.60.260.38.5.1B	6.8	6.43	6.0		58.8			13.5	133	0.76
SFG.66.260.39.5.1B	7.5	6.96	6.6		64.9			14.5	133	0.78
SFG.74.260.41.5.1B	8.4	8.11	7.4		73.1			16.0	133	0.80
SFG.80.260.42.5.1B	9.1	8.63	8.0		79.2			17.0	133	0.81

10.8.4 Liquid data

Liquid temperature	pH value	Maximum dynamic viscosity	Maximum density	Maximum dry solids content
5-40 °C	4-10	≤ 500 mPa·s	1060 kg/m^3	1.5 %

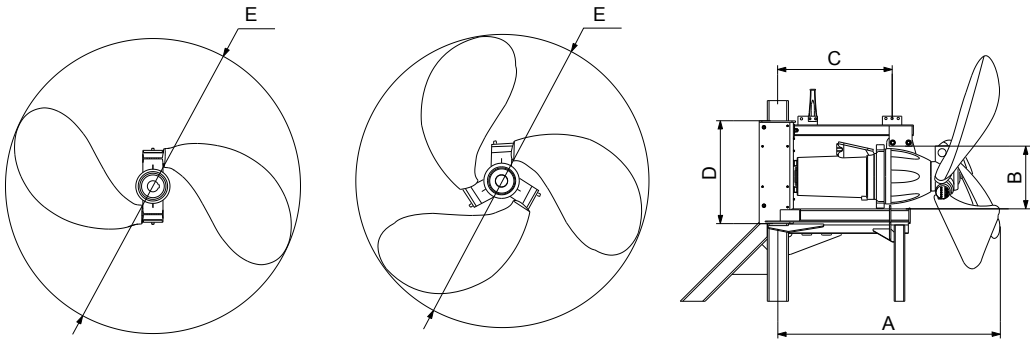
10.9 SFG.H, heavy-duty flowmaker

10.9.1 Dimensions



TM082765

SFG.xx.260 - 2 blade



TM069872

SFG.xx.150 - 2 and 3 blade

SFG.xx.150 - Propeller angle

There are three possible angles available: 18 °, 22 ° and 26 °.

Thrust values vary for each angle.

Type	Propeller version	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Net weight[1] [kg]
SFG.110.150.H.91.5.1B	2-blade	1300	360	650	585	1500	333
SFG.110.150.H.83.5.1B	3-blade	1300	360	650	585	1500	358
SFG.70.260.H.44.5.1B	2-blade	1500	360	650	585	2600	363
SFG.100.260.H.51.5.1B		1500	360	650	585	2600	378

1 With motor bracket and 10 m cable. Weight of cable: 0.5 kg/m.

10.9.2 Physical data

Type	Speed [min^{-1}]	Axial thrust [N]	Thrust-to-power ratio	Enclosure class	Maximum installation depth [m]	Cable type	Flow rate [m^3/h]	Mean flow velocity [m/s]
SFG.110.150.H.91.5.1B	90.7	4180	0.362	IP68	20	LAPP TPE 7G4 x 4 x 1	6918	1.09
SFG.110.150.H.83.5.1B	83.2	4500	0.418				7178	1.13
SFG.70.260.H.44.5.11B	43.8	5600	0.794				13880	0.73
SFG.100.260.H.51.5.1B	50.7	7550	0.696				16117	0.84

10.9.3 Electrical data

Type	P1 [kW]		P2 [kW]	Number of poles	Motor torque [Nm]	Voltage [V]	Operating mode	I_N [A]	I_{start} [A]	Cos φ 1/1
	Rated	Actual								
SFG.110.150.H.91.5.1B	12.0	11.55	11.0	4	71.6	3 X 400-415	S1, D	23.0	165	0.77
SFG.110.150.H.83.5.1B	12.0	10.76	11.0		71.6			23.0	165	0.77
SFG.70.260.H.44.5.11B	7.7	7.05	7.0		45.5			14.5	109	0.78
SFG.100.260.H.51.5.1B	12.0	10.85	11.0		71.6			23.0	165	0.77

10.9.4 Liquid data

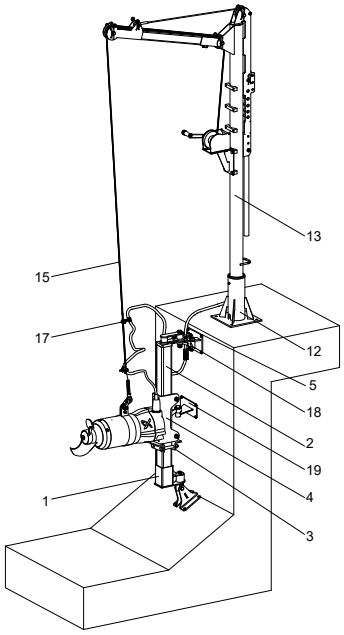
Liquid temperature	pH value	Maximum dynamic viscosity	Maximum density	Maximum dry solids content
5-60 °C	5-10	≤ 5000 mPa·s	1100 kg/m^3	10.0 %

11. Accessories

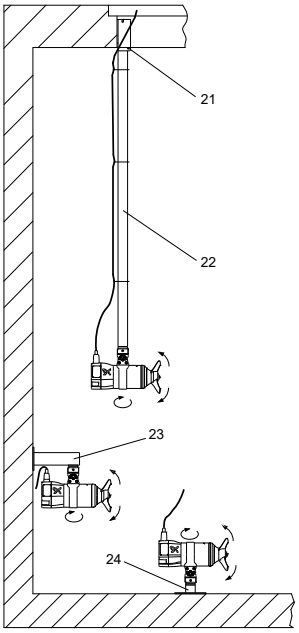
Grundfos offers the following equipment for installation, inspection and service of mixers and flowmakers. The position numbers in figs *Fig. SMD installation* to *Fig. SFG installation* refer to the list of accessories below.

The following accessories are designed for the installation in wastewater plants. When you use a depth blocker for the installation, the mixer rests on the depth blocker during operation.

Note: The accessories listed are not designed for the heavy-duty (H) versions installed in biogas plants. For accessories for these versions, contact Grundfos.



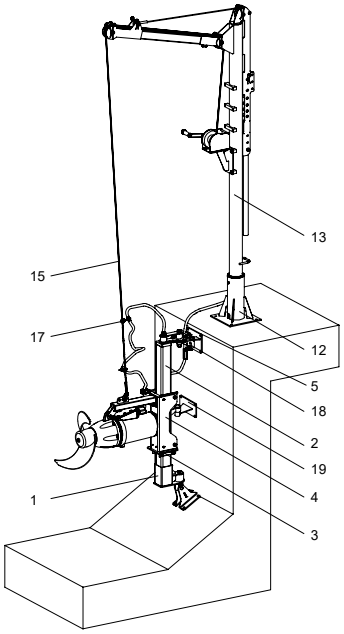
SMD installation



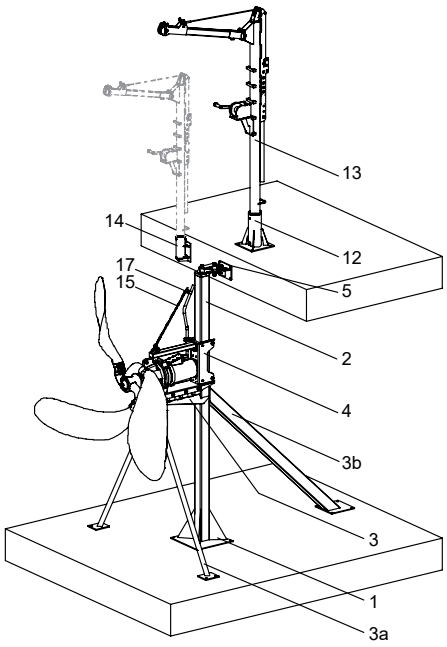
TM081918

TM079892

SMD.09-18, suspended, wall and floor mounting. See products with a "T" in the type description.



SMG installation



TM081916

TM081917

SFG installation

11.1 Selection guide for accessories

Type designation	Column profile			Support legs [1]		Crane type	Wire	Cable clamp
	< 6 m	< 10 m [2]	> 10 m	Front	Back			
SMD.09 - SMD.18	60 x 60 x 3		Contact Grundfos.	No		S (100 kg)	∅4	∅15
SMD.19 - SMD.35	60 x 60 x 3			No		S (100 kg)	∅4	∅17
SMG.09 - SMG.45	80 x 80 x 3	100 x 100 x 4		No		S (100 kg)	∅4	∅17
SMG.48 - SMG.130	100 x 100 x 3	100 x 100 x 4		No		M (250 kg)	∅6	∅20
SMG.140 - SMG.185	100 x 100 x 4	100 x 100 x 5		No		L (500 kg)	∅7	∅20
SFG.xx.130	100 x 100 x 4			Yes	No	M (250 kg)	∅6	∅17
SFG.xx.180	100 x 100 x 4			Yes	> 6 m	M (250 kg)	∅6	∅17
SFG.xx.230	100 x 100 x 4			Yes	> 6 m	M (250 kg)	∅6	∅17
SFG.xx.150/260	120 x 120 x 5			Yes	Yes	L (500 kg)	∅7	∅20

1 Additional legs are required, depending on the tank depth.

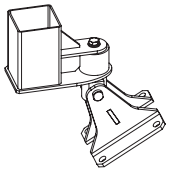
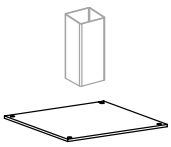
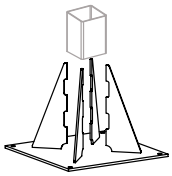
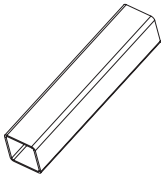
2 If the installation height exceeds 6 m, use either a bigger size column profile or an intermediate fixation bracket (only SMG). If this is not possible, contact Grundfos.

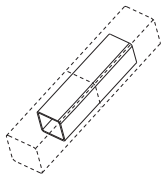
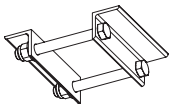
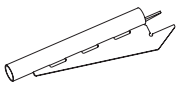
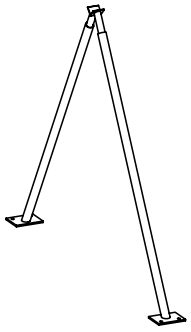
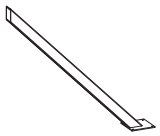
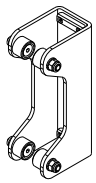
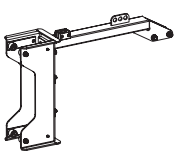
Column profiles adhere to EN 10219-2 standard.

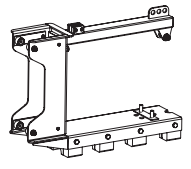
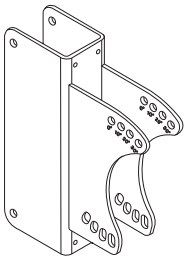
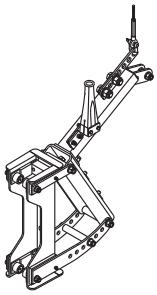
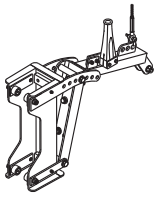
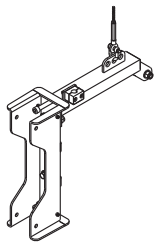
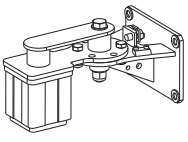
When shortening a column profile, the perpendicularity tolerance of the cutting edge is 0.4 mm.

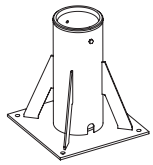
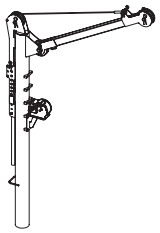
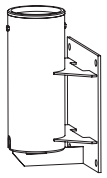
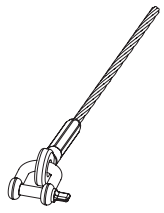
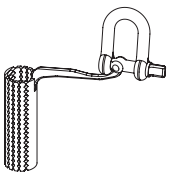
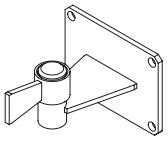
11.2 List of accessories

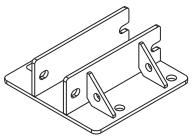
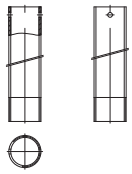
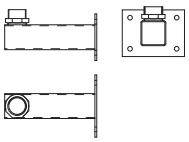
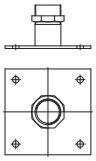
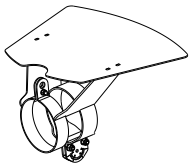
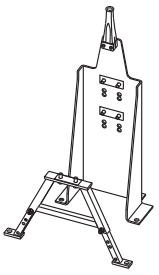
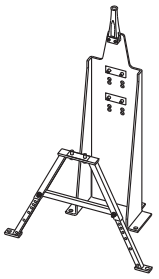
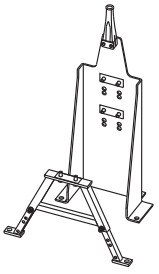
Position numbers refer to figs *Fig. SMD installation* to *Fig. SFG installation*.

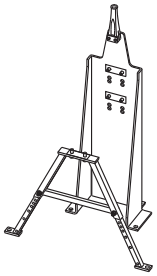
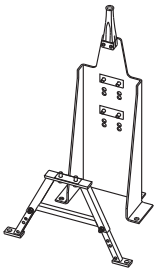
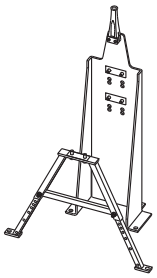
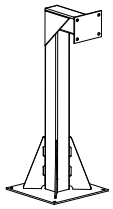
Accessory	Pos.	Description	Dimensions and product range	Material DIN/AISI	Product number
 TM043896	1	Bottom fixation bracket, complete	60 x 60 mm column profile. SMD	1.4301/304	95037099
				1.4404/316 L	95037100
			80 x 80 mm column profile. SMG	1.4301/304	95037101
				1.4404/316 L	95037102
			100 x 100 mm column profile. SMG	1.4301/304	95037103
				1.4404/316 L	95037104
 TM043954	1	Bottom fixation plate, complete	SFG.xx.130	1.4301/304	96489415
				1.4404/316 L	96489416
 TM042717	1	Bottom fixation plate, complete	SFG.xx.180/230/260	1.4301/304	96489411
				1.4404/316 L	96489414
 TM044005	2	Column profile, 60 x 60 x 3 mm	6 m	1.4301/304	99381044
				1.4404/316 L	99381045
		Column profile, 80 x 80 x 3 mm	6 m	1.4301/304	99381046
				1.4404/316 L	99381047
		Column profile, 100 x 100 x 3 mm	6 m	1.4301/304	99381048
				1.4404/316 L	99381049
		Column profile, 100 x 100 x 4 mm	6 m	1.4301/304	99381050
				1.4404/316 L	99381051
		Column profile, 100 x 100 x 5 mm	6 m	1.4301/304	99381052
				1.4404/316 L	99381053
		Column profile, 120 x 120 x 5 mm.	6 m	1.4301/304	99381054
				1.4404/316 L	99381055

Accessory	Pos.	Description	Dimensions and product range	Material DIN/AISI	Product number
 TM049473	2	Connecting piece for column profile Required for column profiles longer than 6 m.	60 x 60 x 3 mm 0.20 m	1.4301/304	95037960
				1.4404/316 L	95037962
			80 x 80 x 3 mm 0.20 m	1.4301/304	95037964
				1.4404/316 L	95037966
			100 x 100 x 3 mm 0.20 m	1.4301/304	95037968
				1.4404/316 L	95037970
			100 x 100 x 4 mm 0.20 m	1.4301/304	95037972
				1.4404/316 L	95037974
			100 x 100 x 5 mm 0.20 m	1.4301/304	95037976
				1.4404/316 L	95037978
			120 x 120 x 5 mm 0.20 m	1.4301/304	95037980
				1.4404/316 L	95037982
 TM044010	3	Depth blocker for clamping	60 x 60 mm column profile. SMD	1.4301/304	95037105
				1.4404/316 L	95037106
			80 x 80 mm column profile. SMG	1.4301/304	95037107
				1.4404/316 L	95037108
			100 x 100 mm column profile. SMG	1.4301/304	95037109
				1.4404/316 L	95037110
 TM044009	3	Depth blocker	SFG.xx.130/180/230	1.4301/304	95037044
				1.4404/316 L	95037045
			SFG.xx.260	1.4301/304	95036467
				1.4404/316 L	95036468
 TM043644	3a	Two front support legs	SFG.xx.130	1.4301/304	96115262
				1.4404/316 L	96115263
			SFG.xx.180-230	1.4301/304	96115264
				1.4404/316 L	96115265
			SFG.xx.260	1.4301/304	95036469
				1.4404/316 L	95036470
 TM043643	3b	Back support leg	SFG.xx.180/230	1.4301/304	95036089
				1.4404/316	95036090
			SFG.xx.260	1.4301/304	95036471
				1.4404/316 L	95036472
 TM065346	4	Motor bracket slide	50 x 50 mm column SMD.09-35	1.4404/316 L	95040165
			60 x 60 mm column SMD.09-35	1.4404/316 L	95040078
			80 x 80 mm column SMD.09-35	1.4404/316 L	99092451
			100 x 100 mm column SMD.09-35	1.4301/304	95040149
 TM044012	4	Motor bracket [1]	80 x 80 mm column profile. SMG.09-40	1.4301/304	95037071
				1.4404/316 L	95037072
			100 x 100 mm column profile. SMG.09-40	1.4301/304	95037471
				1.4404/316 L	95037472
			100 x 100 mm column profile. SMG.48-120	1.4301/304	95037073
				1.4404/316 L	95037074

Accessory	Pos.	Description	Dimensions and product range	Material DIN/AISI	Product number
			100 x 100 mm column profile. SMG.140-185	1.4301/304	95037075
				1.4404/316 L	95037076
 TM044011	4	Motor bracket [1]	100 x 100 mm column profile. SFG.xx.130	1.4301/304	95037077
				1.4404/316 L	95037078
			100 x 100 mm column profile. SFG.xx.180/230	1.4301/304	95037079
				1.4404/316 L	95037080
			120 x 120 mm column profile. SFG.xx.260	1.4301/304	95036347
				1.4404/316 L	95036424
 TM068382	4	Angle-adjustable adapter bracket ± 30 °, to mount on bracket slide 60 x 60 mm [1]	60 x 60 mm column profile. SMD.09-35	1.4404/316 L	95035395
			100 x 100 mm column profile. SMD.09-35	1.4404/316 L	95035405
 TM055099	4	Angle-adjustable motor bracket, for ± 30 ° in steps of 5 ° [1]	50 x 50 mm column profile. SMG.09-40	1.4301/304	95038905
				1.4404/316 L	95038910
			60 x 60 mm column profile. SMG.09-40	1.4301/304	95038906
				1.4404/316 L	95038911
			80 x 80 mm column profile. SMG.09-40	1.4301/304	95038350
				1.4404/316 L	95038360
			100 x 100 mm column profile. SMG.48-120	1.4301/304	95038370
				1.4404/316 L	95038380
 TM055098			100 x 100 mm column profile. SMG.140-180	1.4301/304	95038390
				1.4404/316 L	95038399
			100 x 100 mm column profile. SMG.09-40	1.4301/304	95038940
				1.4404/316 L	95038945
 TM055096	4	Motor bracket adapter *11.2 List of accessories*	50 x 50 mm column profile. SMG.09-40	1.4301/304	95038219
				1.4404/316 L	95038220
			60 x 60 mm column profile. SMG.09-40	1.4301/304	95038317
				1.4404/316 L	95038319
			70 x 70 mm column profile. SMG.09-40	1.4301/304	95038280
				1.4404/316 L	95038321
 TM043881	5	Top fixation bracket, complete, including safety wire	60 x 60 mm column profile	1.4301/304	95037090
				1.4404/316 L	95037091
			80 x 80 mm column profile	1.4301/304	95037092
				1.4404/316 L	95037093
			100 x 100 mm column profile	1.4301/304	95037094
				1.4404/316 L	95037095
			120 x 120 mm column profile	1.4301/304	96845665
				1.4404/316 L	95037150

Accessory	Pos.	Description	Dimensions and product range	Material DIN/AISI	Product number
 TM044000	12	Crane foot	100 kg crane	1.4301/304	95036937
				1.4404/316 L	95037665
				Galvanised steel	95036948
			250 and 500 kg cranes	1.4301/304	95036908
				1.4404/316 L	95037685
				Galvanised steel	95036894
 TM043999	13	Crane with winch	S 100 kg	1.4301/304	95036845
				1.4404/316 L	95037640
				Galvanised steel	95036930
			M 250 kg	1.4301/304	95036900
				1.4404/316 L	95037670
				Galvanised steel	95036874
			L 500 kg	1.4301/304	95036950
				1.4404/316 L	95037700
				Galvanised steel	95036975
 TM044001	14	Crane foot for vertical installation	100 kg crane	1.4301/304	95036979
				1.4404/316 L	95037695
				Galvanised steel	95036995
			250 and 500 kg cranes	1.4301/304	95036980
				1.4404/316 L	95037710
				Galvanised steel	95037000
 TM044002	15	∅4 lifting wire, easy mounting, including ∅8 shackle and wire clamp	10 m (for up to 5 m installation depth)	1.4404/316 L	95037142
			15 m (for up to 10 m installation depth)	1.4404/316 L	95037143
		∅6 lifting wire, easy mounting, including ∅8 shackle and wire clamp	10 m (for up to 5 m installation depth)	1.4404/316 L	95037144
			15 m (for up to 10 m installation depth)	1.4404/316 L	95037145
		∅7 lifting wire, easy mounting, including ∅10 shackle and wire clamp	10 m (for up to 5 m installation depth)	1.4404/316 L	95037146
			15 m (for up to 10 m installation depth)	1.4404/316 L	95037147
 TM044003	17	Cable clamp	∅10	1.4404/316 L	96565202
			∅15	1.4404/316 L	95040076
			∅17	1.4404/316 L	96494352
			∅20	1.4404/316 L	96494354
 TM043998	18	Cable sock, including ∅10 shackle		Synthetic material, 1.4404/316 L	95037141
 TM044004	19	Intermediate fixation bracket, complete	All profile sizes longer than 6 m	1.4301/304	95037148
				1.4404/316 L	95037149

Accessory	Pos.	Description	Dimensions and product range	Material DIN/AISI	Product number
 TM065590	21	Fixation bracket for suspended mounting	SMD.09 - 18.xx.T	1.4404/316L	95040132
 TM043665	22	Tube for suspended mounting, 2" thread, length 3 m	SMD.09 - 18.xx.T	1.4404/316L	95040131
 TM043666	23	Fixation bracket for wall mounting, 2"	SMD.09 - 18.xx.T	1.4404/316L	96115291
 TM043667	24	Fixation plate for floor mounting	SMD.09 - 18.xx.T	1.4404/316L	96115292
 TM068439	25	Vortex shield for SMD	SMD.09-18	1.4404/316L	99210088
			SMD.19-35	1.4404/316L	99210089
 TM055102		Motor bracket for bottom fixation, 50 mm space from propeller tip to bottom		1.4301/304	95039063
			SMG.09-40. Max. propeller size: ∅710	1.4404/316 L	95039065
 TM055103		Motor bracket for bottom fixation, 250 mm space from propeller tip to bottom		1.4301/304	95039067
			SMG.09-40. Max. propeller size:∅710	1.4404/316 L	95039068
 TM055102		Motor bracket for bottom fixation, 50 mm space from propeller tip to bottom		1.4301/304	95039085
			SMG.48-120. Max. propeller size: ∅860	1.4404/316 L	95039086

Accessory	Pos.	Description	Dimensions and product range	Material DIN/AISI	Product number
	TM055103	Motor bracket for bottom fixation, 250 mm space from propeller tip to bottom	SMG.48-120. Max. propeller size:∅860	1.4301/304	95039089
				1.4404/316 L	95039090
	TM055102	Motor bracket for bottom fixation, 50 mm space from propeller tip to bottom	SMG.140-180. Max. propeller size:∅1000	1.4301/304	95039107
				1.4404/316 L	95039108
	TM055103	Motor bracket for bottom fixation, 250 mm space from propeller tip to bottom	SMG.140-180. Max. propeller size: ∅1000	1.4301/304	95039111
				1.4404/316 L	95039112
	TM049385	Support for top fixation		1.4301/304	95037404
				1.4404/316 L	95039149
	TM070971	ALR-20/A-Ex relay for leak sensor, 230 V			99794613
	TM065361	Chemical anchor, M12 x 160 (1 anchor, 1 nut, 1 washer, 1 spring washer, 1 glue cartridge)		316	95036113
		Chemical anchor, M16 x 190 (1 anchor, 1 nut, 1 washer, 1 spring washer, 1 glue cartridge)		316	95037179

1 Contact Grundfos to order standard brackets for mixers and flowmakers assembled from the factory.

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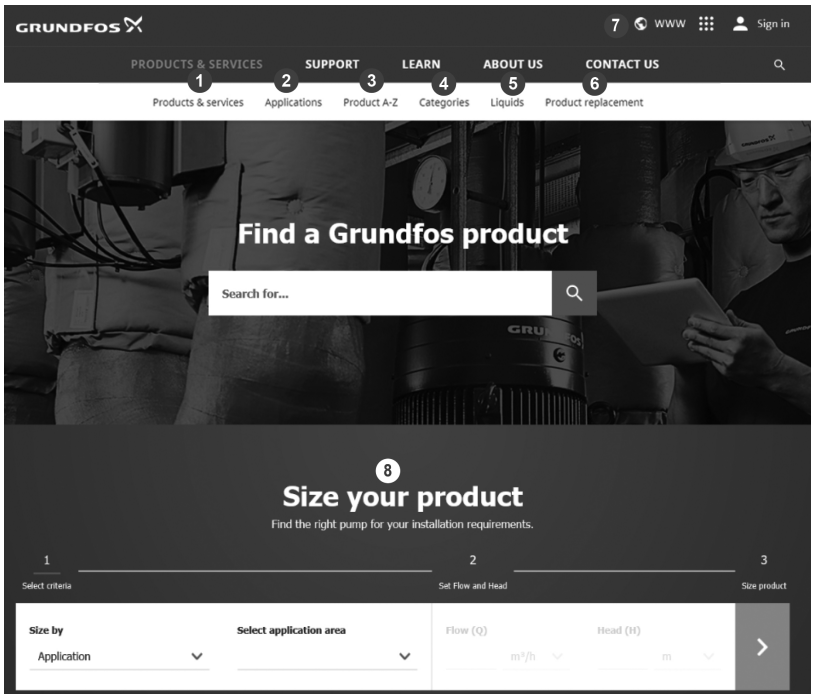

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