SDB TANK BOTTOM MIXER

INSTRUCTION MANUAL

TMXFLOW®
let it flow

CONTENTS

1. GENERAL INFORMATIONS

1.1 INSTRUCTION MANUAL

This manual contains information about the reception, installation, operation, assembly, disassembly and maintenance of the tank bottom mixer SDB. Carefully read the instruction before starting the mixer, familiarize yourself with the installation, operation and correct use of the mixer and strictly follow the instructions. These instructions should be kept in a safe location near the installation area. The information published in the instruction manual is based on updated data. TMXFLOW reserves the right to modify this instruction manual without prior notice.

1.2 COMPLIANCE WITH THE INSTRUCTIONS

Not following the instructions may impose a risk for the operators, the environment and the machine, and may result in the loss of the right to claim damages.
This non-compliance may result in the following risks:

- failure of important machine/plant functions,
- failure of specific maintenance and repair procedures,
- possible electrical, mechanical and chemical hazards,
- risk to the environment due to the type of substances released.

1.3 WARRANTY

The conditions of the warranty are specified in the General Sales Condition that has been delivered at the time of placing your order.

The machine may not undergo any modification without prior approval from the manufacturer.
For your safety, only use original spare parts and accessories.
The usage of other parts will relieve the manufacturer of any liability.
Changing the service conditions can only be carried out with prior written authorization from TMXFLOW.
The non-compliance of the prescribed indications in this manual means misuse of this gear on the technical side and the personal safety and this, exempt TMXFLOW of all responsibility in case of accidents and personal injuries and/or property damage. Also, excluded from the warranty all breakdowns caused by improper use of the gear.

Please do not hesitate to contact us in case of doubts or if further explanations are required regarding specific data (adjustments, assembly, disassembly, etc.).

2. SAFETY

2.1 GENERAL SAFETY INSTRUCTION

Safety hazard for people in general and/or for equipment

Electric Hazard

ATTENTION Important instruction for the protection of the equipment and its functions

3. IDENTIFICATION, DESCRIPTION AND USE

3.1 IDENTIFICATION

The mixer is identified by means of a plate stating its characteristics attached to the motor. The type of mixer and serial number are on the plate. *See figure 4.1 and 4.2.*

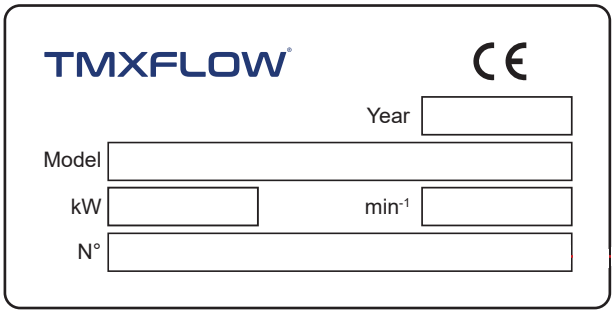


Figure 4.1

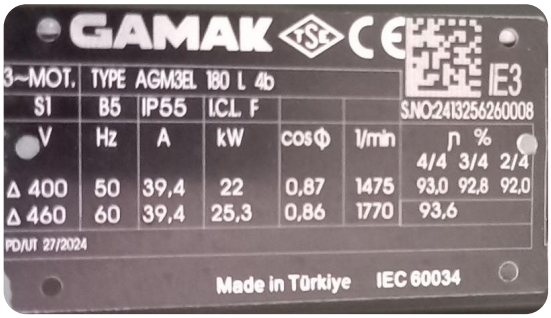


Figure 4.2

Example:

Head Assembly

FBM 30-022

FBM = MIXER Emulfiser

Size
30-022
30-040
30-075
30-185
30-130

3.2 DESCRIPTION

The SBM range includes high-shear tank-bottom mixers
The mixers in this range have been designed so that the mechanical seal is accessible from inside the tank. As such, whenever it is necessary to change the seal, there is no need to detach the mixer from the tank. This range can be used in both open and closed tanks at atmospheric pressure or operating under pressure or in vacuum. They are especially suitable for work in conjunction with anchor-type agitators.

3.3 OPERATION PRINCIPLE

• The impeller sucks the fluid through the holes at the top.
• Once this suction is completed, the fluid reaches the impeller blades and these push it towards the stator where it is sheared.
• The fluid is expelled radially through the stator slots at high speed.

3.4 APPLICATION

Bottom mixers are suitable for particle-reduction processes, dissolution, dispersion, and emulsion. Given their hygienic design, these mixers are suitable for industries as demanding as cosmetics, foodstuffs, and pharmaceutics. They can also be used in other types of industries such as adhesives, chemicals, paints, and plastics.

Each mixer has performance limits. The mixer was selected for a given set of mixing conditions when the order was placed. TMXFLOW shall not be held responsible for any damage that might be suffered or malfunctioning of the equipment if the information provided by the buyer is incomplete or incorrect (e.g. nature of the fluids or installation details).

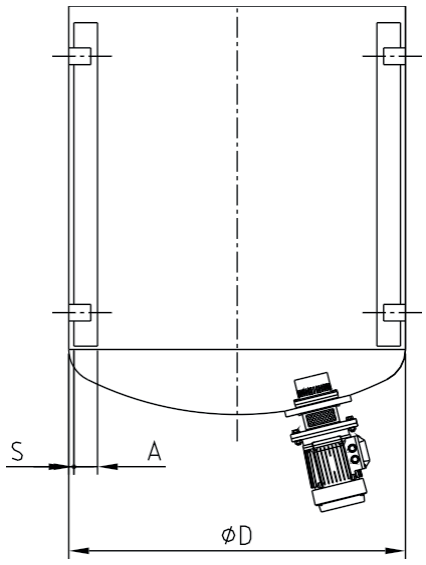
4. INSTALLATION AND ASSEMBLY

4.1 INSTALLATION AND ASSEMBLY

If the mixer is supplied without a drive or other element, the purchaser shall be responsible for its assembly, installation, start-up and operation.

4.2 LOCATION

Place the mixer in such a way as to facilitate inspection and servicing. Leave sufficient room around the mixer for adequate servicing, separate, even when it is in operation. It is very important to be able to obtain access to the electrical connection mechanism of the mixer, even when it is in working mode.
To achieve an effective mixing process it may be necessary to fit baffles to the bottom of the tank. Consult our technical department for each particular application. If required, the approximate dimensions of the baffles in relation to the diameter of the tank are shown in figure 5.1 and table 5.1.



Ø D	300	400	500	600	800	1000	1200	1600	2000	2500	3000	3500	4000
A	20	30	35	40	50	70	80	115	130	180	200	240	280
S	5	5	10	10	10	20	20	20	30	30	50	50	50

4.3 ASSEMBLY

• Place and assemble the mixer at the bottom of the tank ensuring that the O-ring is fitted.
• Once placed on the tank flange, place the screws and washers in their corresponding bore holes and fasten them tightly.
• Make sure that the order components of the installation are prepared and ready for start-up of the mixer.

Force should never be applied to the end of the agitator shaft, as it can easily suffer permanent damage.

4.4 ELECTRICAL CONNECTION

Before connecting the electric motor to the mains, check the local regulations and the corresponding standards regarding electrical safety. Take special account of those parts referring to command and control of the mixer. Check the manufacturer's instruction manual of the motor for connecting it to the mains.

Let the electrical connection of the motors to qualified personnel. Take the necessary measures in order to prevent any type of breakdown. The motor should be protected with devices against overload and short-circuits. It is not possible to use the agitator in areas of risk of fire or explosion if this has not been included in the order.

5. START-UP, OPERATION AND SHUTDOWN

Mixer start-up shall be able to be carried out if the detailed instructions in the section on installation and assembly have previously been realized.

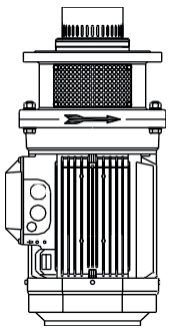
5.1 START-UP

• Check that the electrical supply is appropriate for what is indicated on the motor plate.
• Check the tank's liquid level. Unless specified in the order, the mixer cannot function during tank filling or emptying.
• Check that the mechanical seal is in the condition required to operate properly (see technical specifications).

The mixer can NEVER run without a product. The agitation element must be submerged at least to a height above twice its diameter.

• All the protectors must be in place.
• The performance of the mixer-emulsifier depends on the viscosity of the fluid being mixed. To properly operate the equipment, follow this loading procedure:
• Pour all the low-viscosity components inside the vessel.
• Start up the mixer.
• Check that the direction of rotation of the impeller is correct (it must rotate clockwise looking from the drive side See figure 6.1.
• Add the remaining fluid or soluble components.
• Add any solids that require to be cut or a predetermined time for reaction.
• Add the remaining components, including solids to stabilize the preparation or to increase viscosity.
• Check the motor's electrical consumption.

Respect the direction of rotation of the agitation element as indicated by the arrow stuck on the motor. The wrong direction will cause a loss of mixer efficiency.



TMXFLOW SDB Tank Bottom Mixer

5.2 OPERATION

Do not modify the operating parameters for which the mixer was initially selected without prior written consent of TMXFLOW. (Risk of deterioration and danger for the user). Follow the operating instructions and safety indications described in the instructions manual of the tank on which the mixer is mounted.

Mechanical hazards (drag, shearing, cutting, strike, squashing, clipping. etc.) If the mixer element is accessible from above or at the man way of the tank then the user is exposed to the aforementioned hazards.

The tank should be equipped with protection devices and safety equipment. Check the manufacturer's instructions manual.

The introduction of a solid object or raw material may cause breakage of The agitation element or the breakage of other mechanical parts and endanger safety and they warranty.

6. MAINTENANCE AND CONSERVATION

Maintenance work can only be carried out by qualified personnel that are trained and equipped with the necessary resources to carrying out this work. All parts or materials that are replaced must be properly disposed of / recycled in accordance with the current directives applicable in each area.

Before beginning maintenance work, ensure that the electric motor is disconnected and that the tank is empty.

6.1 MAINTENANCE

• Inspect the mixer regularly.
• Do not fail to keep the mixer clean.
• Check the state of the motor.
• Check the sealing: mechanical seal.
Motor maintenance shall be carried out in accordance with the manufacturer's instructions. See the instructions manual.

6.2 LUBRICATION

Should greasing of the motor bearings shall be carried out in accordance with the manufacturer's instructions.

6.3 SPARE PARTS

To order spare parts it is necessary to indicate the type and serial number included on the mixer's characteristic plate, as well as the position and description of the part as found in chapter 10, technical specifications.

6.4 CONSERVATION

If the agitator is out of service for a considerable period of time, clean and treat the parts with VG 46 mineral oil. The shaft must be stored in the horizontal position and on wooden supports or on supports of a similar material.

7. OPERATING PROBLEMS: CAUSES AND SOLUTIONS

	Operating Problems	Probable Causes
	Motor overload.	1, 2, 3, 10.
	Insufficient mixer.	1, 3, 4, 5.
	Vibrations and noise.	6, 7, 8.
	Leakage.	9, 10.

	Probable Causes	Solutions
1	Viscosity of the liquid too high.	Reduce the viscosity, e.g. by heating the liquid
2	High density.	Increase motor power.
3	Tank too big for the chosen mixer.	Check whit the technical department.
4	Wrong direction of rotation.	Change direction of rotation.
5	Mixer speed too low.	Increased the speed.
6	Liquid level insufficient or none.	Check liquid level in the tank.
7	Shaft bended.	Replace the shaft.
8	Worn bearing to motor.	Replace the motor bearing.
9	V-ring worn or damaged.	Replace the V-ring.
10	The impeller rubs	Decrease the temperature.

If the problems persist stop using the mixer immediately. Contact the MIXER manufacturer or the representative.

8. DISASSEMBLY AND ASSEMBLY

The assembly and disassembly of the agitators should only be carried out by qualified personnel. Ensure that staff read this instruction manual carefully, especially those parts that make direct reference to their work.

8.1 ELECTRICAL SAFETY

Ensure that the motor starter is turned off when carrying out disassembly or assembly work on the agitator.

- **IPlace the agitator switch in the "off" position.**
- **Block the electrical panel and put a warning notice on it.**
- **Take out the fuses and take them with you to the work area.**

8.2 DISASSEMBLY AND ASSEMBLY TO THE MIXER

DISASSEMBLY OF THE STATOR

- Empty the tank.
- Disconnect the cables from the motor terminals.
- Remove the protector by taking out the screws and washers.
- Disconnect the pressure vessel if there is.
- Enter the tank through the inspection hatch if possible. If not, detach the equipment from its location. In the latter case, remove the screws and washers fastening the mixer to the tank. This process must be carried out using a pallet truck in order to support the mixer and move it. Take care to ensure that the mixer is supported by the lantern/motor connection part for better stability and to prevent it from falling.
- Remove the stator , from inside the tank where applicable, by removing the Allen screws.
- Remove O-ring from the stator.

ASSEMBLY THE STATOR

- Place the O-ring to the stator.
- The stator must be assembled from the inside of the tank. Attached the mixer to the tank fastening it with screws and washers. The process must be assisted by a pallet truck: to hold the mixer and to transport it. The mixer must be supported by the lantern/motor connection part for better stability to prevent it from falling.
- Attach the stator to the cover with the screws.
- Connect the pressure vessel if there is.
- Place the protectors to the lantern and fasten them with screws and washers.

DISASSEMBLY AND ASSEMBLY MECHANICAL SEAL

DISASSEMBLY

- All the steps from part 9.2.1 must be carried out.
- Remove the impeller hold with a spanner through the flat surfaces machined on the shaft and by means of a tubular tool remove the nut by a anticlockwise hit with a hammer.
- Remove the key from the shaft.
- Remove the rotary part of the mechanical seal from the impeller.
- Remove the cover by taking the screws out.
- Loosen and remove the fittings of the refrigeration, in the case of having refrigeration.
- Once the cover is out, remove the stationary part of the mechanical seal remove the spring by turning it through the cover pins .
- Remove the o-ring from the cover.

ASSEMBLY

- Assemble the o-ring on the cover.
- Before placing the stationary part of the mechanical seal on the cover 3) check the assembly clearances (see chapter 10.7 or 10.11).
- Place the spring of the mechanical seal on the cover by turning it through the pins, after that the stationary part of the mechanical seal, matching the cover pins.
- In the case of having refrigeration, place the refrigeration connections fittings on the cover.
- Assemble the cover with the mechanical seal to the lantern or the base plate by means of Allen screws.
- Place the rotary part of the mechanical seal to the impeller.
- Assemble the key to the shaft.
- Place the impeller together with the mechanical seal to the shaft of the mixer.
- Assemble the impeller to the shaft by means of the nut having placed previously the o-ring to the nut
- Hold by means of a spanner through the flat surfaces machined on the shaft and by means of a tubular tool remove the nut, tighten strongly up until the impeller.
- Check the clearance between the impeller and the cover. This must be approximately of 0.5 mm all around.
- Make all the steps described on chapter 9.2.2.

DISASSEMBLY AND ASEMBLY MECHANICAL SEAL WITH FLUSHING

DISASSEMBLY

- Make all the steps from chapter 9.3.1.
- Remove by means of a pliers the elastic ring and the lip seal from the cover by means of a rubber hammer.
- Check the state of the Speedi-Sleeve. In the case that the surface is scratched or in bad conditions, it is required to be replaced by a new one.

ASSEMBLY

- In the case of replacing the Speedi-Sleeve, the replacement will be carried out according to the instructions of the manufacturer.
- By means of a rubber hammer, place the lip seal (with the lip according to the drawing) on the cover and finally by means of a pliers assemble the elastic ring
- Proceed according to the steps described on chapter 9.3.2

DISASSEMBLY AND ASSEMBLY OF THE SHAFT, LANTERN AND DRIVE

Proceed according to the steps described on chapter 9.3. or 9.4 (depending on the sealing type)

DISASSEMBLY SIZE SBM-30-022 TO SBM-30-040

- Remove the splash ring and the V-ring from the shaft.
- Remove the drive from underneath the lantern removing the screws and washers and the nut.
- Remove the shaft from the drive by loosening the grab screws.

DISASSEMBLY SIZE SBM-30-075

- Remove the splash ring and the V-ring from the shaft.
- Remove the drive from underneath the lantern removing the screws and washers .
- Remove the counter flange from the lantern removing the screws and washers.
- Remove the shaft from the drive by means of loosening the grab screws.

DISASSEMBLY SIZE SBM-30-185 TO SBM-30-220

- Remove the splash ring and the V-ring from the shaft.
- Remove the drive from underneath the lantern removing the screws and washers and the nuts.
- Remove the shaft from the drive by means of loosening the grab screws.
- Remove the gasket from the protector of the lantern.
- Finally remove the base plate and the screws from the lantern

DISASSEMBLY SIZE SBM-30-185 TO SBM-30-220

- Place the gasket and the protect or to the lantern.
- Assemble the drive to the lantern by means of screws, washers and nuts.
- Assemble the base plate to the lantern by means of screws
- Place the shaft to the end of the shaft drive. Check the assembly of the mechanical seal (See chapter 10.3) and tighten the grab screws.
- Place the V-ring to the shaft until the lips fit on the protector.
- Place the splash ring on the shaft , approximately at the assembly position.
- Follow all the steps described in chapter 9.3 or 9.4 depending on the sealing type.

9. TECHNICAL SPECIFICATIONS

MATERIALS

Parts in contact with the product ..... AISI 316L
Other parts in stainless steel ..... AISI 304L
Seals in contact with the product ..... EPDM (standard)
Other materials for optional gaskets ..... Check with the supplier.

MECHANICAL SEAL

Surface finish ..... Polishing Ra 0.8.
Type of seal ..... Mechanical simple seal
Material stationary part ..... Graphite
Material Rotary part ..... Silicon carbide
Material V-ring ..... EPDM

MECHANICAL SEAL WITH FLUSHING

Maximum pressure ..... 0,5 bar (58 PSI).
Consumption ..... between 2,5-5 l/min.

MOTOR

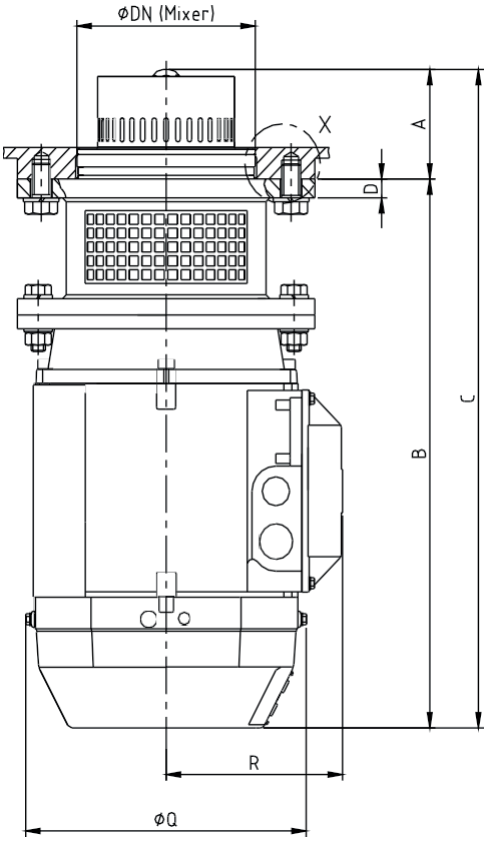
Motor standard, construction IE2 B5 (Flange)
2 poles = 2900 min-1 a 50Hz
Protection P55
Connection ..... 3 ~, 50Hz, 220-240VΔ/380-420VY
3 ~, 50Hz, 380-420VΔ/660-690VY

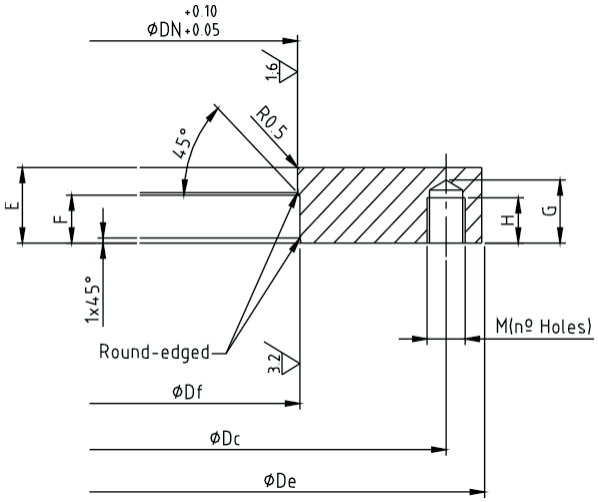
MIXER	PROBABLE CAUSES	PROBABLE CAUSES
SBM-30-022	2,2	3000
SBM-30-040	4	3000
SBM-30-075	7,5	3000
SBM-30-185	18,5 / 22	3000
SBM-15-220	22	1500

When noise levels exceed 85 dB (A) in the area of work. The workers must wear hearing protection.

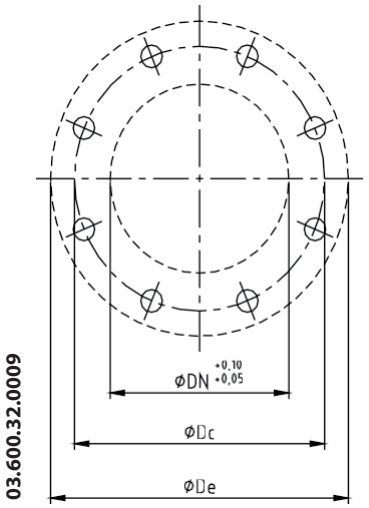
9.2 DIMENSIONS

Model	Size	Power kW	Speed Rpm	A	B	C	D	Q	R	Dimensions flange								
										ØDe	ØDc	ØDf	ØDn	Mxn	E	F	G	H
FBM-30-022	T-90L	2,2	3000	82	390	472	18	176	126	200	160	133.5	131.5	M16x4	25	12	21	15
FBM-30-040	T-90L	4		87	470	557	15	218	154	250	210	152	150	M16x8				
FBM-30-075	T-132S	7,5		87	510	597	15	257	167									
FBM-30-185	T-160L	18,5		108	671	779	26	315	240	350	300	177	175		30	15	27	20
	T-180M	22		108	715	823	26	354	225									
FBM-15-220	T-180L	22	1500	144	715	859	26	354	225									

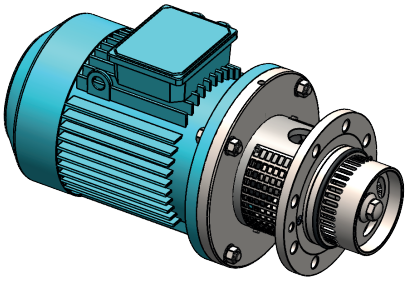


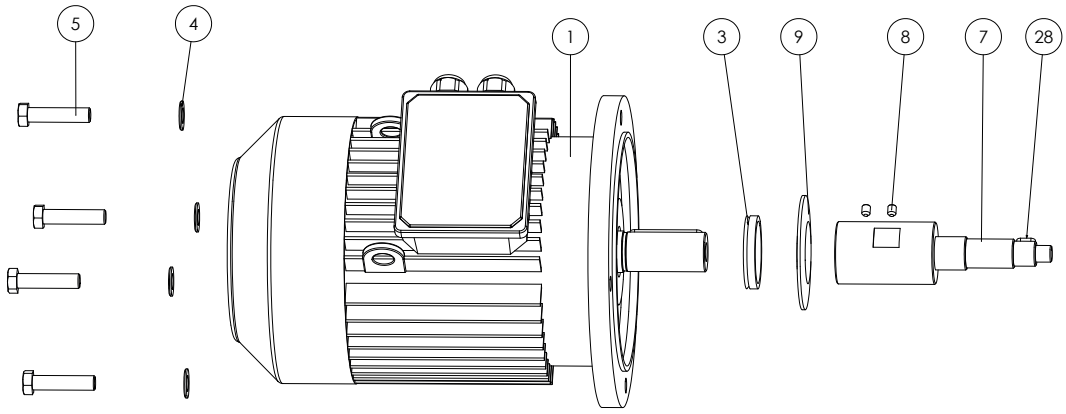


DETAIL X (Customer Base)



Base Mixer

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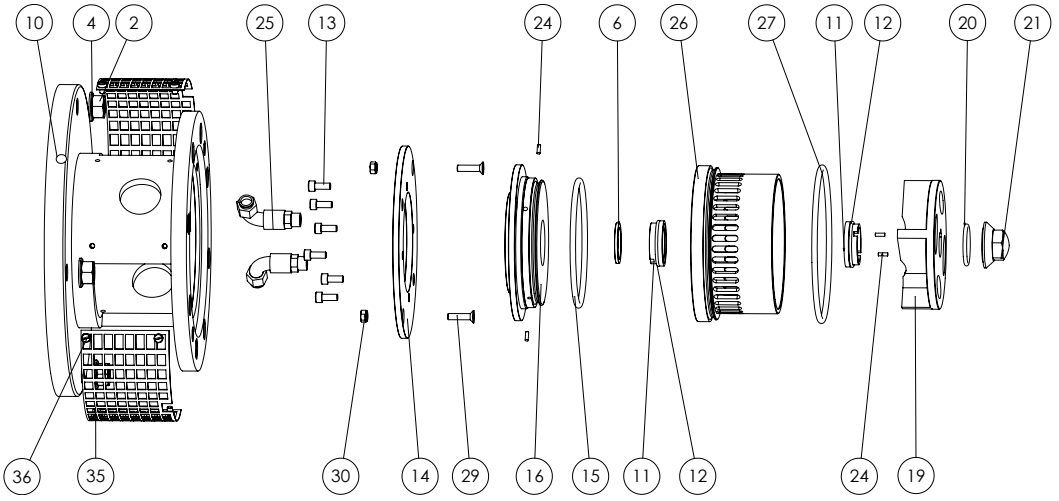
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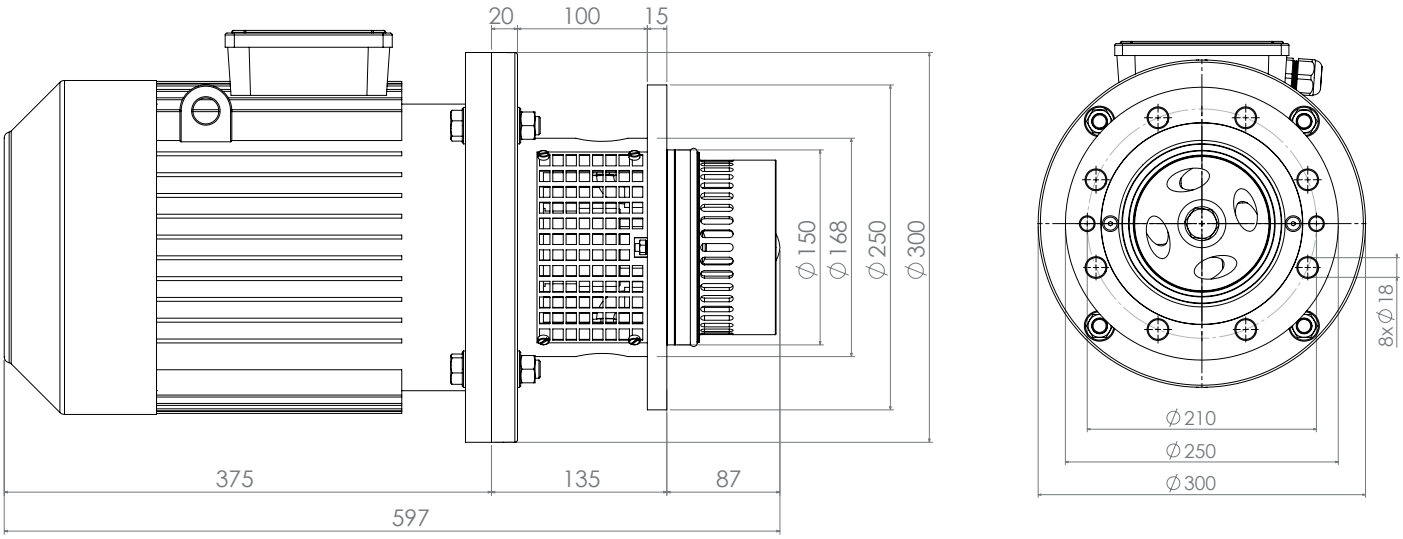
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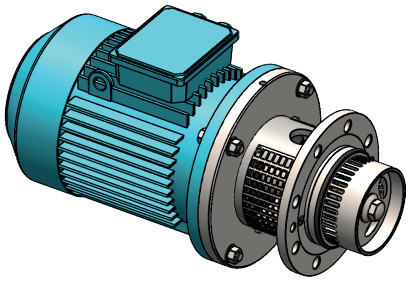

NO	PART NAME	DESCRIPTION	MATERIAL	QTY.
1	MOTOR	TYPE:132	-	1
2	SIX CORNER HEAD NUT	M14	AISI-304	4
3	TIGHTENING SEAL	60x70x11	NBR	1
4	WASHER	M14	AISI-304	8
5	HEXAGON SOCKET HEAD BOLTS	M14x60	AISI-304	4
6	PRESSURE SPRING	-	-	1
7	THARK SHAFT	Ø60x207	AISI-316	1
8	SETSKUR	M8x10	AISI-304	2
9	MOTOR PROTECTION GASKET	60x110x8	NBR	1
10	LANTERN	-	AISI-316	1
11	SEAL	Ø43,5x12,5	SSV	2
12	O-RING	Ø2,6	VITON	2
13	IMBUS BOLT	M6x15	AISI-304	6
14	ROTOR CONNECTION FLANGE	Ø185x6	AISI-316	1
15	O-RING	Ø5,5	VITON	1
16	COOLING FLANGE	Ø150x32	AISI-316	1
19	ROTOR	Ø124x35,5	AISI-316	1
20	O-RING	Ø3,5xØ33,4	VITON	1
21	NUT	M16	AISI-316	1
24	SQUARE HEAD PIN	Ø2,4	AISI-304	4
25	SPRAY HEAD	1/4	AISI-304	2
26	STATOR	Ø150x78	AISI-316	1
27	O-RING	Ø5,3	VITON	1
28	KEY	8x7x18	AISI-304	1
29	COUNTER HEAD BOLT	M6x25	AISI-304	2
30	HEXAGON CORNER HEAD SEAL NUT	M6	AISI-304	2
35	PROTECTION COVER	0,8x85x160	AISI-304	2
36	SCREW DRIVER EDGE BOLT	M5x7,5	AISI-304	8