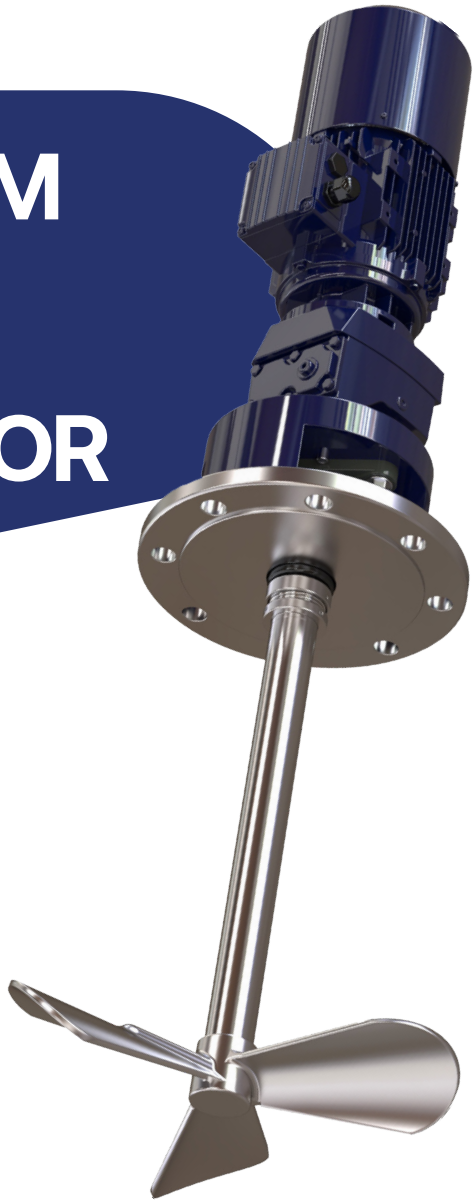
BOTTOM SIDE ENTRY AGITATOR



INSTRUCTION MANUAL

TMXFLOW®
let it flow

CONTENTS

1. GENERAL INFORMATION

1.1 INSTRUCTION MANUAL

This manual contains information about the reception, installation, operation, assembly, disassembly and maintenance of the SKYM vertical agitator.

Carefully read the instruction prior to starting the agitator, familiarize yourself with the installation, operation and correct use of the agitator 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 INSTRUCTIONS MANUAL

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

Any warranty will be void immediately and lawfully and, additionally, TMXFLOW will be compensated for any civil liability claims submitted by third parties, in the following cases:

- The service and maintenance work have not been carried out in accordance with the service instructions, he repairs have not been carried out by our personnel or have been carried out without our written authorisation.

- Mo difications have been carried out on our material or equipment without written authorisation.
- The parts or lubricants used are not original TMXFLOW parts and products.
- The material or equipment has been improperly used, has been used negligently, or has not been used according to the instructions and their intended.

The General Conditions of Delivery already in your possession are also applicable.

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

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 WARNING SYMBOL

Safety hazard for people in general and/or for equipment

Electric Hazard.

ATTENTION Important instruction to prevent damage to the equipment and its functions

2.2 GENERAL SAFETY INSTRUCTIONS

Read the instruction manual carefully before installing and starting the agitator. Contact TMXFLOW in case of doubt.

2.2.A DURING THE INSTALLATION

The Technical Specifications of chapter 9 should always be observed.
The installation and use of the agitator should always be in accordance with applicable regulations in regard to health and safety.

Before starting up the agitator, check that it is properly anchored and its shaft is perfectly aligned. Incorrect alignment and/or excessive stress during coupling can cause serious mechanical problems in the agitator.

Take all possible precautions when lifting the agitator. Always use properly attached slings when moving the agitator with a crane or other lifting device.

Keep the motor and the switchboard under control, particularly in areas where there is a risk of fire or explosion.
When cleaning, do not spray directly on the engine.
Do not disassemble the agitator until the switchboard has been disconnected. Remove the fuses and disconnect the power cable supplying the motor.
All electric work should be carried out by specialised personnel.

2.2.B DURING OPERATION

The Technical Specifications of chapter 9 should always be observed. Under no circumstances can the specified limit values be exceeded.

Before starting up the agitator, remove all the tools used during the assembly.
Do not operate the agitator when the rotating parts are not equipped with their guards or are not properly assembled.

The agitator has rotating parts. Do not place hands or fingers in the agitator while it is operating. This may cause serious injuries.

Do not touch the parts of the agitator that are in contact with the fluid when in operation. When the agitator operates with hot fluids (temperatures above 50ºC), there is a risk of skin burning. In such cases, collective-protection means (in this order or priority: separation, protective screen, heat-insulating material) or, in the absence of this, individual protection gear (gloves) must be used.

The agitator and its installation can generate sound levels above 85 dB(A) under unfavourable operating conditions. In such cases, the operators must use devices for protection against noise.

2.2.C DURING MAINTENANCE

The Technical Specifications of chapter 9 shall always be observed.
The agitator cannot operate without fluid. Standard agitators are not designed to work during the filling or emptying of tanks.
The maximum operating conditions of the agitator should not be exceeded. Nor should the operating parameters for which the agitator was initially designed be modified without written authorisations from TMXFLOW.

Do not leave loose parts on the floor.
Do not disassemble the agitator until the switchboard has been disconnected. Remove the fuses and disconnect the power cable supplying the motor.
All the electric work should be carried out by specialised personnel.

3. INFORMATION

3.1 DESCRIPTION

The Bottom Side Entry Agitator range relates to bottom side agitators with the agitator shaft fixed directly to the gearbox drive. It is attached to the tank by a stainless-steel flange and lantern. The shaft obturation is made using a mechanical seal.
All the parts in contact with the fluid are manufactured in stainless steel 1.4401 (AISI 316L).
The standard agitation element is a type-16 gamma impeller

3.2 OPERATING PRINCIPLE

Bottom Side Entry Agitators are used for the homogenization of liquids stored in large volume tanks.
They are powered by means of a geared motor and are installed inclined in the lower part of the shell of the tank.
The rotation of the propeller creates a flow that pushes the product towards the bottom of the tank, making it rise to the surface of the liquid through the tank wall on the opposite side of the agitator. This effect is favoured if the closure has a dished head. Likewise, the agitator is installed off-centre with respect to the tank to favour a circular flow in the radial plane. In this way, a complete homogenization of the product is ensured.

3.3 APPLICATION

Lateral agitators are an economical solution for storage tanks in the food, pharmaceutical and cosmetic industries.
The most important application is the maintenance and homogenization in large volume tanks of low viscosity products such as wine, oil, milk, beer, alcohol, juices, soft drinks, etc.

Each agitator has performance limits. The agitator 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 of the information provided by the buyer is incomplete or incorrect.

4. INSTALLATION

4.1 RECEPTION OF THE AGITATOR

TMXFLOW is not liable for any deterioration of the material caused by its transport or unpacking. Visually check that the packaging has not been damaged.

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

When receiving the agitator, check the packaging and its content to ensure that it matches the delivery note. TMXFLOW packs the agitators in their fully assembled form or disassembled on a case-by-case basis. Ensure that the agitator has not been damaged in any way. If it is not in good condition and/or any parts are missing, the carrier must submit a report as soon as possible.

The following documentation is included with the agitator:
• Shipping documents,
• Instructions and servicing manual for the agitator,
• Instructions and servicing manual for the gear-motor when the agitator is supplied with a motor by TMXFLOW.

4.2 TRANSPORT AND STORAGE

According to the model, the agitators are too heavy to be stored or installed manually. Use an appropriate mode of transport. Do not handle the agitator by the shaft as this may become deformed.

Take all possible precautions when lifting the agitator. Always use properly attached slings when moving the agitator with a crane or other lifting device.

If the agitator is not to be installed immediately, it must be stored in an appropriate place. The shaft must be stored in a horizontal position and placed on wooden supports or for a similar material. In this position, the shaft will not become deformed but it must not be subject to any type of load.

4.3 LOCATION

Place the agitator in such a way as to facilitate inspections and checks. Leave enough room around the agitator for service, disassembly and maintenance operations. It is very important to be able to access the electric connection device of the agitator, even when in operation.

4.4 ELECTRICAL INSTALLATION

Before connecting the electrical motor to the mains, check local regulations on electrical safety as well as the applicable standards. Check the instructions manual of the manufacturer of the motor for information on how to connect it to the mains.

Take the connection of the electrical motors must be performed by qualified personnel.
Take the appropriate measures to prevent any fault.
The motor must be provided with devices for protection against power overload and short-circuits.
The agitator cannot be used in areas where there is a risk of fire or explosion when this has not been specified in the order.

4.5 ASSEMBLY

To locate and fix the agitator in the support flange of the tank, the propeller must be removed from the shaft. Once the base of the agitator is placed on the supporting flange, the fixing nuts and screws will be assembled in their corresponding holes, without being tightened. When this operation has been carried out, the agitator must be levelled using the following method:
1. Place a spirit level against the shaft.
2. Check 4 points at 90º to each other around the circumference of the shaft and at the same height.
3. Once the shaft is level, firmly tighten the fixing nuts and screws. Finally the propeller is mounted on the end of the shaft. Be careful when assembling the shaft not to hit or strain it so as to avoid it being bent.

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

Check the alignment of the agitator shaft with the half shaft once its assembly is completed.

5. START-UP

The start-up of the agitator can be carried out provided the instructions indicated in the chapter 5. Installation have been followed.

• Check that the power supply matches the rating indicated on the motor plate.
• Check the alignment of the agitator shaft.
• Cheºck the level of fluid in the tank. When not specified in the order, the agitator cannot be operated during the filling or emptying of the tank.
• All the guards must be in place.
• Start up the agitator.
• Check that the direction of rotation of the propellers is correct (it must rotate clockwise when see form the drive side)

Follow the direction of rotation of the agitation components as indicated by the arrow attached to the engine. An incorrect direction of rotations results in a loss of agitation performance.

• Check the electrical consumption of the motor.

Do not modify the operating parameters for which the agitator was initially designed without written authorisation from TMXFLOW (risk of damage and user hazard).
Follow the instructions for use and the safety requirements described in the instructions manual for the tank in which the agitator is mounted.
Mechanical risks (e.g. drag, shear, cutting, impact, flattening and pinching). If the agitation element is accessible from the top or the tank inspections hatch, then the user will be exposed to the above-mentioned risks.

The tank must be fitted with protective devices and safety equipment. Consult the manufacturer's instructions manual.

Introducing an object or solid raw material may cause the agitation component and other mechanical parts to break and compromise its safety or warranty.

6. TROUBLESHOOTING

The attached table lists solutions to problems that may arise while operating the agitator. It is assumed that the agitator has been properly installed and that is has been selected correctly for the specific application. Contact TMXFLOW if technical assistance is required.

Motor overload ⇩	Insufficient agitation ⇩	Vibrations and noise ⇩	Leaks ⇩	PROBABLE CAUSES	SOLUTIONS
☒	☒			Viscosity of the liquid too high	Reduce the viscosity, e.g. by heating the liquid
☒				High density	Increase motor power
	☒			Tank too big for the chosen agitator	Check with the technical department
	☒			Wrong direction of rotation	Change direction of rotation
	☒			Agitator speed too low	Increase the speed
		☒		Liquid level insufficient or none	Check liquid level in the tank
		☒		Shaft vended	Replace the shaft
		☒		Critical speed	Check with the technical department
		☒		Worn bearings	Replace the bearings agitator
			☒	Lip seal damaged or worn	If the lip seal is worn, replace it. If the lip seal is damaged, consult the technical department.
			☒	V-ring worn or damaged	Replace the V-ring

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

7. MAINTENANCE

7.1 GENERAL CONSIDERATIONS

This agitator, just like any other machine, requires maintenance. The instructions contained in this manual cover the identification and replacement of spare parts. The instructions are aimed at maintenance personnel and those responsible for the supply of spare parts.

Carefully read chapter 9. Technical Specifications.
Maintenance work can only be carried out by qualified personnel that are trained and equipped with the necessary resources to carrying out this work.
Before beginning maintenance work, ensure that the electric motor is disconnected and that the tank is empty.
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 agitator is disconnected.

7.2 MAINTENANCE

- Inspect the agitator regularly.
- Do not fail to keep the agitator clean.
- Check the state of the motor or the gear motor.
- Check the state of the bearings.
- Check the sealing: seal and/or V-ring.

Motor or gear motor maintenance shall be carried out in accordance with the manufacturer's instructions, see the instructions manual.

7.3 LUBRICATION

Follow the manufacturer's indications when lubricating the geared motor's bearings.

7.4 SPARE PARTS

To order spare parts it is necessary to indicate the type and serial number included on the agitator's characteristics plate, as well as the position and description of the part as found

7.5 CONSERVATION

If the agitator is out of service for a considerable period of time, clean and treat the parts with VG46 mineral oil. The shaft must be stored in the horizontal position and on wooden supports or on supports of a similar material.

7.6 DISASSEMBLY AND ASSEMBLY OF THE AGITATOR

The disassembly and assembly of the agitators should only be carried out by qualified personnel using only appropriate tools. Ensure that staff read these instructions manual attentively, particularly the instructions that relate to their work.

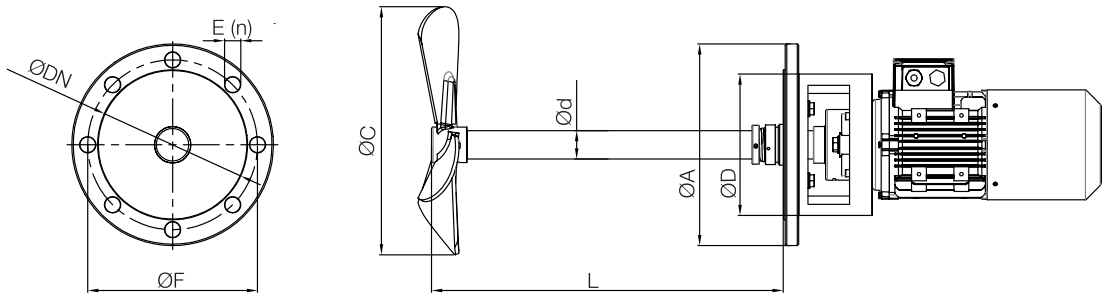
Stop the motor from starting up when carrying out assembly and disassembly work on the agitator.
Place the agitator switch in the "off" position.
Lock out the electrical switchboard or place a warning sign.
Remove the fuses and take them to the workplace.

8. TECHNICAL SPECIFICATIONS

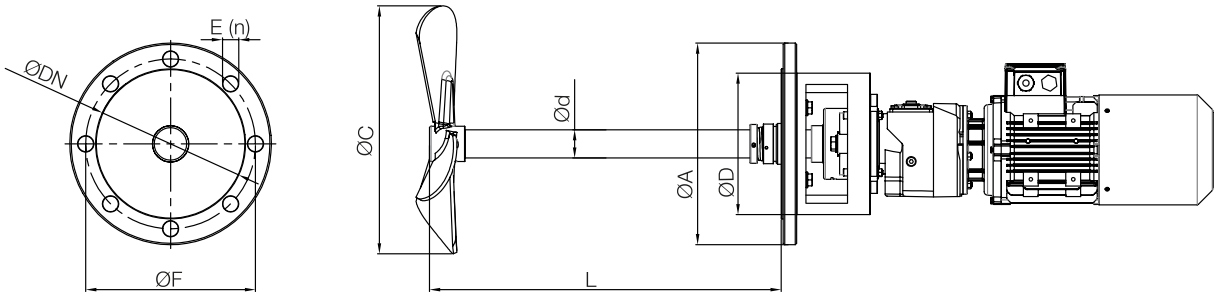
8.1 MATERIALS

Parts in contact with the product	AISI 316L
Lantern and bearing support	GG 15
Mechanical seal	C/SiC/EPDM
Gaskets	EPDM
Surface finish	Ra ≤ 0,8 µm

8.2 DIMENSIONS

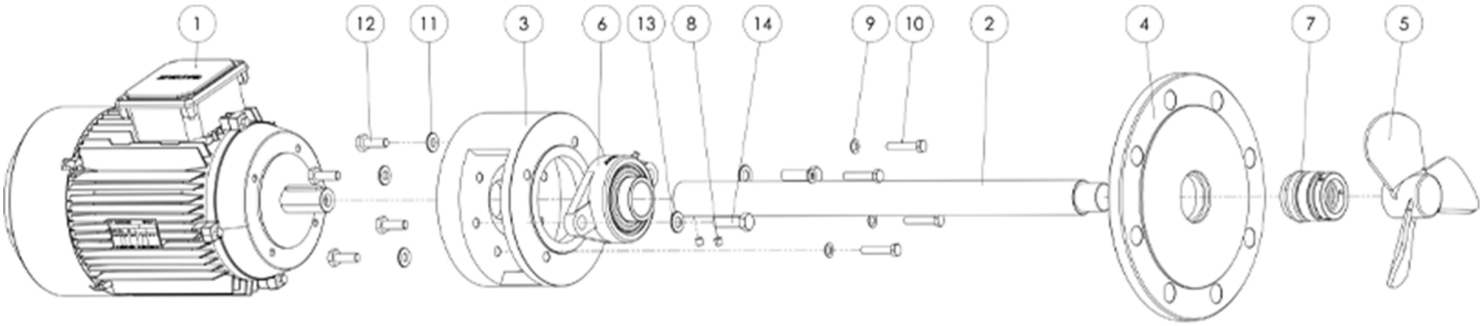


TYPE	ØDN	ØF	ØA	Ød	ØD	E (n)	L	ØC
SKYM 15-15-175	150	240	285	40	212	18(8)	400	175
SKYM 15-30-200	150	240	285	40	212	18(8)	500	200
SKYM 15-55-225	200	295	340	50	259	23(8)	500	225
SKYM 15-75-250	200	350	395	50	259	23(8)	500	250
SKYM 15-11-275	250	240	285	60	312	23(12)	600	275
SKYM 10-01-200	150	240	285	40	212	18(8)	400	200
SKYM 10-22-225	150	295	340	40	212	18(8)	500	225
SKYM 10-30-250	200	395	340	50	259	23(8)	500	250
SKYM 10-40-275	200	350	395	50	259	23(8)	500	275
SKYM 10-55-300	250	350	395	60	312	23(12)	600	300
SKYM 10-75-350	250	350	395	60	312	23(12)	600	350



TYPE	ØDN	ØF	ØA	Ød	ØD	E (n)	L	ØC
SKYR 02-05-325	150	240	285	40	212	18(8)	400	325
SKYR 02-07-400	150	240	285	40	212	18(8)	400	400
SKYR 02-15-500	150	240	285	40	212	18(8)	400	500
SKYR 02-30-600	200	295	340	50	259	23(8)	500	600
SKYR 02-40-650	250	350	395	60	312	23(12)	500	650

8.3 SKYM AGITATOR'S EXPLODED DRAWING AND PARTS LIST



Position	Part Name	Material	QTY
1	Engine	-	1
2	Agitator Shaft	AISI-316	1
3	Lanten	ST 37	1
4	Flange	AISI316	1
5	Marine Wing	AISI 316	1
6	Almond Bed	AISI-3016L	1
7	Mechanical Seal	AISI-3016L	1
8	Setskur		2
9	Washer		4
10	Hexagon Socket Head Bold	304	4
11	Washer	304	4
12	Hexagon Socket Head Bold	304	4
13	Washer	304	2
14	Hexagon Socket Head Bold	304	2