

Stallkamp

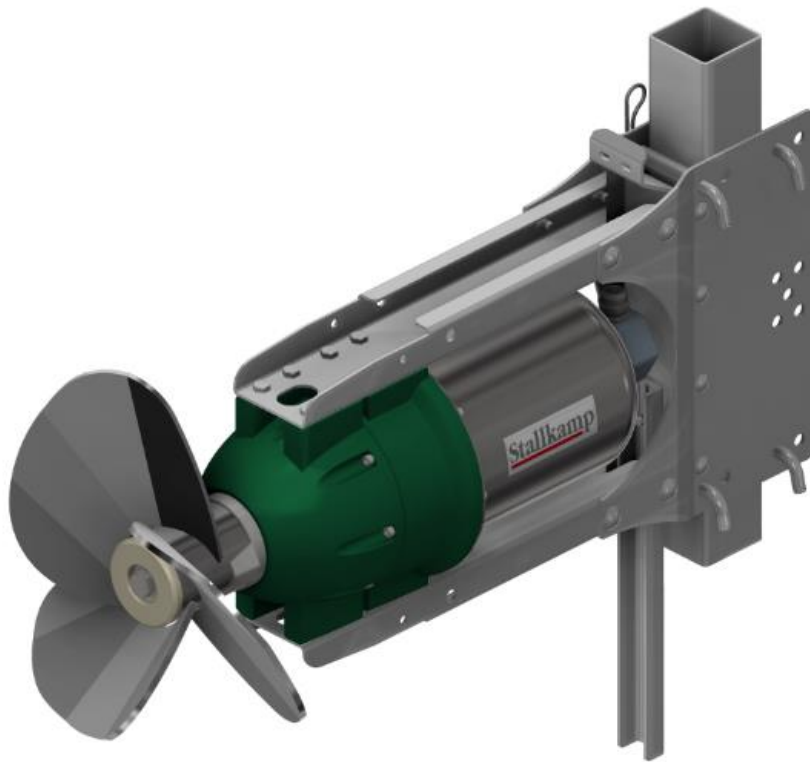
OPERATING MANUAL

Submersible motor agitator

TMR Type 3D/L & 3DB/L M1803

BG 132 4.0/5.5/7.5 kW

BG 160 11.0/17.0/22.0 kW



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General Notices

- **The technical specifications, weights and measures are to be considered approximate and not binding.**
- **Pictures are for illustration purposes and may deviate from the actual product.**

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© Erich Stallkamp ESTA GmbH – In der Bahler Heide 4 – Industriegebiet West – 49413 Dinklage,
Germany

Tel. +49 4443 9666-0 – Fax +49 4443 9666-60
info@stallkamp.de – www.stallkamp.de

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2 GENERAL INFORMATION

Our state-of-the-art devices are developed and manufactured with great care and subject to continuous quality control. This operating manual should help you to become familiar with the device and to make use of its intended applications.

The operating manual contains important notices on how to operate the device safely, appropriately and cost-effectively. It is necessary to observe the operating manual to ensure the reliability and long lifespan of the device and to avoid hazards.

The operating manual does not take local regulations into consideration; the owner is solely responsible for complying with those regulations and ensuring that any assembly personnel employed do so too.

2.1 Designation of notices in the operating manual



In the operating manual, safety notices indicating dangers to people are identified with the general hazard symbol as per DIN 4844-W9.



In the operating manual, warnings about electrical voltage are identified with the safety signs as per DIN 4844-W8.

All other notices whose disregard might restrict the functional reliability of the device or represent a danger for the machine are highlighted with the word:

ATTENTION!

This machine unit may not be operated beyond the values defined in the technical documentation with respect to pumped liquid, delivery flow rate, rotational speed, density, pressure, temperature and motor power, or outside the scope of any other instructions contained in the operating manual or contract documentation. If you have any queries, please consult the manufacturer.

The rating plate displays the most important operating data and the machine serial number. We request that this always be specified in the event of enquiries, subsequent orders and when ordering spare parts.

If additional information or notices are required or in case of damage, please contact your local field sales employee or contact us directly.

2.2 Unauthorised conversion and manufacture of spare parts

Conversions and modifications to the devices and their machine units are only permissible with the explicit approval of the manufacturer. The use of non-"genuine spare parts" voids any liability.

3 SAFETY

This operating manual contains fundamental notices which must be observed during installation and operation as well as when performing maintenance work on the device.

It is therefore imperative that the installer as well as the responsible specialist personnel and owner read this manual before assembly and commissioning, and that it is continually available at the location where the machine is operated.

In addition to the safety notices in this operating manual, all warning signs and regulations of the respective professional association in the latest version must be observed.

3.1 Qualifications of the personnel



The personnel responsible for operation, maintenance, inspection and assembly must be appropriately qualified for this work.

The area of responsibility, competence and monitoring of personnel must be closely regulated by the owner. If the personnel do not possess the necessary knowledge, they should be trained and instructed accordingly.

Furthermore, the owner must ensure that personnel fully understand the contents of the operating manual.

3.2 Danger if the safety notices are not observed

Failure to observe the safety notices can endanger people as well as the environment and the machine. Failure to observe the safety notices results in the forfeiture of all claims for damages.

Specifically, failure to observe instructions can, for example, result in the following dangers:

- Failure of important functions of the device or system.
- Endangerment of people due to electrical, mechanical, chemical and other exposure.
- Endangerment of the environment due to leakage of hazardous materials.

WARNING SIGNS

All notice and warning signs must be observed. Dangerous gases can escape when stirring the manure.



DANGER OF POISONING!

If the manure is stored below slatted floors, the presence of people in buildings during agitation is only permissible with sufficient ventilation. Therefore, windows and doors must be open and the fan set to full power.

3.3 Safety-conscious work

Observe the safety notices presented in this operating manual, the existing national regulations for accident prevention as well as any internal work, operation and safety regulations of the company at all times.

Safety notices for the owner and operator:

- ✓ If hot or cold machine parts are potentially dangerous, these parts must be protected on site to prevent contact.
- ✓ Contact protection for moving parts may not be removed while the machine is in operation.
- ✓ Any leakage of dangerous materials must be conducted away so that there is no endangerment to people and the environment. Observe statutory provisions.

3.4 Safety notices for maintenance, inspection and assembly work



The owner must ensure that all maintenance, inspection and assembly work is carried out by authorised and qualified specialist personnel.

Work on the machine must strictly only be carried out when the machine is at a standstill.

Directly after completion of the work, all safety and protection equipment must be reattached or put back into operation.

4 WARRANTY

This section contains the general specifications for the warranty. Contractual agreements shall always take precedence and are not nullified by it. The period of warranty is a component of the general terms and conditions of Erich Stallkamp ESTA GmbH. Agreements deviating from this must be specified in writing in the order confirmation.

4.1 General

Stallkamp undertakes to rectify every defect to products sold by Stallkamp under the condition:

- ✓ that it is a quality-related defect of the material, manufacture or design;
- ✓ that the defect is reported in writing to Stallkamp or the Stallkamp representative within the period of the warranty;
- ✓ that the product is used exclusively in line with the operating conditions specified in the operating manual and used for the intended purpose;
- ✓ that the monitoring device integrated in the product is correctly connected (temperature protection);
- ✓ that only genuine Stallkamp spare parts are used.

4.2 Exclusion of liability

No warranty is honoured nor liability assumed for damage to the device if one or several of the following points are applicable:

- A faulty configuration of the device on our part because of inadequate or incorrect information from the ordering party or owner.
- Failure to observe the safety notices, regulations or the necessary requirements in this operating manual which apply according to German law.
- Assembly, disassembly or repair of the device not in keeping with the regulations.
- Inadequate maintenance.
- Possible chemical, electrical or electrochemical influences.
- Wear.

Since maintenance has an influence on the safety and functional capability of the device, it is an integral component of the warranty. The owner of the device undertakes to have the manufacturer itself or a service provider approved by the manufacturer perform maintenance work according to the regulations of the manufacturer, including the necessary changing of oil and the repair and replacement of wearing parts. The owner is thus obligated to maintain a maintenance and revision list, which facilitates monitoring of the mandatory inspection and maintenance work (see Point 16 "Maintenance and revision list").

We expressly emphasise that this device is a fluid flow engine in which the protective coating is exposed to constant wear from the abrasive contents of the pumping medium being pumped and should consequently be classed as a wearing part. Wear, damage and secondary damage which result from external influences on the protective coating are expressly excluded from the warranty. The use of devices and/or the field of application and reliability for the application must be verified by the owner and does not form part of the warranty.

The liability of Stallkamp thereby excludes any liability for personal damage, material damage or financial losses.

The manufacturer reserves the right to modify the performance, specification or configuration data without prior notice.

5 PRODUCT DESCRIPTION FOR TMR TYPE 3D M1803

5.1 General description for TMR Type 3D M1803

This operating manual applies to the standard model of the Stallkamp submersible motor agitators.

The agitator must not be operated in explosive environments.

Submersible motor agitator TMR Type 3D M1803 comprising:

- Stainless steel motor housing
- Oil filling in motor compartment with insulating oil
- Thermo-control with thermistor and Klixer per phase for overheating protection
- Cast iron gearbox housing coated with 2-component plastic lacquer
- Oil filling in the gearbox with gear oil
- Single-stage planetary gearbox with impeller torque of 273 rpm
- 10 m electric cable with special double-shell PU external sheath
- Stainless steel slide bearing including system to prove the capacitive level for guide rail 100 x 100 mm
- Maximum submersion depth 10 m
- Temperature of medium being agitated up to max. 50 °C -> Stirring without restrictions as long as motor is not running in overload range.
- Temperature of medium being agitated from 51 °C to max. 70 °C -> Depending on the solid content and the viscosity of the medium being agitated, the cooling of the agitator may not be sufficient in individual cases. The motor is then switched off by the thermal protection switch. In this case, an agitator blade with a smaller exterior diameter is required.

5.2 Intended use of the TMR 3D M1803

The agitator is intended for the following applications:

- (1) Agitation and/or homogenisation of liquid manure in final storage sites, reception pits and manure canals;
- (2) Agitation and/or homogenisation of bio-mass in biogas plants; not, however, in explosive area;
- (3) Agitation and/or homogenisation of mixing pits; not, however, in explosive area;
- (4) Agitation and/or homogenisation of municipal sludge in treatment plants;
- (5) Agitation and/or homogenisation of industrial waste water in industrial plants.
- (6) The agitator is designed for the thorough mixing of liquids with an almost neutral pH; generally pH 6.5–8.1 at a room temperature of 20 °C. The relationship between the pH, temperature and chemical composition of the medium must, however, be taken into account in this process. High temperatures when the pH of the medium being agitated is low could lead to increased levels of corrosion on the agitator. See also the general data sheets "Corrosion rate of cast iron" or consult a sales representative. Additional tests may be required for special applications.
- (7) The agitator has been designed with a wide variety of fields of application in mind in which a high flow rate and/or mixing capacity is required proportional to the power consumption.
- (8) The agitation effect is dependent on the density, viscosity and solid fraction of the medium being agitated as well as on the contents and shape of the tank. The medium being agitated must be capable of flowing. When the agitator is used in liquids which form floating and settling layers, it is important to ensure that the agitator always operates in the liquid zone as this is the only way to guarantee an optimum thorough mixing process which allows the motor to cool down sufficiently.
- (9) For larger tanks, more than one agitator may prove necessary.

5.3 Technical data for TMR Type 3D M1803

Submersible motor agitator TMR Type 3D M1803 comprising:

- Type of agitator: TMR Type 3D M1803
- Three phase motor: 400 V, 50 Hz, 3 phase, 1450 rpm or 460/480 V, 60 Hz, 3 phase, 1750 rpm
- Protection category: IP68
- Insulating category: F = 155 °C
- Motor power: 4.0; 5.5; 7.5; 11.0; 17.0 and 22.0 kW
- Gearbox seal: Slide ring seal
- Slide bearing: V2A stainless steel (1.4301) for guide rail 100 x 100 mm
- Impeller: Stainless steel

5.4 Type plate TMR Type 3D M1803

The type plate displays the most important power and specification data:

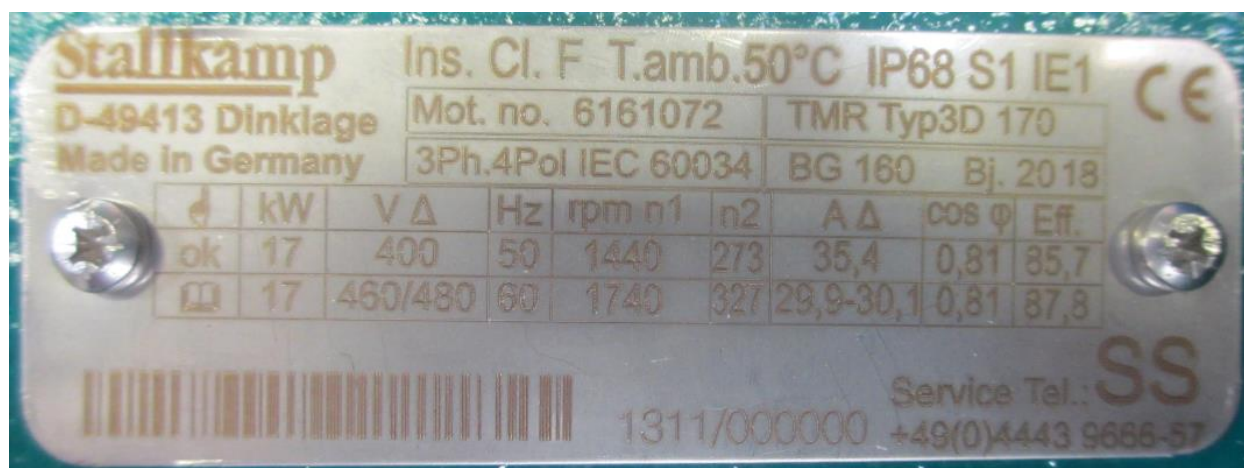


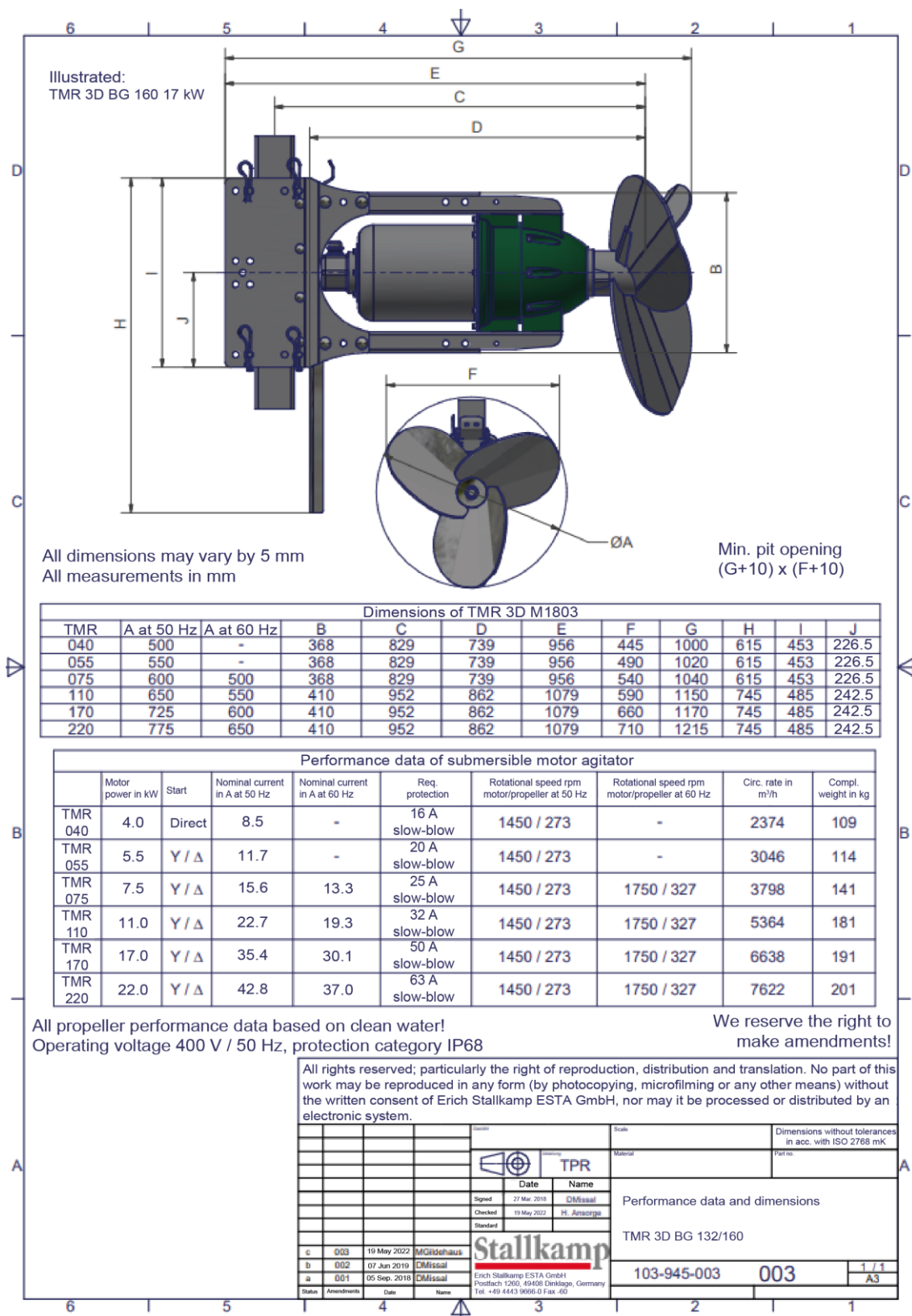
Fig. 1: Type plate

- Motor number: (e.g. 6161072)
- Classification: (e.g. TMR Type 3D 170)
- Performance data: (e.g. 17 kW)
- Year of manufacture: (e.g. 2018)
- Stallkamp serial number: (e.g. 1311/000000)

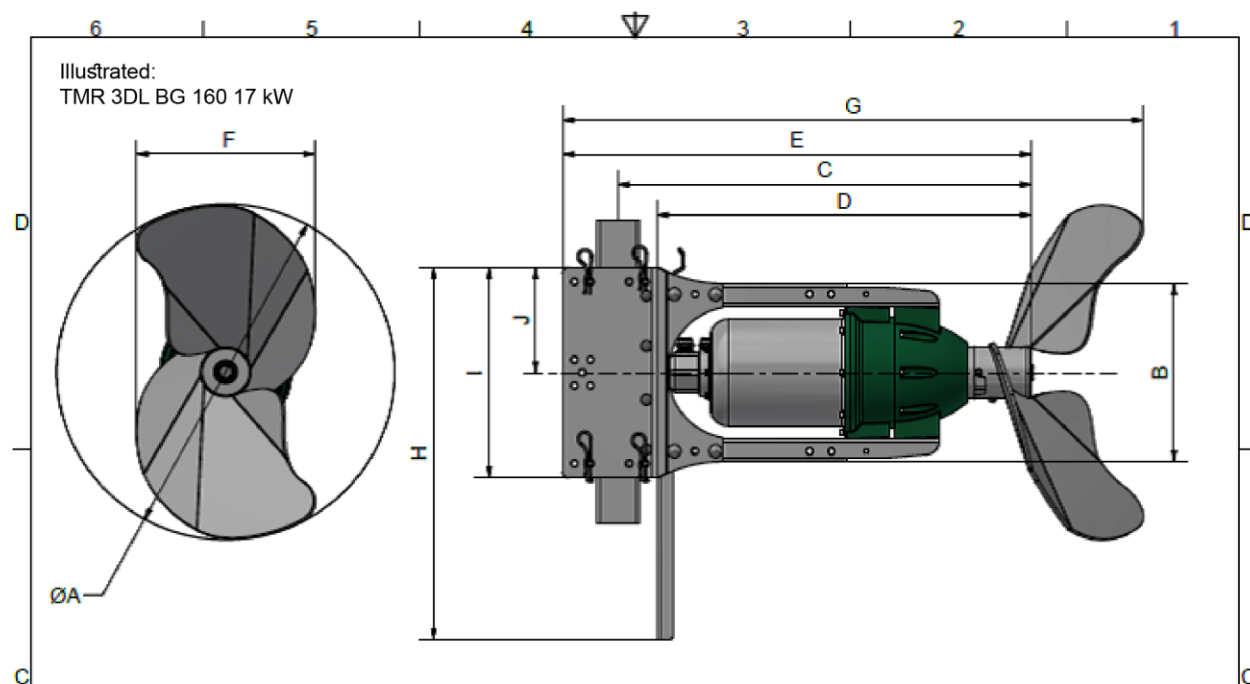
In case of technical queries about the device, the above type plate data must be specified!

6 PERFORMANCE DATA AND DIMENSIONS OF TMR TYPE 3D M1803

6.1 Type 3D blade version – and for circulation systems



6.2 Type 3DL blade version – with fixed direction



All dimensions may vary by 5 mm
All measurements in mm

Min. pit opening
(G+10) x (F+10)

Dimensions of TMR 3DL M1803

TMR 3DL	A at 50 Hz	A at 60 Hz	B	C	D	E	F	G	H	I	J
040	550	-	368	829	739	956	285	1180	615	453	226.5
055	600	-	368	829	739	956	290	1210	615	453	226.5
075	650	550	368	829	739	956	335	1235	615	453	226.5
110	725	600	410	952	862	1079	365	1280	753	485	242.5
170	775	650	410	952	862	1079	415	1335	753	485	242.5
220	825	725	410	952	862	1079	480	1385	753	485	242.5

Performance data of submersible motor agitator TMR 3DL

3DL	Motor power in kW	Start	Nominal current in A at 50 Hz	Nominal current in A at 60 Hz	Req. protection	Rotational speed rpm motor/propeller at 50 Hz	Rotational speed rpm motor/propeller at 60 Hz	Circ. rate in m ³ /h	Compl. weight in kg
TMR 040	4.0	Direct	8.5	-	16 A slow-blow	1450 / 273	-	2991	116
TMR 055	5.5	Y / Δ	11.7	-	20 A slow-blow	1450 / 273	-	3692	128
TMR 075	7.5	Y / Δ	15.6	13.3	25 A slow-blow	1450 / 273	1750 / 327	4539	133
TMR 110	11.0	Y / Δ	22.7	19.3	32 A slow-blow	1450 / 273	1750 / 327	6909	193
TMR 170	17.0	Y / Δ	35.4	30.1	50 A slow-blow	1450 / 273	1750 / 327	8628	234
TMR 220	22.0	Y / Δ	42.8	37.0	63 A slow-blow	1450 / 273	1750 / 327	9860	262

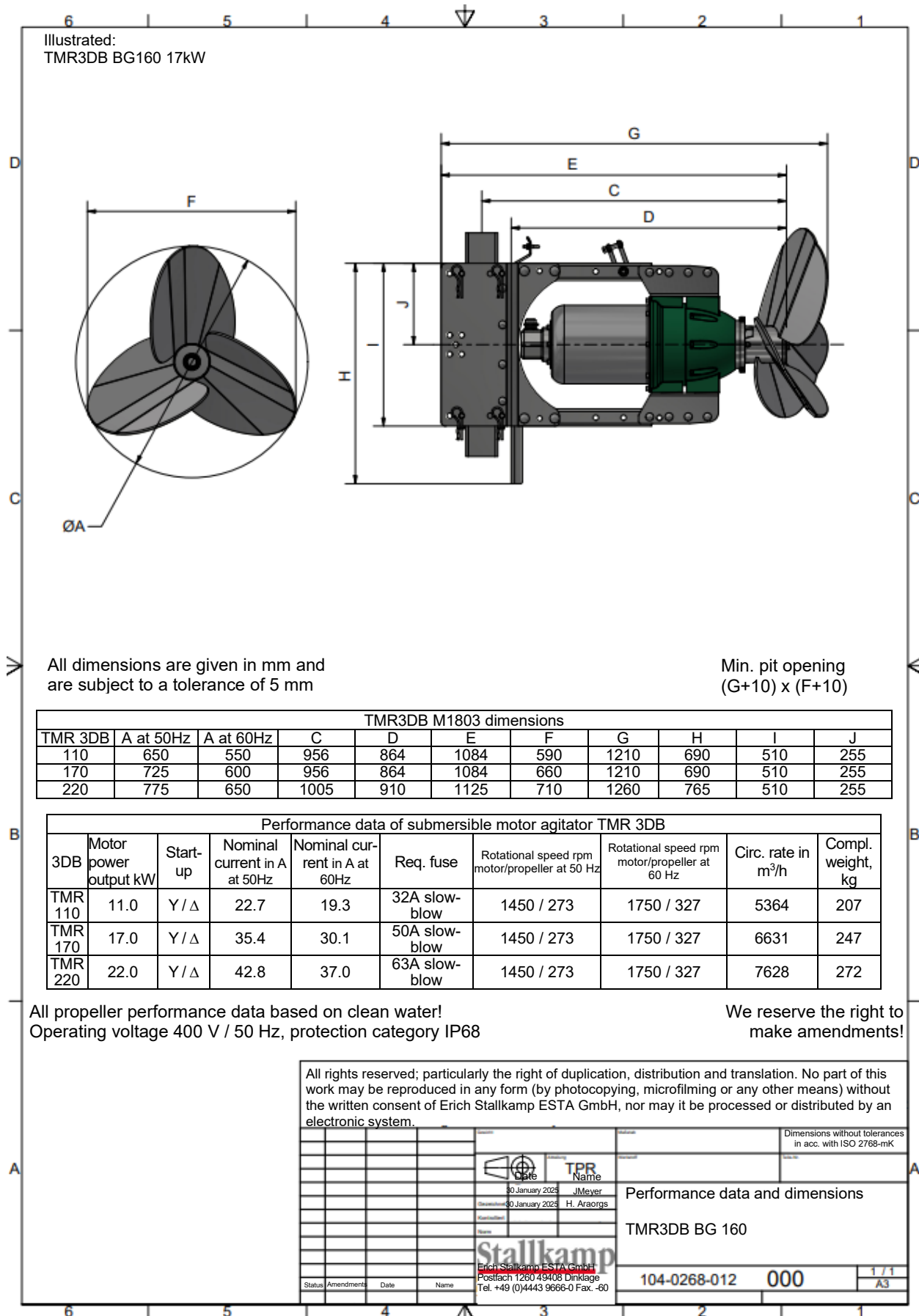
All propeller performance data based on clean water!
Operating voltage 400 V / 50 Hz, protection category IP68

We reserve the right to make amendments!

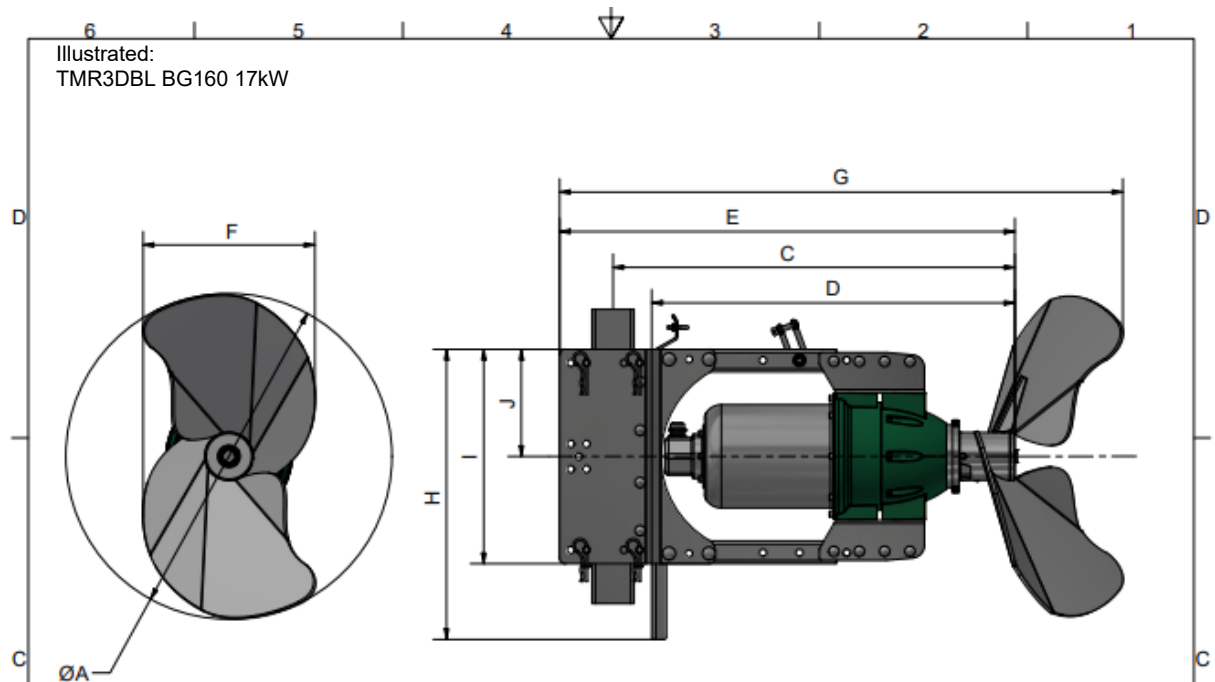
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		Scale: _____ Dimensions without tolerances in acc. with ISO 2768 mk	
Date: 27 October 2022 Signed: J. Mayer Checked: 28 October 2022 Standard: H. Amelge		Material: _____ Part no.: _____	
Performance data and dimensions TMR 3DL BG 132/160			
104-0171-054		001	
1/1 A3			

6.3 Type 3DB version – with larger bracket clearance



6.4 Type 3DBL version – with fixed direction of rotation and larger bracket clearance



All dimensions are given in mm and are subject to a tolerance of 5 mm

Min. pit opening
(G+10) x (F+10)

TMR3DBL M1803 dimensions										
TMR 3DBL	A at 50Hz	A at 60Hz	C	D	E	F	G	H	I	J
110	725	600	956	864	1084	365	1285	690	510	255
170	775	650	956	864	1084	415	1340	690	510	255
220	825	725	1005	910	1125	480	1432	765	510	255

Performance data of submersible motor agitator TMR 3DBL									
3DBL	Motor power output kW	Start-up	Nominal current in A at 50Hz	Nominal current in A at 60Hz	Req. fuse	Rotational speed rpm motor/propeller at 50 Hz	Rotational speed rpm motor/propeller at 60 Hz	Circ. rate in m ³ /h	Compl. weight in kg
TMR 110	11.0	Y / Δ	22.7	19.3	32A slow-blow	1450 / 273	1750 / 327	6909	205
TMR 170	17.0	Y / Δ	35.4	30.1	50A slow-blow	1450 / 273	1750 / 327	8628	247
TMR 220	22.0	Y / Δ	42.8	37.0	63A slow-blow	1450 / 273	1750 / 327	9860	245

All propeller performance data based on clean water!
Operating voltage 400 V / 50 Hz, protection category IP68

We reserve the right to make amendments!

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tent.				Dimensions without tolerances in acc. with ISO 2768-mK			
							
				Date	Name		
				30 January 2025	JIMeyer	Performance data and dimensions TMR3DBL BG 160	
				30 January 2025	H. Araorqs		
				Stallkamp			
Status	Amendments	Date	Name	Erich Stallkamp ESTIA GmbH Postfach 1260 49408 Dinklage Tel. +49 (0)4443 9686-0 Fax. -60		104-0268-000	000
							1 / 1 A3

7 CONSTRUCTION TYPE

7.1 Cable connection

The cable connection compartment is completely sealed off from the surrounding liquid and in the direction of the motor housing.

7.2 Motor

Three phase asynchronous motor as short circuit rotor at 50 Hz.

Continuous operation or intermittent operation with max. 2 evenly distributed activations per hour. Where the ambient temperature exceeds 40 °C, a cooling down time of 15 min. should be allowed after stopping. The stator is insulated to class F (155 °C). The motor has been designed in such way that in the case of nominal voltage deviations up to +/- 5 % it can still attain an unchanged nominal output. With regard to the danger of overheating, +/- 10 % deviations in the nominal voltage are allowed, provided that the motor is not running at full load the whole time. The difference between the individual phases must not exceed 2 %.

7.3 Monitoring device

Three series-connected temperature sensors PTC-150 thermistors and three 150 °C Klixer bi-metal switches are installed in the stator winding. These will start reacting at 150 °C.

ATTENTION! At least one construction type of thermal sensor must always be connected. A special electronic evaluation system is required for the PTC-150 connection. Please consult our sales representative.

7.4 Gearbox

The submersible motor agitator is equipped with a planetary gearbox between the motor and the agitator blade. This gearbox has an oil filling, which must be inspected and renewed after 24 months or 13,000 operating hours.

7.5 Blades

The agitator is equipped with a stainless steel agitator blade. The size of the blade depends on the construction size and the power consumption of the motor. In special cases when an agitator is continuously running in the overload range, a blade with a smaller exterior diameter is required. A significantly smaller agitator blade is required when operating at 60 Hz. Please contact us or one of our sales representatives.

8 TRANSPORT AND STORAGE REGULATIONS FOR TMR TYPE 3D M1803

The agitator must be transported in a lying position. Ensure that the machine is not able to roll.

If the agitator is not used for a long period of time, it must be protected against moisture and heat. The agitator blade should be turned from time to time (approx. every two months) to ensure that the sealing surfaces do not adhere to each another. This is absolutely essential when the device is not in use.

The agitator must be inspected before commissioning following a long period of standstill. It is particularly important to verify that the cable entry points and seals are not damaged in any way.

The instructions under Point "3. Safety" must be observed.

9 ASSEMBLY OF TMR TYPE 3D M1803

9.1 Prior to commissioning: Safety notices

The following rules should always be observed to prevent accidents during service and assembly work:

- (1) Never work alone. The danger of drowning and suffocation must not be underestimated.
- (2) Check whether sufficient oxygen is available and that no poisonous gases exist.
- (3) Before performing welding work or using electrical tools, check whether there is a danger of explosion.
- (4) Be aware of the danger of electrical accidents.
- (5) Examine the lifting gear to ensure its fully satisfactory condition.
- (6) Ensure an adequate fencing off at the place of work, e.g. by means of a cordoning trellis.
- (7) Wear a hardhat, safety glasses and safety footwear.
- (8) Keep a first-aid kit ready.

The health and safety regulations and the applicable regulatory requirements must also be observed.

9.2 Assembly of the system to prove the capacitive level on TMR Type 3D M1803

The supplied system to prove the capacitive level must be assembled on the slide bearing of the submersible motor agitator. Both screws, washers and nuts are located on the slide bearing.

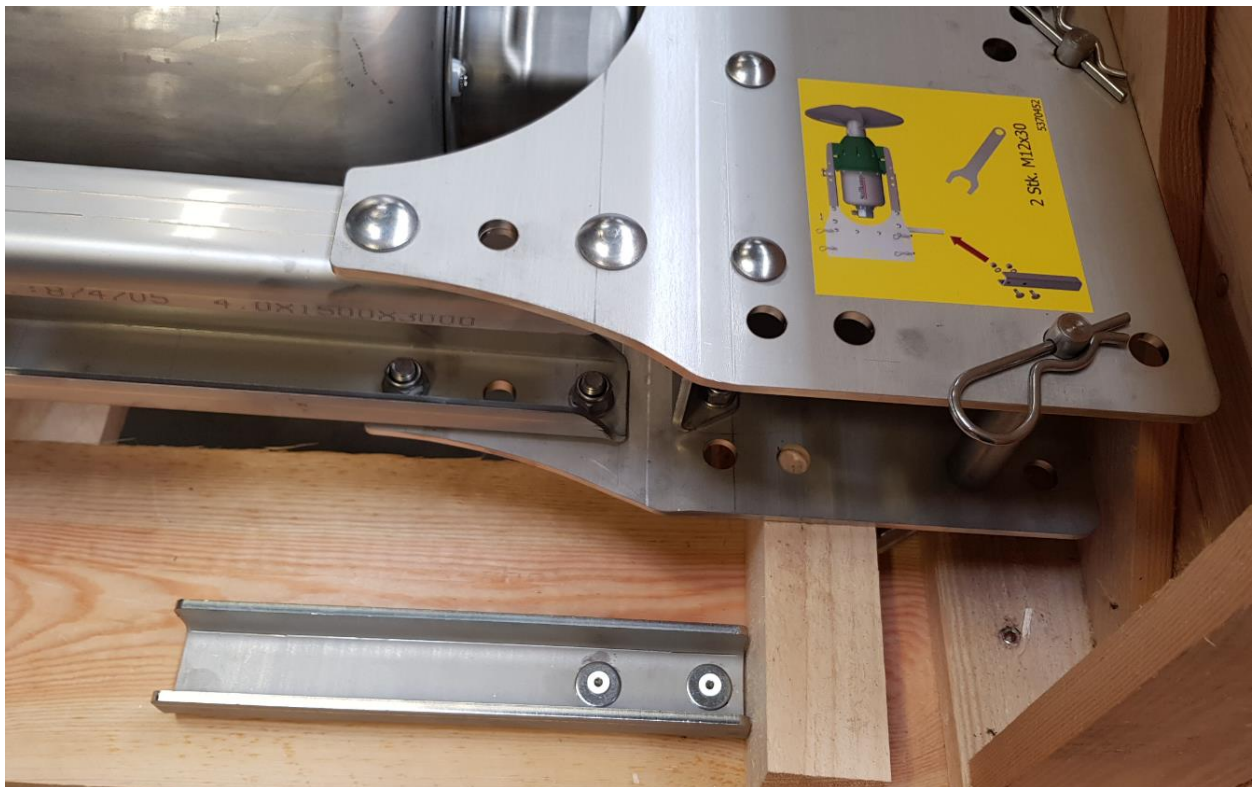


Fig. 2: System to prove the capacitive level

9.3 Commissioning TMR Type 3D M1803

- (1) The agitator can only be operated with a suitable bracket (see lifting gear from the Stallkamp range).
- (2) Lower the agitator approx. 1 m into the manure. **There must be between approx. 30 and 60 cm of liquid above the agitator blade depending on the performance class of the agitator and the fluidity of the medium being agitated. When in operation, the agitator must not create an eddy taking in air in the intake area.**
- (3) **Ensure that the rope of the lifting gear is taut at all times and that the electric cable does not come into contact with the agitator blade. The system to prove the capacitive level on the slide bearing must not touch the bottom of the tank while the agitator is in operation.**
- (4) **Collision check; set the side lays of the wall bracket in such a way that the agitator blades do not touch the tank wall (min. safety clearance of 10 cm).**
- (5) **ATTENTION:** To avoid accidents and damage to the agitator, all lifting and lowering or lateral swinging must only occur when the motor is turned off.
- (6) Commission the agitator with the delta-wye motor protection switch. Attention: Turn through to "Delta"!
ATTENTION: Direction test, see Point 10.2.
- (7) The inclination of the device can be altered from the horizontal position (normal) using the adjustable slide bearing in the hole segment of the sliding block: 7° upwards; 7° downwards.
- (8) As standard, the agitator is protected by:
 - a) an overload protection switch in the switch box;
 - b) an overheating protection switch.

In case of an overload or of overheating, the agitator is switched off by a motor protection switch. If the submersible motor agitator was switched off as a result of overheating, under no circumstances should you try to restart the submersible motor agitator by pressing the switch repeatedly.

A cooling phase of approx. half an hour must be maintained in order to avoid damage occurring to the motor winding. In some cases, it may be possible to restart the submersible motor agitator after approx. 5 minutes, although the motor winding is still partly hot. Even in these cases, it is still important to maintain the cooling phase of approx. half an hour.

- (9) The secure positioning of all screws and connections must be verified.

9.4 Securing the electric cable

The electric cable must be affixed to the rope with cable clips so that it is protected against damage from the agitator propeller. A rope clip must be mounted approx. 500 mm from the lower fastening point on the wire cable of the lifting gear. The first shackle should be attached to the lifting rope above this rope clip so that the cable does not enter the agitator blade if it slips. (See operating manual for lifting gear)

Important: When raising and lowering the agitator, always make sure that the electric cable is guided properly as it could otherwise be damaged by the propeller or the cable gland.

9.5 Securing the electric cable in biogas plants

To improve cable guide of Stallkamp submersible motor agitators in digester fermenters and gas-tight tanks in conjunction with gas-tight wall controls, the cable clamps must be extended with an additional V2A stainless steel ring per cable clamp (2nd to 10th cable clamp, 9 rings). These rings are included in the delivery scope of agitators with 11 to 22 kW.



Fig. 3: Cable clamp with shackle and ring

The V2A stainless steel ring serves as a rope guide. The shackle connects the ring and cable clamp together.



Fig. 4: Rope clip and 1st cable clamp

Above the rope clip, which is to be assembled on the hoisting rope 500 mm away from the agitator, the cable must be fixed to the hoisting rope with the 1st cable clip and one or two shackles. Attention, the two threaded ends of the rope clip must be aligned opposite the cable position as shown.

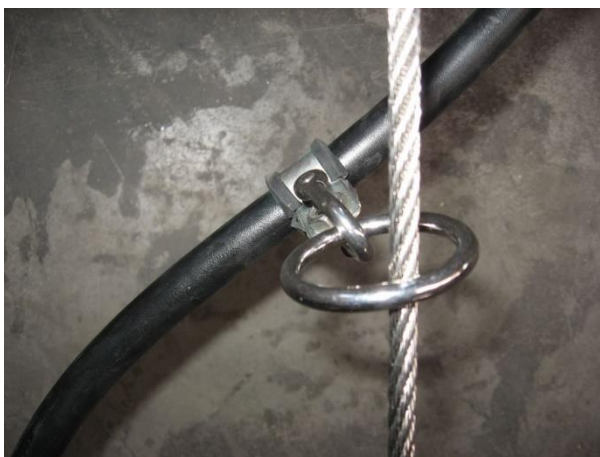


Fig. 5: 2nd cable clamp (1st cable clamp with ring)

The ring is aligned crosswise to the hoisting rope and the shackle is aligned lengthwise to the hoisting rope.

The 4th, 6th, 8th and 10th cable clamps must also be assembled as illustrated.



Fig. 6: The 3rd cable clamp (2nd cable clamp with ring)

The ring is aligned crosswise to the hoisting rope and the shackle is aligned lengthwise to the hoisting rope.

The 5th, 7th and 9th cable clamps must also be assembled as illustrated.



Fig. 7: Cable guide on the wire cable

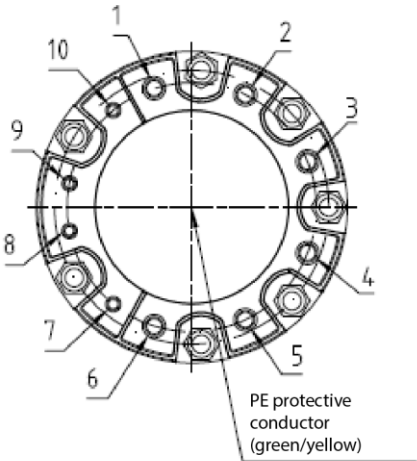
The cable must be attached to the hoisting rope starting from the agitator in a sinusoidal shape. It is absolutely necessary to ensure that the shackles, cable clamps and rings are assembled without tension. The easiest way to do this is to pre-bend the cable as shown and assemble it with shackles and rings.

After all cable clamps have been assembled, the smooth running of the cable on the hoisting rope must be checked by carrying out a functional test.

9.6 Cleaning the submersible motor agitator

- (1) Pressure washers must not be used to clean the TMR.
- (2) The delta-wye motor protection switch must be fastened so that it is protected against moisture.

9.7 Connection plan for TMR Type 3D M1803, 4–22 kW

		4		3		2		1		
		Ⓒ Depending on the model, black marking with no. or colour								
D	Connection sequence to clamp ring		Cable designation on the supply cable		Connection description in motor					
	1	1	brown Ⓒ black Ⓒ grey Ⓒ 2.5 mm² or 4.0 mm² wire green Ⓒ pink Ⓒ white Ⓒ	U1						
	2	2		V1						
	3	3		W1						
	4	4		W2						
	5	5		U2						
6	6	V2								
C										
B										
	7		1 } 0.75 mm² wire		Thermal sensor with thermistor PTC 150 °C (electronic evaluation system req.)					
	8		2 } Ⓒ(blue)							
A	9		3 } 0.75 mm² shielded wire		Leakage display sensor if available (electronic evaluation system req.)					
	10		4 } Ⓒ(red)							
	Ⓐ									
		9		3 } 0.75 mm² shielded wire		Klixer PTO 150 °C bi-metal switch temperature sensor				
		10		4 } Ⓒ(red)						
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10 ELECTRICAL CONNECTION OF TMR TYPE 3D M1803

10.1 Electrical connection and protection of the electrical motor

Electrical connection may only be established by a certified electrician. The VDE regulations (German Association for Electrical, Electronic & Information Technologies) must be observed. Compare the existing voltage with the specifications on the manufacturer's plate of the motor and select the appropriate circuit.

The agitator is watertight to IP68. The manual switch box is splash-proof to IP54. The plastic housing of the automatic delta-wye start-up is splash-proof to IP54.

The technical connection conditions of the local energy supply company must be observed during connection.

The use of a motor protection device is a prerequisite.

The agitator must be properly connected to the mains supply (pay attention to serviceable protective conductors) and check whether the feed cable is properly protected. The respective power consumption of the motor in amperes is shown on the motor's type plate. See Point "6. *Performance data and dimensions of* "

ATTENTION!

The switch box must be protected from moisture at all times!

10.2 Direction test TMR Type 3D M1803

The direction of the stainless steel agitator blade is anticlockwise when viewed from the slide bearing. The agitator blade is a pusher propeller.

The direction must be checked by turning the device on and off again rapidly.



If the direction is incorrect, swap any two of the phases L1, L2 and L3 of the feeder in the switch box!

The electrical installation may only be carried out by a certified electrician.

(as per VDE regulation)

IMPORTANT!!

The electric cable must **never** be subjected to tensile loads, as this can cause damage to the agitator or cause it to leak.

Ensure that the electric cable is always taut and does not droop during operation.

When winching up the agitator, the electric cable must also be pulled up as it could otherwise be damaged.

11 MAINTENANCE OF TMR TYPE 3D M1803

The specified maintenance and inspection work must be performed regularly. This work may only be carried out by trained, qualified and authorised people. The owner of the device undertakes to have the manufacturer itself or a service provider approved by the manufacturer perform maintenance work according to the regulations of the manufacturer, including the necessary changing of oil and the repair and replacement of wearing parts. The owner is thus obligated to maintain a maintenance and revision list, which facilitates monitoring of the mandatory inspection and maintenance work (see Point 16 "Maintenance and revision list").

11.1 Maintenance intervals

The agitator must be inspected for damage before every commissioning. In particular the agitator blade and the cable must be proven to be free of damage. In addition, the secure positioning of all screws and other fastening devices must be verified.

11.1.1 Every 6 months

11.1.1.1 Checking the power consumption on the amperemeter

Power consumption is constant during normal operation. Occasional current fluctuations are caused by the consistency of the medium being agitated and/or the pumping medium. If a constantly increased power consumption is measured, a smaller agitator blade is required (see Point 8.5. Blades) or contact our sales representative.

11.1.2 Every 12 months

11.1.2.1 Check the insulation resistance

At least every 12 months, we recommend measuring the insulation resistance of the motor winding in the scope of maintenance work. If the insulation resistance is not attained, it is possible that moisture has entered the motor. The device must not be recommissioned. Please contact our sales representative.

11.1.2.2 Functional tests on the monitoring devices

At least every 12 months, we recommend checking the monitoring devices in the scope of maintenance work. For these functional tests, the device must be cooled down to ambient temperature. The electrical power cords of the monitoring devices must be disconnected in the switch box. Temperature protection should be checked by taking a continuity measurement. If a leakage detection system is assembled, it should be tested with an ohmmeter. If you identify any defects, please contact our sales representative.

11.1.3 Every 24 months

11.1.3.1 Checking the gear oil

The oil filling in the gearbox should be checked and renewed every 24 months or after 13,000 operating hours. If oil is missing or contaminated with water or other media, the agitator must be taken out of operation immediately. In this case, the oil must be changed immediately and the front shaft seal must be exchanged (see Point 12.2).

The shaft seal (slide ring seal) is a wearing part and must be replaced at the latest every 13,000 operating hours as part of a general repair if the agitators are in continuous operation. The slide ring seal is available as a complete sub-assembly. Please contact us or our sales representative.

11.1.3.2 Check the tightening torque of all screw connections

At least every 24 months, we recommend checking the secure positioning of the screw connections in the scope of maintenance work. The tightening torques for VA stainless steel screws in Nm for different thread sizes are shown below:

(M8 = 18 Nm, M10 = 33 Nm, M12 = 57 Nm, M16 = 135 Nm, M20 = 150 Nm)

11.1.3.3 Visual inspection and cleaning of the connection cable and lifting gears

Every 24 months, we recommend checking the connection cable, shackles and lifting gear for damage and soiling in the scope of maintenance work. Deposits, blockages and adhering fibrous materials must be removed. In addition, the insulation on the connection cable must be inspected for damage, such as scratches, tears, blistering or crushed areas. Damaged components must be exchanged immediately. Please contact our sales representative.

11.1.4 After 13,000 operating hours – 18 months in continuous operation

11.1.4.1 General repair

Every 13,000 operating hours or after 18 months of continuous operation, the agitator should be subjected to a general repair. In this general repair, all wearing parts of the agitator are replaced. Please contact us or our sales representative.

11.1.5 Recommendation at end of the lifespan

At the end of its lifespan, the agitator can be disposed of as general scrap metal. The oils should be drained carefully in advance and disposed of as waste oil. The agitator is composed of various metals: steel, aluminium, copper and stainless steel. Dismantling it into the metal groups considerably increases returns.

11.2 Changing the shaft seal on TMR Type 3D M1803 BG 132/160

The following assembly notices refer to the following drawings:

Drawing no.: 103-944 and 103-889-2 for TMR 3D BG 132

Drawing no.: 103-945 and 103-458-3-2 for TMR 3D BG 160

Disassembly:

1. Remove screw plug no. 26/27 including sealing ring no. 28 (drain oil).
2. Disassemble screw no. 116 and sealing ring no. 117 for agitator blade.
3. Pull off agitator blade no. 115.
4. Loosen and unscrew nut for agitator blade no. 41 including O-ring no. 40.
5. Pull off hub no. 39 including O-ring no. 114.
6. Remove feather key no. 25.
7. Remove race bracket no. 44.
8. Remove race no. 300, O-ring no. 303, O-ring no. 305 and wave spring no. 302 from race bracket.
9. Remove spacer bushing no. 46 including O-ring no. 305.
10. Remove the block ring with pin no. 301 including O-ring no. 304.

Assembly:

1. Assemble the new block ring with pin no. 301 including new O-ring no. 304.
Attention: Observe the position of the pin and the hole!
2. Assemble the old spacer ring no. 46 including new O-ring no. 305.
3. Assemble the new race no. 300, new O-ring no. 303, new O-ring no. 305 and new wave spring no. 302 in the old race bracket (fix the greased wave spring in the race bracket, assemble the slot on the wave spring on the race bracket).
4. Assemble race bracket no. 44.
5. Insert feather key no. 25.
6. Assemble hub no. 39 with new O-ring no. 114.
6. Slide on agitator blade no. 115.
7. Glue nut for agitator blade no. 41 incl. new O-ring no. 40 with Curil and assemble.
8. Assemble the screw for agitator blade no. 116 and new sealing ring no. 117 with Loctite threadlocker.
9. Assemble screw plug no. 27 including sealing ring no. 28.
10. Fill Wibogear XF220 synthetic gear oil in the gearbox.
1.0 litre for TMR BG 132, 1.5 litres for TMR BG 160.
11. Assemble screw plug no. 26 including sealing ring no. 28.

12 NOTICES

12.1 Provisions of the professional association

The accident prevention regulations of the German Agricultural Professional Association stipulate the following in Paragraph 2.8 under "Special provisions for pits and canals":

Paragraph 2.8

§ 1 Protection against falling in

- (1) Pits, ditches, canals, wells and other similar cavities in indoor and outdoor areas must be made safe with fences or coverings to prevent people from falling in. If these are not deeper than 100 cm, other safety precautions will suffice.

§ 2 Openings

- (1) If removal and entry openings and the like are opened, it must be ensured that people and objects cannot fall in.
- (2) Pits and canals that are regularly entered must have facilities which permit entry without danger of accidents. The openings of these pits and canals must be dimensioned in such a way to allow the rescue of any casualties.

§ 3 Entry

- (1) Before entering and while in pits and canals, ensure that sufficient breathing air is present and that operational equipment is reliably protected against being switched on. The handling of naked flames is not permitted.
- (2) Climbing in to rescue casualties is only admissible if the person climbing in is held by two additional people using a rope that is firmly anchored outside the tank.

§ 4 Tanks and canals for animal faeces

- (1) For tanks and canals in the open air, suitable measures must be implemented to ensure that fermentation gas cannot flow into the building.
- (2) Sealed tanks in the open air must have vent openings on opposite sides.
- (3) If tanks and canals are located in buildings – also under slatted floors – it must be ensured that fermentation gas is discharged out of the buildings.
- (4) If tanks and canals in buildings are fitted with agitators and pumping/flushing equipment, there must be facilities for the discharge of fermentation gases, which automatically switch on when the agitators and pumping/flushing equipment are started up. They may only be switched off when the work process is concluded. The extracted gases must not endanger people.
- (5) Canals are to be designed in such way as to avoid any unnecessary whirling up of the faeces.
- (6) However, operating stations for agitators, pumping and flushing equipment etc. must be positioned above the ground.
- (7) Closed rooms in which there are operating stations must not have openings to the tanks and canals.
- (8) Operating instructions must be permanently attached to the operating stations.

§ 5 Removal of animal faeces from tanks and canals

- (1) No smoking and no naked flames are allowed in the immediate proximity of removal openings during the agitation and removal of faeces.
- (2) In buildings in which there are open tanks and canals, the presence of people and animals during agitation and removal is only permissible if there is sufficient ventilation.

§ 6 Warning signs

- (1) Warning signs indicating gas hazards must be placed in a clearly visible position at openings in tanks and canals.
- (2) Refer to the "Information Sheet with Notice, Warning, Mandatory, Prohibition and Rescue Signs" of the German Federal Association of Agricultural Professional Associations.

13 SPARE PARTS LIST TMR TYPE 3D / 3DB M1803



Stallkamp devices may only be repaired by specialists that have been trained by the manufacturer of this device (Erich Stallkamp ESTA GmbH). To access our spare parts price lists, please contact your sales representative.

14 MAINTENANCE AND REVISION LIST

Each person must properly enter all maintenance and revision work in the list and confirm it with his or her own signature and that of their supervisor.

This list must be submitted to the supervisory bodies of the professional association, the TÜV and the manufacturer on request.

Maintenance/revision on the device with the machine no.	Notes	Date	Signature of installer	Signature of supervisor

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Dinklage is in the heart of Germany's Oldenburg Münsterland.

From the A1 exit no. 65, Lohne Dinklage, towards Dinklage; once in Dinklage, head towards Vechta, then into Industriegebiet West.

- Pump technology
- Agitating technology
- Stainless steel tanks



Erich Stallkamp ESTA GmbH

In der Bahler Heide 4 – Industriegebiet West – 49413 Dinklage, Germany
Tel. +49 4443 9666-0 – Fax +49 4443 9666-60
info@stallkamp.de – <http://www.stallkamp.de>

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