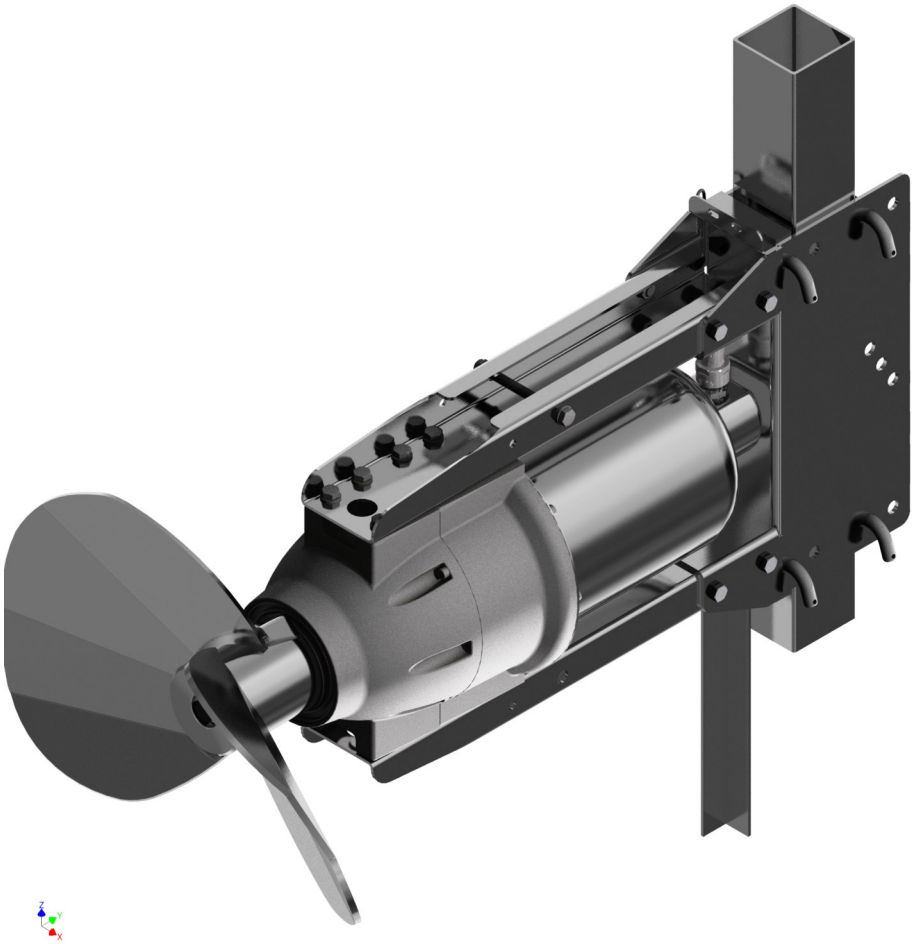
Stallkamp

OPERATING MANUAL

Submersible agitator

Type 3i M1408 stainless steel

BG132 4.0/ 5.5/ 7.5 kW
BG160 11.0/ 17.0/ 22.0 kW



Document no.: 8160552 Version: August 2014

Space for notes:

General information

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

Date saved: 09/09/2019 07:36:00
Date printed 05/12/2024
BA_TMR Typ 3i M1408_englischV1_8160552.DOC

© Erich Stallkamp ESTA GmbH – In der Bahler Heide 4 – Industriegebiet West – 49413 Dinklage, Germany
Tel. +49 (0) 44 43 / 96 66-0 – Fax +49 (0) 44 43 / 96 66-60
info@stallkamp.de – www.stallkamp.de

1 TABLE OF CONTENTS

2 GENERAL INFORMATION

Our devices are developed according to the current state of technology, manufactured with great care and subject to a continual quality control. This operating manual should help you to get to know the device and to employ its proper operational possibilities.

The operating manual contains important notices in order to operate the device safely, appropriately and cost-effectively. It is necessary to observe the operating manual to ensure the reliability and high durability of the device and to avoid hazards.

The operating manual does not take local, on-site requirements into consideration; the operator is solely responsible for ensuring that these are observed, including by external installers.

2.1 Designation of notices in the operating manual

In the operating manual, safety references warning of dangers to persons are identified with the general hazard symbol according to DIN 4844-W9.

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

All other notices which might restrict the functional reliability of the device or represent a danger for the machine if not observed are marked with the word:

ATTENTION!

This machine unit may not be operated beyond the values defined in the technical documentation with respect to conveying liquid, delivery flow rate, speed, density, pressure, temperature as well as motor power output or 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 purchasing spare parts.

Provided that additional information or notes are required or in case of damage, please contact our local field sales employee or contact us directly.

2.2 Unauthorised conversion and spare part manufacture

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

3 SAFETY

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

It is therefore absolutely necessary that the installer as well as the responsible qualified personnel and operator read these instructions before installation and commissioning, and that they are continually available at the location where the machine is operated.

Not only the safety instructions in this operating manual must be observed, but also the warning signs and regulations of the respective professional association in the latest version.

3.1 Qualification of the personnel

The personnel performing the operation, maintenance, inspection and installation must be appropriately qualified for this work.

Area of responsibility, competence and the monitoring of the personnel must be precisely regulated by the operator. If the necessary skills are not available to the personnel, then they should be appropriately trained and instructed.

Furthermore the operator must ensure that the operating staff fully understands the contents of the operating manual.

3.2 Dangers if the safety instructions are not observed

Failure to observe the safety instructions can endanger persons as well as the environment and the machine. Failure to observe the safety instructions results in the loss 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 plant.
- Endangerment of persons due to electrical, mechanical, chemical or other exposure.
- Endangerment of the environment due to leakage of hazardous materials.

WARNING SIGNS

Observe all notices and warning signs. Dangerous gases can escape when agitating the liquid manure.

DANGER OF POISONING!

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

3.3 Safety-conscious work

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

Safety instructions for the operator and attendant:

- ✓ If hot or cold machine parts can pose a hazard, then these parts must be protected on site against 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 persons and environment. Observe statutory provisions.

3.4 Safety instructions for maintenance, inspection and assembly work

The operator has to ensure that all maintenance, inspection and installation work is carried out by authorised and qualified personnel.

Fundamentally, all work on the machine can 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 made functional.

4 GUARANTEE

This section contains the general particulars for the guarantee. Contractual agreements are always treated with priority and are hereby not rescinded. The period of guarantee is a component of Stallkamp's general terms and conditions. Agreements deviating from this must be specified in writing in the order confirmation.

4.1 General

Stallkamp is obligated to repair every defect to products sold by Stallkamp under the condition:

- ✓ that it is a quality 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 guarantee;
- ✓ that the product is employed exclusively in the specified operating conditions described in the operating manual and employed for the intended purpose;
- ✓ that the monitoring device integrated in the product is correctly connected (temperature protection);
- ✓ that genuine Stallkamp parts are used.

4.2 Exclusion of liability

No guarantee or liability is 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 operator;
- Failure to observe the safety instructions, regulations or the necessary requirements in this operating manual which apply according to German law;
- Installation, disassembly or repair of the device not in keeping with the regulations;
- Inadequate maintenance;
- Possible chemical, electrical or electrochemical influences;
- Wear and tear.

Since maintenance has an influence on the safety and functional capability of the device, it is an integral component of the guarantee. The operator of the device is obligated to have the manufacturer himself or a service 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 operator 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 medium being pumped and should consequently be classed as a wearing part. Wear, damage and secondary damages which result from external influences on the protective coating are expressly excluded from the guarantee. The use of devices and/or the field of application and reliability for the application must be verified by the operator and does not form part of the guarantee.

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

The manufacturer reserves the right to modify the performance, specifications or configuration data without prior information.

5 PRODUCT DESCRIPTION TMR 3I

5.1 General description TMR 3i

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

The agitator must not be operated in explosive environments.

Submersible agitator TMR Type 3i M1408 comprising:

- V4A stainless steel crankcase
- Oil filling in motor compartment with insulating oil
- Thermo-control with a thermistor per phase for overheating protection
- Ni-resist stainless steel gearbox housing
- Oil filling in the gearbox with gearbox oil
- Single-stage planetary gear with impeller torque of 373 rpm
- 10m electrical cable with special double-shell PU external sheath
- 6m cable protection hose
- Stainless steel guide slide bearing including depth stop for guide rail 100 x 100 mm
- Maximum submersion depth 10 m
- Temperature of medium being agitated up to max. 50°C -> Agitation 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 contents and the viscosity of the medium being agitated, in isolated cases the cooling of the agitator may not be sufficient. The motor is then switched off by the thermal protection switch. In this case, an agitator blade with a smaller external diameter is required.

5.2 Intended use for TMR 3i

The agitator is intended for the following applications:

(1) Agitation and/or homogenisation of liquid manure in final storage sites, pre-lagoons and liquid manure canals;

(2) Agitation and homogenisation of biomass in biomass systems; not, however, in explosive area

(3) Agitation and/or homogenisation of mixing pits; not, however, in explosive area

(4) Agitation and/or homogenisation of 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 a varying pH value; generally pH 5.3 – 8.1 at a room temperature of 20°C. The relationship between the pH value, temperature and chemical composition of the medium must, however, be taken into account in this process. When the pH value of the medium being agitated is low, high temperatures could lead to increased risk of corrosion on the agitator. See also the general "Corrosion rate of austenitic cast iron alloys" data sheets 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 process 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 TMR 3i M1408

Submersible agitator TMR Type 3i M1408 comprising:

- Type of agitator: TMR Type 3i M1408
- Three phase motor: 400 V, 50 Hz, 3 Ph, 1,450 rpm
- Protection category: IP68
- Insulating category: F = 155°C
- Motor power output: 4.0; 5.5; 7.5; 11.0; 17.0 and 22.0 kW
- Gearbox seal: Shaft seal combined with slide ring sealing
- Guide slide bearing: Stainless steel, 1.4301 for guide rail 100 x 100 mm
- Impeller: Stainless steel

5.4 Type plate TMR 3i M1408

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

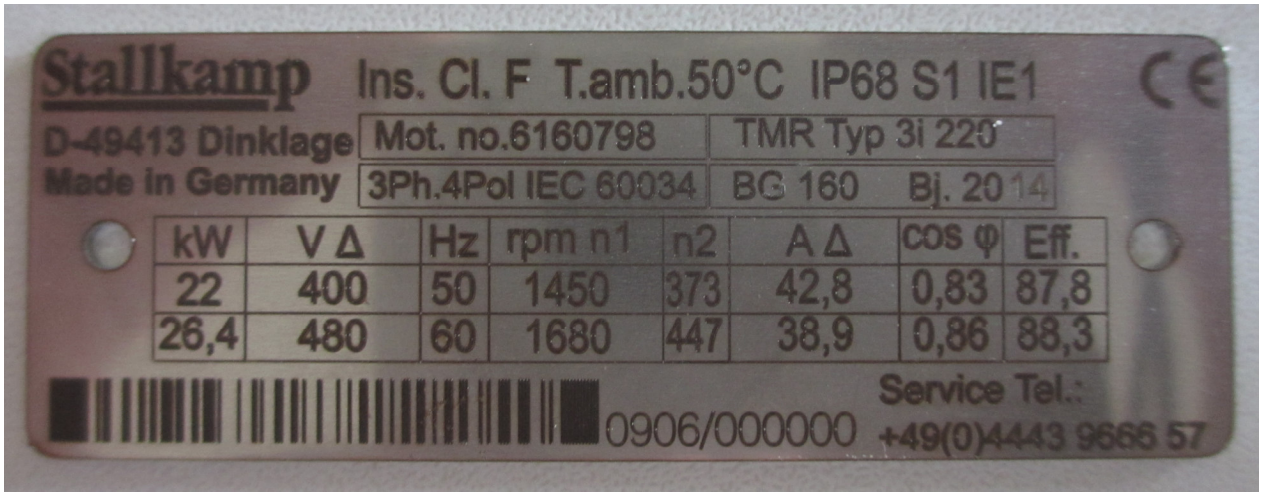


Figure 1

Motor number: (e.g. 6160789)

Classification: (e.g. TMR Type 3i 220)

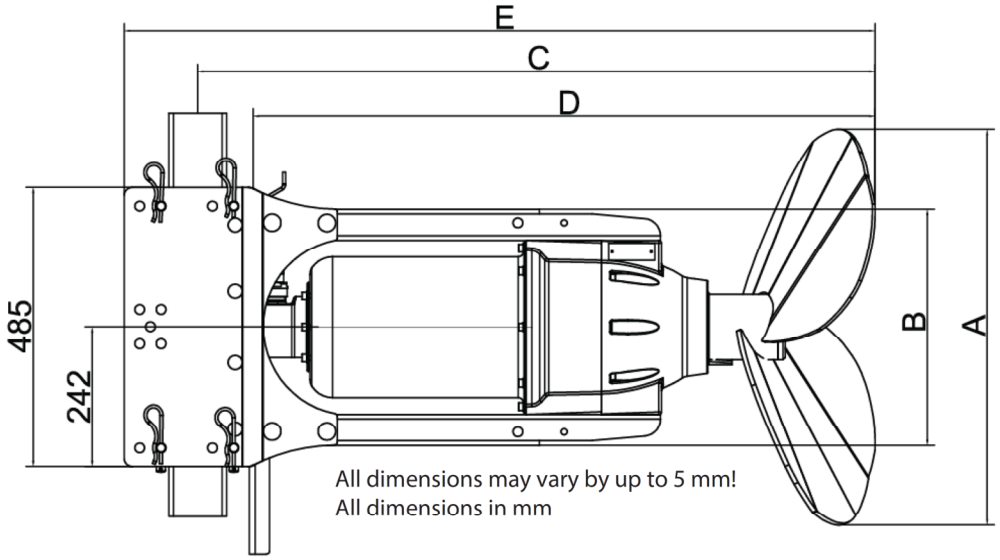
Power data: (e.g. 22kW)

Year of manufacture: (e.g. 2014)

Stallkamp serial number: (e.g. 0906/000000)

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

6 POWER DATA AND DIMENSIONS TMR 3I M1408



Dimensions TMR 3i M 1408					
TMR	A	B	C	D	E
110	610	410	1119	992	1209
170	650	410	1119	992	1209
220	700	410	1210	1083	1300

Power data of submersible agitator							
Type	Motor power output kW	Start	Nominal current in A	Req. fuse	Speed in rpm of motor/impeller	Circulation rate. m3/min	Compl. weight in kg
TMR 110	11.0	Y / Δ	22.1	32A Time-delay	1450 / 373	54.5	177
TMR 170	17.0	Y / Δ	33.0	50A Time-delay	1450 / 373	67.5	187
TMR 220	22.0	Y / Δ	43.0	63A Time-delay	1450 / 373	88.3	197

All impeller power data are based on clean water!
Operating voltage 400 V/ 50 Hz, protection category IP 68

Subject to change without notice!

Programme number –	Scale 1:10	Dimensions without tolerances acc. to DIN 7168 - medium	
Order number –	Material –	Parts no. –	
	Date	Name	Description
Edited by:	02.06.14	Sandhaus	Power data and dimensions of submersible agitator 3i M 1408
Checked by:			
Standard			
Stallkamp Erich Stallkamp ESTA GmbH Postfach 1260 49408 Dinklage Tel. 04443/1005 Fax 3178	Group -	Type -	
	Drawing no. 103-802-5		Sheet
Stat. Change Date Name IT no. 103-802-5.dwg			Sh.

7 CONSTRUCTION TYPE TMR 3I

7.1 Cable connection

The cable connection compartment is completely sealed off from the surrounding liquid and towards the crankcase.

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 according to class F (155°C). The motor has been designed in such a 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 temperature sensing thermistors PTC-150 are connected in series in the stator winding. These will start reacting at 150°C.

ATTENTION! The temperature sensing switches must always be connected. A special electronic evaluation system is required.

The agitator can be equipped with detectors: namely with a leakage detector for the detection of water in the oil.

7.4 Gearbox

The submersible agitator is equipped with a planetary gear between the motor and the agitator blade. This gearbox contains an oil filling, which must be checked once annually.

7.5 Blades

The agitator is equipped with one 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 external diameter is required. A significantly smaller agitator blade is required when operating at 60Hz. Please contact our sales representative.

8 TRANSPORT AND STORAGE REGULATIONS TMR 3I

The agitator must be transported in a lying position. Ensure that the machine is not unable 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 being recommissioned after not being used for a long period of time. It is particularly important to verify that the cable entry points and seals are not damaged in any way.

The directions under Point "*3. Safety*" must be observed.

9 INSTALLATION TMR 3I

9.1 Prior to commissioning: Safety instructions

The following rules should fundamentally be observed to prevent accidents during maintenance and installation 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 welding work or using electrical tools, check whether there is a danger of explosion.

(4) Pay attention to the danger of electrical accidents.

(5) Examine lifting gear to ensure its fully satisfactory condition.

(6) Ensure an adequate shutoff at the place of work, e.g., cordoning trellis

(7) Wear a hardhat, safety glasses and safety footwear.

(8) Keep a first-aid kit ready.

Otherwise observe the health and safety regulations as well as the prevailing governmental regulations.

9.2 Commissioning TMR 3i M1408

(1) The agitator can only be operated with a suitable bracket (see lifting gear from the Stallkamp range).

(2) Lower the agitator approximately 1 m into the liquid 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 media 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 electrical cable does not come into contact with the agitator blade. Always ensure that the cable is submersed only in the area of the mounted cable protection hose. The depth stop on the guide 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 (safety clearance min. 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 guide 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 in the switch box
b) an overheating protection.

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 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.

9.3 Leakage display – special equipment –

In the cases of leaks, i.e., if liquid manure or other foreign liquid enters the agitator, the control lamp on the switch box lights up. If this is the case, lift the agitator out of the liquid and ascertain the reason for the disturbance.

9.4 Securing the electrical cable

The electrical cable must be affixed to the rope with cable clamps 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 rope 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 pay attention to the correct guidance of the electrical cable as it could otherwise be damaged by the propeller or the cable screw connections.

9.5 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.

9.6 Connection plan for TMR 3i M1408, 4-22 kW with leakage display

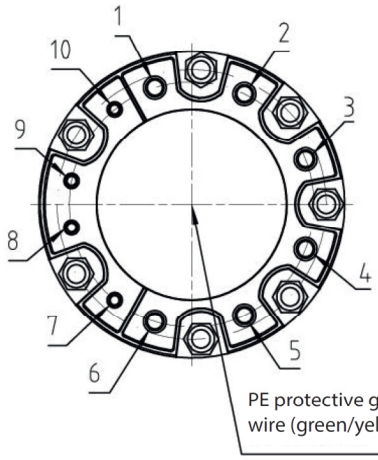
Connection sequence to clamp ring	Cable designation on the supply cable	Connection description in motor	N.B. only applies to: ⓐ
1	1	U1	
2	2	V1	
3	3	W1	
4	4	W2	
5	5	U2	
6	6	V2	
7 8	1 2	Thermal sensor with thermistor PTC 150°C (electronic evaluation system req.) ⓐ	TMR Type 3, 3i and 3M
9 10	3 4	Leakage display sensor if available (electronic evaluation system req.) ⓐ	TMR Type 3i
ⓐ 9 10	3 4	Thermal sensor Klixer bi-metal switch 150°C	TMR Type 3 and 3M

Lead 2.5 mm² / 4.0 mm²

Lead 0.75 mm²

Lead 0.75 mm² shielded

Lead 0.75 mm² shielded



Stat.	Change	Date	Name
a	001	16.03.2016	MNguyen

Programme number: –
Order number: –
Scale:
Dimensions without tolerances in acc. with DIN ISO 2768 - m medium
Material: –
Parts no.:
Description: Connection plan for TMR Type 3, 3i and 3M
4-22kW

	Date	Name
Edited by:	02.03.2009	Kossebau
Checked by:		
Standard		

Stallkamp
Erich Stallkamp ESTA GmbH
Postfach 1260 49408 Dinklage
Tel. 04443/9666-0 Fax -60

Group -
Type -
Drawing no. 25-0106
Index 001
Sheet
Sh.
IT no. 25-0106.dwg

10 ELECTRICAL CONNECTION FOR TMR 3I

10.1 Electrical connection and protection of the electrical motor

The electrical connection may only be carried out 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 motor's manufacturer's plate and select the appropriate circuit.

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

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

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. Power data and dimensions TMR*"

ATTENTION!

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

10.2 Direction test TMR 3i M1408

The blade turns anticlockwise when viewed from the guide slide bearing. The agitator blade is a pusher propeller.

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

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

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

11 MAINTENANCE TMR 3I

The specified maintenance and inspection work must be performed regularly. These tasks may only be carried out by trained, qualified and authorised personnel. The operator of the device is obligated to have the manufacturer himself or a service 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 operator 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 Recommendation: Every 6 months

11.1.1.1 Check the power consumption at the ammeter

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

11.1.2 Recommendation: 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, moisture can enter the motor. The device must not be recommissioned. Please contact our sales representative.

11.1.2.2 Check the functioning of the monitoring device

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

11.1.3 Recommendation: Every 24 months

11.1.3.1 Controlling the gearbox oil

The oil filling in the gearbox should be checked every 24 months. 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 and 12.3)

The shaft seal (slide ring sealing) is a wearing part and must be replaced at the latest every 13,000 operating hours when the agitator is in continuous operation in the scope of general repairs. The slide ring sealing is available as a complete sub-assembly. Please contact 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 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 gear

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

11.1.4.1 General repairs

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

11.1.5 Recommendation at end of service life

At the end of its service life, the agitator can be disposed of normally as scrap. The oils should be removed in advance and disposed of properly. 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 3i M1408 BG 132/160

The following installation instructions refer to the following drawing numbers:

Drawing no.: 103-XXX; 103-XXX TMR BG 132

Drawing no.: 103-802; 103-802-4 TMR BG 160

Disassembly:

1. Remove screw plug no. 27 including sealing ring no. 28 (release oil)
2. Take off screw no. 116, agitator blade no. 115 and O-ring no. 114
3. Loosen and unscrew nut for hub no. 41 and remove O-ring no. 40
4. Pull off hub no. 39, disassemble shaft seal ring no. 37, O-ring no. 38 and ventilation screw no. 47
5. Remove fitting key no. 25
6. Remove race bracket no. 44
7. Remove race no. 300, O-ring no. 303, O-ring no. 305 and sinusoidal spring no. 302 from race bracket
8. Remove fitted washer 55x68x1 no. 310
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

Installation:

1. Install 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. Install the old spacer ring no. 46 including new O-ring no. 305
3. Install fitted washer 55x68x1 no. 310
4. Install the new race no. 300, new O-ring no. 303, new O-ring no. 305 and new sinusoidal spring no. 302 in the old race bracket, (fix sinusoidal spring in race bracket with grease, install the slot on the sinusoidal spring on the race bracket)
5. Install race bracket no. 44
6. Insert fitting key no. 25
7. Push on hub no. 39 with new O-ring no. 38 and no. 114
8. Glue nut for hub no. 41 with new O-ring no. 40 with Curil and install
9. Fill up grease chamber with grease, slide shaft seal ring no. 37 carefully over the hub and glue with outer ring, then install ventilation screw no. 47
10. Install agitator blade no. 115 with screw no. 116 and new copper ring no. 117
11. Fill up gearbox with Wibogear-XF220, 1.0 litre for TMR BG132, 1.5 litres for TMR BG160
12. Install screw plug no. 27 including new sealing ring no. 28

12 NOTES

12.1 Regulation of the professional association

The following accident prevention regulations of the Agricultural Professional Association can be found 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 pits in the house and courtyard area must be protected with railings or coverings to prevent persons falling in. If these are not deeper than 100 cm, other safety precautions can suffice.

§ 2 Openings

(1) If removal and entries openings, etc., are opened, it must be guaranteed that persons and objects cannot fall in.

(2) Pits and canals that are customarily entered must have facilities which permit risk-free entry. 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 entry and during the presence in pits and canals, ensure that sufficient respiratory air is present and that plant facilities are reliably protected against being switched on. The handling of naked flames is not permitted.

(2) Entry for the recovery of an accident victim is only permissible if two other persons secure the entering person with a rope which is firmly anchored outside the tank.

§ 4 Tanks and canals for animal faeces

(1) For tanks and canals in the open air, it must be guaranteed by suitable measures that fermentation gas cannot flow into the buildings.

(2) Closed tanks in the open air must have vent openings on opposite lying sides.

(3) If tanks and canals are found in the buildings - also under slatted floors - it must be guaranteed that fermentation gases are conducted away from the buildings.

(4) If tanks and canals in the buildings are furnished with agitating, pumping and rinsing plants, facilities for the removal of fermentation gases must be present which automatically switch on when the agitator and rinsing works are operating. They may only be switched off after conclusion of the work process. The gases conducted away must not endanger persons.

(5) Canals must be designed so as to avoid any unnecessary whirling up of the faeces.

(6) Operating stations for agitating, pumping and rinsing, etc., equipment must be built up over the floor.

(7) Closed rooms in which there are operating stations may not have openings to the tanks and canals.

(8) Operation instructions must be permanently attached to the operating stands.

§ 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 agitating and removal of faeces.

(2) In the buildings in which there are open tanks and canals, the presence of persons and animals during agitation and removal is only permissible with sufficient ventilation.

§ 6 Warning signs

(1) Easily visible warning signs must be attached to openings of tanks and canals which indicate the danger of the gases.

(2) Refer to the "Information Sheet with Notice, Warning, Prohibition and Rescue Signs" of the Federal Association of Agricultural Trade Associations.

13 SPARE PARTS LIST TMR 3I M1408 BG 132

for TMR 4.0 – 7.5 kW **Drawing no.: 103-XXX**

Attention, BG 132 is not yet released!

13.1 Assembly drawing TMR 3i M1408 BG 132, Drawing no.: 103-XXX

Drawing is not yet released!

13.2 Slide ring sealing for TMR 3i M1408 BG 132, Drawing no.: 103-XXX

Drawing is not yet released!

14 SPARE PARTS LIST TMR 3I M1408 BG 160

for TMR 11.0 – 22.0 kW, Drawing no.: 103-802 and 103-802-4

ZPos	Part	Description_1	Description_2	Amt	ME
Parts list for agitator unit without blade, guide slide bearing and cable					
1	6160924	Crankcase with stator	11 kW TMR 3	1	pc.
1	6160925	Crankcase with stator	17 kW TMR 3	1	pc.
1	6160926	Crankcase with stator	22 kW TMR 3	1	pc.
2	6160805	Motor shaft with rotor	11 kW TMR 3	1	pc.
2	6160806	Motor shaft with rotor	17 kW TMR 3	1	pc.
2	6160807	Motor shaft with rotor	22 kW TMR 3	1	pc.
3	5180125	Self-aligning ball bearings	1208TNG	1	pc.
4					pc.
5	5100724	Laser cutting	Disc Ø80 -0.1/-0.3; t=1mm	1	pc.
6	7161131	Inner ring with bevel 2x30°	LR 50x55x25 for TMR 3	1	pc.
7	7161119	Gearbox cover BG 160	TMR Type 3i	1	pc.
8	5190198	Seal for	Gearbox housing	1	pc.
9					pc.
10	5190237	Shaft seal ring WZ1	55x80x13 FPM one-sided with PTFE	1	pc.
10.1	5190069	Shaft seal ring WBD	55x80x13 FPM	1	pc.
11	5180052	Thrust ball bearing / bearing	6009	1	pc.
12	6160455	Seal set TMR3 Mod08 GL	BG160, 11 to 22 kW Hm-ring	1	pc.
13	7161120	Gearbox housing BG 160	TMR Type 3i	1	pc.
14	5190126	Seal for	Motor cover-crankcase	1	pc.
15	6160808	Gearbox shaft with planetary gear	TMR 3 BG160 triple bearing	1	pc.
16	5180054	Permaglide Ø35xØ39x30	3530 P10	3	pc.
17	7160670	Planetary gear Z=30; BG160	11.0 kW- 22.0 kW	3	pc.
18	7160673	Pinion Z=30; BG160	11 kW-22 kW	1	pc.
19	5250167	Fitting key 10.0x8.0x25.0	DIN 6885 A	1	pc.
20	5250022	Fastening ring	DIN 471 A35	1	pc.
21	7160038	Internal ring gear Z90 BG160	11 to 22 kW TMR	1	pc.
22	5260100	Dowel Ø 8.0 M6 x 40	DIN 7979	4	pc.
23	5180068	Thrust ball bearing / bearing	6014	1	pc.
24	5180147	Angular ball bearing 7211	B - TVP - UO	2	pc.
25	5250176	Fitting key 16.0x10.0x32.0	DIN 6885 AB	1	pc.
26	5200261	Screw plug G1/2"	DIN 908 A2	3	pc.
27	5260115	Magnetic plug 1/2"	made from stainless steel material 1.4305	1	pc.
28	5230077	Copper filling ring 21.0x26.0x2.0	Sealing ring KAFC, free from asbestos	4	pc.
29	5200254	Cylinder screw M8x35	DIN 912 A2	6	pc.
30	5200253	Cylinder screw M8x16	DIN 912 A2	8	pc.
31	5200341	Lock washer Type S	8mm A2	16	pc.
32					pc.

33	6160792	Leakage sensor for TMR 3i		2	pc.
34	5310517	Ceramic lustre clamp		1	pc.
35	5350024	Wibogear XF 220	High-performance gear oil	1.5	L
36	5350050	Wibogear ST S 32	Motor oil for TMR 11kW	7.0	L
36	5350050	Wibogear ST S 32	Motor oil for TMR 17kW	7.2	L
36	5350050	Wibogear ST S 32	Motor oil for TMR 22kW	7.5	L
37	5190202	Radial shaft seal ring	120x150x12 WP2/PTFE/1.4401	1	pc.
38	5190027	O-ring 89.5 x 3.0	NBR70	1	pc.
39	7160956	Hub for	TMR3 BG160 Mod.08	1	pc.
40	5190102	O-ring 65.0 x 2.0	NBR70	1	pc.
41	7160961	Lock nut	TMR3 BG160 Mod.08	1	pc.
42	5260106	Dowel Ø 16.0 x 20.0	DIN 2338	1	pc.
43	5190060	Nilos-ring 6208 JV		1	pc.
44	7160794	Race bracket BG160	for slide ring sealing BG 160	1	pc.
45	7160795	Threaded bushing BG160	for slide ring sealing BG 160	1	pc.
46	7160796	Spacer bushing BG160	for slide ring sealing BG 160	1	pc.
47	5200333	Set screw M6x6		1	pc.
48	5190203	Ball bearing compensating disc	46x40x5	1	pc.
49	5250226	Fitted washer 60x75x5	DIN988	1	pc.
50	5200358	Screw plug M12x1.5	DIN908 A4	1	pc.
51	5200376	Cylinder screw M4x14	ISO 4762/DIN912 A2	1	pc.

Parts list for agitator unit including blade, guide slide bearing and cable

100	8160412	Operating manual TMR Type 3i	M1408 version 1, German	1	pc.
101	6160430	Signage for TMR 2	Sticker	1	pc.
102	6160796	Agitator unit 11.0 kW VA	11.0 kW TMR Type 3i M1408	1	pc.
102	6160797	Agitator unit 17.0 kW VA	17.0 kW TMR Type 3i M1408	1	pc.
102	6160798	Agitator unit 22.0 kW VA	22.0 kW TMR Type 3i M1408	1	pc.
103	6160810	Cable with clamping lid TMR 3i	M1408, 4.0-11kW length 10m	1	pc.
103	6160811	Cable with clamping lid TMR 3i	M1408, 17.0-22kW length 10m	1	pc.
104	5200085	Hex. nut M6	DIN 934 A2	6	pc.
105	5200044	Spring ring M6 mm	DIN 127 A2	6	pc.
106	5200146	Hex. nut M5	DIN 934 A2	1	pc.
107	5230071	Spring ring M5	DIN 127 ST galv.	1	pc.
108	5200083	Hex. nut M4	DIN 934 V2A	4	pc.
109	5200247	Spring ring M4 mm	DIN 127 A2	4	pc.
110	5190121	Seal	for clamping lid	1	pc.
111	5320036	Screw locking device M8	PA 6 natural	6	pc.
112	5200017	Hex. screw M8x20	DIN 933 A2	6	pc.
113	6160973	Guide slide bearing Mod.09 TMR 3	BG 160 11KW V2A	1	pc.
113	6160973	Guide slide bearing Mod.09 TMR 3	BG160 17KW V2A	1	pc.
113	6160974	Guide slide bearing Mod.09 TMR 3	BG160 22KW V2A	1	pc.
114	5700083	O-ring 96.0 x 5.0	NBR 70	1	pc.

115	6160484	Blade TMR 3 BG 160	Mod.08, 11 kW V2A	1	pc.
115	6160486	Blade TMR 3 BG 160	Mod.08, 17 kW V2A	1	pc.
115	6160488	Blade TMR 3 BG 160	Mod.08, 22 kW V2A	1	pc.
116	5200164	Hex. screw M16x50	DIN 933 A4	1	pc.
117	5230075	Copper filling ring 17.0x21.0x2.0		1	pc.
118	5500671	Dairy plant steam hose	25 x 6 mm	6	M
119	5500672	Worm drive hose clip	32- 44 mm VA	6	pc.
120	5260000	V4A Niro-shackle 6.0 mm	straight shape, forged	10	pc.
121	6180136	Cable clamp with shackle	Mod.07 TMP/TMR 4-11kW	5	pc.
121	6180137	Cable clamp with shackle	Mod.07 TMP/TMR 17-22kW	5	pc.
122	7161152	Stripper TMR 3i	1.4301	1	pc.

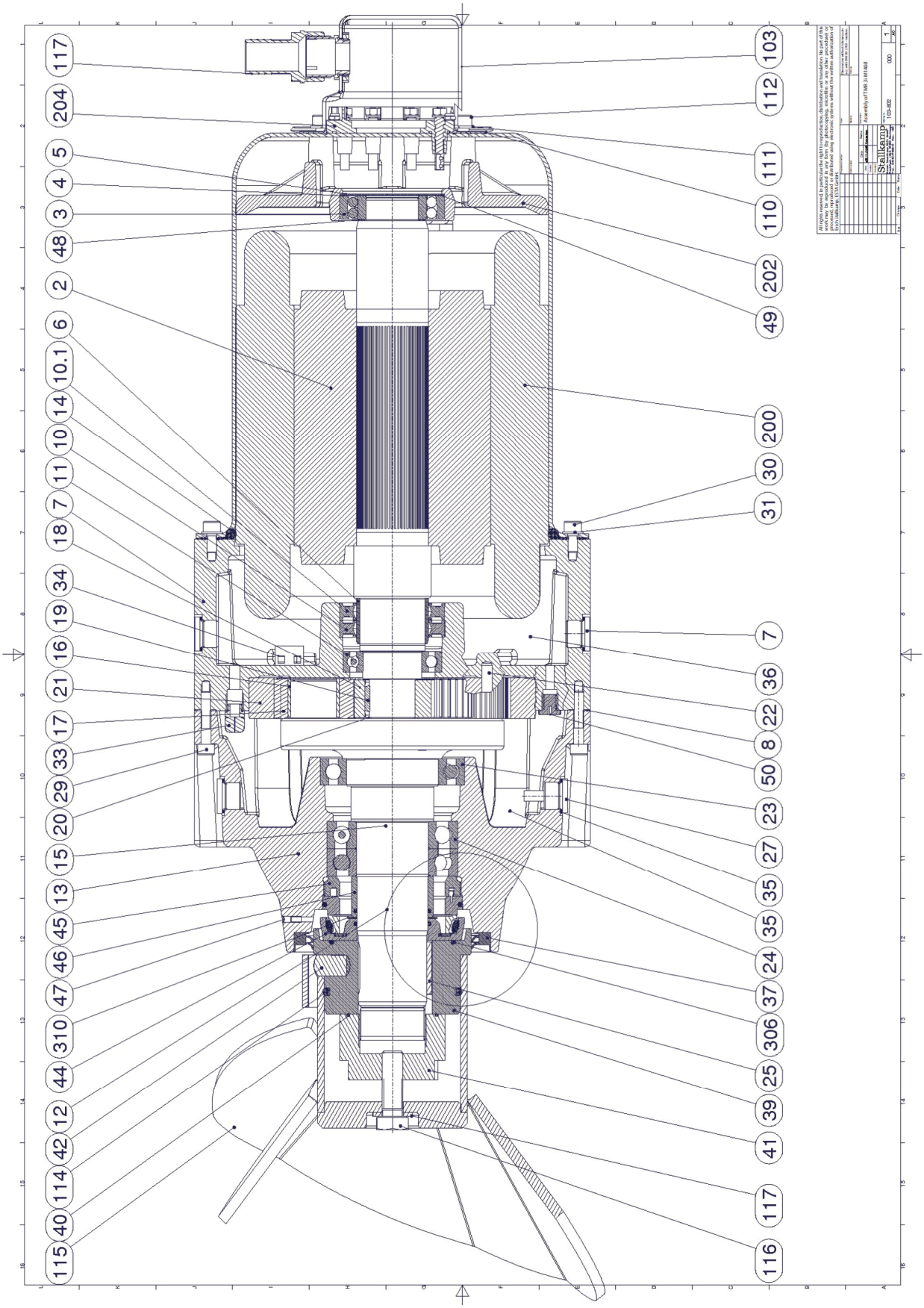
Parts list for crankcase with stator, bearing support and clamp ring

200	5281019	Stator 11 kW BG160	TMR 3	1	pc.
200	5281021	Stator 17 kW BG160	TMR 3	1	pc.
200	5281023	Stator 22 kW BG160	TMR 3	1	pc.
201	7160682	Crankcase 11 kW BG160	TMR 3	1	pc.
201	7160683	Crankcase 17 kW BG160	TMR 3	1	pc.
201	7160684	Crankcase 22 kW BG160	TMR 3	1	pc.
202	7160612	Motor mounting BG 160	TMR 3	1	pc.
203	5190124	O-ring 8.0 x 2.5	NBR72	6	pc.
204	6160392	Clamp ring 4.0-7.5kW for	TMR 3	0	pc.
204	6160397	Clamp ring 11.0 - 22.0kW for	TMR 3	1	pc.
205	5190122	O-ring 12.0 x 1.7	NBR72	6	pc.
206	5190123	O-ring 8.0 x 1.75	NBR72	4	pc.
207	5200279	Hex. nut M5	DIN 985 A2	7	pc.

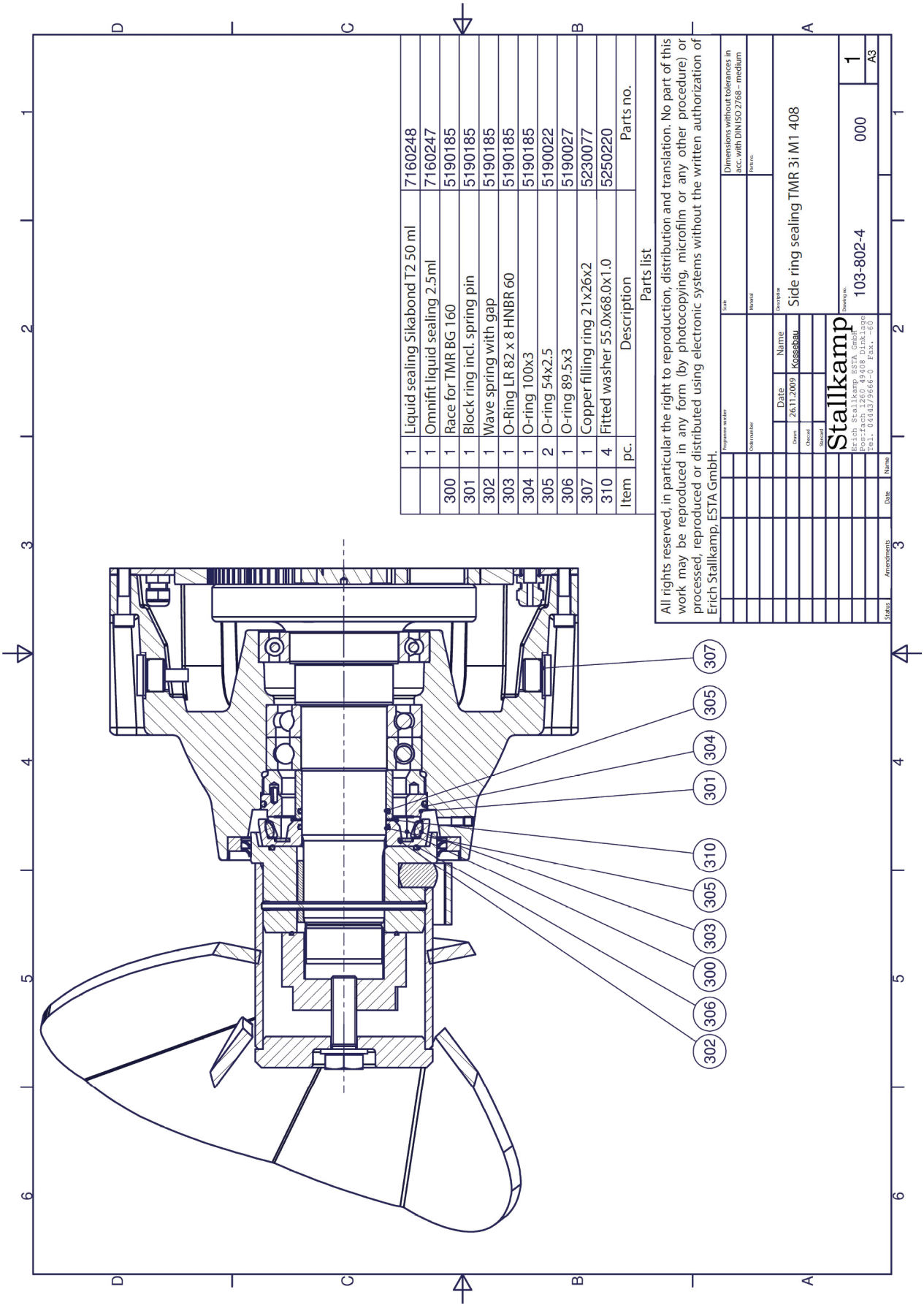
Parts list for seal set slide ring sealing 6160455

300	5190215	Race for TMR BG 160	SIC	1	pc.
301	5190216	Block ring for TMR BG 160	SIC	1	pc.
302	5190168	Wave spring washer with gap YSSR-350	Ø88 x Ø76 x 0.79 / 6	1	pc.
303	5190291	O-Ring LR 82 x 8 FKM 60	for slide ring sealing BG 160	1	pc.
304	5190166	O-ring 100 x 3 HNBR 60	for slide ring sealing BG 160	1	pc.
305	5190022	O-ring 54.0 x 2.5	NBR70	2	pc.
306	5190027	O-ring 89.5 x 3.0	NBR70	1	pc.
307	5230077	Copper filling ring 21.0x26.0x2.0	Sealing ring KAFC, free from asbestos	3	pc.
308	7160248	Liquid seal Sikaflex252 50 ml		1	pc.
309	7160247	Omnifit liquid sealing 2.5 ml	for PG screw connection	1	pc.
310	5250220	Fitted washer 55x68x1		1	pc.

14.1 Assembly drawing TMR 3i M1408 BG 160, Drawing no.: 103-802



14.2 Slide ring sealing for TMR 3i M1408 BG 160, Drawing no.: 103-802-4



15 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 the person responsible.

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

Maintenance / revision on device with the machine no.	Notes	Date	Signature of installer	Signature of person respon-sible

Maintenance / revision on device with the machine no.	Notes	Date	Signature of installer	Signature of person respon-sible

You can find us here

Stallkamp

...Lead by innovative technology

Dinklage lies in the heart of Oldenburg Minster Country.

From the exit (A1) Lohne Dinklage No. 65, direction Dinklage, towards Dinklage Vechta, then industrial area West.

- Pump technology
- Agitating technology
- Stainless steel tanks

Erich Stallkamp ESTA GmbH
In der Bahler Heide 4 – Industriegebiet West – 49413 Dinklage, Germany
Tel. +49 (0) 44 43 / 96 66-0 – Fax +49 (0) 44 43 / 96 66-60
info@stallkamp.de – http://www.stallkamp.de

Stallkamp – the competent solution for every application