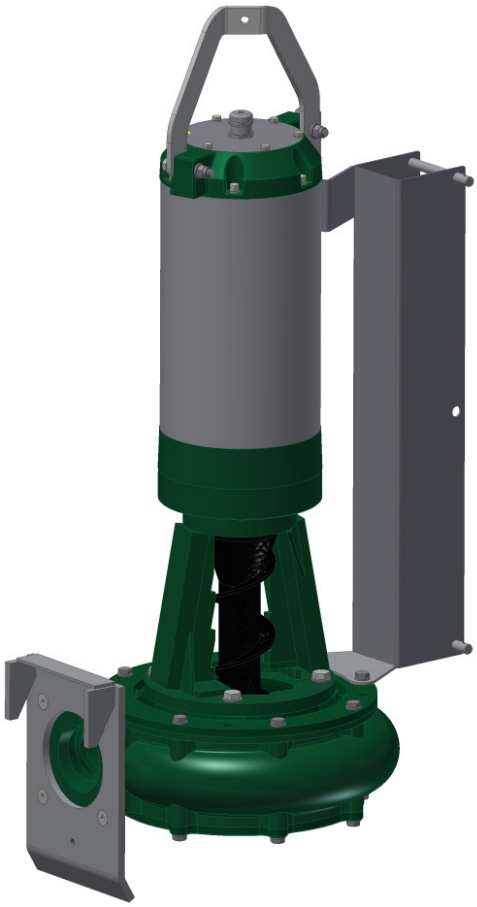
Stallkamp

OPERATING MANUAL

Submersible motor high-pressure pump

TMHP-M1304

BG 160 11.0/ 17.0/ 22.0 kW



Document no.: 8110182 Version: April 2013

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: 15/04/2014 07:53:00
Date printed 16/04/2014
BA TMHP-M1304 - englisch V1

© 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 DECLARATION OF CONFORMITY PURSUANT TO MACHINERY DIRECTIVE 2006/42/EC (ORIGINAL, GERMAN VERSION)

Manufacturer: Erich Stallkamp ESTA GmbH

In der Bahler Heide 4
49413 Dinklage, Germany

Tel.: (0049) 04443 / 9666-0
Fax.: (0049) 04443 / 9666-60

Authorised representative for the composition of the technical documentation:

Dipl.-Ing. (FH) Heiko Ansorge

In der Bahler Heide 4
49413 Dinklage, Germany

Product name: Submersible motor high-pressure pump TMHP-M1304

Type: TMHP-M1304, 11 kW; 17 kW or 22 kW

We hereby declare that the products listed above conform to the pertinent regulations of the EC Directive:

Machinery Directive 2006/42/EC

including all amendments and conform to the pertinent regulations of the Directive on electromagnetic compatibility:

EMC Directive 2004/108/EC.

The following harmonised standards have been applied:

EN ISO 12100-1:2003, Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology

EN ISO 12100-2:2003, Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles

EN 60204-1:2007-06, Safety of machinery - Electrical equipment of machines; Part 1: General requirements

EN 61000-6-1:2007, Electromagnetic compatibility (EMC) Part 6-1: Generic standards – Immunity for commercial environments

EN 61000-6-2:2005, Electromagnetic compatibility (EMC) Part 6-2: Generic standards – Immunity for industrial environments

Dinklage, dated 16. April 2014

Erich Stallkamp, Managing Director

This declaration is not an assurance of characteristics in the sense of the German law on product liability. The safety instructions provided in the product documentation must be observed. If any conversions or modifications are made to the product, this declaration shall lose its validity with immediate effect.

3 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 long service life 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.

3.1 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.

3.2 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.

4 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.

4.1 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.

4.2 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.

4.3 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.

4.4 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.

5 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.

5.1 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.

5.2 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.

6 PRODUCT DESCRIPTION TMHP-M1304

6.1 General description TMHP-M1304

This operating manual applies to the standard model of the Stallkamp submersible motor high-pressure pumps.

The pump may only be operated when completely submersed if used in explosive environments.

Submersible motor high-pressure TMHP-M1304 composed of:

- Stainless steel crankcase
- Oil filling in motor compartment with insulating oil
- Thermo-control with bimetallic switch per phase for overheating protection
- Cast iron pump chassis coated with 2-component plastic lacquer
- Oil filling in oil chamber with hydraulic oil
- Pump impeller torque of 1,450 rpm
- 6m electrical cable with special double-shell PU external sheath
- Stainless steel guide slide bearing including depth stop for guide rail 100 x 100 mm
- Maximum submersion depth 10 m
- Temperature of medium being pumped up to max. 50°C -> Pumping without restrictions as long as motor is not running in overload range.
- Temperature of medium being pumped from 51°C to max. 70°C -> Depending on the solid contents and the viscosity of the medium being pumped, in isolated cases the cooling of the pump may not be sufficient. The motor is then switched off by the thermal protection switch. In this case, a pump impeller with a smaller external diameter is required.

6.2 Proper use of TMHP-M1304

The pump is intended for the following applications:

- Pumping of liquid manure in final storage sites, pre-lagoons and liquid manure canals;
- Pumping of biomass in biogas plants;
- Pumping of sludge in treatment plants;
- Pumping of industrial waste water in industrial plants.

The pump has been designed with a wide variety of fields of application in mind in which a high flow rate is required proportional to the power consumption.

The flow rate (volume flow rate in m^3/h) is dependent on the density and viscosity of the liquid, the type and the dry matter content of the liquid manure (animal feed), the pumping height and distance and the diameter of the pipeline.

6.3 Technical data of TMHP-M1304

Submersible motor high-pressure TMHP-M1304 composed of:

- Pump type: TMHP-M1304
- Threephase motor: 400 V, 50 Hz, 3 Ph, 1,450 rpm
- Protection category: IP68
- Insulating category: F = 155°C
- Motor power output: 11.0; 17.0 and 22.0 kW
- Pump seal: 2 radial shaft seal rings
- Guide slide bearing: Stainless steel, 1.4301 for guide rail 100 x 100 mm
- Impeller: Plated, coated steel
- Shear-pin coupling: A shear-pin coupling is installed between the motor shaft and pump drive to protect the electrical motor!

6.4 Type plate of TMHP-M1304

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

Stallkamp sequential number

Figure 1

Type plate on TMHP-M1304

Serial no.

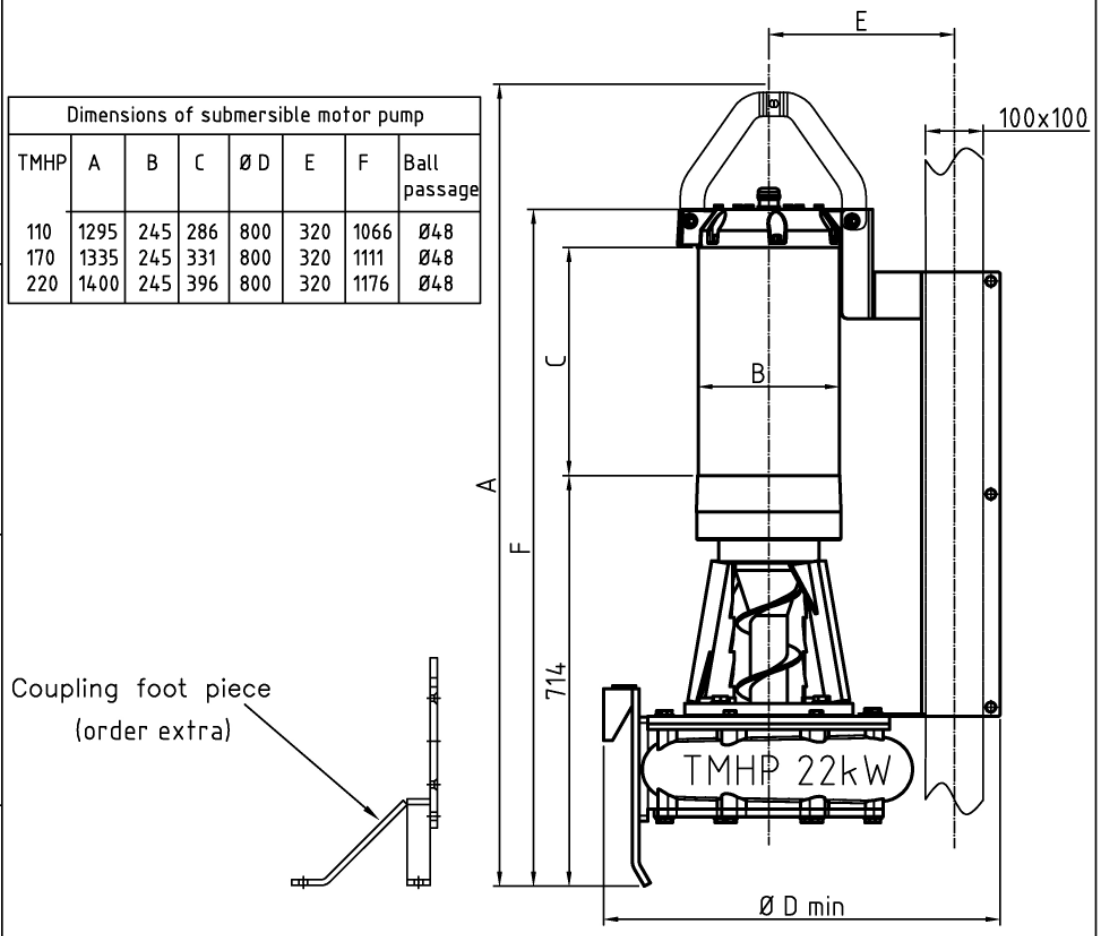
Protection category (here IP68)

Power consumption (here 11 kW)

Year of manufacture (here 0509, which stands for May 2009)

7 POWER DATA AND DIMENSIONS OF TMHP-M1304

Dimensions of submersible motor pump							
TMHP	A	B	C	Ø D	E	F	Ball passage
110	1295	245	286	800	320	1066	Ø48
170	1335	245	331	800	320	1111	Ø48
220	1400	245	396	800	320	1176	Ø48



Power data of submersible motor pump									
Type	Motor power output kW	Start	Nominal current in A	Req. fuse	Speed rpm	Max. pressure in bar	Flow in m3/h	Noise level dB (A)	Complete weight in Kg
TMHP 110	11.0	Y / △	22.1	32A time-delay	1450	2.0	200	48	Approx.255
TMHP 170	17.0	Y / △	33.0	50A time-delay	1450	3,2	300	48	Approx.265
TMHP 220	22.0	Y / △	43.0	63A time-delay	1450	3,8	350	48	Approx.275

All power data are based on clean water!
Operating mode 400V/ 50Hz, protection category IP68

All dimensions in mm
Subject to change without notice

-				Programmnummer –		Ma?stab 1:10	Ma?e ohne Toleranzangaben nach DIN ISO 2768 – mittel	
-				Bestellnummer –		Werkstoff –	Teile-Nr.	
-					Datum	Name	Benennung Power data and dimensions	
-				Bearb.	22.05.2013	Sandhaus	Submersible motor high-pressure pump TMHP	
-				Gepr.				
-				Norm				
-				Stallkamp			Gruppe –	Type –
-				Erich Stallkamp ESTA GmbH Postfach 1260 49408 Dinklage Tel. 04443/9666-0 Fax -60			Zeichnung-Nr. 28-0040-2	Blatt Bl
Zust.	?nderung	Datum	Name	EDV Nr. 28-0040-2 Englisch.dwg				

8 CONSTRUCTION TYPE OF TMHP-M1304

8.1 Cable connection

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

8.2 Motor

Threephase asynchronous motor as short circuit rotor at 50 Hz.

Permanent operation or intermittent operation with max. 6 evenly distributed activations per hour. 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%.

8.3 Monitoring device

Three series-connected temperature sensors are installed in the stator winding. These will start reacting at 150°C.

ATTENTION! The temperature sensing switches must always be connected.

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

8.4 Oil chamber

The device is equipped with an oil chamber between the motor and the pump impeller. This oil chamber contains an oil filling, which must be checked once annually.

8.5 Pump impeller

The devices are equipped with tungsten carbide-plated steel impellers. The size of the impeller depends on the construction size and the power consumption of the motors. In special cases when a pump is continuously running in the overload range, a smaller impeller is required.

9 TRANSPORT AND STORAGE REGULATIONS FOR TMHP-M1304

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

If the device is not used for a long period of time, it must be protected against moisture and heat. The impeller 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 device 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 **4 "Safety"** must be observed.

10 INSTALLATION OF TMHP-M1304

10.1 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.

10.2 Commissioning the TMHP-M1304

(1) The device can only be operated with a suitable bracket (see: lifting gear from the Stallkamp range). Lower the device completely into the liquid manure, making sure that the rope of the lifting gear is taut at all times and that the electrical cable does not come into contact with the impeller.

(2) Connect the pump's pressure connector up to the pressure main tightly so no pressure is lost.

(3) Commission the device with the delta-wye motor protection switch. Attention: turn through to "Delta"!

The impeller turns anticlockwise when viewed from the pump inlet (from above) (**see 11.2 Impeller direction test**).

(4) As standard, the device is protected by:
a) an overload protection in the switch box
b) an overheating protection.

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

ATTENTION: The motor of the device must always remain fully immersed in the liquid to ensure that sufficient cooling is guaranteed at all times.

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

10.3 Leakage display – special equipment –

In the cases of leaks, i.e., if liquid manure or other foreign liquid enters the device, the control lamp on the switch box lights up. The unit switches off after approx. half an hour. If this is the case, lift the device out of the liquid and ascertain the reason for the disturbance.

10.4 Securing the electrical cable

The electrical cable must be affixed to the rope with cable clips so that it is protected against damage from the impeller.

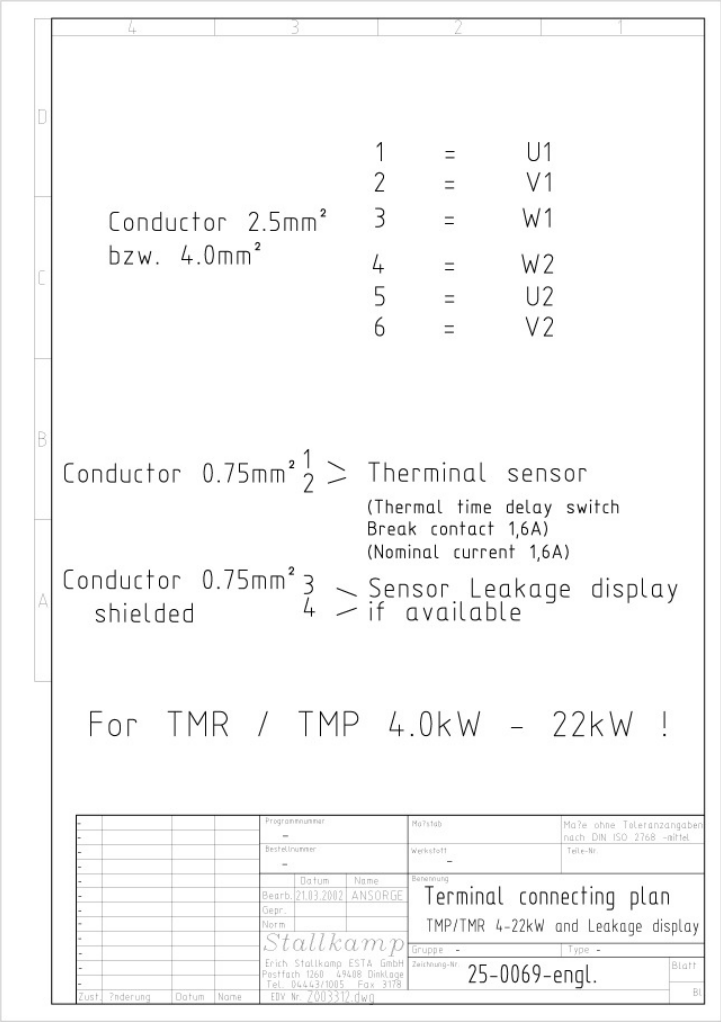
Important: When raising and lowering the device, always pay attention to the correct guidance of the electrical cable as it could otherwise be damaged by the impeller or the cable screw connections.

10.5 Cleaning the device

(1) Pressure washers must not be used to clean the device.

(2) The delta-wye motor protection switch must be fastened so that it is protected against moisture.

10.6 Connection plan TMHP-M1304 and with leakage display



11 ELECTRICAL CONNECTION OF TMHP-M1304

11.1 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 device is watertight according to IP68. The manual switch box is splash-proof according to IP40. The plastic chassis of the automatic delta-wye start-up is splash-proof according to IP65.

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

A motor protection device is a prerequisite.

The device 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 "**7. Power data and dimensions of TMHP-M1304**"

ATTENTION!

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

11.2 Direction test for TMHP-M1304

The impeller turns anticlockwise when viewed from the pump intake (from above).

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.

(in accordance with the VDE regulation or national regulations)

IMPORTANT!!

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

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

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

12 MAINTENANCE OF TMHP-M1304

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**").

12.1 Maintenance intervals

The device must be inspected for damage before every commissioning. In particular the impeller 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.

12.1.1 Recommendation: Every 3 months

12.1.1.1 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 impeller is required (see Point 8.5. Pump impeller or contact our sales representative).

12.1.2 Recommendation: Every 6 months in continuous operation

12.1.2.1 Check the shaft seal

The shaft seal is a wearing part and must be replaced at the latest every 4,500 operating hours when the device is in continuous operation. The shaft seal is available as a complete sub-assembly. Please contact our sales representative.

12.1.3 Recommendation: Every 6 months

12.1.3.1 Check the insulation resistance

Every 4,500 operating hours or at least once annually 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.

12.1.3.2 Check the functioning of the monitoring device

Every 4,500 operating hours or at least once annually we recommend checking the monitoring device 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.

12.1.4 Recommendation: Every 12 months

12.1.4.1 Check the oil filling in the oil chamber

The oil filling in the oil chamber must be checked once annually. If oil is missing or contaminated with water or other media, the device must be taken out of operation immediately. In this case, the oil must be changed immediately and the front shaft seals must be exchanged. (See Point "**12.3 Exchanging the shaft seal on the TM**")

12.1.4.2 Check the tightening torque of all screw connections

Every 9,000 operating hours or at least once annually 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)

12.1.4.3 Visual inspection and cleaning of the connection cable and lifting gear

Every 9,000 operating hours or at least once annually 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.

12.1.5 Recommendation at end of service life

At the end of its service life, the pump can be disposed of normally as scrap. The oils should be removed in advanced and disposed of properly. The pump is composed of various metals: steel, aluminium, copper and stainless steel. Dismantling it into the metal groups considerably increases returns.

12.2 Replacing the shaft coupling on the TMHP-M1304

If foreign bodies cause disruptions when operating the pump, there is a risk of the shaft coupling breaking. In this case, urgent replacement of the shaft coupling SW60 is required.

Disassembly: see 12.3: Disassembly, Point 2 to 6 and point 8 to 9

Installation: see 12.3: Installation, Point 3 to 4 and point 6 to 10

Then perform a functional test!

12.3 Exchanging the shaft seal on the TMHP-M1304

The following installation instructions refer to drawing numbers: 28-0035/1 and 28-0034/1

Before carrying out installation work on the pump, the power supply or voltage in the feed cable to the submersible motor high-pressure pump's switch box must be disconnected. Raise the pump out of the pit and clean it.

Disassembly:

1. Remove stainless steel plug ½" Pos. 26 and copper filling ring ½" Pos. 27 (release oil).
2. Remove lower lid Pos. 67 with 8 screws Pos. 68, remove sliding bearing Pos. 66 from the lid;
3. Untighten the nut in the impeller Pos. 64 (we recommend inserting a piece of wood between the impeller and the bearing lantern in order to block the impeller when untightening the nut), this pulls the sliding bearing Pos. 65 off the shaft end;
4. Pull the impeller Pos. 60 off downwards.
5. Check the true running of the pump shaft. If the true running deviates by >0.5 mm, the shear-pin coupling and if applicable also the pump shaft must be replaced.
6. Remove the distancers Pos. 59 for setting the gap.
7. Disassemble the intermediate ring Pos. 48 incl. bearing lantern and pump housing as an unit from the motor with the screws Pos. 49.
8. Unscrew the pump shaft Pos. 47 with the left-handed thread from the shear-pin coupling SW60 Pos. 29.
9. Disassemble the shaft coupling SW60 Pos. 29 with screw Pos. 30 and remove the fitting key Pos. 28.
10. Untighten and remove packing sleeve Pos. 20 incl. shaft seals using a hook spanner.
11. Remove the shaft protection tube Pos. 18.

Installation:

1. Glue packing sleeve Pos. 20 including shaft seal rings and shaft protection tube at thread using Curil and assemble.
2. Push the O-ring Pos. 19 on carefully, insert the fitting key Pos. 28.
3. Push on the shaft coupling SW60 Pos. 29 and assemble with the screw Pos. 30.
4. Install the pump shaft Pos. 47 with a little Curil on the left-handed thread and check the true running.
5. Install the intermediate ring Pos. 48 incl. bearing lantern and pump housing as an unit on the motor with the screws Pos. 49.
6. Push the distancers Pos. 59 on for setting the impeller gap.
7. Push on the impeller Pos. 60 and check the required clearance (1-2 mm), if applicable additionally install or remove the distancers Pos. 59.
8. Tighten the impeller up with the nut Pos. 64.
9. Install the cover below Pos. 67 with new sliding bearing Pos. 66 and screw Pos. 68.
10. add 0.4 litres of Wibohyd EHF 46 oil.
11. Install the stainless steel plug ½" Pos. 26 with new copper filling ring ½" Pos. 27
12. Carry out functional test.

12.4 Changing the pump impeller of TMHP-M1304

If power consumption is too high when operating the pump, a smaller impeller must be installed.

Disassembly: see 12.3: Disassembly, Point 2 to 6

Installation: see 12.3: Installation, Point 6 to 10

Then perform a functional test!

13 NOTES

13.1 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 entry with a cable 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.

14 SPARE PARTS LIST OF TMHP-M1304

for TMHP-M1304, 11.0-22.0 kW, BG160 **Drawing no.: 24-0132-0**

Item	Parts no.	Description1	Description2	Number
1	7160731	Motor cover for TMR 2	BG 160 model 2007	1
2	5250071	Spacer disc 71.0x79.0x0.6	KAS 80	1
3	5180010	Thrust ball bearing	6208 DDUCM (quality bearing)	1
4	7160742	Blind plug M20x1.5	for motor cover mod. 07	2
5	6160361	Cable screw connection M20x1.5	for motor cover TMR 2 mod. 07	8
6	5200085	Hex. nut M6	DIN 934 A2	8
7	5200044	Spring ring M6 mm	DIN 127 A2	8
8	5220063	Screw plug R1/4"	DIN 906 A4	1
9	6160037	Stainless steel motor with stator BG160	11 KW TMP/TMR	1
9-1	6160038	Stainless steel motor with stator BG160	17KW TMP/TMR	1
9-2	6160039	Stainless steel motor with stator BG160	22KW TMP/TMR	1
10	5240023	Threaded pick-up M8x310/30/30	11KW TMP/TMR	6
10-1	5240022	Threaded pick-up M8x357/30/30	17KW TMP/TMR	6
10-2	5240021	Threaded pick-up M8x421/30/30	22KW TMP/TMR	6
11	5320036	Screw locking device M8	PA 6 natural	6
12	5200096	Hex. cap nut M8	DIN 917 A2	6
13	6110317	Motor shaft with rotor 11 kW	BG160 TMHP without turbulators	1
13-1	6110316	Motor shaft with rotor 17 kW	BG160 TMHP without turbulators	1
13-2	6110315	Motor shaft with rotor 22 kW	BG160 TMHP without turbulators	1
14	7110451	Motor flange TMHP 11-22 kW	BG160	1
15	5190069	Shaft seal ring FPM DIN 3760	55x80x13	1
16	5180057	Internal ring	IR 45 x 55 x 22	1
17	5180040	Angular ball bearing	7208 BWG/BETNU	2
18	7120007	Shaft protection tube	Bushing for sealing rings	1
19	5190017	O-ring 38.0 x 2.0	DIN 3771 NBR70	1
20	7120004	Packing sleeve	for sealing rings	1
21	5190013	Radial shaft seal ring	45x60x8 B2U3SL2 72NBR902	1
22	5190014	Radial shaft seal ring	45x60x10 HB-PTFE-VA	1
23	7120008	Spacer sleeve	between seal rings	1
24	5190181	O-ring 180.0 x 3.0	NBR70	1
25	5220064	Screw plug R1/2"	DIN 906 bronze	1
26	5200261	Screw plug G1/2"	DIN 908 A2	1
27	5230077	Copper filling ring 21.0x26.0x2.0	Sealing ring KAFC, free from asbestos	1
28	5250061	Fitting key 12.0x8.0x55.0	DIN 6885 A	1
29	7110448	Shaft coupling SW60	TMHP BG160 M1304	1
30	5200062	Cyl. screw M12x30	DIN 912 A2	1
31	5200101	Washer 13.0	DIN 125 A2	1
32	5350002	Vitam DE 46	Hydraulic oil	1
33	5350015	Shell Diala S2 ZU-I insulating oil		1

40	5190138	O-ring 159.0 x 3.0	NBR72	1
41	6110335	Cable 6 m with clamping lid	TMHP BG 160 11 kW	1
41-1	6110336	Cable 6 m with clamping lid	TMHP BG 160 17-22 kW	1
42	5200000	Hex. screw M8x16	DIN 933 A2	6
43	5200045	Spring ring M8 mm	DIN 127 A2	6
44	5200085	Hex. nut M6	DIN 934 A2	10
45	5200044	Spring ring M6 mm	DIN 127 A2	11
46	5200070	Cyl. screw with slot M6x12	DIN 84 A2	1
47	7110449	Pump shaft 11-22 kW	TMHP BG160	1
48	7110450	Intermediate flange 11-22 kW	TMHP BG160	1
49	5200172	Cyl. screw M12x55	DIN 912 A2	12
50	6120034	Intermediate bearing lantern for RMP	Mod. 97, drawing. 1-24-0001	1
51	5200040	Hex. screw M16x35	DIN 933 A2	4
52	5200048	Spring ring M16 mm	DIN 127 A2	4
53	7120118	Laser cutting for	intermediate flange RMP mod. 99	1
54	7120005	Split ring for RMP	version mod. 99	1
55	5200032	Hex. screw M12x40	DIN 933 A2	8
56	5200047	Spring ring M12 mm	DIN 127 A2	8
57	7180197	Spiral housing 15 to 30 kW	TMP/TKP/RMP GG 20	1
58	5190018	O-ring 47.0 x 3.0	NBR70 DIN 3771	1
59	7110452	Spacer disk TMHP	D=64, d= 51.5, t=2	3
60	7120090	Impeller for tearing mix pump	11.0 kW turned off to Ø235 mm	1
60-1	7120121	Impeller for tearing mix pump	17.0 kW turned off to Ø285 mm	1
60-2	7120135	Impeller for tearing mix pump	22.0 kW turned off to Ø295 mm	1
61	5250060	Fitting key 10.0x8.0x45.0	DIN 6885 A	1
62	5200103	Washer 25	DIN 125 A2	1
63	5200049	Spring ring B 24 mm	DIN 127 A2	1
64	5200097	Hex. nut M24x1.5	DIN 439 A2	1
65	7120105	Bearing bush	Spiral housing bearing	1
66	5190015	Maintenance-free precision bushing	Form: cylindrical	1
67	7120054	Cover below 15 to 30 kW	RMP GG 20	1
68	5200030	Hex. screw M12x30	DIN 933 A2	8
69	5200047	Spring ring M12 mm	DIN 127 A2	8
70	7110456	Mounting bracket	TMHP BG 160 M1304	1
70-1	6110342	Mounting bracket with sliding clip	TMHP-V BG 160 M1304	1
71	5260095	Stainless steel shackle 12.0 mm	Straight	2
72	5200037	Hex. screw M12x80	DIN 933 A2	2
73	5200091	Hex. nut M12	DIN 985 A2	2
74	6180005	Pump absorb flange, stainless steel	complete TMP/TKP	1
74-1	6180192	Pump absorb flange, stainless steel	with sliding clip	1
75	6110338	Sliding block TMHP 11-22 kW	BG 160 M1304	1
76	5130129	Stainless steel round strand rope 6.0 mm	7x19, SZ, dry, L= 7 m,	1
77	5260006	Wire cable clamp 6.0 mm	Stainless steel	1

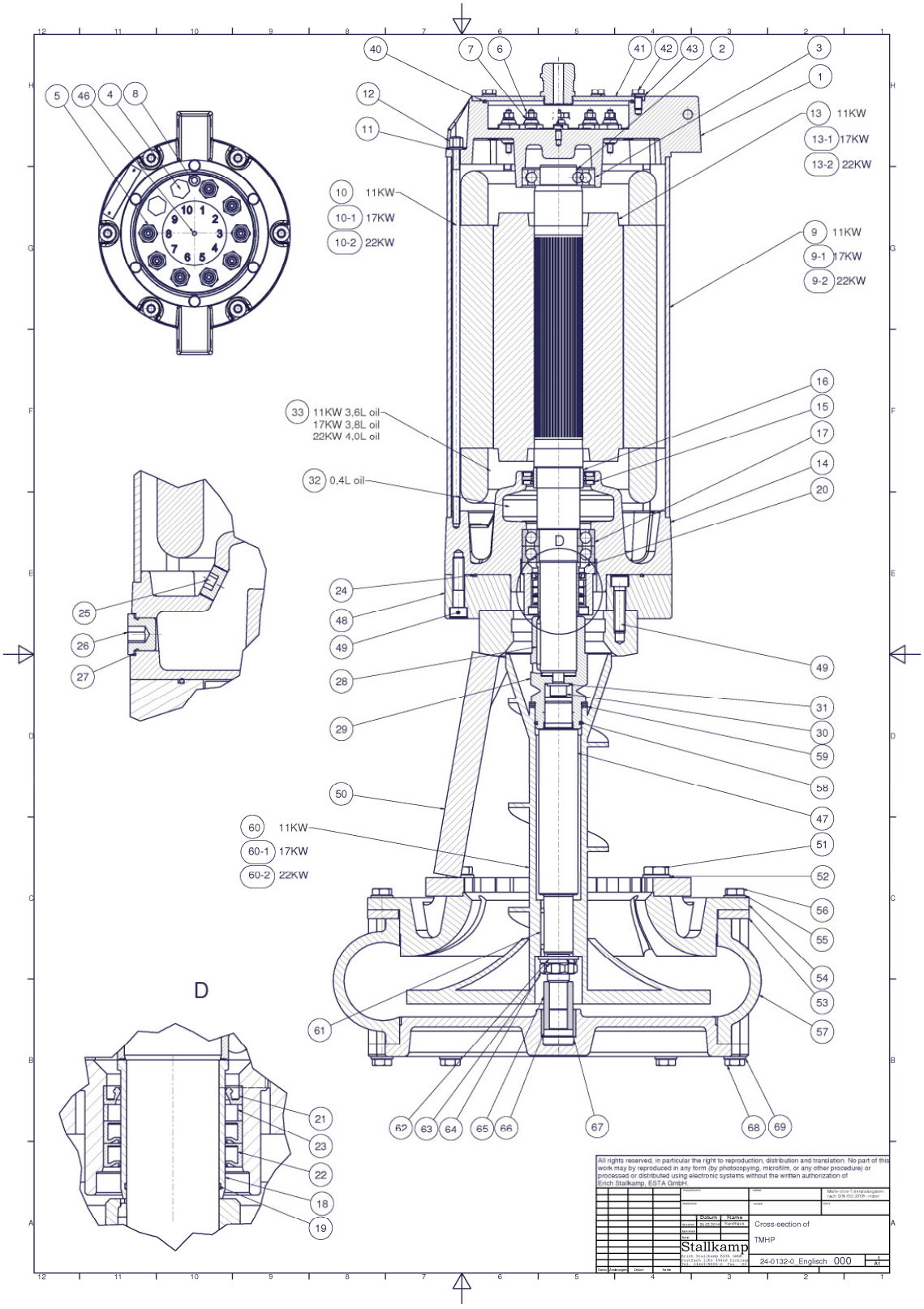
14.1 Spare parts list of assemblies TMHP-M1304

for TMHP-M1304, 11.0-22.0 kW, BG 160 **Drawing no.: 24-0132-0**

Item	Parts no.	Description1	Description2	Number
	6110339	Repair seal set	composed of Pos. 18-23	
18	7120007	Shaft protection tube		1
19	5190017	O-ring 38.0 x 2.0		1
20	7120004	Sleeve		1
21	5190013	Radial shaft seal ring	45x60x8 B2U3SL2 72NBR	1
22	5190014	Radial shaft seal ring	45x60x10 HB-PTFE-VA	1
23	7120008	Spacer sleeve between	seals	1
	6180108	Cable clamp with shackle for	Ø19 mm cable	
	6180100	Cable clamp with shackle for	Ø21 mm cable	
	6160006	Delta-wye motor protection switch	11kW	
	6160008	Delta-wye motor protection switch	17kW	
	6160009	Delta-wye motor protection switch	22kW	

15 ASSEMBLY DRAWING FOR TMHP-M1304, 11.0-22.0 KW, BG 160

for TMHP-M1304, 11.0-22.0 kW, BG 160 **Drawing no.: 24-0132-0**



16 MAINTENANCE AND REVISION LIST OF TMHP-M1304

Each person must clearly correctly 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

...Advantage 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