Stallkamp

OPERATING MANUAL

High-pressure centrifugal pump HKP-M1305

4.0kW, BG100

Figure 1, HKP-M1305

Document no.: 8290017 Version: May 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.**

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

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Product name: High-pressure centrifugal pump HKP-M1305

Type: HKP-M1305 4.0kW BG100

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 compliant with 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

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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 lifespan 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 instructions 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 pumped liquid, delivery flow rate, rotational 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 notices 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-"genuine 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 specialist 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 personnel 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 system.
- 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 notice and warning signs. Dangerous gases can escape when stirring the manure.

DANGER OF POISONING!

If the 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 specialist 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 HKP-M1305

6.1 General description HKP-M1305, 4.0kW

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

The pump must not be operated in explosive environments.

High-pressure centrifugal pump HKP-M1305 4.0kW comprising (see Figure 1):

- Motor housing made of high-quality aluminium alloy
- Ni-Resist pump housing coated with 2-component plastic lacquer
- Suction side connection consisting of 2 ½" PVC standard flange
- Pressure side connection consisting of 2" PVC standard flange
- Ni-Resist pump impeller
- Pump impeller torque of 2910 rpm
- Temperature of medium being pumped up to max. 70°C -> Pumping without restrictions as long as motor is not running in overload range.

6.2 Intended use for HKP-M1305

The pump is intended for the following applications:

- Pumping of liquid feed for animal feeding
- Pumping of feed liquids, incl. whey, brewer's yeast, skimmed milk, porridge, water, etc.
- Mixing and washing round liquid feed
- Filling of storage tanks with liquid feed
- Pumping of thin manure and manure without fibrous material

The pump has been designed for liquid feed systems and pipe systems, which require a high flow rate to power consumption ratio.

The flow rate (volume flow rate in m^3/h) is dependent on the density and viscosity of the liquid, the type and DM content of the wet mash (animal feed) or manure, the support height and distance and the diameter of the pipeline and the number of pipe bends, T-pieces and valves.

6.3 Technical data HKP-M1305, 4.0kW

Liquid feed pump HKP-M1305 comprising:

- Pump type: HKP-M1305 4.0kW
- Three phase motor: 400V, 50Hz, 3Ph, 2910 rpm
- Protection category: IP55
- Insulating category: F = 155°C
- Motor power output: 4.0kW
- Pump seal: 1 radial shaft seal ring, adjustable shaft protection tube
- Pump housing: Ni-Resist stainless steel
- Impeller: Ni-Resist stainless steel

6.4 Type plate HKP-M1305, 4.0kW

The type plate displays the most important power and specification data (see Figure 2).

Figure 2, type plate

Attention, the high-pressure centrifugal pump is designed for operation on 50Hz mains. If used on 60Hz mains, you need a different pump impeller – see spare parts list or contact our sales representative.

7 PERFORMANCE DATA AND CHARACTERISTIC HKP-M1305, 4.0KW

Frequency	[Hz]	50
Voltage	[V]	230 Δ 400 Y
Power	[A]	13.5 Δ 7.1 Y
cos φ		0.86
Motor rotational speed	[1/min]	2910
Motor power	[kW]	4
Max. flow pressure	[bar]	2.6
Max. flow rate with water	[m³/h]	42

There could be deviations from the actual type plate. If you have any questions, please specify the exact motor type and motor manufacturer!

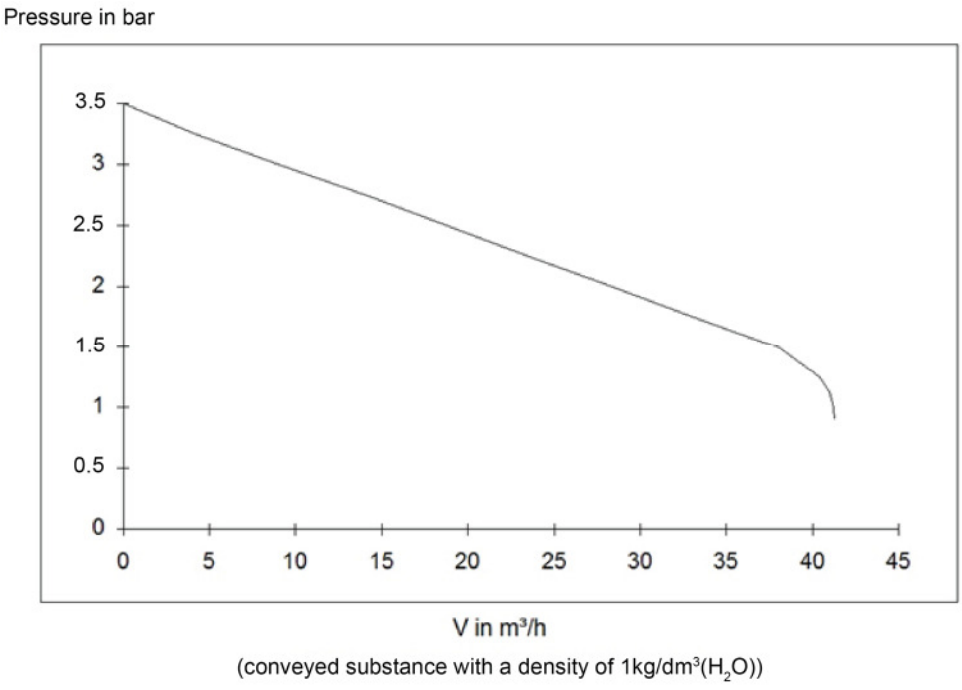


Figure 3, characteristic

8 CONSTRUCTION TYPE HKP-M1305

8.1 Cable connection

The cable connection compartment is sealed off from the environment according to IP55.

8.2 Motor

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

Continuous 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 Pump impeller

The pumps are equipped with Ni-Resist impellers. The size of the impeller depends on the construction size and the power consumption of the motors. The pump flow rate decreases as the counterpressure increases. This can be seen in the characteristic in Figure 3. The characteristic applies only to low-viscosity media with a viscosity of about 1 cSt (centistoke), e.g. water, whey, skimmed milk. In high-viscosity media, the characteristic changes according to the respective viscosity. The pump flow rate, and therefore also the power consumption (current consumption), increases as the counterpressure decreases. When pumping low-viscosity media (water, whey, etc.), it is therefore necessary to **throttle the flow rate** to prevent the power consumption from rising above 7.1A.
If the pipeline is very short and the support height is low, it may be necessary to throttle the flow rate even with thick media. The pump is **throttledvia a ball valve**, which must be installed in the pressure line and closed to the required degree.
If the pump is used as a feed pump, the pipeline should not exceed a total length of 200m. This takes 15 pipe bends into account. For each further bend, the pipeline length must be reduced by 3m. Any geodetic height differences in the delivery pipeline must be taken into account accordingly.

9 TRANSPORT AND STORAGE REGULATIONS FOR HKP-M1305

The pump must be transported in a standing position. Secure the machine against rolling over.

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 INSTALLING THE HKP-M1305

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 HKP-M1305

(1) Ensure even support, good foothold and flange attachment, and precise alignment in case of direct coupling. Avoid construction-related resonances with the rotation frequency or the double mains frequency.

(2) Attention, never allow the pump to run dry to avoid damages to the pump seal. This especially applies during the test run.

(3) The centrifugal pump is not self-priming. It therefore requires a free supply on the suction side. In case of gas-forming liquids, it may be necessary to deaerate the pump before starting

(4) The pump seal is a wearing part. It must be replaced as soon as the seal starts to leak.

(5) Make sure that the pump is not connected to the power supply before connecting it to your pipe system.

Establish the power connection. The pump turns anticlockwise from the perspective of the fan blade **(see 11.2 Direction test)**.

(6) Commission the device with the motor protection switch and examine the pipe system for possible leakages.

(7) As standard, the device is equipped with an overload protection in the switch box.
The device is switched off by the motor protection switch in case of overload. If the device was switched off as a result of overload, 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 free of dirt to ensure sufficient cooling at all times.

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

10.3 Cleaning the HKP-M1305

(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.

10.4 Faults in the HKP-M1305

1. The drive motor does not start, the protection switch turns off immediately:
   Check: Is the motor properly connected?
   Is the impeller blocked by foreign bodies?

2. The pump starts and the protection switch turns off after a short time:
   Check: Is the protection switch set correctly?
   Are all fuses ok?
   Is the power consumption too high due to an excessive flow rate?
   In this case, throttle the flow rate from the ball valve in the pressure line.

3. Pump starts but does not build up pressure.
   Check: Has the pump housing been deaerated?
   Is the suction line between pump and tank free?

4. The pump starts, builds up a pressure of at least 3 bar but no liquid is pumped.
   Check: Is the pressure line valve properly set?
   Pressure line blocked?

5. Centrifugal pump is leaking:
   Replace parts immediately to prevent consequential damages.
   Replacing parts: **Description in the repair set**
   (also see "Replacing the seal")

6. Major pump repairs or pump replacement should be ideally carried out by a specialist. To do this, contact our sales representative.

11 ELECTRICAL CONNECTION ON THE HKP-M1305

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 splash-proof up to IP55.

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

A motor protection device is a prerequisite. The motor fan cover must always be mounted and undamaged. The motor must be kept clean and never covered, to ensure sufficient air circulation.

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**.Performance data** and characteristic HKP"

ATTENTION!

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

11.2 Direction test of the HKP-M1305

The pump direction of rotation is marked with a red arrow on the motor fan cover. When looking towards the impeller, it should be turning anticlockwise.

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

12 MAINTAINING THE HKP-M1305

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 pump 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 amperemeter

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, it is necessary to throttle the pressure line (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 devices (motor protection switch setting) in the scope of maintenance work. If you identify any defects, please contact our sales representative.

12.1.4 Recommendation: every 12 months

12.1.4.1 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 = 18Nm, M10 = 33Nm, M12 = 57Nm, M16 = 135Nm, M20 = 150Nm)

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

Every 9,000 operating hours or at least once annually, we recommend checking the pump, motor and connection cable for damage and soiling in the scope of maintenance work. Deposits, blockages and ad-

hering 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 the lifespan

At the end of its lifespan, the pump can be disposed of normally as scrap. 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 seal on the HKP-M1305

The following installation instructions refer to drawing numbers: 2-02-7014

Before carrying out installation work on the pump, the power supply or voltage in the feed cable to the submersible motor pump's switch box must be disconnected.

Remove the pump from the pipe system and clean it.

Disassembly:

1. Perform a functional check – if the clearance between impeller (Item 2) and pump cover (Item 3) is too large (gap> 5mm), both parts must be replaced by new ones or the pump must be returned to the manufacturer for repair. Please contact our sales representative.
2. Remove screws (Item 19) and pull off pump cover (Item 3), remove O-ring (Item 9).
3. Remove screw (Item 18) and pull off impeller (Item 2).
4. Take out feather key (Item 15).
5. Undo screws (Item 21) and remove housing (Item 1).
6. Disassemble shaft seal rings (Item 16) from housing.
7. Remove a distance ring (Item 6) so that the new shaft seal ring does not run on the old lead-in groove of shaft protection tube.
8. Clean shaft protection tube.

Installation:

1. Fit new radial shaft seal ring (Item 16) after applying a small amount of grease on the sealing lip and shaft protection tube – sealing lip should point towards pump side.
2. Mount housing (Item 1).
3. Insert feather key (Item 15).
4. Seal shaft and feather key with silicone and fit impeller (Item 2).
5. Insert screw (Item 18) with some "Omnifit" thread sealer and screw tight.
6. Clean sealing surfaces of pump housing (Item 1) and pump cover (Item 3).
7. Insert a new O-ring seal carefully (Item 9).
8. Seal sealing surfaces with silicone and tighten screws on pump cover (Item 3).
9. Check gap size and carry out functional check!

13 NOTICES

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 fences or coverings to prevent persons falling in. If these are not deeper than 100cm, other safety precautions 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 accident victims.

§ 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 gases.

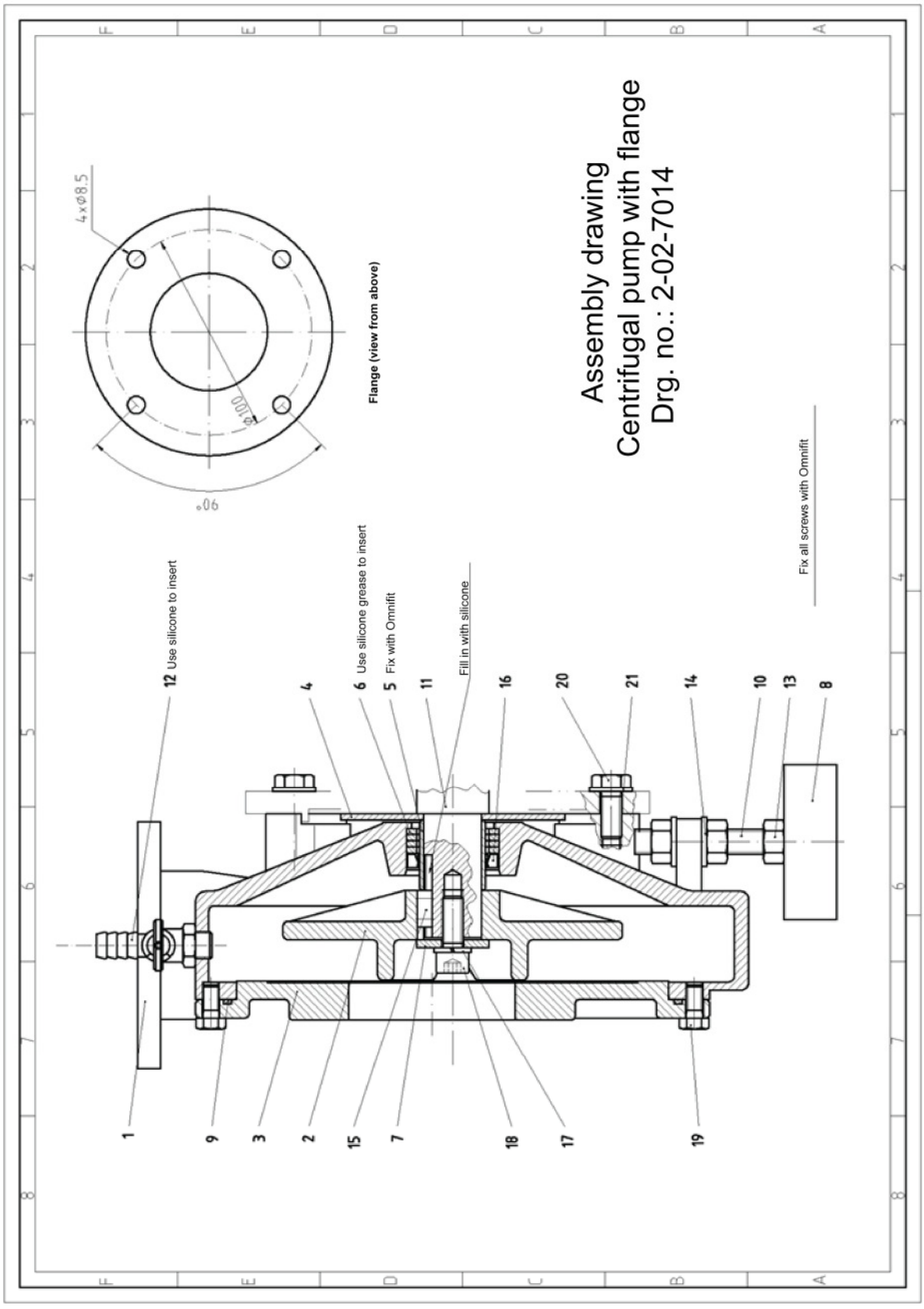
(2) Refer to the "Information Sheet with Notice, Warning, Prohibition and Rescue Signs" of the Federal Association of Agricultural Professional Associations.

14 SPARE PARTS LIST OF THE HKP-M1305 4.0KW

See drawing 2-02-7014

Item no.:	Part number:	Description 1:	Description 2:	Number:
1	7290002	Ni-Resist pump housing	4kW KP with thread	1
2	7290000	Ni-Resist impeller	4kW centrifugal pump 50Hz	1
2.1	7290034	Ni-Resist impeller	4kW centrifugal pump 60Hz	1
3	7290006	Ni-Resist cover	4kW KP with thread	1
4	7290004	Centrifugal disc	4kW KP	1
5	7290001	Sleeve DIA 28x32-34	4kW KP	1
6	7290005	Distance ring PVC 45x35x3	4kW KP	4
7	7290008	V2A stainless steel washer 10x35-4	4kW:	1
8	7290015	Rubber foot	4kW centrifugal pump	4
9	5190038	O-ring 217.0 x 3.0	NBR70	1
10	5240051	Threaded pick-up M12x100	D 9-1 galv./4.6	4
11	5300017	Three phase motor 4kW	230/400V, 50 Hz, 2-pole	1
12	5130010	Mini ball valve 1/4"	Complete external thread	1
13	5230004	Hexagon head Nut M12	DIN 934 steel, galv.	12
14	5230015	Washer 13.0	DIN 125 steel, galv.	8
15	5250143	Feather key 8.0x7.0x16.0	DIN 6885 AB	1
16	5190000	Radial shaft seal ring	32x45x7 BC	1
17	5200157	Lock washer Type S	10 mm V2A stainless steel	1
18	5200060	Fillister head screw M10x30	DIN 912 A2	1
19	5200017	Hexagon head Screw M8x20	DIN 933 A2	8
20	5210041	Hexagon head screw M10x30	DIN 933 steel, galv.	4
21	5230014	Washer 10.5	DIN 125 steel, galv.	4
3.1	5500763	PVC double thread nipple 21/2"	with octagon, external thread	1
3.2	5500765	PVC flange 21/2"	Internal thread	1
1.1	5500762	PVC double thread nipple 2"	with octagon, external thread	1
1.2	5500764	PVC flange 2"	Internal thread	1
	5340022	Sticker: "Red arrow"		1

15 Assembly drawing 2-02-7014 of the HKP-M1305 4.0kW



16 MAINTENANCE AND REVISION LIST OF THE HPK-M1305

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

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