

Oil Skimmer model 1

Maintenance Manual

09-2020

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1. Important safety information and safety instructions

1.1 Range of application



Do not use the oil skimmer model 1 for other purpose than designed. The oil skimmer model 1 is designed to pick up floating oil and fat from liquid surface. The oil skimmer is not designed for other applications.

The manufacturer is not responsible for any damage because of using the oil skimmer for other purpose than designed. The manufacturer is not responsible for any damage because of mechanical, electrical or other changes made by others than the manufacturer.



Please follow the start-up, operating and maintenance instruction of this manual. Please pay attention to the local safety regulations and to the general and special safety regulations in your factory.

Please pay attention to the signs mounted at the oil skimmer model 1

1.2 Safety information and safety instructions

1.2.1 Fundamental safety information



Please pay attention to the local safety precautions and to any other general safety precautions and health regulations. Please pay attention to the safety precautions for electric components. If you do not watch these regulations the manufacturer will not be responsible for any damage. This manual is part of the

oil skimmer model 1 In case you resell the oil skimmer you have to deliver the oil skimmer with this manual. For safe operation of this oil skimmer the oil skimmer has to be operated and serviced or fixed by trained personnel only. Trained personnel are persons, which have knowledge about necessary technical standards, technical regulations and safety information and which are able to handle technical products and recognize possible dangerous situations and are able to avoid these dangerous situations.



The owner of this oil skimmer has to take care, that the persons who are responsible for operating, maintenance and service and repairing of this oil skimmer have read and understood this manual and pay attention to all points of this manual. This is necessary to avoid dangerous situations

- for the user and other persons



-for safe operation of the oil skimmer model 1

and

-to avoid damage at the environment caused by wrong operation.

Before start working please lay down all competences. Everybody has to follow these competences.

Removal, shut-down or switching-off of covers, protection-switches or other safety equipment may cause **severe** injuries or death or material damage. For this reason the manufacturer prohibits to remove or shut off safety devices. The manufacturer prohibits working at the oil skimmer model 1 while the oil skimmer is connected with electric power. After maintenance or other work all safety devices have to be installed correctly.



The manufacturer warrants for the oil skimmer model 1 according to the general sales terms. The manufacturer warrants not for the oil skimmer model 1 in case of damage caused by wrong operation, repairing or maintenance done by not trained personnel, using additional equipment or spare parts which are not specified for the oil skimmer model 1 by manufacturer, changes or conversions without confirmation by manufacturer in writing.



Any failure has to be reported to the responsible person as soon as possible. In case of malfunction the oil skimmer model 1 has to be marked as *defect*. Before restart all defects have to be fixed, otherwise there is no warranty by the manufacturer.

1.2.2 General safety instructions



These safety devices may not be complete. Please contact manufacturer in case of questions or problems. The oil skimmer model 1 is manufactured according to the latest technology and is safe in operation. You may use the oil skimmer model 1 only under the conditions and circumstances which are confirmed by manufacturer. Any change or rebuilding of the oil skimmer is not allowed. Please contact manufacturer before changing the design of the oil skimmer.

1.2.3 Special safety instructions



The oil skimmer model 1 must not be used without the safety hood and the oil collecting pan. In case you do not want to use the original hood or the original oil collecting pan you have to install a safety device with the same effect. During operation of the oil skimmer model 1 do not remove the safety hood in order to avoid accidents. During repairing, servicing, maintenance or cleaning you have to switch-off the oil skimmer before working at the oil skimmer. Make sure that it is not possible to switch-on the oil skimmer during working at the oil skimmer. If using the oil skimmer with an additional oil collecting tank you have to install a safety switch at the oil collecting tank in order to avoid environment damage caused by overfilling the tank with oil.



Do not touch the oil collector tube during operation of the oil skimmer.



Make sure that it is not possible to touch the oil collector tube during operation. This can be done by additional safety guards or rails.



Do not connect the geared motor direct with power. Between power source and geared motor, a motor protection switch is necessary. Please make sure that the motor protection switch is set to correct current. The correct current is shown on the motor data plate. When connecting the geared motor direct with power without motor protection switch and the motor is blocked mechanically the motor may be overheated and destroyed.

2. General description

The Oil Skimmer model 1 is designed to remove floating oil and fat from water, emulsions, washing water or waste water. The floating oil and fat sticks to the outside of the free floating flexible oil collector tube. The oily oil collector tube is drawn into the oil skimmer. Ceramic scrapers remove the oil from the surface of the oil collector tube. The clean oil collector tube returns to the water surface and picks up new oil or fat. The oil, that is removed from the oil collector tube floats into the oil collector pan of the oil skimmer and from there into a collecting tank, which has to be furnished by the customer. The oil skimmer model 1 is designed for tanks with a bigger surface. The minimum surface of the tank has to be 1300 mm x 1300 mm. The skimmer may be mounted up to 20 m above water level. The oil skimmer has to be mounted above the maximum liquid level.

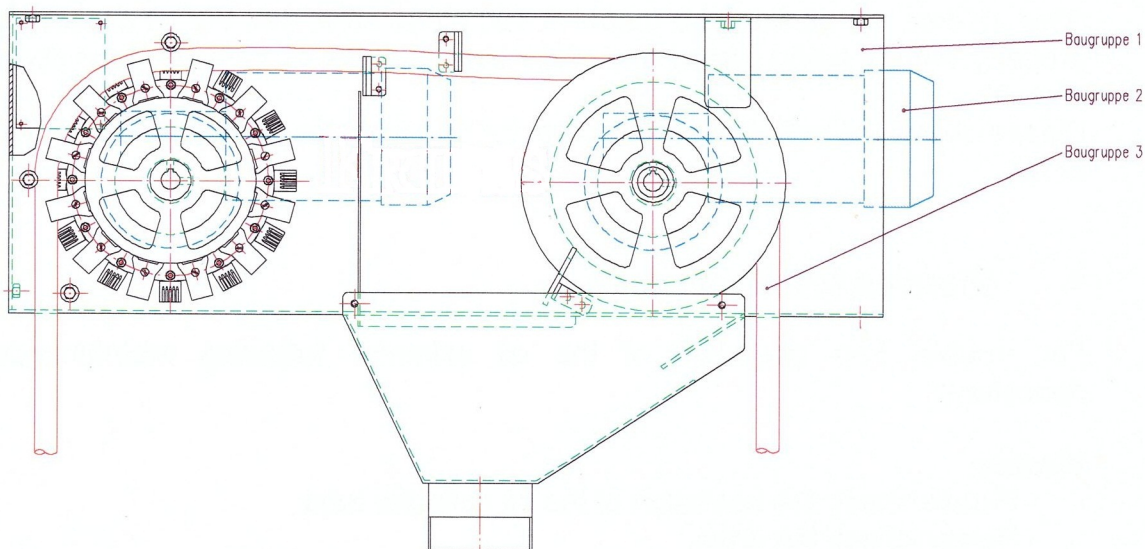
2.1 Description of parts

The oil skimmer model 1 is made of three structural components:

Structural component 1: oil skimmer model 1 with oil collecting pan
or without oil collecting pan

Structural component 2: two gear motor SN8F
The gear motors are special designed for each application and may vary from one oil skimmer to the next. Only the data plate on the gear motor shows the correct technical data.

Structural component 3: oil collector tube
The different oil collector tubes are available:



2.2 Description of process

The oil skimmer model 1 has to be mounted above the maximum liquid level. The oil collector tube must not touch walls or other components when running into the oil skimmer. If the oil collector tube touches other parts it will lose oil and the efficiency will be lower. The oil collector tube, that leaves the oil skimmer, can be guided in order to pass through a small opening in the cover of the tank. Depending on the amount of sludge in the oil the oil skimmer has to be cleaned from time to time. Depending on dirt or sludge in the oil and depending on the viscosity of the oil or fat, the drain must be big enough and steep enough to avoid blocking. The drain must have a diameter of at least 3" and incline of at least 15°. If the oil contains a lot of sludge or when using the oil skimmer with vegetable oil or fat we suggest using an open chute which has to be cleaned from time to time.

3. Start up

3.1 Preparation

Before commissioning check whether the oil collector tube is floating on the bath surface in a semi circular or oval shape. Floating length of the oil collector tube can be up to 3 – 4 m. If you want to service a very big surface of a bigger basin the length of the oil collector tube, floating on the water, maybe longer. In this case you have to mount a guide for the oil collector tube.

Please check after the start of the gear motors the turning sense of the drives. Both drives have to run in the same direction. When looking on the drive wheel the oil collector tube has to run not clockwise. Both gears of the gear motors are filled with lubricant. The lubricant has not to be changed. Please mount the breather screws at the highest possible positions.

In case of longer storing of the oil collector tube we suggest to hang the collector tube for at least two days in not twisted form.

3.2 Start up and operating

After starting the oil skimmer model 1 make sure, that the oil collector runs properly without being turned and make sure, that the oil collector tube does not lose oil.

Please check the outlet of the oil collector pan in order to avoid blocking by dirt or fat.

4. Cleaning and Maintenance

For trouble free operation of the oil skimmer following maintenance is necessary:

Weekly

- Please check the operation of the oil collector tube
- Please check the drain.

Every six months

- Remove the safety hood and clean the oil skimmer.
- Check the scrapers, the oil collector and the ceramic fingers whether they are worn out or cracked.



ATTENTION: Before servicing the oil skimmer watch the safety instructions in this manual !!!

Changing the oil collector tube



ATTENTION: Do not cut the oil collector tube!!!
It is possible to change the oil collector tube as one piece.

Switch off the oil skimmer and protect against restart. Remove the safety hood. Remove the tube guide and both ceramic cylinders according to attached drawing. Change the oil collector tube. Mount both ceramic cylinders and the tube guide. The ceramic cylinder (A) has to be mounted as far away as possible from the drive wheel; the ceramic cylinder (B) has to be mounted as near as possible towards the drive wheel. See attached drawing. Mount the safety hood. Start the unit and check the operation of the oil collector tube.



CAUTION:

The service life of the oil collector tube depends very strongly on the application. In general the following can be applied: The higher the temperature (more than 40 °C), the higher the load on the oil collector tube and the shorter the service life. For certain applications it should be tested whether the oil collector tube and the medium are compatible. The minimum service life of the oil collector tube is approx. 3 months. For applications involving an oil/water mixture at room temperature, a service life of one or two years can be expected. We recommend unrolling the oil collector tube before commissioning and storing it in the unrolled state, hung up for 2 days.

5. Malfunction

The oil skimmer removes no oil

- Check whether there is oil on the water surface
- Check whether the floating oil sticks to the oil collector tube and whether the tube brings the oil to the oil skimmer
- If the oil is not removed from the oil collector tube check and replace the scrapers and the oil collector tube
- Check whether the drain is blocked and clean if necessary

The amount of water in the skimmed oil is too high

-Check whether there is enough oil on the water surface (>0.2 mm). Reduce the operating time of the skimmer by a timer.

-Use the decanter. With the decanter you can eliminate water that is collected by the oil skimmer

After starting the drive wheel or the pulley wheel does not turn

-Switch of the oil skimmer and check by turning of the fan at the motor, whether the motor shaft is blocked or not

-Start the oil skimmer and check whether the motor shaft turns, if the motor turns and the drive wheel or the pulley wheel not, the gear is damaged and has to be replaced

Drive wheel and pulley wheel turn, but the oil collector tube does not move

-Check whether the motors turn the right way

-Check the oil collector tube whether it's worn out

-Check the ceramic fingers of the drive wheel, whether they are worn out

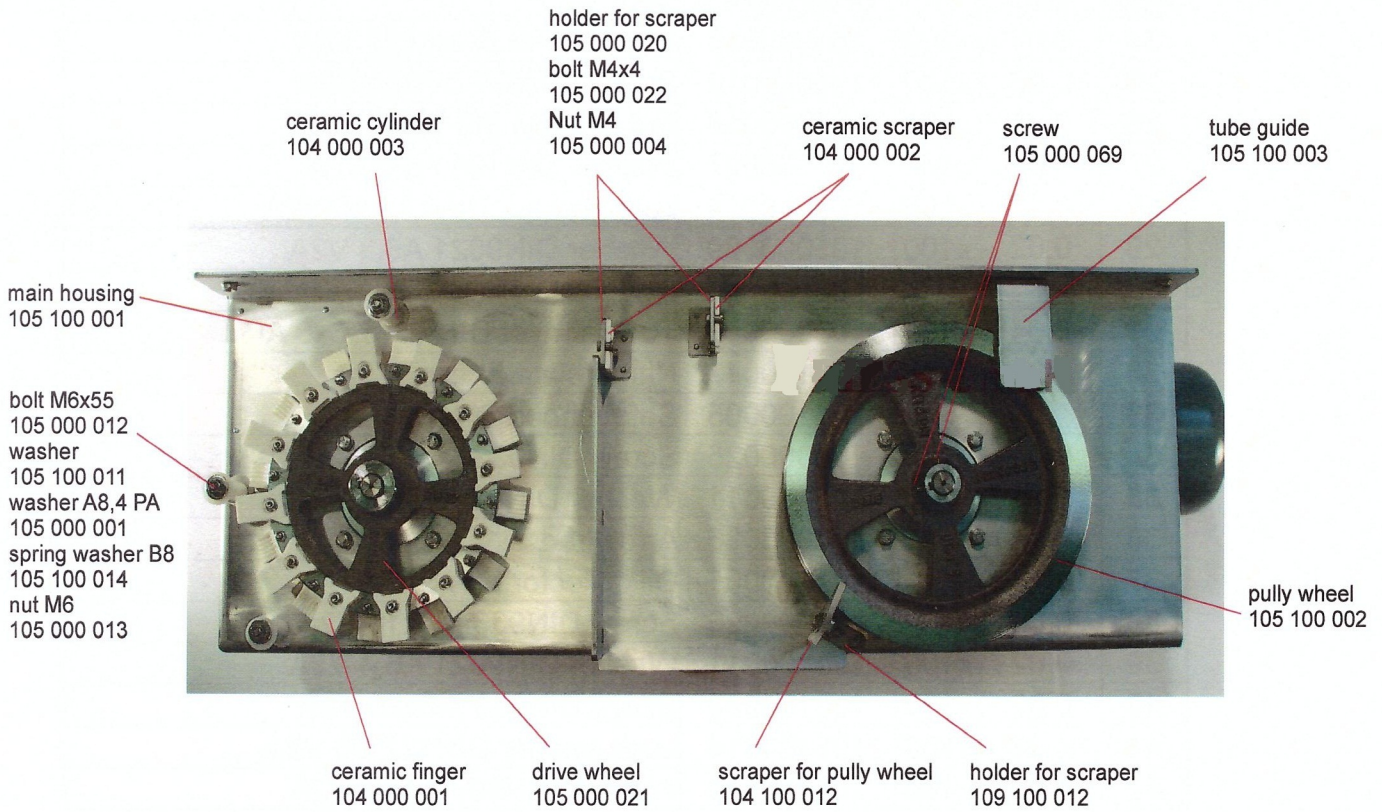
-Check the correct place of the ceramic cylinder. See attached drawing. The ceramic cylinder (A) has to be mounted as far away as possible from the drive wheel; the ceramic cylinder (B) has to be mounted as near as possible towards the drive wheel.

6. Technical documentation

6.1 Parts list

6.1.1 Spare parts

Pos.	no.		Drawing no.	Item
5	24	Pc	104000001	Ceramic finger for drive wheel
6	2	Pc	104000002	Scraper for oil collector tube
9	2	Pc	104100012	Scraper for pulley wheel
		Meter	101000001/2/3	Oil collector tube type



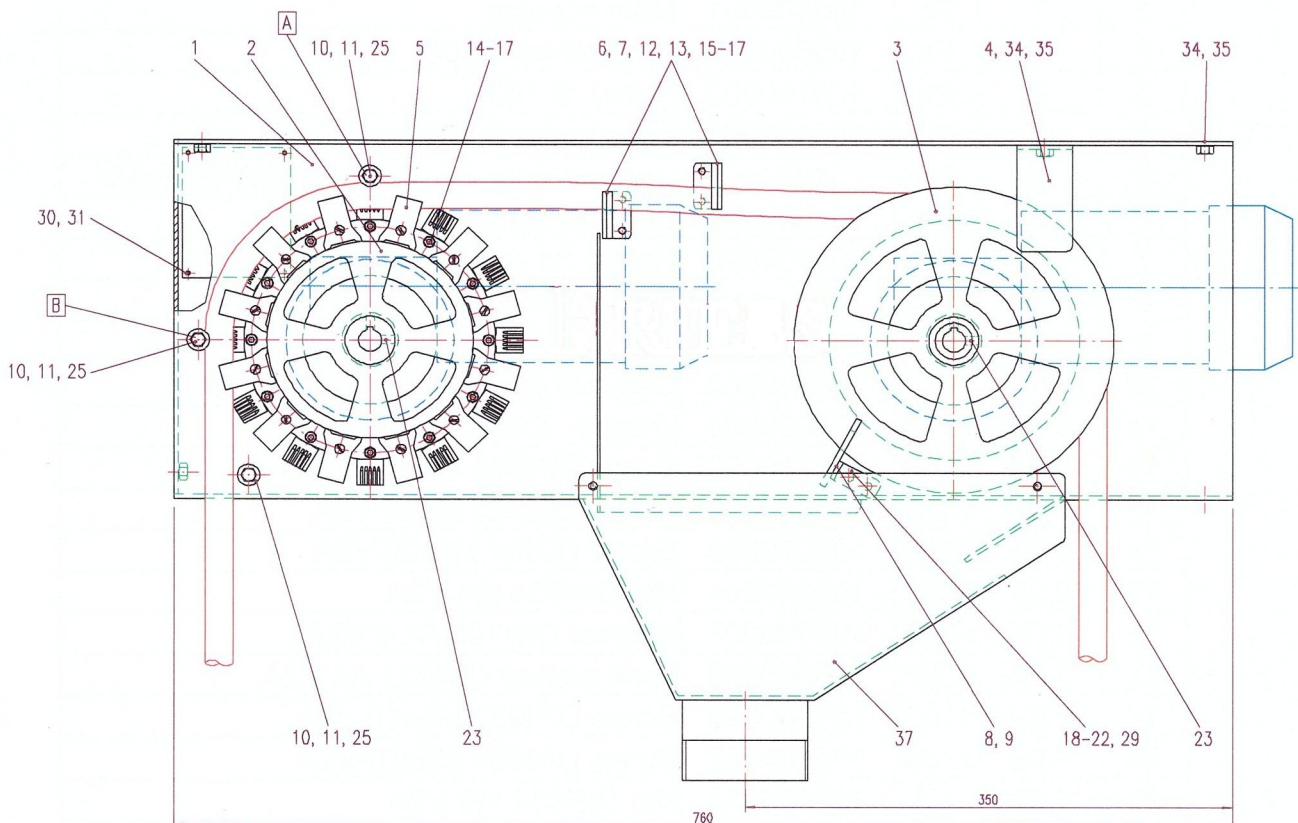
6.1.2 Parts list oil skimmer model 1

Pos.	No.		Drawing no.	Item
1	1	Pc	105100001	Main housing
2	1	Pc	105000021	Drive wheel
3	1	Pc	105100002	Pulley
4	1	Pc	105100003	Tube guide
5	24	Pc	104000001	Ceramic finger
6	2	Pc	104000002	Ceramic scraper
7	2	Pc	105000020	Holder for scraper
8	0,01	x100	104100012	Scraper for pulley wheel
9	1	Pc	105100004	Holder for pulley wheel scraper
10	3	Pc	104000003	Ceramic cylinder
11	0,06	x100	105000001	Washer DIN9021 A8,4 PA
12	0,04	x100	105000006	Screw DIN933 M4x10 V2A
13	0,04	x100	105000022	Screw DIN923 M4x4 V2A
14	0,24	x100	105000003	Screw DIN84 M4x20 V2A
15	0,28	x100	105000004	Nut DIN934 M4 V2A
16	0,28	x100	105000007	Washer DIN125 A4,3 V2A
17	0,28	x100	105000005	Lock washer DIN127 A4 V2A
18	0,02	x100	105000028	Screw DIN933 M5x10 V2A
19	0,02	x100	105100007	Screw DIN933 M5x16 V2A
20	0,02	x100	105000009	Nut DIN934 M5 V2A
21	0,02	x100	105100008	Washer DIN125 A5,3 V2A
22	0,02	x100	105000010	Lock washer DIN127 A5 V2A
23	0,04	x100	105000024	Screw DIN438 M6x12 V2A

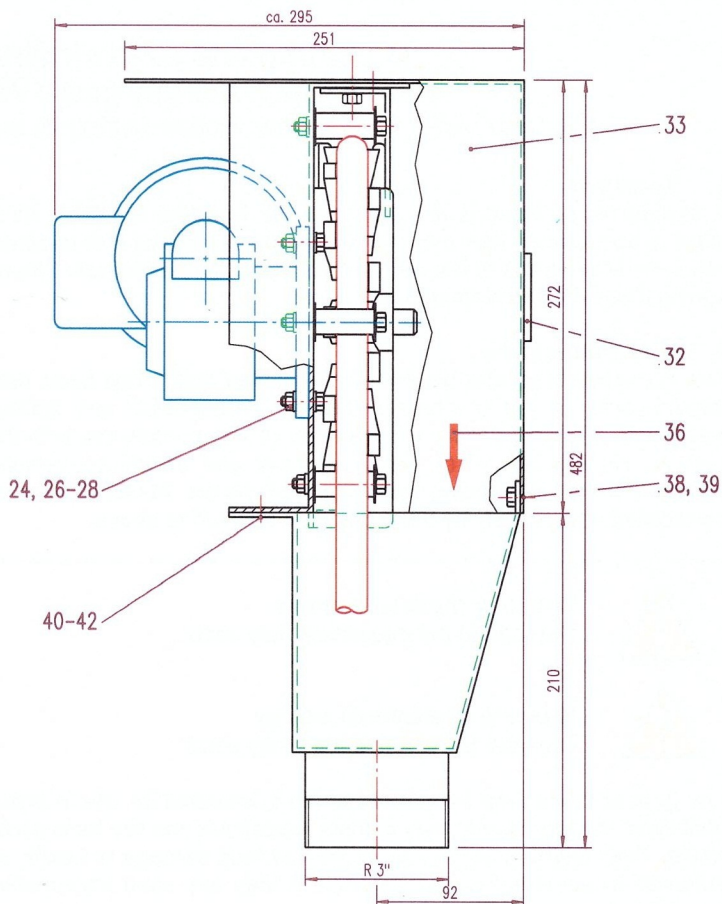
Pos.	No.		Drawing no.	Item
24	0,09	x100	105000026	Screw DIN933 M6x20 V2A
25	0,03	x100	105000012	Screw DIN931 M6x55 V2A
26	0,11	x100	105000013	Nut DIN934 M6 V2A
27	0,08	x100	105000027	Washer DIN125 A6,4 V2A
28	0,11	x100	105000014	Lock washer DIN127 A6 V2A
29	0,02	x100	105000029	Washer DIN9021 A5,3 V2A
30	1	Pc	105000017	Data plate
31	0,04	x100	105000018	Tubular rivet DIN 7337 3x8 Al
32	1	Pc	105100013	Name plate
33	1	Pc	105100005	Safety hood
34	0,04	x100	105000025	Screw DIN933 M6x10 V2A
35	0,04	x100	105100011	Washer DIN9021 A6,4 V2A
36	1	Pc	106000036	Arrow red
37	1	Pc	102100001	Oil collector pan
38	0,02	x100	105000025	Screw DIN933 M6x10 V2A
39	0,02	x100	105100011	Washer DIN9021 A6,4 V2A
40	0,02	x100	105100009	Screw DIN933 M8x20 V2A
41	0,02	x100	105100014	Lock washer DIN127 B8 V2A
42	0,02	x100	105100010	Washer DIN9021 A8,4 V2A

6.2 Drawing

6.2.1 Front View

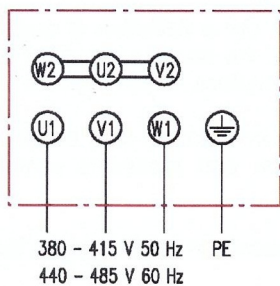


6.2.2 Side View



6.3 Wiring diagram

technical data motor oil skimmer



2 motors
 0,18 kW
 380 - 415 V 50 Hz
 0,7 A
 cos 0,70
 1350 RPM
 IP 54

Typ TP63A4
 cable inlet M 20
 reduction 38:1
 output speed 37 RPM
 torque max. 81 NM

0,18 kW
 440 - 485 V 60 Hz
 0,63 A
 cos 0,70
 1630 RPM

output speed 43 RPM

Attention! Pay attention to the data plate, special configurations are possible

6.4 Manual and safety instructions of gear motor

Operating and safety instructions

Gear types: Planetary gear / Worm gear

Axial gear units, Angular gear, Hollow shaft gear units, Solid shaft gear units

0. Foreword

A geared motor alone is not subject to the Machine Directive. Its installation and/or assembly with other plant in accordance with the intended purpose enables it to become part of the resulting machine or plant which must comply with the relevant standards and directives. The machine manufacturer is responsible for compliance with these standards.

1. Safety Instructions

The commissioning of a machine is prohibited until it has been determined that the protection and safety requirements of the Machinery Directive 2006/42/EC are fulfilled. The basic requirement for proper installation and connection is knowledge of and compliance with the operating and safety instructions, as well as the regulations on safety at work and accident prevention. Only qualified personnel may be commissioned with working on the geared motors. Malfunctions which may compromise their safety must be rectified immediately by the individuals referred to above.



Health or material damage

Damage to the equipment may occur



Warning of electrical energy

Damage to the equipment may occur

The geared motors are equipment which is intended for use in industrial machines and/or systems. During operation, this equipment may contain hazardous and live bare parts, as well as parts which might move or rotate. They might therefore cause very serious damage to health or materials, e.g. if the required cover is removed in an unauthorised manner, if they are used improperly, operated incorrectly or inadequately maintained.

For this reason, those individuals who are responsible for the safety of the machine or plant must ensure that:

- only qualified individuals are commissioned to work on the machines or plant/systems.
- these individuals always have these operating instructions and other product documentation at their disposal during all corresponding work and are placed under an obligation to comply with these documents consistently.
- work on the machines or equipment or in their vicinity is prohibited for unqualified individuals.

2. Qualified Personnel

This term refers to individuals who, on the basis of their training, experience and instruction, as well as their knowledge of relevant standards, provisions, accident prevention regulations and operating conditions, have been authorised by the person responsible for the safety of the machine or plant to carry out the necessary work and to recognise and avoid potential hazards (for a definition of qualified personnel, see VDE 0105 or IEC 364, which also regulates the prohibition of the use of unqualified individuals). Among other things, knowledge of first aid measures and local rescue facilities is also required.

It is assumed that the basic planning work for the machine or plant as well as all work relating to its transport, assembly, installation, commissioning, maintenance and repairs is carried out by qualified personnel or checked by responsible specialists.

Particular attention should be paid to the following:

- technical data and information on permitted use, which is contained in the catalogue, the order documents and the details stated on the plate,
- the general installation and safety regulations,
- the local plant-specific regulations and requirements
- the proper use of tools, lifting and transport equipment,
- the use of personal protective equipment,
- installation conditions, so that the required protection against accidental physical contact is provided during operation and individuals are prevented from coming too close to the equipment.

For reasons of clarity, this documentation cannot contain all detailed information on possible versions of the equipment and cannot take into account every conceivable form of installation, operation or maintenance. Accordingly, this documentation essentially contains only such information as is required for qualified personnel when the geared motors are used for their intended purpose in industrial applications. If – in special cases where the machine or plant is intended to be used in non-industrial situations – more stringent requirements might apply (e.g. protection against contact with children's fingers), these conditions must be ensured during installation by additional protective measures that apply to the machine or plant.

Changes (higher power consumption, temperatures, vibrations, noises etc. or activation of the monitoring equipment) compared to normal operation indicate that the functions of the equipment are impaired. In order to avoid malfunctions which in turn might cause serious direct or indirect personal injury or damage to property, the maintenance personnel responsible must be notified immediately.

IN CASE OF DOUBT, SWITCH OFF THE CORRESPONDING EQUIPMENT IMMEDIATELY!

3. Intended Use

The low-voltage machines are intended for commercial installations. Use in hazardous areas is prohibited unless expressly intended for such purposes (observe additional instructions). Standard geared motors and planetary gears are designed in various protection classes (IP). They are not designed for outdoor installation. They must therefore not be used outdoors. The geared motors are exclusively intended for installation in or assembly on a machine or plant for industrial use. Any other or further use is considered to be contrary to the intended use. The supplier cannot be held responsible for any damage resulting from this.

4. Set-up

The foundations for mounting the gear units and geared motors must be of an appropriate size and vibration-free. When mounting the geared motors, ensure that they are mounted firmly and without any tension on a flat surface. Ensure that the motors are adequately ventilated. If connecting elements are fitted to the drive or output shafts, impacts on the shafts must be avoided, as this can damage the bearings and cause leaks. Otherwise, the shaft ends must be lightly greased before mounting to facilitate assembly. We recommend the use of elastic couplings if possible in order to keep the impacts from the machine when it is being operated as small as possible on the gear unit or the geared motor.

5. Electrical Connection

The electrical connection of the motor may only be carried out by qualified personnel, observing the stipulated protective measures and the local connection conditions (see 1. Safety Instructions). The motor must be connected according to the wiring diagram in the terminal box. Ensure that the voltage of the power source corresponds to that stated on the motor rating plate. The corresponding specifications apply to installed auxiliary equipment such as brakes, tachogenerators and forced cooling fans. The direction of rotation can be changed in the case of three-phase motors by swapping two phases, for AC motors by reconnecting the bridges on the terminal board and for DC motors by reversing the polarity of the armature voltage – all of which must only be carried out when the motor is stationary!

6. Protection

It is essential to connect the protective conductor to the marked earthing screw! A motor protection switch should be provided to protect the motor against overload. Thermal protection devices respond to RMS values and are designed accordingly by the manufacturer during the order process.

7. Maintenance



Caution!

Before maintenance work is started, the geared motor must be permanently disconnected from the power supply.

Motor:

It is advisable - depending on the amount of dust produced – to clean the motor fan cover as well as the motor and gearbox body from time to time in order to remove any dirt (warming). Motors with carbon brushes must be checked at regular intervals. The service life of the brushes depends on the operating mode and operating conditions. If necessary, the carbon brushes must be replaced. After the fan cover, the tension band or the screw caps has/have been removed, the brushes are easily accessible in most cases.

Gears:

On delivery, the geared motors are filled with gear grease or oil and ready for operation. This ensures the long-term lubrication of all drive parts and bearings. Complicated disassembly, cleaning and grease changes are no longer necessary. If re-greasing is required, synthetic and mineral lubricants must not be mixed together.

8. Environmental Protection



Please note that the gear unit or geared motor component can be recycled.

You are welcome to return the component to us when it no longer functions correctly.

As mentioned at the beginning of these instructions under "Intended Use", the gear units described in these operating instructions are products which are intended for commercial installations. Furthermore, the information provided in this operating manual is intended for specialists working in such commercial installations. The gears are designed for a long service life, which can be extended by regular maintenance, whereby defective products can be repaired by appropriate servicing. During the

development of the gears, attention is paid to an environmentally-friendly design and technical safety in compliance with the applicable directives, standards and substance prohibitions (RoHS). The gearbox contains recyclable materials in the form of metals that are to be recycled. Plastics and lubricants must be disposed of properly. Separation of the materials used is made considerably easier by the technical design of the gears and there are numerous return possibilities for these products for recycling by professional disposal companies and the manufacturer itself. The regulations and guidelines which are valid in the country must be observed.

9. Storage

Any damage detected after delivery must be reported to the transport company immediately; if necessary, the device must not be put into operation. If geared motors are put into storage, ensure a dry, dust-free and low vibration ($V_{eff} < 0.2 \text{ mm/s}$) environment (bearing standstill damage). Apply anti-corrosive agent to treated surfaces (flange contact surface and free shaft end). After a prolonged storage period for the geared motors (> 12 months), the condition of the lubricant in the motor bearings must be checked. If there are visible signs of the penetration of moisture and dirt, the bearings must be replaced or re-greased. If the storage period is > 4 years, the bearings must be replaced. If possible, e.g. when the motor is to be operated with the frequency inverter, a grease distribution run of approx. 10 min. at 50 % of the rated speed is recommended. Measure the insulation resistance before commissioning. Dry the winding if the values are < 1.5 mega-ohms.

10. Conclusion

Please note that the contents of the operating and safety instructions and the product documentation are not part of any previous or existing agreement, commitment or legal relationship and are not intended to change any of the above. All obligations on the part of RUHRGETRIEBE are based on the respective sales contract, which also contains the complete and exclusively valid warranty provisions. These contractual warranty provisions are neither extended nor limited by the statements contained in these operating and safety instructions.

(Valid from January 2020; the previous conditions are hereby rendered invalid)

7. Appendage

7.1 Lubrication information's

The gear motors are filled with lubrication. During the life time of the gear motors it is not necessary to change the lubrication.

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