

# Oil Skimmer model 1U

Serial N.



Böttgerstraße 2

D-40789 Monheim

## Maintenance Manual

**FRIESS** GmbH

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## Declaration of conformity According to EC-Machinery Directive 2006/42/EG

FRIESS GmbH declares that the

**Product:** Oil skimmer  
**Type:** 1U  
**Year of manufacturing:**  
**Serial-No:**

complies with the requirements of the European directives.

The manufacturer herewith declares conformity of above mentioned oil skimmer with following standards:

**Machinery Directive:** 2006/42/EG

The oil skimmer is a machine to remove floating oil and fat from water surfaces. The declaration of conformity is only valid if the oil collecting pan is used. If the oil collecting pan is not used, the conformity is unvalid unless an appropriate protection against touching the drive wheel is installed.

This declaration is not valid if the oil skimmer is used for other purposes than designed or if the construction is changed and not confirmed in writing by manufacturer.

Applied harmonized standards:

**EN ISO 12100-1** Safety of machinery  
**EN ISO 12100-2** Safety of machinery  
**EN 60204-1** Safety of machinery

This declaration certifies conformance with the above mentioned directives. Affirmation of attributes in a legal sence is not included. Security declarations given in the product documentation have to be considered.



Oliver Benneck / Executive director

Monheim,

# FRIESS GmbH

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## 1. IMPORTANT SAFETY INFORMATIONS AND SAFETY INSTRUCTIONS

### 1.1 Range of application



Do not use the oil skimmer model 1U for other purpose than designed. The oil skimmer model 1U 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 1U.

### 1.2 Safety information and safety instructions

#### 1.2.1 Fundamental safety informations



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 this regulations the manufacturer will not be responsible for any damage. This manual is part of the **FRIESS** oil skimmer model 1U. 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 personal only. Trained personal are persons, which have knowledge about necessary technical standards, technical regulations and safety information's 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 1U

- 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 to work at the oil skimmer model 1U 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 1U according to the general sales terms. The manufacturer warrants not for the oil skimmer model 1U in case of damage caused by wrong operation, repairing or maintenance done by not trained personal, using additional equipment or spare parts which are not specified for the oil skimmer model 1U 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 1U 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



This safety devices may not be complete. Please contact manufacturer in case of questions or problems. The oil skimmer model 1U is manufactured according to the latest technology and is safe in operation. You may use the oil skimmer model 1U 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 1U must not be used without the oil collecting pan. In case you do not want to use the original oil collecting pan you have to install a safety device with the same effect. During operation of the oil skimmer model 1U do not remove the oil collecting pan or other safety devices 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 open the oil skimmer model 1U during operation of the oil skimmer.  
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.

## **2. GENERAL DESCRIPTION**

The Oil Skimmer model 1U 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. Scrapers made of hardened stainless steel 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 **FRIESS** oil skimmer model 1U is designed for tanks with a surface between 400 x 400 mm up to 1 m<sup>2</sup>. The skimmer may be mounted up to 400 mm above water level. The oil skimmer has to be mounted above the maximum liquid level.

## 2.1 Description of parts

The oil skimmer model 1U is made of four structural components:

Structural component 1: oil skimmer model 1U with oil collecting pan (100 010 002)  
or without oil collecting pan (100 010 001)

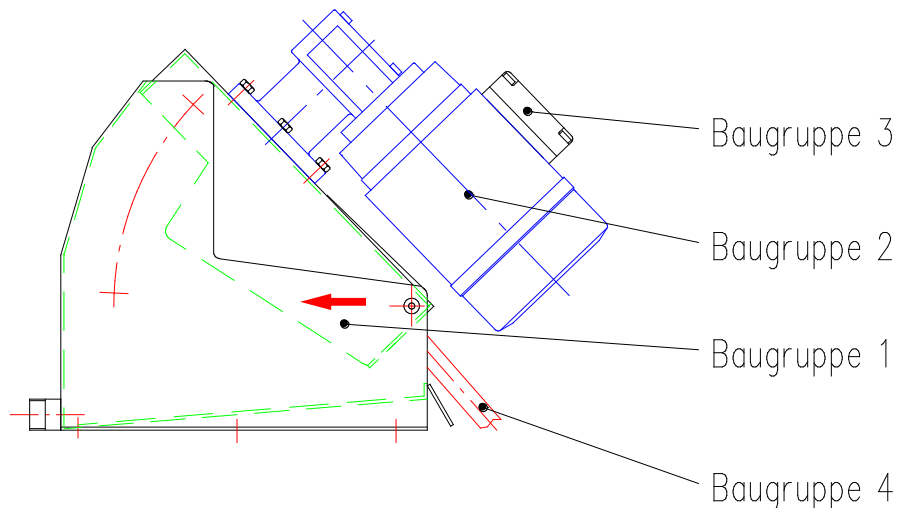
Structural component 2: one gear motor SN5FL  
The gear motor is special designed for each application and may vary from one oil skimmer to the next. Only the data plate on the gear motor shows the correct technical data.

Structural component 3: switchboard  
two different switchboard covers are possible

1. standard cover  
motor 400V 3 phase protection class IP54
2. additional switchboard cover with switch, cable and plug and capacitor  
motor 230V single phase protection class IP44

Structural component 4: oil collector tube

Type U2 (101 010 001) max. length L = 3 m for bath temperature by 0°C to 60°C  
Lifetime for oil collector tube if temperature is less than 35 °C: approx. 6 – 24 months  
Lifetime for oil collector tube if temperature up to 60 °C: approx. 3 – 9 months



## **2.2 Description of process**

The oil skimmer model 1U 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. 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  $\frac{3}{4}$ " 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 to use 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. The maximum length of the oil collector tube is 3,0 m. If you want to service a bigger surface or a bigger basin please guide the oil towards the oil skimmer model 1U or use oil skimmer model W40 or model S 100.

Please check after the start of the gear motor the turning sense of the drive. When looking on the drive wheel the oil collector tube has to run clockwise. The gear motor is 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 1U make sure, that the oil collector tube 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.

Depending on distance between oil skimmer and fluid level and size of the basin you can adjust the oil skimmer base plate in the oil collector pan. To adjust the oil skimmer base plate please loose the screw on the side and turn the base plate, so that the oil collector tube will swim correct on the water surface. As soon as you found the right position please fix the oil skimmer base plate with the screw.

## **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**

- Please open the oil skimmer and clean the oil skimmer and oil collector pan
- 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.

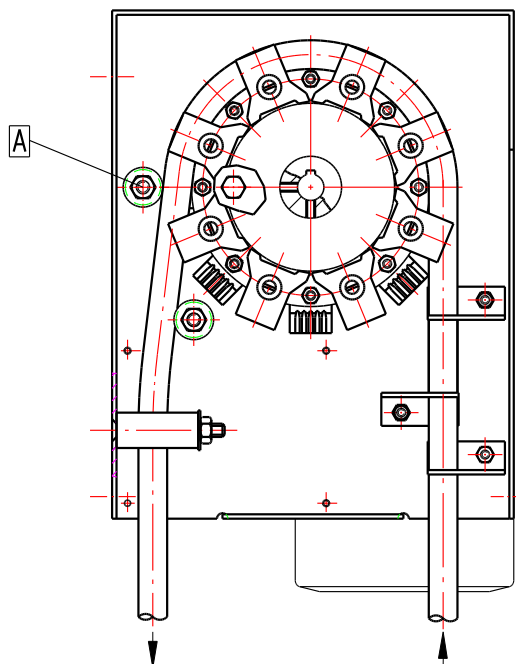
Switch off the oil skimmer and protect against restart. To change the collector tube please pull plug and stop the oil skimmer. Loosen the ceramic cylinder screw no. 18. Remove the old oil collector tube and mount the new oil collector tube.

Mount the ceramic cylinder as near as possible near the drive wheel and start the oil skimmer.



### 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 remove 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 **FRIESS** 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 off the oil skimmer and check by turning of the fan at the motor, whether the motor shaft is blocked ore 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

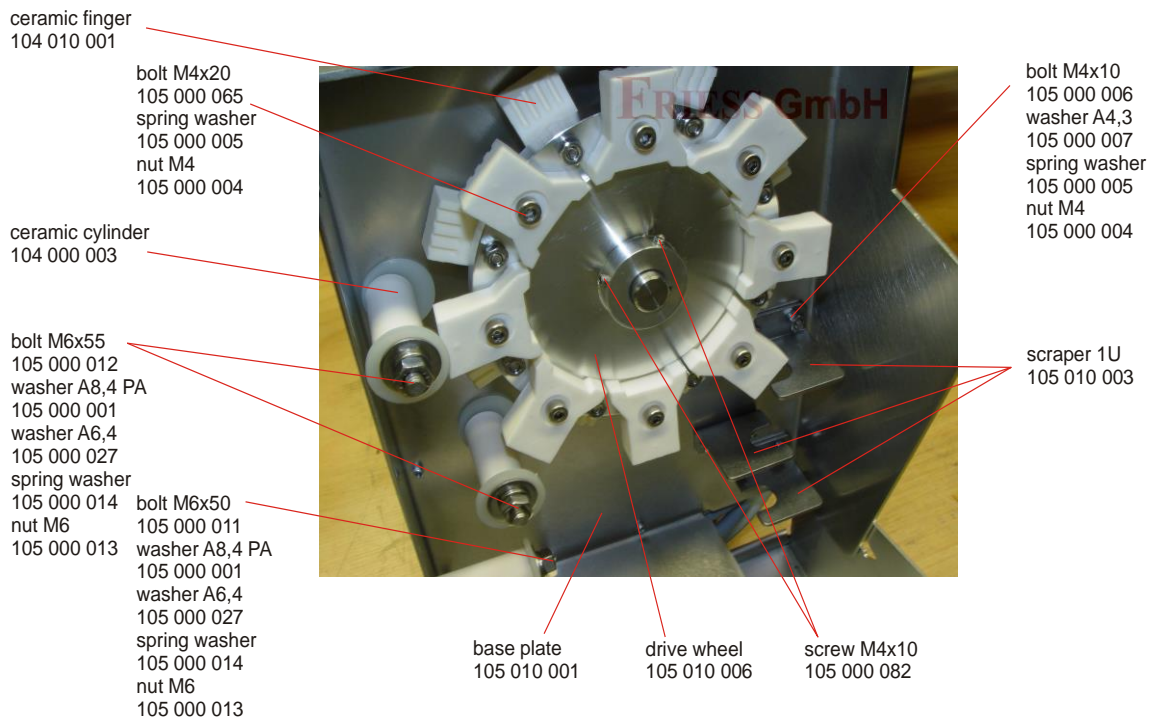
- Check whether the motors turn the right way
- Check the oil collector tube whether it`s worn out
- Check the ceramic fingers of the drive wheel, whether they are worn out
- Check the correct place of the ceramic cylinder. See attached drawing. The ceramic cylinder (A) has to be mounted as far away 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 Wear parts

Pos.	no.		Drawing no.	Item
3	16	Pc	104010001	Ceramic finger 1U
4	3	Pc	105010003	Scraper for oil collector tube
		Meter		Oil collector tube type U2



#### 6.1.2 Parts list oil skimmer model 1U

Pos.	N.	EH	Code	Item
1	1	Stk	105010001	housing 1U
2	1	Stk	105010006	Drive wheel 1U (groß) Al
3	16	Stk	104010001	Ceramic finger 1U
4	3	Stk	105010003	Scraper 1U
5	3	Stk	104000003	Ceramic cylinder 1U / W40 / S 100
6	0,05	x100	105000001	Washer DIN9021 A8,4 PA
7	0,02	x100	105000002	Screw DIN933 M4x12 V2A
8	0,16	x100	105000003	Screw DIN84 M4x20 V2A
9	0,22	x100	105000004	Nut DIN934 M4 V2A
10	0,22	x100	105000005	Lock washer DIN127 B4 V2A
11	0,06	x100	105000006	Screw DIN933 M4x10 V2A
12	0,06	x100	105000007	Washer DIN125 A4,3 V2A
13	0,04	x100	105000026	Screw DIN933 M6x20 V2A
14	0,02	x100	105000025	Screw DIN933 M6x10 V2A
15	0,06	x100	105000027	Washer DIN125 A6,4 V2A
16	0,02	x100	105000012	Screw DIN931 M6x55 V2A

17	0,07	x100	105000013	Nut DIN934 M6 V2A
18	0,07	x100	105000014	Lock washer DIN127 B6 V2A
19	0,01	x100	105000011	Screw DIN963 M6x50 V2A
20	1	Stk	102010001	Oil collecting pan 1U
21	1	Stk	105000016	Star handle DIN6336 KU
22	0,01	x100	105000039	Set screw DIN916 M6x25 V2A
23	1	Stk	105000017	Data plate Friess
24	0,04	x100	105000018	Rivet DIN 7337 3x8 Al
25	1	Stk	106000036	Arrow red

### 6.1.3 Parts list structural components

#### 6.1.3.1 protection class IP 54 (108 010 005)

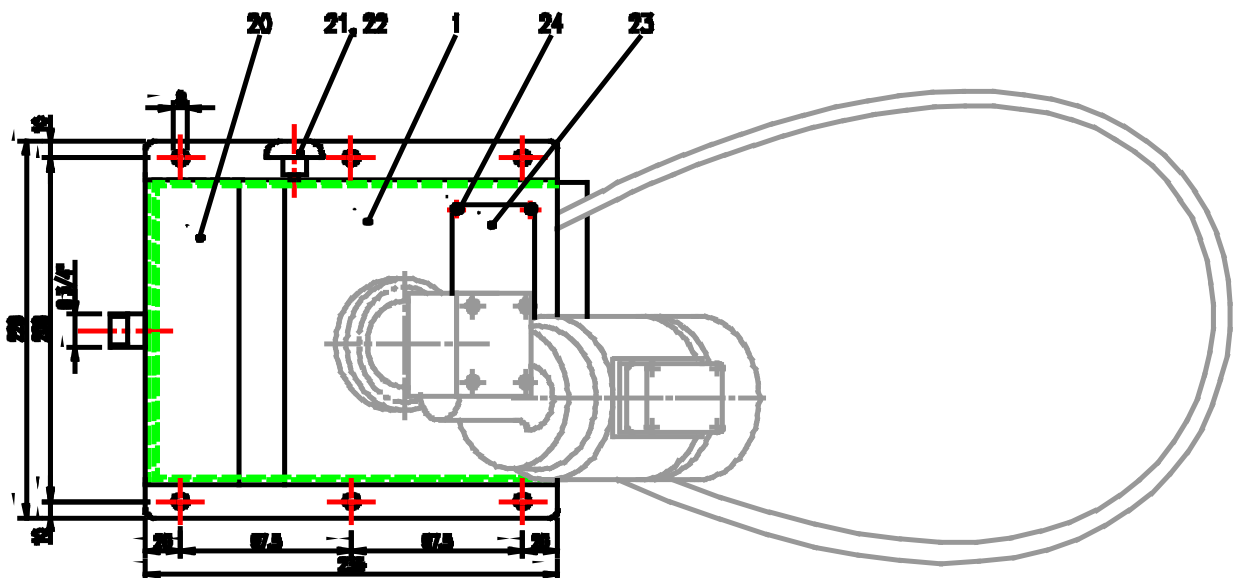
1	1	pc	108 010 005	switchboard standard
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#### 6.1.3.2 protection class IP 44 (108 010 001)

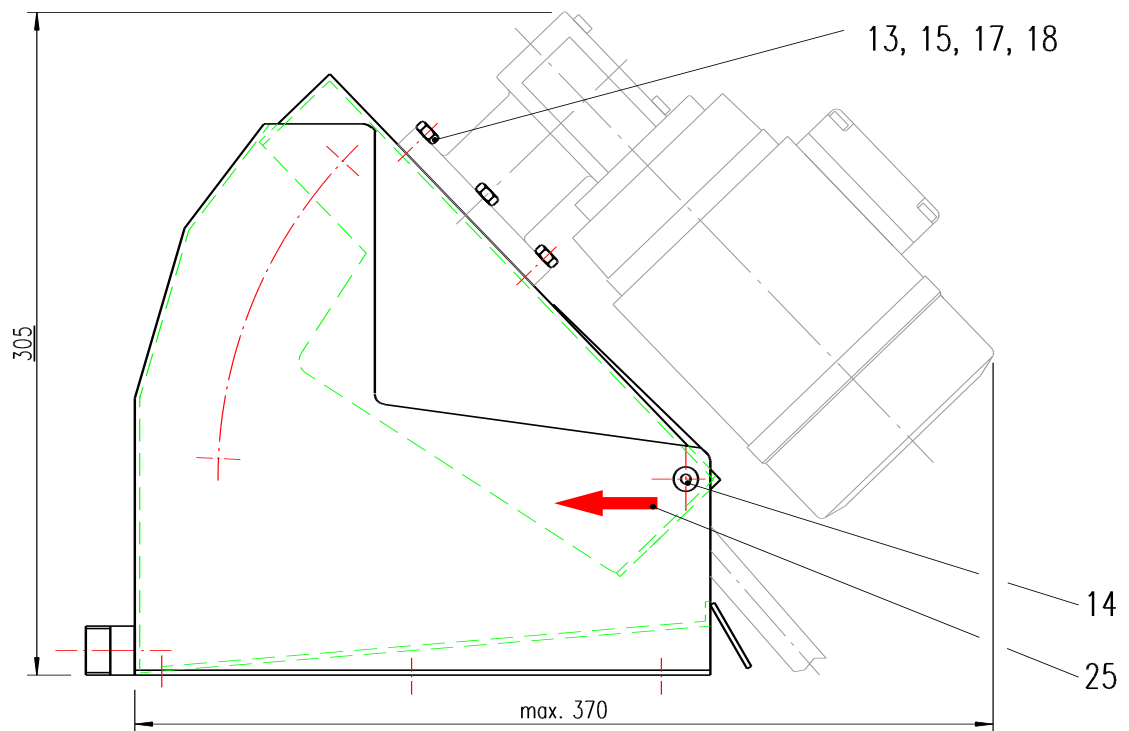
1-5	1	pc	108 010 004	switchboard with switch, cable, plug, capacitor
	1	pc	108 010 003	
	1	pc	108 010 002	
	1	pc	105 000 051	
	3	pc	105 000 052	

## 6.2 Drawing

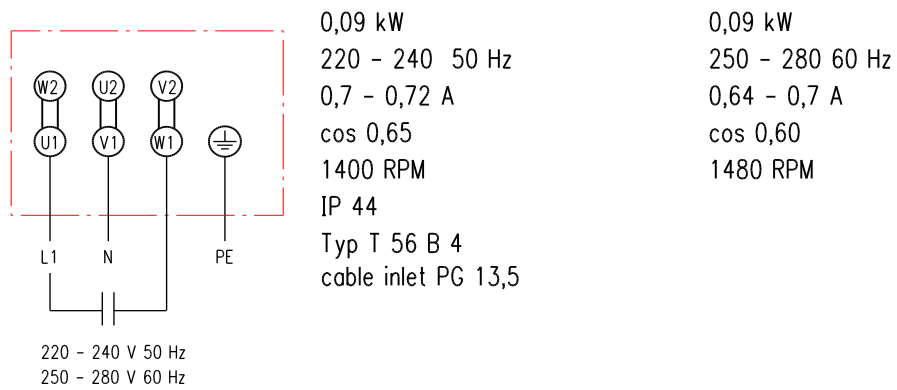
### 6.2.1 Front View



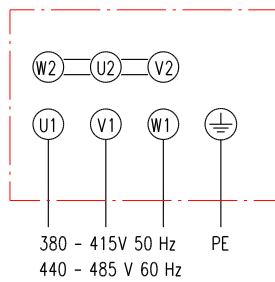
### 6.2.2 Side View



### 6.3 Wiring diagram



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



0,09 kW  
 380 - 415 V 50 Hz  
 0,4 - 0,42 A  
 cos 0,65  
 1400 RPM  
 IP 54  
 Typ T 56 B 4  
 cable inlet PG 11

0,09 kW  
 440 - 485 V 60 Hz  
 0,37 - 0,4 A  
 cos 0,60  
 1480 RPM

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

## 6.4 Operating and safety instructions worm gear motors

### 0. Foreword

A geared motor proper is not subject to the Machinery Directive. Through appropriate installation and/or assembly in an overall system it becomes a component of the machine or plant under construction, which must comply with the relevant standards and directives. The manufacturer of the machine bears the sole responsibility for compliance with these standards.

### 1. Safety Instructions

A machine may not be taken into use until it has been ascertained that it meets the protection and safety requirements of Machinery Directive 89/392/EEC and its amending Directives 91/368/EEC or 93/44/EEC. The basic prerequisite for correct installation and connection is knowledge of, and compliance with, the operating and safety instructions, and the regulations relating to industrial safety and accident prevention. Only qualified persons may be charged with work on geared motors. Faults susceptible to prejudice safety must be rectified immediately by previously appointed staff.

#### **ATTENTION – HIGH VOLTAGE !!!**

Geared motors are devices for use in industrial machinery and plant. In operation, these devices can have dangerous live, non-insulated parts, or perhaps moving or rotating parts. Hence, for example, unauthorised removal of the required casing, or improper use, incorrect operation or poor maintenance, could lead to severe bodily harm or damage to machinery.

Persons responsible for the safety of the machine or plant must therefore ensure that

- only qualified persons are charged with working on the machines or plant.
- such persons always have access to the current operating instructions and other product documentation applicable to the work in hand, and that they are charged with consistent compliance with these documents
- unqualified persons are prohibited from working on or near the machines or equipment.

**Qualified Personnel** are persons who by reason of their training, experience, instruction and their knowledge of the relevant standards, regulations, accident prevention rules and working conditions have been authorized by the person responsible for the safety of the machine or plant to perform the appropriate activities required, and thereby are able to recognise and prevent potentially dangerous situations (For the definition of skilled workers see VDE 0105 or IEC 364, which also regulate the prohibition of the employment of unqualified persons). A knowledge of first aid and the local rescue organisation must also be included.

It is assumed that the basic planning of the machine or plant and all operations relating to its transportation, assembly, installation, commissioning, maintenance and repair will be performed by qualified personnel or controlled by responsible skilled hands. In this respect, special attention should be paid to:

- technical data, and information on permissible use which are included in the catalogue, the documents relating to the order and on the data plate,
- the general regulations applicable to erection and safety,
- the local regulations and requirements specific to the machine or plant
- the proper employment of tools, lifting and transport devices,
- the use of personal protective equipment,
- assembly conditions, to ensure the necessary protection for operators during use, and to prevent personnel from approaching too closely for safety.

The present documentation would become too unwieldy if it contained all the detailed information relative to possible construction variants, and it cannot take into account every conceivable case involving erection, operation or maintenance. Consequently, it only contains the essential instructions necessary for qualified personnel operating geared motors in industrial areas of application. Should, in a special case where it is intended to use the machine or plant in non-industrial areas of application, more stringent requirements have to be met (e.g. to prevent children's fingers from touching the machine), these conditions must be assured during assembly by introducing additional safety measures for the machine or plant.

Changes from normal operation (increased power consumption, raised temperatures, vibrations, noises, etc. or indications from monitoring facilities) lead to the assumption that the machine is not functioning correctly. To prevent faults which, in their turn, might cause serious indirect or direct damage to persons or machinery, the responsible maintenance staff must be informed immediately.

**IN CASE OF DOUBT; SWITCH OFF THE MACHINE INVOLVED AT ONCE !!!**

## **2. Regulation Use**

The geared motors are designed exclusively for installation in or for mating with a machine or plant in industrial use. Use for any other or extended purpose is non-regulation. The supplier will not be liable for any damage arising from this improper use.

## **3. Erection**

The beds on which the gears and geared motors are to be erected must be adequately dimensioned and free from vibration. When mounting the geared motors care must be taken to ensure that these are immovably mounted, free from distortion, and on a level surface. Adequate ventilation for the motors must be assured. Should coupling elements be fitted onto the drive- or output-shaft blows to the shafts must be avoided since they could cause leakage or damage to the bearings. Prior to fitting, the shaft-end should be lightly greased to facilitate mounting. We recommend that a flexible coupling be employed in order to reduce shock on the gears or geared motor from the machine being driven.

## **4. Electrical Connection**

The electrical connection of the motor may only be performed by personnel with the appropriate qualification and in compliance with the prescribed safety precautions and the local regulations governing electrical connections (see para.1 Safety Instructions). The motor must be connected in accordance with the circuit diagram in the terminal box. Care must be taken to ensure that the voltage of the power supply corresponds to that on the performance plate of the motor. Any additional devices installed, such as brakes, revolution counter generators, and secondary fans, must comply with the appropriate standards. The direction of rotation can be changed in three-phase motors by changing two phases, in alternating-current (a.c.) motors by re-clamping the bridges on the terminal boards, and in direct-current (d.c.) motors by changing the polarity of the armature voltage – all this may only be performed when the motor is at standstill !

## **5. Safety Precautions**

The earth lead must without fail be connected to the marked earthing screw! To protect it against overloading every motor should be fitted with a trip switch. Heat-sensitive safety devices react to effective values, and the manufacturer will design them accordingly when ordered. Where a transformer is used, the voltage must be restricted to the level of the effective nominal voltage.

## **6. Maintenance**

**ATTENTION !** Before starting any maintenance operations the geared motor must be permanently disconnected from the mains.

**a) Motor:** It is recommended that, depending on the ambient dust arising, the dirt accumulation on the fan cowling of the motor and the motor and gears themselves should be cleaned off from time to time (heating). In the case of motors with carbon brushes, these should be checked at regular intervals. The life of the brushes depends on the mode and conditions of operation. The brushes must be renewed as and when this becomes necessary. Once the fan cowling, the holding band or the screw-caps have been removed the brushes are in most cases easily accessible.

**b) Gears:** On delivery, the geared motors are ready for use and filled with gear grease or oil. This ensures long-term lubrication for all drive parts and bearings. No complicated stripping, cleaning or grease change are required. Should, however, any additional greasing become necessary then synthetic and mineral lubricants must not be mixed.

## **7. Closing Remarks**

Your attention is drawn to the fact that the contents of the operating and safety instructions and of the product documentation do not form part of any previous or existing agreement, undertaking or legal relationship, nor are they designed to alter such. All the obligations incumbent upon RUHRGETRIEBE are based on the contract of sale in each case, which also contains the complete and solely applicable regulations relating to the guarantee. The contractual provisions of the guarantee are neither extended nor restricted by the statements contained in these operating and safety instructions.

# **7. APPENDAGE**

## **7.1 Lubrication informations**

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