

# FSP 330

## OPERATING MANUAL



Processing status: V 1.1 January 2024



For safe and proper application, please carefully read the operating manual and further product-accompanying documents. The operating manual has to be handed over to the final user and kept until product disposal.

You have purchased a high-quality product and we congratulate you on this decision. Prior to delivery, this product was checked for proper condition within the framework of quality controls. Please read and observe this operating manual so that you can enjoy the product for a long time.

The following guidance will make it easier for you to deal with this operating manual:



Useful tips and additional information which facilitate the work



Step-by-step handling instructions



References to further information in this operating manual



Useful accessories that can be purchased separately



Indication of a possibly hazardous situation that can result in property damage if not avoided



Warning against a hazard area which can lead to personal injuries



Warning of hazardous electrical voltage



We continuously work on the further development of all our products. Therefore modifications of the scope of delivery in terms of shape, engineering and equipment are subject to change without notice.

That is why no claims can be made due to information and figures provided in this operating manual.

If the flat suction pump FSP 330 is used with electronic level control, **two operating manuals** will have to be observed at the same time:

- Flat suction pump FSP 330
- Electronic level control ENS 1.1

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## 1 General aspects

### 1.1 Introduction



This operating manual is valid for the flat suction pump FSP 330. This operating manual enables safe handling of the pump. This operating manual is an integral part of the pump and must be kept in close vicinity of the pump and be accessible to the personnel at any time.

In case of any queries about the flat suction pump FSP 330 and this operating manual, please get in touch with:

Zehnder Pumpen GmbH  
Zwönitzer Straße 19  
D-08344 Grünhain-Beierfeld  
Tel.: +49 (0) 3774 / 52-100  
Facsimile: -150  
info@zehnder-pumpen.de

### 1.2 Warranty

Basically, the statutory regulations apply to the warranty.

Within this warranty period, we will at our discretion, either by means of repair or replacement, correct free of charge all defects due to material or manufacturing defects of the unit.

The warranty excludes all damage attributable to improper use or wear and tear. We do not assume any liability for consequential damages which occur due to a failure of the device.

For warranty claims it is required to submit a copy of the purchase receipt and to prove proper initial commissioning.

In case of non-observation to the operating manual - in particular the safety instructions - as well as unauthorised modification of the device or the installation of non-original spare parts the warranty claims will automatically become void. The manufacturer assumes no liability for any damage resulting from this!



In case of defects or damages, please initially get in touch with your dealer. They will always be your first point of contact!






## 2 Safety



These operating manual contain basic instructions which have to be observed during set-up, operation and maintenance. For this reason, these operating manual must by all means be read before installation and commissioning by the installation technician as well as by the competent specialist staff / user, and must be permanently available at the location of the plant. Not only the general safety instructions mentioned in this chapter on safety have to be observed, but also the special safety instructions mentioned in the other chapters.

### 2.1 Symbols in this operating manual

In these operating manual, safety warnings are marked by symbols.

Warning signs and signal word		Signification	
	<b>DANGER</b>	<b>Personal injuries</b>	Indication of a dangerous situation which, if not avoided, immediately leads to death or severe injuries.
	<b>WARNING</b>		Indication of a dangerous situation which, if not avoided, might lead to death or severe injuries.
	<b>CAUTION</b>		Indication of a dangerous situation which, if not avoided, might lead to moderate or slight injuries.
	<b>DANGER</b>		All live components are protected against unintentional contact. Prior to opening housing covers, plugs and cables, they have to be disconnected from the power supply. Works on electrical components may be carried out only by qualified staff.
	<b>ATTENTION</b>	<b>Material damages</b>	Indication of a situation, if not avoided, might lead to damages of components, the plant and/or its functions or a thing in its surrounding.



Furthermore, the following must be definitely observed and kept in legible condition:

- Instructions attached directly to the machine, such as the rotation arrow.
- Marks for fluid connections.



Smooth operation is ensured by observing the following notes.

Non-observance can lead to failure of electronics, malfunctions and to shorter service life. The operating company bears the responsibility.

## 2.2 Intended use

The flat suction pump FSP 330 is a waste-water submersible pump made of corrosion-proof, impact-resistant plastic and stainless steel, for the following fields of application:

- portable pump for emergency drainage
- cellars, washhouses, pools, shafts
- wherever water must be pumped off "completely"

Pumps of model range Flat suction pump FSP 330 can be used for commercial or non-commercial applications.

For conveying slightly contaminated water with suspended solids (no rocks) up to 1 mm grain size from private households, industry and agriculture. The pump is particularly suitable for pumping off water up to approx. 1 mm.

At pump start, the water level must be approx. 15 mm. The pump is not approved for conveying waste waters containing faeces. Clear to slightly contaminated water without aggressive and abrasive components only must be used as pumping medium.

The flat suction pump is approved for the operation:

- with 230 Volt 50 Hertz alternating voltage
- up to a water temperature of 40 °C

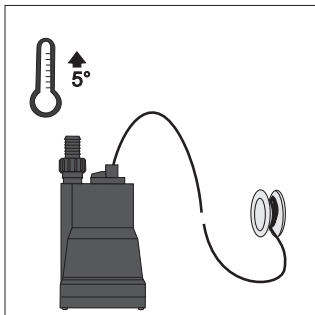


Use in swimming pools, garden ponds and their protected area is permissible only, if built in keeping with VDE 0100/49 D.



The following pumping media are not suitable:

- corrosive, combustible and explosive media
- Waste water from urinal installations and lavatories





Also an automatically working device, such as a submersible pump, must not be operated unattended for a longer period. If you leave the device for a longer period, then please disconnect the power supply of the device.

### **2.3 Selection and qualification of persons**

All activities on the pump have to be carried out by qualified persons, unless the activities in this operating manual are explicitly indicated for other persons (owner, user).

Qualified persons are those who know the relevant provisions, valid standards and accident prevention regulations due to their vocational training and experience. They are able to recognise and avoid potential hazards. The staff for operation, maintenance, inspection and installation must have the corresponding qualification for this work.

Works on electrical components may be carried out only by qualified persons trained for these purposes by observing all valid provisions of the accident prevention regulations.






The operating company / owner have to ensure that only qualified personnel take action on the plant. Moreover, the operating company / owner have to ensure that the content of the operating manual is understood completely by the staff.

People with impaired physical, sensory or mental abilities or lack of experience and knowledge must be supervised or trained how to use this device properly and safely before usage. Children are not allowed to use or play with this device. Cleaning and user maintenance must not be done by children.

## 2.4 Personal protective equipment

For various activities on the pump, personal protective equipment is required, if necessary. Personal protective equipment has to be provided to the personnel and their use has to be checked by supervisory staff.

If personal protective equipment must be used, this is indicated by the following symbols:

Mandatory signs	Signification	Explanation
	Wear safety shoes	Safety shoes provide good non-slip properties, particularly when wet, as well as a high pierce resistance, for example in case of nails, and the protect your feet against falling objects, e.g. during transport
	Wear a safety helmet	Safety helmets protect against head injuries, e.g. in case of falling objects or impacts
	Wear safety gloves	Safety gloves protect your hands against slight bruises, cut injuries, infections and hot surfaces, particularly during transport, commissioning, maintenance, repair and disassembly
	Wear protective clothing	Protective clothing protects your skin against slight mechanical impacts and infections in case of wastewater leakage
	Wear safety goggles	Safety goggles protect your eyes against wastewaters, particularly during commissioning, maintenance, repair and decommissioning



## 2.5 Basic hazard potential



If hot or cold machine parts could lead to hazards, these parts have to be protected against touch by the user.



Touch protection for moving parts (such as coupling) must not be removed from plants in operation.



Leakage (of the shaft seal, for example) of hazardous material conveyed (e.g. explosive, toxic, hot) must be removed in such a way that no danger is caused to persons and the environment. Legal regulations have to be observed.



Hazards caused by electric energy must be excluded (for details here, please refer to the country-specific regulations and the regulations of the local energy supply companies).

Basically, work on the machine may be carried out only at standstill. The procedure to shut down the machine described in the operating instructions must be observed by all means.

In case of contact with waste water or contaminated pump components, e.g. when removing blockages, can result in infections. Protective equipment must be worn.

➔ Chapter 2.4 "Personal protective equipment"

Pumps or pump assemblies, which convey media hazardous to health, must be decontaminated.

Immediately after completing the works, all safety and protection devices have to be fitted again and/or have to be made functional again, e.g. the touch protection device for the coupling and the fan wheel.

Before recommissioning, the points listed in the chapter on initial commissioning have to be observed.

## 2.6 Unauthorised modification and spare parts production

Up to the market launch, the plant was submitted to comprehensive quality controls and all components were checked under high load. Installation of non-approved parts will affect the safety and void the warranty. When replacing parts, only original parts or parts released by the manufacturer have to be used.

## 2.7 Hazards caused by non-observation of safety instructions



The non-observation of the safety instructions may endanger persons as well as the environment, and may have consequences for the environment and machine. The non-observation of the safety instructions will result in the loss of all claims for damages.

In detail, the non-observation of safety instructions may cause the following hazards, for example:

- Malfunction of important functions of the machine / plant
- Malfunction of the mandatory methods of maintenance and repair
- Danger to persons caused by electrical, mechanical and chemical effects
- Danger to the environment caused by leakage of dangerous substances

## 2.8 Safety-conscious work

In addition to the safety instructions in this operating manual, the accident prevention regulations and possibly internal work, operational and safety instructions of the operating company / owner must be observed.

## 2.9 Responsibility of the operating company / owner

Compliance with the following points is the responsibility of the operating company / owner:

- The plant has to be operated for the intended use only when it is in proper condition.  
↳ Chapter 2.2 "Intended use"
- The function of the protection devices, e.g. touch protection device of coupling and fan wheel, must not be impaired.
- Maintenance intervals have to be adhered to and malfunctions have to be immediately removed. Malfunctions have to be removed on ones own only if measures are described in this operating manual. Qualified persons are in charge of all other measures – contact the factory service, if necessary.
- The type plate of the plant has to be checked for completeness and readability.  
↳ Chapter 9.1 "Type plate"
- Personal protective equipment must be sufficiently available and be worn. ↳ Chapter 2.4 "Personal protective equipment"
- The operating manual has to be made available at the place of operation in a readable and complete way.
- Only qualified and authorised personnel may be employed. ↳ Chapter 2.3 "Selection and qualification of persons"

### 3 Transport and storage

#### 3.1 Transport

During transport, it has to be made sure that the pump cannot be knocked into and is not dropped.

#### 3.2 Temporary storage / conservation

For this purpose, the plant has to be warehoused horizontally in a dry, dark or sun-protected as well as frost-proof area. Additional conservation is not required.

### 4 Product description

The flat suction pump is equipped with a robust AC motor. Sealing of the pump housing towards the motor takes place on the pump side by a mechanical seal and by a radial shaft seal on the motor side.

- Suction from 15 mm and up to 1 mm (wipe-dry)
- integrated check valve for backflow prevention
- Motor winding with built-in thermal winding protection
- vertical pressure outlet 1" male thread and additional hose connection DN 25
- Sound level: < 70 dB

In combination with electronic level control ENS 1.1, automatic mode incl. alarm is possible. The switch-on point is at approx. 25 mm, the shut-down point is at approx. 3 mm.

The flat suction pump with ENS 1.1 can be installed in pipes from 200 mm Ø.

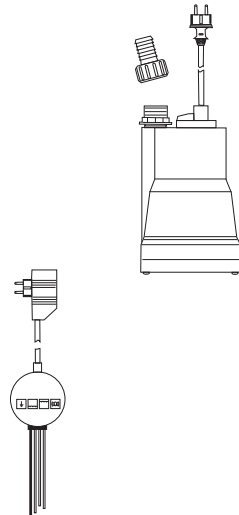
#### 4.1 Scope of delivery

- FSP 330
- electrically wired, cable type 05 RN-F, 10 m
- wired ready-to-plug-in



#### Optional accessories:

- electric level control **ENS 1.1** Art. No. 11414



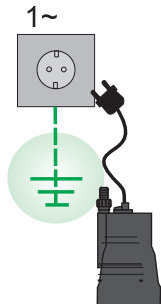
## 5 Installation

### 5.1 Preparations

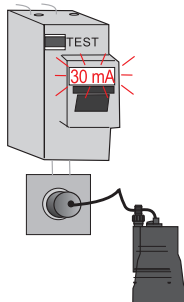
Check whether according to the packaging the plant is suitable for the power system (230 V / 50 Hz). Make sure that all safety rules are observed. Check whether the conveyed media corresponds to the media mentioned in chapter 2.2.

1. Removing the flat suction pump from the packaging.
2. Check for perfect external condition (transport damage).

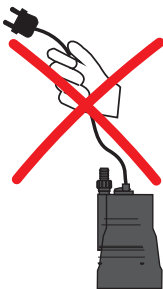
#### Safety instructions



The pump must be connected to a socket with grounding (mandatory provision according to DIN VDE 100)

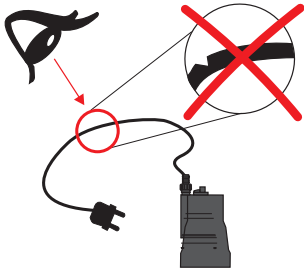


Should the power supply not take place by a mandatory FI operator protection circuit breaker with a rated residual current with max. 30 mA, then the pump must be connected to the socket via a separate FI operator protection circuit breaker (mandatory provision according to EN 60 335-2)

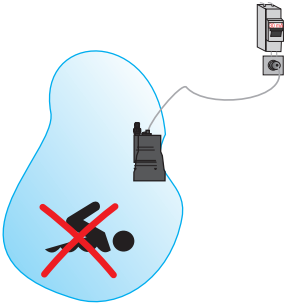


Do not pull the cable of the pump nor carry it in this way

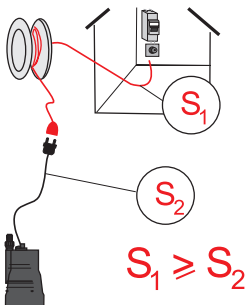
## Safety instructions



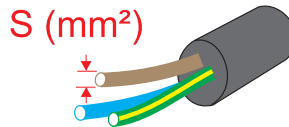
The pump must not be put into operation with a damaged cable



Using the pump at swimming pools and garden ponds is permissible only if the systems have been set up in accordance with DIN VDE 0100/Part 702. It is not allowed to bathe in the pool while operating the pump



Extension cables must have at least the same cable cross section as the connecting cable of the pump

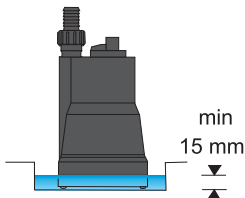


## 6 Commissioning and operation

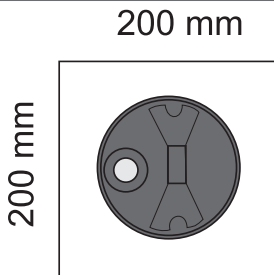


Before commissioning, all connections have to be checked again for correct installation. It has to be made sure in particular that voltage and frequency of the mains and flat suction pump (see type plate) match. It must have been made sure that the safety regulations have been complied with. Commissioning may only be performed by authorised qualified staff.

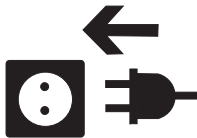
### Commissioning



- A **minimum water level of approx. 15 mm** is required for proper operation of the pump (it sucks off up to 1 mm).
- The suction area must not be clogged by mud and/or fibrous media
- In order to prevent the shaft sealing from being damaged, **the pump must not run dry.**



- If the pump shall be inserted into a pit or a duct, it should have a sized of at least 200 x 200 x 30 mm.



- The pumping process starts on inserting the plug into the socket
- **Never put the pump into operation in a dry state!**



If the pump is installed in a fixed location, e.g. in a drainage shaft, the pump connection cable must be fastened in such a way that it is not permanently submerged.

## 6.1 Handing over the plant to the user

When handing over the plant to the user:

- Explain the functionality of the pump.
- Hand over the pump when it is fully functional.
- Deliver the handover report with essential data of commissioning (e.g. changes to the factory settings).
- Hand over the operating manual.

## 6.2 Operation



The plant may be operated for its intended use. → Chapter. 2.2 “Intended use”



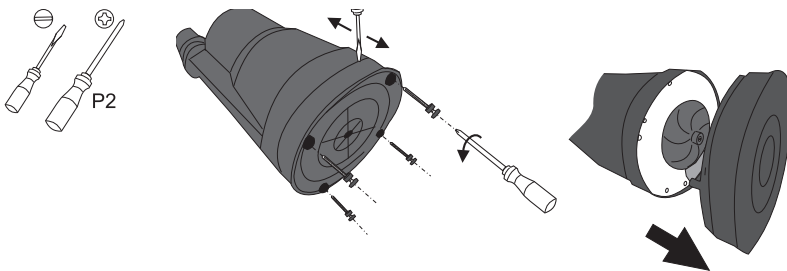
The plant works automatically. Apart from regular maintenance, only occasional visual inspections have to be carried out. In case of irregularities, skilled persons have to be called in, e.g. customer service partners authorised by the manufacturer.

## 7 Maintenance and repair



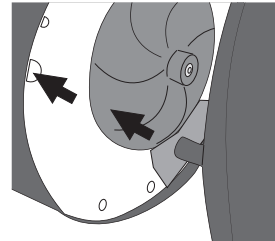
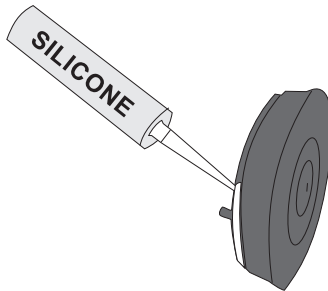
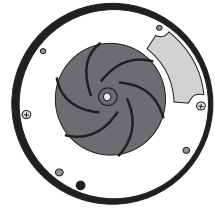
For repairs and maintenance of the pump always unplug the power plug and secure it from being plugged in accidentally during the process.

Maintenance consists of a check and cleaning of the pump interior.

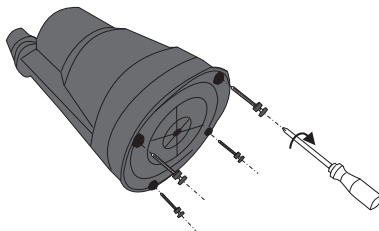


1. ▷ On the bottom side of the pump, loosen the four screws of the pump (with spacers), remove the pump bottom by means of a slot screwdriver.

2. ▷ Remove dirt particles from the impeller and lower side and check for grinding marks of the impeller at the bottom interior.



3. ▷ After cleaning, reassemble the pump. To do this, clean the upper edge of the pump bottom and caulk it using silicone. During assembly pay attention to the correct position of the pump bottom.



4. ▷ Retighten the four sheet-metal screws with spacers.

If the pump is not used at all for a longer period of time, the pump must be cleaned and stored in a frost-free, well-ventilated area.



In case of potential wear and tear of the impeller (e.g. by abrasive media), wear and tear of the mechanical seal is also possible. Verification of the mechanical seal and motor as well as the replacement of the electrical connecting cable may be carried out only by authorised customer services or the manufacturer's plant.

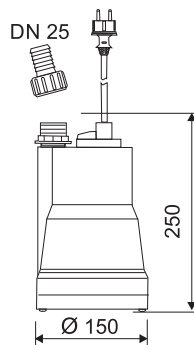


## 8 Detecting and removing malfunctions

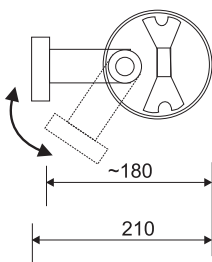
Malfunction	Cause	Troubleshooting
Motor does not rotate	<ul style="list-style-type: none"> <li>• Supply voltage missing</li> <li>• defective power cable</li> <li>• Impeller blocked</li> <li>• Activated motor protection (overheating, blockage, voltage error or other defect)</li> <li>• Motor defective</li> </ul>	<ul style="list-style-type: none"> <li>• Check if the plug is in the outlet</li> <li>• Replacement (customer service)</li> <li>• Clean impeller</li> <li>• Check and inform customer service</li> <li>• Replacement, (Customer service)</li> </ul>
Motor rotates, but does not convey or too little	<ul style="list-style-type: none"> <li>• Impeller clogged or worn</li> <li>• Pressure line clogged or hose kinked</li> </ul>	<ul style="list-style-type: none"> <li>• Clean or replace, inform customer service, if necessary</li> <li>• Clean the pressure line, remove kink</li> </ul>
Flow rate too low	<ul style="list-style-type: none"> <li>• Pump not properly ventilated (air bubble in the housing)</li> <li>• Pressure line dimensioned too small</li> </ul>	<ul style="list-style-type: none"> <li>• When commissioning the pump, bleed the pressure line so that water gets into the pump housing</li> <li>• minimum diameter 25 mm (1")</li> </ul>
Thermal switch shuts off the pump	<ul style="list-style-type: none"> <li>• Motor overloaded, because friction too high through contamination in pump housing</li> </ul>	<ul style="list-style-type: none"> <li>• Dismantle and clean pump, Reduce suction of foreign objects</li> </ul>

## 9 Technical data

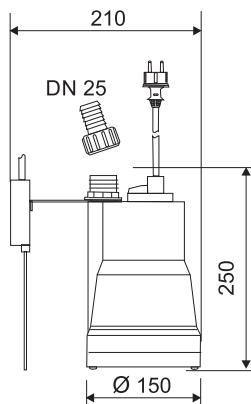
FSP	
Frequency	50 Hz
max. medium temperature	40° C
max. operating temperature	40° C
Maximum grain size	1 mm
Protection class	IP 68
Pressure connection	1", internal thread
Cable	H05 RN-F, 10 m



Type	Rated current [A] 1~ 230 V	Motor power P <sub>i</sub> [kW] 1~	Maximum pumping head [m]	Maximum flow rate [m³/h]	ON min. [mm]	OFF min. [mm]	Weight [kg]
FSP 330	1.3	0.3	7.0	5.5	15	1	3.77



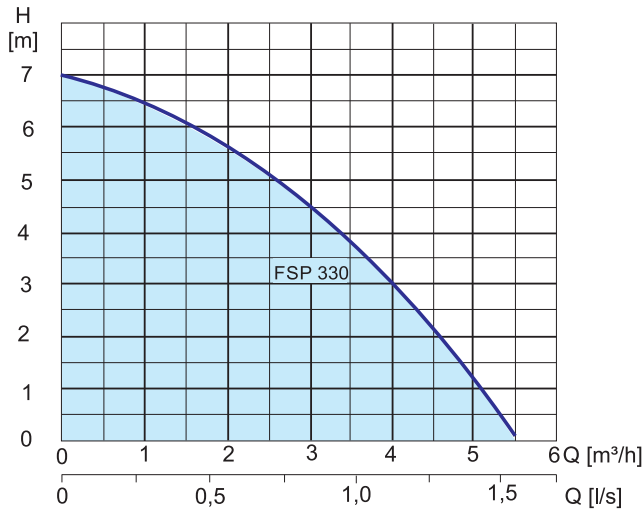
FSP 330 with ENS



## Material specification

- Impeller made of PA6 GK 30
- Motor seal: Shaft seal NBR
- Pump seal: End face mechanical seal consisting of carbon / ceramic / NBR
- Motor housing made of stainless steel 1.4301
- Pump housing made of PP GF 20
- Motor shaft made of stainless steel 1.4104

### Characteristic curve



### 9.1 Type plate

A type plate containing all essential technical data is attached to the pump.

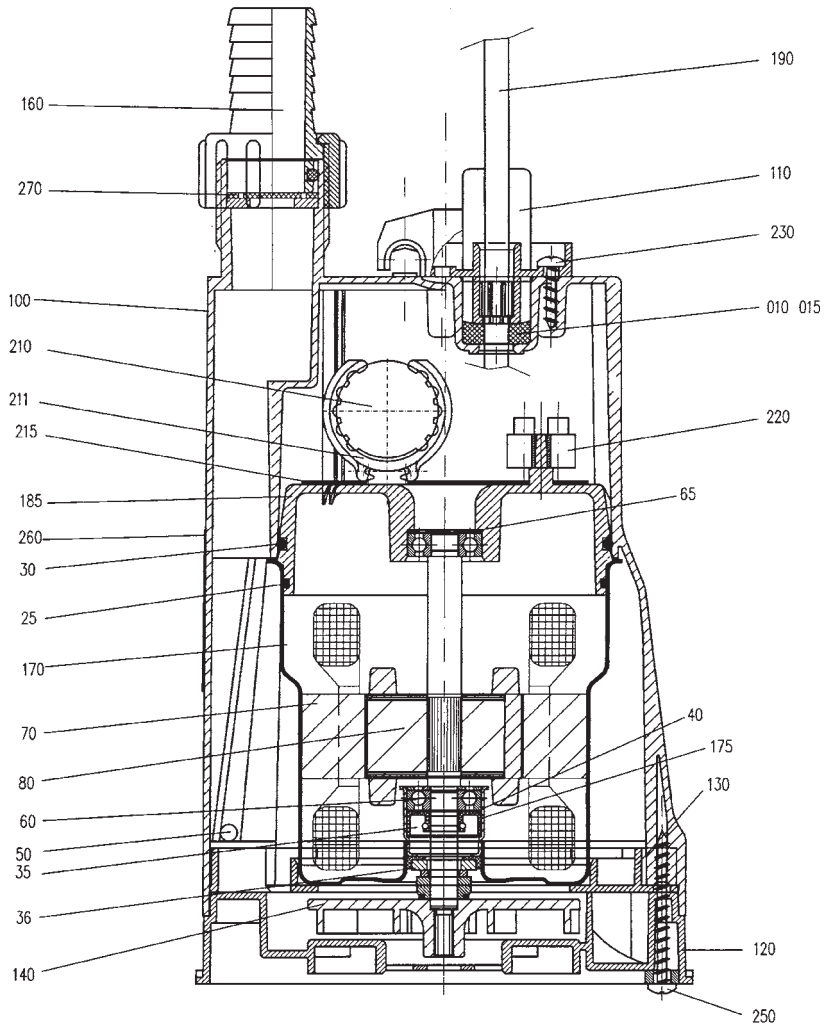


### Flachsaugpumpe FSP 330

$P_1$ : 300 W	$Q_{\max}$ : 5,5 m³/h
U,f : 230 V, 50 Hz	$H_{\max}$ : 7 m
$I_N$ : 1,3 A	$t_{\max}$ : 40°C
n : 2800 U/min	IP 68



## 10. List of spare parts



Item	Number	FSP 330	Zehnder factory number
	1	Motor unit, complete with rotor and impeller	12669
10	1	Seal ring D = 6	15739
15	1	Sealing plug	15755
30	1	O-Ring 88x4	11852
35	1	Radial shaft seal 8x22x7	16804
36	1	End-face mechanical seal	13688
40	1	Adjusting washer	15267
50	1	Ball	15742
60	2	Ball bearing 608	15743
65	1	Spring washer	15268
100	1	Outer case	15762
110	1	Handle	15757
120	1	Pump housing	15762
130	1	Support ring	10234
140	1	Impeller	15765
160	1	Hose nozzle	15753
190	1	Cable 11.5 m with plug	15778
210	1	Capacitor 5 µF	15791
211	1	Capacitor bracket	10131
215	1	Insulating washer	10073
220	1	Terminal strip, 5-pole	13165
230	4	Lenticular self tapping screw 3.9x16	15297
250	4	Lenticular self tapping screw 3.9x50	17582
270	1	Check valve	11888

## 11 Environmental notes

The cardboard packaging is recyclable and to be supplied to waste paper recycling. Please make the polystyrene cushions available for removal by the dual system (yellow bag).

Waste electric and electronic equipment often contain materials which can be reused. But they also include harmful substances which were necessary for the function and safety of the device. In residual waste, or in case of false treatment, these substances can damage human health and the environment. Therefore, in no case, do not put your old device to the residual waste!

Please use the municipal collection points which were set up at your place of residence to dispose of electrical or electronic devices.



## 12 Declaration of conformity

We herewith declare that, on account of its conception and construction type, the device designated in the following complies with the essential requirements relating to the following guidelines:

- Machinery Directive 2006/42/EG
- Low-Voltage Directive 2014/35/EU
- Electromagnetic Compatibility 2014/30/EU

Product designation: **Flat suction pump**

Type designation: **FSP 330**

Applicable EN standards: EN 60335-1:2012/A11:2014; EN 60335-2-41:2003/A2:2010  
EN 809:1998/AC:2010; EN 55014-1:2006/A2:2011,  
EN 55014-2:1997/A2:2008; EN 61000-3-2:2014,  
EN 61000-3-3:2013; EN 61000-6-1:2007,  
EN 61000-6-2:2005, EN 61000-6-3/A1:2011,  
EN 61000-6-4/A1:2011

The mounting and operating manuals have to be observed and followed.

**ZEHNDER Pumpen GmbH**  
**Zwönitzer Straße 19**  
**D-08344 Grünhain-Beierfeld**

Grünhain, 16.01.2024



Alexander Duba  
Produktmanager