Sewage lifting unit W80

Instruction manual

Herewith we **ZEHNDER Pumpen GmbH**
Zwönitzer Straße 19
08344Grünhain - Beierfeld,

declare that the wastewater lifting units of the W 80
series comply with the following relevant directives:

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

Applied harmonised standards, particularly

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
EN 12050-1

Lifting unit according to EN 12050-1
Tested by TÜV Rheinland under test report number 60318866-004

Grünhain, den 22.12.2017

Matthias Kotte
Produktentwicklung

1. General

1.1 Introduction

These operating instructions are valid for the wastewater lifting units of the W 80 series.

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!
As any other electrical appliance, this product can also fail due to missing main power or a technical defect. If a damage can occur as a result, an emergency power generator, a second system and/or a mains-independent alarm system should be planned according to the application. We as manufacturers will be happy to advise you also after the purchase. In case of defects or damages, please get in touch with our dealer.

Distributor: **Zehnder Pumpen GmbH**
Zwönitzer Straße 19
08344 Grünhain-Beierfeld

Construction sizes: W 80
W 80 Doppel

Version of the operating manual: 11.2021

1.2 Inquiries and purchase orders

Please send your inquiries and orders to your specialist retailer or your retailer.

1.3 Technische Daten

Typ	P_1 [kW]	P_2 [kW]	U (V)	I_{max} [A]	[min^{-1}]	Pressure outlet	Inlet	Inlet height h [mm]	Weight [kg]
W 80	4,0	3,0	400	6,9	1400	DN 100	DN 150	900	115
W 80 Doppel	2 x 4,0	2 x3,0	400	2 x 6,9	1400	DN 100	DN 150	900	205

Typ	Gross-Volume [l]	Space required LxB [mxm]	Flow rate Q_{max} [m^3/h]	Delivery-Height H_{max} [m]	Cable length [m]	Impeller-shape
W 80	350	1 x 1	60	11	3,5	Vortex wheel
W 80 Doppel	480	1,5 x 1,5	60	11	3,5	Vortex wheel

Maximum medium temperature: 50°C

Materials
Vessel.....PE-HD
Impeller.....GFK (vortex impeller)
Seal carrier.....gray cast iron
Motor shaft.....Stainless steel
Pump housing.....Gradual cast iron
Seals..... NBR

1.4 Application area

The wastewater lifting units of the W80 series are used for the disposal (collection and conveyance) of domestic and industrial wastewater, including fecal matter, which accumulates below the sewer backflow level.
Double units are used wherever, according to DIN 1986, an interruption of the sewage disposal must not occur.
The wastewater lifting units of the W 80 series must not be used for pumping wastewater containing substances which attack or damage the materials of the pump or the collection tank.

Application limits

- **The lifting unit is not designed for continuous operation! The delivery data stated on the factory plate only apply to intermittent operation (S3 25 %).**
- **The maximum permissible inlet flow rate must always be smaller than the flow rate of a pump (see nameplate)**

1.5 Zubehör

The W80 series sewage lifting units are supplied with:
- Switchgear incl. level control

2. Safety:

(from: "VDMA standard sheet 24 292")

These operating instructions contain basic instructions which have to be observed during set-up, operation and maintenance. For this reason, these operating instructions 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 device.

Not only the general safety instructions mentioned in this main point on safety have to be observed, but also the special safety instructions mentioned in the other main points, for example for private use.

2.1 Labelling of instructions in the operating instructions

The safety instructions mentioned in these operating instructions, which may cause hazards for persons in case of non-observation, have been marked by the general danger symbol

Safety sign according to DIN 4844 - W 9

in case of warning against electrical voltage with

Sicherheitszeichen nach DIN 4844 - W 8

besonders gekennzeichnet.

In case of safety instructions, the non-observation of which may cause hazards for the device and its functions, the word ATTENTIO is added.

Notes directly attached to the device, such as
- Rotation arrow
- Marks for fluid connections

must be definitely observed and kept in legible condition.

2.2 Qualification and training of staff

The personnel for operation, maintenance, inspection and assembly must have the appropriate qualifications for this work. The area of responsibility, competence and supervision of the personnel must be precisely regulated by the operator. If the personnel do not have the necessary knowledge, they must be trained and instructed. If necessary, this can be done by the manufacturer/supplier on behalf of the machine operator. Furthermore, the operator must ensure that the contents of the operating instructions are fully understood by the personnel.

2.3 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 the pump. The non-observation of the safety instructions will result in the loss of all claims for damages.

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

- Malfunction of important functions of the pump
- 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

2.4 Safety-conscious work

The safety instructions mentioned in these operating instructions, the existing national regulations on accident prevention as well as potential in-company work, operating and safety instructions of the user must be observed.

2.5 Safety instructions for user / operator

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

- The pumps are equipped with a thermal winding protection, so when the motor cools down, the pump will start automatically. In case of repairs and maintenance works, the device must therefore definitely disconnected from the mains!

- 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).

2.6 Safety instructions for maintenance, inspection and installation work

The user has to make sure that all maintenance, inspection and installation work is carried out by authorised and qualified specialist personnel only, who has sufficiently been informed by studying the operating instructions. Only genuine spare parts may be used. Basically, work on the pump may be carried out only at standstill. The procedure to shut down the pump described in the operating instructions must be observed by all means. Pumps or pump assemblies, which convey media hazardous to health, must be decontaminated. Immediately after completing the work, all safety and protection devices have to be fitted again and/or have to be made functional again.

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

2.7 Unauthorised modification and spare parts production

Modifications or changes to the machine shall be permissible only after consultation with the manufacturer. Original spare parts and accessories authorised by the manufacturer serve to ensure safety. The use of other parts may results in the loss of liability for the consequences that may occur.

2.8 Impermissible operating modes

The operational safety of the machine supplied is ensured only when used as intended according to Section 1 - General - of the operating instructions. The threshold values indicated in the data sheet must by no means be exceeded.

3. Transport and intermediate storage

3.1 Transport

The W80 series wastewater lifting units must not be thrown or dropped. In addition, they are to be transported horizontally.

3.2 Interim storage/preservation

For temporary storage and preservation, it is sufficient to store them in a cool, dark, dry and frost-proof place. The units should stand horizontally.

4. Description

4.1 General

The wastewater lifting units of the W80 series are plug-in, fully flood-proof single or double units with gas- and odor-tight plastic collecting tank. They operate with vertical, clog-free sewage pumps with automatic level control. They are equipped complete with switchgear and pitot tube for level detection.

4.2 Design and operation

The wastewater (natural gradient) flows through the DN 150 inlet (flange connection) into the collection tank of the W80 wastewater lifting unit. The collection tank is designed for unpressurized operation, i.e. the wastewater is temporarily stored without pressure and then pumped into the sewer.
The water rises in the pitot tube screwed into the top of the tank and compresses the air in the pitot tube until the pressure actuates the pitot switch in the control box. This switches on the pump and conveys the water from the tank via the pressure pipe into the higher sewer. In the case of the W 80 Double lifting unit, there is a changeover switch in the switch box which causes the pumps to be switched on alternately. Only in case of overload operation (one pump cannot cope with the incoming water volume) the second pump switches on.
A small compressor continuously bubbles air through the suction pipe to prevent clogging of the pitot tube.
A non-return valve in the pressure line (to be provided in accordance with DIN 19 760) prevents the water from running back from the pressure line into the tank.
The switchgear is equipped with an alarm buzzer which is activated in the event of pump(s) failure or if the water level in the tank is too high. Furthermore, alarm contacts for externally connectable alarm devices (bell, horn, etc.) are provided in the switchgear. Please refer to the circuit diagram of the switchgear for the location.

5. Installation

5.1 Preparations

- The trouble-free operation of the lifting unit depends not least on correct and proper installation. For this reason, the following points must be observed:
- The installation site should be a well-ventilated, dry and frost-free room.
- The installation site must be sufficiently dimensioned. The room height should be approx. 2 to 2.5 m. According to DIN 1986 Part 3: *"...All system parts...(and)...all operating elements...must be safely accessible and easy to operate at all times. ...These system parts must not be obstructed by stored goods, furniture, coverings or similar..."*
- The foundation of the installation room must be designed to withstand the possible loads that may occur, depending on the size of the system.
- Groundwater or seepage often collects in the rooms, which are often located at a lower level. Therefore, a small shaft should be provided in a corner of the room where these liquids can collect and be disposed of with a basement drainage pump.
- A ceiling hook above the installation site of the lifting unit facilitates installation and any maintenance and repair work on the pump.
- Before starting the installation, all construction and pipe dimensions should be checked and compared with the dimensions of the unit. Special care should be taken to ensure that the inlet pipe, which is always falling, is not lower than the inlet height of the collection tank.

5.2 Assembly

During assembly, it is essential to ensure a stress-free and tight installation of the pipelines and the fittings.

5.2.1 Lineup

The wastewater lifting units of the W80 series are aligned at the installation site according to any existing pipelines. Here it is now set up exactly horizontally and fastened to the floor.
DIN 19 760 Part 1:*"...The sewage lifting unit must be designed in such a way that twisting and floating is avoided by means of fastening devices...".*

5.2.2 Inlet

The inlet pipe is connected to the DN 150 flange. It must always be laid on a downward slope. Gradient sections in the inlet are not permitted.

5.2.3 Pressure line

The installation of a non-return valve in the pressure line of the lifting unit is mandatory:
DIN 19 760 Part 3: *"...backflow preventers must automatically prevent the wastewater from flowing back out of the pressure line after the delivery flow is interrupted. When conveying starts, the backflow preventer must open automatically..."*
It is recommended that a gate valve be installed downstream of the check valve to facilitate cleaning or possible replacement of the check valve.
The discharge pipe must be laid steadily rising and without unnecessary jumps in a bend above the backflow level and then steadily falling to the sewer connection. Pipe and fittings must be supported with pipe clamps or brackets, if necessary.

5.2.4 Venting

The tank vent (DN 100 flange) is either connected directly to the vent line of the building or installed separately leading over the roof.

5.2.5 Electrical connection

Safety regulations

- **All electrical installations used must comply with the IEC 364 / VDE 0100 standard, i.e. sockets, for example, must have grounding terminals.**
- **The electrical connection may only be carried out by a qualified electrician! Observe the relevant VDE regulations 0100!**
- **The electrical network to which the unit is connected must have a high-sensitivity separate residual current circuit breaker IA <30 mA upstream of the control unit, or to prevent failure of the control unit when the residual current circuit breaker responds, one residual current circuit breaker per pump must be installed between the control unit and the pump. When installing in bath and shower rooms, the relevant DIN VDE 0100 Part 701 regulations must be observed.**
- **Please observe the regulations of EN 12 056-4.**
- **In the case of a three-phase connection, the external fuse protection must be implemented with automatic circuit breakers of characteristic K, generally 3-pole mechanically interlocked. This ensures complete mains isolation and excludes 2-phase operation.**
- **All electrical devices such as control unit, alarm transmitter and socket must be installed in dry rooms to prevent flooding.**
- **Attention! Before each assembly and disassembly of the pump or other work on the unit, it must be disconnected from the electrical mains.**
- **The motor can overheat due to overloading. In case of overheating, never touch the hot surfaces on the motor.**
- **If an extension cable is used, it must be of the same quality as the connection cable supplied.**

The control box must be installed in such a way that the blue pneumatic hose for the pneumatic level control can be laid in a continuously rising position. This is the only way to ensure proper functioning of the automatic control system. The switchgear is connected to the electrical unit according to the wiring diagram. The circuit diagram for the wiring of the lifting unit is located in the switch box and should be left there to facilitate the work of the maintenance and customer service personnel.

6. Inbetriebnahme

Before commissioning, all connections must be checked again for correct installation, the gate valve(s) must be opened. Now the plug is plugged into the socket (single system) or the voltage is switched on (double system) and the direction of rotation of the pump is checked for three-phase systems. To do this, remove the screw plug on top of the pot motor. Then the pump is briefly set to "manual" with the manual/0/automatic switch. When the motor runs out, the direction of rotation of the motor shaft on the top of the motor can be compared with the correct direction of rotation (direction of rotation arrow). If the pump rotates in the wrong direction, two of the three phases must be reversed. In the case of double lifting systems, both pumps must be checked. It is then essential to screw the screw plug firmly back into the motor head.

Before carrying out any work on the electrical unit, it must be disconnected from the power supply and secured against unauthorized disconnection!

Now the manual/0/automatic switch is set to "Automatic" and a test run is performed. For this purpose, the collection tank is filled via the normal inlet (sink, toilet, etc.). The unit must switch on automatically, pump the tank empty and switch off again. After switching off, no water may run from the pressure line back into the tank. During the test run, all pipes and fittings are checked again for leaks and resealed if necessary.
If the lifting unit is working properly, the switch remains in the "Automatic" position.

7. Service/Maintenance

7.1 Inspection and maintenance intervals

Inspection and maintenance intervals according to DIN 1986 Part 31: *"Wastewater lifting stations should be checked once a month by the operator for operability and tightness by observing a switching cycle. ...The unit should be maintained by an expert. The intervals should not be greater than*
1. ¼ year for units in commercial operations.
2. ½ year for units in multi-family dwellings.
3. 1 year for units in single-family houses.

7.2 Maintenance

Before carrying out any work on the unit, it must be disconnected from the power supply and secured against unauthorized closing!

7.2.1 Collecting tank

Open the inspection cover and spray out the tank using a hose to loosen dirt deposits on the tank walls. Unscrew the pitot tube and clean it.

7.2.2 Check valve

Open the inspection cover and clean the check valve from the inside.

7.2.3 Other

All further maintenance work must be carried out by the customer service.

The following, among others, may not be discharged:

- **Solids, fibrous materials, tar, sand, cement, ash, coarse paper, wet wipes, paper towels, cardboard, debris, garbage, slaughterhouse waste, grease, oils.**
- **All drainage objects above the backflow level (EN 12 056-1).**
- **Wastewater containing harmful substances (DIN 1986-100), e.g. grease-containing wastewater from commercial kitchens. Discharge may only take place via a grease separator in accordance with DIN 4040-1.**
- **Wastewater containing substances that attack or damage the materials of the pump or collection tank.**

8. Malfunctions: Causes and elimination

Disconnect the mains plug before carrying out any work on the unit!

To remove the motor unit from the tank, only loosen the 4 hexagon socket head screws (pos. 13 of the spare parts list). The 4 hexagon head screws (pos. 5 of the spare parts list) must not be loosened, as otherwise the mechanical seal will be destroyed, oil will leak out and the warranty will be voided!

Malfunction	Cause	Remedy
1. Motor does not rotate	- voltage too low, voltage missing - wrong power connection - power cable defective - impeller blocked - motor protection switched off due to overheating blocking, voltage error - Control error / pneumatic hose defective	- Check supply - Correction - Exchange/Customer service - Cleaning - Check/Customer Service - Exchange/Customer Service
1. Motor turns, but does not convey	- Impeller clogged or worn - Check valve clogged - Gate valve clogged or plugged - Discharge line clogged - Suction port clogged - Direction of rotation incorrect - Lack of water in tank - Tank venting clogged - Pump housing venting clogged	- Cleaning/Exchange - Cleaning - Cleaning/Opening - Cleaning - Cleaning - Correction - Shutdown/Customer service - Cleaning - Clean
3. Motor turns and shuts off	- Voltage incorrect or fluctuating - Thermal protection incorrectly set - Current consumption too high	- Correction/Customer Service - Check/Customer Service - Customer service
4. Motor does not switch off	- Control error - Pitot tube clogged	- Customer Service - Check/Clean

9. Warranty

As the manufacturer, we warrant this device for 24 months from the date of purchase.

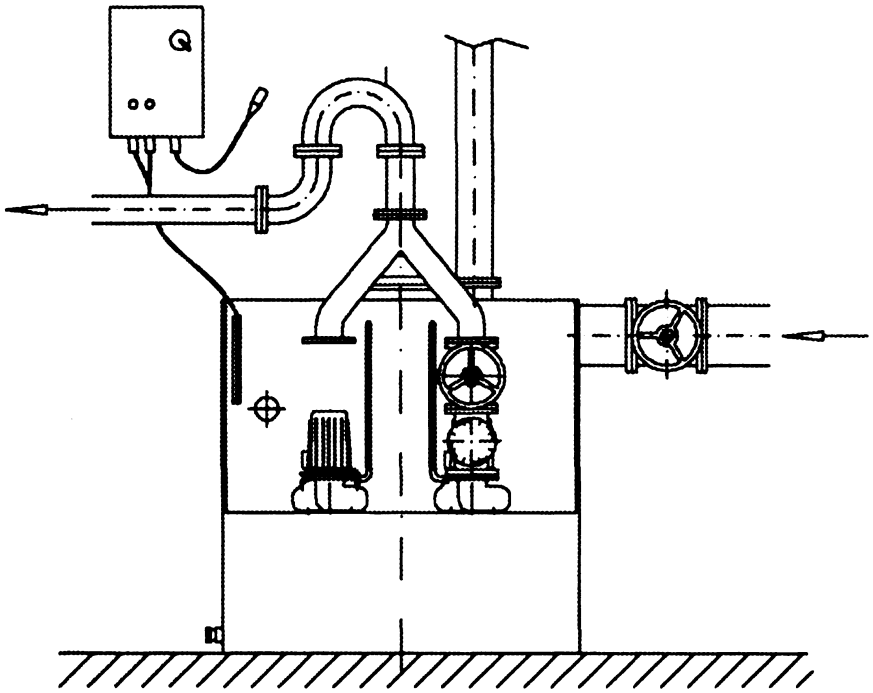
Your proof of purchase is valid as proof. Within this warranty period, we will remedy at our discretion by repair or replacement free of charge all defects that are due to material or manufacturing defect

Damage caused by improper use and wear is excluded from the warranty. Consequential damage caused by failure of the device will not be covered by us.

10. Technical changes

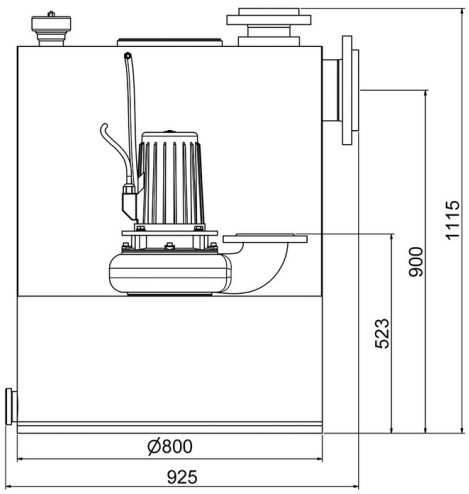
We reserve the right to make technical changes in the interest of further development.

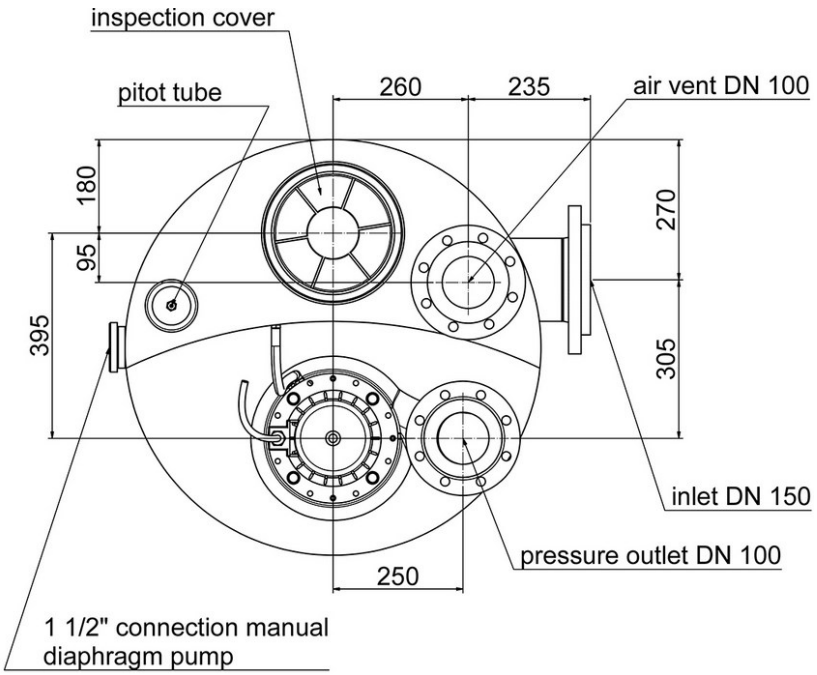
Appendix A: Installation example



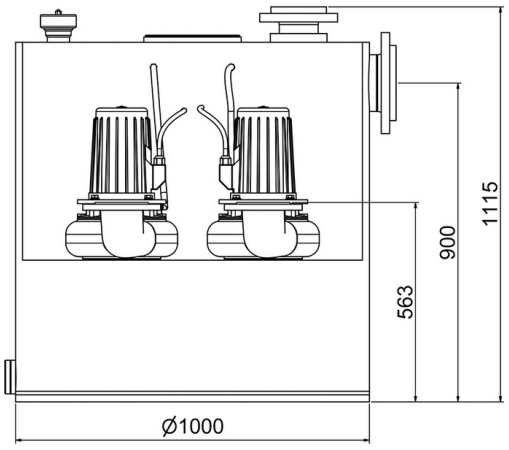
Appendix B: Dimensions

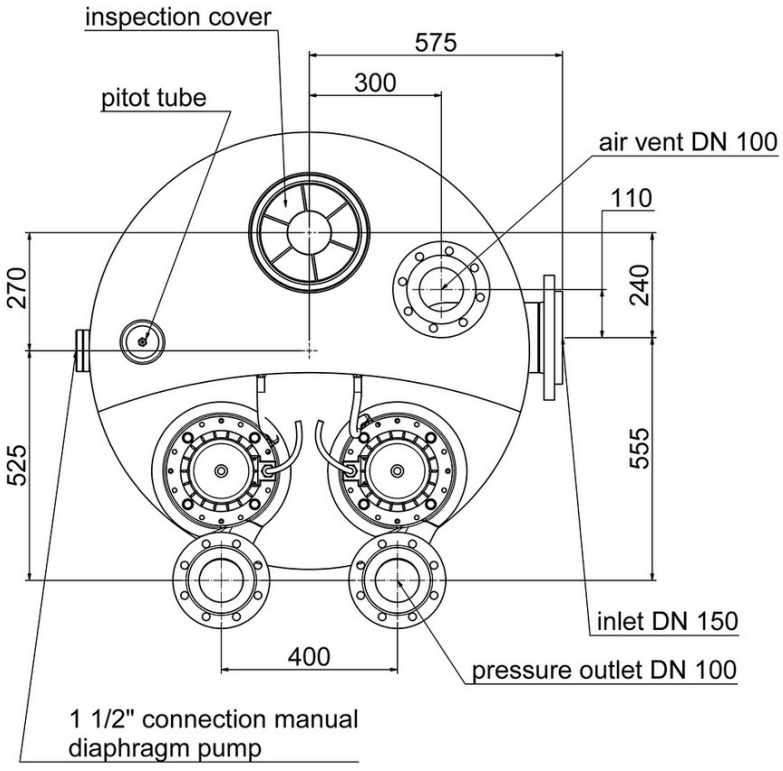
W80



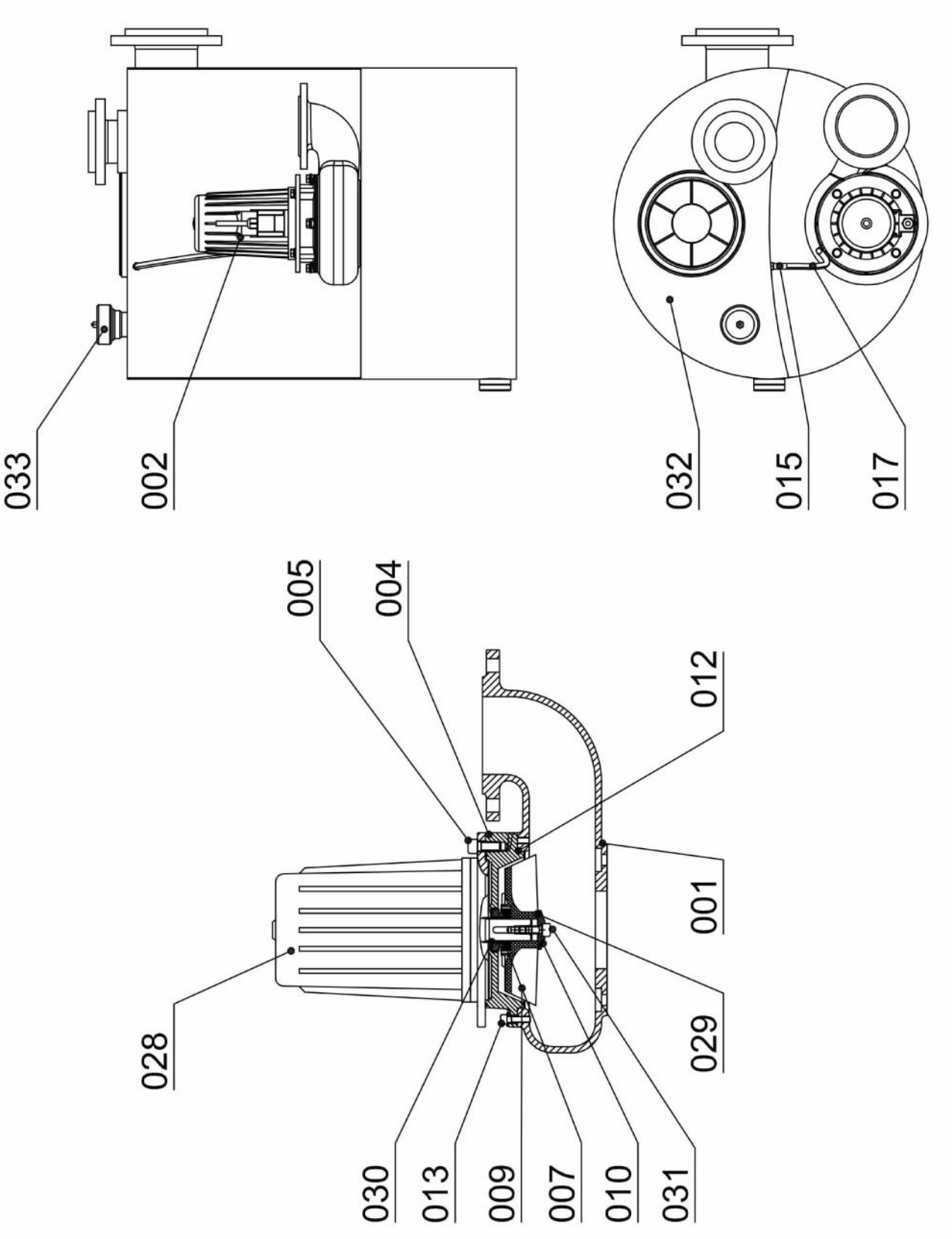


W80 Duplex





Appendix C: Sectional drawing and spare parts list



ZngPos	G.-Menge	ME	ArtNr	Bezeichnung	
001	1,000	Stk	11122	Pumpengehäuse ZP/100-G, bea. je Pumpeneinheit	
002	1,000	Stk	10629	Motoreinheit 3,0 KW 400V GG	
002	2,000	Stk	10629	Motoreinheit 3,0 KW 400V GG	
004	1,000	Stk	14805	Dichtungsträger ZP201-GG	
005	4,000	Stk	16380	Sechskantschr. M12x25 A2	
007	1,000	Stk	14807	Hartgußdichtung 40 -klein-	
007	1,000	Stk	20189	Gleitringdichtung Boy/MB Kit	
009	1,000	Stk	17147	Wirbelrad Ø190	
009	1,000	Stk	10063	Wirbelrad D=190 Hartgußdichtg	
010	1,000	Stk	11687	Laufradkappe D=42	
012	2,000	Stk	14795	O-Ring 190x3-NBR70	
015	1,000	Stk	10849	Schlauchtülle gerade 12-G 3/8	
015	1,000	Stk	10849	Schlauchtülle gerade 12-G 3/8 je Motoreinheit	
017	0,600	m	10704	PVC-Schlauch glasklar ID12x2mm	
017	0,500	m	10704	PVC-Schlauch glasklar ID12x2mm je Motoreinheit	
028	1,000	Stk	14800	Topfmotor 3,0 kW S3-25% 400V	
029	1,000	Stk	10694	O-Ring 15,47x3,53 NBR70	
029	1,000	Stk	11858	O-Ring 30x2,5	
030	1,000	Stk	10497	Distanzhülse 3,0 kW / 4,0 kW	
031	1,000	Stk	16544	Innensechskantschr. M10x50 A2	
032	1,000	Stk	11093	Sammelbehälter W 80	
032	1,000	Stk	11094	Sammelbehälter W 80 Doppel	
033	1,000	Stk	10688	Staurohr W80/WUZ Behälter	
	1,000	Stk	21714	ZPS 1 2.5. -pneum+Schwimmer	nicht dargestellt
	4,000	Stk	16402	Sechsk.schr. DIN 933-M12x55-A2 je Pumpeneinheit	
	4,000	Stk	16381	Innensechskantschr. M8x25 A2 je Pumpeneinheit	
	1,000	Stk	16644	Schlauchschelle 10-16 W4 nicht dargestellt	für Pos. 017
	2,000	Stk	16375	Flachdichtung DN100 NBR70/SBR	nicht dargestellt
	1,000	Stk	16503	Sechskantschr. M8x10 A2	nicht dargestellt
	1,000	Stk	11672	Dichtring 8x14x1 Cu	nicht dargestellt
	4,000	Stk	16479	Federring B12 A2 nicht dargestellt	für Pos. 005
	1,000	Stk	16683	Flachdichtung DN150 DIN 2690	nicht dargestellt
	4,000	Stk	16734	Unterlegscheibe 13x24x2,5 A2 nicht dargestellt	für Pos. 005
	1,000	Stk	14894	Kleinkompressorset	nicht dargestellt
	1,000	Stk	16419	Paßfeder A8x7x22	nicht dargestellt
	5,000	m	14817	Pneumatikschlauch blau 8/6 mm	nicht dargestellt
	4,000	Stk	16479	Federring B12 A2 je Pumpeneinheit	
	4,000	Stk	16514	Sechskantmutter DIN934 M12 A4 je Pumpeneinheit	
	4,000	Stk	16734	Unterlegscheibe 13x24x2,5 A2 je Pumpeneinheit	
	1,000	Stk	20190	Laufradkappe D42 kompl.	
	4,000	Stk	11503	Unterlegscheibe DIN125 M8 A2 je Pumpeneinheit	
	1,000	Stk	16452	Dichtring Cu 10x15x1 nicht dargestellt	für Pos. 031
	1,000	Stk	14797	Flachdichtung 220x100x3(Dxdxs) je Pumpeneinheit	zw. Behälter - PG
	1,000	Stk	16644	Schlauchschelle 10-16 W4 je Motoreinheit	für Pos. 017
	0,250	l	11690	technisches Weißöl NFW	
	1,000	Stk	10705	Winkeltülle 12-G 3/8	