

Floodable Sewage Lifting Unit

## Compacta

From Series S-V/1  
From Series 2013w01

## Installation/Operating Manual



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Installation/Operating Manual Compacta

Original operating manual

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## Glossary

### ATEX

The acronym ATEX is the French abbreviation for "Atmosphère explosible" and refers to the two European Union (EU) directives covering the area of explosion protection: ATEX Equipment Directive 2014/34/EU (also referred to as ATEX 95) and ATEX Workplace Directive 1999/92/EC (also referred to as ATEX 137).

### Bubbler control with compressor

The air compressor is integrated in the measuring system in addition to the pneumatic level measurement. Condensation can be discharged.

### Certificate of decontamination

A certificate of decontamination is enclosed by the customer when returning the product to the manufacturer to certify that the product has been properly drained to eliminate any environmental and health hazards arising from components in contact with the fluid handled.

### DIN 1986-3 and -30

German standard which stipulates technical rules for the operation, maintenance and servicing of drainage systems in buildings and on premises

### DOL starting

For low power ratings (usually up to 4 kW), the three-phase motor is connected directly to the mains voltage.

### Effective volume

Volume in the collection tank between start and stop level that can be lifted

### EN 12 056-4

European standard governing the selection, operation and maintenance of sewage lifting units within buildings and sites.

### EN 12050-1

European Standard for sewage lifting units which are used to dispose of sewage with faeces occurring below the flood level of buildings and land. It defines general requirements as well as principles of construction and testing.

### Flood level

Maximum backflow level of waste water in a drainage system

### Nominal diameter DN

Identifier (inside diameter) used for characterising mating components such as pipes, pipe connections and fittings

### Pneumatic level measurement

Determining the liquid level in the tank by means of a pressure sensor integrated in the control unit.

### Separator

Device for physically separating the two phases of a two-phase flow, e.g. for separating solid particles or liquid drops from flowing gases.

### Sewage lifting unit

Device for collecting and automatically lifting waste water with or without faeces above the flood level

### Soft starting

Measures taken to limit the output of a power supply unit or electric motor, to limit the starting current, and avoid excessive acceleration and torques.

### Star/delta starting

For starting large three-phase squirrel-cage motors (5.5 kW and above). Prevents voltage dips and fuses from tripping. Used if direct starting would result in a high starting current.

### Stormwater

Water from natural precipitation which has not been contaminated by any form of use

### Vent line

Pipe provided to limit pressure fluctuations within the sewage lifting unit. The vent line is led through the roof.

## 1 General

### 1.1 Principles

This operating manual is valid for the type series and variants indicated on the front cover.

The operating manual describes the proper and safe use of this equipment in all phases of operation.

The name plate indicates the type series, the main operating data and the serial number. The serial number uniquely describes the product and is used as identification in all further business processes.

In the event of damage, immediately contact your nearest KSB service facility to maintain the right to claim under warranty.

### 1.2 Installation of partly completed machinery

To install partly completed machinery supplied by KSB refer to the sub-sections under Servicing/Maintenance.

### 1.3 Target group

This operating manual is aimed at the target group of trained and qualified specialist technical personnel. (⇒ Section 2.3, Page 9)


### 1.4 Other applicable documents

**Table 1:** Overview of other applicable documents

Document	Contents
Sub-supplier product literature	Operating manuals and other product literature describing accessories and integrated machinery components








### 1.5 Symbols

**Table 2:** Symbols used in this manual

Symbol	Description
✓	Conditions which need to be fulfilled before proceeding with the step-by-step instructions
▷	Safety instructions
⇒	Result of an action
⇔	Cross-references
1. 2.	Step-by-step instructions
	Note Recommendations and important information on how to handle the product

### 1.6 Key to safety symbols/markings

Table 3: Definition of safety symbols/markings

Symbol	Description
	<b>DANGER</b> This signal word indicates a high-risk hazard which, if not avoided, will result in death or serious injury.
	<b>WARNING</b> This signal word indicates a medium-risk hazard which, if not avoided, could result in death or serious injury.
	<b>CAUTION</b> This signal word indicates a hazard which, if not avoided, could result in damage to the machine and its functions.
	<b>Explosion protection</b> This symbol identifies information about avoiding explosions in potentially explosive atmospheres in accordance with EU Directive 2014/34/EU (ATEX).
	<b>General hazard</b> In conjunction with one of the signal words this symbol indicates a hazard which will or could result in death or serious injury.
	<b>Electrical hazard</b> In conjunction with one of the signal words this symbol indicates a hazard involving electrical voltage and identifies information about protection against electrical voltage.
	<b>Machine damage</b> In conjunction with the signal word CAUTION this symbol indicates a hazard for the machine and its functions.



## 2 Safety

All the information contained in this section refers to hazardous situations.

In addition to the present general safety information the action-related safety information given in the other sections must be observed.

### 2.1 General

- This operating manual contains general installation, operating and maintenance instructions that must be observed to ensure safe operation of the system and prevent personal injury and damage to property.
- Comply with all the safety instructions given in the individual sections of this operating manual.
- The operating manual must be read and understood by the responsible specialist personnel/operators prior to installation and commissioning.
- The contents of this operating manual must be available to the specialist personnel at the site at all times.
- Information and markings attached directly to the product must always be complied with and kept in a perfectly legible condition at all times. This applies to, for example:
  - Arrow indicating the direction of rotation
  - Markings for connections
  - Name plate
- The operator is responsible for ensuring compliance with all local regulations not taken into account.

### 2.2 Intended use

- The lifting unit must not be used in potentially explosive atmospheres.
- The lifting unit must only be operated within the operating limits described in the other applicable documents.
- Only operate lifting units which are in perfect technical condition.
- Do not operate partially assembled lifting units.
- Only use the lifting unit to handle the fluids described in the product literature of the respective design variant.
- Never operate the lifting unit without the fluid to be handled
- Observe the minimum flow rates indicated in the data sheet or product literature (to prevent overheating, bearing damage, etc).
- Observe the minimum flow rate and maximum flow rate indicated in the data sheet or product literature (to prevent overheating, mechanical seal damage, cavitation damage, bearing damage, etc.).
- Do not throttle the flow rate on the inlet side of the lifting unit (to prevent cavitation damage)
- Consult the manufacturer about any use or mode of operation not described in the data sheet or product literature.
- Never exceed the permissible application and operating limits specified in the data sheet or product literature regarding pressure, temperature, etc.
- Observe all safety information and instructions in this manual.

### 2.3 Personnel qualification and training

All personnel involved must be fully qualified to install, operate, maintain and inspect the equipment this manual refers to.

The responsibilities, competence and supervision of all personnel involved in installation, operation, maintenance and inspection must be clearly defined by the operator.

Deficits in knowledge must be rectified by means of training and instruction provided by sufficiently trained specialist personnel. If required, the operator can commission the manufacturer/supplier to train the personnel.

Training on the lifting unit must always be supervised by technical specialist personnel.

#### **2.4 Consequences and risks caused by non-compliance with this manual**

- Non-compliance with these operating instructions will lead to forfeiture of warranty cover and of any and all rights to claims for damages.
- Non-compliance can, for example, have the following consequences:
  - Hazards to persons due to electrical, thermal, mechanical and chemical effects and explosions
  - Failure of important product functions
  - Failure of prescribed maintenance and servicing practices
  - Hazard to the environment due to leakage of hazardous substances

#### **2.5 Safety awareness**

In addition to the safety information contained in this operating manual and the intended use, the following safety regulations shall be complied with:

- Accident prevention, health regulations and safety regulations
- Explosion protection regulations
- Safety regulations for handling hazardous substances
- Applicable standards, directives and laws

#### **2.6 Safety instructions for the operator/user**

- Fit protective equipment (e.g. contact guards) supplied by the operator for hot, cold or moving parts, and check that the equipment functions properly.
- Do not remove any protective equipment (e.g. contact guards) during operation.
- Provide the personnel with protective equipment and make sure it is used.
- Contain leakages (e.g. at the shaft seal) of hazardous fluids handled (e.g. explosive, toxic, hot) so as to avoid any danger to persons and the environment. Adhere to all relevant laws.
- Eliminate all electrical hazards. (In this respect refer to the applicable national safety regulations and/or regulations issued by the local energy supply companies.)

#### **2.7 Safety information for maintenance, inspection and installation**

- Modifications or alterations of the lifting unit require the manufacturer's prior consent.
- Use only original spare parts or parts authorised by the manufacturer. The use of other parts can invalidate any liability of the manufacturer for resulting damage.
- The operator ensures that maintenance, inspection and installation are performed by authorised, qualified specialist personnel who are thoroughly familiar with the manual.
- Carry out work on the lifting unit during standstill only.
- The pump casing must have cooled down to ambient temperature.
- Pump pressure must have been released and the pump must have been drained.
- When taking the lifting unit out of service always adhere to the procedure described in the manual.

- Decontaminate lifting units which handle fluids posing a health hazard.  
(⇒ Section 8.1, Page 47)
- As soon as the work has been completed, re-install and re-activate any safety-relevant devices and protective devices. Before returning the product to service, observe all instructions on commissioning.
- Make sure the lifting unit cannot be accessed by unauthorised persons (e.g. children).

### **2.8 Unauthorised modes of operation**

Always observe the limits stated in the product literature.

The warranty relating to the operating reliability and safety of the lifting unit supplied is only valid if the equipment is used in accordance with its intended use.  
(⇒ Section 2.2, Page 9)

### 3 Transport/Storage/Disposal

#### 3.1 Checking the condition upon delivery

1. On transfer of goods, check each packaging unit for damage.
2. In the event of in-transit damage, assess the exact damage, document it and notify KSB or the supplying dealer and the insurer about the damage in writing immediately.

#### 3.2 Transport

	<b>DANGER</b>
	<p><b>Lifting unit falling off the pallet</b> Risk of injury from falling lifting unit!</p> <ul style="list-style-type: none"> <li>▷ Always transport the lifting unit in a horizontal position.</li> <li>▷ Give due attention to the weight data, centre of gravity and fastening points.</li> <li>▷ Never suspend the lifting unit by its power cable.</li> <li>▷ Use suitable and permitted transport equipment, e.g. crane, forklift or pallet truck.</li> </ul>

Table 4: Weight

Size	Weight <sup>1)</sup>
	[kg]
U100	84
U300	113
UZ150	159
UZ300	164
UZ450	205
UZ900	285

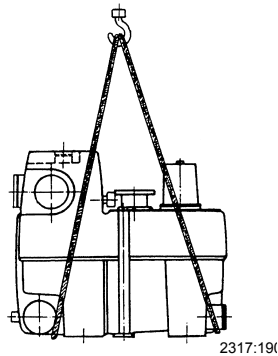


Fig. 1: Transporting the sewage lifting unit (example)

- ✓ Transport equipment / lifting equipment suitable for the corresponding weight has been selected and is on hand.
1. Attach transport equipment / lifting equipment to the sewage lifting unit.
  2. Transport the sewage lifting unit to the place of installation.
  3. Undo holder 732 at the pallet.
  4. Lift the sewage lifting unit off and place it down at the place of installation.

1) Weight of the lifting unit without fill



### 3.3 Storage/preservation

	<b>CAUTION</b>
	<p><b>Damage during storage due to frost, humidity, dirt, UV radiation or vermin</b> Corrosion/contamination of the lifting unit!</p> <p>▸ Store the lifting unit in a frost-proof, roofed area.</p>
	<b>CAUTION</b>
	<p><b>Wet, contaminated or damaged openings and connections</b> Leakage or damage of the lifting unit!</p> <p>▸ Only open the openings of the lifting unit at the time of installation.</p>
	<b>NOTE</b>
	<p>Please observe the manufacturer's instructions for application and removal of the preservative.</p>

If commissioning is to take place some time after delivery, we recommend that the following measures be taken :

**Storage** Store the sewage lifting unit in a dry, protected room with a constant atmospheric humidity.

**Table 5:** Permissible ambient temperatures

Permissible ambient temperature	Value
Maximum	+40 °C
Minimum	0 °C



- Preservation**
1. Remove hexagon socket head cap screws 914.04.
  2. Remove rotating assembly 01-44 from plate 185.01 using two forcing screws (M8).
  3. Lift rotating assembly 01-44 out of collecting tank 591.
  4. Preserve rotating assembly 01-44 with oil.
  5. Fasten rotating assembly 01-44 with hexagon socket head cap screws 914.04. Observe the tightening torques. (⇒ Section 8.6, Page 51)

### 3.4 Return to supplier

1. Drain the lifting unit as described in the manual.
2. Always flush and clean the lifting unit, particularly if it has been used for handling noxious, explosive, hot or other hazardous fluids.
3. If the unit has handled fluids whose residues could lead to corrosion damage in the presence of atmospheric humidity or could ignite upon contact with oxygen, the unit must also be neutralised and blown through with anhydrous inert gas to ensure drying.
4. Always complete and enclose a certificate of decontamination when returning the lifting unit. (⇒ Section 13, Page 74)  
Always indicate any safety and decontamination measures taken.

	<b>NOTE</b>
	<p>If required, a blank certificate of decontamination can be downloaded from the following web site: <a href="http://www.ksb.com/certificate_of_decontamination">www.ksb.com/certificate_of_decontamination</a></p>

### 3.5 Disposal

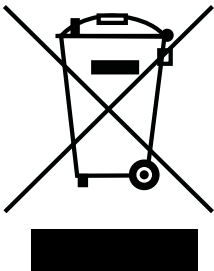
	 <b>WARNING</b>
	<p><b>Fluids handled, consumables and supplies which are hot and/or pose a health hazard</b></p> <p>Hazard to persons and the environment!</p> <ul style="list-style-type: none"> <li>▸ Collect and properly dispose of flushing fluid and any fluid residues.</li> <li>▸ Wear safety clothing and a protective mask if required.</li> <li>▸ Observe all legal regulations on the disposal of fluids posing a health hazard.</li> </ul>

1. Dismantle the waste water lifting unit.  
Collect greases and other lubricants during dismantling.
2. Separate and sort the pump materials, e.g. by:
  - Metals
  - Plastics
  - Electronic waste
  - Greases and other lubricants
3. Dispose of materials in accordance with local regulations or in another controlled manner.

Electrical or electronic equipment marked with the adjacent symbol must not be disposed of in household waste at the end of its service life.

Contact your local waste disposal partner for returns.

If the used electrical or electronic equipment contains personal data, the operator is responsible for deleting it before the equipment is returned.



## 4 Description

### 4.1 General description

- Floodable sewage lifting unit

### 4.2 Product information as per Regulation No. 1907/2006 (REACH)

For information as per chemicals Regulation (EC) No. 1907/2006 (REACH), see <http://www.ksb.com/reach>.

### 4.3 Designation

Lifting unit Example: Compacta UZ X 5.300 D/C

Table 6: Designation key

Code	Description	
Compacta	Type series	
UZ	Design	
	U	Single-pump lifting unit with free-flow impeller
	UZ	Dual-pump lifting unit with free-flow impeller
X	Special design	
5	Hydraulics code	
	3, 4, 5, 10, 11, 12, 13, 14, 15	
300	Total volume of collecting tank [litres]	
	100, 150, 300, 450, 900	
D	Three-phase asynchronous motor	
C	Material	
	C	Variant for aggressive fluids
	- <sup>2)</sup>	Standard variant for domestic waste water and faeces

Control unit Example: BC 2 400 D V N A 100 B 2

Table 7: Designation key

Code	Description	
LevelControl	Type series	
BC	Type	
	BC	Basic Compact (plastic housing)
	BS	Basic control cabinet (sheet steel housing)
2	Number of pumps	
	1	Single-pump lifting unit
	2	Dual-pump lifting unit
400	Voltage, number of wires	
	230	230 V, 3-wire connection
	400	400 V, 4-wire connection / 5-wire connection
D	Starting method	
	D	DOL starting up to 4 kW <sup>3)</sup>
	S	Star-delta starting up to 22 kW <sup>3)</sup>
	W	Soft start
	X	3-wire connection capacitor motor 25 µF
	Y	3-wire connection capacitor motor 40 µF
	Z	3-wire connection capacitor motor 40 µF, start capacitor 66 µF

2) Blank

3) Higher ratings on request.

Code	Description	
V	Sensors	
	V	Voltage input 0.5 - 4.5 V
	P	Pneumatic level measurement 3.5 m
	M	Pneumatic level measurement 10.5 m
	L	Bubbler control 2 m
	H	Bubbler control 3 m
	U	Analog input 4 - 20 mA
	F	Float switch
N	ATEX	
	N	Without ATEX functions
	E	With ATEX functions
A	Installation variants	
	O	Standard
	A	With rechargeable battery
	M	With motor protection switch (if not included in standard version)
	N	With rechargeable battery and motor protection switch (if not included in standard version)
	P	With PTC relay (if not included in standard version; standard for 5.5 kW and above)
	Q	With rechargeable battery and PTC relay (if not included in standard version)
100	Nominal current	
	010	1,0 A
	016	1,6 A
	025	2,5 A
	040	4,0 A
	063	6,3 A
	100	10,0 A
	140	14,0 A
	180	18,0 A
	230	23,0 A
	250	25,0 A
	400	40,0 A
	630	63,0 A <sup>3)</sup>
B2	Design	
	B	Pump variant
	2	Variant for France

4.4 Name plates

Motor

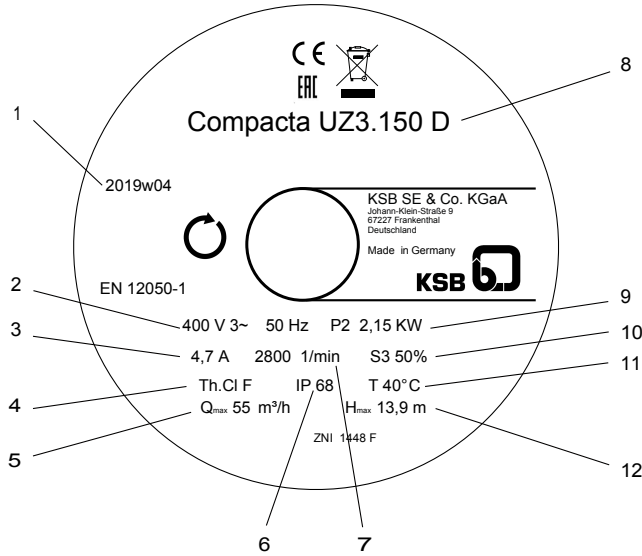


Fig. 2: Motor name plate (example)

1	Year / calender week of construction	7	Rated speed
2	Rated voltage/frequency	8	Type series, size
3	Rated current	9	Rated power
4	Thermal class of winding insulation	10	Duty cycle
5	Maximum permissible flow rate	11	Maximum fluid temperature
6	Enclosure	12	Maximum head

Collecting tank

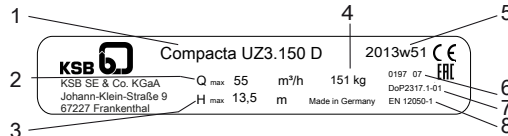


Fig. 3: Name plate of the collecting tank (example)

1	Type series, size	5	Year / calender week of construction
2	Maximum permissible flow rate	6	Notified body, year of introduction
3	Maximum head	7	Declaration of performance reference No.
4	Total weight	8	Principles of construction and testing

Control unit

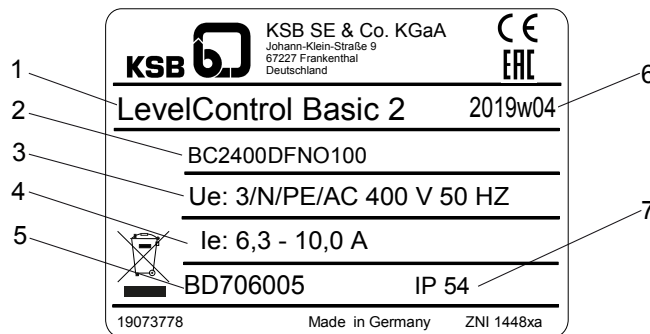


Fig. 4: Control unit name plate (example)

1	Designation	5	Circuit diagram number
2	Product code	6	Year / calender week of construction
3	Nominal voltage	7	Enclosure
4	Nominal current		

## 4.5 Design details

### Design

- Floodable sewage lifting unit<sup>4)</sup> to EN 12050-1
- Gas-tight and water-tight plastic collecting tank, pump unit, sensors and control unit

Compacta, ready to plug in:

- Hydraulics codes 3 to 5, collecting tanks 100, 150, 300, 450

Compacta, ready to connect:

- Hydraulics codes 3 to 5, collecting tank 900
- Hydraulics codes 10 to 15, collecting tanks 450, 900

### Drive

- Surface-cooled
- Thermal overload protection
- To VDE 0530, Part 1/IEC 34-1
- Enclosure IP68 (permanently submerged) to EN 60529 / IEC 529
- Thermal class F
- Electrical voltage 400 V (three-phase asynchronous motor)
- Frequency 50 Hz
- DOL starting
- Star-delta starting (from 5.5 kW, hydraulics codes 12 to 15)

### Impeller type

- Free-flow impeller

### Bearings

- Grease-packed, maintenance-free rolling element bearings

### Shaft seal

- Lubricant chamber for cooling and lubrication fitted in-between the pump-end and the drive-end shaft seals (supplied filled with ecologically acceptable white oil)
- Pump end: 1 mechanical seal
- Drive end: 1 shaft seal ring

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4) Maximum flooding height: 2 metres, maximum flooding period: 7 days (does not apply to control unit). The lifting unit must be cleaned and serviced after it has been flooded.

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### 4.6 Configuration and function

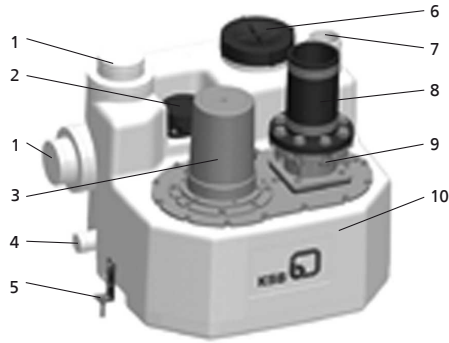


Fig. 5: Illustration of the waste water lifting unit

1	Inlet	2	Level sensor
3	Pump set	4	Drain connection
5	Holder	6	Hand hole cover
7	Vent connection	8	Discharge-side connection
9	Integrated swing check valve	10	Collecting tank

**Design** The waste water lifting unit is designed with a variety of horizontal and vertical inlets (1) and a vertical discharge-side connection (8).

**Function** The fluid to be handled flows into the waste water lifting unit through the selected horizontal or vertical inlet nozzle (1) and is collected in a gas-tight, odour-tight and water-tight collecting tank (10). The lifting unit is controlled by a level sensor (2) in combination with a control unit. As soon as the defined fill level is reached, one or two pump sets (3) are started up automatically. The fluid handled is pumped off to a level above the flood level and discharged into the public sewer.

#### Control unit

	<b>DANGER</b>
	<p><b>Flooding of control unit</b>                  Danger of death from electric shock!</p> <p>▷ Operate the control unit in flood-proof rooms only.</p>

#### LevelControl Basic 1

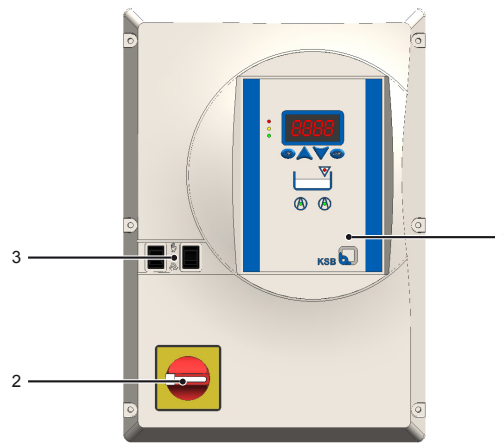
- Pump control and monitoring unit in compact plastic housing
- For one pump
- Level detection via level sensor 0 - 5 V
- DOL starting



Fig. 6: LevelControl Basic 1

**LevelControl Basic 2  
Type Basic Compact (BC)**

- Pump control and monitoring unit in compact plastic housing
- For either one or two pumps
- With display
- Level detection via
  - Level sensor 0 - 5 V
- DOL starting

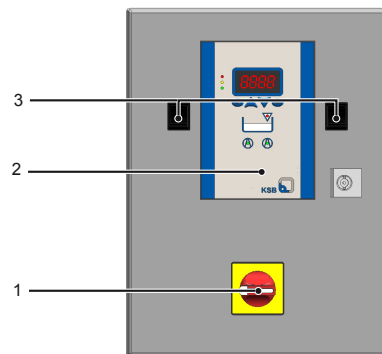


**Fig. 7: Type Basic Compact (BC)**

1	Control panel
2	Master switch (optional)
3	Manual-0-automatic switch

**LevelControl Basic 2  
Type Basic Control Cabinet (BS)**

- Pump control and monitoring unit in sheet steel housing
- For either one or two pumps
- With display
- Level detection via
  - Level sensor 0 - 5 V
- DOL starting or star/delta starting



**Fig. 8: Type Basic Control Cabinet (BS)**

1	Master switch
2	Control panel
3	Manual-0-automatic switch



	<b>NOTE</b>
	The control units are not explosion-proof, and therefore must only be operated outside potentially explosive atmospheres.

The control unit is always located outside the potentially explosive atmosphere and may only be installed in flood-proof rooms.

#### 4.7 Technical data

##### 4.7.1 Electrical data (LevelControl Basic 2)

	<b>NOTE</b>
	The rated current must not be exceeded. Higher currents and power ratings are available on request.

**Table 8:** Electrical data of the LevelControl Basic 2 control unit

Characteristic	Value	
Nominal operating voltage	3~ 400 V AC +10 % -15 % 1~ 230 V AC +10 % -15 %	
Mains frequency	50 Hz ±2 %	
Enclosure	400 V:	IP54
	230 V:	IP54
Insulation voltage	500 V AC	
Nominal motor current (standard variants)	Type BC:	1,6 A / 2,5 A / 4 A / 6,3 A / 10 A
	Type BS:	1,6 A / 2,5 A / 4 A / 6,3 A / 10 A / 14 A / 18 A / 23 A / 25 A / 40 A / 63 A

##### 4.7.2 Sensors (LevelControl Basic 2)

###### Analog level sensor

- Input voltage 0 - 5 V

###### Motor protection

- Thermal circuit breaker / bimetal (24 V)

###### Inputs

- 1 external alarm input via volt-free contact (24 V)
- 1 remote acknowledgement via volt-free contact (24 V)

###### Outputs

- 1 volt-free signalling output (250 V, 1 A, changeover contact)
- 1 signalling output for external alarm equipment, e.g. horn, alarm combination, alarm strobe light (12.6 - 13.2 V)

###### Rechargeable battery

- Mains-independent connection
- Power supply for electronics, sensors, alarm equipment
- Battery life:
  - Approx. 10 hours when supplying the 85 dB(A) piezo buzzer, electronics and sensors
  - Approx. 4 hours when supplying external alarm equipment (e.g. horn, alarm combination, alarm strobe light)

- Charging time approx. 11 hours when the battery was fully discharged.

**4.8 Permissible fluids to be handled**

	<b>WARNING</b>
	<p><b>Pumping of impermissible fluids</b>          Hazardous to persons and the environment!</p> <ul style="list-style-type: none"> <li>▸ Only discharge permissible fluids into the public sewer system.</li> <li>▸ Check the suitability of pump/system materials.</li> </ul>

**Permissible fluids to be handled**

Permissible fluids to be handled to DIN 1986-3 :

- Waste water contaminated by domestic use<sup>5)</sup> together with the necessary flushing water
  - Human faeces
  - Animal faeces (as far as required and permitted)
- Stormwater (if no other way of disposal is available).

**Variant A (standard design)**

- Waste water with faeces
- Waste water without faeces
- Grey water

**Variant C for aggressive fluids**

- Aggressive fluids

**Impermissible fluids to be handled**

- Solids (fibres, tar, sand, cement, ash, coarse paper, paper towels, cardboard, debris, rubbish, offal)
- Grease, oils (For discharging greasy waste water from commercial kitchens, for example, a grease separator to DIN 4040-1 must be installed.)
- Waste water from installations situated above the flood level (EN 12056-1).

**4.9 Collecting tank**

	<b>NOTE</b>
	<p>The effective volume of the lifting unit must be greater than the volumetric content of the discharge line up to the backflow loop.</p>

The collecting tank is designed for unpressurised operation. The waste water is stored in the collecting tank in unpressurised condition; it is then pumped into the sewer system. The effective volume of the collecting tank depends on the inlet nozzle level H.

**Table 9:** Effective collecting tank volume as a function of inlet nozzle level

Size	Total volume [l]	Inlet nozzle level [mm]			
		H = 180	H = 250	H = 700	Vertical
	Effective volume				
	[l]	[l]	[l]	[l]	[l]
U100	100	38	-	-	58
U300	300	113	113	-	133
UZ150	150	65	-	-	75

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5) Waste water from commercial or industrial use must only be discharged into the local sewer system after prior treatment.

Size	Total volume [l]	Inlet nozzle level [mm]			
		H = 180	H = 250	H = 700	Vertical
	Effective volume				
	[l]	[l]	[l]	[l]	
UZ300	300	113	113	-	133
UZ450	450	-	-	290	-
UZ900	900	-	-	580	-

#### 4.10 Noise characteristics

The sound pressure level depends on the local conditions and the duty point. It is  $\leq 70$  dB(A).

#### 4.11 Scope of supply

Depending on the model, the following items are included in the scope of supply:

- Floodable sewage lifting unit
  - Gas-tight and water-tight collecting tank made of impact-resistant plastic
  - 1 or 2 waste water pumps
  - Flexible hose connections incl. hose clips
  - Check valve
  - Y-pipe
  - Analog level sensor
  - Level-dependent control unit

#### 4.12 Dimensions and weights






**available** For dimensions and weights please refer to the outline drawing of the lifting unit.

**Control unit** Table 10: Dimensions and weights


LevelControl	Maximum current	Size H × B × T	[kg]
	[A]	[mm]	
Basic 1	10	135 × 171 × 107	3
Basic 2 BC	10	400 × 281 × 135	3
Basic 2 BS1	10	400 × 300 × 155	10
	14	600 × 400 × 200	14
	18	600 × 400 × 200	14
	23	600 × 400 × 200	14
	25	600 × 400 × 200	14
	40	800 × 600 × 200	18
	63	800 × 600 × 200	18
Basic 2 BS2	10	400 × 300 × 155	16
	14	800 × 600 × 200	19
	18	800 × 600 × 200	19
	23	800 × 600 × 200	19
	25	800 × 600 × 200	19
	40	800 × 600 × 200	24
	63	800 × 600 × 200	26

## 5 Installation at Site

### 5.1 Safety regulations

	<p><b>⚠ DANGER</b></p> <p><b>Improper installation in potentially explosive atmospheres</b> Explosion hazard! Damage to the lifting unit!</p> <ul style="list-style-type: none"> <li>▷ Comply with the applicable local explosion protection regulations.</li> <li>▷ Observe the information in the technical product literature and on the name plates of tank and motor.</li> </ul>
	<p><b>⚠ WARNING</b></p> <p><b>Hot motor surface</b> Risk of injury!</p> <ul style="list-style-type: none"> <li>▷ Allow the motor to cool down to ambient temperature.</li> </ul>
	<p><b>CAUTION</b></p> <p><b>Incorrect connection of the three-phase motor</b> Damage to the lifting unit!</p> <ul style="list-style-type: none"> <li>▷ Always use a 3-pole mechanically interlocked K-type automatic circuit breaker for external protection.</li> </ul>
	<p><b>CAUTION</b></p> <p><b>Incorrect installation of connections and signalling devices</b> A failure of the lifting unit can cause damage to property by flooding due to the risk of backflow from the sewage system.</p> <ul style="list-style-type: none"> <li>▷ Fit operator-supplied mains-independent alarm equipment (e.g. alarm switchgear).</li> <li>▷ Take suitable measures at the site to prevent overflow/flooding (e.g. a swing check valve in the floor drain, or similar).</li> </ul>
	<p><b>NOTE</b></p> <p>If uninterrupted waste water drainage is required, e.g. in basement flats, restaurants/pubs, cinemas, etc., lifting units must be fitted with a stand-by pump (dual-pump unit UZ) in accordance with EN 12 050-1.</p>

### 5.2 Checks to be carried out prior to installation

	<p><b>⚠ WARNING</b></p> <p><b>Installation on mounting surfaces which are unsecured and cannot support the load</b> Personal injury and damage to property!</p> <ul style="list-style-type: none"> <li>▷ Use a concrete of compressive strength class C12/15 which meets the requirements of exposure class X0 to EN 206-1.</li> <li>▷ The mounting surface must have set and must be completely horizontal and even.</li> <li>▷ Observe the weights indicated.</li> </ul>
---	--

Before beginning with the installation check the following:

- All structural work required has been checked and prepared in accordance with the dimensions in the outline drawing.

### 5.3 Installing the sewage lifting unit

	<p><b>⚠ WARNING</b></p>
	<p><b>Insufficient ventilation</b>          Personal injury and damage to property!</p> <ul style="list-style-type: none"> <li>▸ Provide proper aeration and ventilation.</li> <li>▸ For room drainage, a pump sump must be provided.</li> </ul>
	<p><b>NOTE</b></p>
	<p>Lifting units should not be installed next to sleeping or living quarters.</p>
	<p><b>NOTE</b></p>
	<p>The anti-vibration mounts of the sewage lifting unit provide adequate insulation against solid-borne noise.</p>

- ✓ The name plate data of the sewage lifting unit has been compared against the purchase order and the site data (e.g. supply voltage, frequency, pump operating data, etc).
- ✓ The fluid to be handled is an approved fluid. (⇒ Section 4.8, Page 22)
- ✓ The place of installation is frost-proof.
- ✓ The structural work has been prepared properly. See EN 12056.
- ✓ The installation room is of sufficient size. See connection example. (⇒ Section 10.2, Page 63)
- ✓ The installation room is adequately lit.
- ✓ Alarm messages can be noticed on time, e.g. via an external alarm transmitter.
- ✓ The sewage lifting unit has been transported to the place of installation in accordance with the instructions. (⇒ Section 3.2, Page 12)
  1. Place the sewage lifting unit on a level floor. Level it with a with a suitable tool (e.g. spirit level).
  2. Place pads 99-3.2 under the feet of collecting tank 591.
  3. Fit supplied holder 732 to protect the sewage lifting unit against hydrostatic uplift.
  4. Remove the transport lock of the float switch.



Fig. 9: Removing the transport lock

**Battery design with two collecting tanks**

- ✓ The sewage lifting unit has been installed properly.
- 1. Connect the collecting tanks with each other via the the two DN 150 connection nozzles (connection heights 100 mm and 700 mm), using flexible hose connections<sup>6)</sup>.

**5.4 Connecting the piping**

	<p><b>! DANGER</b></p>
	<p><b>Impermissible loads acting on the system nozzles</b>                  Danger to life from leakage of hot, toxic, corrosive or flammable fluids!</p> <ul style="list-style-type: none"> <li>▷ Do not use the lifting unit as an anchorage point for the piping.</li> <li>▷ Anchor the pipes immediately upstream of the lifting unit and connect them without transmitting any stresses or strains.</li> <li>▷ Observe the permissible forces and moments at the lifting unit. (⇒ Section 8.6, Page 51)</li> <li>▷ Take appropriate measures to compensate thermal expansion of the piping.</li> </ul>
	<p><b>CAUTION</b></p>
	<p><b>Incorrect installation of discharge line</b>                  Leaks and flooding of installation room!</p> <ul style="list-style-type: none"> <li>▷ Run the discharge line above the flood level before leading it into the sewer.</li> <li>▷ Do not connect the discharge line to the downpipe.</li> <li>▷ Do not connect any additional sanitary installations to the discharge line.</li> </ul>
	<p><b>NOTE</b></p>
	<p>All pipe connections must be sound-insulated and flexible.</p>
	<p><b>NOTE</b></p>
	<p>Compacta U100, U300, UZ150 and UZ300 have variable inlet nozzle levels. On Compacta U100 and UZ150 the inlet nozzle level arranged at 180 mm cannot be used.</p>
	<p><b>NOTE</b></p>
	<p>The use of check valves and installation of shut-off valves is stipulated in the applicable standard.                  The sewage lifting unit is fitted with an integrated check valve (DN 80)                  Check valves of ≥ DN 80 are equipped with a lifting device to allow pipe drainage. Under normal operating conditions the stem is screwed out as far as it will go, allowing the valve disc to close.</p>
	<p><b>NOTE</b></p>
	<p>To fully drain the collecting tank during maintenance work, connecting a hand diaphragm pump (available as accessory) is recommended.                  After opening the nozzle (DN 40), connect the hand diaphragm pump with flexible hose connections.</p>

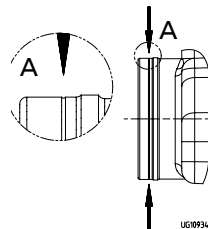
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6) Included in the scope of supply

	<b>NOTE</b>
	<p>Sewage lifting units to EN 12050-1 must be vented through the roof. If changes of direction are unavoidable, lay the pipe with a gradient of at least 1:50.</p>

**Connecting the piping with flexible hose connections**

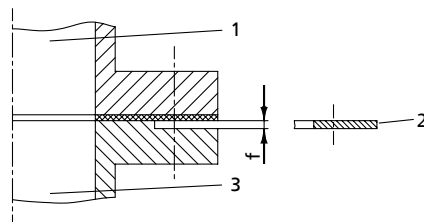
- ✓ The discharge line has been laid with a backflow loop<sup>7)</sup>.
  - ✓ Pipeline weights must be supported on site.
  - ✓ All collecting tank nozzles (except for the vent nozzle<sup>8)</sup>) are closed.
1. Fit a shut-off valve each in the inlet line and in the discharge line downstream of the check valve. Drainage of the sewage lifting unit must not be obstructed and its removal must not be hindered.
  2. Select the nozzles at the collecting tank to be used for the inlet line and discharge line. Provide a vent line (DN 70) at the vertical connection.
  3. Open the nozzles required by sawing off the nozzle faces at the marking (approx. 10 mm).



**Fig. 10:** Marking for opening the nozzles

4. Connect the (DN 70) vent line to the vertical connection by means of the flexible hose connection, making sure that the connection is odour-proof.
5. Carefully connect the pipelines to the collecting tank with flexible hose connections. Fasten the flexible hose connection for the discharge line with pipe clamp 733.03.

**Connecting the piping with flanges**



**Fig. 11:** Flange connection (DN 80)

1	Pipeline flange (with flat face)
2	Spacer disc, ident. No. 11035545
3	Flange of the sewage lifting unit (with raised face)

- ✓ The discharge line has been laid with a backflow loop<sup>7)</sup>.
  - ✓ Pipeline weights must be supported on site.
  - ✓ All collecting tank nozzles (except for the vent nozzle<sup>8)</sup>) are closed.
1. Fit a shut-off valve each in the inlet line and in the discharge line downstream of the check valve. Drainage of the sewage lifting unit must not be obstructed and its removal must not be hindered.
  2. Select the nozzles at the collecting tank to be used for the inlet line and discharge line. Provide a vent line (DN 70) at the vertical connection.

7) The invert of the pipe at its highest point must be above the locally defined flood level (e.g. street level).  
 8) For Compacta U100, U300, UZ150 and UZ300

- Open the nozzles required by sawing off the nozzle faces at the marking (approx. 10 mm).

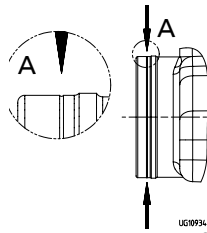


Fig. 12: Marking for opening the nozzles

- Connect the flanges at the pipelines to the nozzles of the collecting tank. Level out the recessed area of the raised face f with split spacers<sup>9)</sup> as per the following table.

Table 11: Number of split spacers depending on the raised face f

Raised face f [mm]	Number of split spacers
3 to 5	1
5 to 7	2

### 5.5 Cellar drainage

	<b>CAUTION</b>
	<p><b>Discharge line for cellar drainage connected to the discharge line of the sewage lifting unit</b></p> <p>Flooding of installation site!</p> <ul style="list-style-type: none"> <li>▷ Never connect the discharge line for cellar drainage to the discharge line of the sewage lifting unit.</li> <li>▷ Separately run the discharge line for cellar drainage above the flood level and into the sewer.</li> <li>▷ Fit a swing check valve in the discharge line.</li> </ul>

**Automatic drainage** For automatic drainage of the installation site (e.g. for seepage water or flooding) we recommend installing a submersible waste water pump. Observe the following points:

- Minimum pit dimensions 500 × 500 × 500 mm
- Select the head H [m] of the pump to match the local requirements.
  - Head  $H = H_{\text{Geodetic}} + H_{\text{Losses}}$

**Manual drainage** For manual drainage of the installation site observe the following:

- Minimum pit dimensions 300 × 300 × 500 mm
- Hand diaphragm pump available as accessory

### 5.6 Electrical connection

	<b>⚠ DANGER</b>
	<p><b>Electrical connection work by unqualified personnel</b></p> <p>Risk of fatal injury due to electric shock!</p> <ul style="list-style-type: none"> <li>▷ Always have the electrical connections installed by a trained and qualified electrician.</li> <li>▷ Observe regulations IEC 60364 and, for explosion-proof models, EN 60079.</li> </ul>

9) Included in the scope of supply



	<p><b>⚠ WARNING</b></p>
	<p><b>Incorrect connection to the mains</b>                  Damage to the mains network, short circuit!                  ▷ Observe the technical specifications of the local energy supply companies.</p>
	<p><b>CAUTION</b></p>
	<p><b>Wrong supply voltage</b>                  Damage to the lifting unit!                  ▷ The maximum permissible deviation in supply voltage is 10 % of the rated voltage indicated on the name plate.</p>

**Lightning protection**

- Electrical installations must be protected against overvoltage (compulsory since 14 December 2018) (see DIN VDE 0100-443 (IEC60364-4-44:2007/A1:2015, modified) and DIN VDE 0100-534 (IEC 60364-5-53:2001/A2:2015, modified). Whenever modifications are made to existing installations, retrofitting a surge protective device (SPD) in accordance with VDE is mandatory.
- A maximum cable length of 10 metres should not be exceeded between the surge protective device (usually type 1, internal lightning protection) installed at the service entrance and the equipment to be protected. For longer cables, additional surge protective devices (type 2) must be provided in the sub-distribution board upstream of the equipment to be protected or directly in the equipment itself.
- The associated lightning protection concept must be provided by the operator or by a suitable provider commissioned by the operator. Surge protective devices can be offered for the control units on request.

**Connecting the LevelControl Basic 1 control unit**


- ✓ The mains voltage at the site has been verified against the data on the name plate.
- 1. Connect the control unit to the output of the external master switch housing with a suitable cable. Guide the mains cable into the master switch housing. Use suitable cable glands.
- 2. Establish the connection in accordance with the wiring diagram. (⇒ Section 10.5, Page 70)
- 3. Prior to switching on the unit, check all protective equipment.

**Connecting the LevelControl Basic 2 control unit**

- ✓ The mains voltage at the site has been verified against the data on the name plate.
- 1. Connect the mains cable to the control unit with a suitable cable gland.
- 2. Establish the connection in accordance with the wiring diagram. (⇒ Section 10.5, Page 70)
- 3. Prior to switching on the unit, check all protective equipment.

**5.7 Checking the direction of rotation**

	<p><b>⚠ WARNING</b></p>
	<p><b>Hands or objects inside the tank</b>                  Risk of personal injury! Damage to the lifting unit!                  ▷ Never insert your hands or any other objects into the tank.                  ▷ Check that the inside of the tank is free from any foreign objects.</p>

	<b>CAUTION</b>
	<b>Wrong direction of rotation</b> The lifting unit does not reach its duty point! ▷ Check the direction of rotation.

1. Prior to commissioning and every time the unit is returned to service, check the direction of rotation. (⇒ Section 6.3.1, Page 32) (⇒ Section 6.3.2, Page 36)

## 6 Commissioning/Start-up/Shutdown

### 6.1 Commissioning/Start-up

#### 6.1.1 Prerequisites for commissioning/start-up

Before commissioning/start-up of the lifting unit make sure that the following requirements are met:

- The lifting unit has been properly connected to the electric power supply and is equipped with all protection devices.
- All relevant VDE standards and/or regulations applicable in the country of use are complied with.

### 6.2 Operating limits

	<b>DANGER</b>
	<p><b>Non-compliance with operating limits</b> Hot or toxic fluid could escape! Explosion hazard!</p> <ul style="list-style-type: none"> <li>▷ Comply with the operating data indicated in the technical product literature.</li> <li>▷ Avoid prolonged operation against a closed shut-off valve.</li> <li>▷ Never exceed the temperatures indicated in the product literature and on the name plate.</li> <li>▷ Prevent dry running.</li> </ul>

Observe the following parameters and values during operation:

Parameter	Value
Maximum permissible fluid temperature	40 °C for max. 5 minutes up to 65 °C
Max. ambient temperature	40 °C (air)
Duty cycle	Intermittent duty S3 50 % to VDE <sup>10)</sup>

#### 6.2.1 Frequency of starts

	<b>CAUTION</b>
	<p><b>Excessively high frequency of starts</b> Damage to the pump set!</p> <ul style="list-style-type: none"> <li>▷ Do not exceed the values for the frequency of starts.</li> </ul>

**Hydraulics codes 3 to 5** The maximum permissible number of starts per hour is 60.

**Hydraulics codes 10 to 15** **Table 12:** Frequency of starts

Motor rating [kW]	Maximum number of starts per pump [Starts/hour]
2,3 - 7,5	20
> 7,5	15

10) The lifting units are designed for S3 duty (intermittent duty). They are used for the disposal of domestic waste water from toilets, bathrooms, washrooms and shower rooms.

6.2.2 Supply voltage

	<b>CAUTION</b>
	<p><b>Wrong supply voltage</b>          Damage to the lifting unit!</p> <ul style="list-style-type: none"> <li>▷ The maximum permissible deviation in supply voltage is 10 % of the rated voltage indicated on the name plate.</li> </ul>

6.3 Prerequisites for commissioning/start-up

	<b>NOTE</b>
	<p>The control unit parameters have been set at the factory. The parameters need not be changed for commissioning.</p>

Ensure that the following requirements are met prior to commissioning/start-up:

- The sewage lifting unit has been properly connected to the electric power supply and is equipped with all protection devices.
- All relevant VDE standards and country-specific regulations are complied with.
- The safety regulations are complied with and the technical data of the sewage lifting unit is suitable for the unit's intended use.
- The sewage lifting unit has been installed properly. All transport locks have been removed.

6.3.1 Commissioning with LevelControl Basic 1

	<b>⚠ DANGER</b>
	<p><b>Control unit cover not closed properly</b>          Danger to life!</p> <ul style="list-style-type: none"> <li>▷ After making the collecting tank settings, properly close the cover of the control unit.</li> <li>▷ After properly closing the cover of the control unit, plug the mains plug into the power supply.</li> </ul>

Settings for the collecting tank

To reduce the frequency of starts the lowest open inlet nozzle can be selected at the control unit.

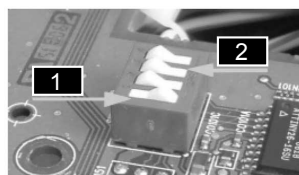


Fig. 13: Settings for the collecting tank

1	On	2	Off
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- ✓ The mains plug of the control unit has been disconnected from the power supply.
- 1. Open the cover of the control unit.
- 2. Set the DIL switch on the control PCB as per the following table.
- 3. Properly close the cover of the control unit.
- 4. Plug the mains plug into the power supply.

Table 13: Possible settings

Collecting tank	Inlet nozzle used	DIL switch settings			
		DIL 1	DIL 2	DIL 3	DIL 4
U3.100 D	Horizontal, 250 mm	Off <sup>11)</sup>	Off <sup>11)</sup>	Off <sup>11)</sup>	Off <sup>11)</sup>
U4.100 D	Vertical	On	Off	Off	Off
U5.100 D					
U3.300 D	Horizontal, 250 mm	On <sup>11)</sup>	Off <sup>11)</sup>	On <sup>11)</sup>	Off
U4.300 D	Horizontal, 320 mm	Off	On	On	Off
U5.300 D	Vertical	On	On	On	Off

Connecting the rechargeable battery



Fig. 14: Connecting the rechargeable battery

1. Properly connect the rechargeable battery in the control unit.

Checking the direction of rotation

	<p><b>WARNING</b></p>
	<p><b>Hands or objects inside the tank</b>                  Risk of personal injury! Damage to the lifting unit!</p> <ul style="list-style-type: none"> <li>▸ Never insert your hands or any other objects into the tank.</li> <li>▸ Check that the inside of the tank is free from any foreign objects.</li> </ul>
	<p><b>CAUTION</b></p>
	<p><b>Wrong direction of rotation</b>                  The lifting unit does not reach its duty point!</p> <ul style="list-style-type: none"> <li>▸ Check the direction of rotation.</li> </ul>

1. Connect the unit to the power supply.



Fig. 15: Rotary field of power supply


- ⇒ Direction-of-rotation indication lights up in green: Correct connection
  - ⇒ Direction-of-rotation indication does not light up: Reverse the rotary field of the power supply inside the control unit.
2. Check the direction of rotation of the pump set at the screw plug. If necessary, correct the direction of rotation at the motor power cable. The correct direction of rotation is indicated on the name plate.

11) Factory setting



Fig. 16: Direction of rotation of the pump

**Functional test and leak testing**

	<b>NOTE</b>
	<p>When the sewage lifting unit is unfilled, a sensor fault may be output. This fault is cleared as soon as the unit is filled.</p>

1. Test-run the sewage lifting unit for several fill and pump-off cycles and check its proper function and leak-free operation, using the checklist provided.

**6.3.1.1 Using additional functions**

**6.3.1.1.1 External alarm**

**Connecting an external alarm**

An input is available for an external alarm. If an alarm is active, the high water LED is lit.



Fig. 17: Connecting an external alarm

**Setting the external alarm**

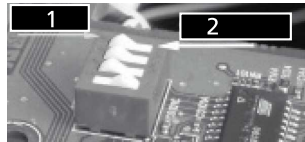


Fig. 18: Default setting of the external alarm

1	NC contact	2	NO contact
---	------------	---	------------

1. Set the alarm contact at DIL switch 4. Default setting = Off (NO contact)

**6.3.1.1.2 Fault signalling contact**

A changeover contact is available for signalling faults.

Example:

- In the event of a fault, changeover contact 11-12 closes.
- If the unit is ready for operation, changeover contact 11-14 closes.



Fig. 19: Connecting a fault signalling contact

6.3.1.1.3 Acknowledging alerts

	<b>NOTE</b>
	<p>Displayed alerts can be acknowledged by pressing this key. The integrated alarm buzzer will be muted. The alert message disappears as soon as the cause of the alert has gone.</p>

Alarms can be acknowledged by pressing the **OK** key on the front of the control unit.

6.3.1.1.4 Messages and faults

Table 14: Messages

	Pump LED	"High water" LED	Operation relay/ general fault message	Pump	Integrated alarm buzzer
<b>Operation:</b>					
Pump OFF	Off			Off	
Pump running	Steady green		Contact 11-14 closed	On	
<b>TCB - Excessive motor temperature</b>					
TCB fault (unacknowledged)	Flashing red		Contact 11-12 closed	Off	Interval tone
TCB fault (acknowledged)	Steady red		Contact 11-12 closed	Off	Off
TCB fault gone (unacknowledged)	Flashing red		Contact 11-14 closed	Depending on filling level	Interval tone
TCB fault gone (acknowledged)	Off		Contact 11-14 closed	Depending on filling level	Off
<b>High water:</b>					
High water (unacknowledged)		Flashing red	Contact 11-12 closed	On	Interval tone
High water (acknowledged)		Steady red	Contact 11-12 closed	On	Off
High water gone		Off	Contact 11-14 closed	Depending on filling level	Off
<b>External fault:</b>					
External fault (unacknowledged)		Flashing red	Contact 11-12 closed	On or Off	Interval tone
External fault (acknowledged)		Steady red	Contact 11-12 closed	On or Off	Off
External fault gone		Off	Contact 11-14 closed	On or Off	Off
<b>LiveZero – Broken wire detection:</b>					
LiveZero (unacknowledged)		Flashing red	Contact 11-12 closed	Off	Interval tone
LiveZero (acknowledged)		Steady red	Contact 11-12 closed	Off	Off
LiveZero gone		Off	Contact 11-14 closed	Depending on filling level	Off
<b>Power failure:</b>					
Power failure			Contact 11-12 closed	Off	Interval tone

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	<b>NOTE</b>
	<p>If battery voltage drops below 5.3 V (Basic 1) or 10.6 V (Basic 2), the control units automatically switch off the mains-independent alert to prevent excessive discharging of the battery.</p>

### 6.3.2 Commissioning with LevelControl Basic 2

#### Settings for the collecting tank

To reduce the frequency of starts the lowest open inlet nozzle can be selected at the control unit.

1. Press the **ESC** key until the level is displayed.
2. Press the **OK** key and **ESC** key simultaneously.
  - ⇒ Parameter number 3.1.2.2 is displayed.
3. Confirm with **OK**.
  - ⇒ A digit flashes in the display.
4. Use the arrow keys to select the inlet nozzle in acc. with the table below.
5. Press **OK**.
  - ⇒ The setting has been saved.

**Table 15:** Possible settings

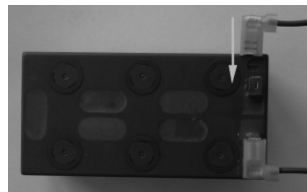
Inlet nozzle used [mm]	Setting displayed
180	1
250	2
320	3
700	4
Vertical	5

#### Connecting the rechargeable battery

	<b>⚠ DANGER</b>
	<p><b>Live voltage</b> Danger to life!</p> <ul style="list-style-type: none"> <li>▷ Only open the device after it has been de-energised.</li> </ul>



**Fig. 20:** Connecting the rechargeable battery (LevelControl Basic 2 BC)



**Fig. 21:** Connecting the rechargeable battery (LevelControl Basic 2 BS)

1. Properly connect the rechargeable battery in the control unit.



Checking the direction of rotation

	<p><b>WARNING</b></p>
	<p><b>Hands or objects inside the tank</b>                  Risk of personal injury! Damage to the lifting unit!</p> <ul style="list-style-type: none"> <li>▷ Never insert your hands or any other objects into the tank.</li> <li>▷ Check that the inside of the tank is free from any foreign objects.</li> </ul>
	<p><b>CAUTION</b></p>
	<p><b>Wrong direction of rotation</b>                  The lifting unit does not reach its duty point!</p> <ul style="list-style-type: none"> <li>▷ Check the direction of rotation.</li> </ul>

1. Connect the unit to the power supply.
  - ⇒ No fault message: Correct connection
  - ⇒ Alarm A12: Reverse the rotary field of the power supply inside the control unit.
2. Check the direction of rotation of the pump set at the screw plug. If necessary, correct the direction of rotation at the motor power cable. The correct direction of rotation is indicated on the name plate.



Fig. 22: Direction of rotation of the pump

Functional test and leak testing

	<p><b>NOTE</b></p>
	<p>When the sewage lifting unit is unfilled, a sensor fault may be output. This fault is cleared as soon as the unit is filled.</p>

1. Set the manual-0-automatic selector switch to automatic.
2. Test-run the sewage lifting unit for several fill and pump-off cycles and check its proper function and leak-free operation, using the checklist provided. (⇒ Section 8.8, Page 52)

6.3.2.1 Using additional functions

6.3.2.1.1 Functional check run

For pumps with long idle periods, a functional check run can be activated at parameter 3-7-1. The functional check run is carried out weekly for a duration of three seconds.



**6.3.2.1.2 External alarm input**

A NO contact can be connected to LevelControl Basic 2 as external alarm. If the contact is activated, alert A10 is displayed and the pumps are stopped.



**6.3.2.1.3 Fault signalling contact**

For fault signalling, a relay contact is available as changeover contact. The NC contact is closed in the event of a fault.



**6.3.2.1.4 External acknowledgement input**

A pushbutton for external acknowledgement can be connected to the **Ack** terminals.



**6.3.2.1.5 Output for horn or signal light**

A horn or signal light 12 V DC, max. 200 mA, can be connected.

**6.4 Shutdown**



1. Pump off the tank contents.
2. Shut off the inlet and discharge lines.
3. De-energise the unit and secure it against unintentional start-up.

	<b>DANGER</b>
	<p><b>Power supply not disconnected</b>            Danger to life!</p> <ul style="list-style-type: none"> <li>▷ Pull the mains plug or disconnect all electrical connections and secure against unintentional start-up.</li> </ul>

4. Drain the tank completely by hand (e.g. by means of the hand diaphragm pump).
5. After prolonged standstill:  
 Remove and clean rotating assembly 01-44.  
 Spray the hydraulic section with oil for preservation.
6. Unscrew handhole cover 160.
7. Clean the tank.

	<b>WARNING</b>
	<p><b>Fluids handled and supplies posing a health hazard</b>            Hazard to persons and the environment!</p> <ul style="list-style-type: none"> <li>▷ Decontaminate lifting units which handle fluids posing a health hazard. Wear safety clothing and a protective mask, if required.</li> <li>▷ Observe all legal regulations on the disposal of fluids posing a health hazard.</li> </ul>

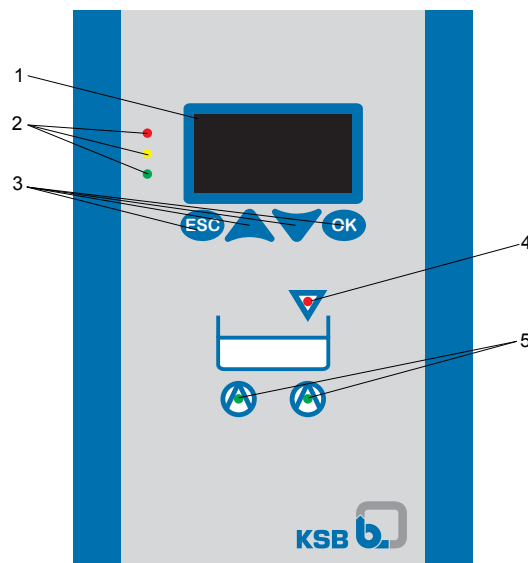
## 7 Operation

	<p style="background-color: #e67e22; color: white; padding: 5px;"><b>⚠ DANGER</b></p> <p><b>Unintentional starting of pumps</b> Risk of injury: Limbs can be pulled into or crushed by machinery!</p> <ul style="list-style-type: none"> <li>▷ Make sure that nobody is within the immediate, hazardous vicinity of the pumps.</li> <li>▷ Make sure that all piping is properly installed and that the fluid handled cannot escape.</li> </ul>
	<p style="background-color: #2980b9; color: white; padding: 5px;"><b>NOTE</b></p> <p>For dual-pump lifting units all instructions refer to both the pump sets. For single-pump lifting units the steps only have to be carried out for one pump set.</p>

Operation via:

- Manual-0-automatic selector switch (⇒ Section 7.2, Page 41)
- Control panel (⇒ Section 7.1, Page 39)
- Service interface (connector inside control unit)

### 7.1 Control panel (LevelControl Basic 2)



**Fig. 23:** Control panel

1	Display
2	Traffic light LEDs
3	Navigation keys
4	"High water" LED
5	LED for pump set information

#### 7.1.1 LED display

##### Traffic light LEDs

These LEDs provide information about the operating status of the control unit.

**Table 16:** LED description

LED	Description
Green	Trouble-free operation
Yellow	One or more warnings are active.
Red	One or more alerts are active.

**LED for pump set information**

These LEDs provide information about the operating status of each pump set.

**Table 17:** LED per pump set

LED	Description
Green	Pump set is ready for operation.
Flashing green	Pump set is in operation.
Yellow	Pump set is OFF (manual-0-automatic selector switch set to 0).
Flashing yellow	Pump set is in manual mode (manual-0-automatic selector switch set to manual).
Red	Pump set is locked when an alarm is active or no enable signal is received.

**"High water" LED**

This LED signals high water. Fault messages with a higher priority overwrite the high water alert.

**Table 18:** LED per pump set

LED	Description
Red	High water <ul style="list-style-type: none"> <li>▪ Forces a start-up of the pump sets.               <ul style="list-style-type: none"> <li>– Exception: ATEX units with defective sensor. Check that the sensors function properly.</li> </ul> </li> </ul>

**7.1.2 Display**

The following information is displayed:






**Fig. 24:** Display

1	Parameter
2	Parameter/measured value
3	Alert

### 7.1.3 Navigation keys




**Table 19:** Control panel: Navigation keys

Key	Description
	<b>Arrow keys:</b> <ul style="list-style-type: none"> <li>▪ Move up/down in the menu options.</li> <li>▪ Increase/decrease a numerical value.</li> </ul>
	<b>Escape key:</b> <ul style="list-style-type: none"> <li>▪ Cancel an entry without saving it.</li> <li>▪ When entering numbers: Go to the previous digit.</li> <li>▪ Move up one menu level.</li> </ul>
	<b>OK key:</b> <ul style="list-style-type: none"> <li>▪ Confirm entries.</li> <li>▪ Confirm a menu selection.</li> <li>▪ When entering numbers: Go to the next digit.</li> </ul>

### 7.2 Manual-0-automatic selector switch

Each pump can be operated as follows by means of a manual-0-automatic selector switch:



**Table 20:** Switch positions of manual-0-automatic selector switch

Switch position	Function
	Function allowing the pump to be operated manually for a short period
	Switch locks in place. The pump is switched off.
	Switch locks in place. The pump is started/stopped by the control unit as a function of demand.

### 7.3 Control panel

#### 7.3.1 Displaying measured values

**Table 21:** Selecting measured value parameters and measured values

	<b>Step 1: Activating measured value parameters</b> <ol style="list-style-type: none"> <li>1. Press the ESC key until the measured value parameters are shown on the display.</li> </ol>
	<b>Step 2: Navigating</b> <ol style="list-style-type: none"> <li>1. Use the arrow keys to select the required measured value parameter. <ul style="list-style-type: none"> <li>⇒ The relevant measured value is displayed automatically after 1.5 seconds.</li> </ul> </li> <li>2. Use the arrow keys to move to a different measured value parameter.</li> </ol>




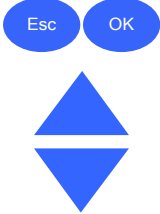

**Table 22:** Measured value parameters



Parameter	Description
1.1.1	Level (Analog) <i>Displays the fill level (analog measurement) [mm]</i>
1.1.3	Mains Voltage <i>Displays the mains voltage [V]</i>
1.2.1	Operating Hours Pump 1 <i>Displays the operating hours of pump set 1 [h]</i>
1.2.2	Start Count Pump 1 <i>Displays the number of starts of pump set 1</i>
1.3.1	Operating Hours Pump 2 <i>Displays the operating hours of pump set 2 [h]</i>
1.3.2	Start Count Pump 2 <i>Displays the number of starts of pump set 2</i>
2.1.1	Pending Messages <i>Displays the pending messages (only for errors / faults)</i>

### 7.3.2 Displaying and changing parameters

The parameters that you can call up depend on the operating mode and measurement method. Only relevant parameters are displayed.

**Table 23:** Displaying and adjusting parameters and parameter values

	<p>Step 1: Activating the setting mode</p> <ol style="list-style-type: none"> <li>1. Press and hold the ESC key and press the OK key. ⇒ P 3.3.2 is displayed.</li> </ol>
	<p>Step 2: Navigating</p> <ol style="list-style-type: none"> <li>1. Use the arrow keys to select the required parameter.</li> </ol>
	<p>Step 3: Confirming the parameter</p> <ol style="list-style-type: none"> <li>1. Press the OK key to confirm the selected parameter. ⇒ The selected parameter value is displayed immediately.</li> </ol>
	<p>Step 4: Changing the parameter value</p> <p>✓ For multi-digit parameter values, the position to be entered flashes.</p> <ol style="list-style-type: none"> <li>1. Press the OK key or ESC key to select the position of the parameter value. ⇒ The position to be entered moves one digit to the right or left respectively.</li> <li>2. Use the arrow keys to change the numerical value.</li> </ol>
	<p>Step 5 a: Confirming the parameter value</p> <p>✓ The required position has been adjusted as required.</p> <ol style="list-style-type: none"> <li>1. Press OK to confirm the adjusted parameter value. ⇒ The parameter value is saved. ⇒ The display shows the selected parameter.</li> </ol>

	<p>Step 5 b: Cancelling a parameter value</p> <ul style="list-style-type: none"> <li>✓ The changed parameter value has not been confirmed.</li> <li>1. To cancel the changed value press the ESC key. <ul style="list-style-type: none"> <li>⇒ The parameter value remains unchanged.</li> <li>⇒ The display shows the selected parameter.</li> </ul> </li> </ul>
	<p>Step 6: Leaving the setting mode</p> <ul style="list-style-type: none"> <li>1. To leave the setting mode press the ESC key. <ul style="list-style-type: none"> <li>⇒ The measured value display is shown. (⇒ Section 7.3.1, Page 41)</li> </ul> </li> </ul>

**Table 24:** Parameter list

Parameter	Description
3.1.2.1	Tank <i>Setting the tank type (may be disabled)</i>
3.1.2.2	Inlet Level <i>Setting the inlet nozzle level to be used for the collecting tank</i>
3.3.4.1	Pumps OFF <i>Level Pumps OFF [mm]</i>
3.3.4.2	Base Load ON <i>Setting the switching point for base load [mm]</i>
3.3.4.3	Peak Load ON <i>Setting the switching point for peak load [mm]</i>
3.3.4.4	High Water <i>Setting the switching point for high water [mm]</i>
3.3.5.3	Stop Delay <i>Setting the stop delay [<math>\frac{1}{10}s</math>]</i>
4.1.1	Firmware version <i>Displays the firmware version</i>

### 7.3.3 Displaying and acknowledging alerts and warnings

The LEDs signal warnings (yellow) and alerts (red).

- Faults with manual acknowledgement: Acknowledgement via the control panel or via the remote acknowledgement input.
- Faults with auto-acknowledgement: Automatic deactivation and acknowledgement as soon as the cause or the fault has been rectified. Manual acknowledgement is possible.

**Table 25:** Displaying and acknowledging fault messages

	<p>Step 1: Displaying fault message.</p> <ol style="list-style-type: none"> <li>1. If the screen for editing parameters is displayed, exit it by pressing ESC. ⇒ The fault with the highest priority is displayed.</li> </ol>
	<p>Step 2: Remedying and acknowledging a fault.</p> <ol style="list-style-type: none"> <li>1. To acknowledge the fault message, press OK. ⇒ Fault no longer active: The horn / buzzer is deactivated. ⇒ Fault is still present: The fault is entered in the alerts list (⇒ Section 7.3.4, Page 45) . The next fault (if any) is displayed.</li> <li>2. Rectify the cause of the fault.</li> </ol>

**Table 26:** Overview of fault messages

Fault message	Priority	Description	Type of message		Acknowledgement
			Warning	Alarm	
A1	1	Motor protection pump 1 <i>Pump set 1 stops.</i>	-	X	Manual
A2	2	Motor protection pump 2 <i>Pump set 2 stops.</i>	-	X	Manual
A3	3	Motor 1 temperature too high <i>Pump set 1 stops.</i>	-	X	Auto
A4	4	Motor 2 temperature too high <i>Pump set 2 stops.</i>	-	X	Auto



Fault message	Priority	Description	Type of message		Acknowledgement
			Warning	Alarm	
A5	5	Power supply failure <i>Pump sets 1 and 2 stop.</i>	-	X	Auto
A6	6	Phase error / phase failure <i>Pump sets 1 and 2 stop.</i>	-	X	Auto
A7	7	Leakage motor 1 (Amarex N/KRT) <i>Pump set 1 stops.</i>	-	X	Manual
A8	8	Leakage motor 2 (Amarex N/KRT) <i>Pump set 2 stops.</i>	-	X	Manual
A9	9	High water alert <i>Pump sets 1 and 2 stop.</i>	-	X	Auto
A10	10	External alarm <i>Pump sets 1 and 2 stop (can be set via the KSB ServiceTool).</i>	-	X	Auto
A11	11	Sensor fault <i>No action</i>	-	X	Auto
A12	12	Incorrect rotary field of mains supply (phase sequence) <i>No action</i>	X	-	Auto
A13	13	Undervoltage (-15 % of nominal voltage 230 V or 400 V) <i>No action</i>	X	-	Auto
A14	14	Overvoltage (+15 % of nominal voltage 230 V or 400 V) <i>No action</i>	X	-	Auto
A15	15	Flat battery <i>No action</i>	X	-	Auto
A16	16	Service interval system <i>No action (deactivated by default; can be set via the KSB ServiceTool).</i>	X	-	Auto

### 7.3.4 Displaying the alerts list

The alerts list serves to call up alerts / warnings that have been acknowledged but are still present.

**Table 27:** Displaying the alerts list

	<p>Step 1: Activating the alerts list</p> <ul style="list-style-type: none"> <li>✓ Alerts / warnings have been acknowledged but are still present. (⇒ Section 7.3.3, Page 44)</li> <li>1. If no measured value parameter is active, press the ESC key. Repeat if necessary.</li> </ul>
	<p>Step 2: Navigating</p> <ul style="list-style-type: none"> <li>1. Use the arrow keys to select parameter P 2.1.1. <ul style="list-style-type: none"> <li>⇒ After 1.5 seconds the most recent fault message on the alerts list is automatically displayed.</li> <li>⇒ If further fault messages are present, the next fault message will be displayed after another 1.5 seconds.</li> </ul> </li> </ul>
	<p>Step 3: Leaving the alerts list</p> <ul style="list-style-type: none"> <li>1. To leave the alerts list press the ESC key. <ul style="list-style-type: none"> <li>⇒ The measured value display is shown. (⇒ Section 7.3.1, Page 41)</li> </ul> </li> </ul>

### 7.3.5 Replacing the rechargeable battery





**NOTE**

The rechargeable batteries must be replaced every five years to ensure that the device operates reliably in battery mode.  
Use original KSB spare parts only.

1. Switch off the power supply.
2. Open the control unit.
3. Disconnect the battery.
4. Undo the battery clamp.
5. Replace the batteries.
6. Reattach the battery clamp.
7. Re-establish the connections for the battery.
8. Close the device properly.
9. Switch the power supply back on.

## 8 Servicing/Maintenance

### 8.1 General information/safety regulations

	<p style="background-color: #e67e22; color: white; padding: 5px;"><b>⚠ DANGER</b></p> <p><b>Insufficient preparation of work at the lifting unit</b> Risk of personal injury!</p> <ul style="list-style-type: none"> <li>▷ Properly shut down the lifting unit and secure it against unintentional start-up.</li> <li>▷ Close the shut-off elements in the suction and discharge line.</li> <li>▷ Drain the lifting unit.</li> <li>▷ Close any auxiliary connections.</li> <li>▷ Allow the lifting unit to cool down to ambient temperature.</li> </ul>
	<p style="background-color: #e67e22; color: white; padding: 5px;"><b>⚠ WARNING</b></p> <p><b>Fluids handled and supplies posing a health hazard</b> Hazard to persons and the environment!</p> <ul style="list-style-type: none"> <li>▷ Decontaminate lifting units which handle fluids posing a health hazard. Wear safety clothing and a protective mask, if required.</li> <li>▷ Observe all legal regulations on the disposal of fluids posing a health hazard.</li> </ul>
	<p style="background-color: #e67e22; color: white; padding: 5px;"><b>⚠ WARNING</b></p> <p><b>Improper lifting/moving of heavy assemblies or components</b> Personal injury and damage to property!</p> <ul style="list-style-type: none"> <li>▷ Use suitable transport devices, lifting equipment and lifting tackle to move heavy assemblies or components.</li> </ul>
	<p style="background-color: #e67e22; color: white; padding: 5px;"><b>⚠ WARNING</b></p> <p><b>Work on the lifting unit by unqualified personnel</b> Risk of personal injury!</p> <ul style="list-style-type: none"> <li>▷ Always have repair and maintenance work performed by specially trained, qualified personnel.</li> </ul>

The operator ensures that maintenance, inspection and installation are performed by authorised, qualified specialist personnel who are thoroughly familiar with the manual.

- Observe the safety instructions and information.
- Observe the general assembly drawings and exploded views.
- For any work on the pump (set) observe the operating manual of the pump (set).
- Never use force when dismantling and reassembling the equipment.
- After maintenance/repair work make sure that inspection cover 160 is closed tightly.
- In the event of damage you can always contact KSB Service.

### 8.2 Maintenance schedule

**Table 28:** Overview of maintenance work to EN 12 056-4

Place of use	Maintenance interval	Servicing/maintenance work
Commercial operation	At least every three months	<ul style="list-style-type: none"> <li>Check the inside of the collecting tank and the float switch for any deposits. If necessary, clean these areas.</li> <li>Measure the insulation resistance of the motor. (⇒ Section 8.2.2, Page 48)</li> </ul>
Multiple dwelling buildings	At least every six months	
Single-family houses	At least once a year	

#### 8.2.1 Inspection contract

For inspection work and servicing work we recommend the KSB inspection contract. Contact your service partner for details.

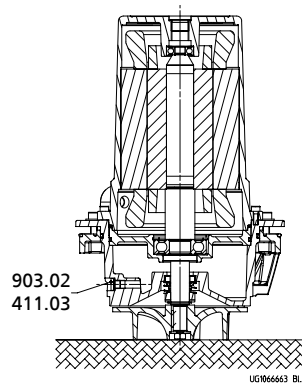
#### 8.2.2 Measuring the insulation resistance

Measure the insulation resistance of the motor when servicing the sewage lifting unit.

- ✓ The maintenance intervals have been observed. (⇒ Section 8.2, Page 48)
  1. Measure the insulation resistance at the cable ends with an insulation resistance measuring device. The insulation resistance must be  $\geq 2 \text{ M}\Omega$ .
    - ⇒ Measuring voltage at 3~ 400 V AC: 1000 V DC
    - ⇒ Measuring voltage at 1~ 230 V AC: 500 V DC
- ⇒ If the values are too low, have the motor overhauled by KSB Service.

#### 8.2.3 Changing the oil

	<b>CAUTION</b>
	<p><b>Fluid entering the oil reservoir</b> Damage to the pump set!</p> <ul style="list-style-type: none"> <li>▷ Check the mechanical seal and shaft seal ring. Replace them if necessary.</li> </ul>
	<b>CAUTION</b>
	<p><b>Excessive oil level</b> Pressure rise inside the pump as oil fill heats up! Mechanical seal failure!</p> <ul style="list-style-type: none"> <li>▷ Fill in the correct oil quantity. (⇒ Section 8.2.3.1, Page 49)</li> </ul>



**Fig. 25:** Draining the oil reservoir

- ✓ A suitable container for collecting the oil is on hand.
  1. Remove rotating assembly 01-44. (⇒ Section 8.3.1, Page 50)
  2. Place rotating assembly 01-44 down in a clean and level assembly area.

3. Undo screw plug 903.2 incl. joint ring 411.03 with a suitable tool. Collect the drained oil in a container and inspect the oil.
  - ⇒ Light yellow to white oil emulsion: Change the oil.
  - ⇒ Liquid in the oil reservoir: Check the mechanical seal and shaft seal ring. Replace them if necessary.
4. Dispose of the drained oil in accordance with the local environmental regulations.
5. Place rotating assembly 01-44 horizontally on wooden supports as shown in the following illustration. Secure it against rolling off.

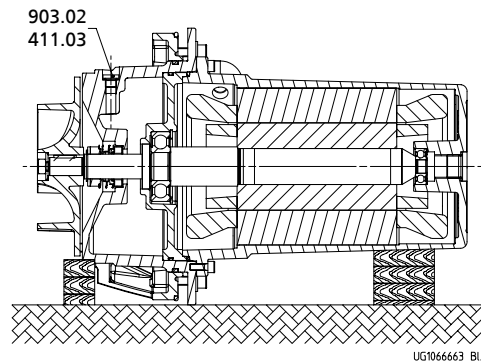


Fig. 26: Filling the oil reservoir

6. Fill in the oil. Observe the oil quality and oil quantity .
7. Fit screw plug 903.2 incl. joint ring 411.03.

### 8.2.3.1 Oil quality

Recommended oil quality:

- Paraffin oil, thin-bodied, made by Merck, No. 7174, or equivalent
- Medical quality
- Non-toxic
- Recognised as safe and therefore food-approved

### 8.2.4 Emergency operation with one pump (for dual-pump lifting units)

	<b>CAUTION</b>
	<p><b>Excessive inflow</b> Flooding of installation room!</p> <p>▷ During emergency operation the inflow should be kept to a minimum.</p>

For emergency operation with one pump of a dual-pump lifting unit during maintenance work / inspection work, proceed as follows:

1. Close the inlet-side and discharge-side shut-off valves.
2. Interrupt power supply. (⇒ Section 6.4, Page 38)
3. Remove rotating assembly 01-44. (⇒ Section 8.3.1, Page 50)
4. Close plate 185.01 with blind flange 724<sup>12)</sup>.
5. For the pump set that has been removed from the unit, set the manual-0-automatic selector switch to 0.
6. For the pump set remaining in the unit, set the manual-0-automatic selector switch to automatic.
7. Open the inlet-side and discharge-side shut-off valves.

12) Available as accessory

### 8.3 Dismantling the hydraulic system

#### 8.3.1 Removing the rotating assembly

1. Remove hex. socket head cap screws 914.04.
2. Use two forcing screws (M8) to separate rotating assembly 01-44 from plate 185.01 and lift it out of the tank 591.
3. Drain the oil from the oil chamber. (⇒ Section 8.2.3, Page 48)
4. Undo nut 920.01 and remove disc 550.10.
5. Use two screwdrivers to lift off impeller 230 (see Fig.).



Fig. 27: Loosening the impeller

6. Remove key 940.
7. Remove circlip 932.02 and support disc 550.02.
8. Carefully pull the rotating assembly of mechanical seal 433 off the shaft.

#### 8.3.2 Dismantling the motor section

1. Remove hex. socket head cap screw 914.01.
2. Push rotor 818 with motor housing with stator pack 80-1 and bearing bracket 330 out of casing cover 161.
3. Take O-ring 412.04 and the stationary assembly of mechanical seal 433 out of casing cover 161.
4. Extract rotor 818 with bearing bracket 330 out of motor housing with stator pack 80-1.



#### NOTE

Place a suitable object (e.g. a cylinder, diam. 15 x 15 mm) against the face of shaft 210 and use the screw plug to press the shaft out of motor housing 811.

5. Take O-ring 412.02 out of bearing bracket 330.
6. Remove O-ring 412.01 and circlip 932.01.
7. Separate the bearing bracket with lip seal 421.01 from bearing 321.01.
8. Remove the lip seal from the bearing bracket.
9. Pull off deep groove ball bearings 321.01 (6201-2RSR/C3) and 321.02 (6305-2RS1-JC3).

### 8.4 Reassembly

#### 8.4.1 General instructions

Observe the following points for reassembly:

The pump shall be reassembled in accordance with the general rules of sound engineering practice.  
 Clean all dismantled components and check them for signs of wear.  
 Replace damaged or worn parts by original spare parts.  
 Make sure that the sealing surfaces are clean and that O-rings are properly seated.  
 We recommend using new O-rings/gaskets whenever the pump is reassembled.

	<b>CAUTION</b>
	<p><b>O-rings do not seal properly</b>                  Damage to the lifting unit!</p> <ul style="list-style-type: none"> <li>▷ Use original O-rings.</li> <li>▷ Do not use O-rings that have been made by cutting an O-ring cord to size and gluing the ends together.</li> </ul>

The shaft surface must be absolutely clean and undamaged.  
 Reassembly is effected in reverse order to dismantling.  
 Use the general assembly drawing and the list of components for orientation.  
 After reassembly measure the insulation resistance. (⇒ Section 8.2.2, Page 48)

#### 8.4.2 Fitting the bearing assembly/shaft seal

	<b>NOTE</b>
	<p>We recommend fitting new bearings/shaft seals whenever the motor section has been dismantled.</p>

**Observe the following points to ensure trouble-free operation of the mechanical seal:**

- The protective wrapping of the contact faces shall only be removed immediately before assembly takes place.
  - Extreme care and cleanliness during installation are of utmost importance for the trouble-free operation of the mechanical seal.
  - The shaft surface in the mechanical seal area must be absolutely clean and smooth.
1. Press in lip seal 421.01, making sure the sealing lip points towards the impeller.
  2. Fit mechanical seal 433.
  3. After reassembly fill the oil reservoir with oil again. (⇒ Section 8.2.3, Page 48)

#### 8.5 Installing the float switch

- ✓ A residual fill level of approx. 50 mm is available in the collecting tank. Top it up if necessary.
1. Install float switch 81-45 incl. O-ring 412.31 with hexagon socket head cap screws 914.31 and discs 550.31. Observe the tightening torques.  
 (⇒ Section 8.6, Page 51)

#### 8.6 Tightening torques

Table 29: Tightening torques

Connection	Tightening torque
	[Nm]
Rotating assembly 01-44 / collecting tank	6
Float switch 81-45 / collecting tank	2
Check valve 747 / collecting tank	6
Motor housing 811 / casing cover	6
Lantern 343 / casing	12

### 8.7 Disposal/recycling of the lifting unit

Lifting units consist of materials that can be separately recycled.  
Plastic components are marked in accordance with ISO 11 469.

### 8.8 Checklist for commissioning/inspection ① and maintenance ②

Table 30: Checklist

Actions	Required during	
	①	②
Read the operating instructions.	①	②
Check the power supply. Compare the actual data against the name plate data.	①	②
Check the direction of rotation. Then check firm seating of screw plug 903.1.		②
Check the earth conductor to ensure that it functions properly (to EN 60 439).	①	②
Check connection of the temperature switches (thermal circuit breakers). Do not interchange cables at the pump end (UZ).	①	②
Check winding resistances.	①	②
Check insulation resistances. (⇒ Section 8.2.2, Page 48)	①	②
Re-tighten the terminals: Motor(s) Control unit Level transmitter	①	②
Replace bearings, if required.	①	②
Check the shaft seal.	①	②
Change the oil in the oil reservoir, if required.	①	②
Replace shaft seal and rotor, if required.	①	②
Check flexible pipe connections for proper fit and wear, if any.	①	②
Check expansion joints (if any) for wear.	①	②
Check the shut-off, drain/vent and check valves for proper functioning and tightness.	①	②
Check the collecting tank. Clean tank from deposits, if any. In case of major grease deposits in the tank as a result of greasy waste water from industrial businesses, inform the customer that according to DIN 1986-100 a grease separator must be installed (upstream of the lifting unit). Check cover 160 for leakage.	①	②
Check the switching mechanism. Remove the level sensor; check for jamming/incrustations; clean, if necessary.	①	②
Check the switchover time from star to delta (required = approx. 3 seconds)	①	②
Check fuses. Size, characteristics, three poles/interlocking device	①	②
Replace the fuses after two years of operation (cartridges).	①	②
Check the pump/motor for smooth operation.	①	②
Check the automatic switching functionality: Manual-0-automatic selector switch Pump changeover after each start/stop cycle (UZ) Additional start-up of stand-by pump at peak load (UZ) Start-up of stand-by pump should duty pump fail (UZ) Set manual selector switch back to automatic mode.	①	②
Check power consumption of motor(s).	①	②
Check tank settings/parameterisation.	①	
Test-run for several start/stop cycles.	①	②
Check the alarm device to ensure that it functions properly.		②
Replace the rechargeable battery after 5 years of operation. (⇒ Section 7.3.5, Page 46)		②
If applicable: reset service alert (LevelControl Basic 2 only).	①	②
Determine the spare parts requirements, if any.	①	②



Actions	Required during	
Advise and/or train operating staff.	①	②
Provide new operating manual if necessary.	①	②

## 9 Trouble-shooting

	<p><b>⚠ WARNING</b></p>
	<p><b>Improper work to remedy faults</b> Risk of injury!</p> <p>▷ For any work performed to remedy faults, observe the relevant information given in this instruction manual and/or in the product literature provided by the accessories manufacturer.</p>
	<p><b>NOTE</b></p>
	<p>After any fault or malfunction, carry out a visual and functional inspection of the lifting unit.</p>
	<p><b>NOTE</b></p>
	<p>If the lifting unit has been flooded, always carry out an inspection.</p>
	<p><b>NOTE</b></p>
	<p>Please contact KSB Service before carrying out any work on the pump's internal parts during the warranty period. Non-compliance will lead to forfeiture of warranty cover and of any and all rights to claims for damages.</p>

If problems occur that are not described in the following table, consultation with KSB Service is required.

- A Pump is running, but does not deliver
- B Insufficient flow rate
- C Excessive current/power input
- D Insufficient discharge head
- E Vibrations and noise during pump operation
- F Lifting unit frequently switches to fault mode

**Table 31: Trouble-shooting**

A	B	C	D	E	F	Possible cause	Remedy <sup>13)</sup>
-	X	-	-	-	X	Pump set delivers against an excessively high pressure.	▪ Sewage lifting unit has been selected incorrectly; a larger sewage lifting unit is required.
-	X	-	-	-	X	Discharge-side shut-off valve not fully open	▪ Fully open the shut-off valve.
-	-	X	-	X	X	Pump set is running in the off-design range.	▪ Check the operating data of the pump set.
X	-	-	-	-	X	Pump set and/or piping not completely vented	▪ Check the vent lines.
X	X	-	-	-	X	Pump inlet clogged, e.g. by deposits.	▪ Clean the pump intake, pump components and collecting tank.
-	X	-	X	X	X	Inlet line or impeller clogged	▪ Remove deposits in the pump and/or piping.
-	-	X	-	X	X	Dirt/fibres in the clearance between the casing wall and impeller; sluggish pump rotor	▪ Check whether the pump rotor can be easily rotated. Clean the hydraulic unit if necessary.
-	X	X	X	X	X	Internal parts worn.	▪ Replace worn parts by new ones.
-	X	-	X	X	X	Impermissible air or gas content in the fluid handled	▪ Contact KSB.

13) The pump set pressure must be released before attempting to remedy faults on parts which are subjected to pressure. Disconnect the pump set from the power supply!

A	B	C	D	E	F	Possible cause	Remedy <sup>13)</sup>
-	-	X	-	-	-	Operating voltage is too low.	<ul style="list-style-type: none"> <li>Check the power supply and cable connections.</li> </ul>
X	-	-	-	-	-	Motor is not running / no voltage.	<ul style="list-style-type: none"> <li>Check electrical installation incl. fuses.</li> </ul>
-	X	X	X	X	X	Wrong direction of rotation	<ul style="list-style-type: none"> <li>Reverse the phases of the power cable or motor power cable. (⇒ Section 5.7, Page 29)</li> </ul>
X	X	-	X	-	X	Motor is running on 2 phases only.	<ul style="list-style-type: none"> <li>Check the voltages of the conductors.</li> <li>Replace the defective fuse if applicable.</li> <li>Check the cable connections.</li> </ul>
X	-	-	-	-	X	Manual-0-automatic selector switch set to 0	<ul style="list-style-type: none"> <li>Set the manual-0-automatic selector switch to automatic.</li> </ul>
X	-	-	-	-	X	Stator winding or power cable are defective.	<ul style="list-style-type: none"> <li>Replace by original spare parts / contact KSB.</li> </ul>
-	X	-	-	-	-	Water level in the tank too low during operation	<ul style="list-style-type: none"> <li>Check the float switch.</li> <li>Check the parameters. Adjust the parameters if required.</li> </ul>
X	-	-	-	-	-	Excessive winding temperature. Monitoring equipment stops the pump set.	<ul style="list-style-type: none"> <li>Let the motor cool down. Motor will re-start automatically.</li> </ul>
-	-	X	-	X	-	Defective radial bearing in the motor	<ul style="list-style-type: none"> <li>Contact KSB.</li> </ul>
-	X	-	-	-	X	Deposits in the collecting tank	Clean the collecting tank; in case of greasy deposits, fit a grease separator.
-	-	-	-	-	X	Check valve does not close properly.	<ul style="list-style-type: none"> <li>Clean the check valve. Screw the lifting screw as far as it will go.</li> </ul>
-	-	-	-	X	-	System-induced vibrations	<ul style="list-style-type: none"> <li>Check the flexible pipe connections</li> </ul>
X	-	-	-	X	X	Defective float switch	<ul style="list-style-type: none"> <li>Check the float switch. Clean or replace it as necessary. (⇒ Section 8.5, Page 51)</li> </ul>

## 10 Related Documents

### 10.1 General assembly drawing/exploded view and list of components

#### 10.1.1 Compacta U100/300, UZ150/300, UZ 450/900 - Rotating assembly

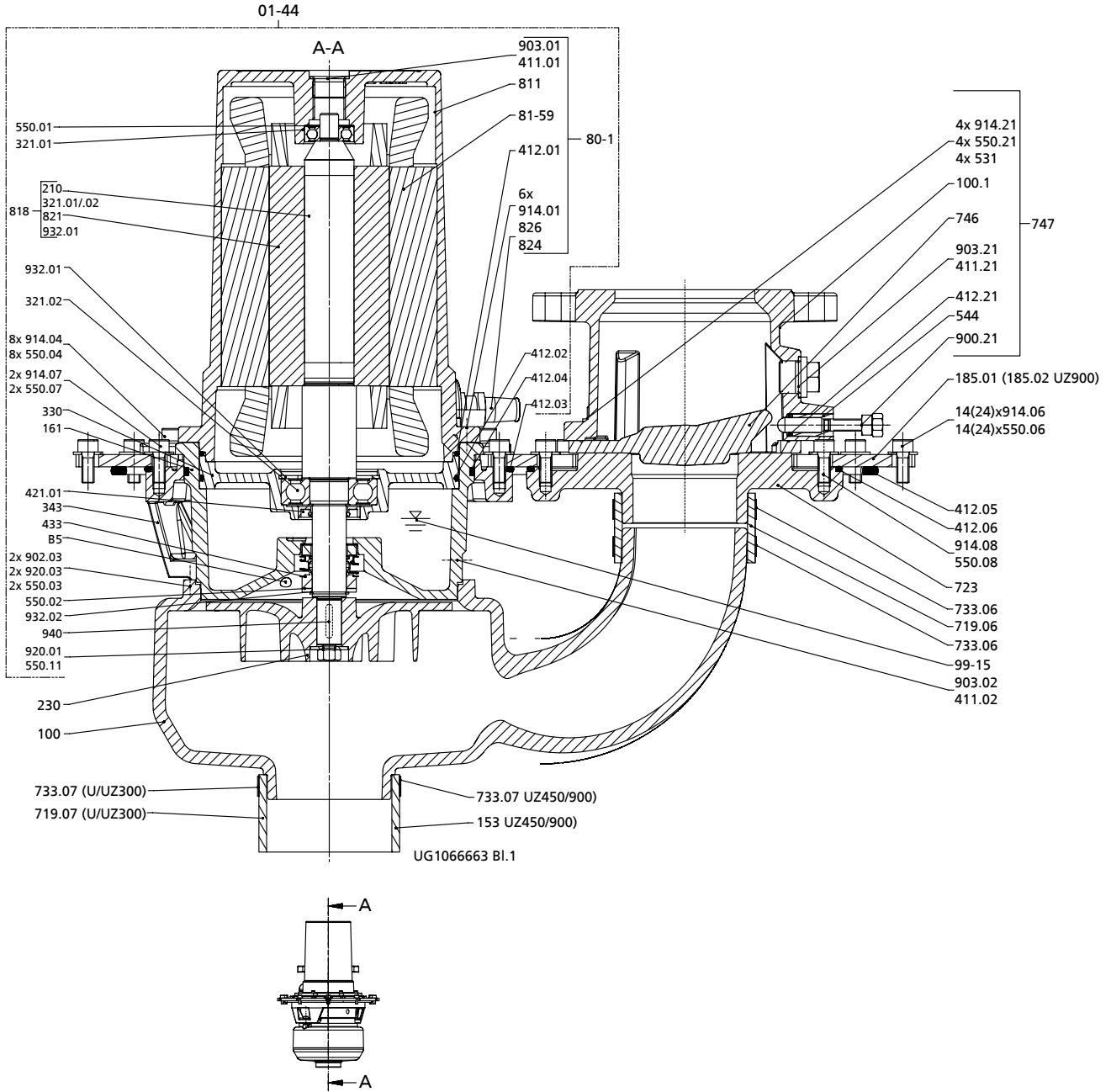


Fig. 28: General assembly drawing Compacta U100/300, UZ150/300, UZ 450/900 - Rotating assembly

Part No.	Part No.	Description	Part No.	Part No.	Description
01-44		Rotating assembly	940		Key
100		Casing	99-15		Lubricating oil
153		Suction nozzle	99-20.01		Bearing/shaft seal repair kit
161		Casing cover		321.01/02	Deep groove ball bearing
185.01/.02		Plate		411.02	Joint ring
230		Impeller		421.01	Lip seal
330		Bearing bracket		433	Mechanical seal
343		Lantern		550.01	Disc

Part No.	Part No.	Description	Part No.	Part No.	Description
412.01-.06		O-ring		550.02	Support disc
719.06/.07		Flexible tube		903.02	Screw plug
723		Flange		932.01/.02	Circlip
733.06/.07		Hose clip	99-20.02		Small parts repair kit
747		Check valve		411.01/.02	Joint ring
	100.01	Body		550.01/.03/ .07/.11	Disc
	400.21	Sealing element		560.02	Support disc
	411.21	Joint ring		902.03	Stud
	412.21	O-ring		903.01/.02	Screw plug
	531	Locking sleeve		914.07	Hexagon socket head cap screw
	544	Threaded bush		920.01/.03	Nut
	550.21	Disc		932.01/.02	Circlip
	746	Valve disc	920.20.03		Check valve repair kit
	900.21	Bolt/screw		400.21	Sealing element
	903.21	Screw plug		411.21	Joint ring
	914.21	Hexagon socket head cap screw		412.21/.22	O-ring
80-1		Motor unit		746	Valve disc
	411.01	Joint ring	99-20.04		Screws repair kit
	412.01	O-ring		550.04/.06/.08	Disc
	811	Motor housing		914.01/.04/ .06/.08	Hexagon socket head cap screw
	81-59	Stator	5B		Vent
	824	Cable			
	826	Cable gland			
	903.01	Screw plug			
	914.01	Hexagon socket head cap screw			
818		Rotor			
	210	Shaft			
	321.01/.02	Deep groove ball bearing			
	821	Rotor core pack			
	932.01	Circlip			

10.1.2 Compacta U100 - Collecting tank

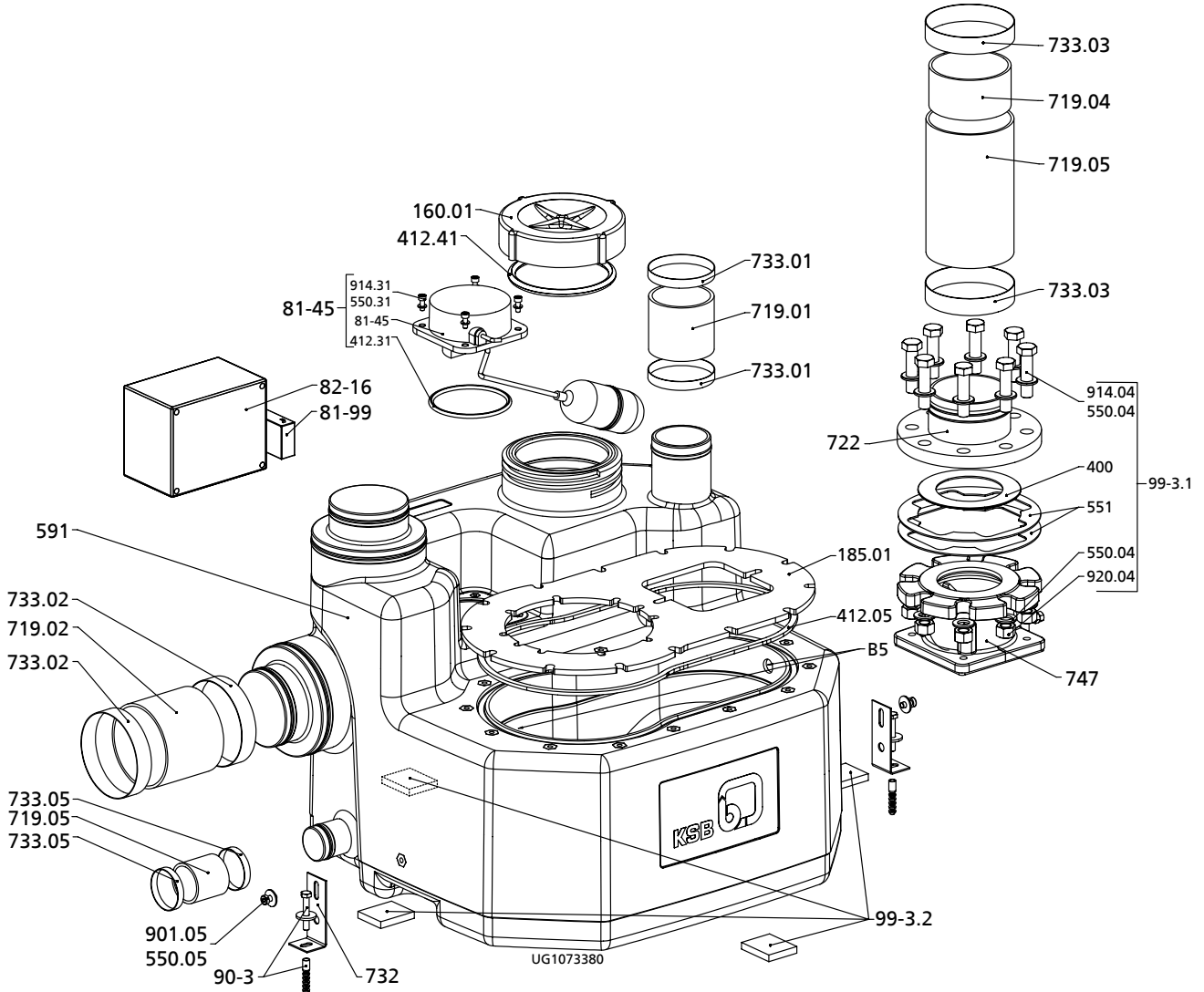


Fig. 29: Exploded view of Compacta U100 - Collecting tank

Part No.	Part No.	Description	Part No.	Part No.	Description
160.01		Cover	81-99		Rechargeable battery
185.01		Plate	82-16		Control unit
400		Gasket	90-3		Set of mounting elements
412.31/.41/.05		O-ring	901.05		Hexagon head bolt
550.05		Disc	99-3.1		Set of installation accessories
551		Spacer disc		400	Gasket
591		Tank		550.04	Disc
719.01/.02/.03/.04/.05		Flexible tube		551	Spacer disc
722		Double-flanged taper		901.04	Hexagon head bolt
732		Holder		920.04	Hexagon nut
733.01/.02/.03/.05		Hose clip	99-3.2		Set of pads
747		Check valve	B5		Vent
81-45		Level sensor			
	412.31	O-ring			
	550.31	Disc			



Part No.	Part No.	Description	Part No.	Part No.	Description
412.31/.41/.05		O-ring		550.31	Disc
550.05		Disc		81-45	Level sensor
551		Spacer disc		914.31	Hex. socket head cap screw
591		Tank	81-99		Rechargeable battery
71-11		Y-pipe set (UZ)	81-16		Control unit
	400	Gasket	90-3		Set of mounting elements
	550.04	Disc	901.05		Hexagon head bolt
	715	Y-pipe	99-3.1		Set of installation accessories
	901.04	Hexagon head bolt		400	Gasket
	920.04	Hexagon nut		550.04	Disc
719.01/.02/.03/.04/.05		Hose		551	Spacer disc
722		Flanged coupling		901.04	Hexagon head bolt
724		Blind flange		920.04	Hexagon nut
732		Holder	99-3.2		Set of pads
733.01/.02/.03/.05		Hose clip	B5		Vent



10.1.4 Compacta UZ450, UZ900 - Collecting tank

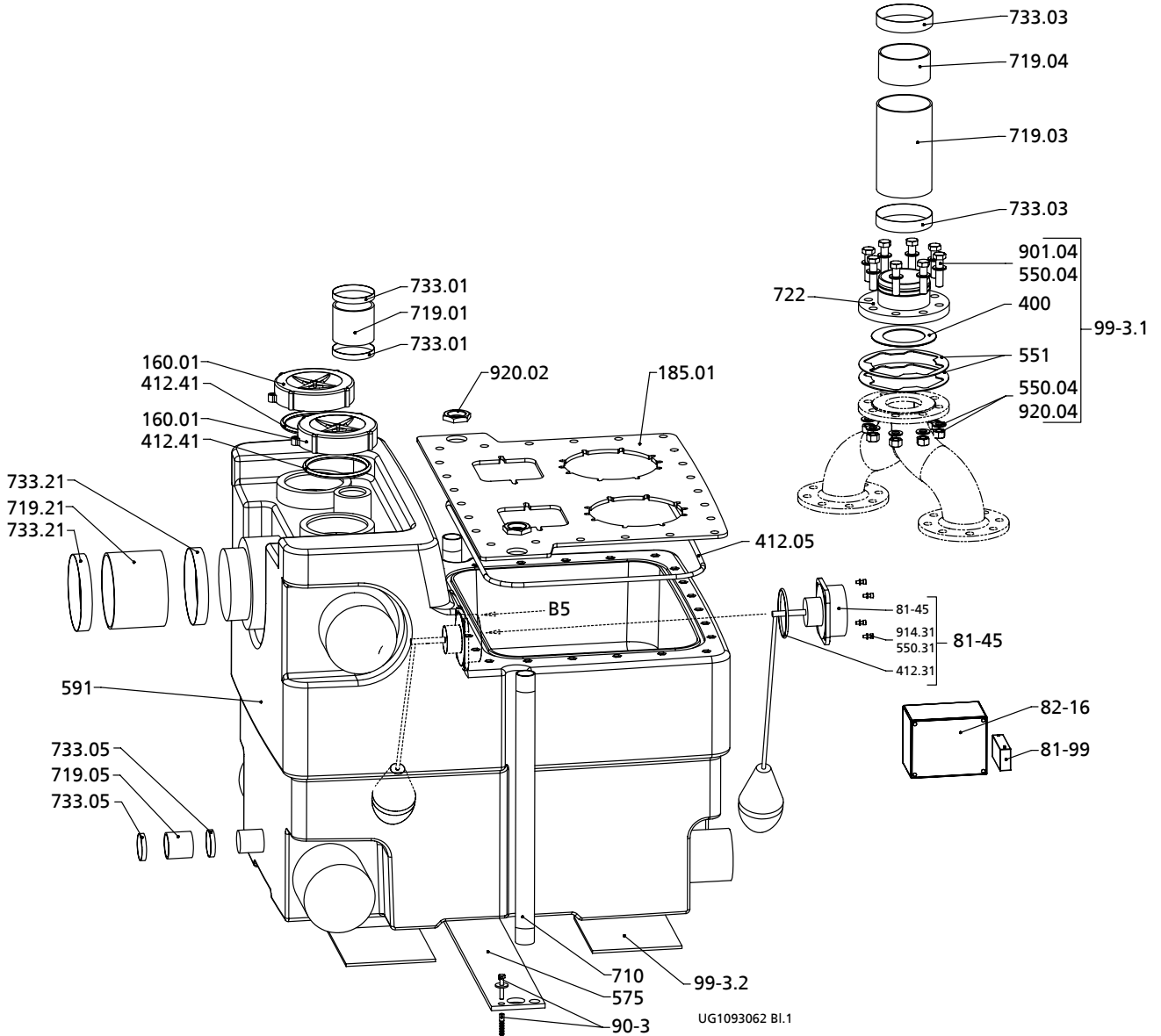


Fig. 31: Exploded view of Compacta UZ450 and UZ900

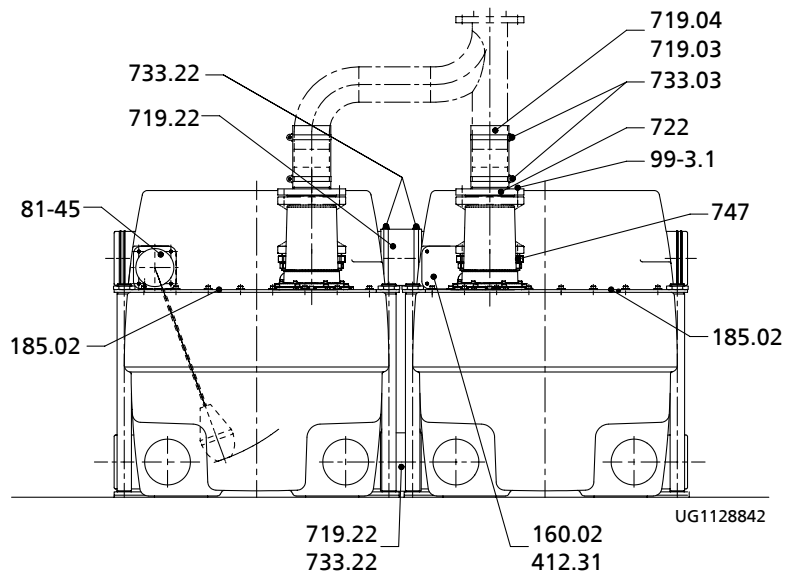


Fig. 32: Generally assembly drawing of Compacta UZ900 with 2 tanks

2317.887/11-EN

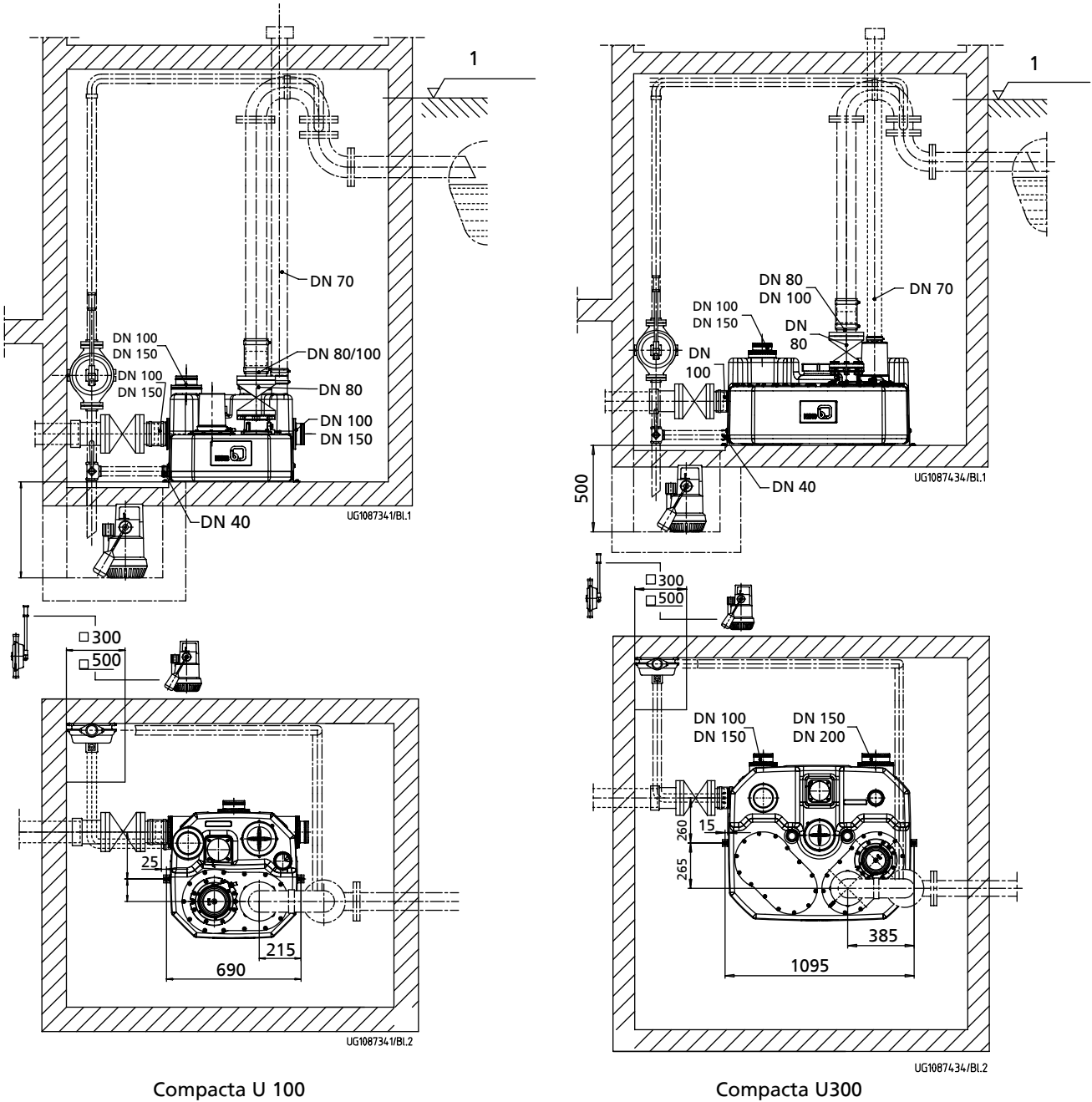
Part No.	Part No.	Description	Part No.	Part No.	Description
160.01/.02		Cover	81-99		Rechargeable battery
17-5		Guide plate <sup>14)</sup>	82-16		Control unit
185.01/.02		Plate	90-3		Set of mounting elements
400		Gasket	920.2		Hex. nut
412.31/.41/.05		O-ring	99-3.1		Set of installation accessories
551		Spacer disc		400	Gasket
575		Strip		550.04	Disc
591		Tank		551	Spacer disc
710		Pipe		901.04	Hexagon head bolt
719.01/.21/ .22/.03/.04/ .05		Hose		920.04	Hexagon nut
722		Flanged coupling	99-3.2		Set of pads
733.01/.21/ .22/.03/.05		Hose clip	5B		Vent
747		Check valve			
81-45		Level sensor			
	412.31	O-ring			
	550.31	Disc			
	81-45	Level sensor			
	914.31	Hex. socket head cap screw			

14) Not shown in drawing.

10.2 Connection examples

10.2.1 Compacta U100, U300

**i** Rooms for lifting units must be dimensioned so as to ensure that there is a working area of at least 60 cm width and height around and above all parts to be operated and serviced.



Compacta U 100

Compacta U300

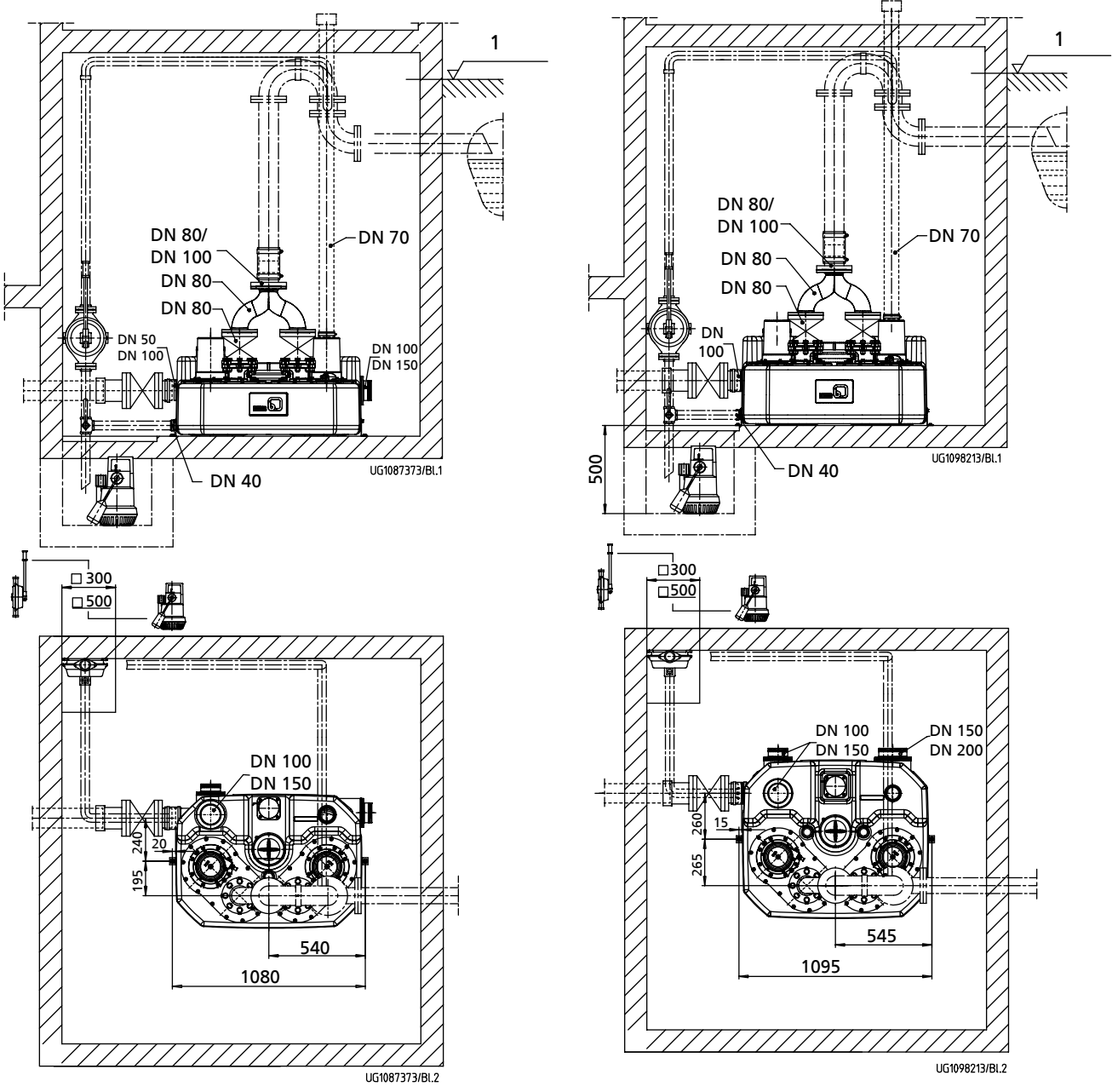
Fig. 33: Connection example Compacta U100, U300

1 Flood level

2317.887/11-EN

10.2.2 Compacta UZ150, UZ300

**i** Rooms for lifting units must be dimensioned so as to ensure that there is a working area of at least 60 cm width and height around and above all parts to be operated and serviced.



Compacta UZ150

Compacta UZ300

Fig. 34: Connection example Compacta UZ150, UZ300

1	Flood level
---	-------------

10.2.3 Compacta UZ3. - 5.450, UZ3. - 5.900

**i** Rooms for lifting units must be dimensioned so as to ensure that there is a working area of at least 60 cm width and height around and above all parts to be operated and serviced.

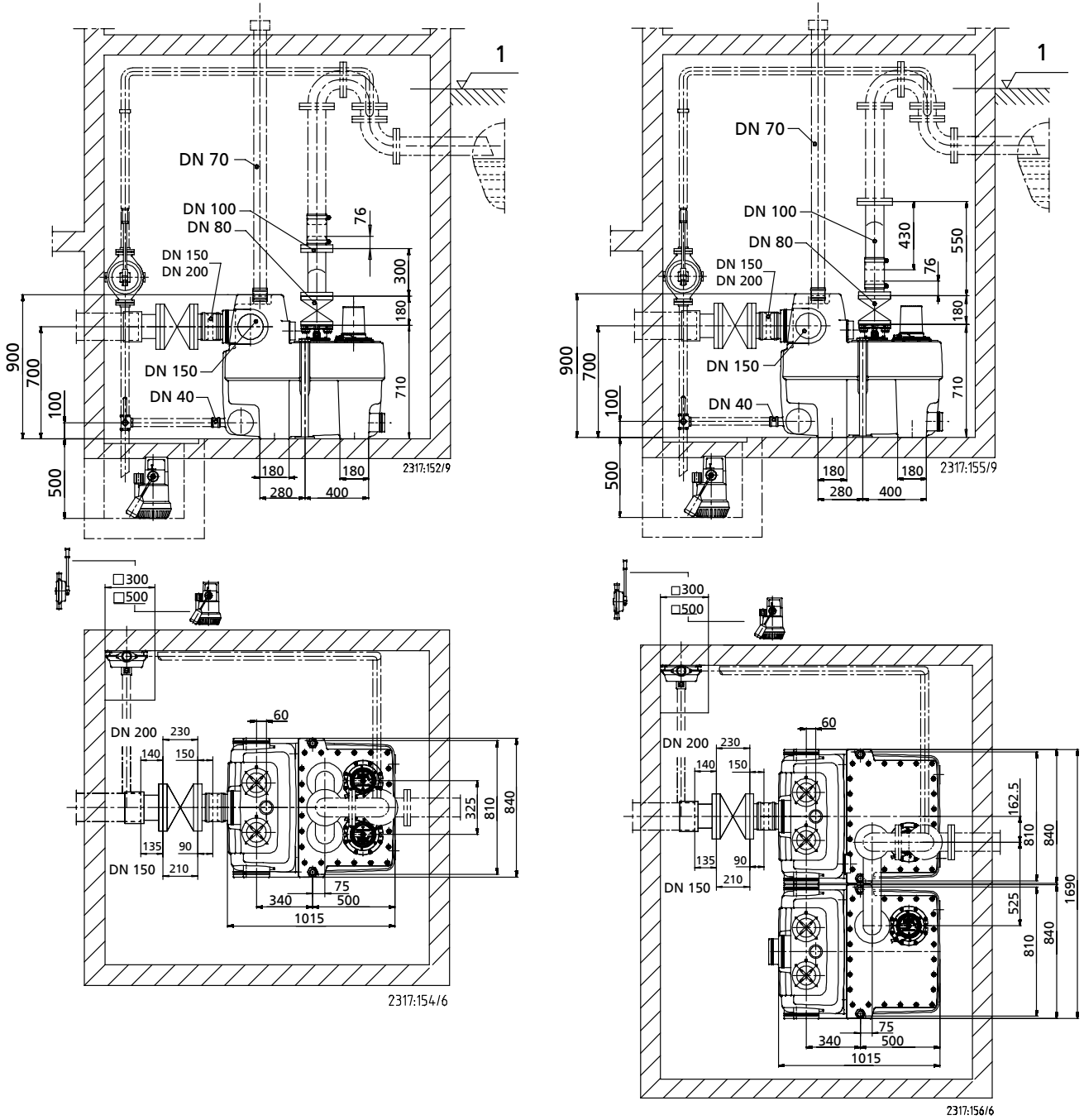
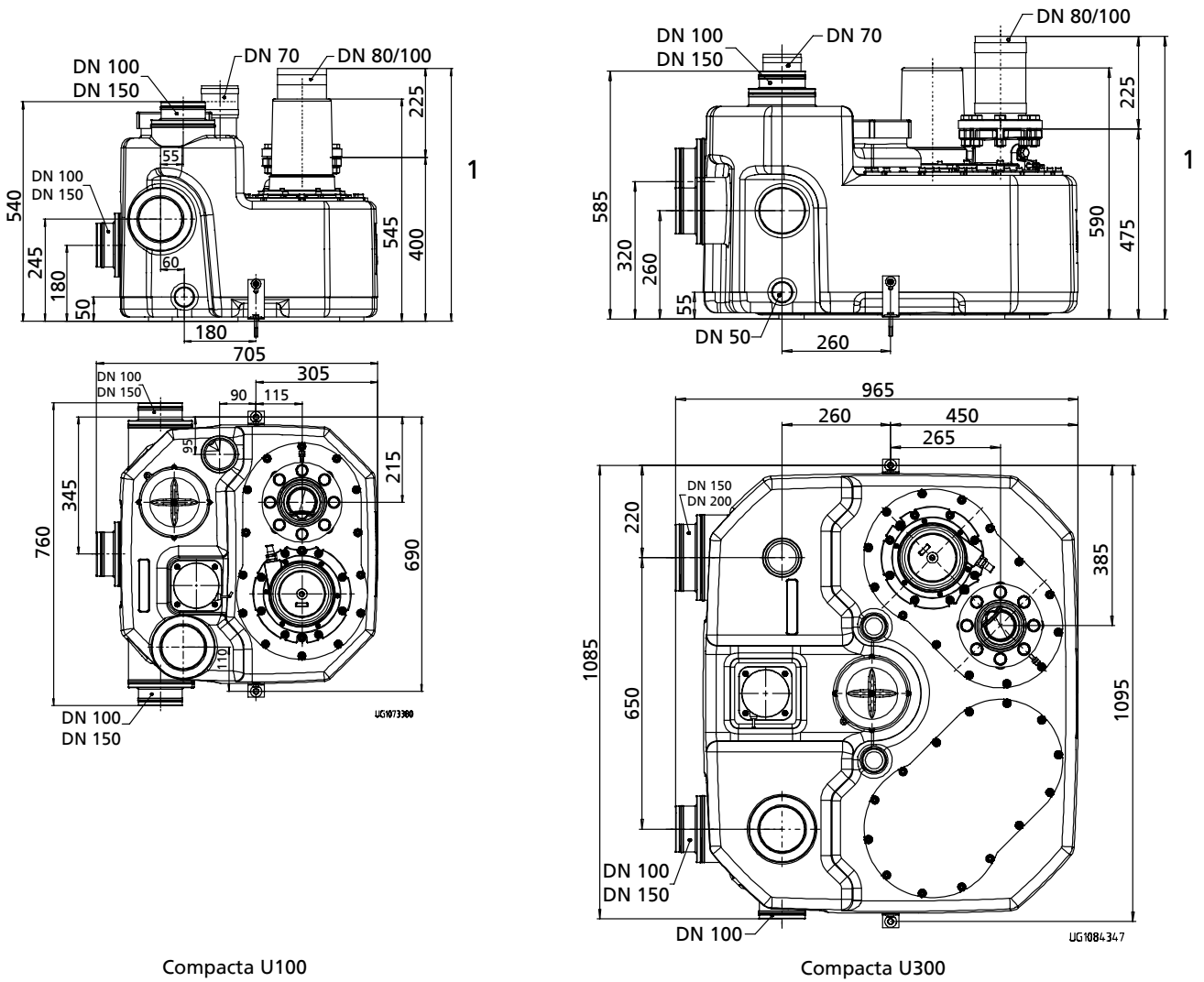


Fig. 35: Connection example Compacta UZ3. - 5.450, UZ3. - 5.900

1	Flood level
---	-------------

10.3 Dimensions

10.3.1 Compacta U100, U300



Compacta U100

Compacta U300

Fig. 36: Dimensions Compacta U100, U300

1	With gate valve: 625 mm
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10.3.2 Compacta UZ150, UZ300

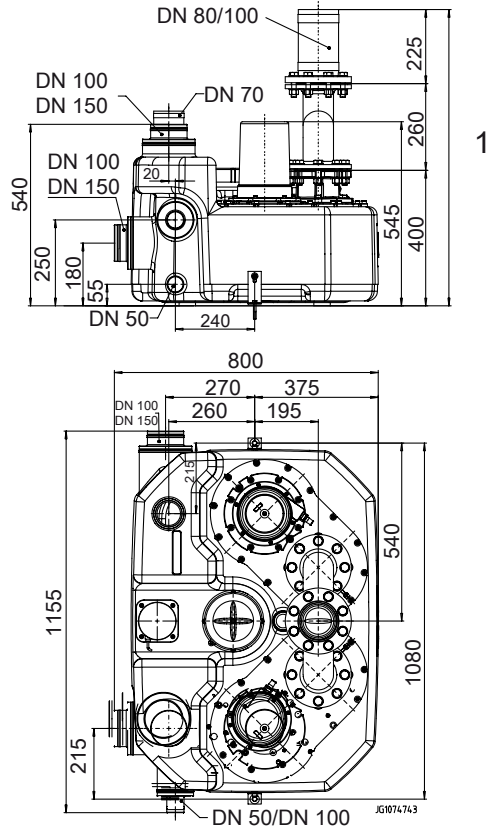


Fig. 37: Dimensions of Compacta UZ150, UZ300

1	With gate valve 1065 mm
---	-------------------------

10.3.3 Dimensions of shut-off elements

10.3.3.1 Inlet line

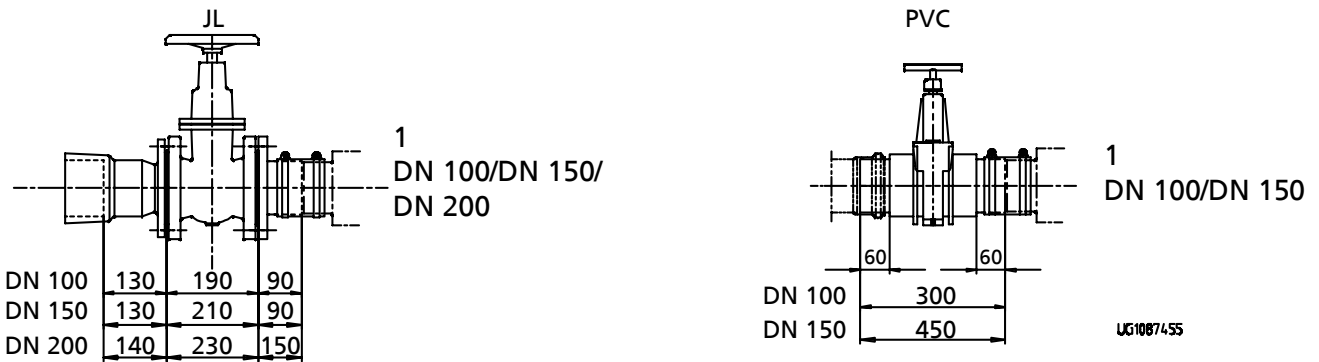
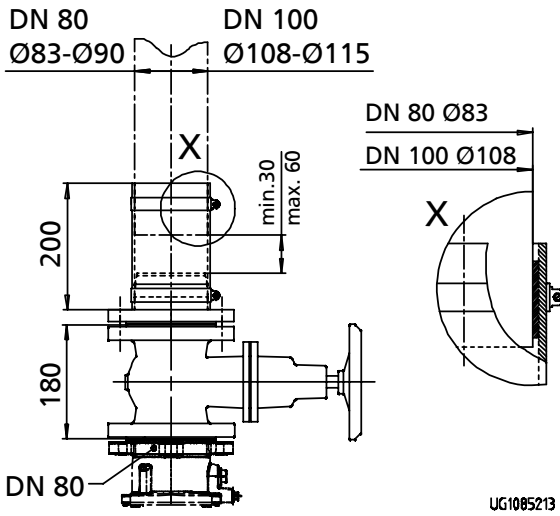


Fig. 38: Dimensions of inlet line with cast iron and PVC gate valve

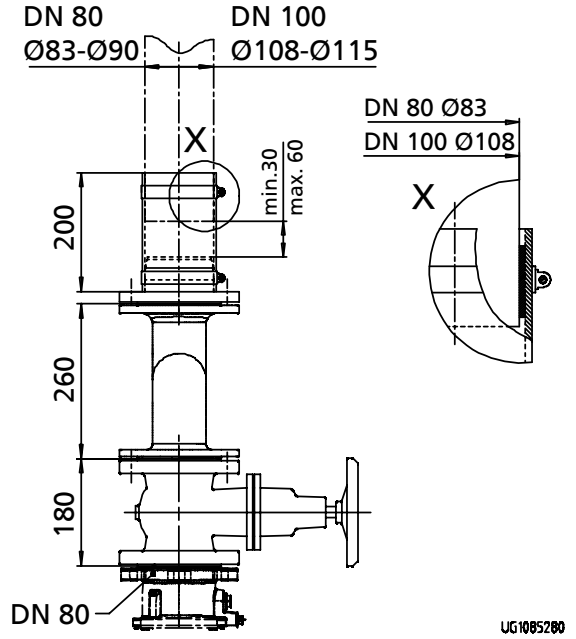
1	Tank connection
---	-----------------

2317.887/11-EN

10.3.3.2 Discharge line



Compacta U100, U300  
Fig. 39: Dimensions of discharge line



Compacta UZ150, UZ300

10.4 Connections

10.4.1 Compacta U100, U300

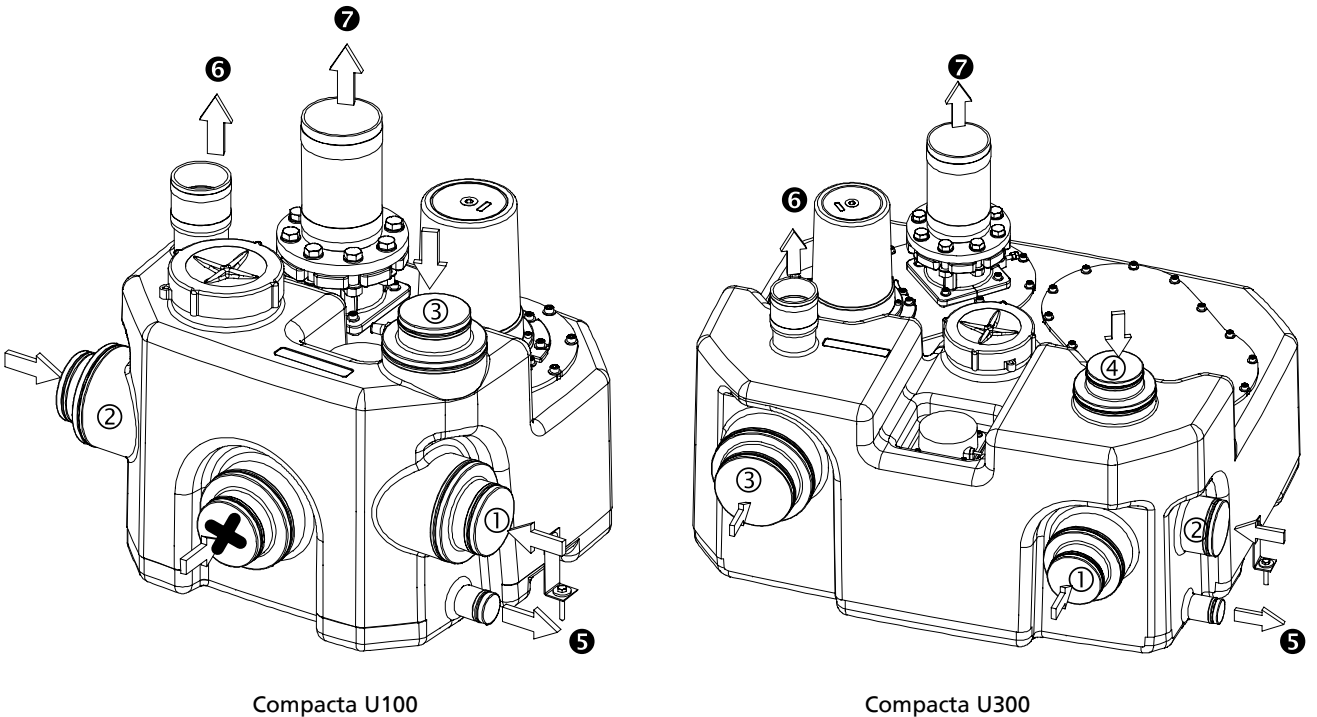


Fig. 40: Connections of Compacta U100 and U300

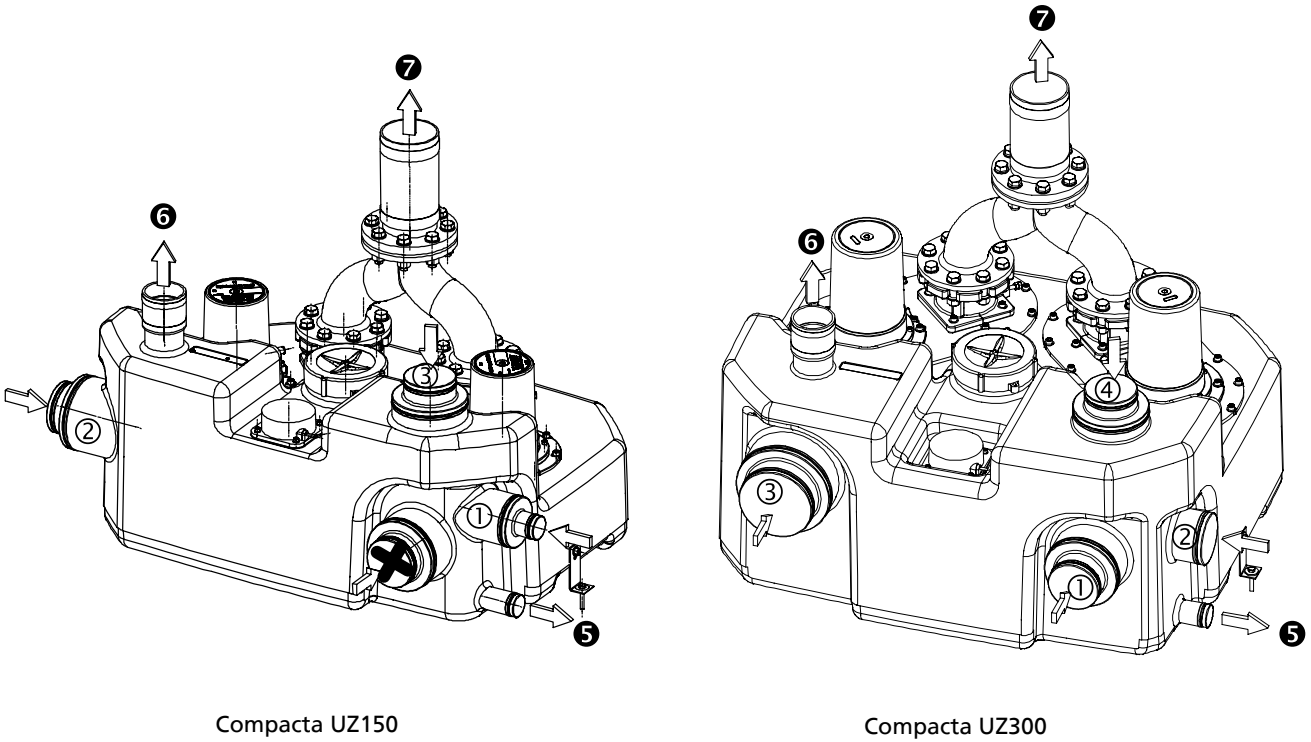
Number	Connection for	Number	Connection for
①	Inlet DN 150/100	①	Inlet DN 150/100
②	Inlet DN 150/100	②	Inlet DN 100
③	Inlet DN 150/100	③	Inlet DN 200/150

2317.887/11-EN



Number	Connection for	Number	Connection for
✘	Inlet cannot be used	④	Inlet DN 150/100
⑤	DN 40 drainage nozzle	⑤	DN 40 drainage nozzle
⑥	Vent DN 70	⑥	Vent DN 70
⑦	Discharge line DN 80/100	⑦	Discharge line DN 80/100

10.4.2 Compacta UZ150, UZ300

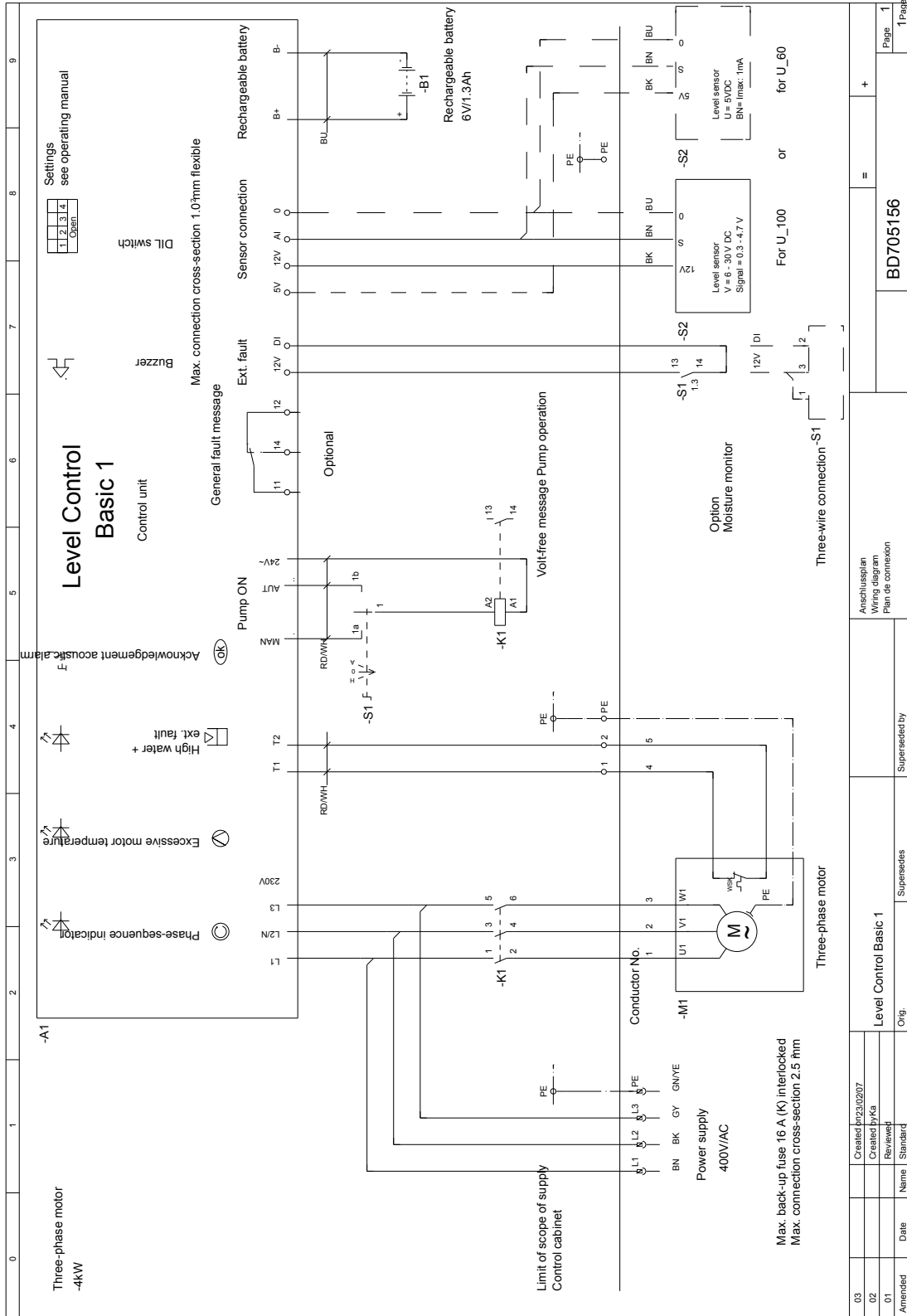


Compacta UZ150  
**Fig. 41: Connections of Compacta UZ150 and UZ300**

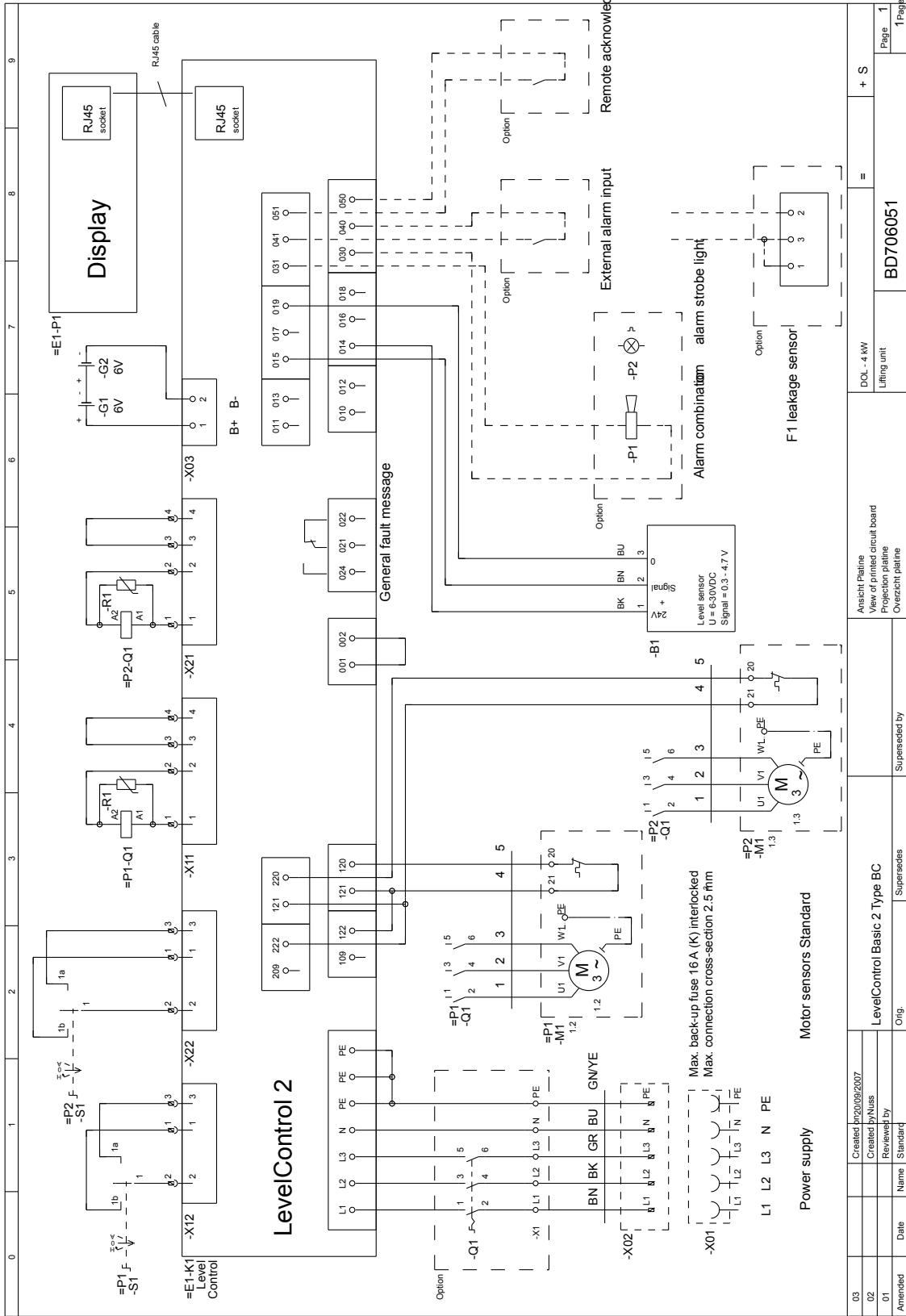
Number	Connection for	Number	Connection for
①	Inlet DN 100/50	①	Inlet DN 150/100
②	Inlet DN 150/100	②	Inlet DN 100
③	Inlet DN 150/100	③	Inlet DN 200/150
✘	Inlet cannot be used	④	Inlet DN 150/100
⑤	DN 40 drainage nozzle	⑤	DN 40 drainage nozzle
⑥	Vent DN 70	⑥	Vent DN 70
⑦	Discharge line DN 80/100	⑦	Discharge line DN 80/100

10.5 Wiring diagrams

10.5.1 LevelControl Basic 1 - three-phase (3~)



10.5.2 LevelControl Basic 2 Type BC - dual-pump unit - DOL - up to 4 kW



## 11 EU Declaration of Conformity

Manufacturer: **KSB SE & Co. KGaA**  
**Johann-Klein-Straße 9**  
**67227 Frankenthal (Germany)**

The manufacturer herewith declares that the product:

### Compacta

**Serial number range: 2020w01 to 2022w52**

- is in conformity with the provisions of the following directives / regulations as amended from time to time:
  - 2006/42/EC: Machinery Directive
  - 305/2011/EU: Regulation laying down harmonised conditions for the marketing of construction products (EU Construction Products Regulation)
  - Electrical components<sup>15)</sup>: 2011/65/EU Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)
  - 2014/30/EU: Electromagnetic Compatibility (EMC)

The manufacturer also declares that

- the following harmonised international standards have been applied:
  - EN 809
  - EN 12050-1
  - ISO 12100
  - EN 60034-1, EN 60034-5/A1
  - EN 60204-1
  - EN 61000-6-2, EN 61000-6-3

Certified by TÜV Rheinland LGA Products GmbH (0197)

Person authorised to compile the technical file:

Armin Reisinger  
Technical Project Manager, Product Development, Business Unit Automation and Drives  
KSB SE & Co. KGaA  
Johann-Klein-Straße 9  
67227 Frankenthal (Germany)

The EU Declaration of Conformity was issued in/on:

Frankenthal, 1 January 2020



---

Jochen Schaab  
Head of Product Development Pump Systems and Drives  
KSB SE & Co. KGaA  
Johann-Klein-Straße 9  
67227 Frankenthal

---

15) Where applicable

**12 Declaration of Performance as per Regulation (EU) No. 305/2011, Annex III**

No.	DoP2317.0-01
For the product	<b>Compacta</b>
(1) Product type	Sewage lifting unit to EN 12050-1
(2) Serial number	See name plate
(3) Intended use	For collecting and automatically lifting waste water with or without faeces above the flood level.
(4) Manufacturer	KSB SE & Co. KGaA 67225 Frankenthal (Germany)
(5) Authorised representative	Not applicable
(6) System of assessment and verification of constancy of performance	System 3
(7) Harmonised standard	The notified body, TÜV Rheinland LGA Products -0197-, performed determination of the product type on the basis of type-testing under system 3 and issued test report 5371383-01.
(8) European Technical Assessment	Not relevant

**Table 32: (9) Declared performance**

Essential characteristics	Performance	Harmonised technical specification
Effectiveness		EN 12050-1:2001
Handling of solids	Passed	
Pipe connections	Passed	
Ventilation	Passed	
Minimum flow velocity	≥ 0,7 m/s	
Minimum cross-section of the system	≥ 65 mm	
Minimum cross-section of the discharge-side connection	DN 80	
Fastening elements	Passed	
Electrical equipment enclosures		
Motor	IP68	
Contactor	IP68	
Corrosion resistance of materials	Passed	
Hydraulic and electric characteristic values	Passed	
Water tightness and air tightness		
Water-tight	10 minutes at 0.5 bar	
Odour-proof	10 minutes at 0.5 bar	
Noise level	≤ 70 dB	

(10) The performance of the product identified in points (1) and (2) is in conformity with the declared performance in point (9). This declaration of performance is issued under the sole responsibility of the manufacturer identified in point (4).

Frankenthal, 01.02.2018



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