

Floodable Sewage Lifting Unit

mini-Compacta

From Series S-Y/1
From Series 2013w01

Installation/Operating Manual



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Installation/Operating Manual mini-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

Discharge line

Pipe for transporting waste water to a level above the flood level into the sewer system

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

Inlet line

Pipe used for draining waste water from sanitary installations into the lifting unit

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.

Waste water

Water which has been changed by some type of use, e.g. domestic waste water

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 and size as well as the main operating data. They uniquely identify the pump (set) and serve as identification for 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
 DANGER	DANGER This signal word indicates a high-risk hazard which, if not avoided, will result in death or serious injury.
 WARNING	WARNING This signal word indicates a medium-risk hazard which, if not avoided, could result in death or serious injury.

Symbol	Description
	CAUTION This signal word indicates a hazard which, if not avoided, could result in damage to the machine and its functions.
	Explosion protection This symbol identifies information about avoiding explosions in potentially explosive atmospheres in accordance with EU Directive 2014/34/EU (ATEX).
	General hazard In conjunction with one of the signal words this symbol indicates a hazard which will or could result in death or serious injury.
	Electrical hazard In conjunction with one of the signal words this symbol indicates a hazard involving electrical voltage and identifies information about protection against electrical voltage.
	Machine damage 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. (⇒ Section 6.4, Page 39)

- Decontaminate lifting units which handle fluids posing a health hazard.
(⇒ Section 8.1, Page 48)
- 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

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

Table 4: Weight

Sizes	Weight ¹⁾ [kg]
US1.40D US1.40E	37
U1.60D U1.60E	41 42
U2.100D U2.100E	48 49
US2.100D US2.100E	56 67
UZ1.150D UZ1.150E	100 111
UZS1.150D UZS1.150E	116 127

- ✓ The lifting unit has been checked for in-transit damage.
 1. Select suitable transport equipment (in acc. with weights table).
 2. Transport the lifting unit to the place of installation.
 3. Remove the transport fixtures.
For safe transport, the lifting unit is bolted to the disposable pallet by means of brackets 732.
 4. Use the recessed grips provided at the sides of the tank to lift the lifting unit and place it down at the place of installation.

1) Weight of the lifting unit without water fill

3.3 Storage/preservation

	CAUTION
	<p>Damage during storage due to frost, humidity, dirt, UV radiation or vermin Corrosion/contamination of the lifting unit!</p> <p>▷ Store the lifting unit in a frost-proof, roofed area.</p>
	CAUTION
	<p>Wet, contaminated or damaged openings and connections Leakage or damage of the lifting unit!</p> <p>▷ Only open the openings of the lifting unit at the time of installation.</p>
	NOTE
	<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.

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 14, Page 102)
Always indicate any safety and decontamination measures taken.

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

3.5 Disposal

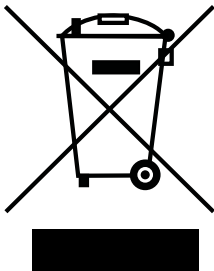
	 WARNING
	<p>Fluids handled, consumables and supplies which are hot and/or pose a health hazard</p> <p>Hazard to persons and the environment!</p> <ul style="list-style-type: none"> ▸ Collect and properly dispose of flushing fluid and any fluid residues. ▸ Wear safety clothing and a protective mask if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

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 Designation

Lifting unit Example: mini-Compacta UZ 1.150 D/C

Table 6: Designation key

Code	Description	
mini-Compacta	Type series	
UZ	Design	
	U	Single-pump lifting unit with free-flow impeller
	US	Single-pump lifting unit with cutter
	UZ	Dual-pump lifting unit with free-flow impeller
	UZS	Dual-pump lifting unit with cutter
X	Special design	
1	Hydraulics code	
	1, 2	
150	Total volume of collecting tank [litres]	
	40, 60, 100, 150	
D	Motor	
	D	Three-phase asynchronous motor
	E	Single-phase AC motor
C	Material	
	C	Variant for aggressive fluids
	_)2)	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 ³⁾
	S	Star-delta starting up to 22 kW ³⁾
	W	Soft start
	X	3-wire connection capacitor motor 25 μF
	Y	3-wire connection capacitor motor 40 μF

2) Blank

3) Higher ratings on request.

Code	Description	
D	Z	3-wire connection capacitor motor 40 µF, start capacitor 66 µF
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 ³⁾
B2	Design	
	B	Pump variant
	2	Variant for France

4.3 Name plates

Motor

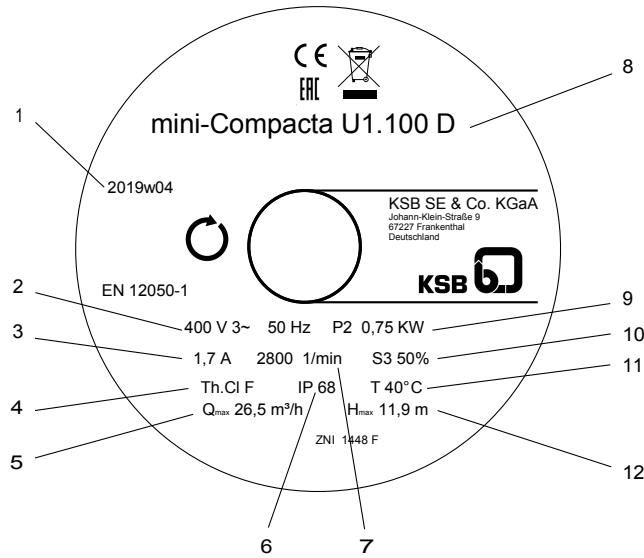


Fig. 1: Motor name plate (example)

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

Tank

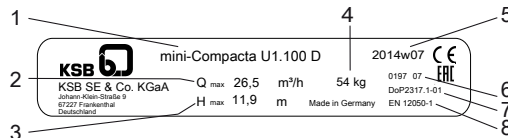


Fig. 2: Tank name plate (example)

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

Switchgear

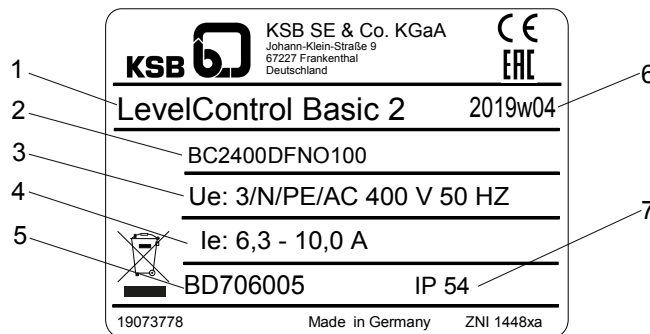


Fig. 3: Switchgear name plate (example)

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

4.4 Design details

Design

- Floodable sewage lifting unit⁴⁾ to EN 12050-1
- Gas-tight and water-tight plastic collecting tank, pump unit, sensors and control unit
- Ready-to-connect sewage lifting unit

Drive

- Surface-cooled
- AC motor / three-phase asynchronous motor
- 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) / 230 V (AC motor)
- Frequency 50 Hz
- DOL starting

Impeller type

- Free-flow impeller
- Cutter

Bearings

- Grease-packed, maintenance-free rolling element bearings

Shaft seal

mini-Compacta US (40 litres) / U (60 litres) / U (100 litres) / UZ (150 litres):

- Impeller end, 1 shaft seal ring
- Drive end: 1 shaft seal ring
- A grease fill is provided between the impeller-end and drive-end shaft seals.

mini-Compacta US (100 litres) / UZS (150 litres) / variant C:

- Impeller end, 1 mechanical seal
- Drive end: 1 shaft seal ring
- An oil reservoir, which is supplied filled with ecologically acceptable white oil, is fitted between the impeller-end and drive-end shaft seals.

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.

4.5 Configuration and function



Fig. 4: Illustration of the waste water lifting unit

1	Inlet	6	Hand hole cover
2	Level sensor	7	Vent connection
3	Pump set	8	Discharge-side connection
4	Drain connection	9	Integrated swing check valve
5	Transport lock / float protection fixture	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.

Switchgear

	<p>⚠ DANGER</p>
	<p>Flooding of control unit Danger of death from electric shock! ▷ Operate the control unit in flood-proof rooms only.</p>
	<p>NOTE</p>
	<p>The control units are not explosion-proof, and therefore must only be operated outside potentially explosive atmospheres.</p>

2317.886/16-EN

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. 5: 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

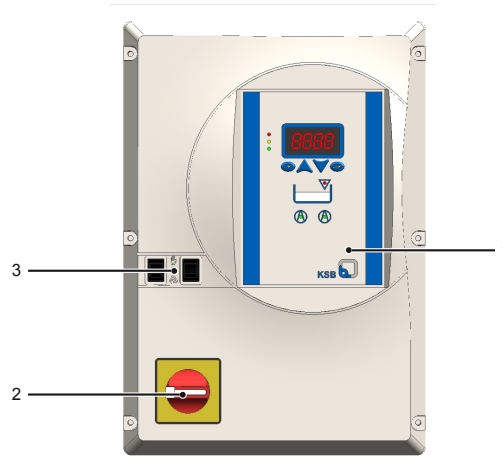


Fig. 6: Type Basic Compact (BC)

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

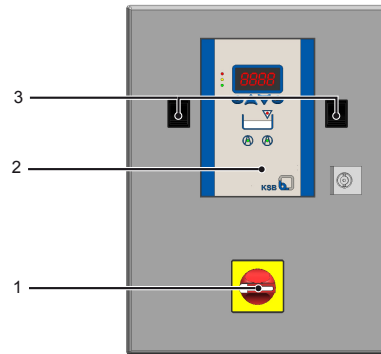


Fig. 7: Type Basic Control Cabinet (BS)

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

4.6 Technical data

4.6.1 Electrical data (LevelControl Basic 1)

	NOTE
	The nominal current must not be exceeded.

Table 8: Electrical data of the LevelControl Basic 1 control unit

Characteristic	Value
Nominal operating voltage	3~ 400 V AC +10 % -10 % 1~ 230 V AC +10 % -10 %
Mains frequency	50 Hz ±2 %
Enclosure	400 V: IP54
	230 V: IP54
Insulation voltage	500 V AC
Nominal motor current	≤ 10 A

4.6.1.1 Sensors (LevelControl Basic 1)

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)

Outputs

- 1 volt-free signalling output (250 V, 1 A, changeover contact)

Rechargeable battery

- Mains-independent connection
- Power supply for electronics, sensors, alarm equipment
- Battery life:
 - Approx. 10 hours when supplying the piezo buzzer 85 dB(A), electronics and sensors

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

4.6.2 Electrical data (LevelControl Basic 2)


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

Table 9: 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

4.6.2.1 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.

4.7 Fluids handled

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

Variant A (standard design)

Permissible fluids According to DIN 1986-3 the following fluids can be discharged into sewer systems:
 Water contaminated by domestic use, human and - as far as required and permitted - animal faeces together with the necessary flushing water as well as stormwater in case no other way of disposal is possible.⁵⁾

Impermissible fluids Substances / water which must **not** be discharged into the sewer system are, amongst others:

Solid matter, fibres, tar, sand, cement, ash, coarse paper, paper towels, cardboard, debris, garbage, offal, grease, oil.

Waste water from installations situated above the flood level (EN 12056-1).

Waste water containing hazardous substances (DIN 1986-100), e.g. greasy waste water from large-scale catering kitchens.

For drainage of greasy water a grease separator to DIN 4040-1 must be fitted.

Variant C for aggressive fluids

Additional permissible fluids In addition to the fluids approved for the standard variant, this lifting unit is also suitable for handling aggressive fluids:

Waste water, e.g. from heat recovery systems

Waste water from swimming pools (increased chlorine concentration)

Waste water with salt content (e.g. seawater)

4.8 Collecting tank

The collecting tank is designed for unpressurised operation. The waste water is stored in the tank in unpressurised condition and is then pumped into the sewer system. The table below indicates the effective tank volume as a function of the inlet nozzle level H in millimetres.

Table 10: Effective tank volume as a function of inlet nozzle level

Size	Total volume [Litre]	Effective volume as a function of inlet nozzle level		
		H = 180 mm [Litre]	H = 250 mm [Litre]	Vertical [Litre]
US40	40	10	-	17
U60	60	20	-	30
U100	100	30	44	62
US100	100	33	46	64
UZ150	150	57	83	91
UZS150	150	-	85	95

4.9 Noise characteristics

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

5) Other types of waste water, e.g. industrial waste water, must not be discharged into the local sewer system without prior treatment.

4.10 Scope of supply

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

Sewage lifting unit consisting of:

- Gas, odour and water-proof collecting tank made of impact-resistant plastic
- Fully floodable submersible motor pump(s)
- Flexible hose connections incl. hose clips
- Check valve
- Y-pipe
- Analog level sensor
- Level-dependent control unit

4.11 Dimensions and weights






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

Control unit Table 11: 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>⚠ DANGER</p> <p>Improper installation in potentially explosive atmospheres Explosion hazard! Damage to the lifting unit!</p> <ul style="list-style-type: none"> ▷ Comply with the applicable local explosion protection regulations. ▷ Observe the information in the technical product literature and on the name plates of tank and motor.
	<p>⚠ WARNING</p> <p>Hot motor surface Risk of injury!</p> <ul style="list-style-type: none"> ▷ Allow the motor to cool down to ambient temperature.
	<p>CAUTION</p> <p>Incorrect connection of the three-phase motor Damage to the lifting unit!</p> <ul style="list-style-type: none"> ▷ Always use a 3-pole mechanically interlocked K-type automatic circuit breaker for external protection.
	<p>CAUTION</p> <p>Incorrect installation of connections and signalling devices 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"> ▷ Fit operator-supplied mains-independent alarm equipment (e.g. alarm switchgear). ▷ Take suitable measures at the site to prevent overflow/flooding (e.g. a swing check valve in the floor drain, or similar).
	<p>NOTE</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>⚠ WARNING</p> <p>Installation on mounting surfaces which are unsecured and cannot support the load Personal injury and damage to property!</p> <ul style="list-style-type: none"> ▷ Use a concrete of compressive strength class C12/15 which meets the requirements of exposure class X0 to EN 206-1. ▷ The mounting surface must have set and must be completely horizontal and even. ▷ Observe the weights indicated.
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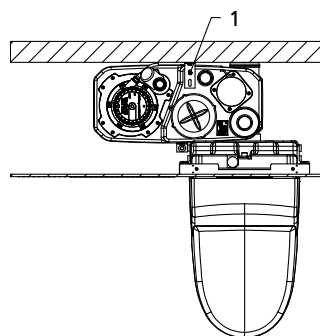
Before beginning with the installation check the following:

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

- ✓ The name plate data 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 4.7, Page 23)
 - ✓ The installation room is frost-proof.
 - ✓ All structural work required has been prepared in accordance with the dimensions stated in the connection example and in EN 12056.
 - ✓ The installation room is of sufficient size. See connection example.
 - ✓ The installation room is adequately lit.
 - ✓ Alarm messages are always recognised in time by the operator. Use an external alarm transmitter, if required.
1. Place the lifting unit on a level floor. Level it with a spirit level.
 2. Place pads 99-3.2 under the feet of tank 591.
 3. Use the transport fixture/float protection fixture supplied to secure the sewage lifting unit firmly to the floor.
 In a pre-wall system of mini-CompactaUS40 fasten the transport fixture/float protection fixture facing the wall to the wall above the sewage lifting unit in such a way that the sewage lifting unit is firmly pressed against the floor.



1	Float protection
---	------------------

4. Then fasten the transport fixture/float protection fixture located at the front to the floor.





	NOTE
	To prevent in-transit damage, the level sensor has been fitted with a transport lock which must be removed prior to commissioning (see Fig.)



Fig. 8: Removing the transport lock

5.4 Connecting the piping

	 DANGER
	<p>Impermissible loads acting on the system nozzles</p> <p>Danger to life from leakage of hot, toxic, corrosive or flammable fluids!</p> <ul style="list-style-type: none"> ▷ Do not use the lifting unit as an anchorage point for the piping. ▷ Anchor the pipes immediately upstream of the lifting unit and connect them without transmitting any stresses or strains. ▷ Observe the permissible forces and moments at the lifting unit. (⇒ Section 8.7, Page 59) ▷ Take appropriate measures to compensate thermal expansion of the piping.

	NOTE
	The installation of check and shut-off elements is mandatory. However, such elements must not obstruct proper drainage or hinder disassembly of the lifting unit.

- ✓ Piping weights have been supported at the site.
- ✓ All tank nozzles (except for the vent nozzle) are closed.
 1. Determine which connection nozzles will be used.
 2. Open the nozzles required (▼A) by sawing off the nozzle faces (approx. 10 mm).

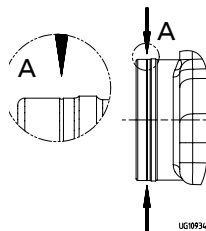








Fig. 9: Opening the nozzles

	NOTE
	All pipe connections must be sound-insulated and flexible.

Carefully tighten all hose straps.

Discharge line

	<p style="background-color: #FFD700; padding: 5px;">CAUTION</p> <p>Incorrect installation of discharge line Leaks and flooding of installation room!</p> <ul style="list-style-type: none"> ▷ Run the discharge line above the flood level before leading it into the sewer. ▷ Do not connect the discharge line to the downpipe. ▷ Do not connect any additional sanitary installations to the discharge line.
	<p style="background-color: #0070C0; color: white; padding: 5px;">NOTE</p> <p>To prevent any backflow from the collecting main, run the discharge line in the form of a pipe loop whose invert at its highest point must be above the locally defined flood level (e.g. street level). A gate valve must be installed downstream of the check valve.</p>
	<p style="background-color: #0070C0; color: white; padding: 5px;">NOTE</p> <p>Check valves of DN ≥ 80 are equipped with a lifting device to allow pipe drainage. Under normal operating conditions, the valve closes if the stem has been screwed out as far as it will go.</p>
	<p style="background-color: #0070C0; color: white; padding: 5px;">NOTE</p> <p>mini-Compacta U/UZ are fitted with an integrated check valve of DN 80. For UZ dual-pump units, the Y-pipe is included in the scope of supply.</p>
	<p style="background-color: #0070C0; color: white; padding: 5px;">NOTE</p> <p>Connect the flexible hose serving as discharge line using the broad hose clips 733.03 included in the supplementary equipment enclosed with the lifting unit.</p>

Installation instructions for flanged connection DN 80

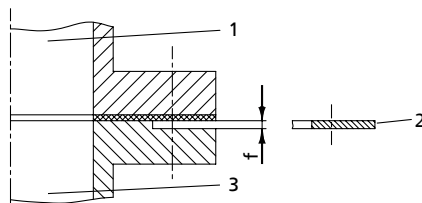


Fig. 10: Flanged connection

1	Plastic flange (piping) with flat face
2	Spacer disc
3	Cast iron flange (lifting unit) with raised face

In case of cast iron flanges (with raised face) to be connected to plastic flanges (with flat face), compensate the raised face by split spacer discs.

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

Two split spacer discs are included in the cardboard box supplied with each lifting unit.

Inlet line

A gate valve must be fitted so that the inlet line can be shut off temporarily during repair work or servicing. For lifting units directly connected to the toilet, the inlet side gate valve is not required.

- ✓ Piping weights have been supported at the site.
- ✓ All inlet nozzles of the collecting tank are closed.
 1. Determine which connection nozzles will be used.
 2. Open the nozzles required by sawing off the nozzle faces (▼A) (approx. 10 mm).

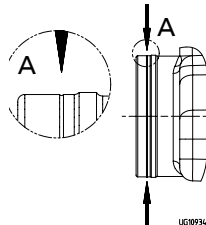


Fig. 11: Opening the nozzles

	NOTE
On mini-Compacta UZS150 the inlet nozzle arranged at 180 mm cannot be used.	

Vent line

Sewage lifting units to EN 12050-1 must be vented through the roof.

The vent line must not be connected to the inlet-side vent line of a grease separator.

Connect the DN 50 or DN 70 vent line to the vertical vent nozzle by means of the flexible hose connection, making sure that the connection is smell-proof.

If changes of direction are unavoidable, the pipe should be laid with a minimum gradient of 1:50.

Drainage nozzle for hand diaphragm pump

	NOTE
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.	

5.5 Cellar drainage

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

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

	<p>⚠ DANGER</p>
	<p>Electrical connection work by unqualified personnel Risk of fatal injury due to electric shock!</p> <ul style="list-style-type: none"> ▷ Always have the electrical connections installed by a trained and qualified electrician. ▷ Observe regulations IEC 60364 and, for explosion-proof models, EN 60079.
	<p>⚠ WARNING</p>
	<p>Incorrect connection to the mains Damage to the mains network, short circuit!</p> <ul style="list-style-type: none"> ▷ Observe the technical specifications of the local energy supply companies.
	<p>CAUTION</p>
	<p>Wrong supply voltage Damage to the lifting unit!</p> <ul style="list-style-type: none"> ▷ The maximum permissible deviation in supply voltage is 10 % of the rated voltage indicated on the name plate.

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 10.6, Page 93)
 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 10.6, Page 93)
- 3. Prior to switching on the unit, check all protective equipment.

5.7 Checking the direction of rotation

	<p style="background-color: #f4a460; padding: 2px;">⚠ WARNING</p> <p>Hands or objects inside the tank Risk of personal injury! Damage to the lifting unit!</p> <ul style="list-style-type: none"> ▷ 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 style="background-color: #f4d03f; padding: 2px;">CAUTION</p> <p>Wrong direction of rotation The lifting unit does not reach its duty point!</p> <ul style="list-style-type: none"> ▷ Check the direction of rotation.

For 1~ 230 V mains connection, checking the direction of rotation is not required.

For 3~ 400 V mains connection, check the direction of rotation during commissioning and every time the product is returned to service. (⇒ Section 6.1, Page 32)

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

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

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 ⁶⁾

6.2.1 Frequency of starts

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

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

6) 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

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

6.3 Prerequisites for commissioning/start-up

	NOTE
	<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.

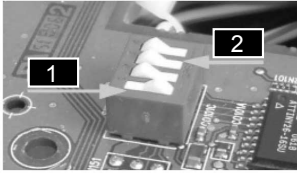
6.3.1 Lifting unit with LevelControl Basic 1



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

Steps required for commissioning:

1. Set the parameter for the inlet nozzle to be used (recommended).
2. Connect the rechargeable battery.
3. Check the direction of rotation.
4. Test the lifting unit for correct function and leak-free operation.



Setting the unit to the lowest inlet nozzle used

The frequency of starts can be reduced by setting the unit to the lowest inlet nozzle used. A switch for this setting is provided on the printed circuit board, which can be accessed after the control unit cover has been opened. Settings see table below.

Table 13: Possible tank settings

Tank	Level of lowest open inlet nozzle [mm]	Coding of DIL switches			
		DIL 1	DIL 2	DIL 3	DIL 4
US1.40E US1.40D	Horizontal, 100 mm (DN 50)	OFF	OFF	OFF	OFF
	Horizontal, 180 mm	OFF	OFF	OFF	OFF
	Vertical	ON	OFF	OFF	OFF
U1.60 E U1.60 D	Horizontal, 100 mm (DN 50)	OFF	OFF	OFF	OFF
	Horizontal, 180 mm	OFF	OFF	OFF	OFF
	Vertical	ON	OFF	OFF	OFF
U1.100 E U1.100 D U2.100 E U2.100 D	Horizontal, 180 mm	OFF	ON	OFF	OFF
	Horizontal, 250 mm	ON	ON	OFF	OFF
	Vertical	OFF	OFF	ON	OFF
US1.100 D US2.100 D	Horizontal, 180 mm	ON	OFF	ON	OFF
	Horizontal, 250 mm	OFF	ON	ON	OFF
	Vertical	ON	ON	ON	OFF

	NOTE
	The codes shown in bold are the default settings.

	NOTE
	For ordering LevelControl Basic 1 as a spare part, please note: The software of LevelControl Basic 1 for mini-Compacta US40 differs from the software of LevelControl Basic 1 for the other mini-Compacta sizes. Choose the correct control unit for any replacements!



Fig. 12: Connecting the rechargeable battery

Connecting the rechargeable battery

To enable the mains-independent alert, connect the rechargeable battery in the control unit.

Checking the direction of rotation

Always perform the two steps in the sequence given below!




Fig. 13: Rotary field of mains connection



Fig. 14: Direction of rotation of the pump

- **Rotary field of mains connection:**
The "rotary field" lamp must light up green. If this is not the case, correct the rotary field by interchanging two phases at the mains connection.
- **Direction of rotation of the pump:**
Check the direction of rotation of the pump at the screw plug. If necessary, correct the direction of rotation by interchanging two phases at the pump connection.
The correct direction of rotation is indicated on the name plate.

Functional test and leak testing

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

Functional test Test-run the lifting unit for several fill and pump-off cycles and check the proper function and leak-free operation of the lifting unit, using the checklist provided. (⇒ Section 8.9, Page 60)

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. 15: Connecting an external alarm

Setting the external alarm

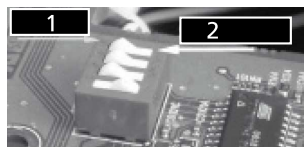


Fig. 16: Default setting of the external alarm

1	NC contact	2	NO contact
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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.

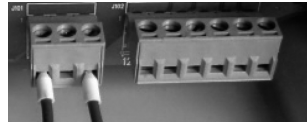


Fig. 17: Connecting a fault signalling contact

6.3.1.1.3 Acknowledging alerts

	NOTE
<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
Operation:					
Pump OFF	Off			Off	
Pump running	Steady green		Contact 11-14 closed	On	
TCB - Excessive motor temperature					
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
High water:					
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
External fault:					
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
LiveZero – Broken wire detection:					
LiveZero (unacknowledged)		Flashing red	Contact 11-12 closed	Off	Interval tone
LiveZero (acknowledged)		Steady red	Contact 11-12 closed	Off	Off

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	Pump LED	"High water" LED	Operation relay/ general fault message	Pump	Integrated alarm buzzer
LiveZero gone		Off	Contact 11-14 closed	Depending on filling level	Off
Power failure:					
Power failure			Contact 11-12 closed	Off	Interval tone

	NOTE
	<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

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



Fig. 18: Connecting the rechargeable battery (LevelControl Basic 2 BC)

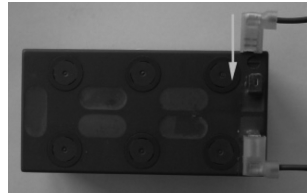


Fig. 19: Connecting the rechargeable battery (LevelControl Basic 2 BS)

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

Checking the direction of rotation

	<p>⚠ WARNING</p>
	<p>Hands or objects inside the tank Risk of personal injury! Damage to the lifting unit!</p> <ul style="list-style-type: none"> ▷ 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>CAUTION</p>
	<p>Wrong direction of rotation The lifting unit does not reach its duty point!</p> <ul style="list-style-type: none"> ▷ Check the direction of rotation.

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. 20: Direction of rotation of the pump

Functional test and leak testing

	<p>NOTE</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 8.9, Page 60)

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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. Interrupt power supply and secure against unintentional start-up.

	DANGER
	<p>Power supply not disconnected Danger to life!</p> <ul style="list-style-type: none"> ▸ Pull the mains plug and secure the pump against unintentional start-up.

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

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

7 Operation

	<p style="background-color: #e67e22; color: white; padding: 5px;">⚠ DANGER</p> <p>Unintentional starting of pumps Risk of injury: Limbs can be pulled into or crushed by machinery!</p> <ul style="list-style-type: none"> ▷ Make sure that nobody is within the immediate, hazardous vicinity of the pumps. ▷ Make sure that all piping is properly installed and that the fluid handled cannot escape.
	<p style="background-color: #2980b9; color: white; padding: 5px;">NOTE</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 42)
- Control panel (⇒ Section 7.1, Page 40)
- Service interface (connector inside control unit)

7.1 Control panel (LevelControl Basic 2)

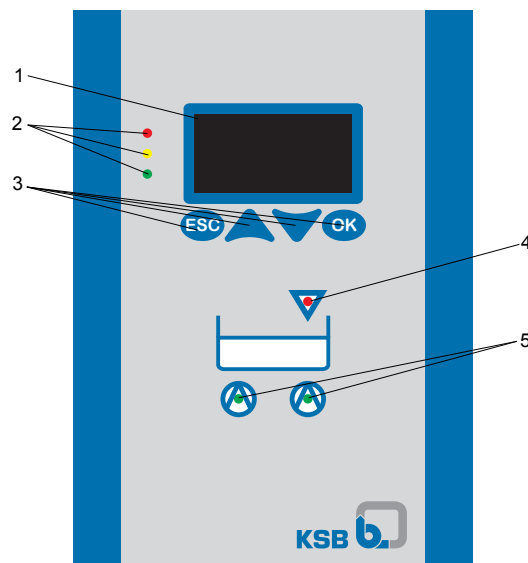


Fig. 21: Control panel

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

7.1.2 Display

The following information is displayed:






Fig. 22: Display

1	Parameter
2	Parameter/measured value
3	Alert

7.1.3 Navigation keys




Table 19: Control panel: Navigation keys

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

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



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

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"> 1. Press and hold the ESC key and press the OK key. ⇒ P 3.3.2 is displayed.
	<p>Step 2: Navigating</p> <ol style="list-style-type: none"> 1. Use the arrow keys to select the required parameter.
	<p>Step 3: Confirming the parameter</p> <ol style="list-style-type: none"> 1. Press the OK key to confirm the selected parameter. ⇒ The selected parameter value is displayed immediately.
	<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"> 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. 2. Use the arrow keys to change the numerical value.
	<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"> 1. Press OK to confirm the adjusted parameter value. ⇒ The parameter value is saved. ⇒ The display shows the selected parameter.



	<p>Step 5 b: Cancelling a parameter value</p> <ul style="list-style-type: none"> ✓ The changed parameter value has not been confirmed. 1. To cancel the changed value press the ESC key. <ul style="list-style-type: none"> ⇒ The parameter value remains unchanged. ⇒ The display shows the selected parameter.
	<p>Step 6: Leaving the setting mode</p> <ul style="list-style-type: none"> 1. To leave the setting mode press the ESC key. <ul style="list-style-type: none"> ⇒ The measured value display is shown. (⇒ Section 7.3.1, Page 42)

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 [$\frac{1}{10}s$]</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"> 1. If the screen for editing parameters is displayed, exit it by pressing ESC. ⇒ The fault with the highest priority is displayed.
	<p>Step 2: Remedying and acknowledging a fault.</p> <ol style="list-style-type: none"> 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 46) . The next fault (if any) is displayed. 2. Rectify the cause of the fault.

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"> ✓ Alerts / warnings have been acknowledged but are still present. (⇒ Section 7.3.3, Page 45) 1. If no measured value parameter is active, press the ESC key. Repeat if necessary.
	<p>Step 2: Navigating</p> <ul style="list-style-type: none"> 1. Use the arrow keys to select parameter P 2.1.1. <ul style="list-style-type: none"> ⇒ After 1.5 seconds the most recent fault message on the alerts list is automatically displayed. ⇒ If further fault messages are present, the next fault message will be displayed after another 1.5 seconds.
	<p>Step 3: Leaving the alerts list</p> <ul style="list-style-type: none"> 1. To leave the alerts list press the ESC key. <ul style="list-style-type: none"> ⇒ The measured value display is shown. (⇒ Section 7.3.1, Page 42)

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

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"> ▪ Check the inside of the collecting tank and the float switch for any deposits. If necessary, clean these areas. ▪ Measure the insulation resistance of the motor. (⇒ Section 8.2.2, Page 49)
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 49)
 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 Unblocking the cutter

mini-Compacta US, UZS

If the water level in the tank rises and the alert is triggered without the pump starting up, the cutter may be blocked.

To unblock the cutter:

1. Interrupt the power supply. (⇒ Section 5.6, Page 30)
2. Remove screw plug 903.01 at the motor housing. Use a socket wrench (WAF 8) on the hexagon of the shaft end to turn the rotor to and fro until it turns freely again.
3. Fit screw plug 903.01 with joint ring 411.01 again.
4. Perform the start-up procedure. (⇒ Section 6.1.1, Page 32)

	NOTE
<p>If the blocked pump has been tripped by the thermal motor protection, it will be operational again after approx. 15 minutes.</p>	

8.2.4 Oil check/Oil change

mini-Compacta US100, UZS150 & Ausführung C

1. Remove the rotating assembly. (⇒ Section 8.3.4, Page 53)
2. Position the rotating assembly as shown.

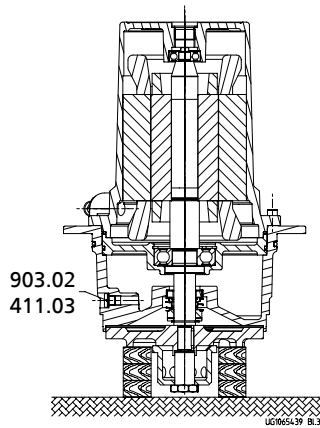


Fig. 23: Draining the oil reservoir

3. Place a suitable vessel under screw plug 903.2.
4. Remove screw plug 903.2 with joint ring 411.03. Drain the oil into the vessel.
5. Check the oil and take appropriate action as described in the table.
6. Fill in oil (see Fig.)

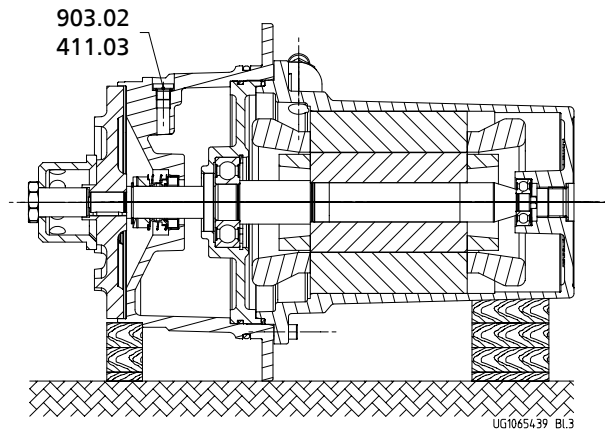



Fig. 24: Filling the oil reservoir

7. Fit screw plug 903.2 together with joint ring 411.03.

Table 29: Condition of oil

Condition of oil	Action
Oil emulsion yellowish to white	Oil can be filled in.
Mainly water in oil reservoir	Check the mechanical seal and the shaft seal ring and replace, if necessary. Fit the mechanical seal and the shaft seal ring.

	CAUTION
	<p>Excessive oil level Pressure rise inside the pump as oil fill heats up! Mechanical seal failure!</p> <p>▶ Fill in the correct oil quantity. (⇒ Section 8.2.4.1, Page 51)</p>

8.2.4.1 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

8.2.5 Emergency operation with one pump

mini-Compacta UZ150, UZS150

	NOTE
	<p>If emergency operation must be ensured during maintenance, inspection or repair work, proceed as follows:</p>

1. Close the inlet-side and discharge-side gate valves.
2. Interrupt the power supply. (⇒ Section 6.4, Page 39)
3. Remove the rotating assembly. (⇒ Section 8.3.1, Page 51)
4. Close the opening for the rotating assembly with a blind flange (available as accessory).
5. Set the switch for the dismantled pump to "0".
6. Set the switch of the remaining pump to "Automatic".
This pump will now be started and stopped automatically via the level sensor.
7. Open the inlet-side and discharge-side gate valves.

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

8.3 Dismantling the hydraulic system

8.3.1 Removing the rotating assembly

mini-Compacta U60, U100, UZ150

1. Remove hexagon socket head cap screws 914.04.
2. Lift rotating assembly 01-44 out of tank 591.
3. Take O-rings 412.11 and 412.12 off casing cover 161.
4. Undo hexagon nut 920.02 and remove disc 550.02.
5. Pull impeller 230 off shaft 210.

	NOTE
	<p>The impeller/shaft connection is a snug fit. If the impeller is hard to remove, it can be loosened by means of a suitable tool (e.g. mandrel) inserted through the vent hole B5 in casing cover 161 until a gap is produced between the impeller and the casing cover. Use two screwdrivers/suitable lever tools to lift off the impeller (see Fig.).</p>



Fig. 25: Loosening the impeller



Fig. 26: Lifting off the impeller

8.3.2 Dismantling the motor section

mini-Compacta U60, U100, UZ150

1. Remove hexagon socket head cap screws 914.01.
2. Remove screw plug 903.01 with joint ring 411.01.
3. Extract rotor 818 with casing cover 161 from motor unit 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.

4. Remove O-ring 412.01 and circlip 932 from the casing cover.
5. Press rotor 818 out of the casing cover.
6. Press lip seals 421.01 and 421.02 out of the casing cover.
7. Pull off deep groove ball bearings 321.01 (6201-2RSR/C3) and 321.02 (6205-LLU/C3/L45).

8.3.3 Removing the rotating assembly and pump/plate assembly

mini-Compacta US40

1. Separate rotating assembly 01-44 from the discharge line.
2. Undo hexagon socket head cap screws 914.02.

3. Lift rotating assembly 01-44 out of the tank.
4. Remove O-ring 412.02.

mini-Compacta US100, UZS150

1. Separate pump/plate assembly 10-5 from the discharge line.
2. Undo hexagon socket head cap screws 914.06.
3. Lift pump/plate assembly 10-5 out of the tank.

8.3.4 Removing the rotating assembly
mini-Compacta US40

1. Undo the tie bolt (hexagon socket head cap screw) 914.03.
2. Remove volute casing 102.
3. Undo impeller screw 914.05.
4. Take off cutter 23-14.
5. Pull impeller 230 off shaft 210.
6. Remove support disc 55-2 and washers 551.

mini-Compacta US100, UZS150

1. Undo hexagon socket head cap screw 914.04.
2. Lift rotating assembly 01-44 out of plate 185.
3. Drain the oil from the oil reservoir. (⇒ Section 8.2.4, Page 49)
4. Remove screw plug 903.01 with joint ring 411.01.
5. Undo impeller nut 922. If required, use a socket wrench (WAF8) to hold the hexagon end of shaft 210.
6. Take off cutter 23-14.
7. Prise off impeller 230 by inserting a screwdriver into the grooves in the impeller shroud and casing cover 161, respectively.
8. Remove key 940.
9. Remove circlip 932.02 and support disc 550.02.
10. Carefully pull the rotating assembly of mechanical seal 433 off shaft 210.

8.3.5 Dismantling the motor section
mini-Compacta US40

1. Remove swing check valve 742.
2. Remove hexagon socket head cap screws 914.01.
3. Pull motor unit 80-1 off rotor 818 with bearing end shield 360.
4. Remove O-ring 412.01 and circlip 932.
5. Pull bearing end shield 360 with lip seals 421.01 and 421.02 off shaft 210.
6. Press shaft seal rings 421.01 and 421.02 (WASY FKM, pressurisable) out of bearing end shield 360.
7. Pull off deep groove ball bearings 321.01 (6201-2RSR/C3) and 321.02 (6305-2RS1-JC3).

mini-Compacta US100, UZS150

1. Remove hexagon socket head cap screw 914.01.
2. Press rotor 818 with motor unit 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. Remove rotor 818 with bearing bracket 330 from motor unit 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.

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

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 49)

8.4.2 Installing the bearing assembly / shaft seal

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

mini-Compacta U60, U100, UZ150

1. Press in lip seals 421.01 and 421.02, making sure the sealing lips point towards the impeller. When pressing in the motor-end lip seal 421.01, observe the installation depth of 10 mm (see Fig.).

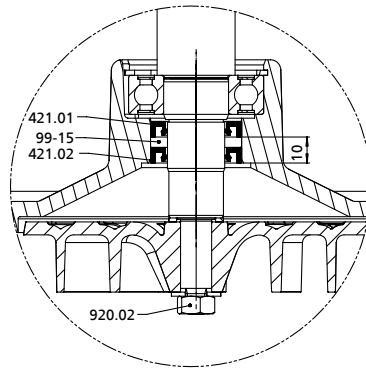


Fig. 27: Fitting the shaft seal

2. Fill the grease reservoir with multi-purpose grease 99-15 (DIN 51 825).
3. Secure the hexagon impeller nut 920.02 with a suitable metal adhesive (e.g. Loctite®).

mini-Compacta US40

1. Press lip seals 421.01 and 421.02 into bearing end shield 360, making sure the sealing lips point towards the impeller. When pressing in the motor-end shaft seal ring 421.01, observe the installation depth of 10 mm (see Fig.).

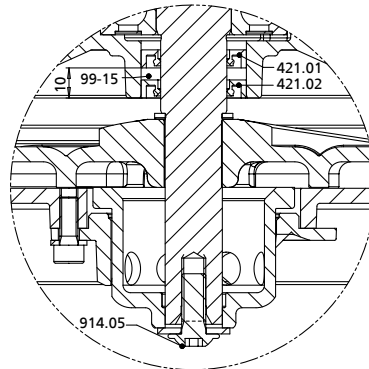


Fig. 28: Fitting the shaft seal

2. Fit lip seal 421.02 (WASY FKM, pressurisable) at the impeller end.
3. Fill the grease reservoir with multi-purpose grease 99-15 (DIN 51 825).
4. Slide deep groove ball bearings 321.01 (6201-2RSR/C3) and 321.02 (6305-2RS1-JC3) onto shaft 210. (⇒ Section 8.2.4, Page 49)
5. Guide shaft 210 through bearing end shield 360. Fasten it above the bearing seat with circlip 932.
6. Insert O-ring 412.01.
7. Fit motor unit 80-1 on pump rotor 818 with bearing end shield 360. Fasten it with hexagon socket head cap screws 914.01.

mini-Compacta US100, UZS150 and variant C

- ✓ Utmost care and cleanliness are observed.
 - ✓ The surfaces in the shaft area are clean and even.
1. Remove the protective wrapping of the seal faces immediately before assembly takes place.
 2. Press in lip seal 421.01, making sure the sealing lip points towards the impeller.
 3. Fit mechanical seal 433.
 4. After reassembly fill the oil reservoir with oil again. (⇒ Section 8.2.4, Page 49)

8.4.3 Fitting the bearing assembly/shaft seal

mini-Compacta US40

	NOTE
	<p>We recommend fitting new bearings/shaft seals whenever the motor section has been dismantled. At the impeller end, use a pressurisable shaft seal ring.</p>

1. Press lip seals 421.01 and 421.02 into bearing end shield 360, making sure the sealing lips point towards the impeller. When pressing in the motor-end shaft seal ring 421.01, observe the installation depth of 10 mm (see Fig.). Make sure that lip seal 421.02 (WASY FKM, pressurisable) is fitted at the impeller end.

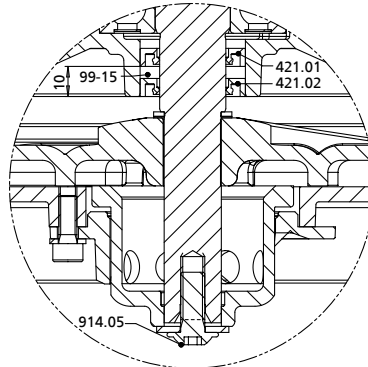


Fig. 29: Fitting the shaft seal

2. Fill the grease reservoir with multi-purpose grease 99-15 (DIN 51 825).
3. Slide deep groove ball bearings 321.01 (6201-2RSR/C3) and 321.02 (6305-2RS1-JC3) onto shaft 210. (⇒ Section 8.2.4, Page 49)
4. Guide shaft 210 through bearing end shield 360. Fasten it above the bearing seat with circlip 932.
5. Insert O-ring 412.01.
6. Fit motor unit 80-1 on rotor 818 with bearing end shield 360. Fasten it with hexagon socket head cap screws 914.01.

mini-Compacta US100, UZS150 & Ausführung C

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

Observe the following 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 overriding importance for 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 8.2.4, Page 49)

8.4.4 Fitting the rotating assembly

mini-Compacta US40

1. Fit the impeller. Check the impeller clearance.

	NOTE
	<p>Measure dimension "B" (see Fig. "Checking the impeller clearance"). The impeller clearance "C" results from the difference "A" (= 30 mm) - "B". An impeller clearance of 0.25 to 0.40 mm is required. If necessary, adjust the clearance by adding adjusting washers 551 (set of adjusting washers) between impeller 230 and the shoulder of shaft 210.</p>

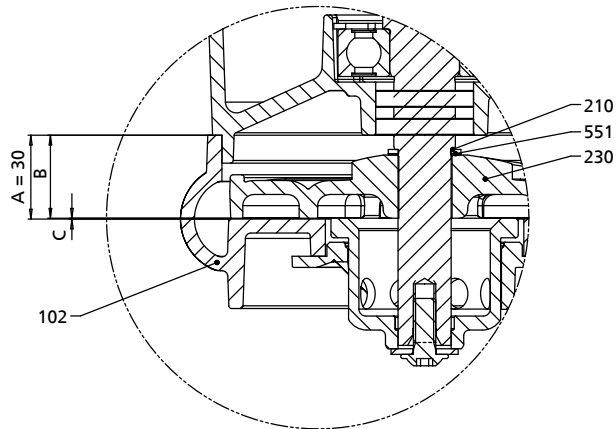


Fig. 30: Checking the impeller clearance

2. Fit cutter 23-14. Fasten it with impeller screw 914.05. Secure impeller screw 914.05 with a suitable metal adhesive (e.g. Loctite).
3. Fit volute casing 102. Fasten it with tie bolt (hexagon socket head cap screw) 914.03.

	NOTE
	<p>Cutter and impeller must be easy to rotate by hand. Rubbing contact is not permissible. Otherwise check the impeller clearance and the tightening torques of the tie bolts.</p>

4. Fit O-ring 412.02 on bearing end shield 360.
5. Lift rotating assembly 01-44 into the tank. Fasten it with hexagon socket head cap screw 914.02.

mini-Compacta US100, UZS150

1. Check the impeller clearance.
 To do so, loosen both hexagon socket head cap screws 914.03 by approx. three turns.

	NOTE
	<p>Measure dimension "B" (see Fig. "Checking the impeller clearance"). The impeller clearance "C" results from the difference "A" (= 34.5 mm) - "B". An impeller clearance of 0.25 to 0.40 mm is required. If necessary, adjust the clearance by adding adjusting washers 550 (set of adjusting washers) between impeller 230 and the shoulder of shaft 210.</p>

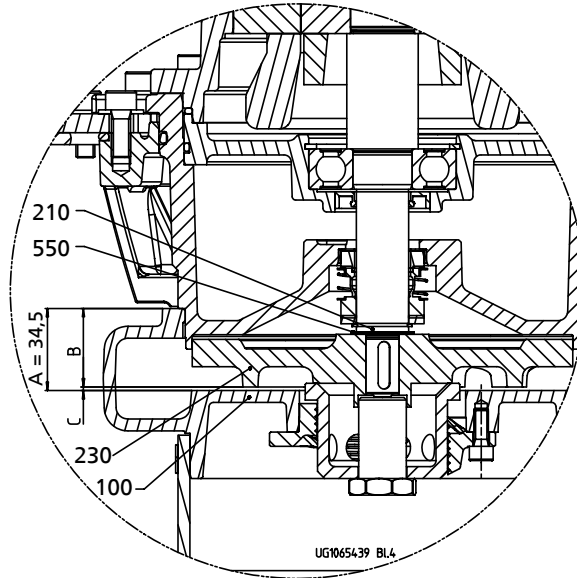


Fig. 31: Checking the impeller clearance

2. Mount the rotating assembly on plate 185 using hexagon socket head cap screws 914.04 and discs 550.04.
3. Tighten pump casing 100 with studs 902.03, discs 550.03 and nuts 920.03 at lantern 343 to max. 12 Nm.
4. Secure nuts 920.03 with Loctite®.
5. After mounting the rotating assembly on the plate, turn the impeller to check for rubbing noises.
6. Fit rotating assembly 01-44 in casing 100.

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 8.7, Page 59)

8.6 Fitting the repair kit and check valve

	CAUTION
	<p>Unevenly tightened screws/bolts O-ring 412.23 will be destroyed!</p> <ul style="list-style-type: none"> ▷ When tightening the four M8 hex. socket head cap screws 914.21 on the tank, tighten the screws crosswise, evenly and repeatedly (max. 2 turns) to a torque of 6 Nm. Non-compliance may result in leakage and destruction of O-ring 412.23.

8.7 Tightening torques

mini-Compacta US40

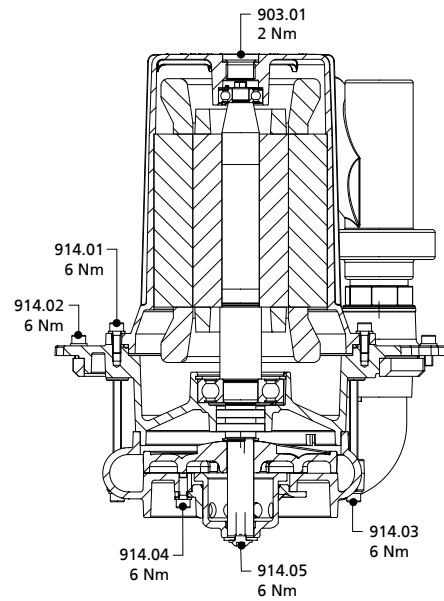


Fig. 32: Tightening torques mini-Compacta US40

Table 30: Tightening torques mini-Compacta US40

Connection	Tightening torque
	[Nm]
Float switch 81-45 / collecting tank	2
Bearing end shield 360 or pump assembly / collecting tank	6
Motor unit 80-1 / bearing end shield 360	6
Screw plug 903.01 (motor housing 811)	2
Hexagon socket head cap screw 914.03 (bearing end shield 360)	6
Hexagon socket head cap screw 914.04 (cutter 500 / volute casing 100)	6
Impeller screw 914.05 (shaft 210)	6

mini-Compacta US, UZS

	NOTE
	Fasten lantern 343, observing clearance Ⓐ.

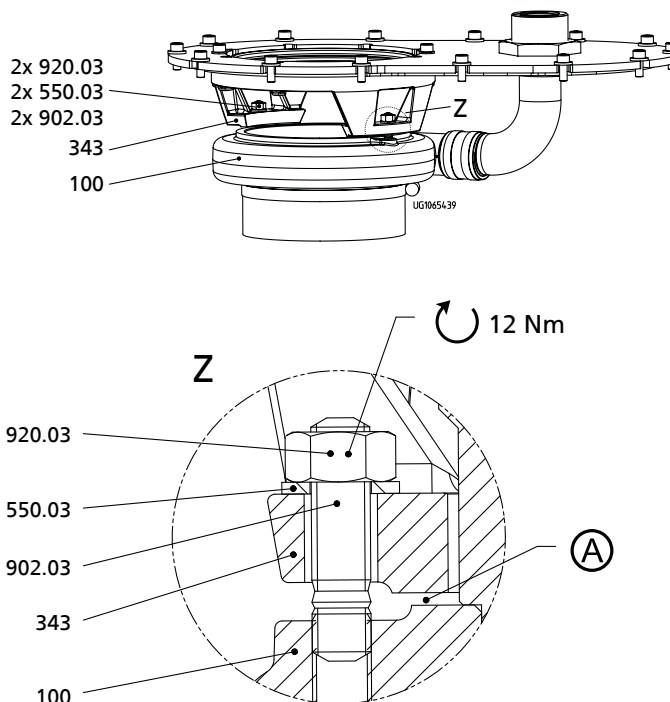


Fig. 33: Tightening torques mini-Compacta US100, UZS150

Table 31: Tightening torques mini-Compacta US100, UZS150

Connection	Tightening torque
	[Nm]
Rotating assembly 01-44 / collecting tank	6
Plate 185 / collecting tank (US/UZS)	6
Level sensor 81-45 / collecting tank	2
Check valve 747 / collecting tank	6
Motor housing 811 / casing cover	6
Lantern 343 / casing (US/UZS)	12

8.8 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.

8.9 Checklist for commissioning/inspection ① and maintenance ②

Table 32: 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 (three-phase units). (⇒ Section 5.7, Page 31) Then check that screw plug 903.1 is firmly seated.	①	②
Check the earth conductor to ensure that it functions properly (to EN 60 439).	①	②
Check winding resistances.		②
Check insulation resistances. (⇒ Section 8.2.2, Page 49)		②
Replace bearings, if required.	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

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Actions	Required during	
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 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 power consumption of motor(s).	①	②
Test-run for several start/stop cycles.	①	②
Check the alarm equipment to ensure that it functions properly.	①	②
Replace the rechargeable battery after 5 years of operation. (⇒ Section 7.3.5, Page 47)		②
Determine the spare parts requirements, if any.	①	②
Advise and/or train operating staff.	①	②
Provide new operating manual if necessary.	①	②

9 Trouble-shooting

	<p>⚠ WARNING</p>
	<p>Improper work to remedy faults 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>NOTE</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 discharge head
- 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 33: Trouble-shooting

A	B	C	D	E	F	Possible cause	Remedy ⁷⁾
-	X	X	-	-	X	Pump delivers against an excessively high pressure.	Lifting unit is too small for the prevailing operating conditions.
-	X	-	-	-	X	Gate valve in the discharge line is not fully open.	Fully open the gate valve.
-	-	X	-	X	X	Pump is running in the off-design range.	Check the pump's operating data.
X	-	-	-	-	X	Pump or piping are not completely vented.	Check the vent lines of lifting unit/pumps.
X	X	-	-	-	X	Pump intake clogged by deposits	Clean the intake, pump components and collecting tank.
-	X	-	X	X	X	Inlet lines 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 rotor.	Check whether the impeller can be easily rotated; clean the hydraulic system if required.
-	X	X	X	X	X	Wear of internal components	Replace worn components by new ones.
-	X	-	X	X	X	Impermissible air or gas content in the fluid handled	Contact the manufacturer.
-	-	X	-	-	-	Operating voltage is too low.	Check mains voltage; check electrical cable connections
X	-	-	-	-	-	Motor is not running because of lack of voltage.	Check electrical installation (and fuses).
-	X	X	X	X	X	Wrong direction of rotation (three-phase units)	Reverse two phases of mains power cable or motor power cable. (⇒ Section 5.7, Page 31)
X	X	-	X	-	X	Motor is running on two phases only (three-phase units).	Check conductor voltages. If necessary, replace defective fuse. Check cable connections.
X	-	-	-	-	X	Manual-0-automatic selector switch set to "0".	Set manual-0-automatic selector switch to "Automatic".

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

A	B	C	D	E	F	Possible cause	Remedy ⁷⁾
X	-	-	-	-	X	Motor winding or power cable are defective.	Replace by new original KSB parts or contact the manufacturer.
-	X	-	-	-	-	Water level in the tank too low during operation	Check level sensor. Check parameters. If necessary, repeat parameterisation.
X	-	-	-	-	-	Temperature sensor in the winding has tripped the pump because of an excessive temperature rise in the winding.	The motor will re-start automatically once the unit has cooled down.
-	-	X	-	X	-	Defective radial bearing in the motor	Contact the manufacturer.
X	-	X	-	X	X	Cutter is blocked (on US/UZS) - Excessive solids content - Impermissible solids	Unblock the cutter (⇒ Section 8.2.3, Page 49)
-	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 tightly.	Clean the check valve, screw the lifting screw back as far as it will go.
-	-	-	-	X	-	System-induced vibrations	Check the flexible pipe connections
X	-	-	-	X	X	Defective level sensor	Check level sensor. Clean or replace as necessary.

	NOTE
	After any fault or malfunction, carry out a visual and functional inspection of the lifting unit.

	NOTE
	If the lifting unit has been flooded, always carry out an inspection.

10 Related Documents

10.1 General assembly drawings/exploded views with list of components

10.1.1 mini-Compacta U60, U100, UZ150 - Rotating assembly

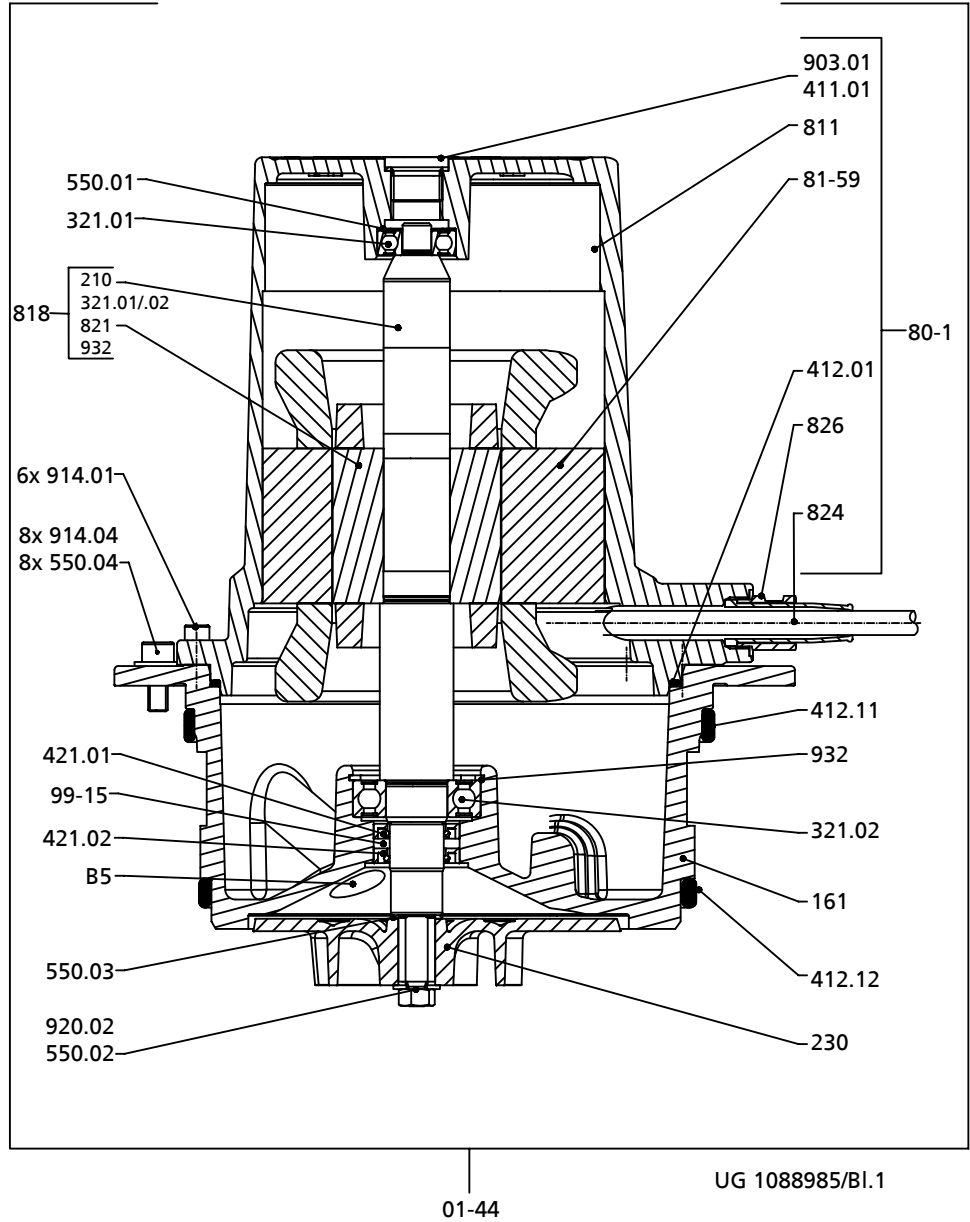


Fig. 34: General assembly drawing of mini-Compacta U60, U100, UZ150 – rotating assembly

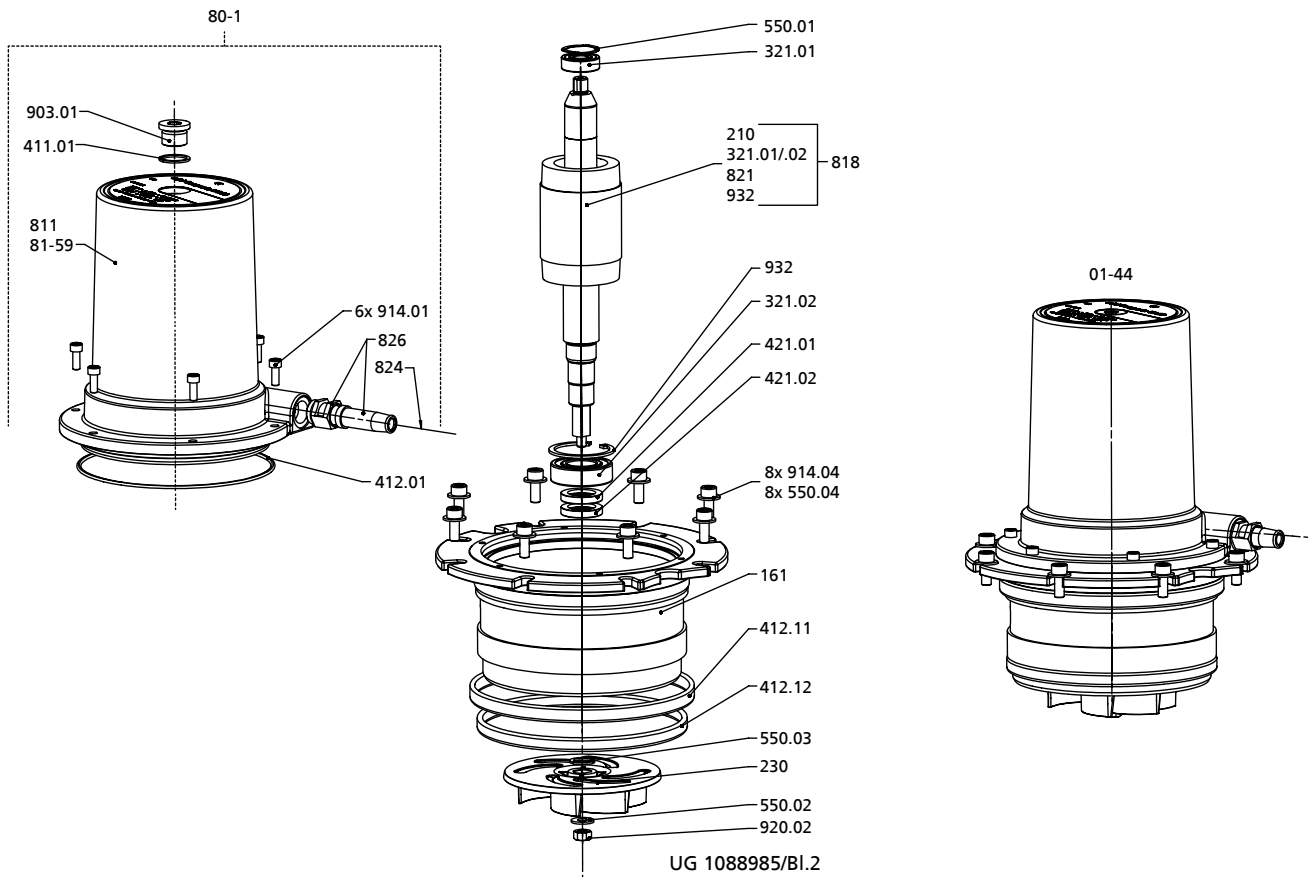


Fig. 35: Exploded view of mini-Compacta U60, U100, UZ150 – rotating assembly

Part No.	Part No.	Description	Part No.	Part No.	Description
01-44		Rotating assembly	99-15		Lubricating grease
161		Casing cover	99-20.01		Bearing repair kit
230		Impeller		321.01/.02	Deep groove ball bearing
412.01		O-ring		421.01/.02	Lip seal
412.11/.12		O-ring		550.01/.02	Disc
80-1		Motor unit		550.03	Support disc
	411.01	Joint ring		920.02	Hexagon nut
	412.01	O-ring		932	Circlip
	811	Motor housing	99-20.02		Small parts repair kit
	81-59	Stator		411.01	Joint ring
	824	Cable		412.01/.11/.12	O-ring
	826	Cable gland		550.01/.02	Disc
	903.01	Screw plug		550.03	Support disc
	914.01	Hexagon socket head cap screw		550.04	Disc
818		Rotor		903.01	Screw plug
	210	Shaft		914.01/.04	Hexagon socket head cap screw
	321.01/.02	Deep groove ball bearing		920.02	Hexagon nut
	821	Rotor core pack		932	Circlip
	932	Circlip	B5		Vent

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10.1.2 mini-Compacta U60 C, U100 C, UZ150 C - Rotating assembly

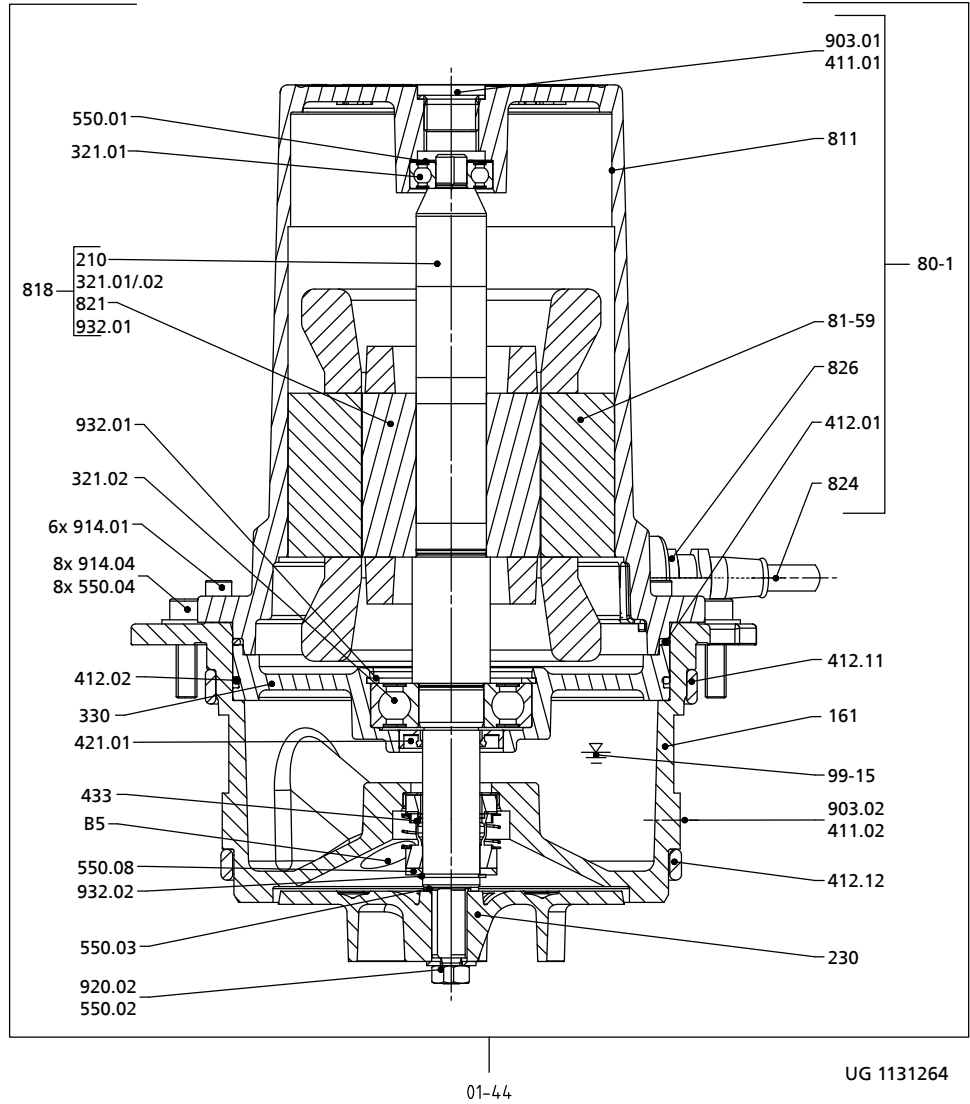


Fig. 36: General assembly drawing of U60 C, U100 C, UZ150 C – rotating assembly

Part No.	Part No.	Description	Part No.	Part No.	Description
01-44		Rotating assembly	99-20.01		Bearing/shaft seal repair kit
161		Casing cover		321.01	Deep groove ball bearing
230		Impeller		321.02	Deep groove ball bearing
330		Bearing bracket		411.02	Joint ring
412.01/02		O-ring		421.01	Lip seal
412.11/12		O-ring		433	Mechanical seal
433		Mechanical seal		550.01	Disc
80-1		Motor unit		550.02	Disc
	411.01	Joint ring		550.03	Support disc
	412.01	O-ring		903.02	Screw plug
	811	Motor housing		920.02	Hexagon nut
	81-59	Stator		932.01/02	Circlip
	824	Cable	99-20.02		Small parts repair kit
	826	Cable gland		411.01/02	Joint ring
	903.01	Screw plug		412.01/02	O-ring
	914.01	Hexagon socket head cap screw		412.11/12	O-ring
818		Rotor		550.01	Disc

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Part No.	Part No.	Description	Part No.	Part No.	Description
	210	Shaft		550.02	Disc
	321.01/.02	Deep groove ball bearing		550.03/.08	Support disc
	821	Rotor core pack		550.04	Disc
	932.01	Circlip		903.01/.02	Screw plug
99-15		Lubricating oil		914.01	Hexagon socket head cap screw
				914.04	Hexagon socket head cap screw
				920.02	Hexagon nut
				932.01/.02	Circlip
			B5		Vent

10.1.3 mini-Compacta U60, U100 - Collecting tank

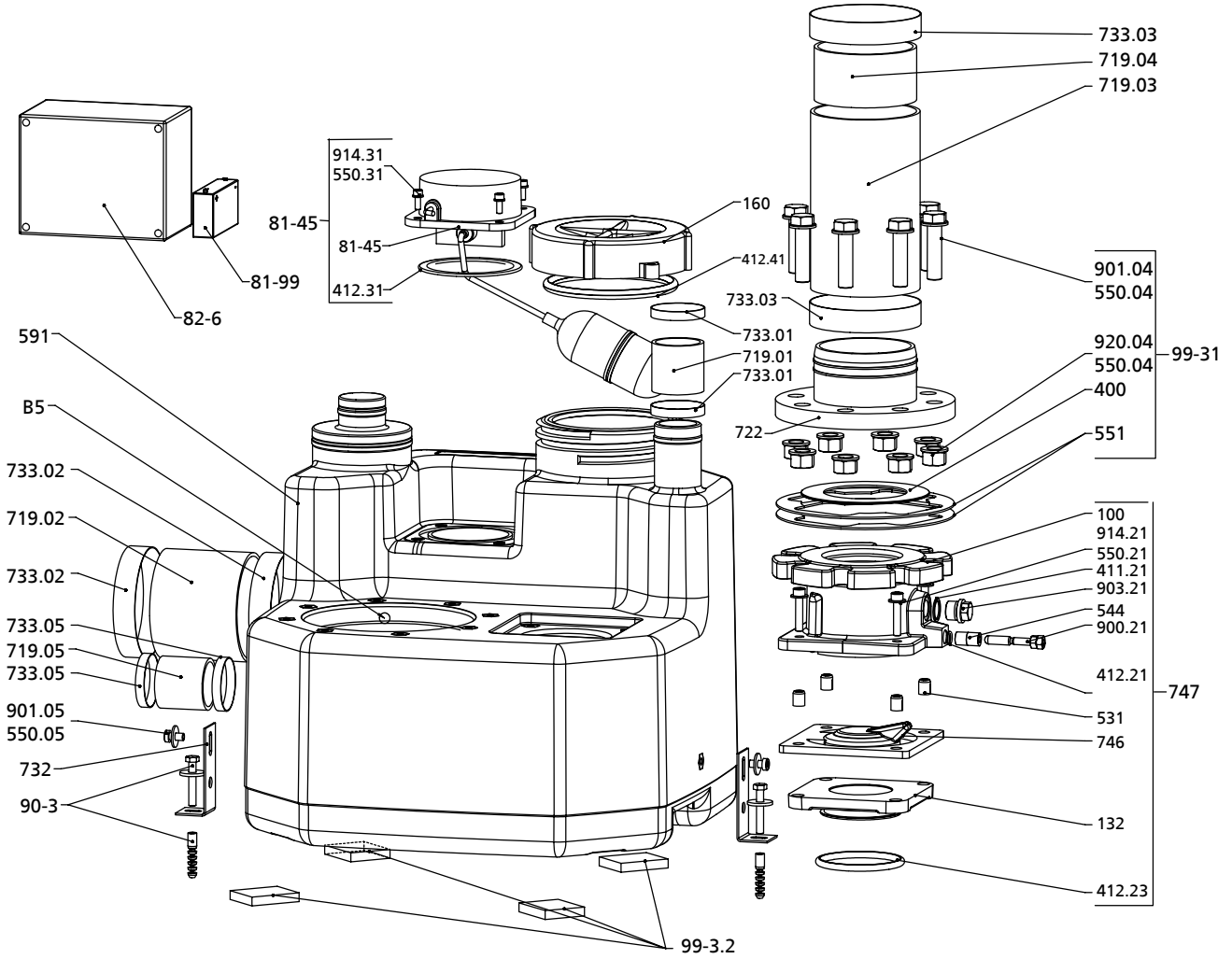


Fig. 37: Exploded view of mini-Compacta U60, U100 - Collecting tank

Part No.	Part No.	Description	Part No.	Part No.	Description
160		Cover	81-45		Level sensor
400		Gasket		412.31	O-ring
412.31		O-ring		550.31	Disc
412.41		O-ring		81-45	Level sensor
550.05		Disc		914.31	Hexagon socket head cap screw
551		Spacer disc	81-99		Rechargeable battery
591		Tank	82-16		Control unit
719.01/.02/.03/.04/.05		Hose	90-3		Set of mounting elements
722		Stub flange	901.05		Hexagon head bolt
732		Bracket	99-20.03		Check valve repair kit
733.01/.02/.03/.05		Hose clip		411.21	Joint ring
747		Check valve		412.21/.23	O-ring
	100	Body		746	Valve disc
	132	Intermediate piece	99-3.1		Set of installation accessories
	411.21	Joint ring		400	Gasket
	412.21/.23	O-ring		550.04	Disc
	531	Locking sleeve		551	Spacer disc
	550.21	Disc		901.04	Hexagon head bolt

Part No.	Part No.	Description	Part No.	Part No.	Description
	746	Valve disc		920.04	Hexagon nut
	900.21	Screw	99-3.2		Set of pads
	903.21	Screw plug	B5		Vent
	914.21	Hexagon socket head cap screw			

10.1.4 mini-Compacta UZ150 - Collecting tank

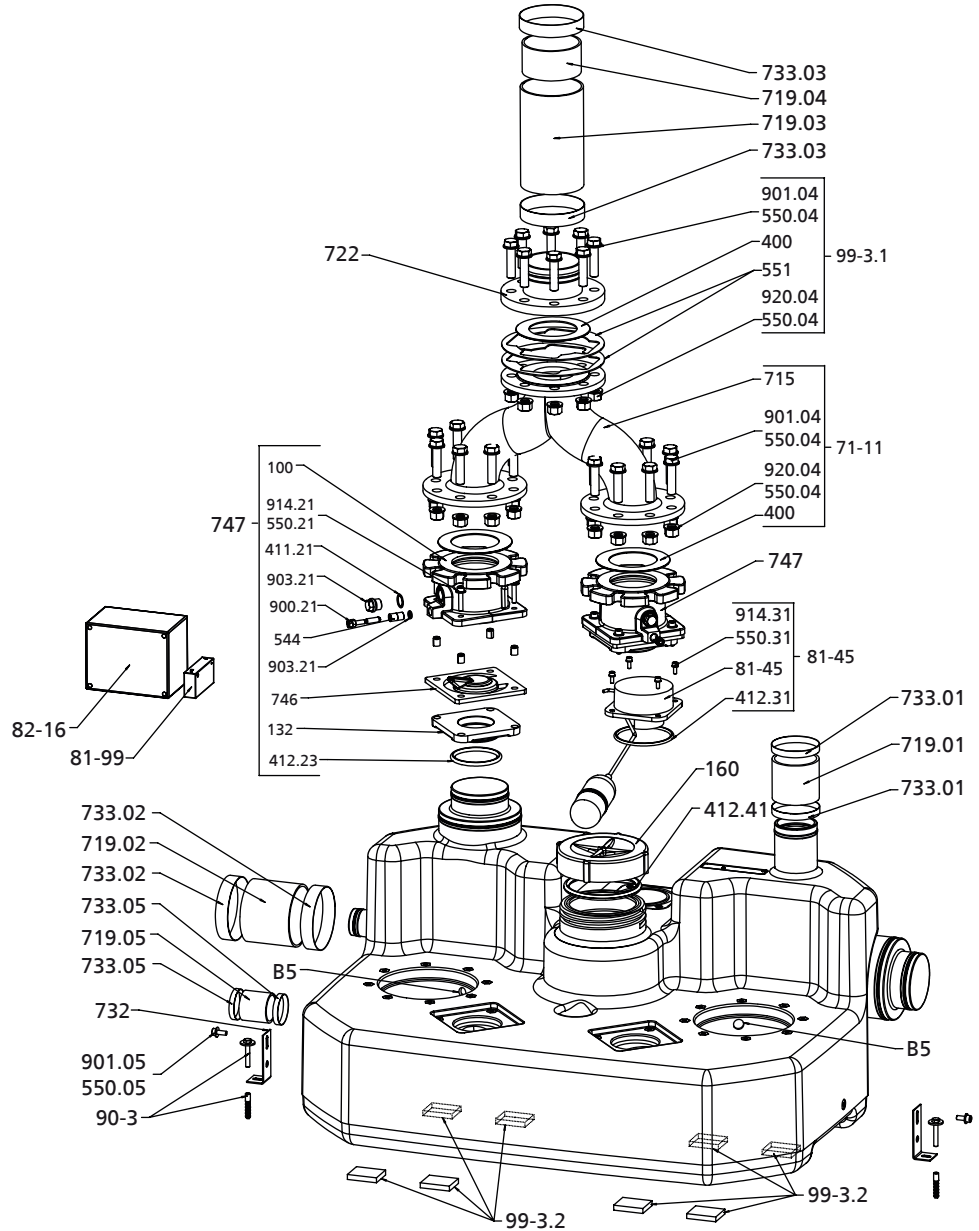


Fig. 38: Exploded view of mini-Compacta UZ150 - Collecting tank

Part No.	Part No.	Description	Part No.	Part No.	Description
160		Cover	81-45		Level sensor
400		Gasket		412.31	O-ring
412.31/.42		O-ring		550.31	Disc
550.05		Disc		81-45	Level sensor
551		Spacer disc		914.31	Hexagon socket head cap screw
591		Tank	81-99		Rechargeable battery
71-11		Y-pipe set	82-16		Control unit
	400	Gasket	90-3		Set of mounting elements
	550.04	Disc	901.05		Hexagon head bolt
	715	Y-pipe	99-20.03		Check valve repair kit
	901.04	Hexagon head bolt		411.21	Joint ring
	920.04	Hexagon nut		412.21/.23	O-ring
719.01/.02/.03/.04/.05		Hose		746	Valve disc

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Part No.	Part No.	Description	Part No.	Part No.	Description
722		Stub flange	99-3.1		Set of installation accessories
732		Bracket		400	Gasket
733.01/.02/ .03/.05		Hose clip		550.04	Disc
747		Check valve		551	Spacer disc
	100	Body		901.04	Hexagon head bolt
	132	Intermediate piece		920.04	Hexagon nut
	411.21	Joint ring	99-3.2		Set of pads
	412.21/.23	O-ring	B5		Vent
	531	Locking sleeve			
	550.21	Disc			
	746	Valve disc			
	900.21	Screw			
	903.21	Screw plug			
	914.21	Hexagon socket head cap screw			

10.1.5 mini-Compacta US40 – Rotating assembly

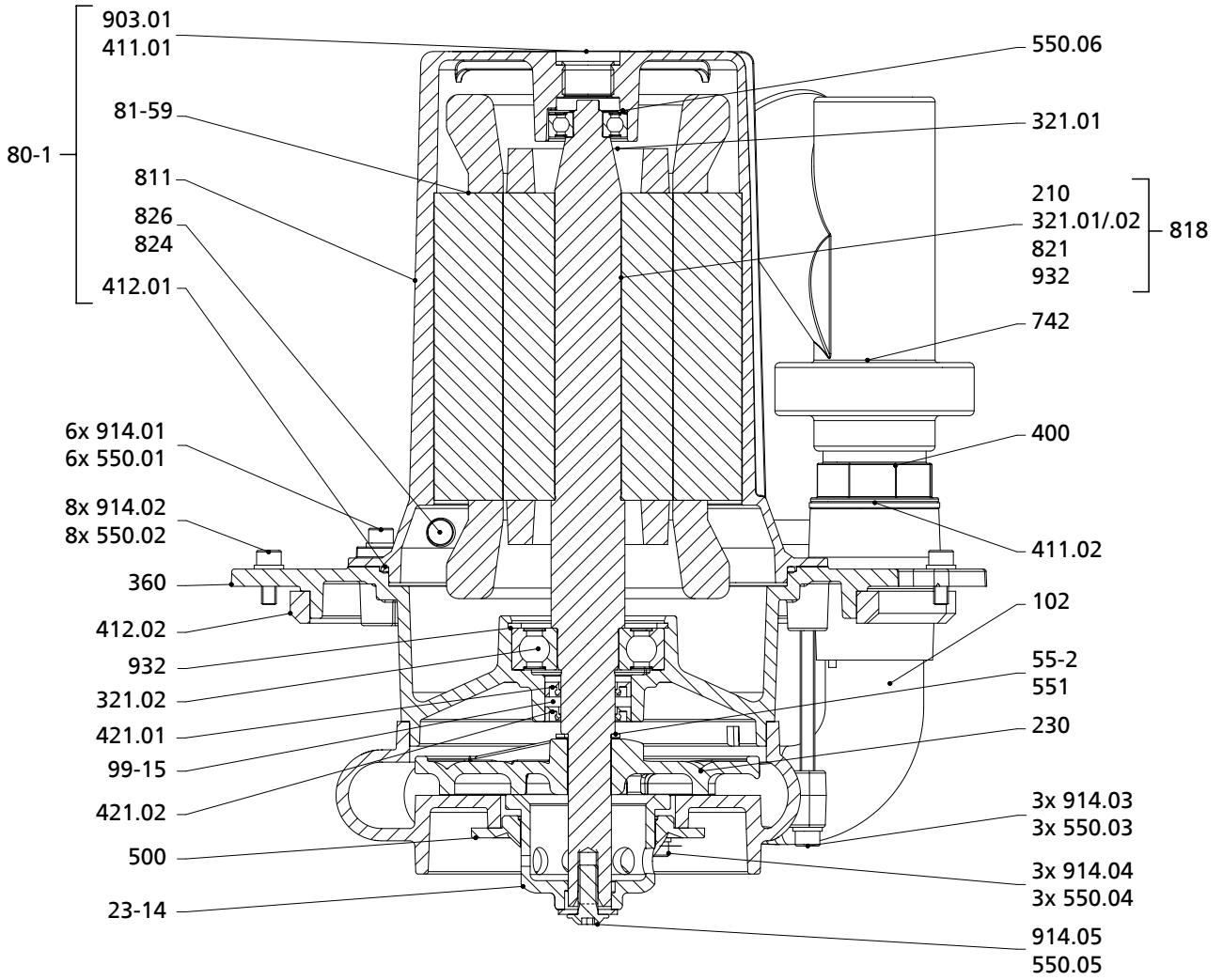


Fig. 39: General assembly drawing of mini-Compacta US40 – rotating assembly

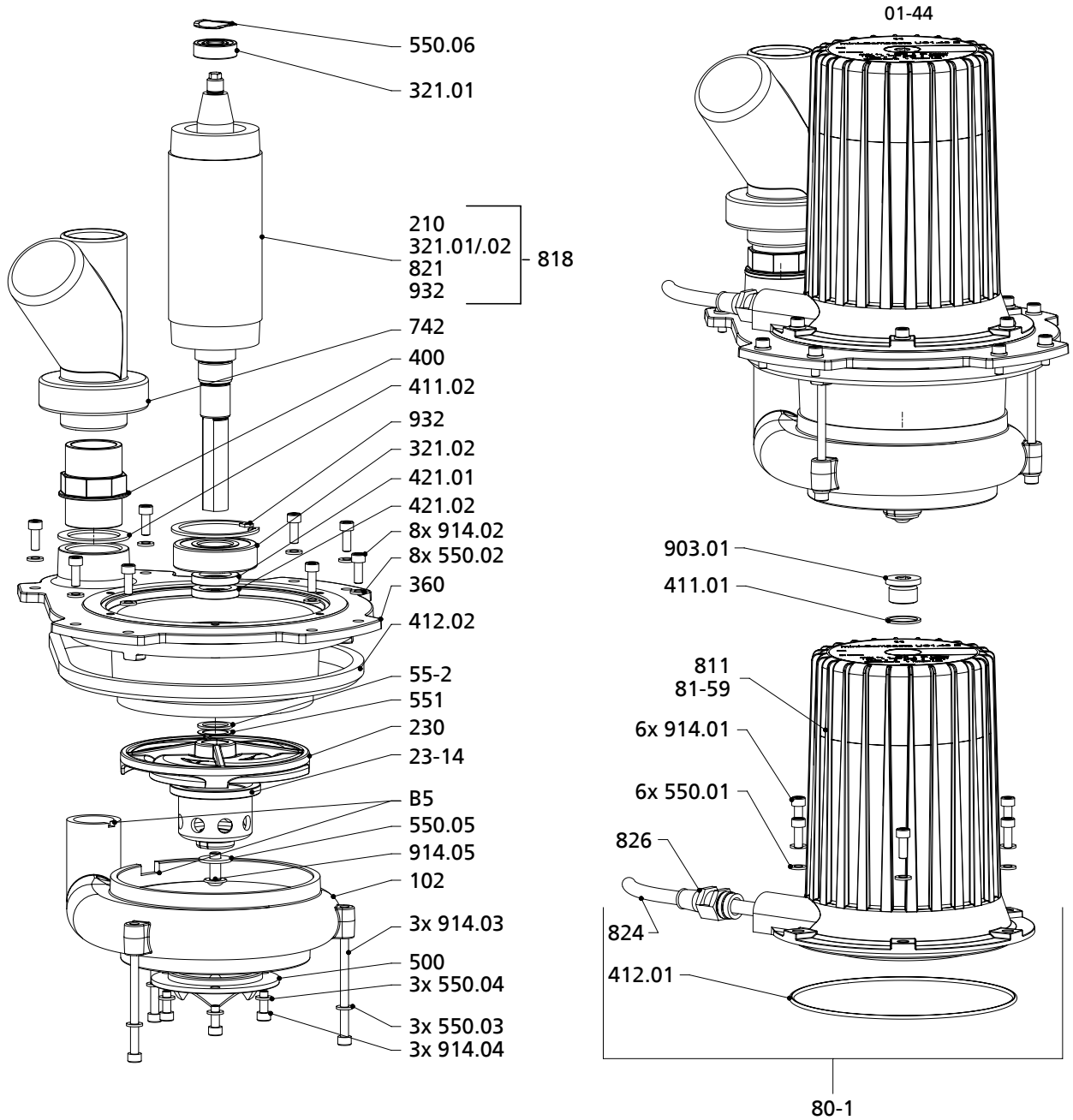


Fig. 40: Exploded view of mini-Compacta US40 – rotating assembly

Part No.	Part No.	Description	Part No.	Part No.	Description
01-44		Rotating assembly	99-20.01		Bearing/shaft seal ring repair kit
102		Volute casing with elbow		321.01/.02	Deep groove ball bearing
23-14		Cutter		411.01	Joint ring
230		Impeller		421.01/.02	Lip seal
360		Bearing end shield		551	Set of adjusting washers
400		Pipe union		55-2	Support disc
412.01/.02		O-ring		903.01	Screw plug
500		Ring		932	Circlip
551		Set of adjusting washers	99-20.02		Small parts repair kit
55-2		Support disc		411.01/.02	Joint ring
742		Swing check valve		412.01/.02	O-ring
80-1		Motor unit		551	Set of adjusting washers

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Part No.	Part No.	Description	Part No.	Part No.	Description
	411.01	Joint ring		55-2	Support disc
	412.01	O-ring		903.01	Screw plug
	811	Motor housing		550.03/.04/.05	Disc
	81-59	Stator		914.03/.04/.05	Hexagon socket head cap screw
	824	Cable	99-20.03		Screws repair kit
	826	Cable gland		550.01/.02	Disc
	903.01	Screw plug		914.01/.02	Hexagon socket head cap screw
818		Rotor	B5		Vent
	210	Shaft			
	821	Rotor core pack			

10.1.6 mini-Compacta US100, UZS150 - Rotating assembly

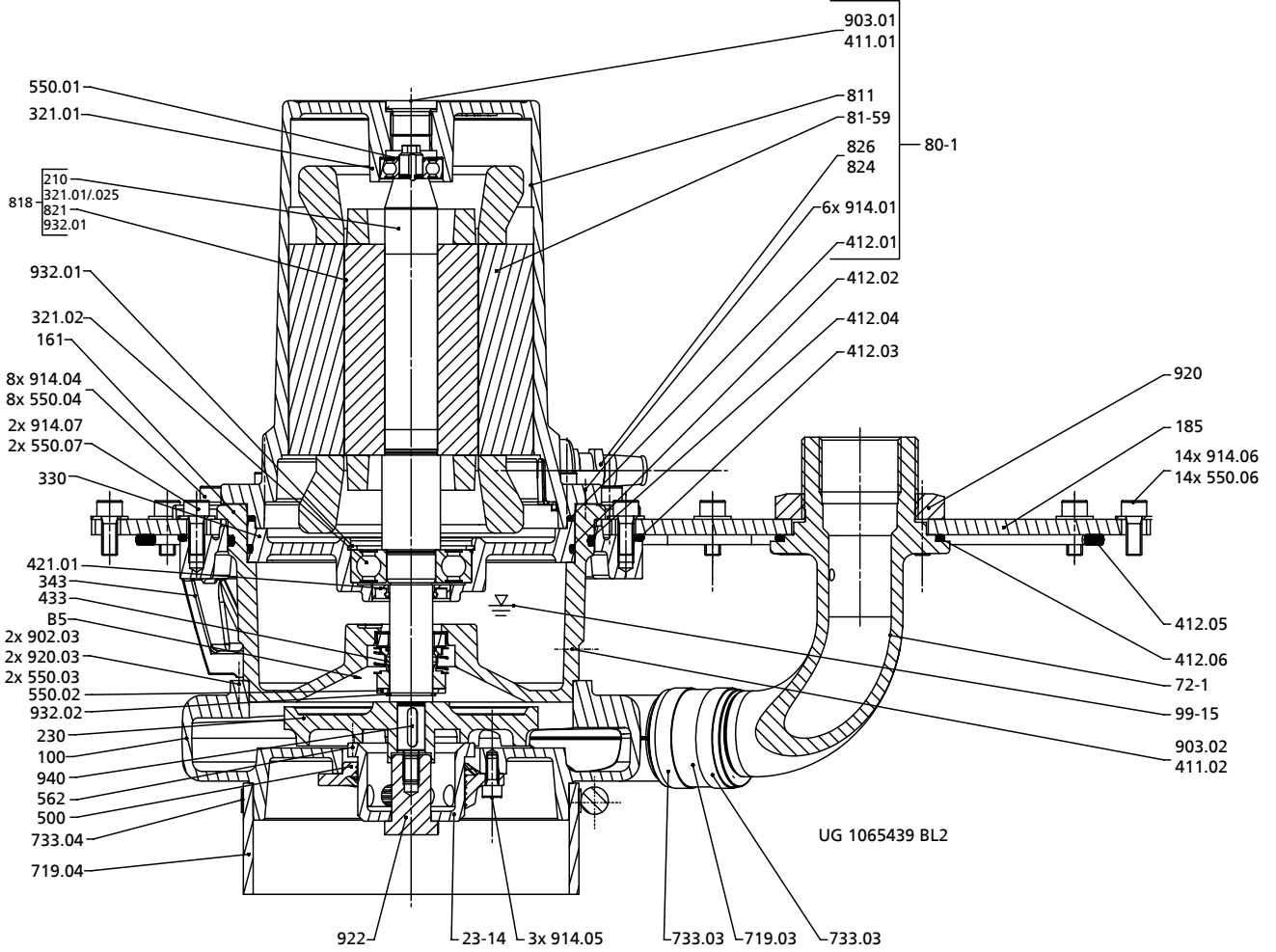


Fig. 41: General assembly drawing US100, UZS150 - Rotating assembly

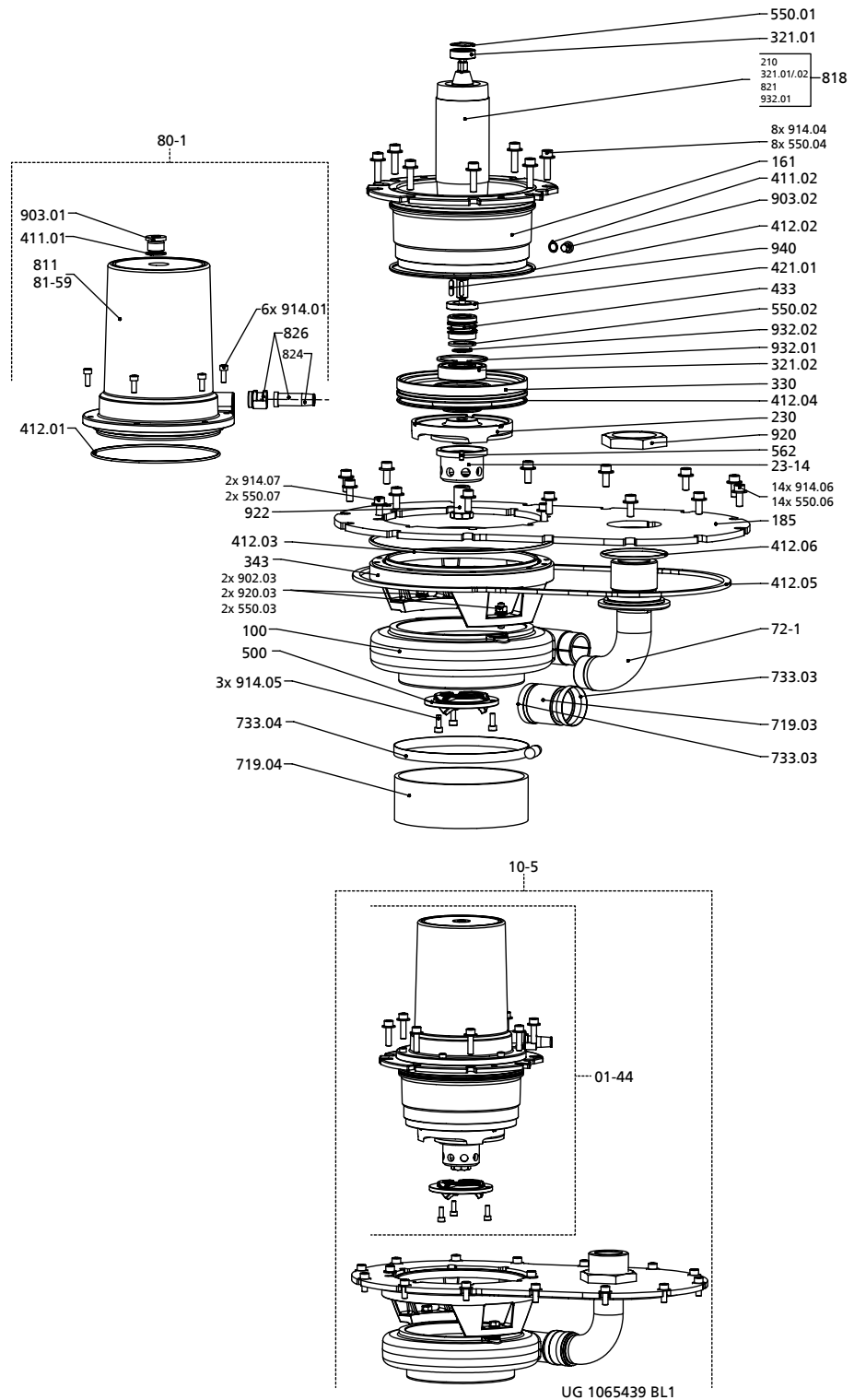


Fig. 42: Exploded view US100, UZS150 - Rotating assembly

Part No.	Part No.	Description	Part No.	Part No.	Description
01-44		Rotating assembly	920		Nut
10-5		Pump section	922		Impeller nut
100		Casing	940		Key
161		Casing cover	99-20.01		Bearing/shaft seal ring repair kit
185		Plate		321.01/02	Deep groove ball bearing
23-14		Cutter		411.02	Joint ring
230		Impeller		421.01	Lip seal

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Part No.	Part No.	Description	Part No.	Part No.	Description
330		Bearing bracket		433	Mechanical seal
343		Lantern		550	Set of spacer discs
412.01/.02/ .03/.04/ .05/.06		O-ring		550.01	Disc
500		Ring		550.02	Support disc
550		Set of spacer discs		903.02	Screw plug
562		Parallel pin		932.01/.02	Circlip
719.03/.04		Hose	99-20.02		Small parts repair kit
72-1		Flanged bend		411.01/.02	Joint ring
733.03/.04		Hose clip		412.01-.05	O-ring
80-1		Motor unit		550	Set of spacer discs
	411.01	Joint ring		550.01/.03/.07	Disc
	412.01	O-ring		550.02	Support disc
	811	Motor housing		562	Parallel pin
	81-59	Stator		903.01/.02/.07	Screw plug
	824	Cable		914.03/.05/.07	Hexagon socket head cap screw
	826	Cable gland		932.01/.02	Circlip
	903.01	Screw plug	99-20.03		Screws repair kit
	914.01	Hexagon socket head cap screw		550.04/.06	Disc
818		Rotor		914.01/.04/.06	Hexagon socket head cap screw
	210	Shaft	B5		Vent
	821	Rotor core pack			

10.1.7 mini-Compacta US40 – Collecting tank

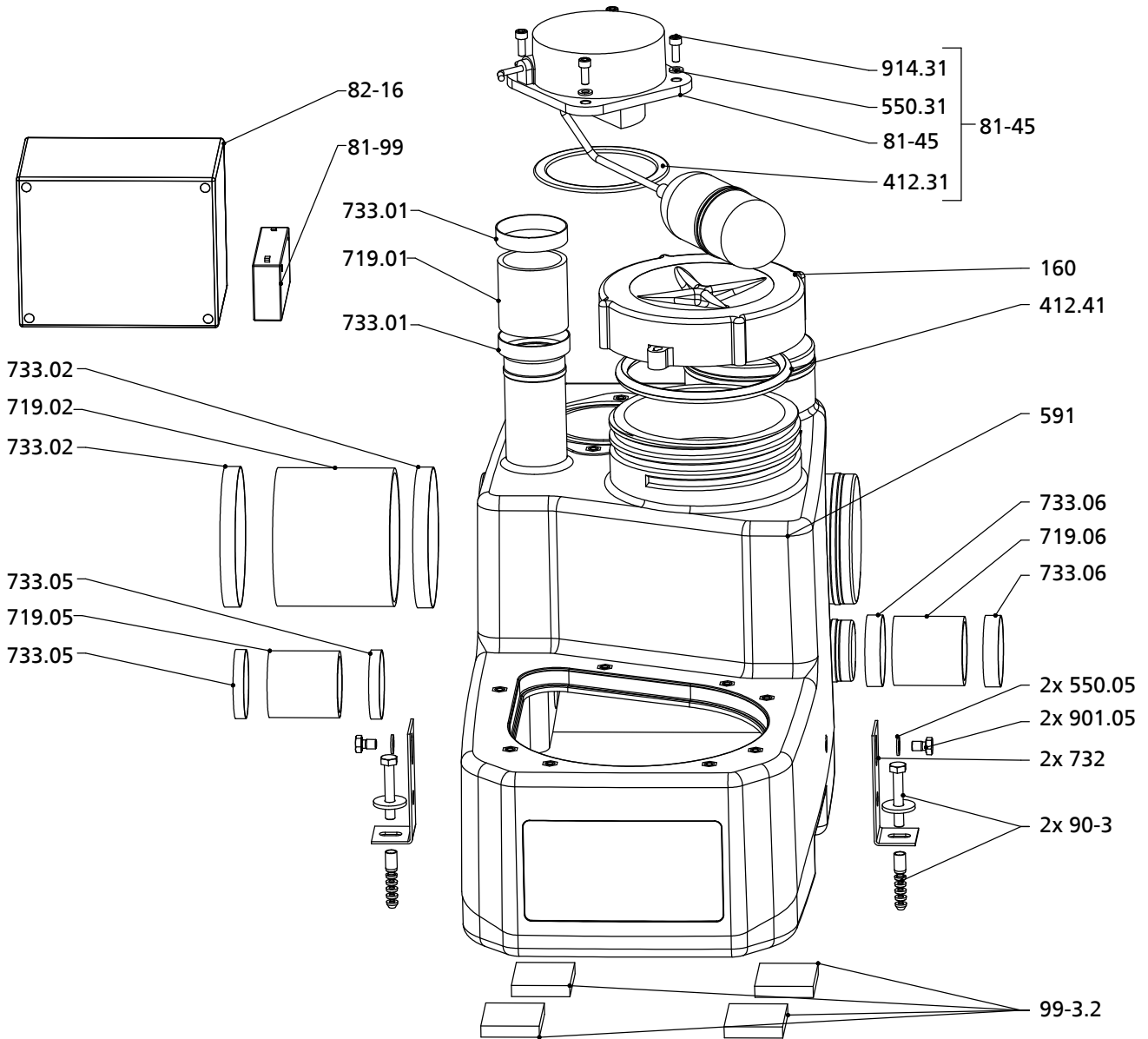


Fig. 43: Exploded view of mini-Compacta US40 – collecting tank

Part No.	Part No.	Description	Part No.	Part No.	Description
160		Cover	81-99		Rechargeable battery
412.31/.41		O-ring	82-16		Control unit
550.05		Disc	90-3		Set of mounting elements
591		Tank	901.05		Hexagon head bolt
719.01/.02/.05/.06		Hose	99-3.2		Set of pads
732		Bracket			
733.01/.02/.05/.06		Hose clip			
84-45		Level sensor			
	412.31	O-ring			
	550.31	Disc			
	81-45	Level sensor			
	914.31	Hexagon socket head cap screw			

10.1.8 mini-Compacta US100 - Collecting tank

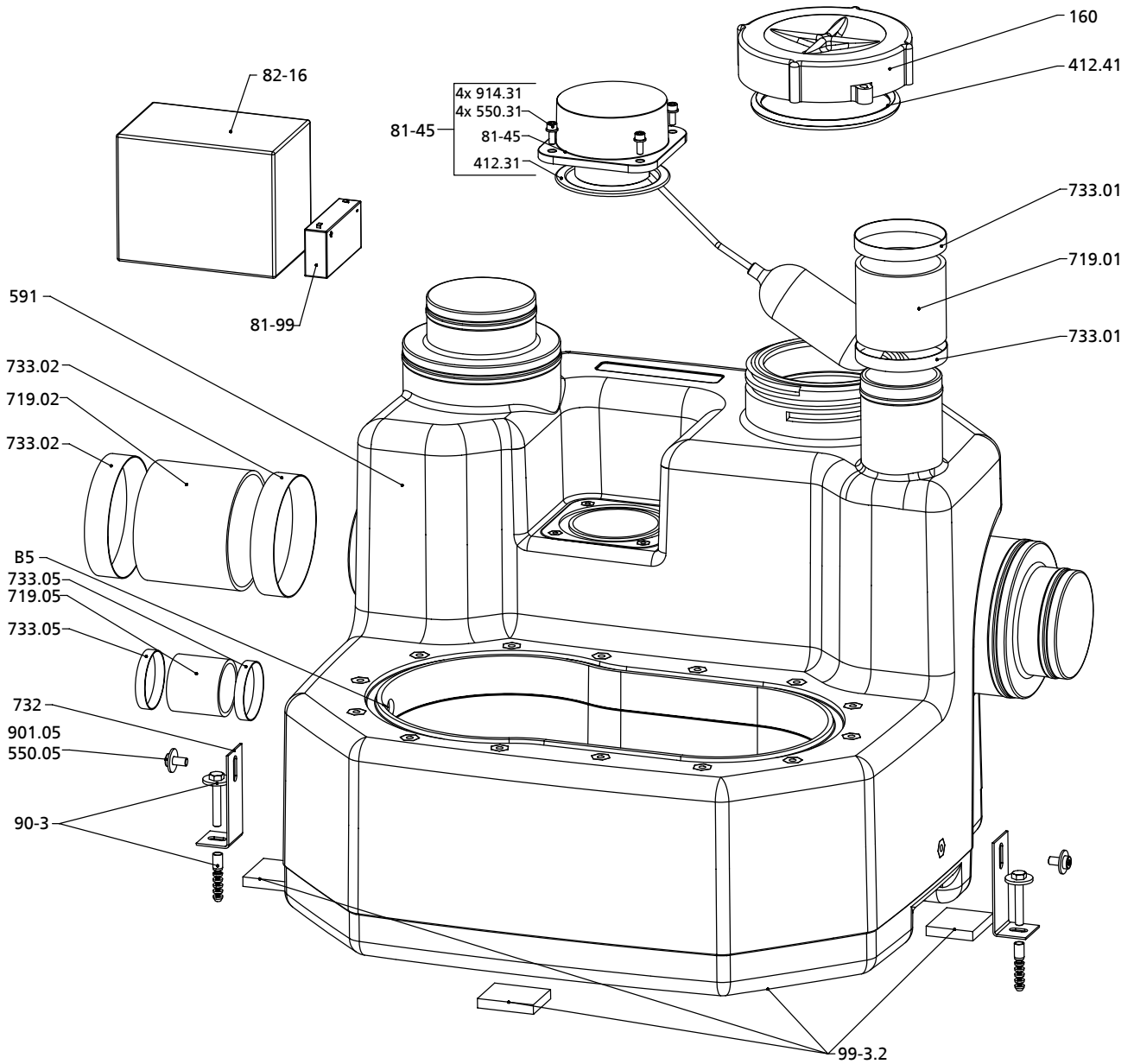


Fig. 44: Exploded view of mini-Compacta US100 – collecting tank

Part No.	Part No.	Description	Part No.	Part No.	Description
160		Cover	81-99		Rechargeable battery
412.31/.41		O-ring	82-16		Control unit
550.05		Disc	90-3		Set of mounting elements
591		Tank	901.05		Hexagon head bolt
719.01/.02/.05		Hose	99-3.2		Set of pads
732		Bracket	B5		Vent
733.01/.02/.05		Hose clip			
84-45		Level sensor			
	412.31	O-ring			
	550.31	Disc			
	81-45	Level sensor			
	914.31	Hexagon socket head cap screw			

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10.1.9 mini-Compacta UZS150 - Collecting tank

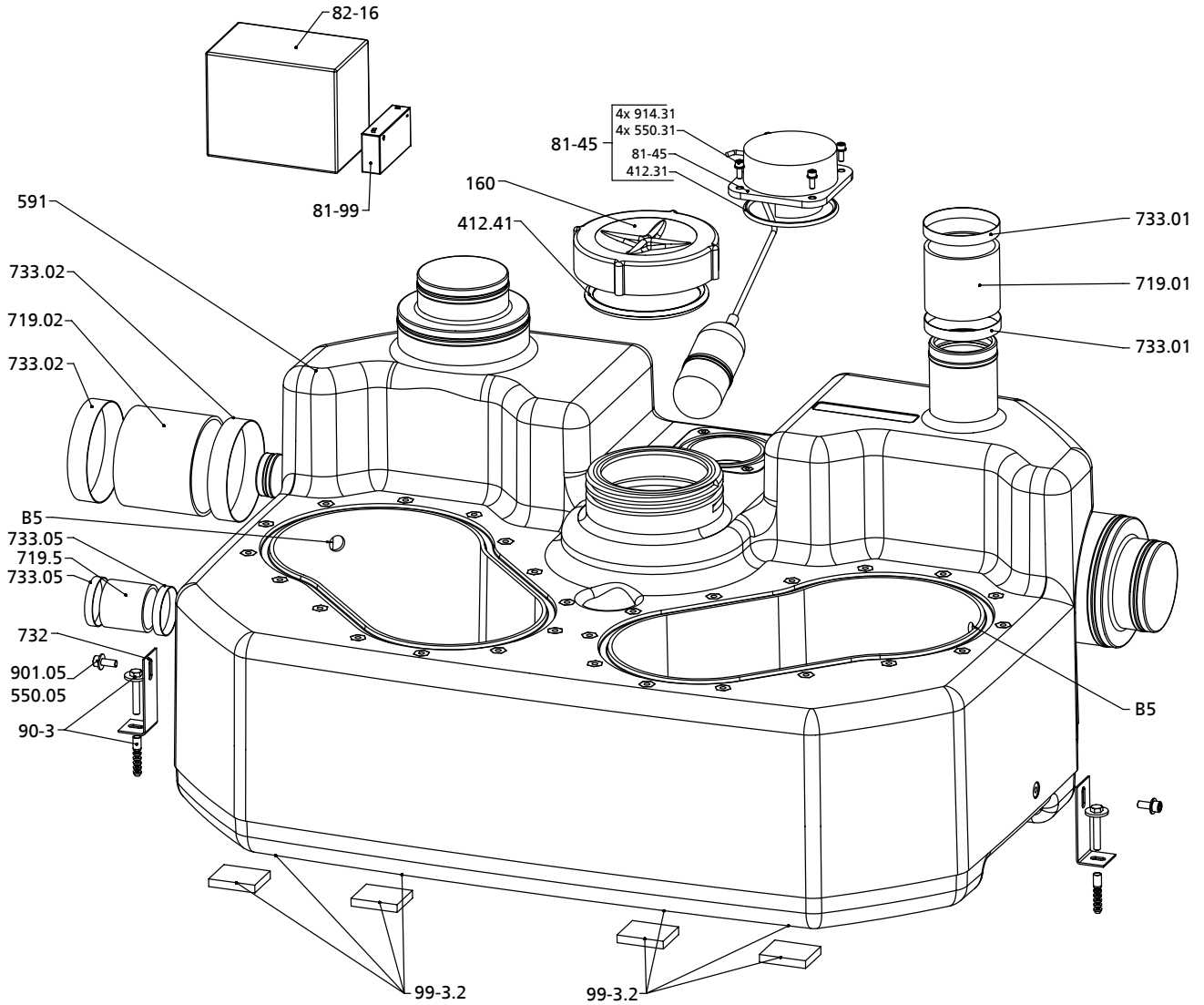



Fig. 45: Exploded view of mini-Compacta UZS150 – collecting tank

Part No.	Part No.	Description	Part No.	Part No.	Description
160		Cover	81-99		Rechargeable battery
412.31/.41		O-ring	92-16		Control unit
550.05		Disc	90-3		Set of mounting elements
591		Tank	901.05		Hexagon head bolt
719.01/.02/.05		Hose	99-3.2		Set of pads
732		Bracket	B5		Vent
733.01/.02/.05		Hose clip			
81-45		Level sensor			
	412.31	O-ring			
	550.31	Disc			
	81-45	Level sensor			
	914.31	Hexagon socket head cap screw			

10.2 Connection examples

10.2.1 mini-Compacta US40, U60, U100, US100

	NOTE
Provide sufficient clearance (at least 600 mm) in all directions for servicing work.	

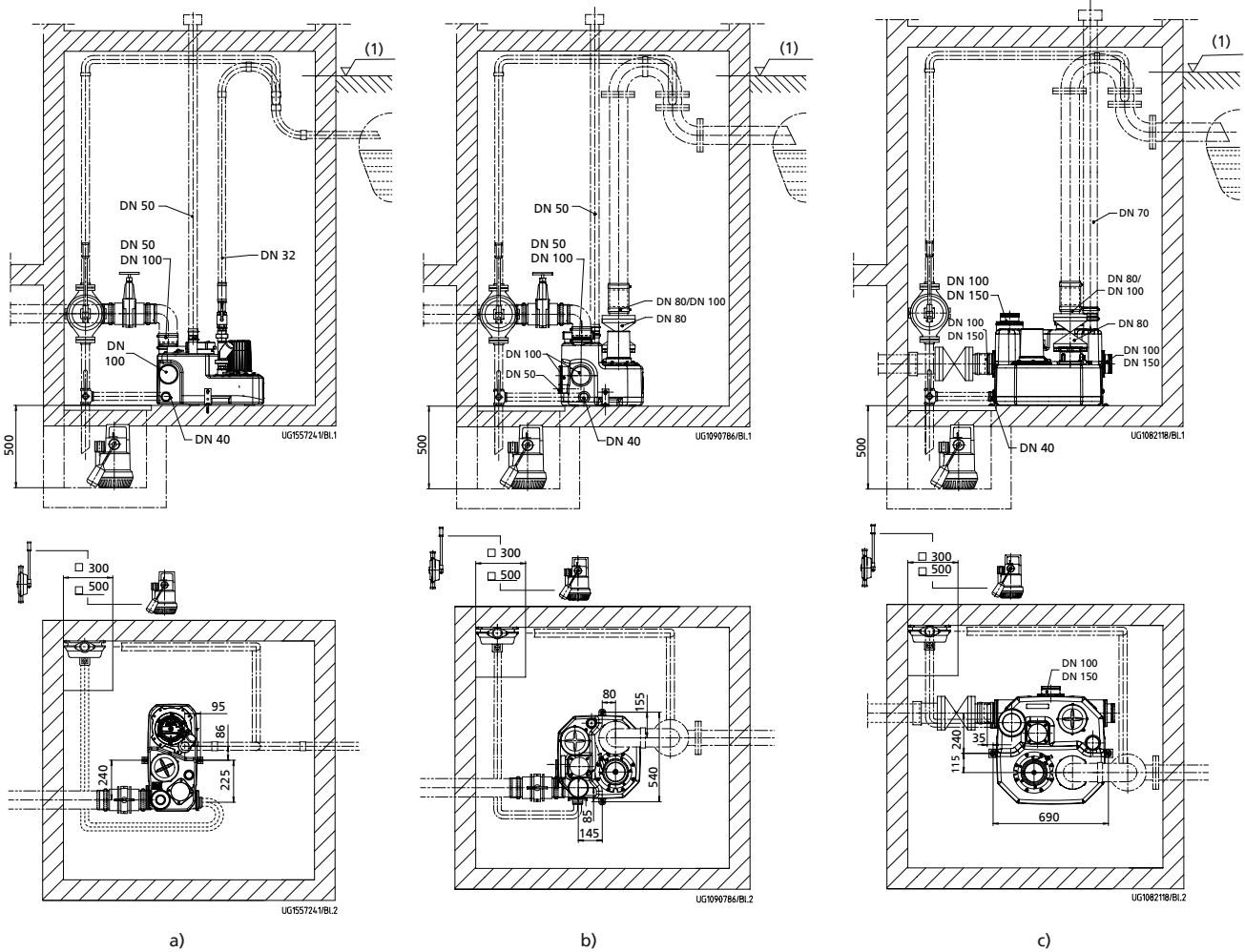


Fig. 46: Connection example mini-Compacta a) US40, b) U60, c) U100 and US100

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

10.2.2 mini-Compacta UZ150, UZS150



NOTE

Provide sufficient clearance (at least 600 mm) in all directions for servicing work.

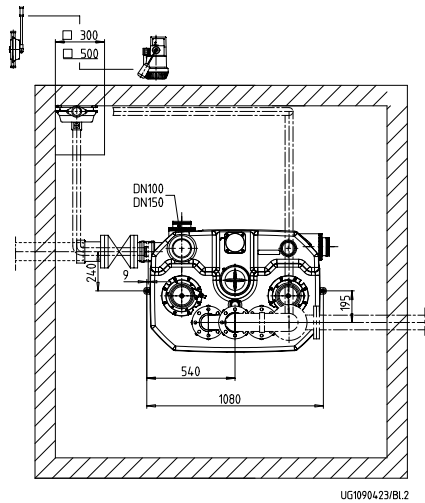
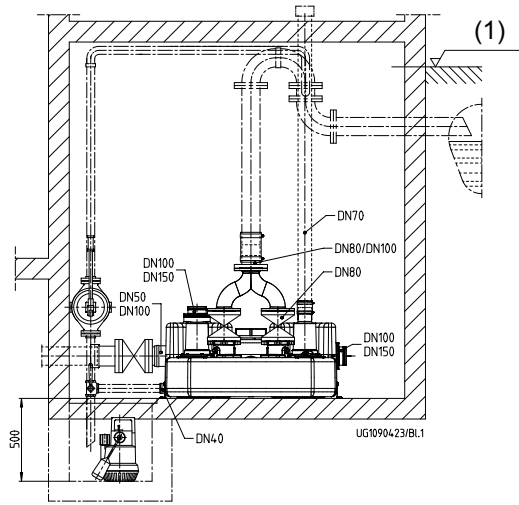


Fig. 47: Connection example mini-Compacta UZ150, UZS150

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

10.2.3 mini-Compacta US40 – concealed in a pre-wall system

mini-Compacta US40 can also be installed directly in the bathroom, concealed in a suitable pre-wall system. The distance between the actual wall and the pre-wall should measure at least 400 mm.

Please note that an opening in the pre-wall is required for inspection work and maintenance work to be carried out. This access opening must be located in the area of the rotating assembly of the lifting unit and measure 400 x 600 mm as a minimum. The opening can be covered with either a removable panel or a door.

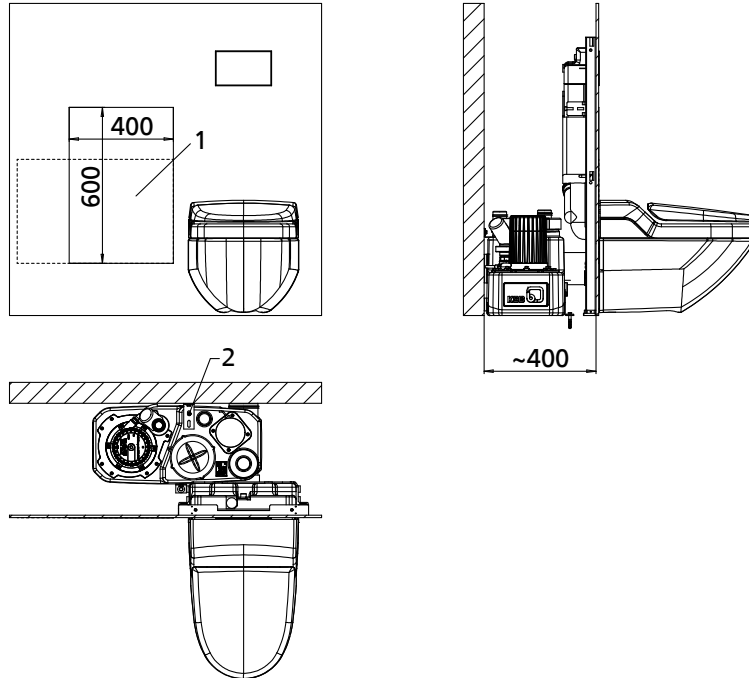


Fig. 48: Installation concealed in a pre-wall system

1	Provide an opening of 400 x 600 mm or larger in the pre-wall for maintenance purposes.
2	Fasten the lug to the wall to prevent the unit from floating.

Direct connection to a wall-mounted toilet bowl

For direct connection to a wall-mounted toilet bowl a base with a minimum height of 70 mm must be provided under the mini-CompactaUS40 at the place of installation. (⇒ Section 10.5, Page 92)

Table 34: Dimensions for direct connection to a wall-mounted toilet bowl [mm]

Height of the inlet nozzle (centreline)	180
Connection dimension of wall-mounted toilet bowl (nozzle centreline)	250

10.3 Dimensions

10.3.1 mini-Compacta US40 and U60

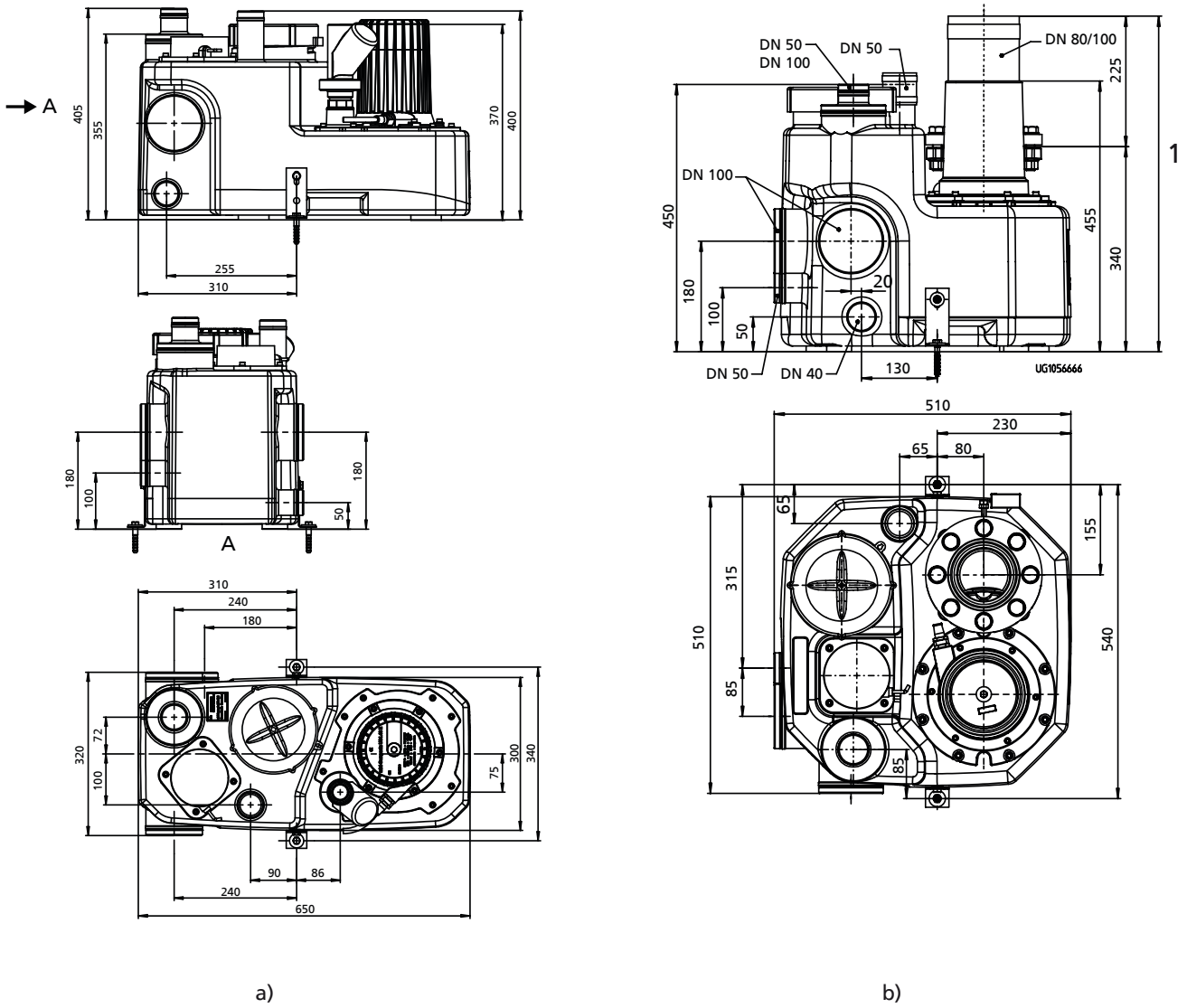


Fig. 49: mini-Compacta a) US40 and b) U60 dimensions

1	With gate valve: 745 mm
---	-------------------------

10.3.2 mini-Compacta U100 and US100

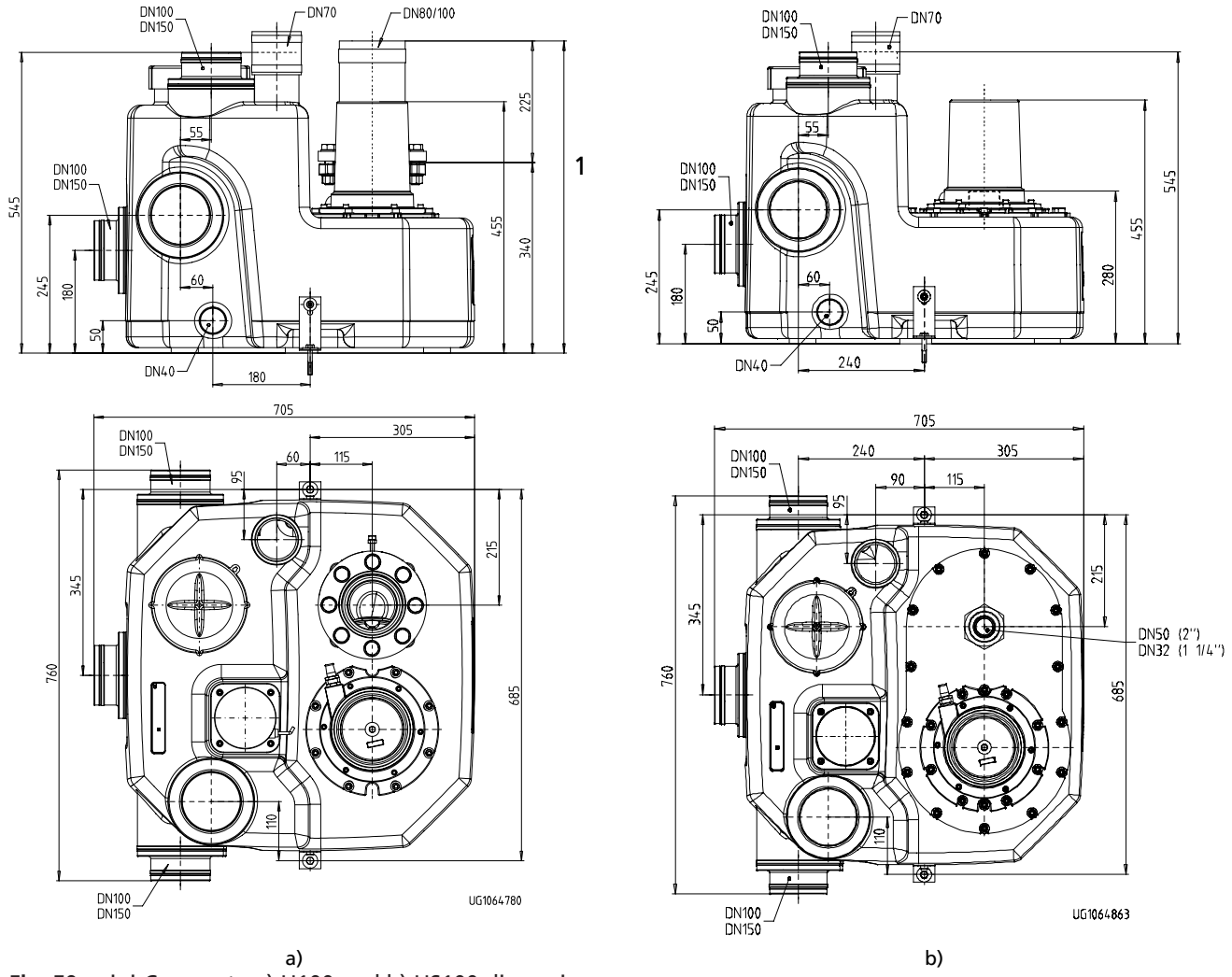


Fig. 50: mini-Compacta a) U100 and b) US100 dimensions

1	With gate valve: 745 mm
---	-------------------------

10.3.3 mini-Compacta UZ150 and UZS150

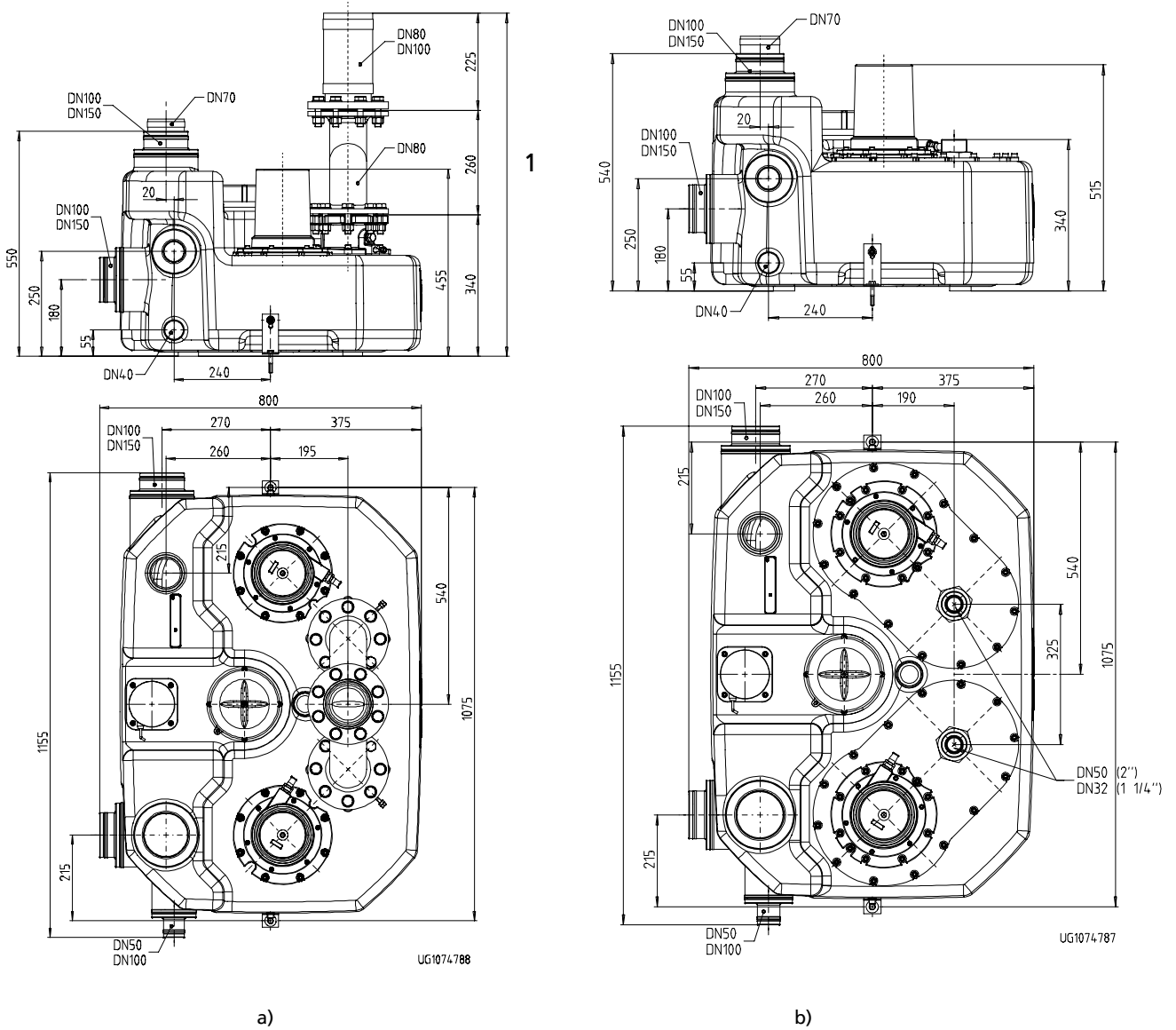


Fig. 51: mini-Compacta a) UZ150 and b) UZS150 dimensions

1	With gate valve: 1005 mm
---	--------------------------

10.3.4 Dimensions of shut-off elements

10.3.4.1 Inlet line US40, U60, U100, US100

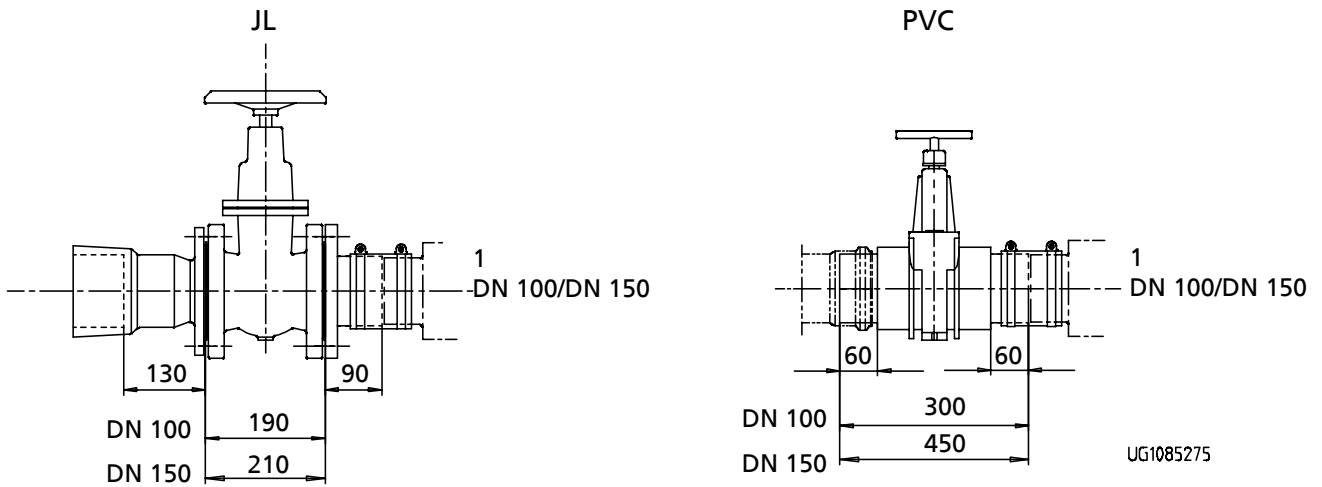


Fig. 52: Dimensions of the inlet line with grey cast iron and PVC gate valve, mini-Compacta US40, U60, U100, US100

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

10.3.4.2 Inlet line UZ150, UZS150

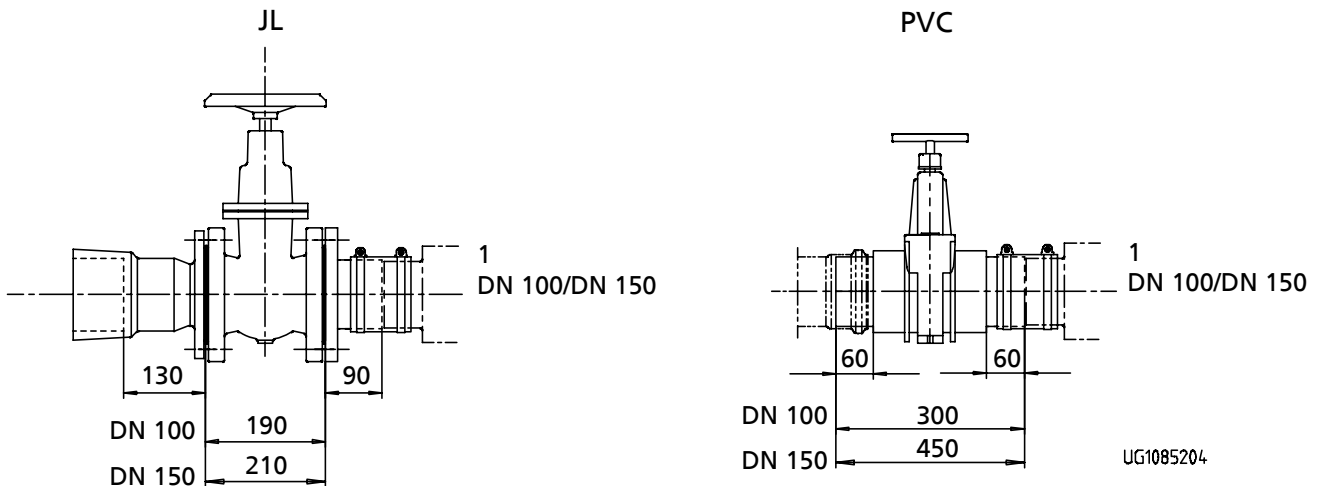


Fig. 53: Dimensions of inlet line with cast iron and PVC gate valve, mini-Compacta UZ150, UZS150

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

10.3.4.3 Discharge line US40, U60, U100, US100

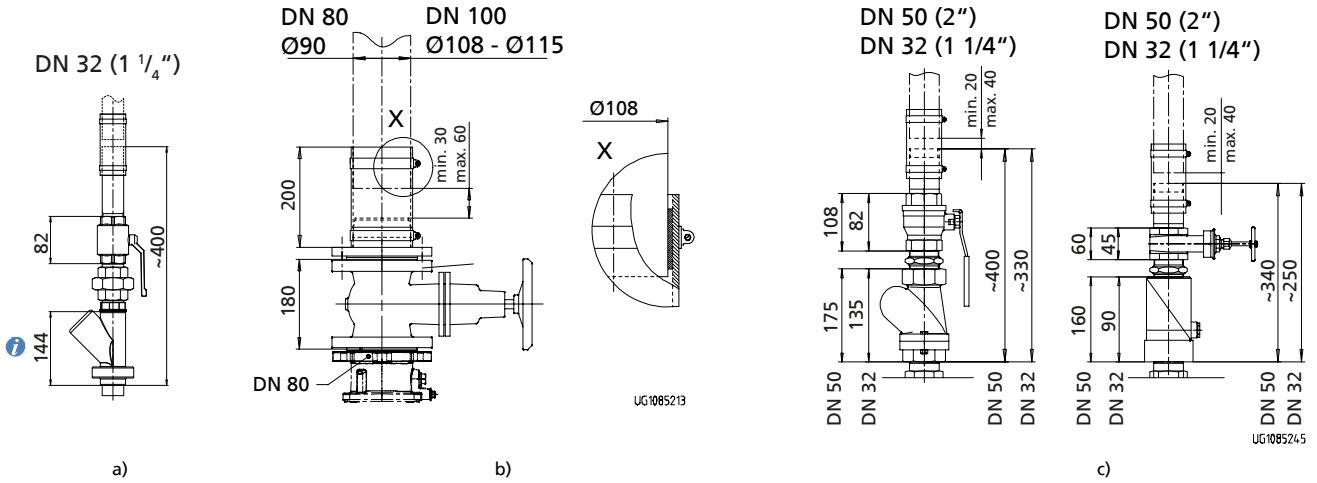


Fig. 54: Dimensions of the discharge line of mini-Compacta a) US40, b) U60, U100 and c) US100

System component

10.3.4.4 Discharge line of UZ150, UZS150

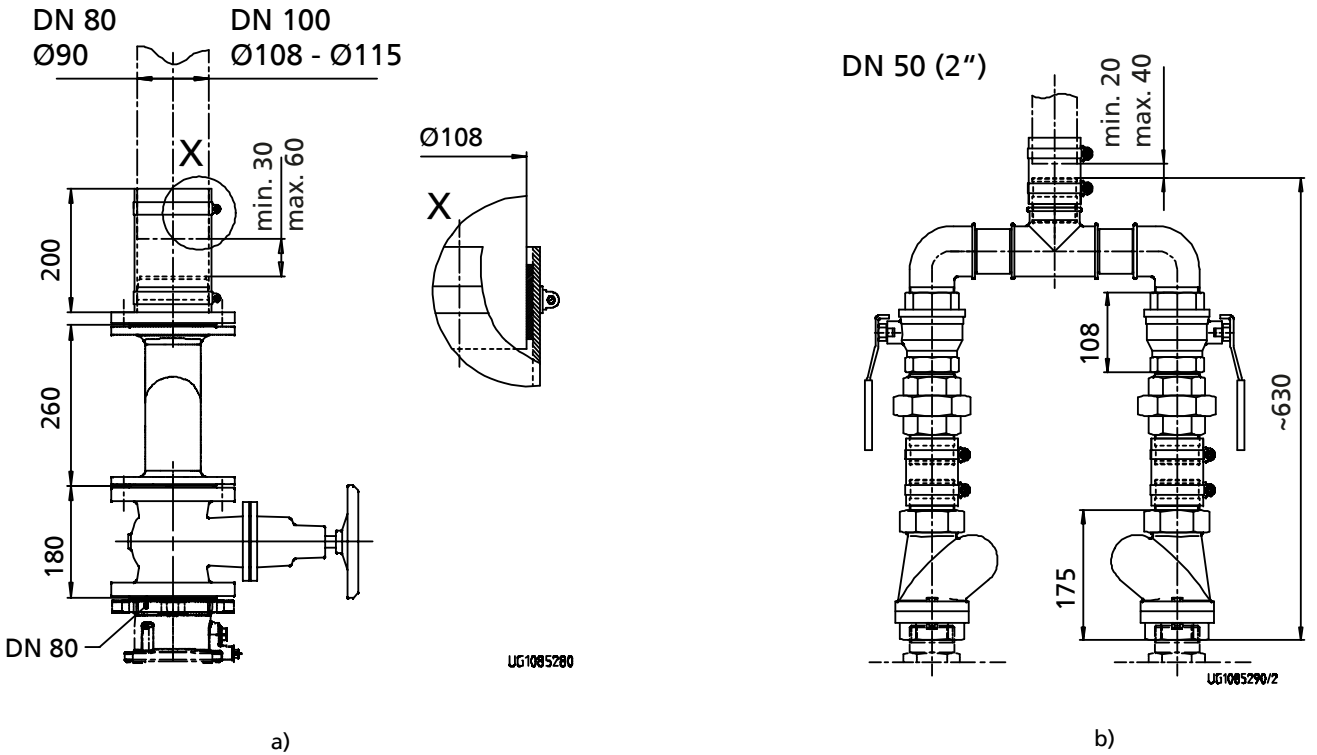


Fig. 55: Dimensions of the discharge line a) mini-Compacta UZ150 and b) UZS150

10.4 Connections

10.4.1 mini-Compacta US40 / U60

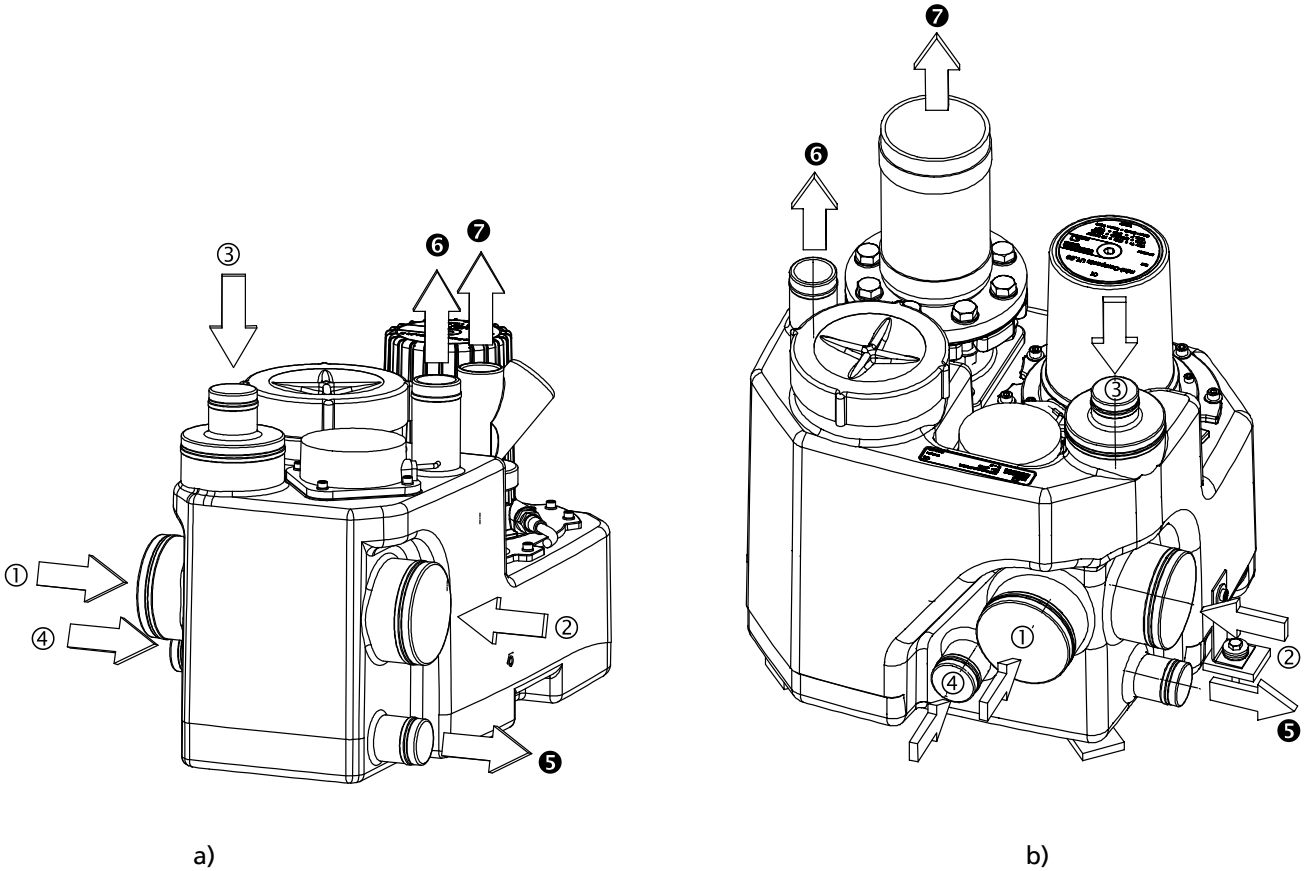


Fig. 56: Connections of mini-Compacta a) US40 and b) U60

Table 35: Connections of mini-Compacta US40 and U60

Number	Connection for	Number	Connection for
①	Inlet DN 100	①	Inlet DN 100
②	Inlet DN 100	②	Inlet DN 100
③	Inlet DN 100/50	③	Inlet DN 100/50
④	Inlet DN 50	④	Inlet DN 50 ⁸⁾
⑤	Drain DN 40	⑤	Drain DN 40
⑥	Vent DN 50	⑥	Vent DN 50
⑦	Discharge line G 1 1/4	⑦	Discharge line DN 80/100

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8) To prevent backflow, all sanitary appliances must be connected to the lifting unit with their pipe invert at least 180 mm above the tank floor. This connection is not suitable for discharge from shower basins.

10.4.2 mini-Compacta U100 / US100

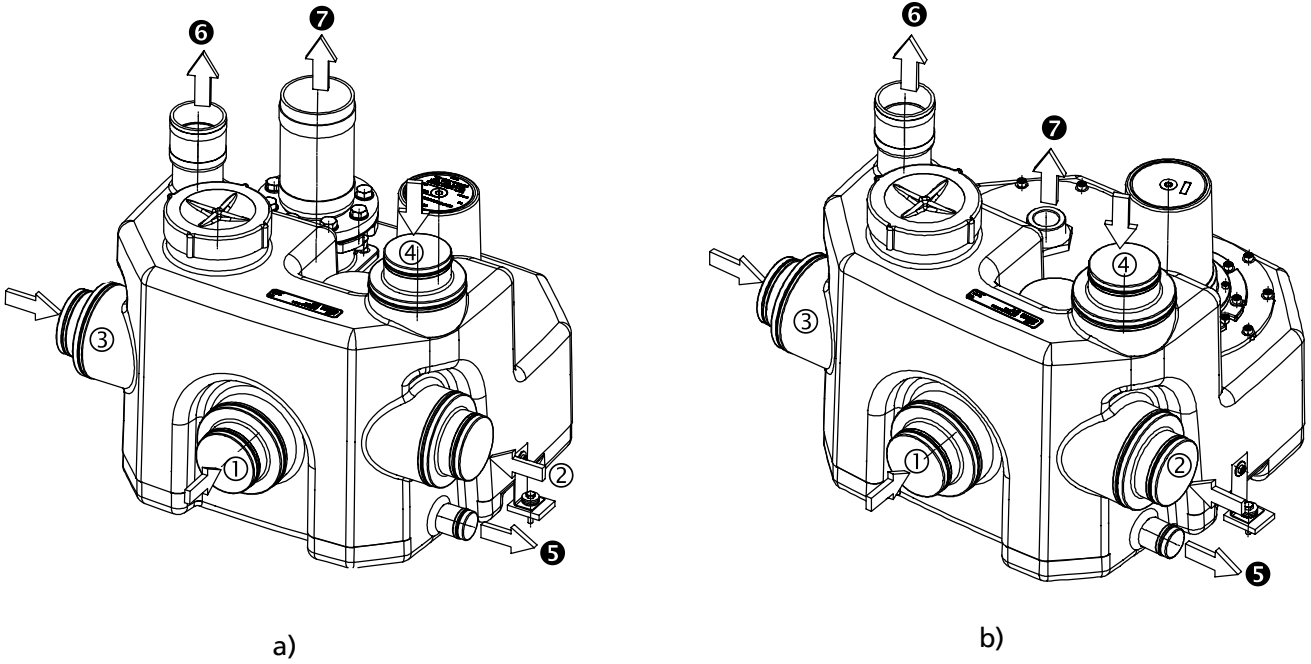


Fig. 57: Connections of mini-Compacta a) U100 and b) US100

Table 36: Connections of mini-Compacta U100 and US100

Number	Connection for	Number	Connection for
①	Inlet DN 150/100	①	Inlet DN 150/100
②	Inlet DN 150/100	②	Inlet DN 150/100
③	Inlet DN 150/100	③	Inlet DN 150/100
④	Inlet DN 150/100	④	Inlet DN 150/100
⑤	Drain DN 40	⑤	Drain DN 40
⑥	Vent DN 70	⑥	Vent DN 70
⑦	Discharge line DN 80/100	⑦	Discharge line DN 50 (DN 32)

10.4.3 mini-Compacta UZ150 / UZS150

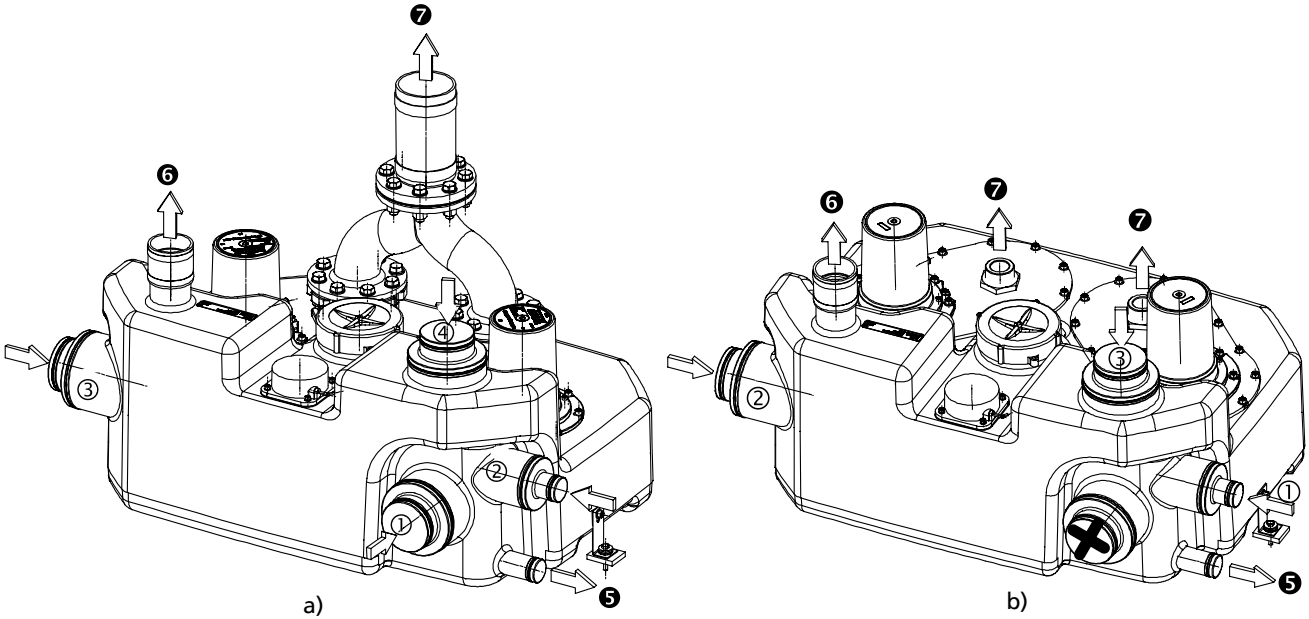


Fig. 58: Connections of mini-Compacta a) UZ150 b) UZS150

Table 37: Connections of mini-Compacta UZ150 and UZS150

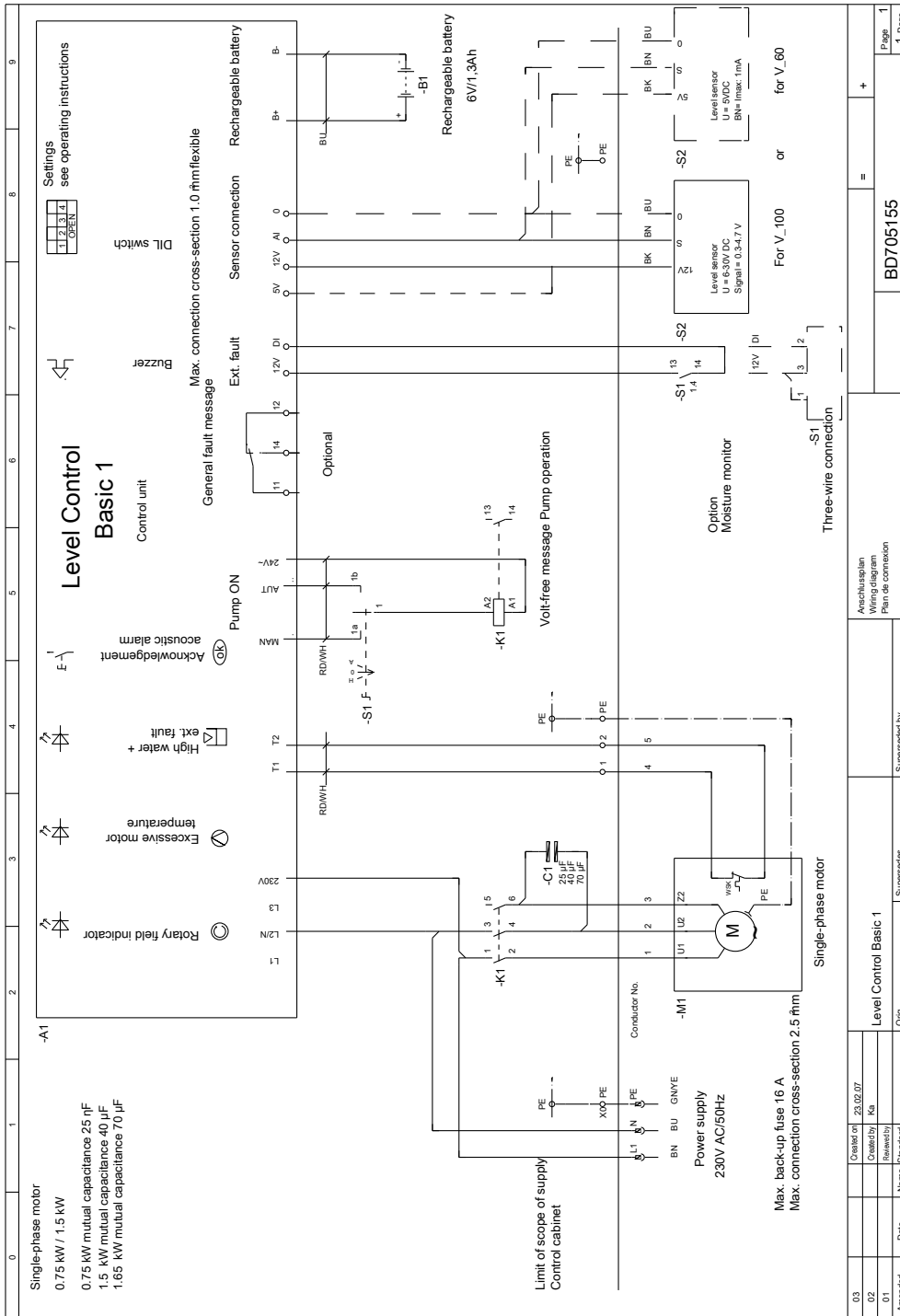
Number	Connection for	Number	Connection for
①	Inlet DN 150/100	①	Inlet DN 100/50
②	Inlet DN 100/50	②	Inlet DN 150/100
③	Inlet DN 150/100	③	Inlet DN 150/100
④	Inlet DN 150/100	✘	This inlet cannot be used on "S" models.
⑤	Drain DN 40	⑤	Drain DN 40
⑥	Vent DN 70	⑥	Vent DN 70
⑦	Discharge line DN 80/100	⑦	Discharge line 2 x DN 50 (DN 32)

10.5 Types of connection

<p>mini-Compacta US40, U60, U100, US100 Connection to a floor-mounted toilet bowl</p>	<p>mini-Compacta US40, U60 Connection to wall-mounted toilet bowl</p>
<p>mini-Compacta U100, US100 Connection to wall-mounted toilet bowl</p>	<p>mini-Compacta US40, U60, U100, US100 Pit installation</p>

10.6 Wiring diagrams

10.6.1 LevelControl Basic 1 - single-phase (1~)

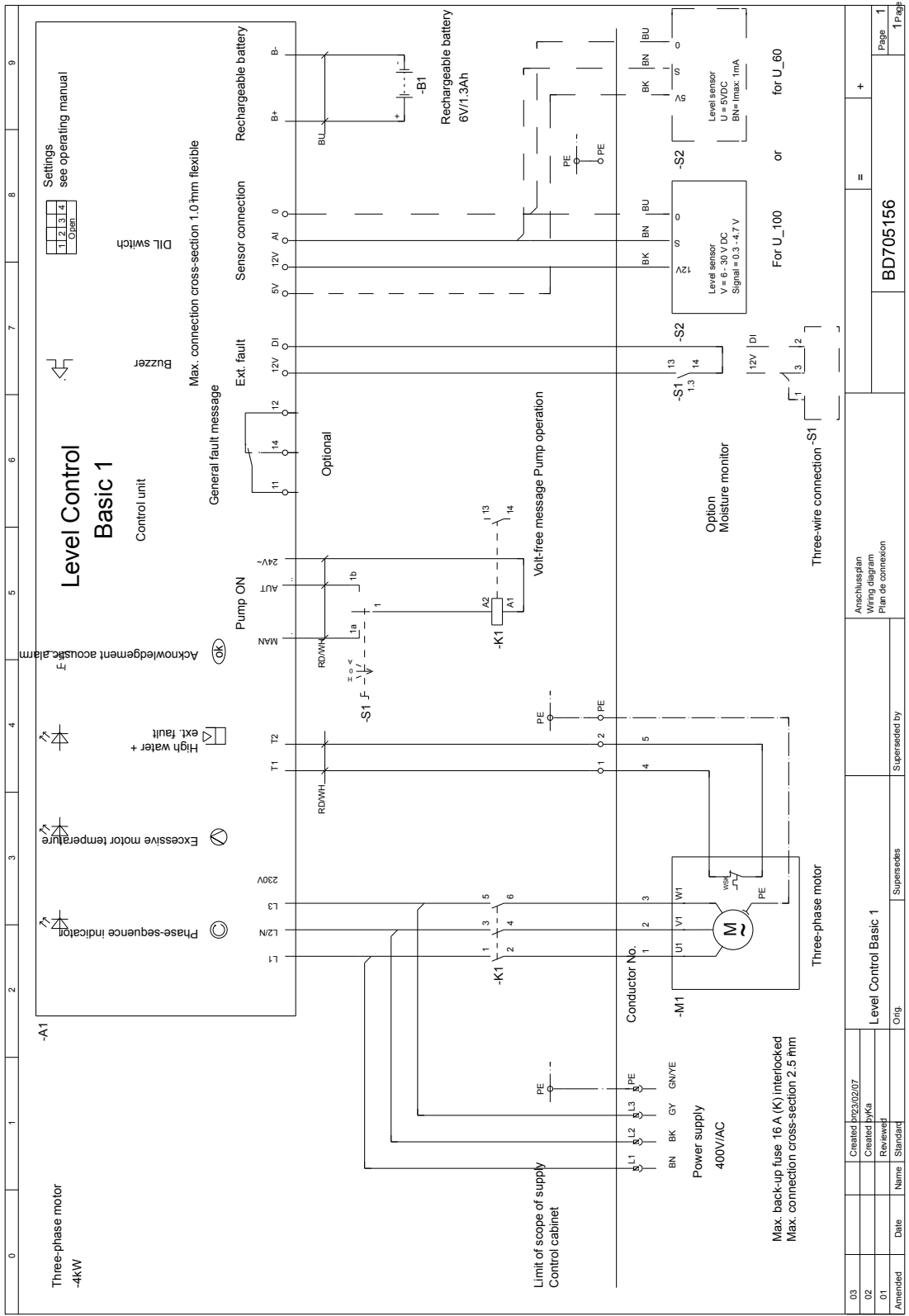


NOTE

This control unit is also used for mini-Compacta US40.

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

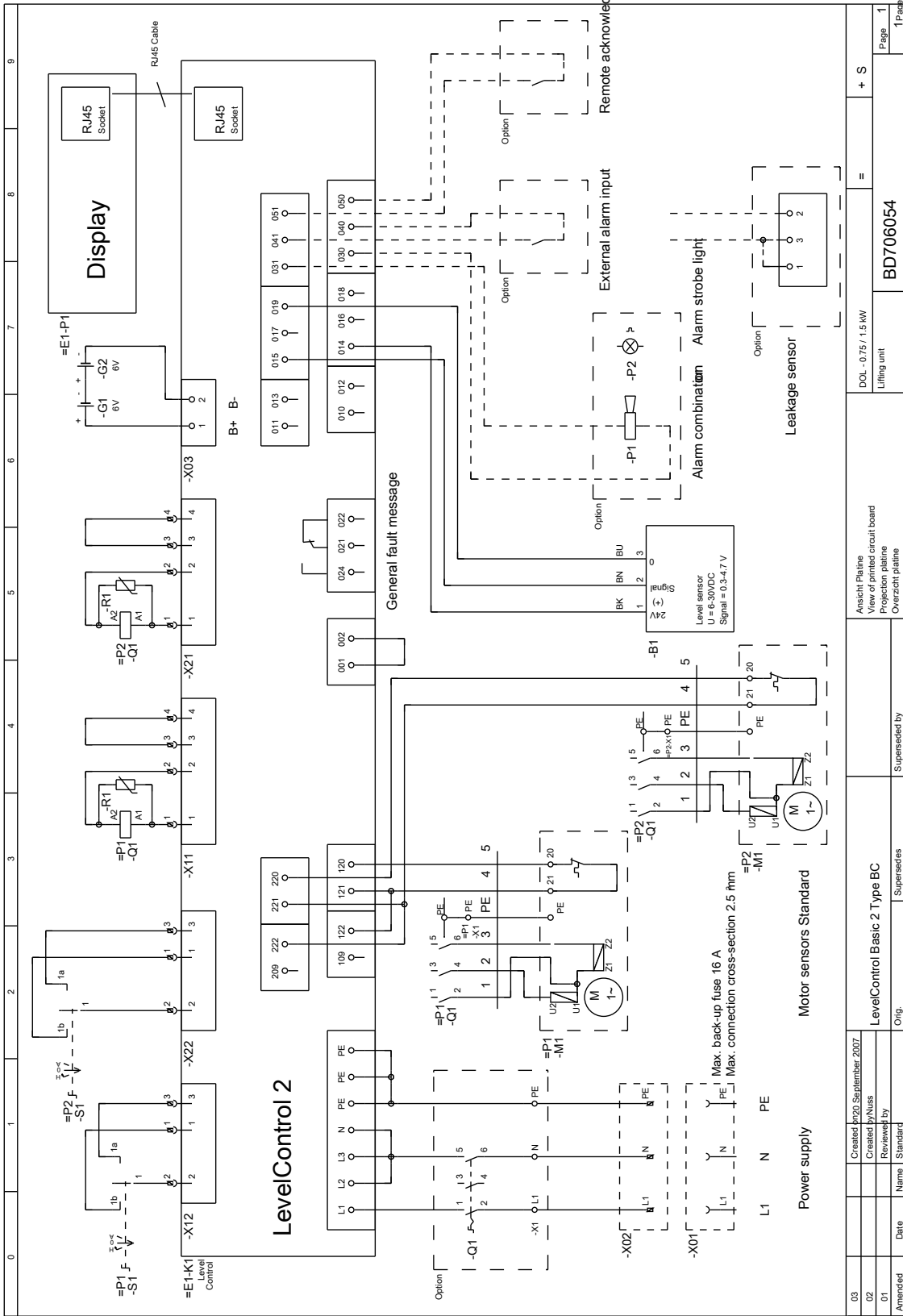


03	Created	19/10/2017				Anschlusspan Wiring diagram Plan de connexion	
02	Created by/ka				Supervised by		
01	Reviewed						Supervised by
Amended	Date	Name	Standard	Origin			
Level Control Basic 1							
BD705156							
+ Page 1 of 1							

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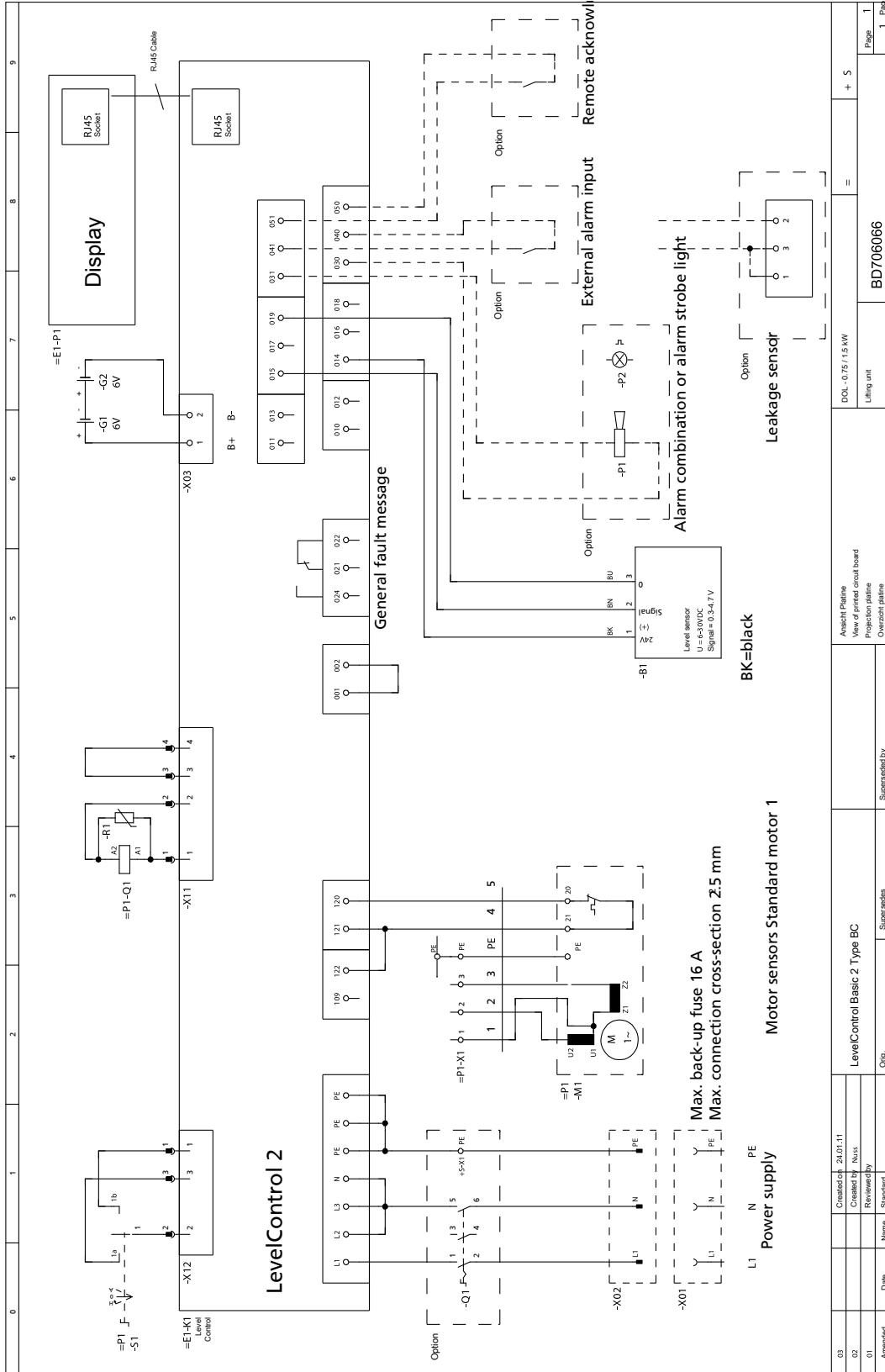
10.6.3 LevelControl Basic 2 Type BC - dual-pump unit - up to 1.5 kW, 1~

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03	Created by	20 September 2007	=		+ S	Page 1
02	Created by	Nies	=			
01	Reviewed by		=			
Amended	Date	Name	=			
Orig.			=			
Supersedes			=			
Superseded by			=			
Anschl. Platine			=			
View of printed circuit board			=			
Projection platine			=			
Überzicht platine			=			
Lifting unit			=			
BD706054			=			

10.6.4 LevelControl Basic 2 Type BC - single-pump unit with cutter - up to 1.5 kW, single-phase 1~



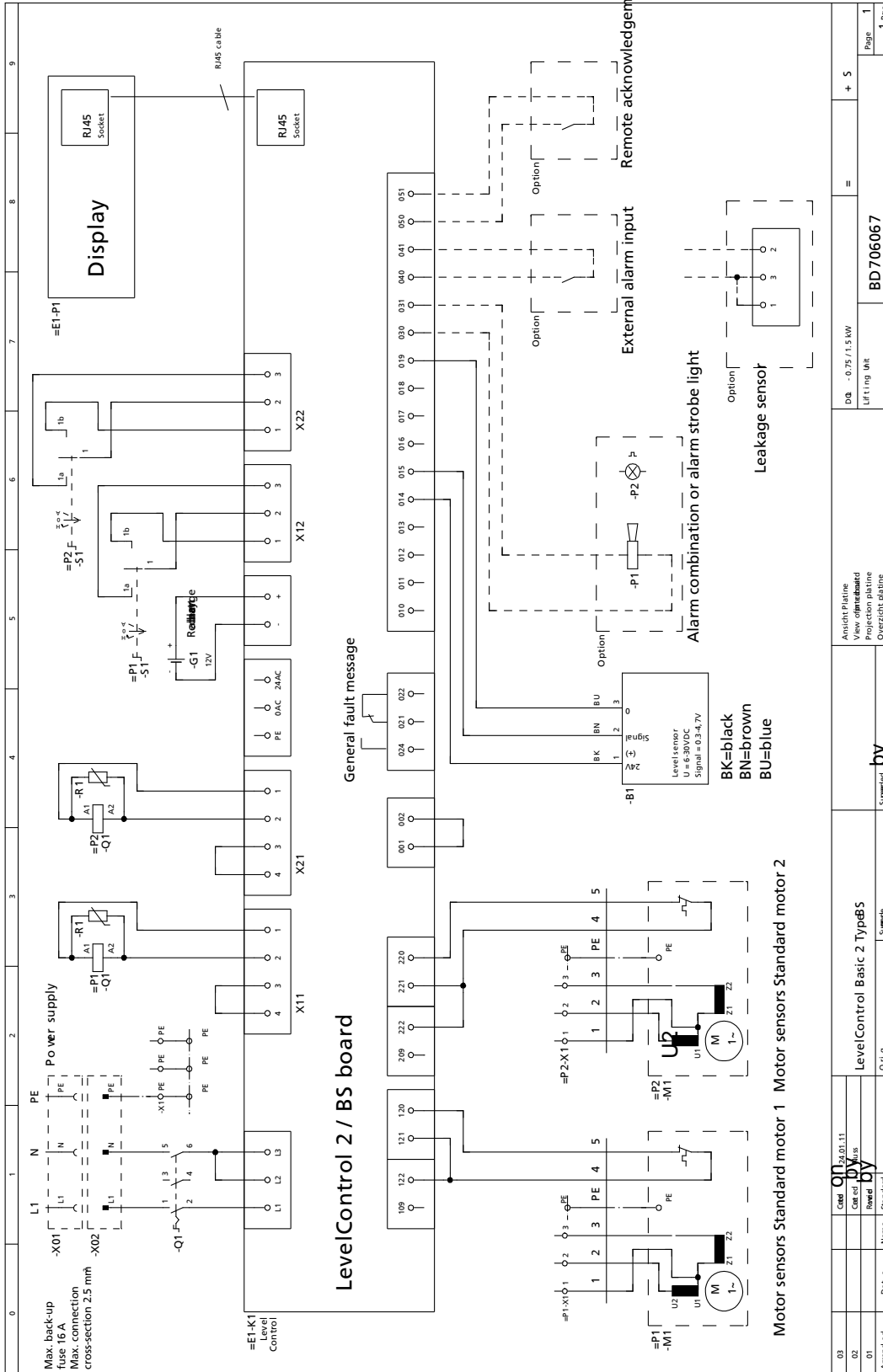
NOTE

Do not use this control unit for mini-Compacta US40.

03	Created	24.01.11	LevelControl Basic 2 Type BC	DOL - 0,75 / 1,5 kW	+ S
02	Created	miss		Lifting unit	
01	Revised	...			
Amended	Date	Name	Standard	Superseded by	Superseded by
				BD706066	

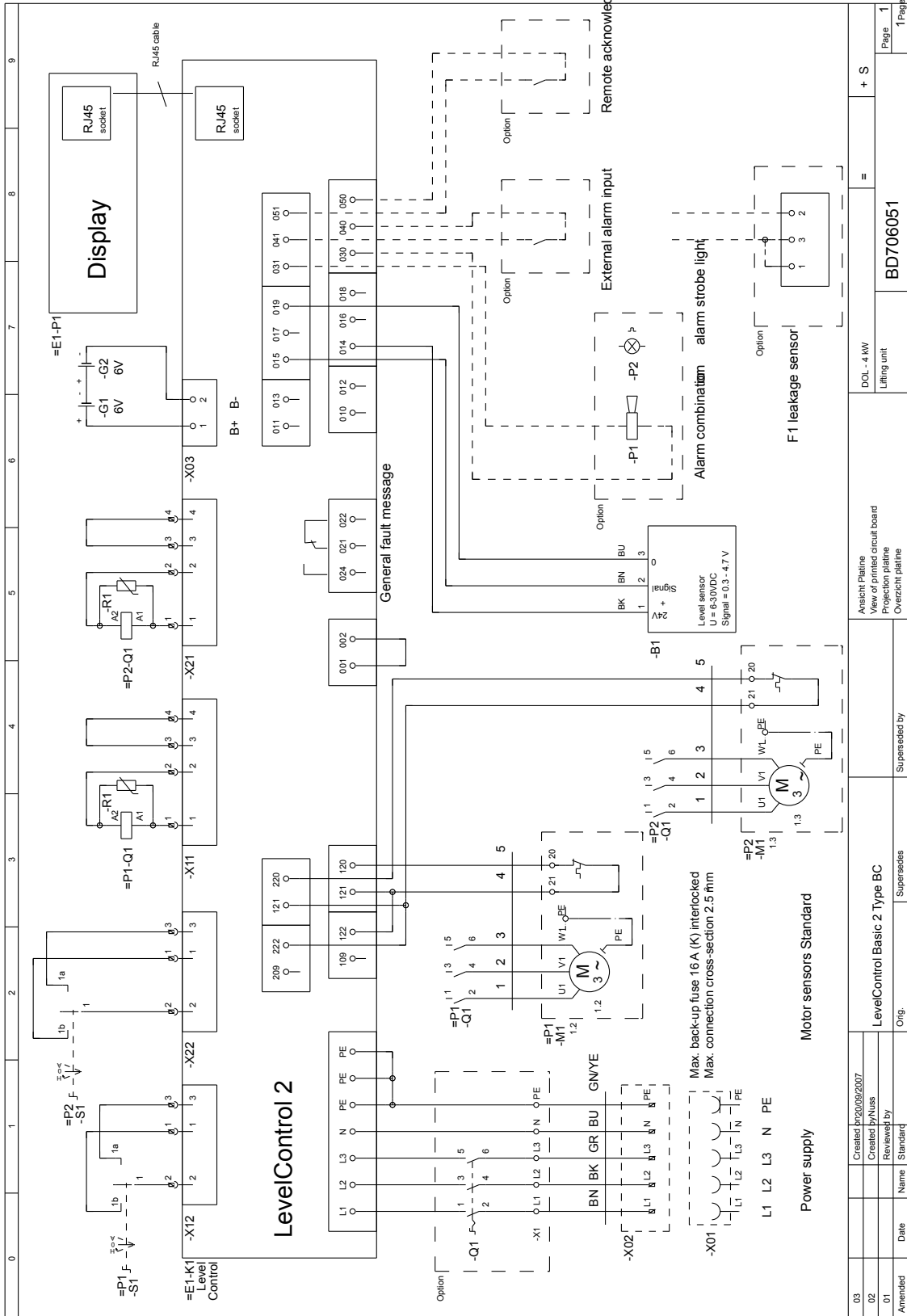
10.6.5 LevelControl Basic 2 Type BS - dual-pump unit with cutter - up to 1.5 kW, 1~

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03	Created	01.11.2017	LevelControl Basic 2 Typ=BS		DB - 0.75 / 1.5 kW		=		+ S	
02	Checked	01.11.2017	LevelControl Basic 2 Typ=BS		Lifting unit		BD706067		Page 1	
01	Revised	01.11.2017	LevelControl Basic 2 Typ=BS		Projection plate				1 Page	
Amended	Date	Name	Standard	Supplied	Summary	by				

10.6.6 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:

mini-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 components⁹⁾: 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

9) Where applicable

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

Number	DoP2317.1-01
For the product	mini-Compacta
(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 5371065-02.
(8) European Technical Assessment	Not relevant

Table 38: (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	≥ 40 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, 1 January 2020



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

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

Number	DoP2317.2-01
For the product	mini-Compacta S
(1) Product type	Sewage lifting unit with cutter 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 5371383-02.
(8) European Technical Assessment	Not relevant

Table 39: (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	Passed	
Minimum cross-section of the discharge-side connection	DN 32	
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, 1 January 2020



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

14 Certificate of Decontamination

Type:

Order number/

Order item number¹⁰⁾:

Delivery date:

Applications:

Fluid handled¹⁰⁾:

Please tick where applicable¹⁰⁾:



Corrosive



Oxidising



Flammable



Explosive



Hazardous to health



Seriously hazardous to health



Toxic



Radioactive



Bio-hazardous



Safe

Reason for return¹⁰⁾:

Comments:

.....

The product/accessories have been carefully drained, cleaned and decontaminated inside and outside prior to dispatch/ placing at your disposal.

We herewith declare that this product is free from hazardous chemicals, biological and radioactive substances.

For mag-drive pumps, the inner rotor unit (impeller, casing cover, bearing ring carrier, plain bearing, inner rotor) has been removed from the pump and cleaned. In cases of containment shroud leakage, the outer rotor, bearing bracket lantern, leakage barrier and bearing bracket or intermediate piece have also been cleaned.

For canned motor pumps, the rotor and plain bearing have been removed from the pump for cleaning. In cases of leakage at the stator can, the stator space has been examined for fluid leakage; if fluid handled has penetrated the stator space, it has been removed.

- No special safety precautions are required for further handling.
- The following safety precautions are required for flushing fluids, fluid residues and disposal:

.....

.....

We confirm that the above data and information are correct and complete and that dispatch is effected in accordance with the relevant legal provisions.

.....
Place, date and signature

.....
Address

.....
Company stamp

10) Required fields

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