

Automatic Waste Water Lifting Unit

Ama-Drainer-Box Mini

Installation/Operating Manual



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Installation/Operating Manual Ama-Drainer-Box Mini

Original operating manual

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Glossary

Backflow

Waste water flowing back from the sewer into the connected drainage piping

Backflow loop

The section of the discharge pipe of a waste water lifting unit that is located above the flood level

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.

Collecting tank

Component of a waste water lifting unit in which the incoming waste water is stored in unpressurised condition prior to automatic lifting.

EN 12050-2

European Standard for waste water lifting units which are used to dispose of faeces-free waste water occurring below the flood level of buildings and sites. It defines general requirements as well as principles of construction and testing.

EN 12056-4

European Standard governing the selection, operation and maintenance of waste water lifting units within buildings and sites.

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

Submersible motor pump

Submersible motor pumps are floodable, close-coupled units which are not self-priming. The pumps are usually operated completely submerged. They may be operated outside the fluid for short periods of time, until the minimum fluid level has been reached.

Swing check valve

Element of a waste water lifting unit which prevents waste water from flowing back from the discharge line into the waste water lifting unit.

Waste water

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

Waste water lifting unit

Device for collecting and automatically lifting faecal-free waste water above the flood level

1 General

1.1 Principles

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

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

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

In the event of damage, immediately contact your nearest KSB Service centre 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 of accessories and integrated machinery components, operating manual of submersible motor pump







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.
 CAUTION	CAUTION This signal word indicates a hazard which, if not avoided, could result in damage to the machine and its functions.
	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.

The safety information in all sections of this manual must be complied with.

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 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 in this operating manual.

2.2 Intended use

- 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.

Prevention of foreseeable misuse

- Never exceed the permissible application and operating limits specified in the data sheet or product literature regarding 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 transport, install, operate, maintain and inspect the equipment this manual refers to.

The responsibilities, competence and supervision of all personnel involved in transport, 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 pump (set) must always be supervised by technical specialist personnel.

This device may be operated by **children** from the age of 8 as well as by persons of limited physical, sensory or mental abilities or lacking experience and knowledge, provided that they are supervised, they have been instructed on how to use this device safely and they understand the hazards it presents. It is impermissible for **children** to play with this device. **Children** must not clean the device or perform any **service work to be carried out by the operator** at the device without supervision.

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 manual and the intended use, the following safety regulations shall be complied with:

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

2.6 Safety instructions for the operator/user

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

2.7 Safety information for maintenance, inspection and installation

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

3 Transport/Temporary 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. ▷ Never suspend the lifting unit by its power cable. ▷ Always prevent the lifting unit from getting knocked or dropped.

3.3 Storage/preservation

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

	CAUTION
	<p>Damage during storage due to frost, humidity, dirt, UV radiation or vermin Corrosion/contamination of the lifting unit!</p> <ul style="list-style-type: none"> ▷ Store the lifting unit in a frost-proof, roofed area.

	CAUTION
	<p>Wet, contaminated or damaged openings and connections Leakage of or damage to the lifting unit!</p> <ul style="list-style-type: none"> ▷ Only remove caps/covers from the openings of the lifting unit at the time of installation.



Store the lifting unit in a dry, protected room where the atmospheric humidity is as constant as possible.

3.4 Return to supplier

1. Prior to returning the product to the supplier, flush and clean it, particularly if it has been used in noxious, explosive, hot or other hazardous fluids.
2. If the product has been used in fluids whose residues could lead to corrosion damage in the presence of atmospheric humidity or could ignite upon contact with oxygen, the product must also be neutralised and treated with anhydrous inert gas to ensure drying.
3. Always complete and enclose a certificate of decontamination when returning the product. (⇒ Section 12, Page 42)
Indicate any safety measures 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 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.

4 Description

4.1 General description

- Automatic waste water lifting unit

Standard design

- Chemically neutral waste water
- Slightly contaminated waste water (up to 50 °C max.)
- Wash water (up to 90 °C max. for short periods $t \leq 3$ minutes)

Variant C for aggressive fluids.

In addition to standard design:

- Swimming pool water
- Brackish water
- Seawater
- Water containing salt
- Aggressive fluids
- Condensate from heat recovery applications

4.2 Designation

Example: Ama-Drainer-Box Mini C

Table 4: Designation key

Code	Description
Ama-Drainer-Box	Type series
Mini	Small waste water lifting unit
C	C variant for aggressive fluids

4.3 Name plate

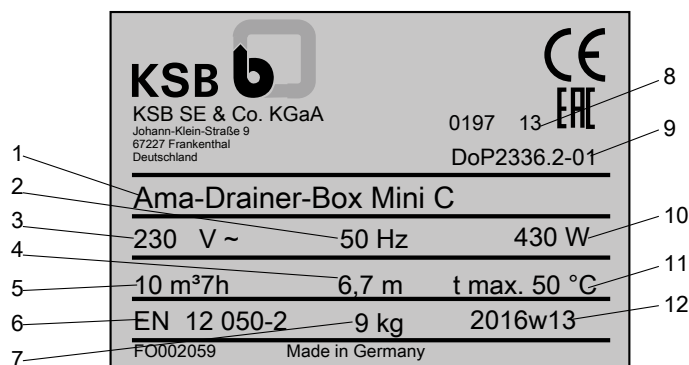


Fig. 1: Name plate (example)

1	Type series, size	2	Rated frequency
3	Rated voltage	4	Maximum head
5	Max. permissible flow rate	6	Principles of construction and testing
7	Total weight	8	Notifying body / year of introduction
9	Reference number of the declaration of performance	10	Rated power
11	Fluid temperature	12	Year of production

The name plate is attached inside the tank.

4.4 Design details

Design

- Tank made of impact-resistant plastic
- Odour-proof cover with activated carbon filter and integrated overflow protection
- Submersible motor pump which starts and stops automatically, with float switch
- Integrated swing check valve
- To EN 12050-2

Installation

- Stationary above-floor installation
- Stationary wall mounting

Drive

- AC motor
- Integrated temperature switch
- Cable and shockproof plug

Impeller type

- Open multi-vane impeller
- Free passage= 10 mm

Connections

- Inlet DN 32 / DN 40 / DN 50
- Discharge-side connection DN 40
- Shower connection DN 50
- Venting via DN 40 spigot and socket connection

4.5 Configuration and function

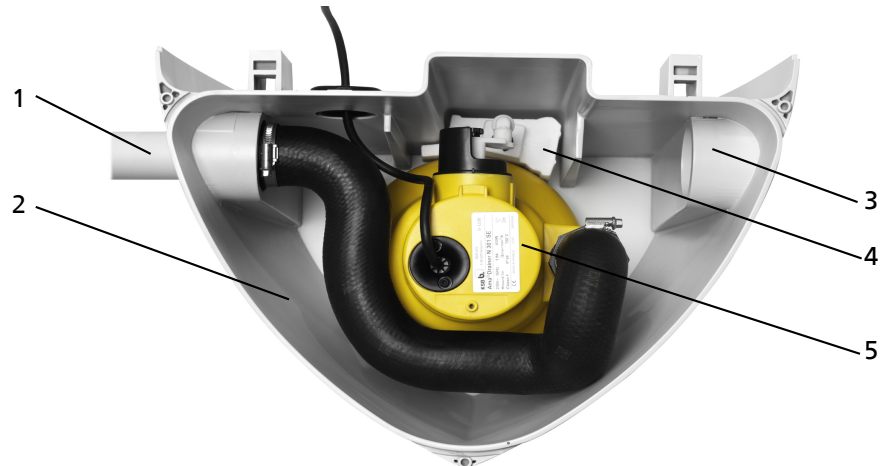


Fig. 2: Description and sectional drawing of the waste water lifting unit

1	Discharge-side connection	4	Float switch
2	Tank	5	Submersible motor pump
3	Inlet		

Design The waste water lifting unit consists of a stable tank (2) with integrated submersible motor pump (5), an inlet-side connection (3) and a discharge-side connection (1).

Function The fluid to be handled flows into the waste water lifting unit through an inlet (3) and is collected in an odour-tight and water-tight plastic tank (2). When a specified fluid level is reached, the float switch (4) triggers the automatic start of the

submersible motor pump (5). The fluid handled is pumped through the discharge-side connection (1) to a level above the flood level and discharged into the public sewer.

4.6 Noise characteristics

Sound pressure level < 70 dB(A)

4.7 Dimensions and weights

For dimensions refer to the outline drawing of the lifting unit.
(⇒ Section 9.3, Page 38)

The total weight of the lifting unit equals 9 kg max.

4.8 Scope of supply

Depending on the design variant the following components are included in the scope of supply¹⁾:

- Tank made of impact-resistant plastic
- Submersible motor pump which starts and stops automatically, with float switch
- Odour-proof cover with activated carbon filter and integrated overflow protection
- Inlet DN 32 / DN 40 / DN 50
- Discharge-side connection DN 40
- Shower connection DN 50

4.9 Accessories






- M1 alarm contactor²⁾
- KSB washing machine interrupter³⁾

Further required accessories can be purchased from our distributors.

1) Supplied fully assembled ex works
2) In combination with one of KSB's alarm switchgears AS 0, AS 2, AS 4 or AS 5 the M1 alarm contactor triggers an alarm if the permissible fluid level in the collecting tank is exceeded.
3) The KSB washing machine interrupter triggers an alarm and stops the washing machine before the collecting tank overflows.

5 Installation at Site





5.1 Safety regulations

	<p style="background-color: #e67e22; color: white; padding: 5px;">⚠ DANGER</p> <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.
	<p style="background-color: #e67e22; color: white; padding: 5px;">⚠ DANGER</p> <p>Electrical connection work by unqualified personnel Danger of death from 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.
	<p style="background-color: #e67e22; color: white; padding: 5px;">⚠ DANGER</p> <p>Unsuitable electrical installation Danger to life!</p> <ul style="list-style-type: none"> ▷ Make sure the electrical installation meets the VDE 0100 installation rules (i.e. sockets with earthing terminals). ▷ Make sure the electric mains is equipped with a residual current device of maximum 30 mA. ▷ Always have the electrical connections installed by a trained and qualified electrician.
	<p style="background-color: #e67e22; color: white; padding: 5px;">⚠ DANGER</p> <p>Improper use Danger of death from electric shock!</p> <ul style="list-style-type: none"> ▷ Any extension cords must match the quality of the power cable supplied with the pump. ▷ Do not expose electrical connections or devices to moisture.
	<p style="background-color: #2980b9; color: white; padding: 5px;">NOTE</p> <p>If the supply of mains voltage is interrupted or the submersible motor pump is defective, there is a risk of flooding damage. Prevent damage by using a mains-independent alarm switchgear or a KSB washing machine interrupter.</p>

5.2 Checks to be carried out prior to installation

Before installing the lifting unit make sure that the following requirements are met:

- Check the data on the name plate of the lifting unit to make sure it can be operated on the available mains.
- The fluid to be handled matches the description of suitable fluids.
- The above safety instructions have been complied with.
- The place of installation is frost-proof.

	NOTE
	Observe the provisions of EN 12056 "Gravity Drainage Systems in Buildings" when installing the unit at site.
	NOTE
	Lifting units in an odour-proof enclosure should be vented via the roof.
	NOTE
	Other operating manuals that describe components of this lifting unit must also be observed. Any transport locks that might have been provided have to be removed prior to assembly and installation.
	NOTE
	Lifting units should not be installed next to sleeping or living quarters.

5.3 Installing the lifting unit

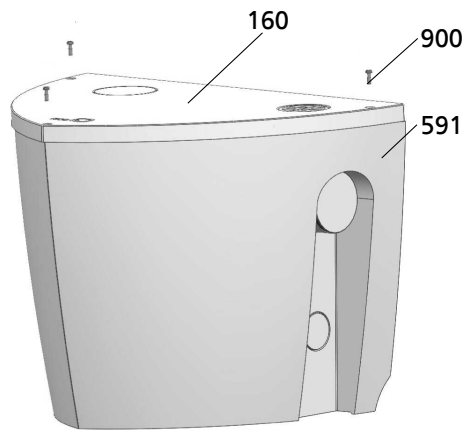


Fig. 3: Installing the waste water lifting unit

160	Cover	591	Collecting tank
900	Screw (with captive fastener)		

5.3.1 Mounting the system on a level floor

1. Undo 3 screws 900 with a suitable tool and take off cover 160.
2. Remove the parts located in tank 591 and keep them in a safe place.
3. Use adhesive tape to stick the 3 supplied rubber buffers 595.01 (Ø 10x4) into the recesses provided at the bottom of tank 591.
4. Place tank 591 on a level floor and align with the help of a spirit level.

5.3.2 Mounting the system on the wall

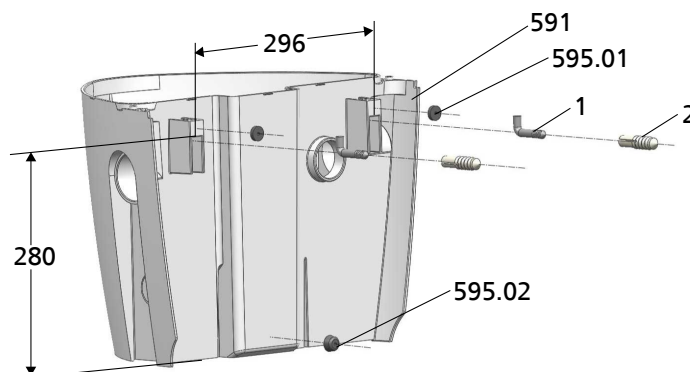


Fig. 4: Wall mounting, dimensions in [mm]

1. Undo 3 screws 900 with a suitable tool and take off cover 160.
2. Remove the parts located in tank 591 and keep them in a safe place.
3. Observe the information given on the drilling template⁴⁾.
4. Use the drilling template and a spirit level to mark and drill the holes for fastening the collecting tank.
Leave a clearance of approximately 80 to 90 mm between the waste water lifting unit and the tank floor.
5. Insert two commercial plug fixings (2) and screw in J-bolts (1).
6. Use the self-adhesive foil to stick the rubber buffers 595.01/02 included in the scope of supply to the back of the tank 591 (see illustration below).
7. Attach tank 591 to the J-bolts.

4) Included in the scope of supply

5.4 Connecting the piping

	<p style="background-color: #FFD700; padding: 5px;">CAUTION</p> <p>Stresses and strains at the piping Impermissible load acting on the collecting tank!</p> <ul style="list-style-type: none"> ▷ Connect the piping without transmitting any stresses or strains; make sure that no forces and moments act on the collecting tank. ▷ Protect the piping against frost.
	<p style="background-color: #0070C0; color: white; padding: 5px;">NOTE</p> <p>All connections are suitable for standardised pipe dimensions. The connections are pressure-sealed and flexible.</p> <p>If the waste water lifting unit is located below the flood level, the discharge line must be laid with a backflow loop (180° bend) above the flood level.</p> <p>If flooding above the flood level could occur, we recommend installing a gate valve in close proximity to the system.</p>

5.4.1 Connecting the inlet and discharge line

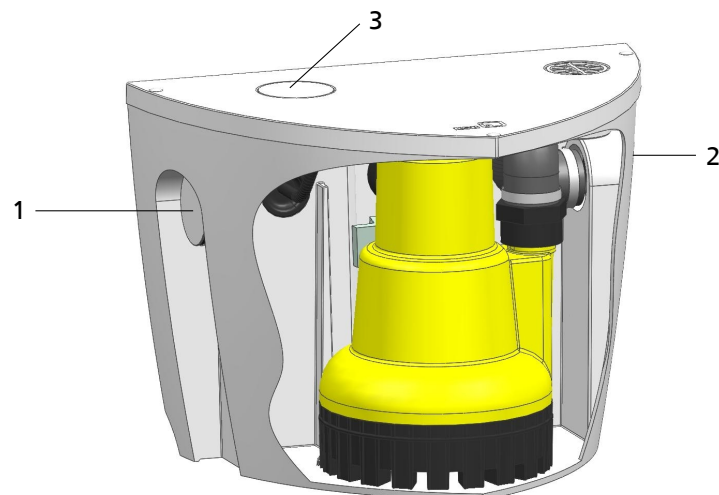


Fig. 5: Connecting the inlet and discharge line

1 + 2	Socket DN 50, horizontal either for inlet line with fitting DN 32 / DN 40 / DN 50 or for discharge outlet with fitting DN 40
3	Socket DN 50, vertical either for inlet line with fitting DN 32 / DN 40 / DN 50 or for connecting a washing machine (via Y-drain)

Connecting the inlet line

- ✓ The cover has been removed.
 - ✓ The collecting tank has been installed properly.
 - ✓ Piping weights have been supported at the site.
1. Select fitting 720.2/3/4 for the corresponding diameter of the pipe.
 2. Press the fitting into the socket (1, 2 or 3) provided for the inlet. Use a lubricant.
 3. Insert the inlet line into the collecting tank through the fitting. The pipe end has to protrude into the collecting tank by approximately 30 mm.

Connecting the discharge line

- ✓ The cover has been removed.
 - ✓ The collecting tank has been installed properly.
 - ✓ Piping weights have been supported at the site.
1. Press fitting 720.3 into the socket (1 or 2) provided for the discharge line. Use a lubricant.
 2. Insert the discharge line into the collecting tank through the fitting. The pipe end has to protrude into the collecting tank by approximately 35 mm.
 3. Close the unrequired socket with fitting 720.2 and plug 916.2.

5.4.2 Connecting auxiliary connections

Connection to a shower

	CAUTION
	<p>Backflow into the shower basin or bathtub The water is not completely drained!</p> <ul style="list-style-type: none"> ▷ Observe the minimum installation height for shower basins and bathtubs (gradient of 1:50 from the shower basin to the inlet of the lifting unit). (⇒ Section 9.4, Page 39)

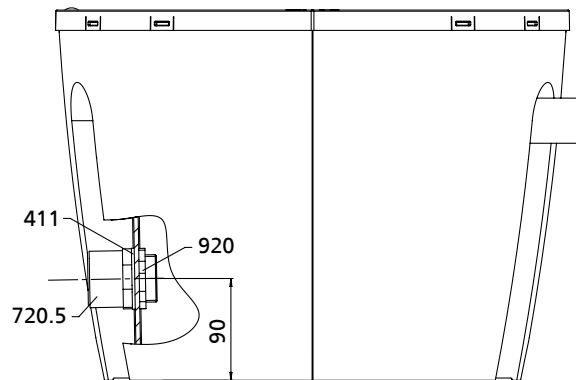


Fig. 6: Shower connection, dimensions [mm]

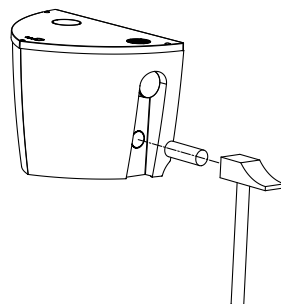



Fig. 7: Opening the shower connection

1. Open the perforated part of the side wall of the collecting tank and debur the hole using suitable tools.
2. Insert fitting 720.5 with joint ring 411 into the hole and fasten it from the inside with nut 920.

Connecting the vent line

	NOTE
	<p>Venting is effected directly into the room the waste water lifting unit is installed in by means of the integrated activated charcoal filter.</p> <p>If the waste water lifting unit is installed in rooms with high hygienic demands (e.g. medical practices) or if unpleasant odours are to be expected (e.g. when pumping waste water with dairy products from a kitchenette for tea/coffee), we recommend venting the waste water lifting unit through the roof.</p>

1. Remove complete vent filter 673 with overflow protection from the collecting tank.
2. Insert the vent line (max. 40 mm outside diameter) into cover 160 by means of a commercial self-sealing DN 40/50 spigot and socket connection. Use a lubricant.

5.5 Installing the pump set

5.5.1 Connecting the flexible discharge tube

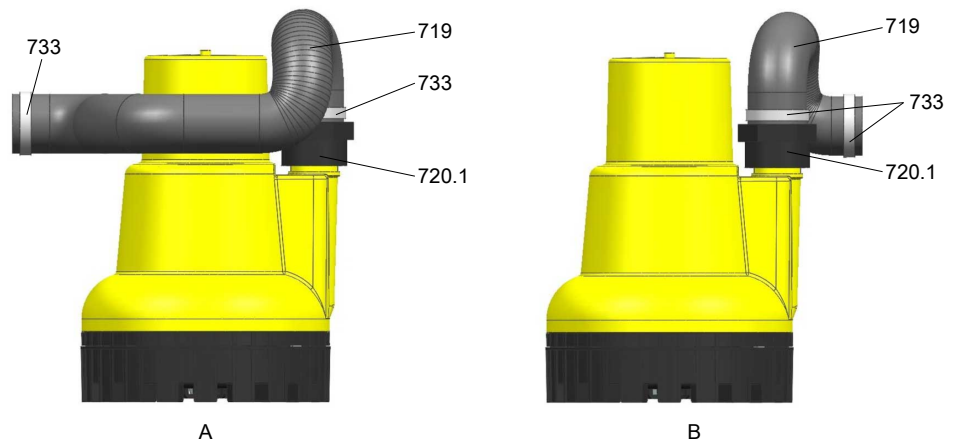


Fig. 8: Discharge outlet on the left and on the right

A	Discharge outlet on the left	B	Discharge outlet on the right
719	Flexible tube	720.1	Fitting
733	Pipe clamp		

Shortening the flexible discharge tube

	DANGER
	<p>Sharp-edged tool Risk of injury!</p> <ul style="list-style-type: none"> ▷ Work cautiously and carefully. ▷ Wear work gloves.

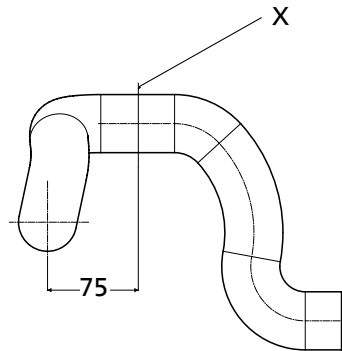


Fig. 9: Flexible discharge tube for discharge outlet on the right, dimension [mm]

X	Line for shortening flexible tube 719 if used for discharge outlet on the right
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5.5.2 Fitting and setting the float switch / automatic switchgear

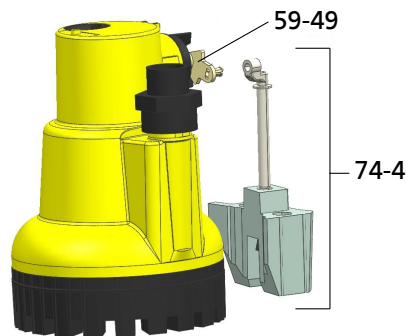


Fig. 10: Fitting the float switch

1. Insert float 74-4 in element 59-49 until it is engaged.

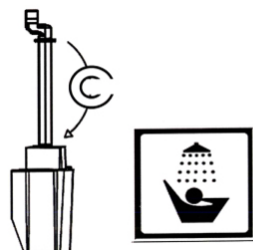


Fig. 11: Setting the float switch for connection to a shower

1. Position circlip 932 in the correct groove via the guide of float 74-4.
 - ⇒ The closer the circlip is to the float, the earlier the pump set is started. (⇒ Section 7.4.1, Page 33)

5.5.3 Installing the pump set

Preparing the cable entry

- ✓ Wall-mounted models: The tank has been removed from the J-bolts.
 1. Press fitted plug 916.1 out of the cable socket.
 2. Guide the power cable with the plug out through the opening in the back of the tank.

3. Keep the cable length inside the tank as short as possible.
4. Slide slit plug over the electric cable using lubricant and press it from outside into the cable socket of the tank. Slit must be pointing upwards.
5. Loop the cable and fasten it to the back of the tank using self-adhesive cable support 81-73.

Installing the pump set

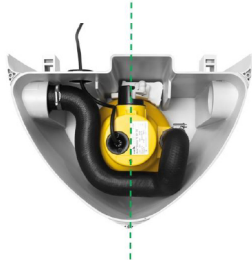


Fig. 12: Correct pump set alignment

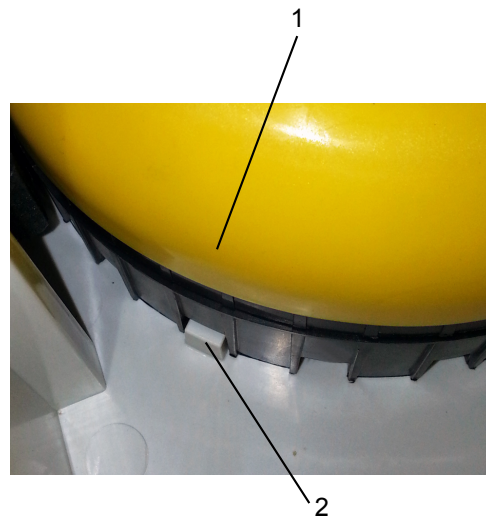


Fig. 13: Pump set engaged in the locking devices

- ✓ The float switch has been fitted.
 - ✓ The cable entry has been prepared.
1. Insert the pump set (1) with assembled flexible discharge tube in the pump locking devices (2) of the tank.
 2. Align the pump set until it is engaged.
The pump set must not be in offset position.
The float must be freely accessible.

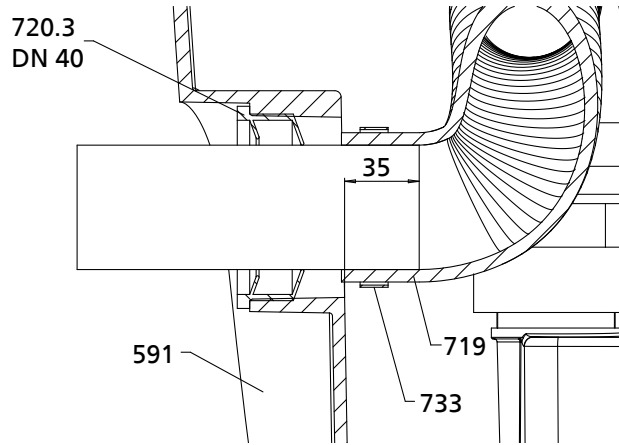


Fig. 14: Connecting the flexible tube, dimensions [mm]

591	Tank	719	Flexible tube
720.3	Fitting	733	Pipe clamp

3. Connect the flexible tube to the discharge line on the required side.

5.5.3.1 Fitting the cover

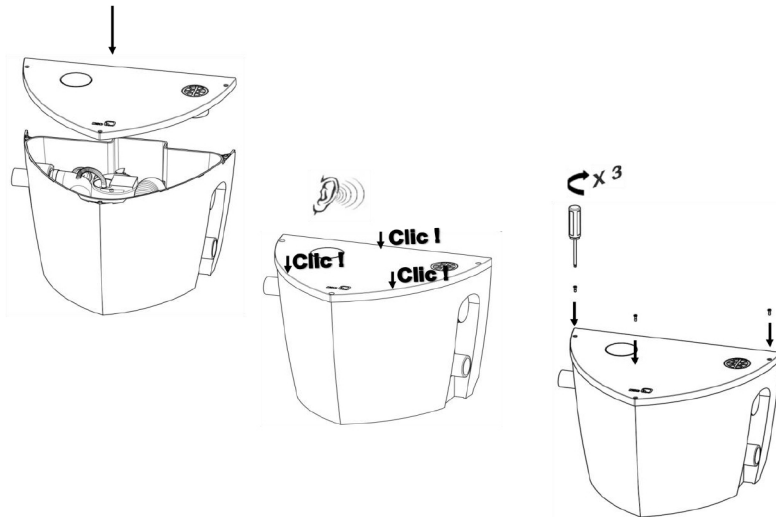



Fig. 15: Fitting the cover

- ✓ The pump set has been engaged in the locking devices without any stresses and strains.
 - ✓ The float switch can move freely.
 - ✓ The flexible tube connections have been fitted pressure-tight.
1. Glue pad 592 to the centre dome⁵⁾ on the inside of the cover.
 2. Check that O-ring 412.01 has been fitted correctly in the cover. Re-adjust it if required.
 3. Position and press the cover onto the tank until you can hear the snap-fit connection.
Perform this step on all three sides.
 4. Tighten 3 screws 900 hand-tight (max. tightening torque: 2 Nm).

5.6 Electrical connection

	<p>⚠ DANGER</p>
	<p>Electrical connection work by unqualified personnel Danger of death from 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.
	<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.

5) Injection-moulded sleeve.

	CAUTION
	<p>Improper routing of power supply cables Damage to the power supply cable!</p> <ul style="list-style-type: none">▷ Never move the power supply cable at temperatures below -25 °C.▷ Never kink or crush the power supply cable.

1. Plug the pump into the mains socket.

6 Commissioning/Start-up/Shutdown

6.1 Commissioning/Start-up

6.1.1 Prerequisites for commissioning/start-up

Before commissioning/starting up the pump set, make sure that the following conditions are met:

- The pump set has been properly connected to the power supply and is equipped with all protection devices. (⇒ Section 5.6, Page 25)
- Any safety regulations have been observed. (⇒ Section 2, Page 8)
- The operating data has been verified.
- VDE standards and regulations applicable in the country of use are complied with.
- A functional test has been performed.
- All connections and pipes have been checked for tightness and re-sealed, if required.
- The operating manual of the pump set has been taken into account.

6.1.2 Start-up

	NOTE
Fill and drain the lifting unit several times to check and re-adjust the switching points. (⇒ Section 7.4.1, Page 33)	

The pump set's automatic switchgear will start up the pump set when the float reaches level A.

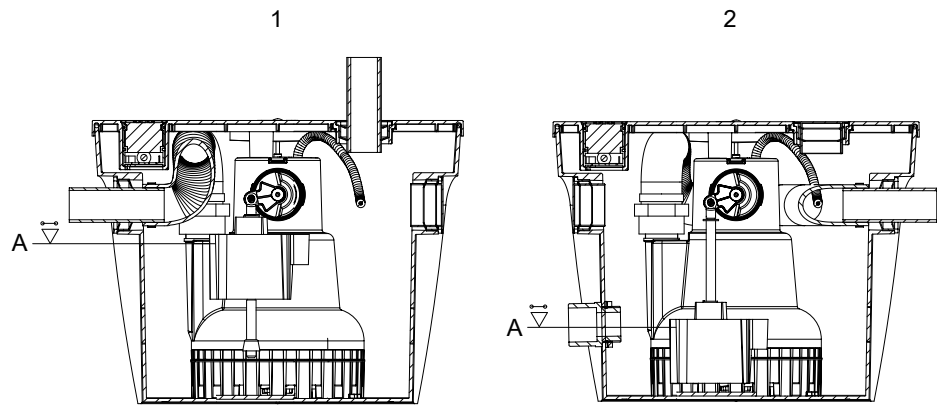



Fig. 16: Switching point A

1	Standard design	2	Connection to a shower
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6.2 Operating limits

	CAUTION
	<p>Unsuitable fluids Damage to the pump!</p> <ul style="list-style-type: none"> ▷ Never use the pump to handle corrosive, combustible or explosive fluids. ▷ Never use the pump to transport waste water from toilets and urinal systems or abrasive fluids. ▷ Never use the pump to handle waste water containing grease. ▷ Do not use the pump for foodstuff applications.

6.2.1 Free passage

The max. free passage is 10 mm.

6.2.2 Fluid handled

6.2.2.1 Permissible fluids to be handled

Standard design

- Chemically neutral waste water
- Slightly contaminated waste water (up to 50 °C max.)
- Wash water (up to 90 °C max. for short periods $t \leq 3$ minutes)

Variant C for aggressive fluids.

In addition to standard design:

- Swimming pool water
- Brackish water
- Seawater
- Water containing salt
- Aggressive fluids
- Condensate from heat recovery applications

6.2.2.2 Head

Table 5: Permissible head

Permissible head	Value
Maximum	6,7 m

6.2.2.3 Flow rate

Table 6: Permissible flow rate

Permissible flow rate	Value
Maximum	10,0 m ³ /h

6.2.2.4 Fluid temperature



Table 7: Temperature limits of the fluid handled



Fluid handled	Fluid temperature
Slightly contaminated waste water	50 °C max. ⁶⁾

6) Up to a maximum of 3 minutes for waste water from the hot water cycle of washing machines and dishwashers for non-industrial use

6.3 Shutdown/storage/preservation

6.3.1 Measures to be taken for shutdown


	 WARNING
	<p>Unintentional start-up of the waste water lifting unit Risk of injury by moving parts!</p> <ul style="list-style-type: none"> ▷ Only carry out work on the waste water lifting unit after the electrical connections have been disconnected. ▷ Make sure that the waste water lifting unit cannot be started up unintentionally.

	 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.

1. Disconnect the lifting unit from the power supply and secure it against unintentional start-up.
2. Remove the lifting unit as per operating instructions.
3. Flush the lifting unit as per operating instructions.
4. Leave the lifting unit to dry.

Special preservation measures are not required.

6.3.2 Shutdown

	NOTE
	<p>Fill and drain the lifting unit several times to check and re-adjust the switching points. (⇒ Section 7.4.1, Page 33)</p>

The pump set's automatic switchgear will stop the pump set when the float reaches level B.

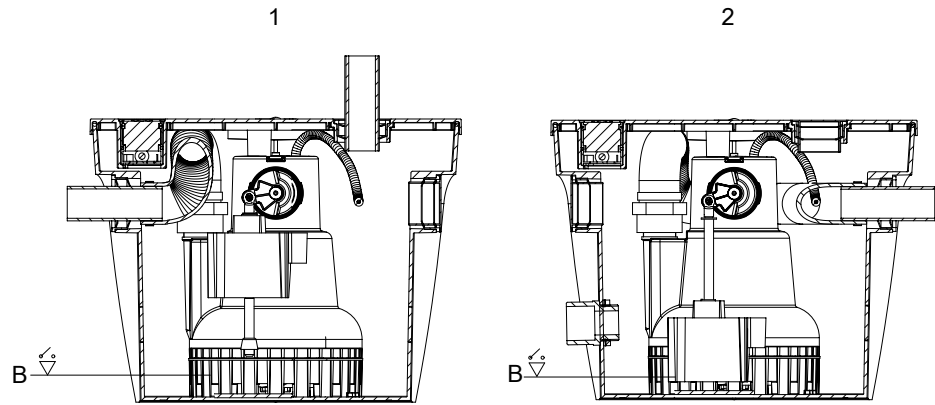


Fig. 17: Switching point B

1	Standard design	2	Connection to a shower
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Pull the mains plug to fully shut down the waste water lifting unit.

6.4 Returning to service

For returning the equipment to service, observe the sections on commissioning/start-up (⇒ Section 6.1, Page 27) and the operating limits. (⇒ Section 6.2, Page 28)

In addition, carry out all servicing/maintenance operations before returning the waste water lifting unit to service (⇒ Section 7, Page 31).

7 Servicing/Maintenance

7.1 Safety regulations

	<p>⚠ DANGER</p> <p>Power supply not disconnected Danger to life!</p> <ul style="list-style-type: none"> ▶ Pull the mains plug or disconnect all electrical connections and secure against unintentional start-up.
	<p>⚠ DANGER</p> <p>Work on the lifting unit by unqualified personnel Danger of death from electric shock!</p> <ul style="list-style-type: none"> ▶ Have system components modified and dismantled by authorised personnel only.
	<p>⚠ WARNING</p> <p>Insufficient stability Risk of crushing hands and feet!</p> <ul style="list-style-type: none"> ▶ During assembly/dismantling, secure the pump (set)/pump parts to prevent tilting or tipping over.

7.2 Maintenance/inspection

The lifting unit is practically maintenance-free.

The operating reliability will be improved if proper functioning of the waste water lifting unit is checked and verified at regular intervals. (EN 12056-4).
 Check the inside of the waste water lifting unit for any deposits, especially in the area of the float. Clean it if required.

Replacing carbon filter insert 673

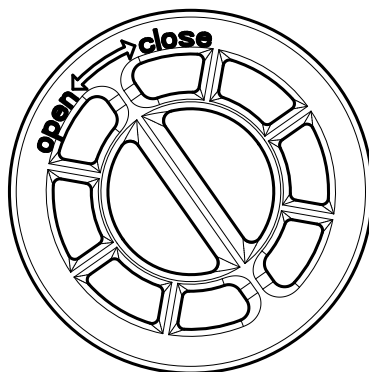


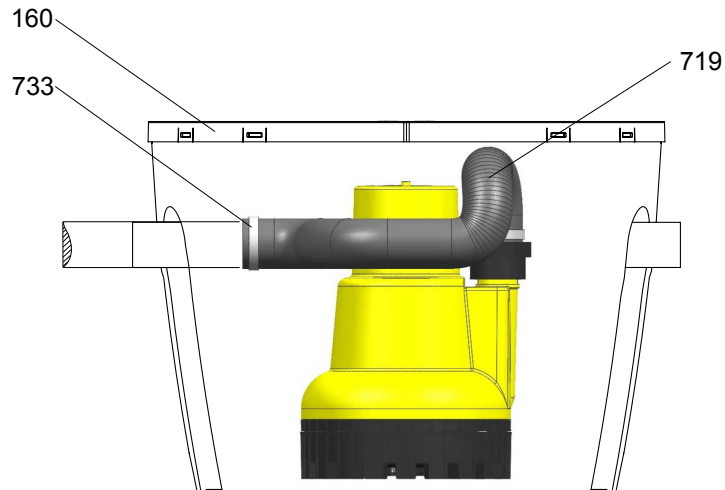
Fig. 18: Replacing the filter insert

Replace the filter element every two years as a minimum – or sooner if odour is detected.
 The bayonet fitting makes replacing the filter insert fast and easy.

	<p>NOTE</p> <p>All maintenance work, service work and installation work can be carried out by KSB Service or authorised workshops. For contact details please refer to the enclosed "Addresses" booklet or visit "www.ksb.com/contact" on the Internet.</p>
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7.3 Drainage/cleaning

	⚠ 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.


Fig. 19: Draining/cleaning the waste water lifting unit

1. Remove the inlet line from the waste water lifting unit.
2. Undo 3 screws 900 with a suitable tool and take off cover 160.
3. Undo and store pipe clamp 733 at the discharge line connection.
 - ⇒ The fluid handled inside the discharge line will flow back into the tank.
4. Pull flexible tube 719 off the discharge line.
5. Lift the pump set out of the tank.
 - ⇒ The pump set will be automatically drained when it is taken out of the fluid handled.
6. Always flush the waste water lifting unit if it has been used for handling noxious, hot or other hazardous fluids.
Always flush and clean the waste water lifting unit before transporting it to the workshop.

7.4 Replacing the pump set

	NOTE
	<p>Ama-Drainer-Box Mini C cannot be fitted with an Ama-Drainer N 301 SE/NE/C series pump. A special pump set from KSB's spare parts programme is required as a replacement.</p>

Installation instructions for an Ama-Drainer N 301 SE series pump.

- ✓ The waste water lifting unit has been disconnected from the mains.
1. Undo 3 screws 900 with a suitable tool and take off cover 160.
 2. Remove the pump set from tank 591 and remove float switch 81-45.

3. Remove and store the handle of the series pump.⁷⁾
4. Replace fitting 720.01 with the connection socket of the series pump. Make sure that swing check valve 747 is installed correctly.
5. Remove the plastic socket with O-ring from automatic switchgear 79-1.1 of the series pump.
6. Fit float switch 81-45.
 - ⇒ Fit element 59-49 with O-ring 412.03 on the shaft of the automatic switchgear.
 - ⇒ Attach float 74-4 to the element.
 - ⇒ Fit and tighten nut 920.02 hand-tight.
7. Set the automatic switchgear as required. (⇒ Section 7.4.1, Page 33)
8. Install the series pump. (⇒ Section 5.5.3, Page 22)

7.4.1 Setting the levels of the automatic switchgear

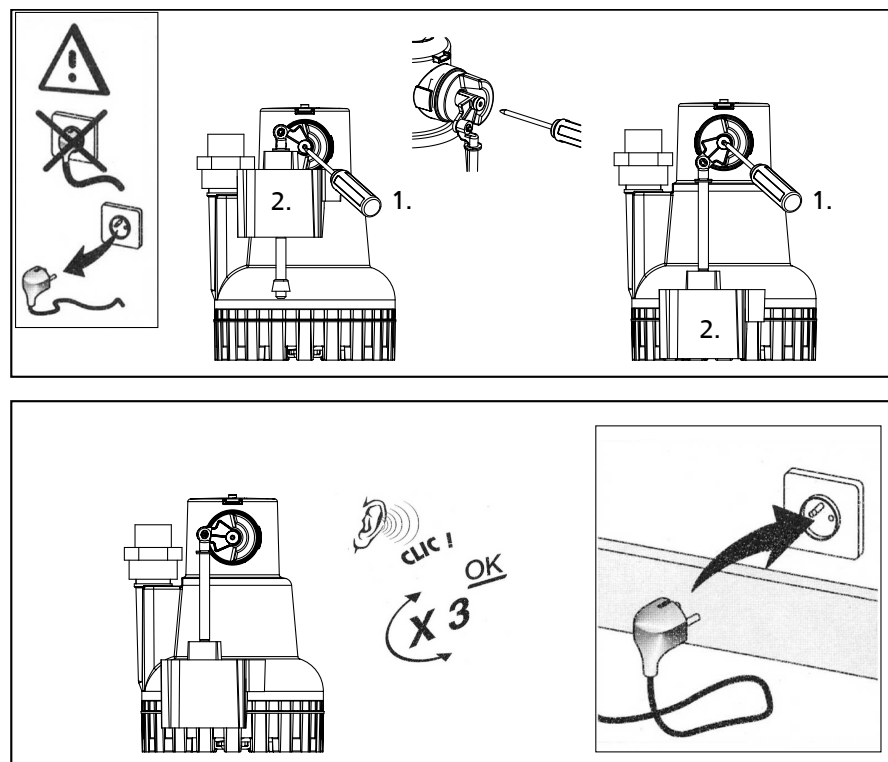


Fig. 20: Setting the levels of the automatic switchgear

- ✓ The waste water lifting unit has been disconnected from the mains.
1. Fasten the guide of the float with a suitable tool (e.g. screwdriver). Do not twist the guide.
 2. Move the float up or down to adjust it to the required cut-in level.
 3. Remove the tool.
 4. Check the cut-in level by moving the float up and down. You should be able to hear a clicking sound each time the float is lifted up to the cut-in level.
 5. Electrical connection of the waste water lifting unit (⇒ Section 5.6, Page 25)

7) The name plate of the series pump is located on the pump handle.

Switching points

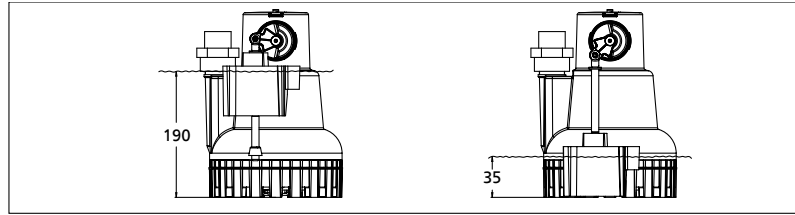


Fig. 21: Switching points standard design

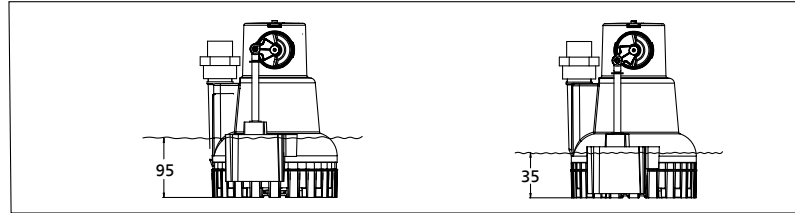


Fig. 22: Switching points for connection to a shower



Table 8: Limits of the switching points

Design	Cut-out level	Cut-in level
	[mm]	[mm]
Standard design	~ 35	~ 190
Connection to a shower	~ 35	~ 95

7.5 Recommended spare parts stock

It is not necessary to keep spare parts on stock.

8 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 operating manual and/or in the product literature provided by the accessories manufacturer.</p>
	<p>NOTE</p>
	<p>Before performing any work on the pump's internal parts during the warranty period please always consult the manufacturer. Our after-sales service will be at your disposal. Non-compliance will lead to forfeiture of any and all rights to claims for damages.</p>

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

Table 9: Trouble-shooting

Fault/malfunction	Possible cause	Remedy ⁸⁾
Pump is running, but does not or hardly deliver.	The hydraulic system is clogged by foreign matter.	Clean the hydraulic system with a water jet. (⇒ Section 6.3, Page 29)
	Clogged discharge line	Clean the discharge line.
	The lift check valve has been fitted for the opposite direction of flow or is defective or clogged.	Fit the lift check valve for the correct direction of flow. Clean the lift check valve.
The pump is not running or only for a short time.	The thermal motor protection device triggers because:	
	1) Pump overheating	Check the fluid temperature.
	2) Pump running dry	Verify the minimum fluid level. Check that the float functions properly.
	3) Impeller blocked	Clean the pump chamber.
	The power supply is interrupted	Check the electrical installation.
	The float has become loose or contaminated.	Fasten the float properly and/or clean it.

8) Release pump set pressure before attempting to remedy faults on parts which are subjected to pressure. Disconnect the pump set from the power supply and let it cool down.

9 Related Documents

9.1 Exploded view and list of components

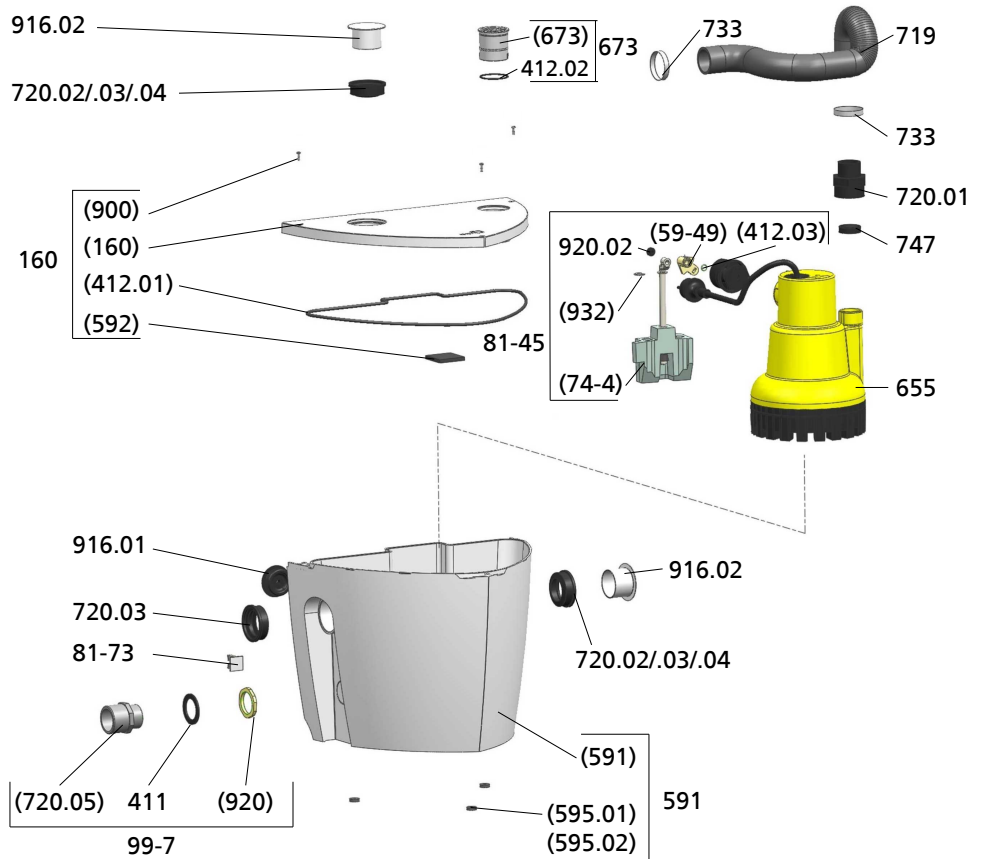


Fig. 23: Exploded view

Table 10: List of components

Part No.	Comprising	Description
160	160	Cover
	412.01	O-ring
	592	Pad
	900	Screw/bolt
591	591	Tank
	595.01	Rubber buffer Ø 10x4
	595.02	Rubber buffer 20,6x13,2
	81-67	Adhesive tape
	81-73	Cable support
655	655	Pump
	747	Swing check valve
	81-45	Float switch
673	673	Vent filter
	412.02	O-ring
719	719	Flexible tube
720.01	720.01	Fitting
733	733	Pipe clamp
747	747	Swing check valve
81-45	81-45	Float switch
	412.03	O-ring
	59-49	Segment

Part No.	Comprising	Description
81-45	74-4	Float
	79-1.1	Automatic switchgear
	920.02	Nut
	932	Circlip
99-20	99-20	Repair kit
	720.02	Fitting DN 50
	720.03	Fitting DN 40
	720.04	Fitting DN 32
	916.01	Cable grommet
	916.02	Cable grommet
99-7	99-7	Installation kit
	411	Joint ring
	720.05	Fitting
	920	Nut
99-9	99-9	Set of sealing elements
	411	Joint ring
	412.01	O-ring
	412.02	O-ring

9.2 Connections



Fig. 24: Connections

Table 11: Overview of connections

Item	Connection	Description
1+2	Inlet / discharge outlet	Socket DN 50, horizontal either for inlet line with fitting DN 32 / DN 40 / DN 50 or for discharge outlet with fitting DN 40
3	Inlet	Socket DN 50, vertical either for inlet line with fitting DN 32 / DN 40 / DN 50 or for connecting a washing machine (via Y-drain)
Auxiliary connections		
4	Cable entry	Cable grommet (Ø 48 mm)
5+6	Connection to a shower	Fitting (outside diameter 50 mm), either on the right or on the left
7	Vent	Carbon filter insert with overflow protection

9.3 Dimensions

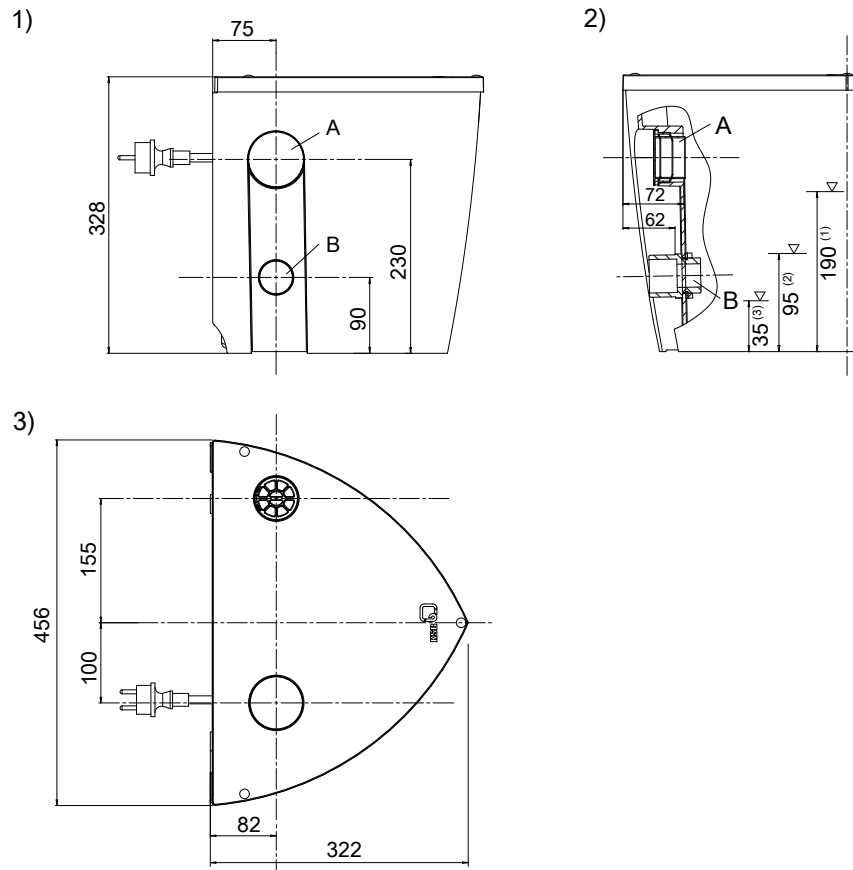


Fig. 25: Dimensions [mm]

1)	Cut-in level (standard design)
2)	Cut-in level (shower connection)
3)	Cut-out level (standard design and shower connection)
A	Inlet / discharge outlet
B	Connection to a shower

9.4 Installation example

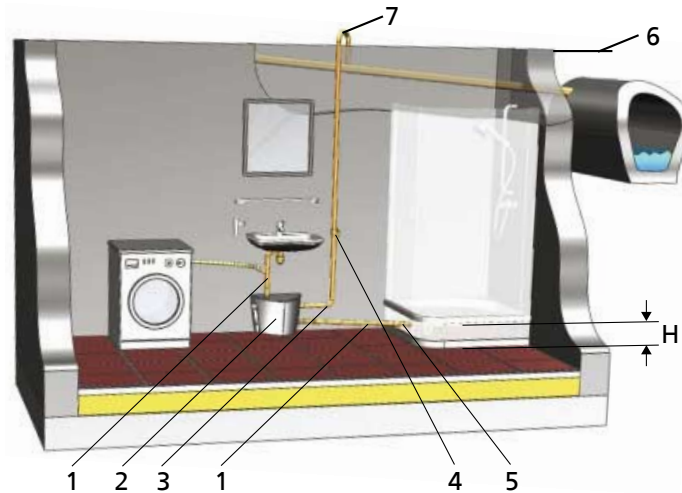


Fig. 26: Installation example

1	Inlet line	2	Waste water lifting unit
3	Discharge line	4	Socket gate valve
5	Valve preventing backflow into the shower basin	6	Flood level
7	Backflow loop	H	Height of backflow loop ⁹⁾

9) Minimum 150 mm

10 EU Declaration of Conformity

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

The manufacturer herewith declares that the product:

Ama-Drainer-Box Mini

Serial number: 2016w16 to 2018w49

- is in conformity with the provisions of the following Directives as amended from time to time:
 - EC Machinery Directive 2006/42/EC
 - Pump set: Electromagnetic Compatibility Directive 2014/30/EU
 - Construction Products Directive 89/106/EEC

The manufacturer also declares that

- the following harmonised international standards have been applied:
 - ISO 12100,
 - EN 809/A1,
 - EN 60034-1, EN 60034-5/A1,
 - EN 60335-1/A1, EN 60335-2-41/A1,
 - EN 12050-2

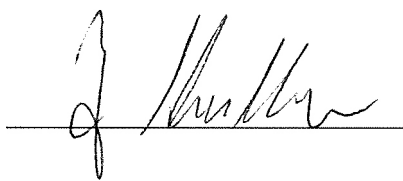
Certified by TÜV Rheinland LGA Products GmbH (0197)

Person authorised to compile the technical file:

Hugues Roland
Head of Design/Engineering
KSB S.A.S.
128, rue Carnot,
59320 Sequedin (France)

The EU Declaration of Conformity was issued in/on:

Frankenthal, 2 January 2018



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

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


No.	DoP2336.2-01
For the product	Ama-Drainer-Box Mini
(1) Product type	Waste water lifting units for waste water without faeces to EN 12050-2
(2) Serial number	See name plate
(3) Intended use	For collecting and automatically lifting waste water 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 7312259-01.
(8) European Technical Assessment	Not relevant

Table 12: (9) Declared performance

Essential characteristics	Performance	Harmonised technical specification
Effectiveness		EN 12050-2:2001
Handling of solids	Passed	
Pipe connections	Passed	
Ventilation	Passed	
Minimum flow velocity	≥ 0,7 m/s	
Minimum cross-section of the system	≥ 10 mm	
Minimum cross-section of the discharge-side connection	DN 32	
Fastening elements	Passed	
Electrical equipment enclosures		
Motor	IP68	
Corrosion resistance of materials	Passed	
Hydraulic and electric characteristic values	Passed	
Water-tight	Passed	
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 February 2018



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

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