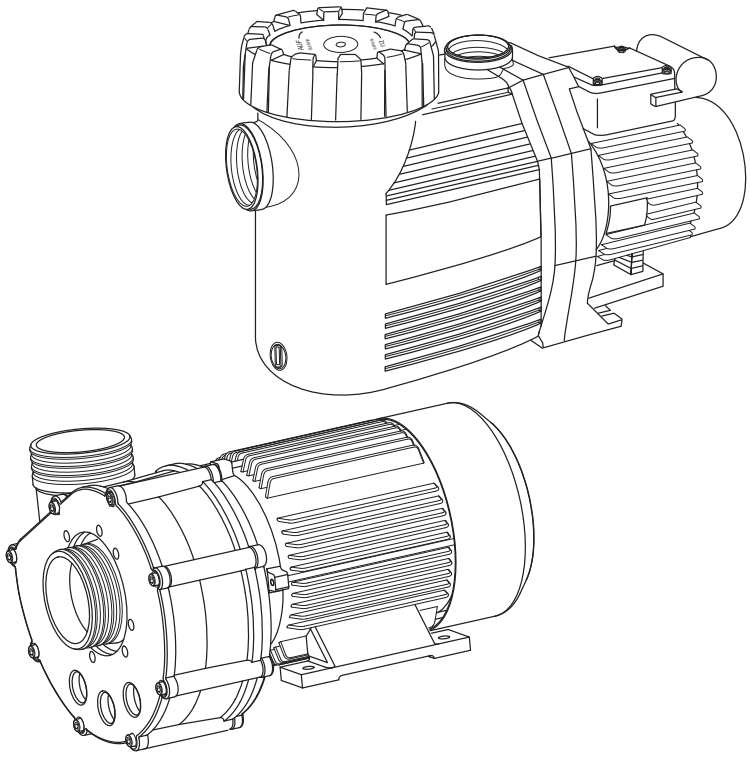
BADU®

EN

EN **Translation of original operation manual**

Non self-priming and self-priming pumps with/without plastic lantern construction (AK)



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SPECK pumpen

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Subject to technical modifications!

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1 About this document

1.1 Using this manual

This manual is a component of the pump/unit. The pump/unit was manufactured and tested according to the generally accepted rules of technology. However, if the pump/unit is used incorrectly, not serviced enough or tampered with, danger to life and limb or material damage could result.

➔ Read the manual carefully before use.

➔ Keep the manual during the service life of the product.

➔ Provide access to the manual for operating and service personnel at all times.

➔ Pass the manual on to any future owners or operators of the product.

1.2 Other applicable documents

- Pump data sheet
- Packing list

1.2.1 Symbols and means of representation

Warnings are used in this manual to warn you of personal injury.

➔ Always read and observe warnings.

⚠ DANGER

Danger for people.
Non-observance results in death or serious injury.

⚠ WARNING

Danger for people.
Non-observance can result in death or serious injury.

⚠ CAUTION

Danger for people.
Non-observance can result in light to moderate injury.

NOTICE

Notes to prevent material damage, for better understanding or to optimise the workflow.

Important information and technical notes are specially marked to explain correct operation.

Symbol	Meaning
➔	Instructions for a one-step action.
1. 2.	Directions for a multi-step action. ➔ Observe the order of the steps.

2 Safety

2.1 Intended use

The pump is intended to circulate swimming pool water in connection with a swimming pool filter system. See the pump data sheet for exceptions.

Observing the following information is vital for intended use:

- This manual
- Pump data sheet

The pump/unit may only be operated within the operating limits and characteristics which are defined in the pump data sheet.

Any other use or use exceeding this is **not** an intended use and must first be authorised by the manufacturer/supplier.

2.1.1 Possible misuse

- Installing the pump/unit with stress on the pipes.
- Using the pump/unit beyond the operating limits specified in the pump data sheet, e.g. excessive system pressure.
- Opening and servicing of the pump/unit by unqualified personnel.

2.2 Personnel qualification

This unit can be used by **children** aged 8 and over as well as by persons with limited physical, sensory or mental capacity or by people with a lack of experience or knowledge, provided that they are supervised or have been instructed in the safe use of the unit and understand the resulting dangers. **Children** may not play with the unit. Cleaning and **user maintenance** may not be carried out by **children** without supervision.

➔ Ensure that the following work is only performed by trained professionals with the following qualifications:

– For mechanical work, for example replacing ball bearings or mechanical seals: qualified mechanics.

– For work on the electric system: electricians.

➔ Ensure that the following requirements are fulfilled:

– Personnel who do not yet have the appropriate qualifications must receive the required training before being allowed to work on the system.

- The personnels' responsibilities, for example working on the product, electric equipment or hydraulic systems, are set based on their qualifications and the job description.
- The personnel have read this manual and understand the necessary working steps.

2.3 Safety regulations

The operator of the system is responsible for the adherence to all relevant statutory regulations and guidelines.

➔ Observe the following regulations when using the pump/unit:

- This manual
- Warning and information signs on the product
- Other applicable documents
- The valid national regulations for accident prevention
- The internal occupational, operational and safety regulations of the operator

2.4 Protective equipment

Reaching into moving parts, e.g. coupling and/or impeller fan, can cause serious injury.

➔ Never operate the pump/unit without protective covers.

2.5 Structural modifications and spare parts

Alterations or modifications can affect operational safety.

➔ Never modify or alter the pump/unit without the manufacturer's permission.

➔ Only use original spare parts and accessories authorised by the manufacturer.

2.6 Signs

➔ Ensure that all the signs on the complete pump/unit remain legible.

2.7 Residual risk

2.7.1 Falling parts

The lifting hooks on the motor are designed for the weight of the motor. The lifting hooks can break if the complete pump unit is attached.

➔ The pump unit, consisting of the motor and the pump, should be attached on both the motor and pump sides. See "Fig. 2" on page 14 .

➔ Only use hoisting and load-bearing equipment which is suitable and technically sound.

➔ Do not stand under suspended loads.

2.7.2 Rotating parts

There is a risk of shearing and crushing due to exposed rotating parts.

➔ Only perform servicing when the pump/unit is not in operation.

➔ Prior to servicing, ensure the pump/unit cannot be switched back on.

➔ Immediately after finishing servicing, reattach or reactivate all protective equipment.

Pumps with plastic lanterns (AK version) have a rotating pump shaft which can catch hair, jewellery or clothing.

➔ Observe the following when near a pump with plastic lanterns (AK version) which is in operation:

– Do not wear loose clothing.

– Wear a hair net.

– Do not wear jewellery.

2.7.3 Electrical energy

There is an increased risk of electric shock when working on the electrical system due to the humid environment.

Electrical protective earth conductors which were not installed correctly can also result in electric shocks, for example due to oxidation or cable breakage.

➔ Observe VDE and utility company regulations.

➔ Build swimming pools and their protection according to DIN VDE 0100-702.

➔ Before working on the electrical system, take the following measures:

– Disconnect system from the power supply.

– Attach a warning sign: “Do not switch on! The system is being worked on.”

– Ensure that the system is free of voltage.

➔ Check the electrical system regularly to ensure it is in proper working condition.

2.7.4 Hot surfaces

The electric motor can reach temperatures of up to 70 °C. There is a risk of being burned.

➔ Do not touch the motor during operation.

➔ Allow the pump/unit to cool down before servicing it.

2.7.5 Hazardous materials

➔ Ensure that leaks of dangerous pumped fluids/gases are led away without endangering people or the environment.

➔ Decontaminate the pump completely during disassembly.

2.7.6 Suction danger

Ensure that the suction openings conform to current guidelines, standards and instructions.

2.8 Faults

➔ In case of a fault, immediately switch the pump off and remove it from operation.

➔ Have all faults repaired immediately.

Seized pump

If a pump seizes, and is switched on several times repeatedly, the motor can be damaged. Observe the following points:

➔ Do not switch the pump/unit on repeatedly.

➔ Turn the motor shaft by hand.See point 6.1.2 on page 21.

➔ Clean pump.

2.9 Preventing material damage

2.9.1 Leakage and pipe breakage

Vibrations and thermal expansion can cause pipes to break.

➔ Install the pump/unit in a manner which reduces structure-borne and airborne noise transmission. When doing so, observe relevant regulations.

If the pipe forces are exceeded, leaks can occur at the screwed connection or the pump itself.

➔ Do not use the pump as a fixed point for the pipe line.

➔ Connect pipes free of load and mount them elastically. Install compensators if necessary.

➔ If the pump leaks, the unit may not be operated and must be disconnected from the mains power supply.

2.9.2 Dry running

If run dry, mechanical seals and synthetic parts can be destroyed within only a few seconds.

➔ Do not allow the pump to run dry. This also applies to checking the rotation direction.

➔ Purge air from pump and suction line prior to start-up.

2.9.3 Cavitation

Pipes which are too long increase resistance. This results in risk of cavitation.

➔ Ensure that the suction line does not leak.

➔ Observe the maximum pipe length.

➔ Only switch the pump on when the valve on the delivery side is opened halfway.

➔ Open the valve on the suction side completely.

2.9.4 Overheating

The following factors can result in the pump overheating:

- Excessive pressure on the delivery side.
- Motor overload switch set incorrectly.
- Ambient temperature which is too high.

➔ Do not operate the pump with the valves closed, minimum flow rate 10 % of Q_{max}.

➔ For pumps with a three-phase motor, install a built-in or external overload switch and set it correctly.

➔ Do not exceed the permitted ambient temperature of 40 °C.

2.9.5 Pressure surges

Valves which close suddenly can cause pressure surges which far exceed the maximum permissible housing pressure of the pump.

➔ Install shock absorber or air vessel.

➔ Avoid valves which close suddenly or, if present, close them slowly.

2.9.6 Blockages in the pump

Pieces of dirt in the suction line can clog and block the pump.

➔ Do not operate the pump without a strainer basket or a strainer basket handle.

➔ Check how easily the pump rotates before starting it up and after longer idle or storage periods.

2.9.7 Drainage

An insufficient drain gap can damage the motor.

➔ Do not block or seal the drain gap between the pump housing and the motor.

2.9.8 Risk of frost

➔ Drain the pump/unit and pipes at risk of freezing in plenty of time.

➔ Remove the pump/unit during periods of frost and store it in a dry room.

2.9.9 Safe use of the product

Safe use of the product is no longer guaranteed in the following instances:

➔ If the pipework is not in proper condition.

➔ If the pump seizes. See point 2.8 on page 10.

➔ If protective devices are damaged or missing, e.g. protection against accidental contact.

➔ If there is stress on the pump/unit or pipes during installation.

3 Description

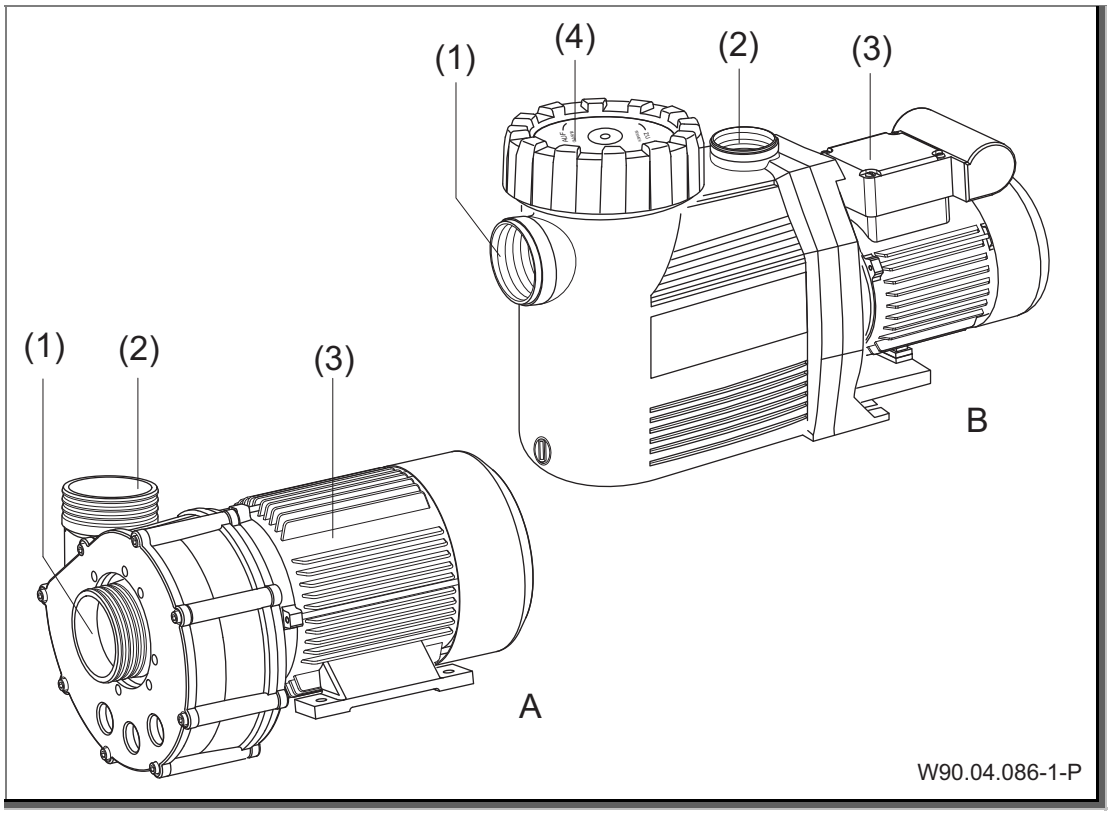

Fig. 1

A Non-self-priming pump
(1) Suction discharge
(2) Pressure discharge
B Self-priming pump
(3) Motor
(4) Lid with strainer basket

3.1 Function

The pump draws the water from the swimming pool via a shut-off valve and the suction discharge (1). If there is a strainer basket (4), it filters out contamination. The water is pumped back to the filter system via the pressure discharge (2) and a shut-off valve.

4 Transport and intermediate storage

4.1 Transport

➔ Check the delivery conditions.

– Check the packaging for transport damage.

– Determine damages, document them with photographs and contact the distributor.

4.2 Lifting the pump

⚠ DANGER

Goods being transported can fall and result in death or crushing of limbs!

The lifting hooks on the motor are designed for the weight of the motor. The lifting hooks can break if the complete pump unit is attached.

➔ Attach the hoisting equipment to both the motor and pump sides if hooks are provided.

➔ Use only hoisting and load-bearing equipment which is suitable, technically sound, and can bear enough weight.

➔ Do not stand under suspended loads.

➔ The motor is the heaviest part of the pump.

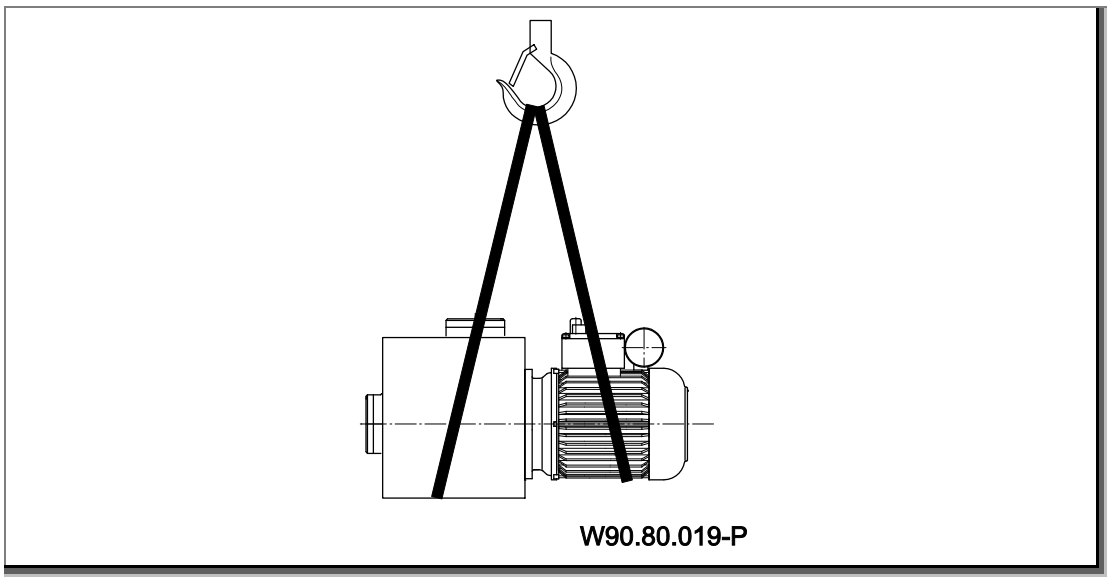

Fig. 2

4.3 Storage

NOTICE

Corrosion is possible due to storage in humid conditions with fluctuating temperatures!
Condensation can corrode windings and metal parts.

➔ Store the pump/unit in a dry environment at a temperature which is as constant as possible.

NOTICE

There is a risk of damage to the threads and entry of foreign matter due to open ports!

➔ Do not remove the port covers until the pipes are ready to be connected.

NOTICE

Damage or loss of individual parts!

➔ Do not open the original packaging until installation or keep individual parts in the original packaging until installation.

4.4 Returns

– Drain the pump/unit completely.
– Rinse and clean the pump/unit with clear water.
– Pack the pump/unit in a box and send it to the specialist retailer or manufacturer.

5 Installation

5.1 Installation site

5.1.1 Outdoor installation

➔ In order to increase the pump's service life, provide simple weather protection.

5.1.2 There must be ground drainage

➔ Calculate the size of the ground drain according to the following criteria:

– Size of the swimming pool.

– Circulation flow rate.

5.1.3 Ventilation and aeration

➔ Ensure sufficient ventilation and aeration. The ventilation and aeration must ensure the following conditions:

– Prevention of condensation.

– Minimum distance from fan cover to the wall: 50 mm.

– Cooling of the pump motor and other system components, for example switch cabinets and control units.

– Limitation of the ambient temperature to maximum 40 °C.

5.1.4 Structure-borne and airborne noise transmission

➔ Observe regulations for structural noise protection, for example DIN 4109.

➔ Install the pump in a manner which reduces structure-borne and airborne noise transmission. Vibration-absorbing materials are suitable bases. Examples:

– Anti-vibration buffers

– Cork lining

– Sufficiently hard foam

5.1.5 Reserve space

➔ Provide enough reserve space to remove the motor unit backwards from the pump in the direction of the motor fan and the strainer basket upwards. See dimensional drawing in the pump data sheet.

5.1.6 Fasteners

➔ Fasten pump using screws.

5.2 Pipes

5.2.1 Pipe sizing

Suction lines which are too long have significant disadvantages:

- Higher resistance which results in reduced suction performance and a higher risk of cavitation.
- Longer priming time, up to 12 minutes.

The dimensions which are specified in the pump data sheet only apply to a pipe length of maximum 5 m.

For longer pipes, losses due to pipe friction must be taken into account.

➔ Size pipes according to the data in the tables. See pump data sheet.

5.2.2 Laying pipes

➔ Keep the suction and pressure lines as short and straight as possible.

➔ Avoid sudden changes to the cross-section and direction.

➔ If possible, lay the suction line below the water level.

➔ Lay the suction line as follows to prevent air pockets from forming:

– For intake mode: continuously falling.

– For suction operation mode: continuously rising.

➔ If the pump is installed above the water level, install a foot valve in the suction line (required for non-self-priming pumps, recommended for self-priming pumps). Thus, the suction line cannot drain when the pump isn't working and the priming time remains short, for example after cleaning the basket.

➔ If clogging is possible, for example with straw or grass, install a filter in the intake or the suction line.

➔ Depending on the type of pump and system, install a non-return valve as necessary.

➔ Install a shut-off valve in both the suction and pressure lines.

➔ Avoid valves which close suddenly. Install a shock absorber or air vessel if necessary.

NOTICE

If the suction line leaks, the pump will prime poorly or not at all.

➔ Ensure the suction line does not leak and make sure that the cover is screwed on tightly.

5.3 Installation

The pump can either be installed below the water level in intake mode or above the water level in suction operation mode.

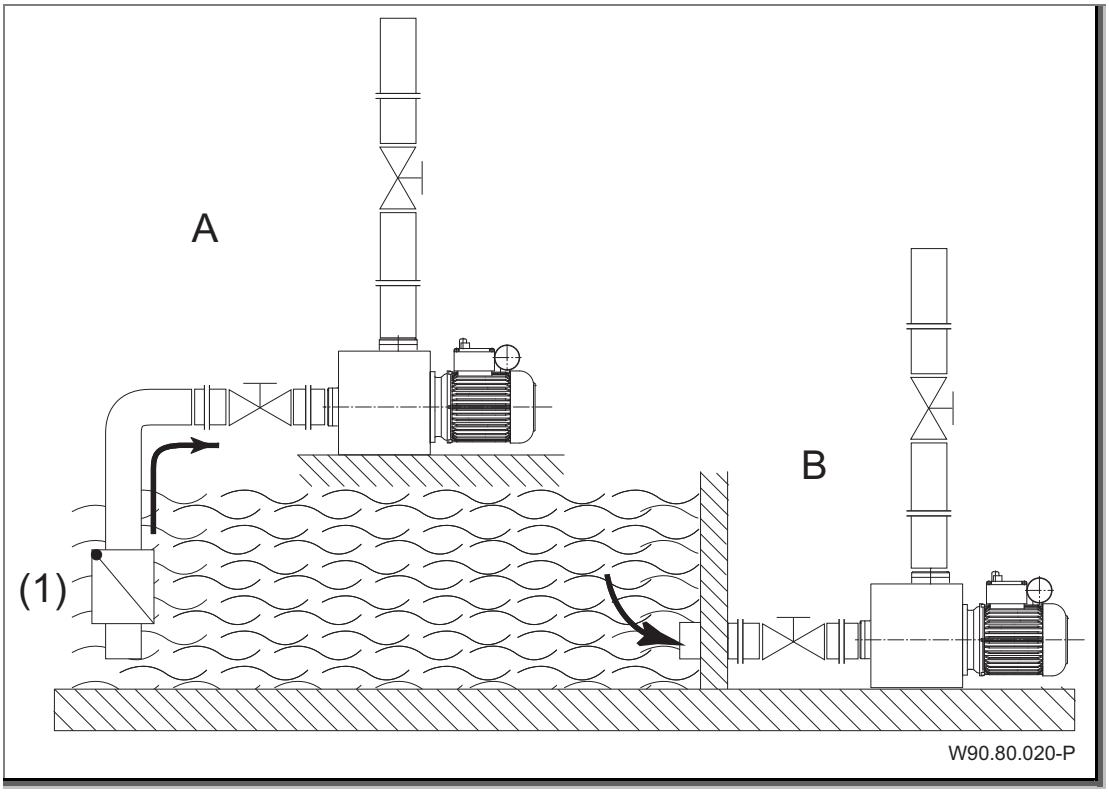

Fig. 3

A Installation above water level = suction operation mode

B Installation below water level = intake mode

(1) Foot valve is necessary for non-self-priming pumps

In suction operation mode, the suction height is significantly reduced by flow resistance in the suction line or pipes which are too low or have diameters which are narrow.

5.3.1 Installing the pump and connecting it to the pipework

1. Install the pump in a horizontal and dry position. When doing so, pay attention to the maximum distance to the water level, i.e. geodetic height. See pump data sheet.

NOTICE

The motor can be damaged due to insufficient drainage!

➔ Do not block or seal the drain gap between the pump housing and the motor.

NOTICE

If it is sealed incorrectly, the thread can be damaged and the sealing effect can be reduced!
Depending on the pump type, teflon tape or the unions enclosed are used to install the pipe.
For ABS bonding, a curing time of at least 12 hours must be observed.

NOTICE

The pump can be damaged by unauthorised mechanical strains being placed on the pump!

➔ Take the pipe up directly before the pump and connect it free of tension.

2. Connect the pipe free of tension according to the VDMA standard sheet 24277. Compensators must be installed for pipe diameters of 90 mm or larger. They are recommended for diameters of 75 mm.
3. Ensure that any leaks cannot cause consequential damage. Install a suitable retainer if necessary.

⚠ WARNING

Pumped fluid hazardous to health!

➔ Observe legal regulations regarding the disposal of media hazardous to health.

5.4 Electrical connection

⚠ WARNING

Risk of electric shock due to incorrect connections!

➔ Electrical connections must always be carried out by authorised specialists.

➔ Observe VDE and utility company regulations.

➔ Install pumps for swimming pools and their protection according to DIN VDE 0100-702.

➔ Install a disconnecting device with at least a 3 mm contact gap per pole to interrupt the power supply.

⚠ WARNING

Risk of electric shock due to voltage on the housing!

➔ A built-in or external overload switch which is set correctly must be installed for pumps with three-phase or A.C. motors without motor protection (see pump data sheet). In doing so, observe the values on the motor name plate.

➔ Protect power supply with a ground fault circuit interrupter, nominal residual current $I_{FN} \leq 30$ mA.

➔ Only use suitable pipe types according to regional regulations.

➔ Adjust minimum diameter of the electrical pipes to accommodate the motor output and pipe length.

➔ Do not bend or squash the pipes.

➔ If hazardous situations can occur, provide an emergency off switch according to DIN EN 809. The builder/operator must make a decision according to this standard.

➔ Connection by customer:

– Fuse protection 1-phase 230 V/3-phase 400 V safety fuse 16 A time delay or 16 A circuit breaker

– Short circuit breaking capacity $I_{CN} \leq 6$ kA

➔ Pumps with cables and plugs are wired ready for connection. If the power cable is damaged, this must be replaced by the manufacturer or the after-sales service in order to avoid any danger.

6 Commissioning/Decommissioning

6.1 Commissioning

NOTICE

The pump/unit can be damaged if it runs dry!

➔ Ensure that the pump/unit is always full of water. This also applies to checking the rotation direction.

6.1.1 Filling self-priming pumps with water

1. Remove the lid. See point 8.1 on page 25

NOTICE

High concentrations of water treatment chemicals can damage the pump!

➔ Do not place water treatment products, particularly in tablet form into the strainer basket.

➔ Observe the ideal pH values of 6.8 - 7.2 and the ideal chlorine values of 0.3 - 1.5 mg/L (private sector) and 0.3 - 0.6 mg/l (public sector).

2. Fill the pump with clean water up to the inlet connection.

NOTICE

Tightening the lid too tight when using the opening device will make it difficult to re-open the lid.

➔ Only apply normal manual force!

3. Replace and tighten the lid.

6.1.2 Checking how easily the pump rotates

After longer idle periods, the pump must be checked for how easily it rotates while it is switched off.

➔ Place a screwdriver in the groove on the end of the motor shaft on the fan side and turn it.

– or –

➔ If there is not a groove on the end of the motor shaft: Remove the fan cover and turn the fan wheel manually in the motor rotation direction.

6.1.3 Switching the pump on

Pre-requisites:

- Strainer basket is installed, where applicable.
- Lid is fitted securely.
- The pump is filled with water for suction operation.

1. Open the valve on the intake side completely.
2. Only open the valve on the delivery side **halfway**.

NOTICE

The pump can be damaged if it runs dry!

➔ Purge air from the pump and suction line.

3. Switch the pump/unit on.

NOTICE

If the pump has a three-phase motor and it turns in the wrong direction, the pump/unit is louder and has a lower capacity.

4. For three-phase motors: Ensure that the motor turns in the direction of the arrow labeled on the fan hood. If the motor rotates in the wrong direction, notify an electrician.
5. As soon as full speed is reached, open the valve on the delivery side completely.
6. Check the mechanical seal for leaking.

6.2 Decommissioning

1. Turn the pump off.
2. Close the valves on the suction and pressure sides.
3. Drain the pump and pipes.
4. If there is a chance of frost, store the pump and pipes sensitive to frost in a dry place, secure from frost.

7 Faults

NOTICE

It is normal for a few drops of water to escape from the mechanical seal from time to time. This is especially true during the break-in period.

Depending on the water quality and number of operating hours, the mechanical seal can begin to leak.

➔ If water leaks constantly, have the mechanical seal replaced by a qualified technician.

NOTICE

We recommend first informing the swimming pool contractor if there are irregularities.

7.1 Overview

Problem	Possible cause	Solution
Pump is switched off by the built-in or external overload switch.	Overload	➔ Check pump. See point 7.1.1 on page 24
Pump seizes.	Sticky mechanical seal because of longer idle period.	➔ Turn the motor shaft. See point 6.1.2 on page 21 ➔ Clean pump.
Water is constantly leaking from the pump.	Mechanical seal is leaking.	➔ Replace the mechanical seal.
Loud motor noise.	– Defective ball bearings. – Direction of rotation is wrong.	➔ Have a mechanic replace the ball bearings. ➔ Inform an electrician.

7.1.1 Check the pump after the overload switch has tripped

If the motor has been switched off by the built-in or external overload switch, carry out the following steps:

1. Disconnect the system from the power supply.
2. Turn the motor shaft on the fan side using a screwdriver and check whether it turns easily.

If the motor shaft is difficult to turn:

1. Remove the screwdriver.
2. Notify Customer Services or your swimming pool builder and have the pump tested.

If the motor shaft is easy to turn:

1. Remove the screwdriver.
2. Only open the valve on the delivery side **halfway**.
3. Reconnect to the power supply.

NOTICE

If the pump seizes and is repeatedly switched on, the motor can be damaged.

➔ Ensure that the pump/unit is only switched on once.

4. Wait until the built-in overload switch automatically switches the motor on after it has cooled down.

   – or –

   Reset the motor overload switch.
5. As soon as full motor speed is reached, open the valve on the delivery side completely.
6. Have an electrician test the power supply, fuses and power consumption.
7. If the built-in or external overload switch switches the motor off again, notify Customer Services.

7.1.2 Spare parts lists

Spare parts lists for each pump can be found on the website www.speck-pumps.com.

8 Maintenance

NOTICE

➔ Before maintenance work, close all shut-off valves and drain all pipes.

All pumps

When?	What?
Regularly	➔ Clean strainer basket.
If there is a chance of frost	➔ Drain pump and pipes sensitive to frost in good time.

Additionally for pumps with plastic lanterns (AK version)

When?	What?
Regularly	➔ Remove salt crystals caused by the salt water. See point 8.3 on page 27
Prior to longer idle periods	➔ Rinse the pump with tap water to prevent crystals from forming on the mechanical seal.

➔ After completing all maintenance work, perform all necessary measures for start-up. See point 6.1 on page 21

➔ Service addresses can be found on our website www.speck-pumps.com.

8.1 Installing or removing the lid/strainer basket

Any lids and strainer baskets must be removed for work to be performed. See 8.1 in the associated pump data sheet.

8.2 Cleaning the strainer basket

1. Switch pump off.
2. Close shut-off valves.
3. Remove lid.
4. Remove strainer basket.
5. Hose strainer basket down with water.
6. Return strainer basket.

NOTICE

High concentration water treatment products can damage the pump!

➔ Do not place water treatment products, particularly in tablet form into the strainer basket.

NOTICE

Tightening the lid too tight when using the opening device will make it difficult to re-open the lid.

➔ Only apply normal manual force.

7. Replace and tighten the lid.

8.3 Removing salt crystals for pumps with plastic lanterns (AK version)

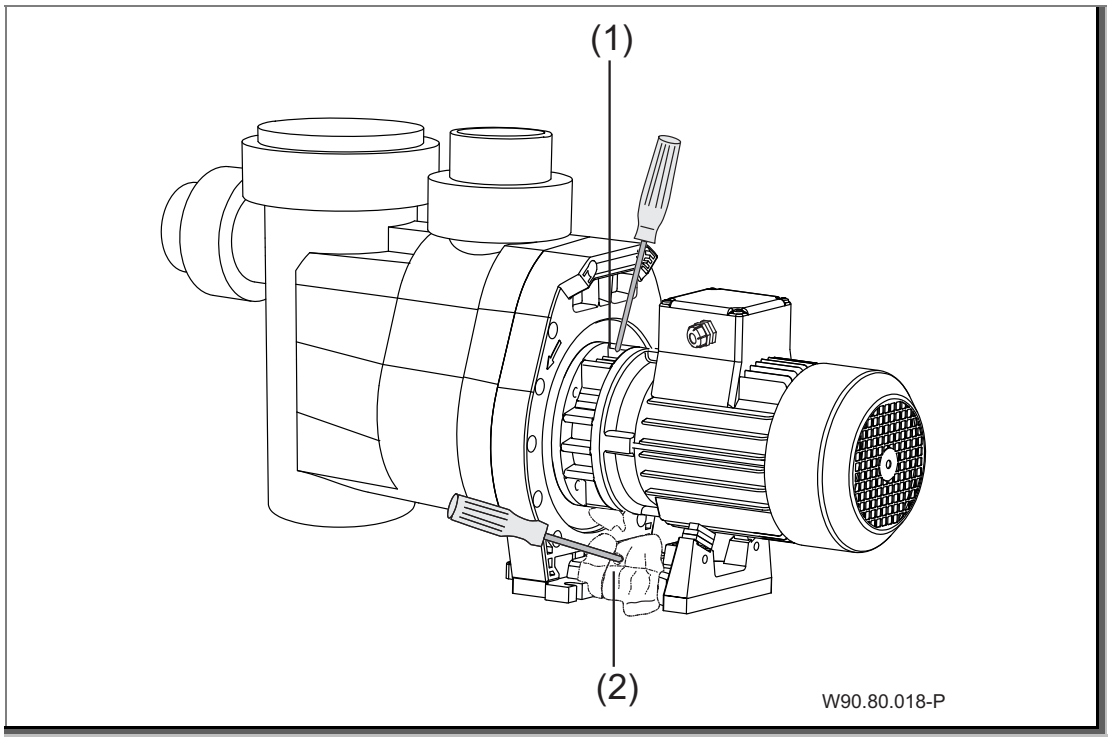

Fig. 4

1. Disconnect system from the power supply.
2. Carefully remove the salt crystals from between the ridges on the lantern (1) from above using a screwdriver.
3. Remove falling salt crust from the motor base (2).
4. Ensure that the motor shaft is completely free of salt crystals and is visible.
5. Turn the motor shaft on the fan side using a screwdriver. The motor shaft must be easy to turn.
6. Reconnect to the power supply.

8.4 Warranty

The warranty includes the devices delivered and all components. However natural wear and tear (DIN 3151/DIN-EN 13306) on all turning and dynamically loaded components, including electronic components under tension, is not covered under the warranty.

Failure to comply with the safety instructions may void the warranty.

9 Disposal

➔ Collect harmful media and dispose of it according to the regulations.

➔ At the end of its service life, the pump/unit or individual components must be disposed of correctly. Disposal in the household waste is not permitted!

➔ Dispose of the packaging materials in the household waste in accordance with the local regulations.

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