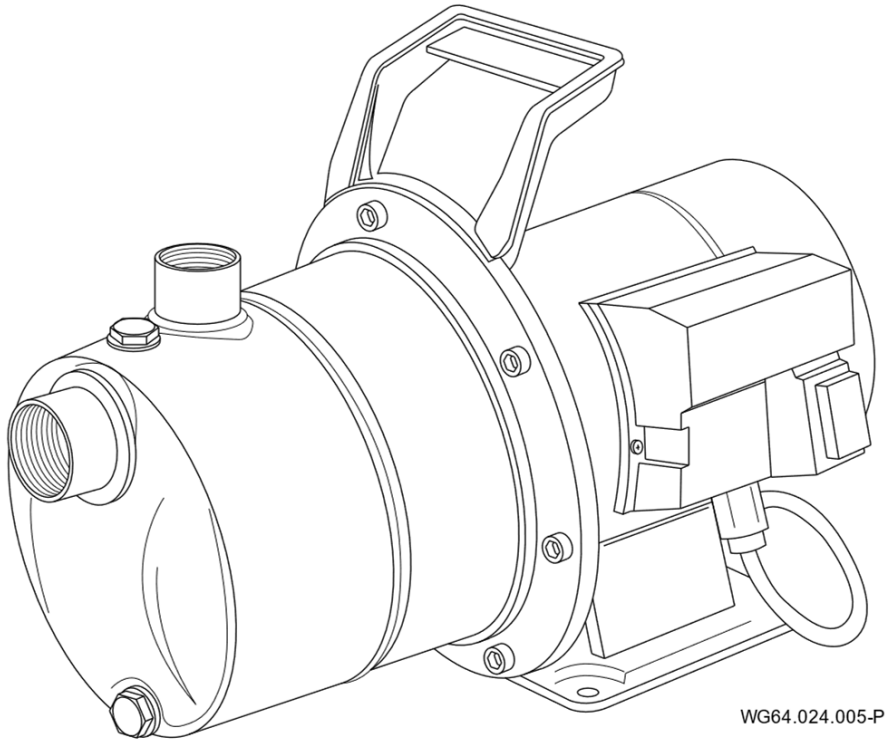
SPECK pumpen

EN

EN **Translation of original operation manual**

SG/SGM

Multipurpose pumps



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SPECK Pumpen Verkaufsgesellschaft GmbH
Hauptstraße 3
91233 Neunkirchen am Sand, Germany

Phone +49 9123 949-0
Fax +49 9123 949-260
info@speck-pumps.com
www.speck-pumps.com

This document and all attached documents are not subject to update service!

Subject to technical modifications!

Table of contents

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 Target group

This instruction manual is intended for qualified professionals.
See point 2.2 on page 7

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 for rainwater utilisation, pressure boosting and for washing systems, equipment engineering and shipping.

Use of the pump in swimming pools or garden ponds is not permitted, if it is operated according to VDI 100, part 702 and part 738.

Observing the following information is vital for intended use:

- This manual

The pump/unit may only be operated within the application limits, as specified in this manual.

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

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 point 4.1 on page 13 .

➔ 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.

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.

2.8 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 19.

➔ Clean pump.

2.9 Preventing material damage

2.9.1 Leakage and pipe breakage

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

Various components can be damaged within seconds due to dry running.

➔ Do not allow the pump to run dry.

➔ Purge air from pump 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.

➔ Open the valves completely.

2.9.4 Overheating

The following factors can lead to the pump overheating:

- Insufficient cooling of the pump.
- Closed valve in the pressure line.

➔ Do not let the pump run dry.

➔ Do not operate the pump with closed valves.

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

Dirt particles can clog and block the pump.

➔ 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 9.

➔ 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

3.1 Design

The self-priming stainless steel pumps are designed with double housing and cooling air supply. The single-phase motor is equipped with an overload protection switch and the motor bearings are lubricated for life. On and off switches are integrated in the terminal box of the SGM. The intake system is made of plastic. The maintenance free mechanical seal is designed with sliding surfaces made from carbon/ceramic and is suitable for constant operation at a medium temperature of 20 °C.

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 Attaching the transport handle

The pump is supplied with a handle, which aids the transport of the pump. In order to attach the handle, both screws on the upper side of the pump must be removed and the handle attached.

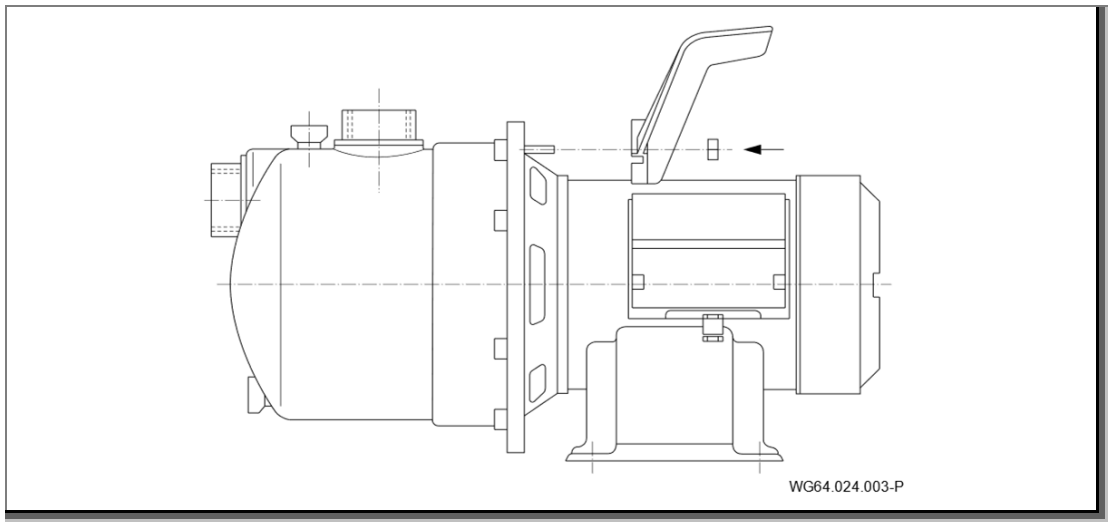


Fig. 1

4.3 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.

4.4 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 winding 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.

4.5 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 Installation

The pump is intended to be installed horizontally.

5.1.2 Ventilation and aeration

➔ Ensure sufficient ventilation and aeration. The ventilation and aeration must ensure the following conditions:
- Prevention of condensation.
- 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.

5.1.3 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

5.1.4 Fasteners

➔ Fasten pump using screws.

5.2 Pipes

5.2.1 Pipe sizing

➔ The diameter of the suction line must be minimum Rp 1 ¼.

➔ For suction heights above 4 – 5 m and suction lengths over 10 m, a suction line with a larger inner diameter is required.

➔ Suction lines made from flexible plastic material or rubber must be reinforced in order to prevent the suction line from contracting during the suction process.

5.2.2 Laying pipe

- ➔ Keep the suction and pressure lines as short and straight as possible.
- ➔ Avoid sudden changes to the cross-section and direction.
- ➔ Do not use the pump as a fixing point for the pipework.
- ➔ The pipework is to be installed free of load.
- ➔ According to DIN 1988, direct connection to the public drinking water supply is not permitted as the maximum operating pressure (pump pressure + pre-pressure) is only **6 bar**.

5.3 Installation

The pump must be positioned horizontally. A foot valve or non-return valve is to be installed at the end of the suction line.

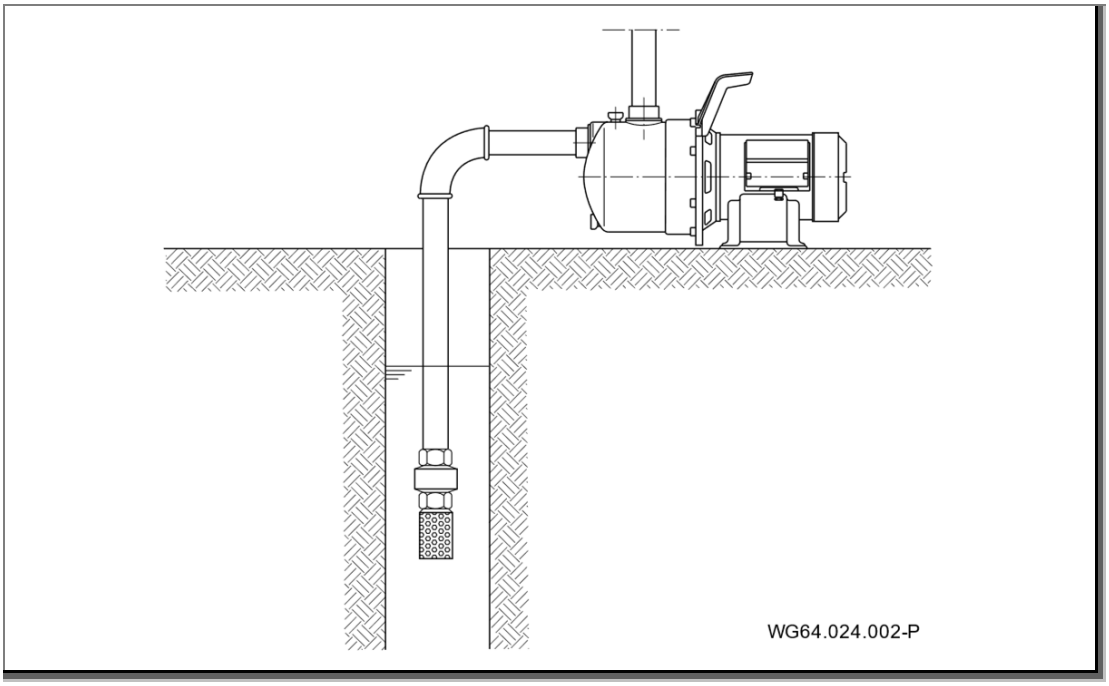


Fig. 2

5.3.1 Installing the pump and connecting it to the pipework

1. Install the pump in a horizontal and dry position.

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!

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. Use compensators if necessary.
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 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!

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

➔ A thermal overload switch, which automatically turns the pump off when it is overloaded and turns it back on again once it has cooled down, is installed in single-phase pumps.

5.4.1 Wiring diagram 1-phase 230V 50 Hz

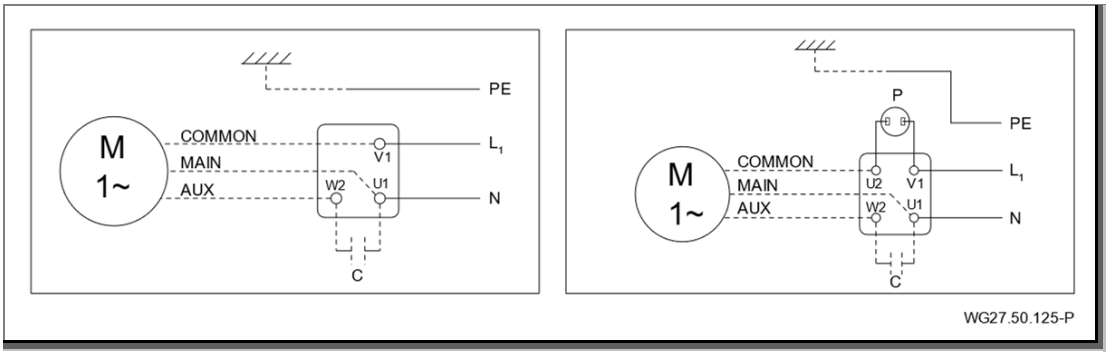


Fig. 3

5.4.2 Wiring diagram 3-phase 400/230V 50 Hz

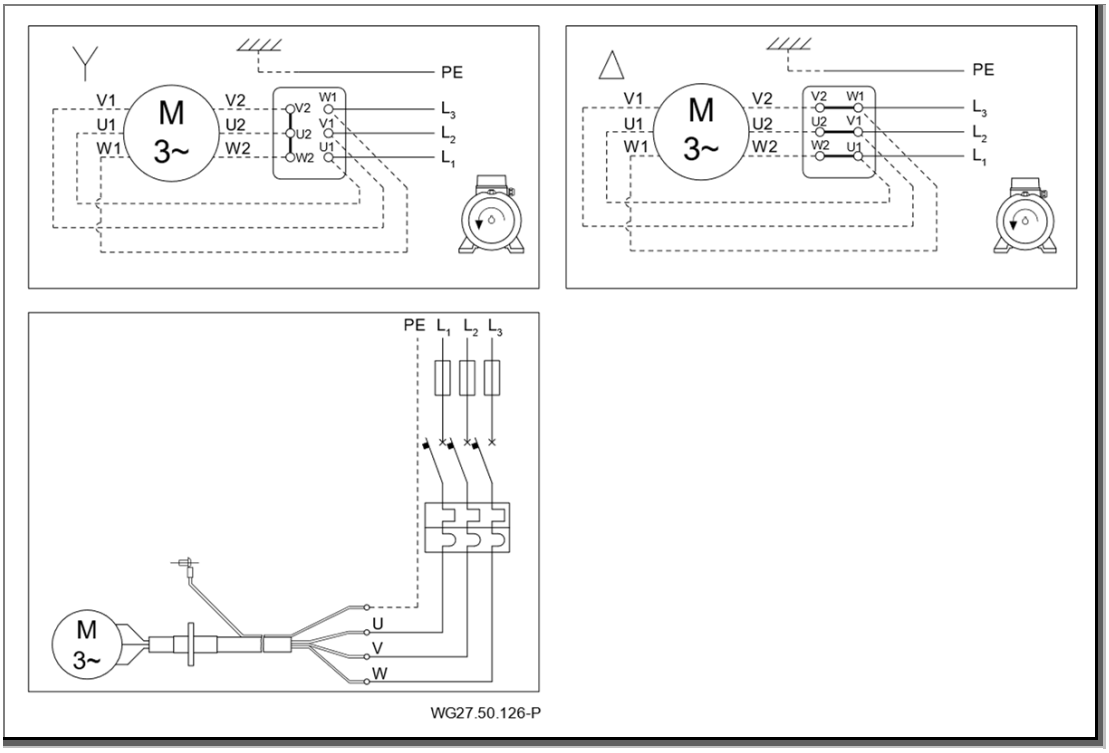


Fig. 4

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 the pump with water

The pump must be filled with the pump medium before commissioning.

1. Remove the screwed plug next to the discharge outlet.
2. Slowly fill the pump with clean water until it drips out of the suction discharge.
3. Screw in and tighten the screwed plug.

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:

- Pump is filled with water.
- Screwed plug is tightened.

1. Fixtures in the suction and pressure lines are open.
2. Switch the motor on.

The necessary priming time is between one second and a few minutes, depending on the suction height and length. If the suction line is equipped with a foot valve in the inlet strainer (recommended mesh size 1 mm), the pump and suction line remain filled.

NOTE

The pump must not run against a closed pressure line. This results in the heating of the medium in the interior of the pump and can damage the pump.

➔ Always leave fixtures open in the pressure line.

6.1.4 Draining the pump

The pump must be drained if there is a risk of frost. To do so, release the screwed plug on the lower and upper part of the pump housing.

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.

7.1 Overview

Problem: Motor doesn't start

Possible cause	Solution
Motor protection triggered.	➔ Wait for the motor winding to cool down and the motor protection to turn back on (1~). ➔ Check the motor protection switch (3~).
No voltage.	➔ Check the power supply.
Burnt fuse	➔ Replace the fuse; if the problem recurs check the electrical connection.
Motor or capacitor faulty.	➔ Replace the motor or capacitor.

Problem: No flow rate; motor turns

Possible cause	Solution
Shut-off valve closed.	➔ Open shut-off valve.
Pump is not filled with media.	➔ Fill pump.
Leak in the unit/pipe.	➔ Check and repair pipework.

Problem: Pump constantly turns off

Possible cause	Solution
Motor protection triggered.	➔ Check pump for impurities. ➔ Clean pump and pump parts. ➔ Pumped media is too viscous.
Pump is running outside of the characteristics.	➔ Correct the pump‘s operating point.

Problem: Too low a flow rate in the pump.

Possible Cause	Solution
The suction height exceeds the pump's suction limit.	➔ Increase the diameter of the suction line.
Possible frictional loss is too large.	➔ Reduce the number of elbows/angles.
Pump or pipework dirty or partly blocked.	➔ Check and clean it.
Incorrect direction of rotation (3~).	➔ Check the electrical connections using the operating manual.

Problem: Leak between pump and motor

Possible cause	Solution
Shaft seal worn or damaged.	➔ Replace the shaft seal.
Pump running dry.	➔ Replace the shaft seal.

8 Maintenance

NOTICE

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

When?	What?
Regularly	➔ Check running noises. ➔ Check the pump for leaks.
If there is a chance of frost	➔ Drain pump and pipes sensitive to frost in good time.

➔ After completing all maintenance work, perform all necessary measures for start-up. See point 6.1 on page 19

8.1 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.

8.2 Service addresses

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

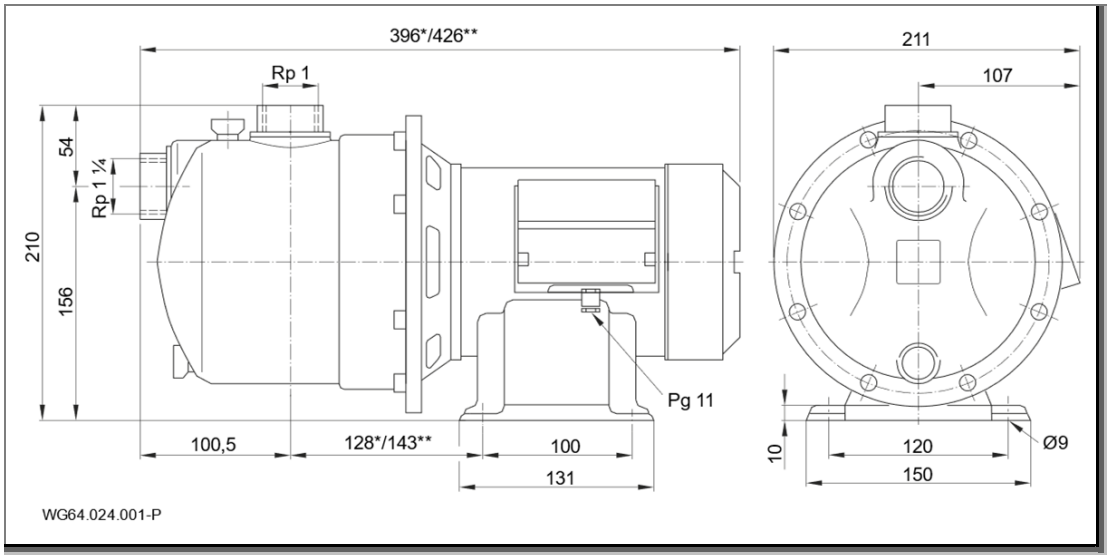
9 Disposal

- ➔ 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.

10 Technical data

50 Hz	SGM 100	SGM 200	SG 100	SG 200
1~ 230 V				
Power input P_1 [kW]	1.05	1.39	-	-
Power output P_2 [kW]	0.60	0.88	-	-
Rated current [A]	4.70	6.70	-	-
Capacitor [µF] 450 V DB	16	20	-	-
3~ 400/230 V				
Power input P_1 [kW]	-	-	0.97	1.15
Power output P_2 [kW]	-	-	0.60	0.88
Rated current [A]	-	-	1.90	2.10
Class of protection	IP 44			
Class of isolation	F			
Motor speed [rpm]	2840			
Continuous sound pressure level [dB(A)]	≤ 70			
max. operating pressure [bar]	6			
max. suction height [m]	8			
Max. ambient temperature [°C]	40			
max. medium temperature [°C]	45			
max. starting frequency	20/hr			

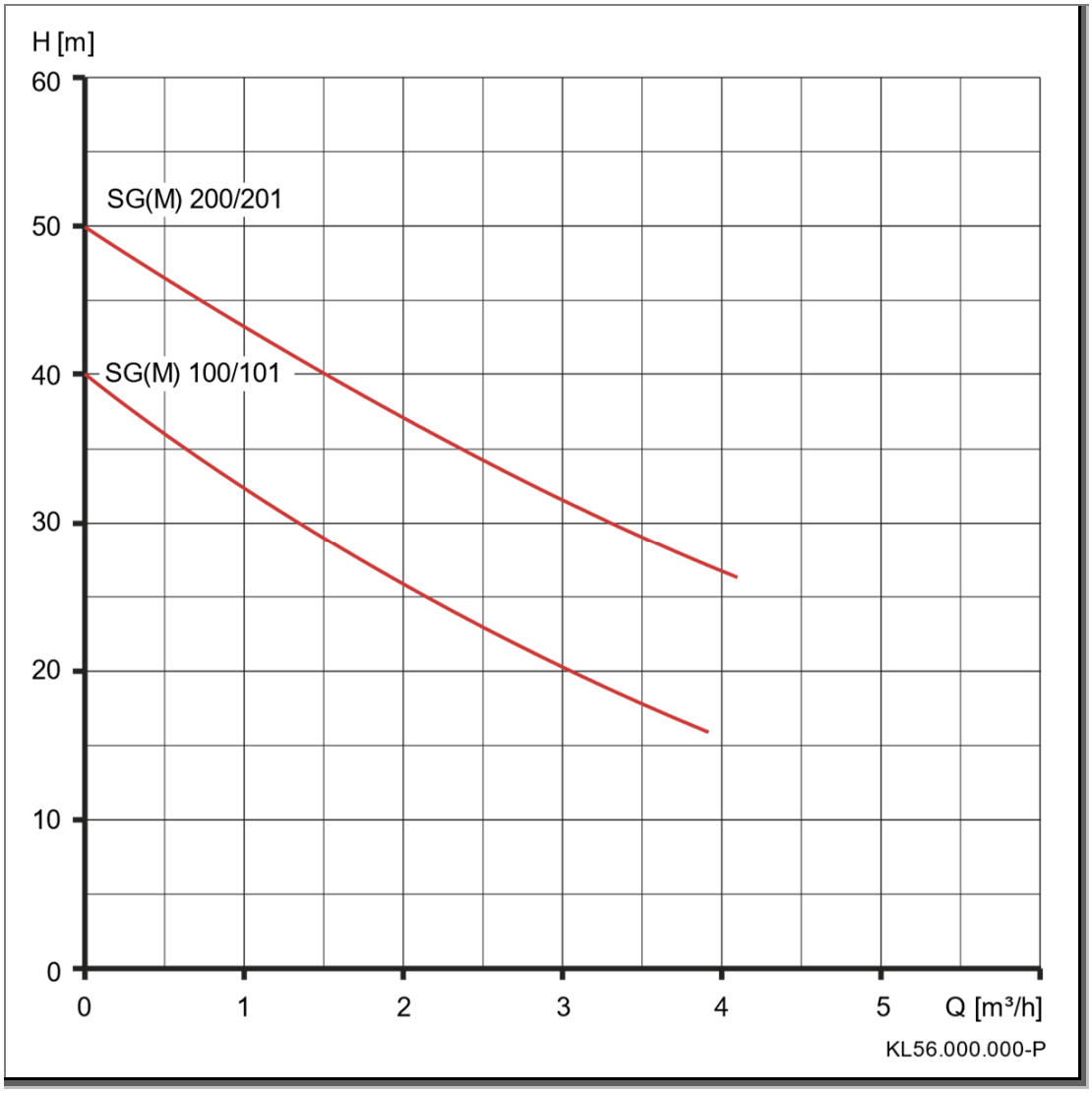
10.1 Dimensional drawing



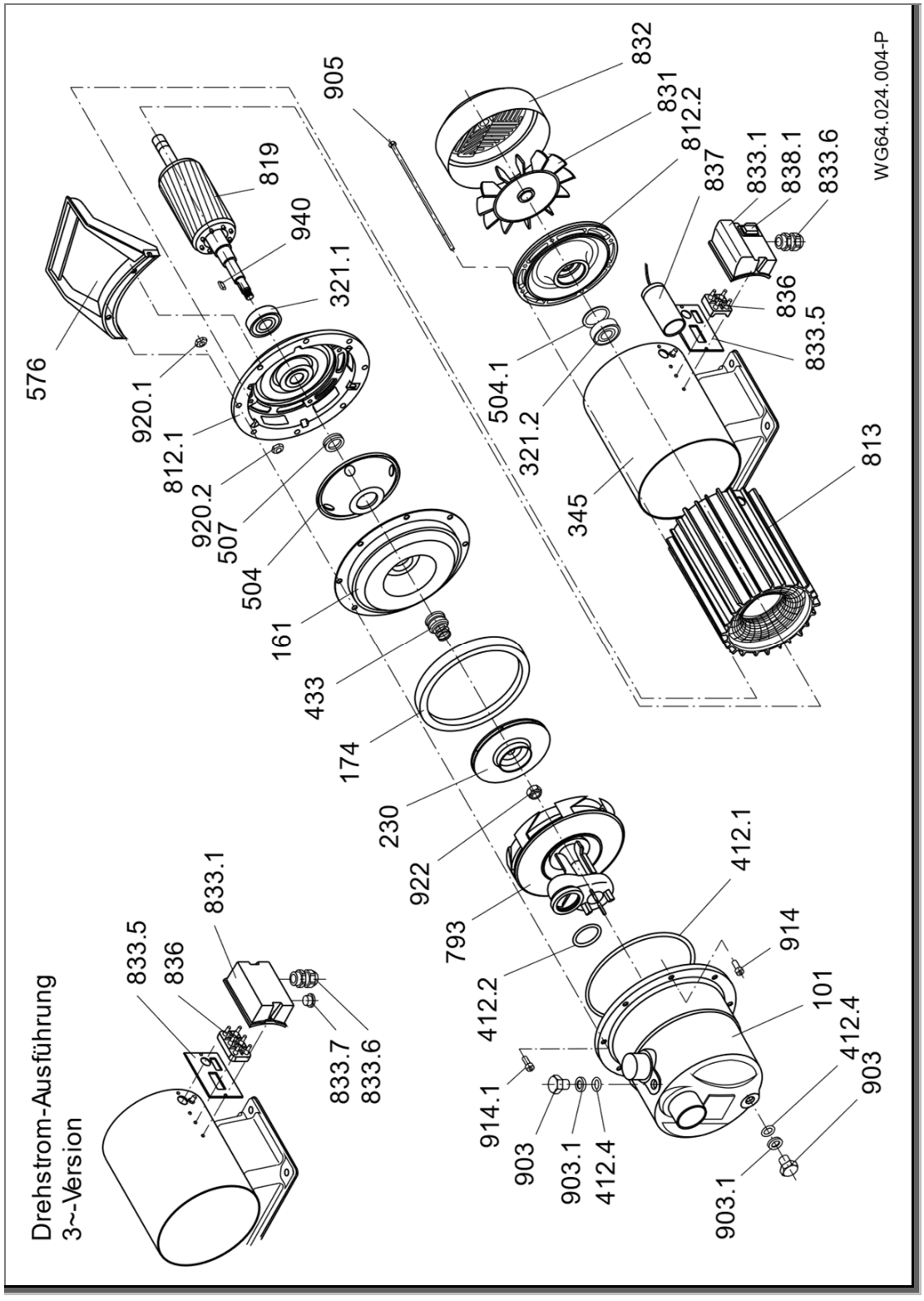
* SG/SGM 100

** SG/SGM 200

10.2 Characteristics



10.3 Exploded drawing



Spare parts list

Pos. no.	Qty	Description
101	1	Housing
161	1	Gland housing
174	1	Spacer
230	1	Impeller
321.1	1	Ball bearing A-side
321.2	1	Ball bearing B-side
345	1	Motor frame with pump foot
412.1	1	Round seal for housing
412.2	1	Round seal for nozzle housing
412.4	2	Round seal for screwed plug
433	1	Mechanical seal
504	1	Spacer plate
504.1	1	Spacer
507	1	Splash ring
576	1	Handle (only for single-phase)
793	1	Nozzle housing with diffuser
812.1	1	A-side end shield
812.2	1	B-side end shield
813	1	Stator and motor housing
819	1	Shaft with rotor
824	1	1.5 m connection cable with plug (only for single-phase)
831	1	Impeller fan
831	1	Fan guard
833.1	1	Terminal box cover
833.5	1	Seal for terminal box cover
833.6	1	Cable gland
833.7	1	Blind plugs (only for three phase)
836	1	Terminal strip
837	1	Condenser (only for single-phase)
838.1	1	On/off switch (only for single-phase)
903	2	Screwed plug
903.1	2	Washer
905	4	Motor tensioning screw
914	8/6	Screw
914.1	2	Screw (only 3~)
920.1	8	Hex nut
920.2	4	Hex nut
922	1	Impeller nut
940	1	Feather key

11 Index

EG-Konformitätserklärung

EC declaration of conformity

Hiermit erklären wir, dass das Pumpenaggregat/Maschine

Hereby we declare that the pump unit

Baureihe

Series

SG/SGM

folgenden einschlägigen Bestimmungen entspricht:

is in accordance with the following standards:

EG-Maschinenrichtlinie 2006/42/EG

EC-Machine directive 2006/42/EC

EMV-Richtlinie 2014/30/EU

EMC-Machine directive 2014/30/EU

EG-Richtlinie 2012/19/EG (WEEE)

Directive 2012/19/EC (WEEE)

EG-Richtlinie 2011/65/EG (RoHS)

Directive 2011/65/EC (RoHS)

Ökodesign-Richtlinie 2009/125/EG

Ecodesign Directive 2009/125/EC

Angewendete harmonisierte Normen, insbesondere

According to the provisions of the harmonized standard for pumps in particular

EN 60335-1:2012 EN 60335-2-41:2012 EN ISO 12100

91233 Neunkirchen am Sand, 28.07.2020

SPECK pumpen

SPECK Pumpen Verkaufsgesellschaft GmbH
Hauptstraße 3, 91233 Neunkirchen am Sand, Germany

i.V. Sebastian Watolla
Technischer Leiter und Dokumentations-bevollmächtigter | Technical director and authorised representative

Armin Herger
Geschäftsführer | Managing Director