



# Sigma 8KBS

from serial no. 183769



## Transport and Installation Instructions

Read thoroughly before installing the centrifuge!



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# 1 General information

## 1.1 Further applicable documents

The following documents apply in addition to these transport and installation instructions:


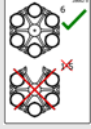



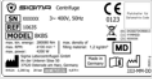





- Operating manual of the blood bank centrifuge Sigma 8KBS (document part no. 07035)

## 2 Safety

## 2 Safety

### 2.1 Marking of the unit

The following symbols are used on this centrifuge:

	On (Power)		Arrow indicating the direction of rotation
	Off (Power)		Rotor loading information
	Hot surface		Bucket loading information
	Attention! General danger		Note concerning the condensate drain
	Name plate		CE mark in compliance with the directive 2006/42/EC
	Do not dispose as part of domestic waste		Consult operating manual
	Medical product in accordance with the regulation (EU) 2017/745		NRTL mark (only for the USA and Canada)
	RCM mark (only for Australia)		China RoHS 2 mark (only for China)
	California Proposition 65 mark (only for the USA)		

  
**NOTE**

The symbols on the centrifuge must be kept readable at all times. If necessary, they must be replaced.

  
**NOTE**

The marking varies depending on the version and country of destination of the centrifuge.



## 2.2 Explanation of the symbols and notes

Sigma operating manuals use the following names and symbols to indicate hazards:



**DANGER**

This symbol stands for a **direct** hazard to the life and health of persons.

Non-observance of these symbols **causes** serious health problems up to life-endangering injuries.



**DANGER**

This symbol stands for a **direct** hazard to the life and health of persons due to electrical voltage.

Non-observance of these symbols **causes** serious health problems up to life-endangering injuries.



**WARNING**

This symbol stands for a **potential** hazard to the life and health of persons.

Non-observance of these symbols **can** cause serious health problems up to life-endangering injuries.



**CAUTION**

This symbol indicates a potentially hazardous situation

Non-observance of these notes can cause minor injuries or damage to property.



**NOTE**

This symbol indicates important information.



**NOTE**

This symbol indicates electrostatic-sensitive devices (ESD).

## 2 Safety

### 2.3 Requirements concerning the personnel



**DANGER**

#### **Risk of injury if the personnel are not sufficiently qualified**

If unqualified personnel perform work on the centrifuge or are present in the danger zone of the centrifuge, hazards result that can cause serious injuries and considerable damage to property.

- Ensure that all the tasks are performed by personnel with the corresponding qualifications.
- Ensure that unqualified personnel stay clear of the danger zones.



**DANGER**

#### **Risk of fatal injury to unauthorised persons due to hazards in the danger zone or work area**

Unauthorised persons who do not fulfil the requirements described herein are not aware of the hazards in the work area. This is why there is a risk of serious or even fatal injuries for unauthorised persons.

- Ensure that unauthorised persons stay clear of the danger zone and work area.
- If in doubt, address these persons and instruct them to leave the danger zone and work area.
- Interrupt any running work if unauthorised persons are present in the danger zone or work area.

This manual uses the following personnel qualifications for various areas of activity:

#### **Qualified electricians**

Qualified electricians have been specifically trained for the environment in which they work and they are familiar with all the relevant standards and regulations. Due to their special training, knowledge, experience and familiarity with the relevant standards and regulations, qualified electricians are in the position to perform work on electrical systems and to autonomously identify and prevent possible hazards.

Qualified electricians must fulfil the requirements as set out in the applicable legal provisions concerning the prevention of accidents.

#### **Specialised personnel**

Due to their special training, knowledge, experience and familiarity with the relevant regulations, specialised personnel are in the position to perform any tasks assigned to them and to autonomously identify and prevent possible hazards.

#### **Forklift operators**

Forklift operators must be at minimum 18 years of age and have the physical and mental capacity to operate industrial trucks with a driver's seat or stand-on trucks.

In addition, forklift operators must have been trained in the operation of industrial trucks with a driver's seat or stand-on trucks.

Forklift operators have provided the owner/operator with evidence of their competence in operating industrial trucks with a driver's seat or stand-on trucks and have been assigned the task of operating the industrial truck by the owner/operator in writing.

**Instructed persons**

Instructed persons have been instructed by the owner/operator about the tasks assigned to them as well as about any possible hazards resulting from improper conduct.

Only persons who can be expected to reliably perform the tasks assigned to them shall be accepted as personnel. Persons whose reactions are compromised, e.g. due to the use of alcohol, drugs or medication, are not permissible.

The personnel must be familiar with the language used in the instructions for use.

## 2 Safety

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### 2.4 Safety instructions

#### 2.4.1 Electrical safety

As protection against electric shock, the centrifuge is equipped with an earthed mains power cable and connector. To ensure the effectiveness of this safety feature, the following must be ensured:



**DANGER**

- Ensure that the wall socket is properly wired and grounded.
- Check that the mains voltage agrees with the nominal voltage listed on the name plate.
- Ensure that the mains power cable is intact prior to using the centrifuge. Damaged or faulty mains power cables must be replaced immediately.
- Do not place vessels containing liquid on the centrifuge lid or within the safety distance of 30 cm around the centrifuge. Spilled liquids may get into the centrifuge and damage electrical or mechanical components.
- Only qualified and specialised personnel are authorised to perform service tasks or repairs of the electrical system for which the housing needs to be removed.
- Inspect the electrical equipment of the unit regularly. Defects such as loose or burnt cables must be eliminated immediately.
- Following the completion of any type of repair or service, the qualified and specialised personnel must perform final inspection and testing in compliance with the relevant standards.

#### 2.4.2 Mechanical safety



**WARNING**

- Do not hold your fingers between the lid and the housing when closing the lid. Risk of crushing!
- Defective lid relieving devices could cause the centrifuge lid to fall (contact the service department, if necessary). Risk of crushing!
- Ensure that all repairs are performed only by authorised and specialised personnel.
- Prior to any start-up, check the centrifuge, rotor, and accessories for signs of damage that can be discerned from the outside. Special attention must be paid to all of the rubber parts (e.g. motor cover, lid seal, and adapters) in terms of visible structural changes. Defective parts must be replaced immediately.
- Open the centrifuge when it is not in use so that moisture can evaporate.

## 3 Transport

### 3.1 Dimensions and weight

	Sigma 8KBS
Height (mm):	990
Height with open lid (mm):	1 679
Width (mm):	810
Depth (mm):	949
Weight (kg):	450

### 3.2 Notes on transport

- Install the transport safety device (see chapter 4.2.1 - "Removal of the transport safety device").
- For transport, use suitable packaging and, if at all possible, the original packaging (see chapter 3.3 - "Packaging").



The centrifuge weighs approx. 450 kg!

- Always lift the centrifuge with a lifting device (e.g. a fork lift).
- When lifting the centrifuge without packaging, always reach under the centrifuge from the rear side.

#### Special equipment - water cooling system

Prior to transporting the centrifuge, the water circuit must be drained in order to avoid damage, e.g. due to freezing. Only specialised personnel are authorised to perform these tasks. Consultation with the manufacturer is obligatory!

### 3 Transport

### 3.3 Packaging



When unloading the centrifuge, ensure to wear safety shoes in order to avoid injuries caused by the rolling centrifuge!

The centrifuge is packaged in a wooden crate.

- Remove the upper cover.
- Remove the packing material and all of the accessories.

One side panel of the wooden crate has metal fittings and an inscription (see the following picture).

- Remove the two lower screws of the metal fittings and then the four outer screws in the upper half of the panel (see the following picture). Then, remove the side panel.



Do not remove the screws in the middle of the side panel. They hold the substructure of the ramp in place.

- 1 Inscription "OPEN HERE"
- 2 Unpacking instructions
- 3 Metal fittings

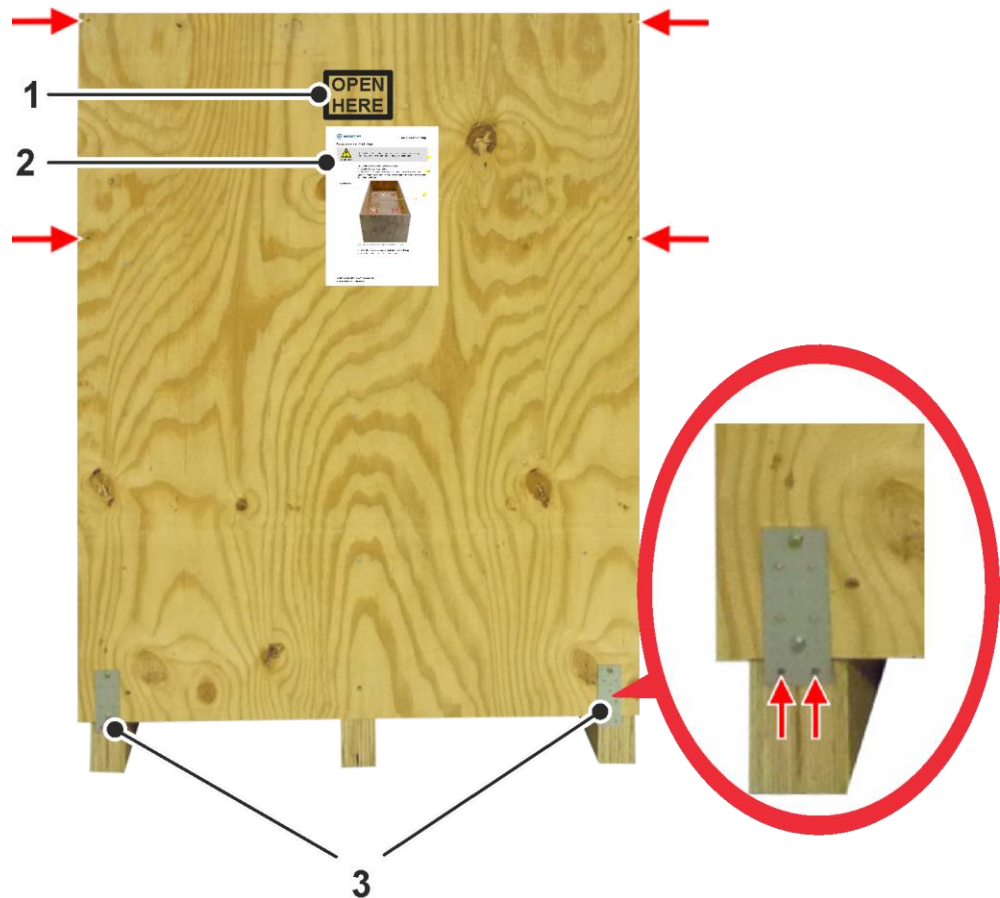
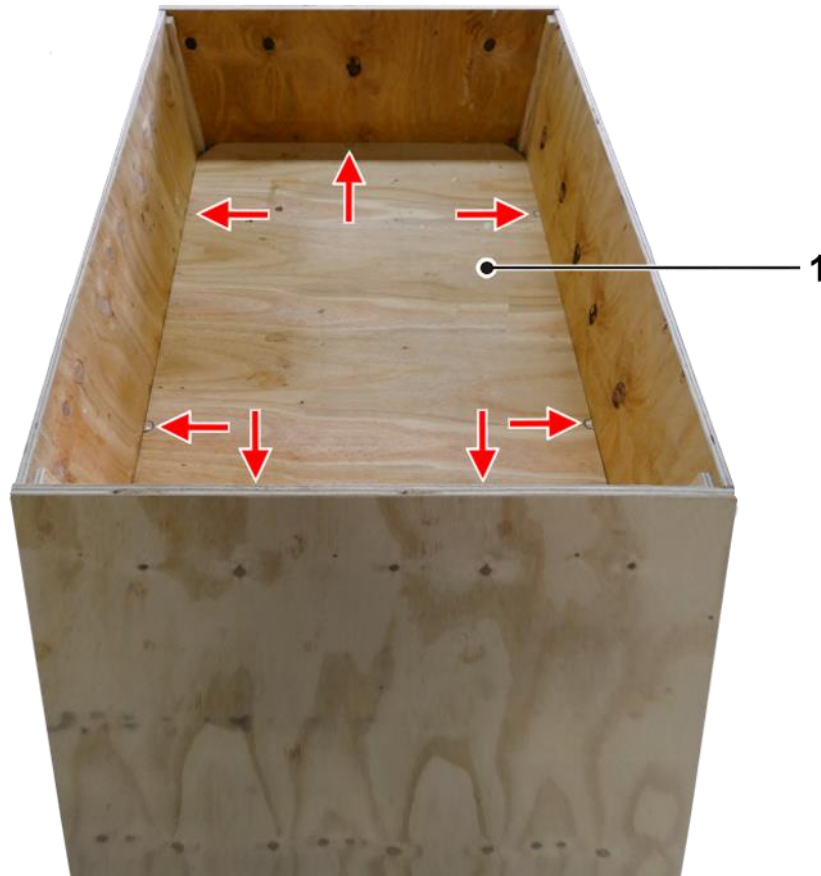


Fig. 1: Positions of the screws for removing the side panel

There is an intermediate panel above the centrifuge. This intermediate panel is fastened in place by way of screws.

1 Intermediate panel



*Fig. 2: Position of the fastening screws of the intermediate panel*

- Loosen the screws of the intermediate panel.
- Remove the intermediate panel.

There are two wooden boards under the intermediate panel. They are fastened to the side panels by way of screws.

- Loosen the screws of the wooden boards.
- Remove the wooden boards.

### 3 Transport

#### Unloading the centrifuge with a forklift truck

- Lift the centrifuge off the bottom of the crate by way of a forklift truck. To do so, insert the forks of the forklift truck from the back.



The centrifuge weighs approximately 450 kg!

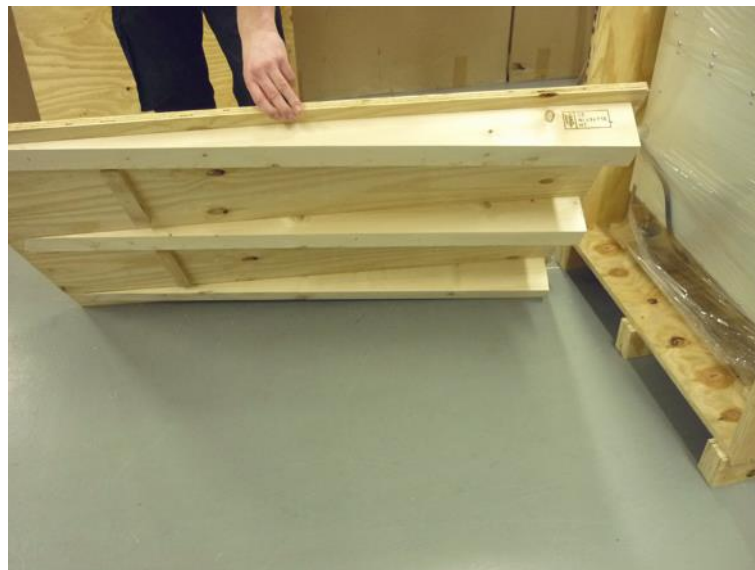
#### Unloading the centrifuge with a hand pallet jack

If no forklift truck is available, one side panel of the wooden crate can be used as a ramp so that the centrifuge can be unloaded from the crate by way of a hand pallet jack (ground clearance 85 mm max.).



Do not remove the screws in the middle of the side panel. They hold the substructure of the ramp in place.

- Position the side panel in front of the bottom of the crate as a ramp.



*Fig. 3: Positioning of the ramp*



### 3 Transport

- Secure the ramp on the bottom of the crate by way of the two metal fittings and the screws that have been removed beforehand (see the following picture).

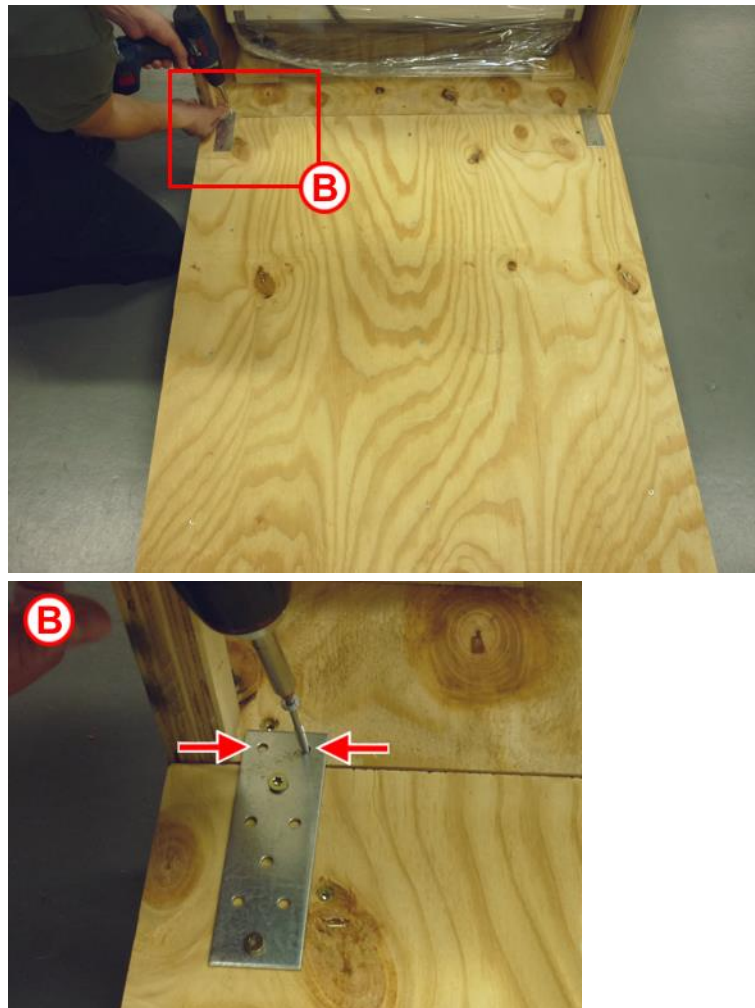


Fig. 4: Positions of the screws for securing the ramp (here: left side)

- Move the pallet jack over the ramp and under the centrifuge and lift the centrifuge off the bottom of the crate.
- Unload the centrifuge carefully via the ramp. While doing so, secure the centrifuge with a sufficient number of persons in order to prevent it from slipping off to the side.



#### CAUTION

Do not unload the centrifuge via the ramp on its castors as the centrifuge would be too difficult to steer and could slip off the ramp.

### 3 Transport

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#### Unloading the centrifuge with an electric pallet jack



Due to its design and dimensions, an electric pallet jack is not suitable for unloading the centrifuge.

- Retain the packaging for any possible future transport of the centrifuge.

## 4 Set-up and connection

### 4.1 Installation requirements

#### 4.1.1 Installation site

Operate the centrifuge only in closed and dry rooms.

All the energy supplied to the centrifuge is converted into heat and emitted to ambient air.

- Air cooled centrifuges: Ensure sufficient ventilation. Keep a safety range of at least 30 cm free around the centrifuge as well as with regard to walls or other devices so that the vents in the machine remain unobstructed and fully effective.



Centrifuges with an air-cooled compressor should not be set up with their left side against a wall, since otherwise the hot air, which is emitted out the back, will be drawn in again as fresh air for cooling. As a result, the unit will switch off due to overheating.

- Water cooled centrifuges: Provide sufficient water throughput.
- Do not position the centrifuge near heat generators.
- Avoid direct sunlight (UV radiation).
- During transport from cold to warmer places, condensational water will collect inside the centrifuge. Allow sufficient time for drying (min. 24 h) before using the centrifuge again.

#### 4.1.2 Type of connection



**DANGER**

The operating voltage on the name plate must correspond to the local supply voltage!

SIGMA laboratory centrifuges are units of protection class I. Centrifuges of this series have a 5-core connecting cable of 2.5 m length. Depending on the voltage variant, the centrifuge comes supplied with a 5-pin CEE connector or without any connector at all (see chapter 4.1.2.1 - "Mains plug").

Behind the front door there are three fuses with a rocker switch.

## 4 Set-up and connection

### 4.1.2.1 Mains plug

#### Voltage variants 3 x 400 V

The 400 V versions of the centrifuge (ref. no. 10635 and 91302) are equipped with a 5-pin CEE connector (3L+N+PE, 6h, 16 A) as per IEC 60309.



Fig. 5: 5-pin CEE connector

The centrifuge must only be operated in a TT system or TN-C-S system.

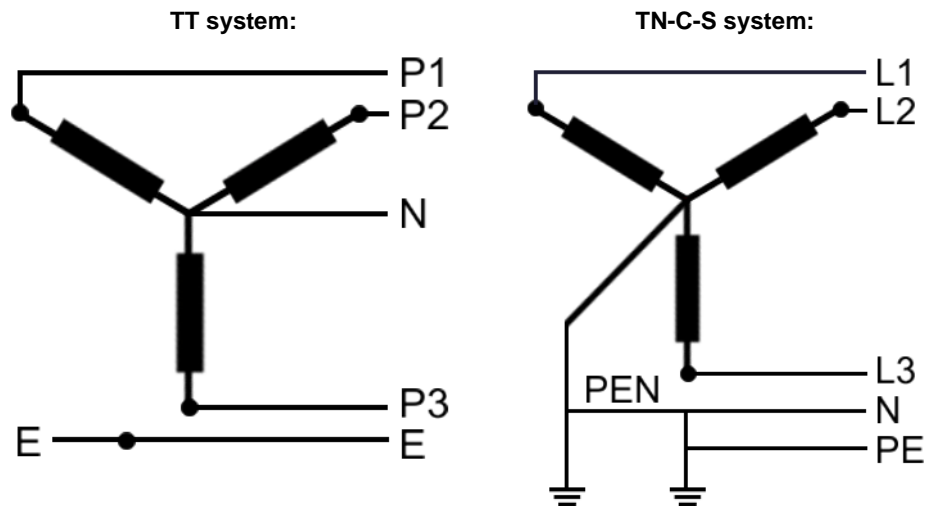


Fig. 6: Network topography of three-phase four-wire systems with an earthed neutral conductor

#### Voltage variant 3 x 220 V

Centrifuges with this voltage variant come supplied without a connector.

- To use these centrifuges, a suitable plug-in type connection must be installed (not included).

The plug-in type connection must be rated in line with the power rating of the centrifuge and be suitable for the mains power supply.

For the connection of the plug-in type connection, the relevant local standards (e.g. regulations, standards) must be complied with.

The centrifuge must only be used in a three-phase three-wire system (not earthed) with a phase line voltage of 220 V.

## 4 Set-up and connection

Local low-voltage grids that do not provide a phase line voltage of 220 V must be adapted accordingly, e.g. by way of a transformer. This transformer must be rated in line with the performance data of the centrifuge. Compliance with the local standards (e.g. laws, standards) is mandatory.

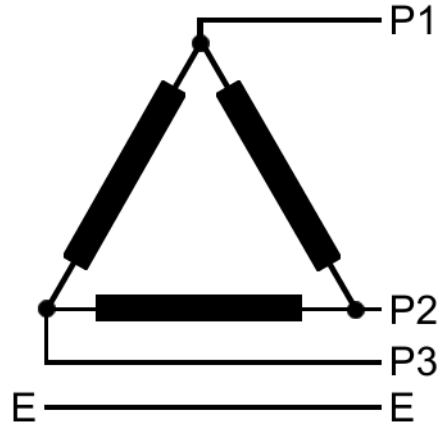


Fig. 7: Network topography of three-phase three-wire systems (not earthed)

### 4.1.2.2 Customer-provided fuses

The centrifuge must be protected with customer-provided fuses/circuit breakers as follows:

- Version 3 x 400 V, 16 A: 16 A circuit breaker of class B or C
- Version 3 x 220 V, 32 A: 32 A circuit breaker of class D or K



To ensure safe disconnection in the event of a fault, an AC/DC-sensitive RCD (residual current device) must be integrated in the wiring system of the building.

### 4.1.2.3 Power isolating device

The electrical installation of the building must include a power isolating device in the form of a switch or circuit breaker. This device must be located near the centrifuge. Furthermore, it must be easily accessible for the operator and marked as the power isolating device for the centrifuge.

## 4 Set-up and connection

### 4.1.3 Special equipment: water cooling system

Centrifuges with water cooling are equipped with a special refrigeration unit with a refrigerant (CFC-free), modified electronic system, and a special software version. The housing of the GMP version is completely closed. All of the other units have vent slots for the motor and electronic power system.

#### Operating conditions

- The centrifuge must only be operated with media-neutral water of drinking water quality (hardness <8) or with another suitable refrigerant. We recommend using a filter (to be provided by the customer).
- The operating pressure of the water must be between 1.5 and 5 bar. We recommend using a pressure reducer (to be provided by the customer).
- The maximum flow rate depends on the operating conditions (e.g. speed and rotor temperature). The minimum cooling water consumption at maximum power is approximately 5 l/min.

At a standstill, the water supply is stopped by a solenoid valve. In the case of the GMP version, the valve is opened in two steps:

1. reduced flow, only for the internal air cooler
  2. unlimited flow, when the compressors are running.
- The maximum temperature at the water inlet is 20°C. The lower the water temperature, the more efficient the cooling.
  - The centrifuge is equipped with a ¾-inch water connector.

- 1 Connector for the cooling water inlet
- 2 Connector for the cooling water outlet



Fig. 8: Connections for the water cooling system

## 4.2 Set-up and alignment of the centrifuge


**DANGER**

The centrifuge must not be connected to the power supply during its set-up and alignment.

Prior to performing any work, disconnect the mains power plug and secure it so that it cannot be reconnected by mistake (e.g. by way of a warning sign)!


**DANGER**

To perform these tasks, the front door must be opened. Only specialised personnel are authorised to perform these tasks.


**NOTE**

See the set-up drawing (see chapter 5.1 - "Layout plan")!

### 4.2.1 Removal of the transport safety device

The centrifuge is equipped with a transport safety device (transport lock) to prevent excessive vibrations of the drive during transport. The transport safety device (transport lock) is fastened to the drive by way of three M8 hexagon screws.


**DANGER**

To perform these tasks, the front door must be opened and the power module must be moved. Only qualified electricians are authorised to perform these tasks.


**DANGER**

The centrifuge must not be connected to the power supply when the transport safety device (transport lock) is being removed.

Prior to performing any work, disconnect the mains power plug and secure it so that it cannot be reconnected by mistake (e.g. by way of a warning sign)!


**NOTE**

Be careful when working on electronic components. Suitable ESD protection measures must be taken!


**CAUTION**

Ensure to remove the transport safety device (transport lock) prior to using the centrifuge for the first time. Otherwise, it will disable the motor bearing!

- Open the front door by turning the locking mechanism clockwise through 90° by way of the supplied square spanner (ref. no. 930 114).

## 4 Set-up and connection

- Remove the RS232 connecting cable between the processor board and power module from the cable holder on the inside of the front door (see the following illustration).

- 1 RS232 connecting cable
- 2 Cable holder

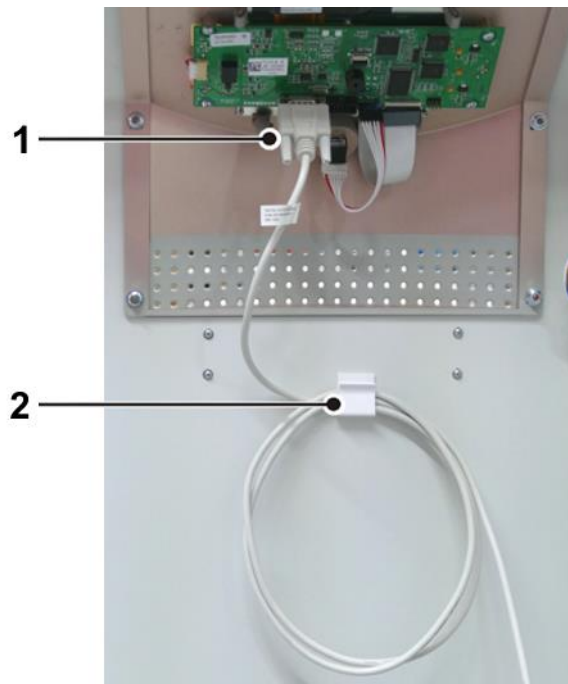


Fig. 9: Cable holder on the inside of the front door

- Loosen the fastening screw in the lower left area of the power module. The power module can then be swung out of the way to the right.



Fig. 10: Position of the screw for loosening the power module



#### 4 Set-up and connection

The transport safety device (transport lock) (see the following picture) is fastened to the drive and base plate by way of three hexagon screws.

- 1 Transport safety device (transport lock)

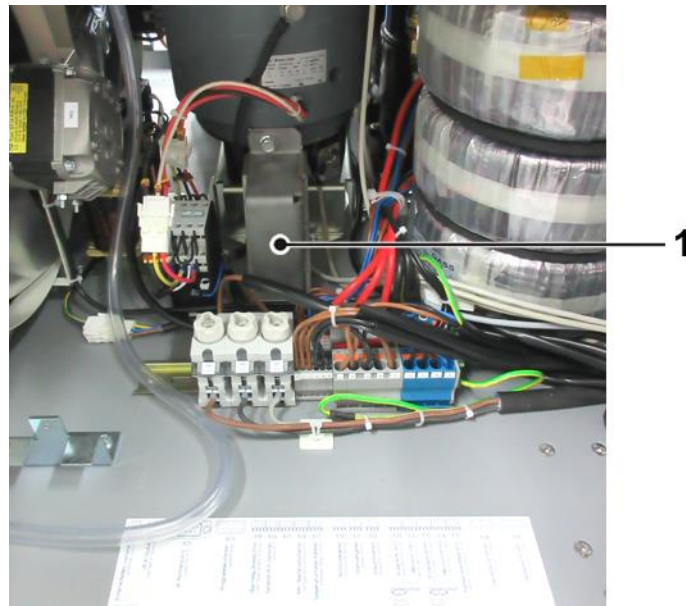


Fig 11: Transport safety device (transport lock) in its installed state

- Remove the hexagon screws by way of a suitable tool (e.g. an AF 13 open-ended spanner, part no. 930015, included in the scope of supply) or, alternatively with a reversible AF 13 ratchet wrench with an extension).

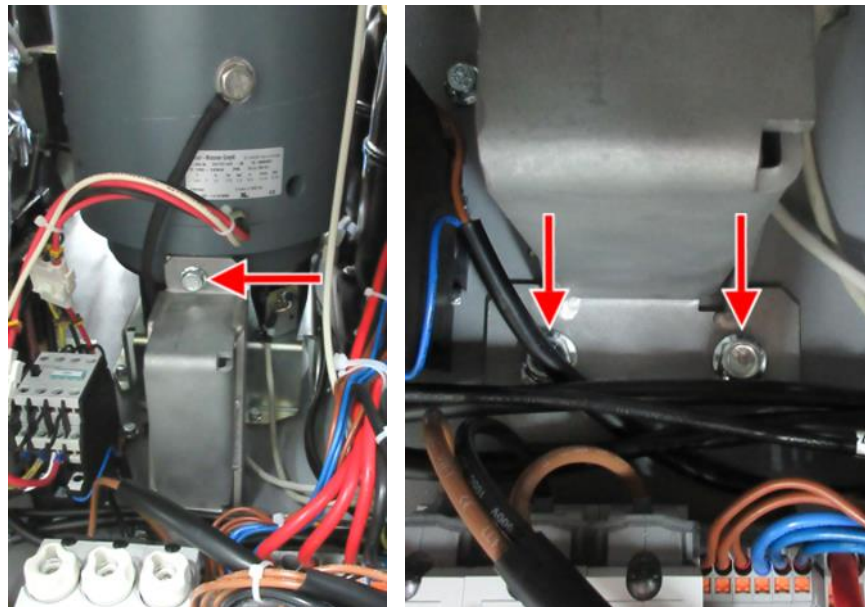


Fig. 12: Position of the fastening screws of the transport safety device (transport lock)

#### 4 Set-up and connection

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- Remove the transport safety device (transport lock) and retain it in case the centrifuge needs to be returned to the manufacturer.

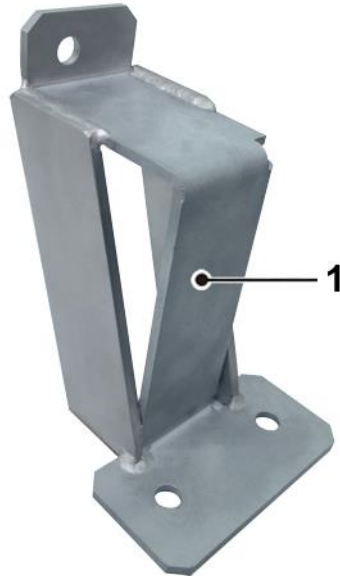


Fig. 13: Transport safety device (transport lock), removed

- 8KS GMP variant: Seal the two openings in the base plate by way of the screws.
- Swing the power module back and secure it in place by way of the hexagon socket head screw.
- Wind up the RS232 cable and push it into the cable holder on the inside of the front door.
- Close the front door.

**4.2.2 Set-up**

- Transport the centrifuge as closely as possible to the installation site with a lifting device (e.g. forklift).
- Set the centrifuge down.
- To place the centrifuge on the castors, open the front door with the supplied square spanner (part no. 930 114) by turning it clockwise by 90°. Open the front door to the left in order to access the two locking screws located at the front.
- Loosen the two hexagon lock nuts with the open spanner, size 24 (part no. 930 024), and screw in the locking screws with the open spanner, size 10/13 (part no. 930015), in the anticlockwise direction up to the stop until the adjustment feet are completely relieved of the load.
- Loosen the lock nuts of the two locking screws on the back from the side and from below with the open spanner, size 24 (part no. 930 024). Then, screw in the locking screws anticlockwise with the open spanner, size 10/13 (part no. 930 015), until the adjustment feet are completely relieved of the load.
- Transport the centrifuge on the castors to the installation site.

**CAUTION**

Do not use the lid handle to move the centrifuge because it could break off!

**CAUTION**

The castors of the centrifuge are made of steel without any plastic coating. Damage to the surface of the floor cannot be excluded.

**4.2.3 Alignment****DANGER**

For reasons of safety, the centrifuge must not be operated while it is set up on its castors!

**NOTE**

The centrifuge must be set-up stably and horizontally at the installation site.

- Set the centrifuge on its adjustable feet (see chapter 4.2.2 - "Set-up" in reverse order). To do so, turn all of the feet clockwise by hand until they touch the ground. Then, perform approximately two more clockwise turns with the open spanner until the castors are suspended in the air.

## 4 Set-up and connection

- Open the lid with the emergency lid release system. To do so, lift off the plugs on the left side (e.g. with a screwdriver) and unlock the lid locks by turning them clockwise with the supplied square spanner .
- Align the centrifuge with a spirit level in two directions.
- Tighten the four lock nuts and close the front door.
- Plug in the mains power plug.

- 1 Locking screw
- 2 Lock nut

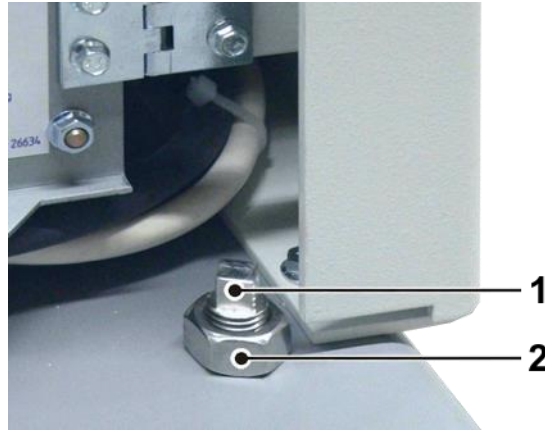


Fig. 14: Alignment at the front

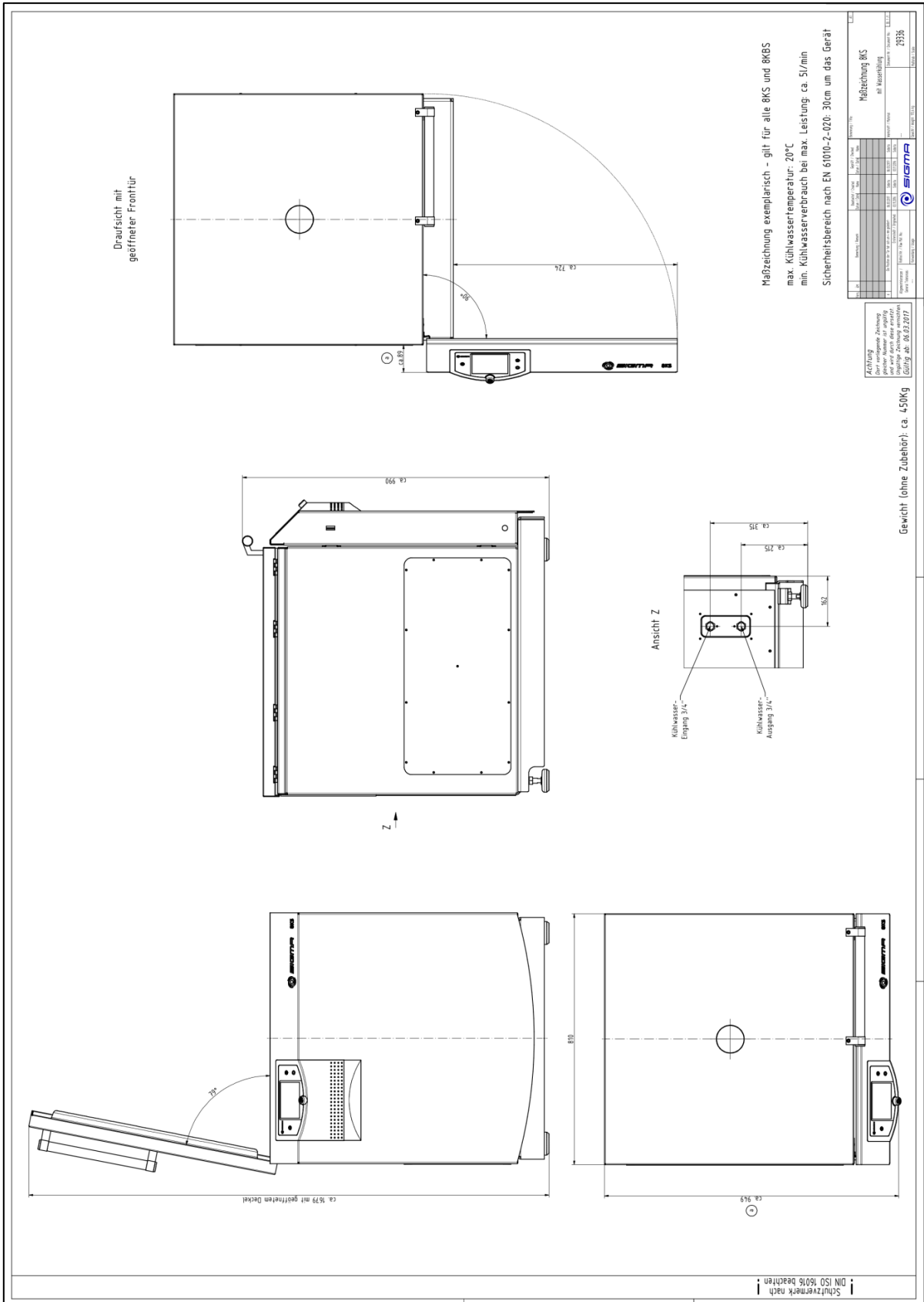
- 3 Adjusting foot
- 4 Castor



Fig. 15: Alignment at the back

# 5 Appendix

## 5.1 Layout plan



## 5 Appendix

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