

# Rittal – The System.

Faster – better – everywhere.

## Enclosure cooling unit with refrigerant R-1234yf



SK 3478800  
SK 3478801  
SK 3479800  
SK 3479801  
SK 3480800  
SK 3484800  
SK 3484840

## Assembly and operating instructions

ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

IT INFRASTRUCTURE

SOFTWARE & SERVICES

FRIEDHELM LOH GROUP



# Preface

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## **Preface**

Dear Customer!

Thank you for choosing a "Blue e+" enclosure cooling unit (referred to hereafter as "cooling unit") from Rittal.

Yours  
Rittal GmbH & Co. KG

Rittal GmbH & Co. KG  
Auf dem Stützelberg

35745 Herborn  
Germany

Phone: +49(0)2772 505-0  
Fax: +49(0)2772 505-2319

E-mail: [info@rittal.de](mailto:info@rittal.de)  
[www.rittal.com](http://www.rittal.com)  
[www.rittal.de](http://www.rittal.de)

We are always happy to answer any technical questions regarding our entire range of products.

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## 1 Notes on documentation

### 1.1 CE labelling

Rittal GmbH & Co. KG confirms the conformity of the cooling unit with the European Union's Machinery Directive 2006/42/EC and EMC Directive 2014/30/EU. A simplified declaration of conformity can be found in the assembly and installation instructions enclosed with the device (see also the Rittal website). These are the original operating instructions.

The built-in passive NFC functionality operates at 13.56 MHz (HF). The reflected field strength depends on the active reader unit. The interface is designed for operation with reader units compliant with EN 300330 (HF).



### 1.2 Storing the documents

The assembly and operating instructions as well as all other applicable documents are an integral part of the product. They must be issued to everyone who works with the unit and must always be available and on hand for operating and maintenance personnel.

### 1.3 Symbols used in these operating instructions

The following symbols are used in this documentation:



**Warning!**

**A dangerous situation which may cause death or serious injury if the instructions are not followed.**



**Caution!**

**A dangerous situation which may lead to (minor) injuries if the instructions are not followed.**



**Note:**

Important notices and indication of situations which may result in material damage.

- This symbol indicates an "action point" and shows that you should perform an operation or procedure.

### 1.4 Other applicable documents

Paper copies of the assembly and operating instructions are available for the unit types described here and are enclosed with the equipment.

We cannot accept any liability for damage associated with failure to observe these instructions.

- Please also observe the instructions for any accessories used.

## 2 Safety instructions

### 2.1 General safety instructions

Please observe the following general safety instructions for the installation and operation of the system:

- Always wear the required personal safety equipment when working on this device. As a bare minimum, this should comprise ear defenders, safety shoes and protective gloves.
- Before removing the hood, allow the unit to cool for at least 10 minutes to eliminate the risk of burns from hot surfaces.
- Please do not make any changes to the cooling unit that are not described in these operating instructions or other applicable assembly and operating instructions.
- Note that refrigerants are odourless. In particular, in case refrigerant is unintentionally released, please keep the workplace well-ventilated to avoid inhaling large quantities of refrigerant.
- To avoid damaging the pipes or heat exchanger, do not use sharp objects when working on the unit.
- The unit must not be drilled or burnt.
- The accumulation of flammable substances inside the unit must be avoided.
- All persons working on the refrigerant circuit must have a certificate of competence from an industry-accredited body that demonstrates their competence in the safe handling of refrigerants using an accepted industry procedure. The work must be performed in accordance with Rittal specifications.
- Only objects approved by Rittal may be used to accelerate the defrosting process.
- When the unit is decommissioned, it must be labelled with the decommissioning date together with a note stating it is filled with flammable refrigerant.
- Please refer to the additional information provided in the document "Supplement to the assembly, installation and operating instructions for devices containing flammable refrigerants to UL 60335-2-40 Annex DD" available on the Rittal website.



- Sticker on the packaging: Flammable, warning of flammable materials



- Sticker near the rating plate: Low flammability (A2L), warning of flammable materials



- Other than these general safety instructions, it is also vital to observe the specific safety instructions when carrying out the tasks described in the following chapters.

### 2.2 Safety instructions for transportation

- The unit may only be shipped as a package.
- Keep the unit aligned with the markings on the packaging throughout transport.
- Use a sufficiently large pallet to prevent it tipping over.
- Please observe the maximum permissible weight to be lifted by one person. Use suitable lifting devices, if needed.
- Shipping braces (such as a structure made from square timbers or boards) must be used when transporting cooling units already mounted on the enclosure. These braces support the cooling unit and prevent it from slipping in case of impact.
- If the cooling unit has been mounted on a door, close the door and keep it closed during transportation.

### 2.3 Safety instructions for assembly

- Ensure that the cooling unit is only installed in a dry condition and in a dry environment.
- To achieve a secure seal against water ingress from outside, the gasket included in the scope of supply must be fitted to seal the interface between the cooling unit and the enclosure in accordance with these instructions.
- When assembling the cooling unit, if possible, position it so no accidental contact can occur during operation.
- All ventilation openings of the cooling unit must be freely accessible after assembly and must not be blocked.
- During assembly, the cooling unit is at risk of dropping through the mounting cut-out.
- When dismantling, there is a risk that the unit could slip and fall. Ensure a secure grip, particularly with contaminated units.

### 2.4 Safety instructions for installation

- Please be sure to observe the applicable regulations governing electrical installations of the country in which the device is installed and operated as well as national regulations for accident prevention. Please also observe any internal company regulations, such as work, operating and safety regulations.
- The connection regulations of the appropriate power supply company are to be followed. Otherwise, there is risk of injury from electric shock if the connection to the unit is defective or connected incorrectly in any way.

## 2 Safety instructions

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- Do not strip too much insulation from the connection cable, otherwise the admissible clearance/creepage distances from the terminal point may not be met.
- The cooling unit must be connected to the mains via an all-pole disconnect to overvoltage category III (IEC 61058-1).
- Pin 4 on the signal connector should not be used. Otherwise, the admissible clearance/creepage distance between the alarm relay and door contact connections will not be met.
- The drill holes on the unit rear may be used only for assembling the IoT interface with the screws supplied with this unit. If longer screws are used, there is a risk of undershooting the clearance and creepage distances or electric shock.

### 2.5 Safety instructions for operation

- The operational safety of the cooling unit is only warranted if used as intended. The technical specifications and limit values stated must not be exceeded under any circumstances. In particular, this applies to the specified ambient temperature range and IP protection category.
- The products should only be combined and operated with the prescribed Rittal system accessories.
- Operating the cooling unit in direct contact with water, aggressive materials or inflammable gases and vapours is prohibited.

### 2.6 Safety instructions for maintenance

- The device must only be cleaned by trained specialists. De-energise the device prior to cleaning.
- Never use flammable liquids for cleaning.
- If assistance of other persons is required for maintenance and repair work, a person trained in handling flammable refrigerants should supervise the work at all times.

### 2.7 Operating and technical staff

- The assembly, installation, commissioning, maintenance and repair of this cooling unit may only be performed by qualified, trained personnel.
- Only properly instructed personnel may operate a cooling unit with the system operational.
- Children and persons with limited cognitive/coordinate abilities must **not** operate, maintain or clean the unit or be allowed to use it as a toy.

### 2.8 Other dangers when using the cooling unit

When installing the cooling unit (see section 5 "Installation"), there is a risk that the enclosure could become unbalanced and tip over.

- In such cases, the enclosure should be bolted to the floor as a precaution.

If the air inlet or outlet of the cooling unit is obstructed, there is a risk of air short-circuits, resulting in inadequate climate control.

- Please ensure that the electronic assemblies in the enclosure are installed in accordance with section 5.3.1 "Assembly instructions".
- Where applicable, use suitable components to divert the air.
- Please observe the prescribed minimum distances at the installation site as outlined in section 5.3.1 "Assembly instructions".

### 2.9 IT safety instructions

To ensure the availability, confidentiality and integrity of data, products, networks and systems must be protected against unauthorised access.

Such protection can be achieved only with organisational and technical measures. To satisfy the increased safety requirements, Rittal recommends the observance of the following measures. Furthermore, more detailed information can be found on the websites of Bundesamt für Sicherheit in der Informationstechnik (Federal Office for IT Security – BSI).

#### 2.9.1 Measures for products and systems Embed products and systems not in public networks.

- Make sure that the system is only operated in protected networks.

#### Configure the firewall

- To protect your networks, and the embedded products and systems against external effects, configure a firewall.
- Also deploy a firewall for segmentation of a network or to isolate a controller.

#### Consider defence-in-depth mechanisms during the planning phase

- Consider defence-in-depth mechanisms for your system planning.
- Defence-in-depth mechanisms cover several levels of mutually coordinated security measures.

#### Restrict access authorisations

- Restrict access authorisations to networks and systems to only persons that need an authorisation.

#### Protect accesses

- Do not use the default passwords; instead, use secure, long passwords containing numbers, a mix of upper case and lower case letters, symbols and no repetitions.
- Create random passwords with a password manager.

### **Deploy the current firmware version**

- Ensure that the current Rittal firmware is deployed on all devices.
- The firmware can be downloaded from the associated product pages in the Internet.
- Observe the associated Release Notes for new firmware versions.

### **Deploy current security software**

- To identify and eliminate security threats, such as viruses, trojans and other malicious software, security software should be installed on all PCs and kept up-to-date.
- Deploy whitelist tools to monitor the device context.
- Deploy an intrusion-detection system to validate the communication of your system.

### **Perform regular threat analyses**

- Rittal recommends that you perform regular threat analyses.
- The threat analyses allow you to determine whether your adopted measures are effective.

### **Protect USB ports against access**

- USB ports must be protected against physical access. Ensure that no unauthorised persons have access to USB ports.
- Sensitive data can be read for an unauthorised access to USB ports.

# 3 Product description

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## 3 Product description

### 3.1 Functional description and components

#### 3.1.1 Function

There are two separate cooling circuits installed in the cooling unit.

- One conventional refrigerant circuit (compression system), and
- One heat pipe integrated into the condenser and evaporator coil.

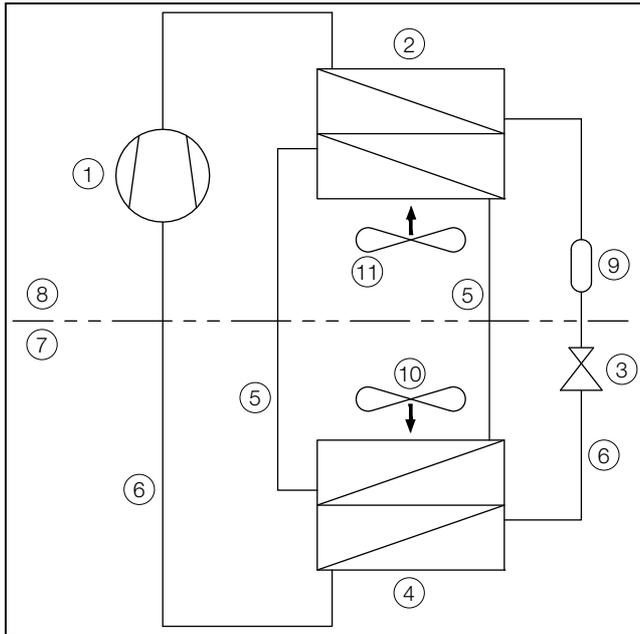


Fig. 1: Cooling circuit

#### Key

- 1 Compressor
- 2 Condenser (dual version)
- 3 Expansion valve
- 4 Evaporator coil (dual version)
- 5 Refrigerant circuit with heat pipe
- 6 Refrigerant circuit with compression system
- 7 Internal circuit
- 8 External circuit
- 9 Dryer/collector
- 10 Internal fan
- 11 External fan

In both cooling circuits, the individual components are connected with pipes in which the refrigerant is circulating. This refrigerant is very environmentally friendly, thanks to the following properties:

- Does not deplete the ozone layer (ozone destruction potential ODP = 0)

#### Refrigerant circuit with compression system

The refrigerant circuit with compression system is comprised of the following four main components:

1. Evaporator coil
2. Compressor
3. Condenser
4. Expansion valve

The evaporator coil fan draws hot air from the enclosure in the internal circuit of the cooling unit and passes it over the evaporator coil. After the evaporator coil, the cooled air is fed back into the enclosure via the outlet opening.

The air is cooled down by evaporating the refrigerant in the evaporator coil. The refrigerant vapour is transported by the compressor in the external circuit of the cooling unit to the condenser. There, the refrigerant condenses and becomes a liquid. The heat produced is dissipated by the condenser fan. The downstream electronic expansion valve reduces the high pressure of the refrigerant, and the refrigerant is then fed back into the evaporator coil.

Both the compressor and the two fans in the cooling unit are activated via an inverter. This makes it possible to control these components, so that the fan and compressor may be activated for a longer time but at a lower output and improved efficiency.

#### Refrigerant circuit with heat pipe

The additional second refrigerant circuit operates without a compressor, expansion valve or other control elements, and is integrated into the evaporator coil and condenser as a heat pipe.

The refrigerant inside the heat pipe absorbs thermal energy from the intake of enclosure air and evaporates. The gaseous refrigerant then rises through the pipeline until it reaches the condenser. The refrigerant is cooled down again in the condenser (provided  $T_u < T_i$ ), and the heat released is emitted into the environment. Gravity then causes the liquid refrigerant to flow back down the pipelines. The whole cycle begins again.

## 3.1.2 Components

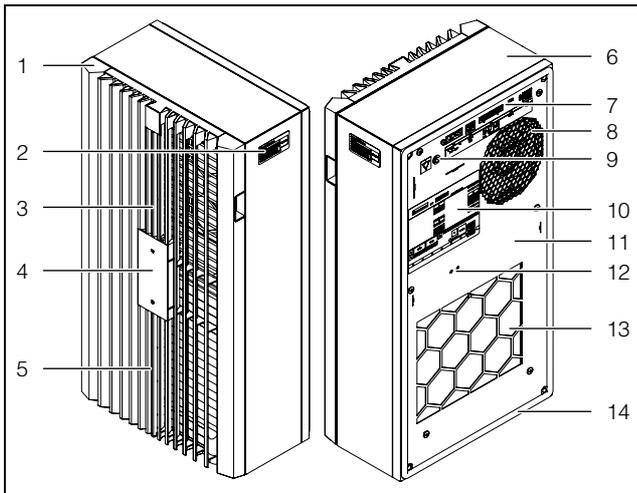


Fig. 2: Main components of cooling unit (SK 347880x/ SK 347980x/SK 3480800)

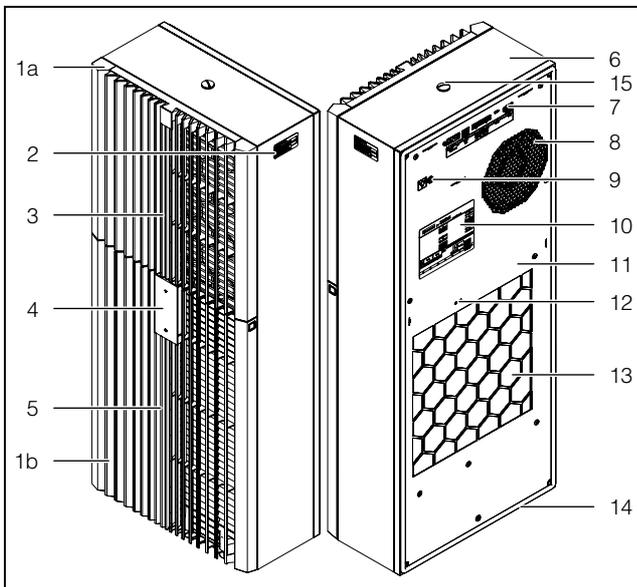


Fig. 3: Main components of cooling unit (SK 34848x0)

### Key fig. 2 and fig. 3

- 1 Louvred grille
- 1a Top louvred grille
- 1b Bottom louvred grille
- 2 Service label
- 3 Air outlet, outside
- 4 Display including NFC interface
- 5 Air inlet, outside
- 6 Cover
- 7 Electrical connections and interfaces
- 8 Air inlet, inside
- 9 Mounting point, potential equalisation
- 10 Rating plate
- 11 Rear panel
- 12 Mounting point, IoT interface
- 13 Air outlet, inside
- 14 Foamed-in seal
- 15 Thread for eyebolt

## 3.1.3 Control

Rittal enclosure cooling units are fitted with a controller for setting the functions of the cooling unit.

Operation using this controller is described in section 7 "Operation".

## 3.1.4 Safety devices

- The cooling units are equipped with various features to prevent inadmissible pressure increases in the cooling cycle. If an unusually high pressure nevertheless occurs, the compressor may be temporarily and automatically deactivated via a safety device. Once the pressure drops back below the admissible pressure, the unit will automatically resume operation.
- Temperature monitoring prevents the evaporator coil from icing over. If there is a risk of icing, the compressor switches itself off and automatically switches itself back on again at higher temperatures.
- The compressor is monitored and protected by the inverter to prevent overloading.
- The fans have a built-in overload protection with automatic reset.
- In order to allow a reduction of pressure inside the compressor and hence a safe restart, once it has been switched off (e.g. upon reaching the set temperature via the door limit switch function or via de-energising), the device will switch back on with a delay of 180 seconds.
- The device has a floating contact on the connection pins on terminals 2 and 3 of the signal connector (X3), via which system messages from the device may be polled, e.g. using a PLC.

## 3.1.5 Condensation

At high levels of humidity and low temperatures inside the enclosure, condensate water may form on the evaporator coil.

All cooling units except SK 3478801 and SK 3479801 have automatic electric condensate evaporation. The thermal component used for this purpose is based on self-regulating PTC technology. Condensate water arising on the evaporator coil is collected in a tank in the external circuit of the cooling unit, and partially evaporated via the airflow. When the water level rises, the water enters the PTC thermal component and is evaporated (through-flow heater principle). The water vapour streams out of the cooling unit with the airflow from the external fan.

If there is a short-circuit in the PTC element, the separate PTC fuse will trip and the condensate can be drained off via the safety overflow.

The condensate is routed out of the unit via the evaporator tray overflow. For this purpose, a hose may be connected to the condensate nozzle (see section 5.3.6 "Connect the condensate water discharge").

## 3 Product description

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### 3.1.6 Filter mats

The entire cooling unit condenser is covered with a dirt-repelling, easy-to-clean hydrophobic RiNano coating. In many applications, therefore, the use of filter media is unnecessary, particularly with dry dusts.

For dry, coarse dust and lint in the ambient air, we recommend installing an additional PU foam filter mat (available as an accessory) in the cooling unit. Depending on the incidence of dust, you will need to replace the filter mat from time to time (see section 7.5.2 "Configuration").

For oily ambient air, we recommend the use of metal filters (also available as an accessory). These may be cleaned with suitable detergents and reused.

### 3.1.7 Door limit switch

The cooling unit may be operated with a floating door limit switch connected. The door limit switch is available as accessory from Rittal.

The door limit switch function causes the fans and the compressor in the cooling unit to gradually slow down and then switch off after approximately 15 seconds when the enclosure door is opened (contacts 5 and 6 closed). This prevents the formation of condensate water inside the enclosure while the enclosure door is open. In order to prevent damage to the unit, it is equipped with an ON delay: The evaporator fan will cut in again after a delay of a few seconds on closure of the door.

Please note that no external voltage may be applied to the door contacts (connection clamps 5 and 6).

## 3.2 Intended use, foreseeable misuse

The cooling unit is intended exclusively for cooling closed control cabinets as well as for professional use. Any other use is not permitted.

The cooling unit is intended for indoor and semi-outdoor use as standard. Semi-outdoor use is defined as follows:

- Siting in a roofed outdoor area.  
The cooling unit is protected from the direct impacts of weather conditions such as precipitation or permanent sunlight.
- Always use within the admissible temperature range.
- The device is secure from unauthorized public access.

The unit must not be installed and operated in locations which are accessible to the general public.

The unit is designed solely for stationary use.

The cooling unit must not be used in environments with conductive, flammable and explosive dusts.

These include:

- Graphite dusts
- Metal dusts
- Cereal dusts
- Wood dusts
- Textile fibres and lint

The cooling unit is state of the art and built according to recognised safety regulations. Nevertheless, improper use can pose a threat to the life and limb of the user or third parties, or result in possible damage to the system and other property.

Consequently, the cooling unit must only be used properly and in a technically sound condition! Any malfunctions which impair safety should be rectified immediately.

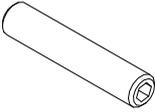
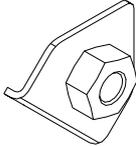
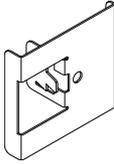
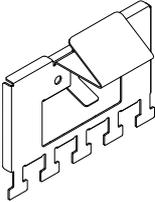
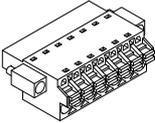
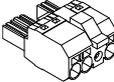
Proper use also includes the observance of the documentation provided, and compliance with the inspection and maintenance conditions.

Rittal GmbH & Co. KG is not liable for any damage which may result from failure to comply with the documentation provided. The same applies to failure to comply with the valid documentation for any accessories used.

Inappropriate use may be dangerous. Examples of inappropriate use include:

- Use of the cooling unit over long periods with the enclosure open.
- Use of impermissible tools.
- Improper operation.
- Improper rectification of malfunctions.
- Use of accessories not approved by Rittal GmbH & Co. KG.

## 3.3 Supply includes

Description	Illustration	SK 347880x SK 347980x SK 3480800	SK 3484800 SK 3484840
Enclosure cooling unit			1x
Shipping bag with			1x
– Assembly and installation instructions			1x
– Grub screw M8x40			4x
– Corner bracket with M8 nut			4x
– Spring clip			2x
– Locator clip with cable fastening		1x	2x
– Signal connector			1x
– Power plug			1x
– Sealing tape 10x10 mm for installation		1x 1.74 m	1x 2.7 m

Tab. 1: Supply includes

# 4 Transport and handling

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## 4 Transport and handling

### 4.1 Delivery

The cooling unit is supplied in one packaging unit.

- Check the packaging carefully for signs of damage. Traces of oil on damaged packaging indicate a loss of refrigerant and/or a leak in the cooling unit. Any packaging damage may be the cause of a subsequent functional failure.

### 4.2 Unpacking

- Remove the packaging materials from the cooling unit.



Note:

After unpacking, the packaging materials must be disposed of in an environmentally friendly way.

- Check the cooling unit for any damage that may have occurred during transport.



Note:

Damage and other faults, e.g. incomplete delivery, should be reported immediately, in writing, to the shipping company and to Rittal GmbH & Co. KG.

- Check the supply contents for completeness (see section 3.3 "Supply includes").

### 4.3 Transport

Cooling unit types SK 347880x/SK 347980x/SK 3480800 weigh up to 16 kg. Cooling unit types SK 34848x0 weigh up to 27 kg.



**Caution!**

**Please note the maximum weights that may be lifted by individuals. It may be necessary to use lifting gear.**

An M12 thread is provided on top of the cover on unit types SK 34848x0 for screw-fastening a Rittal eyebolt (e.g. belonging to an enclosure). The cooling unit is readily transported with the aid of lifting gear and an indoor crane.



Note:

An eyebolt with M12 thread may be ordered as an accessory from Rittal (see section 13 "Accessories").

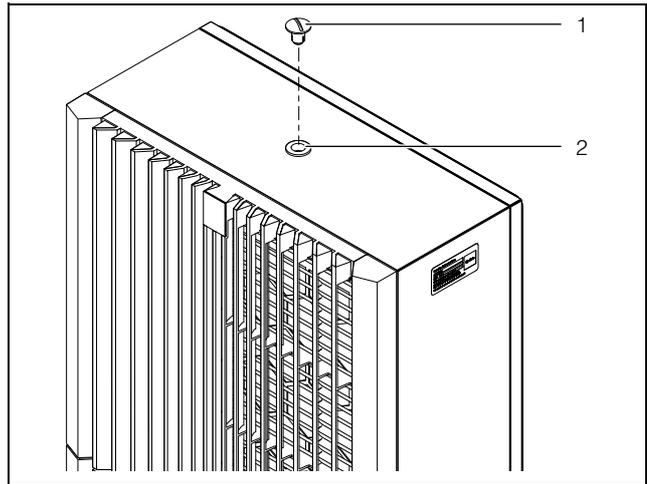


Fig. 4: Thread for eyebolt on top of the cover (only unit type SK 34848x0)

#### Key

- 1 Cover
- 2 M12 thread

- Before transporting by crane, please ensure that the lifting gear and crane have sufficient load capacity to transport the cooling unit safely.
- Never allow anyone to stand beneath a suspended load, even for a short time, during transportation by crane.
- Protect the lifting gear on the crane hook from load deflection, because the load's centre of gravity may be off-centre.
- First position the cooling unit close to the installation site and protect from accidentally being knocked over.

#### Transport of a fitted cooling unit

- Shipping braces (such as a structure made from square timbers or boards) must be used when transporting cooling units already mounted on the enclosure – fig. 5 and fig. 6). These braces support the cooling unit and prevent it from slipping in case of impact. To prevent paint abrasion, please place bubble wrap or similar between the square timbers and the cooling unit.
- Use a sufficiently large pallet to prevent it tipping over.
- If the cooling unit has been mounted on a door, close the door and keep it closed during transportation.

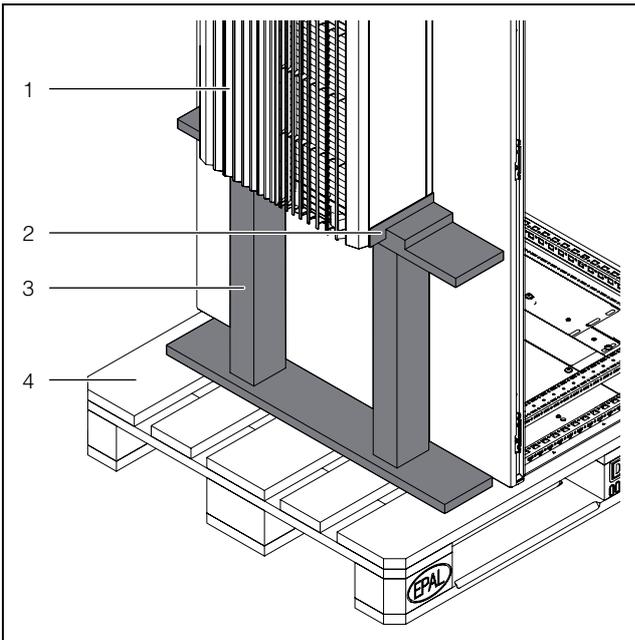


Fig. 5: External mounting of the shipping braces

**Key**

- 1 Fitted cooling unit
- 2 Bubble wrap
- 3 Supporting structure
- 4 Pallet underneath the cooling unit

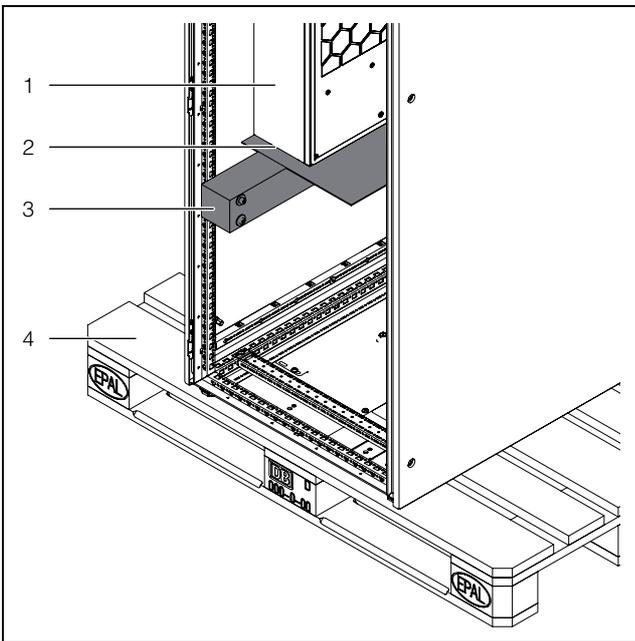


Fig. 6: Internal mounting of the shipping braces

**Key**

- 1 Fitted cooling unit
- 2 Bubble wrap
- 3 Supporting structure
- 4 Pallet underneath the cooling unit

## 5 Installation

### 5.1 Safety instructions

- Work on electrical systems or equipment may only be carried out by an electrician or by trained personnel under the guidance and supervision of an electrician. All work must be carried out in accordance with electrical engineering regulations.
  - The cooling unit may only be connected after the aforementioned personnel have read this information!
  - Use only insulated tools.
  - Follow the connection regulations of the appropriate electrical supply company. Otherwise, there is risk of injury from electric shock if the connection to the unit is defective or connected incorrectly in any way.
  - The cooling unit must be connected to the mains via an all-pole disconnecting device to overvoltage category III (IEC 61058).
  - Do not strip too much insulation from the connection cable, otherwise the admissible clearance/creepage distances from the terminal point may not be met.
  - Pin 4 on the signal connector should not be used. Otherwise, the admissible clearance/creepage distance between the alarm relay and door contact connections will not be met.
  - The cooling unit is not de-energised until all of the voltage sources have been disconnected!
  - Do not assemble and re-activate the device until it is completely dry.
- Please note the maximum weights that may be lifted by individuals. It may be necessary to use lifting gear.
  - During assembly, the cooling unit is at risk of dropping through the mounting cut-out.
  - Always wear the required personal safety equipment when working on this device.
  - Please be sure to observe the applicable regulations governing electrical installations of the country in which the device is installed and operated as well as national regulations for accident prevention. Please also observe any internal company regulations, such as work, operating and safety regulations.
  - The technical specifications and limit values stated must not be exceeded under any circumstances. In particular, this applies to the specified ambient temperature range and IP protection category.

### 5.2 Siting location requirements

- When choosing the installation site for the enclosure, please observe the following:
- The site for the enclosure, and hence the positioning of the cooling unit, must be carefully selected so as to ensure good ventilation (distance between cooling units at least 200 mm, distance from wall see distance "y" in fig. 7 or tab. 2).
  - The cooling unit must be installed and operated with a maximum deviation of 2° from the vertical.

- The installation site must be free from excessive dirt, aggressive ambient conditions and moisture.
- The ambient temperature must not exceed 60 °C.
- It must be possible to fit a condensate water discharge (see section 5.3.6 "Connect the condensate water discharge").
- The mains connection data as stated on the rating plate of the cooling unit must be guaranteed.

### Electromagnetic interference (EMI)

- Interfering electrical installations (high frequency) must be avoided.
- Signal cables must be laid separately from live cables.

### 5.3 Assembly procedure

#### 5.3.1 Assembly instructions

- Before starting assembly, please ensure that the following tools are available:
  - Allen key SW4
  - Open-end spanner SW13
  - Phillips-head screwdriver
- Before assembling, please ensure that the enclosure is sealed on all sides (IP 54). Increased condensation will occur later during operation if the enclosure is not airtight.
- If applicable, additionally fit a door limit switch (such as 4127010) to the enclosure which switches off the cooling unit when the enclosure door is opened to prevent excessive condensation (see section 3.1.7 "Door limit switch").
- Please ensure that the electronic assemblies in the enclosure allow the even circulation of air.
- Measure the distance "x" (fig. 7) from electronic components and other installed equipment inside the enclosure so that the required air circulation is not obstructed.

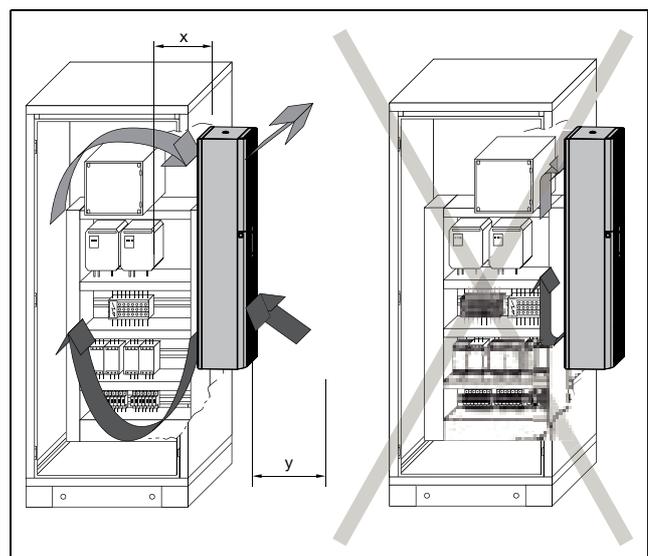


Fig. 7: Air circulation inside the enclosure

Model No.	Dimensions x and y [mm]
SK 347880x	100
SK 347980x	125
SK 3480800	155
SK 34848x0	125

Tab. 2: Dimensions "x" and "y"

- Under no circumstances should the air inlet and outlet openings of the cooling unit be obstructed. Only in this way is it possible to ensure that the maximum cooling output is available.
- Please ensure that the cold airflow from the cooling unit is not directed at active components.

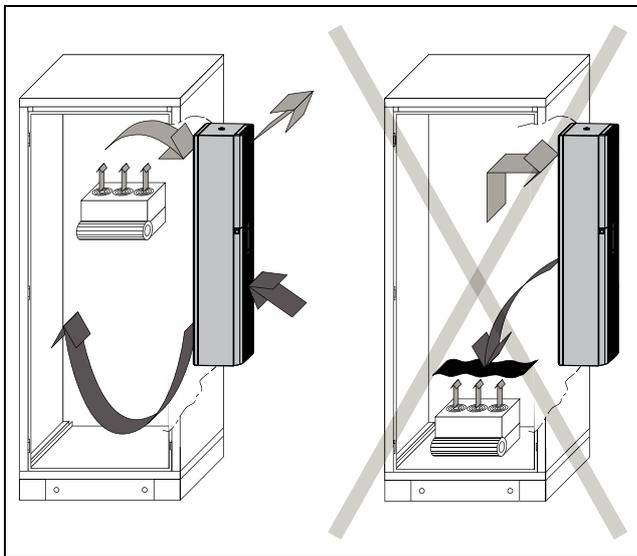


Fig. 8: Never direct the cold airflow at active components (example illustration)

- If appropriate, install components to divert the air.
- When installing in a dismantled door or side panel, please ensure that it cannot fall over when installing the cooling unit in the mounting cut-out.



**Note:**

The pictures in this chapter illustrate the installation of the cooling unit in an enclosure door. Installation in a side panel is carried out in the same way.

### 5.3.2 Mounting options

Essentially, there are two options for fitting the cooling unit on an enclosure door or side panel.

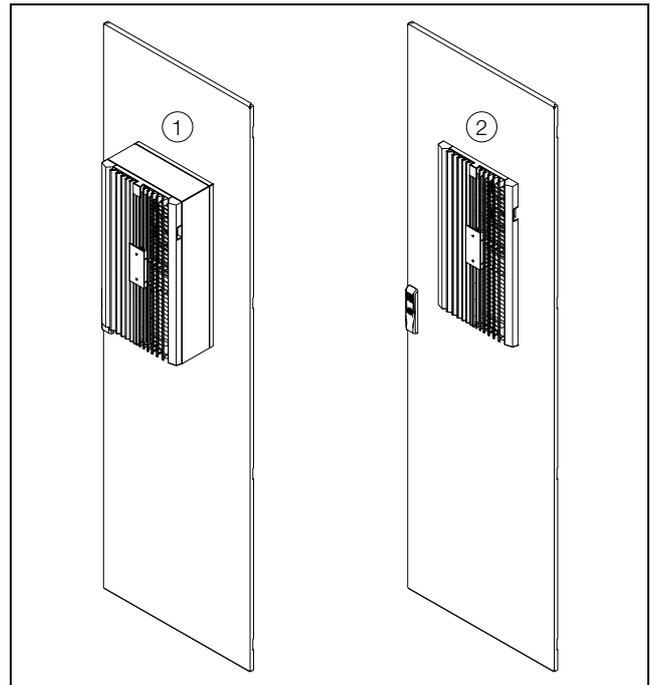


Fig. 9: Mounting options (example illustration)

**Key**

- 1 External mounting
- 2 Internal mounting

- External mounting: All of the cooling unit is outside the enclosure.
- Internal mounting: All of the cooling unit is inside the enclosure. Only the louvred grilles project on the outside.

Your chosen installation option will ultimately depend on how much space you require inside and outside of the enclosure. The various mounting options have no influence on the cooling output of the cooling unit, which remains the same in all cases.

- If there are a large number of components installed **inside the enclosure**, external mounting of the cooling unit may be appropriate. In such cases, the space inside the enclosure may be insufficient for internal mounting, or it may not be possible to guarantee adequate cooling of all components inside the enclosure.
- If the space **surrounding the enclosure** is limited, internal mounting may be appropriate to keep essential escape routes clear.

### 5.3.3 Make a mounting cut-out in the enclosure

In order to mount the cooling unit on the enclosure, a suitable mounting cut-out must be made in the door or side panel of the enclosure.



**Note:**

The dimensions of the mounting cut-outs can be found in section 12.1 "Representation of mounting cut-outs".

# 5 Installation

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- Using the diagrams in section 12.1 "Representation of mounting cut-outs", calculate the required dimensions for your mounting cut-out.
- Make the required mounting cut-out.
- Carefully deburr the cut-out to prevent injuries caused by sharp edges.



**Caution!**

**There is a risk of injury on sharp cut-outs which have not been properly deburred, especially while mounting the cooling unit.**

### 5.3.4 External mounting of the cooling unit



**Note:**

In these instructions, we have only provided images of units SK 34848x0 in cases where assembly deviates from the illustration given.

- Screw two grub screws into the blind rivet nuts in the corners at the bottom rear of the cooling unit (torque = 5 Nm).

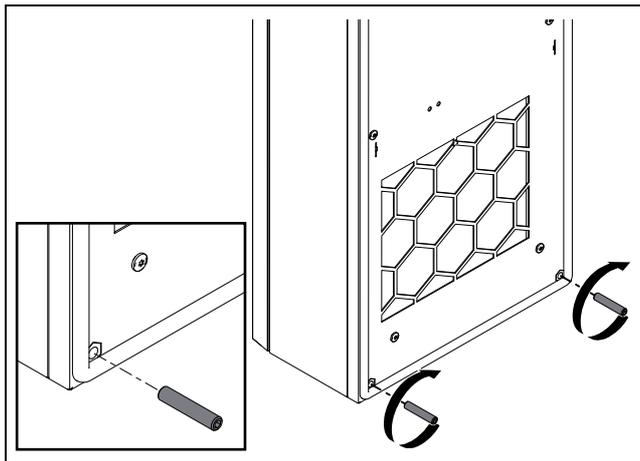


Fig. 10: Screw the lower grub screws into place

- For SK 347880x, SK 347980x and SK 3480800: Insert a locator clip at the top left so that it latches securely home into the cooling unit.

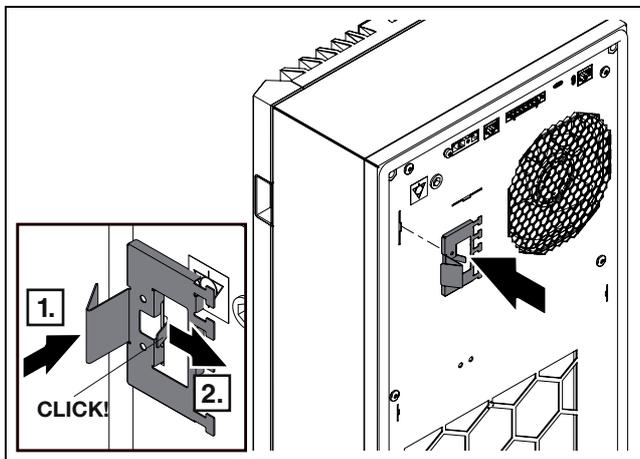


Fig. 11: Insert the locator clip (for SK 347880x, SK 347980x and SK 3480800)

- For SK 34848x0: Insert two locator clips at the top so that they latch securely home into the cooling unit.

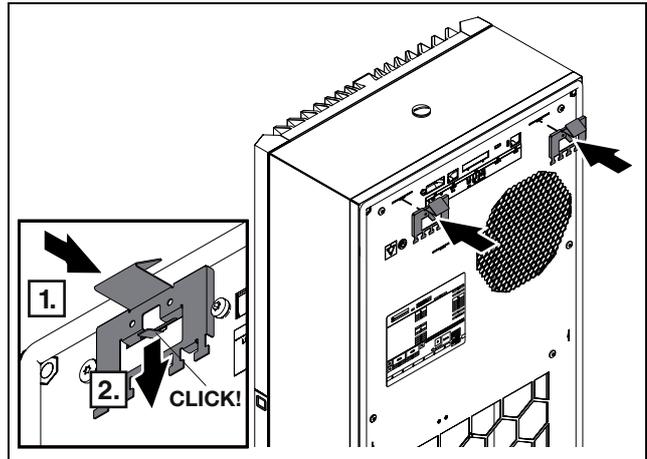


Fig. 12: Inserting the locator clips (for SK 34848x0)

These clips will prevent the cooling unit from falling out of the mounting cut-out later on before it is properly secured using the corner brackets with nuts.



**Note:**

In the subsequent step, take care to ensure that the cooling unit only rests on the grub screws, never on the seal, otherwise the seal could become damaged.

- Lift up the cooling unit, and initially set it down with the two outside lower grub screws resting on the enclosure door or side panel.

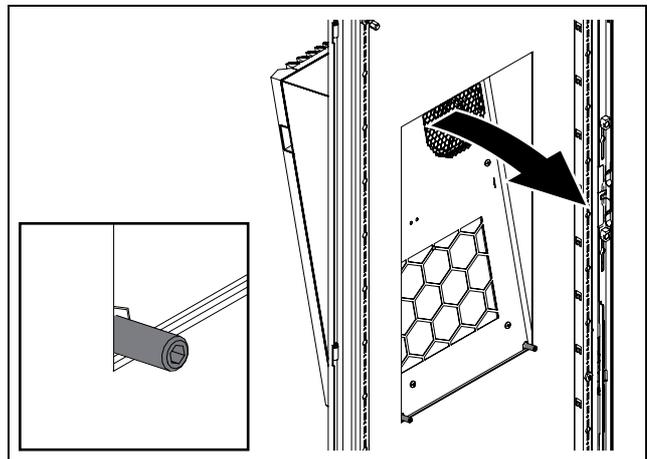


Fig. 13: Position the cooling unit and push it home

- For SK 347880x, SK 347980x and SK 3480800: Push the cooling unit into the mounting cut-out at the top until the clip behind the cut-out audibly latches home.

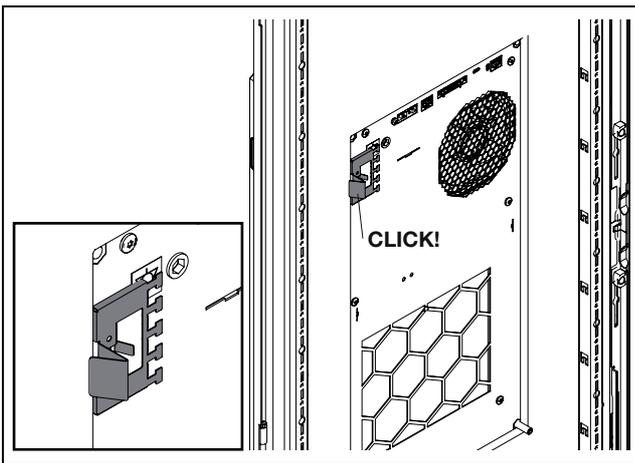


Fig. 14: Lock home the clip behind the cut-out (for SK 347880x, SK 347980x and SK 3480800)

- For SK 34848x0: Push the cooling unit into the mounting cut-out at the top until both clips behind the cut-out audibly lock home.

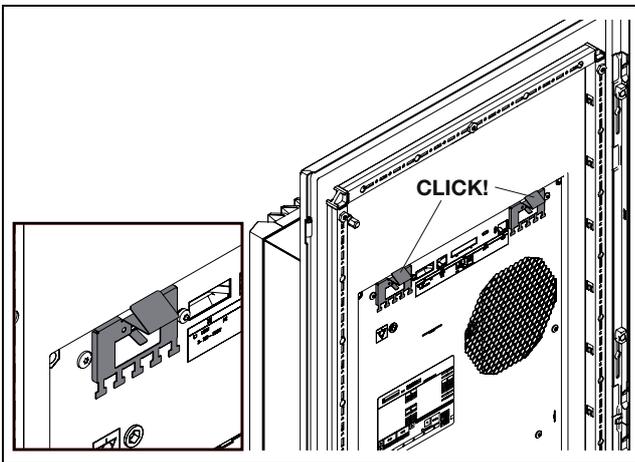


Fig. 15: Lock home the clips behind the cut-out (for SK 34848x0)

- Similarly, at the top, screw two grub screws into the blind rivet nuts in the rear corners of the cooling unit (torque = 5 Nm).

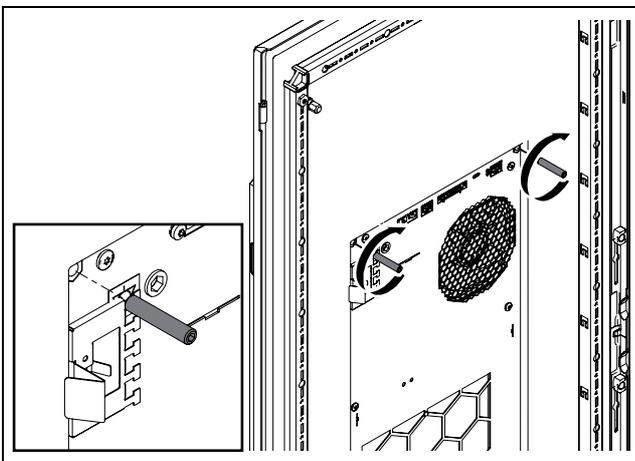


Fig. 16: Screw the upper grub screws into place

- Attach the two corner brackets with nuts to the grub screws at the top and secure (torque = 5 Nm).

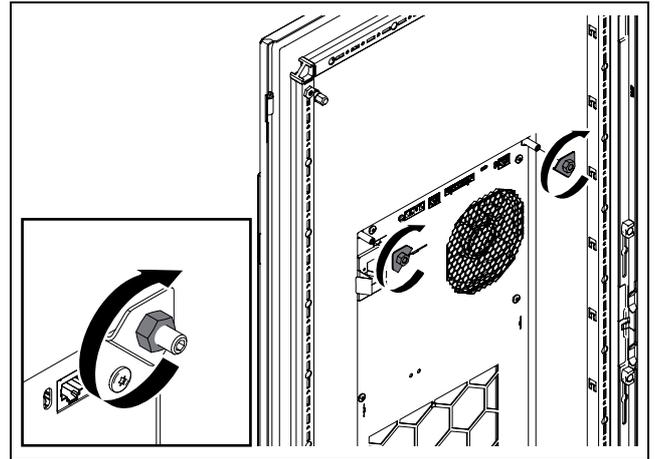


Fig. 17: Secure with corner brackets at the top

- In the same way, attach the two corner brackets with nuts onto the grub screws at the bottom and secure (torque = 5 Nm).

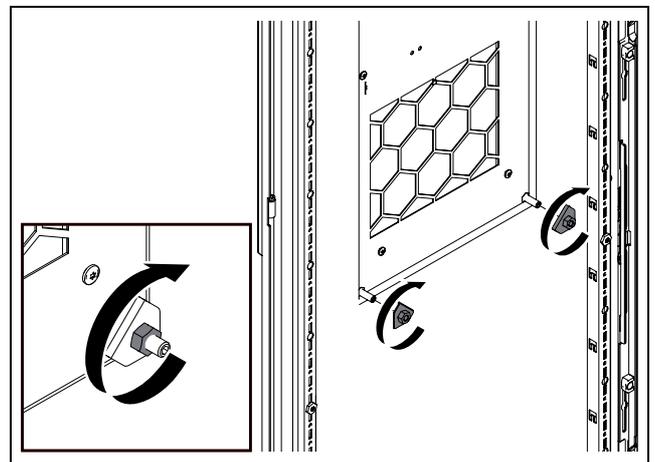


Fig. 18: Secure with corner brackets at the bottom

- Insert one spring clip half-way up the rear of the cooling unit on both the left and right.

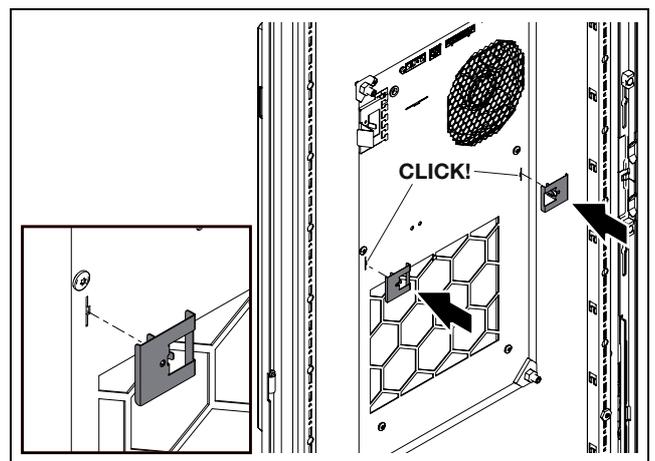


Fig. 19: Secure with spring clips

### 5.3.5 Internal mounting of the cooling unit SK 347880x, SK 347980x and SK 3480800

- Grasp hold of the recessed handles on the left and right of the louvred grille and pull the louvred grille gently upwards out of the device mounting clips.

# 5 Installation

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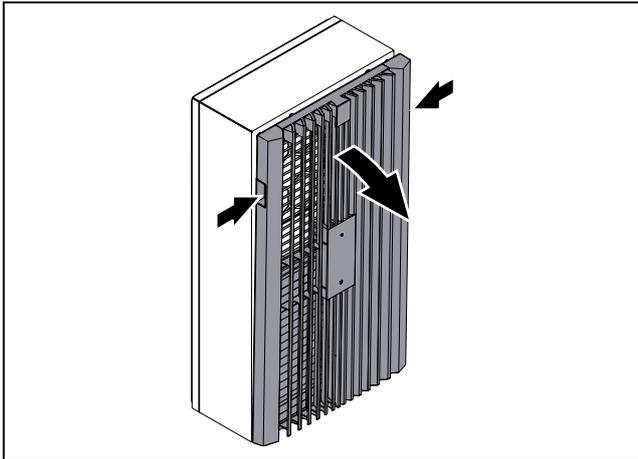


Fig. 20: Pull off the louvred grille (top)

- Next, pull the louvred grille out of the mounting clips at the bottom as well and pull it forwards a maximum of 100 mm away from the device, taking care to hold it as straight as possible.

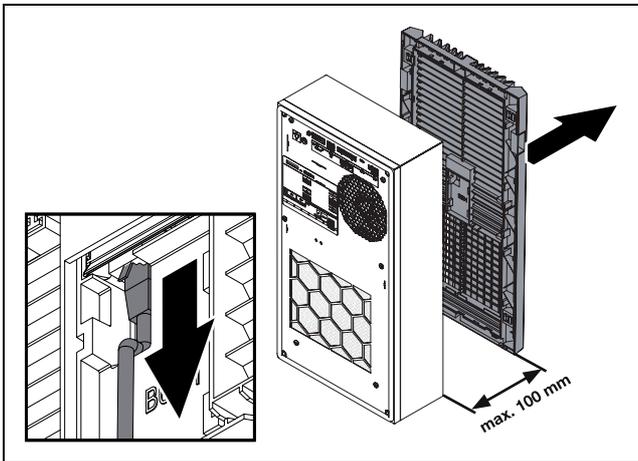


Fig. 21: Pull off the louvred grille and the connector

- Disconnect the connector on the display.
- Place the louvred grille down in a safe place.

## SK 34848x0

- Press the outside buttons on the right and left of the lower louvred grille and pull it away from the device.

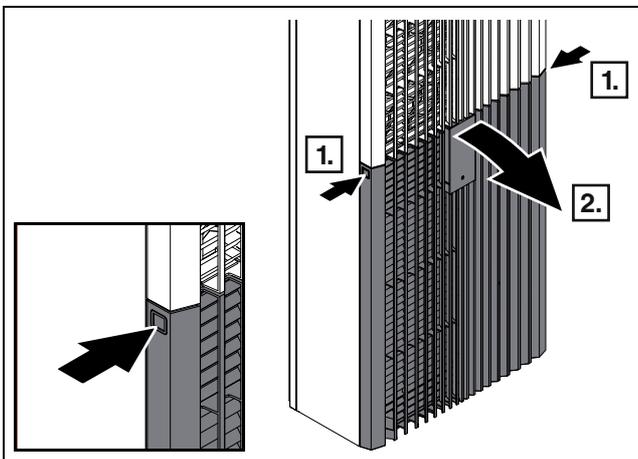


Fig. 22: Pull off the lower louvred grille

- Pull the top louvred grille away from the mounting clips, taking care to hold it as straight as possible.

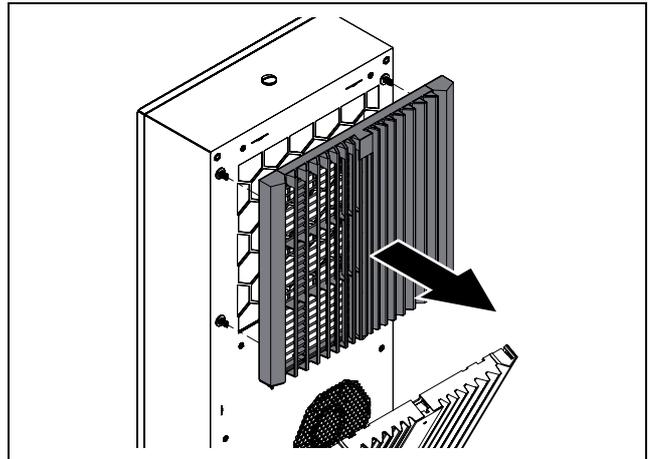


Fig. 23: Pull off the top louvred grille.

- Set the top louvred grille down in a safe place.
- Disconnect the connector on the display.

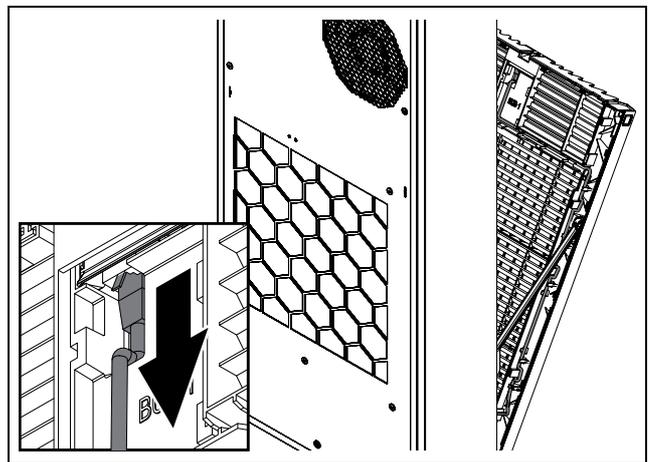


Fig. 24: Pull off the connector

- Carefully remove the connection cable from the groove in the lower louvred grille.

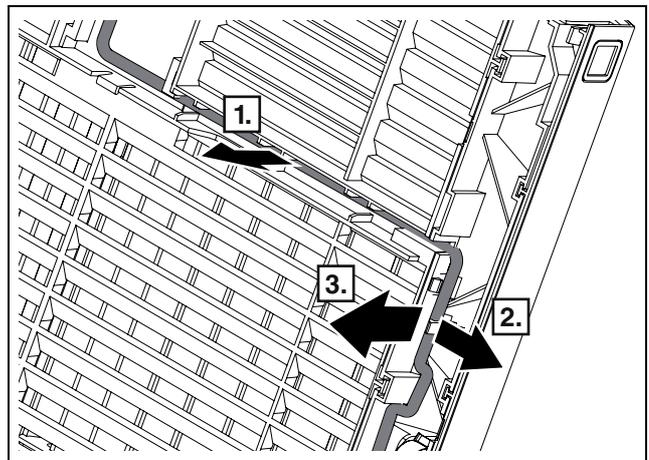


Fig. 25: Remove the connection cable

- Release the range limiters of the lower louvred grille from their holders on the left and right of the device.

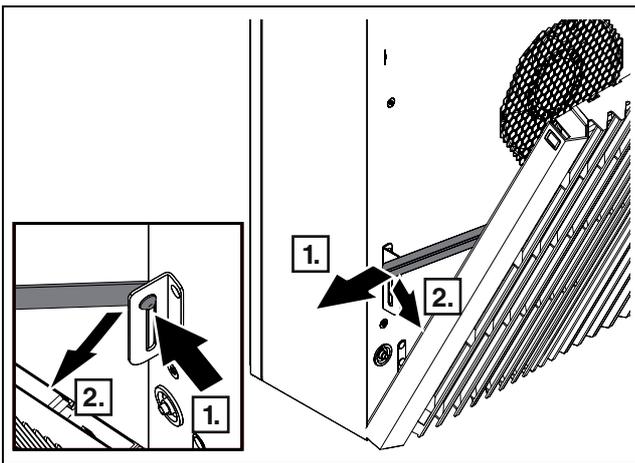


Fig. 26: Release the range limiters

- Next, pull the lower louvred grille upwards at an angle out of the bottom holders and set it down in a safe place.

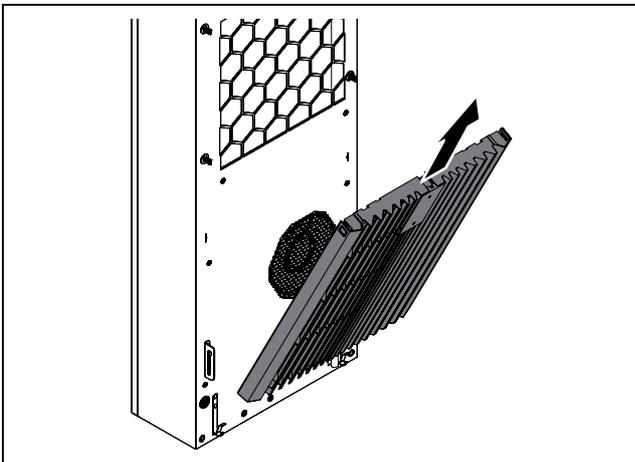


Fig. 27: Pull off the lower louvred grille.

### All device versions

- Apply sealing tape all around the front of the cooling unit.

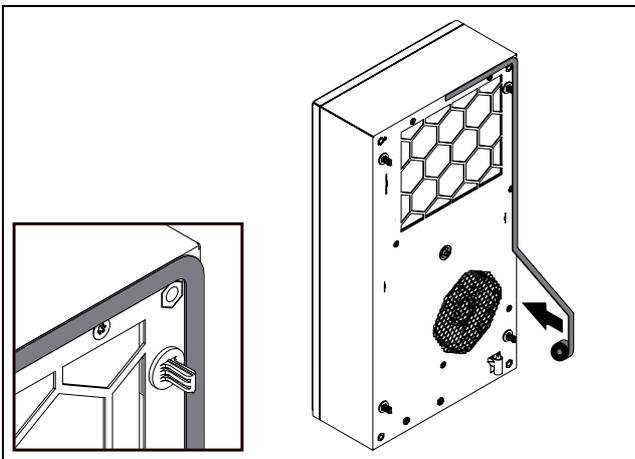


Fig. 28: Apply sealing tape

Start in the top centre of the device to ensure that the joint edge is not at the bottom of the device where water from outside could penetrate.

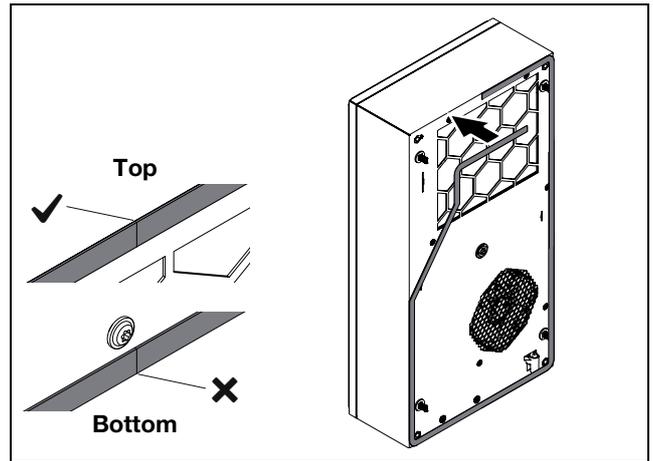


Fig. 29: Position the joint edge at the top

- For SK 347880x, SK 347980x and SK 3480800: At the top left, insert a locator clip so that it latches securely home into the cooling unit.

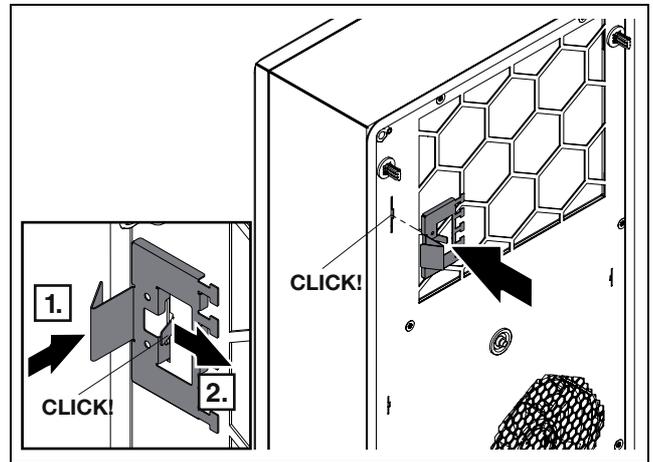


Fig. 30: Latch home the locator clip (for SK 347880x, SK 347980x and SK 3480800)

- For SK 34848x0: Insert two locator clips at the top so that they latch securely home into the cooling unit.

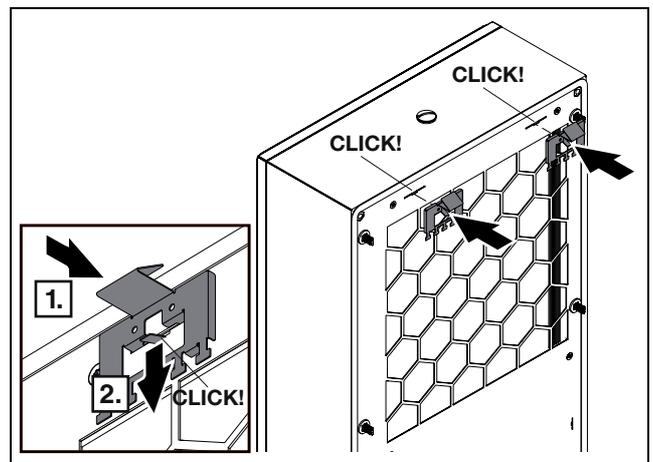


Fig. 31: Latch home the locator clips (for SK 34848x0)

These clips will prevent the cooling unit from falling out of the mounting cut-out later on before it is properly secured with the grub screws.

# 5 Installation

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- At the bottom, screw two grub screws into the blind rivet nuts in the front corners of the cooling unit (torque = 5 Nm).

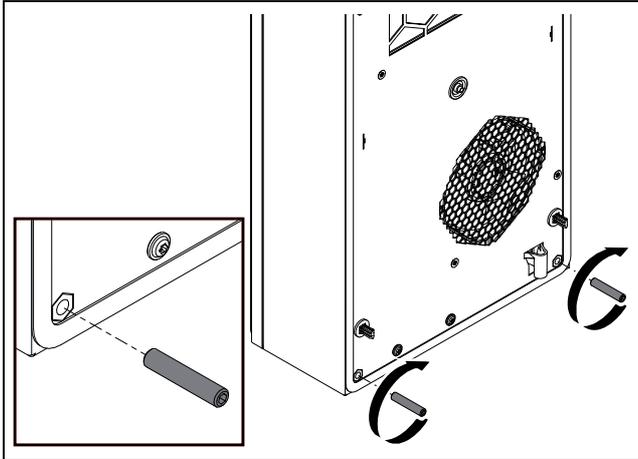


Fig. 32: Screw the bottom grub screws into place

- Lift up the cooling unit, and set it down initially with the two inside lower grub screws resting on the enclosure door or side panel.

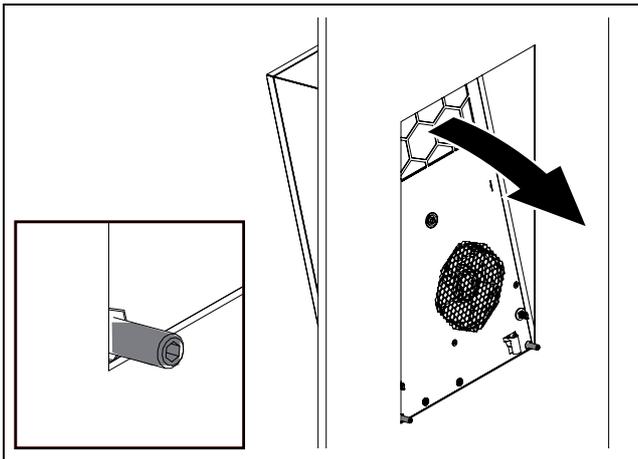


Fig. 33: Position the cooling unit and push it into place

- For SK 347880x, SK 347980x and SK 3480800: Push the cooling unit into the mounting cut-out at the top until the clip behind the cut-out audibly latches home.

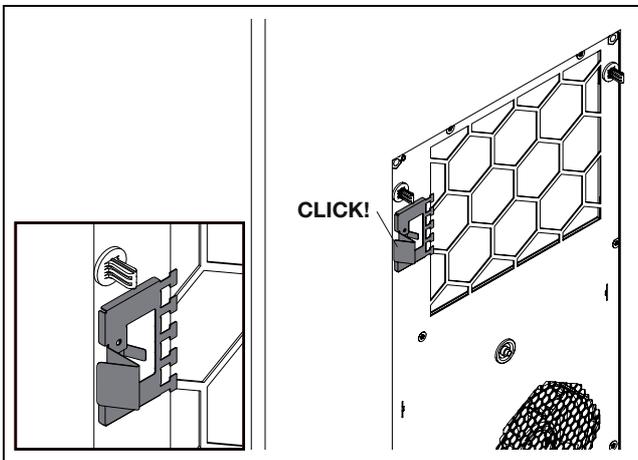


Fig. 34: Latch home the clip behind the cut-out (for SK 347880x, SK 347980x and SK 3480800)

- For SK 34848x0: Push the cooling unit into the mounting cut-out at the top until the clips behind the cut-out audibly latch home.

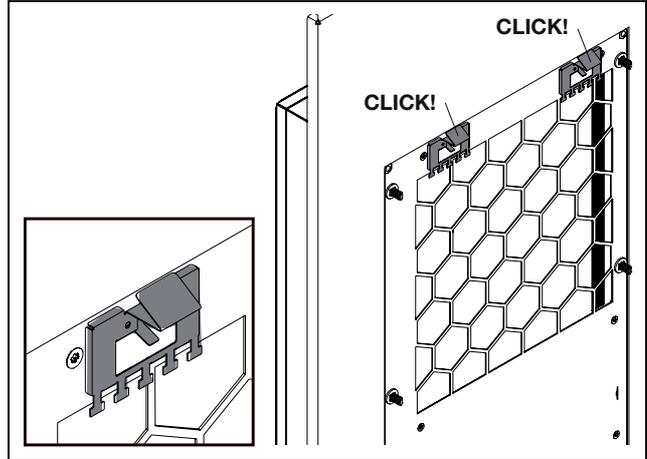


Fig. 35: Lock home the clips behind the cut-out (for SK 34848x0)

- Similarly, at the top, screw two grub screws into the blind rivet nuts at the front corners of the cooling unit (torque = 5 Nm).

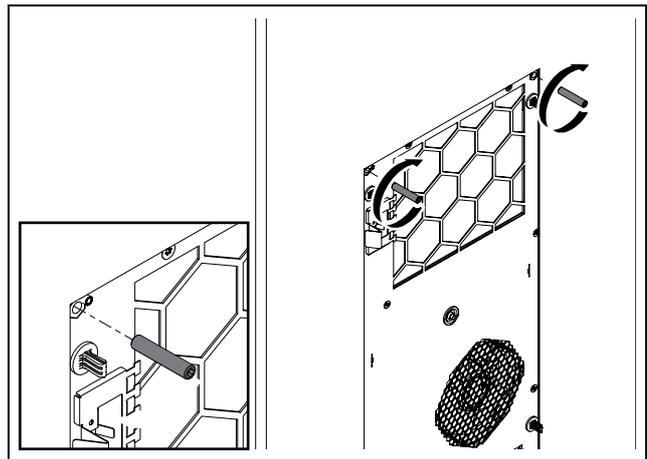


Fig. 36: Screw the top grub screws into place

- Attach the two corner brackets with nuts to the threaded grub screws at the top and secure (torque = 5 Nm).

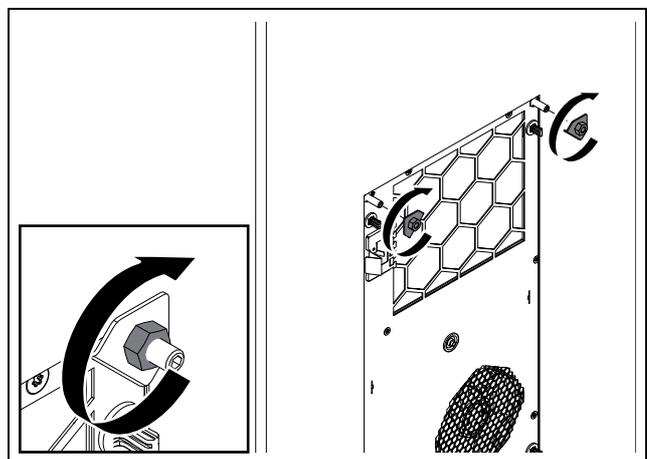


Fig. 37: Secure with corner brackets at the top

- In the same way, insert the two corner brackets with nuts onto the grub screws at the bottom and secure (torque = 5 Nm).

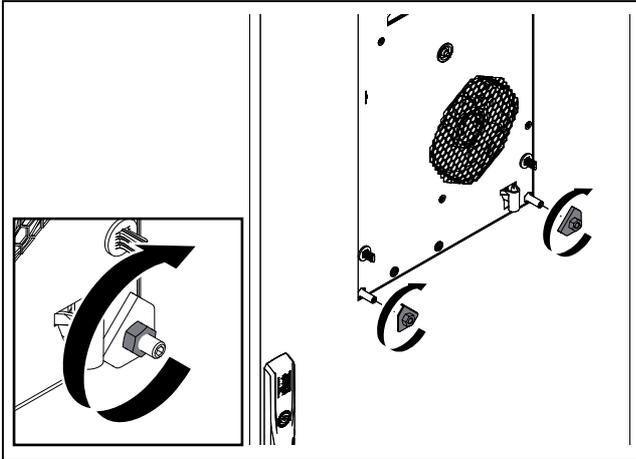


Fig. 38: Secure with corner brackets at the bottom

- Insert one spring clip half-way up the rear of the cooling unit on both the left and right.

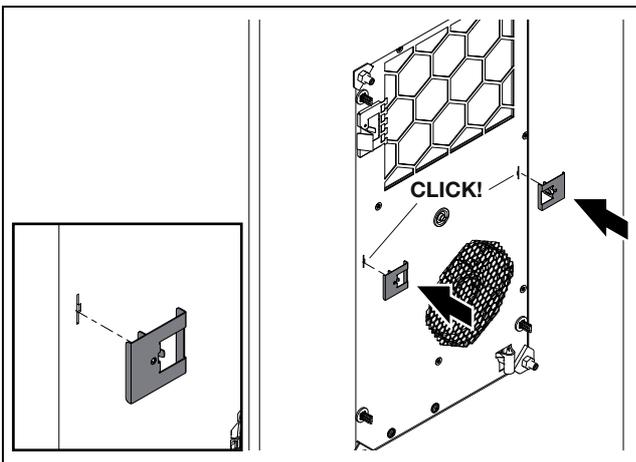


Fig. 39: Secure with spring clips

- For SK 347880x, SK 347980x and SK 3480800: Release the locator clip at the top left and, where applicable, insert it into the rear of the device for cable fixing and routing.

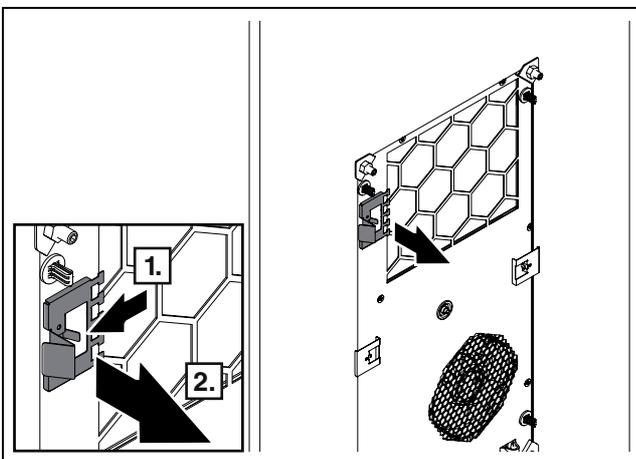


Fig. 40: Release the locator clip (for SK 347880x, SK 347980x and SK 3480800)

- For SK 34848x0: Release the two locator clips at the top and insert one of the clips into the rear of the device for cable fixing and routing. The second clip may likewise be inserted into the top rear of the device.

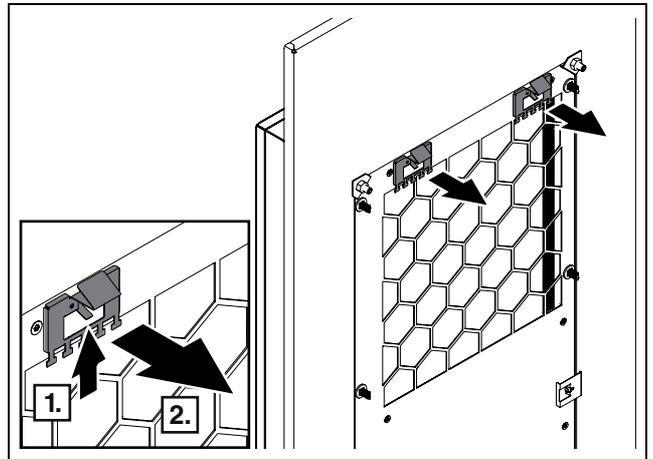


Fig. 41: Release the locator clips (for SK 34848x0)

### SK 347880x, SK 347980x and SK 3480800

- Bring the louvred grille close to the device.
- Connect the connector at the bottom of the display.
- Place the louvred grille onto the mounting clips at the top and bottom, keeping it as straight as possible, and press it fully onto the cooling unit.

### SK 34848x0

- Holding the lower louvred grille at an angle from above, engage it fully with the bottom clips.
- Insert the range limiters for the bottom louvred grille into their holders on the left and right of the device.
- Carefully push the connection cable section by section into the groove in the lower louvred grille.
- Insert the connector into the bottom of the display.
- Position the top louvred grille onto the mounting clips.
- Snap the bottom louvred grille completely onto the cooling unit.

### 5.3.6 Connect the condensate water discharge

There is a condensate water evaporator fitted in the external circuit of the cooling unit (except SK 3478801 and SK 3479801). With an enclosure connected, this condensate water evaporator may typically evaporate condensate water volumes of up to 100 ml/h.

If larger quantities of condensate water are produced, a condensate water discharge hose may additionally be fitted. This hose allows condensate water to be routed out of the cooling unit pressurelessly. A suitable hose is available as an accessory from Rittal (see section 13 "Accessories").

Please follow the instructions given below:

- The hose must be laid with an adequate and constant gradient to prevent siphoning.
- The hose must be laid without any kinks.
- If extended, the cross-section of the hose must not be reduced.

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- The hose should be routed to a drain or external condensate water evaporator by the customer.

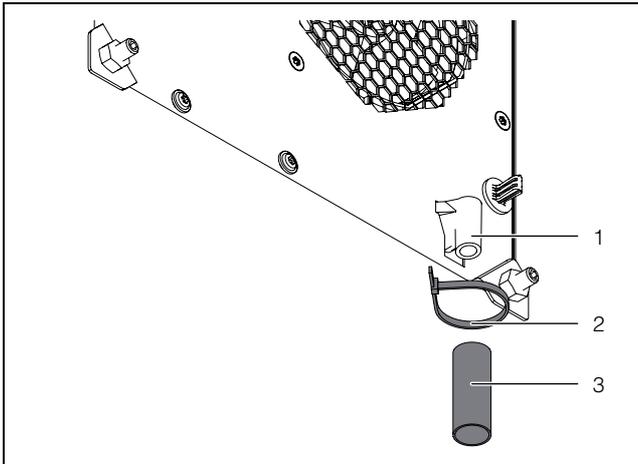


Fig. 42: Connection for condensate water discharge hose

### Key

- 1 Connection point
- 2 Cable tie
- 3 Condensate hose

- Connect a suitable hose to the condensate discharge and secure with a cable tie.
- Lay the hose as per the instructions above.

## 5.4 Electrical connection

### 5.4.1 Notes on electrical installation

- When carrying out the electrical installation, it is important to observe all valid national and regional regulations as well as the provisions of the responsible power supply company.
- Electrical installation must only be carried out by a qualified electrician who is responsible for compliance with the existing standards and regulations.
- All cables have to be insulated for the maximum voltage of the power supply.

### Connection data

- The connected voltage and frequency must correspond to the ranges stated on the rating plate. The units support multiple voltages.
- The cooling unit must be connected to the mains via an all-pole disconnect to overvoltage category III (IEC 61058-1).
- The unit is intrinsically safe and does not require any additional external safety devices for safe operation.
- The connection cable must be protected with a miniature circuit-breaker.
- To ensure the proper functioning of internal pressure-stats in the event of a malfunction, a line fuse of no less than 15 A is required.
- If a motor circuit-breaker or circuit-breaker is used, it should be selected in accordance with EN 60898-1 (tripping characteristic type D).

- For applications in UL-approved facilities, any CCMR-type fuse from Littelfuse may be used, or alternatively, a UL-certified air circuit-breaker.
- Suitable miniature circuit-breakers and circuit-breakers can be found under Rittal accessories (see section 10 "Technical specifications" and section 13 "Accessories").
- Thanks to the integral inverter technology, conventional start-up currents (start-up of internal motors) are not externally visible.
- The mains infeed and the signal cable may optionally be of a shielded design. The cable shield may be contacted at the potential equalisation point.
- No additional temperature control may be connected upstream of the unit at the supply end

### Overvoltage protection and supply line load

Rittal recommends the following measures for protecting the cooling units in non-standard environmental and connection conditions.

- The unit does not have its own overvoltage protection. Measures must be taken at the supply end by the switchgear manufacturer or operator to ensure effective protection against lightning and overvoltage.
- Overvoltage protection must be installed upstream of the infeed to the cooling units and not immediately after the infeed to the entire enclosure. This is the only way to ensure that surge pulses generated by the machine itself are discharged.
- The units are classified as overvoltage category III and meet the requirements of standard EN 60204-1 on the electrical equipment of machines. The mains voltage must not deviate by more than the tolerance specified in section 10 "Technical specifications".
- The units are high-voltage tested ex works. An additional high voltage test must only be carried out with a DC voltage supply source (1500 VDC max.).
- EMC interference signals arising in local industry and plant networks may deviate significantly from those specified in the standards. In these types of network situations, an external EMC filter should be used.
- If the combined output of the frequency converters, power converters or transformers in the network where the device is being operated is >70 kVA, the customer must connect a Class II surge voltage protector in the mains supply line upstream of the cooling unit. The surge voltage protector must be designed to EN 61800 -1. The following values may be assumed as starting-points for the design:

Transformers, power electronics	Assumed discharge energy
70 kVA...100 kVA	40 J
100 kVA...200 kVA	80 J

Tab. 3: Design of the surge voltage protector

Transformers, power electronics	Assumed discharge energy
200 kVA...400 kVA	160 J
400 kVA...800 kVA	320 J

Tab. 3: Design of the surge voltage protector

Technical specifications for a suitable overvoltage protection module:

- Terminal voltage  $U_c = 350...400$  V, 50/60 Hz
- Maximum current  $I_{max} = 40$  kA
- Rated current  $I_n = 20$  kA
- Breakdown voltage  $U_p = 1.75$  kV

### Three-phase devices

- There is no need to observe a counter-clockwise or clockwise phase rotation when making the electrical connection to a three-phase voltage supply. The electronics incorporated into the devices automatically create the required phase rotation.
- Outgoing equipment is monitored by the inverter, and deactivated in the event of a malfunction in the electricity supply.

### SCCR – Short-circuit resistance

Under UL508A Supplement SB, the standard SCCR for cooling units is 5 kA.

If the device is installed on a UL508A feeder circuit >5 kA, a protective device with the corresponding SCCR of the feeder circuit and a peak let-through of <5 kA should be connected upstream in the cooling unit branch.

### Door limit switch

- Each door limit switch can only be assigned to one cooling unit.
- Several door limit switches may be operated in parallel with one cooling unit.
- The minimum cross-section for the connection cable is  $0.3 \text{ mm}^2$  for a cable length of 2 m.
- The line resistance to the door limit switch must not exceed a maximum of  $50 \Omega$ .
- The maximum admissible line length is 10 m.
- The door limit switch only supports a floating connection; no external voltages.
- The contact of the door limit switch must be closed when the door is open.
- The safety extra-low voltage for the door limit switch is provided by the internal power pack: Current approx. 5 mA DC.
- Connect the door limit switch to terminals 5 and 6 of the signal connector.

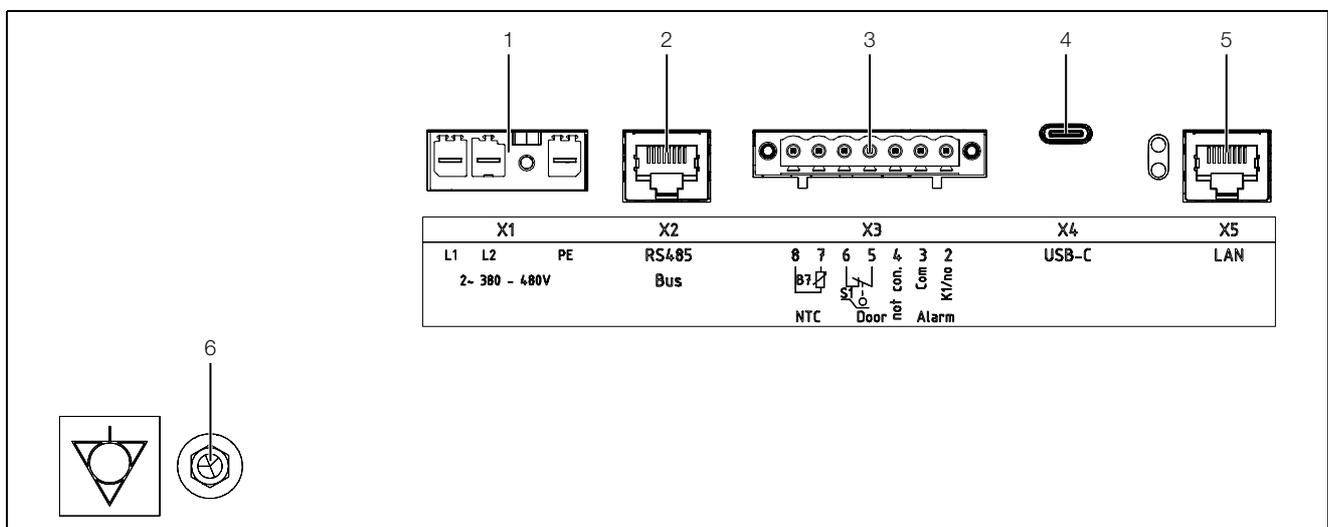


Fig. 43: Mains connection and interfaces

### Key

- X1: Mains connection
- X2: IoT Interface (RS485)
- X3: Signal connections (external temperature sensor, door operated switch and alarm relay)
- X4: USB-C interface
- X5: Ethernet interface RJ 45 (deactivated)
- Potential equalisation (M6)

### Potential equalisation

If, for EMC reasons, the unit is to be integrated into the customer's existing potential equalisation system, a conductor may be connected to the potential equalisa-

tion connection point. The connection point is labelled with the required switch symbol (fig. 43, item 6).

- Attach the potential equalisation to the unit's connection point using the screw, washer and contact washer.

# 5 Installation

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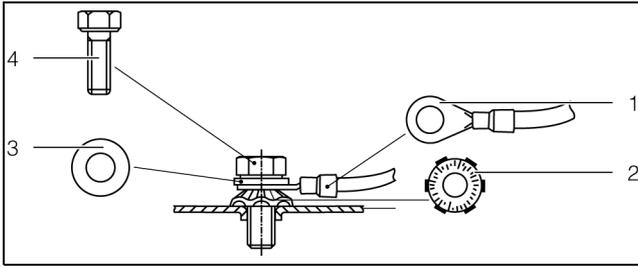


Fig. 44: Potential equalisation arrangement

**Key**

- 1 Ring terminal with PE conductor
- 2 Contact washer
- 3 Washer
- 4 Screw



**Note:**  
According to the standard, the PE conductor in the mains connection cable is not classed as an equipotential bonding conductor.

### 5.4.2 Install the power supply



- Note:**
- We recommend that the power supply cable and the signal cable should be of a shielded design.
  - The cable shield can be contacted at the potential equalisation point (fig. 43).

- Remove the mains connector from the dispatch bag and connect to the mains as shown on the connection diagram (fig. 45 or fig. 46).
- Use copper conductors only to connect the supply cable to the mains connector.

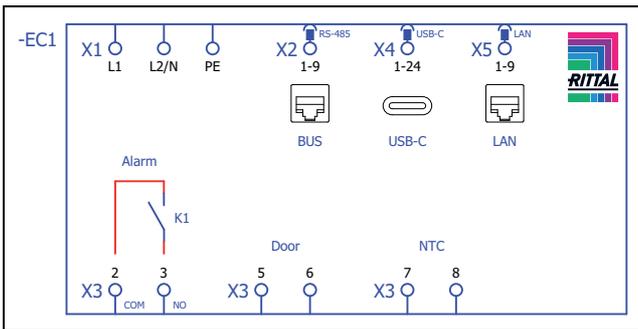


Fig. 45: Circuit diagram SK 3478800, SK 3478801, SK 3479800, SK 3479801, SK 3480800, SK 3484800

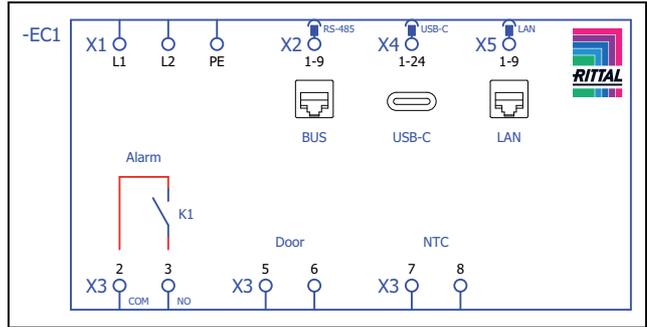


Fig. 46: Circuit diagram SK 3484840

**Key**

- X1 Main terminal strip
- K1 Alarm relay
- Door Door limit switch (optional, without door limit switch: terminal 5, 6 open)
- NTC External temperature sensor (optional)
- X2 RS 485 interface
- X4 USB-C interface
- X5 Ethernet interface RJ 45 (deactivated)

### Attachment option for cable routing

By moving a locator clip and connecting it to the rear of the device near the electrical connections, it can be used as a cable attachment.

- Depending on the type of installation, remove the locator clip from the front (internal mounting) or rear (external mounting) of the unit.

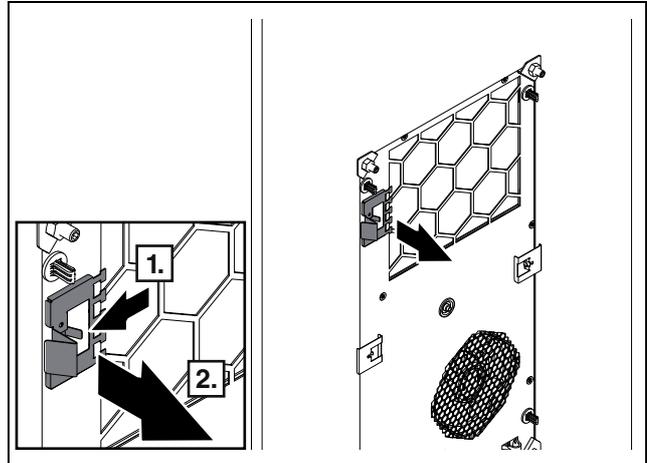


Fig. 47: Removing the locator clips from the front of the device with the installation type "internal mounting" (sample illustration)

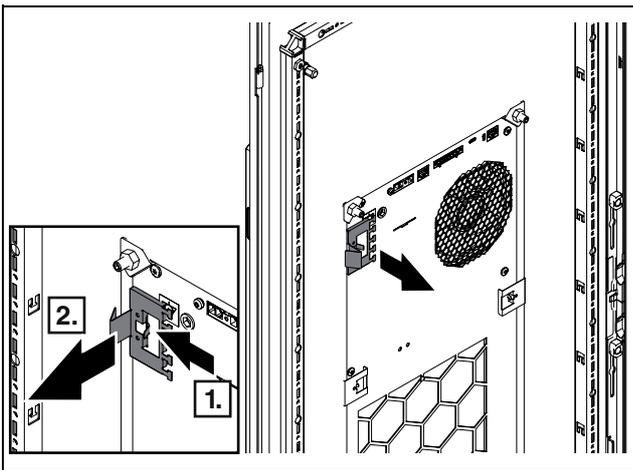


Fig. 48: Removing the locator clips from the rear of the device with the installation type "external mounting" (sample illustration)

- Next, insert the locator clips onto the rear of the device near the electrical connections.

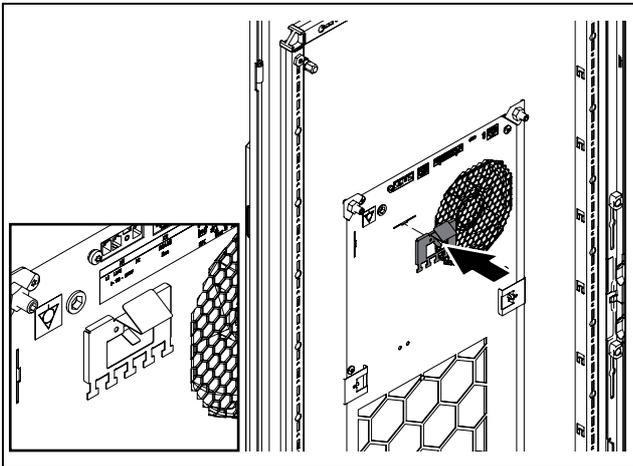


Fig. 49: Locator clip for cable routing (sample illustration)

- Use the locator clips to secure the cables (e.g. using cable ties).

### 5.4.3 Connect the alarm relay

System messages from the cooling unit may be output to an external signal source via a floating relay output. The relay output is in the de-energised state NO (Normally Open). As soon as voltage is applied to the cooling unit, the alarm relay picks up. This is the factory setting for the cooling unit's normal operating state. As soon as a system message occurs or the power supply is interrupted, the alarm relay will drop out and open the contact.

The switch logic of the alarm relay can be altered using the Rittal Scan & Service app (see section 7.5.2 "Configuration").

- Connect a suitable connection cable to terminal 3 (alarm K1) of the signal connector (X3).
- Configure the alarm relay you wish to use to output system message messages (see section 7.4.8 "Evaluate system messages").

AC $\cos \phi = 1$	DC
I max. = 2 A U max. = 250 V	I max. = 2 A U max. = 30 V

Tab. 4: Contact data

### 5.4.4 Interfaces

The cooling unit has the following interfaces for communicating with external systems:

- USB-C interface on the rear
- RS 485 interface on the rear
- NFC interface on the front
- Ethernet interface RJ 45 (deactivated)

#### USB-C interface

An USB-C interface (X4) is located at the rear near the top. A laptop may be connected here for easy update (see section 7.3 "Updater program").

Other USB units are not recognized on this connection.

#### RS 485 interface

An RS 485 interface is located on the rear of the connection box (X2). The IoT interface for linking the cooling unit to the customer's own monitoring, energy management and/or superordinate systems may be connected here.

- The drill holes on the unit rear may be used only for assembling the IoT interface with the screws supplied with this unit. If longer screws are used, there is a risk of undershooting the clearance and creepage distances or electric shock.

- Connect the IoT interface (accessory) to the RS 485 interface (X3).



Note:

A direct connection to the cooling unit via the RS 485 interface is not possible.

#### NFC interface

You can access the cooling unit with the Rittal Scan & Service app via the integral NFC interface. Apps other than those supplied by Rittal are not supported.



Fig. 50: Download options for the Rittal Scan & Service app

# 6 Commissioning

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## 6 Commissioning

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Note:

The oil must collect in the compressor in order to ensure adequate lubrication and cooling. For this reason, do not operate the cooling unit for at least 30 minutes after assembling the equipment.

---

- Observe the aforementioned waiting period of at least 30 minutes before commissioning the unit after assembly.
  - Remove the protective film from the red lug on the display.
  - Next, switch on the voltage supply to the cooling unit. All segments in the 7-segment display will be illuminated in sequence, followed a short time later by the start screen.
  - You can now make your individual settings on the device, such as setting the temperature (see section 7 "Operation").
- 



Note:

It is **not** necessary to carry out leak or pressure tests on the cooling unit prior to commissioning. Rittal has already done this in the factory.

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Note:

When the cooling unit starts up, the current software version appears in the display. Before commissioning, Rittal recommends checking the Rittal website for any software updates.

- If a more recent software version is available, please update the cooling unit software (see section 7.3 "Updater program").
-

## 7 Operation

The cooling unit is operated from the display on the front of the device (fig. 2 or fig. 3, item 4).

### 7.1 Control via the display

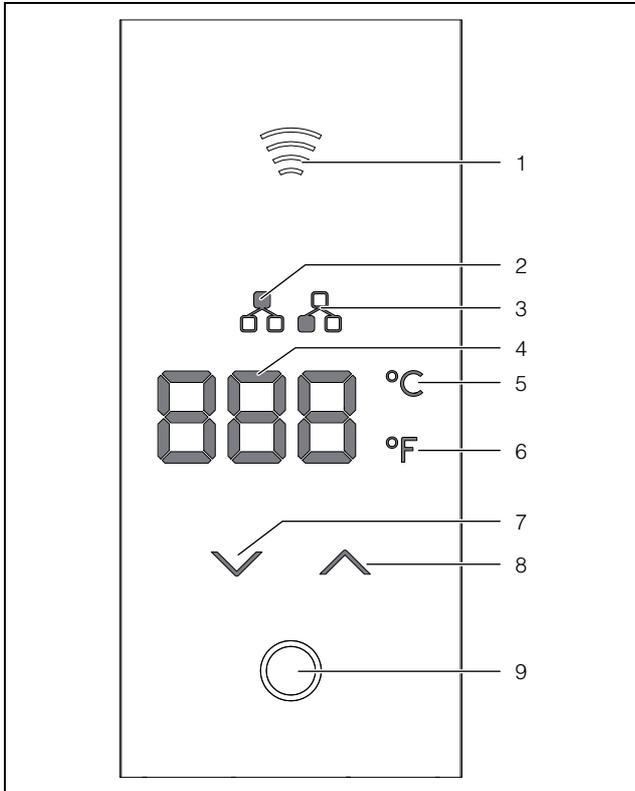


Fig. 51: Display

#### Key

- 1 "NFC" icon
- 2 "Master" icon
- 3 "Slave" icon
- 4 7-segment display (3x)
- 5 "Celsius" unit
- 6 "Fahrenheit" unit
- 7 "Down" arrow key
- 8 "Up" arrow key
- 9 Home key

The cooling unit operates automatically, in other words, as soon as the power supply is switched on, the evaporator fan (see fig. 1, item 10) will start running and circulating the air inside the enclosure.

The compressor and condenser fan are regulated by the controller.

The display has a three-digit, 7-segment display (fig. 51, item 4). After switching on the power supply, the internal temperature appears here after a short time (approx. 10 seconds) and will be permanently displayed as long as there are no error or system messages. If such messages do occur, they will alternate with the temperature display.

The device is programmed using the control components on the display (Home and OK keys and arrow

keys). The relevant parameters also appear in the display.

### 7.2 General information about programming

Use the arrow keys and the Home key directly on the display to set the main parameters within the preset ranges (min. value – max. value).

In principle, the programming of all editable parameters is identical.

■ To operate the touch elements, place one finger fully over the marked or illuminated key.

To enter programming mode:

■ Briefly press the Home key.

In addition to the displayed internal temperature, the Home key and both arrow keys on the display will be back-lit.

■ Press the Home key again for approx. 3 seconds. "Cod" will appear in the display.

■ Briefly press the Home key again.

■ Set the device PIN using the arrow keys.

The number "22" is preset by default.

■ Press the Home key again to confirm the set code.

If the code has been correctly entered, the "tSE" (temperature settings) menu will appear. If no entry is made for 15 seconds, exit the menu and the start screen will automatically appear showing the interior temperature.

■ Alternatively, keep the Home button pressed down for approximately 6 seconds.

This will take you straight back to the start screen.

After activating programming mode, you can navigate through the menus and change the settings as follows:

■ Press on the arrow keys to page through all menus and settings at the current level or to increase or reduce a number.

■ Briefly press the Home key to switch to a sub-menu.

■ Press the Home key for around 3 seconds to switch to the menu above or to confirm a setting (within the prescribed limits).

If a number or setting is changed, the message "ACC" will appear in the display for approximately 1 second.

After that, the next menu up will appear.

More extensive settings can be made with the Rittal Scan & Service app via the NFC interface (see section 7.5 "Rittal Scan & Service app").

### 7.3 Updater program

Software updates can be carried out using the Updater program. The USB-C interface on the rear of the cooling unit serves as an interface.

The Updater program can be found in the Downloads section of the product website.

## 7.4 Setting options via the display

### 7.4.1 Selecting a control mode

The cooling unit controls cooling output according to one of the following three temperature values:

- **Internal temperature (factory setting):** The temperature at which air is drawn out of the enclosure into the cooling unit.
- **External sensor:** The temperature measured with an external temperature sensor at a so-called hot spot in the enclosure.
- **Outlet temperature:** The temperature measured with an external temperature sensor at the cold air outlet from the cooling unit.

#### Control mode "external sensor"

Please observe the following when selecting the sensor position: The sensor must **not**

- be influenced directly by the cold air expelled from the cooling unit,
- be influenced by external heat sources or heat radiation,
- be exposed to humidity,
- have its connection cable laid in the vicinity of AC cables,
- be exposed to different temperature levels within the first 10 cm of the connection cable.

The sensor **must**

- be located within the effective range of the cooling unit,
- be surrounded by adequate moving air which has blended well with the air expelled by the cooling unit,
- be at an adequate distance from solid and liquid substances.



Note:

The external temperature sensor is available as accessory from Rittal (see section 13 "Accessories").

#### Control mode "outlet temperature"

- Attach the temperature sensor to the marking in front of the cooling unit's cold air outlet using a cable tie (fig. 52).

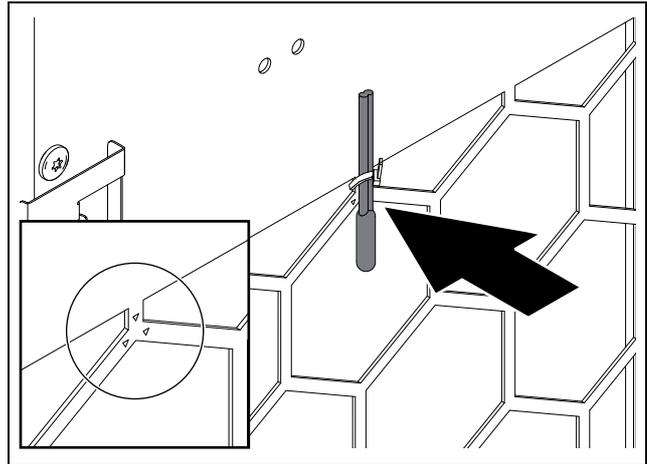


Fig. 52: Temperature sensor in front of cold air outlet (example illustration)



Note:

The sensor element must not be in contact with the enclosure.



Note:

To ensure the accuracy of the outlet temperature, at least 50% of the total cooling output should be installed as heat loss. The output can be taken from the characteristic curve for this unit.

### Selecting a control mode

- Briefly press the Home key in the "tSE" menu. The sub-menu "Con" (control mode) will appear for you to select the control mode.
- Choose your preferred control mode using the arrow keys.
  - "Int": Control mode "Internal temperature"
  - "Est": Control mode "External sensor temperature"
  - "Out": Control mode "Outlet temperature"
- Keep the Home key pressed down for around 3 seconds to switch to the next menu up. If the control mode is altered, the message "ACC" will appear in the display for approximately 1 second. After that, the next menu up "Con" will appear.

### 7.4.2 Setting the target temperature

- Briefly press the Home key in the "tSE" menu. The sub-menu "Con" (control mode) will appear for you to select the control mode.
- Use the arrow keys to select the "SP" (setpoint) menu and briefly press the Home key again. The currently set temperature will be displayed.
- Change the value using the arrow keys until you reach the required set temperature. Depending on the control mode, the set temperature can be changed within the following limits.

Display	Parameter	Setpoint	Factory setting
"Int"	Internal temperature	20 °C (68 °F) ...	35 °C (95 °F)
"Est"	External sensor	50 °C (122 °F)	
"Out"	Outlet temperature	18 °C (64 °F) ... 28 °C (82 °F)	24 °C (75 °F)

Tab. 5: Temperature setting range

- Keep the Home key pressed down for around 3 seconds to switch to the next menu up.  
If you have changed the set temperature, the message "ACC" will appear in the display for approximately 1 second. After that, the next menu up ("SP") will appear.

### 7.4.3 Setting the unit

All temperature values for the unit may be displayed either in degrees Celsius "°C" or degrees Fahrenheit "°F". When changing the unit, all temperature settings are converted automatically.

- Briefly press the Home key in the "tSE" menu.  
The sub-menu "Con" (control mode) will appear for you to select the control mode.
- Use the arrow keys to select the "CF" (Celsius/Fahrenheit) menu and briefly press the Home key again.  
The currently set unit will be displayed.
- Use the arrow keys to switch between the two setting options until your preferred unit is displayed.
- Keep the Home key pressed down for around 3 seconds to switch to the next menu up.  
If you have changed the set unit, the message "ACC" will appear in the display for approximately 1 second. After that, the next menu up ("CF") will appear.

### 7.4.4 Launching test mode

The control system features a test function, during which the cooling unit commences cooling operation independently of the set temperature or door function of the door operated switch.

- Use the arrow keys to select the "tSt" menu from the "tSE" menu, then briefly press the Home key again.  
The current setting "Off" will be displayed.
- Use the arrow keys to select the "On" setting and keep the Home key pressed down for approximately 3 seconds.  
The cooling unit begins operation. The progress of the test is shown in the display as a percentage. Every second, the percentage symbol is refreshed.

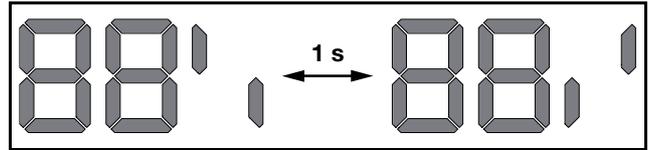


Fig. 53: Percentage symbol being refreshed

The entire test takes around 7 minutes. When the test is complete, in the event of an error "Err" will appear in the display; otherwise it will show "OK".

- Briefly press the Home key to switch back to the start screen.

### 7.4.5 Manually acknowledge a system message

For system messages requiring a manual reset, the message "rSt" will appear in the display alternating with the system code(s) and the temperature display.

- First, rectify the cause of the system message.
- Then, to acknowledge the system message, press then Home key followed by the two arrow keys simultaneously for three seconds.  
"ACC" appears in the display to confirm acknowledgement.

## 7.4.6 Programming overview

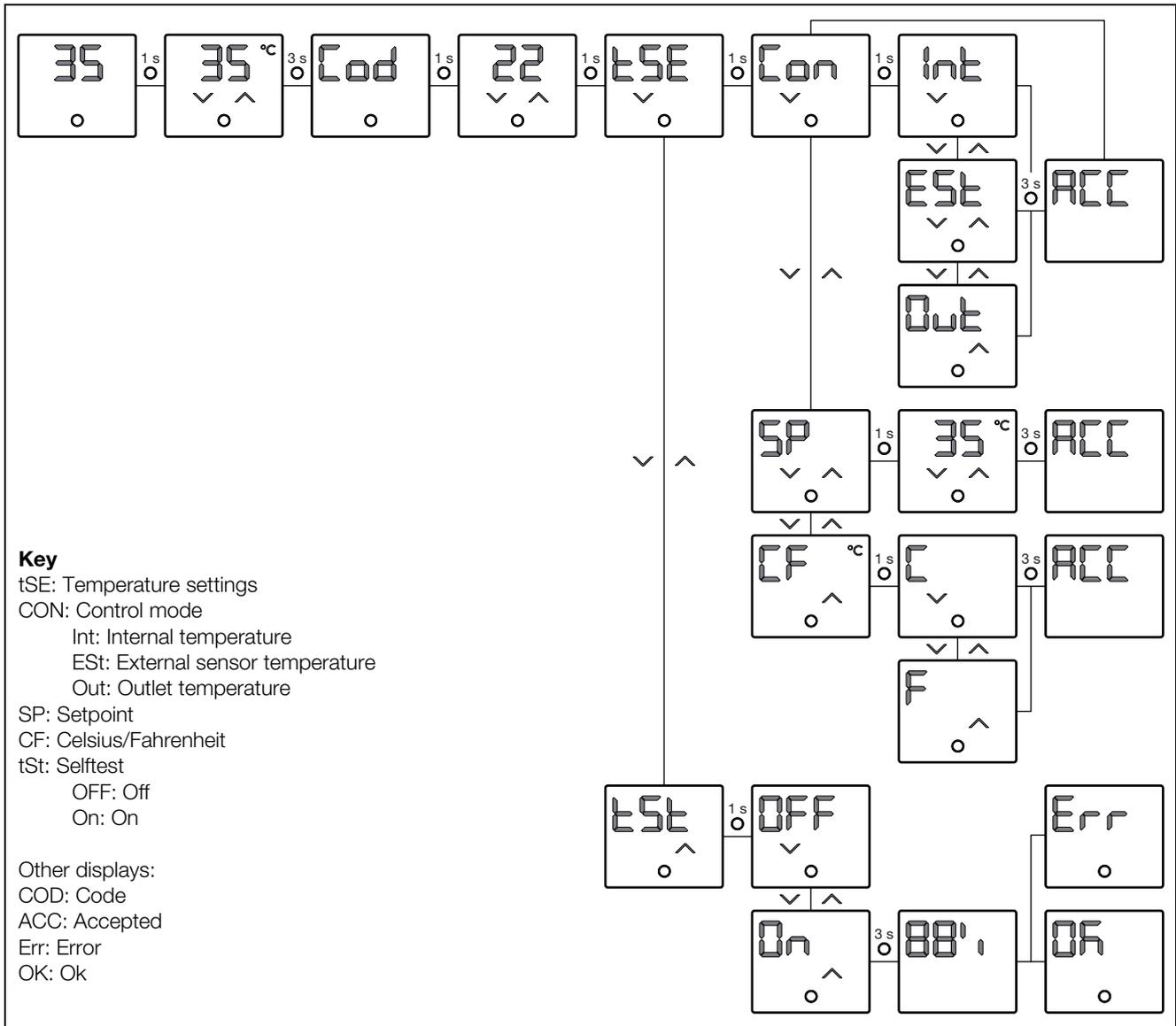


Fig. 54: Programming overview

### 7.4.7 Parallel device control

The IoT interface (Model No. SK 3124300, see section 13 "Accessories") supports parallel activation and deactivation of up to two cooling units. Further information can be found in the "Additional instructions" document for the IoT interface. This document is available for downloading on the Rittal website.

### 7.4.8 Evaluate system messages

System messages appear on the display with a system code. Selected messages will additionally flash up in red. Warning messages (see tab. 7) may additionally appear in yellow if you have activated this in the Rittal Scan & Service app under "System messages". Messages can also be evaluated via a floating alarm relay on terminals 2 and 3 of the signal connector (X3).

The relay output is in the de-energised state NO (Normally Open). As soon as voltage is applied to the cooling unit, the alarm relay picks up. This is the factory setting

for the cooling unit's normal operating state. As soon as a system message occurs or the power supply is interrupted, the alarm relay will drop out and open the contact.

The switch logic of the alarm relay can be altered using the Rittal Scan & Service app (see section 7.5.2 "Configuration").

## 7.5 Rittal Scan & Service app

### 7.5.1 General

The Rittal Scan & Service app allows you to make changes quickly and easily to the cooling unit settings via the NFC interface.

- Install the Rittal Scan & Service app on any suitable mobile phone (see section 13 "Accessories").
- Connect to a cooling unit via an NFC scan. The default setting of the device PIN is 22.

**Note:**

The Rittal Scan & Service app is largely intuitive to use, so we will only briefly consider different app zones and the required settings below.

**7.5.2 Configuration**

The "Configuration" zone allows you to make basic settings for the cooling unit under "Device configuration", some of which can also be set directly on the display of the device itself. The additional settings are briefly outlined below.

**Device name**

Name assigned to the cooling unit by the customer in order to differentiate between multiple devices.

**Alarm threshold**

If the measured temperature is higher than the setpoint plus the set temperature difference, an alarm message (overtemperature) will be output. The table below shows the range for the potential temperature difference (alarm threshold).

Parameter	Alarm limit	Factory setting
Internal temperature	Setpoint + 3 °C (5 °F)	Setpoint + 5 °C (9 °F)
External sensor	Setpoint + 15 °C (27 °F)	
Outlet temperature	Setpoint + 12 °C (21 °F) ... Setpoint + 24 °C (40 °F)	Setpoint + 14 °C (25 °F)

Tab. 6: Alarm threshold

**Note:**

In "external sensor" and "outlet temperature" control mode, the cooling unit additionally monitors the temperature of the air as it is drawn in. If the set alarm limit seems likely to be exceeded (e.g. due to a rise in heat loss), the cooling output is increased for the duration of the threatened overtemperature, and the setpoint is undercut. The "External sensor" control mode uses a fixed alarm threshold of 50 °C (122 °F).

The absolute temperature at which the "Overtemperature" alarm message is output is therefore calculated as follows:

– Limit temperature = Setpoint + alarm threshold

Example of "outlet temperature" control mode:

- Setpoint: 24 °C (75 °F)
- Alarm threshold (difference): 14 °C (25 °F)
- Limit temperature: 38 °C (100 °F)

Current situation:

- Temperature of air intake: 37 °C (< alarm limit)
- Temperature of expelled air: 24 °C (= setpoint)

If the alarm limit is exceeded:

- Temperature of air intake: 39 °C (> alarm limit)
- Temperature of expelled air: 22 °C (< setpoint)

If the alarm limit is subsequently undercut due to an increase in the cooling output:

- Temperature of air intake: 37 °C (< alarm limit)
- Temperature of expelled air: 24 °C (= setpoint)

**Alarm relay > switch logic**

The switch logic of the relay output, i.e. whether it will be used as a normally closed or normally open contact, may be set here.

**Note:**

The factory setting of the relay output in its connected operating state is "closed".

**Assign alarm relay > System message(s)**

Here, you can define which system messages should switch the relay output.

- From the list, activate the slide bar for those messages which you would like to switch the relay output.

**Filter mat > Filter reference**

Here the device may be set permanently to operation with filter mats.

If the device has already been set to operation with filter mats, clicking on the "New filter mat" icon allows you to reset the "Change filter mat" system message.

**Note:**

This message is also reset automatically as soon as the device identifies an improved air throughput in the external circuit thanks to the use of a new filter mat. Assessment of the air throughput only occurs when using the compression system at constant speed, and takes a few minutes.

**Filter mat > Alarm tolerance**

Here, the alarm tolerance may be set to one of five levels, or filter mat monitoring deactivated. If the set alarm tolerance is exceeded, the system code "A03" appears in the display.

Example:

- Setpoint: 35 °C (95 °F)
- External temperature: 20 °C (68 °F)

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If an alarm tolerance level of "medium" is selected, the system will tolerate an impairment to the air throughput in the external circuit of approximately 35% before the system message "Change filter" appears in the display.



**Note:**

The more the air throughput in the external circuit is impaired, the lower the maximum cooling output and energy efficiency of the cooling unit will be.

The following diagram illustrates the development of cooling output depending on the air throughput in the external circuit and the alarm limit (fig. 55).

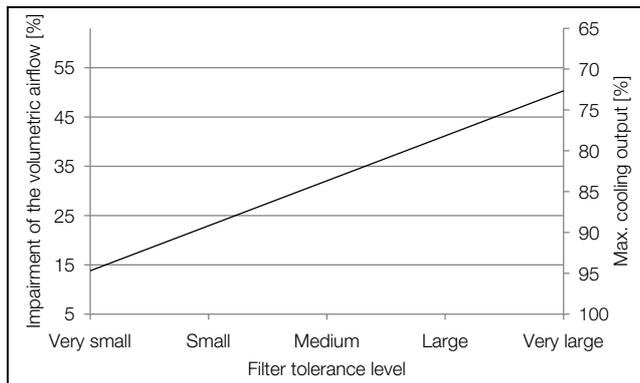


Fig. 55: Sample cooling output development



**Note:**

- If filter mat monitoring is deactivated ("Deactivate" level), it is still possible to select a filter tolerance level. If the threshold is exceeded, the system code "A21" will appear in the display instead of "A03".
- If filter mat monitoring is deactivated and no filter tolerance level is selected, no system message will be output.

### Optical fibre

Here, it is possible to set the colour of the optical fibre in the device's normal state. Choose between white (factory setting), pink, green and blue or deactivate the optical fibre in normal status.

### Change the device PIN

Here, you can change the default device PIN from "22" to any value between "00" and "99".



**Note:**

To change the device PIN again, you will first need to enter the currently stored device PIN.

### "IoT Interface"

In the "Configuration" zone, as well as the device configuration itself, IP information may also be retrieved from a connected IoT interface.

### 7.5.3 Technical Guide

Basic operating data as well as the current status of the cooling unit can be viewed in the "Technical Guide" zone.

### Operating data

- Average energy efficiency ration (EER) for the last 24 operating hours.
- Minimum and maximum internal temperature of the last 24 operating hours.

### Software

Here, you will find information on the software version being used as well as the date of the most recent update and whether there is a current update available.

### System messages

While the 7-segment display only shows a system code, current system messages can be viewed here in plain language, together with troubleshooting measures and solutions, where applicable.

You can also view a message history listing all messages since the device's last restart. For all messages occurring prior to the most recent restart, the number of operating hours at the time of the message is given.

### 7.5.4 Product information

The "product information" zone contains basic information about your cooling unit, such as the item number, serial number etc. It also offers direct access to the available accessories.

### 7.5.5 Services and spare parts

The "Services and spare parts" zone is a quick and easy option for ordering spare parts for your cooling unit.

### 7.5.6 Fast Copy

The "Fast Copy" function allows you to copy the entire configuration of a cooling unit to unlimited other cooling units. This function can be found under Product Management, where all scanned items can be organised in the form of lists and retrieved.

## 7.6 List of system messages

System code	System message	Optical fibre	Alarm relay (factory setting)	Description of the system message
A01	Door contact	Red	–	The door contact switch is reporting that the enclosure door is open. Please close the enclosure door. Problem still persisting? In the Scan & Service app you will find suggestions on how to rectify the problem yourself.
A02	Interior overtemperature	Yellow	–	The measured interior temperature exceeds the set alarm value for your cooling unit. In the Scan & Service app you will find suggestions on how to rectify the problem yourself. Alternatively, please contact the Rittal Service team.
A03	Filter warning	Yellow	–	The filter mat in your cooling unit is dirty. Please clean or replace the filter mat. Problem still persisting? In the Scan & Service app you will find suggestions on how to rectify the problem yourself. Alternatively, please contact the Rittal Service team.
A04	Exterior overtemperature/under-temperature	Yellow	–	Your cooling unit is being operated outside of the admissible ambient temperature range (-20 °C... +60 °C). In the Scan & Service app you will find suggestions on how to rectify the problem yourself. Alternatively, please contact the Rittal Service team.
A07	Leak	Red	X	Your cooling unit is reporting a lack of refrigerant in the active refrigerant cycle. In the Scan & Service app you will find suggestions on how to rectify the problem yourself. Alternatively, please contact the Rittal Service team. You will need to manually acknowledge this system message (see section 7.4.5 "Manually acknowledge a system message").
A09	External fan failure	Red	X	The fan in the external circuit of your cooling unit is defective. Please contact the Rittal Service team.
A10	Internal fan failure	Red	X	The fan in the internal circuit of your cooling unit is defective. Please contact the Rittal Service team.
A11	Compressor fault	Red	X	The compressor in your cooling unit is reporting an error. In the Scan & Service app you will find suggestions on how to rectify the problem yourself. Alternatively, please contact the Rittal Service team
A12	Condenser sensor failure	Red	X	The "Condenser" sensor in your cooling unit is reporting a failure. Please contact the Rittal Service team.
A13	External temperature sensor failure	Red	X	The "External temperature" sensor in your cooling unit is reporting a failure. Please contact the Rittal Service team.

Tab. 7: List of system messages

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System code	System message	Optical fibre	Alarm relay (factory setting)	Description of the system message
A14	Icing sensor failure	Red	X	The "Icing" sensor in your cooling unit is reporting a failure. Please contact the Rittal Service team.
A16	Internal temperature sensor failure	Red	X	The "Internal temperature" sensor in your cooling unit is reporting a failure. Please contact the Rittal Service team.
A18	Electronic fault	Red	X	The electronics in your cooling unit are reporting an error. In the Scan & Service app you will find suggestions on how to rectify the problem yourself. Alternatively, please contact the Rittal Service team.
A20	Voltage	Red	X	You are operating your cooling unit outside of the admissible voltage ranges. In the Scan & Service app you will find suggestions on how to rectify the problem yourself. Alternatively, please contact the Rittal Service team.
A21	Condenser contaminated	Yellow	–	The condenser in your cooling unit is dirty. In the Scan & Service app you will find suggestions on how to rectify the problem yourself. Alternatively, please contact the Rittal Service team.
A22	Air routing, external circuit	Yellow	X	The maximum pressure in the cooling circuit has been exceeded. In the Scan & Service app you will find suggestions on how to rectify the problem yourself. Alternatively, please contact the Rittal Service team.
A23	Air routing, internal circuit	Yellow	–	The evaporation temperature is too low. In the Scan & Service app you will find suggestions on how to rectify the problem yourself. Alternatively, please contact the Rittal Service team.
A24	EEV alarm	Red	–	A malfunction has been detected in the electronic expansion valve. In the Scan & Service app you will find suggestions on how to rectify the problem yourself. Alternatively, please contact the Rittal Service team.
A25	Internal fan alarm	Red	X	The fan in the internal circuit of your cooling unit is running too slowly. Please contact the Rittal Service team.
A26	External fan alarm	Red	X	The fan in the external circuit of your cooling unit is running too slowly. Please contact the Rittal Service team.
A27	Inverter cooler	Yellow	–	The temperature in the power electronics is too high. In the Scan & Service app you will find suggestions on how to rectify the problem yourself. Alternatively, please contact the Rittal Service team.
A28	Sensor failure, suction gas temperature	Red	X	The "suction gas temperature" sensor in your cooling unit is reporting a failure. Please contact the Rittal Service team.

Tab. 7: List of system messages

System code	System message	Optical fibre	Alarm relay (factory setting)	Description of the system message
A29	External sensor	Red	X	The external sensor of your cooling unit is not connected or indicates a malfunction. Please check the connection or choose a different control mode.
A30	Check parameters	Yellow	–	The configuration parameters of the cooling unit cannot be loaded during startup. In the Scan & Service app you will find suggestions on how to rectify the problem yourself. Alternatively, please contact the Rittal Service team.
A31	Inverter fault	Red	X	A hardware problem has been detected in the power electronics. In the Scan & Service app you will find suggestions on how to rectify the problem yourself. Alternatively, please contact the Rittal Service team.
A32	Emergency mode active	Red	–	Your cooling unit is only operating at 50% permanent cooling output due to a previous error. Please contact the Rittal Service team.
A33	Compressor phase	Red	X	The compressor in your cooling unit is reporting an error. Please contact the Rittal Service team.
A34	Overload	Yellow	X	An excessive current flow has been detected in the compressor. In the Scan & Service app you will find suggestions on how to rectify the problem yourself. Alternatively, please contact the Rittal Service team.
A35	Alarm: Active cooling function	Red	–	The cooling function of your cooling unit has been interrupted due to a current or past malfunction. Check and rectify the cause or contact the Rittal Service team. In some cases, where multiple errors have occurred within a short period of time, you may need to acknowledge them manually once the cause has been rectified (see section 7.4.5 "Manually acknowledge a system message").

Tab. 7: List of system messages

## 8 Inspection and maintenance

### 8.1 Safety instructions for maintenance work

The unit must be opened in order to carry out maintenance work. There is a risk of injury from electric shock.

- Switch off the power supply before carrying out maintenance work.
- Secure the power supply to prevent it being switched back on accidentally.
- Disconnect the electrical connection cable of the cooling unit from the power supply.
- Wait at least five minutes before handling the unit. Only then will the capacitors built into the unit have discharged themselves.
- When handling the enclosure, be aware of any exposed power sources, where applicable.
- If possible, disconnect the entire enclosure from the power.
- If assistance of other persons is required for maintenance and repair work, a person trained in handling flammable refrigerants should supervise the work at all times.

There is also a risk of injury from sharp edges, such as the louvres of the heat exchanger.

- Wear cut-resistant gloves for all maintenance work. After removing the cover, there is a risk of burn injuries from hot surfaces on the components inside the unit.
- Before carrying out any work on the interior of the unit, allow it to cool down for at least ten minutes.

### 8.2 Notes on the refrigerant circuit

The cooling unit is filled with the amount of refrigerant required at the factory, checked for leaks, and subjected to a functional test run. The refrigerant circuit is designed in the form of a maintenance-free, hermetically sealed system. For this reason, the operator should not carry out any maintenance work on the refrigerant circuit.



#### Caution!

**Maintenance tasks on the refrigerant circuit must only be undertaken by a qualified refrigeration specialist.**

### 8.3 Maintenance work on the cooling unit

If there is visible dirt present, the components in the outer air circuit should be cleaned using a vacuum cleaner or compressed air.



#### Note:

The maintenance intervals given below depend to a large extent on the level of contamination in the ambient air. For heavily contaminated air, the maintenance intervals will be reduced accordingly.

- Clean the outer surface and louvred grille of the cooling unit and the components of the unit's external circuit at least every 5,000 to 8,000 operating hours, as described in section 8.4 "Compressed air cleaning".
- Any stubborn, oily stains may additionally be removed using a non-flammable detergent, such as degreaser.



#### Caution!

**Never use flammable liquids for cleaning the unit.**

The installed maintenance-free fans are mounted on ball bearings, protected against moisture and dust, and fitted with a temperature monitor.

- Rittal recommends that the cooling unit fans should be checked e.g. for unusual running noises after around 40,000 operating hours.

### 8.4 Compressed air cleaning

#### 8.4.1 Removing an internally mounted unit

Cooling units which are internally mounted in the enclosure must first be completely removed from the mounting cut-out prior to cleaning with compressed air.



#### Note:

A second person will need to assist when dismantling the unit.

- Disconnect all connectors at the rear of the device.
- Where applicable, also disconnect the locator clip(s) from the device if you have used them for cable routing. The cables will then remain in the enclosure (with the cable routing).
- Remove the louvred grille as described in section 5.3.5 "Internal mounting of the cooling unit".



#### Note:

Please note that when removing the louvred grille, contrary to the illustrations shown in section 5.3.5 "Internal mounting of the cooling unit", the cooling unit is fitted on an enclosure door or side panel.

- With a second person assisting you, take steps to secure the device from the outside to prevent it from accidentally falling out of the mounting cut-out.
- First release and remove the two corner brackets with nuts from the grub screws at the bottom, followed by the top.

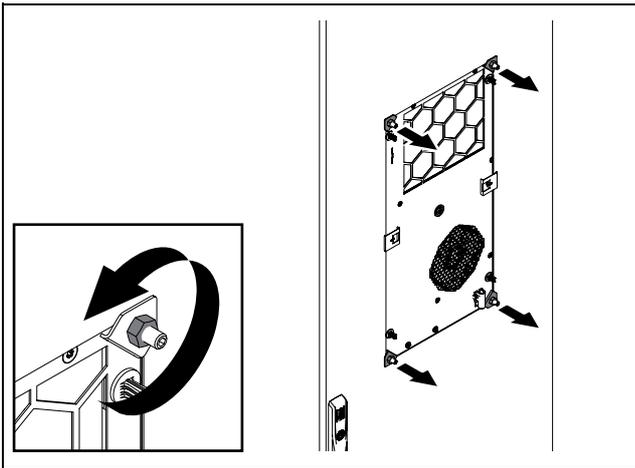


Fig. 56: Unscrew and remove the corner brackets at the top and bottom



**Caution!**  
Remove spring clips only with suitable tools (e. g. needle-nose pliers).

- Half-way up, remove one spring clip from the front of the cooling unit on both the left and right.

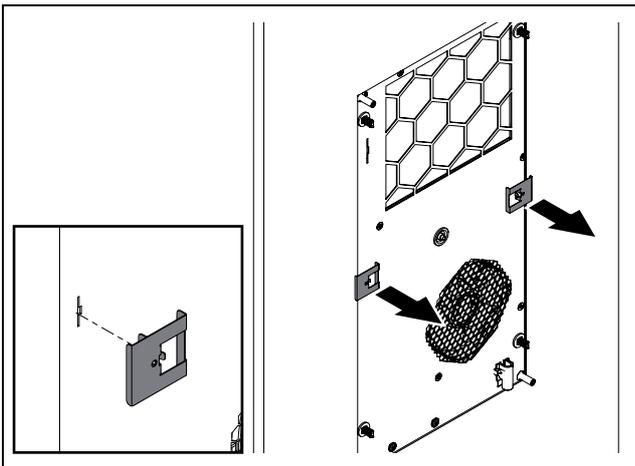


Fig. 57: Remove the spring clips

- Hold the cooling unit as straight as possible when removing it from the mounting cut-out.

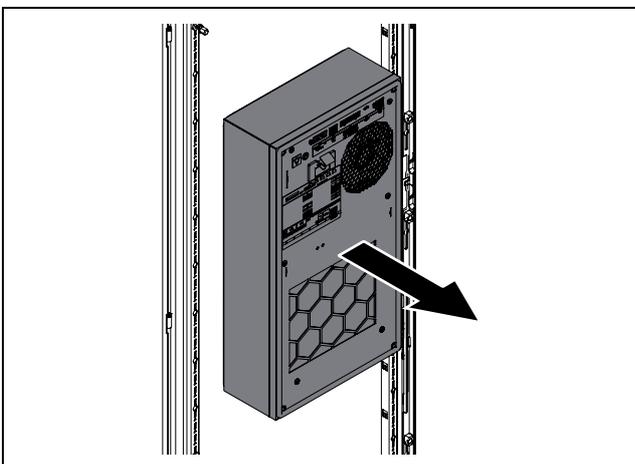


Fig. 58: Remove the cooling unit from the mounting cut-out

- Set the device down safely in a suitable place.
- Next, remove the device's cover as described in section 8.4.3 "Removing the cover".

### 8.4.2 Removing an externally mounted unit

Where cooling units are externally mounted on the enclosure, only the louvred grille must be removed initially prior to cleaning with compressed air. The rear panel including all components can remain in the mounting cut-out.

- Remove the louvred grille as described in section 5.3.5 "Internal mounting of the cooling unit".



Note:

Please note that when removing the louvred grille, contrary to the illustrations shown in section 5.3.5 "Internal mounting of the cooling unit", the cooling unit is fitted on an enclosure door or side panel.

- Next, remove the device's cover as described in section 8.4.3 "Removing the cover".

### 8.4.3 Removing the cover



**Caution!**

After removing the cover, there is a risk of burn injuries from hot component surfaces inside the unit.



**Caution!**

The cooling unit is only stable while the hood and rear wall are joined together. It is therefore particularly important to secure the rear panel to prevent it from falling before you remove the hood.

- Allow the unit to cool down for at least ten minutes before removing the cover.  
This should allow hot surfaces inside the unit to cool down sufficiently.
- For SK 347880x, SK 347980x and SK 3480800:  
Loosen the eight screws connecting the cover to the rear panel.

## 8 Inspection and maintenance

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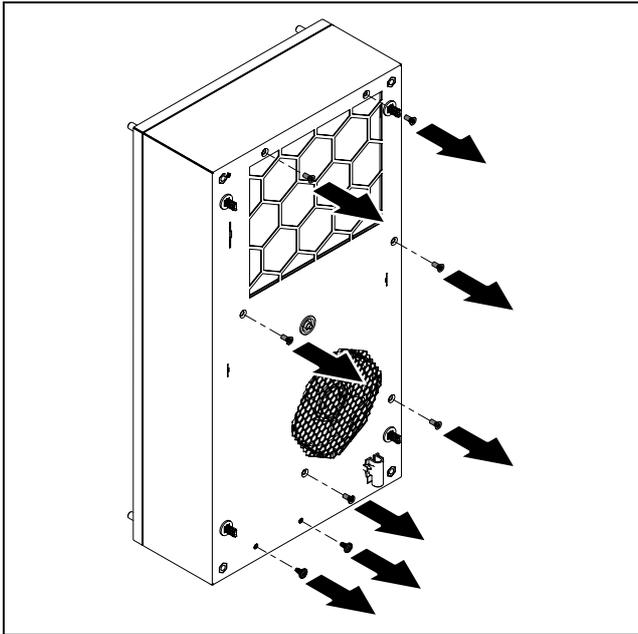


Fig. 59: Loosen the assembly screws (for SK 347880x, SK 347980x and SK 3480800)

- For SK 34848x0: Loosen the ten screws connecting the cover to the rear panel.

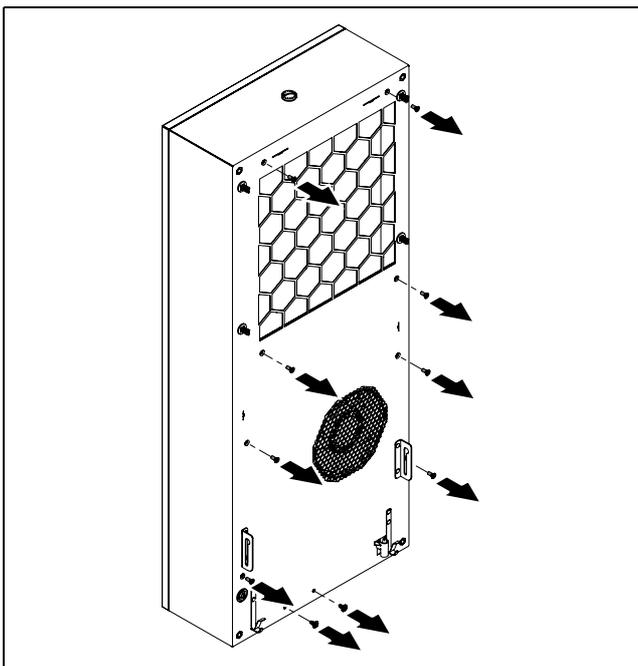


Fig. 60: Loosen the assembly screws (for SK 34848x0)

- Gently pull the cover forwards (approx. 5 cm) away from the rear panel.  
The PE conductor connection between the cover and the rear panel is located at the bottom left.

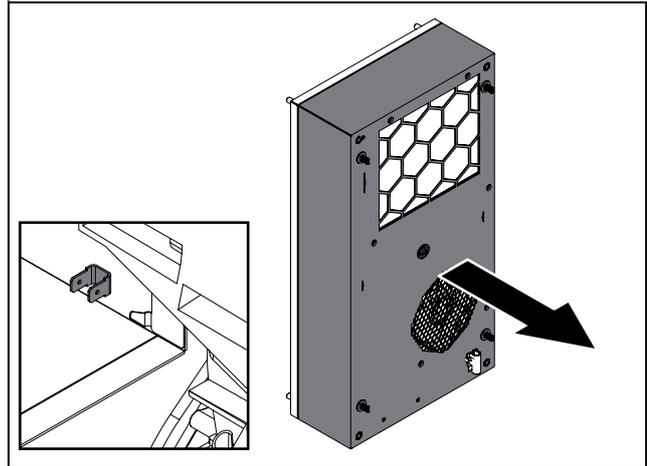


Fig. 61: PE conductor connection (sample illustration)

- Disconnect the PE conductor's flat-pin connector from the inside, preferably on the cover.
- Remove the cover completely from the rear panel, and set or lay it down in a safe place.

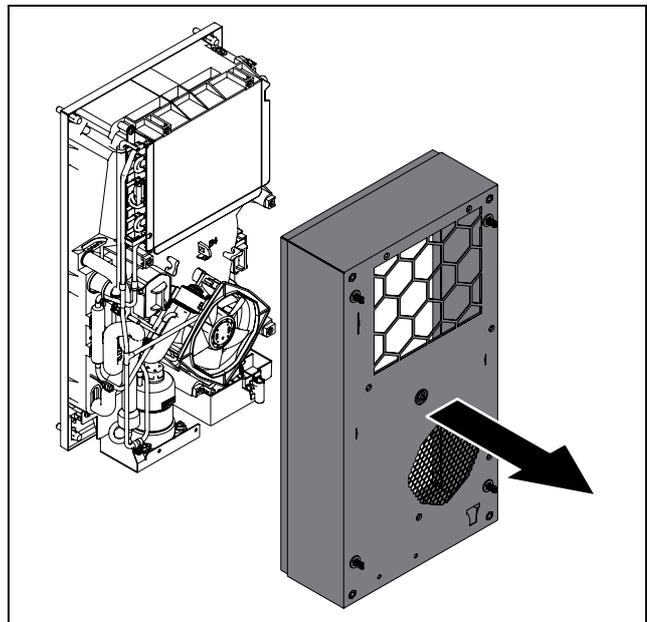


Fig. 62: Remove the cover

Dismantling of the cover is now complete, providing access to all components in the external circuit.

### 8.4.4 Cleaning the components with compressed air

After removing the cover from the unit, you will be able to access the components in the outer circuit, particularly the condenser, the condenser fan and the compressor chamber.

- Wear cut-resistant gloves when cleaning with compressed air, so as to avoid injuries caused by sharp edges inside the unit.
- When cleaning the components with compressed air, blow dirt sideways out of the cooling unit.
- Alternatively, use a suitable vacuum cleaner to clean all components.

### 8.4.5 Re-assembling the cooling unit

Once the cleaning work is complete, the cooling unit must be sealed and, if externally mounted, fitted back into the mounting cut-out.

- First, replace cover onto the rear panel.  
It is assembled in the reverse order from dismantling (see section 8.4.3 "Removing the cover").
- Before fully replacing the cover, make sure that the PE conductor is correctly connected to the flat-pin connector on the cover (fig. 61).
- Furthermore, make sure that the PE conductor is not squashed or damaged when replacing the cover.



#### **Warning!**

**If the PE conductor is not connected or has been incorrectly connected, there is a danger to life from electric shock.**

- During installation, please observe the following torques for the cover assembly screws:
  - 2 screws on the compressor console (at the bottom of the unit): 3 Nm
  - Remaining 6 / 8 screws: 2 Nm
- For externally mounted units, re-fit the cooling unit into the mounting cut-out (see section 5.3.4 "External mounting of the cooling unit").
- For internally mounted units, re-fit the louvred grille onto the cooling unit (see section 5.3.5 "Internal mounting of the cooling unit").
- Make the electrical connection for the cooling unit.

# 9 Storage and disposal

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EN

## 9 Storage and disposal

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Note:

When storing the cooling unit, please observe the temperature range given in the technical specifications.

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- Store the cooling unit in the appropriate position for transport.

The closed refrigerant circuit contains refrigerant and oil which must be properly disposed of for the sake of the environment. Facilities for disposal are available at the Rittal plant or a specialist company. Give us a call (see section 14 "Customer service addresses").

## 10 Technical specifications



Note:

The "Rated input current of the inverter" refers to the maximum current the installed inverter can draw under laboratory conditions. This value is required from the UL approval and is not relevant in practice for installation and operation.

Pos.	Technical specifications		SK 3478800	SK 3478801	SK 3479800	SK 3479801
<b>General specifications</b>						
	Model No.		SK 3478800	SK 3478801	SK 3479800	SK 3479801
	Dimensions (W x H x D) [mm]		300 x 570 x 159		300 x 570 x 199	
<b>Cooling output and efficiency ratings</b>						
7	Total cooling output P <sub>c</sub> [W]	L35 L20	450	450	710	710
		L35 L35	300	300	500	500
		L35 L50	135	135	225	225
	Sensible cooling capacity P <sub>s</sub> [W]	L35 L20	450	450	710	710
		L35 L35	300	300	500	500
		L35 L50	135	135	225	225
	Power consumption P <sub>el</sub> [W]	L35 L20	140	125	235	215
		L35 L35	170	150	260	250
		L35 L50	190	170	300	290
	Energy efficiency ratio (EER)	L35 L20	3.18	3.60	3.04	3.28
		L35 L35	1.80	2.01	1.92	2.0
		L35 L50	0.71	0.79	0.75	0.78
<b>Electrical specifications</b>						
1	Rated voltage [V, ~], tolerance	+10%/-10%	110...240, 1			
2	Rated frequency [Hz]		50/60			
	Rated insulation voltage U <sub>i</sub> [V]		240			
	Rated impulse withstand voltage U <sub>imp</sub> [V]		4000			
3	Rated power input [W]		220		360	
4	Rating of over current protective device [A]		≥15			
5	Minimum circuit ampacity [A]		15			
6	Rated input current of the inverter [A]		6.56			
	Pre-fuse T [A]	EN 61439	≥16			
		UL 508A	≥15			
	Pre-fuse type		CCMR			

Tab. 8: Technical specifications Blue e+ SK 3478800, SK 3478801, SK 3479800, SK 3479801

# 10 Technical specifications

EN

Pos.	Technical specifications		SK 3478800	SK 3478801	SK 3479800	SK 3479801
	Alternatively one of the following pre-fuses		SK 3235600: miniature circuit-breaker 5SY4116-8 (IEC)			
			SK 3235610: circuit-breaker 3RV2021-4AA10-0RT0 (IEC) (SCCR = 55 kA)			
			SK 3235620: circuit-breaker 3RV2711-4AD10-0RT0 (UL and CSA) (SCCR = 65kA)			
	SCCR [kA]		5			
	Cable cross-section [mm <sup>2</sup> ]	EN 61439	≥1.5			
		UL 508A	≥2.1 or ≤14 AWG			
	Overvoltage category		III			
	Level of contamination		III			
<b>Protection category of cooling unit</b>						
18	IP Rating		24			
<b>Protection category with the unit externally mounted</b>						
19	IP Rating		55			
20	UL Type rating		3R, 12			
<b>Electromagnetic compatibility</b>						
	Immunity to interference		For industrial areas to EN 61000-6-2			
	Emitted interference		For residential, business and commercial areas and small companies to EN 61000-6-3			
<b>Technical specifications for a suitable overvoltage protection module</b>						
	Terminal voltage U <sub>c</sub> [V, Hz]		350...400, 50/60			
	Maximum current I <sub>max</sub> [kA]		40			
	Rated current I <sub>n</sub> [kA]		20			
	Breakdown voltage U <sub>p</sub> [kV]		1.75			
<b>Refrigerant circuit</b>						
17	Admissible pressure (PS) HD/ND [MPa]		3.2 / 1.9		3.2 / 2.0	
11	Operating temperature range [°C/°F]		-20...+60/-4...140			
	Heat pipe active mode [°C/°F]		-20...+45/-4...113			
	Refrigerant cycle active mode [°C/°F]		+3...+60/37...140			
	Setting range set value [°C/°F]	Internal temp.	+20...+50/68...122			
		External sensor	+20...+50/68...122			
Outlet temp.		+18...+28/64...82				
14	Refrigerant identification		R1234yf (2,3,3,3-Tetrafluorpropen (C3H2F4))			
12	Refrigerant filling mass compression system [g]		80	80	100	100
13	Refrigerant filling mass heat pipe system [g]		55	55	70	70
15	GWP		0.5			
16	CO <sub>2</sub> e [t]		0.00	0.00	0.00	0.00

Tab. 8: Technical specifications Blue e+ SK 3478800, SK 3478801, SK 3479800, SK 3479801

# 10 Technical specifications

EN

Pos.	Technical specifications	SK 3478800	SK 3478801	SK 3479800	SK 3479801
	<b>Other</b>				
	Weight [kg]	12.2	12.0	13.0	12.8
	Storage temperature range [°C/°F]	-40...+70/-40...158			
	Maximum operating altitude above sea level (NN) [m]	3500			
	Noise pressure level Lp: Maximum value [dB(A)]	67		66	
	Noise pressure level Lp: 100% cooling output [dB(A)]	L35/L35	62		63
	Noise pressure level Lp: 75% cooling output [dB(A)]	L35/L35	56		55
	Noise pressure level Lp: 50% cooling output [dB(A)]	L35/L35	50		51
	Humidity [%]	5...95, non-condensing			
35	Manufacture date	DD.MM.YY			
	<b>Approvals</b>	See product page on the Rittal website			

Tab. 8: Technical specifications Blue e+ SK 3478800, SK 3478801, SK 3479800, SK 3479801

Pos.	Technical specifications	SK 3480800	SK 3484800	SK 3484840	
	<b>General specifications</b>				
	Model No.	SK 3480800	SK 3484800	SK 3484840	
	Dimensions (W x H x D) [mm]	300 x 570 x 250	400 x 950 x 196		
	<b>Cooling output and efficiency ratings</b>				
7	Total cooling output P <sub>c</sub> [W]	L35 L20	980	1290	1290
		L35 L35	720	920	920
		L35 L50	440	550	550
	Sensible cooling capacity P <sub>s</sub> [W]	L35 L20	980	1290	1290
		L35 L35	720	920	920
		L35 L50	440	550	550
	Power consumption P <sub>el</sub> [W]	L35 L20	345	360	385
		L35 L35	410	420	420
		L35 L50	490	480	490
	Energy efficiency ratio (EER)	L35 L20	2.85	3.60	3.34
		L35 L35	1.76	2.19	2.19
		L35 L50	0.90	1.15	1.12
	<b>Electrical specifications</b>				
1	Rated voltage [V, ~], tolerance	+10%/-10%	110...240, 1		380...480, 2
2	Rated frequency [Hz]	50/60			
	Rated insulation voltage U <sub>i</sub> [V]	240			480
	Rated impulse withstand voltage U <sub>imp</sub> [V]	4000			
3	Rated power input [W]	560	600	590	
4	Rating of over current protective device [A]	≥15			

Tab. 9: Technical specifications Blue e+ SK 3480800, SK 3484800, SK 3484840

# 10 Technical specifications

EN

Pos.	Technical specifications		SK 3480800	SK 3484800	SK 3484840
5	Minimum circuit ampacity [A]		15		
6	Rated input current of the inverter [A]		6.6	7.4	2.67
	Pre-fuse T [A]	EN 61439	≥16		
		UL 508A	≥15		
	Pre-fuse type		CCMR		
	Alternatively one of the following pre-fuses		SK 3235600: miniature circuit-breaker 5SY4116-8 (IEC)	-	
			SK 3235610: circuit-breaker 3RV2021-4AA10-ORT0 (IEC) (SCCR = 55 kA)		
			SK 3235620: circuit-breaker 3RV2711-4AD10-ORT0 (UL and CSA) (SCCR = 65kA)		
	SCCR [kA]		5		
	Cable cross-section [mm <sup>2</sup> ]	EN 61439	≥1.5		
		UL 508A	≥2.1 or ≤14 AWG		
	Overvoltage category		III		
Level of contamination		III			
<b>Protection category of cooling unit</b>					
18	IP Rating		24		
<b>Protection category with the unit externally mounted</b>					
19	IP Rating		55		
20	UL Type rating		3R, 12		
<b>Electromagnetic compatibility</b>					
Immunity to interference			For industrial areas to EN 61000-6-2		
Emitted interference			For residential, business and commercial areas and small companies to EN 61000-6-3		
<b>Technical specifications for a suitable overvoltage protection module</b>					
Terminal voltage U <sub>c</sub> [V, Hz]			350...400, 50/60		
Maximum current I <sub>max</sub> [kA]			40		
Rated current I <sub>n</sub> [kA]			20		
Breakdown voltage U <sub>p</sub> [kV]			1.75		
<b>Refrigerant circuit</b>					
17	Admissible pressure (PS) HD/ND [MPa]		3.5 / 2.0	3.4 / 2.1	
11	Operating temperature range [°C/°F]		-20...+60/-4...+140		
	Heat pipe active mode [°C/°F]		-20...+45/-4...+113		
	Refrigerant cycle active mode [°C/°F]		+3...+60/+37...+140		
	Setting range set value [°C/°F]	Internal temp.		+20...+50/+68...+122	
		External sensor		+20...+50/+68...+122	
		Outlet temp.	+18...+28/+64...+82		

Tab. 9: Technical specifications Blue e+ SK 3480800, SK 3484800, SK 3484840

# 10 Technical specifications

EN

Pos.	Technical specifications	SK 3480800	SK 3484800	SK 3484840
14	Refrigerant identification	R1234yf (2,3,3,3-Tetrafluorpropen (C3H2F4))		
12	Refrigerant filling mass compression system [g]	100	220	
13	Refrigerant filling mass heat pipe system [g]	70	120	
15	GWP	0.5		
16	CO2e [t]	0.00	0.00	
<b>Other</b>				
	Weight [kg]	15.3	26.2	26.6
	Storage temperature range [°C/°F]	-40...+70/-40...+158		
	Maximum operating altitude above sea level (NN) [m]	3500		
	Noise pressure level Lp: Maximum value [dB(A)]	69	72	
	Noise pressure level Lp: 100% cooling output [dB(A)]	L35/L35	68	68
	Noise pressure level Lp: 75% cooling output [dB(A)]	L35/L35	64	60
	Noise pressure level Lp: 50% cooling output [dB(A)]	L35/L35	57	56
	Humidity [%]	5...95, non-condensing		
35	Manufacture date	DD.MM.YY		
<b>Approvals</b>		See product page on the Rittal website		

Tab. 9: Technical specifications Blue e+ SK 3480800, SK 3484800, SK 3484840

Country of origin:  
R: \_\_\_\_\_

**Rittal GmbH & Co.KG**  
Auf dem Stuetzelberg  
35745 Herborn

**SK** \*\*\* \_\_\_\_\_

S/N: [\*\*\*\*] Client spec.: [\*\*\*\*\*]

27

REV. [\*\*]

**Enclosure Cooling Unit**  
Schaltschrank-Kühlergerät  
Climatiseur pour armoires électriques  
空调器 (控制柜冷却装置)

Rated voltage/Bemessungsspannung/额定工作电压:

Rated frequency/Frequenz/频率:

Rated power input/Bemessungsleistung/额定功率输入:

Rating of over current protective device (fuse or circuit breaker as defined in manual) / 过电流保护装置额定值 (按照产品手册中定义的熔断器或断路器):

Minimum circuit ampacity / 最小电流:

Input ampere range / 输入电流范围:

Rated input current of the inverter/ 逆变器额定输入电流:

Total cooling capacity DIN EN 14511 / 有效冷却功率:

Gesamtkühlleistung DIN EN 14511/有效冷却功率:

Temperature range/Betriebstemperaturbereich / 温度范围:

Refrigerant charge/Kältemittel-Füllmenge/制冷剂容量:

Heat pipe / Kältemittelkreislauf / 热管:

Refrigerant ID/Kältemittel Identification/制冷剂型号:

GWP:

CO2e:

Allowable pressure(PS)/Zulässiger Druck(PS)/ 允许压力:

IP-Code/Schutzart EN 60529/ IP等级:

Internal circuit/Innenkreislauf/内循环电路防护等级:

External circuit/Außenkreislauf/外循环电路防护等级:

Environmental Type Rating:

Manufacturing date/ Produktionsdatum/生产日期:

Hermetical sealed/Hermetisch geschlossen  
Leakage tested EN-378-2/Dichtheit geprüft

Rittal Service International:  
www.rittal.com/service

Appliance should not be accessible to the general public.  
Rittal Limited  
Brattwell Way  
Hellaby Rotherham  
S66 8QY, UK

# 11 List of spare parts

EN

## 11 List of spare parts

You can find spare parts on the relevant Rittal website under the relevant Model No.



**Note:**

The components used are Rittal-specific components. We recommend using only original Rittal spare parts to ensure the guaranteed unit properties (output).

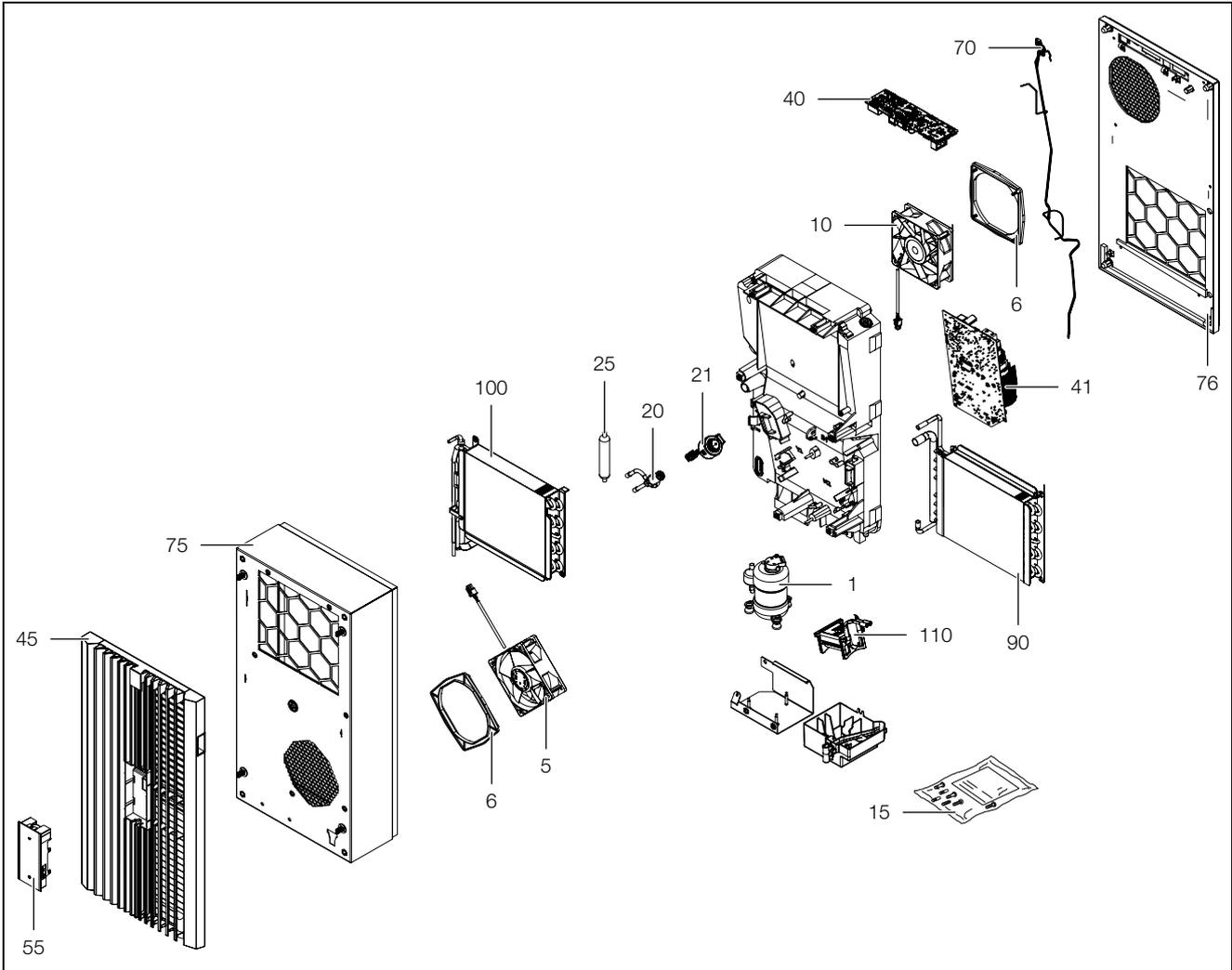


Fig. 63: Spare parts (SK 3478800, SK 3478801, SK 3479800, SK 3479801, SK 3480800, SK 3480800)

**Key**

- |    |                                                       |     |                                                                |
|----|-------------------------------------------------------|-----|----------------------------------------------------------------|
| 1  | Compressor                                            | 100 | Condenser                                                      |
| 5  | Condenser fan                                         | 110 | Condensate water evaporator (except SK 3478801 and SK 3479801) |
| 6  | Sealing ring                                          |     |                                                                |
| 10 | Evaporator coil fan                                   |     |                                                                |
| 15 | Accessories bag                                       |     |                                                                |
| 20 | Expansion valve                                       |     |                                                                |
| 21 | Coil for expansion valve                              |     |                                                                |
| 25 | Filter dryer                                          |     |                                                                |
| 40 | Control module                                        |     |                                                                |
| 41 | Inverter                                              |     |                                                                |
| 45 | Louvred grille                                        |     |                                                                |
| 55 | Display                                               |     |                                                                |
| 70 | Cable set, temperature sensor including display cable |     |                                                                |
| 75 | Cover                                                 |     |                                                                |
| 76 | Rear panel                                            |     |                                                                |
| 90 | Evaporator                                            |     |                                                                |

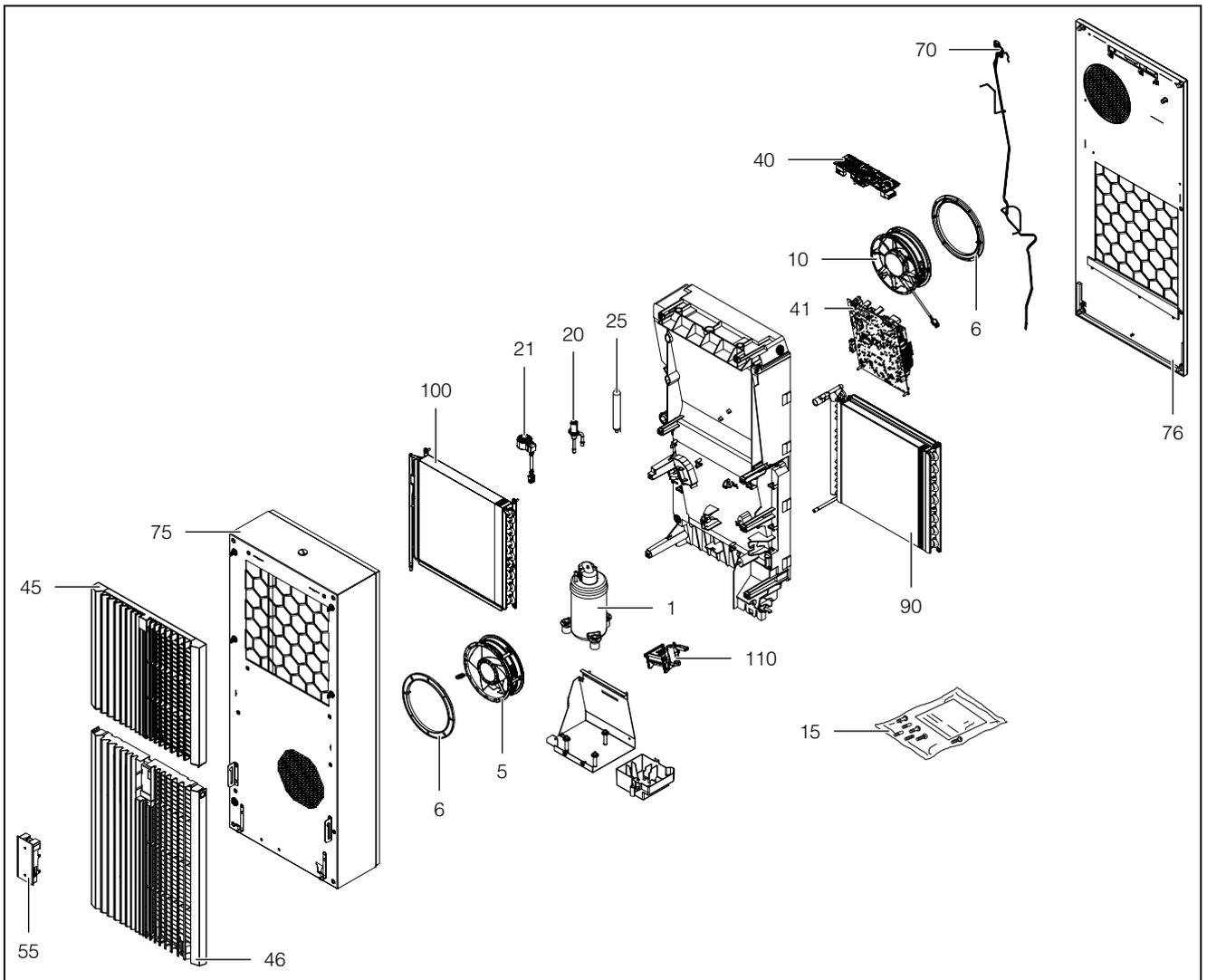


Fig. 64: Spare parts (SK 3484800, SK 3484840)

**Key**

- 1 Compressor
- 5 Condenser fan
- 6 Sealing ring
- 10 Evaporator coil fan
- 15 Accessories bag
- 20 Expansion valve
- 21 Coil for expansion valve
- 25 Filter dryer
- 40 Control module
- 41 Inverter
- 45 Louvred grille, top
- 46 Louvred grille, bottom
- 55 Display
- 70 Cable set, temperature sensor including display cable
- 75 Cover
- 76 Rear panel
- 90 Evaporator
- 100 Condenser
- 110 Condensate water evaporator

## 12 Drawings

### 12.1 Representation of mounting cut-outs

SK 3478800, SK 3478801, SK 3479800, SK 3479801,  
SK 3480800

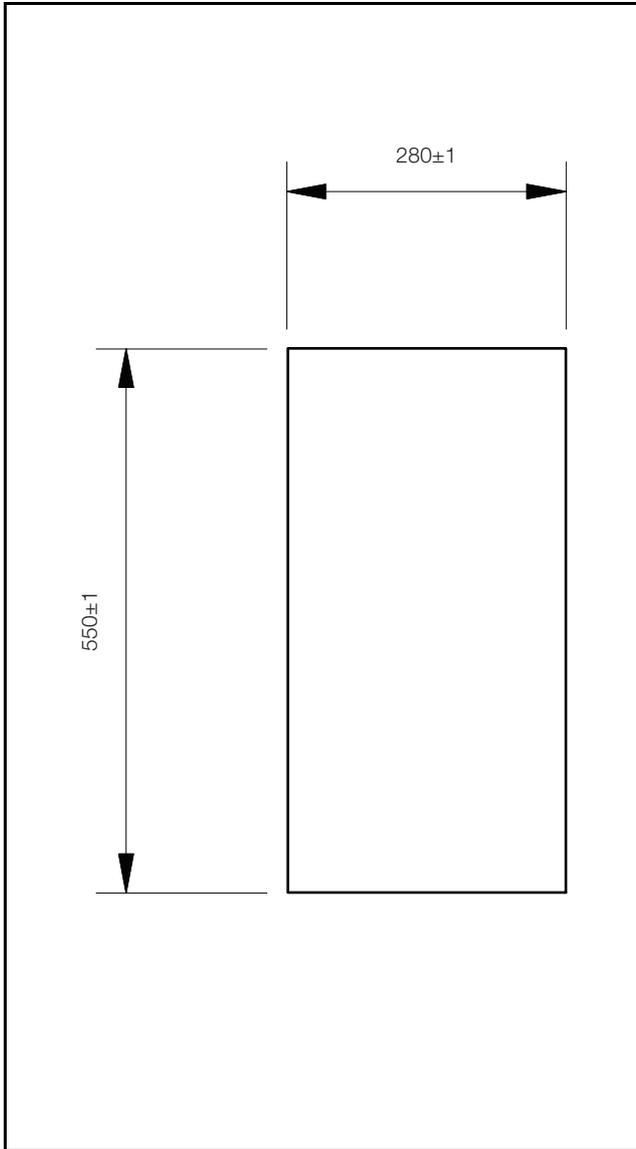


Fig. 65: Mounting cut-out

SK 3484800, SK 3484840

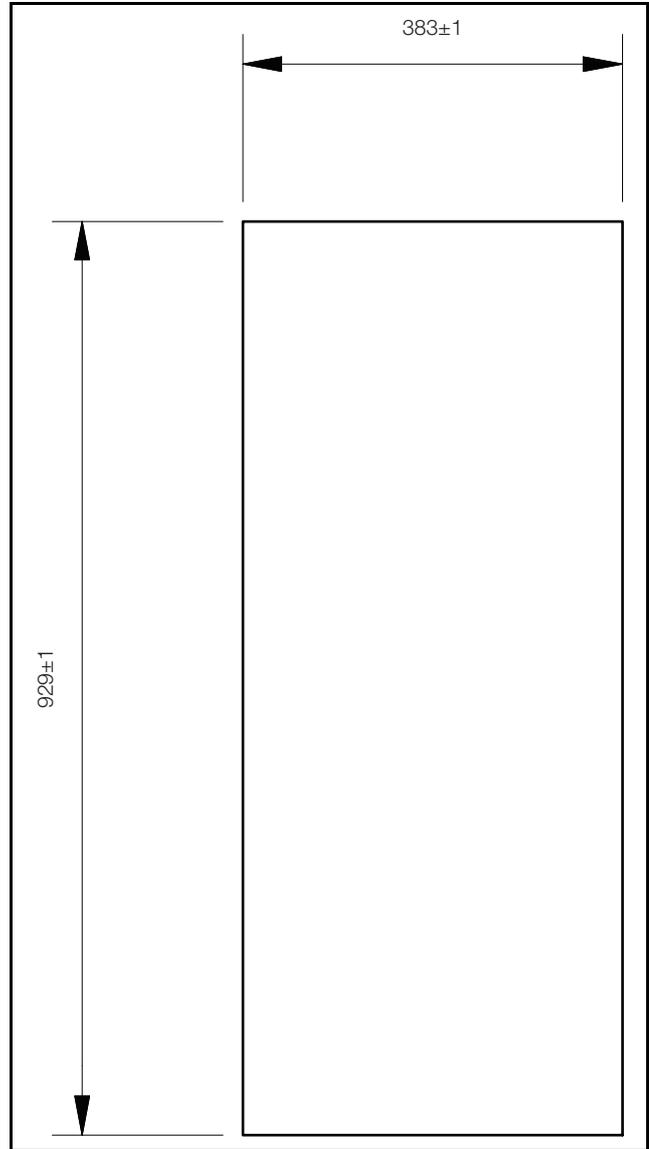


Fig. 66: Mounting cut-out

12.2 External and internal mounting dimensions (SK 347880x – width 300 mm)

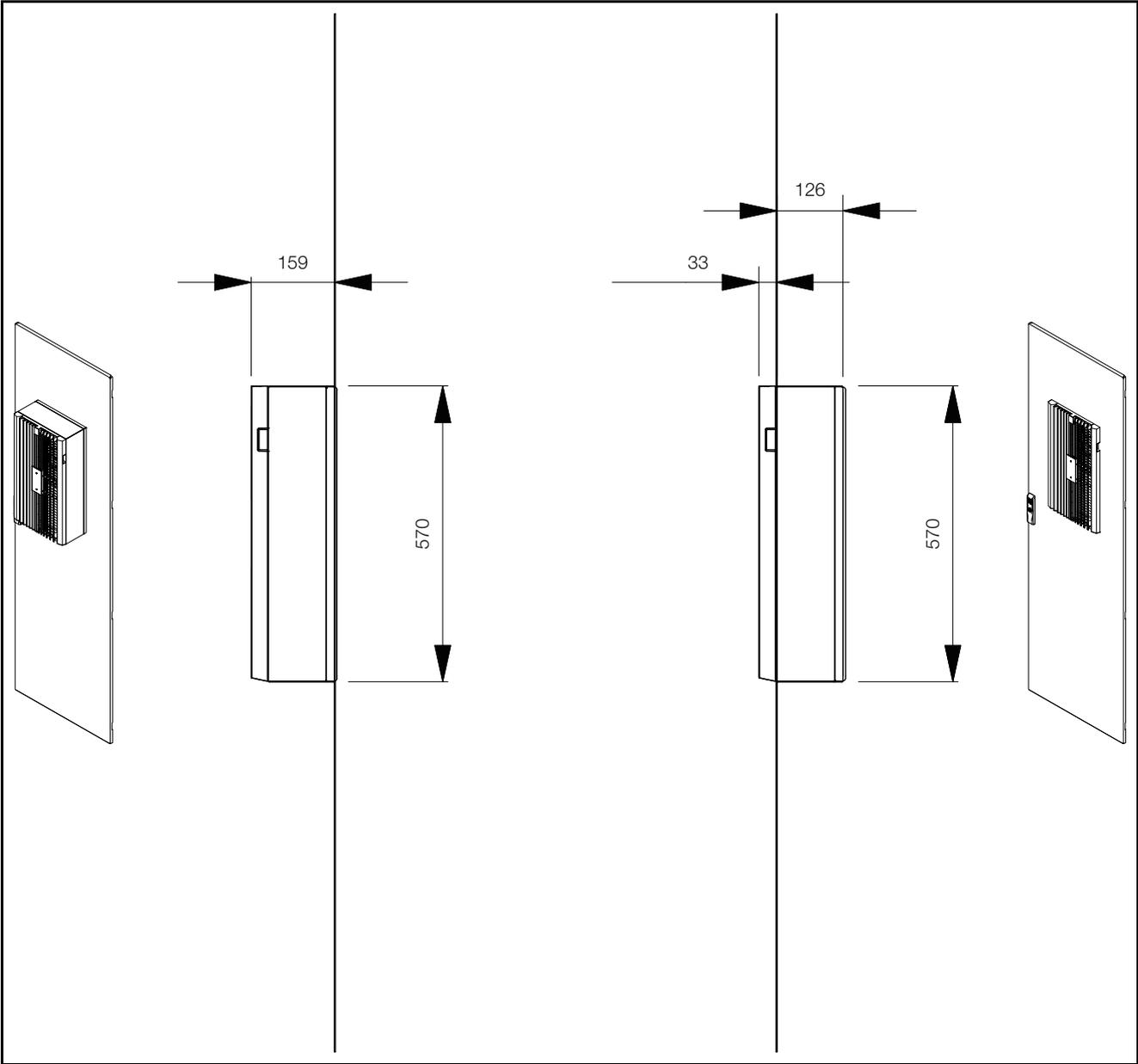


Fig. 67: Dimensions

# 12 Drawings

EN

## 12.3 External and internal mounting dimensions (SK 347980x – width 300 mm)

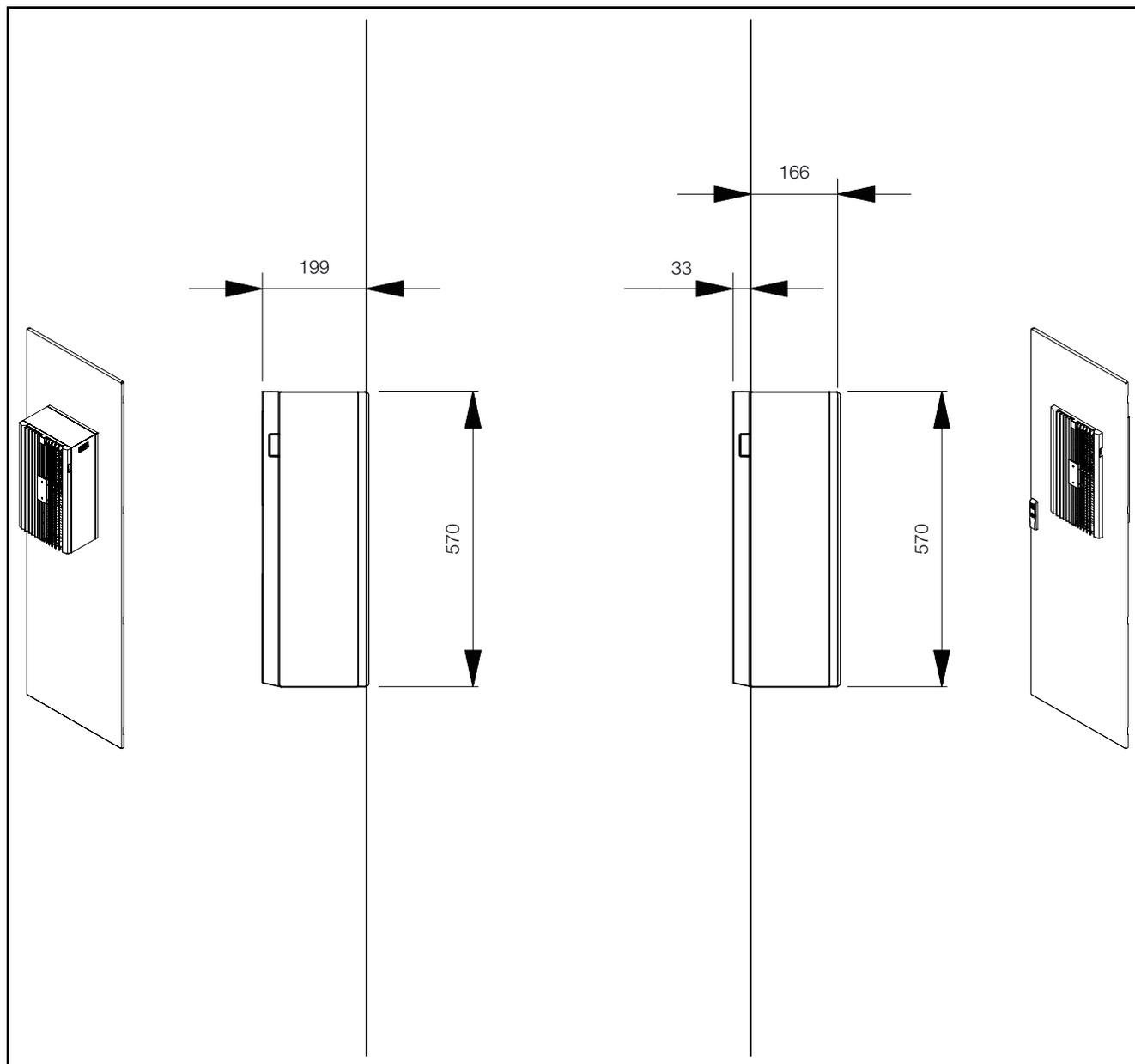


Fig. 68: Dimensions

12.4 External and internal mounting dimensions (SK 3480800 – width 300 mm)

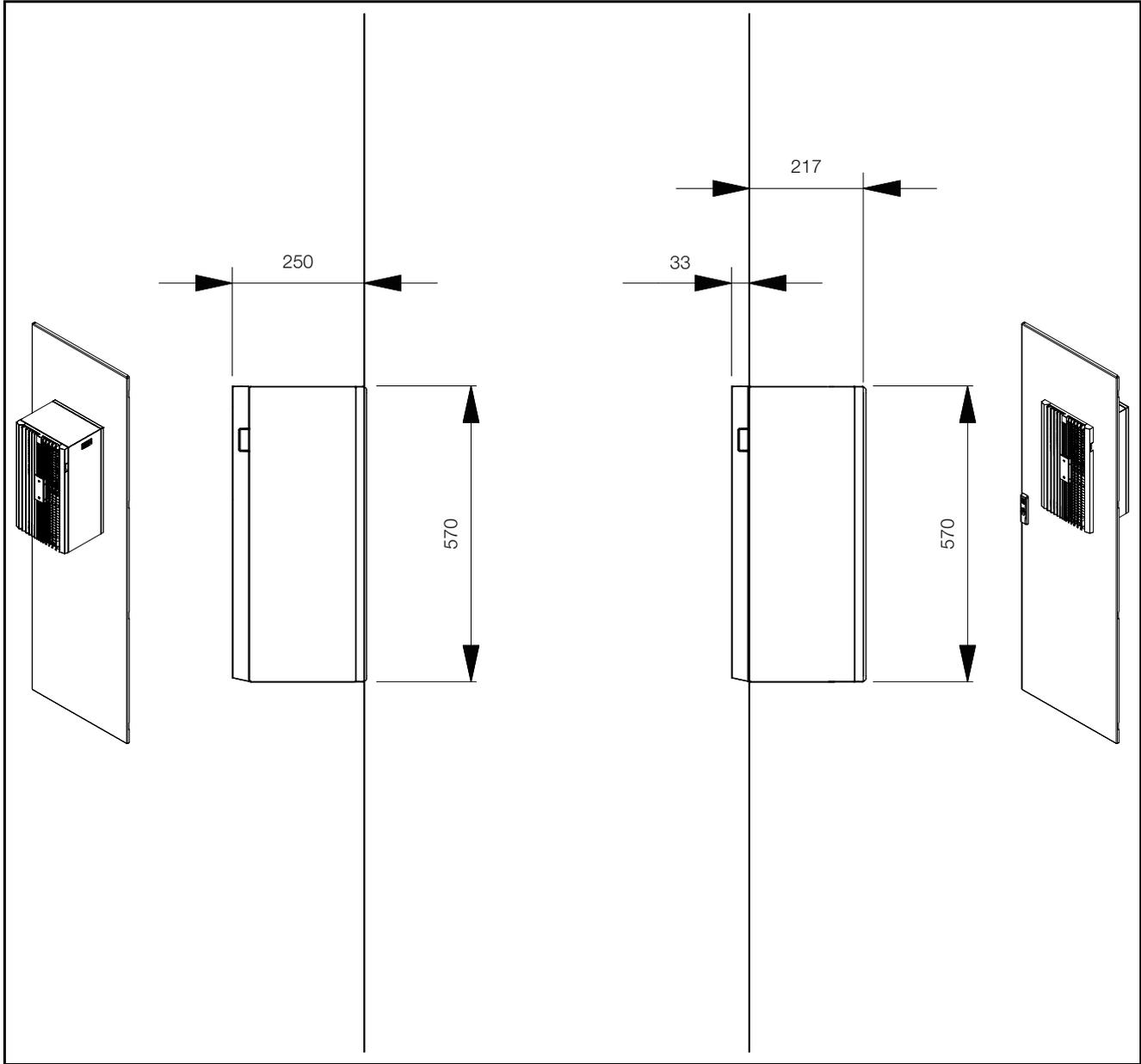


Fig. 69: Dimensions

# 12 Drawings

EN

## 12.5 External and internal mounting dimensions (SK 34848x0 – width 400 mm)

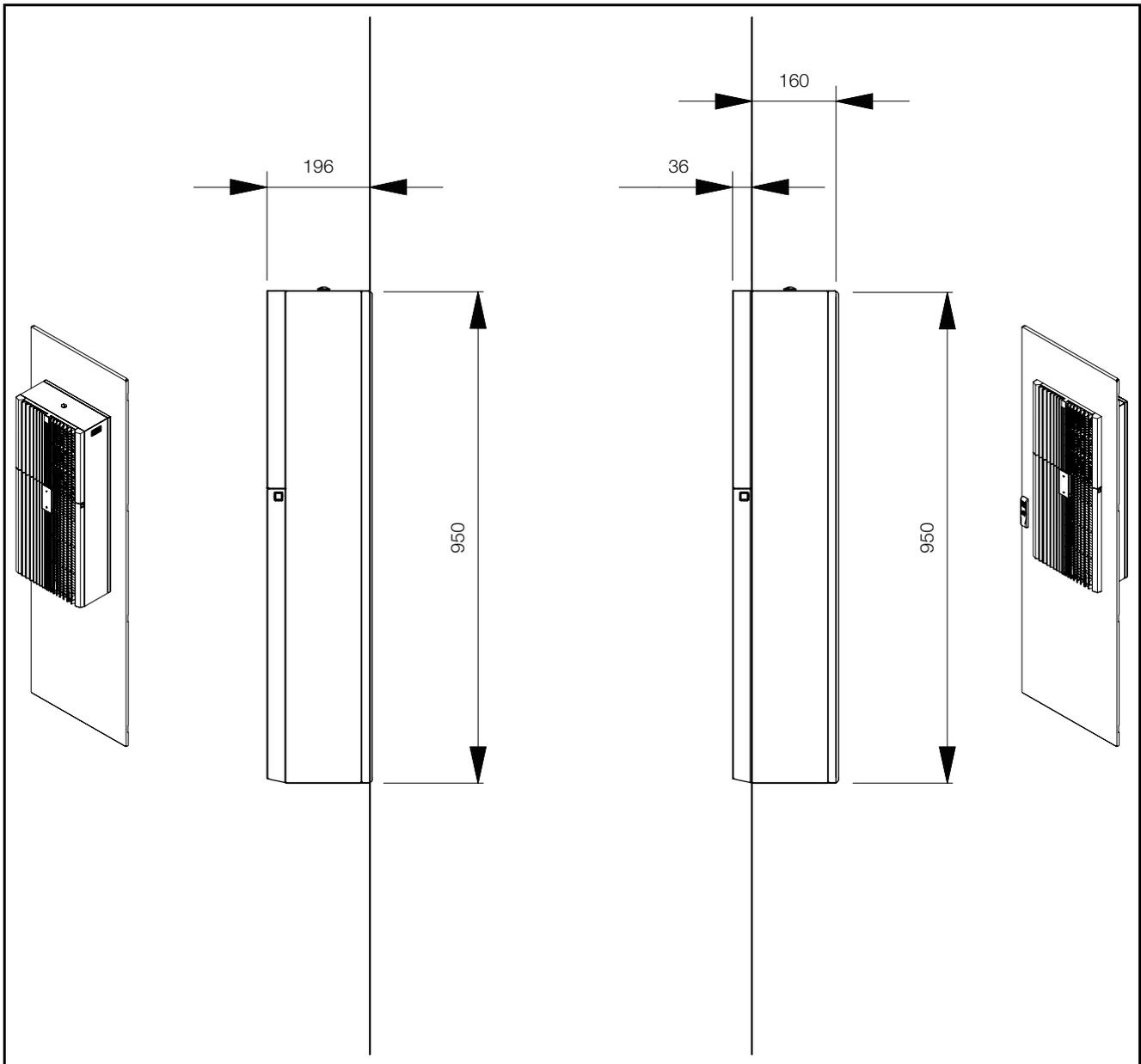


Fig. 70: Dimensions

### 13 Accessories

As well as the accessories listed below, details of our full range of accessories can be found on the Rittal website.

Item	SK 347880x SK 347980x SK 3480800	SK 3484800 SK 3484840
External temperature sensor	SK 3124400	
Condensate water hose	SK 3301612	
Filter mats	SK 3285850	SK 3285950
Metal filter	SK 3285860	SK 3285960
Door limit switch	SZ 4127010	
IoT Interface	SK 3124300	

Item	SK 347880x SK 347980x SK 3480800 SK 3484800	SK 3484840
Pre-fuse	SK 3235600	–
	SK 3235610	
	SK 3235620	

Tab. 10: List of accessories

**Download Rittal Scan & Service app**







Tab. 11: Download Rittal Scan & Service app

# 14 Customer service addresses

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EN

## 14 Customer service addresses

Contact details can be found on the Rittal website at:

– <https://www.rittal.com/rittal-locations>



## 15 Compact service information

Step	See	OK/comment
<b>Assembly and connection</b>		
– Installation site requirements taken into account	Section 5.2	
<b>Assembly instructions</b>		
– Observe the relevant assembly instructions	Section 5.3.1	
– Condensate water discharge connected	Section 5.3.6	
– Electrical installation (overvoltage protection, door limit switch)	Section 5.4	
<b>Commissioning</b>		
Check the assembly – All attachments checked, filter mat fitted		
Commissioning – At least 30 minutes after assembly	Section 6	
– Download the Rittal Scan & Service app to support commissioning and subsequent operation		
– Commissioning check carried out via Rittal Scan & Service app		
<b>Operation</b>		
– Check the device status during operation using the Rittal Scan & Service app		
– Read maintenance instructions and warnings or fault messages using the Rittal Scan & Service app		

Tab. 12: Quick installation check

For all other service enquiries:

Original spare parts	Maintenance, warranty extensions (up to 5 years), service contracts
<ul style="list-style-type: none"> <li>– Enquire directly via Rittal Scan &amp; Service app</li> <li>– <a href="http://www.rittal.com">http://www.rittal.com</a></li> </ul>	<ul style="list-style-type: none"> <li>– Enquire directly via Rittal Scan &amp; Service app</li> <li>– <a href="http://www.rittal.com">http://www.rittal.com</a></li> <li>– Enquire at the relevant national company</li> <li>– <a href="http://www.rittal.com/de_de/service_contact/index.asp">http://www.rittal.com/de_de/service_contact/index.asp</a></li> </ul>
<b>Other service contacts worldwide: Rittal International Service HUBs (see section 14 "Customer service addresses")</b>	

Tab. 13: Service contacts worldwide

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Faster – better – everywhere.

- Enclosures
- Power Distribution
- Climate Control
- IT Infrastructure
- Software & Services

You can find the contact details of all Rittal companies throughout the world here.



[www.rittal.com/contact](http://www.rittal.com/contact)

RITTAL GmbH & Co. KG  
Auf dem Stuetzelberg · 35745 Herborn · Germany  
Phone +49 2772 505-0  
E-mail: [info@rittal.de](mailto:info@rittal.de) · [www.rittal.com](http://www.rittal.com)

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