<table>
<thead>
<tr>
<th>Schaltschrank-Kühlgerät</th>
<th>Cooling unit</th>
<th>Climatiseur</th>
<th>Koelaggregat</th>
<th>Kylaggregat</th>
<th>Condizionatori per armadi di comando</th>
<th>Refrigerador para armarios</th>
<th>エンクロージャー用クーリングユニット</th>
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<tr>
<td>SK 3302.xxx</td>
<td>SK 3302.3xx</td>
<td>SK 3303.xxx</td>
<td>SK 3304.xxx</td>
<td>SK 3305.xxx</td>
<td>SK 3328.xxx</td>
<td>SK 3329.xxx</td>
<td>SK 3332.xxx SK 3361.xxx SK 3366.xxx SK 3377.xxx</td>
</tr>
</tbody>
</table>
# Contents

1 Notes on documentation .................................. 4
   1.1 Associated documents .................................. 4
   1.2 CE labelling ........................................... 4
   1.3 Retention of documents .................................. 4
   1.4 Symbols used ........................................... 4

2 Safety instructions ........................................... 4

3 Device description ........................................... 5
   3.1 Functional description .................................. 5
   3.1.1 How it works ........................................ 5
   3.1.2 Control ............................................. 5
   3.1.3 Bus mode (Comfort controller only) ................ 5
   3.1.4 Safety equipment ................................... 6
   3.1.5 Condensation ....................................... 6
   3.1.6 Filter mats ......................................... 6
   3.1.7 Door limit switch .................................... 6
   3.1.8 Additional interface X3 .............................. 7
   3.2 Proper usage ........................................... 7
   3.3 Scope of supply ......................................... 7

4 Assembly and connection ................................. 7
   4.1 Choosing the installation site ........................... 7
   4.2 Assembly instructions .................................... 7
   4.2.1 General ............................................. 7
   4.2.2 Layout of the electronic components in the enclosure .... 8
   4.3 Fitting the cooling unit .................................. 8
   4.3.1 Cutting out the enclosure .............................. 9
   4.3.2 External mounting of the cooling unit ................. 9
   4.3.3 Partial internal mounting of the cooling unit ....... 9
   4.3.4 Full internal mounting of the cooling unit .......... 9
   4.4 Connecting the condensate discharge .................... 11
   4.5 Notes on electrical installation ......................... 12
   4.5.1 Connection data ..................................... 12
   4.5.2 Overvoltage protection and supply line load .......... 12
   4.5.3 Three-phase devices ................................ 12
   4.5.4 Door limit switch ................................... 12
   4.5.5 Notes on the flicker standard ........................ 12
   4.5.6 Potential equalisation ................................ 12
   4.6 Carrying out the electrical installation ................. 13
   4.6.1 Bus connection (only in conjunction with several units with a Comfort controller) ....................... 13
   4.6.2 Connection X3 for serial interface ................... 13
   4.6.3 Installing the power supply ........................... 14
   4.7 Finalising assembly ..................................... 22
   4.7.1 Installing the filter media ......................... 22
   4.7.2 Fitting the cooling unit ............................. 22
   4.7.3 Setting the filter mat monitor (only with Comfort controller) ........................................... 22

5 Commissioning .............................................. 22

6 Operation ................................................ 23
   6.1 Control using the Basic controller ....................... 23
      6.1.1 Properties ........................................... 23
      6.1.2 Operating and error display ....................... 24
      6.1.3 Test mode for the Basic controller ............... 25
      6.1.4 Setting the temperature ........................... 25
      6.1.5 Resetting the Basic controller ..................... 25
   6.2 Control using the Comfort controller ................. 26
      6.2.1 Properties ........................................... 26
      6.2.2 Launching test mode ............................... 26
      6.2.3 General programming information .................. 26
      6.2.4 Editable parameters ............................... 27
      6.2.5 Programming overview ............................. 28
      6.2.6 Defining system messages for evaluation .......... 29
      6.2.7 Setting the master-slave identifier ............... 30
      6.2.8 Evaluating system messages ....................... 30
      6.2.9 Resetting the Comfort controller ................. 32

7 Inspection and maintenance ............................. 32
   7.1 General .............................................. 32
      7.1.1 Compressed air cleaning SK 3304.xxx, SK 3305.xxx ................. 32
      7.1.2 Compressed air cleaning SK 3328.xxx, SK 3329.xxx, SK 3332.xxx ....... 36

8 Storage and disposal ..................................... 41

9 Technical specifications ................................... 41

10 List of spare parts ....................................... 45

11 Appendix:
   Cut-out and hole sizes ................................... 49
   11.1 Dimensions for external mounting .................... 49
   11.2 Dimensions for partial internal mounting ............ 50
   11.3 Dimensions for full internal mounting ............... 51
1 Notes on documentation

These assembly instructions are aimed at tradespersons who are familiar with assembly and installation of the cooling unit, and at trained specialists who are familiar with operation of the cooling unit.

1.1 Associated documents
There are two sets of instructions for the unit types described here:
– Assembly and installation instructions enclosed with the unit in the form of a paper document
– Assembly, installation and operating instructions enclosed with the unit in the form of a PDF file (Adobe Acrobat) on CD-ROM

We cannot accept any liability for damage associated with failure to observe these instructions. Where applicable, the instructions for any accessories used also apply.

1.2 CE labelling
The declaration of conformity is supplied with the unit as a separate document.

1.3 Retention of documents
These instructions and all associated documents constitute an integral part of the product. They must be given to the plant operator. The plant operator is responsible for storage of the documents so they are readily available when needed.

1.4 Symbols used
Please observe the following safety instructions and other notes in this guide:

Symbol for an instructed action:
• The bullet point indicates that you should perform an action.

Safety and other instructions:

⚠️ Danger!
Immediate danger to life and limb!

⚠️ Caution!
Potential threat to the product and its environment.

>Note:
Useful information and special features.

2 Safety instructions
Please observe the following general safety instructions when assembling and operating the unit:
– Assembly, installation and servicing may only be performed by properly trained specialists.
– Screw the enclosure to the floor to prevent it from tipping over when the cooling unit is installed.
– Do not obstruct the air inlet and air outlet of the cooling unit inside and outside the enclosure (see also section 4.2.2).
– To ensure problem-free opening and closing of the enclosure door, use a ride-up door roller (refer to the accessories in the RITTAL Catalogue). This raises the door slightly and balances out the weight of the cooling unit, to prevent buckling of the door and associated seal problems.
– The heat loss of the components installed in the enclosure must not exceed the specific useful cooling output of the cooling unit.
– When transporting the enclosure with the cooling unit externally mounted, always use an additional shipping brace to support the cooling unit.
– The cooling unit must always be transported in an upright position.
– Use only original spare parts and accessories.
– Do not make any changes to the cooling unit other than those described in these instructions or associated instructions.
– Risk of burn injuries! For cooling units with automatic condensate evaporation, the surface of the thermal element will get very hot during operation, and will remain so for some time afterwards.
– The mains connector of the cooling unit must only be connected and disconnected with the system de-energised. Connect the pre-fuse specified on the rating plate.
3 Device description

Depending on the model chosen, your cooling unit may vary in appearance from the illustrations contained in these instructions. However, the functions are identical in principle.

3.1 Functional description

Enclosure cooling units are designed to dissipate heat from enclosures by cooling the air inside the enclosure and so protect the temperature-sensitive components. They are built into the side or rear panel or into the door of the enclosure.

3.1.1 How it works

The cooling unit (compression refrigeration system) is comprised of four main components (cf. Fig. 2): the evaporator (1), the coolant compressor (2), the condenser (3), and the control or expansion valve (4), which are connected by suitable pipework. This circuit is filled with a readily boiling substance, the refrigerant. Coolant R134a (CH$_2$FCF$_3$) is chlorine-free. Its ozone destruction potential is 0, making it very eco-friendly. A filter dryer (5) which is integrated into the hermetically sealed cooling circuit provides effective protection against moisture, acid, dirt particles, and foreign bodies within the cooling circuit.

In the evaporator coil (1), the liquid coolant is converted to a gaseous state. The energy needed for this purpose is taken from the enclosure air in the form of heat, which has the effect of cooling the enclosure air. In the compressor (2), the coolant is heavily compressed, so that it achieves a higher temperature inside the condenser (3) than the ambient air. This means that excess heat may be emitted to the ambient air via the surface of the condenser, as a result of which the temperature of the coolant drops and it is converted back into liquid. It is re-injected into the evaporator coil via a thermostatic expansion valve (4), which causes it to cool down further, and is then once again able to absorb the energy from the enclosure air in the evaporator coil.

The whole cycle begins again.

3.1.2 Control

RITTAL enclosure cooling units are fitted with a controller for setting the functions of the cooling unit. Depending on the design, this is either a Basic controller (display of the operating status via LED) or a Comfort controller (display plus extended functions, see chapter “6 Operation”, page 23).

3.1.3 Bus mode (Comfort controller only)

The serial unit interface X2 allows you to create a bus connection with up to ten cooling units using the master-slave cable (shielded, four-wire cable, Model No. SK 3124.100). This allows you to implement the following functions:

- Parallel unit control (the cooling units in the network can be switched on and off simultaneously)
- Parallel door status message (“door open”)
- Parallel collective fault message

Data is exchanged via the master-slave connection. During commissioning, assign an address to each unit that also includes the identifier “master” or “slave".

---

Legend

1 Blind nut
2 Evaporator fan
3 Electrical wiring plan
4 X2 master-slave connection
5 X3 optional serial interface
6 X1 terminal strip
7 Air outlet hole
8 Front half of the enclosure
9 Rear half of the enclosure
10 Louvred grille for air outlet
11 Display
12 Infill panel
13 Louvred grille for air inlet
14 Rating plate
15 Condensate discharge
16 Dispatch bag

---

Fig. 2: Cooling circuit

In the evaporator coil (1), the liquid coolant is converted to a gaseous state. The energy needed for this purpose is taken from the enclosure air in the form of heat, which has the effect of cooling the enclosure air. In the compressor (2), the coolant is heavily compressed, so that it achieves a higher temperature inside the condenser (3) than the ambient air. This means that excess heat may be emitted to the ambient air via the surface of the condenser, as a result of which the temperature of the coolant drops and it is converted back into liquid. It is re-injected into the evaporator coil via a thermostatic expansion valve (4), which causes it to cool down further, and is then once again able to absorb the energy from the enclosure air in the evaporator coil. The whole cycle begins again.
3 Device description

3.1.4 Safety equipment
- In the cooling cycle, the cooling unit has a tested pressure-operated switch to EN 12 263 which is set to maximum PS (admissible pressure); this operates via an automatic reset device whenever the pressure drops again.
- 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 refrigerant compressor and the fans are equipped with thermal winding shields to protect against excess current and excess temperatures.
- 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 floating contacts on the connection pins (terminals 3 – 5), via which system messages from the device may be polled, e.g. using a PLC (1x change-over contact Basic controller, 2 x normally open contacts Comfort controller).

3.1.5 Condensation
At high levels of humidity and low temperatures inside the enclosure, condensation may form on the evaporator coil.
The cooling units (except SK 3302.xxx, SK 3303.xxx and SK 3361.xxx) have automatic, electric condensate evaporation. The thermal component used for this purpose is based on self-regulating PTC technology. Condensate 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. The PTC thermal component is permanently connected and has no switchpoint. It is protected against short-circuits with miniature fuses (F1.1, F1.2). If the fuse has tripped, any condensation is drained off via the safety overflow. For unit types SK 3302.xxx, SK 3303.xxx and SK 3361.xxx, the condensation is routed downwards out of the unit via a drain pipe on the evaporator coil divider panel. For this purpose, a hose must be connected to the condensate nozzle (see “4.4 Connecting the condensate drain”, page 11). External condensate evaporators are available as accessories for these unit types (refer also to the accessories in the RITTAL Catalogue).

3.1.6 Filter mats
The cooling unit condenser is finished all over with a dirt-repelling, easy-to-clean RiNano coating. In many cases, therefore, the use of filter media is unnecessary, particularly in the case of 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 from time to time. For air containing oil condensation, we recommend the use of metal filters (also available as an accessory). These may be cleaned with suitable detergents and reused.
Function of the filter mat monitor:
Dirt on the filter mat is automatically determined by measuring the temperature difference in the external circuit of the cooling unit. As the level of filter mat soiling rises, the temperature difference will increase. The nominal value of the temperature difference in the external circuit adapts automatically to the relevant operating points in the performance diagrams. Hence there is no need to readjust the nominal value for different operating points of the cooling unit.

3.1.7 Door limit switch
The cooling unit may be operated with a floating door limit switch connected. The door limit switch is not included with the supply (available as an accessory, Model No. PS 4127.000). The door limit switch function causes the fans and the compressor in the cooling unit to be switched off after approximately 15 seconds when the enclosure door is opened (contacts 1 and 2 closed). This prevents the formation of condensation 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 cuts back in with a delay of approximately 15 seconds after the door has been closed, while the condenser fan and compressor switch on after approximately 3 minutes.

Note:
- No external voltage must be applied to the door contacts (terminals 1 and 2).
- For Basic controller cooling units with 230/115 V and 400 V/2-phase connection, the evaporator fan remains operational even with the door open.
3.1.8 Additional interface X3

Note:
The electrical signals at the interface are of an extra-low voltage (not extra-low safety voltages to EN 60 335).

An additional interface card may be connected to the 9-pole SUB-D connector X3 in order to incorporate the cooling unit into higher-level monitoring systems (available as an accessory, interface card Model No. SK 324.200).

3.2 Proper usage
RITTAL enclosure cooling units were developed and designed in accordance with the state-of-the-art and the recognised rules governing technical safety. Nevertheless, if used improperly, they may pose a threat to life and limb or cause damage to property. The unit is only intended for cooling enclosures. Any other use is deemed improper. The manufacturer will not be liable for any damages caused as a result of improper use, or for incorrect assembly, installation or use. All risk is borne solely by the user. Proper usage also includes the observation of all valid documents and compliance with the inspection and servicing conditions.

3.3 Scope of supply
The unit is supplied in a packaging unit in a fully assembled state. Please check the delivery for completeness:

<table>
<thead>
<tr>
<th>Qty.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Enclosure cooling unit</td>
</tr>
<tr>
<td>1</td>
<td>Dispatch bag:</td>
</tr>
<tr>
<td>1</td>
<td>– Assembly and installation instructions</td>
</tr>
<tr>
<td>1</td>
<td>– Assembly, installation and operating instructions on CD-ROM</td>
</tr>
<tr>
<td>1</td>
<td>– Self-adhesive tape</td>
</tr>
<tr>
<td>1</td>
<td>– Connector X1</td>
</tr>
<tr>
<td>4 – 10</td>
<td>– Threaded rods</td>
</tr>
<tr>
<td>1</td>
<td>– Declaration of conformity</td>
</tr>
<tr>
<td>1</td>
<td>– Nuts, washers</td>
</tr>
<tr>
<td>1</td>
<td>Drilling template</td>
</tr>
</tbody>
</table>

Tab. 1: Scope of supply

4 Assembly and connection

4.1 Choosing the installation site
When choosing the installation site for the enclosure, please observe the following:
– The site for the enclosure, and hence the arrangement of the cooling unit, must be carefully selected so as to ensure good ventilation (distances between units and distances between the unit and the wall must be at least 200 mm in each case).
– The cooling unit must be installed and operated in a vertical position (maximum deviation: 2°).
– The site must be free from excessive dirt and moisture.
– The ambient temperature must not exceed 55°C.
– It must be possible to fit a condensate discharge (see “4.4 Connecting the condensate discharge”, page 11).
– The mains connection data as stated on the rating plate of the unit must be guaranteed.

4.2 Assembly instructions

4.2.1 General
– Check the packaging carefully for signs of damage. Traces of oil on damaged packaging are an indication of refrigerant loss and leakages. Packaging damage may be the cause of a subsequent functional failure.
– The enclosure must be sealed on all sides (IP 54). Increased condensation will occur if the enclosure is not airtight.
– In order to avoid excessive condensation inside the enclosure, we recommend installing a door limit switch (e.g. PS 4127.000) which deactivates the cooling unit when the enclosure door is opened (see “3.1.7 Door limit switch”, page 6).
4 Assembly and connection

4.2.2 Layout of the electronic components in the enclosure

Caution!
Risk of condensation!
When arranging the components inside the enclosure, please ensure that the cold airflow from the cooling unit is not directed at active components. Please also ensure that the cold airflow is not directed at the warm exhaust airflow from active components such as converters. This may lead to an air short-circuit and therefore prevent adequate climate control, or may even cause the cooling unit’s internal safety devices to cease cooling operation.

Air diversion components are available as accessories – please refer to the RITTAL catalogue “System climate control”.

It is important to ensure even air circulation inside the enclosure. Under no circumstances should air inlet and outlet openings be obstructed, otherwise the cooling performance of the unit will be reduced.

Ensure the distance “x” (see Fig. 4) from electronic components and other installed enclosures so that the required air circulation is not obstructed and prevented.

4.3 Fitting the cooling unit

The enclosure cooling unit may optionally be externally mounted on the enclosure (1), partially internally mounted (2) or fully internally mounted (3):

To this end, cut the side panel or door of the enclosure as per the drilling template included with the supply, and drill the relevant holes.

Note:
Units of type SK 3302.xxx can only be either externally mounted or fully internally mounted.
Units of type SK 3332.xxx can only be either externally mounted or partially internally mounted.
For mounting the units SK 3328.xxx, SK 3329.xxx and SK 3332.xxx in the TS side panel or rear panel, we recommend the use of enclosure panel fasteners TS 8800.071 (see RITTAL Catalogue).
4.3.1 Cutting out the enclosure
- Stick the supplied drilling template onto the side panel or door of the enclosure using adhesive tape.
  There are dimensioning lines on the drilling template to suit the various installation options for your cooling unit.
- Using the dimension drawings (see Appendix), identify the valid lines and dimensions for your installation type on the drilling template.

Risk of injury!
Carefully deburr all drilled holes and cut-outs to prevent injuries caused by sharp edges.
- Mark, drill and deburr the holes.
- Make the cut-outs including the line width as per the drilling template.
- Deburr the cut-outs.

4.3.2 External mounting of the cooling unit
- Cut the supplied sealing tape to the correct length and stick it carefully along the back of the unit so that no gaps are left at the joints.

Fig. 6: Attach the sealing tape

- Screw the supplied grub screws into the blind nuts on the rear of the unit.
- Secure the unit using the supplied washers and nuts.

Fig. 7: Secure the cooling unit
(all models except SK 3302.1xx)

Fig. 8: Secure the cooling unit
(SK 3302.1xx "external mounting" only)

Only for SK 3302.xxx:
- Before installing, remove the four screws as shown.

Fig. 9: Only for SK 3302.xxx: Remove the four screws

4.3.3 Partial internal mounting of the cooling unit
- Carefully remove the louvred grille and, where applicable, the infill panel, from the enclosure by pulling forwards.
- Carefully disconnect the connector from the rear of the display and gently push it inwards through the cable gland.

Fig. 10: Remove the louvred grille & disconnect the display
4 Assembly and connection

Risk of damage!
Stability of the cooling unit is only guaranteed in its assembled state.
Brace the rear enclosure half to prevent it from falling over before removing the front enclosure half.

- Loosen the four nuts on the front enclosure half and pull the enclosure forwards by approx. 5 cm.
- Loosen the flat-pin connectors of the PE conductor between the two enclosure halves.
- Disconnect the fan connection.
- Remove the front enclosure tray completely.

Fig. 11: Remove the cover
- Remove the four spacer bolts.
- Cut the supplied sealing tape to the correct length and stick it carefully along the inside of the rear enclosure half so that no gaps are left at the connection points.

Fig. 12: Attach the sealing tape
- Push the rear enclosure half into the mounting cut-out and secure it with the four spacer bolts.
- Push the display cable through the cable gland of the front enclosure half.

Fig. 13: Secure the cooling unit
- Connect the fan connector and PE conductor.
- Mount the front enclosure tray using the washers and nuts.

Fig. 14: Connect the display connector
- Carefully connect the display connector.
- Push the louvred grille and, where applicable, the infill panel, onto the enclosure.
4 Assembly and connection

4.3.4 Full internal mounting of the cooling unit

- Carefully remove the louvred grille and the infill panel from the enclosure by pulling forwards.
- Carefully disconnect the connector from the rear of the display.

![Fig. 15: Remove the louvred grille and disconnect the display](image)

- Cut the supplied sealing tape to the correct length and stick it carefully along the front enclosure half so that no gaps are left at the connection points.

![Fig. 16: Attach the sealing tape](image)

- Loosen the four nuts and washers from the front enclosure half.
- Push the unit into the mounting cut-out from the inside of the enclosure, and secure it to the enclosure from the outside using the washers and nuts.

![Fig. 17: Secure the cooling unit](image)

- Where necessary, additionally secure the unit using the supplied mounting plates as shown in Fig. 17.
- Carefully connect the display connector.
- Push the louvred grille and, where applicable, the infill panel, onto the enclosure.

4.4 Connecting the condensate discharge

Unit types SK 3302.xxx, SK 3303.xxx and SK 3361.xxx support the installation of a condensate discharge hose (Ø 1/2”).

The condensate discharge – must be laid with a suitable and constant gradient (no siphoning) – must be laid without kinks – must not have a reduced cross-section if extended.

The condensate hose is available as an accessory (refer also to Accessories in the RITTAL Catalogue).

![Fig. 18: Connecting the condensate discharge](image)

- Connect a suitable hose to the condensate nozzle and secure using a hose clip.
- Lay the condensate hose into a pay-off or into the external condensate evaporator (refer to accessories in the RITTAL Catalogue).
4.5 Notes on electrical installation

When performing 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.

4.5.1 Connection data
- The connected voltage and frequency must correspond to the values stated on the rating plate.
- The cooling unit must be connected to the mains via an all-pin isolating device, which ensures at least 3 mm contact opening when switched off.
- No additional temperature control may be connected upstream of the unit at the supply end.
- Install the pre-fuse specified on the rating plate to protect the cable and equipment from short-circuits.
- The mains connection must ensure low-noise potential equalisation.

4.5.2 Overvoltage protection and supply line load
- The unit does not have its own overvoltage protection. Measures must be taken by the operator at the supply end to ensure effective lightning and overvoltage protection. The mains voltage must not exceed a tolerance of ±10%.
- In accordance with IEC 61 000-3-11, the unit is intended solely for use at sites with a continuous current-carrying capacity (incoming mains power supply) of more than 100 A per phase and with a supply voltage of 400/230 V. If necessary, the power supply company must be consulted to ensure that the continuous current-carrying capacity at the point of connection to the public grid is sufficient for connection of such a unit.
- The fans and compressors in single- and three-phase units are intrinsically safe (thermal winding protection). The same also applies to the transformer versions of types SK 3304.110, SK 3305.110, SK 3305.510, SK 3328.110, SK 3328.510, SK 3329.110 and SK 3329.510 and to special-voltage units which are likewise equipped with a transformer.
- Install the slow pre-fuse specified on the rating plate (miniature circuit-breaker with “K” characteristic, circuit-breaker for plant or transformer protection) to protect the cable and equipment from short-circuits. Select a suitable circuit-breaker in accordance with the information specified on the rating plate: Set it to the minimum specified value. This will achieve the best short-circuit protection for cables and equipment.
  Example: Specified setting range 6.3 – 10 A; set to 6.3 A.

4.5.3 Three-phase devices
- The three-phase version of models SK 3304.xxx, SK 3305.xxx, SK 3328.xxx, SK 3329.xxx and SK 3332.xxx must be connected to a TN network with star earthing via a circuit-breaker for plant protection (current setting as per the rating plate). Three-phase units with special voltages must be protected with a circuit-breaker for transformer protection (category AC-3) as per the rating plate.
- Units designed for three phase 400/460 V feature additional monitoring of the rotary field or the absence of a phase. If the rotary field is incorrect or a phase is absent, the unit will not run.

4.5.4 Door limit switch
- Each door limit switch must only be assigned to one cooling unit.
- Several door limit switches may be connected in parallel and operated on one cooling unit.
- The minimum cross-section for the connection cable is 0.3 mm² for a cable length of 2 m.
- The line resistance to the door limit switch must not exceed a maximum of 50 Ω.
- 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.

4.5.5 Notes on the flicker standard
The flicker limits specified in standard EN 61 000-3-3 or -3-11 are adhered to, provided the supply impedance is less than approx. 1.5 Ω.
Where necessary, the unit operator should measure the connected impedance or consult the responsible power supply company. If there is no way of influencing the supply impedance and sensitive installed components (e.g. BUS) are subjected to interference, a line reactor or starting-current limiting device should be connected upstream of the cooling unit to restrict the startup current of the cooling unit.

4.5.6 Potential equalisation
RITTAL recommends connecting a conductor with a nominal cross-section of at least 6 mm² to the potential equalisation connection point on wall-mounted cooling units, and incorporating it into the existing potential equalisation system.
According to the standard, the PE conductor in the mains connection cable is not classified as an equipotential bonding conductor.
4.6 Carrying out the electrical installation

4.6.1 Bus connection
(only in conjunction with several units with a Comfort controller)

When using several cooling units, the serial device interface X2 can be used to connect up to ten cooling units with the bus cable (Model No. SK 3124.100).

Note:
The electrical signals at the X2 interface are of an extra-low voltage (not extra-low safety voltages to EN 60 335-1).

When interconnecting, please note the following:
– De-energise the cooling units to be connected.
– Ensure proper electrical insulation.
– Make sure the cables are not laid in parallel to power lines.
– Make sure that the lines are short.

Caution!
Regarding the last slave unit in the group, do not, under any circumstances, connect the remaining socket of the Y cable SK 3124.100 into interface X3 of the cooling unit!

4.6.2 Connection X3 for serial interface

The interface card (Model No. SK 3124.200) may be connected to X3. This is used to evaluate system messages in a PLC, for remotely setting parameters and monitoring, or for integration into the facility management system.
### 4 Assembly and connection

#### Fig. 19: Connection example: Master-slave operation

**Legend**

1. Serial interface (Model No. SK 3124.200)
2. Serial interface cable
3. Master-slave bus cable (Model No. SK 3124.100)
4. RTT RITTAL TopTherm cooling units
5. X1 Supply connection/door limit switch/alarms
6. X2 Master-slave connection Sub-D, 9-pole
7. X3 Serial interface Sub-D, 9-pole
8. St. Sub-D connector, 9-pole
9. Bu. Sub-D jack, 9-pole
10. Adr. Address

#### Fig. 20: Connection example: Door limit switch and master-slave operation

**Legend**

1. Master cooling unit
2. Slave cooling units
3. 2-door enclosure with two door limit switches
4. Enclosure with door limit switch

#### 4.6.3 Installing the power supply

- Complete the electrical installation by following the wiring plan on the rear of the cooling unit (see Fig. 1 on page 5, for key see page 21).
- If you would like the system messages from the cooling unit to be evaluated via the system message relay, you should also connect a suitable low-voltage cable to connection clamps 3 – 5.
4 Assembly and connection

SK 3302.100/.110, SK 3303.100/.110, SK 3302.200/.210, SK 3303.200/.210, SK 3302.300/.310, SK 3361.100/.110, SK 3361.200/.210

Fig. 21: Electrical wiring plan no. 1

SK 3303.500/.510, SK 3303.600/.610, SK 3361.500/.510, SK 3361.600/.610

Fig. 22: Electrical wiring plan no. 2
4 Assembly and connection

SK 3361.540/640

Fig. 23: Electrical wiring plan no. 3

SK 3304.100/200

Fig. 24: Electrical wiring plan no. 4
SK 3305.100/.110, SK 3328.100/.110, SK 3329.100/.110, SK 3305.200/.210, SK 3328.200/.210, SK 3329.200/.210, SK 3366.100/.110, SK 3377.100/.110, SK 3366.200/.210, SK 3377.200/.210

Fig. 25: Electrical wiring plan no. 5

SK 3304.140, SK 3304.142, SK 3305.140, SK 3305.142, SK 3328.140, SK 3329.140, SK 3304.240, SK 3305.240, SK 3328.240, SK 3329.240, SK 3366.140/.240, SK 3377.140/.240

Fig. 26: Electrical wiring plan no. 6
4 Assembly and connection

SK 3304.700, SK 3328.700

Fig. 27: Electrical wiring plan no. 7

SK 3304.800, SK 3328.800

Fig. 28: Electrical wiring plan no. 8
Fig. 29: Electrical wiring plan no. 9

Fig. 30: Electrical wiring plan no. 10
4 Assembly and connection

Fig. 31: Electrical wiring plan no. 11

Fig. 32: Electrical wiring plan no. 12
Fig. 33: Electrical wiring plan no. 13

Legend

A1 Power PCB
A2 Basic or Comfort controller
A3 Starter relay and RC element
B1 Temperature sensor, internal temperature
B2 Icing hazard temperature sensor
B3 Temperature sensor, external 1
B4 Temperature sensor, external 2
B5 Condensate warning sensor (optional)
C1 – C4 Running capacitors
E1 Condensate evaporator
F2 PSA\textsuperscript{11} pressure-operated switch
(3302.1x0 has bridge instead of pressostat)
F3 Bimetal contact compressor
F11/F12 Miniature fuses, condensate evaporator
K1 Relay collective fault 1
K2 Relay collective fault 2
L1 LED operational green
L2 LED alarm red
M1 Compressor
M2 Condenser fan
M4 Evaporator fan
R1 Potentiometer for setting the temperature
S1 Door limit switch
(without door limit switch: terminal 1, 2 open)
T1 Transformer (optional)
X1 Main terminal strip
X2 Master-slave connection
X3 Optional interface

Note:
For technical data refer to the rating plate.

<table>
<thead>
<tr>
<th>AC</th>
<th>DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>cos $\phi = 1$</td>
<td>L/R = 20 ms</td>
</tr>
<tr>
<td>$I_{\text{max.}} = 2$ A</td>
<td>$I_{\text{min.}} = 100$ mA</td>
</tr>
<tr>
<td>$U_{\text{max.}} = 250$ V</td>
<td>$U_{\text{max.}} = 200$ V</td>
</tr>
<tr>
<td>$U_{\text{min.}} = 18$ V</td>
<td>$I_{\text{max.}} = 2$ A</td>
</tr>
</tbody>
</table>

Tab. 2: Contact data
5 Commissioning

4.7 Finalising assembly

4.7.1 Installing the filter media
The cooling unit condenser is finished all over with a dirt-repelling, easy-to-clean RiNano coating. In many cases, therefore, the use of filter media is unnecessary, particularly in the case of 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. For air containing oil condensation, we recommend the use of metal filters (also available as an accessory). When used in textile plants with heavy lint contamination, lint screens should be used (available as an optional extra).

- Pull the louvred air inlet grille from the enclosure.
- Insert the filter mat into the louvred grille as shown in Fig. 34 and push it back onto the enclosure.

![Fig. 34: Installing the filter mat](image)

4.7.2 Fitting the cooling unit
For partial and full internal mounting only.

- Connect the connector to the rear of the display.
- Place the louvred grille onto the unit at the front, and press it down until you hear it snap into place.

![Fig. 35: Connect the display and attach the louvred grille](image)

4.7.3 Setting the filter mat monitor (only with Comfort controller)
Function of the filter mat monitor:
Dirt on the filter mat is automatically detected by measuring the temperature difference in the external circuit of the cooling unit (see “6.2.5 Programming overview”, page 28). As the level of filter mat soiling rises, the temperature difference will increase. The nominal value of the temperature difference in the external circuit adapts automatically to the relevant operating points in the performance diagrams. Hence there is no need to readjust the nominal value for different operating points of the cooling unit.

5 Commissioning

- Once all the assembly and installation work is complete, switch on the power supply to the cooling unit.

The cooling unit starts running:
- With Basic controller: The green operating LED (“line”) is illuminated.
- With Comfort controller: The software version of the controller first appears for approx. 2 sec., then the enclosure internal temperature appears in the 7-segment display.

You can now make your individual settings on the unit, e.g. set the temperature or (with Comfort controller only) assign the network identifier, etc. (refer to the “Operation” chapter).

Caution! Risk of damage!
The oil must collect in the compressor in order to ensure effective lubrication and cooling.
Do not operate the cooling unit for at least 30 min. after assembling the equipment.

- Once all the assembly and installation work is complete, switch on the power supply to the cooling unit.

The cooling unit starts running:
- With Basic controller: The green operating LED (“line”) is illuminated.
- With Comfort controller: The software version of the controller first appears for approx. 2 sec., then the enclosure internal temperature appears in the 7-segment display.

You can now make your individual settings on the unit, e.g. set the temperature or (with Comfort controller only) assign the network identifier, etc. (refer to the “Operation” chapter).
6 Operation

You can operate the cooling unit using the controller on the front of the device (Fig. 1, no. 11, page 5). Depending on the model, the unit is equipped with a Basic or Comfort controller.

6.1 Control using the Basic controller

For unit types SK xxxx.100/.110/.140 and SK xxxx.200/.210/.240/.300/.310.

![Basic controller diagram](image)

**Legend**

1. Controller trim panel
2. Temperature setting
3. LED green ("line")
4. LED red ("alarm")
5. Reset button

**6.1.1 Properties**

- Three voltage variants are supported:
  - 115 V
  - 230 V
  - 400/460 V, 3-phase
- Supports multiple voltages without rewiring
- Integral start-up delay and door limit switch function
- Protective function to prevent icing
- Monitoring of all motors (compressor, condenser fan, evaporator fan)
- Phase monitoring for three-phase units
- Visualisation of the operating status via LED display:
  - Voltage on, unit operational
  - Door open (only if door limit switch installed)
  - Warning of overtemperature
  - High-pressure-operated switch has switched
- Switching hysteresis: 5 K
- Floating system message contact in case of overtemperature
- Temperature setting (setting range 30 – 55°C) via potentiometer
- Test function

The cooling unit operates automatically i.e. after switching on the power supply, the evaporator fan (see Fig. 2, page 5) will run continuously and permanently circulate the internal enclosure air. The built-in Basic controller ensures automatic normal shutdown operation of the cooling unit by the value of the fixed preset switching difference of 5 K.
## 6 Operation

### 6.1.2 Operating and error display

The Basic controller monitors and controls the cooling unit. It indicates the operating and error status via the green and red LEDs (Fig. 36, no. 3 and 4):

<table>
<thead>
<tr>
<th>LED</th>
<th>Status</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Illuminated</td>
<td>Voltage present, unit operational</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Flashing</td>
<td>Only with door limit switch installed: Enclosure door open</td>
<td>In order to avoid condensation, close the enclosure door as quickly as possible.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Only with door limit switch installed: Enclosure door closed</td>
<td>Check the position of the door limit switch.</td>
</tr>
<tr>
<td>Red</td>
<td>Alarm/error/warning</td>
<td>Number of flash intervals for the red LED</td>
<td>Flash interval</td>
</tr>
<tr>
<td></td>
<td>Implement a reset</td>
<td>Device reset</td>
<td>(12)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High pressure alarm</td>
<td>(0)</td>
</tr>
<tr>
<td>Sensors</td>
<td></td>
<td>Potentiometer defective or display error</td>
<td>(3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Interior temperature sensor defective</td>
<td>(4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Anti-icing sensor defective</td>
<td>(5)</td>
</tr>
<tr>
<td>Overload</td>
<td></td>
<td>Compressor overloaded</td>
<td>(6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Interior fan overloaded</td>
<td>(7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exterior fan overloaded</td>
<td>(8)</td>
</tr>
<tr>
<td>Device</td>
<td></td>
<td>Overload mode (heat loss)</td>
<td>(9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low load mode (heat loss)</td>
<td>(11)</td>
</tr>
<tr>
<td>Warning</td>
<td></td>
<td>Anti-icing alarm</td>
<td>(2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overtemperature warning</td>
<td>(1)</td>
</tr>
<tr>
<td>Off</td>
<td></td>
<td>No display</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rotary current phase monitoring: “LED off” = Incorrect phase connection</td>
<td>–</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Key to flash intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>I = 500 ms (red LED on)</td>
</tr>
<tr>
<td>_ = 500 ms (red LED off)</td>
</tr>
<tr>
<td>***** = 3 s pause (red LED off)</td>
</tr>
</tbody>
</table>

Tab. 3: Operating and error display of the Basic controller
6 Operation

The overtemperature message (red LED illuminated) may also be polled via an integral floating contact on the connection clamp of the cooling unit (system message relay with changeover contact, see connection diagrams under “4.6.3 Installing the power supply”, page 14):

– Terminal 3: NC (normally closed)
– Terminal 4: C (connection of the supply voltage to the system message relay)
– Terminal 5: NO (normally open)

The NC and NO definitions refer to the de-energised state. As soon as power is applied to the cooling unit, the system message relay picks up, so that the relay contacts change status (contact 3 – 4 open; contact 4 – 5 closed). This is the normal operating state of the cooling unit. As soon as an error message occurs or the power supply is interrupted, the relay drops out and contact 3 – 4 is closed.

6.1.3 Test mode for the Basic controller

The Basic controller is equipped with a test function whereby the cooling unit commences cooling operation independently of the set temperature or door limit switch function.

First you must dismantle the trim panel of the controller.

• Switch off the mains voltage.
• Remove the louvred grille or infill panel in which the controller is installed.
• Release the display lock from behind and pull it forwards slightly.

The cooling unit will commence operation and the green LED will flash (I, II, I, II, ...). Test mode is completed after approximately 5 minutes. The unit switches off and changes to normal operation.

Key
I = LED 500 ms on
_ = LED 500 ms off

In normal operation, the green LED is permanently illuminated.

• Next, rotate the potentiometer back to the required setpoint.

6.1.4 Setting the temperature

To change the temperature setting:

• Dismantle the trim panel of the controller as described in “6.1.3 Test mode for the Basic controller”, page 25.
• Set the required temperature on the temperature setting device (Fig. 36, page 23).
• Carefully push the trim panel onto the display until you hear it snap into place.
• Push the display back into the infill panel or louvred grille.
• Re-attach the louvred grille or infill panel to the cooling unit.

Note:
With the Basic controller, the temperature is preset at the factory to +35°C. In order to save energy, do not set the temperature any lower than is actually necessary.

6.1.5 Resetting the Basic controller

Following a high-pressure alarm in the cooling cycle, and once the cause has been rectified, you will need to manually reset the Basic controller:

• Dismantle the trim panel of the Basic controller as described in “6.1.3 Test mode for the Basic controller”, page 25.
• Press the reset button (Fig. 36, no. 5) for at least 3 sec.

The red LED is extinguished.

• Re-install the Basic controller.
6 Operation

6.2 Control using the Comfort controller
For unit types SK xxxx.500/.510/.540 and SK xxxx.600/.610/.640.

Fig. 38: Comfort controller

Legend
1 Programming button, also display of the set temperature unit (degrees Celsius)
2 Set button
3 Programming button, also display of the set temperature unit (degrees Fahrenheit)
4 7-segment display

6.2.1 Properties
- Three voltage variants are supported:
  - 115 V
  - 230 V
  - 400/460 V, 3-phase
- Supports multiple voltages without rewiring
- Integral start-up delay and door limit switch function
- Protective function to prevent icing
- Monitoring of all motors (compressor, condenser fan, evaporator fan)
- Phase monitoring for three-phase units
- Master-slave function with a maximum of ten units. One device functions as a master unit. Once the set temperature is reached by one of the connected slave devices or in the event of the door limit switch function, the affected slave unit will report to the master unit, which will switch all the other cooling units on or off as required.
- Switching hysteresis: Adjustable within the range 2 – 10 K, preset to 5 K.
- Visualisation of the current enclosure internal temperature and all error messages in the 7-segment display.
- Using an interface card (Model No. SK 3124.100), the unit may be incorporated into higher-level remote monitoring systems such as the RITTAL Computer Multi Control CMC.

The cooling unit operates automatically i.e. after switching on the power supply, the evaporator fan (see Fig. 2, page 5) will run continuously and permanently circulate the internal enclosure air. The compressor and condenser fan are regulated by the Comfort controller.

The Comfort controller has a 7-segment display (Fig. 38, no. 4). After switching on the power supply, the current software version is initially displayed for approximately 2 sec., followed by a preset option (e.g. 110) or the temperature. In regular operation, the display shows both the temperature (in degrees Celsius or Fahrenheit – users may switch between the two) and any error messages. The current enclosure internal temperature is usually displayed permanently. In the event of an error message, this will alternate with the temperature display. The unit is programmed using buttons 1 – 3 (Fig. 38). The relevant parameters also appear in the display.

6.2.2 Launching test mode
The Comfort controller is equipped with a test function whereby the cooling unit commences cooling operation independently of the set temperature or door limit switch function.
- Simultaneously press buttons 1 and 2 (Fig. 38) for at least 5 sec.

The cooling unit will commence operation. After approximately 5 minutes, test mode will end. The unit switches off and changes to normal operation.

6.2.3 General programming information
Using buttons 1, 2 and 3 (Fig. 38) you can change 24 parameters within the preset ranges (min. value – max. value).

Tables 4 and 5 show the parameters which can be altered. Fig. 39 of page 28 shows which buttons must be pressed.

Note on switching hysteresis:
With a low hysteresis and short switching cycles, there is a risk that cooling may not be adequate or that only partial sections of the enclosure are cooled.

Note on temperature settings:
With the Comfort controller, the temperature is preset at the factory to +35°C. In order to save energy, and due to the risk of increased condensation, do not set the temperature lower than that actually necessary.

Note on useful cooling output:
Interactive performance diagrams for calculating the useful cooling output may be found at www.rittal.com.
In principle, the programming is identical for all editable parameters. To enter programming mode:
- Press button 2 ("Set") for approx. 5 sec.
The controller is now in programming mode. While in programming mode, if you do not press any buttons for approx. 30 sec., the display will first flash, then the controller will switch back to normal display mode. The "Esc" display indicates that any made changes have not been saved.
- Press the programming buttons ▲ (°C) or ▼ (°F) to switch back and forth between the editable parameters (see tables 4 and 5).
- Press button 2 ("Set") to select the displayed parameter for editing.
The current value of this parameter is displayed.
- Press one of the programming buttons ▲ (°C) or ▼ (°F).
The "Cod" display will appear. In order to be able to change a value, you must enter the authorisation code “22”.
- Keep the programming button ▲ (°C) held down until “22” appears.
- Press button 2 ("Set") to confirm the code.

You can now alter the parameter within the preset limits.
- Press one of the programming buttons ▲ (°C) or ▼ (°F) until the required value appears.
- Press button 2 ("Set") to confirm the change.

You can now alter other parameters in the same way. There is no need to re-enter the authorisation code “22”.
- To exit programming mode, press button 2 ("Set") again for approximately 5 sec.
“Acc” will appear in the display to indicate that the changes have been saved. The display will then switch back to regular operation (enclosure internal temperature).

You can also program the Comfort controller using a diagnosis software package (Model No. SK 3159.100), the supply of which also includes a connection cable to the PC. The cable connector on the rear of the Comfort controller display serves as an interface.

### 6.2.4 Editable parameters

See also Fig. 39 on page 28.

<table>
<thead>
<tr>
<th>Progr. level</th>
<th>Display screen</th>
<th>Parameter</th>
<th>Min. value</th>
<th>Max. value</th>
<th>Factory setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>St</td>
<td>Internal enclosure temperature setpoint ( T_i )</td>
<td>20</td>
<td>55</td>
<td>35</td>
<td>The setting of the enclosure internal temperature is preset at the factory to 35°C and may be altered within a range of 20 – 55°C.</td>
</tr>
<tr>
<td>2</td>
<td>Fi</td>
<td>Filter mat monitoring</td>
<td>10</td>
<td>60</td>
<td>99 (= off)</td>
<td>To activate filter mat monitoring, set the display to at least 10 K above the temperature differential displayed in programming mode “Fi”. Filter mat monitoring is preset to “deactivated” in the factory (99 = off).</td>
</tr>
<tr>
<td>3</td>
<td>Ad</td>
<td>Master-slave identifier</td>
<td>0</td>
<td>19</td>
<td>0</td>
<td>See “6.2.7 Setting the master-slave identifier”, page 30.</td>
</tr>
<tr>
<td>4</td>
<td>CF</td>
<td>Temperature conversion °C/°F</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>The temperature display can be switched from °C (0) to °F (1). The corresponding LED displays the current unit of temperature.</td>
</tr>
<tr>
<td>5</td>
<td>H1</td>
<td>Setting for switching difference (hysteresis)</td>
<td>2</td>
<td>10</td>
<td>5</td>
<td>The cooling unit is preset in the factory to a switching hysteresis of 5 K. This parameter should only be changed in consultation with us. Please contact us for advice.</td>
</tr>
<tr>
<td>6</td>
<td>H2</td>
<td>Differential for error message A2</td>
<td>3</td>
<td>15</td>
<td>5</td>
<td>If the internal enclosure temperature exceeds the set value by more than 5 K, then error message A2 (enclosure internal temperature too high) appears on the display terminal. If necessary, the differential may be altered here within the range of 3 – 15 K.</td>
</tr>
</tbody>
</table>

Tab. 4: Editable parameters
6 Operation

6.2.5 Programming overview

Fig. 39: Programming overview
6.2.6 Defining system messages for evaluation

System messages are shown on the display screen of the Comfort controller via the displays A1 to A20 and E0. A more detailed explanation of the system messages may be found in section “6.2.8 Evaluating system messages”, page 30. See also Fig. 39 on page 28.

<table>
<thead>
<tr>
<th>Progr. level</th>
<th>Display screen</th>
<th>Min. value</th>
<th>Max. value</th>
<th>Factory setting</th>
<th>Type or location of fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>A1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>Enclosure door open</td>
</tr>
<tr>
<td>8</td>
<td>A2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>Internal temperature of enclosure too high</td>
</tr>
<tr>
<td>9</td>
<td>A3</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>Filter monitoring</td>
</tr>
<tr>
<td>10</td>
<td>A4</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>Ambient temperature too high/too low</td>
</tr>
<tr>
<td>11</td>
<td>A5</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>Icing hazard</td>
</tr>
<tr>
<td>12</td>
<td>A6</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>PSA[H pressure-operated switch</td>
</tr>
<tr>
<td>13</td>
<td>A7</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>Evaporator coil</td>
</tr>
<tr>
<td>14</td>
<td>A8</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>Condensate warning</td>
</tr>
<tr>
<td>15</td>
<td>A9</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>Condenser fan blocked or defective</td>
</tr>
<tr>
<td>16</td>
<td>A10</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>Evaporator fan blocked or defective</td>
</tr>
<tr>
<td>17</td>
<td>A11</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>Compressor</td>
</tr>
<tr>
<td>18</td>
<td>A12</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>Condenser</td>
</tr>
<tr>
<td>19</td>
<td>A13</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>Ambient temperature sensor</td>
</tr>
<tr>
<td>20</td>
<td>A14</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>Icing temperature sensor</td>
</tr>
<tr>
<td>21</td>
<td>A15</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>Condensate warning temperature sensor</td>
</tr>
<tr>
<td>22</td>
<td>A16</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>Internal temperature sensor</td>
</tr>
<tr>
<td>23</td>
<td>A17</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>Phase monitoring</td>
</tr>
<tr>
<td>24</td>
<td>A18</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>EPROM</td>
</tr>
<tr>
<td>25</td>
<td>A19</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>LAN/Master-Slave</td>
</tr>
</tbody>
</table>

Tab. 5: System messages which may be evaluated via relays

The system messages A1 – A19 may additionally be evaluated via two floating system message relays. In this way, one of the two system message relays may be allocated to each system message.

System alarm relay with normally open contact: see connection diagrams under “4.6.3 Installing the power supply”, page 14:
- Terminal 3: NO (normally open, relay 2)
- Terminal 4: C (connection of the supply voltage to the system message relay)
- Terminal 5: NO (normally open, relay 1)

The definition NO refers to the de-energised state. As soon as power is applied to the cooling unit, both system message relays (relay 1 and 2) energise.

This is the normal operating state of the cooling unit. As soon as a system message occurs or the power supply is interrupted, the corresponding relay will drop out and open the contact.

Program system messages with the value
0: System message is not sent to the system message relay, but merely appears in the display
1: System message is evaluated by relay 1
2: System message is evaluated by relay 2

RITTAL cooling unit assembly and operating instructions
6 Operation

6.2.7 Setting the master-slave identifier
When several cooling units are connected together (maximum ten), one of the cooling units must be defined as the “master” and the others as “slaves”. For this purpose, assign a corresponding identifier (address) to each cooling unit which will enable the cooling unit to be identified in the network. If one of the slave units reaches the set temperature or if the door limit switch function is activated, the affected slave unit will report to the master unit, which then deactivates all the other cooling units.

On the master cooling unit (00 = factory setting), set the number of slave units present in the network:
- 01: Master with 1 slave cooling unit
- 02: Master with 2 slave cooling units
- 03: Master with 3 slave cooling units
- 04: Master with 4 slave cooling units
- 05: Master with 5 slave cooling units
- 06: Master with 6 slave cooling units
- 07: Master with 7 slave cooling units
- 08: Master with 8 slave cooling units
- 09: Master with 9 slave cooling units

On the slave cooling unit (00 = factory setting), set its own address:
- 11: Slave cooling unit no. 1
- 12: Slave cooling unit no. 2
- 13: Slave cooling unit no. 3
- 14: Slave cooling unit no. 4
- 15: Slave cooling unit no. 5
- 16: Slave cooling unit no. 6
- 17: Slave cooling unit no. 7
- 18: Slave cooling unit no. 8
- 19: Slave cooling unit no. 9

Notes:
- Only one unit may be configured as master, and its identifier must match the number of slave units connected.
- The slave units must have different identifiers.
- The identifiers must be numbered in ascending order without any gaps.

For further connection examples, see “4.6.1 Bus connection (only in conjunction with several units with a Comfort controller)”, page 13.

For details of how to set the identifier, see “6.2.4 Editable parameters”, page 27 or “6.2.5 Programming overview”, page 28, parameter “Ad”.

6.2.8 Evaluating system messages
In the Comfort controller, system messages are indicated by a number in the display. Following the appearance of messages A03, A06 and A07 and after rectifying their cause, you will need to reset the Comfort controller (see “6.2.9 Resetting the Comfort controller”, page 32).
### Tab. 6: Troubleshooting with the Comfort controller

<table>
<thead>
<tr>
<th>Display screen</th>
<th>System message</th>
<th>Possible cause</th>
<th>Measures to rectify the fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>A01</td>
<td>Enclosure door open</td>
<td>Door open or door limit switch incorrectly positioned</td>
<td>Close door, position door limit switch correctly, check connection if necessary</td>
</tr>
<tr>
<td>A02</td>
<td>Internal temperature of enclosure too high</td>
<td>Cooling capacity inadequate/unit undersized. Error as a consequence of messages A03 to A17.</td>
<td>Check cooling capacity</td>
</tr>
<tr>
<td>A03</td>
<td>Filter monitoring</td>
<td>Filter mat soiled</td>
<td>Clean or replace; reset the Comfort controller</td>
</tr>
<tr>
<td>A04</td>
<td>Ambient temperature too high/too low</td>
<td>Ambient temperature outside of admissible operating range (+10°C to +60°C)</td>
<td>Raise or lower the ambient temperature (e.g. heat or ventilate the room)</td>
</tr>
<tr>
<td>A05</td>
<td>Icing hazard</td>
<td>Operational display in case of icing hazard. Evaporator coil fan may be mechanically blocked, defective, or cold air outlet obstructed.</td>
<td>Set the enclosure interior temperature to a higher value. Check the evaporator fan; release or exchange if necessary.</td>
</tr>
<tr>
<td>A06</td>
<td>PSA\textsuperscript{1} pressure-operated switch</td>
<td>Ambient temperature too high</td>
<td>Lower the ambient temperature; reset the Comfort controller</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Condenser soiled</td>
<td>Clean the condenser; reset the Comfort controller</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Filter mat soiled</td>
<td>Clean or replace; reset the Comfort controller</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Condenser fan defective</td>
<td>Replace; reset the Comfort controller</td>
</tr>
<tr>
<td></td>
<td></td>
<td>E-valve defective</td>
<td>Have the sensor repaired by a refrigeration engineer; reset the Comfort controller</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PSA\textsuperscript{1} pressure-operated switch defective</td>
<td>Have the switch replaced by a refrigeration engineer; reset the Comfort controller</td>
</tr>
<tr>
<td>A07</td>
<td>Evaporator coil</td>
<td>Lack of coolant; sensor in front of or behind condenser defective.</td>
<td>Have the sensor repaired by a refrigeration engineer; reset the Comfort controller</td>
</tr>
<tr>
<td>A08</td>
<td>Condensate warning</td>
<td>Condensate discharge kinked or blocked</td>
<td>Check condensate discharge; repair any kinks or blockages in the hose as necessary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Only in units with optional condensate evaporation</td>
<td>Check the evaporation unit, exchange if necessary</td>
</tr>
<tr>
<td>A09</td>
<td>Condenser fan</td>
<td>Blocked or defective</td>
<td>Clear the blockage; replace if necessary</td>
</tr>
<tr>
<td>A10</td>
<td>Evaporator fan</td>
<td>Blocked or defective</td>
<td>Clear the blockage; replace if necessary</td>
</tr>
<tr>
<td>A11</td>
<td>Compressor</td>
<td>Compressor overloaded (internal winding protection)</td>
<td>No action required; unit switches back on automatically.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Defective (check by measuring the winding resistance)</td>
<td>Exchange by refrigeration engineer</td>
</tr>
<tr>
<td>A12</td>
<td>Condenser temperature sensor</td>
<td>Open or short-circuit</td>
<td>Replace</td>
</tr>
<tr>
<td>A13</td>
<td>Ambient temperature sensor</td>
<td>Open or short-circuit</td>
<td>Replace</td>
</tr>
<tr>
<td>A14</td>
<td>Icing temperature sensor</td>
<td>Open or short-circuit</td>
<td>Replace</td>
</tr>
<tr>
<td>A15</td>
<td>Condensate warning temperature sensor</td>
<td>Open or short-circuit</td>
<td>Replace</td>
</tr>
<tr>
<td>A16</td>
<td>Internal temperature sensor</td>
<td>Open or short-circuit</td>
<td>Replace</td>
</tr>
<tr>
<td>A17</td>
<td>Phase monitoring</td>
<td>For three-phase devices only; incorrect rotary field/phase absent</td>
<td>Exchange two phases</td>
</tr>
<tr>
<td>A18</td>
<td>EPROM error</td>
<td>New board obstructed</td>
<td>Software update needed (only following board installation with more recent software): Enter the programming level with Code 22; press button 1 and confirm with “Set” until “Acc” appears. Next, disconnect the unit from the mains and reconnect.</td>
</tr>
<tr>
<td>A19</td>
<td>LAN/Master-Slave</td>
<td>Master and slave not connected</td>
<td>Check setting and/or cable</td>
</tr>
<tr>
<td>A20</td>
<td>Voltage drop</td>
<td>Error display not shown</td>
<td>Event is stored in the log file</td>
</tr>
<tr>
<td>E0</td>
<td>Display message</td>
<td>Connection problem between the display and the controller board</td>
<td>Reset: Switch power supply off, then switch on again after approx. 2 sec.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cable defective; connection loose</td>
<td>Exchange the boards</td>
</tr>
<tr>
<td>OL</td>
<td>Overload</td>
<td>Ambient parameters or heat loss outside of the applicable limits</td>
<td></td>
</tr>
<tr>
<td>LH</td>
<td>Low heat</td>
<td>Minimal heat loss inside the enclosure</td>
<td></td>
</tr>
<tr>
<td>rSt</td>
<td>Reset</td>
<td>Manual device reset required; see “6.2.9 Resetting the Comfort controller”, page 32.</td>
<td></td>
</tr>
</tbody>
</table>

Tab. 6: Troubleshooting with the Comfort controller
7 Inspection and maintenance

6.2.9 Resetting the Comfort controller
After the occurrence of faults A03, A06 and A07, you will need to reset the Comfort controller.
• Press buttons 1 (▲) and 3 (▼) (Fig. 38) simultaneously for 5 sec.
The system messages will disappear and the temperature display will be shown.

7 Inspection and maintenance

Risk of electric shock!
The unit is live.
Switch off the power supply before opening, and take suitable precautions against it being accidentally switched back on.

7.1 General
The cooling circuit is designed in the form of a maintenance-free, hermetically sealed system. The cooling unit is filled with the required quantity of refrigerant at the factory, checked for leaks, and subjected to a functional test run.
The installed maintenance-free fans are mounted on ball bearings, protected against moisture and dust, and fitted with a temperature monitor. The life expectancy is at least 30,000 operating hours. The cooling unit is thus largely maintenance-free. All that may be required from time to time is to clean the components of the external air circuit using a vacuum cleaner or compressed air if they become visibly dirty. Any stubborn, oily stains may be removed using a non-flammable detergent, such as degreaser.
Maintenance interval: 2000 operating hours. Depending on the level of contamination in the ambient air, the maintenance interval may be reduced to suit the air pollution intensity.

Sequence of maintenance measures:
– Check the level of dirt.
– Filter soiling? Replace the filter if necessary.
– Cooling membranes soiled? Clean if necessary.
– Activate test mode; cooling function OK?
– Check noise generation of compressor and fans.

Caution!
Risk of fire!
Never use flammable liquids for cleaning.
7 Inspection and maintenance

Fig. 43: Remove the lower louvred grille

Fig. 44: Remove the infill panel

Fig. 45: Disconnect the connector from the display (1)

Fig. 46: Disconnect the connector from the display (2)
7 Inspection and maintenance

Fig. 47: Cooling unit without grille

Fig. 48: Remove the external circuit fan (loosen the four screws)

Fig. 49: Remove the fan

Fig. 50: Disconnect the fan connectors

Fig. 51: Remove the cover (loosen the four screws)

Fig. 52: Push back the display cable

Fig. 53: Push the display cable through the cable gland
7 Inspection and maintenance

- Fig. 54: Remove the cover (1)
- Fig. 55: Remove the cover (2)
- Fig. 56: Loosen the earthing cable between the cover and the chassis (1)
- Fig. 57: Loosen the earthing cable between the cover and the chassis (2)
- Fig. 58: Clean out the heat exchanger coil and compressor chamber using compressed air (1)
7 Inspection and maintenance

Fig. 59: Clean out the heat exchanger coil and compressor chamber using compressed air (2)

7.1.2 Compressed air cleaning
SK 3328.xxx, SK 3329.xxx, SK 3332.xxx

Fig. 60: Disconnect the power cord

Fig. 61: Remove the upper louvred grille (1)

Fig. 62: Remove the upper louvred grille (2)
7 Inspection and maintenance

Fig. 63: Remove the upper louvred grille (3)

Fig. 64: Remove the lower louvred grille (1)

Fig. 65: Remove the lower louvred grille (2)

Fig. 66: Remove the infill panel
7 Inspection and maintenance

Fig. 67: Disconnect the display cable

Fig. 68: Push back the display cable and press it through the cable gland (1)

Fig. 69: Push back the display cable and press it through the cable gland (2)

Fig. 70: Loosen the four screws of the external circuit fan

Fig. 71: Remove the external circuit fan

Fig. 72: Disconnect the fan connectors (1)

Fig. 73: Disconnect the fan connectors (2)

Fig. 74: Disconnect the fan connectors (3)
7 Inspection and maintenance

**Fig. 75:** Disconnect the fan earthing cable (1)

**Fig. 76:** Disconnect the fan earthing cable (2)

**Fig. 77:** Loosen the four screws of the cover

**Fig. 78:** Remove the cover

**Fig. 79:** Disconnect the earthing cable (1)
7 Inspection and maintenance

Fig. 80: Disconnect the earthing cable (2)

Fig. 81: Clean out the heat exchanger coil and compressor chamber using compressed air (1)

Fig. 82: Clean out the heat exchanger coil and compressor chamber using compressed air (2)

Fig. 83: Clean out the heat exchanger coil and compressor chamber using compressed air (3)
8 Storage and disposal

Caution! Risk of damage!
The cooling unit must not be subjected to temperatures above +70°C during storage.

During storage, the cooling unit must stand upright. The closed cooling circuit contains refrigerant and oil which must be properly disposed of for the sake of the environment. Disposal can be performed at the RITTAL plant. Please contact us for advice.

9 Technical specifications

Fig. 84: Rating plate (technical specifications)

– Observe the mains connection data (voltage and frequency) as per the rating plate.
– Observe the pre-fuse as per the specifications on the rating plate.
## 9 Technical specifications

<table>
<thead>
<tr>
<th>Unit</th>
<th>Model No. SK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic controller, RAL 7035</td>
<td>– 3302.100 3302.110 3302.300 3302.310 3303.100 3303.110 3304.100 3304.110 3304.700</td>
</tr>
<tr>
<td>Comfort controller, RAL 7035</td>
<td>– – – – – 3303.500 3303.510 3304.500 3304.510 3304.800</td>
</tr>
<tr>
<td>Comfort controller, stainless steel cover</td>
<td>– – – – – 3303.600 3303.610 3304.600 3304.610 –</td>
</tr>
<tr>
<td>Rated voltage V Hz</td>
<td>230, 1~, 50/60 115, 1~, 60 230, 1~, 50/60 115, 1~, 60 230, 1~, 50/60 115, 1~, 60 230, 1~, 50/60 115, 1~, 60 230, 1~, 50</td>
</tr>
<tr>
<td>Rated current A</td>
<td>1.6/1.7 3.3 1.6/1.7 4.0 2.6/2.6 5.7 5.4/5.0 10.6/11.1 3.0</td>
</tr>
<tr>
<td>Start-up current A</td>
<td>3.0/3.4 8.0 4.3/5.3 12.0 5.1/6.4 11.5 12.0/14.0 26.0/28.0 12.0</td>
</tr>
<tr>
<td>Pre-fuse T</td>
<td>A 10.0 10.0 10.0 10.0 10.0 10.0 11.0 – 16.0 10.0</td>
</tr>
<tr>
<td>Motor circuit-breaker – – – – – – – – –</td>
<td></td>
</tr>
<tr>
<td>Transformer circuit-breaker – – – – – – – – –</td>
<td></td>
</tr>
<tr>
<td>Usef ul cooling output Qk L 35 to DIN 3168</td>
<td>– 300/320 150/170 300/320 150/160 500/610 280/350 1000/1060 790/840 900</td>
</tr>
<tr>
<td>Power consumption P on to DIN 3168</td>
<td>W 300/320 150/170 300/320 150/160 500/610 280/350 1000/1060 790/840 900</td>
</tr>
<tr>
<td>Refrigeration factor ε = Qk/Pel</td>
<td>1.2 1.2 1.1 1.1 1.4 1.4 1.2 1.2 1.9</td>
</tr>
<tr>
<td>Refrigerant – Type – Filling</td>
<td>– R134a R134a R134a R134a R134a R134a R134a R134a R134a</td>
</tr>
<tr>
<td>Admissible pressure bar</td>
<td>25 25 25 25 26 26 25 25 28</td>
</tr>
<tr>
<td>Temperature setting range1) °C</td>
<td>– +20 to +55</td>
</tr>
<tr>
<td>Noise level dB (A)</td>
<td>&lt; 61 &lt; 61 &lt; 61 &lt; 61 &lt; 61 &lt; 61 &lt; 61 &lt; 64 &lt; 64</td>
</tr>
<tr>
<td>Protection category to EN 60 529 – Internal circuit – External circuit</td>
<td>– IP 54 – IP 34</td>
</tr>
<tr>
<td>Dimensions (W x H x D) mm</td>
<td>280 x 550 x 140 525 x 340 x 153 280 x 550 x 200 400 x 950 x 260</td>
</tr>
<tr>
<td>Weight kg</td>
<td>13 13 13 17 17 17 39 44 40</td>
</tr>
</tbody>
</table>

1) Basic controller +30°C to +55°C
## Technical specifications

<table>
<thead>
<tr>
<th>Unit</th>
<th>Model No. SK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic controller, RAL 7035</td>
<td>3304.140 3304.142 3305.100 3305.110 3304.140 3305.142 3328.100 3328.110 3328.140 3329.100 3328.700</td>
</tr>
<tr>
<td>Comfort controller, RAL 7035</td>
<td>3304.540 3304.542 3305.500 3305.510 3305.540 3305.542 3328.500 3328.510 3328.540 3329.500 3328.800</td>
</tr>
<tr>
<td>Basic controller, stainless steel cover</td>
<td>3304.240 3305.200 3305.210 3305.240 3328.200 3328.210 3328.240 3329.200</td>
</tr>
<tr>
<td>Comfort controller, stainless steel cover</td>
<td>3304.640 3305.600 3305.610 3305.640 3328.600 3328.610 3328.640 3329.600</td>
</tr>
<tr>
<td>Rated voltage V, Hz</td>
<td>400, 3~, 50/230, 1~, 50/60 230, 1~, 50/60 115, 1~, 50/60 400, 3~, 50/230, 1~, 50/60 230, 1~, 50/60 115, 1~, 50/60 400, 3~, 50/230, 1~, 50/60 230, 1~, 50/60</td>
</tr>
<tr>
<td>Rated current A</td>
<td>2.8/2.9 6.0/6.5 12.1/13.6 2.6/2.9 7.5/9.1 14.7/17.3 2.8/3.3 8.6/10.6</td>
</tr>
<tr>
<td>Start-up current A</td>
<td>11.5/12.7 22.0/24.0 42.0/46.0 12.2/11.3 22.0/26.0 36.0/39.0 6.8/7.8 21.0/21.0</td>
</tr>
<tr>
<td>Pre-fuse T</td>
<td>6.3 – 10.0 16.0 14.0 – 20.0 6.3 – 10.0 16.0 18.0 – 25.0 6.3 – 10.0 16.0</td>
</tr>
<tr>
<td>Motor circuit-breaker</td>
<td>– – – – – – – –</td>
</tr>
<tr>
<td>Transformer circuit-breaker</td>
<td>– – – – – – – –</td>
</tr>
<tr>
<td>Miniature circuit-breaker/fuse</td>
<td>– – – – – – – –</td>
</tr>
<tr>
<td>Useful cooling output Qk to DIN 3168</td>
<td>35 L 35 L 35 35 L 50 L 35 L 50 1000/1060 790/860 1500/1510 1230/1250 1500/1510 1230/1250 1500/1510 1230/1250 2000/2350 1450/1690 2000/2350 1450/1690 2000/2350 1450/1690</td>
</tr>
<tr>
<td>Power consumption Ptot to DIN 3168</td>
<td>950/975 1085/1285 1000/1175 1250/1350 925/1100 1085/1275 1025/1200 1250/1350 1050/1275 1300/1410 1050/1275 1300/1410 1450/1675 1625/2000</td>
</tr>
<tr>
<td>Refrigeration factor ε = Qk/Pel</td>
<td>1.4 1.5 1.5 1.6 2.0 1.8 1.9 1.7</td>
</tr>
<tr>
<td>Refrigerant – Type</td>
<td>R134a 500 R134a 600 R134a 600 R134a 600 R134a 950 R134a 950 R134a 950 R134a 950 R134a 750</td>
</tr>
<tr>
<td>Temperature setting range</td>
<td>°C</td>
</tr>
<tr>
<td>Noise level dB (A)</td>
<td>&lt; 64 &lt; 64 &lt; 64 &lt; 64 &lt; 64 &lt; 64 &lt; 64 &lt; 64</td>
</tr>
<tr>
<td>Protection category to EN 60 529</td>
<td>– IP 54</td>
</tr>
<tr>
<td>Dimensions (W x H x D) mm</td>
<td>400 x 950 x 260 400 x 1580 x 290</td>
</tr>
<tr>
<td>Weight kg</td>
<td>40 41 46 42 66 73 67 69 66</td>
</tr>
</tbody>
</table>

1) Basic controller +30°C to +55°C
## Technical specifications

<table>
<thead>
<tr>
<th>Unit</th>
<th>Model No. SK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic controller, RAL 7035</td>
<td>3329.110 – 3329.140</td>
</tr>
<tr>
<td>Comfort controller, RAL 7035</td>
<td>3329.510 – 3329.540</td>
</tr>
<tr>
<td>Basic controller, stainless steel cover</td>
<td>3329.210 – 3329.240</td>
</tr>
<tr>
<td>Comfort controller, stainless steel cover</td>
<td>3329.610 – 3329.640</td>
</tr>
<tr>
<td>Rated voltage V, Hz</td>
<td>115, 1~ – 50/60</td>
</tr>
<tr>
<td>Rated current A</td>
<td>17.0/22.0 – 3.7/4.2</td>
</tr>
<tr>
<td>Start-up current A</td>
<td>44.0/42.0 – 9.2/11.0</td>
</tr>
<tr>
<td>Pre-fuse T A</td>
<td>18.0 – 6.3/10.0</td>
</tr>
<tr>
<td>Motor circuit-breaker –</td>
<td>–</td>
</tr>
<tr>
<td>Transformer circuit-breaker –</td>
<td>–</td>
</tr>
<tr>
<td>Useable cooling output Qk to DIN 3168 L 35 L 35</td>
<td>1500/1500 – 1050/1100</td>
</tr>
<tr>
<td>Power consumption PEL to DIN 3168 L 35 L 35</td>
<td>1045/1175 – 1260/1335</td>
</tr>
<tr>
<td>Refrigeration factor ε = Qk/PEL</td>
<td>1.7 – 1.5</td>
</tr>
<tr>
<td>Refrigerant – Type</td>
<td>R134a –</td>
</tr>
<tr>
<td>– Filling g</td>
<td>950 – 300</td>
</tr>
<tr>
<td>Transformer circuit-breaker –</td>
<td>–</td>
</tr>
<tr>
<td>Motor circuit-breaker –</td>
<td>–</td>
</tr>
<tr>
<td>Weight kg</td>
<td>76 – 50</td>
</tr>
<tr>
<td>Dimensions (W x H x D) mm</td>
<td>400 x 1580 x 290 – 500 x 1580 x 340</td>
</tr>
</tbody>
</table>

### Basic controller +30°C to +55°C

<table>
<thead>
<tr>
<th>Unit</th>
<th>Model No. SK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic controller, RAL 7035</td>
<td>3366.100 – 3366.110</td>
</tr>
<tr>
<td>Comfort controller, RAL 7035</td>
<td>3366.500 – 3366.510</td>
</tr>
<tr>
<td>Basic controller, stainless steel cover</td>
<td>3366.200 – 3366.240</td>
</tr>
<tr>
<td>Comfort controller, stainless steel cover</td>
<td>3366.600 – 3366.640</td>
</tr>
<tr>
<td>Rated voltage V, Hz</td>
<td>230, 1~ – 50/60</td>
</tr>
<tr>
<td>Rated current A</td>
<td>7.1/7.3 – 3.0/3.1</td>
</tr>
<tr>
<td>Start-up current A</td>
<td>22.0/24.0 – 8.0/8.8</td>
</tr>
<tr>
<td>Pre-fuse T A</td>
<td>10.0 – 6.3/10.0</td>
</tr>
<tr>
<td>Motor circuit-breaker –</td>
<td>–</td>
</tr>
<tr>
<td>Transformer circuit-breaker –</td>
<td>–</td>
</tr>
<tr>
<td>Useable cooling output Qk to DIN 3168 L 35 L 35</td>
<td>1045/1175 – 1260/1335</td>
</tr>
<tr>
<td>Power consumption PEL to DIN 3168 L 35 L 35</td>
<td>1045/1175 – 1260/1335</td>
</tr>
<tr>
<td>Refrigeration factor ε = Qk/PEL</td>
<td>1.4 – 1.4</td>
</tr>
<tr>
<td>Refrigerant – Type</td>
<td>R134a –</td>
</tr>
<tr>
<td>– Filling g</td>
<td>700 – 300</td>
</tr>
<tr>
<td>Transformer circuit-breaker –</td>
<td>–</td>
</tr>
<tr>
<td>Motor circuit-breaker –</td>
<td>–</td>
</tr>
<tr>
<td>Weight kg</td>
<td>45 – 50</td>
</tr>
<tr>
<td>Dimensions (W x H x D) mm</td>
<td>450 x 1590 x 195 – 450 x 1590 x 165</td>
</tr>
</tbody>
</table>

### 1) Basic controller +30°C to +55°C
10 List of spare parts

Fig. 85: Spare parts for SK 3302.xxx

Fig. 86: Spare parts for SK 3302.3xx
10 List of spare parts

**SK 3303.xxx**
**SK 3361.xxx**

Fig. 87: Spare parts for SK 3303.xxx, SK 3361.xxx

**SK 3304.xxx**
**SK 3305.xxx**

Fig. 88: Spare parts for SK 3304.xxx, SK 3305.xxx
10 List of spare parts

Fig. 89: Spare parts for SK 3328.xxx, SK 3329.xxx

Fig. 90: Spare parts for SK 3332.xxx

RITTAL cooling unit assembly and operating instructions
10 List of spare parts

Legend
1  Compressor
5  Condenser fan
10  Evaporator fan
15  Dispatch bag
20  Expansion valve
25  Filter dryer
30  PSA \(^1\) pressure-operated switch
40  Controller board
45  Louvred grille 1
46  Louvred grille 2
50  Infill panel
55  Display
71  Temperature sensor
75  Enclosure tray
80  Transformer
90  Evaporator coil
100  Condenser
101  Condensate evaporator
102  Miniature fuse, condensate evaporator (T4A; 6.3 x 32 mm)

Fig. 91: Spare parts for SK 3366.xxx, SK 3377.xxx

Note:
As well as the spare part number, when ordering spare parts the following information must be provided:
– Unit model
– Fabrication number
– Date of manufacture
This information may be found on the rating plate.
11 Appendix: Cut-out and hole sizes

11.1 Dimensions for external mounting

Fig. 92: SK 3302.xxx external mounting (except SK 3302.3xx)

Fig. 93: SK 3302.3xx external mounting

Fig. 94: SK 3303.xxx, SK 3361.xxx external mounting

Fig. 95: SK 3366.xxx, SK 3377.xxx external mounting

Fig. 96: SK 3304.xxx, SK 3305.xxx external mounting

Fig. 97: SK 3328.xxx, SK 3329.xxx external mounting
11 Appendix: Cut-out and hole sizes

11.2 Dimensions for partial internal mounting

Fig. 98: SK 3332.xxx external mounting

Fig. 99: SK 3303.xxx, SK 3361.xxx partial internal mounting

Fig. 100: SK 3304.xxx, SK 3305.xxx partial internal mounting

Fig. 101: SK 3328.xxx, SK 3329.xxx partial internal mounting

Fig. 102: SK 3332.xxx partial internal mounting

Fig. 103: SK 3332.xxx partial internal mounting
11 Appendix: Cut-out and hole sizes

11.3 Dimensions for full internal mounting

Fig. 103: SK 3302.1xx full internal mounting

Fig. 104: SK 3302.3xx full internal mounting

Fig. 105: SK 3303.xxx, SK 3361.xxx full internal mounting

Fig. 106: SK 3304.xxx, SK 3305.xxx full internal mounting

Fig. 107: SK 3328.xxx, SK 3329.xxx full internal mounting

Fig. 108: SK 3366.xxx, SK 3377.xxx full internal mounting