

Rittal – The System.

Faster – better – everywhere.

Blue e chiller for cooling media



SK 3336.400

SK 3336.410

SK 3336.430

SK 3336.450

SK 3336.405

SK 3336.415

SK 3336.435

SK 3336.455

Assembly and operating instructions

ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

IT INFRASTRUCTURE

SOFTWARE & SERVICES

FRIEDHELM LOH GROUP



Contents

EN

Contents

1	Notes on documentation	3	6.1.3	Preparation and care	15
1.1	General.....	3	6.1.4	Recommended "Cooling medium for chillers"	16
1.2	CE conformity	3	6.2	Filling the cooling medium	16
1.3	Storing the documents.....	3	6.3	Bleeding the cooling medium pump	17
1.4	Symbols used in these operating instructions	3	6.4	Commissioning procedure	17
1.5	Other applicable documents	3	6.5	Adjusting the bypass valve	17
2	Safety notes	3	7	Operation	18
2.1	General.....	3	7.1	General	18
2.2	Risks in case of failure to observe the safety instructions	3	7.2	Layout of the display	18
2.3	Safety instructions for assembly, inspection and maintenance work	3	7.2.1	Start screen	18
2.4	Unauthorised operation.....	4	7.2.2	Changing a parameter value	19
2.5	Health risks due to the refrigerant R410A and the cooling medium	4	7.3	Info menu.....	20
2.6	First aid measures.....	4	7.3.1	Temperature info	20
2.7	Fire-fighting measures.....	4	7.3.2	Device info	20
2.8	Safety measures and equipment	4	7.3.3	Information on I/O	20
2.9	Potential hazards and how to avoid them.....	5	7.4	Configuration menu.....	21
3	Device description	6	7.4.1	On/Off	21
3.1	General.....	6	7.4.2	Temperature	21
3.2	General functional description	7	7.4.3	Limit values of the temperature values	22
3.3	Control.....	8	7.4.4	Language settings	23
3.4	Characteristic curves.....	8	7.5	System messages.....	23
3.4.1	Characteristic curves of pump	8	7.5.1	Occurrence of a malfunction	23
3.4.2	Performance diagrams	9	7.5.2	Display in case of errors	23
3.5	Safety devices.....	9	8	Inspection and maintenance	23
3.6	Options.....	9	8.1	Overview of the inspection and maintenance tasks	24
3.6.1	Reinforced pump	9	8.2	Maintaining the refrigerant circuit	24
3.6.2	Hot gas bypass control	9	8.3	Monitoring the cooling medium	24
3.6.3	Control voltage 24 V DC	9	8.4	Cleaning the condenser	25
3.7	Proper use, foreseeable misuse	9	8.5	Cleaning the filter mat (accessories).....	25
3.8	Scope of supply.....	10	8.6	Draining the cooling medium tank	26
4	Transport	10	9	Troubleshooting	26
4.1	Delivery.....	10	9.1	List of system messages	26
4.2	Unpacking	10	10	Decommissioning and disposal	31
4.3	Transport.....	10	10.1	Decommissioning.....	31
5	Assembly and connection	11	10.2	Disposal.....	31
5.1	Dimensions.....	11	11	Accessories	31
5.2	Installation site requirements	11	11.1	Metal filter (aluminium filter).....	31
5.3	Installing the chiller	12	11.2	Cooling medium for chillers (ready-mix)	31
5.4	Making the hydraulic connection	12	11.3	Twin castors.....	32
5.5	Making electrical connection	13	12	Appendix	33
5.5.1	Installing the power supply	14	12.1	Block diagram.....	33
5.5.2	Connecting the alarm relay query device	14	12.2	Spare parts	34
5.5.3	External activation	14	12.3	Technical specifications.....	36
5.5.4	Room temperature sensor	14	12.4	Device drawings.....	38
5.5.5	Interfaces	14	12.5	Declaration of Conformity.....	40
5.6	Installing the filter mats (accessories).....	14			
6	Commissioning	14			
6.1	Cooling medium water-glycol mixture	14			
6.1.1	General remarks	15			
6.1.2	Cooling medium requirements	15			

1 Notes on documentation

1.1 General

These instructions are aimed at installers and operators who are familiar with the installation and the operation of the chiller. It is very important to read and follow these assembly and operating instructions prior to commissioning. These are the original operating instructions.

1.2 CE conformity

Rittal GmbH & Co. KG confirms the conformity of the chiller with the European Union's Machinery Directive 2006/42/EC and EMC Directive 2014/30/EC. A corresponding declaration of conformity has been issued and enclosed with the unit.



1.3 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 chiller and must always be available and on hand for operating and maintenance personnel.

1.4 Symbols used in these operating instructions

The following symbols are used in this documentation:



Danger!

A dangerous situation in which failure to comply with the instructions will result in death or severe injury.



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.

1.5 Other applicable documents

Assembly and operating instructions exist as paper documents and/or digital data carriers 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. Where applicable, the instructions for any accessories used also apply.

2 Safety notes

2.1 General

Please observe the following general safety notes when operating and installing the chiller:

- Assembly, installation and maintenance must only be carried out by qualified personnel.
- Children and persons with limited cognitive/coordination abilities must not operate, maintain or clean the unit or be allowed to use it as a toy.
- Only use original spare parts and accessories authorised by the manufacturer to ensure the protection and safety of the chiller. The usage of other parts will render any liability void.
- Do not make any changes to the chiller that have not been agreed with and approved by the manufacturer.
- It is also imperative that you observe the special safety instructions for the individual activities in the individual chapters.

2.2 Risks in case of failure to observe the safety instructions

In case of failure to observe the safety notes, people, the environment and the chiller may be placed at risk. Failure to comply with the safety notes makes all claims for compensation void.

2.3 Safety instructions for assembly, inspection and maintenance work

- The installation, commissioning and servicing of the chiller must be carried out in strict compliance with the technical documentation for the chiller and in such a way that no potentially hazardous situations are allowed to occur.
- Cleaning and maintenance work on the chiller must only be performed with the unit shut down. For this purpose, it is vital to ensure that the chiller is disconnected from the power supply and is secured against switching back on. It is imperative that you observe the procedure for shutting down the chiller described in the assembly and operating instructions.
- All safety devices and protective equipment must be reattached or put in a functional condition immediately after the work is complete.
- Modifications or changes to the chiller are not allowed.
- Only appropriately qualified personnel as defined by BGR500 chap. 2.35 / EN 378 are allowed to work on the refrigerant circuit.

2 Safety notes

EN

- Do not install the chiller without protection outside of covered areas, or in an explosive or aggressive environment.
- Do not install the chiller on an unstable surface or a surface that is not designed for the weight of the chiller.
- Do not bypass any electrical safety devices to make it possible to operate the chiller.

2.4 Unauthorised operation

The safety of the chiller supplied is only ensured if it is used properly (see section 3.7 "Proper use, foreseeable misuse"). Under no circumstances should the limit values specified in the technical data be exceeded.

The chiller is not allowed to be used for the direct cooling of liquids that are used for foodstuffs (e.g. drinking water).

Any existing contact hazard protection for moving parts must not be removed from chillers while operational. Hazards due to electrical power, do not remove any switch box cover!



Explosion hazard!

The use of the chiller for cooling inflammable or pyrophoric substances is prohibited.

2.5 Health risks due to the refrigerant R410A and the cooling medium

The refrigerant changes status during operation and becomes pressurised. The R410A safety data sheet must be observed.

The cooling medium (additive) is a liquid. We suggest: "Cooling medium for chillers" (see section 6.1 "Cooling medium water-glycol mixture"). The safety data sheet "Cooling medium for chillers" must be observed.

2.6 First aid measures

Please refer to safety data sheets R410A and "Cooling medium for chillers".



Note:

Safety data sheets are available for downloading at www.rittal.com.

2.7 Fire-fighting measures

Suitable extinguishing agent

All known extinguishing agents can be used.

2.8 Safety measures and equipment

- Ensure adequate ventilation.
- Hand protection: Safety gloves.
- Eye protection: Safety goggles.
- Body protection: Wear safety shoes when handling pressurised gas bottles.

2.9 Potential hazards and how to avoid them

The following table provides an overview of other potential sources of danger and how to avoid them.

Location	Hazard	Cause	Precautionary measures
Device interior	Severe personal injury or damage to property	Hazard due to electrical equipment of the chiller	Recurrent testing of electrical equipment (Germany BGV A3)
Device interior	Personal injury or damage to property	Electrical hazard while working on the chiller	The power to the chiller must be disconnected via the main switch.
Device interior	Inhalation of toxic gases/materials	Soldering work inside the chiller may release toxic gases due to the installed cooling circuit.	Maintenance may only be carried out by specialist personnel. Before carrying out soldering work on the cooling circuit or in its immediate vicinity, the refrigerant should be drained from the chiller.
Device interior	Risk for the product	Liquid level after transport not in upright position	Only transport the chiller upright. Should the chiller be tilted during transportation, please wait some minutes before switching on again.
Device interior: Micro-channel condenser	Minor cuts	Contact while cleaning the condenser (see section 8.4 "Cleaning the condenser")	Wear safety gloves.
Device interior: Hot or cold parts	Burns / frostbite	Contact with parts with a high or low surface temperature.	The chiller may only be opened by trained, qualified personnel.
Device interior: Cooling medium circuit	Fungus and algae formation	Use of pure water as a cooling medium or refrigerant.	Use a water-glycol mixture as your cooling medium. Rittal recommends the use of "Cooling medium for chillers" (ready-mix).
Device exterior	Severe personal injury or damage to property	The floor on which the chiller is installed is unstable and unable to support its weight. The chiller tips over or the floor gives way.	The weight of the chiller can be found in section 12.3 "Technical specifications". Additionally, please allow for the weight of the liquid in the tank (the capacity of the tank can likewise be found in section 12.3 "Technical specifications") and make sure that the floor is suitable for installation purposes.
Device exterior	Personal injury or damage to property	Hazards when transporting or assembling the chiller	Secure the chiller against any risk of tilting (eyebolts) when transporting or assembling.
Device exterior	Cuts	Contact with fan wheel	Do not remove the protective cover around the fan wheel.
Device exterior: Area around the chiller	Major burns	Fire caused by short-circuiting or overheating of the electricity supply line to the chiller	When replacing, ensure that the cable cross-section and electricity supply line comply with the valid regulations.
Device exterior: Chiller with wheels	Personal injury or damage to property	The chiller starts to move due to unevenness of the floor surface.	If the recooling system is equipped with wheels (option), they must be locked with brakes while operational.

Tab. 1: Hazards and precautionary measures

3 Device description

EN



Note:

Specialist personnel are individuals who, by virtue of their training, education, experience and knowledge of the relevant provisions, regulations and measures for accident prevention and relating to the operating conditions, have been authorised by the owner or responsible individual to ensure the safety of the system, carry out all essential tasks, and are therefore in a position to identify and avert all potential threats.

3 Device description

3.1 General

Chillers are used for the central and economical cooling and supply of a cooling medium (water + glycol, see section 6.1 "Cooling medium water-glycol mixture") in the event of physical separation between the place where cooling is required and the refrigeration. The cooling medium is supplied using a pipe system.

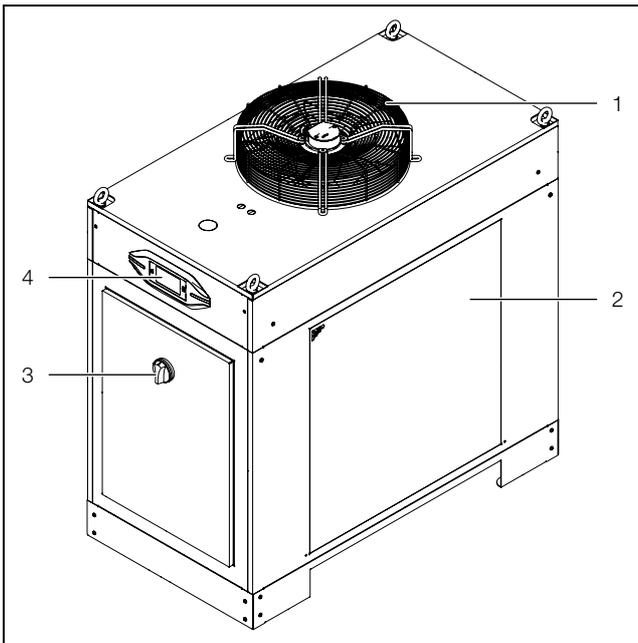


Fig. 1: View from front (333640x and 333641x)

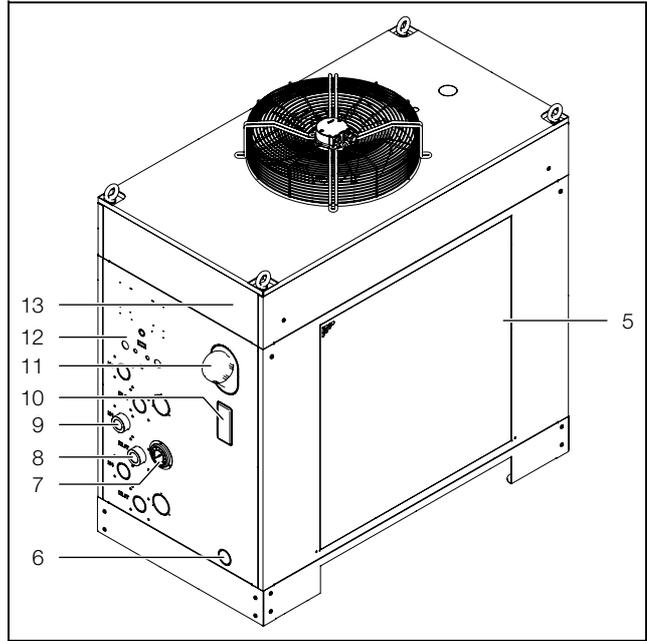


Fig. 2: View from rear (333640x and 333641x)

Key fig. 1 and fig. 2

- 1 Air outlet (2x)
- 2 Louvred grille for air inlet right
- 3 Master switch
- 4 Display
- 5 Louvred grille for air inlet left
- 6 Tank drain nozzle
- 7 Pressure gauge
- 8 Cooling medium connection, inlet
- 9 Cooling medium connection, return
- 10 Cooling medium level display (filling level indicator)
- 11 Fill nozzle for cooling medium
- 12 Electrical interfaces
- 13 Rating plate

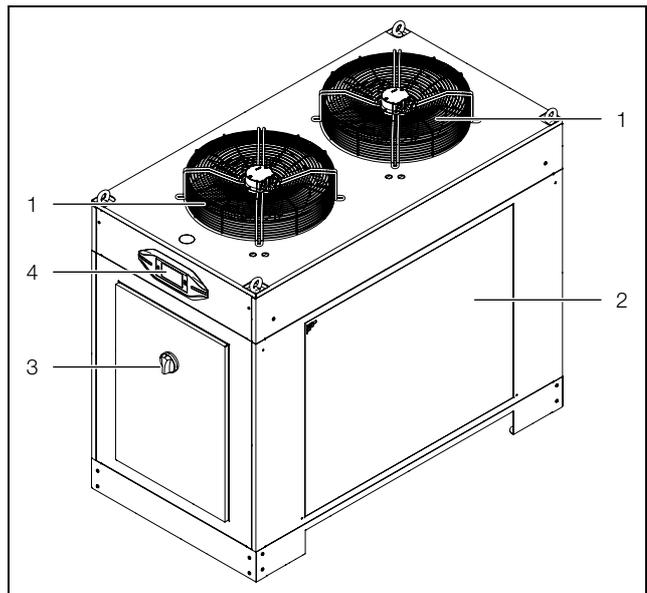


Fig. 3: View from front (333643x and 333645x)

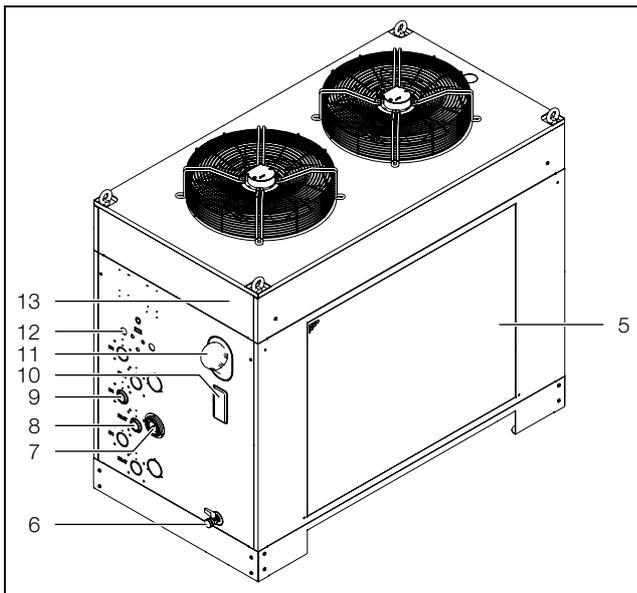


Fig. 4: View from rear (333643x and 333645x)

Key fig. 3 and fig. 4

- 1 Air outlet (2x)
- 2 Louvred grille for air inlet right
- 3 Master switch
- 4 Display
- 5 Louvred grille for air inlet left
- 6 Tank drain nozzle
- 7 Pressure gauge
- 8 Cooling medium connection, inlet
- 9 Cooling medium connection, return
- 10 Cooling medium level display (filling level indicator)
- 11 Fill nozzle for cooling medium
- 12 Electrical interfaces
- 13 Rating plate

The chiller is equipped with an open reservoir for the cooling medium.

3.2 General functional description

The chiller comprises four main components (see fig. 5 and fig. 6):

- Evaporator coil (item 12),
- refrigerant compressor (item 14),
- condenser (item 1) with fan (item 2),
- control or expansion valve (item 4),

which are connected together by pipes. A high-pressure switch (item 15) limits the maximum pressure in the refrigerant circuit. The low-pressure switch (item 13) switches off the refrigerant cycle in the event of low pressure. The R410A (50 % R 32, 50 % R125) refrigerant is chlorine-free. Its Ozone Depletion Potential (ODP) is 0. A filter drier (item 3) which is integrated into the hermetically sealed refrigerant circuit provides effective protection against moisture, acid, dirt particles, and foreign bodies.

In the evaporator coil (item 12), the liquid refrigerant is converted to a gaseous state. The heat necessary for this purpose is taken from the cooling medium in the plate heat exchanger, which has the effect of cooling the

cooling medium. The refrigerant is compressed in the compressor (item 14). As a result the refrigerant has a higher temperature than the ambient air.

This heat is dissipated to the ambient air over the surface of the condenser (item 1), resulting in the refrigerant liquefying again.

The refrigerant is injected into the evaporator (item 12) via an expansion valve (item 4), causing it to expand and as a consequence is able to absorb the heat from the cooling medium (water or water-glycol mixture).

The cooling medium is pumped to the equipment in an additional circuit via the cooling medium tank (item 10) and the cooling medium pump (item 9). Temperature monitoring of the evaporator coil (item 12) ensures protection against freezing if the flowrate is insufficient. The level switch (item 5) emits a warning if the level in the cooling medium tank is too low. The inlet temperature of the cooling medium (water or water-glycol mixture) is regulated using the temperature sensor (item 6) on the water outlet.

A layout drawing of the refrigerant circuit may be found in fig. 5 and fig. 6.

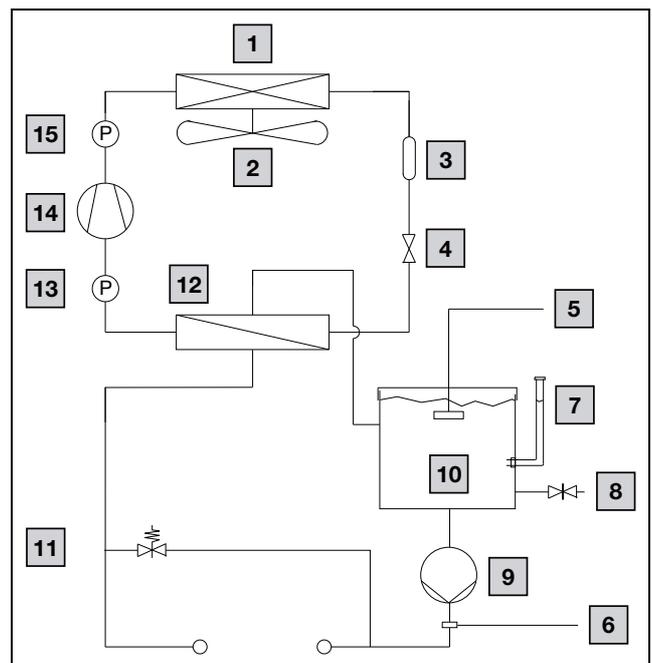


Fig. 5: Schematic diagram of refrigerant circuit (33364x0)

3 Device description

EN

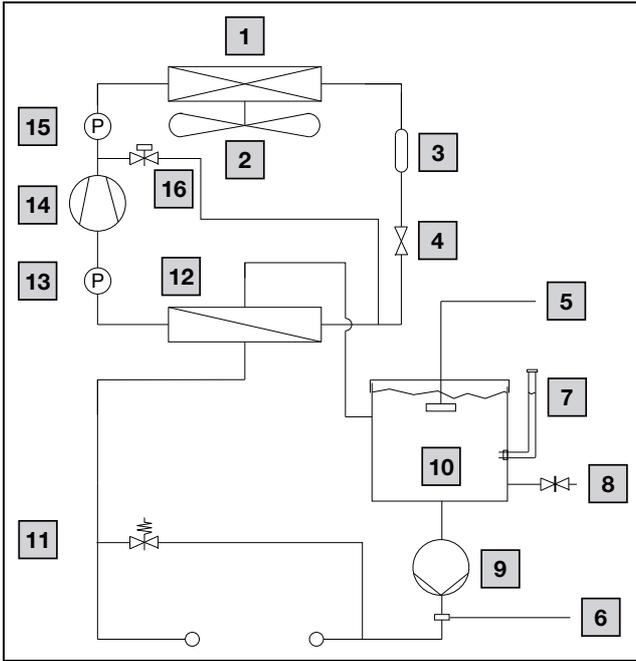


Fig. 6: Schematic diagram of refrigerant circuit (33364x5)

Key

- 1 Condenser, air-cooled
- 2 Condenser fan (axial fan)
- 3 Filter dryer
- 4 Expansion valve
- 5 Fill level monitoring
- 6 Temperature sensor
- 7 Fill nozzle
- 8 Tank drain nozzle
- 9 Cooling medium pump
- 10 Cooling medium tank
- 11 Bypass valve, automatically opening
- 12 Evaporator (plate heat exchanger)
- 13 Low-pressure switch
- 14 Compressor
- 15 High-pressure switch
- 16 Hot gas bypass

3.3 Control

The chillers are fitted with a controller for setting the functions of the chiller. Operation using this controller is described in section 7 "Operation".

3.4 Characteristic curves

3.4.1 Characteristic curves of pump

Characteristic curves measured under the following conditions:

- Ambient temperature (T_a) = 32 °C
- Medium temperature (T_w) = 18 °C
- Cooling medium "water"

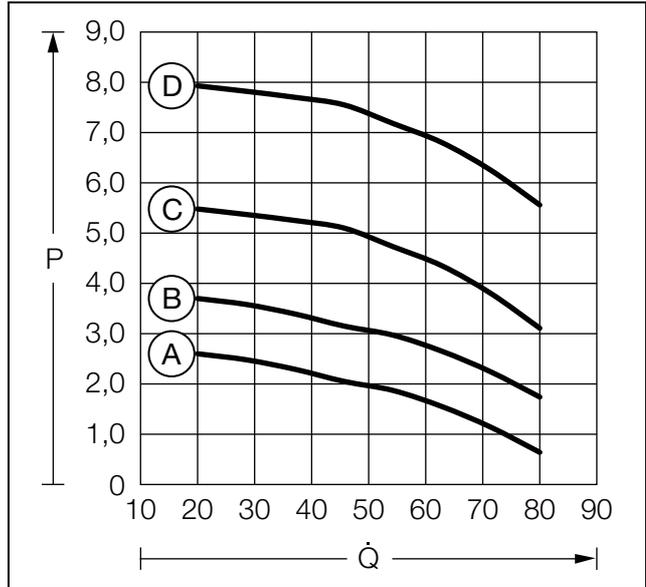


Fig. 7: Characteristic curves 333640x

Key fig. 7

- A Standard pump 2 bar 50 Hz
- B Standard pump 2 bar 60 Hz
- C Reinforced pump 4 bar 50 Hz (option)
- D Reinforced pump 4 bar 60 Hz (option)
- P External static pressure [bar]
- Q Delivery flow [l/min]

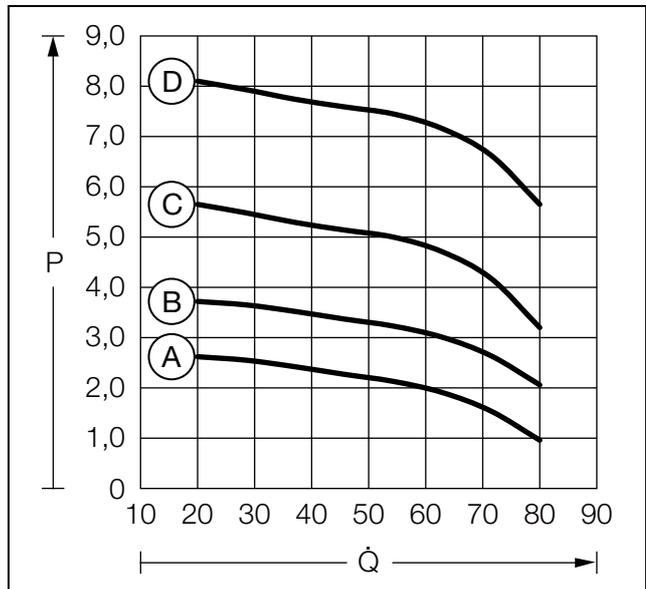


Fig. 8: Characteristic curves 333641x

Key fig. 8

- A Standard pump 2 bar 50 Hz
- B Standard pump 2 bar 60 Hz
- C Reinforced pump 4 bar 50 Hz (option)
- D Reinforced pump 4 bar 60 Hz (option)
- P External static pressure [bar]
- Q Delivery flow [l/min]

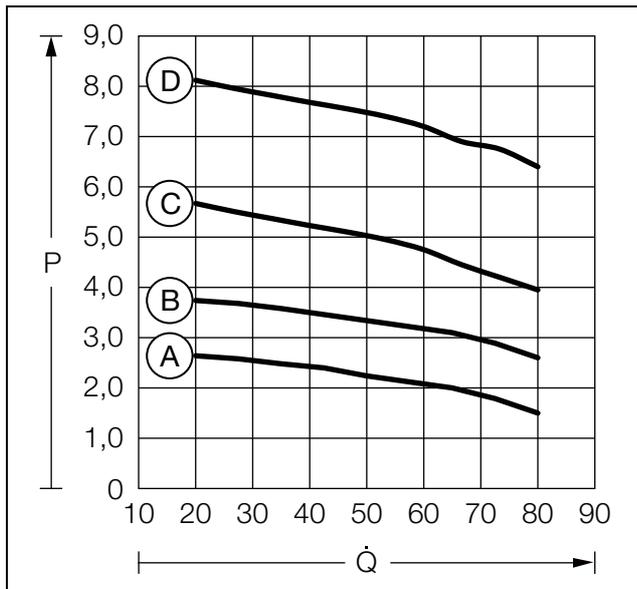


Fig. 9: Characteristic curves 333643x and 333645x

Key fig. 9

- A Standard pump 2 bar 50 Hz
- B Standard pump 2 bar 60 Hz
- C Reinforced pump 4 bar 50 Hz (option)
- D Reinforced pump 4 bar 60 Hz (option)
- P External static pressure [bar]
- Q Delivery flow [l/min]

3.4.2 Performance diagrams

The performance diagrams can be found on the Rittal website.

3.5 Safety devices

- In the cooling circuit, the chiller has a type-tested pressure monitor (to EN 12263) which switches off the chiller if the maximum admissible pressure is exceeded. Once the pressure drops back below the admissible pressure, the unit will automatically resume operation.
- Temperature monitoring prevents the evaporator coil from icing over. The compressor will switch off completely and, at higher temperatures, the unit will automatically resume operation.
- The compressor motor, the fan motors and the cooling medium pump each have a motor circuit-breaker to prevent overcurrent and short-circuits.
- To ensure smooth-running and reliable operation (for example after reaching the setpoint temperature or after a fault), the compressor automatically switches back on after a delay.
- The chiller has two floating contacts, via which system messages from the device may be polled, e.g. using a PLC (2 x normally closed or normally open contacts)

3.6 Options



Note:

The options described below are already installed as standard in the chillers 3336.4x5.

3.6.1 Reinforced pump

For applications requiring a higher cooling medium throughput or pressure, the cooling medium pump can be designed in a higher output category.

3.6.2 Hot gas bypass control

A hot gas bypass control (hereinafter abbreviated to HG-BP) refers to a circuit with a controllable bypass circuit from the high-pressure to the low-pressure side with an infeed between the expansion valve and the evaporator coil.

The control valve in the bypass circuit remains closed when the cooling demand is high. The chiller will then supply its full output. If the required output is reduced, the HG-BP valve is continuously opened via the controller. Hot gas will then flow via the bypass circuit to the evaporator coil input. There, it is mixed with the refrigerant flowing out of the expansion valve and cooled down. As a result, the mixture partially evaporates in the supply line to the evaporator coil, causing the evaporation temperature to rise, and the cooling output to decrease. Overheating of the extracted gas upstream of the compressor is monitored and regulated by the expansion valve.

3.6.3 Control voltage 24 V DC

As standard, a control voltage of 24 V AC is deployed in the chiller. As option, the control voltage can also be provided as 24 V DC.

3.7 Proper use, foreseeable misuse

The chiller is only used for cooling water-glycol mixtures. Any other use is deemed improper.

When using other fluids, please refer to the technical specifications in the appendix, or contact the manufacturer. Under no circumstances should the specified limits in the technical data be exceeded.

The chiller 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 chiller 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, and strictly professional use as defined in DIN EN 61000-3-2.

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

4 Transport

EN

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 include:

- Use of the chiller for cooling flammable or combustible substances.
- The chiller must never be used for the direct cooling of liquids used in the food industry (e.g. drinking water).
- Use of impermissible tools.
- Improper operation.
- Improper rectification of malfunctions.
- Use of accessories not approved by Rittal GmbH & Co. KG.

3.8 Scope of supply

Qty.	Description
1	Chiller
1	Shipping bag with
1	- Assembly and operating instructions
1	- Connection cable (3 m), voltage supply
1	- Connection cable (3 m), signal exchange
4	- Eyebolts (already installed)

Tab. 2: Scope of supply

4 Transport

4.1 Delivery

The chiller is supplied in a packaging unit in a fully assembled state.

- 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 chiller. Any packaging damage may be the cause of a subsequent functional failure.

4.2 Unpacking

- Only transport the chiller in its original packaging material before commissioning for the first time.
- Remove the packaging materials from the chiller.



Note:

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

- Check the chiller 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 3.8 "Scope of supply").

4.3 Transport

If the chiller is stored or transported at temperatures below freezing, return to room temperature before commissioning.

- When transporting the chiller, please make allowance for the weight specified in section 12.3 "Technical specifications".
- Use lifting gear or a floor conveyor with a suitable maximum load capacity.
- If it is necessary to move the chiller in the factory, you must disconnect all connections on the chiller.
- Before transporting, empty the water circuit and tank (see section 8 "Inspection and maintenance").
- Prevent excessive vibration.
- Only transport the chiller upright.
- Transport the chiller
 - in packed state on the supplied pallet,
 - with lifting gear at the eyebolts provided for this purpose (fig. 10, item 1) or
 - using a floor conveyor by holding from below and lifting from the side (fig. 10, item 2).

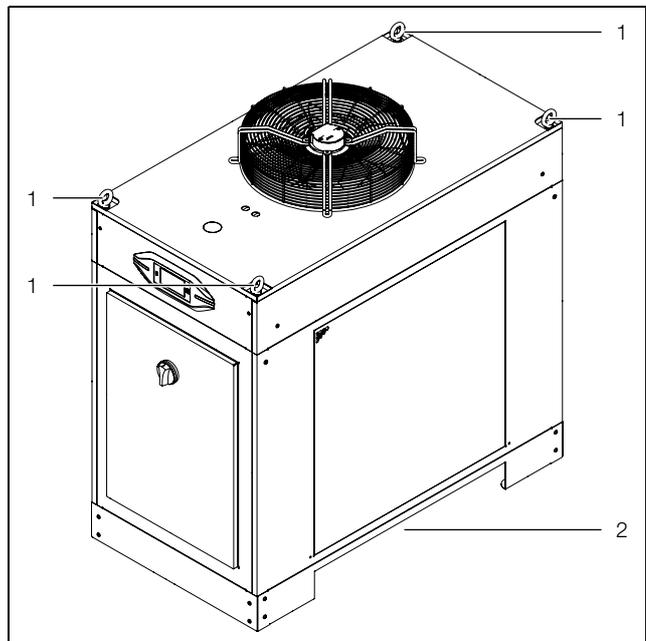


Fig. 10: Transport (333640x)

- When transporting with a floor conveyor, ensure that the forks are sufficiently long so that the chiller can be fully held from below.



Note:
After being transported, the eyebolts must remain installed on the chiller.

5 Assembly and connection

5.1 Dimensions

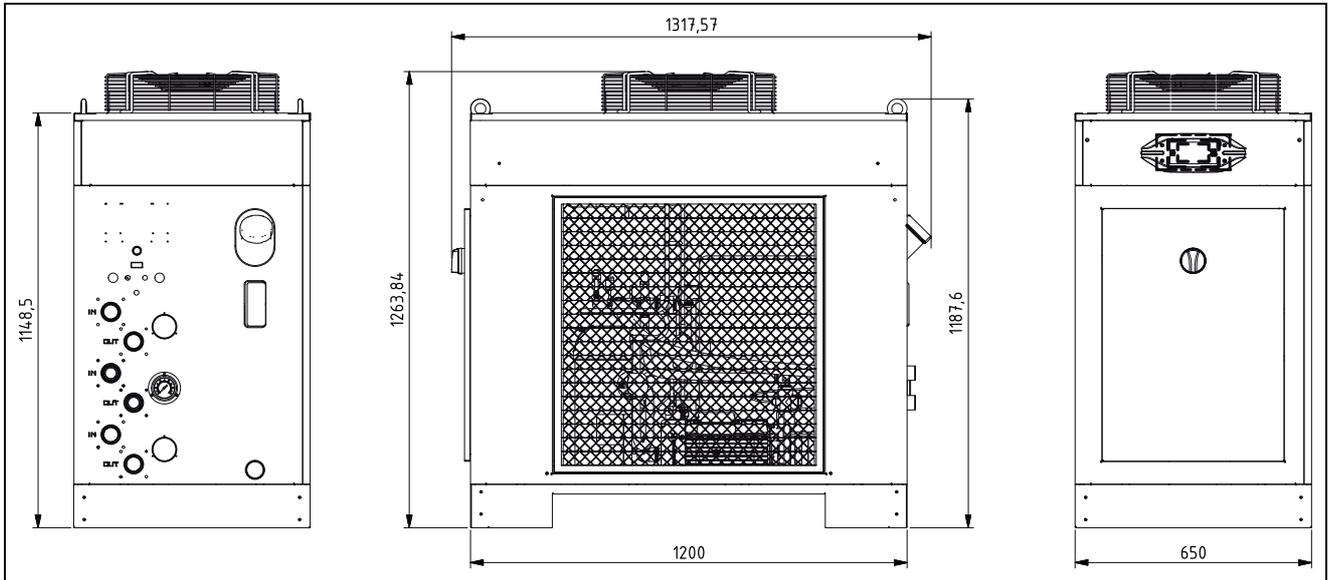


Fig. 11: Dimensions 366640x and 366641x

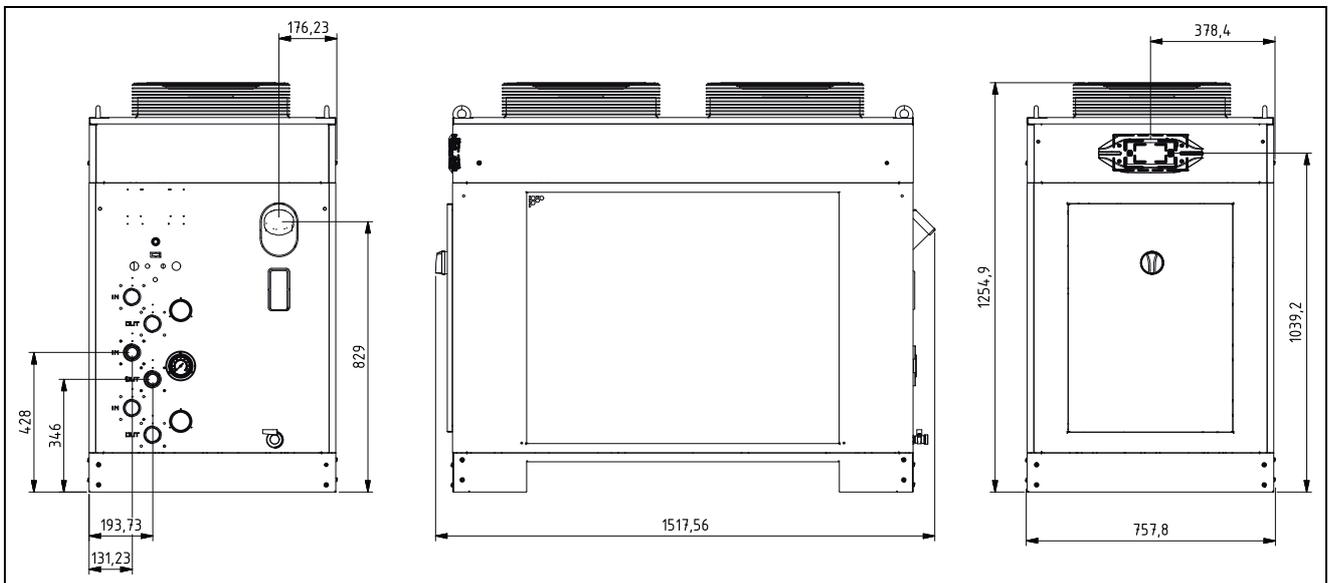


Fig. 12: Dimensions 366643x and 366645x

5.2 Installation site requirements

- The chiller must be adequately protected from external weather conditions.
- If the ambient air contains a high concentration of dust or oily substances, the chiller should be fitted with a metal filter (see section 11.1 "Metal filter (aluminium filter)").
- The supporting surface should be flat and sufficiently robust to hold the weight (see section 12.3 "Technical specifications") during operation.
- The ambient temperature must lie within the limit values indicated in the technical specifications (see section 12.3 "Technical specifications").
- In order to prevent performance losses caused by pressure drops in the pipework, the chiller should be sited as close as possible to the equipment.

5 Assembly and connection

EN

- The opening on top of the chiller must be freely accessible to enable the unhindered expulsion of hot air (see fig. 13). To allow connection of the supply lines and facilitate maintenance and repair work, the minimum distances shown under fig. 13 should be adhered to.
- In order to avoid an "air short-circuit" (mixing of air intake and waste air) and ensure full cooling performance, the minimum distances shown under fig. 13 should likewise be adhered to.

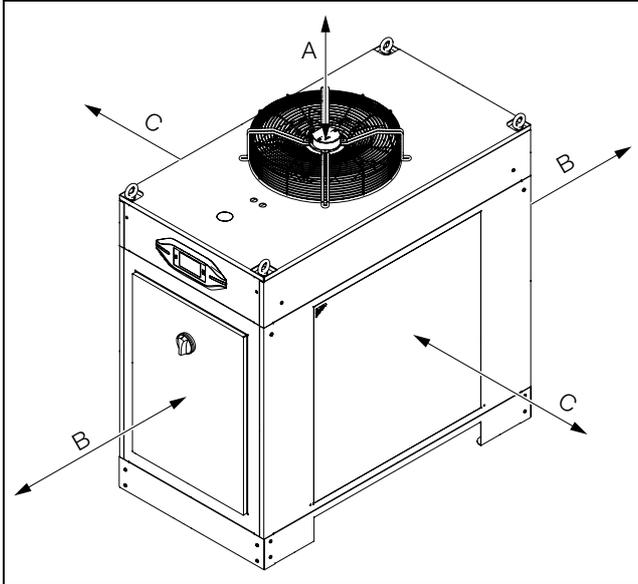


Fig. 13: Minimum distances

Side	Minimum distance [mm]	Reason
A (air outlet, top)	1000	Required distance for air outlet
B (front and rear)	800	Minimum distance for maintenance and connections
C (air inlet, sides)	800	Required distance for air inlet

Tab. 3: Minimum distances

- Ensure the room is adequately ventilated by installing the chiller such that the warm exhaust air does not heat the room excessively.
- In case of installation in a "small" room, it is imperative that you provide forced ventilation, as otherwise the heat dissipated will build up.



Caution!
The connection of an air intake / waste air duct is inadmissible.

- To prevent performance losses, do not install the chiller near any form of heating.

Size of installation room

- Units SK 333640x and 333641x must not be installed in rooms of less than 3 m³.
- Units SK 333643x and 333645x must not be installed in rooms of less than 3.3 m³.

Siting

Chillers must be installed such that they cannot become damaged by internal traffic and transport operations.

5.3 Installing the chiller

- Install the chiller on an even, firm surface. The maximum permissible deviation from the vertical is 2°.
- Avoid the production of noise due to vibration (vibration dampers, sheets of foam rubber).

5.4 Making the hydraulic connection



Caution!

Risk of damage to the cooling medium pump due to soiling in the cooling medium circuit! Flush the cooling medium circuit prior to connecting the chiller.

The cooling medium outlet (fig. 2 or fig. 4, item 8) on the chiller must be connected to the cooling medium inlet on the equipment to be cooled. At the same time, the cooling medium inlet (fig. 2 or fig. 4, item 9) on the chiller must be connected to the cooling medium outlet on the equipment to be cooled. Please observe the following:

- To avoid condensation, always connect the equipment using insulated pipelines and/or hoses.
- The nominal width of the piping must correspond at least to the nominal width of the media connections on the chiller.
- The cooling medium infeed to the chiller must be pressureless, because the tank used in the system is open to the atmosphere.
- Never connect the chiller to the drinking water supply.
- The pipework must be approved for the maximum pressure expected (see section 12.3 "Technical specifications").
- The installation of two shut-off valves is recommended so that, for example, the chiller can be separated hydraulically for maintenance purposes.



Note:

The use of steel pipes or galvanised steel pipes is inadmissible.

Prior to commissioning, it is imperative that the cooling medium pump is filled with cooling medium and bled (see section 6.3 "Bleeding the cooling medium pump").



Caution!

An insufficient flow rate will trigger the safety devices in the chiller. Pay attention to the minimum pressure required and the minimum flow rate required (see section 12.3 "Technical specifications").

If the cooler on the equipment to be cooled is higher than the chiller, we recommend installing a non-return valve in the feed as well as a solenoid valve in the cooling medium circuit return to prevent the tank from overflowing.

A bypass valve should be connected between the inlet and return to protect the cooling medium pump. This opens automatically, for example, if the equipment cycle is shut off. The valve is preset for the associated deployed cooling medium pump and operation with 50 Hz. If the chiller is operated with 60 Hz, the valve setting can be adjusted.

5.5 Making electrical connection

- When carrying out the electrical installation, observe all applicable national and regional regulations as well as the regulations from the responsible utility company.
- Electrical installation must only be carried out by a qualified electrician who is responsible for compliance with the existing standards and regulations.

Connection data

- The connected voltage and frequency must correspond to the values stated on the rating plate.
- If the chiller should be operated with a different connection voltage and frequency, the transformer wiring must be changed.
- The chiller must be connected to the mains via an all-pole isolating device.
- If a motor circuit-breaker or circuit-breaker is used, it should be selected in accordance with EN 60898-1 (tripping characteristic type D).
- To ensure the proper functioning of internal pressure sensors in the event of a malfunction, a slow (time delay) line fuse of no less than 15 A is required.
- Low-noise potential equalisation must be guaranteed with the mains connection. As a general principle, the chiller must be integrated into the building's potential equalisation system.
- The connection must be made with the field rotating clockwise. The direction of rotation of the field can be measured at the connection terminals L1, L2 and L3. Connect with a clockwise rotating field to ensure that the cooling medium pump motor rotates in the correct direction.

Electrical connection with 460 V / 60 Hz

If your chiller uses an auxiliary supply of 24 V AC and you wish to operate your chiller at 460 V/3~/60 Hz, it is nec-

essary to rewire the transformer. This transformer assignment must be carried out by an authorised, trained member of staff prior to installation, observing all safety requirements.

In its delivered state, the transformer is defined to a supply voltage of 400 V.

- Disconnect this connection and reassign it to 460 V (fig. 14).



Fig. 14: Transformer connection

Overvoltage protection and supply line load

- The chiller 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 deviate by more than the tolerance specified in section 12.3 "Technical specifications".
- The chiller and its power electronics are designed in accordance with overvoltage category III. 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 chiller. 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
200 kVA...400 kVA	160 J
400 kVA...800 kVA	320 J

Tab. 4: Design of the surge voltage protector

Interfaces

To evaluate fault messages of the chiller via the alarm relay, an appropriate signal cable is connected at the rear of the chiller (see section 5.5.2 "Connecting the alarm

6 Commissioning

EN

relay query device").

If you require remote activation of the chiller, this can also be achieved via this signal cable.

5.5.1 Installing the power supply

The units are prewired ready for connection in the factory and equipped with a connection cable (length 3 m).

- Establish the mains supply in accordance with the associated connection identification and the circuit diagram using the connection cable at the rear of the chiller.

Strain relief

- Please provide suitable strain relief for the connection cable.

5.5.2 Connecting the alarm relay query device

System messages from the cooling unit may be output to an external signal source via two floating relay outputs. For this purpose, an appropriate cable is already connected at the rear of the chiller.

- Connect the correspondingly labelled wires of the connection cable to the controller in accordance with the circuit diagram.

5.5.3 External activation

The chiller has been prepared for control via an external signal.

- Connect a floating contact to contacts 1 and 2 of the signal cable.

This function is deactivated by default, i.e. the chiller is permanently in operational mode. With the function activated and the contact open, the cooling function and, where applicable, the cooling medium pump are switched off.

5.5.4 Room temperature sensor

The chiller allows for room-temperature-based control. For this purpose, an appropriate room temperature sensor is connected at the rear of the chiller.

- Configure the chiller control mode so that the temperature is regulated by the sensor measurement (see section 7.4.1 "On/Off").

5.5.5 Interfaces

The chiller has the following interfaces for communicating with external systems:

- RS 485 interface on the rear (optional)
- LAN interface (optional)
- Bluetooth and wireless interface (optional)

RS 485 interface (optional)

As option, a RS 485 interface can be installed at the rear. The chiller can be connected to an appropriate monitoring unit via this card.

LAN interface (optional)

As option, a LAN Ethernet TCP/IP card can be installed at the rear. The chiller can be connected to an appropriate monitoring unit via this card.

Bluetooth and wireless interface (optional)

In addition to the optional LAN interface, a Bluetooth and wireless interface can be installed. These interfaces then allow access to the chiller via a tablet or laptop.

5.6 Installing the filter mats (accessories)

For ambient air containing oil, we recommend installing metal filters in the chiller (see section 11.1 "Metal filter (aluminium filter)"). These may be cleaned with suitable detergents and reused (see section 8.5 "Cleaning the filter mat (accessories)").

- Dismantle the side panel (fig. 15, item 2) of the chiller, and place it somewhere safe.

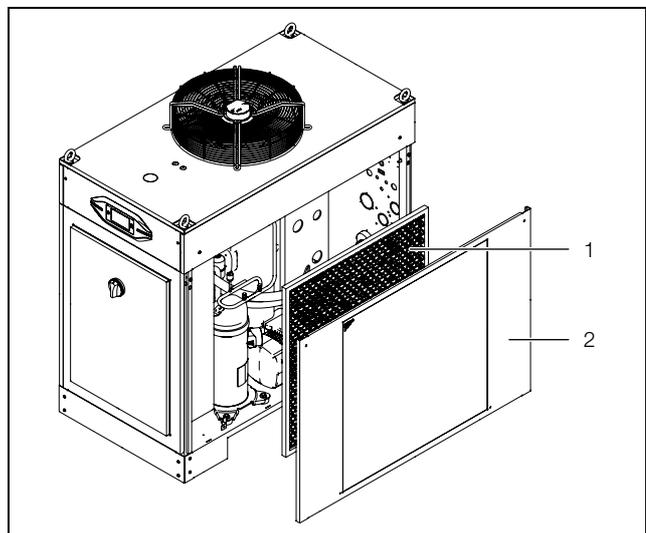


Fig. 15: Remove the side panel

Key

- 1 Metal filter
- 2 Side panel

- Insert the metal filter (fig. 15, item 1) inside the side panel into the designated frame and secure it.
- If necessary, use a tool, such as a screwdriver, to press the filter into the section of the frame.
- Reinstall the side panel, including the metal filter, on the chiller.

6 Commissioning

The chiller has a master switch allowing it to be switched off for maintenance work.

In day-to-day operation, it should be switched on and off by the higher-level controller.

6.1 Cooling medium water-glycol mixture

As standard, the chiller is not suitable for operation below the specified minimum temperature (see section 12.3 "Technical specifications").

Generally speaking, a water-glycol mixture with a maximum glycol proportion of between 20 and 34% by volume should be used as the cooling medium. We recommend our ready-mixed "Cooling medium for chillers" (see section 6.1.4 "Recommended "Cooling medium for chillers"). Other water-glycol mixtures may be possible in individual cases, but only in consultation with the manufacturer.



Caution!

Other additives may damage the pipes and the seal on the cooling medium pump, and are therefore only admissible by arrangement with Rittal.



Note:

With the chiller sited outdoors ("Outdoor" option), it is important to adjust the glycol proportion accordingly.

6.1.1 General remarks

When cooling the water-glycol mixture in an open circuit, always remember that algae, deposits and corrosion can damage the chiller. Residues will always impair the performance of the chiller. Without water treatment it is only seldom possible to achieve satisfactory conditions. By means of regular monitoring of the quality of the cooling medium and cooling medium treatment, you must ensure that deposits and corrosion are avoided, even under extreme conditions.

6.1.2 Cooling medium requirements

The cooling medium must not cause any limescale deposits or loose debris. In other words, it should have a low level of hardness, particularly a low level of calcium hardness. In particular, the level of calcium hardness should not be too high when using the equipment for recirculated cooling. On the other hand, the cooling medium should not be so soft that it attacks the materials. When recooling the cooling medium, the salt content should not be allowed to increase excessively due to the evaporation of large quantities of water, since the electrical conductivity will increase as the concentration of dissolved substances rises, and the cooling medium will become more corrosive. For this reason, not only is it always necessary to add a corresponding quantity of fresh water, but also to remove part of the enriched cooling medium.

Furthermore, the properties of the water used must not deviate from the following list of hydrological data:

Properties	Value
p _H value	(7) 7.5 – 8.5
Electrical conductivity	200 – 1000 µS/cm

Tab. 5: Hydrological data

Properties	Value
Residue on evaporation	< 500 mg/dm ³
Sedimentary substances	< 3 mg/dm ³
Hardness	3 – 8°dH (for German-speaking regions)
Ca + Mg	0.5 – 2 mmol/l (for international region)
Hydrogen carbonate	1 – 5 mmol/dm ³ (60 – 300 mg/dm ³)
Free CO ₂	< 10 mg/dm ³
Sulphide	< 0.01 mg/dm ³
Chloride	< 50 mg/dm ³
Sulphate	< 250 mg/dm ³
Nitrate	< 25 mg/dm ³
Nitrite	< 0.1 mg/m ³
COD	< 7 mg/dm ³
NH ₄	< 0.05 mg/dm ³
Fe	< 0.1 mg/dm ³
Mn	< 0.1 mg/dm ³
Cu	< 0.1 mg/dm ³

Tab. 5: Hydrological data



Note:

The cooling medium thickens due to evaporation. You can return the values to within the usual ranges by completely replacing the cooling medium (see section 8.3 "Monitoring the cooling medium").

Only use distilled or de-ionised water in chillers specified for such use (see data sheet in section 12.3 "Technical specifications").

6.1.3 Preparation and care

There are specific cooling medium requirements depending on the type of equipment being cooled. A suitable process must then be used to prepare and/or maintain the cooling medium to suit the level of contamination and the size and design of the chiller. The most common types of contamination and most frequently used techniques to eliminate them in industrial cooling are shown in the following table:

6 Commissioning

EN

Type of impurity	Removal
Mechanical contamination	Filtering of the cooling medium via mesh filter, gravel filter, cartridge filter, or pre-coated filter
Excessive hardness:	Softening of the cooling medium using ion exchange
Moderate content of mechanical contaminants and hardeners	Addition of stabilisers and/or dispersing agents to the water
Moderate levels of chemical contaminants	Addition of passifiers and/or inhibitors to the cooling medium
Biological contaminants, slime bacteria and algae	Addition of biocides to the cooling medium

Tab. 6: Impurities and removal

6.1.4 Recommended "Cooling medium for chillers"

Rittal recommends the use of "Cooling medium for chillers" (water-glycol mixture). This is a ready-mixed solution and is therefore suitable for immediate use (without the need for mixing) (tab. 7).

Composition

Glycol (20-33% max.) + water (67-80% max.) = ready-mix ("Cooling medium for chillers")

Model No.	Quantity [l]	Application
3301950	10	Outdoor
3301960	10	Indoor
3301955	25	Outdoor
3301965	25	Indoor
3301957	200	Outdoor
3301967	200	Indoor

Tab. 7: Model numbers – Cooling medium for chillers



Note:

When glycol is used, the cooling performance is reduced, depending on the glycol concentration (tab. 8).

Cooling medium for chillers	Temp. [°C]	Loss of cooling performance compared with pure water [%]
Standard (20% glycol) Antifreeze: -10 °C	10	-6
	15	-6
	18	-6
Outdoor (33% glycol) Antifreeze: -20 °C	10	-13
	15	-13
	18	-13

Tab. 8: Performance loss

To prevent problems in the cooling medium circuit (including water-cooled chillers), it is imperative that the VGB Cooling Water Guidelines (VGB-R 455 P) are observed.

The correct glycol concentration proportions may be read and determined using a refractometer.

6.2 Filling the cooling medium

The composition of the cooling medium is described in section 6.1 "Cooling medium water-glycol mixture".

For commissioning, proceed as follows:

- Ensure that any shut-off valves installed in the cooling medium circuit are open.

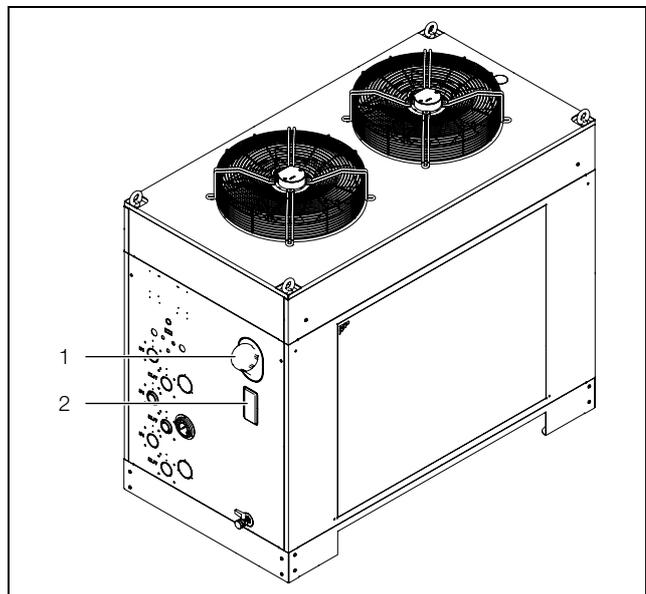


Fig. 16: Filling the cooling medium

Key

- 1 Fill nozzle for cooling medium
- 2 Cooling medium level display (filling level indicator)

- Fill the chiller tank with cooling medium via the fill nozzle (fig. 16, item 1).

- Check the filling level on the container through the opening in the casing (fig. 16, item 2).

If the "Low filling level" warning appears, top up with the following quantity of cooling medium:

- 3336.40x and 3336.41x: approx. 28 l
- 3336.43x and 3336.45x: approx. 44.5 l

If the tank is over-filled, or if a leak occurs, the cooling medium will run off via a hole in the centre of the gland plate.



Note:

Glycol poses a threat to groundwater. The plant operator is obliged to observe the relevant requirements on groundwater protection in his country.

6.3 Bleeding the cooling medium pump

- Bleed the pipes and top-up the cooling medium (see section 6.2 "Filling the cooling medium").
- Bleed the cooling medium pump (with the system at a standstill) by loosening the vent screw (fig. 17, item 1). As soon as cooling medium escapes from the vent screw, bleeding of the pump is complete.

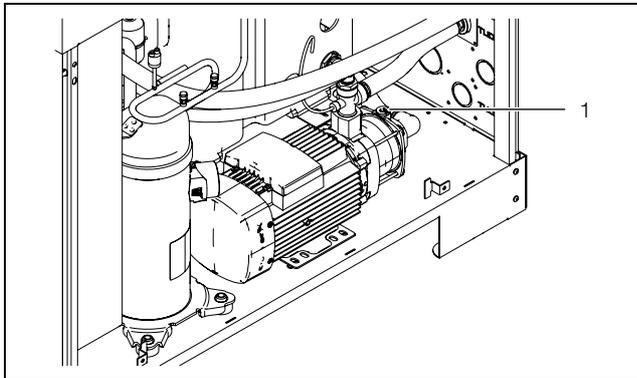


Fig. 17: Bleeding the cooling medium pump

Key

- 1 Vent screw

- Re-tighten the vent screw.
- Check the connection lines and pipe connections for leaks during commissioning.

6.4 Commissioning procedure

- Before switching on the motor for the first time, or if the position of the display showing the direction of rotation has been altered, check whether the display is working correctly, e.g. by moving the display panel with your finger.
- Switch on the power supply to the chiller via the superordinate controller.
- Switch the master switch into the "I" position. The Rittal logo will initially appear on the display, followed a short time later by the start screen.
- Check the direction of rotation of the motor in the cooling medium pump.

The cover of the motor fan is equipped with a display showing the direction of rotation (fig. 18). The motor cooling air is used for the rotation direction display. The correct direction of rotation is also indicated by arrows on the motor fan cover.

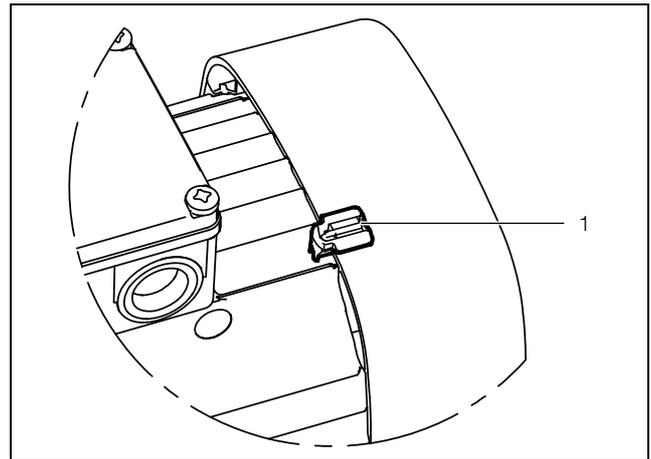


Fig. 18: Checking the direction of rotation

Key

- 1 Rotation direction display

To determine whether the motor's direction of rotation is correct, compare the display with the information in the following list.

- Display panel "black": Direction of rotation correct
- Display panel "white/reflective": Direction of rotation incorrect
- If the direction of rotation is incorrect, you will need to change over the connections for phases L1 and L2 on the chiller's power supply connector.



Note:

If the compressor does not start up, the temperature of the coolant added is lower than the setpoint temperature.

- If necessary, lower the setpoint temperature momentarily (see section 7.2.2 "Changing a parameter value").

The cooling air is drawn in from the side and expelled at the top.

If required, the condenser fan is activated by the temperature controller.

6.5 Adjusting the bypass valve

A bypass valve should be connected between the inlet and return to protect the cooling medium pump. This opens automatically, for example, if the equipment cycle is shut off. The bypass valve must be adjusted to suit the requirements of the customer's application.

- Dismantle the side panel of the chiller and place it somewhere safe.
- Open the bypass valve by rotating in a counter-clockwise direction.
- Vent the cooling medium pump (see section 6.3 "Bleeding the cooling medium pump") and switch it on.
- Shut off the water flow to the customer application completely using a customer-supplied shut-off valve in the pipeline or in the end application.

7 Operation

EN

■ Adjust the bypass valve so that a pressure appropriate for the variant and the operating voltage in accordance with the following table is displayed on the manometer at the rear of the chiller.

Model No.	Display pressure in bar for frequency	
	50 Hz	60 Hz
3336400	2.7	3.5
3336405	5.7	8.2
3336410	2.7	3.5
3336415	5.2	7.5
3336430	2.7	3.5
3336435	5.7	8.2
3336450	2.7	3.5
3336455	5.7	8.2

Tab. 9: Bypass valve setting

- Reopen the water flow to the customer application.
- Reinstall the side panel on the chiller.

7 Operation

7.1 General

The chiller is switched on and off by the higher-level control. It operates automatically, i.e. the cooling medium is pumped continuously and heat extracted from it during this process.

The compressor has a switch-on delay after being switched on or after a fault. If there is a sudden cooling load demand, therefore, cooling medium temperatures may be increased during the startup process.

The chiller is equipped with a touch function display for making basic settings and displaying error messages. This is an industrial-grade touch display which is pressure-sensitive and may therefore be operated with gloves.

7.2 Layout of the display

The display is divided into a top section on a dark background, and a bottom section with the menu bar. This layout is always identical, but the content of the two sections will vary according to the menu selected.

7.2.1 Start screen

The start screen is always displayed while the cooling unit is in normal operation, provided there are no error messages.



Fig. 19: Layout of the start screen

Key

Item	Description	Possible symbols
1	Current medium temperature (3-digit °C, 4-digit °F)	Numbers from 0-9
2	Ambient Temperature (outdoor temperature)	
3	Adjustment Temperature (medium temperature)	
4	Display temperature unit	°C °F
5	USB connection (if connected)	
6	Selftest (function not active)	
7	NFC connection (function not active)	
8	Chiller on/off	
9	Control based on a room sensor or an internal sensor	
10	Pumps on	

Tab. 10: List of all symbols with descriptions

Item	Description	Possible symbols
11	Compressors on	
	Pre-heating heater	
12	Hot gas bypass	
13	3-Way Valve (circuit 2)	
14	Ventilation on	
15	Ventilation on (if double circuit)	
16	Info menu	
17	System messages (where applicable)	
18	Service symbol (if required)	
19	Configuration	

Tab. 10: List of all symbols with descriptions

On - off mode

The chiller can be switched on or off in standby mode in 2 ways:

- Press the centre of the main screen for at least 3 sec.
- Release the screen.

The on/off screen will appear with the chiller status symbol.

- Press on the symbol to change the operating status. After the change, the home screen automatically reappears.

Symbol	Parameter
	Chiller is on.
	Chiller is off.

Tab. 11: Possible symbols when being switched on and off

Alternatively, the chiller can also be switched on or off via the configuration menu (see section 7.4 "Configuration menu").

- On the start screen, click on the "Configuration" button.
- Enter the PIN to gain access to the lower-level screen pages of the "Configuration" zone. "22" is the default PIN.
- Press the "On/Off" symbol to switch the chiller on or off.
- Exit this screen page with the "Back" button.

7.2.2 Changing a parameter value

If a parameter value is changed, the display including the menu bar will also change.

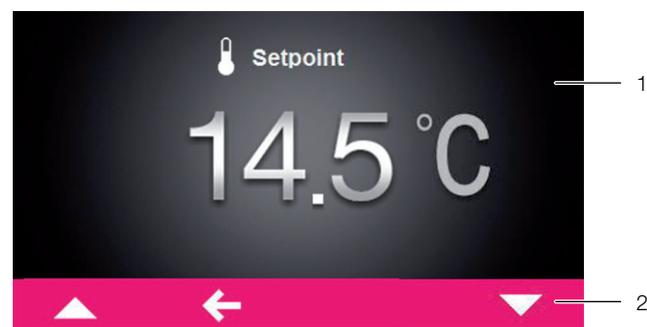


Fig. 20: Screen for changing a parameter value

Key

- 1 Main screen
- 2 Control bar

The currently selected parameter value is displayed in the centre of the main screen. To change this value, you always proceed in the same way, as described below with the example of adjusting the set temperature:

- On the start screen, click on the "Configuration" button.
- Enter the PIN to gain access to the lower-level screen pages of the "Configuration" zone. "22" is the default PIN.
- Click on the "Temperature" symbol.
- Click on the "Type of adjustment" symbol.
- Select the desired type of adjustment on the display.
- Change the setting to the required temperature using the "Up" and "Down" arrows.

7 Operation

EN

- Finally, confirm the set value with "OK".
- Exit this screen page with the "Back" button.

7.3 Info menu

- Click on the "Info" symbol to display a list of lower-level screen pages.

Symbol	Parameter
	Temperature info
	Device info
	Information on the appliance I/O

Tab. 12: "Info" zone

7.3.1 Temperature info

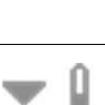
- Click on the "Temperature info" symbol.
A list of different temperature values will be displayed.
- Page through the list using the "Up" and "Down" arrows.

Symbol	Parameter
	Current setpoint Current setpoint for circuit 1.
	Av. medium 24h Average medium temperature over the last 24 hours of operation.
	Av. ambient 24h Average ambient temperature (external temperature) over the last 24 hours of operation.
	Current setpoint Current setpoint for circuit 1 (if any).

Tab. 13: "Temperature info" zone

7.3.2 Device info

- Click on the "Device info" symbol.
A list of general information about the device will be displayed.
- Page through the list using the "Up" and "Down" arrows.

Symbol	Parameter
	Article number
	Serial number
	Manufacture date YYYY-MM-DD
	Hardware release x.xx.xx
	Firmware release x.xx.xx
	Software release x.xx.xx
	Last update YYYY-MM-DD
	L. maintenance YYYY-MM-DD
	User device name Name assigned to the cooling unit by the customer.
	Type of adjustment (circuit 1)
	Type of adjustment (circuit 2)

Tab. 14: "Device info" zone

7.3.3 Information on I/O

- Click on the "Info I/O" symbol.
It displays a list with the information and status related to all chiller inputs and outputs divided into the following sub-menus.

Symbol	Parameter
	Values of analogue inputs
	Values of analogue outputs
	Status of digital inputs
	Status of digital outputs

Tab. 15: "Info I/O" zone

7.4 Configuration menu

- Click on the "Configuration" symbol.
A screen page will appear asking you to enter the PIN in order to access the lower-level screen pages.



Note:
"22" is preset in the factory as the default PIN.

- For the first digit, page through the digits "0" to "9" using the "Up" and "Down" arrows until the required digit appears in the box.
 - Confirm your selection with "OK".
 - For the second digit, once again page through the digits "0" to "9" using the "Up" and "Down" arrows until the required digit appears in the box.
 - Confirm your selection with "OK".
- A list of lower-level screen pages will be displayed.

Symbol	Parameter
	On/Off Device Switch-on and Switch-off
	Temperature Nominal temperature and adjustment type settings.
	Display language Choice of language for display texts.
	Self-test Perform a self-test (function not active).

Tab. 16: "Configuration" zone

7.4.1 On/Off

- Select the symbol "On/Off" to set the chiller switch-on or switch-off.

7.4.2 Temperature

- Click on the "Temperature" symbol to display a list of lower-level screen pages.

Symbol	Parameter
	Change unit Set the unit "°C" or "°F"
	Type of adjustment
	Limit values Limit values of the 2 temperature sensors displayed on the main screen

Tab. 17: "Temperature" zone

Temperature > Unit

All temperature values for the unit may be displayed either in degrees Celsius "°C" or degrees Fahrenheit "°F".

- Click on the "Change unit" symbol.
- Change the required unit ("°C" or "°F") using the "Up" or "Down" arrows.
- Confirm your entry with "OK".

Temperature > Type of adjustment

The chiller can control cooling output according to one of the following two temperature values.

- Click on the "Type of adjustment" symbol.
- Click on the symbol to select the desired setpoint.

Symbol	Parameter
	Set-point on 1 (circuit 1)
	Set-point on 2 (circuit 2)

Tab. 18: "Setpoint zone

- Select the symbol relating to the type of adjustment.

Symbol	Parameter
	Absolute (fixed value control) for a constant medium temperature

Tab. 19: "Type of adjustment" zone

7 Operation

EN

Symbol	Parameter
	Room temperature based control with limit values (only for setpoint 1)
	Room temperature based control without limit values

Tab. 19: "Type of adjustment" zone

- Change the setpoint using the "Up" and "Down" arrows or select the required medium temperature directly.
- Confirm your entry with "OK".

Temperature > Type of adjustment > Absolute

This type of adjustment has been used if the application requires a constant medium temperature. The following parameters will need to be set:

- PSr = setpoint
- Pdr = hysteresis

If the medium temperature is above "PSr+Pdr", the chiller is switched on. If it is below "PSr", the chiller is switched off.

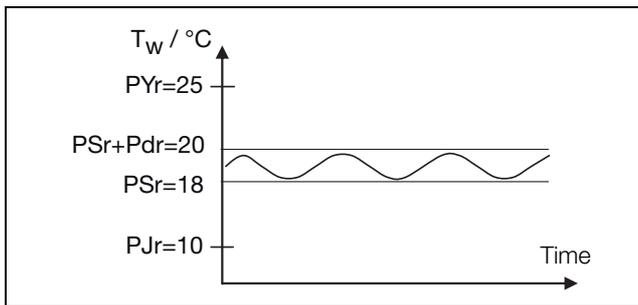


Fig. 21: Type of adjustment "Absolute"

Temperature > Type of adjustment > Room temperature based control with limit values

The following parameters will need to be set:

- PSr = smallest limit value for the cooling medium temperature
- PHc = highest limit value for the cooling medium temperature
- PS1 = smallest limit value for the ambient temperature
- AMB = actual ambient temperature
- PCE = gradient of the compensated setpoint adjustment
- Pdr = hysteresis

If the ambient temperature falls below the parameter value "PS1", fixed value control (absolute) becomes active. The medium temperature is then held at the "PSr" value. If the ambient temperature exceeds the (calculated) parameter value "PS2", also fixed value control (absolute) becomes active. The medium temperature is then held at the "PHc" value.

If the ambient temperature lies between the "PS1" and "PS2" values, the chiller operates in room-temperature-

controlled mode. The medium temperature is calculated with the formula " $PSr+(AMB-PS1)*PCE$ ".

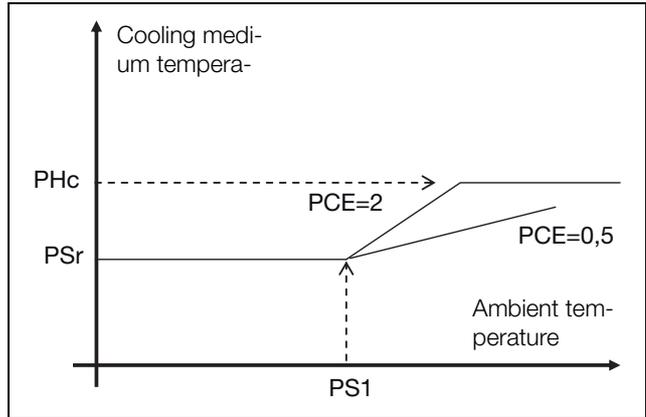


Fig. 22: Type of adjustment "relative with limit values"

Temperature > c > Room temperature based control without limit values

This type of adjustment has to be used if the application requires a medium temperature that varies depending on the ambient temperature. The following parameters will need to be set:

- AMB = actual ambient temperature
- PSr = setpoint as the difference from the ambient temperature
- Pdr = hysteresis

■ Pay attention to the symbol when entering the "PSr" value.

Negative symbol: The medium temperature setpoint lies **below** the ambient temperature.

Positive symbol: The medium temperature setpoint lies **above** the ambient temperature.

If the medium temperature is above "AMB+PSr+Pdr" the chiller is switched on.

If the medium temperature is below "AMB+PSr", the chiller is switched off.

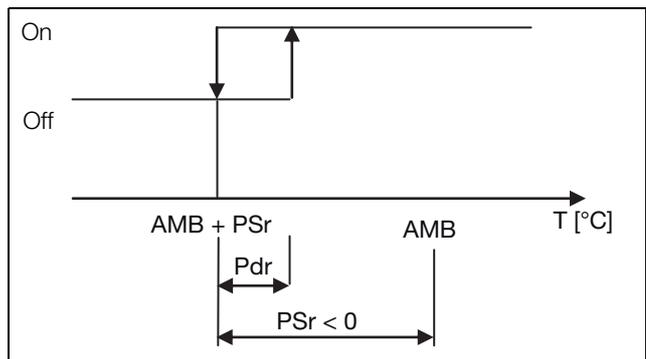


Fig. 23: Type of adjustment "relative with limit values"

7.4.3 Limit values of the temperature values

The values of the two temperature sensors (medium temperature and room temperature) are displayed on the start screen. The value range for the two displays can be adjusted.

- Click on the "Limit values" symbol.

- Choose the desired temperature sensor by selecting it on the display.
- Change the limit value using the "Up" and "Down" arrows or select the required medium temperature directly.
- Confirm the value with "OK".

7.4.4 Language settings

All displays on the unit are available in 5 different languages.

- Click on the "Display language" symbol.
- Page through to the required language using the "Up" and "Down" arrows.
- Confirm the chosen language with "OK".

The language will change over immediately, and all menu displays will appear in the chosen language.

7.5 System messages

We distinguish between three different types of system messages on the unit:

- Malfunctions 
- Errors 
- Servicing 

If a corresponding message applies, the "System messages" symbol is displayed in the menu bar (fig. 19, item 13). A list of all possible system messages may be found in section 9.1 "List of system messages".

- Click on the "System messages" symbol.

A list of all active system messages will be displayed. The individual messages are arranged in ascending order as they occur according to the above three categories.

If an error message can only be resolved by the Rittal Service team, the "Service" symbol will additionally appear after the error message. .

- In such cases, please contact Rittal Service (see section 9 "Troubleshooting").

7.5.1 Occurrence of a malfunction

In the event of a malfunction, the start screen will be superimposed with an error message.

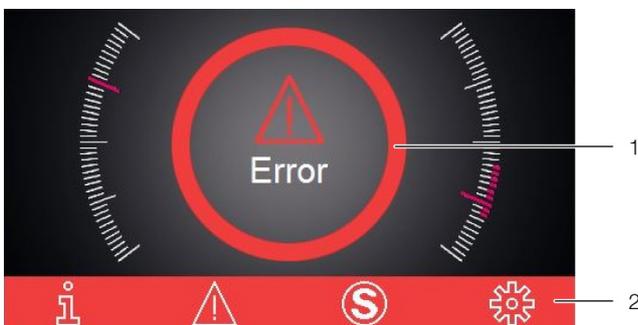


Fig. 24: Screen in the event of a malfunction

Key

- 1 Superimposed
- 2 Menu bar in red

If the malfunctions cannot be resolved by the operator himself, the Service symbol will additionally be displayed (fig. 19, item 14).

- Contact the Rittal Service team if you are unable to resolve the malfunction yourself (see section 9 "Troubleshooting").

7.5.2 Display in case of errors

If errors have occurred or servicing is required, the "System messages" symbol will appear in the menu bar (see section 7.5 "System messages").

Most system messages are reset automatically once the fault has been resolved.

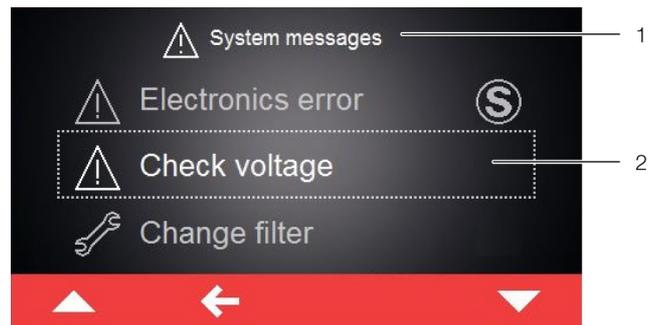


Fig. 25: Screen showing error messages

Key

- 1 "Errors" menu
- 2 Error message

If an error message applies that cannot be resolved by the operator himself and which is not reset automatically, the "Service" symbol will appear after the error message and in the control bar next to the symbol for system messages (fig. 26, item 2).

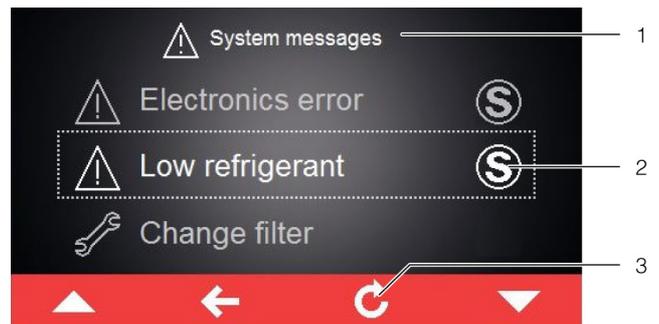


Fig. 26: Screen showing error messages

Key

- 1 "Errors" menu
- 2 Error message
- 3 "Return" button

- Contact Rittal Service (see section 9 "Troubleshooting").
- Acknowledge the error message by pressing the "Return" button.

8 Inspection and maintenance

Proper, regular inspections and maintenance (once a year is recommended) and usage of original spare parts

8 Inspection and maintenance

EN

only are crucial for problem-free operation and a long service life of the chiller.

We therefore recommend a maintenance contract.

We offer maintenance service.

Our service contact:

Phone: +49 2772 505-1855

Fax: +49 2772 505-1850

E-mail: service@rittal.de



Danger!

Risk of electric shock at live connections!

Prior to any inspection and maintenance work, the chiller must be disconnected from the power supply.

When the master switch is switched off, the alarm relay is still live. Disconnect signal connector X2 as well.



Caution!

Never use flammable liquids for cleaning.

8.1 Overview of the inspection and maintenance tasks

Assembly	Task	Interval
Cooling medium level	Check for sufficient filling, top up if necessary.	2 weeks or when indicated on the display
Tank, components, and all connections (piping, valves and fittings, hoses) in the circuit for the equipment to be cooled	Check for leaks.	4 weeks
Condenser	Clean fins using compressed air, or with a brush.	3 months
Metal filter (accessory)	Clean with compressed air.	3 months
Cooling medium	Check cooling medium circuit for soiling and any foreign bodies (chips and the like).	3 months
Enclosure	Check the mains voltage value.	3 months
Pump motor	Clean with compressed air.	6 months

Tab. 20: Inspection and maintenance tasks

Assembly	Task	Interval
Cooling medium	Check mix ratio.	6 months
Condenser fan	Check noise generation, clean.	6 months
Access door	Clean with compressed air.	1 year
Condenser and metal filter (accessory)	Clean with a non-corrosive detergent.	1 year
Enclosure	Check the tightening torque of the contactors.	1 year
Fans	Check the tightening torque of the fans.	1 year
Metal filter (accessory)	Replacement	2 years

Tab. 20: Inspection and maintenance tasks

8.2 Maintaining the refrigerant circuit



Note:

The refrigerant circuit is filled with a comparatively small quantity of refrigerant (< 1.5 kg). This means that maintenance to the cooling circuit (such as regular leak checks) is not generally needed.

As a hermetically sealed system, the refrigerant circuit has been filled in the factory with the required amount of refrigerant, tested for leaks and subjected to a function test run.

Maintenance tasks on the refrigerant circuit are only allowed to be undertaken by a specialist refrigeration company. We recommend a maintenance contract that includes an annual inspection of the refrigerant circuit (European regulation EC no. 517/2014 / fluorinated greenhouse gases).

8.3 Monitoring the cooling medium

The fill level of the cooling medium tank is monitored with a level switch. If the fill level drops below the lower limit, a corresponding message will appear on the display (see section 9.1 "List of system messages").

- Top up with cooling medium as soon as possible if indicated by a message on the display.
- Regularly check the quality of the cooling medium, and if necessary, improve it as described under section 6.1.3 "Preparation and care" beschrieben.
- Regularly measure the glycol content with the aid of a refractometer (fig. 27). If you have any questions about this, please contact our service department.
- In order to prevent the formation of fungus and algae, the cooling medium should be replaced at least once

a year. The use of pure water may also cause the formation of fungus or algae.

If the chiller is used under certain physical conditions ($T_w < 10\text{ }^\circ\text{C}$), condensation may form in the system. This can be minimised by means of suitable insulation or the optionally available room-temperature-based control.



Fig. 27: Refractometer



Note:

The manufacturer's guarantee and liability will be rendered void in cases of incorrect use and treatment of the chiller. To prevent problems in the cooling medium circuit (including water-cooled chillers), it is imperative that the VGB Cooling Water Guidelines (VGB-R 455 P) are observed.

8.4 Cleaning the condenser

To ensure the correct function of the chiller, the fins on the air-cooled condenser must be kept clean. It must be cleaned at regular intervals (see section 8.1 "Overview of the inspection and maintenance tasks"); the frequency of cleaning depends on the degree of soiling in the rooms where the unit is installed.

Ambient air containing oil in conjunction with dust will result in increased soiling of the condenser fins. In such cases, thorough cleaning with compressed air is only possible under certain circumstances. In such cases, the additional use of a metal filter mat is required (see section 11.1 "Metal filter (aluminium filter)").

When cleaning, it is imperative to observe the following warning and safety notes below.



Danger!

Prior to any inspection and maintenance work, the chiller must be disconnected from the power supply at the master switch.



Danger!

Temperatures of up to $60\text{ }^\circ\text{C}$ may occur inside the chiller. Wait approx. 10 min. after you have switched off the chiller to allow the pipe to cool down.



Risk of cuts!

Sharp-edged condenser fins! Use gloves as personal protection equipment.



Caution!

Risk of damage for the condenser fins due to powerful compressed air! Use the compressed air carefully to avoid damage.

When cleaning, please proceed as follows:

- Electrically isolate the chiller at the master switch.
- Secure the master switch to prevent it being switched back on.
- Dismantle the side panel of the chiller and place it somewhere safe.

This gives you access to the condenser at the top centre of the chiller.

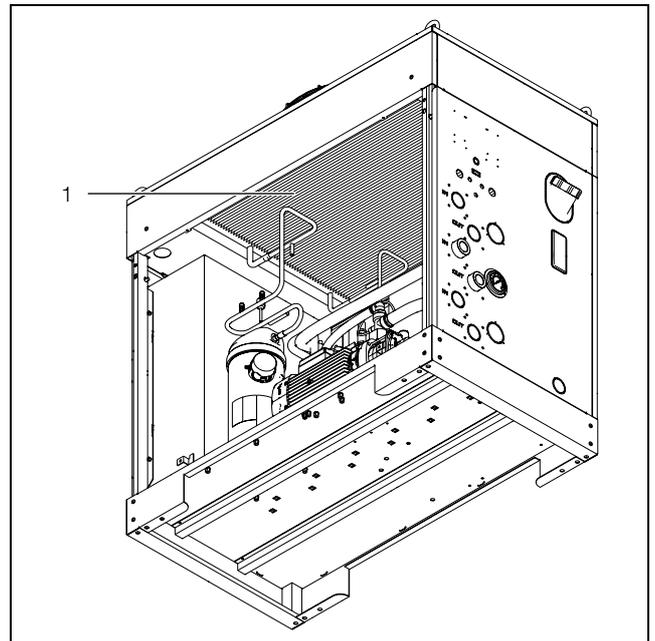


Fig. 28: Cleaning the condenser (shown here: 333640x)

Key

1 Condenser

- Use compressed air or a vacuum cleaner with the brush attachment to clean the condenser.
- Reinstall the side panel on the chiller.

8.5 Cleaning the filter mat (accessories)

Metal filter mats may be washed with water or grease-dissolving detergents.

- Dismantle the side panel of the chiller and place it somewhere safe.
- Remove the metal filter from the frame inside the side panel.
- Clean the metal filter mats e.g. using water and degreaser/detergent.
- Insert the cleaned metal filter inside the side panel into the designated frame and secure it.
- Reinstall the side panel, including the metal filter, on the chiller.

9 Troubleshooting

EN

8.6 Draining the cooling medium tank

- Drain the cooling medium tank via the tank drain nozzle (fig. 2 or fig. 4, item 6), either directly or using a hose, into a container.
- For disposal of the cooling medium, observe the applicable regulations on water pollution.

9 Troubleshooting

In operation, the chiller operates in a safe state. The chiller maintains the cooling medium inlet temperature at the setpoint set.

Possible causes for deviation from the setpoint could be:

- Cooling demand too high
- Ambient temperature too high
- Failure to observe required distances
- Clogged evaporator coil
- Flow rate too low or too high
- Soiled condenser
- Lack of refrigerant
- Level of cooling medium in tank too low
- Cooling medium temperature set too low

- Parameters set incorrectly

The malfunctions are only allowed to be rectified by suitably instructed, qualified personnel.

For information on malfunction analysis, refer to tab. 21 "Error messages" or contact our service department:

Service contact:

Rittal International Service
 Auf dem Stützelberg
 35745 Herborn

Phone: +49 2772 505-1855

Fax: +49 2772 505-1850

E-mail: service@rittal.de

9.1 List of system messages

The applicable error messages are displayed with the corresponding symbol in the Errors list (see section 7.5 "System messages"). Extended information for resolving individual faults may be found in this section.

Contact details for the Rittal Service team can be found in section 9 "Troubleshooting".

System message	Alarm relay output (factory setting)	Troubleshooting measures/solutions
Al. Err. Reg. Probe 	Alarm: OFF Warning: ON	Faulty, defective or disconnected chiller adjustment probe. Check connection or contact the Rittal Service team.
Al. Err. A-freeze Probe 1 	Alarm: OFF Warning: ON	Faulty, defective or disconnected chiller antifreeze probe. Check connection or contact the Rittal Service team.
Al. Err. Inlet Probe 	Alarm: OFF Warning: ON	Faulty, defective or disconnected chiller inlet probe. Check connection or contact the Rittal Service team.
Al. Err. Outlet Probe 	Alarm: OFF Warning: ON	Faulty, defective or disconnected chiller outlet probe. Check connection or contact the Rittal Service team.
Al. Err. Amb. Probe 1 	Alarm: OFF Warning: ON	Faulty, defective or disconnected chiller ambient probe. Check connection or contact the Rittal Service team.
Al. Offline Board 	Alarm: OFF Warning: ON	No communication between touch display and main board inside the electric control board. The board may be defective or not powered. Check connections or contact the Rittal Service team.
Al. Low Press. Switch 1 	Alarm: OFF Warning: ON	There may not be enough refrigerant in the refrigerant active circuit. Contact the Rittal Service team.

Tab. 21: Error messages

System message	Alarm relay output (factory setting)	Troubleshooting measures/solutions
Al. Diff. Press. Switch 	Alarm: OFF Warning: ON	The fluid pressure between inlet and outlet in the chiller hydraulic circuit is not within the permissible values. Make sure the pressure is within the permissible range. Check for leaks in the hydraulic circuit or contact the Rittal Service team.
Al. Flow Switch 1 (C) 	Alarm: OFF Warning: ON	There is no flow in the hydraulic circuit. Check for leaks in the hydraulic circuit or contact the Rittal Service team.
Al. Flow Switch 1 (W) 	Alarm: ON Warning: OFF	There is no flow in the hydraulic circuit. Check for leaks in the hydraulic circuit or contact the Rittal Service team.
Al. Flow Switch 1 (H-C) 	Alarm: OFF Warning: ON	There is no flow in the hydraulic circuit. Check for leaks in the hydraulic circuit or contact the Rittal Service team.
Al. A-freeze Thermostat 1 	Alarm: OFF Warning: ON	The temperature in the cooling circuit is below the limit value. Contact the Rittal Service team.
Al. Level Switch 1 (H-C) 	Alarm: OFF Warning: ON	The fluid level in the tank is below the limit value. Fill the tank after checking that the latter does not leak, or contact the Rittal Service team.
Al. Level Switch 1 (W) 	Alarm: ON Warning: OFF	The fluid level in the tank is below the limit value. Fill the tank after checking that the latter does not leak, or contact the Rittal Service team.
Al. Door Switch 	Alarm: OFF Warning: ON	Close the control cabinet doors or check the door contact switch. Alternatively, contact the Rittal Service team.
Al. High Press. Switch 1 	Alarm: OFF Warning: ON	The pressure in the cooling circuit is higher than the limit value. Check that the amount of gas in the cooling circuit is correct or contact the Rittal Service team.
Al. Break. Switch Pump 1 	Alarm: OFF Warning: ON	The current absorbed by the heater is greater than the set of the corresponding motor protection switch. Check that the motor protection switch is correctly set and that the motor phases are connected. Alternatively, contact the Rittal Service team.
Al. Break. Switch Compr. 1 	Alarm: OFF Warning: ON	The current absorbed by the heater is greater than the set of the corresponding motor protection switch. Check that the motor protection switch is correctly set and that the motor phases are connected. Alternatively, contact the Rittal Service team.
Al. Break. Switch Fans 1 	Alarm: OFF Warning: ON	The current absorbed by the heater is greater than the set of the corresponding motor protection switch. Check that the motor protection switch is correctly set and that the motor phases are connected. Alternatively, contact the Rittal Service team.

Tab. 21: Error messages

9 Troubleshooting

EN

System message	Alarm relay output (factory setting)	Troubleshooting measures/solutions
Al. Heater Break. Switch 	Alarm: OFF Warning: ON	The current absorbed by the heater is greater than the set of the corresponding motor protection switch. Check that the motor protection switch is correctly set and that the resistor phases are connected. Alternatively, contact the Rittal Service team.
Al. Phase Controller 	Alarm: OFF Warning: ON	The chiller does not work within the permissible voltage range. Check the chiller power supply voltage and respect the values indicated on the identification plate. In case of three-phase power supply, also check that all phases are properly connected.
Al. Dirty Filter 1 	Alarm: ON Warning: OFF	The chiller filters may be dirty. Replace or clean the filter and confirm its replacement by resetting the list of system messages on the chiller display. Alternatively, contact the Rittal Service team.
Al. Level Switch 2 (H-C) 	Alarm: OFF Warning: ON	The fluid level in the tank is below the limit value. Fill the tank after checking that the latter does not leak, or contact the Rittal Service team.
Al. Level Switch 2 (W) 	Alarm: ON Warning: OFF	The fluid level in the tank is below the limit value. Fill the tank after checking that the latter does not leak, or contact the Rittal Service team.
Al. Break. Switch Pump 2 	Alarm: OFF Warning: ON	The current absorbed by Pump 2 is greater than the set of the corresponding motor protection switch. Check that the motor protection switch is correctly set and that the motor phases are connected. Alternatively, contact the Rittal Service team.
Al. Flow Switch 2 (C) 	Alarm: OFF Warning: ON	There is no flow in the hydraulic circuit. Check for leaks in the hydraulic circuit or contact the Rittal Service team.
Al. Flow Switch 2 (W) 	Alarm: ON Warning: OFF	There is no flow in the hydraulic circuit. Check for leaks in the hydraulic circuit or contact the Rittal Service team.
Al. Flow Switch 2 (H-C) 	Alarm: OFF Warning: ON	There is no flow in the hydraulic circuit. Check for leaks in the hydraulic circuit or contact the Rittal Service team.
Al. Break. Switch Compr. 2 	Alarm: OFF Warning: ON	The current absorbed by Compressor 2 is greater than the set of the corresponding motor protection switch. Check that the motor protection switch is correctly set and that the motor phases are connected. Alternatively, contact the Rittal Service team.
Al. Break. Switch Fans 2 	Alarm: OFF Warning: ON	The current absorbed by Fan 2 is greater than the set of the corresponding motor protection switch. Check that the motor protection switch is correctly set and that the motor phases are connected. Alternatively, contact the Rittal Service team.
Al. High Press. Switch 2 	Alarm: OFF Warning: ON	The pressure in the cooling circuit 2 is higher than the limit value. Check that the amount of gas in the cooling circuit is correct or contact the Rittal Service team.

Tab. 21: Error messages

System message	Alarm relay output (factory setting)	Troubleshooting measures/solutions
Al. Low Press. Switch 2 	Alarm: OFF Warning: ON	The pressure in the cooling circuit 2 is below the limit value. Check that the amount of gas in the cooling circuit is correct or contact the Rittal Service team.
Al. A-freeze Thermostat 2 	Alarm: OFF Warning: ON	The temperature in the cooling circuit is below the limit value. Contact the Rittal Service team.
Al. Dirty Filter 2 	Alarm: ON Warning: OFF	The chiller filters may be dirty. Replace or clean the filter and confirm its replacement by resetting the list of system messages on the chiller display. Alternatively, contact the Rittal Service team.
Al. High Temp. Reg. 	Alarm: ON Warning: OFF	The chiller adjustment temperature is not within the permitted set values. Make sure that the fluid temperature does not exceed the set range (Default: +3 °C...+40 °C if in ABS; ± 5 °C if in REL) Alternatively, contact the Rittal Service team.
Al. Low Temp. Reg. 	Alarm: ON Warning: OFF	The chiller adjustment temperature is not within the permitted set values. Make sure that the fluid temperature does not exceed the set range (Default: +3 °C...+40 °C if in ABS; ± 5 °C if in REL) Alternatively, contact the Rittal Service team.
Al. Antifreeze 1 	Alarm: OFF Warning: ON	The temperature in the cooling circuit is below the limit value. Contact the Rittal Service team.
Al. Err. Amb. Probe 2 	Alarm: OFF Warning: ON	Faulty, defective or disconnected chiller ambient probe 2. Check connection or contact the Rittal Service team.
Al. High Temp. Amb.2 	Alarm: ON Warning: OFF	The chiller ambient temperature 2 is not within the permitted values. Make sure that the ambient temperature is within the permitted range (-20 °C...+60 °C). Alternatively, contact the Rittal Service team.
Al. Low Temp. Amb.2 	Alarm: ON Warning: OFF	The chiller ambient temperature 2 is not within the permitted values. Make sure that the ambient temperature is within the permitted range (-20 °C...+60 °C). Alternatively, contact the Rittal Service team.
Al. Err. User Probe 	Alarm: OFF Warning: ON	Faulty, defective or disconnected chiller user probe. Check connection or contact the Rittal Service team.
Al. Err. Disch. Probe 1 	Alarm: OFF Warning: ON	Faulty, defective or disconnected chiller discharge probe. Check connection or contact the Rittal Service team.
Al. Fans Press. Transd. 1 	Alarm: OFF Warning: ON	Faulty, defective or disconnected air pressure transducer. Check connection or contact the Rittal Service team.

Tab. 21: Error messages

9 Troubleshooting

EN

System message	Alarm relay output (factory setting)	Troubleshooting measures/solutions
Al. Pumps Press. Transd. 1 	Alarm: OFF Warning: ON	Faulty, defective or disconnected water pressure transducer. Check connection or contact the Rittal Service team.
Al. Pumps Press. Transd. 2 	Alarm: OFF Warning: ON	Faulty, defective or disconnected water pressure transducer 2. Check connection or contact the Rittal Service team.
Al. Fans Press. Transd. 2 	Alarm: OFF Warning: ON	Faulty, defective or disconnected air pressure transducer 2. Check connection or contact the Rittal Service team.
Al. Err. Disch. Probe 2 	Alarm: OFF Warning: ON	Faulty, defective or disconnected chiller discharge probe 2. Check connection or contact the Rittal Service team.
Al. Err. A-freeze Probe 2 	Alarm: OFF Warning: ON	Faulty, defective or disconnected chiller antifreeze probe 2. Check connection or contact the Rittal Service team.
Al. Antifreeze 2 	Alarm: OFF Warning: ON	The temperature in the cooling circuit is below the limit value. Contact the Rittal Service team.
Al. pCO _e Offline 	Alarm: OFF Warning: ON	No communication between display and pCO _e inside the electric control board. The device may be defective or not powered. Check connections or contact the Rittal Service team.
Al. High Temp. Amb. 1 	Alarm: ON Warning: OFF	The chiller ambient temperature is not within the permitted values. Make sure that the ambient temperature is within the permitted range (-20 °C...+60 °C). Alternatively, contact the Rittal Service team.
Al. Low Temp. Amb. 1 	Alarm: ON Warning: OFF	The chiller ambient temperature is not within the permitted values. Make sure that the ambient temperature is within the permitted range (-20 °C...+60 °C) Alternatively, contact the Rittal Service team.
Al. Low Press. Transd. 1 	Alarm: ON Warning: OFF	The chiller condensation pressure is not within the permitted values. Make sure the pressure is within the permissible range (+1 bar...+49 bar). Alternatively, contact the Rittal Service team.
Al. High Press. Transd. 1 	Alarm: ON Warning: OFF	The chiller condensation pressure is not within the permitted values. Make sure the pressure is within the permissible range (+1 bar...+49 bar). Alternatively, contact the Rittal Service team.
Al. Low Press. Transd. 2 	Alarm: ON Warning: OFF	The chiller condensation pressure is not within the permitted values. Make sure the pressure is within the permissible range (+1 bar...+49 bar). Alternatively, contact the Rittal Service team.

Tab. 21: Error messages

System message	Alarm relay output (factory setting)	Troubleshooting measures/solutions
Al. High Press. Transd. 2 	Alarm: ON Warning: OFF	The chiller condensation pressure is not within the permitted values. Make sure the pressure is within the permissible range (+1 bar...+49 bar). Alternatively, contact the Rittal Service team.

Tab. 21: Error messages

10 Decommissioning and disposal

The chiller is only allowed to be shut down by authorised, qualified personnel. For this purpose the chiller must be decommissioned.

10.1 Decommissioning

If the chiller is not to be used for an extended period (more than 6 months) the cooling medium circuit must be drained. This will prevent the evaporation of water, and the water-glycol ratio of the cooling medium will not be altered. If the glycol thickens, the cooling medium pump seal may be irreparably damaged.

- Electrically isolate the chiller at the master switch.
- Secure the master switch to prevent it being switched back on.
- Disconnect all electrical connections to the chiller (mains connector, signal connector and IoT interface).
- Drain the cooling medium tank via the tank drain nozzle (fig. 2, item 7), either directly or using a hose, into a container.
- For disposal of the cooling medium, observe the applicable regulations on water pollution.
- Disconnect and dismantle the cooling medium circuit connections.
- To recommission the chiller, proceed as described in section 6 "Commissioning". Make the same checks as described in that section.

10.2 Disposal



Caution!
Risk for the environment! Intentional release of the refrigerant is strictly prohibited. Refrigerant must be disposed of properly.

- Decommission the chiller (see section 10.1 "Decommissioning").
- Notify your supplier or our service department for proper disposal of the chiller.

Certificate in accordance with BGR 500 chap. 2.35 and DIN EN 378-2 on the inspection of a cooling system



Note:

If a system is changed or taken out of operation for more than 2 years, it is to be re-inspected and a new certificate issued. A system has been modified:

- if a system is opened and converted to a different refrigerant,
- if stationary system is moved elsewhere,
- if an existing system is extended or converted
- or major improvements are carried out.

11 Accessories

11.1 Metal filter (aluminium filter)

Particularly when chiller units are used in dusty and oil-laden environments, it is advisable to use washable metal filters. If air or steam condenses on the metal surfaces, any particles that may be present will adhere to the metal and are easily washed out with water or grease-dissolving detergents.

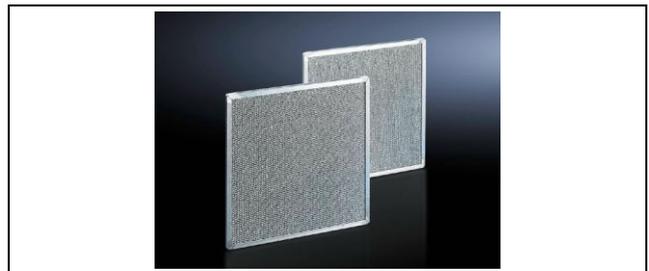


Fig. 29: Metal filters

Chiller	Packs of	Model No.
3336.40x and 3336.41x	2	3286560
3336.43x and 3336.45x	2	3286570

Tab. 22: Metal filters

11.2 Cooling medium for chillers (ready-mix)

Chiller systems are only suitable for the cooling of a water-glycol mixture. As well as protecting against frost,

11 Accessories

EN

this cooling medium also serves to inhibit bacterial growth and provide optimum corrosion protection.



Fig. 30: Cooling medium for chillers (ready-mix)

Mixing ratio	Content	Model No.
1:4 (indoor)	10 l	3301960
	25 l	3301965
	200 l	3301967
1:4 (outdoor)	10 l	3301950
	25 l	3301955
	200 l	3301957

Tab. 23: Cooling medium for chillers (ready-mix)

11.3 Twin castors

With the help of twin castors the chiller can be moved and thus used at different production locations.



Fig. 31: Twin castors

Mounting thread	Maximum admissible static load (per castor)	Model No.
M12 x 20	75 kg	6148000 (recommended)
M12 x 20	120 kg	7495000

Tab. 24: Twin castors

12 Appendix

12.1 Block diagram

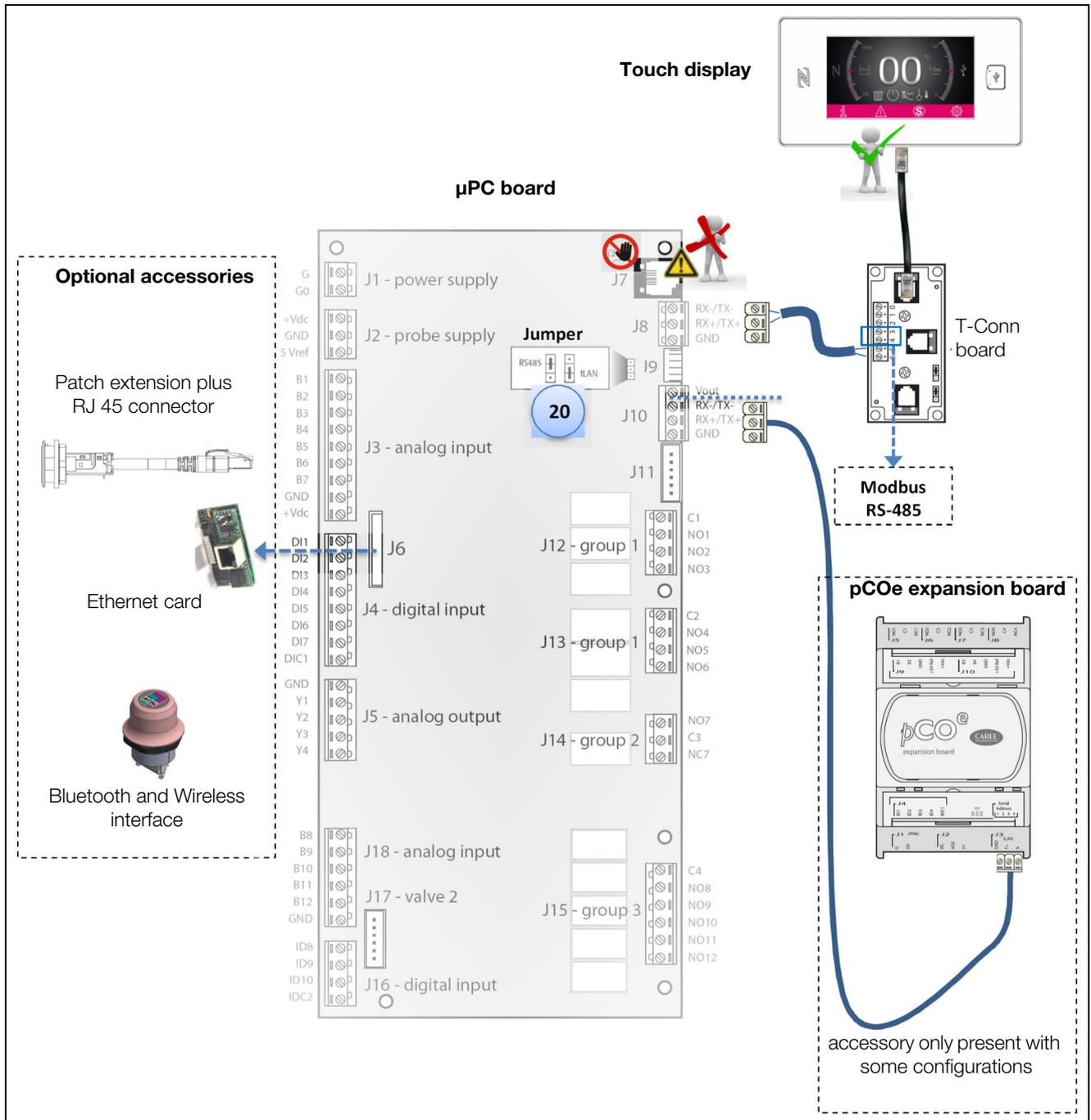


Fig. 32: Block diagram



Note:

Never connect the Touch display directly to the J7 connector (RJ12) on the μPC board. Always use the T-Conn board connected to J8.

12 Appendix

EN

12.2 Spare parts

Spare parts may be ordered directly from the Rittal website.

– http://www.rittal.com/com_en/spare_parts



Note:

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

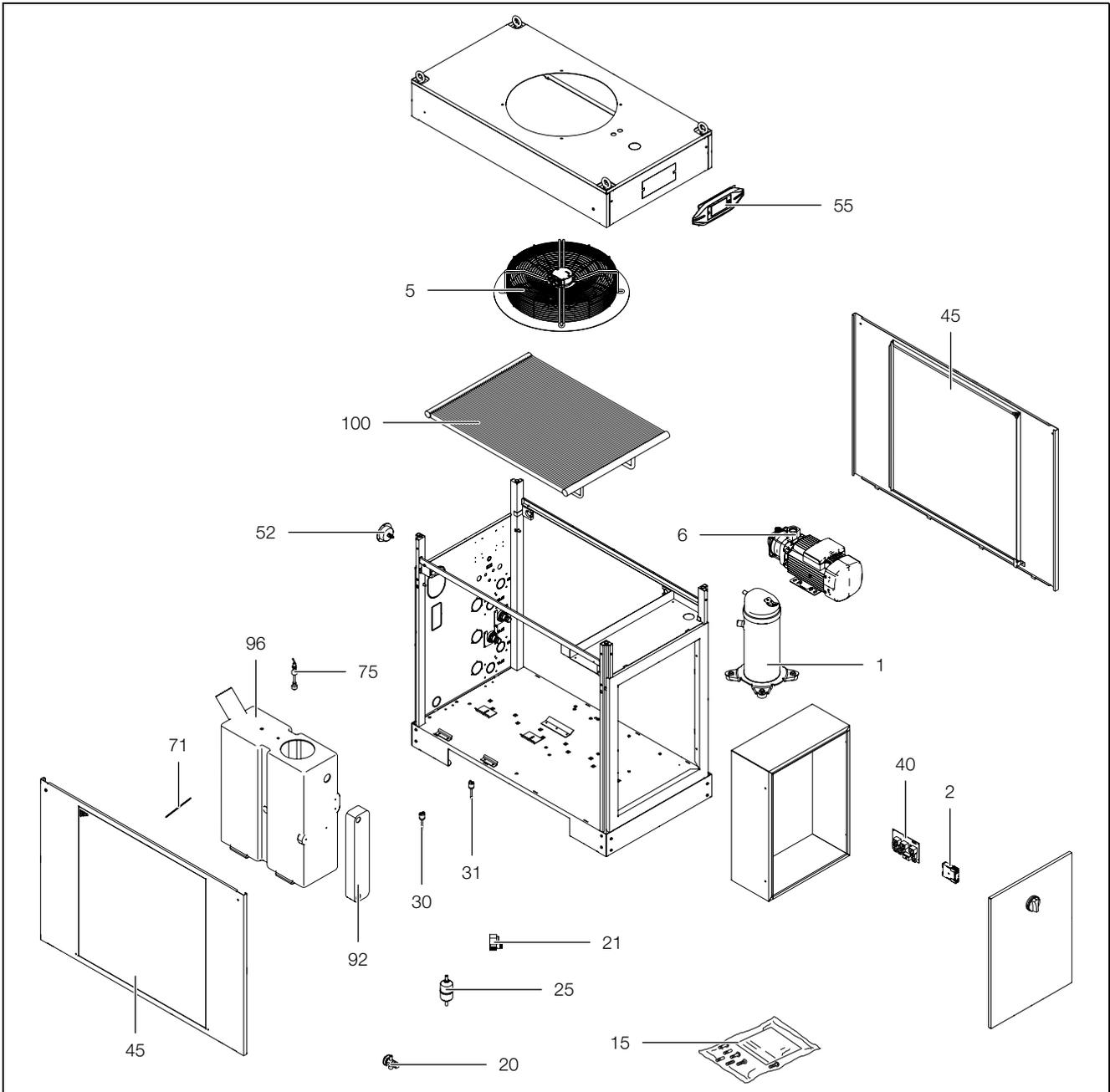


Fig. 33: Spare parts drawing 3336400 and 3336410

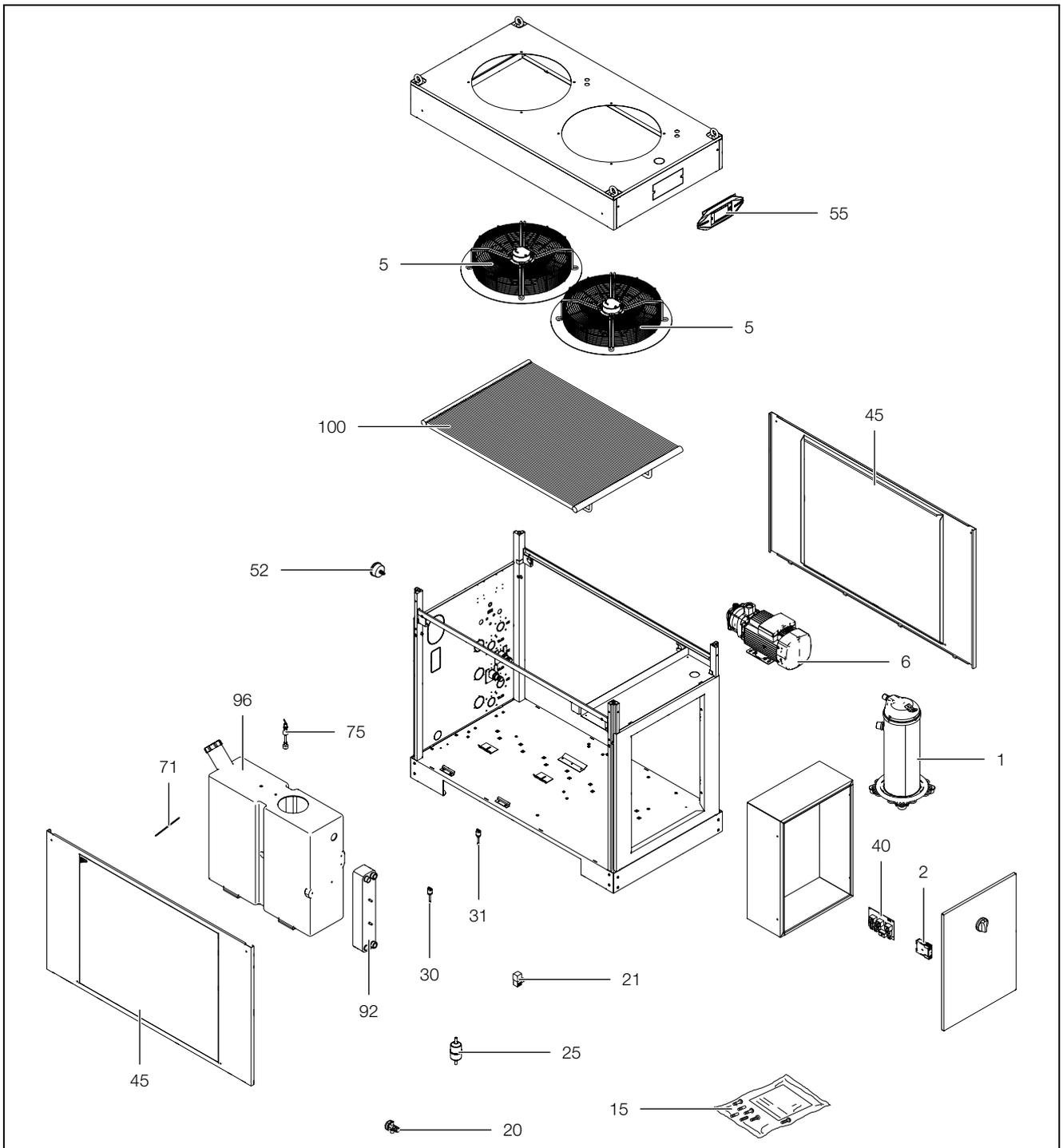


Fig. 34: Spare parts drawing 3336430 and 3336450

Key

- | | | | |
|----|---------------------|-----|--------------------------------------|
| 1 | Compressor | 52 | Manometer |
| 2 | Phase relay | 55 | Display |
| 5 | Axial fan | 70 | Temperature sensor (not illustrated) |
| 6 | Cooling medium pump | 71 | Temperature sensor |
| 15 | Accessories bag | 75 | Level switch |
| 20 | Expansion valve | 92 | Plate heat exchanger |
| 21 | Bypass valve | 96 | Tank |
| 25 | Dryer | 100 | Condenser |
| 31 | Pressostat | 102 | Display cable (not illustrated) |
| 40 | Controller | | |
| 45 | Side panel | | |
| 50 | Cover | | |

12 Appendix

EN

12.3 Technical specifications

Designation	Unit	Model No.		Model No.	
		3336400	3336405	3336410	3336415
Rated voltage +/-10 %	V	400, 3~, 50 460, 3~, 60			
Rated current 50 Hz/60 Hz	A	10.2/11.4	11.1/13.1	12.9/12.9	13.8/14.65
Rated power P_{ei} 50 Hz/60 Hz	kW	6.3/8.8	6.3/8.8	7.02/8.75	7.7/9.9
Total cooling capacity at $T_w = 18\text{ °C}$, $T_a = 32\text{ °C}$, 50 Hz/60 Hz (to DIN EN 14511)	kW	11.8/13.2	14.3/14.8	11.8/13.2	14.3/14.8
Dimensions (W x D x H)	mm	660 x 1315 x 1265			
Operating temperature range	°C	+10...+43			
Refrigerant		R410A			
– Identification	–	R410A			
– Charge	g	1350			
GWP	–	2088			
CO ₂ e	t	2.82			
Air throughput of the fans 50 Hz/60 Hz	m ³ /h	6000/7200			
Temperature hysteresis	K	±2	±0.25	±2	±0.25
Operating temperature range of cooling medium	°C	+10...+25			
Water connections		2 x 1" internal thread			
Pump pressure 50 Hz/60 Hz	bar	2.5/2.5	5/7	2.5/2.5	5/7
Pump capacity 50 Hz/60 Hz	l/min	30/55	30/55	35/55	30/55
Cooling medium tank material		PE plastic			
Tank volume	l	49			
Sound power level Lp	dB (A)	68.0		68.3	
Weight (as delivered)	kg	247		253	
Operating weight	kg	316		302	

Tab. 25: Technical specifications 333640x and 333641x

Designation	Unit	Model No.		Model No.	
		3336430	3336435	3336450	3336455
Rated voltage +/-10 %	V	400, 3~, 50 460, 3~, 60			
Rated current 50 Hz/60 Hz	A	19/15.9	19.9/17.2	21.7/22.4	22.6/24.1
Rated power P_{el} 50 Hz/60 Hz	kW	8.5/10.9	8.5/10.9	10.6/13.3	11.3/14.4
Total cooling capacity at $T_w = 18\text{ °C}$, $T_a = 32\text{ °C}$, 50 Hz/60 Hz (to DIN EN 14511)	kW	19.3/22	19.3/22	24.4/26.3	24.4/26.3
Dimensions (W x D x H)	mm	760 x 1515 x 1265			
Operating temperature range	°C	+10...+43			
Refrigerant – Identification – Charge	– g	R410A 1450			
GWP	–	2088			
CO ₂ e	t	3.03			
Air throughput of the fans 50 Hz/60 Hz	m ³ /h	12000/14500			
Temperature hysteresis	K	±2	±0.25	±2	±0.25
Operating temperature range of cooling medium	°C	+10...+25			
Water connections		2 x 1¼" internal thread			
Pump pressure 50 Hz/60 Hz	bar	2/2	4.75/6.8	1.8/2	4.5/6.8
Pump capacity 50 Hz/60 Hz	l/min	45/75		55/75	
Cooling medium tank material		PE plastic			
Tank volume	l	78			
Sound power level L_p	dB (A)	76.0		76.0	
Weight (as delivered)	kg	310		326	
Operating weight	kg	388		404	

Tab. 26: Technical specifications 333643x and 333645x

12.4 Device drawings

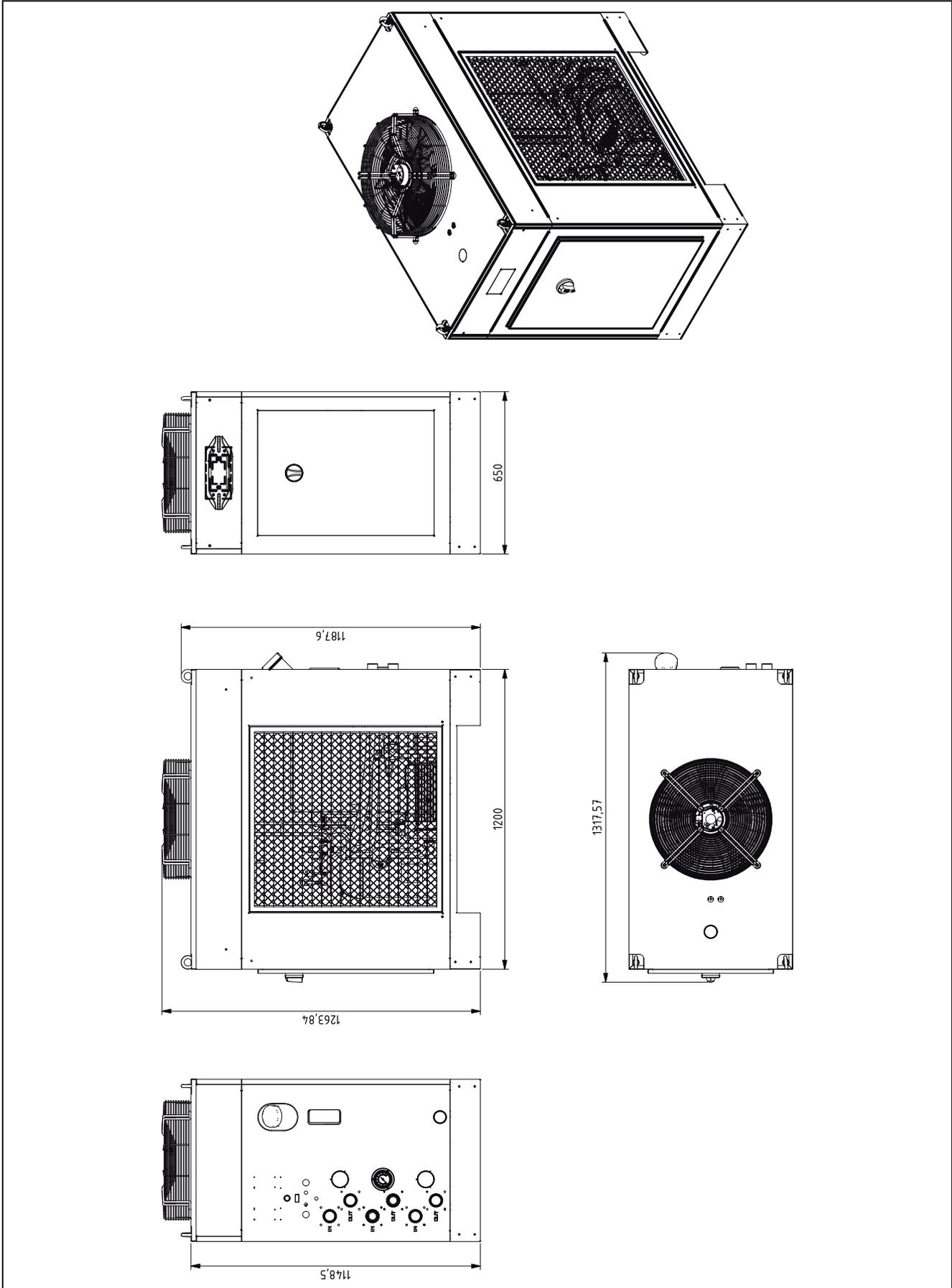


Fig. 35: 3336.40x and 3336.41x

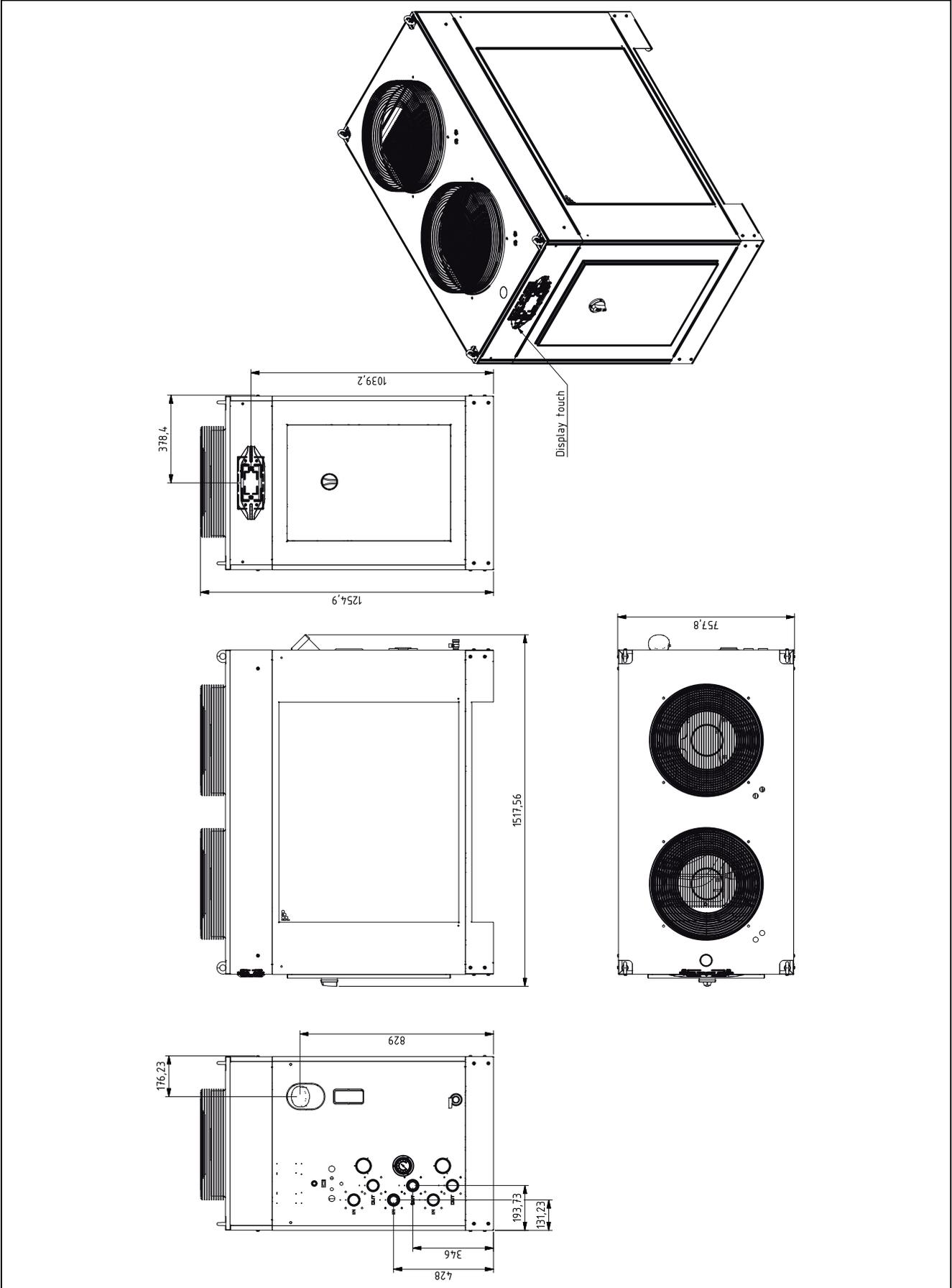


Fig. 36: 333643x and 333645x

12.5 Declaration of Conformity

Vereinfachte EU-Konformitätserklärung / Simplified EU Declaration of Conformity



Wir
We

Rittal GmbH & Co. KG, Auf dem Stützelberg, 35745 Herborn

erklären hiermit, dass die Produkte
hereby declare that the products

Blue e Chiller Gesamtkühlleistung 11 - 25 kW
Blue e Chillers Total cooling output 11 – 25 kW

SK 3336.400 SK 3336.410 SK 3336.430 SK 3336.440 SK 3336.450
SK 3336.405 SK 3336.415 SK 3336.435 SK 3336.445 SK 3336.455

folgenden Richtlinien entsprechen:
conform to the following directives:

Druckgeräterichtlinie 2014/68/EU – Pressure Equipment Directive 2014/68/EU
Maschinenrichtlinie 2006/42/EG – Machinery Directive 2006/42/EC
EMV-Richtlinie 2014/30/EU – EMC Directive 2014/30/EU

Bei einer nicht mit uns abgestimmten Änderung der Maschine verliert diese EU-Konformitätserklärung ihre Gültigkeit.

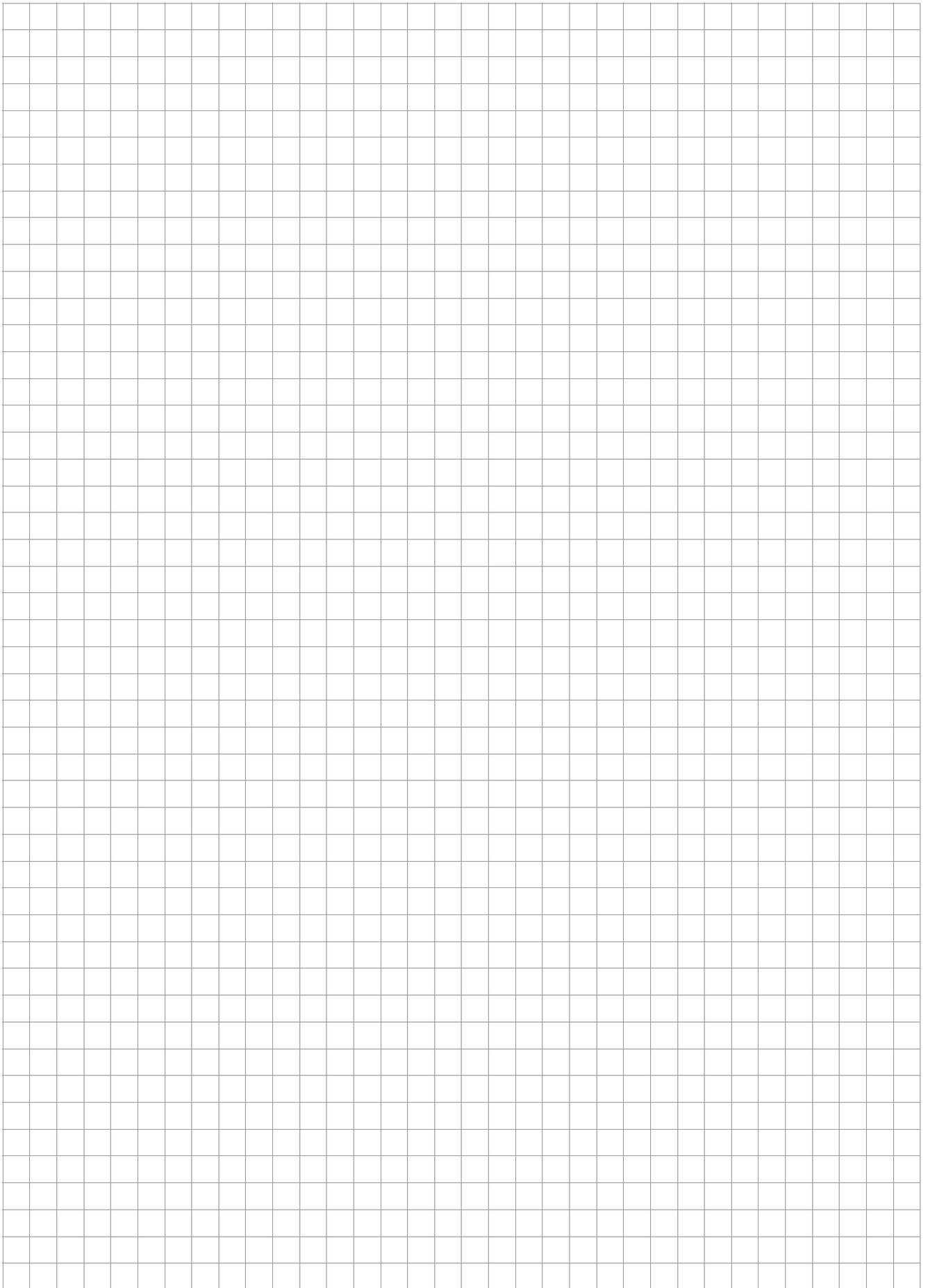
This EU declaration of conformity shall become null and void when the assembly is subjected to any modification that has not met with our approval.

Die vollständige und unterschriebene EU-Konformitätserklärung erhalten Sie auf der Produktseite der Rittal Homepage www.rittal.com.

The complete and signed EU declaration of conformity is available at the product site of Rittal homepage www.rittal.com.

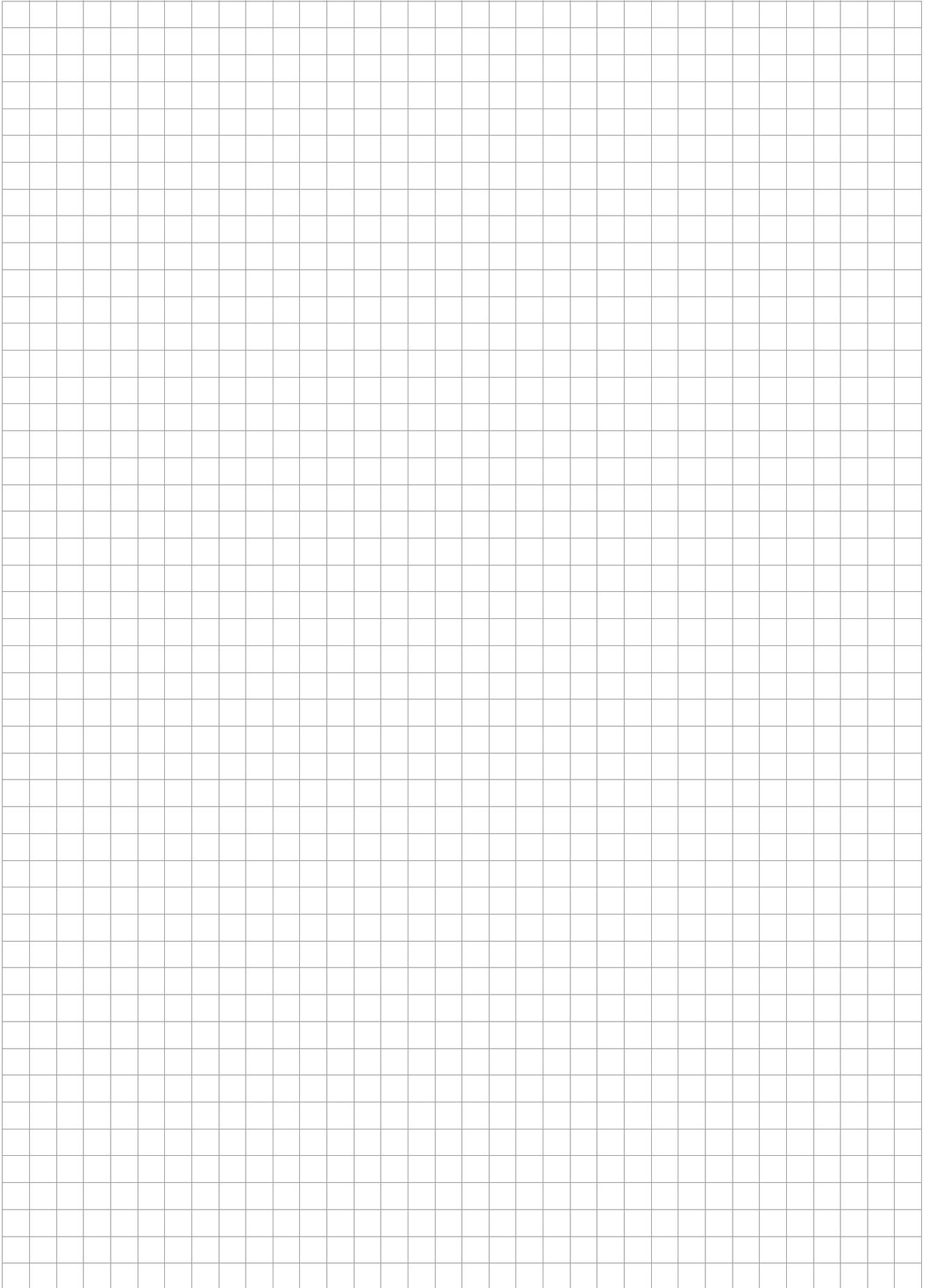
SCHALTSCHRÄNKE > STROMVERTEILUNG > KLIMATISIERUNG > IT-INFRASTRUKTUR > SOFTWARE & SERVICE >

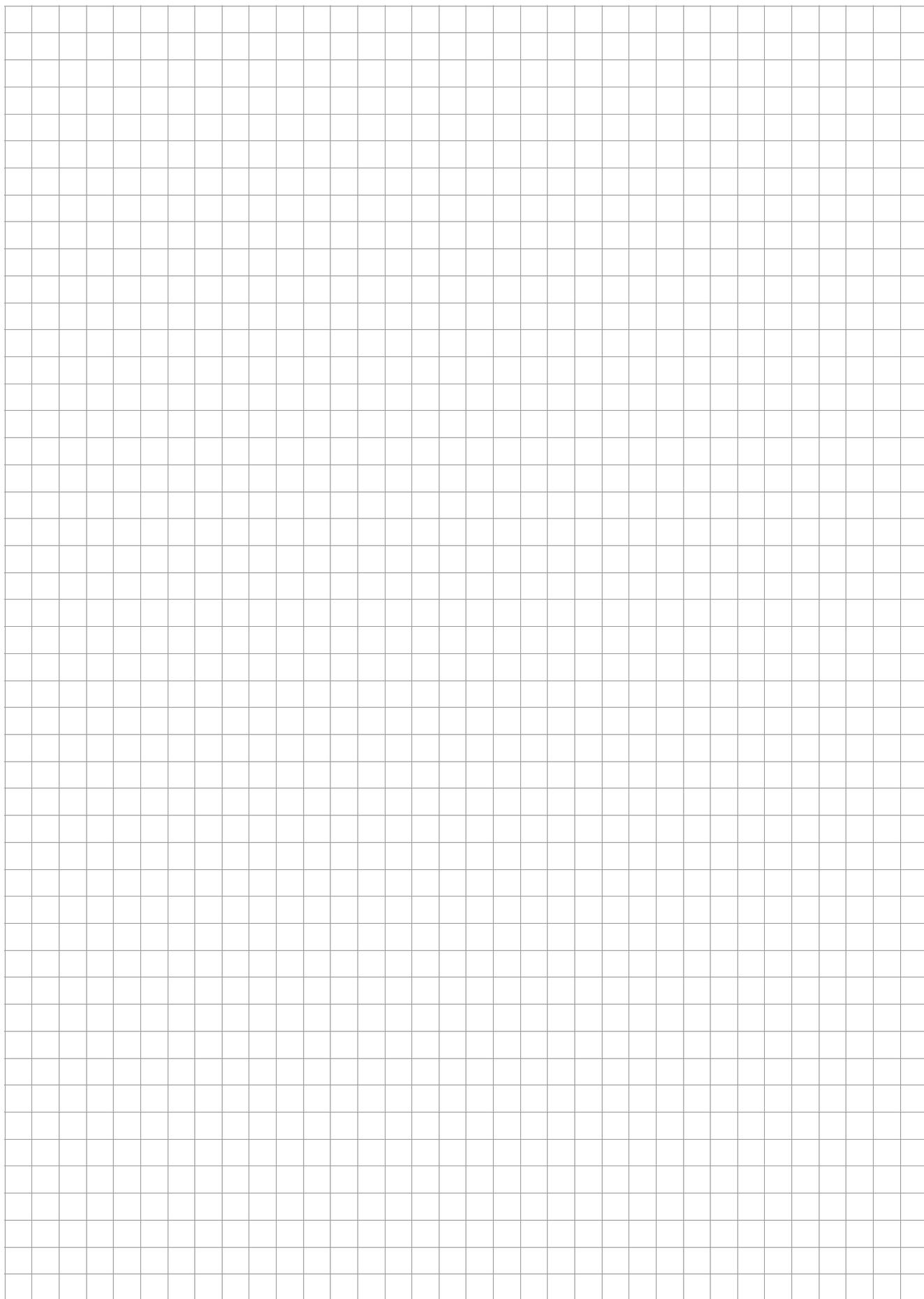
FRIEDHELM LOH GROUP



Notes

EN





Rittal – The System.

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

RITTAL GmbH & Co. KG
Postfach 1662 · 35726 Herborn · Germany
Phone +49 2772 505-0 · Fax +49 2772 505-2319
E-mail: info@rittal.de · www.rittal.com

05.2019 / D-0000-00001802-00

ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

IT INFRASTRUCTURE

SOFTWARE & SERVICES

FRIEDHELM LOH GROUP

