

Rittal – The System.

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HD air/water heat exchangers



3214.700
3215.700

Assembly and operating instructions

ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

IT INFRASTRUCTURE

SOFTWARE & SERVICES

FRIEDHELM LOH GROUP



Contents

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1 Notes on documentation

1.1 CE label

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



1.2 Storing the documents

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

1.3 Symbols used in these operating instructions

The following symbols are used in this documentation:



Warning!

Hazardous situation which may lead to death or serious injury if the instructions are not followed.



Caution!

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



Attention!

Potential threat to the product and the environment.



Hygiene risk!

Failure to observe this note may result in an increased risk of accumulations of undesirable microorganisms.



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/procedure.

1.4 Normative instructions

Because the air/water heat exchangers conform to many technical regulations, the device is suitable for the widest range of markets and application areas. A current overview for the product is available at www.rittal.com.

2 Safety instructions

- Ensure you always observe the safety instructions when performing the tasks described in the following chapters.

Food safety

In accordance with the regulation for food hygiene, EU 852/2004 Article 1 Paragraph 1a, the primary responsibility for food safety lies with the food processing company.

Operating and technical staff

- The mounting, installation, commissioning, maintenance and repair of this unit must only be performed by qualified, trained 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.

3 Cleaning and disinfection

3.1 Cleaning agents

The materials for all external components of the air/water heat exchanger have been selected carefully to ensure the best-possible resistance to the cleaning and disinfection materials used in the food processing industry. Because, however, no general statement can be made concerning the resistance, we recommend the use of the following tested products:

Ecolab

- P3-topax 12
- P3-topax 19
- P3-topax 56
- P3-topax 99

FINK TEC

- 10030 FINK-FC 30 (disinfecting alkaline foam cleaner)
- 17037 FT 37 SR (highly-alkaline foam cleaner)
- 18001 FINK RHE super with foam (highly-alkaline smoke resin solvent)
- 17310 ÖKORON 10 (acidic disinfectant)
- 17313 ÖKORON 13 (acidic disinfectant)
- 18801 FINK aluminium cleaner with foam (acidic foam cleaner)
- 18809 FINK phosphoric acid foam cleaner

JohnsonDiversey

- Superfoam VF3 (alkaline foam)
- Powergel VG1 (alkaline gel with high solvent and tenside content)
- Acifoam VF10 (phosphoric acid foam)
- Divosan Activ VT5 (peracetic acid disinfectant)

4 Device description

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– Divodes FG VT29 (alcohol-based disinfectant)
The tested products made by JohnsonDiversey cover all usual chemical material groups and cleaner types used for the food processing industry (except cleaning materials that contain halogenated compounds) and allow conclusions to be made about JohnsonDiversey's complete cleaner palette in the food processing industry area.
Details for the usual concentrations are contained in the data sheets for the associated cleaner and disinfection product.



Hygiene risk!
Improper cleaning can cause damage to the housing surfaces and so produce favourable conditions for the depositing and propagation of dangerous micro-organisms. Consequently, the following notes must be observed.

3.2 Cleaning

- The air/water heat exchanger should always be cleaned
 - after delivery and installation,
 - after servicing work,
 - regularly in accordance with your internal cleaning schedule.

The following items must not be used for cleaning

- Sharp, hard or pointed objects,
- abrasive procedures that change the surface roughness of the material,
- cleaning materials that can impair health and which contain solvents,
- cleaning materials that contain halogenated compounds, e.g. chlorides (danger of pitting for stainless steel 1.4301/AISI 304).

3.3 Cleaning utensils

- Prior to use, ensure that the cleaning utensils are clean and in a proper hygienic state. If necessary, these utensils should be disinfected prior to use.
- Cleaning utensils must not shed to the surfaces and components anything that could impair the foodstuff (for example: Cloths must be lint-free; bristles must not break).
 - The cleaning utensils should be checked prior to use.
 - Cleaning utensils may not be used when they themselves are not free of rust (danger of extraneous rust for stainless steel).



Note:
It is recommended to use a cloth or brush for cleaning. If cleaning is done using high pressure, care must be taken to ensure that the installed silicone seals are not damaged.

4 Device description

4.1 Overview

Depending on the model chosen, your air/water heat exchanger may vary in appearance from the illustrations contained in these instructions. However, the functions are identical in principle.

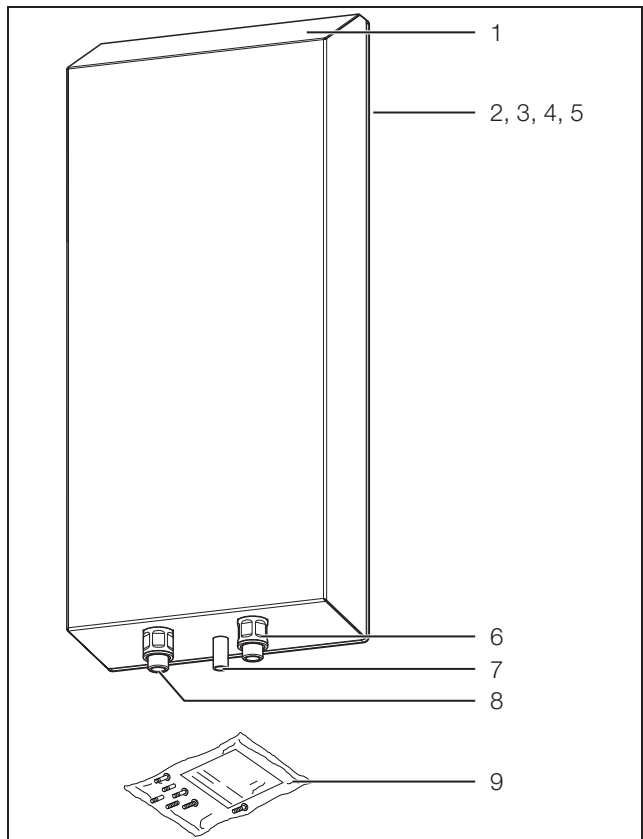


Fig. 1: Device description

Key

- 1 Cover
- 2 X1 terminal strip (unit rear)
- 3 Thermostat (unit rear)
- 4 Potential equalisation (unit rear)
- 5 Rating plate (unit rear)
- 6 Cooling water return (underside of the unit)
- 7 Condensate water discharge (underside of the unit)
- 8 Cooling water inlet (underside of the unit)
- 9 Dispatch bag

4.2 Functional description

Air/water heat exchangers are designed and built to dissipate heat from enclosures by cooling the air inside the enclosure and so protect the temperature-sensitive components.

Air/water heat exchangers are particularly appropriate for the temperature range of +1°C to +70°C where comparable units, such as air/air heat exchangers, enclosure cooling units or fan-and-filter units, cannot be used for system reasons to effectively and economically dissipate heat loss.

4.2.1 How it works

The air/water heat exchanger comprises three main components (see fig. 2):

- Heat exchanger package (item 2),
- fan (item 3) and
- magnetic valve (item 1),

which are connected together by pipes.

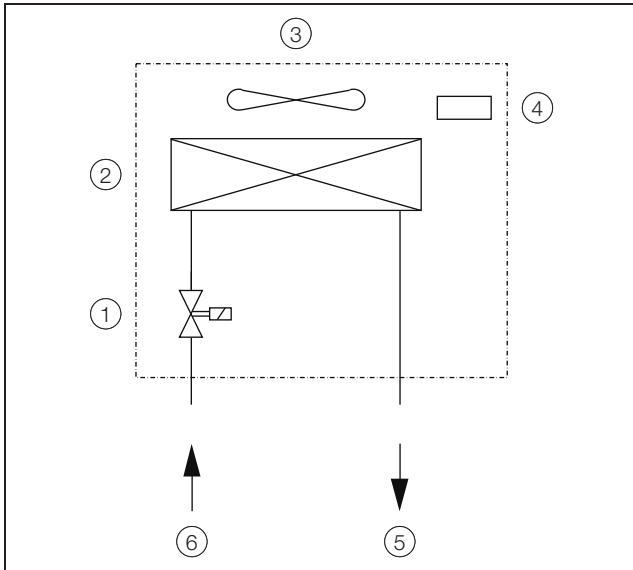


Fig. 2: Functional principal of the air/water heat exchanger

Key

- 1 Magnetic valve
- 2 Heat exchanger
- 3 Fan
- 4 Temperature control
- 5 Cooling water return
- 6 Cooling water inlet

The heat loss of the enclosure is dissipated in a membrane heat exchanger to the water coolant. A fan (item 3) blows the internal enclosure air over the heat exchanger (item 2); except for the inlet and outlet water and the condensed water discharge, the unit is closed to the environment.

The magnetic valve (item 1) controls the cooling output by changing the water flow volume depending on the required setpoint temperature and the water inlet temperature.

4.2.2 Condensation

Any condensation that forms on the heat exchanger (with high humidity and low water temperatures) is routed to the bottom and out of the unit via a drain opening in the heat exchanger tray. For this purpose, a hose must be connected to the condensate nozzle (see section 5.3.4 "Connecting the condensate water discharge"). The condensate must be able to run off freely. The hose used for draining off condensate must be laid free from kinks and checked for correct drainage. Condensate hoses are available as accessories (refer also to Accessories in the Rittal Catalogue).



Note:

With product no. 3215.700, condensate forming at the cold air outlet may be carried into the enclosure in case of high air humidities. To prevent this, the enclosure must be sealed on all sides (IP 54). If the enclosure is open or not fully sealed, the limit values given in tab. 1 must be observed.

Water inlet temperature Tw [°C]	Relative humidity rF [%]
= 10	≤ 55
≥ 16	= 80

Tab. 1: Limit values

4.3 Proper use, foreseeable misuse

The air/water heat exchanger is designed for the cooling of enclosures in the food industry (food areas as defined by DIN EN 1672-2). Under no circumstances should the limit values specified in the technical specifications (see section 11 "Technical specifications") be exceeded. Assembly, installation and servicing may only be performed by properly trained specialists.

Improper use may cause hazards. Improper use may be for example:

- Use of the air/water heat exchanger for a long period with an open enclosure
- Use of accessories not approved by Rittal GmbH & Co. KG
- Use of an incorrect cooling medium
- Use in conjunction with an enclosure for the cooling of foodstuffs in a food industry environment
- Outdoor siting
- Use in the private sector, such as household or domestic use
- Use as an evaporator in conjunction with refrigerants

4.4 Scope of supply

Qty.	Description
1	Air/water heat exchanger
1	Dispatch bag with
1	– HD sealing frame
6, 10	– Threaded bolts M6 x 30 (3214.700, 3215.700)
6, 10	– Hex nuts M6 (3214.700, 3215.700)
6, 10	– Washers (3214.700, 3215.700)
1	– Cable tie

Tab. 2: Scope of supply

5 Installation

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Qty.	Description
2	– Flat seals
1	– Assembly and operating instructions
1	Drilling template

Tab. 2: Scope of supply

5 Installation

5.1 Safety instructions



Warning!

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

Work on electrical systems or equipment may be performed only by an electrician or by trained personnel under the guidance and supervision of an electrician. All work must be performed in accordance with electrical engineering regulations.

The air/water heat exchanger may only be connected after the aforementioned personnel have read this information!

Use only insulated tools.

Follow the connection regulations of the appropriate electrical power company.

The air/water heat exchanger must be connected to the mains via an all-pin disconnecting device to overvoltage category III (IEC 61 058-1).

The air/water heat exchanger is not deenergised until all of the voltage sources have been disconnected!

5.2 Installation site requirements

- The air/water heat exchanger is to be mounted on an enclosure and operated exclusively in accordance with fig. 3 (vertical mounting, water connections at the bottom).
- The ambient temperature must not exceed +70°C.
- It must be possible to fit a condensate discharge (see section 5.3.4 "Connecting the condensate water discharge").
- It must be possible to fit a cooling water supply and return (see 5.4 "Connecting the water connection").
- The mains connection data as stated on the rating plate of the unit must be guaranteed.

- The heat loss of the components installed in the enclosure must not exceed the specific useful cooling output of the air/water heat exchanger.



Hygiene risk!

The unit must be installed such that, during later operation, simple access to all surfaces, the water connections and the condensate drain of the air/water heat exchanger is ensured for the purposes of cleaning and maintenance.

5.3 Assembly procedure

5.3.1 Assembly instructions

- Check the packaging carefully for signs of damage. Any packaging damage may be the cause of a subsequent functional failure.
- The enclosure must be sealed on all sides (IP 54). Increased condensation will occur if the enclosure is not airtight.
- The air inlet and outlet must not be obstructed on the inside of the enclosure.
- When arranging the components inside the enclosure, please ensure that the cold airflow from the air/water heat exchanger is not directed at active components.

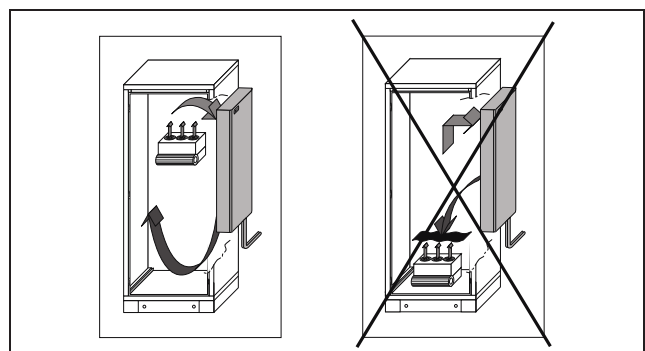


Fig. 3: Never direct the cold airflow at active components

- Exercise particular caution with the airflow from the blowers of built-in electronic components (fig. 3).
- Never site the air/water heat exchanger directly adjacent to the mounting plate. If such installation is unavoidable, appropriate measures must be taken to optimise the air routing.
- It is important to ensure even air circulation inside the enclosure. Under no circumstances should air inlet and outlet openings be obstructed, otherwise the cooling performance of the unit will be reduced.
- Ensure a suitable distance from electronic components and other installed enclosures so that the required air circulation is not obstructed and prevented.

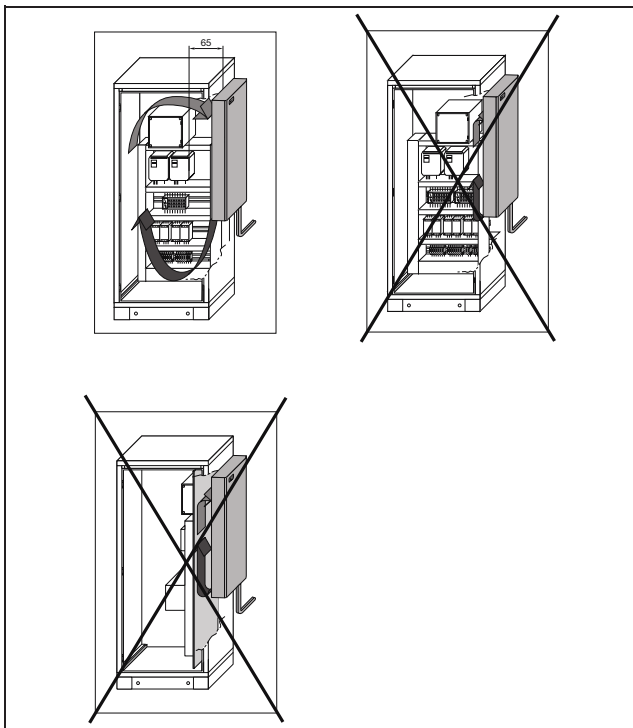


Fig. 4: Targeted air routing inside the enclosure

5.3.2 Make a mounting cut-out

In order to mount the air/water heat exchanger on the enclosure, a suitable mounting cut-out must be made in the door or side panel of the enclosure.

- Stick the supplied drilling template onto the door or side panel of the enclosure.
- Drill all the required holes and make the mounting cut-out.
- Carefully deburr all drilled holes and the cut-out to prevent injuries caused by sharp edges.



Caution!

There is a risk of cutting injury around all drill holes and cut-outs which have not been fully deburred, especially during mounting of the air/water heat exchanger.

5.3.3 Assembling the air/water heat exchanger



Hygiene risk!

The housing surfaces are manufactured with a roughness depth $<0.8 \mu\text{m}$. Any damage to the surface facilitates the accumulation of microorganisms.

- The housing surfaces and the surfaces of the water connections should thus be protected by suitable means to prevent damage during assembly and installation.
- Check all tightening torques specified in these instructions at regular intervals.

Only in this way is it possible to guarantee a reliable and hygiene-compliant seal between the air/water heat exchanger and the enclosure.

- Mount the air/water heat exchanger on a smooth flat surface. The most suitable surface material is stainless steel with a roughness depth $<0.8 \mu\text{m}$.
- Insert the all-round HD seal on the rear of the air/water heat exchanger.

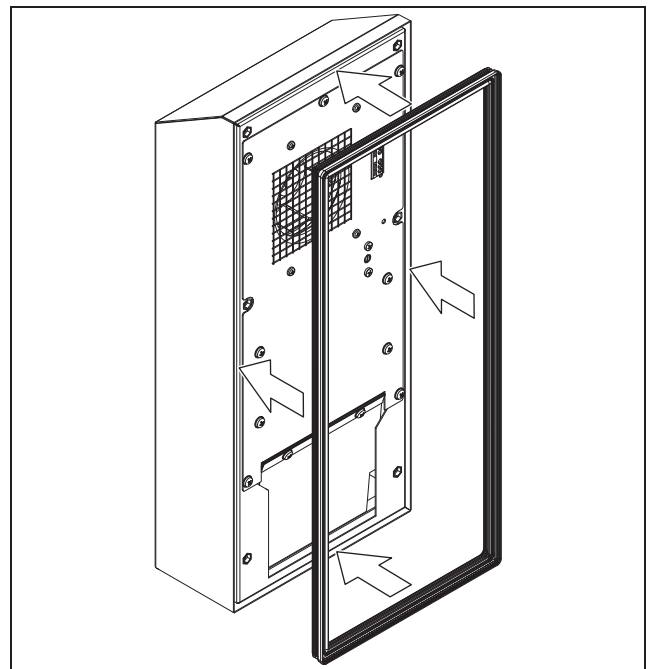


Fig. 5: Inserting the all-round HD seal

- Screw in the threaded bolts on the rear of the air/water heat exchanger.

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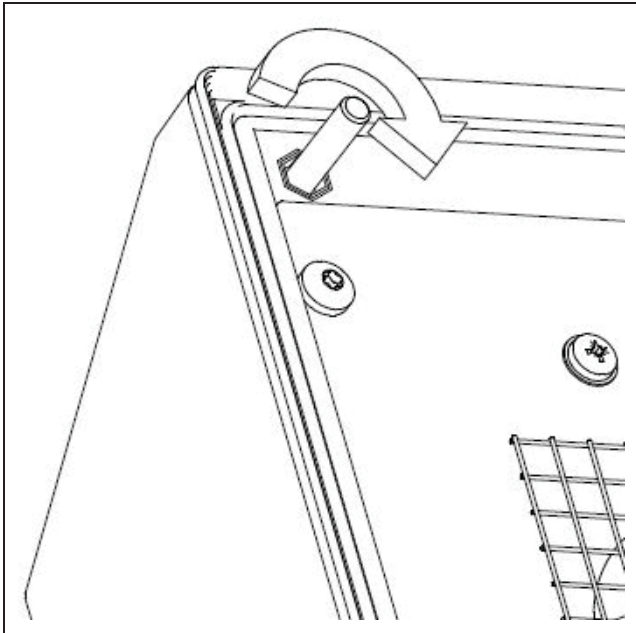


Fig. 6: Screwing in the threaded bolts

- Lift the air/water heat exchanger and position it by inserting the threaded bolts into the corresponding holes in the enclosure.
- Fit appropriate washers and screw hexagon nuts onto the threaded bolts (tightening torque: 2.5 Nm).

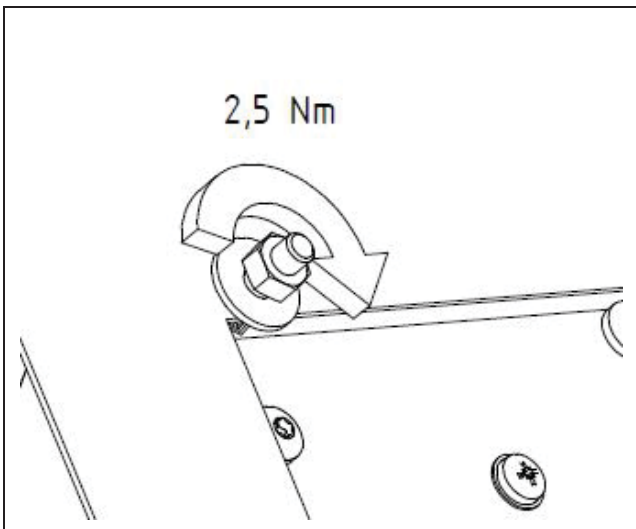


Fig. 7: Screwing the unit to the enclosure

5.3.4 Connecting the condensate water discharge



Hygiene risk!

To avoid germ formation, a drain hose must be provided specifically to drain any condensate from the unit.

The hose must be removed at regular intervals to enable external cleaning of the condensate nozzle.

If the unit is installed in a food area as defined by DIN EN 1672-2, the hose used must be of a food-compatible material.

The hose

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

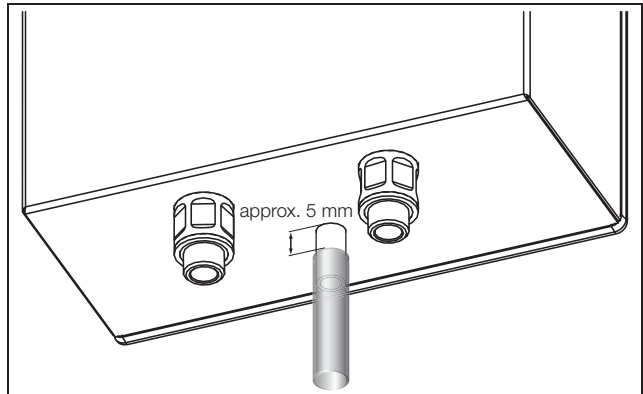


Fig. 8: Connecting the condensate water discharge

Key

- 1 Cooling water connection (inlet)
- 2 Cooling water connection (return)
- 3 Condensate water discharge

- Fit a suitable flexible hose (dia. 12 mm, 1/2") onto the condensate nozzle as shown in fig. 8 (bottom of the unit).
- To prevent the water from backing up, the hose cross-section must not be restricted.



Hygiene risk!

The hose should not end in a pipe or floor drain. There is otherwise a risk of germ formation and bacterial growth in the hose.

For simple cleaning, observe a distance of 5 mm between the end of the hose and the bottom of the unit (fig. 8).

5.4 Connecting the water connection

A fixed pipe connection with G $\frac{3}{8}$ " external thread is provided at the air/water heat exchanger for the water inlet and water return.

- Place the enclosed flat seals on the HD fittings.



Hygiene risk!

The flat seals serve primarily to seal the gap at the connection and enable simple cleaning.

**Attention!**

To establish a tight tubular threaded connection, the user must employ suitable sealing measures (e.g. use of a pipe sealing cord or a sealing compound). The blue ring does not act as a seal for the internal water circuit. Its purpose is instead to ensure compliance with all hygiene-related regulations.

- Tighten the union nut of the pipe until a noticeable increase in force becomes necessary.

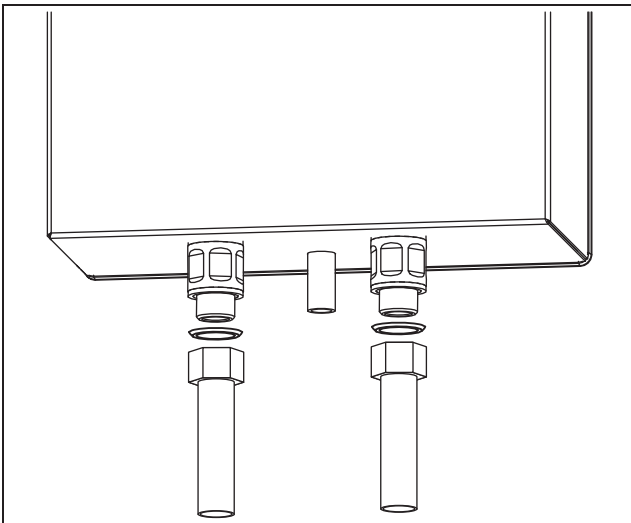


Fig. 9: Connecting the water connection

**Note:**

When loosening and tightening a fixed pipe connection, it is imperative to hold the HD fitting on the unit side in place with a second open-ended wrench (22 mm). Otherwise, the connection in the device could leak.

**Hygiene risk!**

If the unit is installed in a food area as defined by DIN EN 1672-2, all fittings used must be hygiene-compliant (in terms of material and the exclusion of cracks and gaps).

To ensure a flush joint, the pipe side of the screwed connection must possess the same external diameter as the HD fitting mounted on the unit (24 mm).

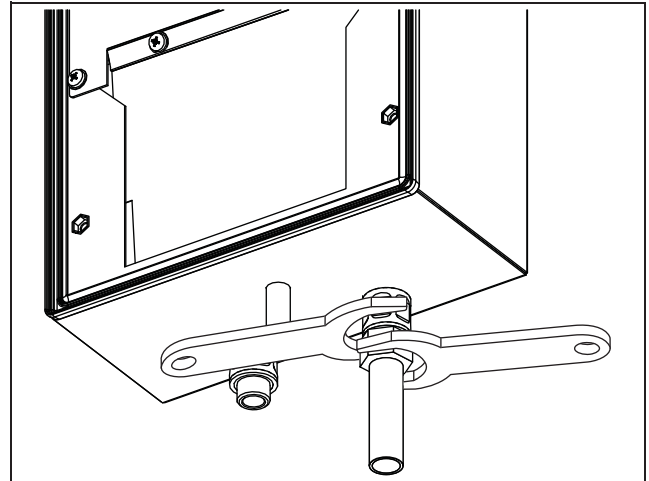


Fig. 10: Attaching a water pipe connection

**Note:**

The water circuit should be protected from ingress of dirt or excess pressure (maximum permitted operating pressure 10 bar)! Observe the flow direction and check for leaks!

The units do not have any separate ventilation. For pressure-sealed systems, install the appropriate ventilation equipment on the water side.

**Warning!**

Switch off the power supply to the air/water heat exchanger before working on the water circuit and take suitable precautions against it being accidentally switched on again.

**Attention!**

Volumetric flows > 400 l/h may cause damage to the device. Suitable measures should be taken to regulate the volumetric flow, such as flow regulator valves (Model Nos. 3301.930/.940, 3201.990). Damage caused by excessive volumetric flows will not be covered by Rittal's warranty.

5.4.1 Notes on water quality

To ensure the reliable operation of the above-mentioned units, the VBG guidelines for cooling water must be observed (VGB R 455 P).

The cooling water must not contain any limescale deposits; in other words, it should have a low level of hardness; in particular, a low level of calcium hardness. In particular, for recooling within the plant, the calcium hardness should not be too high. On the other hand, the water should not be so soft that it attacks the materials. When recooling the cooling water, the salt content

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should not be allowed to increase excessively due to the evaporation of large quantities of water, since electrical conductivity increases as the concentration of dissolved substances rises, and the water thereby becomes more corrosive.

- Always add the appropriate volume of fresh water.
- Always remove part of the enriched water.

The following criteria for the cooling water must be observed:

- Water with high gypsum content is unsuitable for cooling purposes because it has a tendency to form boiler scale that is particularly difficult to remove.
- The water quality should comply with the hydrological parameters specified in section 13 "Hydrological data".
- At best, organic substances should only be present in small quantities, because otherwise sludge deposits and microbiological contamination may occur.

5.4.2 Preparation and maintenance of the water in recooling systems

Depending on the type of installation to be cooled, certain requirements are placed on the cooling water with respect to purity. According to the level of contamination and the size and design of the recooling systems, a suitable process is used to prepare and/or maintain the water.

The most common types of contamination and most frequently used techniques to eliminate them in industrial cooling are:

Contamination of the water	Procedure
Mechanical contamination	Filter the water using: <ul style="list-style-type: none"> – Mesh filter – Gravel filter – Cartridge filter – Precoated filter
Excessive hardness	Soften the water via 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 water
Biological contaminants, such as slime bacteria and algae	Addition of biocides to the water

Tab. 3: Contaminations and techniques used to eliminate them

5.5 Electrical connection

5.5.1 Notes on electrical installation

- When carrying out the electrical installation, observe all applicable national and regional regulations as well as the regulations from the responsible utility company.

The electrical installation must comply with EN 61 439 and may only be carried out by a qualified electrician who is responsible for compliance with the applicable standards and regulations.

Connection data

- The connected voltage and frequency must correspond to the values stated on the rating plate.
- No additional temperature control may be connected upstream of the unit at the supply end.
- The mains connection must ensure low-noise potential equalisation.

Overvoltage protection and supply line load

- The unit does not have its own overvoltage protection. Measures must be taken by the operator at the supply end to ensure effective lightning and overvoltage protection. The mains voltage must not exceed a tolerance of $\pm 10\%$.
- Install the pre-fuse specified on the rating plate to protect the cable and equipment from short-circuits.
- Select a suitable motor circuit-breaker in accordance with the information specified on the rating plate: Set it to the rated current. This will achieve the best short-circuit protection for cables and equipment.

5.5.2 Potential equalisation

If, for EMC reasons, the unit is to be integrated into the customer's existing potential equalisation system, a conductor can be connected to the potential equalisation connection point. The connection point is marked with a schematic symbol.



Note:

According to the standard, the PE conductor in the mains connection cable is not classified as an equipotential bonding conductor.

5.5.3 Install the power supply

- Connect the unit to the power supply voltage, observing the terminal labelling.

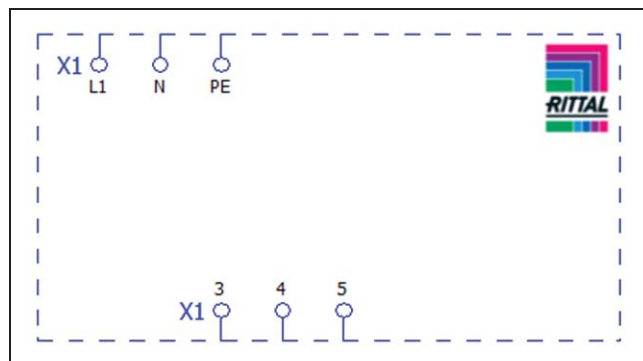


Fig. 11: Wiring plan 3214.700 and 3215.700

Strain relief

- Take the cable tie from the dispatch bag and insert it into the designated hole in the unit.

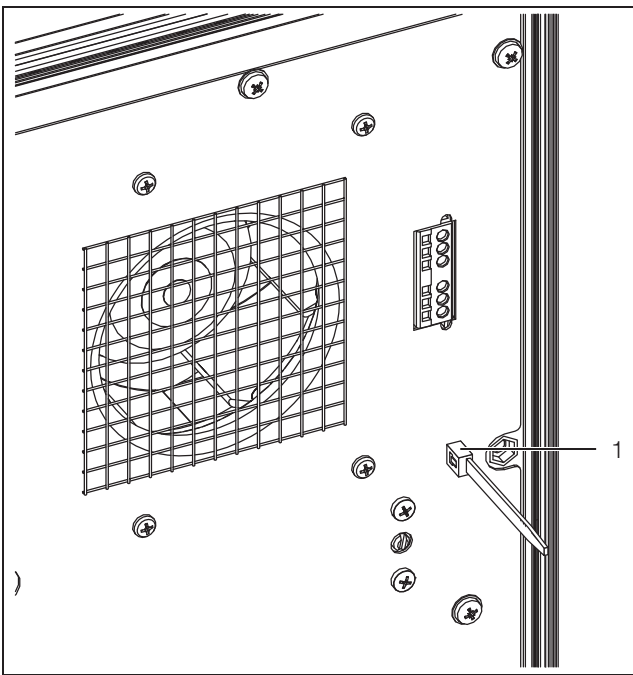


Fig. 12: Attaching the cable tie

Key

1 Cable tie

- Tighten the cable tie to secure the cables.

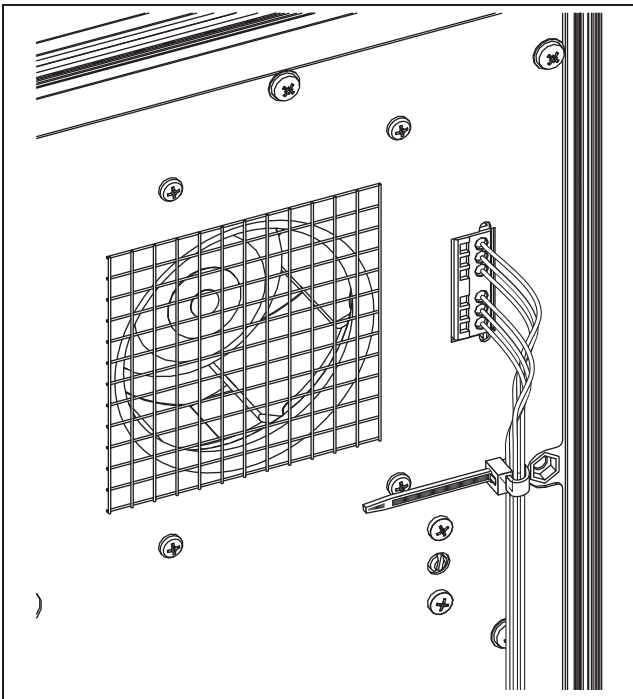


Fig. 13: Cable tie for strain relief

6 Commissioning

- Once all the assembly and installation work is complete, switch on the power supply and the water supply to the air/water heat exchanger.

The air/water heat exchanger starts running. The fan runs permanently and ensures an even temperature distribution in the enclosure.

**Note:**

The air/water heat exchanger must only be operated within the specified water inlet and operating temperature ranges.

7 Set the temperature**Note:**

The temperature is preset at the factory to +35°C. In order to save energy, do not set the temperature lower than that actually necessary.

- Set the desired temperature (setting range 20°C...60°C) at the thermostat on the rear of the unit.

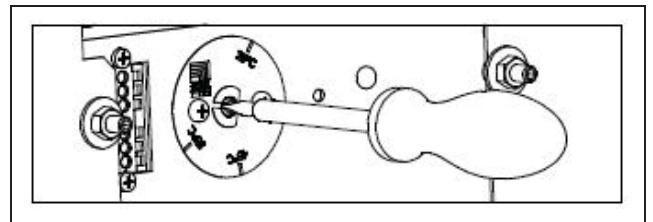


Fig. 14: Setting the desired temperature

**Note:**

The switching hysteresis is 4 K.

8 Temperature monitoring

If the enclosure internal temperature exceeds the set value by more than 10 K, a floating changeover contact is switched. Connection is by way of the terminal strip on the rear of the unit (terminals 3...5, 1x changeover contact).

- Terminal 3: NC (normally closed)
- Terminal 4: C (connection of the supply voltage to the fault signal relay)
- Terminal 5: NO (normally open)

The NC and NO definitions refer to the de-energised state.

9 Inspection and maintenance**Warning!**

Switch off the power supply to the air/water heat exchanger before working on the water circuit and take suitable precautions against it being accidentally switched on again.

**Hygiene risk!**

Maintenance must be performed at regular intervals depending on use and ambient conditions, at least once annually and documented accordingly.

10 Emptying, storage and disposal

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Nature and extent of the work to be performed:

- Check the air/water heat exchanger for damage, e.g. scratched surfaces or damaged seals, at regular intervals.
- Eliminate scratches using a surface polish.
- Replace any damaged seals and check all tightening torques specified in these instructions at regular intervals.
Only in this way is it possible to guarantee a reliable and hygiene-compliant seal between the air/water heat exchanger and the enclosure.
- Check the area around the air/water heat exchanger for any signs of corrosion, as this could lead to corrosion of the unit itself.

The installed fan is mounted on ball bearings, protected against moisture and dust, and fitted with a temperature monitor. The life expectancy is at least 30,000 operating hours. If dirt is present in the cooling water, a filter must be fitted. Maintenance interval: 2,000 operating hours.



Note:

Do not make any changes to the air/water heat exchanger other than those described in these instructions or associated instructions.

10 Emptying, storage and disposal



Note:

The air/water heat exchanger must not be subjected to temperatures above +70°C during storage.

During storage, the air/water heat exchanger must stand upright.

Disposal can be performed at the Rittal plant.

- Please contact us for advice.

Emptying:

During storage and transportation below freezing point, the air/water heat exchanger should be drained completely in the water supply direction using compressed air. To this end, the temperature in the area of the fan air intake must be raised above the set value by artificial means (e.g. with a hot air gun), so that the magnetic valve opens.

11 Technical specifications

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

Technical specifications		
General specifications		
Model number	3214.700	3215.700
Dimensions (width x height x depth) [mm]	220 x 526 x 100	215 x 982 x 100
Weight [kg]	6	14
Water-carrying parts	Copper/brass (Cu/CuZn)*	
Temperature control	Thermostat-controlled magnetic valve	
Noise level Lp [dB(A)]	<70	
Cooling outputs		
Cooling medium	Water (see section 13 "Hydrological data")	
Water connection	3/8" cylindrical external thread	
Useful cooling output [W] L35 W10, 400 l/h	0.65	1.2
Air throughput of fans (unimpeded air flow) [m ³ /h]	280	680
Water inlet temperature [°C]	>+1...+30	
Permissible operating pressure p. max. [bar]	1...10	
Operating temperature [°C]	+1...+70	
Setting range [°C]	+20...+60	
Electrical specifications		
Type of electrical connection	Wiring on terminal strip	
Rated voltage [V, ~]	230	
Rated frequency [Hz]	50/60	
Rated current [A]	0.16/0.14	0.38/0.47
Pre-fuse T	2	4
Power consumption P _{el}	33/34	77/104
Protection category		
to IEC 60 529	IP 56/59	
UL type	4X	

Tab. 4: Technical specifications

* Stainless steel on request

12 List of spare parts

EN

12 List of spare parts

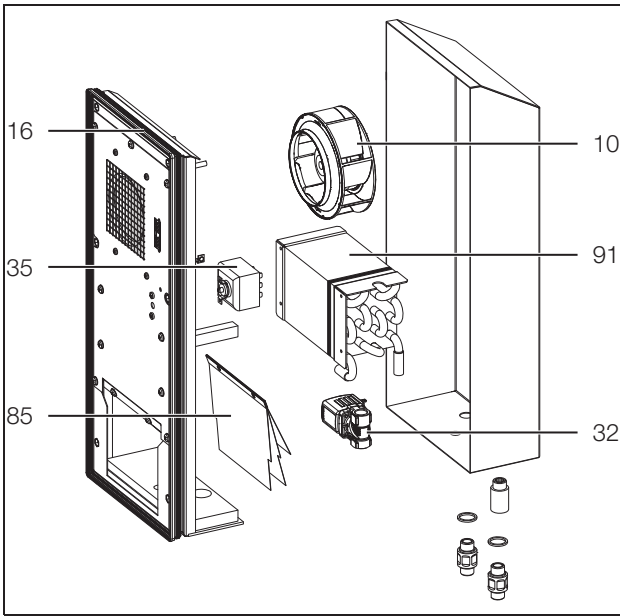


Fig. 15: List of spare parts 3214.700, 3215.700

Key

- 10 Radial fan
- 16 Sealing frame
- 32 Valve
- 35 Thermostat
- 85 Spray eliminator
- 91 Heat exchanger



Note:

As well as the spare part number, when ordering spare parts the following information must be provided:

- Unit model
- Fabrication number
- Date of manufacture

This information may be found on the rating plate.

13 Hydrological data

To avoid system damage and to ensure safe operation, Rittal GmbH & Co. KG recommends the use of system water or an additive whose composition does not differ from that presented in the following summary.

Hydrological data	Unit	Limits
pH value		7...8.5
Calcium hardness	°dH	>3 ...<8
Free carbonic acid	mg/dm ³	8...15
Corresponding carbonic acid	mg/dm ³	8...15
Aggressive carbonic acid	mg/dm ³	free
Sulphides	mg/dm ³	free
Oxygen	mg/dm ³	<10
Chloride ions	mg/dm ³	<50
Sulphate ions	mg/dm ³	<250
Nitrates and nitrites	mg/dm ³	<10
COD	mg/dm ³	<7
Ammonia	mg/dm ³	<5
Iron	mg/dm ³	<0.2
Manganese	mg/dm ³	<0.2
Conductivity	µS/cm	<2200
Residue on evaporation	mg/dm ³	<500
Potassium perman-ganate	mg/dm ³	<25
Suspended matter	mg/dm ³	<5
	mg/dm ³	>3...<15; partial current puri-fication recom-mended
	mg/dm ³	>15; continuous purifi-cation recom-mended

Tab. 5: Hydrological data

The complete absence of corrosion under experimental conditions suggests that solutions with a significantly higher salt content and greater corrosion potential (such as seawater) can still be tolerated.

14 Appendix

14.1 Characteristic curves

14.1.1 Water resistance

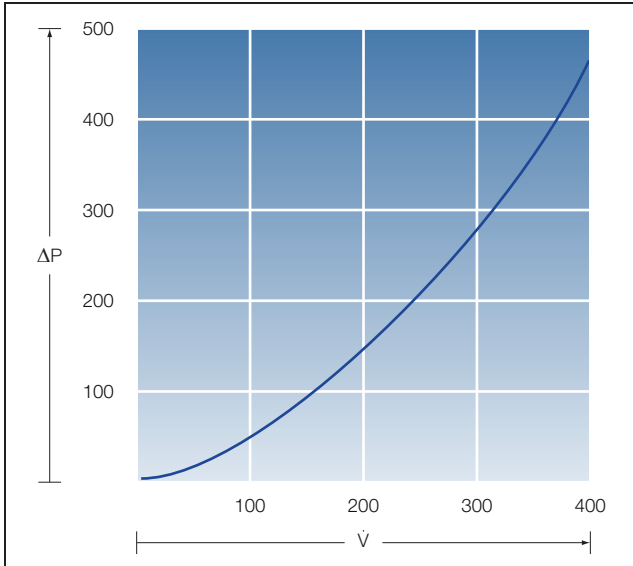


Fig. 16: Water resistance 3214.700, 3215.700

Key

- ΔP Water resistance [mbar]
- \dot{V} Volumetric flow [l/min]

14.1.2 Performance diagrams

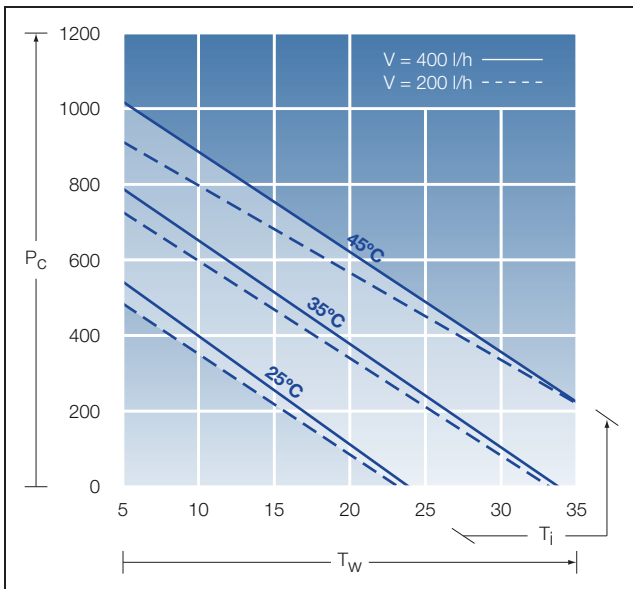


Fig. 17: Performance diagram 3214.700, 50 Hz

Key

- T_w Water inlet temperature [°C]
- P_C Total cooling output [W]
- T_i Enclosure internal temperature [°C]

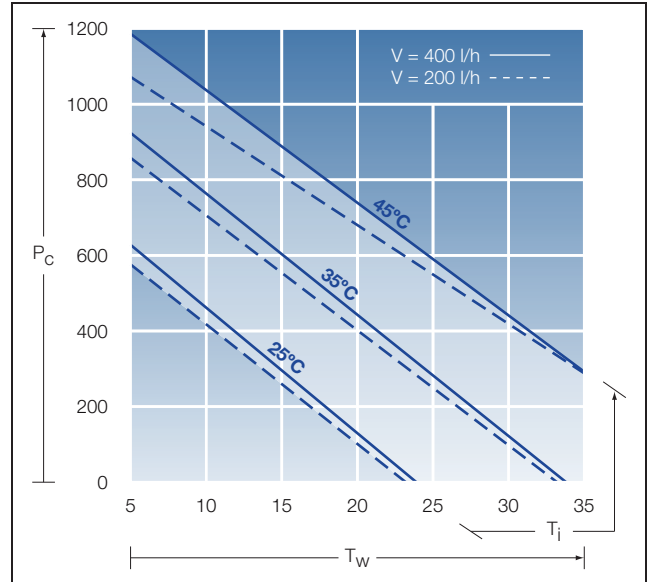


Fig. 18: Performance diagram 3214.700, 60 Hz

Key

- T_w Water inlet temperature [°C]
- P_C Total cooling output [W]
- T_i Enclosure internal temperature [°C]

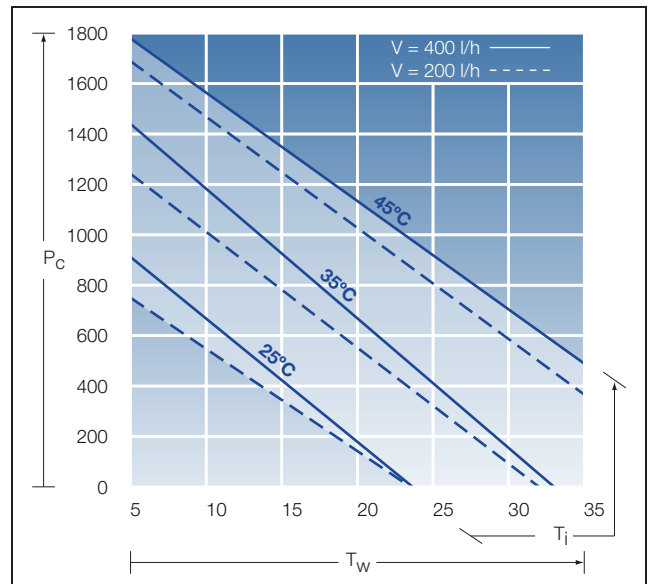


Fig. 19: Performance diagram 3215.700, 50 Hz

Key

- T_w Water inlet temperature [°C]
- P_C Total cooling output [W]
- T_i Enclosure internal temperature [°C]

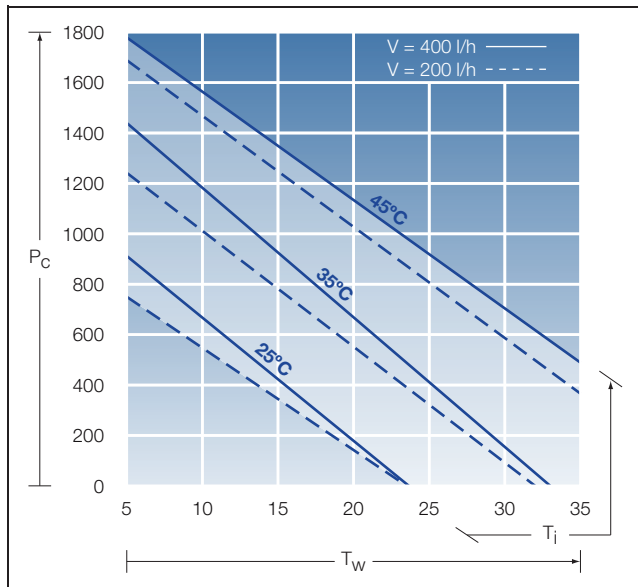


Fig. 20: Performance diagram 3215.700, 60 Hz

Key

- T_w Water inlet temperature [°C]
- P_c Total cooling output [W]
- T_i Enclosure internal temperature [°C]



Note:

The characteristics were determined with clean heat exchangers. The cooling output may be reduced if the heat exchanger is dirty.

14.2 Cut-out and hole sizes

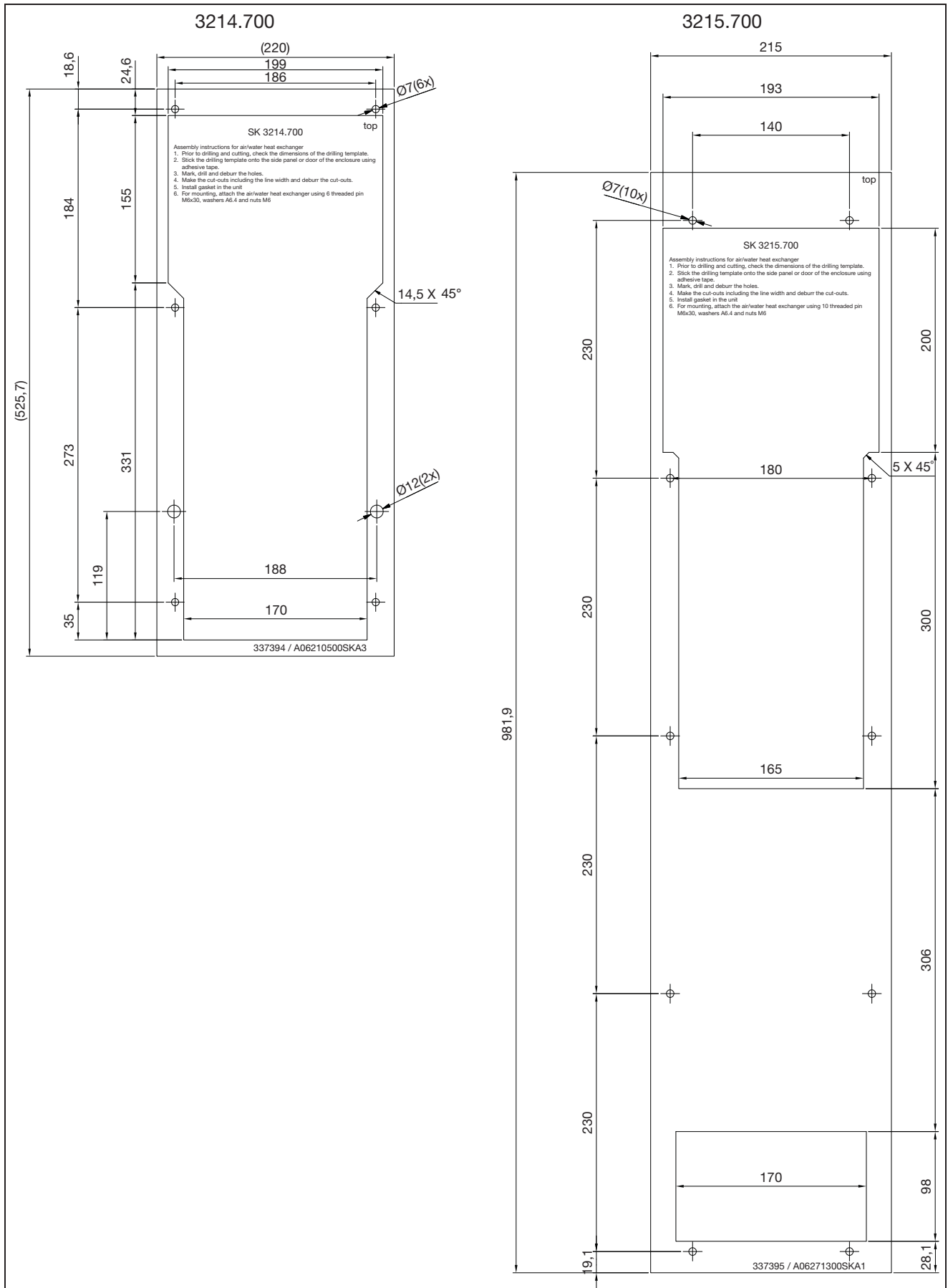


Fig. 21: Cut-out and hole sizes, 3214.700 and 3215.700

15 Declaration of conformity

EU-Konformitätserklärung / EU Declaration of Conformity



Dri171780800

Wir, / We,

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

Erklären, dass die Produkte / declare that the products

**Luft/Wasser-Wärmetauscher Wandanbau
Air/Water Heat Exchanger wall-mounted**

SK 3212.115	SK 3212.230	SK 3214.100	SK 3214.115	SK 3212.029	SK 3212.119
SK 3212.239	SK 3214.102	SK 3214.109	SK 3214.700	SK 3215.100	SK 3215.115
SK 3215.109	SK 3215.700	SK 3216.480	SK 3216.109	SK 3218.220	SK 3218.230
SK 3218.330	SK 3218.339	SK 3218.120			

folgenden Richtlinien entsprechen: / conform to the following Directives

**Maschinenrichtlinie 2006/42/EG - Machinery Directive 2006/42/EC
EMV-Richtlinie 2014/30/EU – EMC Directive 2014/30/EU**

Angewandte harmonisierte Normen: / Applied harmonised standards

EN ISO 12100	Sicherheit von Maschinen (Safety of machinery)
EN ISO 13857	Sicherheitsabstände gegen das Erreichen von Gefährdungsbereichen mit den oberen und unteren Gliedmaßen (Safety distances to prevent hazard zones being reached by upper and lower limbs)
EN 60529	IP Schutzarten durch Gehäuse (IP code)
EN 60335-1	
und -2-40	Sicherheit elektrischer Geräte (appliances -safety)
EN 61000-3-3:2013	Elektromagnetische Verträglichkeit (Electromagnetic compatibility)

E-Schaltplan, Zusammenbauzeichnung und Beschreibung (Wiring diagram, assembly drawing and specification)
siehe Montageanleitung (see assembly instructions)

Verantwortlich für Dokumentation
responsible for documentation

Rittal GmbH & Co. KG
Auf dem Stützelberg
35745 Herborn

Herborn, *10.01.2017*

Frank Himmelhuber, Geschäftsbereichsleiter FuE
Executive Vice President R&D

Bei einer nicht mit uns abgestimmten Änderung des Produkts verliert diese EU-Konformitätserklärung ihre Gültigkeit.
In case of any amendments to the assembly not explicitly agreed with us, this EU Declaration of Conformity shall be invalidated.

Id. 326576, D-0000-00000210



Fig. 22: Declaration of conformity

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