



Resistent

► Assembly, installation and operating instructions

Keep these instructions in a safe place for future use!

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1 General

1.1 About these instructions

These instructions ensure the safe and efficient handling of this equipment. These instructions form an integral part of the equipment and have to be kept in the direct vicinity of the equipment and available to personnel at all times.

All personnel must have carefully read through these instructions prior to commencing all work on the equipment. A fundamental prerequisite for safe working is compliance with all the stated safety instructions and other instructions contained in this manual.

In addition all local occupational health and safety at work regulations apply, as do general safety provisions governing the use of the equipment.

Illustrations in this guide are intended to provide a basic understanding and may differ from the actual model.

Ongoing tests and further developments may result in small variations between the unit supplied and the instructions.

1.2 Explanation of Symbols



DANGER!

This combination of symbol and signal word indicates an immediately dangerous situation caused by electrical power, which will cause death or serious injury if not avoided.



WARNING!

This combination of symbol and signal word indicates a possible hazardous situation.



IMPORTANT NOTE!

It represents a potentially hazardous situation, which could lead to damage to property or for a measure to optimise workflows.



IMPORTANT NOTE!

This symbol highlights useful hints, recommendations and information for efficient and trouble-free operation.

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2 Safety

This section provides an overview of all important safety aspects to ensure optimum protection of personnel as well as safe and trouble-free operation. In addition to the safety instructions in these operating instructions, the valid safety, accident prevention and environmental protection regulations must be observed for the area of use of the unit. It is the duty of the operator to ensure that instructions relating to maintenance (e.g. relating to hygiene) are complied with.

2.1 Correct use

The units are used for the decentralised heating of halls, industrial and commercial workshops. Within the room to be heated, the unit needs to be connected to the building's heating system and power grid. The operating limits and limits of use described in Chapter 2.2 [▶ 6] must be observed.

Intended use of the unit also includes adherence to these instructions.

Information in accordance with EN60335-1

- ▶ This unit can be used by children aged 8 years or more and also by people with reduced physical, sensory or mental capabilities or a lack of experience and knowledge, if they are supervised or have been instructed in the safe use of the unit and the resulting dangers. Do not allow children to play with the unit. Do not allow children to clean and maintain the unit without supervision.
- ▶ The unit is not intended for operation above 2,000 m.a. s.l.
- ▶ This unit is not intended for permanent connection to the drinking water network.
- ▶ This unit is designed to be accessible to the general public.

Any use beyond or other than the stated intended use is considered as misuse.

Any change to the unit or use of non-original spare parts will cause the expiry of the warranty and the manufacturer's liability.

2.2 Limits of operation and use

Limits of operation		
Min./max. water temperature	°C	5 - see type plate
Min./max. air intake temperature	°C	-20 - (+40)
Min./max. air humidity	%	15-75
Min. operating pressure	bar/kPa	-
Max. operating pressure	bar/kPa	see type plate
Min./max. glycol percentage	%	25-50

Tab. 1: Limits of operation

Maximum flow temperatures

Use	Ceiling model	Wall-mounted model
Without shut-off valve	100°C	120°C
With shut-off valve	160°C	160°C

Tab. 2: Maximum flow temperatures

Operating voltage	230 V/ 50/60 Hz
Power/current consumption	On the typeplate

Tab. 3: Operating voltage

We would refer to VDI-2035 Sheets 1 & 2, DIN EN 14336 and DIN EN 14868 with regard to the properties of the medium used to protect the equipment. The following values provide further guidance.

The water used should be free of contamination, such as suspended substances and reactive substances.

Water quality		
pH value (at 20 °C)		8-9
Conductivity (at 20 °C)	µS/cm	< 700
Oxygen content (O ₂)	mg/l	< 0.1
Hardness	°dH	4-8.5
Sulphur ions		not measurable
Sodium ions (Na ⁺)	mg/l	< 100
Iron ions (Fe ²⁺)	mg/l	< 0.1
Manganese ions (Mn ²⁺)	mg/l	<0.05
Ammonia ions (NH ⁴⁺)	mg/l	< 0.1
Chlorine ions (Cl)	mg/l	< 100
CO ₂		< 50
Sulfate ions (SO ₄ ²⁻)	mg/l	< 50
Nitrite ions (NO ₂ ⁻)	mg/l	< 50
Nitrate ions (NO ₃ ⁻)	mg/l	< 50

Tab. 4: Water quality

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WARNING!

Note the maximum flow temperatures to protect the EC fan!

Long periods of idleness with high water temperatures can lead to the impermissible heating up of the EC fan motor. The flow temperatures should therefore be limited depending on the application and the motor model.

If temperature limitation is impossible or inappropriate for the specific purpose, there is also an option of using suitable valves (thermoelectric, motorised or solenoid) to shut off the heating medium. This can interrupt the flow of medium before the EC fan is switched off and the heat exchanger cools down. Appropriate speed controllers with a fan delay shut-off relay and connection terminals for the shut-off valve are available on request.



IMPORTANT NOTE!

Warning of misuse!

In the event of misuse, as outlined below, there is a danger of restricted or failed operation of the unit. Ensure that the air flow can circulate freely.

- ▶ Never operate the unit in humid areas, such as swimming pools, wet areas etc.
- ▶ Never operate the unit in rooms with an explosive atmosphere.
- ▶ Never operate the unit above electrical equipment (such as control cabinets, computers or other electrical units, or contacts that are not drip-proof).
- ▶ Never use the unit as a site heater.
- ▶ Never use in rooms with a high dust content.

2.3 Risk from electrocution!



DANGER!

Risk of fatal injury from electrocution!

Contact with live parts will lead to fatal injury from electrocution. Damage to the insulation or individual components can lead to a fatal injury.

- ▶ Only permit qualified electricians to work on the electrical system.
- ▶ Immediately disconnect the system from the power supply and repair it in the event of damage to the insulation.
- ▶ Keep live parts away from moisture. This can cause a short circuit.
- ▶ Properly earth the unit.



DANGER!

Risk of fatal injury from electrocution!

- ▶ When multiple EC fans are connected in parallel, there is an electrical charge (>50 C) between the line conductor and protective earth conductor when the power is switched off. Before working on the electrical wiring, short-circuit the mains connections and PE!
- ▶ The terminals and connectors are still energised even when the unit is switched off. Use a two-pin voltage tester to establish that the unit has been de-energised. Only open the unit 5 minutes after all poles of the voltage have been switched off.
- ▶ The protective earth carries high leakage currents (depending on the frequency, intermediate voltage and motor capacity). Therefore, check EN-compliant earthing under test conditions (EN 50178, Art. 5.2.11). Without earthing, hazardous voltages can occur on the motor housing. In the event of a fault, electrical voltage will be present at the rotor and impeller. Rotor and impeller are base-insulated. Do not touch!

2.4 Personnel requirements - Qualifications

Expertise

The installation of this product requires specialist expertise in heating, cooling, ventilation, installation and electrical engineering. As this knowledge is normally acquired through professional training in one of the above fields, it is not dealt with further here.

Damage caused by improper installation is the responsibility of the operator or installer. Installers of these units should have adequate knowledge of the following based on their qualifications

- ▶ Safety and accident prevention regulations
- ▶ Guidelines and recognised technical regulations, i.e. VDE regulations (Association of German Electricians, DIN and EN standards).
- ▶ VDI 6022; maintenance personnel must be trained to Category B (possibly Category C) to comply with hygiene requirements (as required).

The installation, operation and maintenance of this unit must comply with the applicable laws, standards, provisions and regulations in the respective country and the current state of the art.

2.5 Personal Protective Equipment

Personal protective equipment is used to protect people from impaired safety and health when working with the unit. The applicable accident prevention regulations at the place of use apply in all cases.

Personnel have to wear personal protective equipment during maintenance and troubleshooting on and with the unit.

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3 Transport, storage and packaging

3.1 General transport instructions

Check on delivery for completeness and transport damage.

Proceed as follows in the event of visible damage:

- ▶ Do not accept delivery or only accept with reservations.
- ▶ Record any transport damage on the transportation documents or on the transport company's delivery note.
- ▶ Submit a complaint to the freight forwarder.



IMPORTANT NOTE!

Warranty claims can only be made within the applicable period for complaints. (More information is available in the T&Cs on the Kampmann website)



IMPORTANT NOTE!

2 people are needed to transport the unit. Wear personal protective clothing when transporting the unit. Only lift the unit on both sides and not by the pipes / valves.



IMPORTANT NOTE!

Material damage caused by incorrect transport!

Units being transported can drop or topple over if transported wrongly. This can cause serious material damage.

- ▶ Proceed carefully when unloading the equipment on delivery and when transporting it on site and note the symbols and instructions on the packaging.
- ▶ Only use the holding points provided.
- ▶ Only remove packaging shortly before assembling the unit.

3.2 Scope of delivery



IMPORTANT NOTE!

Check the scope of delivery!

- ▶ Check the delivery for damage.
- ▶ Check that the articles and type numbers are correct.
- ▶ Is the delivery and number of items delivered correct?

3.3 Storage

Store packaging under the following conditions:

- ▶ Do not store outdoors.
- ▶ Store in a dry and dust-free place.
- ▶ Store in a frost-free place.
- ▶ Do not expose to aggressive media.
- ▶ Protect from direct sunlight.
- ▶ Avoid mechanical vibrations and shocks.



IMPORTANT NOTE!

Under certain circumstances, packages can carry storage instructions that exceed the requirements listed here. Comply with these instructions accordingly.

3.4 Packaging

Handling packaging materials



IMPORTANT NOTE!

Dispose of packaging materials in line with the applicable statutory requirements and local regulations.

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4 Technical data

Unit	Resistent		
Series	84	85	86
IP class	IP54	IP54	IP54
Water content [l]	3.4 - 6.1	4.5 - 8.2	7.0 - 11.5
Weight [kg]	53 - 62	65 - 92	85 - 125
Sound pressure level ⁴ [dB(A)]	19 - 56	17 - 64	20 - 62

Tab. 5: Technical data for Resistent

⁴ The sound pressure level was calculated with an assumed room insulation of 16 dB(A). This corresponds to a distance of 5 m, a room volume of 3000 m³ and a reverberation time of 2.0 s (in accordance with VDI 2081).

5 Construction and function

5.1 Overview

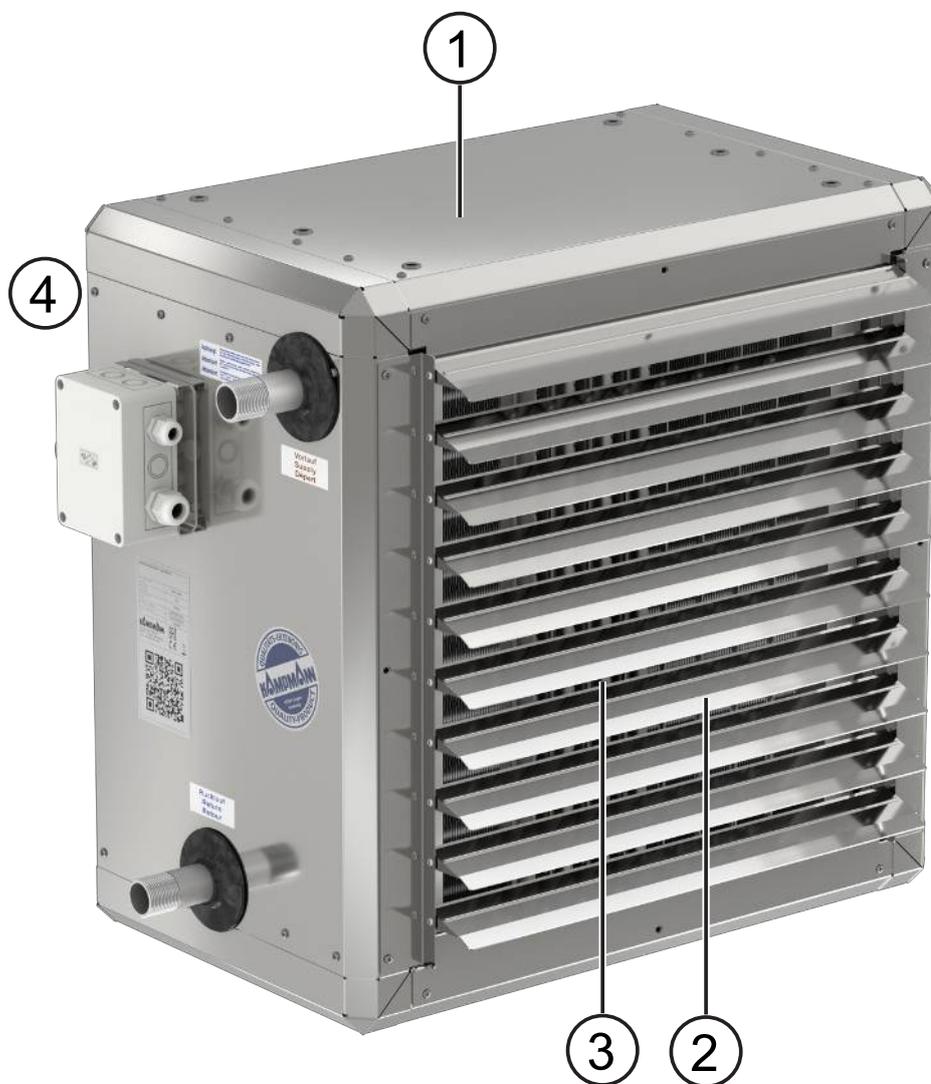


Fig. 1: Resistent at a glance

1	Unit heater housing	2	Louvre (optional)
3	Heat exchanger, copper/aluminium version	4	Whisper-quiet sickle-blade fan

5.2 Brief description

Resistent are used for the decentralised heating and ventilation of high-ceilinged buildings, either wall or ceiling-mounted. Air is drawn in through the EC fan and blown through the heat exchanger into the room through the standard one-row louvre (optional). The air can also optionally be discharged through other diffusers (see Accessories).

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6 Installation and wiring

6.1 Requirements governing the installation site

Only install and assemble the unit if the following conditions are met:

- ▶ Make sure that the unit is securely suspended/standing.
- ▶ Ensure that the airflow can circulate freely.
- ▶ Provide adequate space for appropriately sized flow and return water connections on site (Connection to the pipe network [▶ 18]).
- ▶ There is a power supply on site (Maximum electrical rating values [▶ 20]).

6.2 Minimum clearances

Unit heaters can be free-standing or hung on the wall using the wall brackets supplied, or suspended from the ceiling using the ceiling brackets supplied. Installation using existing wall or ceiling brackets is also possible.

Allow a minimum distance L in accordance with the table below between the intake zone of the unit and the wall/ceiling! If this is not done, it will reduce the output of the unit heater and increase the noise level.

Be sure to observe the minimum distances when using accessories and for maintenance purposes!

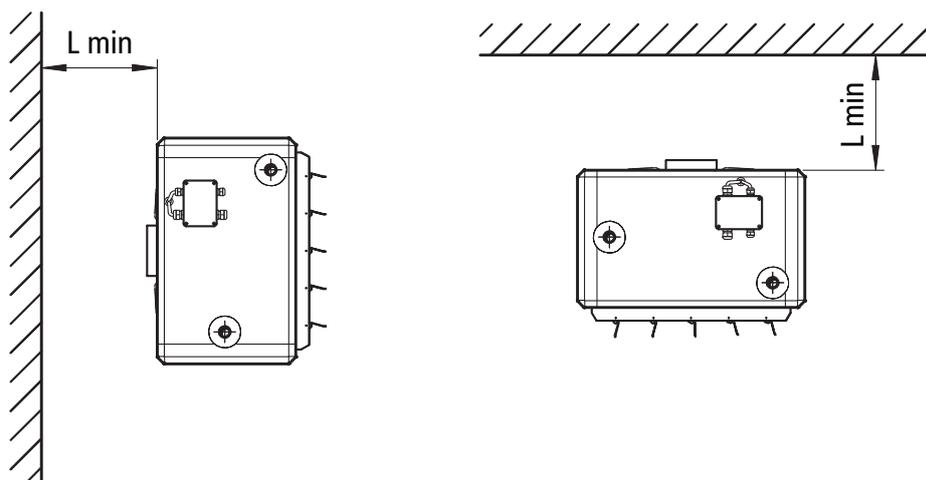


Fig. 2: Resistent minimum distances (wall and ceiling installation)

Unit size	Type	Minimum distance L min	Standard distance L*
4	84_58	160 mm	285 mm
5	85_58	180 mm	285 mm
6	86_58	230 mm	335 mm

Tab. 6: Overview of types with minimum distances

* when using wall brackets, type 8_044

6.3 Installation

2 people are needed to install the unit.



CAUTION!

Risk of injury from sharp metal housing!

The inner metal of the casing can have sharp edges.

- ▶ Wear suitable protective gloves.

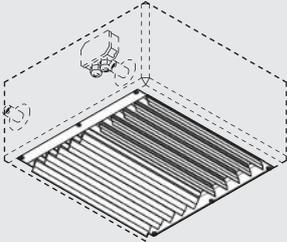
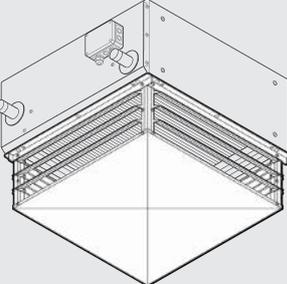
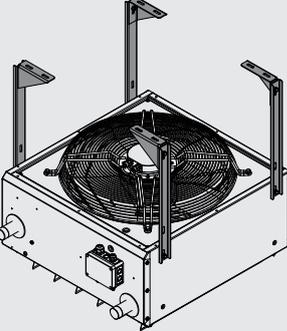


IMPORTANT NOTE!

Horizontal installation of units!

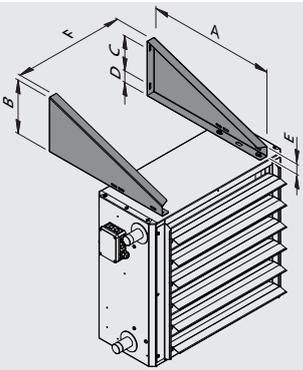
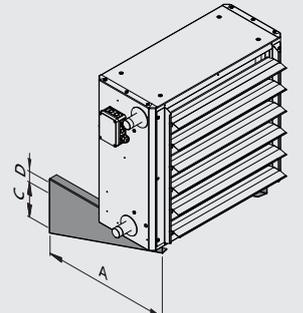
When installing the units, ensure that they are completely horizontal to ensure proper operation.

6.3.1 Installation of accessories

Figure	Description	Dimensions [mm]	Suitable for
	Louvre, type 8*001	A	
		495	Series 84
		595	Series 85
	4-directional air diffuser, type 8*004	695	Series 86
	Universal 4-point brackets, type 80042		Series 84-86

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Figure	Description	Dimensions [mm]						Suitable for
		A	B	C	D	E	F	
	Wall bracket, type 84044	625	265	187	36	50	350	Series 84
	Wall bracket, type 85044	625	265	187	36	50	450	Series 85
	Wall bracket, type 86044	675	282	204	36	50	550	Series 86

Tab. 7: Air-side accessories

6.3.2 Suspension points

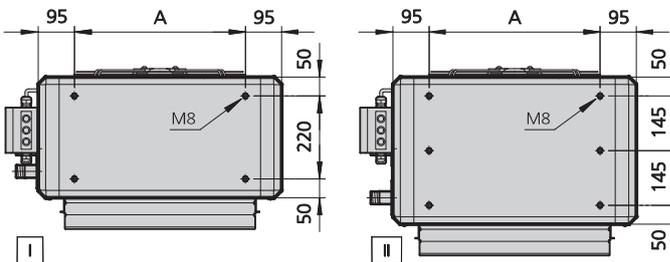


Fig. 3: Resistent suspension points

I: Heat exchanger, galvanised steel

II: Heat exchanger, stainless steel

Unit heater series	A [mm]
84	350
85	450
86	550

Tab. 8: Suspension points for wall / ceiling installation

6.3.3 Universal 4-point brackets type 80042

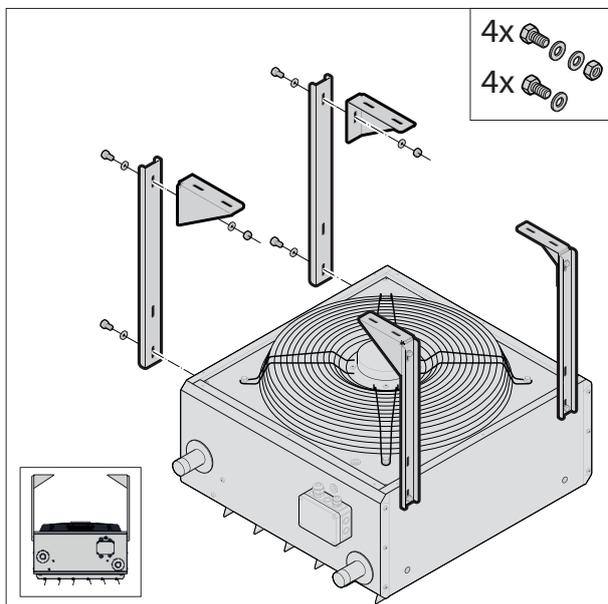


Fig. 4: Universal 4-point brackets, series 84-86

6.3.4 Wall brackets, type 8*044

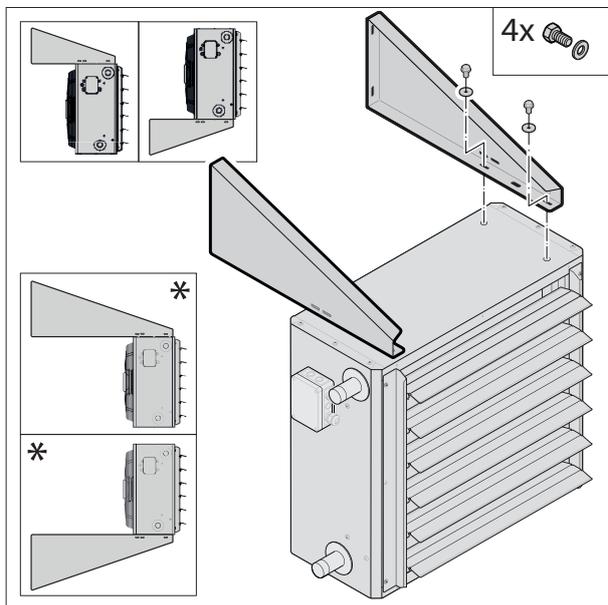


Fig. 5: Wall brackets

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6.4 Installation

Actuator with 'First Open' function

- ▶ When delivered, the actuator is normally open in a de-energised state, thanks to the First Open function. This enables heating mode to run even if the electric wiring is not yet completed.
- ▶ When subsequently commissioned and with the application of power (for longer than 6 minutes), the First Open function is automatically unlocked so that the actuator becomes fully operational.

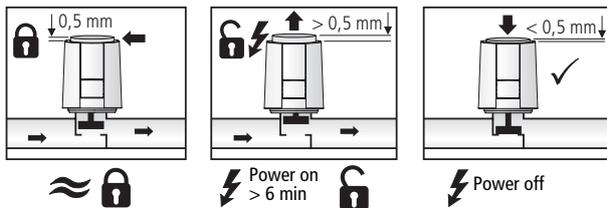


Fig. 6: "First Open" function

Hydraulic connection

Note the following points when connecting the hydraulic side:

- ▶ Install and test safety components (expansion vessels, pressure relief valves and overflow valves).
- ▶ Route condensation lines with a sufficient cross-section without bends and narrow sections with a gradient to the in situ waste water pipe.
- ▶ Allow adequate space for the air flow (air inlet and outlet).

Observe the following additional points for cooling operation:

- ▶ Install continuous, vapor diffusion-tight insulation on all water-bearing components (piping, valves, connections), in each case up to the unit.
- ▶ Select suitable pipe hangers (cold clamps) for cooling operation.
- ▶ Sufficiently dimension the diameter of the condensate pipe.
- ▶ Protect siphons (if any) in the condensate pipe from drying out.

6.4.1 Connection to the pipe network

The supply and return connections protrude laterally from the housing. The heat exchanger connection sizes for stainless steel, galvanised steel heat exchangers are:

- ▶ 1" (series 84+85)
- ▶ 1 1/4" (series 86)

Proceed as follows when making the hydraulic connection:

- ▶ Shut off the supply line from the medium.
- ▶ Connect up the pipework.
- ▶ Remove protective caps from the flow and return.
- ▶ Seal the valve connections and screw in.

Important! Use an appropriate tool (e.g. pipe wrench) to prevent connection spigots from shearing off and twisting. All mechanical connections must be mounted stress-free!

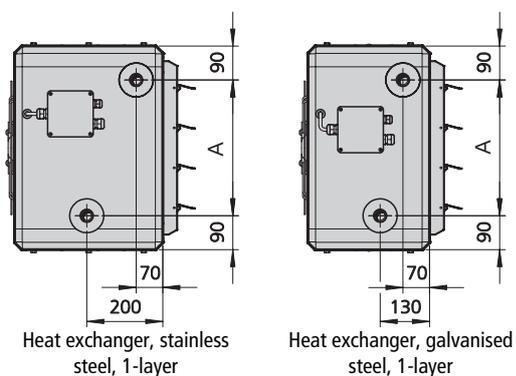


Fig. 7: Resistent EX heat exchanger versions

Series	A [mm]
84	360
85	460
86	560

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7 Electrical connection



IMPORTANT NOTE!

Switch the unit on and off at the control input!

Do not switch the unit on and off at the mains, since a fault message is generated for up to 10 seconds after the mains power is switched on! After this time, the EC fan's electronic circuit is ready for operation and a reliable status message is possible. If no fault is detected, the relay is energised after the initialisation period. The fan restarts automatically when control voltage or the stored speed setpoint is applied, after a mains power failure for example.



IMPORTANT NOTE!

Integrated overload protection for EC fans

All EC fans have integrated overload protection. An upstream motor protective device is not required. First connect the protective earth "PE" conductor to the motor junction box or to the KaControl recirculation air module. When disconnecting, be sure to disconnect the earth terminal last. Connect up the unit in accordance with the valid connection diagram.

To ensure that the switch-on current limit is active, wait until the mains power has been disconnected for at least 90 seconds before restarting!



IMPORTANT NOTE!

Only connect up units with a circuit breaker that switches off all poles from the mains power supply with a contact gap of at least 3 mm! Only connect the unit to permanently installed lines. The operator of the unit is responsible for ensuring EMC compliance of the entire system in accordance with the locally applicable standards.

7.1 Maximum electrical rating values

Electromechanical version (type ... 58/56/68)

Type	Nominal voltage [V]	Mains frequency [Hz]	Active power [kW]	Nominal current [A]	Leakage current [mA]	Maximum pre-fusing [A]	IP class	Protection class
84**58	230	50/60	0.17	1.46	<3.5	B10	54	I
85**58	230	50/60	0.39	1.74	<3.5	C16	54	I
86**58	230	50/60	0.46	2.13	<3.5	C16	54	I

Tab. 9: Electrical data Resistent, without KaControl and valve drive

Type	Number
Speed controller, type 30510	10
Room thermostat, type 30155	2

Tab. 10: Maximum connectible Resistent with EC fan per speed control unit

7.2 Electromechanical control type 8***58

EMC-compliant installation of control cables

To avoid interference, ensure there is sufficient clearance between the mains power and control cables. When using a shielded cable, make sure that the shield is connected just on one side, i.e. only to the signal source with the protective earth (as short and low inductance as possible)!

7.2.1 Connection (**00)

Terminal configuration for control of unit heater with EC fan (86xx58)

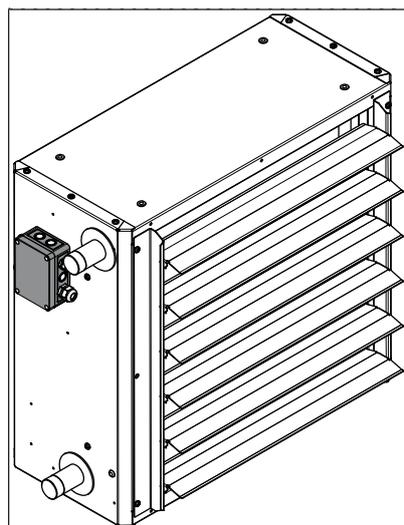
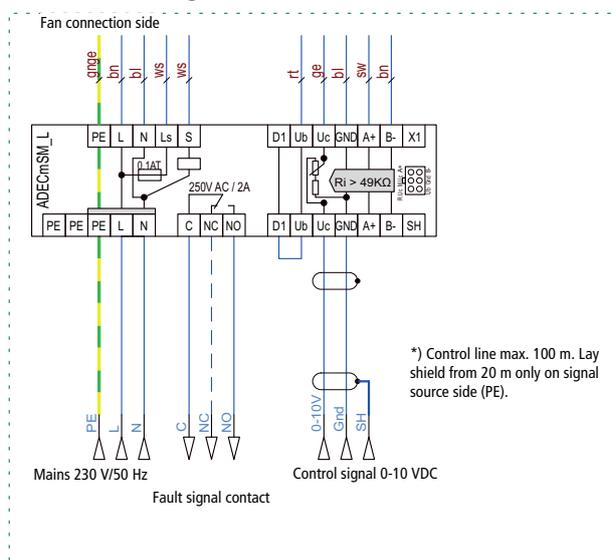


Fig. 8: Resistent with motor junction box

Power supply and control

All sizes require a power supply of 230 V / 50/60 Hz and can be activated via a control input of 0-10 VDC ($R_i > 49 \text{ KO}\Omega$). Types 85xx58 and 86xx58 can alternatively be operated via an integral MODBUS RTU interface. The shield of the Bus line can be wired through to terminal SH, if required.

The motor junction box contains a relay with a potential-free changeover contact, 24 to 250 V / 2 A. This signals an error message from the EC fan or a power failure. In fault-free operation, the relay is energised (Contact C – NO closed). In the event of a fault, the relay becomes de-energised (Contact C - NO open). The fault signalling chain in types 85xx58 and 86xx58 is protected by a relay with a unit fuse $\varnothing 5 \times 20 \text{ mm}$, T0,1A.

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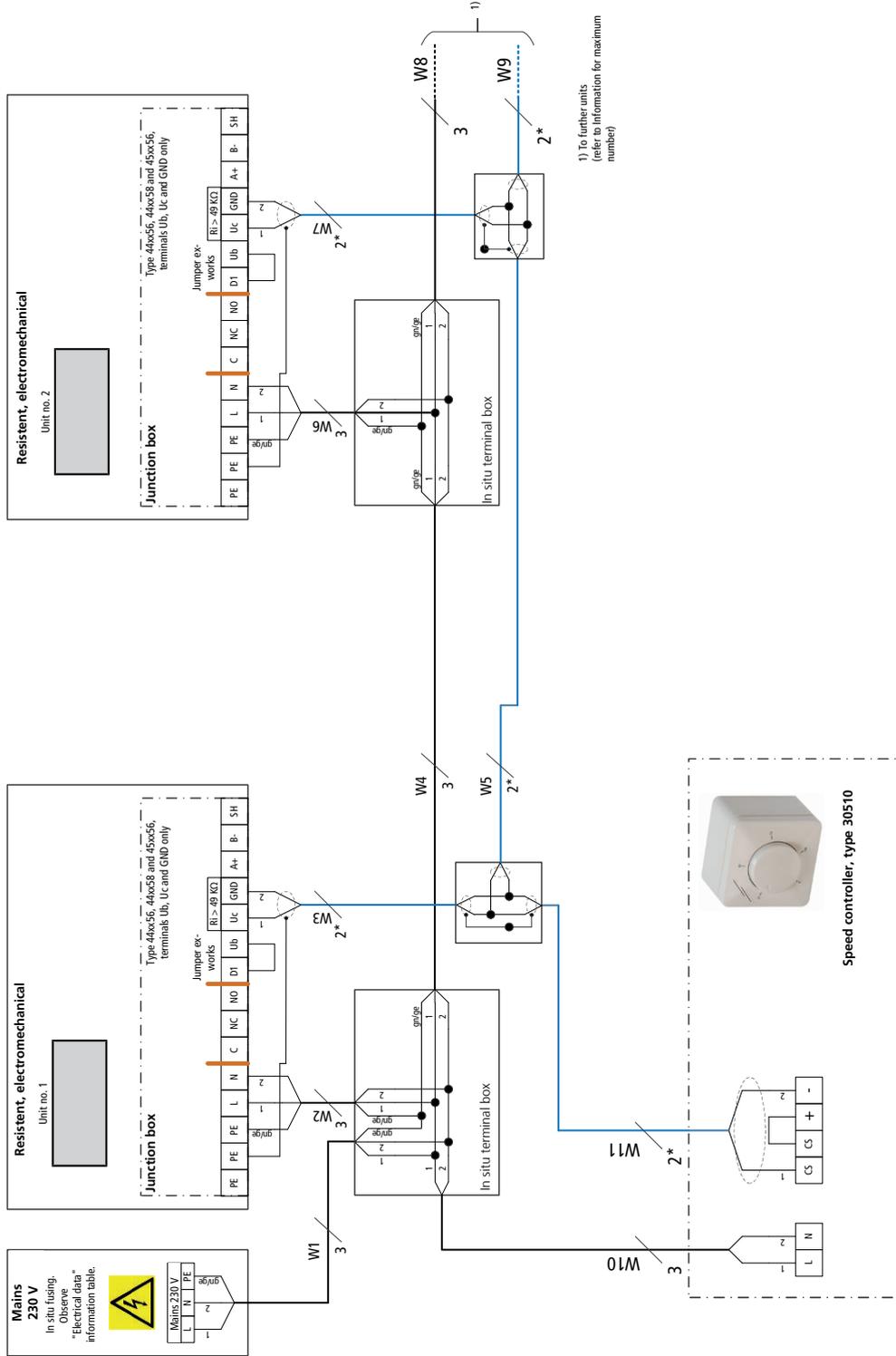


Refer to these points in the following installation diagrams with electromechanical control:

- ▶ Comply with the details on cable types and cabling with due consideration for VDE 0100.
- ▶ Without *: NYM-J. The requisite number of wires, including protective conductor, is stated on the cable. Cross-sections are not stated, as the cable length is involved in the calculation of the cross-section.
- ▶ With *: J-Y(ST)Y 0.8mm, max. 100 m between the speed controller and the last unit heater; provide a shield on one side when longer than 20 m. Lay separately from power lines.
- ▶ With **: Sensor connection cable 1,5 mm² e.g. J-Y(ST)Y, 4 x 2 x 0.8 mm, max. 100 m. Lay separately from high-voltage cables.
- ▶ With ***: J-Y(ST)Y, 0.8 mm, max. 50 m. Lay separately from power lines.
- ▶ With ****: J-Y(ST)Y, 0.8 mm, max. 100 m. Lay separately from power lines.
- ▶ If other types of cables are used, they must be at least equivalent.
- ▶ The terminals on the unit are suitable for a maximum wire cross-section of 2,5 mm².
- ▶ Any RCCBs used must be pulsating current-sensitive (type A). When the power supply to the unit is switched on, pulsed charging currents of the capacitors in the integrated EMC filter can cause FI safety devices to trip. A tripping current of 300 mA is recommended to ensure the highest possible operating reliability.
- ▶ The electrical data need to be respected when rating the in situ mains power supply and fusing.

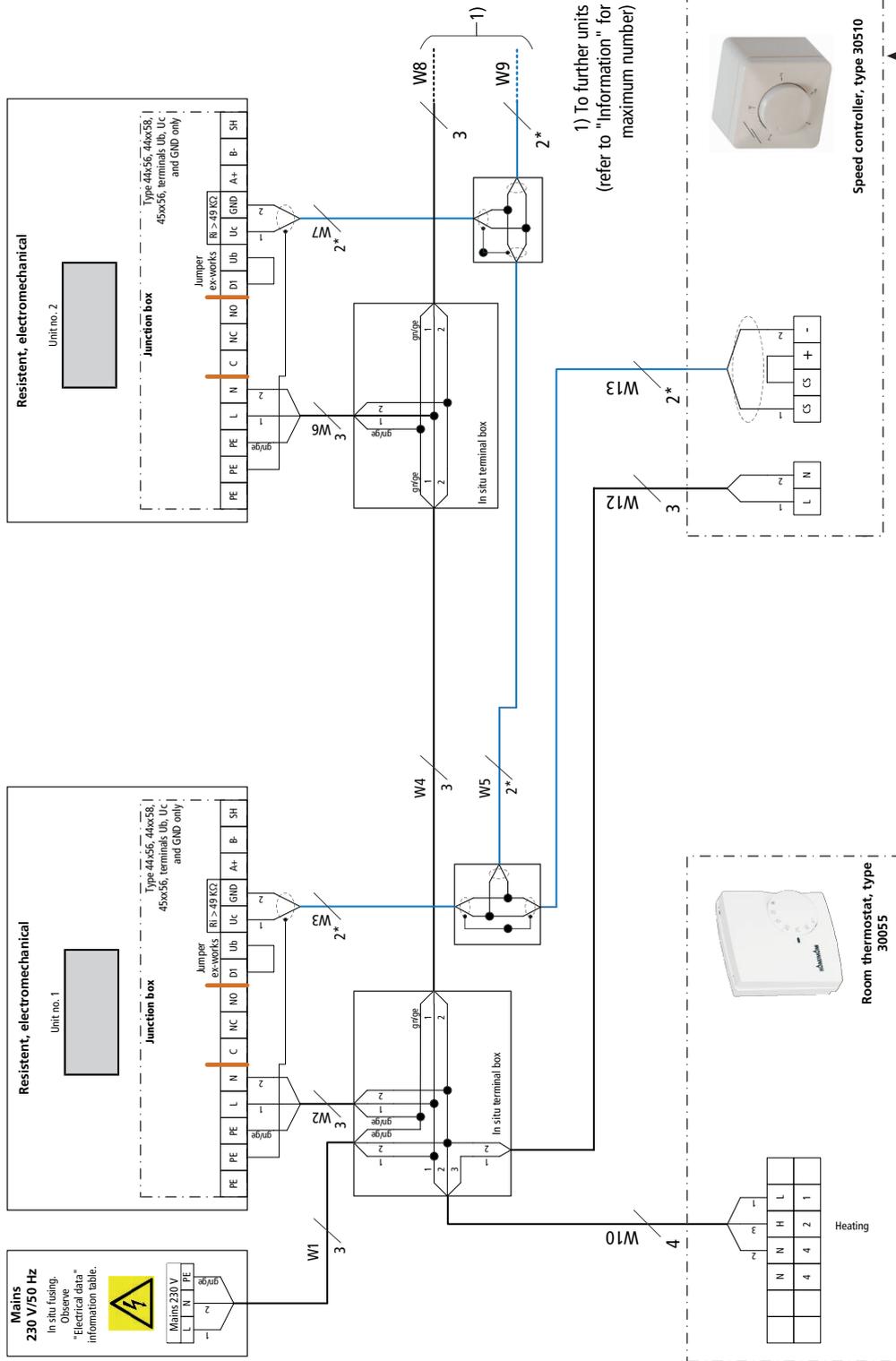
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Cabling of Resistent (**00), actuation by speed controller type 30510



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Cabling of Resistent (**00), actuation by speed controller type 30510 with room thermostat type 30055

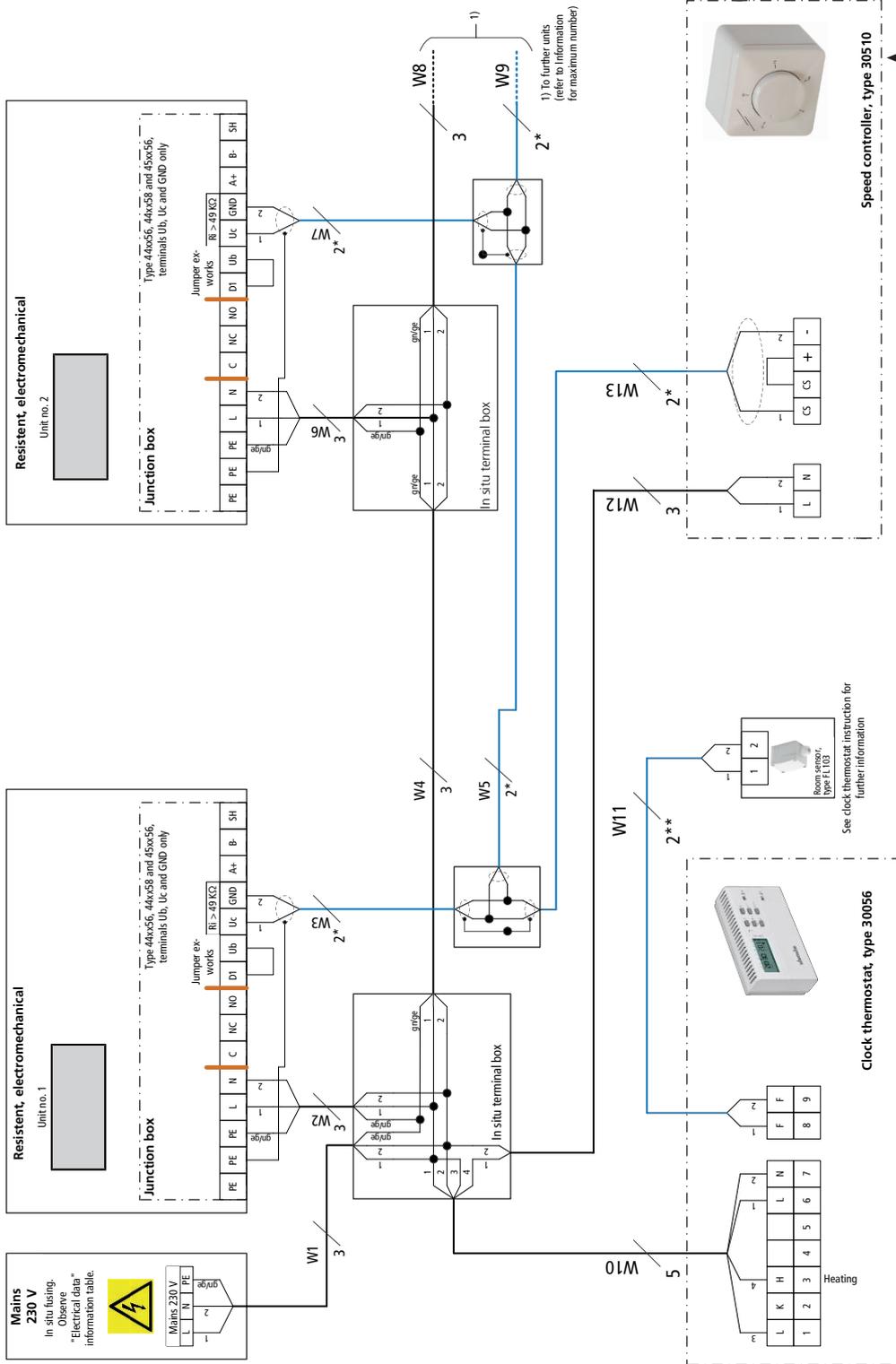


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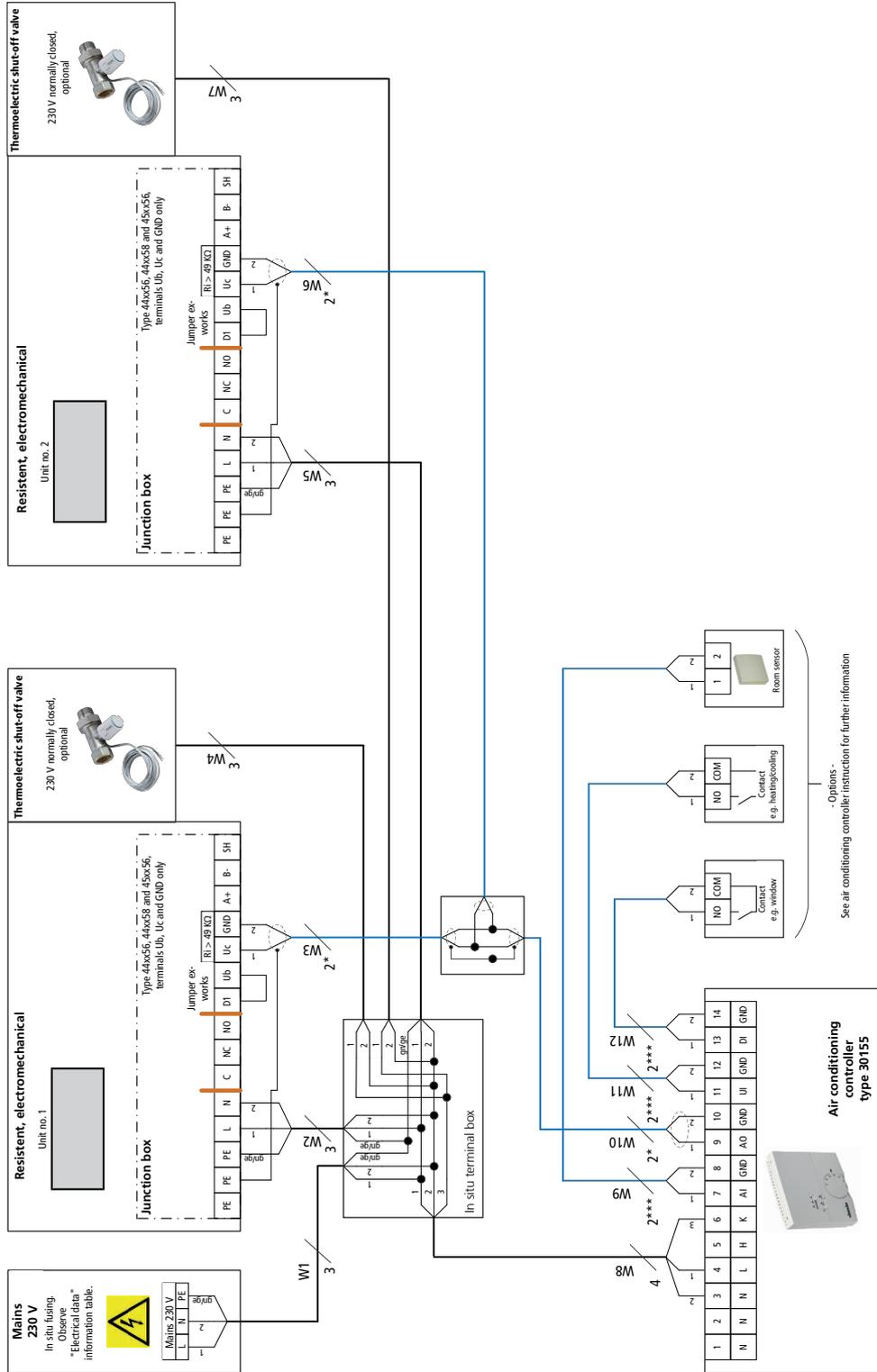
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Cabling of Resistent(* *00), actuation by speed controller type 30510 with clock thermostat type 30056





Cabling of Resistent (00), actuation by climate controller type 30155, 2-pipe valve actuator 230 V AC, Open/Close**

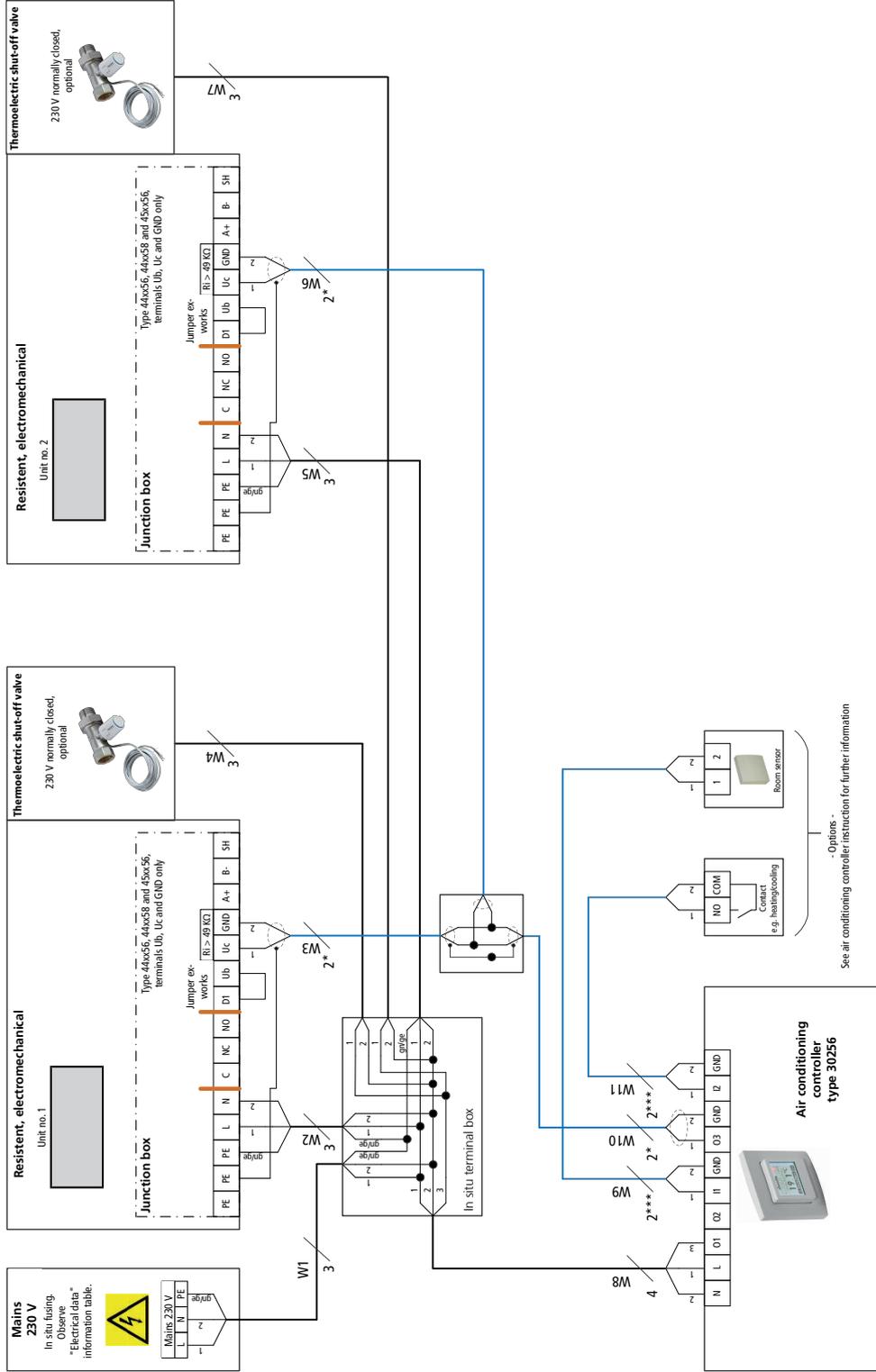


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Cabling of Resistent (**00), actuation by climate controller type 30256, 2-pipe valve actuator 230 V AC, Open/Close

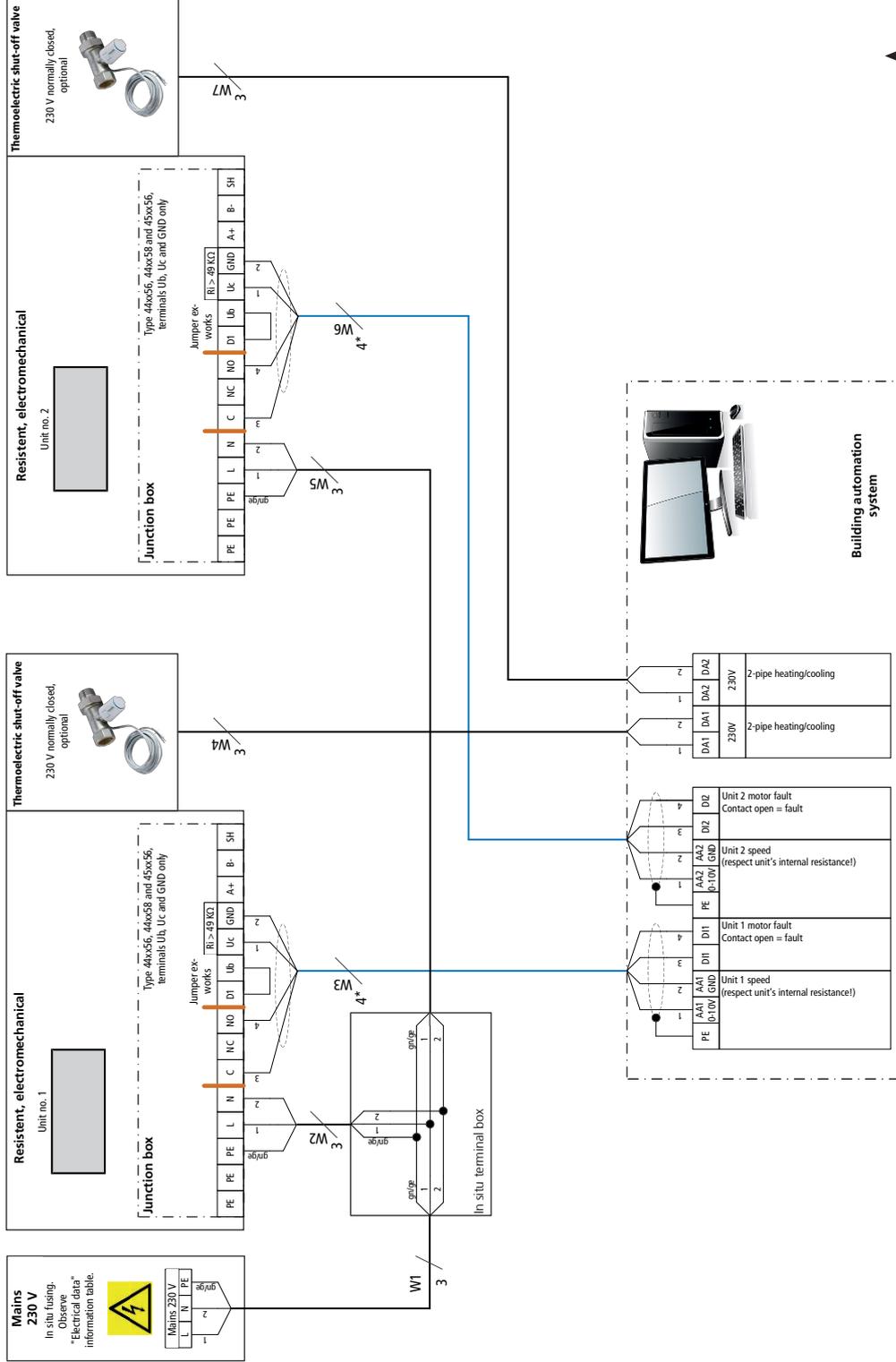


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Cabling of Resistent (**00), actuation by DDC/BMS, 2-pipe valve actuator 230 V AC, Open/Close



8 Pre-commissioning checks

Before initial commissioning, check whether all the necessary conditions have been met so that the unit can operate safely and properly.

Structural tests

- ▶ Check that the unit is securely standing and fixed.
- ▶ Check the horizontal installation/suspension of the unit.
- ▶ Check the completeness and correct seating of all filters (dirt side).
- ▶ Check whether all components are properly fitted.
- ▶ Check whether all air ducts are mechanically fixed in place.
- ▶ Check whether all dirt, such as packaging or site dirt, has been removed.

Electrical tests

- ▶ Check whether all lines have been properly laid.
- ▶ Check whether all lines have the necessary cross-section.
- ▶ Are all wires connected in accordance with the electric wiring diagrams?
- ▶ Is the earth wire connected and wired throughout?
- ▶ Check whether the fault signal contacts of the EC fans have been correctly connected (break contacts in series with multiple units).
- ▶ Check all external electrical connections and terminal connections are fixed in place and tighten if necessary.

Water-side checks

- ▶ Check whether all supply and drainage lines have been properly connected.
- ▶ Fill pipes and unit with water and bleed.
- ▶ Check whether all bleed screws are closed.
- ▶ Check leak tightness (pressure test and visual inspection).
- ▶ Check whether the parts carrying water have been flushed through.
- ▶ Check whether any shut-off valves fitted on site are open.
- ▶ Check whether any electrically actuated shut-off valves have been properly connected.
- ▶ Check whether all valves and actuators are working properly (note permitted mounting position).

Air-side checks

- ▶ Check whether there is unimpeded flow at the air inlet and outlet.
- ▶ Check whether the air inlet filter is fitted and dirt-free.

Once all checks have been completed, initial commissioning can be carried out in line with Chapter 9 "Operation" [▶ 32].

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9 Operation

9.1 Operation of electromechanical control

 <p>A white, square-shaped speed controller with a large circular dial in the center. The dial has markings at 0, 25, 50, 75, and 100. There is a small switch on the top left of the dial.</p>	<p>Speed controller, type 30510</p> <p>The speed controller is used to activate the fan and pre-set the fan speed. Actuation of a thermoelectric shut-off valve is not possible.</p>
 <p>A grey, rectangular electronic fan speed controller with a control panel on the front. The panel includes three rotary knobs, a digital display, and various indicator lights. A small white component is shown to the left of the main unit.</p>	<p>Electronic fan speed controller, type 30515</p> <ul style="list-style-type: none">▶ With integrated digital timer, IP class IP 40▶ 230 V, EC, with day, night, week programme, continuously variable fan operation 0 to 100 %, manual or automatic, 0-10 VDC, recirculation air, including sensor▶ Suitable for: EC units, electromechanical, max. number of connectible units: ten TIP, TOP, Resistent, Ultra or Venkon, two KaCool D AF or KaCool W

Fig. 9: Speed controller, type 30510

Fig. 10: Electronic fan speed controller type 30515

10 Maintenance

10.1 Securing against reconnection



DANGER!

Risk of death by unauthorised or uncontrolled restart!

Unauthorised or uncontrolled restarting of the equipment can result in serious injury or death.

- ▶ Before restarting, ensure that all safety devices are fitted and working properly and that there is no hazard to humans.

Always follow the procedure described below to prevent accidental restart:

1. de-energise.
2. Prevent accidental re-connection.
3. Check that the equipment is de-energised.
4. Cover and cordon off adjacent live parts.



WARNING!

Risk of injury from rotating parts!

The fan impeller can cause severe injuries.

- ▶ Switch off the unit and prevent it from reconnection before commencing any work on moving components of the fan. Wait until all parts have come to a standstill.

10.2 Maintenance Schedule:

The sections below describe maintenance work needed for the proper and trouble-free operation of the equipment.

If there are signs of increased wear during regular checks, shorten the required maintenance intervals to the actual wear and tear. Contact the manufacturer with any questions about maintenance work and intervals.

Interval	Maintenance task	Personnel
As required	Regular visual checks and acoustic checks for damage, dirt and function.	User
every six months	Clean unit components (heat exchanger, condensate tray, condensate pump, float switch).	User
every six months	Check the electrical wiring.	Qualified personnel
every six months	Clean components/surfaces that come into contact with air.	Qualified personnel
quarterly	Check the heat exchanger for dirt, damage, corrosion and leak-tightness. Carefully vacuum the heat exchanger if dirty.	User

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10.3 Clean the inside of the unit

Check all elements that come into contact with air (internal surfaces of the unit, outlet elements etc.) for dirt or deposits during maintenance and use a commercially available product to remove.



DANGER!

Risk of injury from burning

High temperatures are produced at the EC fan's electronic housing. Avoid direct contact!



IMPORTANT NOTE!

Do not use aggressive cleaning agents!

Aggressive cleaning agents that can damage the paintwork must not be used on the EC fan. Water is not permitted to enter the inside of the motor or the electronics (through direct contact with seals or motor openings, for example), respect the protection rating (IP). Check the condensate drain holes (if present), positioned to suit the installation situation, for clearance. Run the EC fan for at least 1 hour at 80 to 100% of maximum speed before cleaning to prevent moisture accumulating in the motor! Run the EC fan for a minimum of 2 hours at 80 to 100% of maximum speed after the cleaning process!

11 Faults

The following chapter describes possible causes of faults and the work needed to rectify them. Should faults occur frequently, shorten the maintenance intervals in line with the actual loading on the unit.

Contact the manufacturer with any faults that cannot be rectified using the following information.

Behaviour in the event of faults

The following applies:

1. Immediately switch off the unit with faults that pose an immediate danger to persons or property!
2. Determine the cause of the fault!
3. Switch off the unit and prevent it from being reconnected if rectifying the fault requires work in the hazard area. Immediately advise a supervisor on site about the fault.
4. Either rectify the fault yourself or have it repaired by authorised personnel, depending on the nature of the fault.

The Fault table [► 36] provides information on who is authorised to rectify and remedy faults.

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Assembly, installation and operating instructions

Status output via flash code

The EC fans are blockage protected. Protective functions that trigger an automatic shut-off in case of a fault are integrated. These depend on the fan type.

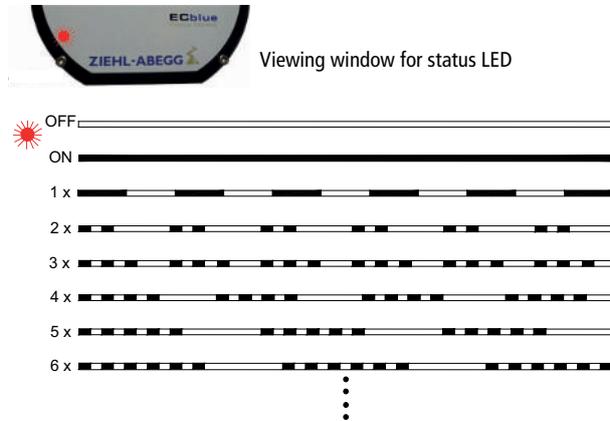


Fig. 11: Flash code

LED code	Relay in the fan*	Cause
OFF	0	No mains power
ON	1	Normal operation without faults
1x	1	No enable = OFF
2x	1	Temperature management active
4x	0	Phase failure (3 ~ types only)
5x	0	Motor blocked
6x	0	Power module fault
7x	0	Intermediate circuit, undervoltage
8x	0	Intermediate circuit, overvoltage
9x	1	Cool down phase, power module
11x	0	Fault, motor start
12x	0	Mains power too low
13x	0	Mains power too high
14x	0	Fault, peak current
17x	0	Temperature alarm
20x	0	MODBUS communication fault

Tab. 11: Status via flash code

* Relay in the fan with factory-programmed function (fault message not inverted)

0 relay de-energised

1 relay energised

11.1 Fault table

Fault	Possible cause	Remedy
No function.	No power supply.	Check voltage, switch on repair switch.
		Replace fuse.
Unit too loud	Speed too high.	Set a lower speed, if possible.
	Air inlet/outlet opening is obstructed.	Free air ducts.
	Filter dirty.	Replace filter.
	Rotating parts unbalanced	Clean and/or replace impeller. Please make sure that no balancing clips are removed during cleaning.
	Fan dirty.	Clean dirt from fan.
	Heat exchanger dirty.	Clean dirt from Heat exchanger.

11.2 Fault table, electromechanical control type ..58

EC fan does not rotate when power is applied to the module and control signal > approx. 2 VDC	Mechanical blockage.	Switch off, de-energise and remove the mechanical blockage.
	Control voltage poles switched.	Connect the control voltage correctly.
Fan does not rotate 100% at max. control signal 10 VDC	Maximum limit set incorrectly.	Change potentiometer setting in the motor junction box.
	Active temperature management effective (motor or electronics overheated).	Check that the airways are clear; remove any foreign bodies, impeller is blocked or dirty; check supply air temperature; check installation location (air speed over heat sink).

11.3 Start-up after rectification of fault

After correction of the fault, carry out the following steps for recommissioning:

1. Make sure that all maintenance covers and access openings are sealed.
2. Switch off the unit.
3. Acknowledge the fault on the controller, if necessary.

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12 Certificates



EU-Konformitätserklärung

EU Declaration of Conformity
Déclaration de Conformité CE
Deklaracja zgodności CE
EU prohlášení o konformite

Wir (Name des Anbieters, Anschrift):

We (Supplier's Name, Address):
Nous (Nom du Fournisseur, Adresse):
My (Nazwa Dostawcy, adres):
My (Jméno dodavatele, adresa):

KAMPMANN GMBH & Co. KG
Friedrich-Ebert-Str. 128-130
49811 Lingen (Ems)

erklären in alleiniger Verantwortung, dass das Produkt:

declare under sole responsibility, that the product:
déclarons sous notre seule responsabilité, que le produit:
deklarujemy z pełną odpowiedzialnością, że produkt:
deklarujeme, vědomi si své odpovědnosti, že produkt:

Type, Modell, Artikel-Nr.:	TOP/TOP C	44****, 45****, 46****, 47****, 48****
Type, Model, Articles No.:	TIP	54****, 55****, 56****
Type, Modèle, N° d'article:	Resistent	84****, 85****, 86****
Typ, Model, Nr artykułu:	Ultra	73****, 84****, 85****, 96****, 97****
Typ, Model, Číslo výrobku:	Bauheizer	54****, 55****, 56****

auf das sich diese Erklärung bezieht, mit der / den folgenden Norm(en) oder normativen Dokumenten übereinstimmt:

to which this declaration relates is in conformity with the following standard(s) or other normative document(s):
auquel se réfère cette déclaration est conforme à la (aux) norme(s) ou autre(s) document(s) normatif(s):
do którego odnosi się niniejsza deklaracja, jest zgodny z następującymi normami lub innymi dokumentami normatywnymi:
na který se tato deklarace vztahuje, souhlasí s následující(mi) normou/normami nebo s normativními dokumenty:

DIN EN 55014-1; -2	Elektromagnetische Verträglichkeit
DIN EN 61000-3-2; -3-3	Elektromagnetische Verträglichkeit
DIN EN 61000-6-1; -6-2; -6-3	Elektromagnetische Verträglichkeit
DIN EN 60335-1; -2-40	Sicherheit elektr. Geräte f. den Hausgebrauch und ähnliche Zwecke

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USt-IdNr: DE313505294
Kampmann.de

Persönlich haftende Gesellschafterin:
Kampmann Beteiligungsgesellschaft mbH
Sitz: Lingen (Ems)

Registergericht: Osnabrück, HRB 211684
Geschäftsführer: Hendrik Kampmann



Gemäß den Bestimmungen der Richtlinien:

Following the provisions of Directive:
Conformément aux dispositions de Directive:
Zgodnie z postanowieniami Dyrektywy:
Odpovídající ustanovení směrnic:

2014/30/EU **EMV-Richtlinie**
2014/35/EU **Niederspannungsrichtlinie**

Frank Bolkenius

Lingen (Ems), den 29.04.2022

Ort und Datum der Ausstellung

Place and Date of Issue
Lieu et date d'établissement
Miejsce i data wystawienia
Místo a datum vystavení

Name und Unterschrift des Befugten

Name and Signature of authorized person
Nom et signature de la personne autorisée
Nazwisko i podpis osoby upoważnionej
Jméno a podpis oprávněné osoby

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<https://www.kampmanngroup.com/hvac/products/unit-heaters/resistent>