



TOP [TOP C]

► 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.

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

These units are used for the decentralised heating and ventilation of high-ceiling buildings, industrial and commercial workplaces and buildings with a connection to a district heating system or broad temperature spreads. Within the room, the unit needs to be connected to the building's heating/cooling/ventilation system and to the building's waste water and power network. The operating limits and limits of use described in Chapter 2.2 [► 7] 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.
- ▶ This unit is not intended for permanent connection to the drinking water supply system.
- ▶ This unit is intended for being 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 | |
|---------------------------|------------------|
| 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.

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| 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

**WARNING!****Respect the maximum flow temperatures to protect the EC fan!**

Prolonged downtimes can lead to impermissible heating of the EC fan motor if heating media temperatures are too high. The flow temperatures should therefore be limited depending on the application and the motor model.

If a temperature limitation is impossible or inappropriate for the purpose concerned, there is also the option of using suitable valves (thermoelectric, motorised or solenoid) to shut off the heating medium.

This interrupts the flow of heating 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 motorised valve are available on request.

**IMPORTANT NOTE!****Warning of misuse!**

In the event of misuse, as itemised below, there is a danger of limited or failing operation of the unit. Ensure that the airflow 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 in aggressive or corrosive atmospheres (e.g. sea air).
- ▶ Never operate the unit above electrical equipment (such as switch cabinets, computers or other electrical units, or contacts that are not drip-proof).
- ▶ Never use the unit as a construction site heater.
- ▶ Never operate the unit in areas 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!**

- ▶ Where multiple EC fans are connected in parallel, an electrical charge (>50 C) is present between line conductor and protective earth conductor when the power is switched off. Before working on the electrical connection, short-circuit the network connections and PE!
- ▶ The terminals and connectors are still energised even when the unit is switched off. Use a two-pole 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 case of a fault, electrical voltage will be present on 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 knowledge of heating, cooling, ventilation, installation and electrical engineering. This knowledge, generally learned in professional training in one of the fields mentioned above, is not described separately.

Damage caused by improper installation is the responsibility of the operator or installer. The installer of these units should have adequate knowledge of the following gained from specialist professional training

- ▶ Safety and accident prevention regulations
- ▶ Guidelines and recognised technical regulations, i.e. Association of German Electricians VDE regulations, 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.

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?

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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.

4 Technical data

| Unit | TOP | | | | |
|---|-----------|-----------|------------|------------|------------|
| Series | 44 | 45 | 46 | 47 | 48 |
| Water content [l] | 1.6 - 6.1 | 2.2 - 8.2 | 3.4 - 11.5 | 4.8 - 16.8 | 5.3 - 17.0 |
| Weight [kg] | 25 – 62 | 32 -92 | 45 – 125 | 53 – 158 | 73 – 204 |
| Sound pressure level ⁴ [dB(A)] | 13 – 56 | 19 – 64 | 20 – 62 | 22 - 61 | 26-63 |

Tab. 5: Technical data, TOP

| Unit | TOP C | | | |
|---|-------------|-------------|-------------|-------------|
| Series | 44 | 45 | 46 | 47 |
| Water content [l] | 2.1 – 2.6 | 3.0 – 3.8 | 4.5 – 5.6 | 6.2 – 7.6 |
| Weight [kg] | 33.4 – 37.9 | 43.6 – 50.0 | 61.4 – 67.0 | 80.9 – 86.0 |
| Sound pressure level ⁴ [dB(A)] | 13 – 56 | 19 – 64 | 20 – 62 | 22 – 61 |

Tab. 6: Technical data, TOP C

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

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5 Construction and function

5.1 Overview

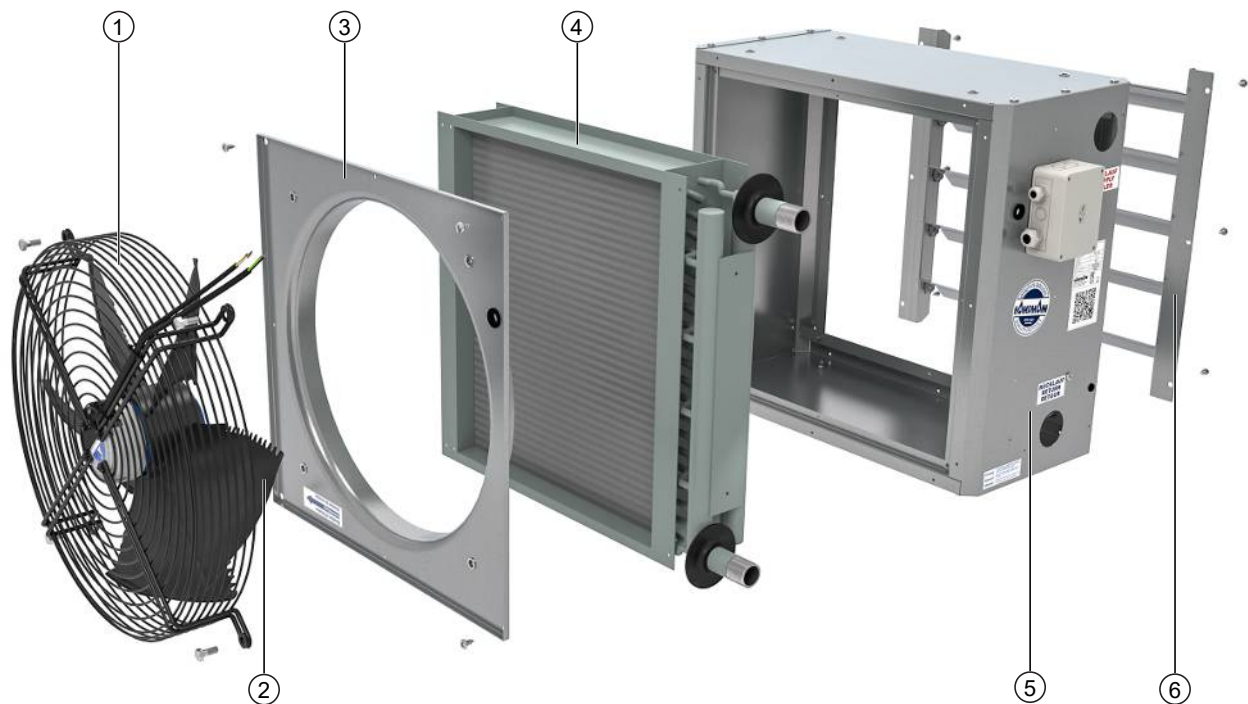



Fig. 1: TOP at a glance

| | | | |
|---|------------------------|---|---|
| 1 | Fan guard | 2 | Whisper-quiet sickle-blade fan |
| 3 | Rear panel with nozzle | 4 | Heat exchanger (example - copper/aluminium model) |
| 5 | Unit heater housing | 6 | Louvre, 1-row (standard) |

5.2 Brief description

TOP unit heaters are used for the decentralised heating or cooling 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 single-row louvre. The air can optionally be discharged through a double-row louvre or other air diffuser (see Accessories).

5.3 Wear parts list

| Figure | Article | Properties | Suitable for | Art. no. |
|---|---------------------------------------|--|--------------|--------------|
|  | ISO Coarse 90% spare filter cartridge | Type 3*611 Suitable for filter box type 3*010 | Series 44 | 198000034611 |
| | | | Series 45 | 198000035611 |
| | | | Series 46 | 198000036611 |
| | | | Series 47 | 198000037611 |

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 wall/ceiling is sufficiently load-bearing to take the weight of the unit (Technical data [► 13]).
- ▶ 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 [► 27]).
- ▶ There is a power supply on site (Maximum electrical rating values [► 30]).
- ▶ If need be, provide a condensation connection with a sufficient gradient on site.

6.2 Minimum clearances

Air heaters can be installed free-standing or suspended on the wall using the supplied wall brackets or suspended from the ceiling using the supplied ceiling brackets (Exception: Series 48 for ceiling mounting only). Installation using existing wall or ceiling brackets is likewise possible.

A minimum clearance L in accordance with the table below must be respected between unit suction area and wall/ceiling! If you do not leave this minimum clearance, the air heater output will be reduced and the noise level will increase.

Be sure to observe the minimum clearances when using accessories or for maintenance purposes!

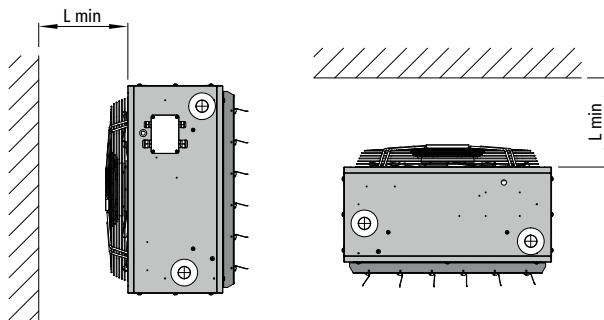


Fig. 2: Minimum clearances TOP

| Series | Type | Minimum clearance L min. | Standard clearance L* |
|--------|---------------|--------------------------|-----------------------|
| 44 | 44_58 / 44_56 | 160 mm | 285 mm |
| 45 | 45_58 / 45_56 | 180 mm | 285 mm |
| 46 | 46_58 | 230 mm | 335 mm |
| 47 | 47_58 / 47_56 | 300 mm | 345 mm |
| 48 | 48_68 | 620 mm | 660 mm |

Tab. 7: Type overview with minimum clearances

* when using wall brackets, type 3_044 (Series 44 - 47) / type 38042 (Series 48)

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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.



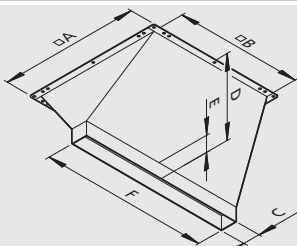
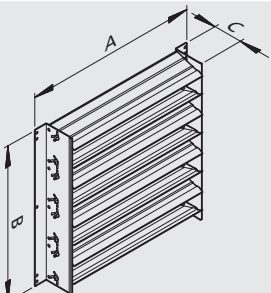
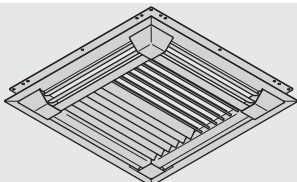

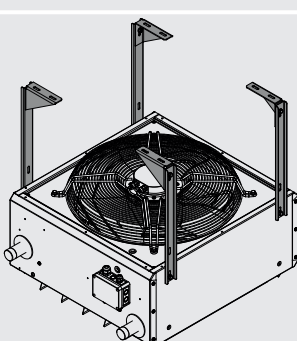
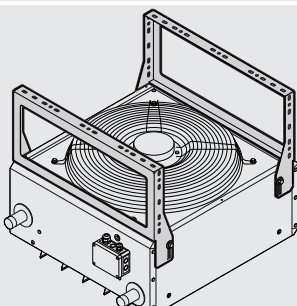
IMPORTANT NOTE!

Horizontal installation of units!

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

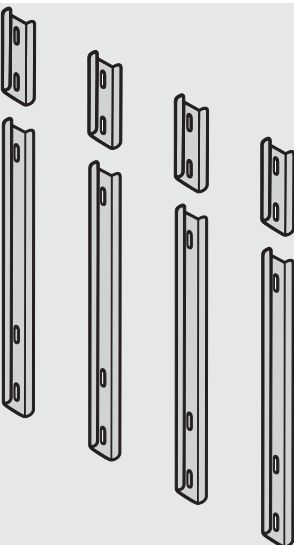
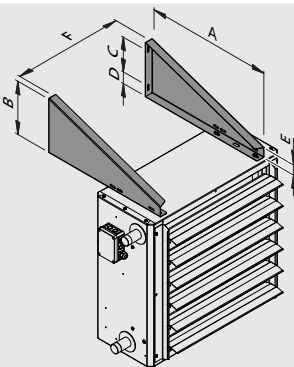
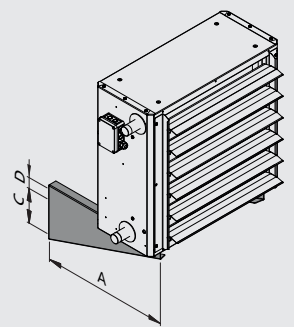
6.3.1 Installation of sheet steel accessories

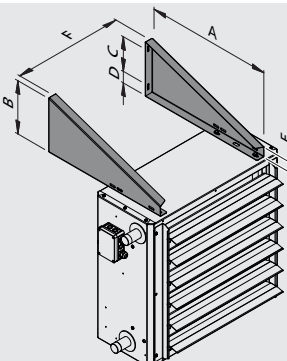
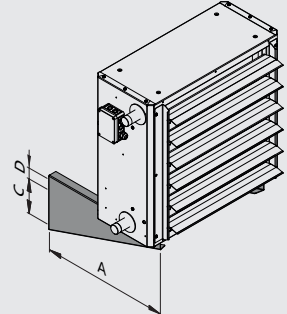
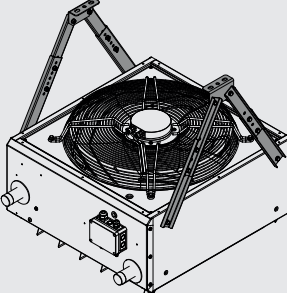
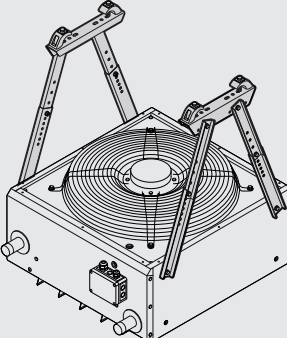

| Figure | Description | Dimensions [mm] | | | | Suitable for |
|--------|--|-----------------|-----|-----|-----|--------------|
| | 2-row louvre, type 3*002 | A | | | | |
| | | 495 | | | | Series 44 |
| | | 595 | | | | Series 45 |
| | | 695 | | | | Series 46 |
| | | 795 | | | | Series 47 |
| | Air diffuser in 4 directions, type 3*004 | | | | | Series 44-47 |
| | Diffuser screen, type 3*005 | H | | F | | |
| | | 500 | | 70 | | Series 44 |
| | | 600 | | 70 | | Series 45 |
| | | 700 | | 70 | | Series 46 |
| | | 800 | | 70 | | Series 47 |
| | Discharge nozzle, type 3*006 | A | B | C | D | |
| | | 450 | 500 | 250 | 230 | Series 44 |
| | | 550 | 600 | 300 | 260 | Series 45 |
| | | 650 | 700 | 350 | 290 | Series 46 |
| | | 750 | 800 | 400 | 320 | Series 47 |
| | | 850 | 900 | 500 | 350 | Series 48 |

| Figure | Description | Dimensions [mm] | | | | | | Suitable for |
|---|--|-----------------|-----|-----|-----|-----|-----|--------------|
|  | Wide nozzle, type 3*007 | A | B | C | D | E | F | |
| | | 500 | 450 | 60 | 300 | 50 | 600 | Series 44 |
| | | 600 | 550 | 90 | 340 | 50 | 700 | Series 45 |
| | | 700 | 650 | 120 | 380 | 50 | 800 | Series 46 |
| | | 800 | 750 | 150 | 420 | 50 | 900 | Series 47 |
|  | Induction louvre, type 3*101 | A | | B | | C | | |
| | | 495 | | 425 | | 100 | | Series 44 |
| | | 595 | | 525 | | 100 | | Series 45 |
| | | 695 | | 625 | | 100 | | Series 46 |
| | | 795 | | 725 | | 100 | | Series 47 |
|  | RaDeck ceiling air outlet, type 3*087 | | | | | | | Series 44-47 |
|  | KaMAX air outlet, type 3*111 | | | | | | | All series |
|  | Universal 4-point brackets, type 30042 | | | | | | | Series 44-47 |
| | Universal 4-point brackets, type 38042 | | | | | | | Series 48 |
|  | Ceiling to wall brackets, type 3*049 | | | | | | | Series 44-47 |

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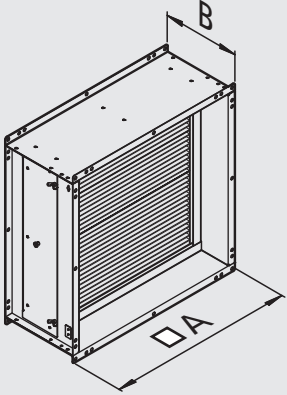
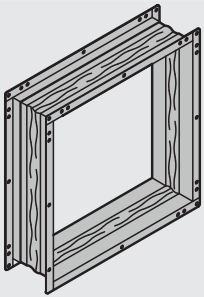
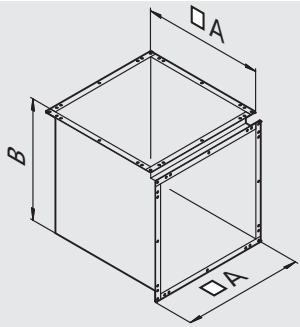
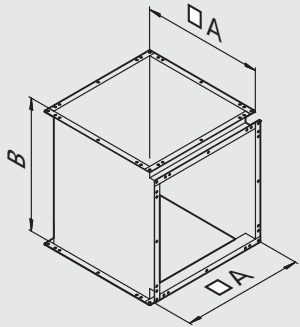
Assembly, installation and operating instructions

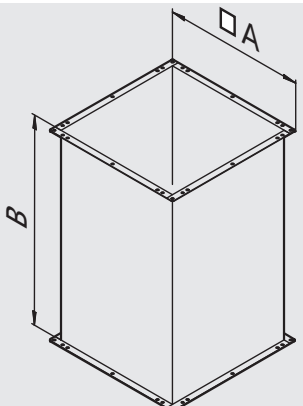
| Figure | Description | Dimensions [mm] | | | | | | Suitable for |
|---|---|-----------------|-----|-----|----|----|-----|--------------|
|  | Universal bracket extension, type 30043 | | | | | | | All series |
|   | Wall bracket, type 34044 | A | B | C | D | E | F | Series 44 |
| | | 585 | 251 | 160 | 40 | 50 | 340 | |
| | Wall bracket, type 35044 | A | B | C | D | E | F | Series 45 |
| | | 585 | 251 | 160 | 40 | 50 | 440 | |
| | Wall bracket, type 36044 | A | B | C | D | E | F | Series 46 |
| | | 635 | 268 | 187 | 40 | 50 | 540 | |
| | Wall bracket, type 37044 | A | B | C | D | E | F | Series 47 |
| | | 685 | 286 | 204 | 40 | 50 | 640 | |

| Figure | Description | Dimensions [mm] | | | | | | Suitable for |
|---|--|--|-----|-----|----|----|---|--------------|
|  | Wall brackets, extended, type 30022 | A | B | C | D | E | F | Series 44 |
| | Wall brackets, extended, type 30024 | 785 | 321 | 123 | 40 | 50 | | |
| | Wall brackets, extended, type 30026 | A | B | C | D | E | F | Series 45 |
| | Wall brackets, extended, type 30020 | 885 | 355 | 143 | 40 | 50 | | |
|  | Universal 2-point brackets, Type 30041 | A | B | C | D | E | F | Series 46 |
| | Universal 2-point brackets, Type 38041 | 1080 | 422 | 175 | 40 | 50 | | |
|  | Universal 2-point T-brackets, type 30047 | Dimensions depending on bracket length | | | | | | Series 47 |
| | | | | | | | | |
|  | | | | | | | | Series 44-47 |
| | | | | | | | | Series 48 |
|  | | | | | | | | Series 44-47 |
| | | | | | | | | |

TOP [TOP C]

Assembly, installation and operating instructions

| Figure | Description | Dimensions [mm] | | Suitable for |
|---|--|-----------------|-----|--------------|
| | | A | B | |
|  | Filter box, filter ISO Coarse 90%. Type 3*010 | 500 | 250 | Series 44 |
| | | 600 | 250 | Series 45 |
| | | 700 | 250 | Series 46 |
| | | 800 | 250 | Series 47 |
|  | Sailcloth connection, type 3*013 | | | Series 44-47 |
|  | Air duct 90°, type 3*021 | A | B | |
| | | 500 | 450 | Series 44 |
| | | 600 | 550 | Series 45 |
| | | 700 | 650 | Series 46 |
| | | 800 | 750 | Series 47 |
|  | Air duct T, type 3*022 | A | B | |
| | | 500 | 450 | Series 44 |
| | | 600 | 550 | Series 45 |
| | | 700 | 650 | Series 46 |
| | | 800 | 750 | Series 47 |

| Figure | Description | Dimensions [mm] | | Suitable for |
|---|----------------------|-----------------|----------|--------------|
|  | Air duct, type 3*015 | A | B | |
| | | 500 | Variable | Series 44 |
| | | 600 | Variable | Series 45 |
| | | 700 | Variable | Series 46 |
| | | 800 | Variable | Series 47 |

Tab. 8: Air-side sheet steel accessories

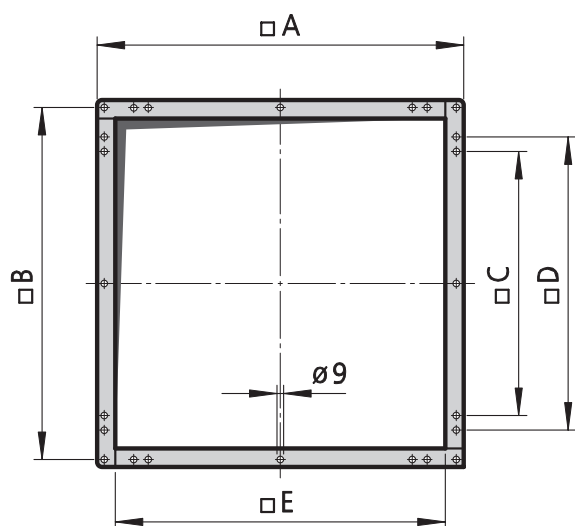


Fig. 3: Connecting frame dimensions

| Series | A [mm] | B [mm] | C [mm] | D [mm] | E [mm] |
|---------|--------|--------|--------|--------|--------|
| 44 ____ | 500 | 480 | 360 | 400 | 450 |
| 45 ____ | 600 | 580 | 460 | 500 | 550 |
| 46 ____ | 700 | 680 | 560 | 600 | 650 |
| 47 ____ | 800 | 780 | 660 | 700 | 750 |
| 48 ____ | 900 | 880 | 760 | 800 | 850 |

Tab. 9: Dimensions

Note: With Series 48, a connection is possible only on the air outlet side.

Factory-fitted accessories

| Description | Add-on to unit heater type |
|---------------------------------------|----------------------------|
| Frost protection thermostat | F |
| Repair switch | R |
| KaControl module, incl. repair switch | C1 |

Tab. 10: Factory-fitted accessories

TOP [TOP C]

Assembly, installation and operating instructions

6.3.2 Suspension points

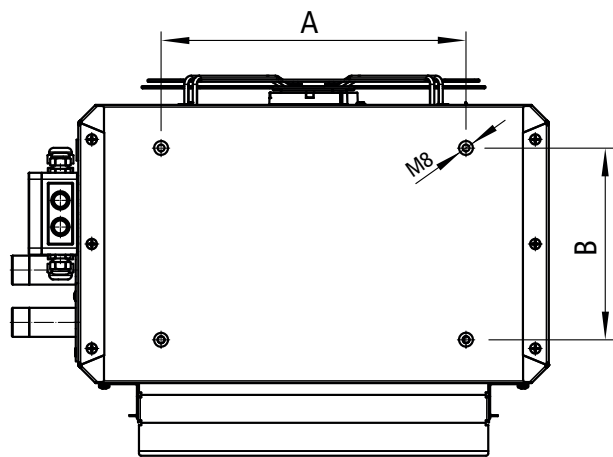


Fig. 4: TOP suspension points

| Air heater series | A [mm] | B [mm] |
|-------------------|--------|--------|
| 44 | 350 | 220 |
| 45 | 450 | 220 |
| 46 | 550 | 220 |
| 47 | 650 | 220 |
| 48 | 750 | 220 |

Tab. 11: Suspension points for wall/ceiling installation

6.3.3 Universal 2-point brackets type 30041

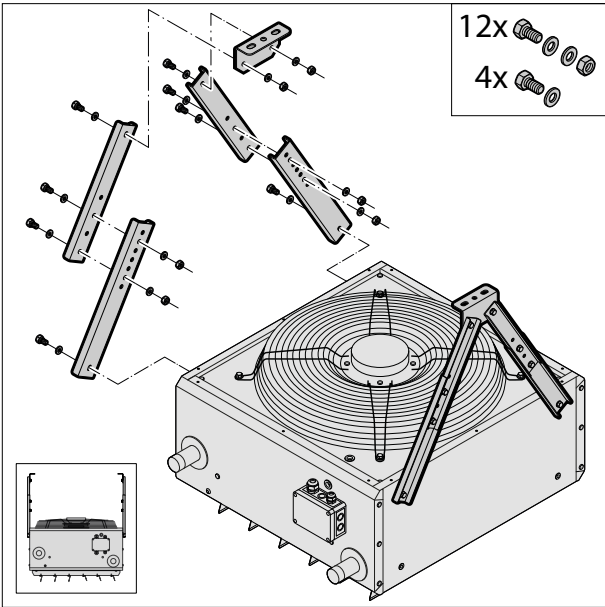


Fig. 5: Universal 2-point brackets, series 44-47

6.3.4 Universal 2-point brackets type 38041

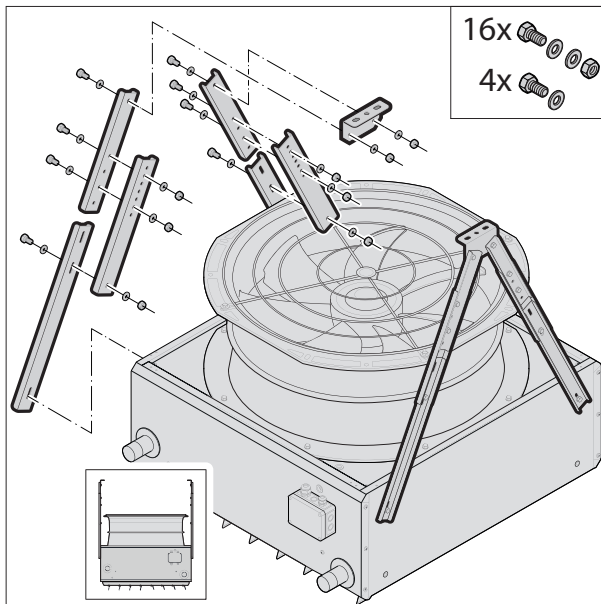


Fig. 6: Universal 2-point brackets, series 48

6.3.5 Universal 4-point brackets type 30042

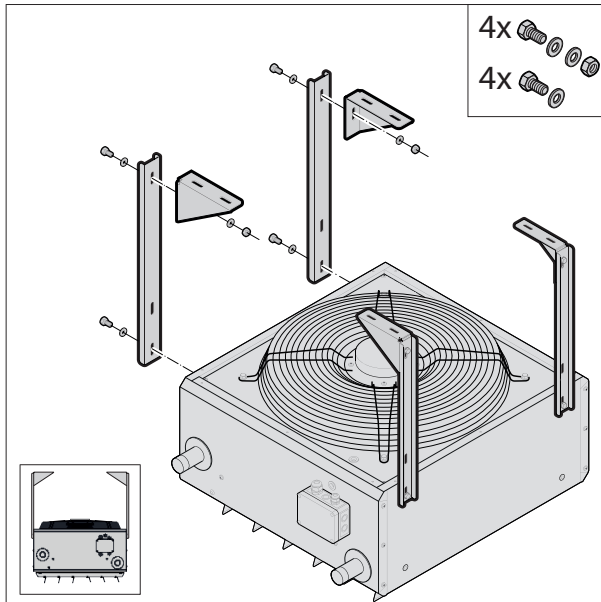


Fig. 7: Universal 4-point brackets, series 44-47

TOP [TOP C]

Assembly, installation and operating instructions

6.3.6 Universal 4-point brackets type 38042

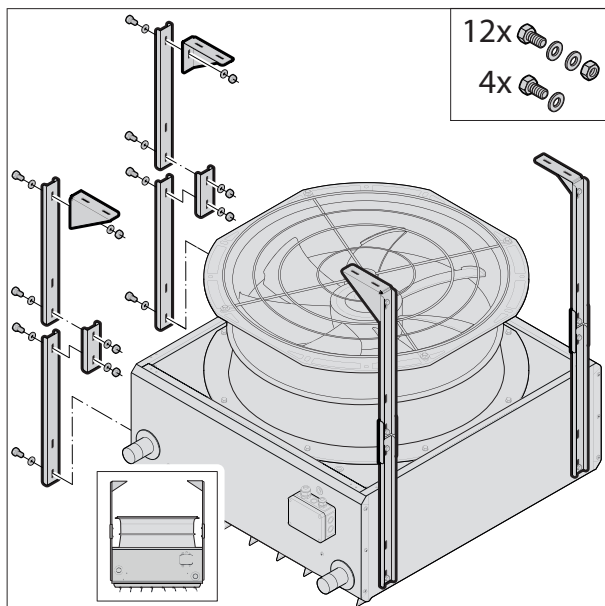


Fig. 8: Universal 4-point brackets, series 48

6.3.7 Universal 2-point T-brackets type 30047

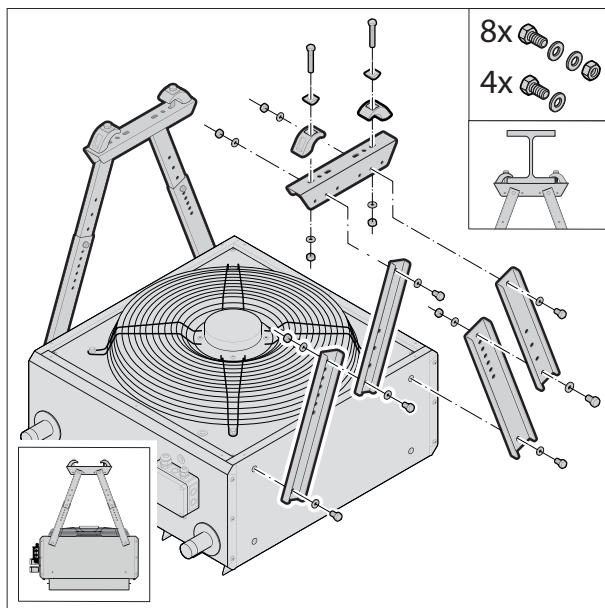


Fig. 9: Universal 2-point T-brackets, series 44-47

6.3.8 Wall brackets, type 3*044, type 3002*

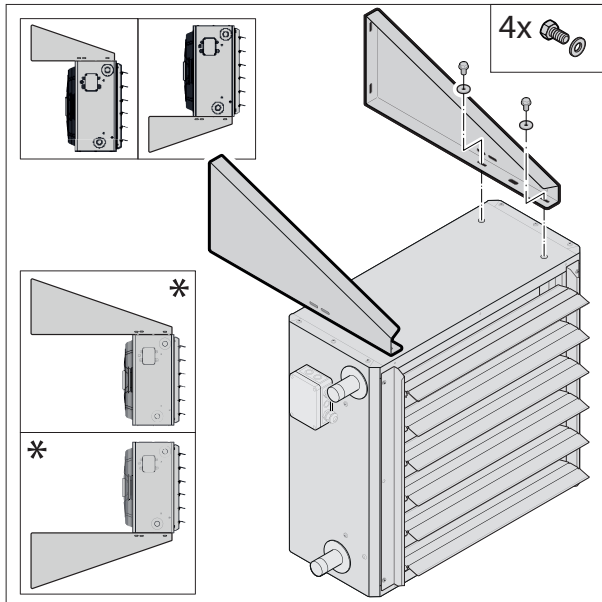


Fig. 10: Wall brackets

* Wall bracket, extended (type 3002*)

6.3.9 Ceiling to wall brackets type 3*049

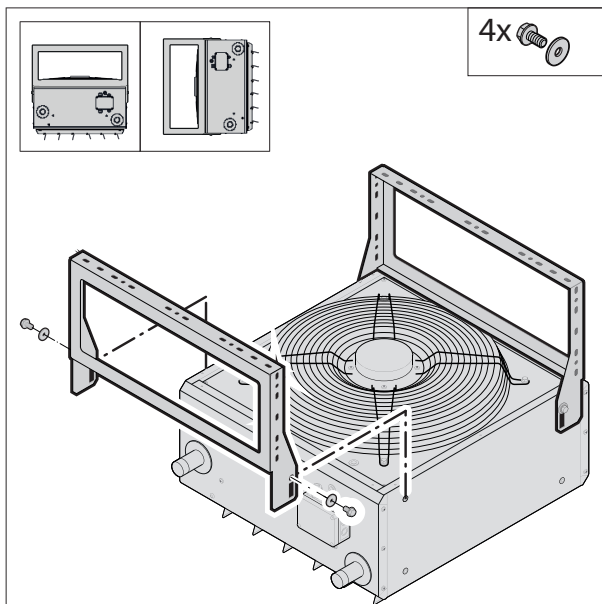


Fig. 11: Ceiling to wall bracket installation

TOP [TOP C]

Assembly, installation and operating instructions

6.3.10 Louvres

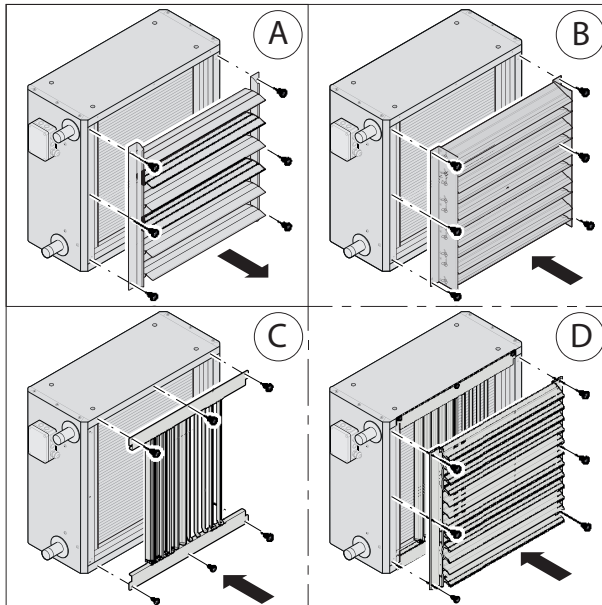


Fig. 12: Louvres

- ▶ Induction louvre mounting (type 3*101): A + B
- ▶ Induction louvre mounting, 2-row (type 3*002): A + C + D

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.

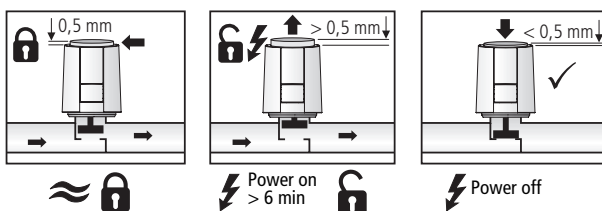


Fig. 13: "First Open" function

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).

Additionally consider the following point with cooling mode:

- ▶ Provide continuous vapour-tight insulation on all components that carry water (pipework, valves, connections) as far as the unit.
- ▶ Select appropriate pipe brackets (cooling clamps) for cooling mode.
- ▶ Dimension the diameter of the condensate line appropriately.
- ▶ Protect any traps (if fitted) in the condensate line from drying out.

6.4.1 Connection to the pipe network

The flow and return connections protrude laterally from the housing. The heat exchanger connection dimensions for copper/aluminium, galvanised and cross-current heat exchangers are:

- ▶ 1" (series 44+45)
- ▶ 1 ¼" (series 46)
- ▶ 1 ½" (series 47+48)
- ▶ Heat exchanger, steam: Steam connection 1 ½", condensate connection 1"

Proceed as follows when connecting up the unit's hydraulic pipework:

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

Important! Use an appropriate tool (e.g. pipe wrench) to protect connecting piece from being sheared off and twisted. The connections must be installed without tension!

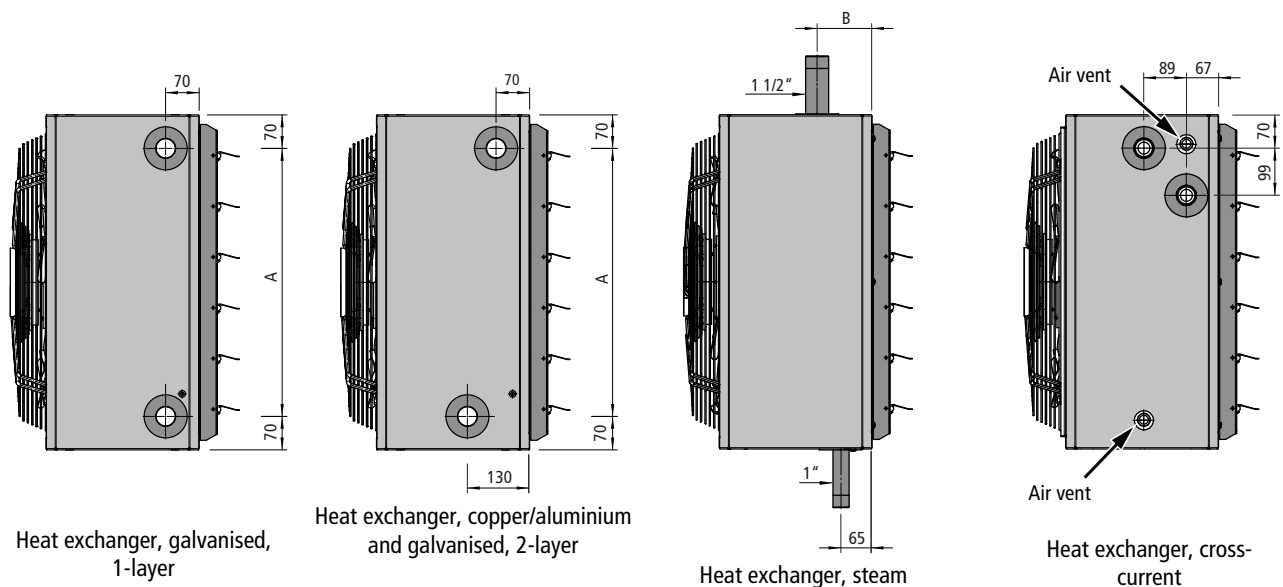


Fig. 14: TOP heat exchanger versions

| Series | A [mm] | B [mm] type 4*22 | B [mm] type 4*32 |
|--------|--------|------------------|------------------|
| 44 | 360 | 85 | 115 |
| 45 | 460 | 85 | 115 |
| 46 | 560 | 85 | 115 |
| 47 | 660 | 85 | 115 |
| 48 | 760 | 85 | 115 |

TOP [TOP C]

Assembly, installation and operating instructions

6.4.2 Condensation connection

TOP C models are equipped as standard with a droplet separator with drain connection. A built-in condensate pump with float switch is optionally available.

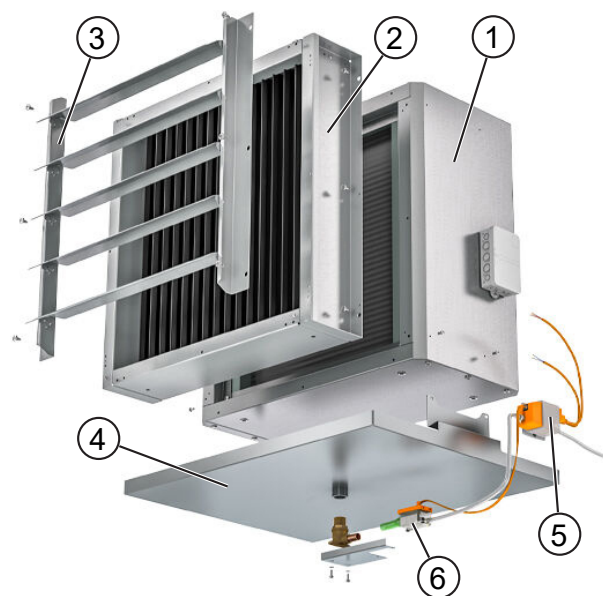


Fig. 15: TOP C

| | | | |
|---|----------------------------|---|-------------------------|
| 1 | TOP C | 2 | Droplet separator |
| 3 | Louvre 1-row | 4 | Condensate tray |
| 5 | Condensate pump (optional) | 6 | Float switch (optional) |

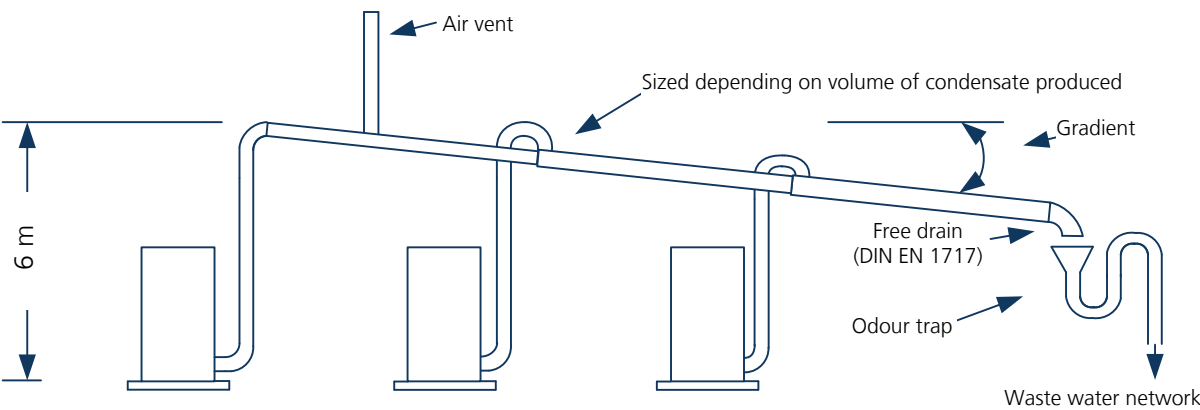


Fig. 16: Laying the condensate drain lines

6.4.2.1 Condensation drain with natural gradient

Provide a suitable condensate line on site and fix in place to drain the condensate with a free drain. A drain connection with a 3/4" female connection is available under the condensate tray for this purpose. Fit the drain with a gradient and with a minimum 1 cm/m incline (in accordance with DIN EN 12056; formerly: DIN 1986-100). Take into account all applicable regulations, such as the use of a ball trap, when connecting the condensate line to the sewer system. Protect the trap from drying out. Consider using water vapour-impermeable insulation depending on the pipe material used for the condensate drain. You will need a condensate pump should a natural gradient be impossible on site. This is used to pump the condensate into higher collection or discharge equipment. When the TOP C version is ordered, the condensate pump with float switch is factory-fitted to the unit.

6.4.2.2 Condensate drainage using a condensate pump

Any condensate produced on the TOP C with a factory-fitted condensate pump is drawn in by suction by the condensate pump via the connected float head and discharged via a hose to be fitted on the pressure side (supplied loose). Depending on conditions on site, the water can be discharged into drainage lines, possibly with a trap connection.

In the event of a fault with the condensate drain, the water level will continue to rise until the float switch triggers an alarm contact. The contact can be analysed by external signalling devices.

We recommend automatically terminating cooling mode, possibly with a shut-off valve, if the alarm contact is triggered to prevent the condensate tray from overflowing.

Condensate drainage on site with a natural gradient

- ▶ The further drainage of condensate from the condensate pump must be provided along a natural gradient with an adequate cross-section (minimum 1/2"). Increase the cross-section of the line with longer condensate lines.
- ▶ Check whether the condensate line needs to be insulated to prevent the build-up of condensate along the line.
- ▶ Do not use a rigid transition to the on-site condensate drain, as this would reduce the delivery height of the pump. We would recommend a free overflow into a trap.

Installation, cabling of the condensate pump

The condensate pump needs a separate power supply 230 V/50 Hz. We would generally advise against connecting it via the room thermostat, as residual condensate could be produced after it has been shut down. Additional wires are needed to analyse the alarm contact.

Use the following types of cable:

- ▶ Mains supply: NYM-J, 1.5 mm²
- ▶ Alarm contact: The cable for the alarm contact depends on the kind of alarm analysis used (e.g. shielded cable).

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!

Special conditions for use in IT systems

Use in IT systems is governed by special conditions, and these are set out in the EC fan operation manual!



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 model (type ... 58/56/68), KaControl model (type ...58C1/56C1/68C1)

| Type | Nominal voltage [V] | Mains frequency [Hz] | Active power [kW] | Nominal current [A] | Leakage current [mA] | Maximum pre-fusing [A] | IP protection rating | Protection class |
|--------------------|---------------------|----------------------|-------------------|---------------------|----------------------|------------------------|----------------------|------------------|
| 44**56 44**56C1 | 230 | 50/60 | 0.14 | 1.27 | <3.5 | B10 | 54 | I |
| 44**58 44**58C1 | 230 | 50/60 | 0.17 | 1.46 | <3.5 | B10 | 54 | I |
| 45**56 45**56C1 | 230 | 50/60 | 0.17 | 1.51 | <3.5 | B10 | 54 | I |
| 45**58 45**58C1 | 230 | 50/60 | 0.39 | 1.74 | <3.5 | C16 | 54 | I |

| Type | Nominal voltage [V] | Mains frequency [Hz] | Active power [kW] | Nominal current [A] | Leakage current [mA] | Maximum pre-fusing [A] | IP protection rating | Protection class |
|--------------------|---------------------|----------------------|-------------------|---------------------|----------------------|------------------------|----------------------|------------------|
| 46**58 46**58C1 | 230 | 50/60 | 0.46 | 2.13 | <3.5 | C16 | 54 | I |
| 47**56 47**56C1 | 230 | 50/60 | 0.37 | 1.69 | <3.5 | C16 | 54 | I |
| 47**58 47**58C1 | 230 | 50/60 | 0.85 | 3.83 | <3.5 | C16 | 54 | I |
| 48**68 48**68C1 | 230 | 50/60 | 0.68 | 3.11 | <3.5 | C16 | 54 | I |

Tab. 12: Electrical data for TOP, without KaControl and valve actuator

| Type | Number |
|---|--------|
| Speed controller, type 30510 | 10 |
| Room thermostat, type 30155 | 2 |
| Clock thermostat 230 V, type 30256 | 2 |
| Electronic speed controller, type 30515 | 10 |

Tab. 13: Maximum connectible unit heaters with EC fan per speed control unit

7.2 Electromechanical control type ...58/56/68

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)

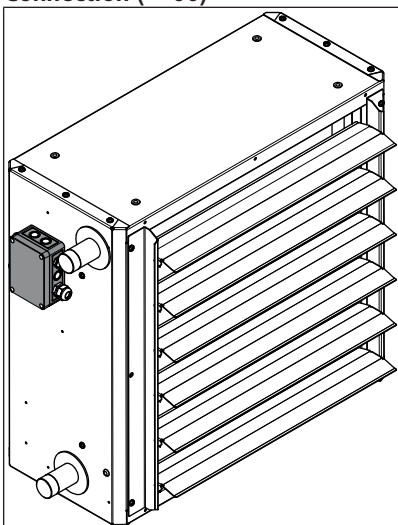


Fig. 17: TOP with motor junction box

Power supply and control

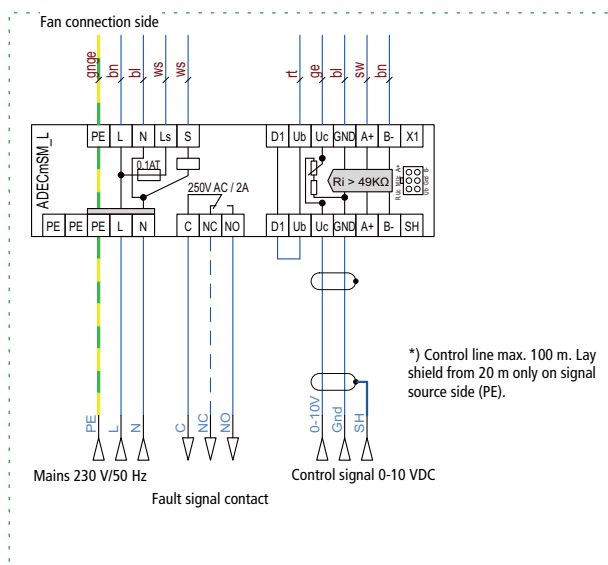
All sizes require a power supply of 230 V / 50/60 Hz and can be activated via a control input of 0-10 VDC ($R_i > 49 \text{ KO}\Omega$). Types 45xx58, 46xx58, 47xx5x and 48xx68 can alternatively be operated via an integral MODBUS RTU interface. The shield of the Bus line can be wired through to terminal 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 45xx58, 46xx58, 47xx5x and 48xx68 is protected by a relay with a unit fuse $\varnothing 5 \times 20 \text{ mm}$, T0,1A.

TOP [TOP C]

Assembly, installation and operating instructions

Terminal configuration for control of unit heater with EC fan (46xx58)



Control via 0 - 10 VDC

The 0 - 10 VDC control signal is interpreted for speed according to the following values:

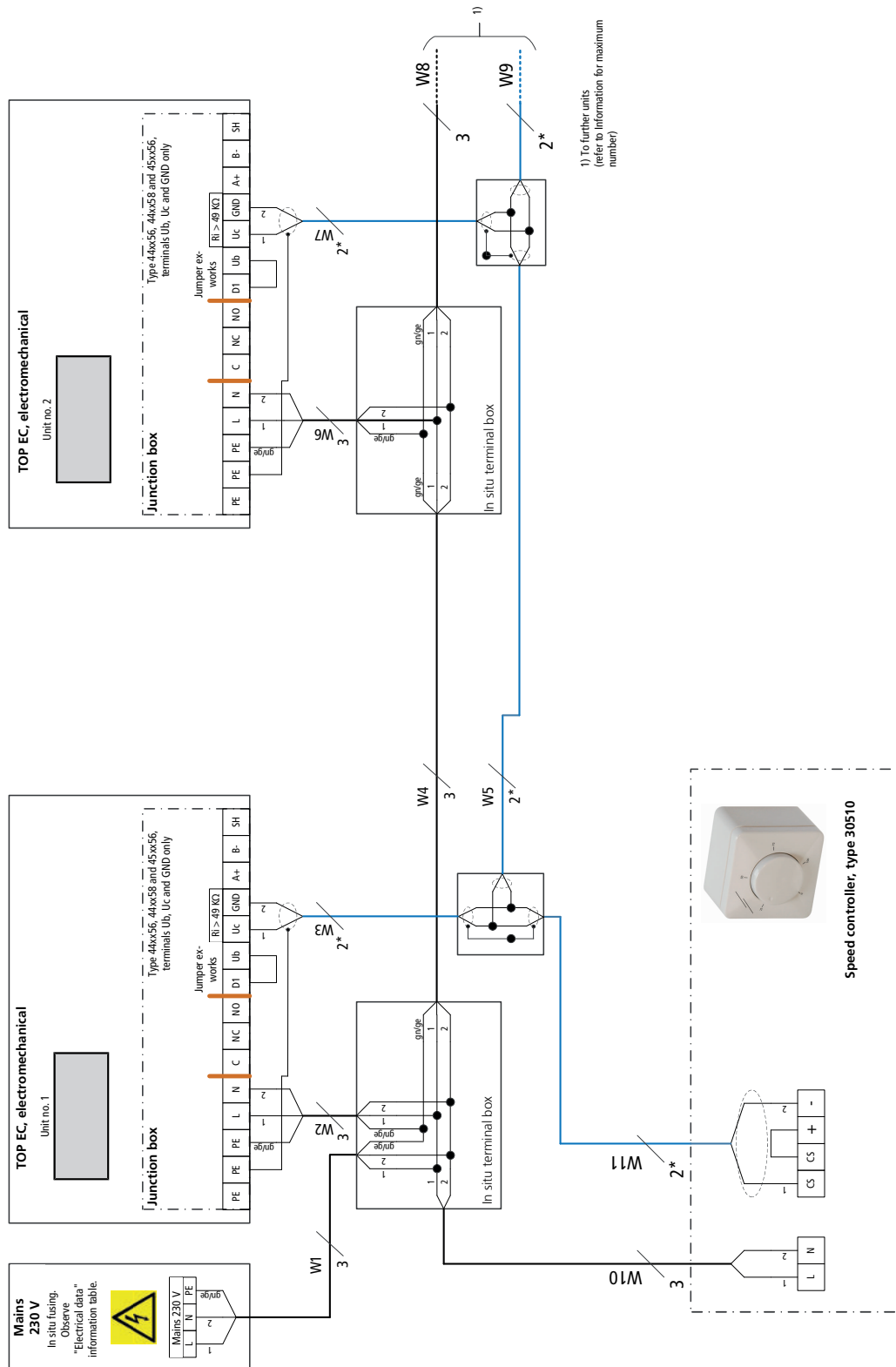
| Control signal | Function |
|----------------|---------------------|
| 0 V | Off |
| 2 - 10 V | $n_{(2 V)} - 100\%$ |

The speed can be limited to approx. 50% of the maximum speed by the potentiometer in the junction box.

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

- ▶ Comply with the details on cable types and cabling with due consideration of VDE 0100.
- ▶ Without *: NYM-J. The requisite number of wires, including PE 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 0.8 mm, max. 100 m between the fan speed controller and the last unit heater; provide a shield on one side when longer than 20 m. Lay separately from high voltage 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 lines.
- ▶ With ***: J-Y(ST)Y, 0.8 mm, max. 50 m. Lay separately from high voltage lines.
- ▶ With ****: J-Y(ST)Y, 0.8 mm, max. 100 m. Lay separately from high voltage 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.
- ▶ When using residual current circuit breakers, they need to be at least mixed frequency-sensitive (type F) for types 44xx5x and 45xx56, and all current-sensitive (type B) for all other types. When the power supply to the unit is switched on, pulsed charging currents of the capacitors in the integrated EMC filter can cause residual current safety devices to trip.
- ▶ Note the electrical data when rating the in-situ mains power supply and fuse.

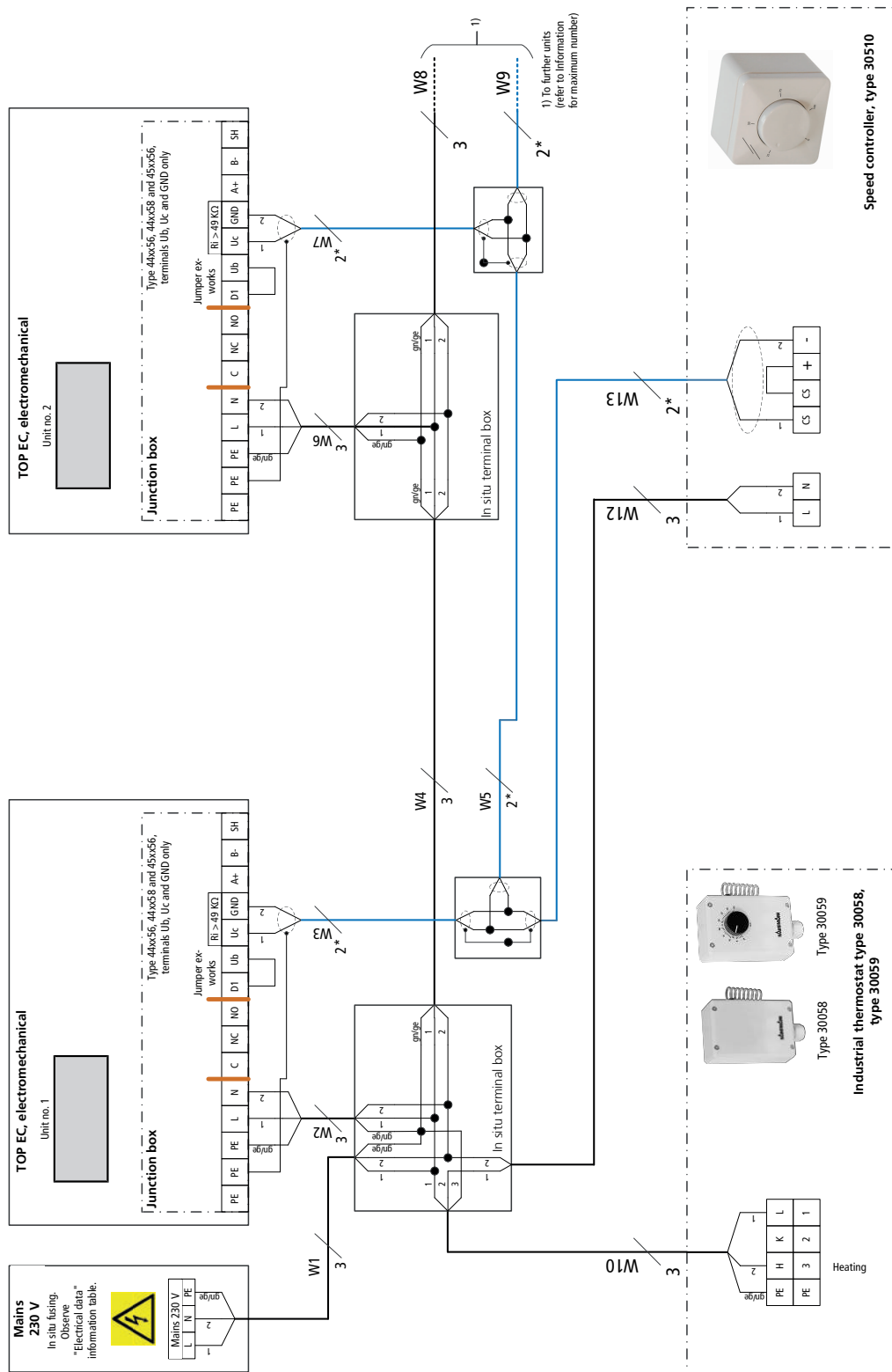
7.2.2 Cabling of TOP (**00), actuation by speed controller type 30510



TOP [TOP C]

Assembly, installation and operating instructions

7.2.3 Cabling TOP (**00), activation via speed controller type 30510 with industrial thermostat type 30058/ 30059



Mains
230 V/50 Hz
In situ fusing.
Observe
"Electrical data"
information table.

TOP EC, electromechanical
Unit no. 1

Junction box
Type 44x56, 44x58, 45x56, terminals Ub, Uc and GND only

TOP EC, electromechanical
Unit no. 2

Junction box
Type 44x56, 44x58, 45x56, terminals Ub, Uc and GND only

In situ terminal box

Wiring connections:

- W1:** Mains L to PE terminal in Unit 1 junction box.
- W2:** Mains N to N terminal in Unit 1 junction box.
- W3:** Mains PE to PE terminal in Unit 1 junction box.
- W4:** Mains L to PE terminal in Unit 2 junction box.
- W5:** Mains N to N terminal in Unit 2 junction box.
- W6:** Mains PE to PE terminal in Unit 2 junction box.
- W7:** Mains L to PE terminal in Unit 1 junction box.
- W8:** Mains N to N terminal in Unit 1 junction box.
- W9:** Mains PE to PE terminal in Unit 1 junction box.
- W10:** Mains L to PE terminal in Unit 2 junction box.
- W11:** Mains N to N terminal in Unit 2 junction box.
- W12:** Mains PE to PE terminal in Unit 2 junction box.
- W13:** Mains L to PE terminal in Unit 1 junction box.
- W14:** Mains N to N terminal in Unit 1 junction box.
- W15:** Mains PE to PE terminal in Unit 1 junction box.

Heating:

| | | | |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| N | N | N | N |
| 4 | 4 | 2 | 1 |

Room thermostat, type 30055

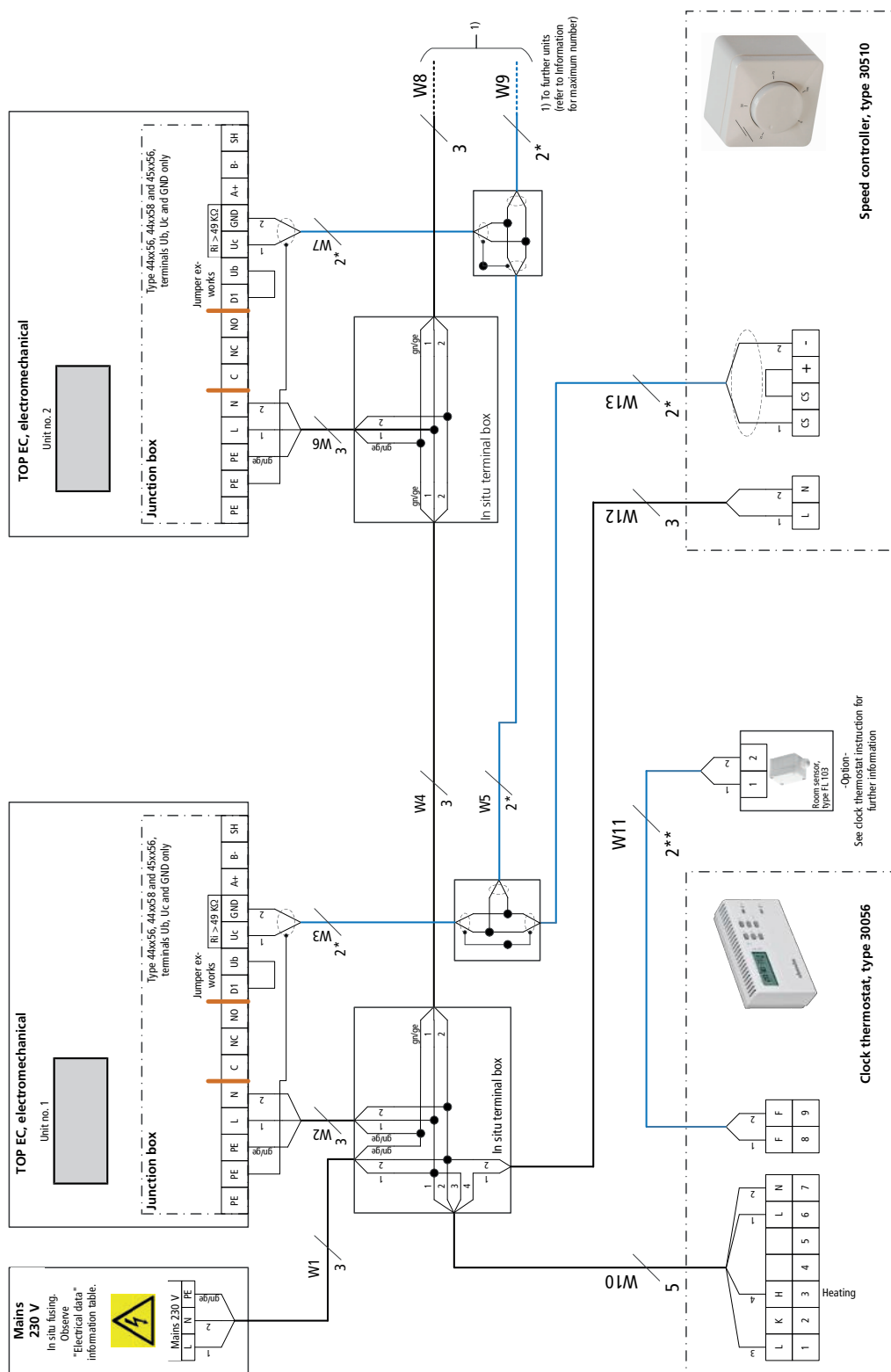
Speed controller, type 30510

1) To further units (refer to "Information" for maximum number)

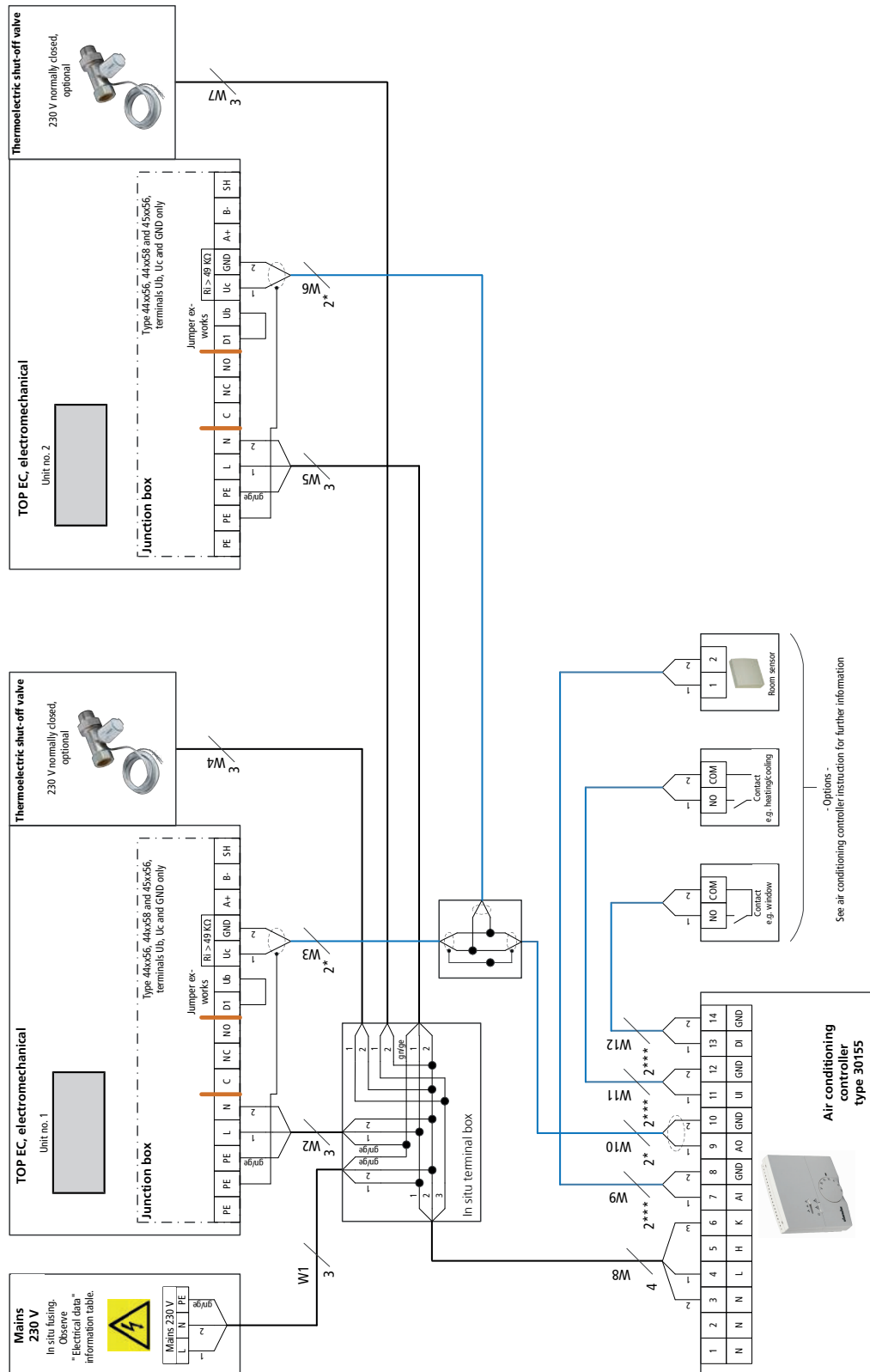
TOP [TOP C]

Assembly, installation and operating instructions

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



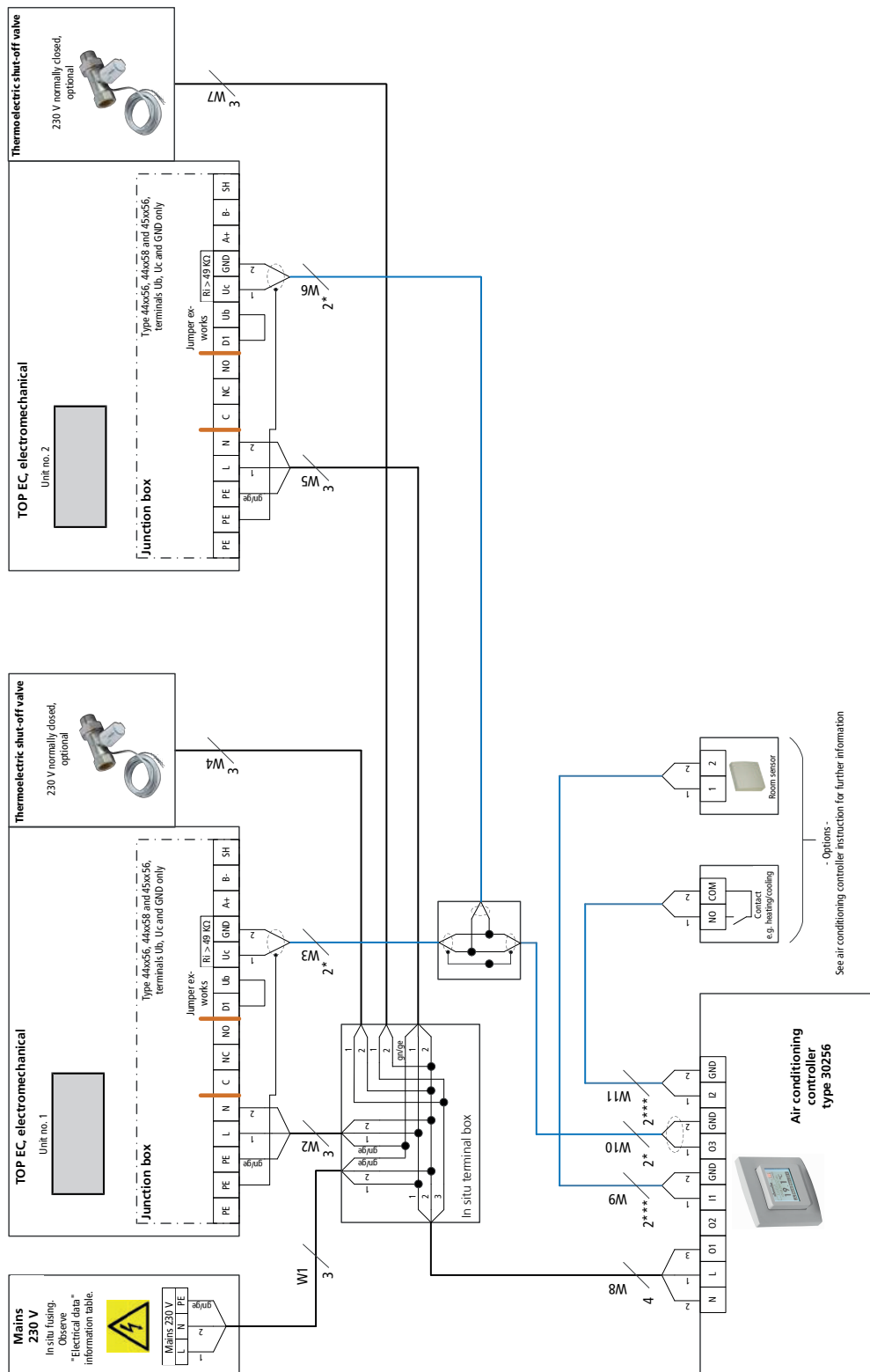
7.2.6 Cabling of TOP (**00), actuation by climate controller type 30155, 2-pipe valve actuator 230 V AC, Open/Close



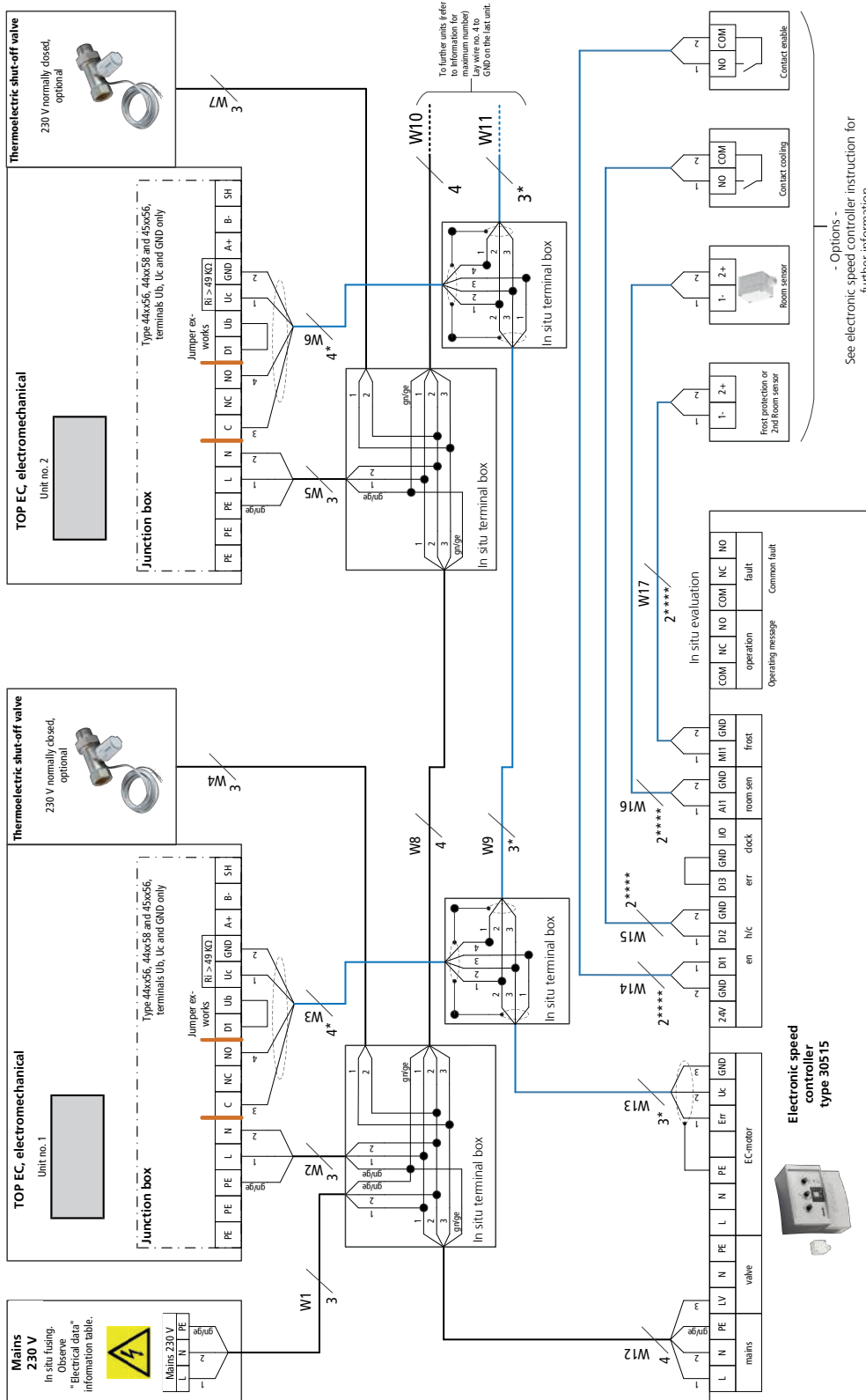
TOP [TOP C]

Assembly, installation and operating instructions

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



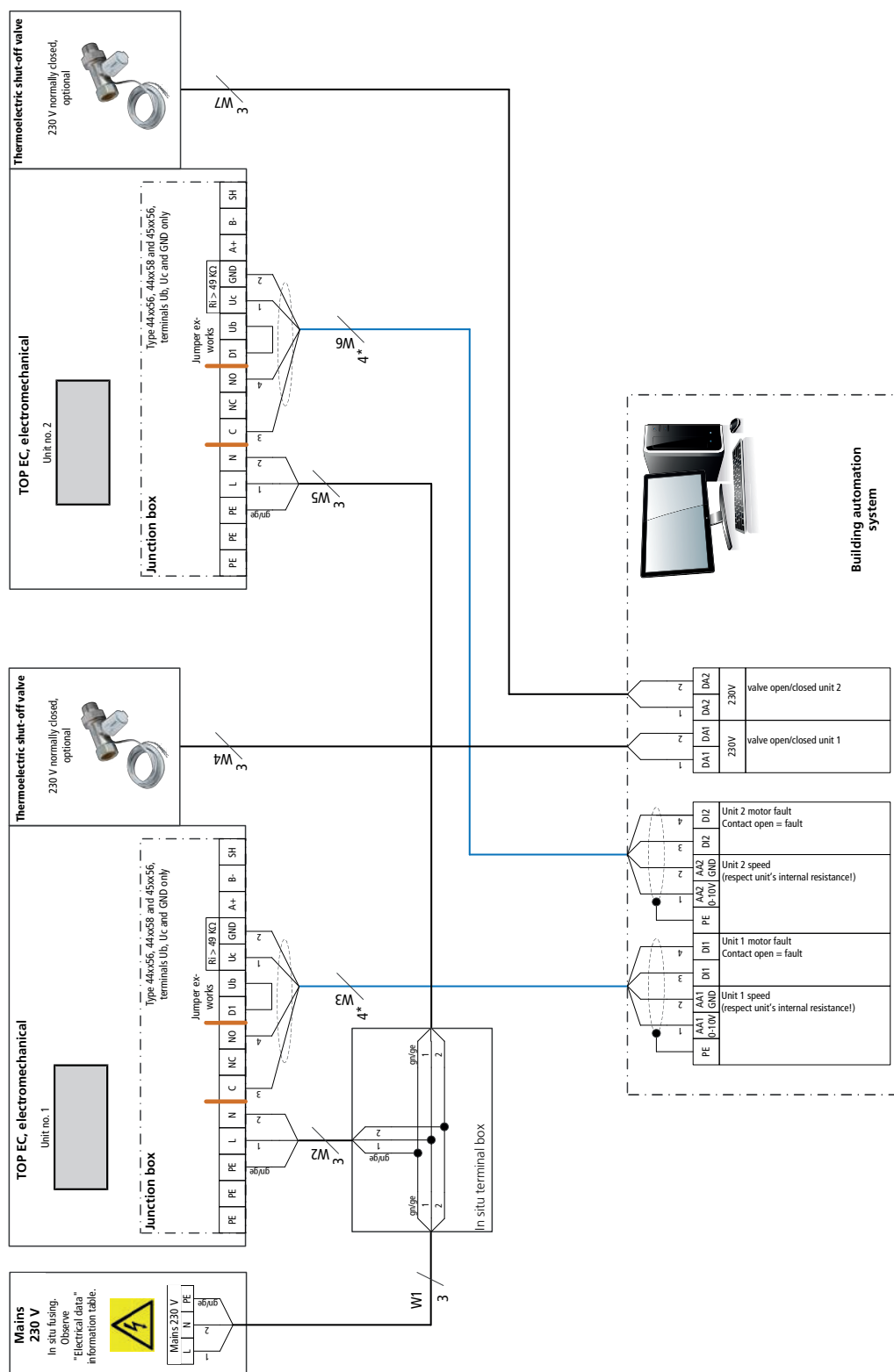
7.2.8 Cabling of TOP (*00), actuation by speed controller type 30515



TOP [TOP C]

Assembly, installation and operating instructions

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



7.3 KaControl (*C1)

7.3.1 KaController installation

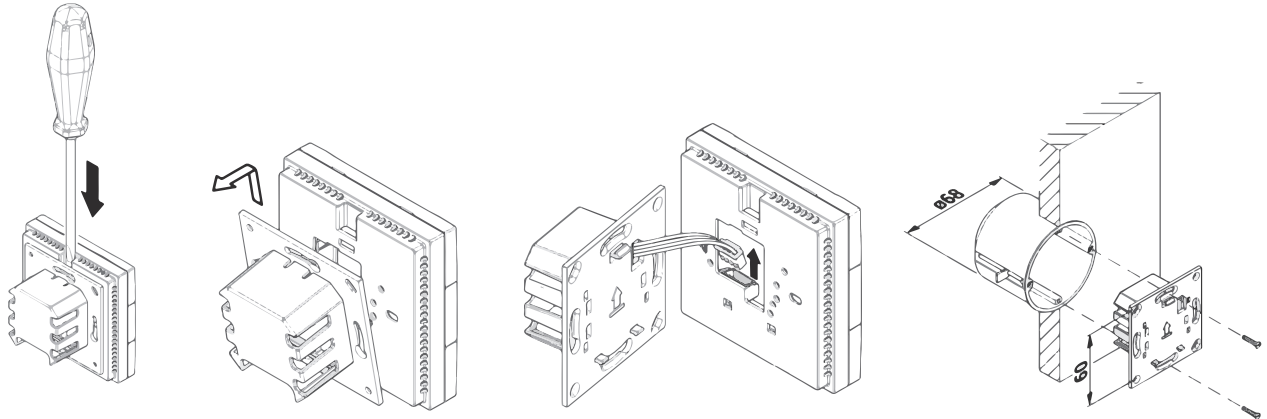


Fig. 18: Installation of flush-mounted back box

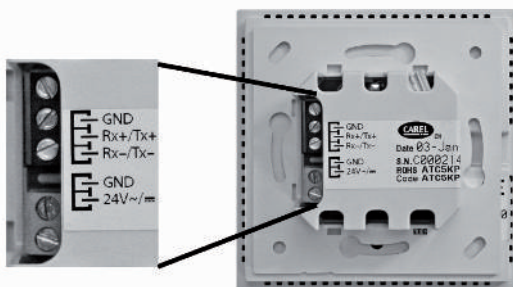


Fig. 19: KaController terminals

Electrical connection

- Connect the KaController to the nearest KaControl unit in line with the wiring diagram. The maximum bus length between the KaController and the KaControl master unit is 30 m.
- The respective KaControl automatically becomes the master unit in the control circuit when a KaController is connected to it.

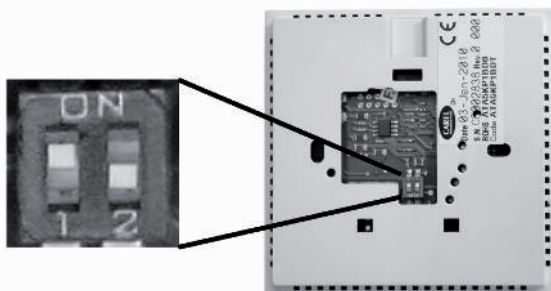


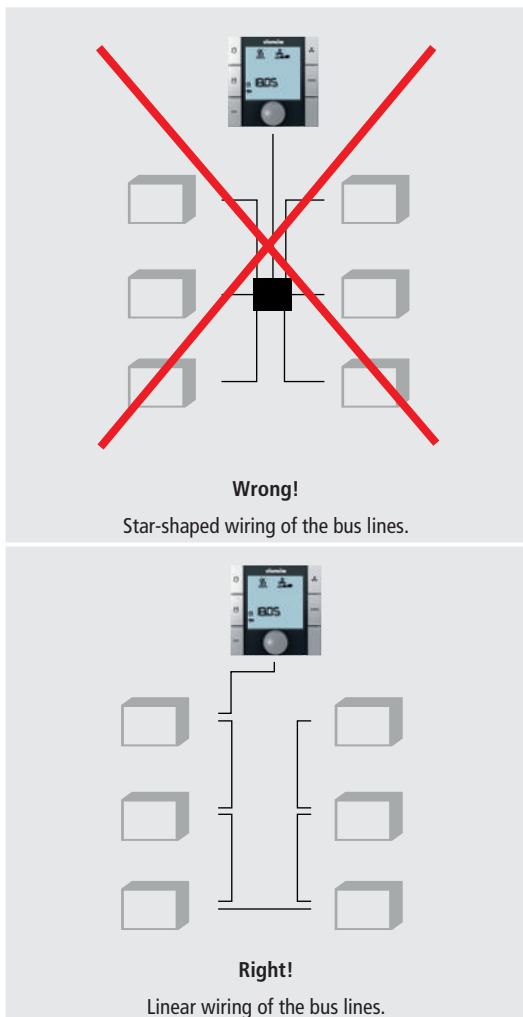
Fig. 20: DIP switch setting on KaController

DIP switch setting

The DIP switches on the rear of the KaController should be set according to the illustration:

- DIP switch 1: ON
- DIP switch 2: OFF

7.3.2 Connection (*C1)



General information

- ▶ Route all low voltage cables along the shortest route.
- ▶ Ensure that low-voltage and power cables are separated, using metal partitions on cable harnesses.
- ▶ Use only shielded cables as low-voltage and bus cables.
- ▶ Lay all BUS cables in a linear pattern. Star-shaped wiring is not permitted.
- ▶ The KaController is connected via a bus connection to the respective control PCB on the unit.

Tab. 14: Wiring of bus lines

**IMPORTANT NOTE!**

Use shielded, paired cables as bus cables, UNITRONIC® BUS LD 2x2x0.22, but at least of the same value or higher.

**IMPORTANT NOTE!**

When laying bus cables, avoid the formation of star points, for instance in junction boxes. Loop the cables through to the units!

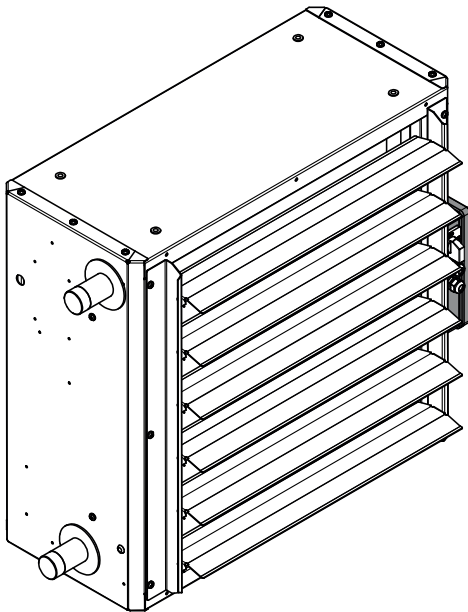
Description of wiring

Fig. 21: TOP with KaControl module

The KaControl module offers the option of controlling the fan motor and valve actuator either via a 0 - 10 VDC signal or via the KaController. The EC fan and the KaControl recirculation air module can be disconnected from the mains power supply via the integral master switch. **None** of the additional attachments are disconnected from the mains power supply via the main switch.

The type of activation is set by 6 DIP switches on the SmartBoard in accordance with the wiring diagram and system configuration.

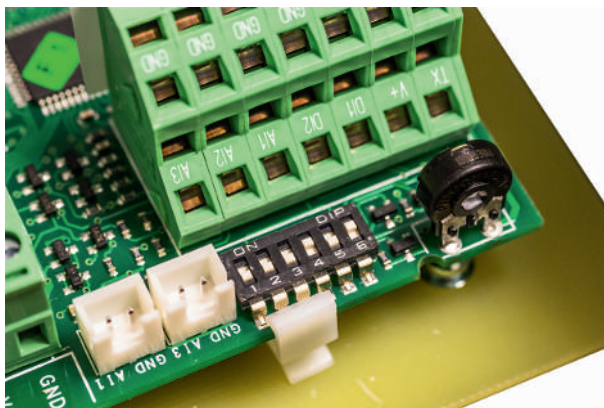


Fig. 22: SmartBoard DIP switch and potentiometer

Control via 0 - 10 VDC

The 0-10 VDC control signal at input terminals AI2 and GND (Ri = 20 kOhm) on the SmartBoard is interpreted for speed and valve control according to the following values:

| Control signal | Function |
|----------------|-------------------------|
| 0 - 3 V | Unit "Off" |
| 3 - 9 V | Valve "Open" |
| 4 - 9 V | Fan speed min. ... 100% |

A maximum limit can be set via the potentiometer on the SmartBoard.

Output terminals V1 and GND are available on the SmartBoard to activate a 24 VDC open/close actuator. Maximum permissible load 0.5 A.

A non-floating fault message 24 VDC/max. 0.5 A is available at terminals V2 and GND after appropriate parametrisation with an additional KaController. Any EC fan fault is signalled to the KaControl system and the red LED in the housing illuminates.



Fig. 23: Power and patch boxes for air heaters

Voltage supply and fusing

EC fan and KaControl recirculation air module are supplied together with 230 V/50 Hz voltage via a supply line. An operating indicator LED is located on the terminal circuit board in the KaControl module. Also installed on the terminal circuit board is a unit fuse Ø5 x 20 mm on the primary side for the control voltage, as well as on the secondary side for the 24 V voltage and a unit fuse Ø5 x 20 mm on the SmartBoard.

| Control voltage (terminal circuit board) | 24 V – voltage (terminal circuit board) | SmartBoard |
|--|---|------------|
| T 1.0 A | T 315 mA | T 5.0 A |

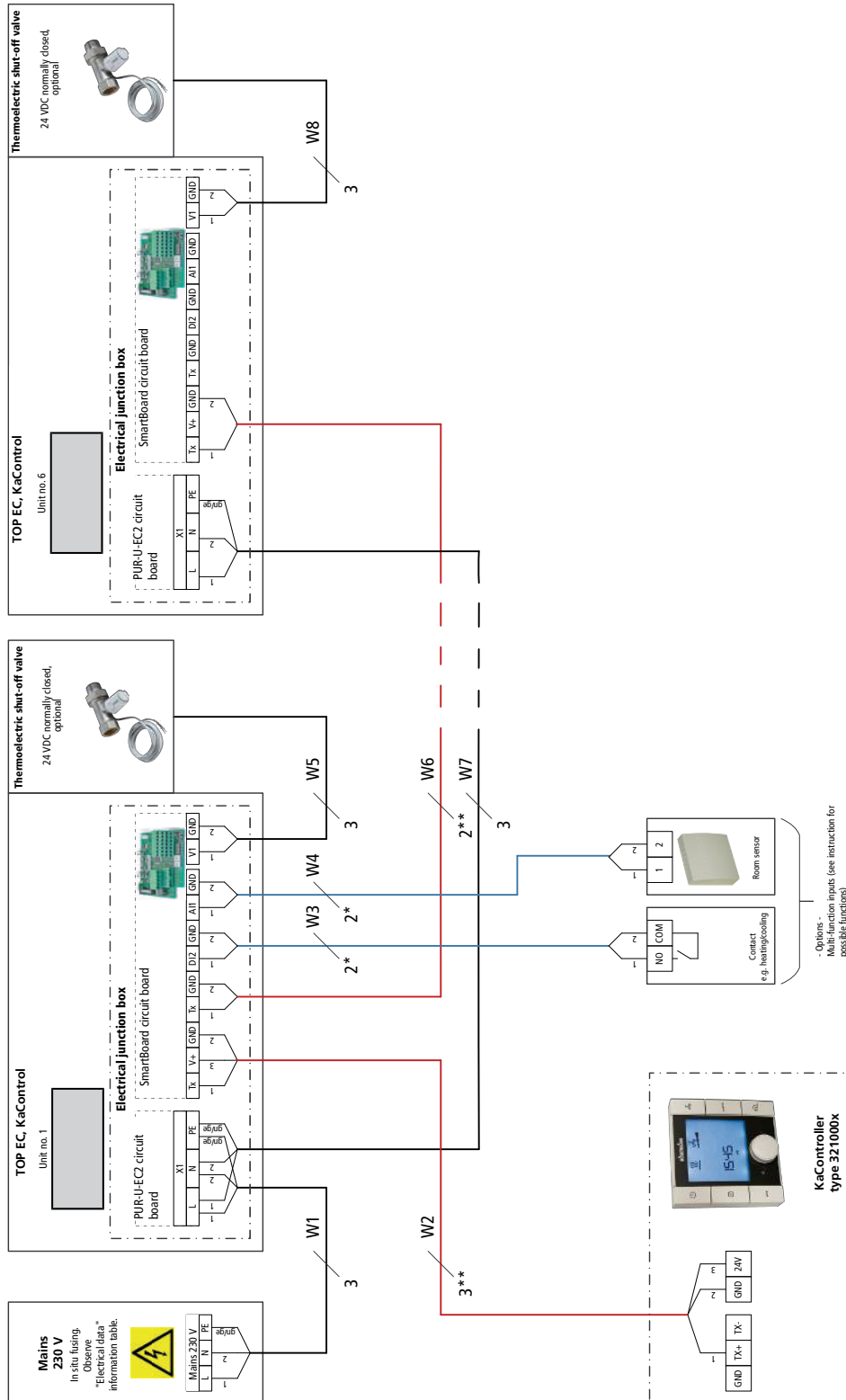
Observe these points in the following installation diagrams with KaControl:

- ▶ Comply with the details on cable types and cabling with due consideration of VDE 0100.
- ▶ Without *: NYM-J. The requisite number of wires, including PE 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. Lay separately from high voltage lines.
- ▶ With **: Lay UNITRONIC BUS LD 0.22 mm² or similar separately from high voltage lines.
- ▶ If other types of cables are used, they must be at least equivalent.
- ▶ Length of Bus line from the KaController to unit 1: max. 30 m.
- ▶ Maximum number of parallel units: 2 units. With a CAN bus card type 3260301 (see Accessories) needed for each unit and a terminal resistor on the first and last unit, maximum 30 no.
- ▶ Length of Bus line from unit 1 to unit 2 max. 30 m. With each unit, requisite CAN bus card type 3260301 (see Accessories), maximum 500 m.
- ▶ Length of cable for room sensor and switching contact maximum 30 m, 1 mm², maximum 100 m
- ▶ The terminals on the unit for the mains power supply are suitable for a maximum wire cross-section of 2.5 mm².
- ▶ When using residual current circuit breakers, they need to be at least mixed frequency-sensitive (type F) for types 44xx5x and 45xx56, and all current-sensitive (type B) for all other types. When the power supply to the unit is switched on, pulsed charging currents of the capacitors in the integrated EMC filter can cause residual current safety devices to trip.
- ▶ The electrical data needs to be respected when rating the in-situ mains power supply and fusing.

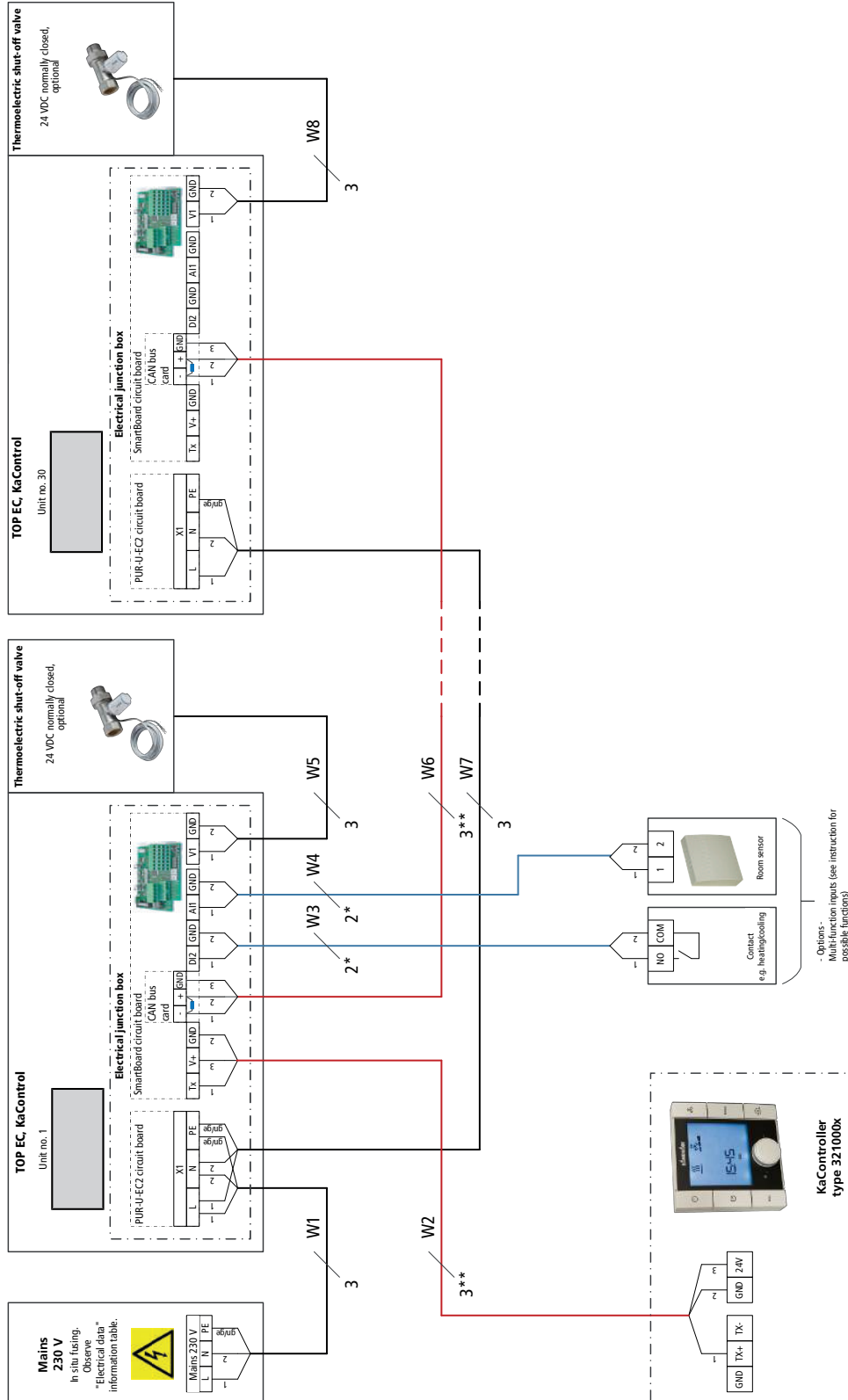
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Assembly, installation and operating instructions

7.3.3 Cabling TOP (*C1), activation via KaController type 321000x, 2-wire, valve 24 VDC, open/closed



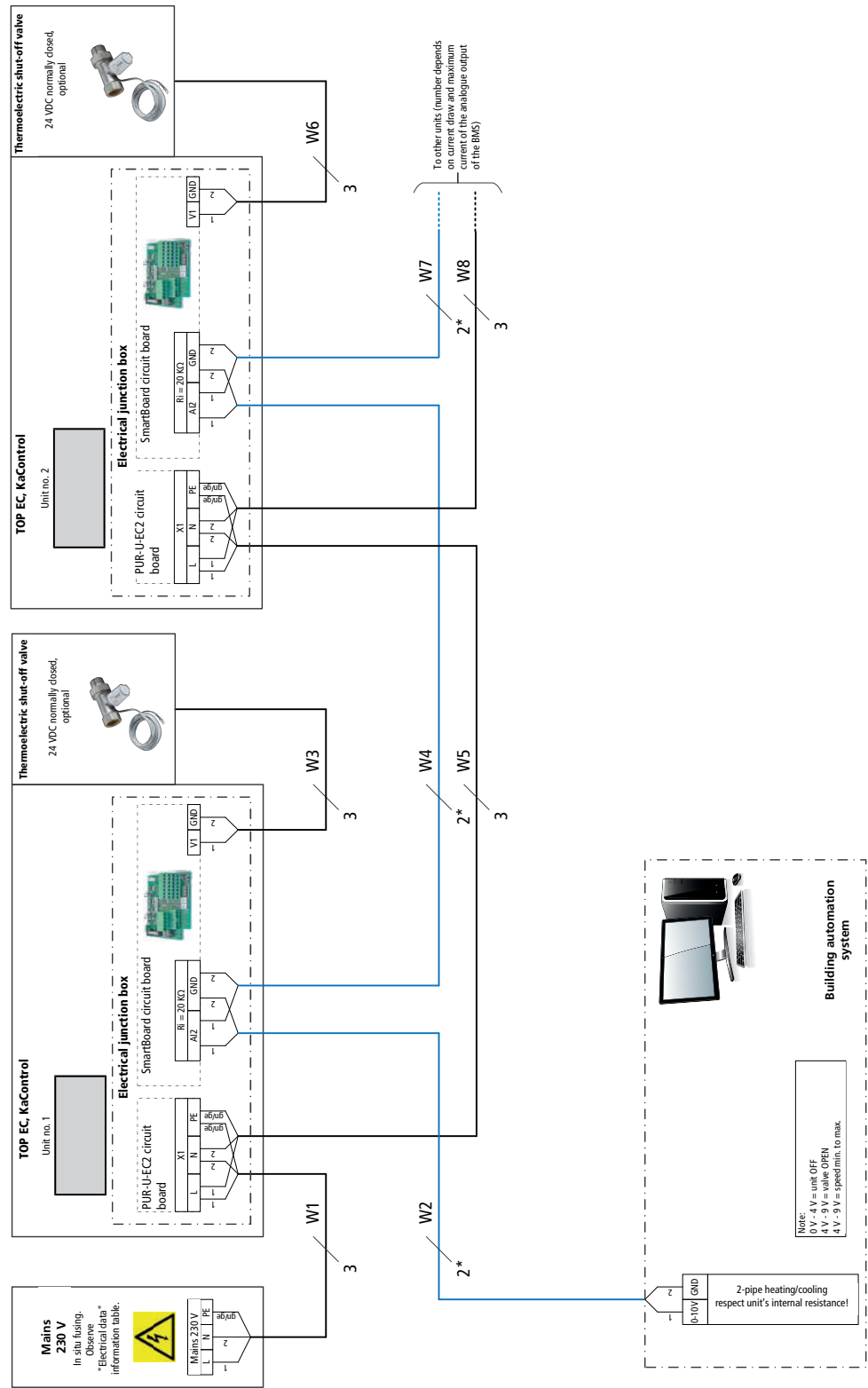
7.3.4 Cabling TOP (*C1), activation via KaController type 321000x, 2-wire, valve 24 VDC, open/closed, with CAN bus card



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Assembly, installation and operating instructions

7.3.5 Cabling TOP (*C1), activation via in situ 0-10 VDC signal



8 Pre-commissioning checks

Before initial commissioning, check whether all the necessary conditions have been met so that the unit can function 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.
- ▶ Check whether DIP switches have been correctly set in accordance with the wiring diagram.

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" [► 50].

9 Operation

9.1 Operation of electromechanical control




| | |
|--|--|
|  <p>A white, square-shaped speed controller with a large rotary dial in the center. The dial has markings for 25, 50, 75, and 100. There are also some smaller markings and a switch on the top left.</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 silver, rectangular electronic speed controller with a digital display and several control knobs and buttons. A small white sensor is shown next to it.</p> | <p>Electronic speed controller, type 30515</p> <ul style="list-style-type: none"> ▶ With integrated digital timer, protection rating 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, incl. sensor ▶ Suitable for: EC units, electromechanical, max. number of connectible units: ten TIP, TOP, Ultra or Venkon, two KaCool D AF or KaCool W |
|  <p>A white, rectangular room thermostat with a large rotary dial for temperature setting. It also features a selector switch for Standby, Manual fan, and Automatic fan, and a 3-stage switch for pre-selecting the fan speed.</p> | <p>Room thermostat, type 30155</p> <ul style="list-style-type: none"> ▶ Electronic room thermostat with 3-stage automatic function for 2- and 4-pipe applications, surface-mounted wall installation on a flush-mounted box in visually unobtrusive design ▶ simple operation using a large rotary dial for temperature setting with mechanical range limitation of the temperature setpoint, operating mode selector switch, Standby, Manual fan, Automatic fan, 3-stage switch for pre-selecting the fan speed when the operating mode selector switch is in the "Manual fan" position ▶ option for external room sensor connection ▶ control input for heating/cooling changeover with 2-pipe applications ▶ digital input can be set to Comfort/ECO or ON/OFF switchover |

Fig. 24: Speed controller, type 30510

Fig. 25: Electronic speed controller type 30515

Fig. 26: Room thermostat, type 30155



Fig. 27: Clock thermostat type 30256

Clock thermostat 230 V, type 30256

- ▶ Electronic clock thermostat for 2- and 4-pipe applications, surface-mounted wall installation on a flush-mounted box in visually unobtrusive design
- ▶ Operation using 4 sensor keys
- ▶ Timer with automatic summer/winter changeover
- ▶ Option for external room sensor
- ▶ Control input for heating/cooling changeover with 2-pipe applications
- ▶ Digital input can be set to Comfort/ECO or ON/OFF switchover
- ▶ Parallel operation of 2 units is possible

9.2 Operation of the KaController

The following information is limited to the key content on the operation of the KaController and KaControl system. More information is included separately in the KaControl SmartBoard user manual.

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Assembly, installation and operating instructions

9.2.1 Function keys, display elements

All menus can be selected and set using the navigator dial.

The LED background lighting is automatically switched off 5 seconds after the KaController is last used. The LED background lighting can be permanently disabled using a parameter setting.

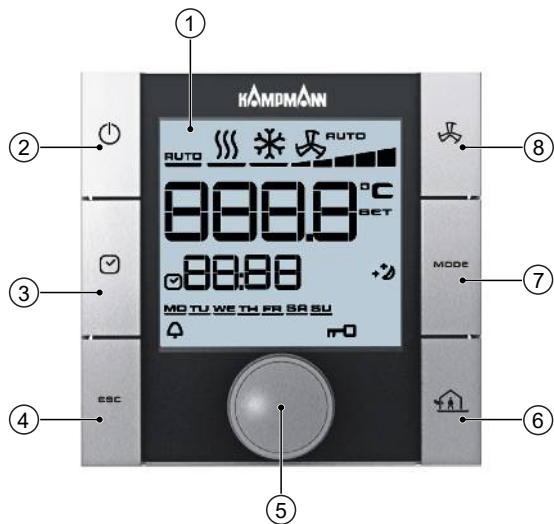




Fig. 28: KaController with function keys, type 3210002

| | | | |
|---|---|---|--|
| 1 | Display with LED background lighting | 2 | ON/OFF key (depending on setting) <ul style="list-style-type: none">▶ ON/OFF▶ Eco mode/Day mode (factory setting) |
| 3 | TIMER button <ul style="list-style-type: none">▶ Set time▶ Set timer programs | 4 | ESC button <ul style="list-style-type: none">▶ back to standard view |
| 5 | Navigator dial <ul style="list-style-type: none">▶ Change settings▶ Call up menus | 6 | House symbol <ul style="list-style-type: none">▶ External ventilation |
| 7 | MODE button <ul style="list-style-type: none">▶ Set operating modes (disabled with 2-pipe applications) | 8 | FAN button <ul style="list-style-type: none">▶ Set fan control |

| | |
|--|---|
|  <p>Fig. 29: KaController type 3210001</p> | <p>KaController without operating keys (one-button operation) type 3210001</p> <ol style="list-style-type: none">1. Display with LED background lighting2. Navigator dial<ul style="list-style-type: none">▶ Change settings▶ Call up menus |
|  <p>Fig. 30: KaController black, type 3210006</p> | <p>KaController, black without function keys (one-button operation) type 3210006</p> <ol style="list-style-type: none">1. Display with LED background lighting2. Navigator dial<ul style="list-style-type: none">▶ Change settings▶ Call up menus |

The symbols shown on the display depend on the application (2-pipe, 4-pipe etc.) and the parameters set.

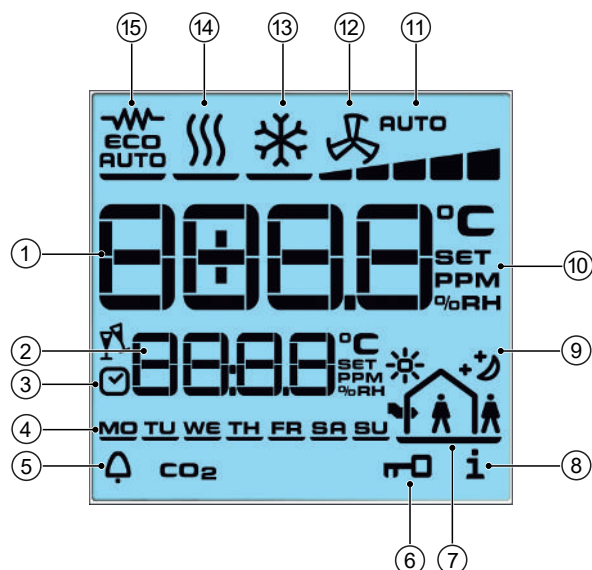


Fig. 31: Display

| | | | |
|----|---|----|-----------------------------|
| 1 | Display of setpoint room temperature | 2 | Current time |
| 3 | Timer program enabled | 4 | Weekday |
| 5 | Alarm | 6 | Selected function is locked |
| 7 | "External ventilation" mode is locked | 8 | Filter alert |
| 9 | Eco mode | 10 | Setpoint setting enabled |
| 11 | Fan control setting Auto-0-1-2-3-4-5 | 12 | Ventilation mode |
| 13 | Cooling mode | 14 | Heating mode |
| 15 | Automatic Heating/Cooling changeover mode | | |

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 |
| quarterly | Check filter for dirt, clean and change filter when needed. | User |
| every six months | Clean unit components (heat exchanger, condensate tray, condensate pump, float switch). | User |
| every six months | Check water-side connections, valves and fittings for dirt, leak-tightness and function. | 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 |

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

The electronics housing of the EC fan reaches high temperatures. 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 must not enter the inside of the motor or the electronics (through direct contact with seals or motor openings, for example), respect the protection rating (IP). The condensation drain holes (if present), positioned to suit the installation situation, must be checked 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!

10.4 Replacing the filter.



CAUTION!

Risk of injury from sharp metal housing!

The inner metal of the casing can have sharp edges.

- Wear suitable protective gloves.

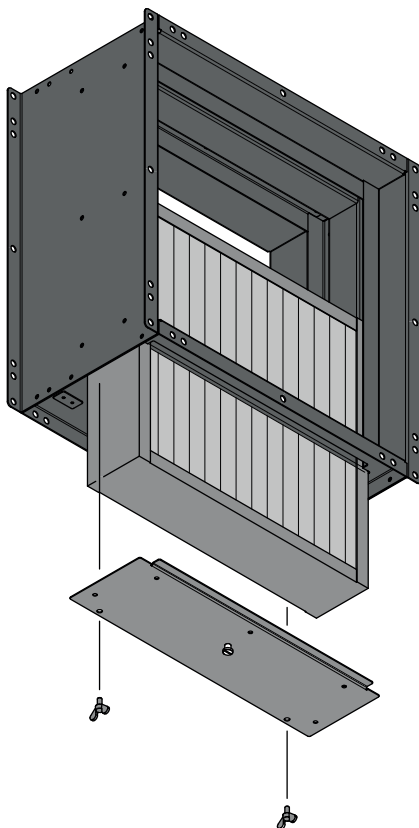


Fig. 32: Changing the ISO Coarse 90% filter cartridge

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 [► 58] provides information on who is authorised to rectify and remedy faults.

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.

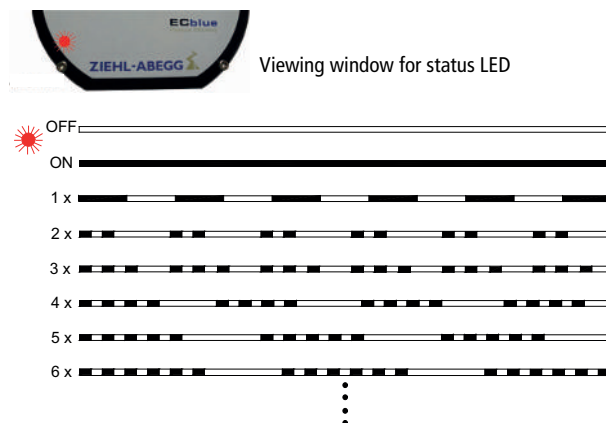


Fig. 33: Flash code

| 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 |

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| LED code | Relay in the fan* | Cause |
|----------|-------------------|----------------------------|
| 17x | 0 | Temperature alarm |
| 20x | 0 | MODBUS communication fault |

Tab. 15: 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. |
| Fan is not running. | Unit is switched off. | Switch on the unit via the controller. |
| | No power supply. | Check power supply and connect. |
| | Electrical cable not connected or incorrectly connected. | Check electrical connection and correct if necessary. |
| | No request from controller, hence fans switch off. | Change controller settings, if required. |
| | Fan blocked. | Clean dirt from fan. |
| | Impermissible operating pressure (e.g. excessive back pressure) | Correct operating point. Allow unit to cool down. Switch off the mains power for min. 25 s and switch on again to reset the error message. Alternatively, reset error message by applying a control signal of <0.5 V to DIN1 or by short circuiting DIN1 to GND. |
| | Temperature monitor has tripped. | Allow the motor to cool down, find and rectify the cause of the fault and release restart lock if necessary. |
| Water outlet | Motor winding interrupted. | Replace unit. |
| | Fault on the heat exchanger. | Replace the heat exchanger if you need to. |
| Unit not heating or cooling sufficiently (LPHW/ CHW) | Hydraulic connection not properly done. | Check flow and return and tighten, if necessary. |
| | Fan is not switched on. | Switch on fan at controller. |
| | Air volume is too low. | Set a higher speed. |
| | Filter is dirty. | Replace filter. |
| | No heating or cooling medium. | Switch on heating and/or cooling system, switch on circulation pump, vent unit/system. |
| | Valves not operating. | Replace faulty valves. |
| | Water volume too low. | Check pump output, check hydraulics. |
| | Setpoint temperature on the controller set too low/high. | Adjust temperature setting on the controller. |
| | Operating unit with integral sensor and/or external sensor is exposed to direct sunlight or positioned over a heat source. | Place operating unit with integral sensor and/or external sensor in a suitable position. |
| | Air cannot blow out or in freely. | Remove obstacles at the air outlet/air inlet. |
| | Heat exchanger dirty. | Clean heat exchanger. |
| | Air in the heat exchanger. | Vent heat exchanger. |
| 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. |

| Fault | Possible cause | Remedy |
|-------|---------------------------|--|
| | 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 ..58/56/68

| Fault | Possible cause | Remedy |
|---|--|--|
| 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). |
| Fault alarm (Contact C – NO open) and EC fan operational | Electronics in motor junction box faulty. | Replace the motor junction box. |
| | Fault signal chain fuse faulty. (45xx58. 46xx58. 47xx5x. 48xx68) | Replace fuse. |

11.3 Fault table, KaControl, type ...58C1/ 56C1/ 68C1

| Fault | Possible cause | Remedy |
|---|---|--|
| EC fan does not rotate when power is applied to the module and control signal > 4 VDC | Mechanical blockage. | Switch off, de-energise and remove the mechanical blockage. |
| | Control voltage fuse on terminal circuit board, 24 V power fuse on terminal circuit board and/or fuse on the SmartBoard faulty. | Replace fuses. |
| | Control voltage poles switched. | Connect the control voltage correctly. |
| EC fan does not rotate 100% at max. control signal 10 VDC | Potentiometer for maximum limit incorrectly set on SmartBoard. | Change potentiometer setting. |
| | 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). |

11.4 KaControl faults

| Code | Alarms | Priority |
|------|---------------------------------------|----------|
| A11 | Faulty control sensor. | 1 |
| A12 | Motor fault. | 2 |
| A13 | Room frost protection. | 3 |
| A14 | Condensation alarm. | 4 |
| A15 | General alarm. | 5 |
| A16 | Sensor AI1, AI2 or AI3 faulty. | 6 |
| A17 | Unit frost protection. | 7 |
| A18 | EEPROM error. | 8 |
| A19 | Offline slave in the CAN bus network. | 9 |

Tab. 16: KaControl unit alarms

| Code | Alarms |
|------|--|
| tAL1 | Temperature sensor in the KaController faulty. |
| tAL3 | Real-time clock in the KaController faulty. |
| tAL4 | EEPROM in the KaController faulty. |
| Cn | Communication fault with the external control. |

Tab. 17: KaController alarms



IMPORTANT NOTE!

Important note!

More information on control settings can be found in the separate KaControl SmartBoard user manual.

11.5 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.

12 List of KaControl parameters

12.1 TOP parameter list

| Parameter | Function | Standard | Min. | Max. | Unit | TOP ¹⁰ |
|-----------|--|----------|------|------|------|-------------------|
| P000 | Software version | 24 | 0 | 255 | - | 24 |
| P001 | Base setpoint for setpoint input $\pm 3K$ | 22 | 8 | 32 | °C | 22 |
| P002 | Switching on / off hysteresis for valves | 3 | 0 | 255 | K/10 | 1 |
| P003 | Neutral zone in a 4-pipe system (only in automatic mode) | 3 | 0 | 255 | K/10 | 3 |
| P004 | Cooling without fan assistance (natural convection) | 0 | 0 | 255 | K/10 | 0 |
| P005 | Heating without fan assistance (natural convection) | 5 | 0 | 255 | K/10 | 0 |
| P006 | Fan On/Off hysteresis (only in ventilation mode) | 5 | 0 | 255 | K/10 | 5 |
| P007 | P-band, heating | 20 | 0 | 100 | K/10 | 20 |
| P008 | P-band, cooling | 20 | 0 | 100 | K/10 | 20 |
| P009 | Offset to the base setpoint for setpoint input $\pm 3K$ | 3 | 0 | 10 | C | 3 |
| P010 | Clip-on sensor: limit temperature to enable fan stages 1 and 2 in heating mode | 26 | 0 | 255 | °C | 26 |
| P011 | Clip-on sensor: limit temperature to enable fan stages 3 and 4 in heating mode | 28 | 0 | 255 | °C | 28 |
| P012 | Clip-on sensor: limit temperature to enable fan stage 5 in heating mode | 30 | 0 | 255 | °C | 30 |
| P013 | Clip-on sensor: hysteresis for limit temperatures P010, P011, P012, P014 | 10 | 0 | 255 | K/10 | 10 |
| P014 | Clip-on sensor: limit temperature for enabling the fan stages in cooling mode | 18 | 0 | 255 | °C | 18 |
| P015 | Function of input AI1 | 0 | 0 | 19 | - | 0 |
| P016 | Function of input AI2 | 0 | 0 | 19 | - | 0 |
| P017 | Function of input AI3 | 0 | 0 | 9 | - | 0 |
| P018 | Temperature increase of cooling setpoint in Eco mode | 30 | 0 | 255 | K/10 | 30 |
| P019 | Temperature decrease of heating setpoint in Eco mode | 30 | 0 | 255 | K/10 | 30 |
| P020 | ADC limit coefficient | 6 | 0 | 15 | - | 6 |
| P021 | ADC average coefficient | 6 | 0 | 15 | - | 6 |
| P022 | Activation/disabling of sun symbol in Comfort mode | 0 | 0 | 1 | - | 0 |
| P023 | Difference for compensation during cooling | 0 | -99 | 127 | K/10 | 0 |
| P024 | Coefficient for compensation during heating | 0 | -20 | 20 | 1/10 | 0 |
| P025 | Difference for compensation during heating | 0 | -99 | 127 | K/10 | 0 |
| P026 | Coefficient for compensation during heating | 0 | -20 | 20 | 1/10 | 0 |
| P027 | Fan setting: maximum run-time for manual fan mode | 0 | 0 | 255 | min | 0 |
| P028 | Flushing function: fan stage during the flushing function | 2 | 1 | 5 | - | 2 |
| P029 | Activation of continuous fan mode | 0 | 0 | 1 | - | 0 |
| P030 | Vent temperature enable | 12 | 0 | 255 | °C | 12 |
| P031 | Vent interval | 27 | 0 | 255 | °C | 27 |
| P032 | Flushing function: maximum idle time of fan | 15 | 0 | 255 | min | 15 |
| P033 | Flushing function: duration of flushing function | 120 | 0 | 255 | s | 120 |
| P034 | Flushing function: activation in operating modes | 0 | 0 | 3 | - | 0 |
| P035 | Fan run-on time after operating mode is switched to stage 1 | 0 | 0 | 255 | s | 0 |

¹⁰

Parameter key TOP, SAP no. 9000812, dated 01.02.2018

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| Parameter | Function | Standard | Min. | Max. | Unit | TOP ¹⁰ |
|-----------|---|----------|------|------|------|-------------------|
| P036 | Type of setpoint | 0 | 0 | 1 | - | 0 |
| P037 | Display | 1 | 0 | 7 | - | 1 |
| P038 | Lock/disable function on control unit | 72 | 0 | 255 | - | 72 |
| P039 | Function of digital output V2 (in 2-pipe system) | 0 | 0 | 3 | - | 0 |
| P040 | Valve actuation via pulse width modulation | 0 | 0 | 1 | - | 0 |
| P041 | Reset time of PI controller to activate the fan in automatic fan mode | 0 | 0 | 20 | min | 0 |
| P042 | Fan setting: lock and activate fan stages | 0 | 0 | 127 | - | 2 |
| P043 | Function of digital input DI1 | 0 | 0 | 22 | - | 5 |
| P044 | Function of digital input DI2 | 0 | 0 | 22 | - | 0 |
| P045 | Threshold voltage for potentiometer that switches on the unit | 10 | 0 | 100 | kOhm | 10 |
| P046 | Temperature setting corresponds to minimum resistance value = 10 kOhm in the potentiometer | 18 | 12 | 34 | °C | 18 |
| P047 | Temperature setting corresponds to maximum resistance value = 100 kOhm in the potentiometer | 24 | 13 | 35 | °C | 24 |
| P048 | Threshold voltage for potentiometer for starting the fans | 10 | 0 | 100 | kOhm | 10 |
| P049 | Threshold voltage for potentiometer for maximum fan speed | 90 | 0 | 100 | kOhm | 90 |
| P050 | Fan setting: max. fan speed | 100 | 0 | 100 | % | 100 |
| P051 | Fan setting: min. fan speed | 0 | 0 | 90 | % | 0 |
| P052 | Fan setting: enable speed limit | 0 | 0 | 1 | - | 0 |
| P053 | Valve activation via pulse width modulation of valve switching cycle | 15 | 10 | 30 | min | 15 |
| P054 | Configuration of bus system | 0 | 0 | 2 | - | 0 |
| P055 | Display of heating/cooling symbols in automatic mode | 0 | 0 | 1 | - | 0 |
| P056 | DI2 setting (polarity) when DIP 4 = ON | 1 | 0 | 1 | - | 1 |
| P057 | Reset setpoint to the value of P01 (after changing an operating program) | 0 | 0 | 1 | - | 0 |
| P058 | Sensor calibration: sensor AI1 | 0 | -99 | 127 | K/10 | 0 |
| P059 | Supply air temperature setpoint in heating mode | 35 | 0 | 50 | °C | 35 |
| P060 | Supply air temperature setpoint in cooling mode | 18 | 0 | 50 | °C | 18 |
| P061 | Sensor calibration: sensor in the KaController | 0 | -99 | 127 | K/10 | 0 |
| P062 | Sensor calibration: sensor AI2 | 0 | -99 | 127 | K/10 | 0 |
| P063 | Outside temperature <P63 fan increase by P122 | 0 | -99 | 127 | °C | 0 |
| P064 | Sensor calibration: sensor AI3 | 0 | -99 | 127 | K/10 | 0 |
| P065 | reserved | - | - | - | - | - |
| P066 | Master/Slave assignment in CAN bus | 0 | 0 | 1 | - | 0 |
| P067 | Serial CAN bus address | 1 | 1 | 125 | - | 1 |
| P068 | Logic of hydronic algorithms | 0 | 0 | 7 | - | 0 |
| P069 | Network address | 1 | 0 | 207 | - | 1 |
| P070 | Dependence of the hydronic algorithms (on Slaves) | 0 | 0 | 7 | - | 0 |
| P071 | Serial address of Slave 1 | 0 | 0 | 207 | - | 0 |
| P072 | Serial address of Slave 2 | 0 | 0 | 207 | - | 0 |
| P073 | Serial address of Slave 3 | 0 | 0 | 207 | - | 0 |
| P074 | Serial address of Slave 4 | 0 | 0 | 207 | - | 0 |
| P075 | Serial address of Slave 5 | 0 | 0 | 207 | - | 0 |

| Parameter | Function | Standard | Min. | Max. | Unit | TOP ¹⁰ |
|-----------|---|----------|------|------|------|-------------------|
| P076 | Serial address of Slave 6 | 0 | 0 | 207 | - | 0 |
| P077 | Serial address of Slave 7 | 0 | 0 | 207 | - | 0 |
| P078 | Serial address of Slave 8 | 0 | 0 | 207 | - | 0 |
| P079 | Serial address of Slave 9 | 0 | 0 | 207 | - | 0 |
| P080 | Serial address of Slave 10 | 0 | 0 | 207 | - | 0 |
| P081 | Dependence of the hydronic algorithms, Slave 1 | 0 | 0 | 7 | - | 0 |
| P082 | Dependence of the hydronic algorithms, Slave 2 | 0 | 0 | 7 | - | 0 |
| P083 | Dependence of the hydronic algorithms, Slave 3 | 0 | 0 | 7 | - | 0 |
| P084 | Dependence of the hydronic algorithms, Slave 4 | 0 | 0 | 7 | - | 0 |
| P085 | Dependence of the hydronic algorithms, Slave 5 | 0 | 0 | 7 | - | 0 |
| P086 | Dependence of the hydronic algorithms, Slave 6 | 0 | 0 | 7 | - | 0 |
| P087 | Dependence of the hydronic algorithms, Slave 7 | 0 | 0 | 7 | - | 0 |
| P088 | Dependence of the hydronic algorithms, Slave 8 | 0 | 0 | 7 | - | 0 |
| P089 | Dependence of the hydronic algorithms, Slave 9 | 0 | 0 | 7 | - | 0 |
| P090 | Dependence of the hydronic algorithms, Slave 10 | 0 | 0 | 7 | - | 0 |
| P091 | Load default values | 0 | 0 | 255 | - | 0 |
| P092 | Password management | 0 | 0 | 255 | - | 0 |
| P093 | Type of pre-comfort (room occupancy) | 0 | 0 | 3 | - | 0 |
| P094 | Pre-comfort timer | 60 | 1 | 255 | min | 60 |
| P095 | Disable DIP switch settings | 0 | 0 | 1 | - | 0 |
| P096 | Digital outputs continuously activated | 0 | 0 | 1 | - | 0 |
| P097 | Read DIP switch | - | 0 | 63 | - | - |
| P098 | Activation 0..10V: switch on limit for valves | 30 | 0 | 100 | V/10 | 30 |
| P099 | Activation 0..10V: min. switch on limit for fan speed | 40 | 0 | 100 | V/10 | 40 |
| P100 | Activation 0..10V: max. switch on limit for fan speed | 90 | 0 | 100 | V/10 | 90 |
| P101 | Valve activation by pulse width modulation of P-band in heating mode | 15 | 0 | 100 | K/10 | 15 |
| P102 | Valve activation by pulse width modulation of P-band in cooling mode | 15 | 0 | 100 | K/10 | 15 |
| P103 | Valve activation by pulse width modulation of reset time of PI controller | 0 | 0 | 20 | min | 0 |
| P104 | Minimum ON time with valve activation PWM | 3 | 0 | 20 | min | 3 |
| P105 | Compensation: max. negative delta setpoint | 50 | 0 | 150 | K/10 | 50 |
| P106 | Compensation: max. positive delta setpoint | 50 | 0 | 150 | K/10 | 50 |
| P107 | Duration of valve open to check water temperature | 5 | 0 | 255 | min | 5 |
| P108 | Duration of valve closed | 240 | 35 | 255 | min | 240 |
| P109 | Dead zone PI control for 3-way valve | 10 | 0 | 100 | K/10 | 10 |
| P110 | Hysteresis to switch between heating/fan operation | 0 | 0 | 20 | °C | 0 |
| P111 | Threshold for switching between heating/fan operation | 0 | 0 | 50 | °C | 0 |
| P112 | reserved | - | - | - | - | - |
| P113 | reserved | - | - | - | - | - |
| P114 | reserved | - | - | - | - | - |
| P115 | reserved | - | - | - | - | - |
| P116 | reserved | - | - | - | - | - |
| P117 | Lock function buttons on KaController | 0 | 0 | 7 | - | 0 |
| P118 | On delay time | 0 | 0 | 255 | sec | 0 |
| P119 | Off delay time | 0 | 0 | 255 | sec | 0 |

TOP [TOP C]

Assembly, installation and operating instructions

| Parameter | Function | Standard | Min. | Max. | Unit | TOP ¹⁰ |
|-----------|---|----------|------|------|------|-------------------|
| P120 | reserved | - | - | - | - | - |
| P121 | reserved | - | - | - | - | - |
| P122 | Relative fan speed increase via contact | 2 | 0 | 5 | - | 2 |
| P123 | Maximum valve running time | 150 | 0 | 255 | sec | 150 |
| P124 | Minimum P + I output variation for valve motion (0 to 10) | 5 | 0 | 100 | % | 5 |
| P125 | reserved | - | - | - | - | - |
| P126 | Weeks of operation | 0 | 0 | 255 | week | 0 |
| P127 | Info weeks of operation reached (filter message) | 0 | 52 | 255 | week | 0 |
| P128 | Reset weeks of operation counter | 0 | 0 | 1 | - | 0 |
| P129 | Fan speed limiter activation in certain operating modes | 0 | 0 | 1 | - | 0 |
| P130 | Absolute fan speed increase via contact | 2 | 0 | 5 | - | 2 |
| P131 | External ventilation, delay time | 0 | 0 | 255 | min | 0 |
| P132 | Operating level, master password | 22 | 0 | 255 | - | 22 |
| P133 | Hysteresis for outside temperature for switching between heating/fan mode | 0 | 0 | 255 | K/10 | 0 |
| P134 | Threshold for outside temperature for switching between heating/fan mode | 0 | 0 | 50 | °C | 0 |
| P135 | Enable virtual sensor | 0 | 0 | 1 | - | 0 |
| P136 | Enable external ventilation | 0 | 0 | 2 | - | 0 |

Tab. 18: Parameter key, SAP no. 9000812, dated 01.02.2018

12.2 KaController parameter list

| Parameter | Function | Standard | Min. | Max. | Unit | Comment |
|-----------|---|----------|------|------|------|----------------------------|
| t001 | Serial address | 1 | 0 | 207 | - | Address in Mod-bus network |
| t002 | Baud rate 0 = Baud rate 4800 1 = Baud rate 9600 2 = Baud rate 19200 | 2 | 0 | 2 | - | |
| t003 | Background lighting function 0 = Slow fade in, fast fade out 1 = Slow fade in, slow fade out 2 = Fast fade in, fast fade out | 0 | 0 | 2 | - | |
| t004 | Strong background lighting | 4 | 0 | 5 | - | |
| t005 | Sensor calibration of KaController sensor | 0 | 60 | 60 | °C | |
| t006 | LCD display contrast | 15 | 0 | 15 | - | |
| t007 | BEEP setting 0 = BEEP ON 1 = BEEP OFF | 0 | 0 | 1 | - | |
| t008 | Password for KaController Parameter menu | 11 | 0 | 999 | - | |
| t009 | Minimum settable setpoint temperature | 8 | 0 | 20 | °C | |
| t010 | Maximum settable setpoint temperature | 35 | 10 | 40 | °C | |
| t011 | Interval of setpoint setting 0 = Automatic setting depending on | 0 | 0 | 2 | - | |

| Parameter | Function | Standard | Min. | Max. | Unit | Comment |
|-----------|--|----------|------|------|------|---------|
| | PCB (parameterisable, freely programmable) 1 = Increment of 1 $\frac{1}{100}$ (parameterisable PCBs) 2 = Increment of 0.5 $\frac{1}{100}$ (freely programmable PCBs) | | | | | |
| t012 | Date/Time setting: Year | 9 | 0 | 99 | - | |
| t013 | Date/Time setting: Month | 1 | 1 | 12 | - | |
| t014 | Date/Time setting: Day | 1 | 1 | 31 | - | |
| t015 | Date/Time setting: Weekday | 1 | 1 | 7 | - | |
| t016 | Date/Time setting: Hour | 0 | 0 | 23 | - | |
| t017 | Date/Time setting: Minute | 0 | 0 | 59 | - | |

TOP [TOP C]

Assembly, installation and operating instructions

13 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.:

Type, Model, Articles No.:

Type, Modèle, N° d'article:

Typ, Model, Nr artykułu:

Typ, Model, Číslo výrobku:

TOP/TOP C

TIP

Resistent

Ultra

Bauheizer

44**; 45****; 46****; 47****; 48******

54**; 55****; 56******

84**; 85****; 86******

73**; 84****; 85****; 96****; 97******

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

DIN EN 61000-3-2; -3-3

DIN EN 61000-6-1; -6-2; -6-3

DIN EN 60335-1; -2-40

Elektromagnetische Verträglichkeit

Elektromagnetische Verträglichkeit

Elektromagnetische Verträglichkeit

**Sicherheit elektr. Geräte f. den Hausgebrauch und
ähnliche Zwecke**

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

Information requirements for fan coils according to regulation (EU) No 2016/2281
 Informationsanforderungen für Fan Coils gemäß Verordnung (EU) Nr. 2016/2281

| TOP Copper-aluminium Kupfer-Aluminium heating only nur heizen 2-pipe unit 2-Rohrsystem | | | | | | | | | | | | | | | |
|--|---------------------------------|-----------------|-----------------------|---------------------------------|--------------------------------|----------------------------|------------------------------|--------------------------|----------------------------|---------------|----------------------------|--|---|---|--|
| | | | Fan Speed Drehzahl | Motor code no. Motorennummer | cooling capacity (sensible) | Kühlleistung (sensibel) | cooling capacity (latent) | Kühlleistung (latent) | Heating capacity | Wärmeleistung | Total electric power input | Elektrische Gesamtleistungsaufnahme | Sound power level (per speed setting, if applicable) | Schallleistungspegel (ggf. je Geschwindigkeitseinstellung) | |
| Fan Ventilator | heat exchanger Wärmetauscher | Series Serie | | | P _{rated,c} kW | | P _{rated,c} kW | | P _{rated,h} kW | | P _{elec} kW | | L _{WA} dB (A) | | |
| EC, 230 V | 20 | 44 | high | 58 | - | | - | | 5,2 | | 0,165 | | 45/54/62/68/73 | | |
| | | | low | 56 | - | | - | | 4,7 | | 0,124 | | 42/51/59/66/71 | | |
| | | 45 | high | 58 | - | | - | | 9,2 | | 0,400 | | 34/56/66/75/81 | | |
| | | | low | 56 | - | | - | | 7,5 | | 0,162 | | 43/52/61/68/72 | | |
| | | 46 | high | 58 | - | | - | | 12,5 | | 0,420 | | 34/55/66/74/80 | | |
| | | | low | 56 | - | | - | | 16,6 | | 0,685 | | 34/56/68/76/81 | | |
| | 30 | 47 | high | 58 | - | | - | | 14,6 | | 0,340 | | 30/49/61/70/75 | | |
| | | | low | 56 | - | | - | | 19,8 | | 0,617 | | 33/54/66/75/80 | | |
| | | 44 | high | 58 | - | | - | | 6,1 | | 0,165 | | 43/52/60/66/71 | | |
| | | | low | 56 | - | | - | | 5,4 | | 0,124 | | 40/49/57/64/69 | | |
| | | 45 | high | 58 | - | | - | | 11,0 | | 0,400 | | 32/54/64/73/79 | | |
| | | | low | 56 | - | | - | | 8,8 | | 0,162 | | 41/50/59/66/70 | | |
| | | 46 | high | 58 | - | | - | | 16,0 | | 0,420 | | 32/53/64/72/78 | | |
| | | | high | 58 | - | | - | | 20,0 | | 0,685 | | 32/54/66/74/79 | | |
| | | 40 | 47 | high | 58 | - | | - | | 17,4 | | 0,340 | | 28/47/59/68/73 | |
| | | | | low | 56 | - | | - | | 26,8 | | 0,617 | | 31/52/64/73/78 | |
| | 44 | | high | 58 | - | | - | | 7,7 | | 0,165 | | 41/50/58/64/69 | | |
| | | | low | 56 | - | | - | | 6,4 | | 0,124 | | 38/47/55/62/67 | | |
| | 45 | | high | 58 | - | | - | | 15,1 | | 0,400 | | 30/52/62/71/77 | | |
| | | | low | 56 | - | | - | | 11,1 | | 0,162 | | 39/48/57/64/68 | | |
| | 46 | | high | 58 | - | | - | | 19,8 | | 0,420 | | 30/51/62/70/76 | | |
| | | | high | 58 | - | | - | | 29,4 | | 0,685 | | 30/52/64/72/77 | | |
| | 47 | | high | 58 | - | | - | | 23,8 | | 0,340 | | 26/45/57/66/71 | | |
| | | | low | 56 | - | | - | | 37,0 | | 0,617 | | 29/50/62/71/76 | | |

| Standard rating conditions for fan coil units according to regulation (EU) No 2016/2281 | | | | | | |
|---|-----------------|---|--------------------------------|--|---------------------------------|---|
| Norm-Prüfbedingungen für Gebläsekonvektoren gemäß Verordnung (EU) Nr. 2016/2281 | | | | | | |
| Cooling Test | Air temperature | 27 °C (dry bulb) 19 °C (wet bulb) | Inlet water temperature | 7 °C | Water temperature rise | 5 °C |
| Test Kühlbetrieb | Lufttemperatur | 27 °C (Trockenkugel) 19 °C (Feuchtkugel) | Wassertemperatur am Einlass | | Anstieg der Wassertemperatur | |
| Heating Test | Air temperature | 20 °C (dry bulb) | Inlet water temperature | 45 °C for 2-pipe units 65 °C for 4-pipe units | Water temperature decrease | 5 °C for 2-pipe units 10 °C for 4-pipe units |
| Test Heizbetrieb | Lufttemperatur | 20 °C (Trockenkugel) | Wassertemperatur am Einlass | 45 °C für 2-Rohrsysteme 65 °C für 4-Rohrsysteme | Sinken der Wassertemperatur | 5 °C für 2-Rohrsysteme 10 °C für 4-Rohrsysteme |
| Sound power test | | At ambient conditions without water flow | | | | |
| Test Schallleistungspegel | | Bei Umgebungsbedingungen ohne Wasserdurchsatz | | | | |

| Contact Details | Kampmann GmbH |
|----------------------|---|
| Kontaktinformationen | Friedrich-Ebert-Straße 128-130, D-49811 Lingen (Ems), Germany |

Information requirements for fan coils according to regulation (EU) No 2016/2281
 Informationsanforderungen für Fan Coils gemäß Verordnung (EU) Nr. 2016/2281

| TOP galvanised steel Stahl verzinkt heating only nur heizen 2-pipe unit 2-Rohrsystem | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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Standard rating conditions for fan coil units according to regulation (EU) No 2016/2281

Norm-Prüfbedingungen für Gebläsekonvektoren gemäß Verordnung (EU) Nr. 2016/2281

| Cooling Test | Air temperature | 27 °C (dry bulb) 19 °C (wet bulb) | Inlet water temperature | 7 °C | Water temperature rise | 5 °C |
|---------------------------|-----------------|---|--------------------------------|--|---------------------------------|---|
| | | 27 °C (Trockenkugel) 19 °C (Feuchtkugel) | Wassertemperatur am Einlass | | Anstieg der Wassertemperatur | |
| Heating Test | Air temperature | 20 °C (dry bulb) | Inlet water temperature | 45 °C for 2-pipe units 65 °C for 4-pipe units | Water temperature decrease | 5 °C for 2-pipe units 10 °C for 4-pipe units |
| Test | Lufttemperatur | 20 °C (Trockenkugel) | Wassertemperatur am Einlass | 45 °C für 2-Rohrsysteme 65 °C für 4-Rohrsysteme | Sinken der Wassertemperatur | 5 °C für 2- Rohrsysteme 10 °C für 4- Rohrsysteme |
| Sound power test | | At ambient conditions without water flow | | | | |
| Test Schallleistungspegel | | Bei Umgebungsbedingungen ohne Wasserdurchsatz | | | | |

| Contact Details | Kampmann GmbH |
|----------------------|---|
| Kontaktinformationen | Friedrich-Ebert-Straße 128-130, D-49811 Lingen (Ems), Germany |

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| Land | Kontakt |
|---------|--|
| Germany | Kampmann GmbH & Co. KG |
| | Friedrich-Ebert-Str. 128 - 130 |
| | 49811 Lingen (Ems) |
| | T +49 591/ 7108-660 |
| | F +49 591/ 7108-173 |
| | E export@kampmann.de |
| | W Kampmann.eu |

| Country | Contact |
|---------------|--|
| Great Britain | Kampmann UK Ltd. |
| | Dial House, Govett Avenue |
| | Shepperton, Middlesex, TW17 8AG |
| | T +44 1932/ 228592 |
| | F +44 1932/ 228949 |
| | E info@kampmann.co.uk |
| | W Kampmann.co.uk |