



TOP

► Assembly, installation and operating instructions

Keep these instructions in a safe place for future use!

Table of contents

1 General	5
1.1 About these instructions	5
1.2 Explanation of Symbols.....	5
2 Safety.....	6
2.1 Correct use.....	6
2.2 Limits of operation and use.....	6
2.3 Risk from electrocution!.....	8
2.4 Personnel requirements - Qualifications	9
2.5 Personal Protective Equipment	9
3 Transport, storage and packaging.....	10
3.1 General transport instructions	10
3.2 Scope of delivery	10
3.3 Storage	11
3.4 Packaging	11
4 Technical data.....	12
5 Construction and function	13
5.1 Overview.....	13
5.2 Brief description	13
6 Installation and wiring	14
6.1 Requirements governing the installation site.....	14
6.2 Minimum clearances.....	14
6.3 Installation	14
6.3.1 Installation of sheet steel accessories.....	15
6.3.2 Suspension points.....	19
6.3.3 Universal 2-point brackets type 30041	19
6.3.4 Universal 2-point brackets type 38041	20
6.3.5 Universal 4-point brackets type 30042	20
6.3.6 Universal 4-point brackets type 38042	21
6.3.7 Universal 2-point T-brackets type 30047	21
6.3.8 Wall brackets, type 3*044, type 3002*	22
6.3.9 Ceiling to wall brackets type 3*049	22
6.3.10 Louvres	23
6.4 Installation	23
6.4.1 Connection to the pipe network	24

7 Electrical connection.....	25
7.1 Maximum electrical rating values	25
7.2 Electromechanical control type ...58/56/68.....	26
7.2.1 Connection (**00).....	27
8 Pre-commissioning checks.....	31
9 Maintenance	32
9.1 Securing against reconnection	32
9.2 Maintenance Schedule:.....	32
9.3 Clean the inside of the unit.....	32
10 Faults	34
10.1 Fault table.....	35
10.2 Fault table, electromechanical control type ..58/56/68	37
10.3 Start-up after rectification of fault	37
Table	38

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 [► 6] must be observed.

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

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.

Information in accordance with UL60335-1

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

2.2 Limits of operation and use

Limits of operation		
Min./max. water temperature	°C (°F)	5 (41) – see typeplate
Min./max. air intake temperature	°C (°F)	-20 (-4) to 40 (104)
Min./max. air humidity	%	15-75
Min. operating pressure	bar/kPa (psi/ ft H ₂ O)	-
Max. operating pressure	bar/kPa (psi/ ft H ₂ O)	see type plate
Min./max. glycol percentage	%	25-50

Tab. 1: Limits of operation

Maximum flow temperatures

Use	Ceiling-mounted model	Wall-mounted model
Without shut-off valve	100°C/ (212°F)	120°C/ (248°F)
With shut-off valve	160°C/ (°320F)	160°C/ (320°F)

Tab. 2: Maximum flow temperatures

Operating voltage	115 V/ 60 Hz. 208 - 240 V/ 60 Hz
Power/Current consumption	On the typeplate

Tab. 3: Operating voltage

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

Water quality		
pH value (at 20 °C/68°F)		8-9
Conductivity (at 20 °C/68°F)	µS/cm / ppm	<700 / <350
Oxygen content (O ₂)	mg/l / (lb/gal)	<0.1 / (<0.00000083)
Hardness	°dH / ppm CaCO ₃	4-8.5 / 0.224-0.476
Sulphur ions		not measurable
Sodium ions (Na ⁺)	mg/l / (lb/gal)	<100 / (<0.00083)
Iron ions (Fe ²⁺)	mg/l / (lb/gal)	<0.1 / (<0.00000083)
Manganese ions (Mn ²⁺)	mg/l / (lb/gal)	<0.05 / (<0.000000415)
Ammonia ions (NH ₄ ⁺)	mg/l / (lb/gal)	<0.1 / (<0.00000083)
Chlorine ions (Cl)	mg/l / (lb/gal)	<100 / (<0.00083)
CO ₂		<50
Sulfate ions (SO ₄ ²⁻)	mg/l / (lb/gal)	<50 / (<0.000415)
Nitrite ions (NO ₂ ⁻)	mg/l / (lb/gal)	<50 / (<0.000415)
Nitrate ions (NO ₃ ⁻)	mg/l / (lb/gal)	<50 / (<0.000415)

Tab. 4: Water quality



WARNING!

Note the maximum flow temperatures to protect the fan!

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

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

This can interrupt the flow of medium before the fan is switched off and the heat exchanger cools down.

Appropriate speed controllers with a fan delay shut-off relay and connection terminals for the shut-off valve are available on request.

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.
- ▶ Carry out all electrical work in accordance with the National Electric Code (NEC and CEC).
- ▶ 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 the 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-pin voltage tester to establish that the unit has been de-energised. Only open the unit 5 minutes after all poles of the voltage have been switched off.
- ▶ The protective earth carries high leakage currents (depending on the frequency, intermediate voltage and motor capacity). Therefore check NEC- and CEC-compliant earthing under test or experiment conditions as well. Without earthing, hazardous voltages can occur on the motor housing. In the event of a fault, electrical voltage will be present at the rotor and impeller. Rotor and impeller are base-insulated. Do not touch!

2.4 Personnel requirements - Qualifications

Specialist knowledge

The installation of this product requires specialist knowledge of heating, cooling, ventilation, installation and electrical engineering. This knowledge, generally learned in vocational 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 vocational training

- ▶ Safety and accident prevention regulations
- ▶ Guidelines and recognised technical regulations, e.g. National Electric Code (NEC) and Canadian Electric Code (CEC).
- ▶ 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?

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.

TOP

Assembly, installation and operating instructions

4 Technical data

Unit	TOP				
Series	44	45	46	47	48
Water content [l] (US gal)	1.6 – 6.1 (0.4 – 1.6)	2.2 – 8.2 (0.6 – 2.2)	3.4 – 11.5 (0.9 – 3.0)	4.8 – 16.8 (1.3 – 4.4)	5.3 – 17.0 (1.4 – 4.5)
Weight [kg] (lbs)	25 – 62 (55 – 137)	32 -92 (71 – 203)	45 – 125 (99 – 276)	53 – 158 (117 – 348)	73 – 204 (161 – 450)
Sound pressure level ⁵ [dB(A)]	13 – 56	19 – 64	20 – 62	22 - 61	26-63

Tab. 5: Technical data, TOP

⁵ The sound pressure level was calculated with an assumed room insulation of 16 dB(A). This corresponds to a distance of 16.4 inches, a room volume of 3000 cft and a reverberation period of 2.0 s.

5 Construction and function

5.1 Overview

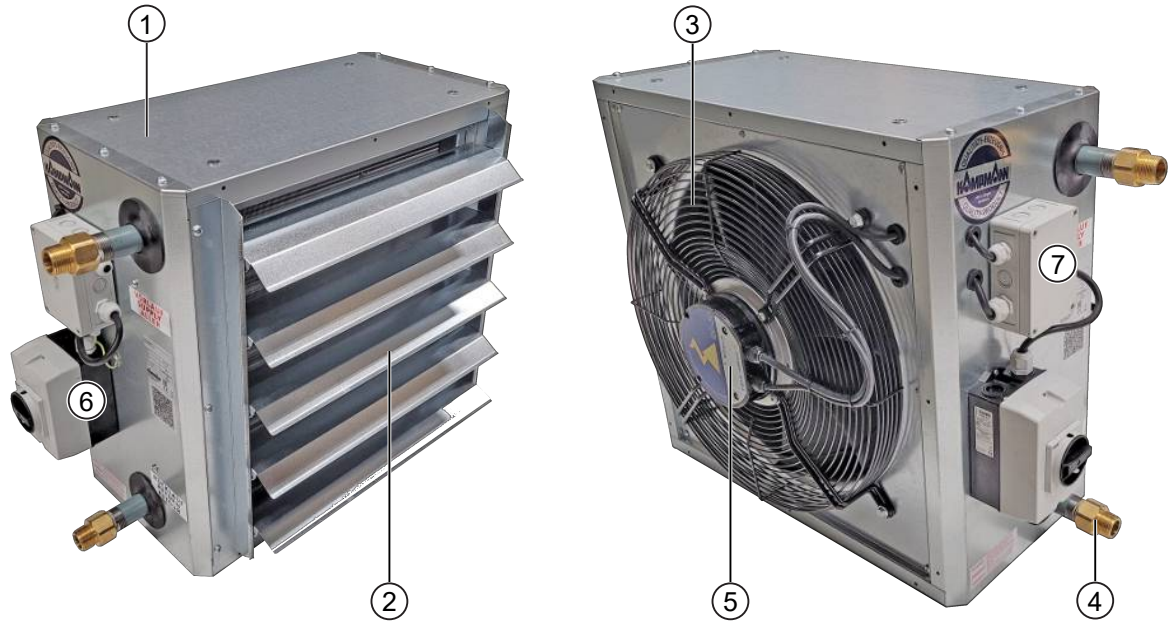


Fig. 1: TOP at a glance

1	Unit heater housing	2	Louvre, single-row
3	Fan guard	4	Heat exchanger
5	Fan	6	Repair switch
7	Electrical junction box		

5.2 Brief description

TOP are used for the decentralised local 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.

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 [► 12]).
- ▶ 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 [► 24]).
- ▶ There is a power supply on site (Maximum electrical rating values [► 25]).

6.2 Minimum clearances

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

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

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

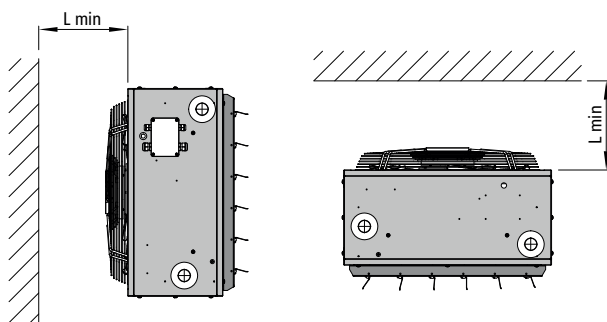


Fig. 2: Minimum distances, TOP

Series	Minimum distance L min	Standard distance L *
44	160 mm (6.3 in)	285 mm (11.2 in)
45	180 mm (7.1 in)	285 mm (11.2 in)
46	230 mm (9.1 in)	335 mm (13.2 in)
47	300 mm (11.8 in)	345 mm (13.6 in)
48	620 mm (24.4 in)	660 mm (26 in)

Tab. 6: Overview of types with minimum distances

* when using wall brackets, type 3_044

6.3 Installation

2 people are needed to install the unit.



CAUTION!

Risk of injury from sharp metal housing!

The inner metal of the casing can have sharp edges.

- Wear suitable protective gloves.



IMPORTANT NOTE!

Horizontal installation of units!

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

6.3.1 Installation of sheet steel accessories

Figure	Description	Dimensions [mm] (in)				Suitable for	
	Louvre, two-row, type 3*002	A					
		495 (19.5)				Series 44	
		595 (23.4)				Series 45	
		695 (27.4)				Series 46	
		795 (31.3)				Series 47	
	4-directional air diffuser, type 3*004					Series 44-47	
	Discharge nozzle, type 3*006	A	B	C	D		
		450 (17.7)	500 (19.7)	250 (9.8)	230 (9.1)	Series 44	
		550 (21.7)	600 (23.6)	300 (11.8)	260 (10.2)	Series 45	
		650 (25.6)	700 (27.6)	350 (13.8)	290 (11.4)	Series 46	
		750 (29.5)	800 (31.5)	400 (15.7)	320 (12.6)	Series 47	
	Induction louvre, type 3*101	A		B		C	
		495 (19.5)		425 (16.7)		100 (3.9)	Series 44
		595 (23.4)		525 (20.7)		100 (3.9)	Series 45
		695 (27.4)		625 (24.6)		100 (3.9)	Series 46
		795 (31.3)		725 (28.5)		100 (3.9)	Series 47


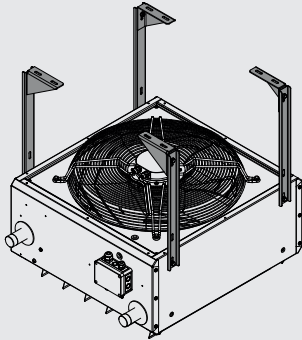
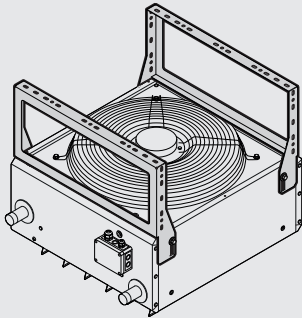
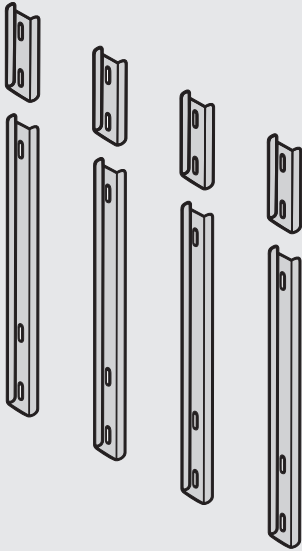
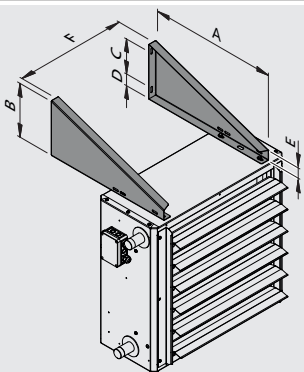
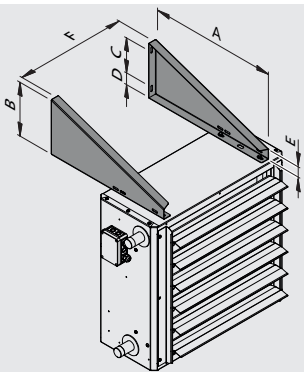
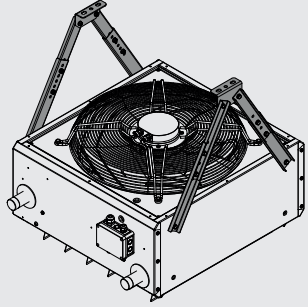
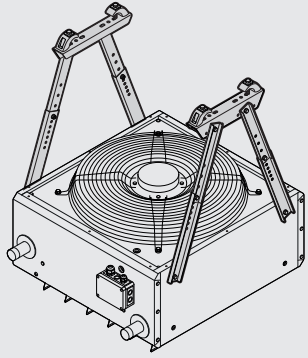
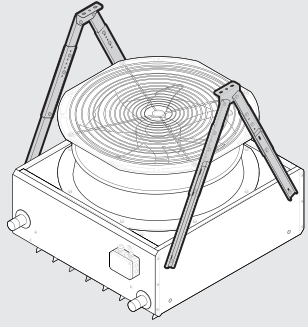
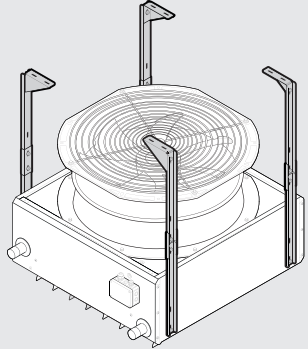
Figure	Description	Dimensions [mm] (in)	Suitable for
	KaMAX air outlet, type 3*111		All series
	Universal 4-point brackets, type 30042		Series 44-47
	Ceiling/wall brackets, type 3*049		Series 44-47
	Universal bracket extension, type 30043		All series

Figure	Description	Dimensions [mm] (in)						Suitable for
	Wall bracket, type 34044	A 585 (23.0)	B 251 (9.9)	C 160 (6.3)	D 40 (1.6)	E 50 (2.0)	F 340 (13.4)	Series 44
	Wall bracket, type 35044	A 585 (23.0)	B 251 (9.9)	C 160 (6.3)	D 40 (1.6)	E 50 (2.0)	F 440 (17.3)	Series 45
	Wall bracket, type 36044	A 635 (25.0)	B 268 (10.6)	C 187 (7.4)	D 40 (1.6)	E 50 (2.0)	F 540 (21.3)	Series 46
	Wall bracket, type 37044	A 685 (27.0)	B 286 (11.3)	C 204 (8.0)	D 40 (1.6)	E 50 (2.0)	F 640 (25.2)	Series 47
	Wall brackets, extended, type 30022	A 785 (30.9)	B 321 (12.6)	C 123 (4.8)	D 40 (1.6)	E 50 (2.0)	F 340 (13.4)	Series 44
	Wall brackets, extended, type 30024	A 885 (34.8)	B 355 (14.0)	C 143 (5.6)	D 40 (1.6)	E 50 (2.0)	F 440 (17.3)	Series 45
	Wall brackets, extended, type 30026	A 1080 (42.5)	B 422 (16.6)	C 175 (6.9)	D 40 (1.6)	E 50 (2.0)	F 540 (21.3)	Series 46
	Wall brackets, extended, type 30020	Dimensions depending on bracket length						Series 47

TOP

Assembly, installation and operating instructions

Figure	Description	Dimensions [mm] (in)	Suitable for
	Universal 2-point brackets. Type 30041		Series 44-47
	Universal 2-point T-beam brackets, type 30047		Series 44-47
	Universal 2-point brackets, type 38041		Series 48
	Universal 4-point brackets, type 38042		Series 48

Tab. 7: Air-side sheet steel accessories

6.3.2 Suspension points

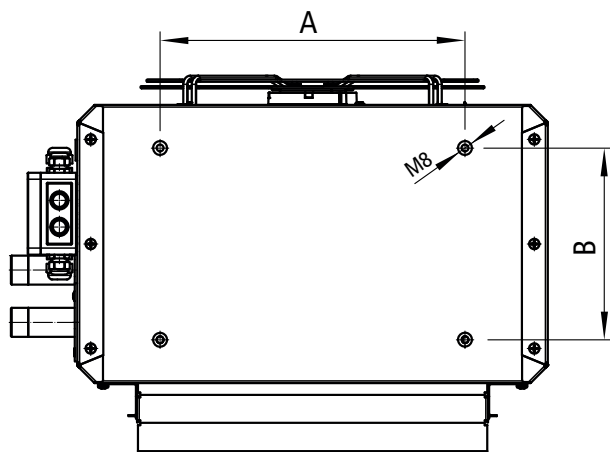


Fig. 3: TOP suspension points

Unit heater series	A [mm] (in)	B [mm] (in)
44	350 (13.8)	220 (8.7)
45	450 (17.7)	220 (8.7)
46	550 (21.7)	220 (8.7)
47	650 (25.6)	220 (8.7)
48	750 (29.5)	220 (8.7)

Tab. 8: Suspension points for wall / ceiling installation

6.3.3 Universal 2-point brackets type 30041

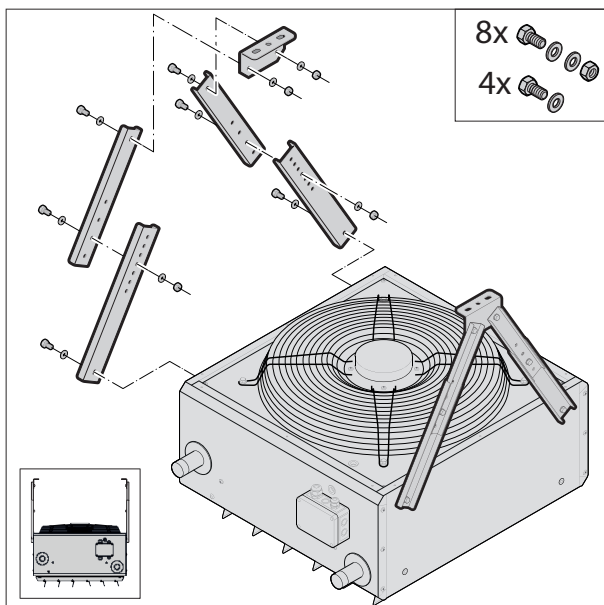


Fig. 4: Universal 2-point brackets, series 44-47

TOP

Assembly, installation and operating instructions

6.3.4 Universal 2-point brackets type 38041

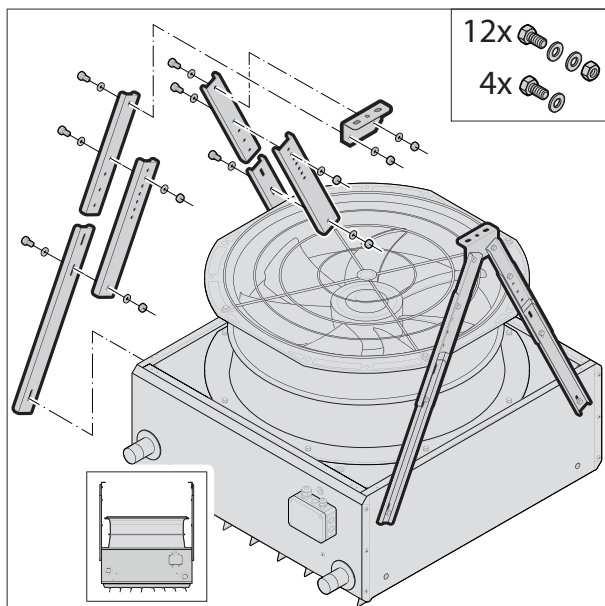


Fig. 5: Universal 2-point brackets, series 48

6.3.5 Universal 4-point brackets type 30042

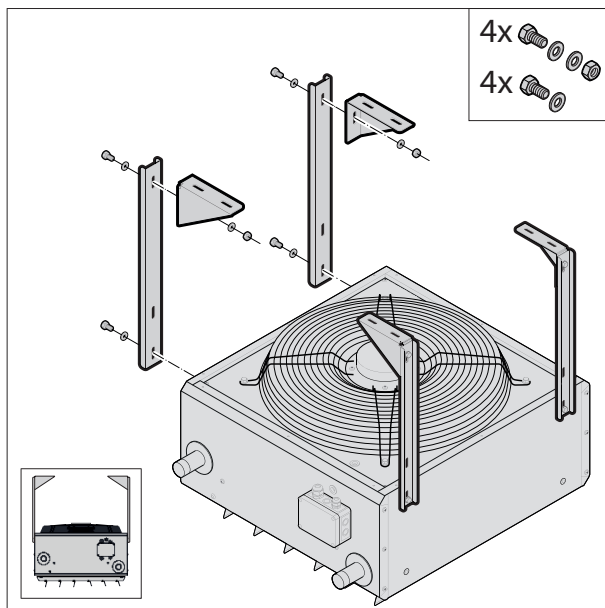


Fig. 6: Universal 4-point brackets, series 44-47

6.3.6 Universal 4-point brackets type 38042

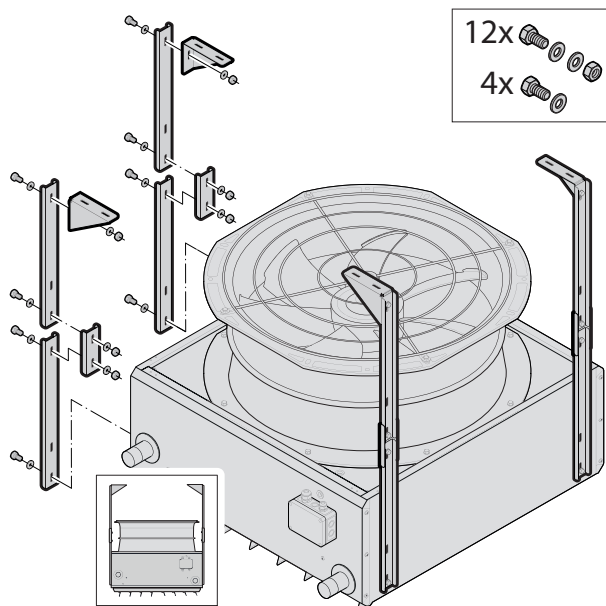


Fig. 7: Universal 4-point brackets, series 48

6.3.7 Universal 2-point T-brackets type 30047

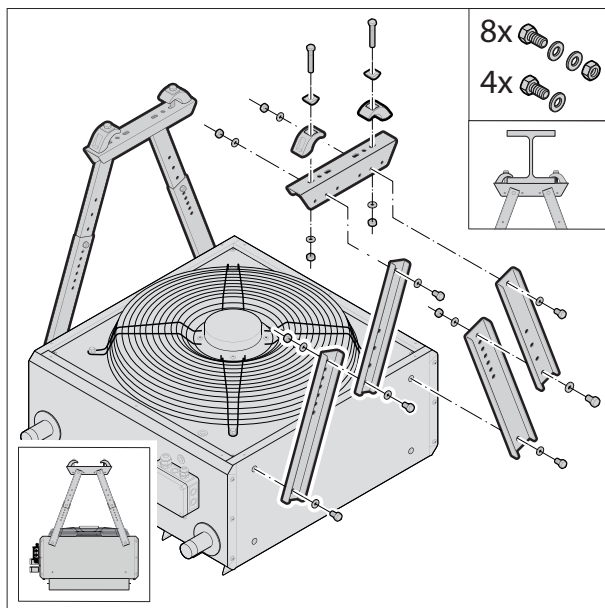


Fig. 8: Universal 2-point T-brackets, series 44-47

TOP

Assembly, installation and operating instructions

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

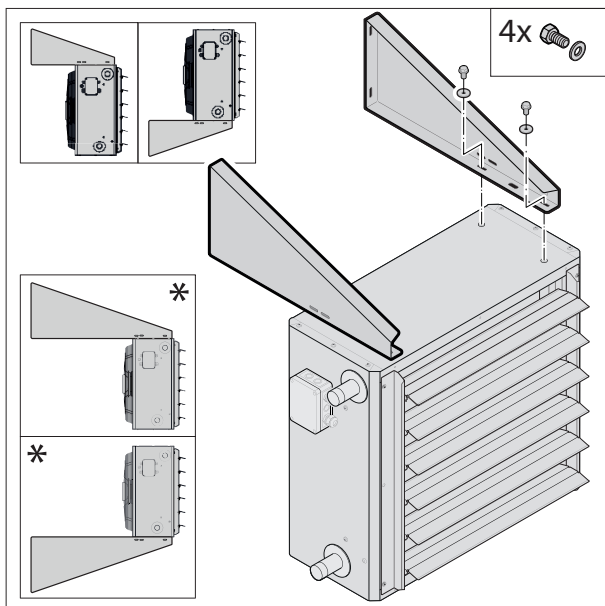


Fig. 9: Wall brackets

* Wall bracket, extended (type 3002*)

6.3.9 Ceiling to wall brackets type 3*049

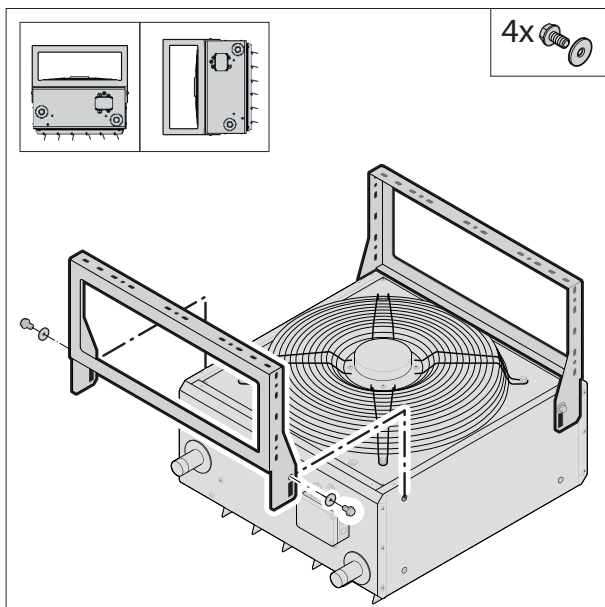


Fig. 10: Ceiling to wall bracket installation

6.3.10 Louvres

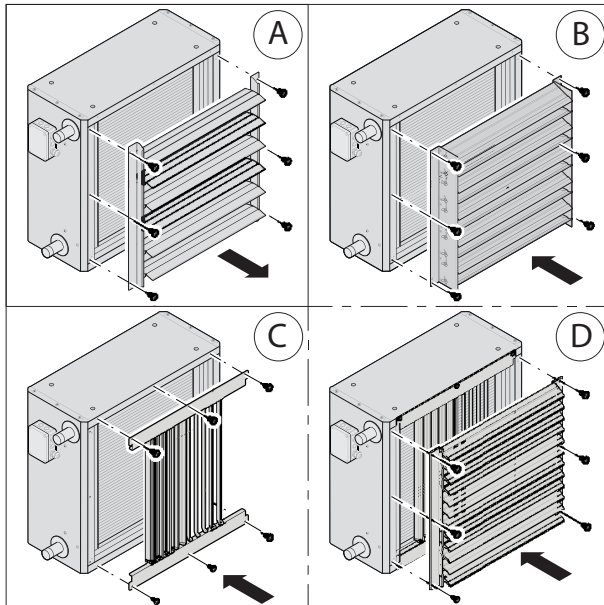


Fig. 11: Louvres

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

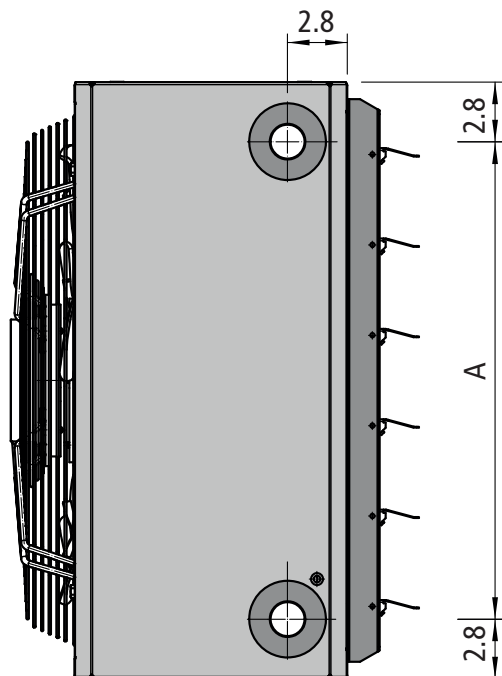
6.4 Installation

Hydraulic connection

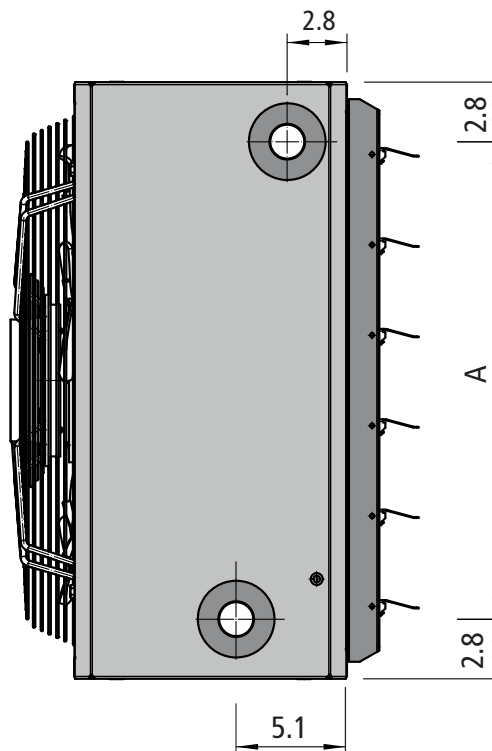
Note the following points when connecting the hydraulic side:

- ▶ 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).

6.4.1 Connection to the pipe network



Heat exchanger, galvanised steel, 1-layer



Heat exchanger, copper/aluminium and galvanised, 2-layer

Series	A [mm] (in)
44	360 (14.2)
45	460 (18.1)
46	560 (22.0)
47	660 (26.0)
48	760 (30.0)

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

- ▶ 1" (series 44+45)
- ▶ 1 ¼" (series 46)
- ▶ 1 ½" (series 47+48)

Proceed as follows when making the hydraulic connection:

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

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

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.



IMPORTANT NOTE!

Provide a possibility of locally switching off all poles of the unit in accordance with NEC/CEC requirements on all versions without built-in repair switch (**U0).

TOP

Assembly, installation and operating instructions

7.1 Maximum electrical rating values

Electromechanical model

Type	Nominal voltage [V]	Mains frequency [Hz]	Active power [kW]	Nominal current [A]	Leakage current [mA]	MOP [A]	IP class	Protection class
44**56	208 - 240	60	0.14	1.45 - 1.20	<3.5	15	54	I
44**58	208 - 240	60	0.17	1.65 - 1.35	<3.5	15	54	I
45**56	208 - 240	60	0.17	1.70 - 1.45	<3.5	15	54	I
45**58	208 - 240	60	0.39	1.95 - 1.75	<3.5	15	54	I
46**58	208 - 240	60	0.46	2.40 - 2.10	<3.5	15	54	I
47**56	208 - 240	60	0.37	1.90 - 1.70	<3.5	15	54	I
47**58	208 - 240	60	0.85	4.30 - 3.70	<3.5	15	54	I
48**68	208 - 240	60	0.68	3.50 - 3.00	<3.5	15	54	I
44**57	208 - 240	60	0.17	1.02 - 1.21	<3.5	15	44	I
45**57	208 - 240	60	0.4	2.07 - 1.85	<3.5	15	44	I
46**57	208 - 240	60	0.4	2.07 - 1.85	<3.5	15	44	I
44**88	115	60	0.12	2.2	<3.5	15	54	I
45**88	115	60	0.39	3.4	<3.5	15	54	I
46**88	115	60	0.34	2.9	<3.5	15	54	I
44**87	115	60	0.17	2.25	<3.5	15	44	I
45**87	115	60	0.33	2.75	<3.5	15	44	I
46**87	115	60	0.33	2.75	<3.5	15	44	I

Tab. 9: Electrical data for TOP, without valve actuator

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)

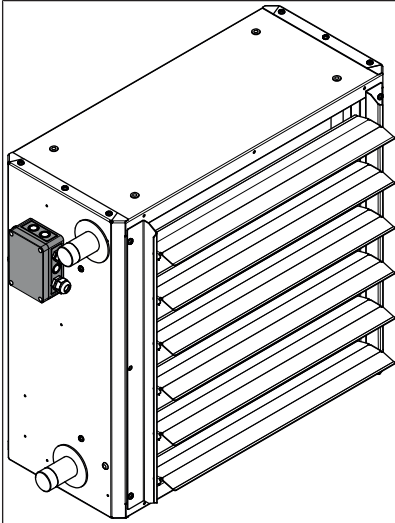


Fig. 12: TOP with motor junction box

Power supply and control

All sizes require a power supply in accordance with Maximum electrical rating values [► 26] and can be controlled via a control input 0-10 VDC ($R_i > 49 \text{ KOhm}$). 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.

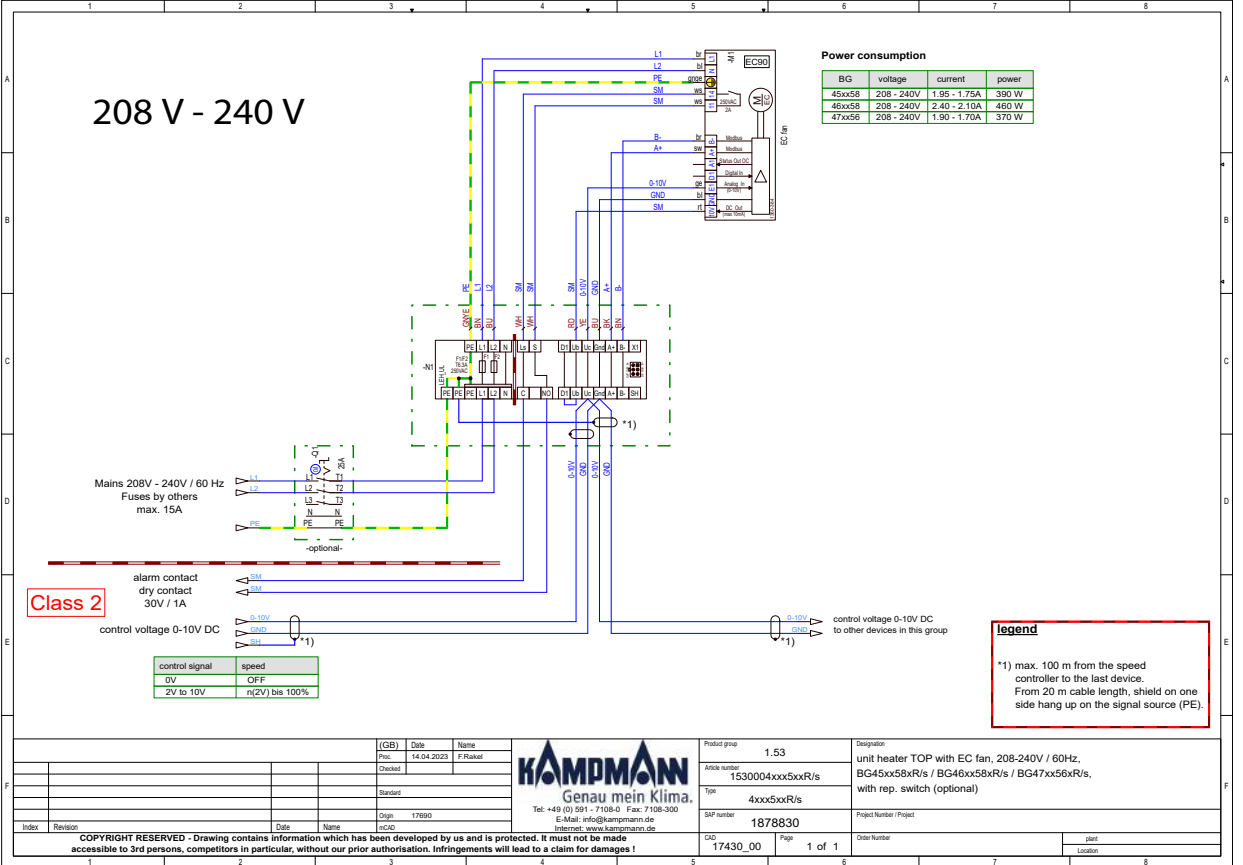
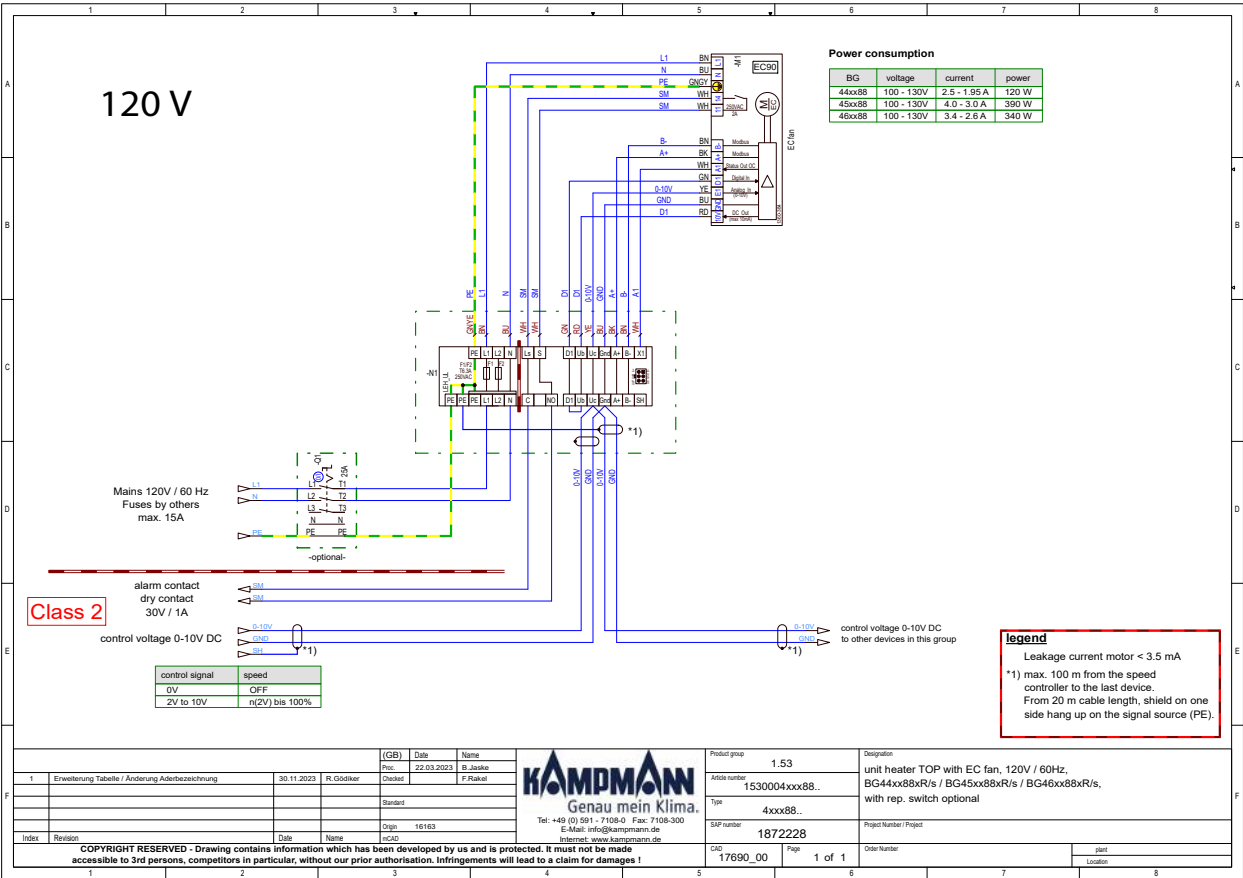
Terminal assignment for control of unit heater with EC fan (120 V // 208-240 V)

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	$n_{(2 \text{ V})} - 100\%$

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



Information on cable laying:

The following information on cable types and cable laying must be observed in compliance with National Electric Code.

The installation, operation and maintenance of these devices must comply with the country-specific applicable laws, standards, regulations and directives.

Without *: NYM-J. The required number of cores incl. protective conductor is indicated on the cable. Cross sections are not indicated, as the cable length is included in the calculation of the cross section.

*): Shielded cable, J-Y(STY) 0.8mm. Lay separately from power lines.

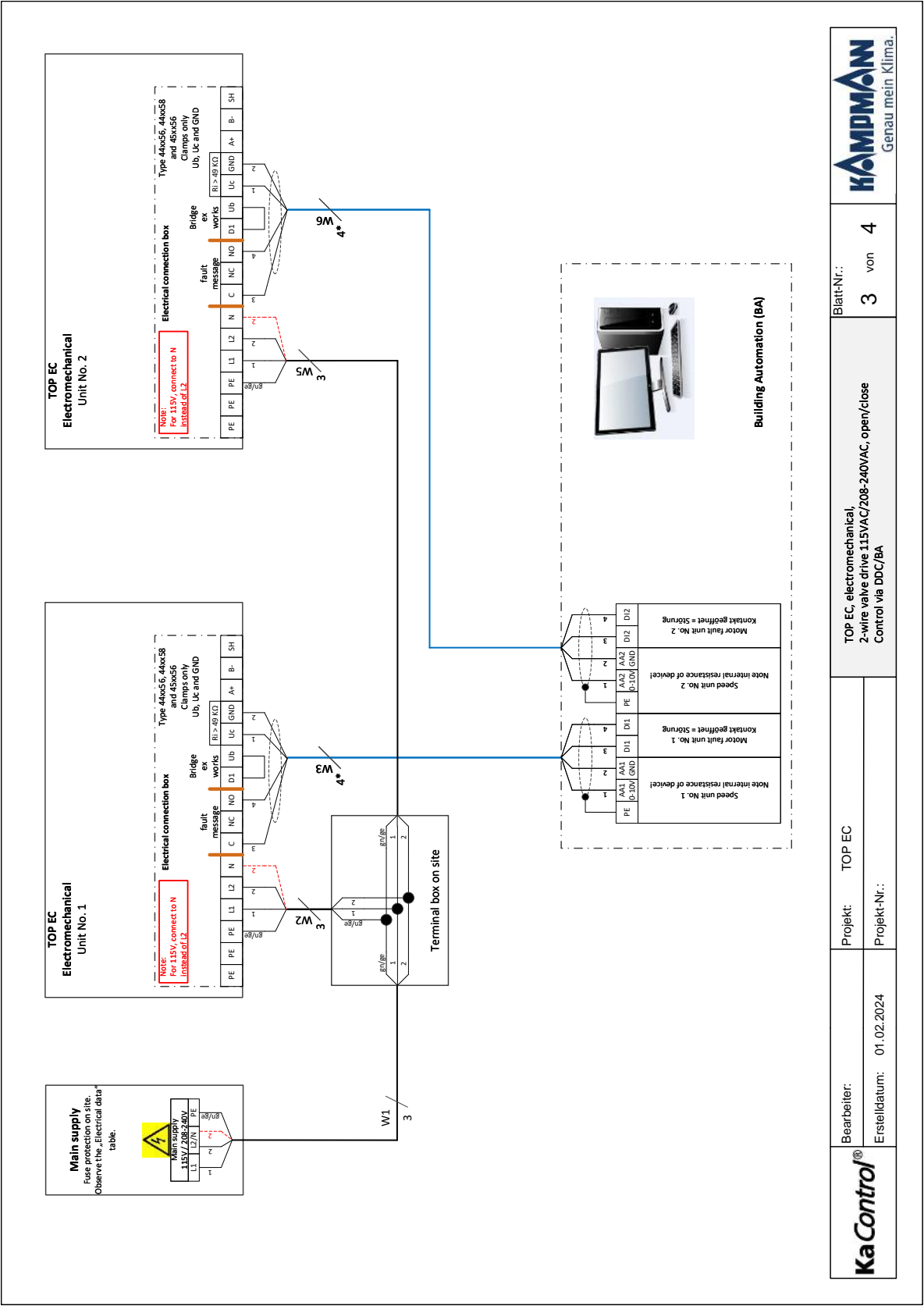
**): Shielded cable stranded in pairs, e.g. UNITRONIC® BUS LD 2x2x0.22, UNITRONIC® BUS LD 3x2x0.22. Install separately from power lines.

- If other cable types are used, they must be at least equivalent.

- Lines for data or bus signals are shown with shield connected at one end. Lines for analog signals are shown with the shield not connected. Due to structural or local conditions and depending on the type and level of interference, which can be caused by magnetic and/or electric fields in high and/or low frequency ranges, among other things, a different connection of the shield (connected at both ends or not connected) may be necessary. This must be checked by the customer and, if necessary, carried out deviating from the specifications in the documentation!

KaControl®	Bearbeiter:	Projekt:	General Information		Blatt-Nr.:	2 von 4
	Erstelldatum: 01.02.2024	TOPE C Projekt-Nr.:				





8 Pre-commissioning checks

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

Structural tests

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

Electrical tests

- ▶ Check whether all lines have been properly laid.
- ▶ Check whether all lines have the necessary cross-section.
- ▶ Are all wires connected in accordance with the electric wiring diagrams?
- ▶ Is the earth wire connected and wired throughout?
- ▶ Check all external electrical connections and terminal connections are fixed in place and tighten if necessary.
- ▶ Check whether the mains voltage corresponds to the respective unit version.

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.

9 Maintenance

9.1 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.

9.2 Maintenance Schedule:

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

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

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

9.3 Clean the inside of the unit

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



DANGER!

Risk of injury from burning

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



IMPORTANT NOTE!

Do not use aggressive cleaning agents!

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

10 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 [► 35] 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.

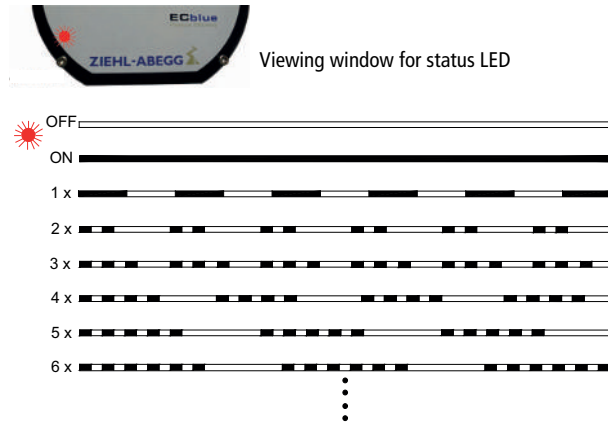


Fig. 13: Flash code

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

Tab. 10: Status via flash code

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

0 relay de-energised

1 relay energised

10.1 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 mains voltage or mains voltage does not correspond to the unit version.	Check the power supply and restore, if necessary.
	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.
System water leakage	Motor winding interrupted.	Replace unit.
	Heat exchanger defect.	Replace heat exchanger if necessary.
Unit not heating or cooling sufficiently (LPHW/ CHW)	Hydraulic connection not correct.	Check flow and return, retighten 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.
	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.

10.2 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).

10.3 Start-up after rectification of fault

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

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

TOP

Assembly, installation and operating instructions

Table

Tab. 1	Limits of operation	7
Tab. 2	Maximum flow temperatures	7
Tab. 3	Operating voltage	7
Tab. 4	Water quality.....	7
Tab. 5	Technical data, TOP.....	12
Tab. 6	Overview of types with minimum distances	14
Tab. 7	Air-side sheet steel accessories	15
Tab. 8	Suspension points for wall / ceiling installation	19
Tab. 9	Electrical data for TOP, without valve actuator	26
Tab. 10	Status via flash code	35

<https://www.kampmann.ca/en/hvac/products/unit-heaters/top>

Country	Contact
Canada	Kampmann Heating, Cooling, Ventilation Ltd.
	1625 Dilworth Drive Unit #207
	Kelowna, BC Canada V1Y 8M4
	T +1 604/ 3621080
	F +1 604/ 6871327
	E info@kampmann.ca
	W Kampmann.ca