

TOP unit heaters

► Installation and operating instructions

Keep these instructions in a safe place for future use!



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Genau mein Klima.

1.53 TOP unit heaters

Unit heaters (2-stage three-phase motor/1-stage AC single-phase motor/continuously variable EC single-phase motor)

Installation and operating instructions

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Installation and operating instructions

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 these instructions are intended to provide a basic understanding and may differ from the actual model.

Anyone involved with the installation, commissioning and use of this product is obliged to pass these instructions on to tradespeople who are involved at the same time or subsequently, as well as to end users or operators. Retain these instructions until final decommissioning!

1.2 Explanation of symbols

Notes



DANGER!

This combination of symbol and signal word indicates an immediately hazardous situation, which will cause death or injuries if not avoided.



Risk from electrocution!

Danger from hazardous electrical voltage! Death of severe bodily injury can occur if appropriate precautionary measures are not taken!



IMPORTANT NOTE!

This combination of symbol and signal word indicates a possible dangerous situation, which can cause material and environmental damage if not avoided.



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

1.3 Copyright protection

The contents of this manual are protected by copyright. Their use is permitted when using the product. Any further use is not permitted without written permission from the manufacturer.

1.4 Customer service

Our Customer Service team is available is available for technical information:

Address	Kampmann GmbH Friedrich-Ebert-Str. 128–130 49811 Lingen (Ems)
Phone	+49 591 7108 670
Fax	+49 591 7108 360
Email	service@kampmann.de
Website	www.kampmann.de

We are always interested in receiving information and experiences relating to the use of our products which could be of value for improving our products.

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2 Safety

This section provides an overview of all important safety aspects to ensure optimum protection of personnel as well as safe and trouble-free operation. Additional order-related safety information is contained in the sections covering the individual phases of the product's life.

2.1 Intended use



Kampmann TOP unit heaters are constructed in line with the state of the art and recognised safety regulations. Nevertheless, their use can result in danger to people or damage to the units or other material assets if they are not appropriately installed and operated or correctly and properly used.

Applications

TOP unit heaters should only be used

- indoors (e.g. production halls, warehouses, workshops in industry and commerce, sports halls, sales showrooms and greenhouses etc.)
- depending on the design of heat exchanger, TOP unit heaters can either be connected to hot water, district hot water, steam or thermal oil.

TOP should not be used

- outdoors,
- in humid areas, such as swimming pools, in wet rooms,
- in areas where there is a risk of explosion,
- in areas with a high dust content,
- in areas with an aggressive atmosphere.

Protect the products from any moisture during storage and installation. If in doubt, check the proposed use with the manufacturer. Any use other than the use specified above is deemed not to be correct and proper. The operator of the unit is solely responsible for any damage arising as a result of this. Correct and proper use is deemed to include observing the installation instructions described in these instructions.

Specialist knowledge

The installation of this product requires specialist knowledge of heating, cooling, ventilation 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.

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, i.e. Association of German Electricians (VDE) regulations, DIN and EN standards.

Purpose and scope of the manual

This manual contains information on the operation of TOP unit heaters. The information contained in these instructions can be changed without prior notification.

2.2 Limits of operation and use

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.

Limits of operation		
Min. water temperature	°C	5
Min./Max. air intake temperature	°C	-20 bis +40
Min./Max. air humidity	%	15-75
Max. operating pressure	bar	see nameplate of the unit heater
Max. water temperature	°C	see nameplate of the unit heater
Min./Max. glycol percentage	%	25-50

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

Water quality		
Ph ^{*1}		8-9
Conductivity ^{*1}	µS/cm	< 700
Oxygen content (O ₂)	mg/l	< 0,1
Hardness	°dH	4-8,5
Sulphur ions (S)		Not measurable
Sodium ions (Na ⁺)	mg/l	< 100
Iron ions (Fe ²⁺ , Fe ³⁺)	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	ppm	< 50
Sulphate ions (SO ₄ ²⁻)	mg/l	< 50
Nitrite ions (NO ₂ ⁻)	mg/l	< 50
Nitrite ions (NO ₃ ⁻)	mg/l	< 50

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Unit heaters (2-stage three-phase motor/1-stage AC single-phase motor/continuously variable EC single-phase motor)

Installation and operating instructions



Important:

Note the maximum flow temperatures to protect the fan!

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

Should a temperature limit not be possible or not be sensible for the intended use, there is also an option of using appropriate 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 fan controllers with a fan run-on relay and connection terminals for the motorised valve are available on request.

Max. flow temperatures*

Use	Motor design	Type of installation	
		Ceiling	Wall
without shut-off valve	AC fan	100 °C	120 °C
	EC fan	100 °C	120 °C
with shut-off valve	AC fan	200 °C	200 °C
	EC fan	160 °C	160 °C

* Fan models and operation for higher temperatures on request.

2.3 Safety information



Only allow a qualified electrician to perform installation, assembly and maintenance work on electrical units in compliance with VDE guidelines. The connection should comply with the applicable VDE regulations and provisions laid down by the regional electricity providers.

Non-compliance with the regulations and operating instructions can result in the units malfunctioning with consequential damage and danger to people. There is a danger of fatal injury caused by wires being swapped due to incorrect wiring!

Regularly check the unit heater's electrical equipment. Immediately replace loose connections and faulty cables.

Disconnect all parts of the system from the mains power supply and prevent them from being reconnected before starting any connection and maintenance work!

EC fans

Electrical loading (>50 C) between the mains conductor and protective conductor after switching off the mains power supply when switching several fans in parallel.

- Ensure that a contact safety device is fitted. The mains connections and PE need to be shorted before working on the electrics.

The terminals and connectors are still energised even when the unit is switched off. Check whether the terminals and connectors are de-energised with a two-pin voltage tester.

- Only open the unit 5 minutes after all poles of the voltage have been switched off.

The protective conductor carries high leakage currents (depending on the frequency, intermediate voltage and motor capacity). Therefore check EN-compliant earthing under test conditions (EN 50 178, art. 5.2.11). Hazardous voltage can occur at the motor housing without earthing.

In the event of a fault, the rotor and impeller can be energised. Rotor and impeller are base-insulated.

- Do not touch when fitted!

The fan runs when control voltage is applied or the saved fan speed starts up automatically when mains power has failed.

- Do not go near the hazard area of the unit.

High temperatures are produced at the fan's electronic housing.

- Burning hazard.

The fan is protected from blockage. Protective functions are integrated depending on the fan type, which cause the fan to switch off automatically in the event of various faults.

- Please refer to the operating instructions for the respective fan.

Please read these instructions in full to ensure correct and proper installation and the correct operation of TOP unit heaters.

Please note the following safety-relevant information



- Disconnect all parts of the system that are being worked on. Ensure that the system cannot be accidentally re-connected!
- Before commencing installation/maintenance work, wait until the fan has come to a standstill after the unit has been switched off. After working on the unit, remove any tools, the short circuit detector or other parts of the unit.
- Caution! Pipes, casings and fittings can become very hot or very cold depending on the operating mode!
- Caution! Wear gloves, safety shoes and suitable protective clothing when transporting the unit! Sharp edges cannot be ruled out despite care during manufacture.
- The operator of the unit is responsible for the EMC conformity of the entire system in accordance with the local applicable standards.

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Modifications to the unit

Do not undertake any modifications or upgrades to the TOP without discussing them with the manufacturer as they can impair the safety and operation of the unit.

Do not carry out any measures on the unit not described in this manual. Make sure that on-site systems and cabling are suitable for connection to the intended system!

3 Transport and storage



- Please note all applicable safety and accident prevention regulations.
- Attention! Risk of sharp edges! Wear gloves, safety shoes and suitable protective clothing during transportation!
- Caution! Do not carry TOP unit heaters by their louvres!
- Use suitable means of transport to avoid any damage to your health!
- Please note the transport information printed on the packaging.

Interim storage

Store the units in dry, dust-free and weather-proof rooms without any temperature fluctuations.

- Never stack the units on top of each other to prevent damage to them!
- Use the original packaging for storage.
- Store TOP unit heaters in the position shown on the packaging.

4 Scope of delivery

Provide materials for fixing the units heaters, e.g. screws, plugs etc., on site, depending on the type of mounting and support structure.

Check immediately on receipt:

- Is the delivery damaged?
- Have the items ordered been delivered?
Check model numbers.
- Is the delivery and number of items delivered correct?

5 Technical data

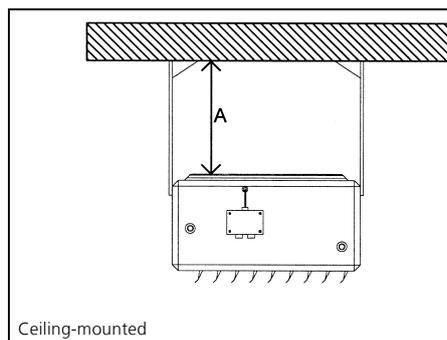
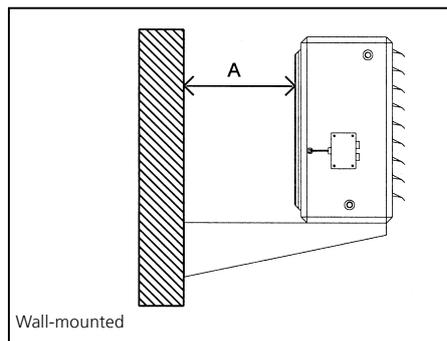
Technical data				
Series	44	45	46	47
Operating voltage	3 x 400 V (500V) or 1 x 230 V ~ 50 Hz			
Enclosure type	IP 54	IP 54	IP 54	IP 54
Water content l	1.6 - 6.1	2.2 - 8.2	3.4 - 11.5	4.8 - 16.8
Weight kg	26 - 62	34 - 92	46 - 125	55 - 150
Sound pressure level ¹⁾ dB(A)	13 - 56	19 - 64	20 - 62	22 - 61

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

Please refer to the typeplate on the unit heater for precise technical data.

The unit conforms to the provisions of:
89/392 EEC, 73/23 EEC; 89/336 EEC; 79/196 EEC.

6 Installation



Example showing AC fan with motor junction box

Qualifications

Installation of this product requires specialised knowledge of heating, cooling and ventilation. 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.

Wall brackets can be used to mount unit heaters upright or suspended on the wall, and ceiling brackets to suspend them from the ceiling. Unit heaters can also be mounted on wall or ceiling brackets provided on site. When installing unit heaters, leave a minimum gap A between the motor guard and the wall or ceiling.

If you do not leave this minimum gap, the output of the unit heaters will be reduced and the noise level will increase. When using accessory components, ensure that you maintain the minimum gap and leave sufficient space around elements that require access for maintenance (e.g. filters).

Overview of types			
Unit size	Type	Minimum clearance A	Standard clearance A *
4	44 __ 36 / 44 __ 31 / 44 __ 33 / 44 __ 34	135 mm	240 mm
5	45 __ 36 / 45 __ 31 / 45 __ 33 / 45 __ 34	150 mm	235 mm
6	46 __ 36 / 46 __ 31 / 46 __ 33	195 mm	280 mm
7	47 __ 36 / 47 __ 31 / 47 __ 33	255 mm	320 mm

* when using wall brackets type 3_044

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Unit heaters (2-stage three-phase motor/1-stage AC single-phase motor/continuously variable EC single-phase motor)

Installation and operating instructions

7 Hydraulic connection

- Connect the TOP as per the labels on the product.
- Route the pipes so that no mechanical stresses are transferred to the heat exchanger and that the unit can be accessed with ease for maintenance and repair work.
- Provide ventilation and drainage for the pipes on site.
- Properly seal pipe connections not being used.
- **Important note:**
The LPHW heat exchanger is suitable for use with hot water heating systems in compliance with DIN 18380. Ensure that operating conditions and water quality conform to VDI 2035 and comply with industry-standard installation regulations.



Caution! Hold the connections on the heat exchanger with a pipe wrench or other suitable tool when connecting the pipework.

8 Factory-fitted accessories

Description of accessories	Suffix to unit heater type
Frost protection thermostat F
Repair switch R
Continuously variable power module including repair switch for unit heater type ending 31 V
KaControl recirculation air module including repair switch for unit heater type ending 31, 33 and 34. C1

Several combinations of components are possible e.g. ...FR

9 Electrical wiring

9.1 Safety information

The electrical wiring of this product requires technical knowledge of electrical engineering. This knowledge, generally learned in vocational training in one of the fields stated, is not described separately here. Errors with the wiring can lead to the unit being damaged! The manufacturer is not liable for any damage to people and materials caused by the wrong wiring and/or improper handling. Note the following safety information before starting work on the controller and the TOP unit heater:

- Regularly check the unit heater's electrical equipment. Immediately replace loose connections and faulty cables.
- Disconnect the system and ensure that it cannot be accidentally reconnected.
- Only use the wiring diagrams enclosed to carry out the electrical connection.
- Only wire the unit in accordance with currently applicable VDE and EN guidelines, as well as Technical Wiring Regulations stipulated by the regional energy supply companies.
- Only connect the unit to fixed wiring.
- The operator of the unit is responsible for the EMC conformity of the entire system in accordance with the local applicable standards.

EC fans

Electrical loading (>50 C) between the mains conductor and protective conductor after switching off the mains power supply when switching several fans in parallel.

- Ensure that a contact safety device is fitted. The mains connections and PE need to be shorted before working on the electrics.

The terminals and connectors are still energised even when the unit is switched off. Check whether the terminals and connectors are de-energised with a two-pin voltage tester.

- Only open the unit 5 minutes after all poles of the voltage have been switched off.

The earth wire carries high leakage currents (depending on the frequency, intermediate voltage and motor capacity). Therefore check EN-compliant earthing under test conditions (EN 50 178, art. 5.2.11). Hazardous voltage can occur at the motor housing without earthing.

1.53 TOP unit heaters

Unit heaters (2-stage three-phase motor/1-stage AC single-phase motor/continuously variable EC single-phase motor)

Installation and operating instructions

In the event of a fault, the rotor and impeller can be energised. Rotor and impeller are base-insulated.

- Do not touch when fitted!

The fan runs when control voltage is applied or the saved fan speed starts up automatically when mains power has failed.

- Do not go near the hazard area of the unit.

High temperatures are produced at the fan's electronic housing.

- Burning hazard.

The fan is protected from blockage. Protective functions are integrated depending on the fan type, which cause the fan to switch off automatically in the event of diverse faults.

- Please refer to the operating instructions for the respective fan.

Please read these instructions in full to ensure correct and proper installation and the correct operation of TOP unit heaters.

9.2 Motor protection

9.2.1 AC fans

Thermal contacts (temperature detectors) are embedded in the motor windings, which open when the maximum winding temperature of 155°C is exceeded. Combined with an appropriate protective switch, the motor is switched off whenever it impermissibly heats up. The motor is thus protected against overload operation, over- and undervoltage, unacceptably high ambient temperatures and jammed rotors.

Thermal contacts meet the conditions for protection against overloading of equipment with electric motor drive (VDE 0730). Commercial motor protection switches or bi-metal trips are not suitable as motor protection with multi-stage motors. Only appropriately wired controllers or modules or a similar type of switch may be used.

Single-phase controller

The thermal contacts switch off and lock the motor via the single-phase controller whenever the motor heats up inadmissibly.

Continuously variable power module type V

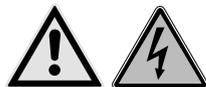
The thermal contacts switch off the motor via the stage switch whenever the motor heats up inadmissibly (without locking the motor!). A potential-free NC contact offers the option to lock the 0-10 V control signal to "0 V" via an on-site controller.



The unit is not short circuit-proof! The device will be damaged beyond repair if the motor cable short circuits. Even when the motor is idle, the motor cables (U1 and U2) still carry mains potential!

KaControl recirculation air module type ...31C1

The thermal contacts switch off the motor via the KaControl module whenever the motor heats up inadmissibly. In addition, the KaControl system sets the speed signal to 0 V. In neither case is the motor locked!



The unit is not short circuit-proof! The device will be damaged beyond repair if the motor cable short circuits. Even when the motor is idle, the motor cables (U1 and U2) still carry mains potential!

9.2.2 EC fans

All EC fans have an integral overload protection; no upstream motor protection device is needed.

Electromechanical control

The motor junction box contains a relay with a potential-free changeover 24 to 250 V/ 2 A. This signals a fault of the fan or power failure only for types 45xx33, 46xx33 and 47xx33. In fault mode, the relay is energised (Contact C – NO closed). In the event of a fault, the relay becomes de-energised (Contact C - NO open)



There is no fault signal contact in fan types 44xx33, 44xx34 and 45xx34 and therefore no fan fault or power failure is reported!



Fan fault indicator

KaControl recirculation air module type ... 33C1/34C1

This is signalled to the KaControl system in the event of a fan fault type 45xx33C1, 46xx33C1 and 47xx33C1 and the red LED in the housing lights up.



There is no fault signal contact in fan types 44xx33, 44xx34 and 45xx34! In the event of a power failure at the unit heater, there is no signal via the KaControl system and the red LED does not light up.

1.53 TOP unit heaters

Unit heaters (2-stage three-phase motor/1-stage AC single-phase motor/continuously variable EC single-phase motor)

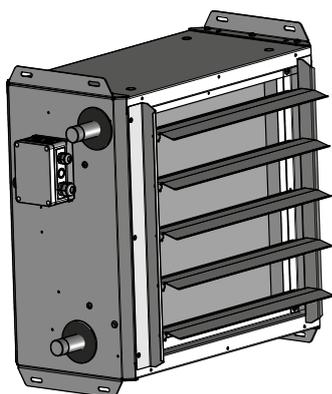
Installation and operating instructions

9.3 Electrical wiring



Damage can be caused by the use of incompatible switching devices and inadequate protective equipment. The manufacturer does not accept any warranty in these cases. Only connect up units that have a circuit breaker which switches off all poles from the mains power supply with a minimum contact gap of 3 mm!

9.3.1 Three-phase motor



TOP with motor junction box



The three-phase outer rotor motor can be switched between 2 stages with a 2-stage three-phase switch (Y/Δ configuration). The motor in each of the two switching configurations (Y or Δ) can be switched between 5 stages by voltage reduction using a 5-stage three-phase controller.

Switching stage 1	Y-connection
Switching stage 2	Delta connection

The fans are operated with a clockwise rotating field!

Caution! Operation of this unit on frequency converters is only permitted if the frequency converter has a sine filter effective on all poles. Missing sine filters can lead to severe thermal damage to the fan motor. In this case, the manufacturer accepts no warranty.

Three-phase parallel connection

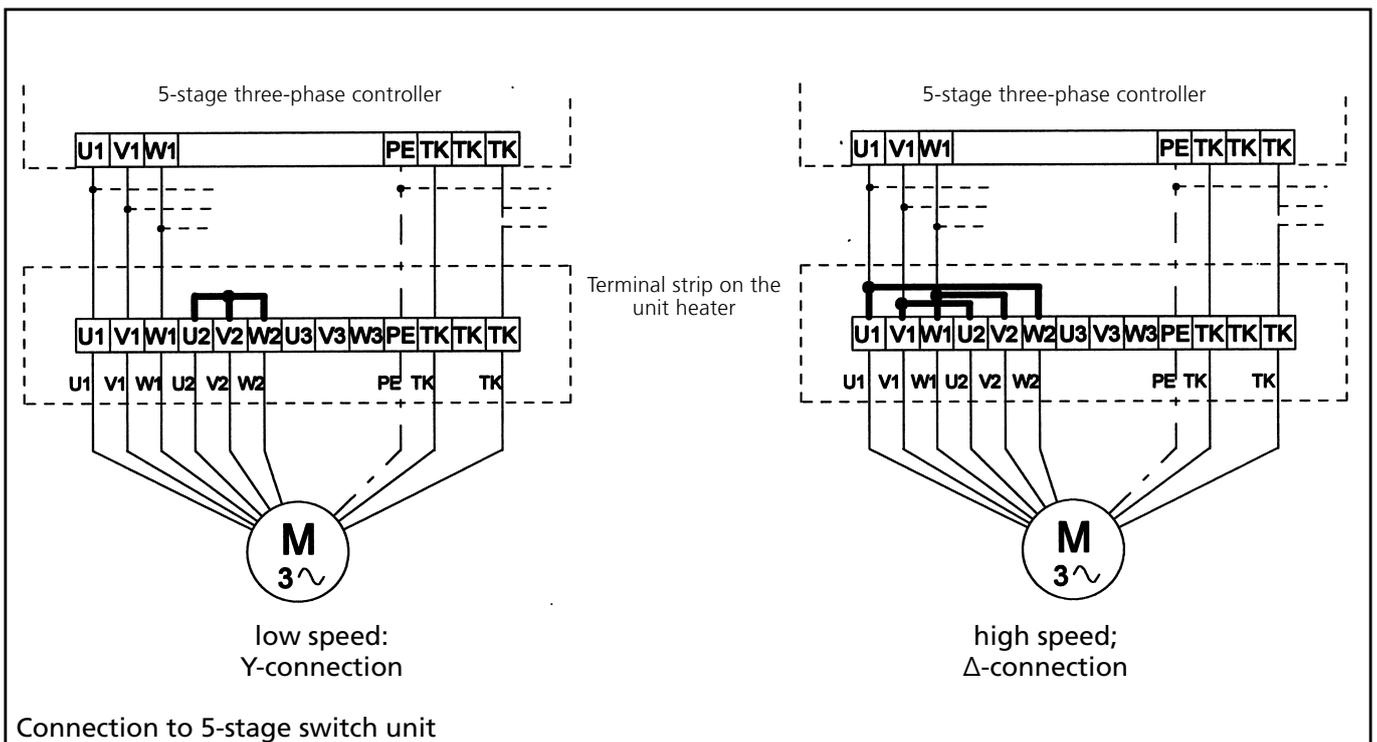
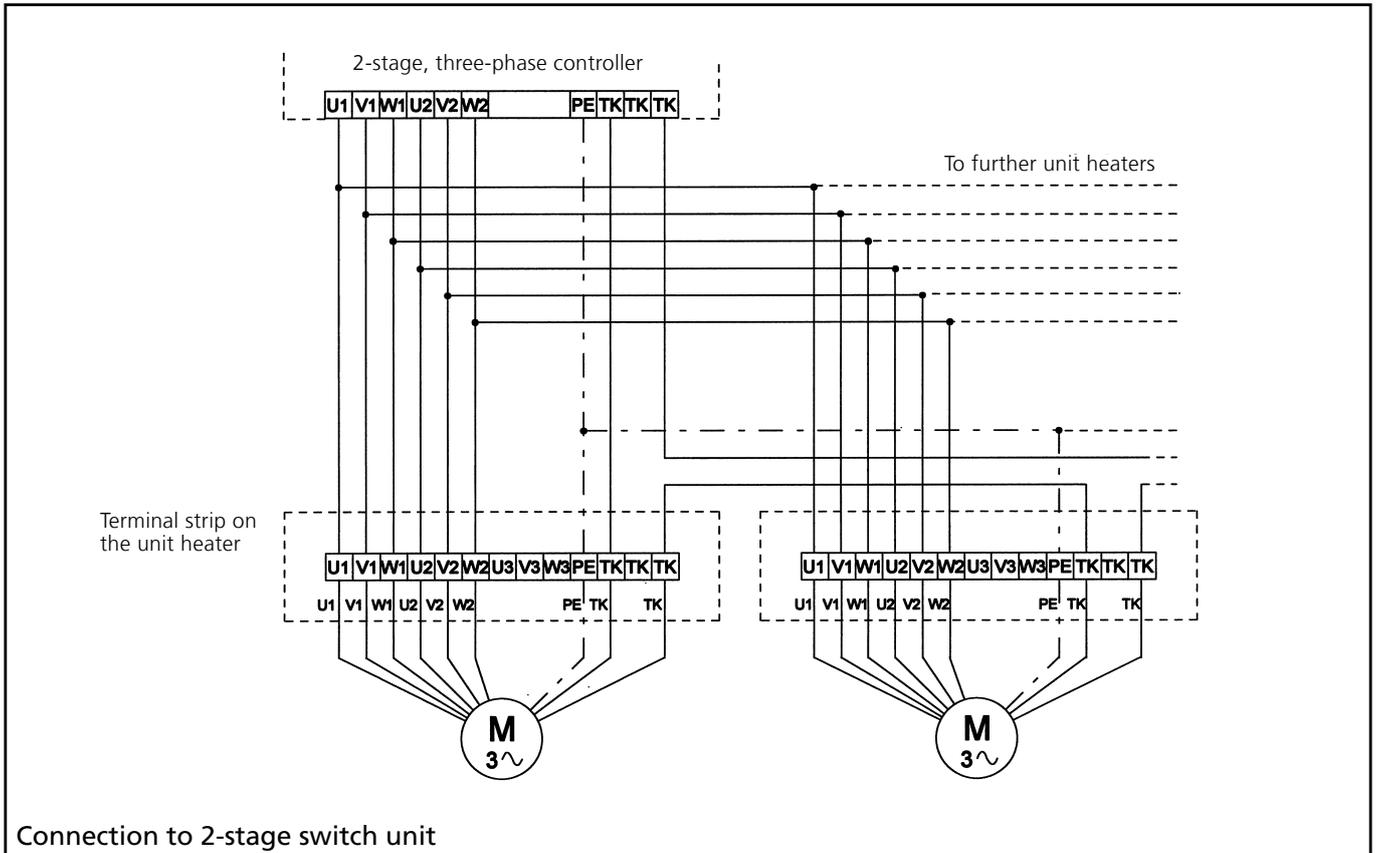
- Several TOP units, even of different sizes, can be connected in parallel to a stage switch if the switching power of the stage switch is not exceeded.
- The thermal contacts of all TOP unit heaters have to be switched in series.
- If several TOP unit heaters are connected to a stage switch, we recommend the use of intermediate terminal boxes.

Max. number of connectable TOP unit heaters						
Description	Type	I _{max.}	44 _ 36	45 _ 36	46 _ 36	47 _ 36
2-stage three-phase switch with room thermostat connection	30049	10 A	19	13	10	5
2-stage three-phase switch with room thermostat connection	30051	10 A	19	13	10	5
5-stage three-phase controller 2 A	30751	2 A	4	3	2	1
5-stage three-phase controller 4 A	30752	4 A	9	6	4	2
5-stage three-phase controller 8 A	30754	8 A	18	12	9	5
Electronic 2-stage three-phase controller	30177	10 A	19	13	10	5
	30277					

Suitable three-phase switching units

Different switches from our range are available to switch and control the speed of the motors. The above table provides an overview of the available switches, their switching power and the resulting max. number of TOP unit heaters, which can be connected to a switch unit.

Three-phase wiring diagrams



1.53 TOP unit heaters

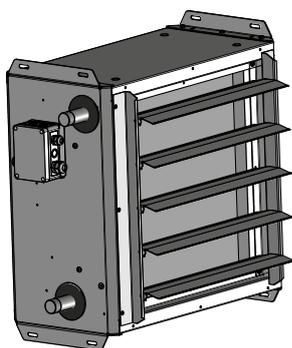
Unit heaters (2-stage three-phase motor/1-stage AC single-phase motor/continuously variable EC single-phase motor)

Installation and operating instructions

9.3.2 AC single-phase motors

The fan motors (230 V/50 Hz) are equipped with a single-phase winding with capacitor auxiliary phase. The speed can be changed using a 7-stage single-phase controller by voltage reduction (transformer principle), a continuously variable single-phase controller, a continuously variable power module or a KaControl recirculation air module.

9.3.2.1 Single-phase controller



TOP with motor junction box

The fan motor has a 230 V main winding with capacitor auxiliary winding. The units are factory-wired to the correct direction of rotation (wiring diagram 1, page 18). If there is no air output then the direction of rotation is incorrectly wired!

Parallel connection of AC single-phase motor

Several TOP units, even of different sizes, can be connected in parallel to a single-phase controller up to the maximum switching power of the single-phase controller. If several TOP unit heaters are connected to a single-phase controller, we recommend the use of intermediate terminal boxes.



Important: Switch the thermal contacts of all fan motors in series!

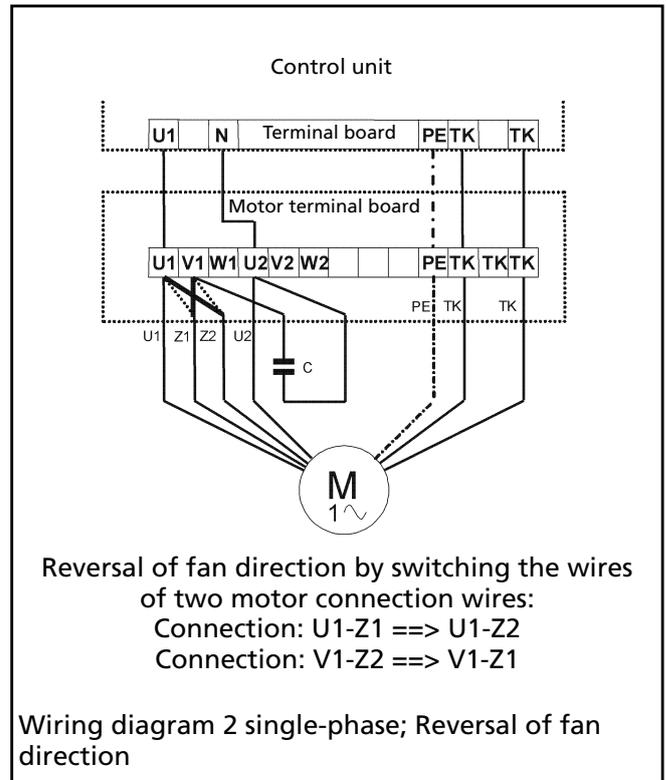
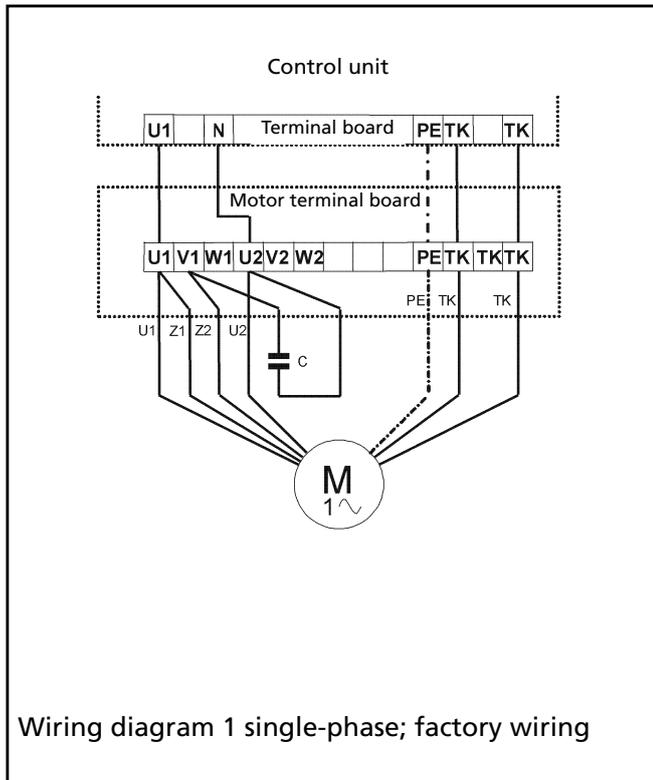


Important: Switch the motor windings of all fans in parallel!

Suitable controllers for AC single-phase motors

Different controllers from our range are available to switch and control the speed of the motors. The table at the bottom of page 18 provides an overview of the available controllers, their switching power and the resulting max. number of TOP unit heaters, which can be connected to a controller.

Single-phase wiring diagrams



Max. number of connectable TOP single-phase unit heaters per controller

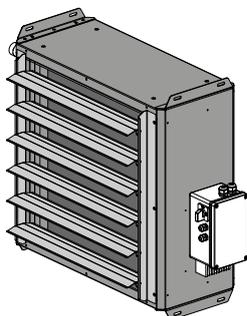
TOP type series	Type	I _{max.}	44 __ 31	45 __ 31	46 __ 31	47 __ 31
7-stage single-phase controller	30771	4 A	5	3	2	1
7-stage single-phase controller	30772	7.5 A	10	5	4	3
Electronic continuously variable Single-phase controller	30540	4.5 A	6	3	2	1
	30543					

1.53 TOP unit heaters

Unit heaters (2-stage three-phase motor/1-stage AC single-phase motor/continuously variable EC single-phase motor)

Installation and operating instructions

9.3.2.2 Continuously variable power module type ...31V



TOP with power module

The continuously variable speed controller offers the option of controlling the fan motor either via a 0-100 KΩ potentiometer, 0-10 VDC signal or 0-5 V DC signal. The type of control is pre-set by a jumper.

To guarantee a reliable start up, the fan is operated for 30 seconds at 120 VAC. A minimum voltage limit of 100 VAC is factory-set.

The maximum limit can be selected via the DIP switch.

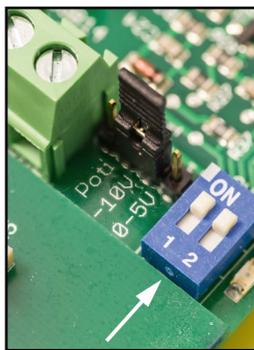
- Models 44, 45 and 46: (see Table 1)
- Model 47: (see Table 2)

DIP switch position		Resulting maximum voltage
DIP 1	DIP 2	
0	0	140 VAC
0	1	160 VAC
1	0	190 VAC
1	1	230 VAC (factory setting)

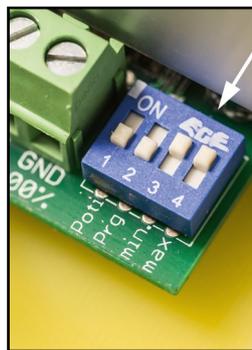
Table 1

DIP switch position		Resulting maximum voltage
DIP 3	DIP 4	
0	0	140 VAC
0	1	160 VAC
1	0	190 VAC
1	1	230 VAC (factory setting)

Table 2



DIP switch for power module for models 44, 45 and 46



DIP switch for power module for model 47

The fan and the power module can be disconnected from the mains power supply via the integral master switch.



All additional electrical components are not disconnected from the mains power supply by the master switch!

Control via 0-100 KΩ potentiometer

When controlling using a 0-100 KΩ potentiometer (linear), the jumpers for models 44, 45 and 46 and the DIP switches 1 and 2 for model 47 need to be wired/set at the potentiometer (Models 44, 45 and 46, see Fig. 1, Model 47 see Fig. 4) on the master unit (the TOP connected to the potentiometer). All additional TOP (slave units) then need to have the jumper and/or DIP switch position 0-5 V. (Models 44, 45 and 46 see Fig. 3, Model 47 see Fig. 6).

Control via 0 - 10 VDC

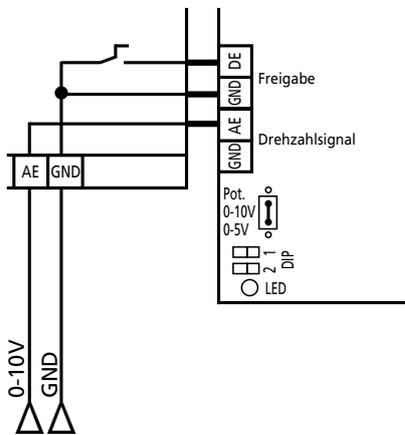
When controlling using 0-10 VDC, the jumpers for models 44, 45 and 46 and the DIP switches 1 and 2 for model 47 need to be wired/set at 0-10 V on all power modules (Models 44, 45 and 46, see Fig. 2, Model 47 see Fig. 5). The 0 - 10 V control signal is interpreted with respect to its speed according to the table (refer to table 3). Input resistance see Table 4.

Control via 0 - 5 VDC

When controlling using 0-5 VDC (e.g. on-site control), the jumpers for models 44, 45 and 46 and the DIP switches 1 and 2 for model 47 need to be wired/set to 0-5 V on all power modules (Models 44, 45 and 46, see Fig. 3, Model 47 see Fig. 6). The speed does not behave linear to the control voltage with this setting. Input resistance see Table 4.

Control signal	Speed of the TOP
0-1.0 V	Off
1.0-9.5 V	0-100 %
9.5-10.0 V	100 %

Table 3



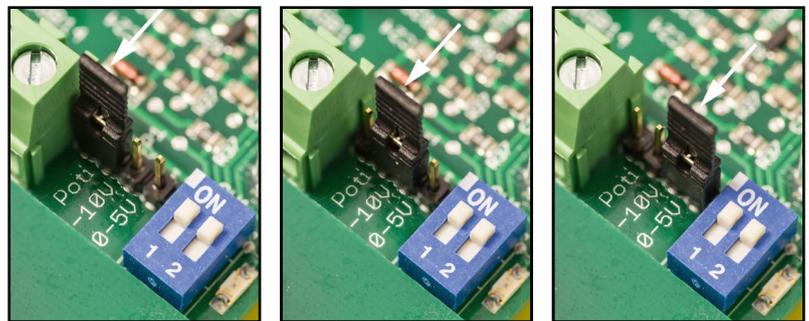
Control signal
Fan speed
0-10 VDC

0 - 10 V connection example

Input resistance	
Models 44, 45 and 46	$R_i > 100 \text{ KOhm}$
BG 47	$R_i > 50 \text{ KOhm}$

Table 4

■ Models 44, 45 and 46: jumper setting Figs. 1 to 3

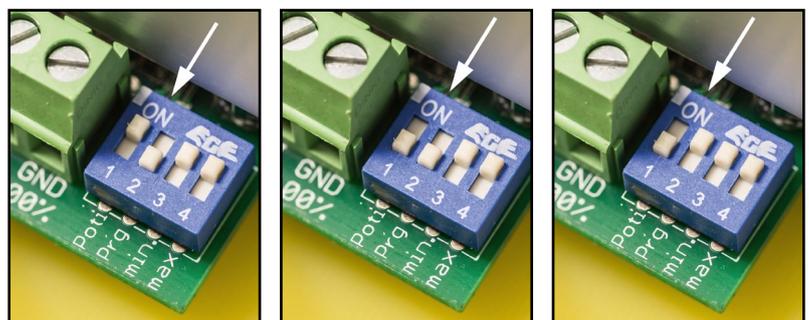


Potentiometer, left setting

0-10 V, middle setting

0-5 V, right setting

■ Model 47: DIP switch setting Figs. 4 to 6



Potentiometer ON-OFF setting

0-10 V, OFF-OFF setting

0-5 V, OFF-ON setting

1.53 TOP unit heaters

Unit heaters (2-stage three-phase motor/1-stage AC single-phase motor/continuously variable EC single-phase motor)

Installation and operating instructions

Enable input (Model 47 only)

A bridge is factory fitted to input terminals DI and GND. After removal of this bridge, the unit can be enabled via an external potential-free N/O or a 24 VDC voltage signal.

Fault signal output

In addition to the motor fault signal alluded to in the paragraph "Continuously variable power module type ...V" in Chapter 9.2.1, the overheating of the power module is signalled by the potential-free N/C (60 V AC/DC max. 1 A). In the event of a fault, the control signal has to be locked to 0 V via the controller.

Cable lengths

Maximum permitted 100 m cable length for enable input, 0-10 VDC control signal and fault signal contact.

Voltage supply and fuse

The fan and power module are together supplied by 1 line with 230 V/5 Hz voltage. An LED operating indicator is positioned on the connecting board in the power module. A protective fuse Ø5x20 mm is also incorporated on the connecting board as the main fuse and **up to approx. 01.2014** a TR5 fuse is fitted on the secondary side for the 24 V voltage (**Model 47 only**) and on the power board. Refer to Table 5 for values. Maximum on-site fuse 10 A.

Leave a minimum gap of 20 cm between low voltage and high voltage cables.

	Connecting board		Power board
	Main fuse	24 V voltage	
Models 44, 45 and 46	T 2.5 A	./.	F 2.5 A
Model 47	T 5.0 A	T 315 mA (up to approx. 01.2014)	T 5.0 A

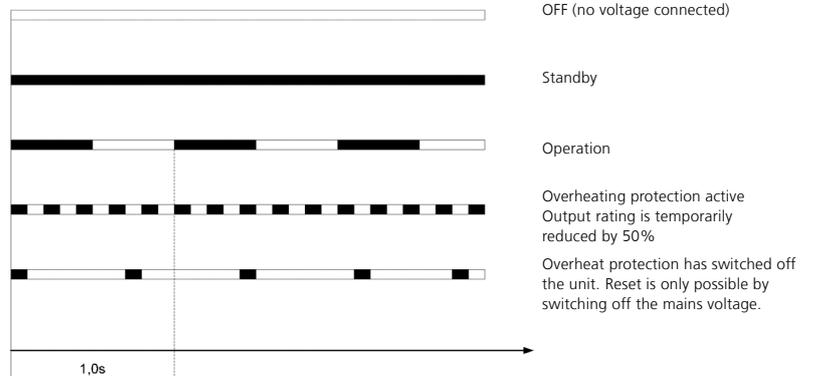
Tabelle 5

Cabling

The connecting cables (not even motor cable up to a length of 2.5 m) need not normally be shielded. In exceptional cases, for instance where cables are laid in electromagnetically highly loaded or sensitive areas, it may be useful to use shielded cables. In this case, one end of the shield must be connected to the protective conductor.

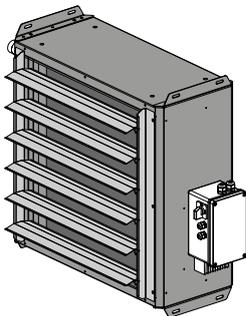
Modes of operation

The operating statuses of the power board are displayed by the LEDs on the power board.



Flash code of the power board

9.3.2.3 KaControl recirculation air module type ...31C1

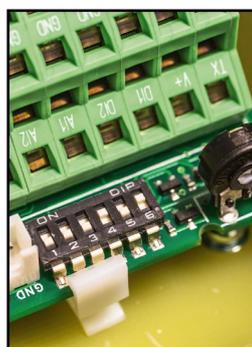


TOP with KaControl recirculation air module

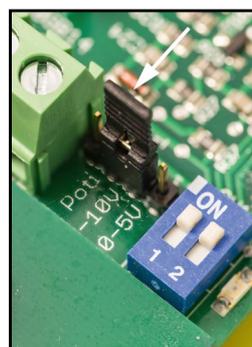
The KaControl recirculation air module offers the option of controlling the fan motor and value actuator either via a 0-10 VDC signal or via the KaControl system. The type of control is set by 6 DIP switches on the KathermBoard as per the applicable wiring diagram and selected system configuration.

Please refer to the KaControl installation instructions for unit heater I438 for information on the KaControl system.

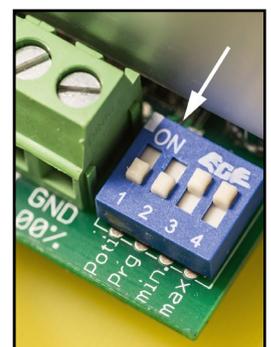
The jumper on the power module for models 44, 45 and 46 must be set to "0-10 V" and the DIP switches 1 and 2 on the power module for model 47 to the OFF position.



DIP switch KathermBoard



Jumpers on power module for models 44, 45 and 46



DIP switch on power module for model 47

1.53 TOP unit heaters

Unit heaters (2-stage three-phase motor/1-stage AC single-phase motor/continuously variable EC single-phase motor)

Installation and operating instructions

The fan and the KaControl recirculation air module can be disconnected from the mains power supply by the integral master switch.



All additional electrical components are **not** disconnected from the mains power supply by the master switch!

Control signal	Function
0 – 3 V	Unit OFF
3 – 9 V	Valve open
4 – 9 V	Min. fan speed 100%

Table 6

0-10 VDC control signal

The 0-10 VDC control signal on input terminals AI2 and GND ($R_i = 20 \text{ k}\Omega$) on the KathermBoard is interpreted in accordance with Table 6 with regard to speed and valve control. To guarantee a reliable start up, the fan is operated for 30 seconds at 120 VAC. A minimum voltage limit of 100 VAC is factory-set.

The maximum limit can be set, as described in Chapter 9.3.2.2 via DIP switches on the power module or alternatively via the KaControl system.

Maximum permissible cable length for the 0-10 VDC control signal is 20 m. Use a shielded cable e.g. J-Y(St)Y, 0.8 mm.

Output terminals V1 and GND are available on the KathermBoard to control a 24 V DC Open/Close actuator. Maximum permissible load 0.5 A

A wet fault message 24 VDC/max. 0.5 A is available at terminals V2 and GND after appropriate parameterisation with an additional KaController unit.

KaControl system

Please refer to the KaControl installation instructions for unit heater I438 for information on the KaControl system.

Voltage supply and fuse

The fan and KaControl module are together supplied by 1 supply line with 230 V/ 50Hz voltage. An LED operating indicator is positioned on the connecting board in the KaControl module. A unit fuse $\varnothing 5 \times 20 \text{ mm}$ is also installed as a main fuse on each connecting board as well as on the secondary side for 24 V voltage, and a TR5 fuse on the power board and a unit fuse $\varnothing 5 \times 20 \text{ mm}$ on the KathermBoard. Refer to Table 7 for values. Maximum on-site fuse 10 A.

	Connecting board		Power board	Katherm-Board
	Main fuse	24 V voltage		
Models 44, 45 and 46	T 2.5 A	T 315 mA	F 2.5 A	T 5.0 A
Model 47	T 5.0 A	T 315 mA	T 5.0 A	T 5.0 A

Table 7

9.3.3 EC single-phase motor



Take into account special conditions for use in IT systems. Please refer to the operating instructions for the respective EC fan for this information.

All EC fans have integral overload protection; no upstream motor protection device is therefore needed.

When using RCCBs for motors with EC technology, ensure that they are sensitive to pulse current for models 44, 45 and 46 (type A) and sensitive to all current for model 47 (type B or B+). It is impossible to protect personnel when operating the unit with residual-current protection devices, as well as with frequency converters. When voltage is applied to the unit, pulse-like capacitor load currents in the integrated EMC filter can lead to the RCCB being immediately tripped.

We would recommend a trip current of 300 mA and delayed tripping (super-resistant, characteristic K) for maximum possible operating safety. First close the "PE" protective conductor on the junction box or the KaControl recirculation air module. When disconnecting, be sure to disconnect the earth conductor connection last. Wire the unit in accordance with the applicable wiring diagram.



Once mains voltage has been applied, allow an initialisation period of approx. 10 seconds until the EC fan's electronics are ready for operation. Only then is a reliable status message possible. If no fault is detected, the relay (depending on model size) is energised after the initialisation period.



To ensure that the switch-on current limit is active, wait a minimum of 30 seconds before switching on again after the mains voltage has been switched off.

Cable protection

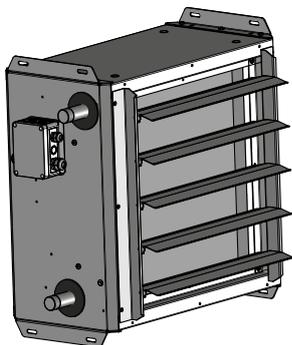
Make sure that the fuse for the mains power connection takes into consideration the cable used, type of cabling, operating conditions and applicable standards. Maximum on-site fuse 16 A.

1.53 TOP unit heaters

Unit heaters (2-stage three-phase motor/1-stage AC single-phase motor/continuously variable EC single-phase motor)

Installation and operating instructions

9.3.3.1 Control with 0-10 VDC type ...33/34

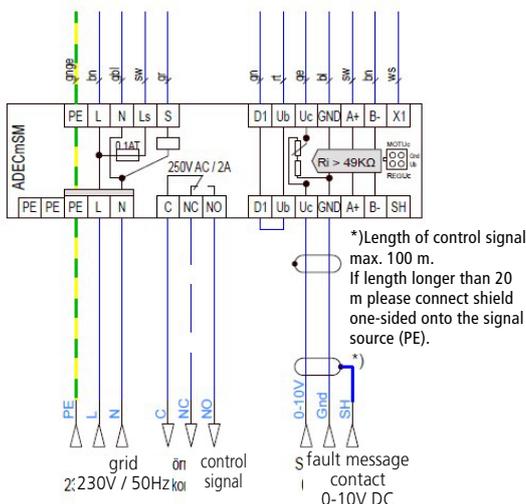


TOP with motor junction box

EMC-compliant installation of control cables

To avoid interference, ensure that there is sufficient distance between the mains power and control cables. Do not allow the length of the control cables to exceed 30 metres, and make sure that they are shielded above a length of 20 metres! When using a shielded cable, make sure that the shield is just connected on one side, i.e. only to the signal source with the protective conductor (as short and induction-poor as possible!)

Fan connection side
e.g. type 45xx33 / 46xx33



Voltage supply, actuation and fuses

All models require a power supply 230 V/50/60 Hz and can be controlled via a control input 0-10 VDC ($R_i > 49 \text{ KO}\Omega$). Types 45xx33, 46xx33 and 47xx33 can alternatively be operated via an integral MODBUS RTU interface. The shield of the BUS cable can also be wired through to terminal SH, if required.

The motor junction box contains a relay with a potential-free changeover 24 to 250 V/ 2 A.

This reports a fault of the fan or power failure only for types 45xx33, 46xx33 and 47xx33. In fault mode, 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 is protected by a relay with a device fuse $\varnothing 5 \times 20 \text{ mm}$, T0,1A.

Controller connection assignment
Unit heater with EC fan



There is no fault signal contact in fan types 44xx33, 44xx34 and 45xx34 and therefore no fan fault or power failure is reported!



Switch the unit on and off via the control input. Do not switch the unit on and off via the mains power supply.

Control signal	TOP speed
0 V	Aus
2.0 - 10 V	$n_{(2V)} - 100\%$

Table 8

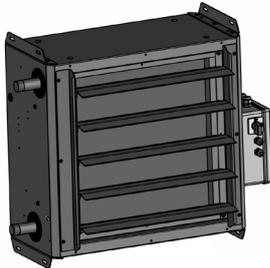
The 0 - 10 V control signal is interpreted with respect to its speed according to the table (refer to table 8). Please refer to the relevant type in the Technical Catalogue for the speed for the 2 V control signal.

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

There is an option to enable the fan in unit heater types 45xx33 and 46xx33 via an external dry N/O contact for low voltage. To do so, remove the factory-fitted bridge between terminals D1 and Ub.

Maximum on-site voltage supply fuse 16 A.

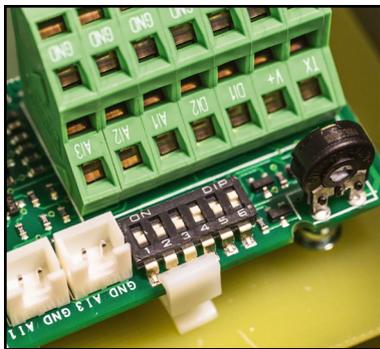
9.3.3.2 KaControl recirculation air module type ...33C1/34C1



TOP with KaControl recirculation air module

The KaControl recirculation air module offers the option of controlling the fan motor and valve actuator either via a 0-10 VDC signal or via the KaControl system. The type of control is set by 6 DIP switches on the KathermBoard as per the applicable wiring diagram and selected system configuration.

Please refer to the KaControl installation instructions for unit heater I438 for information on the KaControl system.



DIP switches and potentiometer KathermBoard



The fan and the KaControl recirculation air module can be disconnected from the mains power supply via the integral master switch.

All additional electrical components are **not** disconnected from the mains power supply by the master switch!

Control signal	Function
0 – 3 V	Unit OFF
3 – 9 V	Valve open
4 – 9 V	Min. fan speed 100%

Table 9

0-10 VDC control signal

The 0-10 VDC control signal at input terminals AI2 and GND ($R_i = 20 \text{ k}\Omega$) on the KathermBoard is interpreted as per Table 9 with regard to speed and valve control.

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

Maximum permissible cable length for the 0-10 VDC control signal is 20 m. Use a shielded cable e.g. J-Y(St)Y, 0.8 mm.

Output terminals V1 and GND are available on the KathermBoard to control a 24 V DC Open/Close actuator. Maximum permissible load 0.5 A

A wet fault message 24 VDC / max. 0.5 A is available at terminals V2 and GND after appropriate parameterisation with an additional KaController unit. This is signalled to the KaControl system in the event of a fan fault **type 45xx33C1, 46xx33C1 and 47xx33C1** and the red LED in the housing lights up.



Fan fault indicator

1.53 TOP unit heaters

Unit heaters (2-stage three-phase motor/1-stage AC single-phase motor/continuously variable EC single-phase motor)

Installation and operating instructions



There is no fault signal contact in fan types 44xx33, 44xx34 and 45xx34. In the event of a fan fault or power failure at the unit heater, this is not reported via the KaControl system and the red LED does not light up!



Switch the unit on and off via the control input. Do not switch the unit on and off via the mains power supply.

KaControl system

Please refer to the KaControl installation instructions for unit heater I438 for information on the KaControl system.

Connecting board		Katherm-Board
Control voltage	24 V voltage	
T 1.0 A	T 315 mA	T 5.0 A

Table 10

Voltage supply and fuse

The fan and KaControl module are together supplied by 1 supply line with 230 V/ 50Hz voltage. An LED operating indicator is positioned on the connecting board in the KaControl module. A unit fuse Ø5x20 mm is also installed on the primary side for the control voltage on the connecting board as well as on the secondary side for 24 V voltage and a unit fuse Ø5x20 mm on the KathermBoard. Refer to Table 10 for values. Maximum on-site fuse 16 A.

10 Commissioning

10.1 Pre-commissioning checks

Perform the following checks before commissioning the TOP unit heater:

- Is the TOP properly and securely fixed in place?
- If the protective conductor connected properly on all units?
- Are the AC fan thermal contacts wired correctly (where several TOP unit heaters are connected in series)?
- Are the EC fan fault signalling contacts wired correctly, if fitted (where several TOP unit heaters are connected in series)?
- Are all the lines connected properly as per the wiring diagrams?
- Are the jumpers and DIP switches correctly set?
- Note the information on commissioning of other system parts and the KaControl system.

10.2 Commissioning

Proceed as follows after conducting the above checks:

- Open the valves on the heating system.
- Properly fill the pipes and heat exchanger, if they have been drained after installation.
- Ensure that the entire system is vented.
- Then check that all pipes and valves are leak-tight.
- Start up the TOP by applying voltage to all electrical components.
- Are the master switches on all TOP switched on?
- Check the direction of rotation and all speed levels or the speed range (0-100 %).

10.3 Post-commissioning checks

Perform the following checks after commissioning the TOP unit heaters:

Are the fans switched off permanently by the thermal contact (the exception are stage switches type 30773 and 30774)?

To do so, disconnect a wire from terminal TK on the stage switch (Danger: 230 V!). All the fans should switch off immediately. The operating readiness indicator should go out on the stage switch. Reconnect the wire to terminal TK. The fans should not start up again. Reset the stage switch and switch it on again. The fans should restart. Briefly disconnect the connecting wires of all thermal contacts individually to check that all thermal contacts are correctly wired.



Are the fans in all TOP unit heaters running in the correct direction at all switching stages?

The direction of rotation is indicated by the arrow. Make sure that the fan is drawing in air. Swap 2 phases on the stage switch if all fans are rotating in the wrong direction at all fan stages. Swap the auxiliary phase connections (Z1, Z2) if the ASC single-phase motors are rotating in the wrong direction. Check the wiring of the incorrectly rotating fans if individual fans are rotating in the wrong direction.

Are all the impellers running smoothly or are grinding noises audible?

Determine the cause as soon as grinding noises become audible. Possible causes are:

- a unit installed in too confined a space
- dirt on site (e.g. pieces of paper) between the impeller and heat exchanger.

1.53 TOP unit heaters

Unit heaters (2-stage three-phase motor/1-stage AC single-phase motor/continuously variable EC single-phase motor)

Installation and operating instructions

11 Decommissioning (longer term)

- Switch of all electrical components.



If there is a risk of frost, it is essential that the heat exchanger and pipework are protected from freezing by the use of anti-freeze!

12 Maintenance and cleaning

12.1 Housing

The galvanised unit heater housing is maintenance-free. Dirt on the housing does not affect the operation of the unit. Cleaning is only necessary for aesthetic reasons.

12.2 Heat exchanger

Dusty and oily deposits on the fins of the heat exchanger restrict the air flow and heat transfer. Only a clean heat exchanger will produce its full heat output in the long term. For this reason, regularly check the unit heater's heat exchanger for dirt and clean if necessary.

Check the unit heater once a year before the start of the heating season, and in less favourable conditions (high dust content in the air), even monthly.

Carefully blast the Cu/Al heat exchanger with compressed air to remove accumulated dust. Proceed extremely carefully, as the aluminium fins bend very easily (bent fins have to be straightened with an appropriate tool).

Any oily deposits on steel heat exchangers can also be cleaned with ease using a steam cleaner.

12.3 Motor



Immediately rectify any defects established on systems/ assemblies/equipment. If the defect constitutes an acute danger, then do not operate the unit / system in its defective state.

- Pay attention to all safety and operating guidelines (EN 50 110, IEC 364) when performing set-up and maintenance work.



Disconnect the motor from the mains voltage supply and prevent it from being re-connected!

The unit heater's external rotor motor is maintenance-free. The motor's ball bearing runs, sealed on both sides, are greased for life. Deposits on the blades of the fan and the fan guard reduce the air volume. Regularly check the fan, inlet nozzle and fan guard (-> Heat exchanger) and clean if dirty.



- Never use aggressive, paint-dissolving cleaning agents to clean the unit heaters.
- Make sure that no water enters the inside of the motor or the electronics (possibly by direct contact with seals or motor openings and note the protection rating (IP).
- Check the condensation water openings, positioned to fit the installation position, to ensure that water runs off freely.
- No warranty can be offered for corrosion / paint adhesion of unpainted / painted fans in the event of improper cleaning of fans.
- Run the fan for a minimum of 1 hour at 80 to 100% of maximum speed before cleaning to avoid the accumulation of moisture in the motor.
- Run the fan for a minimum of 2 hours at 80 to 100% of maximum speed after the cleaning process!

Please refer to the operating instructions for the respective fan for further information.

Once work has been completed, remove the reconnection safety guard.

1.53 TOP unit heaters

Unit heaters (2-stage three-phase motor/1-stage AC single-phase motor/continuously variable EC single-phase motor)

Installation and operating instructions

13 Operating faults

13.1 All unit heaters

Fault	Possible cause	Remedy
Impeller not running concentrically	Rotating parts unbalanced	Clean the unit if still unbalanced after cleaning, replace the unit. Please make sure that no balancing clips are removed during cleaning.
Air flow is not warm in heating mode	Insufficient heating medium	Check heating medium (heating circuit, boiler) and remedy fault
	Air in the heat exchanger	Vent heat exchanger
Fan not moving any or too little air	Air flow is interrupted or disrupted e.g. by dirty filter or dirty heat exchanger	Restore air passage, change the filter and/or replace the heat exchanger
	Wrong direction of rotation	Check the direction of rotation of the fan

13.2 AC single-phase motor with motor junction box type ...31/36

Fault	Possible cause	Remedy
Fan does not rotate when motor is switched on and standby light is on	Setpoint temperature too low	Raise setpoint
	Remote switch contact has switched off	Check remote switch contact, bridge if necessary
Fan does not rotate when motor is switched on and standby light is off	No power supply to unit	Check fuses in sub-junction box
	No control voltage	Check control fuse in switch unit
	Cable connection broken	Check cable connections
	Fan thermal contact has been triggered (overheating risk)	Check motor temperature and allow to cool down if necessary. Clarify the cause of overheating (e.g. blocked motor, intake temperature too high, dirty filter); switch unit off and on again

13.3 AC single-phase motor with power module type 31 V

Fault	Possible cause	Remedy
Fan does not rotate when power is applied to module and control signal > 1 VDC	Main fuse on connecting board, secondary fuse on connecting board (only Model 47 to approx. 01.2014) and/or fuse on power board faulty	Check fuses
	Thermal contact (risk of overheating) or overheating protection in module has triggered	Check motor or module temperature and allow to cool down. Clarify cause of overheating (e.g. motor blocked, inadmissibly high power consumption, intake temperature too high, dirty filter); switch unit off and on again
Fan does not rotate 100 % at max. control signal 10 VDC	Overheating protection in the module has reduced speed	Check automatic speed increase after module has cooled down
	DIP switch for maximum limit set incorrectly	Check DIP switches
Fan rotates at fixed undefined speed in spite of change to control signal 0-10 VDC	Control voltage poles switched	Correctly connect control voltage

13.4 AC single-phase motor with KaControl recirculation air module type 31C1

Fault	Possible cause	Remedy
Fan does not rotate when power is applied to the module and control signal < 4 VDC	Main fuse on connecting board, secondary fuse on connecting board fuse on power board and/or fuse on KathermBoard faulty	Check fuses
	Control voltage poles switched	Correctly connect control voltage
	Thermal contact (risk of overheating) or overheating protection in module has triggered	Check motor or module temperature and allow to cool down. Clarify cause of overheating (e.g. motor blocked, inadmissibly high power consumption, intake temperature too high, dirty filter); switch unit off and on again
Fan does not rotate 100% at max. control signal 10 VDC	Overheating protection in the module has reduced speed	Automatic speed increased after module has cooled down
	DIP switch for maximum limit set incorrectly	Check DIP switches
	Potentiometer for maximum limit on KathermBoard set incorrectly	Check potentiometer

For other faults refer also to KaControl assembly and installation instructions for Unit Heaters I438.

1.53 TOP unit heaters

Unit heaters (2-stage three-phase motor/1-stage AC single-phase motor/continuously variable EC single-phase motor)

Installation and operating instructions

13.5 EC single-phase motor with motor junction box type ...33/34

Fault	Possible cause	Remedy
Fan does not rotate when power is applied to the module and control signal < approx. 1.5 VDC	Mechanical blockage	Switch off, de-energise and remove mechanical blockage
	Bridge missing at enable input (if fitted)	Insert bridge
	Control voltage poles switched	Correctly connect control voltage
	Temperature detector has responded	Allow motor to cool down, identify and rectify cause of fault, possibly remove automatic switch-on lock.
Fan does not rotate 100 % at max. control signal 10 VDC	Maximum limit incorrectly set	Check potentiometer in motor junction box.
	Active temperature management effective (motor or electronics overheated)	Check airways are clear, possibly remove foreign bodies; impeller is blocked or dirty; check temperature of supply air; check installation space (air speed over cooling body)
Fault message (Contact C – NC open) and fan operational	Fault signal chain fuse faulty	Check fuse
	Fan does not have fault signal contact	with additional fans with fault signal contact in a group wire contact C - NO

Refer to the operating instructions for the fan for further fault messages

13.6 EC single-phase motor with KaControl recirculation air module type ...33C1/34C1

Fault	Possible cause	Remedy
Fan does not rotate when power is applied to the module and control signal < 4 VDC	Mechanical blockage	Switch off, de-energise and remove mechanical blockage
	Control voltage fuse on connecting board, 24 V voltage fuse on connecting board and/or fuse on KathermBoard faulty	Check fuses
	Control voltage poles switched	Correctly connect control voltage
	Temperature monitor has responded	Allow motor to cool down, identify and rectify cause of fault, Possibly remove automatic switch-on lock.
Fan does not rotate 100 % at max. control signal 10 VDC	Potentiometer for maximum limit on KathermBoard set incorrectly	Check potentiometer
	Active temperature management effective (motor or electronics overheated)	Check airways are clear, possibly remove foreign bodies; impeller is blocked or dirty; check temperature of supply air; check installation space (air speed over cooling body)
Fan fault signal for fan without fault signal contact	no cable bridge at terminals Ls and S on the PCB	insert cable bridge

For other faults refer also to Assembly and Installation Instructions for KaControl for Unit Heaters I438.

14 Disposal

Recycle dismantled components if no return or disposal agreement has been concluded:

- Scrap metals.
- Recycle plastics.
- Sort and dispose of other components.



IMPORTANT NOTE!

Environmental hazard from incorrect disposal!

Incorrect disposal can present a hazard to the environment.

- Electrical scrap, electronic components, lubricants and other auxiliary materials represent hazardous waste and should only be disposed of by authorised specialist companies.
- If in doubt, seek information on environmentally responsible disposal at the local municipal authority or from a specialist disposal company.

1.53 TOP unit heaters

Unit heaters (2-stage three-phase motor/1-stage AC single-phase motor/continuously variable EC single-phase motor)

Installation and operating instructions

15 Declaration of Conformity



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
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:

Lufterhitzer TOP

Lufterhitzer TIP

Resistent 8000

Ultra

44****, 45****, 46****, 47****

54****, 55****, 56****, 57****

84****, 85****, 86****, 87****

73****, 84****, 85****, 96****, 97****

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

DIN EN ISO 12100

DIN EN ISO 13857

Elektromagnetische Verträglichkeit

Elektromagnetische Verträglichkeit

Elektromagnetische Verträglichkeit

Sicherheit elektr. Geräte f. den Hausgebrauch und ähnliche Zwecke

Sicherheit von Maschinen

Sicherheit von Maschinen





DIN EN 60079-0; -7; -14
DIN EN 13463-5

Explosionsfähige Atmosphäre
Nicht elektrische Geräte für den Einsatz in
explosionsgefährdeten Bereichen

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
2014/34/EU	Richtlinie für Geräte in explosionsgefährdeten Bereichen
EUV 327/2011	Umweltgerechte Gestaltung von Ventilatoren
EUV 1253/2014	Umweltgerechte Gestaltung von Lüftungsanlagen (<i>nur Mischluftgeräte</i>)

Hendrik Kampmann

Lingen (Ems), den 08.09.2016
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

1.53 TOP unit heaters

Unit heaters (2-stage three-phase motor/1-stage AC single-phase motor/continuously variable EC single-phase motor)

Installation and operating instructions



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