



# Ultra

2-stage three-phase motor  
1-stage single-phase motor  
EC single-phase motor

## ► Installation and operating instructions

Please retain carefully for future use!  
Read carefully prior to initial start-up!

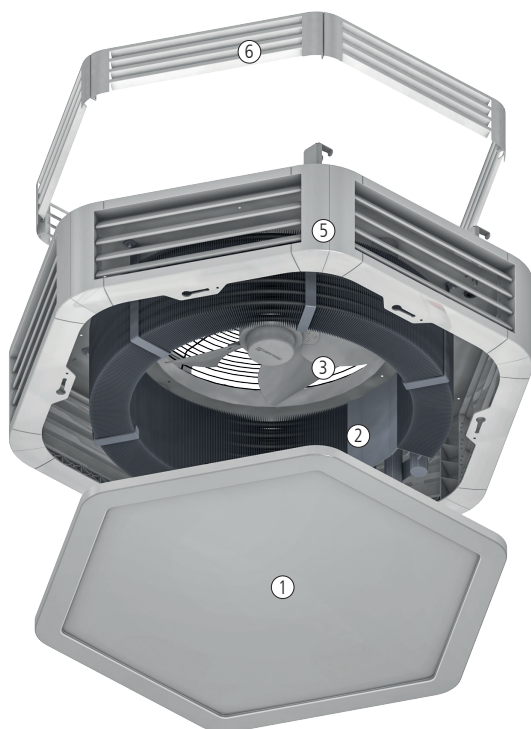


[Kampmann.de/installation\\_manuals](http://Kampmann.de/installation_manuals)

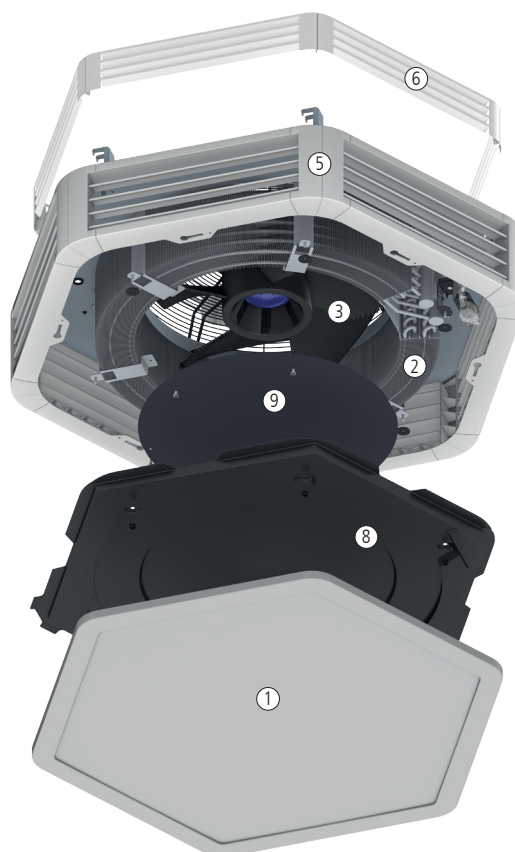
# 1.54 Ultra

Comfortable indoor climate in high-end interiors

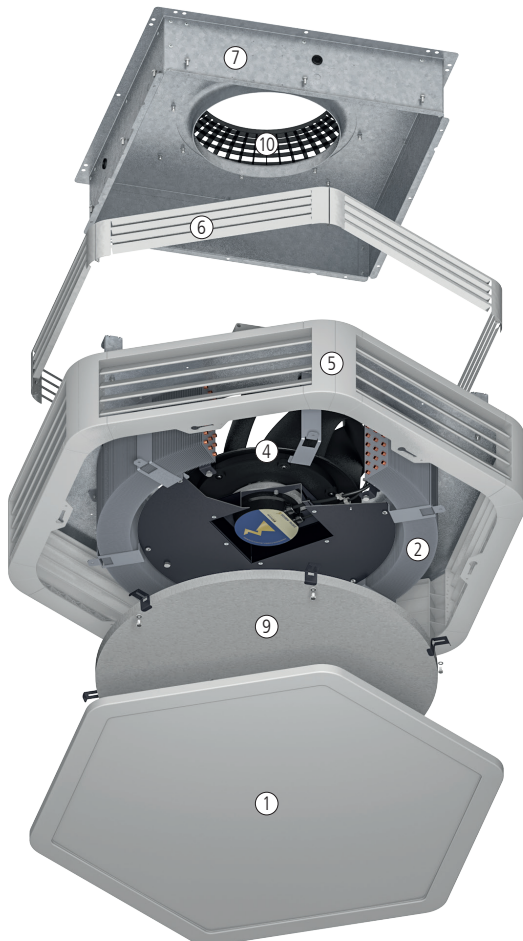
## Installation and operating instructions



Ultra series 73-96 for heating



Ultra series 84-96 for cooling



Ultra series 97 for heating, mixed air  
(optionally also for heating or cooling)

- ① Base cover removable after rotating by 6°
- ② Cu/Al heat exchanger
- ③ Whisper-quiet sickle-blade axial fan
- ④ Whisper-quiet sickle-blade fan
- ⑤ Plastic housing, RAL 9016
- ⑥ Air intake crown, standard
- ⑦ Junction box
- ⑧ Condensation tray
- ⑨ Air guide base
- ⑩ FlowGrid

#### Key to symbols:



#### Caution! Danger!

*Non-compliance with this information can lead to serious personal injuries or damage to property.*



#### Danger from electrocution!

*Non-compliance with this information can lead to serious personal injuries or damage to property by electrocution.*

**Carefully read these instructions in full prior to any assembly and installation work!**

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!

**We reserve the right to make content or design-related changes without prior notice!**

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## **1. Intended use**

Kampmann Ultra units 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 property if they are not appropriately installed and operated or correctly and properly used.

### **Applications**

Ultra should only be used

- indoors (for instance in residential properties and offices, showrooms etc.)

Ultra 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 installation. Check the application with the manufacturer in case of any doubt. 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 also deemed to include compliance with the installation instructions described in this manual.

### **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 these instructions**

This manual contains information on the installation of the Ultra for operation. The information contained in these instructions can be changed without prior notification.

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## Installation and operating instructions

### 1.1 Limits of operation and use

Limits of operation		
Min./max. water temperature	°C	5 – 90
Min./max. air intake temperature	°C	-20 to +40
Min./max. air humidity	%	15 – 75
Max. operating pressure	bar	16
Min./max. glycol percentage	%	25 – 50
Height when ceiling-mounted (max.)	approx. 4 m (with model 96), refer to the technical catalogue for the Ultra for more detailed information on other models	

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

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

Water quality		
pH value* <sup>1</sup>		8 – 9
Conductivity* <sup>1</sup>	µS/cm	< 700
Oxygen content (O <sub>2</sub> )	mg/l	< 0.1
Hardness	°dH	4 – 8.5
Sulphur ions (S)		not measurable
Sodium ions (Na <sup>+</sup> )	mg/l	< 100
Iron ions (Fe <sup>2+</sup> , Fe <sup>3+</sup> )	mg/l	< 0.1
Manganese ions (Mn <sup>2+</sup> )	mg/l	< 0.05
Ammonia ions (NH <sub>4</sub> <sup>+</sup> )	mg/l	< 0.1
Chlorine ions (Cl)	mg/l	< 100
CO <sub>2</sub>	ppm	< 50
Sulphate ions (SO <sub>4</sub> <sup>2-</sup> )	mg/l	< 50
Nitrite ions (NO <sub>2</sub> <sup>-</sup> )	mg/l	< 50
Nitrite ions (NO <sub>3</sub> <sup>-</sup> )	mg/l	< 50

\*<sup>1</sup> at 20 °C

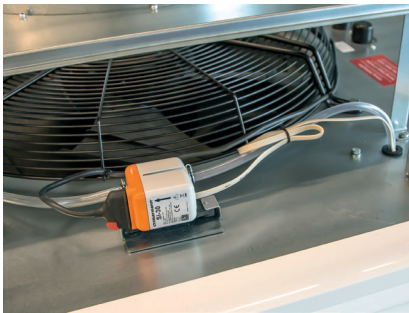
## 1.2 Limits of use for cooling

Due to its generously dimensioned basic construction and low basic fan speeds, the cooling model is fundamentally used with air dehumidification. Nevertheless, specific operating modes and settings need to be taken into account for cooling mode:

- Never move the louvre slats into the end positions, e.g. to shut off a discharge opening. In particular at high fan speeds, there is a risk that water droplets could be carried into the other air outlet fields by inadmissibly high air speeds.
- Only operate the following units at a maximum fan speed of 680 rpm:
  - EC design: type 963133 / type 964133
  - Three-phase model: type 963136 / type 964136
  - Single-phase model: type 963116 / type 964116
  - Refer also to the table in chapter 5 "Technical data".
- To prevent impermissibly severe cooling down of the housing when the fan is at a standstill, we would recommend the use of valves (e.g. thermoelectric shut-off valve with recirculating mode).

This counteracts the outer parts of the housing from experiencing condensation, especially with extreme conditions involving very high levels of humidity.

## 1.3 Condensation pump



condensate pump

The self-priming condensation pump is fixed to the hose connector for the on-site condensation pressurised line.

This ultra-quiet, electromagnetically operating pump is mounted together with the upstream condensation filter on the upper side of the unit.

<b>Max. delivery height:</b>	8 m with max. 4.5 l/h flow rate and a hose length of 10 m
<b>Max. pump volume:</b>	approx. 18 l/h with 0.5 m delivery height and a hose length of 2 m
<b>Supply voltage:</b>	230 V/50 Hz (separate power line needed)
<b>Power consumption:</b>	14 W
<b>Condensation pressure line:</b>	DN 6 mm (hose connection)
<b>Signal contact for condensation overflow</b>	Normally closed (NC) contact, potential-free switch capacity 230 V/5 A

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## Installation and operating instructions

### 1.3.1 Connecting the condensation pump

Flow rate [l/h] of condensation pump – SI 30					
l/h	Total hose length (hose diameter 6 mm)				
max. delivery height	2 m	5 m	10 m	20 m	30 m
0 m	19.2	18.0	16.8	15.3	14.3
0.5 m	18.0	16.8	15.0	14.0	13.8
1.0 m	16.0	15.5	14.4	13.2	12.6
2.0 m		14.3	13.2	11.8	11.0
3.0 m		12.4	11.5	10.0	9.5
4.0 m		10.0	9.3	8.3	7.5
5.0 m			8.1	7.1	6.8
6.0 m			7.2	6.2	5.4
7.0 m			5.4	4.2	
8.0 m			4.5	4.0	

### 1.3.2 Limits of use of the condensation pump

The achievable flow volume of the condensation pump used depends on the delivery height and length of condensation hose connected. The volume of condensation rises and the possible delivery height of the pump falls with extreme air humidity and/or very low system temperatures. Particularly when operating larger Ultra models (Series 96), the volume of condensation produced can exceed the permitted pump volume under extreme conditions. Therefore set up the alarm contact on the float switch so that dehumidification is stopped (e.g. by closing the cooling valve).

Note the following limits of use of the condensation pump for the max. permitted cooling conditions (CHW 6/10 °C at entering air temp. 27 °C / 60 % rel. humidity):

Ultra series 85: max. permitted delivery height with a 5 m hose length: 3 m

Ultra series 96: max. permitted delivery height with a 5 m hose length: 2 m

Precise limits of use for the respective operating modes can be calculated using the calculation program at [www.kampmann.de/ultra/calculation](http://www.kampmann.de/ultra/calculation).

Higher-performance pumps are available on request if higher condensation volumes than the maximum permissible have to be discharged.



## 2. 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 crossed 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 fan

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.

In the event of a fault, electrical voltage will be produced at the rotor and impeller. Rotor and impeller are base-insulated.

- Do not touch when fitted!

The fan runs when control voltage is applied or the stored fan speed starts up automatically when mains power fails.

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

High temperatures occur at the fan's electronic housing.

- Combustion 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 for further information!

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



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## Installation and operating instructions

### 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.

### Modifications to the unit

Do not undertake any modifications or upgrades to the Ultra 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. Ensure that all on-site systems and cabling are suitable for connection to the intended system!



### 3. Scope of delivery

All units are supplied with factory-fitted brackets. Provide materials for fixing the units heaters to the ceiling, 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?



#### 4. Transport and storage

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

#### 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 Ultra unit heaters in the position shown on the packaging.

#### 5. Technical data

##### Technical data • Limits of use for cooling

Series	73		84		85		96		97	
Enclosure type	IP 54		IP 54		IP 54		IP 54		IP 54	
Water content [l]	1.6 - 2.3		2.0 - 2.9		2.0 - 3.8		2.2 - 4.4		3.3	
Weight kg	28 - 30		34 - 43		35 - 45		45 - 55		57	
EC model, 230 V series	/		84_33		85_33		96_33		96_34	
AC model, 400 V series	73_36		84_36		85_36		96_36		/	
AC model, 230 V series	73_16	/	84_16	/	85_16	/	96_16	/	/	/
Nominal speed	/		1040		980		990		680 (990) <sup>1)</sup>	
EC model, 230 V rpm	/		/		/		/		/	
AC model, 400 V rpm	890	680	930	800	820	560	880	680	/	/
AC model, 230 V rpm	880	/	940	/	800	/	910	/	/	/
<b>Cooling options</b>										
EC model, 230 V type	/		843133		853133 854133		963133 964133		963134 964134	
AC model, 400 V type	/		843136		853136 854136		963136 964136		/	
AC model, 230 V type	/		843116	/	853116 854116	/	963116 964116	/	/	
Dry cooling	/		yes	yes	yes	yes	yes	yes	yes	yes
Cooling with dehumidification	/		yes	yes	yes	yes	no	yes	yes	yes

<sup>1)</sup> Figures in brackets refer when the factory setting is changed to the max. possible speed. This is not suitable for cooling with dehumidification!

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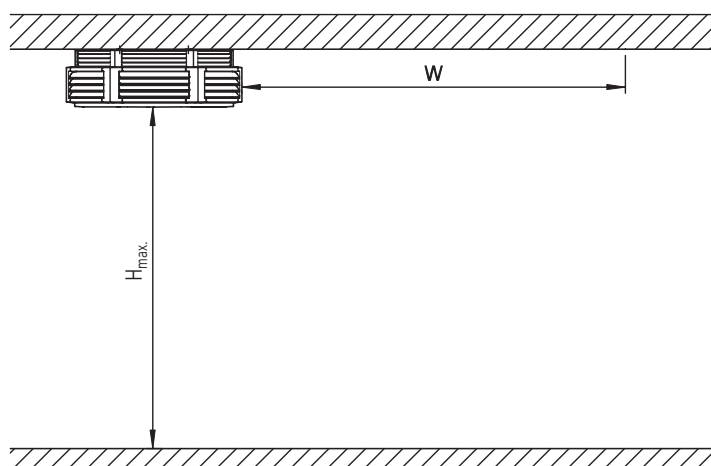
### 6. Installation

- Cut the drilling template from the packing box.
- First install the connections (see Waterside connections on page 15) for simpler installation.
- Fix the Ultra to the ceiling using screws and rawlplugs provided on site as shown on page 13. Ensure that the unit is not under tension or torsion.

#### 6.1 Installation of the Ultra

A drilling template is printed on the cardboard packaging to mark the mounting points of the Ultra on the ceiling.

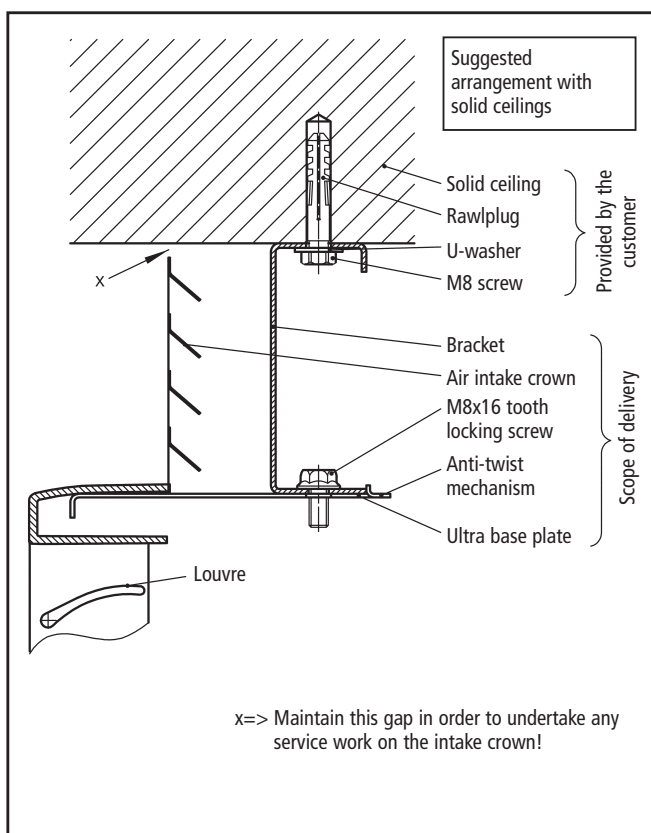
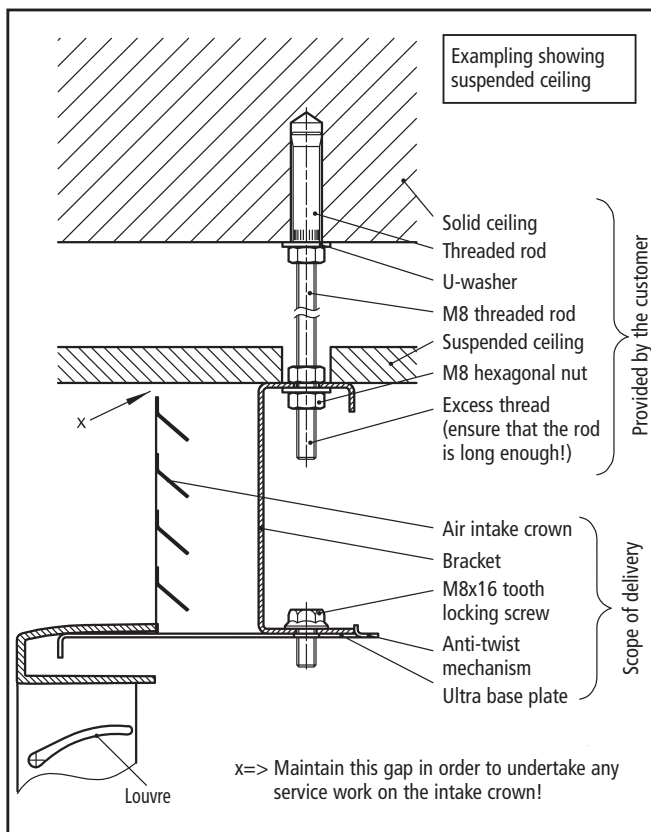
- First determine the installation position. Requirements governing the installation site:
  - a ceiling which permanently and securely supports the unit (call in the services of an architect or structural engineer if necessary)
  - a ceiling that permits vibration-free suspension (consider the use of anti-vibration rubber washers for decoupling purposes!)
  - refer to the table below for the maximum mounting height



#### Maximum mounting height

		EC model																			
Ultra series		84_ _33					85_ _33					96_ _33					96_ _34				
Voltage	[V]	10	8	6	4	2	10	8	6	4	2	10	8	6	4	2	10	8	6	4	2
Speed approx	[rpm]	1070	950	730	490	280	1000	890	700	480	260	1000	800	580	370	170	680	550	410	270	100
Max. installation height H <sub>max</sub>	[m]	2.9	2.7	2.4	2.4	2.3	3.4	3.2	3.0	2.7	2.4	4.1	3.8	3.5	3.2	2.8	3.6	3.4	3.2	3.0	2.7
Throw W	[m]	4.8	4.4	3.4	2.4	1.5	5.6	5.2	4.6	3.9	3.1	7.2	6.2	5.2	4.2	3.3	5.7	5.1	4.4	3.8	3.0

		Three-phase model								Single-phase model			
Ultra series		73_ _36		84_ _36		85_ _36		96_ _36		73_ _16	84_ _16	85_ _16	96_ _16
Switching stage		2	1	2	1	2	1	2	1	1	1	1	1
Speed approx.	[rpm]	920	740	950	830	850	570	880	670	920	950	850	880
Max. installation height H <sub>max</sub>	[m]	2.4	2.3	2.8	2.5	3.3	3.0	3.9	3.4	2.4	2.8	3.3	3.9
Throw W	[m]	3.7	3.2	4.3	3.7	5.5	4.6	6.9	5.4	3.7	4.3	5.5	6.9



Refer to "Commissioning" on page 35 for adjustment of the louvre position.

#### Example showing suspended ceiling

- Use the drilling template to draw the four fixing points on the solid ceiling and drill the holes.
- Tap the rawplugs into the holes. Screw in the sufficiently long threaded rods using the M8 hexagonal nuts and washers as per the diagram.

**Caution!** Never lift the unit by the louvres when transporting or installing it.

- Lift the unit under the ceiling and attach it to the brackets by pushing the slots on the brackets as shown on the adjacent drawing onto the threaded rods.
- Tighten the screw nuts and ensure that the Ultra is level, particularly with cooling mode.

Use all four fixing points! Make sure that the gap (approx. 6 mm) between the ceiling and the air intake crown is not filled by subsequent work on the ceiling, such as plastering, as it would then be impossible to fit or remove the intake crown.

#### Installation with a solid ceiling

- Use the drilling template to draw the four fixing points on the solid ceiling and drill the holes.
- Tap the rawlplugs into the holes and insert the M8 screws with washers and screw nuts as per the diagram.

**Caution!** Never lift the unit by the louvres when transporting or installing it.

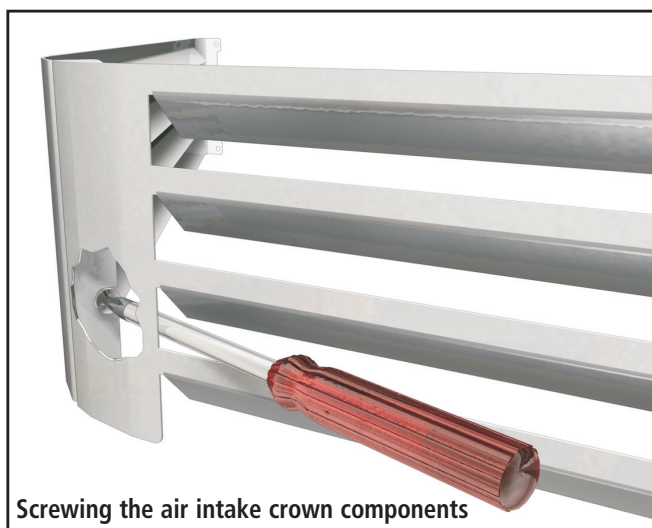
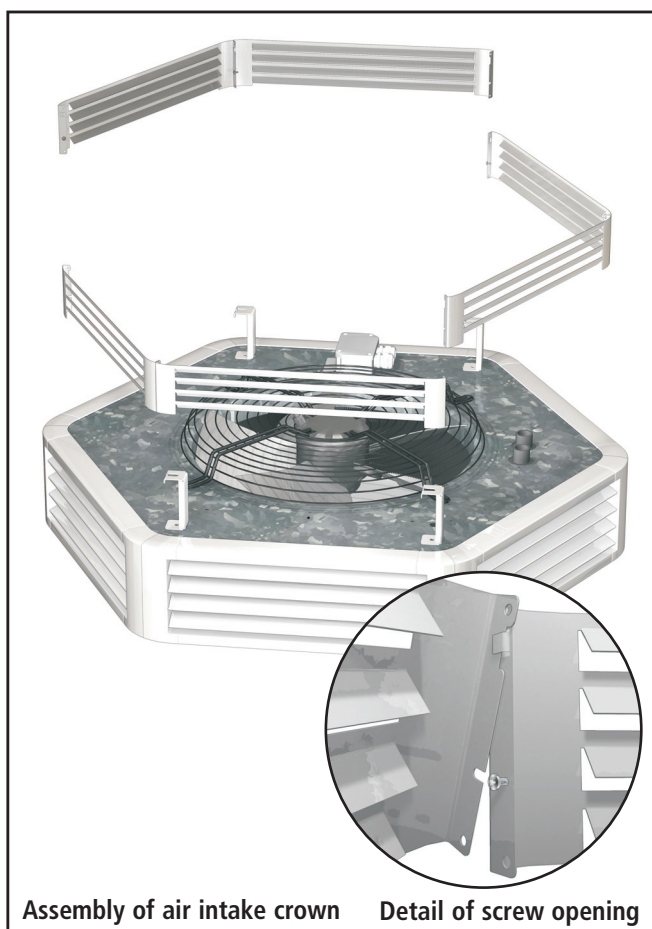
- Lift the unit under the ceiling and attach it to the brackets by pushing the slots on the brackets as shown on the adjacent drawing onto the M8 screws.
- Tighten the screws and ensure that the Ultra is level, particularly with cooling mode.

Use all four fixing points! **Caution!** Make sure that the gap between the ceiling and the air intake crown is not filled by subsequent work on the ceiling, such as plastering, as it would then be impossible to fit or remove the air intake crown.

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**Caution!** Make sure that the gap between the ceiling and the air intake crown is maintained and not filled by subsequent work on the ceiling, such as plastering, to ensure that it is possible to subsequently remove the air intake crown.

### 6.2 Filter assembly


- Fit the filter, if provided as an accessory, once all electrical work has been completed, the water connections have been made and the condensation pump connected.
- The instructions for fitting the filter hood can be found in separate installation instructions. Simple filter attachments with a ring are simply placed over the motor guard. Then fit the air intake crown.

### 6.3 Installation of the air intake crown

**Caution!** Only fit the air intake crown once all connection and installation work has been completed. The terminal box, valves, motor guard, condensation pump etc. can no longer be accessed once the air intake crown has been fitted.

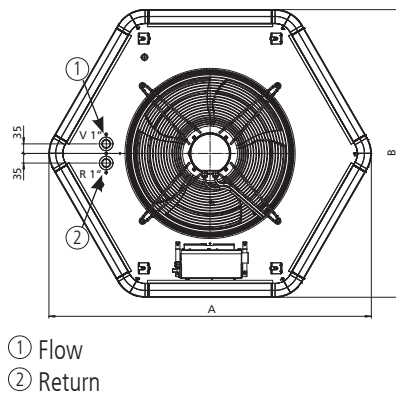
The air intake crown is supplied as standard and serves as an intake grille with recirculation air units, and as a casing and mixed air units. When the Ultra is fitted directly onto a solid ceiling and pipes are run under the ceiling, the air intake crown cannot be fitted as intended. In this case, it can optionally either be omitted entirely or adapted on site, for instance by removing partial segments of the grille.

Before fitting, first loosely connect the individual sections to each other. Once fitted, they become more stable on the Ultra base plate.

 **Caution!** The air intake crown sections may have sharp edges! Risk of injury!

- First screw one of the screws provided into the screw hole provided on each of the six sections (2nd opening from the bottom, see detailed diagram).
- Insert 2 individual parts of the intake crown together and screw them together through the 2nd bottom opening in the louvre.
- Then place the sections in the appropriate position on the base plate of the Ultra (see diagram on page 13 or the drilling template on the cardboard packaging). The louvres should be pointing downwards!
- Then screw the sections to each other by tightening each screw.





## 7. Waterside connection

- Connect the Ultra as per the labels on the product.
- Route the pipes so that no mechanical stresses are transferred to the heat exchanger and the unit can be accessed with ease for maintenance and repair work.
- Provide ventilation for the pipes on site.
- Properly seal pipe connections not being used.
- **Important note:** The 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.

**Caution!** Insulate all pipes with an impermeable material on cooling units! Continue the insulation through as far as the unit.

**Caution!** The use of flexible pipes (such as braided pipe connections, spiral or corrugated pipes) are recommended in particular when installing the unit under a solid ceiling. When used in conjunction with appropriate shut-off valves, it is then possible to dismantle the unit relatively easily without needing to dismantle the fan. EC fans can only be replaced if the entire Ultra has been dismantled.

## 8. Factory-fitted accessories

Description of accessories	Suffix for Ultra type
Frost protection thermostat and square connecting frame	.....F
Repair switch	.....R
Monitoring thermostat with recirculating air units	.....T
Continuously variable power module including repair switch for Ultra type ending 16	.....V
KaControl recirculation air module including repair switch for Ultra type ending 16, 33 and 34.	.....C1

Description of accessories	Suffix for mixed air unit type
Differential pressure switch for filter monitoring	.....D
Limit switch, for mixed air unit	.....E

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

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### Installation and operating instructions

## 9. Installation of condensation drain (with Ultra for cooling)

### 9.1 Routing the condensation lines

Note the following when routing the condensation lines:

- Condensation collection lines should have an appropriately sized inner diameter.
- Make sure that they are routed with a gradient towards a free outlet.

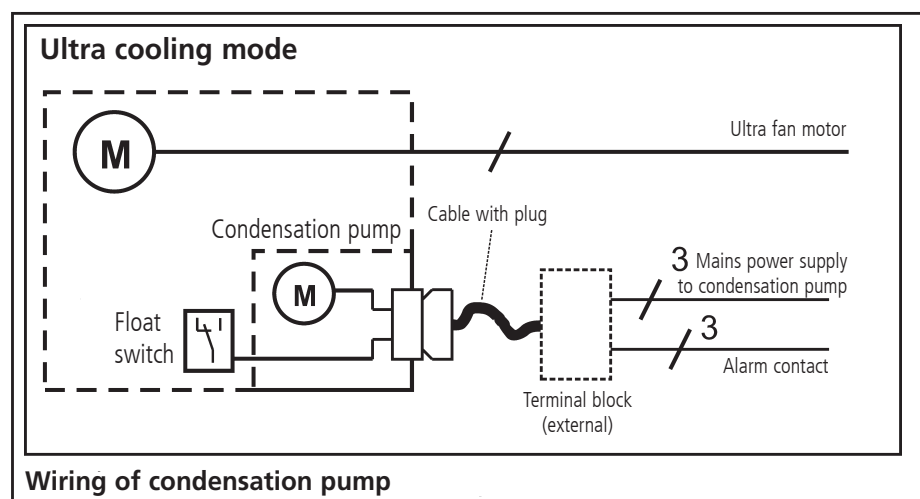
Please refer to the separate instructions for the condensation pump for more information on maintenance, delivery height etc.

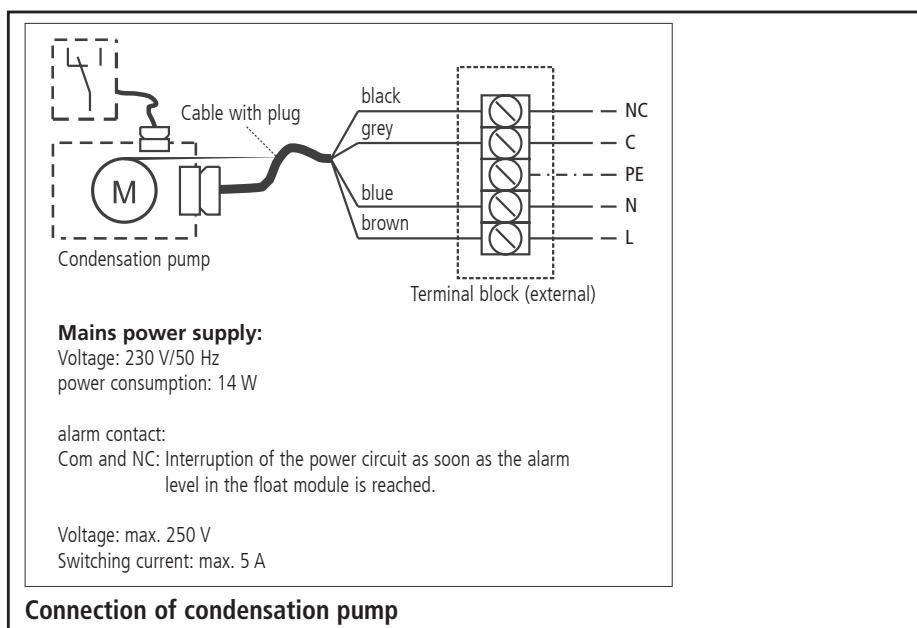
### 9.2 Connecting the condensation pump

Ultra units for cooling are fitted with a condensation tray to collect condensation from the air drawn in. This is drawn off by the condensation pump and discharged along a hose connected on the pressure side. Depending on conditions on site, the water can be discharged into drainage lines, possibly with a trap connection. A float switch monitors the water level and switches the pump off if it is exceeded (refer to separate instructions). The condensation is drained off. An alarm contact is triggered in the event of a malfunction of the condensation drain.

#### 9.2.1 Ultra without fitted KaControl module, recirculation air

We would recommend automatically terminating cooling operation when the maximum condensation level is reached to prevent the condensation tray from overflowing.



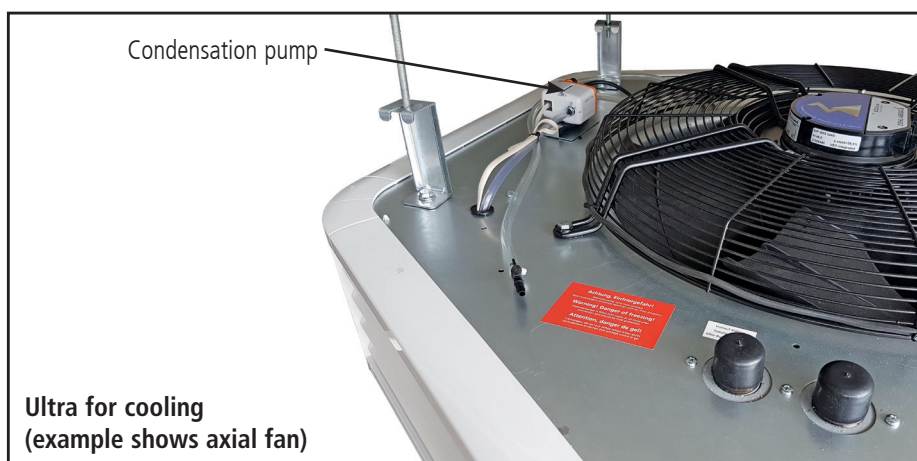


### Wiring and fuses

The condensation pump needs a separate power supply 230 V/50 Hz. Additional wires are needed (top image) to evaluate the alarm contact. Line: NYM-J, 1.5 mm<sup>2</sup> or similar.

### 9.2.2 Ultra with fitted KaControl module, recirculation air

Voltage supply and alarm contact are factory-wired on the Ultra. In the event of an alarm message, the KaControl system closes the valve and the fan is switched to stage 1.



# 1.54 Ultra

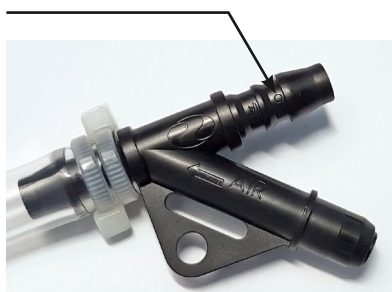
Comfortable indoor climate in high-end interiors

## Installation and operating instructions

### 9.3 Electrical connections

- The condensation pump is fixed to the top of the unit with a rubber pad and can be simply removed for installation and cabling work.
- Connect the voltage supply and alarm contact (separate cable with plug) as per the wiring diagram on page 17 (only with Ultra without KaControl module, recirculation air).
- Then connect the 6 mm-diameter hose (provided on site) to the condensation drain on the vent valve (see diagram on left) and secure in place with cable ties.

Connect a hose here and secure with cable ties!



Vent valve

### 9.4 Commissioning and functional testing of the condensation pump

- Switch on the mains voltage.
- Pour water into the condensation tray. The pump should switch on automatically and switch itself off again.
- Test the alarm switch: add water until the alarm switch is triggered (acoustic or visual warning message fan switches off or similar).

### 9.5 Warning information/Technical data on condensation pump

- Check the float switch with the coarse screen regularly and clean if necessary.
- Regularly check the condensation drain.
- Refer to the technical literature on the condensation pump.
- Refer to chapter 1.3, pages 7-8, for technical data and limits of use.

#### Caution!

In the initial phase of cooling, it is possible that a white film forms in the condensation tray, mainly on the outer edge. This is simply residue from the protective layer in the heat exchanger and can simply be wiped away with a cloth.



## **10. Electrical wiring**

### **10.1 Safety information**

The electrical wiring of this products 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 to work on the controller and on the Ultra:

- 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 fan**

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.

In the event of a fault, electrical voltage will occur at the rotor and impeller. Rotor and impeller are base-insulated.

- Do not touch when fitted!



# 1.54 Ultra

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## Installation and operating instructions

The fan runs when control voltage is applied or the stored fan speed starts up automatically when mains power fails.

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

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

- Combustion 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 for further information!

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

## 10.2 Motor protection

### 10.2.1 AC fans

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

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

### Single-phase controller

The thermal contacts lock the motor via the single-phase controller each time the motor heats up inadmissibly.

### Continuously variable power module type ... V

The thermal switch off the motor via the stage switch each time 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" by means of an on-site controller.



The unit is not short circuit-proof! The device will not work if the motor cable short circuits. Even when the motor is idle, the motor cables (U1 and U2) are still carrying mains potential!

**KaControl recirculation air module type ...16C1**

The thermal contacts switch off the motor via the KaControl module each time the motor heats up inadmissibly. In addition, the KaControl system sets the speed signal to 0 V. In both cases, there is no locking shutdown!

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!

**10.2.2 EC fans**

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

**Electromechanical control**

The motor junction box contains a relay with a potential-free changeover 24 to 250 V/ 2 A. This reports a fault message for the fan or power failure only for models 96 and 97. 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 the fans in models 84 and 85 and therefore no fan fault or power failure is reported!

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

This is signalled to the KaControl system in the event of a fan fault with models 96 and 97.

There is no fault signal contact in the fans in models 84 and 85. In the event of power failure at the unit heater, this is not reported via the KaControl system!

**10.3 Electrical wiring**

The electrics are preferably wired before the intake grille is fitted. If the intake grille has already been fitted, a segment of the intake grille next to the terminal box, continuously variable power module or the KaControl module (recirculation air) merely has to be removed. To do this, the screws are unscrewed through the second louvre opening from the bottom.

Damage can be caused by the use of incompatible switching devices and by the use of inadequate protective equipment. In these cases, the manufacturer does not accept liability.

# 1.54 Ultra

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## Installation and operating instructions

### Terminal box

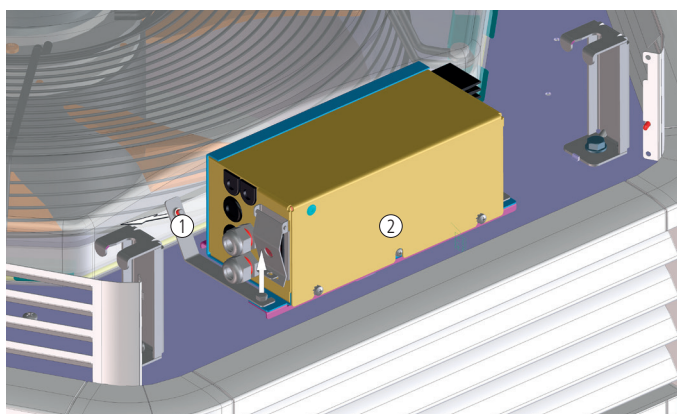
- Unscrew the screw in the terminal box bracket and remove the terminal box from the area close to the intake crown.
- Then loosen the screws in the cover of the terminal box and remove it.
- Electrically wire the unit.
- Commission the unit.
- Replace the cover of the terminal box.
- Fix the bracket to the Ultra.



Make sure that the motor cable is not pushed through the guard close to the fan.

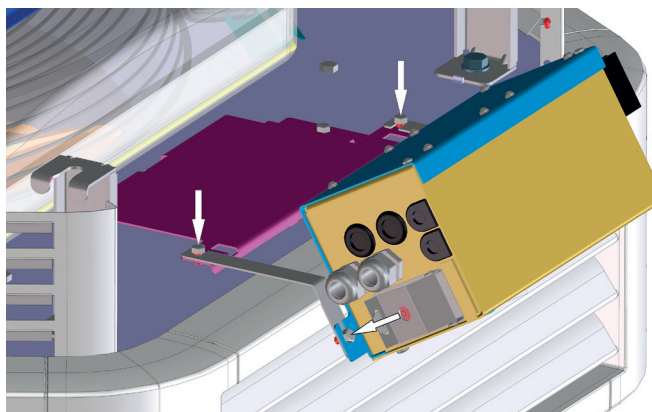
### Continuously variable power module or KaControl module (recirculation air)

- Loosen (do not remove) the two screws that attach the module to the bracket, remove the two metal support strips and the module, leaving the module lying loose on the bracket.

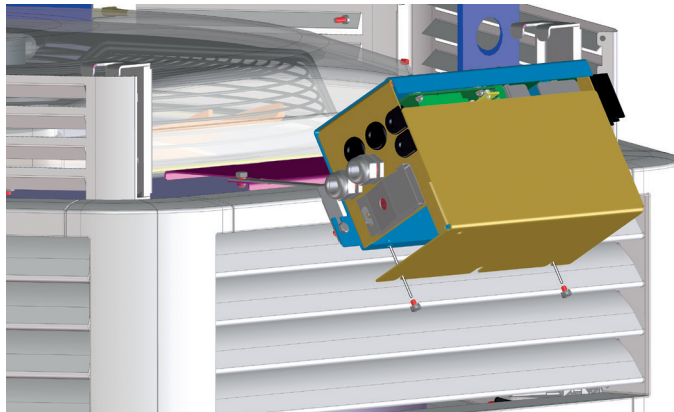


- ① Metal support strips
- ② Module

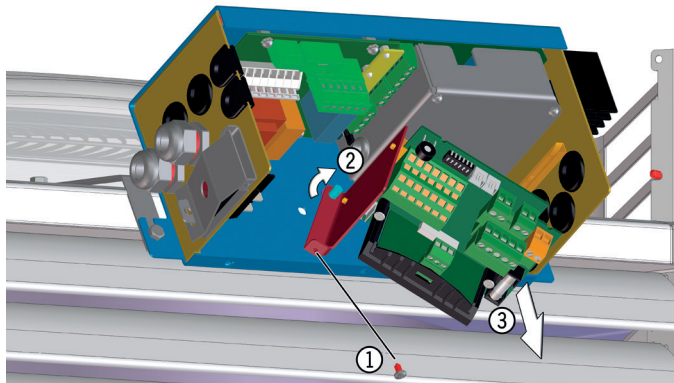
- Loosen (do not remove) the screw in the shorter leg of the metal holding strip and fasten the longer leg to the bracket in such a way that the short leg points downwards over the edge of the unit. Now fix the module to the metal support strips.



- Then remove the two outer screws in the cover of the module and remove them.



- Remove the KathermBoard (only in KaControl module type ...C1) upwards out of the rails. If space is tight, loosen and remove the central screw in the module housing and rotate the metal holding strip with the rails as far as possible to the left so that the KathermBoard can be removed to the front.



- Electrically wire the unit.
- Install the KathermBoard. Position and fix the metal holding strip with the rail for this purpose.
- Commission the unit.
- Replace the cover of the module.
- Fix the module and the holding strips back into the bracket, tightening the screws in the short legs to prevent the screws coming loose through vibration.

Make sure that the various cables are not pushed through the guard close to the fan.



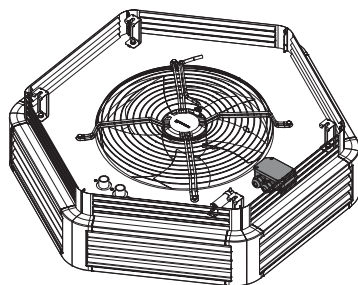
**Only connect up units that have a circuit breaker that switches off all poles from the mains power supply with a minimum contact gap of 3 mm!**

# 1.54 Ultra

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## Installation and operating instructions

### 10.3.1 Three-phase motor



Ultra with motor junction box



The three-phase external rotor motor can be switched between two stages using 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!

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

#### Three-phase parallel connection

- Several Ultra 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 Ultra unit heaters have to be switched in series.
- If several Ultra unit heaters are connected to a single-phase controller, we recommend the use of intermediate terminal boxes.

#### Max. number of connectible Ultra unit heaters

Description	Type	I <sub>max.</sub>	73 _ _ 36	84 _ _ 36	85 _ _ 36	96 _ _ 36
2-stage three-phase switch with room thermostat connection	30049	10 A	30	30	28	10
2-stage three-phase switch with room thermostat connection	30051	10 A	30	30	28	10
5-stage three-phase controller 2 A	30751	2 A	20	10	7	2
5-stage three-phase controller 4 A	30752	4 A	30	20	14	5
5-stage three-phase controller 8 A	30754	8 A	30	30	28	10
Electronic 2-stage three-phase controller	30177	10 A	30	30	28	10
	30277					

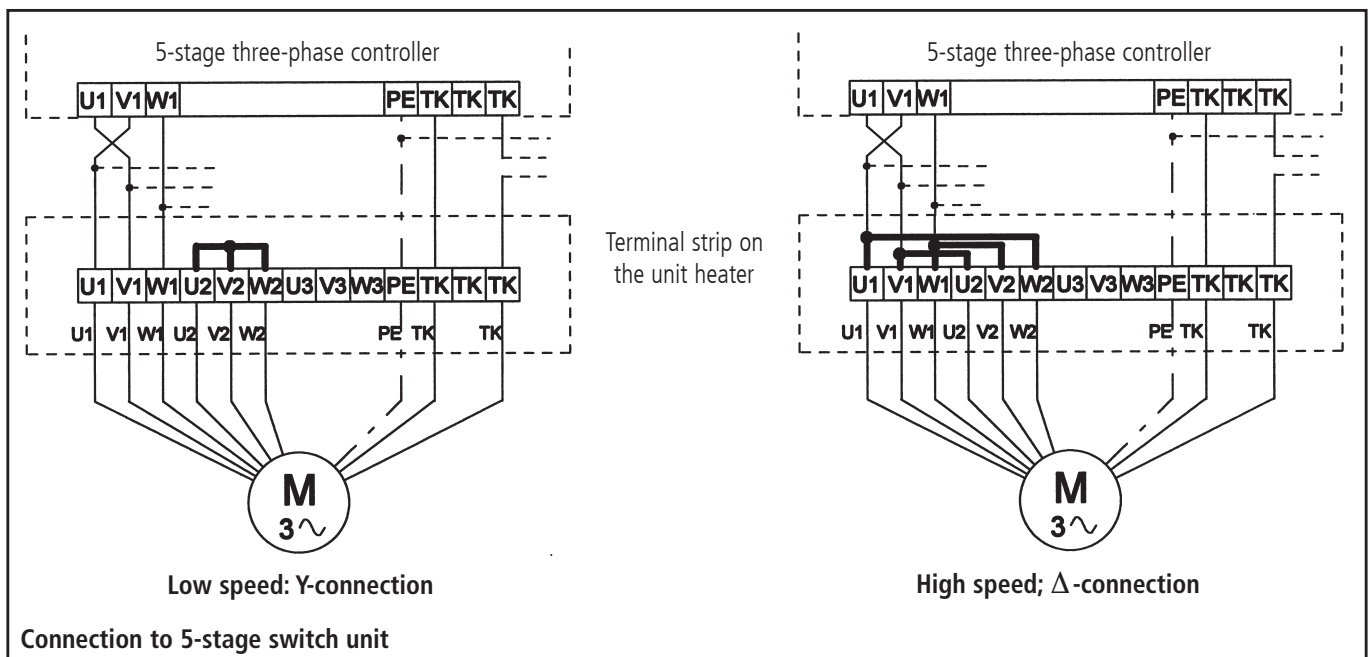
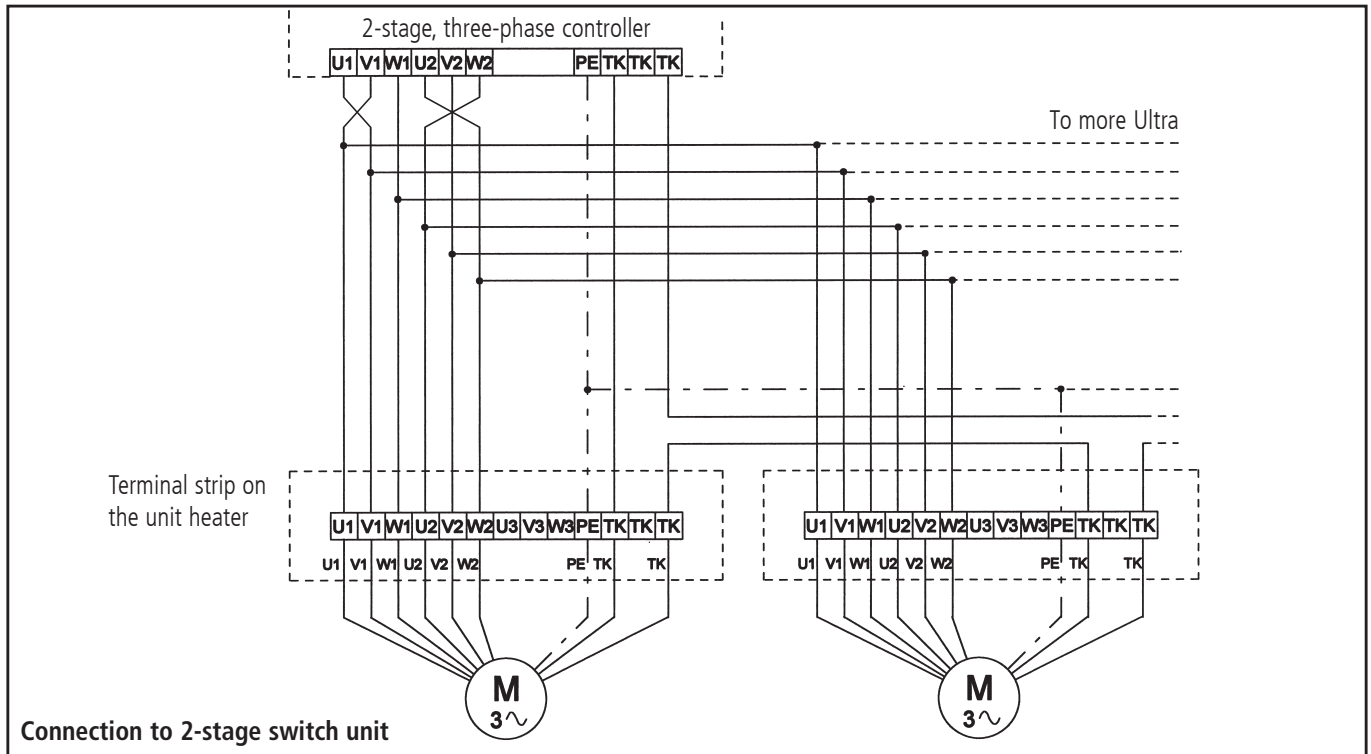


#### Suitable three-phase switching units

Different switches from our range are available to switch and control the speed of the motors. The table at the bottom of page 24 provides an overview of the switching units used, their switching power

and the resulting max. number of Ultras that can be connected to a controller.

#### Three-phase wiring diagrams



# 1.54 Ultra

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## Installation and operating instructions

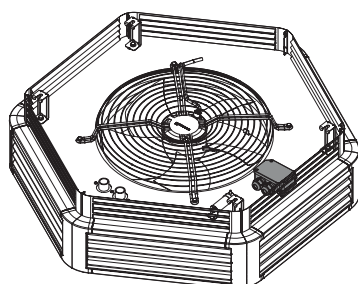
### 10.3.2 AC single-phase motors

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.

#### 10.3.2.1 Single-phase controller

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).

If there is no air output then it means that the direction of rotation is incorrectly wired!



Ultra with motor junction box

#### Parallel connection of AC single-phase motor

Several Ultra units, even different models, can be connected in parallel to a single-phase controller up to the maximum switching power of the single-phase controller. If several Ultra units 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!

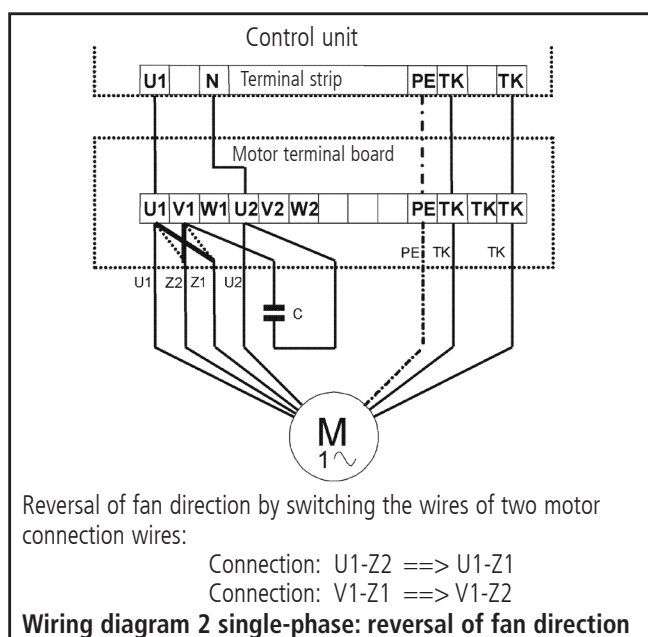
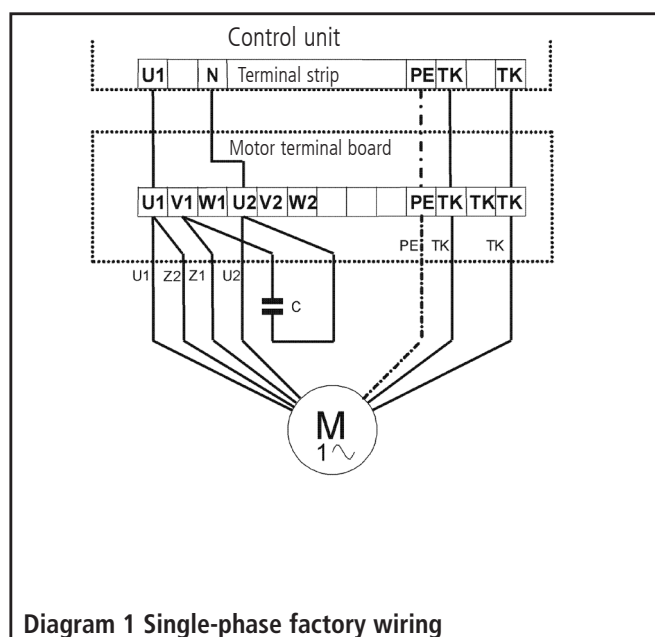


**Important:** Switch the motor windings of all fans in parallel!

#### Suitable controllers for AC single-phase motors

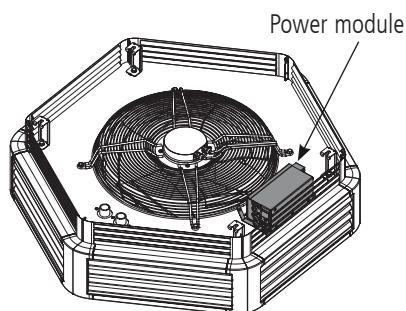
Different controllers from our range are available to switch and control the speed of the motors. The table at the top of page 27 provides an overview of the controllers used, their switching power and the resulting max. number of units that can be connected to a controller.

### Single-phase wiring diagrams



#### Max. number of connectible Ultra single-phase units per controller

Description	Typ e	I <sub>max.</sub>	73 _ 16	84 _ 16	85 _ 16	96 _ 16
7-stage single-phase controller	30771	4 A	16	9	7	2
7-stage single-phase controller	30772	7.5 A	30	17	14	4
Electronic continuously variable single-phase controller	30540	4.5 A	18	10	8	2
	30543					



Ultra with power module

#### 10.3.2.2 Continuously variable power module type ...16V

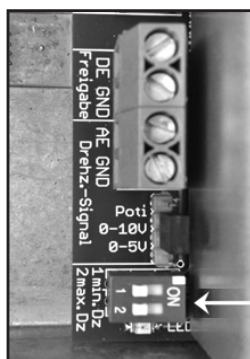
The continuously variable speed controller offers the option of controlling the fan motor either via a 0-100 K $\Omega$  potentiometer, a 0-10 V DC signal or a 0-5 V DC signal. The type of control is pre-set by a jumper/pin.

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

The maximum limit can be selected via the DIP switch (see table 1)

DIP switch position		Resulting maximum voltage
DIP 1	DIP 2	
0	0	140 V AC
0	1	160 V AC
1	0	190 V AC
1	1	230 V AC

Table 1



DIP switch for power module

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

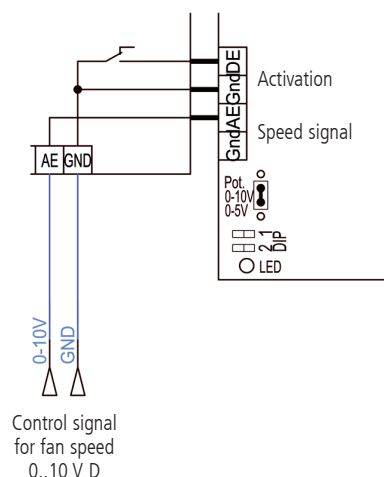


All additional electrical components are not disconnected from the mains power supply by the master switch!

# 1.54 Ultra

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## Installation and operating instructions



Connection example 0-10 V

Control signal	Ultra speed
0-1.0 V	OFF
1.0-9.5 V	0-100 %
9.5-10.0 V	100 %

Table 2

### Control via 0-100a 0-100 K $\Omega$ potentiometer

When controlling using a 0-100 K $\Omega$  potentiometer (linear), the jumper on the master unit (the Ultra connected to the potentiometer) must be connected to the potentiometer (see Fig. 3). All other Ultras (slave units) should then have jumper position 0 - 5 V (see Fig. 3).

### Control via 0-10 V DC

When controlling with 0-10 V DC, the jumper must be connected to 0-10 V on all power units (refer to Fig. 2). The 0 - 10 V control signal is interpreted with respect to its speed according to the table (refer to table 2). Input resistance  $R_i > 100$  k $\Omega$ m.

### Control via 0-5 V DC

When controlling with 0-5 V DC (for instance control by others), the jumper must be connected to 0-5 V on all power units. The speed does not behave linear to the control voltage with this setting (refer to Fig. 3). Input resistance  $R_i > 100$  k $\Omega$ m.

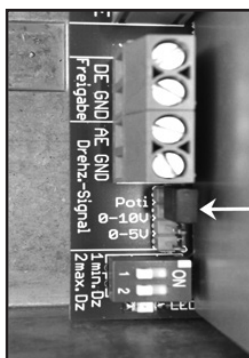


Fig. 1:  
Jumper to  
potentiometer

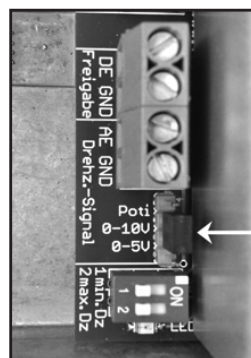


Fig. 2:  
Jumper to 0 - 10 V

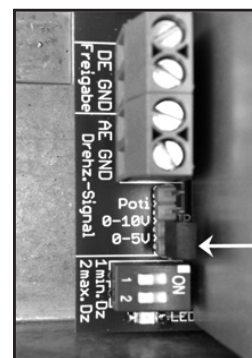


Fig. 3:  
Jumper to 0 - 5 V

### Fault signal output

In addition to the motor fault signal alluded to in the paragraph "Continuously variable power module type ...V" in Chap. 10.2.1, the overheating of the power module is signalled via 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.

### Voltage supply and fuse

The fan and power module are together supplied by one line with 230 V/50 Hz voltage. An operating indicator LED is positioned on the connecting PCB in the power module.

A unit fuse  $\varnothing 5 \times 20$  mm is also installed as a main fuse on the connecting PCB and a TR5 fuse on the power PCB. Refer to Table 3 for values. Maximum on-site fuse 10 A.

Connecting PCB	Power PCB
T2.5 A	F2.5 A

Table 3

#### Cable lengths

Maximum permitted cable length 100 m for control signal 0-10 V DC and fault signal contact.

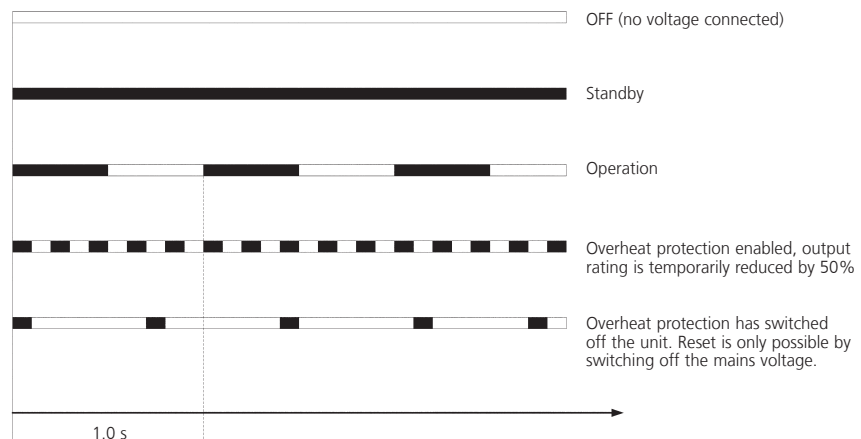
#### Cabling

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

The connecting cables (not even the motor cables) 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.

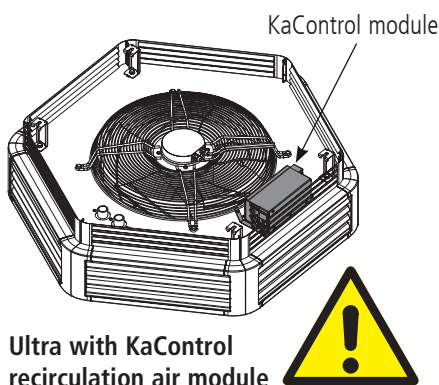
#### Operating statuses

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



#### Flash code of power module

#### 10.3.2.3 KaControl recirculation air module type ...16C1



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

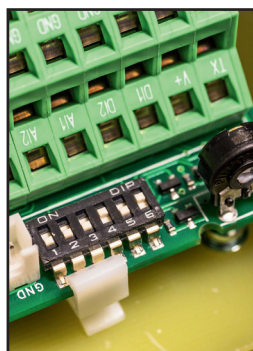
Please refer to the KaControl installation instructions for unit heater I438 for information on the KaControl system.

The jumper on the power module must be set to "0-10 V".

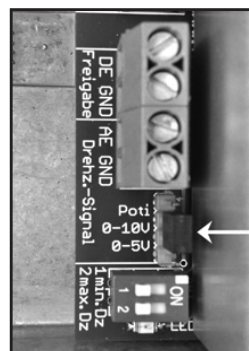
# 1.54 Ultra

Comfortable indoor climate in high-end interiors

## Installation and operating instructions



DIP switch KathermBoard



Jumper on power module



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 6

### 0-10 V DC control signal

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

The maximum limit can be set, as described in Chapter 10.3.2.2. via DIP switches on the power module or alternatively via the KaControl system.

Maximum permissible cable length for the 0-10 V DC 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 V DC/ max. 0.5 A is available at terminals V2 and GND after appropriate parametrisation 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 a supply line with 230 V/50Hz voltage. An operating indicator LED is positioned on the connecting PCB in the KaControl module. A unit fuse Ø5x20 mm is also installed as a main fuse on each connecting PCB as well as on the secondary side for 24 V voltage, and a TR5 fuse on the power PCB and a unit fuse Ø 5x20 mm on the Katherm Board. Refer to Table 7 for values. Maximum on-site fuse 10 A.

Connecting PCB		Power PCB	Katherm Board
Main fuse	24 V voltage		
T 2.5 A	T 315 mA	F 2.5 A	T 5.0 A

Table 7

#### 10.3.3 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 and/or all current (type A or B). It is impossible to protect personnel when operating the unit with residual-current protection devices, as well as with frequency converters. When power 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 tripped (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.



One mains voltage has been applied, allow an initialisation period of approx. 10 seconds until the EC fan's electronics are ready for operation. A reliable status message is then 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.



# 1.54 Ultra

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## Installation and operating instructions



### 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.

### 10.3.3.1 Control with 0-10 VDC type ...33/34

#### 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 100 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!)

All models require a power supply 230 V/50/60 Hz and can be controlled via a control input 0-10 V DC ( $R_i > 49 \text{ k}\Omega$ ). Models 96 and 97 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 message for the fan or power failure only for models 96 and 97. 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 the fans in models 84 and 85 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.

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.

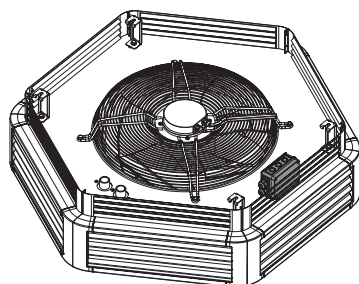
The speed can be limited to approx. 50% of the maximum speed using the potentiometer in the connection box.

70% speed is factory pre-set for types ending in 34.

There is an option to enable the fan in models 96 and 97 via an external potential-free N/O contact for low voltage. To do this, the factory-fitted bridge between terminals D1 and Ub must be removed.

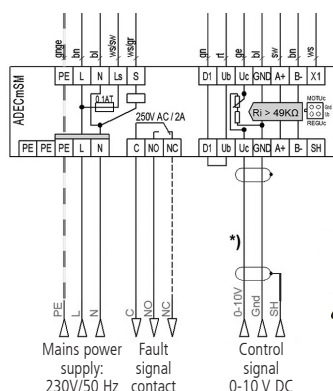
#### Voltage supply and fuse

The fault signalling chain is protected by a device fuse  $\varnothing 5 \times 20 \text{ mm}$ , T0,1A. Maximum on-site fuse 16 A.



Ultra with motor junction box

Fan connection side  
e.g. type 96xx33 / 97xx33

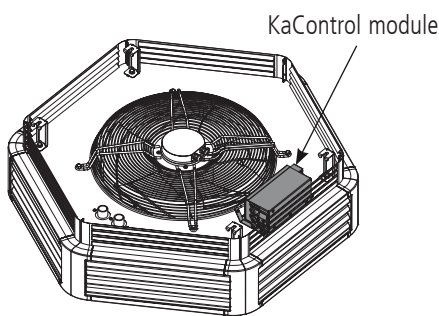


\*) Control line max. 100 m, screened from 20 m, applied on one side on the side of the signal sources (PE).

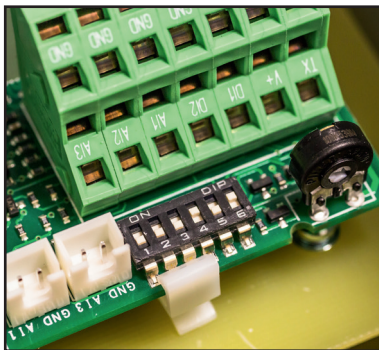
Controller connection assignment  
Unit heater with EC fan

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

Table 8



Ultra with KaControl recirculation air module



DIP switches and KathermBoard potentiometer



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

The KaControl recirculation air module offers the option of controlling the fan motor and valve actuator either via a 0-10 V DC 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 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 V DC control signal

The 0-10 V DC 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 V DC 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 V DC. max. 0.5 A is available at terminals V2 and GND after appropriate parametrisation with an additional KaController unit. This is signalled to the KaControl system in the event of a fan fault only with models 96 and 97.

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There is no fault signal contact in the fans in models 84 and 85. In the event of a fan fault or power failure at the unit heater, this is not reported via the KaControl system!



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.

### Voltage supply and fuse

Connecting PCB		KathermBoard
Control voltage	24 V voltage	
T 1.0 A	T 315 mA	T 5.0 A

Table 10

The fan and KaControl module are together supplied by a supply line with 230 V/50 Hz voltage. An operating indicator LED is positioned on the connecting PCB in the KaControl module. A unit fuse Ø 5x20 mm is also installed on the primary side for the control voltage and possibly for the power supply to the condensation pump as well as on the secondary side for 24 V voltage and a unit fuse Ø 5x20 mm on the Katherm Board. Refer to Table 10 for values. Maximum on-site fuse 16 A.

## 11. Commissioning

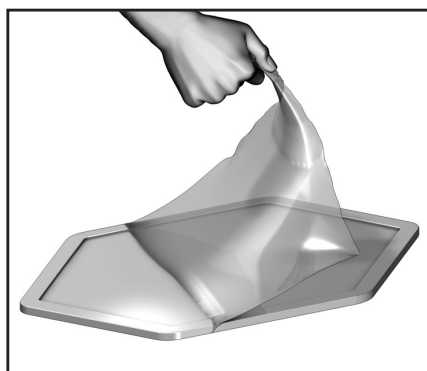
### 11.1 Pre-commissioning checks

The base of the Ultra is covered with a transparent film to protect it from damage during transport and installation.

- Remove the film once the Ultra has been commissioned, by loosening a corner and then pulling it off.

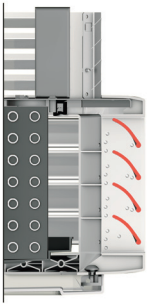
#### Perform the following checks before commissioning the Ultra.

- Is the Ultra properly and securely fixed in place?
- Is the protective conductor connected properly on all units?
- Are the AC fan thermal contacts wired correctly (where several Ultras are connected in series (does not apply to continuously variable power module))?
- Are the EC fan fault signalling contacts wired correctly, if fitted (where several Ultra 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.

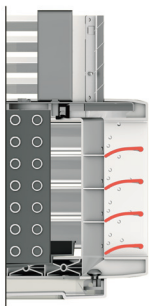


Removing the film\*

\* With non-standard colours, the base cover can be covered with a foam film glued on.



**Heating mode:**  
position diagonally down  
(factory setting)



**Cooling mode:**  
horizontal position

## 11.2 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.
- Check that all pipes and valves are leak-tight.
- Start up the Ultra by applying voltage to all electrical components.
- Check the direction of rotation and all speed levels or the speed range (0-100 %).

## 11.3 Post-commissioning checks

Perform the following checks after commissioning the unit:



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



To do so, disconnect a wire from terminal TK of the stage switch (Danger: 230 V!). All the fans should switch off immediately. The operating readiness indicator must 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.



**If the fan switched off by the thermal contact (applies to the 0 – 100 % variable power module)?**

To do so, disconnect a wire from terminal TK of the motor of the Ultra to be checked (Danger: 230 V!). The fan should switch off immediately. The fault should be reported via the potential-free NCC contact and trigger that the fan switches off, depending on the control used. Reconnect the wire to terminal TK. Depending on the control used, the fan should start up again or may not start up again (in the event of the fan being switched off permanently) Perform this check for every single Ultra to monitor all units.

**Are the fans in all units rotating 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 three-phase 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.

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### Installation and operating instructions

#### 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.



#### 12. Decommissioning (longer term)

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



#### 13. Maintenance/Cleaning

Read the safety information on pages 9 and 19 before commencing maintenance/cleaning work!

##### 13.1 Housing

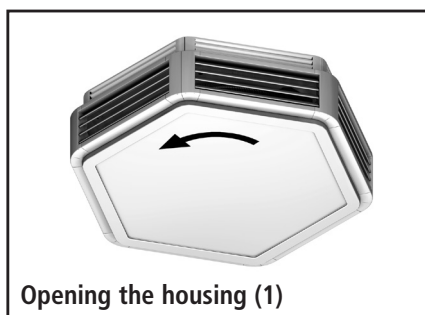
The Ultra housing is maintenance-free. Dirt on the housing does not affect the operation of the unit. Cleaning is only necessary for aesthetic reasons.

##### Opening the housing:

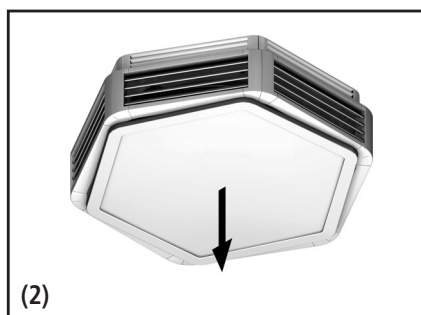
- Turn the housing cover anti-clockwise to access the Ultra for maintenance purposes (see diagram below). Two people are required for this.

**Caution!** Make sure that all locking hooks on the cover are removed from their fixings before lowering the housing cover (risk of breakage!). The heat exchanger of the Ultra can now be accessed for heating for cleaning and maintenance.

- With Ultra units for cooling, the condensation tray also has to be removed after the housing cover has been removed, as described in chapter 13.5, page 40, in order to access the heat exchanger (Caution! Risk of overflowing water!).



Opening the housing (1)



(2)



(3)

### 13.2 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 Ultra heat exchanger for dirt and clean if necessary.

- Check the unit 1x a year before the start of the heating season, and in less favourable conditions (high dust content in the air) even monthly. (Recommendation: produced a maintenance schedule!)
- Carefully blast the heat exchanger with compressed air to remove accumulated dust (Caution! Aluminium fins bend!)

**Caution!** Water remains in the heat exchanger when drained. Therefore protect any heat exchanger that has been operated from frost!

### 13.3 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 and fan guard (see Heat exchanger) and clean if dirty.



- Never use aggressive, paint-dissolving cleaning agents.
- Make sure that no water enters the inside of the motor or the electronics (possibly by direct contact with seals or motor openings and not 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.

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- 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 cleaning!

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

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

### 13.4 Filter (optional accessory)

The filters of mixed air and primary air units or recirculation units with filter must be checked at least 2 x annually or monthly in unfavourable conditions (heavy dust content in the air) and cleaned if necessary (produce a maintenance schedule!). The G3 quality filter is made of plastic and can be beaten to clear off coarse dirt. Replace it in the event of more serious dirt.

The following filters may be fitted depending on the configuration of the unit:

#### **G3 recirculation air filter element, type 6\*050**

- Intended to be placed loose directly on top of the unit and easily removable for maintenance
- Replacement filter mats, 1 set = 5 mats, type 6\*051

#### **Recirculation air filter hood, G3 filter class, type \*\*050, with installation kit**

- For use with suspended ceilings or installation on the slab
- Replacement filter guard, 1 x, type \*\*051

#### **G3 filter insert, type 60126**

- Air filter insert can be removed once the recirculation air grille has been removed
- Ceiling panels do not need to be removed
- Horizontal or vertical in 90° intake bend or in mixed air unit
- Replacement filter mats, 1 set = 5 mats, type 60127



### 13.5 Maintenance of the Ultra for cooling

A float switch monitors the water level and switches the pump off if the maximum condensation level is exceeded. An alarm contact is triggered in the event of a malfunction of the condensation drain. We would recommend automatically terminating cooling operation when the maximum condensation level is reached to prevent the condensate tray from overflowing.



**Float switch fixing**



**Remove slats**

Regular visual control and simple maintenance including cleaning the external pump sump and float switch can be performed without removing the housing cover! Simply remove the discharge slats in the discharge field.

This makes the pump sump, external condensation tray and float switch accessible for visual control and simple maintenance.



**Plug-in nut**

Important:

The nuts used to fix the condensation tray and metal holding strips for the float switch are what are known as plug-in nuts. When fitted, they can be screwed in or plugged in and thus significantly shorten the installation time!



**Float switch mounted in metal holding strip**

Simply unscrew the plug-in nuts upwards to loosen the holding strip including float switch from the unit.

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### Installation and operating instructions



Unscrew the lower housing cover for maintenance.

**Caution!** Residual condensation can escape when dismantling the tray! First unscrew the cover.



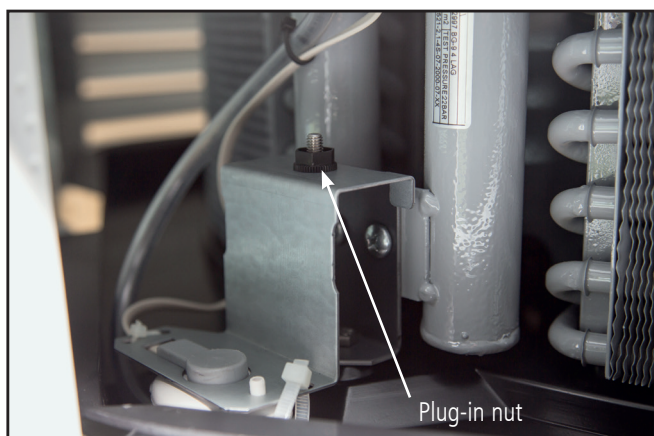
**Caution!** If the alarm (see above) has already been triggered, there can be up to 1 litre of water in the condensation tray! This must be drained away through the outlet spigot before dismantling the condensation tray.



Clean the condensation tray and remove any residual condensation. Check the connecting line to ensure that the condensation is draining away properly.



Clean the condensation lines if the condensation is seriously contaminated or draining away badly. Refer in this respect to the instructions supplied for the condensation pump.



First loosen the plug-in nut to clean the float switch.

**Maintain/clean the heat exchanger, motor and filter, as described in chapters 13.2 to 13.4!**



Open the float switch to clean it by removing the cover (snap-fix cover).

## 14. Operational problems

### 14.1 All unit heaters

Fault	Possible cause	Remedy
Impeller not running concentrically	Rotating parts unbalanced	Clean the unit, replacing the unit if it is still unbalanced after cleaning. 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 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
With the Ultra for cooling: serious condensation forming outside the condensation tray	<ul style="list-style-type: none"> <li>Fan is not working</li> <li>Room air humidity too high</li> </ul>	<ul style="list-style-type: none"> <li>Close the cooling water valve</li> <li>Check the limits of use</li> </ul>

### 14.2 AC single-phase motor with motor junction box type ...16/36

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, insert jumper 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 temperatures too high, dirty filter); switch unit off and on again

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## Installation and operating instructions

### 14.3 AC single-phase motor with power module type ...16V

Fault	Possible cause	Remedy
Fan does not rotate when power is applied to the module and control signal < 1 V DC	Main fuse on the connecting PCB and/or fuse on the power PCB is faulty	Check fuses
	Thermal contact (risk of overheating) or overheating protection in the module has triggered	Check motor or module temperature and allow to cool down if necessary. Clarify the cause of overheating (e.g. blocked motor, impermissibly 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 V DC	Overheating protection in module has reduced speed	Check automatic speed increased after module has cooled down
	DIP switch for maximum limit incorrectly set	Check DIP switches
Fan rotates at fixed undefined speed in spite of change to control signal 0-10 V DC	Control voltage poles switched	Correctly connect control voltage

Refer also to flash code in chapter 10.3.2.2 Continuously variable power module

### 14.4 AC single-phase motor with KaControl recirculation air module type ...16C1

Fault	Possible cause	Remedy
Fan does not rotate when power is applied to the module and control signal > 4 V DC	Main fuse on the connecting PCB, secondary fuse on the connecting PCB, fuse on the power PCB and/or fuse on the KathermBoard is faulty	Check fuses
	Control voltage poles switched	Correctly connect control voltage
	Thermal contact (risk of overheating) or overheating protection in the module has triggered	Check motor or module temperature and allow to cool down if necessary. Clarify the cause of overheating (e.g. blocked motor, impermissibly 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 V DC	Overheating protection in module has reduced speed	Check automatic speed increase after module has cooled down
	DIP switch for maximum limit incorrectly set on PCB	Check DIP switches
	Potentiometer for maximum limit incorrectly set on KathermBoard	Check potentiometer

Refer also to flash code in chapter 10.3.2.2 Continuously variable power module

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

## 14.5 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 V DC	Mechanical blockage	Switch off, disconnect from power supply and remove mechanical blockage
	No bridge on enable input (if present)	Insert bridge
	Control voltage poles switched	Correctly connect control voltage
	Temperature monitor has responded	Allow the motor to cool down, find and rectify the cause of the fault and trigger automatic restart lock if necessary
Fan does not rotate 100% at max. control signal 10 V DC	Maximum limit incorrectly set	Check potentiometer in motor junction box
	Active temperature management effective (motor or electronics overheated)	Check that the airways are clear; remove foreign bodies if present, impeller is blocked or dirty; check supply air temperature; check installation location (air speed over cooling body)
Fault message (Contact C – NO open) and fan operational	Fault signal chain fuse faulty	Check fuse
	Fan without fault signal contact	In the event of additional fans with a fault signal contact in a group, wire contact C - NC

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

## 14.6 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 V DC	Mechanical blockage	Switch off, disconnect from power supply and remove mechanical blockage
	Control voltage fuse on connecting PCB, 24 V power fuse on connecting PCB and/or fuse on the KathernBoard is faulty	Check fuses
	Control voltage poles switched	Correctly connect control voltage
	Temperature monitor has responded	Allow the motor to cool down, find and rectify the cause of the fault and trigger automatic restart lock if necessary
Fan does not rotate 100 % at max. control signal 10 V DC	Potentiometer for maximum limit incorrectly set on KathernBoard	Check potentiometer
	Active temperature management effective (motor or electronics overheated)	Check that the airways are clear; remove foreign bodies if present, impeller is blocked or dirty; check supply air temperature; check installation location (air speed over cooling body)

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

[Kampmann.co.uk/ultra](http://Kampmann.co.uk/ultra)

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