MUB CAV / VAV EC

Installation and Operating Instructions

GB page 32

CE

Green Ventilation

systemair

The data started on these operating instructions are merely fpr the purpose of describing the product. Information about a certain property or suitability for a certain purpose of use cannot be derived from our information. the information does not release the user from his own assessments and examinations.

Please consider the fact that our products are subject to a natural wear and ageing process.

The original operating instructions have been writen in the German language.

Table of contents

1. General information

1.1 Notice symbols

DANGER

Imminent hazard

Failure to comply with this warning will lead directly to death or serious bodily harm.

WARNING

Potential hazard

Failure to comply with this warning will lead directly to death or severe injury.

CAUTION

Hazard with a low risk

Failure to comply with this warning may potentially lead to moderate injuries.

CAUTION

Hazard with risk of damage to objects

Failure to comply with this warning will lead to damage to objects.

Hinweis

Useful information and instructions

1.1.1 Safety symbols

General hazard symbol

Hazard of fire or explosion!

Electrical voltage!

Risk of burns!

1.1.2 Instruction symbols

Instruction

- ☞ Carry out this action.
- ☞ (if applicable, further actions)

Instruction with fi xed sequence

1. Carry out this action.
2. Carry out this action.
3. (if applicable, further actions).

1.2 Notes on the documentation

WARNING

Hazard as a result of improper handling of the fan

These operating instructions describe the safe use of the multibox.

» Read the operating instructions carefully!

» Keep the operating instructions and other valid documents, such as the circuit diagram or motor instructions, with the multibox. They must be permanently available at the place of use.

2. Important safety information

2.1 Safety notes

Designers, installers and operators are responsible for the proper assembly and intended use.

» Only use the Multibox in a proper condition.

» Provide generally prescribed electrical and mechanical protective devices.

» Secure the place of installation and the premises against unauthorised access during installation, commissioning, maintenance and monitoring.

» Observe work safety regulations.

» Safety components must not be bypassed or put out of function.

» Ensure that all warning signs on the Multibox are complete and legible.

» Regularly instruct personnel about safety-conscious behaviour.

NOTE

We have carried out a risk assessment for the Multiboxes. However, it can only apply to the Multibox itself. After installing the Multibox, we recommend carrying out a risk assessment for the whole system. This guarantees that the system will not present a risk.

2.2 Personnel

2.2.1 Installation personnel

Installation may only be carried out by trained, qualifi ed personnel.

2.2.2 Work on the electrical equipment

Work on the electrical equipment of the fan may only be carried out by a qualified electrician or person with electrical training. This person must know the relevant safety rules to recognise and avoid potential risks.

2.2.3 Personnel for operation, use, maintenance and cleaning

Operation, use, maintenance and cleaning may only be performed by trained and authorized personnel. The operating personnel must have the appropriate knowledge required to operate the Multibox. They must be able to act correctly and appropriately in the event of a malfunction or emergency.

2.3 Intended use

The Multibox (MUB) is intended for installation in ventilation systems. It can be installed either in a duct system or as free-intake fans using inlet nozzles and an intake-side protective grille. A free intake/output device via a guard grille is possible following consideration in the design.

- ·The Multibox is suitable for conveying clean air, air with a low dust and grease content, media up to a max. density of 1.3 kg/m^3 and permissible humidity of max. 95 %.
- The maximum permissible operating data on the name plate apply for an air density of 1.2 kg/m^3 (sea level) and a max. air humidity of 80 %.

2.4 Incorrect use

Incorrect use refers mainly to using the Multibox in a way other than that described. The following points are incorrect and hazardous:

- Conveying of explosive and combustible media
- Conveying of aggressive media or media containing dust or grease
- Installation outside without any protection against the weather,
- Installation in wet areas
- Operation in an explosive atmosphere
- Operation without duct system or guard grille
- Operation with the air connections closed

2.5 5 rules of electrical safety

- Disconnect (disconnection of the electrical system from live components at all terminals)
- Prevent reactivation
- Test absence of voltage
- Earth and short-circuit
- Cover or restrict adjacent live parts

3. Warranty

Warranty for our products is based on the contractual stipulations, our quotations and also as a supplement our General Terms and Conditions of Business. Warranty claims shall presuppose that the products are connected properly, operated and used in accordance with the data sheets, and serviced as required.

4. Delivery, transport, storage

4.1 Safety information

Danger from cutting edges!

» Wear protective gloves when unpacking.

Hazard of impact if the fan falls down!

» Transport the fan carefully and with appropriate hoisting equipment!

» Wear a helmet and protective goggles.

Electrical hazard from damaged connection cable or connections!

» Do not hold the connection cable, terminal box or rotor for transport.

4.2 Delivery

Each device leaves our plant in an electrically and mechanically proper condition. The fans are delivered on pallets. We recommend transporting them to the installation site in the original packaging.

Checking delivery

☞ Check the fan for obvious defects that could impair safe operation.

☞ Pay attention above all to defects on the connection cable, terminal box and rotor, cracks in the housing, as well as missing rivets, screws or covering caps.

4.3 Transport

☞ Transport and unload the pallet carefully.

☞ Transport the fan either in the original packaging or on the provided transport equipment (e.g. lifting eyes) using appropriate hoisting equipment.

☞ When unpacking the fan, only lift it by the base frame.

☞ Bear acceptable human lifting or carrying strength in mind when transporting by hand (see weight on the name Plate).

☞ Avoid impacts and distortion of the base plate and other parts of the housing.

4.4 Storage

☞ Store the fan in the original packaging in a dry, dust-free location protected against weather.

☞ Avoid the effects of extreme heat or cold.

CAUTION

Hazard due to loss of function of the motor bearing

» Avoid storing for too much time (recommendation: max. 1 year).

» Turn the rotor manually every three months, wear safety gloves when doing this.

» Check that the motor bearing functions properly before installation.

5. Beschreibung

5.1 EC- Technik

EC technology is based on the optimum utilisation of the motors which are controlled by the integrated electronic. The electronic avoids slippage losses and ensures that the motor is constantly adjusted to optimal operation. In addition, the control electronics ensure that the proportion of effectively used energy is much higher compared to AC motors. EC fans stand out thanks to their effi cient use of energy and their outstanding adjustability. The speed of the fans can be freely adjusted to meet ventilation requirements. The fans also operate very effi ciently. This means that they use far less energy than AC drives, whilst providing the same air performance. Furthermore, EC motors can save energy both in partial and full-load operation. They lose less of their effi ciency in partial-load operation than asynchronous motors of the same power.

5.2 Characteristics

The MUB CAV/VAV with the integrated controller offers you the possibility for a constant airflow (factory setting) or constant pressure ventilation. The following operating modes are possible to adjust with the controller (for further information for adjustment of the controller, please take the attached operating manual of the controller):

- CAV --> Constant Air Volume
- VAV --> Variable Air Volume
- display data

5.2.1 General

- 100% controllable
- Multifunktional use
- low sound level
- Modular system for individual supply and extract air solutions
- Reliable and easy to maintain.
- Backwards- curved, free-running, rotors made from aluminium
- Outlet direction can be modified on site 90°/180°

5.2.2 Motors

- EC- Motor mit hohem Wirkungsgrad
- Eingangsspannung 1- Phasen 200...277V / 3- Phasen 380...480V
- Motoren für 50Hz und 60Hz geeignet
- Leistungselektronik im Motorgehäuse
- Integrierter Motorschutz

5.2.3 Housing

- Self-supporting construction
- Aluminium profi le with encapsulated screw channels
- Corners made of highly impact-resistant PA6
- Corrosion-resistant aluminium
- Thermal decoupling by side panels with tubular rivets
- Double skin panels of galvanised sheet metal
- 20 mm non-fl ammable glass wool insulation

5.2.4 Optionen

- Individual solutions/upgratings by Airhandling units (AHU) --> on request
- Different, based on operating point filter modules, e.g. active carbon or aluminium filter

5.3 Installation arrangement

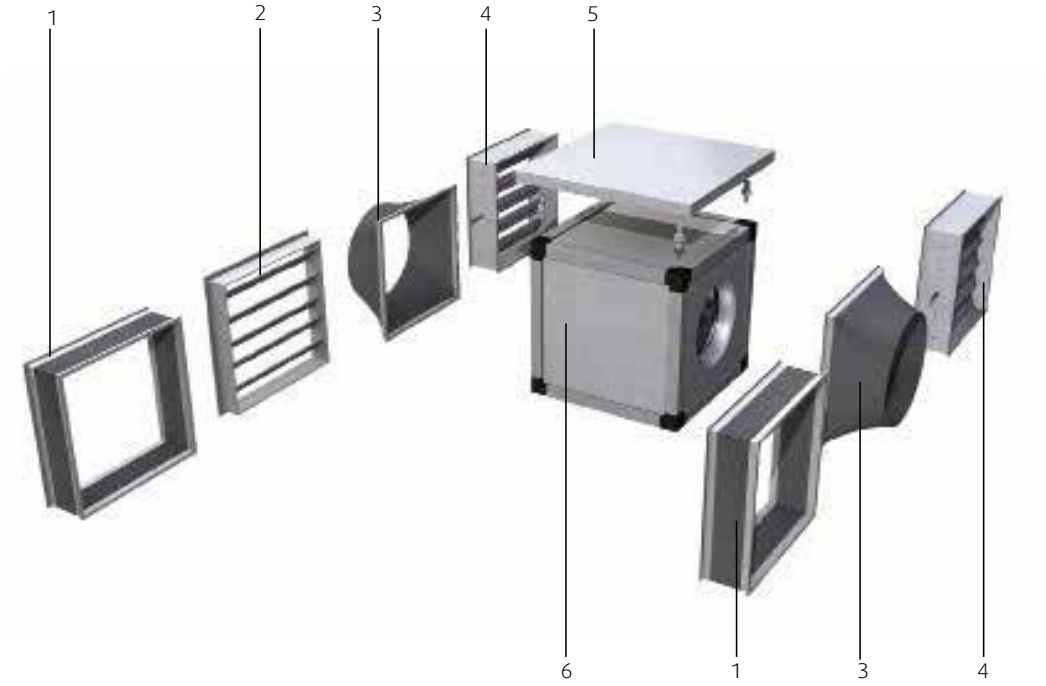


figure 1: Multibox with accessories

1	FGV	Flexible connection	4	SRKG	louver damper
2	WSG	weather protection grating	5	WSD	Weather protection hood
3	USG	Adaptor, square to round	6	MUB	Multibox MUB

tab 1: Multibox with accessories

5.4 Name plates

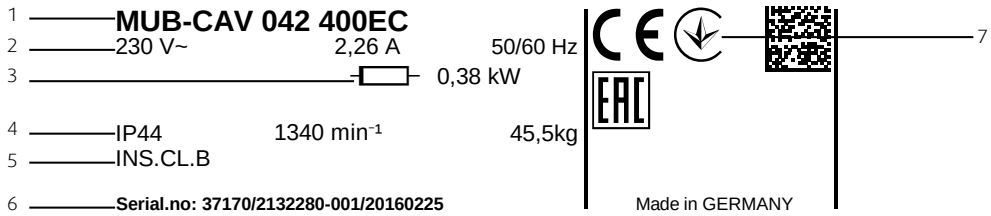


figure 2: Name plate

1	Type designation	5	Motor insulation class
2	Voltage/current/frequency	6	Article number/production number/date of manu-facture
3	Motor power	7	Certifications
4	Protection class/speed/weight		

tab: Name plate

5.5 Dimensions

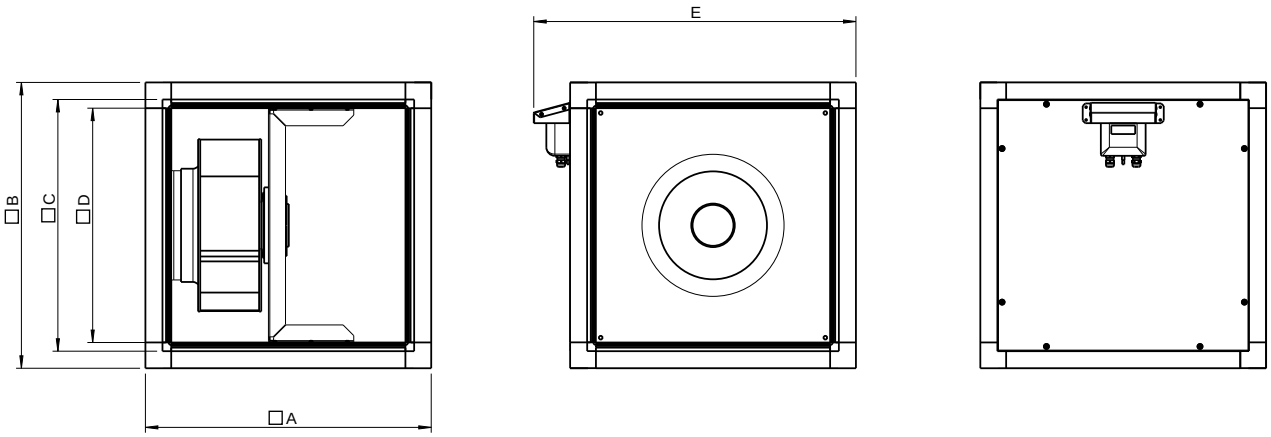


figure 3: dimensions

Size	A	B	C	D	E
025 315	500	500	420	378	586
025 355	500	500	420	378	586
042 400	670	670	590	548	756
042 450	670	670	590	548	756
042 500	670	670	590	548	756
062 560	800	800	720	678	886
062 630	800	800	720	678	886
100 630	1000	1000	920	878	1086
100 710	1000	1000	920	878	1086

Tab 3: Dimensions

5.6 Technical data

Characteristics	Values	
Temperature range medium [°C]	MUB	-20 ... +60
Voltage/current	see name plate	
Protection class	see name plate	
Sound pressure level at 1 m [dB(A)]	46 ... 75	
Dimensions	see name sheet	
Weight	see name plate	
Rotor diameter	see name plate	

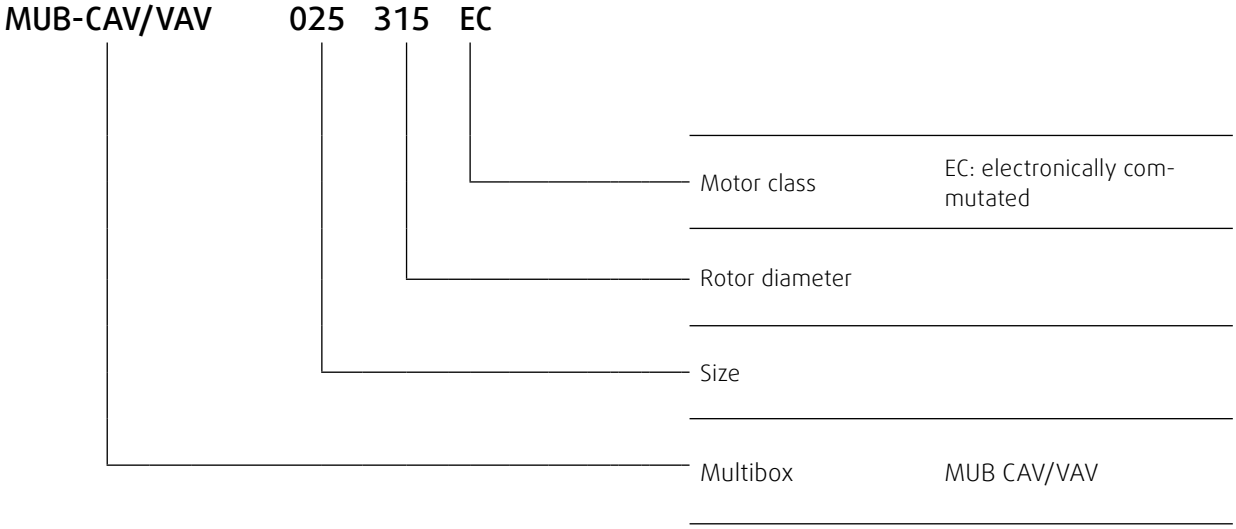
Tab 4: Technische Daten

5.7 Three-stage speed control as per EU Regulation 1253

According to EU Regulation 1253, fans must be fi tted with at least three-stage speed control from 01.01.2016.

- ☞ Please contact your responsible Systemair subsidiary to select the right controller.
- ☞ This regulation is not valid for ventilation systems, whose operating temperature (moved air) exceeds 100°C.

5.8 Type key



5.9 Motor data

The motor data can be found on the motor name plate and in the motor manufacturer's technical documents.

5.10 Sensor-control module for differential pressure and volume PCA1000/6000D2

5.10.1 General

Depending on the operation mode the controller can be used as a sensor or as a regulator for pressure or air volume. Factory setting of the controller is CAV- constant air volume.

The controller works in accordance with the set values for pressure or air volume. The measured actual value is compared with the set value and the controller adjusts accordingly 0-10V controlled output for the EC motors. The specific characteristics of the inlet cone size are considered in the k-factor. Factory setting see table 5. More detailed information in the operating manual of the controller module (PCA1000/6000D2).

Bezeichnung	Artikelnr.	K-Faktor
MUB-CAV/VAV 025 315EC	37168	100
MUB-CAV/VAV 025 355EC	37169	143
MUB-CAV/VAV 042 400EC	37170	172
MUB-CAV/VAV 042 450EC	37171	238
MUB-CAV/VAV 042 450EC-K	37485	235
MUB-CAV/VAV 042 500EC	37172	266
MUB-CAV/VAV 062 560EC	37173	418
MUB-CAV/VAV 062 630EC	37174	500
MUB-CAV/VAV 100 630EC	37486	456
MUB-CAV/VAV 100 710EC	37175	550

Tab 5: K- Faktor

5.10.2 functionality constant air volume (CAV)

Shall the air volume (factory setting) be kept constant, the differential pressure in front of the inlet cone and in the inlet cone has to be kept constant.

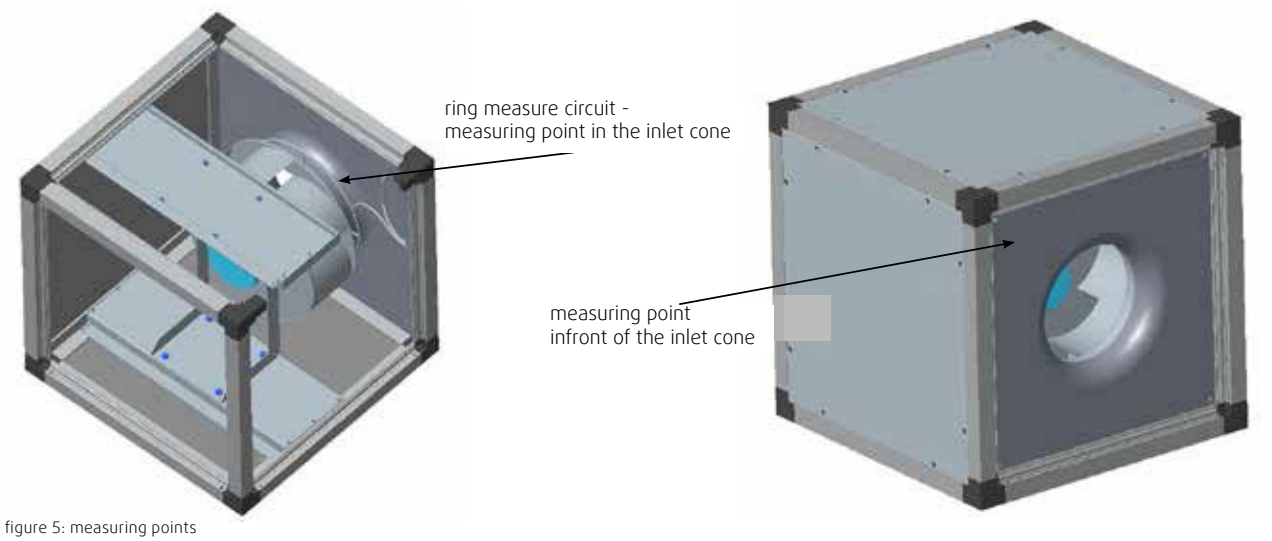


figure 5: measuring points

5.10.2 functionality constant pressure - variable air controll (VAV)

Shall the pressure be kept constant in the duct system, the differential pressure between atmosphere and duct system has to be kept constant. For this operation mode, the position of the measuring tubes have to be changed with the „constant- pressure kit" (article no.: 75625). The manual to change from CAV to VAV is included in the constant pressure kit.

5.10.2 Volumenstrombestimmung für Einstromdüsen mit Druckentnahme

The air volume can be calculated from the differential pressure. (differential pressure between measuring point in the inlet cone and in front of the inlet cone). See the following equation.

Volumenstrom

$$\dot{V} = k \cdot \sqrt{\Delta pw}$$ (V̇ in [m³/h] und Δpw in [Pa])

Shall the air volume (factory setting) be constant, the differential pressure has to be kept constant.

Düsendruck:

$$\Delta pw = \dot{V}^2 / k^2$$ (V̇ in [m³/h] und Δpw in [Pa])

5.10 Sample applications

5.10.1 constant airflow

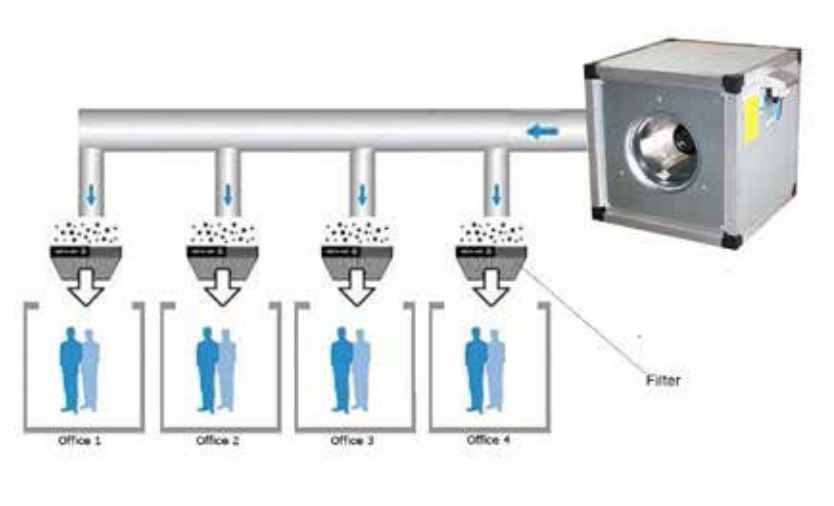


figure 6: constant airflow

5.10.2 constant pressure

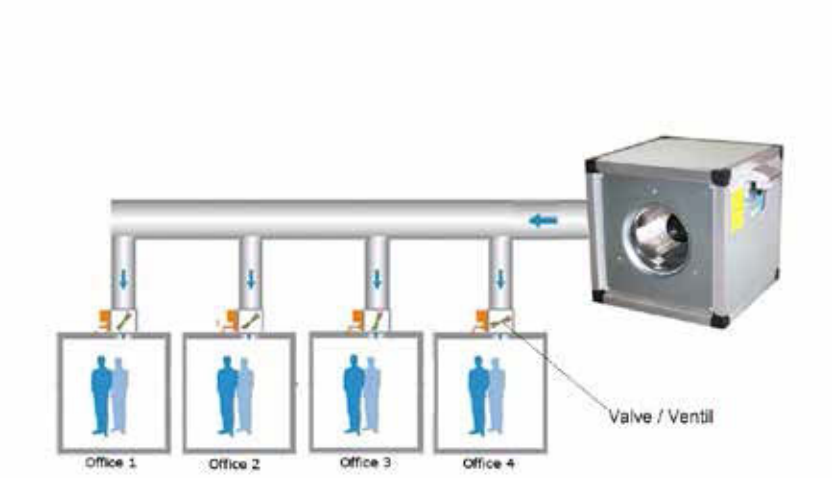


figure 7: constant pressure

6. Installation

6.1 Safety information

» Installation may only be carried out by trained, qualifi ed personnel.

» Comply with the system-related conditions and the requirements of the system manufacturer or plant builder.

» Safety elements, e.g. protective grilles, may not be dismantled, bypassed or put out of function.

Danger of impact from falling fan or parts of the fan!

» Check the surface before installation for load-bearing capacity.

» When selecting the hoisting equipment and fi tting material, observe the weight, tendency to vibrate and shear forces (weight information on the name plate).

» Wear a helmet and protective goggles.

6.2 Installation conditions

☞ Provide contact and intake protection and ensure safety distances according to DIN EN ISO13857 and DIN24167-1.

☞ Ensure that there is enough space for the installation of the fan.

☞ Protect against dust and wetness when installing.

6.3 Instructions for installation

NOTE

When unpacking the Multibox, only lift it by the base frame.

☞ Install the fan in such a way that no vibrations are transmitted to the channel system or the housing frame.

☞ To reduce transmission of vibration to the channel system, we recommend elastic connections from our accessory programm.

☞ Ensure that the fan is installed fi rmly and stably

☞ Ensure secure access to the fan for maintenance and repair.

☞ Ensure uninhibited and constant inflow into the appliance and free exhaust.

☞ Installation in outdorr area only with weather roof from our accessory programm.

NOTE

» To avoid damages on the bearings of the fan, it has to be warranted, that the air is able to enter and escape the fan nontwisting and smoothly.

» Only if the air is able to enter and escape the fan nontwisting and smoothly the stated power is reachable.

☞ Directly before and after the fan you have to install straight ducts. Please pay attention to the following figure (fig. 9).

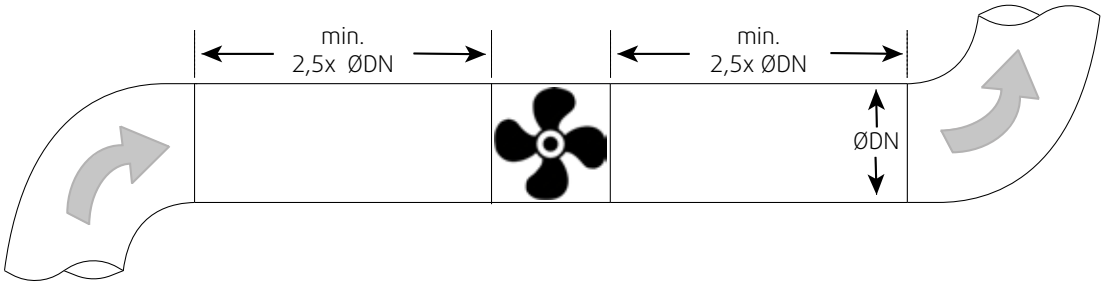


figure 9:Installation

NOTE

» • Minimum distance at the motor side, in case a motor or impeller replacement (see fi g. 8).

» • The minimum distance is required for motor cooling.

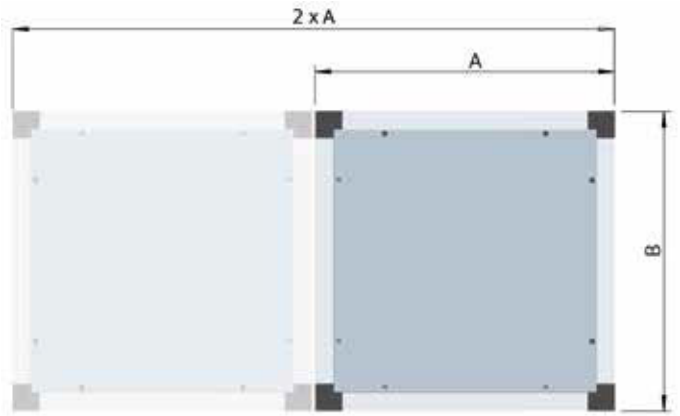


figure 8: Installation precondition

6.3.1 Floor installation

- ☞ Install the base frame on a level, fl at surface.
- ☞ Seal the contact surface between the base frame and the base or surface with cellular rubber or a foamed band.
- ☞ Install connecting ducts and accessories.

6.3.2 Wall or ceiling installation

WARNING

Danger from falling parts!

» Check the base before installation for load capacity/strength.

» When selecting the fi tting material, observe the weight, tendency to vibrate and shear forces (weight information on the name plate).

- ☞ Fit the Multibox on a fi rm base with suitable fi tting material.
- ☞ Install connecting ducts and accessories.

6.4 Shaft extensions

CAUTION

Damage to the motor and the rotor!

The ball bearings of the motor and the counterbalanced rotor may be damaged by forceful impacts in the assembly

of the rotor and/or the shaft extension.

» Attach the rotor and/or the shaft extension to the shaft or the rotor without forceful impacts.

NOTE

The hub can be heated for easier assembly and dismantling, for example with a hot-air blower.

» Precondition for assembly: the wedge is in the intended groove.

» Tools: matching hexagonal wrench and suitable tool for removal, torque wrench for the taper clamping bush.

NOTE

If the intended spot cannot be reached:

☞ Break through the rated break point in the aluminium hub.

☞ Attach the removal tool there.

6.4.1 Steel shaft extension

6.4.1.1 Disassembly

1. Loosen the two screws of the sleeve with the hexagonal wrench.
2. Loosen the screw at the front of the motor shaft with the hexagonal wrench.
3. Pull the shaft extension off with the removal tool.

6.4.1.2 Assembly on the shaft

1. Attach the shaft extension so that the sleeve is over the shaft extension, allowing it to be fi tted.
2. Tighten the two screws of the sleeve with the hexagonal wrench.
3. Tighten the screw at the front of the motor shaft with the hexagonal wrench.
4. Tighten the two screws of the sleeve with the hexagonal wrench such that they push against the wedge of the shaft.

6.4.2 Rotor with screw-down hub made from aluminium or steel

6.4.2.1 Disassembly

1. Loosen the two screws of the hub with the hexagonal wrench.
2. Pull the rotor off at the intended place with the removal tool.

NOTE

If the intended spot cannot be reached:

☞ **Break through the rated break point in the aluminium hub and attach the removal tool there.**

6.4.2.2 Assembly

1. Place the rotor with aluminium or steel hub on the shaft without using force.
2. Tighten the two screws of the hub with the hexagonal wrench.

Please bear in mind that the fastening screws push against the straight side of the shaft extension if the shaft extension is small.

6.4.3 Rotor with taper clamping bush

6.4.3.1 Disassembly

1. Loosen the two opposite screws with the hexagonal wrench.
2. Screw one screw into the middle of the three threaded bores and remove the clamping bush from the shaft.

6.4.3.2 Assembly

1. Insert the clamping bush into the rotor.
2. Slightly tighten the two opposite screws.
3. Place the rotor on the shaft without using force.
4. Tighten the two screws evenly with the torque wrench with the tightening torque according to Tab. 6.

Type of bush	1008	1108	1210	1215	1310	1610	1615	2012	2517	3020
Tightening torque [Nm]	5,7	5,7	20	20	20	20	20	31	49	92

Tab 6: Tightening torques for various types of bush

7. Electrical connection

7.1 Safety information

Danger from electrical voltage!

» The electrical connection may only be established by a trained electrician or trained and qualifi ed personnel.

» The electrical connection should be done in accordance with the valid regulations.

» Prevent the ingress of water into the connection box.

» Observe the 5 rules of electrical safety (see section 2.5)!

7.2 Cables

☞ Only use cables that are confi gured for the current strength according to the name plate.

☞ When measuring the cross-section, observe the measuring guidelines as per EN 61800-5-1.

☞ Include at least the outer conductor cross-section when measuring the earth wire.

7.3 Cablebushing panel

If a cablebushing through the panel is needed, please pay attention to the following notes and the instruction figure (figure 8).

Hinweis

☞ All workingsteps in the following notes and instruction figure (figure 9) have to be done on both sides of the double-walled panel.

☞ All drilling holes have to be burred

☞ To avoid damages to the cable, we recomment to use stepped rubber (available at Systemair articleno. 313521).

Vorsicht

Wear protective goggles and protective gloves while drilling and burring.

Remove metal cuttings afer work.

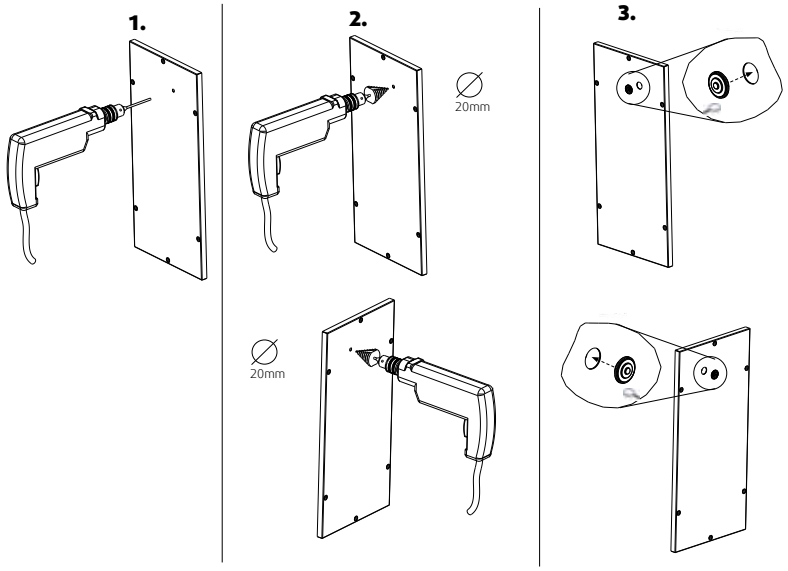


fig. 9: Cablebushing panel

7.4 Connection

You will find the electrical circuit diagram on the base plate of the motor or in the terminal box.

- ☞ Complete the electrical connection according to the circuit diagram.
- ☞ If using plastic terminal boxes, do not use any metal gland connections.
- ☞ Lay the mains supply line through a borehole from the outside.
- ☞ Lay the connection cables in the terminal box in such a way that allows the cover of the terminal box to be closed without resistance.
- ☞ Use all of the locking screws.
- ☞ Insert the screws by hand to avoid damaging the thread.
- ☞ Tighten the nuts of the cable ducts well in order to guarantee protection class IP.
- ☞ Screw the lid of the terminal box/REV switch evenly tight.
- ☞ Furthermore, seal the lid screw connections on the plastic terminal boxes (if using) with sealing putty.

CAUTION

Danger from penetrating liquid Damage to the device from penetrating liquid on the customer-side cable end.

» Connect the cable end in a dry environment!

7.5 Mains deactivation if multiple devices are installed in parallel

CAUTION

If multiple devices are installed in parallel, there will be an electric charge between the mains supply cable and the earth wire connection after the mains power supply is switched off!

» Observe the 5 rules of electrical safety (see section 2.5)!

» Ensure suffi cient protection against accidental contact.

» Short-circuit the mains connections and protective earth prior to working on the electrical connection.

» Only connect the motor to circuits that can be switched off using an all-pole disconnecting switch.

» » Secure the device against reactivation when working on the motor.

7.6 Protecting the motor

WARNING

Danger from electrical voltage!

» Observe the 5 rules of electrical safety when conducting all kind of work on the motor (see section 2.5)!

☞ Avoid phase failures: If using 3-phase motors, use an all-pole C or K circuit breaker (see name plate for current consumption).

7.7 Earth wire transition resistance according to EN 61800 -5-1

CAUTION

» Check compliance with the impedance specifi cations as per EN 61800-5-1 for the earth connection circuit in the end application.

» Connect a further protective earth wire via the additional connection point on the device, depending on the installation situation. The earth wire connection point is located on the housing. It has a bore hole and an earth wire symbol.

7.8 Residual current circuit breaker

☞ Only use universal RCDs (type B or B+).

Note

☞ Use RCDs with a trigger threshold of 300 mA and delayed trigger (super-resistant, K characteristic).

☞ This prevents pulsed charging currents from the capacitors in the integrated EMC fi lter when activating the voltage supply.

8. Commissioning

8.1 Safety information

» Commissioning may only be carried out by trained and instructed qualifi ed personnel!

8.2 Preconditions

- Installation and electrical connection have been correctly performed.
- Residual material from installation and foreign objects have been removed from the fan and ducts.
- Inlet and outlet are free.
- The safety devices have been fi tted (protective grille).
- The earth wire is connected.
- The cable glands are tight.
- The nominal current (from the name plate) is not exceeded.
- The data on the name plate corresponds with the connection data.
- The supply voltage corresponds with the device voltage.

8.3 Notes

8.3.1 Reactive currents

An EMC fi lter is integrated to comply with the limit values for emitted interference and interference resistance. This means that reactive currents in the power supply line can still be measured even if the motor is at standstill and the power supply is activated.

- The values typically lie in a range of <250 mA.
- At the same time, the effective power in this operating state (stand-by) is typically <4 W.

8.3.2 Locked rotor protection

Due to the locked rotor protection, the start-up current (LRA) is equal to or smaller than the nominal current (FLA).

8.4 Tests when activated

☞ Switch the ventilator on.

WARNING

Danger from protruding parts!

» Wear safety goggles when checking the direction of rotation.

☞ Check the direction of rotation/conveyance. The direction of rotation always applies looking at the rotor.

☞ Check:

- Smooth running (any vibrations and noise)
- Current consumption (with appropriate measuring instrument)
- Tightness of all connections

8.5 Checking the safety elements

☞ Check that safety elements and protective grilles are securely fastened.

8.6 Check that safety elements and protective grilles are securely fastened.

☞ Switch the fan off.

WARNING

Danger from electrical voltage!

» Ensure that all phases are completely free of voltage.

» Observe the 5 rules of electrical safety (see section 2.5)!

☞ Check that the connection cables are fi tted properly

☞ Lay the connection cables in the terminal box in such a way that allows the cover of the terminal box to be closed without resistance.

☞ Use all of the locking screws.

☞ Insert the screws by hand to avoid damaging the thread.

8.7 Switching the device on

☞ Before switching the device on, check the device for externally visible damage and ensure that the protective equipment functions properly.

☞ Check the airways of the fan for foreign bodies and remove any found.

☞ Apply the nominal voltage for supply.

☞ Start the device by altering the input signal.

8.8 Switching the device off

8.8.1 Switching the device off during operation

☞ Switch off the device via the control input.

☞ Do not switch the motor (e.g. in cycle operation) on or off via the mains.

8.8.2 Switching the device off for maintenance work

WARNING

Danger from electrical voltage!

» Observe the 5 rules of electrical safety (see section 2.5)!

☞ Switch off the device via the control input.

☞ Do not switch the motor (e.g. in cycle operation) on or off via the mains.

☞ Disconnect the device from the power supply.

☞ When disconnecting, make sure to remove the earth wire last!

9. Operation

9.1 Safety information

Danger from electrical voltage!

» The device may only be operated by persons who:

» – are instructed in the function and risks,

» – who have understood them, and can act accordingly.

» Ensure that children cannot operate or play with the device without supervision.

» Ensure access only to persons who can safely handle the device.

9.2 Operating conditions

- Do not operate the fan in an explosive atmosphere.
- It must not be possible to touch the rotor during operation.
- Safety elements must not be bypassed or put out of function.
- The Multibox may operate inside the limits declared on the name plate.
- Prevent the intake of foreign particles which can destroy the fan.
- Noise emissions can be reduced by using a sound filter.
- Fulfi l the conditions for earthing as per DIN VDE 0160/5.88. ART.6.5.2.1, if the operational leakage current of 3.5 mA is exceeded.

9.3 Integrated protective function

NOTE

The integrated protective functions ensure that the motor switches off automatically in the event of any of the faults described in the table.

Fault	Description/function of safety equipment
Incorrect rotor position detection	The motor will restart automatically.
Blocked rotor	After the block is resolved, the motor will restart automatically.
Power supply undervoltage (mains input voltage is outside the permitted nominal voltage)	Once the supply voltage returns to the permitted value, the motor will restart automatically.

Tab 7: Integrated protective function

9.4 Operation/use

☞ Only use the Multibox in accordance with these operating instructions and the operating instructions of the motor.

☞ Check that the Multibox is functioning properly during operation.

☞ Switch the Multibox off.

WARNING

Danger from electrical voltage and flying parts!

Operator errors could result in personal injury and/or damage to objects!

» Switch the Multibox off immediately:

– in the event of unusual vibrations, pressure fl uctuations or noises from the bearings,

– in the event that values for current, voltage and temperature are exceeded (name plate).

9.5 Switching the device off

9.5.1 Switching the device off during operation

- ☞ Switch off the device via the control input.
- ☞ Do not switch the motor (e.g. in cycle operation) on or off via the mains.

9.5.2 Switching the device off for maintenance work

WARNING

Danger from electrical voltage!

» Observe the 5 rules of electrical safety (see section 2.5)!

- ☞ Switch off the device via the control input.
- ☞ Do not switch the motor (e.g. in cycle operation) on or off via the mains.
- ☞ Disconnect the device from the power supply.
- ☞ When disconnecting, make sure to remove the earth wire last!

9.6 Switching the device on

- ☞ Before switching the device on, check the device for externally visible damage and ensure that the protective equipment functions properly.
- ☞ Check the airways of the fan for foreign bodies and remove any found.
- ☞ Apply the nominal voltage for supply.
- ☞ Start the device by altering the input signal.

10. Troubleshooting/maintenance/repair

10.1 Safety information

» Troubleshooting and maintenance may only be carried out by a trained electrician, or trained and instructed specialist personnel!

» Observe the work protection regulations when troubleshooting!

» Observe the 5 rules of electrical safety (see section 2.5)!

» Switch the fan off.

10.2 Switching the device off for maintenance work

WARNING

Danger from electrical voltage!

» Observe the 5 rules of electrical safety (see section 2.5)!

☞ Switch off the device via the control input.

☞ Do not switch the motor (e.g. in cycle operation) on or off via the mains.

☞ Disconnect the device from the power supply.

☞ When disconnecting, make sure to remove the earth wire last!

10.3 Preconditions

- The power supply has been switched off (all-pole circuit breaker).
- The rotor is at a standstill.

10.4 Faults and troubleshooting

Problem	Possible causes	Remedy
Fan does not run smoothly	Rotor imbalance	Rebalancing by a specialist company
	Adhesions on the rotor	Clean carefully, rebalance
	Material decomposition on the rotor due to aggressive material conveyed	Contact the manufacturer
	Wrong direction of rotation of rotor	Contact the manufacturer
	Deformation of rotor due to excessive temperature	Contact the manufacturer Install new rotor Check mounting
Air output of fan too low	Wrong direction of rotation of rotor	Contact the manufacturer
	Excessive pressure losses in the lines	Change the line routing
	Flow regulators not or only partly open	Check opening position on site
	Intake or pressure ducts are blocked	Remove the blocks
Grinding sounds when starting or operating the fan	Intake line is strained	Loosen intake line and realign
Thermal contacts/resistors have triggered	Wrong direction of rotation of rotor	Change direction of rotation
	Motor blocked	Contact the manufacturer
Fan does not reach nominal speed	Electrical switching devices set incorrectly	Check and possibly reset setting of switching device
	Defective motor winding	Contact the manufacturer
	Incorrectly configured drive motor	Contact the manufacturer for check of start torque
Motor does not rotate	Mechanical blockage	Switch off, disconnect from the power supply and remove the mechanical blockage.
	Faulty supply voltage	Check the supply voltage, re-establish the voltage supply, apply control signal.
	Faulty connection	Disconnect from the power supply, correct the connection, see circuit diagram.
	Temperature monitor has responded	Allow the motor to cool down, find and resolve the cause of the fault, release the reactivation lock if required.
Electronics/motor overheated	Insufficient cooling	Improve cooling. Allow device to cool. To reset the fault message, switch off the supply voltage for at least 25 s and switch on again.
	Ambient temperature too high	Lower ambient temperature. Reset by reducing the control input to 0.

Tab 8: Troubleshooting

10.5 Switching the device on

- ☞ Before switching the device on, check the device for externally visible damage and ensure that the protective equipment functions properly.
- ☞ Check the airways of the fan for foreign bodies and remove any found.
- ☞ Apply the nominal voltage for supply.
- ☞ Start the device by altering the input signal.

10.6 Maintenance/repair

10.6.1 Replacing the bearings

By using ball bearings with „life-long lubrication“, the fan is largely maintenance free. The bearings must be replaced after the lubricant service life has expired (approx. 30,000 to 40,000 h in standard applications).

- ☞ Pay attention to unusual noises from the bearings.

WARNING

Danger from overheating!

» When changing the bearings, only use original Systemair bearings with special lubrication.

10.6.2 Damage

- ☞ Please contact the manufacturer’s customer service department in the event of any kind of damage, e.g. to the windings.

WARNING

Danger from defective fans!

» Replace any defective fans completely.

Repairs may only be done on the manufacturer’s premises and by the manufacturer.
You can find the address on the back of these operating instructions.

10.6.3 High voltage test

WARNING

Danger from high voltage!

The integrated EMC fi lter contains Y capacitors. Applying an AC test voltage will exceed the trigger current.

» Check the device using DC voltage when performing the legally mandated high-voltage test.

» Use a voltage that corresponds with the peak value of the AC voltage required in the standard.

What must be checked?	How to check?	Frequency	What measures?
Damage to device	Visual inspection	At least every 6 months	Replace device
Connection cable fi tting			Secure
Earth wire connection fi tting			Secure
Damage to cable insulation			Replace cables
Protective grille cover			
Damage to fan			
Fan fi tting			

Tab 9: High voltage test

10.7 Spare parts

NOTE

You can obtain original replacement parts from Systemair. These are suitable for the MUB EC series.

☞ Only use original spare parts.

☞ When ordering spare parts, please specify the serial number of the fan. This can be found on the name plate.

11. Cleaning

11.1 Safety information

Danger from electrical voltage!

» The interior of the Multibox may only be cleaned by a trained electrician or trained and instructed specialist personnel!

» Observe the 5 Security Rules!

» Switch the fan off.

Danger from hot surfaces!

» During maintenance and cleaning wear protective gloves!

11.2 Switching the device off

WARNING

Danger from electrical voltage!

» Observe the 5 rules of electrical safety (see section 2.5)!

☞ Switch off the device via the control input.

☞ Do not switch the motor (e.g. in cycle operation) on or off via the mains.

☞ Disconnect the device from the power supply.

☞ When disconnecting, make sure to remove the earth wire last!

11.3 Procedure

Note

Regular cleaning of the fan prevents unbalance. A filter extends the cleaning intervals.

☞ Install a filter monitor.

☞ Keep the airways of the fan clear and clean them if necessary with a brush.

☞ Do not use steel brushes or pointed or sharp-edged objects.

☞ Do not use a high-pressure cleaner (“steam jet cleaner”) under any circumstances.

☞ Do not bend the fan blades when cleaning.

☞ Do not use cleaning agents to clean the interior.

☞ When cleaning the rotor, pay attention to balance weights which have been positioned!

11.4 Switching the device on

☞ Before switching the device on, check the device for externally visible damage and ensure that the protective equipment functions

☞ properly.

☞ Check the airways of the fan for foreign bodies and remove any found.

☞ Apply the nominal voltage for supply.

☞ Start the device by altering the input signal.

12. Uninstalling/disassembly

12.1 Safety information

Danger from electrical voltage!

» The device may only be switched off and uninstalled by a trained electrician or trained and instructed qualified personnel!

» Observe the 5 rules of electrical safety (see section 2.5)!

» Switch the fan off.

Danger of impact from falling fan or parts of the fan!

» When selecting the hoisting equipment and fi tting material, observe the weight, tendency to vibrate andshear forces (weight information on the name plate).

» Wear a helmet and protective goggles.

Danger from impact and cuts!

» Wear protective gloves when dismounting!

» Disassemble carefully.

12.2 Disconnecting

☞ Carefully disconnect all the electrical lines.

☞ Disconnect the fan from the supply connections.

12.3 Disassembly

☞ Carefully remove the fastening material.

☞ Lift the fan using appropriate hoisting equipment via the provided lifting eyes.

☞ Place the fan on an appropriate pallet.

13 Disposal

Both the appliance and the transport packaging predominantly comprise recyclable raw materials.

13.1 Disposal of the fan

13.1.1 Safety information

Danger from electrical voltage!

» The device may only be switched off and uninstalled by a trained electrician or trained and instructed qualified personnel!

» Observe the 5 rules of electrical safety (see section 2.5)!

» Switch the fan off.

13.1.2 Final disassembly and disposal

☞ Disconnect the fan and disassemble as described in chapter 12.

☞ Disconnect the fan from the supply connections.

☞ Disassemble the fan into its components.

☞ Separate the parts according to:
- reusable material,
- material groups to be disposed of (metal, plastics, electrical parts, etc.).

☞ Ensure material is recycled. Observe national regulations.

systemair

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