

# Multibox MUB, MUB/T, MUB/T-S, MUB-CAV/VAV, MUB/F

Installation and Operating Instructions

GB

Document in original language | · 007



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# 1 General information

## 1.1 Notice symbols



### Danger

**Direct hazard**  
Failure to comply with this warning will lead directly to death or to serious injury.



### Caution

**Hazard with a low risk**  
Failure to comply with this warning may lead to moderate injuries.



### Warning

**Potential hazard**  
Failure to comply with this warning may lead to death or serious injury.

### Important

**Hazard with risk of damage to objects**  
Failure to comply with this warning will lead to damage to objects.



### Note:

Useful information and instructions

### 1.1.1 Instruction symbols

#### Instruction

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

#### Instruction with fixed sequence

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

## 2 Important safety information

Planners, plant builders and operators are responsible for the proper assembly and intended use.

- ◆ Read the operating instructions completely and carefully.
- ◆ Keep the operating instructions and other valid documents, such as the circuit diagram or motor instructions, with the fan. They must always be available at the place of use.
- ◆ Observe and respect local conditions, regulations and laws.
- ◆ Only use the fan in a flawless condition.
- ◆ Provide generally prescribed electrical and mechanical protective devices.
- ◆ During installation, electrical connection, commissioning, troubleshooting, and maintenance, secure the location and premises against unauthorised access.
- ◆ Do not circumvent any safety components or put them out of action.
- ◆ Keep all the warning signs on the fan complete and in a legible condition.
- ◆ The device is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.
- ◆ Do not allow children to play with the device.

### 2.1 Personnel

The fan may only be used by qualified, instructed and trained personnel. The persons must know the relevant safety directives in order to recognise and to avoid risks. The individual activities and qualifications can be found in Table 1 *Qualifications*, page 1.

**Table 1 Qualifications**

Activities	Qualifications
Storage, operation, transport, cleaning, disposal	Trained personnel (see following note)
Electrical connection, commissioning, electrical disconnection	Electrical expert or matching qualification

**Qualifications cont'd**

Installation, disassembly	Fitter or matching qualification	
Maintenance	Electrical expert or matching qualification	Fitter or matching qualification
Repair	Electrical expert or matching qualification	Fitter or matching qualification
	Smoke extraction fans and EX fans only by agreement with Systemair.	

**Note:**

The operator is responsible for ensuring that personnel are instructed and have understood the contents of the operating instructions. If something is unclear, please contact Systemair or its representative.

**2.2 Personal protective equipment**

Wear protective equipment during all work in the vicinity of the fan.

- protective working clothes
- protective working gloves
- goggles
- protective working shoes
- helmet
- hearing protection

**2.3 5 rules of electrical safety**

1. Disconnect (disconnection of the electrical system from live components at all terminals)
2. Prevent reactivation
3. Test absence of voltage
4. Ground and short-circuit
5. Cover or restrict adjacent live parts

**3 Warranty**

For the assertion of warranty claims, the products must be correctly connected and operated, and used in accordance with the data sheets. Further prerequisites are a completed maintenance plan with no gaps and a commissioning report. Systemair will require these in the case of a warranty claim. The commissioning report is a component of this document. The maintenance plan must be created by the operator, see section 12.3 *Maintenance*, page 22.

**4 Delivery, transport, storage****4.1 Safety information****Warning: Risk from rotating fan blades**

- ◆ Prevent access by unauthorised persons by safety personnel or access protection.

**Warning: Suspended loads**

- ◆ Wear protective equipment during all work in the vicinity of the fan, details see 2.2 *Personal protective equipment*, page 2.
- ◆ Do not walk under suspended loads.
- ◆ Make sure that there is nobody under a suspended load.

**4.2 Delivery**

Each fan leaves our plant in an electrically and mechanically proper condition. We recommend transporting the fan to the installation site in the original packaging.

**Checking delivery**

- ◆ Check the packaging and the fan for transport damage. Any findings should be noted on the cargo manifest.
- ◆ Check completeness of the delivery.

**Unpacking**



## Warning

When opening the transport packaging, there is a risk of damage from sharp edges, nails, staples, splinters etc.

- ◆ Unpack the fan carefully.
- ◆ Check the fan for obvious transport damage.
- ◆ Only remove the packaging shortly before assembly.
- ◆ Wear protective equipment during all work in the vicinity of the fan, details see 2.2 *Personal protective equipment*, page 2.

## 4.3 Transport

### 4.3.1 Safety information

**Warning: Electrical or mechanical hazards due to fire, moisture, short circuit or malfunction.**

- ◆ Never transport the fan by the connecting wire, terminal box, impeller, protection grille, inlet cone or silencer.
- ◆ In open transport, please make sure that no water can penetrate into the motor or other sensitive parts.
- ◆ We recommend transporting the fan to the installation site in the original packaging.

**Caution: If transported without care during loading and unloading, the fan may be damaged.**

- ◆ Load and unload the fan carefully.
- ◆ Use hoisting equipment that is suitable for the weight to be hoisted.
- ◆ Observe the transportation arrows on the packaging.
- ◆ Use the fan packaging exclusively as transport protection and not as a lifting aid.

## 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.

## Important

**Hazard due to loss of function of the motor bearing**

- ◆ Avoid storing for too long (recommendation: max. 1 year).
- ◆ Check that the motor bearing functions properly before installation.

## 5 Description

### 5.1 MUB equipped with an EC motor

The fans are driven by EC motors. These motors are delivered with a pre-wired potentiometer (0-10 V) that allows you to easily find the required working point of the fan. All motors are suitable for 50/60 Hz. The input voltage for single-phase units can vary between 200 and 277 V for three phase units between 380 and 480 V. All models have one potential-free terminal for error message.

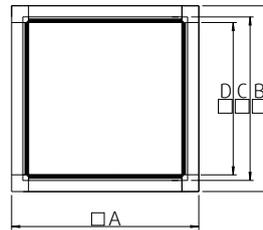
### 5.2 MUB equipped with an AC motor

For information on speed regulation options, see 6 Name plate and type key, page 8.

### 5.3 Description MUB

**Table 2 Dimensions MUB**

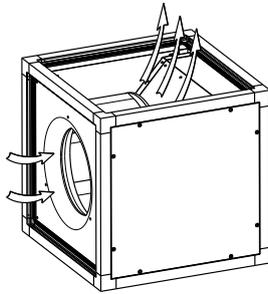
[mm]	A	B	C	D
MUB 025...	500	500	420	378
MUB 042...	670	670	590	548
MUB 062...	800	800	720	678
MUB 100...	1000	1000	920	878



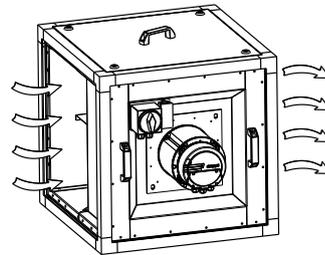
### 5.4 Description MUB/T and MUB/T-S

#### Airflow direction

The MUB/T is suitable for a 90° airflow direction application.

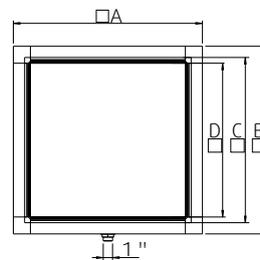


The MUB/T-S is suitable for an inline airflow direction application.



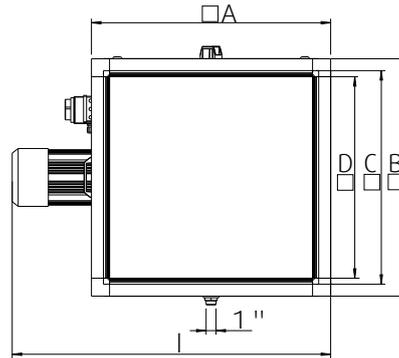
**Table 3 Dimensions MUB/T**

[mm]	A	B	C	D
MUB/T 025...	500	500	420	378
MUB/T 042...	670	670	590	548
MUB/T 062...	800	800	720	678
MUB/T 100...	1000	1000	920	878



**Table 4 Dimensions MUB/T-S**

[mm]	A	B	C	D
MUB/T-S 025 315...	500	500	420	378
MUB/T-S 042 355...	670	670	590	548
MUB/T-S 042 400...	670	670	590	548
MUB/T-S 042 450...	670	670	590	548
MUB/T-S 062 500...	800	800	720	678
MUB/T-S 062 560...	800	800	720	678
MUB/T-S 100 630...	1000	1000	920	878

**Table 5 MUB/T-S Dimensions I**

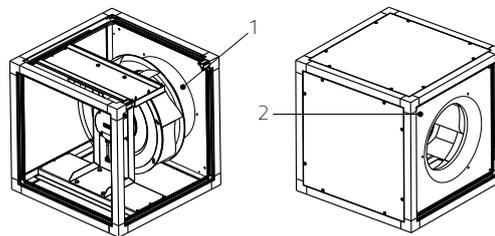
MUB/T-S 025 315...	<b>D2:</b> 751 mm / <b>DV:</b> 672 mm / <b>E4:</b> 690 mm	MUB/T-S 062 500...	<b>D4:</b> 1023 mm
MUB/T-S 042 355...	<b>DV:</b> 795 mm / <b>E4:</b> 777 mm	MUB/T-S 062 560...	<b>D4:</b> 1065 mm
MUB/T-S 042 400...	<b>DV:</b> 813 mm / <b>E4:</b> 849 mm	MUB/T-S 100 630...	<b>D4:</b> 1237 mm
MUB/T-S 042 450...	<b>D4:</b> 867 mm / <b>E4:</b> 874 mm		

## 5.5 Description MUB-CAV/VAV

Please observe that the input voltage of the controller can vary between 195 and 253 V. The MUB-CAV/VAV with the integrated controller offers you the possibility for a constant airflow (factory setting) or a constant pressure ventilation or just to display data.

### Constant air volume function (CAV)

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



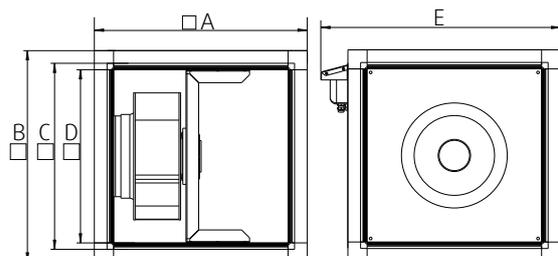
1 measuring point – inlet cone      2 measuring point – in front of the inlet cone

### Constant pressure - variable air volume function (VAV)

If the pressure in the duct system is to be kept constant, the differential pressure between atmosphere and duct system must be kept constant. For this operation mode, the position of the measuring tubes must be changed using the „constant pressure kit“. This kit and its manual are included in the MUB-CAV/VAV

**Table 6 Dimensions MUB-CAV/VAV**

[mm]	A	B	C	D	E
MUB-CAV/VAV 025...	500	500	420	378	586
MUB-CAV/VAV 042...	670	670	590	548	756
MUB-CAV/VAV 062...	800	800	720	678	886
MUB-CAV/VAV 100...	1000	1000	920	878	1086



### 5.5.1 Sensor control module for differential pressure and volume PCA1000/6000D2

The factory setting of the controller is CAV (constant air volume). The measured value is compared with the setpoint value. The controller adjusts the 0-10 V controlled output for the EC motor to keep the air volume constant. The specific characteristics of the inlet cone size are considered in the k-factor. Table 7 *K-factor MUB-CAV/VAV*, page 6. For more detailed information of the controller module (PCA1000/6000D2), see operating manual of the controller.

**Table 7 K-factor MUB-CAV/VAV**

025 315EC	100	042 400EC	172	042 450EC-K	235	062 560EC	418	100 630EC	456
025 355EC	143	042 450EC	238	042 500EC	266	062 630EC	500	100 710EC	550

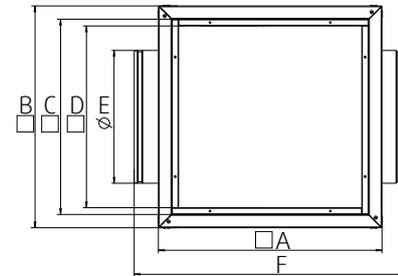
### 5.6 Description MUB/F

The fan is equipped with high-temperature motors for temperature classification F400/120 min, in single and two-speed versions.

The MUB/F smoke extract fans are suitable for the exhaust of hot smoke gases (once) and for daily ventilation requirements. After using the fan for the exhaust of hot smoke gases it has to be renewed.

**Table 8 Dimensions MUB/F**

[mm]	A	B	C	D	E	F
MUB/F 042 400	670	670	590	548	400	783
MUB/F 042 450	670	670	590	548	400	783
MUB/F 062 500	800	800	720	676	560	915
MUB/F 062 560	800	800	720	676	560	915
MUB/F 062 630	800	800	720	676	630	915



## 5.7 Fan data

- Max. temperature of transported air, max. ambient temperature, sound pressure → see data sheet, available in our online catalogue.
- Voltage, current, enclosure class, weight → see name plate

## 5.8 Motor data

The motor data can be found on the name plate of the motor, or in the technical documents of the motor manufacturer.

## 5.9 Intended use

### All MUB- versions:

- The fans are intended for installation in ventilation systems. They can be installed both in duct systems and also with free suction via an inlet cone and a suction-side contact protection grille. Free discharge via a contact protection grille is also possible.
- The maximum permissible operating data on the name plate apply for an air density of  $1.2 \text{ kg/m}^3$  (sea level) and a max. air humidity of 80%.

### MUB and MUB-CAV/VAV:

The fan is suitable for conveying clean air, with a density of  $1.3 \text{ kg/m}^3$  and a max. air humidity of 95%.

### MUB/T and MUB/T-S:

The fan is suitable for conveying contaminated air (dust, kitchen exhaust), with a density of  $1.3 \text{ kg/m}^3$  and a max. air humidity of 95%.

### MUB/F:

- The fan is suitable for conveying clean air, with a density of  $1.3 \text{ kg/m}^3$  and a max. air humidity of 95%.
- The smoke extraction units MUB/F are used in case of fire to extract smoke gases, as well as in normal working conditions of up to  $55^\circ\text{C}$ .

## 5.10 Incorrect use

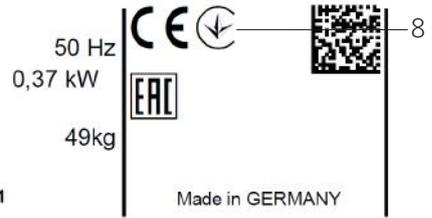
Incorrect use refers mainly to using the fan in another way to that described. The following uses are incorrect and hazardous:

- Conveying of explosive and combustible media
- Conveying of aggressive media
- Operation in an explosive atmosphere
- Operation without duct system or protection grille
- Operation with the air connections closed
- Installation outside without weather protection

## 6 Name plate and type key

- 1 Type designation
- 2 Voltage/current/frequency
- 3 Input power
- 4 Max. temperature of transported air
- 5 Enclosure class/fan impeller speed/weight
- 6 Insulation class

1 **MUB/T 042 400DV**  
 2 400 D V~ 1,39 A  
 3  
 4 tF=120°C  
 5 IP54 1360 min<sup>-1</sup>  
 6 INS.CL.F  
 7 **Serial.no: 3365 /1002900723-001/20170411**



- 7 Article number/production number/manufacturing date
- 8 Certifications

**Table 9 Type key**

MUB/T	042	400	DV	
				<b>Motor type</b>
				EC   Electronically commutated/1 phased or 3 phased
				E2   2 poled/controllable by frequency converter/1 phased
				E4   4 poled/controllable by frequency converter/1 phased
				DV   4 poled voltage controllable/3 phased
				D4   4 poled/controllable by frequency converter/3 phased
				D6   6 poled/controllable by frequency converter/3 phased
				<b>Impeller Diameter</b>
				<b>Size</b>
				<b>Fan type</b>
				MUB   Multibox
				MUB/T   Multibox – high temperature
				MUB/T-S   Multibox – high temperature/inline airflow direction
				MUB-CAV/ VAV   Multibox – constant air volume/variable air volume
				MUB/F   Multibox – smoke extraction fan

## 7 Accessories

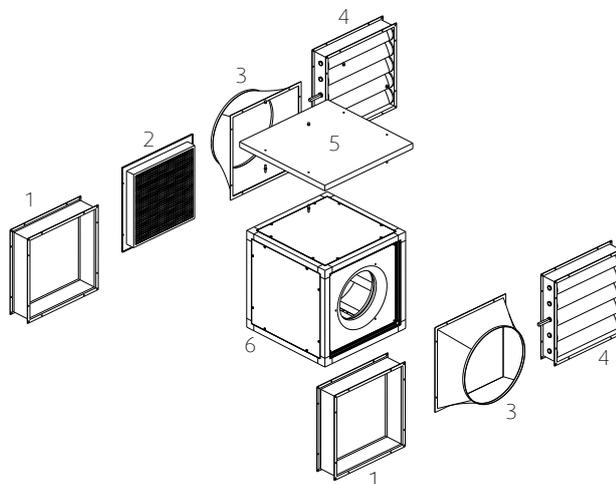


### Note:

For details of the accessories, please check our online catalog or contact Systemair.

**Table 10 Accessories MUB, MUB/T, MUB/T-S, MUB-CAV/VAV**

- 1 FGV Flexible connection
- 2 WSG\* Weather protection grille
- 3 UGS Transition connections, square to round
- 4 Tune-AHU Damper
- 5 WSD\*\* Weather protection roof
- 6 MUB Multibox

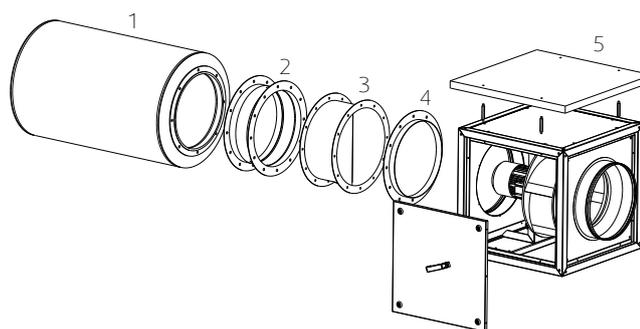


\* 8.6 Weather protection grille (WSG), page 14

\*\* 8.5 Weather protection roof (WSD), page 13

**Table 11 Accessories MUB/F**

- 1 RSA Silencer
- 2 EVH Flexible connection
- 3 LRK Air-operated damper
- 4 GFL Counter flange
- 5 WSD\*\* Weather protection roof



\*\* 8.5 Weather protection roof (WSD), page 13

## 8 Installation

### 8.1 Safety information

**Danger: Risk that MUB/F does not work in case of fire.**

- ◆ Use installation material with fire resistance classes that meet temperature requirements.

**Warning: Danger from falling fan or fan parts.**

- ◆ Check the surface before installation for load bearing capacity.
- ◆ Consider all static and dynamic loads when selecting hoisting equipment and fastening components.

#### General safety information

- ◆ Installation may only be carried out by adequately qualified persons, details see Table 1 *Qualifications*, page 1.
- ◆ Wear protective equipment during all work in the vicinity of the fan, details see 2.2 *Personal protective equipment*, page 2.
- ◆ Abide by the system-related conditions and requirements of the system manufacturer or plant constructor.
- ◆ Do not dismantle or circumvent safety elements, or put them out of function.
- ◆ Move the impeller of the fan by hand before you install it in order to check that it moves freely.
- ◆ Provide contact and intake protection and ensure safety distances according to DIN EN ISO13857 and DIN 24167-1.
- ◆ Use vibration dampers to prevent vibration transmissions. For example, article #37324 in our accessory range.
- ◆ Prevent the possibility of foreign bodies being drawn in.
- ◆ To reduce transmission of vibration to the duct system, we recommend flexible connections from our accessory range, see chapter Accessories.

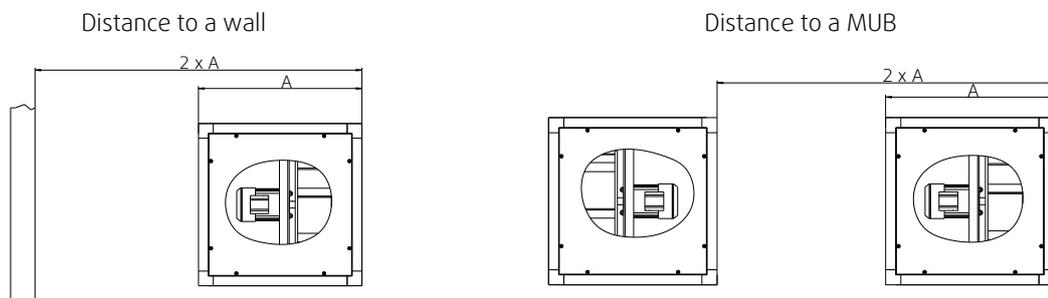
### 8.2 Preconditions

- ◆ Ensure that the fan and all its components are undamaged.
- ◆ Ensure that there is enough space to install the fan.
- ◆ Protect against dust and moisture when installing.
- ◆ Ensure that the information on the name plates (fan and motor) matches up with the operating conditions.
- ◆ Fit the fans in such a way that there is sufficient access for troubleshooting, maintenance and repair.

#### Important

##### Overheating motor

- ◆ The installation distance must correspond to the adjacent image when the motor is aligned as implied. If the motor protrudes out of the housing, the distance between other motors or a wall has to be  $2 \times A$ .
- ◆ As well as adhering to the maximum ambient temperature (see fan data sheet), care must be taken that the ventilation for the motors is sufficient. Trapped heat must be avoided at all costs.



**Important****Damage to the bearings or other parts of the fan can occur.**

- ◆ Do not place a duct bend directly before or after the fan!
- ◆ Ensure a smooth and constant air flow to the device. Ensure a free exhaust. See Fig. 1 *Straight ducts*, page 11.

- Rectangular duct system: **D** = Hydraulic diameter
- Round duct system: **D** = Nominal diameter

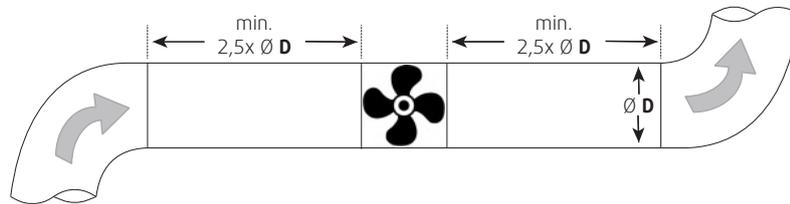


Fig. 1 Straight ducts

**8.3 Installation variations**

MUB/T, MUB/T-S

**Important****Damage to the fan if condensation water cannot drain.**

- ◆ Ensure that the drain plug is always at the lowest point of the fan to ensure that the condensation water can drain.

MUB, MUB/F

The installation is possible in any mounting position.

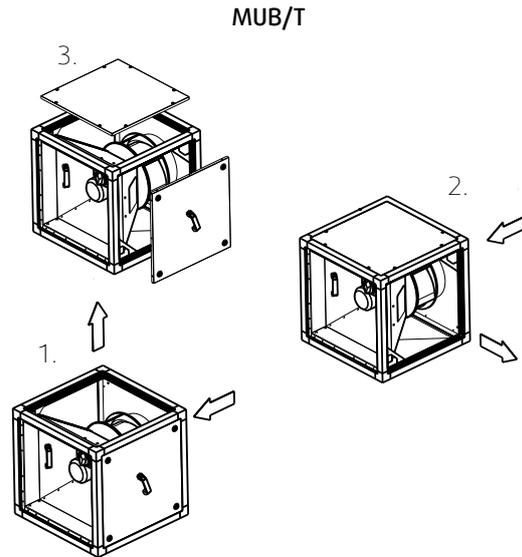
## 8.4 Changing the discharge direction

### Important

An inline airflow direction is not possible with a MUB/T. This application can be implemented with a MUB/T-S

#### Legend

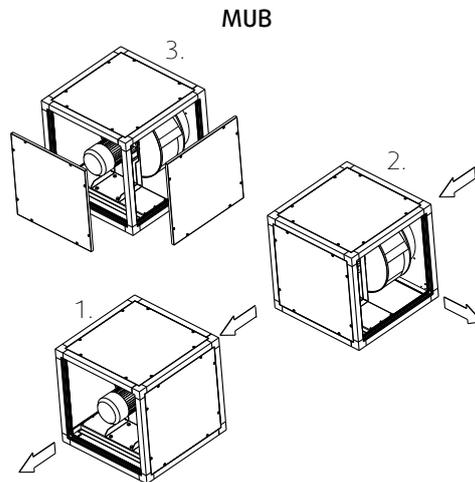
1. MUB/T with airflow direction 90° upwards (factory assembly)
2. MUB/T with airflow direction 90° sideways
3. Change of airflow direction



As a default, the Multiboxes have been designed for an inline airflow direction. The airflow can be changed from inline to 90° by replacing the side panels.

#### Legend

1. Multibox with inline airflow direction (factory assembly)
2. Multibox with 90° airflow direction
3. Change of airflow direction



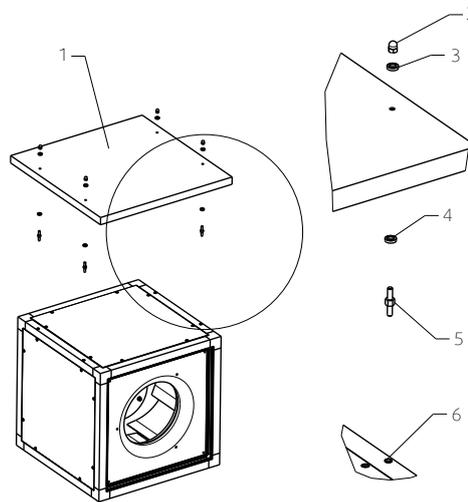
## 8.5 Weather protection roof (WSD)

### Important

#### Damage to the motor due to moisture.

- ◆ Only install outdoors with the weather protection roof from our accessory range, see chapter Accessories.
- ◆ Install the weather protection roof as described below.

- 1 Weather protection roof (WSD)
- 2 Cap nut
- 3 Double facets ring
- 4 Double facets ring
- 5 Distance bolt
- 6 Clinch nut



## 8.6 Weather protection grille (WSG)

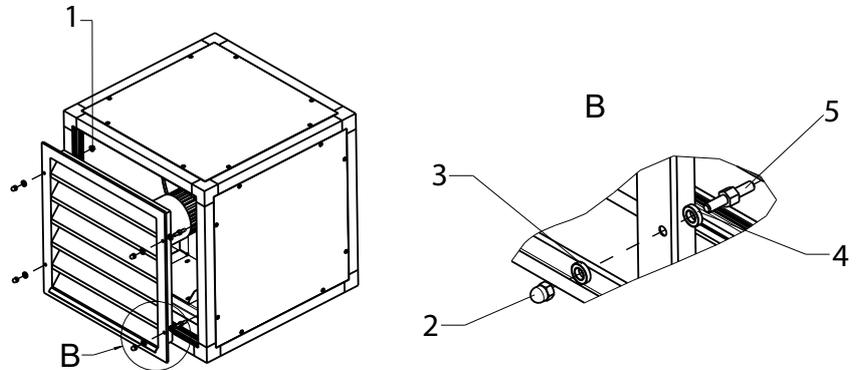


**Note:**

For reasons of space there are two versions of Weather protection grille (WSG) existing, a standard version and a "turned" version. Please chose the correct WSG for your Multibox from the Systemair online catalogue.

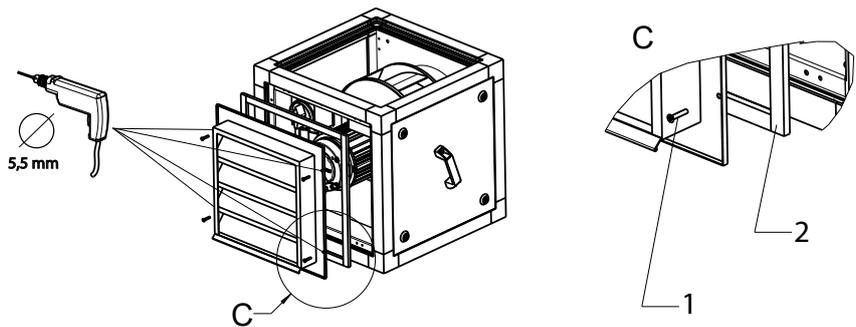
**Standard version**

- 1 Catch nut
- 2 Cap nut
- 3 Double facets ring
- 4 Double facets ring
- 5 Distance bolt



**"Turned" version**

- 1 Self-drilling screw
- 2 Microcellular rubber



**Note:**

The microcellular rubber (included with the delivery of WSG 025 MUB/T complete) with a height of 12 mm has to be used for size 025.

## 8.7 Assembly/Disassembly impeller – Internal rotor motor

If an external rotor motor is used, the motor and impeller can't be separated.

### Important

#### Damage to the motor and impeller.

The ball bearing of the motor and the balanced impeller may be damaged by forceful impacts.

- ◆ Attach the impeller and/or the shaft extension to the shaft or the rotor without forceful impacts.
- ◆ **Do not separate the impeller and the hub. They were balanced as one unit by Systemair.**

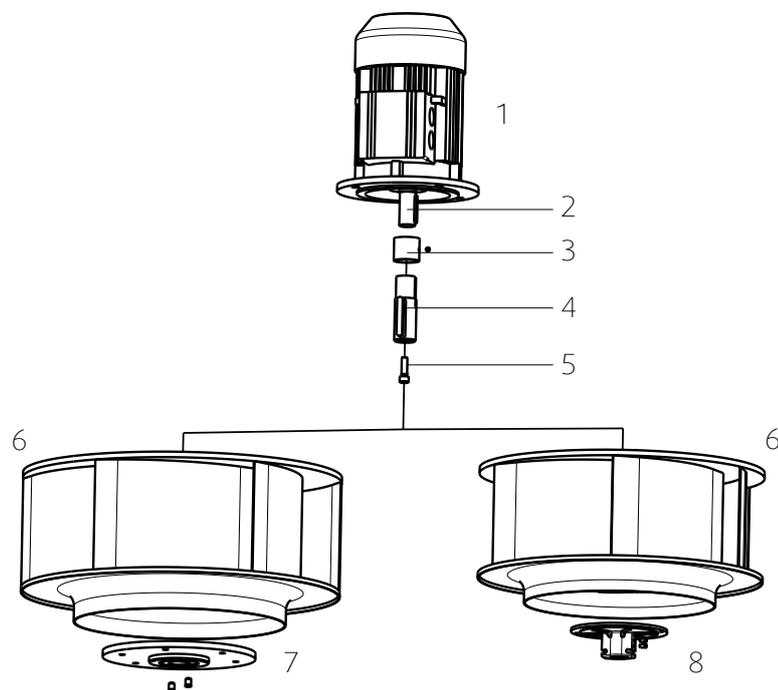


#### Note:

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

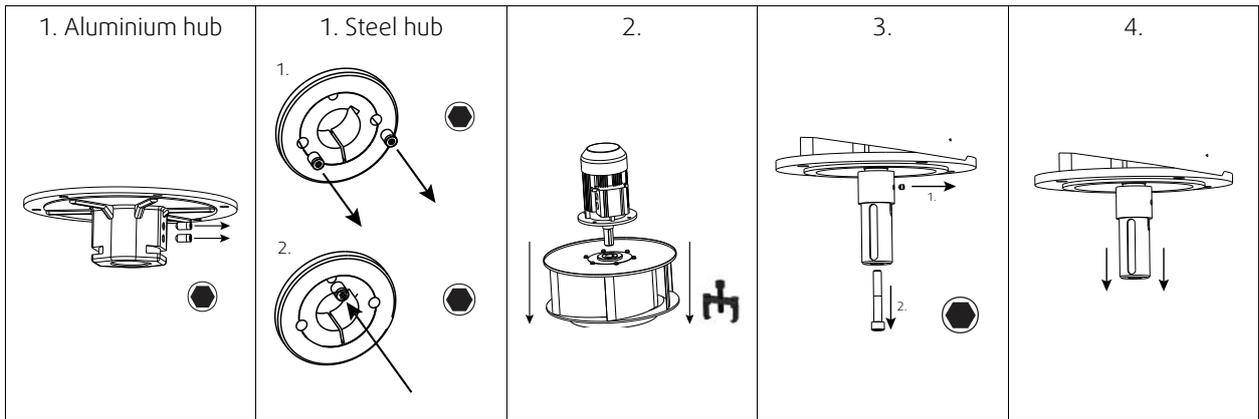
- Precondition for assembly: the wedge is in the intended groove.
- Tools: hexagon socket wrench and suitable tool for removal, torque wrench for the taper clamping bush.

- 1 Motor
- 2 Motor shaft
- 3 Sleeve (not available at every fan)
- 4 Shaft extension (not available at every fan)
- 5 Hexagon socket screw
- 6 Impeller
- 7 Steel hub
- 8 Aluminium hub

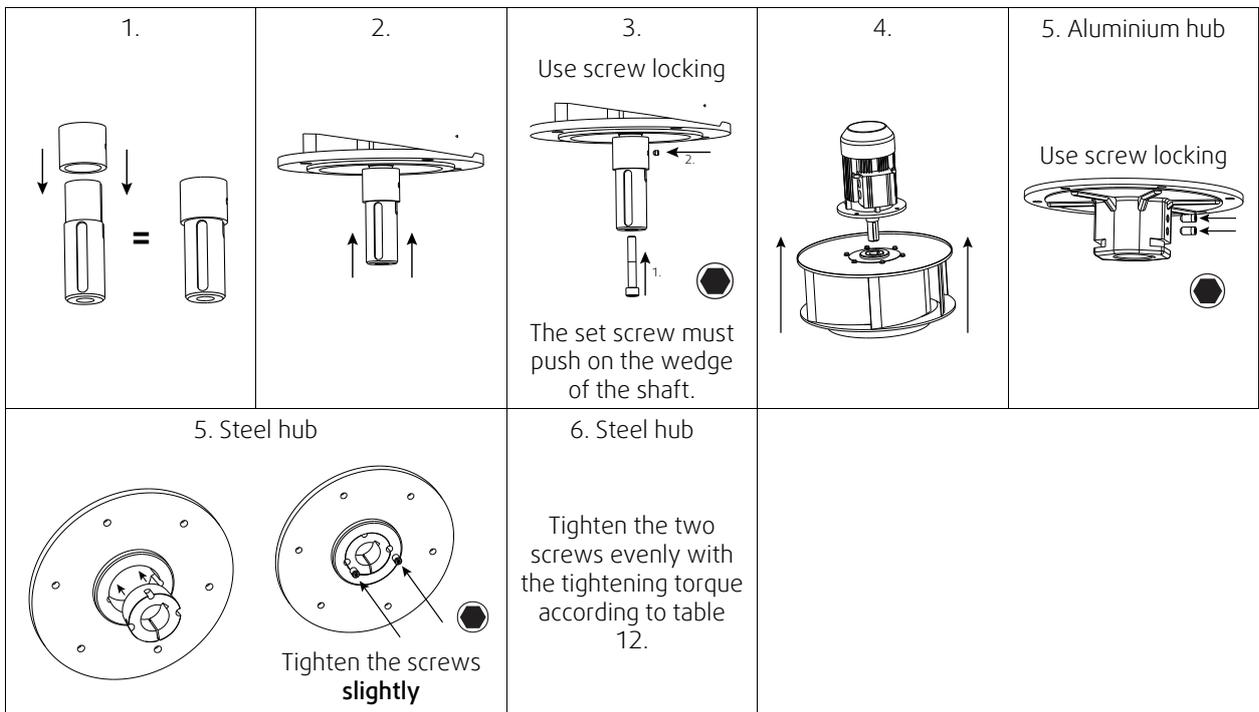


The hub is shown without impeller due to better lucidity.

**Disassembly**



**Assembly**



**Table 12 Tightening torques for various types of bush**

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

## 9 Electrical connection

### 9.1 Safety information

#### Warning: Danger from electrical voltage!

- ◆ Observe the 5 rules of electrical safety, see 2.3 *5 rules of electrical safety*, page 2.
- ◆ Prevent the ingress of water into the connection box.
- ◆ Electrical connection may only be carried out by adequately qualified persons, details see Table 1 *Qualifications*, page 1.
- ◆ Observe and respect local conditions, regulations and laws.
- ◆ Wear protective equipment during all work in the vicinity of the fan, details see 2.2 *Personal protective equipment*, page 2.

#### Warning: Danger due to electrostatic influence on medical implants!

- ◆ Persons with medical implants should keep enough distance to the according devices.

### 9.2 Preconditions

- ◆ Abide by the system-related conditions and requirements of the system manufacturer or plant constructor.
- ◆ Safety elements may not be dismantled, circumvented or deactivated.
- ◆ Install a circuit breaker in the permanent electrical installation, with a contact opening of at least 3 mm at each pole.

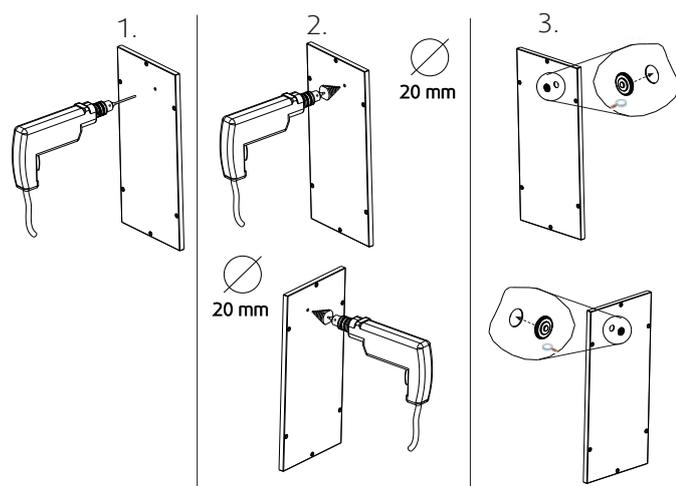
### 9.3 Connection

- ◆ Check if the data on the nameplate matches the connection data.
- ◆ Complete the electrical connection according to the circuit diagram.
- ◆ 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 all glands well in order to guarantee protection class IP.
- ◆ Screw the lid of the terminal box/inspection switch evenly tight.
- ◆ Connect the cable end in a dry environment.

### 9.4 Cable bushing panel

If a cable bushing through the panel is needed, please pay attention to the following notes and instructions, see adjacent picture.

- ◆ Perform all work steps in the following notes and instruction on both sides of the double-walled panel.
- ◆ Deburr the bore holes to avoid damaging the cable.
- ◆ We recommend using stepped rubber to avoid damaging the cable (available at Systemair, article no. 313521).



### 9.5 Protective grounding wire

The protective grounding must have a cross-section equal to or greater than that of the phase conductor.

## 9.6 Residual current circuit breaker

All-current-sensitive residual current circuit breakers are required for use in alternating-current systems with 50/60 Hz, in combination with electronic devices such as EC motors, frequency converters or uninterruptible power supplies (UPS).

## 9.7 Protecting the motor



### Note:

In fans equipped with an EC motor, there is no additional motor protection needed. The motor protection is integrated in the electronics of the motor.



### Warning

#### Fan switches off in case of fire.

The motors of the MUB/F have no motor protection fitted as standard. Any kind of motor protection must be bypassed in case of fire.

### Important

#### Damage to motor due to overcurrent, overload or short circuit.

- ◆ Lead-out temperature monitors must be integrated in the control circuit in such a way that, if a fault occurs, the motor cannot switch on again automatically after it has cooled down.
- ◆ Motor lines and temperature monitor lines should be laid separately on principle.
- ◆ Without thermal protection: Use a motor protection switch!

## 9.8 Variable-speed fans



### Warning

Resonant frequencies may result in increased vibration in certain speed ranges. These vibrations may destroy components.

- ◆ Only operate the fan outside these speed ranges.
- ◆ Skip over these speed ranges.
- ◆ Pass through these speed ranges so quickly that any vibration cannot exceed the admissible resonant frequency values.
- ◆ Observe the operating instructions of the frequency converter.



### Caution

#### Damage as a result of incorrect commissioning of the frequency converter.

- ◆ Install the fan and frequency converter as near as possible to one another.
- ◆ Use shielded cables.
- ◆ All components (fan, frequency converter and motor) must be grounded.
- ◆ We recommend using all-pole sinus filters.
- ◆ Avoid running the fan via the frequency converter below 10 Hz.
- ◆ Heating of the motor due to use of a variable frequency drive must be checked in the application by the customer.
- ◆ Never exceed the maximum impeller rotation speed indicated on the name plate of the fan.

## 10 Commissioning

Warranty claims can only be made if commissioning work is carried out correctly and written evidence thereof is provided.

It is recommended to fill out the commissioning report 19 *Commissioning Report*, page 25.

### 10.1 Safety information

- ◆ Commissioning may only be carried out by adequately qualified persons, details see Table 1 *Qualifications*, page 1.
- ◆ Wear protective equipment during all work in the vicinity of the fan, details see 2.2 *Personal protective equipment*, page 2.

### 10.2 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.
- ◆ Safety devices have been fitted.
- ◆ Ground cable is connected.
- ◆ Cable glands are tight.
- ◆ Nominal current (from the name plate) is not exceeded.
- ◆ Data on the name plate corresponds with the connection data.

### 10.3 Tests

- ◆ Before switching the fan on, check for externally visible damage and ensure that the protective equipment functions properly.

#### AC motor

1. Switch the fan on.
2. Checks:
  - ◆ Direction of rotation/conveyance. The direction of rotation always applies looking at the impeller.
    - The direction of rotation is best observed just before the fan stops.
  - ◆ Smooth running (any vibrations and noise)
  - ◆ Current consumption
    - ◆ Compare the current consumption with the nominal consumption on the name plate.
  - ◆ Tightness of all connections
3. Switch the fan off.

#### EC motor

When the mains are switched on, the motor starts an initialization (a few seconds). After the initialization the control input is active.

1. Switch the fan on via the control input.
2. Checks:
  - ◆ Direction of rotation/conveyance. The direction of rotation always applies looking at the impeller.
    - The direction of rotation is best observed just before the fan stops.
  - ◆ Smooth running (any vibrations and noise)
  - ◆ Current consumption
    - ◆ Compare the current consumption with the nominal consumption on the name plate.
  - ◆ Tightness of all connections
3. Switch the fan off via the control input.

## 11 Operation

### 11.1 Safety information

**Warning: Hazard from electrical voltage or moving components.**

- ◆ The device may only be operated by adequately qualified persons, details see Table 1 *Qualifications*, page 1.
- ◆ Abide by the system-related conditions and requirements of the system manufacturer or plant constructor.

### 11.2 Preconditions

- ◆ Ensure access only to persons who can safely handle the device.
- ◆ Only use the fan in accordance with the operating instructions and the operating instructions for the motor.
- ◆ Do not dismantle or circumvent safety elements, or put them out of function.

## 12 Troubleshooting/maintenance/repair

### 12.1 Safety information

- ◆ Troubleshooting/maintenance/repair may only be carried out by adequately qualified persons, details see Table 1 *Qualifications*, page 1.
- ◆ Wear protective equipment during all work in the vicinity of the fan, details see 2.2 *Personal protective equipment*, page 2.
- ◆ Observe the 5 rules of electrical safety, see 2.3 *5 rules of electrical safety*, page 2.
- ◆ Abide by the system-related conditions and requirements of the system manufacturer or plant constructor.
- ◆ The impeller must be at a standstill.

### 12.2 Troubleshooting

**Table 13 Troubleshooting**

Problem	Possible causes	Remedy
Fan does not run smoothly	Impeller imbalance	Rebalancing by a specialist company if possible, otherwise contact Systemair.
	Soiling on the impeller	Clean carefully, rebalance
	Material decomposition on the impeller due to aggressive material conveyed.	Contact Systemair
	Impeller rotates in wrong direction.	Change direction of rotation if possible, otherwise contact Systemair.
	Deformation of impeller due to excessive temperature.	Ensure that the temperature does not exceed the certified value/Install new impeller.
	Vibrations, oscillations	Check the installation of the fan/check the duct system, see 8 <i>Installation</i> , page 10.
Air output of fan too low	Impeller rotates in wrong direction.	Change direction of rotation if possible, otherwise contact Systemair.
	Wrong wiring configuration (e.g. Y instead of Delta).	Check and possibly correct the wiring configuration.
	Pressure losses too high.	Optimize the line routing.
	Flow regulators not or only partly open.	Check opening position on site.
	Intake or pressure ducts are blocked.	Remove the blockage.
Grinding sounds when starting or operating the fan	Check if the duct connections of the fan are strained.	Loosen the duct connections and realign it.

**Troubleshooting cont'd**

Thermal contacts/ resistors have triggered	Impeller rotates in wrong direction.	Change direction of rotation if possible, otherwise contact Systemair.
	Missing phase	In case of a 3 phase standard motor (not EC), check if all 3 phase are present.
	Motor overheated	Check the cooling impeller (if used), measure the motor winding (if possible) / contact Systemair.
	Capacitor (if used) not or not correctly connected.	Connect the capacitor correctly.
	Motor blocked	Contact Systemair
Fan does not reach nominal speed	Defective motor winding	Contact Systemair
	Improperly aligned drive motor	Contact Systemair
	Control units (if used) such as frequency converter or transformer are set incorrectly.	Correct the settings of the control units.
	Mechanical blockage	Remove the blockage.
Motor does not rotate	Faulty supply voltage	Check the supply voltage, re-establish the voltage supply.
	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.
Electronics/motor overheated	Insufficient cooling	Improve cooling.
	Overloaded motor	Check if the correct fan is used for your application.
	Ambient temperature too high	Check if the correct fan is used for your application.



**Note:**

For all other damage/defects, please contact Systemair. Defective safety-relevant fans (for Ex and smoke extraction applications) must be replaced completely.

## 12.3 Maintenance

Warranty claims can only be made if maintenance work is carried out correctly and written evidence thereof is provided.

We recommend regular maintenance intervals to ensure continuous fan operation. These maintenance intervals are specified in the "Activities" table below. In addition, the operator must carry out follow-up activities such as cleaning, replacing defective components or other corrective measures. For traceability reasons, a maintenance plan must be created which documents the work carried out. This must be created by the operator. If the operating conditions are "extreme", the maintenance intervals must be reduced so that maintenance is carried out more frequently. Examples of extreme operating conditions:

- Kitchen exhaust fans
- Ambient temperature > 40 °C or < -10 °C, or temperature fluctuations > 20 K

**Table 14 Activities**

Activity	Normal operating conditions		Extreme operating conditions	
	Every six months	Annually	Quarterly	Every six months
Check the fan and its components for visible damage, corrosion and contamination.		X		X
Check the impeller for damage and imbalance.		X		X
Check the condensate drain is working correctly.		X	X	
Clean the fan/ventilation system (see 13 <i>Cleaning</i> , page 23).	X		X	
Check the screwed connections for damages/defects and check that they are firmly seated.		X	See normal operating conditions	
Check the fan intake is free from contamination.		X		X
Check that the fan and its components are being used correctly.	X		See normal operating conditions	
Check the current consumption and compare this with the rated data.		X		X
Check the vibration dampers (if used) are working correctly and check for visible damage and corrosion.		X	See normal operating conditions	
Check the electrical and mechanical protective equipment is working correctly.		X	See normal operating conditions	
Check the fan's rating plate is legible.		X		X
Check the connection clamps and screwed cable connections for damage/defects, and check that they are firmly seated.		X	See normal operating conditions	
Check the flexible connectors for damage.	X		See normal operating conditions	



### Note:

For all other damage/defects, please contact Systemair. Defective safety-relevant fans (for Ex and smoke extraction applications) must be replaced completely.

## 12.4 Spare parts

- ◆ Use original spare parts from Systemair only.
- ◆ When ordering spare parts, please specify the serial number of the fan. This can be found on the name plate.

## 13 Cleaning

### 13.1 Safety information

- ◆ Cleaning may only be carried out by adequately qualified persons, details see Table 1 *Qualifications*, page 1.
- ◆ Wear protective equipment during all work in the vicinity of the fan, details see 2.2 *Personal protective equipment*, page 2.
- ◆ Observe the 5 rules of electrical safety, see 2.3 *5 rules of electrical safety*, page 2.
- ◆ The impeller must be at a standstill.

### 13.2 Procedure

#### Important

##### Keeping the fan clean extends its service life.

- ◆ Install a filter monitor.
- ◆ Do not use steel brushes 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.
- ◆ When cleaning the impeller, pay attention to balance weights that have been positioned
- ◆ Keep the airways of the fan clear and clean them if necessary with a brush.

## 14 Deinstallation/dismantling

Deinstall and dismantle the fan in reverse order of installation and electrical connection.

## 15 Disposal

- ◆ Ensure material is recycled. Observe national regulations.
- ◆ The device and the transport packaging are predominantly made from recyclable raw materials.
- ◆ Disassemble the fan into its components.
- ◆ Separate the parts according to:
  - reusable material
  - material groups to be disposed of (metal, plastics, electrical parts, etc.)

## 16 EU Declaration of conformity – Multibox

<b>The manufacturer:</b>	Systemair GmbH Seehöfer Straße 45 97944 Boxberg Germany
<b>Product designation:</b>	Multibox
<b>Type designation:</b>	MUB, MUB EC, MUB–CAV/VAV
<b>Since year of manufacture:</b>	2016

The manufacturer declares that the above mentioned products in their design and construction and the version marketed by us complies with the harmonization legislation listed below:

<b>EU directives:</b>	2006/42/EC	Machinery directive
	2014/30/EU	Directive electromagnetic compatibility (EMC)
	2011/65/EU	RoHS directive
	2009/125/EC	ErP guidelines
<b>Regulations:</b>	1253/2014	Only for ventilation units above 30W

## 17 EU Declaration of conformity – Thermo fans

<b>The manufacturer:</b>	Systemair GmbH Seehöfer Straße 45 97944 Boxberg Germany
<b>Product designation:</b>	Thermo fans
<b>Type designation:</b>	AxZent; KBT; KBR; MUB-K; MUB/T; MUB/T-S; MUB/T EC; MUB/T-S EC; DVN; DVN EC; DVNI; DVNI
<b>Since year of manufacture:</b>	2016

The manufacturer declares that the above mentioned products in their design and construction and the version marketed by us complies with the harmonization legislation listed below:

<b>EU directives:</b>	2006/42/EC	Machinery directive
	2014/30/EU	Directive electromagnetic compatibility (EMC)
	2011/65/EU	RoHS directive

## 18 EU Declaration of conformity – Smoke extract fans

<b>The manufacturer:</b>	Systemair GmbH Seehöfer Straße 45 97944 Boxberg Germany
<b>Product designation:</b>	Smoke extract fans
<b>Type designation:</b>	KBR/F; MUB/F
<b>Since of manufacture:</b>	2016

The manufacturer declares that the above mentioned products in their design and construction and the version marketed by us complies with the Harmonization legislation listed below:

<b>EU directives:</b>	2006/42/EC	Machinery directive
	2014/30/EU	Directive electromagnetic compatibility (EMC)
	2011/65/EU	RoHS directive

## 19 Commissioning Report

Warranty claims can only be made if commissioning work is carried out correctly and written evidence thereof is provided.

### Fan

Description:

Article no.:

Manufacturing order no.:

### Installer

Company:

Contact person:

Company address:

Tel. no.:

Email:

### Operator (Place of installation)

Company:

Contact person:

Company address:

Tel. no.:

Email:

### Type of connection

Yes No

Directly to mains

0-10 V signal (EC motor)

via contactor control

Transformer

Frequency converter

Sinus filter

Shielded cables

### Motor protection

Yes No

Motor protection switch or motor protection relay

PTC resistor

Resistance value [ $\Omega$ ]:

Thermal contact

Electrical motor protection

Others:

### Functional check

Yes No

Impeller easily rotatable (by hand)

Rotation direction acc. to directional arrow

### Nominal data - Fan (name plate on fan housing)

Voltage [V]:

Current [A]:

Frequency [Hz]:

Power [kW]:

Fan impeller speed [rpm]:

### Measured data at commissioning

Voltage [V]:

Temp. of transported air [ $^{\circ}$ C]:

Current L1 [A]\*:

Fan impeller speed [rpm]:

Current L2 [A]: \_\_\_\_\_

Air volume [m<sup>3</sup>/s]: \_\_\_\_\_

Current L3 [A]: \_\_\_\_\_

Differential pressure [Pa]\*: \_\_\_\_\_

\*For single-phase fans, fill in line "Current L1 [A]"

\*Δ- Pressure between suction-side and discharge of the fan

If an air flow measurement is not possible, this value can be calculated using the following formula:

$$\frac{\text{Duct cross-section [m}^2\text{]}}{\quad} \times \frac{\text{Flow speed [m/s]}}{\text{Grille measurement acc. to VDI 2044}} = \text{Air volume [m}^3\text{/s]:}$$

	Yes	No
Commissioning of the fan successful?	<input type="checkbox"/>	<input type="checkbox"/>

\_\_\_\_\_  
Date, installer's signature

\_\_\_\_\_  
Date, operator's signature





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