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General information 1

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.



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

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.
- Abide by the system-related conditions and requirements of the system manufacturer or plant constructor.
- Safety elements may not be dismantled, circumvented or deactivated.
- ◆ 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.
- ◆ Before any work on the fan, test absence of voltage.

Even when the motor is stopped, dangerous voltages may be present on terminals.

- ◆ 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 2.



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				
Installation, disassembly	Fitter or matching qualification				
Maintenance	Electrical expert or matching qualification	Fitter or matching qualification			
Poppir	Electrical expert or matching qualification	Fitter or matching qualification			
Repair	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.

Personal protective equipment 2.2

- ◆ 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 2. Prevent reactivation the electrical system from live components at all terminals)

 - 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 12.2 Maintenance, page 13.

4 Delivery, transport, storage

Safety information

Warning: Risk from rotating fan blades

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

Warning: Suspended loads

- ◆ Do not walk under suspended loads.
- ◆ Make sure that there is nobody under a suspended load.

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

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.

Transport

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.

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.

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 Intended use

All KBR- versions:

- The fan is intended for installation in ventilation systems.
- The fans are exclusively intended for extract air applications.

KBR

The fan is suitable for extracting contaminated air (dust, kitchen exhaust).

KBR/F

- The fan is suitable for conveying contaminated air.
- The smoke extraction units KBR/F are used in case of fire to extract smoke gases, as well as in normal working conditions of up to 200°C.

Incorrect use

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

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



Technical data 5.2

Max. ambient temperature [°C]	see data sheet, available in our online catalogue.			
Sound pressure [dB]	see data sheet, available in our online catalogue.			
Voltage, current, frequency, enclosure class, weight	see name plate of the fan			
The motor data can be found on the name plate of the motor, or in the technical documents of the motor manufacturer.				

The data on the name plate of the fan apply to "standard air" according to ISO 5801.

KBR

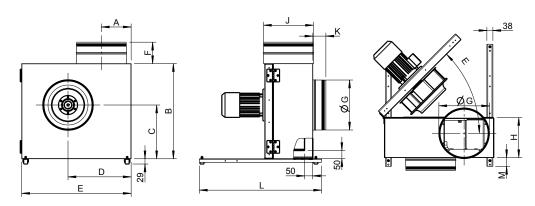
• Temperature range [°C] of transported air = -20 to 120 (This is the maximum range. For the temperature range of your fan, please check the data sheet.)

KBR/F

• Temperature range [°C] of transported air = -20 to 200 or up to 400°C/120 min (once)

KBR and KBR/F 5.3

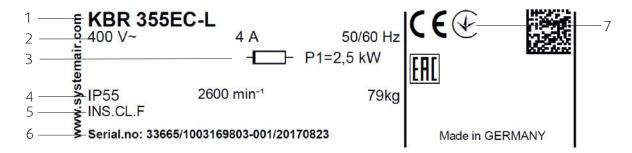
Table 2 Dimensions



KBR KBR/F	А	В	С	D	Е	F	F KBR/F	G	Н	J	K	K KBR/F	L	M
280	171,5	537	295	360	625	125	60	280	234	291	70	8	620	55
315	187,5	600	339	398	690	125	60	315	249	307	70	8	770	55
355	206,7	655	372	451	770	125	60	355	273	331	70	8	770	55

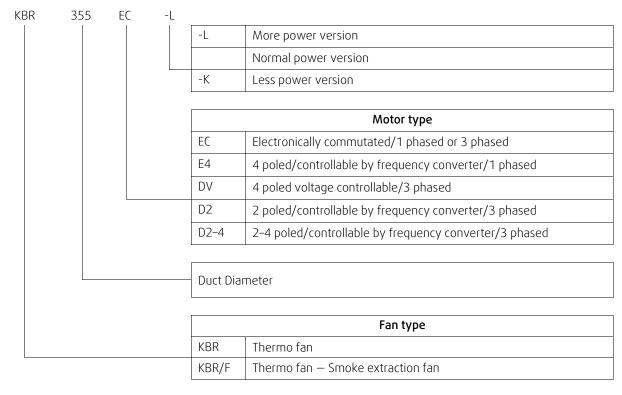


6 Name plate and type key



- 1 Type designation
- 2 Voltage/current/frequency
- 3 Input power
- 4 Enclosure class/fan impeller speed/ weight
- 5 Insulation class
- 6 Article number/production number/manufacturing date
- 7 Certifications

Table 3 Type key



7 Accessories

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

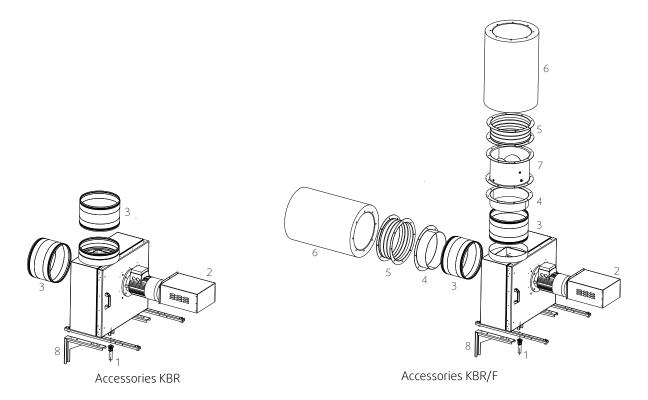


Table 4 Accessories

1	ALS-KBR	Drain plug	5	EVH	Flexible connection AXC 400°C
2	WSD-KBR-2	Weather roof for motor	6	RSA	Silencer
3	ASF	Flexible connection	7	LRK	Air-operated damper
4	UGF	Transition flange		WBK	Wall bracket

8 Installation

Safety information

- ◆ Observe 2 Important safety information, page 1
- ◆ Use installation material with fire resistance classes that meet temperature requirements.
- ◆ Provide contact and intake protection and ensure safety distances according to DIN EN ISO13857 and DIN 24167-1.
- ◆ To reduce transmission of vibration to the duct system, we recommend flexible connections from our accessory range, see chapter Accessories.

Preconditions

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

Important

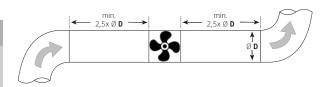
Damage to the bearings or other parts of the fan can occur.

- ◆ Do not place a duct bend directly before or after the fan!
- Ensure a smooth and constant air flow to the device.

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.



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

Installation positions

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.

8.1 Assembly/Disassembly impeller — Internal rotor motor

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

Important

Damage to the motor and impeller.

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

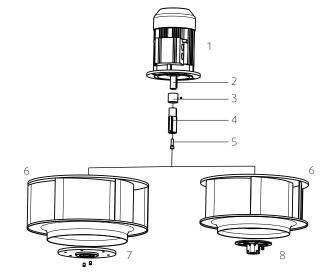
- ◆ Attach the impeller and/or the shaft extension to the shaft or the rotor without forceful impacts.
- Do not separate the impeller and the hub. They were balanced as one unit by Systemair.



Note:

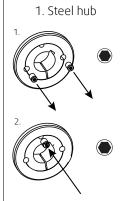
The hub can be heated for easier assembly and disassembly, for example with a hot-air blower.

- · 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

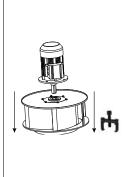


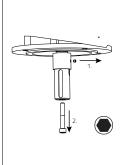
The hub is shown without impeller due to better lucidity.



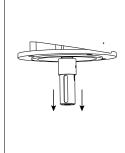


Disassembly 2.

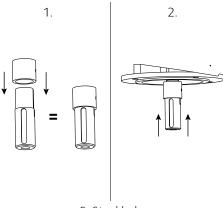




3.

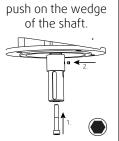


4.



3. Use screw locking The set screw must

Assembly



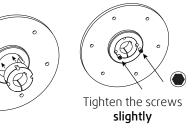
5. Aluminium hub 4.







5. Steel hub



Tighten the two screws evenly with the tightening torque according to table 5.

6. Steel hub

Table 5 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

Safety information

- ◆ Observe 2 Important safety information, page 1
- ◆ Prevent the ingress of water into the connection box.

Connection

- Check if the data on the nameplate matches the connection data.
- ◆ Complete the electrical connection according to the circuit diagram.
- Fans with EC- motors must be switched on/off via the control input.
- ◆ Connect the cable end in a dry environment.
- Install a circuit breaker in the permanent electrical installation, with a contact opening of at least 3 mm at each pole.

Protective grounding wire

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

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).

9.1 Electrical connection accessories

The following wiring diagrams show the electrical connections between accessories and fans (with EC motor) or frequency converters (e.g. FRQ, FRQS, FXDM) which can be controlled with a 0–10V signal. If you are not sure if your fan is equipped with an EC- motor please see chapter 6 *Name plate and type key*, page 5.

motor/frequency converter



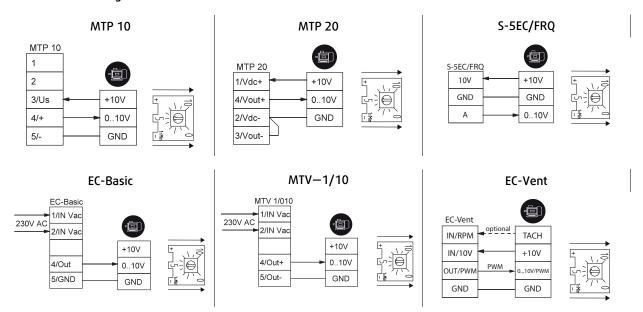
Wire- colours of motors with carried out cables:

+10V = red

0..10V/PWM = yellow

GND = blue

Controll via 0-10V signal



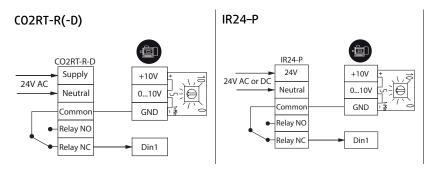
Controll via switching on / off

The following fans are equipped with a DIN1 connection:

KBR 355EC-L

Din1: enable electronics

- enable: pin open or voltage 5–50 V DC
- · disable: bridge to GND



9.2 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.

Important

Damage to motor due to overcurrent, overload or short circiut.

- ◆ 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!

9.3 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.
- ◆ 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.
- ◆ 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.
- ◆ In any case Systemair recommends an all-pole sine filter if the fan is operated with a frequency converter.

10 Commissioning

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

Safety information

◆ Observe 2 Important safety information, page 1

Preconditions

- ◆ Installation and electrical connection have been correctly performed.
- Before switching the fan on, check for externally visible damage and ensure that the protective equipment functions properly.
- ◆ Inlet and outlet are free.
- ◆ Cable glands are tight.
- ◆ Safety devices have been fitted.

Commissioning of speed-controlled fans

Check the fan for vibrations at all normal operation speeds during commissioning. Determine and evaluate vibrations on the housing and bearing areas in accordance with DIN ISO 14694 depending on motor power and positioning.

Measurable vibration velocities depend e.g. on following factors:

- positioning
- bottom section/foundation state
- · flow conditions

The working point of the fan, as well as used external devices and accessories, also influence the running characteristics.

<u>Tests</u>

Do the tests requested in the commissioning report (16 Commissioning Report, page 15)

11 Operation

Safety information

◆ Observe 2 Important safety information, page 1

Troubleshooting/maintenance/repair **12**

Safety information

◆ Observe 2 Important safety information, page 1

12.1 Troubleshooting

Table 6 Troubleshooting

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Thermal contacts/ resistors have triggered Motor overheated Check the cooling impeller (if used), measure the motor winding (if possible) / contact Systemair. Capacitor (if used) not or not correctly connected. Motor blocked Contact Systemair Check the winding by resistance measurement (if possible). Contact Systemair Check the winding by resistance measurement (if possible). Contact Systemair Control units (if used) such as frequency converter or transformer are set incorrectly. Correct the settings of the control units.							
resistors have triggered Motor overheated Check the cooling impeller (if used), measure the motor winding (if possible) / contact Systemair. Capacitor (if used) not or not correctly connected. Motor blocked Contact Systemair Check the winding by resistance measurement (if possible). Contact Systemair Control units (if used) such as frequency converter or transformer are set incorrectly. Check the winding by resistance measurement (if possible). Contact Systemair Control units (if used) such as frequency converter or transformer are set incorrectly.	Thermal contacts/	Missing phase					
Connected. Motor blocked Contact Systemair Check the winding by resistance measurement (if possible). Contact Systemair Fan does not reach nominal speed Control units (if used) such as frequency converter or transformer are set incorrectly. Control units. Control units (if used) such as frequency converter or transformer are set incorrectly.	resistors have	Motor overheated	Check the cooling impeller (if used), measure the motor winding (if possible) / contact Systemair.				
Pefective motor winding Check the winding by resistance measurement (if possible). Contact Systemair Control units (if used) such as frequency converter or transformer are set incorrectly. Check the winding by resistance measurement (if possible). Correct the settings of the control units.			Connect the capacitor correctly.				
Pefective motor winding possible). Contact Systemair Control units (if used) such as frequency converter or transformer are set incorrectly. Control units (if used) such as frequency converter or transformer are set incorrectly.		Motor blocked	Contact Systemair				
nominal speed frequency converter or Correct the settings of the control units. transformer are set incorrectly.		Defective motor winding	possible).				
Mechanical blockage Remove the blockage.		frequency converter or	Correct the settings of the control units.				
		Mechanical blockage	Remove the blockage.				



Troubleshooting cont'd

	Faulty supply voltage	Check the supply voltage, re-establish the voltage supply.				
Motor does not rotate	Faulty connection	Allow the motor to cool down, find and resolve the cause of the fault.				
rotate	Temperature monitor has responded.	Allow the motor to cool down, find and resolve the cause of the fault.				
	Insufficient cooling	Improve cooling.				
Electronics/motor overheated	Overloaded motor	Check if the correct fan is used for your application.				
overnedicd	Ambient temperature too high	Check if the correct fan is used for your application.				



Note:

For all other damage/defects, please contact Systemair.

12.2 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
- \cdot Durable ambient temperature > 30 °C or < -10 °C, or temperature fluctuations > 20 K

Table 7 Activities

	Normal c condi		Extreme operating conditions	
Activity	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	Χ	
Clean the fan/ventilation system (see 13 <i>Cleaning</i> , page 14).	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.		Х		Х
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



Activities cont'd

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.	Х		See normal operating conditions

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

Safety information

◆ Observe 2 Important safety information, page 1

Procedure

Keeping the fan clean extends its service life.

- · Install a filter monitor.
- · Change the filters of the ventilation system.
- 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 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		
AA A A A A A A A A A A A A A A A A A A		\/	NI-
Motor protection		Yes	No
Motor protection switch or motor protection	relay		
PTC resistor	0.1.1.1.1.1		
	Resistance value $[\Omega]$:		
Thermal contact			
Electrical motor protection			
Others:			
Functional check		Yes	No
Impeller easily rotatable (by hand)			
Rotation direction acc. to directional arrow			
Smooth running without unusual noise/			
vibrations			
Nominal data - Fan (name plate on fan hou	sing)		
Voltage [V]:	Current [A]:		
Frequency [Hz]:	Power [kW]:		
Fan impeller speed [rpm]:	<u> </u>		
Managed Life of account of the	_		
Measured data at commissioning			
Voltage [V]:	Temp. of transported air [°C]:		

16 | EU Declaration of conformity

Current L1 [A]*:	Fan impel	ler speed [rpm]:	
Current L2 [A]:	Air volum	e [m3/s]:	
Current L3 [A]:	Differentia	al pressure [Pa]*:	
*For single-phase fans, fill in line "Current L1 [A]"	*Δ- Pressure t	petween suction-side and discharge of the fan	
If an air flow measurement is not possible, this value can be calculated using the following formula:			
X		= - -	
Duct cross-section [m ²]	Flow speed [m/s] Grille measurement acc. to VDI 2044	Air volume [m³/s]:	
		Yes	No
Commissioning of the fan successful?		Yes 🗆	No
Commissioning of the fan successful?			
Commissioning of the fan successful? Date, installer's signature			

17 EU Declaration of conformity

The manufacturer: Systemair GmbH

Seehöfer Straße 45 97944 Boxberg Germany

Product designation: Thermo fans

Type designation: AxZent; KBR; MUB-K; MUB/T; MUB/T-S; DVN; DVNI

Since year of manufacture: 2018

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:

EU directives: 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

The manufacturer: Systemair GmbH

Seehöfer Straße 45 97944 Boxberg Germany

Product designation: Smoke extract fans

Type designation: KBR/F; MUB/F

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:

EU directives: 2006/42/EC Machinery directive

2014/30/EU Directive electromagnetic compatibility (EMC)

2011/65/EU RoHS directive



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