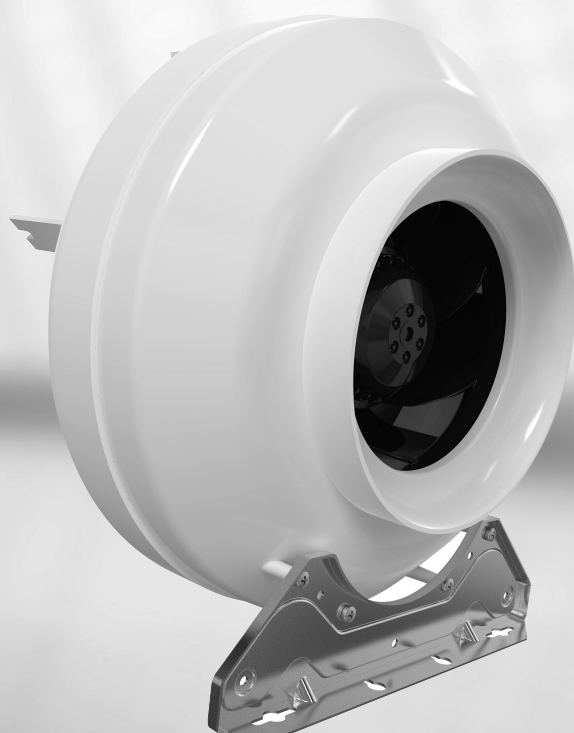


# Circular duct fan RVK

Installation and Operating Instructions

GB

Document in original language | · 002



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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 11.3 *Maintenance*, page 10.

**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.

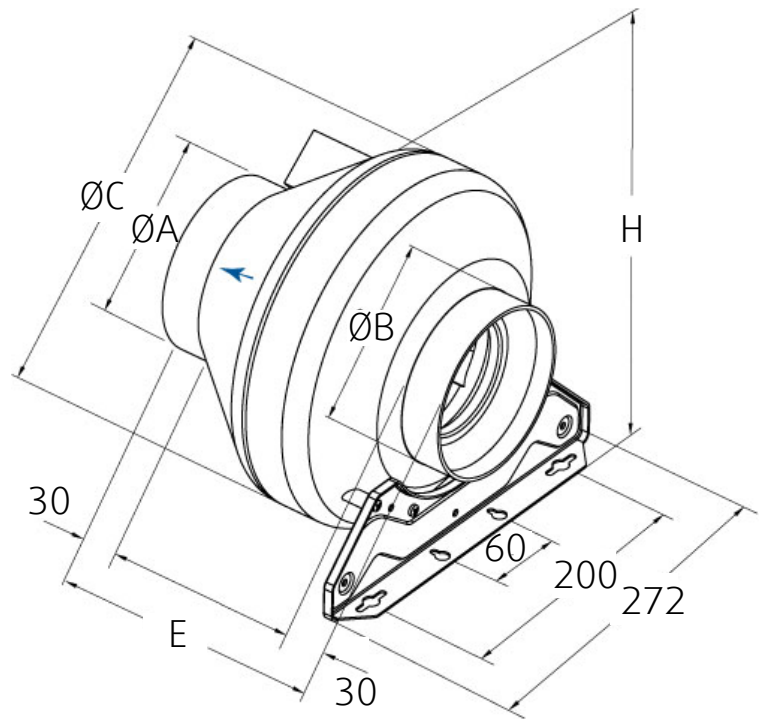
## 5 Description

For information on speed regulation options, see 6 Name plate and type key, page 5.

### 5.1 Dimensions

[mm]

RVK	A/B	C	E	H
100E2	99	251	237,5	265
125E2	124	251	233	265
150E2	149	341	230	360
160E2	159	341	230	360
200E2	199	341	229	360
250E2	249	341	229	360
315E2	314	405	265	430



#### 5.1.1 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

### 5.2 Intended use

- The fans are intended for installation in ventilation systems. They can be installed both in duct systems and also with free suction via a suction-side contact protection grille. Free discharge via a contact protection grille is also possible.
- The fan is suitable for conveying clean air, with a density of 1.3 kg/m<sup>3</sup> and a max. air humidity of 95%.
- The maximum permissible operating data on the name plate apply for an air density of 1.2 kg/m<sup>3</sup> (sea level) and a max. air humidity of 80%.

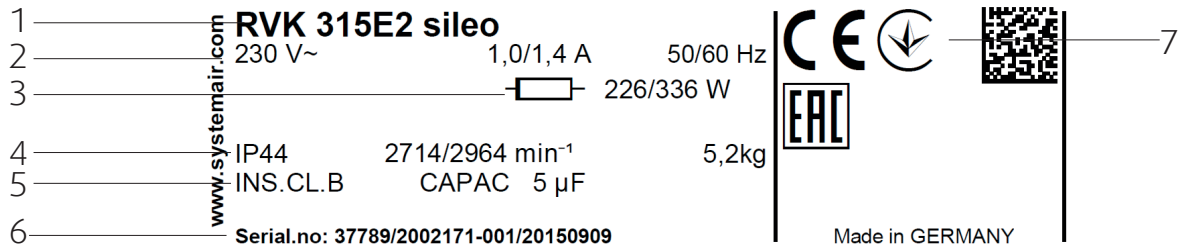
### 5.3 Incorrect use

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                          | 5 | Insulation class  |
| 2 | Voltage/current/frequency                 | 6 | Article number/production number/<br>manufacturing date |
| 3 | Input power                               | 7 | Certifications  |
| 4 | Enclosure class/fan impeller speed/weight |   |   |

**Table 2 Type key**

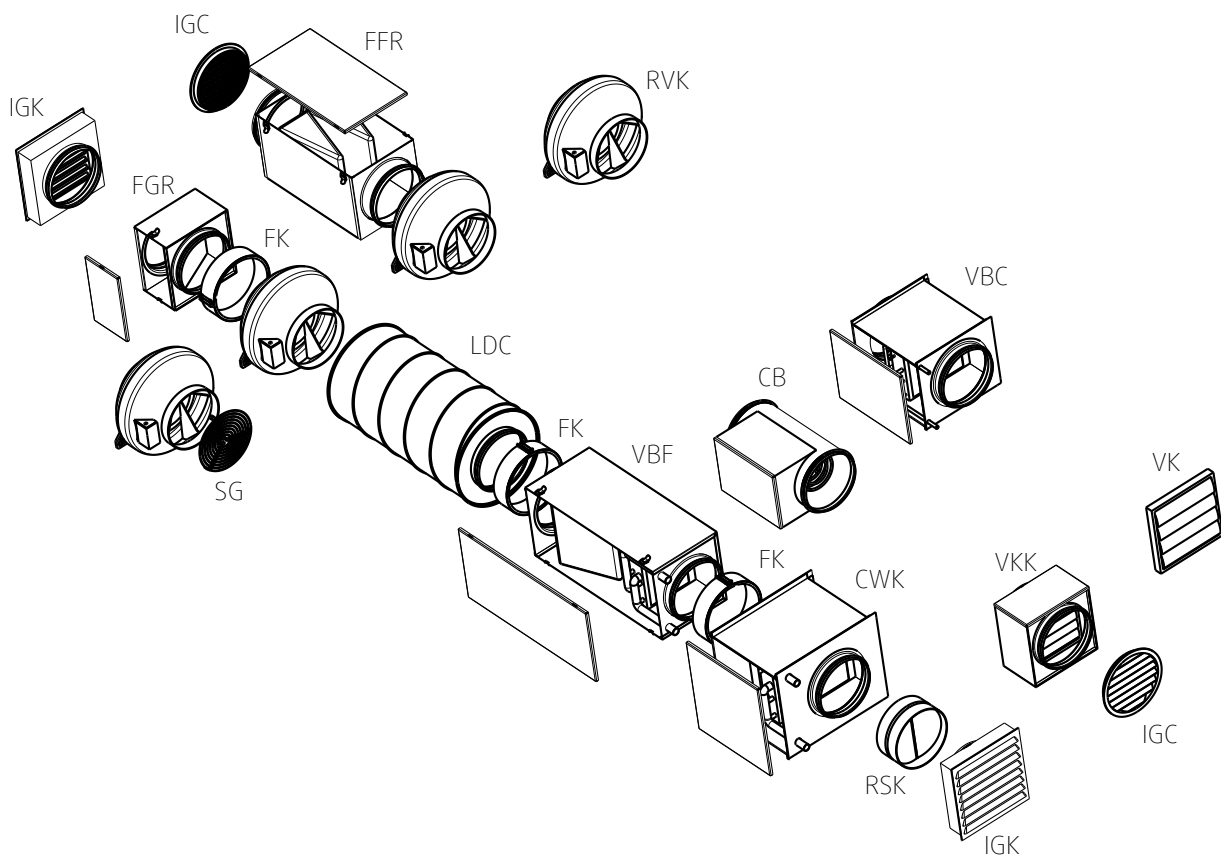
RVK	315	E2	-L	
			-	Normal motor version
			-L	Large motor version
		<b>Motor type</b>		
		E2	2 poled/voltage controllable/1 phased	
		Size		
		<b>Fan type</b>		
RVK	Circular duct fan			

## 7 Accessories



### Note:

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



<b>RVK</b>	fan	<b>LDC</b>	Silencer	<b>VKK</b>	Back draft damper
<b>IGC</b>	Round protection grille	<b>VBF</b>	Water heating battery	<b>VK</b>	Louvre Shutter
<b>IGK</b>	Wall grid	<b>CWK</b>	Duct cooling battery	<b>FK</b>	Fast clamp
<b>FGR</b>	Filter cassette	<b>CB</b>	Duct heater	<b>RSK</b>	Back draft damper
<b>FFR</b>	Filter cassette	<b>VBC</b>	Water heating battery	<b>SG</b>	Protection guard

## 8 Installation

### 8.1 Safety information

#### 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.
- ◆ Provide contact and intake protection and ensure safety distances according to DIN EN ISO13857 and DIN 24167-1.
- ◆ Prevent the possibility of foreign bodies being drawn in.
- ◆ To reduce transmission of vibration to the duct system, we recommend fast clamps 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

**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 7.

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

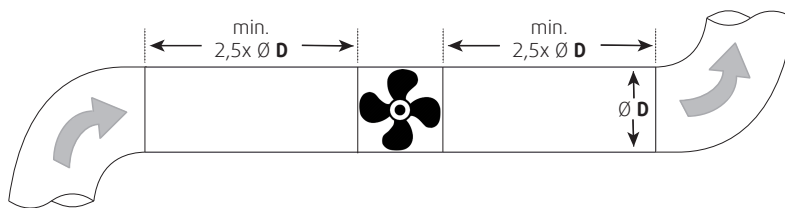


Fig. 1 Straight ducts

## 8.3 Installation variations

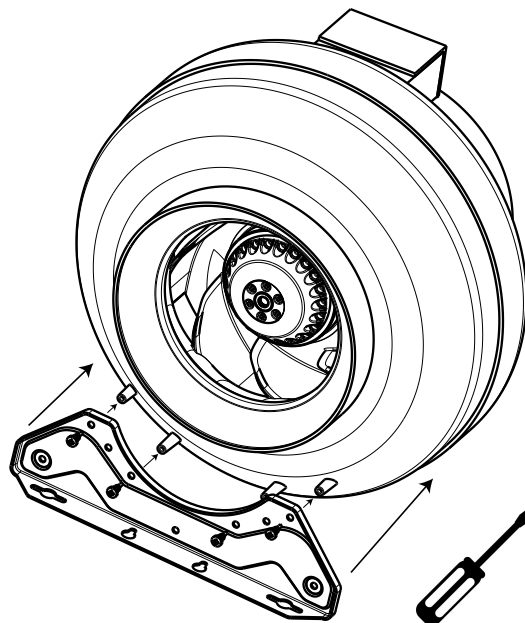
The installation is possible in any mounting position.

## 8.4 Installation with mounting bracket

### **i** Note:

The mounting bracket is included with the delivery.

- ◆ Mount the mounting bracket on the fan, see adjacent image.



## 9 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 16 *Commissioning Report*, page 12.

## 9.1 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.

## 9.2 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.

## 9.3 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.

## 10 Operation

### 10.1 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.

### 10.2 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.

## 11 Troubleshooting/maintenance/repair

### 11.1 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.

### 11.2 Troubleshooting

**Table 3 Troubleshooting**

Problem	Possible causes	Remedy
Fan does not run smoothly	Soiling on the impeller	Clean carefully
	Material decomposition on the impeller due to aggressive material conveyed.	Contact Systemair
	Impeller rotates in wrong direction.	Contact Systemair
	Deformation of impeller due to excessive temperature.	Ensure that the temperature does not exceed the certified value/Install new fan
	Vibrations, oscillations	Check the installation of the fan/check the duct system, see 8 <i>Installation</i> , page 6
Air output of fan too low	Impeller rotates in wrong direction.	Contact Systemair
	Wrong wiring configuration	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.
Thermal contacts/resistors have triggered	Impeller rotates in wrong direction.	Contact Systemair
	Motor overheated	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
	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.

**Troubleshooting cont'd**

	Insufficient cooling	Improve cooling.
Electronics/motor overheated	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.

**11.3 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:

- Ambient temperature > 40 °C or < 0 °C, or temperature fluctuations > 20 K

**Table 4 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
Clean the fan/ventilation system (see 12 <i>Cleaning</i> , page 11).	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 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	

**Note:**

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

**11.4 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.

## 12 Cleaning

### 12.1 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.
- ◆ Ensure that the power supply has been switched off (all-pole circuit breaker).
- ◆ The impeller must be at a standstill.

### 12.2 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.

## 13 Deinstallation/dismantling

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

## 14 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.)

## 15 Regulation 1253/2014

### Regulation 1253/2014

You have bought a ventilation unit which underlies the regulation 1253/2014. This regulation rules the requirements to the environmental design of ventilation units!

#### Operation of the ventilation unit as a residential ventilation unit (RVU)

directive of the regulation:

- minimum 3-step speed control (steps 0,1,2,3).
- sensor (for example for humidity or temperature)

## 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

### 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]*:
<small>*For single-phase fans, fill in line "Current L1 [A]"</small>	<small>*Δ- Pressure between suction-side and discharge of the fan</small>

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

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

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

Date, installer's signature

Date, operator's signature

## 17 EU Declaration of conformity

**The manufacturer:** Systemair GmbH  
Seehöfer Straße 45  
97944 Boxberg  
Germany

**Product designation:** Circular duct fans

**Type designation:** RVK

**Since year of manufacture:** 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



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