

Circular duct fan Systemair prioAir

Installation and Operating Instructions

CE



GB

 systemair

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1 General information

1.1 List of information



DANGER

Direct danger

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



WARNING

Possible danger

Failure to comply with this warning potentially leads to death or to serious bodily harm.



CAUTION

Hazard with a low risk

Failure to comply with this warning potentially leads to moderate injuries.

ATTENTION

Hazard with risk of property damage

Failure to comply with this warning leads to property damage.



NOTE

Useful information and notes

1.1.1 Safety symbols



General hazard symbol



Hazard of fire or explosion!



Electrical voltage!



Risk of burning

1.1.2 List of instructions for action

Instruction for action

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

Instructions for action with fixed order!

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

1.2 Notes on the documentation



WARNING

Hazard as a result of improper dealing with the circular duct fan

These operating instructions describe safe use of the circular duct fan.

- » Read the operating instructions carefully!
- » Keep the operating instructions with the circular duct fan prioAir. They must permanently be available at the place of use.

Applicable documents:

- Technical documents provided by the motor manufacturer
- Technical documents provided by the controller manufacturer

2 Important safety information

2.1 Safety notes

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

- Only use the circular duct fan prioAir in a proper condition.
- Provide generally prescribed electrical and mechanical protective devices.
- During mounting, commissioning, maintenance and control, secure the place of mounting and the premises for possible preparations against unauthorised access.
- Observe rules for safe work.
- Safety components must not be bypassed or put out of function.
- Keep all the warning signs on the fan complete and readable.
- Regularly instruct the personnel about safety-conscious behaviour.



NOTE

We have carried out a risk assessment for the circular duct fan prioAir. However, it can only apply to the circular duct fan prioAir itself. After installation of the circular duct fan prioAir, we recommend to carry out a risk assessment for the whole system. In this way, you have the guarantee that there is no risk potential from the system.

2.2 Personnel

2.2.1 Mounting personnel

- Mounting may only be carried out by trained, qualified personnel.

2.2.2 Work on the electrical equipment

- Work on the electrical equipment of the fan may only be done by a qualified electrician or electrotechnically educated person. This person must know the relevant safety rules to recognise and avoid potentially risks.

2.2.3 Personnel for operation, use, maintenance and cleaning

- Operation, use, maintenance and cleaning may only be carried out by trained and authorized personnel. The operating personnel must have appropriate knowledge about handling with the circular duct fan prioAir. In the case of a malfunction or an emergency they must react correctly and adequately.

2.3 Intended use

The circular duct fans prioAir are intended for installation in ventilation systems. They can be installed either in duct systems or as a free sucking fan over a nozzle and a sucking side protection grid. A free blow-out and/or suction device via a contact-protection grid is possible following consideration in the design.

- The circular duct fans prioAir are suitable for extraction of clean air, air with a low dust and grease content, media up to max. density of $1,3 \text{ kg/m}^3$ and a maximum permissible humidity of 95 %.
- The maximum permissible operating data on the name plate apply for an air density $\rho = 1,2 \text{ kg/m}^3$ (sea level) and a maximum air moisture of 80 %.
- The circular duct fans prioAir are suitable for the following ambience and conveyed medium temperature range:
 - prio 200 EC from $-25 \text{ }^\circ\text{C}$ to $+55 \text{ }^\circ\text{C}$
 - prio 200 E2 from $-30 \text{ }^\circ\text{C}$ to $+55 \text{ }^\circ\text{C}$

2.4 Incorrect use

Above all, the incorrect use means using the circular duct fans prioAir in a way other than that described. The following points are incorrect and hazardous:

- Operation in medical devices with life-sustaining or life-supporting function
- Extraction of explosive and combustible media,
- Extraction of aggressive, dust or grease containing media,
- Outdoor installation without weather protection,
- Operation in an explosion hazardous atmosphere,
- Operation without duct system or protective guard,
- Operation with the air connections closed

3 Warranty

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

4 Delivery, transport, storage

4.1 Delivery

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



CAUTION

Danger from cutting edges!

- » Wear protective gloves when unpacking.

Check delivery

- ☞ Check the circular duct fan prioAir for obvious defects, which can impair safe operation.
- ☞ First of all, pay attention for defects on the connection cable, terminal box and rotor, cracks in the housing, missing rivets, screws or covering caps.

4.2 Transport



WARNING

Hazard of impact if the circular duct fan falls down!

- » Transport the fan carefully!



WARNING

Electrical hazard from damaged connections

- » Do not use the terminal box or rotor for transport.

- ☞ Transport the prioAir circular duct fan in its original packing material.
- ☞ Avoid shocks or impact.

5 Storage



CAUTION

Hazard due to loss of function of the motor bearings!

- » Avoid storing for too long time (recommendation: max. 1 year).
- » Before installation, check proper function of the motor bearings

- ☞ Store the circular duct fan prioAir in the original packaging dustproof, dry and protected against weather.
- ☞ Avoid effects of extreme heat or cold.

5 Description

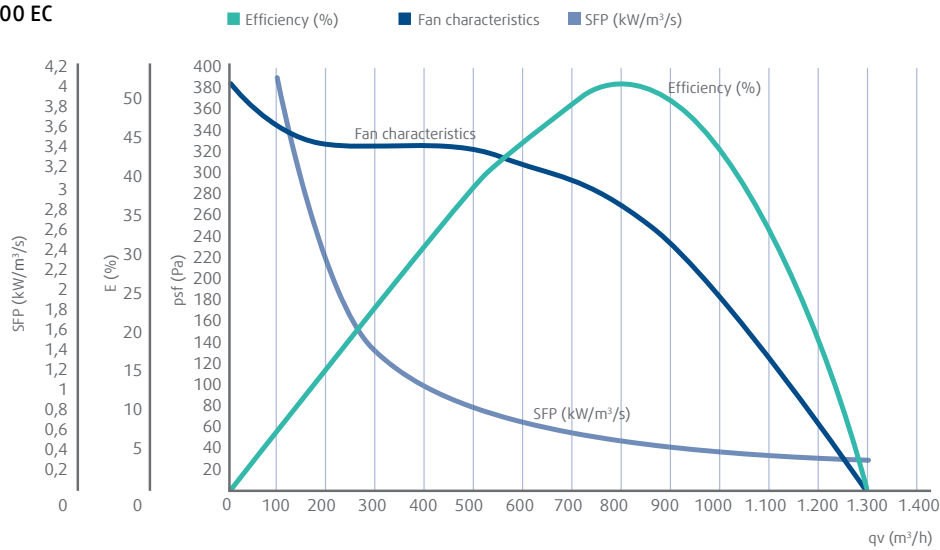
5.1 Circular duct fan prio 200 EC and prio 200 E2

- Low SFP-values (Specific Fan Power pursuant to EN 13779) and very high efficiency. Your benefit: maximum power and low energy consumption.
- Powerful EC-motor with integrated electronics.
- Your benefit: reduced energy consumption lowers operating costs.
- Compact design.
- Your benefit: lower space requirement, no large external parts.
- Material: special composite material.
- Your benefit: reduced weight, easy and fast installation.
- Low noise
- Long life



The circular duct fans are fitted with backward curved, free-running polyamide fan wheels and voltage-controllable external rotor motors.

prio 200 EC



prio 200 E2

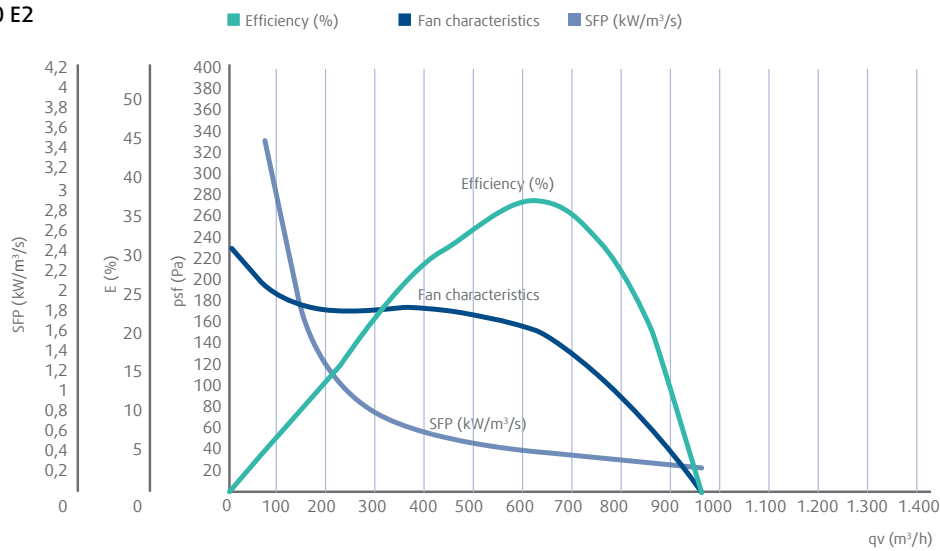


Fig. 1: SFP-values and efficiency

5.1.1 Name plates

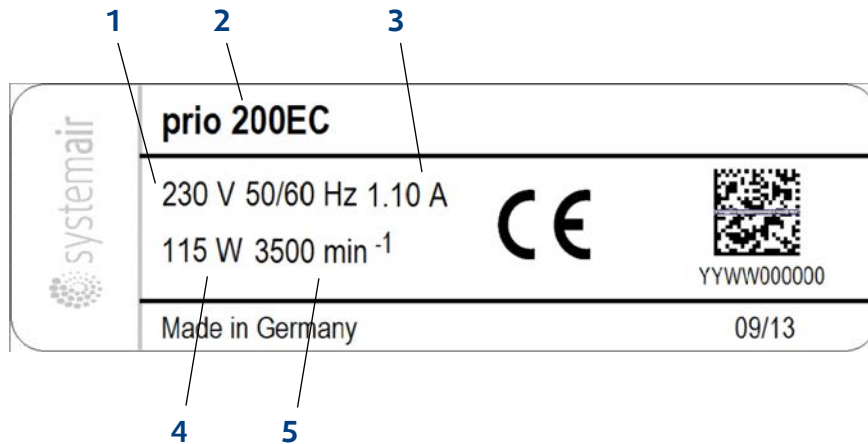


Fig. 2: Name plate prioAir 200 EC

Legend

- | | | | |
|---|---------------------|---|-------------------|
| 1 | Voltage / frequency | 4 | Output |
| 2 | Type designation | 5 | Speed (max./min.) |
| 3 | Current | | |

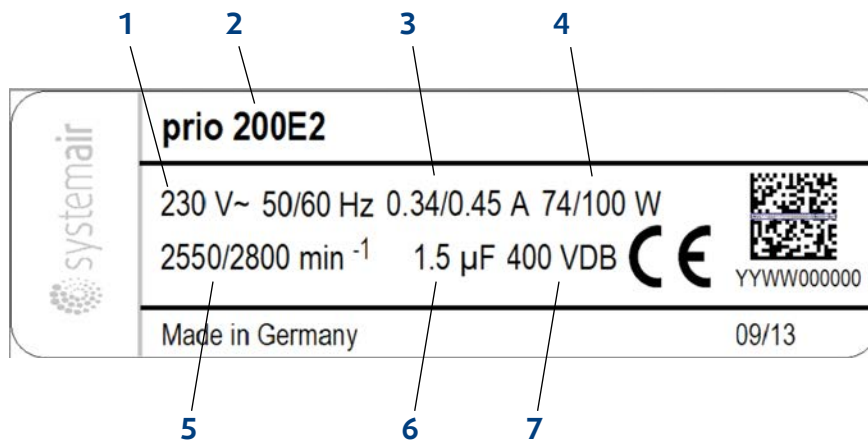


Fig. 3: Name plate prioAir 200 E2

Legend

- | | | | |
|---|---------------------|---|------------------------|
| 1 | Voltage / frequency | 5 | Speed (max./min.) |
| 2 | Type designation | 6 | Capacity |
| 3 | Current | 7 | Insulation class motor |
| 4 | Output | | |

5.1.2 Dimensions

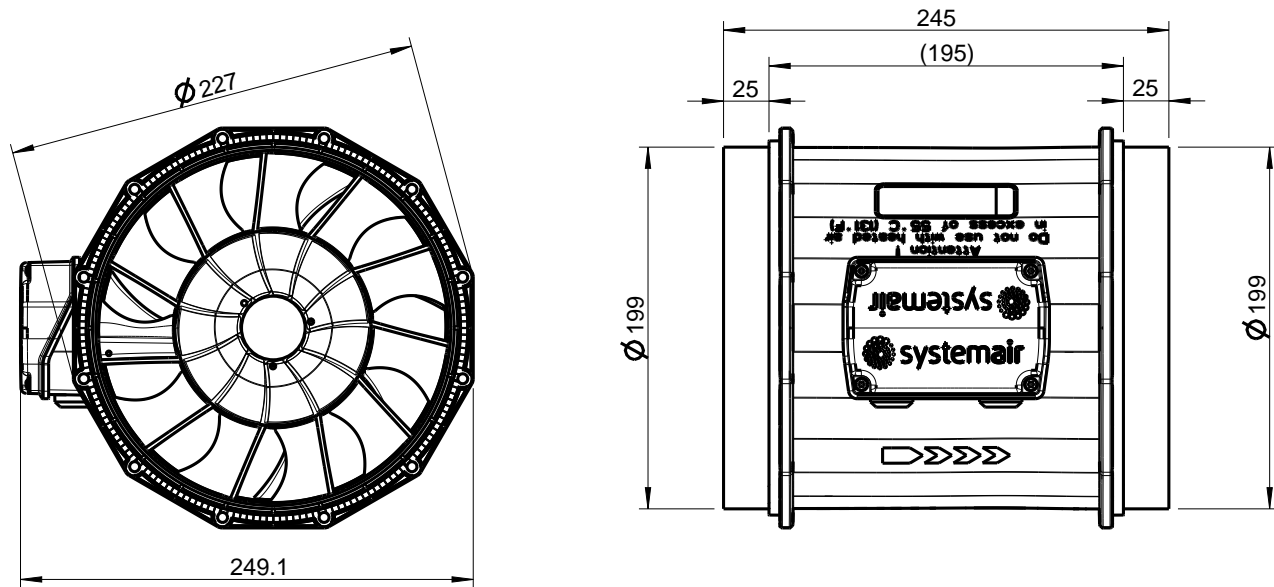


Fig. 4: Dimensions of the prio 200 EC and prio 200 E2

5.2 Type key

prio	200	EC	Number of poles (N/A in EC)
			Motor type: E: single-phase AC EC: electronically commutated
			Size
			Type designation

5.3 Technical data

	prio 200 EC	prio 200 E2
Temperature range conveying material [°C]	-25 ... +55	-30 ... +55
Temperature range environment [°C]	-40 ... +80	-40 ... +80
Voltage / current strength	see name plate	
Protection class	see name plate	
Sound level at 1 m [dB(A)]	<80	
Dimensions	see 5.1.2 on page 10	
Weight	see data sheet	
Rotor diameter	see name plate or box sticker	

Table 1: Technical data of the circular duct fans



NOTE

Further technical data can be found in the data sheet of your circular duct fan.

5.4 Safety devices

The circular duct fan motors are fitted with an internal motor protection system.

5.5 Instructions regarding motor and controller

The data can be found in the manufacturer's technical documents.

6 Installation

6.1 Safety information

- Mounting may only be carried out by trained, qualified personnel.
- Comply with the system-related conditions and the requirements of the system manufacturer or plant builder.
- Safety components, e.g. protective grids, may not be dismantled or circumvented or put out of function.

6.2 Preconditions for installation



WARNING

Danger of impact from parts of fans dropping!

- » Check the base before installation for load capacity/strength.
- » When selecting the fitting material observe the weight, tendency to vibrations and shear forces (weight information on the name plate)..

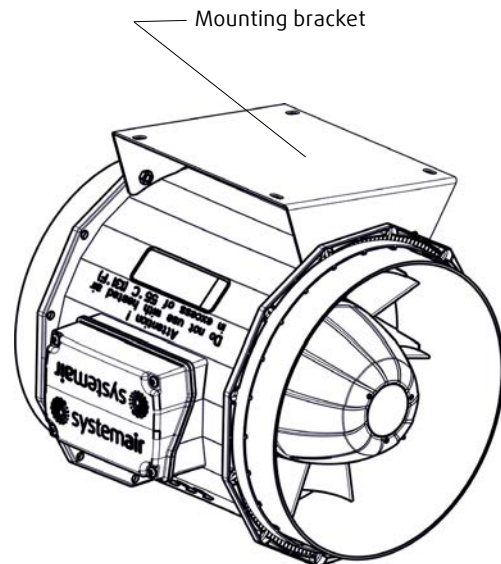
- Place of installation protected against dust, moisture and weather influences.
- The installation position can be selected freely (horizontal or vertical).
- Ensure safe access to the duct fan for maintenance and repair work.
- Provide for contact and intake protection and safety distances according to DIN EN ISO 13857.
- Ensure uninhibited and constant inflow into the appliance and free blow-out.

6.3 Assembly of the fan

- ☞ Install the duct system on a firm base.
- ☞ Insert the duct fan directly into the duct without using a mounting bracket.
- ☞ Pay attention to the direction of flow (arrows).
- ☞ Mount the duct fan to the duct.
- ☞ Do not create tension on the duct fan housing during installation.

Alternative:

- ☞ Mount the duct fan to a wall or ceiling using the mounting bracket (firm base).
- ☞ Push the duct system onto the air connections.
- ☞ Pay attention to the direction of flow (arrows).
- ☞ Attach the duct system to the duct fan.
- ☞ Do not create tension on the duct fan housing during installation.



NOTE

Use padded connector sleeves for installation, to significantly reduce noise transmission to the duct system.

7 Electrical connection



WARNING

Hazard from electrical voltage!

- » Electrical connection only by a trained electrician or trained and instructed qualified personnel!
- » Electrical connection in accordance with the valid regulations.
- » Prevent the ingress of water into the connection box/service switch.
- » Observe 5 safety rules for the electrical expert!
 - disconnect from the power supply (all-pole),
 - prevent switching on again,
 - test absence of voltage,
 - earthing and short-circuiting,
 - protect adjacent live parts by covers and barriers and fit a suitable warning notice.

- ☞ Make the electrical connections according to the wiring diagram
 - prio 200 E2 see figure 5
 - prio 200 EC see figure 6.

- ☞ Arrange the connecting wires in the switch box in such way that the cover can be closed without resistance.
- ☞ Use all cover screws.
- ☞ Apply screws by hand to avoid damage to the thread.

7.1 Wiring diagram prio 200 E2

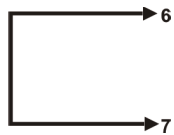
	Color		Function/pin assignment	
		blue	L	Power supply 230 V AC, 50 ... 60 Hz
black		N	Neutral conductor	
green/ yellow		PE	Protective conductor	

Fig. 5: Wiring diagram of the prio 200 E2

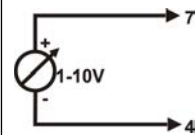
7.2 Wiring diagram prio 200 EC

Client side

max. speed

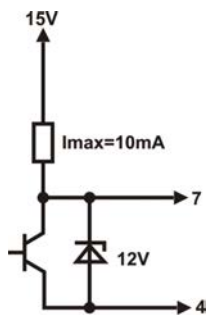


adjustable speed



10 V | n = max
1 V | n = min
<1 V | n = 0

adjustable speed through PWM 1 ... 10 KHz



100 % PWM | n = max
10 % PWM | n = min
<10 % PWM | n = 0

adjustable speed through potentiometer

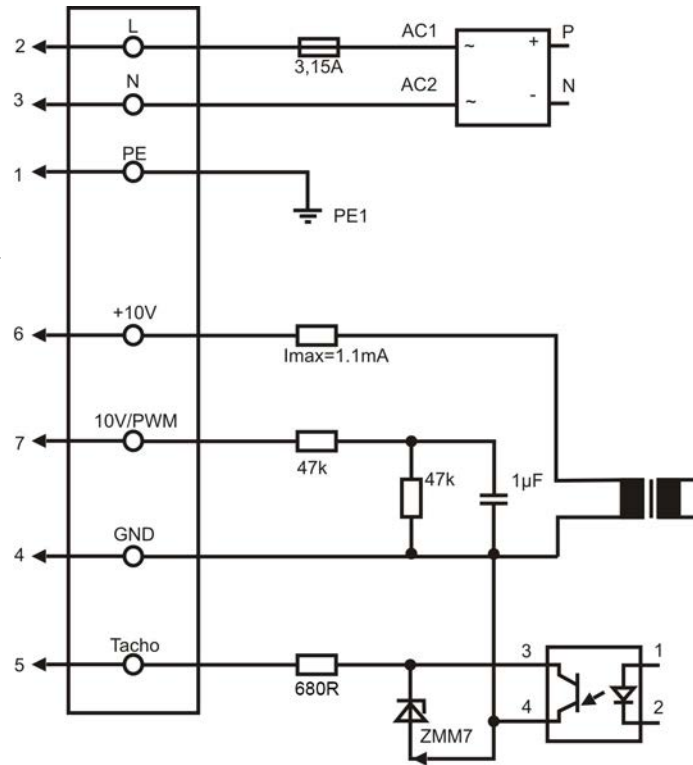
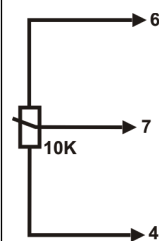


Fig. 6: Wiring diagram of the prio 200 EC

Wire no.	Connection	Colour	Function/assignment
1	PE	green/yellow	Protective conductor
2	L	brown	Power supply 230 V AC, 50 ... 60 Hz, see type plate for voltage range
3	N	blue	Neutral conductor
4	GND	blue	GND-connection of the controller interface
5	speedometer	white	Speed output: Open Collector, 1 impulse per revolution, electrically isolated, Isink_max = 10 mA
6	10 V / max. 1.1 mA	red	Voltage output 10 V / 1.1 mA, electrically isolated
7	0 ... 10 V PWM	yellow	Controller input 0 ... 10 V or PWM, electrically isolated

8 Commissioning

8.1 Preconditions

- Mounting and electrical connection have been correctly performed.
- Installation residuals and foreign objects have been removed from the fan.
- Inlet and outlet are free.
- The safety devices have been fitted (protection against contact).
- Grounding connected.
- The cable glands are tight.
- Provided mains connection complies with the data on the name plate.
- Nominal current (from the name plate) does not exceed the mains data.

8.2 Commissioning



WARNING

Hazard from electrical voltage!

- » Commissioning by trained and instructed qualified personnel only!

- ☞ Switch the circular duct fan on as planned.



WARNING

Hazard from bursting parts!

- » » When checking the direction of rotation, wear safety goggles.

- ☞ Check:
 - the direction of rotation / conveying. The direction of rotation always applies looking at the rotor.
 - smoothly running
- ☞ Check, if safety elements e.g. protective guards are fastened.

9 Operation

9.1 Safety notes



WARNING

Hazard from electrical voltage!

- » The device may only be operated by persons
 - instructed in function and risks,
 - who have understood handling and can accordingly react.
- » Ensure that children cannot operate or play with the device without supervision.
- » Ensure access only to persons, who can safe handle the device.

9.2 Operating conditions

- Do not operate the circular duct fan in an explosion-hazardous atmosphere.
- During operation, touching the rotor must not be possible.
- Safety components must not be bypassed or put out of function.
- The circular duct fan may operate inside limits declared on the nameplate.
- Prevent suction of foreign particles, this can destroy the fan.
- Sound development can be reduced by using a sound filter.

9.3 Operation/use

- ☞ Operate the circular duct fan only in accordance with the instructions in this manual and the applicable documents.
- ☞ Control the circular duct fan during operation for correct function.
- ☞ Switch the circular duct fan off as planned.



WARNING

Hazard from electrical voltage and flying parts!

Errors occurring can lead to personal and/or property damage!

Switch the circular duct fan off as planned:

- » in cases of a non-typical noise from bearings, vibrations, pressure pulsation.
- » in case of overcurrent, overvoltage or temperature (nameplate).

10 Maintenance/troubleshooting



WARNING

Hazard from electrical voltage!

- » Trouble setting and service only by a trained electrician or trained and instructed qualified personnel!
- » Observe rules for safe work while troubleshooting!
- » Observe 5 safety rules for the electrical expert!
 - disconnect from the power supply (all-pole),
 - prevent switching on again,
 - test absence of voltage,
 - earthing and short-circuiting,
 - protect adjacent live parts by covers and barriers.

10.1 Faults and troubleshooting

Fault	Possible causes	Remedy
The circular duct fan does not run smoothly	Rotor imbalance	Re-balancing by specialist company
	Adhesions to the rotor	Clean carefully, rebalance if necessary
	Material decomposition on the rotor due to aggressive material conveyed	Contact Systemair
	Deformation of rotor due to excessive temperature	Contact Systemair, Install new rotor, Check bearings
Air output of circular duct fan too low	Wrong direction of rotation of rotor	Change direction of rotation
	Losses of pressure in lines too high	Different line guidance
	Throttle organs not or only partly open	Check opening position on site
	Intake or pressure paths blocked	Remove obstacles
Grinding sounds in operation or start of the circular duct fan	Intake line installed twisted	Loosen intake line and realign
Internal motor protection was initiated	Motor blocked	Contact Systemair
The circular duct fan does not reach nominal speed	Electrical switching devices set wrongly	Check and possibly reset setting of switching device
	Motor coil defective	Contact Systemair

Table 2: Troubleshooting

10.2 Cleaning

Regular cleaning of the circular duct fan prevents unbalance.



WARNING

Hazard from electrical voltage!

- » Interior cleaning of the circular duct fan only by a trained electrician or trained and instructed qualified personnel!
- » Observe rules for safe work while troubleshooting!
- » Observe 5 safety rules for the electrical expert!
 - disconnect from the power supply (all-pole),
 - prevent switching on again,
 - test absence of voltage,
 - earthing and short-circuiting,
 - protect adjacent live parts by covers and barriers.



CAUTION

Danger from hot surfaces!

- » During maintenance and cleaning wear protective gloves!

- ☞ Keep the airways of the circular duct fan clean and clean them if necessary with a brush.
- ☞ Do not use a steel brush.
- ☞ **Do not use a high-pressure cleaner (“steam jet cleaner”) under any circumstances.**
- ☞ Do not bend the fan blades when cleaning.
- ☞ Do not use any detergents for interior cleaning.

10.3 Maintenance, service

The fan is by built-in for-life lubricated ball bearings as far as possible low-maintenance product. After their life time (app. 30.000 to 40.000 h), a replacement of the bearings is necessary.



WARNING

Hazard from electrical voltage!

Observe at maintenance and service:

- » Rotor must stand still..
- » Electrical circuit must be interrupted and secured against restarting.
- » Observe the rules for safe work.

- ☞ Pay attention to a non-typical noise from bearings.
- ☞ For replacement use only original ball bearings (special grease) of Systemair.
- ☞ For all other damages (e.g. damage to winding) please contact our Service Department. Defective circular duct fans must be replaced completely. Repairs may be accomplished only in the company of manufacturer and by the manufacturer. You find the address on the back of these operating instructions.

10.4 Spare parts

In case of order of spare parts please specify the type description of the circular duct fan. You can find it on the name plate.

11 Uninstalling/dismounting



WARNING

Hazard from electrical voltage!

- » Switching off and de-installation only by a trained electrician or trained and instructed qualified personnel!
- » Observe 5 safety rules for the electrical expert!
 - disconnect from the power supply (all-pole),
 - prevent switching on again,
 - test absence of voltage,
 - earthing and short-circuiting,
 - protect adjacent live parts by covers and barriers.

- ☞ Carefully disconnect all the electrical lines.
- ☞ Separate the circular duct fan from the supply connections.



CAUTION

Gefährdung durch Stoß und Schneiden!

- » Wear protective gloves when dismantling!
- » Dismount carefully..

- ☞ Carefully remove the fastening material.
- ☞ Place the circular duct fan on the floor.

12 Disposal

Both the appliance and also the matching transport packaging predominantly comprise recycling-capable raw materials.

12.1 Disposal of the circular duct fan



Should the circular duct fan be disposed, proceed as follows:

- ☞ Switch the circular duct fan free of voltage.
- ☞ Disconnect the circular duct fan from the supply connections.
- ☞ Disassemble the circular duct fan into its components.
- ☞ Separate the parts according to
 - reusable material
 - material groups to be disposed (metal, plastics, electrical parts, etc.)
- ☞ Provide for the recycling of material. Consider the national regulation.

12.2 Disposal of packaging

- ☞ Provide for the recycling of material. Consider the national regulation.

13 EC-Declaration of Conformity

EG-Konformitätserklärung <i>EC Declaration of Conformity</i>		
Der Hersteller: <i>The Manufacturer</i>	Systemair GmbH Seehöfer Str. 45 D-97944 Windischbuch Tel.: +49-79 30 / 92 72-0	
erklärt hiermit, dass folgende Produkte: <i>certified herewith that the following products:</i>		
Produktbezeichnung: <i>product designation</i>	Rohrventilatoren <i>Circular duct fans</i>	
Typenbezeichnung: <i>type designation</i>	prioAir	
Ab Baujahr: <i>Since year of manufacture</i>	2013	
allen einschlägigen Bestimmungen der Maschinen Richtlinie RL 2006/42/EG entspricht. <i>ensure all relevant regulations of machinery directive RL 2006/42/EG.</i>		
Die Maschine entspricht weiterhin allen Bestimmungen der Richtlinien Elektrische Betriebsmittel (2006/95/EG), Elektromagnetische Verträglichkeit (EMV) (2004/108/EG) und RoHS-Richtlinie 2011/65/EU. <i>The products ensure furthermore all regulations of directives electrical equipment (2006/95/EG), electromagnetic compatibility (EMC) (2004/108/EG) and RoHS-directive 2011/65/EU.</i>		
Folgende harmonisierte Normen sind angewandt: <i>The following standards are used:</i>		
EN ISO 12100-1:2003	Sicherheit von Maschinen - Grundbegriffe, allgemeine Gestaltungsleitsätze, Teil 1: Grundsätzliche Terminologie, Methodik <i>Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology</i>	
EN ISO 12100-2:2003	Sicherheit von Maschinen - Grundbegriffe, allgemeine Gestaltungsleitsätze, Teil 2: Technische Leitsätze und Spezifikationen <i>Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles</i>	
EN 60204-1:2011	Sicherheit von Maschinen - Elektrische Ausrüstungen von Maschinen, Teil 1: Allgemeine Anforderungen <i>Safety of machinery - Electrical equipment of machines - Part 1: General requirements</i>	
DIN EN 61000-6-1:2007	Elektromagnetische Verträglichkeit (EMV) - Teil 6-1: Fachgrundnormen - Störfestigkeit für Wohnbereich, Geschäfts- und Gewerbebereiche sowie Kleinbetriebe <i>Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments</i>	
DIN EN 61000-6-2:2005	Elektromagnetische Verträglichkeit (EMV) - Teil 6-2: Fachgrundnormen - Störfestigkeit für Industriebereiche <i>Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments</i>	
Boxberg, 01.06.2013 Datum/date	 ppa Harald Rudelgass, Technischer Leiter ppa. Harald Rudelgass, Technical director	

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