

Supply Air Unit SUE

Installation and Operating Instructions

GB

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1 General information

1.1 Warning 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.
- ◆ 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.
- ◆ When lifting the device, use suitable lifting gear.
- ◆ 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
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 Maintenance.

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

- The SUE is intended to provide rooms with pre-heated air.
- 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.

5.2 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 filter.
- Operation without duct system or protection grille
- Operation with the air connections closed
- Installation outside without weather protection

5.3 Technical data

Max. ambient temperature [°C]	40
Min. ambient temperature [°C]	-20
Max. temperature of transported air [°C]	50
Sound pressure [dB]	see data sheet, available in our online catalogue
Voltage, current, frequency, enclosure class, weight	see name plate of the fan

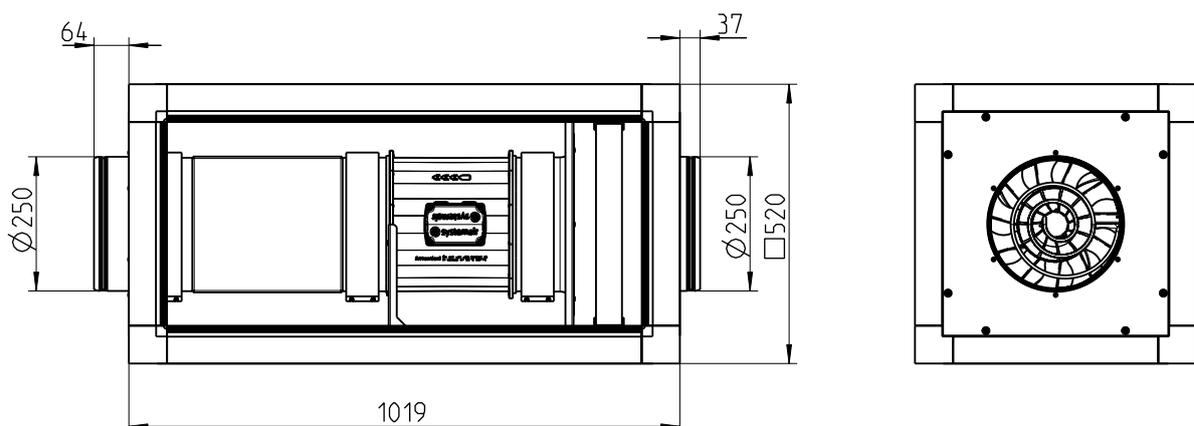
The motor data can be found on the name plate of the motor, or in the technical documents of the motor manufacturer.

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

The SUE consists from the following components:

Fan with EC motor, Duct heater, TCA temperatur control module, S-5EC step switch, Filter, TFK Temperature sensor

Table 2 Dimensions SUE



Possible adjustments

Temperature

TCA
Factory setting: 20°C

The value can be adjusted, see manual of the controller TCA (attached to the SUE).



Air volume

S-5EC
5 steps-switch

The air volume can be adjusted with the 5 steps switch.



6 Name plate and type key

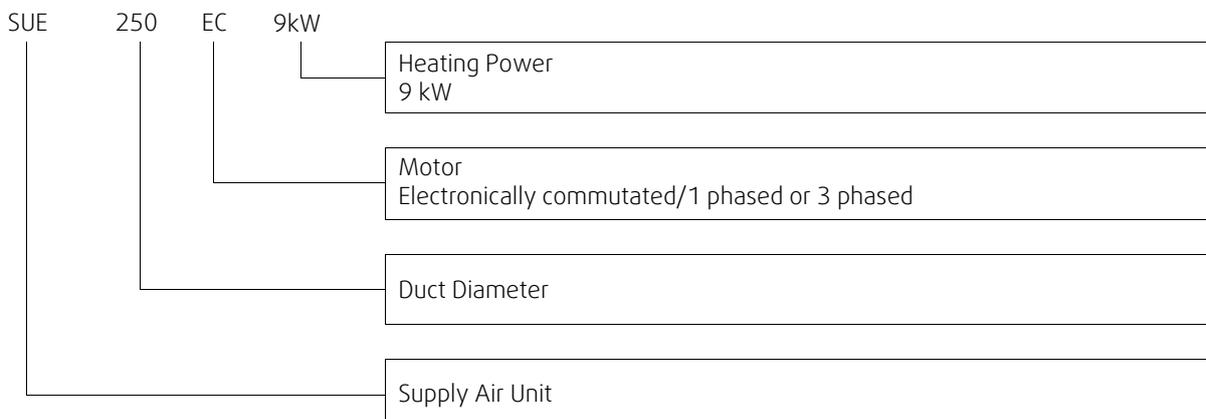
Zuluftgerät SUE 250EC 9kW
 400 V~ 14,3 A 50/60 Hz
  9160 W
 IP44 2670 min⁻¹ 55kg
 INS.CL.B
Serial.no: 94729/1006724118-001/20220210



Made in GERMANY

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

Table 3 Type key

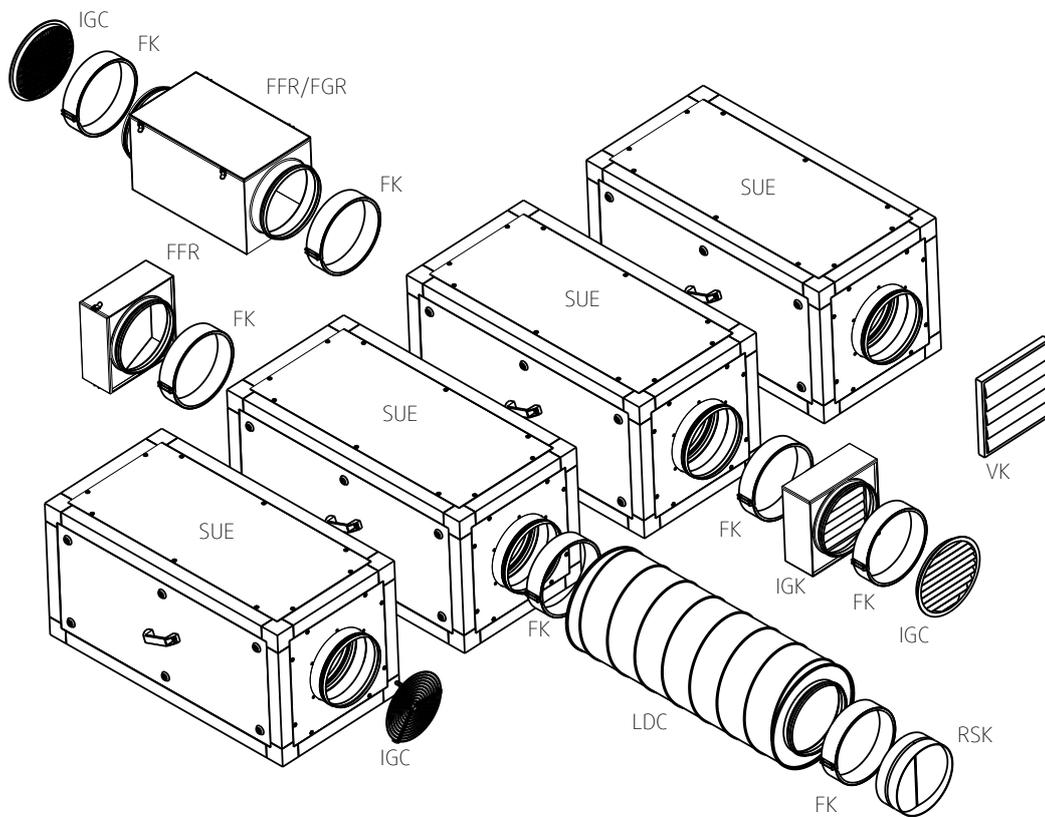


7 Accessories



Note:

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



SUE	Supply Air Unit
IGC	Round protection grille
IGK	Wall grid
LDC	Silencer

VK	Louvre Shutter
FFR	Filter cassette
FGR	Filter cassette

FK	Fast clamp
RSK	Back draft damper
SG	Protection guard

8 Installation

Safety information

- ◆ Observe 2 *Important safety information*, page 1
- ◆ Check the surface before installation for load bearing capacity.
- ◆ Consider all static and dynamic loads when selecting hoisting equipment and fastening components.
- ◆ Provide contact and intake protection and ensure safety distances according to DIN EN ISO13857 and DIN 24167-1.

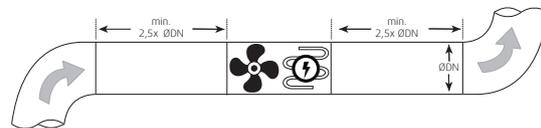
Preconditions

- ◆ 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.
- ◆ A warning sign must be attached close to the air outlet, stating that the air outlet must not be covered.

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

TFK

The distance between the TFK and the SUE must be at least 1 meter.

Installation positions

The inspection opening* of the SUE can be freely placed upwards or sideways.



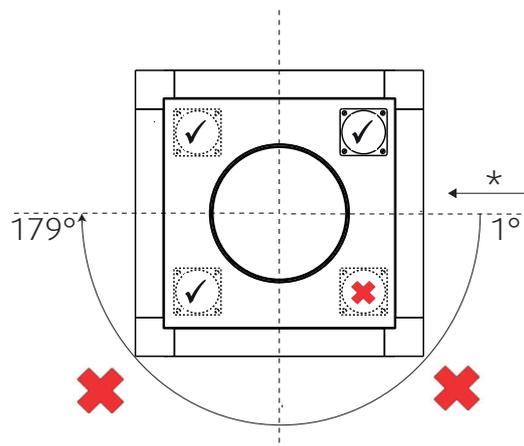
Caution

- ◆ Mounting must only be done horizontally. There is a risk of fire if the unit is installed vertically.

Important

The overheating protection may not work correctly!

- ◆ Do not place the inspection opening* downwards.



If the SUE is equipped with a drain plug:

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.

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.

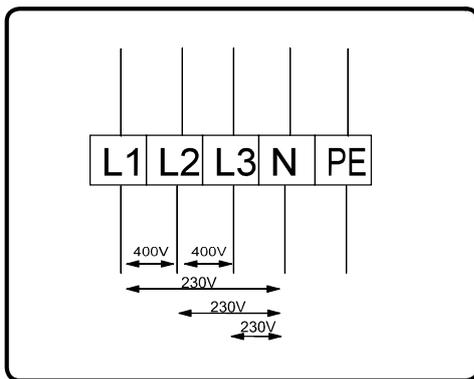
Protective grounding wire

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 Wiring diagram



Wiring diagram

9.2 Protecting the motor & heater

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.

Heater



Note:

- The SUE has a built-in airflow sensor that ensures that the heater will not actuate, unless there is an appropriate airflow through the duct heater.
- The SUE is equipped with two overheating cut-outs, to prevent overheating when the airflow is too low or in case of a fault in the system

1 x overheating cut- out with automatically reset

1 x overheating cut- out with manually reset (***Reset button**)

If the overheating cut-out has been activated, observe the following steps

1. Observe the 5 rules of electrical safety, see 2.3 5 rules of electrical safety, page 2.
2. Investigate carefully the reason for activation of the cut-out.
3. When the fault has been eliminated, the **Reset-button*** can be pressed.

*Reset- button



9.3 Variable-speed fans



Warning

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

- ◆ Only operate the fan outside these speed ranges.

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.

Tests

Do the tests requested in the commissioning report (17 Commissioning Report, page 14)

11 Operation

Safety information

- ◆ Observe 2 Important safety information, page 1

Important

Risk of contamination of the airflow sensor and the heating elements.

- ◆ Do not remove the built-in filter during operation.
- ◆ Change the filter frequently to avoid pressure- losses.

12 Troubleshooting/maintenance/repair

Safety information

- ◆ Observe 2 Important safety information, page 1

12.1 Troubleshooting

Table 4 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 7
Air output of fan too low	Fan operation in resonant frequency range	Consider chapter 9.3 <i>Variable-speed fans</i> , page 9
	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.
Grinding sounds when starting or operating the fan	Intake or pressure ducts are blocked	Remove the blockage.
	Dirty air filters of the ventilation system.	Change filters.
	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.
Motor overheated		Contact Systemair
Motor blocked		Contact Systemair
Fan does not reach nominal speed	Defective motor winding	Contact Systemair
	Control units (S-5EC) is 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.
Full heating power but no regulation	Wrong parameters in the TCA (Temperature controller)	Correct the settings of the control units. Contact Systemair
	overheating cut-out activated	Eliminate the fault and reset the overheating cut-out.
	overheating cut-out defect	Check the overheating cut-out elements. Contact Systemair
	Heating element defect	Check the heating elements. Contact Systemair
No or not enough heating power	Faulty supply voltage	Check the supply voltage, re-establish the voltage supply.
		Check the interlocking devices, fuses, breakers etc.
	Wrong parameters in the TCA (Temperature controller)	Correct the settings of the control units. Contact Systemair
	"Air output of fan too low" or "Motor does not rotate" -> airflow sensor disables the heating	See "Air output of fan too low" or "Motor does not rotate" of this chapter Check if the filter



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:

- Durable ambient temperature > 30 °C or < 0 °C, or temperature fluctuations > 20 K

Table 5 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 13 <i>Cleaning</i> , page 12).	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	

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 Product fiche SUE

For more information in local language www.systemair.de

Trade name		Systemair
Product No.		94729
Product Name		SUE 250EC 9kW
ErP compliance		2018
Unit category		NRVU
Unit type		UVU
Drive		external MSD or VSD
Heat recovery type		none
Temperature ratio		N/A
qv nom	m ³ /h	618
P nom	W	67
Ps nom	Pa	105
Fan η	%	26.9
External Leakage		
Sound power level (LWA)	dB(A)	70.7

17 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 [Ω]:

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 housing)

Voltage [V]:

Current [A]:

Frequency [Hz]:

Power [kW]:

Fan impeller speed [rpm]:

Measured data at commissioning

Voltage [V]:

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

Current L1 [A]*:	Fan impeller speed [rpm]:
Current L2 [A]:	<i>"Air volume", "Differential pressure" not necessary for Jet fans</i>
Current L3 [A]:	Air volume [m ³ /s]:
For single-phase fans, fill in line "Current L1 [A]"	Differential pressure [Pa]:
	*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:

	X		=	
Duct cross-section [m ²]		Flow speed [m/s] <small>Grille measurement acc. to VDI 2044</small>		Air volume [m ³ /s]:

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

Date, installer's signature

Date, operator's signature



Systemair GmbH
Seehöfer Str. 45
97944 Boxberg
Germany

Tel.: +49 (0)7930/9272-0
Fax: +49 (0)7930/9273-92

info@systemair.de
www.systemair.de