

Roof fan plastic DVP

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.
- ◆ 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.
- ◆ 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
Repair	Electrical expert or matching qualification	Fitter or matching qualification
	Smoke extraction fans and EX fans only by agreement with Systemair.	

**Note:**

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

2.2 Personal protective equipment

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

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

2.3 5 rules of electrical safety

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

3 Warranty

For the assertion of warranty claims, the products must be correctly connected and operated, and used in accordance with the data sheets. Further prerequisites are a completed maintenance plan with no gaps and a commissioning report. Systemair will require these in the case of a warranty claim. The commissioning report is a component of this document. The maintenance plan must be created by the operator, see section 12.2 *Maintenance*, page 12.

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



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.

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.

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.

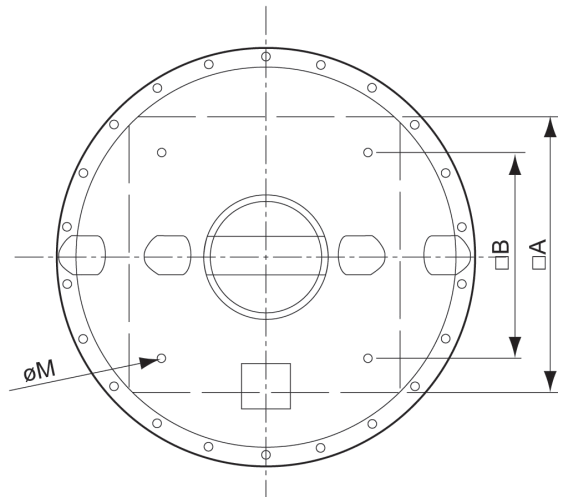
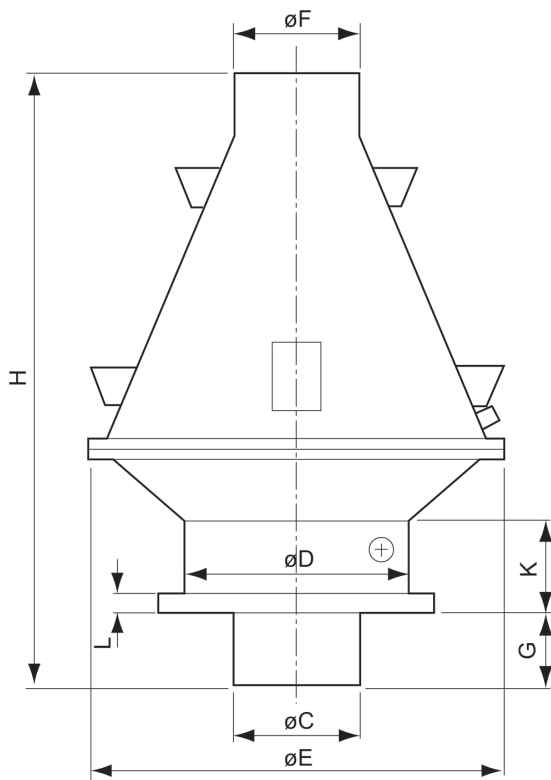
5 Description



- 1 Motor ventilation air inlet
- 2 Motor ventilation air outlet
- 3 Drain in horizontal position
- 4 Drain in vertical position

5.1 Dimension

Table 2 Dimensions



[mm]	A	B	ØC	ØD	ØE	ØF	G	H	K	L	ØM
DVP 200DD2-4	435	330	200	355	662	200	119	1065	146	30	4x10
DVP 250DD2-4	595	450	250	400	768	250	119	981	181	30	4x12
DVP 315D4-8	665	535	315	560	810	315	218	1161	200	30	4x12
DVP 400D4-8 DVP 400D4-8-L	939	750	400	601	976	400	218	1134	235	30	4x14

5.2 Technical data

Max. ambient temperature [°C]	
Max. temperature of transported air [°C]	see data sheet, available in our online catalogue.
Sound pressure [dB]	
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.	

5.3 Chemical components

The standard variants of the plastic used are polypropylene (PP). As a matter of principle, the rotor material is the indicator for the selection.



Note:

The list "COMPATIBILITY WITH CHEMICAL AGENTS" is available in our online catalogue. This list has been produced to the best of our knowledge, all statements without guarantee for correctness. Examination of the media to be transported is a matter for the plant operator. Here, it is merely a question of a recommendation.

5.4 Intended use

- The fans have been developed and built to convey air with the simultaneous presence of corrosive gases/vapours.
- 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 fans are exclusively intended for extract air applications.

5.5 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 abrasive, explosive, combustible air or air with solid particles.
- Operation without duct system or protection grille
- Operation in an explosive atmosphere
- Operation with the air connections closed

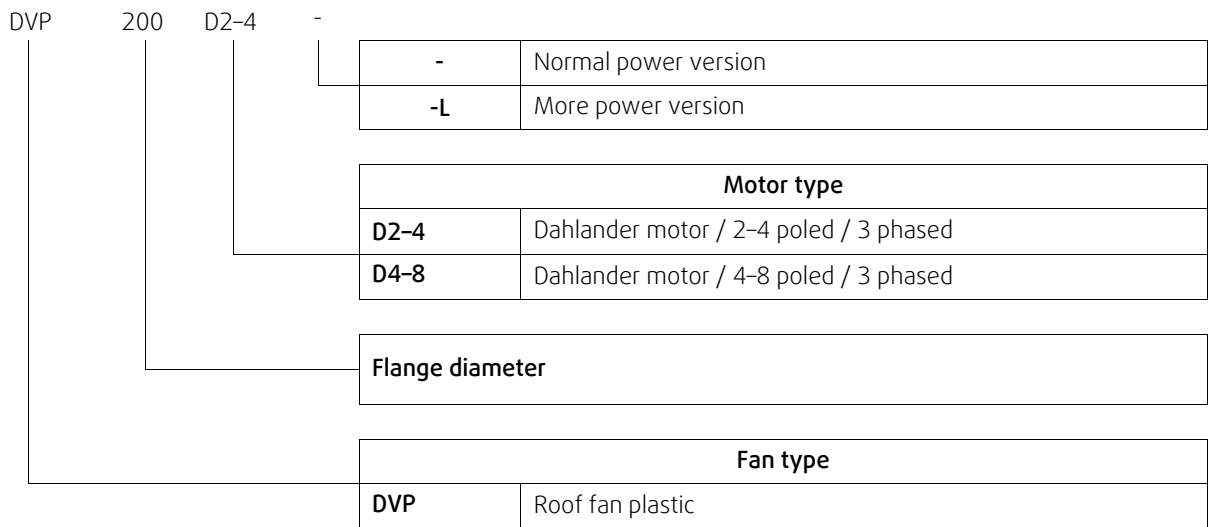
6 Name plate and type key

- 1 Type designation
- 2 Production number
- 3 Execution
- 4 Impeller speed
- 5 Air volume
- 6 Pressure
- 7 Input power
- 8 Max. temperature of transported air
- 9 Material casing
- 10 Material impeller
- 11 Max. speed of impeller
- 12 Weight
- 13 Enclosure class

made in France/UE

1	Type : DVP 400D4-8L	Poids total/ Total weight:
2	N°fab/Fab number : V14172	71 Kgs
3	Execution : EXE 3	
4	Vit.Turb./Imp.Speed: 1440 / 720	tr/min-rpm
5	Debit/Flow : 1902 / 951	m3/h
6	Press.Stat/Pressure: 608 / 152	Pa
7	Puiss./Power inst.: 4 / 1	kW IP55
8	T ° max °C: 60	
9	Volute/Casing: PPH	
10	Turb/Impeller: PPH	ØImpeller: 560 mm
11	Vit.Rotation/Speed Maxi: 1850	tr/min-rpm
	Year/Annee de fab: 2018	

Table 3 Type key



7 Accessories

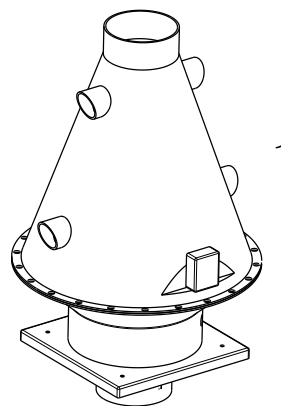


Note:

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

Table 4 Accessories

1	DVP	Fan
2	VKS-DVP	Back draft damper
3	ASF-DVP	Inlet flange
4	ASS-DVP	Flexible inlet connection
5	FDS	Flat roof socket
6	SDS	Slanting roof socket



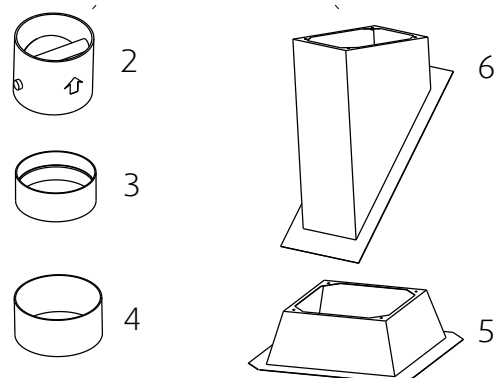
Note:

If the degree of inclination is higher than 5°, a SDS (Slanting roof socket) has to be used.



Note:

Systemair recommends a Back draft damper (VKS) to avoid cold air intake at a standstill of the fan, see 7 Accessories, page 7.



8 Installation

Safety information

- ◆ Fans installed in areas where personnel access regularly must be equipped with a splinter guard, please contact Systemair.
- ◆ 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.
- ◆ The materials the fan is made of have to be compatible to the transported media.
- ◆ The fan must not bear the weight and dilation of ducting or chimneys.

Preconditions

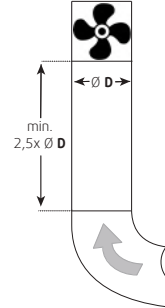
- ◆ Ensure that the fan and all its components are undamaged.
- ◆ Fit the fans in such a way that there is sufficient access for installation, troubleshooting, maintenance and repair.
- ◆ Protect against dust and moisture when installing.
- ◆ Ensure that the information on the name plates (fan and motor) matches up with the operating conditions.
- ◆ If harmful or hazardous products are transported, check the general condition of the fan before opening.

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.

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



8.1 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.

9 Electrical connection

Safety information

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

Warning: Danger due to electrostatic influence on medical implants (e.g. cardiac pacemaker)!

- ◆ Persons with medical implants (e.g. cardiac pacemaker) should keep enough distance to the fan.

Connection

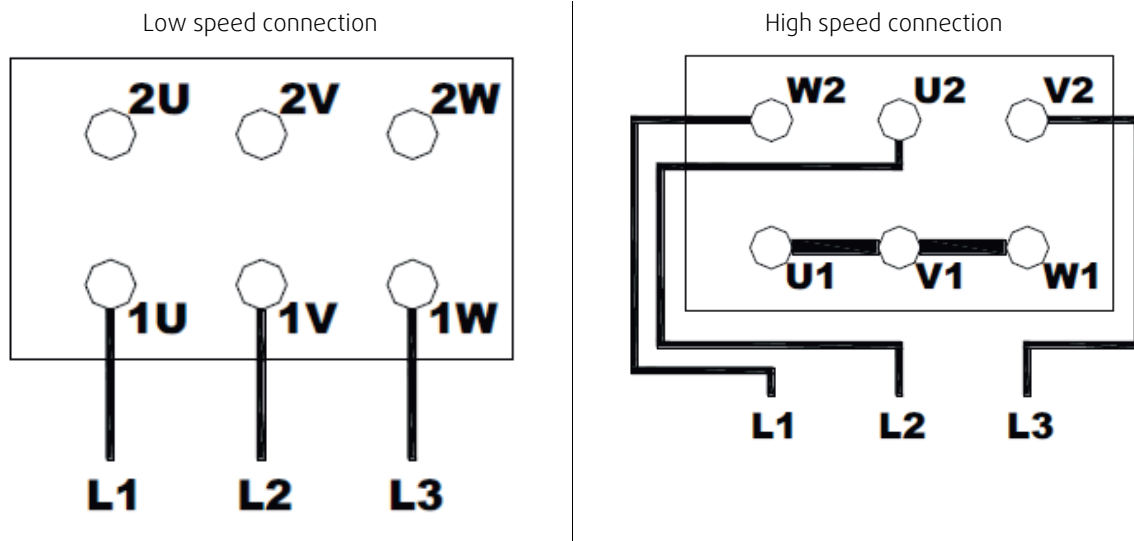
- ◆ Check if the data on the nameplate matches the connection data.
- ◆ Complete the electrical connection according to the circuit diagram.
- ◆ Fans with EC- motors must be switched on/off via the control input.
- ◆ Connect the cable end in a dry environment.
- ◆ Install a circuit breaker in the permanent electrical installation, with a contact opening of at least 3 mm at each pole.
- ◆ Potentially, the fans may become charged with static electricity. If this represents a risk, please contact Systemair.

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 Protecting the motor

Important

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

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

9.2 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.
- ◆ We recommend using all-pole sinus filters.
- ◆ Avoid running the fan via the frequency converter below 10 Hz.
- ◆ Heating of the motor due to use of a variable frequency drive must be checked in the application by the customer.
- ◆ Never exceed the maximum impeller rotation speed indicated on the name plate of the fan.

10 Commissioning

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

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.

Tests

Do the tests requested in the commissioning report (17 *Commissioning Report*, page 13)

11 Operation**Safety information**

- ◆ Observe 2 *Important safety information*, page 1

Warning: Risk by careless use of aggressive media.

Careless use of aggressive media can lead to very severe injuries.

- ◆ Pay attention to the safety data sheet of the chemical substances transported with the fan.

12 Troubleshooting/maintenance/repair**Safety information**

- ◆ Observe 2 *Important safety information*, page 1
- ◆ Pay attention to the safety data sheet of the chemical substances transported with the fan.

12.1 Troubleshooting**Table 5 Troubleshooting**

Problem	Possible causes	Remedy
Fan does not run smoothly	Impeller imbalance	Rebalancing by a specialist company if possible, otherwise contact Systemair.
	Soiling on the impeller	Clean carefully, rebalance
	Material decomposition on the impeller due to aggressive material conveyed.	Contact Systemair
	Impeller rotates in wrong direction.	Change direction of rotation if possible, otherwise contact Systemair.
	Deformation of impeller due to excessive temperature.	Ensure that the temperature does not exceed the certified value/Install new impeller.
	Vibrations, oscillations	Check the installation of the fan/check the duct system, see 8 <i>Installation</i> , page 7.
Air output of fan too low	Fan operation in resonant frequency range	Consider chapter 9.2 <i>Variable-speed fans</i> , page 9
	Impeller rotates in wrong direction.	Change direction of rotation if possible, otherwise contact Systemair.
	Wrong wiring configuration (e.g. Y instead of Delta).	Check and possibly correct the wiring configuration.
	Pressure losses too high.	Optimize the line routing.
	Flow regulators not or only partly open.	Check opening position on site.
	Intake or pressure ducts are blocked.	Remove the blockage.

Troubleshooting cont'd

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.	Change direction of rotation if possible, otherwise contact Systemair.
	Missing phase	In case of a 3 phase standard motor (not EC), check if all 3 phase are present.
	Motor overheated	Check the cooling impeller (if used), measure the motor winding (if possible) / contact Systemair.
	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	Frozen condensate blocking the impeller	Thaw and drain the condensate
	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.
Electronics/motor overheated	Temperature monitor has responded.	Allow the motor to cool down, find and resolve the cause of the fault.
	Insufficient cooling	Improve cooling.
	Overloaded motor	Check if the correct fan is used for your application.
	Ambient temperature too high	Check if the correct fan is used for your application.



Note:

For all other damage/defects, please contact Systemair.

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 > 35 °C or < 5 °C, or temperature fluctuations > 20 K

Table 6 Activities

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

Spare parts

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

13 Cleaning

13.1 Safety information

- ◆ Cleaning may only be carried out by adequately qualified persons, details see Table 1 *Qualifications*, page 2.
- ◆ Observe the 5 rules of electrical safety, see 2.3 *5 rules of electrical safety*, page 2.
- ◆ The impeller must be at a standstill.
- ◆ Pay attention to the safety data sheet of the chemical substances transported with the fan.

13.2 Procedure

Important

Keeping the fan clean extends its service life.

- ◆ Drain condensation off
- ◆ Only use compressed air if the fan is used for conveying air in the presence of gases/vapours without hovering particles.
- ◆ If the fan is used in an environment with vapours of specific chemical substances, get information from the chemical safety data sheet with a view to the recommended cleaning products.
- ◆ Install a filter monitor.
- ◆ Do not use steel brushes or sharp-edged objects.
- ◆ Do not use a high-pressure cleaner (steam jet cleaner) under any circumstances.
- ◆ Do not bend the fan blades when cleaning.
- ◆ When cleaning the impeller, pay attention to balance weights that have been positioned
- ◆ Keep the airways of the fan clear and clean them if necessary with a brush.

14 Deinstallation/dismantling

- ◆ Pay attention to the safety data sheet of the chemical substances transported with the fan.

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

15 Disposal

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

16 EU Declaration of conformity

The manufacturer:	Systemair GmbH Seehöfer Straße 45 97944 Boxberg Germany
Product designation:	Roof fans
Type designation:	DVS; DHS; DVSI; DVC/DVCI; DVP
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:

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

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 [$^{\circ}$ C]: _____

Current L1 [A]*: _____

Fan impeller speed [rpm]: _____

Current L2 [A]: _____

Air volume [m³/s]: _____

Current L3 [A]: _____

Differential pressure [Pa]*: _____

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

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

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

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

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

Date, installer's signature

Date, operator's signature



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