

Safety notes

For AC built-in fans

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CONTENTS

1. SAFETY REGULATIONS AND NOTES	1
1.1 Hazard levels for warning notices	1
1.2 Staff qualification	1
1.3 Basic safety rules	1
1.4 Voltage and current	1
1.5 Safety and protective functions	2
1.6 Electromagnetic radiation	2
1.7 Mechanical movement	2
1.8 Emissions	2
1.9 Hot surface	2
1.10 Transport	2
1.11 Storage	2
1.12 Disposal	2
2. INTENDED USE	3
3. CONNECTION AND START-UP	3
3.1 Mechanical connection	3
3.2 Electrical connection	3
3.3 Checking connections	4
3.4 Switching on the device	4
3.5 Switching off the device	4
4. MAINTENANCE, PROBLEMS, POSSIBLE CAUSES AND REMEDIES	5
4.1 Safety inspection	5

1. SAFETY REGULATIONS AND NOTES

Please read this document carefully before starting work with the device. Observe the following warnings to prevent malfunctions or danger to persons. This document is to be regarded as part of the device.

The device is only to be sold or passed on together with this document. This document may be duplicated and forwarded for information about potential dangers and their prevention.

1.1 Hazard levels for warning notices

These operating instructions use the following hazard levels to indicate potentially hazardous situations and important safety regulations:



DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. The measures must be strictly observed.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. Exercise extreme caution while working.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or damage of property.

NOTE

A potentially harmful situation can occur and, if not avoided, can lead to property damage.

1.2 Staff qualification

Only authorised electricians are permitted to install the device, to carry out a test run and to perform work on the electrical installation. The device may only be transported, unpacked, operated, maintained and otherwise used by trained and authorised technical staff.

1.3 Basic safety rules

The safety hazards associated with the device must be assessed again following installation in the final product. Note the following when working on the device:

→ Do not make any modifications, additions or conversions to the device without the approval of ebm-papst.

1.4 Voltage and current

Check the electrical equipment of the device at regular intervals. Replace loose connections and defective cables immediately.



DANGER

Device electrically charged

Electric shock

→ When working on an electrically charged device, stand on a rubber mat.



WARNING

Terminals and connections may be live even with the device switched off.

Electric shock

→ Wait five minutes following after disconnecting the voltage at all poles before touching the device.



Safety notes

For AC built-in fans



DANGER

The motor restarts automatically when operating voltage is applied, e.g. after a power failure.

Risk of injury

- Keep out of the device's danger zone.
- When working on the device, switch off the mains power and ensure that it cannot be switched back on.
- Wait until the device stops.
- If the device is provided with thermal overload protectors, insert them into the control circuit so that the cooled motor does not switch on automatically following a malfunction.

1.5 Safety and protective functions



DANGER

Missing and/or malfunctioning protective device

Without a protective device there is a risk of serious injury, for instance when reaching into the device during operation.

- Only operate the device with a fixed protective device and guard grille. The safety barrier must be capable of withstanding the kinetic energy of a fan blade.
- The device is a built-in component. The operator is responsible for providing adequate protection.
- Stop the device immediately if a safety device is found to be missing or ineffective.



DANGER

Loose objects in flow area

The air flow in the device may lead to loose objects moving and causing injuries.



DANGER

Weight clips may become loose and cause injuries.

- Please take measures to prevent injuries.



NOTE

Increased speed causes the noise level to rise.

- Please wear hearing protection.

1.6 Electromagnetic radiation

Interference from electromagnetic radiation is possible, e.g. in conjunction with open and closed-loop control devices.

If impermissible radiation levels occur following installation, appropriate shielding measures have to be taken before being market introduction.



NOTE

Electrical or electromagnetic interference after installing the device in customer equipment.

- Verify that the entire set-up is EMC-compliant.

1.7 Mechanical movement



DANGER

Rotating device

Risk of injury to any parts of the body coming into contact with the rotor and impeller.

- Secure the device against accidental contact. Wait until all parts have come to a standstill before starting work on the installation/machine.



WARNING

Rotating device

Long hair and dangling items of clothing and jewellery can become entangled and be pulled into the device. Risk of injury.

- Do not wear any loose-fitting or dangling clothing or jewellery while working on moving parts.

- Protect long hair with a cap.



NOTE

Imbalance

Operating an imbalanced device can lead to unwanted vibrations. This can damage the device. Remove any imbalances or consult ebm-papst.

1.8 Emissions



WARNING

Depending on the installation and operating conditions, the sound pressure level may exceed 70 dB(A).

Risk of noise-induced hearing loss

- Take appropriate technical safety measures.
- Protect operating personnel with appropriate safety equipment, e.g. hearing protection.

1.9 Hot surface



CAUTION

High temperatures on motor housing

Risk of burns

- Ensure sufficient protection against accidental contact.

1.10 Transport



CAUTION

Transport of fan

- Transport the fan in its original packaging only.
- Use a lashing strap, for example, to stop the fan slipping.

1.11 Storage

Store the device in the original packaging in a clean and dry environment that offers protection from the weather. Protect the device against environmental effects and dirt until final installation. We recommend storing the device no longer than one year. Maintain the storage temperature.

1.12 Disposal

Observe all the relevant local requirements and regulations with regard to disposal of the device.



Safety notes

For AC built-in fans

2. INTENDED USE

The device is exclusively designed as a built-in device for conveying air according to its technical data. Any other usage above and beyond this does not conform with the intended purpose and constitutes misuse of the device. Customer equipment must be suited to the mechanical, thermal and service life demands involved.

Intended use also includes

- Using the device in neutral-earthed power systems only (applies only to three-phase devices).
- Conveying air with a density of 1.2 kg/m³.
- The device is only to be used at the permissible ambient temperature.
- Operating the device with all protective devices.
- Compliance with all safety instructions.

Non-intended use

Operating the device in the following ways in particular is prohibited and could be hazardous:

- Conveying air that contains abrasive particles.
- Conveying highly corrosive air, such as salt spray. Exception: Devices designed for salt spray with corresponding protection.
- Conveying air with high dust pollution, e.g. suctioning off sawdust.
- Conveying combustible gases/particles.
- Operating the fan close to flammable materials or components.
- Operating the fan in an explosive atmosphere.
- Using the fan as a safety component or to perform safety-related functions.
- Stopping the impeller via blocking.
- In addition, all applications not listed among the intended uses.



DANGER

It is forbidden to block the impeller when it is running

This presents a potentially fatal hazard!

It is forbidden to block the impeller by inserting objects.

If you have special questions, consult ebm-papst for support.

Electromagnetic compatibility



If several fans are switched in parallel on the mains side so that the line current of the arrangement is in the range of 16-75 A, then this arrangement conforms to IEC 61000-3-12 provided that the short-circuit power S_{sc} at the connection point of the customer system to the public power system is greater than or equal to 120 times the rated output of the arrangement. It is the responsibility of the installation engineer or operator/owner of the device to ensure, if necessary after consultation with the network operator, that this device is only connected to a connection point with a S_{sc} value that is greater than or equal to 120 times the rated output of the arrangement.

3. CONNECTION AND START-UP

3.1 Mechanical connection



CAUTION

Cutting and crushing hazard



Cutting and crushing hazard when removing device from packaging

- Lift the device out of its packaging carefully, taking care to avoid any impact.
- Wear safety shoes and cut-resistant safety gloves.

CAUTION

Heavy load when unpacking device

Risk of physical injury, such as back injuries.

- Two people are required to lift the device out of its packaging if it weighs more than 10 kg. Use a suitable lifting system if the device weighs more than 50 kg.

→ Install the device in a way that is suitable for the respective application.

→ Make use of suitable fasteners for installation.

3.2 Electrical connection

Perform electrical connection after mechanical connection.



DANGER

Voltage at the device

- Always start by connecting a protective earth. Check the protective earth. Alternatively, install the device in the application in a way that prevents brush contact. When removing the device, ensure that the protective earth is always disconnected last.



DANGER

Faulty insulation

- Risk of fatal injury from electric shock. Check the insulation for damage before commissioning the device.
- Use only cables that meet the specified installation requirements for voltage, current, insulation material, load etc.



DANGER

Electrical load (>50 µC) between mains wire and protective earth connection after switching off supply when switching multiple devices in parallel.

Electric shock, risk of injury

- Make sure that sufficient protection against accidental contact is provided. Before working on the electrical connection, the connections to the mains supply and PE must be shorted.

CAUTION

Voltage

- The fan is a built-in component and has no isolating switch.
- Only connect the fan to circuits that can be switched off with an all-pole disconnection switch.
- When working on the motor, you must switch off the system/machine in which the motor is installed and secure it from being switched on again.



Safety notes

For AC built-in fans

CAUTION

Electric shock

Electric voltage on the metal part

→ Only use the device with the intended cable protection (this only applies to devices that are delivered by ebm-papst pre-prepared for construction of terminal boxes)

3.2.1 Prerequisites

- Check whether the data on the type plate match the connection data.
- Before connecting the device, make sure the mains power matches the fan voltage.
- Only use cables designed for the current level indicated on the type plate.

Residual current circuit breaker (RCCB)



Devices with AC voltage are only permitted with pulse current-sensitive and/or universal residual current devices (type A or B). Like frequency inverters, residual current devices cannot provide personal safety while operating the device.

Voltage control



Excessive current may occur with speed control using transformers or electronic voltage regulators (e.g. phase control). In addition, noises can occur with phase control depending on how the device is installed.

Frequency converters



For operation with frequency converters, fit sinusoidal filters that work on all poles (phase-phase and phase-earth) between the frequency converter and the motor.

Motor protection for devices without overheating protection



WARNING

Device without overheating protection

The device is delivered without any automatic overheating protection. The device can become hot and catch fire.
→ Please take measures to prevent overheating! (Applies only to devices configured without thermal overload protectors)

Motor protection for devices with overheating protection

CAUTION

Voltage

The device is a built-in component and has no isolating switch.

- Only connect the device to circuits that can be de-energised with an all-pole disconnection switch.
- When working on the device, the system/machine in which the device is installed must be secured so as to prevent it from being switched back on. (Applies only to devices configured with thermal overload protectors)



The motors are equipped with thermal overload protectors to protect the devices. Check to make sure that the thermal overload protector is correctly connected before each operation. Failure to connect the thermal overload protector correctly will invalidate any claim for defects. (Applies only to devices configured with thermal overload protectors)

Connect wires to terminals

(applies only to devices with terminal connection).



WARNING

Live terminals and connections even with device switched off

Electric shock

→ Wait five minutes following after disconnecting the voltage at all poles before touching the device.



WARNING

Voltage at cable gland

Electric shock

→ Do not use metal cable glands with plastic terminal boxes.

3.3 Checking connections

- Ensure isolation from supply.
- Secure against renewed switch-on.
- Check the connection lines for proper fit.

3.4 Switching on the device

The device may only be switched on if it has been installed properly and in accordance with its intended use, including the required safety mechanisms and professional electrical connection. This also applies for devices which have already been equipped with plugs and terminals or similar connectors by the customer.

- Before switching on, check the device for visible external damage and make sure the protective devices are functional.
- Check the fan's air flow paths for foreign matter and remove any foreign matter found.
- Apply the nominal supply voltage.



WARNING

Hot motor housing

Risk of fire

→ Make sure there are no combustible and flammable substances in the vicinity of the device.

3.5 Switching off the device

Disconnect the device from the power supply.



Safety notes

For AC built-in fans

4. MAINTENANCE, PROBLEMS, POSSIBLE CAUSES AND REMEDIES

Do not perform any repairs on the device. Send the device to ebm-papst for repair or replacement. Ensure that all safety measures are retaken after maintenance.

WARNING

Live terminals and connections even with device switched off

Electric shock

→ Wait five minutes following after disconnecting the voltage at all poles before touching the device.

CAUTION

Electrical load on capacitor after device is switched off

Electric shock, risk of injury

→ Discharge the capacitors before working on the device.
(Applies only to devices with capacitors)

CAUTION

The motor restarts automatically when operating voltage is applied, e.g. after a power failure.

Risk of injury

Keep out of the device's danger zone.

→ When working on the device, switch off the mains power and ensure that it cannot be switched back on.

→ Wait until the device stops.

→ If the device is provided with thermal overload protectors, insert them into the control circuit so that the cooled motor does not switch on automatically following a malfunction.



If the device is out of use for some time, e.g. when in storage, we recommend switching it on for at least two hours to allow any condensation to evaporate and to move the bearings.

Malfunction/ fault

Possible cause

Possible remedy

Motor does not turn

- Mechanical blockage
- Mains power faulty
- Faulty connection
- Broken motor winding
- Thermal overload protector has responded (applies only to devices configured with thermal overload protector)

- Switch off, isolate from supply and remove mechanical blockage
- Check mains power, restore power supply
- Correct connection
- Replace device
- Allow motor to cool down, locate and eliminate cause of fault, release re-start lockout if applicable

Impeller not running smoothly

- Imbalance in rotating parts

- Clean the device; if imbalance persists, replace it

Excess temperature Motor

- Ambient temperature too high
- Impermissible operating point
- Deficient cooling

- If possible, reduce ambient temperature
- Check operating point
- Improve cooling



NOTE

In the event of any other malfunctions, contact ebm-papst.

4.1 Safety inspection

What to check	How to check	How often
Shock protection enclosure	Visual inspection	At least every 6 months
Fan for damage	Visual inspection	At least every 6 months
Fan mounting	Visual inspection	At least every 6 months
Connection lines mounting	Visual inspection	At least every 6 months
Cable insulation	Visual inspection	At least every 6 months



