Installation, safety and maintenance instructions for gas-air systems

The device type and date of manufacture (week/year) can be found on the device type plate. In the event of any queries about the device, please quote all the details given on the type plate.

For further information please visit:
www.ebmpapst.com

ebm-papst Landshut GmbH
Hofmark-Aich-Str. 25
84030 Landshut
Phone +49 871 707-0
Fax +49 871 707-465
Info3@de.ebmpapst.com
www.ebmpapst.com

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1. SAFETY REGULATIONS AND NOTES

These instructions must always be made available before working on or with the product, prior to installation and start-up, before performing any maintenance and servicing work and prior to any other usage. Keep the instructions in a safe place for later reference and for any subsequent owners.

Always study these operating instructions carefully before working on or with the product. Observe the following notes and warnings to avoid all risk of injury, damage and malfunctioning and act accordingly.

The product documentation is to be regarded as part of the device. The device is only to be sold or passed on together with this documentation.
This product documentation can and should be duplicated and handed over as a source of information on risks and hazard avoidance.

1.1. Hazard levels for warning notices

In this product documentation use is made of the following hazard levels to indicate potentially hazardous situations and important safety regulations:



DANGER

Indicates an imminently hazardous situation which will result in serious injury or even death if the specified actions are not taken. Compliance with the instructions is imperative.

WARNING

Indicates a potentially hazardous situation which can result in serious injury or even death if the specified actions are not taken. Exercise extreme caution while working.

CAUTION

Indicates a potentially hazardous situation which can result in slight or minor injury or damage to property if the specified actions are not taken.

NOTE

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

1.2. Warranty and liability

Warranty and liability claims in the event of injury and property damage will not be accepted if these can be attributed to one or more of the following causes:

- Improper use of the device
- Inexpert installation, start-up, operation and servicing of the device
- Operation of the device with defective safety equipment or with safety mechanisms and guards not correctly fitted or not in proper working order
- Non-observance of the safety and installation instructions
- Unauthorised structural modifications to the device
- Inexpert repair work
- Force majeure
- Damage arising from continued usage although a fault has occurred
- Unsuitable flow media
- Defects in supply lines
- Non-use of ebm-papst genuine parts

1.3. Personnel qualifications

The product is only to be transported, unpacked, operated, serviced or put to any other form of use by appropriately qualified, trained and instructed specialist personnel (exclusively by a qualified electrician where applicable).

1.4. Basic rules for safety

The safety hazards associated with the device must be carefully re-assessed. The end product is only to be started up after being fully checked for compliance with all the pertinent legal requirements, directives and safety provisions governing the area of application concerned (e.g. specific national accident prevention regulations and technical rules). Observe the following when working on the device:

- Do not make any modifications or additions to the system or perform any conversion work without the approval of ebm-papst Landshut.
- Heed the information given in the operating instructions of the end device manufacturer.

1.5. Voltage and current

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



DANGER

Device electrically charged

Risk of electric shock.

→ Stand on a rubber mat when working on an electrically charged device.



DANGER

Live terminals and connections even with the device switched off

Electric shock

→ Wait five minutes following all-pole disconnection of the voltage before touching the device.



DANGER

In the event of a fault, the rotor and impeller may carry voltage.

→ Do not touch the rotor and impeller when installed.



DANGER

If control voltage is being applied or a speed setpoint has been stored, the device will start up again automatically, e.g. after mains failure. The safety valves of the gas valve open automatically.

Risk of injury

→ Keep out of the device hazard zone.
→ When working on the device, switch off the mains power and secure against renewed switch-on.
→ Wait for the device to stop.

1.6. Safety and protective functions



DANGER

Missing guard and non-functioning protective device

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

→ Never operate the device without a fixed safety barrier and guard grille. The safety barrier must be capable of withstanding the kinetic energy of a fan blade.
→ Protective devices are not designed to be walked on
→ The device is a built-in component which does not function independently. As the operator, you are responsible for ensuring that the device is secured adequately.
→ Stop the device immediately if a protective device is found to be missing or ineffective.

1.7. 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 screening measures have to be taken before market introduction.



NOTE

Electrical or electromagnetic interference after installing the device in customer equipment

→ Make sure the entire installation satisfies EMC requirements.

1.8. Mechanical movement



DANGER

Rotating device

There is a risk of injury to any parts of the body coming into contact with the rotor and – if fitted – the impeller.
→ Secure the device to prevent contact.
→ Never attempt to use any objects to brake rotating parts during operation/following shut-off (run-on).
→ Wait until all parts have come to a standstill before starting work on the installation/machine.
→ Risk of flying particles. Never look in the direction of the exhaust/keep out of the exhaust area.
→ Wear close-fitting protective clothing, safety goggles and a hair net.
→ Remove ties, jewellery and any other objects which could be drawn in by the rotor and – if fitted – the impeller.

1.9. Deflagration



DANGER

Escape of gas after deflagration if housing is not gas-tight

Risk of fatal injury

→ After deflagration check whether the system components are gas-tight.
→ Replace leaking system components immediately.



DANGER

Risk of fire and deflagration

The system does not have explosion protection type approval. Rotating parts may scrape against stationary parts. This can lead to sparking and chipping. The surface temperature may rise and there is a risk of fire.

→ Check the possible hazards associated with the installation, operation, servicing or disposal of the device when fitted in the end product.

Take all appropriate action in this regard.

1.10. Noise emissions

WARNING

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

Risk of noise-induced hearing loss

→ Implement the necessary technical safety measures.
→Provide the operating personnel with appropriate safety equipment, e.g. hearing protection.
→ Other acoustic warning signals cannot be heard if hearing protection has to be worn. Ensure that appropriately adapted personal safety equipment is provided on site and that the workplace is safeguarded.
→ Also observe the stipulations of local authorities.

1.11. Hot surface



CAUTION

High temperature at the housing

Risk of burns

→Ensure adequate contact protection.

1.12. Transportation



NOTE

Transporting the device

→ The device is only to be transported in its original packaging.
→ During transportation the packaged devices must be suitably fastened and secured to prevent damage caused for example by slipping of the load.

1.13. Storage

- Store the device, partially or fully assembled, in a dry and weatherproof manner in the original packaging in a clean environment.
- Protect the device against environmental influences and dirt until final installation.
- We recommend storing the device for no longer than one year in order to guarantee trouble-free operation and the longest possible service life.
- Ensure compliance with the specified storage temperature.

1.14. Disposal

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

2. INTENDED USE

The device is designed exclusively as a built-in device in accordance with the technical specifications. It does not function independently and is not intended to be handed over to end customers.
Any other usage above and beyond this does not conform to the intended purpose and constitutes misuse of the device.
The end manufacturer is responsible for the end product and must ensure that adequate safety precautions are taken. Customer equipment must be suited to the mechanical, thermal and service life demands involved. All intended applications must be checked by the end manufacturer with respect to safety.

2.1. General conditions also governing intended use

- The device is only to be used at the permissible ambient temperature.
- The specifications must be observed.
- Only gases belonging to gas families 2 & 3 (as defined by DVGW worksheet G260) are to be conveyed.
- The device is to be fitted in a complete system for conveying air/gas mixtures.
- The built-in component is not to be started up until it has been installed in the customer's device.
- In LPG installations the gas valve is not to be operated at temperatures below 0°C. Suitable for LPG in gaseous state only, liquid hydrocarbons would destroy the sealing materials.

2.2. Improper use

In particular the following types of device usage are prohibited and could lead to hazardous situations:

- The conveying of a medium containing abrasive particles.
- The conveying of a medium containing substances (halogens, chlorides, fluorides etc.) which are aggressive and/or highly corrosive.
- The conveying of a medium with a high dust pollution level, e.g. construction materials.
- Operation of the device in an environment containing explosive gases or dusts, combustible solids or flammable liquids.
- The conveying of air/gas mixtures when not fitted in a complete system satisfying the requirements described above.
- Operation in medical equipment with a life-sustaining or life-support function.
- Contact with substances which could damage device components, e.g. cleaning fluids.
- Operation with completely or partially disassembled or manipulated protective devices.
- Exposure to radiation which could damage device components, e.g. intense UV radiation.
- Operation with external vibration.
- Operation of the device in an explosive atmosphere.
- In addition, all applications not listed under Intended use.

3. CONNECTION AND START-UP

3.1. Mechanical connection



CAUTION

Risk of cuts and crushing hazard when removing the device from its 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 removing the 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.

- Check the device for transportation damage. Devices must not be installed if they are damaged.
- Install the device in accordance with the application concerned.
- Make use of suitable fasteners for installation.
- Protect flange surfaces, tighten screws diagonally and take care to avoid strain on installation.



DANGER

Escape of gas if housing is not gas-tight

Risk of fatal injury

→ Prior to start-up and after performing any work, check the device to make sure there is no leakage of gas.
When doing so, seal off the intake and exhaust openings as well as the shaft penetration.
→ Also check that rotating parts are not scraping against fixed parts.
→ The gas supply must be interrupted when working on the unit.
→ Avoid naked flames.



DANGER

Leaks may occur.

The design of the device means that it is not tightly sealed at the shaft penetration for example. This can result in leakage in the event of inexpert operation.
Deflagration is also a possible cause of long-term damage or housing deformation which may result in leakage. A mixture of air and gas may accumulate on the outside of the gas device.
The device could explode and cause serious injury.
→ Check the possible hazards associated with the installation, operation, servicing or disposal of the gas device in conjunction with the device concerned.

Avoid any such hazards.
Take all appropriate action in this regard.

Safety measures if there is a smell of gas

→ Avoid naked flames and spark formation (e.g. switching lights and electrical appliances on and off, including mobile phones)
→ Open windows and doors
→ Close the gas shut-off valve
→ Warn the occupants of the building and leave the premises
→ Inform the gas company from outside the building

DANGER

Risk of toxic gas formation

Gas valve offset and main flow restrictor settings influence the mixture composition and thus the combustion quality. The settings must therefore be checked and if necessary corrected on start-up and after servicing the unit. The settings made must always be in accordance with the operating instructions of the end device manufacturer.

CAUTION

The use of leak detector spray can cause malfunctioning. Leak detector spray must be kept away from electrical contacts and must not be allowed to ingress into the diaphragm opening at the gas control valve.

3.2. Electrical connection

DANGER

Voltage at the device

Electric shock

→ A protective earth is also always to be provided for the housing/metal parts if these are not connected to a protective earth connection (yellow/green wire) at the motor.
→ Check the protective earth.

DANGER

Faulty insulation

Risk of fatal injury from electric shock

→ Check the insulation for possible damage prior to connection/start-up.
→ Only use wiring conforming to the insulation specifications with regard to voltage, current, insulation material and load rating etc.
→ Take care to route the wiring such that it cannot come into contact with any rotating parts.

WARNING

Voltage, electric shock

The device is a built-in component with no isolating switch. Metallic parts may be live.

→ The device is only to be used together with the specified cable protection.
→ Only connect the device to circuits which can be de-energised with an all-pole disconnection switch.
→ When working on the device, the power must be interrupted and the system/machine in which the device is installed must be secured so as to prevent renewed switch-on.

WARNING

Water ingress into wires or cables

The ingress of water at the customer cable end can lead to device damage.

→Make sure the end of the cable is connected in a dry location.

NOTE

Risk of device interference

→ Never route the control lines of the device right alongside the power supply line and ignition cable (if fitted). Maintain the greatest possible clearance.
Recommendation: Clearance > 10 cm (separate cable routing).

Prerequisites

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

Connect wires to terminals (only applies to devices with terminal connection).

WARNING

Live terminals and connections even with the device switched off

Electric shock

→ Wait five minutes following all-pole disconnection of the voltage before touching the device.

WARNING

Voltage at the cable gland

Electric shock

→ Never use metal cable glands for plastic terminal boxes.

Residual current circuit breakers (RCCB)

We strongly recommend making exclusive use of universal residual current devices (type B or B+). As is also the case with frequency converters, the use of residual current devices of type A does not provide protection for personnel during operation of the device.
When the device power supply is switched on, charging current pulses from the capacitors in the integrated EMC filter can lead to the instant triggering of residual current devices. We recommend the use of residual current circuit breakers with an activation threshold of 300 mA and delayed tripping (super-resistant, characteristic K).

Reactive currents

On account of the EMC filter integrated to ensure compliance with the EMC limits (interference emission and immunity to interference), reactive currents in the mains line can be measured even when the motor is at a standstill and with the mains power switched on.

3.3. Plug connection

3.3.1. Preparation of connection line

The cables, including the customer interface, are subject to the specifications for internal wiring.
Ensure standard conformity and check the protection rating in the end device after installing the ebm-papst device.

3.3.2. Making supply connections

WARNING

Voltage

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

→ Connect the device to a suitable tripping device.
→ Only connect the device to circuits which 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 renewed switch-on.
→ Never reach into the opening - risk of injury. The protective earth must be connected.
→ Caution - metallic parts may be live: Interrupt the power supply.
→ Protection for the system must be provided in the device by way of a fuse, thermal cut-out, overcurrent release or similar.
→ In accordance with DIN EN 60335-1, a fuse with a rating of max. 16 A must be fitted in the supply line for equipment protection.

- Check the pin assignment of your connector.
- Plug the mating connector into the built-in connector.
- Ensure that the connector is properly engaged.

3.4. Checking connections

- Ensure isolation from supply (all phases). Secure against renewed switch-on.
- Check that the mating connector is properly engaged in the built-in connector.
- Check that the mating connector is properly attached to the connection line.

3.5. General – switching on the device

WARNING

Hot housing

Risk of fire

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

- Before switching on, check the device for visible external damage and make sure the protective devices are functional.
- Apply the nominal supply voltage.
- Start the device by changing the input signal.
- Check the air flow paths of the device for foreign matter and remove any foreign matter found.
- Apply 0 VDC to the 0-10 V control input if this is being used.
- Apply 0% PWM to the PWM control input if this is being used.
- On connection, make sure the earth conductor connection is connected first.

3.6. General – switching off the device

Device switch-off during operation:

- Switch off the device via the control input.
- Do not switch the motor on and off at the mains (e.g. in cyclic operation).

Device switch-off for maintenance:

- Switch off the device via the control input.
- Disconnect the device from the power supply.
- On disconnection, make sure the earth conductor connection is disconnected last.

4. MAINTENANCE

- Do not perform any repairs on your device. Send the device to ebm-papst for repair or replacement.
- Always use new seals following the removal or re-fitting of parts.
- The gas supply must be interrupted when working on the system.

WARNING

Live terminals and connections even with the device switched off

Electric shock

→ Wait five minutes following all-pole disconnection of the voltage before touching the device.

WARNING

If control voltage is being applied or a speed setpoint has been stored, the device will start up again automatically, e.g. after mains failure. The safety valves of the gas valve open automatically.

Risk of injury

→Keep out of the device hazard zone.
→ When working on the device, switch off the mains power and secure against renewed switch-on.
→ Wait for the device to stop.
→ After working on the device, remove any tools or other objects used.

WARNING

The motor may start up again automatically if the control signal of a device connected to the mains is no longer applied.

Risk of injury

→ When working on the device, switch off the mains power and secure against renewed switch-on.
→Wait for the device to stop.

WARNING

Device still electrically charged following switch-off

Electric shock, risk of injury

Capacitors store electrical energy and are therefore always to be handled with caution. They may still be charged with life-threatening high voltages for a long time after switch-off. The same applies to all system components and devices conductively connected to a capacitor. The general rules of electrical engineering on working with live components in electrical installations are always to be observed.

5. MANUFACTURER CODES

DE(L):

ebmpapst Landshut GmbH
Hofmark-Aich-Str. 25
84030 Landshut
Germany

DE(M):

ebmpapst Mulfingen GmbH & Co. KG
Bachmühle 2
74673 Mulfingen
Germany

Slovenia(Y):

ebm-papst Slovenija d.o.o
Podskrajnik 16
1380 Cerknica
Slovenia

Czech Republic(N):

ATAS elektromotory Náchod a.s.
Bratří Čapků 722
547 30 Náchod
Czech Republic

China(S):

ebm-papst Ventilator (Shanghai) Co.,Ltd
No.418, Hua Jing Road, Wai Gao Qiao Free Trade Zone, Pudong
200131 Shanghai
People's Republic of China

China(N):

ebm-papst Motor (Shanghai) Co.,Ltd.
No.289 Xuanzhong Road, Nanhui Industrial Zone
201300 Shanghai
People's Republic of China

Serbia(S):

ebmpapst d.o.o Sombor
Konjovićeva 78
25000 Sombor
Serbia