Installation and safety instructions for AC/DC built-in devices

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

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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 warning levels

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



DANGER

Indicates an imminent hazardous situation which, if the appropriate action is not taken, will result in serious and even fatal injury. The measures must be strictly observed.

WARNING

Indicates a potentially hazardous situation which, if the appropriate action is not taken, could result in serious and even fatal injury. Exercise extreme caution while working.

CAUTION

Indicates a potentially hazardous situation which, if the appropriate action is not taken, could result in slight or minor injury or damage to property.

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
- The conveying of unsuitable media
- Defects in supply lines

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 safety regulations

The safety hazards associated with the device must be carefully re-assessed following installation in the end device. 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, additions or conversions to the system 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

Terminals and connections may be live 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, voltage will be applied to the rotor and – if fitted – to the impeller

→ Never touch the rotor and – if fitted – the impeller when installed.



DANGER

If control voltage is being applied or a specified speed value has been stored, the device will start up again automatically, e.g. after mains failure.

Risk of injury

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

1.6. Safety and protective functions



DANGER

Missing guard and non-functioning safety device

Without a guard there is a risk of serious injury on reaching into the device during operation for example.

→ Never operate the device without a fixed safety barrier and screen. The safety barrier must be capable of withstanding the kinetic energy of a fan blade.
→ The device is a built-in component which does not function independently. The operator is responsible for providing adequate protection.
→ Stop the device immediately if a safety 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 shielding measures have to be taken before being placed on the market.



NOTE

Electrical or electromagnetic interference after fitting the device in customer installations.

→ Make sure the entire installation satisfies EMC requirements.

1.8. Mechanical movement



DANGER

Rotating device

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. Wait until all parts have come to a standstill before starting work on the installation/machine.

1.9. 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

→ Take appropriate technical safety measures.
→ Protect operating personnel with appropriate safety equipment, e.g. hearing protection.
→ Also observe the regulations of local authorities.

1.10. Hot surface



CAUTION

High temperature at the housing

Risk of burns

→ Ensure that sufficient protection against accidental contact is provided.

1.11. Transportation



NOTE

Transportation of 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.

1.12. 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 ambient influences and dirt until final installation.
- We recommend storing the device for no longer than one year in order to guarantee proper operation and maximum possible service life.
- Ensure compliance with the specified storage temperature.

1.13. 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. Intended use also includes

- The device is only to be used at the permissible ambient temperature.
- The device is only to be operated with all safety devices in position.
- The specifications must be observed.
- The built-in component is not to be started up until it has been installed in the customer's device.

2.2. Improper use

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

General and fans:

- 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 content, e.g. construction materials.

General:

- Operation of the device in an environment containing explosive gases or dusts, combustible solids or flammable liquids.
- Use of the device as a safety component or for the implementation of safety-related functions.
- 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 safety 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 possible applications not listed under Intended use.

3. CONNECTION AND START-UP

3.1. Mechanical connection



CAUTION

Risk of cuts and crushing 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

Unpacking the device involves lifting a heavy load

Risk of sustaining 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. Damaged devices are not to be installed.
- 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.

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

→ 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

Ingress of water into wires or cables

The ingress of water at the customer end of the cable may damage the device.

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



NOTE

Risk of subjecting devices to interference

→ Never route the control lines of the device right alongside the power supply line and ignition cable (if applicable). Maintain the greatest possible clearance.

Recommendation: Clearance > 10 cm (separate cable routing).

Prerequisites

- Check that the data on the rating plate correspond to 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 rating plate.

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

WARNING

Terminals and connections may be live 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 cable gland

Electric shock

→ Never use metal cable glands for plastic terminal boxes.

Residual current circuit breakers

It is strongly recommended to make 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 may cause residual current devices to be instantly tripped. 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 integrated EMC filter fitted to ensure compliance with the EMC limits (interference emission and immunity), reactive currents can be measured in the mains line even with the motor not running and mains power switched on.

3.3. Plug connection

3.3.1. Preparation of cable for connection

The cables, including the customer interface, are subject to the specifications for internal wiring.
Ensure conformity with applicable standards and check the type of protection 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 fan/motor 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 to protect the device.

- Check the pin assignment of your connector.
- Plug the built-in connector and mating connector together.
- Make sure the connector is properly engaged.

3.4. Checking connections

- Ensure isolation from the 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 connecting cable.

3.5. General – switching on 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 any obvious external damage and make sure the safety devices are functioning properly.
- Apply the nominal supply voltage.
- Start the device by altering 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.

3.6. General – switching off device

- Device switch-off during operation:
- Switch off the device by way of the control input.
- Do not switch the motor on and off at the mains (e.g. in cyclical operation).
- Device switch-off for maintenance:
- Switch off the device by way of the control input.
- Disconnect the device from the power supply.
- On disconnection, make sure the earth conductor connection is disconnected last.

4. MAINTENANCE

– Never perform repair work on the device. Send the device to ebm-papst for repair or replacement.

WARNING

Terminals and connections may be live 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 specified speed value has been stored, the device will start up again automatically, e.g. after mains failure.

Risk of injury

→ Keep out of the danger zone of the device.
→ When working on the device, switch off the mains power supply 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 ceases to be applied.

Risk of injury

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

WARNING

Device still electrically charged following switch-off

Risk of electric shock on contact

→ Wait 5 minutes following all-pole disconnection of the voltage before touching the device.