Installation, safety and maintenance instructions for AC/DC built-in components

This product is a built-in component. The built-in component type and date of manufacture (calendar week/year) can be found on the nameplate of the built-in component. In the event of any queries about the built-in component, please quote all the details given on the nameplate.

For further information please visit:
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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 any 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 risk of injury, damage and malfunctioning and act accordingly.

The product documentation is to be regarded as part of the built-in component. The built-in component 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

This product documentation uses 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, will 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 built-in component
- Inexpert installation, start-up, operation and servicing of the built-in component
- Operation of the built-in component 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
- Unauthorized structural modifications to the built-in component
- Inexpert repair work
- Force majeure
- Damage arising from continued usage although a fault has occurred
- Unsuitable conveying and surrounding media
- Defects in supply lines
- Non-use of ebm-papst genuine parts

1.3. Personnel qualifications

The built-in component is only to be transported, unpacked, operated, serviced or put to any other form of use by appropriate, 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 built-in component 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 and product accident prevention regulations and technical rules). Observe the following when working on the built-in component:

– Do not make any modifications or additions to the built-in component 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 built-in component at regular intervals. Replace any loose connections or defective cables immediately.

DANGER

If control voltage is applied, the built-in component may re-start automatically, e.g. after a power failure.

Risk of injury

→ Keep out of the built-in component's hazard zone.
→ When working on the built-in component, switch off the line voltage at all poles and secure it against being switched on again.
→ Wait until the built-in component stops.

DANGER

Live terminals and connections even with the built-in component switched off

Electric shock

→ The electrical connections of the built-in component may still have an electrical voltage present after 5 minutes due to loads in internal capacities.

DANGER

In the event of a fault, there may be voltage at the rotor and – if present – the fan impeller.

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

1.6. Safety and protective functions

DANGER

Missing guard and non-functioning protective device

Without a protective device, there is a risk of serious injury, for instance when reaching into the built-in component during operation.
→ Only operate the built-in component with a fixed protective device and guard grill. The protective device must be capable of withstanding the kinetic energy of a fan blade.
→ Protective devices are not designed to be walked on.
→ The product is a built-in component without an independent function. As the operator, you are responsible for adequately safeguarding the built-in component.
→ Stop the built-in component 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 shielding measures have to be taken before market introduction.

NOTE

Electrical or electromagnetic interference after installing the built-in component in customer equipment.

→ Make sure that the entire installation satisfies EMC requirements.

1.8. Mechanical hazard

DANGER

Rotating built-in component parts

There is a risk of injury to any parts of the body coming into contact with the rotor and – if present – the fan impeller.
→ Secure the built-in component against accidental contact.
→ Particles may be flung out. Do not look into the outlet / keep body away from the outlet.
→ Wear close-fitting protective clothing, goggles and a hair net.
→ Remove ties, jewelery and any other objects which could be drawn in by the rotor and – if fitted – the fan impeller.
→ 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.

1.9. Noise emissions

WARNING

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

There is a risk of noise-induced hearing loss

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

1.10. Hot surface

CAUTION

Surfaces of the built-in component can become hot.

→ There is therefore a risk of burns. Adequate accidental contact protection must be ensured, for instance by installing in a device with housing.

1.11. Transportation

NOTE

Transporting the built-in component

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

1.12. Storage

→ Store the built-in component, partially or fully assembled, in a dry and weather-proof manner in the original packaging in a clean environment.
→ Protect the built-in component against ambient influences and dirt until final installation.
→ We recommend storing the built-in component 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.

1.13. Disposal

Observe all the relevant local requirements and regulations with regard to disposal of the built-in component.

2. INTENDED USE

The product is designed exclusively as a built-in component 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 or usage above and beyond this does not conform to the intended purpose and constitutes misuse of the built-in component.
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. The safety of all intended applications must be checked by the end manufacturer.

2.1. General intended use

Intended use includes:

- The built-in component is only to be used at the permissible ambient temperature.
- The specifications must be observed.
- Operation in the ambient medium air.
- The built-in component is not to be started up until it has been installed in the end device.
- The built-in component is only to be operated with all protective devices in position.
- In line with EN60335-1, the end device may only be opened with a tool to touch the built-in component.

2.2. Improper use

Using the built-in component in the ways listed below in particular is prohibited and can lead to hazardous situations:

General:

- Operating the built-in component in an environment containing explosive gases or dusts, combustible solids or flammable liquids.
- Operating the built-in component in an explosive atmosphere.
- Using the built-in component as a safety component or to perform safety-related functions.
- Operation in medical equipment with a life-sustaining or life-support function.
- Contact with substances which could damage the built-in component, e.g. fluids or cleaning agents.
- Contact with hardened masonry, concrete walls or flooring, as materials escape that can lead to damage to the built-in component.
- Operating the device with protective devices that have been tampered with or completely or partially disassembled.
- Exposure to radiation which could damage built-in components, e.g. intense UV radiation.
- Operation with external vibration.
- All other applications not listed as intended uses.

General and fans:

- Conveying a medium/operation in a medium that contains abrasive (erosive) particles.
- Conveying a medium/operation in a medium containing aggressive substances (halogens, chlorides, fluorides etc.) and/or highly corrosive substances.
- Conveying a medium/operation in a medium with high dust exposure, e.g. construction materials.

3. CONNECTION AND START-UP

3.1. Mechanical connection

CAUTION

Cutting and crushing hazard when removing the built-in component from the packaging.
→ Lift the built-in component 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 built-in component

Risk of physical injury, such as back injuries.

→ Two people are required to lift the built-in component out of its packaging if it weighs more than 10 kg.

- Check the built-in component for transportation damage. Built-in components must not be installed if they are damaged.
- Install the built-in component in accordance with the application concerned. It is imperative to keep ventilation openings and cooling fins free.
- Use suitable fasteners for installation.
- Protect flange surfaces, tighten screws crosswise and ensure that the built-in component is installed free of tension.
- Damage to the built-in component (intake flange, discharge flange) due to impermissibly high forces is the responsibility of the end device manufacturer.

NOTE

Damage to the built-in component due to vibrations

Bearing damage, reduced service life

→ There must be no forces or impermissibly severe vibrations transferred to the built-in component from components of the end device. Severe vibrations can be caused, for example, by improper handling, transport damage due to the resulting imbalance, and component or structural resonance.

→ If the built-in component is connected to air ducts, this connection should be isolated from vibration, for example using expansion joints.

→ As part of commissioning the built-in components, speed ranges with excessively high vibration levels and any possible resonant frequencies must be determined. In the application, these must be passed through as quickly as possible, as operation can lead to premature failure if the vibration levels are too high.

3.2. Electrical hookup

DANGER

Voltage at the built-in component

Electric shock

→ A protective earth is also always to be provided for the housing and metal parts if these are not connected to a protective earth terminal (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 cables that comply with the specified insulation regulations with regard to voltage, current, insulation material, load rating etc. as well as a corresponding cross-section for conductivity.
→ Route cables so that they cannot be touched by rotating parts and do not put mechanical force on them, i.e. if necessary, fit strain relief.

WARNING

Voltage, electric shock

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

Metallic parts may be live.

→ The built-in component is only to be used together with the specified cable guard.
→ When working on the gas valve and/or the built-in components, the power supply must be interrupted at all poles, it must be ensured that it is safely isolated from supply and the system/machine in which the built-in component is installed must be secured against switching on again.

WARNING

Water ingress into wires or cables

Water can get in at the customer's cable end and damage the built-in component.

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

NOTE

Risk of built-in component interference

→ Never route the control wire of the built-in component right alongside the supply line and ignition cable (if fitted). Maintain the greatest possible clearance.
Recommendation: Clearance > 10 cm (separate cable routing).

Requirements

- Check whether the data on the nameplate matches the connection data.
- Before connecting the built-in component, make sure that the power supply matches the built-in component voltage.
- Only use cables designed for the current level indicated on the nameplate.
- Connect wires to terminals (only applies to built-in components with terminal connection).

WARNING

Live terminals and connections even with the built-in component switched off

Electric shock

→ The electrical connections of the built-in component may still have an electrical voltage present after 5 minutes due to loads in internal capacities. The built-in component may therefore only be opened by trained, expert personnel after determining the freedom from voltage and load.

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 using RCD protective devices in accordance with VDE0100-530. An RCD type A is only sufficient for built-in components with protection class 2. For built-in components with protection class 1, single-phase supply, an RCD type F may be sufficient. Depending on the type of built-in component and the application, we strongly recommend using an RCD type B or B+.
If you have any queries about this, please contact us.

When the built-in component power supply is switched on, charging current pulses from the capacitors in the integrated EMC filter can lead to the instant triggering of RCD protective devices or circuit breakers. We recommend the use of residual current circuit breakers with a trip threshold of 100 mA or 300 mA as well as circuit breakers for higher start-up currents (characteristic C).

Reactive currents/leakage 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 supply line, for example in the form of leakage currents, can be measured even when the motor is at a standstill and with the line voltage switched on.

3.3. Connecting the built-in component via plug

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 standards and check the degree of protection in your end device after installing the ebm-papst built-in component.

3.3.2. Making power supply connections

WARNING

Voltage

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

On connection, make sure that the ground connection is connected first.

→ When working on the gas valve and/or the built-in components, the power supply must be interrupted at all poles, it must be ensured that it is safely isolated from supply and the system/machine in which the built-in component is installed must be secured against switching on again.
→ Never reach into the opening - risk of injury. The protective earth must be connected.
→ Caution - metallic parts may be live: Interrupt the power supply.

→ In accordance with international standards (e.g. IEC 60335-1), a fuse, safety temperature limiter, overcurrent release must be connected upstream in the supply line for built-in component protection. A circuit breaker from the building installation alone is not sufficient for this purpose. Please contact us to choose a fine-wire fuse, which is preferably interchangeable.

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

NOTE

Electrical connection of the built-in component using a plug connection

→ When establishing the electrical connection of the built-in component using a plug connection (supply line or control wire), it must be ensured that the plug is positioned correctly and straight, and that connecting is done at a low force.

→ If there is too much force, the mating connector of the built-in component or the complete built-in component may become damaged.

→ The plug connection itself is not suitable for long-term plugging in and unplugging. As a rule, the electrical connection should only be made once and should only be repeated in exceptional cases (e.g. in case of servicing).

3.4. Checking electrical connections

- Ensure safely isolated from supply (at all phases). Secure against being switched on again.
- Check that the mating connector is properly engaged with the built-in connector.
- Check that the mating connector is properly attached to the cable.

3.5. General – Switching the built-in component on

WARNING

Hot housing

Risk of fire

→ Make sure there are no combustible and flammable substances in the vicinity of the built-in component.

- Before switching on, check the built-in component for visible external damage and make sure the protective devices are functional.
- Check the built-in components' air flow paths for foreign matter and remove any foreign matter found.
- Apply 0 VDC to the 0-10 V control input (if you are using the control input).
- Apply 0 % PWM to the PWM control input (if you are using the PWM control input).
- Apply the nominal supply voltage.
- Start the built-in component by changing the input signal.

3.6 General – Switching the built-in component off

Switching the built-in component off during operation:

- Switch off the built-in component via the control input, if available.
- In cyclic operation, do not switch the built-in component on and off at the power supply.

Switching the built-in component off for maintenance work:

- Switch off the built-in component via the control input, if available.
- Disconnect the built-in component from the power supply at all poles.

On disconnection, make sure that the ground connection is disconnected last.

4. MAINTENANCE

- Do not perform any repairs on your built-in component. Motor protection caps, if fitted, must not be removed. Send the built-in component to ebmpapst for repair or replacement.
- Always use new seals following the removal or re-fitting of parts.
- The built-in component is to be inspected regularly, ideally every year, and, if required, it should have the relevant maintenance work performed.
- The built-in component should only be cleaned with a damp cloth so that no electrostatic charges can occur.

WARNING

Live terminals and connections even with the built-in component switched off. Electric charge after the built-in component has been switched off.

Electric shock, risk of injury

→ The electrical connections of the built-in component may still have an electrical voltage present after 5 minutes due to loads in internal capacities.

→ 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 recognized rules of electrical engineering on working with live components in electrical installations are always to be observed.

WARNING

If voltage is applied, the built-in component may restart automatically, e.g. after a power failure.

Risk of injury

→ Keep out of the built-in component's hazard zone.
→ When working on the built-in component, switch off the line voltage at all poles and secure it against being switched on again.
→ Wait until the built-in component stops.
→ After working on the built-in component, remove any tools or other objects used from the built-in component.

WARNING

If the control signal of a built-in component connected to the power is removed, the motor may restart automatically depending on the interface configuration.

Risk of injury

→ When working on the built-in component, switch off the line voltage at all poles and secure it against being switched on again.
→ Wait until the built-in component stops.

5. MANUFACTURER CODES

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