

ebm-papst Mulfingen GmbH & Co. KG
 Bachmühle 2
 D-74673 Mulfingen
 Phone +49 (0) 7938 81-0
 Fax +49 (0) 7938 81-110
 info1@de.ebmpapst.com
 www.ebmpapst.com

CONTENTS

1. SAFETY REGULATIONS AND NOTES	1
1.1 Levels of hazard warnings	1
1.2 Staff qualification	1
1.3 Basic safety rules	1
1.4 Electrical voltage	1
1.5 Safety and protective functions	2
1.6 Electromagnetic radiation	2
1.7 Mechanical movement	2
1.8 Deflagration	2
1.9 Emission	2
1.10 Hot surface	3
1.11 Transport	3
1.12 Storage	3
1.13 Disposal	3
2. PROPER USE	3
3. TECHNICAL DATA	5
3.1 Product drawing	5
3.2 Nominal data	6
3.3 Data according to ErP directive	6
3.4 Technical features	6
3.5 Mounting data	6
3.6 Transport and storage conditions	6
3.7 Electromagnetic compatibility	7
4. CONNECTION AND START-UP	7
4.1 Connecting the mechanical system	7
4.2 Connecting the electrical system	7
4.3 Connection in terminal box	8
4.4 Factory settings	10
4.5 Connection screen	11
4.6 Checking the connections	12
4.7 Switch on device	12
4.8 Switching off the device	12
5. INTEGRATED PROTECTIVE FUNCTIONS	12
6. MAINTENANCE, MALFUNCTIONS, POSSIBLE CAUSES AND REMEDIES	13
6.1 Cleaning	14
6.2 Safety test	14

1. SAFETY REGULATIONS AND NOTES

Please read these operating instructions carefully before starting to work with the device. Observe the following warnings to prevent malfunctions or physical damage to both property and people.

These operating instructions are to be regarded as part of this device. If the device is sold or transferred, the operating instructions must accompany it.

These operating instructions may be duplicated and forwarded for information about potential dangers and their prevention.

1.1 Levels of hazard warnings

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. Compliance with the measures is mandatory.

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

The device may only be transported, unpacked, installed, operated, maintained and otherwise used by qualified, trained and authorised technical staff.

Only authorised specialists are permitted to install the device, to carry out a test run and to perform work on the electrical installation.

1.3 Basic safety rules

Any safety hazards stemming from the device must be re-evaluated once it is installed in the end device.

Observe the following when working on the unit:

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

1.4 Electrical voltage

- ⇒ Check the electrical equipment of the device at regular intervals, refer to chapter 6.2 Safety test.

- ⇒ Replace loose connections and defective cables immediately.



DANGER

Electrical load on the device

Risk of electric shock

- Stand on a rubber mat if you are working on an electrically charged device.

WARNING

Terminals and connections have voltage even with a unit that is shut off

Electric shock

- Wait five minutes after disconnecting the voltage at all poles before opening the device.

CAUTION

In the event of failure, there is electric voltage at the rotor and impeller

The rotor and impeller are base insulated.

→ Do not touch the rotor and impeller once they are installed.

CAUTION

If control voltage is applied or a speed setpoint is stored, the motor automatically restarts, e.g. after a power failure.

Danger of injury

→ Keep out of the danger zone of the device.

→ When working on the device, switch off the mains supply voltage and secure the latter from being switched on again.

→ Wait until the device stops.

→ After working on the device, remove any used tools or other objects from the device.

1.5 Safety and protective functions**DANGER**

Missing safety device and non-functioning safety device

If there is no safety device, you could be seriously injured, for example if you reach into the running device or your hands are sucked into it.

→ Operate the device only with a fixed and isolating safety protection and a fixed guard grille.
The guard must withstand the kinetic energy of a fan blade detaching at maximum speed.

→ The device is a built-in component. You, the owner/operator, are responsible for providing adequate protection for the device.

→ Shut down the device immediately if you detect a missing or ineffective protective feature.

1.6 Electromagnetic radiation

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

If unacceptable emission intensities occur when the fan is installed, appropriate shielding measures have to be taken by the user.

NOTE

Electrical or electromagnetic interferences after integrating the device in installations on the customer's side.

→ Verify that the entire setup is EMC compliant.

1.7 Mechanical movement**DANGER**

Danger of injury from open blower

Gas escapes. When the blower is open, you come into contact with rotating and electrically live parts. Escaping gas may also cause explosions.

→ Never open the blower.

**DANGER**

Flying parts

Missing safety devices may cause balancing weights or broken fan blades to be ejected at high speeds, causing bodily harm.

→ Take appropriate safety measures.

WARNING

Rotating device

Long hair, loose items of clothing and jewellery could become entangled and pulled into the device. You could be injured.

→ Do not wear any loose clothing or jewellery while working on rotating parts.

→ Protect long hair by wearing a cap.

WARNING

Flying parts

Missing safety devices may cause fan blades to be ejected at high speeds, causing bodily harm.

→ Take appropriate safety measures.

The safety devices must prevent contact with rotating parts and the printed circuit board.

1.8 Deflagration**DANGER**

Gas escapes through leaky housing after deflagration

Danger of injury

→ After a deflagration, check that the housing of the gas blower is tightly sealed.

→ Replace any gas blower with a leaky housing.

**DANGER**

Fire and deflagration hazard

The gas blower is not approved according to Ex protection guidelines. Rotating parts can scrape against stationary parts. This may cause sparks and chips. The surface temperature may rise, resulting in a fire.

→ Check which hazards arise from installing, operating, servicing or disposing the gas blower in conjunction with your device.

Prevent these hazards.

Carry out all appropriate measures to this purpose.

1.9 Emission**WARNING**

Depending on the installation and operating conditions, a sound pressure level greater than 70 dB(A) may arise.

Danger of noise-induced hearing loss

→ Take appropriate technical safety measures.

→ Protect operating personnel with appropriate safety equipment, e.g. hearing protection.

→ Also observe the requirements of local agencies.

1.10 Hot surface



CAUTION

High temperature at the electronics enclosure

Danger of burn injuries

- Ensure that sufficient protection against accidental contact is provided.

1.11 Transport

NOTE

Transport of blower

- Transport the blower in its original packaging only.
- Secure the blower so that it does not slip, e.g. by using a clamping strap.

1.12 Storage

- ⇒ Store the device, partially or fully assembled, in a dry and weatherproof manner in the original packing in a clean environment.
- ⇒ Protect the device from environmental impacts and dirt until the final installation.
- ⇒ We recommend storing the device for a maximum up to one year to guarantee proper operation and longest possible service life.
- ⇒ Even devices explicitly suited for outdoor use are to be stored as described prior to being commissioned.
- ⇒ Maintain the storage temperature, see chapter 3.6 Transport and storage conditions.
- ⇒ Please make sure that all screwed cable glands are fitted with dummy plugs.

1.13 Disposal

When disposing of the device, please comply with all relevant requirements and regulations applicable in your country.

2. PROPER USE

The device is exclusively designed as a built-in device for moving air and gases according to its technical data.

Any other or secondary use is deemed improper and constitutes a misuse of the device.

Installations on the customer's side must meet the mechanical, thermal and service life-related stresses that can occur.

Proper use also includes:

- Use the device in power systems with earthed neutral (TN/TT power systems) only.
- Moving air in gas burners.
- Moving air with a density ranging from 0.9 to 1.2 kg/m³.
- Minding the operating instructions.
- Using the device within the permitted ambient temperature range; see chapter 3.6 Transport and storage conditions and chapter 3.2 Nominal data.
- Only using the device in stationary systems.
- Installing the device into an overall system for moving air.
- Commissioning the built-in component only after installation in the customer unit.
- Operating the device with all protective features in place.
- Only using the device in stationary systems.
- Carrying out all maintenance.

Improper use

Using the device in the following ways is particularly prohibited and may cause hazards:

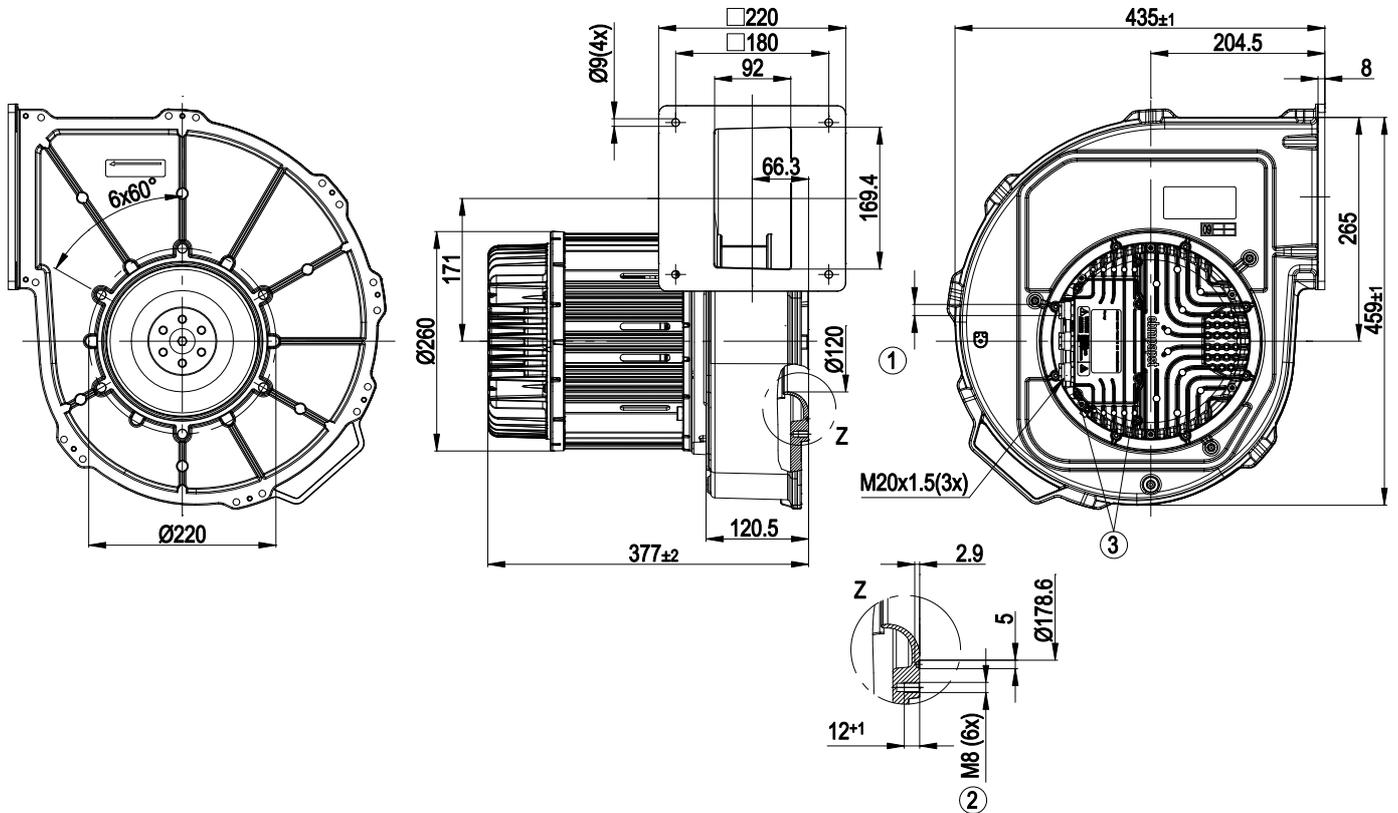
- Operating the device with an imbalance, e.g. caused by dirt deposits or icing.
- Moving a medium that contains abrasive particles.
- Moving a highly corrosive medium.
- Moving a medium that contains dust pollution, e.g. suctioning off saw dust.
- Operating the gas blower in an environment that contains flammable gases or dust or combustible solids or fluids.
- Moving an air/gas mixture outside an overall system that fulfils the requirements described above.
- Using the blower as a safety component or for taking on safety-related functions.
- Operation in medical equipment with a life-sustaining or lifesaving function.
- Contact with materials that could damage blower parts, e.g. liquids during cleaning.
- Operation with completely or partially disassembled or modified protective features.
- Exposure to radiation which could damage blower parts, e.g. strong UV radiation.
- Operation with external vibrations.
- Operating the device in an explosive atmosphere.
- Operation with completely or partially disassembled or modified protective features.
- In addition, all application options that are not listed under proper use.

- Operation in medical equipment with a life-sustaining or lifesaving function.
- Operation with external vibrations.
- Moving solids content in flow medium.
- Painting the device
- Connections (e.g. screws) coming loose during operation.
- Opening the terminal box during operation.



3. TECHNICAL DATA

3.1 Product drawing



All measures have the unit mm.

1	Cable diameter min. 4 mm, max. 10 mm, tightening torque 4 ± 0.6 Nm
2	Depth of screw 10-12 mm, tightening torque 20 ± 3 Nm
3	Tightening torque 3.5 ± 0.5 Nm



You can control the blower either via the 0-10 VDC input or the PWM input. Note: Inputs cannot be used simultaneously.

3.2 Nominal data

Motor	M3G112-EA
Phase	3~
Nominal voltage / VAC	400
Nominal voltage range / VAC	380 .. 480
Frequency / Hz	50/60
Type of data definition	ml
Speed / min ⁻¹	6100
Power input / W	2400
Current draw / A	4.0
Min. ambient temperature / °C	-25
Max. ambient temperature / °C	50
Min. temp. of flow medium / °C	-25
Max. temp. of flow medium / °C	+50

ml = Max. load · me = Max. efficiency · fa = Running at free air
cs = Customer specs · cu = Customer unit

Subject to alterations

3.3 Data according to ErP directive

Installation category	A
Efficiency category	Static
Variable speed drive	Yes
Specific ratio*	1.00

* Specific ratio = $1 + p_{is} / 100\,000\text{ Pa}$

	Actual	Request 2013	Request 2015
Overall efficiency η_{es} / %	59.8	51.3	54.3
Efficiency grade N	66.5	58	61
Power input P_{ed} / kW	2.29		
Air flow q_v / m ³ /h	1165		
Pressure increase total p_{sf} / Pa	4000		
Speed n / min ⁻¹	6495		

Data definition with optimum efficiency.

The ErP data is determined using a motor-impeller combination in a standardised measurement configuration.

3.4 Technical features

Mass	22.3 kg
Size	250 mm
Surface of rotor	Coated in black
Material of electronics housing	Die-cast aluminium
Material of impeller	Aluminium sheet
Housing material	Die-cast aluminium
Material of distancing profiles	Aluminium
Direction of rotation	Clockwise, seen on rotor

Type of protection	IP 20
Insulation class	"B"
Humidity class	F0
Mounting position	Any
Cooling bore / aperture	Rotor-side
Operation mode	S1
Motor bearing	Ball bearing
Technical features	- Output 10 VDC, max. 10 mA - Output 20 VDC, max. 50 mA - Tach output - Alarm relay - Motor current limit - PFC, passive - Soft start - Control input 0-10 VDC / PWM - Over-temperature protected electronics / motor - Line undervoltage / phase failure detection
Touch current acc. IEC 60990 (measuring network Fig. 4, TN system)	<= 3.5 mA
Electrical leads	Via terminal box
Motor protection	Thermal overload protector (TOP) wired internally
Protection class	I (if protective earth is connected by customer)
Approval	EAC; UL 1004-7 + 60730



For cyclic speed loads, note that the rotating parts of the device are designed for maximum one million load cycles. If you have specific questions, contact ebm-papst for support.

3.5 Mounting data

⇒ Secure the mounting screws against accidentally coming loose (e.g. by using self-locking screws).

Strength class for mounting screws	8.8
------------------------------------	-----

You can obtain additional mounting data from the product drawing if necessary.

3.6 Transport and storage conditions

⇒ Use the device in accordance with its protection type.

Max. permissible ambient motor temp. (transp./ storage)	+80 °C
Min. permissible ambient motor temp. (transp./storage)	-40 °C

3.7 Electromagnetic compatibility



If several devices 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.

4. CONNECTION AND START-UP

4.1 Connecting the mechanical system



DANGER

Gas leaking from improperly sealed housing

Risk of fatal injury

- Prior to commissioning, check that the housing of the gas blower is pressure-tight.
When doing so, close the intake and exhaust opening and the shaft opening.
- In addition, check that rotating parts do not scrape against stationary parts.



DANGER

Leaks may occur.

As a result of design necessities, the gas blower is not tightly sealed, e.g. at the shaft opening. This may cause leaks during operation. Deflagrations may also cause long-term damage or deformation of the housing, which can result in leaks. An air/gas mixture may accumulate outside of the gas blower. The blower may explode. You could be severely injured.

- Check which hazards arise from installing, operating, servicing or disposing of the gas blower in conjunction with your device.
Prevent these hazards.
Carry out all appropriate measures to this purpose.



CAUTION

Cutting and crushing hazard when removing the blower from the packaging



- Carefully remove the blower from its packaging, only touching the housing. Make sure to avoid any shock.
- Wear safety shoes and cut-resistant safety gloves.

CAUTION

Heavy load when taking out the device

Bodily harm, e.g. back injuries, are possible.

- Two people should remove the device out of its packaging together.

⇒ Check the device for transport damage. Damaged devices must no longer be installed.

⇒ Install the undamaged device according to your application.

4.2 Connecting the electrical system



DANGER

Electric voltage on the device

Electric shock

- Always install a protective earth first.
- Check the protective earth.



DANGER

Incorrect insulation

Risk of fatal injury from electric shock

- Use only cables that meet the specified installation requirements for voltage, current, insulation material, load etc.
- Route cables such that they cannot be touched by any rotating parts.

**DANGER**

Electrical load (>50 µC) between mains wire and protective earth connection after switching of the 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**Electrical voltage**

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

- Connect the device only to circuits that can be switched off using an all-pole disconnecting switch.
- When working on the device, you must switch off the system/machine in which the device is installed and secure it from being switched on again.

NOTE**Interferences and failures are possible**

Maintain a distance to the power supply line when routing the control lines of the device.

- Ensure a sufficiently large clearance.
- Recommendation: clearance > 10 cm (separate cable routing)

NOTE**Water penetration into leads or wires**

Water enters at the cable end on the customers side and can damage the device.

- Make sure that the cable end is connected in a dry environment.



The control voltage circuit is not electrically isolated. Connect the device only to circuits that can be switched off using an all-pole disconnecting switch.

4.2.1 Prerequisites

- ⇒ Check whether the data on the type plate agree with the connection data.
- ⇒ Before connecting the device, ensure that the supply voltage matches the operating voltage of the device.
- ⇒ Only use cables designed for current according to the type plate. For determining the cross-section, follow the basic principles in accordance with EN 61800-5-1. The protective earth must have a cross-section equal to or greater than the outer conductor cross-section. We recommend the use of 105°C cables. Ensure that the minimum cable cross-section is at least AWG26/0.13 mm².

4.2.2 Power supply connection, fuse protection

Assignment of conductor cross-sections and the fuse protection required for them (overload protection only, no device protection).

Nominal voltage	Safety fuse		Automatic circuit breaker	Wire cross-section	Wire cross-section
	VDE	UL	VDE	mm ²	*AWG

3/PE AC 380 - 480 VAC	16 A	15 A	C16A	1.5	16
3/PE AC 380 - 480 VAC	20 A	20 A	C20A	2.5	14
3/PE AC 380 - 480 VAC	25 A	25 A	C25A	4.0	12
3/PE AC 380 - 480 VAC	32 A	30 A	C32A	6.0	10

* AWG = American Wire Gauge

4.2.3 Idle current

Because of the EMC filter integrated for compliance with EMC limits (interference emission and interference immunity), idle currents in the mains cable can be measured even when the motor is at a standstill and the mains voltage is switched on.

- The values lie in a range of typical < 250 mA.
- The effective power in this operating state (readiness for operation) is simultaneously at typical < 5 W.

4.2.4 Residual current operated device

Only universal (type B or B+) RCD protective devices are permitted. Like frequency inverters, RCD protective devices cannot provide personal safety while operating the device. When switching on the power supply of the device, pulsed charge currents from the capacitors in the integrated EMC filter can lead to the RCD protective devices triggering without delay. We recommend residual current devices with a trigger threshold of 300 mA and delayed triggering (super-resistant, characteristic K).

4.2.5 Leakage current

For asymmetrical power systems or if a phase fails, the leakage current can increase to a multiple of the nominal value.

4.2.6 Locked-rotor protection

Due to the locked-rotor protection, the start-up current (LRA) is equal to or less than the nominal current (FLA).

4.3 Connection in terminal box**4.3.1 Preparing connection lines for the connection**

Strip the cable just enough so that the screwed cable gland is tight and the terminals are relieved of strain. Tightening torque, see chapter 3.1 Product drawing.

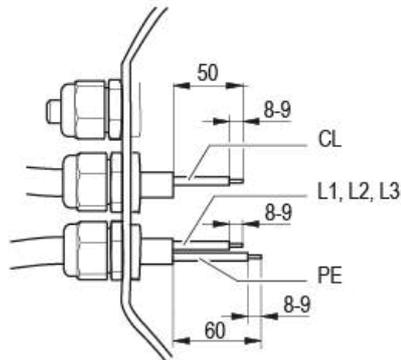


Fig. 1: Recommended stripping lengths in mm (inside the terminal box)
Legend: CL = control lines

4.3.2 Connecting cables with terminals

WARNING

Terminals and connections have voltage even with a unit that is shut off

Electric shock

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

⇒ Remove the cap from the screwed cable gland.

Remove the cap only in those places where cables are inserted.

⇒ Mount the screwed cable glands with the seal inserts provided in the terminal box.

⇒ Insert the line(s) (not included in the standard scope of delivery) into the terminal box.

⇒ First connect the "PE" (protective earth) connection.

⇒ Connect the lines to the corresponding terminals.

Use a screwdriver to do so.

During the connection work, ensure that no cables splice off.

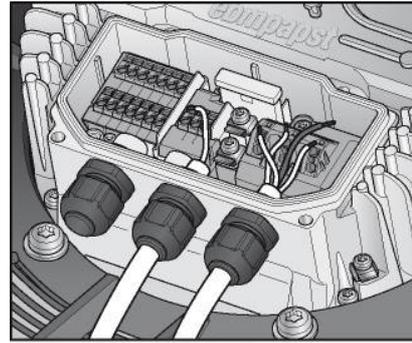


Fig. 2: Connecting the wires to terminals

⇒ Seal the terminal box.

4.3.3 Cable routing

No water may penetrate along the cable in the direction of the cable gland. When routing the cable, ensure that the screwed cable glands are arranged at the bottom. The cables must always be routed downwards.

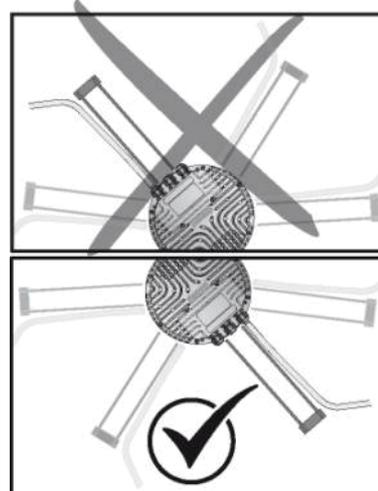


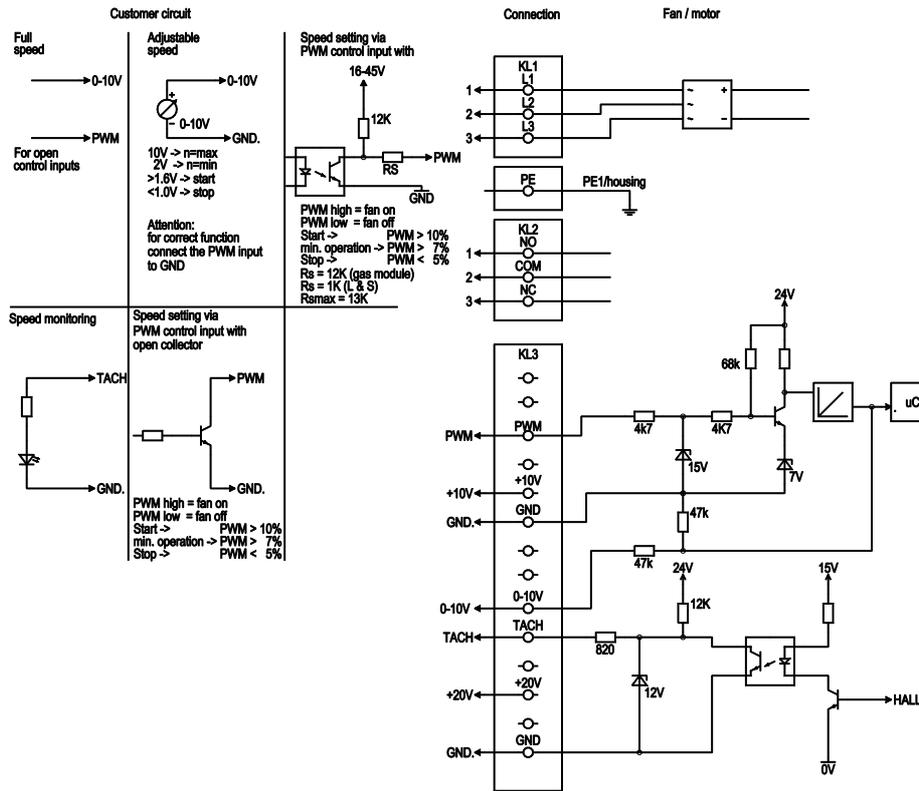
Fig. 3: Cable routing for fans installed upright.

4.4 Factory settings

Factory settings with which the device is pre-set by ebm-papst.

Control mode parameter set 1	PWM controlling
Control mode parameter set 2	PWM controlling
Fan / device address	01
Max. PWM / %	100
Min. PWM / %	5,1
Save set value to EEPROM	Yes
Set value control	Analogue (linear)
Control function parameter set 1	Positive (heating)
Control function parameter set 2	Positive (heating)

4.5 Connection screen



No.	Conn.	Designation	Function / assignment
1	1,2,3	L1,L2,L3	Power supply 3-phase, 50/60 Hz
		PE	Protective earth
2	1	NO	Alarm relay, make for failure
2	2	COM	Alarm relay, common connection (2A, 250VAC,AC1)
2	3	NC	Alarm relay, break for failure
3	PWM	PWM	Set value input via PWM; 16-45 V high level; 1-10 kHz; can be used exclusively as an alternative to connection 0-10 V
3	GND	GND	Signal ground for control interface
3	GND	GND	Signal ground for control interface
3	0 - 10 V	0 - 10 V	Analogue setpoint input, 0 - 10 V (impedance 100 kΩ), can be used exclusively as an alternative to connection PWM; for correct function, the PWM input must be bridged with GND.
3	+ 20 V	+ 20 V	Supply for external sensor; 20 VDC(±20%) max. 50 mA
3	+ 10 V	+ 10 V	Supply for external potentiometer, 10 VDC(±10%) max. 10 mA
3	Tach	Tach	Speed monitoring output; 12 VDC(±10%) max. 10 mA; impedance 1 kΩ; 4 pulses / revolution

4.6 Checking the connections

- ⇒ Make sure that the power is off (all phases).
- ⇒ Secure it from being switched on again.
- ⇒ Check the correct fit of the connection lines.
- ⇒ Screw the terminal box cover closed again. Terminal box tightening torque, see chapter 3.1 Product drawing.
- ⇒ Route the connecting cables in the terminal box so that the terminal box cover closes without resistance.
- ⇒ Use all plug screws (the entire number). In doing so, insert the screws manually to avoid damage to the thread.
- ⇒ Make sure that the terminal box is correctly closed and sealed and that all screws and screwed cable glands are properly tightened.

4.7 Switch on 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.



WARNING
Hot motor housing
 Fire hazard

→ Ensure that no combustible or flammable materials are located close to the blower.

- ⇒ Inspect the device for visible external damage and the proper function of the protective features before switching it on.
- ⇒ Check the air flow paths of the fan for foreign objects and remove any that are 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 voltage to the voltage supply.
- ⇒ Start the device by changing the input signal.

4.8 Switching off the device

Switching off the device during operation:

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

Switching off the device for maintenance work:

- ⇒ Switch off the device via the control input.
- ⇒ Do not switch the motor (e.g. in cyclic operation) on and off via power supply.
- ⇒ Disconnect the device from the supply voltage.
- ⇒ When disconnecting, be sure to disconnect the earth wire connection last.

5. INTEGRATED PROTECTIVE FUNCTIONS

The integrated protective functions cause the motor to switch off automatically in case of faults described in the table.

Malfunctions	Description / Function of safety feature
Rotor position detection error	An automatic restart occurs.
Locked rotor	⇒ After the blockage is removed, the motor restarts automatically.
Line under-voltage (mains input voltage outside of permitted nominal voltage)	⇒ If the mains supply voltage returns to permitted values, the motor restarts automatically.
Phase failure	A phase of the supply voltage fails for at least 5 s. ⇒ If all phases are correctly supplied again, the motor automatically restarts after 10 - 40 s.

6. MAINTENANCE, MALFUNCTIONS, POSSIBLE CAUSES AND REMEDIES

Do not perform any repairs on your device. Return the device to ebmpapst for repair or replacement.

WARNING

Terminals and connections have voltage even with a unit that is shut off

Electric shock

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

CAUTION

If the control signal of a blower that is connected to the power system is removed, the motor can restart automatically.

Danger of injury

→ When working on the blower, switch off the mains supply voltage and secure it from being switched on again.

→ Wait until the device stops.

CAUTION

Electrical load after device is switched off

Electric shock in case of contact

→ Wait for five minutes after disconnecting the voltage at all poles before touching the unit.

CAUTION

If control voltage is applied or a speed setpoint is stored, the motor automatically restarts, e.g. after a power failure.

Danger of injury

→ Keep out of the danger zone of the device.

→ When working on the device, switch off the mains supply voltage and secure the latter from being switched on again.

→ Wait until the device stops.

→ After working on the device, remove any used tools or other objects from the device.



If the blower remains out of use for some time, e.g. when in storage, we recommend switching the blower on for at least 2 hours to allow any condensate to evaporate and to move the bearings.

Malfunction/error	Possible cause	Possible remedy
Impeller running roughly	Imbalance in rotating parts	Clean the device; if imbalance is still evident after cleaning, replace the device. If you have attached any weight clips during cleaning, make sure to remove them afterwards.
Motor does not turn	Mechanical blockage	Switch off, de-energise, and remove mechanical blockage.

	Mains supply voltage faulty	Check mains supply voltage, restore power supply. Important! The error message resets automatically. The device starts up again automatically without advance warning.
	Faulty connection	De-energise, correct connection, see connection diagram.
	Motor winding broken	Replace device
	Thermal overload protector responded	Allow motor to cool off, locate and rectify cause of error, if necessary cancel restart lock-out
	Insufficient cooling	Improve cooling. Let the device cool down. To reset the error message, switch off the mains supply voltage for a min. of 25 s and switch it on again. Alternatively, reset the error message by applying a control signal of <0.5 V to DIN1 or by short circuiting Din1 to GND.
	Ambient temperature too high	Reduce the ambient temperature. Let the device cool down. To reset the error message, switch off the mains supply voltage for a min. of 25 s and switch it on again. Alternatively, reset the error message by applying a control signal of <0.5 V to DIN1 or by short circuiting Din1 to GND.

	Unacceptable operating point (e.g. counterpressure is too high)	Correct the operating point. Let the device cool down. To reset the error message, switch off the mains supply voltage for a min. of 25 s and switch it on again. Alternatively, reset the error message by applying a control signal of <0.5 V to DIN1 or by short circuiting Din1 to GND.
Deflagration	Leakage of the handled air/gas mixture	Check for leaks; replace blower if not properly sealed

Tightness of screwed cable gland	Visual inspection	At least every 6 months	Retighten, replace if damaged
Condensate discharge holes for clogging, as necessary	Visual inspection	At least every 6 months	Open bore holes



If you have any other problems, contact ebm-papst.

6.1 Cleaning

NOTE

The device does not need to be cleaned.

6.2 Safety test

NOTE

High-voltage test

The integrated EMC filter contains Y capacitors. Therefore, the trigger current is exceeded when AC testing voltage is applied.

→ Test the device with DC voltage when you carry out the high-voltage test required by law. The voltage to be used corresponds to the peak value of the AC voltage required by the standard.

What has to be tested?	How to test?	Frequency	Which measure?
Check the protective casing against accidental contact for damage and to ensure that it is intact	Visual inspection	At least every 6 months	Repair or replacement of the device
Check the device for damage to blades and housing	Visual inspection	At least every 6 months	Replacement of the device
Mounting the connection lines	Visual inspection	At least every 6 months	Fasten
Check the insulation of the wires for damage	Visual inspection	At least every 6 months	Replace wires