Translation of the original operating instruction

Operating instructions

ebm-papst Mulfingen GmbH & Co. K0	ebm-papst	Mulfingen	GmbH	& Co.	. KG
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Bachmühle 2 D-74673 Mulfingen Phone +49 (0) 7938 81-0 Fax +49 (0) 7938 81-110 info1@de.ebmpapst.com www.ebmpapst.com

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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 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

Rotating device

Body parts that come into contact with the rotor and impeller can be injured.

- → Secure the device against accidental contact.
- → Before working on the system/machine, wait until all parts have come to a standstill.

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.

1.8 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.

1.9 Hot surface



CAUTION

High temperature at the electronics enclosureDanger of burn injuries

Danger of burn injuries

Ensure that sufficient protection against accidental contact is provided.

1.10 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 3.5 Transport and storage conditions.

1.11 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 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:

- Moving air with a density of 1.2 kg/m³.
- Using the device in accordance with the permitted ambient temperature, see chapter 3.5 Transport and storage conditions and chapter 3.2 Nominal data.
- Operating the device with all protective features in place.
- Minding the operating instructions.

Improper use

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

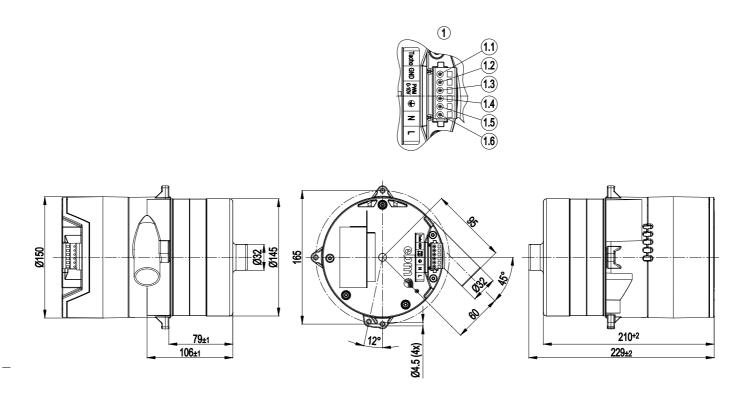
- Operating the device with an imbalance, e.g. caused by dirt deposits or icing.
- Moving air that contains abrasive particles.
- Moving highly corrosive air, e.g. salt spray mist. Exceptions are devices that are intended for salt spray mist and protected accordingly.
- · Moving air that contains dust pollution, e.g. suctioning off saw dust.
- Operating the device close to flammable materials or components.
- Operating the device in an explosive atmosphere.
- Using the device as a safety component or for taking on safetyrelated functions.
- Operation with completely or partially disassembled or modified protective features.
- In addition, all application options that are not listed under proper use.





3. TECHNICAL DATA

3.1 Product drawing



All measures have the unit mm

1	Connector housing WAGO 231-106
1.1	Tach
1.2	GND
1.3	PWM, 0-10 V
1.4	PE
1.5	N
1.6	L





3.2 Nominal data

Motor	M3G074-BF
Phase	1~
Nominal voltage / VAC	230
Nominal voltage	208 250
range / VAC	
Frequency / Hz	50/60
Type of data definition	me
Speed / min-1	13000
Power input / W	600
Current draw / A	2.6
Min. ambient temperature	-25
/ °C	
Max. ambient	50
temperature	

ml = Max. load \cdot me = Max. efficiency \cdot fa = Running at free air

cs = Customer specs · cu = Customer unit

Subject to alterations

/°C

3.3 Technical features

Mass	4.0 kg
Size	125 mm
Surface of rotor	Coated in black
Material of impeller	Aluminium sheet
Number of blades	6
Direction of rotation	Clockwise, seen on rotor
Type of protection	IP 20
Insulation class	"B"
Mounting position	Any
Condensate discharge	None
holes	
Operation mode	S1
Motor bearing	Ball bearing
Technical features	- Tach output
	- Motor current limit
	- PFC, active
	- Soft start
	- Control input 0-10 VDC / PWM
	- Over-temperature protected
	electronics / motor
Touch current acc.	<= 3.5 mA
IEC 60990 (measuring	
network Fig. 4, TN	
system)	
Electrical leads	With plug
Motor protection	Locked-rotor protection
Product conforming	EN 61800-5-1; CE
to standard	
Approval	VDE; UL 507; CSA C22.2 Nr.113



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.

3.4 Mounting data

For depth of screw, see chapter 3.1 Product drawing

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

Strength class for	8.8
mounting screws	

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

3.5 Transport and storage conditions

⇒ Use the device in accordance with its protection type.

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

3.6 Electromagnetic compatibility

EMC interference	Acc. to EN 61000-6-2	
immunity		
EMC harmonics	Acc. to EN 61000-3-2/3	
EMC interference	Acc. to EN 61000-6-4 (industrial	
emission	environment)	





4. CONNECTION AND START-UP

4.1 Connecting the mechanical system



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.
- 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.
- \rightarrow 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.

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

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



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 crosssection.

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 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 < 4 W.

4.2.3 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 via plug

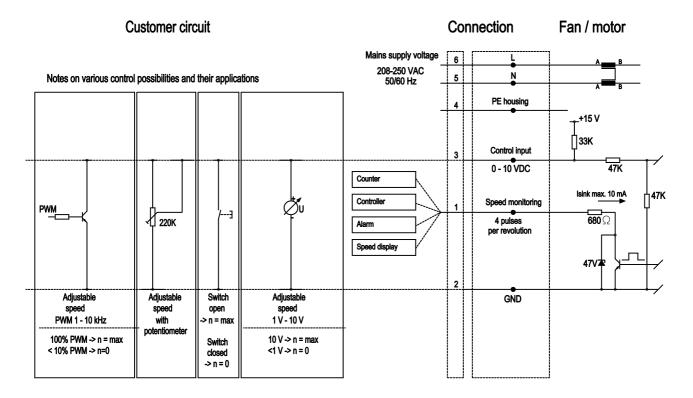
4.3.1 Establish supply connections

- ⇒ Check the PIN assignment of your connector.
- Connect the panel connector and mating connector.
- ⇒ Ensure that the connector is locked in correctly.





4.4 Connection screen







4.5 Checking the connections

- ⇒ Make sure that the power is off (all phases).
- ⇒ Secure it from being switched on again.
- Check that the mating connector is correctly locked into the panel connector.
- Check that the mating connector is correctly crimped to the connection line.

4.6 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 the nominal voltage to the voltage supply.
- ⇒ Start the device by changing the input signal.

4.7 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.

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.





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

Malfunction/error	Possible cause	Possible remedy
Impeller running	Imbalance in rotating	Clean the device; if
roughly	parts	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
	14	blockage.
	Mains supply	Check mains supply
	voltage faulty	voltage,
		restore power
		supply,
	Coulty composition	apply control signal.
	Faulty connection	De-energise, correct
		connection, see
		connection diagram.

Overtemperature of electronics/motor	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.
	Ambient temperature too high	Reduce the ambient temperature. Reset by reducing control input to 0.
	Unacceptable operating point	Correct the operating point. Let the device cool down.



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

6.1 Cleaning

NOTE

Damage to the device during cleaning.

Malfunction possible

- → Do not clean the device using a water jet or high-pressure washer.
- → Do not use any cleaners containing acids, bases or solvents.
- → Do not use any pointed or sharp-edged objects to clean.

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	How to test?	Frequency	Which
be tested?			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





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Check the	Visual inspection	At least every	Replace wires
insulation of		6 months	
the wires for			
damage			





