Translation of the original operating instruction

Operating instructions

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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 5.2 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

The motor restarts automatically when operating voltage is applied, 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.
- \rightarrow Wait until the device stops.

1.5 Safety and protective functions



DANGER

sucked into it.

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

- 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 Mechanical movement



DANGER

Rotating device

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

- \rightarrow 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.

1.7 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.

1.8 Hot surface



CAUTION

High temperature at the motor housing

Danger of burn injuries

→ Ensure that sufficient protection against accidental contact is provided.

1.9 Transport

NOTE

Transport of device

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

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 3.6 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 3.6 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:

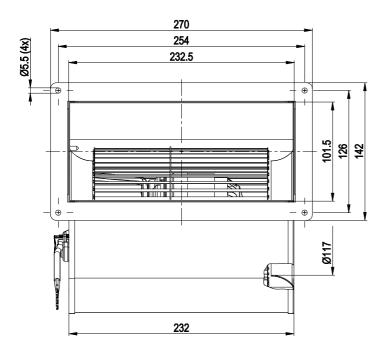
- Operating the device with an imbalance, e.g. caused by dirt deposits or icing.
- Moving air that contains abrasive particles.
- Moving highly corrosive air, e.g. salt spray mist. Exceptions are devices that are intended for salt spray mist and protected accordingly.
- . Moving air that contains dust 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.

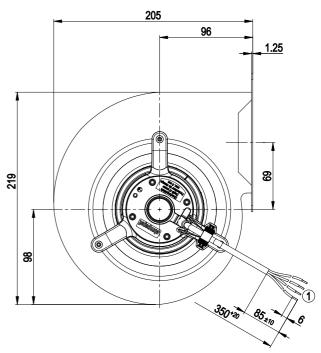




3. TECHNICAL DATA

3.1 Product drawing





All measures have the unit mm.

Connection line PVC 4G 0.5 mm², 4x lead tips crimped



3.2 Nominal data

Motor	M2E068-EC	
Phase	1~	1~
Nominal voltage / VAC	230	230
Frequency / Hz	50	60
Type of data definition	ml	ml
Valid for approval /	CE	CE
standard		
Speed / min-1	2050	2550
Power input / W	300	330
Current draw / A	1.31	1.45
Motor capacitor / μF	8	8
Capacitor voltage / VDB	400	400
Capacitor standard	P0 (CE)	P0 (CE)
Min. back pressure / Pa	200	400
Min. ambient temperature	-25	-25
/ °C		
Max. ambient	30	25
temperature		
/ °C		

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

Subject to alterations

3.3 Data according to ErP directive

Installation category	Α
Efficiency category	Static
Variable speed drive	No
Specific ratio*	1.00

^{*} Specific ratio = 1 + pfs / 100 000 Pa

	Actual	Request 2013	Request 2015
Overall efficiency ηes / %	28.2	26.8	33.8
Efficiency grade N	38.4	37	44
Power input Pe / kW	0.24		
Air flow qv / m³/h	705		
Pressure increase total psf / Pa	351		
Speed n / min-1	2435		

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	4.4 kg	
	-	
Size	146 mm	
Surface of rotor	Uncoated	
Material of impeller	Sheet steel, galvanised	
Housing material	Sheet steel, galvanised	
Motor suspension	Motor mounted via brackets on one side	
Direction of rotation	Counter-clockwise, seen on rotor	
Type of protection	IP 44; Depending on installation and	
	position	
Insulation class	"B"	
Humidity class	F0	
Mounting position	Any	

Condensate discharge	None
holes	
Operation mode	S1
Motor bearing	Ball bearing
Touch current acc.	< 0.75 mA
IEC 60990 (measuring	
network Fig. 4, TN	
system)	
Motor protection	Thermal overload protector (TOP) wired
	internally
Cable exit	Axial
Protection class	I (if protective earth is connected by
	customer)
Product conforming	CE
to standard	
Approval	CCC; GOST



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

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

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	- 40 °C
ambient motor temp.	
(transp./storage)	





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.
- → 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 and the data of the operating capacitor.
- 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 Voltage control



With open loop speed control using transformers or electronic voltage regulators (e.g. phase angle control), excessive current may occur.

In addition, noises can occur with phase angle control depending on the mounting situation.

4.2.3 Frequency inverter

Please use a frequency converter only after consultation with ebm-papst.



Fit sinusoidal filters that work on all poles (live-live and liveearth) between the frequency inverter and the motor for operation with frequency inverters.

Depending on how the device is installed, noises may occur.

Heating of the motor due to use of a frequency converter must be checked in the application by the customer.

4.3 Connection of the cables

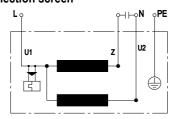
External leads are brought out of device.

- ; First connect the "PE" (protective earth) connection.
- Connect the lines according to your application. When doing so, observe chapter 4.4 Connection screen.





4.4 Connection screen



U1	blue
Z	brown
U2	black
PE	green/yellow



4.5 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.

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.

4.7 Switching off the device

- Disconnect the device from the supply voltage at the main switch for the supply line.
- ; When disconnecting, be sure to disconnect the earth wire connection

5. 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.

CALITION

Electrical load on the capacitor after device is switched off Electric shock, risk of injury

→ Discharge the capacitors before working on the device.

CAUTION

The motor restarts automatically when operating voltage is applied, 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.



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 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.
	Faulty connection	De-energise, correct connection, see connection diagram.
	Thermal overload protector responded	Allow motor to cool off, locate and rectify cause of error, if necessary cancel restart lock-out





	Unacceptable	Check operating point
	operating point	
Overtemperature of	Ambient temperature	Lower ambient
motor	too high	temperature if possible
	Insufficient cooling	Improve cooling



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

5.1 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.

5.2 Safety test

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







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Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов:
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001:
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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