# Operating manual

**2214F/2TDHOU-754**



Product type, manufacturing date (calendar week/year of construction) and if required, conformity mark can be found on the nameplate on the product.
Please provide us with the contents of the nameplate when making enquiries about the product.

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## Original operating manual

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## 1 SAFETY REGULATIONS AND INFORMATION

Read the operating manual carefully before commencing work at the product. Pay attention to the following warnings to avoid risk to persons or malfunctioning.
This operating manual is an integral part of the product.
In the event of resale or change of ownership the operating manual must accompany the product. This operating manual may be copied and provided as information on potential risks and their avoidance.

**Hazard classification of warning notices**

The following risk ratings are used in this operating manual to denote potential risk situations and important safety instructions:



**DANGER**
This is a potentially dangerous situation and warns of an impending health risk or risk of fatal injury if this warning is not observed. Observe this warning.

**WARNING**
The dangerous situation can occur and can result in major or fatal injuries if the warning is not observed. Work with extreme care.

**CAUTION**
The dangerous situation can occur and can result in minor injuries or damage to property if the warning is not observed.

**NOTE**
A potentially dangerous situation can occur and results in damage to property if not avoided.

**Qualification of personnel**

Only skilled electricians are permitted to install the product, to carry out the test run and to work at the electrical unit.
Only instructed and authorized skilled personnel are permitted to transport, unpack, operate and service the product.

**Basic safety regulations**

Safety risks related to the product must be reassessed after installing in the final device.
The operating manual was developed in accordance with European market requirements and may need adapting to the market requirements of the country in question.

When working at the product, observe the following:

- Do not make any changes to the product.



**WARNING**
**Impermissible high load**

- Stop the product immediately after impermissible loading (e.g. impact, heat, overvoltage).

**Electrical voltage and current**



**DANGER**
**Electrical voltage**

Regularly check the electrical equipment of the product.
- Eliminate immediately loose connections and defective cables.

**Safety and protective functions**



**DANGER**
**Missing safety device and faulty protective equipment.**

Without protective equipment severe injuries can occur, e.g. by taking hold of the rotating equipment.
- Operate the product with protection guards only.

**Electromagnetic radiation**

Electromagnetic compatibility (EMC) may affect the system integration of the product due to interaction.

- Ensure the electromagnetic compatibility of the entire system.

**Moving parts**

**DANGER**
**Self-starting product**



If voltage is applied, the motor automatically restarts after a mains failure or when blocking has been eliminated.
- Do not stand in the danger zone of the product.
- Switch off the mains voltage when working on the product and secure against switching on again.

**DANGER**
**Rotating impeller**





Contact with the impeller may result in injuries. Long hair, loose-fitting garments and jewellery can be caught and pulled into the product. Risk of injury.
- Before starting the product, ensure that it is securely fixed and that the guards are in place.
- Do not wear loose-fitting garments or jewellery when working on moving parts.
- Protect long hair by wearing a hair net.

**DANGER**
**Faults in safety installations**



Safety installations (e.g. smoke detectors) may be affected by the airflow of the product.
- If necessary, provide other suitable safety measures.

**WARNING**
**Parts transported by the airflow**



The product can transport small parts in the airflow and catapult them out.
- Ensure that there are no loose small-parts in the intake and exhaust area.
- Do not stand in the danger zone of the product.

**CAUTION**
**High risk of fire spreading**



Can cause fire to spread.
- Never direct the airflow (intake/exhaust side) at a potential source of fire.

**Hot surface**



**CAUTION**
**High temperature at motor housing.**
**Risk of burns**

- Provide adequate protection against accidental contact.

**Transport**

Only transport the product in its original packaging. Secure during transport.
The vibration values, temperature and climate ranges should not be exceeded during transport.

**Storage**

Store the product in a dry and clean environment that is well protected. Ensure that the storage temperature is adhered to,*see Chapter 3, Technical Data*.If the product is not operated for a longer period of time, we recommend running it for approx. 15 minutes annually to move the motor bearings.

**Cleaning**



**NOTE**
**Product damaged during cleaning**

- Do not clean the product using a water jet or pressure washer. Do not put any pressure on the rotor. Do not use cleaning agents containing acids, caustic solutions or solvents.

**Disposal**

When disposing of the product, observe all requirements and regulations that are relevant in your country.

## 2 INTENDED USE

The product is designed exclusively as a built-in device for conveying air according to the technical data.
Every use that is not in accordance with the intended purpose, is regarded as misuse of the product.
On-site installations must comply with the mechanical, thermal and service life requirements, *see Chapter 3, Technical Data.*

**Intended use includes:**

- Operating the product with all protective equipment
- Do not put the product into operation before it has been installed in the customer's application
- Observation of the operating manual

**Use for other than the intended purpose**

Using the product for the purposes mentioned below is prohibited and can be dangerous:

- Conveyance of air that contains abrasive particles.
- Conveyance of air that has a highly corrosive effect.
- Conveyance of air that has a high dust load, e.g. vacuuming sawdust.
- Conveyance of inflammable gases/particles.
- Contact with materials that can damage the product, e.g. acids, caustic solutions, solvents.
- Exposure to radiation that can damage product components, e.g. strong UV rays or thermal radiation.
- Operating during external vibration.
- Operating the product close to inflammable materials or components.
- Operating the product in an explosive atmosphere
- Use of the prouct as a safety component or for performing safety-relevant functions.
- Operating in medical devices with life-sustaining or life-saving function if not validated together with ebm-papst.
- Operating in non-stationary systems, e.g. railway vehicles, aircraft and spacecraft if not validated together with ebm-papst.
- Operating with fully or partially dismantled or manipulated protective equipment.
- Operating the product under conditions other than those mentioned in the technical data.
- Furthermore, all fields of application not mentioned under intended use.

An in situ assessment must be conducted of the heating behavior (appropriate and inappropriate operation), the protection against contact, electrical shocks, impact of foreign objects or water and the usage at altitudes higher than 2000 meters.

Contact ebm-papst if you have specific queries regarding the product.

## 3 TECHNICAL DATA

**Drawing, see annex**

**Technical description**

| | |
|---|---|
| Airflow direction | Air outlet over struts |
| Rotating direction looking at rotor | Counterclockwise |
| Nominal voltage | 24 V |
| Current consumption | 1.450 mA |
| Power consumption | 36 W |
| Speed | 4.250 1/min |
| Max. free-air flow | 800,0 m3/h |
| Mass | 1,0 kg |
| Protection class | III |

The product is for the use in partial sheltered rooms or open, roofed areas. Direct exposure to water is allowed provided that this does not prevent the normal operation. Saline ambient conditions must be avoided.

Pollution degree 3 (according DIN EN 60664-1)
It occurs conductive pollution or dry non-conductive pollution which becomes conductive due to condensation.

**Ambient conditions**

| **Permitted ambient temperature** | |
|---|---|
| **Transport and storage** | **Operation** |
| -40 °C ... 80 °C | -20 °C ... 70 °C |

**Vibration and shock load**

The mechanical Vibration and Shock data for the product is available. If the operation of the product should take place in a sinusoidal vibration containing environment or fixing the product on sinusoidal vibrating surface, please contact our technical support.

Do not operate your product in the resonance range.

## 4 CONNECTION AND COMMISSIONING

**Connect mechanical parts**



**CAUTION**
**Risk of cutting/squashing when removing the product from the packaging and during mounting.**

Grasp the housing and lift the product carefully out of the packaging. Avoid impact.
- ➢ Wear safety boots and cut-resistant gloves.



**NOTE**
**Risk of damage to electronic components.**

- ➢ Use ESD protective equipment when mounting.

**Connect electrical parts**

Connect to the mains after installation.



**DANGER**
**Compliance with the electrical installation regulations**

- ➢ Observe the connection regulations that are valid in your country. (e.g. fusing, GFCI)



**CAUTION**
**Electrical voltage**
**The product is a built-in component and has no switch for disconnecting power.**

- ➢ Only connect the product to current circuits that can be switched off by a switch (all poles disconnected). When working on the product, secure the system/machine in which the product is installed against switching on again.

**NOTE**
Electromagnetic compatibility (EMC) may affect the system integration of the product due to interaction.

- ➢ Ensure the electromagnetic compatibility of the entire system.

**Voltage control**



Speed control via the supply voltage is only permitted within the stipulated supply voltage range. Speed control via PWM of the supply voltage is not permitted.

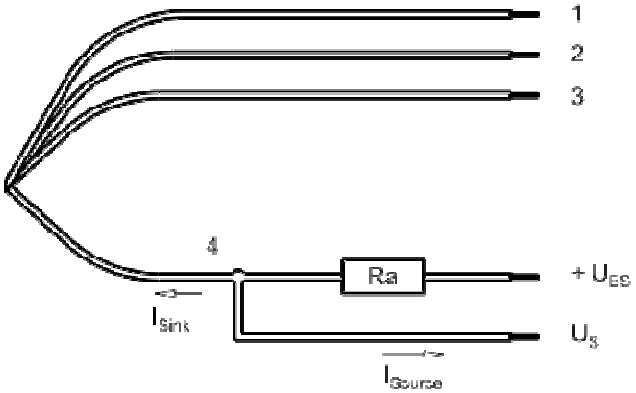
**Requirements:**

- Before connecting the product, ensure that the supply voltage corresponds with the product voltage.
- Check whether the data on the nameplate corresponds with the interface data.



Only use cables that are designed for the current on the nameplate and the corresponding ambient conditions. Ensure that the electrical interface data is adequately protected (mechanical).

Find additional information in drawing or label.




| Wire | Color | Operation |
|---|---|---|
| 1 | red | + UB |
| 2 | blue | - GND |
| 3 | violet | PWM |
| 4 | white | Tacho |

The auxilliaries shown on the schematic diagram (which are required for the intended use) are not part of our delivery.

**Check connections**

**NOTE**
DC-fans <=60V are products of Protection Class III and must be operated with safety extra-low voltage.

**Connect product**

Check the product for visible damage and the operability of protective equipment before switching on.
If damage is visible, do not start the product.

## 5 FAULTS, POSSIBLE CAUSES AND REMEDIES

Replace your product by a new one, do not repair it.



**DANGER**
**Electrical voltage at motor**

- Wait five minutes after the voltage (all poles) has been switched off before opening the product.

| Fault/ Error | Possible cause | Possible remedial action |
|---|---|---|
| Motor is not rotating | Mechanical blocking | Switch off, de-energize and eliminate mechanical blocking. |
| | Mains voltage fault | Check mains voltage, re-connect voltage supply. |
| | Connection faulty | Rectify connection, see pin connection. |
| | Motor is too hot | Allow motor to cool / identify cause of fault. |
| | Motor winding interrupted | Exchange product. |
| | Ambient temperature too high | Reduce ambient temperature if possible. |
| Impeller out of true | Unbalance of rotating parts | Clean product if still unbalanced after cleaning, exchange product. |



In case of further faults, contact ebm-papst.

**Technical safety inspection**

| What requires checking? | How to check? | Frequency |
|---|---|---|
| Protection against accidental contact/ protective clothing | Visual inspection | min. 1/2 yearly |
| Check product for damage | Visual inspection | min. 1/2 yearly |
| Fixation of product | Visual inspection | min. 1/2 yearly |
| Fixation of wires | Visual inspection | min. 1/2 yearly |
| Insulation of wires | Visual inspection | min. 1/2 yearly |
| Check impeller for wear/sediments/ corrosion | Visual inspection | min. 1/2 yearly |

## 6 COMPLIANCE

The product bears the CE mark.

The CE mark is affixed to adequately sized nameplates.

Within the meaning of the EMC Guideline 2014/30/EU this document is intended as:

- Mounting instructions/operating manual as per Art. 18, Paragraph (1)
- Installation instructions as per Art. 4
- Operating manual as per Art. 9, Paragraph (3)
- Instructions for use/operating manual as per Art. 18, Paragraph (3)
- Maintenance instructions as per Art.4; Art. 18, Paragraph (1)

Usage restrictions for residential areas as per Art. 18, Paragraph (2)
Accompanying documents as per Art. 17, Paragraph (1)

Within the meaning of Directive 2014/35/EU - electrical equipment designed for use within certain voltage limits – this document is intended as:

- Instructions for use/operating manual as per Art. 6, Paragraph (7); Art. 8 Paragraph (4)

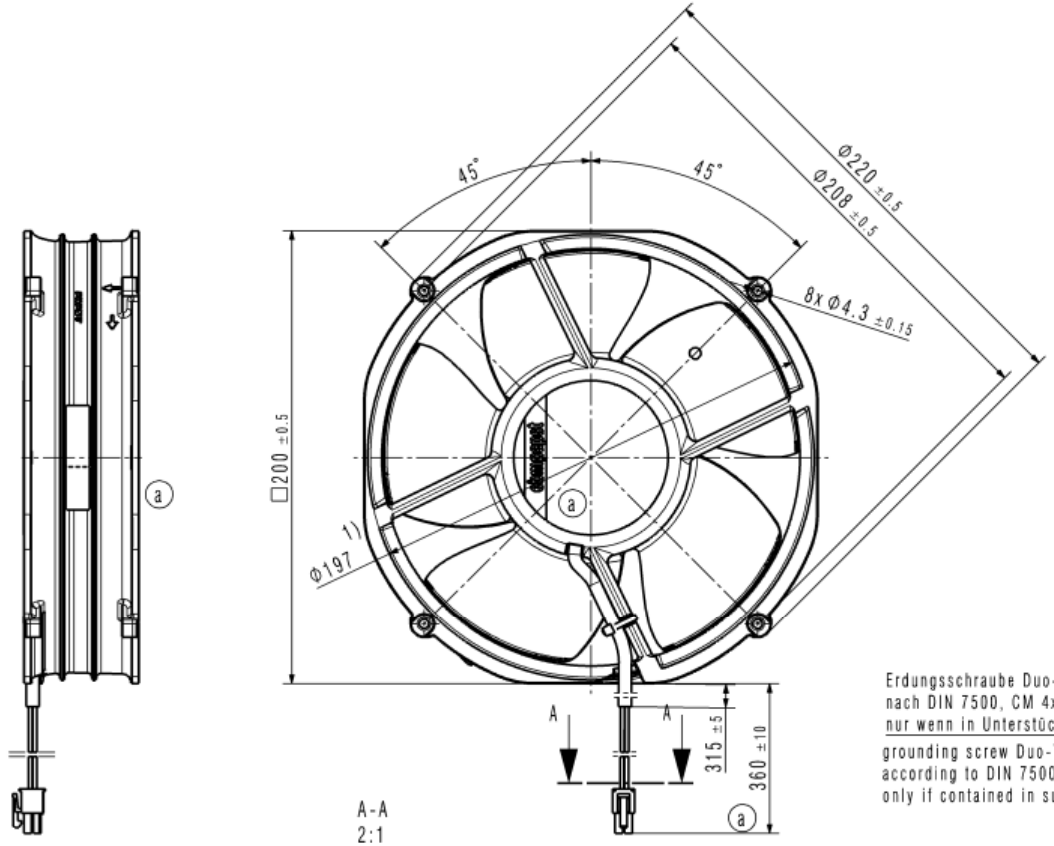
Within the meaning of the Directive 2006/42/EU Machine Guideline, this document is intended as

- Mounting instructions as per Art. 13, Paragraph 1b

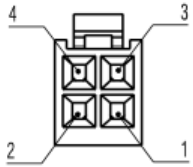
The product bears the EAC mark.

**The information in this document and in the product data sheet applies to mounting, installation, operation, use and maintenance.**

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A-A
2:1




Steckergehäuse/
Plug housing:
Molex 39-01-2040

Kontakt / Contact:
Molex 39-00-0059

1) Maße für Montageausschnitt

- Axialspiel der Kugellager mit Feder spielfrei verspannt

1) measures of mounting cut-out

- ball bearings without clearance by a pre-loaded spring

| Steckerbelegung / Pin configuration | |
|---|---|
| Pin | Farbe / Color |
| 1 | rot / red (+ UB) |
| 2 | blau / blue (- GND) |
| 3 | violett / violet (PWM) |
| 4 | weiß / white (Tacho) |

| | | | | |
|---|---|---|---|---|
| SAP-Status/State | Aend.-Nr./ Change-No. | CATIA-System-Version/ CATIA-System-Version | CAD-Umgebung/ CAD-Environment | Werkstoff / Material: |
| | | | | Artikel / Title: |
| Toleranzen / Tolerances: | | 4220010130 CPA008 - 9256414754 CPR008B | | |
| Allgemeintoleranzen / Gen. Tolerances: | | 3D-Referenzmodell / 3D-Referenzmodell | | Zchg.-Nr./ Drawing No: |
| | | Datum | Name | |
| | Bearb./ Drawn | | | |
| | Gepr./ Checked | | | |
| | Freig./ Releas. | | | |

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