



# Operating manual

2218F/2TDH4PU



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.



**CAUTION  
In the event of a fault, the product is energized.**

Product has basic insulation.  
Do not touch the product after installing.

**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.



**DANGER  
Blocking of escape routes**

The product can create dangerously high pressure.  
When operating the product ensure that there is adequate supply and exhaust air.



**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.



**CAUTION  
Extinguishing flames**

The airflow can extinguish flames (e.g. of a gas burner).  
Do not direct the airflow (intake/exhaust side) at an open flame.

**Hot surface**



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

Provide adequate protection against accidental contact.

**Emission**



**DANGER  
Acoustic alarms can be overheard.**

Alarm signals can be overheard  
Take technical protective measures, e.g. optical warnings.



**WARNING  
A noise pressure level higher than 70dB(A) is possible depending on the installation and operating conditions.**

Risk of deafness due to noise.  
Take technical protective measures.  
Provide operating personnel with protective equipment, e.g. ear protection.

**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 device, partially or fully assembled, in a dry place, protected against the weather and free from vibration, in the original packaging in a clean environment.

Protect the device against environmental effects and dirt until final installation.

To guarantee trouble-free operation and the longest possible service life do not store the device for more than one year.

Even devices explicitly intended for outdoor use are to be stored as described prior to commissioning.

Maintain the storage temperature, see *Chapter 3, Technical Data*

## 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 product 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	48 V
Current consumption	2.150 mA
Power consumption	103 W
Speed	6.500 1/min
Max. free-air flow	1.220,0 m <sup>3</sup> /h
Mass	1,0 kg
Protection class	I

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 ... 65 °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**  
Do not touch. Risk of fatal injury from electrical current.



Ensure that the electrical lines are de-energized.  
Secure the operating voltage against switching on again.  
Never work on parts that are energized. Only allow skilled electricians to work on the product.



**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.

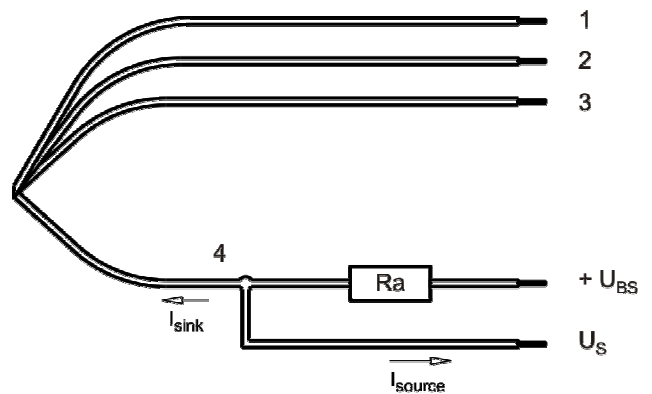
### Requirements:

- 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 auxiliaries 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 I and must be earthed.  
**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.

## 6 COMPLIANCE

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.

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.

### Note

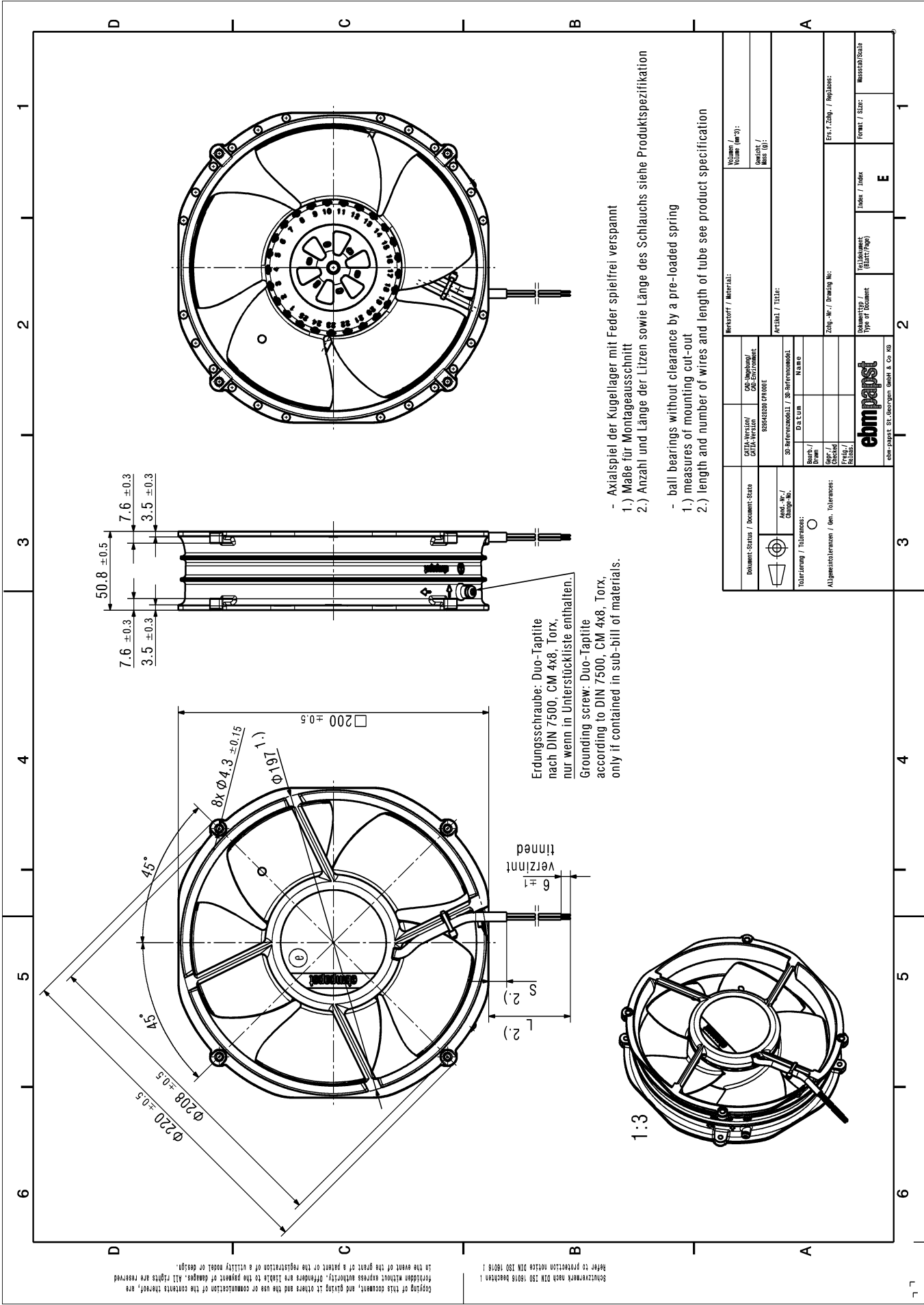
If the device is not operated for a lengthy period in installed condition in a dry environment, it is to be started up and operated at full speed for one hour at least every four months. If the device is not operated for a lengthy period in installed condition in a damp environment (e.g. outdoors), it is to be started up and operated at full speed for at least three hours once a month to move the bearings and allow any condensate that may have ingressed to evaporate.



In case of further faults, contact ebmpapst.

### 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
Fixation of protective earth connection	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



Erdungsschraube: Duo-Tapfite nach DIN 7500, CM 4x8, Torx, nur wenn in Unterstückliste enthalten.  
 Grounding screw: Duo-Tapfite according to DIN 7500, CM 4x8, Torx, only if contained in sub-bill of materials.

- Axialspiel der Kugellager mit Feder spielfrei verspannt
- 1.) Maße für Montageausschnitt
- 2.) Anzahl und Länge der Litzen sowie Länge des Schlauchs siehe Produktspezifikation
- ball bearings without clearance by a pre-loaded spring
- 1.) measures of mounting cut-out
- 2.) length and number of wires and length of tube see product specification

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