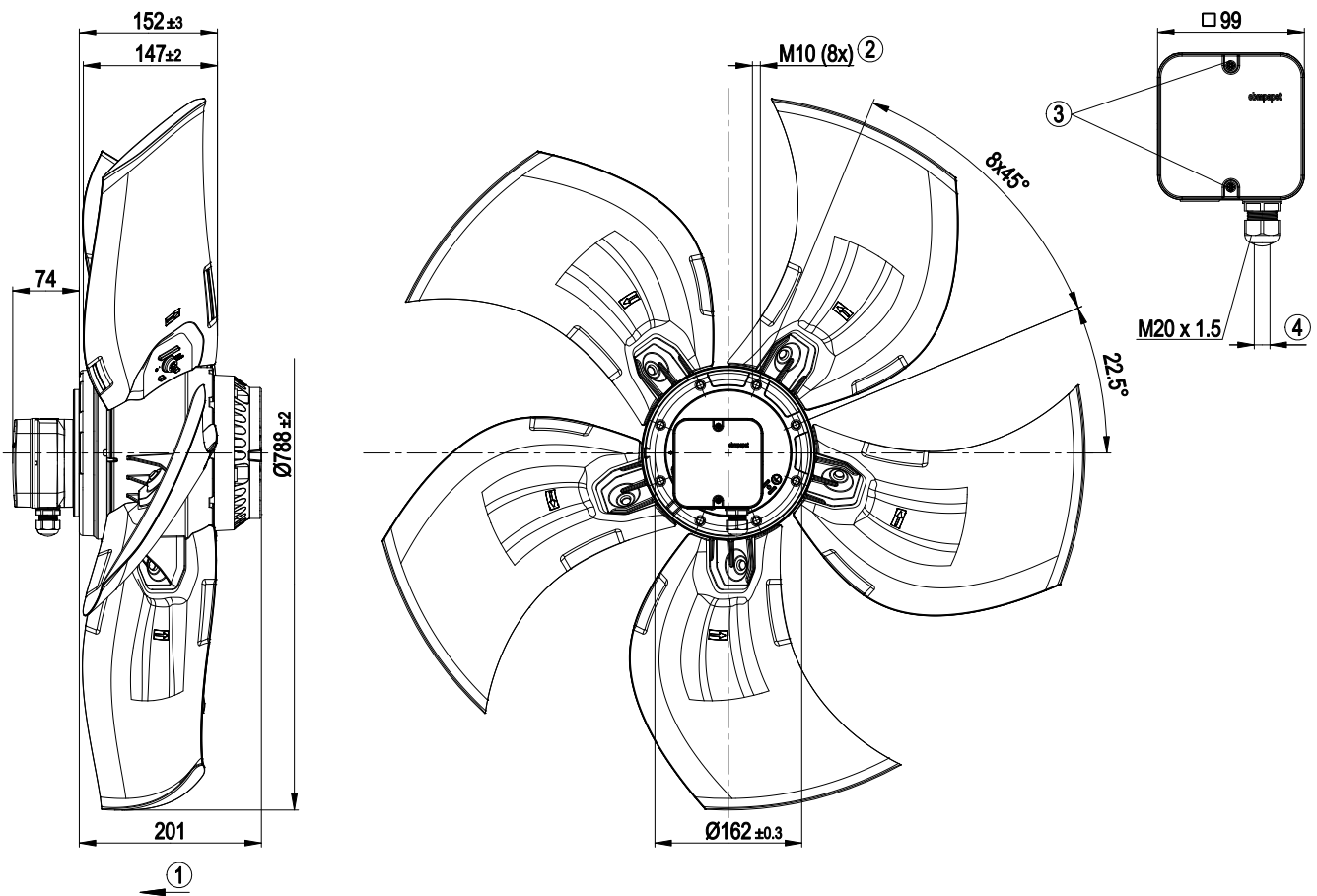


3. TECHNICAL DATA

3.1 Product drawing



All measures have the unit mm.

1	Direction of air flow "V"
2	Screw depth max. 18 mm
3	Tightening torque 1.5±0.2 Nm
4	Cable diameter: min. 7 mm, max. 14 mm, tightening torque: 2±0.3 Nm

3.2 Nominal data

Motor	M6D138-LA		
Phase	3~	3~	3~
Nominal voltage / VAC	400	400	415
Connection	Δ	Y	Δ
Frequency / Hz	50	50	50
Type of data definition	ml	ml	ml
Valid for approval / standard	CE	CE	CE
Speed / min ⁻¹	895	685	915
Power input / W	2000	1270	1690
Current draw / A	4.3	2.5	3.7
Max. back pressure / Pa	180	100	90
Min. ambient temperature / °C	-40	-40	-40
Max. ambient temperature / °C	50	50	60
Starting current / A	13	4.3	

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	No
Specific ratio*	1.00

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

	Actual	Request 2013	Request 2015
Overall efficiency η_{es} / %	35.4	31.2	35.2
Efficiency grade N	40.2	36	40
Power input P_e / kW	1.76		
Air flow q_v / m ³ /h	17035		
Pressure increase total p_{sf} / Pa	132		
Speed n / min ⁻¹	900		

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	26.4 kg
Size	800 mm
Surface of rotor	Cast in aluminium
Material of terminal box	PP plastic
Material of blades	Die-cast aluminium
Number of blades	5
Blade angle	0
Direction of air flow	"V"
Direction of rotation	Clockwise, seen on rotor
Type of protection	IP 54
Insulation class	"F"
Humidity class	F3-1
Mounting position	Any

Condensate discharge holes	On rotor and stator sides
Operation mode	S1
Motor bearing	Ball bearing
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) brought out
Cable exit	Axial
Protection class	I (if protective earth is connected by customer)
Product conforming to standard	EN 60034; EN 61800-5-1; CE
Approval	EAC; VDE



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	10.9
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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

4. CONNECTION AND START-UP

4.1 Connecting the mechanical system



CAUTION

Cutting and crushing hazard when removing the fan from the packaging



→ Carefully remove the device from its packaging, holding it by the centre of the blades only. 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.
- ⇒ Do not make any modifications, additions or renovations to the device. Replacing the terminal box is not permitted.
- ⇒ 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 fan is a built-in component and features no electrically isolating switch.

→ Only connect the fan to circuits that can be switched off with an all-pole separating switch.

→ When working on the fan, you must switch off the installation/machine in which the fan 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 cross-section. We recommend the use of 105°C cables. Ensure that the minimum cable cross-section is at least AWG26/0.13 mm².

Earth wire contact resistance to EN 61800-5-1

Compliance with the impedance specifications to EN 61800-5-1 for the protective earth circuit must be verified in the end application. Depending on the installation situation, it may be necessary to install an additional protective earthing conductor via the additional protective earth connection point available on the device. The protective earth connection point is located on the housing and has a protective earth symbol and a bore hole.

4.2.2 Residual current operated device



Only pulse-current sensitive and/or universal RCD protective devices (Type A or B) are permitted. Like frequency inverters, RCD protective devices cannot provide personal safety while operating the device.

4.2.3 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.

4.2.4 Frequency inverter

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



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

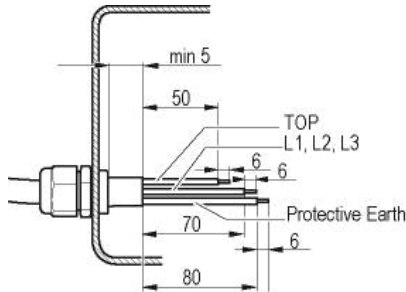
Depending on how the device is installed, noises may occur.

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

4.3 Connection 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.



4.3.2 Connecting cables with terminals

- ⇒ Remove the cap from the screwed cable gland.
- Remove the cap only in those places where cables are inserted.
- ⇒ 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.
- ⇒ Connect the thermal overload protector (TOP).

Use a screwdriver to do so.

During the connection work, ensure that no cables splice off. The terminal strip is equipped with a penetration prevention device.

- ⇒ Insert the strands until they meet resistance.
- ⇒ Seal the terminal box.

4.3.3 Cable routing

No water may penetrate along the cable in the direction of the cable gland.

Fans installed lying flat

Make sure that the cable is routed in the form of a loop (water trap).

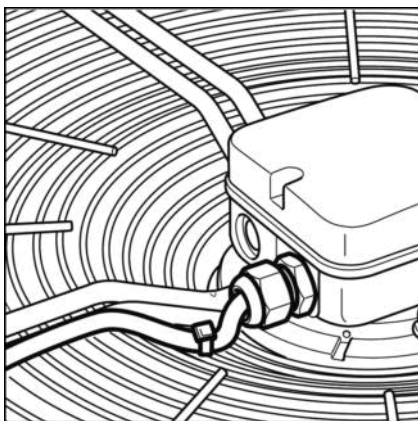


Fig. 2: Fan installed lying flat, cable routed as a water trap.

Fans installed in upright position

When routing the cable, ensure that the screwed cable glands are arranged at the bottom. The cables must always be routed downwards.

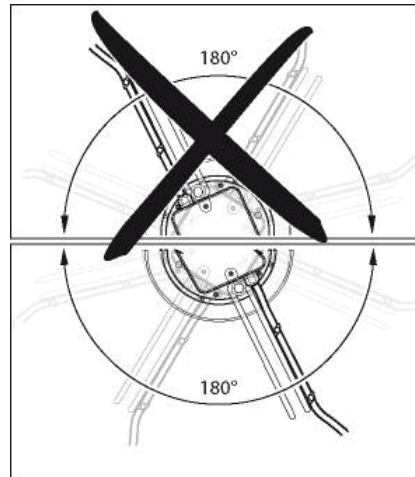


Fig. 3: Cable routing for fans installed upright.

4.3.4 Motor protection

CAUTION Voltage

The device is a built-in component with no isolating switch.

- Connect the device to a suitable tripping device.
- Only connect the device to circuits which can be de-energised with an all-pole disconnection switch.
- When working on the device, the system/machine in which the device is installed must be secured so as to prevent it from being switched back on.

NOTE

Lack of motor protection

Without motor protection, the motor can overheat and suffer damage.

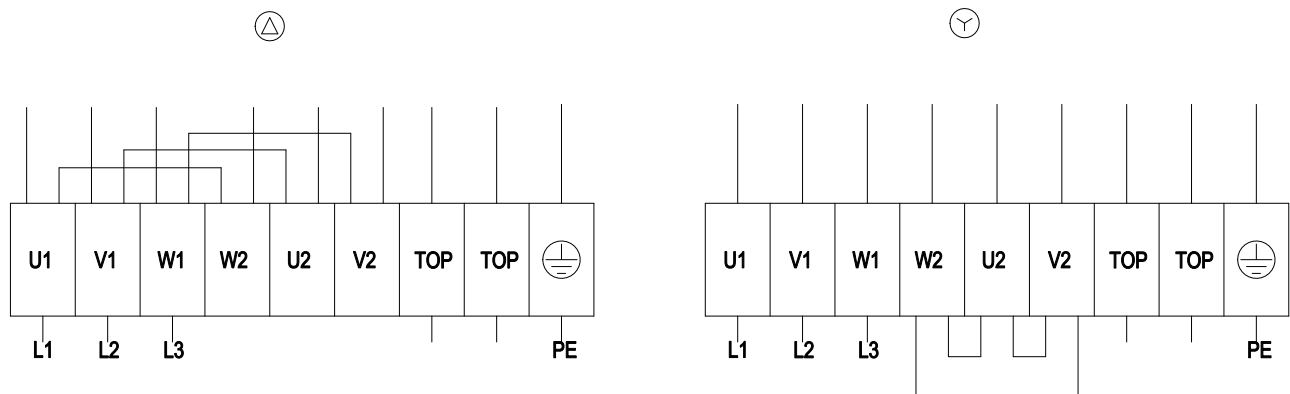
- Connect up the thermal overload protector installed in the coil.

The motors are equipped with thermal overload protectors to protect the devices.

Check to make sure that the thermal overload protector is correctly connected before each operation.

Failure to connect up the thermal overload protector correctly will invalidate your warranty claim.

4.4 Connection screen



Δ	Delta connection
Y	Star connection
L1	= U1 = black
L2	= V1 = blue
L3	= W1 = brown
W2	yellow
U2	green
V2	white
TOP	2 x grey
PE	green/yellow

4.5 Open additional screwed cable glands

You have the ability to break a second cable gland opening through on the terminal box.

WARNING

In event of a fault, the screwed cable gland is under electrical voltage

Electric shock

→ Do not use metal cable glands for plastic terminal boxes.

- ⇒ Screw the cable gland into the pre-cut thread using a screwdriver. When doing so, note the tightening torques, see chapter 3.1 Product drawing.
- ⇒ Remove the plastic tab that falls off when the wire is pressed through into the terminal box.

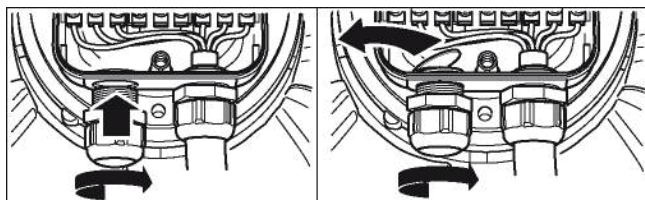


Fig. 4: Screwed cable gland opening

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.
- ⇒ 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 fan.

- ⇒ 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.

4.8 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 last.

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.

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.
- Insert the brought-out thermal overload protector into the control circuit so that the cooled off motor does not switch on independently after a fault.



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 operating point	Check operating point

Overtemperature of motor	Ambient temperature too high	Lower ambient 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 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
Mounting of protective earth connection	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
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
Weld seams for crack formation	Visual inspection	At least every 6 months	Replace device

