

Fcontrol

FXDM

Frequency inverter with integrated sine filter for 3 ~ fans

Quick Start Guide



Detailed Description on www.ziehl-abegg.com

Software version: D1333A from Version 2.37

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1 General notes

1.1 Structure of the short operating instructions



Attention!

This Quick Start Guide contains basic information on safety, use, installation and quick commissioning.

The detailed Operating Instructions can be found on our website. The additional information they contain must be observed.

To download the Operating Instructions, go to www.ziehl-abegg.com and enter the article number "Part No." of the device as the search key (see name plate).

Example:

search key

123456

Enter the article number

1.2 Exclusion of liability

Concurrence between the contents of these operating instructions and the described hardware and software in the device has been examined. It is still possible that non-compliances exist; no guarantee is assumed for complete conformity. To allow for future developments, construction methods and technical data given are subject to alteration. We do not accept any liability for possible errors or omissions in the information contained in data, illustrations or drawings provided.

ZIEHL-ABEGG SE is not liable for damage due to misuse, incorrect use, improper use or as a consequence of unauthorized repairs or modifications.

2 Safety instructions

2.1 Intended use

The equipment is to be used solely for the purposes specified and confirmed in the order.

Any other use above and beyond this is considered not for the intended purpose unless agreed otherwise by contract. The manufacturer will not be liable for any damage resulting from this. The individual or company using it bears the sole risk.

Reading these operating instructions and complying with all contained instructions - especially the safety notifications contained therein - are considered part of intended use. To consider is also the manual of attached components. Not the manufacturer, rather the operator of the device is liable for any personal harm or material damage arising from non-intended use!

2.2 Explanations of symbols

Safety instructions are highlighted with warning triangles and are depicted according to the degree of hazard as follows.

	<p>Attention! General hazardous area. Death or severe injury or significant property damage can occur if the corresponding precautions are not taken!</p>
	<p>Danger due to electric current Danger by dangerous, electric voltage! Death or severe injury can occur if the corresponding precautions are not taken!</p>
	<p>Information Important additional information and advice for user.</p>

2.3 Work on the device



Information

Mounting, electrical connection, and start-up operation may only be carried out by an electrical specialist in accordance with electrotechnical regulations (e.g. EN 50110 or EN 60204)!



Danger due to electric current

- It is generally forbidden to carry out work on electrical live parts. Protection class of the device when open is IP00! It is possible to touch hazardous voltages directly.
- The safe isolation from the supply must be checked using a **two-pole** voltage detector.
- Even after disconnecting the mains voltage, life-threatening charges can appear between the protective ground “PE” and the mains connection.
- The protective earth is conducting high discharge currents (dependent on the switching frequency, current-source voltage and motor capacity). Earthing in compliance with EN specifications shall therefore be observed even for testing and trial conditions (EN 50 178, Art. 5.2.11). Without earthing, dangerous voltages can be present on the motor housing.

Waiting period at least 3 minutes!

- Through use of capacitors, danger of death exists even after switching off the device through directly touching the energized parts or due to parts that have become energized due to faults.
- It is only permitted to remove the housing cover after waiting for 3 minutes once the line supply cable has been shut down. Should measurement or adjustment work be unavoidable on the opened unit while still powered, then this may only be performed by qualified personnel acquainted with the thereby associated hazards.



Attention!

Even after switching off, dangerous temperatures can still occur in and on the device.



Attention!

Automatically restart after a power failure or mains disconnection!

3 Product overview

3.1 Application

The frequency inverter is designed for a stepless control of fans without additional (electromagnetic) motor noise.

Only suitable for drives with low set-off torque (e.g.: fans or pumps).

3.2 Functional description

The frequency inverters of these series generate their 3~ output with variable voltage and frequency from the three-phase mains on the input.

The devices are constructed in accordance with the general requirement in EN 61800-2 for adjustable speed electrical power systems and is intended for one-quadrant drives.



Information

By using the integrated all-pole effective Sine filter (phase to phase and phase to ground), an absolute parallel control of fans without risk of damage for motors is possible. Screened motor cables are not required!

3.3 Maintenance

The device must be checked for soiling and, if necessary, cleaned in periodic intervals. The ventilation grilles on the bottom and on the top of the device must be free to ensure adequate cooling of the device. They can be cleaned with a vacuum cleaner, broom or brush.

3.4 Transport

- The device is packed ex factory to suit the transport method previously agreed.
- Always use the original packaging materials when transporting the device.
- Avoid shocks and impacts to the device during the transport.
- During manual handling the human lifting and carrying restrictions must be observed and adhered to.

3.5 Storage

- The device must be stored in its original packaging in a dry and weather-proof room.
- Avoid exposure to extreme heat and cold.
- Avoid over-long storage periods (we recommend a maximum of one year).

3.6 Disposal / recycling



Disposal must be carried out professionally and in an environmentally friendly way in accordance with the respective national legal stipulations.

- ▷ Separate the materials by type and in an environmentally friendly way.
- ▷ If necessary, commission a specialist company with the waste disposal.

4 Mounting

4.1 General notes



Attention!

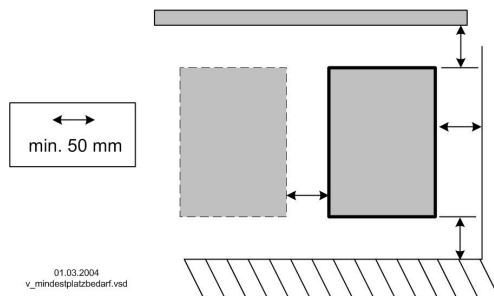
The following points must be complied with during the mechanical installation to avoid causing a defect in the device due to assembly errors or environmental influences:

- Before installation remove the device from the packing and check for any possible shipping damage! Start-up is not allowed in the case of transport damage!
- At a weight greater than 25 kg for men / 10 kg for women, the device should be lifted out by two persons (according to REFA). The values may differ from country to country.
- Wear safety shoes and gloves for handling!
- Assemble the device on a clean and stable base. Do not distort during assembly! Use the appropriate mounting devices for proper installation of the unit!
- A mounting on vibrating base is not permissible, if no data to the vibration strength is made (see Technical data)!
- When mounted onto lightweight walls, there must be no impermissibly high vibrations or shock loads. Any banging shut of doors that are integrated into these lightweight walls, can result in extremely high shock loads. Therefore, we advise you to decouple the devices from the wall.
- Do not allow drilling chips, screws and other foreign bodies to reach the device interior!
- Maintain the stated minimum clearances to ensure unobstructed cooling- air feed as well as unobstructed outgoing air discharge (☞ minimum space requirement)!
- The device should be installed in a location where it will not be disturbed, but at the same time can be easily accessed!
- Care must be taken to avoid direct radiation from the sun!
- The device is designed for vertical installation (cable inlet down). A horizontal or reclined installation is only permissible after technical release of the manufacturer!
- Be sure to observe proper heat dissipation (see Technical data, heat dissipation).

4.2 Minimum space requirement

In order to ensure sufficient ventilation of the device, clearance on all sides of at least 50 mm has to be maintained to the housing walls, switch cabinet doors, wiring ducts, etc. The same clearance applies to the installation of several devices next to each other.

When installing several devices on top of each other, the danger of reciprocal heating exists. This layout is only then permissible when the air suctioned from the upper unit does not become warmer than the permissible ambient temperature (see Technical data). I.e., a correspondingly larger clearance or thermal shielding is required.



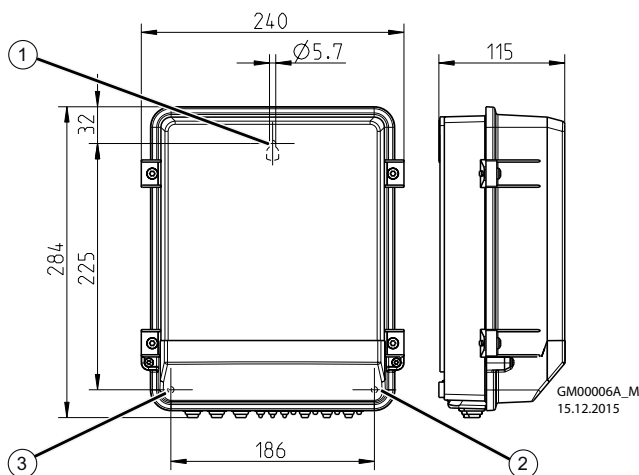
4.3 Fastening the device

The type of fastening and the number of fastening points are dependent on the housing design. All the fastening points available must be used for safe fastening.

Proceed as follows:

Type FXDM2.5AM

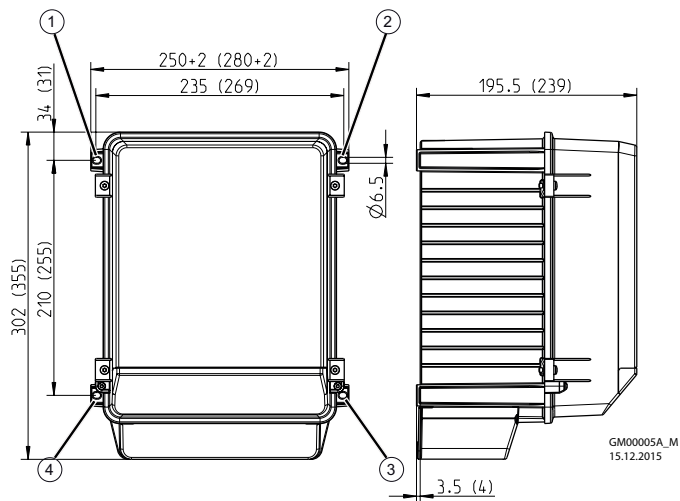
Fastening at 3 points



- ▷ Drill fastening point "1".
- ▷ Screw in flat-head screw up to a distance of approx. 2 mm and mount the device.
- ▷ Remove the terminal compartment cover.
- ▷ Align the device and mark the position of both lower fastening points "2" + "3".
- ▷ Remove the device and drill the fastening points "2" + "3".
- ▷ Remount the device and tighten the fastening point screws "2" + "3".

Type FXDM5...18 (FXDM22)

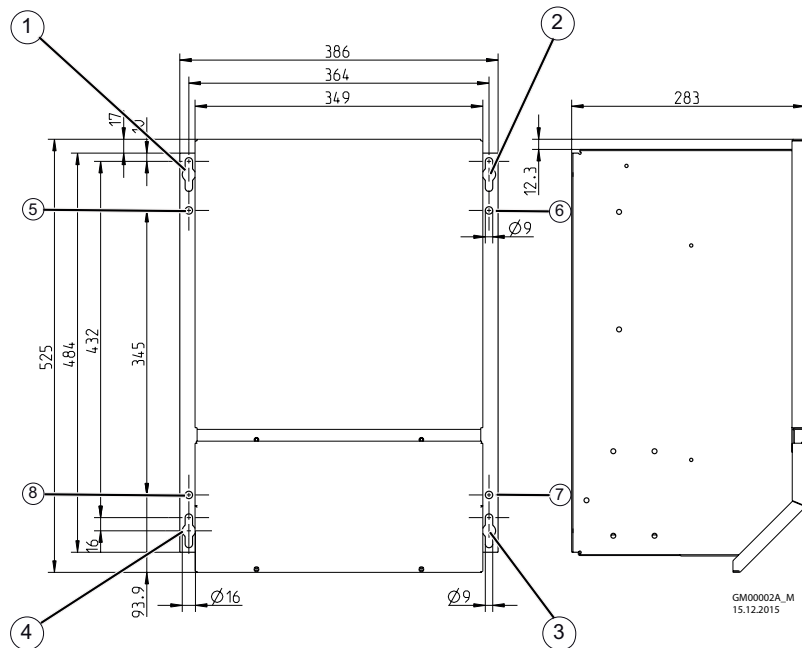
Fastening at 4 points



- ▷ Drill fastening points “1” - “4”.
- ▷ Fasten device with screws.

Type FXDM32...50 (IP54 / IP65)

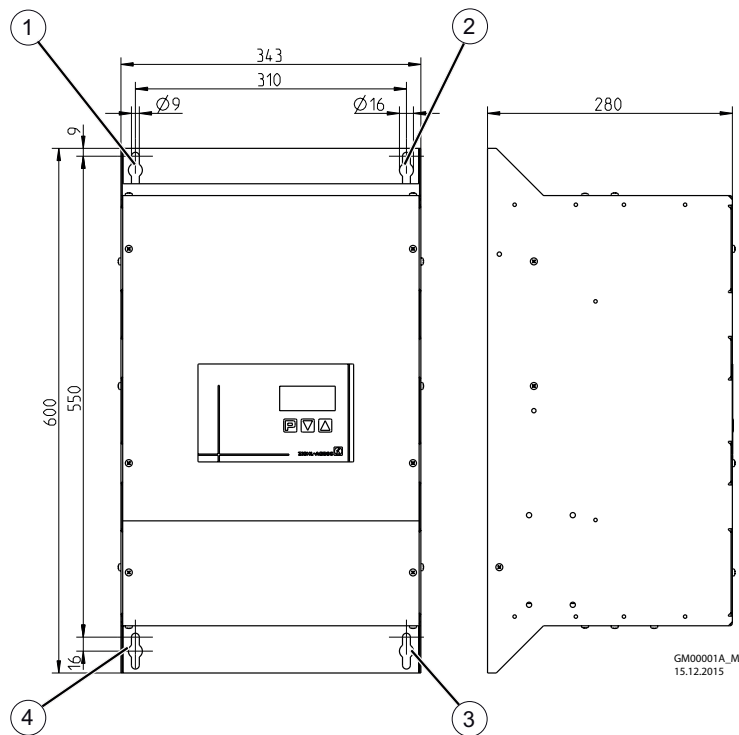
Fastening at 8 points



- ▷ Drill 8 fastening points.
- ▷ Screw in fastening point screws “1” - “4” up to a distance of approx. 5 mm and mount the device.
- ▷ Tighten fastening point screws “1” - “4”
- ▷ Screw in fastening point screws “5” - “8” and tighten.

Type FXDM32...50 (IP20)

Fastening at 4 points

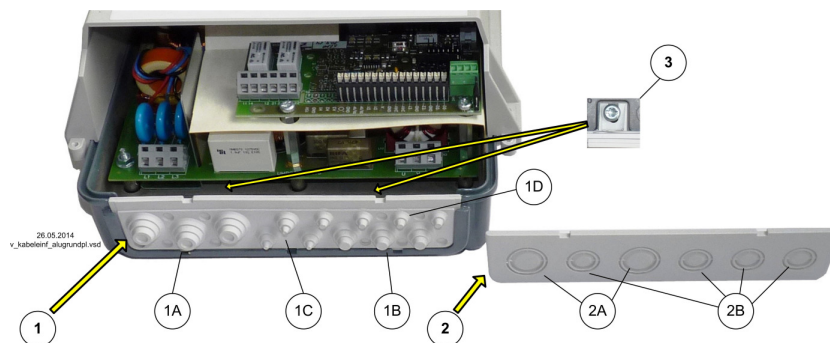


- ▷ Drill 4 fastening points.
- ▷ Screw in screws “1” - “4” up to a distance of approx. 5 mm and mount the device.
- ▷ Tighten fastening point screws “1” - “4”.

4.4 Cable inlet

- ▷ Remove the terminal compartment cover.
- ▷ Depending on the housing model cut off necessary cable inlets respectively to the cable diameter. Or alternative use cable inlet for cable glands. Metal sheet housings are supplied with stoppers. Any cable ducts openings not used must be sealed!
- ▷ Strip and insert the cables properly.
- ▷ Attach cover for terminal compartment again carefully before start-up.

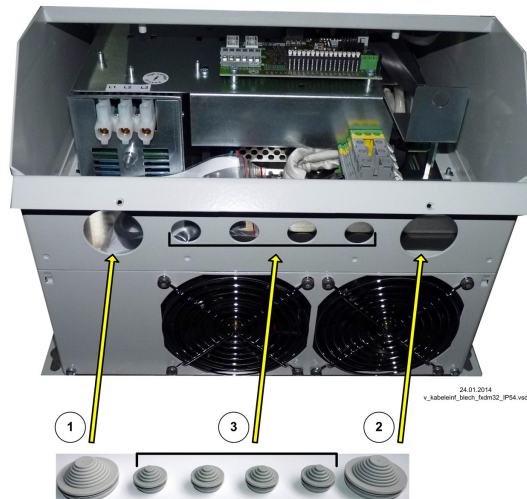
Housing with aluminum base plate



- 1 Cable inlet with step nozzles (factory installed)
- 1A 3 x max. 18 mm
- 1B 3 x max. 14 mm
- 1C 3 x max. 11 mm
- 1D 4 / 8 x max. 8 mm
- 2 attached cable inlet for cable glands
- 2A 17 / 21 mm
- 2B 12.5 / 17 mm
- 3 Fastening screws

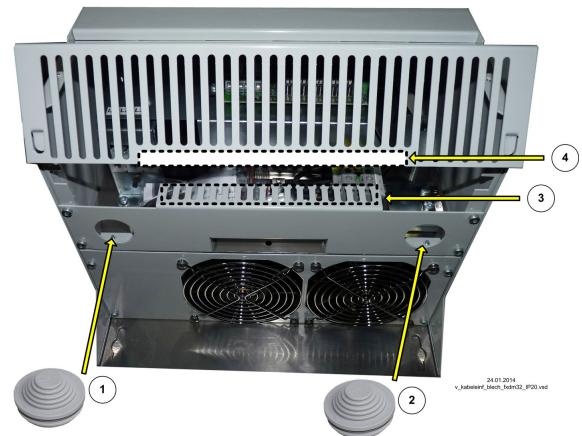
Sheet metal housing

IP54



- 1 Inlet mains connection (40 mm)
- 2 Inlet motor connection (40 mm)
- 3 Inlet control cables (20 mm)

IP20



- 1 Inlet mains connection (32 mm)
- 2 Inlet motor connection (32 mm)
- 3 Ridges for connecting the control cables
- 4 Cut-out for control cables in the cover

**Information**

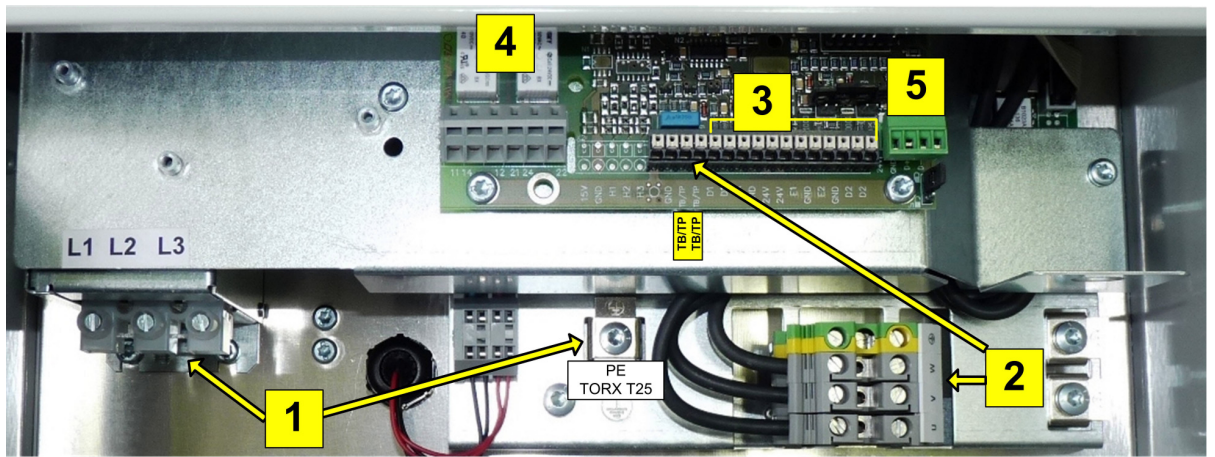
- Cable glands can be used alternatively (not included in delivery). The manufacturer's specifications for tightening torque and sealing area must be observed!
- Openings which are not needed must be sealed!

5 Electrical installation**5.1 Safety instructions****Danger due to electric current**

- It is forbidden to carry out work on electrically live parts. Even after disconnection, the dc-link is still live. Always wait at least 3 minutes.
- In accordance with the defined networks in EN 60990, the device has a leakage current > 3.5 mA so it must be permanently connected. The protective ground must be made double in accordance with EN 50178 Point 5.2.11 and 5.3.2.1 up to a cross section of at least 10 mm².
- For an installation of r.c.d. protection, it shall be observed that this must be of "universal-current sensitivity" (Type B). In accordance with EN 50178, Section 5.2, other types of current-operated protective devices may not be used. To ensure as high a degree of reliability as possible, we recommend a tripping current of 300 mA.
- Not suitable for IT system!
- To activate the on current limitation, you must wait at least 90 seconds after switching off the line voltage before switching back on!
- Never apply line voltage to the control terminals and to the terminals for motor protection function "TB / TP"!

5.2 Connection**Information**

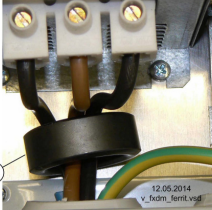

This Quick Start Guide does not list all connection options or notes for electrical installation (full description see Operating Instructions, connection diagram see Enclosure).



09.05.2014
v_fxdm_connection.vsd

Example: Position of terminals for devices in sheet metal housing

- 1 Line
- 2 Motor
- 3 Modulation
- 4 Indication relays
- 5 MODBUS

Terminal	Information
<p>L1 L2 L3</p>  <p>PE</p> <p>1 Ferrite ring for FXDM32/40/50</p>	<p>Mains connection</p> <p>Here, it must be strictly observed that the mains voltage lies within the allowable tolerance specifications (see Technical data and nameplate affixed to the side). Ferrite ring for FXDM32/40/50 For compliance with interference emission according to EN 61000-6-3 the wires for "L1", "L2" and "L3" must be laid through the attached ferrite ring.</p>
<p>U, V, W, PE</p> <p>TB / TP - TB / TP</p> 	<p>Motor connection</p> <p>Several motors can be connected to the device. The maximum total current of all motors must not exceed the rated current for the controller. Screened motor cables not required!</p> <p>Motor protection</p> <p>Motor protection is possible by connecting thermostats "TB" or thermistors "TP". When several motors are connected ensure that the thermostats "TB" or thermistors "TP" are always connected in series. If the motor protection function of the device is not necessary the both terminals "TB / TP" have to be bridged.</p> <p>Motor fault</p> <p>When a connected thermostat or thermistor responds (interruption between the two terminals "TB/TP") the device switches off and does not switch back on. Reset required, switch off the device and turn on again.</p>
<p>K1: 11 - 14 - 12 K2: 21 - 24 - 22</p>	<p>Relay</p> <p>Various functions can be allocated to the relay outputs "K1" and "K2" (see Operating Instructions / IO Setup). "K1 Function" factory setting: <input type="checkbox"/>1K = Operating indication. I.e. energized for operation without fault, for enable "OFF" de-energized. "K2 Function" factory setting: <input type="checkbox"/>2K = Fault indication. I.e. energized for operation without fault and for enable "OFF".</p>
<p>D1 - D1, D2 - D2 Digital In 1 / 2</p>	<p>Digital inputs</p> <p>The digital inputs "D1" and "D2" can be allocated with various functions. E.g. for enable of the device <input type="checkbox"/>1D (see Operating Instructions / IO Setup). "D1 Function", "D2 Function" Factory setting: <input type="checkbox"/>OFF = no function.</p>
<p>A - GND Analog Out 1</p>	<p>Analog output</p> <p>The analog output 0...10 V can be allocated with various functions (see Operating Instructions / IO Setup). "A Function" Factory setting: <input type="checkbox"/>1A = Constant voltage +10 V (e.g. voltage supply for speed setting potentiometer).</p>

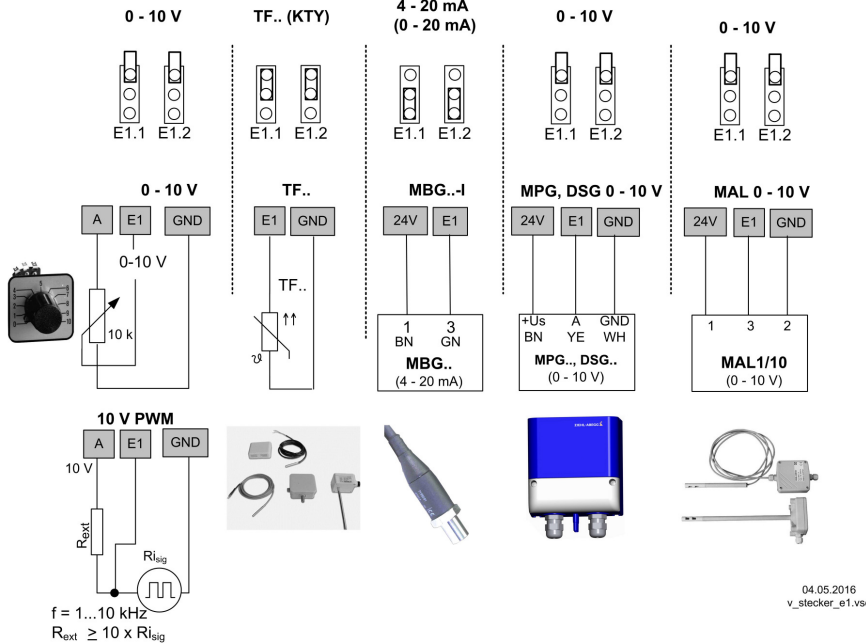
Terminal	Information
24V - GND 24V DC Out	Voltage supply For external devices, e.g. for sensors, terminal.
E1 - GND, E2 - GND Analog In 1 / 2	Analog inputs For speed setting signal or sensor signal. Connection depending on programmed function, see selection Mode.
GND, A (D+), B (D-)	RS-485 MODBUS Interface for networking via MODBUS RTU. "A (D+)" must always be connected to "A (D+)" of the next devices, the same applies to "B (D-)". In addition, a "GND" connection must be established, as dissimilar potential (over 10 V!) will lead to the destruction of the RS-485 interface (e.g. lightning).

6 Base setup

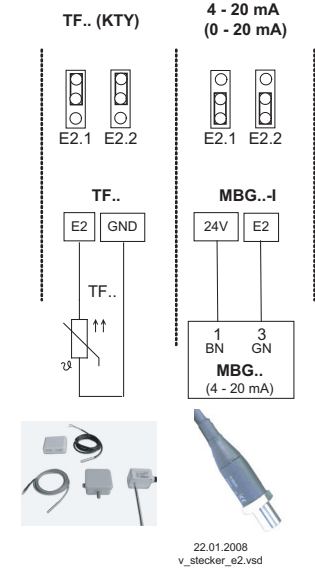
6.1 Jumper for the input signal

Jumper position factory setting for 0 - 10 V signal. For temperature sensors (TF..) or sensors with 4 - 20 mA bring the internal jumper for the external signal in the correct position. Caution- not under voltage! Observe the safety notices! When using “other sensors” bring the jumper in the correct position. The adjustment of the measuring range takes place in the Base setup of respective Mode.

E1 Analog In (factory setting 0 - 10 V)

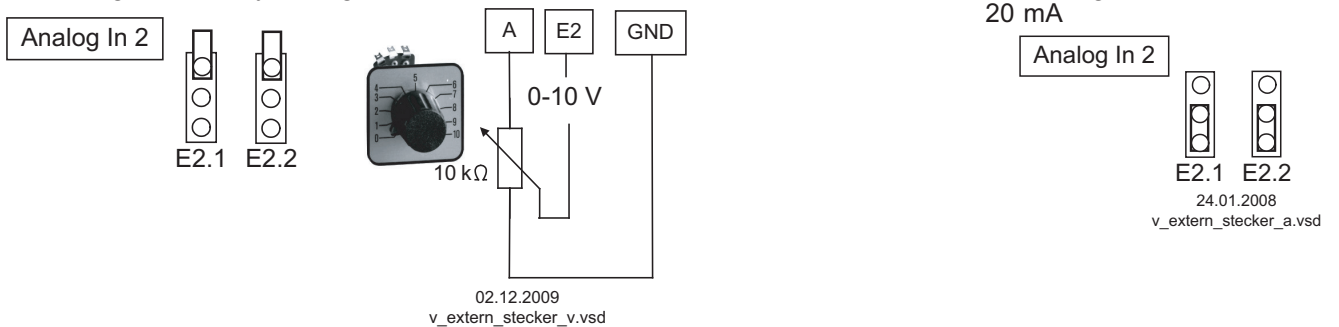


E2 Analog In for modes with two sensors



6.1.1 External Setpoint / External speed setting in manual operation

External Setpoint or external manual operation is possible by 0 - 10 V (0 - 20 mA, 4 - 20 mA) Signal at terminals “E2” and “GND”. Place internal Jumper “E2.1” and “E2.2” for “E2 Analog In” in correct position. “E2” Configuration in base setup. For Potentiometer Analog Out1 (terminal “A”) program to function **1A** = “+10 V” (like factory setting see IO Setup). If a second sensor is connected at input 2, external Setpoint or speed setting in manual operation is possible with additional modul “Z-Modul-B” (input E3 see IO Setup). E2 Analog In = factory setting 0 - 10 V



External Setpoint via external signal instead of “Setpoint 1”. The “external Setpoint” function must be activated in base setup **1E** for “E2 function”. The active external Setpoint value is displayed in the “info” menu group.

External speed setting in manual operation. The “external manual operation” function must be activated in the basic settings **2E** for “E2 function”. Switchover between settings on the device and external manual operation via the digital input (see IO Setup: “Control / manual operation” **7D**).

6.2 Select operation mode



Information

Simple installation is possible through the selection of the preprogrammed mode of operation. This determines the basic function of the device; factory setting **1.01** = Speed controller (activation via 0 - 10 V signal). The controller configuration is automatically carried out during selection of the application related mode of operation. The factory presets in accordance with the mode of operation are based on many years of experience, which is suitable for many applications. Under special circumstances, these can be individually adapted (see Controller Setup: "Controller Configuration"). The purpose of the device is to reach and maintain the target values set. To accomplish this, the measured actual value (sensor value) is compared with the adjusted target value, and the controlled value (modulation) is deduced from this.

Mode	Signal or Sensor (input)	Function
1.01	Signal 0 - 10 V (PWM)	Speed controller, two step operation with external switch over (factory setting)
1.02	-	Manual speed controller with direct setting by the ▼+ ▲ keys (0 - 100 % or in 1 - 5 steps)
2.01	Sensor TF..(E1)	Temperature control airconditioning and refrigeration. (preset set-point 20.0 °C, P-band 5.0 K)
2.02	Sensor TF..(E2)	Temperature control depending on outdoor temperature (preset set-point 5.0 °C, - P-band 20.0 K)
2.03	Sensor TF..(E1)	Temperature control with additional functions (shutter and heating)
2.04	1x Sensor TF..(E1) 1x Sensor TF..(E2)	Temperature control with two sensors, comparison or average
2.05	1x Sensor TF..(E1) 1x Sensor TF..(E2)	Temperature control with two sensors differential temperature
3.01	Sensor MBG.. (E1)	Pressure control condensers (refrigeration)
3.02	Sensor MBG..(E1)	Pressure control for condensers with input for refrigerant
3.03	1x Sensor MBG..(E1) 1x Sensor MBG..(E2)	Pressure control for two circuit condensers
3.04	1x Sensor MBG..(E1) 1x Sensor MBG..(E2)	Pressure control for two circuit condensers with input for refrigerant
4.01	Sensor DSG..(E1)	Pressure control for ventilation systems
4.02	1x Sensor DSG..(E1) 1x Sensor TF..(E2)	Pressure control depending on outdoor temperature
4.03	1x Sensor DSG..(E1) 1x BUS RS 485	Pressure control depending on outdoor temperature, MODBUS for outdoor temperature and remote control by central operating device type AXE-200
5.01	Sensor DSG..(E1)	Volume control (constant) for ventilation systems
5.02	1x Sensor DSG..(E1) 1x Sensor TF..(E2)	Volume control with setpoint depending on outdoor temperature
6.01	Sensor MAL..(E1)	Air velocity control e.g. clean room

7 Start-up


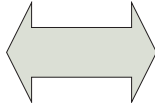
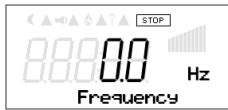


7.1 Prerequisites for commissioning



Attention!

1. You must mount and connect the device in accordance with the operating instructions.
2. Double check that all connections are correct.
3. The mains voltage must match the information on the rating plate.
4. The rated current on the rating plate will not be exceeded.
5. Make sure that no persons or objects are in the hazardous area.

7.2 Procedure for commissioning

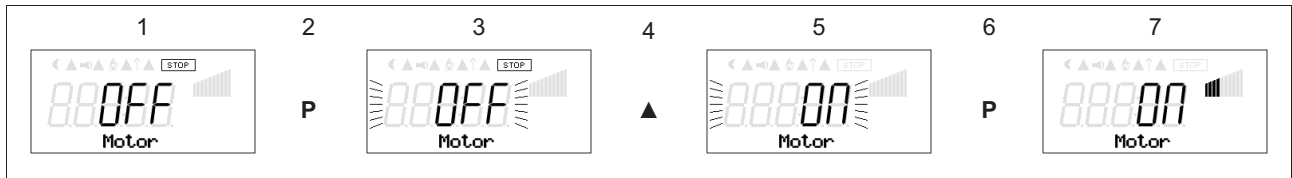
Sequence	Setting												
1	<ul style="list-style-type: none"> ▷ Check if Thermostats or Thermistors of the motor are connected to input “TB/TP In”. ▷ If the motor protection function of the device is not necessary the both terminals “TB / TP” have to be bridged. 												
2	▷ Check connection and close housing carefully.												
3	<ul style="list-style-type: none"> ▷ Turn on mains voltage. <div style="display: flex; align-items: center; justify-content: center; gap: 20px;">    </div> <p style="text-align: center;">Display after first turning on the mains voltage.</p>												
4	<p>In the menu group Start the adjustment for Motor is OFF for factory setting => display: STOP.</p> <p>This prevents the system from inadvertently starting up before configuration is complete.</p> <p>Operation of the device after pressing the Esc hotkey combination.</p> <div style="display: flex; align-items: center; justify-content: center; gap: 20px;">  <div style="text-align: center;"> <p>Switch-over between “OFF” and “Start” with the key shortcut for Escape ((Esc = ▼ + ▲).</p> </div>  </div>												
5	<p>Menu group: Start</p> <ul style="list-style-type: none"> ▷ Set the menu language if necessary (factory setting English = Language GB). 												
6	<p>Menu group: Base setup</p> <ul style="list-style-type: none"> ▷ Setting the desired operation Mode (factory setting 1.01 = Speed controller see Selection Mode). ▷ Further settings depend on the selected mode and the sensor / setting signal used. <p>Attention!</p> <p>When saving the operating mode, the respective preset factory operating-mode setting is loaded. That means, the settings you have made, e.g., in “Motor setup” are lost. An exception: the menu language setting remains preserved.</p>												
7	<p>The Motorsetup factory installed values are for variable voltage external rotor motors 400 V / 50 Hz. After checking of the motor data the setting are to be adapted if necessary.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Motor rated voltage (see Rating plate)</th> <th style="text-align: left;">Setting Edgefrequency</th> <th style="text-align: left;">Setting Max. Frequency</th> </tr> </thead> <tbody> <tr> <td>3 ~ 400 V, 50 Hz</td> <td>48.5 Hz</td> <td>50 Hz</td> </tr> <tr> <td>3 ~ 400 V, 50/60 Hz</td> <td>48.5 Hz</td> <td>60 Hz</td> </tr> <tr> <td>3 ~ 400 V, 60 Hz</td> <td>57 Hz</td> <td>60 Hz</td> </tr> </tbody> </table> <p>Additional settings see Motor Setup.</p>	Motor rated voltage (see Rating plate)	Setting Edgefrequency	Setting Max. Frequency	3 ~ 400 V, 50 Hz	48.5 Hz	50 Hz	3 ~ 400 V, 50/60 Hz	48.5 Hz	60 Hz	3 ~ 400 V, 60 Hz	57 Hz	60 Hz
Motor rated voltage (see Rating plate)	Setting Edgefrequency	Setting Max. Frequency											
3 ~ 400 V, 50 Hz	48.5 Hz	50 Hz											
3 ~ 400 V, 50/60 Hz	48.5 Hz	60 Hz											
3 ~ 400 V, 60 Hz	57 Hz	60 Hz											
8	<p>Menu group Setting:</p> <ul style="list-style-type: none"> ▷ Set the parameters for the control operation 												
9	<p>Menu group Start:</p> <ul style="list-style-type: none"> ▷ Switch setting for Motor to ON. 												



Information

Settings for U/f characteristic can only be made when no motor modulation is present! This is the same also for the setting of Mode.

Switch Motor to ON in menu group “Start”

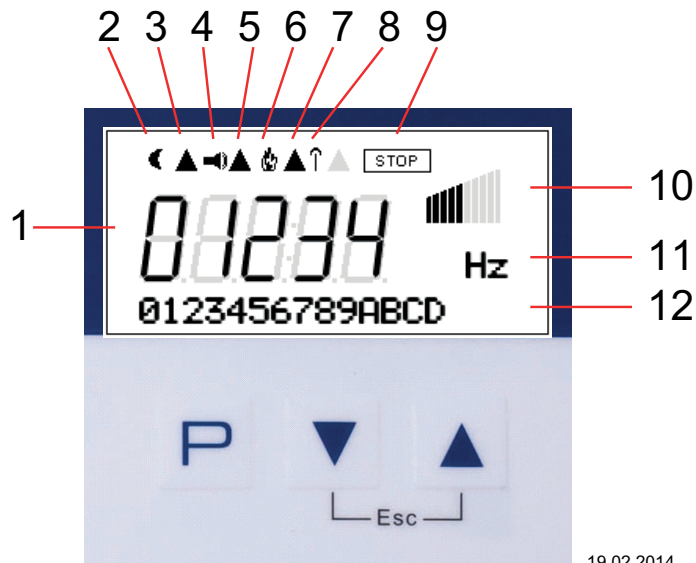


7.3 Menu Mode **1.01**

Start	Info	Setting	Events	Base setup	Controller Setup	IO Setup	Limits	Motor Setup	Diagnostic
OFF Motor	0.0 Hz Frequency	50.0 Hz Set Internal1	-0- Motor fault	1.01 Mode	OFF PIN Protection	1A A Function	OFF Controller function	8.0 A MotorRatedCurr.	OTC 00012:56:-15
---- PIN input	0.0 A Motor current	----- Set Internal2	-1- Overtemperature	0 - 10 V E1 Analog In	OFF Set protection	0.0 V A min.	----- Level min	400 V MotorRatedVolt.	OTM 00010:56:-11
GB Language	8 W Input power	0.0 Hz Min. Speed	-2- ext. Fault	OFF E2 Function	OFF Save User Setup	10.0 V A max.	----- Level max.	48.5 Hz Edgefrequency	585 V DC-Voltage
OFF Reset	8 W Output power	50.0 Hz Max. Speed	-3- Sensor 2	----- E2 Analog In	----- Limit	OFF A Inverting	----- Level Delay	50.0 Hz Max. Frequency	32.4 °C Heatsink
1.01 Mode	0.0 Hz Set external1	ON Set external1			----- Group 2 ON value	OFF D1 Function	OFF Lmt E1 Function	40 sec Rampup time	29.5 °C Capacitor
2.28 Fcontrol					----- nmin at Group2	----- D1 Inverting	----- Lmt E1 min	40 sec Rampdown time	29.5 °C Filterchoke

8 Controls and Menu


8.1 Multipurpose LC display and keyboard



19.02.2014
v_display_erklaerung_fcontrol.vsd

- | | | | | | | | | | |
|---|---|----------|---------------------------|---|------------------------------|---|--------------------------------|-----|--|
| <ol style="list-style-type: none"> 1. Numeric display 5 digit 2. Moon-Symbol for set point 2 3. Current derating active 4. Alarm-Symbol (fault indication) 5. Brake motor or motor heating active 6. Fire-Symbol (heating operation) 7. Derating (power reduction active) 8. External switch over direction of rotation active 9. STOP-Symbol (enable) 10. Bargraph Fanlevel 11. Text line 3 figures (display unit, etc.) 12. Text line 16 figures (display text menu.) | <table border="0"> <tr> <td style="text-align: center;">P</td> <td>Program key and open menu</td> </tr> <tr> <td style="text-align: center;">▼</td> <td>Menu selection, reduce value</td> </tr> <tr> <td style="text-align: center;">▲</td> <td>Menu selection, increase value</td> </tr> <tr> <td style="text-align: center;">▼+▲</td> <td>ESC-key combination, Escape = leave menu</td> </tr> </table> | P | Program key and open menu | ▼ | Menu selection, reduce value | ▲ | Menu selection, increase value | ▼+▲ | ESC-key combination, Escape = leave menu |
| P | Program key and open menu | | | | | | | | |
| ▼ | Menu selection, reduce value | | | | | | | | |
| ▲ | Menu selection, increase value | | | | | | | | |
| ▼+▲ | ESC-key combination, Escape = leave menu | | | | | | | | |


8.2 Menu operation




Speed
rpm

Display after turning on the voltage supply.
description for menu language English = "GB" (delivery status).
Switch over between "Start" and *Actual value with Escape **[Esc]**.

Example for mode **1.01** (speed controller).




Start



Start

By pushing the **P** key one reaches the menu item "START".


P ↓ ↑ ESC



Motor

Motor OFF / ON

▲ ▼



PIN input

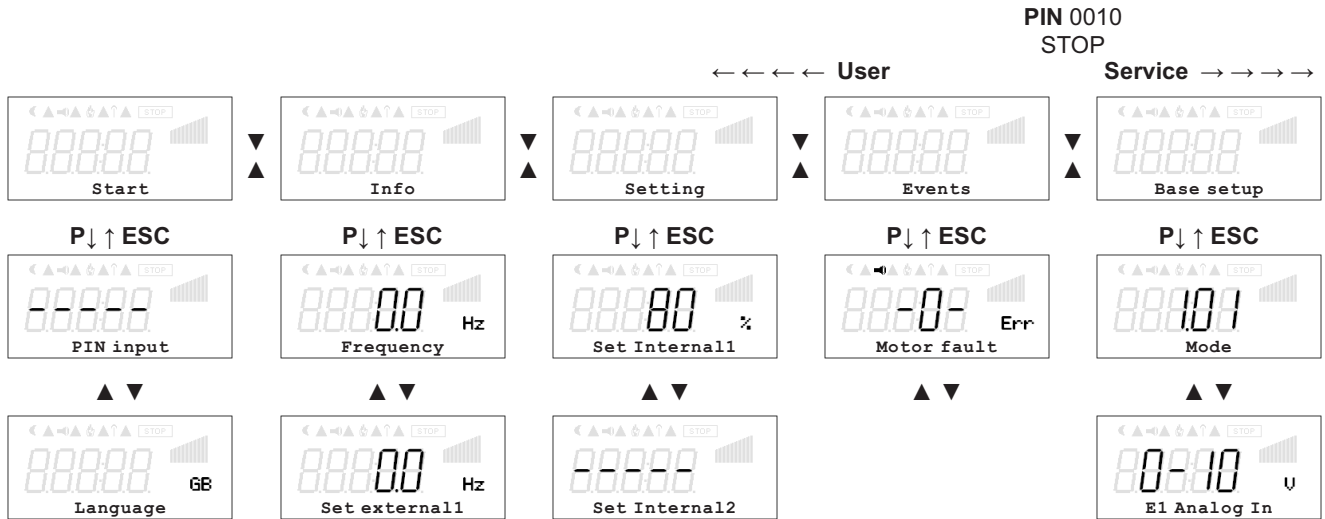
One moves up and down within the menu group using the arrow keys.

▲ ▼



In the menu point “Language” display language can be selected.
One returns to the menu group “Start” using the ESC (▼ + ▲) shortcut keys.

8.3 Menu structure



Menu dependent on device type

Selection of the menu group (e.g. Base setup) to the right through the ▼-key, to the left through the ▲-key.

You can go to the menu items in the menu groups (e.g. mode of operation) by using the P key. Use the arrow keys to move up and down within the menu group.

The menu groups consist of one area for the user (user menu) and one area for installation (service). The service area can be protected against unauthorized access by using a PIN.

In order to simplify the initial start-up operation, the service level is enabled at first. I.e., not protected by the PIN 0010 (see Controller Setup, PIN protection = OFF). If PIN protection is activated (ON), the service menu remains enabled after input of PIN 0010 as long as one is pressing keys. If no keys are pressed for ca. 15 minutes, the PIN is automatically erased, i.e. the service level is blocked.

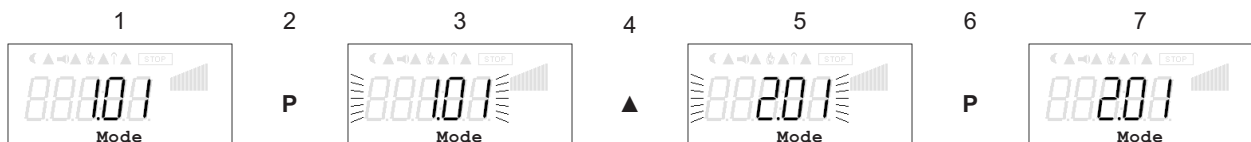
To make adjustments, press the P key after selecting the menu item. If the previously set value starts to ash, it can be adjusted with the ▼ + ▲ keys and then saved with the P key. To exit the menu without making any changes, use the “Esc” short-key, i.e., the originally set values remain.



Information

After installation of the device has been carried out, PIN protection should be activated (see Controller Setup)!

8.4 Example for programming mode **2.01** in “Base setup”



9 Enclosure

9.1 Technical data

Type (Part-No.)	Rated current* Output {1} [A]	Rated current (1 fundamental component @ 50 Hz) Input {2} [A]	Rated temperature [°C]	max. line fuse {3} [A]	Max. heat dissipation approx. {2} [W]	Noise approx. {4} [dB]	Weight [kg]	Housing protection IP
FXDM2.5AM (308099)	2.5	2.5 (2.3)	40	6	50	-	3.3	54
FXDM5AM (308138)	5	4.8 (4.4)	50	10	100	54.6	7.2	54
FXDM5M (308137)	5	4.8 (4.4)	50	10	100	54.6	7.0	54
FXDM8AM (308140)	8	7.0 (6.5)	50	10	150	54.6	7.9	54
FXDM8M (308139)	8	7.0 (6.5)	50	10	150	54.6	7.7	54
FXDM10AM (308142)	10	9.4 (8.6)	55	16	210	54.6	8.2	54
FXDM10M (308141)	10	9.4 (8.6)	55	16	210	54.6	8.0	54
FXDM14AM (308144)	14	13.5 (12.3)	40	16	310	54.6	8.7	54
FXDM14M (308143)	14	13.5 (12.3)	40	16	310	54.6	8.5	54
FXDM18AM (308174)	18	16.7 (15.5)	40	20	400	-	9.1	54
FXDM18M (308173)	18	16.7 (15.5)	40	20	400	-	8.9	54
FXDM22AM (308108)	22	19.2 (17.7)	40	25	520	-	14.5	54
FXDM22M (308115)	22	19.2 (17.7)	40	25	520	-	14.3	54
FXDM32AM (308009)	32	27.6 (25.7)	50	35	700	65.7	29.6	54
FXDM32AM (308225)	32	27.6 (25.7)	50	35	700	65.7	29.6	65
FXDM32M (308096)	32	27.6 (25.7)	50	35	700	65.7	29.6	54
FXDM32AME (308008)	32	27.6 (25.7)	50	35	700	65.7	33.1	20
FXDM32ME (308007)	32	27.6 (25.7)	50	35	700	65.7	33.1	20
FXDM40AM (308177)	40	34.0 (31.5)	50	50	790	65.7	29.6	54
FXDM40AM (308226)	40	34.0 (31.5)	50	50	790	65.7	29.6	65
FXDM40M (308178)	40	34.0 (31.5)	50	50	790	65.7	29.6	54
FXDM40AME (308176)	40	34.0 (31.5)	50	50	790	65.7	33.1	20

Type (Part-No.)	Rated current* Output {1} [A]	Rated current (1 fundamental component @ 50 Hz) Input {2} [A]	Rated temperature [°C]	max. line fuse {3} [A]	Max. heat dissipation approx. {2} [W]	Noise approx. {4} [dB]	Weight [kg]	Housing protection IP
FXDM40ME (308175)	40	34.0 (31.5)	50	50	790	65.7	33.1	20
FXDM50AM (308183)	50	47.5 (43.2)	50	63	910	65.7	32.8	54
FXDM50AM (308227)	50	47.5 (43.2)	50	63	910	65.7	32.8	65
FXDM50M (308184)	50	47.5 (43.2)	50	63	910	65.7	32.8	54
FXDM50AME (308182)	50	47.5 (43.2)	50	63	910	65.7	36.7	20
FXDM50ME (308181)	50	47.5 (43.2)	50	63	910	65.7	36.7	20

{1} Rated current output Δ current indication rating plate @ rated voltage, @ rated temperature ($\cos \varphi$ 0.8 at the output).

{2} At rated voltage ($\cos \varphi$ 0.8 at the output), values for different specifications on request.

{3} Max. line fuse on site (line protection fuse) according to EN 60204-1 Classification VDE0113 Part 1

{4} Sound power level A-weighted by internal fan (- no indication)

Line voltage*	3 ~ 208...480 V (-15 up to +10 %), 50/60 Hz
Rated voltage	400 V
Maximal output voltage	95 % of U_{Line}
Maximal output frequency	150 Hz (for FXDM22 max. 60 Hz permissible!)
Power factor	> 0.9
Switching frequency	16 kHz
Input resistance for sensor or signal set for the rotational speed	for 0 - 10 V input: $R_i > 100 \text{ k}\Omega$ for 4 - 20 mA input: $R_i = 100 \Omega$
Voltage supply e.g. for sensors	+24 V \pm 20 %, I_{max} 120 mA (for connection to an external AXG terminal minus approx. 50 mA)
Output (0 - 10 V)	I_{max} 10 mA (short-circuit-proof)
Digital inputs "D1" and "D2"	Input resistance: R_i approx. 4 k Ω
Max. contact rating of the internal relay	2 A / 250 VAC
Max. permissible ambient temperature for operation	55 °C
Min. permissible ambient temperature for operation	0 °C (if mains voltage is not switched off up to -20 °C) To avoid condensation the device must be continuously energized due to the application of heat, with interruptions such that cooling to the point of condensation does not occur.
Permissible temperature range for storage and transport	-30...+80 °C (FXDM22: -30... +70 °C)
Max. permissible installation height	0..4000 m amsl above 1000 m amsl the rated current is to be reduced by 5 % / 1000 m
Permissible rel. humidity	85 % no condensation
Electromagnetic compatibility for the standard voltage 230 / 400 V according to DIN IEC 60038	Interference emission EN 61000-6-3 (domestic household applications) Interference immunity EN 61000-6-2 (industrial applications)
Harmonics current	For devices < 4 A according EN 61000-3-2 For devices \geq 4 A and \leq 16A according EN 61000-3-2 (see Operating Instructions / Electrical installation / harmonics current for devices \geq 4 and \leq 16 A)

	For devices > 16A and ≤ 75A according to EN61000-3-12 (see Electrical Installation / Harmonics current and line impedance)
	Please ask manufacturer for the individual harmonic oscillation levels of the current as a percentage of the fundamental oscillation of the rated current.
Vibratory strength (for vertical installation, i.e. cable inlet down).	FXDM2.5(A)M...22(A)M and FXDM32(A)ME...50(A)ME Broadband noise (simulated life-endurance test) in accordance with EN 61373, category 1 class B. Shock test according to EN 61373, category 1

* Regarding the mains connection, these devices are to be classified as category "C2" devices according to the relevant DIN EN 61800-3. The increased requirements placed on electrical interference > 2 kHz for category "C1" devices are complied with in addition.

9.1.1 Versions type-lines Fcontrol

In IP54 for wall mounting

- **FXDM..external** terminal type AXG-1A(E), for start-up and setting necessary.
- **FXDM..A** internal LCD-Multifunction display with plain language text.

In IP20 for switch cabinet mounting

- **FXDM..E** external terminal type AXG-1A(E), for start-up and setting necessary.
- **FXDM..AE** internal LCD-Multifunction display with plain language text.

9.1.2 Max. load dependent on ambient temperature and line voltage.

The maximum permissible temperature for the rated current at rated voltage is specified as rated temperature.

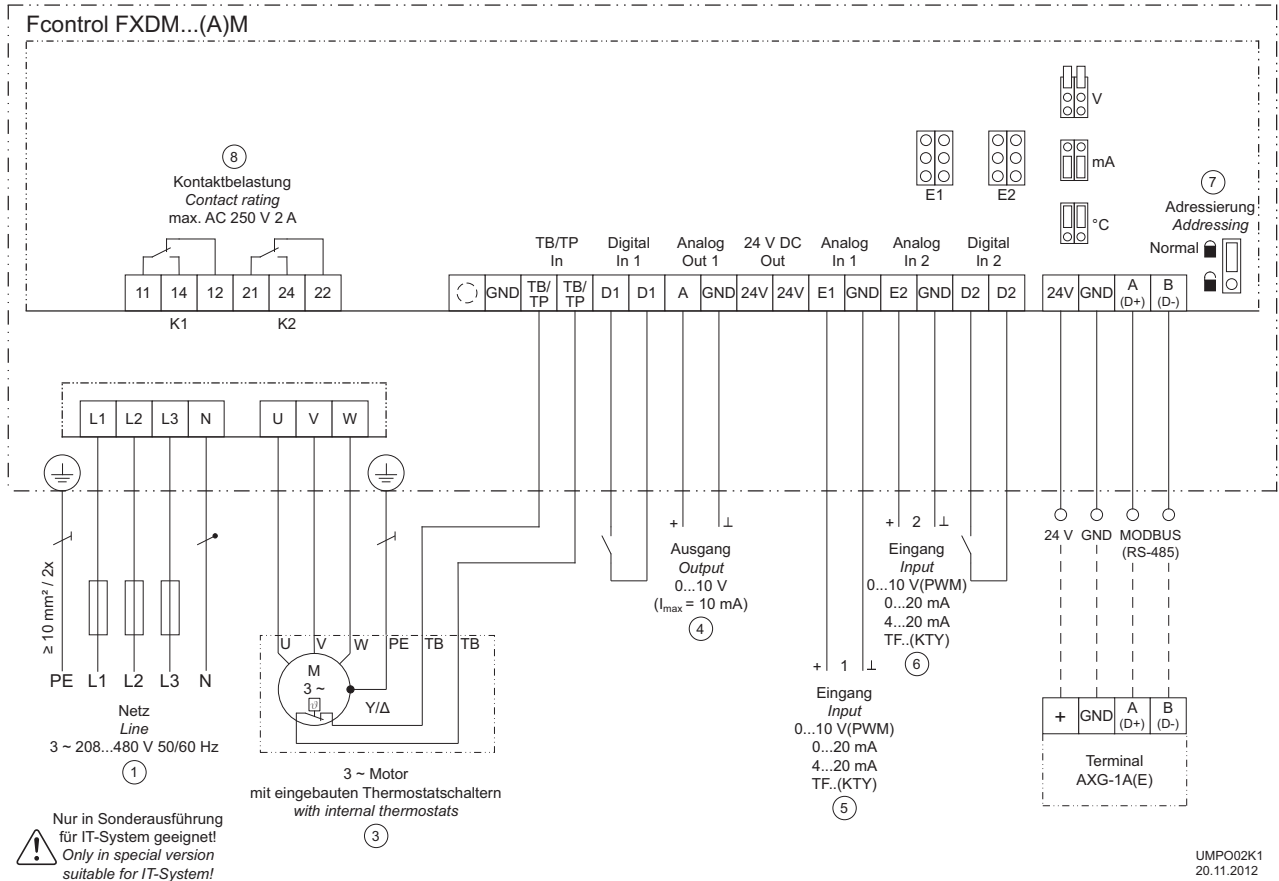
Since the dissipation of the power loss (heat development) in the device is decisively dependent on the ambient temperature, the max. load must be reduced at an ambient temperature above the rated temperature (see following table)!

The average value measured during a 24 h period must be 5 K under the max. ambient temperature. For installation in a switch cabinet, the device's dissipation and its possible affect on the ambient temperature must be taken into consideration!

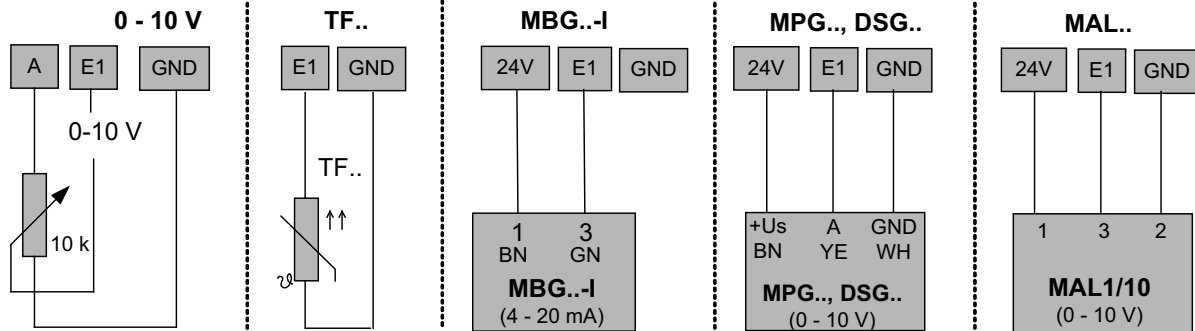
Since the power loss in the device increases with rising line voltage, the following table must be observed.

Type	Maximal load depending on line voltage and ambient temperature					
	208 V (-15 %) ... 415 V (+6 %)			over 415 V (+6 %) ... 480 V (+10 %)		
	40 °C	50 °C	55 °C	40 °C	50 °C	55 °C
FXDM2.5(A)M	2.5 A	2.0 A	1.5 A	2.2 A	1.5 A	1.2 A
FXDM5(A)M	5.0 A	5.0 A	4.2 A	5.0 A	5.0 A	4.0 A
FXDM8(A)M	8.0 A	8.0 A	7.5 A	8.0 A	8.0 A	7.0 A
FXDM10(A)M	10.0 A	10.0 A	10.0 A	10.0 A	10.0 A	10.0 A
FXDM14(A)M	14.0 A	12.0 A	11.0 A	14.0 A	12.0 A	10.5 A
FXDM18(A)M	18.0 A	16.0 A	12.0 A	18.0 A	15.0 A	11.5 A
FXDM22(A)M	22.0 A	18.0 A	15.3 A	22.0 A	17.0 A	14.5 A
FXDM32(A)M(E)	32.0 A	32.0 A	30.0 A	32.0 A	32.0 A	30.0 A
FXDM40(A)M(E)	40.0 A	40.0 A	37.0 A	40.0 A	40.0 A	35.0 A
FXDM50(A)M(E)	50.0 A	50.0 A	48.0 A	50.0 A	50.0 A	46.0 A

9.2 Connection diagram



- 1 Line 3 ~ 208...480 V, 50/60 Hz ("N" - connection only available for FXDM22)
- 2 Only in special version suitable for IT system!
- 3 3 ~ Motor with internal thermostats
- 4 Output 0...10 V ($I_{max} = 10 \text{ mA}$)
- 5 Input 1: 0...10 V, 0...20 mA, 4...20 mA, TF..(KTY)
- 6 Input 2: 0...10 V, 0...20 mA, 4...20 mA, TF..(KTY)
- 7 Addressing, normal lock closed
- 8 Contact rating max. 2A / 250 V AC



9.3 **Manufacturer reference**

Our products are manufactured in accordance with the relevant international regulations. If you have any questions concerning the use of our products or plan special uses, please contact:

ZIEHL-ABEGG SE
Heinz-Ziehl-Straße
74653 Künzelsau
Telephone: +49 (0) 7940 16-0
Telefax: +49 (0) 7940 16-504
info@ziehl-abegg.de
http://www.ziehl-abegg.de

9.4 **Service information**

If you have any technical questions while commissioning or regarding malfunctions, please contact our technical support for control systems - ventilation technology.

phone: +49 (0) 7940 16-800

Email: fan-controls-service@ziehl-abegg.de

Our worldwide contacts are available in our subsidiaries for deliveries outside of Germany, see www.ziehl-abegg.com.

If you make returns for inspections or repairs we need certain information in order to facilitate focused trouble shooting and fast repair. Please use our repair ticket for this. It is provided to you after you have consulted our support department.

In addition, you can download it from our homepage. Support - Downloads - General documents.