

User manual

DC-Motor controller

MTR 101



Stand: 08/2010

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Warranty

According to the current general terms of delivery and payment MSF- Vathauer Antriebstechnik GmbH & Co. KG provides a guarantee of 12 months after delivery on all electronic devices covering design, material or faulty workmanship.

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Attention!

Read this manual carefully and completely.
Start with the installation and commissioning only after reading.

Technical changes reserved.

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1. Safety and application instructions for DC-Motor controller:

As long as any electrical equipment and machinery is switched on, the operator may touch voltage leading and non-isolated conductors or rotating parts when he removes the covers and the prescribed protections, in handling the machine improperly, or during service work or improper use, and may well cause personal injuries and material damage.

All works with transport, installation and commissioning as well as maintenance have to be done by properly trained personnel (regard IEC 364 res. VENELEC HD 384 or DIN VDE 0100 and IEC report 664 or DIN VDE 0110 and national accident prevention regulations or VGB 4).

Qualified personnel in terms of these basic security considerations are persons that are used to installation; assembly, commissioning and operation of the product and that have qualifications according to their work (defined in IEC 364 or DIN VDE 0105).

1.2. Intended Usage

DC-Motor controller is a component for the installation within machines that are operated in industrial plants.

The commissioning of the DC-Motor controller is prohibited until it is ascertained that the machine that includes the DC-motor controller follows the restrictions of the EEC directive 89/ 392/ EEC (machine directive).

The DC-Motor controller matches the protection goals of the low voltage directive 73/ 231/ EEC and the harmonized norms of the series prEN 50178/ DIN VDE 0160 in connection with EN 60439-1/ DIN VDE 0660 part 500 and EN 601146/ DIN VDE 0558.

The operation is only permitted according to the EEC directive (89/ 336/ EEC).

The technical data and information to connection conditions are to be found at the rating plate or the documentation and have to be completely fulfilled.

1.3. Transport and Storage

The considerations for transport, storage and the appropriate handling must be regarded.

Damages recognized after delivery must be immediately announced to the transport company. If applicable, notify the distributor before commissioning.

Regard the environmental conditions according to prEN 50178.

1.4. Installation

Installation and cooling of the devices must be according to the specifications of the concerning documentation.

The DC-Motor controller must be secured from improper operational demands. Take care to not bend electronic devices and/or change isolation distances. Avoid touching electronic elements and contacts.

DC-Motor controllers contain electrostatic imperiled elements. Improper handling may easily destroy these elements. Inbuilt electrical components must not be destroyed (health risk in certain circumstances).

1.5. Electrical connection

At working at current DC-Motor controller and/or machinery and equipment with supplied power regard the valid national accident prevention regulations (e.g. VGB 4).

The electrical installation has to be done according to the valid directives (e.g. cable diameters, fuse protection, ground wire connection). More detailed information is to be found in the documentation.

Compliance with the limits for the plant according to the EEC juridical directive is in responsibility of the manufacturer of the plant. Considerations for the EEC-compatible installation like screening, grounding, alignment of filters and laying of cables are to be found in the documentation of the other components.

1.6. Operation

Plants that contain DC-Motor controllers have to be provided, if applicable, with additional observation and security installations according to the concerning valid security directives, e.g. act on technical work equipment, accident prevention regulations etc. The documentation of the manufacturer has to be regarded.

After disconnection the DC-Motor controller from the supply voltage, voltage conducting device parts and cable conductors must not be immediately touched because of possibly charged condensers. Please regard the according notification signs on the DC-Motor controller. During operation all covers must kept closed.

1.7. Maintenance and servicing

The documentation of the manufacturer has to be regarded.

1.8. Safety and Installation considerations

DC-Motor controllers from MSF-Vathauer Antriebstechnik GmbH & Co. KG are operating resources for the deployment in industrial high-voltage plants and are operated with voltages that may cause heavy injuries or death when touching!

- Installations and works may only be executed by qualified electrical trained personnel and at voltage free device. The user manual has to be available at any time and has to be consequently regarded.
- The local directives for building electrical plants and accident prevention regulations must be fulfilled.
- The device is up to 5 minutes after disconnecting from the voltage conducted with dangerous voltage. Due to this, opening of the device is only permitted 5 minutes after disconnecting the device from voltage. Before turning the mains voltage on all covers must be mounted again.
- Also at motor standstill (e.g. due to electronics lock, short circuit at the output clamps or blocked drive) the voltage circuit clamps, motor clamps and clamps for the brake resistance may conduct dangerous voltage. A motor standstill is not identical with a galvanic disconnection from the mains voltage.
- **Attention:** The DC-Motor controller may, depending on the settings, start automatically after powering the mains voltage.



Attention! Danger to Life!

The power supply conducts voltage under certain circumstances for up to 5 minutes after turning off the mains voltage. Clamps drive cables and drive clamps may conduct voltage! Touching open or free clamps, cables and device parts may cause heavy injuries or death!



Attention

- Children and the public must not have access to the device!
- The device may only be used for the purpose intended by the manufacturer. Unauthorized changes and the use of replacement parts and additional devices that are not sold or approved by the manufacturer may cause fire, electric shocks and injuries.
- Keep the manual in reach and make it available for every user!

European EMC directive

If the DC-Motor controller is installed according to the recommendations of this manual it fulfills the requirements of the EMC directive according to the EEC product norm for motor driven systems EN 61800-3.

2. Assembly and Installation

2.1. Wiring guidelines of superior control

The DC-Motor controllers are developed for the operation in industrial environments where high values of electromagnetic interferences are expected. In general, a professional installation ensures a risk less and error-free operation. If limits are required that exceed the EMC directive limits, the following directives are recommended.

1. Please make sure that all devices in the control cabinet are connected together at a shared grounding point or rail with short cores and great diameter are properly grounded. It is especially important that every control device connected to the DC-Motor controller (e.g. automation devices) is connected via a short core with high diameter at the same grounding point like the DC-Motor controller.
2. As far as possible you should use screened cables for the control. The cable ends have to be terminated carefully and it must be taken care that the cores are not unscreened over long distances. The screen of analog set point cables should only be grounded at the DC-motor controller single-sided. Not used cores of the control cores should be grounded.
3. Make sure that contactors and relays in the control cabinets are suppressed either by RC connection or varistors in case of ac contactors or by „ free wheeling diodes“ at dc contactors, **where the dejam devices have to be connected at the contactor coil**. The dejamming is especially important when the contactors are controlled by the relays in the DC-motor controller.
4. Using shielded cables for the power connections and ground the screen at both ends.
5. If the drive is to operate in an environment sensitive to electromagnetic interference, then the use of radio frequency interference filters is recommended to limit the conducted and radiated interference from the DC motor controller. In this case, the filter is to be mounted as close to the DC-Motor controller and well grounded.

At installation of the DC-Motor Controllers you must not disregard safety directives!

2.2. Measures to secure the EMC

The following measures are to secure the EMC. The device fulfills the demands of the high noise immunity and the slight-noise emissions for the usage in industries, under the guidelines of this manuals installation consideration.

2.4 Grounding, earthen, potential compensation

The correct professional grounding or earthen guarantees the protection of the staff against dangerous touch voltages (input, output and intermediate circuit voltage). Parasitic current inductance and low-impedance potential compensation are important measures to reduce electromagnetic influences.

2.5. Filtering

Filters are inserted into the lead-bound transfer way between the source of interference and the interference suppressor, which is to reduce lead-bound transmissions and to increase the noise immunity. Additional, external filter may have a negative effect on the noise emission!

2.6. Screening: Signal- and control-cable

Screening is used for decoupling fields between two spatially separate areas, i.e. is also used to decrease the emission of electromagnetic radiation and to increase the noise immunity. The consistent use of metal cases is one of the most important standard measures to safeguard the EMC

2.7. Coupling into motor cables

The use of twisted core cables can essentially reduce inductive couplings into a circuit. Cable screens must reduce capacitive, inductive and electromagnetic interferences. It is important to note that to reduce low frequency capacitive interference, it is often sufficient to place a one sided screening, whereas inductive and high frequency electromagnetic interference can only be prevented by screening both sides of the cable.

The screening must not be used as a protection earthen!!!

3. Technical Features

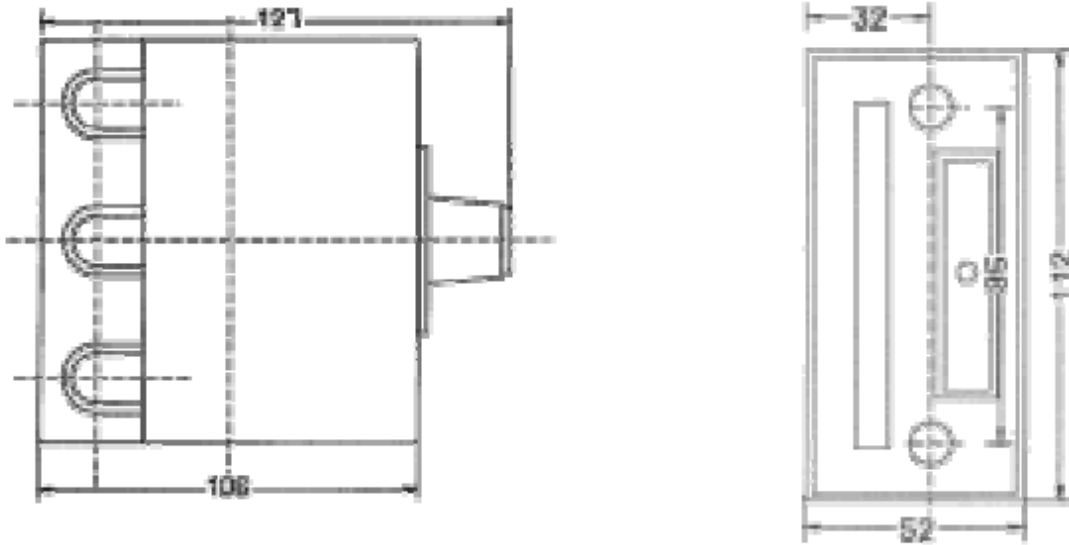
DC motor controller type MTR 101 is a compact mounted motor controller that can be used for both permanent magnet and for shunt motors.

In the motor controller MTR 101, the armature current is protected by an over current (thermal switch). A high turndown ratio is achieved

To adjust the motor speed, a good concise Scala is attached to the integrated potentiometer with a "ON-OFF" switch.

4. Technical Data

4.1 Measurements



4.2 Technical Specifications

	MTR 101
Supply voltage:	230V 50/60 Hz
Armature voltage:	0-180 Vdc
Factory setting:	20-180 Vdc
Field voltage:	200 V
Max. output power:	250 W
Fusing:	Fuse
Fuse armature side:	Thermo switch
Max. armature current:	1,5 A
Form factor w/o armature choke:	1,4
Casing (upper part):	Plastic
Housing (lower part):	ABS-reinforced with glass fibre
Terminals:	2 x 1,5 ²
Control ratio:	1:10
Protection class:	IP 20

4.2 Terminal assignment

Connect the controller according to the wiring diagram. The device is not floating. Therefore, except at the power supply terminals, no voltages are applied which are connected to power or ground

