SIGMATEK

MDM 011-Z1

Regen Resistor

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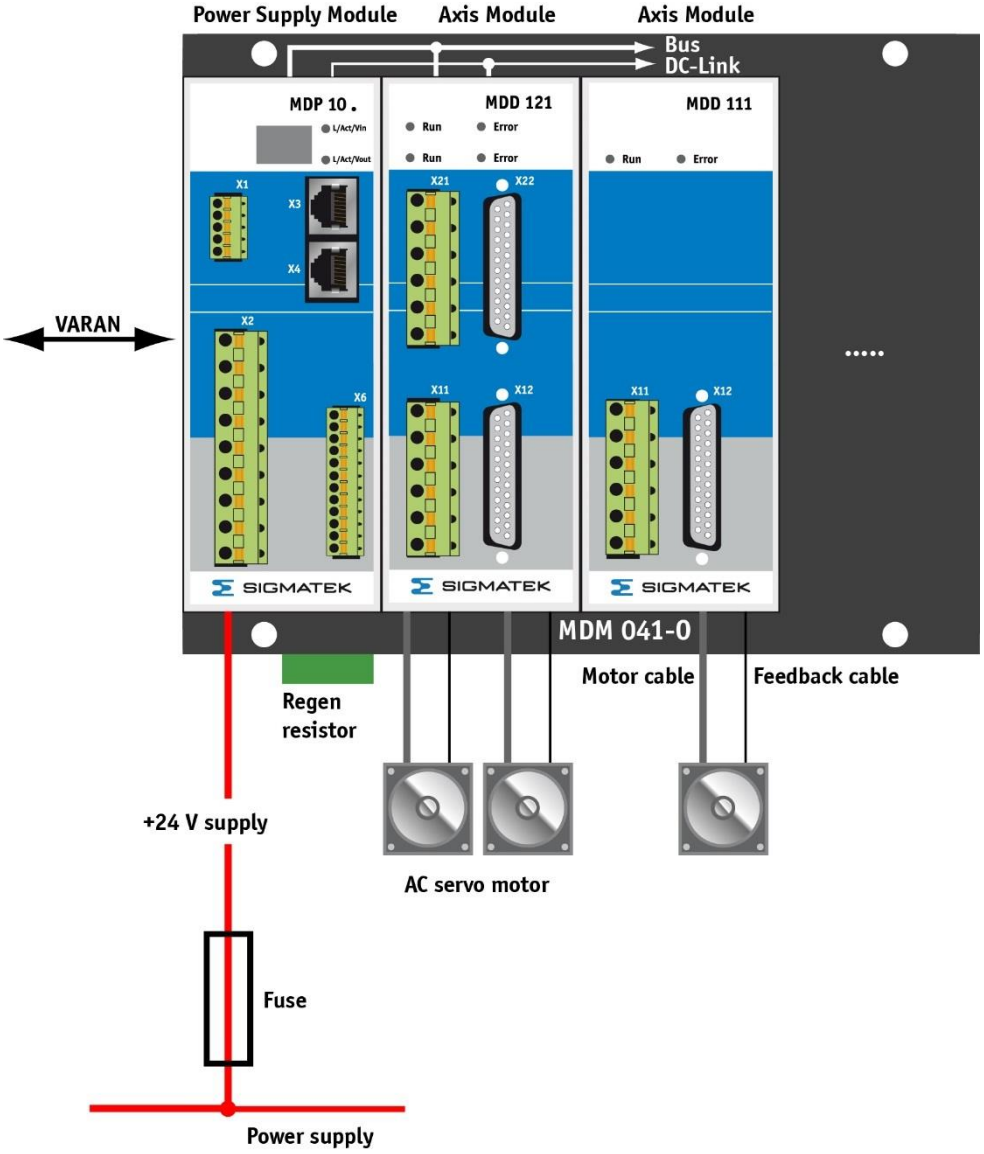
Translation from German

Regen Resistor MDM 011-Z1

The regen resistor 09-402-011-Z1 is an accessory for the MDM 0x1-O module carrier.

Servo Drive System Components



Contents

1 Designated Use

The servo amplifier from SIGMATEK GmbH & Co KG was designed and produced with state of the art technology. The products are completely tested before delivery; for reliability in particular. It is a built-in component for electrical systems, which can only be operated as an integral part of such systems.

Before installation of the product, the following conditions for designated use must be met:

- Every user of the product must read and understand the safety instructions for designated and non-designated use.
- The machine manufacture must perform a safety analysis of the machine to ensure that no injury or damage is caused to personnel and equipment by unexpected movements.
- The servo amplifier must be operated under the assembly and installation conditions described in this document. The environmental conditions (temperature, protection type, humidity, voltage input, EMC and mounting position) must be especially observed.
- The amplifier can only be operated in a control cabinet with **at least IP54**.
- The servo drive can only be operated in original condition without mechanical or electrical changes.
- Mechanical or electrical defects or defective components may not be installed or operated.
- The servo amplifier is designed to regulate the torque, speed or position controller circuits of synchronous motors.
- The specified rated voltage of the motor must be at least as high as the power supply voltage of the servo drive system (230 V, 400 V or 480 V).
- The servo drive was designed for use in an industrial environment. If the product is used in residential areas, the power supply must be equipped with an additional filter.
- The MDP 101-1 and MDP 102-1 power modules can only be used with the MDD 111-1 MDD 121-1 axis modules.

1.1 Non-designated Use

If a servo amplifier is operated in according with the environmental conditions described in this document, it is "designated use".

Because of salt-containing and conductive contamination, the servo amplifier cannot be used on ships (sea operation) or in offshore applications.

The servo amplifier cannot be operated under any environmental conditions other than those described in this documentation (overheated, without a control cabinet, incorrect installation, etc.)

Extreme caution is needed in production facilities, in which conductive material such as carbon fiber, graphite, and cast iron chips or similar material is used. In such cases, the control cabinet must be hermetically sealed (no forced ventilation with fan filters) or placed outside of the contaminated area. Especially during the initial start-up, the danger posed by open control cabinet doors is extremely high. Contaminated servo amplifiers may no longer be used.

2 For Your Safety

To avoid injury or material damage, it is important to read the documentation provided before installation and startup of the servo drive system. The technical data and connection instructions (specification label and documentation) must be followed.

Only qualified personnel may perform tasks such as transportation, assembly, Initial startup and maintenance. Qualified personnel are persons familiar with the transportation, setup, assembly, initial startup and operation of the product.

The machine manufacturer must perform a safety analysis for the entire machine. With the appropriate measures, the manufacturer ensures that no injuries or damage can be caused by unexpected movements.

Improper operation of the servo amplifier or failure to observe the following guidelines and improper handling of the safety equipment can cause damage to the machine, personnel injury, and electrical shock or in extreme cases, death.

2.1 Notes

Danger! Electric Shock

After disconnecting the servo drive system from the voltage supply, a **wait-time of at least 7 minutes** is required before voltage carrying components of the amplifier (i.e. terminals) can be touched or connectors removed. After turning off the voltage supply, the internal capacitors can have dangerous voltage levels for up to 7 minutes. For safety purposes, measure the voltage in the intermediate circuit and wait until the voltage is below 40 V.

The electrical connectors of the servo drive system cannot be removed while voltage is applied.

The possibility for arcing exists and could cause injury as well as damage to the contacts.

When using a ground fault interrupter in the circuit, a Type B FI-switch must be used. If an FI switch of Type "A" is used, A DC leakage current could cause it to malfunction.

Failure to follow these instructions can lead to death, serious injury or damage to the machine.

Caution General

The use of the servo drive system is defined by EN 61800-3. In residential areas, EMC problems can arise. In such a case, additional filtering measures must be taken.

The servo drive contains components sensitive to electrostatic, which can be damaged by improper handling. Before touching the servo drive system, the user must discharge their body by touching a grounded object with a conductive surface. Contact with highly insulated material (synthetic fiber, plastic foil etc.) must be avoided. The servo drive is must be place on a conductive surface.

Opening the device is not allowed. During operation, all covers and cabinet doors must be closed; the danger of death, severe health hazards or material damage exists.

According to their protection type, servo amplifiers can contain blank components that are conductive. Control and power connections can have a voltage even when the motor is not turning.

The servo drive system has a ground leakage current greater than 3.5 mA. Particular focus must therefore be placed on grounding the servo drive system. See technical data for the power module.

The +24V auxiliary supply voltage as well as the +24 V BR voltage supply for the holding brake must be galvanically separated as protective extra-low voltage PELV according to EN 60950.

Failure to follow the above safety measures can lead to severe injuries and machine damage.

Caution! Hot Surface

During operation, the housing of the servo drive system can get hot and reach temperatures of over 80 °C (176 °F).

The temperature of the housing and module carrier must be checked before touching and it may be necessary to wait until it is below 40 °C (104 °F).

Failure to follow the above safety measures can lead to severe injuries.

3 General Instructions

3.1 About this Manual

The manual describes the 09-402-011-Z1 brake resistor. The following information is provided:

- Technical data of the brake resistor
- Assembly and Installation
- Transport, Storage, Maintenance, Disposal

3.2 Symbols Used

	Warning, dangerous electrical voltage	**DANGER!** Pay special attention to this instruction! It warns of imminent danger, which can cause severe injury and death, and indicates the appropriate measures to take.
	Hot surface warning	**DANGER!** Pay special attention to this instruction! It warns of imminent danger, which can cause severe injury and death, as well as indicates the appropriate safety measures to take.
	General warning	Describes situations through which the product or device in the surrounding area can be damaged and indicates the appropriate measures to take.
	Danger for ESD-sensitive components	Danger for ESD-sensitive components
	Important Guidelines	
	INFORMATION	Provides user tips, informs of special features and identifies especially important information in the text.

3.3 Abbreviations

AWG	American Wire Gauge (American cable coding)
BGND	Mass for the 24 V auxiliary and braking supply
CE	Communauté Européenne
CLOCK	Clock signal
EMC	Electromagnetic Compatibility
EN	European Norm
IGBT	Insulated Gate Bipolar Transistor
LED	Light Emitting Diode
PELV	Protective Extra Low Voltage
RES	Resolver
V AC	Alternating Current
V DC	Direct Current

4 Technical Data

4.1 Regen Resistor

Resistance	25Ω	
Continuous power	200 W	with cooling at an environmental temperature of 25 °C
Nominal temperature at rated power	250 °C	maximum surface temperature
U_{max}	1000 V	

4.2 Mechanics

Dimensions	104 x 36 x 27 mm (W x H x D)
Weight	200 g
Cable length	600 mm

4.3 Environmental Conditions, Ventilation and Mounting

Storage temperature	-10 ... +50 °C
Environmental temperature	0 ... +55 °C (32 … 131 °F)
Humidity	0-85 %, non-condensing
Operating Conditions	Pollution degree 2 Elevation up to 1000 m at rated values Elevation from 1000 to 2500 m above sea level with a reduction of 1.5 %/100 m
Storage conditions	Page 20
Transport conditions	Page 19
Mounting position	Page 14
Protection type of the servo drive housing	IP55

4.4 Miscellaneous

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5 Installation

5.1 Important Guidelines

- The regen resistor must be properly grounded.
- Before installation, the servo amplifier must be mechanically tested. If damage from transportation is determined, for example, the amplifier cannot be used. Electronic components cannot be handled.
- The main supply can under no circumstances exceed the maximum allowed values for the servo drive system. Attention should be paid to different power supply options.

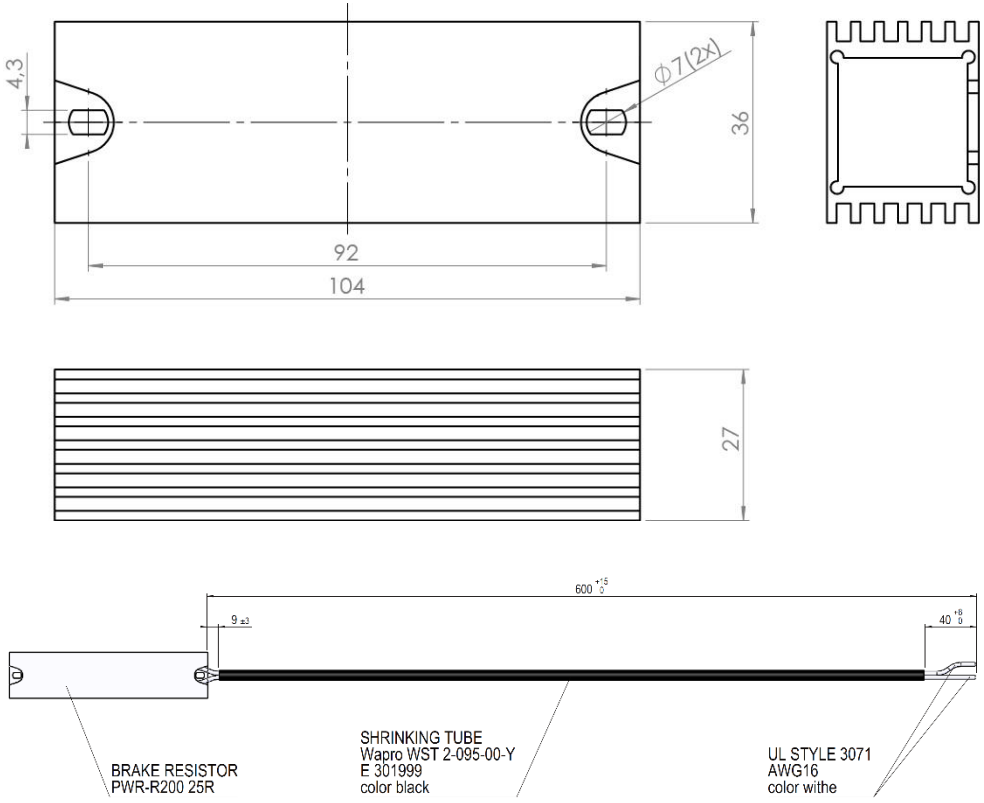
- Ensure the regen resistor is installed correctly. During operation, the surface of the resistor can get very hot. Therefore, it should never be installed near flammable material.

5.2 Ground

The regen resistor is grounded via the mounting bore holes. The ground connection can therefore be made at the right or left bore hole using an eyelet.

The entire MDD system is grounded over the module carrier through the control cabinet.

5.3 Mechanical Dimensions and Mounting



The regen resistor's mounting holes are designed for M4 screws.

6 Maintenance

The components in the servo drive are maintenance-free.

Note: Opening the housing results in the loss of warranty.

Dirt on the housing can be removed with isopropyl alcohol or similar products.

- Contamination in the device must be removed by the manufacturer.
- The protective grate (fan) can be cleaned with a dry brush.
- Spraying or submerging is not recommended.

6.1 Exchange and Repair

Repair: repair of the servo drive system must be performed by the manufacturer.

Exchange: if a servo drive system component must be exchanged, the following points must be followed (no special tools needed for installation).

Turn off the control cabinet supply and
remove the servo drive system fuses.

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After disconnecting the servo drive system from the main voltage supply, a **wait-time of 7 minutes** is required before current-conducting components in the drive (i.e. contacts) can be touched or connectors removed.
Capacitors can contain dangerous voltages for up to 7 minutes after the supply is disconnected. For safety purposes, measure the voltage in the intermediate circuit and wait until the voltage is below 40 V.

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During operation, the heat sink of the servo drive system can reach temperatures of over 80° C (176° F).
The heat sink temperature should be checked before handling and it may be necessary to wait until it is below 40 °C (104 °F).

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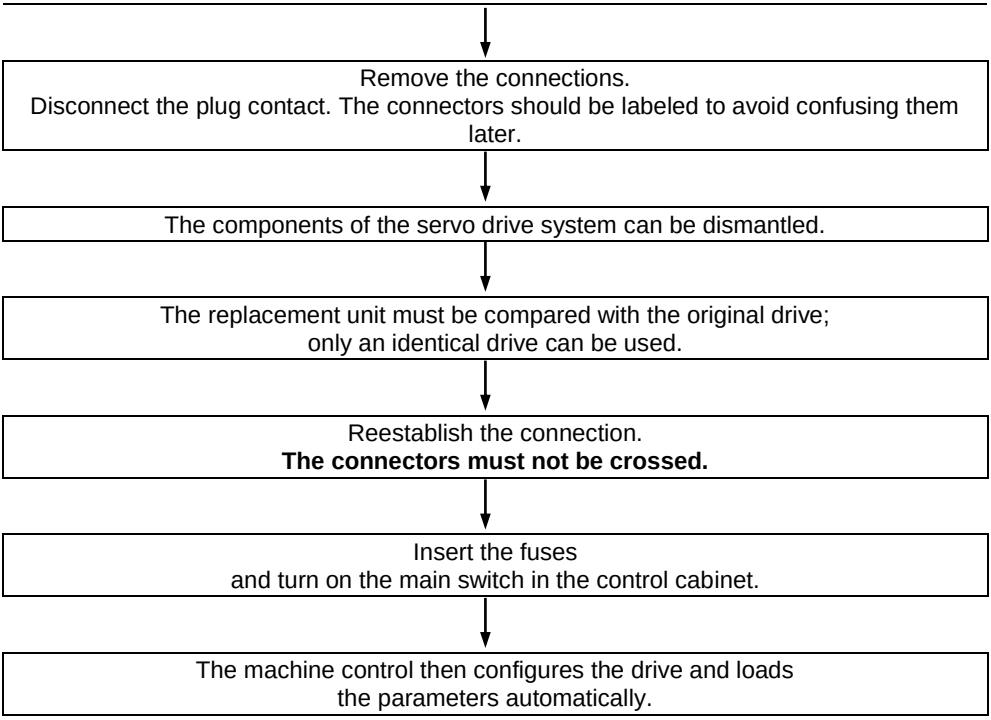
Remove the connections.
Disconnect the plug contact. The connectors should be labeled to avoid confusing them later.
The components of the servo drive system can be dismantled.
The replacement unit must be compared with the original drive;
only an identical drive can be used.
Reestablish the connection.
The connectors must not be crossed.
Insert the fuses
and turn on the main switch in the control cabinet.
The machine control then configures the drive and loads
the parameters automatically.

7 Conformity with European Guidelines and Norms

Servo amplifiers and components, which are designed for installation in electrical systems / machines for industrial use. With the installation into machines / systems, the servo amplifier should not be operated until it has been determined that the machine/system meets the requirements of the EG-machine guideline 2006/42/EG and the EG-EMC guideline 2004/108/EG.

Note: The machine manufacturer must perform a safety analysis for the entire machine. The manufacturer must take appropriate measures to ensure that no injuries or damage can be caused by unexpected movements.

7.1 CE-Conformity CE

With the supply of servo amplifiers within the European community, compliance with the EG-EMC 2004/108/EC and low voltage 2006/95/EG guidelines is mandatory.

In this servo drive system,

- the harmonized standard EN 61800-5-1 (Electrical Power Amplifier Systems with Adjustable Speed - part 5-1: Requirements for the Safety of Electrical, Thermal and Energetic Demands) was included with the 2006/95/EG low voltage guideline,

as well as

- the harmonized standard EN 61800-3 (Electrical Power Amplifier systems with Adjustable Speed - Part 3: EMC Product Norm including Special Test Processes) for EMC guideline

2004/108/EG.

To meet the EMC conditions for installation, the documentation contains detailed information on:

- Shielding
- Ground Connection
- Wiring in the control cabinet
- Filters (as required)

The servo amplifiers from the MDD 100 series were tested with the system components and the corresponding defined configurations described in this document. Each change in the configuration and installation described in this document requires new measurements to ensure the requirements are met.

8 Appendix

8.1 Transport

- For transport, the original recyclable packaging from the manufacturer must be used.
- During transport, dropping should be avoided.
- The storage temperature must be between -10 … +50 °C (14 ... 122 °F), change max. 20K/h.
- maximum 95 % humidity, non-condensing
- The components of the servo drive system contain parts sensitive to electrostatic, which can be damaged by improper handling. Before touching, the user must discharge their body by touching a grounded object with a conductive surface. Contact with highly insulated material (synthetic fiber, plastic foil etc.) must be avoided. The servo drive system components must be placed on a conductive surface.
- If the packaging is damaged, the drive must be visually inspected for damage. If damaged, the transport company and the manufacturer must be informed. The drive should not be installed and operated if damaged!

8.2 Packaging

- recyclable cardboard with liner
- Labeling: Type shield on the outside of the casing

8.3 Storage

- Only the original recyclable packaging from the manufacturer can be used.
- The components of the servo drive system contain parts sensitive to electrostatic, which can be damaged by improper handling. Before touching, the user must discharge their body by touching a grounded object with a conductive surface. Contact with highly insulated material (synthetic fiber, plastic foil etc.) must be avoided. The servo drive system components must be placed on a conductive surface.
- A maximum of 10 servo drive system components can be stacked on top of one another.
- The storage temperature must be between -10 … +50 °C (14 ... 122 °F), changes max. 20K/h.
- maximum humidity 95 %, non-condensing
- Shelf life:

  < 1 year: without limitations
  ≥ 1 year: The intermediate circuit capacitors of the servo amplifier must be reformed before the initial startup. In addition, all electrical connections must be removed and the power module supplied with 230 VAC, single phase at terminals L1 / L2 for 30 minutes.

8.4 Disposal

- The servo drive systems components can be disassembled by removing the screws in its main components (heat sink, steel housing, circuit boards).
- Disposal should be carried out by certified companies.

Documentation Changes

Change date	Affected page(s)	Chapter	Note