

SIEMENS

DC-PMM/48V

Power Management Modul
für Positionier-Motor POSMO A

Power Management Module
for Positioning Motor POSMO A

Best. Nr. / Order No.: 9AL2137-1BA00-1AA0

Betriebsanleitung
Operating Instructions

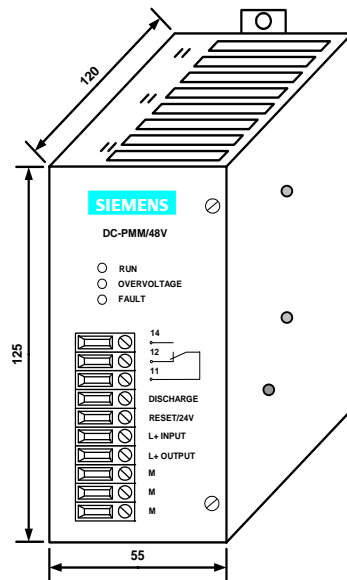
04.03

UL File – Number E216683

Gültig für Geräteversion A und Softwarestand V2.01
Valid for Version A and Software Release V2.01



Maßbild
Dimension drawing



Abmessungen / Dimensions: 125 mm x 120 mm x 55 mm

ENGLISH

CAUTION

Only qualified personnel may open the device.

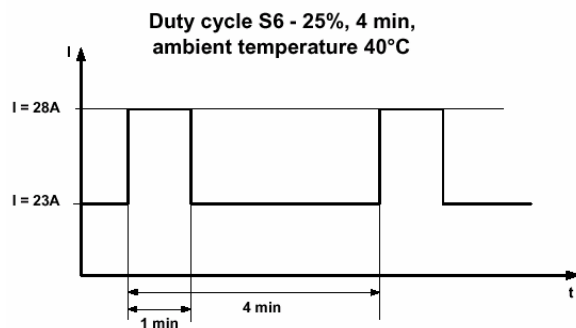
Electrostatic Sensitive Devices (ESD)

Technical data

Power supply

Rated input voltage: 48V DC
 Operating voltage range: 38.4V DC – 57.6V DC

Maximum permissible continuous current via PMM: 25A at 40°C ambient temperature
 Maximum permissible current via PMM in intermittent duty S6: 28A at 40°C ambient temperature



The DC-PMM/48V is not designed to withstand sustained short-circuiting. A current-controlled mains adapter must therefore be used to supply the power (e.g. SITOP POWER from Siemens).

If a compatible power supply is used, an external, quick-acting fuse must be used on the input side to make sure that the permissible current through the device is not exceeded.

Environment

Temperature for storage and transport: -25 to 85°C
Temperature for operation: 0 to 40°C
Air-cooled

Protection and monitoring function

Overvoltage detection through motor braking; trigger threshold at approx. 58.1V.

I^2t monitoring and fuse to protect the pulsed resistor against thermal overload.

In addition, a varistor (SIOV-S14K50 from EPCOS) is connected in parallel to the output terminals L+ Output and M.

Relay data

Type of relay: Monostable Relay with changeover contact
Contact Rating: 0.46A, 150V AC, Resistive
0.46A, 65V DC, Resistive
1A, 30V DC, Resistive

Pulsed resistor data

Maximum pulse load capacity: 40Ws
Continuous load: 15W

Terminal block data

Rated current/range: 30A / 4mm²
Maximum load current/range: 32A / 6mm²
Connected load capacity:
- rigid / flexible / conductor sizes: 0.5 - 6mm² / 0.5 - 4mm² / 20 - 10AWG
- flexible using connector sleeve without/with plastic sleeve: 0.5 - 4mm² / 0.5 - 4mm²
Screw thread: M3
Pickup momentum: 0.5 – 0.6Nm
Insulation length: 14mm

Applicable standards

Type of protection: IP20 as per IEC 529
EMC tests: Burst as per IEC 1000-4-4
Field coupling as per IEC 1000-4-3

Weight 0.5kg

Installation

The DC-PMM/48V is a rack-mounting unit; it may not be installed in the open air.

The device must be installed vertically for proper heat dissipation. Make sure that the air vents are at the top and bottom to ensure an adequate air flow.

A clearance of 100mm should be observed at the top and bottom of the device.

Also note that the pulsed resistor may cause the right-hand side of the PMM to heat up considerably (e.g. frequent braking by one or more POSMO A).

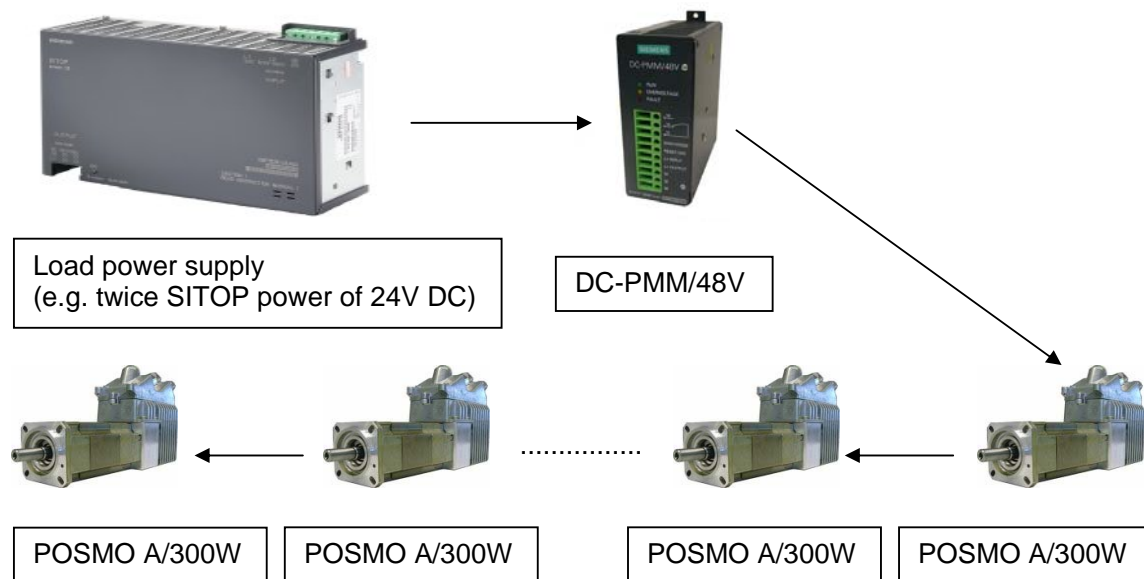
Description of functions

The DC-PMM/48V is installed between one or more positioning motors (POSMO A) and the load power supply, and is used as feedback protection for the latter. The device is integrated between the load power supply and the first positioning motor.

The PMM detects when the positioning motor brakes and uses an internal pulsed resistor to convert the feedback energy from the motor to heat.

An integrated I^2t monitor protects the pulsed resistor against thermal overloading, thus preventing damage to the resistor. Should the DC-PMM/48V detect motor braking, not permitting any further reduction of braking energy via pulsed resistor due to I^2t monitoring, the device has faulted itself, not reacting to any further braking until a reset (cold restart of the unit) has been carried out. This reset is actuated by a 24V pulse at the RESET terminal or by removing and reapplying the supply voltage to the PMM itself. The relay contacts of the PMM are used as signaling and monitoring contacts for the operating states "Ready" and "Fault". For "Ready", output 14 of the relay is switched to input 11; otherwise, output 12 is switched to input 11 (changeover contact).

Principle drawing showing integration of DC-PMM/48V in the device group:



The DC-PMM/48V is connected directly after the load power supply and before the first POSMO A, with terminals L+ Input and M (existing three times altogether) of the PMM to be wired to the load power supply, terminals L+ Output and M to be wired to the first motor.

When connecting several positioning motors of type POSMO A, the supply voltage is picked up from the relevant terminals of the first motor and transferred to the next motor. The power supply for subsequent motors is thus always picked up from the last POSMO A and connected to the following positioning motor.

The maximum permissible number of POSMO A that can be connected to one DC-PMM/48V depends on the maximum permissible overall current over the PMM, the simultaneity factor of feedbacks by a braking operation and the feedback energy of a motor.

Observe and calculate the feedback energy obtained by braking operations.

The maximum continuous load capacity of the pulsed resistor is 15W, the pulse load capacity is 40Ws.

Make sure that the pulse load capacity is not exceeded in order to protect the PMM from damage.

The integrated I^2t monitor makes sure that the maximum permissible continuous rating of 15W is not exceeded.

Example 1:

If five motors with a rated current of 5A each and a feedback energy of 3Ws per braking operation brake constantly or over a longer period of time within a second, one DC-PMM/48V is adequate.

- Overall current in that case via PMM: $5 \times 5A = 25A$
- Pulse load at pulsed resistor: $5 \times 3Ws = 15Ws$
- Continuous rating via pulsed resistor: $15Ws / 1s = 15W$

Example 2:

If five motors with a rated current of 5A each and a feedback energy of 3.5Ws per braking operation brake once simultaneously, one DC-PMM/48V is adequate for that single braking operation as well.

In this case constant braking of the motors or braking over a longer period of time within a second is not possible as the maximum permissible continuous load of 15W is exceeded and the I^2t monitor is responding. The device turns to the "fault" state and must be reset.

- Overall current in that case via PMM:	5 x 5A	=	25A
- Pulse load at pulsed resistor:	5 x 3.5Ws	=	17.5Ws
- Continuous rating via pulsed resistor:	17.5Ws / 1s	=	17.5W

In this case of application only a maximum of four motors may brake constantly or over a longer period of time within a second without response from the I^2t monitor, turning the device to the "fault" state ($4 \times 3.5Ws / 1s = 14W < 15W$).

Connector and terminal assignment

Terminal	Function	Remarks
14	Relay make contact	Signals that the unit is ready for operation. Contact is made when the supply voltage is applied properly.
12	Relay break contact	Signals malfunction. Contact is made when the supply voltage is not applied or in case of malfunction.
11	Relay input	Floating input for relay make/break contact.
DISCHARGE	Discharge contact	If this contact is grounded (M), the internal backup capacitors of the PMM and POSMO A are discharged via the internal pulsed resistor. This contact must not be grounded when the supply voltage is connected (since this would destroy the device)!
RESET/24V	Reset input of PMM	Reset input for +24V DC. If a 24V pulse lasting at least 500msec. is present at this input, the PMM is reset to its basic setting. This is also required as an acknowledgement after a fault has occurred in order to return the PMM to the "Ready" state. If the supply voltage of a SITOP power supply (24V DC) is applied briefly to this input, for example, via a pushbutton, the device is reset. While a voltage is present at this terminal, the PMM is not "Ready". The device is not operable until the reset voltage is removed! Wait for approx. 60 sec. before resetting the device after a fault to avoid damaging the resistor due to thermal overloading.
L + INPUT	Input from main power supply (+48 V DC)	Input for +48V DC from main power supply connected.
L + OUTPUT	Output for motor supply (+48V DC)	+48V DC output to supply the positioning motors POSMO A.
M (3x)	Ground	Ground connections for the power supplies and also for external reset voltage at input RESET/24V.

Meaning of the LEDs

LED	Meaning	Remarks
RUN	Ready	Green LED. Signals that the device is ready for operation and that the supply voltage has been applied correctly.
OVERVOLTAGE	Overvoltage	Yellow LED. Flashing of LED signals temporary overvoltage. If the OVERVOLTAGE LED lights up together with FAULT, this means that the overvoltage could not be eliminated and that the PMM has faulted (see description of FAULT).
FAULT	Fault	Red LED. <u>FAULT flashing:</u> The applied supply voltage is below the required minimum voltage of 38.4V. Correct supply voltage is checked only if voltage has been applied or after resetting, i.e., no monitoring of undervoltage once the device has turned to the "Ready" state. <u>Permanent lighting of FAULT:</u> The security monitor of the PMM has responded. If lighting of this LED may not be removed after resetting the device the fuse is damaged due to a device error. In this case, send the device to the manufacturer to repair. Just changing the fuse may not restore the "Ready" state of the PMM. <u>Permanent lighting of FAULT and OVERVOLTAGE:</u> If the LEDs FAULT and OVERVOLTAGE light up permanently, the PMM has faulted due to overvoltage lasting too long (response of I ² t monitor) and is waiting for a reset to return to the "Ready" state. This function is necessary to protect the integrated resistor from thermal overloading. Wait for approx. 60 sec. before resetting the device after a fault to avoid damaging the resistor due to thermal overload.

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