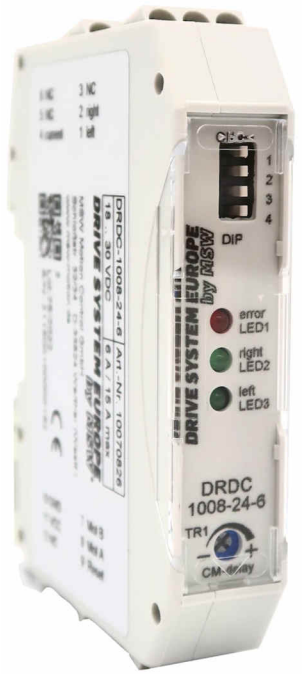
Motor controller DRDC-1008-24-6

Industrial motor controller for brushed DC motors

Control with the following functions:

- reversal of direction of rotation
- overcurrent shutdown
- overcurrent indication output
- adjustable current monitoring delay
- short circuit detection
- dynamic brake

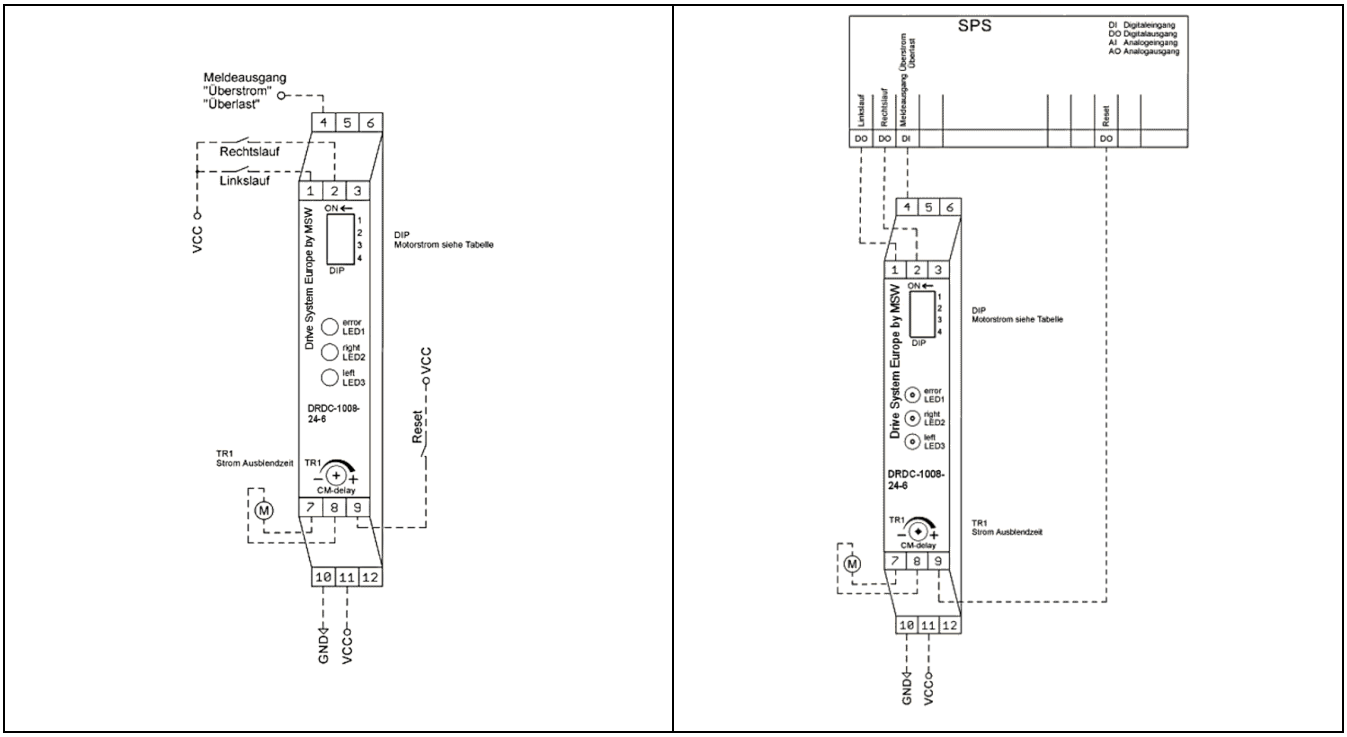


The module DRDC-1008-24-6 is a two quadrant motor control for use in industrial environments. It ensures the switching on and off, as well as the controlled driving of motors.
Over a DIP switch the motor current limit value for the overcurrent shutdown is adjustable.
The continuous load current form the module is 6A. A digital output reports if the module is in overcurrent shutdown mode.
Current monitoring delay is adjustable over Trimmer TR1.
The module has two digital inputs to select the rotation directions and one digital input to reset the module if an overcurrent shutdown has appeared.

Technical data

Type	DRDC-1008-24-6	
Operating data	Nominal voltage [VDC] Supply voltage [VDC] Control inputs [VDC]	24 18 - 30 24
	Quiescent current typ [mA]	50
load circuit	Max. current / continuous load current [A] Short circuit current detection typ [A]	15 / 6 80
	Shut-down time after short circuit typ [µs]	100
Other data	Permissible ambient temperature [°C]	-20 to +60
	Start up time [sec]	2
	Norms	RoHS2 EN 61326-1:2013-01 EN 61000-6-2:2005-08
	EMC emitted interference, operation in industrial DC network EMC emitted interference, operation with power supply	EN 61326-1:2013-01, Class A EN 61326-1:2013-01, Class B
	Installation orientation Assembly	any top-hat rail EN 50022
	Temperature monitoring / overvoltage protection	yes / yes
	Currentlimitation adjustable over DIP [A]	0.5 … 6 (in 0.5 A-steps)
	Disable Time trimmer TR1 (CM-delay) [s]	0 … 1
	Dynamic brake (Armature short circuit)	always on
	Dimensions B x H x T [mm] Weight [kg]	85 x 70.4 x 17.5 0.075

	DRDC-1008-24-6	
Digital output „overcurrent“	„Ready“ „Overcurrent“	GND (4.7 kΩ Pull-Down) Vcc
	Current typ typically [mA] Short circuit-proof	700 Yes, self-limiting
Digital input	High signal typically [VDC] Low signal typically [VDC]	> 10 < 4
	Impedance typically [kΩ]	15
	Status indication	LED green left/right LED error



Terminal diagram and state table

4	5	6
Digital output „overcurrent“ High-active	Reserved NC	Reserved NC
1	**2**	**3**
Digital input „direction left“ (p- switch)	Digital input „direction right“ (p- switch)	Reserved NC
7	**8**	**9**
Motor winding B	Motor winding A	Digital input „reset“ (p- switch)
10	**11**	**12**
GND supply	+24 V supply	Reserved NC

1 „left“	2 „right“	8 Motor „A“	7 Motor „B“	Function
0	1	Vcc	GND	run right
1	0	GND	Vcc	run left
1	1	GND	GND	dyn. braking
0	0	GND	GND	dyn. braking

Function: setting the maximum motor current

DIP 1	DIP 2	DIP 3	DIP 4	max. current [A]
OFF	OFF	OFF	OFF	0.50
ON	OFF	OFF	OFF	0.75
OFF	ON	OFF	OFF	1.00
ON	ON	OFF	OFF	1.25
OFF	OFF	ON	OFF	1.50
ON	OFF	ON	OFF	1.75
OFF	ON	ON	OFF	2.00
ON	ON	ON	OFF	2.25
OFF	OFF	OFF	OFF	2.50
ON	OFF	OFF	ON	3.00
OFF	ON	OFF	ON	3.50
ON	ON	OFF	ON	4.00
OFF	OFF	ON	ON	4.50
ON	OFF	ON	ON	5.00
OFF	ON	ON	ON	5.50
ON	ON	ON	ON	6.00

LED 1 red	LED 2 green	LED 3 green	meaning
OFF	OFF	OFF	Module is operational
OFF	ON	OFF	Run right
OFF	OFF	ON	Run left
flashing	OFF	ON	Module error 1 (see table) Occurred while running left
flashing	ON	OFF	Module error 1 (see table) Occurred while running right
flashing	flashing	flashing	Internal error

1	overcurrent
2	over-temperature
3	short circuit detected
4	overvoltage
5	overload
6	under-temperature
7	low supply voltage

Module errors are displayed as flashing sequences.
The end of the sequence is indicated by a pause of 1 second.
The number of flashes indicates the error number.

Description of the individual functions

Function: overcurrent shutdown

The module has a DIP switch to adjust the current limit.
In case of an overcurrent shut-off the digital output (4) is set HIGH.
To reset the module set a HIGH Signal on digital input “reset” (9) or set both direction inputs (1 & 2) to low and start again in any direction.

Function: overcurrent shut-off

The overcurrent output (digital output terminal 4) is “high” when the module detects an overcurrent.
With active overcurrent shutdown the motor is switched off simultaneous with the overcurrent output.
With deactivated overcurrent shutdown the overcurrent output is “high” when an overcurrent is detected and the motor runs till overload shutdown or stop from the user.

Function: dynamic brake

The motor always stops with dynamic brake while normal operation.

Function: overload shutdown

The module is internally protected with an overload shutdown. In case of rising of the motor current over the rated continuous load current the module switches of with a thermal safety function. After the shutdown the module is locked for a cooldown phase which is managed by the module.

In case of an overcurrent shut-off the digital output (4) is set HIGH.
To reset the module the cooldown phase must be over and both direction inputs (1 & 2) must set to low and start again in any direction.

Function: disable overcurrent shutdown

The overcurrent shutdown is disabled while on digital input on terminal (9) a HIGH signal applied.
The overload shutdown is still active.

Function: current monitoring delay

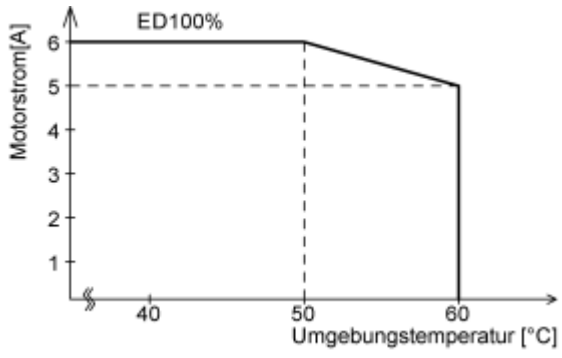
The current monitoring delay is adjustable by trimmer TR1. After setting any direction of rotation input the overcurrent shutdown is disabled for the adjusted time.

Function: overload / short circuit detection

When the module detects overload or short circuit on the motor output, the motor switches off without dynamic braking. The motor can be restarted by means of a reset (9) or fresh setting of any input of direction of rotation.

Temperature derating

At 100% duty cycle and aligned modules with 10 mm spacing the following diagram is valid.



Safety notes

1. **Maximum operational data**
   The maximum operating data must not be exceeded.
2. **Installation**
   The installation and start-up must be performed by specialist personnel exclusively.
   All affected components must be disconnected from the mains.
3. **Start-up**
   For the first start-up, the motor should be operated without load.
4. **Risk of death**
   Do not touch live parts after switching on!
   The assembly must be operated exclusively on safety extra-low voltage. With operation on extra-low voltage (e.g. via autotransformer), death or injury can occur.
5. **Fire protection**
   The assembly must be installed in a switch cabinet, which is suitable as a fire protection enclosure.
   The assembly must be safeguarded with a pre-fuse aligned with the nominal data.
6. **Field of application**
   The assembly may only be used as intended.
   Other components must be checked for their approvals and regulations.
7. **Safety devices**
   An additional safety device must be used to bring the system into a safe state in case of a cable break, incorrect operation, failure of the control/controller unit.
8. **EMC / EMI**
   The wiring must be done according to EMC / EMI standards. If necessary, shielded cables and EMC suppressors must be used for the connected consumer.
   For operation in a public low-voltage distribution network, the module must be supplied with an approved adapter.
   If the module is supplied with an AC adapter, other equipment, operated on the same power supply, must be suitable for use in industrial environments.
9. **Repairs**
   Repairs must be performed by authorised persons exclusively. With unauthorised opening, the warranty cover is voided and this may also result in danger for the user and for the system.
10. **Maintenance**
    The assembly is wear-free by design.
    For modules with cooling openings free air circulation must be checked at the cooling openings or on the housing at regular intervals. If necessary, the cooling holes / the housing must be cleaned.
    Good ventilation must be ensured.

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