



Industrial motor controller for brushed DC motors 24 VDC

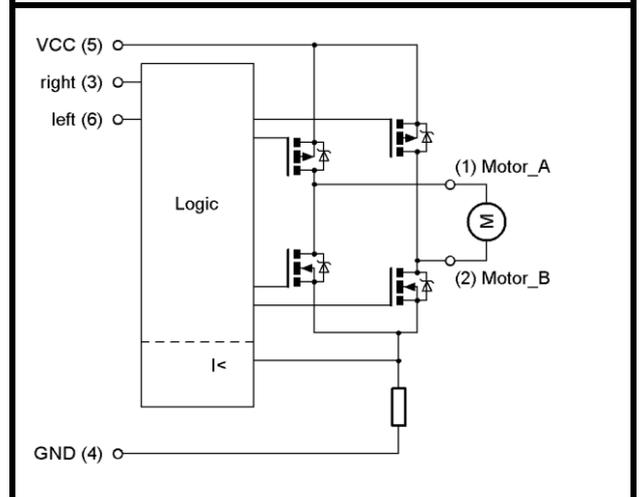
Design for output currents up to 6 A

Control with the following functions:

- reversal of direction of rotation
- short circuit detection
- dynamic brake
- adjustable start ramp

To snap onto the DIN rail
EN 50022

Unit width: 17,5 mm



Type	M2-MWS-6-30
Article number	06.34.015
Operating data	
Nominal voltage	U_{nom} 24,0 VDC
Supply voltage	V_{CC} 18 .. 30 VDC
Control inputs	U_{DI} 24,0 VDC
Quiescent current typ	I_0 50 mA
Technical data: load circuit	
Max. current / continuous load current	I_{max}/I_{con} 15 / 6 A
Short circuit current detection typ	I_{SC} 80 A
Shut-down time after short circuit typ	t_{sc} 100 μ s
Power stage driver	MOS-FET
Other data	
Dimensions	17,5 x 70,4 x 85,0 mm
Connectors	screw terminal, pitch 5 mm cross section 0,2 – 2,5 mm ²
Permissible ambient temperature	T_{amb} -20 .. +60 °C
Temperature monitoring / overvoltage protection	yes / yes
Status indication: error / right / left	LED1 red / LED2 green / LED3 green
Startramp adjustable over DIP	50 .. 4000 ms
Dynamic brake (Armature short circuit)	Can be switched off

Other data	
Installation orientation / Assembly	any / top-hat rail EN 50022
Installation place, typical	Switch cabinet
Storage temperature	-30 .. +85 °C
Permissible humidity	0 to 95 %, non-condensing
Weight	0,075 kg
Start up time	2 s
MTBF (SN29500, 40°C, rated load)	94,1 years
Hazardous substance norm	RoHS2
EMC interference immunity	EN 61326-1:2013-01 EN 61000-6-2:2005-08
EMC emitted interference, operation in industrial DC network	EN 61326-1:2013-01, Class A
EMC emitted interference, operation with power supply	EN 61326-1:2013-01, Class B
supply unit / power unit	KDR 120-24, Ott GmbH & Co. KG or comparable

Technical data: digital input	
High Signal typ.	U > 10 V
Low Signal typ.	U < 4 V
Impedance typ.	R _{DI} 15 kΩ

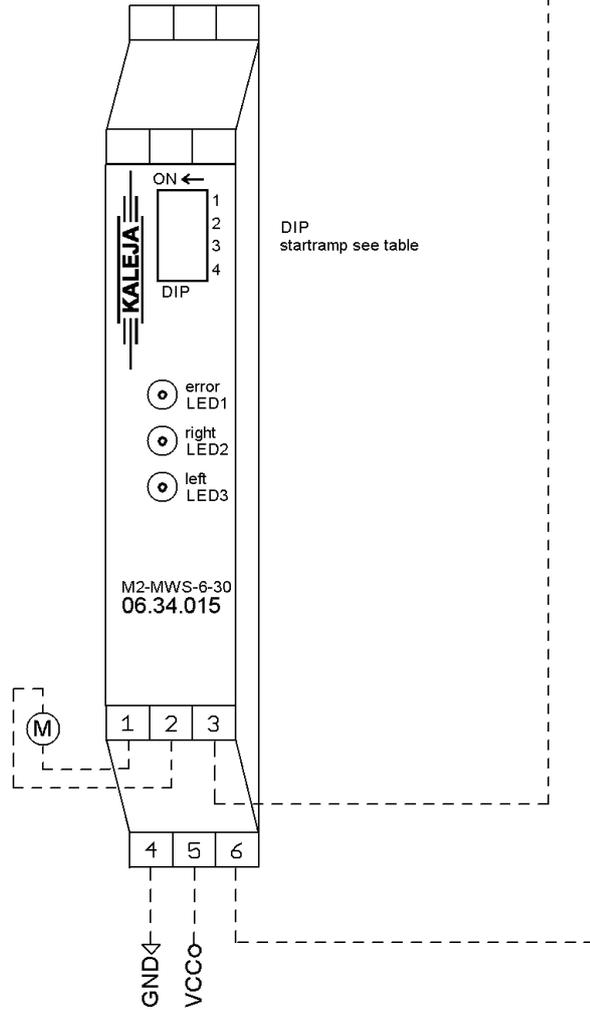
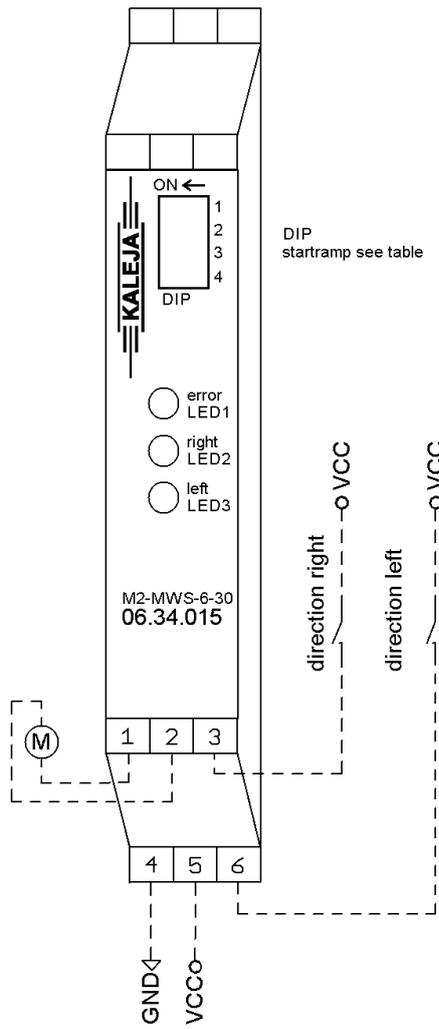
Flammability	
Housing, terminals, printed circuit board	UL94V-0

Starting behavior	
After applying supply voltage, the module is ready for operation when the start up time has elapsed.	

Description	
The module 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 start ramp time is adjustable. The continuous load current from the module is 6A.	

Typical application: Standard

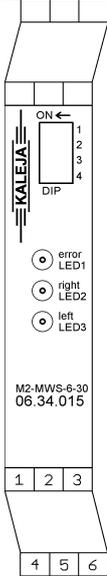
Typical application: PLC



PLC							
						direction right	direction left
						DO	DO

DI digital in
DO digital out
AI analog in
AO analog out

Terminal diagram



1 Motor winding B	2 Motor winding A	3 digital input „right“ (p- switch)
4 GND supply	5 +24 V supply	6 digital input „left“ (p- switch)

State table

direction „left“ (6)	direction „right“ (3)	Motor „A“ (2)	Motor „B“ (1)	Funktion
0	1	VCC	GND	run right
1	0	GND	VCC	run left
1	1	GND	GND	dyn. braking
0	0	GND	GND	stop

0 = off 1 = on x = don't care

Function: overload shutdown Function: setting the start ramp

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.

To reset the module the cooldown phase must be over and both direction inputs (3 & 6) must set to low and start again in any direction.

After setting a direction the module ramps the pwm speed to 100%. The ramp up time is adjustable over the DIP switch on the front of the module.

DIP1	DIP2	DIP3	DIP4	Ramp time [ms]
Off	Off	Off	Off	50
On	Off	Off	Off	75
Off	On	Off	Off	100
On	On	Off	Off	150
Off	Off	On	Off	200
On	Off	On	Off	300
Off	On	On	Off	400
On	On	On	Off	500
Off	Off	Off	On	750
On	Off	Off	On	1000
Off	On	Off	On	1500
On	On	Off	On	2000
Off	Off	On	On	2500
On	Off	On	On	3000
Off	On	On	On	3500
On	On	On	On	4000

Function: dynamic brake	Function: short circuit detection
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If both direction inputs (3 & 6) are **“high”** the motor stops **with** dynamic break.

When the module detects short circuit on the motor output, the motor switches off without dynamic braking. The motor can be restarted by fresh setting of any input of direction of rotation.

If both direction inputs (3 & 6) are **“low”** the motor stops **without** dynamic break.

Device status	Display elements
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The module status is displayed via the LEDs on the module front plate.

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.

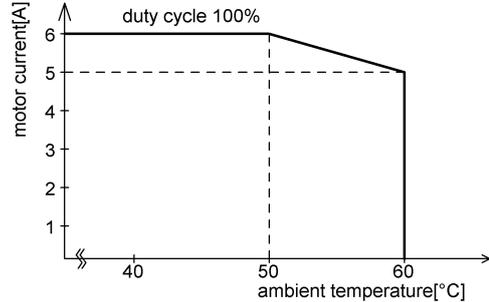
LED1 red	LED2 green	LED2 green	meaning
Off	Off	Off	Module is operational
Off	On	Off	Run right
Off	Off	On	Run left
flashing	Off	On	Module error 1 (see table) Occurred while running left
flashing	On	Off	Module error 1 (see table) Occurred while running right
flashing	flashing	flashing	Internal Error

Module error 1

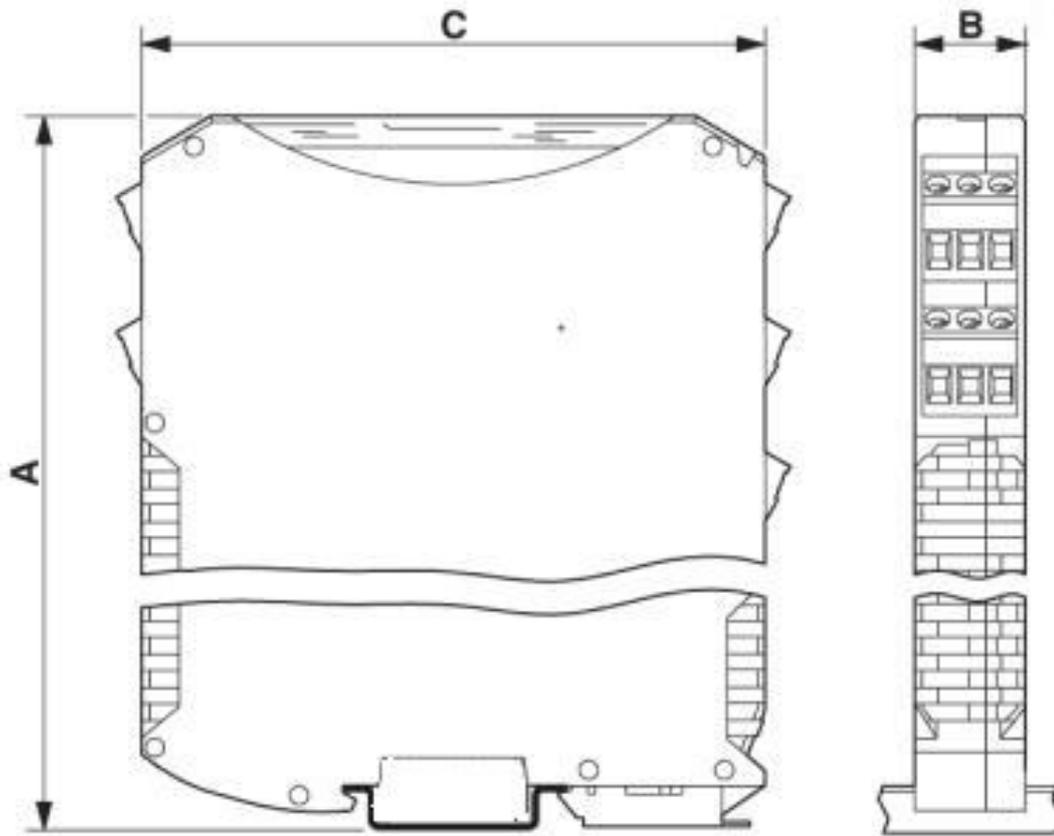
1	overcurrent
2	Over-temperature
3	short circuit detected
4	overvoltage
5	overload
6	Under-temperature
7	Low supply voltage
8	

Temperature derating

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



Dimensional drawing



A = 70,4 mm; B = 17,5 mm; C = 85 mm

Safety notes

Maximum operational data

The maximum operating data must not be exceeded.

Installation

The installation and start-up must be performed by specialist personnel exclusively.

All affected components must be disconnected from the mains.

Start-up

For the first start-up, the motor should be operated without load.

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.

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.

Field of application

The assembly may only be used as intended.

Other components must be checked for their approvals and regulations.

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.

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 AC 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.

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.

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.

contact details



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