1.7 Motor Control Relays

Application	Types	Output	DC ratings	Mounting
DC Motor controller	CMC1	2x MOSFET	16 A (20 A) / 24 V	DIN
	CMC15	2x MOSFET H bridge	10 A (20 A) / 24 V	DIN
	CMC16	2x MOSFET H bridge	10 A (20 A) / 24 V	DIN
DC Motor control relay	KDM3-24	1x PNP & 1x NPN	3 A / 32 V	S7-C

CMC1

DC Motor controller with adjustable start and breaking ramps for DC motors up to 384W

Type: CMC1/DC12-24V

The CMC is a control device for DC motors and permits operation in both rotating directions, i. e. the rotating direction can be reversed with the input signal. Alternatively, two motors can be operated in the same direction.
The CMC1 allows also to control lamps or electromagnets. The start and breaking ramps of the connected loads can be adjusted by two potentiometers in the time range 0 - 4 seconds.

Maximum load	**16 A / 24 V**

Outputs	**Drive**
Type	MOSFET
Nominal switching current	16 A
Inrush current	20 A (short-term)
Nominal voltage	24 V
Switching power	384 W

Control input V_n =	**12-24 V**
Nominal operating voltage range (DC)	12 – 24 V
Admissible voltage range (DC)	8 – 28 V
Current consumption	DC
12 V	3 mA
24 V	6 mA

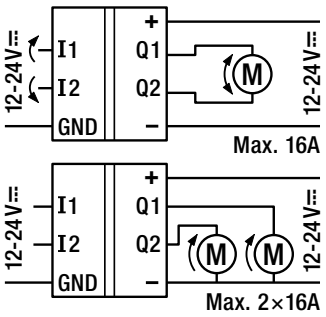
Power supply	
Nominal operating voltage (DC)	12 – 24 V
Operating voltage (DC)	8 – 28 V
Max. current consumption without load	10 mA
Max. power consumption	DC
12 V	120 mW
24 V	240 mW

General Specifications	
Ambient temperature storage/operation	-40 – +85°C / -25 – +60°C
Connection terminals	Screw terminal 2.5 mm^2
DC voltage endurance at rated load	> 100 000 h (at 25 °C)
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	Aluminium
Weight	80 g

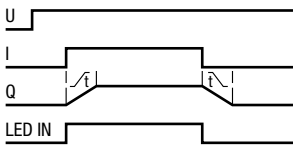
Standard types

DC 12-24	**CMC1/DC12-24V**

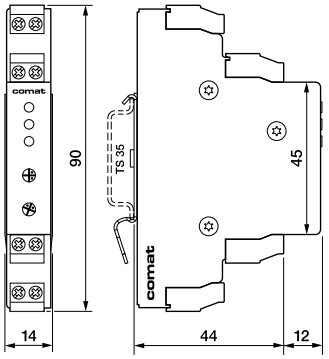
Connection diagram



Function diagramm



Dimensions [mm]



Technical approvals, conformities

CMC15

DC Motor controller with adjustable start and breaking ramps and speed control by 0 ... 10 V signal for DC motors up to 240W

Type: CMC15/DC12-24V

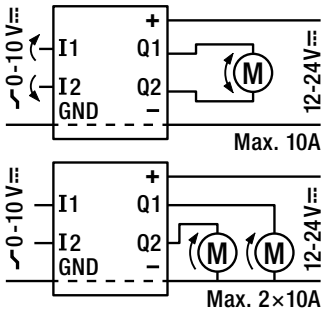
The CMC15 is a control device for DC motors and permits operation in both rotating directions, i. e. the rotating direction can be reversed with the input signal. Alternatively two motors can be operated in the same rotating direction. The motor speed is set by a 0 – 10 V signal.

Maximum load	**10 A / 24 V**
Outputs	**Drive**
Type	MOSFET H bridge
Nominal switching current	10 A
Inrush current	20 A / max. 3 s
Nominal voltage	24 V
Switching power	240 W
Analogue inputs	
Nominal operating voltage range (DC)	0 – 10 V
Resolution	8 Bit
Input impedance	55 kΩ
Power supply	
Nominal operating voltage (DC)	12 – 24 V
Operating voltage (DC)	8 – 28 V
Max. current consumption without load	10 mA
Max. power consumption	DC
12 V	120 mW
24 V	240 mW
Time response	
Start ramp	0 – 2 s
Breaking ramp	0 – 2 s
General Specifications	
Ambient temperature storage/operation	-40 – +85°C / -25 – +60°C
Connection terminals	Screw terminal 2.5 mm^2
DC voltage endurance at rated load	> 100 000 h (at 25 °C)
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	Aluminium
Weight	80 g

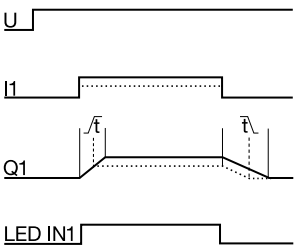
Standard types

DC 12-24	**CMC15/DC12-24V**

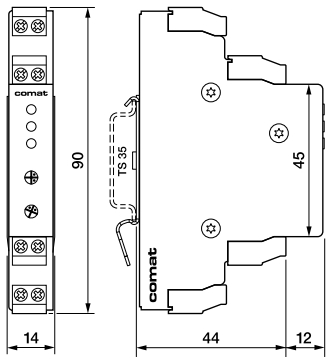
Connection diagram



Function diagramm



Dimensions [mm]



Technical approvals, conformities

CMC16

DC Motor controller with adjustable start and breaking ramps and speed control by 4 ... 20 mA signal for DC motors up to 240W

Type: CMC16/DC12-24V

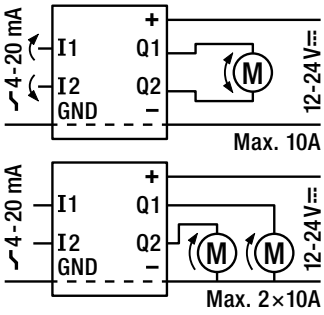
The CMC16 is a control device for DC motors and permits operation in both rotating directions, i. e. the rotating direction can be reversed with the input signal. Alternatively two motors can be operated in the same rotating direction. The motor speed is set by a 4 – 20 mA signal.

Maximum load	**10 A / 24 V**
Outputs	**Drive**
Type	MOSFET H bridge
Nominal switching current	10 A
Inrush current	20 A / max. 3 s
Nominal voltage	24 V
Switching power	240 W
Analogue inputs	
Nominal operating voltage range (DC)	4 – 20 mA
Resolution	8 Bit
Input impedance	190 Ω
Power supply	
Nominal operating voltage (DC)	12 – 24 V
Operating voltage (DC)	8 – 28 V
Max. current consumption without load	10 mA
Max. power consumption	DC
12 V	120 mW
24 V	240 mW
Time response	
Start ramp	0 – 2 s
Breaking ramp	0 – 2 s
General Specifications	
Ambient temperature storage/operation	-40 – +85°C / -25 – +60°C
Connection terminals	Screw terminal 2.5 mm^2
DC voltage endurance at rated load	> 100 000 h (at 25 °C)
Ingress protection degree	IP 20
Mounting	DIN rail TS35
Housing material	Aluminium
Weight	80 g

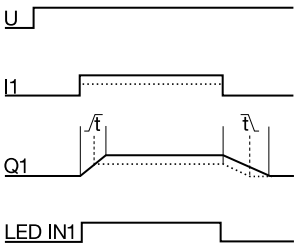
Standard types

DC 12-24	**CMC16/DC12-24V**

Connection diagram



Function diagramm



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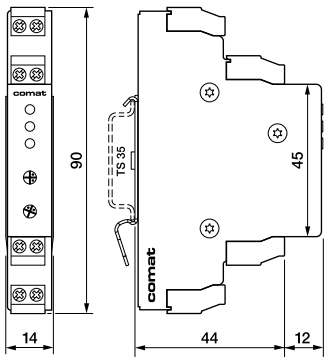


Technical approvals, conformities

Plug-in solid state relay

KDM 3-24

DC Motor control relay with brake function, DC 24 V
1 high side switch and 1 N-channel brake switch

Type: KDM 3-24/DC12-24V R
Solid state relay for DC-motor control
and similar applications
1 high side + 1 N channel transistor switch
All overload and short circuit protected
Adjustable or disabled brake function by
external resistor or jumper
LED status indicator
Pluggable module

Maximum load	**3 A / 32 V**	
Outputs	**Drive**	**Brake**
Type: Power MOS FET	High side	N-channel
Max. switching current	3 A	3 A, 10 sec
Max. continuous current	3 A (5 A) [1]	2 A
Max. inrush current, 1 sec [2]	20 A	7
Switching voltage range	10 … 32 V	10 … 32 V
Max. Load	100 W	65 W
Thermal overload protection [2]	self restoring	self restoring
Over current limiting [2]	typ. 35 A	7 … 14 A
Clamp voltage	typ. 58 V	60 … 70 V
Max. inductive switch-off energy [2]	1 Ws single pulse	0.4 Ws single pulse
ON resistance @ 25 °C	≤ 50 mΩ	≤ 100 mΩ
Leakage current	≤ 10 µA	

[1] Repetitive operation: When the ratio t_{pulse} / t_{cycle} is a low value then the current can be increased up to 5 A @ T_A ≤ 50 °C.
[2] Not for continous repetitive operation

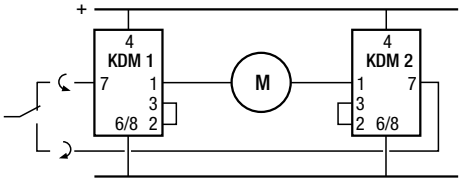
Control input V_N =	**DC 12-24 V**
Operating voltage range	9 … 28 V
Release voltage	≤ 2 V
Typical input current @ 12 / 24 V	2 / 6.5 mA
Power consumption @ 12 / 24 V	25 / 160 mW
Polarity reversal	protected

General Specifications	
Ambient temperature storage/operation	-40 … +85°C / -25 … +60°C
ON delay	1 ms
Release time	1 ms
Ingress protection degree	IP 40 when the device is plugged in
Housing material	Lexan
Weight	27 g

Standard types	
DC 12-24	**KDM3-24/DC12-24V R**

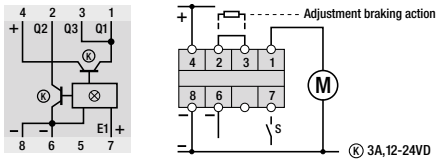
Accessories	
Socket:	**S7-C**

Application example
Four quadrant (forward / reversed) motor control

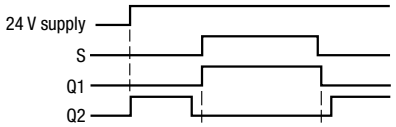


Operating with brake resistors (on 2–3) is not recommended in this application.

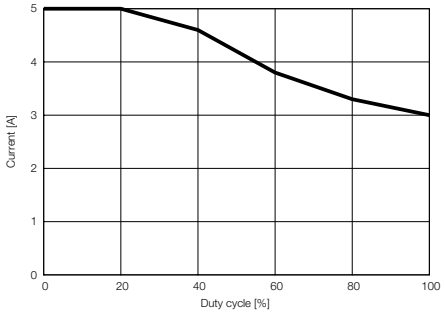
Connection diagram



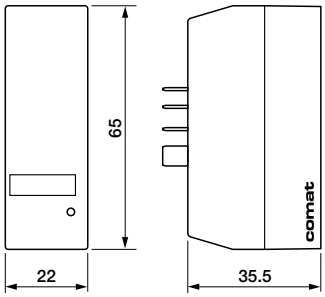
Function diagramm



Output current vs. duty cycle



Dimensions [mm]



Technical approvals, conformities

CE RoHS

Notes