

# EM-285 DC-MOTOR SPEED REGULATOR

## 12 / 24V 20A



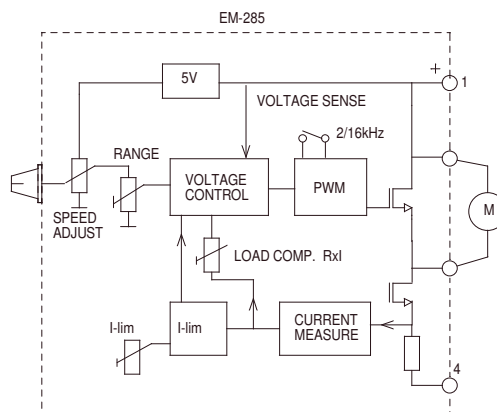
### FEATURES

- Speed cont. to 1-direction
- Panel mountable
- Small size
- Motor size 30-200W
- Good speed regulation
- Load comp. adjustable Rxl
- Adjustable current limit
- Overheating protection
- EMC tested.

EM-285 is a PWM-based DC-motor driver. The materials and features meet the industrial standards. Motor voltage is regulated against supply voltage changes, and there is also a load compensation adjustment ( Rxl ), which enables steady speed during motor loading. Because of these features EM-285 can offer a good DC-motor speed regulation. In the power line of EM-285 there is an overvoltage limit, which trips the power stage in case the voltage would try to rise too high. This is possible in deceleration situation (emf voltage generation in braking). If potentiometer is turned on zero-position, the driver will make a shorting on motor wires for 5s. This creates a powerful braking (dynamic brake) which can be used to stop or lower the motor speed fast. The current limit and potentiometer range can be adjusted with on-board trimmer potentiometer. The device is EMC measured and meets industrial requirements in typical installation. EM-285 is easy to mount to a D10mm hole in the assembly panel. The power stage is not short circuit protected, so it is recommended to use an external fuse in application supply wiring.

### TECHNICAL DATA

Supply voltage 10-35Vdc  
 Overvoltage shut down 38V  
 Undervoltage shut down 10V  
 Start up voltage 11V  
 Idle current typ. 20mA  
 Motor current cont. max 20A ( Ta<50 °C )  
 Motor current peak max 30A ( 10s. )  
 Power losses 5W ( at 20A and 16kHz )  
 Power losses 4W ( at 20A and 2kHz )  
 Current limit adj. 1-30A  
 PWM frequency 2kHz or 16kHz  
 Temperature limit 90 °C  
 Motor and supply connectors 2.5mm  
 EMC EN 50081-2 & EN 50082-2  
 Weight 85g  
 Operating temp ( Ta ) -20...60 °C



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# EM-285 WIRING and INSTALLATION

Recommended supply voltage 12-32Vdc filtered DC  
Ripple should be less than 20% at max. power.  
At high power use the supply wires should be as short as possible. The use of external fuse is recommended.  
ATT. Wrong supply polarity can damage device.  
ATT. Driver has no inbuilt fuse.

Select operation frequency. At 2kHz there are lower power losses and lower EMC emission level, but some cases there can occur audible noise.

Range trim is used to scale the usable speed adjust range. See diagram below.

Current limit ( I-lim ) limits the motor current, in other words the motor torque. This adjustment should be used to set the limit to suitable level according to the application.

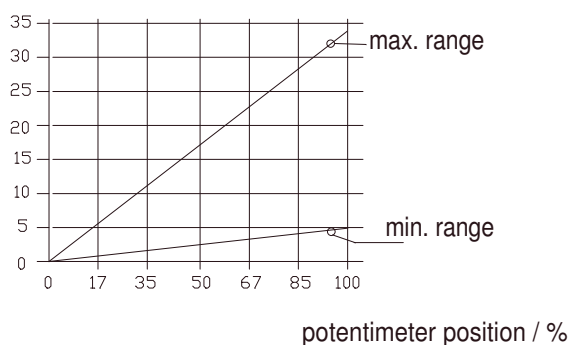
This device can be installed using one 10mm diameter hole. If the environment has high vibration level, the fastening can be secured with two external 3mm screws.

The body of this device can warm up, specially when continuous current is higher than 15A. Take this account when installing device in to plastic enclosure. In high power application the metal box is recommended. Metal box also offers a better EMC properties and cooling. The body temperature rise from ambient at 20A current is 45°C at pwm-freq. of 16kHz and 35°C at pwm-freq of 2kHz

Load compensation ( RxI ) should be set to minimum in beginning. Next set the a motor rpm 20-30%. and slowly increase compensation and simultaneously try loading the motor. If motor rpm is no affected by loading the compensation adjustment is in optimum. But if motor starts to twitch or running turns nervous the adjustment is overcompensating.

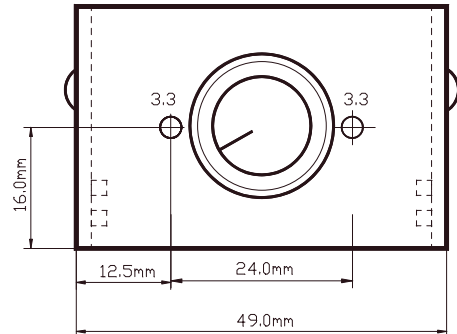
Motor voltage vs. potentiometer position

Motor voltage/V

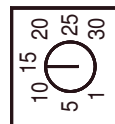


Range is adjustable with inbuilt range trim

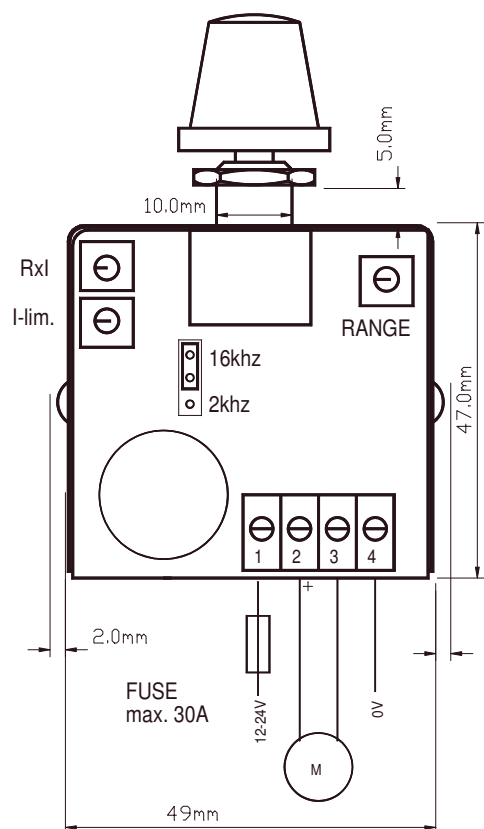
0% = potentiometer full counter clockwise  
100% = potentiometer full clockwise



RxI  
compensation  
adjustment



I-lim./ A  
current limit



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