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 RxI**
- **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 (RxI), 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 powerfull 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
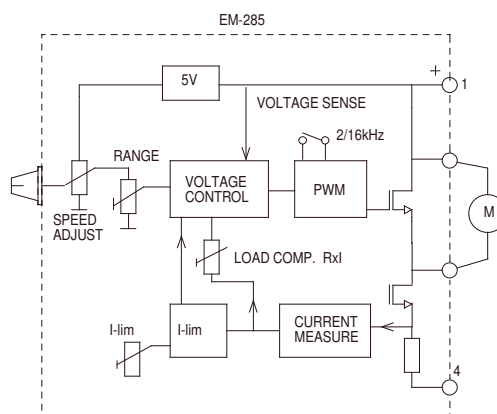
EM-285 WIRING and INSTALLATION

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 audiable 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 enviroment has high vibration level, the fastening can be
secured with two external 3mm screws.

The body of this device can warm up, specially when
continuos 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 simultanously 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
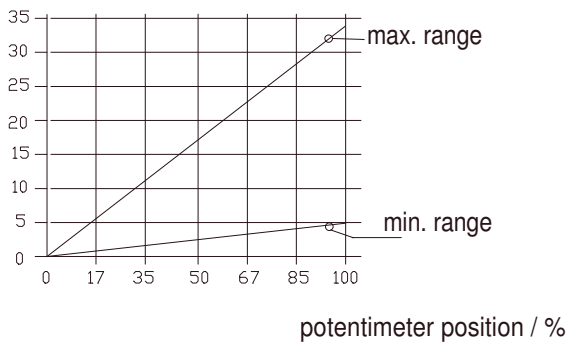running turns nervous the adjustment is overcompensating.
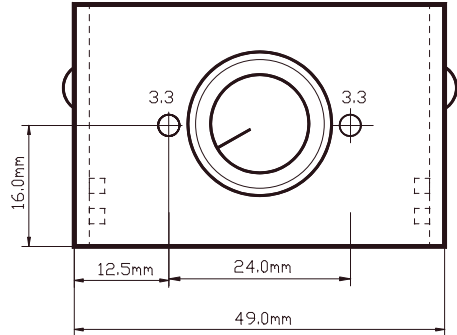
RxI
compensation
adjustment
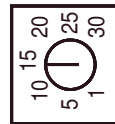
I-lim./ A
current limit

Motor voltage vs. potentiometer position

Motor voltage/V

max. range

min. range

potentimeter position / %

Range is adjustable with inbuilt range trim

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

RANGE

RxI
I-lim.

16khz
2khz

1 2 3 4

FUSE
max. 30A

12-24V

0V

M