

EM-240 BRUSHLESS DC-MOTOR CONTROLLER 12-24V 1.5A



FEATURES:

- Hall sensor supply and input
- Open or closed loop activity
- Controlled direction change
- Braking
- Settable current limit
- Settable start and stop ramp
- Dip-switch settable
- EMC tested

EM-240 controller is designed for small brushless DC-motors. The unit is suitable for three phase hall transducer brushless motors. There are two operating modes: in open loop operating mode the motor voltage is proportional to control value with the characteristics of a common DC-motor with brushes. In closed loop operation hall transducer signal is used to regulate motor speed. Through the feedback, a precise motor rpm in relation to control value can be achieved.

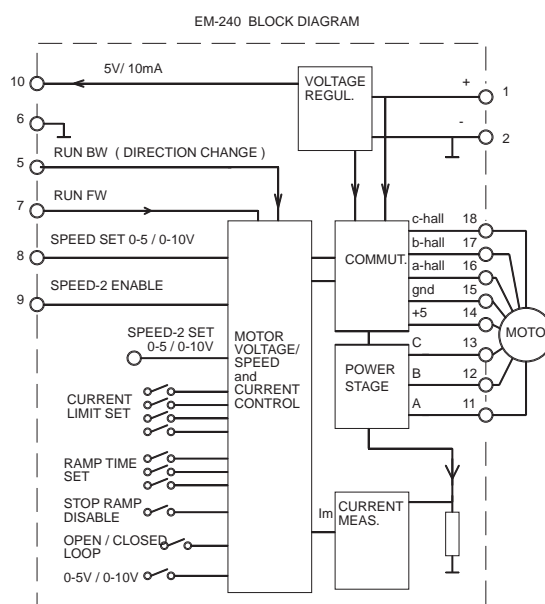
The motor operating speed and running direction can be adjusted and the motor may be braked in both operating modes. The power stage uses PWM principle and is highly efficient.

Speed control value is given as analog voltage signal. The auxiliary voltage signal is regulated and may be used as reference value for control potentiometer. The acceleration speed can be adjusted with acceleration and deceleration ramp. Deceleration ramp can also be bypassed when rapid braking is desired. Additionally the unit is equipped with speed2-feature, which can be activated individually. This is especially practical in positioning applications.

Current limit can be used to restrict motor torque and is dip-switch settable. Control inputs work with positive (NPN) logic. EM-170 is EMC-tested in accordance with industrial standards.

TECHNICAL DATA:

Supply	12-35V
Current cons.	max 2A
Idle current	20mA
Output voltage	0-32V
Motor rpm	max. 18000 rpm
Output current	1.5A continuous 2A (10s)
Current limit	0.2, 0.3, 0.4, 0.5, 0.6 0.7, 0.8, 0.9, 1, 1.1, 1.2 1.3, 1.4, 1.5, 1.7 and 2A
Ramp time	0, 0.1, 0.2, 0.3, 0.5 0.7, 1.0, 1.5s
Input control voltage	0-10V (Rin 100kohm)
ON/OFF control	0-1V ="off" 4-30V="on"
Input impedance	10kohm
Auxiliary voltage	10V (max. 5mA)
Operation freq.	16kHz
Operating temp.	0-60°C
EMC	EN-50081 and EN-50082-2
Measures	60x60x20mm
Weight	30g



EM-240 OPERATING INSTRUCTIONS

Supply filtered 12-35VDC with ripple < 20% with full load.

CAUTION ! reverse polarity can damage the unit

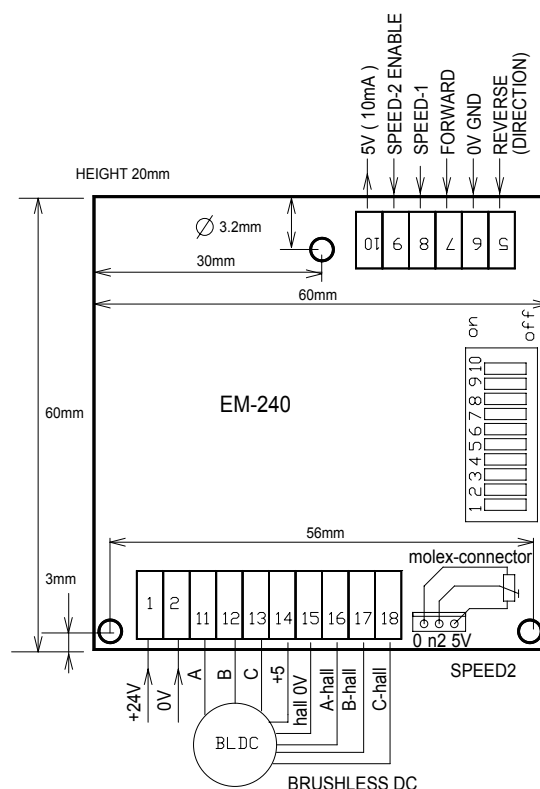
CAUTION ! no internal fuse

SETTINGS AND CONNECTING UNIT

Switch off power before connecting motor and power supply to EM-240. Prepare the control circuit. Set current limit and ramp time according to application.

In open loop mode motor rpm will drop when loaded (in relation to control voltage), whereas in closed loop mode the motor rpm will be constant (in relation to control voltage) unless the current limit is not exceeded. The control value relation to motor output voltage is illustrated in the chart below. Speed-2 control value is given via molex-connector, the scaling is same as in speed-1 input. If speed-2 feature is not required, this potentiometer can simply be left out. Recommended speed control potentiometer value is 2..50kohm for both speed-1 and speed-2.

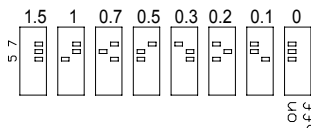
Control inputs can be used with switches, analog voltage or NPN outputs of a logic. A voltage signal greater than 4V is logic 1, maximum input voltage 30V. Forward input will start up the motor in forward direction. Reverse input will start up the motor in reverse direction. When motor is already running forward, direction will change. Speed-2 will set the running speed according to input signal in molex connector. Notice: Speed-2 input will start up the motor in forward direction even if no other inputs are activated. Control voltage and speed set value are in reference with 0V gnd potential (pin6).



current limit / A
dip-switches 1-4



ramp time / s
dip-switches 5-7



"on" = deceleration on

"off" = deceleration off = brake on

dip-switch 8

on = closed loop

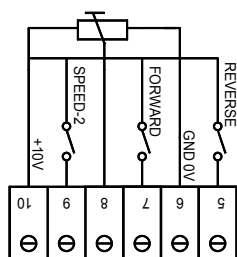
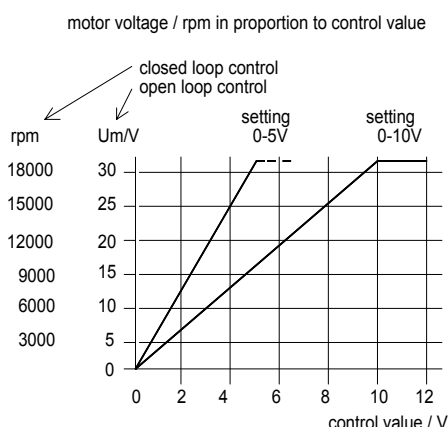
dip-switch 9

off = open loop

on = 0-10V

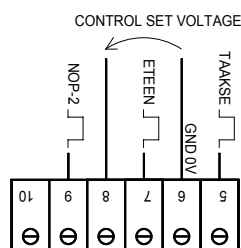
off = 0-5V

dip-switch 10, control voltage



EXAMPLE 1

Speed control with potentiometer.
Speed-2 with external potentiometer.
Control input with switches.



EXAMPLE 2

Speed control with voltage 0-5V or 0-10V.
Speed-2 with external potentiometer.
Control input with 4-30Vdc voltage.