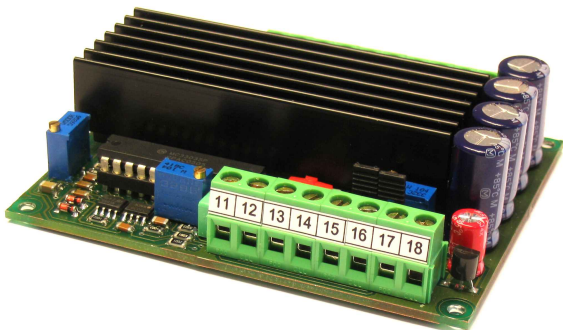


EM-206 BRUSHLESS MOTOR CONTROLLER

12-36V 10A



FEATURES:

- Three phase output
- Continuous speed adjustment
- Reversing
- Braking
- $\pm 10V$ control option
- Hall sensor supply and input
- 60° or 120° commutation
- Settable / controllable current limit
- Fault output
- Open or closed loop activity
- High efficiency
- Rail base mountable

EM-206 is a DC-motor controller that is designed for brushless motors with hall sensor feedback. The unit has a mosfet-type high efficiency power stage. EM-206 can be connected to motors using 60° or 120° commutation. The unit is equipped with standard controls, such as speed, stop, reversing and braking. Mechanical installation can be done with screws or by using a rail mounting base.

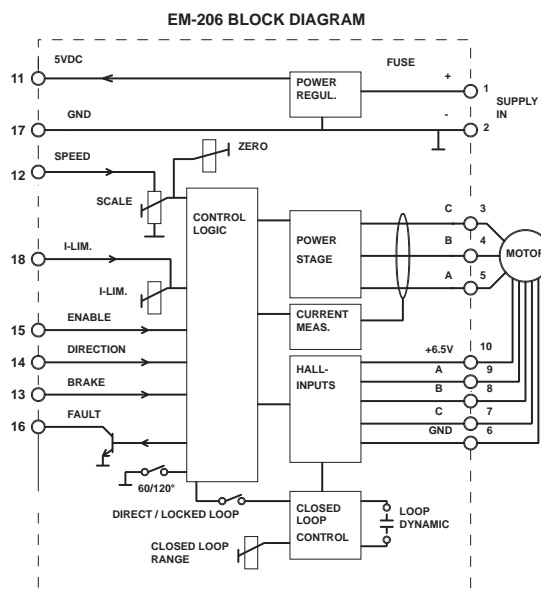
There are two control options. Direct control (open loop) sets motor voltage in proportion to control voltage, as with a standard DC-motor. Frequency locked control (closed loop) uses hall sensor feedback for speed set besides commutation set. This way a precise speed control is attained. Closed loop response can be altered so that the adjustment remains stable in given application. Speed control signal can be scaled with trimmers.

Current limit restricts motor torque when motor current exceeds set value. Current limit can be set with a trimmer or with external signal. Fault output indicates the operation of the current limit. EM-206 is protected against surge voltage and overheating (excess load). The unit requires an external fuse.

As an option, EM-A1 expansion card can be installed, this makes it possible to control EM-206 with $\pm 10V$ signal.

TECHNICAL DATA:

Supply voltage	12...36 Vdc
Over voltage protect.	39Vdc
Idle current	approx. 50mA
Motor current	10A rms
	15A 50/50%
Current limit	0...15A
Current limit input	0-5V corresponds to 0-15A (input imp. 10k)
Thermal protection	120°C (heat sink)
Voltage loss	0.8V @ $I_m=10A$
Control voltage	0-10V (0-5V adjustable)
Control potentiometer	2-10k
Control voltage output	5V (max 10mA)
Hall voltage output	6.5V
Digital control	"high" @ $U_{in}=3...30V$ "low" @ $U_{in}=0...1V$ or open
Control Input impedance	10k
Fault output	NPN open coll. 30V 10mA
Dimensions	89x73x25mm
Weight	approx. 130g



EM-206 OPERATING INSTRUCTIONS

Operating voltage 12-36V filtered, with less than 20% ripple.
An external supply fuse is recommended, suitable values 1-12A.

Speed control set with voltage or potentiometer. Range is adjustable with SCALE and ZERO trim.
The recommended pot. value is 2-10k, the control voltage signal should be 0-5V or 0-10V.

There is option for $\pm 10V$ control input if EM-A1 is assembled. Otherwise use two jumpers.
Speed input impedance of is 100kohm.

Speed control mode NORMAL or CLOSED LOOP is selected with SW1.

Normal speed control: Motor acts like a normal DC-motor without feedback.

Closed loop control: The control unit uses a hall sensor signal to regulate motor speed.

Accuracy of the motor rpm is typically $\pm 1\%$ in this mode.

The useable rpm range in closed loop mode is selected with "CLOSED LOOP RANGE" trimmer.

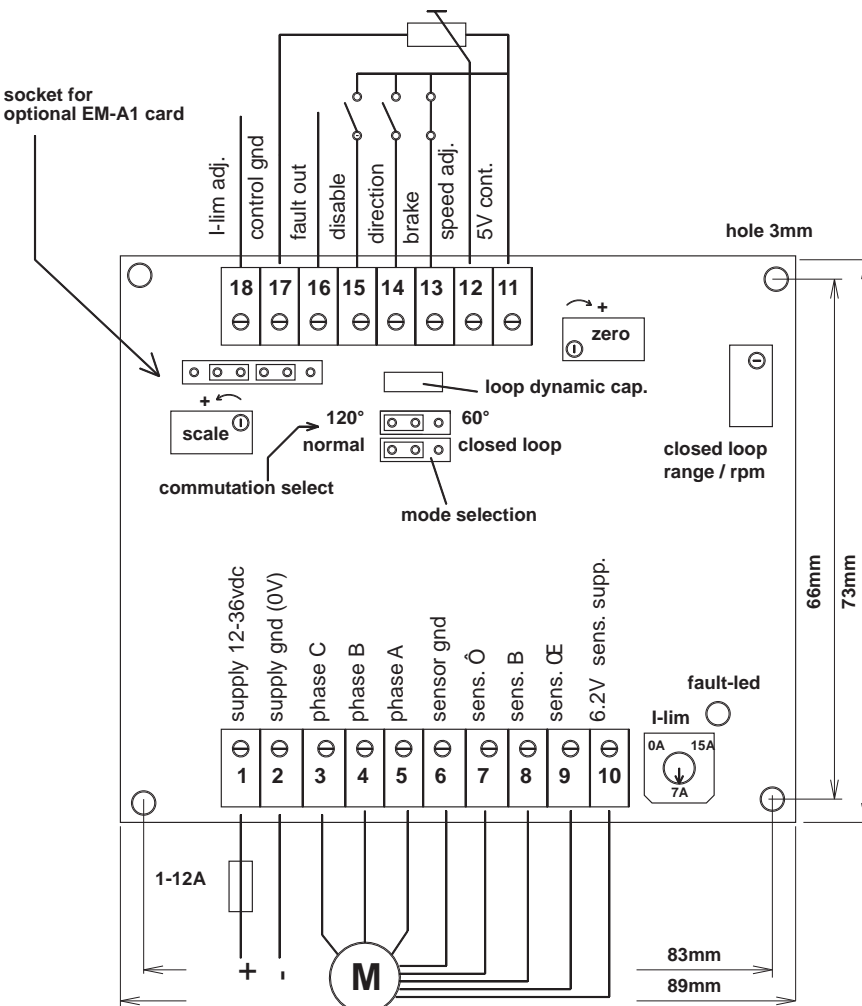
The loop dynamic behaviour can be changed with LOOP DYNAMIC

CAPASITOR. The capacitor is assembled to socket, and it is easily exchanged.

Recommended value is 47nF...1000nF.

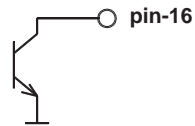
Current limit adjust (I-LIM) limits the motor current (torque). Normally current limit is set with I-lim trimmer.
If external I-lim control voltage is preferred, I-lim trim must be set to minimum, and control pin 18 connected to a potentiometer or a voltage signal of 0-5V (adj. range 0-15A). Input impedance of pin 18 is 10kohm.

Connection example: control with pot. and switches



FAULT-output is pulled down and FAULT LED is lighted if at least one of the following conditions occurs:

- undervoltage
- current limit
- sensor fault
- disable input selected



Brake input: Brakes if "low"; connected to GND or open (brake has higher priority than disable). This function short-circuits motor wiring.

Direction in: "high" voltage 4-30V pin 14 for reverse

Disable in: "high" voltage 4-30V pin 15 disables output (motor freewheeling)

