

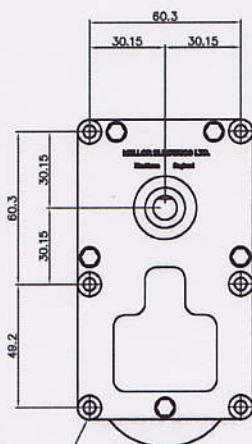
contraves drives



FBBD T3 Series Brushless DC Unit

- 12 - 36v DC
- Output Torque: Up to 35Nm depending on speed
- Speed Range: 0.8 - 50rpm

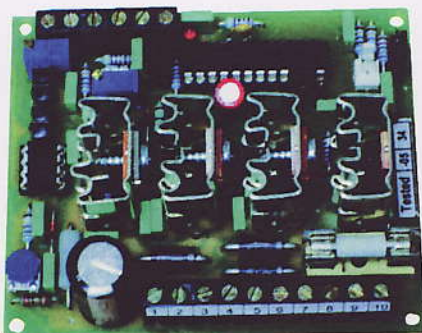
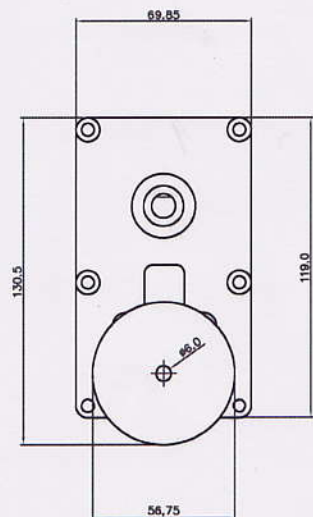
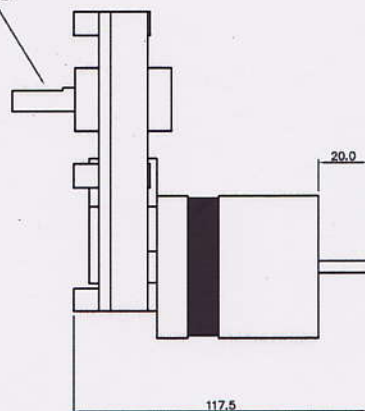
The motor can be speed controlled with the EM-106 drive board to give input speeds ranging from 250 - 2500rpm. Brushless DC technology gives extended life and quiet operation compared to traditional brushed DC motors. High quality engineering ensures quiet running and a long running life.



6 mounting holes - thread to suit customers requirements

Applicable to all FB models

Shaft Ø and length to suit customers requirements



Driveboard

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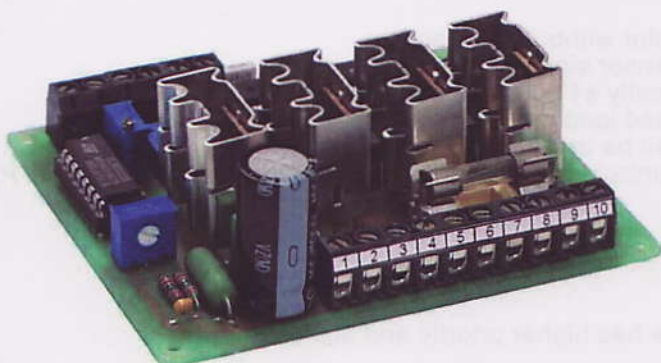
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EM-106 BRUSHLESS DC-MOTOR CONTROL UNIT

12-24V 5A



FEATURES:

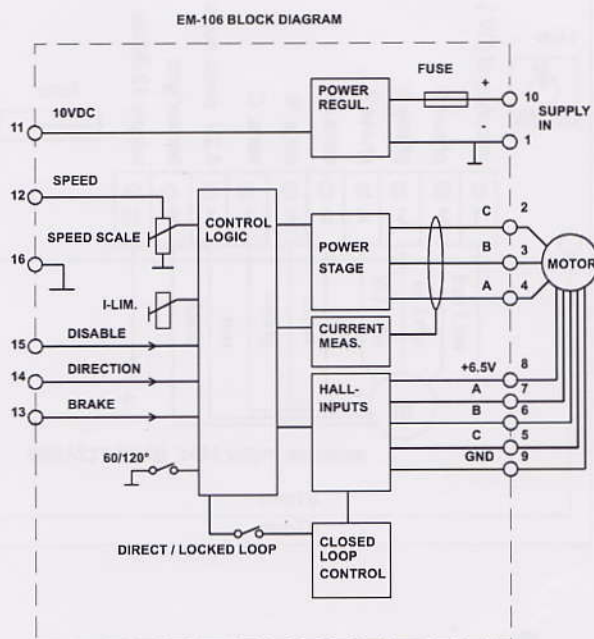
- Three phase output
- Direction change
- Hall-transducer supply and input
- Supports 60° and 120° commutating
- Adjustable current limit
- Direct or freq.locked driving
- High efficiency
- Inbuilt fuse
- Rail mounting base available

EM-106 controller is designed for brushless hall-feedback DC-motors. The device uses mosfet-type power stage with high efficiency. EM-106 can be connected to 60- or 120 degrees commutating motor. Standard driving includes speed adjustment, stopping, direction change and braking. The controller can be installed using screws or a standard rail mounting base.

There are two control modes: Within direct driving mode the motor voltage is set in proportion to the control voltage as with a normal DC-motor. Alternatively in frequency locked mode the controller uses the hall-transducer signal to speed adjustment besides commutating. This mode gives very precise speed referenced to the control voltage. As an additional feature the controller has an adjustment for loop response so that it provides as stable control as possible within all applications. Control input can be scaled with a trim. The current limit is set with a trim, it restricts driving when motor current exceeds the given value. The controller is protected against reversed input voltage polarity and fuse protected against over current.

TECHNICAL DATA:

Supply voltage	12...36 Vdc
Idle current	approx. 30 mA
Control current	5 A cont. 8A 50/50%
Current limit	1...8 A
Operating freq.	22 kHz
Voltage loss /V	0,8 V (Im=5 A)
Control voltage	0...10 V
Control pot.	2...10k
Control input	10 V max (20 mA)
Hall-input	6,5 V
Digital control	"on" at Uin 3...30 V "off" at Uin 0...1 V or open
Dimensions	87*73*35 mm
Weight	approx. 90 g



EM-106 OPERATING INSTRUCTIONS

Operating voltage 12-36V filtered, less than 20% ripple.

Speed control set with voltage or potentiometer. Range is adjustable with SCALE and ZERO trim.
Speed control mode NORMAL or CLOSED LOOP is selected with SW1.

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

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

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

The desired rpm range in closed loop mode is selected with SW3.

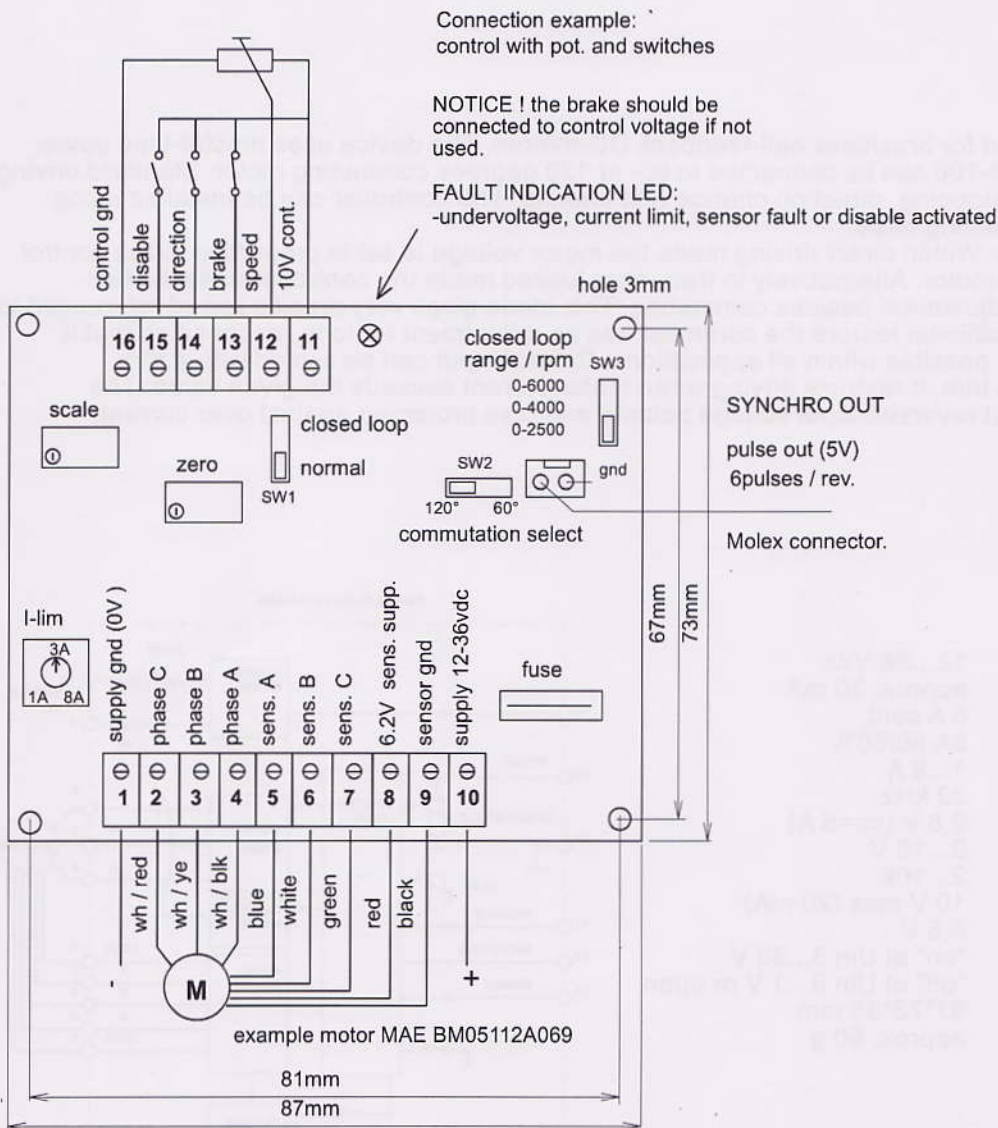
Synchro control:

A SYNCHRO OUT feature can be used if phase locking loop (PLL) control (clock accuracy, frequency control) is needed. This control mode needs external PLL-unit.

Current limit adjust (I-LIM) limits the motor current (torque).

Commutation phase of motor is selected with SW2.

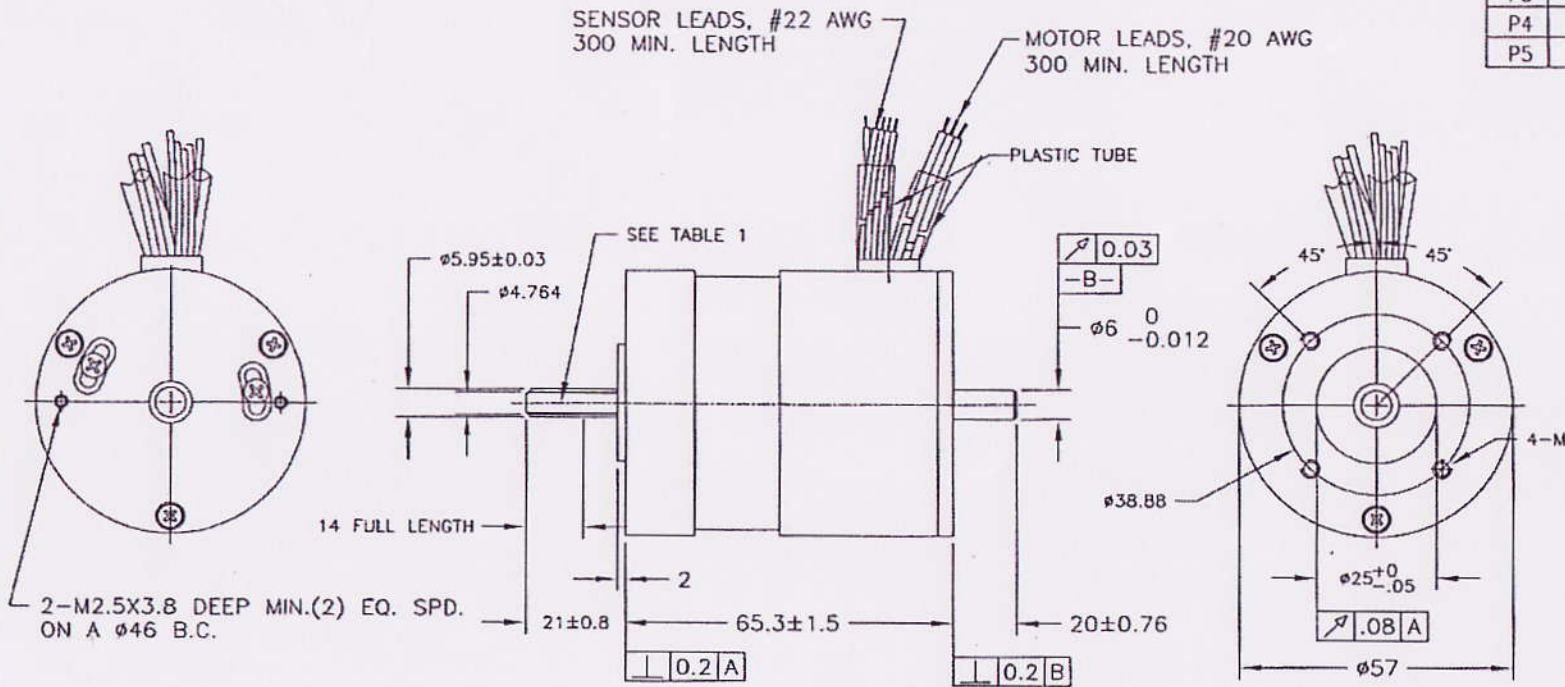
If disable and brake is selected simultaneously, brake has higher priority and activates.



NOTES:

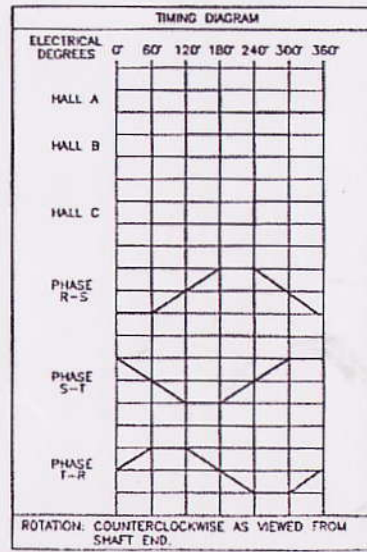
1. HI-POT: 1200VAC/1S, 2mA

REV	DESCRIPTION	DATE	APPROVE
P1	PRELIMINARY	05/11/08	ZQY
P2	PRELIMINARY	05/11/17	ZQY
P3	PRELIMINARY	05/12/22	ZQY
P4	PRELIMINARY	06/01/04	ZQY
P5	PRELIMINARY	06/03/29	ZQY

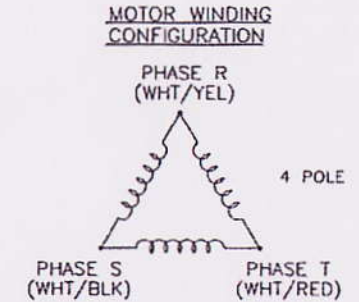


PARAMETER	VALUE
DIA. PITCH	64
NO. OF TEETH	12
PRESS ANGLE	20°
ADDENDUM COEFF. ha*	1
BACKLASH COEFF. C*	0.35
MODIFICATION COEFF. X	0.49
CIRCULAR RUNOUT Fr	0.05
BASE TANGENT LENGTH (OVER 3 TEETH)	3.13 $\begin{smallmatrix} -0.01 \\ -0.04 \end{smallmatrix}$

	TOL.	UNITS	VALUE
MAX. OPERATING SPEED (S _{nl})	MAX.	R.P.M.	5000
CONTINUOUS TORQUE (T _c)	MAX.	Nm	0.14
PEAK TORQUE (T _p)	MAX.	Nm	0.42
CONTINUOUS CURRENT (I _c)	MAX.	AMPS	2.48
PEAK CURRENT (I _p)	MAX.	AMPS	7.44
TORQUE SENSITIVITY (K _t)	±10%	Nm/AMPS	0.057
BACK EMF CONSTANT (K _e) (L-L, D.C.)	±10%	V/K R.P.M.	6
D.C. RESISTANCE (R _t) (L-L)	±10%	OHMS	2.13
INDUCTANCE (L) (L-L)	±15%	mH	3.18
ROTOR INERTIA (J _a)	NOM.	Kg-cm ²	0.075
WEIGHT	NOM.	Kg	0.5



COLOR	FUNCTION
WHT/YEL	PHASE R
WHT/BLK	PHASE S
WHT/RED	PHASE T
GREEN	HALL A
WHITE	HALL B
BLUE	HALL C
RED	+5-24 VDC
BLACK	GROUND



NOTE: THIS DRAWING HAS BEEN CREATED BY AUTOCAD. MANUAL REMISIONS ARE NOT ALLOWED.

MATERIAL		TOLERANCE UNLESS OTHERWISE SPECIFIED ISO 2768-1 MEDIUM			
DRAWN ZQY	CHECKED	APPROVED - DATE	FILENAME	DATE 05/11/08	SCALE N/A
DC BLS MOTOR					SHEET 1/1

RATED VOLTAGE: 24VDC
WORKING POINT: 2500RPM AT 0.11Nm

TECHNICAL DATA
MOTOR

Motor Type – 12v–36v Brushless DC

Continuous Current at 24v –
2.48 Amps

Peak Current at 24v –
7.44 Amps

Back EMF Constant at 24v –
6 V/K R.P.M. $\pm 10\%$

D.C. Resistance at 24v –
2.13 Ohms $\pm 10\%$

Inductance at 24v –
3.18 mH $\pm 10\%$

Temp. Rise –
23°C – 35°C / 4Hrs

TECHNICAL DATA
MOTOR GEARBOX

Output Torque at 3.5rpm @ 24v –
51.9N/m

Output Torque at 5.3rpm @ 24v –
39.1N/m

Output Torque at 10rpm @ 24v –
22.1N/m

