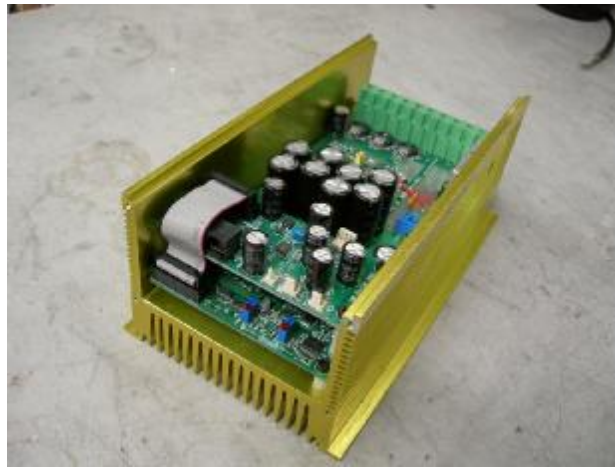




**ELECTRIC MOTOR POWER Pty. Ltd**

**ELECTRIC MOTOR POWER PTY LTD  
12V-48V 100A Controller for Brushless DC Motors**

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EMP 100 Amp Controller Overview

**Features:**

- Two current limits
  - Peak current limit to protect controller
  - Timed current shut off to protect motor
- Input voltage sensing and auto-shut off at low voltage
- Full variable speed control.
- Inputs
  - Variable acceleration and speed via potentiometers
  - Forward reverse input
- Voltage range 12-48v DC (extended ranges available)

..../.2

- LCD readout of parameters (optional)
- Max power 5kW continuous for 48v (100A continuous)
- UART communication to allow synchronised motor control

### **Specifications:**

- Ø Input voltage 12-48v DC.
  - Ø Continuous max current per phase 100Amps
  - Ø Max input current 100Amps (5 minutes)
  - Ø Max power rating 4800Watts on 48v DC
  - Ø Max peak current\* 200Amps
  - Ø Input circuit breaker rating\*\* 100Amps
- \* Peak current rating for 1-second non-repetitive  
\*\* Input fuse not included and must be used to prevent damage in the event of failure

### **Inputs:**

#### Direction – Frw/Rev

- This input is a voltage free contact. The state (open or closed) of this input will determine the direction of rotation of the motor.
- If the motor is in motion when this input is changed then the motor will decelerate to a stop then accelerate in the opposite direction.

#### Speed

- This 3 terminal input is used for a 22K pot to control speed. If not used then a link should be placed between pin 1 & 2 of this terminal block for zero speed or 2 & 3 for maximum speed.
- If the wiring to the pot will be more than 10 meters, then a 1µF 50V capacitor should be placed between pin 1 & 2, to improve noise rejection induced on cabling.

#### Acceleration

- This 3 terminal input is used for a 22K pot to control acceleration. If not used then a link should be placed between pin 1 & 2 of this terminal block.
- If the wiring to the pot will be more than 10 meters, then a 1µF 50V capacitor should be placed between pin 1 & 2, to improve noise rejection induced on cabling.

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### Input Voltage

- The input voltage must be in the range of the rated voltage of the controller selected.
- There is reverse protection fitted to the controller. If power is applied to the controller with out a switch there will be a small spark as the capacitors are charged up, this is normal and indicates that you have connected power correctly.

### Controller Voltage rating

- 12-48v DC (absolute max is 54VDC for fully charged batteries)

### Outputs

- (a) Break  
Connect EMP break to this output ensuring that wires do not short across this terminal causing a fault in the break output. The output voltage to the break is equivalent to the mains input voltage.

### Motor connection

- PHA Red
- PHB Blue
- PHC White
- +V (Connect positive from the battery)
- -V (Connect negative from the battery)

**Please refer to attached schematics for connections to controller.**

### Current Limit

- This is set in the factory to your requirements and limits the maximum instantaneous current available to the motor windings. Please note that this current is not the current measured at the input voltage terminals.
- There is also a preset delayed current limit below this setting. If the motor current is in this region for more than the delayed current time, then the motor will shut down. To restart the motor the speed must be set to zero, then back to the desired speed. The delayed current level and shut down time must be specified on order.

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## **IMPORTANT INFORMATION**

- Ensure that positive and negative to the battery are correctly connected as this is very critical.
  - Follow colour coding as noted on diagram, i.e.  
Phase A=Red/1,  
Phase B=Blue/2,  
Phase C=White/3
  - The 5-Pin encoder should be connected to the controller before operating (can only be fitted one way).
  - Potentiometers for speed control and acceleration/deceleration should be done as per attached drawing.
  - To control "Forward/Reverse" connect a non-voltage contact switch as per attached diagram.
- (1) When all above connections are in place, turn speed potentiometer to minimum before applying voltage.
  - (2) Turn potentiometer clockwise slowly to ensure the motor starts operating smoothly. If motor fails to operate smoothly, then connections need to be checked. This procedure needs to be performed only once (during the commissioning of the motor).
  - (3) If no speed pot is to be used then a temporary pot should be fitted for commissioning to check that the installation is correct before fitting the fixed speed jumper.

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## CONNECTION DIAGRAM

