

LC-4 DC Brushless Motor Control

MOTOR COMPATIBILITY

The LC-4 family is compatible with any three phase WYE or DELTA wound brushless DC motor designed to operate with high voltage DC power and processing a minimum winding electrical time constant of 0.5mSec. or greater.

AVAILABLE CONFIGURATIONS

The LC-4 series is available in two versions. The packaged version conforms to NEMA type 1 requirements and features a protective cover, heat sink, quick disconnect wiring terminations, and diagnostic LEDs. An OEM open flame version comes with one or more circuit boards mounted to an L-shaped aluminum mounting base. Optional safety cover available. The packaged unit has its own built-in heat sink, while the open flame unit must be attached to a suitable heat conductive surface for proper operation.

LC-4 GENERAL SPECIFICATIONS

Model Number	LC-4A	LC-4B	LC-4C
Max. Power Output (Watts):	720	1280	2400
Max. Rated Current at 25°C (Note 2): Continuous Peak:	4.5	8.0	15
Motor Supply Voltage Phase-to-Phase (Note 3):	+ 160 VDC		
Input Voltage:	+ 98 to + 130 volts AC RMS, single phase, 50/60 Hz.		
PWM Operating Frequency:	Approximately 18 KHz.		
Auxiliary Voltage Output:	Nominal + 12 volts DC, 25 mA maximum.		
Current Limit Adjustment:	10 to 100%		
Automatic Overvoltage Trip:	Above rated voltage, drive latched off.		
Automatic Undervoltage Trip:	Below rated voltage, drive latched off.		
Automatic Over-temperature Trip:	When heat sink reaches approximately 50°C, drive latched off.		
Control Inputs (Note 4): Speed input:	0 to +10 VDC analog signal or external PWM signal; +10 to -10 VDC available. Ground for "forward" rotation. Ground to "stop" rotation. Pulse input.		
Motor Direction: Start/Stop: Dynamic Brake: External Current Limiting:			
Control Outputs: Current Signal (Optional):	Voltage signal proportional to current.		
Closed Loop Speed Regulation Single Quadrant:	Using motor Hall sensors or incremental encoder output signals. Regulation to within +/- 1% of set speed. Contact factory for details.		
Selectable Commutation Code:	60 or 120 electrical degree phase displacement standard.		
Commutation Control:	Provided by rotor position sensors in motor (Hall or optical). Three (3) required.		
Ambient Temperature: Operating:	-20°C to +50°C.		
Storage/Shipping:	-20°C to +85°C.		
Relative Humidity:	5 to 95% non-condensing.		

Note 1: Four quadrant operation requires derating unless unit purchased with optional "servo" upgrade.

Note 2: Unit must be mounted vertically to allow for proper convection air control. Prolonged high amperage duty cycles and/or high ambient temperatures may require forced air cooling. Heat sink temperatures above 50°C require current derating. The maximum heat sink temperature must not exceed 60°C.

Note 3: Phase-to-phase at maximum rated continuous load amperage and + 120 VAC-RMS supply input at 25°C.

Note 4: All non-analog inputs are TTL compatible.



HIGH VOLTAGE, AC POWER WITH DC CONTROL

The LC-4 is a + 160 VDC high voltage control which combines the power and availability of AC input, with the control and versatility of DC PWM output, all in one compact unit. You don't need a separate power supply.

The LC-4 family of DC brushless motor controls uses an advanced design of PWM drive technology to produce surprisingly powerful DC brushless motor control capability at an affordable price.

Brushless motors offer all of the advantages of DC brush type motors, and more, such as; higher speed capability, higher efficiency, and more power for a given frame size than their brush type equivalents. And best of all there are no brushes to maintain, meaning reduced maintenance and extended operating life.

This high voltage DC brushless controller is capable of four quadrant¹ velocity control of a single DC brushless motor. It offers many standard features like remotely selectable start/stop, forward/reverse, dynamic braking, and open or closed loop speed control via external analog signal or optional PWM signal input. The integrated single quadrant closed loop speed control system using Hall sensor feedback is standard.

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PROTECTION FEATURES

- Automatic current limiting
- MOV protection circuitry
- Over-temperature trip
- Over/under voltage trip
- Magnetically/optically isolated output stages
- Locked rotor protection
- Fused AC line

OPERATING FEATURES

- Analog speed control
- External start/stop, forward/reverse, and dynamic braking
- 115 VAC line input; no transformers needed
- Variable acceleration/deceleration
- Torque (current) output (optional)
- Dual speed selection (electronic gearing)
- External PWM input
- Diagnostic LEDs
- Quite, high efficiency PWM switching
- Selectable commutation code
- Built-in single quadrant closed loop speed control

ADJUSTMENTS

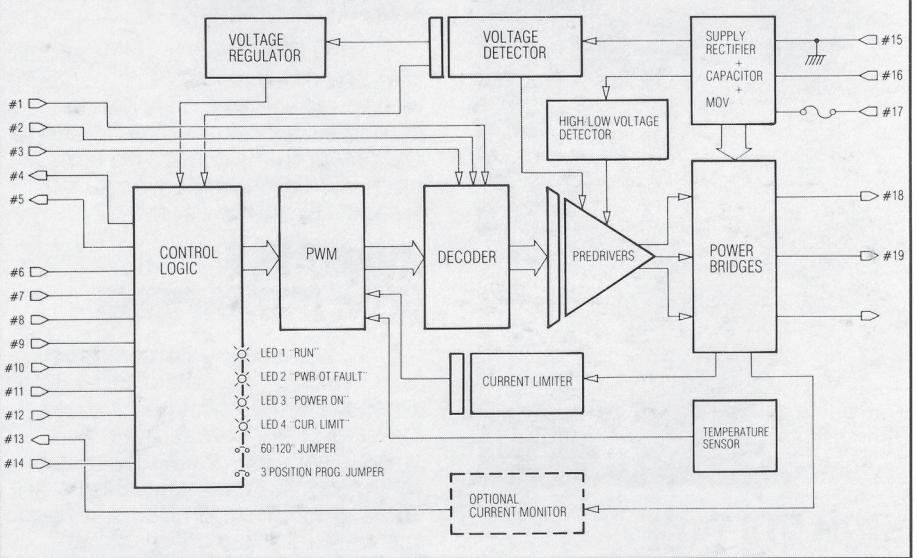
- Soft start
- Tachometer gain
- Current limit set point
- Closed loop speed control
- Velocity set point 1
- Velocity set point 2

IF YOU NEED MORE INFORMATION . . .

Automation Inc., designs and manufactures a complete line of DC brushless motor controllers for a variety of industrial motion control applications. We also can provide a custom design for a controller, and can help you find the right motor for your specific requirements.

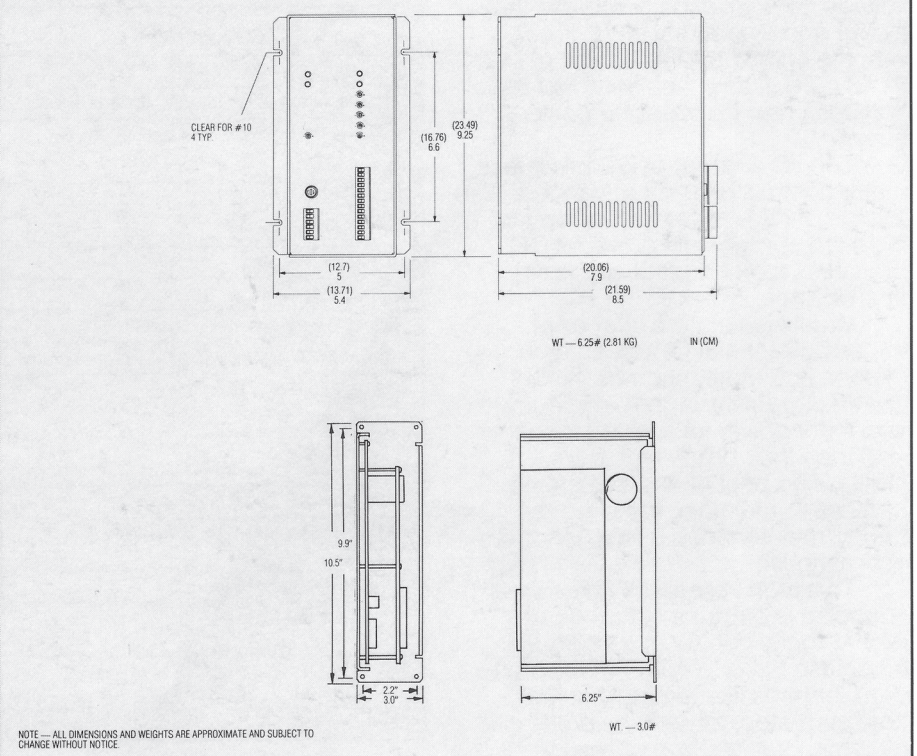
We invite you to learn more about Automation. If you have any questions or would like more information, please call 734-662-7771 or fax 734-662-3707.

FUNCTIONAL DIAGRAM



#1 S1 HALL INPUT • #2 S2 HALL INPUT • #3 S3 HALL INPUT • #4 + 12 VDC REG. OUTPUT • #5 LOGIC GND • #6 START/STOP • #7 FWD/REVERSE • #8 DYNAMIC BRAKE • #9 OPEN LOOP SPEED • #10 DUAL SPEED SELECT • #11 EXT. CLOSED LOOP SPEED • #12 EXT. ENCODER OR PWM INPUT • #13 CURRENT SIGNAL (OPTIONAL) • #14 EXT. CURRENT LIMIT TRIP • #15 CHASSIS GROUND • #16 115 VAC • #17 115 VAC • #18 MOTOR PHASE 1 • #19 MOTOR PHASE 2 • #20 MOTOR PHASE 3

DIMENSIONS



NOTE — ALL DIMENSIONS AND WEIGHTS ARE APPROXIMATE AND SUBJECT TO CHANGE WITHOUT NOTICE.

LC-4 MODEL NUMBERING SYSTEM

MODEL DESIGNATOR _____ L C 4 A S O 0 1 0
 POWER LEVEL _____ A = 4.5 Amp, B = 8.0 Amp, C = 15.0 Amp
 PACKAGING CODE _____ P = NEMA 1 Package, O = Open Frame, S = Open Frame With Safety Cover
 CUSTOMIZATION CODE _____ Factory Assigned
 OPTION CODE _____ 001 = Current Sensor, 010 = +/- 10 VDC Input, 100 = Aux Shunt Regulator, 55 Watt

For more information including custom user options available, please contact: