



**Kinetek Controls®**

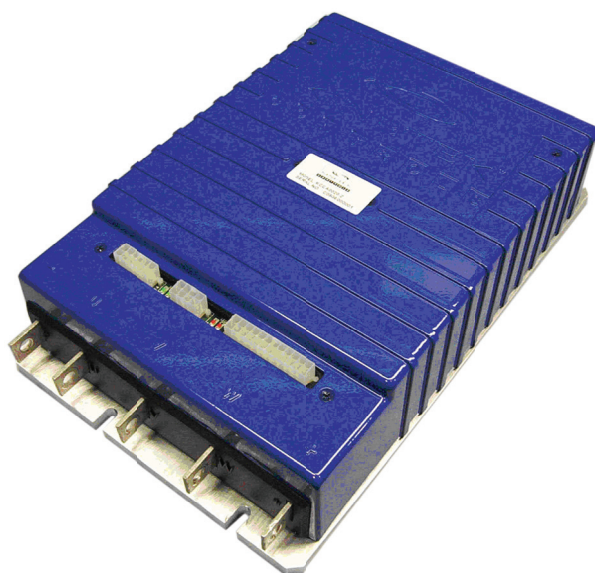
A Kinetek Company®

# Low Voltage AC Motor Controllers

## KCCA0007, KCCA0020, KCCA0021, KCCA0033

**Kinetek AC Controllers** are designed for low voltage electric vehicle applications using a three-phase, AC induction traction motor. Kinetek controllers use a Digital Signal Processor to run state-of-the-art algorithms with field oriented control and space vector pulse width modulation to optimize efficiency and battery life.

Four controller models provide control across a wide range of battery voltages; the KCCA0007 for 24V vehicles; the KCCA0020 for 36V vehicles; the KCCA0021 for 48V vehicles; and the KCCA0033 for 72V vehicles. Each controller provides fully solid state, four-quadrant, bi-directional operation with regenerative braking.



### Current Ratings, Amps rms per phase (sufficient mounting plate, 25-degrees C ambient)

Controller	Voltage	3 minutes	5 minutes	1 hour	Continuous
KCCA0007	24V	425A	425A	235A	200A
KCCA0020	36V	425A	425A	235A	200A
KCCA0021	48V	425A	425A	245A	200A
KCCA0033	72V	425A	375A	200A	170A

Input Battery Voltage (VDC)				Environmental Specifications	
Controller	Minimum	Nominal	Maximum	Ambient Operating Temperature	Heatsink Linear Cutback Temperature
KCCA0007	15V	24V	46V	-35° - +50°C -31° - +122°F	+70° - +120°C +158° - +248°F
KCCA0020	15V	36V	46V		
KCCA0021	38V	48V	60V	5 to 95% humidity	5 to 95% humidity
KCCA0033	57V	72V	90V		

Physical Specifications				
Dimensions	13.5" x 8.5" x 3.2 inches 343 x 216 x 81 mm		Weight	11.0 lbs (5.0 kg)
	Minimum clearance with mating connector and harness: 4.25 inches (108 mm)			

### Features

- 24, 36, 48, and 72VDC models
- Up to 8 vehicle inputs at battery B+ voltage
- 6 active high inputs for switches to B+
  - Enable / seat switch options
  - Forward & Reverse directional inputs
  - 3 spare inputs
- 2 active low inputs for switches to B-
  - Quadrature encoder (Digital speed sensor inputs)
- Up to 6 vehicle outputs at battery voltage
  - 2A rating
  - Open drain (Sink to B-)
  - Over current / short circuit protection
  - Line contactor driver
  - Spare outputs
  - PWM capable
- Up to 6 analog inputs
  - POT1: 2-wire or 3-wire (throttle), 5 to 10k Ohm
  - POT2: 2-wire, 5 to 10 k Ohm
  - 2 channel analog speed sensor inputs (resolver type)
  - Motor temperature input (thermistor / RTD)
  - Spare analog input
- Key switch input (Logic power from B+)
- Pre-charge circuit
- Serial communication
- RS-232 (for user configuration)
- CAN 2.0b
- FLASH in-circuit reprogrammable memory
- EEPROM user programmable configuration memory
- Fault Checks and Indicator (Fault codes also available via serial communication)
  - LED 1, LED 2: Fault Code (Red)
  - LED 3: Power On (green)
  - LED 4: Motor Enabled (green)

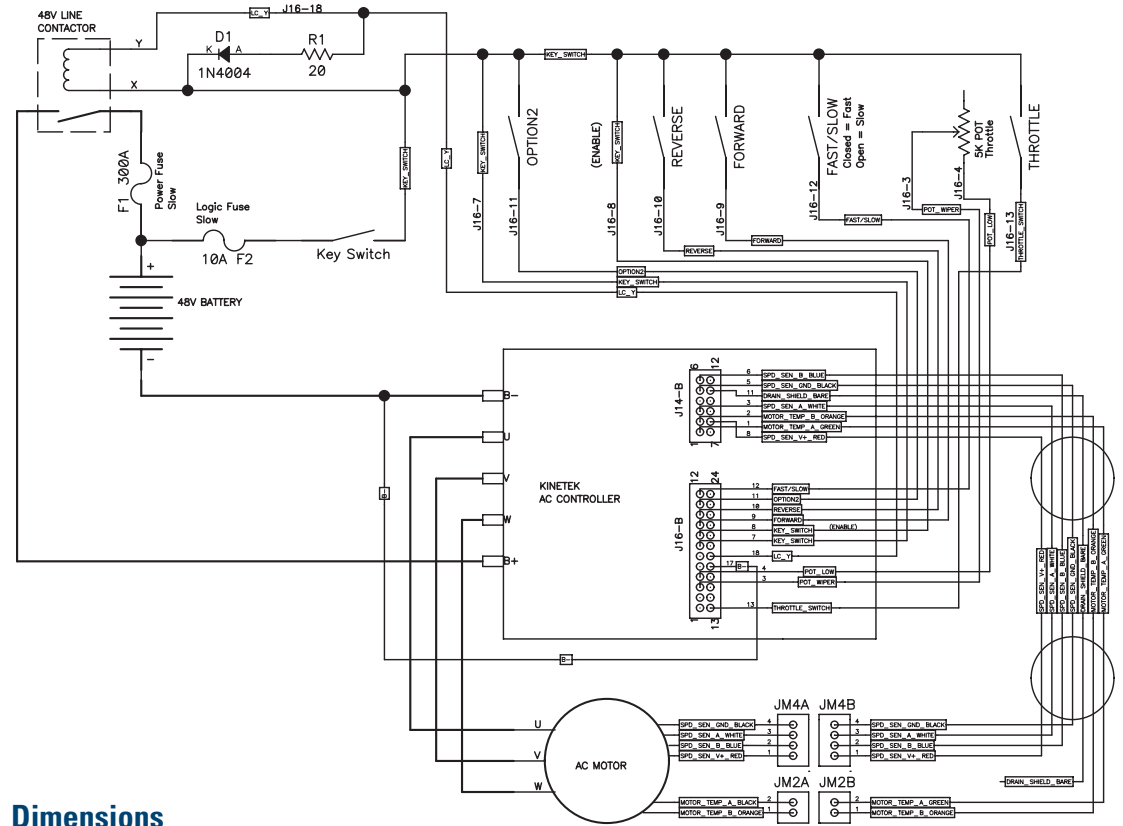
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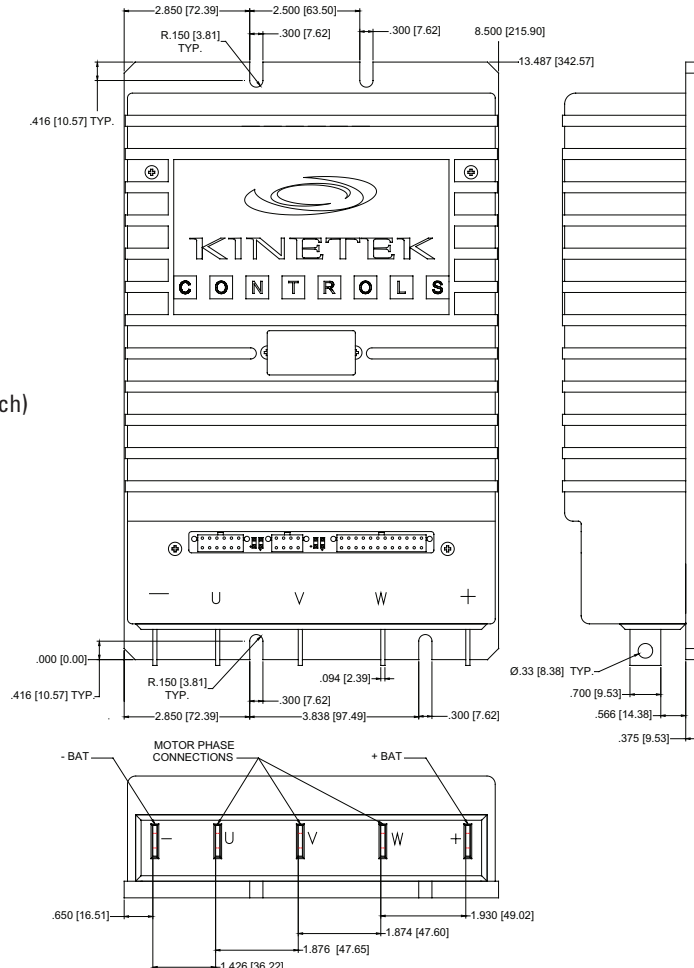
## Connector Pin Out

- Busbars for #10 terminals
  - B-
  - Phase U
  - Phase V
  - Phase W
  - B+
- J14
  - Pin 1: Motor Temperature A
  - Pin 2: Motor Temperature B
  - Pin 3: Speed Sensor A1 / Quad A
  - Pin 4: Speed Sensor A2
  - Pin 5: Speed Sensor Ground
  - Pin 6: Speed Sensor B1 / Quad B
  - Pin 7: Speed Sensor B2
  - Pin 8: Speed Sensor V+
  - Pin 9: Spare Analog In B
  - Pin 10: Spare Analog In A
  - Pin 11: Analog Ground
  - Pin 12: +15V (50 mA)
- J15
  - Pin 1: Digital Ground
  - Pin 2: Reserved
  - Pin 3: Reserved
  - Pin 4: Transmit
  - Pin 5: Receive
  - Pin 6: Reserved
  - Pin 7: Reserved
  - Pin 8: +5V (50 mA)
- J16
  - Pin 1: CAN High
  - Pin 2: CAN Low
  - Pin 3: Potentiometer 1 Wiper
  - Pin 4: Potentiometer 1 Low
  - Pin 5: Potentiometer 2 Wiper
  - Pin 6: Potentiometer 2 Low
  - Pin 7: Key Switch In
  - Pin 8: Input 1 (Enable/Seat switch)
  - Pin 9: Input 2 (Reverse)
  - Pin 10: Input 3 (Forward)
  - Pin 11: Input 4
  - Pin 12: Input 5
  - Pin 13: Input 6
  - Pin 14: ~ Input 7 (active low)
  - Pin 15: ~ Input 8 (active low)
  - Pin 16: Potentiometer 1 (high)
  - Pin 17: B-
  - Pin 18: Output 1 (L Ctctr drive)
  - Pin 19: Output 2
  - Pin 20: Output 3
  - Pin 21: Output 4
  - Pin 22: Output 5
  - Pin 23: Output 6
  - Pin 24: B-

## Electrical



## Dimensions



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