



CURTIS

Motor Controllers



# PM Electric Power Steering Controller

## Model 1220



RV



# Model 1220



## PM Electric Power Steering Controller

The Curtis Model 1220 is a brushed DC permanent magnet motor controller for electric power steering, steer-by-wire systems and only works with Curtis VCL enabled AC traction controllers. The steering motor functions as an actuator to change the angle of the wheel(s) thereby changing travel direction. Model 1220 interprets the steering command input and wheel position feedback, driving the steering motor to move the wheel to the desired position.

Intended applications are Class 3 material handling vehicles such as pallet trucks, stackers and other similar industrial vehicles.

### FEATURES

#### Advanced Motor Control

- ▶ Absolute position control mode.
- ▶ 16 kHz Pulse Width Modulation (PWM) switching frequency ensures silent operation.
- ▶ Advanced PWM techniques produce low motor harmonics, low torque ripple, and minimized heating losses, resulting in high efficiency.
- ▶ Configurable homing methods, center offset, and end-stop protection.
- ▶ 24V nominal supply voltage.
- ▶ 40A 2-minute current rating.

#### Unmatched Flexibility

- ▶ Integrated hour meter and diagnostic log functions.
- ▶ Curtis 840 Spyglass can be connected to show traction and steering information such as BDI, hourmeter, fault, traction speed, and steered wheel angle.
- ▶ +5V low-power supply for input sensors, etc.
- ▶ Curtis 1313 handheld programmer and 1314 PC Programming Station provide easy programming and powerful system diagnostic and monitoring capabilities.
- ▶ External Status LED driver gives instant diagnostic indication.

#### Maximum Safety

- ▶ Dual steering command inputs for redundant check.
- ▶ Fault output can be used to turn off traction controller's main contactor or interlock connection.
- ▶ Steered wheel position (angle) output can be used to limit traction motor speed.



- ▶ Following error check ensures the wheel position tracks the steering command.
- ▶ Power On Self-Test: FLASH, ALU, EEPROM, software watchdog, RAM, etc.
- ▶ Power On Hardware Check: Motor Open, Motor Short, and MOSFET short.
- ▶ Periodic Self-Tests: EEPROM parameters, Motor Open and command and feedback devices.

#### Robust Reliability

- ▶ Intelligent thermal cutback and overvoltage/under voltage protection functions maintain steering while reducing traction speed until severe over/under limits are reached.
- ▶ Standard Mini-Fit Molex Jr. and Fast-on terminals provide proven, robust wiring connections.
- ▶ Electronics sealed to IP65.
- ▶ Reverse polarity protection on battery connections.
- ▶ Inputs protected against shorts to B+ and B-.

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### FEATURES continued

#### Meets or complies with relevant US and International Regulations

- ▶ EMC: Designed to the requirements of EN12895.
- ▶ UL recognized per UL583.
- ▶ Sealing to IP65 (excluding connectors).
- ▶ Regulatory compliance of the complete vehicle system with the controller installed is the responsibility of the vehicle OEM.



**NOTE:** The Curtis Model 1220 does not satisfy EN1175 1:1998+A1:2010 Article 5.9.6 as it is not a category 3 device under EN ISO 13849-1:2008. It should not be used on any vehicle within the scope of the Machinery Directive 2006/42/EC that will be operated within the European Economic Area (EEA).

### MODEL CHART

Model	Nominal Battery Voltage (V)	Max Boost Current, > 10 Sec (A)	2 Min Current Rating (A)	60 Min Current Rating (A)
1220-2201	24	50	40	20

### SYSTEM ACCESSORIES



**Curtis AC Motor Speed Controllers** provide highly efficient control of AC induction motors performing traction drive or hydraulic pump duties, and offer the highest levels of functional safety.



**The Curtis Model 840 LCD Multifunction Display** contains 8 large, easy to read characters to provide display of battery discharge (BDI), hour meter and error messages. Built-in backlight is also available.



**The Curtis Model 1313 Handheld Programmer** is ideal for setting parameters and performing diagnostic functions.

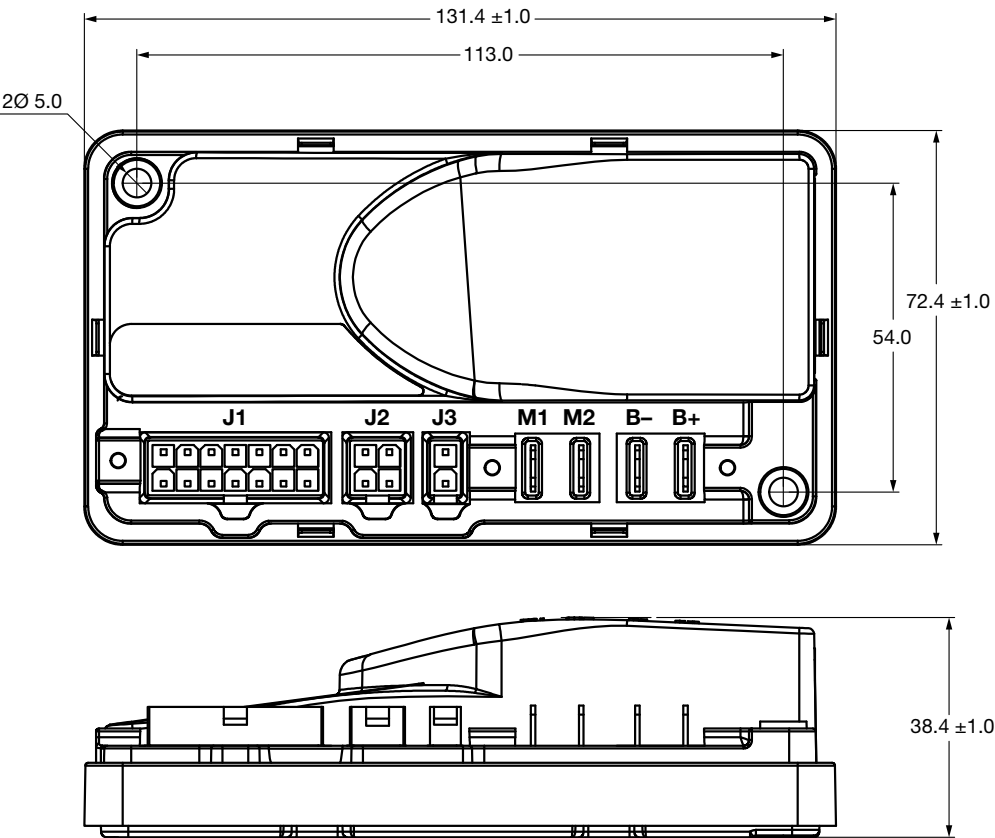
Contact Curtis to obtain the VCL Vehicle Control Language compiler and development tools.

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### DIMENSIONS mm



### J1



Pin	Function	Pin	Function
1	Status LED	8	Rx2 (from Traction Controller)
2	Steer Motor Encoder Phase A	9	Steer Motor Encoder Phase B
3	Position Analog 2	10	Feedback Pot Low
4	Interlock Input	11	Position Analog 1
5	KSI	12	Steering Angle Output
6	Command Analog 1	13	Command Analog 2
7	+5V	14	Command Pot Low

### J2



Pin	Function
1	Rx1 (from Programmer)
2	GND
3	Tx1 (to Programmer/840)
4	B+

### J3



Pin	Function
1	Fault Output
2	Home Switch

### MOLEX MATING CONNECTOR DATA

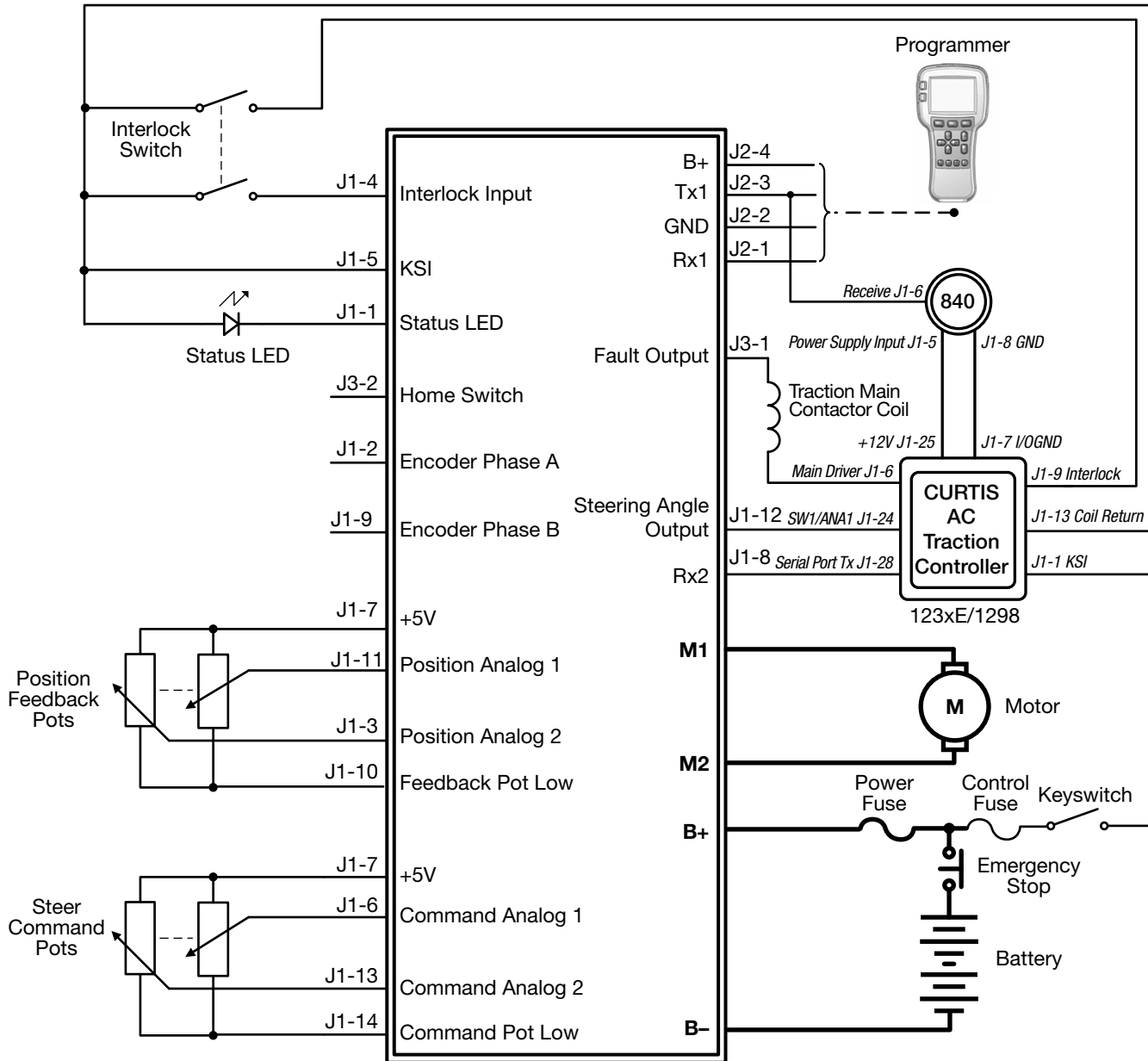
Connector	Molex Part Number
J1	39-01-2140
J2	39-01-2040
J3	39-01-2020

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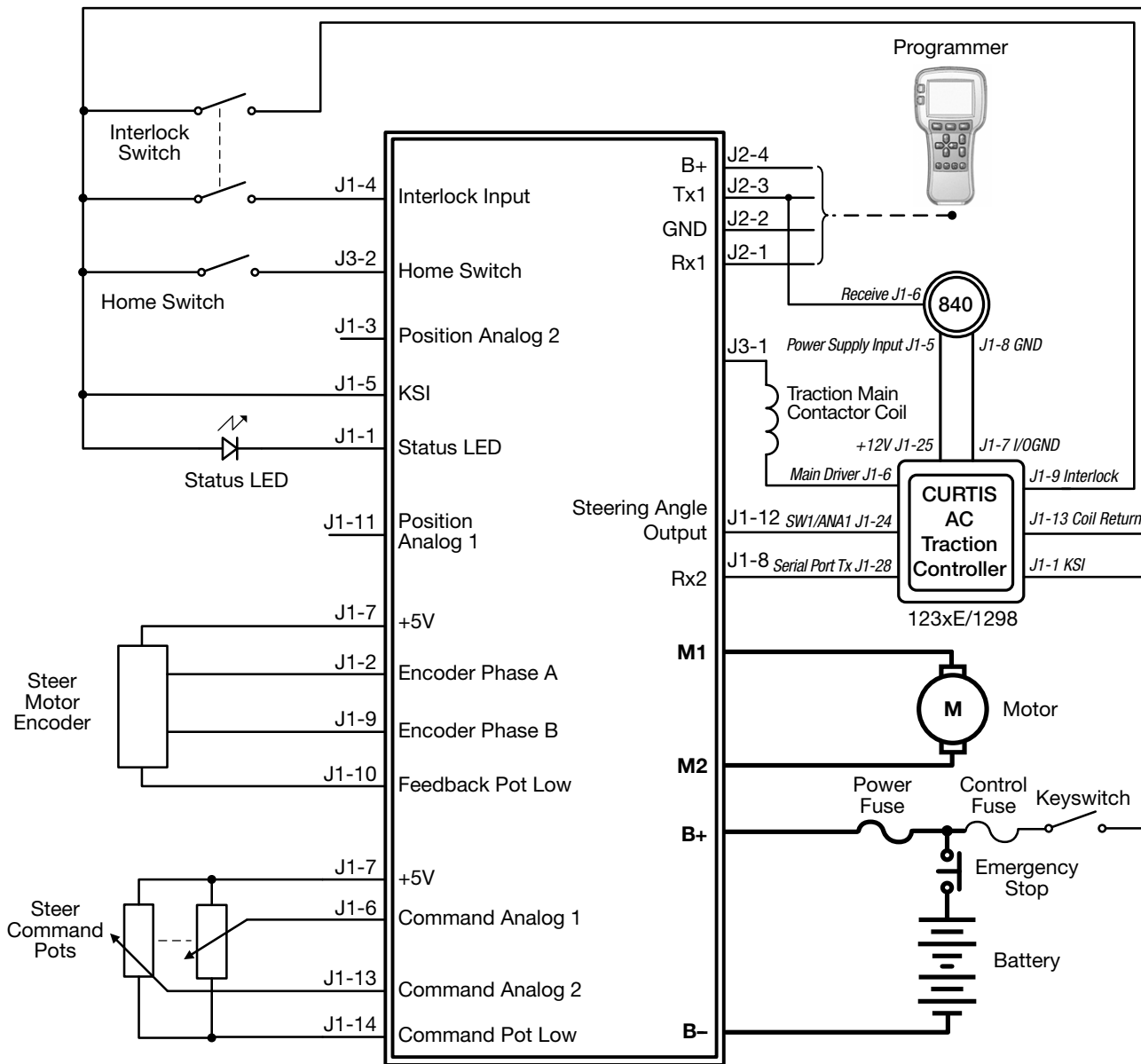
### TYPICAL WIRING DIAGRAM Analog Feedback



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### TYPICAL WIRING DIAGRAM Encoder Feedback



**WARRANTY** Two year limited warranty from time of delivery.

The Curtis Difference  
You feel it when you drive it



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Specifications subject to change without notice

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