



CURTIS

A KOHLER COMPANY



Motor Controllers

Permanent Magnet Electric Power Steering Controller

Model 1220E



Model 1220E



The Curtis Model 1220E is a brushed DC permanent magnet motor controller for electric power steering and steer-by-wire systems. This controller is exclusively designed for Curtis Vehicle Control Language (VCL) enabled AC-traction controllers. The steering motor functions as an actuator to change the travel trajectory by changing the angle of the wheels. Model 1220E steers the vehicle by interpreting the steering command input and wheel position feedback. Intended applications are Class III material handling vehicles such as pallet trucks, stackers and similar industrial vehicles.

FEATURES

- ▶ Absolute and relative position control modes.
- ▶ 20 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 and 36/48V nominal supply voltage.
- ▶ 60A 1-minute current rating.
- ▶ Integrated hour meter and diagnostic log functions.
- ▶ Curtis 840 Spyglass can be connected to show traction and steering information such as BDI, hour meter, fault, traction speed, and steered wheel angle.
- ▶ +5V and +12V low-power supplies for input sensors, etc.
- ▶ CANopen system communication.
- ▶ Curtis 1313 handheld programmer and Curtis Integrated Toolkit™ (CIT) provide easy programming and powerful system diagnostic and monitoring capabilities.
- ▶ Status LED on the cover gives instant diagnostic indication.



Maximum Safety

- ▶ Dual redundant configuration of all safety relevant parts.
- ▶ Fault output can be used to turn off traction controller's main contactor and EM Brake.
- ▶ Separate input paths to each micro for all input and feedback signals.
- ▶ 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.



Meets or complies with relevant US and International Regulations

- ▶ EMC: Designed to the requirements of EN 12895:2015+A1:2019.
- ▶ Designed to the requirements of EN 1175:2020.
- ▶ UL recognized per UL583.
- ▶ Designed to the EN13849 standard achieving Category 3 for all Safety Functions.
- ▶ Electronics sealed to IP54.
- ▶ Regulatory compliance of the complete vehicle system with the controller installed is the responsibility of the vehicle OEM.





SYSTEM ACCESSORIES

The Curtis Integrated Toolkit (CIT)

A fully integrated suite of development and diagnostic tools for use on CAN systems using Curtis and other 3rd party CAN-based products. It is comprised of the following tools that run in a shared environment:



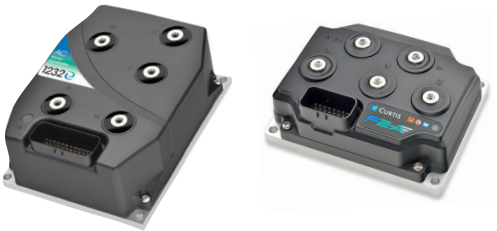
- **Launchpad**
Starting point and project editor.

► **Programmer**
Configure parameters, view monitor values, and view active faults and the fault history.
- **TACT**
Oscilloscope and datalogging tool.

► **VCL Studio**
Editor and compiler for VCL software.
- **Menu Editor**
Create and modify programming menus.

► **Package & Flash**
Load your software into CAN device.

The Curtis Integrated Toolkit is compatible with many leading USB>CAN interface dongles from Peak, Kvaser, iFAC, Sontheim, etc. Contact your local Curtis Sales office for further information.



Curtis AC Motor Speed Controllers

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.



Curtis Model 840

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.



Curtis Model 1313

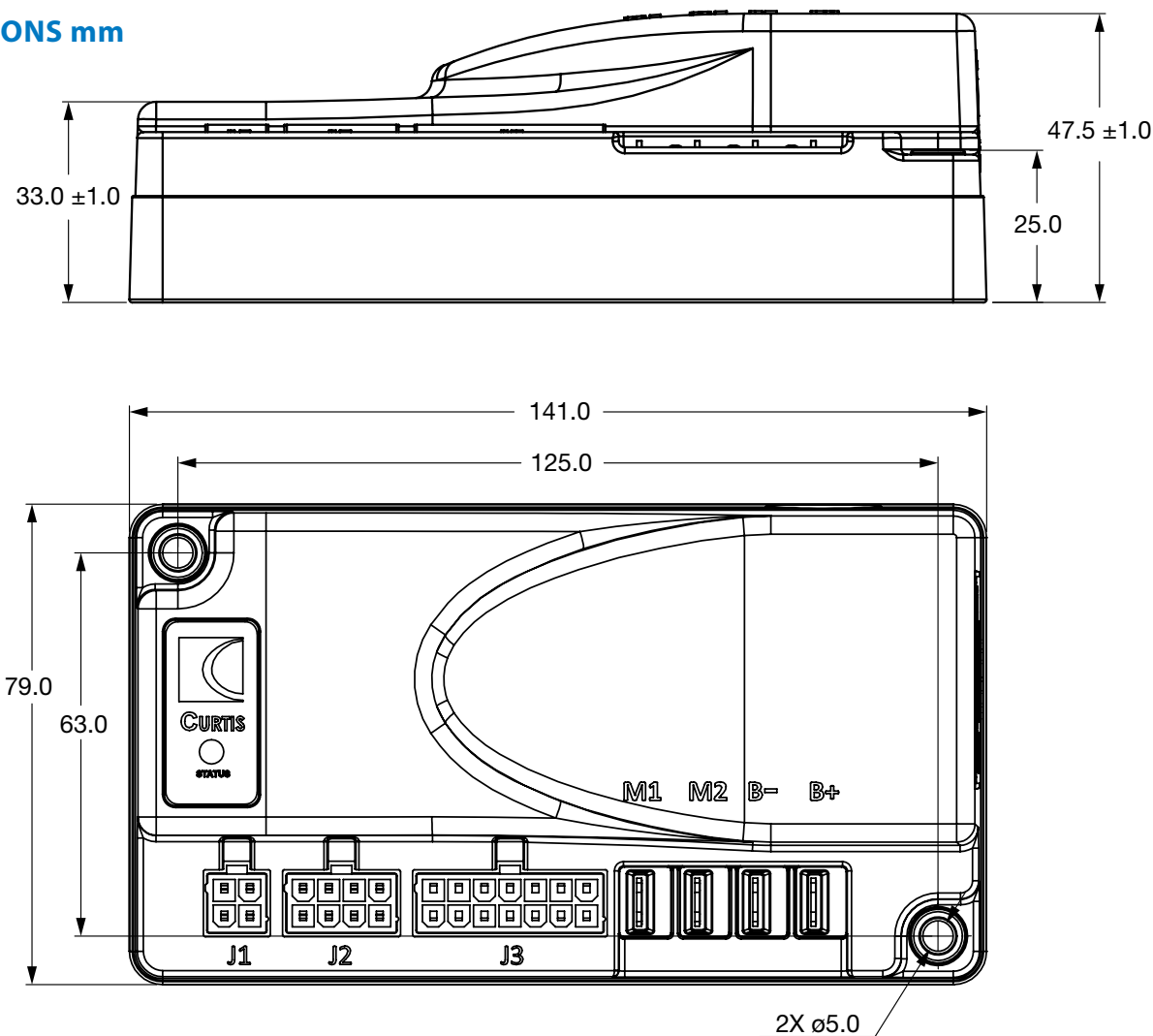
The Curtis Model 1313 Handheld Programmer is ideal for setting parameters and performing diagnostic functions.

MODEL CHART

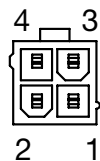
Model Number	Nominal Battery Voltage (V)	Max Boost Current, 10 Sec (A)	1 Min Current Rating (A)	60 Min Current Rating (A)
1220E-24xx	24	70	60	30
1220E-54xx	36–48	70	60	30



DIMENSIONS mm

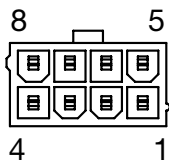


PINOUT CHART



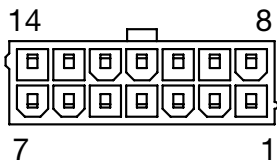
J1

Pin	Description
1	Rx
2	I/O GND
3	Tx
4	+12V



J2

Pin	Description
1	Home Switch 2
2	Interlock Input 2
3	Command Encoder 2A
4	Command Encoder 2B
5	Steer Motor Encoder 2A
6	Steer Motor Encoder 2B
7	CAN Term H
8	Aux Analog Input



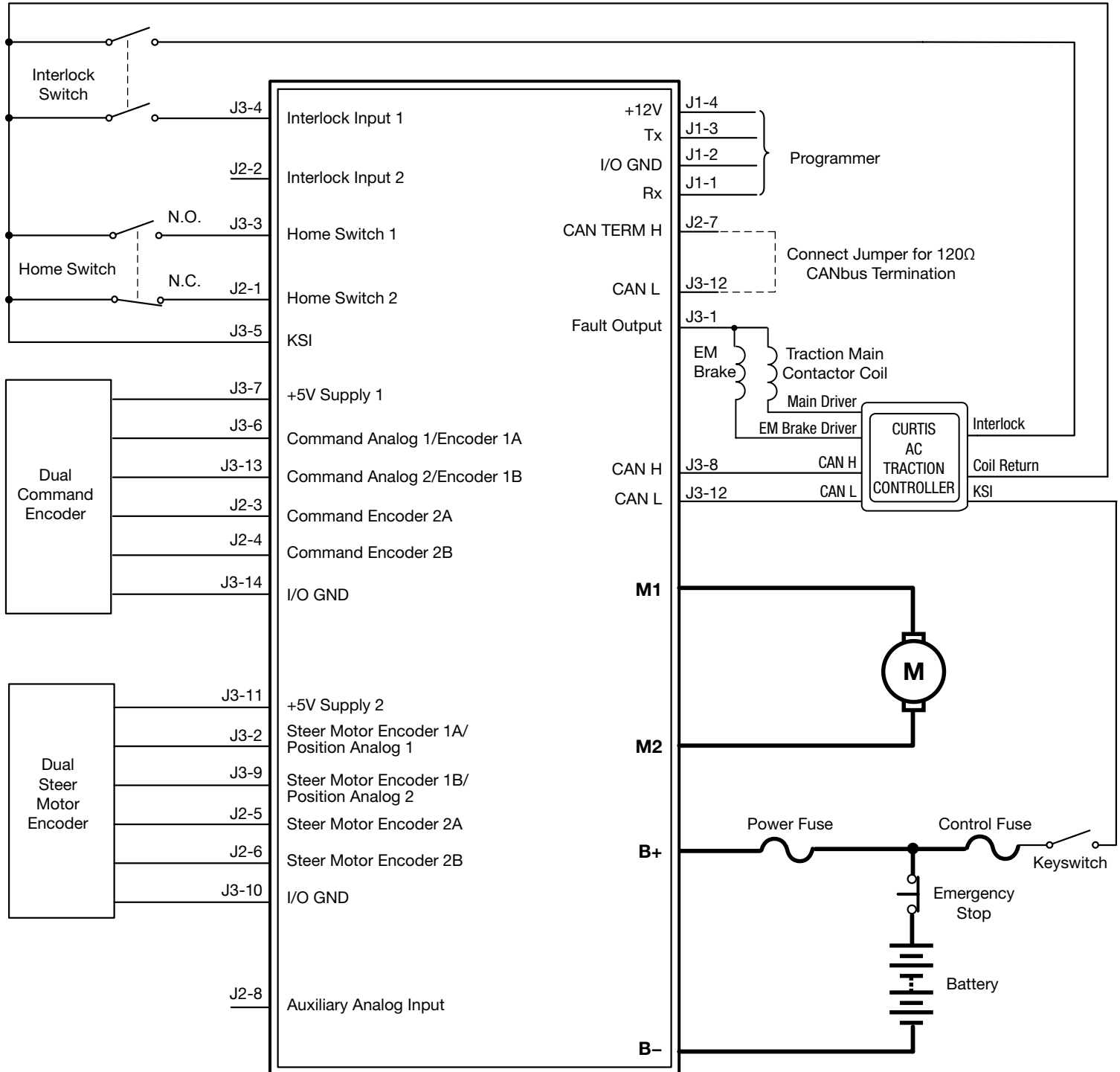
J3

Pin	Description	Pin	Description
1	Fault Output	8	CAN H
2	Steer Motor Encoder 1A / Position Analog 1	9	Steer Motor Encoder 1B / Position Analog 2
3	Home Switch 1	10	I/O GND
4	Interlock Input 1	11	+5V Supply 2
5	KSI	12	CAN L
6	Comm and Analog 1 / Comm and Encoder 1A	13	Comm and Analog 2 / Comm and Encoder 1B
7	+5V Supply 1	14	I/O GND



CONNECTOR WIRING

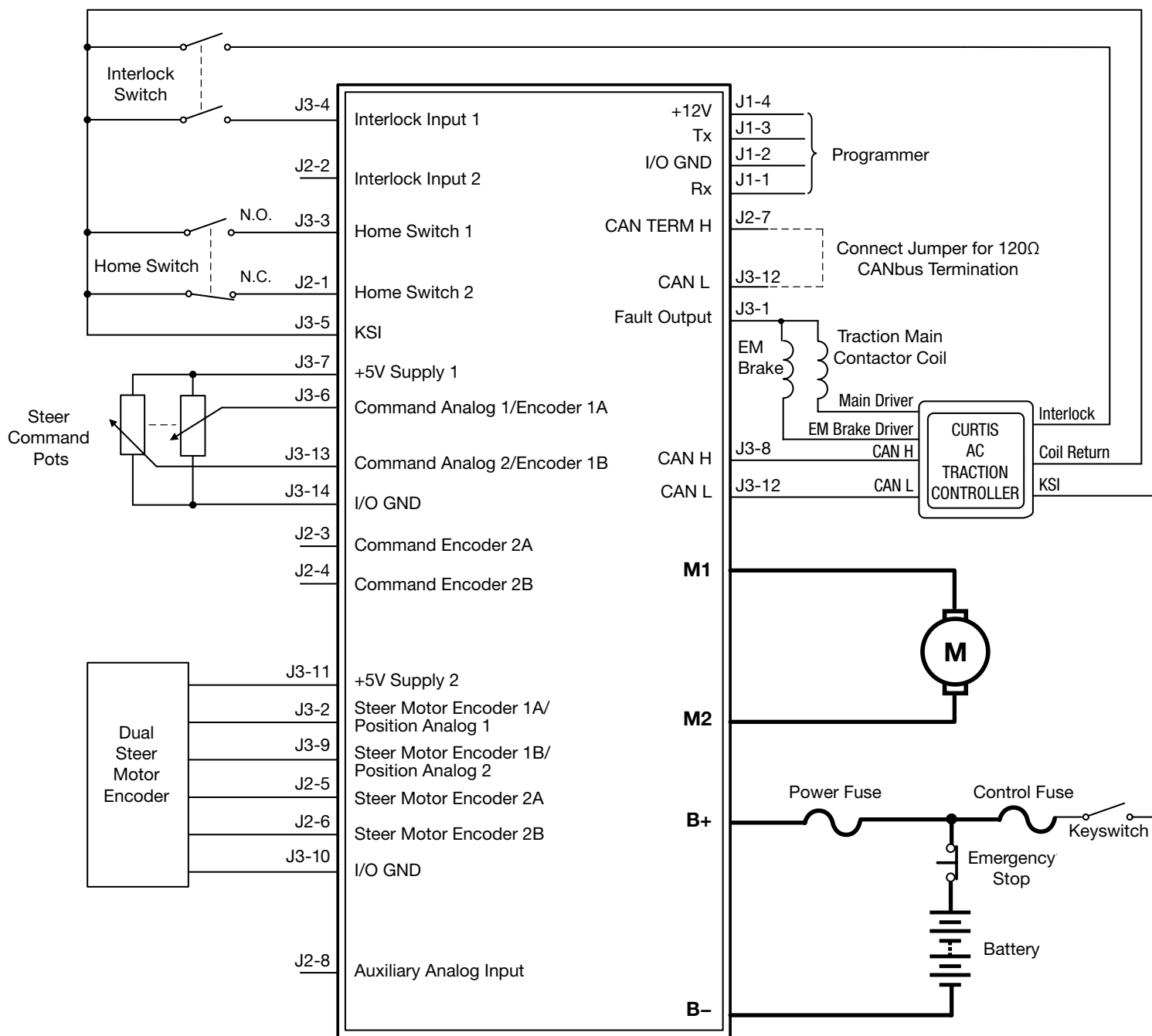
Relative Position Mode





CONNECTOR WIRING

Absolute Position Mode



WARRANTY Two year limited warranty from time of delivery.

The Curtis Difference
You feel it when you drive it