CURTIS

A KOHLER COMPANY

Motor Controllers

AC Motor Controller with VCL

Model 1226AC













1226AC

Superb Performance and Value

The Curtis Model 1226AC Motor Controller provides accurate speed and torque control of 3-phase AC induction, PMAC and BLDC motors.

Model 1226AC is optimized for use as a traction controller on sub-2.0 ton Class III low-lift pallet trucks. The controller is also suitable for traction or hydraulic pump control on other types of battery powered vehicles. Vehicle designers can define and control the dynamic performance of vehicles' drivetrains. Model 1226AC is also a powerful system controller that can operate as a commander device on the CANbus.

FEATURES

Fit for Purpose

- Field-oriented motor control algorithms maintain optimal performance for 3-phase AC motors under all operating conditions.
- Rugged housing with a small footprint for the power rating.
- Heavy duty M5 busbars for motor and battery connectors.
- Impervious to most oils, solvents, degreasers and other chemicals often encountered by industrial vehicles.
- IP54 environmental protection as per IEC 60529.
- Exceeds global conformance requirements for functional safety, electrical safety and EMC.
- CE marked as a programmable safety device.
- UL583 recognized component (pending).

Motors

- Works with any AC induction, PMAC or BLDC motor.
- Motor auto-characterization simplifies on-truck pairing with different induction motor types.
- Comprehensive library of AC motor types stored in controller memory.

You Feel It When You Drive It— Maximum Torque, Minimum Losses, Full Control

- Curtis' renowned field-oriented control algorithms and advanced PWM switching technology assure maximum torque and system efficiency across the entire torque/speed spectrum.
- Smooth and predictable drive control that only Curtis can deliver.





FEATURES continued

Get More Out of Your Battery—Regardless of the Technology

- High-efficiency means more of your battery's energy is converted to motor output power.
- Configurable overvoltage and undervoltage protection parameters.
- Wide operating voltage range allows use with cell chemistries such as lithium ion.
- Configurable CANbus and VCL allow easy integration with the Battery Management Systems (BMS) typically found on lithium battery packs.

Powerful Dual Microprocessors

- Dual-micro architecture achieves category 2 functional safety under EN ISO 13849-1:2015 and EN 1175:2020.
- Blazing processor speeds for precise regulation of voltage, frequency and current.

Customize Your Vehicle with VCL

- The Curtis Vehicle Control Language (VCL) enables Curtis AC Motor Controllers to operate as system controllers, eliminating the need for costly additional controllers.

Flexible I/O

- All I/O pins are multi-function, and can be configured to provide up to:
  - Nine analog inputs.
  - Twenty digital inputs.
  - Five output drivers, including proportional valve and EM brake drivers.
  - One potentiometer input.
  - Position sensor inputs (Hall position sensors, sine/cosine position sensors, quadrature encoders with open collector outputs, and three-line quadrature encoders with open collector outputs).
  - +5V and +14V external power supplies.
  - One motor temperature sensor.

Comprehensive CAN Capabilities

- Configurable 11 or 29 bit protocol support for CANopen or J1939 use.
- Plug and play support for Curtis CAN displays and CAN tiller heads from leading manufacturers FREI and REMA.
- Complies with CANopen protocol DS301.
- Acts as a "CAN interpreter" that allows third-party CAN devices with differing profiles to work on the same CANbus.

Diagnostics

- Status LEDs for at-a-glance system troubleshooting.
- Thermal cutback, warning and automatic shutdown protect the motor and controller.
- Error logging, fault history and CAN Emergency Messages.

CAN-based Programming

- Programmable over the CANbus.
- Supports most CAN-based service tools used by major industrial truck manufacturers worldwide.
- Develop, configure, optimize and debug vehicle systems with the Curtis Integrated Toolkit.



SYSTEM ACCESSORIES



CURTIS™ INTEGRATED TOOLKIT

Curtis Model 3141

A cost-effective, CAN-based LCD vehicle status display in a rugged 52mm diameter housing is the ideal partner to Model 1226AC.

- Large, easy-to-read 16-segment format LCD.
- Battery Discharge Indicator, Service (Hours) Counter and Diagnostic/ Message Center functions.
- Sealed to IP65 (IP67 optional).
- 12–48V nominal operating voltage range.
- CE compliant, UL583 recognized component.
- Optional backlight and heater.

The Curtis Integrated Toolkit

The Curtis Integrated Toolkit (CIT) provides a suite of development and diagnostic tools for working with CAN systems that use Curtis and third-party CAN devices. CIT consists of the following tools:

- **Launchpad**
  Starting point and project editor.
- **Programmer**
  Configure parameters, view monitor values, and view active faults and the fault history.
- **TACT**
  Stand-alone oscilloscope and data-logging tool.
- **VCL Studio**
  Editor and compiler for VCL software.
- **Menu Editor**
  Create and modify programming menus.
- **Package & Flash**
  Load your software into CAN devices.

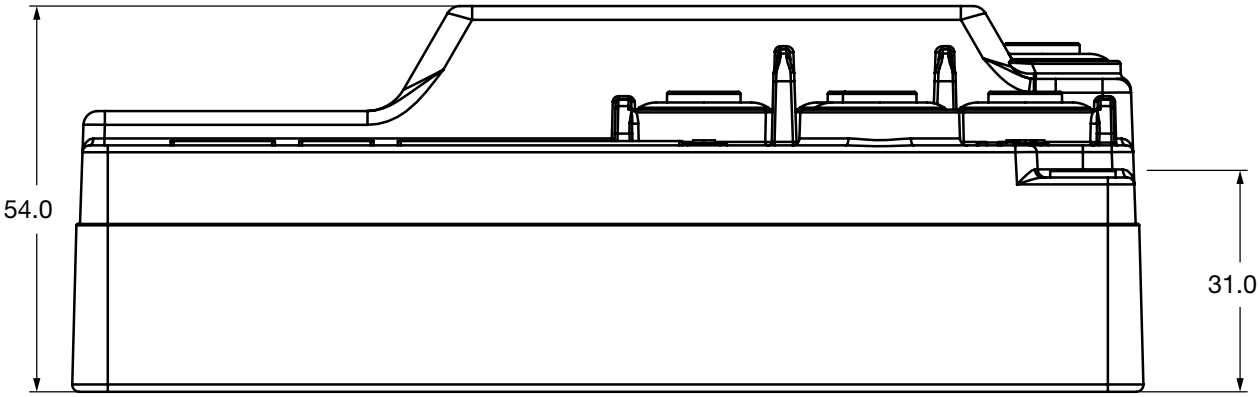
The Curtis Integrated Toolkit is compatible with many leading USB>CAN interface dongles from Peak, Kvaser, iFAC, Sontheim, etc. Contact your local Curtis Sales office for further information.

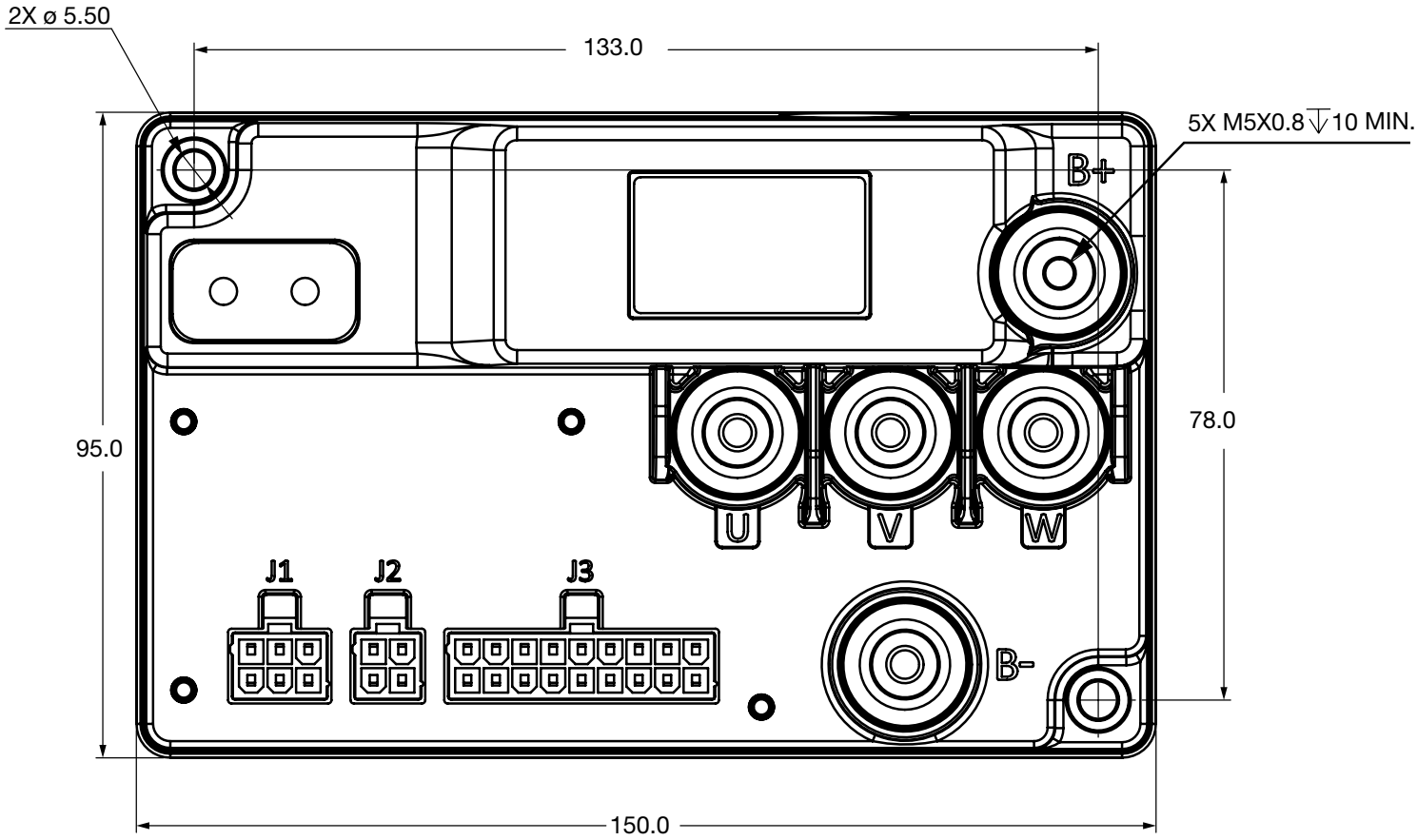
MODEL CHART

Model Number	Nominal Battery Voltage	Maximum Current (RMS S2-2 minutes)	Boost Current (RMS)	Current Rating (RMS S2-60 minutes)
1226AC-2201	24V	130A	150A	60A
1226AC-5101	36–48V	90A	110A	45A
1226AC-6101	60–80V	70A	80A	30A

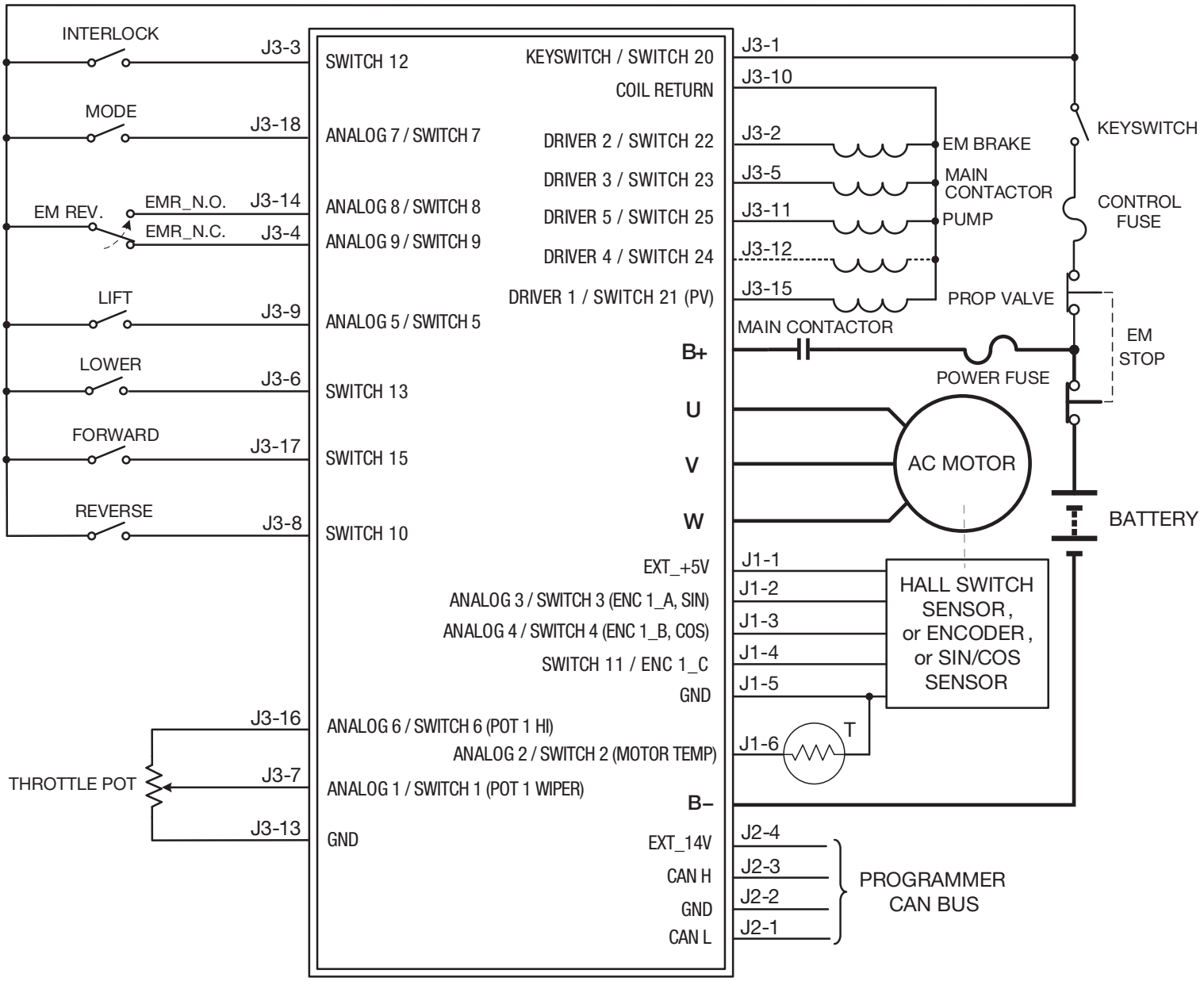
Specifications are subject to change. Please contact your Curtis sales representative for more information.

DIMENSIONS

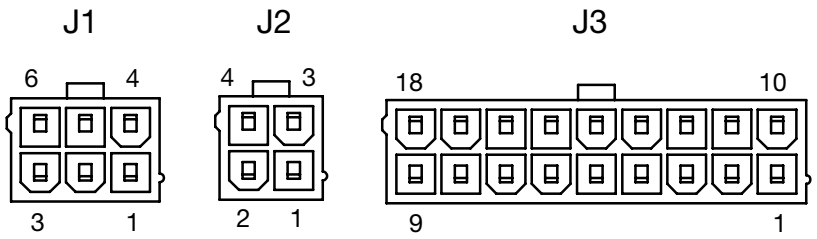




WIRING DIAGRAM



CONNECTOR PINOUT CHARTS



J1

Pin	Description
1	+5V external power supply
2	Analog 3 / Switch 3 / Position sensor (Hall A, Sine, Channel A)
3	Analog 4 / Switch 4 / Position sensor (Hall B, Cosine, Channel B)
4	Switch 11 / Position sensor (Hall C, Channel C)
5	I/O ground
6	Analog 2 / Switch 2 / Motor temperature sensor

NOTE: Mating connector: Molex #39-01-2065 with appropriate 45750 series crimp terminals.

J2

Pin	Description
1	CAN low
2	I/O ground
3	CAN high
4	+14V external power supply

NOTE: Mating connector: Molex #39-01-2045 with appropriate 45750 series crimp terminals.

J3

Pin	Description	Pin	Description
1	Keyswitch / Switch 20	10	Coil Return
2	Driver 2 (EM brake) / Switch 22	11	Driver 5 / Switch 25
3	Switch 12	12	Driver 4 / Switch 24
4	Analog 9 / Switch 9	13	I/O ground
5	Driver 3 / Switch 23	14	Analog 8 / Switch 8
6	Switch 13	15	Driver 1 (Proportional valve) / Switch 21
7	Analog 1 / Switch 1 / Pot wiper	16	Analog 6 / Switch 6 / Pot high
8	Switch 10	17	Switch 15
9	Analog 5 / Switch 5	18	Analog 7 / Switch 7

NOTE: Mating connector: Molex #39-01-2185 with appropriate 45750 series crimp terminals.



1226AC

SPECIFICATIONS

	1226AC-2201	1226AC-5101	1226AC-6101
Nominal Input Voltage	24V	36–48V	60–80V
Minimum Voltage	9.6V	14.4V	24V
Brownout Voltage	8V	12V	19.8V
Maximum Voltage	30V	60V	100V
PWM Frequency	10 kHz nominal (configurable)		
Maximum Controller Output Frequency	800Hz		
Electrical Isolation to Heatsink	500 VAC		
Storage Ambient Temperature	–40°C to 85°C		
Operating Ambient Temperature	–40°C to 50°C		
Thermal Cutback	The controller linearly reduces the maximum current limit when the internal heatsink temperature is between 85°C and 95°C; complete cutoff occurs above 95°C and below –40°C.		
Design Life	8000 hours		
Ingress Protection	Electronics sealed to IP54 as per IEC 60529		
Weight	0.7 kg		
Dimensions (W × L ×H)	95 mm × 150 mm × 54 mm		
Mounting	2x ø5.5 mm		
Power Connections	5 M5X0.8		
EMC	Designed to the requirements of EN 12895:2015		
Safety	Designed to the requirements of EN ISO 13849-1:2015 and EN 1175:2020		
UL	UL recognized component per UL583 (pending)		

Note: *Regulatory compliance of the complete vehicle system with the controller installed is the responsibility of the vehicle OEM.*

WARRANTY

Two year limited warranty from time of delivery.

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Specifications subject to change without notice

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