Brushed DC Permanent Magnet Motor Controller
Model 1226
The Curtis Model 1226 Motor Speed Controllers provide efficient, optimal control of permanent magnet drive motors for battery powered vehicles. Optimized for use on light duty Class III pallet trucks and sweeper scrubber floorcare machines. Highly flexible programmability allows them to be applied on any low power PM motor application.

**FEATURES**

**Easy Installation and Set-up**
- Easily programmed with Model 1313 handheld or 1314 PC programming station, or can be supplied pre-programmed.
- Compatible with industrial tiller handle wig-wag throttles such as the Curtis Model ET-190E.
- Simplified troubleshooting and diagnostics.
- Industry standard Molex Mini-fit Jr. logic connectors with heavier duty M5 threaded busbars for battery and motor wiring.

**Smooth and Secure Control**
- Advanced speed regulation maintains precise speed over varied terrain, obstacles, curbs and ramps.
- Linear cutback of current ensures smooth control, with no sudden loss of power during under-voltage or over-temperature.
- Proprietary algorithms help prevent gearbox wear while providing smooth starts and reversals.
- The vehicle is brought to a complete halt before the electromagnetic brake is applied, ensuring safe and secure stopping under all conditions.
- Charger inhibit input prevents driving while charger is connected.
- Key Off Decel function ensures a smooth “brake to stop” when the key is turned off or a fault occurs that requires the vehicle to stop.
- Emergency reverse with belly button switch input.
- Anti-roll back/roll-forward function provides smooth and safe vehicle control on hills and ramps.
- Temporary “Boost Current” feature provides greatly improved performance with transient loads such as starting on a hill, crossing thresholds, climbing obstacles, etc.
- Hydraulic Lift Lockout functionality to protect the vehicle’s batteries from damaging level of discharge.
- Dynamic pot fault detection (open/short wiring fault detection).
- Push input and a Push-too-Fast function which ‘loads’ the motor to prevent excessive motor speeds when the EM brake is off.

**Highly Flexible I/O**
- All I/O pins are multi-function, and can be configured to provide up to:
  - 13 digital Inputs;
  - 6 Analog Inputs;
  - 1 Potentiometer Source;
  - 1 Speed limit Input;
  - 2 Active Low 2A drivers;
  - 1 Active High or Low 2 Amp driver;
  - 3 Programmable momentary switching options;
  - +5V and +14V external power (120mA).
Valuable Additional Features

- Automatically compensates for changes in motor condition to ensure optimum drive performance at all times.
- Multi-mode provides for two distinct and programmable control modes (indoor/outdoor modes).
- Power Saver function prevents the controller draining the battery when vehicle is inactive.
- Battery Discharge Indicator output.
- Single channel speed sensor input for limiting the max speed.
- Adjustable EM-brake hold voltage reduces heating of the Brake Coil.
- Output driver for connection of remote status LED.
- Programmable High/Low side Horn Driver (30mA).
- 3 integrated LED status indicator (15mA).
- Brake light driver output option.
- Speed limit pot input function.

Meets or complies with relevant US and International Regulations

EMC: Designed to the requirements of EN12895:2015.
UL 583 (pending).
Electronics sealed to IP54 per IEC 60529.
Regulatory compliance of the complete vehicle system with the controller installed is the responsibility of the vehicle OEM.

MODEL CHART

<table>
<thead>
<tr>
<th>Model</th>
<th>Nominal Voltage</th>
<th>Drive Current 1 min, A</th>
<th>Drive Current 1 hour (S2-60)</th>
<th>Peak current (A) 10 seconds</th>
<th>Internal Relay or Contactor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1226-2201</td>
<td>24</td>
<td>130</td>
<td>70</td>
<td>150</td>
<td>Internal Relay</td>
</tr>
<tr>
<td>1226-3101</td>
<td>36</td>
<td>90</td>
<td>50</td>
<td>110</td>
<td>Internal Relay</td>
</tr>
<tr>
<td>1226-5201</td>
<td>36/48</td>
<td>130</td>
<td>50</td>
<td>150</td>
<td>Contactor</td>
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FUNCTIONAL SAFETY DATA

<table>
<thead>
<tr>
<th>Safety Function</th>
<th>Performance Level (PL)</th>
<th>Designated Architecture</th>
<th>MTTFd</th>
<th>DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncommanded Powered Movement Motor Braking Torque</td>
<td>c</td>
<td>Category 2</td>
<td>≥ 16 years</td>
<td>≥ 90%</td>
</tr>
</tbody>
</table>
**WIRING DIAGRAM**

1226-22xx, 1226-31xx and 1226-52xx
DIMENSIONS mm

1226

2X Ø 5.50

4X M5X 0.8 \( \sim \) 10 MIN

2X Ø 5.50

133

95

78

150

J1 J2 J3

Mating connector: Molex 39-01-2180 with appropriate 45750-series crimp terminals.

Mating connector: Molex 39-01-2040 with appropriate 45750-series crimp terminals.

J1-6 Pin

Molex: 39-28-8060

1 EXT_+5V
2 Speed Sensor Input/ Switch6/Analog6
3 Generic Driver 1
4 Brake+
5 I/O Ground
6 Motor Temp Sensor Input/Switch5/Analog5

J2-4 Pin

Molex: 39-28-8040

1 Serial RX/CAN L
2 I/O Ground
3 Serial Tx/CAN H
4 EXT_+14V

Mating connector: Molex 39-01-2060 with appropriate 45750-series crimp terminals.
## Connector Pinout Charts

### J1

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EXT +5V</td>
</tr>
<tr>
<td>2</td>
<td>Speed Sensor Input/ Switch6/Analog6</td>
</tr>
<tr>
<td>3</td>
<td>Generic Driver 1</td>
</tr>
<tr>
<td>4</td>
<td>Brake +</td>
</tr>
<tr>
<td>5</td>
<td>I/O Ground</td>
</tr>
<tr>
<td>6</td>
<td>Motor Temp Sensor Input/Switch5/Analog5</td>
</tr>
</tbody>
</table>

NOTE: Molex #39-28-8060, mating connector: Molex #39-01-2065 with appropriate 45750 series crimp terminals.

### J2

<table>
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<th>Pin</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Serial Rx/CAN L</td>
</tr>
<tr>
<td>2</td>
<td>I/O Ground</td>
</tr>
<tr>
<td>3</td>
<td>Serial Tx/CAN H</td>
</tr>
<tr>
<td>4</td>
<td>EXT +14V</td>
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### J3

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<th>Pin</th>
<th>Description</th>
<th>Pin</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>KSI</td>
<td>10</td>
<td>Coil Return</td>
</tr>
<tr>
<td>2</td>
<td>Horn Driver</td>
<td>11</td>
<td>Generic Driver 3</td>
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<tr>
<td>3</td>
<td>Interlock Input/ Switch 7</td>
<td>12</td>
<td>Generic Driver 2</td>
</tr>
<tr>
<td>4</td>
<td>EMR NC Input/ LED3 Driver/ Switch 3/Analog3</td>
<td>13</td>
<td>I/O Ground</td>
</tr>
<tr>
<td>5</td>
<td>BDI Output</td>
<td>14</td>
<td>EMR NO Input/ Switch 10</td>
</tr>
<tr>
<td>6</td>
<td>Speed Limit Pot Input/ Switch 2/Analog 2</td>
<td>15</td>
<td>Charge Inhibit/ Switch 11</td>
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<td>7</td>
<td>Pot Wiper/ Switch1/Analog1</td>
<td>16</td>
<td>Pot High/ Switch 4/ Analog 4</td>
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<tr>
<td>8</td>
<td>Reverse Input/ LED2 Driver/ Switch 8</td>
<td>17</td>
<td>Forward Input/ Switch 12</td>
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<tr>
<td>9</td>
<td>Push Input/ Switch 9</td>
<td>18</td>
<td>Mode Input/ LED1 Driver/ Switch 13</td>
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</tbody>
</table>


### Warranty

Two year limited warranty from time of delivery.

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