# Feature

- Standard Size 36 mm Package (1.42")
- Durable Magnetic Technology
- Multi-Turn Absolute Encoder (14 Bit/39 Bit)
- SSI and CANopen Communications
- Proven New Turns Counting Technology – No Gears or Batteries

The Model MA36S Multi-Turn Absolute Encoder is ideal for a wide variety of industrial applications – especially where you need an encoder with the capability of output even in power-off scenarios. Its fully digital output and innovative use of battery-free multi-turn technology make the Model MA36S an excellent choice for applications with a high presence of noise. Its durable magnetic technology and high IP rating make it a perfect choice for dirty, industrial environments. Available with a 6 mm or 1/4" shaft and a servo mount, the Model MA36S is easily designed into a variety of applications.

# Common Applications

Robotics, Telescopes, Antennas, Medical Scanners, Windmills, Elevators, Lifts, Motors, Automatic Guided Vehicles, Rotary and X/Y Positioning Tables

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## Model MA36S Ordering Guide

Blue type indicates price adder options. Not all configuration combinations may be available. Contact Customer Service for details.

For single turn applications see Model SA36S.

### Mechanical

<table>
<thead>
<tr>
<th>Model</th>
<th>Single Turn Resolution</th>
<th>Electrical</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA36S</td>
<td>12 Bit (CANopen) 08 to 14 Bit (SSI)</td>
<td>5 VDC</td>
</tr>
<tr>
<td>MB</td>
<td>36 mm Servo Mount</td>
<td>V3 10 to 30 VDC</td>
</tr>
</tbody>
</table>

### Electrical

<table>
<thead>
<tr>
<th>Comm Protocol</th>
<th>Software Rev</th>
<th>Connector Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1 CANopen</td>
<td>A Revision A</td>
<td>EMJ 5-pin M12 End Mount</td>
</tr>
<tr>
<td>P2 SSI</td>
<td></td>
<td>EMK 8-pin M12 End Mount</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EC6 6 Ft End Mount Cable with Gland Nut</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SC6 6 Ft Side Mount Cable with Grommet</td>
</tr>
</tbody>
</table>

### Notes:

1. Available with SSI only.
2. For mating connectors, cables, and cordsets, see Accessories or visit www.encoder.com. For Connector Pin Configuration Diagrams, see Technical Information or visit www.encoder.com.
3. Available with CANopen only.

Please note that configuration options for this product have changed. Confirm configuration options before ordering or contact Customer Service for assistance.
MODEL MA36S SPECIFICATIONS

Electrical
- Input Voltage: 10 to 30 VDC max SSI or CANopen
  5 VDC SSI Only
- Input Current: 50 mA max with no external load
- Power Consumption: 0.5 W max
- Resolution (Single): Up to 12 bit (CANopen)
- Resolution (Multi): Up to 39 bit multi-turn (CANopen or SSI)
- Accuracy: ± 0.35°
- Repeatability: ± 0.2°

CANopen Interface
- Protocol: CANopen
  Communication profile CiA 301
  Device profile for encoder CiA 406 V3.2 class C2
- Node Number: 0 to 127 (default 127)
- Baud Rate: 10 Kbaud to 1 Mbaud with automatic bit rate detection

Programmable CANopen Transmission Modes
- Synchronous: When a synchronization telegram (SYNC) is received from another bus node, PDOs are transmitted independently.
- Asynchronous: A PDO message is triggered by an internal event (e.g., change of measured value, internal timer, etc.)

SSI Interface
- Clock Input: via opto coupler
- Clock Frequency: 100 kHz to 500 KHz
- Data Output: RS485 / RS422 compatible
- Output Code: Gray or binary
- SSI Output: Angular position value
- Parity Bit: Optional (even/odd)
- Error Bit: Optional
- Turn On Time: < 1.5 sec
- Pos. Counting Dir.: Connect DIR to GND for CW
- (when viewed from shaft end)
- Set to Zero: Apply VDC for 2 sec

Protection: Galvanic Isolation

Mechanical
- Max Shaft Speed: 12,000 RPM
- Radial Shaft Load: 7 lb (32 N) = bearing life 1.10^10 revs
  3.6 lb (16 N) = bearing life 1.10^11 revs
- Axial Shaft Load: 5 lb (20 N) = bearing life 1.10^10 revs
  2.3 lb (10 N) = bearing life 1.10^11 revs
- Starting Torque: < 0.45 oz-in typical
- Housing: Ferrous chrome-plated magnetic screening
- Weight: 5 oz typical

Environmental
- Storage Temp: -40° to 100° C
- Humidity: 95% RH non-condensing
- Vibration: 5 g at 10 to 2000 Hz
- Shock: 100 g @ 6 ms duration
- Sealing: IP67; shaft sealed to IP65

MODEL MA36S SOLID SHAFT

All dimensions are in inches with a tolerance of +0.005” or +0.01” unless otherwise specified. Metric dimensions are given in brackets [mm].

WIRING TABLE
For EPC-supplied mating cables, refer to wiring table provided with cable.

### SSI ENCODERS

<table>
<thead>
<tr>
<th>Function</th>
<th>Gland Cable†</th>
<th>Wire Color</th>
<th>8-pin M-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>+VDC</td>
<td>White</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>+VDC</td>
<td>Brown</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>SSI CLK+</td>
<td>Green</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SSI CLK-</td>
<td>Yellow</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>SSI DATA+</td>
<td>Gray</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>SSI DATA-</td>
<td>Pink</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>PRESET</td>
<td>Blue</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>DIR</td>
<td>Red</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Shield</td>
<td>Side - Exit Housing</td>
<td>Housing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>End - Exit N/C</td>
<td>Housing</td>
<td></td>
</tr>
</tbody>
</table>

### CANOPEN ENCODERS

<table>
<thead>
<tr>
<th>Function</th>
<th>Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>+VDC</td>
<td>2</td>
</tr>
<tr>
<td>Ground (GND)</td>
<td>3</td>
</tr>
<tr>
<td>CAN&lt;sub&gt;High&lt;/sub&gt;</td>
<td>4</td>
</tr>
<tr>
<td>CAN&lt;sub&gt;Low&lt;/sub&gt;</td>
<td>5</td>
</tr>
<tr>
<td>CAN&lt;sub&gt;clsk&lt;/sub&gt; / Shield</td>
<td>1</td>
</tr>
</tbody>
</table>

†Standard cable is 24 AWG conductors with foil and braid shield.