The Model MA63S Multi-Turn Absolute Encoder offers a high performance solution for your absolute feedback needs. This encoder is especially suited for applications where position information must be retained after loss of system power (i.e., system resets, outages, etc.). It provides maintenance-free feedback thanks to its innovative battery-free and gear-free multiturn technology. This encoder is the perfect choice for harsh industrial applications thanks to its rugged magnetic technology, available IP67 rating, and proven "encoder within an encoder" design. Available with several shaft sizes and mounting styles, the Model MA63S is easily designed into OEM and aftermarket applications.

**COMMON APPLICATIONS**
Robotics, Telescopes, Antennas, Medical Scanners, Wind Turbines, Elevators, Lifts, Motors, Automatic Guided Vehicles, Rotary and X/Y Positioning Tables

### MODEL MA63S ORDERING GUIDE

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

#### Mechanical

- **MA63S** Absolute Series
- **38** 3/8", 0.375"  
- **10** 10 mm
- **MA** 2.50" Flange  
- **MC** 2.50" Servo Mount

#### Electrical

- **SINGLE TURN RESOLUTION**
  - 12 Bit (CANopen) \(^1\)
  - 08 to 14 Bit (SSI) \(^2\)
- **MULTI-TURN RESOLUTION**
  - 18 Bit (CANopen) \(^3\)
  - 39 Bit (CANopen) \(^3\)
  - 00 to 39 Bit (SSI Only) \(^3\)
- **INPUT VOLTAGE**
  - 5 V DC \(^4\)
  - 10 to 30 V DC
- **SOFTWARE REV**
  - A Revision A
- **TEMP**
  - 0-85°C Std \(^5\)
  - -40-85°C
- **SEAL**
  - IP50 Std \(^6\)
  - IP66 \(^7\)
  - IP67

- **SHAFT SIZE**
  - 38 3/8", 0.375"  
  - 10 10 mm
- **MULTI-TURN RESOLUTION**
  - 18 Bit (CANopen) \(^3\)
  - 39 Bit (CANopen) \(^3\)
  - 00 to 39 Bit (SSI Only) \(^3\)
- **COMM PROTOCOL**
  - P1 CANopen \(^1\)
  - P2 SSI \(^2\)
  - P3
- **CONNECTOR TYPE**
  - SMJ 5-pin M12 Side Mount \(^6\)
  - SMK 5-pin M12 Side Mount \(^6\)

**NOTES:**
3. For single turn resolution, enter 00 (SSI only)
4. Available with SSI only.
5. For mating connectors, cables, and cordsets see Accessories at encoder.com. For Connector Pin Configuration Diagrams, see Technical Information or see Connector Pin Configuration Diagrams at encoder.com.
6. Available with CANopen only.
**MODEL MA63S SPECIFICATIONS**

**Electrical**
- Input Voltage: 10 to 30 VDC max SSI or CANopen
  - 5 VDC SSI Only
- Input Current: 50 mA typical for 10 to 30 VDC
  - 80 mA typical for 5 VDC
- Power Consumption: 0.5 W max
- Resolution (Single): 12 bit (CANopen)
  - 8 to 14 bit (SSI)
- Resolution (Multi): Up to 39 bit multi-turn
  - (CANopen or SSI)
- Accuracy: ± 0.35°
- Repeatability: ± 0.2°
- CE/EMC: Immunity tested per EN 61000-6-2:2006
  - Emissions tested per EN 61000-6-3:2011

**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: 100KHz to 500KHz. Higher frequencies may be available. Contact Customer Service.
- 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 VDC for CW
  - Connect DIR to GND for CCW (when viewed from shaft end)
- Set to Zero: Yes, see Technical Bulletin "Understanding EPC’s SSI Encoders"

**Protection**
- Galvanic Isolation

**Mechanical**
- Max Shaft Speed: 8,000 RPM
- Shaft Material: 303 Stainless Steel
- Radial Shaft Load: 80 lb max. Rated load of 20 to 40 lb for bearing life of 1.5 x 10^9 revolutions
- Axial Shaft Load: 80 lb max. Rated load of 20 to 40 lb for bearing life of 1.5 x 10^9 revolutions
- Starting Torque: 1 oz-in typical with no seal
  - 3.0 oz-in typical with IP66 shaft seal
- Housing: Black non-corrosive finish
- Weight: 20 oz typical

**Environmental**
- Storage Temp: -40° to 100° C
- Humidity: 95% RH non-condensing
- Vibration: 5 g @ 10 to 2000 Hz
- Shock: 100 g @ 6 ms duration
- Sealing: IP50 standard; IP66 or IP67 optional

**MODEL MA63S 2.5" FLANGE MOUNT (MA)**

**MODEL MA63S 2.5" SERVO MOUNT (MC)**

**WIRING TABLE**

<table>
<thead>
<tr>
<th>SSI ENCODERS</th>
<th>Function</th>
<th>Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground (GND)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>+VDC</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>SSI CLK+</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SSI CLK-</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>SSI DATA+</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>SSI DATA-</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>PRESET</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>DIR</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Shield</td>
<td>Housing</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CANOPEN ENCODERS</th>
<th>Function</th>
<th>Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground (GND)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>+VDC</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CAN_High</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>CAN_Low</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>CAN_data / Shield</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

For CE (Conformity European) requirements, use M12 cordset with shield connected to M12 coupling nut. Trim back and insulate unused wires.