**Model 711 - Incremental Shaft Encoder**

**Features**
The Original Industry-Standard Cube
Versatile Housing Styles
Unidirectional Output
Resolutions Available to 10,000 CPR

The Model 711 Accu-Coder™ is the original, industry standard cube encoder. Designed for compatibility with most programmable controllers, electronic counters, motion controllers, and motor drives, it is ideally suited for applications that require a simple, symmetrical, unidirectional square wave output in a single channel format. Critical performance specifications for the most popular resolutions and advanced Opto-ASIC circuitry – a single chip design that eliminates many board level components – increase the reliability of an already dependable and durable encoder. With new options continually being added, the Model 711 excels in a wide variety of industrial applications.

**Common Applications**
Feedback for Counters, PLCs & Motors, Measuring for Packaging, Filling & Material Handling Machines, Wire Winding, Film Extrusion

---

**Model 711 Ordering Guide**

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

<table>
<thead>
<tr>
<th>MODEL</th>
<th>711</th>
<th>0256</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>Pull-Up Resistor</td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>Open Collector</td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td>Push-Pull</td>
<td></td>
</tr>
<tr>
<td>HV</td>
<td>Line Driver</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CYCLES PER REVOLUTION (CPR)</th>
<th>1-10,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>See CPR Options below for available resolutions.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HOUSING TYPE</th>
<th>S 2.25” Standard Housing</th>
<th>S1 2.25” Standard Housing with IP50 Felt Shaft Seal 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>IND12</td>
<td>Industrial Housing with IP66 Shaft Seal</td>
<td></td>
</tr>
<tr>
<td>HD1</td>
<td>3” x 3” x 6” Heavy Duty Housing</td>
<td></td>
</tr>
<tr>
<td>HD3</td>
<td>Heavy Duty Housing with Conduit Connector &amp; Terminal Strip</td>
<td></td>
</tr>
<tr>
<td>HD5</td>
<td>Heavy Duty Housing with 10 mm Outer Bearing 2</td>
<td></td>
</tr>
<tr>
<td>HD10</td>
<td>Heavy Duty Housing with Ultra Heavy Duty Bearings, 0.625” or 0.500” Shaft</td>
<td></td>
</tr>
<tr>
<td>HD12</td>
<td>Heavy Duty Housing with IP66 Outer Shaft Seal</td>
<td></td>
</tr>
<tr>
<td>HD14</td>
<td>Heavy Duty Housing with IP66 Shaft Seal and with Conduit Connector &amp; Terminal Strip</td>
<td></td>
</tr>
<tr>
<td>5PY</td>
<td>Standard Cube With 5PY Adaptor</td>
<td></td>
</tr>
<tr>
<td>EX</td>
<td>Explosion-proof Housing</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SHAFT DIAMETER</th>
<th>1/4”, 0.250” 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5/16”, 0.3125” 6</td>
</tr>
<tr>
<td>6</td>
<td>3/8”, 0.375” 7</td>
</tr>
<tr>
<td>8</td>
<td>1/2”, 0.500” 8</td>
</tr>
<tr>
<td>10</td>
<td>5/8”, 0.625” 9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SHAFT TYPE</th>
<th>S Single</th>
</tr>
</thead>
<tbody>
<tr>
<td>D Double ended 8</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MATING CONNECTOR</th>
<th>N No Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y Yes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONNECTOR TYPE</th>
<th>S Standard 6-pin MS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y 7-pin MS</td>
<td></td>
</tr>
<tr>
<td>J 5-pin M12 (12 mm)</td>
<td></td>
</tr>
<tr>
<td>K 8-pin M12 (12 mm)</td>
<td></td>
</tr>
<tr>
<td>G Gland Nut – 18&quot; Cable</td>
<td></td>
</tr>
<tr>
<td>T Solder or Screw Terminal</td>
<td></td>
</tr>
<tr>
<td>B Solder Terminal with Conduit Box</td>
<td></td>
</tr>
</tbody>
</table>

**Model 711 CPR Options**

<table>
<thead>
<tr>
<th>0001 thru 0189*</th>
<th>0193</th>
<th>0198</th>
<th>0200</th>
<th>0205</th>
<th>0210</th>
<th>0240</th>
</tr>
</thead>
<tbody>
<tr>
<td>0250</td>
<td>0256</td>
<td>0276</td>
<td>0298</td>
<td>0300</td>
<td>0305</td>
<td>0308</td>
</tr>
<tr>
<td>0336</td>
<td>0350</td>
<td>0360</td>
<td>0400</td>
<td>0480</td>
<td>0500</td>
<td>0512</td>
</tr>
<tr>
<td>0590</td>
<td>0592</td>
<td>0600</td>
<td>0720</td>
<td>0800</td>
<td>0960</td>
<td>1000</td>
</tr>
<tr>
<td>1024</td>
<td>1200</td>
<td>1250</td>
<td>1500</td>
<td>1800*</td>
<td>2000</td>
<td>2048</td>
</tr>
<tr>
<td>2500</td>
<td>3000</td>
<td>3600*</td>
<td>4096</td>
<td>5000</td>
<td>6000</td>
<td>7200*</td>
</tr>
<tr>
<td>8192</td>
<td>10,000</td>
<td>7200*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Contact Customer Service for availability.

Contact Customer Service for other disk resolutions. Not all disk resolutions available with all output types.

**Notes:**
1. Available with 0.250” shaft only.
2. Only available with 6-pin MS or Screw Terminal Connector Types.
3. Only available with 5/16”, 0.3125” shaft.
4. Contact Customer Service for custom shaft lengths and diameters.
5. Standard housing only.
6. Standard or 5PY housing only.
7. HD10 housing only.
8. Not available for HD or EX housings.
9. 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.
10. For non-standard cable lengths, add a forward slash (/) plus cable length expressed in feet. Example: G/6 = 6 feet of cable.
11. For CPR > 2500 Standard cable length only.

Twelve terminals available for HD and EX housings. Solder terminals available for S and S1 housings.
MODEL 711 SPECIFICATIONS
Common to all cube housing styles.

Electrical
- Input Voltage: 4.75 to 28 VDC max for temperatures up to 85° C; 4.75 to 24 VDC for temperatures between 85° C and 100° C.
- Input Current: 80 mA maximum with no output load.
- Input Ripple: 100 mV peak-to-peak at 0 to 100 kHz.
- Output Format: Incremental – Square wave with single channel.
- Output Types: Open Collector – 250 mA max per channel; Pull-Up – Open Collector with 1.5k ohm internal resistor, 250 mA max per channel; Push-Pull – 20 mA max per channel; Line Driver – 20 mA max per channel (Meets RS 422 at 5 VDC supply).

Max Frequency: 1 to 2500 CPR (125 kHz); 2501 to 5000 CPR (250 kHz); 5001 to 10,000 CPR (500 kHz).

Electrical Protection: Reverse voltage and output short circuit protected. NOTE: Sustained reverse voltage may result in permanent damage.

Symmetry: 180° (±18°) electrical.
Rise Time: Less than 1 microsecond.
Accuracy: Within 0.05° mechanical from one cycle to any other cycle, or 3 arc minutes.

Mechanical
- Max Speed: 6000 RPM. Higher shaft speeds achievable, contact Customer Service.
- Shaft Material: 303 Stainless Steel.

Housing: Black non-corrosive finished 6063-T6 aluminum.
Bears: Precision ABEC ball bearings.

Environmental
- Operating Temp: 0° to 85° C.
- Storage Temp: -25° to 85° C.
- Humidity: 98% RH non-condensing.
- Vibration: 10 g @ 58 to 500 Hz.
- Shock: 50 g @ 11 ms duration.

STANDARD CUBE HOUSING (S, S1) SPECIFICATIONS

Mechanical
- Shaft Type: Single or double-ended (specify choice).
- Radial Loading: 15 lb maximum (0.250” diameter shaft); 40 lb maximum (0.375” diameter shaft).
- Axial Loading: 10 lb maximum (0.250” diameter shaft); 30 lb maximum (0.375” diameter shaft).
- Starting Torque: 0.13 oz-in typical for 0.250” shaft; 0.38 oz-in typical for 0.375” shaft.
- Moment of Inertia: 6.5 x 10^-6 oz-in-sec^2.
- Weight: 10 oz for standard housing.

Radial Loading: 15 lb maximum (0.250” diameter shaft); 40 lb maximum (0.375” diameter shaft).
Axial Loading: 10 lb maximum (0.250” diameter shaft); 30 lb maximum (0.375” diameter shaft).
Starting Torque: 0.13 oz-in typical for 0.250” shaft; 0.38 oz-in typical for 0.375” shaft.
Moment of Inertia: 6.5 x 10^-6 oz-in-sec^2.
Weight: 10 oz for standard housing.

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

STANDARD CUBE HOUSING (S, S1)

CUBE PIVOT MOUNTING BRACKETS
176430-01 Single Pivot
176431-01 Double Pivot
176430-02 Spring Loaded Single Pivot
176431-02 Spring Loaded Double Pivot
Encoder sold separately.

WAVEFORM DIAGRAM

1. Standard cable is 24 AWG conductors with foil and braid shield.
INDUSTRIAL CUBE HOUSING (IND12)

This more robust unit meets requirements between Standard and Heavy Duty housings while retaining the Cube design. The Industrial 12 (IND12) model features an IP66 shaft seal. The tough, sealed aluminum housing has a wall thickness of 0.187” and offers greater protection from wash down, sprays, dust, moisture, shock, vibration, and other hazards found in industrial environments.

INDUSTRIAL CUBE HOUSING (IND12) SPECIFICATIONS

Refer to all Standard Cube Housing specifications except as follows:

**Mechanical**

Shaft Size: 0.375” diameter
Shaft Type: Single- or Double-Ended Shaft Available
Radial Loading: 40 lb Maximum
Axial Loading: 30 lb Maximum
Starting Torque: 3 oz-in Starting Torque w/IP66 Shaft Seal

**Heavy Duty Housing Options**

HD 1 Heavy Duty 3” x 6” housing
HD 3 Heavy Duty w/ conduit connector (threaded for 0.500” NPT Conduit) and terminal strip
HD 5 Heavy Duty w/10 mm outer bearing
HD 12* Heavy Duty w/ IP66 rated outer shaft seal
HD 14* Heavy Duty w/ IP66 rated outer shaft seal, conduit connector (threaded for 0.500” NPT Conduit), and terminal strip

*These units have an outer boss diameter of 1.000”

HEAVY DUTY CUBE HOUSING (HD12)

The Heavy Duty housing uses a separate 0.375” diameter external shaft and bearing assembly to rotate the shaft of an internally mounted Cube Housing. This provides mechanical isolation from external loads and stress. A flexible coupling between the external shaft and the encoder protects the internal unit from axial and radial loading. The 0.250” aluminum walls protect the encoder from external shock, vibration, and the outside environment.

HEAVY DUTY CUBE HOUSING (HD12) SPECIFICATIONS

Refer to all cube specifications except as follows:

**Mechanical**

Max Speed: 6000 RPM
Shaft Size: 0.375”
Rotation: Either direction
Radial Loading: 40 lb maximum (50 lb for HD 5)
Axial Loading: 30 lb maximum (35 lb for HD 5)
Bearings: Precision ABEC ball bearings
Starting Torque: 1 oz-in; 3 oz-in w/IP66 seal

All dimensions are in inches with a tolerance of ±0.005” or ±0.01” unless otherwise specified

ULTRA HEAVY DUTY CUBE HOUSING (HD10)

The HD 10 Ultra Heavy Duty encoder is designed for use in applications with severe shaft loading conditions. The HD 10 offers two shaft sizes: 0.500” and 0.625”. Shaft material is 303 stainless steel. Bearings are conservatively rated at 95 lb radial and 60 lb axial shaft loading. IP66 shaft seal is standard on all units. The HD 10 Ultra Heavy Duty housing uses a larger external shaft and R10 bearing assembly to rotate the shaft of an internally mounted Cube Housing. This provides mechanical isolation from external loads and stress. A flexible coupling between the external shaft and the encoder protects the internal unit from axial and radial loading. The 0.250” aluminum walls protect the encoder from external shock, vibration, and the outside environment.

ULTRA HEAVY DUTY CUBE HOUSING (HD10) SPECIFICATIONS

**Mechanical**

Max Speed: 6000 RPM
Shaft Size: 0.500” or 0.625”
Rotation: Either direction
Radial Loading: 95 lb operating
Axial Loading: 60 lb operating
Bearings: ABEC precision ball bearings
Starting Torque: 3 oz-in IP66 rated
Mounting: Tapped holes face and base
Weight: 3.85 lb
ULTRA HEAVY DUTY CUBE HOUSING (HD10)—CONT'D

EXPLOSION-PROOF HOUSING (EX)
An explosion-proof housing is available for installing the Cube Series Accu-Coder™ in hazardous locations. The Cube Series encoder is mounted within the explosion-proof housing and is coupled to the 0.375” shaft assembly by a flexible shaft coupling. This decreases radial and axial loading on the internal encoder shaft and bearings to ensure long life. Electrical connection to the Accu-Coder™ is by an internal barrier terminal strip. A threaded hole for 0.500” NPT conduit is provided.

CUBE SERIES OPTIONAL 5PY ADAPTER (175443)
The all aluminum optional 5PY adapter allows any standard housing Cube Series encoder to replace DC tachometer technology. The 5PY adapter is interchangeable with any 5PY tach generator.

Order standard housing Cube Series Accu-Coder™ with 5/16” shaft and specify part #175443.