FEATURES
The Original Industry-Standard Cube
Versatile Housing Styles
Bi-Directional, Constant Pulse Width
Resolutions Available up to 10,000 CPR

The Model 715 Accu-Coder™ is ideally suited for applications requiring bi-directional feedback with a constant pulse width. The Model 715 is available in two versions. The Model 715-1 provides output pulses for clockwise shaft rotation on one channel and pulses for counterclockwise rotation on another. The Model 715-2 provides output pulses for counting on one channel while the other channel indicates direction of rotation. Critical performance specifications for the most popular resolutions and advanced Opto-ASIC circuitry – a single chip design that eliminates many board level components – increases the reliability of an already dependable and durable encoder. With new options continually being added, the Model 715 excels in a wide variety of industrial applications.

COMMON APPLICATIONS
Measuring for Cut-to-Length, Labeling & Filling, Position Control, Motion Following, or Slaving Applications

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. Neither SPY nor Ringer housing options are available on this model.
6. Standard or SPY 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: G8 / 6 feet of cable.
**MODEL 715 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° to 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 timed output
- Output Types: Open Collector – 250 mA max per channel
  - Pull-Up – Open collector with 1.5K ohm internal resistor, 250 mA max per channel
- Max Frequency: Less than 1 microsecond
- Accuracy: Within 0.05° mechanical from one cycle to any other cycle, or 3 arc minutes

**Mechanical**
- Rise Time: Less than 1 microsecond
- Accuracy: Within 0.05° mechanical from one cycle to any other cycle, or 3 arc minutes

**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**

Cube Housing with 1/4" Shaft (4)
- 6-32 UNC-2B .250 DEEP
- SAME MOUNTING HOLE PATTERN IS ALSO PROVIDED ON THE OPPOSITE END AND BASE

Cube Housing with 3/8" Shaft (6)
- 6-32 UNC-2B .250 DEEP
- SAME MOUNTING HOLE PATTERN IS ALSO PROVIDED ON THE OPPOSITE END AND BASE

**Wiring Table**
For EPC-supplied mating cables, refer to wiring table provided with cable.
Trim back and insulate unused wires.

<table>
<thead>
<tr>
<th>Function</th>
<th>Gland Cable†</th>
<th>Wire Color</th>
<th>5-pin M12</th>
<th>8-pin M12</th>
<th>6-pin MS</th>
<th>Term. Block</th>
</tr>
</thead>
<tbody>
<tr>
<td>Com</td>
<td>Black</td>
<td>3</td>
<td>7</td>
<td>A,F</td>
<td>1,6</td>
<td></td>
</tr>
<tr>
<td>+VDC</td>
<td>Red</td>
<td>1</td>
<td>2</td>
<td>B</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>White</td>
<td>4</td>
<td>1</td>
<td>D</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Blue</td>
<td>2</td>
<td>4</td>
<td>E</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Shield</td>
<td>Bare</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
</tbody>
</table>

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

**Waveform Diagrams**

Model 715-1
- CLOCKWISE ROTATION AS VIEWED FROM THE MOUNTING FACE
- COUNTER-CLOCKWISE ROTATION AS VIEWED FROM THE MOUNTING FACE

Model 715-2
- CLOCKWISE ROTATION AS VIEWED FROM THE MOUNTING FACE
- COUNTER-CLOCKWISE ROTATION AS VIEWED FROM THE MOUNTING FACE

Model 715-1 Bi-Directional Encoder
The 715-1 provides two output channels. A constant pulse width is generated on one channel with clockwise shaft rotation, and on the other channel with counter-clockwise shaft rotation. Specify PPR in any even numbered value between 2 and 10,000. Specify any pulse width from 10 microseconds to 100 milliseconds and pulse polarity. Some options require Heavy Duty housing. The Line Driver output option is not available.

Model 715-2 Bi-Directional Encoder
The 715-2 provides two output channels. One channel has a constant pulse width output regardless of shaft rotation direction. The other channel indicates direction with logic level “1” for clockwise shaft rotation, and level “0” for counter-clockwise shaft rotation. Options are the same as for the Model 715-1.

**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.
CUBE HOUSINGS

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; 3 oz-in w/IP66 Shaft Seal

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
- 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; 3 oz-in w/IP66 Shaft Seal

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: Single- or Double-Ended Shaft Available
- Radial Loading: 95 lb operating
- Axial Loading: 60 lb operating
- Bearings: ABEC precision ball bearings
- Bearing Life: 15,000 hours at rated load
- Starting Torque: 3 oz-in; 3 oz-in w/IP66 seal
- Mounting: Tapped holes face and base
- Weight: 3.25 lb
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.

EXPLOSION-PROOF HOUSING (EX) SPECIFICATIONS

The explosion-proof housing is designed to meet the following:
- NEC Class 1, Groups C and D
- NEC Class 2, Groups E, F, and G
- UL Standard 1203
- Class 1, Division 1, Groups C and D
- Class 2, Division 1, Groups E, F, and G
- CSA Standard C 22.2 No. 30-M 1986
- NEMA 7 and NEMA 9

Refer to all cube specifications except as follows:

Mechanical
- Max Speed: 4000 RPM
- Radial Loading: 30 lb operating
- Axial Loading: 30 lb operating
- Weight: 6 lb
- Finish: Unpainted Aluminum

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.