

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.

711	–	0256	–	S	–	HD1	–	6	–	S	–	S	–	N	
MODEL		CYCLES PER REVOLUTION (CPR)		OUTPUT TYPE		HOUSING TYPE		SHAFT DIAMETER⁴		SHAFT TYPE		MATING CONNECTOR		CONNECTOR TYPE⁹	
711 Unidirectional Cube (Single Channel)		1-10,000 See CPR Options below for available resolutions. (1271 and above is a price adder)		S Pull-Up Resistor O Open Collector PP Push-Pull HV Line Driver		S 2.25" Standard Housing S1 2.25" Standard Housing with IP50 Felt Shaft Seal ¹ IND12 Industrial Housing with IP66 Shaft Seal HD1 3" x 3" x 6" Heavy Duty Housing ² HD3 Heavy Duty Housing with Conduit Connector & Terminal Strip HD5 Heavy Duty Housing with 10 mm Outer Bearing ² HD10 Heavy Duty Housing with Ultra Heavy Duty Bearings, 0.625" or 0.500" Shaft ² HD12 Heavy Duty Housing with IP66 Outer Shaft Seal ² HD14 Heavy Duty Housing with IP66 Shaft Seal and with Conduit Connector & Terminal Strip 5PY Standard Cube With 5PY Adaptor ³ EX Explosion-proof Housing		4 1/4", 0.250" ⁵ 5 5/16", 0.3125" ⁶ 6 3/8", 0.375" 8 1/2", 0.500" ⁷ 10 5/8", 0.625" ⁷		S Single D Double ended ⁸		N No Connector Y Yes		S Standard 6-pin MS Y 7-pin MS J 5-pin M12 (12 mm) ⁸ K 8-pin M12 (12 mm) ⁸ G Gland Nut – 18" Cable ¹⁰ T Solder or Screw Terminal ¹¹ B Solder Terminal with Conduit Box	

MODEL 711 CPR OPTIONS

0001 thru 0189*	0193	0198	0200	0205	0210	0240
0250	0256	0276	0298	0300	0305	0308
0315	0333	0336	0350	0360	0400	0480
0500	0512	0580	0597	0600	0700	0720
0800	0840	0960	1000	1024	1200	1250
1270	1500	1800*	2000	2048	2500	3000
3600*	4096	5000	6000	7200*	8192	10,000

*Contact Customer Service for availability.

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

NOTES:

- Available with 0.250" shaft only.
- Only available with 6-pin MS or Screw Terminal Connector Types.
- Only available with 5/16", 0.3125" shaft.
- Contact Customer Service for custom shaft lengths and diameters.
- Standard housing only.
- Standard or 5PY housing only.
- HD10 housing only.
- Not available for HD or EX housings.
- 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.
- For non-standard cable lengths, add a forward slash (/) plus cable length expressed in feet. Example: G/6 = 6 feet of cable. For CPR > 2500. Standard cable length only.
- Screw 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 Frequency1 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 Speed6000 RPM. Higher shaft speeds achievable, contact Customer Service.
 Shaft Material303 Stainless Steel

HousingBlack non-corrosive finished 6063-T6 aluminum
 Bearings.....Precision ABEC ball bearings

Environmental

Operating Temp0° 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 TypeSingle 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 Torque0.13 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-sec²
 Weight.....10 oz for standard housing

WIRING TABLE

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

Function	Gland Cable† Wire Color	5-pin M12	8-pin M12	10-pin MS	7 pin MS HV	7-pin MS O,S PP	6-pin MS HV, No Index	6-pin MS O,S PP	Term. Block HV, No Index	Term. Block O,S HV,PP
Com	Black	3	7	F	F	F	A	A,F	1	1,6
+VDC	Red	1	2	D	D	D	B	B	2	2
A	White	4	1	A	A	A	C	D	3	4
A'	Brown	--	3	H	C	--	D	--	4	--
Case	--	--	--	G	G	G	--	--	--	--
Shield	Bare	--	--	--	--	--	--	--	--	--

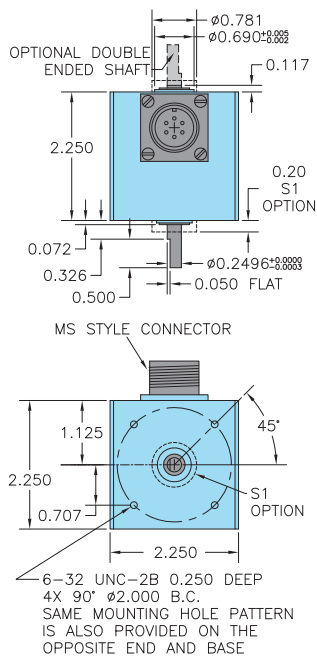
†Standard cable is 24 AWG conductors with foil and braid shield.

WAVEFORM DIAGRAM

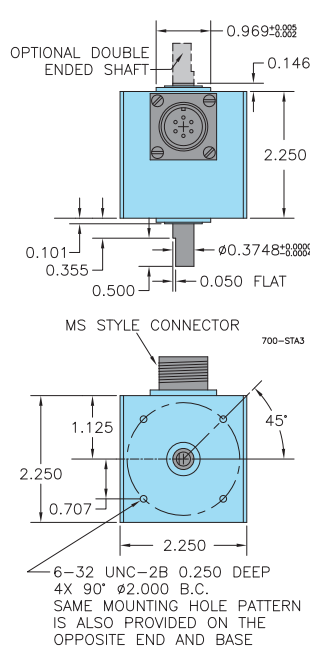
OUTPUT A 

STANDARD CUBE HOUSING (S, S1)

Cube Housing with 1/4" Shaft (4)

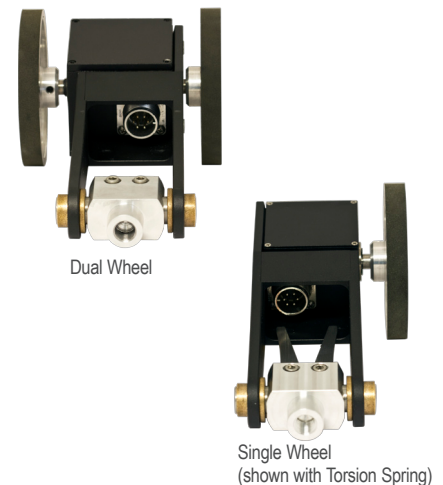


Cube Housing with 3/8" Shaft (6)



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)

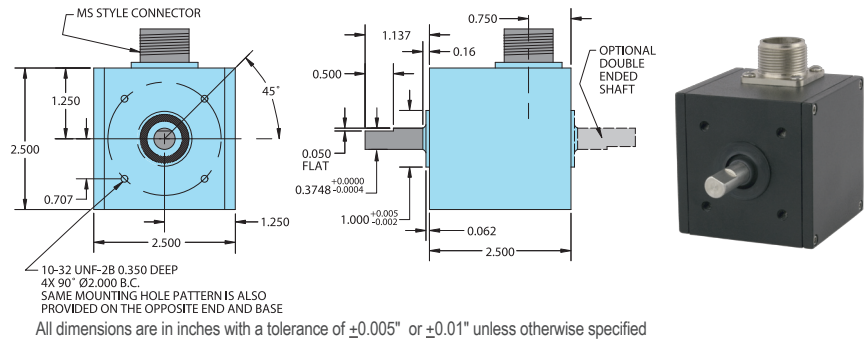
This more robust unit meets requirements between Standard and Heavy Duty housings while retaining the Cube design. The Industrial 12 (IND12) model features an IP66 shaft seal. The tough, sealed aluminum housing has a wall thickness of 0.187" and offers greater protection from wash down, sprays, dust, 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 Starting Torque 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 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

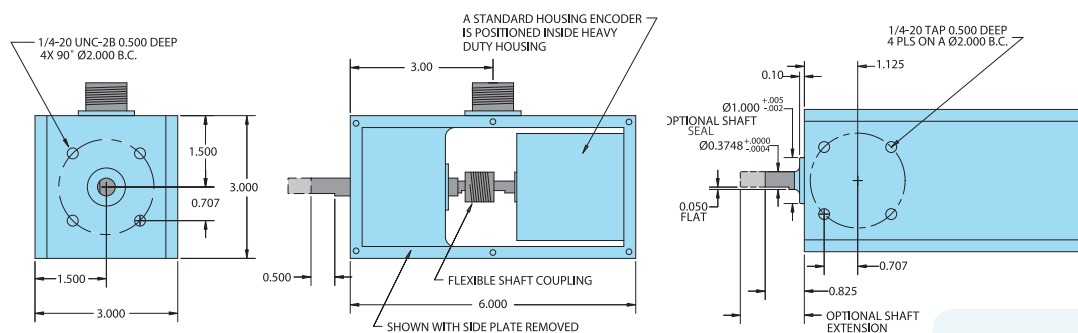
*These units have an outer boss diameter of 1.000"

HEAVY DUTY CUBE HOUSING (HD12) 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
 Mounting Tapped holes face and base
 Weight 3.25 lb



ULTRA HEAVY DUTY CUBE HOUSING (HD10)

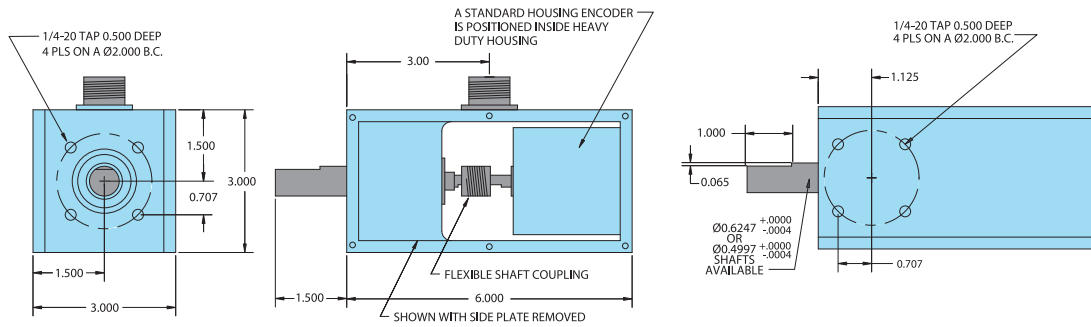
The HD 10 Ultra Heavy Duty encoder is designed for use in applications with severe shaft loading conditions. The HD 10 offers two shaft sizes: 0.500" and 0.625". Shaft material is 303 stainless steel. Bearings are conservatively rated at 95 lb radial and 60 lb axial shaft loading. IP66 shaft seal is 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 (HD 10) 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
 Bearing Life 15,000 hours at rated load
 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

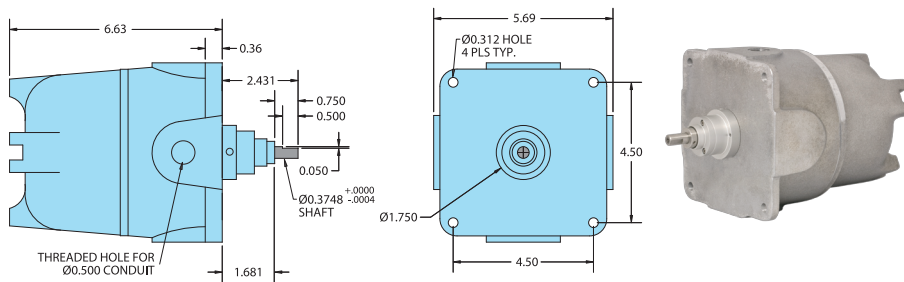


All dimensions are in inches with a tolerance of ± 0.005 " or ± 0.01 " unless otherwise specified



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

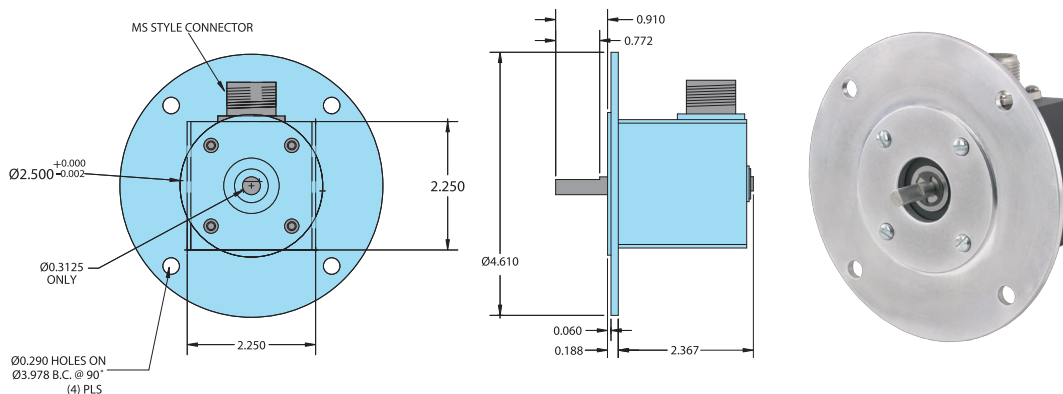
Refer to all cube specifications except as follows:

Mechanical

Max Speed 4000 RPM
 Radial Loading 30 lb operating
 Axial Loading 10 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.



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

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