

Model 716

Now up to
10,000 CPR!



Features

- The Original Industry-Standard Cube
- Five Versatile Housing Styles
- Thousands of Configurations
- New Resolutions Available to 10,000!

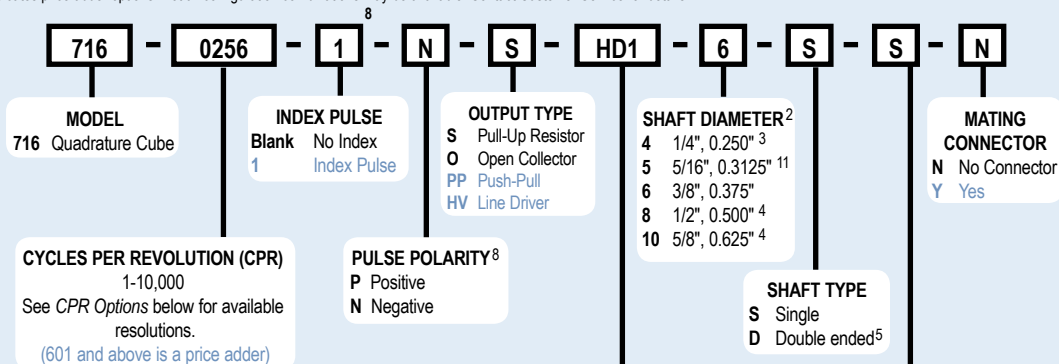
The Model 716 Accu-Coder™ is ideally suited for applications requiring a quadrature output. Designed for compatibility with most programmable controllers, electronic counters, motion controllers, and motor drives, it is ideally suited for industrial applications where it is important that the direction of rotation be known. Increasing critical performance specifications for the most popular resolutions and features advanced Opto-ASIC circuitry, a single chip design that eliminates many board level components. This increases the reliability of an already dependable and durable encoder. With new options continually being added, we just keep getting better, and better!

Common Applications

Feedback for counters, PLC's & Motors, Cut To Length, Labeling, Measuring For Packaging, Filling & Materials Handling Machines, Wire Winding, Film Extrusion

Model 716 Ordering Guide

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



For specification
assistance call
Customer Service at
1-800-366-5412

HOUSING TYPE	
S	2.25" Standard Housing
S1	2.25" Standard Housing with IP50 Felt Shaft Seal ¹
IND12	Industrial Housing with IP65 Shaft Seal
HD1	3" x 3" x 6" Heavy Duty Housing
HD3	Heavy Duty Housing with Conduit Connector & Terminal Strip
HD5	Heavy Duty Housing with 10 mm Outer Bearing
HD10	Heavy Duty Housing with Ultra Heavy Duty Bearings
HD12	Heavy Duty Housing with IP65 Outer Shaft Seal
HD14	Heavy Duty Housing with IP65 Shaft Seal and with Conduit Connector & Terminal Strip
5PY	Standard Cube With 5PY Adaptor ¹¹
EX	Explosion-proof Housing

CONNECTOR TYPE ⁹	
S	Standard 6-pin MS Style
Y	7-pin MS Style
X	10-pin MS Style
J	5-pin M12 (12 mm) ⁵
K	8-pin M12 (12 mm) ⁵
G	Gland Nut - 18" Cable ⁶
T	Solder or Screw Terminal ⁷
B	Solder Terminal with Conduit Box

NOTES:

- 1 Available with 0.250" shaft only.
- 2 Contact Customer Service for custom shaft lengths and diameters.
- 3 Standard housing only.
- 4 HD10 housing only.
- 5 Not available for HD or EX housings.
- 6 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.
- 7 Screw terminals available for HD and EX housings. Solder terminals available for S and S1 housings.
- 8 Complete only if Index Pulse option is selected.
- 9 For Mating Connectors, Cables, and Cordsets see www.encoder.com
- 10 Only available with 5/16" (0.3125") shaft.
- 11 Standard or 5PY housing only.

Model 716 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

Model 716

Model 716 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 Ripple100 mV peak-to-peak at 0 to 100 kHz
Output FormatIncremental- Square wave with single channel
Output TypesOpen Collector- 250 mA max per channel
Pull-Up- 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
Standard Cube- 0 to 20 kHz
IndexStandard Cube- Once per revolution, 180° electrical minimum non-gated

Symmetry180° (±18°) electrical
Quad Phasing.....90° (±22.5°) electrical
Rise Time.....Less than 1 microsecond
Accuracy.....Within 0.05° mechanical from one cycle to any other cycle, or 3 arc minutes

Mechanical

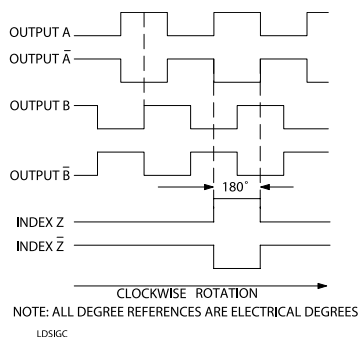
Max Speed.....6000 RPM. Higher shaft speeds achievable, contact Customer Service.
Shaft Material.....303 stainless steel
Housing.....Black non-corrosive finished 6063-T6 aluminum
BearingsPrecision ABEC Ball Bearings
Electrical Conn.....Refer to ordering guide notes

Environmental

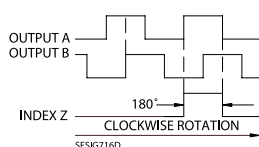
Operating Temp.....0° to 85° C or 0° to 100° C at 5 to 24 VDC
Storage Temp-25° to +85° C
Humidity.....98% RH non-condensing
Vibration.....10 g @ 58 to 500 Hz
Shock.....50 g @ 11 ms duration

Waveform Diagrams

Line Driver and Push-Pull



Open Collector and Pull-Up



Wiring Table

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 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	---
B	Blue	2	4	B	B	B	E	E	5	5
B'	Violet	---	5	I	E	---	F	---	6	---
Z	Orange	5	6	C	---	C	---	C	---	3
Z'	Yellow	---	8	J	---	---	---	---	---	---
Case	Green ¹	---	---	G	G	G	---	---	---	---
Shield	Bare	---	---	---	---	---	---	---	---	---

¹E-Cube Only

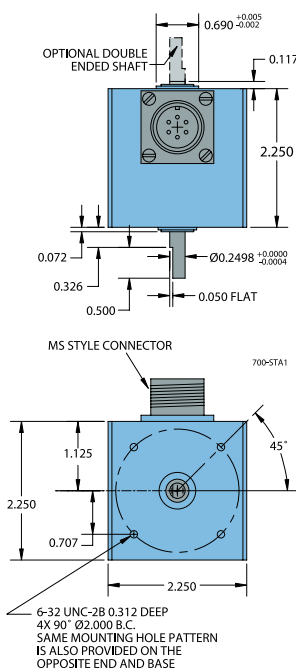
Standard Cube Housing (S, S1)

Standard Cube Housing (S, S1) Specifications

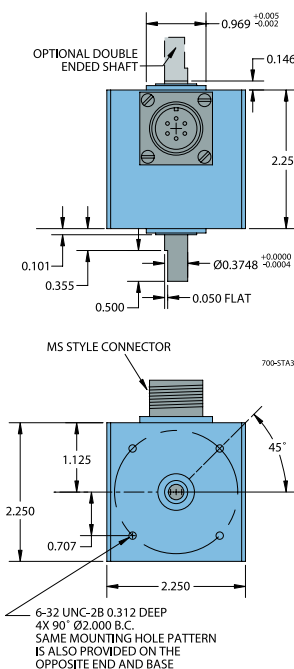
Mechanical

Shaft Size0.250" or 0.375"
Shaft TypeSingle or double-ended (specify choice)
Radial Loading15 lb maximum (0.250" diameter shaft)
40 lb maximum (0.375" diameter shaft)
Axial Loading10 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 Inertia6.5 x 10⁻⁶ oz-in-sec²
Mounting.....Tapped mounting holes on three sides for base or face mounting
Weight.....10 oz for standard housing

Cube Housing With 1/4" Shaft (4)



Cube Housing With 3/8" Shaft (6)



Cube Housings

Industrial Cube Housing (IND12)

Industrial Housing Features

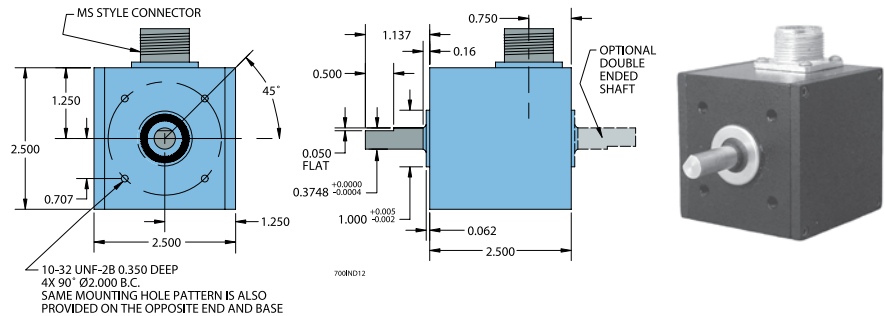
This more robust unit meets requirements between Standard and Heavy Duty housings while retaining the Cube design. The Industrial 12 (IND12) model features an IP65 shaft seal. The tough, sealed aluminum housing has a wall thickness of 0.187" and offers greater protection from wash down, sprays, dust, 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/IP65 Shaft Seal



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

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/IP65 rated outer shaft seal
- HD 14* Heavy Duty w/IP65 rated outer shaft seal, conduit connector (threaded for 0.500" NPT Conduit), and terminal strip

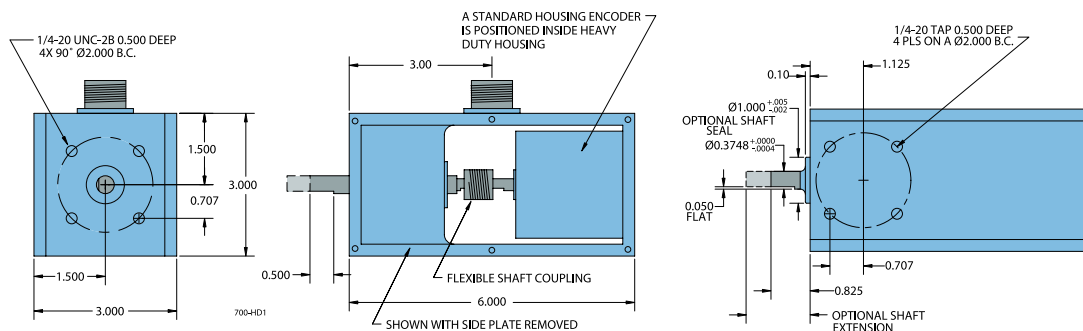
* These units have an outer boss diameter of 1.000"

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/IP65 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. IP65 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

Refer to all cube specifications except as follows:

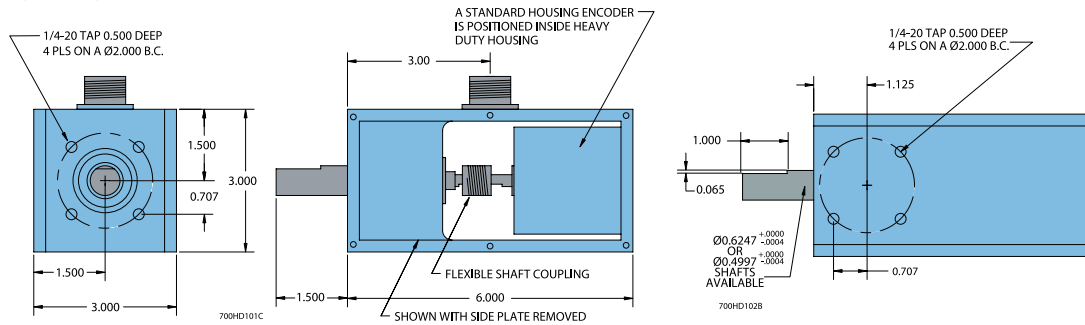
Mechanical

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 IP65 rated
Mounting	Tapped holes face and base
Weight	3.85 lb

Cube Housings

Ultra Heavy Duty Cube Housing (HD10)

(Continued)

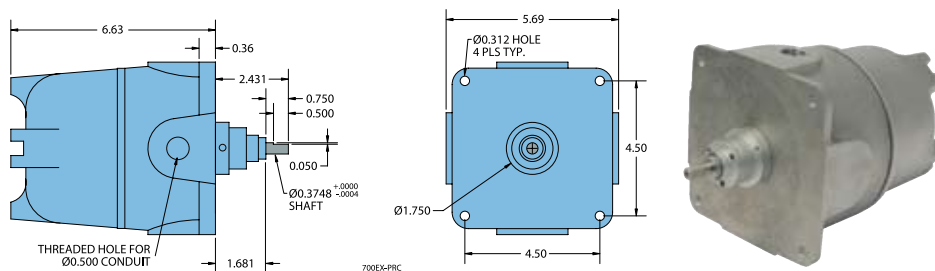


All dimensions are in inches with a tolerance of $\pm 0.005"$ or $\pm 0.01"$ unless otherwise specified



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

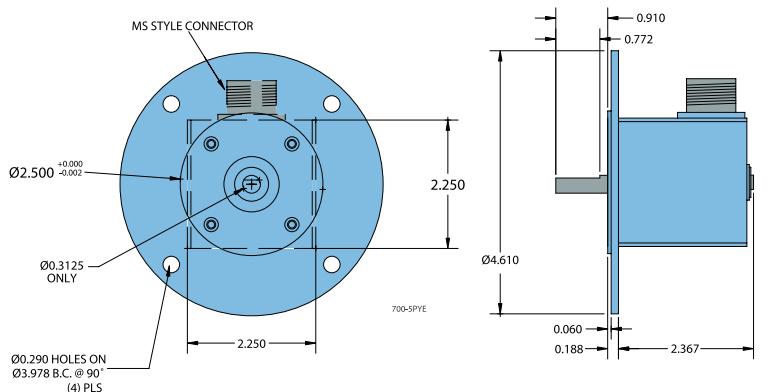
Max Speed 4000 RPM
 Radial Loading 30 lb operating
 Axial Loading 10 lb operating
 Weight 6 lb
 Finish Unpainted Aluminum

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.

Ordering Information

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



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

