

Model 711 Single Channel Model 716 Quadrature

**BRITISH
ENCODER**
PRODUCTS COMPANY



Features

- The Original Industry-Standard Cube
- Wide Choice of PPR's
- Enhanced Technology Using Opto-ASIC Circuitry
- Industrial and Heavy Duty Options Available

The Model 711/716 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.

The new Opto-ASIC version increases critical performance specifications for the most popular resolutions. This version 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, the 711/716 just keeps getting better and better.

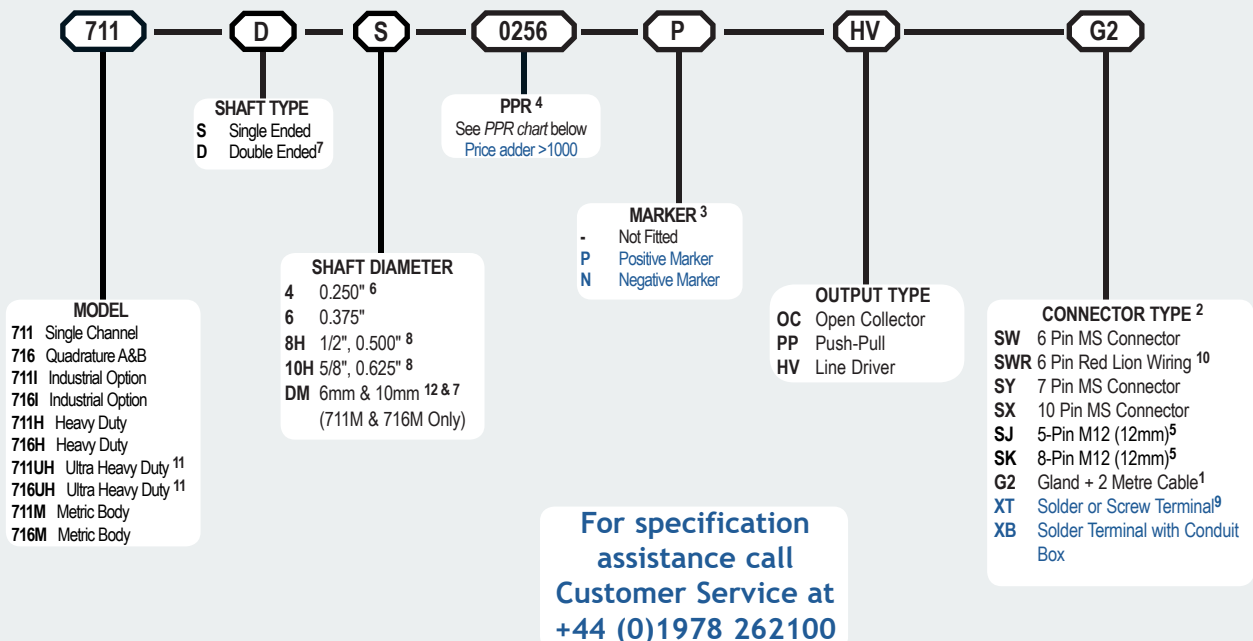
Common Applications

Feedback for counters, PLC's & Motors, Cut to Length, Labelling, Measuring for Packaging, Filling & Materials Handling Machines, Wire Winding, Film Extrusion.

Model 711/716 Ordering Guide

Blue type indicates price adder options. Not all configuration combinations may be available.

Contact Customer Service for details.



Model 711/716 PPR Options

0001 thru 0189	0193	0198	0200	0205	0210	0240
0250	0256	0298	0300	0305	0315	0333
0360	0400	0480	0500	0512	0580	0597
0720	0800	0960	1000	1024	1200	1250
1800*	2000	2048	2500	3000	3600*	4096
7200*	8192	10000			5000	6000

*Contact Customer Service for Availability.

Contact Customer Service for other disc resolutions;
not all disc resolutions available with all output types
See [Note 4](#) for Details

NOTES:

- 1 For Non-standard cable lengths - call the sales office.
- 2 For mating connectors - see accessories pages.
- 3 Call sales office for marker availability and configuration options.
- 4 For PPR between 0001 and 0189 call sales office for availability.
- 5 Not Available in Heavy Duty and Ultra Heavy Duty Housing.
- 6 Standard 711/716 Only.
- 7 Double ended not available in Heavy Duty and Ultra Heavy Duty Housing.
Please note that DM Shaft Diameter is 6mm 1 end and 10mm the other.
- 8 Ultra Heavy Duty Housing only.
- 9 Screw Terminals available for Heavy Duty housing
Solder Terminals available for Standard Housing
- 10 See Wiring Tables for Red Lion Configuration Options.
- 11 711UH and 716UH Only Available with 0.500" or 0.625" Shafts
- 12 For shaft dimensions see drawing on page 2 (711M/716M Metric Housing)

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Model 711/716 Specifications

Electrical

Input Voltage4.75 to 24 Vcc max to temperatures up to 70°C
Input Current	.....100 mA max (65 mA typical) with no output load
Input Ripple	.....100 mV peak to peak at 0 to 100 kHz
Output Format	.....711. Square wave with single channel.....716. Quadrature two square waves, channel A leading B for clockwise shaft rotation, as viewed from the encoder mounting face. See <i>Waveform Diagrams</i> below.
Output Types	.....Open Collector- 20 mA max per channel.....Push-Pull- 20 mA max per channel.....20 mA max per channel.....Line Driver- 20 mA max per channel (Meets RS 422 at 5 VCC supply)
Index	.....Once per revolution.
Freq. Response	.....20 kHz standard
Noise Immunity	.....Tested to BS EN61000-6-2; BS EN50081-2; BS EN61000-4-2; BS EN61000-4-3; BS EN61000-4-6; BS EN500811
Symmetry	.....180° (±18°) electrical
Quad. Phasing	.....90° (±22.5°) electrical
Min. Edge Sep	.....67.5° electrical
Accuracy	.....Within 0.10° mechanical or 6 arc-minutes from true position
Electrical Conn.	.....Refer to ordering guide notes

Mechanical

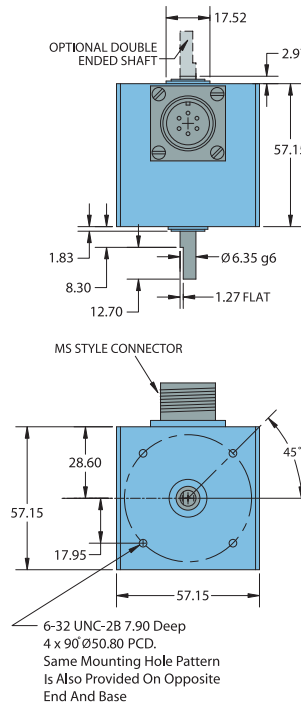
Shaft Size	.....0.250" or 0.375" / 6mm&10mm (Metric)
Shaft Type	.....Single or double-ended (specify choice) / 711/716M is double ended and has 6mm Dia on 1 end and 10mm Dia on the other
Shaft Material	.....303 stainless steel
Radial Loading	.....7 Kg maximum (0.250" diameter shaft) .....18 Kg maximum (0.375" diameter shaft)
Axial Loading	.....4.5 Kg maximum (0.250" diameter shaft) .....13.6 Kg maximum (0.375" diameter shaft)
Starting Torque	.....9.18 x 10 ⁻⁴ Nm typical for 0.250" shaft.....2.68 x 10 ⁻³ Nm typical for 0.375" shaft
Housing	.....Black non-corrosive finished 6063-T6 aluminum
Bearings	.....Precision ABEC Ball Bearings
Mounting	.....Tapped mounting holes on three sides for base or face mounting
Weight	.....300 grams typical

Environmental

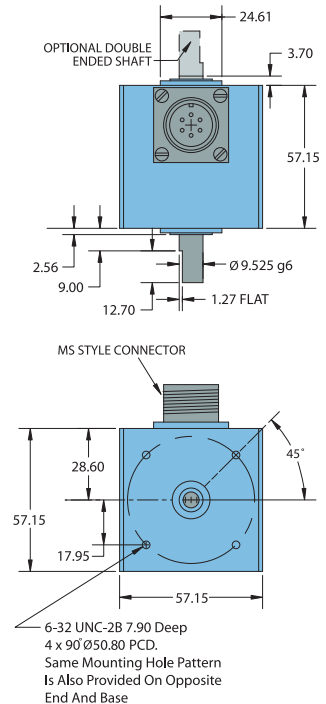
Operating Temp	.....0° to +70° C standard models
Storage Temp	.....-25° to +85° C
Humidity	.....98% RH non-condensing
Vibration	.....10 g @ 58 to 500 Hz
Shock	.....80 g @ 11 ms duration
Sealing	.....IP50 standard

Model 711/716 Encoder

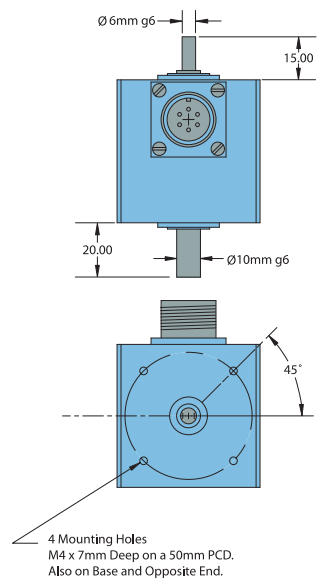
711/716 Housing With 1/4" Shaft



711/716 Housing With 3/8" Shaft

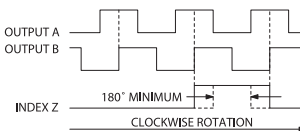


711M/716M Metric Housing



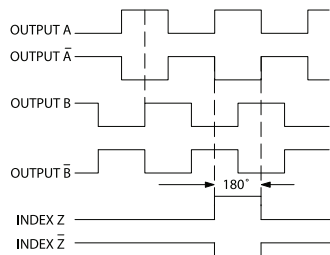
Waveform Diagrams

Open Collector and Push Pull



NOTE: ALL DEGREE REFERENCES ARE ELECTRICAL DEGREES
NOTE: INDEX IS POSITIVE GOING

Line Driver (HV)



NOTE: ALL DEGREE REFERENCES ARE ELECTRICAL DEGREES

All dimensions are in mm with a tolerance of ±0.127mm or ±0.254 unless otherwise specified

Wiring Table

													711R HV OC,PP	711RZ HV# OC,PP	716R HV# OC,PP	716RZ HV OC,PP
Function	Gland Cable† Wire Color	5-pin M12** PP,OC	8-pin M12** HV	8-pin M12** OC,PP	6 Pin MS** PU,OC,PP	6 Pin MS** HV (A&B)	6 Pin MS** HV (A&Z)	7 Pin MS** HV	7 Pin MS** OC,PP	10 Pin MS** HV	Terminal Block HV (no Z)	Terminal Block OC,PP				
0 Volts	Black	3	7	7	A	A	A	F	F	F	1	1,6	B	B	B	B
+VCC	Red	1	2	2	B	B	B	D	D	D	2	2	A	A	A	A
A	White	4	1	1	D	D	D	A	A	A	3	4	C	C	C	C
A'	Brown	--	3	--	--	C	C	C	--	H	4	--	E [#]	E [#]	E [#]	--
B	Blue	2	4	4	E	E	--	B	B	B	5	5	--	--	D	D
B'	Violet	--	5	--	--	F	--	E	--	I	6	--	--	--	F [#]	--
Z	Orange	5	6	6	C	--	E	--	C	C	--	3	--	F	--	E
Z'	Yellow	--	8	--	--	F	--	F	--	J	--	--	--	D [#]	--	--
Shield	Bare*	Case	Case	8	Case	Case	Case	G	G	G	--	--	Case	Case	Case	Case

*CE: Cable shield (bare wire) is connected to internal case.

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

**CE: Shield is connected to connector case unless otherwise specified.

#Only on HV Option for Red Lion Wiring

CAUTION - Always check wiring colour code against Encoder Label due to changes in specification since September 2006

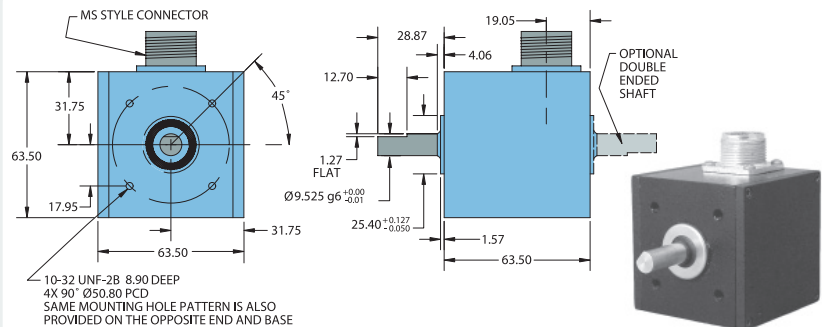
This more robust unit meets requirements between Standard and Heavy Duty housings while retaining the Cube design. The Industrial model features an IP65 shaft seal. The tough, sealed aluminium housing has a wall thickness of 4.75mm and offers greater protection from wash down, sprays, dust, moisture, shock, vibration, and other hazards found in industrial environments.

Industrial Cube Housing (711I/716I) 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 10 Kg Maximum
Axial Loading 5 Kg Maximum
Starting Torque 0.0219 Nm Starting Torque w/IP65 Shaft Seal



Heavy Duty Cube Housing (711H/716H)

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 6.35mm aluminium walls protect the encoder from external shock, vibration, and the outside environment.

Heavy Duty Housing Measurement

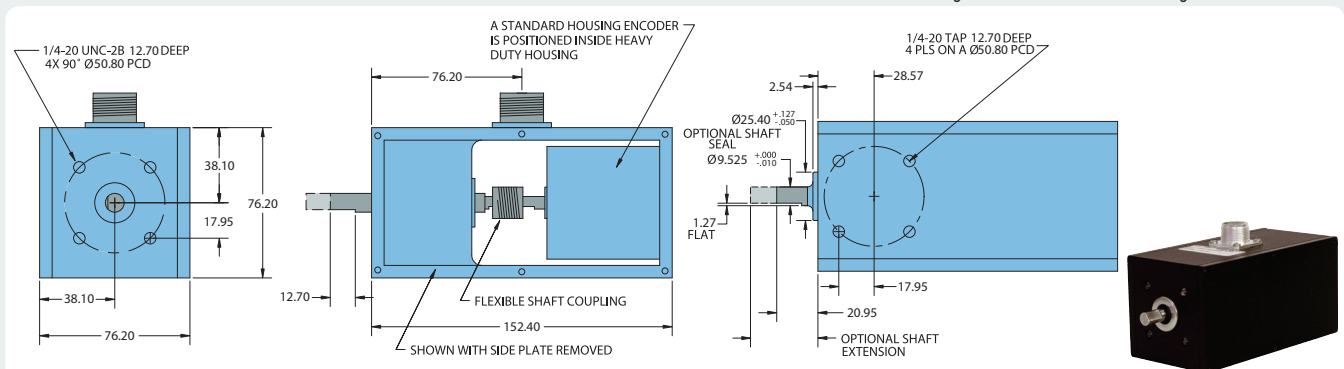
- Heavy Duty 76.20mm X 152.40mm housing

Heavy Duty Cube Housing (711H/716H) Specifications

Refer to all cube specifications except as follows:

Mechanical

Max Speed	6000 RPM
Shaft Size	0.375"
Rotation	Either direction
Radial Loading	15 Kg maximum
Axial Loading	10 Kg maximum
Bearings	Tapped ABEC ball bearings
Mounting	Pressed holes face and base
Weight	2.0 Kg



Ultra Heavy Duty Cube Housing (711UH/716UH)

The Ultra Heavy Duty Encoder is designed for use in applications with severe shaft loading conditions. The 711UH/716UH offers two shaft sizes: 0.500" and 0.625". Shaft material is 303 stainless steel, Bearings are conservatively rated at 43Kg radial and 27Kg axial shaft loading. IP65 is standard on all units.

The 711UH/716UH 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" aluminium walls protect the encoder from shock, vibration and the outside environment.

Heavy Duty Cube Housing (711UH/716UH) Specifications

Refer to all cube specifications except as follows:

Mechanical

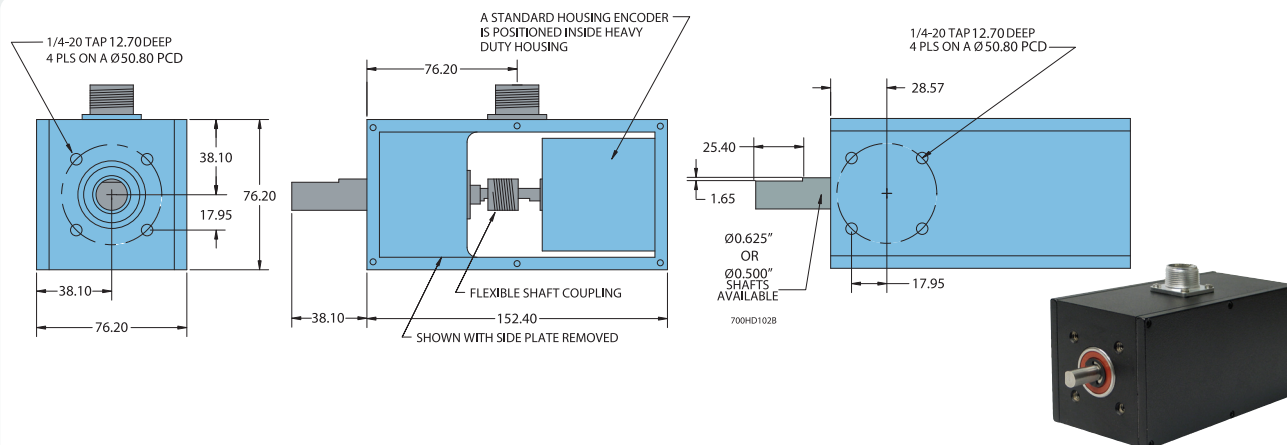
Max Speed	6000 RPM
Shaft Size	0.500" or 0.625"
Rotation	Either direction
Radial Loading	43 Kg maximum
Axial Loading	27 Kg maximum
Bearings	Precision ABEC ball bearings
Starting Torque	0.0211 Nm IP65 Rated
Mounting	Tapped holes face and base
Weight	1.78 Kg

Model 711/716 Cube Housings & Brackets

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Ultra Heavy Duty Cube Housing (711UH/716UH)

(Continued)



Pivot Brackets

700 Series Pivot Brackets

Gravity Driven Pivot Brackets allow an Encoder and Measuring Wheel to adjust to variations in the material surface being measured. A spring loaded version is also available

These Brackets replace our original Pivot brackets (140039 & 140040) & are for Standard Cube and Industrial Cube Housing's Only

176430-01 Single Pivot Mounting Bracket

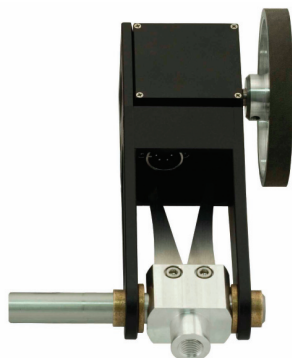
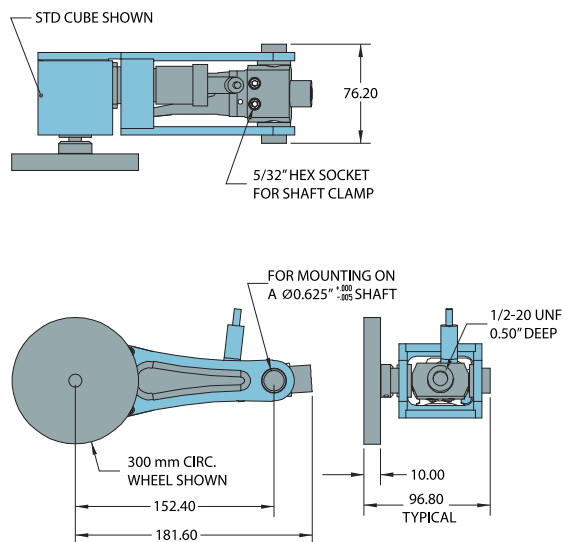
176431-01 Double Pivot Mounting Bracket

176430-02 Spring Loaded Single Pivot Mounting Bracket

176431-02

Spring Loaded Double Pivot Mounting Bracket

Single Wheel Bracket



Dual Wheel Bracket

