

# SERIES 22

# Dynapar™ brand

## “QUBE” Encoder

### Key Features

- Economical Anodized Housing
- Dual Shaft Output Option
- Up to 1270PPR with Optional Index



## SPECIFICATIONS

### STANDARD OPERATING CHARACTERISTICS

**Code:** Incremental

**Resolution:** 1 to 1270 PPR (pulses/revolution)

**Accuracy:** (Worst case any edge to any other edge)  $\pm 2.5$  arc-min.

**Format:** Two channel quadrature (AB) with optional Index (Z) and complementary outputs

**Phase Sense:** A leads B for CW shaft rotation as viewed from the shaft end of the encoder farthest from the connector or cable

**Quadrature Phasing:**  $90^\circ \pm 18^\circ$  electrical

**Symmetry:**  $180^\circ \pm 18^\circ$  electrical

**Index:**  $225^\circ \pm 90^\circ$  electrical (active high)

**Waveforms:** Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pf

### ELECTRICAL

**Input Power:** 4.5 min. to 26 VDC max. at 110 mA max., not including output loads

**Outputs:**  
7273 Open Collector: 30 VDC max., 40 mA sink max.  
7272 Push-Pull and Differential Line Driver: 40 mA sink or source

**Frequency Response:** 120 kHz min. data, 50 kHz min. Index

### CONNECTIONS

#### Mating Connector:

6 pin, style MS3106A-14S-6S (MCN-N4)

7 pin, style MS3106A-16S-1S (MCN-N5)

5 pin, style M12: Cable with connector available

8 pin, style M12: Cable with connector available

Mechanical

**Shaft Loading:** 40 lbs. radial, 30 lbs. axial

**Shaft Speed:** 6,000 RPM max.

**Shaft Tolerance:** Nominal  $-0.0003"/-0.0007"$

**Starting Torque:** 2.5 oz-in max.

**Moment of Inertia:**  $1.3 \times 10^{-4}$  oz-in-sec<sup>2</sup>

**Weight:** 14 oz. max.

### ENVIRONMENTAL

**Operating Temperature:** 0 to +70 °C;

**Storage Temperature:** -40 to +90 °C



# SERIES 22

## Ordering Information

To order, complete the model number with code numbers from the table below:

Code 1: Model	Code 2: Pulses/Rev	Code 3: Mechanical	Code 4: Output	Code 5: Electrical	Code 6: Termination
□ □ □	□ □ □ □	□	□	□	□
Ordering Information					
22 Qube Encoder, Bidirectional	0001	0360	0 3/8" Double Ended Shaft	0 Single Ended, Table 1	available when Code4 = 0, 1, 5, 6, 7 or 8: 0 5-26 VDC in, 5-26 VDC Open Collector w/2.2k pull-ups out 1 5-26 VDC in, 5-26 VDC Open Collector w/o pull-up out 2 5-26 VDC in, 5V Totem Pole out
	0010	0400	1 3/8" Single Ended Shaft	2 Differential, Table 2	
22M Metric Qube Encoder, Bidirectional	0050	0480	2 1/4" Double Ended Shaft	4 Differential, Table 4	available when Code4 = 2, 3, 4, 9 or A: 3 5-26 VDC in, 5V Line Driver out 4 5-26 VDC in, 5-26 VDC CMOS Line Driver
	0060	0500	3 1/4" Single Ended Shaft	1 Single Ended, with Index, Table 3	
	0100	0512	available when Code 1 = 22M:	available only when Code 6 is 1 to 5:	
	0120	0600	4 6mm Double Ended Shaft	3 Differential, with Index, Table 5	
	0125	0720	5 6mm Single Ended Shaft	available only when Code 6 is 6:	
	0150	0800		5 5 pin M12 connector, single ended, no index, Table 6	
	0180	0900		6 5 pin M12 connector, single ended, with index, Table 6	
	0192	1000		7 8 pin M12 connector, single ended, no index, Table 7	
	0200	1024		8 8 pin M12 connector, single ended, with index, Table 7	
	0250	1200		9 8 pin M12 connector, differential, no index, Table 8	
0256	1250		A 8 pin M12 connector, differential, with index, Table 8		
0300	1270				
					0 MS Connector 1 18" Cable 2 3' Cable 3 6' Cable 4 10' Cable 5 15' Cable 6 M12 Connector

**10 foot Cable Assemblies with MS Connector**

- 1400607-0010 6 Pin MS, Cable Assy. For Use with Single Ended Outputs
- 108241-0010 6 Pin MS, Cable Assy. For Use with Single Ended w/Index Outputs
- 1400664-0010 6 Pin MS, Cable Assy. For Use with Differential Line Driver Outputs
- 1400431-0010 7 Pin MS, Cable Assy. For Use with Differential Line Driver Outputs

**15 foot Cable Assemblies with M12 Connector**

- 112859-0015 5 Pin M12, Cable Assy. For Use with Single Ended Outputs
- 112860-0015 8 Pin M12, Cable Assy. For Use with Single Ended Outputs
- 112860-0015 8 Pin M12, Cable Assy. For Use with Differential Line Driver Outputs

**Mating Connectors (no cable)**

- 6 pin, style MS3106A-14S-6S (MCN-N4)
- 7 pin, style MS3106A-16S-1S (MCN-N5)

## ELECTRICAL CONNECTIONS

### MS Connector Accessory Cables - when Code 4= 0 to 4

**Table 1 – Current Sink Output**

Pin	Function	Wire Color Code	Cable Acc'y #14006070010 Color Code
A	Common	BLK	BLK
B	Power Source	RED	RED
C	Case (Ground)	GRN/BLK	GRN
D	Signal A	GRN	BRN
E	Signal B	ORN	ORN
F	Supply Common	BLK	BLK

**Table 2 – 7 Pin Line Driver Output**

Pin	Function	Wire Color Code	Cable Acc'y #14004310010 Color Code
A	Signal A	GRN	RED
B	Signal B	ORN	BLU
C	Signal $\bar{A}$	RED/BLK	YEL
D	Power Source	RED	WHT
E	Signal $\bar{B}$	WHT/BLK	GRN
F	Common	BLK	BLK
G	Case (Ground)	GRN/BLK	

**Table 3 – Current Sink Output w/Marker**

Pin	Function	Wire Color Code	Cable Acc'y #108241-0010 Color Code
A	Common	BLK	BLK
B	Power Source	RED	RED
C	Signal Z	WHT	GRN
D	Signal A	GRN	BRN
E	Signal B	ORN	ORN
F	Common	BLK	BLK

**Table 4 – 6-Pin Line Driver**

Pin	Function	Wire Color Code	Cable Acc'y #14006640010 Color Code
A	Common	BLK	BLK
B	Power Source	RED	RED
C	Signal A	GRN	BRN
D	Signal $\bar{A}$	RED/BLK	BRN/WHT
E	Signal B	ORN	ORN
F	Signal $\bar{B}$	WHT/BLK	ORN/WHT

**Table 5 – Cable termination Line Driver Output with Marker**

Function	Wire Color Code
Signal A	GRN
Signal B	ORN
Signal Z	WHT
Power Source	RED
Supply Common	BLK
Case (Ground)	GRN/BLK
Signal $\bar{A}$	RED/BLK
Signal $\bar{B}$	WHT/BLK
Signal $\bar{Z}$	BLU

**Cable Configuration:** PVC jacket, 105 °C rated, overall foil shield; 3 twisted pairs 26 AWG (output signals), plus 2 twisted pairs 24 AWG (input power)

### 5 & 8 Pin M12 Accessory Cables - when Code 4= 5 to 9 and A

Connector pin numbers and cable assembly wire color information is provided here for reference.

Encoder Function	Table 6 5 Pin Single Ended		Table 7 8 Pin Single Ended		Table 8 8 Pin Differential	
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color
Sig. A	4	BLK	1	BRN	1	BRN
Sig. B	2	WHT	4	ORG	4	ORG
*Sig. Z	5	GRY	6	YEL	6	YEL
Power +V	1	BRN	2	RED	2	RED
Com	3	BLU	7	BLK	7	BLK
Sig. $\bar{A}$	–	–	–	–	3	BRN/WHT
Sig. $\bar{B}$	–	–	–	–	5	ORG/WHT
*Sig. $\bar{Z}$	–	–	–	–	8	YEL/WHT

\* Index not provided on all models. See ordering information

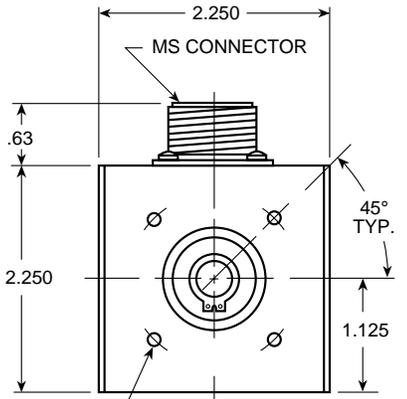
**Cable Configuration:** PVC jacket, 105 °C rated, overall foil shield; 24 AWG conductors, minimum

See “Accessories” Section for Connectors and Cable Assemblies Ordering Information

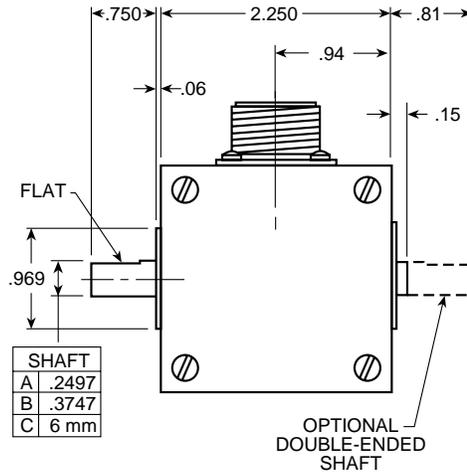
## DIMENSIONS

### MS Connector Models

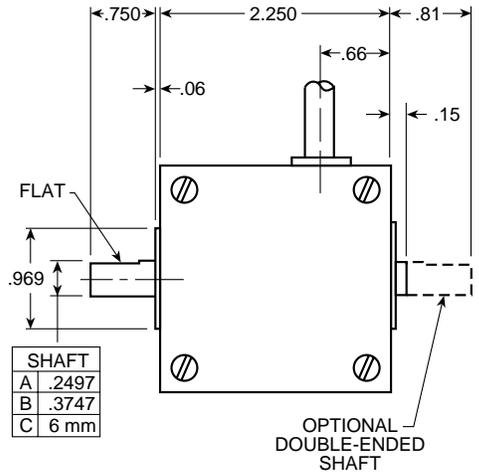
Approximate Dimensions (in inches)



6-32 UNC-2B THREADS x .187 DEEP ON 2.00 DIA. B.C., 4 HOLES ON 3 FACES (FRONT, REAR & BOTTOM).  
 FOR MODELS 22M ONLY: M3 x 0.5<sup>6H</sup> THREADS x 5mm DEEP ON A 50.8mm DIA. B.C. ON (3) FACES



### Prewired Cable Models



### M12 Connector Models

