

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) ± 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: 1.3×10^{-4} oz-in-sec²

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

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

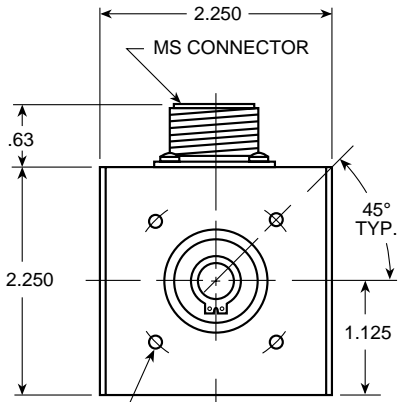
Cable Configuration: PVC jacket, 105 °C rated, overall foil shield; 24 AWG conductors, minimum

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

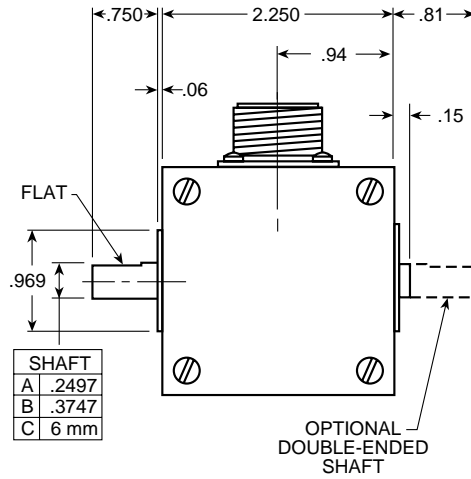
DIMENSIONS

MS Connector Models

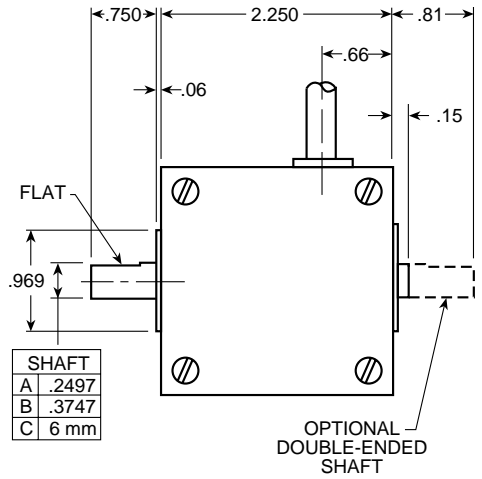
Approximate Dimensions (in inches)



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^{6H} THREADS x 5mm DEEP ON A 50.8mm DIA. B.C. ON (3) FACES



Prewired Cable Models



M12 Connector Models

