

# NexGen SERIES 22

**Dynapar™ brand**

## “QUBE” Encoder

### Key Features

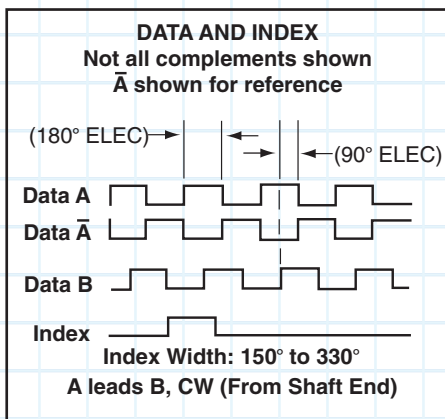
- New Phased-Array ASIC Sensor
- Double the Shaft Loading of Previous Qube
- Expanded Resolution Up to 3600 PPR
- New IP67 Sealing Option
- Unbreakable Code Disc



## SPECIFICATIONS

### STANDARD OPERATING CHARACTERISTICS

**Code:** Incremental, Optical  
**Resolution:** 1 to 3600 PPR (pulses/revolution)  
**Format:** Two channel quadrature (AB) with optional Index (Z), and complementary outputs  
**Phase Sense:** A leads B for CW shaft rotation when viewing the shaft farthest from connector or cable  
**Quadrature Phasing:**  
 For resolutions to 625 PPR: 90° ± 15° electrical;  
 For resolutions over 625 PPR: 90° ± 30° electrical  
**Symmetry:**  
 For resolutions to 625 PPR: 180° ± 18° electrical  
 For resolutions over 625 PPR: 180° ± 25° electrical  
**Index:** 150° to 330° A Leads B, CW (From Shaft End)  
**Waveforms:** Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pf



### ELECTRICAL

**Input Power:** 5-26VDC; 75 mA max., not including output loads.  
**Outputs:**  
 7272 Push-Pull: 40mA, sink or source  
 7272 Differential Line Driver: 40 mA, sink or source  
 7273 Open Collector: 40mA, sink max  
**Frequency Response:** 125 kHz (data & index)  
**Noise Immunity:** Tested to EN61326-1  
**Electrical Immunity:** Reverse polarity and short circuit protected  
**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  
**Termination:** MS Connector, M12 Connector or Cable Exit

### MECHANICAL

**Shaft Sizes:** 6mm, 1/4” or 3/8”  
**Shaft Loading:** 80 lbs. radial, 80 lbs. axial  
**Shaft Speed:** 6,000 RPM max.  
**Shaft Tolerance:** Nominal -.0003”/- .0006”  
**Starting Torque:** 2.5 oz-in max.; w/shaft seals: 4.0 oz-in max.; w/double shaft seal: 6.0 oz-in max.  
**Housing and Cover:** Aluminum  
**Shaft Material:** Stainless Steel  
**Disc Material:** Mylar  
**Weight:** 14 oz. max.

### ENVIRONMENTAL

**Operating Temperature:** -40 to +100 °C  
**Storage Temperature:** -40 to +100 °C  
**Shock:** 100Gs for 11 milliseconds duration  
**Vibration:** 5 to 2000 Hz at 20Gs  
**Humidity:** Up to 98% (non-condensing)  
**Enclosure Rating:** IP67 with shaft seals

**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	Available only when Code 1 is 22	0 Single Ended, Table 1	Available when Code 4 = 0, 1, 5, 6, 7 or 8:	0 MS Connector
	0010	0500		1 Single Ended, with Index, Table 3	0 5-26 VDC in, 5-26 VDC Open Collector w/2.2k pull-ups out	Available when Code 3 is 0, 1, 2, 3, 4 or 5
22M Metric Qube Encoder, Bidirectional	0012	0512	0 3/8" Double ended shaft	2 Differential, Table 2	1 5-26 VDC in, 5-26 VDC Open Collector w/o pull-up out	1 18" Cable
	0024	0600	1 3/8" Single ended shaft	available only when Code 6 is 1 to 5 or A to E:	2 5-26 VDC in, 5V Totem Pole out	2 3' Cable
	0025	0625	2 1/4" Double ended shaft	3 Differential, with Index, Table 5	available only when code 6 is 0:	3 6' Cable
	0035	0720	3 1/4" Single ended shaft	4 Differential, Table 4	4 5-26 VDC in, 5V Line Driver out	4 10' Cable
	0040	0800	A Same as "0" with shaft seal	available only when Code 6 is 6:	4 5-26 VDC in, 5-26 VDC CMOS Line Driver	5 15' Cable
	0050	1000	B Same as "1" with shaft seal	5 5 pin M12 connector, single ended, no index, Table 6		Available when Code 4 is 5, 6, 7, 8, 9 or A
	0060	1024	C Same as "2" with shaft seal	6 5 pin M12 connector, single ended, with index, Table 6		6 M12 Connector
	0100	1200	D Same as "3" with shaft seal	7 8 pin M12 connector, single ended, no index, Table 7		Available when Code 3 is A,B,C,D,E or F
	0120	1250	Available only when Code 1 is 22M	8 8 pin M12 connector, single ended, with index, Table 7		A 18" Sealed Cable
	0125	1270	4 6mm Double ended shaft	9 8 pin M12 connector, differential, no index, Table 8		B 3' Sealed Cable
	0150	1440	5 6mm Single ended shaft	A 8 pin M12 connector, differential, with index, Table 8		C 6' Sealed Cable
	0192	2000	E Same as "4" with shaft seal			D 10' Sealed Cable
0200	2048	F Same as "5" with shaft seal			E 15' Sealed Cable	
0240	2500					
0250	2540					
0256	2600					
0300	3600					

**Cable Assemblies with MS Connector\***

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

**Cable Assemblies with M12 Connector\***

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

\*Note: Standard cable length is 10 feet but may be ordered in any length in 5 foot increments. For example, for a 20 foot cable, replace XXXX with -0020.

**Mating Connectors (no cable)**

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



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## ELECTRICAL CONNECTIONS

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

Connector & mate/accessory cable assembly pin numbers and wire color information is provided here for reference.

Table 1 - Current Sink Output		
Encoder Function	Cable # 1400607XXXX 6 Pin Single Ended	
	Pin	Wire Color Code
Common	A	BLK
Power Source	B	RED
Case	C	GRN
Signal A	D	BRN
Signal B	E	ORG
Common	F	BLK

Table 2 - 7 Pin Line Driver Output		
Encoder Function	Cable # 1400431XXXX 7 Pin Differential Line Driver	
	Pin	Wire Color Code
Signal A	A	RED
Signal B	B	BLU
Signal A̅	C	YEL
Power Source	D	WHT
Signal B̅	E	GRN
Common	F	BLK
Case	G	—

Table 3 - Current Sink Output w/ Marker		
Encoder Function	Cable # 108241-XXXX 6 Pin Single Ended w/ Index Outputs	
	Pin	Wire Color Code
Common	A	BLK
Power Source	B	RED
Signal Z*	C	GRN
Signal A	D	BRN
Signal B	E	ORG
Common	F	BLK

Table 4 - 6 Pin Line Driver		
Encoder Function	Cable # 1400664XXXX 6 Pin Single Ended	
	Pin	Wire Color Code
Common	A	BLK
Power Source	B	RED
Signal A	C	BRN
Signal A̅	D	BRN/WHT
Signal B	E	ORG
Signal B̅	F	ORG/WHT

Table 5 - Cable Termination Line Driver Output with Marker	
Encoder Function	Wire Color Code
Signal A	BRN
Signal B	ORG
Signal Z*	YEL
Power Source	RED
Com	BLK
Case	GRN
Signal A̅	BRN/WHT
Signal B̅	ORG/WHT
Signal Z*	YEL/WHT

### \*\*\*\*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		Table 7		Table 8	
	Cable # 112859-XXXX 5 Pin Single Ended		Cable # 112860-XXXX 8 Pin Single Ended		Cable # 112860-XXXX 8 Pin Differential	
	Pin	Wire Color Code	Pin	Wire Color Code	Pin	Wire Color Code
Signal A	4	BLK	1	BRN	1	BRN
Signal B	2	WHT	4	ORG	4	ORG
Signal Z*	5	GRY	6	YEL	6	YEL
Power +V	1	BRN	2	RED	2	RED
Com	3	BLU	7	BLK	7	BLK
Signal A̅	—	—	—	—	3	BRN/WHT
Signal B̅	—	—	—	—	5	ORG/WHT
Signal Z̅*	—	—	—	—	8	YEL/WHT

#### NOTES:

- 1) Cable Configuration (Tables 1 and 3 - 5): PVC jacket, 105° C rated, overall foil shield; 3 twisted pairs 26 AWG (output signals), plus 2 twisted pairs 24 AWG (input power)
- 2) Cable Configuration (Table 2): PVC jacket, 105°C rated, overall foil shield; 22 AWG conductors, minimum
- 3) Cable Configuration (Tables 6 - 8): PVC jacket, 105 °C rated, overall foil shield; 24 AWG conductors, minimum
- 4) Standard cable length is 10 feet but may be ordered in any length in 5 foot increments. For example, for a 20 foot cable, replace -XXXX with -0020
- 5) \* Index not provided on all models. See ordering information.
- 6) "MS" Type mating connectors and pre-build cables are rated NEMA 12
- 7) "M12" Cable assemblies are rated IP67

**DIMENSIONS** inches [mm]

