

MX21 INSTA-MOUNT™ | SERIES

MODULAR INCREMENTAL ROTARY OPTICAL ENCODER



Introduction

By the time you have read this first sentence, you could have installed the model MX21 INSTA-MOUNT™ modular optical encoder. In addition to its quick and easy installation, the MX21 is designed to operate with jitter-free output signals without tight controls on shaft endplay, runout, or perpendicularity. The new INSTA-MOUNT™ encoder is capable of operating within a temperature range of -10°to +70°C, requiring less than 30 milliamps of L.E.D. current, without degradation of output signals and is short circuit protected.

The MX21 is perfectly suited for motor manufacturers and other high volume OEMs. The INSTA-MOUNTTM Series encoder offers 5V TTL compatible quadrature outputs with index and complements as options. Axial shaft movements during operation, of ±0.010", will not adversely affect the output signals. Shaft runouts of 0.005" TIR can also be absorbed by this device without affecting output signal performance.



Mechanical

Dimensions	See Figure 1
Weight	2.1 oz. (Approx.)
Moment of Inertia	2.6 x 10 ⁻⁵ oz in sec ²
Bore Size	see "Ordering Options"

Motor Interface

Mount Holes	#4-40 or M3 x 0.5 @ 180° on 1.812" dia. B.C.
Mount Hardware	2 socket head cap screws
Perpendicularity Shaft to Mount	0.002" TIR
Shaft Runout	0.005" max (each 0.0001 degrades accuracy by 0.5 arc minutes)
Shaft Endplay Dynamic or Static	±0.010"
Shaft Finish	16 micro inches or better. End must be chamfered or rounded
Shaft Tolerance	nominal -0.0002"/-0.0007"
Shaft Length	0.56" minimum (remove cover button for motor through-shafts)



Electrical

Code	Incremental	
Pulses per revolutions (PPR)	See Ordering Options	
Index Pulse Options	MX212: No Index MX213, MX216: U = Ungated Index, G = Gated Index	
Supply Voltage	5 volts ±5% @ 80mA max.	
Output Format	MX212: Dual channel in quadrature MX213: Dual channel in quadrature with index MX216: Dual channel in quadrature with index and complements	
Output Type	MX212 & 213: square wave TTL. 16mA sink 500ΩA source. Short circuit protected MX216: TTL differential line driver (26LS31 or equiv.) should be terminated into a line receiver (26LS32, or equivalent circuit)	
Frequency Response	Frequency (kHz) = (RPM X PPR)/60	
Rise Time	1.0μ sec. max.	

Enviromental

Storage: -40°C to +125°C

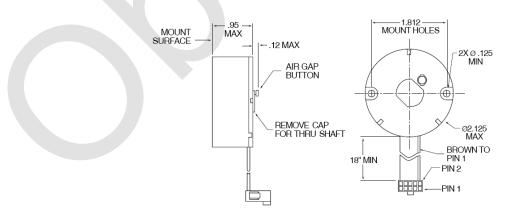
Terminations

Ribbon	28 AWG flat ribbon cable with 10 position connector Berg P/N 65863-165 or equiv. Mates with Berg P/N65863-165 or equiv) (mating connector not provided)
Round Cable	28AWG 8 Conductor shielded cable

^{*}NOTE: See pinout tables, under "Terminations" section.

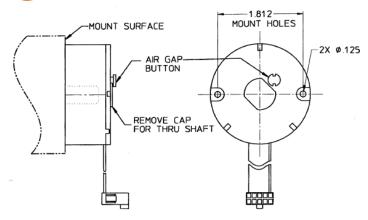


Fig.1









Preparation

- 1. Inspect motor interface per MX21 Data Sheet or specification drawing.
- 2. Motor shaft must be free of burrs & other surface defects.

Installation

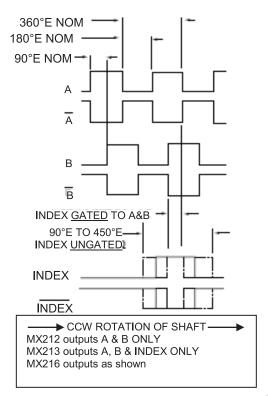
- 1. Motor shaft should NOT be rotating during initial encoder installation.
- 2. Hold encoder perpendicular to motor shaft. Guide the encoder onto the motor shaft, pushing encoder STRAIGHT on until it is flush against the mount surface. Do NOT rock side to side.
- 3. Install two #4-40 mount screws. Do not fully tighten at this point. (Note: A thread sealant should be applied to the screw threads)
- 4. Rotate the motor shaft (300 RPM, minimum). Press the air-gap button until it bottoms to the top of the encoder momentarily, then release. CAUTION: DO NOT press air-gap button while motor shaft is stationary. Button should only be pressed for one or two seconds while shaft is rotating.
- 5. Tighten mounting screws fully. (recommended torque is 30 to 40 ounce inches.)
- 6. This completes the mechanical installation. Proceed with electrical connections as indicated on product data sheet or specification drawing.

Removal

- 1. Motor shaft may be stationary or rotating up to 1000 RPM during encoder removal.
- 2. Remove two mounting screws.
- 3. Grasp encoder firmly and pull STRAIGHT off of the motor shaft. Do NOT rock side to side.



OUTPUT WAVEFORM





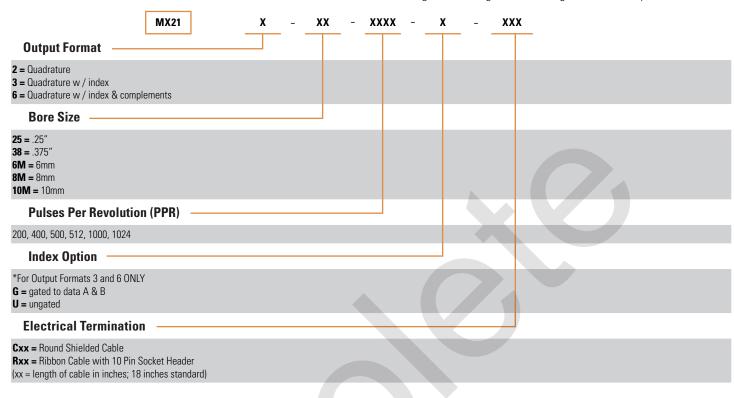
Pinout MX212/213			
PIN#	Signal	PIN#	Signal
1	Channel A	6	NC
2	+5 volts	7	NC
3	Ground	8	Channel B
4	NC	9	NC
5	NC	10	Index (213)

Pinout MX216			
PIN#	Signal	PIN#	Signal
1	NC	6	Channel A
2	+5 volts	7	Channel B
3	Ground	8	Channel B
4	NC	9	Index
5	Channel \overline{A}	10	Index

Color Codes		
Red	+5 volts	
Black	Ground	
White	А	
Green	В	
Orange	Index	
Blue	Ā	
White/Black	B	
Red/Black	Index	

Example: MX213-38-512-G-R18

Use this diagram, working from left to right to construct your model number



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