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-MOUNT™ 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.

SPECIFICATIONS

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

Temperature	Operating: -10°C to +70°C Storage: -40°C to +125°C

Terminations

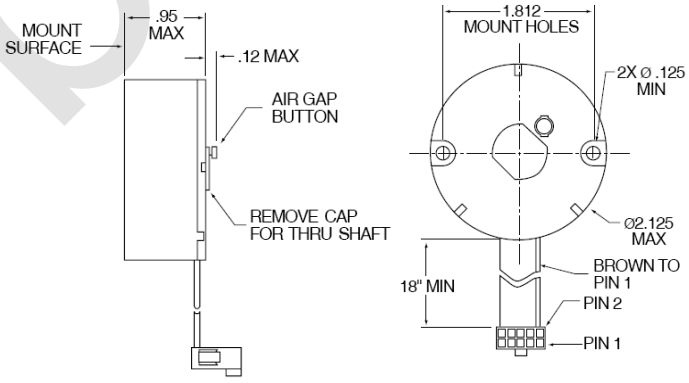
Ribbon	28 AWG flat ribbon cable with 10 position connector Berg P/N 65863-165 or equiv. Mates with Berg P/N65863-165 or equiv) (mating connector not provided)
Round Cable	28AWG 8 Conductor shielded cable

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

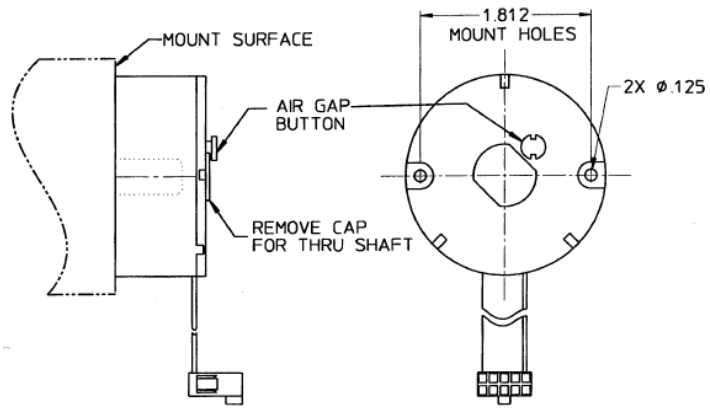
DIMENSIONS

All dimensions are in: inches .xx = ±0.02, .xxx = ±0.005

Fig.1



INSTALLATION INSTRUCTIONS



Preparation

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

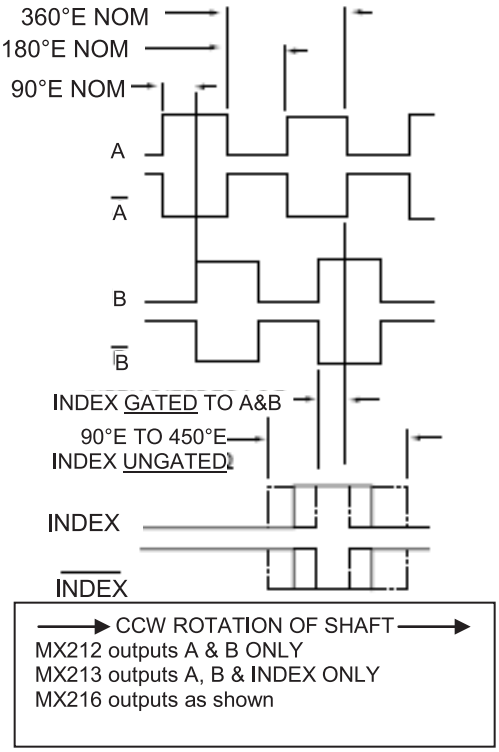
Installation

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



TERMINATIONS

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 $\overline{B}$
3	Ground	8	Channel B
4	NC	9	$\overline{Index}$
5	Channel $\overline{A}$	10	Index

Color Codes	
Red	+5 volts
Black	Ground
White	A
Green	B
Orange	Index
Blue	$\overline{A}$
White/Black	$\overline{B}$
Red/Black	$\overline{Index}$

ORDERING OPTIONS

Example : MX213-38-512-G-R18

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

MX21 X - XX - XXXX - X - XXX

Output Format

2 = Quadrature
3 = Quadrature w / index
6 = Quadrature w / index & complements

Bore Size

25 = .25"
38 = .375"
6M = 6mm
8M = 8mm
10M = 10mm

Pulses Per Revolution (PPR)

200, 400, 500, 512, 1000, 1024

Index Option

*For Output Formats 3 and 6 ONLY
G = gated to data A & B
U = ungated

Electrical Termination

Cxx = Round Shielded Cable
Rxx = Ribbon Cable with 10 Pin Socket Header
(xx = length of cable in inches; 18 inches standard)

Mailing Address: Sensata Technologies, Inc., 529 Pleasant Street, Attleboro, MA 02703, USA.

CONTACT US

Americas
+1 (800) 350 2727
sales.beisensors@sensata.com
Europe, Middle East & Africa
+33 (3) 88 20 8080
position-info.eu@sensata.com
Asia Pacific
sales.isasia@list.sensata.com
China +86 (21) 2306 1500
Japan +81 (45) 277 7117
Korea +82 (31) 601 2004
India +91 (80) 67920890
Rest of Asia +886 (2) 27602006 ext 2808

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