MX15 Series

By the time you have read this first sentence, you could have installed BEI's model MX15 INSTA-MOUNT™ modular optical encoder. In addition to its quick and easy installation, the MX15 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 MX15 is perfectly suited for motor manufacturers and other high volume OEMs.

BEI's 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.

Standard Features

- Resolutions to 1024 PPR

- Quick and easy installation

- Tolerant of axial shaft movement often associated with less expensive motors

- Jitter-free outputs

- Index options

- Increased MTBF (lower component count)

- 26LS31 line driver output from MX156

- High Frequency response

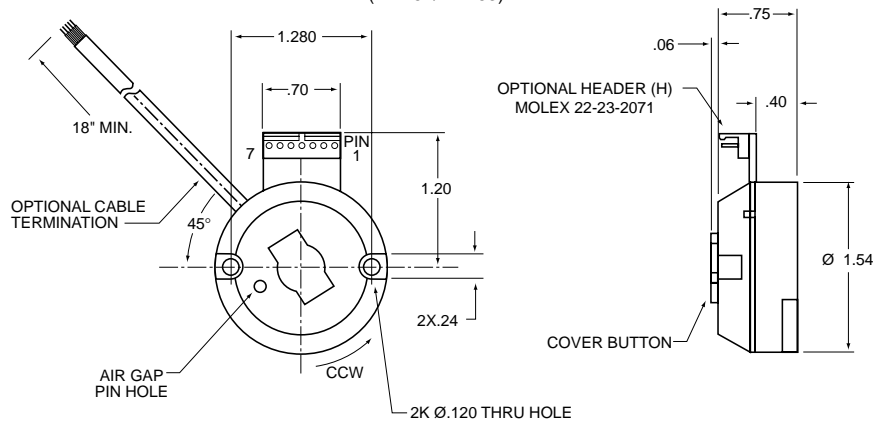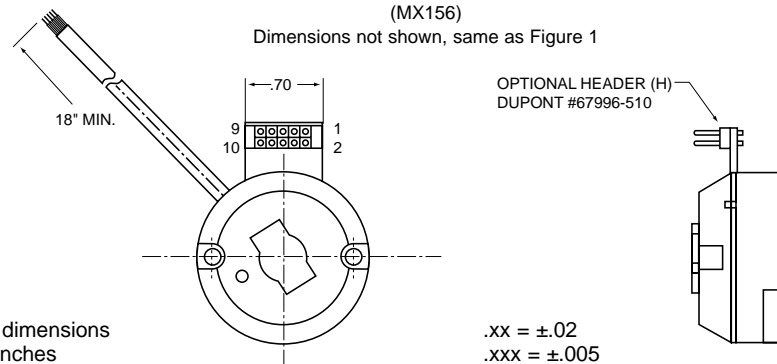- 2-year warranty

Figure 1
(MX152/MX153)

Figure 2
(MX156)
Dimensions not shown, same as Figure 1

All dimensions in inches

.xx = ±.02
.xxx = ±.005

Performance Specifications

Mechanical

Dimensions	see Figure 1
Weight	2.0 oz.
Moment of Inertia	2.6×10^{-5} oz in sec^2
Bore Size	see "Ordering Information"

Motor Interface

Mount Holes	#2-56 threads @ 180° on 1.280 dia. B.C.
Mount Hardware	#2-56 x 3/4 in. long (provided)
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	±0.005"
Shaft Finish	16 microinches or better End must be chamfered or rounded
Shaft Tolerance	0.0002"/-0.0007" (e.g. Ø.2493/.2498)
Shaft Length	0.45" minimum (remove cover button for motor through-shafts)

Electrical

Code	incremental
Pulses per Revolution	see "Ordering Information"
Index Pulse Options (no index on MX152)	ungated index (U) gated index (G)
Supply Voltage	5 volts ±5% @ 80mA max.
Output Format (MX152 & MX153)	dual channel quadrature and index (no index on MX152)
Output Format (MX156)	dual channel quadrature and index with complements
Output Type (MX152 & MX153)	square wave TTL. 16mA sink 500µA source. Short circuit protected
Output Type (MX156)	TTL differential line driver (26LS31 or equiv.) should be terminated into a line receiver (26LS32, or equivalent circuit)
Frequency Response	see graph: Fig. 3
Rise Time	1.0µsec. max.

Environmental

Temperature	operating: -10°C to +70°C storage: -40°C to +125°C
Enclosure	unsealed housing unit must be protected from harsh environments

Termination

Terminal Board (Header)
(MX152 & MX153)

Pinout

Pin #	Signal	Pin #	Signal
1	N/C	5	data B
2	index (MX153)	6	data A
3	N/C	7	ground
4	+5 volt		

(MX156)

Pinout

Pin #	Signal	Pin #	Signal
1	+5 volt	6	data $\overline{A}$
2	+5 volt	7	ground
3	index	8	ground
4	index	9	data B
5	data A	10	data $\overline{B}$

Round Shielded Cable
(MX152 & MX153)

Color Code

Color	Function	Color	Function
Red	+5 volt	Green	data B
Black	ground	Orange	index (MX153)
White	data A		

(MX156)

Color Code

Color	Function	Color	Function
Red	+5 volt	Green	data B
Black	ground	Wht/Blk	date $\overline{B}$
White	data A	Orange	index
Blue	data $\overline{A}$	Red/Blk	$\overline{index}$

Figure 3

$$KHz = \frac{RPM \times PPR}{60}$$
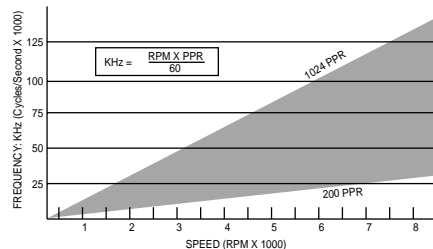
Ordering Information

MX15 X - XX - XXXX - X - X

- Basic Model No.
- Output Format
  - 2 = Quadrature
  - 3 = Quadrature w/index
  - 6 = Quadrature w/index & complements
- Bore Size
  - 25-.25", 38-.375"
  - 6M-6mm, 8M-8mm
- Pulses Per Revolution (PPR)
  - 500, 512, 1000, 1024
- Index Option
  - G = gated to data A & B
  - U = ungated
- Electrical Termination
  - T = terminal board
  - H = terminal board w/header
  - P = round shielded cable

EXAMPLE: MX153-25-500-U-P

Output Wave Form

360°E NOM.
180°E NOM.
90°E NOM.

A
$\overline{A}$
B
$\overline{B}$

INDEX GATED TO A & B

90°E TO 450°E INDEX UNGATED

INDEX
$\overline{INDEX}$

CCW ROTATION OF SHAFT

- ■ MX152 OUTPUTS A & B ONLY
- ■ MX153 OUTPUTS A, B & INDEX ONLY
- ■ MX156 OUTPUTS AS SHOWN

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Specifications subject to change without notice. Printed in U.S.A.   BE0025-MX15-1001