Micro Motor Encoder

Product ID | E16 »



Features of the E16 Micro Motor Encoder

- Miniature 16 mm kit version for mounting on a motor or other shaft
- Supports 1.5 mm (0.059 in.) and 2 mm (0.079 in.) shaft sizes
- For NEMA 6 and larger motors
- 10 Resolutions from 250 to 4,096 CPR (1,000 to 16,384 PPR)
- A/B/Index quadrature output
- Push-on hub for quick assembly
- Cable with polarized connector (sold separately)

Description

The E16 micro motor encoder is only 16 mm in diameter and mounts directly to a motor or other rotating shaft. This incremental encoder uses a specially patterned optical disk on a precision-machined aluminum hub.

RoHS COMPLIANT

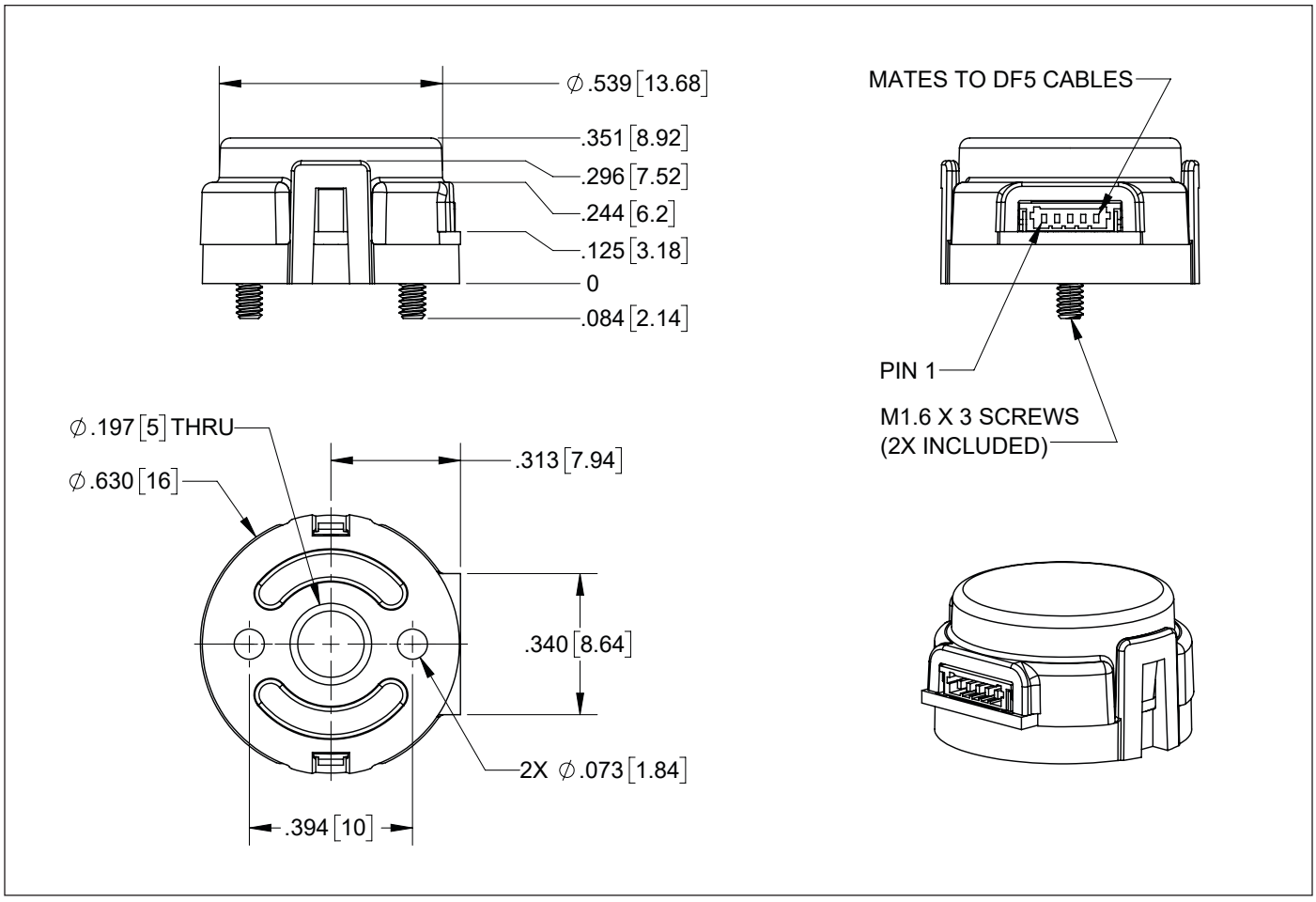
This disk, in combination with a custom detector, creates a system highly tolerant to mechanical misalignment. A push-on hub design and a robust, glass-filled polymer housing provide easy installation in space-limited applications.

The E16 optical rotary encoder offers 10 resolutions and compatibility with two shaft sizes (1.5 mm and 2.0 mm). It comes standard with a two-channel quadrature output with index.

This optical rotary encoder is designed for use with a polarized connector. After making each selection in the Product Configurator, compatible cables will be displayed below and must be purchased separately.

Please Note: Due to the E16's design, it is recommended for use as a one-time installation.

Mechanical Drawings



E16 Micro Motor Encoder

Specifications

Environmental

Parameter	Value	Units
Operating Temperature	-40 to 100	C
Electrostatic Discharge, IEC 61000-4-2	± 12	kV
Vibration (10Hz to 2kHz, sinusoidal)	20	G
Shock (6 milliseconds, half-sine)	75	G

Mechanical

Parameter	Value	Units
Max. Shaft Axial Play	±0.010	in.
Max. Shaft Runout	0.002 T.I.R.	in.
Max. Acceleration	250000	rad/sec²
Maximum RPM, CPR = 250/500/1000/2000	48000	RPM
Maximum RPM, CPR = 256/512/1024/2048	46875	RPM
Maximum RPM, CPR = 4000	27750	RPM
Maximum RPM, CPR = 4096	27099	RPM
Codewheel Moment of Inertia	2.8×10^{-7}	oz-in-s²
Mounting Screw Size Default (D-option base)	M1.6 x 3	mm
Screw Bolt Circle Diameter	10 ±0.13	mm
Minimum Shaft Length (1)	6	mm
Maximum Shaft Length (1)	7.75	mm
Mounting Screw Torque	1-2	in-lbs
	Technical Bulletin TB1001 - Shaft and Bore Tolerances	*Download*(1)

(1) Including axial play.

Specifications

Electrical

Parameter	Min.	Typ.	Max.	Units	Notes
Supply Voltage	4.5	5.0	5.5	V	
Supply Current		18	26	mA	no load
Low-level Output		 0.1	0.4	V V	I_{OL}= 4 mA, Vcc = 5V no load
High-level Output	4.7	 4.9		V V	I_{OH}= 4 mA, Vcc = 5V no load
Output Rise Time		80	135	ns	no load
Output Fall Time		80	135	ns	no load
Maximum Output Frequency 250/256 CPR 500/512 CPR 1,000/1,024 CPR 2,000/2,048 CPR 4,000/4,096 CPR	 0.2 0.4 0.8 1.6 1.85			 MHz MHz MHz MHz MHz	

Phase Relationship

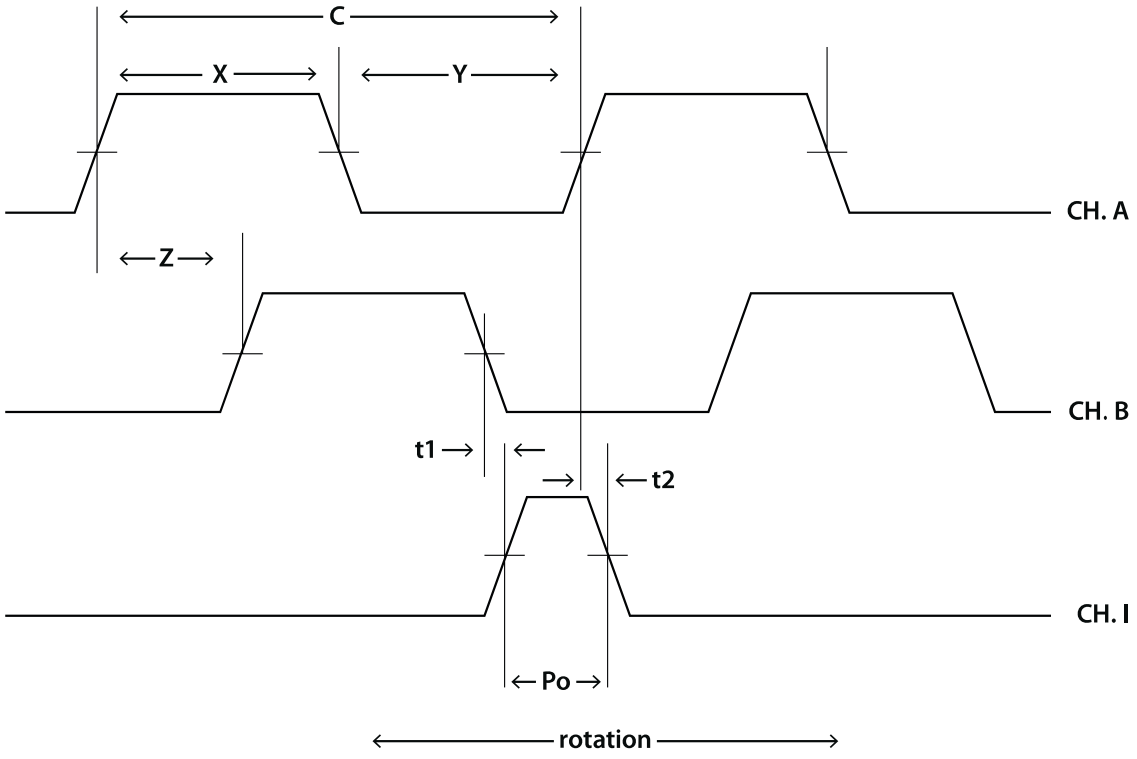
- Specifications apply over the entire operating temperature range.
- Values are for the worst error over full rotation.
- Refer to the timing diagram below.

Parameter	Symbol	Min.	Typ.	Max.	Units
Symmetry	X, Y	150	180	210	°e
Quadrature	Z	60	90	120	°e
Index Pulse Width	Po	60	90	120	°e
Ch. I Rise After Ch. B or Ch. A Fall	t1		10		ns
Ch. I Fall After Ch. B or Ch. A Rise	t2		10		ns

Specifications

Phase Relationship

Timing Diagram



A leads B for clockwise shaft rotation, B leads A for counter clockwise shaft rotation viewed from the cover side of the encoder.

Pin-Outs

Pin	Description
1	Ground
2	Index
3	A channel
4	+5VDC power
5	B channel

Specifications

Accessories

1. Centering Tool*

Part #: CTOOL-E16-(Shaft Diameter)
Description: This reusable tool is used to accurately center the E16 base on the shaft.

2. Spacer Tool*

Part #: SPACER-E16
Description: This reusable tool is used to properly space the code-wheel from the encoder.

*Both the **CTOOL** and **SPACER-E16** tools are included with all packaging options.

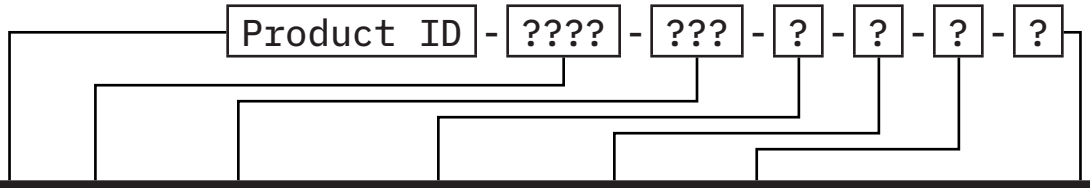
3. SCREWS

Part #: SCREW-M16-3MM-PH
Description: Pan Head, Philips M1.6-0.35, length 3mm.
Use: Base Mounting
Quantity Required: 2
Screws are included

Notes

- Cables and connectors are not included and must be ordered separately.
- US Digital® warrants its products against defects in materials and workmanship for two years. See complete *warranty*(2) for details.

Part Number Guide and Configuration Options



E16	CPR	Bore Size	Output	Cover	Base	Packaging
	250 256 500 512 1000 1024 2000 2048 4000 4096	059 (1.5mm) 079 (2.0mm)	**S** (Single-Ended)	**D** (Default)	**D** (Default)	Bulk (**B**) - Includes one centering and spacer tool per order, plus an extra set per 100 encoders. Individual (**1**) - Includes one centering and spacer tool per order, plus an extra set per 100 encoders. Individual (**2**) - Includes one centering and spacer tool per encoder.

PLEASE NOTE: This chart is for informational use only. Certain product configuration combinations are not available. Visit the *E16 product page*[3] for pricing and additional information.

Reference Links

(1) Technical Bulletin TB1001 - Shaft and Bore Tolerances

(2) Legal Terms and Conditions, Warranty

(3) E16 Micro Motor Encoder

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