E8T Features

- Kit version for mounting on a motor or other shaft
- Supports 10 shaft sizes (3 to 8 mm and 1/8 to 3/8 in.)
- For NEMA 11-23 and larger motors
- 9 Resolutions from 180 to 720 CPR (720 to 2,880 PPR)
- Single-ended or optional Differential output
- Choice of three base styles and two cover options
- Push-on hub for quick assembly
- High retention connector/cable (sold separately)

US Digital E8T Motor Encoder Description

The US Digital E8T miniature motor encoder mounts directly to a motor or other rotating shaft. This incremental encoder uses a specially patterned optical disk on a precision-machined aluminum hub.

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 E8T mini motor encoder offers 9 available resolutions and compatibility with 10 shaft sizes, 3 base configurations, and 2 cover styles, enabling it to fit a wide range of applications. Users can choose between single-ended or differential outputs.

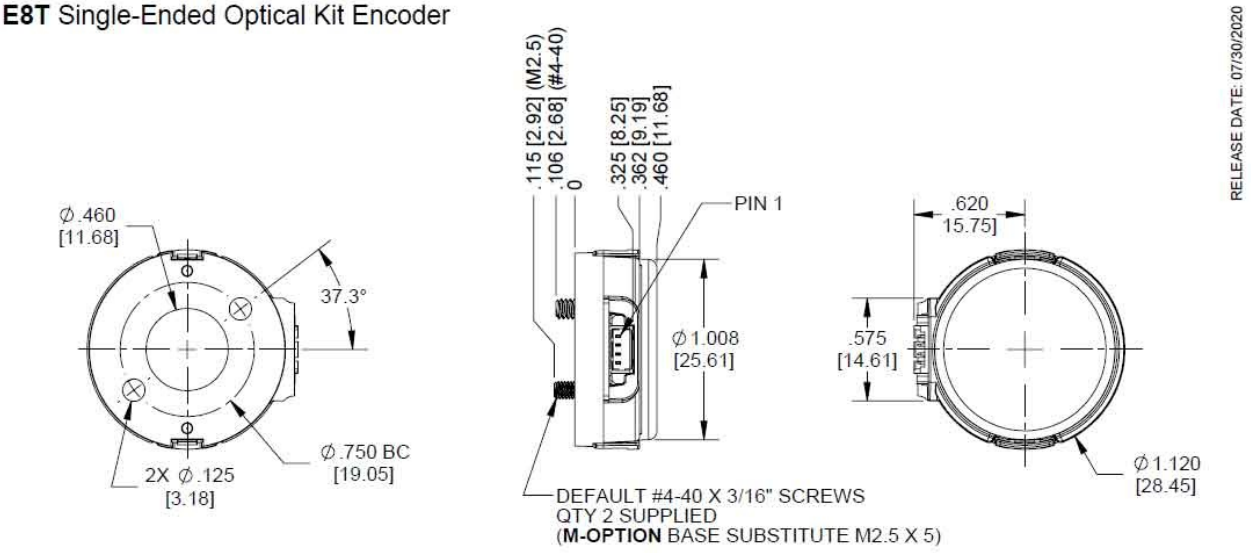
This optical encoder is designed for use with a high-retention connector. After making each selection in the Product Configurator, compatible cables and connectors will be displayed below and must be purchased separately.

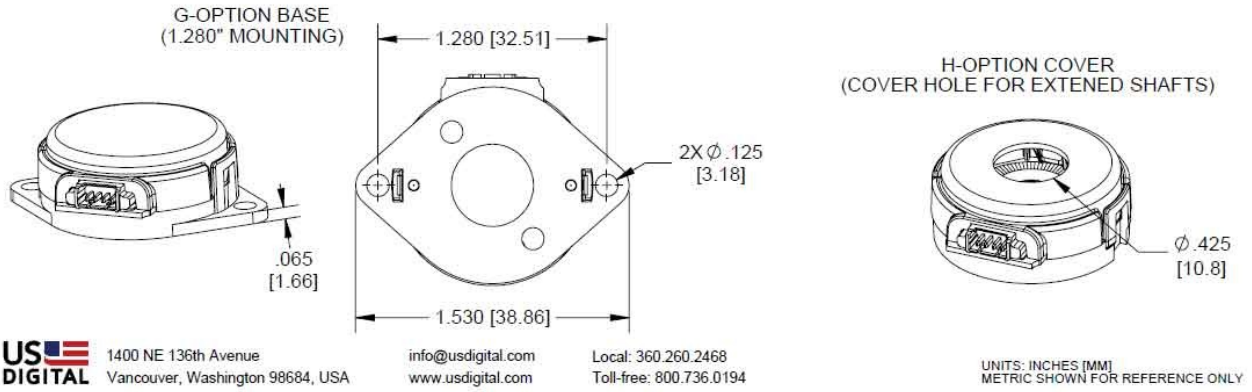
Please Note: Due to the E8T's design, it is recommended for use as a one-time installation.

Mechanical Drawings

E8T Single-Ended Optical Kit Encoder

RELEASE DATE: 07/30/2020





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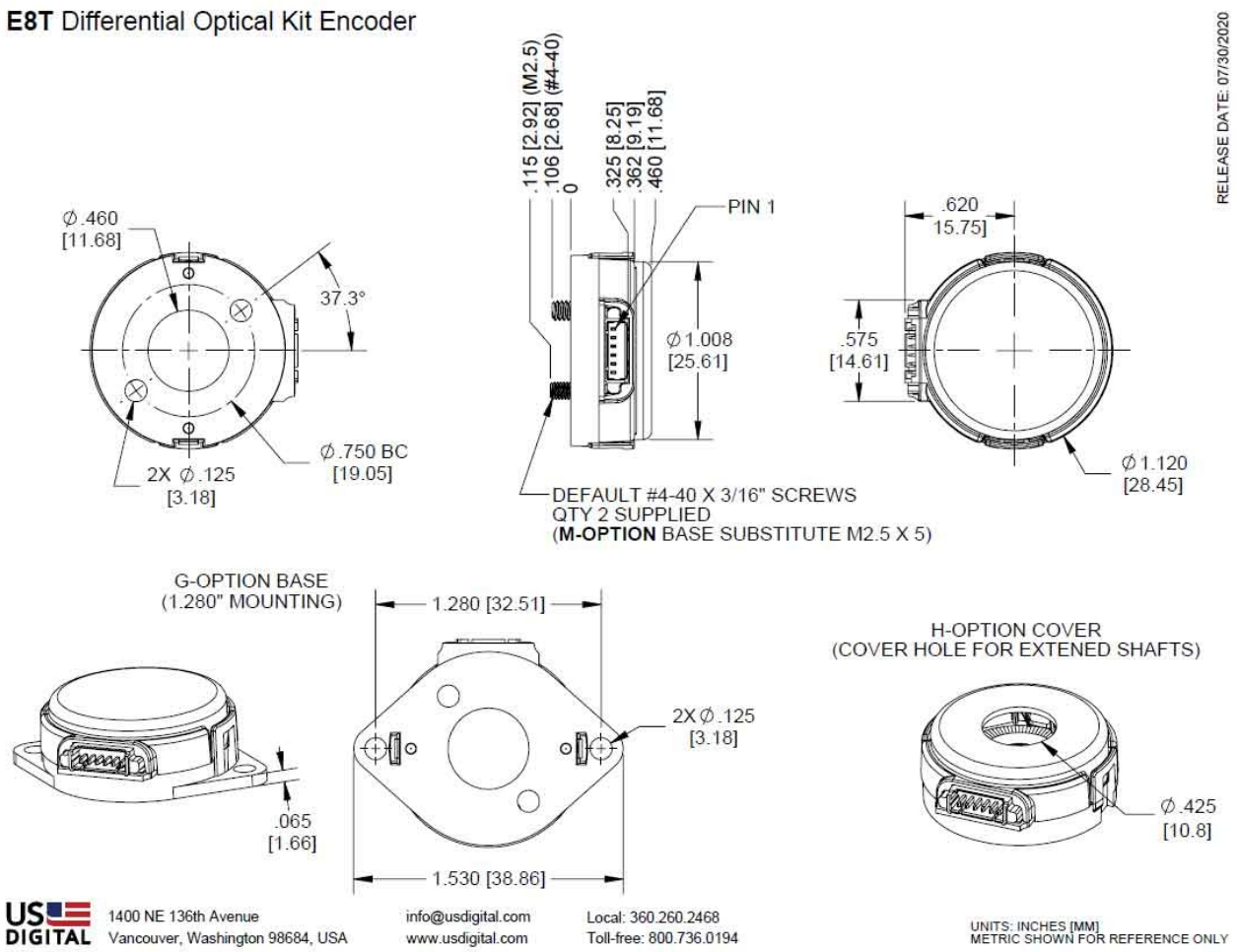
UNITS: INCHES [MM]
METRIC SHOWN FOR REFERENCE ONLY



Specifications

ENVIRONMENTAL

PARAMETER	VALUE	UNITS
Operating Temperature	-20 to 100	C
Electrostatic Discharge, IEC 61000-4-2 Single-ended (-S option) Differential (-D option)	 ± 12 ± 7	 kV
Vibration (10Hz to 2kHz, sinusoidal)	20	G
Shock (6 milliseconds, half-sine)	75	G

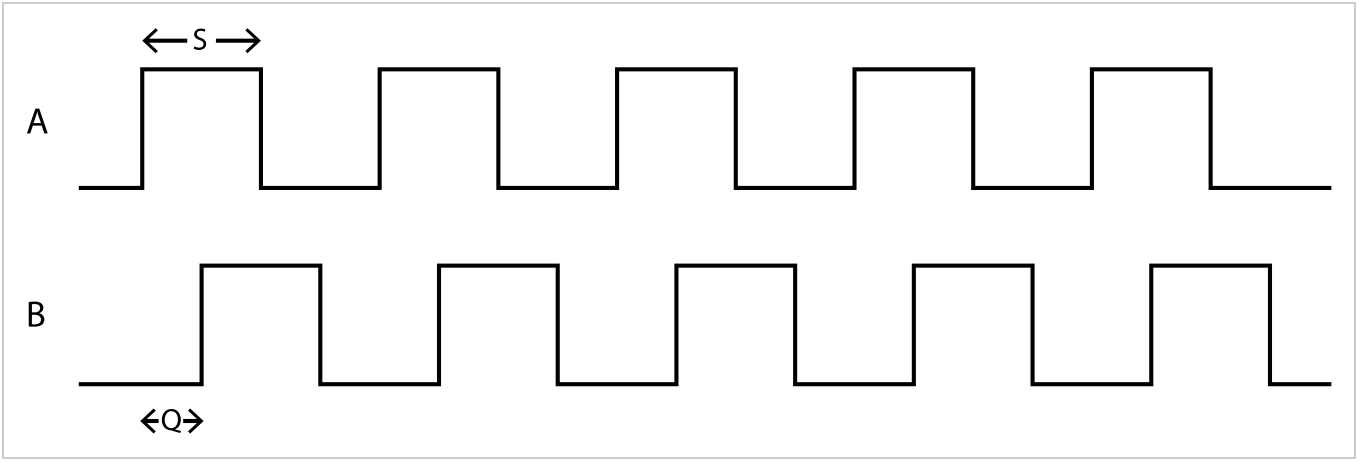
MECHANICAL

PARAMETER	VALUE	UNITS
Max. Shaft Axial Play	± .010	in.
Max. Shaft Runout	0.002 T.I.R.	in.
Max. Acceleration	250000	rad/sec²
Maximum RPM (1) Maximum A/B Frequency e.x. CPR = 200, Max. RPM = 30000	minimum value of ((6 x 10^6)/CPR) and (60000) 100	RPM kHz
Codewheel Moment of Inertia	1.789 x 10^-6	oz-in-s²
Mounting Screw Size Default (D-option), 1.28" base (G-option) Metric (M-option)	 #4-40 x 3/16 M2.5 x 5	 in. mm
Screw Bolt Circle Diameter Default (D-option), Metric (M-option) 1.28" base (G-option)	 0.75 ±0.005 1.28 ±0.005	 in.
Minimum Shaft Length (2)	0.295	in.
Maximum Shaft Length (2)	0.400 (D option) / no limit (H option)	in.
Mounting Screw Torque	2-3	in-lbs
Technical Bulletin TB1001 - Shaft and Bore Tolerances		Download *(https://www.usdigital.com/media/yyvb4qsy/tb_1001.pdf)*

(1) 60000 RPM is the maximum rpm due to mechanical considerations. The maximum RPM due to the module's maximum frequency response is dependent upon the module's resolution (CPR).

(2) Including axial play.

PHASE RELATIONSHIP



PARAMETER	MIN.	TYP.	MAX.	UNITS
Symmetry, S	105	180	255	electrical degrees
Quadrature Delay, Q	30	90	150	electrical degrees

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

(2) Typical values represent the encoder performance at typical mounting alignment, whereas the maximum values represent the encoder performance across the range of recommended mounting tolerance.

SINGLE-ENDED ELECTRICAL

SPECIFICATIONS	MIN.	TYP.	MAX.	UNITS	NOTES
Supply Voltage	4.5	5.0	5.5	V	
Supply Current		25	30	mA	no load
Low-level Output			0.4	V	I_{OL} = 8 mA
		0.035		V	no load
High-level Output	2.4			V	I_{OH} = -8 mA
		4.0		V	no load
Output Rise Time		100		ns	no load
Output Fall Time		50		ns	no load

DIFFERENTIAL ELECTRICAL

SPECIFICATIONS	MIN.	TYP.	MAX.	UNITS	NOTES
Supply Voltage	4.5	5.0	5.5	V	
Supply Current		27	32	mA	no load
Differential Output Voltage High	4.75	5.0		V	Min. @ 25mA load, Typ. @ no load
Differential Output Voltage Low		0.25	0.60	V	Typ. @ no load, Max. @ 4.5mA load
Differential Output Voltage	3.0	3.8		V	RL = 100 ohm
Differential Output Rise/Fall Time			20	ns	

PIN-OUTS

4-PIN SINGLE-ENDED (1)		6-PIN DIFFERENTIAL (2)	
Pin	Description	Pin	Description
1	+5VDC power	1	Ground
2	A channel	2	A channel
3	Ground	3	A- channel
4	B channel	4	+5VDC power
		5	B channel
		6	B- channel

(1) 4-pin single-ended mating connector is CON-MIC4 *(https://www.usdigital.com/products/accessories/connectors/con-mic4/)*
(2) 6-pin differential mating connector is CON-MIC6 *(https://www.usdigital.com/products/accessories/connectors/con-mic6/)*

OPTIONS

H-OPTION (HOLE IN COVER)

The **H**-option adds a 0.425" diameter hole in the cover for the shaft to pass through.

M-OPTION (METRIC MOUNTING SCREWS WITH DEFAULT BASE)

Provides metric M2.5, length 5mm screws. When **M**-option is NOT specified the default is #4-40, length 0.188" screws. The mounting bolt circle diameter is 0.75"

G-OPTION (1.28" DIAMETER BOLT CIRCLE MOUNT)

Provides 1.28" diameter bolt circle mount in addition to 0.75" diameter bolt circle mount. Screws are #4-40, length 0.188"

ACCESSORIES

1. Centering Tool*

Part #: CTOOL - (Shaft Diameter)
Description: This reusable tool is used to accurately center the **E8T** base on the shaft.

2. Spacer Tool*

Part #: SPACER-E8T
Description: This reusable tool is used to properly gap the codewheel from the encoder sensor.

**Both the CTOOL and SPACER-E8T tools are included with all packaging options.*

3. Screws

Part #: SCREW-440-188-PH
Description: Pan Head, Philips #4-40 UNC x 3/16"
Use: Base Mounting
Quantity Required: 2
Screws are included

Part #: SCREW-M25-5MM-PH
Description: Pan Head, Phillips M2.5 x 0.45 x 5mm
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 *(https://www.usdigital.com/company/warranty)* for details.

Configuration Options

E8T	-	CPR (Cycles Per Revolution)	-	Bore Size	-	Output	-	Cover	-	Base	-	Packaging
		180		118 (*3.0mm*)		S (*Single-Ended*)		D (*Default*)		D (*Default, #4-40 x 3/16" Screws*)		Bulk (B) - Includes one centering and spacer tool per order, plus an extra set per 100 encoders.
		200		125 (*1/8"*)		D (*Differential*)		H (*Through-Hole*)		M (*Metric, M2.5 X 5MM Screws*)		Individual (1) - Includes one centering and spacer tool per order, plus an extra set per 100 encoders.
		250		156 (*5/32"*)						G (*1.28" Diameter Bolt Circle, #4-40 x 3/16" Screws*)		Individual (2) - Includes one centering and spacer tool per encoder.
		256		157 (*4.0mm*)								
		360		197 (*5.0mm*)								
		400		236 (*6.0mm*)								
		500		250 (*1/4"*)								
		512		276 (*7.0mm*)								
		720		315 (*8.0mm*)								
				375 (*3/8"*)								

PLEASE NOTE: This chart is for informational use only. Certain product configuration combinations are not available. Visit the E8T product page *(https://www.usdigital.com/products/E8T)* for pricing and additional information.