



Features

- Subminiature size, easy installation
- Single-ended or differential output option
- A and B quadrature TTL outputs
- Fits shaft diameters from 0.118" (3mm) to 0.276" (7mm)
- Accepts +/- 0.020" axial shaft play
- Off-axis mounting tolerance of 0.010"
- Count frequency from DC to 60 KHz
- 180 to 612 cycles per rev (CPR)
- 720 to 2048 quadrature states per rev.
- Single +5V supply

Description

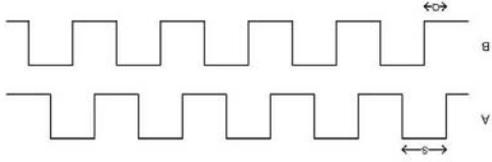
The E8P optical incremental kit encoder is designed for high volume, low cost, mid-resolution OEM motion control applications. The E8P is small enough for a NEMA Size 11 stepper motor. The E8P uses a single 5V supply and offers two TTL quadrature outputs. Single-ended or differential output options are available. A single chip reflective encoder module incorporates an LED, monolithic detector and molded lenses. The phased array technology accepts far wider mechanical tolerance and misalignment than traditional aperture type encoders. The E8P uses an innovative, patent pending, push-on codewheel that provides extremely secure and accurate, yet easy installation without set screws.

The E8P provides mounting holes for two #4-40, length .250" screws or two M2.5x4.5mm, length 6mm screws on a 0.75" diameter bolt circle. When mounting holes are not available, an option with a transfer adhesive pre-applied to the base is available. A centering tool is provided to center the base to the motor shaft during installation. The codewheel pushes on by hand using a spacer tool to set the gap in one step. The cover snaps on to complete the assembly in seconds.

The single-ended output version has a 4-pin high retention polarized connector and is designed to drive cables up to six feet long. For longer cable lengths, the differential output version (6-pin connector) is recommended to maximize noise immunity. The internal 26C31 differential line driver can source and sink 20 mA at TTL levels. The recommended receiver is industry standard 26C32. Maximum noise immunity is achieved when the differential receiver is terminated with a 110 Ω resistor in series with a .0047 μ F capacitor placed across each differential pair. The capacitor simply conserves power. Otherwise power consumption would increase by approximately 20 mA per pair, or 40 mA for 2 pairs.



Phase Relationship



Parameter	Typ.	Units
Symmetry, S	180 ± 16	electrical degrees
Quadrature Delay, Q	90 ± 12	electrical degrees

A leads B for clockwise shaft rotation, and B leads A for counterclockwise rotation viewed from the coverlabel side of the encoder.

Pin-outs

4-pin Single-ended		6-pin Differential	
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	5	B channel
6		6	B- channel



Parameter

Parameter	Value	Units
Shaft to Mounting Surface Perpendicularity	90 ± 1	deg.
Acceleration	250000 max.	rad/sec ²
Maximum RPM (1)	e.x. CPR = 720, max. rpm = 5000 e.x. CPR = 180, max. rpm = 20000	rpm
	minimum value of (3600000/CPR) and (60000)	

(1) 60000 rpm is the maximum rpm due to mechanical considerations. The maximum rpm due to the module's 60kHz maximum count frequency is (3600000/CPR).

Base Options

Base Option	Bolt Circle	Screws Included
D	0.75"	#4-40, length: 2.50" pan head philips (qty: 2)
M	0.75"	M2.5x.45mm, length: 6mm pan head philips (qty: 2)
T	n/a	none - .005" thick transfer adhesive with peel away backing mount.

The included centering tool and spacer tool are used to center the base to the motor shaft and to set the codewheel gap.

Single-ended Electrical

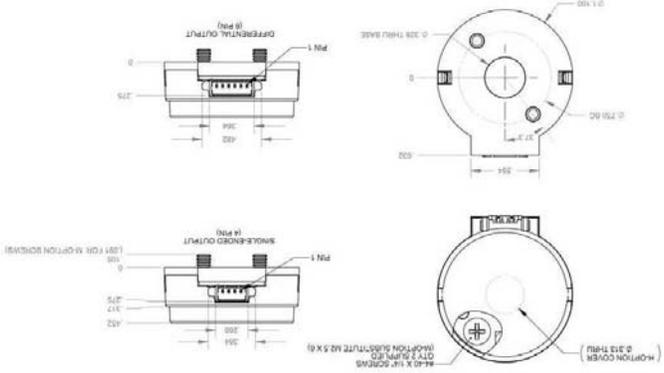
Specifications	Min.	Typ.	Max.	Units	Notes
Supply Voltage	4.5	5.0	5.5	V	
Supply Current	21	27		mA	no load
Low-level Output		0.4		V	IOL = 6 mA
High-level Output	2.4			V	IOL = -1 mA
Rise Time	500			ns	CL = 25 pF, RL = 2.7 k Ω
Fall Time	100			ns	

Differential Electrical

Specifications	Min.	Typ.	Max.	Units	Notes
Supply Voltage	4.5	5.0	5.5	V	
Supply Current	23	30		mA	
Low-level Output		0.2	0.4	V	IOL = 20mA max.
High-level Output	2.4	3.4		V	IOL = -20mA max.
Differential Output Rise/Fall Time			15	ns	

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E8P Optical Encoder



Environmental

Parameter	Value	Units
Vibration (5Hz to 2kHz)	20	G
Max. Relative Humidity	90	%
Storage Temperature	-40 to 100	C
Operating Temperature	-20 to 100	C
Electrostatic Discharge, Human Body Model	± 3	kV
Single-ended (S-option)	± 2	
Differential (D-option)	± 2	

Mechanical

Parameter	Value	Units
Moment of Inertia	1.81 x 10 ⁻⁵	oz-in-s ²
Required Shaft Length	0.385 to 0.400"	in.
With-Cover option	>=0.385"	in.
With-Cover option	>=0.385"	in.
Mounting Screw Torque (D, -M option)	2-3	in.-lbs
Shaft Axial Play	± 0.020	in.
Off-axis Mounting Tolerance	± 0.010	in.

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