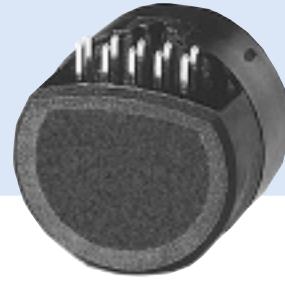


# Series E9 Miniature Encoder

- Ideal for position and speed sensing in small machines and actuators
- Low power standby mode is ideal for battery powered devices
- 200 kHz operating frequency
- Resolution to 512 lines/rev
- CE Qualified



MOTOR MOUNT

## APPLICATION/INDUSTRY

The E9 series incremental optical encoder provides high performance feed-back for precision motion control in a very small package. Its small envelope makes it ideal for instrument axes for position and speed control in mechanisms too small to accept standard encoders.

## DESCRIPTION

Its high performance, advanced features, and competitive pricing make it the encoder of choice for a broad range of applications.

The E9 optical encoders utilize a patent-pending ASIC that integrates all encoder electronics, including the optoelectronic sensors, which enhances reliability and accuracy.

Outputs are quadrature A and B channels with up to 512 lines per rev, an index pulse, unique up/down and rotation direction signals (version 2) or complementary CMOS-compatible (version 1). The E9 also has a low-power standby mode to conserve power in battery-operated applications.

## SPECIFICATIONS

### STANDARD OPERATING CHARACTERISTICS

**Code:** Incremental, Optical  
**Resolution:** Incremental pulses per revolution; 100 to 512  
**Phasing:** 90° ±18° electrical degrees  
**Symmetry:** 180° ±18° electrical  
**Index Pulse Width:** 90° ±36° electrical

### ELECTRICAL

**Supply Voltage:** 5 VDC ±10%  
**Supply Current:** 10 mA, typ.  
**Standby Current:** 50 µA, max.  
**Output Signals:** 2.5 V min. high (V<sub>OH</sub>); 0.5 V max. low (V<sub>OL</sub>). 3 mA sink/source (25°C), 2 mA (100°C)  
**Frequency Response:** 200 kHz  
**Termination:** 10 pin header (accessory connector/12" ribbon cable, part no. CA0040012)  
**Recommended Mating Connector:** Thomas & Betts part number 622-1030

### MECHANICAL

**Weight:** 0.18 oz (5.07 g)  
**Moment of Inertia:** 0.28 x 10<sup>-5</sup> oz-in-sec<sup>2</sup> (0.20 gm-cm<sup>2</sup>)  
**Hub Bore:** 1.5, 2.0, 2.5, 3.0, 4.0 mm; 0.125, 0.156 inch  
**Hub Dia. Tolerance:** +0.0004"/-0.0000" (+0.010 mm/-0.000 mm)  
**Mating Shaft Length:** See table  
**Mating Shaft Runout:** 0.001 TIR  
**Mating Shaft Endplay:** >256 ppr: ±0.003" (±0.076mm); 250, 256 ppr: +0.005/-0.003" (+0.127/-0.076mm); <250 ppr: +0.007/-0.003" (+0.178/-0.076mm)

### ENVIRONMENTAL

**Operating Temperature:** -40° to 100°C  
**Storage Temperature:** -50° to 125°C  
**Relative Humidity:** 90% non-condensing

## Output Waveforms & Connections (Direction viewing encoder cover)

Code 4= 00

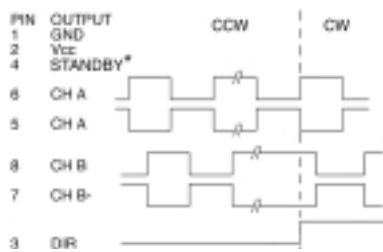


Figure 1

Code 4= 01

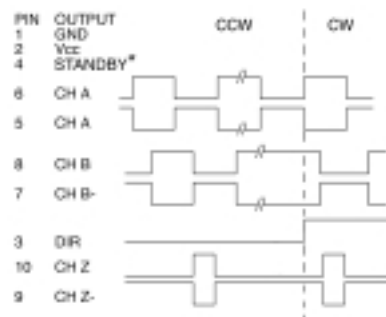


Figure 2

Code 4= 02

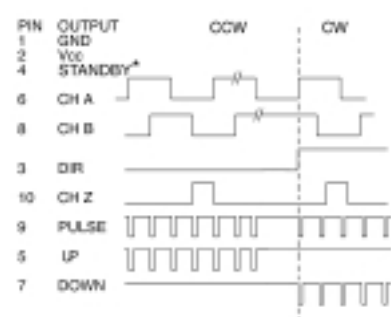
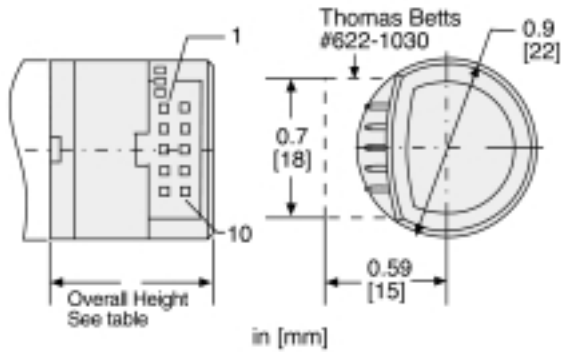


Figure 3

\* For operation, connect **STANDBY (4)** to **Vcc (2)**

# Series E9 Miniature Encoder

## Dimensions/Installation



Base (Code 3)	Overall Height inch (MM)	Motor Shaft Length inch (MM)	
		Max.	Min
A	0.795 (20.20)	0.479 (12.16)	0.467 (11.86)
C, D, E	0.929 (23.60)	0.613 (15.56)	0.581 (14.76)

Bases C and D provide clearance for motor-bosses with maximum dimensions of 0.5 in. Dia. x 0.15 in. high. Base E provides clearance for motor-bosses with maximum dimensions of 1.0 in. x 0.15 in. high

MOTOR MOUNT

## Ordering Information

To order, complete the model number with code numbers from the table below:

Code 1: Model	Code 2: PPR	Code 3: Hub Bore	Description	Code 4: Output	Description	Code 5: Mounting	Description
<b>E9</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/>	
Ordering Information							
E9 0.9" Diameter Incremental Modular Encoder	0100	1.5	1.5 mm	00	See Figure 1	0	No mounting base
	0144	2.0	2.0 mm	01	See Figure 2	A	4x M1.6 on 0.728" BC
	0200	2.5	2.5 mm	02	See Figure 3	C	2x #2-56 on 0.75" BC
	0256	3.0	3.0 mm			D	3x #0-80 on 0.823" BC
	0300	4.0	4.0 mm			E	2x #2-56 on 1.812" BC
	0360	125	0.125 in				
	0500	156	0.156 in				
	0512						

**IMPORTANT:** To properly install Series E9, a specialized mounting kit must be purchased. Only one kit is required to install any number of encoders with the same hub bore size.

Kit Part Number: MK E9  Code 3 (from Models Table, above) designating Hub Bore requirement.

Example: Kit for installing encoders with 3.0 mm hub Bore= **MK E9 3.0**