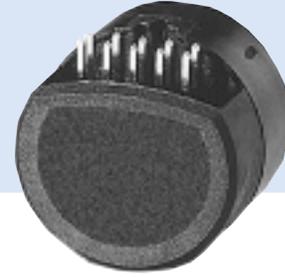**DANAHER**
INDUSTRIAL CONTROLS

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_{OH}); 0.5 V max. low (V_{OL}). 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)
Reccomended Mating Connector: Thomas & Betts part number 622-1030

MECHANICAL

Weight: 0.18 oz (5.07 g)
Moment of Inertia: 0.28 x 10^{-5} oz-in-sec^2 (0.20 gm-cm^2)
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

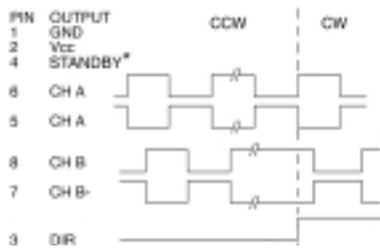## Output Waveforms & Connections (Direction viewing encoder cover)
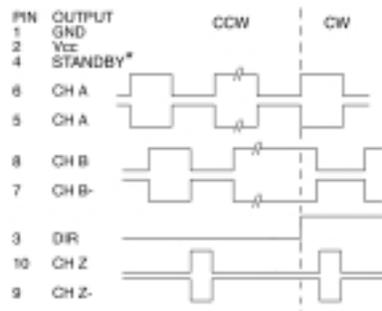
Code 4=00

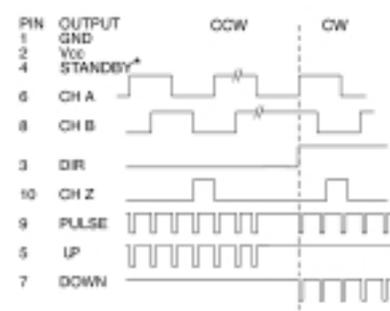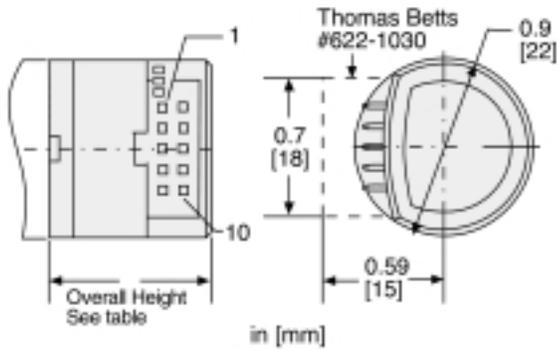Figure 1

Code 4=01

Figure 2

Code 4=02

Figure 3

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

Spec Tech Industrial 203 Vest Ave. Valley Park, MO 63088   Phone: 888 SPECTECH
E-mail: sales@spectechind.com   www.spectechind.com

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

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
E9	☐☐☐☐	☐	☐☐	☐☐	☐

			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 0n 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**