

## for Miniature DC and Stepper Motors



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

### GENERAL INFORMATION

The type E9 incremental optical encoder provides high performance feedback 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. 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 patentpending 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.

### TECHNICAL DATA mechanical

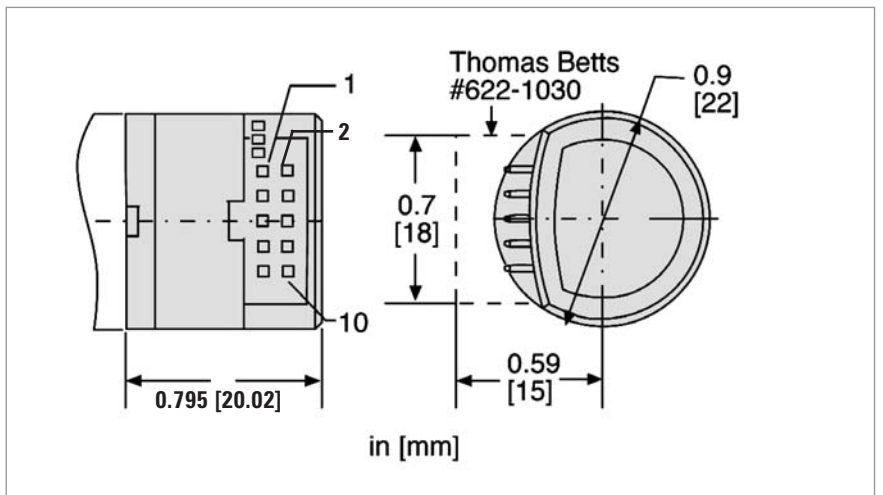
Weight	5.07 g	
Moment of inertia	0.20 gcm <sup>2</sup>	
Hollow shaft diameter	1.5 / 2.0 / 2.5 / 3.0 / 4.0 mm 1.125" / 0.156"	
Hollow shaft tolerance	+ 0.010 / - 0.000 mm	
Mating shaft length	max. 12.16 mm min. 11.36 mm	
Mating shaft runout	± 0.0125 mm	
Mating shaft endplay	>256 ppr	±0.076mm;
	250, 256 ppr	+0.127 / -0.076mm;
	<250 ppr	+0.178/ -0.076mm
Operating temperature	-40 ... + 100 °C	
Storage temperature	-50 ... + 125 °C	
Relative humidity	90 %, non-condensing	

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TECHNICAL DATA  
electrical

Code	Incremental, optical
Resolution	100 up to 512 ppr
Phasing	90° ±18° electrical
Symmetry	180 ±18° electrical
Index pulse width	90° ±36° electrical
Supply voltage	DC 5 V ±10 %
Supply current	10 mA, typ.
Standby current	max. 50 µA
Output signals	min. 2.5 V high (V <sub>OH</sub> ) max. 0.5 V low (V <sub>OL</sub> )
Output current	3 mA sink/source (25°C), 2 mA (100°C)
Max. output frequency	200 kHz
Connection	10 pole header
Recommended mating connector	Thomas & Betts; part number 622-1030; on request

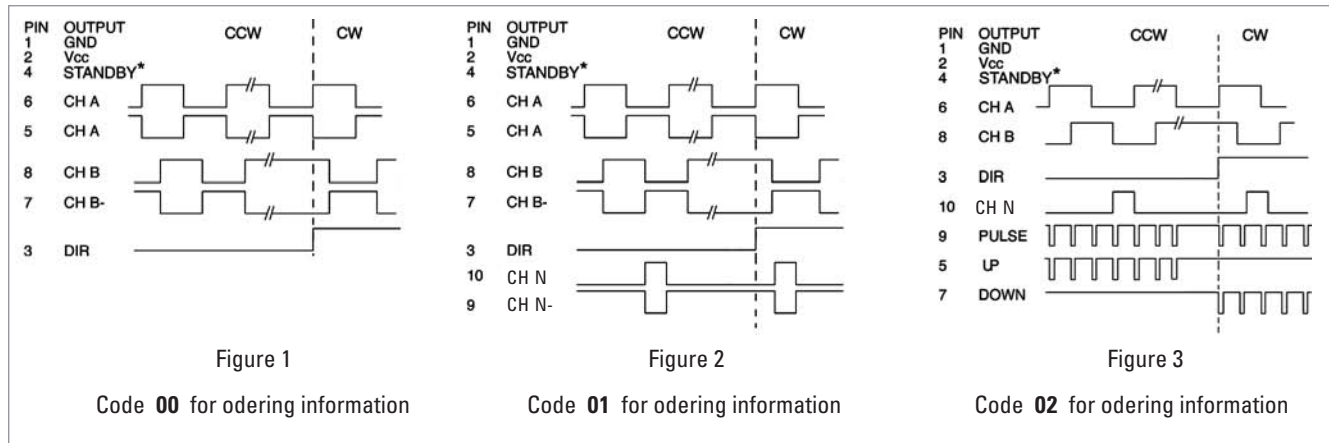
DIMENSIONAL DRAWINGS



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### OUTPUT WAVEFORMS AND CONNECTIONS

(Direction viewing encoder cover)



### ACCESSORIES

	Ordering code
10 pole header, 30 cm ribbon cable with connector	CA 0 040 012

### ORDERING INFORMATION

Type	Pulses ppr	Hub shaft	Output	Mounting
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>E9-</b>	<b>0100 0300</b> <b>0144 0360</b> <b>0200 0500</b> <b>0256 0512</b>	<b>1.5</b> 1.5 mm <b>2.0</b> 2.0 mm <b>2.5</b> 2.5 mm <b>3.0</b> 3.0 mm <b>125</b> 0.125 inch <b>156</b> 0.156 inch	<b>00</b> see fig. 1 <b>01</b> see fig. 2 <b>02</b> see fig. 3	<b>0</b> No mounting base <b>A</b> 4 x M1.6 on 0.728" TK <b>C</b> 2 x #2-56 on 0.75" TK <b>D</b> 3 x #0-80 on 0.823" TK <b>E</b> 2 x #2-56 on 1.812" TK

#### Important:

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

MK

E9

Hub shaft

**1.5** 1.5 mm

**2.0** 2.0 mm

**2.5** 2.5 mm

**3.0** 3.0 mm

**125** 0.125 inch

**156** 0.156 inch

Please designate hub shaft diameter.

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