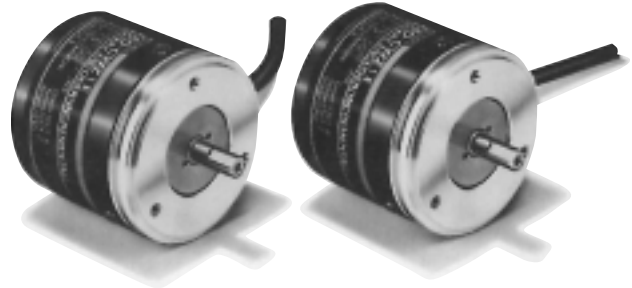


## Incremental Rotary Encoder

## E6D

### High-Resolution Optical Incremental Encoder Ideal for Industrial Applications

- Resolution as high as 6,000 pulses/revolution in a rugged 55 mm (2.17 inch) diameter housing
- Superb reliability and accuracy: phase error as small as  $1/4T \pm 0.07T$
- High response frequency of 200 kHz
- Shaft withstands radial shaft loading of 5 kgf (36.2 ft-lbs.) and axial shaft loading of 3 kgf (21.7 ft-lbs.)



## Ordering Information

### ■ ENCODERS

When ordering, add the resolution (pulses per revolution) after the part number. For example, **E6D-CWZ1E 1500P/R**. Standard stock products are shown in bold in the Part Number Index.

Resolution (pulses per revolution)	Output phases	Output form	Supply voltage	Part number
720, 800, 1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500, 3000, 3200, 3600, 4096, 5000, 6000	A, B (reversible), and Z (zero)	Voltage	5 VDC	<b>E6D-CWZ1E</b> □□□
		Open collector	12 VDC	<b>E6D-CWZ2C</b> □□□

### ■ REPLACEMENT PARTS

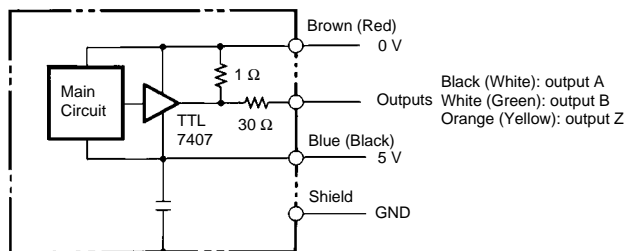
Description	Part number
Shaft coupler (supplied with each encoder)	<b>E69-C06B</b>
Mounting bracket (supplied with E6D-CWZ encoders)	<b>E69-FCA-02</b>

# Specifications

Part number	E6D-CWZ1E	E6D-CWZ2C
Supply voltage	5 VDC $\pm 5\%$ ; max. 5% ripple peak-to-peak	
Current consumption	150 mA max.	
Resolution (pulses per revolution)	720, 800, 1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500, 3000, 3200, 3600, 4096, 5000, 6000	
Output phases	A, B, Z	
Output form	Voltage output	Open collector output
Output capacity	Output resistance: 1 k $\Omega$ Residual voltage: 0.7 V max. at 10 mA sink current Sink current: 35 mA max.	Applied voltage: 30 VDC max. Residual voltage: 1 V max. at 35 mA sink current 0.7 V max. at 10 mA sink current Sink current: 35 mA max.
Maximum response frequency	200 kHz	
Rotation direction	Reversible, CW + CCW	
Phase difference of output	90° $\pm 25^\circ$ between A and B (1/4T $\pm 0.07T$ )	
Output rise and fall times	1 $\mu$ s max.	
Starting torque	100 g-cm (1.39 oz.-inch) max.	
Shaft loading	Radial	5 kgf (36.2 ft-lbs.) max.; 2 kgf (14.5 ft-lbs.) at rated accuracy
	Axial	3 kgf (21.7 ft-lbs.) max.; 1 kgf (7.2 ft-lbs.) at rated accuracy
Moment of inertia	30 g-cm <sup>2</sup> (0.165 oz.-inch <sup>2</sup> )	
Maximum rpm	12,000 rpm	
Electrical connection	Prewired with 0.5 m (1.64 ft.) length cable	
Weight	Approx. 280 g (9.9 oz.)	
Enclosure rating	IEC: IP50	
Ambient temperature	Operating	-10° to 70°C (14° to 158°F)
	Storage	-25° to 80°C (-13° to 176°F)
Ambient humidity	35 to 85% RH	
Vibration resistance	Mechanical durability: 10 to 55 Hz, 1.5 mm double amplitude, in X, Y, and Z directions for 2 hours each	
Shock resistance	Mechanical durability: 500 m/s <sup>2</sup> (approx. 50 G) in X, Y, and Z directions, 3 times each	
Insulation resistance	10 M $\Omega$ minimum at 500 VDC between current-carrying part and housing	
Dielectric strength	500 VAC, 50/60 Hz for 1 minute between current-carrying part and housing	

## OUTPUT CIRCUIT DIAGRAMS

### Voltage Output E6D-CWZ1E

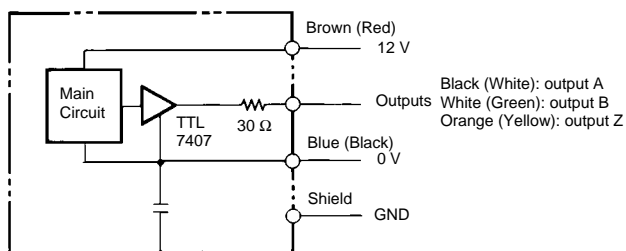


### Wire Color Code

Note: IEC colors shown first.

Wire color	Signal
Brown (Red)	V <sub>CC</sub>
Black (White)	A
White (Green)	B
Orange (Yellow)	Z
Blue (Black)	0 V (common)

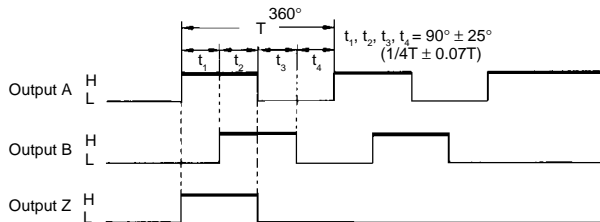
### Open Collector Output E6D-CWZ2C



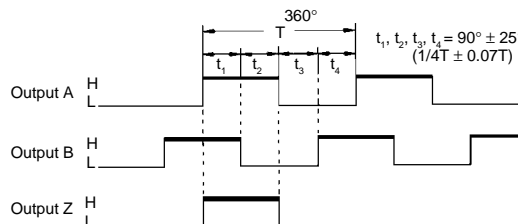
■ TIMING CHARTS

Voltage Output Type  
E6D-CWZ1E

Direction of rotation: CW  
Clockwise as viewed from the shaft → CW direction

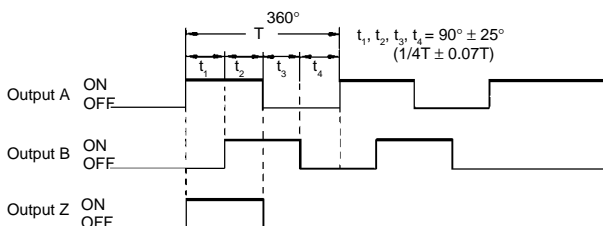


Direction of rotation: CCW  
Counterclockwise as viewed from the shaft → CCW direction

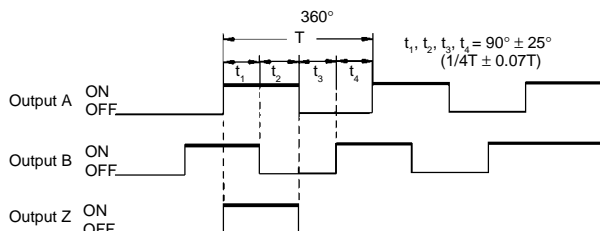


Open Collector Output Type  
E6D-CWZ2C

Direction of rotation: CW  
Clockwise as viewed from the shaft → CW direction



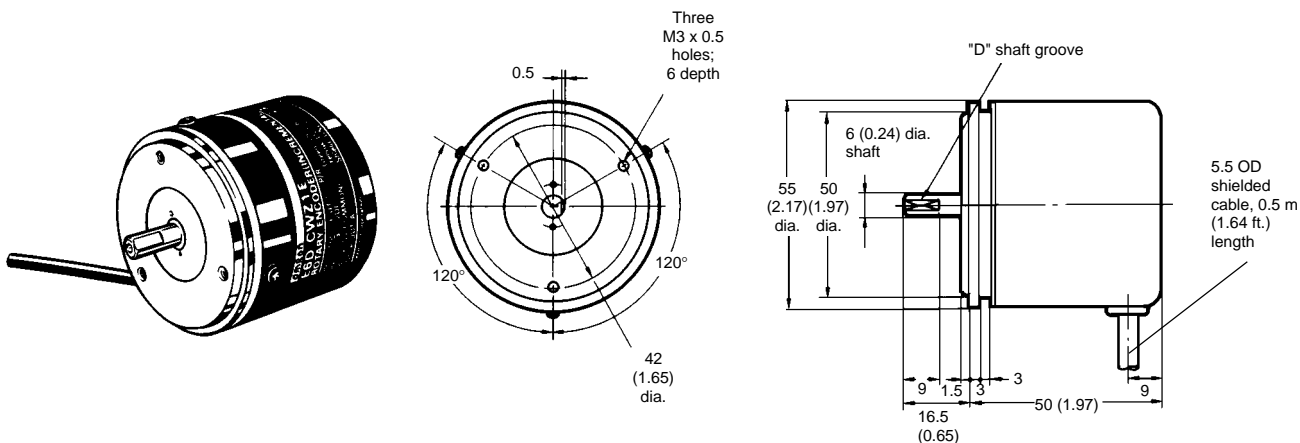
Direction of rotation: CCW  
Counterclockwise as viewed from the shaft → CCW direction



Dimensions

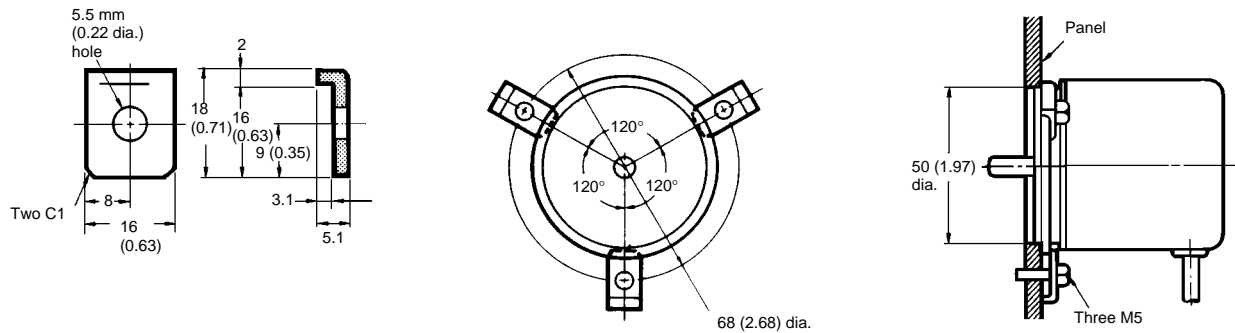
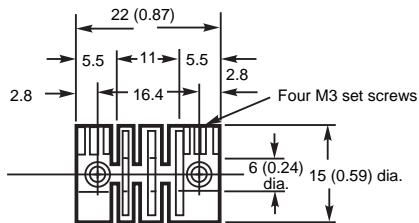
Unit: mm (inch)

■ ENCODERS



**Mounting Bracket E69-FCA-02**

Mounting bracket E69-FCA-02 is supplied with E6D-CWZ encoders.

**Dimensions with Encoder****Shaft Coupler E69-C06B****Note:**

1. Material: Glass-filled polybutadiene terephthalate (PBT).
2. A coupler is supplied with each E6D encoder.
3. Each set screw must be tightened to 2.5 kg-cm (2.17 in-lbs.)

**NOTE: DIMENSIONS ARE IN MILLIMETERS. To convert millimeters to inches, divide by 25.4.**

# OMRON

Omron Europe B.V. EMA-ISD, tel:+31 23 5681390, fax:+31 23 5681397, <http://www.eu.omron.com/ema>