

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**.

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	E6D-CWZ1E □□□
		Open collector	12 VDC	E6D-CWZ2C □□□

■ REPLACEMENT PARTS

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

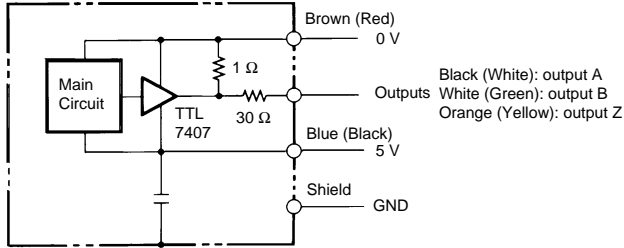
Specifications

Part number	E6D-CWZ1E		E6D-CWZ2C
Supply voltage	5 VDC \pm 5%; max. 5% ripple peak-to-peak		12 VDC \pm 10%; max. 5% ripple
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 Ω 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° between A and B (1/4T \pm 0.07T)		
Output rise and fall times	1 μ 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 ² (0.165 oz-inch ²)		
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°C to 70°C (14°F to 158°F)	
	Storage	-25°C to 80°C (-13°F 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 ² (approx. 50 G) in X, Y, and Z directions, 3 times each		
Insulation resistance	10 M Ω 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		

Operation

OUTPUT CIRCUIT DIAGRAMS

Voltage Output E6D-CWZ1E

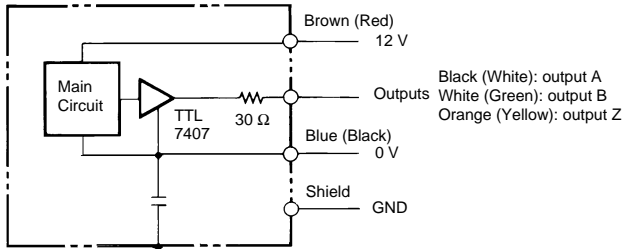


Wire Color Code

Note: IEC colors shown first.

Wire color	Signal
Brown (Red)	V_{CC}
Black (White)	A
White (Green)	B
Orange (Yellow)	Z
Blue (Black)	0 V (common)

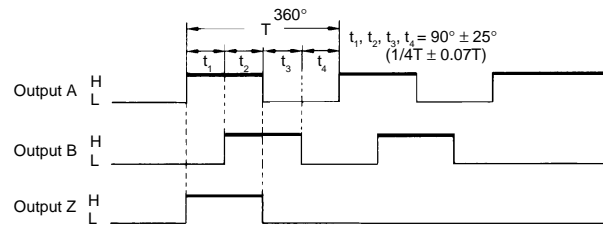
Open Collector Output E6D-CWZ2C



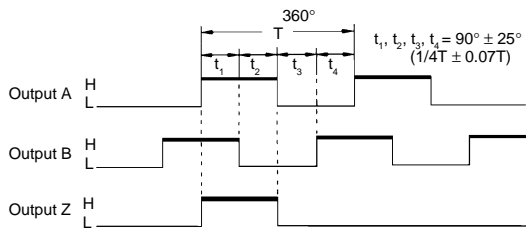
TIMING CHARTS

Voltage Output Type E6D-CWZ1E

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

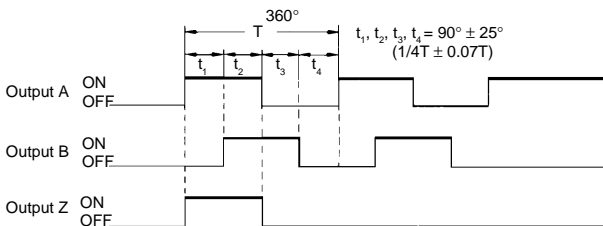


Direction of rotation: CCW
Counterclockwise as viewed from the shaft → CCW direction

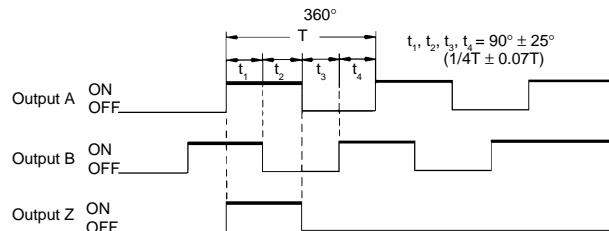


Open Collector Output Type E6D-CWZ2C

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



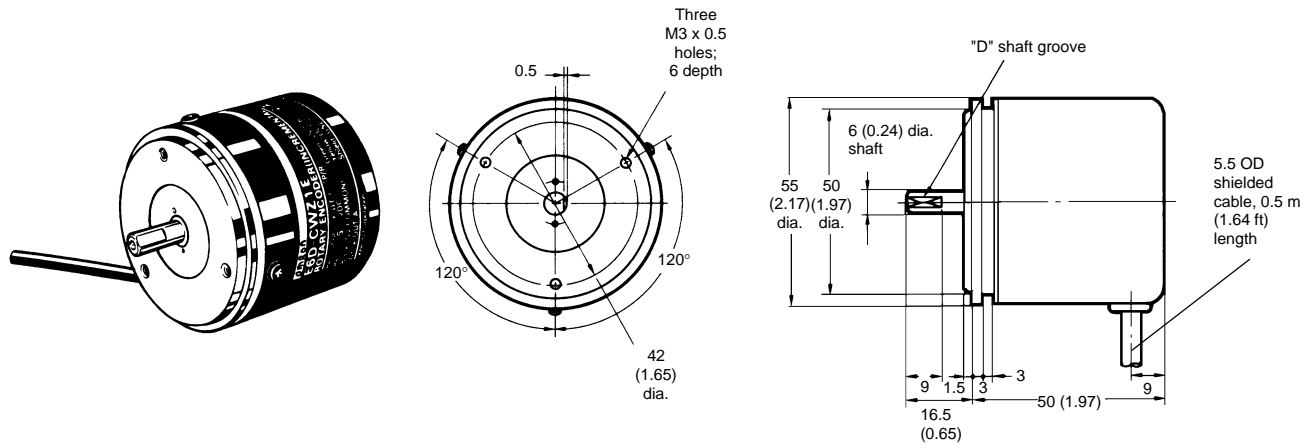
Direction of rotation: CCW
Counterclockwise as viewed from the shaft → CCW direction



Dimensions

Unit: mm (inch)

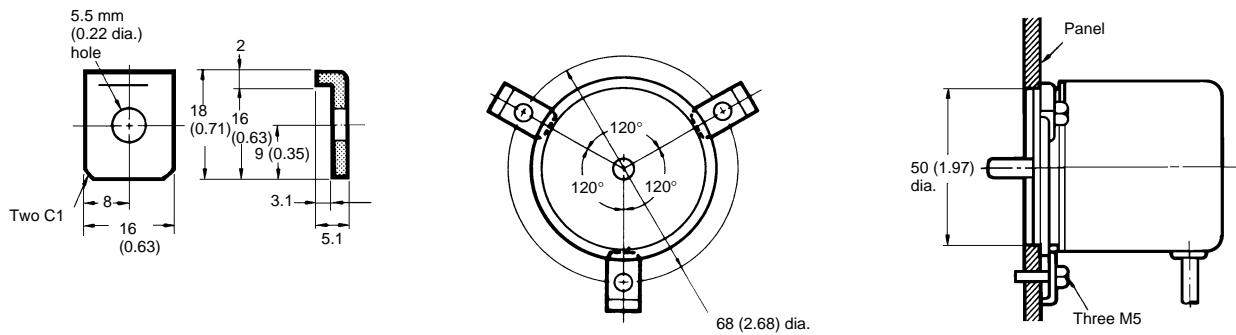
ENCODERS



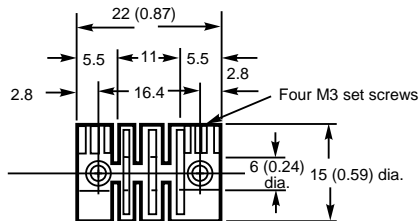
Mounting Bracket E69-FCA-02

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)

OMRON

OMRON ELECTRONICS LLC

One East Commerce Drive
Schaumburg, IL 60173

1-800-55-OMRON

OMRON ON-LINE

Global - <http://www.omron.com>

USA - <http://www.omron.com/oei>

Canada - <http://www.omron.com/oci>

OMRON CANADA, INC.

885 Milner Avenue
Scarborough, Ontario M1B 5V8

416-286-6465