OMRON

Incremental Rotary Encoder — E6A2

Miniature Rotary Encoder for Positioning in Space-Confined Areas

- Wide variety of supply voltages and output forms to match input devices
- Models with zero index function ideal for positioning applications
- High resolution models (300 or 360 pulses per revolution) substantially improve measuring accuracy
- High response frequency and noise immunity make encoders ideal for factory automation applications

CE

Ordering Information

■ ENCODERS

When ordering, add the resolution (pulses per revolution) between the part number and cable length.
For example, **E6A2-CWZ3E *200* P/R 0.5M**.

Resolution (pulses per revolution)	Output phases	Output form	Supply voltage	**Part number**
10, 60, 100, 200, 300, 360	A	Voltage	5 to 12 VDC	**E6A2-CS3E ❑❑❑P/R 0.5M**
		Open collector	5 to 12 VDC	**E6A2-CS3C ❑❑❑P/R 0.5M**
		Open collector	12 to 24 VDC	**E6A2-CS5C ❑❑❑P/R 0.5M**
100, 200	A, B	Voltage	5 to 12 VDC	**E6A2-CW3E ❑❑❑P/R 0.5M**
		Open collector	5 to 12 VDC	**E6A2-CW3C ❑❑❑P/R 0.5M**
		Open collector	12 to 24 VDC	**E6A2-CW5C ❑❑❑P/R 0.5M**
100, 200	A, B, Z (zero)	Voltage	5 to 12 VDC	**E6A2-CWZ3E ❑❑❑P/R 0.5M**
		Open collector	5 to 12 VDC	**E6A2-CWZ3C ❑❑❑P/R 0.5M**

■ REPLACEMENT PARTS

Description	**Part number**
Shaft coupler (supplied with each encoder)	**E69-C04B**
Mounting bracket (supplied with E6A2-CWZ encoders)	**E69-1**

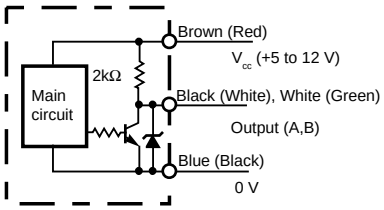
Specifications

Part number		E6A2-CS3E	E6A2-CW3E	E6A2-CWZ3E	E6A2-CS3C	E6A2-CW3C	E6A2-CWZ3C	E6A2-CS5C	E6A2-CW5C
Supply voltage		5 VDC -5% to 12 VDC +10%; max. 5% ripple peak-to-peak						12 VDC -10% to 24 VDC +15%; max. 5% ripple	
Current consumption		30 mA max.		50 mA max.	20 mA max.		30 mA max.	20 mA max.	
Resolution (pulses per revolution)		10, 60, 100, 200, 300, 360	100, 200	100, 200	10, 60, 100, 200, 300, 360	100, 200	100, 200	10, 60, 100, 200, 300, 360	100, 200
Output phases		A	A, B	A, B, Z	A	A, B	A, B, Z	A	A, B
Output form		Voltage output			Open collector output			Open collector output	
Output capacity		Output resistance: 2 kΩ Residual voltage: 0.4 V max. Sink current: 20 mA max.			Applied voltage: 30 VDC max. Residual voltage: 0.4 V max. Sink current: 30 mA max.			Applied voltage: 30 VDC Residual voltage: 0.4 V Sink current: 30 mA max.	
Maximum response frequency		30 kHz	20 kHz	20 kHz	30 kHz	20 kHz	20 kHz	30 kHz	20 kHz
Rotation direction		Reversible, CW + CCW			Reversible, CW + CCW			Reversible, CW + CCW	
Phase difference of output		—	90° ±45°	90° ±45°	—	90° ±45°	90° ±45°	—	90° ±45°
Output rise and fall times		1.0 μs max. (at sink current of 10 mA with 2 m cable)			1.0 μs max. (at control output voltage of 5 V and load resistance of 1 kΩ with 2 m cable)				
Starting torque		10 g-cm (0.14 oz.-inch) max.							
Shaft loading	Radial	1 kgf (7.2 ft•lbs)							
	Axial	0.5 kgf (3.6 ft•lbs)							
Moment of inertia		1 g-cm^2 (0.0055 oz-inch^2)							
Maximum rpm		5,000 rpm							
Electrical connection		Prewired with 0.5 m (1.64 ft) length cable							
Weight		Approx. 35 g (1.2 oz)							
Enclosure rating		IEC: IP50							
Ambient temperature	Operating	-10°C to 55°C (14°F to 131°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 MΩ 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							

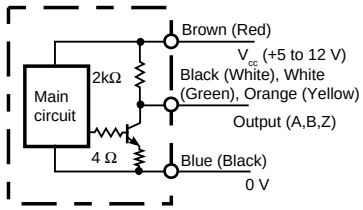
Operation

■ OUTPUT CIRCUIT DIAGRAMS

Voltage Output
E6A2-CS3E, E6A2-CW3E



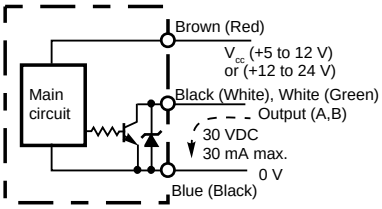
E6A2-CWZ3E



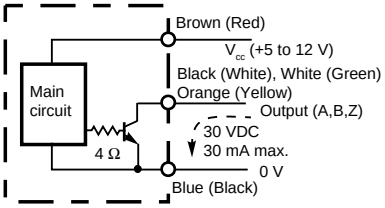
Wire Color Code
Note: IEC colors shown first.

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

Open Collector Output
E6A2-CS❑❑C, E6A2-CW❑❑C



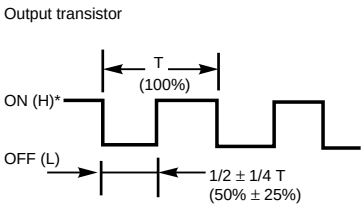
E6A2-CWZ3C



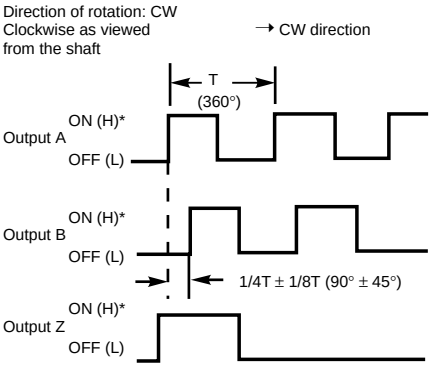
Note:
1. The white (green) and orange (yellow) lines of the single type (E6A2-CS) do not output signals (no connection).
2. The orange (yellow) line of the reversible type (E6A2-CW) does not output signal (no connection).
3. The voltage output type is capable of sinking a maximum of 20 mA.

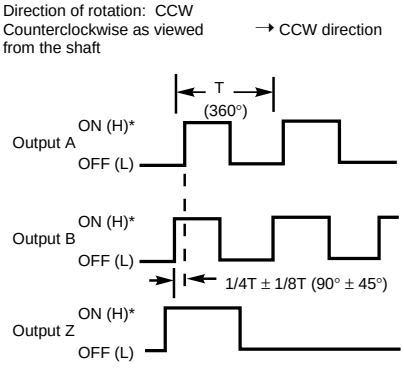
■ TIMING CHARTS

E6A2-CS



E6A2-CW, E6A2-CWZ



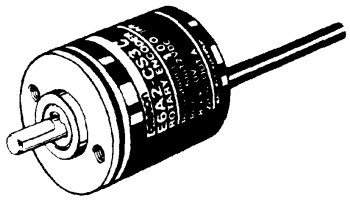


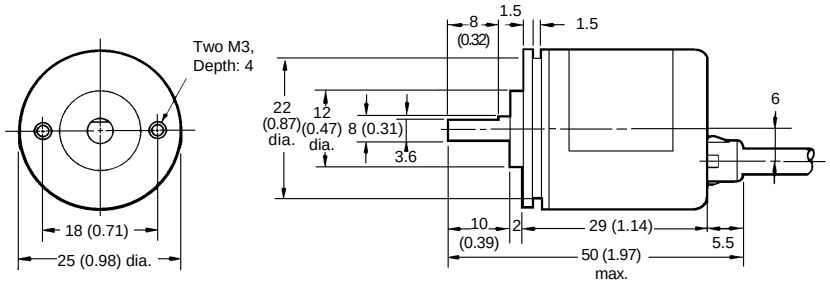
Note:
1. *(H) and (L) indicate the output levels of the voltage output type.
2. Output A leads B by 1/4T ±1/8T when the shaft revolves clockwise. Output A lags behind B by 1/4T ±1/8T when the shaft revolves counterclockwise.

Dimensions

Unit: mm (inch)

■ ENCODERS

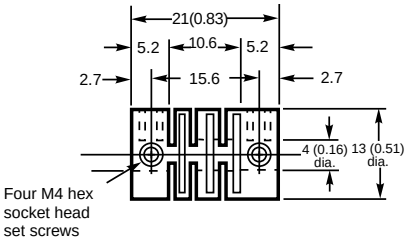




*Output cable (shielded) O.D.: 4 dia.
Standard length: 50 cm (1.64 ft)

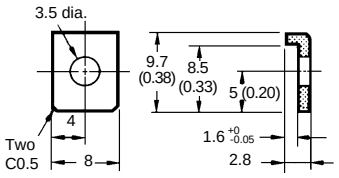
■ ACCESSORIES

Shaft Coupler E69-C04B

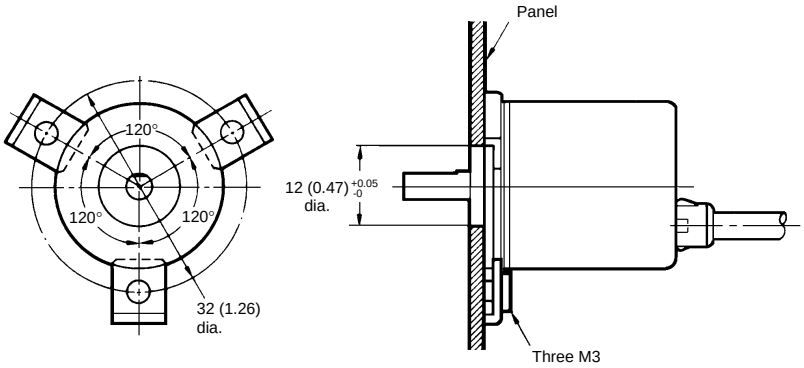


Note:
1. Material: Glass-filled polybutadiene terephthalate (PBT).
2. A coupler is supplied with each E6A2 encoder.
3. Each set screw must be tightened to 2.5 kg-cm (2.17 in-lbs)

Mounting Bracket E69-1
supplied with E6A2-CWZ encoders



Dimensions with Encoder



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Cat. No. CEDSAX4 11/01