

Product Category

Sensors

Rotary Encoders

Incremental

E6A2-C

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Incremental 40-mm-dia. Rotary Encoder

## E6B2-C

General-purpose Encoder with  
External Diameter of 40 mm



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last update: February 1, 2023

| Model                            |        | E6B2-CWZ6C                                                                                                             | E6B2-CWZ5B                                                                                                                 | E6B2-CWZ3E                                                                                                        | E6B2-CWZ1X                                                                                                                                      |
|----------------------------------|--------|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Power supply voltage             |        | 5 VDC -5% to 24 VDC +15%, ripple (p-p): 5% max.                                                                        | 12 VDC -10% to 24 VDC +15%, ripple (p-p): 5% max.                                                                          | 5 VDC -5% to 12 VDC +10%, ripple (p-p): 5% max.                                                                   | 5 VDC ±5%, ripple (p-p): 5% max.                                                                                                                |
| Current consumption *1           |        | 0.6 W max. (80 mA max.)                                                                                                | 0.8 W max. (100 mA max.)                                                                                                   | 0.6 W max. (100 mA max.)                                                                                          | 160 mA max.                                                                                                                                     |
| Resolution (pulses/rotation)     |        | 10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000          | 100, 200, 360, 500, 600, 1,000, 2,000                                                                                      | 10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 1,000, 1,200, 1,500, 1,800, 2,000                      | 10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000                                             |
| Output phases                    |        | Phases A, B, and Z                                                                                                     |                                                                                                                            |                                                                                                                   | Phases A, $\bar{A}$ , B, $\bar{B}$ , Z, and $\bar{Z}$                                                                                           |
| Phase difference between outputs |        | 90°±45° between A and B (1/4 T ± 1/8 T)                                                                                |                                                                                                                            |                                                                                                                   |                                                                                                                                                 |
| Output configuration             |        | NPN open-collector output                                                                                              | PNP open-collector output                                                                                                  | Voltage output (NPN output)                                                                                       | Line driver output *2                                                                                                                           |
| Output capacity                  |        | Applied voltage: 30 VDC max.<br>Sink current: 35 mA max.<br>Residual voltage: 0.4 V max.<br>(at sink current of 35 mA) | Applied voltage: 30 VDC max.<br>Source current: 35 mA max.<br>Residual voltage: 0.4 V max.<br>(at source current of 35 mA) | Output resistance: 2 kΩ<br>Sink current: 20 mA max.<br>Residual voltage: 0.4 V max.<br>(at sink current of 20 mA) | AM26LS31 equivalent<br>Output current<br>High level: IO = -20 mA<br>Low level: IS = 20 mA<br>Output voltage: VO = 2.5 V min.<br>VS = 0.5 V max. |
| Maximum response frequency *3    |        | 100 kHz                                                                                                                | 50 kHz                                                                                                                     | 100 kHz                                                                                                           |                                                                                                                                                 |
| Rise and fall times of output    |        | 1 μs max. (Control output voltage: 5 V, Load resistance: 1 kΩ, Cable length: 2 m max.)                                 | 1 μs max. (Cable length: 2 m max., Sink current: 10 mA)                                                                    |                                                                                                                   | 0.1 μs max. (Cable length: 2 m max., IO = -20 mA, IS = 20 mA)                                                                                   |
| Starting torque                  |        | 0.98 mNm max.                                                                                                          |                                                                                                                            |                                                                                                                   |                                                                                                                                                 |
| Moment of inertia                |        | 1×10 <sup>-6</sup> kgm <sup>2</sup> max.; 3 × 10 <sup>-7</sup> kgm <sup>2</sup> max. at 600 P/R max.                   |                                                                                                                            |                                                                                                                   |                                                                                                                                                 |
| Shaft loading                    | Radial | 30 N                                                                                                                   |                                                                                                                            |                                                                                                                   |                                                                                                                                                 |
|                                  | Thrust | 20 N                                                                                                                   |                                                                                                                            |                                                                                                                   |                                                                                                                                                 |
| Maximum permissible speed        |        | 6,000 r/min                                                                                                            |                                                                                                                            |                                                                                                                   |                                                                                                                                                 |
| Protection circuits              |        | Power supply reverse polarity protection, Load short-circuit protection                                                |                                                                                                                            |                                                                                                                   | ---                                                                                                                                             |
| Ambient temperature range        |        | Operating: -10 to 70°C (with no icing), Storage: -25 to 85°C (with no icing)                                           |                                                                                                                            |                                                                                                                   |                                                                                                                                                 |
| Ambient humidity range           |        | Operating/Storage: 35% to 85% (with no condensation)                                                                   |                                                                                                                            |                                                                                                                   |                                                                                                                                                 |

|                              |                                                                                                                            |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>Insulation resistance</b> | 20 MΩ min. (at 500 VDC) between current-carrying parts and case                                                            |
| <b>Dielectric strength</b>   | 500 VAC, 50/60 Hz for 1 min between current-carrying parts and case                                                        |
| <b>Vibration resistance</b>  | Destruction: 10 to 500 Hz, 150 m/s <sup>2</sup> or 2-mm double amplitude for 11 min 3 times each in X, Y, and Z directions |
| <b>Shock resistance</b>      | Destruction: 1,000m/s <sup>2</sup> 3 times each in X, Y, and Z directions                                                  |
| <b>Degree of protection</b>  | IEC 60529 IP50                                                                                                             |
| <b>Connection method</b>     | Pre-wired Models (Standard cable length: 500 mm)                                                                           |
| <b>Materials</b>             | Case: ABS, Main unit: Aluminum, Shaft: SUS420J2                                                                            |
| <b>Weight (packed state)</b> | Approx. 100 g                                                                                                              |
| <b>Accessories</b>           | Coupling, Hexagonal wrench, Instruction manual                                                                             |

\*1. An inrush current of approximately 9 A will flow for approximately 0.3 ms when the power is turned ON.

\*2. The line driver output is a data transmission circuit compatible with RS-422A and long-distance transmission is possible with a twisted-pair cable. The quality is equivalent to AM26LS31.

\*3. The maximum electrical response speed is determined by the resolution and maximum response frequency as follows:

$$\text{Maximum electrical response speed (rpm)} = \frac{\text{Maximum response frequency}}{\text{Resolution}} \times 60$$

This means that the E6B2-C Rotary Encoder will not operate electrically if its speed exceeds the maximum electrical response speed.

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