


E6CP-A

General-purpose Absolute Encoder with External Diameter of 50 mm

- Absolute model.
- External diameter of 50 mm.
- Resolution: 256 (8-bit).
- Lightweight construction using plastic body.



 Be sure to read *Safety Precautions* on page 5.

Ordering Information

Encoders [Refer to *Dimensions* on page 5.]

| Power supply voltage | Output configuration | Resolution (divisions) | Connector for H8PS Cam Positioner | Model |
|----------------------|-----------------------|------------------------|-----------------------------------|-----------------------|
| 5 to 12 VDC | Open-collector output | 256 (8-bit) | None | E6CP-AG3C 256P/R 2M |
| 12 to 24 VDC | | | Supported | E6CP-AG5C 256P/R 2M |
| | | | | E6CP-AG5C-C 256P/R 2M |

Note: When connecting to the H8PS, use the E6CP-AG5C-C, which is connected using a connector. It cannot be used on other models.

Accessories (Order Separately)

[Dimensions: Refer to *Accessories* for coupling dimensions and to page 5 for the dimensions of other accessories.]

| Name | Model | Remarks |
|------------------------|-----------|---|
| Couplings | E69-C06B | Provided with the E6CP-AG3C and E6CP-AG5C. |
| | E69-C68B | Different end diameter |
| | E69-C610B | Different end diameter |
| | E69-C06M | Metal construction |
| Servo Mounting Bracket | E69-2 | Provided with the product. (Three brackets in a set.) |
| Extension Cable | E69-DF5 | 5 m |
| | E69-DF10 | 10 m |
| | E69-DF20 | 20 m |
| | | Models are also available with 15-m and 98-m cables. |

Refer to *Accessories* for details.

Ratings and Specifications

| Item | Model | E6CP-AG3C | E6CP-AG5C | E6CP-AG5C-C |
|-------------------------------|--------|---|---|---|
| Power supply voltage | | 5 VDC -5% to 12 VDC +10%, ripple (p-p): 5% max. | 12 VDC -10% to 24 VDC +15%, ripple (p-p): 5% max. | |
| Current consumption*1 | | 90 mA max. | 70 mA max. | |
| Resolution (rotations) | | 256 (8-bit) | | |
| Output code | | Gray code | | |
| Output configuration | | Open-collector output | | |
| Output capacity | | Applied voltage: 28 VDC max. Sink current: 16 mA max. Residual voltage: 0.4 V max. (at sink current of 16 mA) | | |
| Maximum response frequency*2 | | 5 kHz | | |
| Logic | | Negative logic (high = 0, low = 1) | | |
| Accuracy | | ±1° max. | | |
| Direction of rotation | | Output code incremented by CW (as viewed from the end of the shaft) | | |
| Rise and fall times of output | | 1 μs max. (Control output voltage: 16 V, Load resistance: 1 kΩ, Output cable: 2 m max.) | | |
| Starting torque | | 0.98 mN·m max. | | |
| Moment of inertia | | 1 × 10 ⁻⁶ kg·m ² max. | | |
| Shaft loading | Radial | 30 N | | |
| | Thrust | 20 N | | |
| Maximum permissible speed | | 1,000 r/min | | |
| Ambient temperature range | | Operating: -10 to 55°C (with no icing), Storage: -25 to 85°C (with no icing) | | |
| Ambient humidity range | | Operating/Storage: 35% to 85% (with no condensation) | | |
| Insulation resistance | | 20 MΩ min. (at 500 VDC) between current-carrying parts and case | | |
| Dielectric strength | | 500 VAC, 50/60 Hz for 1 min between current-carrying parts and case | | |
| Vibration resistance | | Destruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions | | |
| Shock resistance | | Destruction: 1,000 m/s ² 3 times each in X, Y, and Z directions | | |
| Degree of protection*3 | | IEC 60529 IP50 | | |
| Connection method | | Pre-wired Models (Standard cable length: 2 m) | | Connector Models (Standard cable length: 2 m) |
| Material | | Case: ABS, Main unit: PPS, Shaft: SUS416, Mounting Bracket: Galvanized iron | | |
| Weight (packed state) | | Approx. 200 g | | |
| Accessories | | Coupling (excluding Connector Models), Servo Mounting Bracket, Instruction manual | | |

*1. An inrush current of approximately 8 A will flow for approximately 0.3 ms when the power is turned ON.

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

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

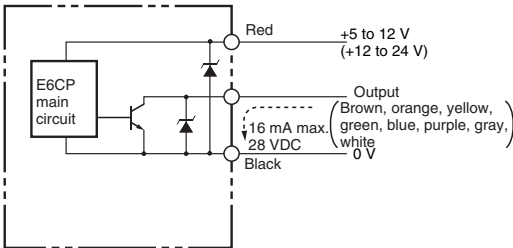
This means that the Rotary Encoder will not operate electrically if its speed exceeds the maximum electrical response speed.

*3. No protection is provided against water or oil.

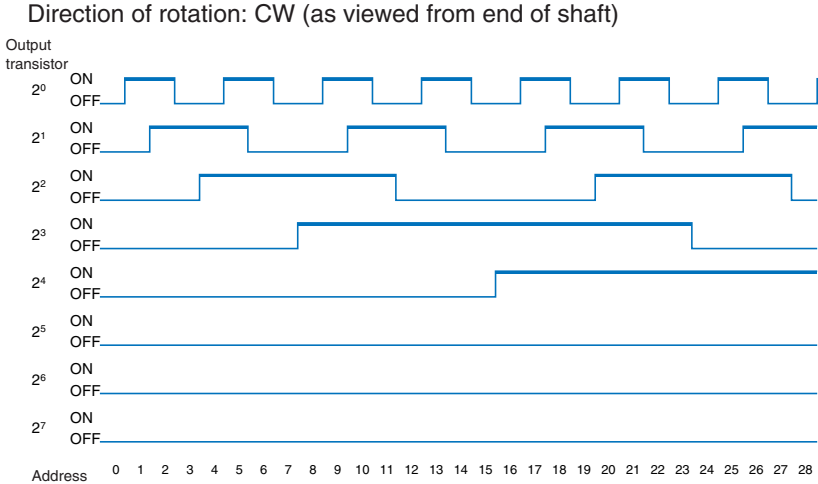
I/O Circuit Diagrams

| | |
|----------------------|-------------|
| E6CP-AG3C, E6CP-AG5C | E6CP-AG5C-C |
|----------------------|-------------|

Output Circuits



Output mode



Connection

| Color | E6CP-AG3C | E6CP-AG5C |
|--------|--------------------------|---------------------------|
| Red | Power supply 5 to 12 VDC | Power supply 12 to 24 VDC |
| Black | 0 V (common) | |
| Brown | Output 2 ⁰ | |
| Orange | Output 2 ¹ | |
| Yellow | Output 2 ² | |
| Green | Output 2 ³ | |
| Blue | Output 2 ⁴ | |
| Purple | Output 2 ⁵ | |
| Gray | Output 2 ⁶ | |
| White | Output 2 ⁷ | |

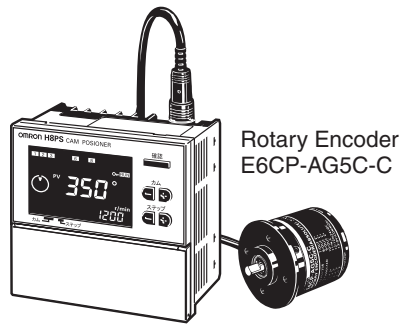
Note: The circuit is the same for all bit outputs.
Each E6CP Rotary Encoder has one main circuit.

| Terminal No. | E6CP-AG5C-C |
|--------------|----------------------------|
| 1 | Connected internally |
| 2 | |
| 3 | Output 2 ⁵ |
| 4 | Output 2 ¹ |
| 5 | Output 2 ⁰ |
| 6 | Output 2 ⁷ |
| 7 | Output 2 ⁴ |
| 8 | Output 2 ² |
| 9 | Output 2 ³ |
| 10 | Output 2 ⁶ |
| 11 | --- |
| 12 | Power supply: 12 to 24 VDC |
| 13 | 0 V (common) |

Note: The circuit is the same for all bit outputs.
Each E6CP Rotary Encoder has one main circuit.

Positioner Connection Example

H8PS Cam Positioner Connection



Note: The E6CP-AG5C cannot be connected to the H8PS.

Ordering Information

| Model |
|------------|
| H8PS-8A |
| H8PS-8AP |
| H8PS-8AF |
| H8PS-8AFP |
| H8PS-16A |
| H8PS-16AP |
| H8PS-16AF |
| H8PS-16AFP |
| H8PS-32A |
| H8PS-32AP |
| H8PS-32AF |
| H8PS-32AFP |

Specifications

| | |
|-----------------------------|--|
| Rated voltage | 24 VDC |
| Cam precision | 0.5° (for 720 resolution), 1° (for 256/360 resolution) |
| No. of output points | 8-point output type: 8 cam outputs, 1 RUN output, 1 pulse output 16-point output type: 16 cam outputs, 1 RUN output, 1 pulse output 32-point output type: 32 cam outputs, 1 RUN output, 1 pulse output |
| Encoder response | RUN mode, test mode: 256/360 resolution 1,600 r/min max. (1,200 r/min when advance compensation is set for four cams or more) 720 resolution 800 r/min max. (600 r/min when advance compensation is set for four cams or more) |
| Additional functions | <ul style="list-style-type: none"> • Origin compensation (zeroing) • Rotation direction switching • Angle display switching • Teaching • Pulse output • Angle/number of rotations display switching • Puncture * • Angle advance • Number of rotations alarm output • Setting with support software (order separately) * |

Note: For 16-point and 32-point output types only

Safety Precautions

Refer to *Warranty and Limitations of Liability*.

⚠ WARNING

This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.



Precautions for Correct Use

Do not use the Encoder under ambient conditions that exceed the ratings.

● **Mounting**

For front-surface mounting, the maximum tightening torque is 1.76 N·m. (Effective screw length: 7 mm min.)

● **Wiring**

Spurious pulses may be generated for outputs when power is turned ON. Wait at least 1 s after turning ON the power to the Encoder before using the connected device.

● **Connection**

Spurious pulses may be generated when power is turned ON and OFF. Wait at least 1 s after turning ON the power to the Encoder before using the connected device, and stop using the connected device at least 1 s before turning OFF the power to the Encoder. Also, turn ON the power to the load only after turning ON the power to the Encoder.

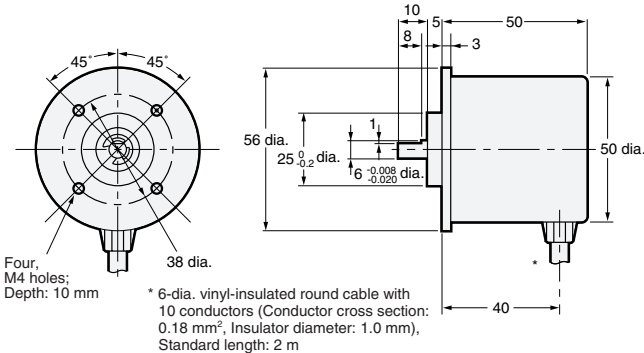
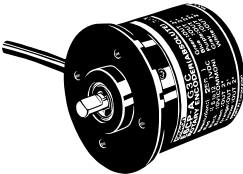
(Unit: mm)

Dimensions

Tolerance class IT16 applies to dimensions in this datasheet unless otherwise specified.

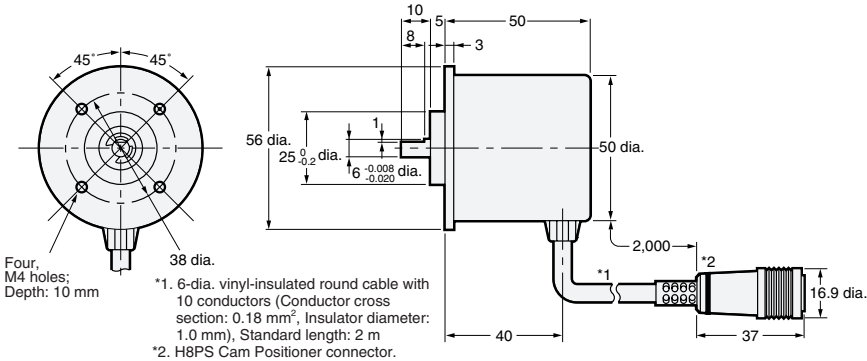
Encoder

E6CP-AG3C
E6CP-AG5C



The E69-C06B Coupling is provided.

E6CP-AG5C-C



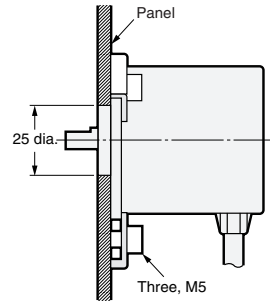
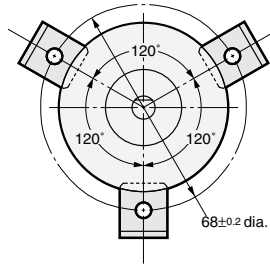
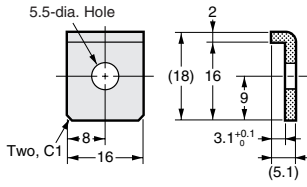
The E69-C06B Coupling is sold separately.

Accessories (Order Separately)

Servo Mounting Bracket

E69-2

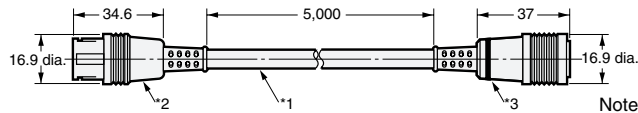
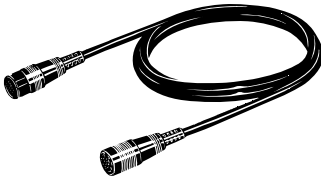
Mounting Bracket Installation



Note: Provided with the product.

Extension Cable

E69-DF5



- *1. 6-dia. shielded cable with 12 conductors (Conductor cross section: 0.2 mm², Insulator diameter: 1.1 mm), Standard length: 5 m
- *2. Connects to connector on E6CP-AG5C-C.
- *3. Connects to H8PS Cam Positioner.

Note: 1. The E69-DF5 (5 m) is also available with the following cable lengths: 10 m, 15 m, 20 m, and 98 m.
2. Cable can be extended to 100 m when the H8PS Cam Positioner is connected.

Couplings

E69-C06B

E69-C68B

E69-C610B

E69-C06M

Refer to *Accessories* for details.