

## 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	Models are also available with 15-m and 98-m cables.
	E69-DF10	10 m	
	E69-DF20	20 m	

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 <sup>−6</sup> kg·m <sup>2</sup> 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 <sup>2</sup> 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:

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

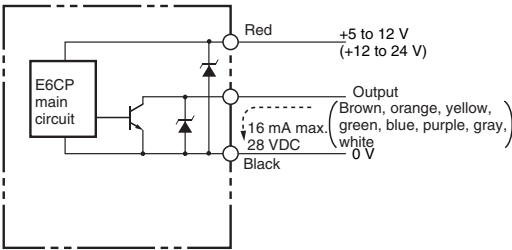
This means that the Rotary Encoder will not operate electrically if its speed exceeds the maximum electrical response speed.

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

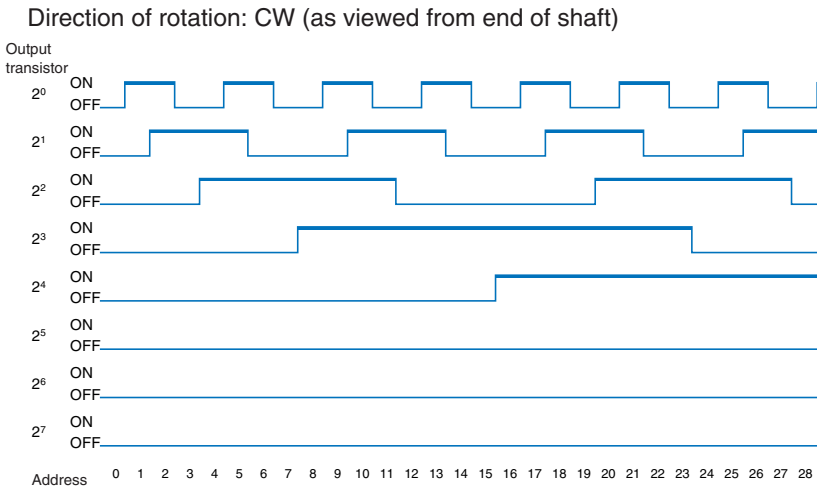
I/O Circuit Diagrams

E6CP-AG3C, E6CP-AG5C	E6CP-AG5C-C
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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 <sup>0</sup>	
Orange	Output 2 <sup>1</sup>	
Yellow	Output 2 <sup>2</sup>	
Green	Output 2 <sup>3</sup>	
Blue	Output 2 <sup>4</sup>	
Purple	Output 2 <sup>5</sup>	
Gray	Output 2 <sup>6</sup>	
White	Output 2 <sup>7</sup>	

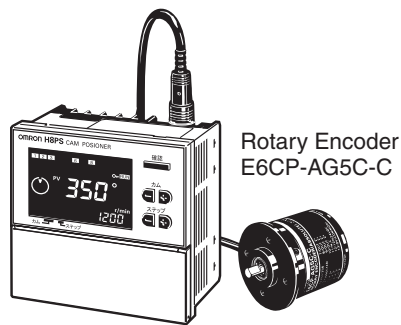
Note: The circuit is the same for all bit outputs.  
Each E6CP Rotary Encoder has one main circuit.

Terminal No.	E6CP-AG5C-C
1	Connected internally
2	
3	Output 2 <sup>5</sup>
4	Output 2 <sup>1</sup>
5	Output 2 <sup>0</sup>
6	Output 2 <sup>7</sup>
7	Output 2 <sup>4</sup>
8	Output 2 <sup>2</sup>
9	Output 2 <sup>3</sup>
10	Output 2 <sup>6</sup>
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"><li>• Origin compensation (zeroing)</li><li>• Rotation direction switching</li><li>• Angle display switching</li><li>• Teaching</li><li>• Pulse output</li><li>• Angle/number of rotations display switching</li><li>• Puncture *</li><li>• Angle advance</li><li>• Number of rotations alarm output</li><li>• Setting with support software (order separately) *</li></ul>

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

Programmable Controller Connection

Connection is possible with the CQM1H-CPU51 and CQM1H-ABB21.

Refer to the *CQM1H Programmable Controller Catalog* (P050) for details on the CQM1H Programmable Controller.

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.

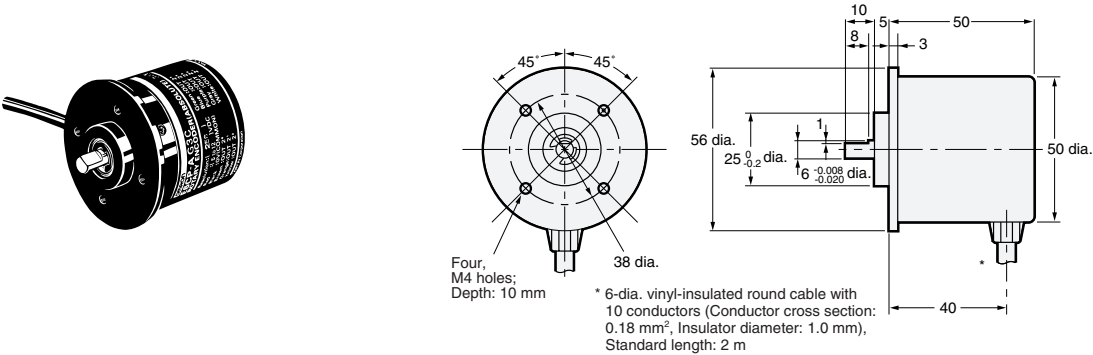
(Unit: mm)

Dimensions

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

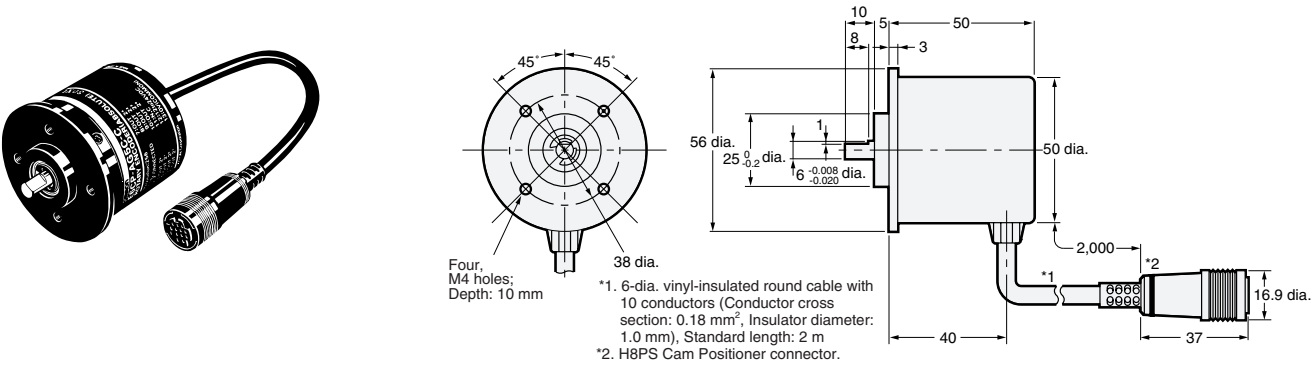
Encoder

E6CP-AG3C  
E6CP-AG5C



The E69-C06B Coupling is provided.

E6CP-AG5C-C

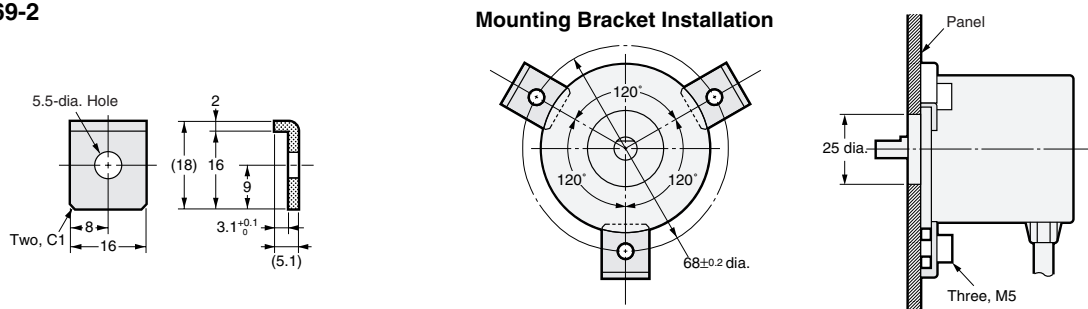


The E69-C06B Coupling is sold separately.

Accessories (Order Separately)

Servo Mounting Bracket

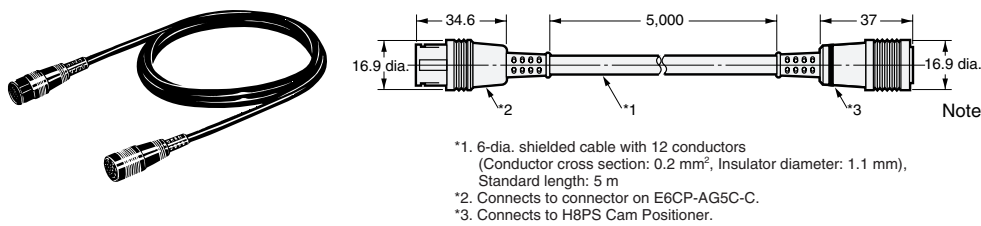
E69-2



Note: Provided with the product.

Extension Cable

E69-DF5



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.

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