


# 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

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:

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

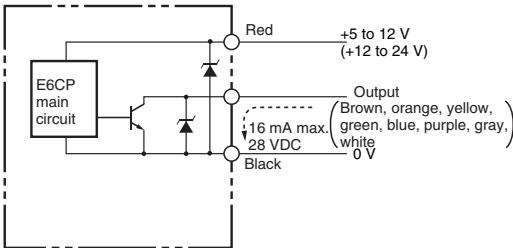
This means that the Rotary Encoder will not operate electrically if its speed exceeds the maximum electrical response speed.

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

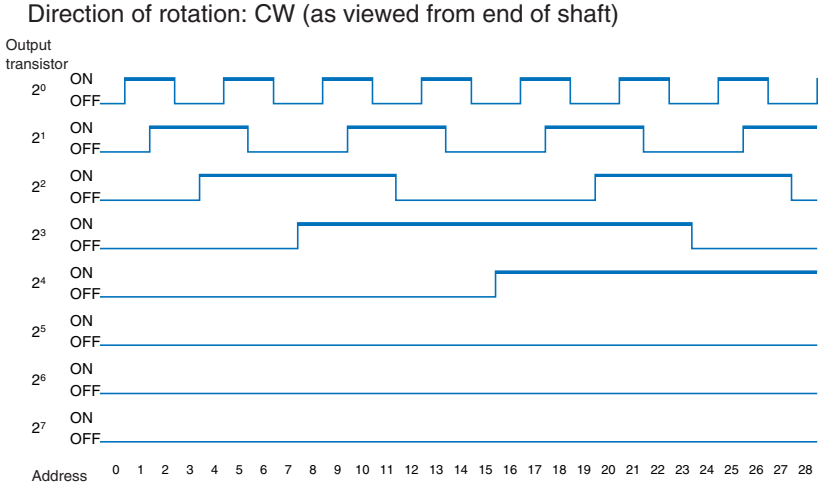
I/O Circuit Diagrams

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

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>	

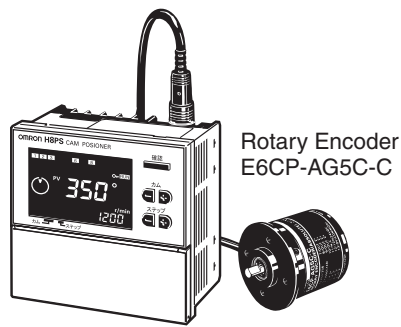
Note: The circuit is the same for all bit outputs. Each E6CP Rotary Encoder has one main circuit.

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

<b>Rated voltage</b>	24 VDC
<b>Cam precision</b>	0.5° (for 720 resolution), 1° (for 256/360 resolution)
<b>No. of output points</b>	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
<b>Encoder response</b>	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)
<b>Additional functions</b>	<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

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.

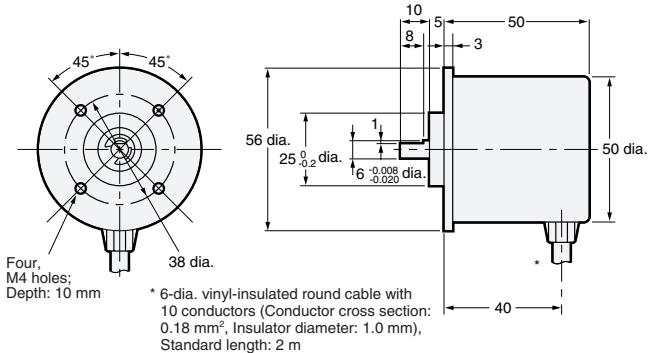
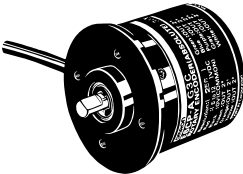
(Unit: mm)

Dimensions

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

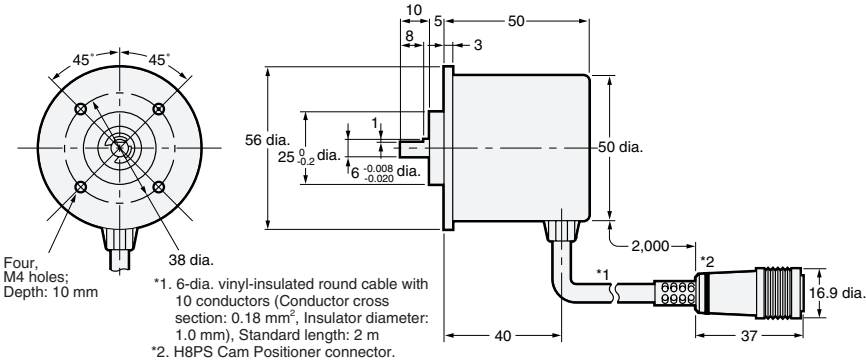
Encoder

E6CP-AG3C  
E6CP-AG5C



The E69-C06B Coupling is provided.

E6CP-AG5C-C



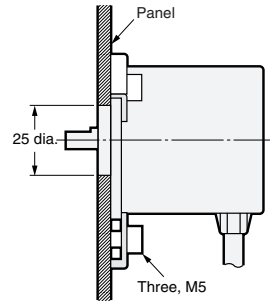
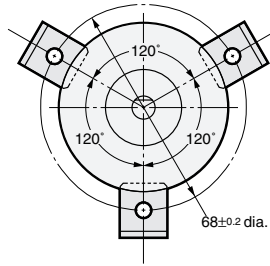
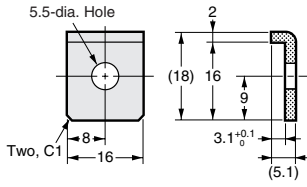
The E69-C06B Coupling is sold separately.

Accessories (Order Separately)

Servo Mounting Bracket

E69-2

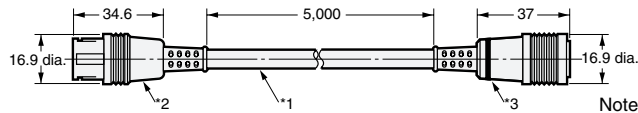
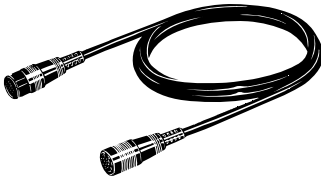
Mounting Bracket Installation



Note: Provided with the product.

Extension Cable

E69-DF5



- \*1. 6-dia. shielded cable with 12 conductors (Conductor cross section: 0.2 mm<sup>2</sup>, 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.

## Read and Understand This Catalog

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

## Warranty and Limitations of Liability

### WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

### LIMITATIONS OF LIABILITY

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

In no event shall the responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.

## Application Considerations

### SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the products.

At the customer's request, OMRON will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this catalog.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

### PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

## Disclaimers

### CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons.

It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the products may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased products.

### DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

### PERFORMANCE DATA

Performance data given in this catalog is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

### ERRORS AND OMISSIONS

The information in this document has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.

2011.7

In the interest of product improvement, specifications are subject to change without notice.

**OMRON Corporation**  
Industrial Automation Company

<http://www.ia.omron.com/>

(c)Copyright OMRON Corporation 2011 All Right Reserved.