Low-cost Encoder with Diameter of 50 mm

E6CP-A

CSM_E6CP-A_DS_E_4_1

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			None	**E6CP-AG5C 256P/R 2M**
			Supported	**E6CP-AG5C-C 256P/R 2M**

Note: When connecting to the H8PS, use the E6CP-AG5C-C. 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^{-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:

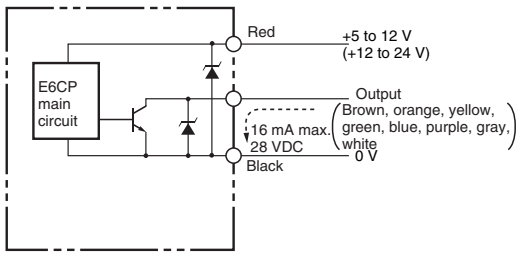
$$\text{Maximum electrical response speed (rpm)} = \frac{\text{Maximum response frequency}}{\text{Resolution}} \times 60$$

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

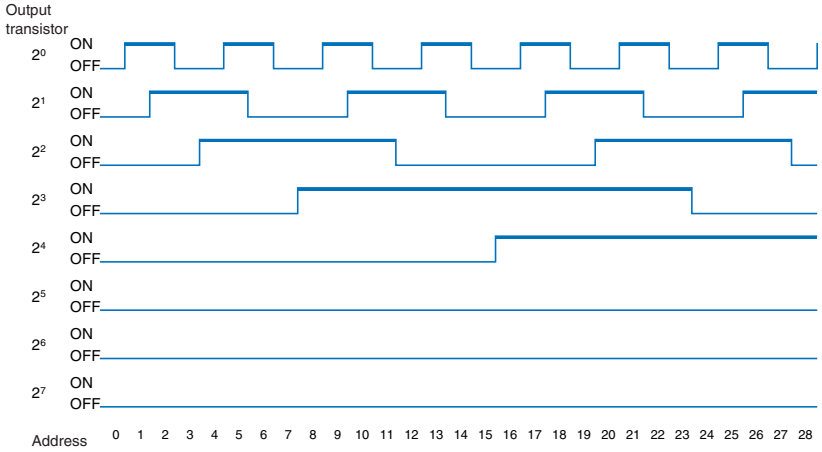
E6CP-AG3C, E6CP-AG5C	E6CP-AG5C-C

Output Circuits



Output mode

Direction of rotation: CW (as viewed from end of shaft)



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	

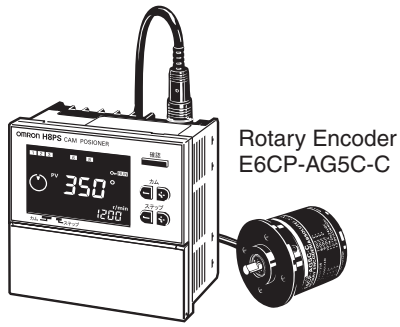
Note: The circuit is the same for all bit outputs.

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.

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	● 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

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.

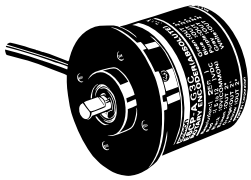
(Unit: mm)

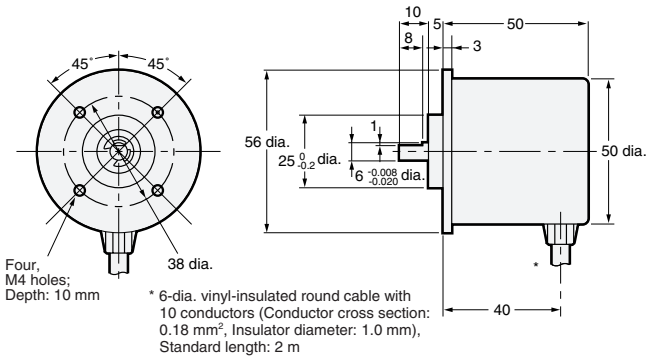
Dimensions

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

Encoder

E6CP-AG3C
E6CP-AG5C

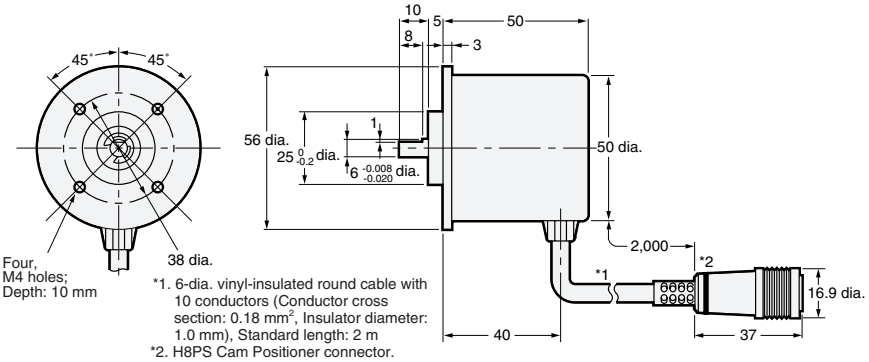




* 6-dia. vinyl-insulated round cable with 10 conductors (Conductor cross section: 0.18 mm², Insulator diameter: 1.0 mm), Standard length: 2 m

The E69-C06B Coupling is provided.

E6CP-AG5C-C



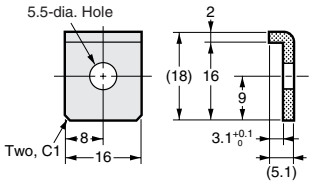
*1. 6-dia. vinyl-insulated round cable with 10 conductors (Conductor cross section: 0.18 mm², Insulator diameter: 1.0 mm), Standard length: 2 m
*2. H8PS Cam Positioner connector.

The E69-C06B Coupling is sold separately.

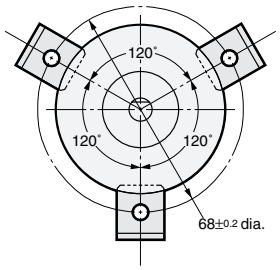
Accessories (Order Separately)

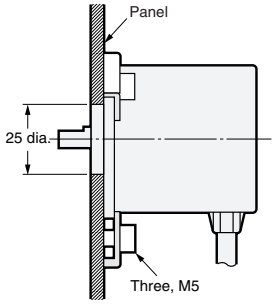
Servo Mounting Bracket

E69-2



Mounting Bracket Installation

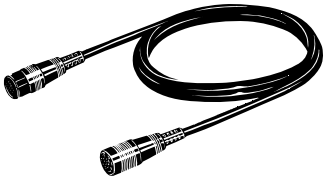


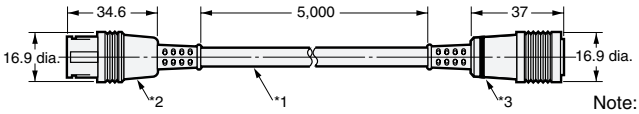


Note: Provided with the product.

Extension Cable

E69-DF5





*1. 6-dia. shielded cable with 12 conductors
(Conductor cross section: 0.2 mm^2, 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.

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

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2010.8

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