E6F-C/E6H-C

相關情報技術簡介（技術篇）.....1015

確保最強的軸強度堅固型

■確保最強的軸強度之堅固型。
　徑向120N、軸向50N強力
■實現IP65f之防滴、防油構造
■採用互補輸出，而能長距離延長導線
■附輸出負荷短路保護回路，提高可靠性

種類

（ 、◎標記之機種為標準庫存機種。無標記（接單生產機種）之交貨期，請洽詢交易廠商經銷商。）

本體

電源電壓	輸出形式	分解能（脈衝/回轉）	型式
DC12～24V	互補輸出	100、200、360、500、600	E6F-CWZ5G型
		1,000	

注. 訂貨時請務必指定分解能。（例：E6F-C WZ5G型　100P/R）

附件（選購）

種類	型形式	備注
耦合器	◎E69-C10B型	—
	◎E69-C610B型	異口徑型
	E69-C10M型	金屬型
伺服（servo）安裝用安裝金屬零件	E69-2 350型	3個1組

E6H-C

採用不需耦合器之中空軸。小型、高分解能泛用型

■對應廣泛的電源電壓DC5～24V
　（集極開路型）
■外徑 ϕ40，至3,600P/R的高分解能
■厚度26mm之薄型
■亦備有差動(Line Driver)輸出
　（最大可延長至100m）

種類

（ 之機種為標準庫存機種。無標記（接單生產機種）之交貨期，請洽詢交易廠商經銷商。）

電源電壓	輸出形式	分解能（脈衝/回轉）	型式
DC5～24V	集極開路	300、360、500、600、720、800、1,000、1,024	E6H-CWZ6C型
		1,200、1,500、1,800、2,000、2,048	
		2,500、3,600	
DC5～12V	電壓輸出	300、360、500、600、720、800、1,000、1,024	E6H-CWZ3E型
		1,200、1,500、1,800、2,000、2,048	
		2,500、3,600	
DC5～12V	差動輸出	300、360、500、600、720、800、1,000、1,024	E6H-CWZ3X型
		1,200、1,500、1,800、2,000、2,048	
		2,500、3,600	

注. 訂貨時除形式以外，亦請務必指定分解能。（例：E6H-CWZ6C型　1000P/R）

Hollow-shaft Encoder with Diameter of 40 mm

E6H-C

CSM_E6H-C_DS_E_3_1

Hollow Shafts Eliminate the Need for a Coupling. Compact, High-resolution, General-purpose Rotary Encoder.

- Power supply voltage from 5 to 24 VDC (for Models with Open-collector Output).
- Resolution of up to 3,600 ppr in Encoders with an external diameter of only 40 mm.
- Only 26 mm thick.
- Line driver output also available (maximum cable length extension of 100 m).

⚠ Be sure to read *Safety Precautions* on page 4.

Ordering Information

Encoders [Refer to *Dimensions* on page 4.]

Power supply voltage	Output configuration	Resolution (pulses/rotation)	Model
5 to 24 VDC	Open-collector output	300, 360, 500, 600, 720, 800, 1,000, 1,024 1,200, 1,500, 1,800, 2,000, 2,048 2,500, 3,600	**E6H-CWZ6C (resolution) 0.5M** Example: E6H-CWZ6C 300P/R 0.5M
5 to 12 VDC	Voltage output	300, 360, 500, 600, 720, 800, 1,000, 1,024 1,200, 1,500, 1,800, 2,000, 2,048 2,500, 3,600	**E6H-CWZ3E (resolution) 0.5M** Example: E6H-CWZ3E 300P/R 0.5M
5 to 12 VDC	Line-driver output	300, 360, 500, 600, 720, 800, 1,000, 1,024 1,200, 1,500, 1,800, 2,000, 2,048 2,500, 3,600	**E6H-CWZ3X (resolution) 0.5M** Example: E6H-CWZ3X 300P/R 0.5M

Ratings and Specifications

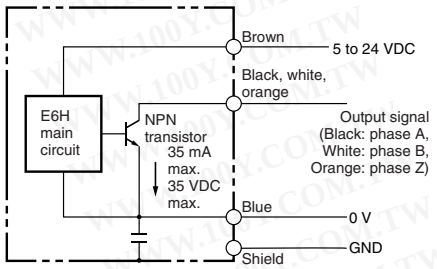
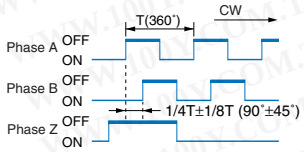
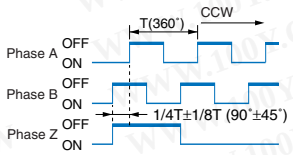
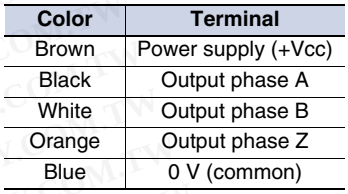
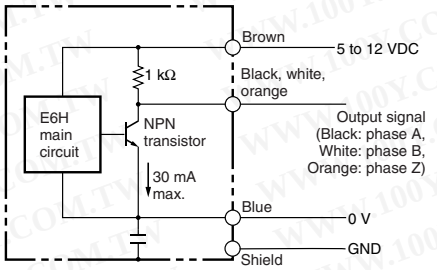
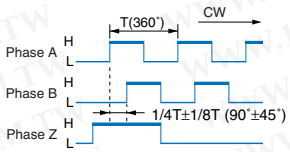
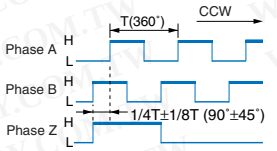
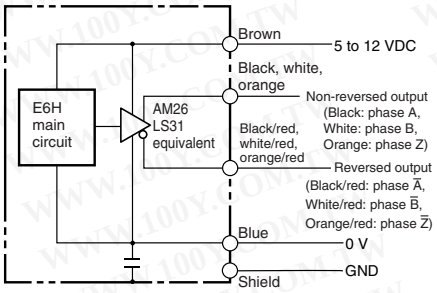
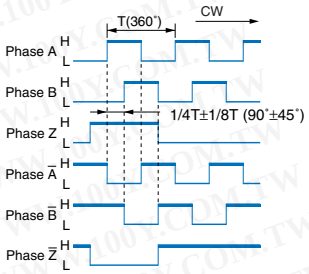
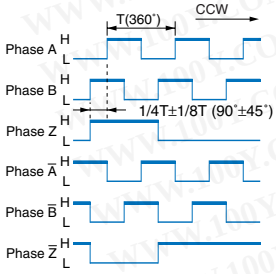
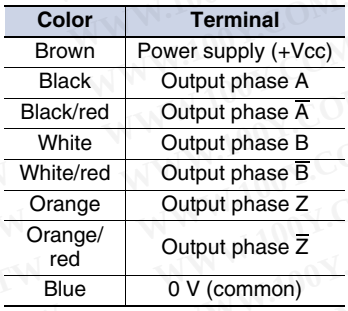
Item / Model		E6H-CWZ6C	E6H-CWZ3E	E6H-CWZ3X
Power supply voltage		5 VDC –5% to 24 VDC +15%, ripple (p-p): 5% max.	5 VDC –5% to 12 VDC +10%, ripple (p-p): 5% max.	
Current consumption*1		100 mA max.		150 mA max.
Resolution (pulses/rotation)		300, 360, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000, 2,048, 2,500, 3,600		
Output phases		Phases A, B, and Z		Phases A, $\overline{A}$, B, $\overline{B}$, Z, and $\overline{Z}$
Output configuration		Open-collector output	Voltage output	Line-driver output*4
Output capacity		Applied voltage: 35 VDC max. Sink current: 35 mA max. Residual voltage: 0.7 V max. (at sink current of 35 mA)	Output resistance: 1 kΩ Sink current: 30 mA max. Residual voltage: 0.7 V max. (at sink current of 30 mA)	Output current: High level: I_O = –10 mA Low level: I_S = 10 mA Output voltage: V_O = 2.5 V min. V_S = 0.5 V
Maximum response frequency*2		100 kHz		
Phase difference between outputs		90°±45° between A and B (1/4 T ± 1/8 T)		
Rise and fall times of output		1 μs max. (Control output voltage: 5 V, Load resistance: 1 kΩ, Output cable: 500 mm)		1 μs max. (I_O = –10 mA, I_S = 10 mA, Output cable: 500 mm)
Starting torque		1.5 mN·m max.		
Moment of inertia		2×10^{-6} kg·m^2 max.		
Shaft loading	Radial	29.4 N		
	Thrust	4.9 N		
Maximum permissible speed		10,000 r/min		
Ambient temperature range		Operating: –10 to 70°C (at 90% humidity max.), Storage: –30 to 85°C (with no icing)		
Ambient humidity range		Operating/Storage: 90% max. (with no condensation)		
Insulation resistance		Excluded because of capacitor ground.		
Dielectric strength		Excluded because of capacitor ground.		
Vibration resistance		Destruction: 10 to 500 Hz, 100 m/s^2 or 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions		
Shock resistance		300 m/s^2 for 11 ms 3 times each in X, Y, and Z directions (excluding shock to the shaft)		
Degree of protection*3		IEC 60529 IP50		
Connection method		Pre-wired Models (Standard cable length: 0.5 m)		
Material		Case: Iron, Main unit: Aluminum, Pressboard panel: SUS304		
Weight (packed state)		Approx. 120 g		
Accessories		Instruction manual		

*1. An inrush current of approximately 6 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.
*4. 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.

I/O Circuit Diagrams

Model	Output Circuits	Output mode	Connection
E6H-CWZ6C		Open-collector output Direction of rotation: CW (as viewed from end of shaft)  Direction of rotation: CCW (as viewed from end of shaft) 	
E6H-CWZ3E		Voltage output Direction of rotation: CW (as viewed from end of shaft)  Direction of rotation: CCW (as viewed from end of shaft) 	
E6H-CWZ3X		Line-driver output Direction of rotation: CW (as viewed from end of shaft)  Direction of rotation: CCW (as viewed from end of shaft) 	 Note: 1. Receiver: AM26LS32 equivalent 2. "Black/red" indicates a red strip.

Note: Normally connect GND to 0 V or to an external ground.

Safety Precautions

Refer to *Warranty and Limitations of Liability*.

⚠ WARNING

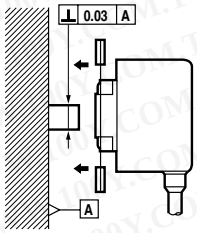
This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.

Precautions for Correct Use

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

● Mounting

- The diameter of the mating shaft must be 8 $^{-0.012}_{-0.004}$ mm and 8 to 11 mm long from the mounting surface.
- The allowable displacement in the mating shaft must 0.05 mm in the radial direction and 0.3 mm in the thrust direction.
- The mounting surface and shaft must be perpendicular to within 0.03 mm.
- When securing the Encoder, do not allow force to be applied to the leaf spring.



Eccentricity will develop in the Encoder if the above values are not satisfied, and the mounting leaf spring may be destroyed.

- When securing the Encoder, use two M3 screws to secure the leaf spring to the mounting surface.
- Use the Allen set screw provided with the hollow shaft to secure the shaft. Use a tightening torque of 0.4 N·m and apply screw lock glue to the screw to prevent it from becoming loose.
- If wiring after securing the Encoder, do not pull on the cable. Also, do not apply shock to the Encoder or hollow shaft.
- If the Encoder phase Z must be aligned with the origin of the installation device, mount the Encoder while checking the phase Z output.

● Wiring

Spurious pulses may be generated when power is turned ON and OFF. Wait at least 0.1 s after turning ON the power to the Encoder before using the connected device, and stop using the connected device at least 0.1 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.

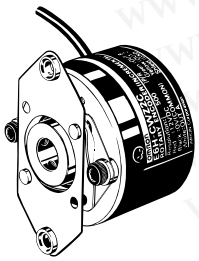
Rotary Encoder Recommended Power Supplies: Consult your OMRON representative for details.

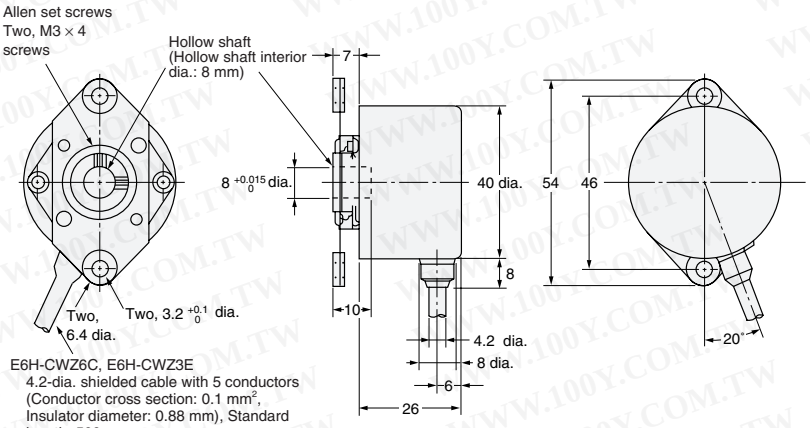
(Unit: mm)

Dimensions

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

E6H-C





E6H-CWZ6C, E6H-CWZ3E
4.2-dia. shielded cable with 5 conductors
(Conductor cross section: 0.1 mm^2,
Insulator diameter: 0.88 mm), Standard
length: 500 mm
E6H-CWZ3X
5.5-dia. shielded cable with 8 conductors
(Conductor cross section: 0.1 mm^2,
Insulator diameter: 1.0 mm), Standard
length: 500 mm