

Incremental ϕ 60mm Hollow Shaft Type

Diameter ϕ 60mm Hollow shaft type Incremental Rotary encoder

■ Features

- External diameter ϕ 60mm, inner diameter of shaft ϕ 20mm
- Easy installation at narrow space
- Suitable for measuring Angle, Position, Revolution, Speed, Acceleration and distance
- Power supply : 5VDC, 12–24VDC \pm 5%
- Various output types



⚠ Please read "Caution for your safety" in operation manual before using.

■ Ordering information

E60H	20	–	8192	–	3	–	N	–	24	–	
Series	Shaft diameter		Pulse/1 Revolution		Output phase		Output		Power supply		Cable
Diameter ϕ 60mm, hollow shaft type	ϕ 20mm		5000, 8192		3 : A, B, Z 6 : A, \bar{A} , B, \bar{B} , Z, \bar{Z}		T : Totem pole output N : NPN open collector output V : Voltage output L : Line driver output(*)		5 : 5VDC \pm 5% 24 : 12–24VDC \pm 5%		No mark: Normal type (*) C: Cable outgoing connector type

*Standard : E60H20–[PULSE]–3–N–24

*The power of Line driver is only for 5VDC

*Cable length : 250mm

■ Specifications

Item		Diameter ϕ 60mm hollow shaft type of Incremental rotary encoder		
Resolution(P/R)		5000, 8192		
Electrical specification	Output phase	A, B, Z phase (Line driver output A, \bar{A} , B, \bar{B} , Z, \bar{Z} phase)		
	Phase difference of output	Phase difference between A and B : $\frac{T}{4} \pm \frac{T}{8}$ (T=1cycle of A phase)		
	Control output	Totem pole output	<ul style="list-style-type: none"> • Low \Rightarrow Load current:Max. 30mA, Residual voltage : Max. 0.4VDC • High \Rightarrow Load current:Max. 10mA, Output voltage (Power supply 5VDC):Min. (Power supply–2.0) VDC, Output voltage (Power supply 12–24VDC):Min. (Power supply–3.0) VDC 	
		NPN open collector output	Load current : Max. 30mA, Residual voltage : Max. 0.4VDC	
		Voltage output	Load current : Max. 10mA, Residual voltage : Max. 0.4VDC	
		Line driver output	<ul style="list-style-type: none"> • Low \Rightarrow Load current : Max. 20mA, Residual : Max. 0.5VDC • High \Rightarrow Load current : Max. –20mA, Output voltage : Min. 2.5VDC 	
	Response time (Rise/Fall)	Totem pole output	Max. 1 μ s	<ul style="list-style-type: none"> • Measuring condition \Rightarrow Cable length : 2m, I sink = Max. 20mA
		NPN open collector output	Max. 1 μ s	
		Voltage output	Max. 1 μ s	
		Line driver output	Max. 0.5 μ s	
	Max. Response frequency	300kHz		
	Power supply	<ul style="list-style-type: none"> • 5VDC \pm5% (Ripple P–P:Max. 5%) • 12–24VDC \pm5% (Ripple P–P:Max. 5%) 		
	Current consumption	Max. 80mA (disconnection of the load), Line driver output:Max. 50mA (disconnection of the load)		
Insulation resistance	Min. 100M Ω (at 500VDC mega between all terminals and case)			
Dielectric strength	750VAC 50/60Hz for 1 minute (Between all terminals and case)			
Connection	Cable outgoing type, 200mm cable outgoing connector type			
Mechanical specification	Starting torque	Max. 150gf \cdot cm (0.015N \cdot m)		
	Rotor inertia	Max. 110g \cdot cm ² (11 \times 10 ^{–5} kg \cdot m ²)		
	Shaft loading	Radial : 5kgf, Thrust : 2.5kgf		
	Max. allowable revolution	(Note1)	6000rpm	
Vibration	1.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hours			
Shock	Max. 100G			
Ambient temperature	–10 ~ 70 $^{\circ}$ C (at non–freezing status), Storage : –25 ~ 85 $^{\circ}$ C			
Ambient humidity	35–85%RH, Storage : 35–90%RH			
Protection	IP50 (IEC standard)			
Cable	ϕ 5mm, 5P, Length : 2m, Shield cable (Line driver output : ϕ 5mm, 8P)			
Accessory	Bracket			
Unit weight	Approx. 300g			

* **(Note1)** Not indicated type is customizable.

* **(Note2)** Max. allowable revolution \geq Max. response revolution 【Max. response revolution (rpm) = $\frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$ 】

(A) Counter

(B) Timer

(C) Temp. controller

(D) Power controller

(E) Panel meter

(F) Tacho/Speed/Pulse meter

(G) Display unit

(H) Sensor controller

(I) Switching power supply

(J) Proximity sensor

(K) Photo electric sensor

(L) Pressure sensor

(M) Rotary encoder

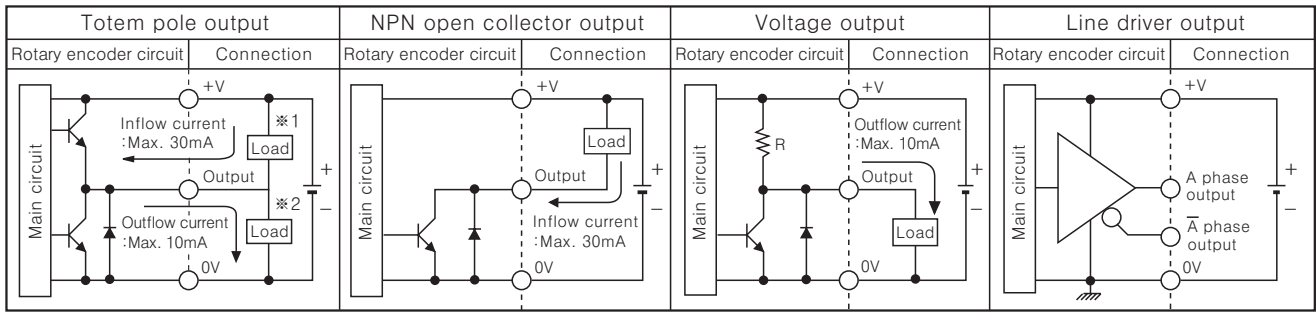
(N) Stepping motor & Driver & Controller

(O) Graphic panel

(P) Production stoppage models & replacement

E60H Series

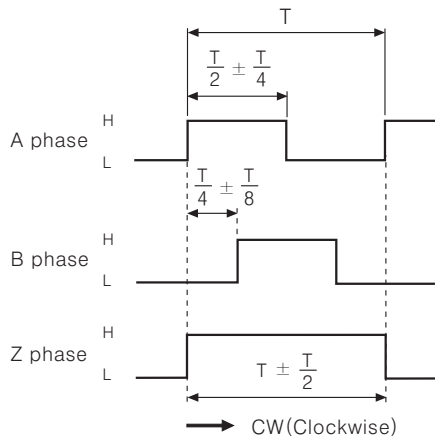
Control output diagram



- ⊞ Totem pole output type can be used for NPN open collector output type(※1) or Voltage output type(※2).
- ⊞ All output circuits of A, B, Z phase is same.(Line driver output is A, \bar{A} , B, \bar{B} , Z, \bar{Z})

Output waveform

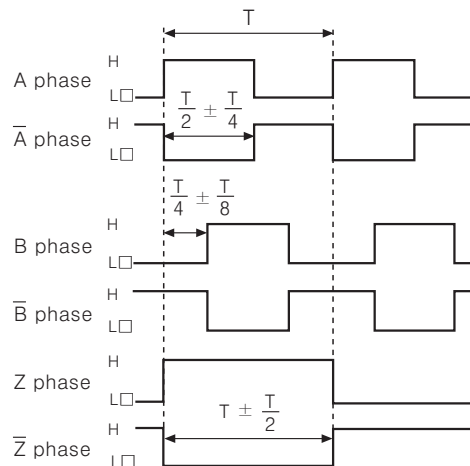
- Totem pole output / NPN open collector output / Voltage output



→ CW(Clockwise)

※CW : As viewed from the shaft.

- Line driver output

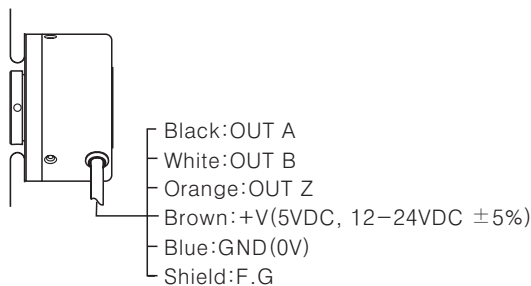


→ CW(Clockwise)

Connections

Normal type

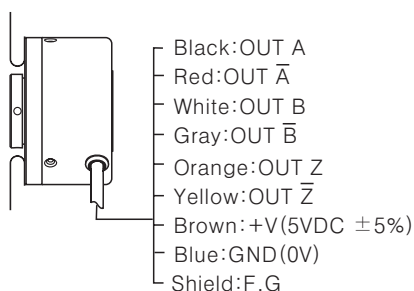
- Totem pole output / NPN open collector output / Voltage output



※Unused wires must be insulated.

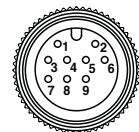
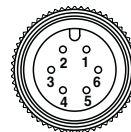
※The metal case and shield cable of encoder should be grounded(F.G).

- Line driver output



Cable outgoing connector type

- Totem pole output
- NPN open collector output
- Voltage output
- Line driver output



Totem pole output NPN open collector output Voltage output			Line driver output		
Pin No	Function	Cable color	Pin No	Function	Cable color
①	OUT A	Black	①	OUT A	Black
②	OUT B	White	②	OUT \bar{A}	Red
③	OUT Z	Orange	③	+V	Brown
④	+V	Brown	④	GND	Blue
⑤	GND	Blue	⑤	OUT B	White
⑥	F.G	Shield	⑥	OUT \bar{B}	Gray
			⑦	OUT Z	Orange
			⑧	OUT \bar{Z}	Yellow
			⑨	F.G	Shield

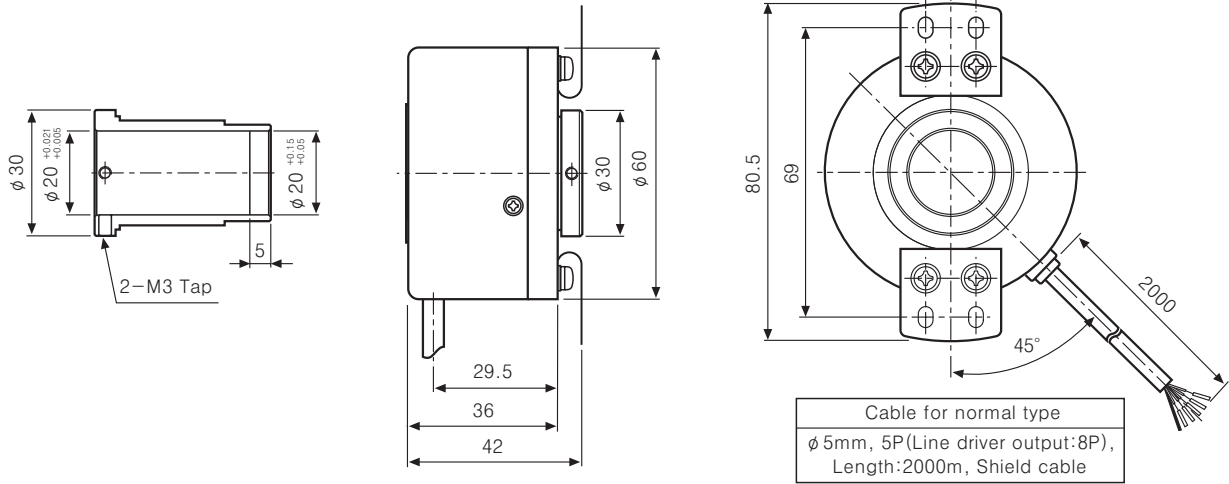
※F.G(Field Ground):It should be grounded separately.

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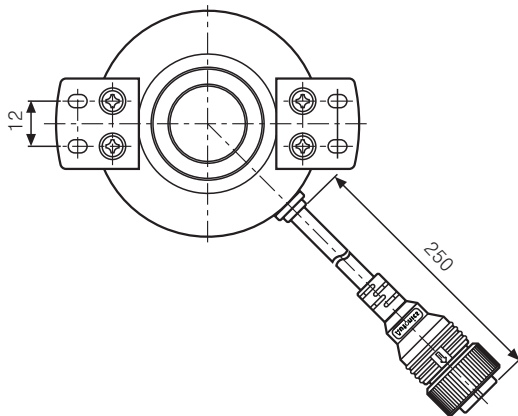
Dimension

Normal type

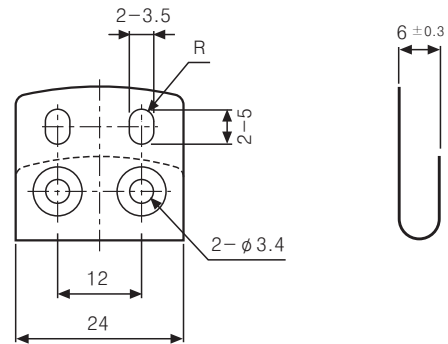
(Unit:mm)



Cable outgoing connector type



Bracket



*Connector cable is customizable and see M-48 for specifications.

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