

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, 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 ø 60mm, hollow type	ø 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 ±5% 24 : 12–24VDC ±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 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	• 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	• 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
		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	• 5VDC $\pm$ 5% (Ripple P–P: Max. 5%) • 12–24VDC $\pm$ 5% (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)	
	Dielectric strength	750VAC 50/60Hz for 1 minute (at 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. 75G	
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		Spring bracket	
Unit weight		Approx. 300g	

※ (Note1) Not indicated type is available to customize.

※ (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

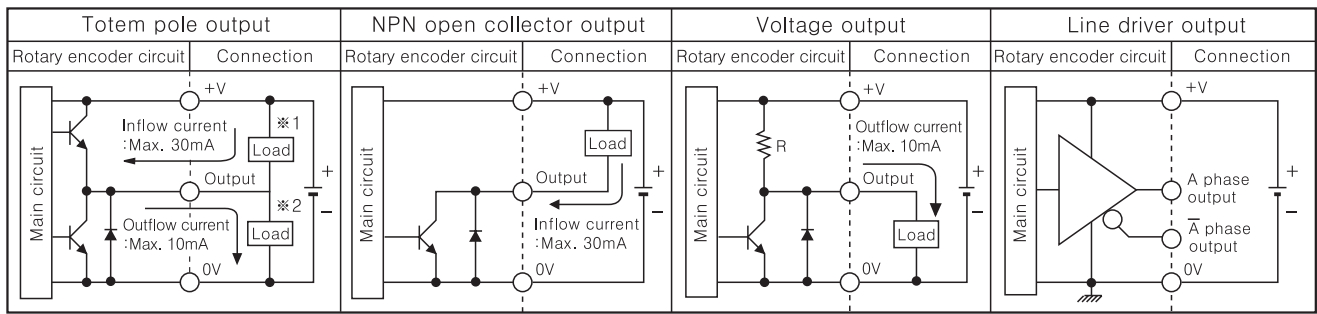
(N) Stepping motor & Driver & Controller

(O) Graphic panel

(P) Production stoppage models & replacement

E60H Series

Control output diagram

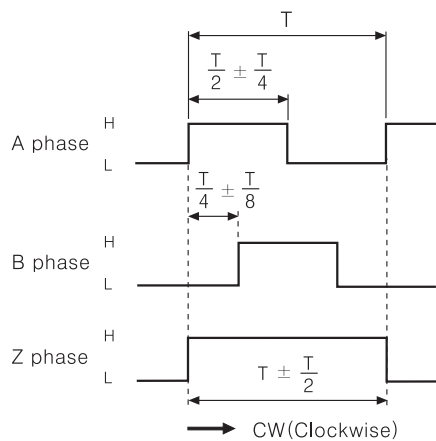


※ Totem pole output type can be used for NPN open collector output type(※1) or Voltage output type(※2).

※ All output circuits of A, B, Z phase is same. (Line driver output is A, A⁻, B, B⁻, Z, Z⁻)

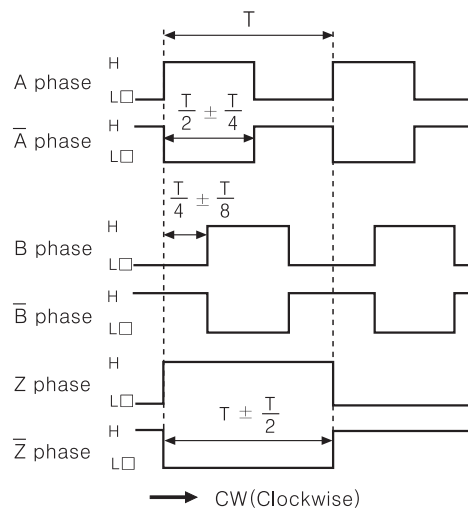
Output waveform

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



※ CW : In a view of shaft.

- Line driver output

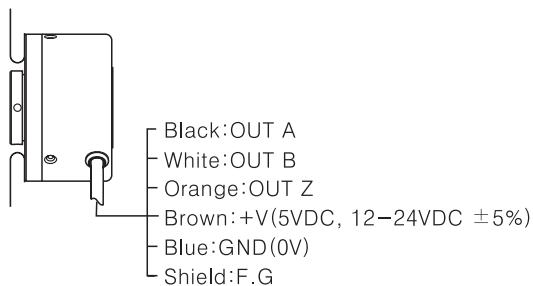


→ CW(Clockwise)

Connections

Normal type

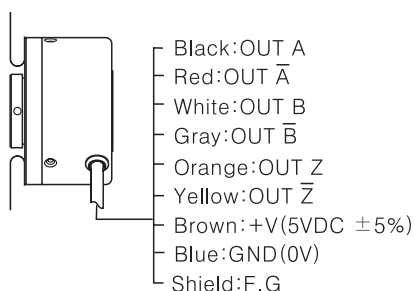
- Totem pole output / NPN open collector output / Voltage output



※ Unused wires must be insulated.

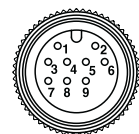
※ The metal case and shield cable of encoder should be grounded(F.G).

- Line driver output



Cable outgoing connector type

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



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 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 B	Gray
			⑦	OUT Z	Orange
			⑧	OUT Z	Yellow
			⑨	F.G	Shield

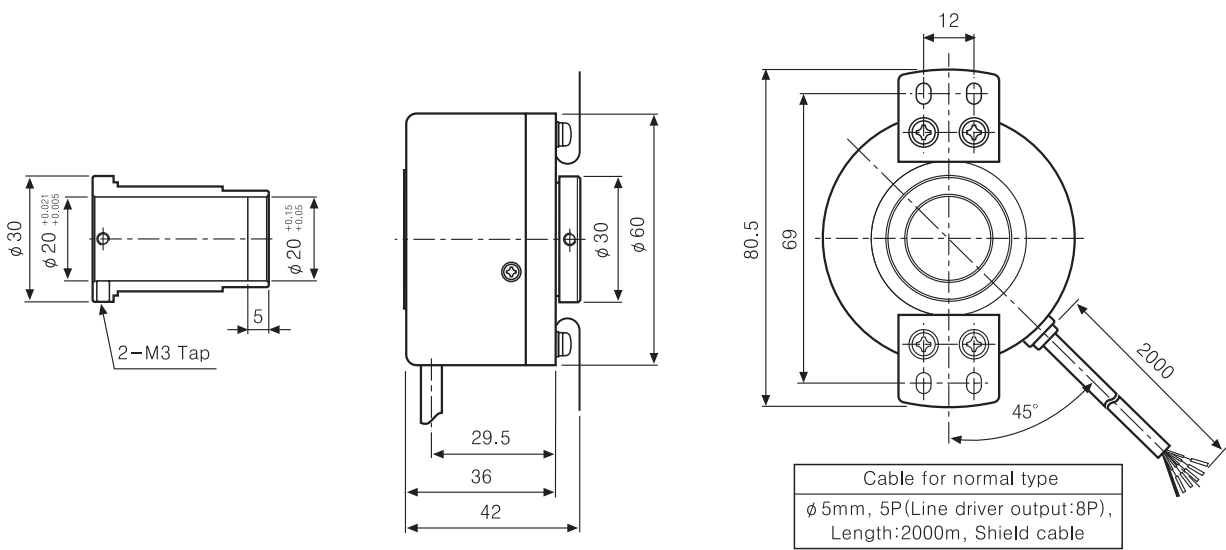
※ F.G(Field Ground): It should be grounded separately.

Incremental $\phi 60\text{mm}$ Hollow Shaft Type

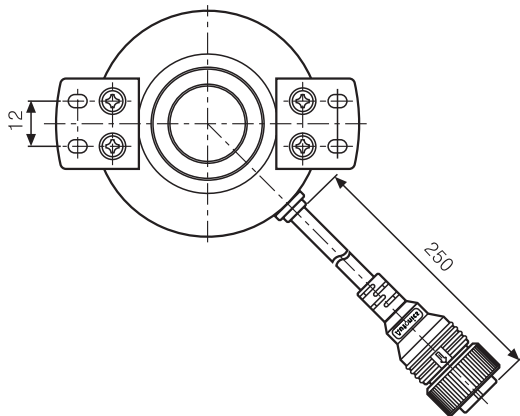
Dimension

Normal type

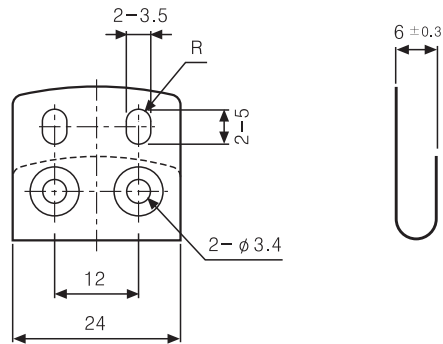
(Unit:mm)



Cable outgoing connector type



Bracket



※The connector cable is optional and refer to M-46 for the specification.

(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