

E60H Series

Diameter ø60mm Hollow shaft type Incremental Rotary Encoder

■ Features

- Diameter ø60mm, Inner diameter of shaft ø20mm
- Easy installation at narrow space
- Suitable for measuring angle, position, revolution, speed, acceleration and distance
- Power supply : 5VDC, 12-24VDC ±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/1Revolution	Output phase	Output	Power supply	Cable					
Diameter ø60mm, hollow shaft type	ø20mm	100, 1024, 500, 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: Cable type C: Connector cable type(※)					

※Standard : E60H20-PULSE-3-N-24

※Cable length : 250mm

■ Specifications

Item		Diameter ø60mm hollow shaft type of incremental rotary encoder		
Resolution(P/R) ^{※1}		100, 1024, 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 - Load current:Max. 30mA, Residual voltage : Max. 0.4VDC • High - Load current:Max. 10mA, Output voltage(Power voltage 5VDC):Min. (Power voltage-2.0)VDC, Output voltage(Power voltage 12-24VDC):Min. (Power voltage-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 - Load current : Max. 20mA, Residual voltage : Max. 0.5VDC • High - Load current : Max. -20mA, Output voltage(Power voltage 5VDC):Min. 2.5VDC, Output voltage(Power voltage 12-24VDC):Min. (Power voltage-3.0)VDC	
	Res- ponse time (Rise/ Fall)	Totem pole output	Max. 1μs	• Measuring condition - Cable length : 2m, I sink = 20mA
		NPN open collector output		
		Voltage output		
		Line driver output		
	Max. Response frequency		300kHz	
	Power supply		• 5VDC ±5%(Ripple P-P:Max. 5%) • 12-24VDC ±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. 100MΩ(at 500VDC megger between all terminals and case)		
Dielectric strength		750VAC 50/60Hz for 1 minute(Between all terminals and case)		
Connection		Cable type, 250mm connector cable type		
Mechanical specification	Starting torque		Max. 150gf·cm(0.015N·m)	
	Moment of inertia		Max. 110g·cm ² (11×10 ⁻⁶ kg·m ²)	
	Shaft loading		Radial : 5kgf, Thrust : 2.5kgf	
	Max. allowable revolution ^{※2}		6000rpm	
Vibration		1.5mm amplitude or 300m/s ² at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock		Approx. Max. 100G		
Environment	Ambient temperature		-10 to 70°C, storage : -25 to 85°C	
	Ambient humidity		35 to 85%RH, storage : 35 to 90%RH	
Protection		IP50(IEC standard)		
Cable		ø5, 5-wire, Length : 2m, Shield cable(Line driver output : ø5, 8-wire) (AWG24, Core diameter : 0.08mm, Number of cores : 40, Insulator out diameter : ø1)		
Accessory		Bracket 2EA		
Weight ^{※3}		Approx. 397g(approx. 330g)		

※1: Not indicated type is customizable.

※3: The weight with packaging and the weight in parentheses is only unit weight.

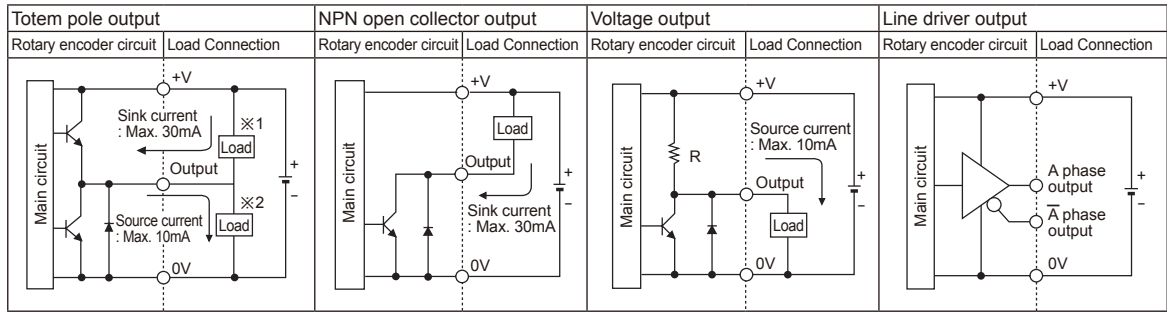
※2: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

$$[\text{Max. response revolution(rpm)}] = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$$

※Environment resistance is rated at no freezing or condensation.

Incremental ø60mm Hollow Shaft type

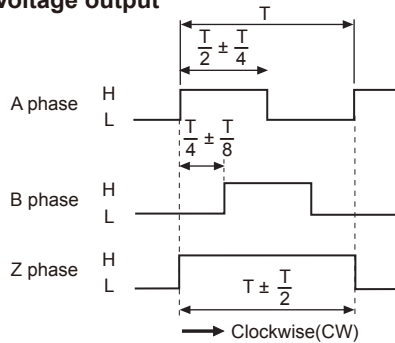
Control output diagram



- 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 are the same. (Line driver output is A, $\bar{A}$, B, $\bar{B}$, Z, $\bar{Z}$)

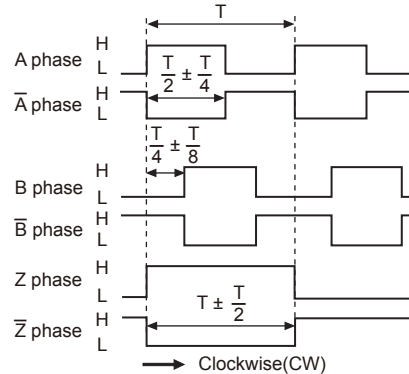
Output waveform

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



※CW : Right turn as from the shaft

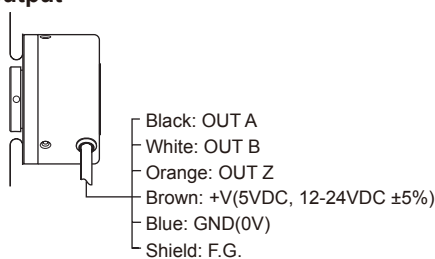
- Line driver output



Connections

◎ Cable type

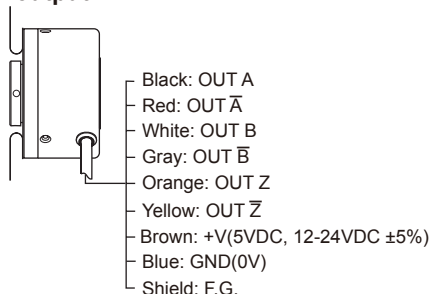
- Totem pole output / NPN open collector output / Voltage output



※Unused wires must be insulated.

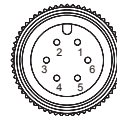
※The metal case and shield cable of encoder should be grounded(F.G.).

- Line driver output



◎ Connector cable 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.

(A) Photo electric sensor

(B) Fiber optic sensor

(C) Door/Area sensor

(D) Proximity sensor

(E) Pressure sensor

(F) Rotary encoder

(G) Connector/Socket

(H) Temp. controller

(I) SSR/Power controller

(J) Counter

(K) Timer

(L) Panel meter

(M) Tacho/Speed/ Pulse meter

(N) Display unit

(O) Sensor controller

(P) Switching mode power supply

(Q) Stepper motor& Driver&Controller

(R) Graphic/Logic panel

(S) Field network device

(T) Software

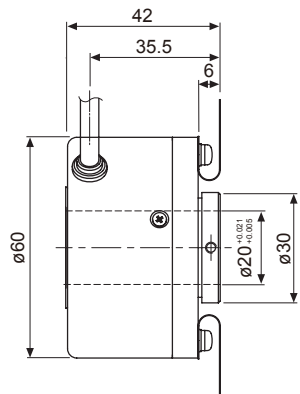
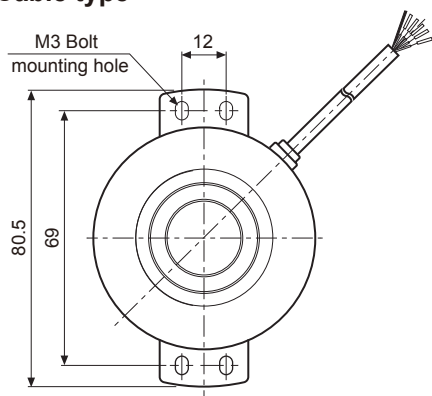
(U) Other

E60H Series

■ Dimension

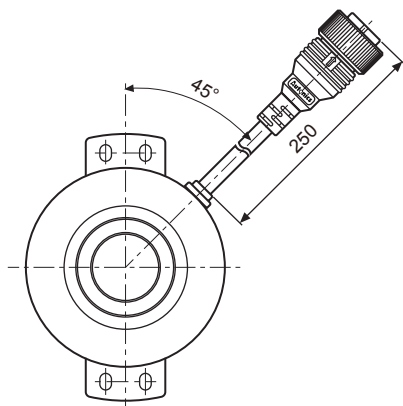
◎ Cable type

(unit: mm)

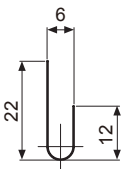
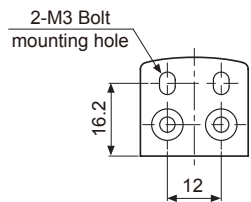


Cable
ø5, 5-wire(Line driver output : 8-wire),
Length : 2000m, Shield cable

◎ Connector cable type



● Bracket



※Connector cable is customizable and refer to the G-10 for specifications.