


E60H Series

Hollow Shaft Type Ø60mm Incremental Rotary Encoder

■ Features

- 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 inner diameter	Pulses/revolution	Output phase	Control output	Power supply	Cable					
Ø60mm, hollow shaft type	Ø20mm	100, 1024, 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: Radial cable type C: Radial cable connector type					

■ Specifications

Item	Hollow Shaft Type Ø60mm Incremental Rotary Encoder		
Resolution (PPR) ^{※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	Output between A and B phase: $\frac{T}{4} \pm \frac{T}{8}$ (T=1 cycle 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. 1 μ s (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	Over 100M Ω (at 500VDC megger between all terminals and case)	
Dielectric strength	750VAC 50/60Hz for 1 minute (between all terminals and case)		
Connection	Radial cable type, Radial cable connector type		
Mechanical specification	Starting torque	Max. 150gf·cm (0.0147 N·m)	
	Moment of inertia	Max. 110g·cm ² (11×10 ⁻⁶ kg·m ²)	
	Shaft loading	Radial: Max. 5kgf, Thrust: Max. 2.5kgf	
	Max. allowable revolution ^{※2}	6,000rpm	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction 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 structure	IP50 (IEC standard)		
Cable	Ø5mm, 5-wire (line driver output: 8-wire), 2m, Shield cable (AWG24, core diameter: 0.08mm, number of cores: 40, insulator out diameter: Ø1mm)		
Accessory	Bracket: 2		
Approval	CE (except line driver output)		
Weight ^{※3}	Approx. 391g (approx. 330g)		

※1: Not indicated resolutions are customizable.

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

※3: The weight includes packaging.

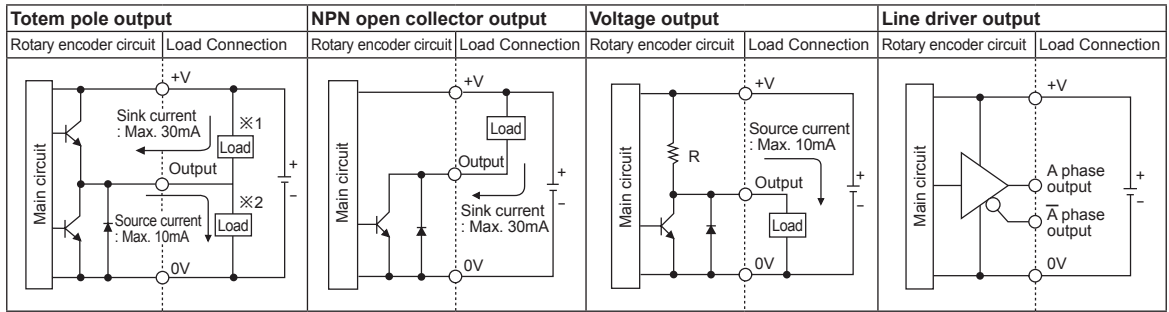
The weight in parenthesis is for unit only.

[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

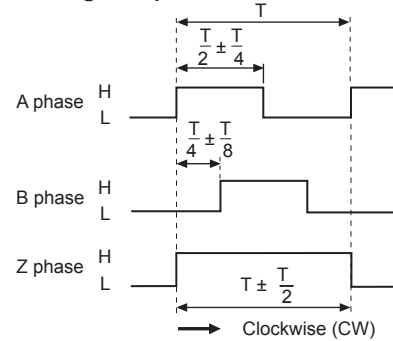
Control Output Diagram



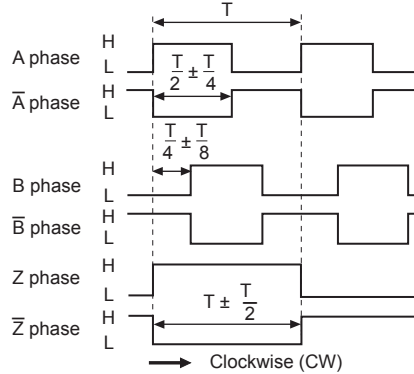
- All output circuits of A, B, Z phase are same. (line driver output is A, \bar{A} , B, \bar{B} , Z, \bar{Z})
- Totem pole output type can be used for NPN open collector type (※1) or voltage output type (※2).

Output Waveforms

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



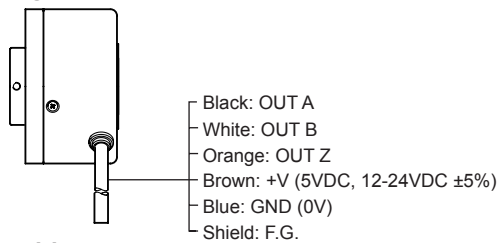
- Line driver output



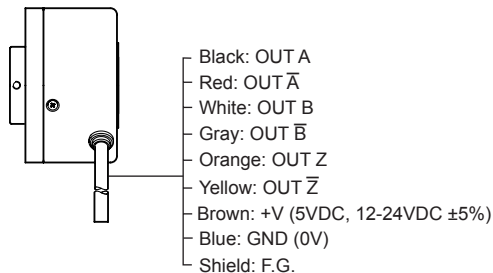
Connections

Radial cable type

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



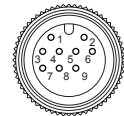
- Line driver output



- ※ Unused wires must be insulated.
- ※ The metal case and shield cable of encoder should be grounded (F.G.).

Radial cable 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.

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) Door/Area Sensors

(D) Proximity Sensors

(E) Pressure Sensors

(F) Rotary Encoders

(G) Connectors/ Connector Cables/ Sensor Distribution Boxes/Sockets

(H) Temperature Controllers

(I) SSRs / Power Controllers

(J) Counters

(K) Timers

(L) Panel Meters

(M) Tacho / Speed / Pulse Meters

(N) Display Units

(O) Sensor Controllers

(P) Switching Mode Power Supplies

(Q) Stepper Motors & Drivers & Controllers

(R) Graphic/ Logic Panels

(S) Field Network Devices

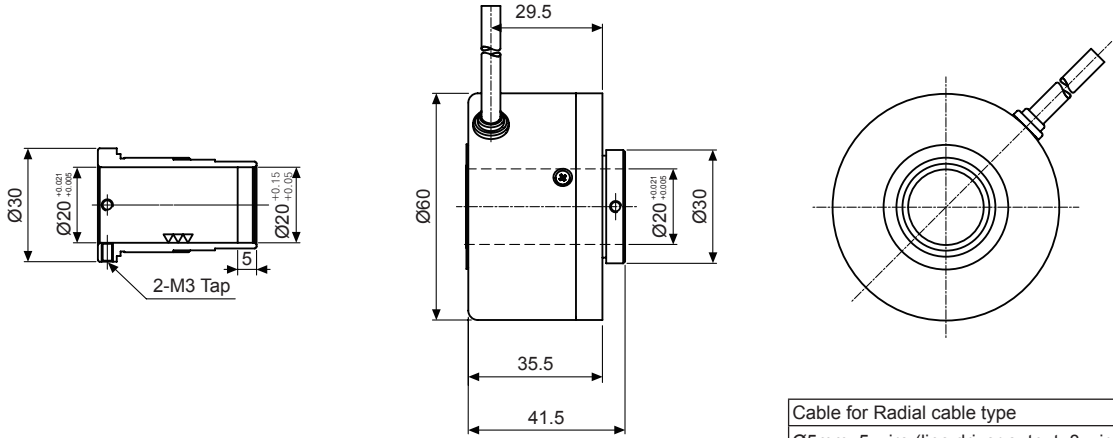
(T) Software

E60H Series

■ Dimensions

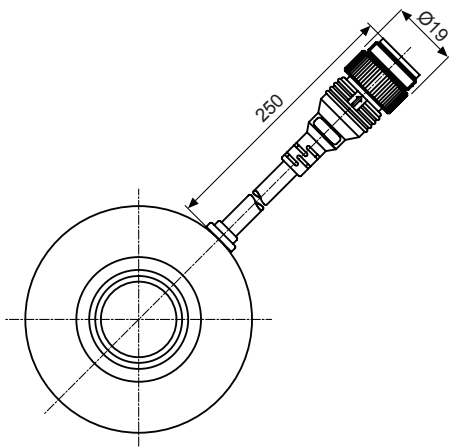
◎ Radial cable type

(unit: mm)

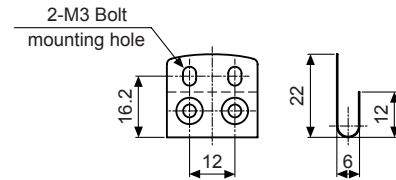


<p>Cable for Radial cable type Ø5mm, 5-wire (line driver output: 8-wire), 2,000mm, Shield cable</p>

◎ Radial cable connector type



● Bracket



<p>Cable for Radial cable connector type Ø5mm, 5-wire (line driver output: 8-wire), 250mm, Shield cable</p>

※Connector cable is sold separately and refer to page G-10 for specifications.