Diameter ϕ60mm Hollow shaft type Incremental Rotary encoder

▣Features

- ●External diameter ϕ60mm, inner diameter of shaft ϕ20mm
- ●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 ϕ60mm, hollow shaft type	ϕ20mm	5000, 8192	3 : A, B, Z 6 : A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$	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

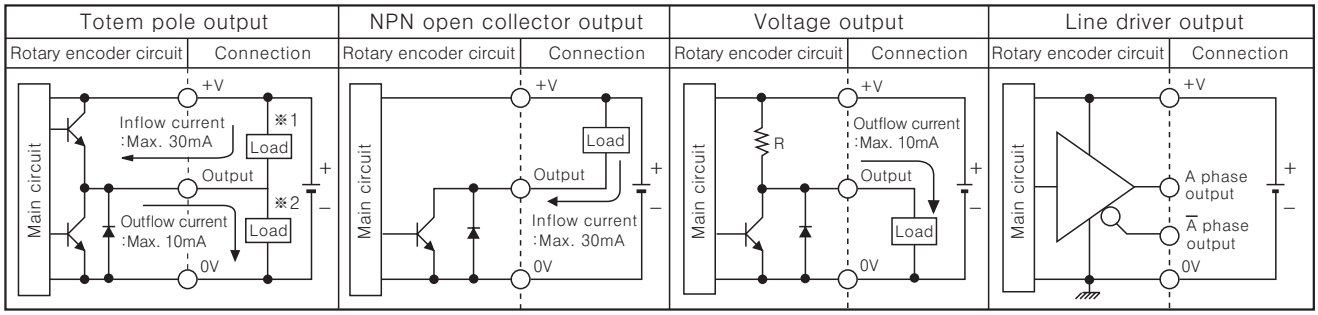
▣Specifactions

Item			Diameter ϕ60mm hollow shaft type of Incremental rotary encoder	
Resolution(P/R)			5000, 8192	
Electrical specification	Output phase		A, B, Z phase (Line driver output A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$ 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 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 ☞ Load current : Max. 20mA, Residual : Max. 0.5VDC • High ☞ Load current : Max. −20mA, Output voltage : Min. 2.5VDC	
	Response time (Rise/Fall)	Totem pole output	Max. 1μs	• Measuring condition ☞ Cable length : 2m, I sink = Max. 20mA
		NPN open collector output	Max. 1μs	
		Voltage output	Max. 1μs	
		Line driver output	Max. 0.5μs	
	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 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 • cm(0.015N • m)	
	Rotor inertia		Max. 110g · cm² (11×10⁻⁵ kg · m²)	
	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℃(at non−freezing status), Storage : −25 ~ 85℃	
Ambient humidity			35~85%RH, Storage : 35~90%RH	
Protection			IP50(IEC standard)	
Cable			ϕ5mm, 5P, Length : 2m, Shield cable(Line driver output : ϕ5mm, 8P)	
Accessory			Bracket	
Unit weight			Approx. 300g	

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

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

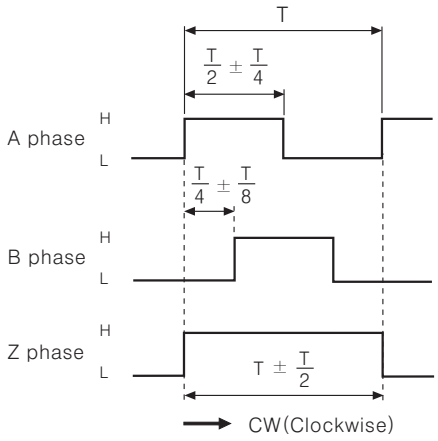
▣Control output diagram



☞ 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, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$)

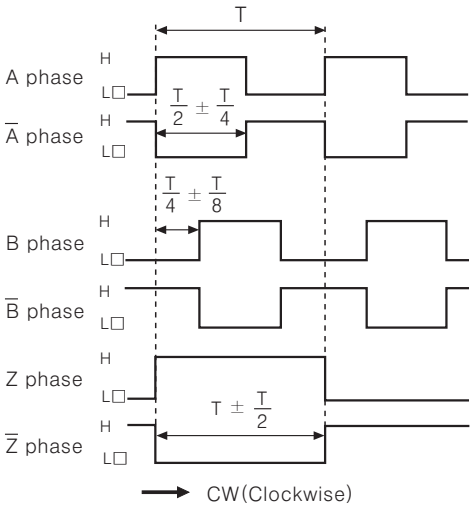
▣Output waveform

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



※CW : As viewed from the shaft.

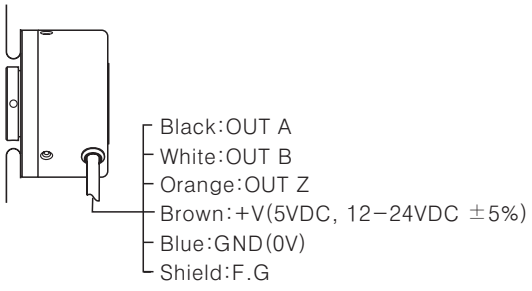
●Line driver output



▣Connections

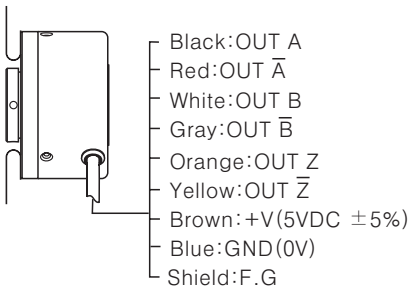
■Normal type

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



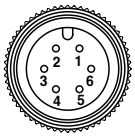
※Unused wires must be insulated.
※The metal case and shield cable of encoder should be grounded(F.G).

●Line driver output



■Cable outgoing connector type

●Totem pole output
NPN open collector output
Voltage output



●Line driver output

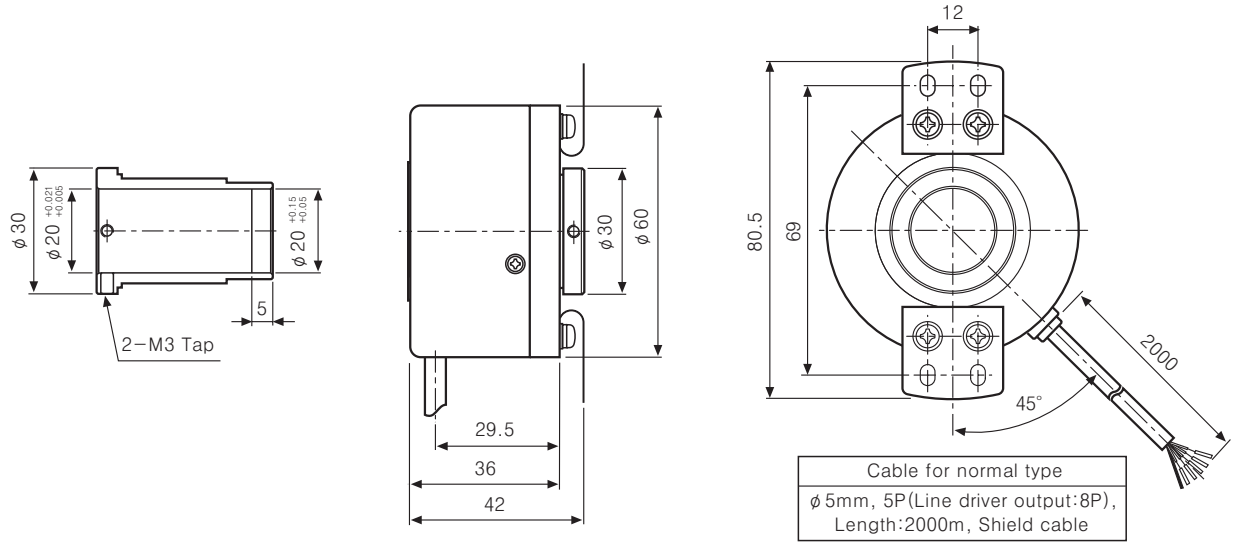
Totem pole output NPN open collector output Voltage output			Line driver output		
Pin No	Function	Cable color	Pin No	Function	Cable color
①	OUT A	Black	①	OUT A	Black
②	OUT B	White	②	OUT Ā	Red
③	OUT Z	Orange	③	+V	Brown
④	+V	Brown	④	GND	Blue
⑤	GND	Blue	⑤	OUT B	White
⑥	F.G	Shield	⑥	OUT B̄	Gray
			⑦	OUT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

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

▣Dimension

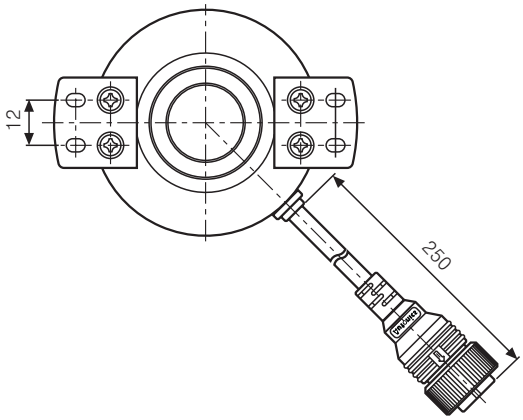
(Unit:mm)

■Normal type

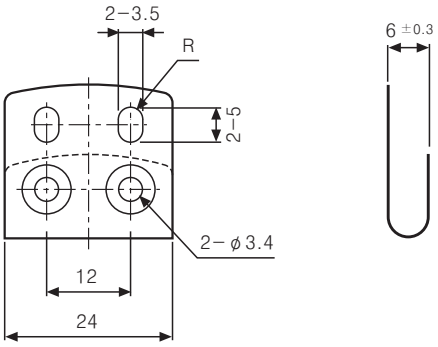


Cable for normal type
ϕ5mm, 5P(Line driver output:8P), Length:2000m, Shield cable

■Cable outgoing connector type



●Bracket



※Connector cable is customizable and see M-46 for specifications.