Diameter ϕ60mm Hollow shaft type Incremental Rotary encoder

▣Features

Line-up

- ●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	100, 1024, 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%	Blank: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

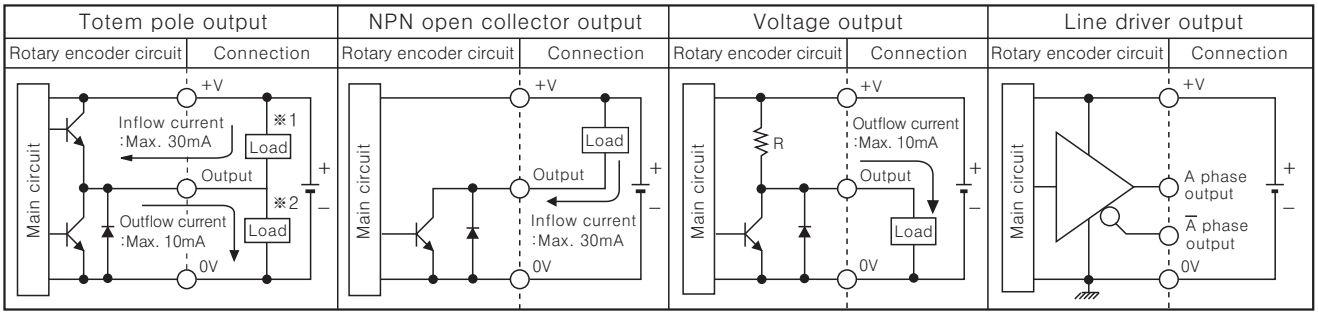
Item			Diameter ϕ60mm hollow shaft type of incremental rotary encoder	
Resolution(P/R)			**(Note1)** 100, 1024, 5000, 8192	
Electrical specification	Output phase		A, B, Z phase (Line driver output A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$ phase)	
	Phase difference of output		Phase difference 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. 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	
	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 megger between all terminals and case)	
	Dielectric strength		750VAC 50/60Hz for 1 minute(Between all terminals and case)	
	Connection		Cable outgoing type, 250mm cable outgoing connector type	
Mechanical specification	Starting torque		Max. 150gf · cm(0.015N · m)	
	Moment of inertia		Max. 110g · cm^2(11×10^{-5} kg · m^2)	
	Shaft loading		Radial : 5kgf, Thrust : 2.5kgf	
	Max. allowable revolution		**(Note2)** 6000rpm	
Vibration			1.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours	
Shock			Max. 100G	
Ambient temperature			-10 to 70℃(at non-freezing status), Storage : -25 to 85℃	
Ambient humidity			35 to 85%RH, Storage : 35 to 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.】

Make sure that max. response revolution should be lower than max. allowable revolution when selecting the resolution.

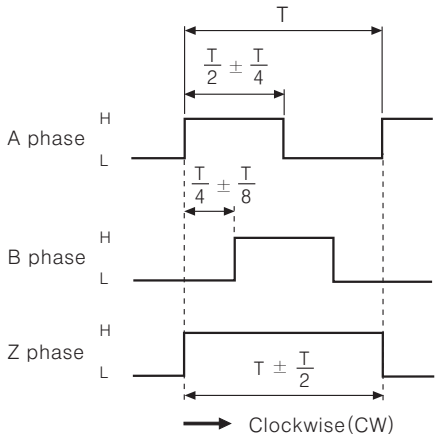
▣Control output diagram



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

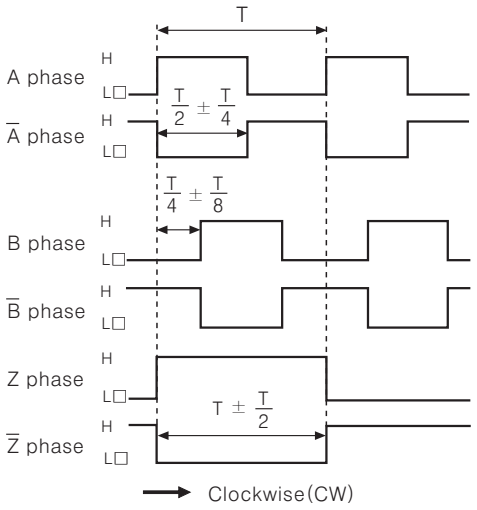
▣Output waveform

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



※CW : Right turn as from the shaft

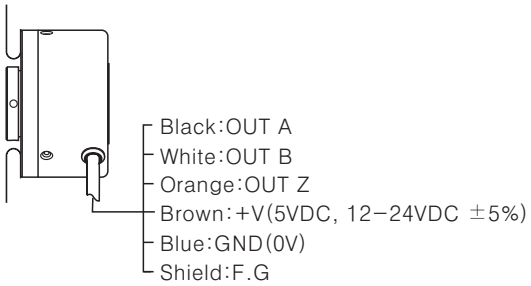
●Line driver output



▣Connections

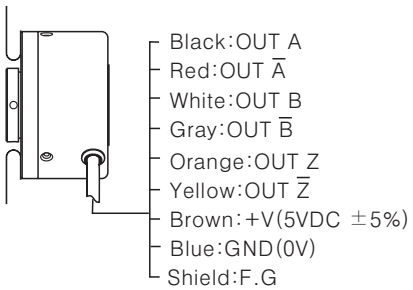
■Normal type

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



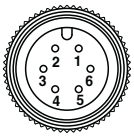
※Unused wires must be insulated.
※The metal case and shield cable of encoder should be grounded(F.G).

●Line driver output



■Cable outgoing connector type

●Totem pole output
NPN open collector output
Voltage output



●Line driver output

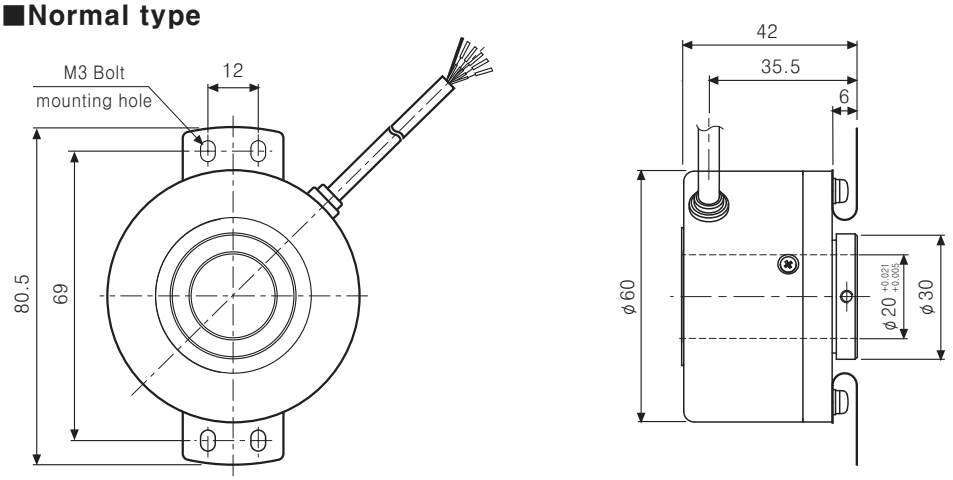
Totem pole output NPN open collector output Voltage output			Line driver output		
Pin No	Function	Cable color	Pin No	Function	Cable color
①	OUT A	Black	①	OUT A	Black
②	OUT B	White	②	OUT Ā	Red
③	OUT Z	Orange	③	+V	Brown
④	+V	Brown	④	GND	Blue
⑤	GND	Blue	⑤	OUT B	White
⑥	F.G	Shield	⑥	OUT B̄	Gray
			⑦	OUT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

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

▣Dimension

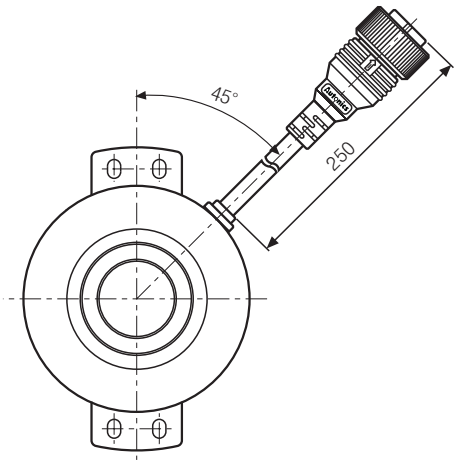
(Unit:mm)

■Normal type

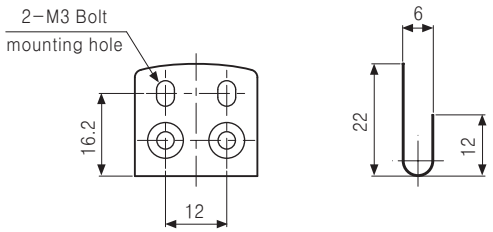


Cable for normal type
ϕ5mm, 5P(Line driver output:8P), Length:2000m, Shield cable

■Cable outgoing connector type



●Bracket



※Connector cable is customizable and see G-6 for specifications.