

E50SP Series

Diameter ϕ 50mm shaft type Incremental Rotary encoder

■ Features

- Light plastic body
- Suitable for measuring Angle, Position, Revolution, Speed, Acceleration, Sensing distance
- Power supply : 5VDC, 12–24VDC $\pm$ 5%
- Cost-effective

■ Applications

- Various tooling machinery, packing machine and general industrial machinery etc.

⚠ Please read "Caution for your safety" in operation manual before using.



■ Ordering information (Former name : ENB)

E50S	8	P	—	600	—	3	—	N	—	24	—	
Series	Shaft diameter	External material	Pulse/1Revolution	Output phase	Control output	Power supply	Cable					
Diameter ø 50mm, shaft type	6 : ø 6mm 8 : ø 8mm	Plastic	Refer to resolution	2:A, B 3:A, B, Z 4:A, $\bar{A}$, B, $\bar{B}$ 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:E50S8P—PULSE—3—N—24

※Standard : A, B, Z ※The power of Line driver is only for 5VDC

※Cable length : 250mm

■ Specifications

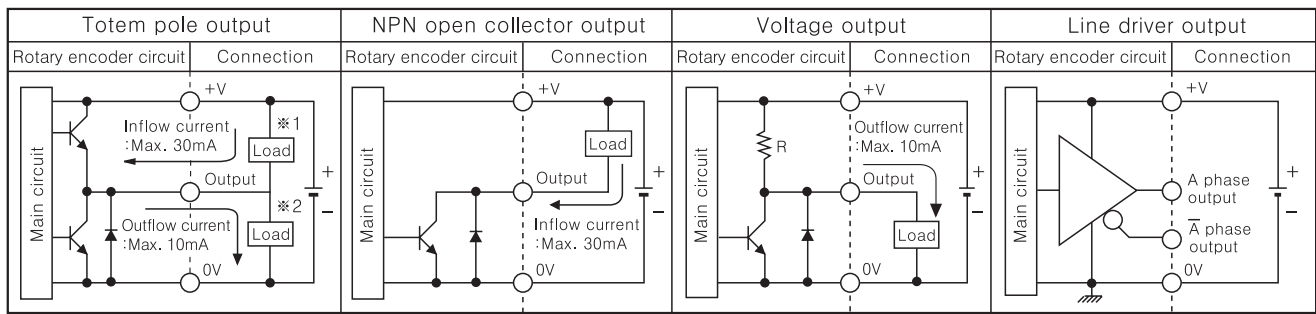
Item		Diameter ϕ 50mm shaft type of Incremental rotary encoder	
Resolution(P/R)		(Note1)	*1, *2, *5, 10, *12, 15, 20, 23, 25, 30, 35, 40, 45, 50, 60, 75, 100, 120, 125, 150, 192, 200, 240, 250, 256, 300, 360, 400, 500, 512, 600
Electrical specification	Output phase	A, B, Z phase(Line driver : A, $\bar{A}$, B, $\bar{B}$, Z, $\bar{Z}$ phase)	
	Phase difference of output	Output 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	180kHz	
	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 (Between all terminals and case)	
	Connection	Cable outgoing type, 200mm cable outgoing connector type	
Mechanical specification	Starting torque	Max. 100gf $\cdot$ cm (0.01N $\cdot$ m)	
	Rotor inertia	Max. 40g $\cdot$ cm ² (4 $\times$ 10 ^{–6} kg $\cdot$ m ²)	
	Shaft loading	Radial : Max. 2kgf, Thrust : Max. 1kgf	
	Max. allowable revolution	(Note2)	5000rpm
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℃ (at non-freezing status), Storage:–25 ~ 85℃	
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		ϕ 8mm coupling standard, ϕ 6mm coupling (Option), Bracket	
Unit weight		Approx. 235g	

※ (Note1) * pulse is only for A, B phase (Line Driver output is for A, $\bar{A}$, B, $\bar{B}$ phase)

※ (Note2) Max. allowable revolution $\geq$ Max. response revolution $\left[\text{Max. response resolution (rpm)} = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec} \right]$

Incremental ϕ 50mm Shaft Type

Control output diagram



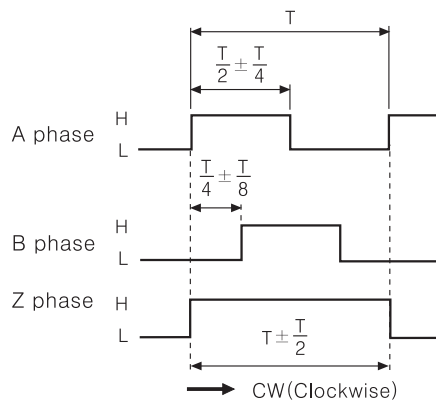
☞ Totem pole output type can be used for NPN open collector output type(*1) or Voltage output type(*2).

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

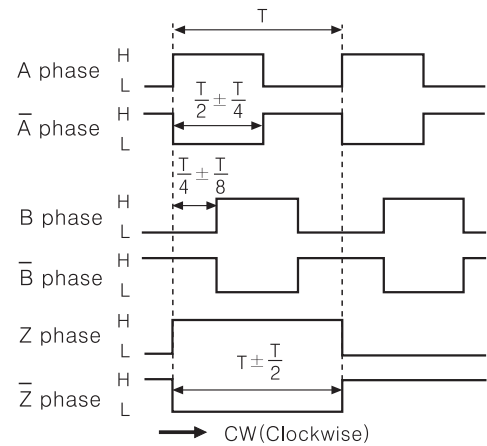
Output waveform

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

●Line driver output



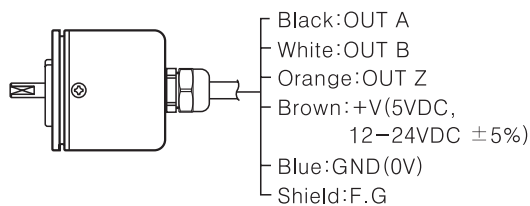
※CW : In a view of shaft



Connections

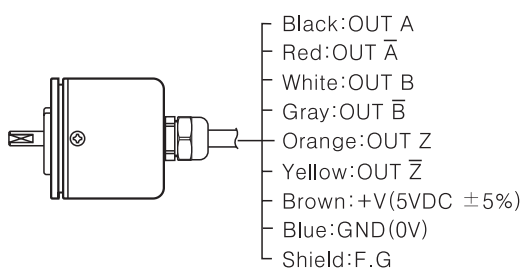
Normal type

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



※Unused wires must be insulated.

●Line driver output



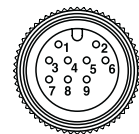
Cable outgoing connector type

●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 A-bar	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-bar	Gray
			⑦	OUT Z	Orange
			⑧	OUT Z-bar	Yellow
			⑨	F.G	Shield

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

(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

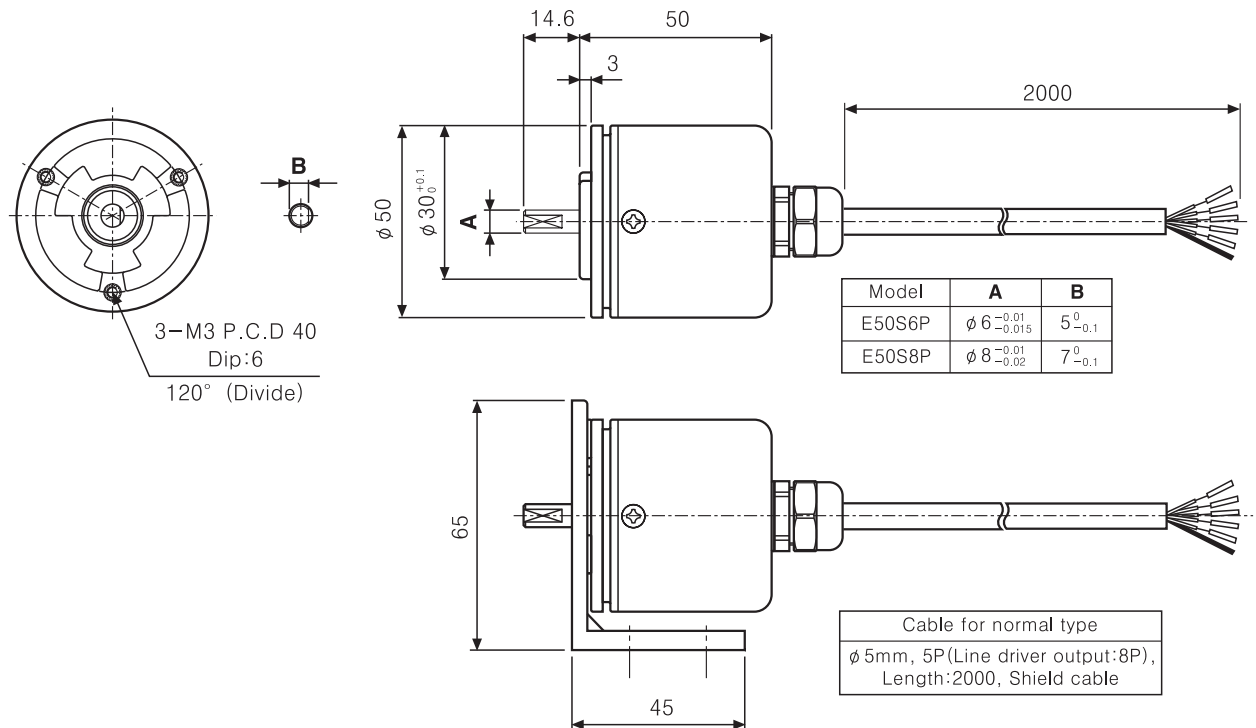
(O) Graphic panel

(P) Production stoppage models & replacement

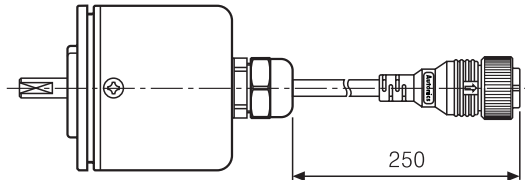
■ Dimensions

■ Normal type

(Unit:mm)

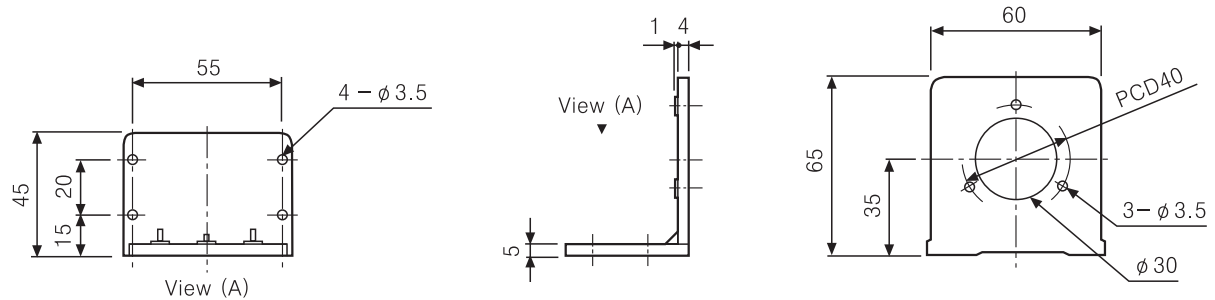


■ Cable outgoing connector type



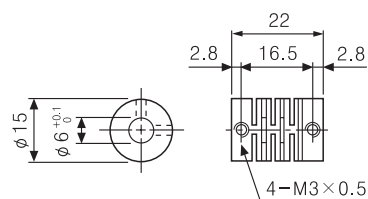
※The connector cable is optional and refer to M-46 for the specification.

©Bracket



©Coupling

- $\phi 6$ coupling



- $\phi 8$ coupling

