

E50S Series

Diameter ϕ 50mm Shaft type Incremental Rotary encoder

Line-up



■ Features

- 12–24VDC power supply of line driver output(Line-up)
- Suitable for measuring angle, position, revolution, speed, acceleration and distance
- Power supply : 5VDC, 12–24VDC ±5%

■ 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	—	5000	—	3	—	N	—	24	—	
Series	Shaft diameter	Pulse/1Revolution		Output phase		Output		Power supply		Cable	

*Standard:E50S8-[PULSE]-3-N-24

*Standard:A, B, Z

*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, 800, 1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500, 3000, 3600, 5000, 6000, 8000 (Not indicated resolution is customizable.)	
Output phase		A, B, Z phase (Line driver : 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 \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 (Power supply 5VDC) : Min. 2.5VDC, Output voltage (Power voltage 12–24VDC) : Min. (Power supply -3.0)VDC	
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		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. 100M Ω (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, 200mm cable outgoing connector type, Connector integrated type(Rear, Side)	
Mechanical specification	Starting torque	(Note2) Max. 70gf · cm (0.007N · m)/Connector Type : Max. 800gf · cm (0.08N · m)	
	Moment of inertia	Max. 80g · cm ² (8×10^{-6} kg · m ²)/Connector Type : Max. 400gf · cm ² (4×10^{-5} kg · m ²)	
	Shaft loading	Radial : Max. 10kgf, Thrust : Max. 2.5kgf	
	Max. allowable revolution	(Note3) 5000rpm	
Vibration		1.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours	
Shock		Max. 75G	
Ambient temperature		-10 to 70°C (at non-freezing status), Storage : -25 to 85°C	
Ambient humidity		35 to 85%RH, Storage : 35 to 90%RH	
Protection		IP50, Customizable as IP64, Connector integrated type : IP65 (IEC standard)	
Cable		ϕ 5mm, 5P, Length : 2m, Shield cable (Line driver output : ϕ 5mm, 8P)	
Accessory		ϕ 8mm coupling, bracket	
Approval		CE (Except for line driver output)	
Unit weight		Approx. 275g, Connector integrated type : 180g	

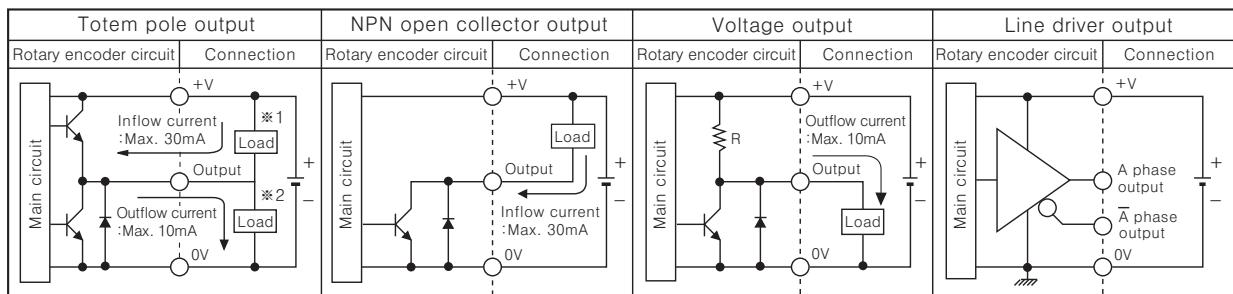
(Note1) pulse is only for A, B phase (Line driver output is for A, \overline{A} , B, \overline{B} phase).

*(Note2) Lower torque than the rated value, it can be customizable.

*(Note3) Max. allowable revolution \geq Max. response resolution [Max. response resolution(rpm) = $\frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec.}$]

Incremental ϕ 50mm Shaft Type

Control output diagram

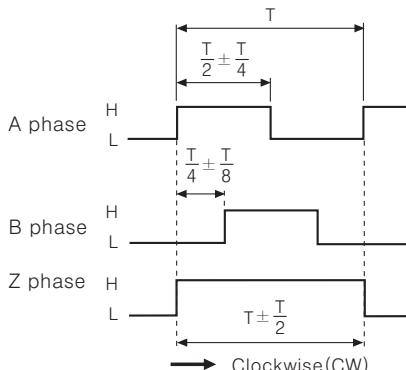


- Totem pole output type can be used for NPN open collector output type (*1) or Voltage output type (*2).
- All output circuits of A, B, Z phase are the same. (Line driver output is A, \bar{A} , B, \bar{B} , Z, \bar{Z})

- (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 power supply
 (Q) Stepping motor & Driver & Controller
 (R) Graphic/Logic panel
 (S) Field network device
 (T) Production stoppage models & replacement
 (U) Datasheet.su

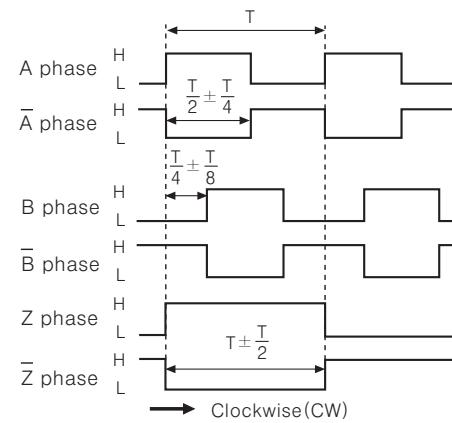
Output waveform

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



※ CW : Right turn as from the shaft

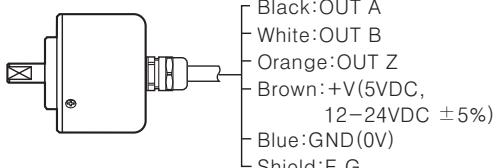
- Line driver output



Connections

Normal type

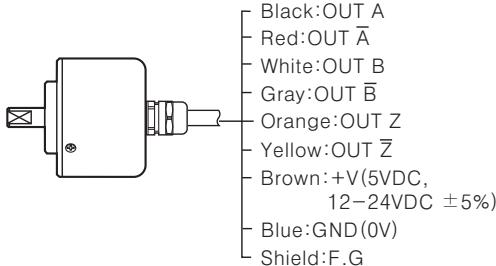
- Totem pole output / NPN open collector output / Voltage output



※ Unused wires must be insulated.

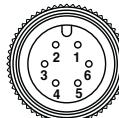
※ The metal and shield cable of encoder should be grounded(F.G)

- Line driver output

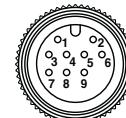


Cable outgoing connector/Connector integrated type

- Totem pole output
 NPN open collector output
 Voltage output



- Line driver output



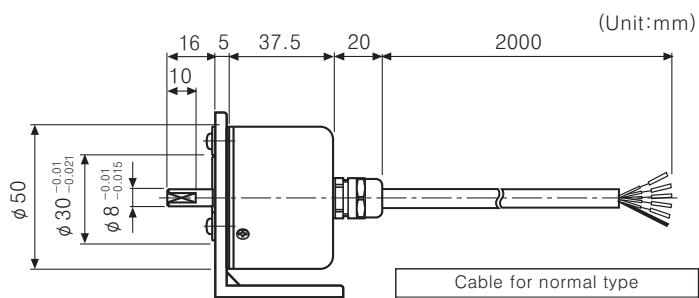
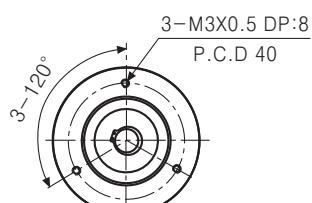
Totem pole output NPN open collector output Voltage output			Line driver output		
Pin No	Function	Cable color	Pin No	Function	Cable color
①	OUT A	Black	①	OUT A	Black
②	OUT B	White	②	OUT \bar{A}	Red
③	OUT Z	Orange	③	+V	Brown
④	+V	Brown	④	GND	Blue
⑤	GND	Blue	⑤	OUT B	White
⑥	F.G	Shield	⑥	OUT \bar{B}	Gray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

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

E50S Series

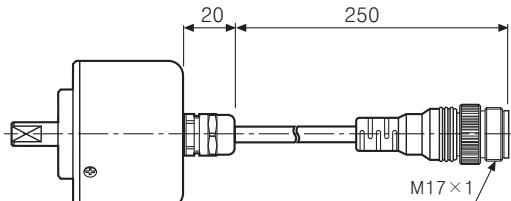
■Dimensions

■Normal type



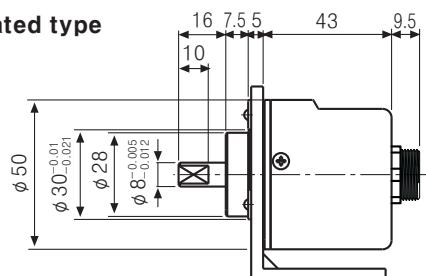
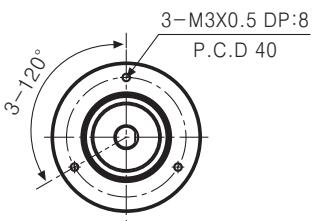
Cable for normal type
Ø 5mm, 5P(Line driver output:8P),
Length:2000, Shield cable

■Cable outgoing connector type

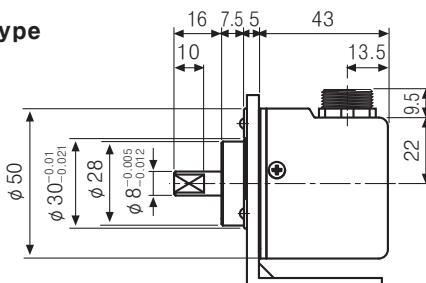
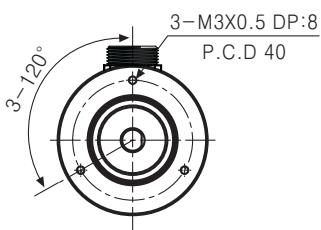


*Connector cable is customizable and see G-6 for specifications.

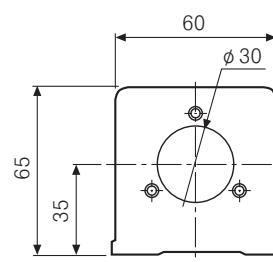
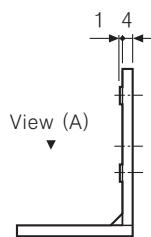
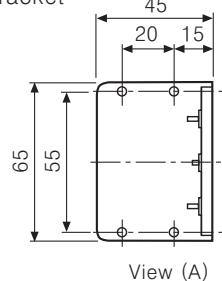
■Rear side outgoing connector integrated type



■Side outgoing connector integrated type



●Bracket



●Coupling (E50S)

