

E50S Series

Diameter ϕ 50mm Shaft type Incremental Rotary encoder

■ Features

- Suitable for measuring Angle, Position, Revolution, Speed, Acceleration and 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	-	5000	-	3	-	2	-	24	-	
Series	Shaft diameter	Pulse/1Revolution	Output phase	Output	Power supply	Cable					
Diameter ϕ 50mm, shaft type	ϕ 8mm	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 \pm 5% 24:12-24VDC \pm 5%	No mark:Normal type C:Cable outgoing connector type(*) CR:Rear side outgoing connector integrated type CS:Side outgoing connector integrated type					

*Standard:E50S8-[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, 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, \bar{A} , B, \bar{B} , Z, \bar{Z} phase)		
Phase difference of output		Phase difference between A and B : $\frac{T}{4} \pm \frac{T}{8}$ (T=1cycle of A phase)		
Electrical specification	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	• Measuring condition \Rightarrow Cable length : 2m, I sink = Max. 20mA
		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 \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 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, Connector integrated type (Rear, Side)		
Mechanical specification	Starting torque	(Note2) Max. 70gf \cdot cm (0.007N \cdot m)/Connector Type : Max. 800gf \cdot cm (0.08N \cdot A)		
	Rotor inertia	Max. 80g \cdot cm ² (8×10^{-6} kg \cdot m ²)/Connector Type : Max. 400gf \cdot cm ² (4×10^{-5} kg \cdot m ²)		
	Shaft loading	Radial : Max. 10kgf, Thrust : Max. 2.5kgf		
	Max. allowable revolution	(Note3) 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 $^{\circ}$ C (at non-freezing status), Storage:-25 ~ 85 $^{\circ}$ C		
Ambient humidity		35~85%RH, Storage: 35~90%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		
Unit weight		Approx. 275g, Connector integrated type:180g		
Approval		CE (Except for Line driver output)		

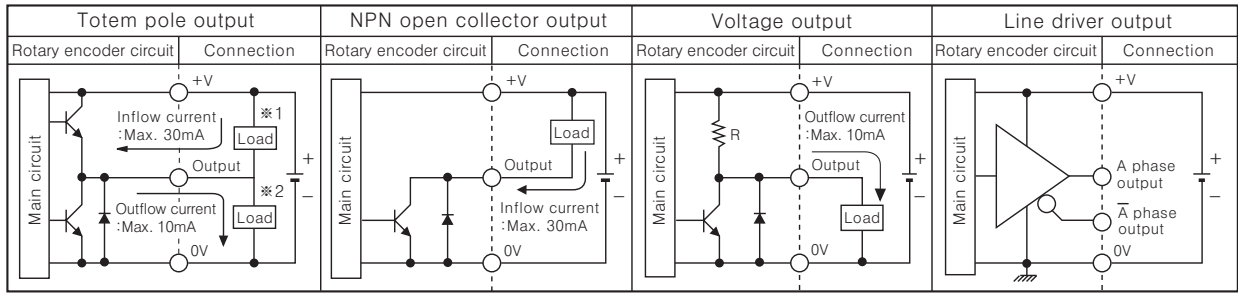
* **(Note1)** * pulse is only for A, B phase (Line Driver output is for A, \bar{A} , B, \bar{B} phase). It can be produced under 1000P/R for connector integrated type.

* **(Note1)** Lower torque than the rated value, it can be customizable.

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

Incremental ϕ 50mm Shaft Type

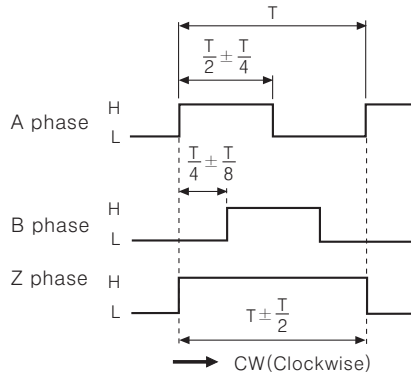
Control output diagram



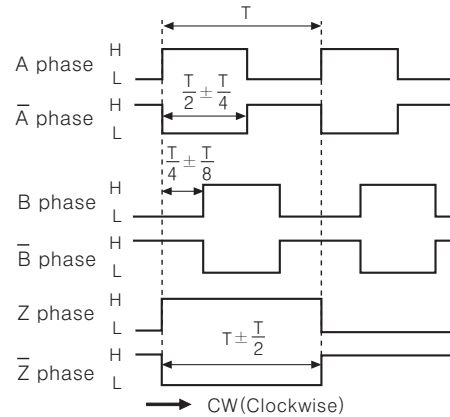
※ Totem pole output type can be used for NPN open collector output type(※1) or Voltage output type(※2).
 ※ All output circuits of A, B, Z phase is same. (Line driver output is for A, \bar{A} , B, \bar{B} , Z, \bar{Z})

Output waveform

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



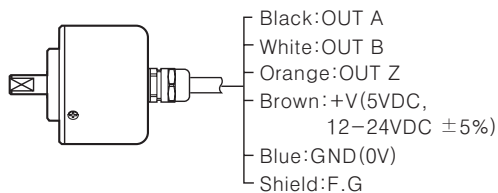
※CW : As viewed from the shaft



Connections

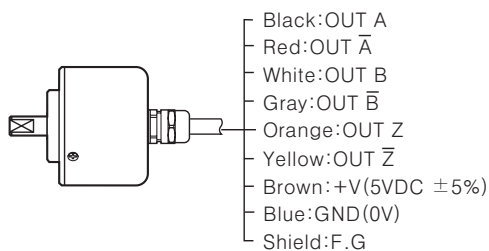
Normal type

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



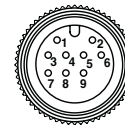
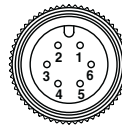
※ Unused wires must be insulated.
 ※ The metal and shield cable of encoder should be grounded(F.G)

- 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.

(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

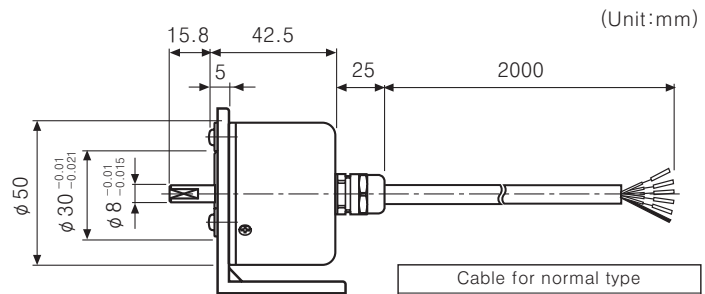
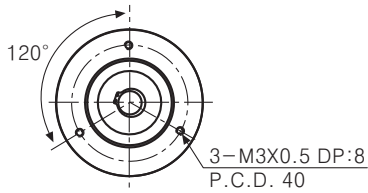
(P) Field network device

(Q) Production stoppage models & replacement

E50S Series

■ Dimensions

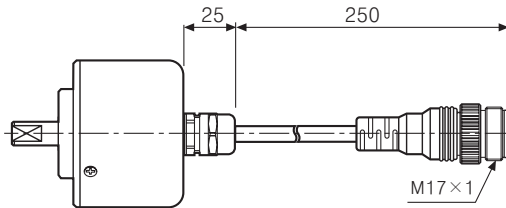
■ Normal type



(Unit:mm)

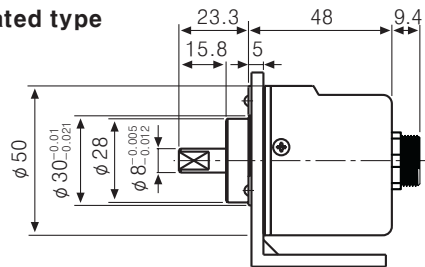
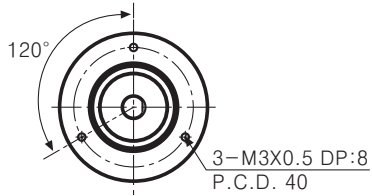
Cable for normal type
 ϕ 5mm, 5P(Line driver output:8P),
 Length:2000, Shield cable

■ Cable outgoing connector type

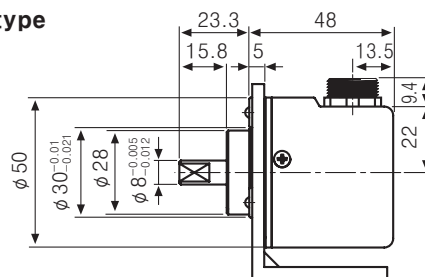
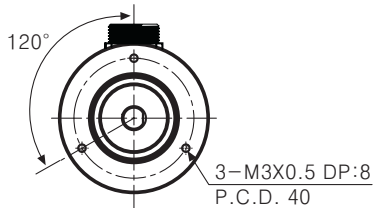


※ Connector cable is customizable and see M-57 for specifications.

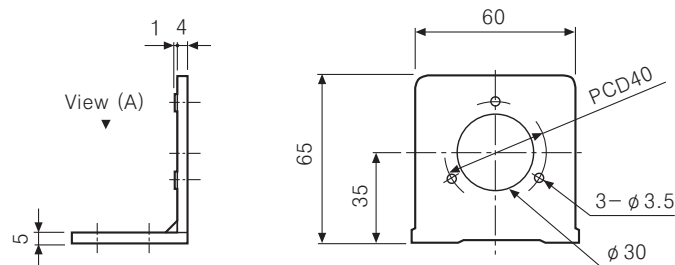
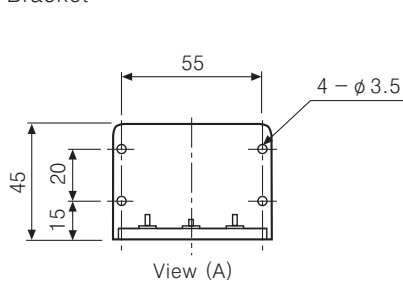
■ Rear side outgoing connector integrated type



■ Side outgoing connector integrated type



● Bracket



● Coupling

