

Incremental ϕ 50mm Shaft Type

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/1 Revolution	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
* Option: \bar{A} , \bar{B}
* As for option models, ask before making a purchase.

* 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 type is available to customize)		
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)		
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
Electrical specification	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 \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 (0.008N \cdot A)	
	Rotor inertia	Max. 80g \cdot cm ² (8 \times 10 ⁻⁶ kg \cdot m ²) / Connector Type : Max. 400gf \cdot cm ² (4 \times 10 ⁻⁶ 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 revolution (rpm) = $\frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$]

(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

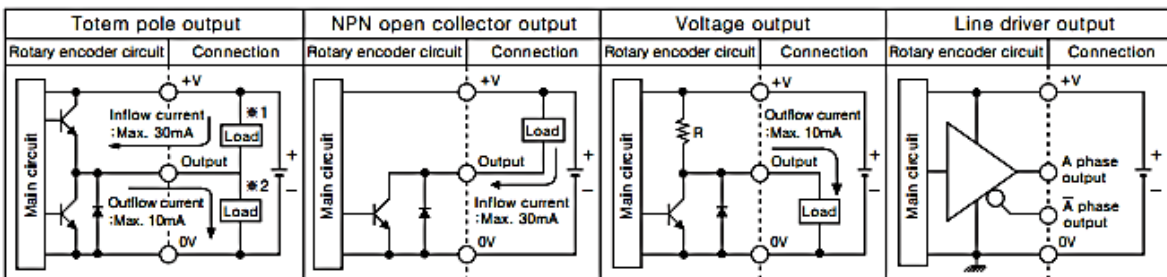
(N) Stepping motor & Driver & Controller

(O) Graphic panel

(P) Production stoppage models & replacement

E50S Series

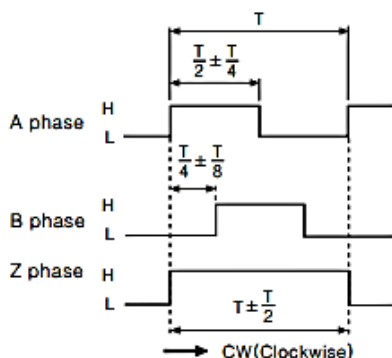
Control output diagram



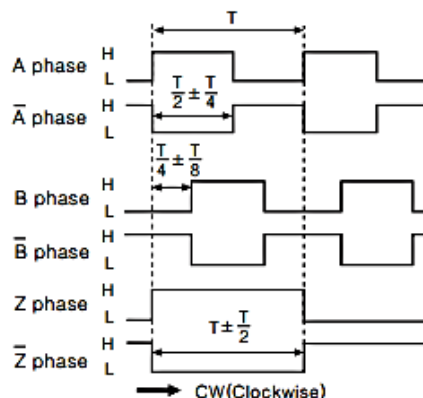
- Totem pole output type can be used for NPN open collector output type(≠1) or Voltage output type(≠2).
- All output circuits of A, B, Z phase is same. (Line driver output is for A, \bar{A} , B, \bar{B} , Z, \bar{Z})

Output waveform

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



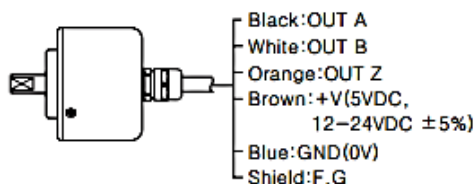
※CW : As viewed from the shaft



Connections

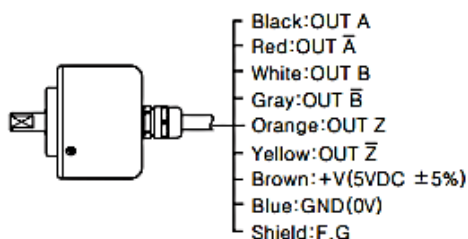
Normal type

- 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



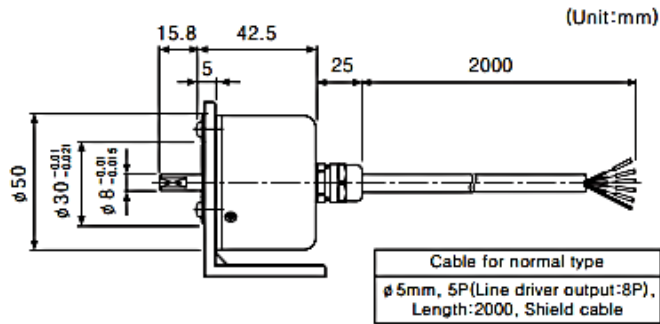
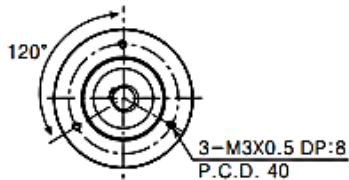
Totem pole output NPN open collector output Voltage output			Line driver output		
Pin No	Function	Cable color	Pin No	Function	Cable color
①	OUT A	Black	①	OUT A	Black
②	OUT B	White	②	OUT \bar{A}	Red
③	OUT Z	Orange	③	+V	Brown
④	+V	Brown	④	GND	Blue
⑤	GND	Blue	⑤	OUT B	White
⑥	F.G	Shield	⑥	OUT \bar{B}	Gray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

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

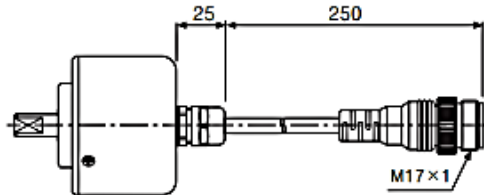
Incremental $\phi 50$ mm Shaft Type

Dimensions

Normal type

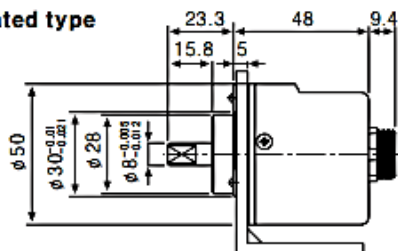
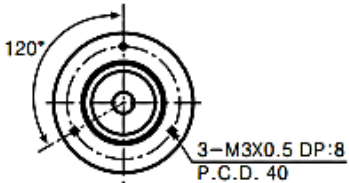


Cable outgoing connector type

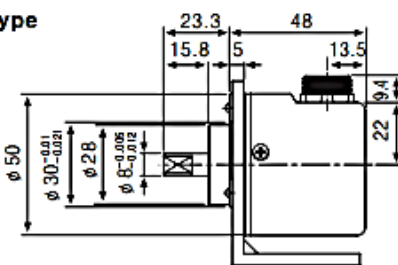
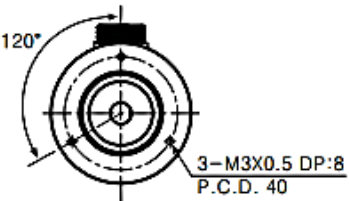


*Connector cable is customizable and see M-48 for specifications.

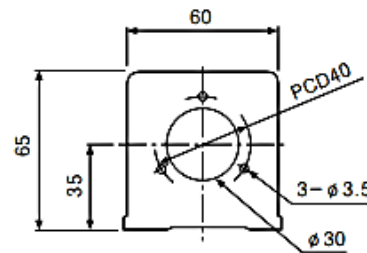
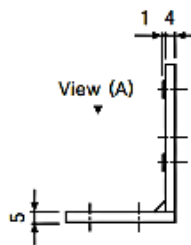
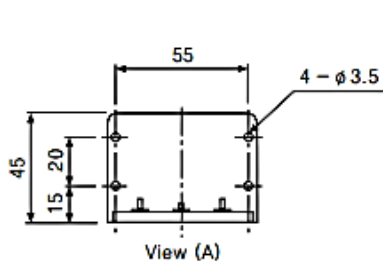
Rear side outgoing connector integrated type



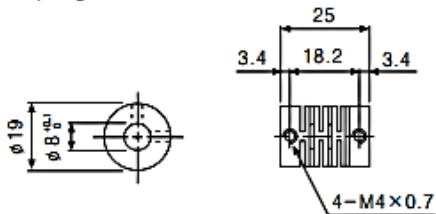
Side outgoing connector integrated type



Bracket



Coupling



- (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