

E40 Series

Diameter ø40mm Shaft type/Hollow type/Built-in type Incremental Rotary Encoder

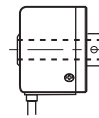
■ Features

- 12-24VDC power supply of line driver output(Line-up)
- Easy installation at narrow space
- Small moment of inertia
- Power supply : 5VDC, 12-24VDC ±5%
- Various output types

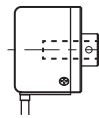
⚠ Please read "Caution for your safety" in operation manual before using.



E40S Series



E40H Series



E40HB Series

■ Ordering information

Series	Shaft type	Hollow type	Pulse/1Revolution	Output phase	Output	Power supply	Cable
S: Shaft type H: Hollow type HB: Hollow built-in type	External 6: ø6mm 8: ø8mm	Inner 6: ø6mm 8: ø8mm 10: ø10mm 12: ø12mm	Series	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: Cable type C: Connector cable type(※)

※Standard: E40S6-[PULSE]-3-N-24, E40H8-[PULSE]-3-N-24
E40HB8-[PULSE]-3-N-24

※Cable length : 250mm

■ Specifications

Item	Diameter ø40mm shaft/hollow shaft/hollow built-in type of incremental rotary encoder	
Resolution(P/R) ^{*1}	*1, *2, *5, 10, *12, 15, 20, 23, 25, 30, 35, 40, 45, 50, 60, 75, 100, 120, 150, 192, 200, 240, 250, 256, 300, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500, 3000, 3600, 5000 (Not indicated resolution is customizable.)	
Electrical specification	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=1 cycle of A phase)
	Control output	Totem pole output
		NPN open collector output
		Voltage output
		Line driver output
	Response time (Rise/Fall)	Totem pole output
		NPN open collector output
		Voltage output
		Line driver output
Mechanical specification	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 type, 250mm connector cable type
	Starting torque	Shaft type : Max. 40gf·cm(0.004N·m), Hole type : Max. 50gf·cm(0.005N·m)
	Moment of inertia	Max. 40g·cm ² (4×10 ⁻⁶ kg·m ²)
	Shaft loading	Radial : Max. 2kgf, Thrust : Max. 1kgf
	Max. allowable revolution ^{※2}	5000rpm
Vibration	1.5mm amplitude or 300m/s ² at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours	
Shock	Approx. Max. 50G	
Environment	Ambient temperature	-10 to 70°C, storage : -25 to 85°C
	Ambient humidity	35 to 85%RH, storage : 35 to 90%RH
Protection	IP50(IEC standard) ※Option type is available for IP64 (IEC standard).	
Cable	ø5, 5-wire, Length : 2m, Shield cable(Line driver output : ø5, 8-wire) (AWG24, Core diameter: 0.08, Number of cores: 40, Insulator out diameter: ø1)	
Accessory	• Shaft type : ø6mm coupling standard, ø8mm coupling(Sold separately) • Hole type : Bracket	
Approval	CE (Except line driver output)	
Unit weight	Approx. 160g	

※1: 'v' pulse is only for A, B phase(Line Driver output is for A, $\bar{A}$, B, $\bar{B}$ phase)

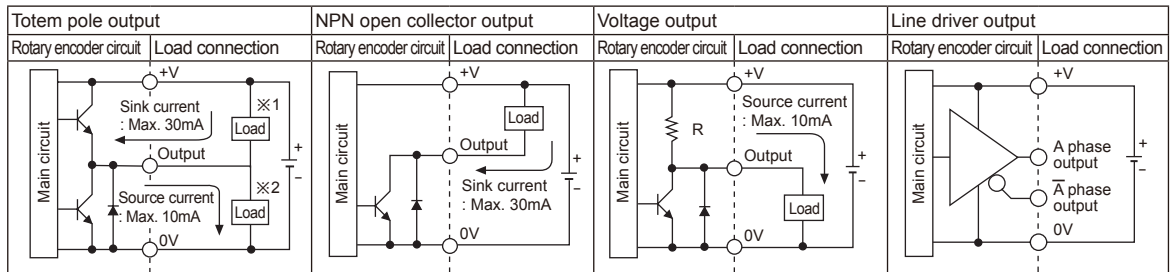
※2: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

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

※Environment resistance is rated at no freezing or condensation.

Incremental ø40mm Shaft/Hollow Shaft/Built-in type

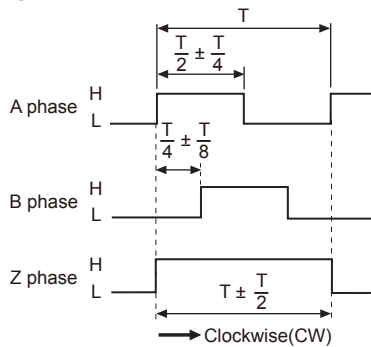
■ Control output diagram



- 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, $\bar{Z}$)

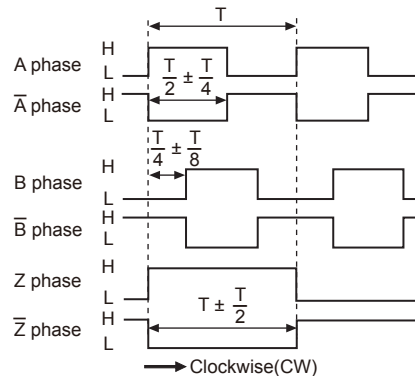
■ Output waveform

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



- ※Z phase output is option.
- ※CW : Right turn as from the shaft.

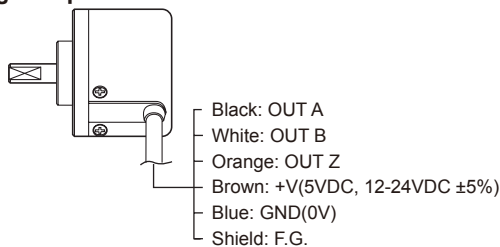
- Line driver output



■ Connections

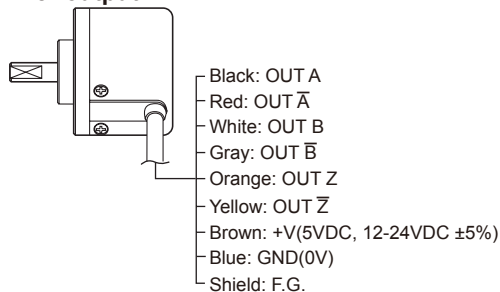
◎ Cable type

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



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

- Line driver output



◎ Connector cable 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) 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 mode power supply

(Q) Stepper motor& Driver&Controller

(R) Graphic/Logic panel

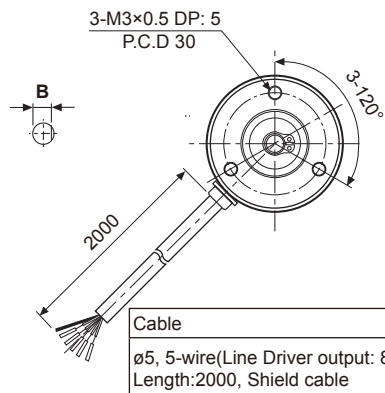
(S) Field network device

(T) Software

(U) Other

(unit: mm)

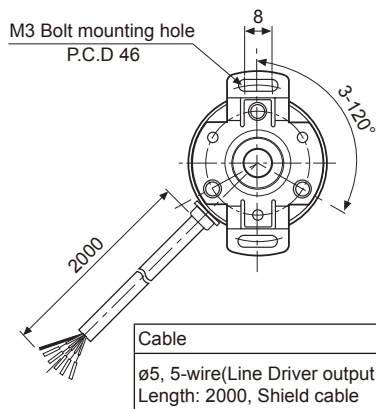
- Shaft type



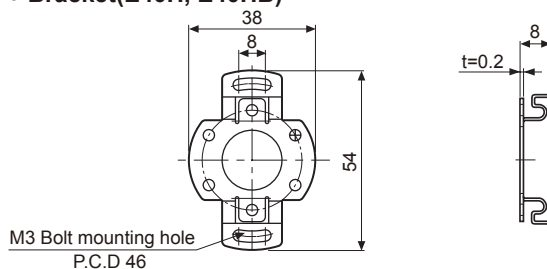
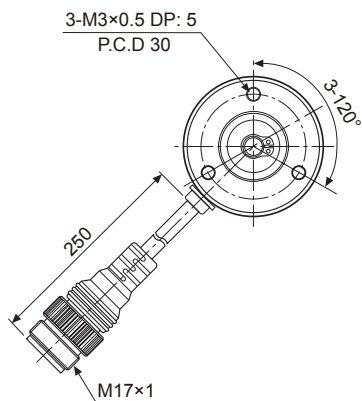
E40H

E40HB

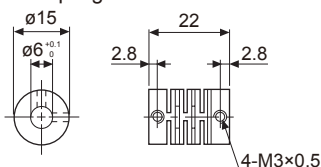
A	ø
B	ø
Tolerance	+0



- **Bracket(E40H, E40HB)**



- ø6 Coupling



- Parallel misalignment : Max. 0.25mm
- Angular misalignment: Max. 5°
- End-play: Max. 0.2mm

- ※For parallel misalignment, angular misalignment, end-play terms, refer to the F-78 page.
- ※For flexible coupling(ERB Series) information, refer to the F-71 page.