

Incremental ϕ 40mm Hollow Shaft/Built-in Type

Diameter ϕ 40mm Hollow shaft built-in type Incremental Rotary encoder

Features

- Light plastic body
- Easy installation at narrow space
- Small moment of inertia
- Power supply : 5VDC, 12-24VDC \pm 5%
- Various output types

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

Ordering information

E40HB	8	P	600	3	N	24	
Series	Shaft diameter	External material	Pulse/1Revolution	Output phase	Control output	Power supply	Cable
Diameter ϕ 40mm HB : Hollow shaft built-in type	ϕ 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 \pm 5% 24 : 12-24VDC \pm 5%	Blank:Normal type (*) C:Cable outgoing connector type

*Standard:E40HB8P-PULSE-3-N-24

*Standard:A, B, Z

*The power of Line driver is only for 5VDC

*Cable length:250mm

Specifications

Item	Diameter ϕ 40mm hollow shaft built-in 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	Phase difference between A and B : $\frac{T}{4} \pm \frac{T}{8}$ (T=1 cycle 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 voltage : 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)	
	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		
Mechanical specification	Starting torque	Max. 50gf \cdot cm (0.005N \cdot m)	
	Moment of inertia	Max. 40g \cdot cm ² (4×10^{-6} kg \cdot m ²)	
	Shaft loading	Radial : Max. 3kgf, Thrust : Max. 0.5kgf	
	Max. allowable revolution	(Note2) 3000rpm	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours		
Shock	Max. 50G		
Ambient temperature	-10 to 70 $^{\circ}$ C (at non-freezing status), Storage : -25 to 85 $^{\circ}$ C		
Ambient humidity	35 to 85%RH, Storage : 35 to 90%RH		
Protection	IP50 (IEC standard)		
Cable	ϕ 5mm, 5P, Length : 2m, Shield cable (Line driver output : ϕ 5mm, 8P)		
Accessory	Bracket		
Unit weight	Approx. 130g		

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

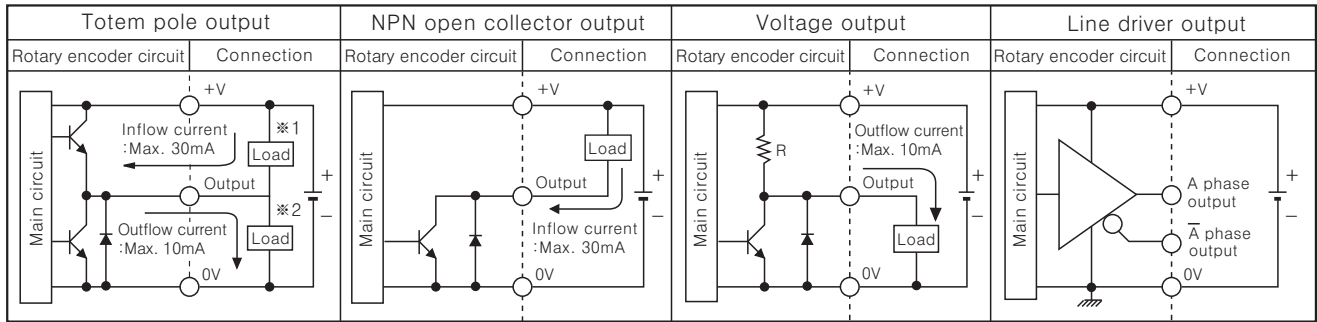
* **(Note2)** Max. allowable revolution \geq Max. response revolution [Max. response revolution (rpm) = $\frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec.}$]

Make sure that max. response revolution should be lower than max. allowable revolution when selecting the resolution.

- (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

E40HBP Series

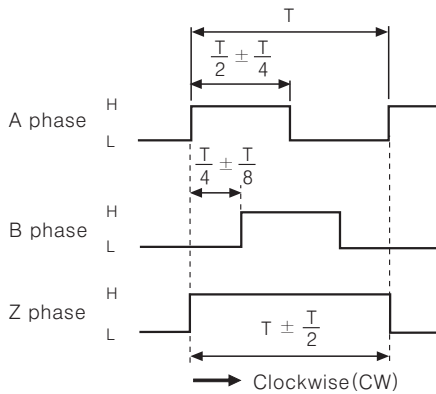
Control output diagram



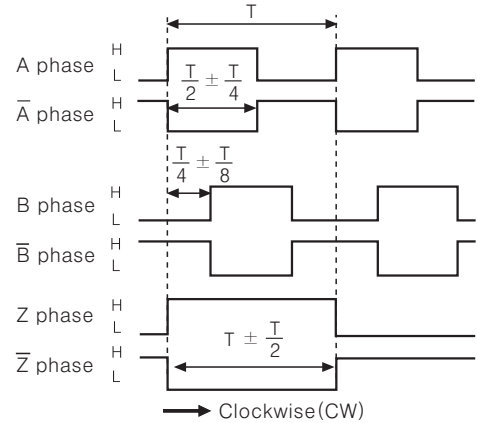
- Totem pole output type can be used for NPN open collector output type (※1) or Voltage output type (※2).
- All output circuits of A, B, Z phase are the same. (Line driver output is A, \bar{A} , B, \bar{B} , Z, \bar{Z})

Output waveform

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



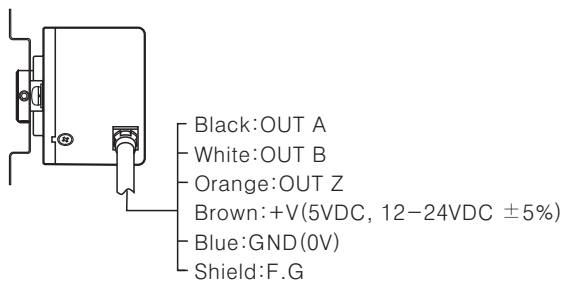
※CW : Right turn as from the shaft



Connections

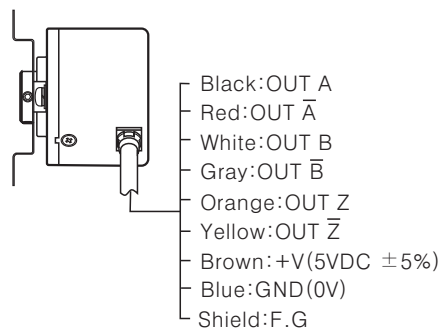
Normal type

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



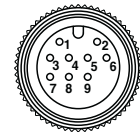
※Unused wires must be insulated.

- 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 \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

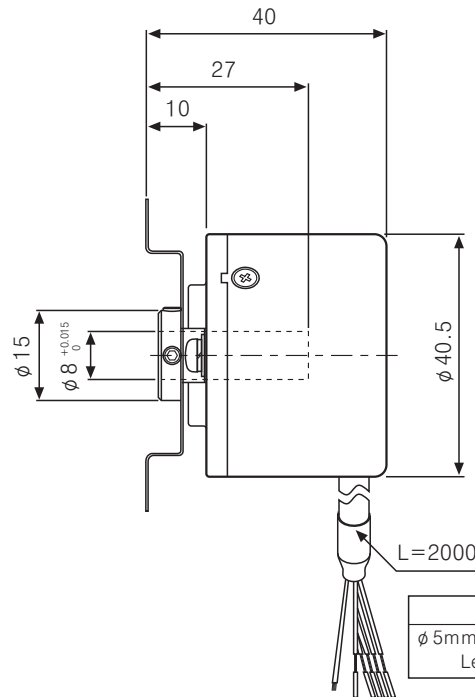
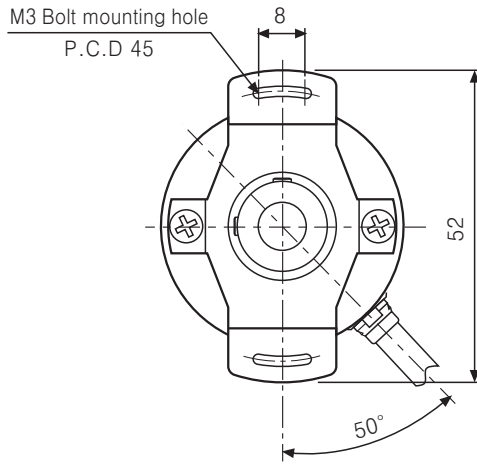
※F.G(Field Ground):It should be grounded separately .

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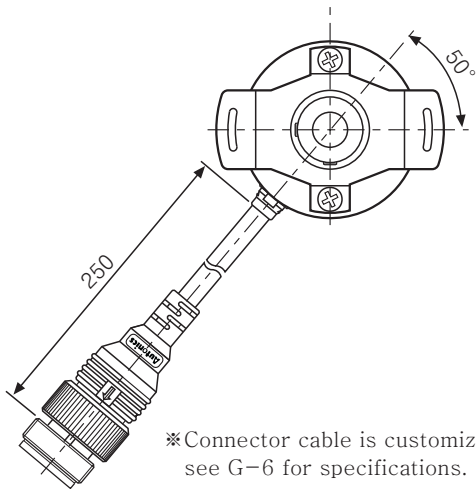
■ Dimensions

■ Normal type

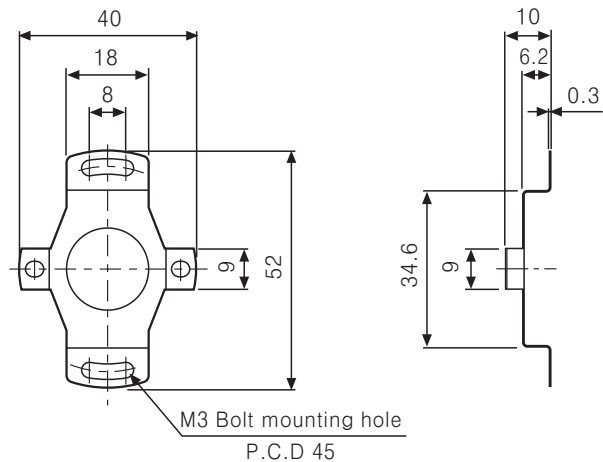
(Unit:mm)



■ Cable outgoing connector type



● Bracket



(A)	Photo electric sensor
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(C)	Door/Area sensor
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