

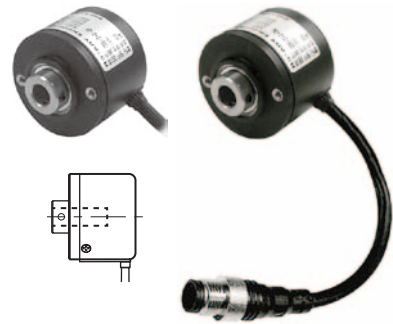
E40HBP Series Incremental ø40mm Hollow Shaft Built-in type

Diameterø40mm 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 ±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 ø40mm HB : Hollow shaft built-in type | ø8mm | 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 ±5% 24: 12-24VDC ±5% | No mark: Cable type C: Connector cable type(※) |

※Standard : E40HB68P-[PULSE]-3-N-24

※Standard: A, B, Z

※The power of Line driver is only for 5VDC

※Cable length : 250mm

■ Specifications

| Item | Diameter ø40mm hollow shaft 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, 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=1cycle of A phase) | |
| | Control output | Totem pole output | • Low - Load current : Max. 30mA, Residual voltage : Max. 0.4VDC • High - Load current : Max. 10mA, Output voltage(Power voltage 5VDC):Min. (Power voltage -2.0)VDC, Output voltage(Power voltage 12-24VDC) : Min. (Power voltage-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 |
| | Response time (Rise/Fall) | Line driver output | • Low - Load current : Max. 20mA, Residual voltage : Max. 0.5VDC • High - Load current : Max. -20mA, Output voltage(Power voltage 5VDC): Min. 2.5VDC, Output voltage(Power voltage 12-24VDC): Min. (Power voltage-3.0)VDC |
| | | Totem pole output | • Measuring condition - Cable length : 2m, I sink = 20mA |
| | | NPN open collector output | |
| | Voltage output | Max. 0.5μs | |
| | Max. Response frequency | 180kHz | |
| 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) | | |
| 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 | | |
| Mechanical specification | Starting torque | Max. 50gf·cm(0.005N·m) | |
| | Moment of inertia | Max. 40g·cm ² (4×10 ⁻⁶ kg·m ²) | |
| | Shaft loading | Radial : Max. 3kgf, Thrust : Max. 0.5kgf | |
| | Max. allowable revolution *2 | 3000rpm | |
| 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) | | |
| 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 | Bracket | | |
| Unit weight | Approx. 130g | | |

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

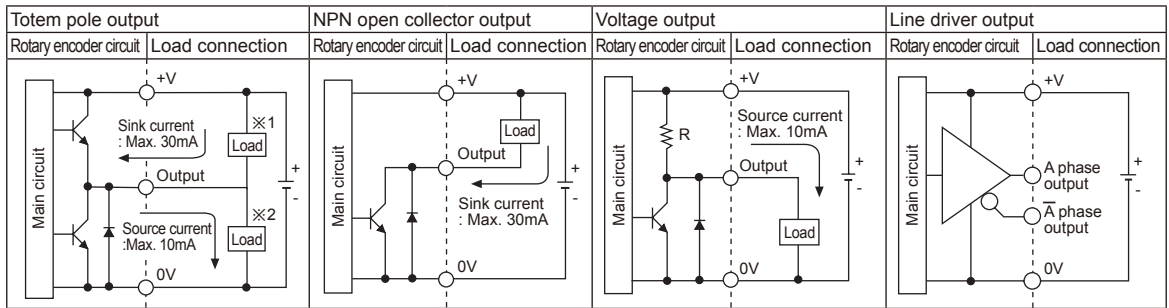
※2: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

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

※Environment resistance is rated at no freezing or condensation.

E40HBP Series

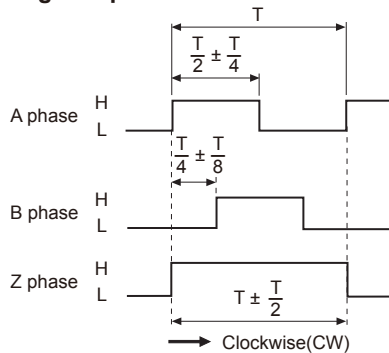
Control output diagram



- 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})

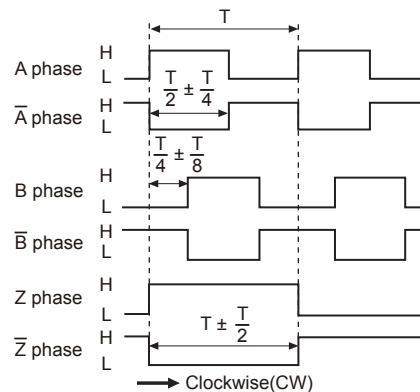
Output waveform

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



×CW : Right turn as from the shaft

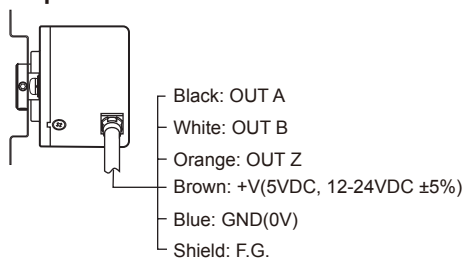
- Line driver output



Connections

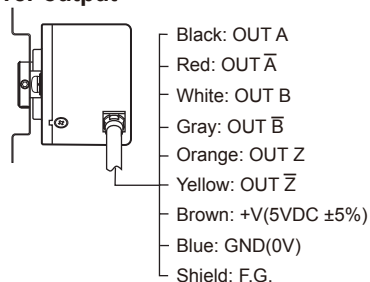
◎ Cable type

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



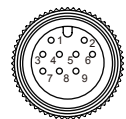
×Unused wires must be insulated.

- 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 |

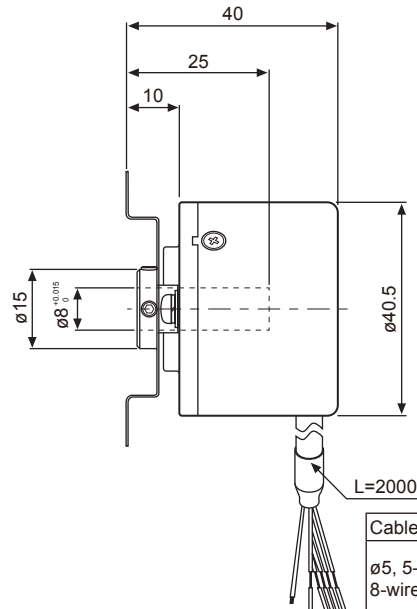
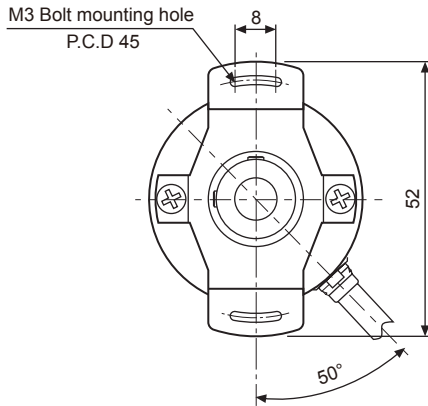
×F.G.(Field Ground): It should be grounded separately .

Incremental $\phi 40\text{mm}$ Hollow Shaft Built-in type

■ Dimensions

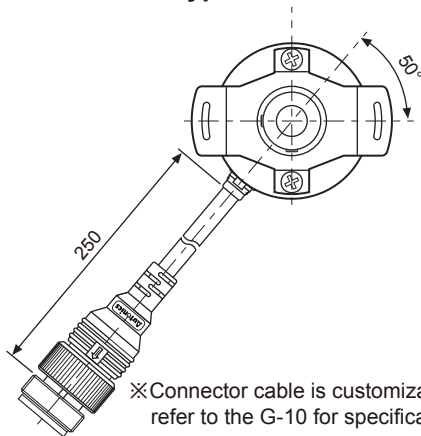
(unit: mm)

◎ Cable type

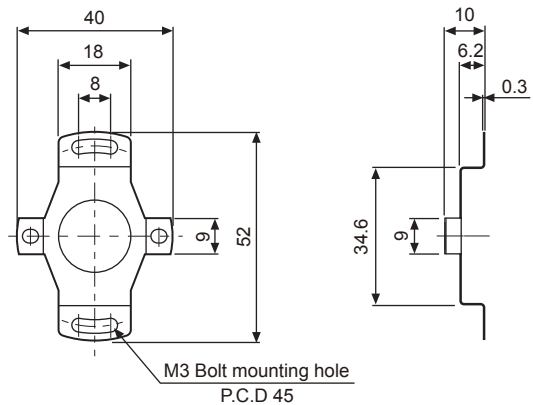


Cable
 $\phi 5$, 5-wire (Line Driver output :
 8-wire), Length:2000, Shield cable

◎ Connector cable type



● Bracket



| | |
|-----|----------------------------------|
| (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 |