Shaft Type Ø50mm Absolute Rotary Encoder

■ Features

- Light as plastic structure
- Power supply: 5VDC, 12-24VDC ±5%
- Shift gray code output

■ Applications

- Precision machine tool, Fabric machinery, Robot, Parking system

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

■ Ordering Information

EP50S **6** **P** – **360** – **3** **F** – **N** – **24**

Series	Shaft diameter	Outer meterial	Steps/revolution	Output code	Revolution direction	Control output	Power supply
Ø50mm shaft type	6: Ø6mm 8: Ø8mm	Plastic	180, 360	3: Shift gray code	F: Output value increases at CW direction R: Output value increase at CCW direction	N: NPN open collector output	5: 5VDC ±5% 24: 12-24VDC ±5%

■ Specifications

Item		Shaft Type Ø50mm Absolute Rotary Encoder
Resolution		180, 360-division
Electrical specification	Output code	Gray code (shift gray code)
	Output phase / Output angle	TS: Signal Pulse (9-bit), TS: 2°±25'
	Control output	NPN open collector output - Load current: Max. 15mA, Residual voltage: Max. 1VDC
	Response time (rise/fall)	Ton=Max. 1μs, Toff=Max. 1μs (cable length: 2m, I sink = 15mA)
	Max. response frequency	20kHz
	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)
	Connection	Axial cable type (cable gland)
Mechanical specification	Starting torque	Max. 40gf·cm (0.004N·m)
	Moment of inertia	Max. 50g·cm² (5×10⁻⁶kg·m²)
	Shaft loading	Radial: 2kgf, Thrust: 1kgf
	Max. allowable revolution※1	3,000rpm
Insulation resistance		Over 100MΩ (at 500VDC megger between all terminals and case)
Dielectric strength		750VAC 50/60Hz for 1 minute (between all terminals and case)
Vibration		1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours
Shock		Approx. max. 50G
Environment	Ambient temperature	-10 to 55℃, storage: -25 to 85℃
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH
Protection structure		IP50 (IEC standard)
Cable		Ø6mm, 12-wire, 2m, Shield cable (AWG24, core diameter: 0.08mm, number of cores: 40, insulator out diameter: Ø1mm)
Accessory		Fixing bracket, Coupling
Weight※2		Approx. 308g (approx. 280g)

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

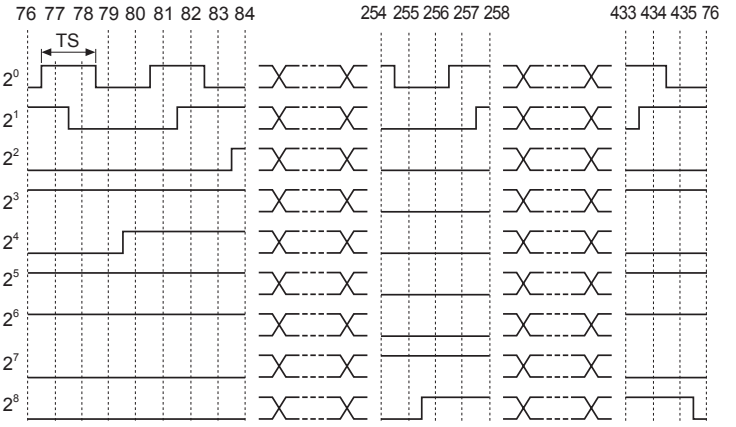
$$[\text{Max. response revolution (rpm)} = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}]$$

※2: The weight includes packaging. The weight in parenthesis is for unit only.
※Environment resistance is rated at no freezing or condensation.

■ Output Waveform

● 360-division (shift gray code output)

Model	EP50S□P-360-3F-N

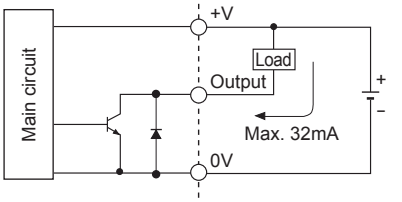


※TS=2°±25'
※Above waveform is based on the positive logic. (the output waveform of negative logic is opposite to the above waveform.)

■ Control Output Diagram

NPN open collector output

Rotary encoder circuit | Load connection



※Be sure that if overload or short-circuit to output terminal, output circuit is damaged.

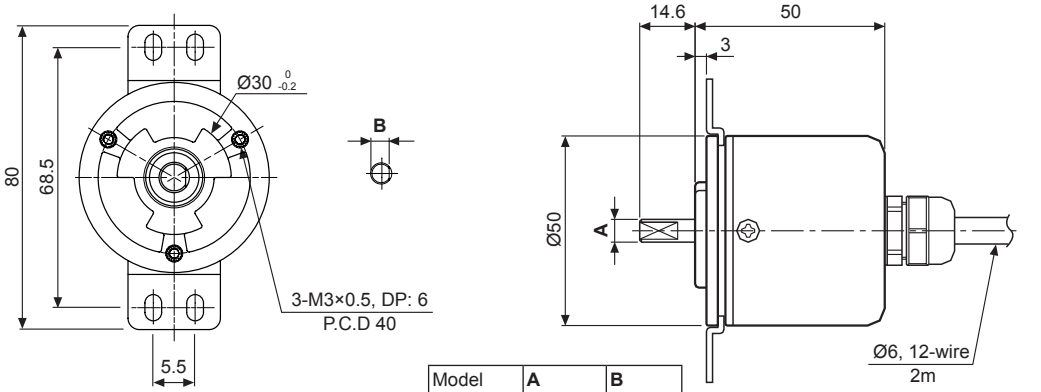
■ Connections

● Shift gray code

Color \ Resolution		360-division
Power	White	+V (5VDC, 12-24VDC)
	Boack	0V (GND)
Output wire	Brown	2^0
	Red	2^1
	Orange	2^2
	Yellow	2^3
	Blue	2^4
	Purple	2^5
	Gray	2^6
	White/Brown	2^7
	White/Red	2^8
	White/Orange	N·C
	Shield wire	F.G.

■ Dimensions

(unit: mm)

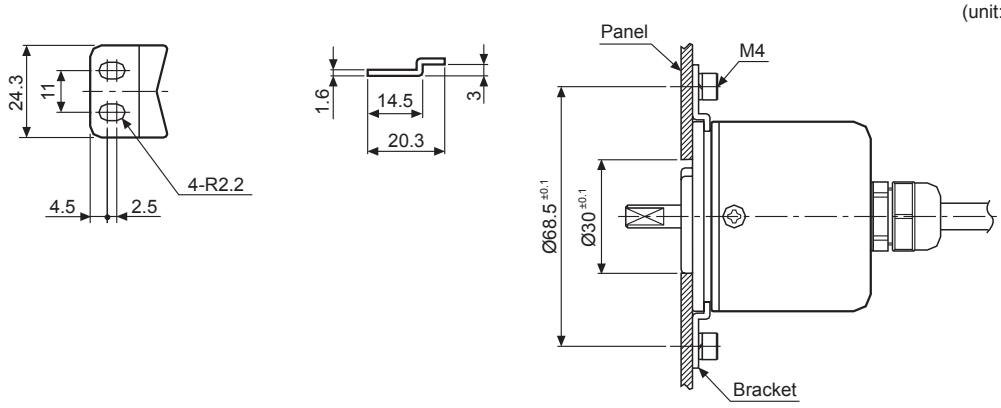


Model	A	B
E50S6P	Ø6 -0.013 -0.007	5
E50S8P	Ø8 -0.015 -0.01	7

▣ Dimensions

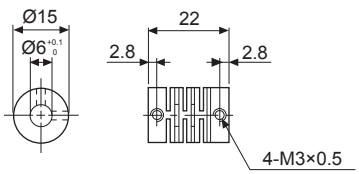
● Bracket

(unit: mm)

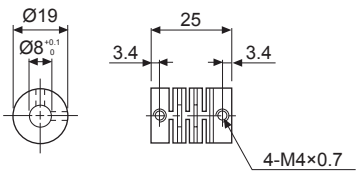


● Coupling

● Ø6mm coupling



● Ø8mm coupling



- Parallel misalignment: Max. 0.25mm
- Angular misalignment: Max. 5°
- End-play: Max. 0.5mm

※For parallel misalignment, angular misalignment, end-play terms, refer to page F-87.
※For flexible coupling (ERB series) information, refer to page F-80.