

## Shaft Type Ø50mm Plastic case, Single-turn Absolute Rotary Encoder

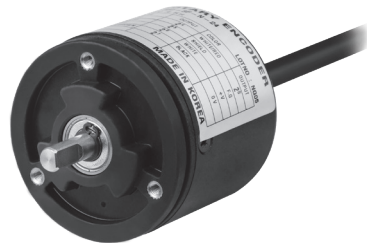
### ■ Features

- 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 "Safety Considerations" in the instruction manual before using.**



### ■ Ordering Information

EP50S	6	P	360	3	F	N	24
Series	Shaft diameter	Outer material	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 Single-turn 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·cm <sup>2</sup> (5×10 <sup>-6</sup> kg·m <sup>2</sup> )
	Shaft loading	Radial: 2kgf, Thrust: 1kgf
	Max. allowable revolution <sup>※1</sup>	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°C, storage: -25 to 85°C
	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 <sup>※2</sup>		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.

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

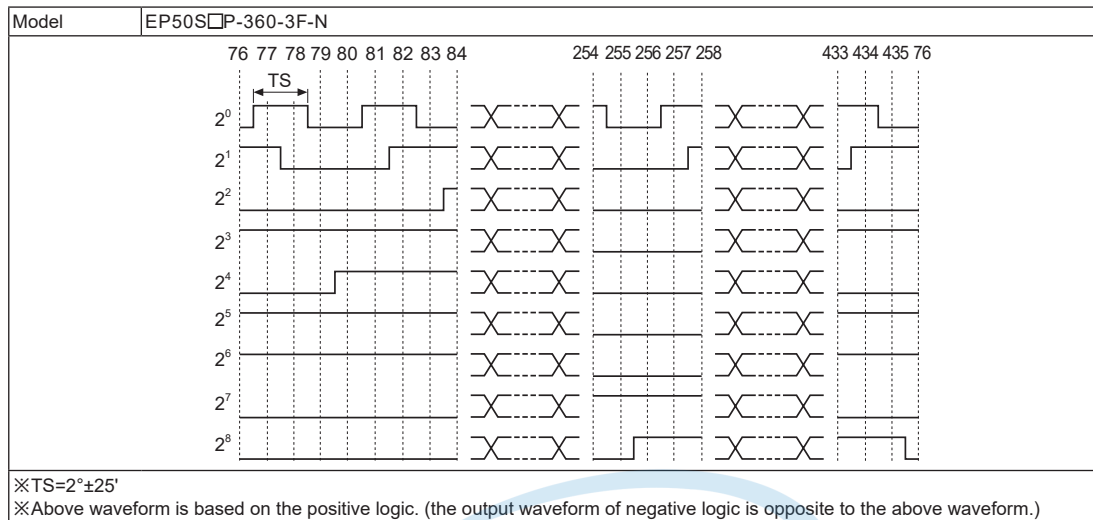
※2: The weight includes packaging. The weight in parenthesis is for unit only.

※Environment resistance is rated at no freezing or condensation.

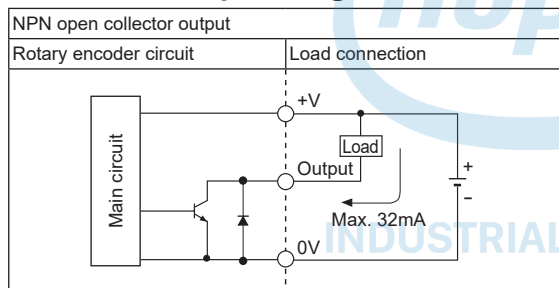
# Plastic case, Absolute Ø50mm Single-turn Shaft Type

## Output Waveform

360-division



## Control Output Diagram



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

## Connections

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

※Do not apply tensile strength over 30N to the cable.

SENSORS

CONTROLLERS

MOTION DEVICES

SOFTWARE

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) LIDAR

(D) Door/Area Sensors

(E) Vision Sensors

(F) Proximity Sensors

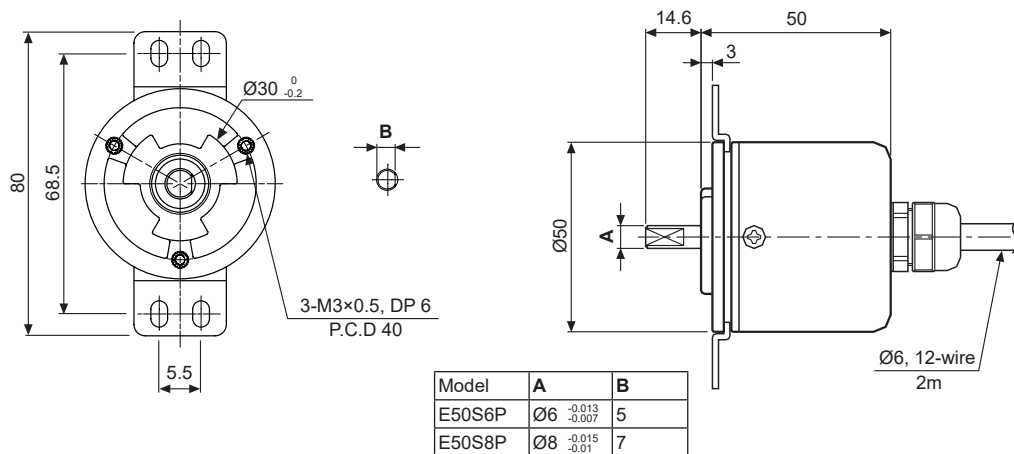
(G) Pressure Sensors

(H) Rotary Encoders

(I) Connectors/ Connector Cables/ Sensor Distribution Boxes/ Sockets

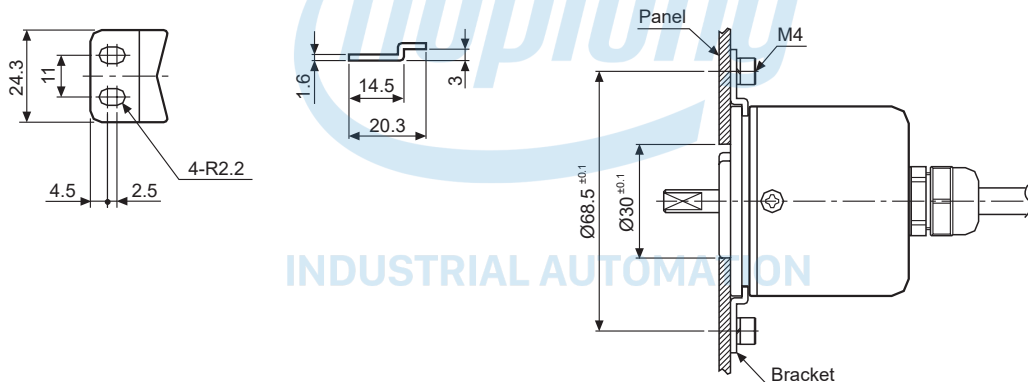
## ■ Dimensions

(unit: mm)



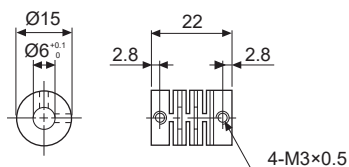
## ○ Bracket

(unit: mm)

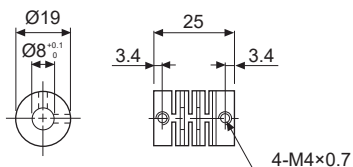


## ○ Coupling

### ● $\varnothing 6$ mm coupling



### ● $\varnothing 8$ mm coupling



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

※Do not load overweight on the shaft.

※Do not put strong impact when insert a coupling into shaft. Failure to follow this instruction may result in product damage.

※Fix the unit or a coupling by a wrench under 0.15N-m of torque.

※When you install this unit, if eccentricity and deflection angle are larger, it may shorten the life cycle of this unit.

※For parallel misalignment, angular misalignment, end-play terms, refer to the "Glossary" section of Technical Description.

※For flexible coupling (ERB series) information, refer to the ERB series section.