## **Absolute Ø50mm Shaft Type**

## Shaft Type Ø50mm Absolute Rotary Encoder

#### Features

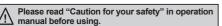
· Light as plastic structure

Power supply: 5VDC, 12-24VDC ±5%

Shift gray code output

## Applications

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



# Ordering Information

EP50S	6	Ρ.	- 360	- 3	F -	- N -	- 24
Series		Outer meterial	Steps/revolution	Output code			Power supply
	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	- 1	5: 5VDC ±5% 24: 12-24VDC ±5%

### Specifications

Resolution   180, 360-division   180, 360-division   Gray code (shift gray code)   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)   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   3,000rpm   Insulation resistance   Over 100MΩ (at 500VDC megger 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   Ambient temperature   Ambient temperat	Item			Shaft Type Ø50mm Absolute Rotary Encoder			
Output phase / Output angle   TS: Signal Pulse (9-bit), TS: 2°±25'	Resolution			180, 360-division			
Max. response frequency   20kHz	Output c		ode	Gray code (shift gray code)			
Max. response frequency   20kHz			nase / Output angle	TS: Signal Pulse (9-bit), TS: 2°±25'			
Max. response frequency   20kHz	Control of Respons	Control o	utput	NPN open collector output - Load current: Max. 15mA, Residual voltage: Max. 1VDC			
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Connection	O May ro		oonse frequency	20kHz			
Connection	Į.	Power su	pply	• 5VDC ±5% (ripple P-P: max. 5%) • 12-24VDC ±5% (ripple P-P: max. 5%)			
Connection	<u>8</u>	Current of	onsumption	Max. 80mA (disconnection of the load)			
Mechanical specification       Moment of inertia       Max. 50g·cm² (5×10-6kg·m²)         Specification       Shaft loading       Radial: 2kgf, Thrust: 1kgf         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 Ambient humidity       -10 to 55°C, storage: -25 to 85°C         Ambient humidity       35 to 85%RH, storage: 35 to 90%RH	Ш	Connecti	on	Axial cable type (cable gland)			
specification       Shaft loading       Radial: 2kgf, Thrust: 1kgf         Max. allowable revolution**1       3,000 rpm         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 Ambient humidity       -10 to 55°C, storage: -25 to 85°C         Ambient humidity       35 to 85%RH, storage: 35 to 90%RH			Starting torque	Max. 40gf·cm (0.004N·m)			
Max. allowable revolution <sup>x1</sup> 3,000 rpm       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 Ambient humidity     -10 to 55°C, storage: -25 to 85°C       Ambient humidity     35 to 85%RH, storage: 35 to 90%RH	Me	echanical	Moment of inertia	Max. 50g·cm² (5×10-6kg·m²)			
Insulation resistance   Over 100MΩ (at 500VDC megger between all terminals and case)	specification	ecification					
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 Ambient humidity  35 to 85%RH, storage: 35 to 90%RH			Max. allowable revolution*1	3,000rpm			
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 Ambient humidity  35 to 85%RH, storage: 35 to 90%RH	Insulation resistance		sistance	Over 100MΩ (at 500VDC megger between all terminals and case)			
Shock Approx. max. 50G  Environment Ambient temperature Ambient humidity Ambient humidity Approx. max. 50G  -10 to 55°C, storage: -25 to 85°C  35 to 85°RH, storage: 35 to 90%RH	Dielectric strength		ength	750VAC 50/60Hz for 1 minute (between all terminals and case)			
Environment Ambient temperature -10 to 55°C, storage: -25 to 85°C Ambient humidity 35 to 85%RH, storage: 35 to 90%RH	Vibration			1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours			
Ambient humidity 35 to 85%RH, storage: 35 to 90%RH	Shock			Approx. max. 50G			
Ambient humidity 35 to 85%RH, storage: 35 to 90%RH	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)	Protection structure		ructure	IP50 (IEC standard)			
Cable Ø6mm, 12-wire, 2m, Shield cable (AWG24, core diameter: 0.08mm, number of cores: 40, insulator out diameter: Ø1mm)	Cable						
Accessory Fixing bracket, Coupling	Accessory			Fixing bracket, Coupling			
Weight <sup>x2</sup> Approx. 308g (approx. 280g)	Weight <sup>**2</sup>			Approx. 308g (approx. 280g)			

X1: Make sure that max. response revolution should be lower than or equal to max. allowable revolution when selecting the resolution. [Max. response revolution (rpm)= Max. response frequency × 60 sec] Resolution

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

(A) Photoelectric Sensors

(C) Door/Area Sensors

(D) Proximity Sensors

(E) Pressure Sensors

## (F) Rotary Encode

(I) SSRs / Power Controllers

(M) Tacho / Speed / Pulse Meters

(P) Switching Mode Power Supplies

(Q) Stepper Motors

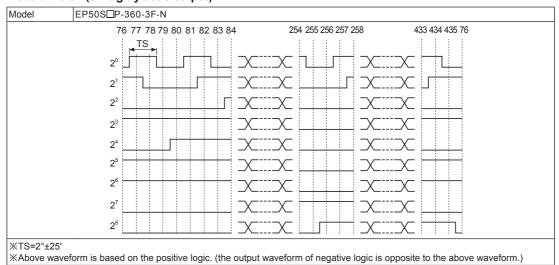
(R) Graphic/ Logic Panels

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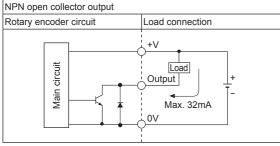
## **EP50SP Series**

## Output Waveform

## • 360-division (shift gray code output)



## **■** Control Output Diagram



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

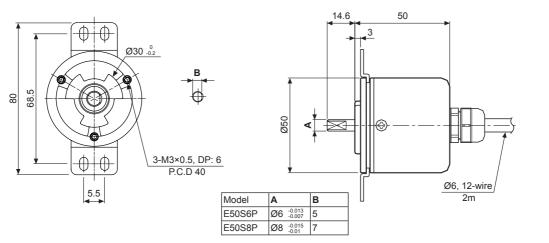
### Connections

#### • Shift gray code

Resolution		360-division
Power	White	+V (5VDC, 12-24VDC)
Po	Boack	0V (GND)
Output wire	Brown	2 <sup>0</sup>
	Red	21
	Orange	22
	Yellow	2 <sup>3</sup>
	Blue	24
	Purple	2 <sup>5</sup>
	Gray	2 <sup>6</sup>
	White/Brown	27
	White/Red	2 <sup>8</sup>
	White/Orange	N·C
	Shield wire	F.G.

#### Dimensions

(unit: mm)

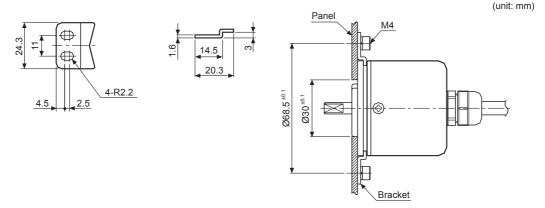


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# Absolute Ø50mm Shaft Type

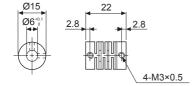
#### Dimensions

#### Bracket

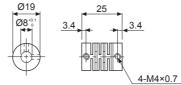


#### • Coupling

• Ø6mm 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.

(A) Photoelectric Sensors

(B) Fiber Optic

> (C) Door/Area Sensors

(D) Proximity Sensors

(E) Pressure Sensors

#### (F) Rotary Encoders

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

(H) Temperature Controllers

(I) SSRs / Power Controllers

(J) Counters

(K) Timers

anel

(M) Tacho / Speed / Puls

(N) Display Units

> O) ensor

(P) Switching Mode Power Supplies

(Q) Stepper Motors & Drivers & Controllers

(R) Graphic/ Logic Panels

(S) Field Network Devices

(T) Software

Autonics F-55