

## Shaft Type/Blind Hollow Shaft Type Ø58mm Single-turn Absolute Rotary Encoder

### ■ Features

- Ø58mm flange type
- Applicable to various mounting environments
- Various output code: BCD, Binary, Gray code (customizable)
- Various and high resolution (720, 1024-division)

### ■ Applications

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



**⚠ Please read "Safety Considerations" in the instruction manual before using.**



### ■ Ordering Information

<b>EP58SC</b>	<b>10</b>	<b>1024</b>	<b>1</b>	<b>R</b>	<b>P</b>	<b>24</b>	
Series Ø58mm	Shaft diameter		Pulses/revolution	Output code	Rotating direction	Control output	Power supply
SC: Shaft clamping	External	10 Ø10mm	Refer to resolution	1: BCD code 2: Binary code 3: Gray code	F: Output value increases at CW direction R: Output value increases at CCW direction	P: PNP open collector output N: NPN open collector output	5: 5VDC ±5% 24: 12-24VDC ±5%
SS: Shaft synchro	6 Ø6mm						
HB: Blind hollow shaft	Inner	8 Ø8mm					

### ■ Specifications

Type	Shaft Type/Blind Hollow Shaft Type Ø58mm Single-turn Absolute Rotary Encoder									
Resolution	720, 360, 180, 90, 45-division				1024, 512, 256, 128, 64-division					
Output code	Division	BCD code			Binary code			Gray code		
		720	TS: 0.5°±25' (11-bit)	TS: 0.5°±25' (10-bit)	TS: 1°±25' (10-bit)	1024	TS: 0.3515°±15' (13-bit)	TS: 0.3515°±15' (10-bit)	TS: 0.703°±15' (10-bit)	
		360	TS: 1°±25' (10-bit)	TS: 1°±25' (9-bit)	TS: 2°±25' (9-bit)	512	TS: 0.703°±15' (11-bit)	TS: 0.703°±15' (9-bit)	TS: 1.406°±15' (9-bit)	
		180	TS: 2°±25' (9-bit)	TS: 2°±25' (8-bit)	TS: 4°±25' (8-bit)	256	TS: 1.406°±15' (10-bit)	TS: 1.406°±15' (8-bit)	TS: 2.8125°±15' (8-bit)	
		90	TS: 4°±25' (8-bit)	TS: 4°±25' (7-bit)	TS: 8°±25' (7-bit)	128	TS: 2.8125°±15' (9-bit)	TS: 2.8125°±15' (7-bit)	TS: 5.625°±15' (7-bit)	
		45	TS: 8°±25' (7-bit)	TS: 8°±25' (6-bit)	TS: 16°±25' (6-bit)	64	TS: 5.625°±15' (7-bit)	TS: 5.625°±15' (6-bit)	TS: 11.25°±15' (6-bit)	
Electrical specification	Control output	PNP open collector output Output voltage: min. (power supply-1.5)VDC=, load current: max. 32mA								
		NPN open collector output Load current: max. 32mA, residual voltage: max. 1VDC=								
Response time (rise/fall)		Ton=800ns, Toff=Max. 800ns (cable: 2m, I sink = 32mA)								
Max. response frequency		35kHz								
Power supply		• 5VDC= ±5% (ripple P-P: max. 5%) • 12-24VDC= ±5% (ripple P-P: max. 5%)								
Current consumption		Max. 100mA (disconnection of the load)								
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)								
Connection		Axial cable type (cable gland)								
Mechanical specification	Starting torque		• SC/SS type: max. 40gf·cm (0.004N·m)				• HB type: max. 90gf·cm (0.009N·m)			
	Moment of inertia		• SC/SS type: max. 15g·cm <sup>2</sup> (1.5×10 <sup>-6</sup> kg·m <sup>2</sup> )				• HB type: max. 20g·cm <sup>2</sup> (2.0×10 <sup>-6</sup> kg·m <sup>2</sup> )			
	Shaft loading		• SC/SS type: radial: max. 10kgf, thrust: max. 2.5kgf				• HB type: radial: max. 2kgf, thrust: max. 1kgf			
	Max. allowable revolution <sup>※2</sup>		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 temp.		-10 to 70°C, storage: -25 to 85°C							
	Ambient humi.		35 to 85%RH, storage: 35 to 90%RH							
Protection structure		IP50 (IEC standard)								
Cable		Ø7mm, 15-wire, 2m, Shield cable								
Accessories		Ø10mm (SC type)/Ø6mm (SS type) coupling, Fixing bracket								
Approval		CE								
Weight <sup>※3</sup>		• SC type: approx. 545g (approx. 435g)				• SS type: approx. 525g (approx. 415g)				
		• HB type: approx. 520g (approx. 410g)								

※1: TS=Signal Pulse

※Environment resistance is rated at no freezing or condensation.

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

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

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

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

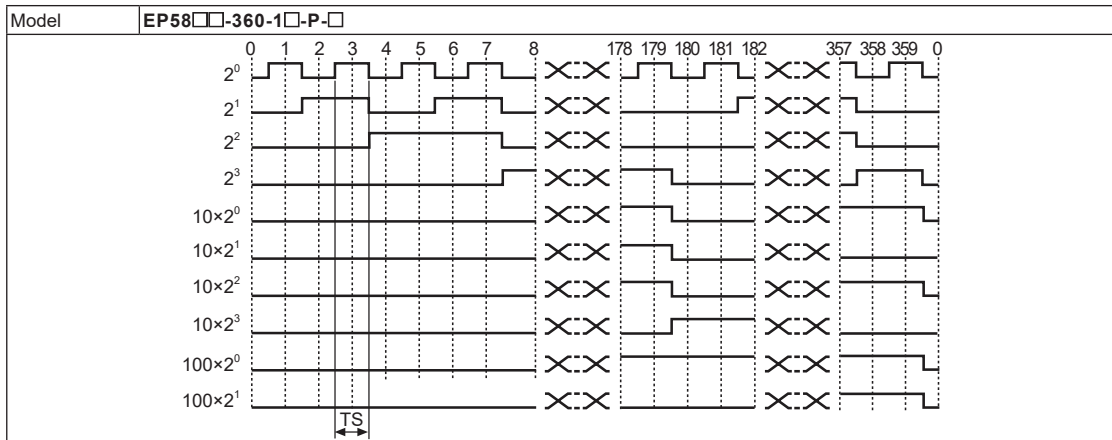
(H) Rotary Encoders

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

# EP58 Series

## Output Waveform

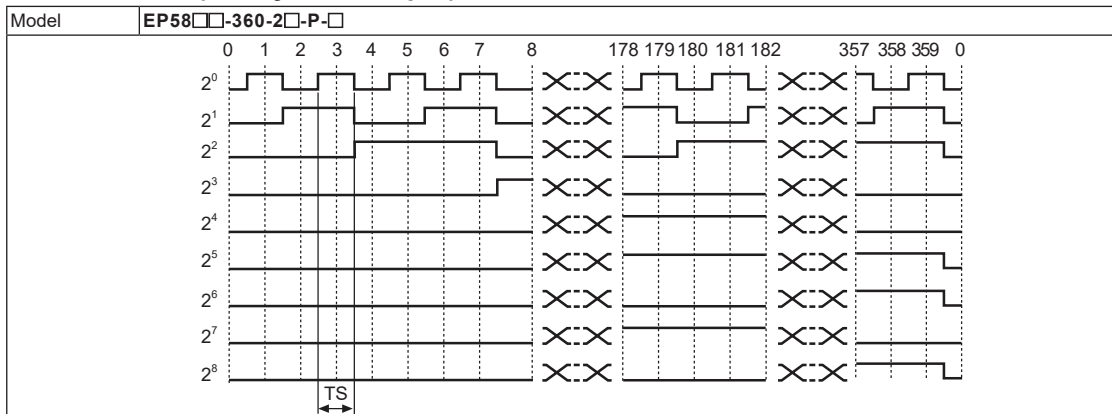
### 360-division (BCD code output)



※TS=1°±25'

※Above waveform is based on the positive logic. (the output waveform of negative logic is opposite to the above waveform.)

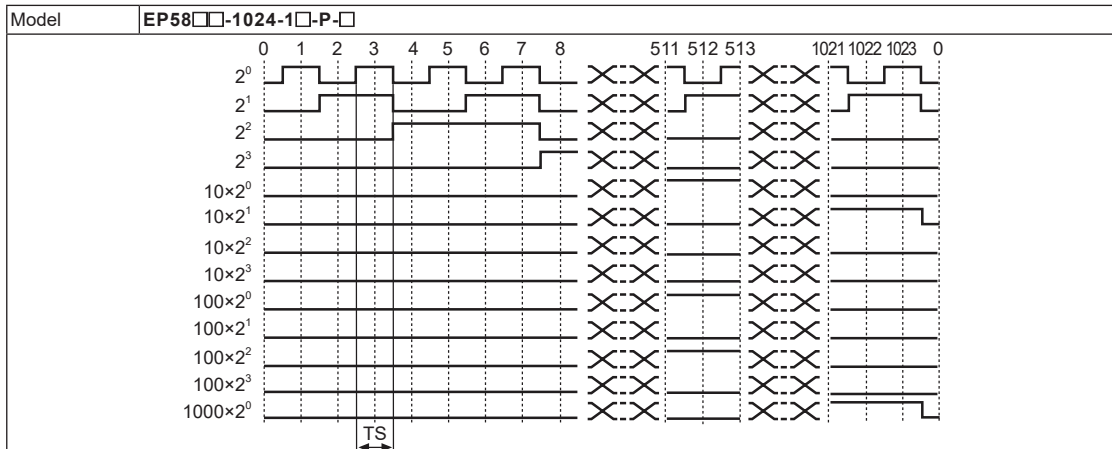
### 360-division (Binary code output)



※TS=1°±25'

※Above waveform is based on the positive logic. (the output waveform of negative logic is opposite to the above waveform.)

### 1024-division (BCD code output)



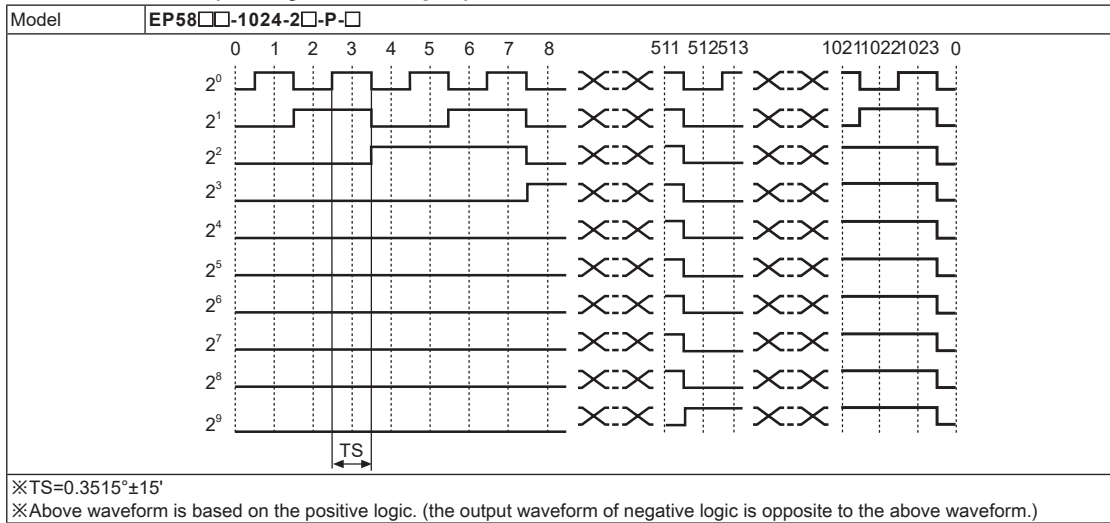
※TS=0.3515°±15'

※Above waveform is based on the positive logic. (the output waveform of negative logic is opposite to the above waveform.)

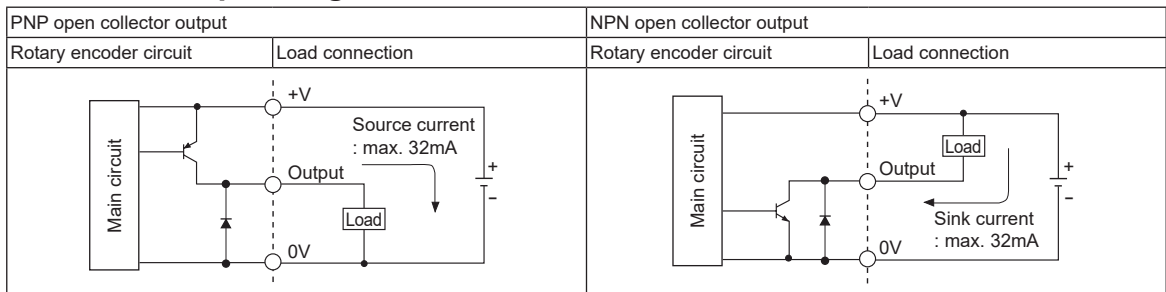
# Absolute Ø58mm Single-turn Shaft/Blind Hollow Shaft Type

## Output Waveform

### 1024-division (Binary code output)



## Control Output Diagram



※In case of overload or short on output terminal, it may cause output circuit break.

## Connections

### BCD code

Resolution	45-division	64-division	90-division	128-division	180-division	256-division	360-division	512-division	720-division	1024-division	
Color	White	+V									
Power	Black	GND (0V)									
Output wire	Brown	$2^0$									
	Red	$2^1$									
	Orange	$2^2$									
	Yellow	$2^3$									
	Blue	$2^0 \times 10$									
	Purple	$2^1 \times 10$									
	Gray	$2^2 \times 10$									
	White/Brown	N-C	$2^3 \times 10$								
	White/Red	N-C	$2^3 \times 100$								
	White/Orange	N-C	$2^1 \times 100$								
White/Yellow	N-C	$2^2 \times 100$									
White/Blue	N-C									$2^3 \times 100$	
White/Purple	N-C	$2^0 \times 1000$									
Shield wire	F.G.										

### Binary code / Gray code

Resolution	45-division	64-division	90-division	128-division	180-division	256-division	360-division	512-division	720-division	1024-division	
Color	White	+V									
Power	Black	GND (0V)									
Output wire	Brown	$2^0$									
	Red	$2^1$									
	Orange	$2^2$									
	Yellow	$2^3$									
	Blue	$2^4$									
	Purple	$2^5$									
	Gray	N-C	$2^6$								
	White/Brown	N-C									$2^7$
	White/Red	N-C								$2^8$	
	White/Orange	N-C							$2^9$		
White/Yellow	N-C										
White/Blue	N-C										
White/Purple	N-C										
Shield wire	F.G.										

※Unused wires must be insulated.

※Encoder metal case and shield wire must be grounded (F.G.).

※N-C (not connected)

※Output cable must not be short-circuited, because Driver IC is used in output circuit.

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

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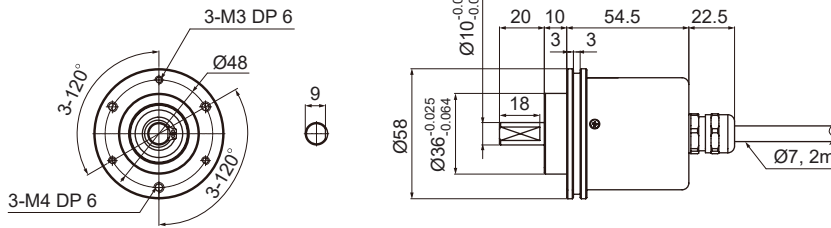
(I) Connectors/ Connector Cables/ Sensor Distribution Boxes/ Sockets

# EP58 Series

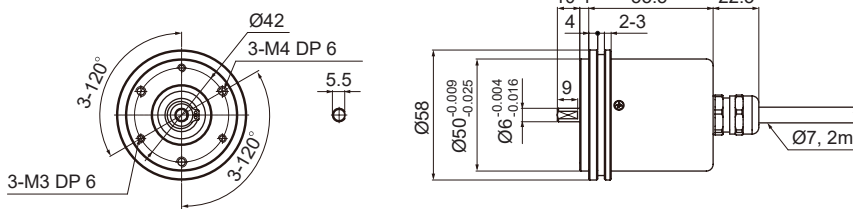
## ■ Dimensions

(unit: mm)

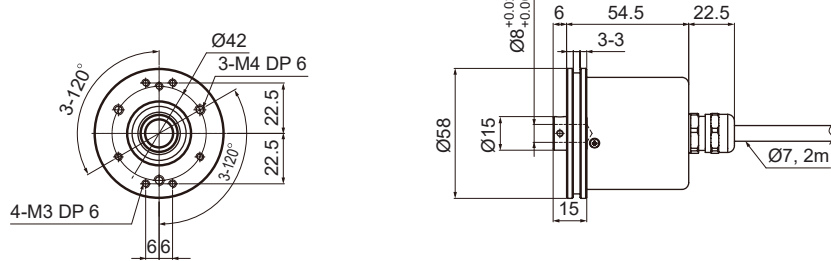
### ○ EP58SC10



### ○ EP58SS6

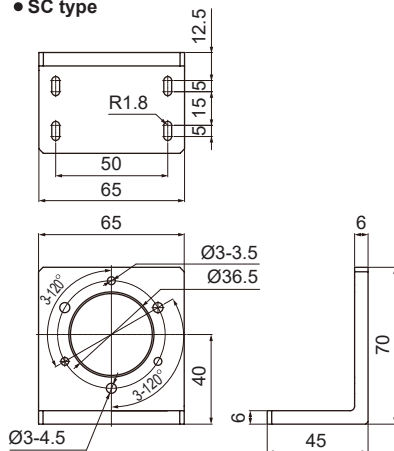


### ○ EP58HB8

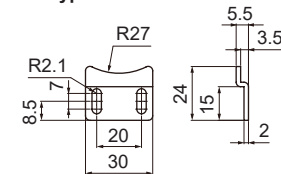


## ○ Bracket

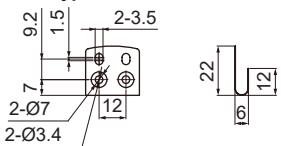
### ● SC type



### ● SS type

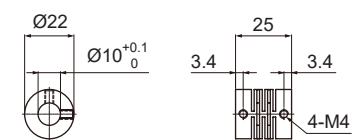


### ● HB type

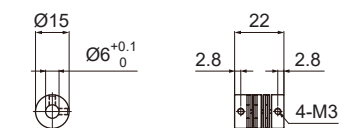


## ○ Coupling

### ● EP58SC10



### ● EP58SS6



- 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.