Shaft Type/Blind Hollow Shaft Type Ø58mm 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 operation manual before using.

■ Ordering Information

EP58SC | **10** | – | **1024** | – | **1** | **R** | – | **P** | – | **24**

Series Ø58mm	Shaft diameter			Steps/ 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	External	6	Ø6mm					
HB: Blind hollow shaft	Inner	8	Ø8mm					

■ Specifications

Type			Shaft Type/Blind Hollow Shaft Type Ø58mm Absolute Rotary Encoder							
Resolution			720, 360, 180, 90, 45-division				1024, 512, 256, 128, 64-division			
Electrical specification	Output code		Division	BCD code	Binary code	Gray code	Division	BCD code	Binary code	Gray code
	Output phase/ Output angle		720	TS: Signal Pulse (11-bit) TS: 0.5°±25'	TS: Signal Pulse (10-bit) TS: 0.5°±25'	TS: Signal Pulse (10-bit) TS: 1°±25'	1024	TS: Signal Pulse (13-bit) TS: 0.3515°±15'	TS: Signal Pulse (10-bit) TS: 0.3515°±15'	TS: Signal Pulse (10-bit) TS: 0.703°±15'
			360	TS: Signal Pulse (10-bit) TS: 1°±25'	TS: Signal Pulse (9-bit) TS: 1°±25'	TS: Signal Pulse (9-bit) TS: 2°±25'	512	TS: Signal Pulse (11-bit) TS: 0.703°±15'	TS: Signal Pulse] (9-bit) TS: 0.703°±15'	TS: Signal Pulse (9-bit) TS: 1.406°±15'
			180	TS: Signal Pulse (9-bit) TS: 2°±25'	TS: Signal Pulse (8-bit) TS: 2°±25'	TS: Signal Pulse (8-bit) TS: 4°±25'	256	TS: Signal Pulse (10-bit) TS: 1.406°±15'	TS: Signal Pulse (8-bit) TS: 1.406°±15'	TS: Signal Pulse (8-bit) TS: 2.8125°±15'
			90	TS: Signal Pulse (8-bit) TS: 4°±25'	TS: Signal Pulse (7-bit) TS: 4°±25'	TS: Signal Pulse (7-bit) TS: 8°±25'	128	TS: Signal Pulse (9-bit) TS: 2.8125°±15'	TS: Signal Pulse (7-bit) TS: 2.8125°±15'	TS: Signal Pulse (7-bit) TS: 5.625°±15'
			45	TS: Signal Pulse (7-bit) TS: 8°±25'	TS: Signal Pulse (6-bit) TS: 8°±25'	TS: Signal Pulse (6-bit) TS: 16°±25'	64	TS: Signal Pulse (7-bit) TS: 5.625°±15'	TS: Signal Pulse (6-bit) TS: 5.625°±15'	TS: Signal Pulse (6-bit) TS: 11.25°±15'
	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=800nsec, Toff=Max. 800nsec (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·cm² (1.5×10^{-6}kg·m²) • HB type: max. 20g·cm² (2.0×10^{-6}kg·m²)							
	Shaft loading		• SC/SS type: Radial: 10kgf, Thrust: 2.5kgf • HB type: Radial: 2kgf, Thrust: 1kgf							
	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		-10 to 70℃, storage: -25 to 85℃							
	Ambient humidity		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							
Unit weight			• SC type: Approx. 435g • SS type: Approx. 415g • HB type: Approx. 410g							

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

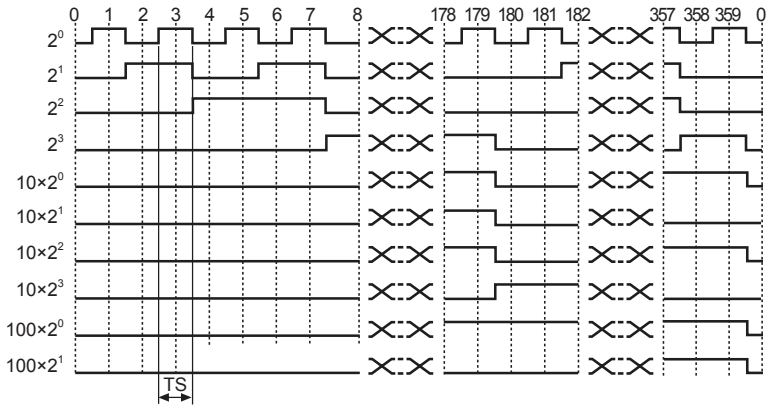
$$[\text{Max. response revolution (rpm)} = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}]$$

※Environment resistance is rated at no freezing or condensation.

▣ Output Waveform

• 360-division (BCD code output)

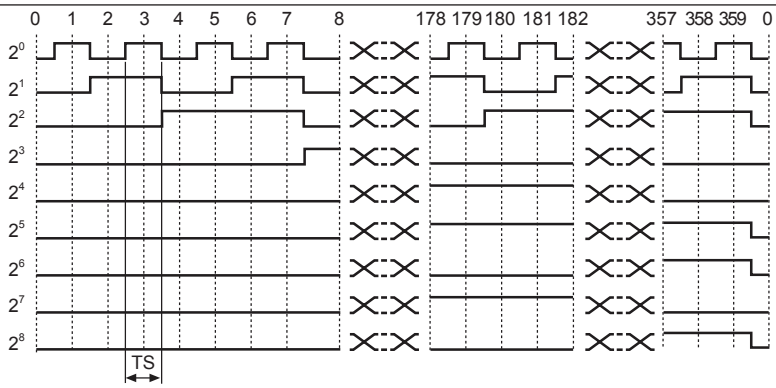
Model	EP58□□-360-1□-P-□



※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)

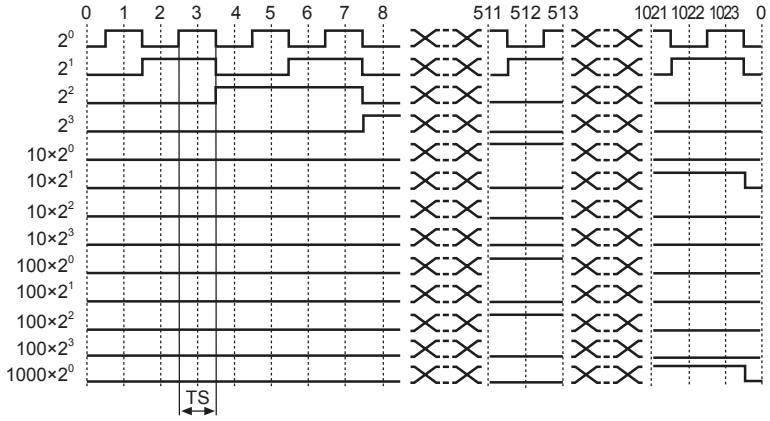
Model	EP58□□-360-2□-P-□



※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)

Model	EP58□□-1024-1□-P-□

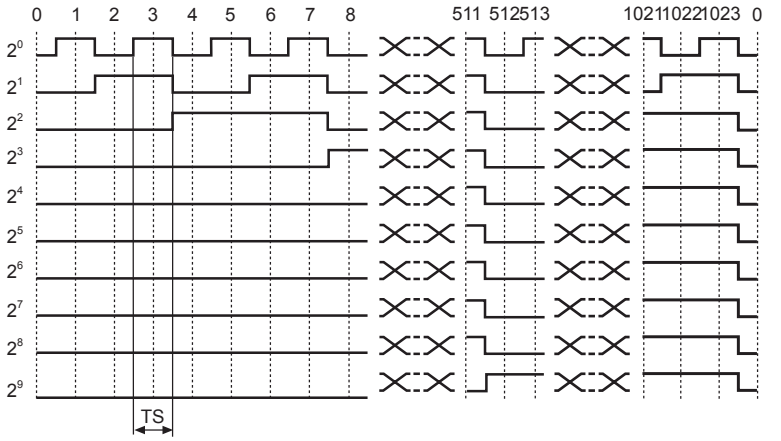


※TS=0.3515°±15'
※Above waveform is based on the positive logic. (the output waveform of negative logic is opposite to the above waveform.)

▣ Output Waveform

● 1024-division (Binary code output)

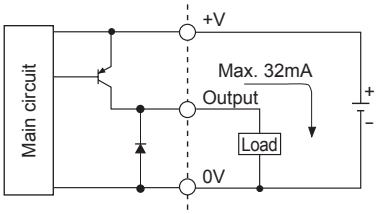
Model	EP58□□-1024-2□-P-□

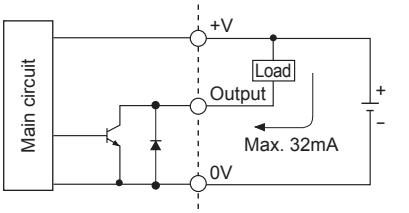


※TS=0.3515°±15'
※Above waveform is based on the positive logic. (the output waveform of negative logic is opposite to the above waveform.)

▣ Control Output Diagram

PNP open collector output		NPN open collector output	
Rotary encoder circuit	Load connection	Rotary encoder circuit	Load connection





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

▣ Connections

● BCD code

Color \ Resolution		45-division	48-division	64-division	90-division	128-division	180-division	256-division	360-division	512-division	720-division	1024-division
Power	White	+V										
	Black	GND (0V)										
Output wire	Brown	2^0										
	Red	2^1										
	Orange	2^2										
	Yellow	2^3										
	Blue	(2^0×10)										
	Purple	(2^1×10)										
	Gray	(2^2×10)										
	White/Brown	N·C			2^3×10							
	White/Red	N·C				2^0×100						
	White/Orange	N·C					2^1×100					
	White/Yellow	N·C								2^2×100		
	White/Blue	N·C										2^3×100
	White/Purple	N·C										2^0×1000
	Shield wire	F.G.										

● Binary code / Gray code

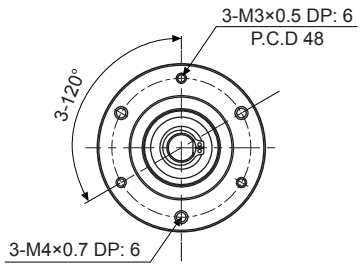
Color \ Resolution		45-division	48-division	64-division	90-division	128-division	180-division	256-division	360-division	512-division	720-division	1024-division
Power	White	+V										
	Black	GND (0V)										
Output wire	Brown	2^0										
	Red	2^1										
	Orange	2^2										
	Yellow	2^3										
	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.										

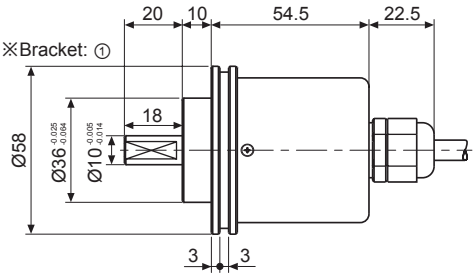
※Unused wires must be insulated.
※Encoder metal case and shield wire must be grounded (F.G.).
※N·C: Not connected.
※Output cable must not be short-circuited, because Driver IC is used in output circuit.

▣ Dimensions

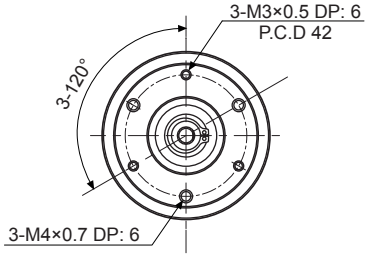
(unit: mm)

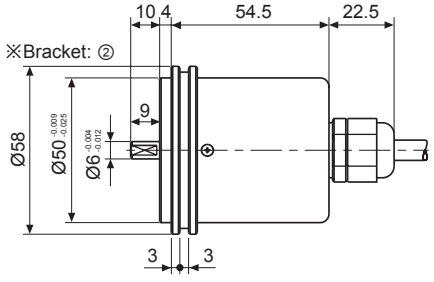
◎ Shaft clamping type



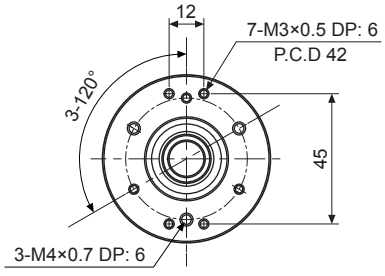


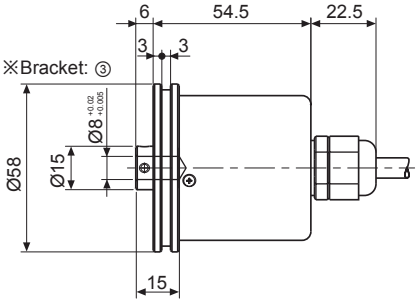
◎ Shaft synchro type





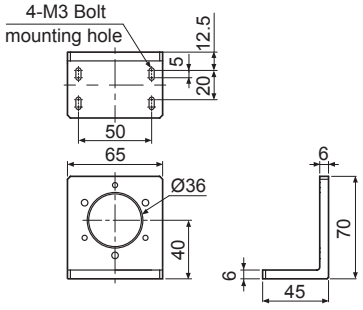
◎ Blind hollow shaft type



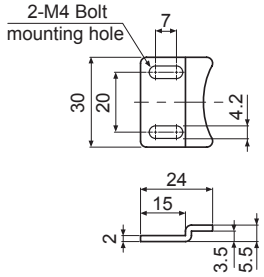


● Bracket

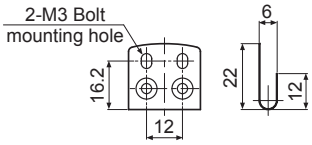
※SC type: ①



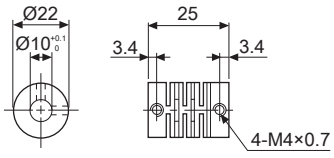
※SS type: ②



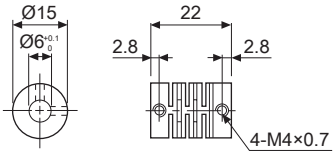
※HB/H type: ③



- Ø10 Coupling (EP58SC10 series)



- Ø6 Coupling (EP58SS6 series)



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

※When mounting the coupling to the encoder shaft, if there is combined misalignment (parallel, angular misalignment) between rotating encoder shaft and mate shaft, it may cause encoder and coupling's life cycle to shorten.
※Do not load overweight on the shaft.
※For parallel misalignment, angular misalignment, end-play terms, refer to page F-87.
※For flexible coupling (ERB series) information, refer to page F-80.