

ϕ 50mm Shaft Absolute Type

Diameter ϕ 50mm shaft type Absolute Rotary encoder

■ Features

- Compact size of external diameter 50mm
- Various output code: BCD, Binary, Gray Code (Option)
- Various resolution (720/1024 divisions)
- IP 64 (Partial waterproof, Oil proof)

■ Applications

Precision machine tool, Fabric machinery, Robot, Parking system

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



■ Ordering information

EP50S	8	1024	1	R	P	24
Series	Inside	Pulse/1Revolution	Output code	Revolution direction	Control output	Power supply
Diameter ϕ 50mm shaft type	ϕ 8mm	Refer to revsolutions	1 : BCD Code 2 : Binary Code 3 : Grey Code	F : Output value increase at CW direction R : Output value increase at CCW direction	1 : PNP open collector output 2 : NPN open collector output	5 : 5VDC $\pm$ 5% 24 : 12–24VDC $\pm$ 5%

* Gray code is optional.

■ Specifications

Item		Diameter ϕ 50mm shaft type of Absolute rotary encoder	
Resolution		(Note1)	*6, *8, *12, *16, *24, *32, *40, 45, 60, 64, 90, 128, 180, 256, 360, 512, 720, 1024
Electrical specification	Output code/Output angle		Refer to "Output waveform"
	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 length:2m, I sink=32mA)
	Max. Response frequency		35kHz
	Power supply		• 5VDC $\pm$ 5% (Ripple P–P : Max. 5%) • 12–24VDC $\pm$ 5% (Ripple P–P : Max. 5%)
	Current consumption		Max. 100mA (disconnection of the load)
	Insulation resistance		Min. 100M Ω (at 500VDC)
	Dielectric strength		750VAC 50/60Hz for 1 minute (Between all terminals and case)
	Connection		Cable outgoing type (Cable gland)
Mechanical specification	Starting torque		Max. 40gf • cm (0.004N • m)
	Rotor inertia		Max. 40g • cm ² (4×10^{-6} kg • m ²)
	Shaft loading		Radial : 10kgf, Thrust : 2.5kgf
	Max. allowable revolution		(Note2) 3000rpm
Vibration		1.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hours	
Shock		Max. 50G	
Ambient temperature		–10 ~ 70°C (at non-freezing status), Storage: –25 ~ 85°C	
Ambient humidity		35~85%RH, Storage: 35~90%RH	
Protection		IP64 (IEC standard)	
Cable		ϕ 7mm, 15P, Length : 2m, Shield cable	
Accessory		Fixing bracket, Coupling	
Unit weight		Approx. 380g	
Approval		CE	

※ (Note1) "*" Marked division in resolution division in resolution is being developed. Not indicated type is available to customize.

※ (Note2) Max. allowable revolution $\geq$ Max. response revolution $\left[\text{Max. response revolution (rpm)} = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec} \right]$

(A)
Counter

(B)
Timer

(C)
Temp.
controller

(D)
Power
controller

(E)
Panel
meter

(F)
Tacho/
Speed/
Pulse
meter

(G)
Display
unit

(H)
Sensor
controller

(I)
Switching
power
supply

(J)
Proximity
sensor

(K)
Photo
electric
sensor

(L)
Pressure
sensor

(M)
Rotary
encoder

(N)
Stepping
motor &
Driver &
Controller

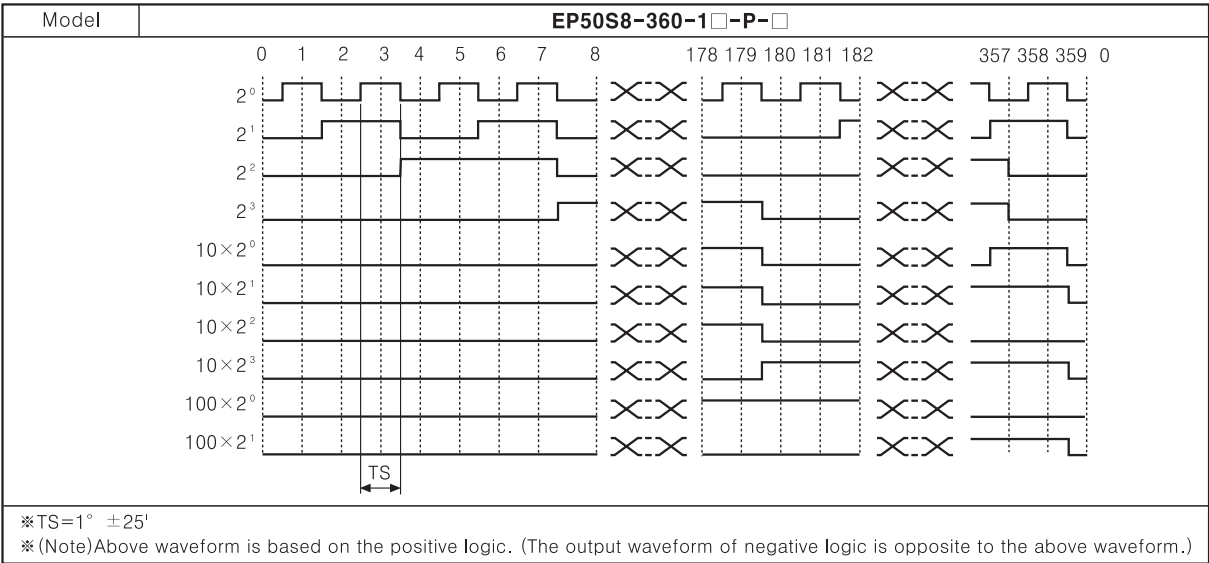
(O)
Graphic
panel

(P)
Production
stoppage
models &
replacement

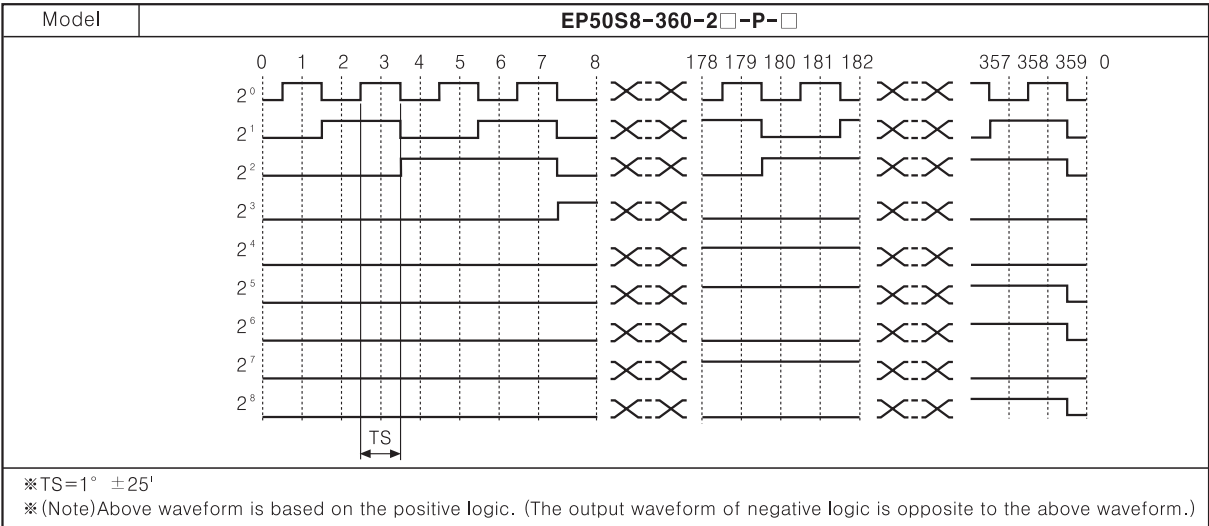
EP50S Series

Output waveform

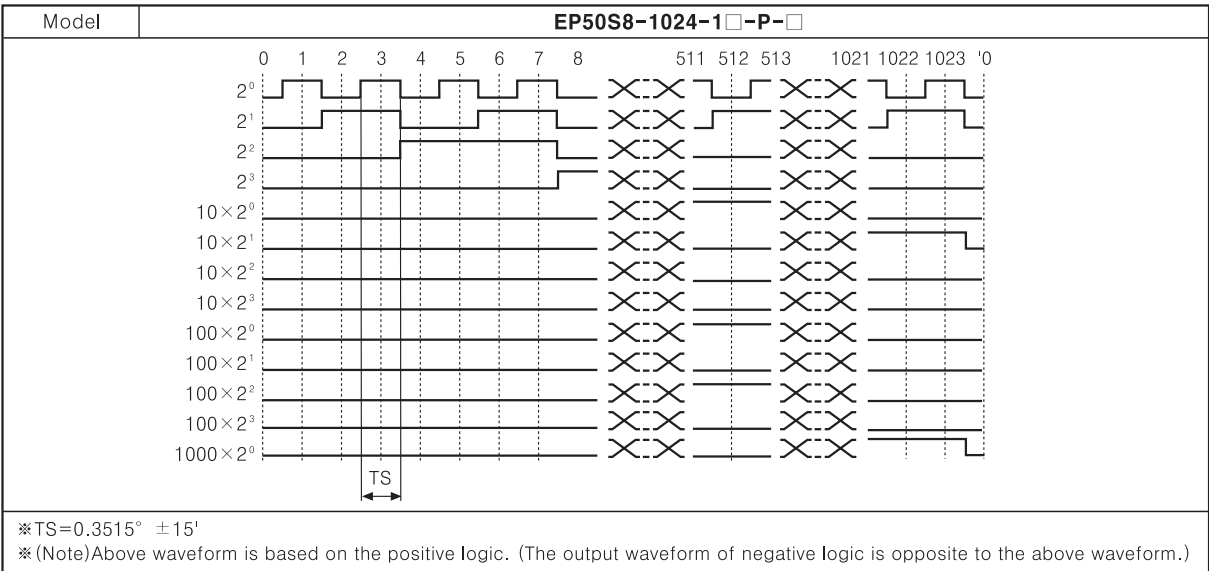
360 division (BCD CODE output)



360 division (BINARY CODE output)



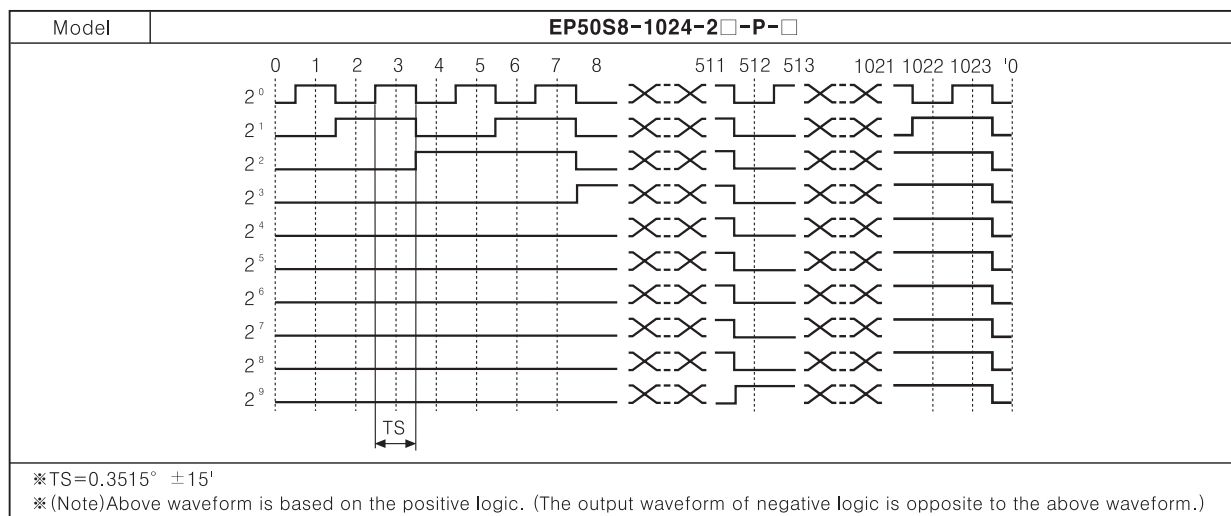
1024 division (BCD CODE output)



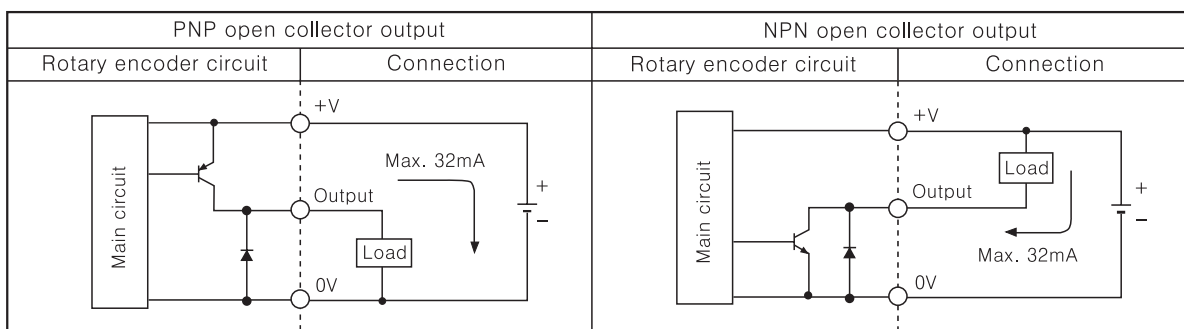
∅ 50mm Shaft Absolute Type

■ Output waveform

● 1024 division (BINARY CODE output)



■ Control output diagram



※Output circuit of all phases is same.

■ Connections

● BCD Code

Resolution	6	8	12	16	24	32	40	45	60	64	90	128	180	256	360	512	720	1024
Color	division	division	division	division	division	division	division	division	division	division	division	division	division	division	division	division	division	division
Power	White	+V																
	Black	GND (0V)																
Output	Brown	TP1	TP1	TP1	TP1	TP1	TP1	TP1	2°	2°	2°	2°	2°	2°	2°	2°	2°	2°
	Red	TP2	TP2	TP2	TP2	TP2	TP2	TP2	2¹	2¹	2¹	2¹	2¹	2¹	2¹	2¹	2¹	2¹
	Orange	2°	2°	2°	2°	2°	2°	2°	2²	2²	2²	2²	2²	2²	2²	2²	2²	2²
	Yellow	2¹	2¹	2¹	2¹	2¹	2¹	2¹	2³	2³	2³	2³	2³	2³	2³	2³	2³	2³
	Blue	2²	2²	2²	2²	2²	2²	2²	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)
	Purple	EP		2³	2³	2³	2³	2³	(2¹×10)	(2¹×10)	(2¹×10)	(2¹×10)	(2¹×10)	(2¹×10)	(2¹×10)	(2¹×10)	(2¹×10)	(2¹×10)
	Gray	NC		(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2²×10)	(2²×10)	(2²×10)	(2²×10)	(2²×10)	(2²×10)	(2²×10)	(2²×10)	(2²×10)	(2²×10)
	White/Brown	NC		EP	EP	(2¹×10)	(2¹×10)	(2¹×10)	NC			(2³×10)	(2³×10)	(2³×10)	(2³×10)	(2³×10)	(2³×10)	(2³×10)
	White/Red	NC				EP	EP	EP	NC				(2²×100)	(2²×100)	(2²×100)	(2²×100)	(2²×100)	(2²×100)
	White/Orange	NC												(2¹×100)	(2¹×100)	(2¹×100)	(2¹×100)	(2¹×100)
	White/Yellow	NC														(2²×100)	(2²×100)	(2²×100)
	White/Blue	NC																(2³×100)
	White/Purple	NC																(2²×1000)
	Shielded wire	F.G																

EP50S Series

■ Connections

● Binary code

Resolution		6	8	12	16	24	32	40	45	60	64	90	128	180	256	360	512	720	1024	
Color		division	division	division	division	division	division	division	division	division	division	division	division	division	division	division	division	division	division	
Power	White	+V																		
	Black	GND(0V)																		
Output	Brown	TP1	TP1	TP1	TP1	TP1	TP1	TP1	2°	2°	2°	2°	2°	2°	2°	2°	2°	2°	2°	
	Red	TP2	TP2	TP2	TP2	TP2	TP2	TP2	2 ¹	2 ¹	2 ¹	2 ¹	2 ¹	2 ¹	2 ¹	2 ¹	2 ¹	2 ¹	2 ¹	
	Orange	2°	2°	2°	2°	2°	2°	2°	2 ²	2 ²	2 ²	2 ²	2 ²	2 ²	2 ²	2 ²	2 ²	2 ²	2 ²	
	Yellow	2 ¹	2 ¹	2 ¹	2 ¹	2 ¹	2 ¹	2 ¹	2 ³	2 ³	2 ³	2 ³	2 ³	2 ³	2 ³	2 ³	2 ³	2 ³	2 ³	
	Blue	2 ²	2 ²	2 ²	2 ²	2 ²	2 ²	2 ²	2 ⁴	2 ⁴	2 ⁴	2 ⁴	2 ⁴	2 ⁴	2 ⁴	2 ⁴	2 ⁴	2 ⁴	2 ⁴	
	Purple	EP	EP	2 ³	2 ³	2 ³	2 ³	2 ³	2 ⁵	2 ⁵	2 ⁵	2 ⁵	2 ⁵	2 ⁵	2 ⁵	2 ⁵	2 ⁵	2 ⁵	2 ⁵	
	Gray	NC		EP	EP	2 ⁴	2 ⁴	2 ⁴	NC			2 ⁶	2 ⁶	2 ⁶	2 ⁶	2 ⁶	2 ⁶	2 ⁶	2 ⁶	
	White/Brown	NC				EP	EP	2 ⁵	NC					2 ⁷	2 ⁷	2 ⁷	2 ⁷	2 ⁷	2 ⁷	
	White/Red	NC						EP	NC							2 ⁸	2 ⁸	2 ⁸	2 ⁸	
	White/Orange	NC																	2 ⁹	2 ⁹
	White/Yellow	NC																		
	White/Blue	NC																		
	White/Purple	NC																		
	Shiled wire	F.G																		

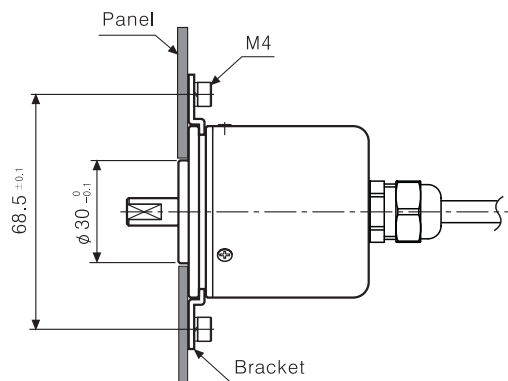
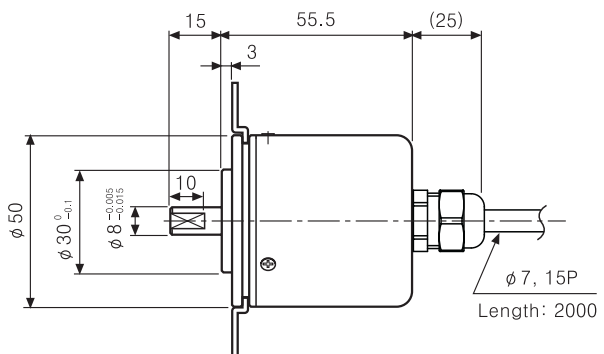
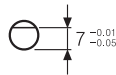
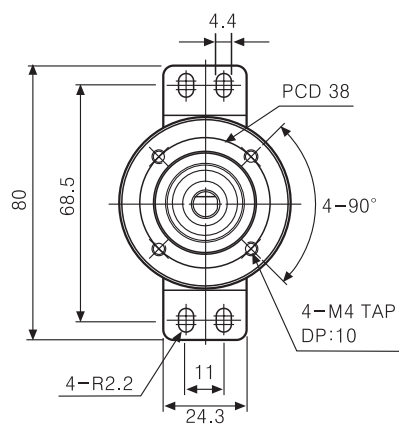
※ Unused wires must be insulated.

※ The metal case and shield wire of encoder should be grounded(F.G).

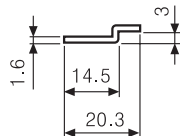
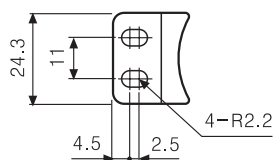
※ NC : Not Connected.

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

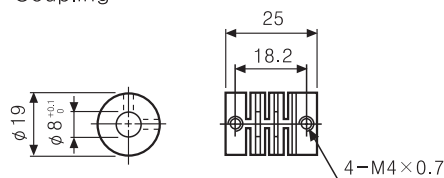
■ Dimensions



● Bracket



● Coupling



(Unit:mm)