

EP50S8 Series

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 water proof, Drip proof)

■ Applications

Precision machine tool, Fabric machinery, Robot, Parking system



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



■ Ordering information

EP50S8	-	1024	-	1	-	R	-	1
Series		Pulse/1Revolution		Output code		Rotating direction		Control output
Diameter ϕ 50mm shaft type		See resolution		1 : BCD code 2 : Binary code 3 : Gray 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

*Gray code is optional.

■ Specifications

Item	Diameter ϕ 50mm shaft type Absolute Rotary encoder		
Resolution	6, 8, 12, 16, 24, 32, 40, 45, 60, 64, 90, 128, 180, 256, 360, 512, 720, 1024 division (Not indicated type is available to customize)		
Electrical specification	Output code/Output angle	See output waveform	
	Control output	PNP open collector output	Output voltage : Min. (Power voltage - 1.5)VDC, Load current : Max. 32mA
		NPN open collector output	Load current : Max. 32mA, Residual voltage : Max. 1VDC
	Response time (Rise/Fall)	T _{on} = 800nsec, T _{off} = 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 \cdot cm (0.004N \cdot m)	
	Moment of inertia	Max. 40g \cdot cm ² (4 \times 10 ⁻⁶ kg \cdot m ²)	
	Shaft loading	Radial : 10kgf, Thrust : 2.5kgf	
	Deviation of shaft position	Radial : Max. 0.1mm, Thrust : 0.2mm	
	Max. allowable revolution	(★Note1)	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 specification)		
Cable	15P, ϕ 7mm, Length : 2m, Shield cable		
Accessory	Mounting bracket, Coupling		
Weight	Approx. 380g		
Approval	CE		

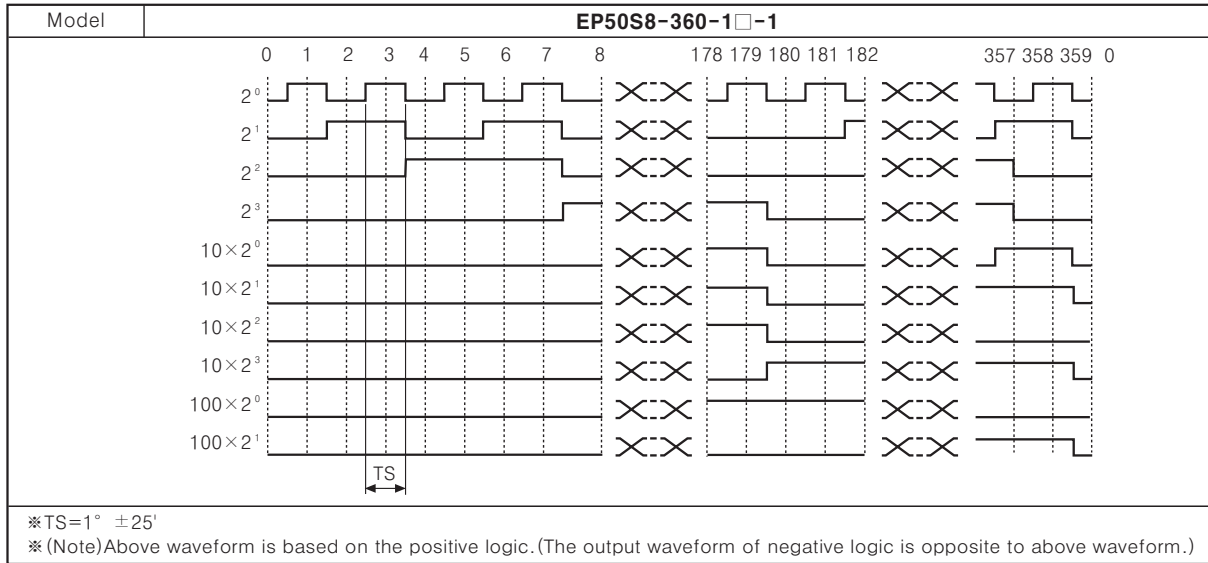
* **(★Note1)** Max. allowable revolution \geq Max. response revolution [Max. response revolution (rpm) = $\frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$]

Please select the resolution to make lower max. revolution than max. allowable revolution.

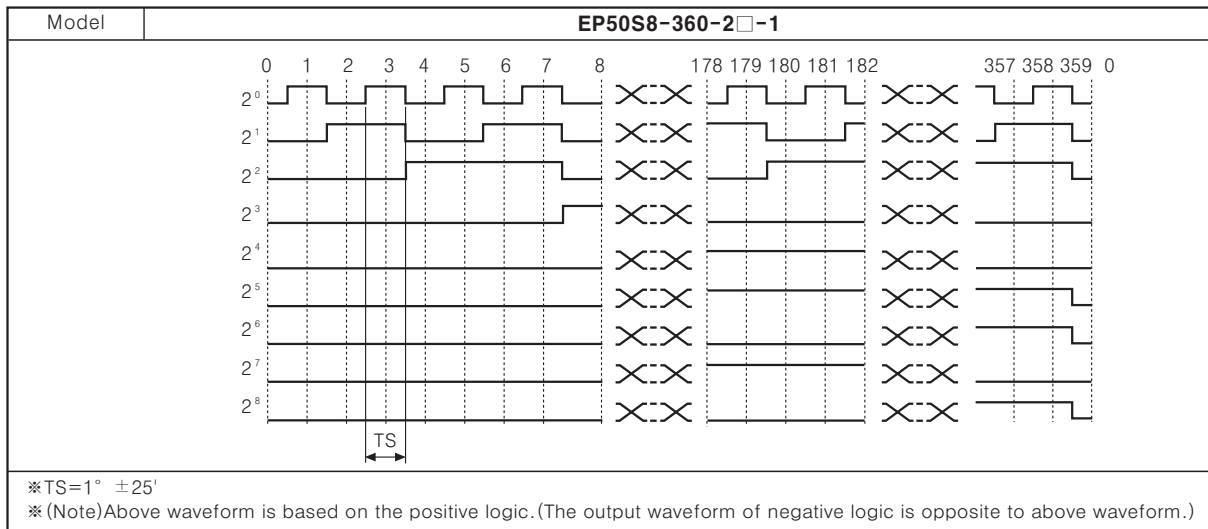
Absolute ϕ 50 Standard Shaft Type

Output waveform

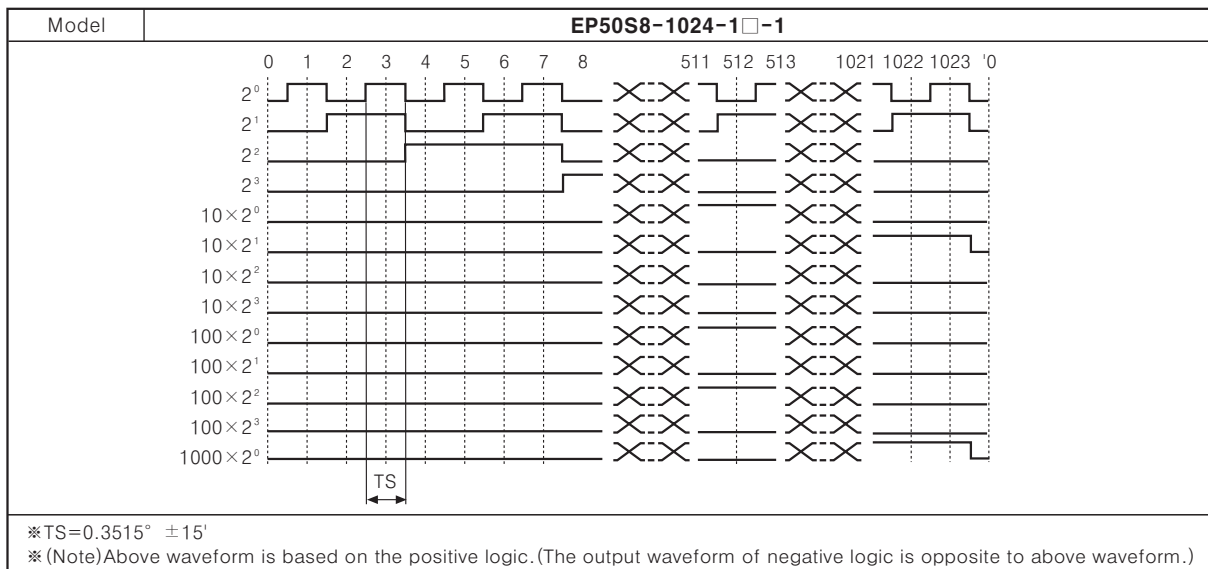
●360 division (BCD CODE output)



●360 division (BINARY CODE output)



●1024 division (BCD CODE output)



(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) Proximity sensor

(J) Photo electric sensor

(K) Pressure sensor

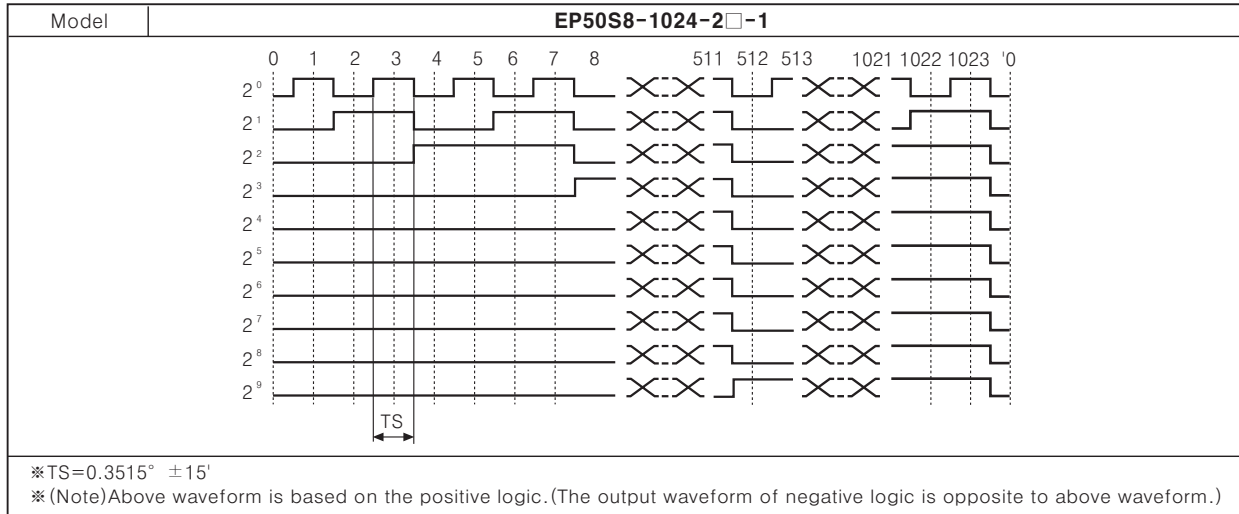
(L) Rotary encoder

(M) 5-Phase stepping motor & Driver & Controller

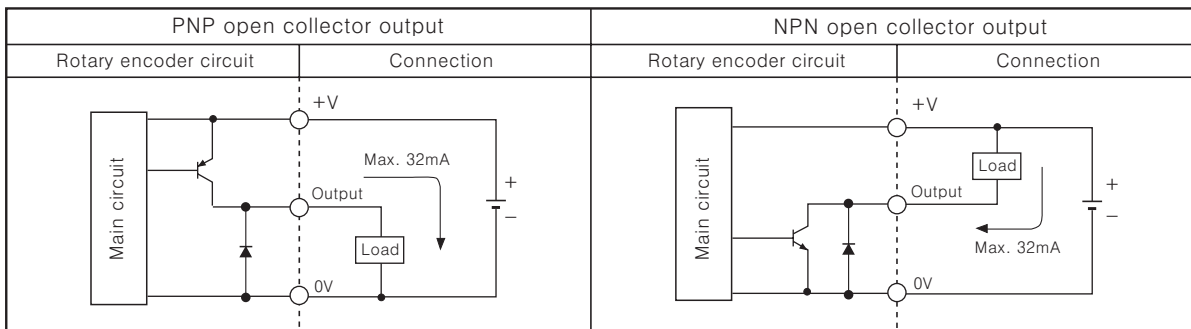
EP50S8 Series

Output waveform

1024 division (BINARY CODE output)



Control output diagram



※Output circuit of all phases is the 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	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°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)
	Purple	EP		2 ³	2 ³	2 ³	2 ³	2 ³	(2 ¹ ×10)	(2 ¹ ×10)	(2 ¹ ×10)	(2 ¹ ×10)	(2 ¹ ×10)	(2 ¹ ×10)	(2 ¹ ×10)	(2 ¹ ×10)	(2 ¹ ×10)	(2 ¹ ×10)	(2 ¹ ×10)
	Gray	NC		(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)	(2°×10)
	White/Brown	NC		EP	EP	(2 ¹ ×10)	(2 ¹ ×10)	(2 ¹ ×10)	NC			(2 ³ ×10)	(2 ³ ×10)	(2 ³ ×10)	(2 ³ ×10)	(2 ³ ×10)	(2 ³ ×10)	(2 ³ ×10)	(2 ³ ×10)
	White/Red	NC			EP	EP	EP	NC				(2°×100)	(2°×100)	(2°×100)	(2°×100)	(2°×100)	(2°×100)	(2°×100)	(2°×100)
	White/Orange	NC							NC				(2 ¹ ×100)	(2 ¹ ×100)	(2 ¹ ×100)	(2 ¹ ×100)	(2 ¹ ×100)	(2 ¹ ×100)	(2 ¹ ×100)
	White/Yellow	NC										(2 ² ×100)		(2 ² ×100)	(2 ² ×100)	(2 ² ×100)	(2 ² ×100)		
	White/Blue	NC															(2 ³ ×100)		
	White/Purple	NC															(2°×1000)		
	Shielded wire	F.G																	

Absolute ϕ 50 Standard Shaft Type

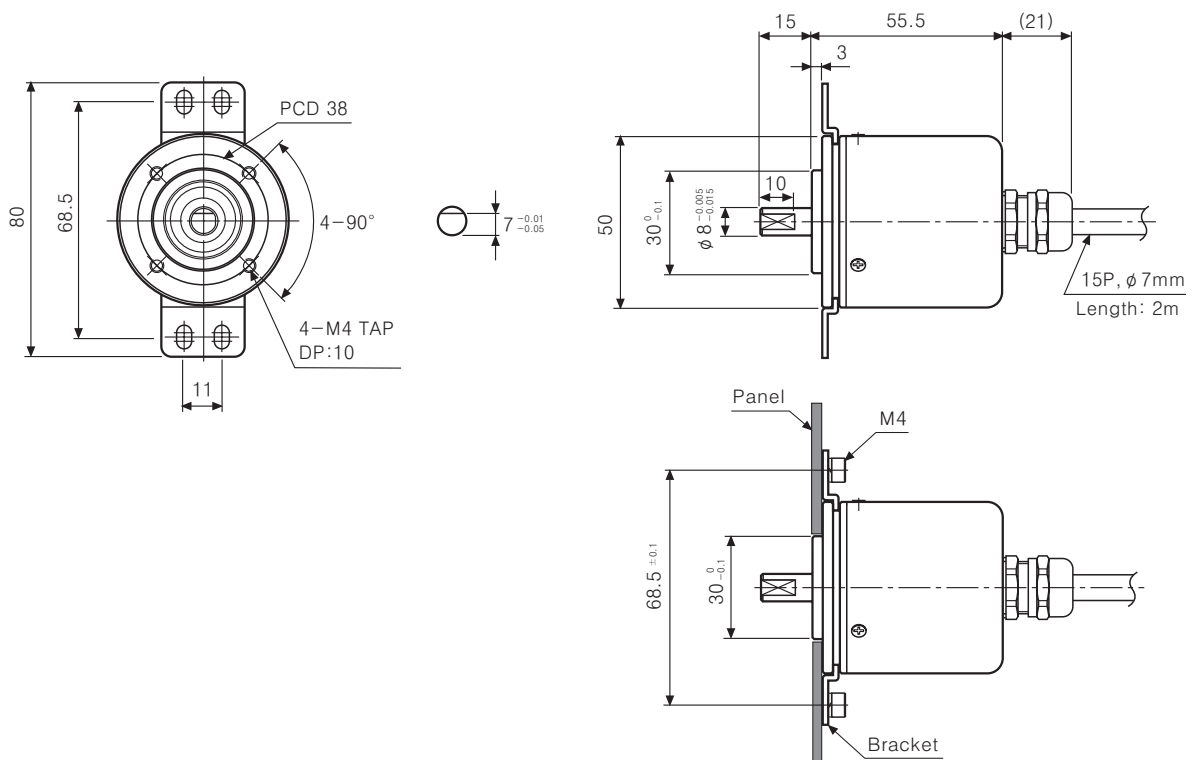
Connections

Binary code

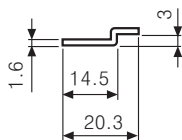
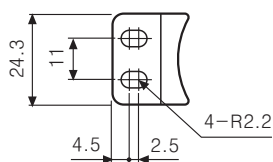
Resolution	6	8	12	16	24	32	40	45	60	64	90	128	180	256	360	512	720	1024		
Color	division	division	division	division	division	division	division	division	division	division	division	division	division	division	division	division	division	division		
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	Black	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	2 ⁷	2 ⁷	
	White/Red	NC					EP	NC					2 ⁸	2 ⁸	2 ⁸	2 ⁸	2 ⁸	2 ⁸		
	White/Orange	NC																	2 ⁹	2 ⁹
	White/Yellow	NC																		
	White/Blue	NC																		
	White/Purple	NC																		
	Shielded wire	F.G																		

- * Unused wires must be insulated.
- * Encoder case and shield wire must be a good earth grounded.
- * NC : Not Connected.
- * Output cable must not be short-circuited due to Driver IC is used in output circuit.

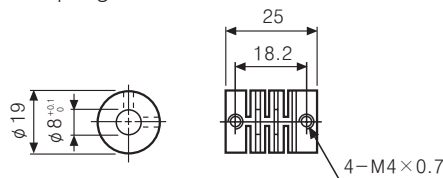
Dimensions



Bracket



Coupling



Unit:mm

(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)
Proximity
sensor

(J)
Photo
electric
sensor

(K)
Pressure
sensor

(L)
Rotary
encoder

(M)
5-Phase
stepping
motor &
Driver &
Controller