EPM 50 Series

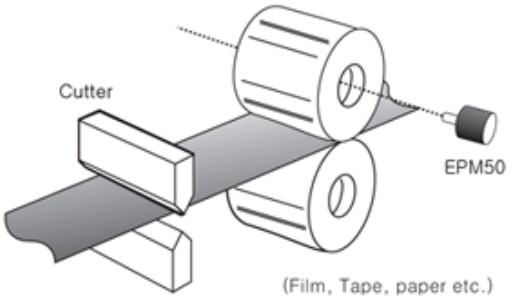
ø50mm shaft type absolute multi-turn rotary encoders EPM50 Series makes possible to provide both synchronous output of absolute position data per revolution and revolution count data with 23 bit high resolution and accuracy. It also offers more diverse user's choice with parallel and serial(SSI) transmission type line-up.

Major features

* Synchronous output available for both absolute position data per revolution and revolution count data
* 23bit high resolution
* Easy zero adjustment using single-turn / multi-turn data separate reset function
* Memorizing revolution data up to ±90° after blackout using memory back up function
* Maximizing users convenience with latch, clear, overflow alarm function
* CW / CCW direction setting possible with direction function
* Parallel data / Serial data transmission type
* ø50mm compact body
* Protection structure IP64

Applications

Measuring the Length of sheet



Ordering Information

EPM50S	8	10	13	B	PN		24
Series	Shaft diameter	Single−turn	Multi−turn	Output code	Control output		Power supply
Diameter ø 50mm	ø 8mm	10bit (1024 division)	13bit (8192 revolution)	Binary Code	PN	Parallel NPN O.C.	12−24VDC ±5%
					S	SSI	

Specification Table

Type			ø50mm Multi-turn absolute encoder	
Model			**EPM50S8-1013-B-S-24**	**EPM50S8-1013-B-PN-24**
Resolution		Single-turn	1024 division(10Bit)	
		Multi-turn	8192 revolution(13Bit)	
Rotation limit when power is off			**(★1)** ±90°	
Electrical specification	Output	Output code	24bit, Binary 2 code	Binary 2 code
		Output Interface	SSI(Synchronous Serial Interface)	Parallel
		Output type	Line driver	NPN open collector output
		Output signal	Single-turn data, Multi-turn count, **(★2)** OVF alarm	
		Line driver output	• Low: Sink current – max. 20mA, Residual voltage – max. 0.5VDC • High: Sink current – max. –20mA, Output voltage – max. 2.5VDC	———
		NPN open collector output	———	Sink current : Max. 32mA, Residual voltage : Max. 1VDC
		Logic	———	Negative logic output
		Response time	———	Max. 1㎲(Cable: 2m, I sink = 32mA)
	Input	Input signal	**(★3)** Single-turn data reset, **(★4)** Multi-turn count reset, Direction, Clear	
			———	Latch
		Input level	High : 5–24VDC, Low : 0–1.2VDC	
		Input logic	**(★5)** Low Active, HIGH or OPEN for common use	
		Input time	Direction : Over 100ms	
			Single-turn data reset : Over 100ms	
			Multi-turn count reset : Over 100ms	
			Clear : Over 100ms	
			No Latch function	Latch : Over 500㎲
		SSI Clock Input Frequency	100kHz~1MHz	———
	Max. Response frequency		———	50kHz
	Power supply		12–24VDC, ±5%(Ripple P–P : Max. 5%)	
	Current consumption		Max. 150mA(Disconnection of the load)	Max. 70mA(Disconnection of the load)
	Insulation resistance		Min. 100MΩ(At 500VDC between all terminals and case)	
	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)	
		Moment of inertia	Max. 40g · cm²(4×10⁻⁶ kg · m²)	
		Shaft loading	Radial : 10kgf, Thrust : 2.5kgf	
		Max. revolution	**(★6)** 3000rpm	
Vibration			1.5mm amplitude at frequency of 10 to 55Hz (for one minute cycle) in each of X, Y, Z direction for 2 hours	
Shock			Max. 50G	
Ambient temperature			–10 to 70℃(At non-freezing status), Storage:–25 to 85℃	
Ambient humidity			35 ~ 85%RH	
Protection			IP64	
Cable			ø6mm 10P, Length:2m, Shield cable	ø6mm 17P, LengthX2:2m, Shield cable
Accessories			Mounting bracket, coupling	
Approval			CE	
Unit weight			Approx. 322g	Approx. 475g

※**(★1)**It calibrates the multi-turn counts by comparing single-turn data before/after power off without counting multi-turn counts when power is off. It shall be used on the condition that no over-rated revolution occurred since proper multi-turn data may not be available if any revolutions occurred over ±90° from the position when power is off.

※**(★2)**OVF alarm is ON when multi-turn count is out of counting range (0~8191 revolution). It shall be initialized by changing the setting of Direction or applying multi-turn count reset or Clear signals.

※**(★3)**Single-turn data shall be initialized as 「0」 when single-turn data reset is input.

※**(★4)**Multi-turn count shall be initialized as 「0 revolution」 when multi-turn count reset is input.

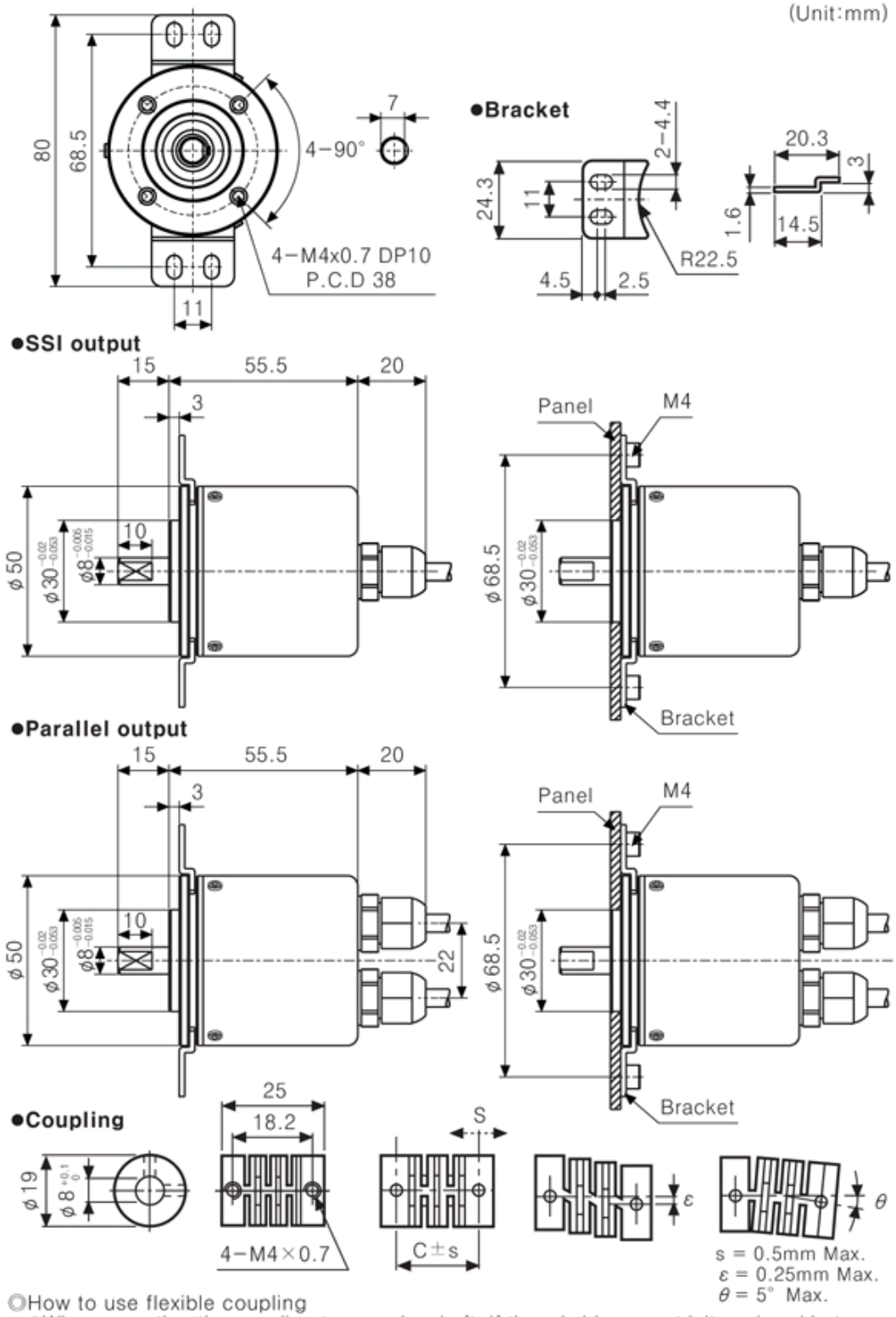
※**(★5)**High Active is optional.

※**(★6)**In case of Parallel type model, select the resolution to make max. Response revolution is lower than max. Allowable revolution.

$$\text{【Max. Response Revolution (rpm)} = \frac{\text{Max. Allowable Revolution}}{\text{Resolution}} \times 60\ \text{sec】}$$

Dimensions

(Unit:mm)



◎How to use flexible coupling

- ●When mounting the coupling to encoder shaft, if there is big eccentricity or bend 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.

Connections

●SSI output

Cable			
Cable color	Description	Cable color	Description
Brown	CLOCK+	Gray	Single−turn data reset
Red	CLOCK−	Blue	Multi−turn count reset
Orange	DATA+	Purple	Clear
Yellow	DATA−	Green	Direction
White	+V (12−24VDC)		
Black	GND (0V)		
Shield wire	Signal shield cable(F.G)		

●Parallel output

Multi-turn count cable (Sheath color : Black)			Single-turn data cable (Sheath color : Gray)		
Cable color	Description		Cable color	Description	
Brown	Multi−turn count	2^0	Brown	Single−turn data	2^0
Red		2^1	Red		2^1
Orange		2^2	Orange		2^2
Yellow		2^3	Yellow		2^3
Green		2^4	Green		2^4
Blue		2^5	Blue		2^5
Purple		2^6	Purple		2^6
Gray		2^7	Gray		2^7
Pink		2^8	Pink		2^8
Clear		2^9	Clear		2^9
Light brown		2^{10}	Light brown	NC	
Light yellow		2^{11}	Light yellow	Direction	
Light green		2^{12}	Light green	Latch	
Light blue	OVF		Light blue	Clear	
Light purple	Multi−turn count reset		Light purple	Single−turn data reset	
White	+V(12−24VDC)		White	+V(12−24VDC)	
Black	GND(0V)		Black	GND(0V)	
Shield wire	Signal shield cable(F.G)		Shield wire	Signal shield cable(F.G)	

※Do the wiring properly.
※Encoder's metal case and shield cable must be grounded (F.G).
※Do the wiring with care for short since dedicated Driver IC is used for I/O circuit.
※As for Parallel output, it is recommended to connect +V and GND of both multi−turn count cable and single−turn data cable.

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