

INCREMENTAL ROTARY ENCODERS

Optical Incremental Rotary Encoder (E Series)

ES-E-01-003003

※ It is an encoder of reliable and excellent quality that is applicable to the automated control industry.
※ The above specifications are subject to change without notice.

Ordering Information

E50S	8		1000	T	24
Series	Outside diameter	Body material	Resolution	Control output	Power supply
E40S: Ø40mm Shaft	6: Ø6mm 8: Ø8mm	No mark: Aluminum	Refer to Resolution	T: Totem pole output N: NPN O.C output V: Voltage output	24: 5~24VDC
E50S: Ø50mm Shaft	8: Ø8mm	P: Plastic (PA66-GF30)		L: Line driver output	5 : 5VDC 24: 5~24VDC

※ The PA66-GF15 is a lightweight material with very high stiffness, excellent wear resistance, very high strength, and resistance to oil and fuel applied to the aviation, automobile and machine industries.

Connections

■ T:Totem pole Output N:NPN O.C Output V:Voltage Output

Function	Color	Function	Color
OUT A	Green	+V	Red
OUT B	White	GND(0V)	Black
OUT Z	Blue	Shield	F.G.

■ L:Line driver Output

Function	Color	Function	Color
OUT A	Green	OUT $\bar{A}$	Brown
OUT B	White	OUT $\bar{B}$	Orange
OUT Z	Blue	OUT $\bar{Z}$	Yellow
+V	Red	Shield	F.G.
GND(0V)	Black	-	

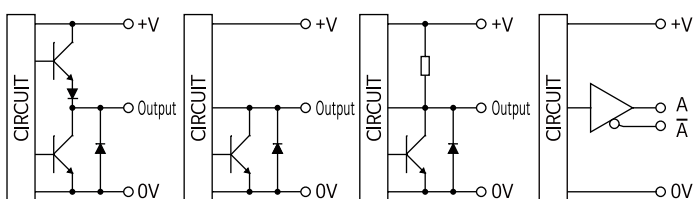
※ Unused wires must be insulated.

※ The encoder and shield cable must be grounded (F.G.).

※ F.G.(Frame Ground) must be grounded separately.

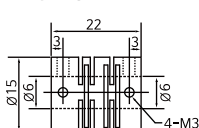
Control output diagram

■ Totem pole Output ■ NPN O.C Output ■ Voltage Output ■ Line driver Output



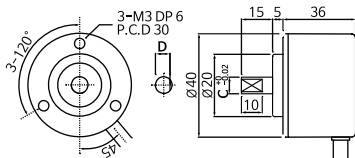
Dimensions

■ Coupling: E40S6



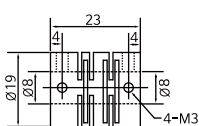
■ E40S: Outside diameter $\varnothing 40\text{mm}$

※Unit:mm

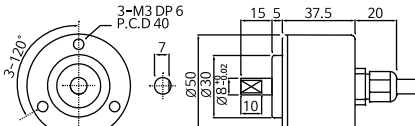


	C	D
E40S6	Ø6	5
E40S8	Ø8	7

■ Coupling: E40S8, E50S8



■ E50S: Outside diameter $\varnothing 50\text{mm}$



Specifications

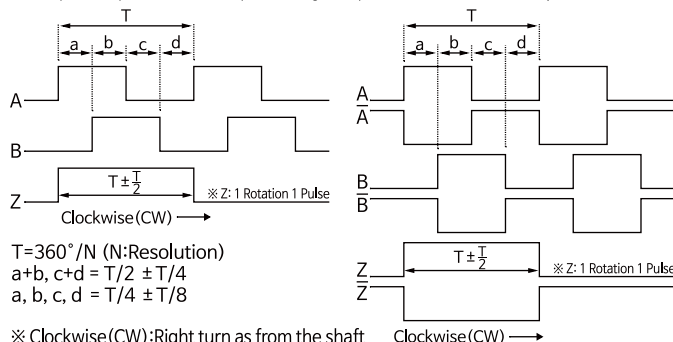
Model		Outside diameter Ø40mm, Ø50mm Incremental rotary encoder
Power supply		5VDC±5%, 5VDC~24VDC±5% (Ripple P~P : Max. 5%)
Current consumption		Max. 80mA (no load)
Resolution (P/R)		60,100,200,256,300,360,400,500,1000,1024,2000,2500,3000,3600
Control Output	Totem pole output	「L」Level - Load current: Max. 10mA, Residual voltage: Max. 0.5VDC 「H」Level - Load current: Max. 10mA Power voltage: Min. (Power voltage-2.5VDC)
	NPN O.C output	Load current: Max. 20mA, Residual voltage: Max. 0.5VDC
	Voltage output	Load current: Max. 10mA, Residual voltage: Max. 0.5VDC
	Line driver output	Load current : 「H」Level I _o = Max. ~20mA, 「L」Level I _s = Max. 20mA Output voltage: Min. (Power voltage-2.5VDC), V _s = Max. 0.5VDC
Response time	Totem pole output	Max. 1μs (Cable length : 1.5m, I sink=20mA)
	NPN O.C output	
	Voltage output	Max. 2μs (Cable length : 1.5m, I sink=20mA)
	Line driver output	Max. 1μs (Cable length : 1.5m, I sink=20mA)
Max. Response frequency		150kHz
Max. Allowable revolution		5,000rpm
Shaft loading		Radial: Max. 2kg·f, Thrust: Max. 1kg·f
Shock		Max. 50G
Vibration		Max. 5G
Protection		IP50 (IEC standard)
Environment	Ambient temperature	-10 ~ 70℃ (no freezing or condensation)
	Storage temperature	-20 ~ 85℃ (no freezing or condensation)
	Ambient humidity	35% ~ 85% RH
	Storage humidity	35% ~ 90% RH
E50S Series		Axial cable type
E40S Series		Radial cable type ※ Axial cable type Option
Cable		Shield cable, Length: 1.5m
Accessory		Product, Coupling, Bolt, Instruction manual
Approval		

※ Select resolution to satisfy $\text{Max. allowable revolution} \geq \text{Max. response revolution}$

※ Max.response revolution (rpm) = (Max.response frequency / resolution) X 60 sec

Output Waveform

■ Totem pole Output, NPN O.C Output, Voltage Output ■ Line driver Output



Cautions during use

■ Environment

Environment
Please do not use this unit with below environment, or it may cause malfunction.

- 1) Place where this unit or component may be damaged by strong vibration or impact.
- 2) Place where there is a lot of flammable or corrosive gases.
- 3) Place where strong magnet field or electric noise occurs.
- 4) Place where strong acids or alkali near and direct ray of the sun.

■ Cautions during installation

- 1) Do not load overweight on the shaft.
- 2) Do not put strong impact when insert a coupling into shaft.
- 3) If the coupling error (parallel misalignment, angular misalignment) between the shaft increases while installation, the life cycle of the coupling and the encoder can be shorten.
- 4) Do not connect, repair, or inspect the unit while connected to a power source.
- 5) If a big impact or strong vibration applies to the product it may cause pulse errors.

■ Wire Connection

- 1) Do not pull out the wire with over 20N strength after fixing the unit and wiring the cable.
- 2) If wire encoder cable with high voltage line or power cable in the same conduit, it may cause a malfunction or mechanical problem. Please wire it separately or use separated conduit.

■ **Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.**

- 1) medical equipment, ship, vehicle, railways, aircraft, safety equipment, etc
2) Failure to follow this instruction may result in personal injury, economic loss or fire