

φ 30 Body Standard Shaft Type

Diameter φ 30mm shaft type INCREMENTAL Rotary encoder

■ Features

- φ 30mm shaft type rotary encoder
- Easy installation at narrow space
- Small inertia moment
- Wide range of power source : 5VDC, 12-24VDC ±5%
- Various output types



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



■ Ordering information

E30S	4	1024	3	2	24	
Series	Shaft diameter	Pulse/1Revolution	Output phase	Output	Power supply	Cable
Diameter φ 30mm, shaft type	φ 4mm	See resolution	2:A, B 3:A, B, Z 4:A, \bar{A} , B, \bar{B} 6:A, \bar{A} , B, \bar{B} , Z, \bar{Z}	1:Totem pole output 2:NPN open collector output 3:Voltage output L:Line driver output(※)	5 :5VDC ±5% 24:12-24VDC ±5%	No mark:Normal type (※) 2C:Cable outgoing connector type

※Standard:E30S4-PULSE-3-2-24(12-24VDC) ※Standard:A, B, Z ※The power of Line driver is only for 5VDC ※Cable length:200mm

■ Specifications

Item	Diameter φ 30mm shaft type Incremental Rotary encoder		
Resolution (P/R)	100, 200, 360, 500, 1000, 1024, 3000 (Not indicated type is available to customize)		
Electrical specification	Phase difference of output	Output between A and B phase : $\frac{T}{4} \pm \frac{T}{8}$ (T=1cycle of A phase)	
	Control output	Totem pole output	• Low \Rightarrow Load current : Max. 30mA, Residual voltage : Max. 0.4VDC • High \Rightarrow Load current : Max. 10mA, Output voltage : Min. (Power supply-1.5)VDC
		NPN open collector output	Load current : Max. 30mA, Residual voltage : Max. 1VDC
		Voltage output	Load current : Max. 10mA, Residual voltage : Max. 0.4VDC
		Line driver output	Low \Rightarrow Load current : Max. 20mA, Residual : Max. 0.5V High \Rightarrow Load current : Max. -20mA, Output voltage : Min. 2.5V
	Response time (Rise/Fall)	Totem pole output	Max. 1μs
		NPN open collector output	Max. 1μs
		Voltage output	Max. 1μs (5VDC:Output resistance 820Ω), Max. 2μs (12-24VDC:Output resistance 4.7kΩ)
		Line driver output	Max. 0.5μs
	Max. Response frequency	180kHz	
Current consumption	Max. 60mA (disconnection of the load), Line driver output:Max. 50mA (disconnection of the load)		
Insulation resistance	Min. 100MΩ (at 500VDC)		
Dielectric strength	750VAC 50/60Hz for 1 minute (Between all terminals and case)		
Connection	Cable outgoing type, 200mm cable outgoing connector type		
Mechanical specification	Starting torque	Max. 20gf · cm (0.002N · m)	
	Moment of inertia	Max. 20g · cm ² (2 × 10 ⁻⁶ kg · m ²)	
	Shaft loading	Radial : Max. 2kgf, Thrust : Max. 1kgf	
	Deviation of shaft position	Radial : Max. 0.1mm, Thrust : Max. 0.2mm	
	Max. allowable revolution	(★Note1) 5000rpm	
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	IP50 (IEC specification)		
Cable	(★Note2) 5P, (Line driver:8P) φ 5mm, Length:2m, Shield cable (Basic)		
Accessory	φ 4mm coupling		
Weight	Approx. 80g		
Approval	CE (Except Line driver output)		

※ **(★Note1)** Max. allowable revolution ≥ 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.

※ **(★Note2)** The cable length is changeable. (Option)

(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

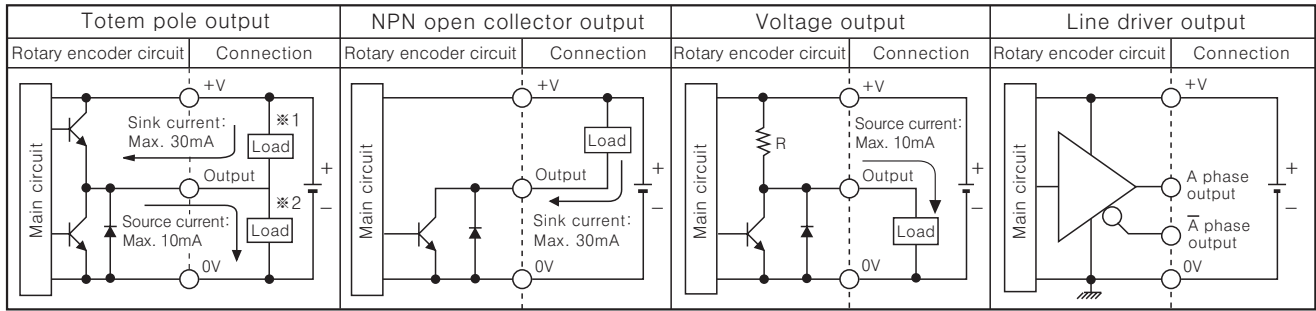
(K)
Pressure
sensor

(L)
Rotary
encoder

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

E30S4 Series

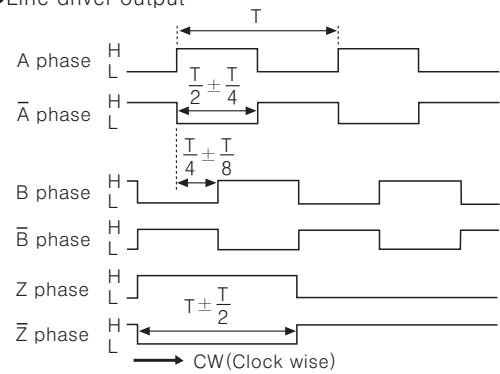
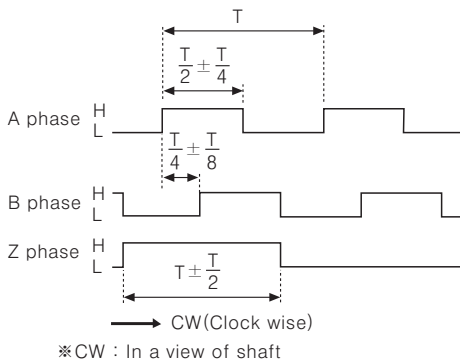
Control output diagram



☞ Totem pole output type can be used for NPN open collector output type(*1) or Voltage output type(*2).
 ☞ All output circuits are the same A, B, Z phase(Line driver output is A, \bar{A} , B, \bar{B} , Z, \bar{Z})

Output waveform

- Totem pole output / NPN open collector output / Voltage output
- Line driver output



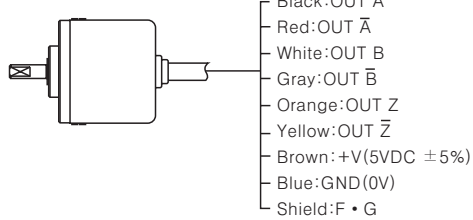
Connections

Normal type

- Totem pole output / NPN open collector output / Voltage output

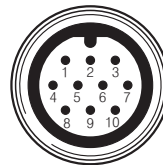


- Line driver output



※ The body of encoder is connected to a shield.
 ※ Unused wires must be insulated.

Cable outgoing connector type

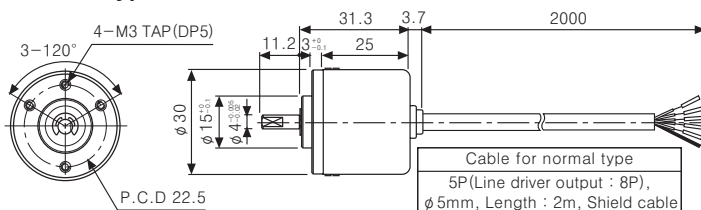


Pin No.	Cable color	Totem pole output NPN open collector output Voltage output	Line driver output
①	Black	OUT A	OUT A
②	Red	N.C	OUT \bar{A}
③	Brown	+V	+V
④	Blue	GND	GND
⑤	White	OUT B	OUT B
⑥	Gray	N.C	OUT \bar{B}
⑦	Orange	OUT Z	OUT Z
⑧	Yellow	N.C	OUT \bar{Z}
⑨	Shield	F.G	F.G
⑩	Purple	N.C	N.C

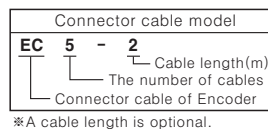
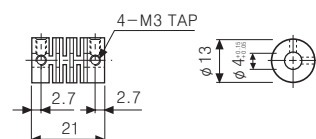
※ N.C(Not Connected)
 ※ F.G(Field Ground)

Dimensions

Normal type

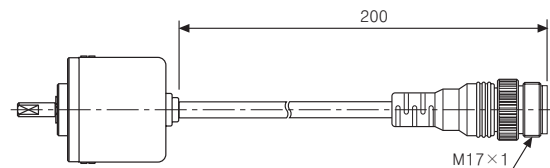


- Coupling

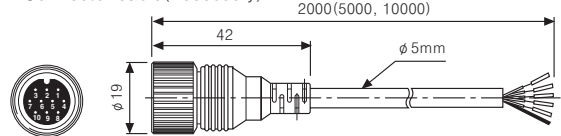


Cable outgoing connector type

Unit:mm



- Connector cable(Accessory)



※ Connector cable model ☞ Line driver output : EC8-2(Standard), EC8-5, EC8-10
 ☞ Etc. : EC5-2(Standard), EC5-5, EC5-10