

E30S Series

Diameter ϕ 30mm Shaft type Incremental Rotary encoder

Features

- Diameter ϕ 30mm of miniature shaft type rotary encoder
- Easy installation at narrow space
- Small moment of inertia
- Power supply : 5VDC, 12–24VDC \pm 5%
- Various output types

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



Ordering information

E30S **4** – **1024** – **3** – **N** – **24** –

Series	Shaft diameter	Pulse/1Revolution	Output phase	Output	Power supply	Cable
Diameter ϕ 30mm, shaft type	ϕ 4mm	Refer to resolution	3:A, B, Z 6:A, \bar{A} , B, \bar{B} , Z, \bar{Z}	T:Totem pole output N:NPN open collector output V:Voltage output L:Line driver output(*)	5 :5VDC \pm 5% 24:12–24VDC \pm 5%	Blank:Normal type (*) C:Cable outgoing connector type

*Standard:E30S4–**PULSE**–3–N–24

*Standard:A, B, Z

*The power of Line driver is only for 5VDC

*Cable length:250mm

Specifications

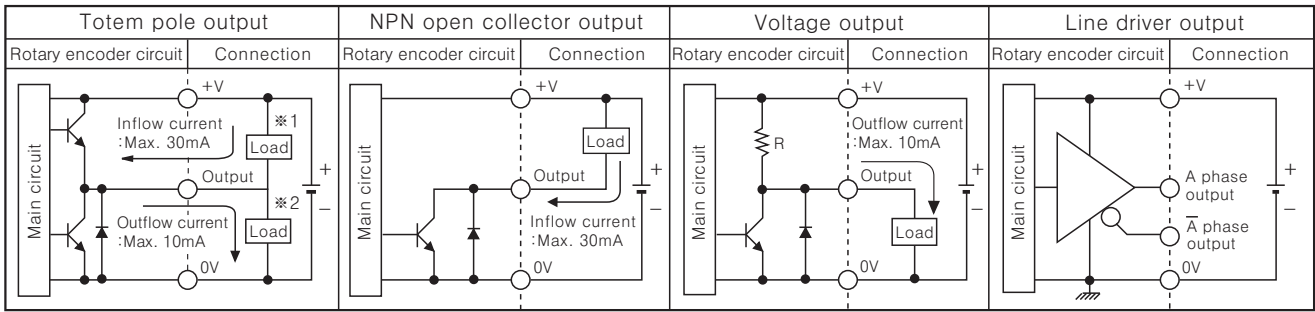
Item	Diameter ϕ 30mm shaft type of incremental rotary encoder		
Resolution (P/R)	100, 200, 360, 500, 1000, 1024, 3000 (Not indicated resolution is customizable.)		
Electrical specification	Output phase	A, B, Z phase (Line driver : A, \bar{A} , B, \bar{B} , Z, \bar{Z} phase)	
	Phase difference of output	Phase difference between A and B : $\frac{T}{4} \pm \frac{T}{8}$ (T=1 cycle of A phase)	
	Control output	Totem pole output	<ul style="list-style-type: none"> • Low \Rightarrow Load current : Max. 30mA, Residual voltage : Max. 0.4VDC • High \Rightarrow Load current : Max. 10mA, Output voltage (Power supply 5VDC) : Min. (Power supply–2.0) VDC, Output voltage (Power supply 12–24VDC) : Min. (Power supply–3.0) VDC
		NPN open collector output	Load current : Max. 30mA, Residual voltage : Max. 0.4VDC
		Voltage output	Load current : Max. 10mA, Residual voltage : Max. 0.4VDC
		Line driver output	<ul style="list-style-type: none"> • Low \Rightarrow Load current : Max. 20mA, Residual voltage : Max. 0.5VDC • High \Rightarrow Load current : Max. –20mA, Output voltage : Min. 2.5VDC
	Response time (Rise/Fall)	Totem pole output	Max. 1 μ s
		NPN open collector output	Max. 1 μ s
		Voltage output	Max. 1 μ s (5VDC:Output resistance 820 Ω), Max. 2 μ s (12–24VDC:Output resistance 4.7k Ω)
		Line driver output	Max. 0.5 μ s
	Max. Response frequency	300kHz	
	Power supply	<ul style="list-style-type: none"> • 5VDC \pm5% (Ripple P–P : Max. 5%) • 12–24VDC \pm5% (Ripple P–P : Max. 5%) 	
	Current consumption	Max. 80mA (disconnection of the load), Line driver output : Max. 50mA (disconnection of the load)	
Insulation resistance	Min. 100M Ω (at 500VDC megger between all terminals and case)		
Dielectric strength	750VAC 50/60Hz for 1 minute (Between all terminals and case)		
Connection	Cable outgoing type, 250mm cable outgoing connector type		
Mechanical specification	Starting torque	Max. 20gf \cdot cm (0.002N \cdot m)	
	Moment of inertia	Max. 20g \cdot cm ² (2×10^{-6} kg \cdot m ²)	
	Shaft loading	Radial : Max. 2kgf, Thrust : Max. 1kgf	
	Max. allowable revolution	(★Note1) 5000rpm	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours		
Shock	Max. 50G		
Ambient temperature	–10 to 70 $^{\circ}$ C (at non-freezing status), Storage : –25 to 85 $^{\circ}$ C		
Ambient humidity	35 to 85%RH, Storage : 35 to 90%RH		
Protection	IP50 (IEC standard)		
Cable	ϕ 5mm, 5P, Length : 2m, Shield cable (Line driver : ϕ 5mm, 8P)		
Accessory	ϕ 4mm coupling		
Approval	CE (Except for line driver output)		
Unit weight	Approx. 80g		

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

Make sure that max. response revolution should be lower than max. allowable revolution when selecting the resolution.

Incremental ϕ 30mm Shaft Type

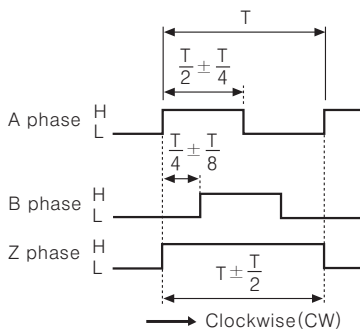
Control output diagram



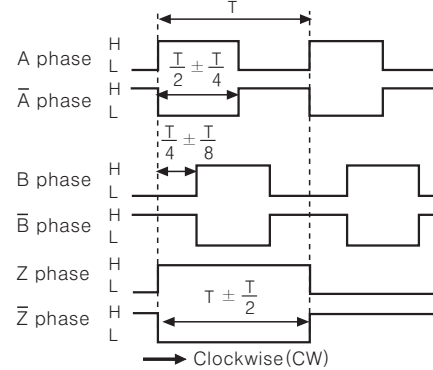
- Totem pole output type can be used for NPN open collector output type(*1) or Voltage output type(*2).
- All output circuits of A, B, Z phase are the same. (Line driver output is for A, \bar{A} , B, \bar{B} , Z, \bar{Z})

Output waveform

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



*CW : Right turn as from the shaft



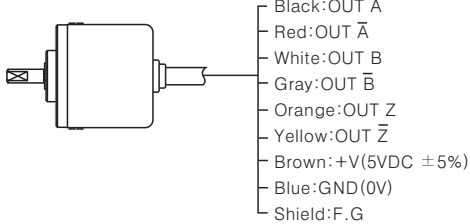
Connections

Normal type

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



- Line driver output



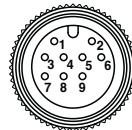
- * Unused wires must be insulated.
- * The metal case and shield wire of encoder should be grounded (F.G).

Cable outgoing connector type

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



- Line driver output

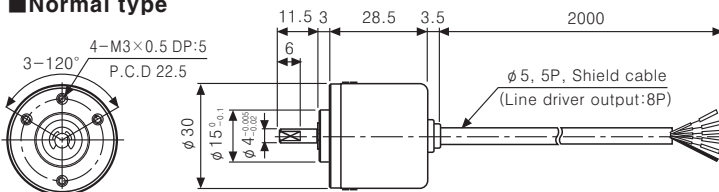


Totem pole output NPN open collector output Voltage output			Line driver output		
Pin No	Function	Cable color	Pin No	Function	Cable color
①	OUT A	Black	①	OUT A	Black
②	OUT B	White	②	OUT \bar{A}	Red
③	OUT Z	Orange	③	+V	Brown
④	+V	Brown	④	GND	Blue
⑤	GND	Blue	⑤	OUT B	White
⑥	F.G	Shield	⑥	OUT \bar{B}	Gray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

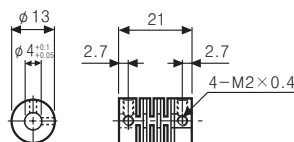
* F.G(Field Ground): It should be grounded separately.

Dimensions

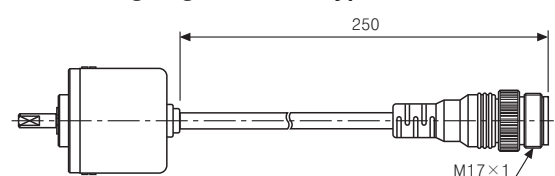
Normal type



- Coupling (E30S)



Cable outgoing connector type



* Connector cable is customizable and see G-6 for specifications.

(Unit:mm)

(A) Photo electric sensor

(B) Fiber optic sensor

(C) Door/Area sensor

(D) Proximity sensor

(E) Pressure sensor

(F) Rotary encoder

(G) Connector/Socket

(H) Temp. controller

(I) SSR/Power controller

(J) Counter

(K) Timer

(L) Panel meter

(M) Tacho/Speed/Pulse meter

(N) Display unit

(O) Sensor controller

(P) Switching power supply

(Q) Stepping motor & Driver & Controller

(R) Graphic/Logic panel

(S) Field network device

(T) Production stoppage models & replacement