


E20 Series

Diameter ϕ 20mm Shaft type/Hollow shaft built-in type Incremental Rotary encoder

■ Features

- Diameter ϕ 20mm of miniature rotary encoder
- Easy installation at narrow space
- Small moment of inertia
- Power supply : 5VDC, 12VDC \pm 5%
- Various output types

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



E20S SERIES



E20HB SERIES


■ Ordering information

E20	S	2	360	3	N	12	R
Series	Shaft type	Hollow type	Pulse/1Revolution	Output phase	Output	Power supply	Cable
Diameter ϕ 20mm, S:Shaft type HB:Hollow shaft built-in type	External 2 : ϕ 2mm	Inner 2 : ϕ 2mm 2.5 : ϕ 2.5mm 3 : ϕ 3mm	100, 200, 320, 360	3 : A, B, Z 6 : A, \bar{A} , B, \bar{B} , Z, \bar{Z}	N:NPN open collector output V:Voltage output L:Line driver output(*)	5 : 5VDC \pm 5% 12 : 12VDC \pm 5%	R:Rear side outgoing cable type S:Side outgoing cable type

*Standard : E20S2-PULSE-3-N-12-R
E20HB2-PULSE-3-N-12-R

*Standard : A, B, Z *The power of Line driver is only for 5VDC

■ Specifications

Item	Diameter ϕ 20mm shaft/hollow shaft built-in type incremental rotary encoder		
Resolution (P/R)	100, 200, 320, 360 (Not indicated pulse and output type is customizable.)		
Electrical specification	Output phase	A, B, Z phase (Line driver output 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=1cycle of A phase)	
	Control output	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)	NPN open collector output	Max. 1 μ s
		Voltage output	Max. 1 μ s
		Line driver output	Max. 0.5 μ s
	Max. Response frequency	100kHz	
	Power supply	<ul style="list-style-type: none"> • 5VDC \pm5% (Ripple P-P : Max. 5%) • 12VDC \pm5% (Ripple P-P : Max. 5%) 	
Current consumption	Max. 60mA (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	500VAC 50/60Hz for 1 minute (Between all terminals and case)		
Connection	Cable outgoing type (Rear / Side)		
Mechanical specification	Starting torque	Max. 5gf \cdot cm (5×10^{-4} N \cdot m)	
	Moment of inertia	Max. 0.5g \cdot cm ² (5×10^{-8} kg \cdot m ²)	
	Shaft loading	Radial : 200gf, Thrust : 200gf	
	Max. allowable revolution	(Note1) 6000rpm	
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 : -20 to 80 $^{\circ}$ C		
Ambient humidity	35 to 85%RH, Storage : 35 to 90%RH		
Protection	IP50 (IEC standard)		
Cable	ϕ 3mm, 5P (Line driver output : 8P), Length : 1m, Shield cable		
Accessory	ϕ 2mm Coupling (Shaft type), Bracket (Hollow shaft built-in type)		
Approval	 (Except line driver output)		
Unit weight	Approx. 35g		

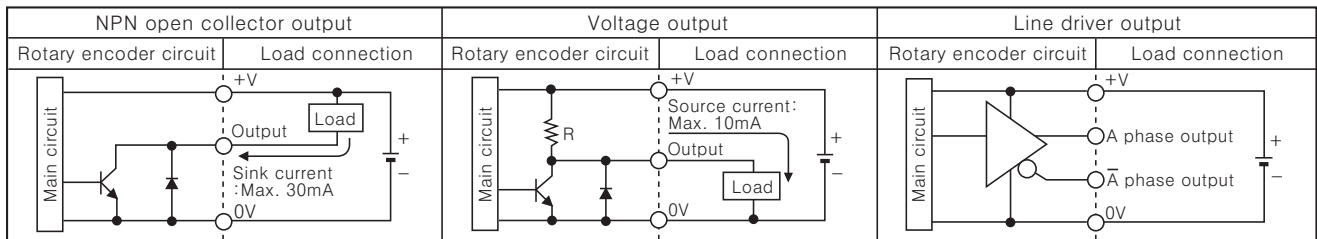
* **(Note1)** Max. allowable revolution \geq Max. response revolution

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

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

Incremental ϕ 20mm Shaft/Hollow shaft built-in Type

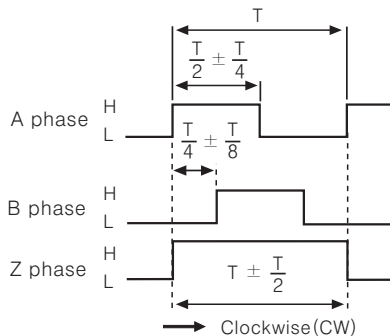
Control output diagram



●The output circuit of A, B, Z phase are the same. (Line driver output is A, \bar{A} , B, \bar{B} , Z, \bar{Z})

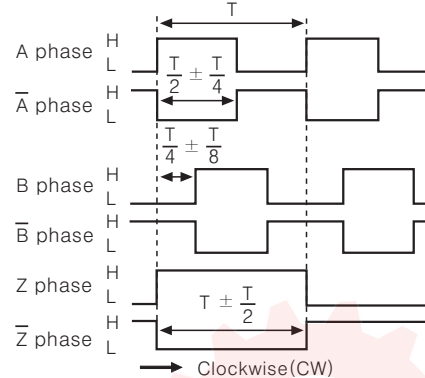
Output waveform

●NPN open collector output / Voltage output



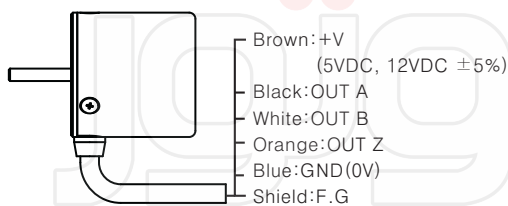
※CW : Right turn as from the shaft

●Line driver output

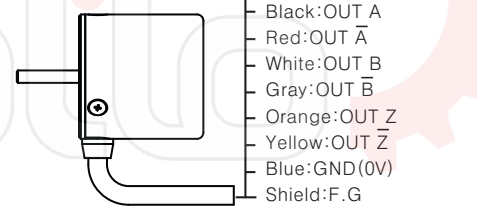


Connections

●NPN open collector output / Voltage output

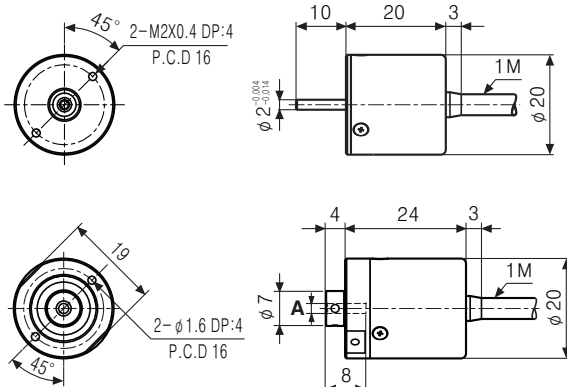


●Line driver output



Dimensions

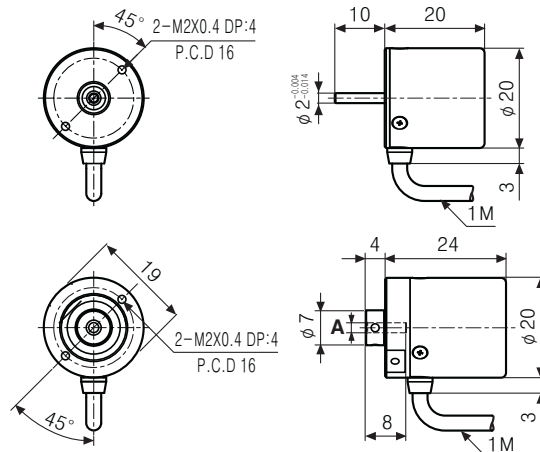
■Rear side outgoing cable type



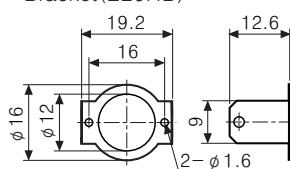
A	ϕ 2	ϕ 2.5	ϕ 3
Tolerance		+0.014	+0.004

■Side outgoing cable type

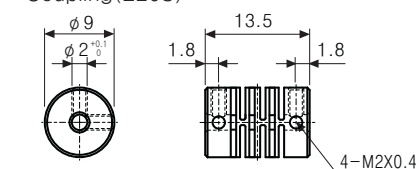
(Unit:mm)



●Bracket (E20HB)



●Coupling (E20S)



(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