

# E20 Series

## Shaft Type/Blind Hollow Shaft Type Ø20mm Incremental Rotary Encoder

### ■ Features

- Ø20mm of miniature rotary encoder
- Easy installation at narrow space
- Low moment of inertia
- Power supply: 5VDC, 12VDC ±5%
- Various output types

**⚠ Please read "Safety Considerations" in the instruction manual before using.**



E20S Series



E20HB Series

### ■ Ordering Information

<b>E20</b>	<b>S</b>	<b>2</b>	<b>360</b>	<b>3</b>	<b>N</b>	<b>12</b>	<b>R</b>
Series	Shaft diameter		Pulses/revolution	Output phase	Control output	Power supply	Cable
Ø20mm S: shaft type	External	2: Ø2mm	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 ±5% 12: 12VDC ±5%	R: Axial cable type S: Radial cable type
Ø20mm HB: blind hollow shaft type	Inner	2: Ø2mm 2.5: Ø2.5mm 3: Ø3mm					

※The power of Line driver is only for 5VDC.

### ■ Specifications

Item	Shaft Type/Blind Hollow Shaft Type Ø20mm Incremental Rotary Encoder		
Resolution (PPR) <sup>※1</sup>	100, 200, 320, 360		
Electrical specification	Output phase		
	A, B, Z phase (line driver output A, A, B, B, Z, 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	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	• [Low] - Load current: max. 20mA, residual voltage: max. 0.5VDC=
	Response time (rise/fall)	NPN open collector output	• [High] - Load current: max. -20mA, output voltage: min. 2.5VDC=
		Voltage output	Max. 1µs (cable length: 1m, I sink = 20mA)
		Line driver output	Max. 0.5µs (cable length: 1m, I sink = 20mA)
Max. response frequency	100kHz		
Power supply	• 5VDC= ±5% (ripple P-P: max. 5%) • 12VDC= ±5% (ripple P-P: max. 5%)		
Current consumption	Max. 60mA (disconnection of the load), Line driver output: max. 50mA (disconnection of the load)		
Insulation resistance	Over 100MΩ (at 500VDC megger between all terminals and case)		
Dielectric strength	500VAC 50/60Hz for 1 minute (between all terminals and case)		
Connec ion	Axial cable type, radial cable type		
Mechanical specification	Starting torque		
	Max. 5gf·cm (5×10 <sup>-4</sup> N·m)		
	Moment of inertia		
	Max. 0.5g·cm <sup>2</sup> (5×10 <sup>-8</sup> kg·m <sup>2</sup> )		
Shaft loading		Radial: 200gf, Thrust: 200gf	
Max. allowable revolution <sup>※2</sup>		6,000rpm	
Vibra ion	1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours		
Shock	Approx. max. 50G		
Environment	Ambient temperature	-10 to 70°C, storage: -20 to 80°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH	
Protec ion structure	IP50 (IEC standard)		
Cable	Ø3mm, 5-wire (line driver output: 8-wire), 1m, Shield cable		
Accessory	Ø2mm Coupling (shaft type), Bracket (blind hollow shaft type)		
Approval	CE (except line driver output)		
Unit weight	Approx. 35g		

※1: Not indicated resolutions are customizable.

※2: Make sure that max. response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

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

※Environment resistance is rated at no freezing or condensation.

# Incremental Ø20mm Shaft/Blind Hollow Shaft type

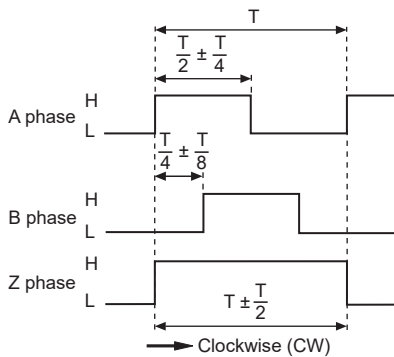
## Control Output Diagram

NPN open collector output		Voltage output	
Rotary encoder circuit	Load connection	Rotary encoder circuit	Load connection
Line driver output			
Rotary encoder circuit	Load connection		

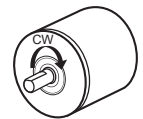
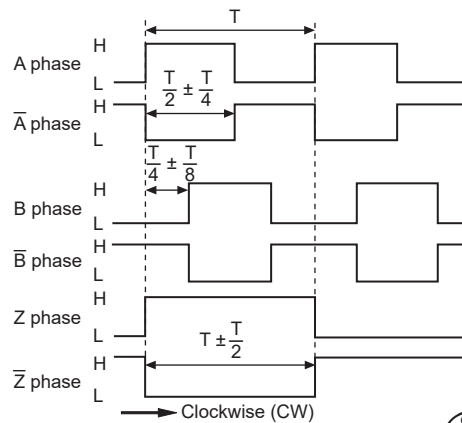
※The output circuit of A, B, Z phase are same. (line driver output is A,  $\bar{A}$ , B,  $\bar{B}$ , Z,  $\bar{Z}$ )

## Output Waveform

### ⊙ NPN open collector output / Voltage output

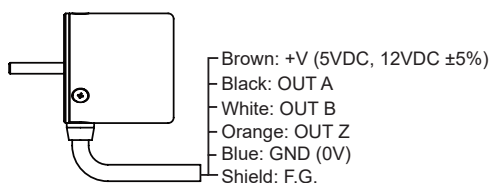


### ⊙ Line driver output

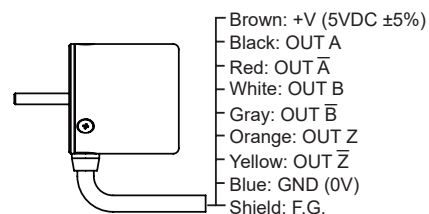


## Connections

### ⊙ NPN open collector output / Voltage output



### ⊙ Line driver output



※Do not apply tensile strength over 15N to the cable.

SENSORS

CONTROLLERS

MOTION DEVICES

SOFTWARE

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) LIDAR

(D) Door/Area Sensors

(E) Vision Sensors

(F) Proximity Sensors

(G) Pressure Sensors

(H) Rotary Encoders

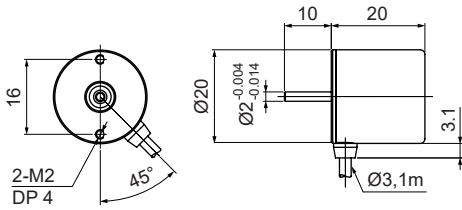
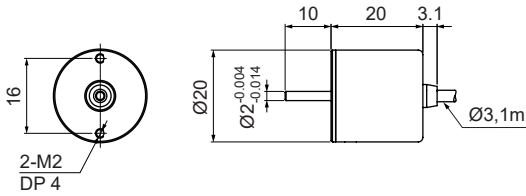
(I) Connectors/ Connector Cables/ Sensor Distribution Boxes/ Sockets

# E20 Series

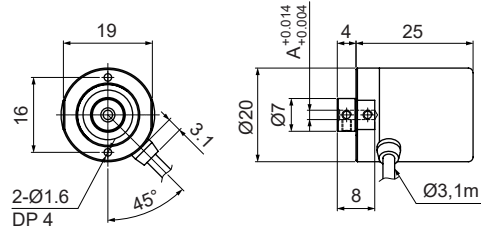
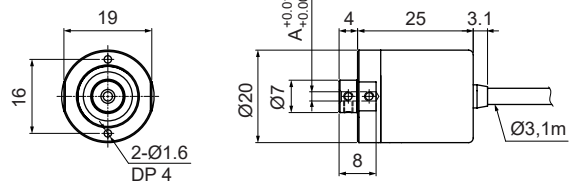
## ■ Dimensions

(unit: mm)

### ◎ Shaft type

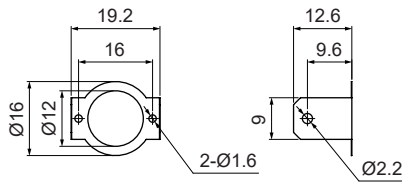


### ◎ Blind hollow shaft type

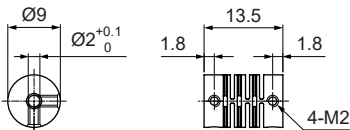


Model	E20HB2	E20HB2.5	E20HB3
A	Ø2	Ø2.5	Ø3

### ◎ Bracket (E20HB)



### ◎ Coupling (E20S)



- Parallel misalignment: max. 0.15mm
- Angular misalignment: max. 2°
- End-play: max. 0.5mm

※ Do not load overweight on the shaft.

※ Do not put strong impact when insert a coupling into shaft.

Failure to follow this instruction may result in product damage.

※ Fix the unit or a coupling by a wrench under 0.15N·m of torque.

※ When you install this unit, if eccentricity and deflection angle are larger, it may shorten the life cycle of this unit.

※ For parallel misalignment, angular misalignment, end-play terms, refer to the "Glossary" section of Technical Description.

※ For flexible coupling (ERB series) information, refer to ERB series section.