

## Hollow Shaft Type Ø80mm Incremental Rotary Encoder

### ■ Features

- Ø80mm, Inner diameter of shaft Ø30mm, Ø32mm
- No coupling needed with direct installation at motor or rotation shaft of machine
- Power supply: 5VDC, 12-24VDC ±5%
- Various output types



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



### ■ Ordering Information

**E80H** **30** - **3200** - **3** - **N** - **24** -

Series	Shaft diameter	Pulses/revolution	Output phase	Control output	Power supply	Cable
Ø80mm, hollow shaft type	30: Ø30mm 32: Ø32mm	60, 100, 360, 500, 512, 1024, 3200	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 ±5% 24: 12-24VDC ±5%	No mark: Radial cable type C: Radial cable connector type

### ■ Specifications

Item	Hollow Shaft Type Ø80mm Incremental Rotary Encoder		
Resolution (PPR) <sup>※1</sup>	60, 100, 360, 500, 512, 1024, 3200		
Output phase	A, B, Z phase (line driver output A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$ phase)		
Phase difference of output	Output between A and B phase: $\frac{T}{4} \pm \frac{T}{8}$ (T=1 cycle of A phase)		
Electrical specification	Control output	Totem pole output	• [Low] - Load current: max. 30mA, residual voltage: max. 0.4VDC= • [High] - Load current: max. 10mA, Output voltage (power voltage 5VDC= Output voltage (power voltage 12-24VDC= Output voltage (power voltage 3.0)VDC= Output voltage (power voltage 3.0)VDC= Output voltage (power voltage 3.0)VDC=
		NPN open collector output	Load current: max. 30mA, residual voltage: max. 0.4VDC= Output voltage (power voltage 5VDC= Output voltage (power voltage 12-24VDC= Output voltage (power voltage 3.0)VDC= Output voltage (power voltage 3.0)VDC=
		Voltage output	Load current: max. 10mA, residual voltage: max. 0.4VDC= Output voltage (power voltage 5VDC= Output voltage (power voltage 12-24VDC= Output voltage (power voltage 3.0)VDC= Output voltage (power voltage 3.0)VDC=
		Line driver output	• [Low] - Load current: max. 20mA, residual voltage: max. 0.5VDC = • [High] - Load current: max. -20mA, Output voltage (power voltage 5VDC= Output voltage (power voltage 12-24VDC= Output voltage (power voltage 3.0)VDC= Output voltage (power voltage 3.0)VDC=
Response time (rise, fall)	Totem pole output	Max. 1μs (cable length: 2m, I sink = 20mA)	
	NPN open collector output		
	Voltage output		
	Line driver output		Max. 0.5μs (cable length: 2m, I sink = 20mA)
Max. response frequency	200kHz		
Power supply	• 5VDC= • 12-24VDC= • 5% (ripple P-P: max. 5%)		
Current consumption	Max. 80mA (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	750VAC 50/60Hz for 1 minute (between all terminals and case)		
Connection	Radial cable type, Radial cable connector type		
Mechanical specification	Starting torque	Max. 200gf·cm (0.0196N·m)	
	Moment of inertia	Max. 800g·cm <sup>2</sup> (8×10 <sup>-5</sup> kg·m <sup>2</sup> )	
	Shaft loading	Radial: max. 5kgf, Thrust: max. 2.5kgf	
	Max. allowable revolution <sup>※2</sup>	3,600rpm	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours		
Shock	Approx. max. 75G		
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH	
Protection structure	IP50 (IEC standard)		
Cable	Ø5mm, 5-wire (line driver output: 8-wire), 2m, Shield cable (AWG24, core diameter: 0.08mm, number of cores: 40, insulator out diameter: Ø1mm)		
Accessory	Spring bracket		
Approval	CE (except for line driver output)		
Unit weight	Approx. 560g		

※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.

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

# E80H Series

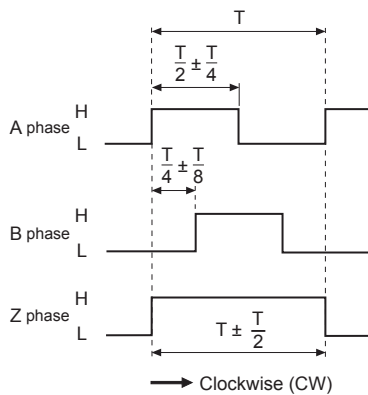
## Control Output Diagram

Totem pole output		NPN open collector output	
Rotary encoder circuit	Load Connection	Rotary encoder circuit	Load Connection
Voltage output		Line driver output	
Rotary encoder circuit	Load Connection	Rotary encoder circuit	Load Connection

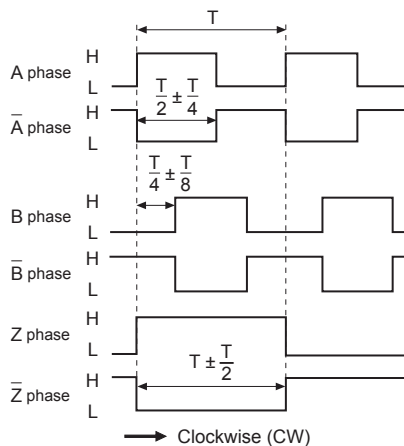
- All output circuits of A, B, Z phase are same. (line driver output is A,  $\bar{A}$ , B,  $\bar{B}$ , Z,  $\bar{Z}$ )
- Totem pole output type can be used for NPN open collector type (※1) or voltage output type (※2).

## Output Waveforms

### ⊙ Totem pole output / NPN open collector output / Voltage output



### ⊙ Line driver output

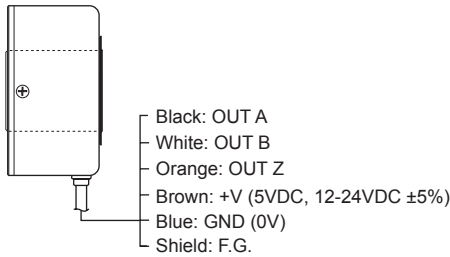


# Incremental Ø80mm Hollow Shaft Type

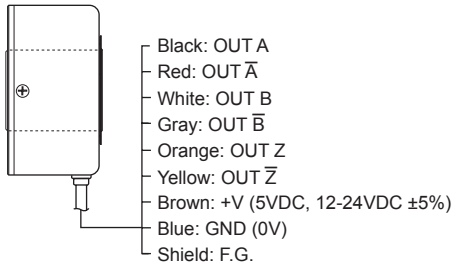
## ■ Connections

### ◎ Radial cable type

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



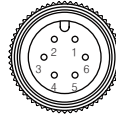
### • Line driver output



- ※Unused wires must be insulated.
- ※The metal case and shield cable of encoder should be grounded (F.G.).
- ※Do not apply tensile strength over 30N to the cable.

### ◎ Radial cable connector type

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



Pin No.	Function	Cable color
1	OUT A	Black
2	OUT B	White
3	OUT Z	Orange
4	+V	Brown
5	GND	Blue
6	F.G.	Shield

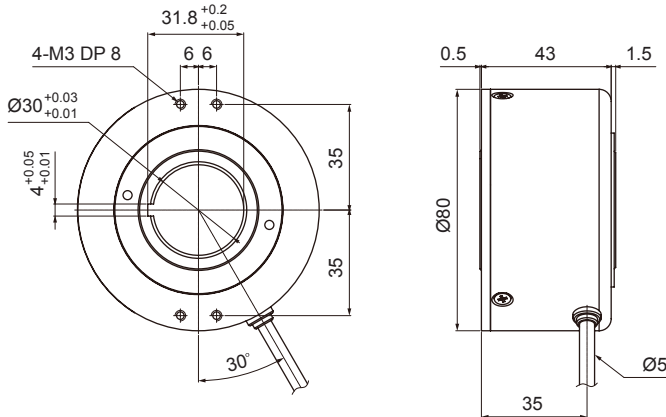


Pin No.	Function	Cable color
1	OUT A	Black
2	OUT $\bar{A}$	Red
3	+V	Brown
4	GND	Blue
5	OUT B	White
6	OUT $\bar{B}$	Gray
7	OUT Z	Orange
8	OUT $\bar{Z}$	Yellow
9	F.G.	Shield

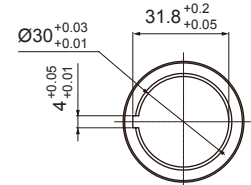
※F.G. (field ground): It should be grounded separately.

## ■ Dimensions

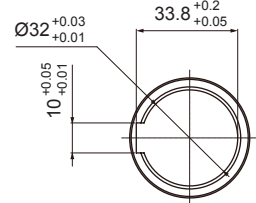
(unit: mm)



### • Shaft inner diameter (standard)



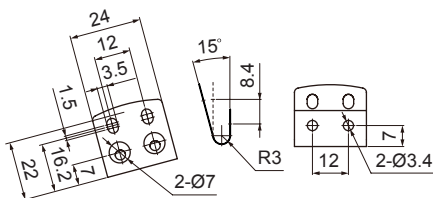
### • Shaft inner diameter (option)



Cable for radial cable type	Cable for radial cable connector type
Ø5mm, 5-wire (line driver output: 8-wire), Length: 2m, Shield cable	Ø5mm, 5-wire (line driver output: 8-wire), Length: 250mm, Shield cable

※Connector cable is sold separately and refer to page H-10 for specifications.

### ◎ Bracket



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OTHERS

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