


# E88H Series Incremental Ø88mm Hollow Shaft Type

## Hollow Shaft Type Ø88mm Incremental Rotary Encoder

### ■ Features

- Ø88mm, Inner diameter of shaft Ø30mm
- No coupling needed with direct installation at elevator winding machine
- Power supply: 5VDC, 15VDC ±5%
- Control output: Complemental output, Line driver output

 Please read "Safety Considerations" in operation manual before using.



### ■ Ordering Information

<b>E88H</b>	<b>30</b>	<b>1024</b>	<b>2</b>		<b>15</b>
Series	Shaft inner diameter	Pulses/revolution	Output phase	Control output	Power supply
Ø88mm, hollow shaft type	Ø30mm	1024	2: A, B 6: A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$	No mark: Complemental output L: Line driver output	15: 15VDC ±5% 5: 5VDC ±5%

### ■ Specifications

Item	Hollow Shaft Type Ø88mm Incremental Rotary Encoder	
Model	<b>E88H30-1024-2-15</b>	<b>E88H30-1024-6-L-5</b>
Revolution (PPR)	1,024	
Electrical specification	Output phase	A, B phase A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$ phase
	Phase difference of output	Output between A and B phase: $\frac{T}{4} \pm \frac{T}{10}$ (T=1cycle of A phase)
	Control output	• [L]-Load current: max. 15mA, Residual voltage: max. 2.0VDC= • [H]-Load current: max. 15mA, Output voltage: min. 10VDC= • [L]-Load current: max. 20mA, Residual voltage: max. 0.5VDC= • [H]-Load current: max. -20mA, Output voltage: min. 2.5VDC=
	Response time (rise, fall)	Max. 1µs (cable length: 8m, load resistance: 1kΩ) Max. 0.5µs (cable length: 8m, I sink=20mA)
	Max. response frequency	150kHz
	Power supply	15VDC= ±5% (ripple P-P: max. 5%) 5VDC= ±5% (ripple P-P: max. 5%)
	Current consumption	Max. 60mA (disconnection of the load) Max. 50mA (disconnection of the load)
	Insulation resistance	Over 100MΩ (at 500VDC megger)
	Dielectric strength	750VAC 50/60Hz for 1 min (between all terminals and case)
	Connection	Radial cable type
Mechanical specification	Starting torque	Max. 600gf·cm (0.06N·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>※1</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. 100G	
Environment	Ambient temp.	-10 to 70°C, storage: -25 to 85°C
	Ambient humi.	35 to 85%RH, storage: 35 to 90%RH
Protection structure	IP50 (IEC standard)	
Cable	Ø6mm, 6-wire, 8m, shield cable (AWG24, core diameter: 0.16mm, number of cores: 11, insulator out diameter: Ø1mm)	Ø6mm, 8-wire, 8m, shield cable (AWG24, core diameter: 0.08mm, number of cores: 40, insulator out diameter: Ø1mm)
Accessory	Spring bracket: 2	
Approval	CE (except line driver output model)	
Weight <sup>※2</sup>	Approx. 1.49kg (approx. 1.45kg)	

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

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

※2: The weight includes packaging. The weight in parenthesis is for unit only.

※Environment resistance is rated at no freezing or condensation.

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) Door/Area Sensors

(D) Proximity Sensors

(E) Pressure Sensors

(F) Rotary Encoders

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

(H) Temperature Controllers

(I) SSRs / Power Controllers

(J) Counters

(K) Timers

(L) Panel Meters

(M) Tacho /  
Speed / Pulse  
Meters

(N) Display Units

(O) Sensor Controllers

(P) Switching  
Mode Power  
Supplies

(Q) Stepper Motors  
& Drivers  
& Controllers

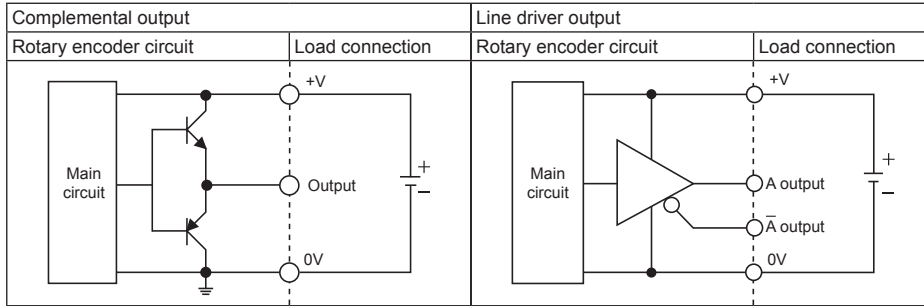
(R) Graphic/  
Logic  
Panels

(S) Field  
Network  
Devices

(T) Software

# E88H Series

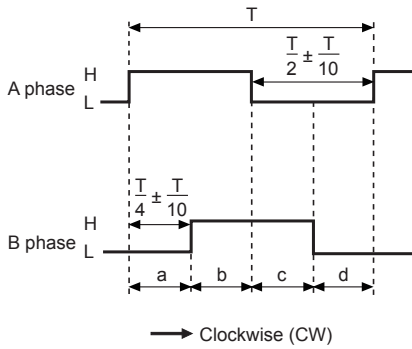
## Control Output Diagram



※All output circuits of A,  $\bar{A}$ , B,  $\bar{B}$ , Z,  $\bar{Z}$  phase are the same.

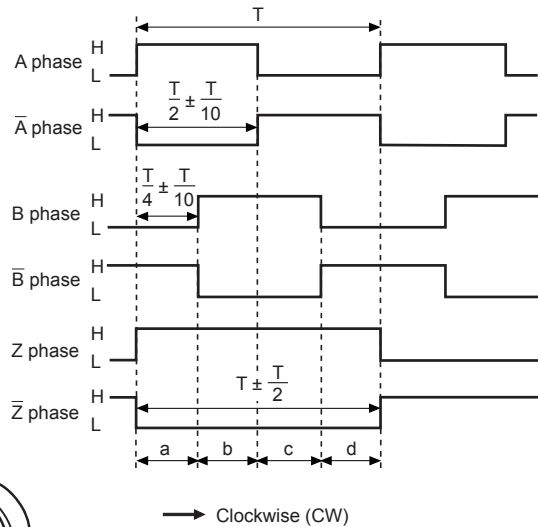
## Output Waveforms

### Complemental output



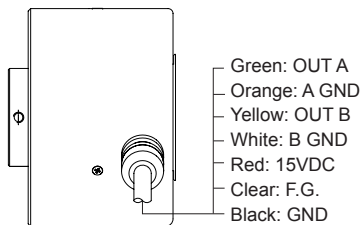
Note	Standard error
a+b+c+d	T (1 cycle of A, B phase)
a+b, c+d	$\frac{T}{2} \pm \frac{T}{10}$
a, b, c, d	$\frac{T}{4} \pm \frac{T}{10}$

### Line driver output

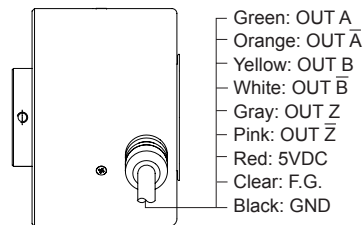


## Connections

### Complemental output



### Line driver output



※Unused wires must be insulated.

※The metal case and shield cable of encoder should be grounded (F.G.).

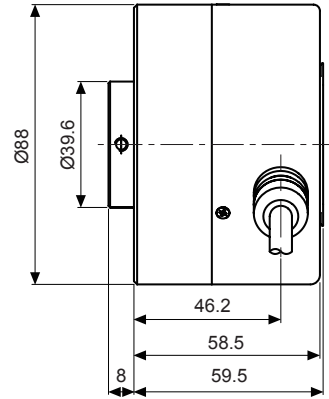
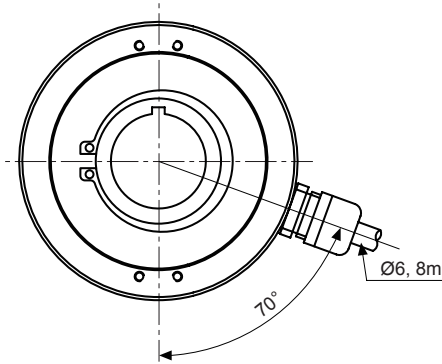
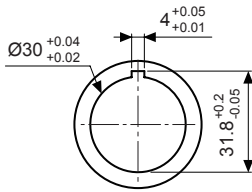
※The output circuit has the dedicated IC and be sure not to short-circuit when wiring the output cables.

※Do not apply tensile strength over 30N to the cable.

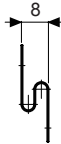
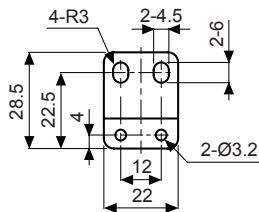
# Incremental Ø88mm Hollow Shaft Type

## ■ Dimensions

(unit: mm)



## ● Bracket



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

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(C)	Door/Area Sensors
(D)	Proximity Sensors
(E)	Pressure Sensors
(F)	Rotary Encoders
(G)	Connectors/ Connector Cables/ Sensor Distribution Boxes/Sockets
(H)	Temperature Controllers
(I)	SSRs / Power Controllers
(J)	Counters
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(M)	Tacho / Speed / Pulse Meters
(N)	Display Units
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(P)	Switching Mode Power Supplies
(Q)	Stepper Motors & Drivers & Controllers
(R)	Graphic/ Logic Panels
(S)	Field Network Devices
(T)	Software