

## Shaft Type/Hollow Shaft Type/Blind Hollow Shaft Type Ø58mm Incremental Rotary Encoder

### ■ Features

- Ø58mm flange type
- Suitable for measuring angle, position, revolution, speed, acceleration and distance
- Power supply: 5VDC, 12-24VDC ±5%

### ■ Applications

- Various tooling machinery, packing machine and general industrial machinery, etc.

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



### ■ Ordering Information

**E58SC** - **10** - **8000** - **3** - **N** - **24** -

Series (Ø58mm)	Shaft diameter	Pulses/revolution	Output phase	Control output	Power supply	Cable
SC: Shaft Clamping	External	10 Ø10mm	Refer to resolution 2: A, B 3: A, B, Z 4: A, $\bar{A}$ , B, $\bar{B}$ 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 <sup>※1</sup> : Axial cable type C <sup>※1</sup> : Axial cable connector type CR: Axial connector type CS: Radial connector type
SS: Shaft Synchro		6 Ø6mm				
H: Hollow shaft	Inner	12 Ø12mm				
HB: Blind hollow shaft						

※1: E58H (hollow shaft) has only radial cable type, radial cable connector type.

### ■ Specifications

Item	Shaft Type/Hollow Shaft Type/Blind Hollow Shaft Type Ø58mm Incremental Rotary Encoder	
Resolution (PPR) <sup>※1</sup>	+1, +2, +5, 10, +12, 15, 20, 23, 25, 30, 35, 40, 45, 50, 60, 75, 100, 120, 125, 150, 192, 200, 240, 250, 256, 300, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500, 3000, 3600, 5000, 6000, 8000	
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): Min. (power voltage-2.0)VDC, Output voltage (power voltage 12-24VDC): Min. (power voltage-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
Electrical specification	Line driver output	• [Low] - Load current: Max. 20mA, Residual voltage: Max. 0.5VDC • [High] - Load current: Max. -20mA, Output voltage (power voltage 5VDC): Min. 2.5VDC, Output voltage (power voltage 12-24VDC): Min. (power voltage-3.0)VDC
	Response time (rise, fall)	Totem pole output
	NPN open collector output	Max. 1µs (cable length: 2m, I sink = 20mA)
	Voltage output	Max. 0.5µs (cable length: 2m, I sink = 20mA)
Line driver output	Max. 0.5µs (cable length: 2m, I sink = 20mA)	
Max. response frequency	300kHz	
Power supply	• 5VDC ±5% (ripple P-P: Max. 5%) • 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 min (between all terminals and case)	
Connection	Axial cable type, Axial cable connector type, Axial/Radial connector type	
Mechanical specification	Starting torque	• SC/SS type: Max. 40gf·cm (0.004N·m) • H/HB type: Max. 90gf·cm (0.009N·m)
	Moment of inertia	• SC/SS type: Max. 15g·cm <sup>2</sup> (1.5×10 <sup>-6</sup> kg·m <sup>2</sup> ) • H/HB type: Max. 20g·cm <sup>2</sup> (2×10 <sup>-6</sup> kg·m <sup>2</sup> )
	Shaft loading	• SC/SS type-Radial: Max. 10kgf, Thrust: Max. 2.5kgf • H/HB type-Radial: Max. 2kgf, Thrust: Max. 1kgf
	Max. allowable revolution <sup>※2</sup>	5,000rpm
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	Coupling (SC type: Ø10mm, SS type: Ø6mm), Bracket	
Approval	CE (except for line driver output)	
Weight <sup>※3</sup>	Cable type, Cable connector type	• SC type: Approx. 420g (approx. 310g), SS type: Approx. 395g (approx. 285g), H type: Approx. 380g (approx. 270g), HB type: Approx. 380g (approx. 270g)
	Connector type	• SC type: Approx. 340g (approx. 230g), SS type: Approx. 315g (approx. 205g), HB type: Approx. 310g (approx. 200g)

※1: \*\* pulse is only for A, B phase. (line driver output is for A,  $\bar{A}$ , B,  $\bar{B}$  phase) [In case of hollow shaft type, 6000, 8000 PPR excluded]  
Not indicated resolutions are customizable.

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

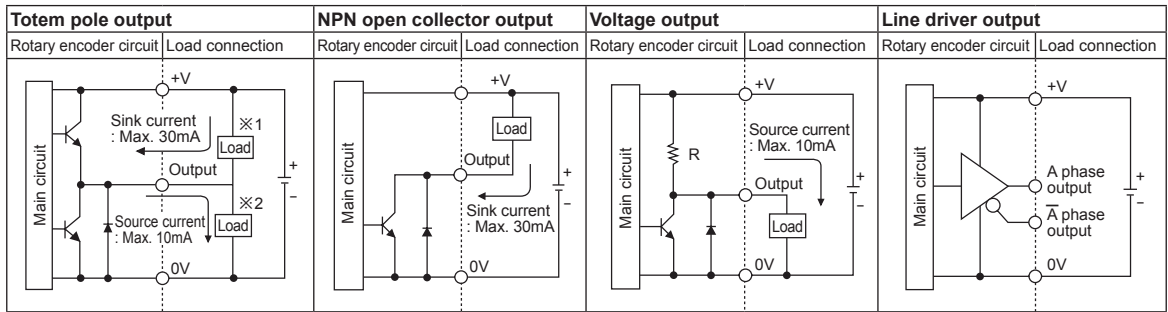
※2: Make sure that max. response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

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

※Environment resistance is rated at no freezing or condensation.

# Incremental Ø58mm Shaft/Hollow Shaft/Blind Hollow Shaft Type

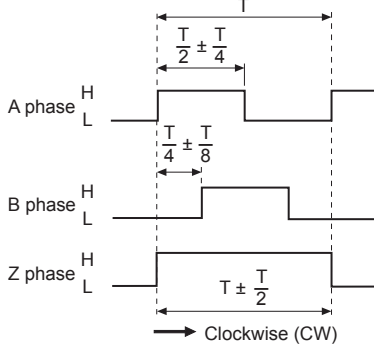
## Control Output Diagram



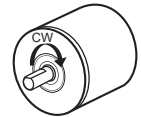
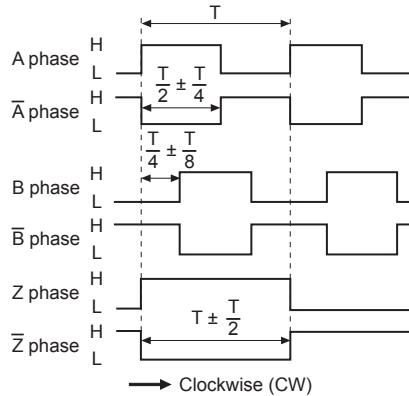
- All output circuits of A, B, Z phase are same. (line driver output is A,  $\bar{A}$ , B,  $\bar{B}$ , Z,  $\bar{Z}$ )
- Totem pole output type can be used for NPN open collector type (※1) or voltage output type (※2).

## Output Waveforms

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



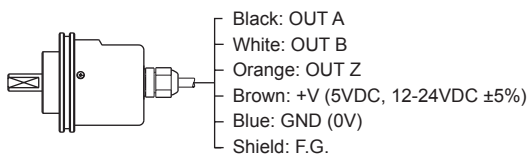
- Line driver output



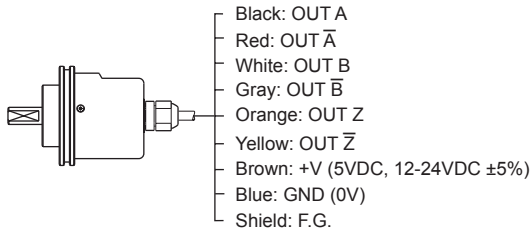
## Connections

### ◎ Cable type

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



- Line driver output



- ※ Unused wires must be insulated.
- ※ The metal cable and shield cable of encoder should be grounded (F.G.)

### ◎ Cable connector type / 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.

(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

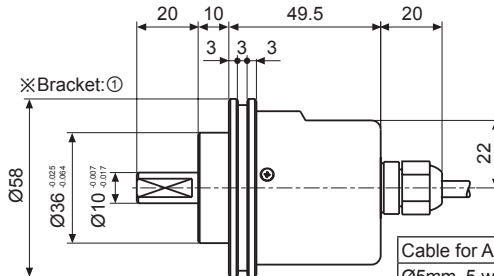
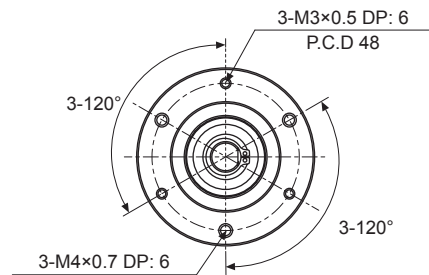
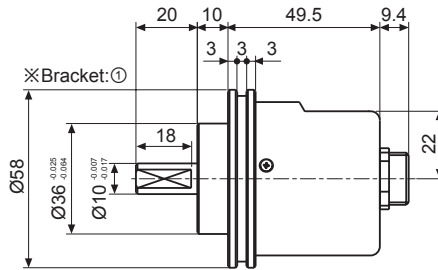
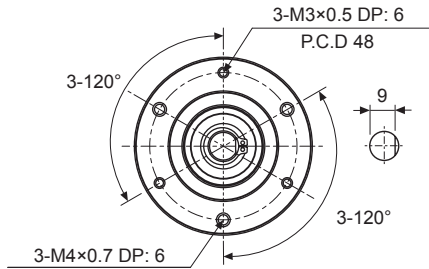
(T) Software

# E58 Series

## ■ Dimensions

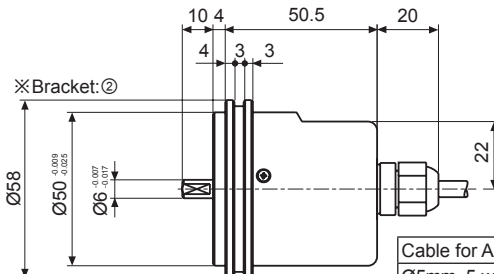
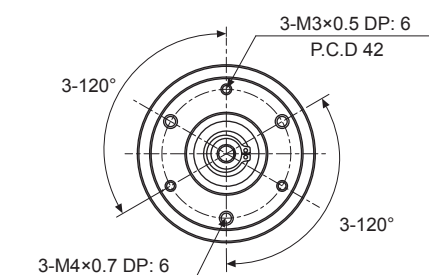
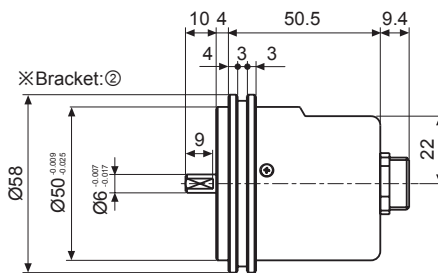
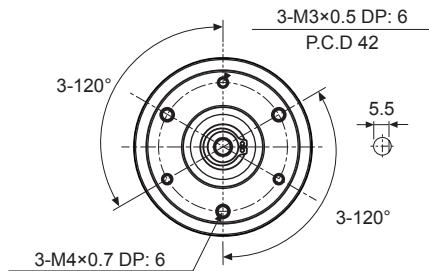
### ◎ Shaft clamping type

(unit: mm)



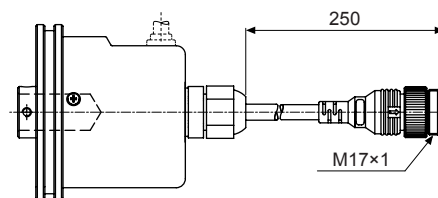
Cable for Axial cable type  
 Ø5mm, 5-wire (line driver output: 8-wire),  
 2000mm, Shield cable

### ◎ Shaft synchro type



Cable for Axial cable type  
 Ø5mm, 5-wire (line driver output: 8-wire),  
 2000mm, Shield cable

### ● Cable connector type



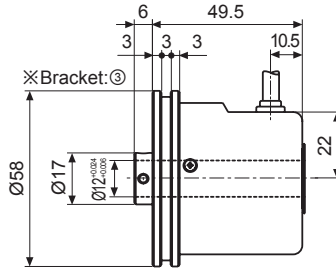
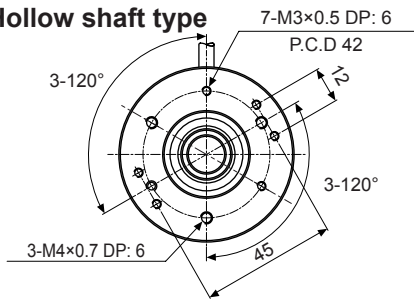
Cable for Connector type  
 Ø5mm, 5-wire (line driver output: 8-wire),  
 250mm, Shield cable

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

# Incremental Ø58mm Shaft/Hollow Shaft/Blind Hollow Shaft Type

## ■ Dimensions

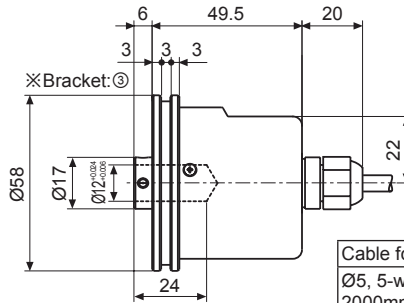
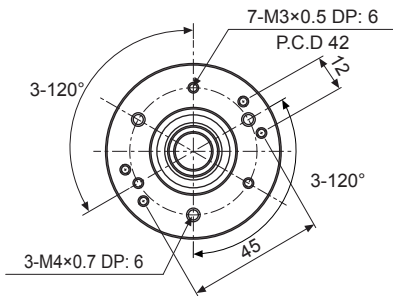
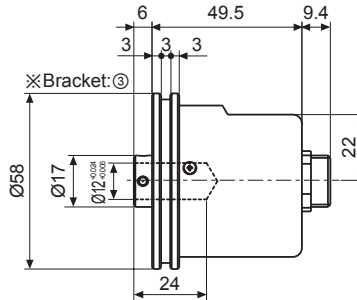
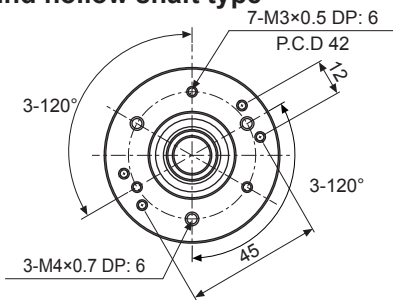
### ◎ Hollow shaft type



Cable for Radial cable type  
 Ø5mm, 5-wire (line driver output: 8-wire),  
 2000mm, Shield cable

(unit: mm)

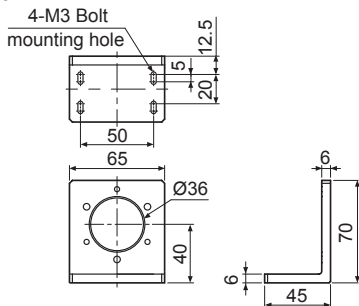
### ◎ Blind hollow shaft type



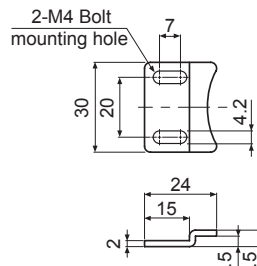
Cable for Axial cable type  
 Ø5, 5-wire (line driver output: 8-wire),  
 2000mm, Shield cable

## ● Bracket

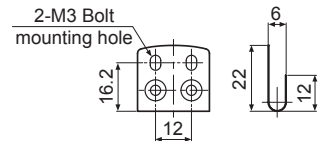
### ※SC type: ①



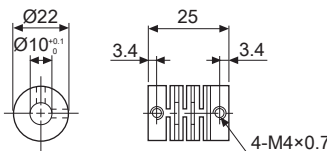
### ※SS type: ②



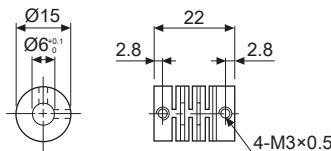
### ※H/HB type: ③



### ● Ø10mm Coupling (E58SC10 Series)



### ● Ø6mm Coupling (E58SS6 Series)



- Parallel misalignment: Max. 0.25mm
- Angular misalignment: Max. 5°
- End-play: Max. 0.5mm

※When mounting the coupling to the encoder shaft, if there is combined misalignment (parallel, angular misalignment) between rotating encoder shaft and mate shaft, it may cause encoder and coupling's life cycle to shorten.

※Do not load overweight on the shaft.

※For parallel misalignment, angular misalignment, end-play terms, refer to page F-87.

※For flexible coupling (ERB series) information, refer to page F-80.

(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
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(R)	Graphic/ Logic Panels
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(T)	Software