

# E58 Series

## Diameter $\phi$ 58mm Shaft type/Hollow type/Built-in type Incremental Rotary encoder

### Features

- Diameter  $\phi$  58mm flange type
- Suitable for measuring angle, position, revolution, speed, acceleration and distance
- Power supply : 5VDC, 12–24VDC  $\pm$ 5%

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



### Ordering information

<b>E58SC</b>	<b>10</b>	<b>8000</b>	<b>3</b>	<b>N</b>	<b>24</b>		
Series Diameter $\phi$ 58mm	Shaft diameter		Pulse/ 1 Revolution	Output phase	Output	Power supply	Cable
SC: Shaft Clamping	External	10 $\phi$ 10mm	Refer to resolution	2: A, B	T: Totem pole output N: NPN open collector output	5: 5VDC $\pm$ 5% 24: 12–24VDC $\pm$ 5%	Blank: Normal type C: Cable outgoing connector type (250mm) CR: Axial connector integrated type CS: Radial connector integrated type
SS: Shaft Synchro		6 $\phi$ 6mm		3: A, B, Z (Standard)	V: Voltage output		
H: Hollow	Inner	12 $\phi$ 12mm		4: A, $\bar{A}$ , B, $\bar{B}$	L: Line driver output (The power of Line driver is only for 5VDC.)		
HB: Hollow Built-in				6: A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$			

\*Standard: E58SC10–PULSE–3–N–24 \*Customizable model specifications are available.

\*Standard cable for shaft/built-in encoder is axial connector type cable.  
Standard cable for hollow shaft encoder is radial connector type cable.

### Specifications

Item	Diameter $\phi$ 58mm incremental rotary encoder	
Resolution (P/R)	<b>(Note1)</b> *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	Phase difference between A and B phase : $\frac{T}{4} \pm \frac{T}{8}$ (T=1 cycle of A phase)	
Control output	Totem pole output	• Low $\Rightarrow$ Load current : Max. 30mA, Residual voltage : Max. 0.4VDC • High $\Rightarrow$ 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
	Line driver output	• Low $\Rightarrow$ Load current : Max. 20mA, Residual voltage : Max. 0.5VDC • High $\Rightarrow$ Load current : Max. –20mA, Output voltage : Min. 2.5VDC
Res–response time (Rise/Fall)	Totem pole output	Max. 1 $\mu$ s (Cable length: 2m, I sink=20mA)
	NPN open collector output	
	Voltage output	
	Line driver output	Max. 0.5 $\mu$ s (Cable length: 2m, I sink=20mA)
Max. Response frequency	300kHz	
Power supply	• 5VDC $\pm$ 5% (Ripple P–P : Max. 5%) • 2–24VDC $\pm$ 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	Min. 100M $\Omega$ (at 500VDC mega for all terminals and case)	
Dielectric strength	750VAC 50/60Hz for 1 minute (all terminals and case)	
Connection	Cable outgoing type, Cable outgoing connector type, Connector integrated type (axial, radial)	
Mechanical specification	Starting torque	• SC/SS type : Max. 40gf $\cdot$ cm (0.004N $\cdot$ m) • HB/H type : Max. 90gf $\cdot$ cm (0.009N $\cdot$ m)
	Moment of inertia	• SC/SS type : Max. 15g $\cdot$ cm <sup>2</sup> (1.5 $\times$ 10 <sup>–6</sup> kg $\cdot$ m <sup>2</sup> ) • HB/H type : Max. 20g $\cdot$ cm <sup>2</sup> (2 $\times$ 10 <sup>–6</sup> kg $\cdot$ m <sup>2</sup> )
	Shaft loading	• SC/SS type $\Rightarrow$ Max. Radial : 10kg $\cdot$ f, Thrust : Max. 2.5kg $\cdot$ f • HB/H type $\Rightarrow$ Max. Radial : 2kg $\cdot$ f, Thrust : Max. 1kg $\cdot$ f
	Max. allowable revolution	<b>(Note2)</b> 5000rpm
Vibration	1.5mm amplitude at frequency of 10 to 55Hz (for one minute cycle) in each of X, Y, Z directions for 2 hours	
Shock	Max. 75G	
Ambient temperature	–10 to 70 $^{\circ}$ C (at non–freezing status), Storage : –25 to 85 $^{\circ}$ C	
Ambient humidity	35 to 85%RH, Storage : 35 to 90%RH	
Protection	IP50 (IEC standard)	
Cable	$\phi$ 5mm, 5P, Length : 2m, Shield cable (Line driver output : $\phi$ 5mm, 8P)	
Accessory	$\phi$ 10mm (SC type) / $\phi$ 6mm (SS type) coupling, Fixing bracket	
Approval	CE (Except Line driver output)	
Unit weight	• SC–CS/CR type: Approx. 230g, SS–CS/CR type: Approx. 205g, HB–CS/CR type: Approx. 200g • SC type: Approx. 310g, SS type: Approx. 285g, HB type: Approx. 270g, H type: Approx. 270g	

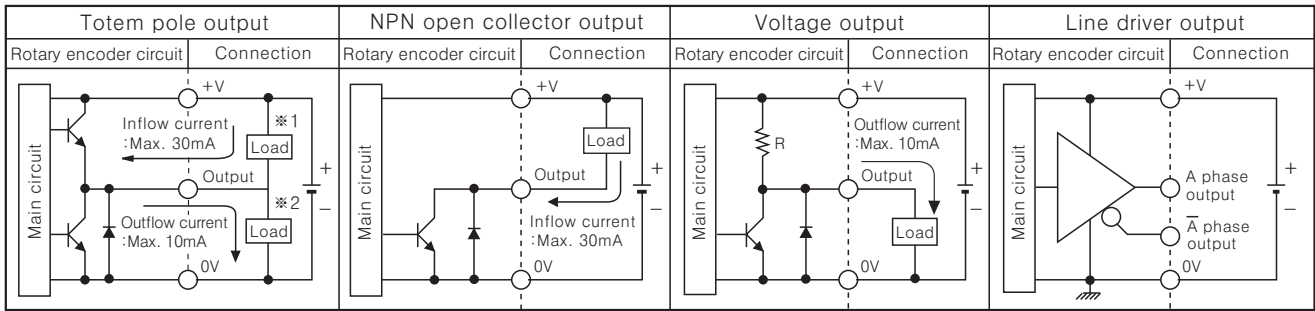
\***(Note1)** 1, 2, 5 12 P/R output A and B phase only. (But Line driver output : A,  $\bar{A}$ , B,  $\bar{B}$  phase) [In case of hollow shaft type, 6000, 8000 P/R excluded]

\***(Note2)** Max. allowable revolution  $\geq$  Max. response revolution **[Max. response revolution (rpm) =  $\frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec.}$ ]**

Please select the resolution to make max. revolution lower than max. allowable revolution.

# Incremental $\phi$ 58mm Shaft/Hollow Shaft/Built-in Type

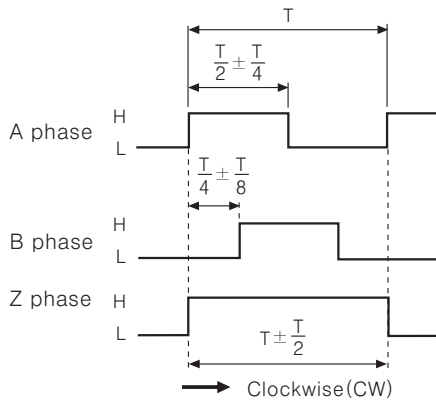
## Control output diagram



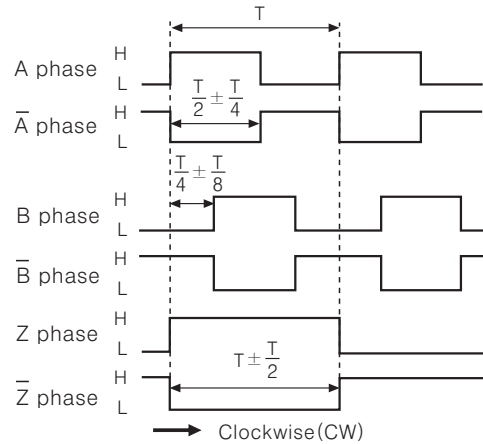
- Totem pole output type can be used for NPN open collector output type (\*1) or Voltage output type (\*2).
- All output circuits of A, B, Z phase are the same. (Line driver output is A,  $\bar{A}$ , B,  $\bar{B}$ , Z,  $\bar{Z}$ )

## Output waveform

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



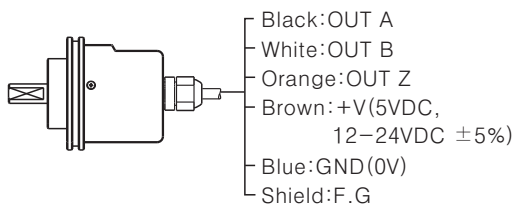
\*CW : Right turn as from the shaft



## Connections

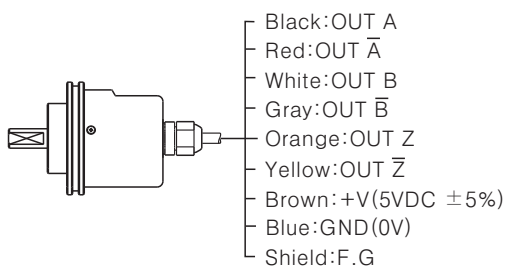
### Normal type

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



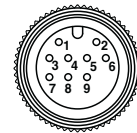
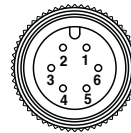
- Unused wires must be insulated.
- The metal and shield cable of encoder should be grounded (F.G)

- Line driver output



### Cable outgoing connector/ Connector integrated 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) 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

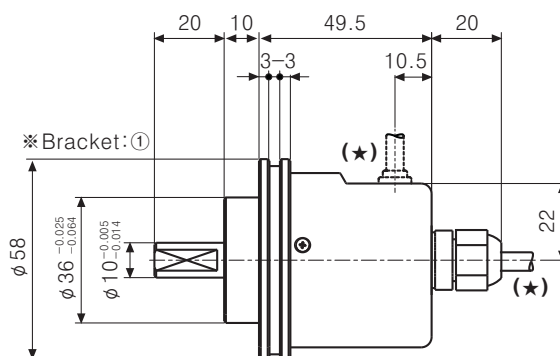
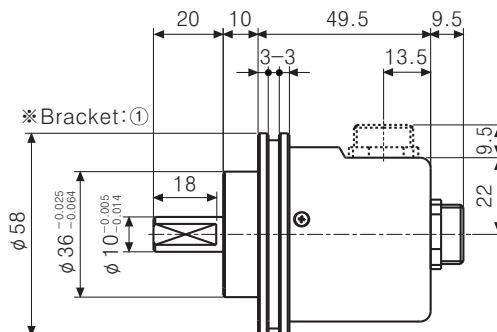
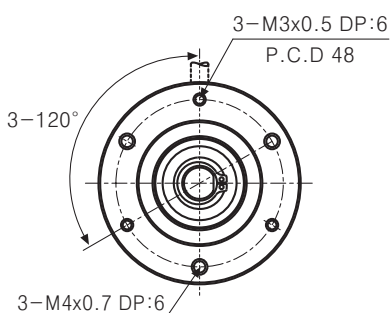
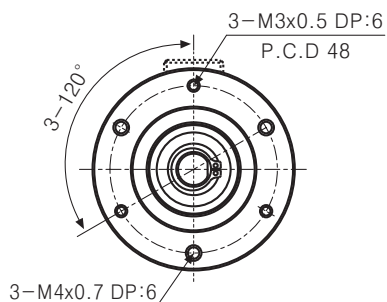
(T) Production stoppage models & replacement

# E58 Series

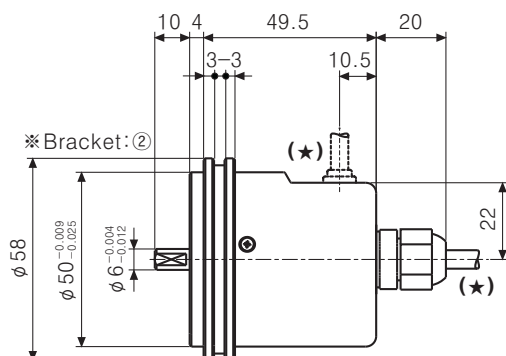
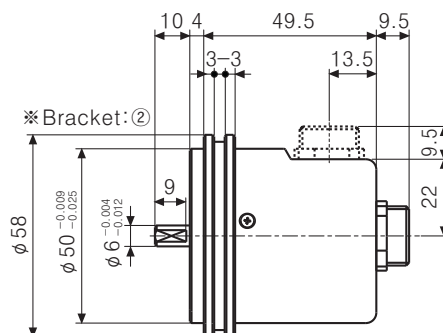
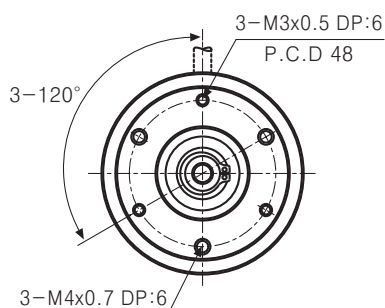
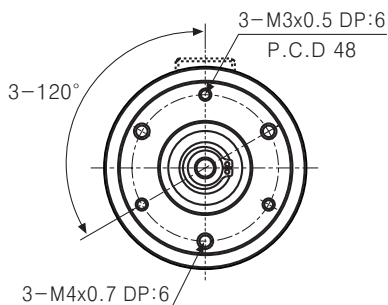
## ■ Dimensions

(Unit:mm)

### ■ Shaft clamping type

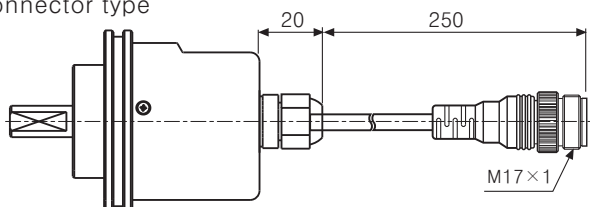


### ■ Shaft synchro type



※(★) Cable for normal type  
φ5mm, 5P(Line driver output:8P),  
Length:2000, Shield cable

### ● Cable outgoing connector type

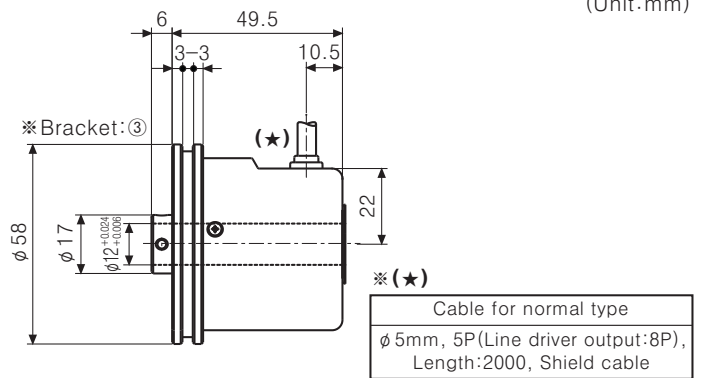
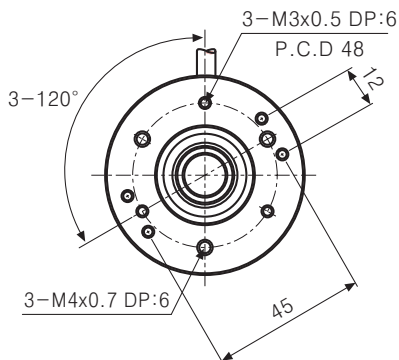


※Connector cable is customizable and  
see G-6 for specifications.

# Incremental $\phi 58\text{mm}$ Shaft/Hollow Shaft/Built-in Type

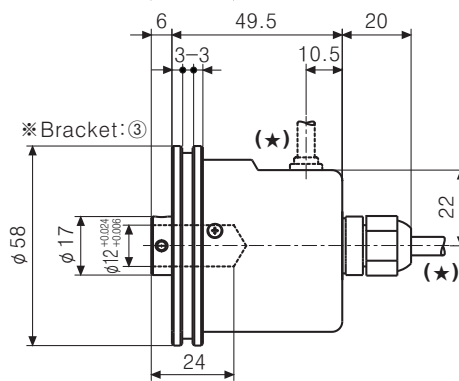
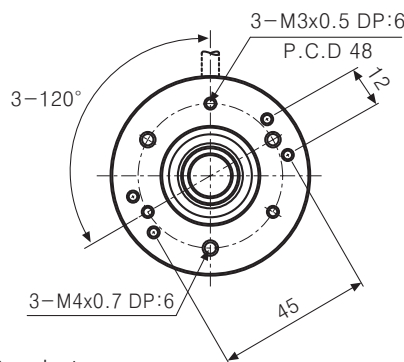
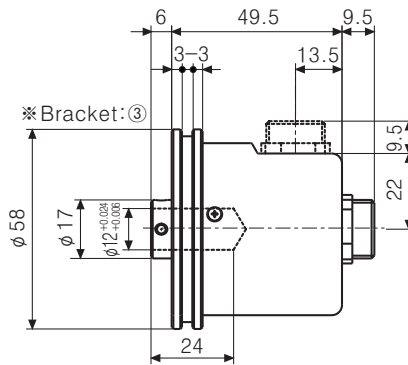
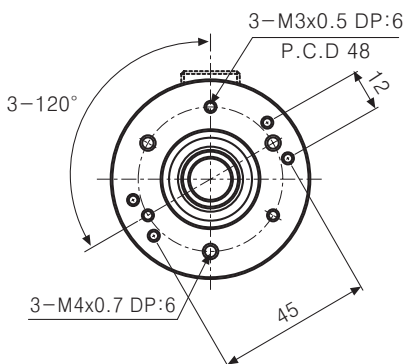
## Dimensions

### Hollow type



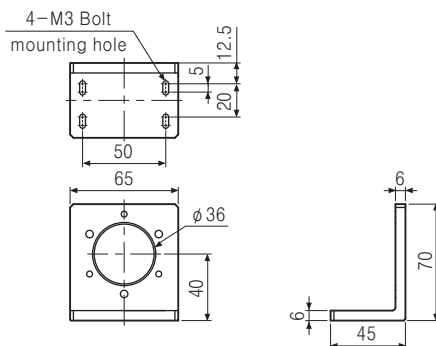
(Unit:mm)

### Hollow built-in type

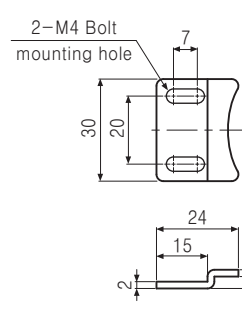


### Bracket

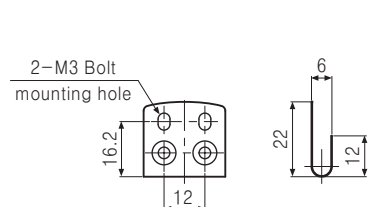
#### SC type: ①



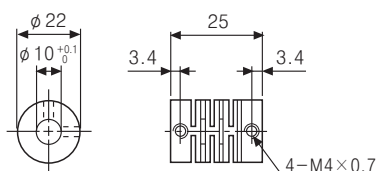
#### SS type: ②



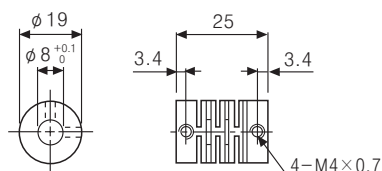
#### HB/H type: ③



#### $\phi 10$ Coupling (E58SC10 Series)



#### $\phi 8$ Coupling (E58SS6 Series)



(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