

E58 Series

Ø58mm Incremental Rotary Encoder

■ Features

[Totem pole, NPN open collector, Voltage, Line driver output type]

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



[Analog sine wave OP Amp output type]

- Taper shaft
- Analog sine wave OP Amp output
- Power supply: 5VDC ±5%



⚠ Please read "Safety Considerations" 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 ^{※1}		
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 : Axial/Radial cable type C: Axial/Radial 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										
S: Shaft	External	Ø9.25mm		2048	10: A, $\bar{A}$, B, $\bar{B}$, Z, $\bar{Z}$, C, $\bar{C}$, D, $\bar{D}$	A: Analog sine wave OP Amp output	5: 5VDC ±5%	R: Axial cable type S: Radial cable type		

※1: Please refer to 'connection' in the specifications for the detailed information about cable.

Incremental Ø58mm Shaft/Hollow Shaft/Blind Hollow Shaft Type

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

Specifications

Item		Shaft Type/Hollow Shaft Type/Blind Hollow Shaft Type Ø58mm Incremental Rotary Encoder	
Resolution (PPR) ^{※1}		*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	
Electrical specification	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)	
	Control output	Totem pole output	• [Low] - Load current: max. 30mA, residual voltage: max. 0.4VDC=
		NPN open collector output	• [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=
		Voltage output	Load current: max. 30mA, residual voltage: max. 0.4VDC=
		Line driver output	Load current: max. 10mA, residual voltage: max. 0.4VDC=
	Response time (rise, fall)	Totem pole output	• [Low] - Load current: max. 20mA, residual voltage: max. 0.5VDC=
		NPN open collector output	• [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=
		Voltage output	
		Line driver output	
	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	• SC/SS/HB type: axial cable type, axial cable connector type, axial/radial connector type • H type: radial cable type, radial cable 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 ² (1.5×10 ⁻⁶ kg·m ²) • H/HB type: max. 20g·cm ² (2×10 ⁻⁶ kg·m ²)	
	Shaft loading	• SC/SS type-Radial: max. 10kgf, Thrust: max. 2.5kgf • H/HB type-Radial: max. 2kgf, Thrust: max. 1kgf	
	Max. allowable revolution ^{※2}	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 ^{※3}	Cable type, Cable connector type	• SC type: approx. 420g (approx. 310g) • SS type: approx. 395g (approx. 285g) • H/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.

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

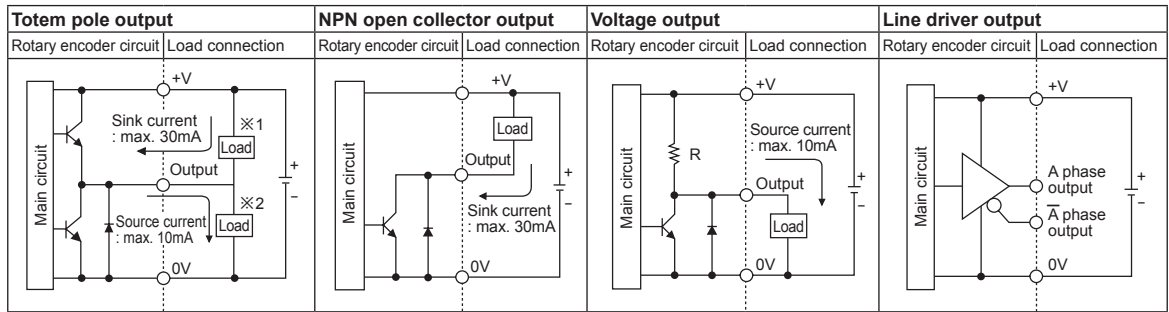
$$[\text{Max. response revolution (rpm)}] = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$$

※3: 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

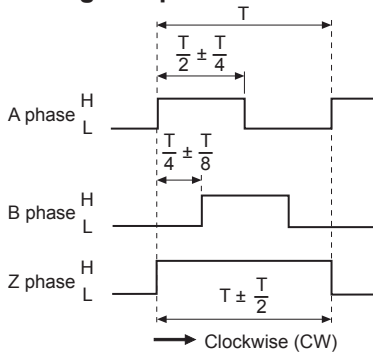
Control Output Diagram



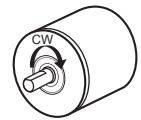
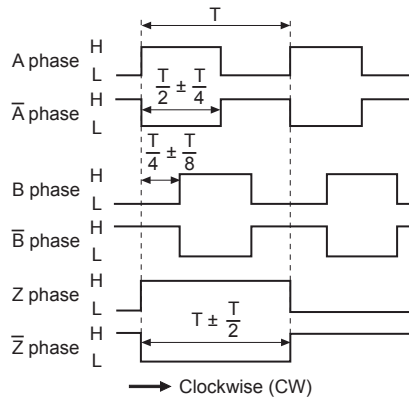
- All output circuits of A, B, Z phase are same. (line driver output is A, $\bar{A}$, B, $\bar{B}$, Z, $\bar{Z}$)
- Totem pole output type can be used for NPN open collector type (※1) or voltage output type (※2).

Output Waveforms

Totem pole output / NPN open collector output / Voltage output



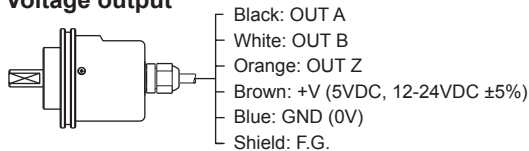
Line driver output



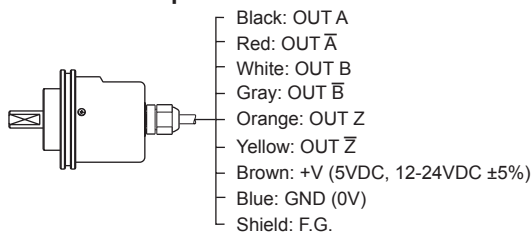
Connections

Axial/Radial cable type

Totem pole output / NPN open collector output / Voltage output



Line driver output



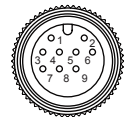
- ※Unused wires must be insulated.
- ※The metal cable and shield cable of encoder should be grounded (F.G.)
- ※Do not apply tensile strength over 30N to the cable.

Axial/Radial cable connector type / Axial/Radial connector type

Totem pole output / NPN open collector output / Voltage 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 A-bar	Red
3	+V	Brown
4	GND	Blue
5	OUT B	White
6	OUT B-bar	Gray
7	OUT Z	Orange
8	OUT Z-bar	Yellow
9	F.G.	Shield

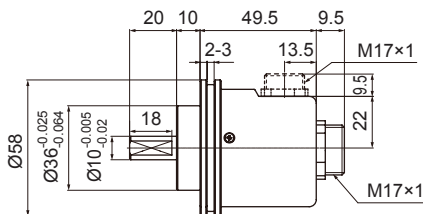
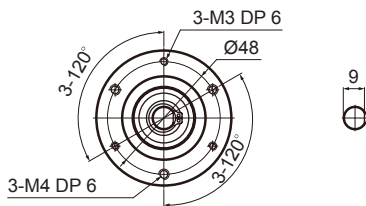
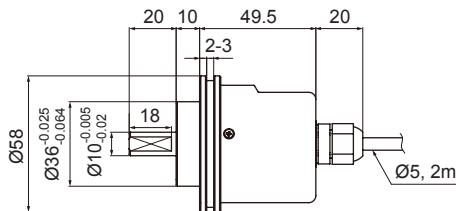
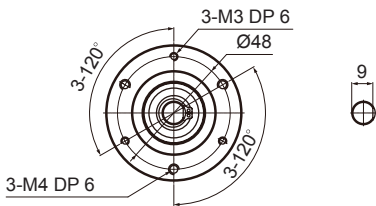
- ※F.G. (field ground): It should be grounded separately.

Incremental Ø58mm Shaft/Hollow Shaft/Blind Hollow Shaft Type

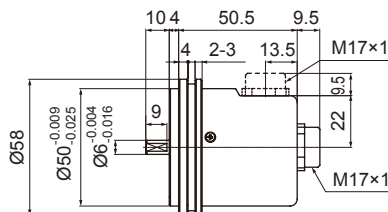
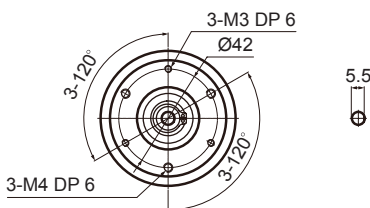
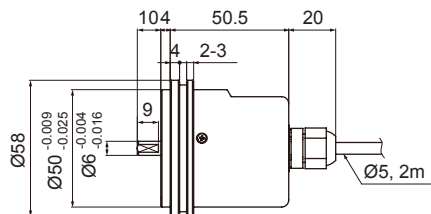
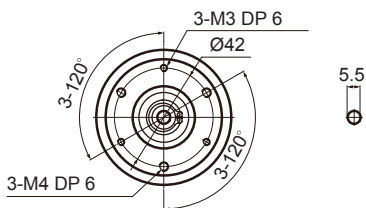
■ Dimensions

○ Shaft clamping type (SC)

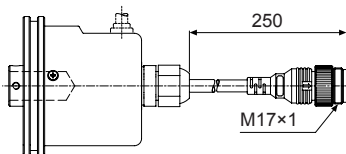
(unit: mm)



○ Shaft synchro type (SS)



● Axial / Radial cable connector type



Cable for Axial/Radial cable 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.

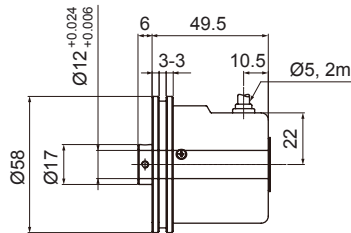
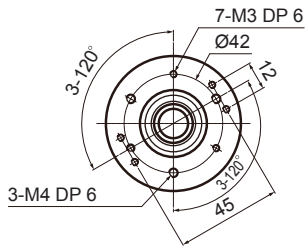
(A)	Photoelectric Sensors
(B)	Fiber Optic Sensors
(C)	Door/Area Sensors
(D)	Proximity Sensors
(E)	Pressure Sensors
(F)	Rotary Encoders
(G)	Connectors/ Connector Cables/ Sensor Distribution Boxes/Sockets
(H)	Temperature Controllers
(I)	SSRs / Power Controllers
(J)	Counters
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(T)	Software

E58 Series

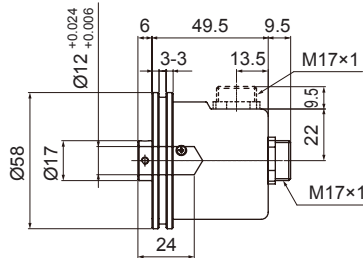
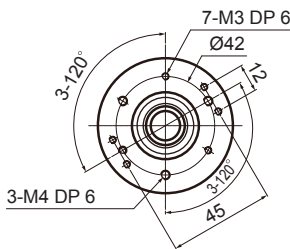
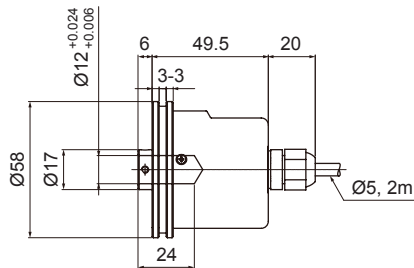
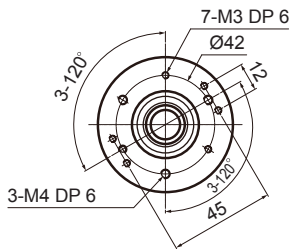
■ Dimensions

○ Hollow shaft type (H)

(unit: mm)

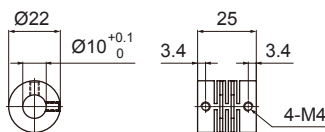


○ Blind hollow shaft type (HB)

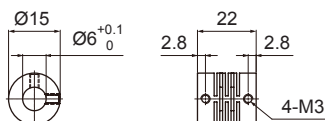


○ Coupling

● E58SC10



● E58SS6



- Parallel misalignment: max. 0.25mm
- Angular misalignment: max. 5°
- 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 0.15 N·m of torque.

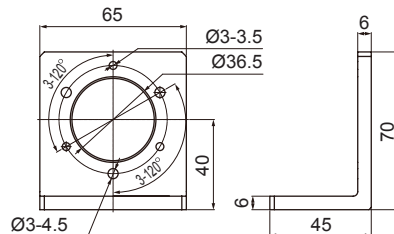
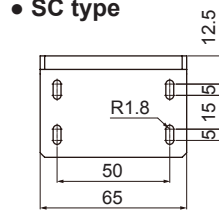
※When you install this unit, if eccentricity and deflection angle are larger, it may shorten the life cycle of this unit.

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

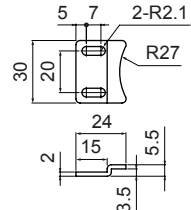
※For flexible coupling (ERB series) information, refer to page F-80.

○ Bracket

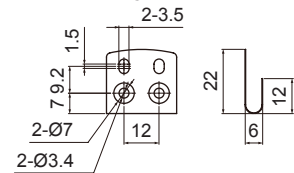
● SC type



● SS type



● H/HB type



Incremental Sine Wave Ø58mm Shaft Type

Shaft Type Ø58mm Sine Wave Incremental Rotary Encoder

■ Specifications

Item		Shaft Type Ø58mm Sine Wave Incremental Rotary Encoder	
Model		E58S9.25-2048-10-A-5-R	E58S9.25-2048-10-A-5-S
Revolution (PPR)		2,048	
Output phase		A, $\bar{A}$, B, $\bar{B}$, Z, $\bar{Z}$, C, $\bar{C}$, D, $\bar{D}$ phase	
Phase difference of output		Phase difference between A and B: $\frac{T}{4} \pm \frac{T}{8}$ (T=1 cycle of A phase)	
		Phase difference between C and D: 90°	
Electrical specification	Control output	Output type	OP Amp output
		Output current	Max. 10mA
		Output voltage	V_{opp} : 0.5V±0.1V
		DC offset	V_{DC} : 2.5V±0.3V
	Max. response frequency		200kHz
	Power supply		5VDC: ±5% (ripple P-P: max. 5%)
	Current consumption		Max. 120mA (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		Axial cable type Radial cable type
Mechanical specification	Starting torque		Max. 100gf·cm (0.0098N·m)
	Moment of inertia		Max. 15g·cm ² (1.5×10 ⁻⁶ kg·m ²)
	Shaft loading		Radial: 10kgf, Thrust: 2.5kgf
	Max. allowable revolution		6,000rpm
Shaft		Taper shaft Ø9.25mm, Taper 1:10	
Vibration		1.5mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours	
Shock		Approx. max. 100G	
Environment	Ambient temp.	-20 to 100°C, storage: -25 to 100°C	
	Ambient humi.	35 to 85%RH, storage: 35 to 90%RH	
Protection structure		IP50 (IEC standard)	
Cable		Ø6mm, 17-wire, 9m, Shield cable (AWG28, core diameter: 0.08mm, number of cores: 17, insulator out diameter: Ø0.8mm)	
Accessory		M5×0.8 (50L), M5×0.8 (47L) wrench bolt	
Approval		CE	
Weight※1		Approx. 1.02kg (approx. 930g)	

※1: 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

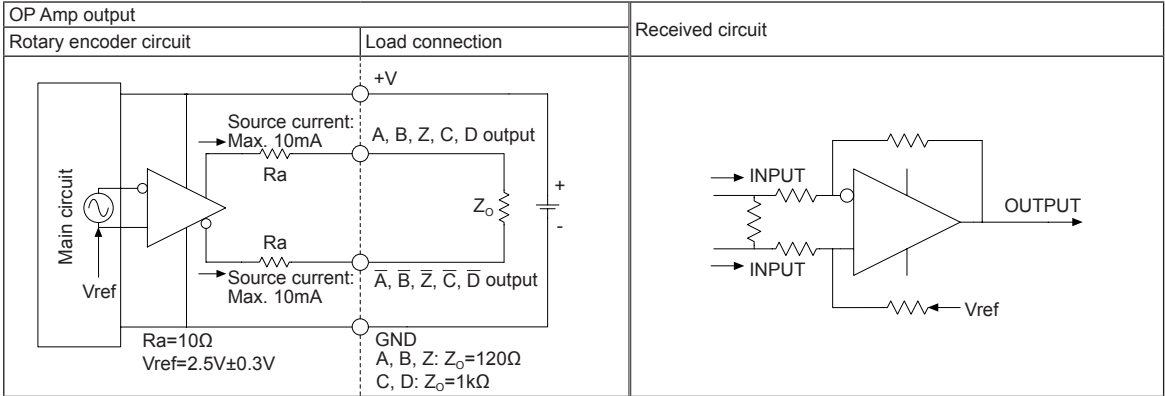
(Q)
Stepper Motors
& Drivers
& Controllers

(R)
Graphic/
Logic
Panels

(S)
Field
Network
Devices

(T)
Software

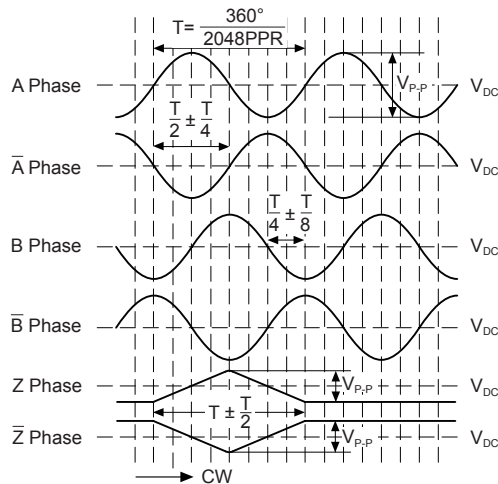
Control Output Diagram



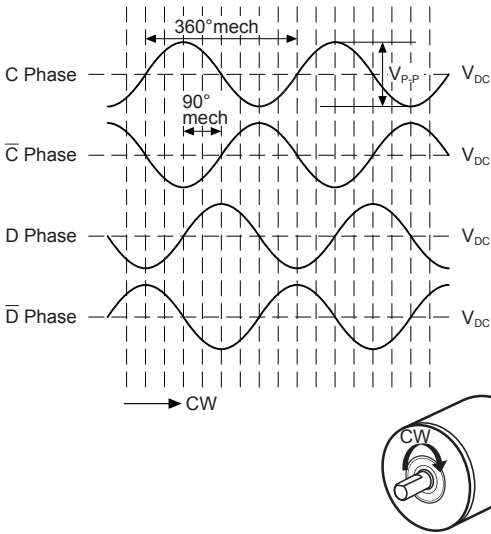
• All output circuits of A, $\bar{A}$, B, $\bar{B}$, Z, $\bar{Z}$, C, $\bar{C}$, D, $\bar{D}$ phase are the same.

Output Waveforms

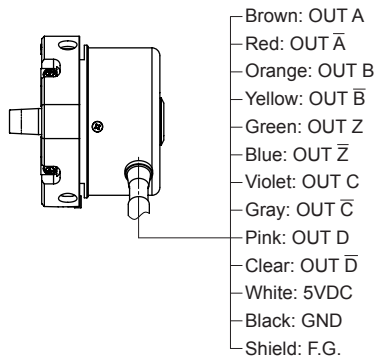
○ A, $\bar{A}$, B, $\bar{B}$, Z, $\bar{Z}$ phase



○ C, $\bar{C}$, D, $\bar{D}$ phase



Connections



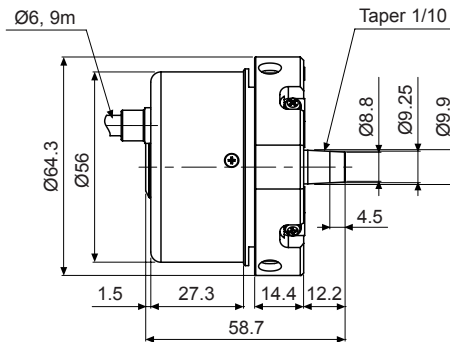
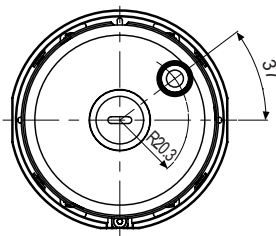
※Unused wires must be insulated.
※The metal case and shield cable of encoder should be grounded (F.G.).
※The output circuit has the dedicated IC and be sure not to short-circuit when wiring the output cables.

Incremental Sine Wave Ø58mm Shaft Type

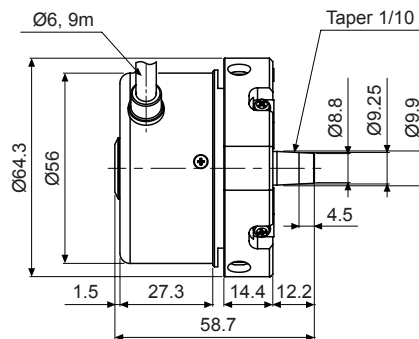
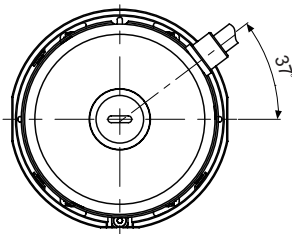
■ Dimensions

(unit: mm)

○ Axial cable type

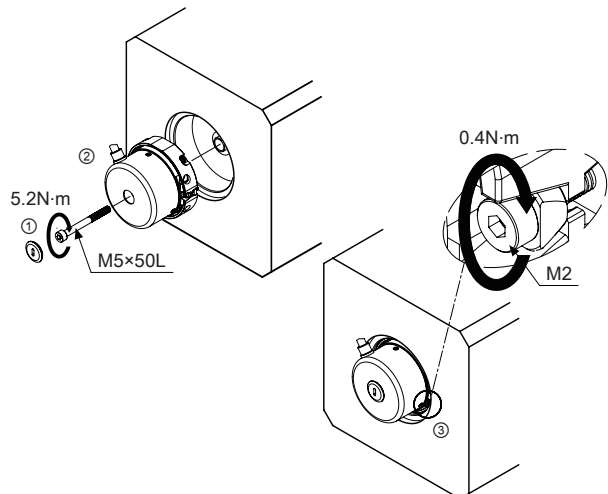
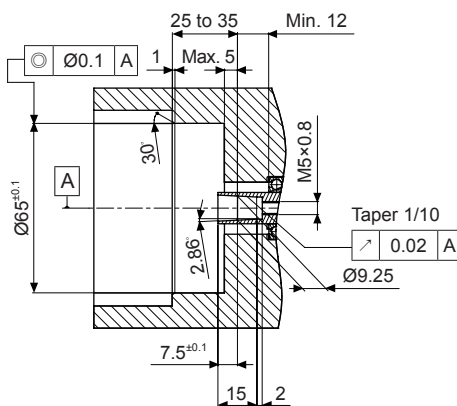


○ Radial cable type



■ Installation

(unit: mm)



- ① Insert the M5×50L wrench bolt at rear of the E58S .
- ② Install the E58S on the device.
- ③ Adjust bracket size with M2 wrench.

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(B)	Fiber Optic Sensors
(C)	Door/Area Sensors
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(Q)	Stepper Motors & Drivers & Controllers
(R)	Graphic/ Logic Panels
(S)	Field Network Devices
(T)	Software