

# Autonics ROTARY ENCODER (INCREMENTAL TYPE) E58 SERIES INSTRUCTION MANUAL



Thank you for choosing our Autonics product.  
Please read the following safety considerations before use.

## ■ Safety Considerations

※ Please observe all safety considerations for safe and proper product operation to avoid hazards.  
※ ⚠ symbol represents caution due to special circumstances in which hazards may occur.

- ⚠ **Warning** Failure to follow these instructions may result in serious injury or death.
- ⚠ **Caution** Failure to follow these instructions may result in personal injury or product damage.

## ⚠ Warning

- Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.** (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)  
Failure to follow this instruction may result in fire, personal injury, or economic loss.
- Install on a device panel to use.**  
Failure to follow this instruction may result in fire.
- Do not connect, repair, or inspect the unit while connected to a power source.**  
Failure to follow this instruction may result in fire.
- Check 'Connections' before wiring.**  
Failure to follow this instruction may result in fire.
- Do not disassemble or modify the unit.**  
Failure to follow this instruction may result in fire.

## ⚠ Caution

- Use the unit within the rated specifications.**  
Failure to follow this instruction may result in fire or product damage.
- Do not short the load.**  
Failure to follow this instruction may result in product damage by fire.
- Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**  
Failure to follow this instruction may result in fire or explosion.
- Do not use the unit near the place where there is the equipment which generates strong magnetic force or high frequency noise and strong alkaline, strong acidic exists.**  
Failure to follow this instruction may result in product damage.

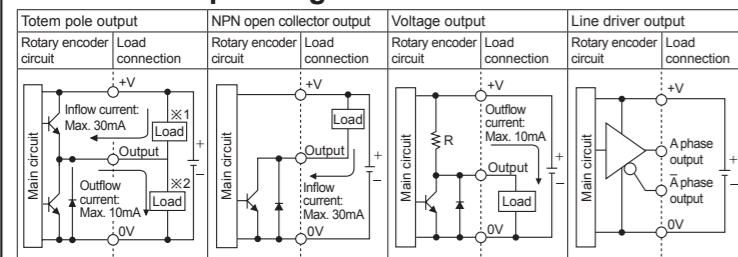
## ■ Ordering Information

E58SC 10 8000 3 N 24

Series	Shaft diameter	Pulses/ Revolution	Output phase	Control output	Power supply	Cable*1
SC : Shaft Clamping	10 Ø10mm	Refer to resolution	2: A, B 3: A, B, Z 4: A, A, B, B, Z 6: A, A, B, B, Z, 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	12 Ø12mm					
HB : Hollow Built-in						

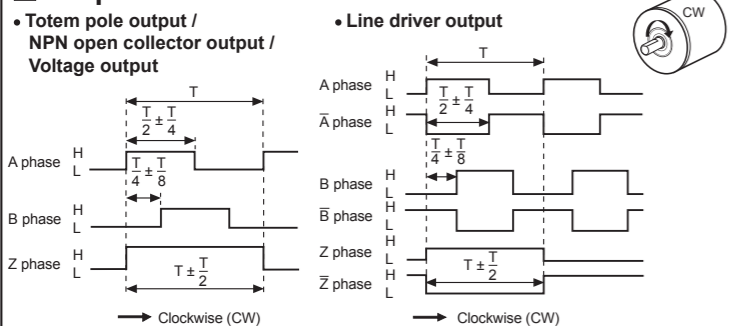
※1: E58H (hollow shaft) has only radial cable type, radial cable connector type.  
Axial or radial cable spec is available when putting order.

## ■ Control Output Diagram



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

## ■ Output Waveforms



※ The above specifications are subject to change and some models may be discontinued without notice.  
※ Be sure to follow cautions written in the instruction manual, and the technical descriptions (catalog, homepage).

## ■ Specifications

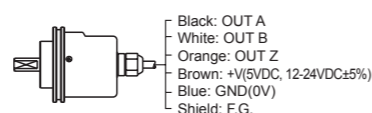
Item	Diameter Ø58mm incremental rotary encoder
Model	Totem pole output E58□□□□-3-T□□□
	NPN open collector output E58□□□□-3-N□□□
	Voltage output E58□□□□-3-V□□□
	Line driver output E58□□□□-3-L□□□
Resolution (PPR)*1	*1, *2, *5, 10, *12, 15, 20, 23, 25, 30, 35, 40, 45, 50, 60, 75, 100, 120, 125, 150, 192, 200, 240, 250, 256, 300, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500, 3000, 3600, 5000, 6000, 8000
Output phase	A, B, Z phase (line driver output: A, A, B, B, Z, 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	Totem pole output
	NPN open collector output
	Voltage output
	Line driver output
Response time (rise, fall)	Totem pole output
	NPN open collector output
	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	Axial/Radial cable type, Axial/Radial connector type, Axial/Radial connector type
Mechanical specification	Starting torque
	Moment of inertia
	Shaft loading
	Max. allowable revolution*2
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 temp.
	Ambient humid.
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), Fixing bracket
Approval	Cable type
	Cable connector type
	Connector type

※1: "\*" pulse is only for A, B phase. (line driver output is for A, A, B, 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.  
[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.

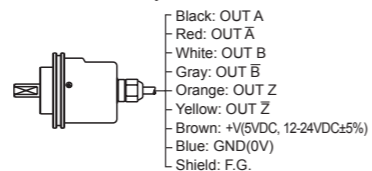
## ■ Connections

### ○ 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
- Line driver output

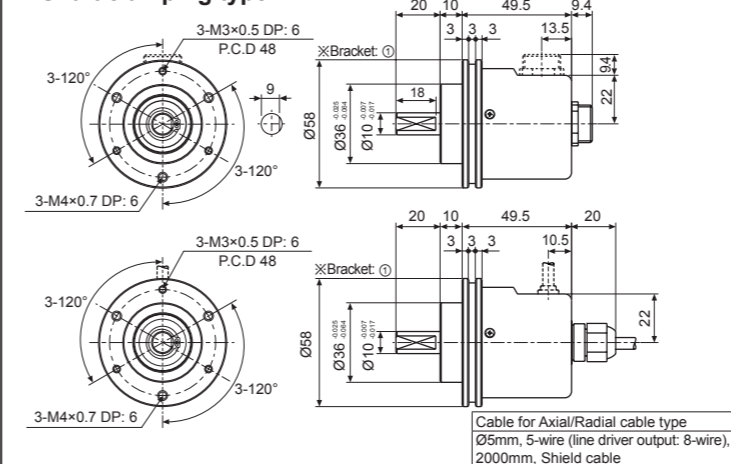


Pin No.	Function	Cable color	Pin No.	Function	Cable color
1	OUT A	Black	1	OUT A	Black
2	OUT B	White	2	OUT A	Red
3	OUT Z	Orange	3	+V	Brown
4	+V	Brown	4	GND	Blue
5	GND	Blue	5	OUT B	White
6	F.G.	Shield	6	OUT B	Gray
			7	OUT Z	Orange
			8	OUT Z	Yellow
			9	F.G.	Shield

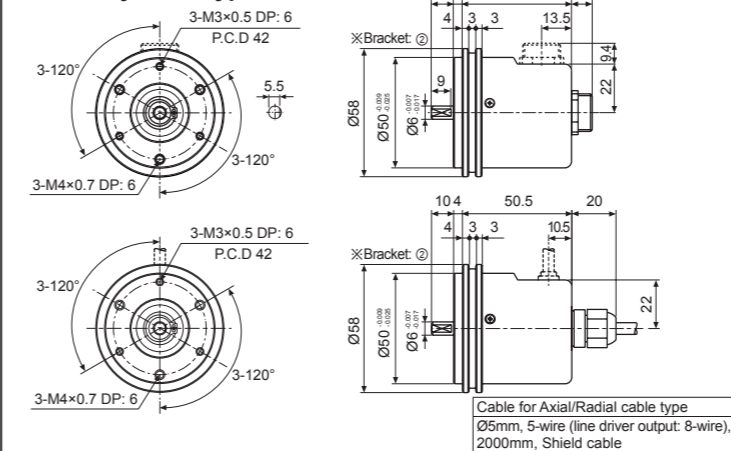
※ F.G. (field ground): It should be grounded separately.

## ■ Dimensions

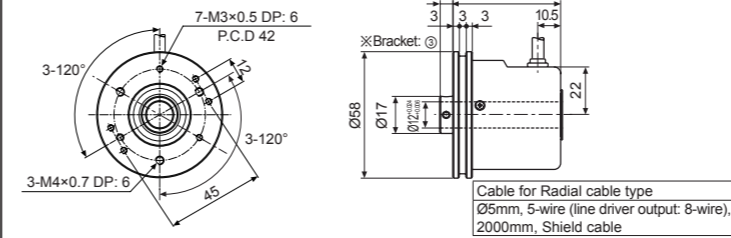
### ○ Shaft clamping type



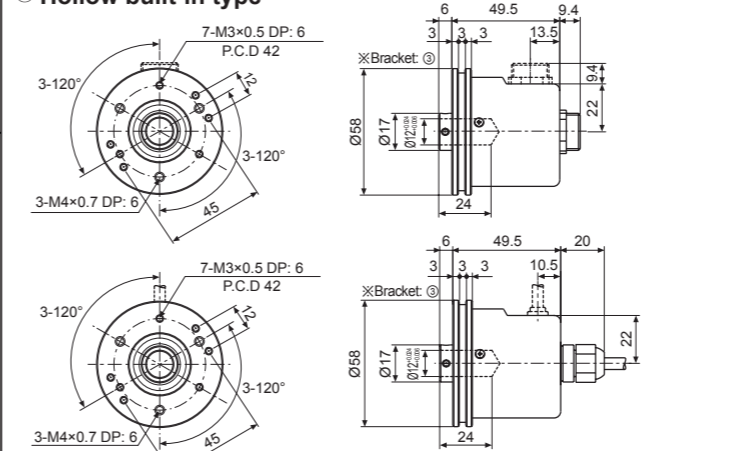
### ○ Shaft synchro type



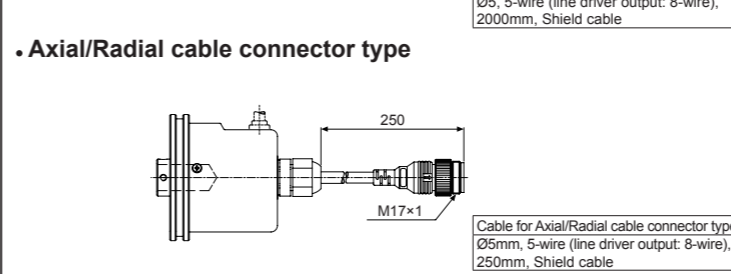
### ○ Hollow type



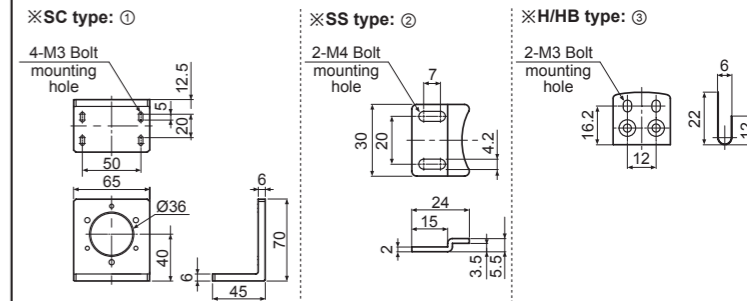
### ○ Hollow built-in type



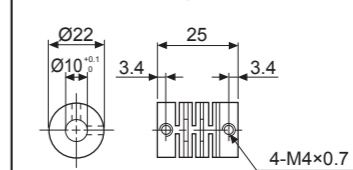
### ○ Axial/Radial cable connector type



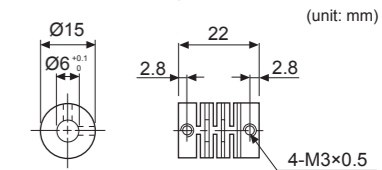
## • Bracket



## • Ø10mm Coupling (E58SC10 Series)



## • Ø6mm Coupling (E58SC6 Series)



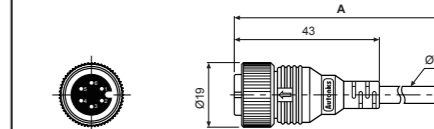
- Parallel misalignment: Max. 0.25mm
- Angular misalignment: Max. 5°
- End-play: Max. 0.5mm

※ Do not load overweight on the shaft.  
※ For flexible coupling (ERB series) information, refer to catalogue.  
※ 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.

## ○ Connector cable (sold separately)

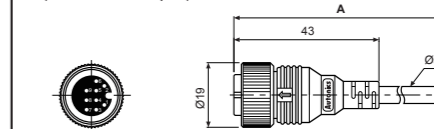
- CID6S-2, CID6S-5, CID6S-10

(Totem pole output / NPN open collector output / Voltage output)



- CID9S-2, CID9S-5, CID9S-10

(line driver output)



Model	Cable length
CID6S-2	2m
CID6S-5	5m
CID6S-10	10m
CID9S-2	2m
CID9S-5	5m
CID9S-10	10m

## ■ Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, It may cause unexpected accidents.
- 5VDC, 12-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- For using the unit with the equipment which generates noise (switching regulator, inverter, servo motor, etc.), ground the shield wire to the F.G. terminal.
- Ground the shield wire to the F.G. terminal.
- When using switching mode power supply, frame ground (F.G.) terminal of power supply should be grounded.
- Wire as short as possible and keep away from high voltage lines or power lines, to prevent inductive noise.
- For Line driver unit, use the twisted pair wire which is attached seal and use the receiver for RS-422A communication.
- Check the wire type and response frequency when extending wire because of distortion of waveform or residual voltage increment etc by line resistance or capacity between lines.
- This unit may be used in the following environments.
  - ① Indoors (in the environment condition rated in 'Specifications')
  - ② Altitude max. 2,000m
  - ③ Pollution degree 2
  - ④ Installation category II

## ■ Major Products

- Photoelectric Sensors
- Fiber Optic Sensors
- Door Sensors
- Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Connector/Sockets
- Switching Mode Power Supplies
- Control Switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper Motors/Drivers/Motion Controllers
- Graphic/Logic Panels
- Field Network Devices
- Laser Marking System (Fiber, CO<sub>2</sub>, Nd: YAG)
- Laser Welding/Cutting System
- Temperature Controllers
- Temperature/Humidity Transducers
- SSRs/Power Controllers
- Counters
- Timers
- Panel Meters
- Tachometer/Pulse (Rate) Meters
- Display Units
- Sensor Controllers

## Autonics Corporation

http://www.autonics.com

■ HEADQUARTERS:  
18, Bansong-ro 513 beon-gil, Haeundae-gu, Busan, South Korea, 48002  
TEL: 82-51-519-3232  
E-mail: sales@autonics.com