

**Autonics**

**ROTARY ENCODER(INCREMENTAL TYPE)  
E58 SERIES**

**M A N U A L**



Thank you very much for selecting Autonics products.  
For your safety, please read the following before using.

**Caution for your safety**

- Please keep these instructions and review them before using this unit.
- Please observe the cautions that follow:
- Warning** Serious injury may result if instructions are not followed.
- Caution** Product may be damaged, or injury may result if instructions are not followed.
- The following is an explanation of the symbols used in the operation manual.
- Caution:** Injury or danger may occur under special conditions.

**Warning**

- In case of using this unit with machineries(Nuclear power control, medical equipment, vehicle, train, airplane, combustion apparatus, entertainment or safety device etc), it is required to install fail-safe device, or contact us. It may cause a fire, human injury or property loss.

**Caution**

- Do not drop water or oil on this unit. It may cause damage or miscontrol due to malfunction.
- Please observe the rated voltage. It may shorten the life cycle or damage to the product.
- Please check the polarity of power and wrong wiring. It may result in damage to this unit.
- Do not short circuit the load. It may cause damage to this unit.

**Outline**

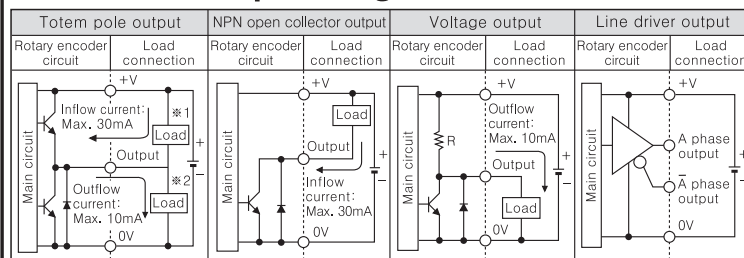
It is widely used in length, angle and position control by converting revolution value of shaft into number of pulse as an optical incremental Encoder.

**Ordering information**

| E58SC   | 10                             | 8000                | 3  | N  | 24   |
|---|--------------------------------|---------------------|--|--|--|
| Series<br>Diameter φ58mm  | Shaft diameter                 | Pulse/1Revolution   | Output phase   | Output   | Power supply   |
| SC : Shaft Clamping<br>SS : Shaft Synchro<br>H : Hollow shaft<br>HB : Hollow shaft built-in | 10 φ10mm<br>6 φ6mm<br>12 φ12mm | Refer to resolution | 2:A, B<br>3:A, B, Z<br>(Standard)<br>4:A, Ā, B, B̄<br>6:A, Ā, B, B̄, Z, Z̄ | T:Totem pole output<br>N:NPN open collector output<br>V:Voltage output<br>L:Line driver output | 5:5VDC ±5%<br>24:12~24VDC ±5%  |
|   |                                |                     |  |  | Cable<br>No mark:Normal type<br>C:Axial outgoing connector type (250mm)<br>CR:Axial connector integrated type<br>CS:Radial connector integrated type |

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

**Control output diagram**



For the output circuit for A, B, Z phase are all the same. (Line Driver output is A, Ā, B, B̄, Z, Z̄)  
Totem pole output can be used for NPN open collector type(\*1) or voltage output type(\*2).

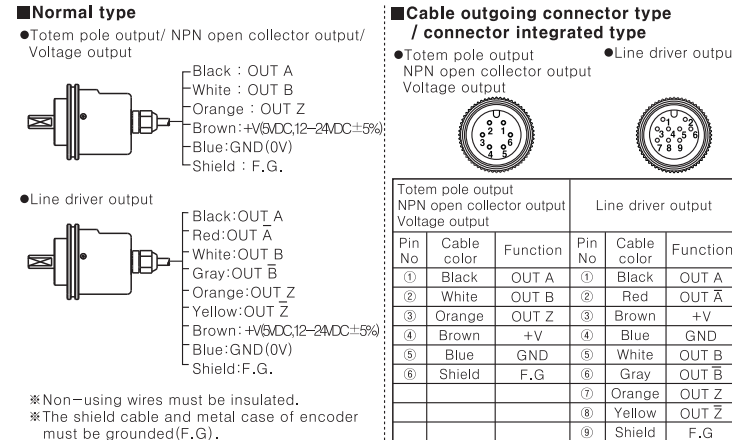
\*The above specifications are subject to change and some models may be discontinued without notice.

**Specifications**

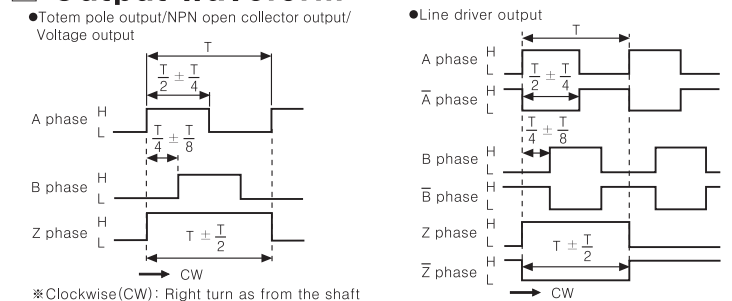
| Item                       | Diameter φ58mm Incremental Rotary encoder  |
|----------------------------|--|
| Model                      | Totem pole output: E58□□-□□□□-3-T-□<br>NPN open collector output: E58□□-□□□□-3-N-□<br>Voltage output: E58□□-□□□□-3-V-□<br>Line driver output: E58□□-□□□□-6-L-□   |
| Resolution(P/R)            | *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, Ā, B, B̄, Z, Z̄ 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)  |
| Electrical specification   | Totem pole output<br>Load current : Max. 30mA, Residual voltage : Max. 0.4VDC<br>High Load current : Max. 10mA<br>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<br>Load current : Max. 30mA, Residual voltage : Max. 0.4VDC<br>Voltage output : Max. 10mA, Residual voltage : Max. 0.4VDC  |
|                            | Line driver output<br>Low load current: Max. 20mA, Residual voltage : Max. 0.5VDC<br>High load current: Max. 20mA, Residual voltage : Max. 0.5VDC<br>Power voltage 12~24VDC Output voltage: Min. (Power voltage=3.0)VDC                                  |
|                            | Totem pole output<br>NPN open collector output<br>Max. 1μs (Cable length:2m, I sink=20mA)  |
| Response time (Rise/Fall)  | Line driver output<br>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),<br>Line driver output : Max. 50mA (disconnection of the load)   |
| Insulation resistance      | Min. 100MΩ (at 500VDC megger between 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<br>SC/SS type : Max. 40gf·cm (0.004N·m)<br>HB/H type : Max. 90gf·cm (0.009N·m)   |
|                            | Moment of inertia<br>SC/SS type : Max. 15g·cm <sup>2</sup> (1.5×10 <sup>-6</sup> kg·m <sup>2</sup> )<br>HB/H type : Max. 20g·cm <sup>2</sup> (2×10 <sup>-6</sup> kg·m <sup>2</sup> )   |
|                            | Shaft loading<br>SC/SS type : Max. Radial : 1kgf, Thrust : Max. 2.5kgf<br>HB/H type : Max. Radial : 2kgf, Thrust : Max. 1kgf   |
|                            | Max. allowable revolution<br>(Note2) 5000rpm   |
| Vibration                  | 1.5mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each of X, Y, Z directions for 2 hours  |
| Shock                      | Max. 75G   |
| Ambient temperature        | -10 to 70°C, Storage : -25 to 85°C   |
| Ambient humidity           | 35 to 85%RH, Storage : 35 to 90%RH   |
| Protection                 | IP50 (IEC standard)  |
| Cable                      | φ5mm, 5-wire, Length:2m, Shield cable (Line driver output: φ5mm, 8-wire) (AWG24, Core diameter:0.08mm, Number of cores:40, Insulator diameter: φ1mm)   |
| Accessory                  | φ10mm(SC type)/φ6mm(SS type) coupling, Fixing bracket  |
| Unit weight                | SC-CS/CR type: Approx. 230g, SS-CS/CR type: Approx. 205g, HB-CS/CR type: Approx. 200g<br>SC type: Approx. 310g, SS type: Approx. 285g, HB type: Approx. 270g, H type: Approx. 270g   |
| Approval                   | CE (Except Line driver output)   |

(Note1) 1, 2, 5, 12 P/R are output A and B phase only. (But Line driver output : A, Ā, B, B̄ phase)  
(In case of hollow shaft type, except 6000, 8000 P/R)  
(Note2) Max. allowable revolution ≥ Max. response revolution  
[Max. response revolution (rpm) = Max. response frequency × 60 sec]  
Resolution  
Please select the resolution to make max. revolution lower than max. allowable revolution.  
\*The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

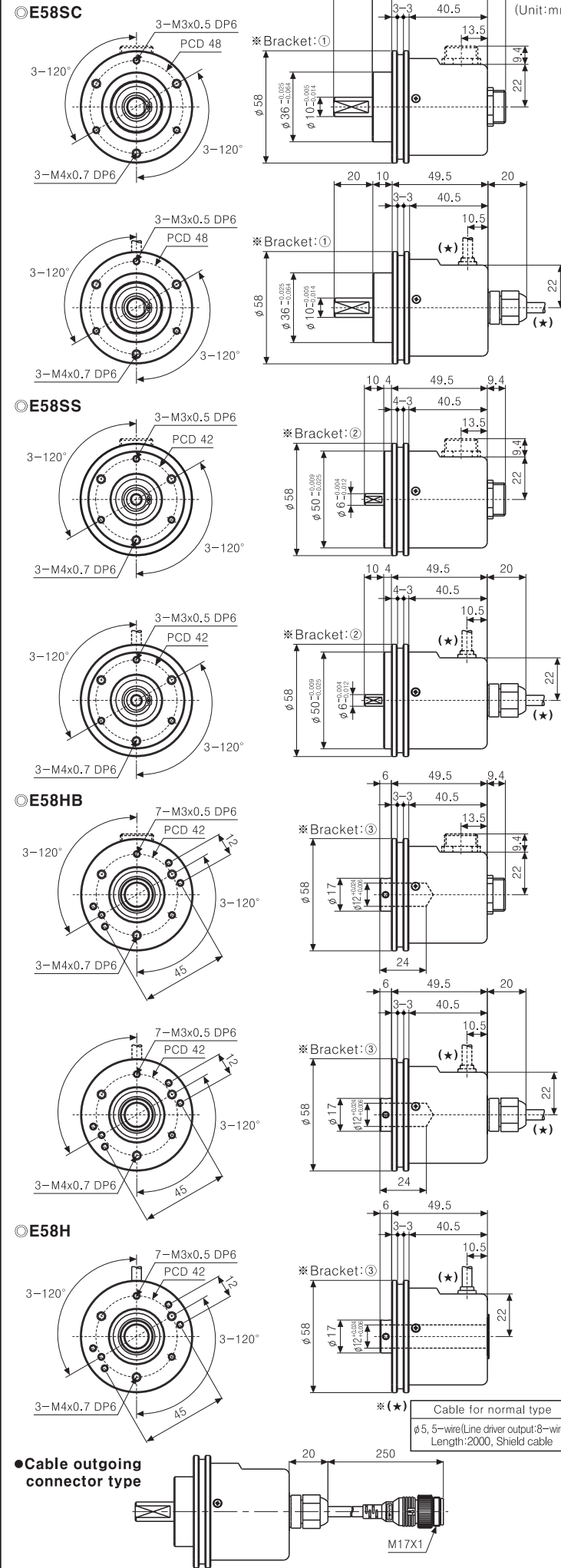
**Connections**



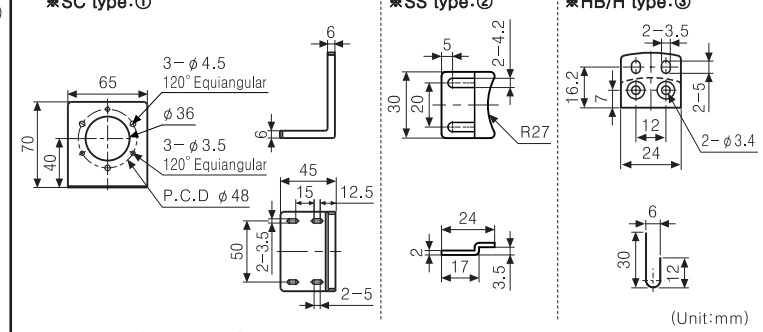
**Output waveform**



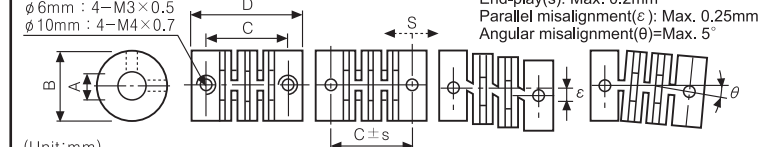
**Dimensions**



**Bracket**

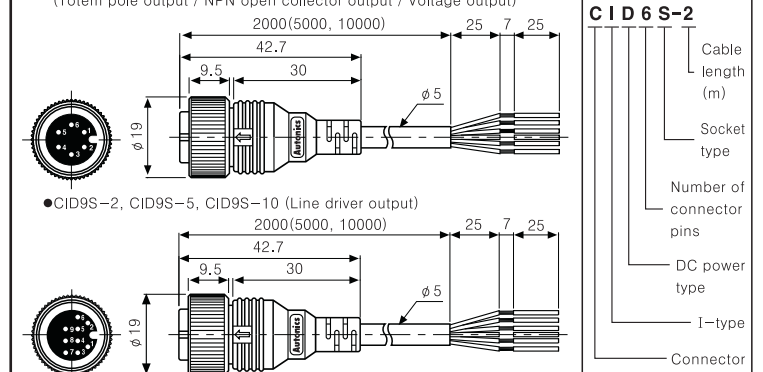


**Coupling (E58SC10/E58SS6 Series)**



| Type          | Item                                | A   | B    | C  | D |
|---------------|-------------------------------------|-----|------|----|---|
| E58SS6 φ6mm   | φ6 <sup>+0.1</sup> <sub>-0.1</sub>  | φ15 | 16.5 | 22 |   |
| E58SC10 φ10mm | φ10 <sup>+0.1</sup> <sub>-0.1</sub> | φ22 | 18.2 | 25 |   |

**Connector cable**



**Caution for using**

- Installation
    - This unit consists of precision components. If you drop this unit, it may lose the function. Please treat this product carefully.
    - When installing this unit, if parallel and angular misalignment is larger, load is applied to the shaft. It may shorten the life cycle of this unit.
    - Do not put strong impact when inserting coupling into shaft.
  - For using
    - Please use Twist pair shield cable and use proper receiver for RS-422A communication.
    - Do not connect and cut circuit during power on, or it may cause damage to the unit.
    - When using switching power, install the surge absorber on power line and make the wire as short as possible to avoid noise.
  - Environment
    - Please do not use this unit with below environment, it may cause malfunction.
    - Place where this unit or component may be damaged by strong vibration or impact.
    - Place where there are lots of flammable or corrosive gases.
    - Place where strong magnet field or electric noise occurs.
    - Place where is beyond of rating temperature or humidity.
    - Place where strong acids or alkali near by.
    - Place where there is the direct ray of the sun.
  - Vibration and Impact
    - If big impact or strong vibration applies to the product it may cause pulse errors. Be sure that when installing this unit.
    - Encoder with high resolution can be easily affected by vibration, therefore tighten fixing bracket when installing this unit.
  - Wire connection
    - Do not pull out the wire with over 30N strength after fixing the unit and wiring the cable.
    - If wiring encoder cable with high voltage line or power cable in the same conduit, it may cause a malfunction or mechanical problem. Please wire it separately or use separated conduit.
- \*It may cause malfunction if above instructions are not followed.**

**Major products**

- Photoelectric sensors
- Fiber optic sensors
- Door sensors
- Door side sensors
- Area sensors
- Proximity sensors
- Pressure sensors
- Rotary encoders
- Connectors/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/soldering system
- Temperature controllers
- Temperature/Humidity transducers
- Tachometer/Pulse/Rate/meters
- SSR/Power controllers
- Sensor controllers
- Display units
- Panel meters
- Counters
- Timers

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