

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 malfunction due to malfunction.
- Please observe voltage rating. 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 result in damage to this unit.

Outline

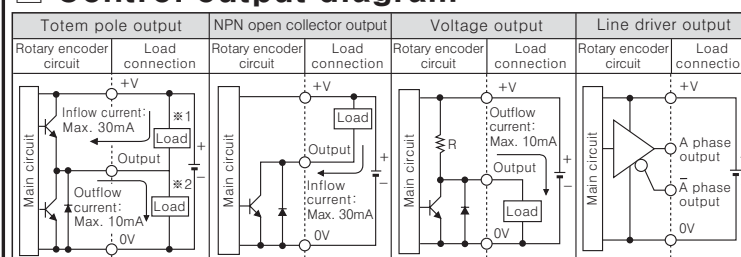
It is widely used in length, angle and position control by converting revolution value of shaft into number of pulse as an optical incremental Encoder.

Ordering information

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

*Standard cable for shaft/built-in encoder is axial connector type cable.
Standard cable for hollow shaft encoder is radial connector type cable.
*Customizable model specifications are available.
*The power of Line driver is only for 5VDC.

Control output diagram



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

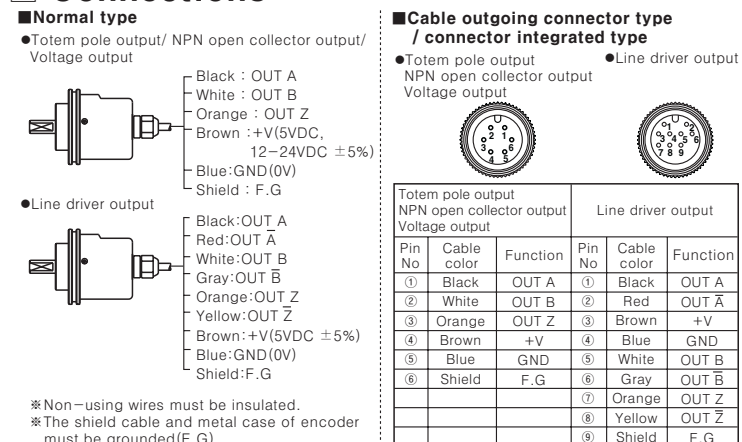
*The above specifications are subject to change without notice.

Specifications

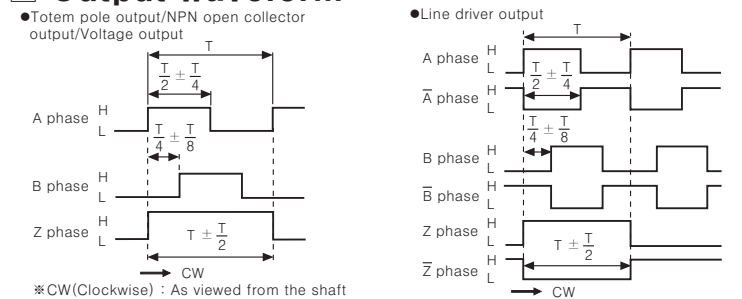
Item	Diameter φ58mm Incremental Rotary encoder	
Model	Totem pole output: E58□□-□□□□-3-T-□ NPN open collector output: E58□□-□□□□-3-N-□ Voltage output: E58□□-□□□□-3-V-□ Line driver output: E58□□-□□□□-6-L-5	
Resolution(P/R)	*1, *2, *5, 10, *12, 15, 20, 23, 25, 30, 35, 40, 45, 50, 60, 75, 100, 120, 125, 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, A, B, B, Z, Z phase)	
Phase difference of output	Phase difference between A and B phase: $\frac{T}{4} + \frac{T}{8}$ (T=1 cycle of A phase)	
Electrical specification	Totem pole output Control 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 Voltage output	Load current: Max. 30mA, Residual voltage: Max. 0.4VDC Load current: Max. 10mA, Residual voltage: Max. 0.4VDC
	Line driver output	•Low ⇒ Load current: Max. 20mA, Residual voltage: Max. 0.5VDC •High ⇒ Load current: Max. -20mA, Output voltage: Min. 2.5VDC
	Totem pole output NPN open collector output Voltage output Line driver output	Max. 1μs (Cable length: 2m, I sink=20mA) 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	Min. 100MΩ (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 · cm (0.004N · m) •HB/H type: Max. 90gf · cm (0.009N · m)
	Moment of inertia	•SC/SS type: Max. 15g · cm ² (1.5 × 10 ⁻⁶ kg · m ²) •HB/H type: Max. 20g · cm ² (2 × 10 ⁻⁶ kg · m ²)
	Shaft loading	•SC/SS type ⇒ Max. Radial: 10kg · f, Thrust: Max. 2.5kg · f •HB/H type ⇒ Max. Radial: 2kg · f, Thrust: Max. 1kg · f
Max. allowable revolution	(Note2) 5000rpm	
Vibration	1.5mm amplitude at frequency of 10-55Hz (for one minute cycle) in each of X, Y, Z directions for 2 hours	
Shock	Max. 75G	
Ambient temperature	-10 ~ 70°C (at non-freezing status), Storage: -25 ~ 85°C	
Ambient humidity	35 ~ 85%RH, Storage: 35-90%RH	
Protection	IP50 (IEC standard)	
Cable	φ5mm, 5P, Length: 2m, Shield cable (Line driver output: φ5mm, 8P)	
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 •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, A, B, B phase)
[In case of hollow shaft type, 6000, 8000 P/R excluded]
* (Note2) Max. allowable revolution ≥ Max. response revolution
[Max. response revolution (rpm) = $\frac{\text{Resolution}}{\text{Resolution}} \times 60 \text{ sec}$]
Please select the resolution to make max. revolution lower than max. allowable revolution.

Connections

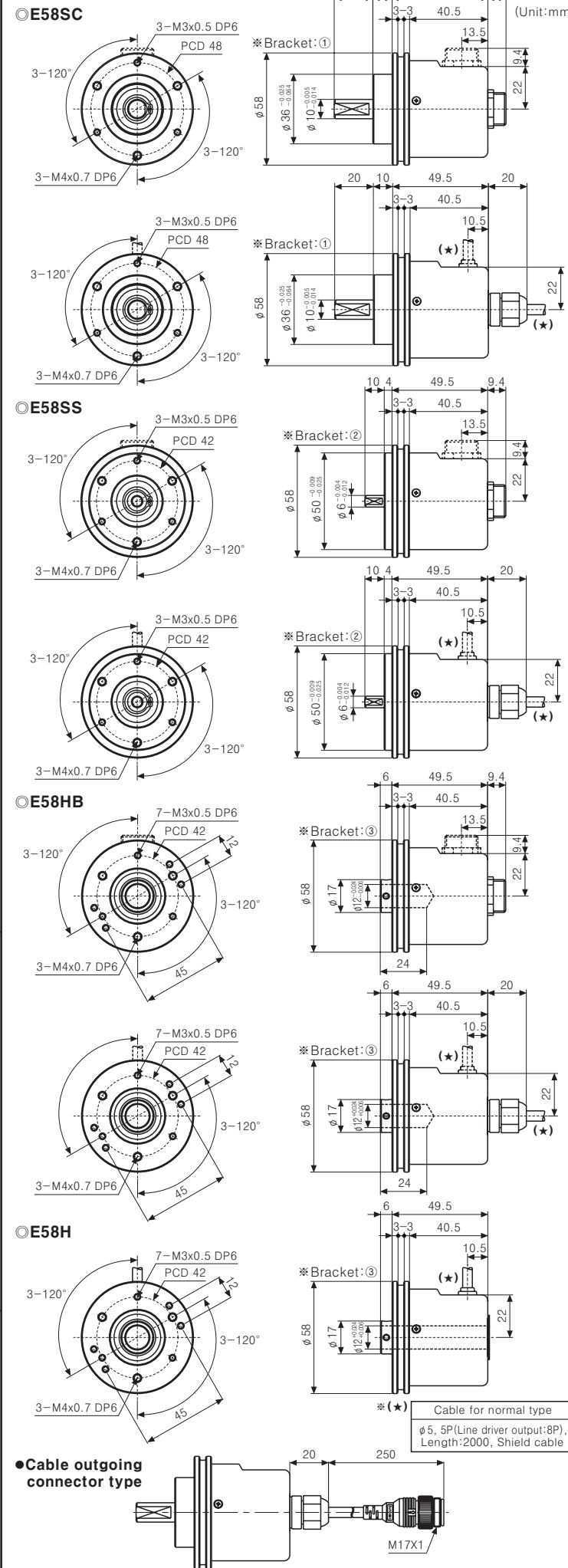


Output waveform

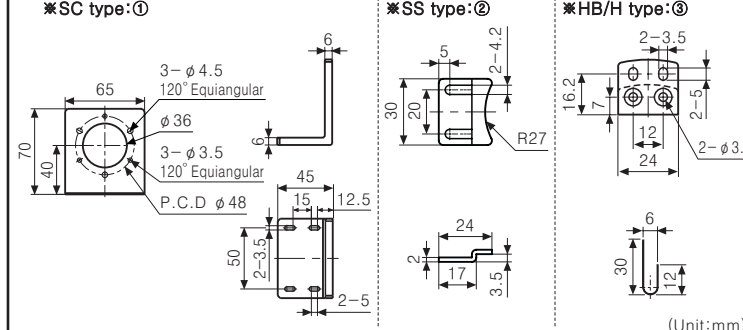


*CW (Clockwise): As viewed from the shaft

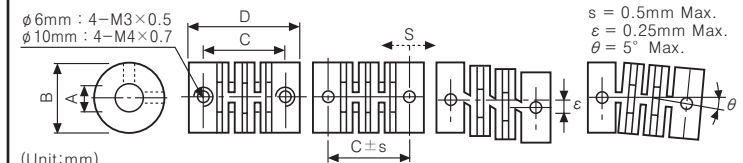
Dimensions



Bracket

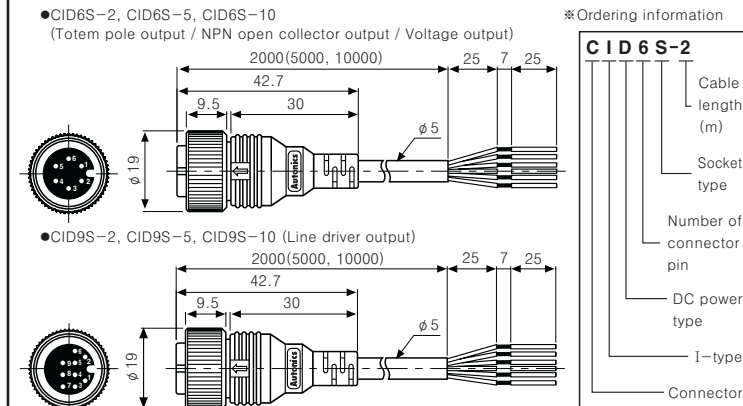


Coupling (E58SC10/E58SS6 Series)



When mounting the coupling to encoder shaft, if there is big eccentricity or bend 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.

Connector cable



Caution for using

- Installation
 - Handle the unit with care since it consists of precision components.
 - Be careful not to make eccentricity and deflection angle larger, it may shorten the life cycle.
 - Do not put strong impact when insert 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 use 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 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.
- Vibration and Impact
 - When the strong impact loads on this unit, it may cause an error.
 - High resolution encoder can be easily affected by vibration, fix the bracket firmly to install.
- Wire connection
 - Do not draw the wire with over strength 30N after wiring.
 - If wire 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

- PROXIMITY SENSOR
- AREA SENSOR
- DOOR/DOOR SIDE SENSOR
- PRESSURE SENSOR
- PHOTOELECTRIC SENSOR
- FIBER OPTIC SENSOR
- ROTARY ENCODER
- SENSOR CONTROLLER
- SWITCHING POWER SUPPLY
- TEMPERATURE CONTROLLER
- TEMPERATURE/HUMIDITY TRANSDUCER
- POWER CONTROLLER
- TACHOMETER/PULSE (RATE) METER
- PANEL METER
- SIGNAL CONVERTOR
- TIMER
- GRAPHIC PANEL
- STEPPING MOTOR & DRIVER & MOTION CONTROLLER

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