

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

1. In case of using this unit with machinery(Ex: nuclear power control, medical equipment, ship, vehicle, train, airplane, combustion apparatus, safety device, crime/disaster prevention equipment, etc) which may cause damages to human life or property, it is required to install fail-safe device.
It may cause a fire, human injury or damage to property.

Caution

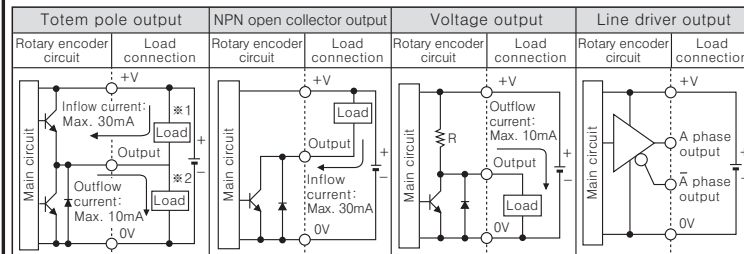
- Do not drop water or oil on this unit.**
It may cause damage or malfunction due to malfunction.
- Please observe the rated voltage.**
It may shorten the life cycle or damage to the product.
- Please check the polarity of power and wrong wiring.**
It may result in damage to this unit.
- Do not short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

Ordering information

E58SC	10	8000	3	N	24	CS
Series Diameter ø 58mm	Shaft diameter 10 ø 10mm	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 shaft HB : Hollow shaft built-in	6 ø 6mm 12 ø 12mm	Refer to resolution	4:A, Ā, B̄, Z̄ 6:A, Ā, B̄, Z̄			

*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



⚠ 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).

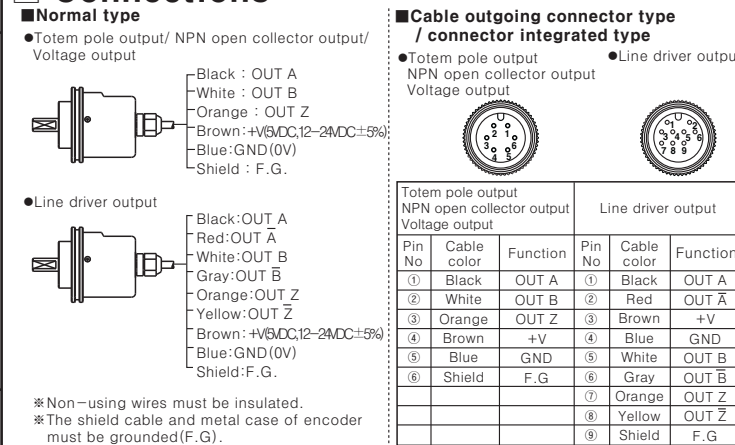
*The above specifications are subject to change without notice.

Specifications

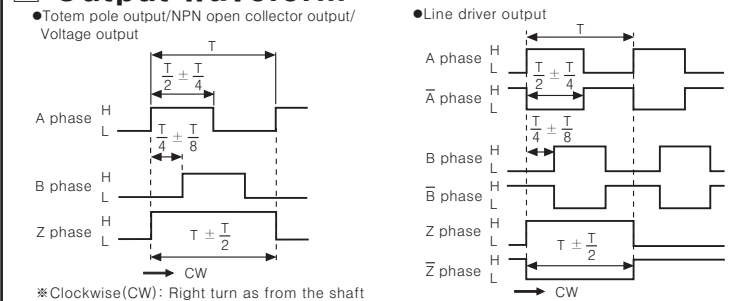
Item	Specifications
Model	Diameter ø 58mm Incremental Rotary encoder E58□□-□□□□-3-T-□ E58□□-□□□□-3-N-□ E58□□-□□□□-3-V-□ E58□□-□□□□-6-L-□
Resolution(P/R)	+1, +2, +5, 10, +12, 15, 20, 23, 25, 30, 35, 40, 45, 50, 60, 75, 100, 120, 125, 150, 192, 200, 240, 250, 256, 300, 360, 400, 500, 512, 600, 800, 1000, 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 ●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 Load current : Max. 30mA, 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 Power voltage 12~24VDC Output voltage: Min. (Power voltage-3.0)VDC
	Totem pole output NPN open collector output Voltage output Line driver output Max. 1μs (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 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 ●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 ⁻⁴ kg·m ²) ●HB/H type : Max. 20g·cm ² (2×10 ⁻⁴ kg·m ²)
	Shaft loading ●SC/SS type : Max. Radial : 1kgf, Thrust : Max. 2.5kgf ●HB/H type : Max. Radial : 2kgf, Thrust : Max. 1kgf
	Max. allowable revolution (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	ø 5mm, 5-wire, Length:2m, Shield cable(Line driver output: ø 5mm, 8-wire) (AWG24, Core diameter:0.08mm, Number of cores:40, Insulator diameter: ø 1mm)
Accessory	ø 10mm(SC type)/ø 6mm(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, 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) = $\frac{\text{Resolution}}{\text{Resolution}} \times 60 \text{ sec}$]
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

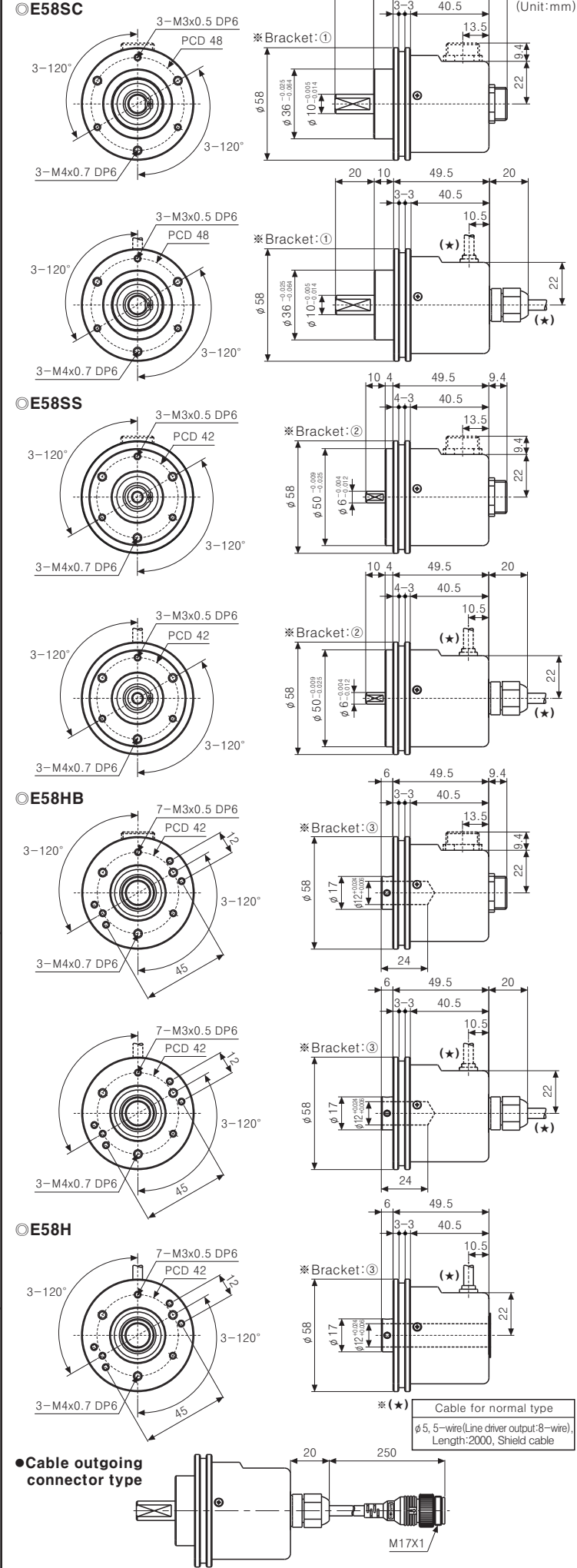


Output waveform

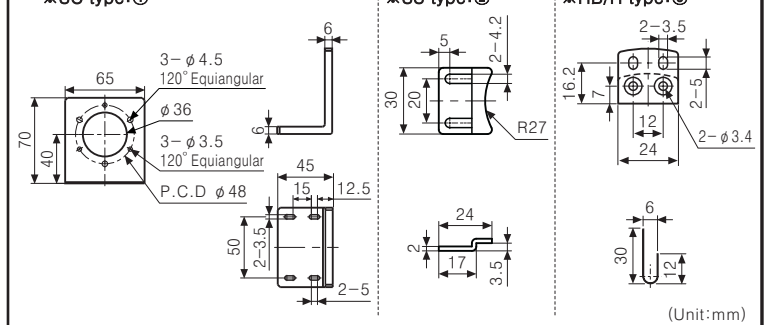


*Clockwise(CW): Right turn as from the shaft

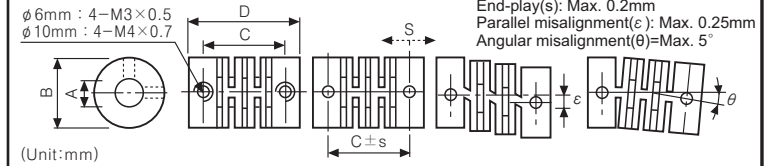
Dimensions



Bracket



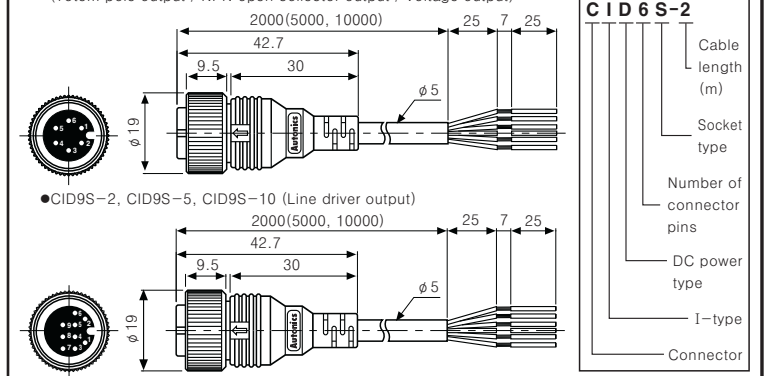
Coupling(E58SC10/E58SS6 Series)



Type	Item	A	B	C	D
E58SS6 ø 6mm		ø 6 ^{+0.01}	ø 15	16.5	22
E58SC10 ø 10mm		ø 10 ^{+0.01}	ø 22	18.2	25

*When mounting the coupling to encoder shaft, if there is combined misalignment(parallel, angular misalignment) 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.
*For more information about flexible couplings (ERB Series), refer to Autonics catalogue.

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 mechanical 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 sensors
- Area sensors
- Door/Door side sensors
- Counters
- Rotary encoders
- Power controllers
- Panel meters
- Temperature controllers
- Temperature/Humidity transducers
- Stepping motors/drivers/motion controllers
- Laser marking system(CO₂, Nd:YAG)
- Laser welding/soldering system
- Proxibed sensors
- Fiberopticsensors
- Pressure sensors
- Timas
- Display units
- Sensor controllers
- Graphical Log panels
- Tachometer/Pulse(Rate) meters

Autonics Corporation
http://www.autonics.com

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HEAD QUARTERS :
41-5, Yongdang-dong, Yangsan-si, Gyeongsang, 626-847, Korea

OVERSEAS SALES :
Bldg. 402 3rd Fl. Bucheon Techno Park, 193, Yaldae-dong, Wornmi-gu, Bucheon-si, Gyeonggi-do, 420-734, Korea
TEL: 82-32-610-2730 / FAX: 82-32-329-0728
E-mail: sales@autonics.com

The proposal of a product improvement and development : product@autonics.com

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