

**Autonics**

**ROTARY ENCODER(INCREMENTAL TYPE)  
E100H 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. When use this unit for controlling highly affective equipment to human or properties. (Medical instrument, Vehicles, Train, Airplane, combustion apparatus, entertainment etc.), it requires installing a fail safety device.**  
It may cause serious human injury or a fire, property.

**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**

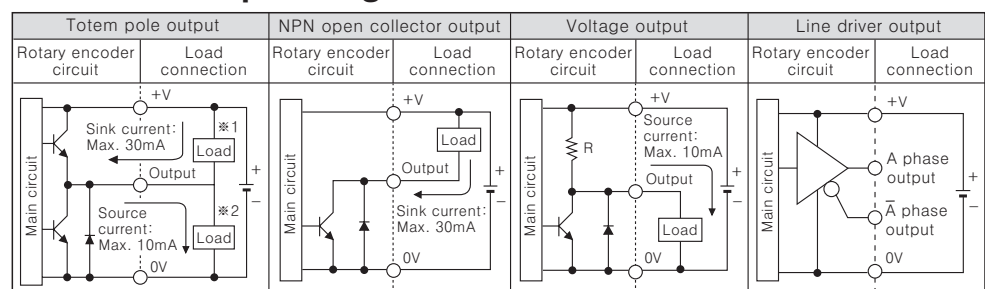
This Rotary Encoder is optical incremental type, these Encoder register position and angular speed determination by counting the number of pulses on the rotary shaft.

**Ordering information**

<b>E100H</b>	<b>35</b>	<b>10000</b>	<b>3</b>	<b>N</b>	<b>24</b>
Series	Shaft inside diameter	Pulse/1 Revolution	Output phase	Output	Power supply
Diameter $\phi$ 100mm, Hollow shaft type	$\phi$ 35mm	512, 1024, 10000	3 : A, B, Z 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 $\pm$ 5% 24 : 12-24VDC $\pm$ 5%

※The power of Line driver is only for 5VDC

**Control output diagram**



※ The output circuit of A, B, Z phase are the same. (Line Driver output is A,  $\bar{A}$ , B,  $\bar{B}$ , Z,  $\bar{Z}$ )  
 ※ Totem pole output can be used for NPN open collector output type(※1) or voltage output type(※2).  
 ※ The above specification are changeable without notice anytime.

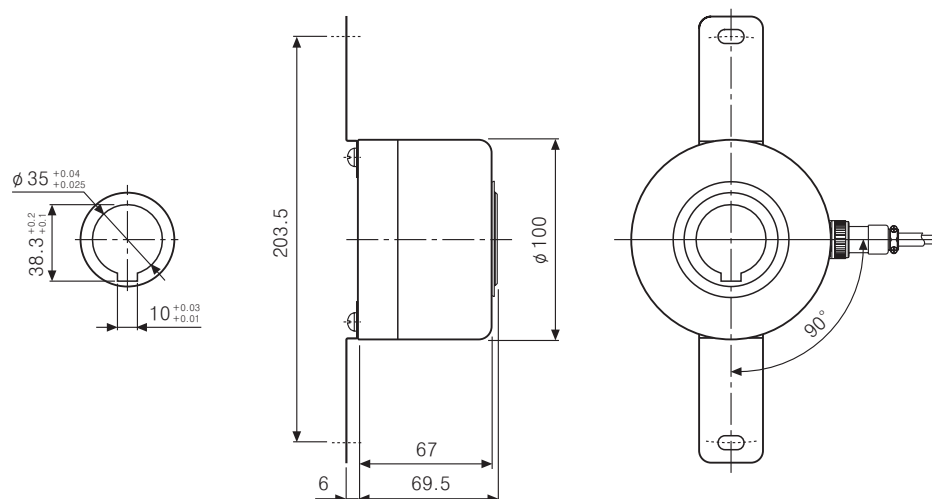
**Specifications**

Item	Diameter $\phi$ 100mm hollow shaft type Incremental Rotary encoder	
Model	<b>E100H35-□-□-3-T-□</b> <b>E100H35-□-□-3-N-□</b> <b>E100H35-□-□-3-V-□</b> <b>E100H35-□-□-6-L-5</b>	
Resolution(P/R)	512, 1024, 10000(Not indicated type is available to customize)	
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=1cycle of A phase)	
Electrical specification	Control output	• Low $\Rightarrow$ Load current:Max. 30mA, Residual voltage:Max. 0.4VDC • High $\Rightarrow$ 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
	Voltage output	Load current : Max. 10mA, Residual voltage : Max. 0.4VDC
	Line driver output	• Low $\Rightarrow$ Load current : Max. 20mA, Residual : Max. 0.5VDC • High $\Rightarrow$ Load current : Max. -20mA, Output voltage : Min. 2.5VDC
Response time (Rise/Fall)	Totem pole output	Max. 1 $\mu$ s
	NPN open collector output	Max. 1 $\mu$ s
	Voltage output	Max. 1 $\mu$ s
	Line driver output	Max. 0.5 $\mu$ s
Max. Response frequency	300kHz	
Power supply	• 5VDC $\pm$ 5%(Ripple P-P:Max. 5%) • 12-24VDC $\pm$ 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. 100M $\Omega$ (at 500VDC between all terminals and case)	
Dielectric strength	750VAC 50/60Hz for 1 minute(Between all terminals and case)	
Connection	Cable connector type	
Mechanical specification	Starting torque	Max. 300gf $\cdot$ cm(0.03N $\cdot$ m)
	Moment of inertia	Max. 800g $\cdot$ cm <sup>2</sup> ( $8 \times 10^{-5}$ kg $\cdot$ m <sup>2</sup> )
	Shaft loading	Radial : 5kgf, Thrust : 2.5kgf
	Max. allowable revolution	(Note1) 3600rpm
Vibration	1.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours	
Shock	Max. 75G	
Ambient temperature	-10 to 70 $^{\circ}$ C(at non-freezing status), Storage:-25 to 85 $^{\circ}$ C	
Ambient humidity	35 to 85%RH, Storage: 35 to 90%RH	
Protection	IP50(IEC standard)	
Cable	$\phi$ 5mm, 5P, Length:2m, Shield cable(Line Driver output: $\phi$ 6mm, 8P)	
Accessory	Bracket 2EA	
Weight	Approx. 1200g	
Approval	CE (Except Line driver output)	

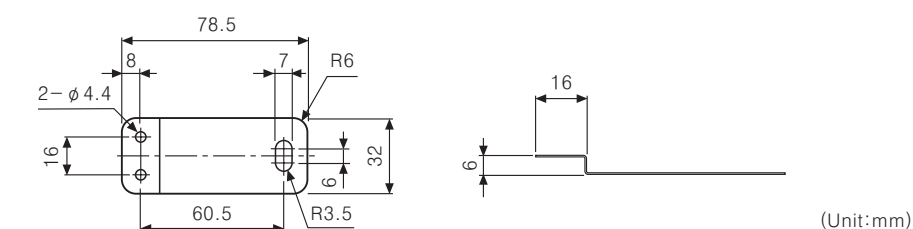
※ (Note1) Max. allowable revolution  $\geq$  Max. response revolution  

$$\left[ \text{Max. response revolution(rpm)} = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec} \right]$$
  
 Please select the resolution to make lower max. revolution than max. allowable revolution.

**Dimensions**

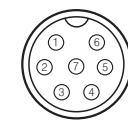


●Bracket



**Connections**

●Totem pole output/NPN open collector output / Voltage output



SCN-16-7P

Pin No	Cable color	Function
①	Brown	+V
②	Blue	0V
③	Black	OUT A
④	White	OUT B
⑤	Orange	OUT Z
⑥	Shield	F.G
⑦	N.C	N.C

※ Un used wires must be insulated.  
 ※ The shield wire and metal case of encoder must be grounded(F.G).

●Line Driver output



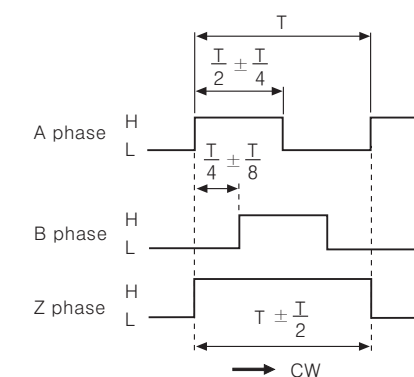
SCN-20-10P

Pin No	Cable color	Function
①	Brown	+V
②	Blue	0V
③	Black	OUT A
④	Red	OUT $\bar{A}$
⑤	Shield	F.G
⑥	White	OUT B
⑦	Gray	OUT $\bar{B}$
⑧	Orange	OUT Z
⑨	Yellow	OUT $\bar{Z}$
⑩	N.C	N.C

※ N.C(Not Connected)

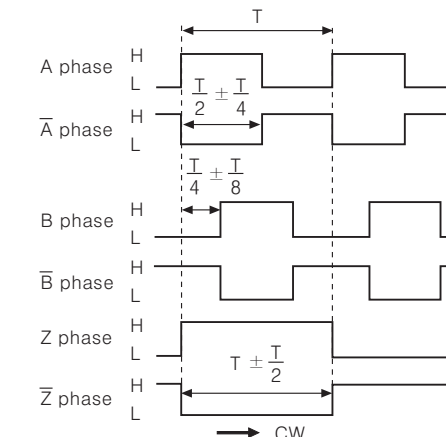
**Output waveform**

●Totem pole output/NPN open collector output / Voltage output



※ CW(Clockwise) : In a view of shaft.

●Line Driver output



**Caution for using**

- Installation
  - ① This unit is consisted of precision components. Therefore please treat this product carefully.
  - ② For the installation, please check the assembly dimension of mate target, then try not to occur the offset between them.
  - ③ Do not put strong impact when insert coupling into shaft.
- For using
  - ① Please connect shield wire to F.G terminal.
  - ② Do not connect and cut circuit off during power on. It may result in damage to this unit.
  - ③ When the power source is a Switching power, please install the surge absorber in power line and wire should be short in order not to be influenced by noise.
  - ④ Please apply 5VDC to encoder when use Line Driver type.
- Environment
  - ① Please do not use this unit with below environment, it results in malfunction.
    - ① Place where this unit or component may be damaged by strong vibration or impact.
    - ② Place where there are lots of flammable or corrosive gases.
    - ③ Place where strong magnet field or electric noise are occurred.
    - ④ Place where is beyond of rating temperature or humidity.
    - ⑤ Place where strong acids or alkali near by.
- Vibration and Impact
  - ① When the strong impact loads on this unit, the error pulse may occur as if the slit is revolving.
  - ② Please fix this unit firmly when mount it in order to avoid malfunction by residual vibration.
- Wire connection
  - ① If use the cable of encoder and high voltage line or power cable in the same conduit, it may cause a malfunction or mechanical trouble. Please wire separately or use separated conduit.
  - ② Please check wire and response frequency when extend wire, distortion of waveform or residual voltage increment by line resistance or capacity between lines.

※ It may cause malfunction if above instructions are not followed.

**Major products**

- PROXIMITY SENSOR ■ PHOTOELECTRIC SENSOR
- AREA SENSOR ■ FIBER OPTIC SENSOR
- DOOR/DOOR SIDE SENSOR ■ PRESSURE SENSOR
- ROTARY ENCODER ■ COUNTER
- TIMER ■ TEMPERATURE CONTROLLER
- TEMPERATURE/HUMIDITY TRANSDUCER
- POWER CONTROLLER ■ PANEL METER
- TACHO/LINE SPEED/PULSE METER
- DISPLAY UNIT ■ SENSOR CONTROLLER
- SWITCHING POWER SUPPLY
- GRAPHIC PANEL
- 5-PHASE STEPPING MOTOR & DRIVER & CONTROLLER
- LASER MARKING SYSTEM(CO<sub>2</sub>, Nd:YAG)

**Autonics Corporation**  
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