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

1. Do not drop water or oil on this unit.
It may cause damage or miscontrol due to malfunction.
2. Please observe voltage rating.
It may shorten the life cycle or damage to the product.
3. Please check the polarity of power and wrong wiring.
It may result in damage to this unit.
4. 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.

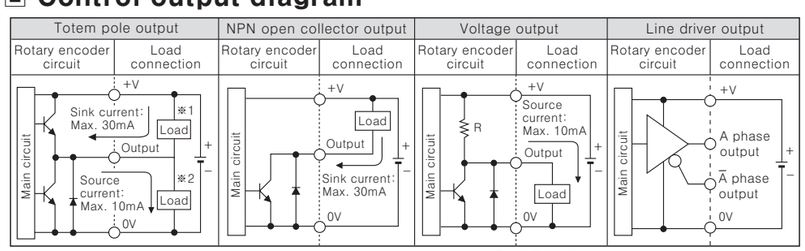
▣ Ordering information

E100H — **35** — **10000** — **3** — **N** — **24**

Series	Shaft inside diameter	Pulse/1Revolution	Output phase	Output	Power supply
Diameter ø100mm, Hollow shaft type	ø35mm	512, 1024, 10000	3 : A, B, Z 6 : A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$	T : Totem pole output N : NPN open collector output V : Voltage output L : Line driver output	5 : 5VDC ±5% 24 : 12-24VDC ±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, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$)
☞ 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

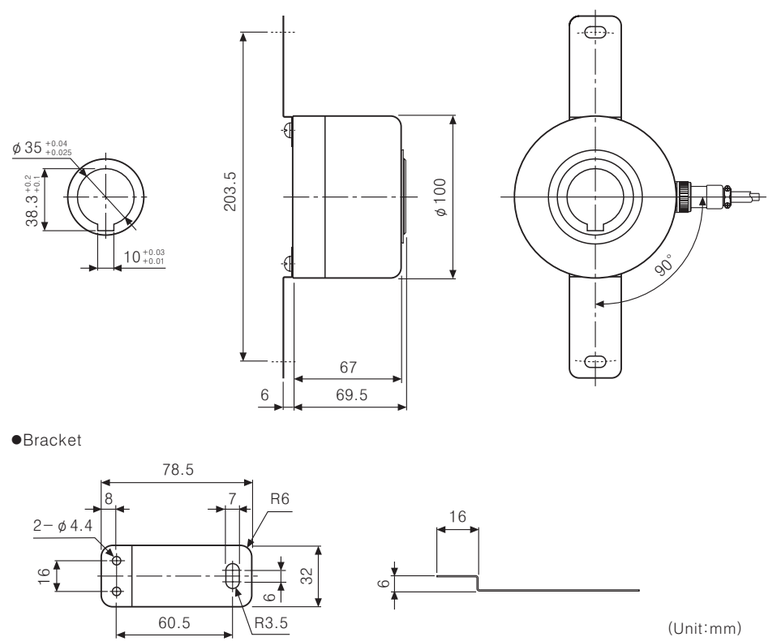
Item			Diameter ø100mm hollow shaft type Incremental Rotary encoder
Model			**E100H35-□-3-T-□** **E100H35-□-3-N-□** **E100H35-□-3-V-□** **E100H35-□-6-L-5**
Resolution(P/R)			512, 1024, 10000(Not indicated type is available to customize)
Electrical specification	Output phase		A, B, Z phase (Line driver output A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$ phase)
	Phase difference of output		Output between A and B phase : $\frac{T}{4} \pm \frac{T}{8}$ (T=1cycle of A phase)
	Control output	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
		Voltage output	Load current : Max. 10mA, Residual voltage : Max. 0.4VDC
		Line driver output	• Low ☞ Load current : Max. 20mA, Residual : Max. 0.5VDC • High ☞ Load current : Max. -20mA, Output voltage : Min. 2.5VDC
	Response time (Rise/Fall)	Totem pole output	Max. 1μs (• Measuring condition ☞ Cable length : 2m, I sink=Max. 20mA)
		NPN open collector output	Max. 1μs
		Voltage output	Max. 1μs
		Line driver output	Max. 0.5μs
	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 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 • cm(0.03N • m)
	Moment of inertia		Max. 800g • cm² (8×10⁻⁵kg • m²)
	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℃(at non-freezing status), Storage:-25 to 85℃
Ambient humidity			35 to 85%RH, Storage: 35 to 90%RH
Protection			IP50(IEC standard)
Cable			ø5mm, 5P, Length:2m, Shied cable(Line Driver ouput: ø6mm, 8P)
Accessory			Bracket 2EA
Weight			Approx. 1200g
Approval			CE (Except Line driver output)

※**(Note1)** Max. allowable revolution ≥ Max. response revolution

$$[\text{Max. response revolution(rpm)} = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}]$$

Please select the resolution to make lower max. revolution than max. allowable revolution.

▣ Dimensions



▣ Connections

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

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).

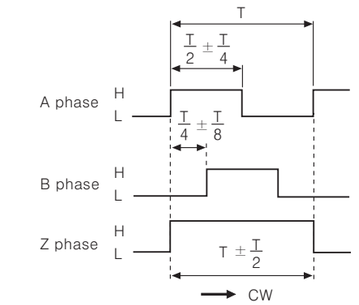
●Line Driver output

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

※N.C(Not Connected)

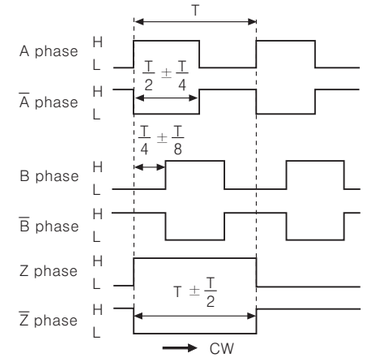
▣ Output waveform

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



※CW(Clockwise) : In a view of shaft.

●Line Driver output



▣ Caution for using

1. Installation
①This unit is consisted of precision components. Therefore please treat this product carefully.
②For the installation, please check the assembly dimension of mate target, then try not to occur the offset between them.
③Do not put strong impact when insert coupling into shaft.
2. For using
①Please connect shield wire to F.G terminal.
②Do not connect and cut circuit off during power on. It may result in damage to this unit.
③When 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.
④Please apply 5VDC to encoder when use Line Driver type.
3. Environment
Please do not use this unit with below environment, it results in malfunction.
①Place where this unit or component may be damaged by strong vibration or impact.
②Place where there are lots of flammable or corrosive gases.
③Place where strong magnet field or electric noise are occurred.
④Place where is beyond of rating temperature or humidity.
⑤Place where strong acids or alkali near by.
4. Vibration and Impact
①When the strong impact loads on this unit, the error pulse may occur as if the slit is revolving.
②Please fix this unit firmly when mount it in order to avoid malfunction by residual vibration.
5. Wire connection
①If 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.
②Please 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_2, Nd:YAG)

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