Autonics

ROTARY ENCODER(HAND TYPE)
ENH 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 pluses on the rotary shaft.

▣ Ordering information

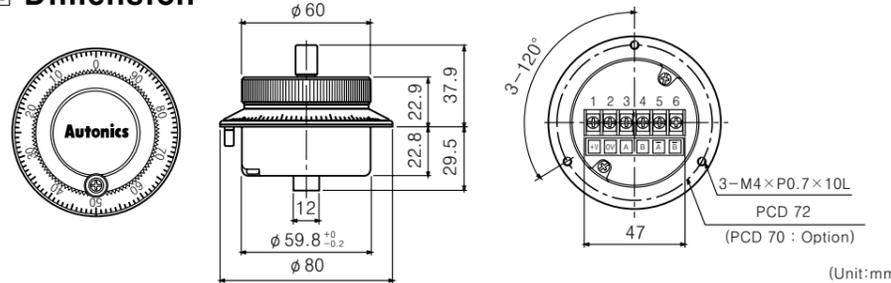| ENH	100	2		L
Series	Pulse/1Revolution	Click stop position	Output	Power supply
Handle Type, Rotary encoder (Incremental Type)	25 P/R 100 P/R	1 : A, B phase High 2 : A, B phase Low	1:Totempole output L:Line Driver output	Totempole output : 5VDC ±5%, 7−24VDC ±5% Line Driver output : 5VDC ±5%

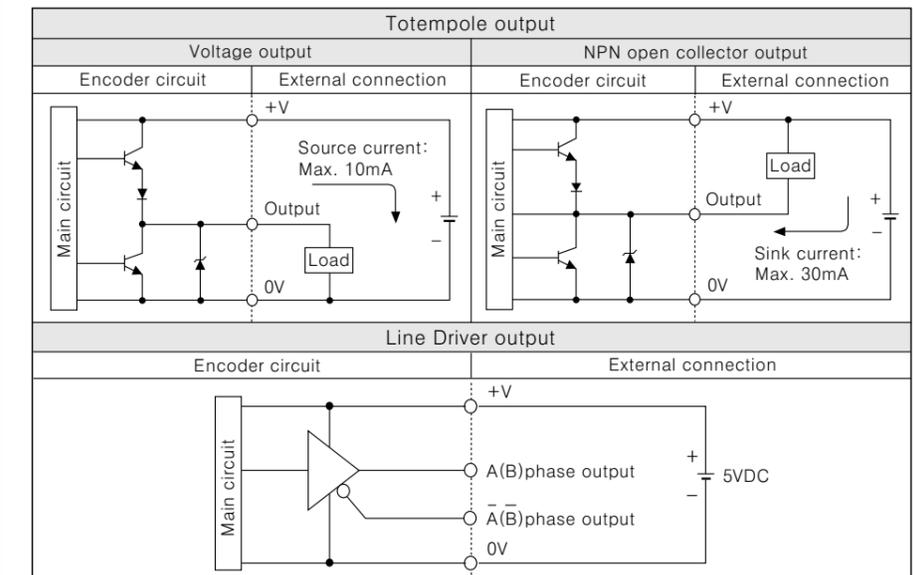※**The above specification are changeable without notice anytime.**

▣ Specification

Item		Handle type Rotary Encoder(Incremental Type)	
Model	Totempole output	ENH−☐−1−1, ENH−☐−2−1	
	Line Driver output	ENH−☐−1−L, ENH−☐−2−L	
Resolution (P/R)		25, 100	
Electrical specification	Output phase	A / B Phase(Line Driver:A, Ā, B, B̄ Phase)	
	Phase difference of output	Phase defference between A phase and B phase: T/4 ±T/8(T=1cycle of A phase)	
	Control output	Totempole output	Low ☞ Load current:Max. 30mA, Residual voltage:Max. 0.4V
			High ☞ Load current:Max.10mA, Output voltage:Min. (Power supply−1.5)V
		Line Driver output	Low ☞ Load current:Max. 20mA, Residual voltage:Max. 0.5V
			High ☞ Load current:Max. −20mA, Output voltage:Min. 2.5V
	Response time (Rise & Fall)	Totempole output	Rise:Max. 1μs Fall:Max. 1μs (Cable:1m, sink current=10mA)
		Line Driver output	Rise:Max. 2μs Fall:Max. 1μs (Cable:1m, sink current=20mA)
	Power supply	Totempole output	5VDC ±5%, 7 to 24VDC(Ripple P−P:Max. 5%)
		Line Driver output	5VDC ±5%(Ripple P−P:Max. 5%)
	Current consumption	Totempole output	Max. 50mA
		Line Driver output	Max. 80mA
	Max. Response frequency		10kHz
Mechanical specification	Starting torque	Max. 1kgf・cm(98000μN・m)	
	Mechanical revolution(rpm)	1000rpm	
Insulation resistance		Min. 100MΩ (at 500VDC between terminals and case)	
Dielectric strength		750VAC 50/60Hz for 1 minute between power input terminal and control output terminal	
Vibration		1.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours	
Shock		Max. 50G	
Ambient temperature		• −10 to 70℃(LINE DRIVER: 0 to 70℃)(non−freezing condition) • Storage:−25 to 85℃	
Ambient humidity		35 to 85%RH, Storage:35 to 90%RH	
Protection		IP50(IEC specification)	
Weight		Approx. 300g	

※Resolution and output phase can be developed or changed by company specification.
※Control output is optional.

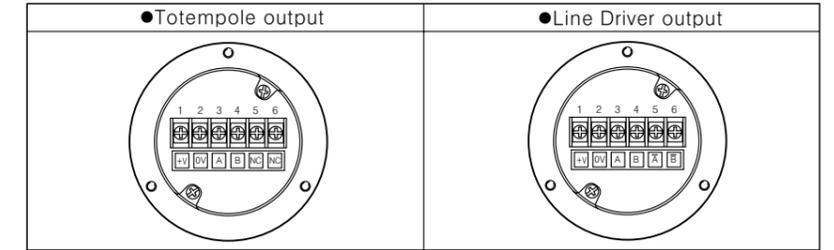※Max. response frequency(rpm)= $\frac{Max. rpm}{Revolution} \times$ 60(but max. rpm ≦ max. allowable prevolution)

▣ Dimension

φ60
φ59.8 +0 -0.2
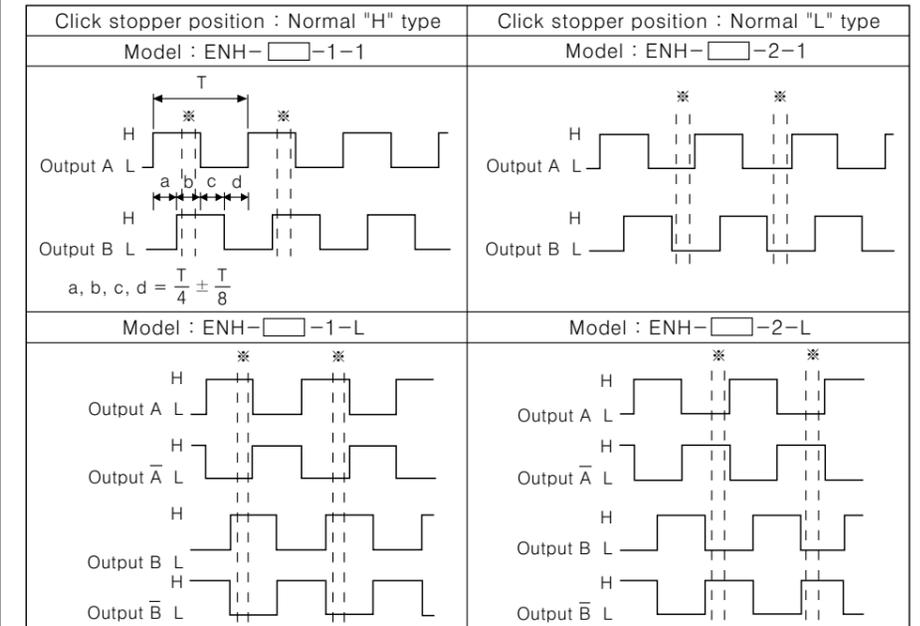φ80
37.9
22.9 22.9
22.8
29.5
12
3−120°
3−M4×P0.7×10L
PCD 72
(PCD 70 : Option)
47

(Unit:mm)

▣ Control output diagram

Totempole output

Voltage output		NPN open collector output	
Encoder circuit	External connection	Encoder circuit	External connection

+V
Source current: Max. 10mA
Output
Load
0V

+V
Load
Output
Sink current: Max. 30mA
0V

Line Driver output

Encoder circuit	External connection

+V
A(B)phase output
Ā(B̄)phase output
0V
5VDC

▣ Connetion

●Totempole output	●Line Driver output

▣ Output waveform

Click stopper position : Normal "H" type	Click stopper position : Normal "L" type
Model : ENH−☐−1−1	Model : ENH−☐−2−1

a, b, c, d = $\frac{T}{4} \pm \frac{T}{8}$

Model : ENH−☐−1−L	Model : ENH−☐−2−L

※:Stop position fo click stopper by output waveform. (CW:Clock Wise)

▣ Caution for using

1. Installation
   ①This unit is consisted of precision components. Therefore please treat this product carefully.
   ②Panel for installing this unit should be good earth ground.
   ③When the surge occurred in power source, please install a surge absorber for removing surge.
2. For using
   ①Please use attached SIL Twist pair wire and use proper receiver for RS−422A communication.
   ②Do not connect and cut circuit off during power on. It may result in damage to this unit.
3. Environment
   Please do not use this unit with below environment, it results in malfunction.
   ①Place where strong magnet field or electric noise are occurred.
   ②Place where is beyond of rating temperature or humidity.
4. Vibration and Impact
   ①Do not put strong impact when mount this unit on panel.
   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 make the cable as shorter as it can be in order to avoid noise affection.
   ③Please fix terminal block firmly for not escaped when pull the wire from terminal block with 10N strength.

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

▣ Main products

- COUNTER
- TIMER
- TEMPERATURE CONTROLLER
- PANEL METER
- TACHOMETER
- LINE SPEED METER
- DISPLAY UNIT
- PROXIMITY SWITCH
- PHOTOELECTRIC SENSOR
- FIBER OPTIC SENSOR
- PRESSURE SENSOR
- ROTARY ENCODER
- SENSOR CONTROLLER
- POWER CONTROLLER
- STEPPING MOTOR & DRIVER & CONTROLLER

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