Autonics

ROTARY ENCODER
(INCREMENTAL MANUAL HANDLE TYPE)
ENH SERIES
M A N U A L

CE

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 equpment, ship, vehicle, train, airplane, conbustion 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 demage to property.
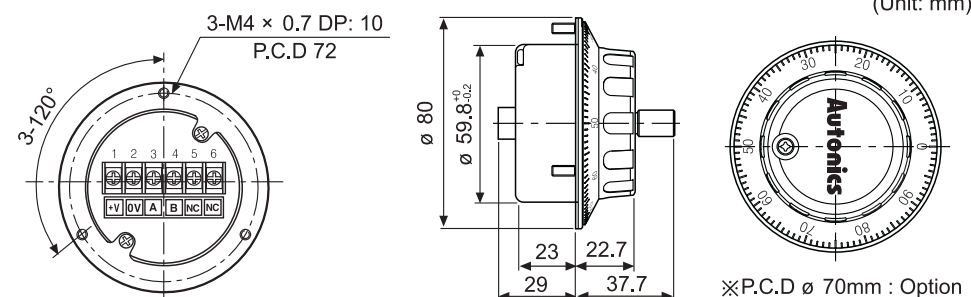
⚠ Caution

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.

■ Ordering information

ENH	100	1	T	24
Series	Pulse/ 1Revolution	Click stop position	Output	Power supply
Handle type	25 100	1 : Normal "H" 2 : Normal "L"	T : Totem pole output V : Voltage output L : Line driver output	5 : 5VDC ± 5% 24 : 12-24VDC ± 5%

※The power of Line driver is only for 5VDC

■ Dimensions

(Unit: mm)

3-M4 × 0.7 DP: 10
P.C.D 72
3-120°
ø 80
ø 59.8 +0/-0.2
23　22.7
29　37.7
※P.C.D ø 70mm : Option

※**The above specifications are subject to change and some models may be discontinued without notice.**

■ Specifications

Item		Handle type Incremental Rotary encoder
Model	Totempole output	**ENH-☐-1-T-☐, ENH-☐-2-T-☐**
	Voltage output	**ENH-☐-1-V-☐, ENH-☐-2-V-☐**
	Line driver output	**ENH-☐-1-L-5, ENH-☐-2-L-5**
Resolution (P/R)※1		25, 100

Electrical specification			
Output phase		A, B phase (Line driver output A, Ā, B, B̄ 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	Totempole output	• Low - Load current:Max. 30mA, Residual voltage:Max. 0.4VDC
		• High - Load current:Max. 10mA,
		  Output voltage(Power supply 5VDC): Min. (Power supply-2.0)VDC,
		  Output voltage(Power supply 12-24VDC): Min. (Power supply-3.0)VDC	

	Voltage output	Load current:Max. 10mA, Residual voltage:Max. 0.4VDC	
	Line driver output	• Low - Load current: Max. 20mA, Residual: Max. 0.5V • High - Load current: Max. -20mA, Output voltage: Min. 2.5V	
Response time (Rise & Fall)	Totempole output	Max. 1μs	• Measuring condition - I sink=Max. 20mA
	Voltage output	Max. 1μs	
	Line driver output	Max. 0.2μs	
Power supply	Totempole output	• 5VDC ± 5%(Ripple P-P:Max. 5%) • 12-24VDC ± 5%(Ripple P-P:Max. 5%)	
	Voltage output		
	Line driver output	5VDC ± 5%(Ripple P-P:Max. 5%)	
Current consumption		Max. 40mA(disconnection of the load), Line driver output: Max. 50mA(disconnection of the load)	
Max. Response frequency		10kHz	
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		Terminal block type	

| Mechanical specification		
Starting torque		Max. 1kgf·cm(0.098N·m)
Shaft loading		Radial: 2kgf, Thrust: 1kgf
Mechanical revolution※2		Max. 200rpm(Normal), 600rpm(Peak)
Vibration		1.5mm amplitude at frequency of 10~55Hz in each of X, Y, Z directions for 2 hours
Shock		Max. 50G
Ambient temperature		-10~70℃, Storage: -25~85℃
Ambient humidity		35~85%RH, Storage: 35~90%RH
Protection		IP50(IEC standard)
Weight※3		Approx. 330g(Approx. 260g)

※**1**: Not indicated type is customizable.
※**2**: Make sure that.Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.
$$[\text{Max. response revolution(rpm)} = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}]$$
※**3**: The weight in parentheses is except this packaging box.
※Environment resistance is rated at no freezing or condensation.
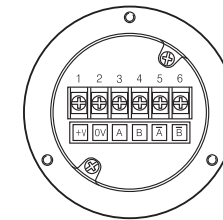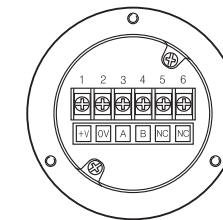
■ Control output diagram

Totem pole output	Voltage output	Line driver output
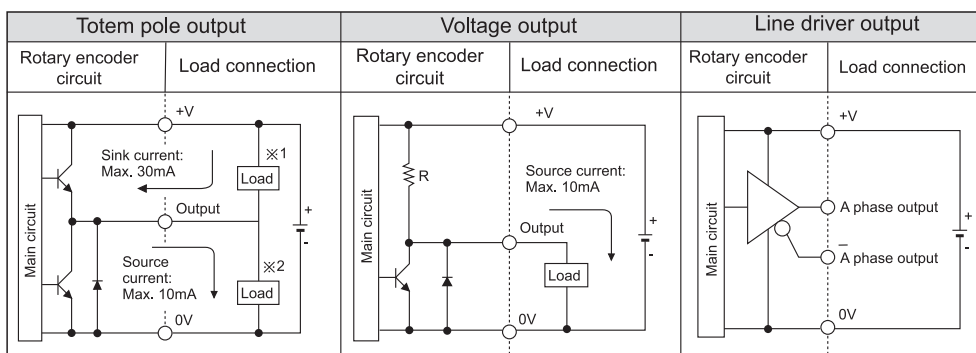
☞ The output circuit of A, B phase are the same. (Line Driver output is A, Ā, B, B̄)
☞ Totem pole output can be used for NPN open collector type(※1) or voltage output type(※2).
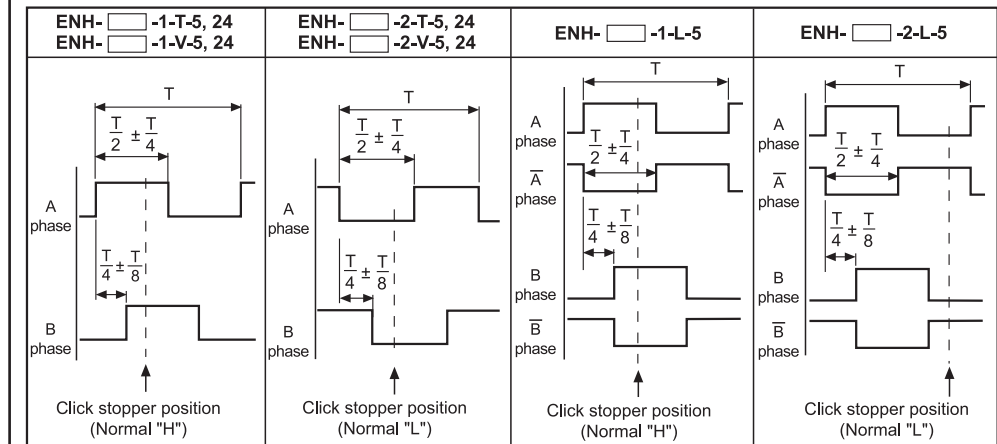
■ Connections

• Totempole output / Voltage output
• Line driver output

※Do not use terminals 5 and 6.

■ Output waveform

ENH-☐-1-T-5, 24 ENH-☐-1-V-5, 24	ENH-☐-2-T-5, 24 ENH-☐-2-V-5, 24	ENH-☐-1-L-5	ENH-☐-2-L-5
Click stopper position (Normal "H")	Click stopper position (Normal "L")	Click stopper position (Normal "H")	Click stopper position (Normal "L")

※Click stopper position Normal "H" or Normal "L" : It shows the wave form when the handle is stopped.

■ Caution for using

1. **Installation**
① This unit is consisted of precision components. Therefore please treat this product carefully.
② Panel for installing this unit should be good earth ground.
③ When the surge occurred in power source, please install a surge absorber for removing surge.

2. **For using**
① Please use attached Sil Twist pair wire and use proper receiver for RS422A communication.
② Do 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.
① Place where strong magnet field or electric noise are occurred.
② Place where is beyond of rating temperature or humidity.

4. **Vibration and Impact**
① Do not put strong impact when mount this unit on panel.
② Please fix this unit firmly when mount it in order to avoid malfunction by residual vibration.

5. **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 make the cable as shorter as it can be in order to avoid noise affection.
③ Please 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.

■ Major products

- ■ Photoelectric sensors
- ■ Fiber optic sensors
- ■ Door sensors
- ■ Door side sensors
- ■ Area sensors
- ■ Proximity sensors
- ■ Pressure sensors
- ■ Rotary encoders
- ■ Connectors/Sockets
- ■ Switching mode power supplies
- ■ Control switches/Lamps/Buzzers
- ■ I/O Terminal Blocks & Cables
- ■ Stepper motors/drivers/motion controllers
- ■ Graphic/Logic panels
- ■ Field network devices
- ■ Laser marking system(Fiber, CO₂, Nd:YAG)
- ■ Laser welding/soldering system
- ■ Temperature controllers
- ■ Temperature/Humidity transducers
- ■ SSR/Power controllers
- ■ Counters
- ■ Timers
- ■ Panel meters
- ■ Tachometer/Pulse(Rate)meters
- ■ Display units
- ■ Sensor controllers