Manual Handle Type Pulse Generators

ENH Series

PRODUCT MANUAL

For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.
The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

Features

- Ideal for manual pulse input applications including NC machinery and milling machines
- Terminal connection type
- Resolutions: 25, 100 pulses per revolution
- Power supply: 5 VDC⎓ ± 5%, 12 - 24 VDC⎓ ± 5%

Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- ⚠ symbol indicates caution due to special circumstances in which hazards may occur.

⚠ Warning Failure to follow instructions may result in serious injury or death.

01. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime / disaster prevention devices, etc.)
Failure to follow this instruction may result in personal injury, economic loss or fire.

02. Do not use or store the unit in the place where flammable / explosive / corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact or salinity may be present.
Failure to follow this instruction may result in explosion or fire.

03. Install on a device panel to use.
Failure to follow this instruction may result in fire.

04. Do not connect, repair, or inspect the unit while connected to a power source.
Failure to follow this instruction may result in fire.

05. Check 'Connections' before wiring.
Failure to follow this instruction may result in fire.

06. Do not disassemble or modify the unit.
Failure to follow this instruction may result in fire.

⚠ Caution Failure to follow instructions may result in injury or product damage.

01. Use the unit within the rated specifications.
Failure to follow this instruction may result in fire or product damage.

02. Do not short the load.
Failure to follow this instruction may result in fire.

03. Do not use the unit near the place where there is the equipment which generates strong magnetic force or high frequency noise and strong alkaline, strong acidic exists.
Failure to follow this instruction may result in product damage.

Cautions during Use

- Follow instructions in 'Cautions during Use'.
  Otherwise, It may cause unexpected accidents.
- 5 VDC⎓, 12 - 24 VDC⎓ power supply should be insulated and limited voltage / current or Class 2, SELV power supply device.
- For using the unit with the equipment which generates noise (switching regulator, inverter, servo motor, etc.), ground the shield wire to the F.G. terminal.
- Ground the shield wire to the F.G. terminal.
- When supplying power with SMPS, ground the F.G. terminal and connect the noise canceling capacitor between the 0 V and F.G. terminals.
- Wire as short as possible and keep away from high voltage lines or power lines, to prevent inductive noise.
- For Line driver unit, use the twisted pair wire which is attached seal and use the receiver for RS-422A communication.
- Check the wire type and response frequency when extending wire because of distortion of waveform or residual voltage increment etc. by line resistance or capacity between lines.
- This unit may be used in the following environments.
  - Indoors (in the environment condition rated in 'Specifications')
  - Altitude max. 2,000 m
  - Pollution degree 2
  - Installation category II

Cautions during Installation

- Install the unit correctly with the usage environment, location, and the designated specifications.
- When fixing the product with a wrench, tighten under 0.15 N m.

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

ENH - ❶ - ❷ - ❸ - ❹

❶ Resolution
Number: Refer to resolution in 'Specifications'

❷ Click stopper position
1: Normal "H"
2: Normal "L"

❸ Control output
T: Totem pole output
V: Voltage output
L: Line driver output

❹ Power supply
5: 5 VDC ⎓ ±5%
24: 12 - 24 VDC ⎓ ±5%

Product Components

- Product
- Instruction manual

Connections

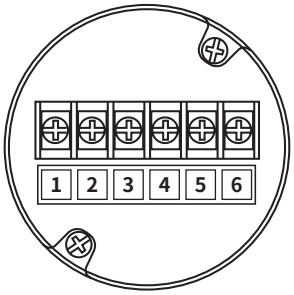
- Unused wires must be insulated.
- The metal case and shield cable of encoders must be grounded (F.G.).

■ Totem pole / Voltage output

Pin	Function	Pin	Function
1	+V	4	OUT B
2	GND	5	-
3	OUT A	6	-

■ Line driver output

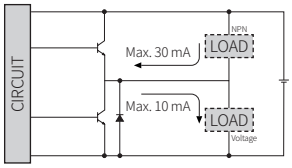
Pin	Function	Pin	Function
1	+V	4	OUT B
2	GND	5	OUT $\overline{A}$
3	OUT A	6	OUT $\overline{B}$



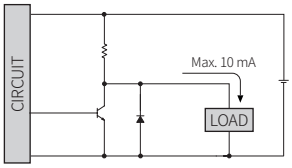
Inner Circuit

- Output circuits are identical for all output phase.

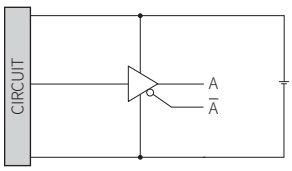
■ Totem pole output



■ Voltage output



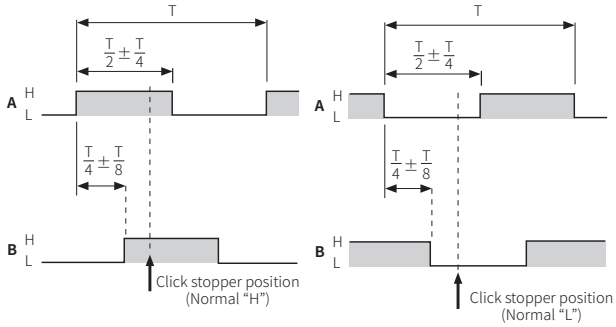
■ Line driver output



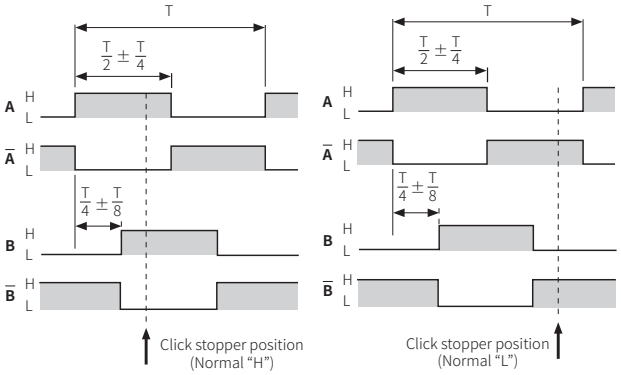
Output Waveform

- The rotation direction is based on facing the shaft, and it is clockwise (CW) when rotating to the right.
- Phase difference between A and B: $\frac{T}{4}\pm\frac{T}{8}$ (T = 1 cycle of A)
- Click stopper position Normal "H" or Normal "L"
  : It shows the waveform when the handle is stopped.

■ Totem pole / Voltage output



■ Line driver output



Specifications

Model	ENH-□-□-T-□	ENH-□-□-V-□	ENH-□-□-L-5
Resolution	25 / 100 PPR model		
Control output	Totem pole output	Voltage output	Line driver output
Output phase	A, B	A, B	A, B, $\overline{A}$, $\overline{B}$
Inflow current	≤ 30 mA	-	≤ 20 mA
Residual voltage	≤ 0.4 VDC⎓	≤ 0.4 VDC⎓	≤ 0.5 VDC⎓
Outflow current	≤ 10 mA	≤ 10 mA	≤ -20 mA
Output voltage (5 VDC⎓)	≥ (power supply -2.0) VDC⎓	-	≥ 2.5 VDC⎓
Output voltage (12 - 24 VDC⎓)	≥ (power supply -3.0) VDC⎓	-	-
Response speed 01)	≤ 1 µs	≤ 1 µs	≤ 0.2 µs
Max. response freq.	10 kHz		
Max. allowable revolution 02)	Normal: ≤ 200 rpm, Peak: ≤ 600 rpm		
Starting torque	≤ 0.098 N m		
Alloawable shaft load	Radial: ≤ 2 kgf, Thrust: ≤ 1 kgf		
Unit weight (packaged)	≈ 260 g (≈ 330 g)		
Certification	CE UK CA EAC	CE UK CA EAC	EAC

01) Based on cable length: 1 m, I sink: 20 mA
02) Select resolution to satisfy Max. allowable revolution ≥ Max. response revolution
[max. response revolution (rpm) = $\frac{\text{max. response frequency}}{\text{resolution}}$ × 60 sec]

Model	ENH-□-□-T-□	ENH-□-□-V-□	ENH-□-□-L-5
Power supply	5 VDC⎓ ± 5% (ripple P-P: ≤ 5%) / 12 - 24 VDC⎓ ± 5% (ripple P-P: ≤ 5%) model		5 VDC⎓ ± 5% (ripple P-P: ≤ 5%)
Current consumption	≤ 40 mA (no load)		≤ 50 mA (no load)
Insulation resistance	≥ 100 MΩ (500 VDC⎓ megger)		
Dielectric strength	Between the charging part and the case: 750 VAC~ 50 / 60 Hz for 1 min.		
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours		
Shock	≤ 50 G		
Ambient temp.	-10 to 70 °C, storage: -25 to 85 °C (no freezing or condensation)		
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)		
Protection rating	IP54 (front part, IEC standard)		
Connection	Terminal block type		

Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.