

Autonics Portable handle type Rotary encoder(INCREMENTAL TYPE) ENHP SERIES

INSTRUCTION MANUAL



Thank you for choosing our Autonics product.
Please read the following safety considerations before use.

■ Safety Considerations

※ Please observe all safety considerations for safe and proper product operation to avoid hazards.
※ ⚠ symbol represents caution due to special circumstances in which hazards may occur.

- ⚠ **Warning** Failure to follow these instructions may result in serious injury or death.
- ⚠ **Caution** Failure to follow these instructions may result in personal injury or product damage.

⚠ Warning

1. **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 fire, personal injury, or economic loss.
2. **Install on a device panel to use.**
Failure to follow this instruction may result in fire.
3. **Do not connect, repair, or inspect the unit while connected to a power source.**
Failure to follow this instruction may result in fire.
4. **Check 'Connections' before wiring.**
Failure to follow this instruction may result in fire.
5. **Do not disassemble or modify the unit.**
Failure to follow this instruction may result in fire.

⚠ Caution

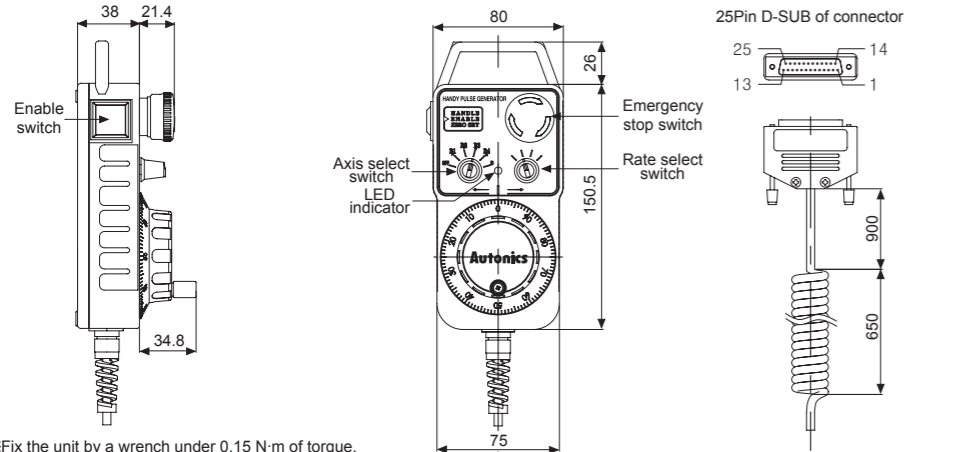
1. **Use the unit within the rated specifications.**
Failure to follow this instruction may result in fire or product damage.
2. **Do not short the load.**
Failure to follow this instruction may result in product damage by fire.
3. **Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**
Failure to follow this instruction may result in fire or explosion.
4. **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.

■ Ordering Information

| Model | Pulses/Revolution | Clickstopper position | Control output | Power supply |
|-----------------|-------------------|-----------------------|--------------------|--------------|
| ENHP-100-1-T-5 | 100 PPR | Normal "H" | Totem pole output | 5VDC±5% |
| ENHP-100-1-T-24 | | | | 12-24VDC±5% |
| ENHP-100-2-T-5 | | Normal "L" | Totem pole output | 5VDC±5% |
| ENHP-100-2-T-24 | | | | 12-24VDC±5% |
| ENHP-100-1-L-5 | | Normal "H" | Line driver output | 5VDC±5% |
| ENHP-100-2-L-5 | | | | 5VDC±5% |

※Line driver power is only 5VDC.

■ Dimensions



※Fix the unit by a wrench under 0.15 N·m of torque.

※The above specifications are subject to change and some models may be discontinued without notice.
※Be sure to follow cautions written in the instruction manual, and the technical descriptions (catalog, homepage).

■ Specifications

| Model | ENHP-100-1-T-□, ENHP-100-2-T-□ | ENHP-100-1-L-5, ENHP-100-2-L-5 |
|------------------------------|--|---|
| Control output | Totem pole output | Line driver output |
| Resolution (PPR) | 100 | |
| Output phase | A, B phase | A, \bar{A} , B, \bar{B} phase |
| Mechanical specification | Phase difference of output | Phase difference between A and B: $\frac{T}{4} \pm \frac{T}{8}$ (T=1 cycle of A phase) |
| | Rotary switch output | BCD Code output - AXIS SELECT SWITCH (OFF, X, Y, Z, A, B) - RATE SELECT SWITCH (R1, R2, R3, R4) |
| Mechanical specification | Control output | <ul style="list-style-type: none"> •[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= |
| | Response time (Rise/Fall) | Max. 1 μ s (Cable length: 1m, I sink=Max. 20mA) / Max. 0.5 μ s (Cable length: 1m, I sink=Max. 20mA) |
| Power supply | <ul style="list-style-type: none"> •5VDC= ±5%(Ripple P-P: Max. 5%) •12-24VDC= ±5%(Ripple P-P: Max. 5%) | 5VDC= ±5%(Ripple P-P: Max. 5%) |
| Current consumption | Max. 40mA(disconnection of the load) | Min. 50mA(disconnection of the load) |
| Max. Respose frequency | 10kHz | |
| Insulation resistance | Min. 100M Ω (at 500VDC megger between all terminals and case) | |
| Dielectric strength | 750VAC 50/60Hz for 1 minute(Between all terminals and case) | |
| Connection | 25Pin D-SUB of connector type | |
| Starting torque | Max. 1kgf·cm (0.098N·m) | |
| Shaft loading | Radial: 2kgf, Thrust: 1kgf | |
| Max. allowable revolution *1 | Max. 200rpm(Normal), 600rpm(Peak) | |
| Vibration | 1.5mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours | |
| Shock | Max. 50G | |
| Environment | Ambient temperature | -10 to 70°C, storage: -25 to 85°C |
| | Ambient humidity | 35 to 85%RH, storage: 35 to 90%RH |
| Protection structure *2 | IP67(IEC standard) for Box | |
| Cable | Ø5mm, 18-wire, Length: 8m, Spring code cable (AWG28, Core wire diameter: 0.08mm, No. of core wire: 18, Insulator out diameter: Ø0.7mm) | |
| Unit weight | Approx. 730g | |

*1: Make sure that max. response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

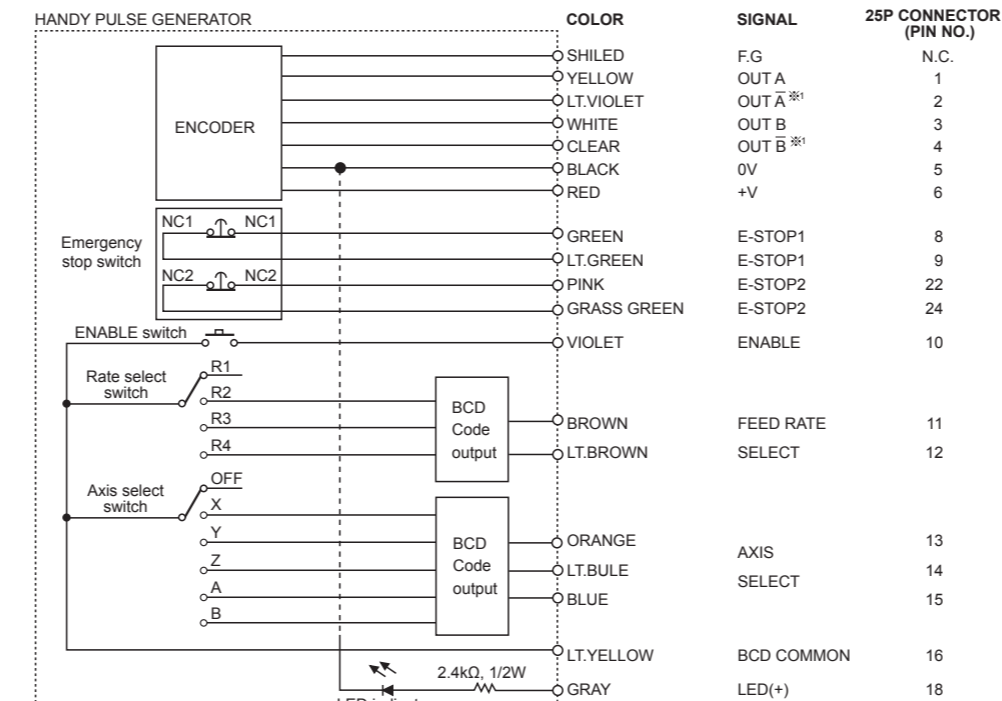
[Max. response revolution(rpm) = Max. response frequency × 60 sec.]

revolution

*2: It is protection for the rear case and the wiring part.

*Environment indicates a non freezing or condensation environment.

■ Connections



● AXIS SELECT

| AXIS | BCD Code output | PIN NO.15 | PIN NO.14 | PIN NO.13 |
|--------|-----------------|-----------|-----------|-----------|
| OFF | 0 | 0 | 0 | 0 |
| X axis | 0 | 0 | 1 | 1 |
| Y axis | 0 | 1 | 0 | 0 |
| Z axis | 0 | 1 | 1 | 1 |
| A axis | 1 | 0 | 0 | 0 |
| B axis | 1 | 0 | 1 | 1 |

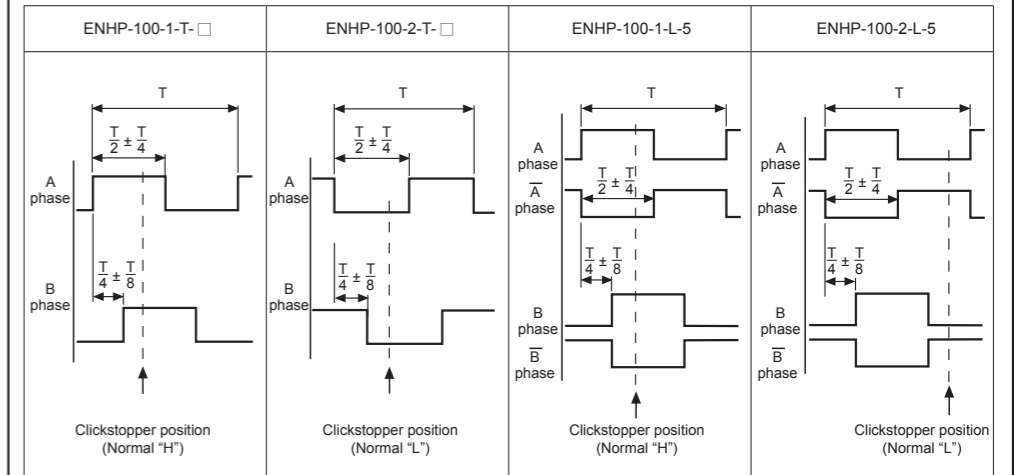
*1: Totem pole output does not have \bar{A} , \bar{B} output signal.

*COMMON terminal (PIN NO.16) of Axis select switch and Rate select switch is common.

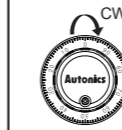
● RATE SELECT

| RATE | BCD Code output | PIN NO.12 | PIN NO.11 |
|------|-----------------|-----------|-----------|
| R1 | 0 | 0 | 0 |
| R2 | 0 | 1 | 1 |
| R3 | 1 | 0 | 0 |
| R4 | 1 | 1 | 1 |

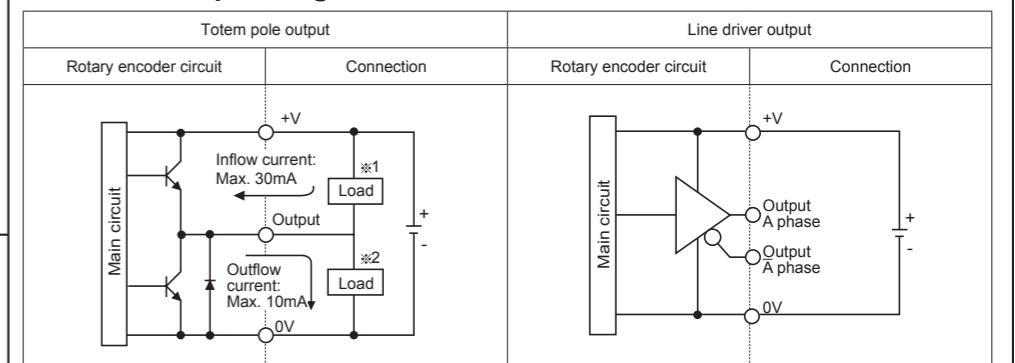
■ Output Waveform



※Clickstopper position Normal "H" or Normal "L": It shows the waveform when the handles is stopped.



■ Control Output Diagram



※The output circuits of A, B phase (Line driver output A, \bar{A} , B, \bar{B} phase) are the same.

※Totem pole output type can be used for NPN open collector output type (*1) or voltage output type (*2).

■ Cautions during Use

1. Follow instructions in 'Cautions during Use'. Otherwise, It may cause unexpected accidents.
2. 5VDC, 12-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
3. 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.
4. Ground the shield wire to the F.G. terminal.
5. When using switching mode power supply, frame ground (F.G.) terminal of power supply should be grounded.
6. Wire as short as possible and keep away from high voltage lines or power lines, to prevent inductive noise.
7. For Line driver unit, use the twisted pair wire which is attached seal and use the receiver for RS-422A communication.
8. 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.
9. This unit may be used in the following environments.
 - ① Indoors (in the environment condition rated in 'Specifications')
 - ② Altitude max. 2,000m
 - ③ Pollution degree 2
 - ④ Installation category II

■ Major Products

- Photoelectric Sensors
- Fiber Optic Sensors
- Door Sensors
- Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Connector/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/Cutting System
- Temperature Controllers
- Temperature/Humidity Transducers
- SSRs/Power Controllers
- Counters
- Timers
- Panel Meters
- Tachometer/Pulse (Rate) Meters
- Display Units
- Sensor Controllers

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