

# ENC Series

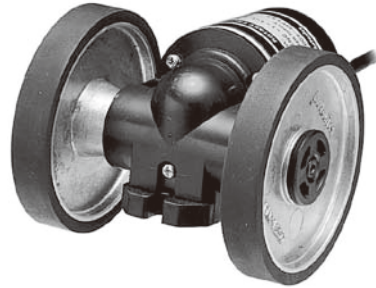
## Wheel type of Incremental Rotary Encoder

### ■ Features

- Suitable for measuring the length or speed of target moving successively by wheel type
- The output waveform according to measuring distance is proportional to the unit of International Measurement type (Meter or inch)
- Power supply : 5VDC, 12-24VDC ±5%

### ■ Applications

- Various packing machine, sheet manufacturing, textile machinery, and general industrial machinery etc.



⚠ Please read "Caution for your safety" in operation manual before using.



### ■ Ordering information

| ENC        | -              | 1                              | -                                | 1  | - | N                                 | - | 24  | - |  |
|------------|----------------|--------------------------------|----------------------------------|--|---|-----------------------------------|---|---|---|--|
| Series     | Output phase   | Min. measuring unit            |                                  | Output   |   | Power supply                      |   | Cable   |   |  |
| Wheel type | 1 : A, B phase | 1 : 1mm<br>3 : 1m<br>5 : 0.1yd | 2 : 1cm<br>4 : 0.01yd<br>6 : 1yd | T : Totem pole output<br>N : NPN open collector output<br>V : Voltage output |   | 5 : 5VDC ±5%<br>24 : 12-24VDC ±5% |   | No mark : Cable type<br>C : Connector cable type(※) |   |  |

※Cable length : 250mm

### ■ Specifications

|                          |  |   |   |
|--------------------------|--|---|---|
| Item                     | Wheel type of incremental rotary encoder   |   |   |
| Resolution(P/R)          | Refer to resolution(Next page)   |   |   |
| Electrical specification | Output phase   | A, B phase  |   |
|                          | Phase difference of output   | Phase difference between A and B : $\frac{T}{4} \pm \frac{T}{8}$ (T=1 cycle of A phase) |   |
|                          | Control output   | Totem pole output   | • Low - Load current : Max. 30mA, Residual voltage : Max. 0.4VDC<br>• High - Load current : Max. 10mA,<br>Output voltage(Power voltage 5VDC) : Min. (Power voltage-2.0)VDC,<br>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  |
|                          | Response time (Rise/Fall)  | Totem pole output   | Max. 1μs  |
|                          |  | NPN open collector output   |   |
|                          |  | Voltage output  |   |
|                          | Max. Response frequency  | 180kHz  |   |
|                          | 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)  |   |
| Insulation resistance    | Min. 100MΩ(at 500VDC megger between all terminals and case)  |   |   |
| Dielectric strength      | 750VAC 50/60Hz for 1 minute(Between all terminals and case)  |   |   |
| Connection               | Cable type, 250mm connector cable type   |   |   |
| Mechanical specification | Starting torque  | Depend on coefficient of friction   |   |
|                          | Max. allowable revolution <sup>※1</sup>  | 5000rpm   |   |
| Vibration                | 1.5mm amplitude or 300m/s <sup>2</sup> at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours                                      |   |   |
| Shock                    | Approx. Max. 75G   |   |   |
| Environment              | Ambient temperature  | -10 to 70°C(at non-freezing status), storage : -25 to 85°C                              |   |
|                          | Ambient humidity   | 35 to 85%RH, storage : 35 to 90%RH  |   |
| Cable                    | ø5, 5-wire, Length : 2m, Shield cable(Line driver output : ø5, 8-wire)<br>(AWG24, Core diameter : 0.08mm, Number of cores : 40, Insulator out diameter : ø1) |   |   |
| Protection               | IP50(IEC standard)   |   |   |
| Approval                 | CE   |   |   |
| Unit weight              | Approx. 494g   |   |   |

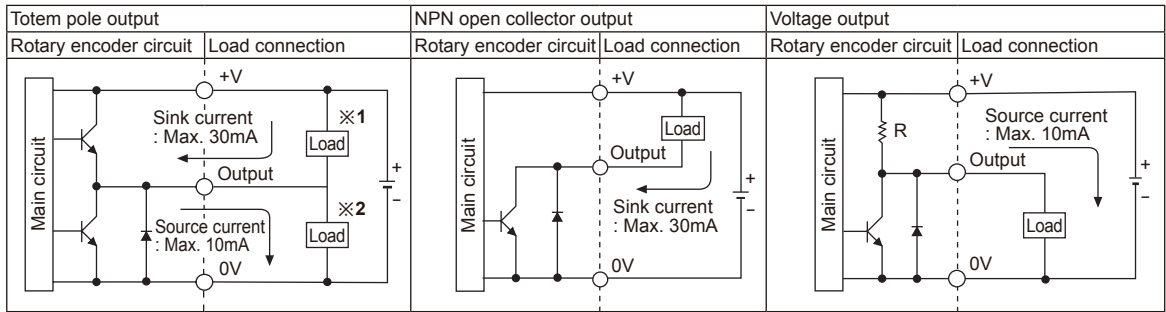
※1: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

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

※Environment resistance is rated at no freezing or condensation.

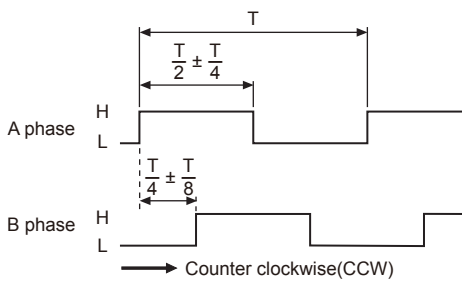
# Incremental Wheel type

## Control output diagram



- The output circuits of A, B phase are the same.
- Totem pole output type can be used for NPN open collector type(※1) or voltage output type(※2).

## Output waveform



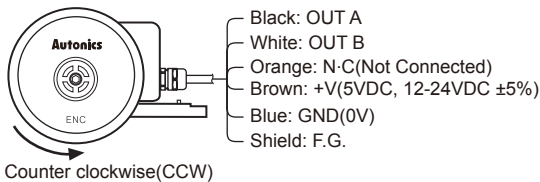
※CCW: Based on wheel rotation direction.

## Resolution

| No | The number of encoder pulse | Gear ratio | Wheel circumference | Moving distance per 1pulse |
|----|-----------------------------|------------|---------------------|----------------------------|
| 1  | 250Pulse                    | 1:1        | 250mm               | 1mm/1Pulse                 |
| 2  | 100Pulse                    | 4:1        | 250mm               | 1cm/1Pulse                 |
| 3  | 1Pulse                      | 4:1        | 250mm               | 1m/1Pulse                  |
| 4  | 100Pulse                    | 4:1        | 228.6mm (0.25/yd)   | 0.01yd/1Pulse              |
| 5  | 10Pulse                     | 4:1        | 228.6mm (0.25/yd)   | 0.1yd/1Pulse               |
| 6  | 1Pulse                      | 4:1        | 228.6mm (0.25/yd)   | 1yd/1Pulse                 |

## Connections

### ◎ Cable type



- ※Unused wires must be insulated.
- ※The metal case and shield wire of encoder must be grounded(F.G.)

### ◎ Connector cable type

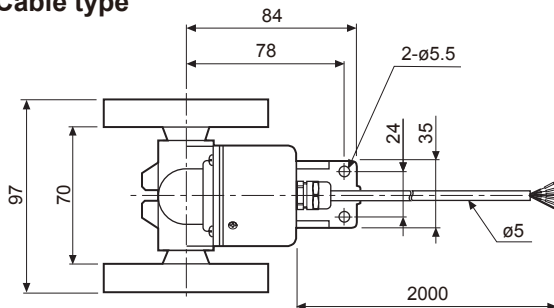


| Pin No | Cable color | Function |
|--------|-------------|----------|
| ①      | Black       | OUT A    |
| ②      | White       | OUT B    |
| ③      | Orange      | N-C      |
| ④      | Brown       | +V       |
| ⑤      | Blue        | GND      |
| ⑥      | Shield      | F.G.     |

※F.G.(Field Ground) : It must be grounded separately.

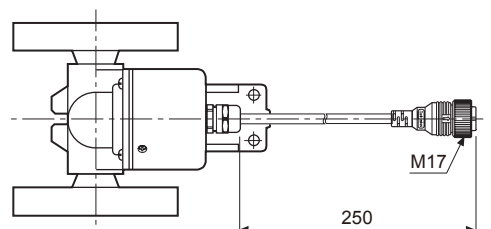
## Dimensions

### ◎ Cable type



- ※The wheel circumference is changed according to model(ø), please refer to resolution chart.
- ※Connector cable is sold separately and see G-10 for specifications.

### ◎ Connector cable type



| Cable for cable type                      | Cable for connector cable type           |
|---|--|
| ø5, 5-wire, Length : 2000mm, Shield cable | ø5, 5-wire, Length : 250mm, Shield cable |

(A) Photo electric sensor

(B) Fiber optic sensor

(C) Door/Area sensor

(D) Proximity sensor

(E) Pressure sensor

(F) Rotary encoder

(G) Connector/Socket

(H) Temp. controller

(I) SSR/ Power controller

(J) Counter

(K) Timer

(L) Panel meter

(M) Tacho/ Speed/ Pulse meter

(N) Display unit

(O) Sensor controller

(P) Switching mode power supply

(Q) Stepper motor& Driver&Controller

(R) Graphic/ Logic panel

(S) Field network device

(T) Software

(U) Other