

# Incremental Measuring Wheel Type

## Incremental measuring wheel type Rotary encoder

### ■ Features

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

### ■ Application

- Packing machine, Sheet manufacturing , Textile machinery and General industrial plants.



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



### ■ Ordering information

ENC	1	1	N	24	2C
Series	Output phase	Min. measuring unit	Output	Power supply	Cable
Wheel type	1 : A, B phase	1 : 1mm 2 : 1cm 3 : 1m 4 : 0.01yd 5 : 0.1yd 6 : 1yd	T : Totem pole output N : NPN open collector output V : Voltage output	5 : 5VDC ±5% 24 : 12–24VDC ±5%	No mark: Normal type (*) C: Cable outgoing connector type

\*Cable length: 250mm

### ■ Specifications

Item		Incremental measuring wheel type of 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	<ul style="list-style-type: none"> <li>• Low <math>\Rightarrow</math> Load current : Max. 30mA, Residual voltage : Max. 0.4VDC</li> <li>• High <math>\Rightarrow</math> 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</li> </ul>	
		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. 1 $\mu$ s	Cable length : 2m, I sink = Max. 20mA
		NPN open collector output	Max. 1 $\mu$ s	
		Voltage output	Max. 1 $\mu$ s	
	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. 100M $\Omega$ (at 500VDC mega between all terminals and case)		
	Dielectric strength	750VAC 50/60Hz for 1 minute (Between all terminals and case)		
Connection	Cable outgoing type, 250mm cable outgoing connector type			
Mechanical specification	Starting torque	Depend on coefficient of friction		
	Max. allowable revolution	<b>(Note1)</b> 5000rpm		
Vibration	1.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hours			
Shock	Max. 75G			
Ambient temperature	–10 ~ 70°C (at non-freezing status), Storage: –25 ~ 85°C			
Ambient humidity	35~85%RH, Storage: 35~90%RH			
Cable	$\phi$ 5mm, 5P, Length: 2m, Shield cable			
Protection	IP50 (IEC standard)			
Unit weight	Approx. 495g			
Approval	CE			

※ (★Note1) Max. allowable revolution  $\geq$  Max. response revolution **[**Max. response revolution (rpm) =  $\frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$  **]**

(A) Counter

(B) Timer

(C) Temp. controller

(D) Power controller

(E) Panel meter

(F) Tacho/Speed/Pulse meter

(G) Display unit

(H) Sensor controller

(I) Switching power supply

(J) Proximity sensor

(K) Photo electric sensor

(L) Pressure sensor

(M) Rotary encoder

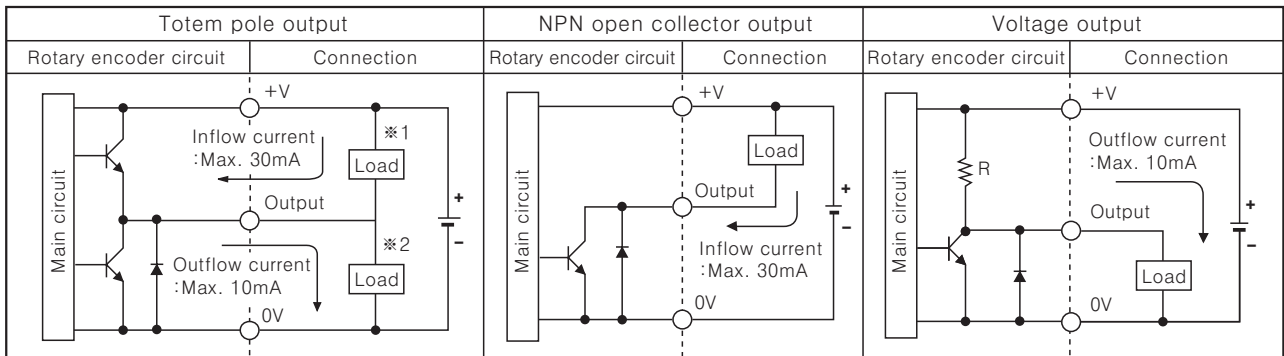
(N) Stepping motor & Driver & Controller

(O) Graphic panel

(P) Production stoppage models & replacement

# ENC Series

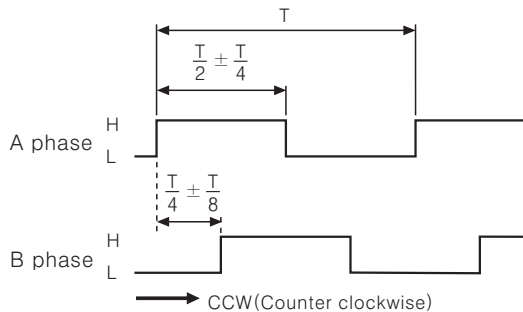
## Control output diagram



☞ The output circuit of A, B phase are same.

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

## Output waveform



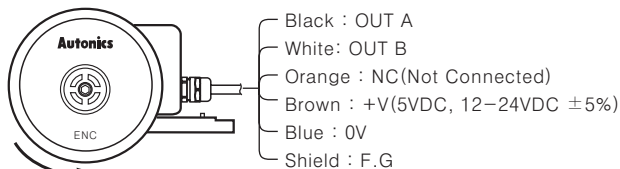
※CCW: Same revolution direction with connection F.G as below.

## Resolution

No	Min. measuring unit	Moving distance per 1pulse	Gear ratio	Wheel circumference	SLIT(P/R)
1	1mm	1mm/Pulse	1 : 1	250mm	250Pulse
2	1cm	1cm/Pulse	4 : 1	250mm	100Pulse
3	1m	1m/Pulse	4 : 1	250mm	1Pulse
4	0.01yd	0.01yd/Pulse	4 : 1	228.6mm (0.25/yd)	100Pulse
5	0.1yd	0.1yd/Pulse	4 : 1	228.6mm (0.25/yd)	10Pulse
6	1yd	1yd/Pulse	4 : 1	228.6mm (0.25/yd)	1Pulse

## Connections

### Connector type



CCW(Counter clockwise)

※Unused wires must be insulated.

※The metal case and shield wire of encoder should be grounded(F.G)

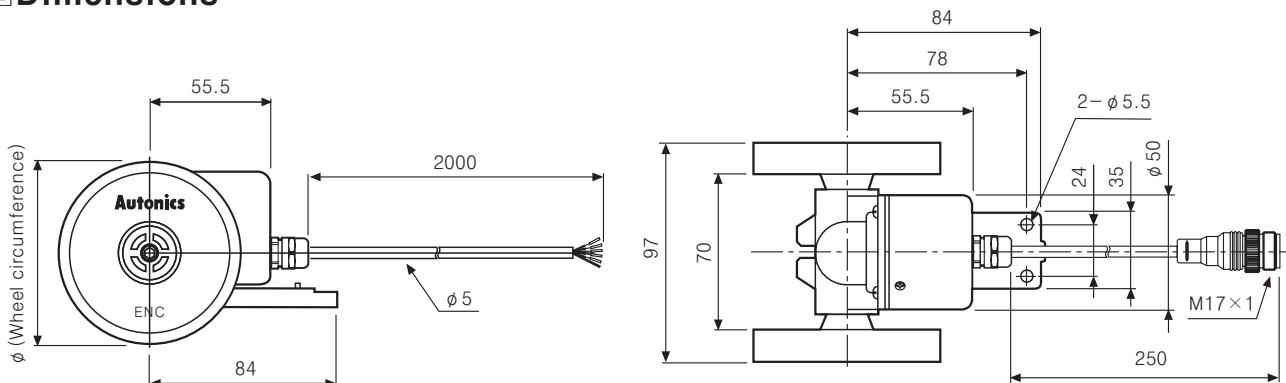
### Cable outgoing connector type



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

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

## Dimensions



※The wheel circumference is changed according to model( $\phi$ ), please refer to resolution chart.

※Connector cable is customizable and see M-48 for specifications.

(Unit:mm)