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.**

CE

▣ Ordering information

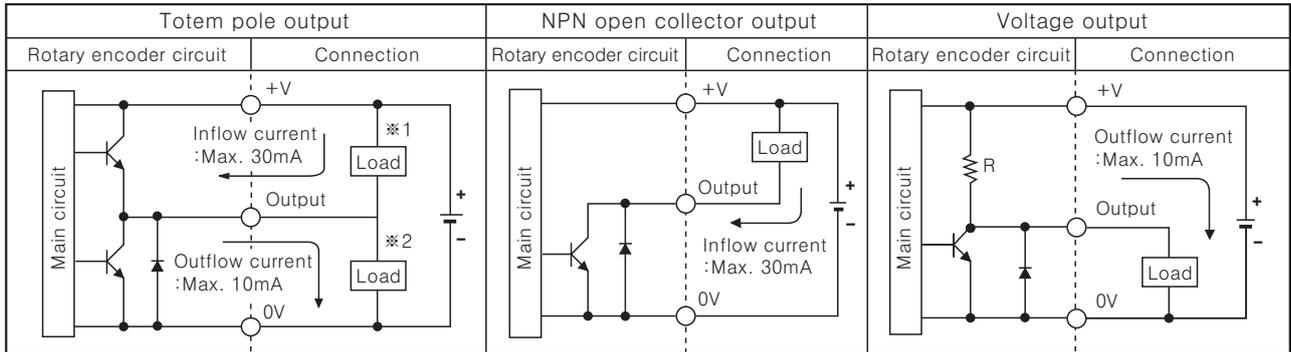| ENC	− 1	− 1	− N	− 24	−
Series	Output phase	Min. measuring unit	Output	Power supply	Cable
Wheel type	1 : A, B phase	1 : 1mm 2 : 1cm 3 : 1m 4 : 0.01yd 5 : 0.1yd 6 : 1yd	T : Totem pole output N : NPN open collector output V : Voltage output	5 : 5VDC ±5% 24 : 12−24VDC ±5%	No mark : Normal type C : Cable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

※Cable length : 250mm

▣ Specifications

Item			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=1cycle of A phase)
	Control output	Totem pole 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
		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 (Cable length : 2m, I sink = 20mA)
		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 outgoing type, 250mm cable outgoing connector type
Mechanical specification	Starting torque		Depend on coefficient of friction
	Max. allowable revolution	**(Note1)**	5000rpm
Vibration			1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours
Shock			Max. 75G
Ambient temperature			−10 to 70℃ (at non−freezing status), Storage : −25 to 85℃
Ambient humidity			35 to 85%RH, Storage : 35 to 90%RH
Cable			ϕ5mm, 5P, Length: 2m, Shield cable (AWG 24, Core wire diameter: 0.08mm, No. of core wire: 40, Insulator out diameter: ϕ1mm)
Protection			IP50(IEC standard)
Approval			CE
Unit weight			Approx. 494g

※(★**Note1**)Make sure that max. response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

【Max. response revolution(rpm) $= \dfrac{\text{Max. response frequency}}{\text{Resolution}} \times 60$ sec.】

Incremental Wheel Type

■Control output diagram

Totem pole output		NPN open collector output		Voltage output	
Rotary encoder circuit	Connection	Rotary encoder circuit	Connection	Rotary encoder circuit	Connection

- 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).
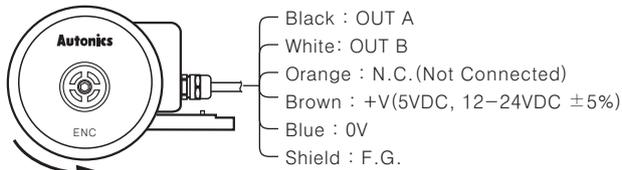
■Output waveform

※CCW: Based on wheel rotation direction.
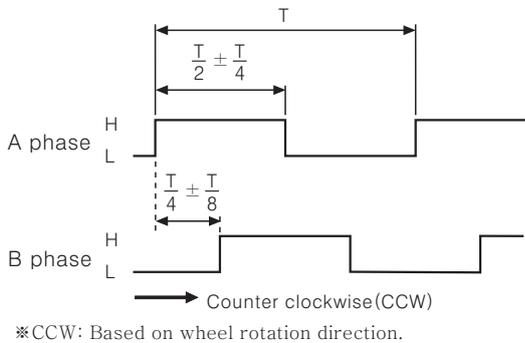
■Resolution

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

■Connections

■Normal type

Black : OUT A
White : OUT B
Orange : N.C.(Not Connected)
Brown : +V(5VDC, 12−24VDC ±5%)
Blue : 0V
Shield : F.G.

Counter clockwise(CCW)

※Unused wires must be insulated.
※The metal case and shield wire of encoder must be grounded(F.G.)
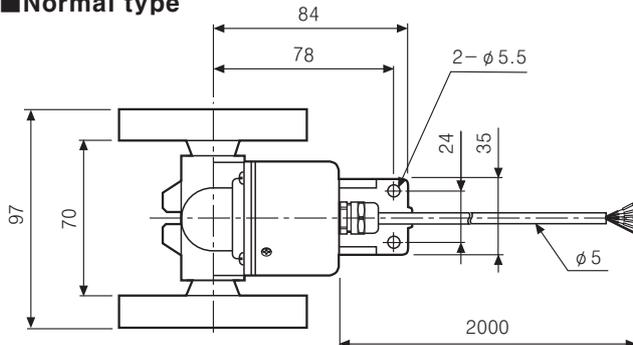
■Cable outgoing connector type
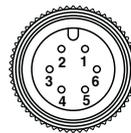
Pin No	Cable color	Function
1	Black	OUT A
2	White	OUT B
3	Orange	N.C.
4	Brown	+V
5	Blue	GND
6	Shield	F.G.

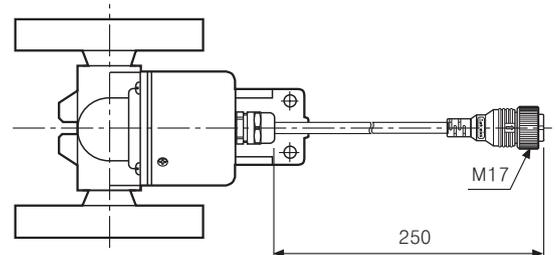※F.G.(Field Ground) : It must be grounded separately.

■Dimensions

(Unit:mm)

■Normal type

■Cable outgoing connector type

※The wheel circumference is changed according to model(∅), please refer to resolution chart.
※Connector cable is sold separately and see G−6 for specifications.

Cable for normal type	Cable for Cable outgoing connector type
∅5mm, 5P, Length : 2000mm, Shield cable	∅5mm, 5P, Length : 250mm, Shield cable