

## Side-Mounting Shaft Type Incremental Rotary Encoder

### ■ Features

- Strong die cast structure against external impact
- Convenient structure for direct mounting on the frame
- Connector type
- Power supply: 5VDC, 12-24VDC ±5%

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



### ■ Ordering Information

ENA	5000	3	N	24
Series	Pulse/1Revolution	Output phase	Control output	Power supply
Side-mounting shaft type (External diameter of shaft:Ø10mm)	Refer to resolution	2: A, B 3: A, B, Z	T: Totem pole output N: NPN open collector output V: Voltage output	5 : 5VDC ±5% 24: 12-24VDC ±5%

### ■ Specifications

Item	Side-mounting shaft type of incremental rotary encoder		
Resolution (P/R) <sup>※1</sup>	*1, *2, *5, 10, 12, 15, 20, 23, 25, 30, 35, 40, 45, 50, 60, 75, 100, 120, 150, 192, 200, 240, 250, 256, 300, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500, 3000, 3600, 5000		
Electrical specification	Output phase	•ENA-□□-2-□□□: A, B phase      •ENA-□□-3-□□□: A, B, Z 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 • High - Load current:Max. 10mA, Output voltage (Power voltage 5VDC):Min. (Power voltage-2.0)VDC, 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 (Cable length: 2m, I sink = 20mA)
		NPN open collector output	
		Voltage output	
	Max. Response frequency	300kHz	
	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	Connector type		
Mechanical specification	Starting torque	Max. 70gf·cm (0.007N·m)	
	Moment of inertia	Max. 80g·cm <sup>2</sup> (8×10 <sup>-6</sup> kg·m <sup>2</sup> )	
	Shaft loading	Radial: 10kgf, Thrust: 2.5kgf	
	Max. allowable revolution <sup>※2</sup>	5000rpm	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each X, Y, Z direction for 2 hours		
Shock	Approx. Max. 75G		
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	IP50 (IEC standard)		
Cable	ENA-□□-2-□□□	Ø5mm, 4-wire, Length: 2m, Shield cable (AWG 24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: Ø1mm)	
	ENA-□□-3-□□□	Ø5mm, 5-wire, Length: 2m, Shield cable (AWG 24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: Ø1mm)	
Accessory	Ø10mm coupling, connector cable		
Approval	CE		
Unit weight	Approx. 345g		

※1: '\*' pulse is only for A, B phase. Not indicated resolutions are customizable.

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

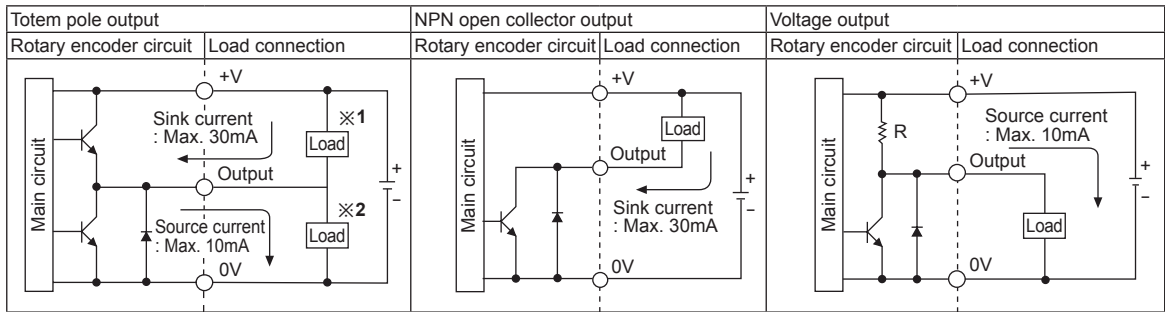
$$[\text{Max. response revolution (rpm)}] = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$$

※Environment resistance is rated at no freezing or condensation.

- (A) Photoelectric Sensors
- (B) Fiber Optic Sensors
- (C) Door/Area Sensors
- (D) Proximity Sensors
- (E) Pressure Sensors
- (F) Rotary Encoders
- (G) Connectors/ Sockets
- (H) Temperature Controllers
- (I) SSRs / Power Controllers
- (J) Counters
- (K) Timers
- (L) Panel Meters
- (M) Tacho / Speed / Pulse Meters
- (N) Display Units
- (O) Sensor Controllers
- (P) Switching Mode Power Supplies
- (Q) Stepper Motors & Drivers & Controllers
- (R) Graphic/ Logic Panels
- (S) Field Network Devices
- (T) Software

# ENA Series

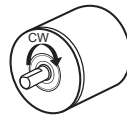
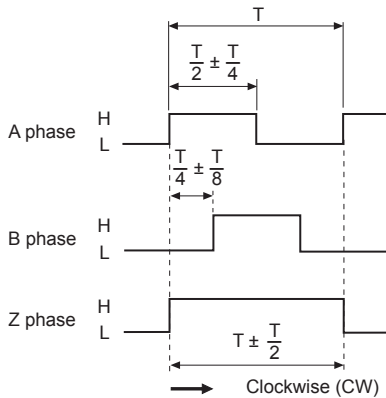
## Control Output Diagram



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

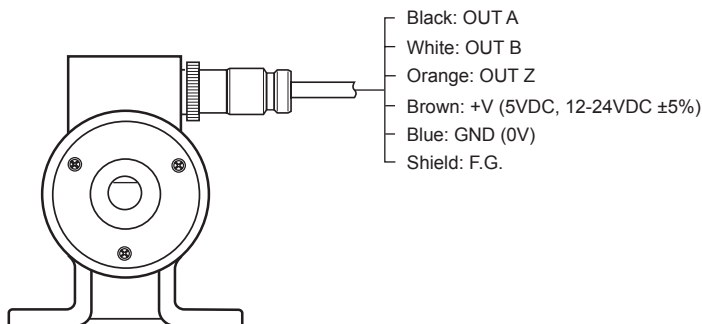
## Output Waveform

- Totem pole output / NPN open collector output / Voltage output



※In case of ENA-□-3-□-□ model, Z phase is output.

## Connections



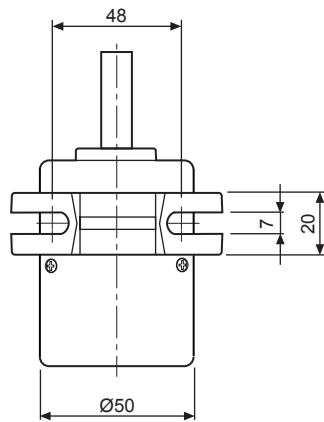
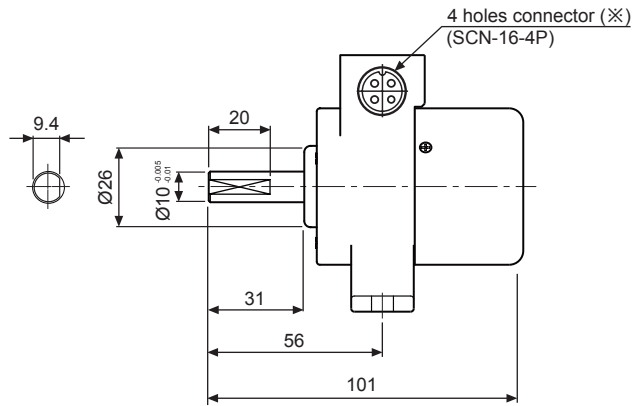
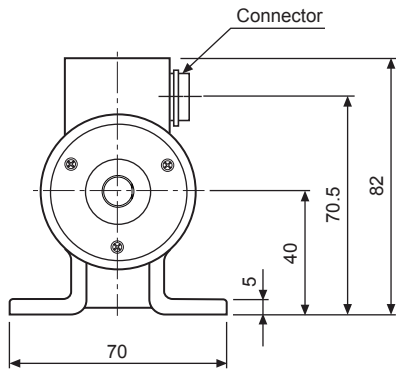
Pin No	Cable color	Function
①	Black	OUT A
②	White	OUT B
③	Brown	+V
④	Blue	GND
①	Black	OUT A
②	White	OUT B
③	Orange	OUT Z
④	Brown	+V
⑤	Blue	GND

- ※In case of ENA-□-3-□-□ model, Z phase is output.
- ※Unused wires must be insulated.
- ※The metal case and shield cable of encoder must be grounded (F.G.).

# Incremental Side-Mounting Type

## ■ Dimensions

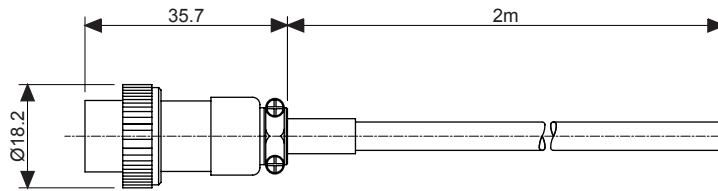
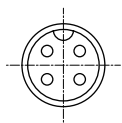
(unit: mm)



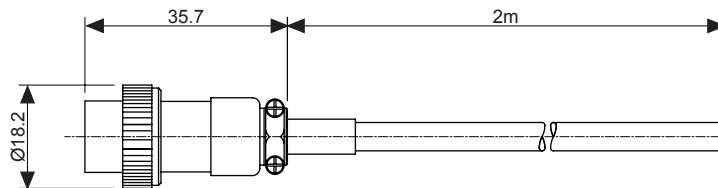
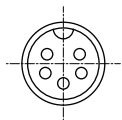
※ENA-□-3-□-□  
: 5 holes connector (SCN-16-5P)

## ◎ Connector cable

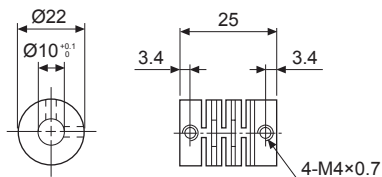
- ENA (2m, 4-wire)



- ENA (2m, 5-wire)



## ◎ Coupling (ENA)



- Parallel misalignment: Max. 0.25mm
- Angular misalignment: Max. 5°
- End-play: Max. 0.5mm

※For parallel misalignment, angular misalignment, end-play terms, refer to page F-71.

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