

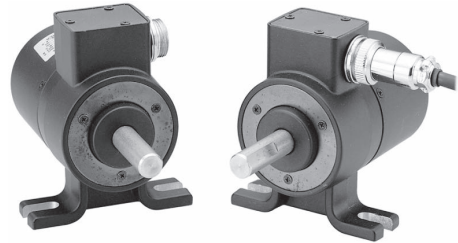
ENA Series Incremental Side-Mounting Shaft Type

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 "Safety Considerations" in operation manual before using.



■ Ordering Information

ENA	5000	3	N	24
Series	Pulses/revolution	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 Incremental Rotary Encoder		
Resolution (PPR) ^{*1}	*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=
		NPN open collector output	• [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=
		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	Over 100MΩ (at 500VDC megger between all terminals and case)		
Dielectric strength	750VAC 50/60Hz for 1 minute (between all terminals and case)		
Connection	Radial connector type		
Mechanical specification	Starting torque	Max. 70gf·cm (0.007N·m)	
	Moment of inertia	Max. 80g·cm ² (8×10 ⁻⁶ kg·m ²)	
	Shaft loading	Radial: 10kgf, Thrust: 2.5kgf	
	Max. allowable revolution ^{*2}	5,000rpm	
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, 2m, Shield cable (AWG 24, core diameter: 0.08mm, number of cores: 40, insulator out diameter: Ø1mm)	
	ENA-□-3-□-□	Ø5mm, 5-wire, 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/ Connector Cables/ Sensor Distribution Boxes/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

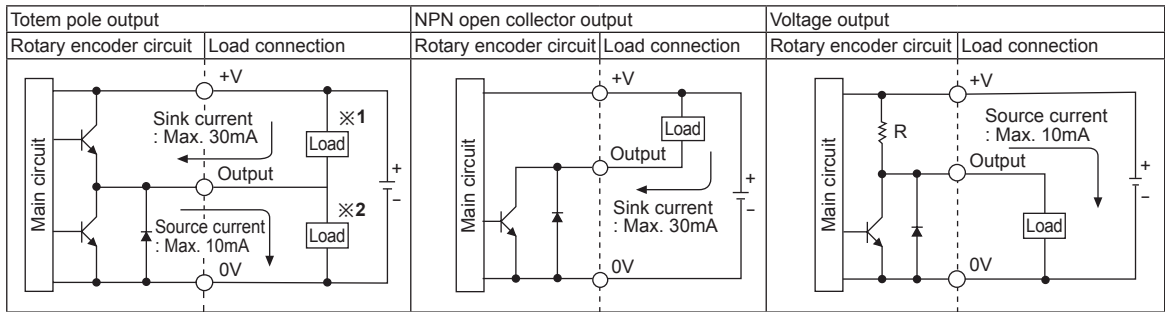
(R) Graphic/ Logic Panels

(S) Field Network Devices

(T) Software

ENA Series

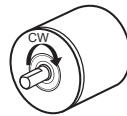
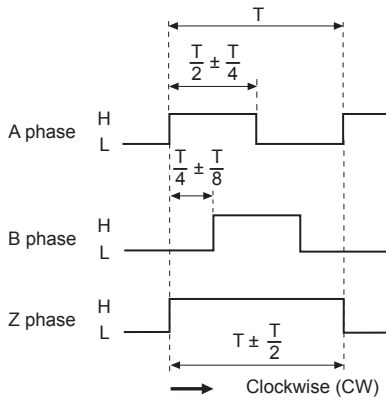
Control Output Diagram



- 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).

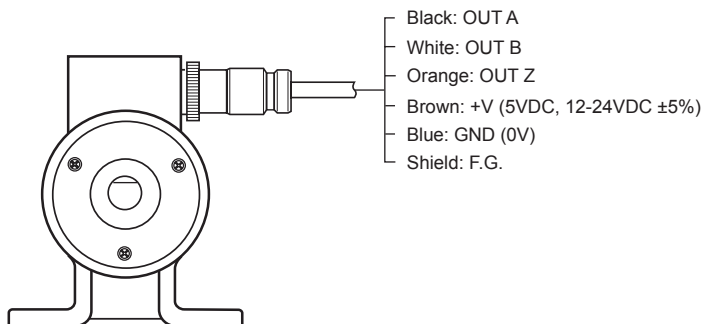
Output Waveform

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



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

Connections



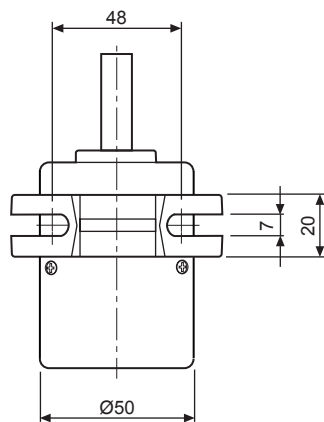
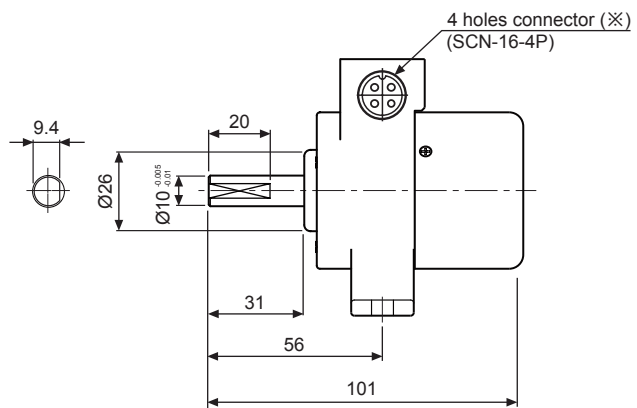
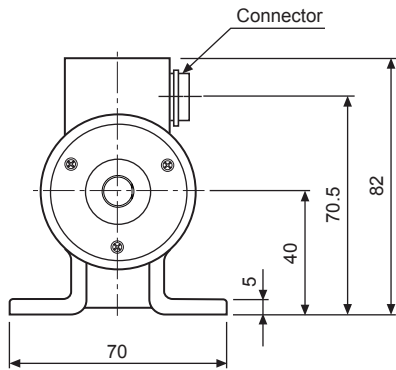
Pin No	Cable color	Function
①	Black	OUT A
②	White	OUT B
③	Brown	+V
④	Blue	GND
①	Black	OUT A
②	White	OUT B
③	Orange	OUT Z
④	Brown	+V
⑤	Blue	GND

- ※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 Shaft Type

■ Dimensions

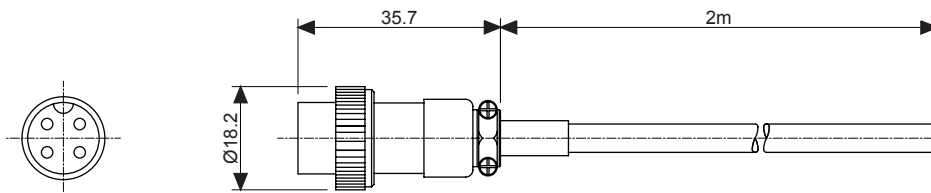
(unit: mm)



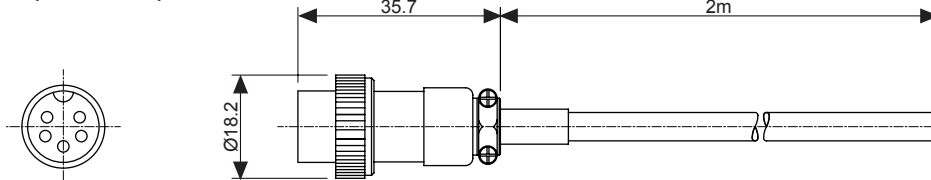
※ENA-□□-3-□□□
: 5 holes connector (SCN-16-5P)

◎ Connector cable (accessory)

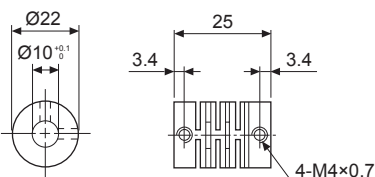
● ENA (2m, 4-wire)



● ENA (2m, 5-wire)



◎ Coupling (ENA)



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

※When mounting the coupling to the encoder shaft, if there is combined misalignment (parallel, angular misalignment) between rotating encoder shaft and mate shaft, it may cause encoder and coupling's life cycle to shorten.

※Do not load overweight on the shaft.

※For parallel misalignment, angular misalignment, end-play terms, refer to page F-87.

※For flexible coupling (ERB series) information, refer to page F-80.

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