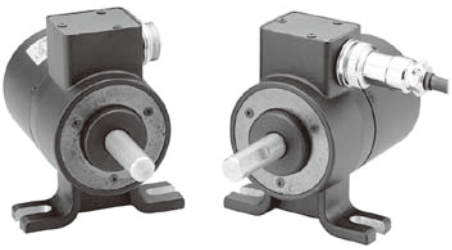
Side-mounting Shaft type Incremental Rotary Encoder

■ 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 — 2 — N — 24

Series	Pulse/1Revolution	Output phase	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%

※Standard : ENA-□-2-N-24

■ Specifications

Item			Side-mounting shaft type of incremental rotary encoder	
Resolution(P/R)※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		A, B phase(Option : A, B, Z 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 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	• Measuring condition - 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·cm²(8×10^{-6} kg·m²)	
	Shaft loading		Radial : 10kgf, Thrust : 2.5kgf	
	Max. allowable revolution※2		5000rpm	
Vibration			1.5mm amplitude or 300m/s^2 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℃, storage : -25 to 85℃	
		Ambient humidity	35 to 85%RH, storage : 35 to 90%RH	
Protection			IP50(IEC standard)	
Cable			ø5, 5-wire, Length : 2m, Shield cable (AWG 24, Core diameter : 0.08mm, Number of cores : 40, Insulator out diameter : ø1)	
Accessory			ø10mm coupling	
Approval			CE	
Unit weight			Approx. 345g	

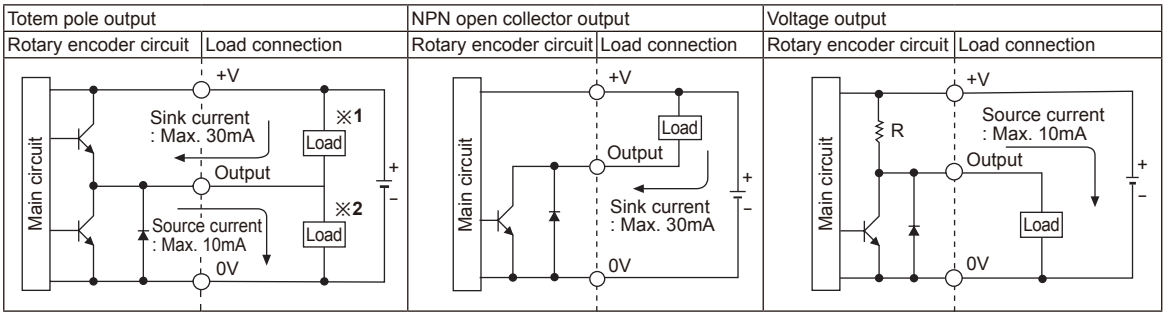
※1: '*' pulse is only for A, B phase

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

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

※Environment resistance is rated at no freezing or condensation.

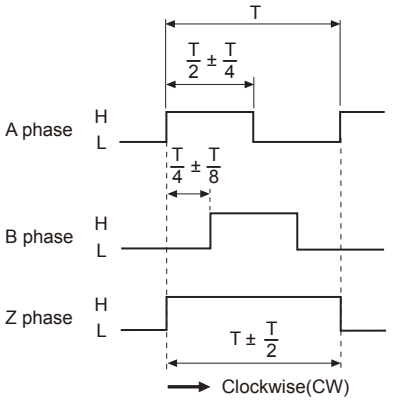
▣ Control output diagram



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

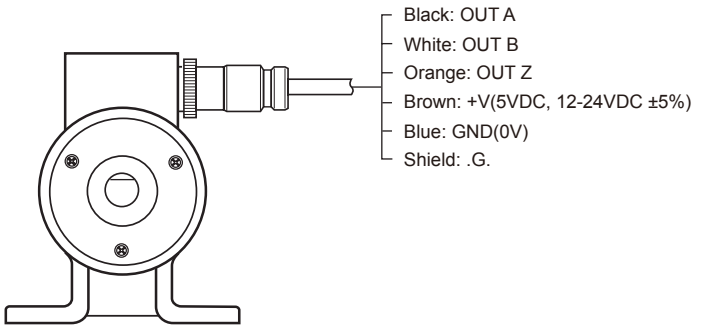
▣ Output waveform

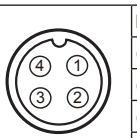
- **Totem pole output / NPN open collector output / Voltage output**



※Z phase output is option.
※CW : Right turn as from the shaft

▣ Connections





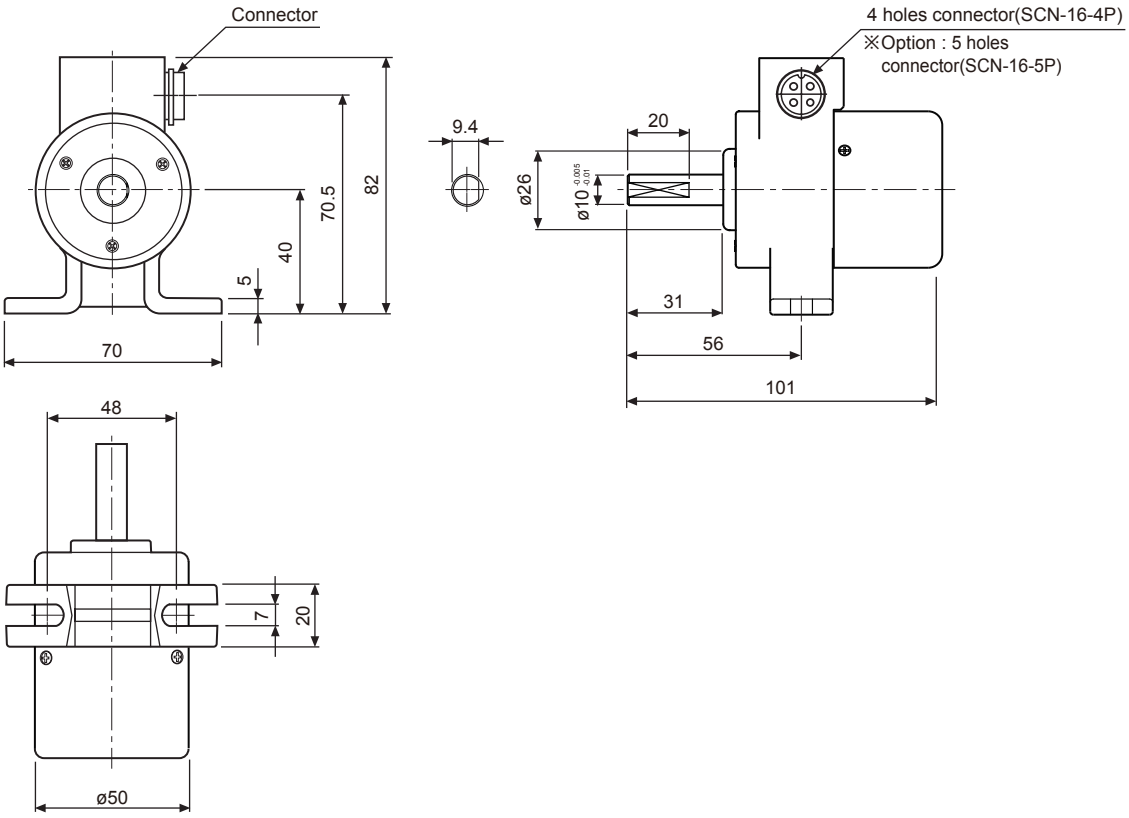
Pin No	Cable color	Function
①	Black	OUT A
②	White	OUT B
③	Brown	+V
④	Blue	GND

①	Black	OUT A
②	White	OUT B
③	Orange	OUT Z
④	Brown	+V
⑤	Blue	GND

※Z phase output is option.
※Unused wires must be insulated.
※The metal case and shield cable of encoder must be grounded(F.G.).

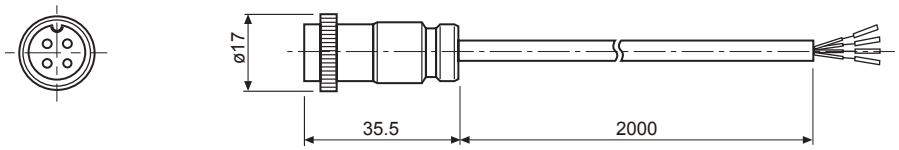
▣ Dimensions

(unit: mm)

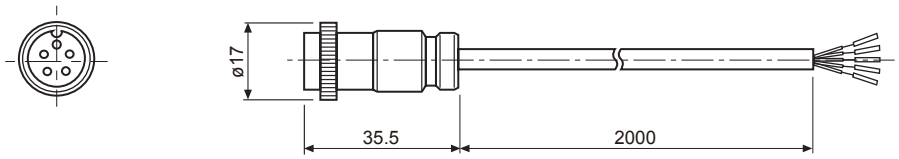


◎ Connector cable

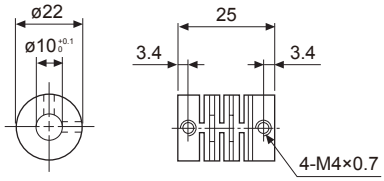
- **ENA(2m, 4-wire)**



- **ENA(2m, 5-wire) (Option)**



◎ 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 the F-78 page.