

E18S Series

Ø18mm Incremental Rotary Encoder

■ Features

- Ultra-compact (Ø18mm) and ultra-lightweight (12g/10g)
- Easy installation in tight or limited spaces
- Low moment of inertia
- Power supply: 5VDC ±5%




[Axial cable type]



[Radial cable type]

■ Applications

- Suitable for office machine such as ATMs, bill counting machines, copy machines

 Please read "Safety Considerations" in operation manual before using.



※Except for No Amp. output type.

■ Ordering Information


E18S **2.5** – **200** – **1** – **N** – **5** – **R**

Series	Shaft diameter	Pulses/revolution	Output phase	Control output	Power supply	Cable
Ø18mm, shaft type	2: Ø2mm 2.5: Ø2.5mm	100, 200, 300, 400	1: A	N: NPN open collector output V: Voltage output	5: 5VDC ±5%	R: Axial cable type S: Radial cable type
Ø18mm, shaft type	2: Ø2mm 2.5: Ø2.5mm	200, 300	1: A	A: No Amp.	5: 5VDC ±5%	R: Axial cable type S: Radial cable type

Incremental Ø18mm Shaft Type

Shaft Type Ø18mm Incremental Rotary Encoder

■ Specifications

Item	Ø18mm shaft type of Incremental Rotary Encoder		
Resolution (PPR) ^{※1}	100, 200, 300, 400		
Electrical specification	Output phase	A phase	
	Control output	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)	NPN open collector output	Max. 1μs (cable length: 1m, I sink = 20mA)
		Voltage output	
	Max. response frequency	25kHz	
	Power supply	5VDC≡ ±5% (ripple P-P: max. 5%)	
	Current consumption	Max. 50mA (disconnection of the load)	
	Insulation resistance	Over 100MΩ (at 500VDC megger between all terminals and case)	
	Dielectric strength	500VAC 50/60Hz for 1 min (between all terminals and case)	
Connection	Axial cable type, radial cable type		
Mechanical specification	Starting torque	Max. 10gf·cm (9.8×10 ⁻⁴ N·m)	
	Moment of inertia	Max. 0.5g·cm ² (5×10 ⁻⁸ kg·m ²)	
	Shaft loading	Radial: max. 200gf, Thrust: max. 200gf	
	Max. allowable revolution ^{※2}	6,000rpm	
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. 50G		
Environment	Ambient temperature	-10 to 70°C, storage: -20 to 80°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH	
Protection structure	IP50 (IEC standard)		
Cable	Ø1.28mm, 3-wire, 150mm, Flat ribbon cable (AWG26, core diameter: 0.16mm, number of cores: 7, insulator diameter: Ø1.28mm)		
Accessory	Ø2mm coupling (supplied only for Ø2mm shaft diameter model)		
Approval			
Weight ^{※3}	Ø2mm Shaft diameter model: approx. 35.4g (approx. 12g) Ø2.5mm Shaft diameter model: approx. 34.2g (approx. 12g)		

※1: 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.

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

※3: The weight includes packaging. The weight in parenthesis is for unit only.

※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

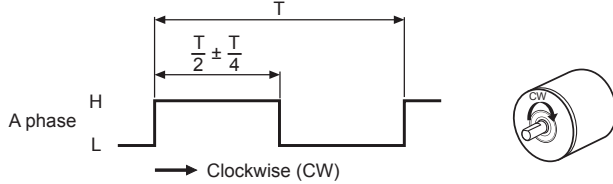
(R) Graphic/ Logic Panels

(S) Field Network Devices

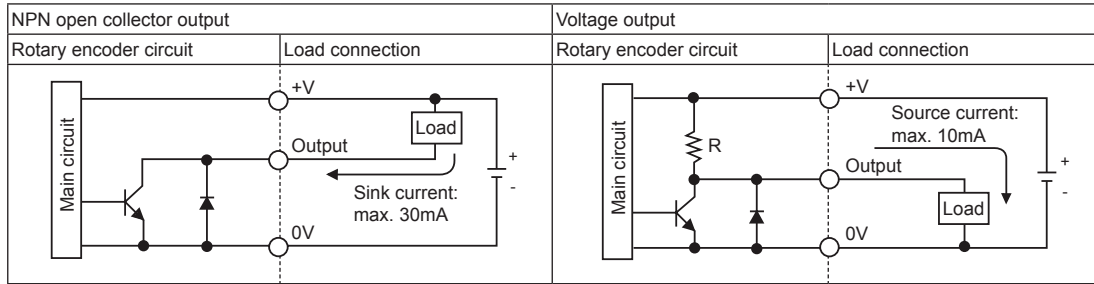
(T) Software

E18S Series

Output Waveform



Control Output Diagram



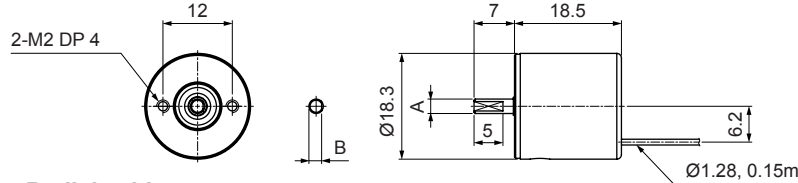
Connections



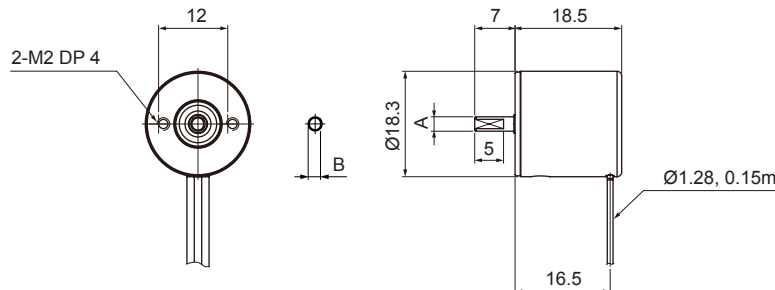
※Do not apply tensile strength over 10N to the cable.

Dimensions

• Axial cable type

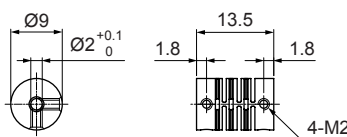


• Radial cable type



Model	A	B
E18S2	$\varnothing 2.0_{-0.02}^{-0.004}$	1.7
E18S2.5	$\varnothing 2.5_{-0.02}^{-0.004}$	2.2

⊙ Coupling



- Parallel misalignment: max. 0.15mm
- Angular misalignment: max. 2°
- End-play: max. 0.2mm

- ※Do not load overweight on the shaft.
- ※Do not put strong impact when insert a coupling into shaft.
- Failure to follow this instruction may result in product damage.
- ※Fix the unit or a coupling by a wrench under 0.15 N·m of torque.
- ※When you install this unit, if eccentricity and deflection angle are larger, it may shorten the life cycle of this unit.
- ※For parallel misalignment, angular misalignment, end-play terms, refer to page F-87.
- ※For flexible coupling (ERB series) information, refer to page F-80.

Incremental No Amp. output Type Ø18mm Shaft Type

Shaft Type No Amp. Output Type Ø18mm Incremental Rotary Encoder

■ Specifications

Item		Ø18mm shaft type of Incremental Rotary Encoder	
Resolution (PPR) ^{※1}		200, 300	
Electrical specification	Output phase	A phase	
	Output waveform	Quasi-sinusoidal (No Amp.)	
	Output signal amplitude	Min. 150mV _{P-P}	
	Output amplitude variation	Max. 40%	
	Max. response frequency	10kHz	
	Power supply	5VDC \pm 5% (ripple P-P: max. 5%)	
	Insulation resistance	Over 100M Ω (at 500VDC megger between all terminals and case)	
	Dielectric strength	500VAC 50/60Hz for 1 min (between all terminals and case)	
	Connection	Axial cable type, radial cable type	
Optical elements specifications	LED	Current flow	I _F : max. 50mA
		Reverse voltage	V _R : max. 5VDC \pm
		Current consumption	P _D : max. 95mW
	Photo transistor	Collector-Emitter voltage	V _{CE0} : max. 30VDC \pm
		Emitter-Collector voltage	V _{EC0} : max. 5VDC \pm
		Collector current	I _C : max. 20mA
	Collector Current consumption	P _C : max. 75mW	
Mechanical specification	Starting torque	Max. 10gf·cm (9.8 \times 10 ⁻⁴ N·m)	
	Moment of inertia	Max. 0.5g·cm ² (5 \times 10 ⁻⁸ kg·m ²)	
	Shaft loading	Radial: max. 200gf, Thrust: max. 200gf	
	Max. allowable revolution ^{※2}	3,000rpm	
Vibration		1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each of X, Y, Z directions for 2 hours	
Shock		Approx. max. 50G	
Environment	Ambient temperature	-10 to 70°C, storage: -20 to 80°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH	
Protection structure		IP50 (IEC standard)	
Cable		Ø1mm, 4-wire, 150mm, Flat ribbon cable (AWG26, core diameter: 0.16mm, number of cores: 7, insulator diameter: Ø0.98mm)	
Accessory		Ø2mm coupling (only for the Ø2mm shaft diameter model)	
Weight ^{※3}		Approx. 33.5g (approx. 10g)	

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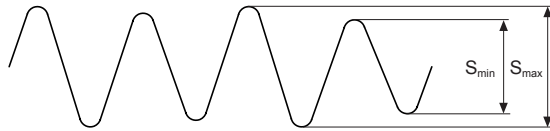
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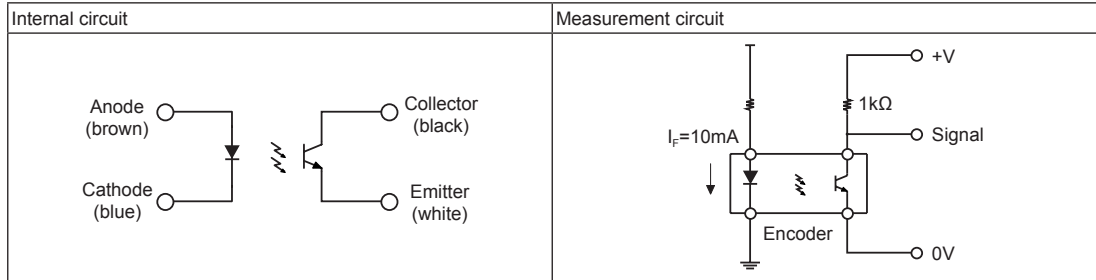
E18S Series

Output Waveform

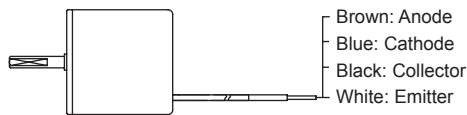


※ Output signal amplitude: $S_{min} \geq 150mV_{P-P}$
 Output amplitude variation: $(S_{max}/S_{min}-1) \times 100 \leq 40\%$

Control Output Diagram



Connections

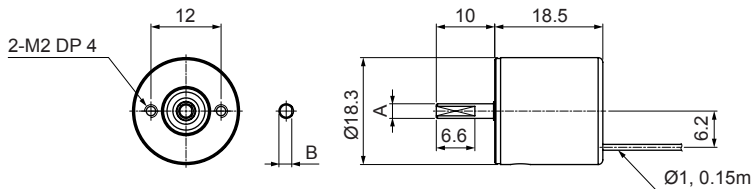


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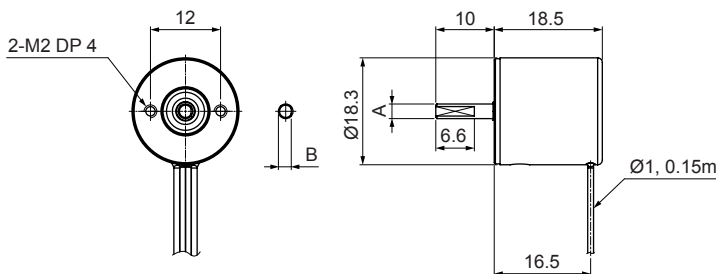
Dimensions

• Axial cable type

(unit: mm)

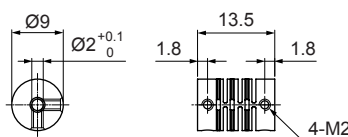


• Radial cable type



Model	A	B
E18S2	$\begin{matrix} \text{Ø}2.0 \\ -0.01 \\ -0.02 \end{matrix}$	$\begin{matrix} 1.8 \\ 0 \\ -0.1 \end{matrix}$
E18S2.5	$\begin{matrix} \text{Ø}2.5 \\ -0.01 \\ -0.02 \end{matrix}$	$\begin{matrix} 2.3 \\ 0 \\ -0.1 \end{matrix}$

○ Coupling



- Parallel misalignment: max. 0.15mm
- Angular misalignment: max. 2°
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