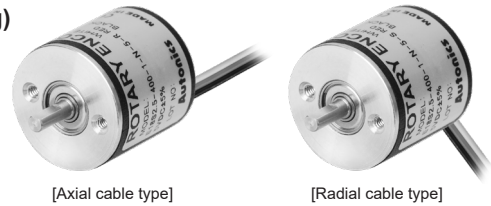


Shaft Type Ø18mm Incremental Rotary Encoder [NPN open collector/Voltage/No Amp. output]

■ Features

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



■ Applications

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

⚠ Please read "Safety Considerations" in the instruction 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

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(I) Connectors/ Connector Cables/ Sensor Distribution Boxes/ Sockets

E18S Series

Shaft Type Ø18mm Incremental Rotary Encoder [NPN open collector/Voltage output]

■ 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	CE c RU _{us}		
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.

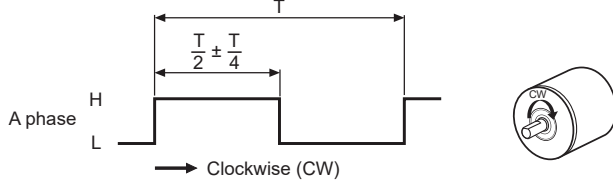
$$[\text{Max. response revolution (rpm)} = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}]$$

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

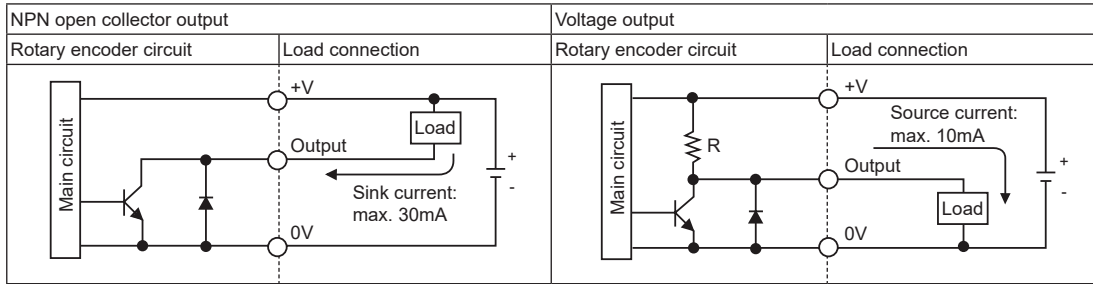
※Environment resistance is rated at no freezing or condensation.

Incremental Ø18mm Shaft Type

Output Waveform



Control Output Diagram



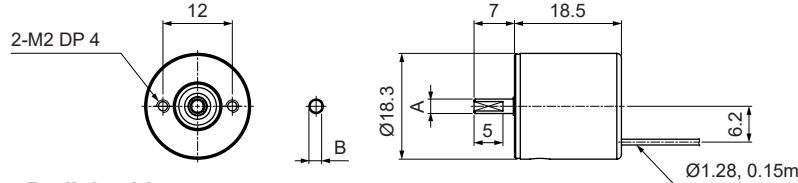
Connections



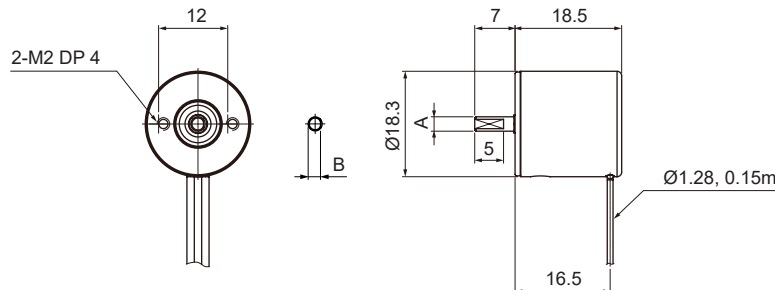
※Do not apply tensile strength over 10N to the cable.

Dimensions

• Axial cable type



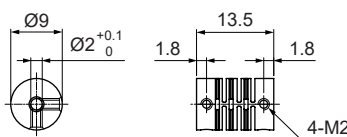
• Radial cable type



(unit: mm)

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 0.15N·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 the "Glossary" section of Technical Description.
- ※For flexible coupling (ERB series) information, refer to ERB series section.

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E18S Series

Shaft Type Ø18mm Incremental Rotary Encoder [No Amp. output]

■ 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 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	
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 _{CEO} : max. 30VDC \pm
		Emitter-Collector voltage	V _{ECO} : max. 5VDC \pm
		Collector current	I _C : max. 20mA
		Collector Current consumption	P _C : max. 75mW
Mechanical specification	Starting torque	Max. 10gf·cm (9.8×10 ⁻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}	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)		

※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.

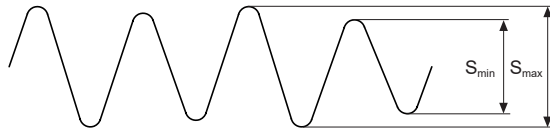
$$[\text{Max. response revolution (rpm)} = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}]$$

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

※Environment resistance is rated at no freezing or condensation.

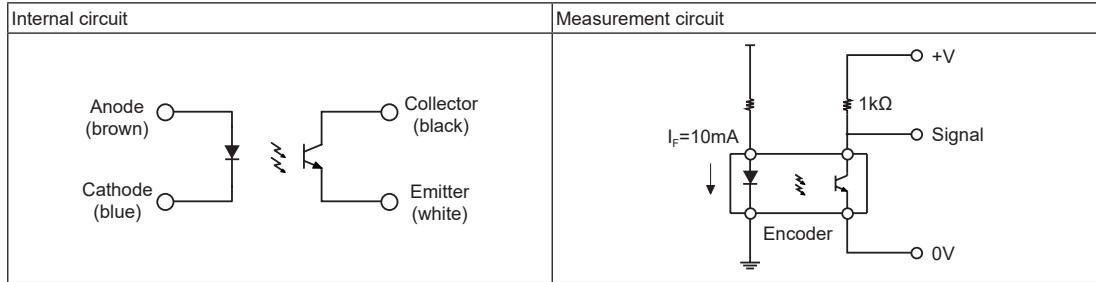
Incremental Ø18mm Shaft Type

Output Waveform

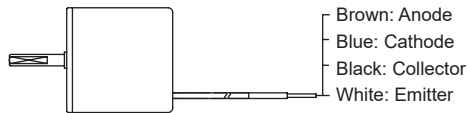


※ Output signal amplitude: $S_{min} \geq 150mV_{P-P}$
 Output amplitude variation: $(S_{max}/S_{min}-1) \times 100 \leq 40\%$

Control Output Diagram



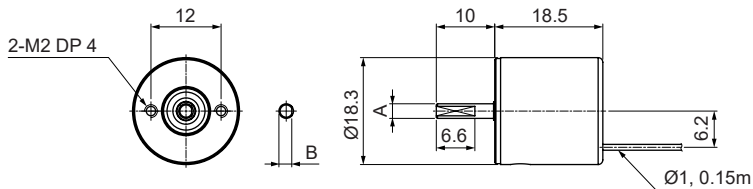
Connections



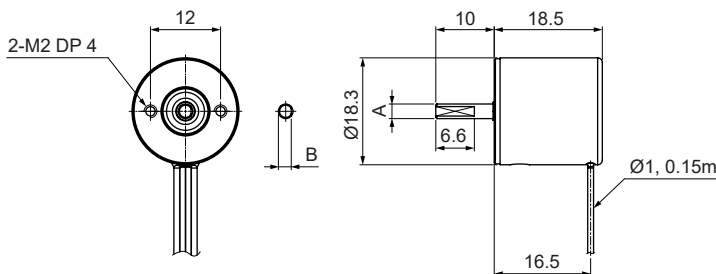
※ Do not apply tensile strength over 10N to the cable.

Dimensions

• Axial cable type



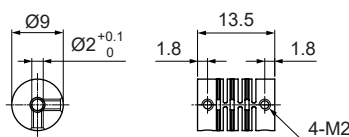
• Radial cable type



(unit: mm)

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°
- 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 0.15N·m of torque.
- ※ When you install this unit, if eccentricity and deflection angle are larger, it may shorten the life cycle of this unit.
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