

Autonics

ROTARY ENCODER (INCREMENTAL TYPE)

E18S SERIES

INSTRUCTION MANUAL



[Axial cable type] [Radial cable type]

Thank you for choosing our Autonics product.
Please read the following safety considerations before use.

■ Safety Considerations

※ Please observe all safety considerations for safe and proper product operation to avoid hazards.

※ ⚠ symbol represents caution due to special circumstances in which hazards may occur.

⚠ Warning Failure to follow these instructions may result in serious injury or death.

⚠ Caution Failure to follow these instructions may result in personal injury or product damage.

⚠ Warning

1. **Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.** (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)

Failure to follow this instruction may result in fire, personal injury, or economic loss.

2. **Install on a device panel to use.**

Failure to follow this instruction may result in fire.

3. **Do not connect, repair, or inspect the unit while connected to a power source.**

Failure to follow this instruction may result in fire.

4. **Check 'Connections' before wiring.**

Failure to follow this instruction may result in fire.

5. **Do not disassemble or modify the unit.**

Failure to follow this instruction may result in fire.

⚠ Caution

1. **Use the unit within the rated specifications.**

Failure to follow this instruction may result in fire or product damage.

2. **Do not short the load.**

Failure to follow this instruction may result in product damage by fire.

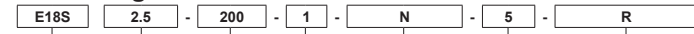
3. **Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**

Failure to follow this instruction may result in fire or explosion.

4. **Do not use the unit near the place where there is the equipment which generates strong magnetic force or high frequency noise and strong alkaline, strong acidic exists.**

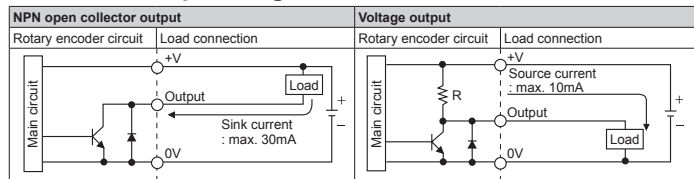
Failure to follow this instruction may result in product damage.

■ Ordering Information



Series	Shaft diameter	Pulses/ Revolution	Output phase	Control output	Power supply	Cable
Diameter 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

■ Control Output Diagram



※ The above specifications are subject to change and some models may be discontinued without notice.

※ Be sure to follow cautions written in the instruction manual, and the technical descriptions (catalog, homepage).

■ Specifications

Item	Diameter Ø18mm shaft type of incremental rotary encoder	
Model	E18S □ □ - 1 - N - 5 □	
NPN open collector output	E18S □ □ - 1 - V - 5 □	
Voltage output	E18S □ □ - 1 - V - 5 □	
Resolution (PPR) ^{※1}	100, 200, 300, 400	
Output phase	A phase	
Electrical specification	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. 1μs (cable length: 1m, I sink = 20mA)
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}	6000rpm
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, RoHS	
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.

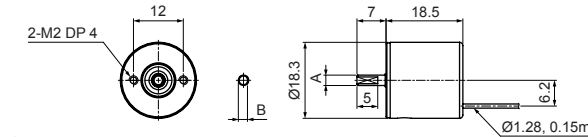
$$[\text{Max. response revolution (rpm)}] = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$$

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

※Environment resistance is rated at no freezing or condensation.

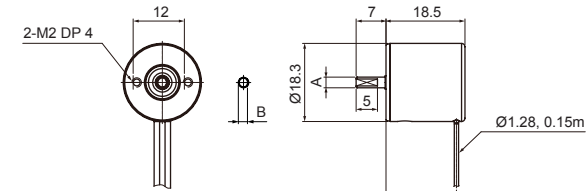
■ Dimensions

○ Axial cable type



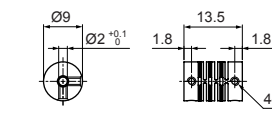
(unit: mm)

○ Radial cable type



Model	A	B
E18S2	Ø2.0 ^{+0.004} _{-0.02}	1.7
E18S2.5	Ø2.5 ^{+0.004} _{-0.02}	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.

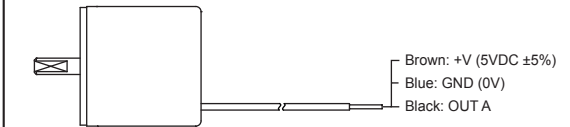
Failure to follow this instruction may result in product damage.

※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.

■ Connections

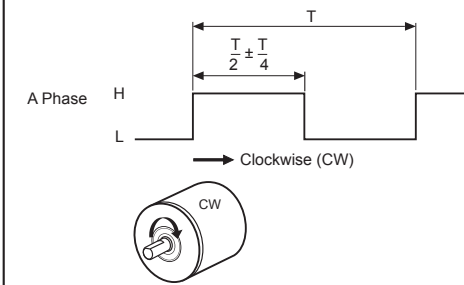
- NPN open collector output/Voltage output



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

■ Output Waveform

- NPN open collector output / Voltage output



■ Cautions during Use

1. Follow instructions in 'Cautions during Use'. Otherwise, It may cause unexpected accidents.
2. 5VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
3. For using the unit with the equipment which generates noise (switching regulator, inverter, servo motor, etc.), ground the shield wire to the F.G. terminal.
4. When using switching mode power supply, frame ground (F.G.) terminal of power supply should be grounded.
5. Check the wire type and response frequency when extending wire because of distortion of waveform or residual voltage increment etc by line resistance or capacity between lines.
6. This unit may be used in the following environments.
 - ① Indoors (in the environment condition rated in 'Specifications')
 - ② Altitude max. 2,000m
 - ③ Pollution degree 2
 - ④ Installation category II

■ Major Products

- Photoelectric Sensors
- Temperature Controllers
- Fiber Optic Sensors
- Temperature/Humidity Transducers
- Door Sensors
- SSRs/Power Controllers
- Door Side Sensors
- Counters
- Area Sensors
- Timers
- Proximity Sensors
- Panel Meters
- Pressure Sensors
- Tachometer/Pulse (Rate) Meters
- Rotary Encoders
- Display Units
- Connector/sockets
- Sensor Controllers
- Switching Mode Power Supplies
- Control Switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper Motors/Drivers/Motion Controllers
- Graphic/Logic Panels
- Field Network Devices
- Laser Marking System (Fiber, CO₂, Nd: YAG)
- Laser Welding/Cutting System

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