

Autonics

ROTARY ENCODER(INCREMENTAL TYPE)

E15S2-36-2-N-5-R

INSTRUCTION MANUAL



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.

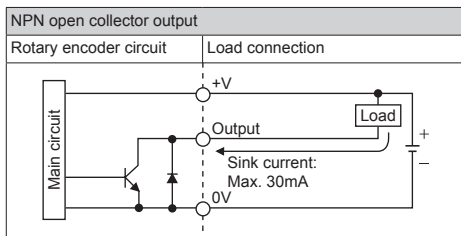
3. **Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**

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.

■ 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	Ø15mm Shaft type Incremental Rotary Encoder
Model	E15S2-36-2-N-5-R
Resolution(PPR)	36
Output phase	A, B 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	NPN open collector output - Load current: Max. 30mA, Residual voltage: Max. 0.4VDC=
Response time (Rise/Fall)	Max. 1µs(cable length: 1m, I sink = 20mA)
Max. Response frequency	10kHz
Power supply	5VDC= ±5%(ripple P-P: max. 5%)
Current consumption	Max. 50mA (disconnection of the load)
Insulation resistance	Min. 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
Starting torque	Max. 10gf cm(10×10 ⁻⁴ N m)
Moment of inertia	Max. 0.5g cm ² (5×10 ⁻⁹ kg m ²)
Shaft loading	Radial: 200gf, Thrust : 200gf
Max. allowable revolution ^{※1}	3000rpm
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. 50G
Ambient temperature	-10 to 70°C, Storage: -20 to 80°C
Ambient humidity	35 to 85%RH, Storage: 35 to 90%RH
Protection	IP50(IEC standards)
Cable	Ø3mm, 4-wire, length:500mm, Flexible PVC insulation shielded cable (AWG30, Core diameter:0.102mm, Number of cores: 7, Insulator diameter: Ø0.71mm)
Accessory	Ø2mm Coupling
Weight ^{※2}	Approx. 37g(Approx. 14g)

※1: Max. allowable revolution ≥ Max. response revolution

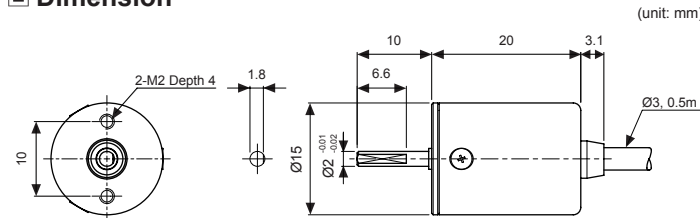
$$[\text{Max. response revolution(rpm)}] = \frac{\text{Max. response frequency} \times 60 \text{ sec}}{\text{Resolution}}$$

Please select the resolution to make lower max. response revolution than max. allowable revolution.

※2: The weight with packaging and the weight in parentheses is only unit weight.

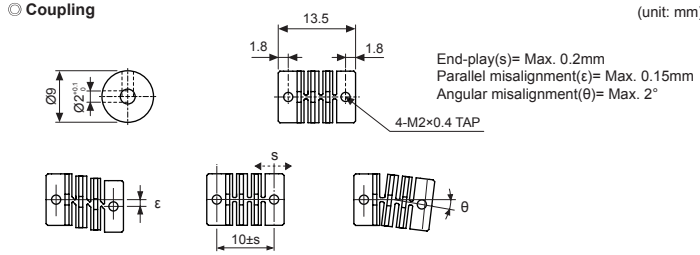
※Environment resistance is rated at no freezing or condensation.

■ Dimension



■ Accessory

○ Coupling



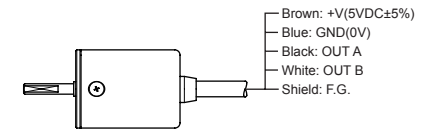
※ Do not load overweight on the shaft.
※ Do not put strong impact when insert a coupling into shaft.

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.

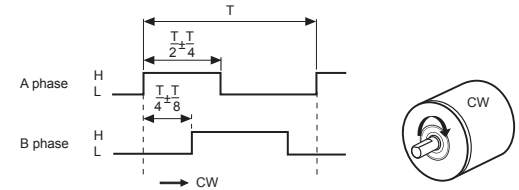
※ When you install this unit, if eccentricity and deflection angle are larger, it may shorten the life cycle of this unit.

■ Connections



※ Unused wires must be insulated.
※ The metal case and shield cable should be grounded(F.G.).
※ Do not apply tensile strength over 15N to the cable.

■ Output Waveform



■ Cautions during use

- Follow instructions in 'Cautions during Use'. Otherwise, It may cause unexpected accidents.
- 5VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- 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.
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- When using switching mode power supply, frame ground (F.G.) terminal of power supply should be grounded.
- Wire as short as possible and keep away from high voltage lines or power lines, to prevent inductive noise.
- 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.
- This unit may be used in the following environments.
 - Indoors (in the environment condition rated in 'Specifications')
 - Altitude max. 2,000m
 - Pollution degree 2
 - Installation category II

■ Major Products

- Photoelectric Sensors
- Fiber Optic Sensors
- Door Sensors
- Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Connector/Sockets
- 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
- Temperature Controllers
- Temperature/Humidity Transducers
- SSRs/Power Controllers
- Counters
- Timers
- Panel Meters
- Tachometer/Pulse (Rate) Meters
- Display Units
- Sensor Controllers

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