

Autonics ROTARY ENCODER (SINE WAVE INCREMENTAL TYPE) E60H 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

- 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 personal injury, economic loss or fire.
- Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**
Failure to follow this instruction may result in explosion or fire.
- Install on a device panel to use.**
Failure to follow this instruction may result in fire.
- Do not connect, repair, or inspect the unit while connected to a power source.**
Failure to follow this instruction may result in fire.
- Check 'Connections' before wiring.**
Failure to follow this instruction may result in fire.
- Do not disassemble or modify the unit.**
Failure to follow this instruction may result in fire.

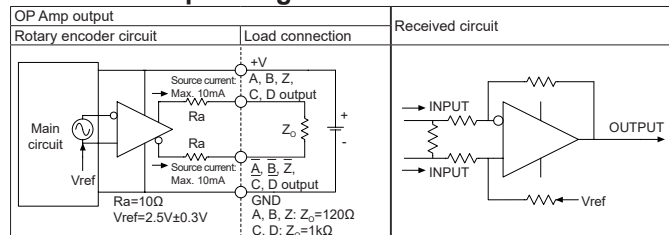
⚠ Caution

- Use the unit within the rated specifications.**
Failure to follow this instruction may result in fire or product damage.
- Do not short the load.**
Failure to follow this instruction may result in fire.
- 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

E60H	20	2048	10	A	5	R
Series	Shaft inner diameter	Pulses/revolution	Output phase	Control output	Power supply	Cable
Ø60mm, hollow shaft type	Ø20mm	2048	10: A, Ā, B, B̄, Z, Z̄, C, C̄, D, D̄	A: Analog sine wave OP Amp output	5: 5VDC ±5%	R: Axial cable type S: Radial cable type

■ Control Output Diagram



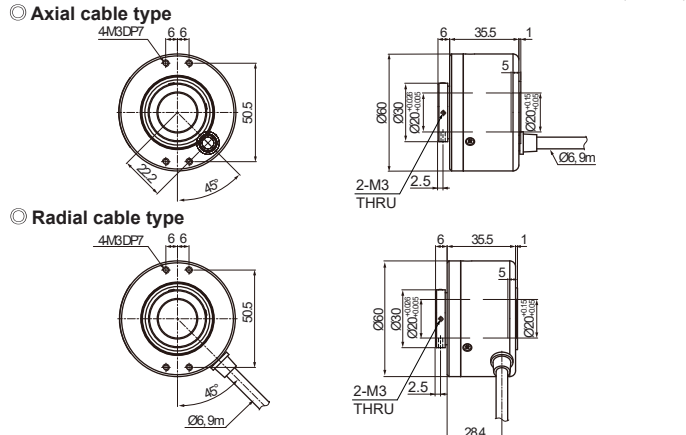
※ All output circuits of A, Ā, B, B̄, Z, Z̄, C, C̄, D, D̄ phase are the same.
 ※ The above specifications are subject to change and some models may be discontinued without notice.
 ※ Be sure to follow cautions written in the instruction manual.

■ Specifications

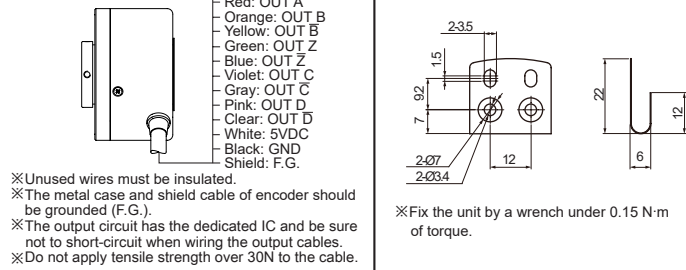
Item	Hollow Shaft Type Ø60mm SINE WAVE INCREMENTAL Rotary Encoder		
Model	E60H20-2048-10-A-5-R	E60H20-2048-10-A-5-S	
Revolution (PPR)	2,048		
Output phase	A, Ā, B, B̄, Z, Z̄, C, C̄, D, D̄ phase		
Phase difference of output	Phase difference between A and B: $\frac{T}{4} \pm \frac{T}{8}$ (T=1 cycle of A phase) Phase difference between C and D: 90°		
Electrical specification	Control output	Output type OP Amp output	
	Control output	Output current	Max. 10mA
		Output voltage	$V_{p-p} = 0.5V \pm 0.1V$
		DC OFFSET	$V_{DC} = 2.5V \pm 0.3V$
		Max. response frequency	200kHz
	Power supply	5VDC ±5% (ripple P-P: max. 5%)	
	Current consumption	Max. 120mA (disconnection of the load)	
	Insulation resistance	Over 100MΩ (at 500VDC between all terminals and case)	
	Dielectric strength	750VAC 50/60Hz for 1 minute (between all terminals and case)	
	Connection	Axial cable type	Radial cable type
Mechanical specification	Starting torque	Max. 200gf·cm (0.02N·m)	
	Moment of inertia	Max. 110g·cm ² (11×10 ⁻⁶ kg·m ²)	
	Shaft loading	Radial: 5kgf, Thrust: 2.5kgf	
	Max. allowable revolution	6000rpm	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours		
Shock	Max. 100G		
	Ambient temp.	-20 to 100°C, storage: -25 to 100°C	
Environment	Ambient humi. 35 to 85%RH, storage: 35 to 90%RH		
	Protection structure	IP40 (IEC standard)	
Cable	Ø6mm, 17-wire, 9m ^{※1} , Shield cable (AWG28, core diameter: 0.08mm, number of cores: 17, insulator out diameter: Ø0.8mm)		
Accessory	Bracket: 2		
Approval	CE		
Weight ^{※2}	Approx. 750g (approx. 720g)		

※1: Option is 7m, 15m.
 ※2: The weight includes packaging. The weight in parenthesis in for unit only.
 ※ Environment resistance is rated at no freezing or condensation.

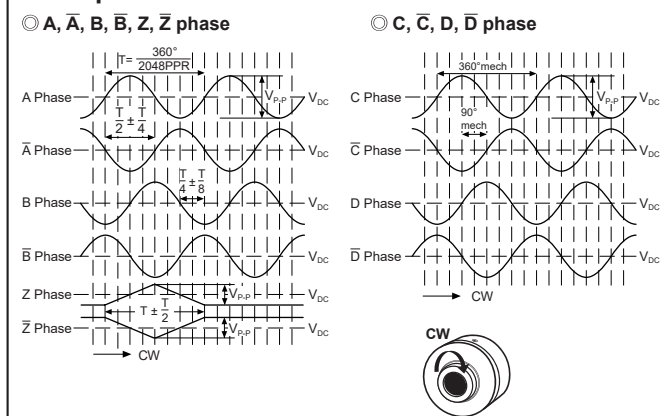
■ Dimensions



■ Connections



■ Output Waveforms



■ 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.
- Ground the shield wire to the F.G. terminal.
- 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
- Connectors/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, Co., 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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