

Autonics

ROTARY ENCODER(INCREMENTAL TYPE) E40S/E40H/E40HB/E80H SERIES

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.

■ Ordering Information

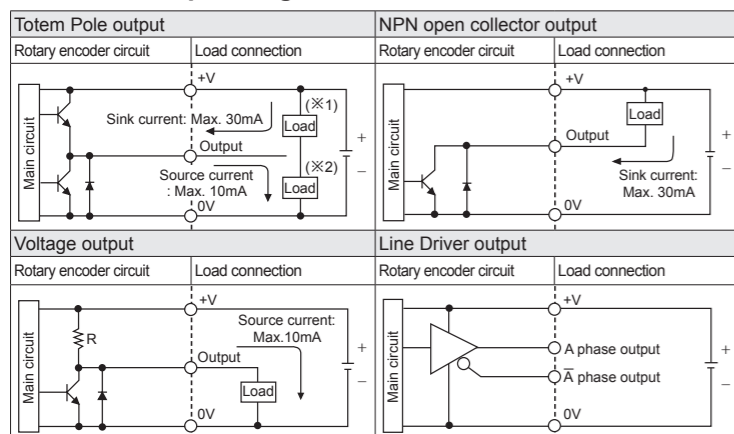
E40S - 6 - 5000 - 3 - N - 24

Series	Shaft diameter	Pulses / Revolution	Output phase	Output	Power supply	Cable
E40S	∅6mm	*1,2,5,10,12,15,20,23,25,30,35,40,45,50	2: A, B	T: Totem pole output	5: 5VDC ±5% 24: 12-24VDC ±5%	No mark Radial cable type C(※) Radial cable connector type
	∅8mm	60,75,100,120,125,150 192,200,240,250,256	3: A, B, Z	N: NPN open collector output		
E40H E40HB	∅6mm	300,360,400,500,512	4: A, Ā, B, B̄	V: Voltage output	5: 5VDC ±5% 24: 12-24VDC ±5%	No mark Radial cable type C(※) Radial cable connector type
	∅8mm	600,800,1000,1024,1200,1500,1800,2000,2048	6: A, Ā, B, B̄, Z, Z̄	L: Line Driver output		
E80H	∅30mm	60,100,360,500	3: A, B, Z	L: Line Driver output	5: 5VDC ±5% 24: 12-24VDC ±5%	No mark Radial cable type C(※) Radial cable connector type
	∅32mm	512,1024,3200	6: A, Ā, B, B̄, Z, Z̄			

※ * indicates the standard specification of diameters.

※ 1, 2, 5, 12 PPR are output A, B phase only. (But Line Driver output A, Ā, B, B̄ phase)

■ Control Output Diagram



※ The output circuit of A, B, Z phase are the same. (Line Driver output is A, Ā, B, B̄, Z, Z̄ phase)

※ Totem Pole output can be used for NPN open collector type(※1) or voltage output type(※2).

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

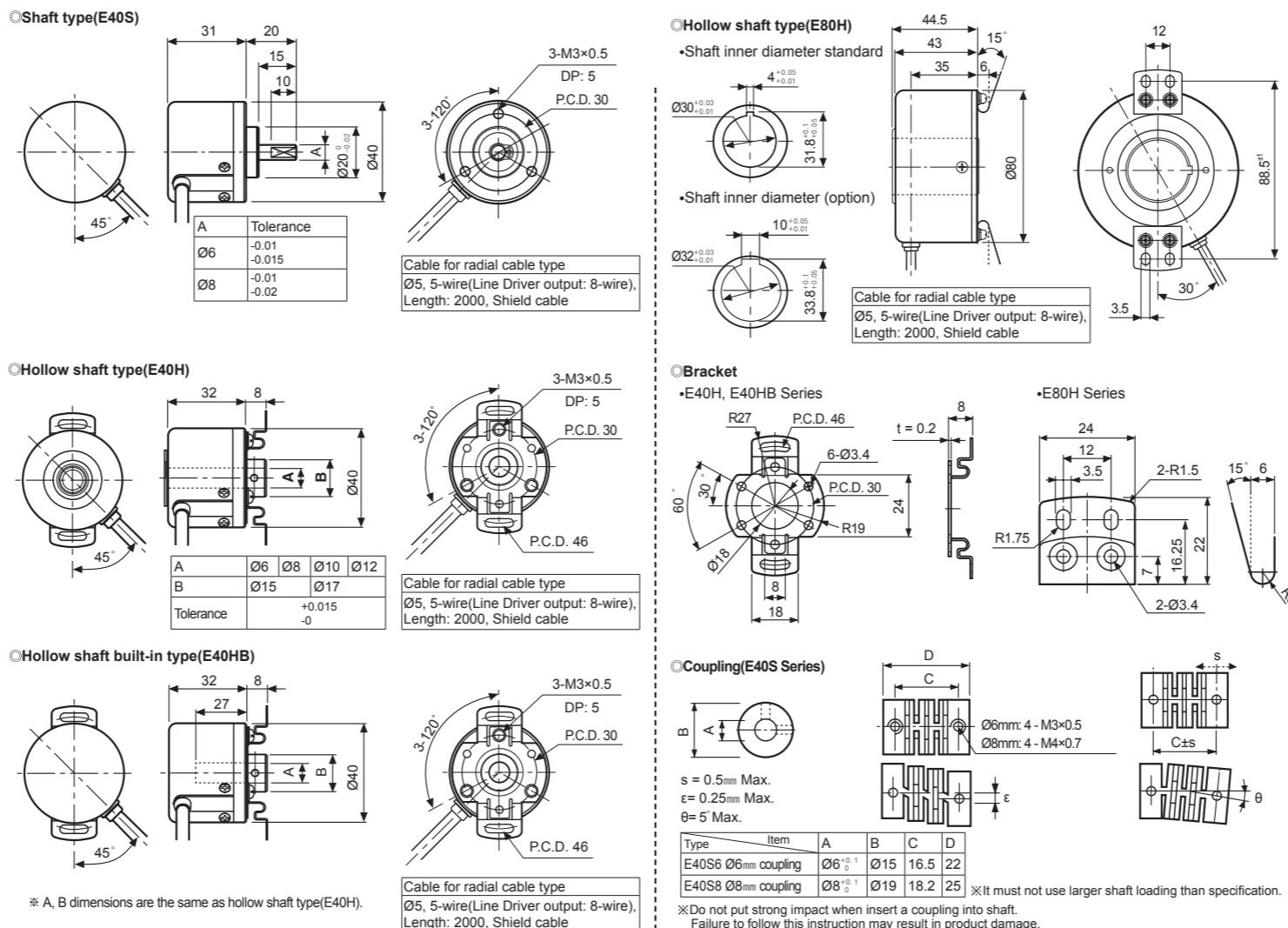
※ Be sure to follow cautions written in the instruction manual, and the technical descriptions (catalog, homepage).

■ Specifications

Model	∅40mm Shaft type	∅40mm Hollow shaft type	∅40mm Hollow shaft Built-in type	∅80mm Hollow shaft type
Totem Pole output	E40S	E40H	E40HB	E80H
NPN open collector output	E40S	E40H	E40HB	E80H
Voltage output	E40S	E40H	E40HB	E80H
Line Driver output	E40S	E40H	E40HB	E80H
Resolution(PPR)	*1, *2, *5, 10, *12, 15, 20, 23, 25, 30, 35, 40, 45, 50, 60, 75, 100, 120, 125, 150, 192, 200, 240, 250, 256, 300, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500, 3000, 3600, 5000 (Not indicated type is available to customize)			60, 100, 360, 500, 512, 1024, 3200
Output phase ^{※1}	A, B, Z phase(Line Driver output: A, Ā, B, B̄, Z, Z̄ phase)			
Phase difference between output	Output between A and B phase: $\frac{T}{4} \pm \frac{T}{8}$ (T = 1 cycle of A phase)			
Electrical specification	Control output			
	Totem Pole output			
	NPN open collector output			
	Voltage output			
Mechanical specification	Response time(Rise/Fall)			
	Totem Pole output			
	NPN open collector output			
	Voltage output			
Max. Response frequency				
Power supply				
Current consumption				
Insulation resistance				
Dielectric strength				
Connection				
Starting torque				
Moment of inertia				
Shaft loading				
Max. allowable revolution ^{※2}				
Vibration				
Shock				
Environment				
Protection structure				
Cable				
Accessory				
Approval				
Unit weight				

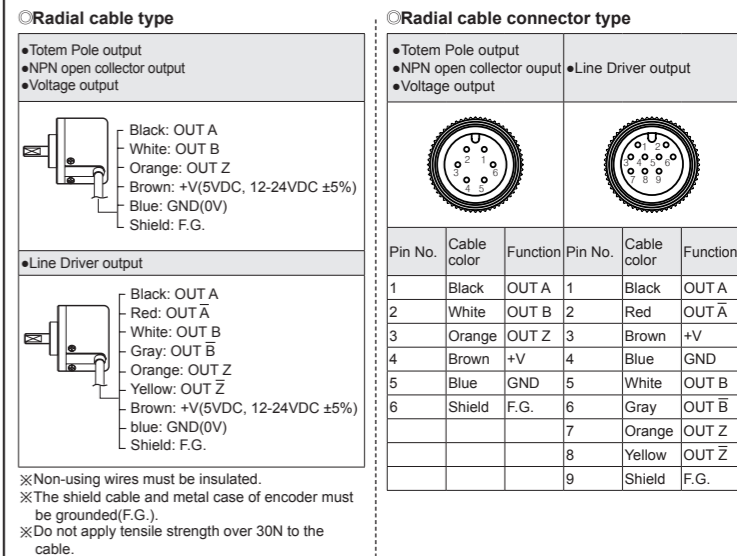
※1: 1, 2, 5, 12 PPR are output A, B phase only. (But Line Driver output: A, Ā, B, B̄ phase)
 ※2: Max. allowable revolution ≥ Max. response revolution [Max. response revolution(rpm) = $\frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$] Please select the resolution to make lower max. revolution than max. allowable revolution.
 ※ Environment resistance is rated at no freezing or condensation.

■ Dimensions

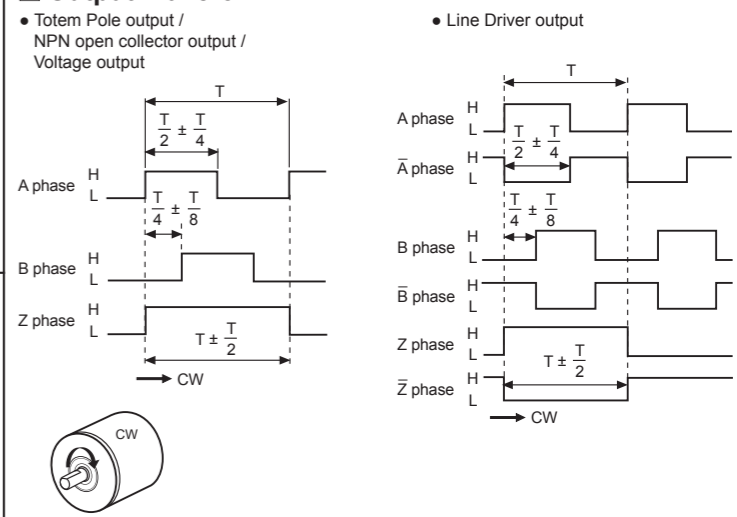


※ A, B dimensions are the same as hollow shaft type(E40H).

■ Connections



■ Output Waveform



■ Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, It may cause unexpected accidents.
- 5VDC, 12-24VDC 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.
- For Line driver unit, use the twisted pair wire which is attached seal and use the receiver for RS-422A communication.
- 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.
 - ①Indoors (in the environment condition rated in 'Specifications')
 - ②Altitude max. 2,000m
 - ③Pollution degree 2
 - ④Installation category

■ 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 ■ Smart Plug (Power Meters)
 ■ Rotary Encoders ■ Power Analyzers
 ■ 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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