

# 40 mm Diameter Incremental Rotary Encoders



## E40 Series PRODUCT MANUAL

**For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.**

The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

### Features

- Ø40 mm housing incremental rotary encoders
- Shaft, hollow shaft, blind hollow shaft models available
- Easy installation in tight or limited spaces
- Low shaft moment of inertia
- Various resolutions: 1 to 5000 pulses per revolution
- Various control output options
- Power supply: 5 VDC $\pm$  5%, 12 - 24 VDC $\pm$  5%

### Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- $\triangle$  symbol indicates caution due to special circumstances in which hazards may occur.

**$\triangle$  Warning** Failure to follow instructions may result in serious injury or death.

- 01. 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.
- 02. 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.
- 03. Install on a device panel to use.**  
Failure to follow this instruction may result in fire.
- 04. Do not connect, repair, or inspect the unit while connected to a power source.**  
Failure to follow this instruction may result in fire.
- 05. Check 'Connections' before wiring.**  
Failure to follow this instruction may result in fire.
- 06. Do not disassemble or modify the unit.**  
Failure to follow this instruction may result in fire.

**$\triangle$  Caution** Failure to follow instructions may result in injury or product damage.

- 01. Use the unit within the rated specifications.**  
Failure to follow this instruction may result in fire or product damage.
- 02. Do not short the load.**  
Failure to follow this instruction may result in fire.
- 03. 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.

### Cautions during Use

- Follow instructions in 'Cautions during Use'.  
Otherwise, it may cause unexpected accidents.
- 5 VDC $\pm$ , 12 - 24 VDC $\pm$  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 supplying power with SMPS, ground the F.G. terminal and connect the noise canceling capacitor between the 0 V and F.G. terminals.
- 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.
  - Indoors (in the environment condition rated in 'Specifications')
  - Altitude max. 2,000 m
  - Pollution degree 2
  - Installation category II

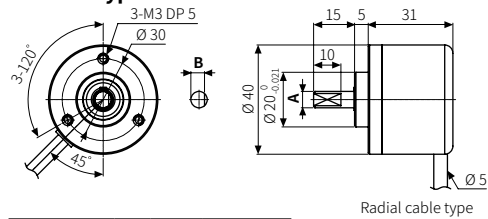


<b>Power supply</b>	5 VDC $\pm$ 5% (ripple P-P: $\leq$ 5%) / 12 - 24 VDC $\pm$ 5% (ripple P-P: $\leq$ 5%) model
<b>Current consumption</b>	Totem-pole, NPN open collector, Voltage output: $\leq$ 80 mA (no load) Line driver output: $\leq$ 50 mA (no load)
<b>Insulation resistance</b>	Between all terminals and case: $\geq$ 100 M $\Omega$ (500 VDC $\approx$ megger)
<b>Dielectric strength</b>	Between all terminals and case: 750 VAC $\sim$ 50 / 60 Hz for 1 minute
<b>Vibration</b>	1 mm double amplitude at frequency 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
<b>Shock</b>	$\leq$ 50 G
<b>Ambient temp.</b>	-10 to 70 °C, storage: -25 to 85 °C (no freezing or condensation)
<b>Ambient humi.</b>	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)
<b>Protection rating</b>	IP50 (IEC standard)
<b>Connection</b>	Radial cable type / cable connector type model
<b>Cable spec.</b>	$\varnothing$ 5 mm, 5-wire (Line driver output: 8-wire), shield cable cable type: 2 m, cable connector type: 250 mm
<b>Wire spec.</b>	AWG24 (0.08 mm, 40-core), insulator diameter: $\varnothing$ 1 mm
<b>Connector spec.</b>	Totem-pole, NPN open collector, Voltage output: M17 6-pin socket type Line driver output: M17 9-pin socket type

## Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics website.
- Following items are based on cable type.  
Refer to 'Specifications' for detailed specifications of cable, wire and connector.

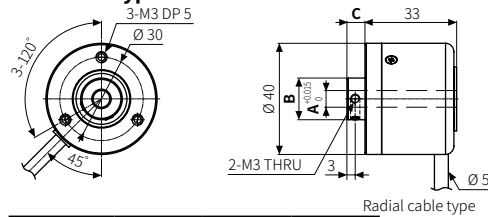
### ■ Shaft type



Radial cable type

	A	B
E40S6	$\varnothing$ 6 $\begin{smallmatrix} -0.004 \\ -0.016 \end{smallmatrix}$	5
E40S8	$\varnothing$ 8 $\begin{smallmatrix} -0.005 \\ -0.02 \end{smallmatrix}$	7

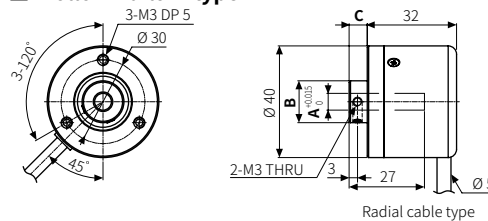
### ■ Hollow type



Radial cable type

	A	B	C
E40H6	$\varnothing$ 6	$\varnothing$ 15	6.5
E40H8	$\varnothing$ 8	$\varnothing$ 15	6.5
E40H10	$\varnothing$ 10	$\varnothing$ 17	6.3
E40H12	$\varnothing$ 12	$\varnothing$ 17	6.3

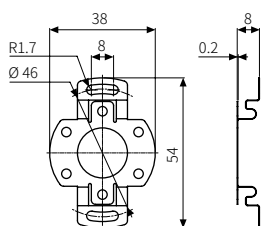
### ■ Hollow Built-in type



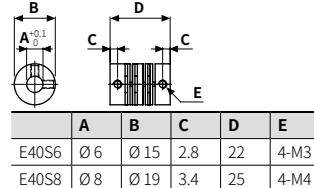
Radial cable type

	A	B	C
E40HB6	$\varnothing$ 6	$\varnothing$ 15	6.5
E40HB8	$\varnothing$ 8	$\varnothing$ 15	6.5
E40HB10	$\varnothing$ 10	$\varnothing$ 17	6.3
E40HB12	$\varnothing$ 12	$\varnothing$ 17	6.3

### ■ Bracket



### ■ Coupling



	A	B	C	D	E
E40S6	$\varnothing$ 6	$\varnothing$ 15	2.8	22	4-M3
E40S8	$\varnothing$ 8	$\varnothing$ 19	3.4	25	4-M4

- Parallel misalignment:  $\leq$  0.25 mm
- Angular misalignment:  $\leq$  5°
- End-play:  $\leq$  0.5 mm