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

x 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	*Ø6mm Ø8mm	*1,*2,*5,10,*12,15,20, 23,25,30,35,40,45,50,	2: A, B	T: Totem pole		
	Inside diameter	60,75,100,120,125,150 192,200,240,250,256,	3: A, B, Z	output		
E40H E40HB	Ø6mm *Ø8mm Ø10mm Ø12mm	300,360,400,500,512, 600,800,1000,1024,1200, 1500,1800,2000,2048, 2500,3000,3600,5000	4: A, Ā, B, B 6: A, Ā, B, B, Z, Z	N: NPN open collector output V: Voltage output	5: 5VDC ±5% 24: 12-24VDC ±5%	No mark : Radial cable type C(※) : Radial cable
E80H	*Ø30mm Ø32mm	60,100,360,500 512,1024,3200	3: A, B, Z 6: A, Ā, B, B̄, Z, Z̄	L: Line Driver output		connector type
*" * " ir *1, 2, 5	*Cable length : 250mm					

■ Control Output Diagram

Totem Pole output		NPN open collector output		
Rotary encoder circuit	Load connection	Rotary encoder circuit	Load connection	
Vain circu	Max. 30mA Load Output (X2) Courrent ax. 10mA Load	Main circuit	Output + Output - Out	
Voltage output		Line Driver output		
Rotary encoder circuit	Load connection	Rotary encoder circuit	Load connection	
Main circuit	Source current: Max.10mA Output Load OV	Main circuit	A phase output +	

- *The output circuit of A, B, Z phase are the same.(Line Driver output is A, A, B, B, Z, Z phase) *Totem Pole output can be used for NPN open collector type(*1) or voltage output type(*2).
- XThe above specifications are subject to change and some models may be disconti
- without notice.

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

Specifications

Incremental Rotary encoder		Ø40mm Shaft type	Ø40mm Hollow shaft type	Ø40mm Hollow shaft Built- in type	Ø80mm Hollow shaft type		
	tem Pole output	E40S	E40H	E40HB	E80H		
NPN open collector output Voltage output		E40S	E40H	E40HB	E80H		
≥ ∨	ltage output	E40SD	E40H	E40HB	E80HUU		
Lii	ne Driver output	E40SD-D-L-D-D	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		
Outpu	t phase ^{**1}	A, B, Z phase(Line Driver output: A, Ā, B, B, Z, Ž phase)					
Phase difference between output		Output between A and B phase: $\frac{T}{4} \pm \frac{T}{8}$ (T= 1cycle of A phase)					
	Totem Pole output NPN open collector output	Low > Load current: Max. 30mA, Residual voltage: Max. 0.4VDC= High > Load current: Max. 10mA, Output voltage(Power voltage 5VDC=): Min.(Power voltage-2.0)VDC=, Output voltage(Power voltage 12-24VDC=): Min. (Power voltage-3.0)VDC=					
	NPN open collector output	t Load current: Max. 30mA, Residual voltage: Max. 0.4VDC==					
_ .	Voltage output	Load current: Max. 10mA, Residual voltage: Max. 0.4VDC					
cation	Voltage output Line Driver output	Low Load current: Max. 20mA, Residual voltage: Max. 0.5VDC == High Load current: Max20mA, Output voltage(Power voltage 5VDC=-): Min. 2.5VDC=-, Output voltage(Power voltage 12-24VDC=-): Min. (Power voltage-3.0)VDC=-					
l spe	Totem Pole output NPN open collector output output Voltage output	Max. 1//s (Cable length: 2m, I sink=20mA)					
일달	Voltage output						
Electrical	E Line Driver output	Max. 0.5 \(\infty\) (Cable length: 2m, I sink=20mA)					
Ш M	ax. Response frequency	300kHz			200kHz		
Po	ower supply	5VDC= ±5%(Ripple P-P: Max. 5%) 12-24VDC= ±5%(Ripple P-P: Max. 5%)					
Cı	urrent consumption	Max. 80mA (disconnection of the load), Line Driver output: Max. 50mA(disconnection of the load)					
ln:	sulation resistance	Min. 100llΩ(at 500VDC megger between all terminals and case)					
Di	electric strength	750VAC 50/60Hz for 1 minute(Between all termials and case)					
Connection		Radial cable type, Radial cable connector type					
≅ 5 Starting torque		Shaft Type: Max. 40qf-cm(0.004N-m), Hollow Type	e: Max. 50gf·cm(0.005N·m)		Max. 200gf-cm(0.02N-m)		
Starting torque Starting torque Moment of inertia Shaft loading Max. allowable revolution Shaft loading Max. allowable revolution Shaft loading Shaft loading		Max. 40q·cm ² (4×10 ⁻⁶ kq·m ²)	Max. 800g·cm²(8×10 ⁻⁵ kg·m²)				
18,91	Shaft loading	Radial: 2kgf, Thrust: 1kgf	Radial: 5kgf, Thrust: 2.5kgf				
1 8 St	Max allowable revolution*2	5.000rpm	3,600rpm				
\/ibrat	ion	1.5m amplitude at frequency of 10 to 55Hz (for 1 min.) in each X, Y, Z direction for 2 hours					
Vibration Shock		1.3m aripinuos at requercy or to to 33rz (or 1 min.) in each X, 1, 2 direction for 2 floors Max. 50G Max. 75G					
Ambient tempe.		Wax. 756					
Enviro	Ambient humi.	25. 10 to 70 5 KH. Storage: 25 to 90 KH					
Protection structure		So til oom kin, sullage. So til 90%kin P50IEC Standards					
Cable		#30(EC Standards) Ø5mm, 5-wire, Length: 2m, Shield cable(Line Driver output: Ø5mm, 8-wire) (AWG 24, Core wire diameter: 0.08mm, No. of core wire: 40, Insulator out diameter: Ø1mm)					
Accessory		Ø6mm coupling(Standard), Ø8mm coupling(Option)	Bracket				
Approval		C € (Except for Line Driver output)					
Unit weight		Approx. 120g			Approx. 560g		
X1: 1, 2, 5, 12 PPR are output A, B phase only (But Line Driver output: A, A, B, B, B phase)							
1, a, o, 12 1 1 1 a o outpot 1, o price o my, out and o more outpot 1, 1, o, o price of							

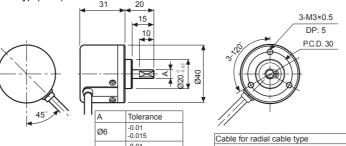
XEnvironment resistance is rated at no freezing or condensation.

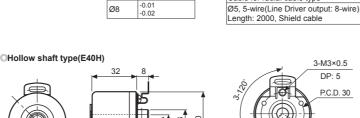
Dimensions OShaft type(E40S) OHollow shaft type(E80H) 43 Shaft inner diameter standard

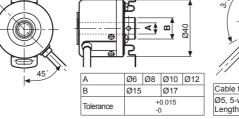
Ø30+0.0

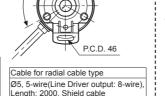
Shaft inner diameter (option)

※2: Max. allowable revolution ≥ Max. response revolution [Max. response revolution f(pm)] = Max. response frequency
★60 sec] Please select the resolution to make lower max. revolution than max. allowable revolution







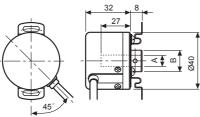


Cable for radial cable type

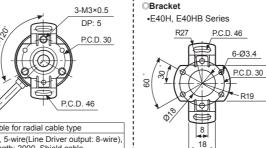
Length: 2000, Shield cable

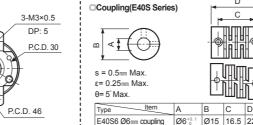
Ø5, 5-wire(Line Driver output: 8-wire),

OHollow shaft built-in type(E40HB)









B C D E40S6 Ø6mm coupling | Ø6^{+0.1} | Ø15 | 16.5 | 22 E40S8 Ø8mm coupling Ø8 to 1 Ø19 18.2 25 × It must not use larger shaft loading than specification

**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.

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Cable for radial cable type

Length: 2000, Shield cable

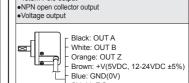
t = 0.2

Ø5. 5-wire(Line Driver output: 8-wire).

Connections



•Totem Pole output



•Line Driver output



XNon-using wires must be insulated.XThe shield cable and metal case of encoder must be grounded(F.G.). **Do not apply tensile strength over 30N to the

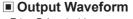
ORadial cable connector type

•Totem Pole output ●Line Driver output Voltage output

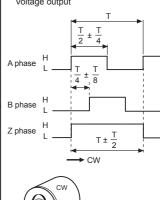








• Totem Pole output / NPN open collector output Voltage output



(unit: mm

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3.5

•E80H Series

12

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Ø6mm: 4 - M3×0.5

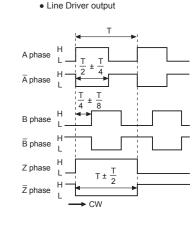
3.5

—(∱

30°

2-R1.5

2-Ø3.4



Cautions during Use

- 1. Follow instructions in 'Cautions during Use'. Otherwise, It may cause unexpected accidents.
 2. 5VDC, 12-24VDC 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. Ground the shield wire to the F.G. terminal.
- 5. When using switching mode power supply, frame ground (F.G.) terminal of power supply should be grounded.
- 6. Wire as short as possible and keep away from high voltage lines or power lines, to prevent inductive noise.
- 7. For Line driver unit, use the twisted pair wire which is attached seal and use the receiver for RS-422A communication.
- 8. 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
- 9. This unit may be used in the following environments

①Indoors (in the environment condition rated in 'Specifications'







■ Control Switches/Lamps/Bu

■ I/O Terminal Blocks & Cables Stepper Motors/Drivers/

■ Graphic/Logic Panels ■ Field Network Devices ■ Laser Marking System (Fiber, CO₂, Nd: YAG)

■ Laser Welding/Cutting System

DRW171368AA