Rus Automation

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

INSTRUCTION MANUAL

E40S









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

 $leph \Lambda$ 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 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		_] -		50	00		- L	3	3		- [N			- [24				_	╛
Series	Shaft diameter	Pul	ses / F	Revo	lution	Ou	tput	pha	ase	Out	pu	ıt			Pov	ver	supp	oly	Ca	able	:		
E40S	E40S *Ø6mm *1,*2,*					2: /	А, В			T: T	ote	m po	ole										
	Inside diameter	1	-,,	- /	,125,150 50,256,	3: A, B, Z 4: A, A, B, B		,	0	utp	out .						No mark						
E40H E40HB	Ø6mm *Ø8mm	600,		00,10	24,1200,			В, Е	- 1			N ope		put	5: 5VDC ±5% : Rad	Radia	al cable type						
	Ø10mm Ø12mm),1800,),3000,			2	z, Z			V: \	/olt	age (outp	ut	±5% : Radia		Radial cable connector type						
E80H	*Ø30mm	60,1	00,360	,500			A, B, ∧ ⊼	, Z B, Ē	5			Driv	er				COLOI	type	•				
LOUIT	Ø32mm	512,	1024,3	200			ч, д, z, Z		٥,	0	utp	out											
*** " indicates the standard specification of diameters.										9													

■ Control Output Diagram

Totem Pole output		NPN open collector output						
Rotary encoder circuit	Load connection	Rotary encoder circuit	Load connection					
	Max. 30mA (×1) + courput (×2) - ax. 10mA courput coad	Main circuit	Output					
Voltage output		Line Driver output						
Rotary encoder circuit	Load connection	Rotary encoder circuit	Load connection					
Main circuit	Source current: Max.10mA Output Load	Main circuit	A phase output					

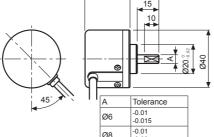
- *The output circuit of A, B, Z phase are the same.(Line Driver output is A, A, B, B, Z, Z phase) *Totem Pole output can be used for NPN open collector type(*1) or voltage output type(*2).
- XThe above specifications are subject to change and some models may be disconti
- **Be sure to follow cautions written in the instruction manual, and the technical descriptions (catalog, homepage).

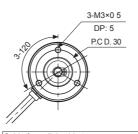
Autonics | • Specifications

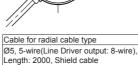
Incremental Rotary encoder		ntal Rotary encoder	Ø40mm Shaft type	Ø40mm Hollow shaft type	Ø40mm Hollow shaft Built- in type	Ø80mm Hollow shaft type					
Totem Pole output			E40SD-D-T-D-D	E40H	E40HB	E80H					
<u> </u>	NPN open collector output Voltage output		E40SD-D-N-D-D	E40H	E40HB N-D-D	E80H					
∣ĕ	S Voltage output		E40S[]-[]-[]-V-[]-[]	E40H	E40HB	E80H					
-	Line Driver output		E40S	E40H	E40HB	E80H					
Day	o luti	on(PPR)	*1, *2, *5, 10, *12, 15, 20, 23, 25, 30, 35, 40, 45, 5	0, 60, 75, 100, 120, 125, 150, 192, 200, 240, 25	0, 256, 300, 360, 400, 500, 512, 600, 800,	60, 100, 360, 500, 512, 1024, 3200					
		` '	1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500,		e to customize)	60, 100, 360, 500, 512, 1024, 3200					
Out			A, B, Z phase(Line Driver output: A, \overline{A} , B, \overline{B} , Z, \overline{Z} p	hase)							
	Phase difference between output		Output between A and B phase: $\frac{T}{4} \pm \frac{T}{8}$ (T= 1cycle of A phase)								
	Ħ		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::								
	ŏ		Load current: Max. 30mA, Residual voltage: Max. 0.4VDC=								
_	5		Load current: Max. 10mA, Residual voltage: Max. 0.4VDC==								
[윤	Control 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=-								
٤			 High Load current: Max20mA, Output volta 	ge(Power voltage 5VDC): Min. 2.5VDC, Out	tput voltage(Power voltage 12-24VDC): Min.	(Power voltage-3.0)VDC					
lectrical specification	Totem Pole output NPN open collector output NPN open collector output Voltage output Voltage output		Max. 1//5 (Cable length: 2m, I sink=20mA)								
ts	چ ۾ 1	Line Driver output	Max. 0.5 (Cable length: 2m, I sink=20mA)								
🛎	Max. Response frequency		300kHz			200kHz					
	Power supply			12-24VDC ±5%(Ripple P-P: Max. 5%)		ZOOKIIZ					
			Max. 80mA (disconnection of the load), Line Driver output: Max. 50mA(disconnection of the load)								
	_		Min. 100MQ(at 500VDC megger between all terminals and case)								
			750VAC 50/601/c for 1 minute(Between all terminals and case)								
			Radial cable type, Radial cable connector type								
<u></u>			Shaft Type: Max. 40gf·cm(0 004N m), Hollow Type	· Max 50of cm(0 005N·m)		Max. 200gf-cm(0.02N m)					
			Max. 40g·cm ² (4×10 ⁻⁶ kg m ²)	. max. oog. om(o.ooorrm)		Max. 800g cm²(8×10 ⁻⁵ kg·m²)					
echani			Radial: 2kgf, Thrust: 1kgf			Radial: 5kgf, Thrust: 2 5kgf					
Jec			<u> </u>	<u> </u>							
			5,000rpm			3,600rpm					
	ration		1 5mm amplitude at frequency of 10 to 55Hz (for 1 m Max. 50G	in.) In each X, Y, Z direction for 2 nours		M 750					
Sno	Shock		-10 to 70°C, Storage: -25 to 85°C			Max. 75G					
Env	Environment Ambient tempe.										
D	44:-		35 to 85% RH, Storage: 35 to 90%RH								
Pro	Protection structure		P50(EC Standards) Ø5mm, 5-wire, Length: 2m, Shield cable(Line Driv								
Cal	Cable		(AWG 24, Core wire diameter: 0 08mm, No. of cor								
Acc	Accessory		Ø6mm coupling(Standard), Ø8mm coupling(Option)	Bracket							
App			C € (Except for Line Driver output)								
Uni	Unit weight		Approx. 120g			Approx. 560g					
※ 1	1. 2	. 5. 12 PPR are output A. I	B phase only.(But Line Driver output: A, A, B, B pha	se)							
			x. response revolution [Max. response revolution(e select the resolution to make lower max. revo	lution than max. allowable revolution.					

XEnvironment resistance is rated at no freezing or condensation

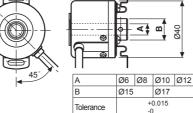
Dimensions OShaft type(E40S)

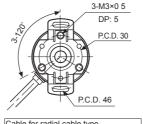






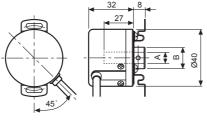
OHollow shaft type(E40H)





Cable for radial cable type Ø5 5-wire(Line Driver output: 8-wire)

OHollow shaft built-in type(E40HB)

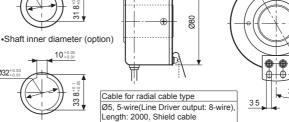




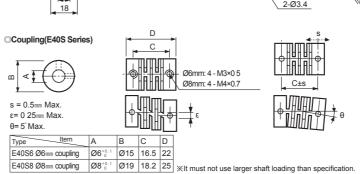
3-M3×0.5 DP: 5 P.C D. 30 P.C.D. 46

Cable for radial cable type Ø5, 5-wire(Line Driver output: 8-wire), Length: 2000, Shield cable

OHollow shaft type(E80H) 43 Shaft inner diameter standard 35 Ø30+0.0



○Bracket •E40H, E40HB Series •E80H Series P.C D. 46 t = 0.2 6-Ø3.4 2-R1 5 3.5 P.C.D. 30 —(1)- \bigoplus 2-Ø3.4

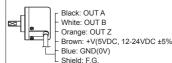


**Do not put strong impact when insert a coupling into shaft.
Failure to follow this instruction may result in product damage.
**Fix the unit or a coupling by a wrench under 0.15 N·m of torque.
*When you install this unit, if eccentricity and deflection angle are larger, it may shorten the life cycle of this unit.

Connections

Radial cable type









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

•Totem Pole output Line Driver output Voltage output

ORadial cable connector type

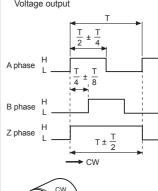


0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	

Pin No.	Cable color	Function	Pin No.	Cable color	Function
1	Black	OUT A	1	Black	OUTA
2	White	OUT B	2	Red	OUTĀ
3	Orange	OUT Z	3	Brown	+V
4	Brown	+V	4	Blue	GND
5	Blue	GND	5	White	OUT B
6	Shield	F.G.	6	Gray	OUT B
			7	Orange	OUT Z
			8	Yellow	OUT Z
			9	Shield	F.G.

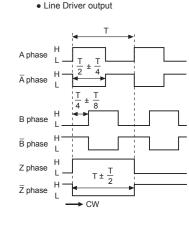
Output Waveform

• Totem Pole output / NPN open collector output / Voltage output



(unit: mm

30°



Cautions during Use

- 1. Follow instruc ions 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
- This unit may be used in the following environments ①Indoors (in the environment condition rated in 'Specifications')
- ②Altitude max. 2,000m ③Pollution degree 2 (4) Installation category I

Major Products

■ Photoelectric Sensors
■ Temperature Controllers ■ Fiber Optic Sensors ■ Temperature/Humidity Transducers SSRs/Power Controllers

Door Sensors ■ Door Side Sensors

Counters Area Sensors

■ Proximity Sensors ■ Panel Meters ■ Tachometer/Pulse (Rate) Meters Pressure Sensors ■ Display Units

■ Rotary Encoders
■ 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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