Autonics

ROTARY ENCODER (INCREMENTAL TYPE) E58 SERIES

INSTRUCTION MANUAL





Thank you for choosing our Autonics product. Please read the following safety considerations before use.

Safety Considerations

XPlease 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 personal injury, economic loss or fire.
- 2. 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 explosion or fire.

- 3. Install on a device panel to use.
 Failure to follow this instruction may result in fire.

 4. Do not connect, repair, or inspect the unit while connected to a power source.
- Failure to follow this instruction may result in fire.

 5. 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

- 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 fire
- 3. 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

E58SC			10	- 800	0 - 3	- N	_ 24	-
Series Diameter Ø58mm	Shaft of	dian	neter	Pulses/ Revolution	Output phase	Control output	Power supply	Cable ^{×1}
SC : Shaft Clamping	Exter-	10	Ø10mm			T: Totem pole output		No mark: Axial/Radial cable type
SS : Shaft Synchro	nal	6	Ø6mm	Refer to	3: A, B, Z	N: NPN open collector output V: Voltage output	±5% 24: 12-24VDC	C: Axial/Radial cable connector type CR: Axial connector type
H : Hollow	Inner	10	Ø12mm	resolution				
HB : Hollow Built-in	miler	12	ווווובושן		5, 2, 2	L: Line driver output		CS: Radial connector type

X1: Please refer to 'connection' in the specifications for the detailed information about cable.

Control Output Diagram

Totem pole output	NPN open collector output	Voltage output	Line driver output	
Rotary encoder circuit Load connection				
Inflow current: X 1 Load	Output + Hinflow current: Max. 30mA	+V Outflow current Max.10mA + Output	Aphase output + Āphase output - Āupase output - Āupase output	

%All output circuits of A, B, Z phase are the same. (line driver output is A, \overline{A} , B, \overline{B} , Z, \overline{Z}) %Totem pole output type can be used for NPN open collector type (χ 1) or voltage output type (χ 2).

Output Waveforms • Totem pole output / Line driver output NPN open collector output Voltage output → Clockwise (CW) Clockwise (CW)

*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

IICI	11		Diameter 930mm incremental rotary encoder				
Totem pole output NPN open collector output output		Totem pole output	E58				
			E58□□-□□-3-N-□-□				
	Voltage output		E58				
Line driver output		Line driver output	E58				
Resolution (PPR) ^{×1}		n (PPR) ^{×1}	*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, 6000, 8000				
	Outpu	ut phase	A, B, Z phase (line driver output: A, A, B, B, Z, Z phase)				
	Phase	e difference of output	Output between A and B phase: $\frac{T}{4} \pm \frac{T}{8}$ (T=1 cycle of A phase)				
	that	Totem pole 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::				
	Control output	NPN open collector output	Load current: max. 30mA, residual voltage: max. 0.4VDC				
	E	Voltage output	Load current: max. 10mA, residual voltage: max. 0.4VDC				
Electrical specification	0	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::				
ŝ	ne .	Totem pole output					
Electi	onse tir e, fall)	Totem pole output NPN open collector output Voltage output Line driver output	Max. 1μs (cable length: 2m, I sink = 20mA)				
	esp (ris	Voltage output					
			Max. 0.5μs (cable length: 2m, I sink = 20mA)				
	Max.	response frequency	300kHz				
	Powe	r supply	• 5VDC== ±5% (ripple P-P: max. 5%) • 12-24VDC== ±5% (ripple P-P: max. 5%)				
	Current consumption		Max. 80mA (disconnection of the load), Line driver output: max. 50mA (disconnection of the load)				
	Insulation resistance		Over 100MΩ (at 500VDC megger between all terminals and case)				
	Dielectric strength		750VAC 50/60Hz for 1 min (between all terminals and case)				
	Connection		SC/SS/HB type: axial cable type, axial cable connector type, axial/radial connector type H type: radial cable type, radial cable connector type				
ation	Starting torque Moment of inertia Shaft loading Max. allowable		SC/SS type: max. 40gf·cm (0.004N·m) H/HB type: max. 90gf·cm (0.009N·m)				
specifica			SC/SS type: max. 15g·cm² (1.5×10 ⁶ kg·m²) H/HB type: max. 20g·cm² (2×10 ⁶ kg·m²)				
chanical	Shaft	loading	SC/SS type-radial: max. 10kgf, thrust: max. 2.5kgf H/HB type-radial: max. 2kgf, thrust: max. 1kgf				
Mec		allowable ution ^{※2}	5,000rpm				

Diameter Ø58mm incremental rotary encoder

SC type: approx. 340g (approx. 230g), SS type: approx. 315g (approx. 205g),
 HB type: approx. 310g (approx. 200g)

direction for 2 hours

-10 to 70°C, storage: -25 to 85°C

35 to 85%RH, storage: 35 to 90%RH

(€ (except for line driver output)

Approx. max. 75G

IP50 (IEC standard)

*1: **1 pulse is only for A, B phase. (line driver output is for A, Ā, B, B phase)
(In case of hollow shaft type, 6000, 8000 PPR excluded) Not indicated resolutions are customizable.

*2: Make sure that Max. response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z

Ø5mm, 5-wire (line driver output: 8-wire), 2m, Shield cable (AWG24, core diameter: 0.08mm, number of cores: 40, insulator out diameter: Ø1mm)

SC type: approx. 420g (approx. 310g), SS type: approx. 395g (approx. 285g).

Coupling (SC type: Ø10mm, SS type: Ø6mm), Fixing bracket

Cable connector type H type: approx. 380g (approx. 270g), HB type: approx. 380g (approx. 270)g

[Max. response revolution (rpm)= Max. response frequency Recolution × 60 sec] [Max. response revolution (rpm)= Resolution × 60 sec]

×3: The weight includes packaging. The weight in parenthesis is for unit only.

Environment resistance is rated at no freezing or condensation.

Connections

Cable type.

Vibration

Environment

Cable

Accessory

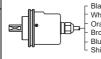
Approval

Weight

Protection structure

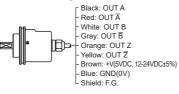
○ Axial/Radial Cable type

Totem pole output / NPN open collector output /



Black: OUT A White: OUT B Orange: OUT Z Brown: +V(5VDC 12-24VDC+5%) Shield: F.G.

Line driver output



XUnused wires must be insulated *Do not apply tensile strength over 30N to the cable.

Axial/Radial cable connector type / Axial/Radial connector type

 Totem pole output / Line driver output NPN open collector output Voltage output



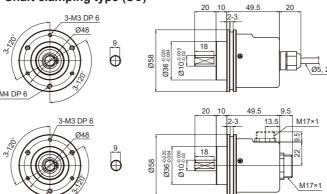


	• NPN	n pole ou open colle ge outpu	ector output	Line driver output		
i	Pin No.	Function	Cable color	Pin No.	Function	Cable cold
i	1	OUTA	Black	1	OUTA	Black
i	2	OUT B	White	2	OUTĀ	Red
i	3	OUT Z	Orange	3	+V	Brown
i	4	+V	Brown	4	GND	Blue
i	5	GND	Blue	5	OUT B	White
į	6	F.G.	Shield	6	OUT B	Gray
i				7	OUT Z	Orange
i				8	OUT Z	Yellow
i				9	F.G.	Shield
- 6						

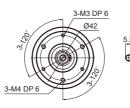


ge outpu	t			
Function	Cable color	Pin No.	Function	Cable color
OUTA	Black	1	OUT A	Black
OUT B	White	2	OUTĀ	Red
OUT Z	Orange	3	+V	Brown
+V	Brown	4	GND	Blue
GND	Blue	5	OUT B	White
F.G.	Shield	6	OUT B	Gray
		7	OUT Z	Orange
		8	OUT Z	Yellow
		9	F.G.	Shield

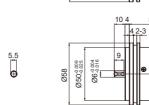
Dimensions Shaft clamping type (SC)



Shaft synchro type (SS)



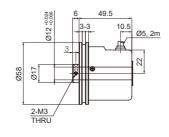
Ø42



Ø6-0.004

O Hollow type (H)

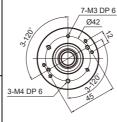


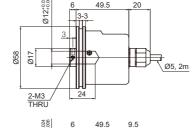


50.5

13.5 M17×1

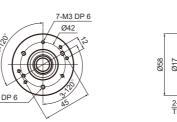
Hollow built-in type (HB)



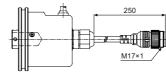


13.5

. \ M17×1

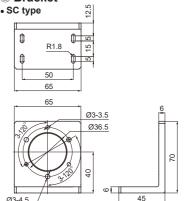


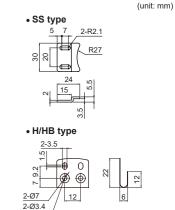
Axial/Radial cable connector type



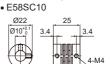
Cable for Axial/Radial cable connector type Ø5mm, 5-wire (line driver output: 8-wire), 250mm, Shield cable

O Bracket





Coupling





 Parallel misalignment: max. 0.25mm Angular misalignment: max. 5°
 Angular misalignment: max. 5°
 End-play: max. 0.5mm

XDo not load overweight on the shaft.

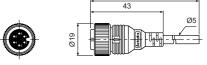
*For flexible coupling (ERB series) information, refer to catalogue.
*Do not put strong impact when insert a coupling into shaft.
Failure to follow this instruction may result in product damage.

Fix the unit or a coupling by a wrench under 0.15 N.m of forque.
 When you install this unit, if eccentricity and deflection angle are larger, it may shorten the life cycle of this unit.

Connector cable (sold separately)

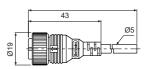
• CID6S-2, CID6S-5, CID6S-10

(Totem pole output / NPN open collector output / Voltage output)



• CID9S-2, CID9S-5, CID9S-10 (line driver output)





ЖΑ	
Model	Cable length
CID6S-2	2m
CID6S-5	5m
CID6S-10	10m
CID9S-2	2m
CID9S-5	5m
CID9S-10	10m

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 lines.
- 9. 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 II

Major Products ■ Photoelectric Sensors ■ Temperature Controllers

- Fiber Optic Sensors Temperature/Humidity Transducers SSRs/Power Controllers
- Door Side Sensors
 Area Sensors
- Proximity Sensors ■ Panel Meters
- Pressure Sensors
 Rotary Encoders
- Tachometer/Pulse (Rate) Meters
 Display Units
 Sensor Controllers ■ Connector/Sockets ■ Switching Mode Power Supplies
- 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

Autonics Corporation

DRW160479AD