

Specification

Product name:

EROI52C-2048-PN-5V

Main specifications

SIN-COS photoelectric encoder

Single-turn resolution: 2048P/R

EDLC: Not mounted

Comply with RoHS

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1. Cautions

1.1 Cautions on use

This chapter describes important precautions for use to prevent failures and malfunctions of this product.

Precautions for storage/ transportation/ mounting location

Do not mount or store this product in the following types of locations:

- A location where the ambient temperature exceeds the temperature condition for storing and mounting or where the relative humidity exceeds the condition for storing and mounting.
- A location subject to extreme changes in temperature and dew condensation. *1
- A location exposed to corrosive gas*2 (hydrogen sulfide, sulfurous acid, chlorine, and ammonia, etc.) and flammable gas.
- A location exposed to damp, dust, salinity, or metallic particles.
- A location subject to water, oil, or chemical.
- A location subject to excessive vibration or impact.
- *1: If the motor or the like encoder mounted on is packed, perform dew condensation prevention such as silica gel for drying, etc.
- *2: Keep in mind that there are cases where corrosive gas is generated due to evaporation of a component of grease around the encoder.

Precautions for mounting

- By following the manual “7. Installation and disassembly process”, mount encoders.
- Pay enough attention to the installation environment so that oil or foreign objects will not enter the inside of the encoder.
- Be sure to take antistatic measure to the installation environment so that excessive voltage will not be applied to electrical parts.
- Pay great attention to the assembling location because vibration and impact on the encoder may cause malfunctions.
- Pay much attention not to apply strong shock such as a hammer to the encoder.
- Fix the encoder cable not to apply tension or bending force to the cable and the adhesive point of it so.
- Pay much attention to the assembling environment such as the method of casing the encoder and wiring of motor cables because noise to the encoder may cause malfunctions.
- Be sure to use a metallic case, which can be electromagnetically shielded, as an encoder case, and to keep potential stable. Be sure to secure the space between electrical parts in the base plate and the encoder case.
- If electromagnetic field generated by the motor located next to the encoder or generated by welding current is applied to the encoder case, use soft magnetic material (soft iron, etc.) as the material of the encoder case.

- Do not place the motor power line near the encoder.
- Be sure to ground the FG line of the motor and the FG line of the mechanical device.
- Take countermeasures against surge on the AC power supply component on the supply side with a surge protector, etc., so that surge does not affect the DC power supply line to the encoder.
- After mounting of the encoder, please adequately perform system evaluation in advance.
- Do not conduct voltage resistance tests and insulation resistance test to the encoder.
- Do not use the product that is dropped or accidentally hit by tools.

Precautions for Wiring

- Be sure to perform correct wiring.
- Perform wiring while the power is turned off.
- Use in specified power supply voltage. Take into consideration the voltage drop of the power supply depending on the length of wiring.
- Do not put the encoder wiring and other power lines through the same duct, and do not use them by bundling in parallel.
- Use twisted pair lines for signal lines and power supply lines of the encoder wiring.
- Use braided shield wires for encoder wiring cables. Braided shield wires must be grounded at both the encoder side and the other side (i.e., the controller side).

Precautions for operation

- Conduct thorough review and check of the safety design of the device to prevent failures and malfunctions of the encoder before use of the product.
- When an alarm occurs, remove the cause and secure the safety first, and then reset the alarm to restart the operation.
- Do not apply excessive force to the cables.
- Impress neither excess voltage nor the backward voltage that exceeds the absolute maximum rating. There is a possibility that the fear of the destruction of the element or the ignition happens.

1.2 General Precautions

- This product is used being incorporated into a general electronic equipment (e.g., office automation equipment, communication devices, home appliances, amusement apparatus, measuring instrument, general industrial devices). Please note it is not intended for the use which requires extremely high reliability and safety (e.g., transportation equipment, aerospace instrument, nuclear control system, life-support medical equipment).
- We are trying to improve the quality and the reliability, but in general, it is impossible to completely avoid malfunction and failure of semiconductor products are unavoidable. When using this product, please adopt safety precautions to avoid accidents considering the situation which may occur by malfunction, etc. of this product. We do not bear responsibility for damages and adverse effects on lives or property of other people caused by malfunction, failure, or the life span of this product, or for failure of the equipment, the

facility, or the machinery where this product is installed or used, except only the responsibility to consider safety related to this product. This section prescribes exclusionary items only with regard to product liability. Please implement safety design of the system on your responsibility.

- We consider there is no problem based on the confirmation that there is no difference in the function and the quality by adequate evaluation of reliability for the combined adoption. We can trace the part by lot unit based on the serial number of the product, and we sincerely respond with regard to the quality control. We appreciate your understanding. If there is any change in the part or the outside specification, or when we judge that there is any significant effect on the quality, we will submit an application form for the change in the manufacturing condition.
- The product and the technology of the product (including the software) described in this document fall under the restricted freight prescribed in “Foreign Exchange and Foreign Trade Act,” etc. They shall not be exported without authorization from the appropriate government authorities.

2. Technical Specifications

2.1 Electrical Parameters

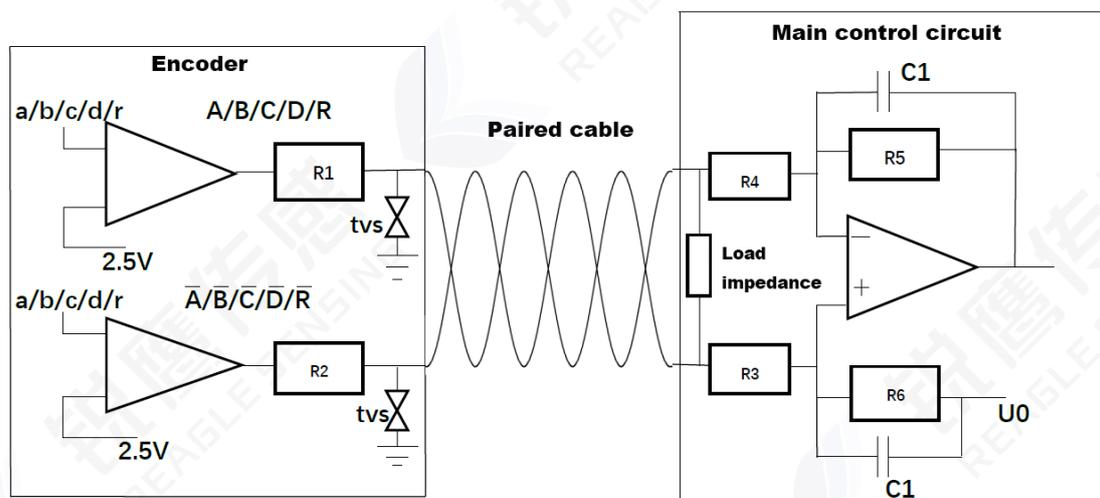
Table 2.1	
Items	T=25℃
Resolution	2048P/R
Output Waveform	Sine and Cosine wave analog signal
Supply voltage	5±5%V
Main power supply Current(Typ)	100mA
Response Frequency	≤100KHZ
Transmission Distance	≤30m
Insulation Resistance	>500MΩ
Output Sine and Cosine Differential Signal Amplitude (VPP)	Vpp=1V±0.1V (with load)
DC Offset Voltage	Voff=2.5V±20mV
Output Signal	A+/A- B+/B- C+/C- D+/D- R+/R-
R signal amplitude	2V±0.4V
R signal period	T=1/2T±1/4T
R+/R-	R+: 2V/3V R-: 3V/2V

Single-end output impedance	10Ω
The load impedance of ABR signal	100Ω
The load impedance of CD signal	1KΩ
Output method	Differences drive output

2.2 Mechanical and Environmental Parameters

Table 2.2	
Item	Instruction
overall dimension	diameter: Ø 65 mm; height: 55 mm
Shaft Hole Diameter	Φ9.25 mm (conical shaft 1:10)
Connection Method	expansion ring fastening screw
Maximum Rotational Speed	2000 rpm/min
Starting Torque	≤0.01N·m (20°C)
Allowable axial deviation	≤±0.2 mm
Allowable radial deviation	≤0.03 mm
Impact Resistance	Acceleration: 980 m/s ² Testing time: 11 ms Number of tests: 3 times (each direction)
Vibration Resistance	Direction: X、Y、Z Testing time: 2 h (each direction) Frequency: 10 to 55 Hz (Maintain amplitude of 1.5mm) 55 to 2000 Hz (Acceleration-98 m/s ²)
IP Class	IP40
Operating Temperature	-40°C~+120°C
Storage Temperature	-40°C~+120°C
Humidity	95%RH (no condensation)
Cable form	Terminal type
Weight	≈0.3kg (excluding cable)

3. Application circuits



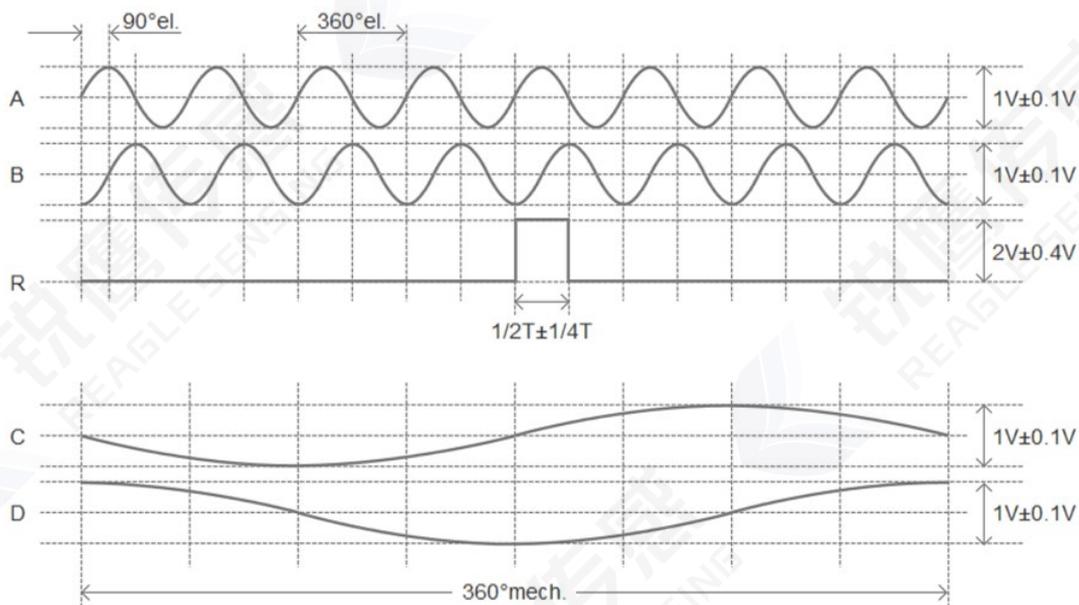
ABZ signal load resistance $R_L=100\Omega$

CD signal load resistance $R_L=1\text{ K}\Omega$

$R_1= R_2=10\Omega$

4. Waveform

CW direction: clockwise of shaft of the encoder



5. Wire terminal requirements

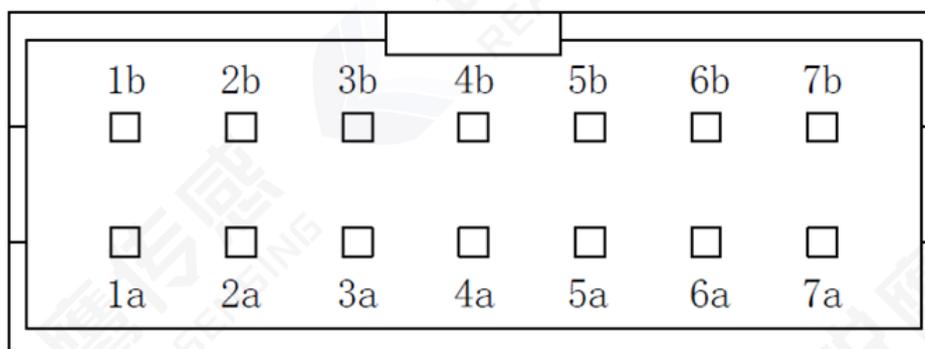


Table 5.1

PIN	Function	PIN	Function
1b	VCC	1a	C-
2b	D+	2a	A-
3b	B+	3a	Not Connected
4b	R+	4a	R-
5b	GND	5a	B-
6b	A+	6a	D-
7b	C+	7a	Not Connected

6. Mechanical Specifications

The outside dimensions and mechanical specifications of an encoder are described below.

- The dimensions and tolerance in a figure are shown in units of millimeters.

6.1 Mechanical Dimensions and Drawings

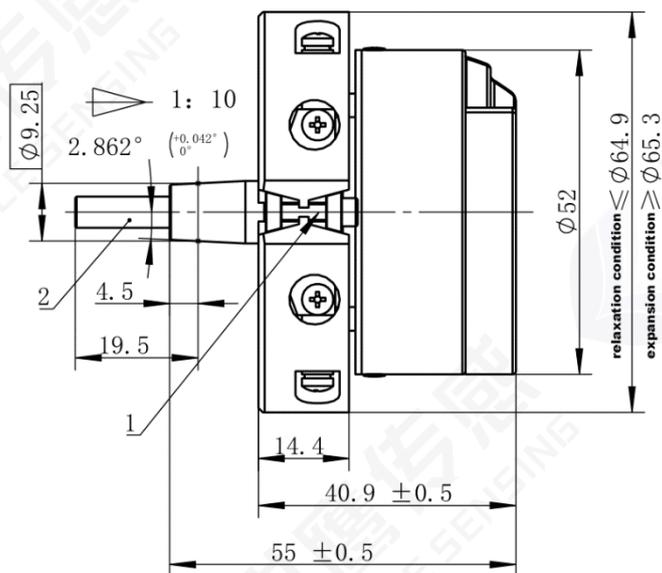


Figure 6.1 Dimensional data of encoder

6.2 Recommended traction machine dimensions for the encoder

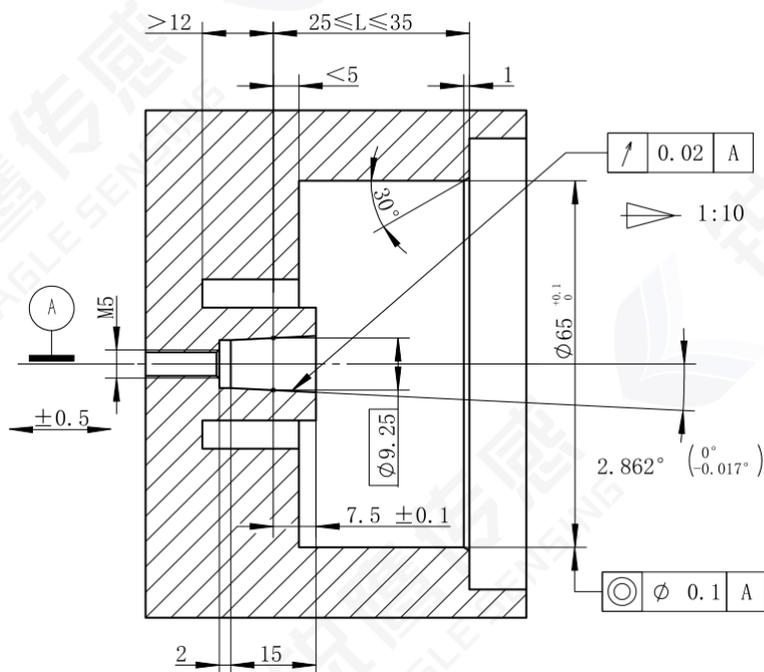
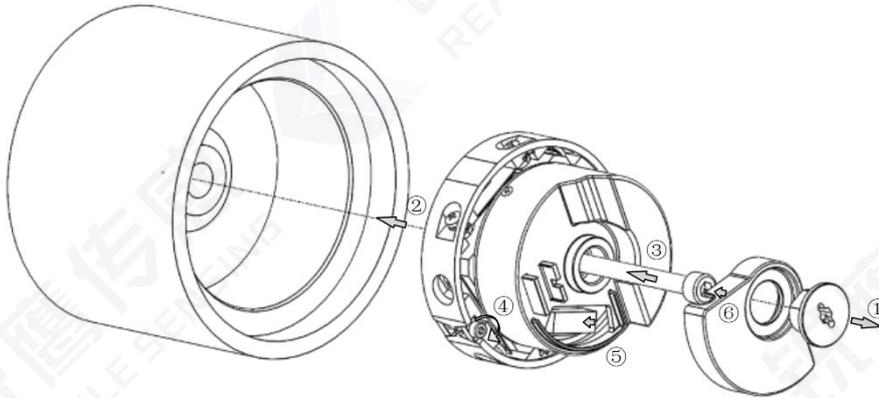


Figure 6.2 Recommended traction machine dimensions

7. Installation and disassembly process



- ①-encoder thread plug; ②-mounting hole of traction machine; ③-M5x50 hex socket screw;
④-expansion ring fastening screw; ⑤-encoder socket; ⑥-upper cover

7.1 Installation process

- Remove the encoder thread plug ① and the upper cover ⑥ to expose the central shaft;
- Put the encoder into the mounting hole of the traction machine ② and make the cone shaft fit with the cone hole. Insert the M5x50 hex socket screw ③ through the center hole of the cone shaft and tighten it with the taper hole of the traction machine .The required tightening torque is 5.0~5.5Nm;
- Tighten the expansion ring fastening screw ④ clockwise, tightening torque 0.6~0.8Nm, to ensure that the expansion ring is reliably fixed;
- Connect the encoder cable to the encoder socket ⑤ and put the wire end metal ring into the rear cover slot of the encoder;
- Cover the upper cover of the encoder and tighten the thread plug. The installation is complete.

7.2 Disassembly process

- Remove encoder thread plug ① and upper cover ⑥ of the encoder to expose the central shaft ;
- Loosen the expansion ring fastening screw counterclockwise ④ ;
- Turn the M5x50 hex socket screw ③ counterclockwise so that it exits 1 or 2 turns. Screw the M10x20 screw clockwise into the center hole of the cone shaft and push the M5 screw until the cone shaft disengages from the cone hole ;
- Remove the M10 screw, then remove the M5x50 hex socket screw ③ and the encoder, complete disassembly.

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