Oriental motor

HM-60418-3

OPERATING MANUAL

Stepping Motor **PKP Series** Encoder

Thank you for purchasing an Oriental Motor product.
This Operating Manual describes product handling procedures and safety precautions.
- Please read it thoroughly to ensure safe operation.
- Always keep the manual where it is readily available.

Introduction

This manual explains the descriptions and specifications about the encoder for the stepping motor **PKP** Series encoder type. Refer to the operating manual of the **PKP** Series for the motor itself.

- **Item included with the encoder**
  - OPERATING MANUAL (this manual)..... 1 copy
- **How to identify the product model**

PKP244D23A2 - R3JL

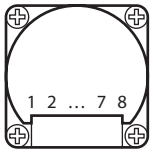
Resolution (P/R)	200	400	500	1,000
Line driver output	**R3EL**	**R3FL**	**R3GL**	**R3JL**
Voltage output	**R3E**	**R3F**	**R3G**	**R3J**

Precautions for use

- The encoder uses semiconductor elements. Handle the encoder with care since static electricity may damage semiconductor elements. Also, effective measures must be taken against static electricity.
- Do not make a strong impact on the motor output shaft or encoder. Doing so may cause damage to the encoder.
- In order to protect the encoder, use the motor so that the surface temperature on the motor case does not exceed 85 °C (185 °F).
- Use the product in a condition that the ambient temperature is −10 to +50 °C (+14 to 122 °F) (Non-freezing).
- Do not connect or disconnect the connector while the power is supplied.
- For the power supply, use a DC power supply with reinforced insulation on its primary and secondary sides. Failure to do so may cause electric shock.
- A magnetic sensor is built into the encoder. Installing the motor close to equipment that generates a strong magnetic field may affect the angular accuracy of the encoder. Note on the environment when transporting and storing or the installation location when using.

Connection

- **Pin assignment**



Pin No.	Lead wire color *1	Encoder model *2		Function
		R3□L	**R3□**	
1	Black	GND	GND	Power supply input (GND)
2	Red	A+	A	Phase A output +
3	Brown	A–	N.C.	Phase A output –
4	Green	B+	B	Phase B output +
5	Blue	B–	N.C.	Phase B output –
6	Yellow	Z+	Z	Phase Z output +
7	Orange	Z–	N.C.	Phase Z output –
8	White	Vcc	Vcc	Power supply input (+5 V)

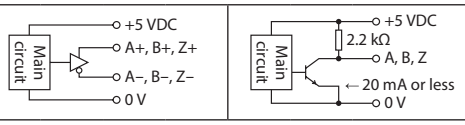
*1 These are colors of the lead wires of the "connection cable for encoder" of Oriental Motor.
*2 The box (□) in the model name indicates the letter representing the resolution.

- **Applicable connector and cable**

Connector	Housing: 51021-0800 (Molex Incorporated) Contact: 50079-8X00 (Molex Incorporated) Crimping tool: 200218-1900 (Molex Incorporated)
Cable	Applicable cable: AWG28 to 26 (0.08 to 0.128 mm^2) Outer sheath diameter: ø0.5 to 1.04 mm (0.02 to 0.04 in.) Stripping length of wire insulation: 1.4 to 1.9 mm (0.06 to 0.07 in.)

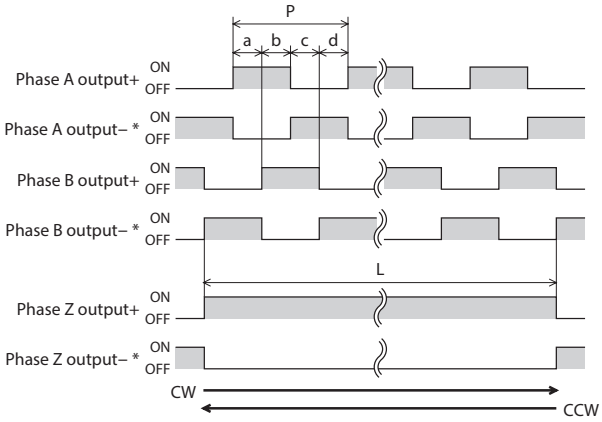
Note Use the shielded cable when extending the wiring or suppressing the effect of noise. Also, wire it away from the power lines such as the motor cable and power cable, and keep it as short as possible.

Specifications

Encoder model		**R3EL**	**R3FL**	**R3GL**	**R3JL**	**R3E**	**R3F**	**R3G**	**R3J**
Encoder type		Incremental							
Output circuit		Line driver output *				Voltage output			
Resolution (P/R)		200	400	500	1,000	200	400	500	1,000
Output signals		Phase A, Phase B, Phase Z: 3-channel							
Output circuit									
Maximum current		20 mA							
Output voltage	H-level	2.5 V or more				4.3 V or more (with no load)			
	L-level	0.5 V or less							
Response frequency		200 kHz or less				100 kHz or less			
Power supply voltage		5 VDC±10 %							
Current consumption (With no load)		30 mA or less				45 mA or less			
Angular accuracy		±0.36° (Conversion value at motor output shaft)							

* Equivalent to 26C31

- **Output waveform**



* Line driver output only

- **Waveform precision**
  - Duty cycle: 50 %±12.5 % for both A-phase output and B-phase output
  - Phase Z output (Standard type): L* = (Encoder resolution/50) × P
    Phase Z output (High-resolution type): L* = (Encoder resolution/100) × P
    * 7.2° when converted to motor output shaft (3.6° for high-resolution type)
  - Phase difference: a, b, c, d=P/4±P/8
  - Rise time and fall time of signals: 1 µs or less (At connector terminals)

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• Please contact your nearest Oriental Motor office for further information.

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