High-Torque 2-Phase Stepper Motors
PKP Series
Standard Type with Encoder
High-Resolution Type with Encoder

High-Torque 2-Phase Stepper Motors - A new encoder motor addition to the PKP Series. Encoder motors contribute to the improvement of equipment reliability.

Features
- Motor Position Information Detection is Possible
  Using an encoder motor makes it possible to monitor current position and detect positional errors. For example, normal operation of the motor can be confirmed by comparing the current position and the command position.

- Small Encoder
  Comes with a small encoder that is suitable for compact equipment.

- Frame size of 35 mm

- High Reliability Thanks to Line Driver Output
  Line driver output is employed for the output circuit. Anti-noise capability is excellent thanks to a differential output, making it possible to dramatically increase the wiring distance compared to voltage output.

- Main encoder specifications
  - Output circuit type: Line driver output
  - Resolution: 200 P/R (standard type), 400 P/R (high-resolution type)
  - Output signal: A-phase, B-phase, Z-phase (3ch)

Product Lineup

<table>
<thead>
<tr>
<th>Type</th>
<th>Wiring</th>
<th>Frame Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>20 mm</td>
</tr>
<tr>
<td>Standard Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic step angle: 1.8°</td>
<td>Unipolar</td>
<td>●</td>
</tr>
<tr>
<td>Encoder resolution: 200 P/R</td>
<td>Bipolar</td>
<td>●</td>
</tr>
<tr>
<td>High-Resolution Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic step angle: 0.9°</td>
<td>Unipolar</td>
<td>–</td>
</tr>
<tr>
<td>Encoder resolution: 400 P/R</td>
<td>Bipolar</td>
<td>–</td>
</tr>
</tbody>
</table>

- : Models available
  - : No models available
### Product Number Code

**PKP 2 4 3 M D 15 A - R2F L - L**

1. **Series**
   - **PKP**

2. **2-Phase**

3. **Motor Frame Size**
   - 1: 20 mm
   - 3: 35 mm
   - 4: 42 mm
   - 6: 56.4 mm

4. **Motor Case Length**

5. **Motor Type**
   - Blank: Standard type
   - **M**: High-resolution type

6. **Number of Lead Wires**
   - D: 4
   - U: 5 or 6

7. **Winding Specification**

8. **Motor Shaft Configuration**
   - A: Single shaft

9. **Encoder Resolution**
   - **R2E**: 200 P/R
   - **R2F**: 400 P/R

10. **Encoder Output Circuit Type**
    - L: Line driver output

11. **Connection Cable**

# There are also voltage output types for the encoder output circuit. For details, please contact the nearest Oriental Motor sales office.

### Product Line and Prices

#### Standard Type with Encoder

- **Unipolar (5 or 6 lead wires)**
  - Product Name
    - PKP213U05A-R2EL-L
    - PKP214U06A-R2EL-L
    - PKP233U12A-R2EL-L
    - PKP235U12A-R2EL-L
    - PKP243U12A-R2EL-L
    - PKP244U12A-R2EL-L
    - PKP246U12A-R2EL-L
    - PKP264U20A-R2EL-L
    - PKP266U20A-R2EL-L
  - **Product Name**
    - PKP243MU09A-R2FL-L
    - PKP244MU12A-R2FL-L
    - PKP264MU20A-R2FL-L
    - PKP266MU20A-R2FL-L

- **Bipolar (4 lead wires)**
  - Product Name
    - PKP213D05A-R2EL-L
    - PKP214D06A-R2EL-L
    - PKP233D15A-R2EL-L
    - PKP235D15A-R2EL-L
    - PKP243D15A-R2EL-L
    - PKP244D15A-R2EL-L
    - PKP246D15A-R2EL-L
    - PKP264D28A-R2EL-L
    - PKP266D28A-R2EL-L
  - **Product Name**
    - PKP243MD15A-R2FL-L
    - PKP244MD15A-R2FL-L
    - PKP264MD28A-R2FL-L
    - PKP266MD28A-R2FL-L

#### High-Resolution Type with Encoder

- **Unipolar (6 lead wires)**
  - Product Name
    - PKP243MU09A-R2FL-L
    - PKP244MU12A-R2FL-L
    - PKP264MU20A-R2FL-L
    - PKP266MU20A-R2FL-L
  - **Product Name**
    - PKP243MD15A-R2FL-L
    - PKP244MD15A-R2FL-L
    - PKP264MD28A-R2FL-L
    - PKP266MD28A-R2FL-L

Products include the following:
- Motor, Motor Connection Cable, Encoder Connection Cable, Operating Manual
- Excluding frame size of 20 mm.
Standard Type with Encoder  Frame Size 20 mm (Unipolar 5 lead wires)

**Specifications**

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Max. Holding Torque N·m</th>
<th>Rotor Inertia Moment J: kg·m²</th>
<th>Rated Current A/Phase</th>
<th>Voltage V</th>
<th>Winding Resistance Ω/Phase</th>
<th>Basic Step Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP213U05A-R2EL-L</td>
<td>0.014</td>
<td>$1.66 \times 10^{-7}$</td>
<td>0.5</td>
<td>4.25</td>
<td>8.5</td>
<td>1.8°</td>
</tr>
<tr>
<td>PKP214U06A-R2EL-L</td>
<td>0.026</td>
<td>$2.96 \times 10^{-7}$</td>
<td>0.6</td>
<td>4.2</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

*A 0.6 m encoder connection cable is included with these products.

**Speed – Torque Characteristics**

- **PKP213U05A-R2EL-L**
  - Constant Current Driver. Power Supply Voltage: 24 VDC
  - Current: 0.5 A/Phase (At 2-phase excitation)
  - External Load Inertia: J: J₀ kg·m²

- **PKP214U06A-R2EL-L**
  - Constant Current Driver. Power Supply Voltage: 24 VDC
  - Current: 0.6 A/Phase (At 2-phase excitation)
  - External Load Inertia: J: J₀ kg·m²

**Note**

- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Please keep the motor case temperature at a maximum of 85°C to protect the encoder.

**Dimensions (Unit = mm)**

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Motor Product Name</th>
<th>L</th>
<th>Mass kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP213U05A-R2EL-L</td>
<td>PKP213U05A-R2EL</td>
<td>46.5</td>
<td>0.06</td>
</tr>
<tr>
<td>PKP214U06A-R2EL-L</td>
<td>PKP214U06A-R2EL</td>
<td>56.5</td>
<td>0.08</td>
</tr>
</tbody>
</table>

**Applicable Connector (Molex)**

- Connector Housing: 51021-0800
- Contact: 50079-8100
- Crimp Tool: 57067-3000

**Included**

- Encoder connection cable
  - Connector Housing: 51021-0800 (Molex)
Standard Type with Encoder  Frame Size 20 mm (Bipolar 4 lead wires)

Specifications

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Max. Holding Torque N·m</th>
<th>Rotor Inertia Moment J·kg·m²</th>
<th>Rated Current A/Phase</th>
<th>Voltage V</th>
<th>Winding Resistance Ω/Phase</th>
<th>Basic Step Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP213D05A-R2EL-L</td>
<td>0.02</td>
<td>1.68×10⁻⁷</td>
<td>0.5</td>
<td>4.25</td>
<td>8.5</td>
<td>1.8°</td>
</tr>
<tr>
<td>PKP214D06A-R2EL-L</td>
<td>0.036</td>
<td>2.96×10⁻⁷</td>
<td>0.6</td>
<td>3.9</td>
<td>6.5</td>
<td></td>
</tr>
</tbody>
</table>

*Note:* A 0.6 m encoder connection cable is included with these products.

Speed – Torque Characteristics

PKP213D05A-R2EL-L
Constant Current Driver, Power Supply Voltage: 24 VDC
Current: 0.5 A/Phase (At 2-phase excitation)
External Load Inertia: JL=0 kg·m²

PKP214D06A-R2EL-L
Constant Current Driver, Power Supply Voltage: 24 VDC
Current: 0.6 A/Phase (At 2-phase excitation)
External Load Inertia: J=0 kg·m²

Note

Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Please keep the motor case temperature at a maximum of 85°C to protect the encoder.

Dimensions (Unit = mm)

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Motor Product Name</th>
<th>L</th>
<th>Mass kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP213D05A-R2EL-L</td>
<td>PKP213D05A-R2EL</td>
<td>46.5</td>
<td>0.06</td>
</tr>
<tr>
<td>PKP214D06A-R2EL-L</td>
<td>PKP214D06A-R2EL</td>
<td>56.5</td>
<td>0.08</td>
</tr>
</tbody>
</table>

*Applicable Connector (Molex)*

<table>
<thead>
<tr>
<th>Connector Housing 51021-0800</th>
<th>Contact 50079-8100</th>
<th>Crimp Tool 57067-3000</th>
</tr>
</thead>
</table>

*Included*

Encoder connection cable

8 Encoder Leads
UL Style 3265, AWG26
Connector Housing 51021-0800 (Molex)
Standard Type with Encoder  Frame Size 35 mm (Unipolar 6 lead wires)

Specifications

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Max. Holding Torque N·m</th>
<th>Rot. Inertia Moment J kg·m²</th>
<th>Rated Current A/Phase</th>
<th>Voltage V</th>
<th>Winding Resistance Ω/Phase</th>
<th>Basic Step Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP233U12A-R2EL-L</td>
<td>0.16</td>
<td>$2.4 \times 10^{-7}$</td>
<td>1.2</td>
<td>3.24</td>
<td>2.7</td>
<td>1.8˚</td>
</tr>
<tr>
<td>PKP235U12A-R2EL-L</td>
<td>0.3</td>
<td>$5.0 \times 10^{-7}$</td>
<td>4.08</td>
<td>4.06</td>
<td>3.4</td>
<td></td>
</tr>
</tbody>
</table>

*A 6 m motor connection cable and 6 m encoder connection cable are included with these products.

Speed – Torque Characteristics  $f_s$: Max. starting frequency

![Frequency vs. Torque Graph]

Note
Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Please keep the motor case temperature at a maximum of 85˚C to protect the encoder.

Dimensions  (Unit = mm)

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Motor Product Name</th>
<th>L</th>
<th>Mass kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP233U12A-R2EL-L</td>
<td>PKP233U12A-R2EL</td>
<td>50.5</td>
<td>0.19</td>
</tr>
<tr>
<td>PKP235U12A-R2EL-L</td>
<td>PKP235U12A-R2EL</td>
<td>65.5</td>
<td>0.295</td>
</tr>
</tbody>
</table>

Applicable Connector (Molex)

<table>
<thead>
<tr>
<th>Connector Housing</th>
<th>Motor</th>
<th>Encoder</th>
</tr>
</thead>
<tbody>
<tr>
<td>51103-0600</td>
<td>51021-0800</td>
<td></td>
</tr>
<tr>
<td>50079-8100</td>
<td>50079-8100</td>
<td></td>
</tr>
<tr>
<td>57295-5000</td>
<td>50786-3000</td>
<td></td>
</tr>
</tbody>
</table>

Motor connection cable

Product Name: LC2U06B

Encoder connection cable

8 Encoder Leads
UL Style 3265, AWG26
Connector Housing 51021-0800 (Molex)
Standard Type with Encoder  Frame Size 35 mm (Bipolar 4 lead wires)

### Specifications

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Max. Holding Torque N·m</th>
<th>Rotor Inertia Moment J·kg·m²</th>
<th>Rated Current A/Phase</th>
<th>Voltage V</th>
<th>Winding Resistance Ω/Phase</th>
<th>Basic Step Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP233D15A-R2EL-L</td>
<td>0.2</td>
<td>$24 \times 10^{-7}$</td>
<td>1.5</td>
<td>2.43</td>
<td>1.62</td>
<td>1.8°</td>
</tr>
<tr>
<td>PKP235D15A-R2EL-L</td>
<td>0.37</td>
<td>$50 \times 10^{-7}$</td>
<td>1.5</td>
<td>3.6</td>
<td>2.4</td>
<td>1.8°</td>
</tr>
</tbody>
</table>

*Note:* A 0.6 m motor connection cable and 0.6 m encoder connection cable are included with these products.

### Speed – Torque Characteristics

PKP233D15A-R2EL-L
- Constant Current Driver
- Power Supply Voltage: 24 VDC
- Current: 1.5 A/Phase (At 2-phase excitation)
- External Load Inertia: $J_L = 34 \times 10^{-7} \text{ kg·m}^2$

PKP235D15A-R2EL-L
- Constant Current Driver
- Power Supply Voltage: 24 VDC
- Current: 1.5 A/Phase (At 2-phase excitation)
- External Load Inertia: $J_L = 34 \times 10^{-7} \text{ kg·m}^2$

*Note:* Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Please keep the motor case temperature at a maximum of 85°C to protect the encoder.

### Dimensions (Unit = mm)

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Motor Product Name</th>
<th>L</th>
<th>Mass kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP233D15A-R2EL-L</td>
<td>PKP233D15A-R2EL</td>
<td>50.5</td>
<td>0.19</td>
</tr>
<tr>
<td>PKP235D15A-R2EL-L</td>
<td>PKP235D15A-R2EL</td>
<td>65.5</td>
<td>0.295</td>
</tr>
</tbody>
</table>

*Note:* Available Connectors (Molex)
- Motor Connector Housing: 51103-0600
- Encoder Connector Housing: 51021-0800
- Contact: 50351-8100
- Crimp Tool: 57295-5000

*Included*
- Motor connection cable: Product Name: LC2B06B
- Encoder connection cable: Product Name: LC2B06B

*Note:* 51103-0600 (Molex) 4 Motor Leads UL Style 3265, AWG24

*Note:* 51021-0800 (Molex) 8 Encoder Leads UL Style 3265, AWG24
Standard Type with Encoder  Frame Size 42 mm (Unipolar 6 lead wires)

Specifications

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Max. Holding Torque N·m</th>
<th>Rotor Inertia Moment J: kg·m²</th>
<th>Rated Current A/Phase</th>
<th>Voltage V</th>
<th>Winding Resistance Ω/Phase</th>
<th>Basic Step Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP243U09A-R2EL-L</td>
<td>0.25</td>
<td>36×10⁻⁶</td>
<td>0.95</td>
<td>4.47</td>
<td>4.7</td>
<td>1.8°</td>
</tr>
<tr>
<td>PKP244U12A-R2EL-L</td>
<td>0.39</td>
<td>57×10⁻⁶</td>
<td>1.2</td>
<td>4.8</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PKP245U12A-R2EL-L</td>
<td>0.45</td>
<td>83×10⁻⁶</td>
<td>1.2</td>
<td>4.56</td>
<td>3.8</td>
<td></td>
</tr>
<tr>
<td>PKP246U12A-R2EL-L</td>
<td>0.75</td>
<td>114×10⁻⁶</td>
<td>1.2</td>
<td>7.2</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

A 0.6 m motor connection cable and 0.6 m encoder connection cable are included with these products.

Speed – Torque Characteristics  fs: Max. starting frequency

<table>
<thead>
<tr>
<th>PKP243U09A-R2EL-L</th>
<th>PKP244U12A-R2EL-L</th>
<th>PKP245U12A-R2EL-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant Current Driver</td>
<td>Power Supply Voltage: 24 VDC</td>
<td>Power Supply Voltage: 24 VDC</td>
</tr>
<tr>
<td>Current: 0.95 A/Phase (At 2-phase excitation)</td>
<td>Current: 1.2 A/Phase (At 2-phase excitation)</td>
<td>Current: 1.2 A/Phase (At 2-phase excitation)</td>
</tr>
<tr>
<td>External Load Inertia: J=34×10⁻⁷ kg·m²</td>
<td>External Load Inertia: J=34×10⁻⁷ kg·m²</td>
<td>External Load Inertia: J=34×10⁻⁷ kg·m²</td>
</tr>
<tr>
<td>Torque [N·m]</td>
<td>Torque [N·m]</td>
<td>Torque [N·m]</td>
</tr>
<tr>
<td>Pulse Speed [kHz]</td>
<td>Pulse Speed [kHz]</td>
<td>Pulse Speed [kHz]</td>
</tr>
<tr>
<td>Full Step 1.8˚/step</td>
<td>Pullout Torque fs</td>
<td>Speed [r/min]</td>
</tr>
<tr>
<td>204</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>642</td>
<td>2500</td>
<td>1500</td>
</tr>
<tr>
<td>3142</td>
<td>2000</td>
<td>1500</td>
</tr>
</tbody>
</table>

Note

Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Please keep the motor case temperature at a maximum of 85˚C to protect the encoder.

Dimensions

<table>
<thead>
<tr>
<th>Unit (mm)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Motor Product Name</th>
<th>L</th>
<th>Mass kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP243U09A-R2EL-L</td>
<td>PKP243U09A-R2EL</td>
<td>46.5</td>
<td>0.26</td>
</tr>
<tr>
<td>PKP244U12A-R2EL-L</td>
<td>PKP244U12A-R2EL</td>
<td>52.5</td>
<td>0.31</td>
</tr>
<tr>
<td>PKP245U12A-R2EL-L</td>
<td>PKP245U12A-R2EL</td>
<td>60.5</td>
<td>0.40</td>
</tr>
<tr>
<td>PKP246U12A-R2EL-L</td>
<td>PKP246U12A-R2EL</td>
<td>72.5</td>
<td>0.51</td>
</tr>
</tbody>
</table>

Applicable Connector (Molex)

<table>
<thead>
<tr>
<th>Motor</th>
<th>Encoder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector Housing</td>
<td>51103-0600</td>
</tr>
<tr>
<td>Contact</td>
<td>50351-8100</td>
</tr>
<tr>
<td>Crimp Tool</td>
<td>57295-5000</td>
</tr>
</tbody>
</table>

Included

Motor connection cable

Product Name: LC2U06B

Encoder connection cable

8 Encoder Leads
UL Style 3265, AWG26
Connector Housing
51021-0800 (Molex)
Standard Type with Encoder  Frame Size 42 mm (Bipolar 4 lead wires)

### Specifications

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Max. Holding Torque N·m</th>
<th>Rotor Inertia J·kg·m²</th>
<th>Rated Current A/Phase</th>
<th>Voltage V</th>
<th>Winding Resistance Ω/Phase</th>
<th>Basic Step Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP243D15A-R2EL-L</td>
<td>0.35</td>
<td>36 × 10⁻⁵</td>
<td>1.5</td>
<td>2.85</td>
<td>1.9</td>
<td>1.8˚</td>
</tr>
<tr>
<td>PKP244D15A-R2EL-L</td>
<td>0.48</td>
<td>57 × 10⁻⁵</td>
<td>1.5</td>
<td>3.9</td>
<td>2.6</td>
<td></td>
</tr>
<tr>
<td>PKP245D15A-R2EL-L</td>
<td>0.58</td>
<td>83 × 10⁻⁵</td>
<td>1.5</td>
<td>3.6</td>
<td>2.4</td>
<td></td>
</tr>
<tr>
<td>PKP246D15A-R2EL-L</td>
<td>0.93</td>
<td>114 × 10⁻⁵</td>
<td>1.5</td>
<td>5.8</td>
<td>3.87</td>
<td></td>
</tr>
</tbody>
</table>

*A 0.6 m motor connection cable and 0.6 m encoder connection cable are included with these products.*

### Speed – Torque Characteristics

- **PKP243D15A-R2EL-L**
- **PKP244D15A-R2EL-L**
- **PKP245D15A-R2EL-L**
- **PKP246D15A-R2EL-L**

**Note**

*Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Please keep the motor case temperature at a maximum of 85˚C to protect the encoder.*

### Dimensions (Unit = mm)

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Motor Product Name</th>
<th>L</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP243D15A-R2EL-L</td>
<td>PKP243D15A-R2EL</td>
<td>46.5</td>
<td>0.26</td>
</tr>
<tr>
<td>PKP244D15A-R2EL-L</td>
<td>PKP244D15A-R2EL</td>
<td>52.5</td>
<td>0.31</td>
</tr>
<tr>
<td>PKP245D15A-R2EL-L</td>
<td>PKP245D15A-R2EL</td>
<td>60.5</td>
<td>0.40</td>
</tr>
<tr>
<td>PKP246D15A-R2EL-L</td>
<td>PKP246D15A-R2EL</td>
<td>72.5</td>
<td>0.51</td>
</tr>
</tbody>
</table>

**Applicable Connector (Molex)**

- Connector Housing: [51103-0600](#) 51021-0800
- Contact: [50031-6100](#) 50079-8100
- Crimp Tool: [57295-5000](#) 57067-3000

**Included**

- Motor connection cable: *LC2B06B*
- Encoder connection cable: *51103-0600 (Molex)* 600 8 Encoder Leads UL Style 3265, AWG24
- Encoder connection cable: *51021-0800 (Molex)* 600 1 8 Encoder Leads UL Style 3265, AWG24
Standard Type with Encoder  Frame Size 56.4 mm (Unipolar 6 lead wires)

### Specifications

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Max. Holding Torque N·m</th>
<th>Rotor Inertia Moment J. kg·m²</th>
<th>Rated Current A/Phase</th>
<th>Voltage V</th>
<th>Winding Resistance Ω/Phase</th>
<th>Basic Step Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP264U20A-R2EL-L</td>
<td>0.51</td>
<td>120×10⁻⁷</td>
<td>2</td>
<td>2.9</td>
<td>1.45</td>
<td>1.8°</td>
</tr>
<tr>
<td>PKP266U20A-R2EL-L</td>
<td>1.1</td>
<td>280×10⁻⁷</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>PKP268U20A-R2EL-L</td>
<td>1.75</td>
<td>480×10⁻⁷</td>
<td>2</td>
<td>4.9</td>
<td>2.45</td>
<td></td>
</tr>
</tbody>
</table>

A 0.6 m motor connection cable and 0.6 m encoder connection cable are included with these products.

### Speed – Torque Characteristics

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Torque [N·m]</th>
<th>Pulso Speed [kHz]</th>
<th>Full Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP264U20A-R2EL-L</td>
<td>0.4</td>
<td>0</td>
<td>64</td>
</tr>
<tr>
<td>PKP266U20A-R2EL-L</td>
<td>0.8</td>
<td>2</td>
<td>2500</td>
</tr>
<tr>
<td>PKP268U20A-R2EL-L</td>
<td>1.2</td>
<td>4</td>
<td>2000</td>
</tr>
</tbody>
</table>

Note: Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Please keep the motor case temperature at a maximum of 85°C to protect the encoder.

### Dimensions

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Motor Product Name</th>
<th>L</th>
<th>Mass kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP264U20A-R2EL-L</td>
<td>PKP264U20A-R2EL</td>
<td>55.5</td>
<td>0.47</td>
</tr>
<tr>
<td>PKP266U20A-R2EL-L</td>
<td>PKP266U20A-R2EL</td>
<td>75.5</td>
<td>0.74</td>
</tr>
<tr>
<td>PKP268U20A-R2EL-L</td>
<td>PKP268U20A-R2EL</td>
<td>92.5</td>
<td>1.11</td>
</tr>
</tbody>
</table>

Applicable Connector (Molex):
- Motor Connector Housing: 51067-0600
- Encoder Connector Housing: 51021-0800
- Motor Crimp Tool: 57189-5000
- Encoder Crimp Tool: 57190-5000

Motor connection cable: LC2U06C
- Motor Leads: UL Style 3265, AWG22

Encoder connection cable:
- 8 Encoder Leads: UL Style 3265, AWG26
- Connector Housing: 51021-0800 (Molex)
Specifications

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Max. Holding Torque N·m</th>
<th>Rotor Inertia Moment J: kg·m²</th>
<th>Rated Current A/Phase</th>
<th>Voltage V</th>
<th>Winding Resistance Ω/Phase</th>
<th>Basic Step Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP264D28A-R2EL-L</td>
<td>0.6</td>
<td>$120 \times 10^{-7}$</td>
<td>2.8</td>
<td>2</td>
<td>0.73</td>
<td>1.8°</td>
</tr>
<tr>
<td>PKP266D28A-R2EL-L</td>
<td>1.4</td>
<td>$290 \times 10^{-7}$</td>
<td>2.8</td>
<td>2.8</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PKP268D28A-R2EL-L</td>
<td>2.3</td>
<td>$490 \times 10^{-7}$</td>
<td>3.4</td>
<td>3.4</td>
<td>1.23</td>
<td></td>
</tr>
</tbody>
</table>

* A 0.6 m motor connection cable and 0.6 m encoder connection cable are included with these products.

Motor connection cable: LC2B06C

Encoder connection cable: LC2B06C

Applicable Connector (Molex):
- Connector Housing: 51067-0600
- Contact: 50217-9101
- Crimp Tool: 57189-5000

 inkl. Kabel 8 Encoder Leads UL Style 3265, AWG26

Note: Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Please keep the motor case temperature at a maximum of 85°C to protect the encoder.
High-Resolution Type with Encoder  Frame Size 42 mm (Unipolar 6 lead wires)

**Specifications (Reel)**

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Max. Holding Torque N·m</th>
<th>Rotor Inertia Moment J·kg·m²</th>
<th>Rated Current A/Phase</th>
<th>Voltage V</th>
<th>Winding Resistance Ω/Phase</th>
<th>Basic Step Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP243MU09A-R2FL-L</td>
<td>0.25</td>
<td>$36 \times 10^{-7}$</td>
<td>0.95</td>
<td>4.47</td>
<td>4.7</td>
<td>0.9°</td>
</tr>
<tr>
<td>PKP244MU12A-R2FL-L</td>
<td>0.35</td>
<td>$57 \times 10^{-7}$</td>
<td>1.2</td>
<td>4.8</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

*A 0.6 m motor connection cable and 0.6 m encoder connection cable are included with these products.

**Speed – Torque Characteristics**  \(fs\): Max. starting frequency

- **PKP243MU09A-R2FL-L**
  - Unipolar Constant Current Driver
  - Power Supply Voltage: 24 VDC
  - Current: 0.95 A/Phase (At 2-phase excitation)
  - External Load Inertia: \(34 \times 10^{-7}\) kg·m²
  - Full Step 0.9°/step

- **PKP244MU12A-R2FL-L**
  - Unipolar Constant Current Driver
  - Power Supply Voltage: 24 VDC
  - Current: 1.2 A/Phase (At 2-phase excitation)
  - External Load Inertia: \(34 \times 10^{-7}\) kg·m²
  - Full Step 0.9°/step

**Note**

- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Please keep the motor case temperature at a maximum of 85˚C to protect the encoder.

**Dimensions (Unit = mm)**

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Motor Product Name</th>
<th>L</th>
<th>Mass kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP243MU09A-R2FL-L</td>
<td>PKP243MU09A-R2FL-L</td>
<td>46.5</td>
<td>0.26</td>
</tr>
<tr>
<td>PKP244MU12A-R2FL-L</td>
<td>PKP244MU12A-R2FL-L</td>
<td>52.5</td>
<td>0.31</td>
</tr>
</tbody>
</table>

**Applicable Connector (Molex)**

- Motor Connector Housing: 51103-0600, 51021-0800
- Encoder Connector Housing: 50351-8100, 50079-8100
- Crimp Tool: 57295-5000, 57087-3000

**Included**

- Motor connection cable: Product Name: LC2U06B
- Encoder connection cable: Product Name: LC2U06B (Molex)
High-Resolution Type with Encoder  Frame Size 42 mm (Bipolar 4 lead wires)

Specifications

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Max. Holding Torque N·m</th>
<th>Rotor Inertia Moment J kg·m²</th>
<th>Rated Current A/Phase</th>
<th>Voltage V</th>
<th>Winding Resistance Ω/Phase</th>
<th>Basic Step Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP243MD15A-R2FL-L</td>
<td>0.30</td>
<td>36×10⁻⁷</td>
<td>1.5</td>
<td>2.85</td>
<td>1.9</td>
<td>0.9°</td>
</tr>
<tr>
<td>PKP244MD15A-R2FL-L</td>
<td>0.42</td>
<td>57×10⁻⁷</td>
<td>1.5</td>
<td>3.9</td>
<td>2.6</td>
<td></td>
</tr>
</tbody>
</table>

A 0.6 m motor connection cable and 0.6 m encoder connection cable are included with these products.

Speed – Torque Characteristics

PKP243MD15A-R2FL-L

Bipolar Constant Current Driver
Power Supply Voltage: 24 VDC
Current: 1.5 A/Phase (At 2-phase excitation)
External Load Inertia: J = 34×10⁻⁷ kg·m²
Full Step 0.9°/step

PKP244MD15A-R2FL-L

Bipolar Constant Current Driver
Power Supply Voltage: 24 VDC
Current: 1.5 A/Phase (At 2-phase excitation)
External Load Inertia: J = 34×10⁻⁷ kg·m²
Full Step 0.9°/step

Note

Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Please keep the motor case temperature at a maximum of 85˚C to protect the encoder.

Dimensions (Unit = mm)

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Motor Product Name</th>
<th>L</th>
<th>Mass kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP243MD15A-R2FL-L</td>
<td>PKP243MD15A-R2FL</td>
<td>46.5</td>
<td>0.26</td>
</tr>
<tr>
<td>PKP244MD15A-R2FL-L</td>
<td>PKP244MD15A-R2FL</td>
<td>52.5</td>
<td>0.31</td>
</tr>
</tbody>
</table>

Applicable Connector (Molex)

<table>
<thead>
<tr>
<th>Motor</th>
<th>Encoder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector Housing</td>
<td>51103-0800 51021-0800</td>
</tr>
<tr>
<td>Contact</td>
<td>50051-8100 50079-8100</td>
</tr>
<tr>
<td>Crimp Tool</td>
<td>57295-5000 57067-3000</td>
</tr>
</tbody>
</table>

Included

Motor connection cable
Product Name: LC2806B

Encoder connection cable

8 Encoder Leads
UL Style 3265, AWG26
Connector Housing 51021-0800 (Molex)

Included

Motor connection cable
Product Name: LC2806B

Encoder connection cable

8 Encoder Leads
UL Style 3265, AWG26
Connector Housing 51021-0800 (Molex)
High-Resolution Type with Encoder Frame Size 56.4 mm (Unipolar 6 lead wires)

### Specifications

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Max. Holding Torque N·m</th>
<th>Rotor Inertia Moment J [kg·m²]</th>
<th>Rated Current A/Phase</th>
<th>Voltage [V]</th>
<th>Winding Resistance ω [Ω/Phase]</th>
<th>Basic Step Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP264MU20A-R2FL-L</td>
<td>0.51</td>
<td>120×10⁻⁷</td>
<td>2</td>
<td>2.9</td>
<td>1.45</td>
<td>0.9°</td>
</tr>
<tr>
<td>PKP266MU20A-R2FL-L</td>
<td>1.1</td>
<td>280×10⁻⁷</td>
<td>4</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PKP268MU20A-R2FL-L</td>
<td>1.75</td>
<td>480×10⁻⁷</td>
<td>4.9</td>
<td>2.45</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*A 0.6 m motor connection cable and 0.6 m encoder connection cable are included with these products.

### Dimensions (Unit = mm)

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Motor Product Name</th>
<th>L</th>
<th>Mass kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP264MU20A-R2FL-L</td>
<td>PKP264MU20A-R2FL</td>
<td>55.5</td>
<td>0.47</td>
</tr>
<tr>
<td>PKP266MU20A-R2FL-L</td>
<td>PKP266MU20A-R2FL</td>
<td>70.5</td>
<td>0.74</td>
</tr>
<tr>
<td>PKP268MU20A-R2FL-L</td>
<td>PKP268MU20A-R2FL</td>
<td>92.5</td>
<td>1.11</td>
</tr>
</tbody>
</table>

Note: Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Please keep the motor case temperature at a maximum of 85°C to protect the encoder.

### Motor Encoder Connector

- Connector Housing: 51067-0600, 51021-0800
- Contact: 50217-9101, 50079-8100
- Crimp Tool: 57189-5000, 57190-5000, 57067-3000

- Motor connection cable: 600, 6 Motor Leads, UL Style 3265, AWG22
- Encoder connection cable: 8 Encoder Leads, UL Style 3265, AWG26

- Included Motor connection cable: LC2U06C
- Included Encoder connection cable: 51067-0600 (Molex)
High-Resolution Type with Encoder Frame Size 56.4 mm (Bipolar 4 lead wires)

Specifications

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Max. Holding Torque N·m</th>
<th>Rotor Inertia J·kg·m²</th>
<th>Rated Current A/Phase</th>
<th>Voltage V</th>
<th>Winding Resistance Ω/Phase</th>
<th>Basic Step Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP264MD28A-R2FL-L</td>
<td>0.6</td>
<td>120×10⁻⁷</td>
<td>2.8</td>
<td>2</td>
<td>0.73</td>
<td>0.9°</td>
</tr>
<tr>
<td>PKP266MD28A-R2FL-L</td>
<td>1.32</td>
<td>290×10⁻⁷</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PKP268MD28A-R2FL-L</td>
<td>2.23</td>
<td>490×10⁻⁷</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*All 0.6 m motor connection cable and 0.6 m encoder connection cable are included with these products.

Speed – Torque Characteristics

Note: Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Please keep the motor case temperature at a maximum of 85°C to protect the encoder.

Dimensions (Unit = mm)

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Motor Product Name</th>
<th>L</th>
<th>Mass kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKP264MD28A-R2FL-L</td>
<td>PKP264MD28A-R2FL</td>
<td>55.5</td>
<td>0.47</td>
</tr>
<tr>
<td>PKP266MD28A-R2FL-L</td>
<td>PKP266MD28A-R2FL</td>
<td>70.5</td>
<td>0.74</td>
</tr>
<tr>
<td>PKP268MD28A-R2FL-L</td>
<td>PKP268MD28A-R2FL</td>
<td>92.5</td>
<td>1.11</td>
</tr>
</tbody>
</table>

Included

Motor connection cable
Product Name: LC2806C

Encoder connection cable

Applicable Connector (Molex)

<table>
<thead>
<tr>
<th>Connector Housing</th>
<th>Motor</th>
<th>Encoder</th>
</tr>
</thead>
<tbody>
<tr>
<td>51067-0600</td>
<td></td>
<td>51021-0800</td>
</tr>
<tr>
<td>50217-9101</td>
<td></td>
<td>50079-8100</td>
</tr>
<tr>
<td>57189-5000</td>
<td></td>
<td>57190-5000</td>
</tr>
<tr>
<td>57067-3000</td>
<td></td>
<td>57067-3000</td>
</tr>
</tbody>
</table>

Included

Motor connection cable
Product Name: LC2806C

Encoder connection cable

Included

Motor connection cable
Product Name: LC2806C

Encoder connection cable

Connector Housing
51067-0600 (Molex)
General Specifications

Specifications Motor

Heat-Resistant Class 130 (B)

Insulation Resistance 100 MΩ or higher when a 500 VDC megger is applied between the windings and the case under normal ambient temperature and humidity.

Dielectric Strength

No abnormality is judged even with application of 1.0 kVAC at 50 Hz or 60 Hz between the windings and the case for 1 minute under normal ambient temperature and humidity.

(0.5 kVAC for models with a frame size of 42 mm)

Operating Environment (In operation)

Ambient Temperature −10 to +50°C (non-freezing)

Ambient Humidity 85% max. (non-condensing)

Atmosphere No corrosive gases or dust. The product should not be exposed to water, oil or other liquids.

Temperature Rise Winding temperature rise is 80°C max. (measured by the resistance change method) at the rated voltage, at standstill, and 2-phase excitation.

Stop Position Accuracy

0.075 T.I.R. (mm)

Shaft Runout 0.05 T.I.R. (mm)

Radial Play 0.075 mm max. (Load 10 N) [1 N load for PKP21□]

Axial Play 0.075 mm max. (Load 10 N) [1 N load for PKP21□]

Concentricity of Installation Pilot to the Shaft 0.075 T.I.R. (mm)

Perpendicularity of Installation Surface to the Shaft 0.075 T.I.R. (mm)

Note

Do not measure insulation resistance or perform the dielectric strength test while the motor and driver are connected.

Encoder Specifications

Encoder Name R2EL R2FL

Resolution 200 P/R 400 P/R

Output Circuit Type Line Driver

Output Type Incremental

Output Signal A-phase, B-phase, Z-phase (3ch)

Power Supply Voltage 5 VDC ± 10%

Current 30 mA max.

There is also a voltage output type for the encoder output circuit.

For details, please contact the nearest Oriental Motor sales office.

Permissible Radial Load and Permissible Axial Load

Unit = N

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor Frame Size</th>
<th>Product Name</th>
<th>Permissible Radial Load</th>
<th>Permissible Axial Load</th>
<th>Motor Self-Weight max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Type</td>
<td>20 mm</td>
<td>PKP213 PKP214</td>
<td>12 15 34 52</td>
<td>0 1 3 3 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>35 mm</td>
<td>PKP233 PKP235</td>
<td>20 25 34 52</td>
<td>0 1 3 3 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>42 mm</td>
<td>PKP243 PKP244 PKP245 PKP246</td>
<td>20 25 34 52</td>
<td>0 1 3 3 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>56.4 mm</td>
<td>PKP264 PKP266 PKP268</td>
<td>61 73 90 110 160</td>
<td>0 1 3 3 5</td>
<td></td>
</tr>
<tr>
<td>High-Resolution Type</td>
<td>42 mm</td>
<td>PKP243 PKP244</td>
<td>20 25 34 52</td>
<td>0 1 3 3 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>56.4 mm</td>
<td>PKP264 PKP266 PKP268</td>
<td>61 73 90 110 160</td>
<td>0 1 3 3 5</td>
<td></td>
</tr>
</tbody>
</table>

The applicable motor products are listed such that the model can be determined.

Inner Wiring Diagram for Motor

- Unipolar 6 Lead Wires
  - (4) Black
  - (5) Yellow
  - (6) Green
  - Color of Lead Wire: Red White Blue
  - Connector Terminal Number: (3) (2) (1)

- Unipolar 5 Lead Wires
  - (4) Black
  - Orange
  - Green
  - Color of Lead Wire: Red Blue
  - Connector Terminal Number: (3) (2) (1)

- Bipolar 4 Lead Wires
  - (4) Black
  - (6) Green
  - Color of Lead Wire: Red Blue
  - Connector Terminal Number: (3) (2) (1)
Accessories (Sold separately)

There are handy accessories for installing and operating PKP series equipment. They have been evaluated in combination with Oriental Motor products, so they can be easily used with peace of mind.

Flexible Coupling

There are two types of coupling with high strength, high accuracy, vibration suppression, and other similar features that can be selected based on the type and application of the stepper motor.

Motor Mounting Bracket

A convenient bracket for mounting and securing a stepper motor.

Safety Precautions

- Thoroughly read the operating manual before using a product so that it is used correctly.
- The products listed in this catalogue are for industrial use and built-in components. Do not use for any other application.

For more information please contact:

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