PA-12 Data Sheet

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## Specifications

### Coreless Motors (R)  
PA-12- XXX-XXX-XX-X  
Stroke - Force - Voltage - Core Type

<table>
<thead>
<tr>
<th>Model Number</th>
<th>PA-12-10645012R</th>
<th>PA-12-22038212R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Force</td>
<td>4.50lbs / 80.0mm/s</td>
<td>3.82lbs / 80.0mm/s</td>
</tr>
<tr>
<td>No Load Speed</td>
<td>80.0mm/s</td>
<td>80.0mm/s</td>
</tr>
<tr>
<td>Full Load Speed</td>
<td>68.0mm/s</td>
<td>69.3mm/s</td>
</tr>
<tr>
<td>Self Lock Force</td>
<td>1.57lbs / 1.57lbs</td>
<td>1.57lbs / 1.57lbs</td>
</tr>
<tr>
<td>Input Voltage</td>
<td>12VDC</td>
<td>12VDC</td>
</tr>
<tr>
<td>Stroke Length</td>
<td>1.06&quot;</td>
<td>2.20&quot;</td>
</tr>
</tbody>
</table>

**Gear Ratio**  
10:1

**Gear Type / Rod Type**  
4 Aluminum alloy/stainless steel & 2 Polyketone Gears / Stainless Steel Rod

**Motor Type / Watt**  
Coreless Motor / 26W

**Recommended Duty Cycle**  
50%

**Communication**  
RS-485

### Model Number  
PA-12-10622412R  
PA-12-22017512R

| Rated Force    | 22.48lbs        | 17.50lbs        |
| No Load Speed  | 7.7mm/s         | 7.7mm/s         |
| Full Load Speed| 6.3mm/s         | 6.7mm/s         |
| Self Lock Force| 22.48lbs / 16.86lbs | 17.50lbs / 13.15lbs |
| Input Voltage  | 12VDC           | 12VDC           |
| Stroke Length  | 1.06"           | 2.20"           |

**Gear Ratio**  
50:1

**Gear Type / Rod Type**  
4 Aluminum alloy/stainless steel & 2 Polyketone Gears / Stainless Steel Rod

**Motor Type / Watt**  
Coreless Motor / 26W

**Recommended Duty Cycle**  
50%

**Communication**  
RS-485

### Mechanical Backlash  
0.05mm (50μm)

### Positional Sensor  
10K linear Potentiometer

### Input Voltage  
12.1V (Rated)

### Current Consumption  
| Idle | 30mA at 12.1V |
| Max (Stall) | 2.3A at 12.1V |

### Audible Noise  
Approx. 50db at 1m

### Operating Temperature  
-10°C to 60°C

### Communication  
RS-485

### Included Accessories  
See page 8

### LED Indication  
7 Error Indications: (Overload, Checksum, Data Range, Overheat, Stroke Limit, Input voltage, Instruction Error)
# Specifications

## Cored Motors (T)

### PA-12- XXX-XXX-XX-X

**Stroke - Force - Voltage - Core Type**

<table>
<thead>
<tr>
<th>Model Number</th>
<th>PA-10613412T</th>
<th>PA-10613474T</th>
<th>PA-10626912T</th>
<th>PA-10626974T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Force</td>
<td>1.34lbs</td>
<td>1.34lbs</td>
<td>2.69lbs</td>
<td>2.69lbs</td>
</tr>
<tr>
<td>No Load Speed</td>
<td>36mm/s</td>
<td>36mm/s</td>
<td>12mm/s</td>
<td>12mm/s</td>
</tr>
<tr>
<td>Full Load Speed</td>
<td>25.1mm/s</td>
<td>23.9mm/s</td>
<td>10.4mm/s</td>
<td>9mm/s</td>
</tr>
<tr>
<td>Self Lock Force / Z-Axis Force</td>
<td>0.67lbs / 0.67lbs</td>
<td>0.67lbs / 0.67lbs</td>
<td>2.69lbs / 2.02lbs</td>
<td>2.69lbs / 2.02lbs</td>
</tr>
<tr>
<td>Input Voltage</td>
<td>12VDC</td>
<td>7.4VDC</td>
<td>12VDC</td>
<td>7.4VDC</td>
</tr>
<tr>
<td>Stroke Length</td>
<td>1.06&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gear Ratio</td>
<td>10:1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gear Type / Rod Type</td>
<td>4 Aluminum alloy/stainless steel &amp; 2 Polyketone Gears / Stainless Steel Rod</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motor Type</td>
<td>Cored Motor / 4.2W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommended Duty Cycle</td>
<td>50%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>TTL/PWM</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Positional Accuracy

- **0.05mm (50μm)**

### Micro Controller

- 32bit ARM Core, 4096 Resolution (A/D converter)

### Mechanical Backlash

- **0.05mm (50μm)**

### Positional Sensor

- 10K linear Potentiometer

### Input Voltage

- **12.1V / 7.4V (Rated)**

### Current Consumption

- **Idle**: 30mA at 12.1V / 25mA at 7.4V
- **Max (Stall)**: 0.33A at 12.1V / 0.46A at 7.4V

### Size/Weight (excluding rod & hinge)

- **27mm**
- **57.5mm (L) x 29.9mm (W) x 15mm (H) / Approx. 46-65g**

### Audible Noise

- Approx. 50db at 1m

### Operating Temperature

- -10°C to 60°C

### Communication

- TTL/PWM

### Included Accessories

- See page 8

### LED Indication

- 7 Error Indications: (Overload, Checksum, Data Range, Overheat, Stroke Limit, Input voltage, Instruction Error)
- Wire Harness (Molex to S-02 PWM wire to be packed in Cored versions only)
- PWM/TTL (PT version): Molex to S-02 and Molex to Molex Type (Molex 50-37-5033, 3pin) / 200mm length, 0.08x60(22AWG) or RS-485 (F version): Molex to Molex Type (Molex 0510650400, 4pins) / 200mm length, 0.08x60(22AWG)
Dimensions
(Dimensions in inches)

1.06" Model

2.20" Model
Current vs Load Coreless (R)

Current vs. Load: PA-12-Coreless (R) Linear Actuator

Current vs Load Cored (T)

Current vs. Load: PA-12-Cored (T) Linear Actuator
Speed vs Load Coreless (R)

Speed vs. Load: PA-12 Coreless Motors (R)

Speed vs Load Cored (T)

Speed vs Load: PA-12 Cored Motors (T)
Feedback Specifications

TTL/PWM - 3Pin Connector

The direction of data signal for TxD and RxD of TTL level will be determined according to the level of direction_port as below:
- The level of "direction_port" is LOW : Data signal will be inputted to RxD.
- The level of "direction_port" is HIGH : TxD signal will be outputted as Data.

RS-485 - 4Pin Connector

<table>
<thead>
<tr>
<th>PIN NUMBER(COLOR)</th>
<th>PIN NAME</th>
<th>FUNCTION(RS485)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Yellow)</td>
<td>D-</td>
<td>RS485 –</td>
</tr>
<tr>
<td>2 (White)</td>
<td>D+</td>
<td>RS485 +</td>
</tr>
<tr>
<td>3 (Red)</td>
<td>VCC</td>
<td>Power +</td>
</tr>
<tr>
<td>4 (Black)</td>
<td>GND</td>
<td>Power -</td>
</tr>
</tbody>
</table>

※If the power is supplied from outside, you can connect to 485 D+, 485 D- only.

You can convert TX and RX mode by controlling “Direction_Port pin” in above circuit.
- The level of "direction_port" is LOW : Data signal will be inputted to RxD.
- The level of "direction_port" is HIGH : TxD signal will be outputted as Data.

※ If the power is supplied from outside, you can connect to 485 D+, 485 D- only.
Included Accessories

1. Hinge Shaft (1pc)
2. Hinge Base (1pc)
3. Rod End Tip (1pc)
4. Hinge (1pc)
5. M2.5x6 Screws (3pcs)
6. M3 Nut (2pcs)
7. Wire (PF Version)
   4Pin Molex to Molex (RS-485)
8. Wire (PT Version)
   3Pin Molex to Molex (TTL) & S-02 to Molex (PWM)

#6 M3 nut can be used to fix the hinge and hinge base. The M3 nut can also be used between rod-end and rod-end tip as a stopper.

Rod End Tip → Rod End
            M3 Nut
Optional Accessories

(Dimensions in inches)

BRK-12

PRT-12

LC-12