Harmonic Drive®
High Precision SHA-CG Actuators
Compact, Hollow Shaft Design

**Direct Drive Motor Performance**
- ~ 80-90% less weight
- ~ 50% more compact

**High torque for fast acceleration and positioning**

The SHA-CG delivers high precision with improved positioning accuracy and surface runout. Ideal for high precision rotary applications such as indexing tables.

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**Application Examples**

- **Theta Axis**
- **Wafer Dicing**
- **Precision Machining (Indexing Device)**

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**Measurement, Analytical and Test Systems**
**Optical Equipment**
**Machine Tools**

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**Theta Axis Wafer Dicing Precision Machining (Indexing Device)**

The SHA-CG delivers high precision with improved positioning accuracy and surface runout. Ideal for high precision rotary applications such as indexing tables.
**Product Features**

- Improved output shaft runout accuracy (radial runout & axial runout: less than 0.010mm)
- Improved structure for high precision surface and shaft runout. Ideal for index table application.
- Output shaft resolution is evenly divisible

**Indexing at 0.01° / 0.001° / 0.0001°**

**A mounting stand is available as an option**

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**Outline Dimensions**

**SHA20A-CG**

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**Note:** The dimension tolerances that are not specified are depending on the manufacturing method. Please check the confirmation drawing or contact us for dimension tolerances not shown.
Vertical stand for index application is also available

Improved structure for high precision surface and shaft runout. Ideal for index table application.

* Value in parenthesis is with brake. Output Encoder Resolution = Encoder Resolution x Reduction Ratio.

□

(65.5)

Motor Voltage

<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Size</td>
<td>25A</td>
<td>40A</td>
<td>120:1</td>
<td>100:1</td>
<td>80:1</td>
<td>50:1</td>
<td>80:1</td>
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<tr>
<td>Ø4 H7</td>
<td>19.6</td>
<td>14.3</td>
<td>18.0</td>
<td>18.0</td>
<td>11.0</td>
<td>13.2</td>
<td>15.1</td>
<td>5.2</td>
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<tr>
<td>Torque [Nm]</td>
<td>841</td>
<td>802</td>
<td>738</td>
<td>675</td>
<td>686</td>
<td>548</td>
<td>333</td>
<td>484</td>
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<tr>
<td>Ø94</td>
<td>26</td>
<td>17.5</td>
<td>120</td>
<td>107</td>
<td>178</td>
<td>229</td>
<td>178</td>
<td>120</td>
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<tr>
<td>Hollow Shaft Diameter</td>
<td>Ø45±0.5</td>
<td>Ø27±0.5</td>
<td>Ø43 H7</td>
<td>C0.5</td>
<td>C0.4</td>
<td>Ø72</td>
<td>Ø84 H7</td>
<td>Ø90 H7</td>
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<tr>
<td>Shaft Dia.</td>
<td>80±0.035</td>
<td>7±0.030</td>
<td>80±0.035</td>
<td>7±0.030</td>
<td>5.4</td>
<td>7.0</td>
<td>7.6</td>
<td>8.7</td>
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<tr>
<td>Accuracy (arc-sec)</td>
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<td>40</td>
<td>30</td>
<td>40</td>
<td>40</td>
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<tr>
<td>Mass*</td>
<td>3.95</td>
<td>3.95</td>
<td>(4.1)</td>
<td>(4.1)</td>
<td>2.6</td>
<td>4.7</td>
<td>4.7</td>
<td>4.7</td>
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<tr>
<td>Shaft Dia.</td>
<td>17</td>
<td>17</td>
<td>17</td>
<td>17</td>
<td>17</td>
<td>17</td>
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<tr>
<td>Hollow Shaft Diameter</td>
<td>+0.5</td>
<td>−0.2</td>
<td>+0.015</td>
<td>+0.012</td>
<td>+0.035</td>
<td>+0.030</td>
<td>+0.035</td>
<td>+0.030</td>
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<td>Cable dia. Ø5.6</td>
<td>7±0.030</td>
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<td>Encoder Cable</td>
<td>AWG16-4C+AWG24-2C</td>
<td>AWG18-4C+AWG24-2C</td>
<td>AWG24-3P+Shield</td>
<td>AWG24-3P+Shield</td>
<td>Encoder Cable</td>
<td>AWG24-3P+Shield</td>
<td>Encoder Cable</td>
<td>AWG24-3P+Shield</td>
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The SHA-CG Series actuators is compact, delivers high torque and features a hollow shaft that allows design versatility in demanding applications.

### Model Options

- **Gearhead**
  - Harmonic Drive® Gear - CSG Series 50:1 – 160:1

- **Cable Orientation**
  - Option Side exit

- **Encoder**
  - Magnetic Absolute Encoder (17 bit)
  - Multi-Turn (25 bit)
  - Absolute Encoder: Mitsubishi format, S800 format, Incremental Encoder
  - Option

- **Brake**
  - No Brake
  - Motor Brake (installed without draw-in change)

- **Servomotor**
  - 200V AC
  - 100V AC (size 25)
  - 100V AC
  - 72V DC, 48V DC

- **Environmental**
  - Standard
  - IP 54
  - Temperature Range -5°C - 40°C
  - UL, CE marking, RoHS

- **Cross Roller Bearing**
  - Larger size bearing for higher load capacities

- **Output Bearing**
  - Cross Roller Bearing

- **Option**
  - Origin & End Limit Sensor
  - Mounting Stand

### Driver and Extension Cables

<table>
<thead>
<tr>
<th>General Purpose I/O Commands</th>
<th>Size 20</th>
<th>Size 25</th>
<th>Size 32</th>
<th>Size 40</th>
</tr>
</thead>
<tbody>
<tr>
<td>HA-800B-3D/E-200</td>
<td>HA-800B-3D/E-200</td>
<td>HA-800B-3D/E-200</td>
<td>HA-800B-3D/E-200</td>
<td>HA-800B-3D/E-200</td>
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<tr>
<td>HA-800C-3D/E-200</td>
<td>HA-800C-3D/E-200</td>
<td>HA-800C-3D/E-200</td>
<td>HA-800C-3D/E-200</td>
<td>HA-800C-3D/E-200</td>
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