**ASTRO SYSTEM**

**Outside Diameter ø22.8 mm**

- ASTRO system consists of 3 kinds of air motors, AM-300 (30,000 min⁻¹, 57W), AM-310 (30,000 min⁻¹, 108W), and AM-600 (58,000 min⁻¹, 76W) enabling wide variety of processing works by the combination of various kinds of spindles. By connecting speed reducer between the motor and the spindle, the torque is increased. Select the motor and the spindle depending on the application of processing work.

- The ASTRO system is applicable to the secondary processing machine, single purpose machine, special purpose machine, etc.

**Outside Diameter ø25 mm**

**ASTRO SYSTEM**

**Outside Diameter ø30 mm**

**ASTRO SYSTEM**
MULTI-PURPOSE AIR MOTOR & SPINDLE  φ22.8 mm “ASTRO SYSTEM”

- ASTRO system consists of 3 kinds of air motors, AM-300 (30,000 min⁻¹, 57W), AM-310 (30,000 min⁻¹, 108W), AM-600 (50,000 min⁻¹, 76W), enabling a wide variety of operations by the combination of various kinds of spindles. Higher torque is provided by connecting speed reducers.

ASTRO System φ22.8 mm System Chart

- ASTRO system has been designed to operate smoothly at high speed for long continuous cutting and grinding by connecting an air line kit directly between the air compressor and the air motor. (Air Line Kit Refer to 3-p21, p22 in detail)
- Air supply and exhaust air hoses are supplied with an air motor. Air supply hose is provided with metal fitting to connect to 0.16 mm one-touch joint. Air exhaust hose is supplied with silencer.

Drilling Capacity Reference Table

This table summarizes the drilling capacity for the ASTRO System spindles. Please use this table as a guide for the selection of the proper motor given the torque, speed and size requirements for your application. Data is given for three materials Medium Carbon Steel (S45C), aluminum and brass.

<table>
<thead>
<tr>
<th>Combination as System</th>
<th>Motor</th>
<th>Speed Reducer</th>
<th>Speed</th>
<th>Output (W)</th>
<th>Max. Torque (lbf in)</th>
<th>Max. Drill Diameter for drilling (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM-300R</td>
<td>NR-2350</td>
<td>ARG-01 (1/3.92)</td>
<td>30,000</td>
<td>57</td>
<td>6.9</td>
<td>ø1.0, ø1.5, ø2.0</td>
</tr>
<tr>
<td>AM-300R</td>
<td>NR-2350</td>
<td>ARG-02 (1/1.38)</td>
<td>2,000</td>
<td>108</td>
<td>10.9</td>
<td>ø1.8, ø1.9</td>
</tr>
<tr>
<td>AM-310R</td>
<td>NR-2350</td>
<td>ARG-01 (1/3.92)</td>
<td>8,000</td>
<td>57</td>
<td>26.5</td>
<td>ø1.5, ø2.0</td>
</tr>
<tr>
<td>AM-310R</td>
<td>NR-2350</td>
<td>ARG-02 (1/1.38)</td>
<td>2,000</td>
<td>108</td>
<td>51.9</td>
<td>ø2.5, ø3.0</td>
</tr>
<tr>
<td>AM-310R</td>
<td>NR-2350</td>
<td>ARG-02 (1/1.38)</td>
<td>2,000</td>
<td>108</td>
<td>201.9</td>
<td>ø3.5, ø4.3</td>
</tr>
<tr>
<td>AM-2525R</td>
<td>NR-2550</td>
<td>ARG-02 (1/1.38)</td>
<td>24,000</td>
<td>130</td>
<td>22.5</td>
<td>ø2.0, ø3.0</td>
</tr>
<tr>
<td>AM-2525R</td>
<td>NR-2550</td>
<td>ARG-02 (1/1.38)</td>
<td>8,000</td>
<td>130</td>
<td>80.5</td>
<td>ø2.7, ø2.8</td>
</tr>
<tr>
<td>AM-2525R</td>
<td>NR-2550</td>
<td>ARG-02 (1/1.38)</td>
<td>1,500</td>
<td>130</td>
<td>332.2</td>
<td>ø4.3, ø5.2</td>
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<tr>
<td>AM-3020R</td>
<td>NR-452E</td>
<td>ARG-01 (1/14)</td>
<td>19,000</td>
<td>130</td>
<td>22</td>
<td>ø2.3, ø4.0</td>
</tr>
<tr>
<td>AM-3020R</td>
<td>NR-452E</td>
<td>ARG-02 (1/14)</td>
<td>4,750</td>
<td>130</td>
<td>108</td>
<td>ø3.2, ø5.0</td>
</tr>
</tbody>
</table>

Drilling Capacity Reference Table

- ASTRO System Torque-Speed Characteristics

- Referring to the system chart and torque characteristics, select the air motor and the spindle freely depending on the application.

ASTRO SYSTEM Features

- Gang slide NC lathes can be transformed into complex machining centers.
- Specialized machine design will be made compact and universal.

Mounting ASTRO System on existing equipment and can eliminate secondary operations or the equipment can be turned into a special purpose machine.

- The ASTRO System is applicable to secondary operation machines, simple purpose machines or special machining and grinding machines.

The air motors are explosion-proof and do not generate heat even in continuous use.

- Five different motors are available as follows: 30,000 min⁻¹ (57W), 50,000 min⁻¹ (108W), 50,000 min⁻¹ (76W) all with ø22.8 mm O.D. and 24,000 min⁻¹ (110W) is available with ø25 mm O.D. motors. Select the motor most suitable for your application.

- When ASTRO System is used at low motor speed, a speed reducer (ARG-01, or other selections) is added in order to obtain the speed of your choice.

- Collet Chuck, Jacobs drill chuck, saw axis and grinding stone axes are available for grinding, drilling, milling, slitting, chamfer and deburring operations.

Application Examples

- The ASTRO System is applicable to secondary operation machines, simple purpose machines or special machining and grinding machines.

- Five different motors are available as follows: 30,000 min⁻¹ (57W), 50,000 min⁻¹ (108W), 50,000 min⁻¹ (76W) all with ø22.8 mm O.D. and 24,000 min⁻¹ (110W) is available with ø25 mm O.D. motors. Select the motor most suitable for your application.

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- Collet Chuck, Jacobs drill chuck, saw axis and grinding stone axes are available for grinding, drilling, milling, slitting, chamfer and deburring operations.

Drilling Capacity Reference Table

This table summarizes the drilling capacity for the ASTRO System spindles. Please use this table as a guide for the selection of the proper motor given the torque, speed and size requirements for your application. Data is given for three materials Medium Carbon Steel (S45C), aluminum and brass.

- Conditions: High speed steel drill was used with a feed rate of 0.025mm/min. Tool life was not considered in determining the above capacities. Use this table as a reference to extrapolate suitability for a given application.

- Combining 1/16 Reduction to 1/32 Reduction with 1/8 Reduction to 1/16 Reduction, and 1/16 Reduction to 1/32 Reduction to 1/64 Reduction is allowed.

- The speed-motor combinations are determined by the application.

- Referring to the system chart and torque characteristics, select the air motor and the spindle freely depending on the application.

- Combining of the system chart and torque characteristics. Astro System is designed to operate smoothly at high speed for long continuous cutting and grinding by connecting an air line kit directly between the air compressor and the air motor. (Air Line Kit Refer to 3-p21, p22 in detail.)

- Air supply and exhaust air hoses are supplied with an air motor. Air supply hose is provided with metal fitting to connect to ø0.16 mm one-touch joint. Air exhaust hose is supplied with silencer.
**ULTRA-PRECISION SMALL DIAMETER ø22.8 mm HIGH-TORQUE AIR MOTOR**

- **Small diameter ø22.8 mm.**
- **Ultra-precision vane-type air motor.**
- **Outside housing is made of stainless steel (SUS416).**

### CAT. No. 1021 AIR MOTOR AM-300R (Forward Rotation) 57W

- **Motor Speed** 30,000 min⁻¹ (0.6MPa)
- **Max. Output Power** 57W
- **Proper Air Pressure** 0.3~0.5MPa
- **Air Consumption** 110NL/min
- **Length of Motor Hose** 2 m
- **Hose Diameter** Air Inlet I.D. ø4.7 mm x O.D. ø6.5 mm
- **Weight (w/o hose)** 135 g

### CAT. No. 1018 90° ANGLE TYPE AIR MOTOR AM-300RA (Forward Rotation) 57W

- **Motor Speed** 30,000 min⁻¹ (0.6MPa)
- **Max. Output Power** 57W
- **Proper Air Pressure** 0.3~0.5MPa
- **Air Consumption** 110NL/min
- **Length of Motor Hose** 2 m
- **Hose Diameter** Air Inlet I.D. ø4.7 mm x O.D. ø6.5 mm
- **Weight (w/o hose)** 176 g

### CAT. No. 1079 AIR MOTOR AM-310R (Forward Rotation) 108W

- **Motor Speed** 30,000 min⁻¹ (0.6MPa)
- **Max. Output Power** 108W
- **Proper Air Pressure** 0.3~0.5MPa
- **Air Consumption** 220NL/min
- **Length of Motor Hose** 2 m
- **Hose Diameter** Air Inlet I.D. ø4.7 mm x O.D. ø6.5 mm
- **Weight (w/o hose)** 203 g

### CAT. No. 1051 90° ANGLE TYPE AIR MOTOR AM-310RA (Forward Rotation) 108W

- **Motor Speed** 30,000 min⁻¹ (0.6MPa)
- **Max. Output Power** 108W
- **Proper Air Pressure** 0.3~0.5MPa
- **Air Consumption** 220NL/min
- **Length of Motor Hose** 2 m
- **Hose Diameter** Air Inlet I.D. ø4.7 mm x O.D. ø6.5 mm
- **Weight (w/o hose)** 244 g

**Note:** Order with a catalogue number. 3-p5
ULTRA-PRECISION SMALL DIAMETER ø22.8 mm SPINDLE

ASTRO SYSTEM can be used in conjunction with water or oil based coolants.

CAT. No. 1086 SPINDLE NR-302

- Allowable Motor Speed: 30,000 min⁻¹
- Spindle Accuracy: Within 1 µm
- Standard Size Collet Chuck (CHG-3.0) ø3.0 mm
- Weight: 215 g

CAT. No. 8220 SPINDLE NR-2350 (Ceramic Bearings)

- Allowable Motor Speed: 50,000 min⁻¹
- Spindle Accuracy: Within 1 µm
- Standard Size Collet Chuck (CHG-3.0) ø3.0 mm
- Weight: 215 g

CAT. No. 1020 SPINDLE NR-301

- Allowable Motor Speed: 30,000 min⁻¹
- Spindle Accuracy: Within 2 µm
- Standard Size Collet Chuck (CHG-3.0) ø3.0 mm
- Weight: 202 g

ULTRA-PRECISION SMALL DIAMETER ø22.8 mm SPINDLE

CAT. No. 2511 SPINDLE NR-310

- Allowable Motor Speed: 30,000 min⁻¹
- Spindle Accuracy: Within 2 µm
- Standard Size Collet Chuck (CHG-3.0) ø3.0 mm
- Weight: 171 g

CAT. No. 1074 SPINDLE AMH-301

- Allowable Motor Speed: 30,000 min⁻¹
- Spindle Accuracy: Within 2 µm
- Standard Size Collet Chuck (CHG-3.0) ø3.0 mm
- Weight: 208 g

CAT. No. 1073 SPINDLE NR-601

- Allowable Motor Speed: 60,000 min⁻¹
- Spindle Accuracy: Within 2 µm
- Standard Size Collet Chuck (CHG-3.0) ø3.0 mm
- Weight: 208 g

Order with a catalogue number.
**ULTRA-PRECISION SMALL DIAMETER ø22.8 mm SPINDLE**

### Caution:
Use the motor at motor speed less than maximum allowable speed or use the speed reducer. DO NOT exceed the allowable motor speed for the spindle and the reducer.

### Technical Notes:
- This spindle is capable of working on corners difficult to work with straight type, drilling on side face and, slitting of aluminum, brass, etc. with the use of ø30 mm Metal Saw.
- This is a spindle withstands up to 30,000 min⁻¹ without connecting to an air motor but by belt drives with the use of pulley. (Belt ø6 mm round belt)

<table>
<thead>
<tr>
<th>CAT. No.</th>
<th>Model</th>
<th>Standard Equipment</th>
<th>Accessories</th>
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<td>1094</td>
<td>RAS-100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1024</td>
<td>RA-100</td>
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<td></td>
</tr>
<tr>
<td>1075</td>
<td>RA-200</td>
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<tr>
<td>1087</td>
<td>NR-302P</td>
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</tr>
<tr>
<td>1022</td>
<td>ARG-01</td>
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<td></td>
</tr>
<tr>
<td>1023</td>
<td>ARG-02</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### EXAMPLES
- **1075RA-200**: Maximum allowable motor speed 30,000 min⁻¹
- **1024RA-100**: Maximum allowable motor speed 20,000 min⁻¹
- **1094RAS-100**: Maximum allowable motor speed 20,000 min⁻¹

### Product Information
- The belt-driven spindle is the replacement product of the belt-driven spindle.

### Specification Details
- **90° Angle Spindle**
- **Speed Reducer**: 1/3.92 ARG-01
- **SPEED REDUCER 1/15.39 ARG-02**
- **Belt Driven Spindle**: NR-302P

### Caution
- DO NOT exceed the allowable motor speed for the spindle.
Data Technical Examples

- Small diameter ø25 mm.
- Ultra-precision vane type air motor spindle.
- Rigid stainless steel (SUS416) outer housing.

**ASTRO System ø25 mm System Chart**

- ASTRO system has been designed to operate smoothly at high speed for long continuous cutting and grinding by connecting an air line kit directly between the air compressor and the air motor. (Air Line Kit Refer to 3-p21, 22 in detail)
- Air supply and exhaust air hoses are supplied with an air motor. Air supply hose is provided with metal fitting to connect to ø6 mm one-touch joint. Air exhaust hose is supplied with silencer.

- Ultra-precision, compact, vane-type air motor provides high torque with small volume of air consumption. Withstands long continuous operation without heat generation. Silencer keeps noise to a minimum.

- The installation space is reduced by installing the air inlet and exhaust air hoses at 90° angle from the rear end of the motor.

**AM-2525 Torque-Speed Characteristics**

- Motor Speed 24,000 min⁻¹
- Max. Output Power 130W
- Proper Air Pressure 0.3~0.5MPa
- Air Consumption 230NL/min
- Length of Motor Hose 2 m
- Hose Diameter Air Inlet I.D. ø4.5 mm x O.D. ø6.7 mm
- Exhaust Air I.D. ø6.0 mm x O.D. ø7.5 mm
- Weight (w/o hose) 241 g

**AM-2525RA (Forward Rotation) 120W 22,000 min⁻¹**

- Motor Speed 22,000 min⁻¹
- Max. Output Power 120W
- Proper Air Pressure 0.3~0.5MPa
- Air Consumption 230NL/min
- Length of Motor Hose 2 m
- Hose Diameter Air Inlet I.D. ø4.5 mm x O.D. ø6.0 mm
- Exhaust Air I.D. ø6.0 mm x O.D. ø7.5 mm
- Weight (w/o hose) 241 g

- Order with a catalogue number. 3-p11
ULTRA-PRECISION SMALL DIAMETER ø25 mm SPINDLE

**ASTRO SYSTEM** can be used in conjunction with water or oil based coolants.

**CAT. No.** 1819
**SPINDLE** NR-2550 (Ceramic Bearing)

- **Maximum rotating speed at the cutting tool**: 50,000 min⁻¹
- **Outside diameter ø25.4 mm type is also available.**

**CAT. No.** 1809
**SPINDLE** NR-2531

- **Maximum rotating speed at the cutting tool**: 30,000 min⁻¹
- **Outside diameter ø25.4 mm type is also available.**

---

**ULTRA-PRECISION SMALL DIAMETER ø25 mm SPINDLE**

**CAUTION**
Use the motor at motor speed less than maximum allowable speed or use the speed reducer.

**CAT. No.** 1814
**90°ANGLE SPINDLE** RAS-2510

- **Maximum allowable motor speed for the spindle**: 20,000 min⁻¹
- **Outside diameter ø25.4 mm type is also available.**

**CAT. No.** 1813
**90°ANGLE SPINDLE** RAS-2520

- **Maximum allowable motor speed for the spindle**: 20,000 min⁻¹
- **Outside diameter ø25.4 mm type is also available.**

---

**Order with a catalogue number. 3-p13**
Use the motor at motor speed less than maximum allowable speed or use the speed reducer.

DO NOT exceed the allowable motor speed for the spindle and the reducer.

Caution: Use the motor at motor speed less than maximum allowable speed or use the speed reducer.

If the speed reducer is connected between the motor and the spindle, it reduces the rotating speed and increases the torque while keeping the motor speed unchanged.

SPEED REDUCER 1/4 ARG-2504

<table>
<thead>
<tr>
<th>CAT. No.</th>
<th>SPEED REDUCER 1/4 ARG-2504</th>
</tr>
</thead>
<tbody>
<tr>
<td>1822</td>
<td></td>
</tr>
</tbody>
</table>

Maximum allowable motor speed 30,000 min⁻¹

Maximum rotating speed at the cutting tool 7,500 min⁻¹

- Speed Reducing Mechanism: Planetary gear system
- Weight: 150 g

Maximum allowable motor speed 25,000 min⁻¹

Outside diameter ø25.4 mm type is also available.

SPEED REDUCER 1/16 ARG-2516

<table>
<thead>
<tr>
<th>CAT. No.</th>
<th>SPEED REDUCER 1/16 ARG-2516</th>
</tr>
</thead>
<tbody>
<tr>
<td>1824</td>
<td></td>
</tr>
</tbody>
</table>

Maximum allowable motor speed 30,000 min⁻¹

Maximum rotating speed at the cutting tool 1,870 min⁻¹

- Speed Reducing Mechanism: Planetary gear system
- Weight: 205 g

Maximum allowable motor speed 30,000 min⁻¹

Outside diameter ø25.4 mm type is also available.

Order with a catalogue number.
**ASTRO System φ30 mm System Chart**

- ASTRO system has been designed to operate smoothly at high speed for long continuous cutting and grinding by connecting an air line kit directly between the air compressor and the air motor. (Air Line Kit Refer to 3-p21, 22 in detail)
- Air supply and exhaust air hoses are supplied with an air motor. Air supply hose is provided with metal fitting to connect to ø6 mm one-touch joint. Air exhaust hose is supplied with silencer.

**AM-3020 Torque-Speed Characteristics**

- Referring to the system chart and torque characteristics, select the air motor and the spindle freely depending on the application.
- Small diameter ø30 mm.
- Ultra-precision vane type air motor spindle.
- Rigid stainless steel (SUS416) outer housing.

**Order with a catalogue number.** 3-p17
**ULTRA-PRECISION ø30 mm SPINDLE**

**ASTRO SYSTEM**
can be used in conjunction with water or oil based coolants.

**Production to be discontinued in 2006**

The NR-402E is the replacement product.

**Cat. No. 1565** **SPINDLE** **NR-402E**

**40,000 min⁻¹**

- Allowable Motor Speed .............................................. 40,000 min⁻¹
- Spindle Accuracy .................................................. Within 1 µm
- Standard Size Collet Chuck (CHK-3.0) ....................... ø3.0 mm
- Weight ................................................................. 440 g
- Optional >
  - Collet Chuck (CHK-3.0) ............................................... ø3.0 mm
  - Drill Chuck Axis (DCH-J0K) ................................. For Jacob’s Taper No. 0
  - Chuck Nut (K-265) ...................................................... For Collet Chuck (CHK)
  - Metal Saw Axis (KCH-03) ................................. For ø6 (I.D.) x ø30 mm (O.D.)

**Additional Spindle Accessories**
- Chuck Nut (K-265) ................................................. 1 pc.
- Spindle Accuracy ............................................... Within 2 µm
- Maximum allowable motor speed for the spindle 15,600 min⁻¹

**Cat. No. 1566** **SPINDLE** **NR-452E**

**50,000 min⁻¹**

- Allowable Motor Speed .............................................. 50,000 min⁻¹
- Spindle Accuracy .................................................. Within 1 µm
- Standard Size Collet Chuck (CHK-3.0) ....................... ø3.0 mm
- Weight ................................................................. 440 g
- Optional >
  - Collet Chuck (CHK-3.0) ............................................... ø3.0 mm
  - Drill Chuck Axis (DCH-J0K) ................................. For Jacob’s Taper No. 0
  - Chuck Nut (K-265) ...................................................... For Collet Chuck (CHK)
  - Metal Saw Axis (KCH-03) ................................. For ø6 (I.D.) x ø30 mm (O.D.)

**Additional Spindle Accessories**
- Chuck Nut (K-265) ................................................. 1 pc.
- Chuck Nut (K-265) ................................................. 1 pc.
- Spindle Accuracy ............................................... Within 1 µm
- Maximum allowable motor speed for the spindle 20,000 min⁻¹

**Cat. No. 1569** **90° ANGLE SPINDLE** **RAS-150E**

**20,000 min⁻¹**

- Spindle Accuracy .................................................. Within 2 µm
- Standard Size Collet Chuck (CHK-3.0) ....................... ø3.0 mm
- Weight ................................................................. 1575 g
- Optional >
  - Collet Chuck (CHK-3.0) ............................................... ø3.0 mm
  - Drill Chuck Axis (DCH-J0K) ................................. For Jacob’s Taper No. 0
  - Chuck Nut (K-265) ...................................................... For Collet Chuck (CHK)
  - Metal Saw Axis (KCH-03) ................................. For ø6 (I.D.) x ø30 mm (O.D.)

**Additional Spindle Accessories**
- Chuck Nut (K-265) ................................................. 1 pc.
- Spindle Accuracy ............................................... Within 1 µm
- Maximum allowable motor speed for the spindle 30,000 min⁻¹

**Cat. No. 1579** **90° ANGLE SPINDLE** **RAX-270E**

**20,000 min⁻¹**

- Spindle Accuracy .................................................. Within 3 µm
- Standard Size Collet Chuck (CHK-3.0) ....................... ø3.0 mm
- Weight ................................................................. 580 g
- Optional >
  - Collet Chuck (CHK-3.0) ............................................... ø3.0 mm
  - Drill Chuck Axis (DCH-J0K) ................................. For Jacob’s Taper No. 0
  - Chuck Nut (K-265) ...................................................... For Collet Chuck (CHK)

**Additional Spindle Accessories**
- Chuck Nut (K-265) ................................................. 1 pc.
- Chuck Nut (K-265) ................................................. 1 pc.
- Spindle Accuracy ............................................... Within 3 µm
- Maximum allowable motor speed for the spindle 5,000 min⁻¹

**Cat. No. 1578** **90° ANGLE SPINDLE** **RAX-70E**

**30,000 min⁻¹**

- Spindle Accuracy .................................................. Within 3 µm
- Standard Size Collet Chuck (CHK-3.0) ....................... ø3.0 mm
- Weight ................................................................. 580 g
- Optional >
  - Collet Chuck (CHK-3.0) ............................................... ø3.0 mm
  - Drill Chuck Axis (DCH-J0K) ................................. For Jacob’s Taper No. 0
  - Chuck Nut (K-265) ...................................................... For Collet Chuck (CHK)

**Additional Spindle Accessories**
- Chuck Nut (K-265) ................................................. 1 pc.
- Chuck Nut (K-265) ................................................. 1 pc.
- Spindle Accuracy ............................................... Within 3 µm
- Maximum allowable motor speed for the spindle 5,000 min⁻¹

**Order with a catalogue number.**
ULTRA-PRECISION ø30 mm SPINDLE

Caution: Use the motor at motor speed less than maximum allowable speed or use the speed reducer. DO NOT exceed the allowable motor speed for the spindle and the reducer.

CAT. No. 1505 90°ANGLE SPINDLE RA-150E

- Maximum rotating speed at the cutting tool: 7,490 min⁻¹
- Standard Size Collet Chuck (CHS-3.0): ø0.8 mm~ø3.0 mm
- Weight: 385 g
- Optional:
  - Collet Chuck (CHS-3.0): ø0.8 mm~ø3.0 mm in 0.1 mm increments and ø3.15 mm
  - Metal Saw Axis (KCH-02): For ø(0.8) x ø30 mm (ø3.2)...

90° Angle Spindle

CAT. No. 1506 90°ANGLE SPINDLE RA-270E

- Maximum allowable motor speed for the spindle: 20,000 min⁻¹
- Maximum rotating speed at the cutting tool: 13,330 min⁻¹
- Standard Size Collet Chuck (CHS-3.0): ø0.8 mm~ø3.0 mm
- Weight: 240 g
- Optional:
  - Collet Chuck (CHS-3.0): ø0.8 mm~ø3.0 mm in 0.1 mm increments and ø3.15 mm

90° Angle Spindle

SPEED REDUCER & AIR LINE KIT

Caution: Use the motor at motor speed less than maximum allowable speed or use the speed reducer. DO NOT exceed the allowable motor speed for the spindle and the reducer.

CAT. No. 1507 SPEED REDUCER 1/4 ARG-01E

- Maximum allowable motor speed: 30,000 min⁻¹
- Maximum rotating speed at the cutting tool: 7,500 min⁻¹
- Speed Reducing Mechanism: By planetary gear system
- Weight: 242 g

SPEED REDUCER 1/4

CAT. No. 1508 SPEED REDUCER 1/16 ARG-02E

- Maximum allowable motor speed: 30,000 min⁻¹
- Maximum rotating speed at the cutting tool: 1,870 min⁻¹
- Speed Reducing Mechanism: By planetary gear system
- Weight: 385 g

SPEED REDUCER 1/16

CAT. No. 1542 AIR LINE KIT AL-0304

- The AL-0304 is a system supplying oil to the motor side automatically by regulating the air pressure. However, in some cases the filter of AL-0304 may not provide sufficient filter effects, and it is recommended to install either an air dryer or a large air filter between the compressor and AL-0304.

Air Line Kit (For ø6 mm, ø8 mm Hose)

Order with a catalogue number. 3-p21
The AL-951 is equipped with a filter, a regulator and a lubricator as a set that is required when installing ASTRO system on a NC lathe. In addition, two solenoid operated valves (DC 24V), which can be controlled by M-codes from NC device, are assembled and two air motors can be operated at the same time. Auto-drain mechanism works automatically when stagnant water is trapped in the air filter. Alarm buzzer is also assembled in the lubricator to warn of shortage of lubrication oil. As an option, additional solenoid operated valve can be installed to operate three air motors at the same time.

Air Line Kit (For ø6 mm Hose · Filter Mesh 5 µm)

<table>
<thead>
<tr>
<th>CAT. No.</th>
<th>Model</th>
<th>Standard Equipment</th>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>1030 AL-951</td>
<td></td>
<td>• Air Filter • Air Regulator • Air Pressure Gauge • Lubricator • Solenoid Valve (DC 24V) : 2 pcs. • Buzzer (DC 24V) • Hose for Piping (K-260) : 2 m • Lubricating Oil (K-202) : 1 pc.</td>
<td></td>
</tr>
</tbody>
</table>

Air Branching Joint

It is essential to run air motors with air line kits to ensure proper air pressure and lubrication. This branching joint is designed to supply even, compressed air and oil for 3 to 6 air motors where installation of individual air kits is not feasible.

The inlet hose size is ø12 mm and the exhaust hose size is ø6 mm.

Please use with the AL-951.

<table>
<thead>
<tr>
<th>CAT. No.</th>
<th>Model</th>
<th>Standard Equipment</th>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>2051 DJ-6</td>
<td></td>
<td>• Plug (air stopper) : 3 pcs.</td>
<td></td>
</tr>
</tbody>
</table>

Lubricating Oil

Use ISO VG15 Liquid Paraffin (Shell Ongina oil #15) for lubricator.

<table>
<thead>
<tr>
<th>CAT. No.</th>
<th>Model</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>1057 K-211</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>CAT. No.</th>
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<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>1058 K-202</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Order with a catalogue number.