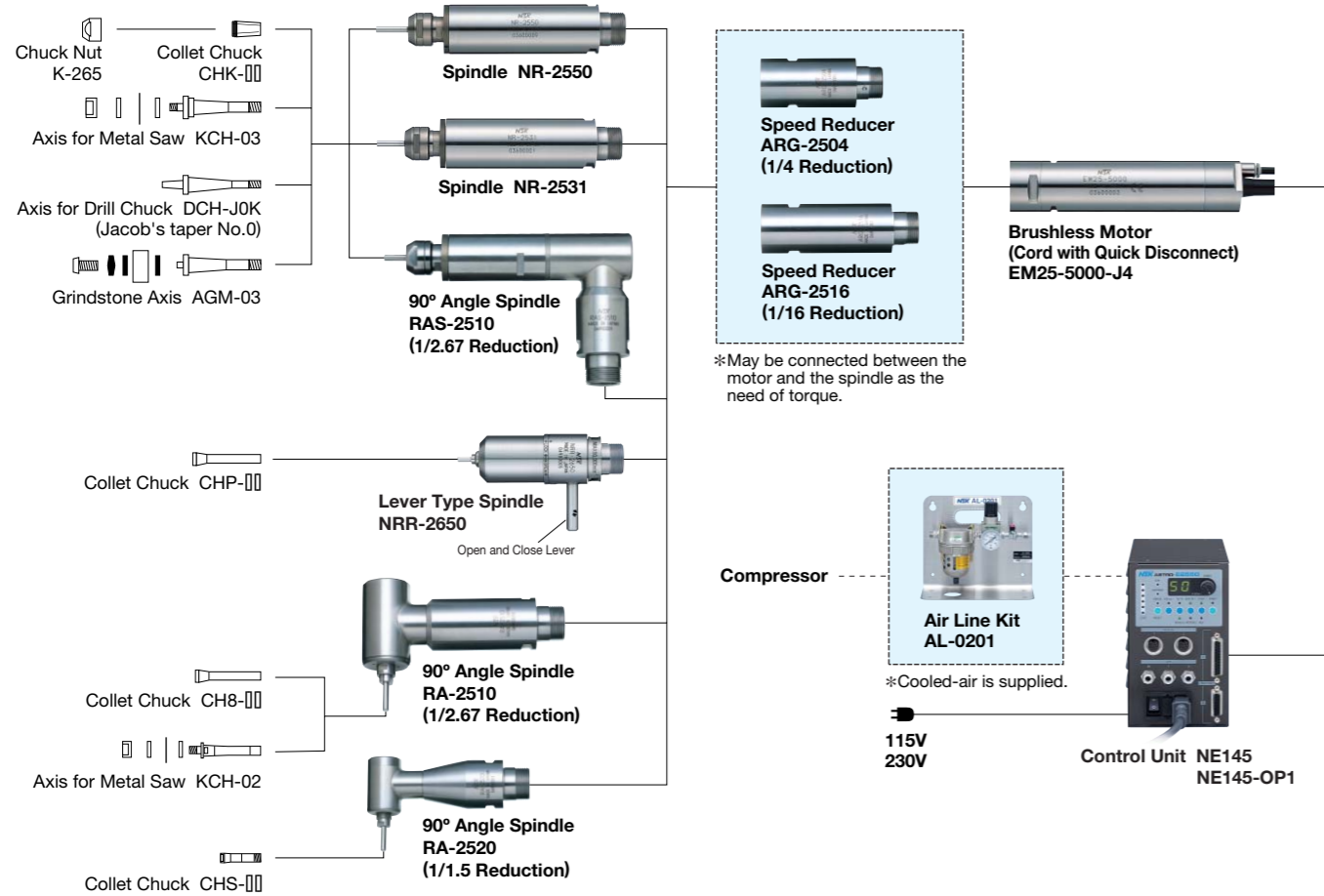


# ULTRA-PRECISION BRUSHLESS MOTOR & SPINDLE "ASTRO-E 2550"

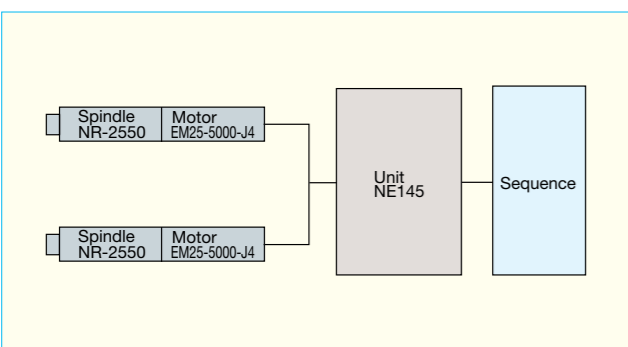
## ASTRO-E 2550 System Chart

● Interchangeable with a variety of attachments depending on the application.



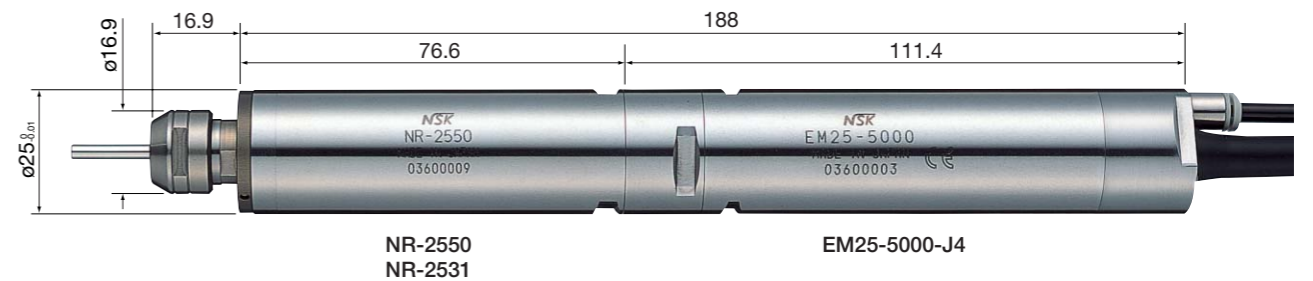
\*Do not exceed the maximum motor speed recommendation for the spindles. Excess speed will dramatically reduce bearing life.

## Automatic Control System Chart with 2 Motors



\*The ASTRO-E 2550 control unit has the ability to control up to 2 motors sequentially. 2 motors can not be run simultaneously.

## Features of ASTRO-E 2550



### ● Maximum Output 125W

The ASTRO-E 2550 motor is a brushless DC motor utilizing hall elements and Rare-earth magnet in the rotor. The Motor develops 125W.

### ● Brushless Motor

The brushless DC Motor designs allows for excellent reliability and durability. The EM25-5000-J4 can be steplessly controlled from 50,000 min<sup>-1</sup>.

### ● Air-Cooling system provides Excellent Durability

Air-cooled motor uses a small volume of air (35L/min) to prevent heat buildup and allow long continuous operation. Regulate the cooling air supply between 0.15-0.25MPa. If the air pressure is too low the control will limit the maximum motor speed to 30,000 min<sup>-1</sup> for safety.

Clean dry air is required to cool the motor and protect the spindle from contaminants. Use a filter and regulator. (Proper air pressure 0.15~0.25MPa) (Use Air Line Kit AL-0201)

### ● Wide Variety of Interchangeable Attachments are Available

Straight-type and 90° angle type spindle are available along with speed reducers to increase torque and provide outstanding system flexibility.

### ● Safe Protective Function

The ASTRO-E 2550 is equipped with a protective function to stop the spindle rotation automatically in case of overload ensuring safe and smooth operation. When the protective circuit is activated, an error code is shown on the digital display. In case of an air supply failure, the protective circuit limits the motor/spindle to 30,000 min<sup>-1</sup> maximum.

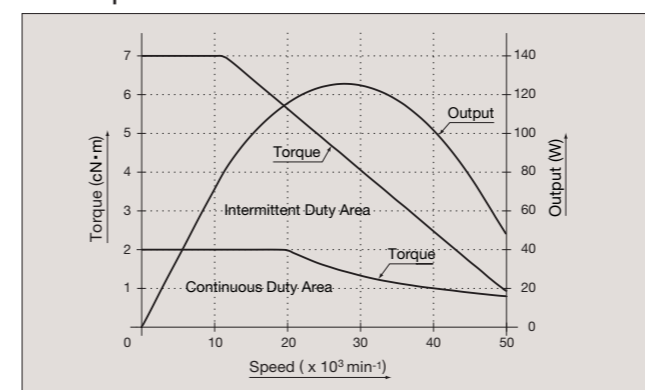
### ● Centering Mode Switch

This switch activates the centering mode, which maintains a constant 500 min<sup>-1</sup> spindle speed for centering the tool.

### ● Operating Parameters

The operating parameters can be preset, 'Fixed motor speed for each motors', 'Maximum Motor Speed' can be set.

### ● Torque Characteristics of ASTRO-E 2550



### ● 2 Motors can be connected (No Simultaneous Operation)

Up to 2 motors may be connected to 1 control unit and operated sequentially making this system very easy to use when multiple live tools are required.

### ● Compact Vertical Control Unit

The compact, vertical design of the control unit makes it extremely easy to mount in cramped control cabinets.

### ● Dual Voltage Power Source AC 115V/230V

The control unit is compatible with 115-230V main supply voltage and is equipped with a switch for voltage selection. The power supply cord is packaged for your ordered voltage specifications. Fuses and power must be exchanged to compatible component when changing supply voltage. Verify that voltage selection, power cord and fuse type are compatible with supply voltage prior to connecting to power supply.

### ● Stainless Steel Outside Body

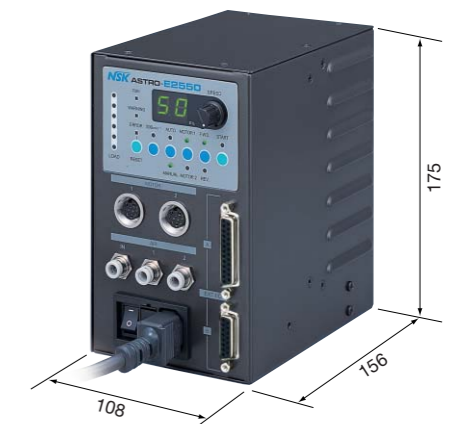
The housings of the motor and spindle are made from precision ground (SUS416).

### ● Spindle

The NR-2531 is assembled with high speed angular bearing to provide maximum rigidity and is designed to withstand continuous operation at up to 30,000 min<sup>-1</sup>. The NR-2550 is assembled with ultra-precision ceramic bearings and is designed to withstand continuous operation at up to 50,000 min<sup>-1</sup>.

### ● Special Safety Version Available

The safety relay utilizes normally open contacts. The emergency stop signal lines must be supplied with power to hold the safety relay contacts closed and allow the control unit to supply power to the motor. Any system errors, trouble with the machining center or the connections between the ASTRO-E 2550 control unit and the machining center's controller will cause the relay contacts to open and the ASTRO-E 2550 motor or stop.



# “ASTRO-E 2550” COMBINATION EXAMPLE

## High Precision and High-Performance Control Unit

### ● High-Performance Electric Circuit

‘High grade feedback loop to maintain constant spindle speed even if load is varied’, and ‘Gentle start/Quick stop functions’ are provided.

### ● Warning/Error Function

Motor/Spindle is stopped safety, Warning/Error LED is lit, and Warning/Error Signal is output to external when there is something wrong with the motor/spindle, or any breakage is detected.

- Warning : ● Air shortage ● Overload operation  
● Motor cord disconnection and etc.
- Error : ● Internal Circuit Error ● Voltage/Electric current Error  
● Overheat/Overload operation ● Operation Error  
● Air shortage ● Locked Motor and others (Total 13 items)

### ● Selector Function

Max. 2 motor can be controlled sequentially. 2 motors can not be run simultaneously.

### ● External Input-Output Connector

(Refer to Technical Data p8~p11 in detail)  
Motor/Spindle can be controlled and monitored by external input-output connector. Control : Start/Stop, Motor Speed Control, FWD./REV. Rotation and etc. Monitor : While Rotating, Rotation Pulse, Unit Power Source Detection, AUTO Mode, Motor Speed Voltage and etc. And Error Output can be reversed by the parameter setting.

### ● Motor Speed Display

Motor speed is displayed precisely and digitally.

### ● LOAD Monitor LED

Motor load is displayed by 6 LED's to mean load level.

## ASTRO-E 2550 NR-2550 Combination Example 50,000 min<sup>-1</sup>



### Unit Specifications

Model	NE145
Power Source	AC 115V/230V (Switchable type) 50-60 Hz
Power Consumption	92W
Weight	3.6 kg
Dimensions	W108 x D156 x H175 mm

### Motor & Spindle

Motor	EM25-5000-J4
Spindle	NR-2550
Speed	5,000~50,000 min <sup>-1</sup> 500 min <sup>-1</sup> : for centering
Weight	510 g (w/o motor cable)
Dimensions	ø25 x 188 mm

### ASTRO-E 2550, NR-2550 Combination Example

CAT. No.	Model	Product
9795 (115V)	NE145	Control Unit
8333	EM25-5000-J4	Brushless Motor
1819	NR-2550	Spindle

## ASTRO-E 2550 NR-2531 Combination Example 30,000 min<sup>-1</sup>



### Unit Specifications

Model	NE145
Power Source	AC 115V/230V (Switchable type) 50-60 Hz
Power Consumption	92W
Weight	3.6 kg
Dimensions	W108 x D156 x H175 mm

### Motor & Spindle

Motor	EM25-5000-J4
Spindle	NR-2531
Speed	5,000~30,000 min <sup>-1</sup> 500 min <sup>-1</sup> : for centering
Weight	510 g (w/o motor cable)
Dimensions	ø25 x 188 mm

### ASTRO-E 2550, NR-2531 Combination Example

CAT. No.	Model	Product
9795 (115V)	NE145	Control Unit
8333	EM25-5000-J4	Brushless Motor
1809	NR-2531	Spindle

\*Please use within max. motor speed down to 30,000 min<sup>-1</sup>.  
If not, the spindle may be damaged earlier.

# “ASTRO-E 2550” CONTROL UNIT

- 5,000~50,000 min<sup>-1</sup>
- Max. Output (125W) brushless DC Motor with an outside diameter of ø25 mm.
- Electric motor utilizes a wide selection of attachments. ● 2 motors can be connected (No Simultaneous Operation).
- Designed to be installed on Special Purpose machine, NC Lathes, Robots, etc.
- The NRR-2650 has a simple lever operated collet. No wrenches are required for tool changing.

## ASTRO-E 2550 CONTROL UNIT NE145 50,000 min<sup>-1</sup>



### Specifications

Model	: NE145 / NE145-OP1
Power Source	: AC 115V/230V, 50-60 Hz (switchable type)
Power Consumption	: 92W
Weight	: 3.6 kg
Dimensions	: W108 x D156 x H175 mm

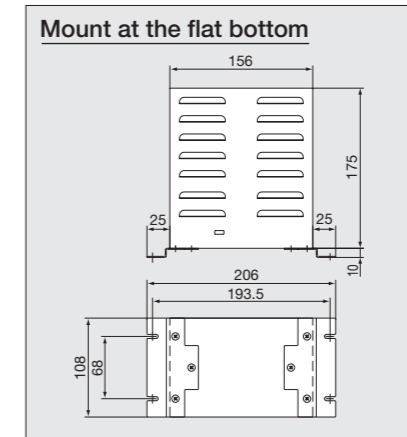
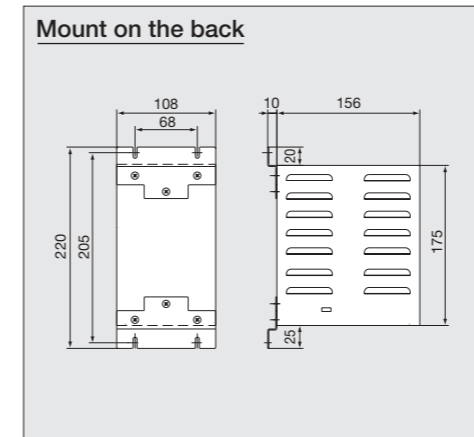
### ASTRO-E 2550 Control Unit

CAT. No.	Model	Standard Equipment · Accessories
9795 (115V)	NE145	● Power Cord ● Air Hose with filter (K-251) : ø6 mm x 2 m ● Bracket (2 pcs.) ● Connector Cap ● Grip ● Air Plug ● Screw (7 pcs.)
9797 (230V)		
9798 (115V)	NE145-OP1	
9800 (230V)		

\*Please refer to Technical Data p8-p11 in detail about External Input-Output Connector.

\*The NE145-OP1 is the Special Safety Version it has an "Emergency Stop Input" and "Safety Relay". Please contact us regarding delivery.

### ● Mounting Bracket (for rack mount)



\* Order with a catalogue number. 2-p27

# "ASTRO-E 2550" BRUSHLESS MOTOR & SPINDLE

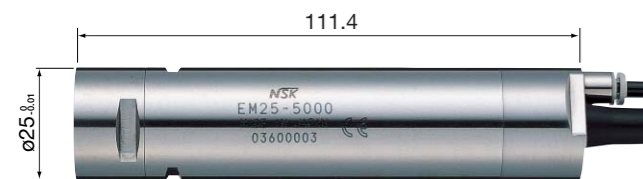
ASTRO-E 2550 can be used in conjunction with water or oil based coolants.

New Model Name for ASTRO-E 2550 Motor

EM	25	5000	J4
Product Symbol	Outside Diameter	Max. Motor Speed	Cord Variety

\*Do not exceed the allowable motor speed for the spindle.

## CAT. No. 8333 BRUSHLESS MOTOR EM25-5000-J4 (Cord with Quick Disconnect) 50,000 min<sup>-1</sup>



- Motor Speed ..... 5,000~50,000 min<sup>-1</sup>
- Max. Output Power ..... 125W
- Housing ..... Stainless steel (SUS416)
- Cord ..... Length 4 m
- Air Coolant Hose ..... Length 4 m
- Weight ..... 250 g (w/o Cord)

### Brushless Motor

CAT. No.	Model	Outside Diameter	Standard Equipment - Accessories
8333	EM25-5000-J4	25 mm	<ul style="list-style-type: none"> <li>• Cord with Quick Disconnect</li> <li>• Air Coolant Hose</li> <li>• Reducer</li> <li>• Spanner (22 x 27) : 1 pc.</li> </ul>

\*There is not an outside diameter 25.4 mm dimension.

## CAT. No. 1819 SPINDLE NR-2550 (Ceramic Bearing) 50,000 min<sup>-1</sup>



- Allowable Motor Speed ..... 50,000 min<sup>-1</sup>
- Spindle Accuracy ..... Within 1 μm
- Standard Size Collet Chuck (CHK-3.0) ..... 3.0 mm
- Weight ..... 253 g

< Optional >

- Collet Chuck (CHK-□□) ..... 0.5 mm~0.6 mm in 0.1 mm increments and 2.35, 3.175, 6.35 mm
- Chuck Nut (K-265) ..... For Collet Chuck (CHK)
- Metal Saw Axis (KCH-03) ..... For 6 (I.D.) x 30 mm (O.D.)
- Drill Chuck Axis (DCH-J0K) ..... For Jacob's Taper No. 0
- Grindstone Axis (AGM-03) ..... For grinding wheel with I.D. of 5 mm

### Spindle

CAT. No.	Model	Outside Diameter	Standard Equipment - Accessories
1819	NR-2550	25 mm	<ul style="list-style-type: none"> <li>• Collet Chuck 3.0 mm (CHK-3.0) : 1 pc.</li> <li>• Chuck Nut (K-265) : 1 pc.</li> <li>• Spanner (12 x 14) : 2 pcs., (22 x 27) : 1 pc.</li> </ul>

\*Outside diameter 25.4 mm type is also available.

## CAT. No. 1809 SPINDLE NR-2531 30,000 min<sup>-1</sup>

Production to be discontinued in 2006

\*The NR-2550 is the replacement product.



- Allowable Motor Speed ..... 30,000 min<sup>-1</sup>
- Spindle Accuracy ..... Within 1 μm
- Standard Size Collet Chuck (CHK-3.0) ..... 3.0 mm
- Weight ..... 258 g

< Optional >

- Collet Chuck (CHK-□□) ..... 0.5 mm~0.6 mm in 0.1 mm increments and 2.35, 3.175, 6.35 mm
- Chuck Nut (K-265) ..... For Collet Chuck (CHK)
- Metal Saw Axis (KCH-03) ..... For 6 (I.D.) x 30 mm (O.D.)
- Drill Chuck Axis (DCH-J0K) ..... For Jacob's Taper No. 0
- Grindstone Axis (AGM-03) ..... For grinding wheel with I.D. of 5 mm

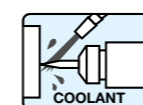
### Spindle

CAT. No.	Model	Outside Diameter	Standard Equipment - Accessories
1809	NR-2531	25 mm	<ul style="list-style-type: none"> <li>• Collet Chuck 3.0 mm (CHK-3.0) : 1 pc.</li> <li>• Chuck Nut (K-265) : 1 pc.</li> <li>• Spanner (12 x 14) : 2 pcs., (22 x 27) : 1 pc.</li> </ul>

\*Outside diameter 25.4 mm type is also available.

- Designed for obtaining strong rigidity in both radial and thrust directions by utilizing 2 restriction type angular bearings on the front side and 2 on the rear side. This spindle can be used for small-diameter milling, drilling, slitting, chamfering, grinding, etc.

# "ASTRO-E 2550" SPINDLE



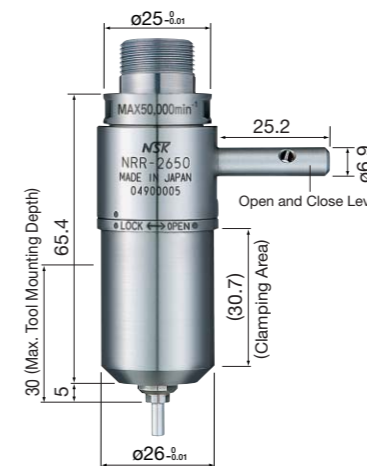
**Caution :** Use the motor at motor speed less than maximum allowable speed or use the speed reducer. DO NOT exceed the allowable motor speed for the spindle and the reducer.

## CAT. No. 1835 LEVER TYPE SPINDLE NRR-2650 50,000 min<sup>-1</sup>

**New**  
No wrenches are required for tool changing.



NRR-2650 Installed Example



- Allowable Motor Speed ..... 50,000 min<sup>-1</sup>
- Spindle Accuracy ..... Within 1 μm
- Standard Size Collet Chuck (CHP-3.175) ..... 3.175 mm
- Weight ..... 270 g

< Optional >

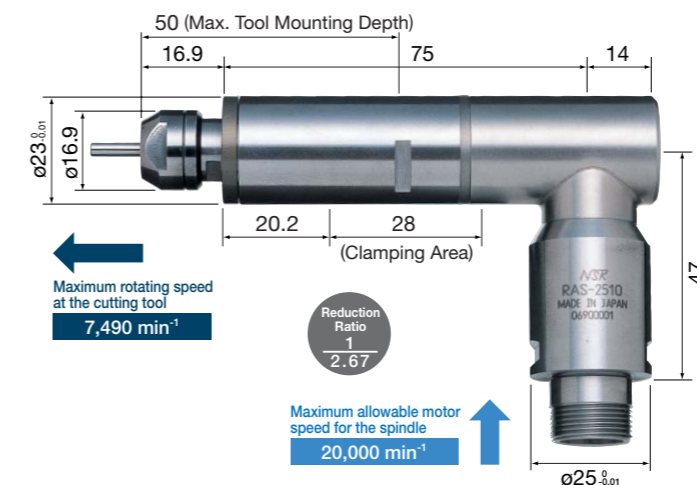
- Collet Chuck (CHP-□□) ..... 2.0, 3.0, 3.175 mm

### Lever Type Spindle

CAT. No.	Model	Outside Diameter	Standard Equipment - Accessories
1835	NRR-2650	25 mm	<ul style="list-style-type: none"> <li>• Collet Chuck 3.175 mm (CHP-3.175)</li> <li>• Spanner (7 x 5.1), (8 x 5), (22 x 27) : 1 pc. each</li> </ul>

\*There is not an outside diameter 25.4 mm dimension.

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



- 90° Angle Type Spindle can use up to a 6 mm collet chuck and is suitable for installation where space restrictions exist.

Maximum allowable motor speed for the spindle **20,000 min<sup>-1</sup>**

Maximum rotating speed at the cutting tool <Reduction Ratio : 1/2.67> **7,490 min<sup>-1</sup>**

- Spindle Accuracy ..... Within 2 μm
- Standard Size Collet Chuck (CHK-3.0) ..... 3.0 mm
- Weight ..... 340 g

< Optional >

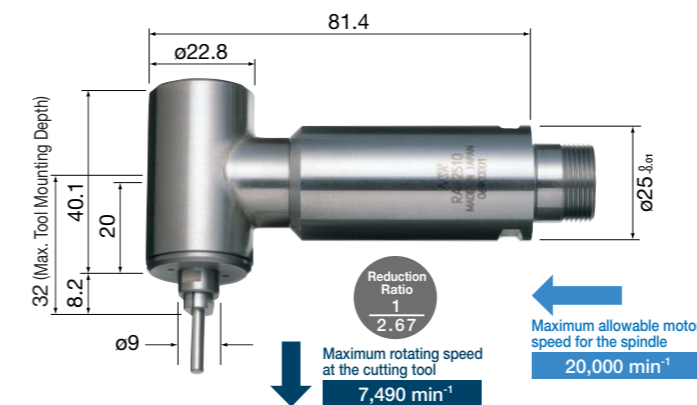
- Collet Chuck (CHK-□□) ..... 0.5 mm~0.6 mm in 0.1 mm increments and 2.35, 3.175, 6.35 mm
- Chuck Nut (K-265) ..... For Collet Chuck (CHK)
- Metal Saw Axis (KCH-03) ..... For 6 (I.D.) x 30 mm (O.D.)
- Drill Chuck Axis (DCH-J0K) ..... For Jacob's Taper No. 0
- Grindstone Axis (AGM-03) ..... For grinding wheel with I.D. of 5 mm

### 90° Angle Spindle

CAT. No.	Model	Outside Diameter	Standard Equipment - Accessories
1814	RAS-2510	25 mm	<ul style="list-style-type: none"> <li>• Collet Chuck 3.0 mm (CHK-3.0) : 1 pc.</li> <li>• Chuck Nut (K-265) : 1 pc.</li> <li>• Spanner (12 x 14) : 2 pcs., (22 x 27) : 1 pc.</li> </ul>

\*Outside diameter 25.4 mm type is also available.

## CAT. No. 1812 90° ANGLE SPINDLE RA-2510



- This spindle is capable of working on corners difficult to work or unfit for working with straight type, drilling on side face and, slitting of aluminum, brass, etc. with the use of 30 mm Metal Saw.

Maximum allowable motor speed for the spindle **20,000 min<sup>-1</sup>**

Maximum rotating speed at the cutting tool <Reduction Ratio : 1/2.67> **7,490 min<sup>-1</sup>**

- Standard Size Collet Chuck (CH8-3.0) ..... 3.0 mm
- Weight ..... 300 g

< Optional >

- Collet Chuck (CH8-□□) ..... 0.8 mm~3.0 mm in 0.1 mm increments and 2.35, 3.175 mm
- Metal Saw Axis (KCH-02) ..... For 6 (I.D.) x 30 mm (O.D.)

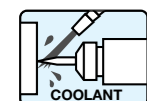
### 90° Angle Spindle

CAT. No.	Model	Outside Diameter	Standard Equipment - Accessories
1812	RA-2510	25 mm	<ul style="list-style-type: none"> <li>• Collet Chuck 3.0 mm (CH8-3.0) : 1 pc.</li> <li>• Spanner (7 x 5.5), (8 x 5), (22 x 27) : 1 pc. each</li> </ul>

\*Outside diameter 25.4 mm type is also available.

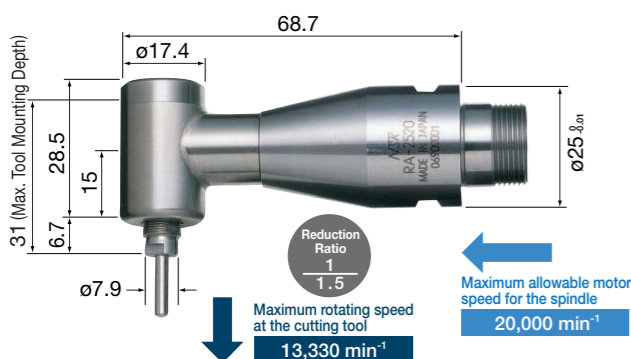
# “ASTRO-E 2550” SPINDLE & SPEED REDUCER

# “ASTRO-E 2550” 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. 1813 90° ANGLE SPINDLE RA-2520



Maximum allowable motor speed for the spindle **20,000 min<sup>-1</sup>**

Maximum rotating speed at the cutting tool <Reduction Ratio : 1/1.5> **13,330 min<sup>-1</sup>**

- Standard Size Collet Chuck (CHS-3.0) ..... ø3.0 mm
- Weight ..... 175 g

< Optional >

- Collet Chuck (CHS-□□) ..... ø0.8 mm~ø3.0 mm in 0.1 mm increments and ø2.35, ø3.175 mm

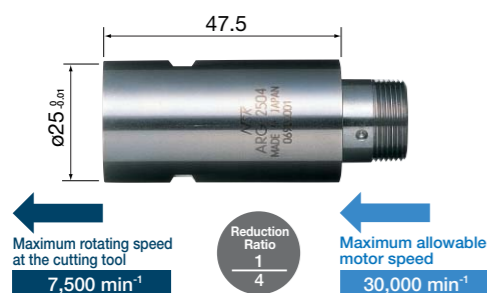
### 90° Angle Spindle

CAT. No.	Model	Outside Diameter	Standard Equipment - Accessories
1813	RA-2520	ø25 mm	<ul style="list-style-type: none"> <li>• Collet Chuck ø3.0 mm (CHS-3.0) : 1 pc.</li> <li>• Spanner (7 x 5.1), (8 x 5), (22 x 27) : 1 pc. each</li> </ul>

\*Outside diameter ø25.4 mm type is also available.

- This spindle can be used for working on corners difficult to work or unfit for working with straight type, drilling on side face, etc.

## CAT. No. 1822 SPEED REDUCER 1/4 ARG-2504



Maximum allowable motor speed **30,000 min<sup>-1</sup>**

Maximum rotating speed at the cutting tool <Reduction Ratio : 1/4> **7,500 min<sup>-1</sup>**

- Speed Reducing Mechanism ..... By planetary gear system
- Weight ..... 150 g

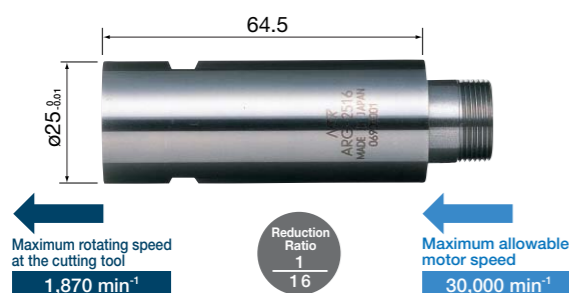
### Speed Reducer 1/4

CAT. No.	Model	Outside Diameter	Speed Reduction Ratio
1822	ARG-2504	ø25 mm	1/4

\*Outside diameter ø25.4 mm type is also available.

- 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.

## CAT. No. 1824 SPEED REDUCER 1/16 ARG-2516



Maximum allowable motor speed **30,000 min<sup>-1</sup>**

Maximum rotating speed at the cutting tool <Reduction Ratio : 1/16> **1,870 min<sup>-1</sup>**

- Speed Reducing Mechanism ..... By planetary gear system
- Weight ..... 205 g

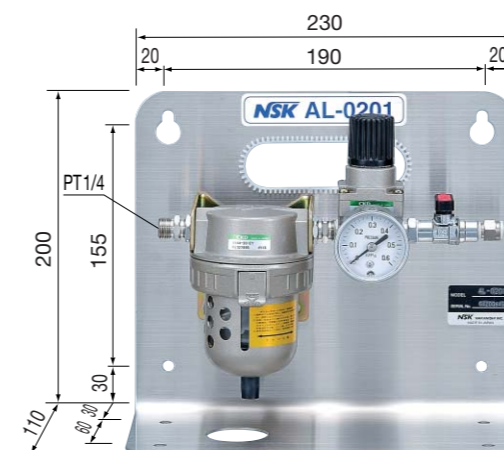
### Speed Reducer 1/16

CAT. No.	Model	Outside Diameter	Speed Reduction Ratio
1824	ARG-2516	ø25 mm	1/16

\*Outside diameter ø25.4 mm type is also available.

- 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.

## CAT. No. 1541 AIR LINE KIT AL-0201



- The AL-0201 is Clean air supply unit for the ASTRO-E 2550 control unit. The dust and moisture in the compressed air are eliminated by the filter in the first stage and regulator provides accurate and stable air to the control unit.

### Air Line Kit (For ø6 mm Hose · Filter Mesh 0.3 μm)

CAT. No.	Model	Standard Equipment - Accessories
1541	AL-0201	<ul style="list-style-type: none"> <li>• Air Filter</li> <li>• Air Regulator</li> <li>• Air Pressure Gauge</li> <li>• Air ON-OFF Valve</li> <li>• Hose for Piping (K-260) : 2 m</li> </ul>