

# "E3000 SERIES" COMBINATION EXAMPLE & AIR LINE KIT & PARTS

## E3000 SERIES Combination Example

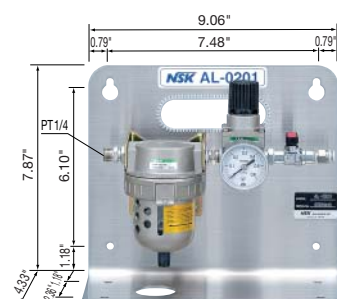
60,000 min<sup>-1</sup> (rpm)



NE211, EM30-S6000, EMCD-3000, CHK-3.175 Combination Example

CAT. No.	Model	Product
9775	NE211	CONTROL UNIT
1747	EM30-S6000	BRUSHLESS MOTOR SPINDLE
1748	EMCD-3000	MOTOR CORD 13 ft
PL42685	CHK-3.175	COLLET CHUCK

## CAT. No. AL0201 AIR LINE KIT AL-0201

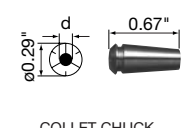
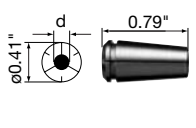
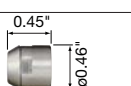


● The AL-0201 is **Clean air** supply unit for the E3000 Series control unit. The dust and moisture in the compressed air are eliminated by the filter in the first stage and regulator provides accurate and stable air to the control unit.

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

CAT. No.	Model	Standard Equipment · Accessories
AL0201	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) : 6 ft</li> </ul>

## Parts

Product	CAT. No.	Model	Inside Diameter : ød	Fit to
 COLLET CHUCK	RA11812	CHA-2.35	ø2.35	EM20-S6000 · EM25-S6000
	RA11813	CHA-3.0	ø3.0	
	RA11818	CHA-3.175	ø1/8"	
	RA11819	CHA-4.0	ø4.0	
	—	CHA-□□	ø0.5, ø0.6, ø0.7 (★) ø0.8-ø3.9 every 0.1 mm (Except ø3.0)	
 COLLET CHUCK	PL42690	CHK-2.35	ø2.35	EM30-S6000 *High precision type is also available for CHK-3.0, 3.175, 4.0, 6.0, 6.35 (The value of run-out is within 3 µm)
	PL42669	CHK-3.0	ø3.0	
	PL42685	CHK-3.175	ø1/8"	
	PL42678	CHK-4.0	ø4.0	
	PL42686	CHK-6.0	ø6.0	
	PL42675	CHK-6.35	ø1/4"	
	—	CHK-□□	ø0.5, ø0.6, ø0.7 (★) ø0.8-ø5.9 every 0.1 mm (Except ø3.0, ø4.0)	
 COLLET NUT	2102	CHN-A	Collet Nut for Collet Chuck (CHA)	EM20-S6000 · EM25-S6000
	RA11900	K-265	Collet Nut for Collet Chuck (CHK)	EM30-S6000

★ : Please call us regarding delivery, small size collets are made to order.

\*Order by catalog number.

● Specifications may be changed without notice.

**NSK AMERICA**

NSK AMERICA CORPORATION:  
700B Cooper Court, Schaumburg, Illinois 60173, USA  
TEL : (800)-585-4675 FAX : (800)-838-9328

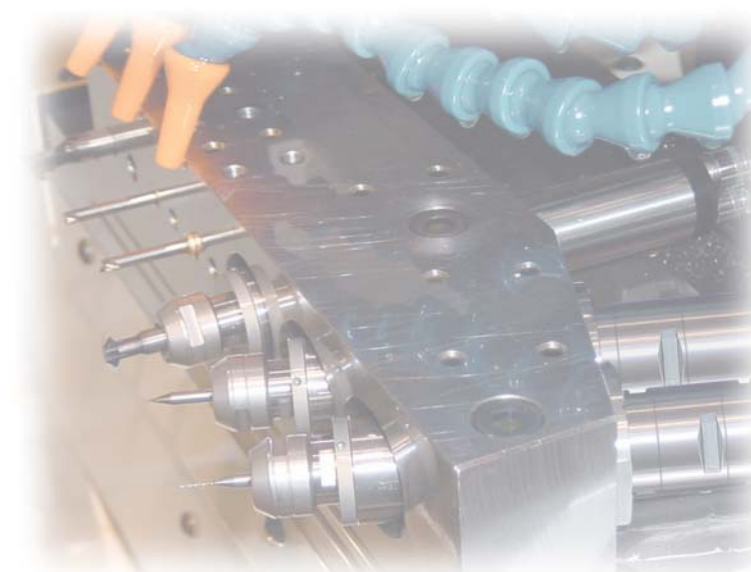
<http://www.nskamericacorp.com> e-mail: [info@nskamericacorp.com](mailto:info@nskamericacorp.com)



PR-K224U Ver.1 '06.08.05.A

BRUSHLESS MOTOR SPINDLE

**NEW**  
**E3000**

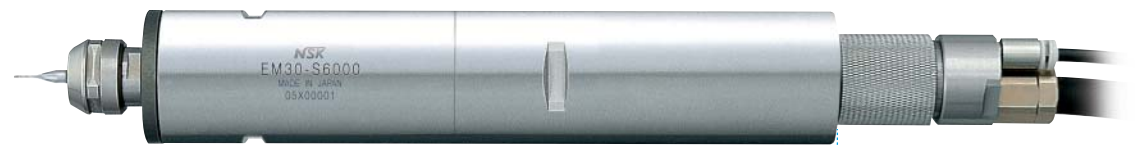


**NSK AMERICA**

# BRUSHLESS MOTOR SPINDLE "E3000 SERIES"

- 5,000~60,000 min<sup>-1</sup>(rpm)
- Max. Output 350W {For ø1.18" (ø30 mm)} brushless DC Motor Spindle with an outside diameter of ø0.79", ø0.98", ø1.18" (ø20, ø25, ø30 mm).
- Designed for high speed milling and drilling, etc on CNC lathes and special purpose machines. Compact size makes it very easy to incorporate into machine design.

## Features of E3000 Series



EM30-S6000

Motor Cord Sold Separately

### ● Maximum Motor Speed 60,000 min<sup>-1</sup>(rpm)

The maximum motor speed 60,000 min<sup>-1</sup>(rpm) is realized by using high performance brushless motor and ceramic bearings.

### ● Maximum Motor Output with 480W Power Supply

350W for ø1.18" (ø30mm) spindle.  
250W for ø0.98" (ø25mm) and ø0.79" (ø20mm) spindle.

### ● Motor Spindle Diameter

A ø0.79" (ø20mm), ø0.98" (ø25mm), ø1.18" (ø30mm) motor spindle diameter are available.

### ● Air-Cooling System

Air-cooled motor uses a small volume of air (1.0CFM) to minimize heat buildup and allow continuous operation. Cooling air pressure required is 36-44PSI. In case of an air supply failure, the protective circuit limits the motor spindle to 30,000 min<sup>-1</sup>(rpm).

### ● Spindle Accuracy

Spindle Accuracy is within 1µm (TIR).

### ● High Rigidity, Short Body

E3000 series uses a short body that is hardened and precision ground for excellent durability.

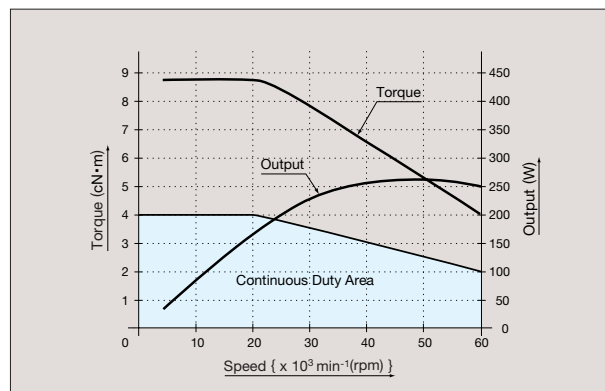
### ● Motor Connector Attaches Directly to the Back of the Motor / Spindle.

Simple screw-lock connector makes changing motors extremely easy. Electric and Air feed incorporated into a single connector.

### ● Power Source Auto Detection

Power Source is 100-240V for international operation. Eliminate the need of setting the voltage or changing fuses.

### ● Torque Characteristics of ø0.79", ø0.98" (ø20, ø25 mm)



### ● Protection System, External Input / Output Control Signal

Error function : Motor/Spindle is stopped safety, Error LED is lit. ex.) Overload operation, Air shortage, Motor Spindle can be controlled and monitored by external input-output connector. ex.) Control ; Start/Stop, FWD./REV., Motor Speed Control Monitor ; While rotating, Torque Load.

### ● Use E2550 Motor & Spindle with E3000 Control Unit

E2550 motor & spindle can be used with E3000 control unit. {Less than 50,000 min<sup>-1</sup>(rpm)}

### ● ø0.897" (ø22.8mm) Spindle Usage

Use ø0.897" (ø22.8mm) spindles from our general catalog and an EM25-5000-J4 motor {ø0.98" (ø25mm) 125W} with NE211.

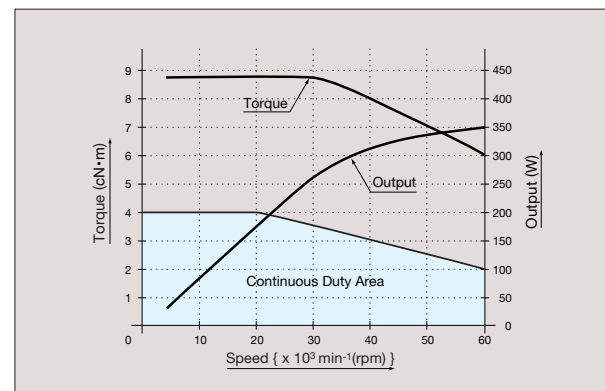
### ● Special Safety Version Available

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 E3000 Series control unit and the machining center's controller will cause the relay contacts to open and the E3000 Series motor or stop.

### ● Centering Mode Switch

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

### ● Torque Characteristics of ø1.18" (ø30 mm)



## E3000 Series Milling and Drilling Capacity Reference

- The following table expresses the E3000 milling & drilling capacity with the max usable cutting tool diameter under our conditions.
- Cutting tool capabilities vary depending on the tools being used or cutting conditions.

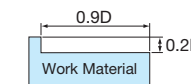
ø : Tool Size (mm) S : Spindle Motor Speed { min<sup>-1</sup>(rpm) } F : Feed Rate (mm/min) f : Drilling Step (mm/rev)

	Milling			Drilling		
	S50C (Iron)	SUS304 (Stainless Steel)	A2017 (Aluminum)	S50C (Iron)	SUS304 (Stainless Steel)	A2017 (Aluminum)
EM30-S6000	ø2.0 S16,000 / F480	ø2.0 S12,000 / F250	ø2.0 S57,000 / F2,400	ø2.5 S18,000 / f 0.06	ø1.5 S10,000 / f 0.01	ø3.0 S23,000 / f 0.08
EM25-S6000	ø1.5 S20,000 / F1,000	ø1.5 S16,000 / F700	ø1.5 S60,000 / F5,000	ø2.0 S20,000 / f 0.05	ø1.0 S12,000 / f 0.01	ø2.5 S23,000 / f 0.07
EM20-S6000	ø1.5 S20,000 / F100	ø1.5 S16,000 / F100	ø1.5 S60,000 / F1,000	ø2.0 S20,000 / f 0.05	ø1.0 S12,000 / f 0.01	ø2.5 S23,000 / f 0.07

#### \*End Mill Cutting Condition

- Use End Mill 2 flutes with ultra hard coating.
- Used in conjunction with water or oil based coolants.

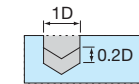
\*Milling Depth/per 1D : End Mill Size



#### \*Drilling Conditions

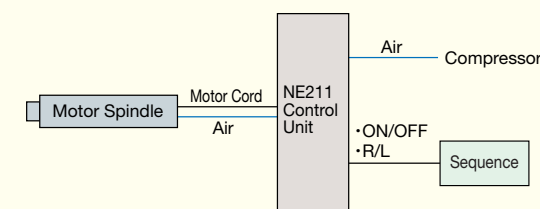
- Use Micro Drill with ultra hard coating
- Used in conjunction with water or oil based coolants.

\*Drilling/Step D : Drilling Size

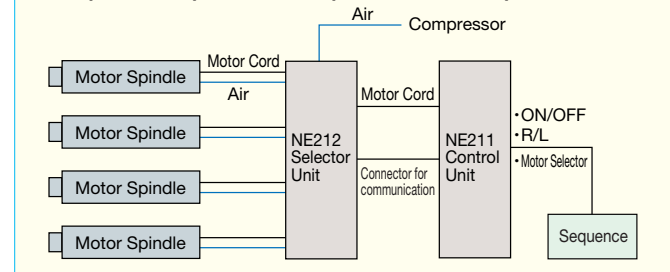


## Automatic Control System Chart

### ● Single Motor Spindle Operation

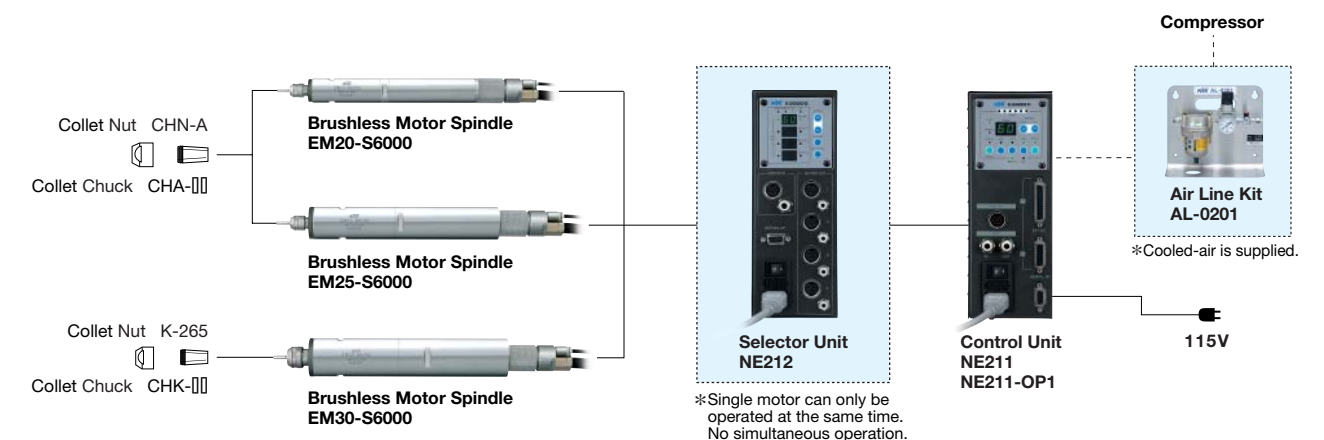


### ● Sequential Operation of up to 4 Motor / Spindles



\*When connecting NE211 to NE212, up to 4 motors can be connected to NE212 providing individual control of each motor. (4 motors can not be run simultaneously.)

## E3000 Series Connection Drawing



\*Single motor can only be operated at the same time. No simultaneous operation.

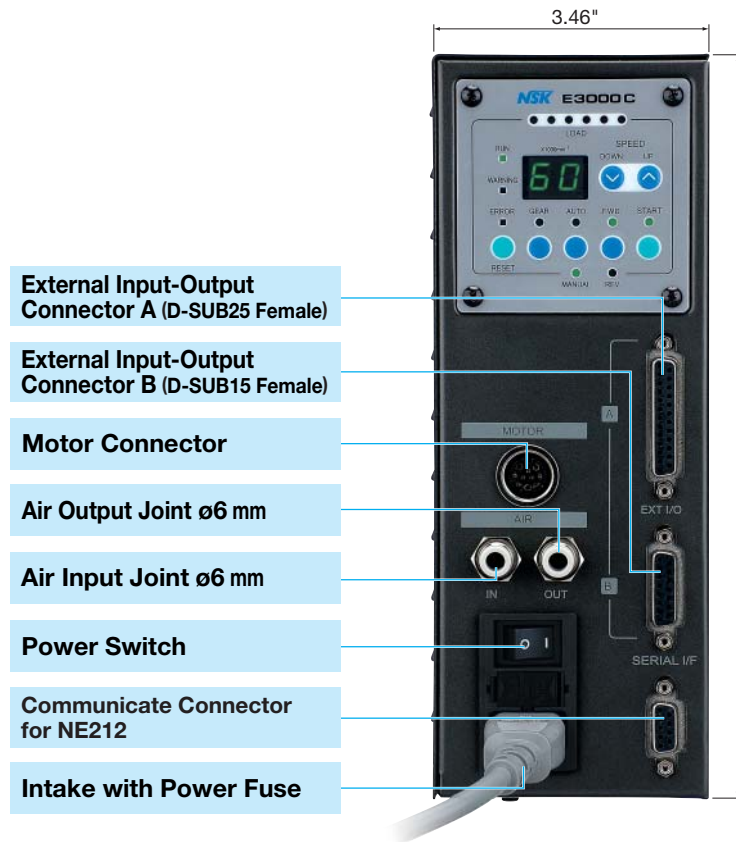
\*Cooled-air is supplied.



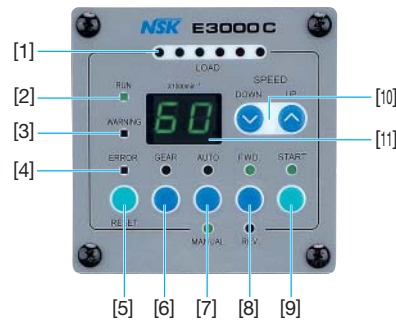
# "E3000 SERIES" CONTROL UNIT

- AC100-240V for international operation
- 5,000~60,000 min<sup>-1</sup> (rpm) {variable in 1,000 min<sup>-1</sup> (rpm) increments}
- Maximum Output 350W for ø1.18" (ø30 mm), 250W for ø0.79" (ø20 mm), ø0.98" (ø25 mm)
- ø0.79" (ø20 mm), ø0.897" (ø22.8 mm), ø0.98" (ø25 mm), ø1" (ø25.4 mm), ø1.18" (ø30 mm) spindles are available.

CAT. No. **9775** CONTROL UNIT NE211 60,000 min<sup>-1</sup> (rpm)



- [1] Load Meter
- [2] Running LED (RUN)
- [3] Warning LED (WARNING)
- [4] Error LED (ERROR)
- [5] Error Reset Switch (RESET)
- [6] Gear Setting Switch (GEAR)
- [7] Control Switch (AUTO/MANUAL)
- [8] Rotating Direction Selector Switch (FWD./REV.)
- [9] Start Switch (START)
- [10] Motor Speed Adjustment Switch (SPEED)
- [11] Display



**Specifications**  
 Model : NE211  
 Power Source : AC115V  
 Motor Speed : 5,000-60,000 min<sup>-1</sup> (rpm)  
 Max. Output Power : 350W (For ø1.18")  
 Power Consumption : 1.8A  
 Air Flow Volume : 1.0CFM (36-44PSI)  
 Weight : 6 lb. 2.77 oz.  
 Dimensions : W3.46" x D5.43" x H9.37"

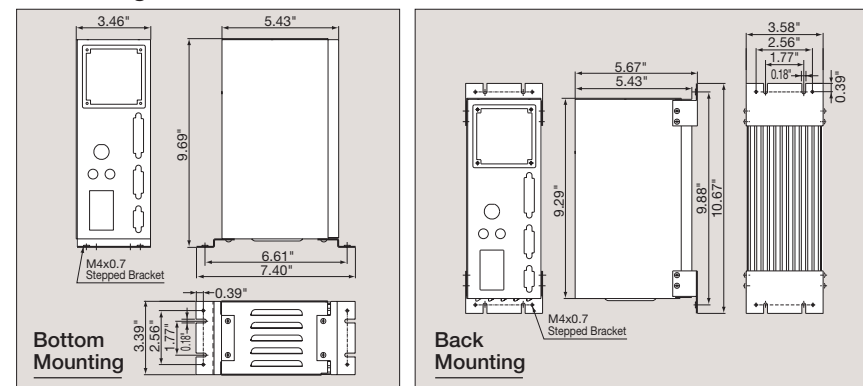
## E3000 Control Unit

CAT. No.	Plug Type	Model	Standard Equipment · Accessories
9775	115V	NE211	<ul style="list-style-type: none"> <li>• Power Cord : 6 ft</li> <li>• Air Hose with filter</li> <li>• Reducer</li> <li>• Air Plug (Provided)</li> <li>• Connector Cap (Provided)</li> <li>• Bracket</li> <li>• Grip</li> <li>• Screw</li> <li>• Rubber Pad</li> <li>• Fuse (T6.3AL) 250V : 2 pcs.</li> </ul>

\*The NE211-OP1 {CAT.No. : 9778 (115V)} is an Optional Safety Version with an "Emergency Stop Input" and "Safety Relay".

\*AC100-240V for international operation. Please check the power source plug type (P.4) and order accordingly.

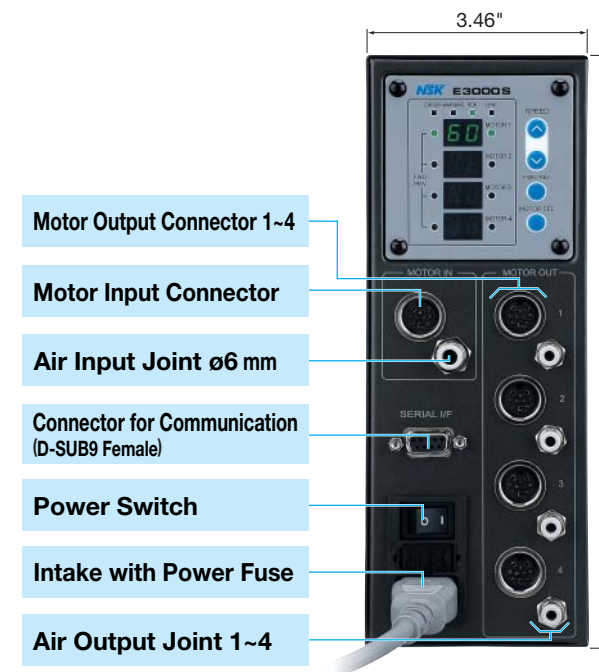
## ● Mounting Bracket



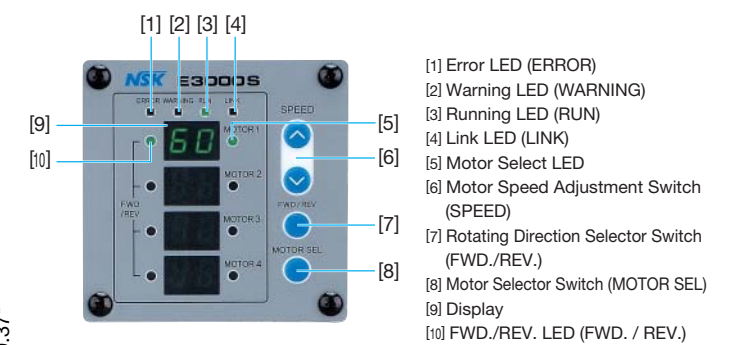
# "E3000 SERIES" SELECTOR UNIT

- AC100-240V for international operation
- Up to 4 motors can be connected to NE212 providing individual control of each motor. (Simultaneous motor operation is not permitted)

CAT. No. **9781** SELECTOR UNIT NE212 60,000 min<sup>-1</sup> (rpm)



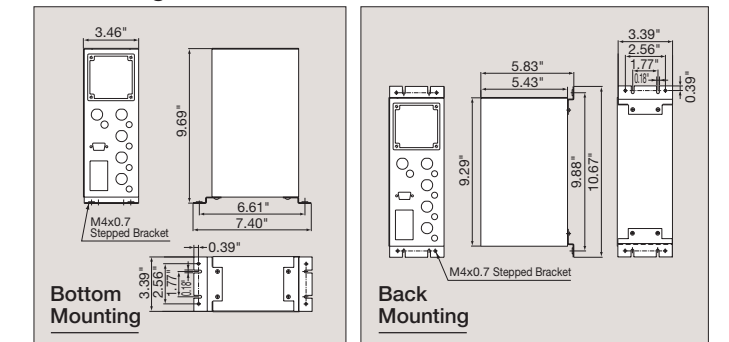
- Motor Output Connector 1~4
- Motor Input Connector
- Air Input Joint ø6 mm
- Connector for Communication (D-SUB9 Female)
- Power Switch
- Intake with Power Fuse
- Air Output Joint 1~4



- [1] Error LED (ERROR)
- [2] Warning LED (WARNING)
- [3] Running LED (RUN)
- [4] Link LED (LINK)
- [5] Motor Select LED
- [6] Motor Speed Adjustment Switch (SPEED)
- [7] Rotating Direction Selector Switch (FWD./REV.)
- [8] Motor Selector Switch (MOTOR SEL)
- [9] Display
- [10] FWD./REV. LED (FWD. / REV.)

**Specifications**  
 Model : NE212  
 Power Source : AC115V  
 Power Consumption : 0.15A  
 Air Flow Volume : Max. 4.0CFM (51PSI / Using max. 4 motor/spindles)  
 Weight : 4 lb. 3.02 oz.  
 Dimensions : W3.46" x D5.43" x H9.37"

## ● Mounting Bracket



## E3000 Selector Unit

CAT. No.	Plug Type	Model	Standard Equipment · Accessories
9781	115V	NE212	<ul style="list-style-type: none"> <li>• Power Cord : 6 ft</li> <li>• Connect NE211 to NE212 Cable : 23.62"</li> <li>• Communication Cable : 23.62"</li> <li>• Connector Cap (Provided)</li> <li>• Plug to avoid Air Flow</li> <li>• Bracket</li> <li>• Grip</li> <li>• Screw</li> <li>• Rubber Pad</li> <li>• Fuse (T1.6AL) 250V : 2 pcs.</li> </ul>

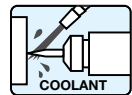
\*Power Source for Global Operation (AC100~240V). Please check the power source plug type and order accordingly.

## ● Power Source Plug

Plug Type	Main Usable Area	Product
For 100V	Japan	
For 115V	America	
For 200V	Without Plug	

Plug Type	Main Usable Area	Product
For 240V	Europe	
For 230V	Australia	

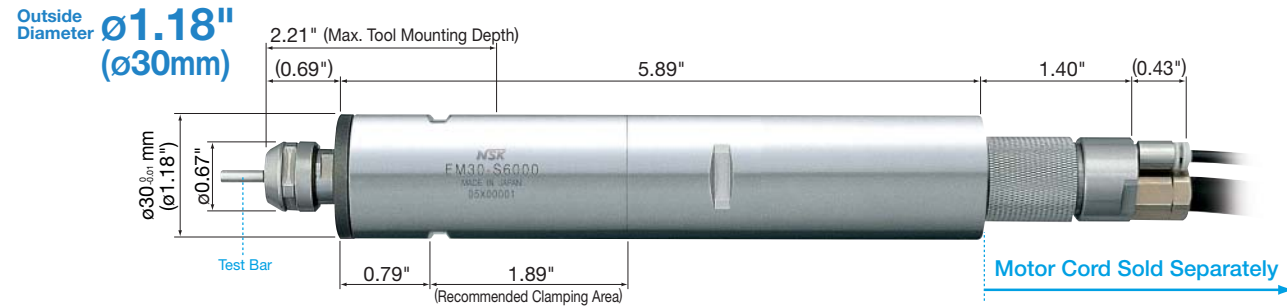
# "E3000 SERIES" BRUSHLESS MOTOR SPINDLE



E3000 Series can be used in conjunction with water or oil based coolants.

**Note :** Collet Chuck and Motor Cord are sold separately. Please specify the desired Collet Chuck size when ordering.

## CAT. No. 1747 BRUSHLESS MOTOR SPINDLE EM30-S6000 60,000 min<sup>-1</sup> (rpm)

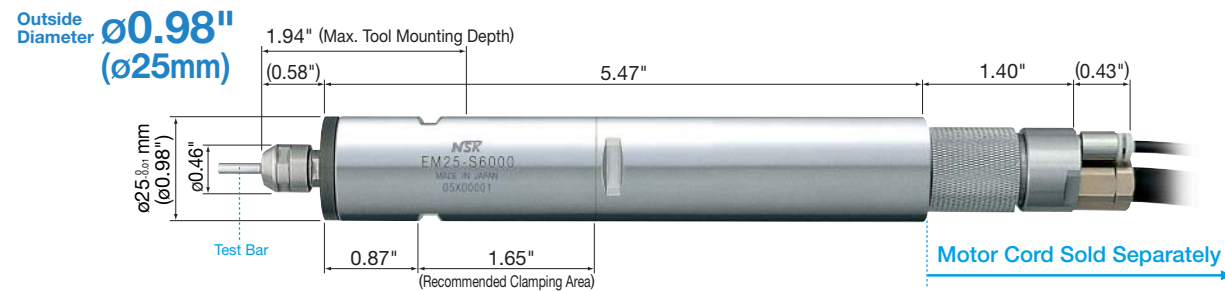


- Motor Speed ..... 60,000 min<sup>-1</sup>(rpm)
  - Spindle Accuracy ..... Within 1 µm
  - Max. Output Power ..... 350 W
  - Weight ..... 1 lb. 4.28 oz. (w/o cord)
- < Optional > Collet Chuck & Motor Cord Sold Separately.
- Collet Chuck (CHK-□□) ..... ø0.5 mm~ø6.0 mm in 0.1 mm increments and ø2.35 mm, ø1/8", ø1/4"
  - \*High precision type is also available for CHK-3.0, 3.175, 4.0, 6.0, 6.35 (The value of run-out is within 3 µm).
  - Motor Cord ..... Length 13 ft

**Brushless Motor Spindle ø1.18"(ø30 mm)**

CAT. No.	Model	Standard Equipment · Accessories
1747	EM30-S6000	<ul style="list-style-type: none"> <li>• Collet Nut (K-265) : Provided</li> <li>• Wrench (12 x 14) : 2 pcs.</li> </ul>

## CAT. No. 1746 BRUSHLESS MOTOR SPINDLE EM25-S6000 60,000 min<sup>-1</sup> (rpm)



- Motor Speed ..... 60,000 min<sup>-1</sup>(rpm)
  - Spindle Accuracy ..... Within 1 µm
  - Max. Output Power ..... 250 W
  - Weight ..... 13.23 oz. (w/o cord)
- < Optional > Collet Chuck & Motor Cord Sold Separately.
- Collet Chuck (CHA-□□) ..... ø0.5 mm~ø4.0 mm in 0.1 mm increments and ø2.35 mm, ø1/8"
  - Motor Cord ..... Length 13 ft

**Brushless Motor Spindle ø0.98"(ø25 mm)**

CAT. No.	Model	Standard Equipment · Accessories
1746	EM25-S6000	<ul style="list-style-type: none"> <li>• Collet Nut (CHN-A) : Provided</li> <li>• Wrench (8 x 5) , (9 x 11) : 1 pc. each</li> </ul>

# "E3000 SERIES" MOTOR CORD



**Note :** Collet Chuck and Motor Cord are sold separately. Please specify the desired Collet Chuck size when ordering.

## CAT. No. 1745 BRUSHLESS MOTOR SPINDLE EM20-S6000 60,000 min<sup>-1</sup> (rpm)



- Motor Speed ..... 60,000 min<sup>-1</sup>(rpm)
  - Spindle Accuracy ..... Within 1 µm
  - Max. Output Power ..... 250 W
  - Weight ..... 8.11 oz. (w/o cord)
- < Optional > Collet Chuck & Motor Cord Sold Separately.
- Collet Chuck (CHA-□□) ..... ø0.5 mm~ø4.0 mm in 0.1 mm increments and ø2.35 mm, ø1/8"
  - Motor Cord ..... Length 13 ft

**Brushless Motor Spindle ø0.79"(ø20 mm)**

CAT. No.	Model	Standard Equipment · Accessories
1745	EM20-S6000	<ul style="list-style-type: none"> <li>• Collet Nut (CHN-A) : Provided</li> <li>• Wrench (8 x 5) , (9 x 11) : 1 pc. each</li> </ul>

## CAT. No. 1748 MOTOR CORD 13 ft EMCD-3000

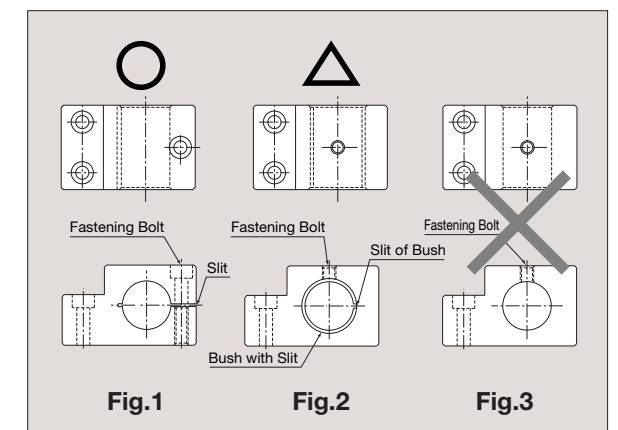


**Motor Cord 13 ft**

CAT. No.	Model	Standard Equipment · Accessories
1748	EMCD-3000	<ul style="list-style-type: none"> <li>• Air Hose</li> <li>• Connector Cap (Provided)</li> </ul>

### Installation of Motor and Spindle

- When installing a motor and spindle, it is not recommended to fix the motor or spindle with a fastening bolt in direct contact with the spindle body as shown in Fig.3. This can cause deformation of the spindle body and damage internal components. The installation shown in Fig.1 is the recommended installation method. Therefore, the installation as shown in Fig.1 is the most recommendable. (In case it is impossible, install as shown in Fig.2.)
- When mounting the spindle avoid the area where ball bearings are located. If the spindle is mounted inappropriately, this will cause and damage to the spindle. (Refer to the clamping area drawing in this catalog.)



### Caution

- Even when using the recommended installation method it is possible to deform the spindle housing from excessive clamping force. Use only the clamping force needed to secure the spindle do not over tighten.