



# Motors & Spindles, Micro-grinders

Ultra-Precision Electrically / Pneumatically Driven

# Precision & Reliability

# NSK America

NAKANISHI  
E4000 CONTROL UNIT

AMERICAN ROTARY TOOLS CO. (ARTCO TOOLS)  
250 WEST DUARTE ROAD, #E  
MONROVIA, CA USA 91016-7464

Tel: (626) 358-8466 Fax: (626) 358-0076  
Toll Free USA Tel: (800) 624-2212 Fax: (800) 624-2210  
Email: [info@artcotools.com](mailto:info@artcotools.com)

2010/11  
Edition

HIGH POWER SOLUTIONS

# E4000 Series

## Electric System



Outside Diameter **Ø1.57" (Ø40 mm)**

2,000~40,000 min<sup>-1</sup>(rpm)  
Max. Output 1,200W

- Up to Ø0.31" shank of tool can be used.
- By attaching on a special purpose machine, NC lathe, robot etc., high precision milling, drilling, slitting, chamfering, grinding, etc. is possible.

● One Piece Type



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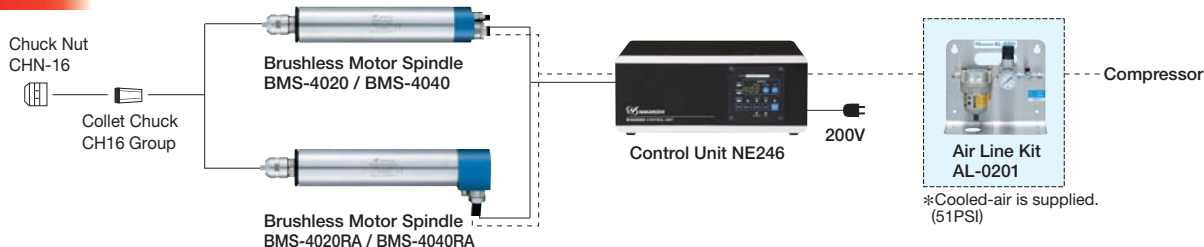
1
EmaxEVO
ESPERT
ROTUS
ECOMO
IMPULSE
PRESTO II
SHEENUS neo
SONIC CUTTER
2
iSpeed
E2530
E2550
E3000
E3200
E4000
3
MA SERIES
Ø0.897"
Ø1.0"
Ø0.98"
Ø1.18"
MS SERIES
Ø0.75"
Ø0.79"
Ø0.87"
Ø0.91"
Ø1.0"
Ø0.98"
Ø1.18"
HIGH SPEED
AMX
4
HES
HTS
HPS
SMS
PL
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# BRUSHLESS MOTOR SPINDLE "E4000 SERIES"

- High-speed rotation, high-precision and high-power brushless DC motor/spindle of 2,000~40,000 min<sup>-1</sup>(rpm).
- High-power 1,200W brushless DC motor spindle with an external diameter of ø1.57" (ø40 mm).
- Maximum cutting tool shank diameter of ø0.31" (ø8.0 mm) can be used.
- Ideal for use on special purpose machines, NC lathes, robots, etc. for small diameter end milling, drilling, slitting, chamfering, grinding, etc.

## E4000 Series System Chart

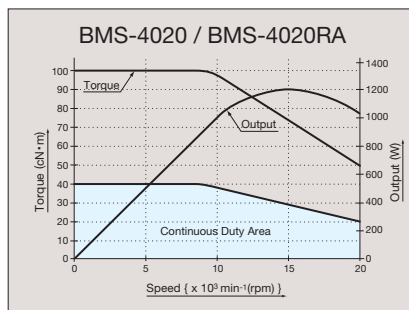
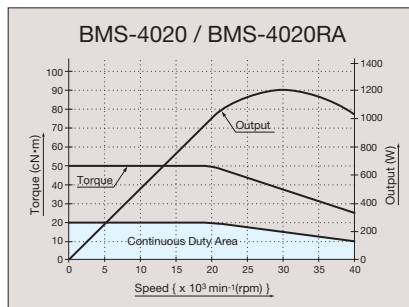
**NEW**



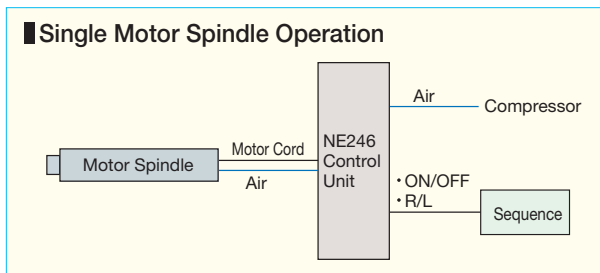
## Features of E4000 Series

- 2,000~40,000 min<sup>-1</sup>(rpm), 500 min<sup>-1</sup>(rpm) (for centering rotation)
- Rated output 400W (Max. output 1,200W) ● Spindle accuracy 1 μm or less.
- Achieved continuous run of over 5,000 hours.  
{NAKANISHI's factory test without load at 40,000 min<sup>-1</sup>(rpm)}
- Motor weight 3 lb. 4.91 oz. (BMS-4020, BMS-4040)  
4 lb. 6.55 oz. (BMS-4020RA, BMS-4040RA)
- Proper coolant air pressure 51PSI ● Coolant air consumption 3.53CFM
- Extremely low vibration brushless DC motor.
- Utilizes a double pair of ultra-precision ceramic bearings to obtain high rigidity in both radial and thrust directions. Incorporates 2 ceramic bearings on the front side and 2 on the rear side.
- External housing made of precision ground stainless steel SUS-416.

### ● Torque Characteristics



### ■ Automatic Control System Chart



## E4000 Series Combination Example

40,000 min<sup>-1</sup>(rpm)



### E4000, BMS-4040 Combination Example

CAT. No.	Model	Product	Price
8472	NE246	Control Unit	4,500.00
1786	BMS-4040	Motor Spindle	5,800.00
9253	EMCD-4000-2M	Motor Cord	150.00
9257	EMCD-4000S-2M	Motor Cord	250.00
AL0201	AL-0201	Air Line Kit	291.00

Total 10,991.00

# "E4000 SERIES" CONTROL UNIT

AMERICAN ROTARY TOOLS CO.

Toll Free USA Tel: (800) 624-2212

CAT. No.

**8472 CONTROL UNIT NE246**

**40,000 min<sup>-1</sup>(rpm)**

## ● 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 safely and quickly, Warning/Error LED is lit, Warning/Error Signal is output to external device when a problem or tool breakage is detected.

Warning : • Air shortage • Overload operation

• Motor Sensor Error • Control Unit Overheat

Error : • Internal Circuit Error • Voltage/Currency Error

• Overheat/Overload operation • Operation Error

• Air shortage

## ● Maximum RPM Setting by Parameter

Capable of setting the maximum motor speed for the allowable motor speed by the Parameter Setting

## ● External Input-Output Connector

(Refer to Technical Data 7-p22~p27 in detail)

### • Input Signal Examples :

Start / Stop, Forward / Reverse, Pulse Speed Increase / Decrease, Speed Control, Error Code Release.

### • Output Signal Examples :

Error / Warning, At-Speed, RPM Monitoring, Torque Monitoring, Rotating Signal.

## ● Motor Speed Display

Motor speed is displayed precisely and digitally.

## ● Operation Panel Extension Cord 4m is available

NEW



\*: Load Meter



[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

LOAD 

- : Continuous load area
- : Intermittent load area
- : Overload

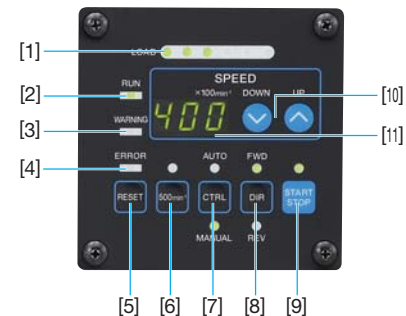
## ● E4000 Optional Safety Relay Box

The Safety Relay Box is for use with the E4000 Control Unit. The Safety Relay "A" contacts switch the Motor Power Line and "B" contacts switch the external outputs to the machining center's CNC controller.

• 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 E4000 Control Unit to supply power to the motor. Any system errors, trouble with the machining center or the connections between the E4000 Control Unit and the machining center's controller will cause the relay contacts to open and the E4000 motor to stop.

• The Emergency Stop Signal Input can be connected to any and all portions of the machine's safety systems (E-Stop String) to stop the E4000 motor any time that stoppage of the spindle and motor is required.

• The "B" contact outputs can be used to detect an open circuit on the motor line and integrated with the machines safety systems to stop the machine in case a problem occurs.



### Specifications

Model : NE246  
 Power Source : AC200V  
 Motor Speed : 2,000-40,000 min<sup>-1</sup>(rpm)  
 Max. Output Power : 1,200W  
 Power Consumption : 3.2A  
 Air Flow Volume : 3.53FM (51PSI)  
 Weight : 14 lb. 12.34 oz.  
 Dimensions : W9.84" x D11.42" x H3.94"

## E4000 Control Unit

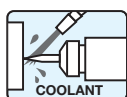
CAT. No.	Plug Type	Model	Standard Equipment · Accessories	Price
8472	200V	NE246	<ul style="list-style-type: none"> <li>• Power Cord : 13 ft</li> <li>• Air Hose with filter : 6 ft</li> <li>• Connector Cap (Provided)</li> <li>• Connector Cover (Provided)</li> <li>• Bracket : 4 pcs.</li> <li>• Rubber Pad</li> </ul>	4,500.00

\*Please refer to Technical Data 7-p22~p27 in detail about External Input-Output Connector.

\* Order by catalog number. 2-p85

1
EmaxEVO
ESPERT
ROTUS
ECOMO
IMPULSE
PRESTO II
SHEENUS 1100
SONIC CUTTER
2
iSpeed
E2530
E2550
E3000
E3200
E4000
3
MA SERIES
ø0.897"
ø1.0"
ø0.98"
ø1.18"
MS SERIES
ø0.75"
ø0.79"
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# "E4000 SERIES" BRUSHLESS MOTOR SPINDLE



E4000 Series can be used in conjunction with water or oil based coolants.

- 1 EmaxEVO
- ESPERT
- ROTUS
- ECOMO
- IMPULSE
- PRESTO II
- SHEENUS neo
- SONIC CUTTER
- 2 iSpeed
- E2530
- E2550
- E3000
- E3200
- E4000
- 3 MA SERIES
- MA SERIES
- MS SERIES
- MS SERIES
- HIGH SPEED
- AMX
- 4 HES
- HTS
- HPS
- SMS
- PL
- 5 AIR LINE KIT
- 6 PARTS
- 7 TECHNICAL DATA
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- INDEX

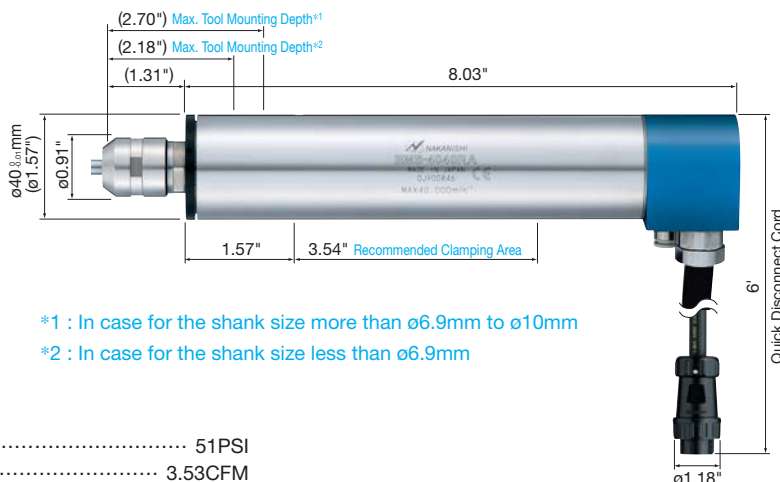
## BRUSHLESS MOTOR SPINDLE BMS SERIES 40,000 · 20,000 min<sup>-1</sup>(rpm)

**NEW**

● **STRAIGHT TYPE**  
BMS-4020  
BMS-4040



● **90° ANGLE TYPE (RA)**  
BMS-4020RA  
BMS-4040RA



\*1 : In case for the shank size more than ø6.9mm to ø10mm  
\*2 : In case for the shank size less than ø6.9mm

- Proper Air Pressure ..... 51PSI
- Air Consumption ..... 3.53CFM
- Min. Bending Cord Radius ..... R70 mm
- < Optional >
- Collet (CH16-□□) ..... ø3.0 mm~ø8.0 mm  
(See Page 6-p5 for details)
- Motor Cord to drive the motor ..... ø1.18"
- Motor Cord to signal the motor ..... ø0.39"
- Air Hose ..... ø6mm

**Note : Motor Cord is sold separately.**

### 40,000 min<sup>-1</sup>(rpm)

CAT. No.	Model	Shape	Max. Torque	Spindle Accuracy	Max. Output	Rated Output	Weight *	Cord Length	Price
1786	BMS-4040	Straight	0.5 N · m	Within 1 µm	1,200W	400W	3 lb 4.91 oz.	1 ft	5,800.00
1787	BMS-4040RA	90° Angle					4 lb 6.55 oz.	6 ft	6,000.00

\* w/o Motor Cord

### 20,000 min<sup>-1</sup>(rpm)

CAT. No.	Model	Shape	Max. Torque	Spindle Accuracy	Max. Output	Rated Output	Weight *	Cord Length	Price
1784	BMS-4020	Straight	1.0 N · m	Within 1 µm	1,200W	400W	3 lb 4.91 oz.	1 ft	5,300.00
1785	BMS-4020RA	90° Angle					4 lb 6.55 oz.	6 ft	5,500.00

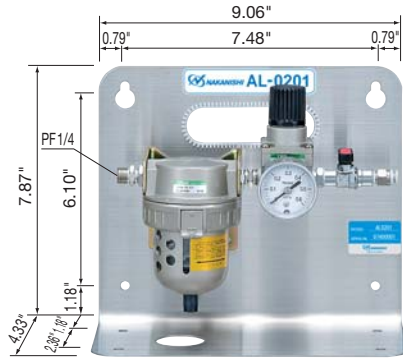
\* w/o Motor Cord

Standard Equipment · Accessories									
• Collet ø1/4" (CH16-6.35) : 1 pc. • Collet Nut (CHN-16) • Wrench (15 x 17), (22 x 27) : 1 pc. each									

# "E4000 SERIES" AIR LINE KIT & MOTOR CORD

**AMERICAN ROTARY TOOLS CO. Toll Free USA Tel: (800) 624-2212**

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



● The AL-0201 is a **Clean air** supply unit for E4000 Series control unit. Dust and moisture in the compressed air are eliminated by the filter in the first stage and the 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	Price
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-275) : 6 ft</li> </ul>	291.00

## MOTOR CORD to drive the motor with Air Hose

Product	CAT. No.	Model	Length	Std. Accessories	Fit to	Price
<p>Connector Diameter : ø1.18"</p>	9253	EMCD-4000-2M	6 ft (2.0m)	• Air Hose	BMS-4020 BMS-4040 BMS-4020RA BMS-4040RA	150.00
	9254	EMCD-4000-4M	13 ft (4.0m)			250.00
	9255	EMCD-4000-6M	20 ft (6.0m)			350.00
	9256	EMCD-4000-8M	26 ft * (8.0m)			450.00

\*Never use for 90° Angle Motor.

## MOTOR CORD to signal the motor

Product	CAT. No.	Model	Length	Std. Accessories	Fit to	Price
<p>Connector Diameter : ø0.39"</p>	9257	EMCD-4000S-2M	6 ft (2.0m)	—	BMS-4020 BMS-4040 BMS-4020RA BMS-4040RA	250.00
	9258	EMCD-4000S-4M	13 ft (4.0m)			400.00
	9259	EMCD-4000S-6M	20 ft (6.0m)			550.00
	9260	EMCD-4000S-8M	26 ft * (8.0m)			690.00

\*Never use for 90° Angle Motor.

**⚠** Please purchase both the motor cord to drive the motor and the motor cord to signal the motor

## CAT. No. 8475 SAFETY RELAY BOX



● Mounts directly on the NE246 Control. Allows Emergency Stop Signal from the CNC to stop the E4000 Spindle or the NE246 Control to stop the machine operation.

**Safety Relay Box**

CAT. No.	Model	Standard Equipment · Accessories
8475	E4000-SRB	<ul style="list-style-type: none"> <li>• Relay Cord (Motor Power Line)</li> <li>• Emergency Stop Cord</li> </ul>

Please contact NSK America for specification and pricing.

\* Order by catalog number. **2-p87**

- 1
- EmaxEVO
- ESPERT
- ROTUS
- ECOMO
- IMPULSE
- PRESTO II
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