



# 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

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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"
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HIGH SPEED
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# iSpeed

**NEW**

## iSpeed3 SERIES

1,000~80,000 min<sup>-1</sup>(rpm)  
Output 140W / 150W

Outside Diameter : ø0.75", ø0.79", ø0.87" and ø0.98"  
(ø19.05, ø20, ø22 and ø25 mm)

- Shorter spindle length is suitable for compact sized automatic CNC lathes.
- The iSpeed3 series have sensorless motors and are equipped with super precision hybrid ceramic bearings for longer spindle life.



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# iSpeed3 Series

## Electric System

Outside Diameter  $\phi 0.75''$ ,  $\phi 0.79''$ ,  $\phi 0.87''$  and  $\phi 0.98''$   
 ( $\phi 19.05$ ,  $\phi 20$ ,  $\phi 22$  and  $\phi 25$  mm)

1,000~80,000 min<sup>-1</sup>(rpm)  
 Output 140W / 150W

- One Piece Type



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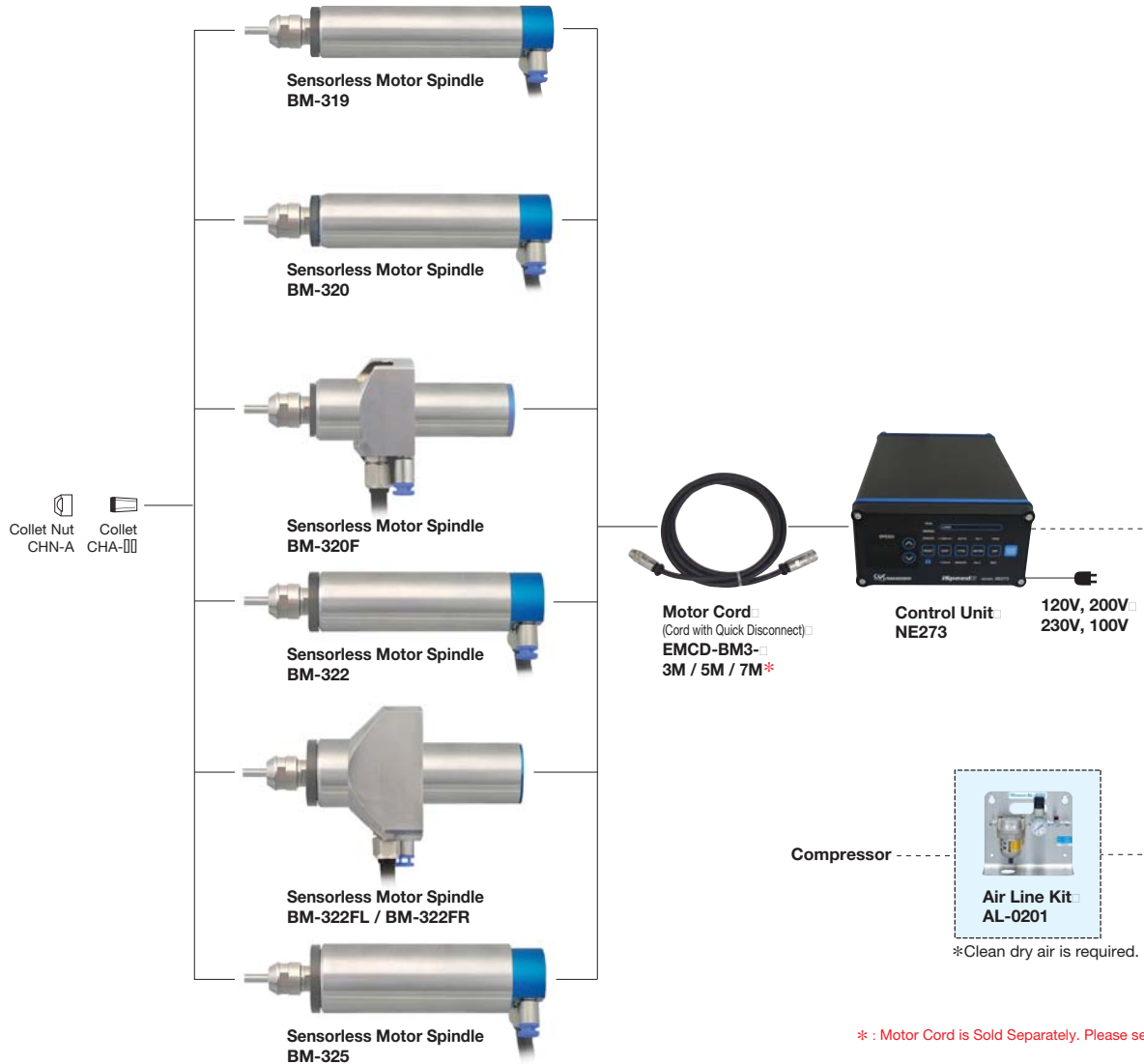
# SENSORLESS MOTOR SPINDLE "iSpeed3 SERIES" One Piece Type

ø0.75", ø0.79", ø0.87" and ø0.98"  
(ø19.05, ø20, ø22 and ø25 mm)

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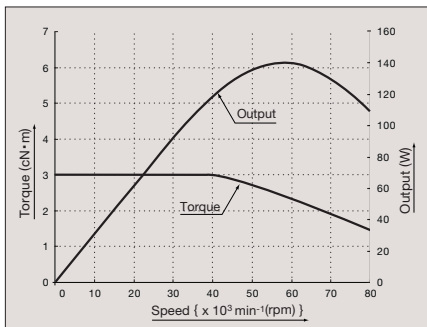
## iSpeed3 Series System Chart



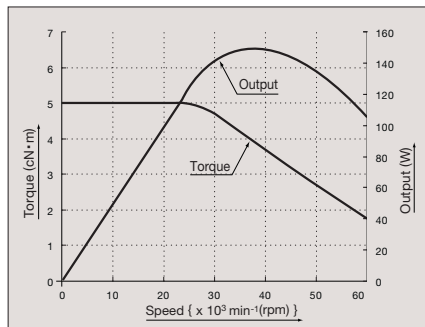
\* : Motor Cord is Sold Separately. Please see for 2-p7.

## Torque Characteristics Graph

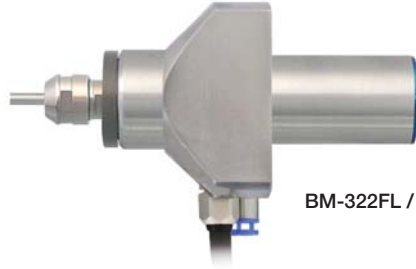
● BM-319, BM-320, BM-320F



● BM-322, BM-322FL/BM-322FR, BM-325



**Features of iSpeed3 Series**



BM-322FL / BM-322FR

● **Maximum 60,000 / 80,000 min<sup>-1</sup>(rpm)**

A maximum motor speed 80,000 min<sup>-1</sup>(rpm) (BM-319, BM-320, BM-320F) is realized by using a high performance brushless motor and ceramic bearings. A maximum motor speed 60,000 min<sup>-1</sup>(rpm) (BM-322, BM-322FL/BM-322FR, BM-325) is realized by using a high performance brushless motor and ceramic bearings.

● **Maximum Motor Power Output 140W / 150W**

● **Available Spindle Diameters**

ø0.75"(ø19.05mm), ø0.79"(ø20mm), ø0.87"(ø22mm), ø0.98"(ø25mm)

● **Air-Cooling System**

Air-cooled motor uses a small volume of air (1.0 CFM) to minimize heat buildup and allow continuous operation. Air pressure required is 23-50 PSI.

● **Spindle Accuracy**

Spindle Accuracy is within 1 μm (TIR).

● **High Rigidity, Short Body**

iSpeed3 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 Required**

Input power required is 120VAC for U.S. usage.

● **Input / Output Controls Signal Examples :**

● **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, Motor Torque Output.

● **Motor Protection System**

Motor Spindle is stopped safely and quickly. A Warning / Error LED is lit, Warning / Error Signal is output to an external device when a problem occurs.

● **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 iSpeed3 Series control unit and the machining center's controller will cause the relay contacts to open and the iSpeed3 Series motor to stop.

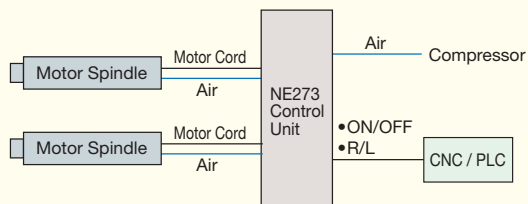
● **Centering Mode Switch**

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

**Automatic Control System Chart**

● **Sequential Operation of up to 2 Motor / Spindles**

\* 2 motors can not be operated simultaneously.



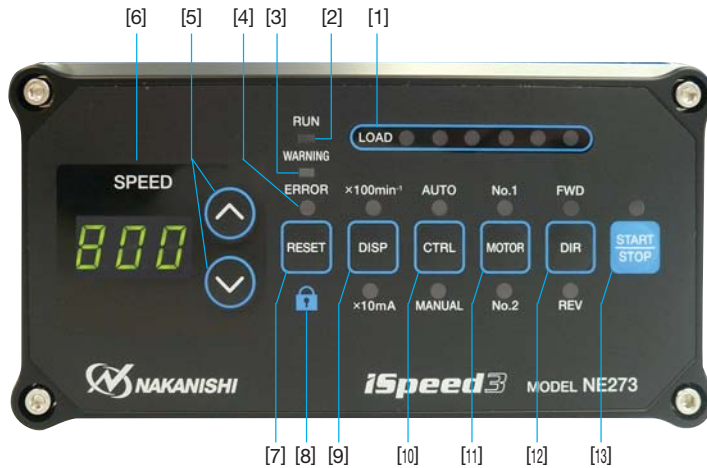
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# "iSpeed3 SERIES" CONTROL UNIT

- 1,000~80,000 min<sup>-1</sup>(rpm) ● Maximum Output 150W
- External Input / Output Control Signal (Refer to 7-p28~p33 page of this catalog)

CAT. No. **8478** **iSpeed3 CONTROL UNIT NE273** **80,000 min<sup>-1</sup>(rpm)**

**NEW**



- [1] Load LED (LOAD)\*
- [2] Running LED (RUN)
- [3] Warning LED (WARNING)
- [4] Error LED (ERROR)
- [5] Motor Speed Switch (UP / DOWN)
- [6] Rotating Speed Display (SPEED)
- [7] Error Reset Switch (RESET)
- [8] KEY HOLD Switch
- [9] DISP (DISPLAY) Switch
- [10] Control Switch (AUTO / MANUAL)
- [11] Motor Selection Switch (No.1 / No.2)
- [12] Rotating Direction Selector Switch (FWD./REV.)
- [13] Start Switch (START)

\*: Load LED



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

### Specifications

Model	: NE273
Power Source	: AC 120V 60Hz, AC 200V 50Hz-60Hz AC 230V 50Hz, AC 100V 50Hz-60Hz (4 types)
Motor Speed	: 1,000-80,000 min <sup>-1</sup> (rpm)
Max. Output Power	: 150W (For ø0.87", ø0.98")
Rated Power Consumption	: 1.1A
Air Flow Volume	: 1.0CFM (23-50PSI)
Weight	: 7 lb. 11.46 oz.
Dimensions	: W5.59" x D9.21" x H2.83"

### iSpeed3 Control Unit

CAT. No.	Plug Type	Model	Standard Equipment · Accessories	Price
8478	120V	NE273	<ul style="list-style-type: none"> <li>• Power Cord : 6 ft</li> <li>• Air Hose with filter</li> <li>• Motor Connector Cap</li> <li>• Connector Cap A / B (Provided)</li> <li>• Bracket</li> <li>• Plate nut</li> <li>• M3 Screw</li> </ul>	
8480	230V			

\*Please refer to Technical Data 7-p28~p33 in detail about External Input-Output Connector.

\*Please check the power source plug type and order accordingly.

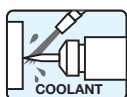
### ● Power Source Plug

Plug Type	Main Usable Area	Product
For 100V (A type)	For Japan	
For 120V (B type)	For U.S.A. and Canada	

Plug Type	Main Usable Area	Product
For 200V (C type)	Without Plug	
For 230V (D type)	For Europe	

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# "iSpeed3 SERIES" SENSORLESS MOTOR SPINDLE

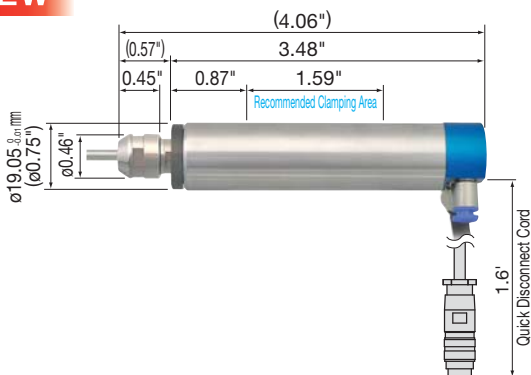


iSpeed3 Series can be used in conjunction with water or oil based coolants.

## CAT. No. 7626 SENSORLESS MOTOR SPINDLE BM-319 80,000 min<sup>-1</sup>(rpm)

Outside Diameter **ø0.75"**(ø19.05mm)

**NEW**



- Motor Speed ..... 1,000~80,000 min<sup>-1</sup>(rpm)
- Spindle Accuracy ..... Within 1 µm
- Max. Output Power ..... 140W
- Standard Size Collet (CHA-3.175) ..... ø1/8"
- Weight ..... 7.41 oz.

< Optional >

- Collet (CHA-□□) ..... ø0.5 mm~ø4.0 mm (See Page 6-p2 for details)
- Motor Cord ..... Length 10 ft, 16 ft, 22 ft

### Sensorless Motor Spindle ø0.75"(ø19.05 mm)

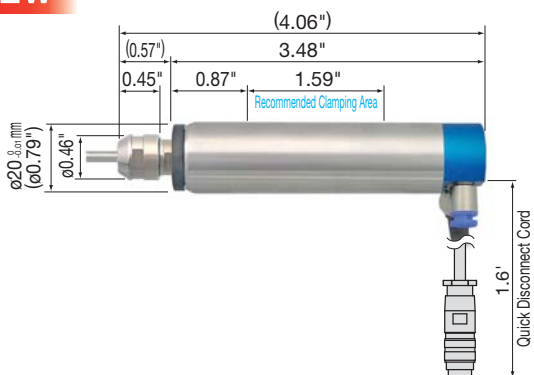
CAT. No.	Model	Standard Equipment · Accessories	Price
7626	BM-319	<ul style="list-style-type: none"> <li>• Collet ø1/8" (CHA-3.175) : 1 pc.</li> <li>• Collet Nut (CHN-A) : 1 pc.</li> <li>• Wrench (8 x 5), (9 x 11) : 1 pc. each</li> </ul>	

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

## CAT. No. 7628 SENSORLESS MOTOR SPINDLE BM-320 80,000 min<sup>-1</sup>(rpm)

Outside Diameter **ø0.79"**(ø20mm)

**NEW**



- Motor Speed ..... 1,000~80,000 min<sup>-1</sup>(rpm)
- Spindle Accuracy ..... Within 1 µm
- Max. Output Power ..... 140W
- Standard Size Collet (CHA-3.175) ..... ø1/8"
- Weight ..... 8.11 oz.

< Optional >

- Collet (CHA-□□) ..... ø0.5 mm~ø4.0 mm (See Page 6-p2 for details)
- Motor Cord ..... Length 10 ft, 16 ft, 22 ft

### Sensorless Motor Spindle ø0.79"(ø20 mm)

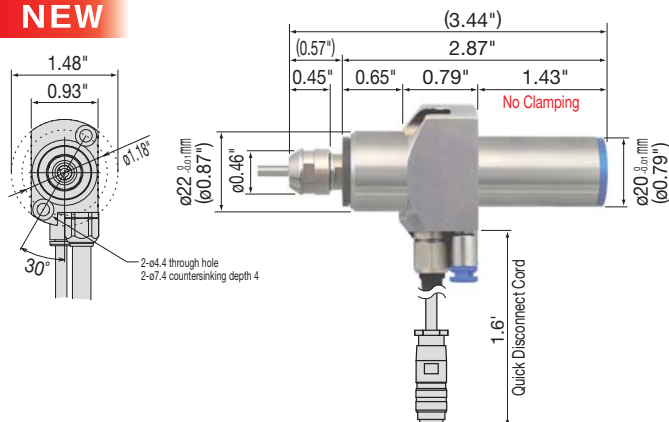
CAT. No.	Model	Standard Equipment · Accessories	Price
7628	BM-320	<ul style="list-style-type: none"> <li>• Collet ø1/8" (CHA-3.175) : 1 pc.</li> <li>• Collet Nut (CHN-A) : 1 pc.</li> <li>• Wrench (8 x 5), (9 x 11) : 1 pc. each</li> </ul>	

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

## CAT. No. 7633 SENSORLESS MOTOR SPINDLE BM-320F 80,000 min<sup>-1</sup>(rpm)

Outside Diameter **ø0.79"**(ø20mm)

**NEW**



- Motor Speed ..... 1,000~80,000 min<sup>-1</sup>(rpm)
- Spindle Accuracy ..... Within 1 µm
- Max. Output Power ..... 140W
- Standard Size Collet (CHA-3.175) ..... ø1/8"
- Weight ..... 9.52 oz.

< Optional >

- Collet (CHA-□□) ..... ø0.5 mm~ø4.0 mm (See Page 6-p2 for details)
- Motor Cord ..... Length 10 ft, 16 ft, 22 ft

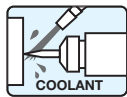
### Sensorless Motor Spindle ø0.79"(ø20 mm)

CAT. No.	Model	Standard Equipment · Accessories	Price
7633	BM-320F	<ul style="list-style-type: none"> <li>• Collet ø1/8" (CHA-3.175) : 1 pc.</li> <li>• Collet Nut (CHN-A) : 1 pc.</li> <li>• Wrench (8 x 5), (9 x 11) : 1 pc. each</li> <li>• M4 Bolt : 2 pcs.</li> </ul>	

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

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# "iSpeed3 SERIES" SENSORLESS MOTOR SPINDLE & PARTS



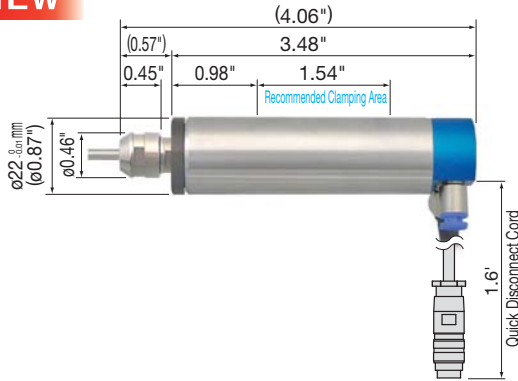
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## CAT. No. 7635 SENSORLESS MOTOR SPINDLE BM-322 60,000 min<sup>-1</sup>(rpm)

Outside Diameter **ø0.87" (ø22mm)**

**NEW**



- Motor Speed ..... 1,000~60,000 min<sup>-1</sup>(rpm)
- Spindle Accuracy ..... Within 1 µm
- Max. Output Power ..... 150W
- Standard Size Collet (CHA-3.175) ..... ø1/8"
- Weight ..... 8.82 oz.

< Optional >

- Collet (CHA-□□) ..... ø0.5 mm~ø4.0 mm  
(See Page 6-p2 for details)
- Motor Cord ..... Length 10 ft, 16 ft, 22 ft

### Sensorless Motor Spindle ø0.87" (ø22 mm)

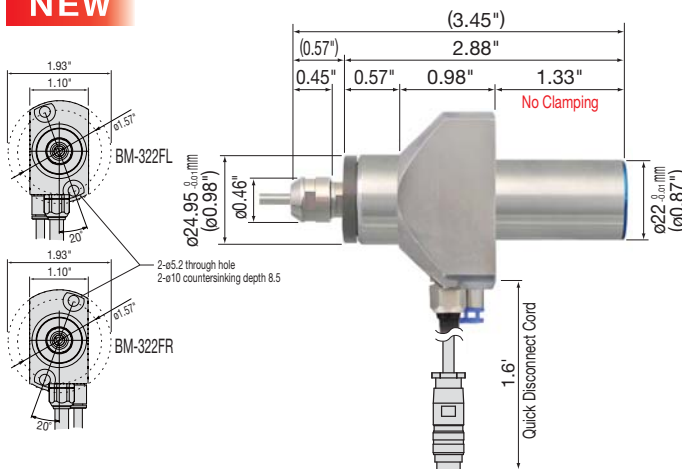
CAT. No.	Model	Standard Equipment · Accessories	Price
7635	BM-322	<ul style="list-style-type: none"> <li>• Collet ø1/8" (CHA-3.175) : 1 pc.</li> <li>• Collet Nut (CHN-A) : 1 pc.</li> <li>• Wrench (8 x 5), (9 x 11) : 1 pc. each</li> </ul>	

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

## SENSORLESS MOTOR SPINDLE BM-322FL / BM-322FR 60,000 min<sup>-1</sup>(rpm)

Outside Diameter **ø0.87" (ø22mm)**

**NEW**



- Motor Speed ..... 1,000~60,000 min<sup>-1</sup>(rpm)
- Spindle Accuracy ..... Within 1 µm
- Max. Output Power ..... 150W
- Standard Size Collet (CHA-3.175) ..... ø1/8"
- Weight ..... 12.70 oz.

< Optional >

- Collet (CHA-□□) ..... ø0.5 mm~ø4.0 mm  
(See Page 6-p2 for details)
- Motor Cord ..... Length 10 ft, 16 ft, 22 ft

### Sensorless Motor Spindle ø0.87" (ø22 mm)

CAT. No.	Model	Standard Equipment · Accessories	Price
7639	BM-322FL	<ul style="list-style-type: none"> <li>• Collet ø1/8" (CHA-3.175) : 1 pc.</li> <li>• Collet Nut (CHN-A) : 1 pc.</li> <li>• Wrench (8 x 5), (9 x 11) : 1 pc. each</li> <li>• M5 Bolt : 2 pcs.</li> </ul>	
7641	BM-322FR		

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

## SPACER for BM-322FL / BM-322FR



- By using this spacer between the edge of flange and the edge of machine, this is possible to carry the length of the cutting tool edge 10mm forward.

### Spacer

CAT. No.	Model	Specifications	Price
1882	SP-22x10L	Dimensions ø22 (I.D.) x 10mm	68.00

## SPLIT BUSHING

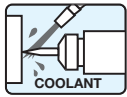


- Bushing to allow ø22mm (0.87") BM-322, BM-322FL and BM-322FR to be mounted in larger dia. ø25mm (0.98") or ø25.4mm (1.0") holders.

### Split Bushing

CAT. No.	Model	I.D.	O.D.	Length	Price
1883	RB-22x25x34L	ø0.87" (ø22mm)	ø0.98" (ø25mm)	33.5mm	
1884	RB-22x25.4x34L	ø0.87" (ø22mm)	ø1.0" (ø25.4mm)		

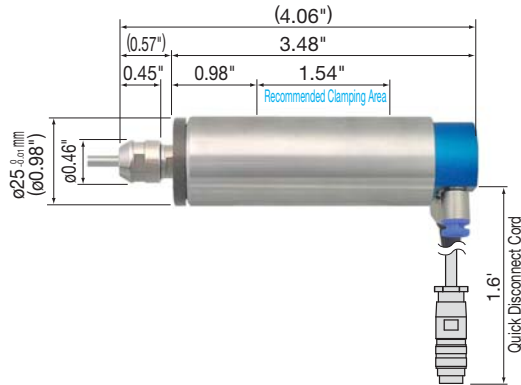
# "iSpeed3 SERIES" SENSORLESS MOTOR SPINDLE & PARTS



CAT. No. **7637** **SENSORLESS MOTOR SPINDLE BM-325** 60,000 min<sup>-1</sup>(rpm)

Outside Diameter **ø0.98" (ø25mm)**

**NEW**



- Motor Speed ..... 1,000~60,000 min<sup>-1</sup>(rpm)
- Spindle Accuracy ..... Within 1 µm
- Max. Output Power ..... 150W
- Standard Size Collet (CHA-3.175) ..... ø1/8"
- Weight ..... 11.29 oz.

< Optional >

- Collet (CHA-□□) ..... ø0.5 mm~ø4.0 mm  
(See Page 6-p2 for details)
- Motor Cord ..... Length 10 ft, 16 ft, 22 ft

### Sensorless Motor Spindle ø0.98" (ø25 mm)

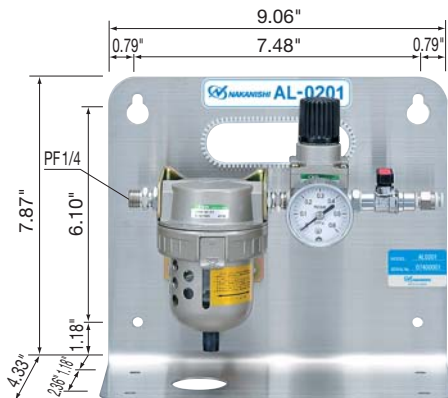
CAT. No.	Model	Standard Equipment · Accessories	Price
<b>7637</b>	<b>BM-325</b>	<ul style="list-style-type: none"> <li>• Collet ø1/8" (CHA-3.175) : 1 pc.</li> <li>• Collet Nut (CHN-A) : 1 pc.</li> <li>• Wrench (8 x 5), (9 x 11) : 1 pc. each</li> </ul>	

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

## MOTOR CORD

Product	CAT. No.	Description · Model	Length	Std. Accessories	Fit to	Price
	<b>9261</b>	Motor Cord 3M EMCD-BM3-3M	10 ft (3.0m)	<ul style="list-style-type: none"> <li>• Air Hose</li> <li>• Connector</li> <li>• Protection Cap</li> </ul>	BM-319 · BM-320 BM-320F · BM-322 BM-322FL · BM-322FR BM-325	
	<b>9262</b>	Motor Cord 5M EMCD-BM3-5M	16 ft (5.0m)			
	<b>9263</b>	Motor Cord 7M EMCD-BM3-7M	22 ft (7.0m)			

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



- The AL-0201 is a **Clean air** supply unit for iSpeed3 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
<b>AL0201</b>	<b>AL-0201</b>	<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>	

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\* Order by catalog number. **2-p7**

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