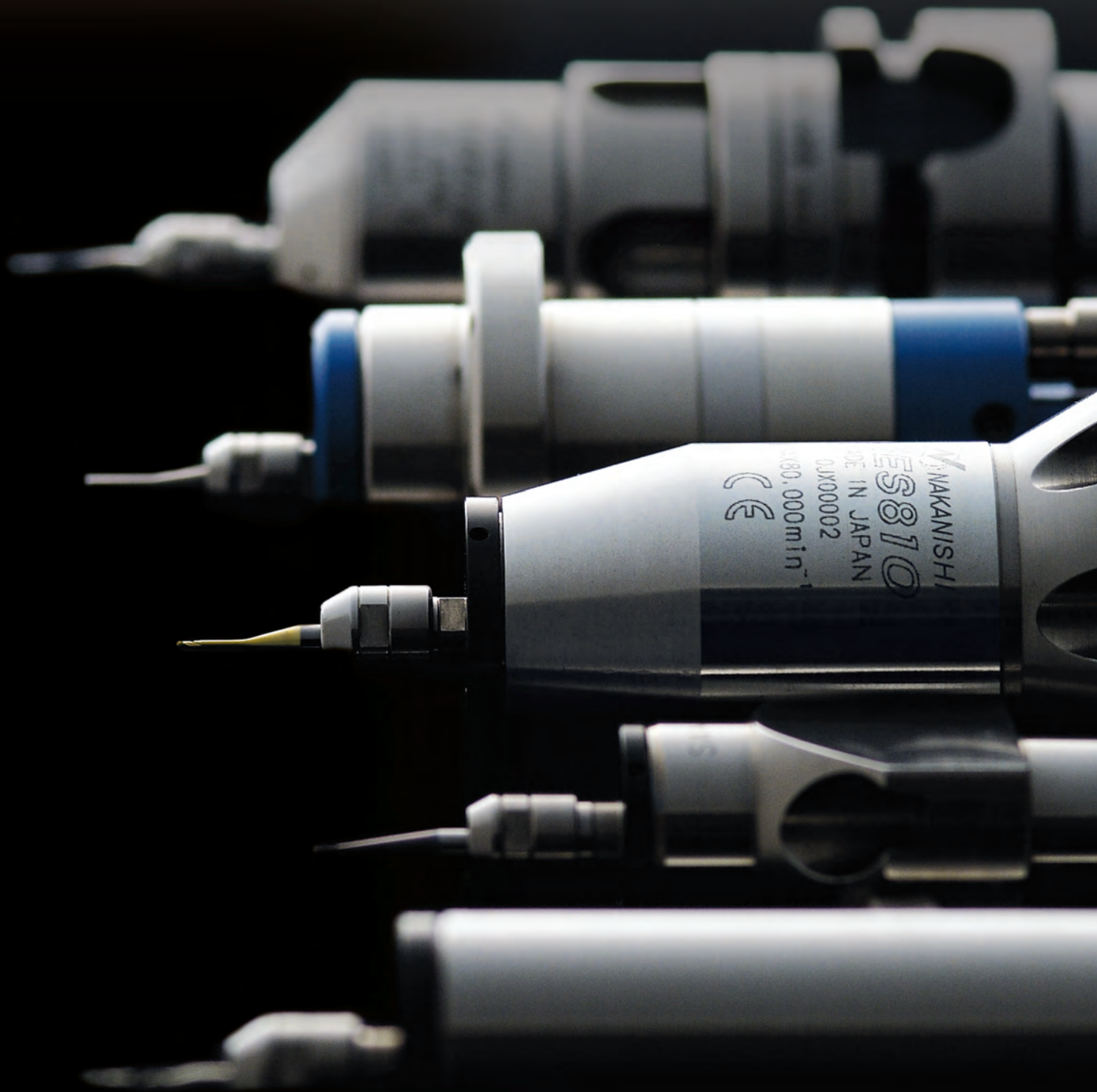


# MACHINE TOOLS SPINDLES



1
EmaxEVO
ESPERT
ROTUS
IMPULSE
PRESTO II
Sheenus ZERO
Sonic-Cutter ZERO
2
iSpeed3
E2000 ø1.07"/ø0.98"/ø0.897"
E3000 — One Piece
E3000 — Modular
ø1.18"
ø1.07"/ø0.98" ø0.897"
E3000 — 80,000rpm
E4000
3
MA
ø0.897"
ø1.0" ø0.96"
ø1.18"
MS
ø0.75" ø0.79"
ø0.87" ø0.91"
ø1.0" ø0.96"
4
HES
iSpeed5
HTS
PLANET
Xpeed
ABT
5
AIR LINE KIT
6
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7
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# THE TRANSFORMER

**8,000 RPM**  
BEFORE



**80,000 RPM**  
AFTER

## HES SERIES

Transform your Conventional Machine  
into a High-Speed Machining Center

Upgrade your existing NC Milling machines and CNC machining centers to high speed machines.

## HES510

5,000~50,000 rpm Output : 340W

BT30 / 40 / 50, CAT40/50  
ST32, HSK A63/A100



## HES810

20,000~80,000 rpm Output : 350W

BT30 / 40 / 50, CAT40  
ST32, HSK A63/A100



1

EmaxEVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

ø1.0"/ø0.98"/ø0.897"

E3000

— One Piece

E3000

— Modular

ø1.18"

ø1.07"/ø0.98"/ø0.897"

E3000

— 30,000rpm

E4000

3

MA

ø0.897"

ø1.0"/ø0.98"

ø1.18"

MS

ø0.75"/ø0.79"

ø0.897"/ø0.91"

ø1.0"/ø0.98"

4

HES

iSpeed5

HTS

PLANET

Xpeed

ABT

5

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## UPGRADE YOUR EXISTING NC MILLING MACHINES AND CNC MACHINING CENTERS TO HIGH SPEED MACHINES

1

EmaxEVO  
ESPERT  
ROTUS  
IMPULSE  
PRESTO II  
Sheenus  
ZERO  
Sonic-Cutter  
ZERO

2

iSpeed3  
E2000  
ø1.0"/ø0.98"/ø0.897"  
E3000  
One Piece  
E3000  
Modular  
ø1.18"  
ø1.0"/ø0.98"/ø0.897"  
E3000  
80,000rpm  
E4000

3

MA  
ø0.897"  
ø1.0"  
ø0.98"  
ø1.18"  
MS  
ø0.75"  
ø0.79"  
ø0.897"  
ø0.91"  
ø1.0"  
ø0.98"

4

HES  
iSpeed5  
HTS

PLANET

Xpeed

ABT

5

AIR LINE KIT

6

PARTS

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- ULTRA-PRECISION HIGH-SPEED MILLING SPINDLE

### HES SERIES



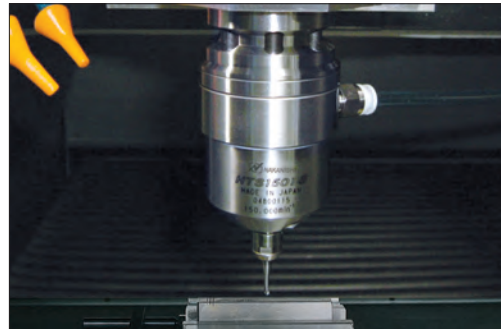
- FULLY TOOL CHANGEABLE ULTRA-PRECISION HIGH-SPEED MILLING SPINDLE

### iSpeed5 SERIES








- ULTRA-HIGH SPEED AIR TURBINE MILLING SPINDLE

### HTS SERIES



## Milling System Comparison

Series	Drive Type	Type		Consumption	Product Name	Max Speed	Output Power	Max Collet Size	Shank
<b>HES</b> 	Electric	Brushless DC	120V	1.0 CFM (cooling)	HES510	50,000	340W	1/4"	BT30 / 40 / 50 CAT40 / 50 ST32 HSK A63
	Electric	Brushless DC	120V	0.53 CFM (cooling)	HES810	80,000	350W	4.0 mm	BT30 / 40 / 50 CAT40 ST32 HSK A63
<b>iSpeed5</b> 	Electric	Brushless DC	120V	1.0 CFM (cooling)	5ATC60	60,000	350W	6.35 mm	BT40 / 50 CAT40 / 50, IT40 / 50 HSK A63 / A100
	Electric	Brushless DC	120V	1.0 CFM (cooling)	5ATC80	80,000	350W	4.0 mm	BT40 / 50 CAT40 / 50, IT40 / 50 HSK A63 / A100
<b>HTS</b> 	Pneumatic	Air Turbine	73PSI	3.18 CFM	HTS1501	150,000	25W	4.0 mm	Straight ø20 mm BT30 / 40 / 50 HSK E25 / 32 / 40 / 50 HSK A63, HSK F63
<b>Xpeed</b> 	Pneumatic	Air Turbine	87PSI	10.60 CFM	Xpeed1200	120,000	192W	4.0 mm	Flange
	Pneumatic	Air Turbine	87PSI	5.65 CFM	Xpeed1600	160,000	56W	4.0 mm	Flange
<b>ABT</b> 	Pneumatic	Air Turbine	80PSI	< 1.77 CFM	ABT1000	100,000	88W	4.0 mm	Grip Ring



- The Ultra-Precision, High-Speed HES510 spindles allow you to use your existing equipment for a much larger variety of operations. Conventional milling machines and machining centers can now do high-speed machining, small diameter drilling and milling with extremely good surface finishes with the HES510. • Max. Output 340W

### HES510 Features

- **5,000-50,000 rpm**
- **Maximum Output 340W**  
The HES510 motor is a brushless DC motor that utilizes hall elements and rare-earth magnets to realize max. output 340W in a very compact size.
- **Ceramic Bearings**  
The spindle uses a double pair of ceramic bearings in the front and in the rear. This arrangement maximizes both radial and axial rigidity to insure extremely high-precision cutting. The motor also uses ceramic bearings to maximize life expectancy.
- **Smooth Rotation**  
The absence of a commutator and the use of a photo coupler sending a feedback signal of 48 pulses per revolution result in very smooth rotation with low vibration throughout the speed range.
- **One-Piece motor and spindle construction**  
The motor and spindle are built as a single unit minimizing size and weight and allowing usage on a very wide variety of machines.
- **Emergency Connector**  
The system incorporates an emergency, breakaway connector to help prevent system damage in case the machine's main spindle is rotated accidentally.
- **Excellent Durability by air-cooling system**  
Air-cooling motor uses a small volume of air (1.0 CFM) to prevent heat buildup and allow long, continuous operation.
- **Best for small diameter drilling and milling**  
Less than  $\phi 0.08"$  ( $\phi 2$  mm) small diameter drilling and milling with extremely good surface finishes, using a high-speed brushless motor.

### Cooling Air

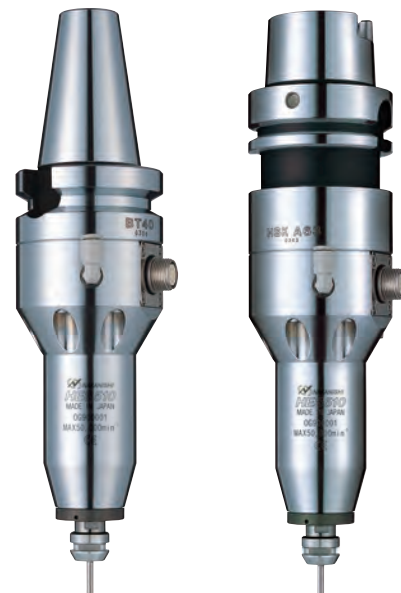
Clean dry air is required to cool the motor and protect the spindle from contaminants. Please use a filter and regulator. (Proper air pressure 29-44PSI) (Use Air Line Kit AL-C1204)

### Large Variety of Tapers Available

BT, CAT, ST32 and HSK A tapers are available.

### Protection Circuit

The controller is compact and lightweight. It features a protection circuit to stop the motor automatically in case of overload ensuring safe and smooth operation.



### HES510 Specifications

- Speed ..... 5,000-50,000 rpm
- Max. Output Power ..... 340W
- Spindle Accuracy ..... Within 1  $\mu$ m

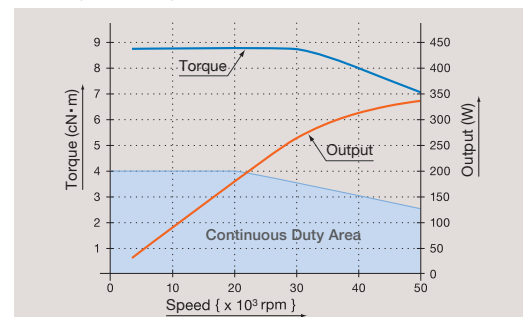
< Additional Equipment Required >

- NE-211 Control Unit
- Motor Cord (EMCD)
- Air Line Kit (AL-C1204)

#### Additional collet purchase required:

- Collet Series CHK-XX .....  $\phi 0.5\text{mm} \sim \phi 6.35\text{mm}$   
Recommended ..... CHK-3.175  $\phi 1/8"$   
(See Page 6-p3 for additional sizes)
- Motor Cord (EMCD-810-□□) ..... Length 13 ft (9248) / 19 ft (9249) / 26 ft (9250)  
Provided with Air Cooling Hose  $\phi 4$  mm

### Torque & Output Power Characteristic of HES510



### HES510 Connection Drawing

The HES510 motor and spindle require dry, clean, regulated air. Please refer to the drawing to the right for proper components. Air Line Kit AL-C1204 supplies clean dry air to the controller through the filter and the regulator.



1

EmaxEVO  
ESPERT  
ROTUS  
IMPULSE  
PRESTO II  
Sheenus  
ZERO  
Sonic-Cutter  
ZERO

2

iSpeed3  
E2000  
 $\phi 1.0" \sim \phi 0.98" / \phi 0.897"$   
E3000  
— One Piece  
E3000  
— Modular  
 $\phi 1.18"$   
 $\phi 1.87" \sim \phi 0.98"$   
 $\phi 0.897"$   
E3000  
— 30,000rpm  
E4000

3

MA  
 $\phi 0.897"$   
 $\phi 1.0"$   
 $\phi 0.98"$   
 $\phi 1.18"$   
MS  
 $\phi 0.75"$   
 $\phi 0.79"$   
 $\phi 0.897"$   
 $\phi 0.91"$   
 $\phi 1.0"$   
 $\phi 0.98"$

4

HES  
iSpeed5  
HTS  
PLANET  
Xspeed  
ABT

5

AIR LINE KIT

6

PARTS

7

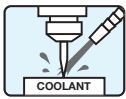
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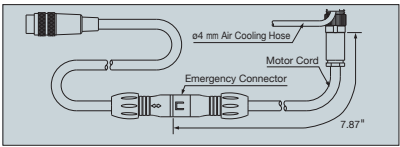
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# HES510 ULTRA-PRECISION HIGH-SPEED MILLING SPINDLE



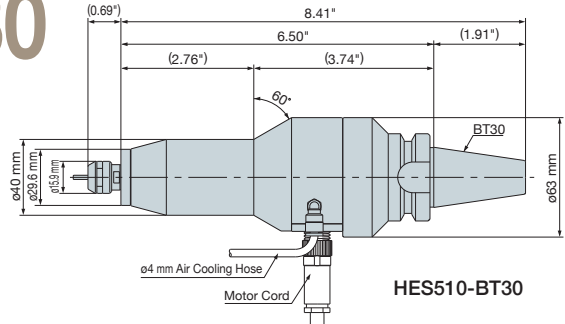
HES Series can be used in conjunction with water or oil based coolants.



\*All HES Series Spindles incorporate an emergency connector

## HES510-BT30

30



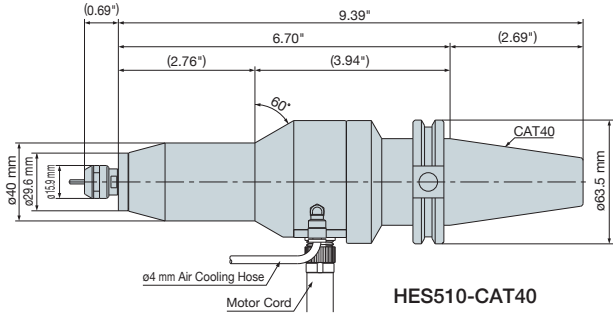
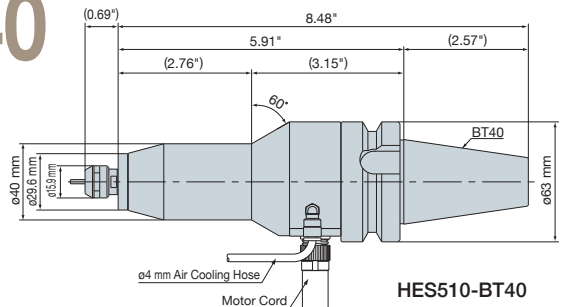
• Additional collet purchase required:

Collet Series CHK-XX .....  $\varnothing 0.5\text{mm} \sim \varnothing 6.35\text{mm}$   
Recommended ..... CHK-3.175  $\varnothing 1/8"$   
(See Page 6-p3 for additional sizes)

Product Code	Product Name	Standard Equipment · Accessories	Weight	
7890	HES510-BT30	• Collet Nut (K-265) : 1 pc. • Wrench (12 x 14) : 2 pcs.	4.85 lb.	

## HES510-BT40 / CAT40

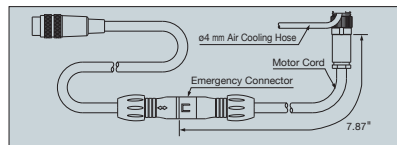
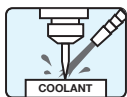
40



• Additional collet purchase required:

Collet Series CHK-XX .....  $\varnothing 0.5\text{mm} \sim \varnothing 6.35\text{mm}$   
Recommended ..... CHK-3.175  $\varnothing 1/8"$   
(See Page 6-p3 for additional sizes)

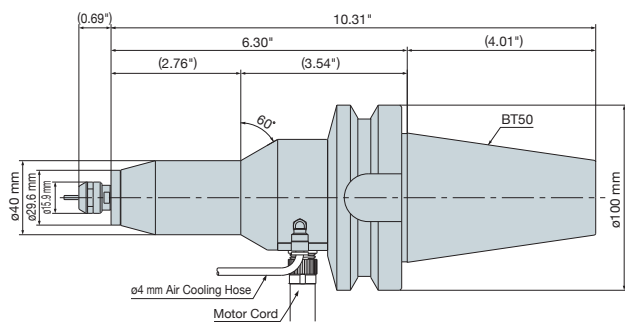
Product Code	Product Name	Standard Equipment · Accessories	Weight	
7891	HES510-BT40	• Collet Nut (K-265) : 1 pc. • Wrench (12 x 14) : 2 pcs.	5.07 lb.	
7893	HES510-CAT40		5.75 lb.	



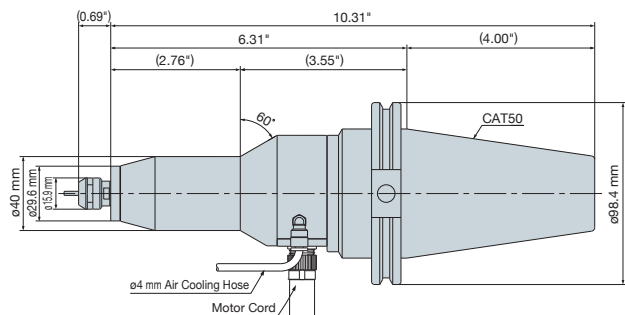
\*All HES Series Spindles incorporate an emergency connector

## HES510-BT50 / CAT50

# 50



HES510-BT50



HES510-CAT50

### • Additional collet purchase required:

Collet Series CHK-XX .....  $\varnothing 0.5\text{mm} \sim \varnothing 6.35\text{mm}$   
 Recommended ..... CHK-3.175  $\varnothing 1/8"$   
 (See Page 6-p3 for additional sizes)

Product Code	Product Name	Standard Equipment · Accessories	Weight
7892	HES510-BT50	• Collet Nut (K-265) : 1 pc. • Wrench (12 x 14) : 2 pcs.	11.02 lb.
7894	HES510-CAT50		9.70 lb.



## Caution

- If the machine's main spindle is rotated by mistake, the Emergency Connector on the motor is designed to separate. In order for the Emergency Connector to function as designed it must be set and positioned correctly. Please refer to the owner's manual for proper installation and check the integrity of the Emergency Connector and suspension prior to each use.

1

E-maxEVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

$\varnothing 1.0" / \varnothing 0.92" / \varnothing 0.89"$

E3000

— One Piece

E3000

— Modular

$\varnothing 1.18"$

$\varnothing 1.07" / \varnothing 0.98"$

$\varnothing 0.89"$

E3000

— 30,000rpm

E4000

3

MA

$\varnothing 0.897"$

$\varnothing 1.0"$

$\varnothing 0.98"$

$\varnothing 1.18"$

MS

$\varnothing 0.75"$

$\varnothing 0.79"$

$\varnothing 0.89"$

$\varnothing 0.91"$

$\varnothing 1.0"$

$\varnothing 0.98"$

4

HES

iSpeed5

HTS

PLANET

Xpeed

ABT

5

AIR LINE KIT

6

PARTS

7

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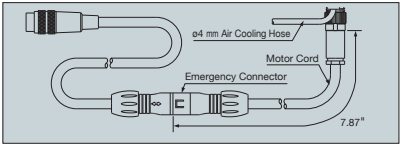
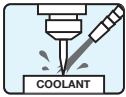
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# HES510 ULTRA-PRECISION HIGH-SPEED MILLING SPINDLE



\*All HES Series Spindles incorporate an emergency connector

## HES510-ST32

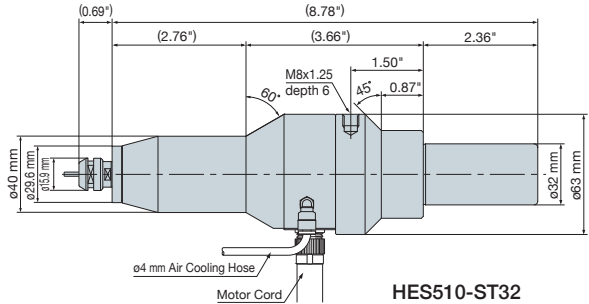
# ST32

• Additional collet purchase required:

Collet Series CHK-XX .....  $\varnothing 0.5\text{mm} \sim \varnothing 6.35\text{mm}$

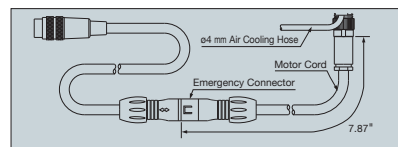
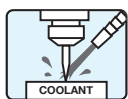
Recommended ..... CHK-3.175  $\varnothing 1/8"$

(See Page 6-p3 for additional sizes)



Product Code	Product Name	Standard Equipment · Accessories	Weight	
7899	HES510-ST32	• Collet Nut (K-265) : 1 pc. • Wrench (12 x 14) : 2 pcs.	5.29 lb.	

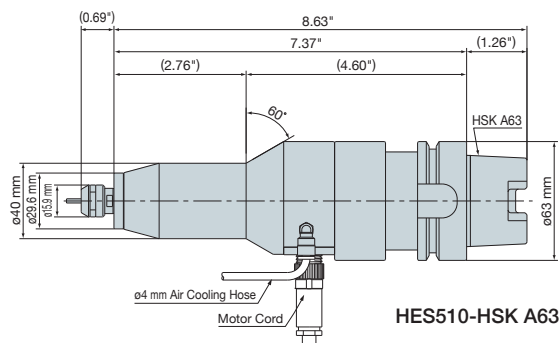




\*All HES Series Spindles incorporate an emergency connector

## HES510-HSK A63

# HSK A63



### • Additional collet purchase required:

Collet Series CHK-XX ..... ø0.5mm~ø6.35mm  
 Recommended .....CHK-3.175 ø1/8"  
 (See Page 6-p3 for additional sizes)

Product Code	Product Name	Standard Equipment · Accessories	Weight	
7897	HES510-HSK A63	• Collet Nut (K-265) : 1 pc. • Wrench (12 x 14) : 2 pcs.	5.95 lb.	

## ⚠ Caution

- If the machine's main spindle is rotated by mistake, the Emergency Connector on the motor is designed to separate. In order for the Emergency Connector to function as designed it must be set and positioned correctly. Please refer to the owner's manual for proper installation and check the integrity of the Emergency Connector and suspension prior to each use.

## 25 Pin INTERFACE CABLE



- 3 Meter long Interface Cable provides a DB25 Male Connector at one end and a blunt cut on the opposite end. Includes a pin-out wire diagram for easy interfacing of I/O signals from any NSK Control to a CNC Control.

### 25 Pin Interface Cable

Product Code	Product Name		
DB25M	DB25M	For NSK Control Connector A 12.5 ft	
DB25MXL	DB25MXL	For NSK Control Connector A 25 ft	

## 15 Pin INTERFACE CABLE



- 3 Meter long Interface Cable provides a DB15 Male Connector at one end and a blunt cut on the opposite end. Includes a pin-out wire diagram for easy interfacing of the (OP1) "E-Stop Input Circuit" and "Safety Relay Circuit" from the NSK Control to a CNC Control.

### 15 Pin Interface Cable

Product Code	Product Name		
DB15M	DB15M	For NSK Control Connector B	

1

E-maxEVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

ø1.0"/ø0.92"/ø0.897"

E3000

— One Piece

E3000

— Modular

ø1.18"

ø1.97"/ø0.98"

ø0.897"

E3000

— 30,000rpm

E4000

3

MA

ø0.897"

ø1.0"

ø0.98"

ø1.18"

MS

ø0.75"

ø0.79"

ø0.897"

ø0.91"

ø1.0"

ø0.98"

4

HES

iSpeed5

HTS

PLANET

Xpeed

ABT

5

AIR LINE KIT

6

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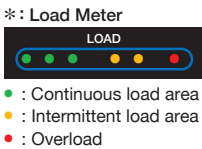
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# HES510 CONTROLLER

- AC100-240V for international operation
- 1,000~50,000 rpm
- Maximum Output 350W

Product Code **9775** **CONTROLLER NE211**

**50,000 rpm**



External Input-Output  
Connector A (D-SUB25 Female)

External Input-Output  
Connector B (D-SUB15 Female)

Motor Connector

Air Output Joint  $\phi 6$  mm

Air Input Joint  $\phi 6$  mm

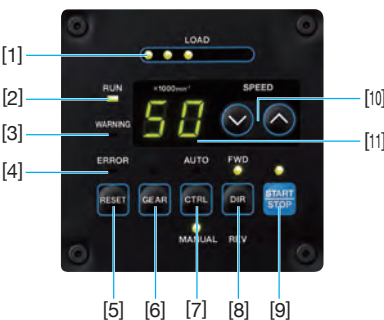
Power Switch

Communication Connector

Intake with Power Fuse



- [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

Product Name	: NE211
Power Source	: AC120V / 240V
Motor Speed	: 1,000-50,000 rpm
Max. Output Power	: 350W
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 Controller

Product Code	Plug Type	Product Name	Standard Equipment · Accessories
9775	120V (B type)	NE211	<ul style="list-style-type: none"><li>• Power Cord : 6 ft · Air Hose with filter · Reducer</li><li>• Connector Cap (Provided) · Bracket · Nylon Clip</li><li>• Screw · Rubber Pad · Fuse (T6.3AL) 250V: 2 pcs.</li></ul>

\*Please refer to Technical Data 7-p2~p9 in detail about External Input-Output Connector.

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

Interface Cable  
Page 4-p13

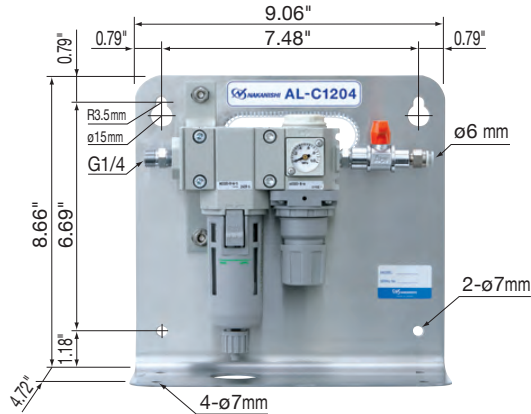


## ● Power Source Plug

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

# HES510 AIR LINE KIT & MOTOR CORD

## Product Code 4504 AIR LINE KIT AL-C1204




- The AL-C1204 Air Line Kit is designed to deliver clean, dry air to Electric Motors via the Controller. The filter removes small amounts of debris while the adjustable regulator provides the correct air pressure for cooling and purging.

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

Product Code	Product Name	Standard Equipment · Accessories	
4504	AL-C1204	<ul style="list-style-type: none"> <li>• Air Filter · Air Regulator</li> <li>• Air Pressure Gauge</li> <li>• Air ON-OFF Valve</li> <li>• Hose for Piping (K-275) : 6 ft</li> </ul>	

## MOTOR CORD

Product	Product Code	Description · Product Name	Length	Standard Equipment · Accessories	Fit to	
	9248	Motor Cord 4M EMCD-810-4M	13 ft	<ul style="list-style-type: none"> <li>• Air Cooling Hose : ø4 mm</li> <li>• Reducer</li> <li>• Connector Cap (Provided)</li> </ul>	HES510	
	9249	Motor Cord 6M EMCD-810-6M	19 ft			
	9250	Motor Cord 8M EMCD-810-8M	26 ft			

## CONTROL PANEL EXTENSION CORD



### Control Panel Extension Cord

Product Code	Product Name	For use with	
8407	E3000-PEX4	NE211	

## HES Purchasing Example



### HES Purchasing Example

Product Code	Product Name	Description
7893	HES510-CAT40	Spindle with CAT40
9775	NE211	Controller
9248	EMCD-810-4M	13 ft Motor Cord
4504	AL-C1204	Air Line Kit

1

EmaxEVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

ø1.0"/ø0.92"/ø0.89"

E3000

— One Piece

E3000

— Modular

ø1.18"

ø1.07"/ø0.98"

ø0.89"

E3000

— 30,000rpm

E4000

3

MA

ø0.897"

ø1.0"

ø0.98"

ø1.18"

MS

ø0.75"

ø0.79"

ø0.89"

ø0.91"

ø1.0"

ø0.98"

4

HES

iSpeed5

HTS

PLANET

Xpeed

ABT

5

AIR LINE KIT

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PARTS

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# HES810

## ULTRA-PRECISION HIGH SPEED MILLING SPINDLE ELECTRIC SYSTEM

- The Ultra-Precision, High-Speed HES810 spindles allow you to use your existing equipment for a much larger variety of operations. Conventional milling machines and machining centers can now do high-speed machining, small diameter drilling and milling with extremely good surface finishes with the HES810. • Max. Output 350W

### HES810 Features

- **20,000-80,000 rpm**
- **Maximum Output 350W**

The HES810 motor is a brushless DC motor that utilizes hall elements and rare-earth magnets to achieve max. output 350W in a very compact size.

- **Ceramic Bearings**

The spindle uses a double pair of ceramic bearings in the front and in the rear. This arrangement maximizes both radial and axial rigidity to insure extremely high-precision cutting. The motor also uses ceramic bearings to maximize life expectancy.

- **Smooth Rotation**

The absence of a commutator and the use of a photo coupler sending a feedback signal of 48 pulses per revolution result in very smooth rotation with low vibration throughout the speed range.

- **One-Piece motor and spindle construction**

The motor and spindle are built as a single unit minimizing size and weight and allowing usage on a very wide variety of machines.

- **Emergency Connector**

The system incorporates an emergency, breakaway connector to help prevent system damage in case the machine's main spindle is rotated accidentally.

- **Excellent Durability by air-cooling system**

Air-cooling motor uses a small volume of air (0.53 CFM) to prevent heat buildup and allow long, continuous operation.

- **Best for small diameter drilling and milling**

Less than  $\phi 0.08"$  ( $\phi 2$  mm) small diameter drilling and milling with extremely good surface finishes, using a high-speed brushless motor.

- **Cooling Air**

Clean dry air is required to cool the motor and protect the spindle from contaminants. Please use a filter and regulator. (Proper air pressure 29-44PSI) (Use Air Line Kit AL-C1204)

- **Large Variety of Tapers Available**

BT, CAT, ST32 and HSK A tapers are available.

- **Protection Circuit**

The controller is compact and lightweight. It features a protection circuit to stop the motor automatically in case of overload ensuring safe and smooth operation.



### HES810 Specifications

- Speed ..... 20,000-80,000 rpm
- Ideal Operating Speed ..... 50,000-80,000 rpm
- Max. Output Power ..... 350W
- Spindle Accuracy ..... Within 1  $\mu$ m

< Additional Equipment Required >

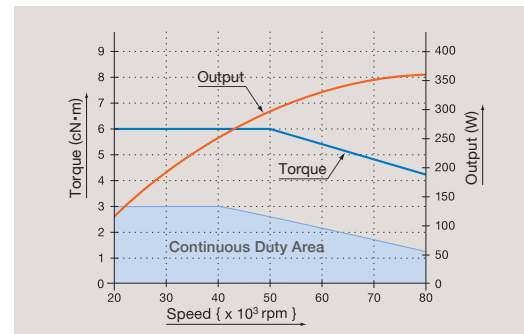
- NE-211 Control Unit
- Motor Cord (EMCD)
- Air Line Kit (AL-C1204)

- **Additional collet purchase required:**

Collet Series CHA-XX .....  $\phi 0.5\text{mm} \sim \phi 4.0\text{mm}$   
Recommended ..... CHA-3.175  $\phi 1/8"$   
(See Page 6-p2 for additional sizes)

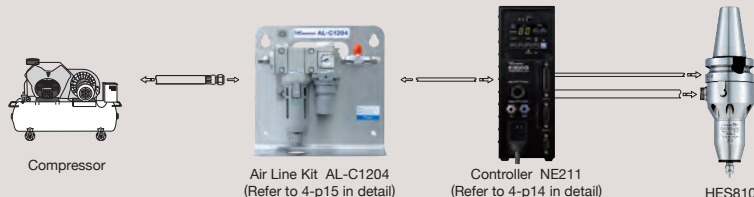
- Motor Cord (EMCD-810- ) ..... Length 13 ft (9248) / 19 ft (9249) / 26 ft (9250)  
Provided with Air Cooling Hose  $\phi 4$  mm

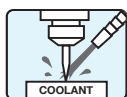
- **Torque & Output Power Characteristic of HES810**



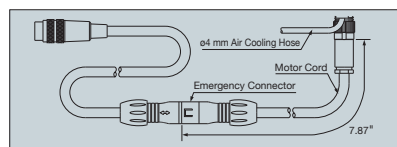
### HES810 Connection Drawing

The HES810 motor and spindle require dry, clean, regulated air. Please refer to the drawing to the right for proper components. Air Line Kit AL-C1204 supplies clean dry air to the controller through the filter and the regulator.





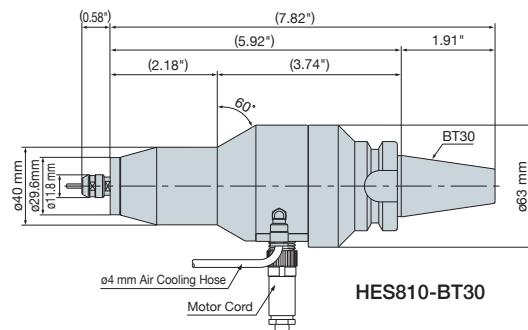
HES Series can be used in conjunction with water or oil based coolants.



\*All HES Series Spindles incorporate an emergency connector

## HES810-BT30

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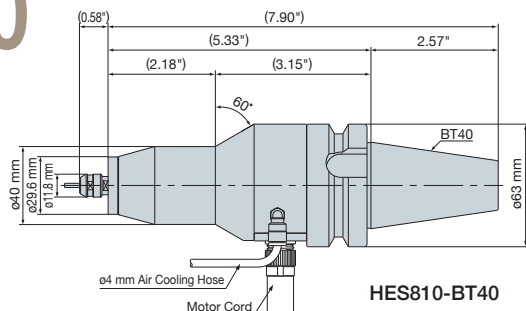
• Additional collet purchase required:

Collet Series CHA-XX .....  $\varnothing 0.5\text{mm} \sim \varnothing 4.0\text{mm}$   
 Recommended ..... CHA-3.175  $\varnothing 1/8"$   
 (See Page 6-p2 for additional sizes)

Product Code	Product Name	Standard Equipment · Accessories	Weight	
7878	HES810-BT30	<ul style="list-style-type: none"> <li>Collet Nut (CHN-A) : 1 pc.</li> <li>Wrench (8 x 5), (9 x 11) : 1 pc. each</li> </ul>	4.41 lb.	

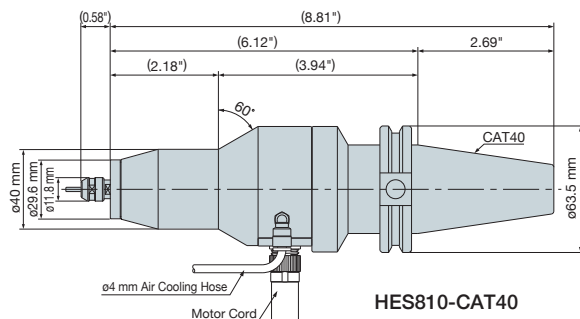
## HES810-BT40 / CAT40

40



• Additional collet purchase required:

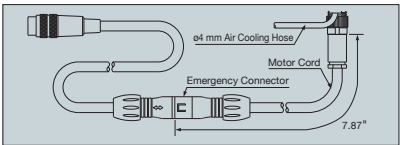
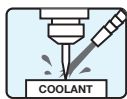
Collet Series CHA-XX .....  $\varnothing 0.5\text{mm} \sim \varnothing 4.0\text{mm}$   
 Recommended ..... CHA-3.175  $\varnothing 1/8"$   
 (See Page 6-p2 for additional sizes)



Product Code	Product Name	Standard Equipment · Accessories	Weight	
7897	HES810-BT40	<ul style="list-style-type: none"> <li>Collet Nut (CHN-A) : 1 pc.</li> <li>Wrench (8 x 5), (9 x 11) : 1 pc. each</li> </ul>	4.85 lb.	
7881	HES810-CAT40		5.28 lb.	



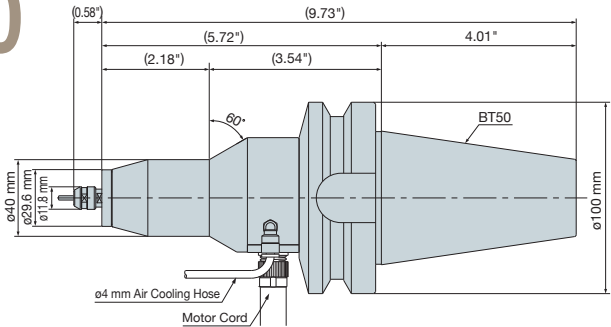
# HES810 ULTRA-PRECISION HIGH-SPEED MILLING SPINDLE



\*All HES Series Spindles incorporate an emergency connector

## HES810-BT50

50



HES810-BT50

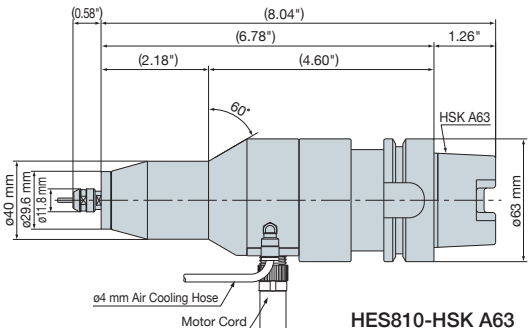
• Additional collet purchase required:

Collet Series CHA-XX .....  $\varnothing 0.5\text{mm} \sim \varnothing 4.0\text{mm}$   
Recommended ..... CHA-3.175  $\varnothing 1/8"$   
(See Page 6-p2 for additional sizes)

Product Code	Product Name	Standard Equipment · Accessories	Weight	
7880	HES810-BT50	• Collet Nut (CHN-A) : 1 pc. • Wrench (8 x 5), (9 x 11) : 1 pc. each	10.80 lb.	

## HES810-HSK A63

HSK A63

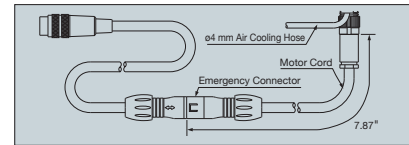
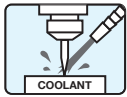


HES810-HSK A63

• Additional collet purchase required:

Collet Series CHA-XX .....  $\varnothing 0.5\text{mm} \sim \varnothing 4.0\text{mm}$   
Recommended ..... CHA-3.175  $\varnothing 1/8"$   
(See Page 6-p2 for additional sizes)

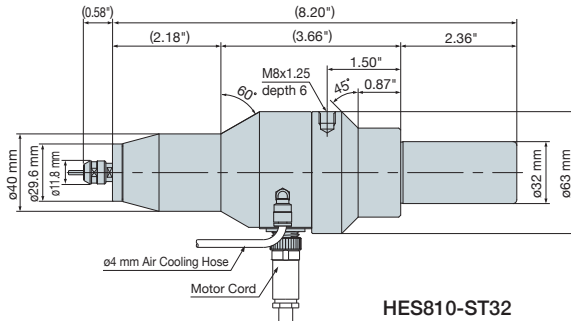
Product Code	Product Name	Standard Equipment · Accessories	Weight	
7884	HES810-HSK A63	• Collet Nut (CHN-A) : 1 pc. • Wrench (8 x 5), (9 x 11) : 1 pc. each	5.73 lb.	



\*All HES Series Spindles incorporate an emergency connector

## HES810-ST32

# ST32



### • Additional collet purchase required:

Collet Series CHA-XX .....  $\varnothing 0.5\text{mm} \sim \varnothing 4.0\text{mm}$   
 Recommended ..... CHA-3.175  $\varnothing 1/8"$   
 (See Page 6-p2 for additional sizes)

Product Code	Product Name	Standard Equipment · Accessories	Weight	
7885	HES810-ST32	<ul style="list-style-type: none"> <li>Collet Nut (CHN-A) : 1 pc.</li> <li>Wrench (8 x 5), (9 x 11) : 1 pc. each</li> </ul>	5.07 lb.	

## ⚠ Caution

- If the machine's main spindle is rotated by mistake, the Emergency Connector on the motor is designed to separate. In order for the Emergency Connector to function as designed it must be set and positioned correctly. Please refer to the owner's manual for proper installation and check the integrity of the Emergency Connector and suspension prior to each use.

## 25 Pin INTERFACE CABLE



- 3 Meter long Interface Cable provides a DB25 Male Connector at one end and a blunt cut on the opposite end. Includes a pin-out wire diagram for easy interfacing of I/O signals from any NSK Control to a CNC Control.

### 25 Pin Interface Cable

Product Code	Product Name		
DB25M	DB25M	For NSK Control Connector A 12.5 ft	
DB25MXL	DB25MXL	For NSK Control Connector A 25 ft	

## 15 Pin INTERFACE CABLE



- 3 Meter long Interface Cable provides a DB15 Male Connector at one end and a blunt cut on the opposite end. Includes a pin-out wire diagram for easy interfacing of the (OP1) "E-Stop Input Circuit" and "Safety Relay Circuit" from the NSK Control to a CNC Control.

### 15 Pin Interface Cable

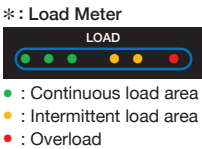
Product Code	Product Name		
DB15M	DB15M	For NSK Control Connector B	

HES810 CONTROLLER

- AC100-240V for international operation
- 1,000~80,000 rpm
- Maximum Output 350W

Product Code **9775** **CONTROLLER NE211**

**80,000 rpm**



External Input-Output  
Connector A (D-SUB25 Female)

External Input-Output  
Connector B (D-SUB15 Female)

Motor Connector

Air Output Joint ø6 mm

Air Input Joint ø6 mm

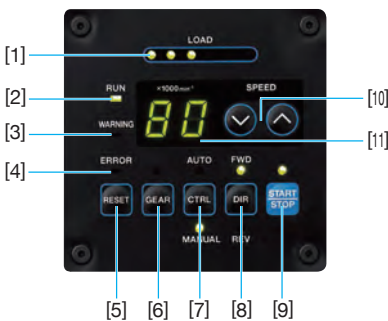
Power Switch

Communication Connector

Inlet with Power Fuse



- [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**

Product Name : NE211  
Power Source : AC120V / 240V  
Motor Speed : 1,000-80,000 rpm  
Max. Output Power : 350W  
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 Controller**

Product Code	Plug Type	Product Name	Standard Equipment · Accessories
9775	120V (B type)	NE211	• Power Cord : 6 ft · Air Hose with filter · Reducer • Connector Cap (Provided) · Bracket · Nylon Clip • Screw · Rubber Pad · Fuse (T6.3AL) 250V: 2 pcs.

\*Please refer to Technical Data 7-p2~p9 in detail about External Input-Output Connector.  
\*AC100-240V for international operation. Please check the power source plug type and order accordingly.

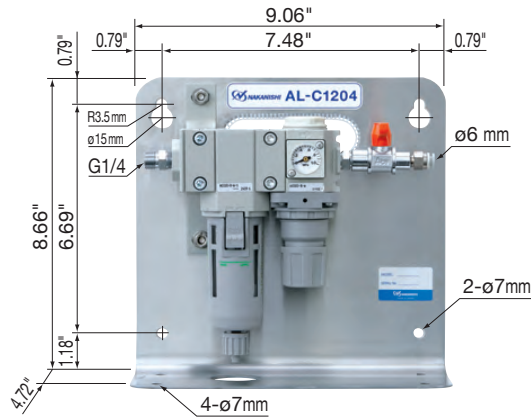
Interface Cable  
Page 4-p13

● Power Source Plug

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

# HES810 AIR LINE KIT & MOTOR CORD

## Product Code 4504 AIR LINE KIT AL-C1204




- The AL-C1204 Air Line Kit is designed to deliver clean, dry air to Electric Motors via the Controller. The filter removes small amounts of debris while the adjustable regulator provides the correct air pressure for cooling and purging.

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

Product Code	Product Name	Standard Equipment · Accessories	
4504	AL-C1204	<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>	

## MOTOR CORD

Product	Product Code	Description · Product Name	Length	Standard Equipment · Accessories	Fit to	
	9248	Motor Cord 4M EMCD-810-4M	13 ft	<ul style="list-style-type: none"> <li>• Air Cooling Hose : ø4 mm</li> <li>• Reducer</li> <li>• Connector Cap (Provided)</li> </ul>	HES810	
	9249	Motor Cord 6M EMCD-810-6M	19 ft			
	9250	Motor Cord 8M EMCD-810-8M	26 ft			

## CONTROL PANEL EXTENSION CORD



### Control Panel Extension Cord

Product Code	Product Name	For use with	
8407	E3000-PEX4	NE211	

## HES Purchasing Example



### HES Purchasing Example

Product Code	Product Name	Description
7881	HES810-CAT40	Spindle with CAT40
9775	NE211	Controller
9248	EMCD-810-4M	13 ft Motor Cord
4504	AL-C1204	Air Line Kit

1

EmaxEVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

ø1.0"/ø0.98"/ø0.897"

E3000

— One Piece

E3000

— Modular

ø1.18"

ø1.0"/ø0.98"/ø0.897"

E3000

— 30,000rpm

E4000

3

MA

ø0.897"

ø1.0"/ø0.98"

ø1.18"

MS

ø0.75"/ø0.79"

ø0.89"/ø0.81"

ø1.0"/ø0.98"

4

HES

iSpeed5

HTS

PLANET

Xpeed

ABT

5

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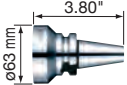
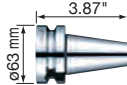
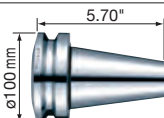
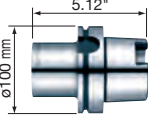
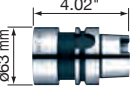
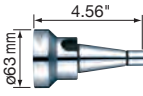
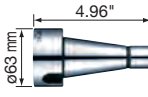
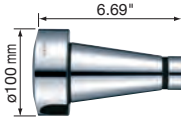
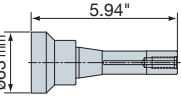
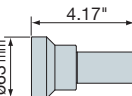
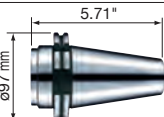
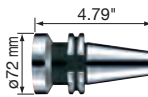
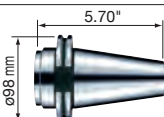
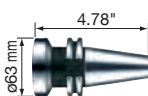
APPLICATION

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# HES SERIES SHANKS

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EmaxEVO
ESPERT
ROTUS
IMPULSE
PRESTO II
Sheenus ZERO
Sonic-Cutter ZERO
2
iSpeed3
E2000 ø1.0"/ø0.98"/ø0.897"
E3000 One Piece
E3000 Modular
ø1.18"
ø1.0"/ø0.98" ø0.897"
E3000 80,000rpm
E4000
3
MA
ø0.897"
ø1.0" ø0.96"
ø1.18"
MS
ø0.75" ø0.79"
ø0.897" ø0.91"
ø1.0" ø0.96"
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Product	Product Code	Product Name	Description	Fit to	
	9148	HES510-BT30-SK	• Type : BT30 • Weight : 23.28 oz.	HES510-BT30 HES810-BT30	
	9149	HES510-BT40-SK	• Type : BT40 • Weight : 27.87 oz.	HES510-BT40 HES810-BT40	
	9150	HES510-BT50-SK	• Type : BT50 • Weight : 122.75 oz.	HES510-BT50 HES810-BT50	
	9151	HES510-HSK A100-SK	• Type : HSK A100 • Weight : 102.65 oz.	HES510-HSK A100	
	9152	HES510-HSK A63-SK	• Type : HSK A63 • Weight : 43.03 oz.	HES510-HSK A63 HES810-HSK A63	
	9153	HES510-NT30-SK	• Type : NT30 • Weight : 24.69 oz.	HES510-NT30	
	9154	HES510-NT30M-SK	• Type : NT30M *Metric threads • Weight : 24.69 oz.	HES510-NT30M	
	9155	HES510-NT40-SK	• Type : NT40 • Weight : 32.80 oz.	HES510-NT40 HES810-NT40	
	9156	HES510-NT40M-SK	• Type : NT40M *Metric threads • Weight : 32.80 oz.	HES510-NT40M	
	9157	HES510-NT50-SK	• Type : NT50 • Weight : 135.80 oz.	HES510-NT50	
	9158	HES510-NT50M-SK	• Type : NT50M *Metric threads • Weight : 136.16 oz.	HES510-NT50M	
	9159	HES510-R8-SK	• Type : R8 • Weight : 32.00 oz.	HES510-R8	
	9160	HES510-ST32-SK	• Type : ST32 • Weight : 31.82 oz.	HES510-ST32 HES810-ST32	
	9190	HES510-IT50-SK	• Type : IT50 • Weight : 103.56 oz.	HES510-IT50	
	9191	HES510-IT40-SK	• Type : IT40 • Weight : 37.81 oz.	HES510-IT40 HES810-IT40	
	9192	HES510-CAT50-SK	• Type : CAT50 • Weight : 103.53 oz.	HES510-CAT50	
	9193	HES510-CAT40-SK	• Type : CAT40 • Weight : 38.20	HES510-CAT40 HES810-CAT40	

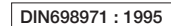
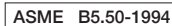


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## BT30



## BT40

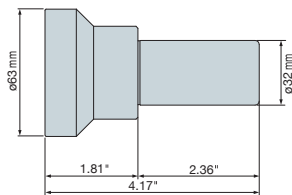




Taper Shanks Dimensions

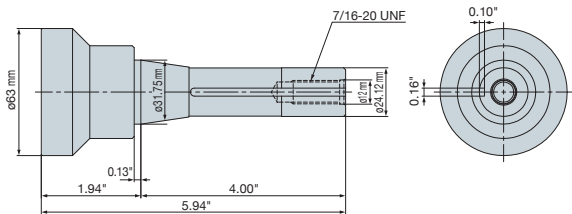
# ST32

ST32



# R8

R8



1

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ESPERT

ROTUS

IMPULSE

PRESTO II

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Sonic-Cutter

ZERO

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— One Piece

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— Modular

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Ø1.07"/Ø0.98"

Ø0.897"

E3000

— 30,000rpm

E4000

3

MA

Ø0.897"

Ø1.0"

Ø0.98"

MS

Ø0.75"

Ø0.79"

Ø0.897"

Ø0.91"

Ø1.0"

Ø0.98"

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iSpeed5

HTS

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Xpeed

ABT

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ø1.07"/ø0.98" ø0.897"
E3000 — 80,000rpm
E4000
3
MA
ø0.897"
ø1.0" ø0.98"
ø1.18"
MS
ø0.75" ø0.79"
ø0.87" ø0.91"
ø1.0" ø0.98"
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# AUTO PILOT ENGAGED



## iSpeed5

Fully Tool-Changeable Electric Spindles  
to Increase Your Machine Tool Speed

1	EmaxEVO
	ESPRT
	ROTUS
	IMPULSE
	PRESTO II
	Sheenus ZERO
	Sonic-Cutter ZERO
2	iSpeed3
	E2000 ø1.0"/ø0.92"/ø0.897"
	E3000 — One Piece
	E3000 — Modular
	ø1.18"
	ø1.57"/ø0.98" ø0.897"
	E3000 — 30,000rpm
	E4000
3	MA
	ø0.897"
	ø1.0" ø0.98"
	ø1.18"
	MS
	ø0.75" ø0.79"
	ø0.93" ø0.91"
	ø1.0" ø0.98"
4	HES
	iSpeed5
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5	AIR LINE KIT
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1

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IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

ø1.0"/ø0.98"/ø0.897"

E3000

One Piece

E3000

Modular

ø1.18"

ø1.0"/ø0.98"/ø0.897"

E3000

80,000rpm

E4000

3

MA

ø0.897"

ø1.0"/ø0.98"

ø1.18"

MS

ø0.75"/ø0.79"

ø0.897"/ø0.91"

ø1.0"/ø0.98"

4

HES

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- Upgrade your existing CNC machining centers to high speed machines with full automatic tool changeability.

60,000 ~ 80,000 max rpm  
Output 350 W



- The iSpeed5 System primarily consists of a motor spindle, stop block, air pressure switch and control unit.
- Power, cooling air, and control signals are provided to the spindle when engaged to the innovative electromechanical stop block that attaches to your machine tool spindle.
- The iSpeed5 is created for continuous lights out manufacturing even in the case of cutting fluids and coolants.
- The internal air passage allows the pressurization and cooling of the system while preventing the entry of contaminants into the stop block.

## iSpeed5 Features

- **Maximum 60,000 / 80,000 rpm**  
Variable speed units
- **Maximum Motor Power Output 350W**
- **Available Collets**  
NR3060S: CHK diameter 0.5mm ~ 6.35mm  
NR3080S: CHA diameter 0.5mm ~ 4.0mm

The required components of the iSpeed5 System are as follows:

- iSpeed5 Controller
- iSpeed5 Motor Spindle Unit
- 60,000 or 80,000 rpm High Speed Spindle
- Stop Block Complete with Motor Cord
- Special Flange (if needed)
- 25pin Interface Cable
- Air Line Kit Filter
- Pressure Switch
- CHK or CHA Collet
- Collet Nut Wrenches
- Spindle Wrench
- User Manual



## iSpeed5 Specifications

- Speed ..... 60,000 / 80,000 rpm
- Max. Output Power ..... 350W
- Spindle Accuracy ..... Within 1  $\mu$ m

< Optional >

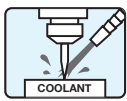
- Air Line Kit (AL-C1204) ..... For Controller NE287
- Collet (CHK- □□) .....  $\phi$ 0.5 mm- $\phi$ 6.35 mm
- Collet (CHA- □□) .....  $\phi$ 0.5 mm- $\phi$ 4.0 mm

## System Chart (Motor Speed 60,000 rpm and 80,000 rpm)



\*CAT40/BT40/HSK63A weigh less than 9lb. CAT50/HSK100A weigh less than 13lb.

1
Emax EVO
ESPERT
ROTUS
IMPULSE
PRESTO II
Sheenus ZERO
Sonic-Cutter ZERO
2
iSpeed3
E2000 $\phi$ 1.0"/ $\phi$ 0.98"/ $\phi$ 0.897"
E3000 - One Piece
E3000 - Modular $\phi$ 1.18"
$\phi$ 1.07"/ $\phi$ 0.98" $\phi$ 0.897"
E3000 - 80,000rpm
E4000
3
MA
$\phi$ 0.897"
$\phi$ 1.0"
$\phi$ 0.98"
$\phi$ 1.18"
MS
$\phi$ 0.75"
$\phi$ 0.79"
$\phi$ 0.897"
$\phi$ 0.91"
$\phi$ 1.0"
$\phi$ 0.98"
4
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iSpeed5 Series can be used  
in conjunction with water  
or oil based coolants.

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Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

ø1.0"/ø0.98"/ø0.897"

E3000

One Piece

E3000

Modular

ø1.18"

ø1.0"/ø0.98"/

ø0.897"

E3000

80,000rpm

E4000

3

MA

ø0.897"

ø1.0"/

ø0.98"

ø1.18"

MS

ø0.75"/

ø0.79"/

ø0.837"/

ø0.91"/

ø1.0"/

ø0.98"

4

HES

iSpeed5

HTS

PLANET

Xpeed

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5

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APPLICATION

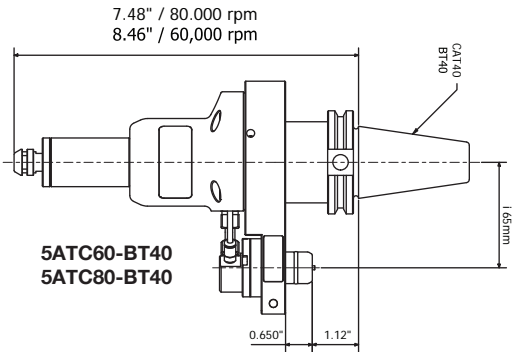
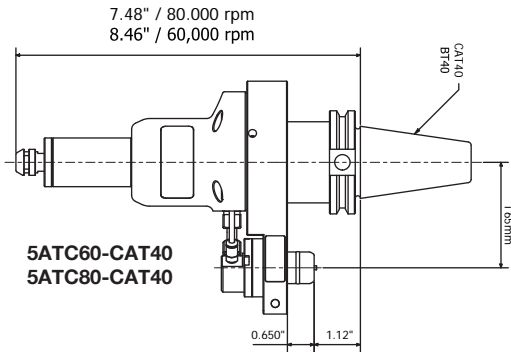
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5ATC60-CAT40 / BT40

5ATC80-CAT40 / BT40

40

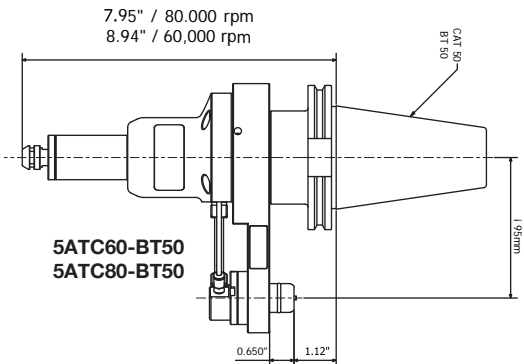
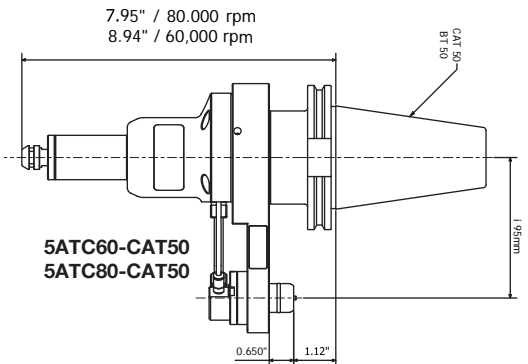


Product Code	Product Name	Description	
506001	5ATC60-CAT40	60,000 RPM ATC Spindle CAT40 iSpeed5	
506002	5ATC60-BT40	60,000 RPM ATC Spindle BT40 iSpeed5	
508001	5ATC80-CAT40	80,000 RPM ATC Spindle CAT40 iSpeed5	
508002	5ATC80-BT40	80,000 RPM ATC Spindle BT40 iSpeed5	

5ATC60-CAT50 / BT50

5ATC80-CAT50 / BT50

50

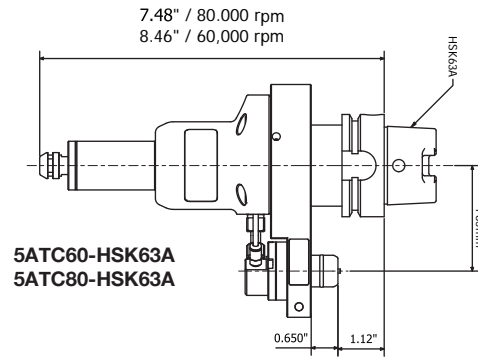


Product Code	Product Name	Description	
506003	5ATC60-CAT50	60,000 RPM ATC Spindle CAT50 iSpeed5	
506004	5ATC60-BT50	60,000 RPM ATC Spindle BT50 iSpeed5	
508003	5ATC80-CAT50	80,000 RPM ATC Spindle CAT50 iSpeed5	
508004	5ATC80-BT50	80,000 RPM ATC Spindle BT50 iSpeed5	

## 5ATC60-HSK63A

## 5ATC80-HSK63A

# HSK 63A

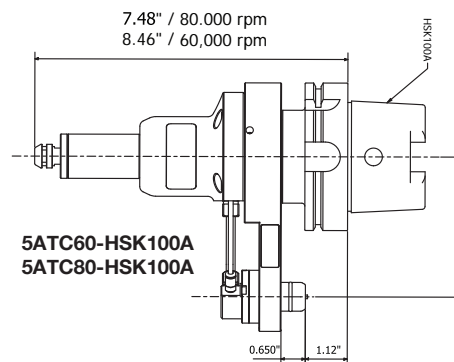


Product Code	Product Name	Description	
506005	5ATC60-HSK63A	60,000 RPM ATC Spindle HSK63A iSpeed5	
508005	5ATC80-HSK63A	80,000 RPM ATC Spindle HSK63A iSpeed5	

## 5ATC60-HSK100A

## 5ATC80-HSK100A

# 100



Product Code	Product Name	Description	
506006	5ATC60-HSK100A	60,000 RPM ATC Spindle HSK100A iSpeed5	
508006	5ATC80-HSK100A	80,000 RPM ATC Spindle HSK100A iSpeed5	

1

EmaxEVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

ø1.0"/ø0.98"/ø0.897"

E3000

— One Piece

E3000

— Modular

ø1.18"

ø1.07"/ø0.98"/ø0.897"

E3000

— 80,000rpm

E4000

3

MA

ø0.897"

ø1.0"

ø0.98"

ø1.18"

MS

ø0.75"

ø0.79"

ø0.897"

ø0.91"

ø1.0"

ø0.98"

4

HES

iSpeed5

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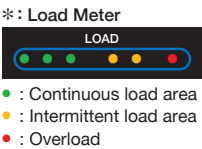
- AC100-240V Auto-Sensing
- 1,000~80,000 rpm
- Maximum Output 350W

Product Code

8491

CONTROLLER NE287

80,000 rpm



- [1] Load Meter
- [2] Display
- [3] Motor Speed Adjustment Switch (SPEED)
- [4] Display Switch (RPM/MILLIAMP)
- [5] Error Reset Switch (RESET)
- [6] Stop Block Connection LED
- [7] Motor Indicator (SPEED 1-4)
- [8] Air Connection LED
- [9] Control Switch (AUTO/MANUAL)
- [10] Handy Controller Connection
- [11] Start Switch (START/STOP)
- [12] Rotating Direction Selector Switch (FWD/REV)

Specifications	
Product Name	: NE287
Power Source	: AC120V/240V
Motor Speed	: 1,000-80,000 rpm
Max. Output Power	: 350W
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"

iSpeed5 Controller

Product Code	Plug Type	Product Name	Standard Equipment · Accessories	
8491	C type	NE287	• Power Cord : 6 ft · Air Hose with filter · Reducer • Connector Cap (Provided) · Bracket · Nylon Clip • Screw · Rubber Pad · Fuse (T6.3AL) 250V: 2 pcs.	

\*Please refer to Operation Manual for details about External Input-Output Connector.

Interface Cable DB25M

● Power Source Plug

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



Product Code **8492** **Handy Controller**



- The iSpeed5 handy controller allows hand-held operation of the system from a distance. The device features all of the same buttons and functions as the main controller, including speed adjustment, reverse and reset.

Product Code	Product Name	Description	
8492	NE287 HC	iSpeed5 Handy Controller	

Product Code **500101** **Stop Block**



- The iSpeed5 stop block integrates with the iSpeed5 controller in order to make automatic tool change possible. The stop block shape and size are unique to your machine brand and model. Please contact your NSK Sales Representative for inquiries.

Product Code	Product Name	Description	
500101	SB-1	Stopblock Style 1	
500102	SB-2	Stopblock Style 2	
500103	SB-3	Stopblock Style 3	
500104	SB-4	Stopblock Style 4 Shutter Mazak	

Product Code **ISE30A** **Pressure Switch**



Product Code	Product Name	Description	
ISE30A	5ATC-PS	Air Pressure Switch for iSpeed5	

Product Code **8493** **Bracket (L-Type)**



Product Code	Description	
8493	BRACKET (L-Type)	

Product Code **8494** **Bracket (H-Type)**



Product Code	Description	
8494	BRACKET (H-Type)	

1

EmaxEVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

ø1.0"/ø0.98"/ø0.897"

E3000

— One Piece

E3000

— Modular

ø1.18"

ø1.07"/ø0.98"

ø0.897"

E3000

— 30,000rpm

E4000

3

MA

ø0.897"

ø1.0"

ø0.98"

ø1.18"

MS

ø0.75"

ø0.79"

ø0.897"

ø0.91"

ø1.0"

ø0.98"

4

HES

iSpeed5

HTS

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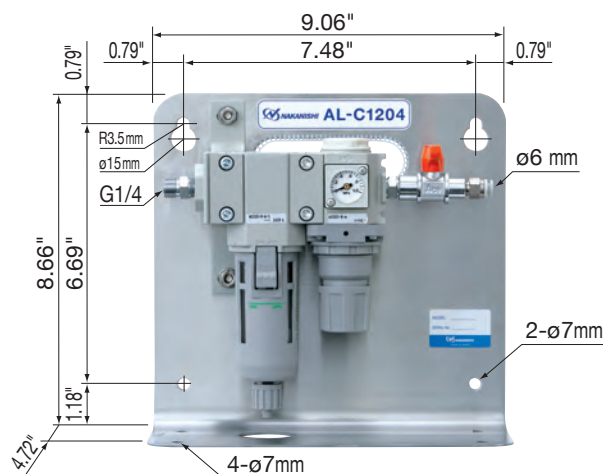
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Product Code **4504**    **AIR LINE KIT**    **AL-C1204**



- The AL-C1204 Air Line Kit is designed to deliver clean, dry air to Electric Motors via the Controller. The filter removes small amounts of debris while the adjustable regulator provides the correct air pressure for cooling and purging.

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

Product Code	Product Name	Standard Equipment · Accessories	
4504	AL-C1204	<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>	

Dramatically shorten mold cavity machining time.

### HTS1501S-BT30 / 40 / 50

150,000 rpm

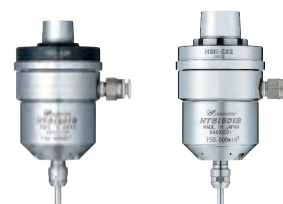
Output : 25W



### HTS1501S-HSK E25 / 32 / 40 / 50

150,000 rpm

Output : 25W



### HTS1501S-HSK A63

150,000 rpm

Output : 25W



### HTS1501S-HSK F63

150,000 rpm

Output : 25W



### HTS1501S-M2040

150,000 rpm

Output : 25W



1

EmaxEVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

ø1.0" / ø0.92" / ø0.897"

E3000

— One Piece

E3000

— Modular

ø1.18"

ø1.07" / ø0.98"

ø0.897"

E3000

— 80,000rpm

E4000

3

MA

ø0.897"

ø1.0"

ø0.98"

ø1.18"

MS

ø0.75"

ø0.79"

ø0.897"

ø0.91"

ø1.0"

ø0.98"

4

HES

iSpeed5

HTS

PLANET

Xspeed

ABT

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ROTUS

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PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

ø1.0"/ø0.98"/ø0.897"

E3000

One Piece

E3000

Modular

ø1.18"

ø1.0"/ø0.98"/ø0.897"

E3000

80,000rpm

E4000

3

MA

ø0.897"

ø1.0"/ø0.98"

ø1.18"

MS

ø0.75"/ø0.79"

ø0.897"/ø0.91"

ø1.0"/ø0.98"

4

HES

iSpeed5

HTS

PLANET

Xspeed

ABT

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## HTS Series Features

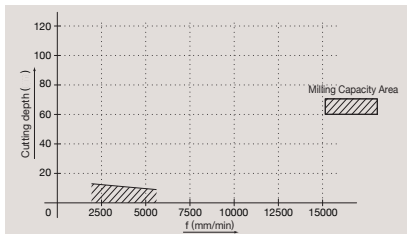
- High Speed 150,000 rpm
- Suitable for cutting tool diameters of less than R0.5mm in reference to Ball End Mills
- Negligible spindle expansion  
Air Turbine mechanism has extremely low heat generation.  
Up to cutting tool R x 0.1 mm depth of cut is possible.
- Very High Feed Rates are possible
- Highly stable milling conditions are possible even with very small diameter cutting tools.  
Usable max. cutting tool diameter : Ball End Mill R0.5 mm, Square End Mill ø1 mm
- Spindle Accuracy is within 1  $\mu$ m
- Dramatically shorten mold cavity machining time

## HTS Series Milling Capacity Reference

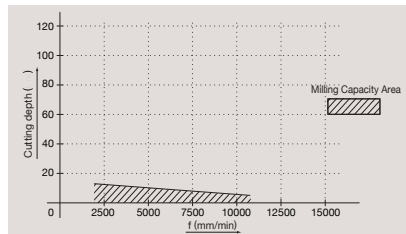
### Milling : Straight Milling / Work : NAK80 / Motor Speed : 150,000 rpm

Caution) 1. Ball End Mill Type with ultra hard coating. Cutting tool capabilities vary depending on the tools being used.  
2. Milling capacity may change depending on the tools being used, the material being cut and other application variables.

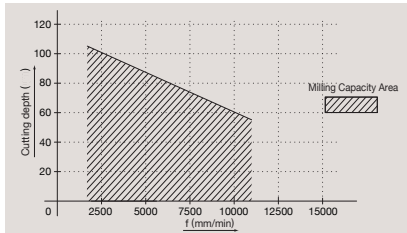
- Ball End Mill Size : R0.05 mm L = 0.1 mm



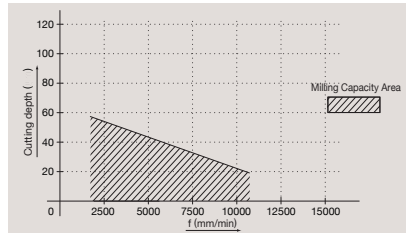
- Ball End Mill Size : R0.1 mm L = 0.5 mm



- Ball End Mill Size : R0.2 mm L = 1.0 mm



- Ball End Mill Size : R0.5 mm L = 2.5 mm



## HTS Series Specifications

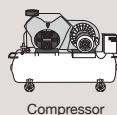
- Speed ..... 150,000 rpm (73PSI)
- Max. Output Power ..... 25W
- Air type ..... Side Air Supply Type
- Shank ..... Straight, BT30 / 40 / 50, HSK E25 / 32 / 40 / 50 / A63 / F63
- Proper Air Pressure ..... 44~73PSI
- Air Consumption ..... 3.18CFM
- Spindle Accuracy ..... Within 1  $\mu$ m
- Hose Diameter (Air Intake) ..... ø6 mm (O.D.)
- Standard Size Collet (CHA-4.0) ..... ø4.0 mm

< Optional >

- Collet (CHA- □□) ..... ø0.5 mm~ø4.0 mm  
(See Page 6-p2 for details)

### HTS Series Connection Drawing

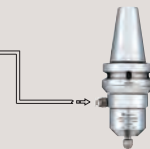
Clean, lubricated, and regulated air is required for HTS Series spindles. Please refer to the diagram to the right for proper connections. AL-M1202 incorporates a filter, regulator and lubricator to provide the appropriate air.



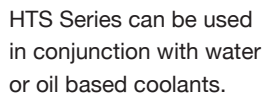
Compressor



Air Line Kit AL-M1202  
(Refer to 4-p22 in detail)

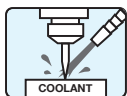


HTS Series

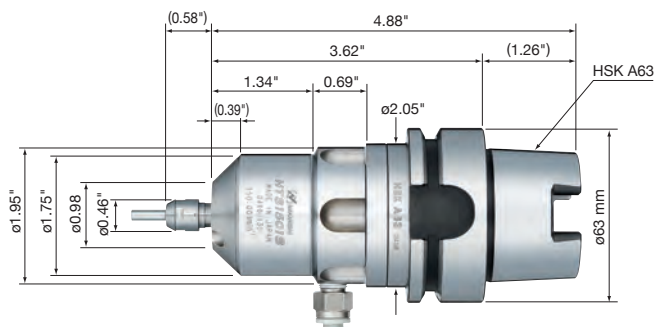








## Product Code 8298 HTS1501S-HSK A63



● HSK A63 taper shanks make this spindle very easy to attach to your machining centers. Very High speed milling is possible.

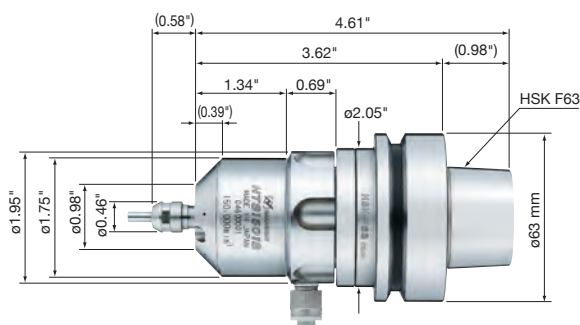
### Air Turbine Spindle

Product Code	Product Name	Weight	
8298	HTS1501S-HSK A63	49.38 oz.	

#### Standard Equipment · Accessories

- Collet  $\phi 4.0$  mm (CHA-4.0) • Collet Nut (CHN-AA)
- Wrench (8 x 5), (9 x 11) : 1 pc. each • Filter Joint (FJ-01)
- Hose (K-247) :  $\phi 6$  mm x 13 ft

## Product Code 8282 HTS1501S-HSK F63



● HSK F63 taper shanks make this spindle very easy to attach to your machining centers. Very High speed milling is possible.

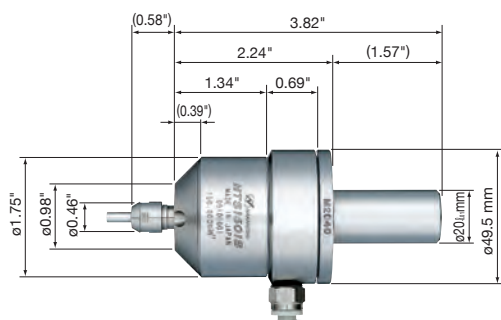
### Air Turbine Spindle

Product Code	Product Name	Weight	
8282	HTS1501S-HSK F63	48.68 oz.	

#### Standard Equipment · Accessories

- Collet  $\phi 4.0$  mm (CHA-4.0) • Collet Nut (CHN-AA)
- Wrench (8 x 5), (9 x 11) : 1 pc. each • Filter Joint (FJ-01)
- Hose (K-247) :  $\phi 6$  mm x 13 ft

## Product Code 8299 HTS1501S-M2040



● Straight shanks make this spindle very easy to attach to smaller machining centers. Very High speed milling is possible.

### Air Turbine Spindle

Product Code	Product Name	Weight	
8299	HTS1501S-M2040	25.04 oz.	

#### Standard Equipment · Accessories

- Collet  $\phi 4.0$  mm (CHA-4.0) • Collet Nut (CHN-AA)
- Wrench (8 x 5), (9 x 11) : 1 pc. each • Filter Joint (FJ-01)
- Hose (K-247) :  $\phi 6$  mm x 13 ft



## Caution

- Do not rotate the machining center's main spindle with the HTS1501 spindle installed.

1

EmaxEVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

$\phi 1.0''/\phi 0.98''/\phi 0.897''$

E3000

— One Piece

E3000

— Modular

$\phi 1.18''$

$\phi 1.07''/\phi 0.98''$

$\phi 0.897''$

E3000

— 80,000rpm

E4000

3

MA

$\phi 0.897''$

$\phi 1.0''$

$\phi 0.98''$

$\phi 1.18''$

MS

$\phi 0.75''$

$\phi 0.79''$

$\phi 0.897''$

$\phi 1.0''$

$\phi 0.98''$

4

HES

iSpeed5

HTS

PLANET

Xpeed

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AIR LINE KIT

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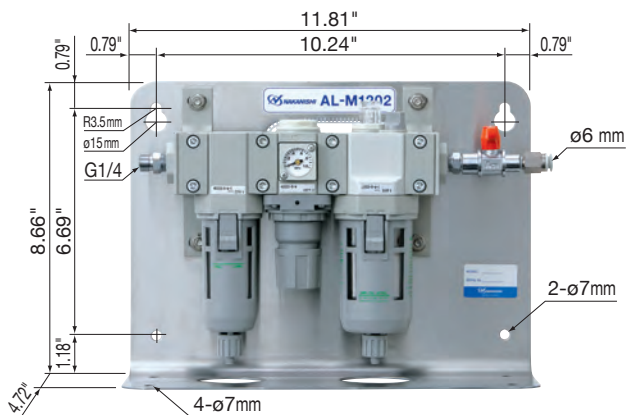
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Product Code **4502** **AIR LINE KIT AL-M1202**



- The AL-M1202 provides simple, automatic conditioning of the air supplied to NAKANISHI Air Motors. The filter removes water and impure substances from the input air supply. The regulator maintains the proper air pressure, and the lubricator ensures proper oil flow to the motor and spindle. This Air Line Kit is wall mountable.

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

Product Code	Product Name	Standard Equipment · Accessories	
4502	AL-M1202	• Air Filter · Air Regulator • Air Pressure Gauge · Lubricator • Air ON-OFF Valve • Hose for Piping (K-275) : 6 ft • Lubricating Oil (K-211) : 1 pc.	

**LUBRICATING OIL**

Lubricating Oil (4 oz.)

Product Code	Product Name	Product	
AA10478C	K-211		

Lubricating Oil (32 oz.)

Product Code	Product Name	Product	
AA10480C	K-202		

## PLANET 600

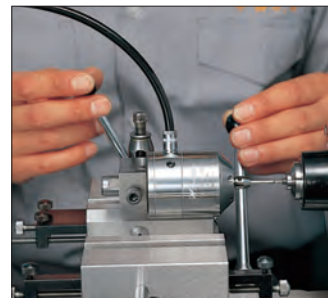
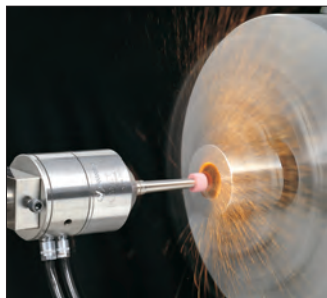
65,000 rpm

- Turns a Milling Machine into a Jig Grinding Machine, a Lathe into Internal Grinding Machine.



## EASILY MOUNTED ON AVAILABLE BORING HEAD.

Typical application example of jig grinding after material hardening.

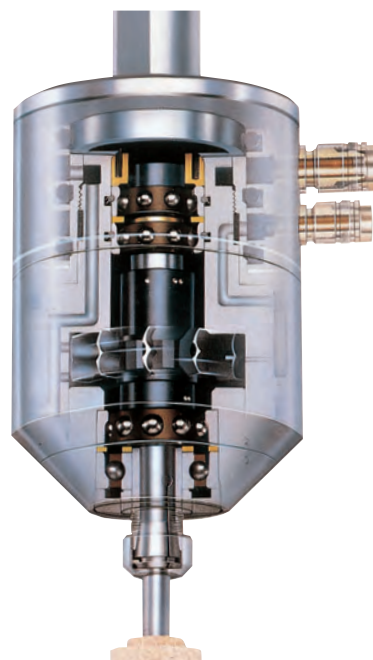


## PLANET Series Features

- The PLANET 600 System has an adapted air exhaust system that keeps noise to a minimum.
- Excellent performance at a relatively low cost.
- Turns a milling machine or machining center into a Jig Grinding machine when attaching a standard adjustable boring head to the machine and utilizing the PLANET 600.
- When mounted in a turning center, the PLANET 600 can be used as a precision internal grinder.
- Can be used as a high speed grinder in specialty built machines.
- Collets ranging from 0.5mm thru 6.35mm are available to accommodate all the most common tool shanks.

### Special Built-In type high speed bearings will withstand extended periods of operation.

Ultra Precision ball bearing technology has been developed due to several years of cooperative studies between Nakanishi and several major bearing manufacturers.

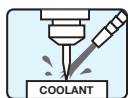


### PLANET Series Connection Drawing

Clean, lubricated, and regulated air is required for PLANET Series spindles. Please refer to the diagram to the right for proper connections. AL-M1202 incorporates a filter, regulator and lubricator to provide the appropriate air.



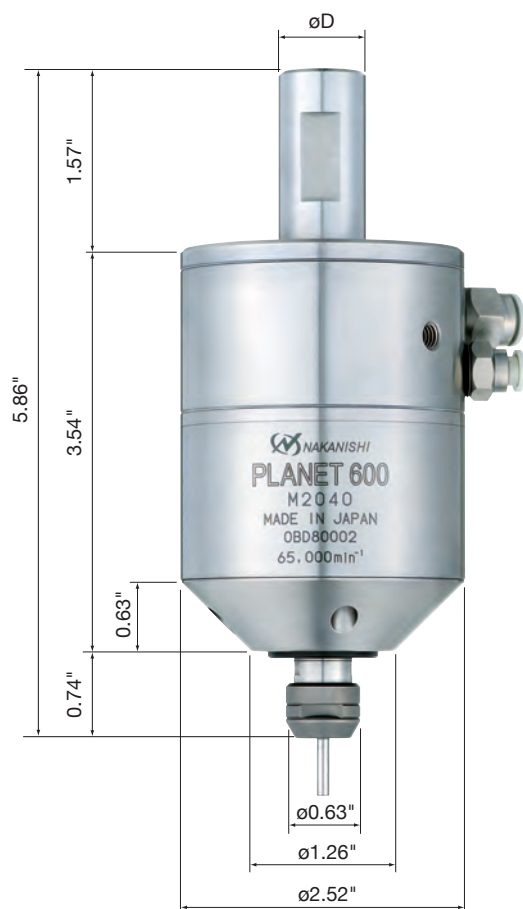




PLANET Series can be used in conjunction with water or oil based coolants.

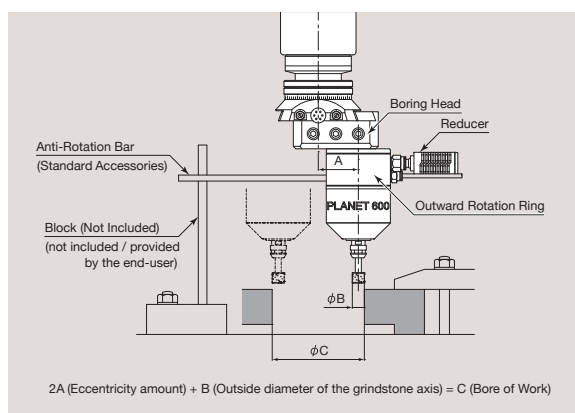
## PLANET 600

65,000 rpm



### Straight Shank : ø20mm, ø3/4"

- Makes Jig Grinding possible for small and large diameter holes ( ~ ø2.76").



### Processable Range

Max. Processable Diameter	ø2.76"
Max. Processable Depth	2.36"
Max. Grindstone Diameter	ø0.63"

- Speed ..... 65,000 rpm
- Air Input ..... Side Air Supply
- Proper Air Pressure ..... 58 PSI
- Air Consumption ..... 6.18 CFM
- Spindle Accuracy ..... Within 1 µm
- Hose Diameter (Air Intake) ..... ø6 mm (O.D.)

### • Additional collet purchase required:

- Collet Series CHK-XX ..... ø0.5mm~ø6.35mm  
Recommended ..... CHK-3.175 ø1/8"  
(See Page 6-p3 for additional sizes)
- Collet Nut ..... K-265

Product Code	Shank øD	Product Name	Standard Equipment · Accessories	Weight
7355	ø20mm x 1.57"	PL600-M2040	• Collet Nut (K-265) : 1 pc. • Intake Air Hose (K-254) with Filter Joint (FJ-01) : ø6 mm x 6 ft : 1 pc. • Silencer : 1 pc. • Anti-Rotation Bar : 1 set • Wrench (12 x 14) : 2 pcs.	3 lb.13.38 oz.
7356	ø3/4" x 1.57"	PL600-H3440		3 lb.13.20 oz.

1

EmaxEVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

ø1.0" ø0.98" ø0.897"

E3000

— One Piece

E3000

— Modular

ø1.18"

ø1.07" ø0.98"

ø0.897"

E3000

— 80,000rpm

E4000

3

MA

ø0.897"

ø1.0"

ø0.98"

ø1.18"

MS

ø0.75"

ø0.79"

ø0.63"

ø0.91"

ø1.0"

ø0.98"

4

HES

iSpeed5

HTS

PLANET

Xspeed

ABT

5

AIR LINE KIT

6

PARTS

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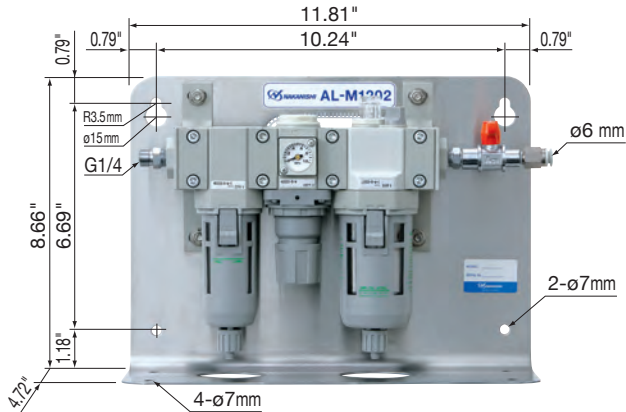
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E3000 One Piece
E3000 Modular
ø1.18"
ø1.0"/ø0.98"/ø0.897"
E3000 80,000rpm
E4000
3
MA
ø0.897"
ø1.0"/ø0.98"
ø1.18"
MS
ø0.75"/ø0.79"
ø0.897"/ø0.91"
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Product Code **4502**    **AIR LINE KIT    AL-M1202**



- The AL-M1202 provides simple, automatic conditioning of the air supplied to NAKANISHI Air Motors. The filter removes water and impure substances from the input air supply. The regulator maintains the proper air pressure, and the lubricator ensures proper oil flow to the motor and spindle. This Air Line Kit is wall mountable.

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

Product Code	Product Name	Standard Equipment · Accessories	
4502	AL-M1202	• Air Filter · Air Regulator • Air Pressure Gauge · Lubricator • Air ON-OFF Valve • Hose for Piping (K-275) : 6 ft • Lubricating Oil (K-211) : 1 pc.	

**LUBRICATING OIL**

Lubricating Oil (4 oz.)

Product Code	Product Name	Product	
AA10478C	K-211		

Lubricating Oil (32 oz.)

Product Code	Product Name	Product	
AA10480C	K-202		



1

EmaxEVO  
ESPERT  
ROTUS  
IMPULSE  
PRESTO II  
Sheenus  
ZERO  
Sonic-Cutter  
ZERO

2

iSpeed3  
E2000  
ø1.0"/ø0.98"/ø0.897"  
E3000  
– One Piece  
E3000  
– Modular  
ø1.18"  
ø1.0"/ø0.98"  
ø0.897"  
E3000  
– 80,000rpm  
E4000

3

MA  
ø0.897"  
ø1.0"  
ø0.98"  
ø1.18"  
MS  
ø0.75"  
ø0.79"  
ø0.897"  
ø0.91"  
ø1.0"  
ø0.98"

4

HES  
iSpeed5  
HTS  
PLANET  
Xpeed  
ABT

5

AIR LINE KIT

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E3000 — One Piece
E3000 — Modular
ø1.18"
ø1.07"/ø0.98" ø0.897"
E3000 — 80,000rpm
E4000
3
MA
ø0.897"
ø1.0" ø0.96"
ø1.18"
MS
ø0.75" ø0.79"
ø0.87" ø0.91"
ø1.0" ø0.98"
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# Air-Turbine

## Air Bearing

### Xpeed1600

160,000 rpm Output : 56W

<Flange Mount>

Outside Diameter  $\phi 1.57"$  ( $\phi 40$  mm)



### Xpeed1200

120,000 rpm Output : 192W

<Flange Mount>

Outside Diameter  $\phi 2.56"$  ( $\phi 65$  mm)



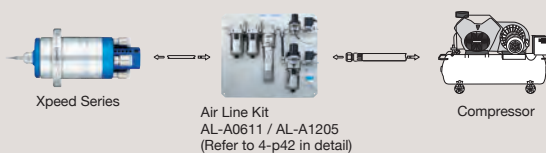
### ◀ AIR BEARING ▶ Xpeed Series

**Xpeed1600 160,000 rpm Output 56W**  
**Xpeed1200 120,000 rpm Output 192W**

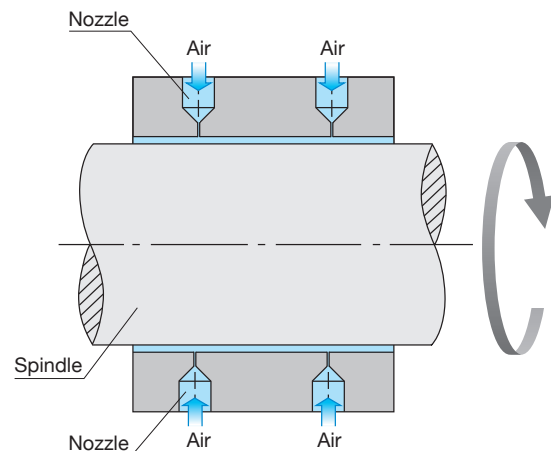
- Ideal for extremely high precision, small diameter machining applications.
- Air bearings use compressed air blown into a small gap between the spindle and the bearing surface. The spindle floats on an even cushion of compressed air. This non-contact type of bearing means the spindle has a very long service life because of low friction and wear ; it also means that the spindle generates almost no heat or vibration.
- The spindle and bearing are finished with a very high-accuracy process to ensure extremely low vibration and very high rotating accuracy.

#### Xpeed Series Connection Drawing

The Xpeed Series motor and spindle require dry, clean, regulated air. Please refer to the drawing for proper components.



#### Principle of Air Bearing



1

EmaxEVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

$\phi 1.0" / \phi 0.98" / \phi 0.897"$

E3000

— One Piece

E3000

— Modular

$\phi 1.18"$

$\phi 1.07" / \phi 0.98"$

$\phi 0.897"$

E3000

— 80,000rpm

E4000

3

MA

$\phi 0.897"$

$\phi 1.0"$

$\phi 0.98"$

$\phi 1.18"$

MS

$\phi 0.75"$

$\phi 0.79"$

$\phi 0.897"$

$\phi 0.91"$

$\phi 1.0"$

$\phi 0.98"$

4

HES

iSpeed5

HTS

PLANET

Xpeed

ABT

5

AIR LINE KIT

6

PARTS

7

TECHNICAL

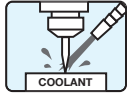
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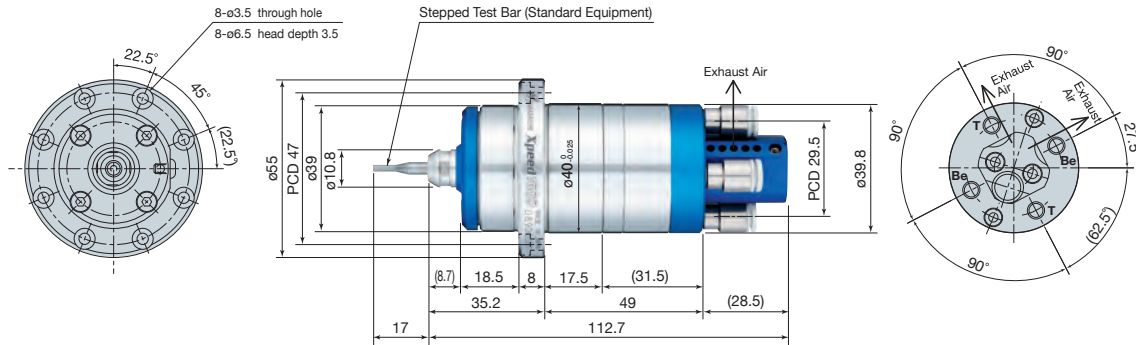


Xpeed Series can be used  
in conjunction with water  
or oil based coolants.

Product Code **1855** **Xpeed1600** O. D.  $\phi 1.57"$  ( $\phi 40$  mm) <Output 56W>

**160,000 rpm**

### Flange Mount



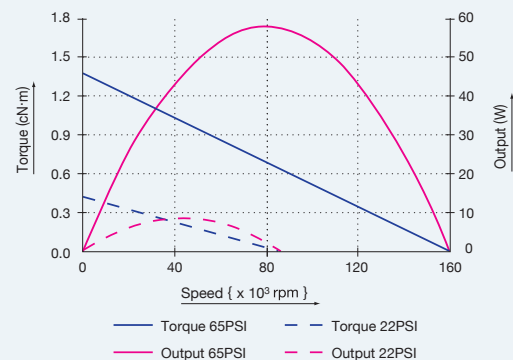
#### < Specifications >

Spindle Accuracy :	Within 1 $\mu$ m
Standard Size Collet (CHA-4.0AA) :	$\phi 4.0$ mm
Main body mount method :	Flange mounting method,
	M3 bolt (8 locations, 45° Angle, PCD47)
Bearing Type :	Static Air Bearing
Proper Air Pressure for Air Bearing :	87 PSI
Air Consumption for Air Bearing :	1.41 CFM
Proper Air Pressure for Air Turbine :	22~65 PSI
Air Consumption for Air Turbine :	5.65 CFM
Bearing Load Capacity :	Radial : Less than 15N
	Thrust : Less than 25N
	(Bearing Air supply pressure 87 PSI)
Useable Max. Diameter of Grindstone :	Less than $\phi 2.0$ mm (For $\phi 4.0$ mm shank)
Hose Diameter :	Bearing supply $\phi 4$ mm (2 locations)
	Turbine Air supply $\phi 6$ mm (2 locations)
Others :	Detection of Rotation Speed Mark

#### < Optional >

Collet (CHA-□□AA) :  $\phi 3.0$  mm,  $\phi 1/8"$ ,  $\phi 4.0$  mm (See Page 6-p2 for details)

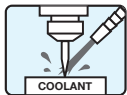
#### • Torque & Output Power Characteristic



Product Code	Product Name	Speed	Max. Output	Weight	
<b>1855</b>	<b>Xpeed1600</b>	160,000 rpm	56W	1 lb. 2.34 oz.	

#### Standard Equipment • Accessories

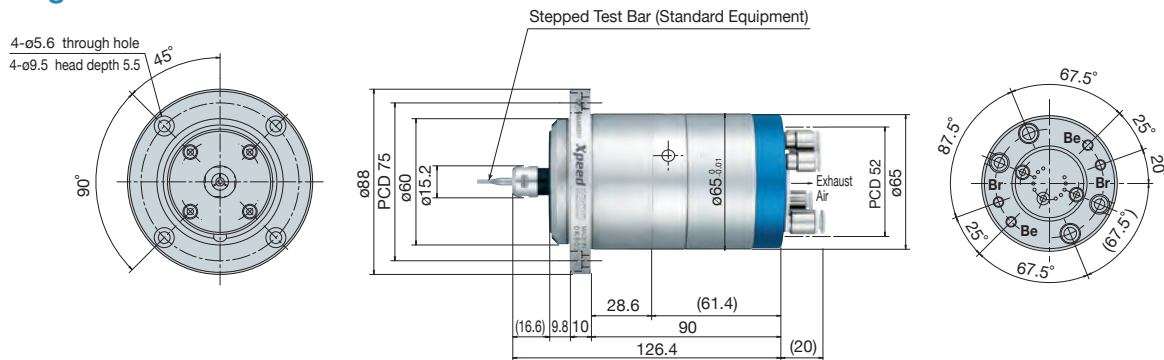
• Collet  $\phi 4.0$  mm (CHA-4.0AA) • Collet Nut (CHN-3A) •  $\phi 4$  mm Hose (transparent 4.5 ft) : 1 pc. •  $\phi 6$  mm Hose (blue 4.5 ft) : 1 pc.  
•  $\phi 6$  mm Air Plug : 2 pcs. •  $\phi 4$  mm Air Plug : 2 pcs. • Stepped Test Bar ( $\phi 2.0$  mm x  $\phi 4.0$  mm x 34L) : 1 pc.  
• Bar Wrench (K-277) : 1 pc. • Torque Wrench (10 mm) : 1 pc. • Allen Wrench (2 mm) : 1 pc.  
• Hexagon Socket Button Head Bolt (M3 x 5L) : 1 pc. • Gasket (for M3 Screw) : 1 pc.



**Note :** Dimensions shown on this page are all in metric (mm). Please divide them by 25.4 for conversion to inch.

**Product Code 1854 Xpeed1200 O. D.  $\phi 2.56'' (\phi 65 \text{ mm})$  <Output 192W> 120,000 rpm**

## Flange Mount



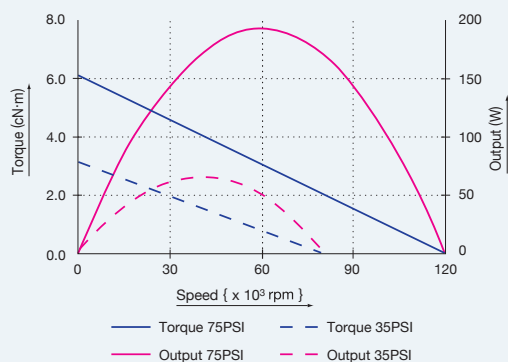
### < Specifications >

Spindle Accuracy :	Within 1 $\mu\text{m}$
Standard Size Collet (CHK-4.0AA) :	$\phi 4.0 \text{ mm}$
Main body mount method :	Flange mounting method, M5 bolt (4 locations, 90° Angle, PCD75)
Bearing Type :	Static Air Bearing
Proper Air Pressure for Air Bearing :	87 PSI
Air Consumption for Air Bearing :	2.83 CFM
Proper Air Pressure for Air Turbine :	35~75 PSI
Air Consumption for Air Turbine :	10.60 CFM
Bearing Load Capacity :	Radial : Less than 25N Thrust : Less than 70N (Bearing Air supply pressure 87 PSI)
Useable Max. Diameter of Grindstone :	Less than $\phi 2.0 \text{ mm}$ (For $\phi 4.0 \text{ mm}$ shank)
Hose Diameter :	Bearing supply $\phi 6 \text{ mm}$ (2 locations) Break Air supply $\phi 6 \text{ mm}$ (2 locations) Turbine Air supply $\phi 6 \text{ mm}$ (2 locations)
Others :	Detection of Rotation Speed Mark

### < Optional >

Collet (CHK-□□AA) :  $\phi 3.0 \text{ mm}$ ,  $\phi 1/8''$ ,  $\phi 4.0 \text{ mm}$ ,  $\phi 6.0 \text{ mm}$ ,  $\phi 1/4''$  (See Page 6-p3 for details)

### • Torque & Output Power Characteristic



Product Code	Product Name	Speed	Max. Output	Weight
1854	Xpeed1200	120,000 rpm	192W	5 lb. 1.13 oz.

#### Standard Equipment • Accessories

• Collet  $\phi 4.0 \text{ mm}$  (CHK-4.0AA) • Collet Nut (K-265A) •  $\phi 6 \text{ mm}$  Hose (transparent 6 ft) : 1 pc. •  $\phi 6 \text{ mm}$  Hose (blue 6 ft) : 1 pc.  
•  $\phi 6 \text{ mm}$  Air Plug : 6 pcs. • Stepped Test Bar ( $\phi 2.0 \text{ mm} \times \phi 4.0 \text{ mm} \times 34\text{L}$ ) : 1 pc. • Wrench (12 x 14) : 1 pc.  
• Torque Wrench (14 mm) : 1 pc.

## ⚠ Caution

- Air bearing spindles require clean dry air for proper operation.
- Never rotate the spindle, change cutting tools or collet without supplying clean, dry air to the bearing surfaces.
- Always supply clean, dry air to the bearing surfaces even when the spindle is not being rotated.
- Do not start the machine process until after stable rotation has been established and verified.

1

EmaxEVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

2

iSpeed3

E2000

$\phi 1.0'' (\phi 25.4 \text{ mm})$

E3000

— One Piece

E3000

— Modular

3

MA

$\phi 0.897''$

$\phi 1.0''$

$\phi 0.98''$

$\phi 1.18''$

MS

$\phi 0.75''$

$\phi 0.79''$

$\phi 0.89''$

$\phi 0.91''$

$\phi 1.0''$

$\phi 0.98''$

4

HES

iSpeed5

HTS

PLANET

Xpeed

ABT

5

AIR LINE KIT

6

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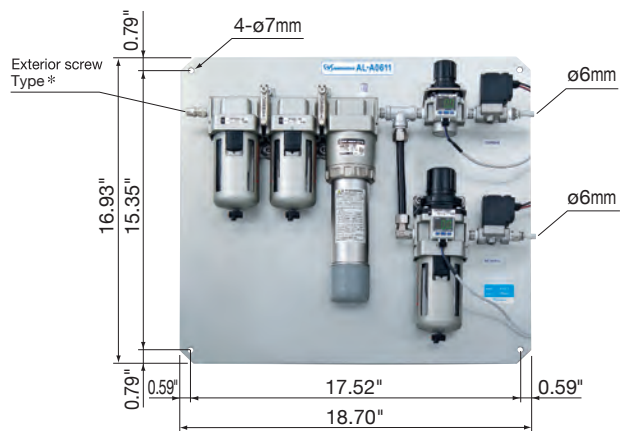
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E3000 - One Piece
E3000 - Modular
ø1.18"
ø1.0"/ø0.98"/ø0.99"
E3000 - 80,000rpm
E4000
3
MA
ø0.997"
ø1.0"/ø0.98"
ø1.18"
MS
ø0.75"/ø0.79"
ø0.97"/ø0.91"
ø1.0"/ø0.98"
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Product Code **1548**    **AIR LINE KIT    AL-A0611**



- The AL-A0611 is a high filtered Air Line Kit utilizing a \*0.01µm micro mist filter system.
  - This Air Line Kit is highly recommended for use on all Xpeed Series Air Turbine / Air Bearing motor/spindles.
- \*Exterior screw Type (Model KK13P-02M by SMC Corporation)

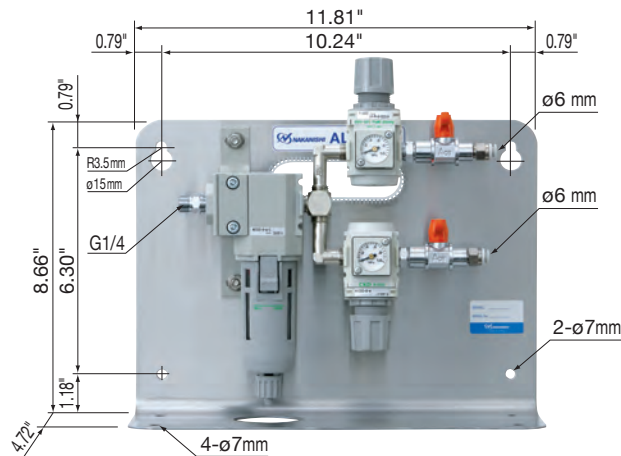
**Air Line Kit (For ø6 mm Hose · Filter Mesh 0.01 µm )**

Product Code	Product Name	Standard Equipment · Accessories	
<b>1548</b>	<b>AL-A0611</b>	• Mist Separator • Micro Mist Separator • Membrane Air Dryer • Regulator · Solenoid Valve • Digital Pressure Switch	

**Fit to**

<b>Spindle</b>	Xpeed1600 · Xpeed1200
----------------	-----------------------

Product Code **4505**    **AIR LINE KIT    AL-A1205**



- This unit is also designed for use on Air Turbine / Air Bearing Motor/Spindles such as the Xpeed1600. One air output drives the Air Turbine Motor. The other air output drives the Air Bearing Spindle.
- Always supply air to the Air Bearing Spindle before starting the Air Turbine Motor. When stopping the spindle, always stop the Air Turbine Motor before removing the air from the Air Bearing Spindle.

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

Product Code	Product Name	Standard Equipment · Accessories	
<b>4505</b>	<b>AL-A1205</b>	• Air Filter · Air Regulator • Air Pressure Gauge • Air ON-OFF Valve • Hose for Piping (K-275) : 6 ft	

**Fit to**

<b>Spindle</b>	Xpeed1600
----------------	-----------



## ABT-1000

100,000 rpm Output : 88W

<Straight Type>

Outside Diameter  $\phi 1.57"$  ( $\phi 40$  mm)



## Features

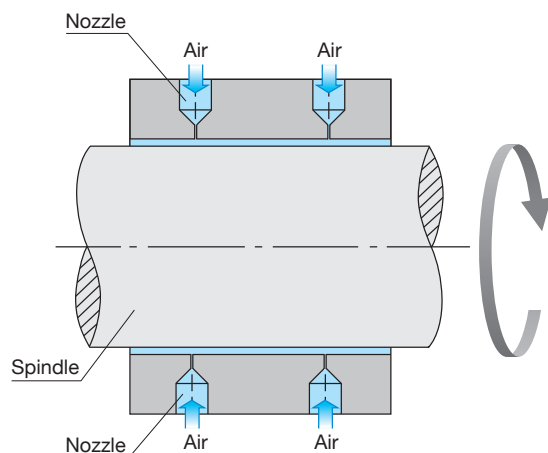
- Ideal for extremely high precision, small diameter machining applications.
- Air bearings use compressed air blown into a small gap between the spindle and the bearing surface. The spindle floats on an even cushion of compressed air. This non-contact type of bearing means the spindle has a very long service life because of low friction and wear ; it also means that the spindle generates almost no heat or vibration.
- The spindle and bearing are finished with a very high-accuracy process to ensure extremely low vibration and very high rotating accuracy.
- The ABT Series are equipped with a Rotational Speed Detection Sensor. When in operation, a digital pulse signal representing the RPM can be output. The rotation speed and load condition can be monitored using a high performance, locally available speed meter.

### ABT Series Connection Drawing

The ABT Series motor and spindle require dry, clean, regulated air. Please refer to the drawing for proper components.



### Principle of Air Bearing



1

EmaxEVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

$\phi 1.0" / \phi 0.98" / \phi 0.897"$

E3000

— One Piece

E3000

— Modular

$\phi 1.18"$

$\phi 1.07" / \phi 0.98"$

$\phi 0.897"$

E3000

— 80,000rpm

E4000

3

MA

$\phi 0.897"$

$\phi 1.0"$

$\phi 0.98"$

$\phi 1.18"$

MS

$\phi 0.75"$

$\phi 0.79"$

$\phi 0.897"$

$\phi 1.0"$

$\phi 0.98"$

4

HES

iSpeed5

HTS

PLANET

Xspeed

ABT

5

AIR LINE KIT

6

PARTS

7

TECHNICAL

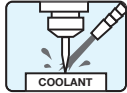
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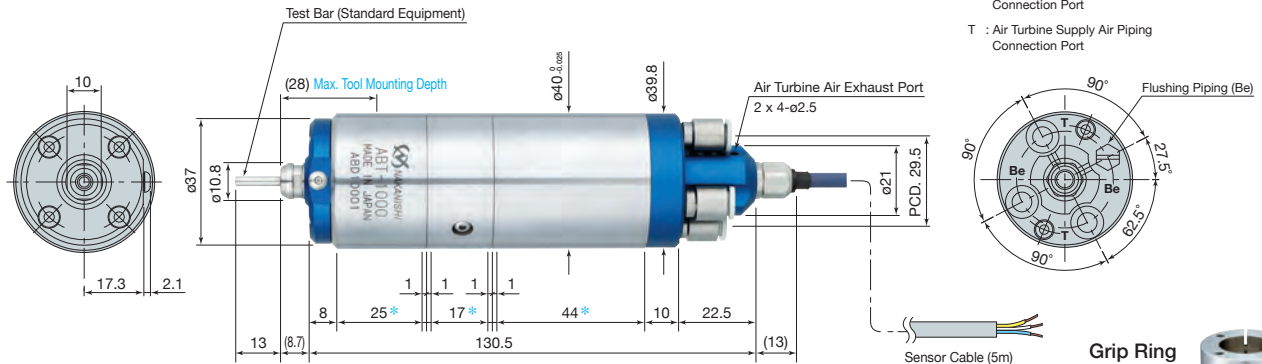
ABT Series can be used in conjunction with water or oil based coolants.

**Note** : Dimensions shown on this page are all in metric (mm). Please divide them by 25.4 for conversion to inch.

Product Code **1856** **ABT-1000** O. D.  $\phi 1.57"$  ( $\phi 40$  mm) <Output 88W>

**100,000 rpm**

### Straight Type



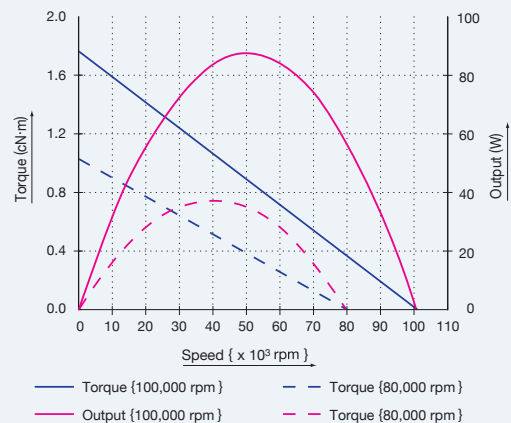
#### < Specifications >

Spindle Accuracy :	Within 1 $\mu$ m
Main body mount method :	Outside Mounting Diameters clamp method
Bearing Type :	Static Air Bearing
Proper Air Pressure for Air Bearing :	80 PSI
Air Consumption for Air Bearing :	Less than 1.77 CFM
Proper Air Pressure for Air Turbine :	80 PSI
Air Consumption for Air Turbine :	4.24 CFM
Bearing Load Capacity :	Radial : Less than 20N Thrust : Less than 35N (Bearing Air supply pressure 80 PSI)
Useable Max. Diameter of Grindstone :	Less than $\phi 2.0$ mm (For $\phi 4.0$ mm shank)
Hose Diameter :	Bearing supply $\phi 6$ mm (1 location) Turbine Air supply $\phi 6$ mm (2 locations)
Others :	Rotational Speed Detection Sensor with 5 meter cable

#### < Optional >

Collet (CHA-□□) :  $\phi 0.5$  mm ~  $\phi 4.0$  mm (See Page 6-p2 for details)

#### • Torque & Output Power Characteristic



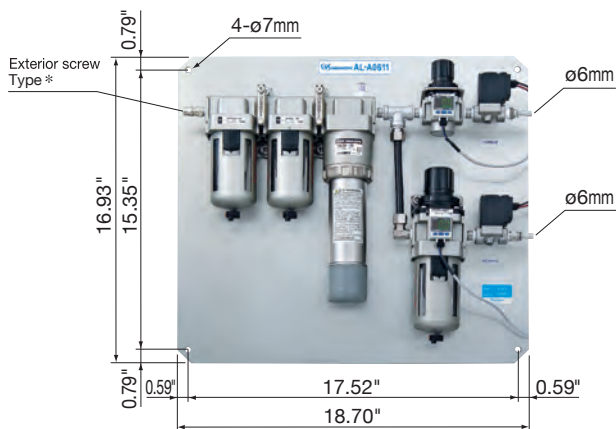
Product Code	Product Name	Speed	Max. Output	Weight	
<b>1856</b>	<b>ABT-1000</b>	100,000 rpm	88W	1 lb. 12.92 oz.	

Standard Equipment · Accessories	<ul style="list-style-type: none"> <li>• Collet Nut (CHN-3A) · Test Bar (<math>\phi 3.0</math> mm x 40L) : 1 pc. · Bar Wrench (K-277) : 1 pc.</li> <li>• Wrench (10 x 10) : 1 pc. · Allen Wrench (2 mm) : 1 pc. · Hexagon Socket Button Head Bolt (M3 x 5L) : 1 pc.</li> <li>• Gasket (for M3 Screw) : 1 pc. · Protective Cover : 1 pc. · Connection Joint (KQ2S06-M5N) : 3 pcs.</li> <li>• Connection Joint (M-5P) : 1 pc. · Cap (K1020A223) : 1 pc.</li> </ul>
----------------------------------	--

### ⚠ Caution

- Air bearing spindles require clean dry air for proper operation.
- Never rotate the spindle, change cutting tools or collet without supplying clean, dry air to the bearing surfaces.
- Always supply clean, dry air to the bearing surfaces even when the spindle is not being rotated.
- Do not start the machine process until after stable rotation has been established and verified.

Product Code **1548** **AIR LINE KIT AL-A0611**



- The AL-A0611 is a high filtered Air Line Kit utilizing a \*0.01µm micro mist filter system.
  - This Air Line Kit is highly recommended for use on all ABT Series Air Turbine / Air Bearing motor/spindles.
- \*Exterior screw Type (Model KK13P-02M by SMC Corporation)

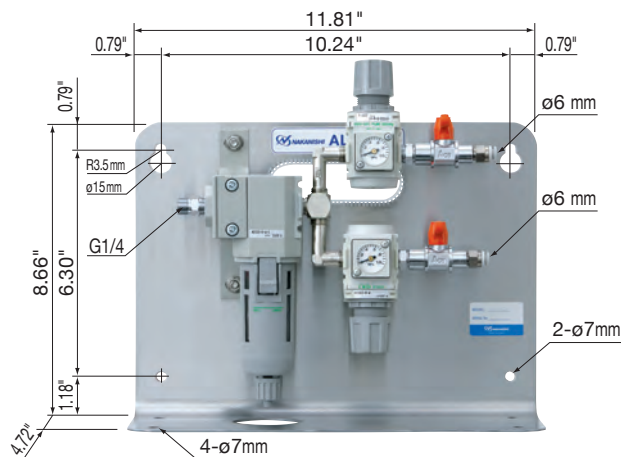
**Air Line Kit (For ø6 mm Hose · Filter Mesh 0.01 µm )**

Product Code	Product Name	Standard Equipment · Accessories	
<b>1548</b>	<b>AL-A0611</b>	<ul style="list-style-type: none"> <li>• Mist Separator</li> <li>• Micro Mist Separator</li> <li>• Membrane Air Dryer</li> <li>• Regulator · Solenoid Valve</li> <li>• Digital Pressure Switch</li> </ul>	

**Fit to**

Spindle	ABT-1000
---------	----------

Product Code **4505** **AIR LINE KIT AL-A1205**



- This unit is also designed for use on Air Turbine / Air Bearing Motor/Spindles such as the ABT Series. One air output drives the Air Turbine Motor. The other air output drives the Air Bearing Spindle.
- Always supply air to the Air Bearing Spindle before starting the Air Turbine Motor. When stopping the spindle, always stop the Air Turbine Motor before removing the air from the Air Bearing Spindle.

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

Product Code	Product Name	Standard Equipment · Accessories	
<b>4505</b>	<b>AL-A1205</b>	<ul style="list-style-type: none"> <li>• Air Filter · Air Regulator</li> <li>• Air Pressure Gauge</li> <li>• Air ON-OFF Valve</li> <li>• Hose for Piping (K-275) : 6 ft</li> </ul>	

**Fit to**

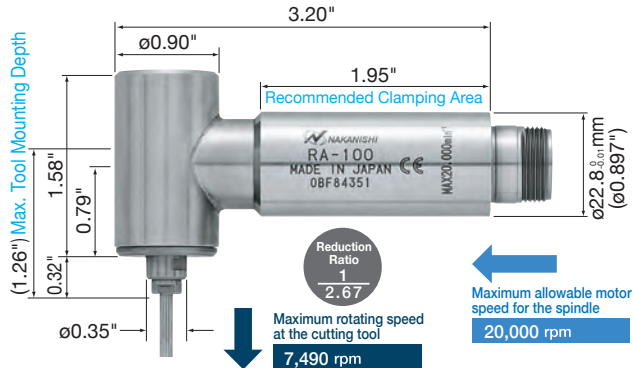
Spindle	ABT-1000
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# MACHINE TOOL SPINDLES INFORMATION

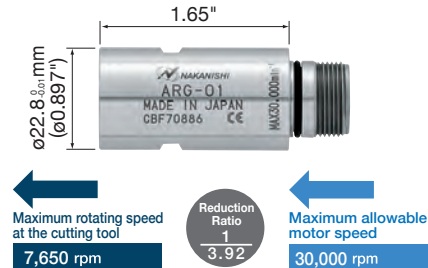
## Maximum Motor Speed for Angle Type Spindles / Speed Reducers.

- When using an angle type spindle or a speed reducer, do not exceed the maximum motor speed or the reducer.

Example : 90° Angle Spindle RA-100  
(Reduction Ratio = 1 : 2.67)



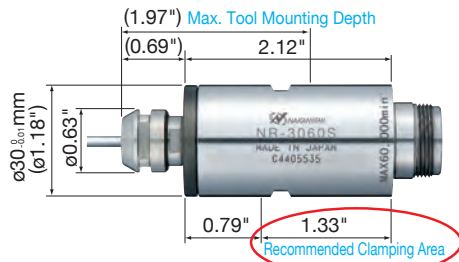
Example : Speed Reducer ARG-01  
(Reduction Ratio = 1 : 3.92)



## "Recommended Clamping Area" and "Maximum Motor Speed"

- Please refer to the picture below for proper clamping location.

Example : Spindle NR-3060S



Please refer to the appropriate spindle's catalog page for dimensions.

- The allowable motor speed is printed on the spindle housing.

Example : Spindle NR-3060S 60,000 rpm



Please refer to the appropriate spindle's catalog page for dimensions.

## "External Input / Output Control Signal Specifications"

- For iSpeed3, iSpeed5, E2000, E3000 & E4000 control signal specifications, please refer to TECHNICAL DATA (7-p2~p39) for complete details.

• iSpeed3



• iSpeed5



• E2000



• E3000

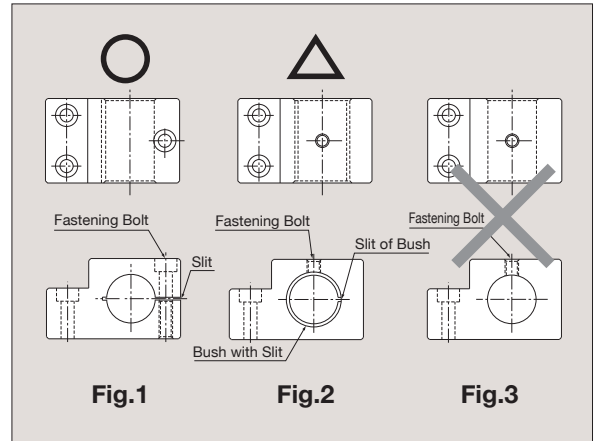


• E4000



## 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 damage to the spindle.  
(Refer to the recommended clamping area drawing in this catalog.)
- Tighten the spindle in the holder using a well-calibrated torque wrench. The correct torque will be different depending on the holder type and accuracy.

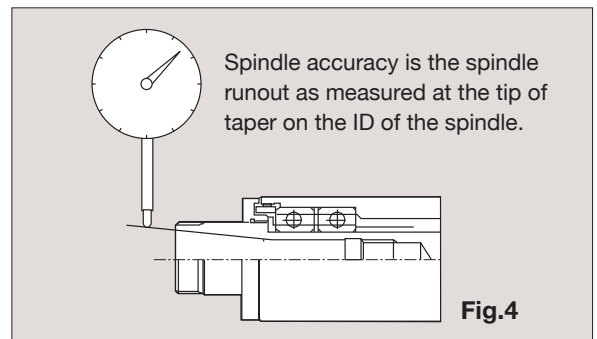


### Caution

- 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.

## Spindle Accuracy

- NAKANISHI's spindle accuracy is measured by the method indicated in the drawings shown in Fig.4.



## Lubricating Oil

- Lubricating oil is required for air motors, air turbine motors. Please use our standard lubricating oil, or Chevron Superla white oil #9.



• Lubricating Oil (4 oz.)



• Lubricating Oil (32 oz.)

## Drilling Capacity Reference Table

This table summarizes the drilling capacity for the spindles. Please use this table as a guide for the selection of the proper model given the torque, speed and size requirements for your application. Data is given for three materials, Iron, Stainless Steel and Aluminum.

\*Conditions : High speed steel drill was used with a feed rate of 60 mm/min. Tool life was not considered in determining the above capacities.  
Use this table as a reference to extrapolate suitability for a given application.

\*Cutting tool capabilities vary depending on the tools being used or cutting conditions.

### E3000 Series (Page 2-p37~)

- The following table expresses the E3000 milling & drilling capacity with the max usable cutting tool diameter under our conditions.

ø : Tool Size (mm) S : Spindle Motor Speed {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	ø2.0	ø2.0	ø2.5	ø1.5	ø3.0
	S16,000 / F480	S12,000 / F250	S57,000 / F2,400	S18,000 / f 0.06	S10,000 / f 0.01	S23,000 / f 0.08
EM25-S6000	ø1.5	ø1.5	ø1.5	ø2.0	ø1.0	ø2.5
	S20,000 / F1,000	S16,000 / F700	S60,000 / F5,000	S20,000 / f 0.05	S12,000 / f 0.01	S23,000 / f 0.07
EM20-S6000	ø1.5	ø1.5	ø1.5	ø2.0	ø1.0	ø2.5
	S20,000 / F100	S16,000 / F100	S60,000 / F1,000	S20,000 / f 0.05	S12,000 / f 0.01	S23,000 / f 0.07

### E2000 Series (Page 2-p17~)

- The following table expresses the E2000 milling & drilling capacity with the max usable cutting tool diameter under our conditions.

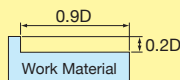
ø : Tool Size (mm) S : Spindle Motor Speed {rpm} F : Feed Rate (mm/min) f : Drilling Step (mm/rev)

	Milling			Drilling		
	S50C (Iron)	SUS304 (Stainless Steel)	A2017 (Aluminum)	S50C (Iron)	SUS304 (Stainless Steel)	A2017 (Aluminum)
NR-303+ EM25-5000-J4	ø1.5	ø1.5	ø2.0	ø1.5	ø1.0	ø2.5
	S20,000 / F600	S18,000 / F540	S30,000 / F1,500	S20,000 / f 0.05	S15,000 / f 0.01	S25,000 / f 0.03
NR-303+ARG-01+ EM25-5000-J4	ø3.0	ø2.5	ø4.0	ø2.5	ø1.5	ø3.5
	S7,500 / F380	S7,500 / F300	S7,500 / F750	S7,500 / f 0.08	S5,000 / f 0.02	S7,500 / f 0.1

#### \*End Mill Cutting Condition

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

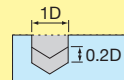
\*Milling Depth/per  
1D : End Mill Size



#### \*Drilling Conditions

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

\*Drilling/Step  
D : Drilling Size



### MA Series (Page 3-p1~)

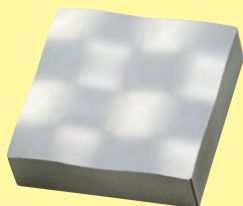
Combination as System			Speed {rpm}	Output (W)	Max. Torque (cN·m)	Max. Drill Diameter for drilling (mm)		
Motor	Speed Reducer	Spindle				S45C	Aluminum	Brass
AM-300R	—	NR-2351	30,000	57	6.9	ø1.0	ø1.5	ø2.0
AM-300R	ARG-01 (1/3.92)	NR-2351	8,000	57	26.5	ø1.9	ø2.9	ø3.4
AM-300R	ARG-02 (1/15.39)	NR-2351	2,000	57	100.9	ø2.8	ø3.8	ø4.5
AM-310R	—	NR-2351	30,000	108	13.7	ø1.5	ø2.0	ø3.0
AM-310R	ARG-01 (1/3.92)	NR-2351	8,000	108	51.9	ø2.5	ø3.5	ø4.0
AM-310R	ARG-02 (1/15.39)	NR-2351	2,000	108	201.9	ø3.5	ø4.3	ø4.8
AM-2526R	—	NR-2551	24,000	130	22.5	ø2.0	ø3.0	ø3.5
AM-2526R	ARG-2504N (1/4)	NR-2551	6,000	130	85.3	ø2.7	ø3.8	ø4.4
AM-2526R	ARG-2516N (1/16)	NR-2551	1,500	130	332.2	ø4.3	ø5.2	ø5.5
AM-3020R	—	NR-453E	19,000	130	27	ø2.3	ø4.0	ø4.5
AM-3020R	ARG-011E (1/4)	NR-453E	4,750	130	108	ø3.2	ø5.0	ø5.5
AM-3020R	ARG-021E (1/16)	NR-453E	1,190	130	432	ø4.0	ø6.0	ø6.0







## MS Series (Page 3-p27~)

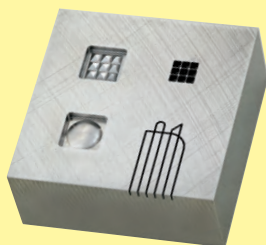
Series Code	Speed {rpm}	Output (W)	Max. Torque (cN·m)	Max. Dia. of Drill (mm)		
				S45C	Aluminum	Brass
MSS-19 Series <Outside Diameter $\phi 0.75"$ >	30,000	72	9.2	$\phi 1.0$	$\phi 1.5$	$\phi 2.0$
MSS-20 Series <Outside Diameter $\phi 0.79"$ >	8,000	72	36	$\phi 2.0$	$\phi 3.0$	$\phi 3.5$
MSS-22 Series <Outside Diameter $\phi 0.87"$ >	2,000	72	141	$\phi 3.0$	$\phi 4.0$	$\phi 4.0$
MSST-23 Series <Outside Diameter $\phi 0.91"$ >	30,000	108	13.7	$\phi 1.5$	$\phi 2.0$	$\phi 3.0$
	8,000	108	52	$\phi 2.5$	$\phi 3.5$	$\phi 4.0$
	2,000	108	202	$\phi 4.0$	$\phi 4.6$	$\phi 5.2$
MSSH-25 Series <Outside Diameter $\phi 1.0"$ >	24,000	130	22.5	$\phi 2.0$	$\phi 3.0$	$\phi 3.5$
MSS-25 Series <Outside Diameter $\phi 0.98"$ >	6,000	130	85	$\phi 2.7$	$\phi 3.8$	$\phi 4.4$
	1,500	130	332	$\phi 4.3$	$\phi 5.2$	$\phi 5.5$

## HES810 (Page 4-p10~)



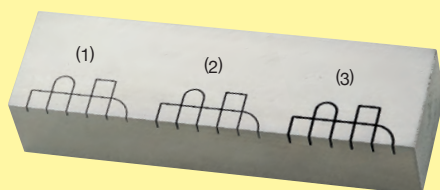
Material		STAVAX (HRC 52) 50 x 50 x 15 (mm)							
Usable Tool		Ultra-Hard Coated Ball End Mill R1.0		CBN Ball End Mill R1.0					
Cutting Process		1. Rough Cutting	2. Semi-Finishing Cutting	3. Finishing Cutting					
Cutting Depth		0.2 x 0.3mm	0.1 x 0.2mm	0.02 x 0.03mm	Total Time	Surface Roughness			
						Cutting Direction		Pf Direction	
						Ryμm	Raμm	Ryμm	Raμm
M/C Main Spindle 20,000 rpm	Work Feed mm / min	1,600	1,600	1,000	2h12min	1.1687	0.1420	1.6646	0.2336
HES810 80,000 rpm						45min	0.8518	0.1305	1.7495

## HTS1501 (Page 4-p17~)



Material	NAK80 (HRC 40)		
Motor Speed	150,000 rpm		
Usable Tool	R 0.2 x 2L Ball End Mill		
Rough Cutting	Ad 0.03 x Rd 0.04mm		
Work Feed	2,000mm/min		
Finishing Cutting	Ad 0.01 x Rd 0.01mm		
Work Feed	1,500mm/min		
Total Time	4h 31min		

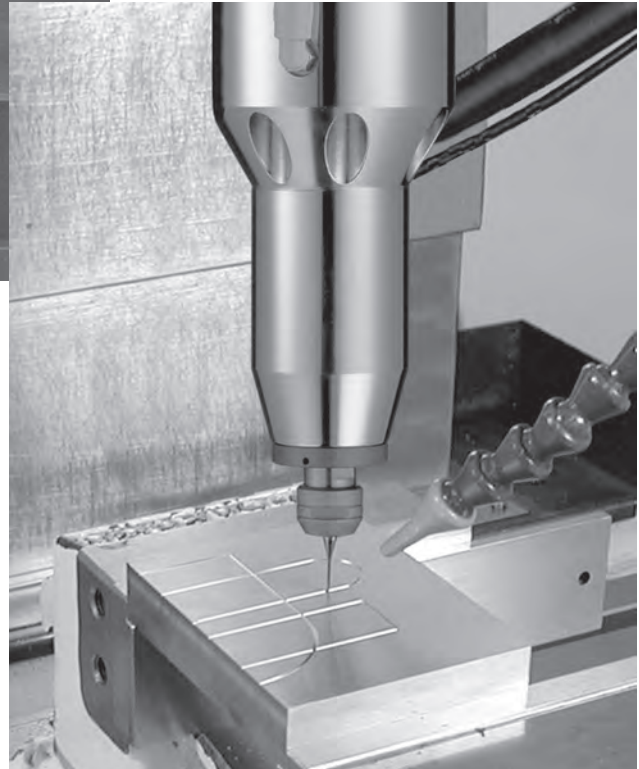
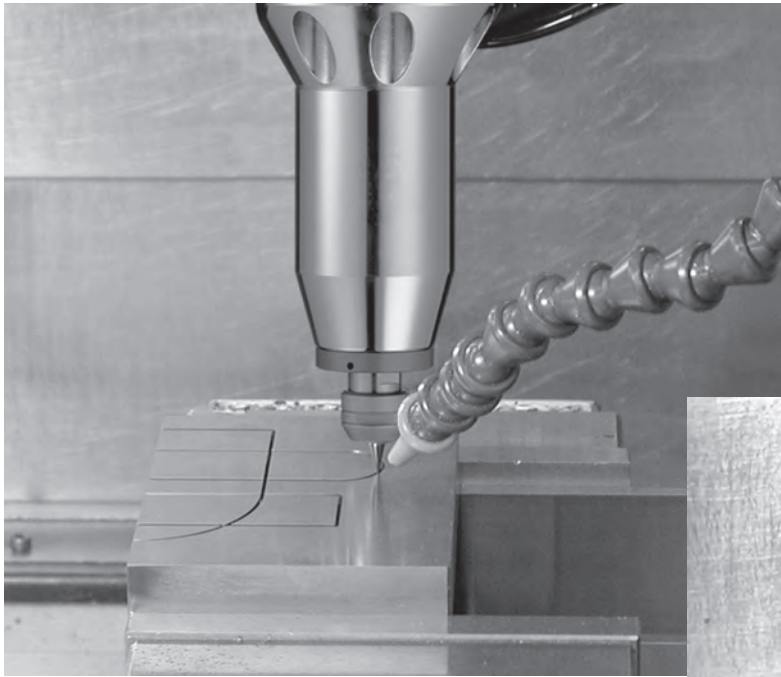
## HTS1501 (Page 4-p17~)



Material	NAK80 (HRC 40)		
Motor Speed	150,000 rpm		
Sample No.	(1)	(2)	(3)
Usable Tool	$\phi 0.2 \times 2$	$\phi 0.3 \times 3$	$\phi 0.4 \times 4$
Cutting Depth	Ad 0.003mm	Ad 0.005mm	Ad 0.007mm
Work Feed	2,000mm/min		
Total Time	29min. 50sec.	27min. 43sec.	26min. 22sec.

## HES SERIES

- APPLICATION EXAMPLE : SMALL DIAMETER END MILLING FOR RIB PROCESSING
- WORK PIECE : FPH40 (HRC35-40)
- WORK CONDITIONS :
  - (1) HES510-NT40
  - ø1 mm END MILLING
  - ; TOOL SPEED : 40,000 rpm ; FEED : 1,000 mm/min ; DEPTH OF CUT : 20 µm
- INSTALLATION : NC MILLING LATHE

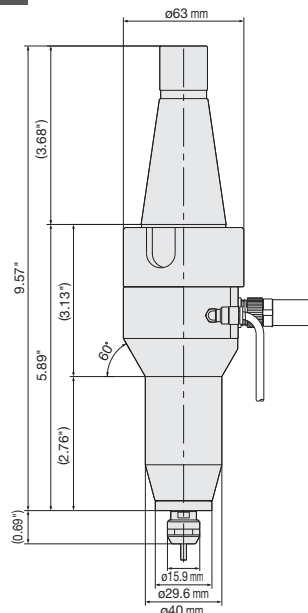


<Application Example, Installation>

### HES SERIES

5,000~50,000 rpm

- HES510-NT40



1

Emax EVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

ø1.0"/ø0.98"/ø0.897"

E3000

— One Piece

E3000

— Modular

ø1.18"

ø1.0"/ø0.98"/ø0.897"

E3000

— 80,000rpm

E4000

3

MA

ø0.897"

ø1.0"

ø0.98"

ø1.18"

MS

ø0.75"

ø0.73"

ø0.897"

ø0.91"

ø1.0"

ø0.98"

4

HES

iSpeed5

HTS

PLANET

Xpeed

ABT

5

AIR LINE KIT

6

PARTS

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## HES SERIES

### • APPLICATION EXAMPLE : COMPLEX PROCESS

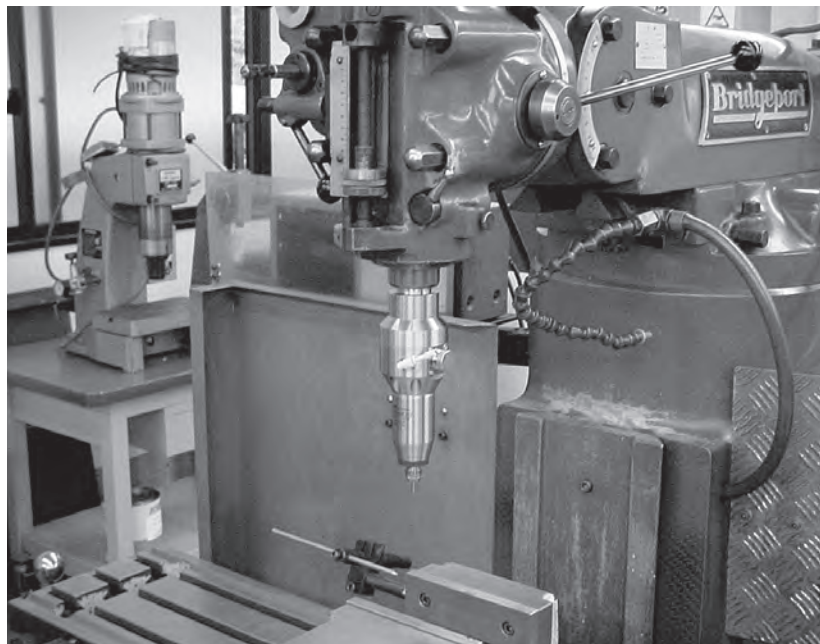
#### • WORK CONDITIONS :

(1) SPINDLE : HES510-R8

MAX POWER : 340 W ; MAX RPM : 50,000 rpm

MACHINE : KNEE MILL

MAX RPM : 4,000 rpm



**EXAMPLE:** NAKANISHI HES510-R8  
MOUNTED DIRECTLY INTO THE MACHINES  
SPINDLE TO ALLOW SECOND OPERATION  
DRILLING, MILLING OR GRINDING  
ON A MACHINE THAT HAS INSUFFICIENT  
RPM FOR SMALL DIAMETER CUTTERS.

1

EmaxEVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

ø1.0"/ø0.98"/ø0.957"

E3000

~ One Piece

E3000

~ Modular

ø1.18"

ø1.0"/ø0.98"

ø0.957"

E3000

~ 50,000rpm

E4000

3

MA

ø0.897"

ø1.0"

ø0.98"

ø1.18"

MS

ø0.75"

ø0.79"

ø0.87"

ø0.91"

ø1.0"

ø0.98"

4

HES

iSpeed5

HTS

PLANET

Xpeed

ABT

5

AIR LINE KIT

6

PARTS

7

TECHNICAL

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### <Application Example, Installation>

#### HES SERIES

5,000~50,000 rpm

• HES510-R8

