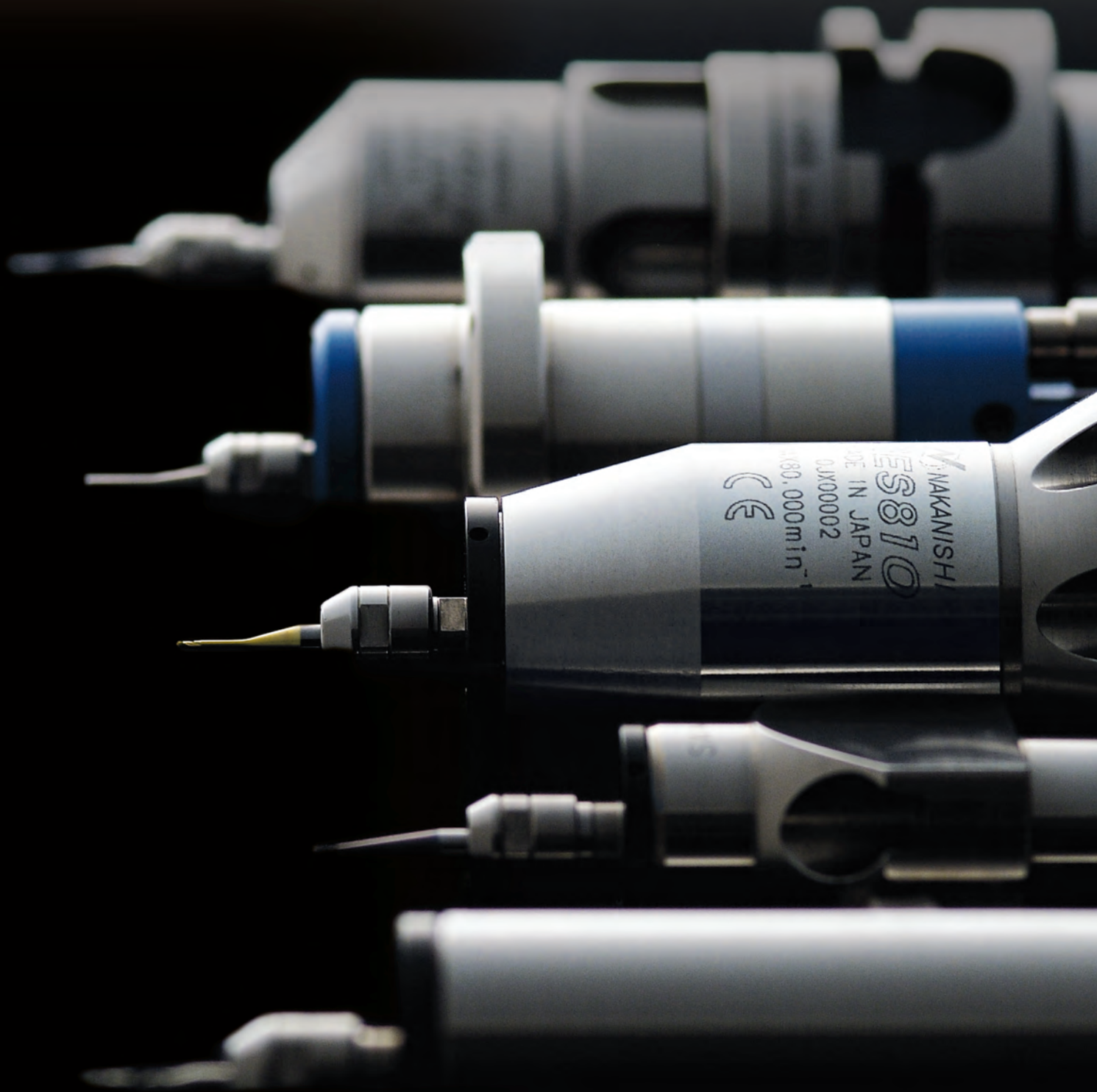


MACHINE TOOLS SPINDLES



Air-speed

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"/ø0.87"/ø0.91"/ø1.0"/ø0.98"

4

HES

iSpeed5

HTS

PLANET

Xpeed

ABT

5

AIR LINE KIT

6

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MA SERIES

- **Modular Type**
- **Outside Diameter :**
ø0.897", ø0.98", ø1.0" and ø1.18"
(ø22.8, ø25, ø25.4 and ø30 mm)



MS SERIES

- **One Piece Type**
- **Outside Diameter :**
ø0.75", ø0.79", ø0.87", ø0.91", ø0.98" and ø1.0"
(ø19.05, ø20, ø22, ø23, ø25 and ø25.4 mm)



Modular Type Spindle

- Separate motor and spindle for flexible application changes.
- Easy to interchange components.



O.D. $\phi 0.897$ "
($\phi 22.8$ mm)
 (Modular Type)
 Angle Spindles and
 Straight Spindles are available.



O.D. $\phi 1.18$ "
($\phi 30$ mm)
 (Modular Type)
 Angle Spindles and
 Straight Spindles are
 available.



O.D. $\phi 0.98$ "/1.0"
($\phi 25/25.4$ mm)
 (Modular Type)
 Straight Spindles are
 available.



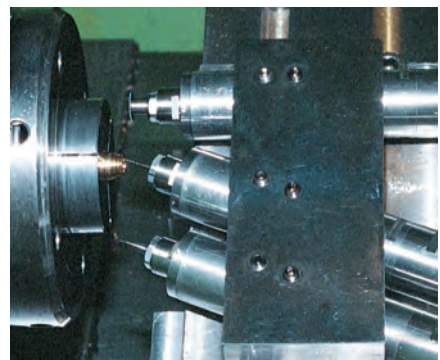
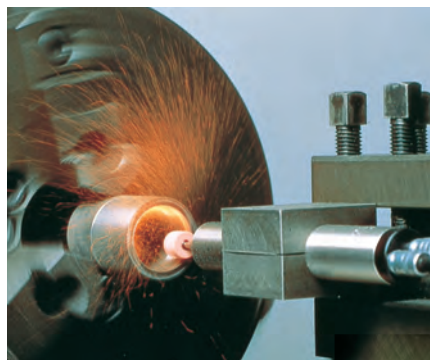
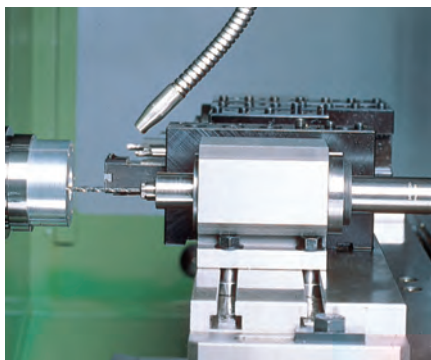
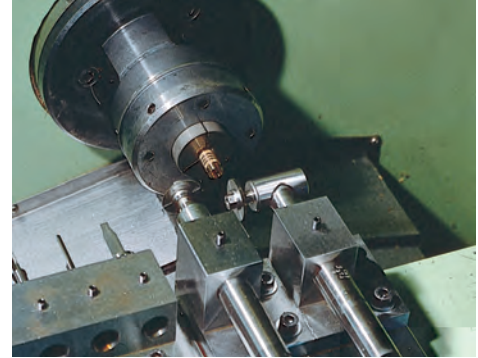
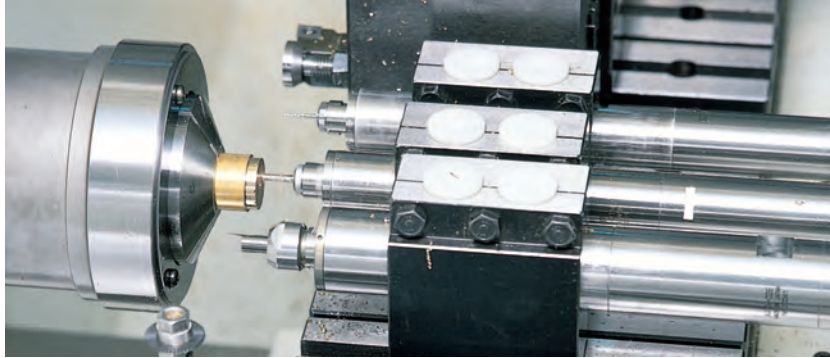
1	EmaxEVO
	ESPERT
	ROTUS
	IMPULSE
	PRESTO II
	Sheenus ZERO
	Sonic-Cutter ZERO
2	iSpeed3
	E2000 $\phi 1.0"/\phi 0.98"/\phi 0.897"$
	E3000 — One Piece
	E3000 — Modular
	$\phi 1.18"$
	$\phi 1.0"/\phi 0.98"/\phi 0.897"$
	E3000 — 30,000rpm
	E4000
3	MA
	$\phi 0.897"$
	$\phi 1.0"$
	$\phi 0.98"$
	$\phi 1.18"$
	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	TECHNICAL DATA
8	APPLICATION EXAMPLES
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FEATURES & DRILLING CAPACITY REFERENCE TABLE

MA Series Features

- Gang slide NC lathes can be transformed into complex machining centers.
- Specialized machine design will be made compact and universal.
- Mounting MA Series on existing equipment can eliminate secondary operations or the equipment can be turned into a special purpose machine.
- The MA Series is applicable to secondary operation machines, single purpose machines or special machining and grinding machines.
- The air motors are explosion proof and do not generate heat even in continuous use.
- When MA Series is used at low motor speed, a speed reducer (ARG-01, or other selections) is added in order to obtain the speed of your choice.
- Collet, Jacobs drill chuck, saw arbor and grinding stone arbor are available for grinding, drilling, milling, slitting, chamfer and deburring operations.

Application Examples



Drilling Capacity Reference Table

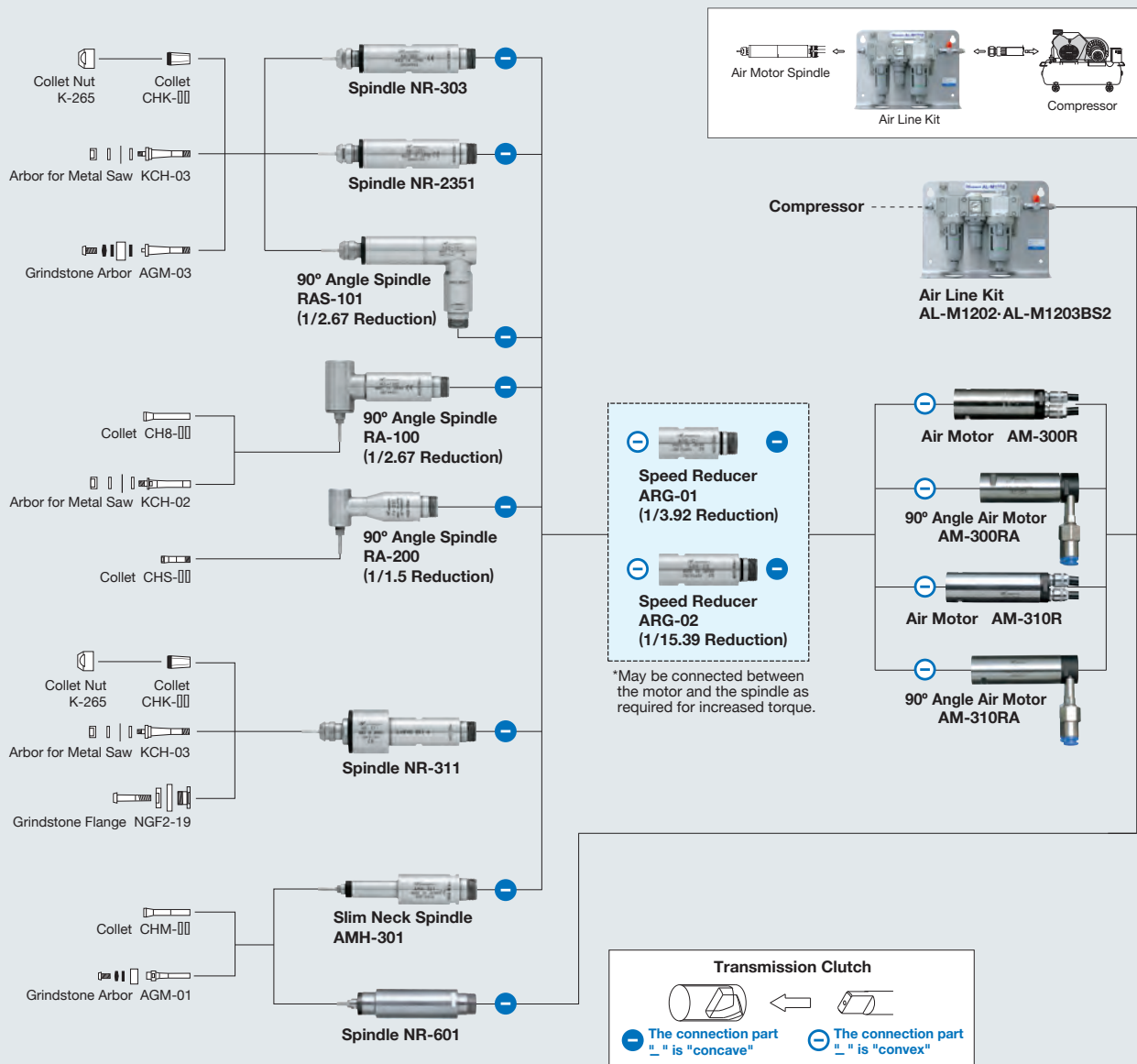
This table summarizes the drilling capacity for the MA Series spindles. Please use this table as a guide for the selection of the proper model given the torque, speed and size requirements for your application. Data is given for three materials Medium Carbon Steel (S45C), aluminum and brass.

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

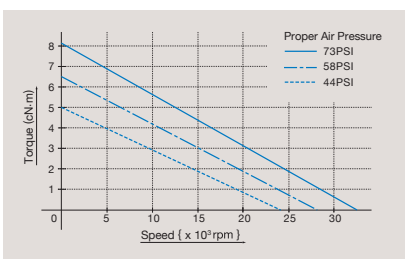
Combination as System			Speed {min ⁻¹ (rpm)}	Output (W)	Max. Torque (cN·m)	Max. Drill Diameter for drilling (mm)		
Motor	Speed Reducer	Spindle				S45C	Aluminum	Brass
AM-300R	—	NR-2351	30,000	57	6.9	ø1.0	ø1.5	ø2.0
AM-300R	ARG-01 (1/3.92)	NR-2351	8,000	57	26.5	ø1.9	ø2.9	ø3.4
AM-300R	ARG-02 (1/15.39)	NR-2351	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

MA Series ø0.897" (ø22.8 mm) System Chart

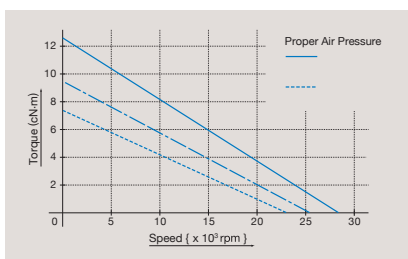
- MA Series has been designed to operate smoothly at high speed for long continuous cutting and grinding by connecting an air line kit directly between the air compressor and the air motor. (Air Line Kit Refer to 3-p10 in detail)
- Air supply and exhaust air hoses are supplied with an air motor. Air supply hose is provided with metal fitting to connect to ø0.24" (ø6 mm) one-touch joint. Air exhaust hose is supplied with silencer.



AM-300R Torque-Speed Characteristics



AM-310R Torque-Speed Characteristics



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

1

Emax EVO
ESPERT
ROTUS
IMPULSE
PRESTO II
Sheenus ZERO
Sonic-Cutter ZERO

2

iSpeed3
E2000
ø1.0" (ø25.4 mm) / ø0.897"
E3000
- One Piece
E3000
- Modular
ø1.18"
ø1.0" (ø25.4 mm) / ø0.897"
E3000
- 80,000rpm
E4000

3

MA
ø0.897"
ø1.0" (ø25.4 mm) / ø0.98"
ø1.18"
MS
ø0.75" (ø19.0 mm) / ø0.79"
ø0.897" (ø22.8 mm) / ø0.91"
ø1.0" (ø25.4 mm) / ø0.98"

4

HES
iSpeed5
HTS
PLANET
Xspeed
ABT

5

AIR LINE KIT

6

PARTS

7

TECHNICAL DATA

8

APPLICATION EXAMPLES

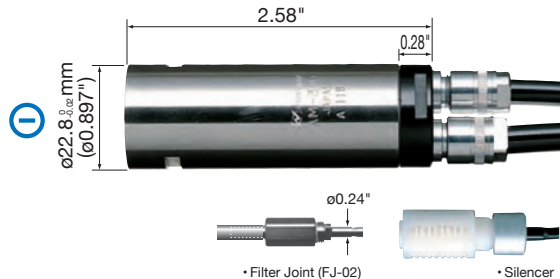
INDEX

HIGH-TORQUE AIR MOTOR O.D. $\phi 0.897"$ ($\phi 22.8\text{mm}$)

- Small diameter $\phi 0.897"$ ($\phi 22.8\text{ mm}$).
- Ultra-precision vane type air motor.
- Outside housing is made of stainless steel (SUS416).

1

Product Code 1021 AIR MOTOR AM-300R (Forward Rotation) 57W 30,000 rpm



- Motor Speed 30,000 rpm(58PSI)
- Max. Output Power 57W
- Proper Air Pressure 44~73PSI
- Air Consumption 3.18CFM
- Motor Hose (Diameter / Length)
 - Air Intake $\phi 3.7$ (I.D.) x $\phi 5.7$ (O.D.) mm / 6 ft
 - Exhaust Air $\phi 5.0$ (I.D.) x $\phi 6.5$ (O.D.) mm / 3 ft
- Weight (w/o hose) 4.76 oz.

2

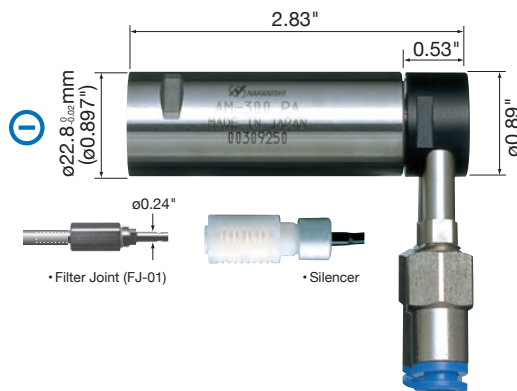
- Ultra precision, compact, vane-type air motor provides high torque with small volume of air consumption. Withstands long continuous operation without heat generation. Silencer keeps noise to a minimum.

Air Motor (R=Forward, L=Reverse)

Product Code	Product Name	Standard Equipment · Accessories	
1021	AM-300R	• Hose (K-221) : 6 ft • Filter Joint (FJ-02) • Silencer (K-209) • Wrench (20 x 24) : 1 pc.	

3

Product Code 1018 90° ANGLE TYPE AIR MOTOR AM-300RA (Forward Rotation) 57W 30,000 rpm



- Motor Speed 30,000 rpm(58PSI)
- Max. Output Power 57W
- Proper Air Pressure 44~73PSI
- Air Consumption 3.18CFM
- Motor Hose (Diameter / Length)
 - Air Intake $\phi 4.0$ (I.D.) x $\phi 6.0$ (O.D.) mm / 6 ft
 - Exhaust Air $\phi 5.5$ (I.D.) x $\phi 8.0$ (O.D.) mm / 3 ft
- Weight (w/o hose) 6.21 oz.

- Air hose is attached on the rear end of air motor at 90° angle which decreases the installation space.

90° Angle Type Air Motor (RA=Forward, LA=Reverse)

Product Code	Product Name	Standard Equipment · Accessories	
1018	AM-300RA	• Hose (K-215) : $\phi 6\text{ mm}$ x 6 ft • Hose (K-216) : $\phi 8\text{ mm}$ x 3 ft • Filter Joint (FJ-01) · Silencer (K-208) • Wrench (20 x 24) : 1 pc.	

5

Product Code 1079 AIR MOTOR AM-310R (Forward Rotation) 108W 30,000 rpm



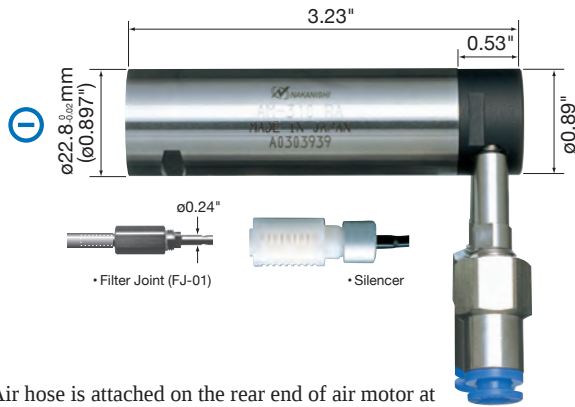
- Motor Speed 30,000 rpm(73PSI)
- Max. Output Power 108W
- Proper Air Pressure 44~73PSI
- Air Consumption 6.71CFM
- Motor Hose (Diameter / Length)
 - Air Intake $\phi 4.5$ (I.D.) x $\phi 6.7$ (O.D.) mm / 6 ft
 - Exhaust Air $\phi 5.5$ (I.D.) x $\phi 7.5$ (O.D.) mm / 3 ft
- Weight (w/o hose) 7.16 oz.

- Ultra-precision, compact, vane-type air motor provides high torque with small volume of air consumption. Withstands long continuous operation without heat generation. Silencer keeps noise to a minimum.

Air Motor (R=Forward, L=Reverse)

Product Code	Product Name	Standard Equipment · Accessories	
1079	AM-310R	• Hose (K-204) : 6 ft • Filter Joint (FJ-02)	
1085	AM-310L	• Silencer (K-208) • Wrench (20 x 24) : 1 pc.	

Product Code **1081** **90° ANGLE TYPE AIR MOTOR AM-310RA (Forward Rotation) 108W 30,000 rpm**



- Air hose is attached on the rear end of air motor at 90° angle which decreases the installation space.

- Motor Speed 30,000 rpm (73PSI)
- Max. Output Power 108W
- Proper Air Pressure 44~73PSI
- Air Consumption 6.00CFM
- Motor Hose (Diameter / Length)
 - Air Intake $\varnothing 4.0$ (I.D.) x $\varnothing 6.0$ (O.D.) mm / 6 ft
 - Exhaust Air $\varnothing 5.5$ (I.D.) x $\varnothing 8.0$ (O.D.) mm / 3 ft
- Weight (w/o hose) 8.61 oz.

90° Angle Type Air Motor (RA=Forward, LA=Reverse)

Product Code	Product Name	Standard Equipment · Accessories	
1081	AM-310RA	• Hose (K-215) : $\varnothing 6$ mm x 6 ft • Hose (K-216) : $\varnothing 8$ mm x 3 ft • Filter Joint (FJ-01) · Silencer (K-208) • Wrench (20 x 24) : 1 pc.	

1

EmaxEVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

$\varnothing 1.0''/\varnothing 0.98''/\varnothing 0.89''$

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

TECHNICAL

DATA

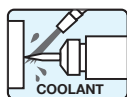
8

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SPINDLE O.D. $\phi 0.897"$ ($\phi 22.8\text{mm}$)

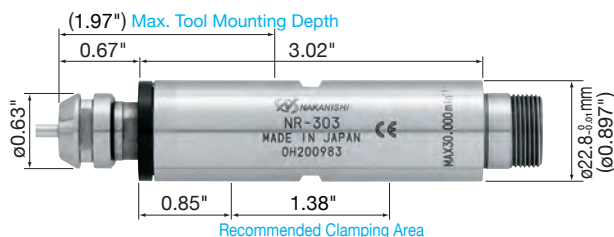


MA Series can be used in conjunction with water or oil based coolants.

1

Product Code **7861** **SPINDLE NR-303**

30,000 rpm



- This spindle is ideal for small diameter drilling, milling and grinding. A wide selection of collets and accessories is available.

- Allowable Motor Speed 30,000 rpm
- Spindle Accuracy Within 2 μm
- Weight 7.58 oz.

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)

- Collet Nut (K-265) For Collet (CHK)
- Metal Saw Arbor (KCH-03) For $\phi 0.24"$ (I.D.) x $\phi 1.18"$ (O.D.)
- Grindstone Arbor (AGM-03) For grinding wheel with I.D. of $\phi 5\text{ mm}$

Spindle

Product Code	Product Name	Standard Equipment · Accessories	
7861	NR-303	• Collet Nut (K-265) : 1 pc. • Wrench (12 x 14) : 2 pcs., (20 x 24) : 1 pc.	

3

Product Code **7855** **SPINDLE NR-2351**

50,000 rpm



- This spindle is ideal for ultra-precision, small diameter drilling, milling and grinding. A wide selection of collets and accessories is available.

- Allowable Motor Speed 50,000 rpm
- Spindle Accuracy Within 1 μm
- Weight 7.58 oz.

Additional collet purchase required:

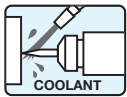
Collet Series CHK-XX $\phi 0.5\text{mm} \sim \phi 6.35\text{mm}$
Recommended CHK-3.175 $\phi 1/8"$
(See Page 6-p3 for additional sizes)

- Collet Nut (K-265) For Collet (CHK)
- Metal Saw Arbor (KCH-03) For $\phi 0.24"$ (I.D.) x $\phi 1.18"$ (O.D.)
- Grindstone Arbor (AGM-03) For grinding wheel with I.D. of $\phi 5\text{ mm}$

Spindle

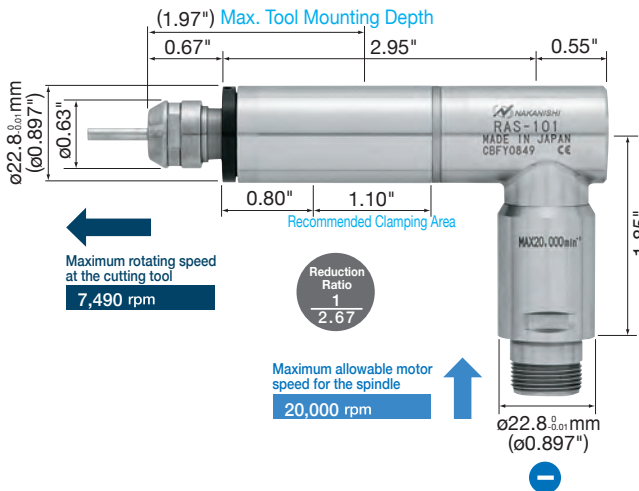
Product Code	Product Name	Standard Equipment · Accessories	
7855	NR-2351	• Collet Nut (K-265) : 1 pc. • Wrench (12 x 14) : 2 pcs., (20 x 24) : 1 pc.	

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



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

Product Code 7839 90° ANGLE SPINDLE RAS-101



- 90° Angle type spindle with wide chucking range up to $\phi 1/4$ " ($\phi 6.35$ mm) is suitable for installations where space restrictions exist.

Maximum allowable motor speed for the spindle **20,000 rpm**

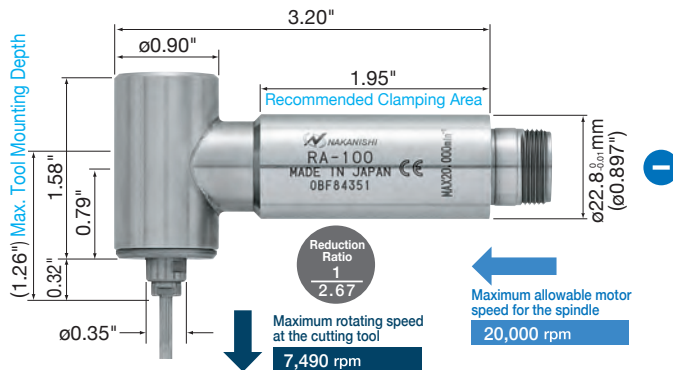
Maximum rotating speed at the cutting tool
<Reduction Ratio : 1/2.67> **7,490 rpm**

- Spindle Accuracy Within 2 μ m
- Weight 11.46 oz.
- Additional collet purchase required:
 - Collet Series CHK-XX $\phi 0.5$ mm~ $\phi 6.35$ mm
 - Recommended CHK-3.175 $\phi 1/8$ "
 - (See Page 6-p3 for additional sizes)
- Collet Nut (K-265) For Collet (CHK)
- Metal Saw Arbor (KCH-03) For $\phi 0.24$ " (I.D.) x $\phi 1.18$ " (O.D.)
- Grindstone Arbor (AGM-03) For grinding wheel I.D. of $\phi 5$ mm

90° Angle Spindle

Product Code	Product Name	Standard Equipment - Accessories	
7839	RAS-101	• Collet Nut (K-265) : 1 pc. • Wrench (12 x 14) : 2 pcs., (20 x 24) : 1 pc.	

Product Code 2902 90° ANGLE SPINDLE RA-100



- This spindle is capable of working on corners difficult to work with straight type, drilling on side face and, slitting of aluminum, brass, etc. with the use of $\phi 1.18$ " ($\phi 30$ mm) Metal Saw.

Maximum allowable motor speed for the spindle **20,000 rpm**

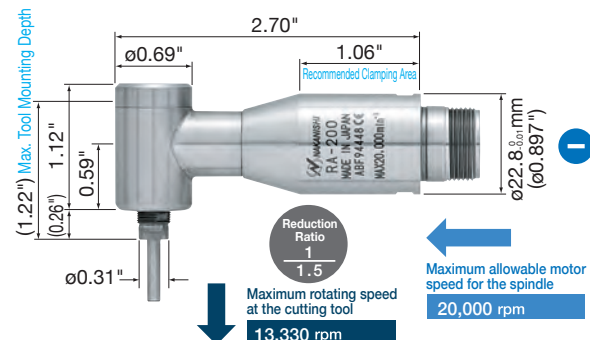
Maximum rotating speed at the cutting tool
<Reduction Ratio : 1/2.67> **7,490 rpm**

- Standard Size Collet (CH8-3.175) $\phi 1/8$ "
- Weight 9.56 oz.
- < Optional >
 - Collet (CH8- □□) $\phi 0.8$ mm~ $\phi 3.175$ mm
 - (See Page 6-p5 for details)
- Metal Saw Arbor (KCH-02) For $\phi 0.24$ " (I.D.) x $\phi 1.18$ " (O.D.)

90° Angle Spindle

Product Code	Product Name	Standard Equipment - Accessories	
2902	RA-100	• Collet $\phi 1/8$" (CH8-3.175) : 1 pc. • Wrench (7 x 5.5), (8 x 5), (20 x 24) : 1 pc. each.	

Product Code 2903 90° ANGLE SPINDLE RA-200



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

Maximum allowable motor speed for the spindle **20,000 rpm**

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

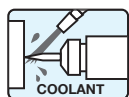
- Standard Size Collet (CHS-3.175) $\phi 1/8$ "
- Weight 5.82 oz.
- < Optional >
 - Collet (CHS- □□) $\phi 0.8$ mm~ $\phi 3.175$ mm
 - (See Page 6-p4 for details)

90° Angle Spindle

Product Code	Product Name	Standard Equipment - Accessories	
2903	RA-200	• Collet $\phi 1/8$" (CHS-3.175) : 1 pc. • Wrench (7 x 5.1), (8 x 5), (20 x 24) : 1 pc. each.	

*Order by product code.

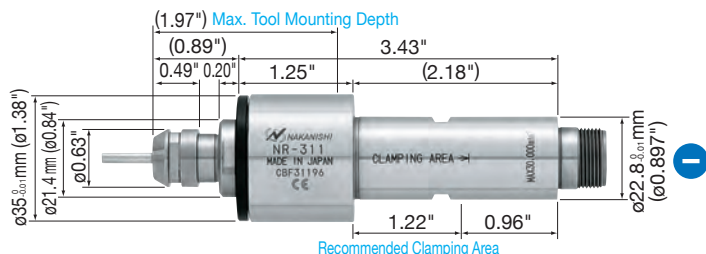
SPINDLE O.D. $\phi 0.897$ "($\phi 22.8$ mm)



1

Product Code **7832** **SPINDLE NR-311**

30,000 rpm



- Large precision angular ball bearings are assembled on the front part of the spindle to provide rigidity on both the radial and the thrust sides. This spindle is suitable for grinding of deep hole, grinding by $\phi 1.57$ " (40 mm) grindstone and small-diameter end milling.

- Allowable Motor Speed 30,000 rpm
- Spindle Accuracy Within 2 μ m
- Weight 13.05 oz.

Additional collet purchase required:

Collet Series CHK-XX $\phi 0.5$ mm~ $\phi 6.35$ mm
 Recommended CHK-3.175 $\phi 1/8$ "
 (See Page 6-p3 for additional sizes)

- Collet Nut (K-265) For Collet (CHK)
- Metal Saw Arbor (KCH-03) For $\phi 0.24$ " (I.D.) x $\phi 1.18$ " (O.D.)
- Grindstone Flange (NGF2-19) $\phi 19.05$ (I.D.) x $\phi 40$ (O.D.) x 7 (W) mm

Spindle

Product Code	Product Name	Standard Equipment · Accessories	
7832	NR-311	• Collet Nut (K-265) : 1 pc. • Wrench (12 x 14), (20 x 24) : 1 pc. each	

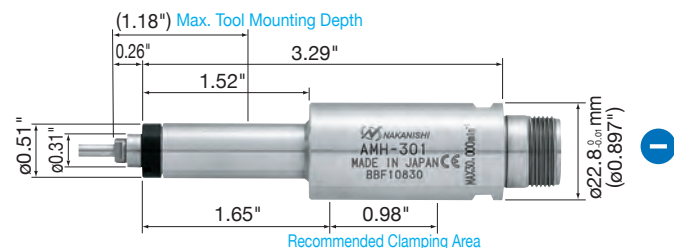
2

iSpeed3
 E2000
 $\phi 1.0$ "($\phi 25.4$ mm)
 E3000
 One Piece
 E3000
 Modular
 $\phi 1.18$ "
 $\phi 1.0$ "($\phi 25.4$ mm)
 E3000
 30,000rpm
 E4000

3

Product Code **2974** **SPINDLE AMH-301**

30,000 rpm



- Suitable for the grinding of the inner surface of slender and deep holes. (Example) If a $\phi 0.55$ " grindstone is mounted on the grinding arbor AGM-01, this spindle is suitable for the inner grinding of $\phi 0.59$ " or more and with the depth of 1.57" or less.

- Allowable Motor Speed 30,000 rpm
- Standard Size Collet (CHM-3.175) $\phi 1/8$ "
- Weight 6.03 oz.

< Optional >

- Collet (CHM-□□) $\phi 1.0$ mm~ $\phi 3.175$ mm
 (See Page 6-p4 for details)
- Grindstone Arbor (AGM-01) For grinding wheel with I.D. of $\phi 5$ mm

Spindle

Product Code	Product Name	Standard Equipment · Accessories	
2974	AMH-301	• Collet $\phi 1/8$" (CHM-3.175) : 1 pc. • Wrench (7 x 5.1), (6 x 4.5), (20 x 24) : 1 pc. each	

4

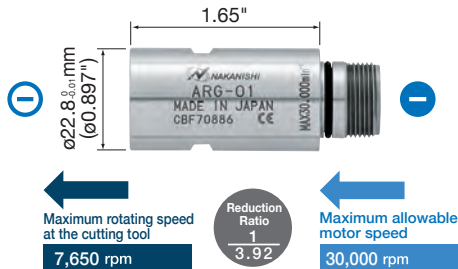
HES
 iSpeed5
 HTS
 PLANET
 Xpeed
 ABT
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SPEED REDUCER O.D. $\phi 0.897$ "($\phi 22.8$ mm)



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

Product Code **1022** **SPEED REDUCER 1/3.92 ARG-01**



Maximum allowable motor speed **30,000 rpm**

Maximum rotating speed at the cutting tool
<Reduction Ratio : 1/3.92> **7,650 rpm**

- Speed Reducing Mechanism By planetary gear system
- Weight 3.81 oz.

- If the speed reducer is connected between the motor and the spindle, it reduces the rotating speed and increases the torque while keeping the motor speed unchanged.

Speed Reducer 1/3.92

Product Code	Product Name	Speed Reduction Ratio	
1022	ARG-01	Speed Reduction Ratio 1/3.92	

Product Code **1023** **SPEED REDUCER 1/15.39 ARG-02**



Maximum allowable motor speed **30,000 rpm**

Maximum rotating speed at the cutting tool
<Reduction Ratio : 1/15.39> **1,940 rpm**

- Speed Reducing Mechanism By planetary gear system
- Weight 5.22 oz.

- If the speed reducer is connected between the motor and the spindle, it reduces the rotating speed and increases the torque while keeping the motor speed unchanged.

Speed Reducer 1/15.39

Product Code	Product Name	Speed Reduction Ratio	
1023	ARG-02	Speed Reduction Ratio 1/15.39	

1

EmaxEVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

$\phi 1.0$ "($\phi 25.4$ mm)/ $\phi 0.897$ "

E3000

— One Piece

E3000

— Modular

$\phi 1.18$ "

$\phi 1.97$ / $\phi 0.98$ "

$\phi 0.897$ "

E3000

— 30,000rpm

E4000

3

MA

$\phi 0.897$ "

$\phi 1.0$ "

$\phi 0.98$ "

$\phi 1.18$ "

MS

$\phi 0.75$ "

$\phi 0.75$ "

$\phi 0.897$ "

$\phi 0.91$ "

$\phi 1.0$ "

$\phi 0.98$ "

4

HES

iSpeed5

HTS

PLANET

Xspeed

ABT

5

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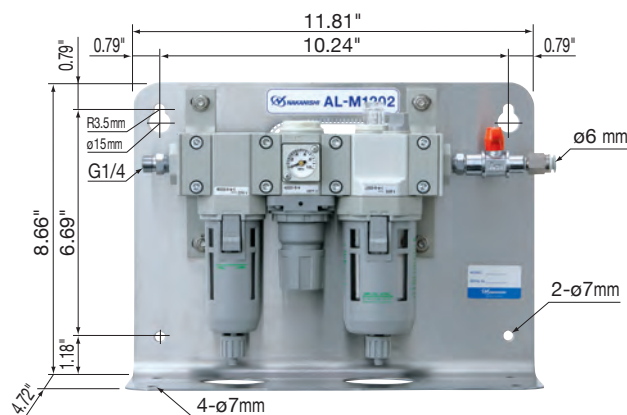
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E3000 One Piece
E3000 Modular
ø1.18"
ø1.0"/ø0.98"/ø0.897"
E3000 80,000rpm
E4000
3
MA
ø0.897"
ø1.0" ø0.98"
ø1.18"
MS
ø0.75" ø0.79"
ø0.87" ø0.91"
ø1.0" ø0.98"
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HTS
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Product Code **4502** **AIR LINE KIT AL-M1202**

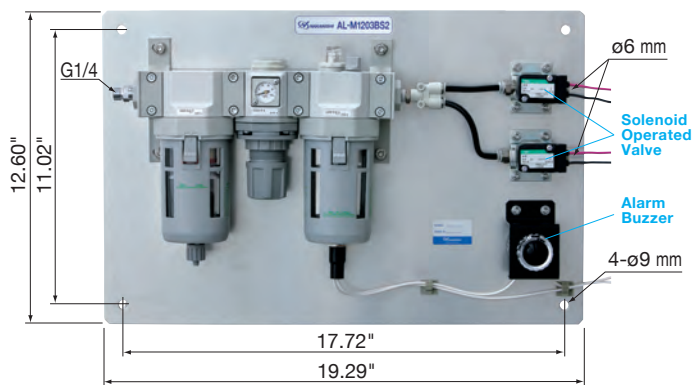


- The AL-M1202 provides simple, automatic conditioning of the air supplied to NAKANISHI Air Motors. The filter removes water and impure substances from the input air supply. The regulator maintains the proper air pressure, and the lubricator ensures proper oil flow to the motor and spindle. This Air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

Product Code **4503** **AIR LINE KIT AL-M1203BS2**



- The AL-M1203BS2 is equipped with 2 (DC+24V) Air Solenoids, a large capacity filter, large capacity oil reservoir, high flow regulator and a low oil level warning alarm, making this unit ideal for use on CNC machines. This Air Line Kit allows for the operation of 2 Air Motors.

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

Product Code	Product Name	Standard Equipment · Accessories	
4503	AL-M1203BS2	• Air Filter · Air Regulator • Air Pressure Gauge · Lubricator • Solenoid Valve (DC 24V) : 2 pcs. • Buzzer (DC 24V) · Hose for Piping (K-275) : 6 ft • Lubricating Oil (K-202) : 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"
ø1.07"/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
Xpeed
ABT

5

AIR LINE KIT

6

PARTS

7

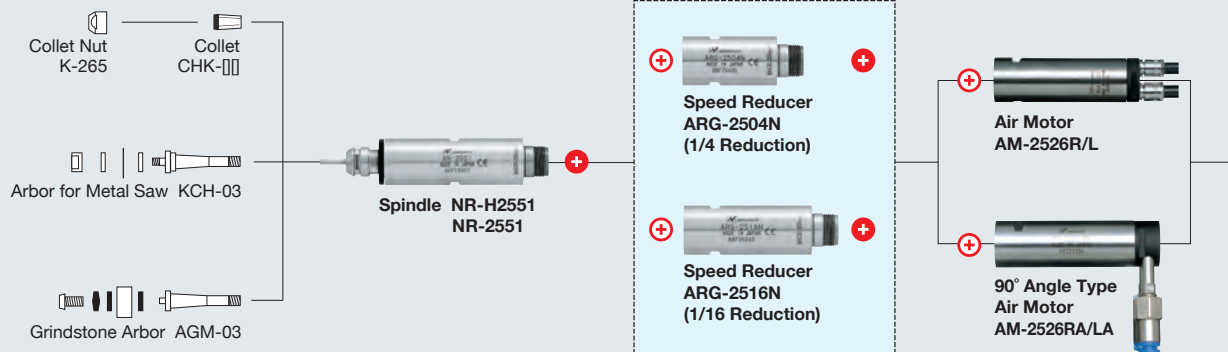
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DATA

8

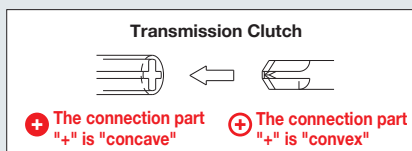
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MA Series ø1.0"(ø25.4 mm), ø0.98"(ø25 mm) System Chart

- MA Series has been designed to operate smoothly at high speed for long continuous cutting and grinding by connecting an air line kit directly between the air compressor and the air motor. (Air Line Kit Refer to 3-p16 in detail)
- Air supply and exhaust air hoses are supplied with an air motor. Air supply hose is provided with metal fitting to connect to ø0.24"(ø6 mm) one-touch joint. Air exhaust hose is supplied with silencer.



*May be connected between the motor and the spindle as required for increased torque.

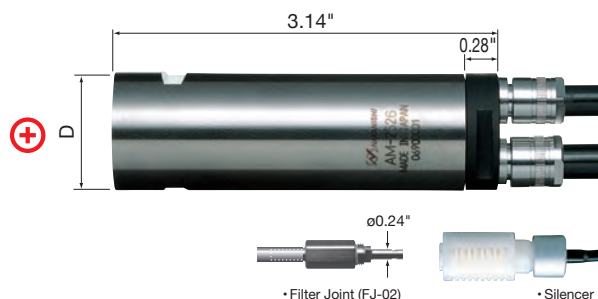


***Do not exceed the maximum motor speed recommendation for the spindles.
Excess speed will dramatically reduce bearing life.**

HIGH-TORQUE AIR MOTOR O.D. $\phi 1.0"$, $\phi 0.98"$ ($\phi 25.4$, $\phi 25$ mm)

- Small diameter $\phi 0.98"$ ($\phi 25$ mm).
- Ultra-precision vane type air motor.
- Rigid stainless steel (SUS416) outer housing.

Product Code **1801** **AIR MOTOR AM-2526R** (Forward Rotation) **130W** **24,000 rpm**



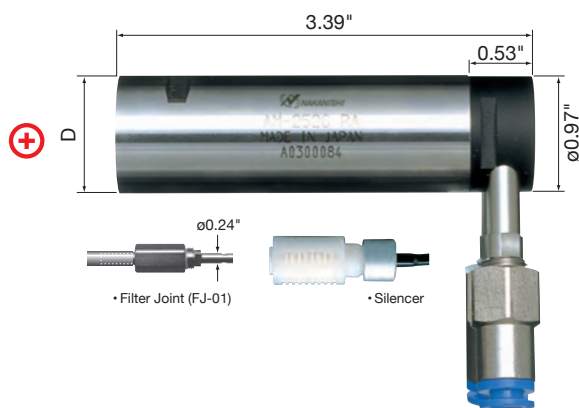
- Ultra precision, compact, vane-type air motor provides high torque with small volume of air consumption. Withstands long continuous operation without heat generation. Silencer keeps noise to a minimum.

- Motor Speed 24,000 rpm (73PSI)
- Max. Output Power 130W
- Proper Air Pressure 44~73PSI
- Air Consumption 7.24CFM
- Motor Hose (Diameter / Length)
 - Air Intake $\phi 4.5$ (I.D.) x $\phi 6.7$ (O.D.) mm / 6 ft
 - Exhaust Air $\phi 5.5$ (I.D.) x $\phi 7.5$ (O.D.) mm / 3 ft
- Weight (w/o hose) 7.05 oz.

Air Motor D= $\phi 1.0"$ ($\phi 25.4$ mm), $\phi 0.98"$ ($\phi 25$ mm) (R=Forward, L=Reverse)

Product Code	Product Name	Outside Diameter	Standard Equipment · Accessories	
1801	AM-2526R	$\phi 0.98"$ ($\phi 25$ mm)	• Hose (K-204) : 6 ft • Filter Joint (FJ-02) • Silencer (K-208) • Wrench (22 x 27) : 1 pc.	

Product Code **1803** **AIR MOTOR AM-2526RA** (Forward Rotation) **120W** **22,000 rpm**



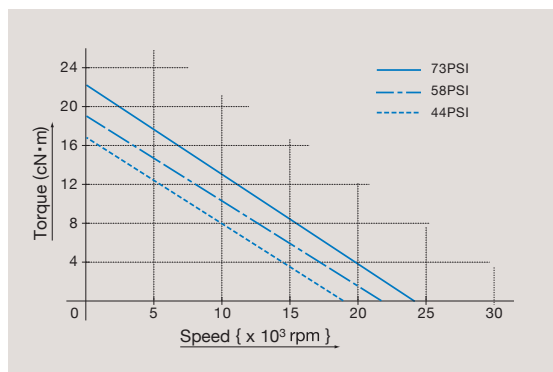
- The installation space is reduced by installing the air intake and exhaust air hoses at 90° angle from the rear end of the motor.

- Motor Speed 22,000 rpm (73PSI)
- Max. Output Power 120W
- Proper Air Pressure 44~73PSI
- Air Consumption 6.00CFM
- Motor Hose (Diameter / Length)
 - Air Intake $\phi 4.0$ (I.D.) x $\phi 6.0$ (O.D.) mm / 6 ft
 - Exhaust Air $\phi 5.5$ (I.D.) x $\phi 8.0$ (O.D.) mm / 3 ft
- Weight (w/o hose) 8.50 oz.

Air Motor D= $\phi 1.0"$ ($\phi 25.4$ mm), $\phi 0.98"$ ($\phi 25$ mm) (R=Forward, L=Reverse)

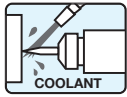
Product Code	Product Name	Outside Diameter	Standard Equipment · Accessories	
1803	AM-2526RA	$\phi 0.98"$ ($\phi 25$ mm)	• Hose (K-215) : $\phi 6$ mm x 6 ft • Hose (K-256) : $\phi 8$ mm x 3 ft • Filter Joint (FJ-01) • Silencer (K-209) • Wrench (22 x 27) : 1 pc.	

• AM-2526R Torque-Speed Characteristics



1	EmaxEVC
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
$\phi 1.18"$	
$\phi 1.97"/\phi 0.98"/\phi 0.897"$	
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	
Xpeed	
ABT	
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SPINDLE O.D. $\phi 1.0"$, $\phi 0.98"$ ($\phi 25.4$, $\phi 25\text{mm}$)



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

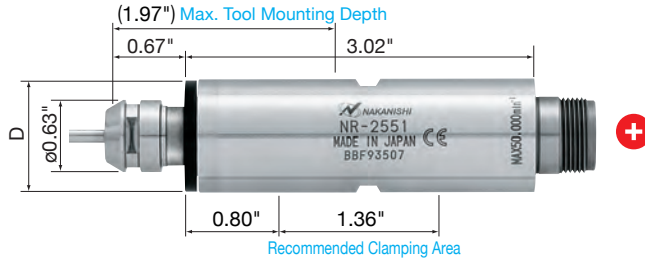
1

Product Code

7854

SPINDLE NR-H2551 (Ceramic Bearing)

50,000 rpm



- Allowable Motor Speed 50,000 rpm
- Spindle Accuracy Within 1 μm
- Weight 8.92 oz.

• 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)

- Collet Nut (K-265) For Collet (CHK)
- Metal Saw Arbor (KCH-03) For $\phi 0.24"$ (I.D.) x $\phi 1.18"$ (O.D.)
- Grindstone Arbor (AGM -03) For grinding wheel with I.D. of $\phi 5\text{ mm}$

2

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

Spindle D = $\phi 1.0"$ ($\phi 25.4\text{ mm}$), $\phi 0.98"$ ($\phi 25\text{ mm}$)

Product Code	Product Name	Outside Diameter	Standard Equipment · Accessories
7854	NR-H2551	$\phi 1.0"$ ($\phi 25.4\text{ mm}$)	• Collet Nut (K-265) : 1 pc. • Wrench (12 x 14) : 2 pcs., (22 x 27) : 1 pc.
7853	NR-2551	$\phi 0.98"$ ($\phi 25\text{ mm}$)	

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

3

MA

$\phi 0.897"$

$\phi 1.0"$

$\phi 0.98"$

$\phi 1.18"$

MS

$\phi 0.75"$

$\phi 0.79"$

$\phi 0.87"$

$\phi 0.91"$

$\phi 1.0"$

$\phi 0.98"$

4

HES

iSpeed5

HTS

PLANET

Xpeed

ABT

5

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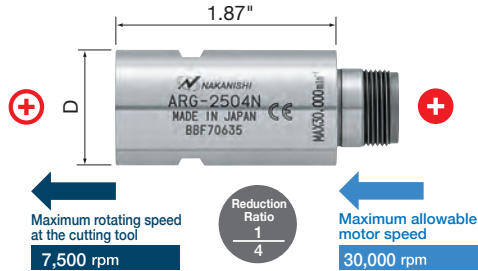
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SPEED REDUCER O.D. $\phi 1.0"$, $\phi 0.98"$ ($\phi 25.4$, $\phi 25\text{mm}$)



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

Product Code **1822** SPEED REDUCER 1/4 ARG-2504N



- If the speed reducer is connected between the motor and the spindle, it reduces the rotating speed and increases the torque while keeping the motor speed unchanged.

Maximum allowable motor speed **30,000 rpm**

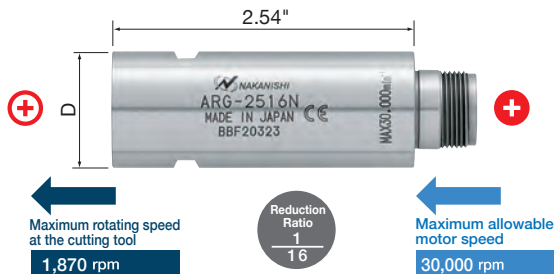
Maximum rotating speed at the cutting tool
<Reduction Ratio : 1/4> **7,500 rpm**

- Speed Reducing Mechanism By planetary gear system
- Weight 5.29 oz.

Speed Reducer D= $\phi 1.0"$ ($\phi 25.4$ mm), $\phi 0.98"$ ($\phi 25$ mm)

Product Code	Product Name	Outside Diameter	Speed Reduction Ratio	
1822	ARG-2504N	$\phi 0.98"$ ($\phi 25$ mm)	Speed Reduction Ratio 1/4	

Product Code **1824** SPEED REDUCER 1/16 ARG-2516N



- If the speed reducer is connected between the motor and the spindle, it reduces the rotating speed and increases the torque while keeping the motor speed unchanged.

Maximum allowable motor speed **30,000 rpm**

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

- Speed Reducing Mechanism By planetary gear system
- Weight 7.23 oz.

Speed Reducer D= $\phi 1.0"$ ($\phi 25.4$ mm), $\phi 0.98"$ ($\phi 25$ mm)

Product Code	Product Name	Outside Diameter	Speed Reduction Ratio	
1824	ARG-2516N	$\phi 0.98"$ ($\phi 25$ mm)	Speed Reduction Ratio 1/16	

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

$\phi 1.18"$

$\phi 1.87"$, $\phi 0.98"$

$\phi 0.897"$

E3000

— 30,000rpm

E4000

3

MA

$\phi 0.897"$

$\phi 1.0"$

$\phi 0.98"$

$\phi 1.18"$

MS

$\phi 0.75"$

$\phi 0.75"$

$\phi 0.897"$

$\phi 0.91"$

$\phi 1.0"$

$\phi 0.98"$

4

HES

iSpeed5

HTS

PLANET

Xspeed

ABT

5

AIR LINE KIT

6

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7

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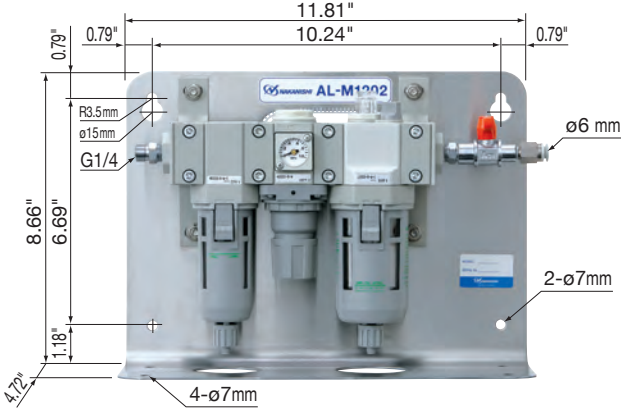
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E2000 ø1.0"/ø0.98"/ø0.897"
E3000 One Piece
E3000 Modular
ø1.18"
ø1.0"/ø0.98"/ø0.897"
E3000 80,000rpm
E4000
3
MA
ø0.897"
ø1.0" ø0.98"
ø1.18"
MS
ø0.75" ø0.79"
ø0.87" ø0.91"
ø1.0" ø0.98"
4
HES
iSpeed5
HTS
PLANET
Xpeed
ABT
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Product Code **4502** **AIR LINE KIT AL-M1202**

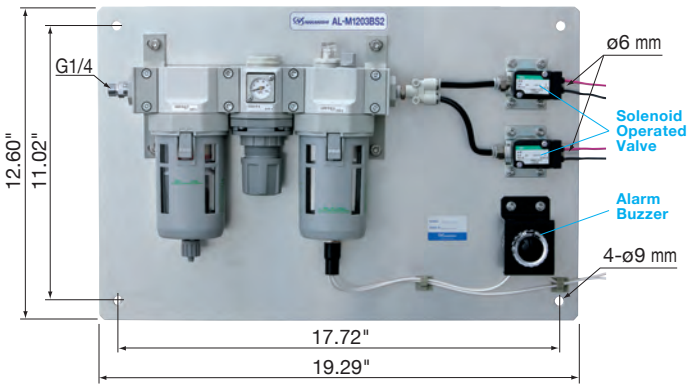


- The AL-M1202 provides simple, automatic conditioning of the air supplied to NAKANISHI Air Motors. The filter removes water and impure substances from the input air supply. The regulator maintains the proper air pressure, and the lubricator ensures proper oil flow to the motor and spindle. This Air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

Product Code **4503** **AIR LINE KIT AL-M1203BS2**



- The AL-M1203BS2 is equipped with 2 (DC+24V) Air Solenoids, a large capacity filter, large capacity oil reservoir, high flow regulator and a low oil level warning alarm, making this unit ideal for use on CNC machines. This Air Line Kit allows for the operation of 2 Air Motors.

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

Product Code	Product Name	Standard Equipment · Accessories	
4503	AL-M1203BS2	• Air Filter · Air Regulator • Air Pressure Gauge · Lubricator • Solenoid Valve (DC 24V) : 2 pcs. • Buzzer (DC 24V) · Hose for Piping (K-275) : 6 ft • Lubricating Oil (K-202) : 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"
ø1.07"/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
Xpeed
ABT

5

AIR LINE KIT

6

PARTS

7

TECHNICAL
DATA

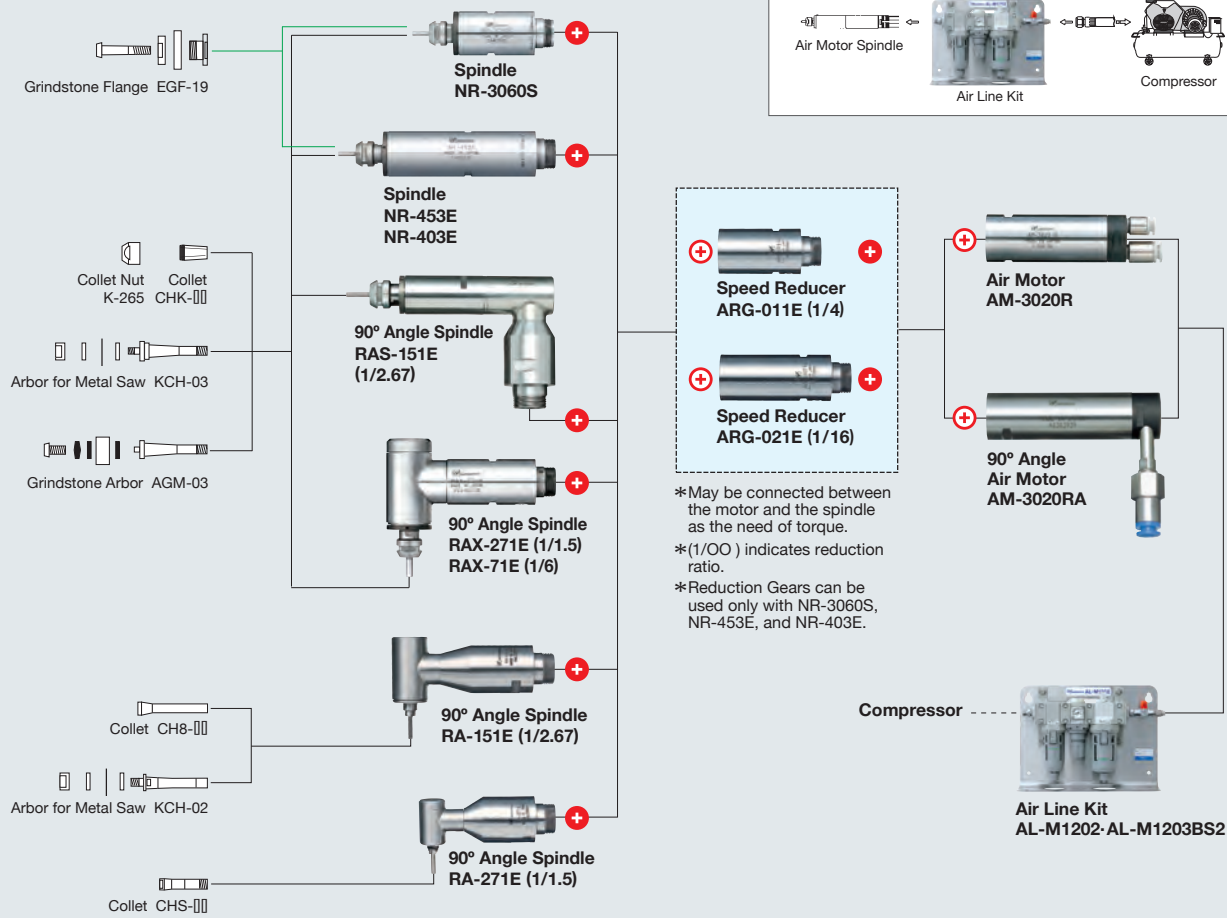
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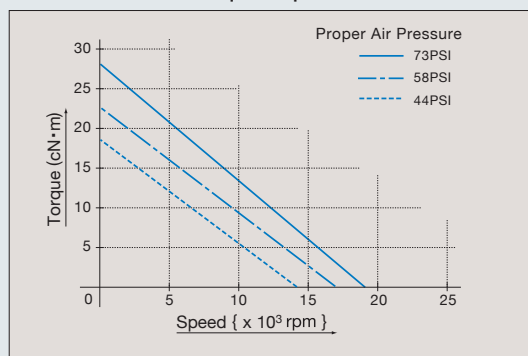
- MA Series consists of 3 kinds of air motors, AM-3020R {19,000 rpm, 130W}, AM-3020RA {18,000 rpm, 125W}, enabling a wide variety of operations by the combination of various kinds of spindles. Higher torque is provided by connecting speed reducers.

MA Series ø1.18"(ø30 mm) System Chart

- MA Series has been designed to operate smoothly at high speed for long continuous cutting and grinding by connecting an air line kit directly between the air compressor and the air motor. (Air Line Kit Refer to 3-p25 in detail)
- Air supply and exhaust air hoses are supplied with an air motor. Air supply hose is provided with metal fitting to connect to ø6 mm one-touch joint. Air exhaust hose is supplied with silencer.



AM-3020R Torque-Speed Characteristics

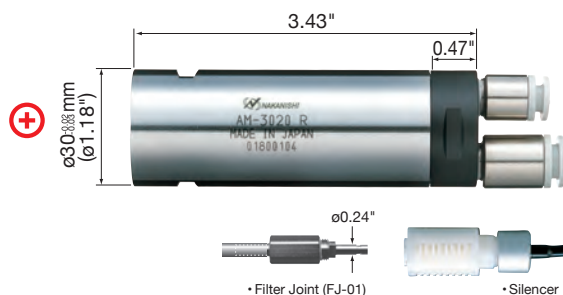


*Do not exceed the maximum motor speed recommendation for the spindles. Excess speed will dramatically reduce bearing life.

HIGH-TORQUE AIR MOTOR O.D. ø1.18"(ø30mm)

- Ultra-precision vane type air motor.
- Rigid stainless steel (SUS416) outer housing.

Product Code 1797 AIR MOTOR AM-3020R (Forward Rotation) 130W 19,000 rpm



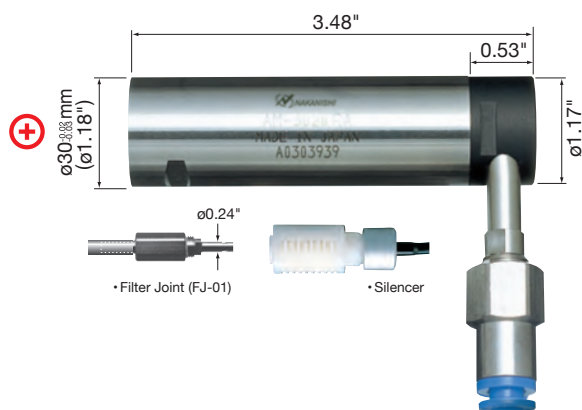
- Ultra precision, compact, vane-type air motor provides high torque with small volume of air consumption. Withstands long continuous operation without heat generation. Silencer keeps noise to a minimum.

- Motor Speed 19,000 rpm (73PSI)
- Max. Output Power 130W
- Proper Air Pressure 44~73PSI
- Air Consumption 6.36CFM
- Motor Hose (Diameter / Length)
 - Air Intake ø4.0 (I.D.) x ø6.0 (O.D.) mm / 6 ft
 - Exhaust Air ø6.0 (I.D.) x ø8.0 (O.D.) mm / 3 ft
- Weight (w/o hose) 10.51 oz.

Air Motor

Product Code	Product Name	Standard Equipment · Accessories	
1797	AM-3020R	• Hose (K-215) : ø6 mm x 6 ft • Hose (K-256) : ø8 mm x 3 ft • Filter Joint (FJ-01) • Silencer (K-208) • Wrench (22 x 27) : 1 pc.	

Product Code 1799 AIR MOTOR AM-3020RA (Forward Rotation) 125W 18,000 rpm



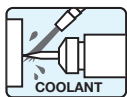
- The installation space is reduced by installing the air intake and exhaust air hoses at 90° angle from the rear end of the motor.

- Motor Speed 18,000 rpm (73PSI)
- Max. Output Power 125W
- Proper Air Pressure 44~73PSI
- Air Consumption 6.18CFM
- Motor Hose (Diameter / Length)
 - Air Intake ø4.0 (I.D.) x ø6.0 (O.D.) mm / 6 ft
 - Exhaust Air ø6.0 (I.D.) x ø8.0 (O.D.) mm / 3 ft
- Weight (w/o hose) 11.96 oz.

90° Angle Type Air Motor

Product Code	Product Name	Standard Equipment · Accessories	
1799	AM-3020RA	• Hose (K-215) : ø6 mm x 6 ft • Hose (K-256) : ø8 mm x 3 ft • Filter Joint (FJ-01) • Silencer (K-208) • Wrench (22 x 27) : 1 pc.	

SPINDLE O.D. $\phi 1.18"$ ($\phi 30\text{mm}$)



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

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

$\phi 1.18"$

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

E3000 60,000rpm

E4000

3

MA

$\phi 0.897"$

$\phi 1.0"/\phi 0.98"$

$\phi 1.18"$

MS

$\phi 0.75"/\phi 0.79"$

$\phi 0.87"/\phi 0.91"$

$\phi 1.0"/\phi 0.98"$

4

HES

iSpeed5

HTS

PLANET

Xpeed

ABT

5

AIR LINE KIT

6

PARTS

7

TECHNICAL DATA

8

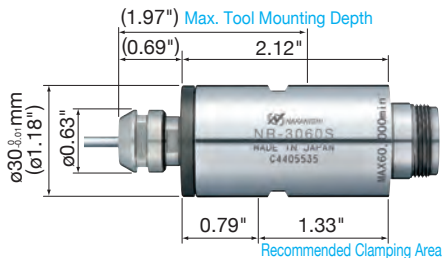
APPLICATION EXAMPLES

INDEX

Product Code

7859 SPINDLE NR-3060S

60,000 rpm



- This spindle can be used for small-diameter milling, drilling, slitting, chamfering, grinding, etc.

- Allowable Motor Speed 60,000 rpm
- Spindle Accuracy Within 1 μm
- Weight 9.17 oz.
- Ceramic Bearing

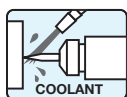
Additional collet purchase required:

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)

- Collet Nut (K-265) For Collet (CHK)
- Metal Saw Arbor (KCH-03) For $\phi 0.24"$ (I.D.) x $\phi 1.18"$ (O.D.)
- Grindstone Arbor (AGM-03) For grinding wheel with I.D. of $\phi 5\text{ mm}$
- Grindstone Flange (EGF-19) $\phi 19.05$ (I.D.) x $\phi 40$ (O.D.) x 7 (W) mm

Spindle

Product Code	Product Name	Standard Equipment · Accessories	
7859	NR-3060S	• Collet Nut (K-265) : 1 pc. • Wrench (12 x 14) : 2 pcs., (22 x 27) : 1 pc.	



Product Code **7847** **SPINDLE NR-403E**

40,000 rpm



- This spindle can be used for small-diameter milling, drilling, slitting, chamfering, grinding, etc.

- Allowable Motor Speed 40,000 rpm
- Spindle Accuracy Within 1 μ m
- Weight 15.52 oz.

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)

- Collet Nut (K-265) For Collet (CHK)
- Metal Saw Arbor (KCH-03) For $\phi 0.24"$ (I.D.) x $\phi 1.18"$ (O.D.)
- Grindstone Arbor (AGM-03) ... For grinding wheel with I.D. of $\phi 5$ mm
- Grindstone Flange (EGF-19) $\phi 19.05$ (I.D.) x $\phi 40$ (O.D.) x 7 (W) mm

Spindle

Product Code	Product Name	Standard Equipment · Accessories	
7847	NR-403E	• Collet Nut (K-265) : 1 pc. • Wrench (12 x 14) : 2 pcs., (22 x 27) : 1 pc.	

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

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

— 30,000rpm

E4000

3

MA

$\phi 0.897"$

$\phi 1.0"$

$\phi 0.98"$

$\phi 1.18"$

MS

$\phi 0.75"$

$\phi 0.75"$

$\phi 0.897"$

$\phi 0.91"$

$\phi 1.0"$

$\phi 0.98"$

4

HES

iSpeed5

HTS

PLANET

Xspeed

ABT

5

AIR LINE KIT

6

PARTS

7

TECHNICAL

DATA

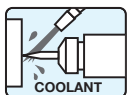
8

APPLICATION

EXAMPLES

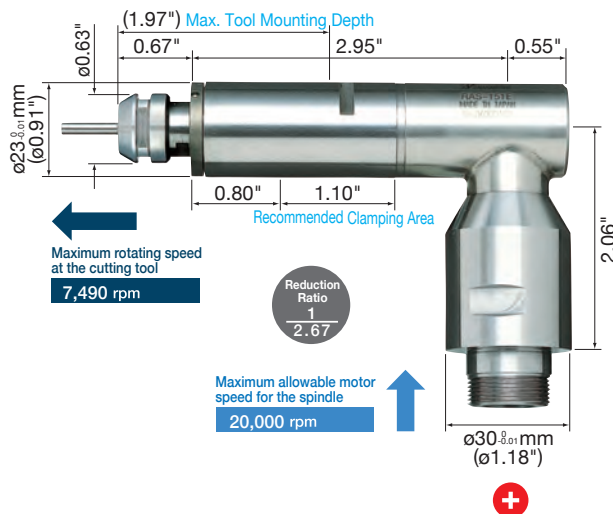
INDEX

SPINDLE O.D. $\phi 1.18"$ ($\phi 30\text{mm}$)



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

Product Code **7840** **90° ANGLE SPINDLE RAS-151E**



Maximum allowable motor speed for the spindle **20,000 rpm**

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

- Spindle Accuracy Within 2 μm
- Weight 14.57 oz.
- **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)
- Collet Nut (K-265) For Collet (CHK)
- Metal Saw Arbor (KCH-03) For $\phi 0.24"$ (I.D.) x $\phi 1.18"$ (O.D.)
- Grindstone Arbor (AGM-03) For grinding wheel with I.D. of $\phi 5\text{mm}$

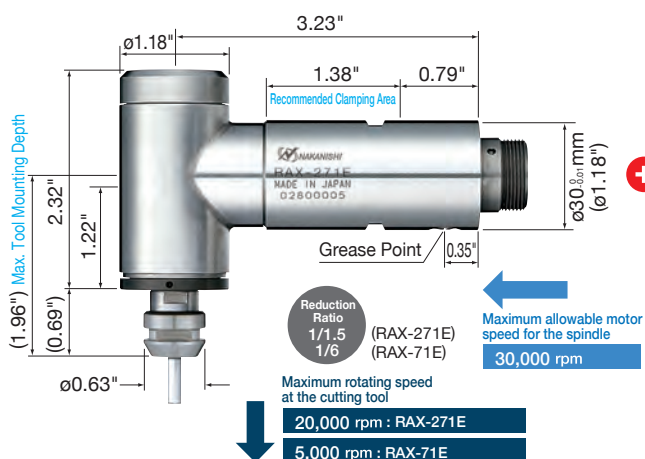
90° Angle Spindle

Product Code	Product Name	Standard Equipment · Accessories	
7840	RAS-151E	• Collet Nut (K-265) : 1 pc. • Wrench (12 x 14) : 2 pcs., (22 x 27) : 1 pc.	

- 90° Angle Type Spindle can use up to a $\phi 1/4"$ ($\phi 6.35\text{mm}$) collet and is suitable for installation where space restrictions exist.

Product Code **7856** **90° ANGLE SPINDLE RAX-271E (Speed Reduction Ratio 1/1.5)**

Product Code **7857** **90° ANGLE SPINDLE RAX-71E (Speed Reduction Ratio 1/6)**



Maximum allowable motor speed for the spindle **30,000 rpm**

Maximum rotating speed at the cutting tool
RAX-271E <Reduction Ratio : 1/1.5> **20,000 rpm**
RAX-71E <Reduction Ratio : 1/6> **5,000 rpm**

- Spindle Accuracy Within 2 μm
- Weight 1 lb. 4.46 oz.
- **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)
- Collet Nut (K-265) For Collet (CHK)
- Metal Saw Arbor (KCH-03) For $\phi 0.24"$ (I.D.) x $\phi 1.18"$ (O.D.)
- Grindstone Arbor (AGM-03) For grinding wheel with I.D. of $\phi 5\text{mm}$

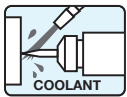
90° Angle Spindle

Product Code	Product Name	Standard Equipment · Accessories	
7856	RAX-271E	• Collet Nut (K-265) : 1 pc. • Wrench (12 x 14) : 2 pcs., (22 x 27) : 1 pc.	
7857	RAX-71E	• Gear Grease (10mL) • Grease Nipple : 1 pc.	



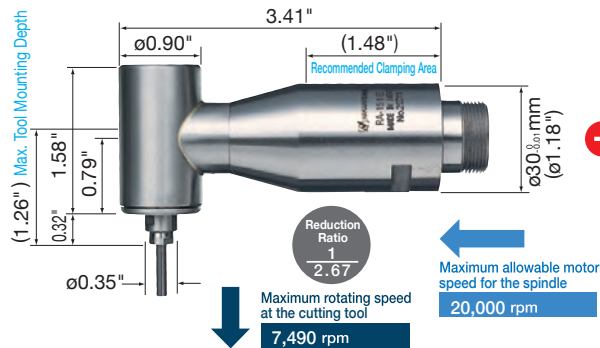
To extend the life expectancy of the Speed Reducer, inject grease every 70 to 100 hours. Grease injection prevents friction of the internal gears as well as heat generation. Adding grease also prevents the degradation of the existing grease in the reducer. Please maintain a reducer grease maintenance program.

- This spindle is capable of working on corners difficult to work with straight type, drilling on side faces and milling of grooves.



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

Product Code **2910** 90°ANGLE SPINDLE RA-151E



- This spindle is capable of working on corners difficult to work or unfit for working with straight type, drilling on side face and, slitting of aluminum, brass, etc. with the use of 0.118" (0.30 mm) Metal Saw.

Maximum allowable motor speed for the spindle **20,000 rpm**

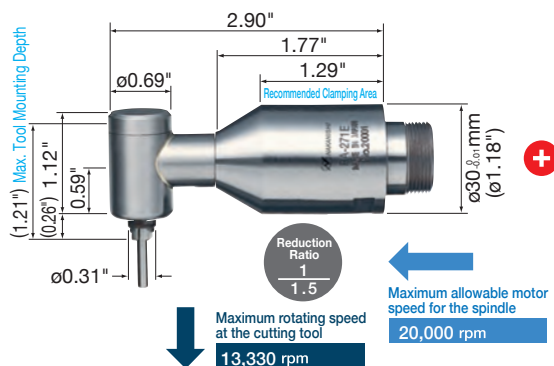
Maximum rotating speed at the cutting tool
<Reduction Ratio : 1/2.67> **7,490 rpm**

- Standard Size Collet (CH8-3.175) 0.118"
- Weight 13.58 oz.
- < Optional >
- Collet (CH8- []) 0.8 mm~0.3.175 mm
(See Page 6-p5 for details)
- Metal Saw Arbor (KCH-02) For 0.24" (I.D.) x 0.118" (O.D.)

90° Angle Spindle

Product Code	Product Name	Standard Equipment · Accessories	
2910	RA-151E	• Collet 0.118" (CH8-3.175) : 1 pc. • Wrench (7 x 5.5), (8 x 5), (22 x 27) : 1 pc. each	

Product Code **2911** 90°ANGLE SPINDLE RA-271E



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

Maximum allowable motor speed for the spindle **20,000 rpm**

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

- Standard Size Collet (CHS-3.175) 0.118"
- Weight 8.47 oz.
- < Optional >
- Collet (CHS- []) 0.8 mm~0.3.175 mm
(See Page 6-p4 for details)

90° Angle Spindle

Product Code	Product Name	Standard Equipment · Accessories	
2911	RA-271E	• Collet 0.118" (CHS-3.175) : 1 pc. • Wrench (7 x 5.1), (8 x 5), (22 x 27) : 1 pc. each	

SPEED REDUCER O.D. $\phi 1.18"$ ($\phi 30\text{mm}$)



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

1

EmaxEVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

$\phi 1.0"/\phi 0.98"/\phi 0.997"$

E3000

One Piece

E3000

Modular

$\phi 1.18"$

$\phi 1.0"/\phi 0.98"/\phi 0.997"$

E3000

80,000rpm

E4000

3

MA

$\phi 0.897"$

$\phi 1.0"/\phi 0.98"$

$\phi 1.18"$

MS

$\phi 0.75"/\phi 0.79"$

$\phi 0.87"/\phi 0.91"$

$\phi 1.0"/\phi 0.98"$

4

HES

iSpeed5

HTS

PLANET

Xpeed

ABT

5

AIR LINE KIT

6

PARTS

7

TECHNICAL

DATA

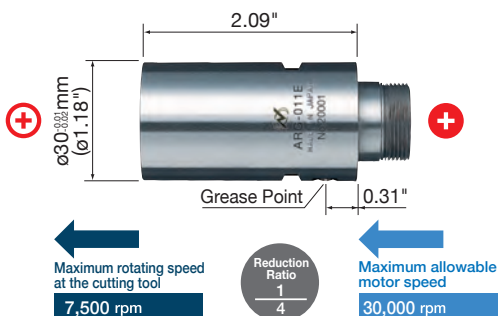
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Product Code **1507** SPEED REDUCER 1/4 ARG-011E



- If the speed reducer is connected between the motor and the spindle, it reduces the rotating speed and increases the torque while keeping the motor speed unchanged.

Maximum allowable motor speed **30,000 rpm**

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

- Speed Reducing Mechanism By planetary gear system
- Speed Reduction Ratio 1/4
- Weight 8.54 oz.

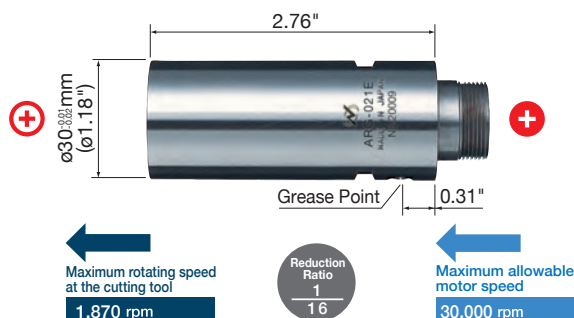
Speed Reducer 1/4

Product Code	Product Name	Standard Equipment · Accessories	
1507	ARG-011E	• Gear Grease (10mL) • Grease Nipple : 1 pc.	



To extend the life expectancy of the Speed Reducer, inject grease every 70 to 100 hours. Grease injection prevents friction of the internal gears as well as heat generation. Adding grease also prevents the degradation of the existing grease in the reducer. Please maintain a reducer grease maintenance program.

Product Code **1508** SPEED REDUCER 1/16 ARG-021E



- If the speed reducer is connected between the motor and the spindle, it reduces the rotating speed and increases the torque while keeping the motor speed unchanged.

Maximum allowable motor speed **30,000 rpm**

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

- Speed Reducing Mechanism By planetary gear system
- Speed Reduction Ratio 1/16
- Weight 11.46 oz.

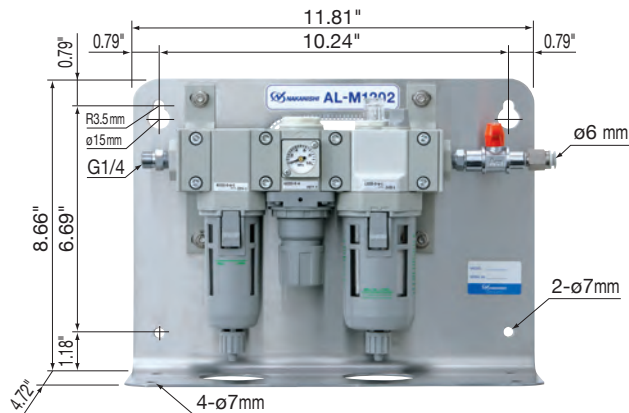
Speed Reducer 1/16

Product Code	Product Name	Standard Equipment · Accessories	
1508	ARG-021E	• Gear Grease (10mL) • Grease Nipple : 1 pc.	



To extend the life expectancy of the Speed Reducer, inject grease every 70 to 100 hours. Grease injection prevents friction of the internal gears as well as heat generation. Adding grease also prevents the degradation of the existing grease in the reducer. Please maintain a reducer grease maintenance program.

Product Code 4502 AIR LINE KIT AL-M1202

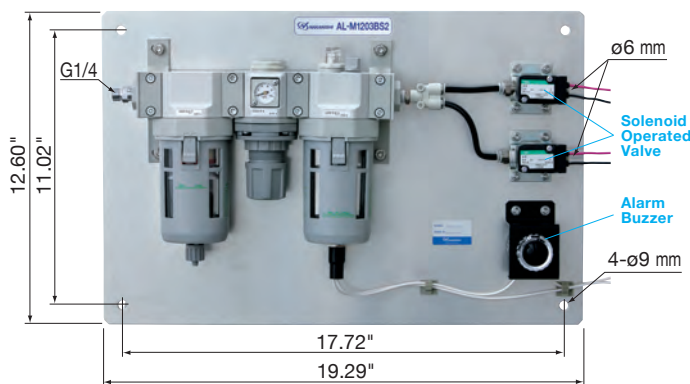


- The AL-M1202 provides simple, automatic conditioning of the air supplied to NAKANISHI Air Motors. The filter removes water and impure substances from the input air supply. The regulator maintains the proper air pressure, and the lubricator ensures proper oil flow to the motor and spindle. This Air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

Air Line Kit (For 0.6 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.	

Product Code 4503 AIR LINE KIT AL-M1203BS2



- The AL-M1203BS2 is equipped with 2 (DC+24V) Air Solenoids, a large capacity filter, large capacity oil reservoir, high flow regulator and a low oil level warning alarm, making this unit ideal for use on CNC machines. This Air Line Kit allows for the operation of 2 Air Motors.

Air Line Kit (For 0.6 mm Hose · Filter Mesh 0.3 μm)

Product Code	Product Name	Standard Equipment · Accessories	
4503	AL-M1203BS2	• Air Filter · Air Regulator • Air Pressure Gauge · Lubricator • Solenoid Valve (DC 24V) : 2 pcs. • Buzzer (DC 24V) · Hose for Piping (K-275) : 6 ft • Lubricating Oil (K-202) : 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 ø1.07"/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" ø0.98"
ø1.18"
MS
ø0.75" ø0.79"
ø0.87" ø0.91"
ø1.0" ø0.98"
4
HES
iSpeed5
HTS
PLANET
Xpeed
ABT
5
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One Piece Type Spindle

- Shorter overall length suitable for CNC lathes and special purpose machines.
- Hardened and precision ground for high rigidity & excellent durability.
- External one-piece housing includes both the motor & spindle.



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

Xspeed

ABT

5

AIR LINE KIT

6

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7

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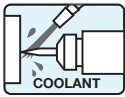
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SYSTEM CHART



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

MS Series System Chart

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"

ø0.87"
ø0.91"

ø1.0"
ø0.98"

4

HES

iSpeed5

HTS

PLANET

Xpeed

ABT

5

AIR LINE KIT

6

PARTS

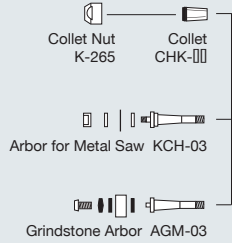
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TECHNICAL
DATA

8

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ø0.98"
ø25mm

Air Motor Spindle
MSS-25 Series

Straight Type

ø0.98"
ø25mm

Air Motor Spindle
MSS-25 Series

Angle Type

ø0.91"
ø23mm

Air Motor Spindle
MSST-23 Series

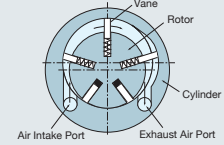
Straight Type

ø0.91"
ø23mm

Air Motor Spindle
MSST-23 Series

Angle Type

● Air Motor



Compressor

Air Line Kit
AL-M1202·AL-M1203BS2

ø0.79"
ø20mm

Air Motor Spindle
MSS-20 Series

Straight Type

ø0.79"
ø20mm

Air Motor Spindle
MSS-20 Series

Angle Type

ø0.75"
ø19.05mm

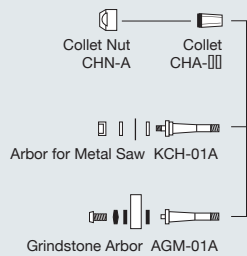
Air Motor Spindle
MSS-19 Series

Straight Type

ø0.75"
ø19.05mm

Air Motor Spindle
MSS-19 Series

Angle Type

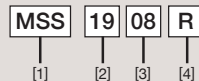


Configuration & Characteristics

Model Code Example

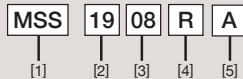
• Straight Type

- [1] SERIES CODE
[2] OUTSIDE DIAMETER
[3] SPEED
[4] R=FORWARD (Right)



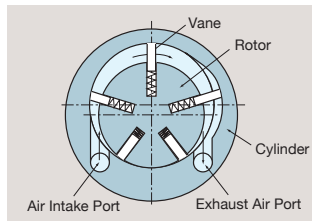
• 90° Angle Type

- [1] SERIES CODE
[2] OUTSIDE DIAMETER
[3] SPEED
[4] R=FORWARD (Right)
[5] CODE FOR 90° ANGLE TYPE



- The design of NAKANISHI's air motors gives the highest output power in this small spindle class.

• Air Motor



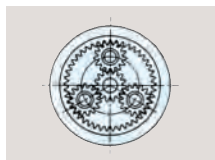
The rotor of the air motor rotates off center in the cylinder. The vanes are pushed by compressed air and this rotates the rotor. This small air motor produces high torque making it suitable for small diameter drilling, milling, slitting and grinding.

• Silencer

By utilizing a silencer on the exhaust air tubing the noise generated by the motor or turbine is greatly reduced.

• Speed Reduction System

A planetary gear speed reduction system is incorporated in some of the MS Series motor/spindles. The speed reduction ratio is either 1/4 or 1/16. This maintains a high motor speed while giving very high torque, low speed rotation at the spindle. By carefully selecting only the highest grade materials for the planetary gear reducers we can ensure high load capacity.



1/4 · 1/16 :
Planetary Gear System

• Outer Housing Material

The outer housing is (SUS416) precision ground to +0/-0.01mm.

• Configuration

Either straight or 90° air connection types are available depending on the mounting and plumbing restrictions in your installation.

• Very high spindle accuracy makes ultra-precision machining possible.

• Spindle Accuracy

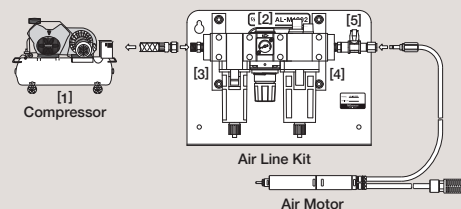


Spindle accuracy is the spindle runout as measured at the tip of taper on the ID of the spindle.

• MS Series Set-Up Chart (Air line kit is required for operation)

The MS Series spindles are specifically designed for long term continuous use in high speed machining applications such as small diameter drilling, milling, slitting and grinding applications.

It runs by connecting the air line kit to Compressor [1] directly. Stably adjusted air pressure is supplied through Air Regulator [2] that also controls the speed of spindle. Air is purified by Air Filter [3] and Lubricator [4] supplies lubricant automatically to the air spindle while in operation. Switch [5] controls the operation of air spindle ON and OFF.



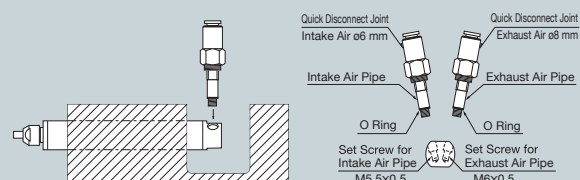
Air Line Kit Refer to 3-p34

• Installation of 90° Angle Type

- MSS · MSST series angle (RA) type drive air and exhaust air pipes can be removed enabling the motor spindle installed through the front of a holder with backside restriction as shown in the illustration.

Installation

- [1] Remove Intake and Exhaust Air Pipes from motor spindle.
 - [2] Insert the straight spindle from the front side of holder and fix it.
 - [3] Mount the intake and exhaust air pipes to the spindle fixed on the holder and attach a hose to the quick disconnect joint.
- Urethane hose of 6 x 4 for intake air and 8 x 5 for exhaust air can be installed.



*The motor speed of 90° Angle air connection type motor / spindles are 10% less than that of the straight type.

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"

ø1.97"/ø0.98"

ø0.897"

E3000

— 80,000rpm

E4000

3

MA

ø0.897"

ø1.0"

ø0.98"

ø1.18"

MS

ø0.75"

ø0.75"

ø0.897"

ø0.91"

ø1.0"

ø0.98"

4

HES

iSpeed5

HTS

PLANET

Xspeed

ABT

5

AIR LINE KIT

6

PARTS

7

TECHNICAL

DATA

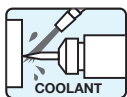
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AIR MOTOR SPINDLE O.D. $\phi 0.75"$ ($\phi 19.05\text{mm}$), $\phi 0.79"$ ($\phi 20\text{mm}$) Output 72W

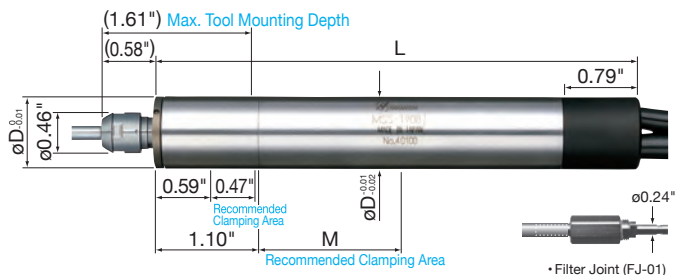


1

MSS-19 · MSS-20 SERIES STRAIGHT · 90° ANGLE TYPE

30,000 · 8,000 · 2,000 rpm

● STRAIGHT TYPE (R)



- Proper Air Pressure 44~73PSI
- Air Consumption 5.47CFM
- Spindle Accuracy Within 2 μm
- Motor Hose (Diameter / Length)
- [R-type] Air Intake $\phi 3.7$ (I.D.) x $\phi 5.7$ (O.D.) mm / 6 ft
- Exhaust Air $\phi 5.0$ (I.D.) x $\phi 6.5$ (O.D.) mm / 3 ft
- [RA-type] Air Intake $\phi 4.0$ (I.D.) x $\phi 6.0$ (O.D.) mm / 6 ft
- Exhaust Air $\phi 5.5$ (I.D.) x $\phi 8.0$ (O.D.) mm / 3 ft

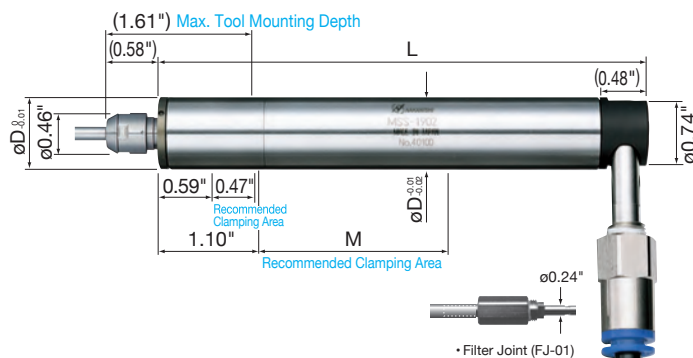
• Additional collet purchase required:

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)

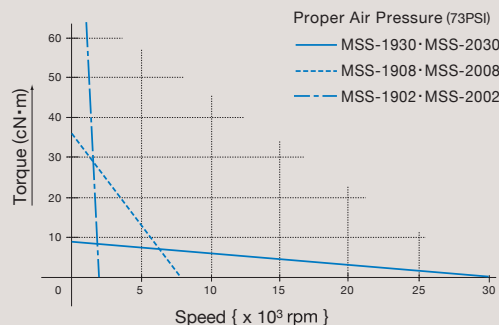
- Collet Nut (CHN-A) For Collet (CHA)
- Metal Saw Arbor (KCH-01A) For $\phi 0.24"$ (I.D.) x $\phi 1.18"$ (O.D.)
- Grindstone Arbor (AGM-01A) ... For grinding wheel with I.D. of $\phi 5\text{mm}$

2

● 90° ANGLE TYPE (RA)



MSS-19 · MSS-20 SERIES Torque-Speed Characteristics



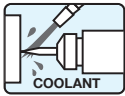
Caution : Two recommended clamp areas are laser-marked on the spindle. Select one of them for clamping, and do not clamp both areas.

MSS-19 Series D = ø0.75"(ø19.05 mm)		MSS-20 Series D = ø0.79"(ø20 mm)		30,000 rpm (73PSI)								
Product Code	Product Name	Product Code	Product Name	Shape	Rotating Direction	Max. Output	Max. Torque	Length	M	Weight (MSS-19 / MSS-20)		
7849	MSS-1930R	7851	MSS-2030R	Straight	FWD. (CW)	72W	9.2 cN · m	4.37"	0.91"	6.03 oz. / 6.70 oz.		
7850	MSS-1930RA	7852	MSS-2030RA	90° Angle				4.06"		7.73 oz. / 8.43 oz.		
				8,000 rpm (73PSI) 1/4 Speed Reduction								
Product Code	Product Name	Product Code	Product Name	Shape	Rotating Direction	Max. Output	Max. Torque	Length	M	Weight (MSS-19 / MSS-20)		
7824	MSS-1908R	7828	MSS-2008R	Straight	FWD. (CW)	72W	36 cN · m	4.99"	1.54"	7.13 oz. / 7.94 oz.		
7825	MSS-1908RA	7829	MSS-2008RA	90° Angle				4.69"		8.82 oz. / 9.67 oz.		
				2,000 rpm (73PSI) 1/16 Speed Reduction								
Product Code	Product Name	Product Code	Product Name	Shape	Rotating Direction	Max. Output	Max. Torque	Length	M	Weight (MSS-19 / MSS-20)		
7826	MSS-1902R	7830	MSS-2002R	Straight	FWD. (CW)	72W	141 cN · m	5.55"	2.09"	7.62 oz. / 8.50 oz.		
7827	MSS-1902RA	7831	MSS-2002RA	90° Angle				5.24"		9.31 oz. / 10.23 oz.		

Standard Equipment · Accessories

- Collet Nut (CHN-A) · Wrench (8 x 5), (9 x 11) : 1 pc. each · Hose (K-221 : R type) : 6 ft · Hose (K-215 : RA type) : $\phi 6\text{mm}$ x 6 ft
- Hose (K-216 : RA type) : $\phi 8\text{mm}$ x 3 ft · Filter Joint (FJ-01) · Silencer (K-209 : R type), (K-208 : RA type)

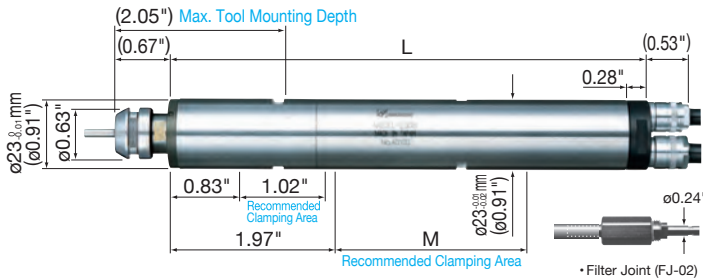
AIR MOTOR SPINDLE O.D. $\phi 0.91"$ ($\phi 23\text{mm}$) Output 109W



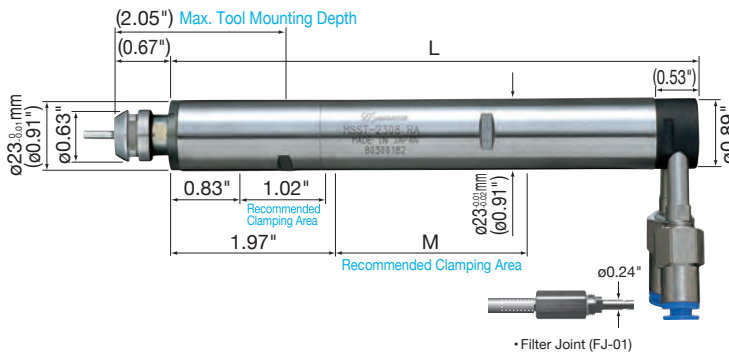
MSST-23 SERIES STRAIGHT · 90° ANGLE TYPE

30,000 · 8,000 · 2,000 rpm

● STRAIGHT TYPE (R)



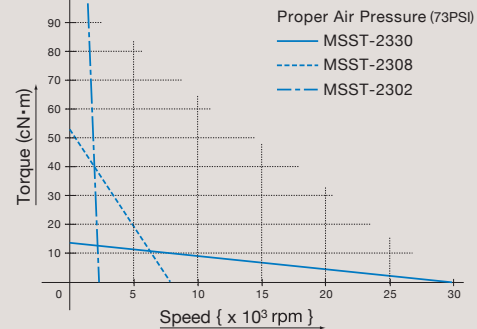
● 90° ANGLE TYPE (RA)



Caution : Two recommended clamp areas are laser-marked on the spindle. Select one of them for clamping, and do not clamp both areas.

- Proper Air Pressure 44~73PSI
- Air Consumption (R-type) : 6.71CFM
(RA-type) : 6.00CFM
- Spindle Accuracy Within 2 μm
- Motor Hose (Diameter / Length)
[R-type] Air Intake $\phi 4.5$ (I.D.) x $\phi 6.7$ (O.D.) mm / 6 ft
Exhaust Air $\phi 5.5$ (I.D.) x $\phi 7.5$ (O.D.) mm / 3 ft
[RA-type] Air Intake $\phi 4.0$ (I.D.) x $\phi 6.0$ (O.D.) mm / 6 ft
Exhaust Air $\phi 5.5$ (I.D.) x $\phi 8.0$ (O.D.) mm / 3 ft
- **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)
- Collet Nut (K-265) For Collet (CHK)
- Metal Saw Arbor (KCH-03) For $\phi 0.24"$ (I.D.) x $\phi 1.18"$ (O.D.)
- Grindstone Arbor (AGM-03) ... For grinding wheel with I.D. of $\phi 5\text{mm}$

MSST-23 SERIES Torque-Speed Characteristics



R : 30,000 rpm (73PSI) / RA : 27,000 rpm (73PSI)

Product Code	Product Name	Shape	Rotating Direction	Max. Output	Max. Torque	Length	M	Weight
7833	MSST-2330R	Straight	FWD. (CW)	108W	13.7 cN · m	5.01"	0.98"	11.57 oz.
7834	MSST-2330RA	90° Angle				5.27"		13.02 oz.

R : 8,000 rpm (73PSI) / RA : 7,200 rpm (73PSI) 1/4 Speed Reduction

Product Code	Product Name	Shape	Rotating Direction	Max. Output	Max. Torque	Length	M	Weight
7835	MSST-2308R	Straight	FWD. (CW)	108W	52 cN · m	6.30"	2.28"	14.64 oz.
7836	MSST-2308RA	90° Angle				6.56"		16.08 oz.

R : 2,000 rpm (73PSI) / RA : 1,900 rpm (73PSI) 1/16 Speed Reduction

Product Code	Product Name	Shape	Rotating Direction	Max. Output	Max. Torque	Length	M	Weight
7837	MSST-2302R	Straight	FWD. (CW)	108W	202 cN · m	6.47"	2.44"	14.29 oz.
7838	MSST-2302RA	90° Angle				6.73"		15.73 oz.

Standard Equipment · Accessories

- Collet Nut (K-265) · Wrench (12 x 14) : 2 pcs. · Hose (K-204 : R type) : 6 ft · Hose (K-215 : RA type) : $\phi 6\text{mm}$ x 6 ft
- Hose (K-216 : RA type) : $\phi 8\text{mm}$ x 3 ft · Filter Joint (FJ-02 : R type), (FJ-01 : RA type) · Silencer (K-209 : R type), (K-208 : RA type)

*Refer to Page 3-p29 for mounting instructions for the 90° Angle Type.

1

EmaxEVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

$\phi 1.0" \phi 0.92" \phi 0.897"$

E3000

— One Piece

E3000

— Modular

$\phi 1.18"$

$\phi 1.97" \phi 0.98"$

$\phi 0.897"$

E3000

— 30,000rpm

E4000

3

MA

$\phi 0.897"$

$\phi 1.0"$

$\phi 0.98"$

$\phi 1.18"$

MS

$\phi 0.75"$

$\phi 0.75"$

$\phi 0.897"$

$\phi 0.91"$

$\phi 1.0"$

$\phi 0.98"$

4

HES

iSpeed5

HTS

PLANET

Xpeed

ABT

5

AIR LINE KIT

6

PARTS

7

TECHNICAL

DATA

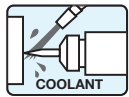
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APPLICATION

EXAMPLES

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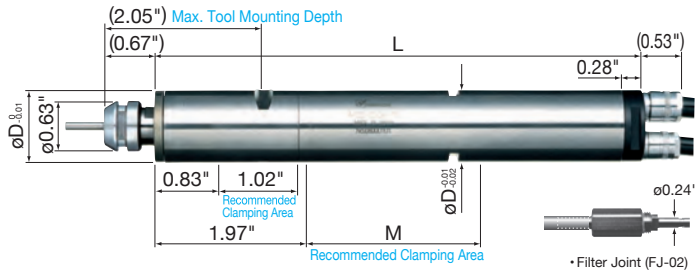


1

MSS-25 SERIES STRAIGHT · 90° ANGLE TYPE

24,000 · 6,000 · 1,500 rpm

● STRAIGHT TYPE (R)

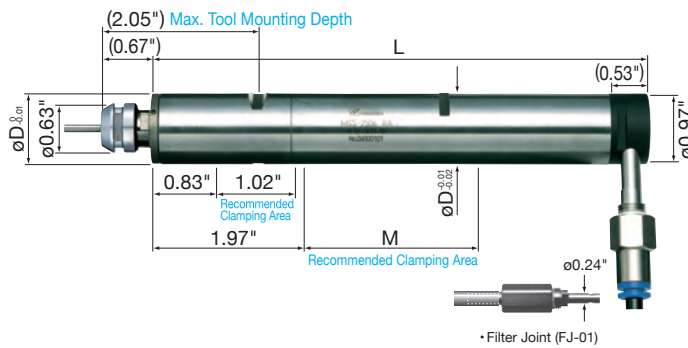


- Proper Air Pressure 44~73PSI
- Air Consumption (R-type) : 7.24CFM
(RA-type) : 6.00CFM
- Spindle Accuracy Within 2 µm
- Motor Hose (Diameter / Length)
[R-type] Air Intake ø4.5 (I.D.) x ø6.7 (O.D.) mm / 6 ft
Exhaust Air ø5.5 (I.D.) x ø7.5 (O.D.) mm / 3 ft
[RA-type] Air Intake ø4.0 (I.D.) x ø6.0 (O.D.) mm / 6 ft
Exhaust Air ø5.5 (I.D.) x ø8.0 (O.D.) mm / 3 ft

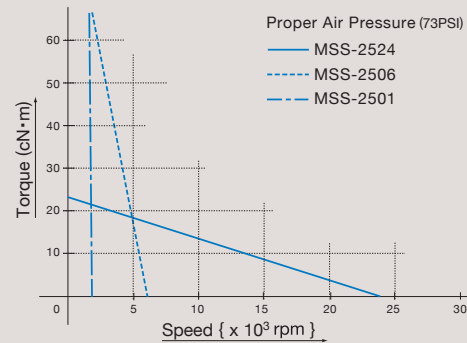
• Additional collet purchase required:

- Collet Series CHK-XX ø0.5mm~ø6.35mm
Recommended CHA-3.175 ø1/8"
(See Page 6-p3 for additional sizes)
- Collet Nut (K-265) For Collet (CHK)
- Metal Saw Arbor (KCH-03) For ø0.24" (I.D.) x ø1.18" (O.D.)
- Grindstone Arbor (AGM-03) ... For grinding wheel with I.D. of ø5 mm

● 90° ANGLE TYPE (RA)



MSS-25 SERIES Torque-Speed Characteristics



Caution : Two recommended clamp areas are laser-marked on the spindle. Select one of them for clamping, and do not clamp both areas.

MSS Series D = ø0.98"(ø25 mm)		R : 24,000 rpm (73PSI) / RA : 22,000 rpm (73PSI)							
Product Code	Product Name	Shape	Rotating Direction	Max. Output	Max. Torque	Length	M	Weight	
7841	MSS-2524R	Straight	FWD. (CW)	130W	22.5 cN · m	5.17"	0.98"	13.93 oz.	
7842	MSS-2524RA	90° Angle				5.43"		15.38 oz.	

R : 6,000 rpm (73PSI) / RA : 5,500 rpm (73PSI) 1/4 Speed Reduction

Product Code	Product Name	Shape	Rotating Direction	Max. Output	Max. Torque	Length	M	Weight	
7843	MSS-2506R	Straight	FWD. (CW)	130W	85 cN · m	6.46"	2.28"	1 lb. 1.11 oz.	
7844	MSS-2506RA	90° Angle				6.72"		1 lb. 2.55 oz.	

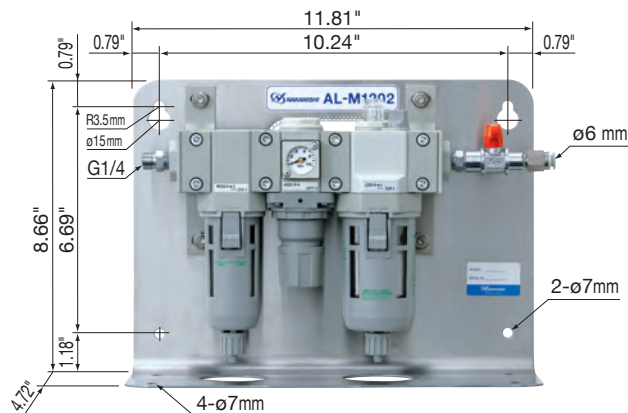
R : 1,500 rpm (73PSI) / RA : 1,400 rpm (73PSI) 1/16 Speed Reduction

Product Code	Product Name	Shape	Rotating Direction	Max. Output	Max. Torque	Length	M	Weight	
7845	MSS-2501R	Straight	FWD. (CW)	130W	332 cN · m	6.63"	2.44"	1 lb. 0.76 oz.	
7846	MSS-2501RA	90° Angle				6.89"		1 lb. 2.20 oz.	

Standard Equipment · Accessories

- Collet Nut (K-265) • Wrench (12 x 14) : 2 pcs. • Hose (K-204 : R type) : 6 ft • Hose (K-215 : RA type) : ø6 mm x 6 ft
- Hose (K-216 : RA type) : ø8 mm x 3 ft • Filter Joint (FJ-02 : R type), (FJ-01 : RA type) • Silencer (K-209 : R type), (K-20 : 8 : RA type)

Product Code 4502 AIR LINE KIT AL-M1202

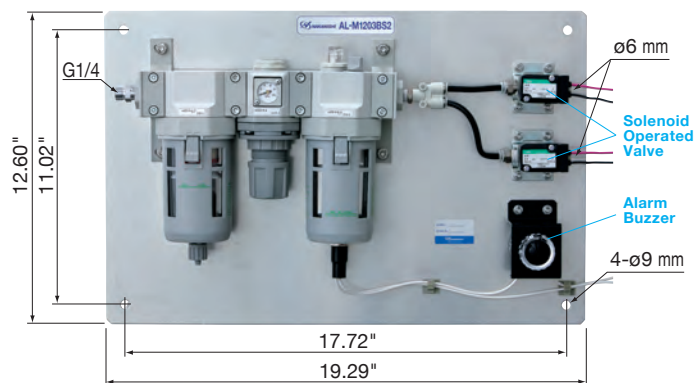


- The AL-M1202 provides simple, automatic conditioning of the air supplied to NAKANISHI Air Motors. The filter removes water and impure substances from the input air supply. The regulator maintains the proper air pressure, and the lubricator ensures proper oil flow to the motor and spindle. This Air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

Product Code 4503 AIR LINE KIT AL-M1203BS2



- The AL-M1203BS2 is equipped with 2 (DC+24V) Air Solenoids, a large capacity filter, large capacity oil reservoir, high flow regulator and a low oil level warning alarm, making this unit ideal for use on CNC machines. This Air Line Kit allows for the operation of 2 Air Motors.

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

Product Code	Product Name	Standard Equipment · Accessories	
4503	AL-M1203BS2	• Air Filter · Air Regulator • Air Pressure Gauge · Lubricator • Solenoid Valve (DC 24V) : 2 pcs. • Buzzer (DC 24V) · Hose for Piping (K-275) : 6 ft • Lubricating Oil (K-202) : 1 pc.	

LUBRICATING OIL

Lubricating Oil (4 oz.)

Product Code	Product Name	Product	
AA10478C	K-211		

Lubricating Oil (32 oz.)

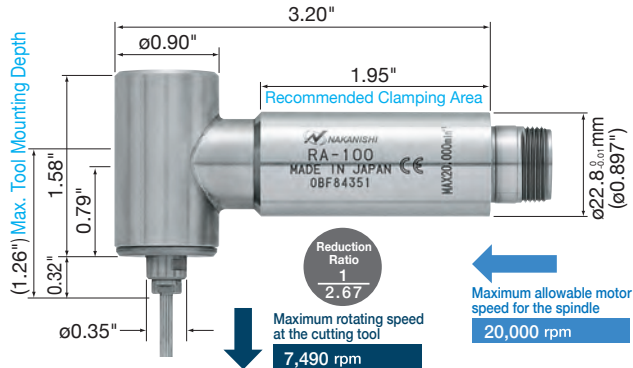
Product Code	Product Name	Product	
AA10480C	K-202		

MACHINE TOOL SPINDLES INFORMATION

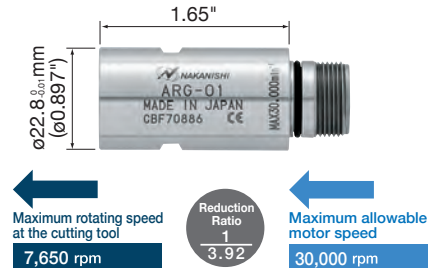
Maximum Motor Speed for Angle Type Spindles / Speed Reducers.

- 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)



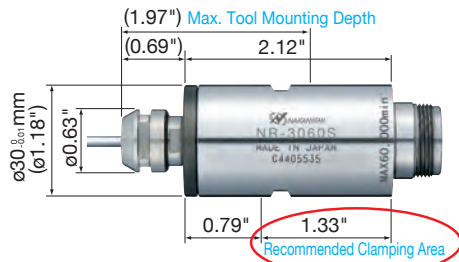
Example : Speed Reducer ARG-01
(Reduction Ratio = 1 : 3.92)



"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

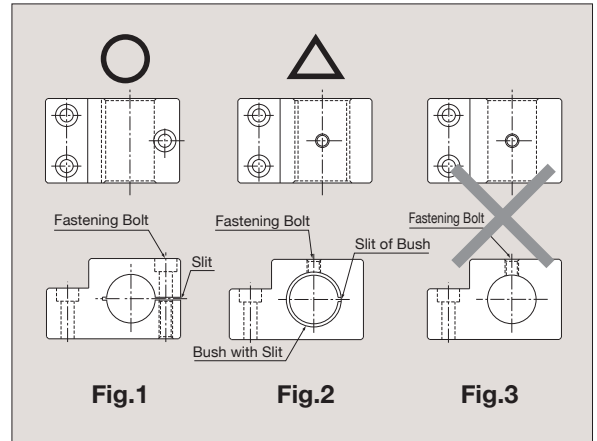


• E4000



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.

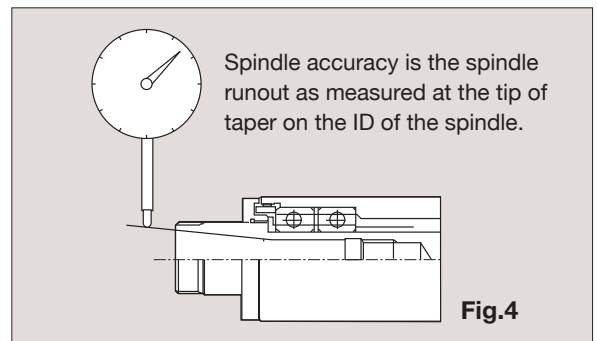


Caution

- 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.

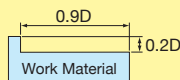
ø : Tool Size (mm) S : Spindle Motor Speed {rpm} F : Feed Rate (mm/min) f : Drilling Step (mm/rev)

	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.

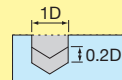
*Milling Depth/per
1D : End Mill Size



*Drilling Conditions

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

*Drilling/Step
D : Drilling Size



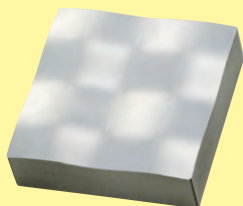
MA Series (Page 3-p1~)

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~)

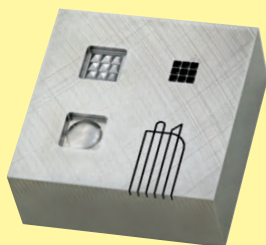
Series Code	Speed {rpm}	Output (W)	Max. Torque (cN·m)	Max. Dia. of Drill (mm)		
				S45C	Aluminum	Brass
MSS-19 Series <Outside Diameter $\phi 0.75"$ >	30,000	72	9.2	$\phi 1.0$	$\phi 1.5$	$\phi 2.0$
MSS-20 Series <Outside Diameter $\phi 0.79"$ >	8,000	72	36	$\phi 2.0$	$\phi 3.0$	$\phi 3.5$
MSS-22 Series <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~)



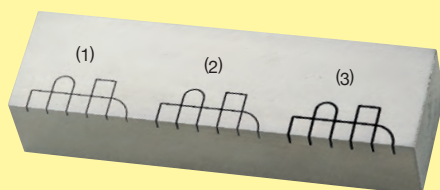
Material		STAVAX (HRC 52) 50 x 50 x 15 (mm)							
Usable Tool		Ultra-Hard Coated Ball End Mill R1.0		CBN Ball End Mill R1.0					
Cutting Process		1. Rough Cutting	2. Semi-Finishing Cutting	3. Finishing Cutting					
Cutting Depth		0.2 x 0.3mm	0.1 x 0.2mm	0.02 x 0.03mm	Total Time	Surface Roughness			
						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.

MA SERIES / E3000 SERIES

• APPLICATION EXAMPLE : AIR MOTOR CYLINDER PLATE

• WORK PIECE : BRASS

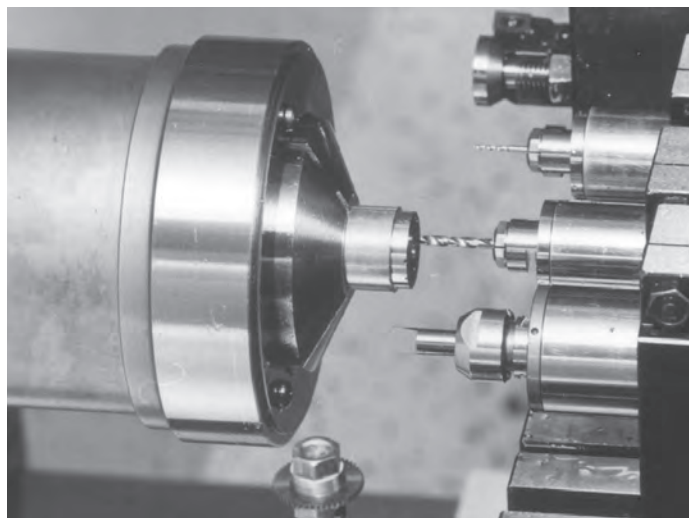
• WORK CONDITIONS :

- (1) AM-300R + ARG-02 + NR-303
 $\phi 24 \times t 1.1$ METAL SAWING ; TOOL SPEED : 2,000 rpm ; FEED : 50 mm/min
- (2) EM-3060 + ARG-021E + NR-453E
 $\phi 3.6^{+0.04}_{+0.03}$ END MILLING ; TOOL SPEED : 1,750 rpm ; FEED : 50 mm/min
- (3) AM-300R + ARG-02 + NR-303
 $\phi 2.5$ DRILLING ; TOOL SPEED : 2,000 rpm ; FEED : 70 mm/min
- (4) AM-300RA + ARG-01 + NR-303
 $\phi 1.1$ DRILLING ; TOOL SPEED : 8,000 rpm ; FEED : 50 mm/min

• INSTALLATION : GANG TOOL NC LATHE



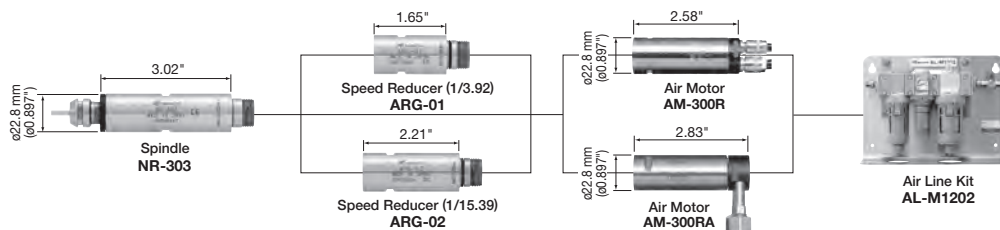
INSTALLATION



<Application Example, Installation>

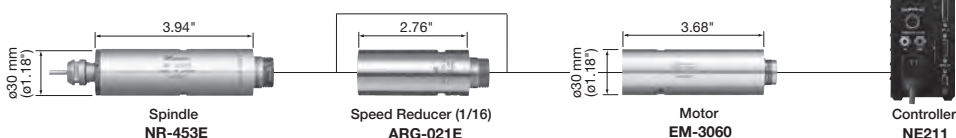
MA SERIES

2,000~30,000 rpm Output 57 W



E3000 SERIES

1,000~60,000 rpm Output 350 W



1

Eimax EVO

ESPERT

ROTUS

IMPULSE

PRESTO II

Sheenus

ZERO

Sonic-Cutter

ZERO

2

iSpeed3

E2000

$\phi 1.0^{+0.07}_{+0.05}$ / $\phi 0.98^{+0.07}_{+0.05}$

E3000

— One Piece

E3000

— Modular

$\phi 1.18^{+0.07}_{+0.05}$ / $\phi 0.98^{+0.07}_{+0.05}$

E3000

— 80,000rpm

E4000

3

MA

$\phi 0.897^{+0.07}_{+0.05}$

$\phi 1.0^{+0.07}_{+0.05}$ / $\phi 0.98^{+0.07}_{+0.05}$

$\phi 1.18^{+0.07}_{+0.05}$

MS

$\phi 0.75^{+0.07}_{+0.05}$ / $\phi 0.73^{+0.07}_{+0.05}$

$\phi 0.89^{+0.07}_{+0.05}$ / $\phi 0.91^{+0.07}_{+0.05}$

$\phi 1.0^{+0.07}_{+0.05}$ / $\phi 0.98^{+0.07}_{+0.05}$

4

HES

iSpeed5

HTS

PLANET

Xpeed

ABT

5

AIR LINE KIT

6

PARTS

7

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EXAMPLES

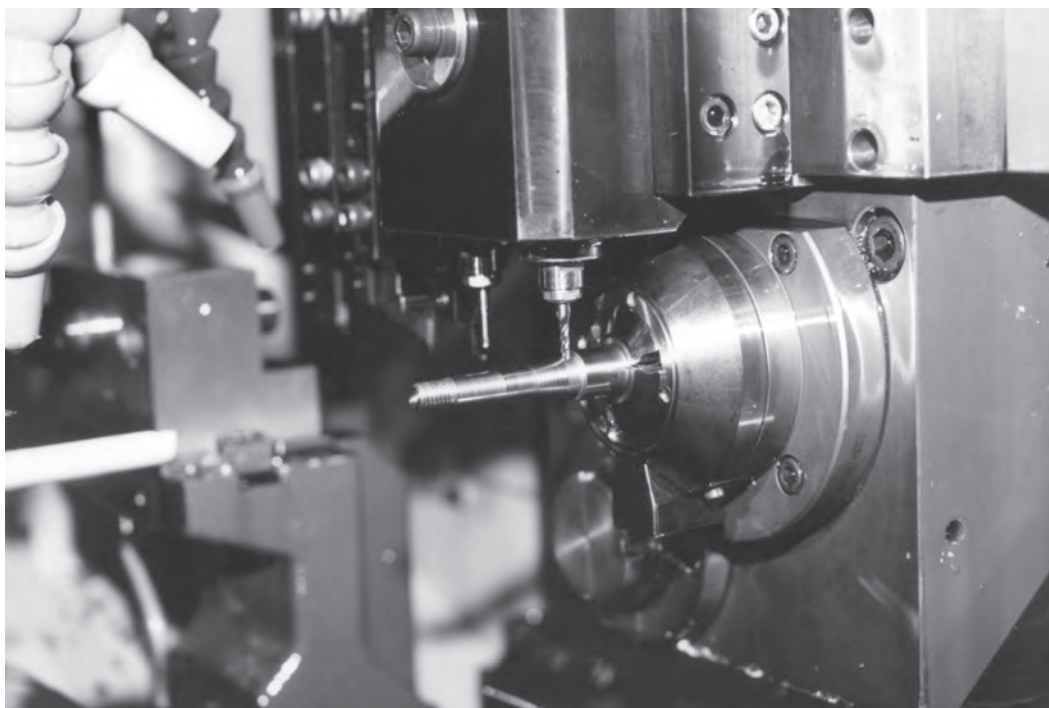
INDEX

MA SERIES

- APPLICATION EXAMPLE : METAL SAW SHAFT (END MILLING)
- WORK PIECE : SUS-420
- WORK CONDITIONS :
(1) AM-300R + ARG-02 + NR-303
ø2 END MILLING ; TOOL SPEED : 2,000 rpm ; FEED : 50 mm/min
- INSTALLATION : NC LATHE



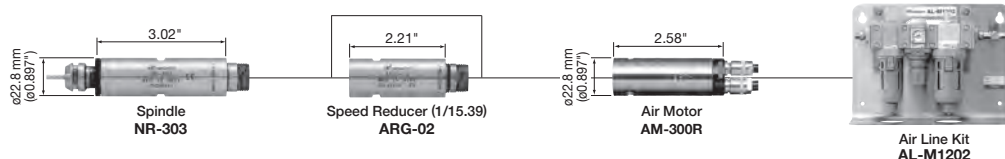
INSTALLATION



<Application Example, Installation>

MA SERIES

2,000~30,000 rpm Output 57 W



MA SERIES

• APPLICATION EXAMPLE : SMALL DIAMETER DRILLING

• WORK PIECE : BRASS

• WORK CONDITIONS :

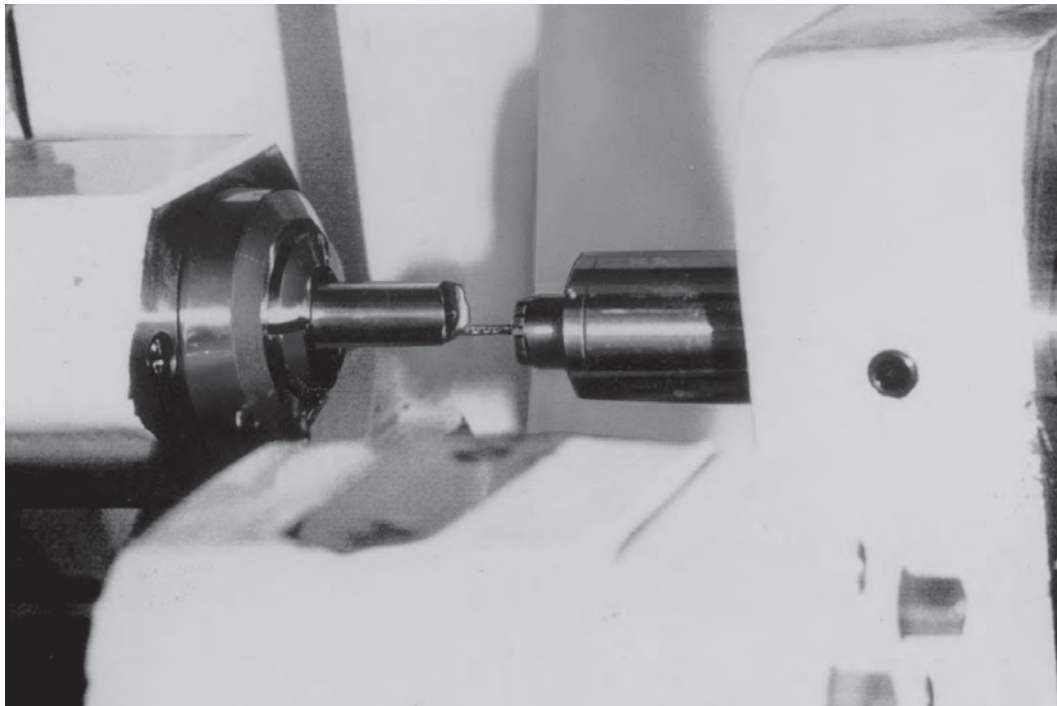
(1) AM-300R + NR-303

ø0.78 DRILLING 1.5 mm deep ; TOOL SPEED : 30,000 rpm ; FEED : 100 mm/min

• INSTALLATION : NC LATHE



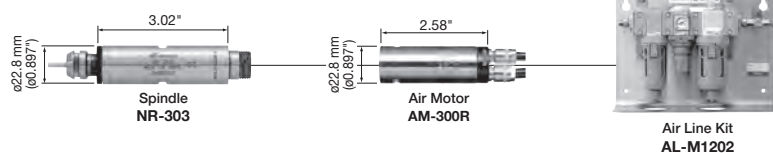
INSTALLATION



<Application Example, Installation>

MA SERIES

2,000~30,000 rpm Output 57 W



1
Emax EVO
ESPRT
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"
ø0.897"
ø0.91"
ø1.0"
ø0.98"
4
HES
iSpeed5
HTS
PLANET
Xpeed
ABT
5
AIR LINE KIT
6
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MA SERIES

• APPLICATION EXAMPLE : SMALL DIAMETER END MILLING

• WORK PIECE : BRASS

• WORK CONDITIONS :

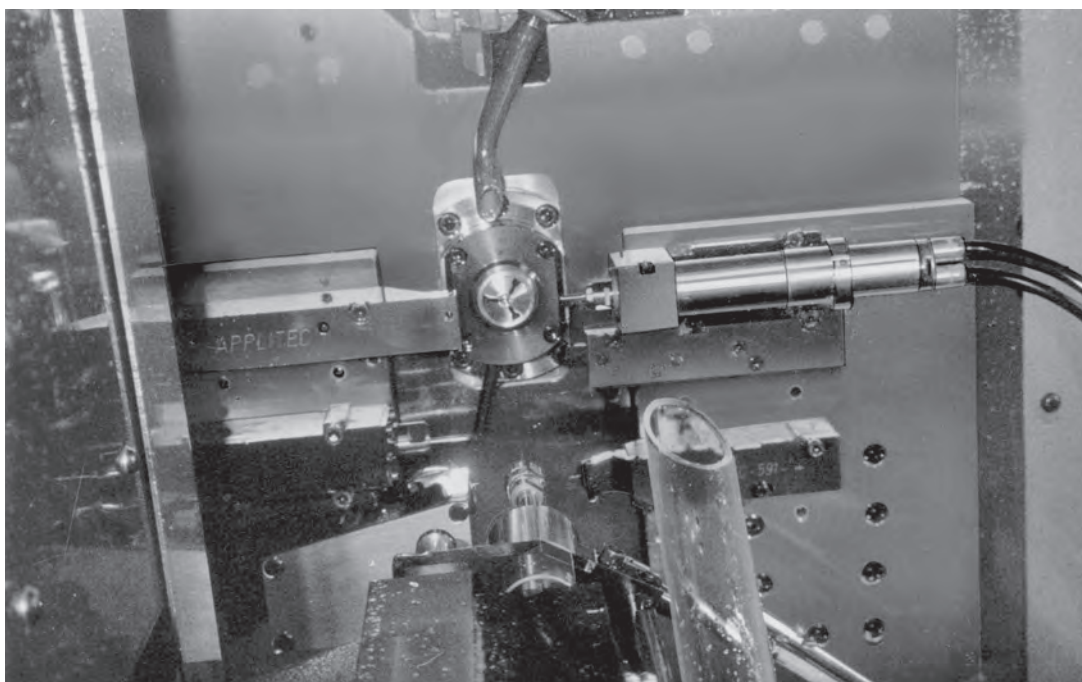
(1) AM-310R + NR-303

ø3.0 END MILLING ; TOOL SPEED : 30,000 rpm ; FEED : 60 mm/rev

• INSTALLATION : NC LATHE (TORNOS DECO 2000)



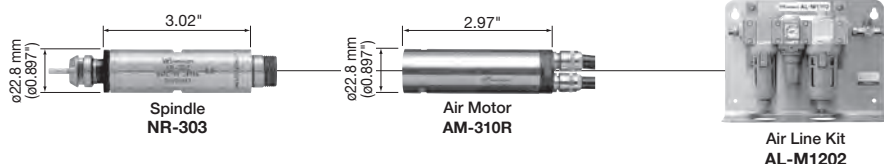
INSTALLATION



<Application Example, Installation>

MA SERIES

2,000~30,000 rpm Output 108 W

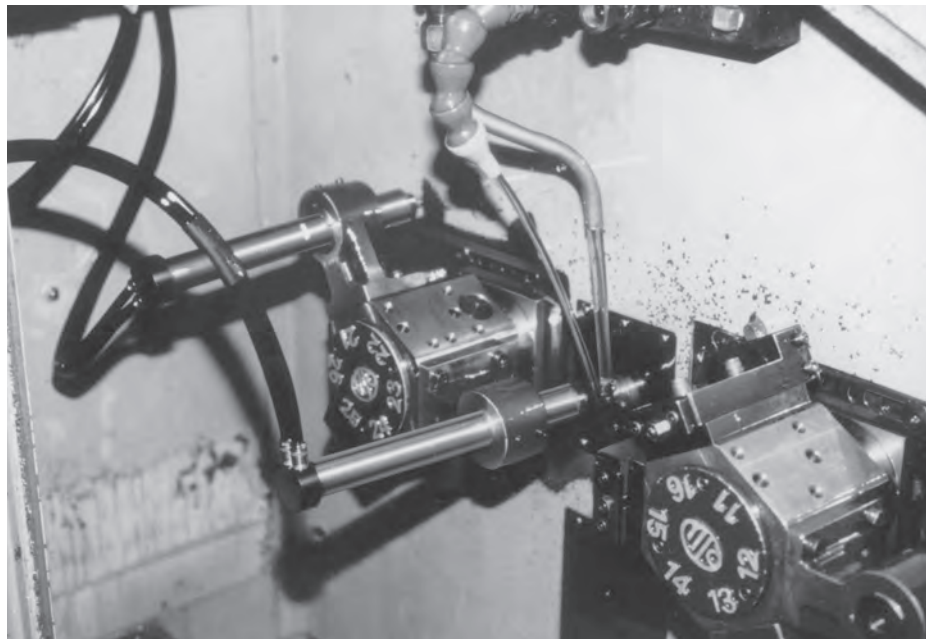


MA SERIES

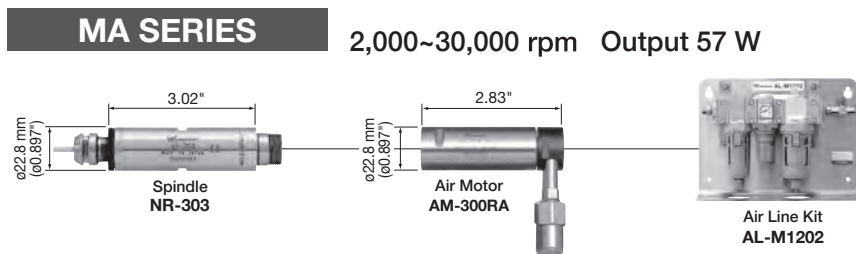
- APPLICATION EXAMPLE : END MILLING
- WORK PIECE : SUS
- WORK CONDITIONS :
 - (1) AM-300RA + NR-303
 $\phi 1.2$ END MILLING ; TOOL SPEED : 30,000 rpm ; FEED : 50 mm/min
 - (2) AM-300RA + NR-303
 $\phi 0.6$ END MILLING ; TOOL SPEED : 30,000 rpm ; FEED : 50 mm/min
- INSTALLATION : NC LATHE



INSTALLATION



<Application Example, Installation>



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
	$\phi 1.18$ "
	$\phi 1.0$ "/ $\phi 0.98$ " $\phi 0.897$ "
	E3000 — 30,000rpm
	E4000
3	MA
	$\phi 0.897$ "
	$\phi 1.0$ "
	$\phi 0.98$ "
	$\phi 1.18$ "
	MS
	$\phi 0.75$ "
	$\phi 0.79$ "
	$\phi 0.89$ "
	$\phi 0.91$ "
	$\phi 1.0$ "
	$\phi 0.98$ "
4	HES
	iSpeed5
	HTS
	PLANET
	Xpeed
	ABT
5	AIR LINE KIT
6	PARTS
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MA SERIES / MS SERIES

• APPLICATION EXAMPLE : COMPLEX PROCESS

• WORK PIECE : BRASS

• WORK CONDITIONS :

(1) AM-300R + ARG-02 + NR-303

ø10 METAL SAWING ; TOOL SPEED : 2,000 rpm ; FEED : 30 mm/min

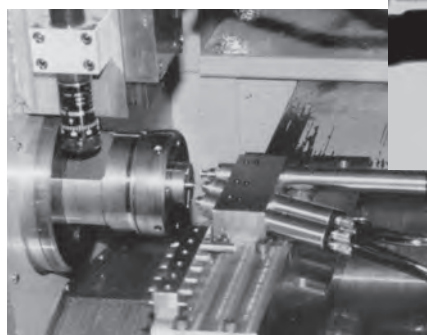
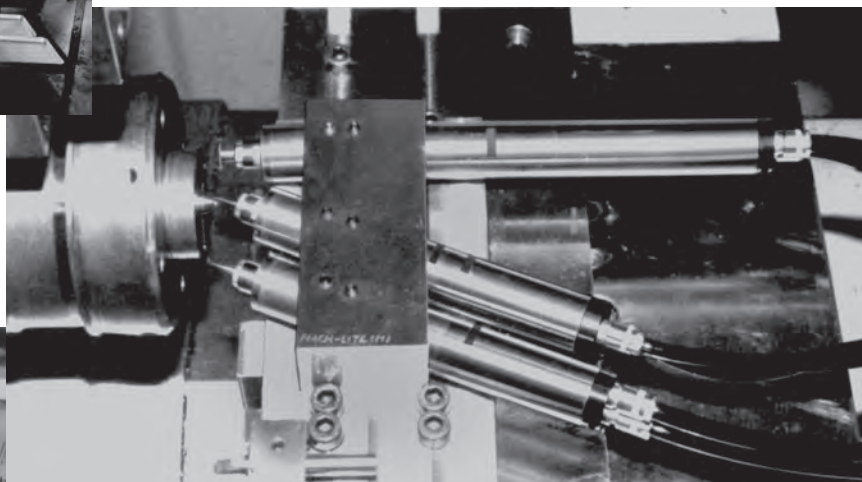
(2) AM-300R + NR-303 or MSST-2330R

ø0.5 DRILLING ; TOOL SPEED : 30,000 rpm ; FEED : 40 mm/min

• INSTALLATION : NC LATHE



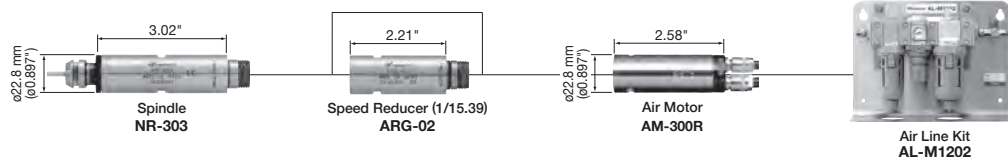
INSTALLATION



<Application Example, Installation>

MA SERIES

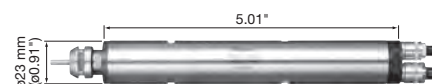
2,000~30,000 rpm Output 57 W



MS SERIES

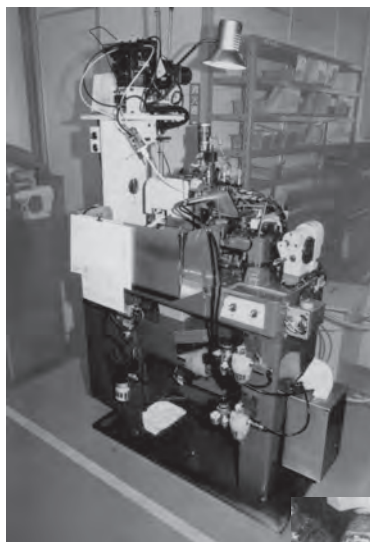
30,000 · 8,000 · 2,000 rpm Output 108 W

• MSST-23 Series Straight Type

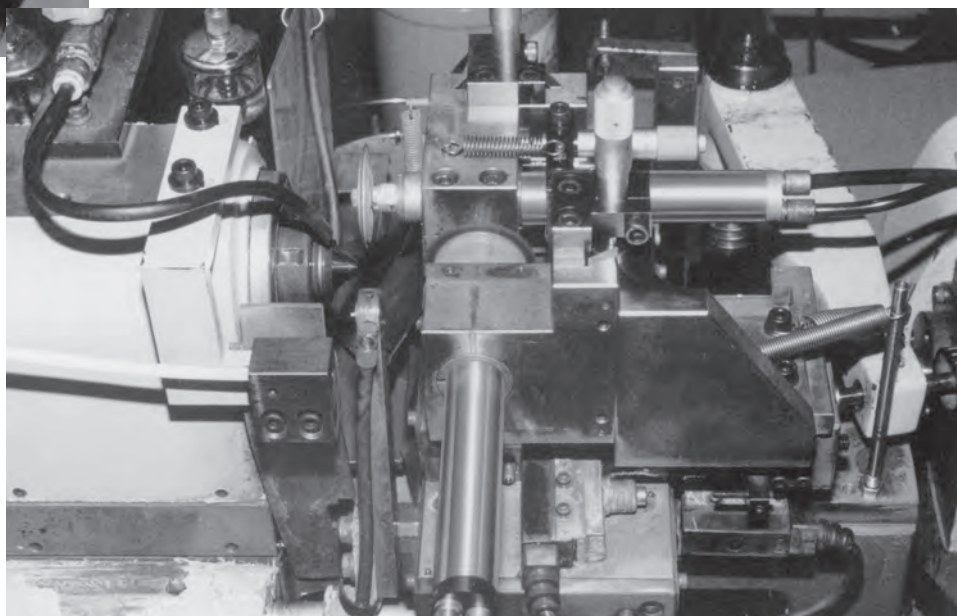


MS SERIES

- APPLICATION EXAMPLE : METAL SAWING AND SLOTTING
- WORK PIECE : SUS-440C
- WORK CONDITIONS :
 - (1) MSST-2302R
 - ø50 x t 0.3 FINE CUTTER ; TOOL SPEED : 15,000 rpm ; FEED : 0.028 mm/rev
- INSTALLATION : SPECIAL PURPOSE MACHINE



INSTALLATION

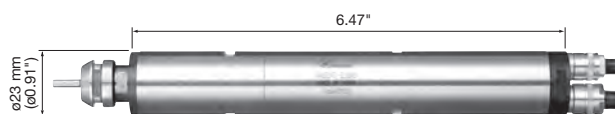


<Application Example, Installation>

MS SERIES

30,000 · 8,000 · 2,000 rpm Output 108 W

- MSST-23 Series Straight Type



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

Xspeed

ABT

5

AIR LINE KIT

6

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7

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MS SERIES

• APPLICATION EXAMPLE : DRILLING

• WORK PIECE : S-45C

• WORK CONDITIONS :

(1) MSST-2302R

ø5 DRILLING ; TOOL SPEED : 2,000 rpm ; FEED : 30 mm/min

• INSTALLATION : NC MILLING LATHE



<Application Example, Installation>

MS SERIES

30,000 · 8,000 · 2,000 rpm Output 108 W

• MSST-23 Series Straight Type

