

# E2000



**MAFRA**  
MAILE GMBH  
PRÄZISIONSMASCHINEN

E2000



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MAILE GMBH  
PRÄZISIONSMASCHINEN  
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※Specifications and design are subject to change without notice.

NAKANISHI INC. 2022



SERIES **E2000**

ULTRA-HIGH-SPEED & SUPER-PRECISION

# Baby-E

Smallest model in Nakanishi E series

## ✔ Spindle accuracy within 1 $\mu\text{m}$

- Optimum for high-precision machining
- Longer tool life

## ✔ Ceramic Bearing

- Higher rigidity for heavy cutting
- Longer bearing life

## ✔ Brushless motor





- No need to replace carbon brushes to enable maintenance-free operation
- Carbon brush dust will no longer penetrate the bearing to extend the product life








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## Motor

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## Motor cord

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Motor cord [ Length ] 4m, 6m, 8m

## Controller



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Controller

## Accessories



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Air line kit



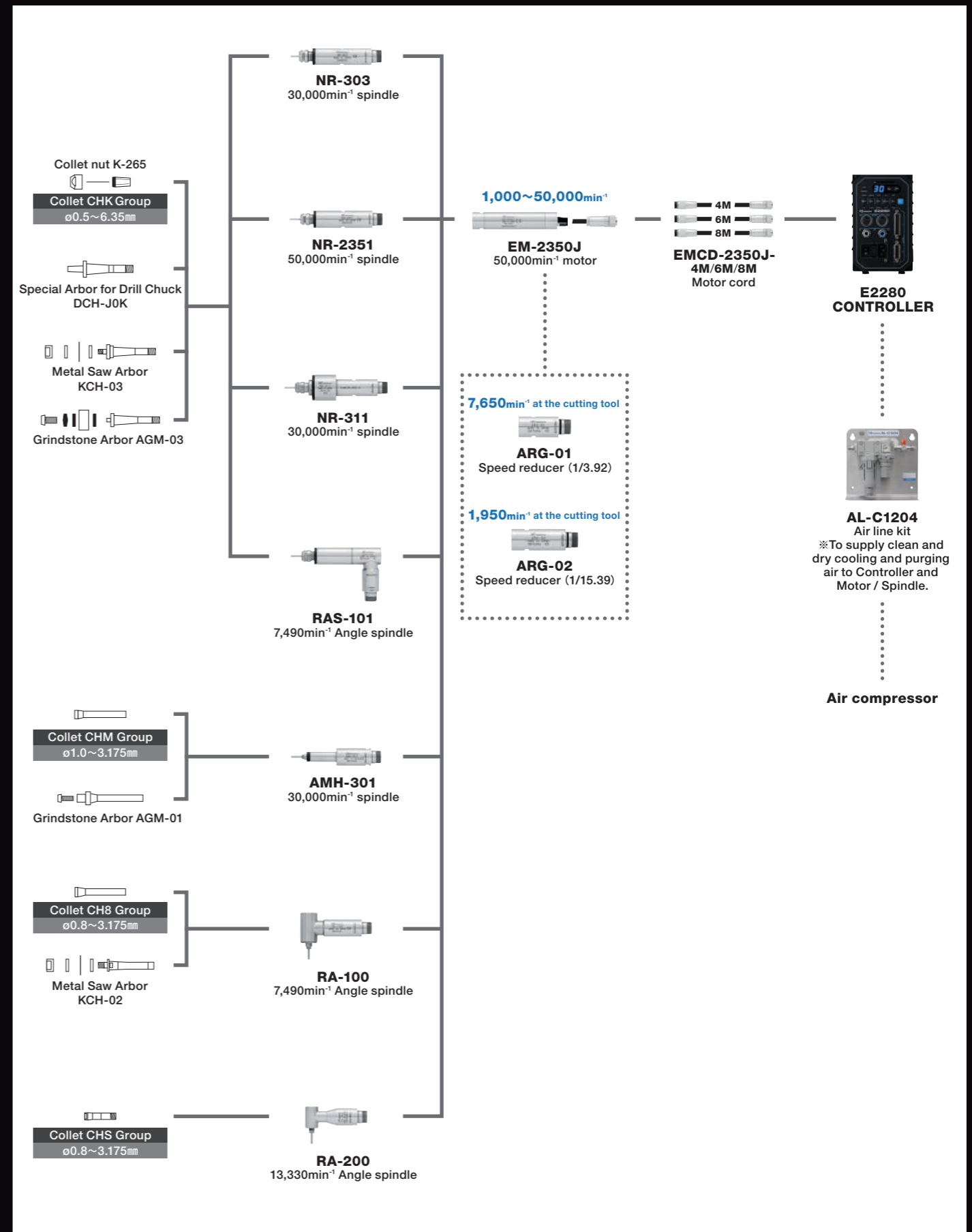
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**CHK / CHM**  
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Collet

# System Chart

## [E2000]



Spindle  
Guide

CHK



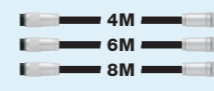
NR-303



NR-2351



EM-2350J



EMCD-2350J



E2280 CONTROLLER



AL-C1204

E2000 SERIES

Shown In Actual Size

## Straight type spindle

## NR-303

O.D.  $\varnothing$ 22.8mm

## Specifications

DXF data DXF files are available on our website

Order by Code No.

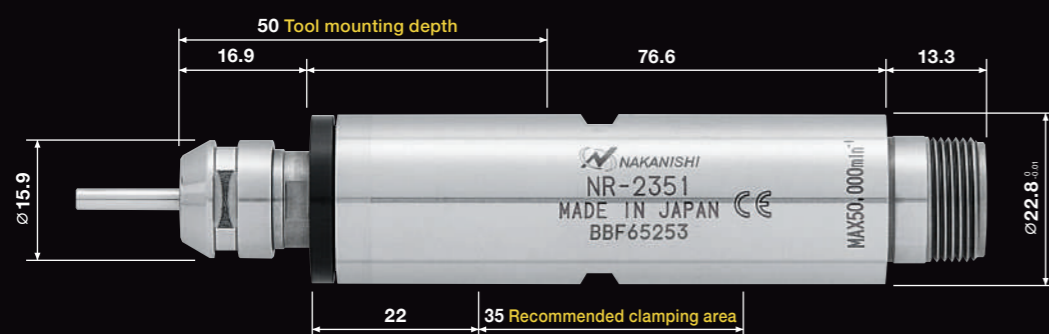
## NR-303

Code No. **7861** Model **NR-303**

O.D.	Max. rpm	Spindle Accuracy	Collet	Weight
$\varnothing$ 22.8mm	30,000min <sup>-1</sup>	Within 2 $\mu$ m	CHK Group ( $\varnothing$ 0.5 ~ $\varnothing$ 6.35mm)	215g
Standard Accessories		Collet nut (K-265) / Wrench (12×14) : 2pcs. · (20×24) : 1pc.		
Options		Collet (CHK Group) : $\varnothing$ 0.5~ $\varnothing$ 6.35mm <b>p.17</b> Metal Saw Arbor (KCH-03) : $\varnothing$ d (I.D.) × under $\varnothing$ 30mm (O.D.) Grindstone Arbor (AGM-03) : Grindstone I.D. $\varnothing$ 5.0mm		

\* Collet is sold separately.

## NR-2351

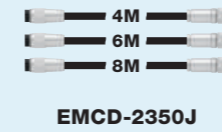
O.D.  $\varnothing$ 22.8mm

## NR-2351

Code No. **7855** Model **NR-2351**

O.D.	Max. rpm	Spindle Accuracy	Collet	Weight
$\varnothing$ 22.8mm	50,000min <sup>-1</sup>	Within 1 $\mu$ m	CHK Group ( $\varnothing$ 0.5 ~ $\varnothing$ 6.35mm)	215g
Standard Accessories		Collet nut (K-265) / Wrench (12×14) : 2pcs. · (20×24) : 1pc.		
Options		Collet (CHK Group) : $\varnothing$ 0.5~ $\varnothing$ 6.35mm <b>p.17</b> Metal Saw Arbor (KCH-03) : $\varnothing$ d (I.D.) × under $\varnothing$ 30mm (O.D.) Grindstone Arbor (AGM-03) : Grindstone I.D. $\varnothing$ 5.0mm		

\* Collet is sold separately.

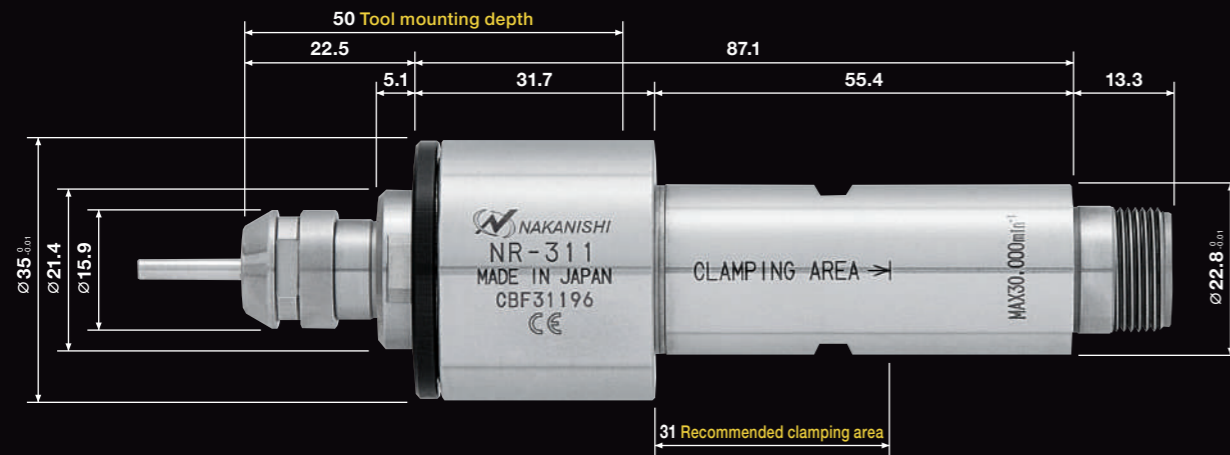
Spindle  
Guide

E2000 SERIES

Shown In Actual Size

## Straight type spindle

## NR-311

O.D.  $\varnothing$ 22.8mm

## Specifications

DXF data DXF files are available on our website

Order by Code No.

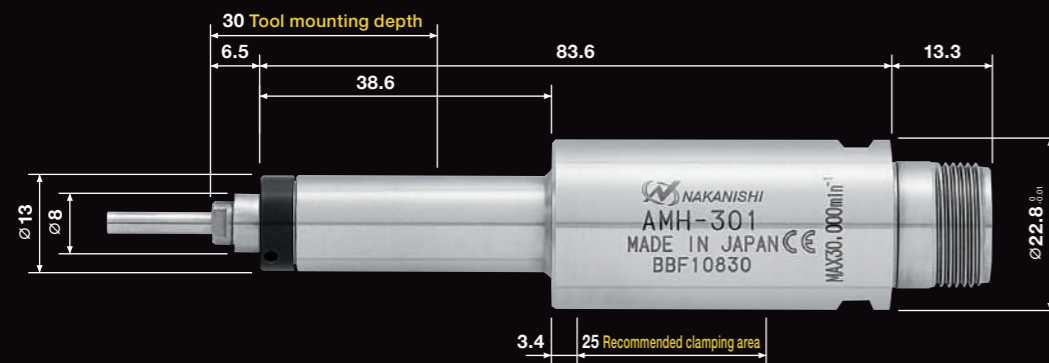
## NR-311

Code No. **7832**Model **NR-311**

O.D.	Max. rpm	Spindle Accuracy	Collet	Weight
$\varnothing$ 22.8 <sub>mm</sub>	30,000min <sup>-1</sup>	Within 2 $\mu$ m	CHK Group ( $\varnothing$ 0.5 ~ $\varnothing$ 6.35mm)	370g
<b>Standard Accessories</b> Collet nut (K-265) / Wrench (12×14)·(20×24) : 1pc. each				
<b>Options</b> Collet (CHK Group) : $\varnothing$ 0.5~ $\varnothing$ 6.35mm <b>p.17</b> Metal Saw Arbor (KCH-03) : $\varnothing$ d (I.D.) × under $\varnothing$ 30mm (O.D.) Grindstone Flange (NGF2-19) : $\varnothing$ 19.05 (I.D.) × $\varnothing$ 40 (O.D.) × 7mm (W)				

\* Collet is sold separately.

## AMH-301

O.D.  $\varnothing$ 22.8mm

## AMH-301

Code No. **1074**Model **AMH-301**

O.D.	Max. rpm	Collet	Weight
$\varnothing$ 22.8 <sub>mm</sub>	30,000min <sup>-1</sup>	CHM Group ( $\varnothing$ 1.0 ~ $\varnothing$ 3.175mm)	171g
<b>Standard Accessories</b> Collet : $\varnothing$ 3.0mm (CHM-3.0) / Wrench (7×5.1)·(6×4.5)·(20×24) : 1pc. each			
<b>Options</b> Collet (CHM Group) : $\varnothing$ 1.0~ $\varnothing$ 3.175mm <b>p.17</b> Grindstone Arbor (AGM-01) : Grindstone I.D. $\varnothing$ 5.0mm			

Spindle  
Guide

CH8 / CHS



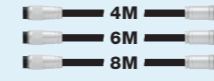
RA-100



RA-200



EM-2350J



EMCD-2350J



E2280 CONTROLLER



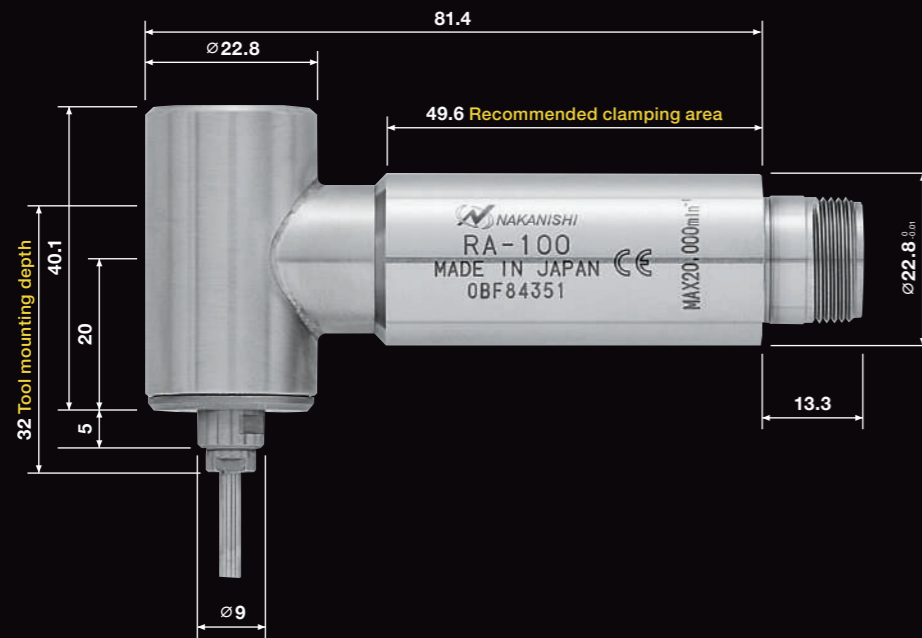
AL-C1204

E2000 SERIES

Shown In Actual Size

## Angle type spindle

## RA-100

O.D.  $\phi$ 22.8mm

## Specifications

DXF data DXF files are available on our website

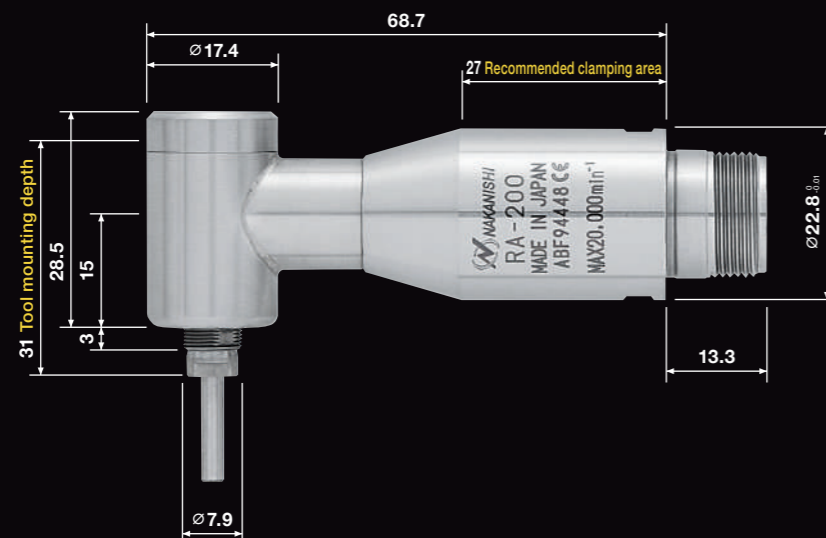
Order by Code No.

## RA-100

Code No. **1024** Model **RA-100**

O.D.	Max. speed at the cutting tool	Reduction ratio	Max. Allowable Motor Speed for The Spindle	Collet	Weight
$\phi$ 22.8mm	<b>7,490</b> min <sup>-1</sup>	$\frac{1}{2.67}$	<b>20,000</b> min <sup>-1</sup>	<b>CH8</b> Group ( $\phi$ 0.8 ~ $\phi$ 3.175mm)	<b>271g</b>
Standard Accessories		Collet : $\phi$ 3.0mm (CH8-3.0) / Wrench (7×5.5) · (8×5) · (20×24) : 1pc. each			
Options		Collet (CH8 Group) : $\phi$ 0.8~ $\phi$ 3.175mm <b>p.17</b> Metal Saw Arbor (KCH-02) : $\phi$ d (I.D.) × under $\phi$ 30mm (O.D.)			

## RA-200

O.D.  $\phi$ 22.8mm

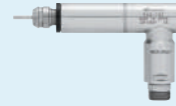
## RA-200

Code No. **1075** Model **RA-200**

O.D.	Max. speed at the cutting tool	Reduction ratio	Max. Allowable Motor Speed for The Spindle	Collet	Weight
$\phi$ 22.8mm	<b>13,330</b> min <sup>-1</sup>	$\frac{1}{1.5}$	<b>20,000</b> min <sup>-1</sup>	<b>CHS</b> Group ( $\phi$ 0.8 ~ $\phi$ 3.175mm)	<b>165g</b>
Standard Accessories		Collet : $\phi$ 3.0mm (CHS-3.0) / Wrench (7×5.1) · (8×5) · (20×24) : 1pc. each			
Options		Collet (CHS Group) : $\phi$ 0.8~ $\phi$ 3.175mm <b>p.17</b>			

Spindle  
Guide

CHK



RAS-101



EM-2350J



EMCD-2350J



E2280 CONTROLLER



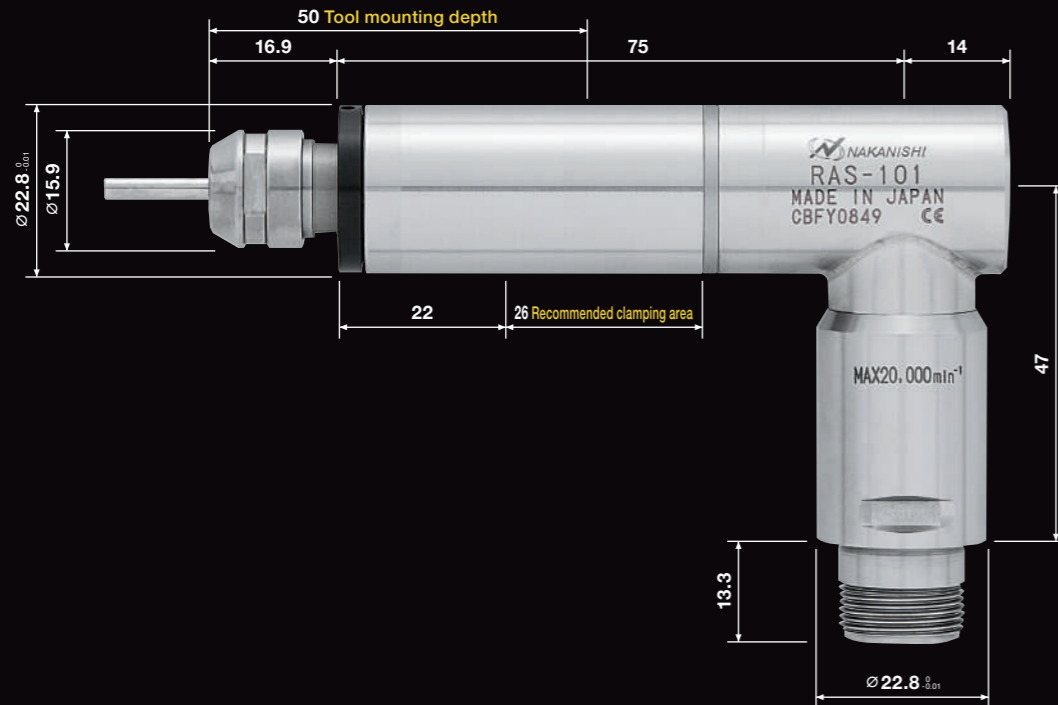
AL-C1204

E2000 SERIES

Shown In Actual Size

# Angle type spindle

## RAS-101

O.D.  $\phi 22.8\text{mm}$ 

## Specifications

DXF  
dataDXF files are available  
on our website

Order by Code No.

### RAS-101

Code No. **7839**Model **RAS-101**

O.D.	Max. speed at the cutting tool	Reduction ratio	Max. Allowable Motor Speed for The Spindle	Spindle Accuracy	Collet	Weight
$\phi 22.8\text{mm}$	<b>7,490</b> min <sup>-1</sup>	<b><math>\frac{1}{2.67}</math></b>	<b>20,000</b> min <sup>-1</sup>	Within <b>2</b> $\mu\text{m}$	<b>CHK</b> Group ( $\phi 0.5 \sim \phi 6.35\text{mm}$ )	<b>325g</b>
<b>Standard Accessories</b>		Collet nut (K-265) / Wrench (12×14) : 2pcs. · (20×24) : 1pc.				
<b>Options</b>		Collet (CHK Group) : $\phi 0.5 \sim \phi 6.35\text{mm}$ <b>p.17</b>				
		Metal Saw Arbor (KCH-03) : $\phi d$ (I.D.) × under $\phi 30\text{mm}$ (O.D.)				
		Grindstone Arbor (AGM-03) : Grindstone I.D. $\phi 5.0\text{mm}$				

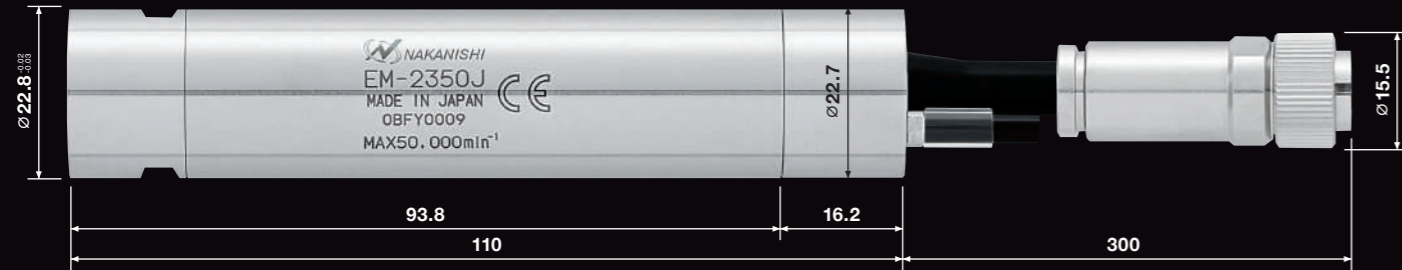
\* Collet is sold separately.



# Motor / Speed reducer

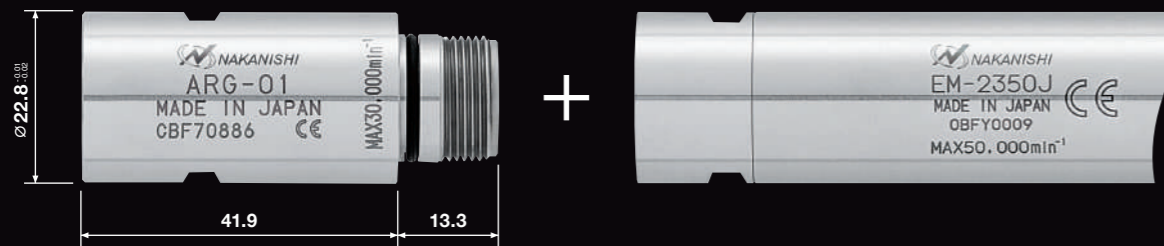
## EM-2350J

Motor

O.D.  $\varnothing$ 22.8mm

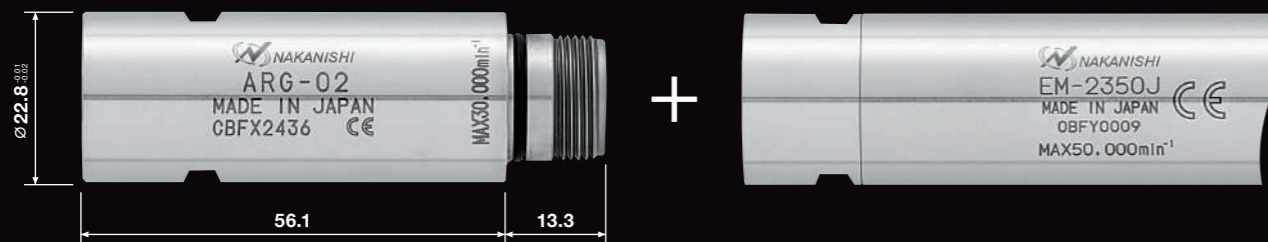
## ARG-01

Speed reducer (1/3.92)

O.D.  $\varnothing$ 22.8mm

## ARG-02

Speed reducer (1/15.39)

O.D.  $\varnothing$ 22.8mm

# Specifications

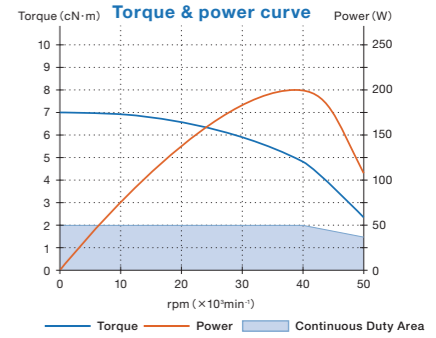
**DXF data** DXF files are available on our website

Order by Code No.

## EM-2350J

Code No. **7721** Model **EM-2350J**

O.D.	Speed Range	Max. power	Weight
$\varnothing$ 22.8mm	1,000~50,000min <sup>-1</sup>	200w	260g (Motor cord is included.)
<b>Standard Accessories</b> Wrench (20×24) : 1pc.			
<b>Options</b> Motor cord : Length 4m (7722), 6m (7723), 8m (7724)			



## ARG-01

Code No. **1022** Model **ARG-01**

O.D.	Max. speed at the cutting tool	Reduction ratio	Max. rpm	Weight
$\varnothing$ 22.8mm	7,650min <sup>-1</sup>	$\frac{1}{3.92}$	30,000min <sup>-1</sup>	108g

## ARG-02

Code No. **1023** Model **ARG-02**

O.D.	Max. speed at the cutting tool	Reduction ratio	Max. rpm	Weight
$\varnothing$ 22.8mm	1,950min <sup>-1</sup>	$\frac{1}{15.39}$	30,000min <sup>-1</sup>	148g

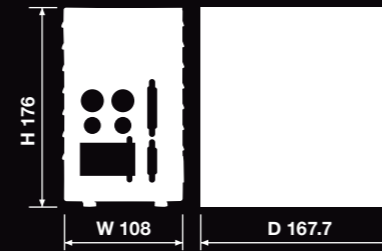


# E2280 Controller



## E2280 CONTROLLER Controller

Code No. **7720**



### Equipped with selector

- Up to 2 motors to control  
※not simultaneously
- Providing individual speed control of each motor

### External Input / Output Control Signal Operation

- External Input  
Motor ON / OFF,  
Error Released, Rotating Direction,  
Motor Speed Setting and etc.
- External Monitor  
Motor Current, Error, Warning,  
Rotating pulse and etc.
- Parameter Setting  
Maximum motor speed setting,  
Fix the motor speed  
※For more information, please refer to the  
operation manual on our website.

Speed Range	Input Voltage	Max. power
1,000~50,000min <sup>-1</sup>	AC100~240v Without plug Multiple output power	200w
Power consumption	Air consumption	Weight
AC1.4A	1motor : 30Nℓ/min (0.25MPa) / 2motors : 63Nℓ/min (0.30MPa)	2.2kg
Standard Accessories	Power cord : 3m / Air hose with filter (K-251 : 2058) : 2m / Power cord hook Connector cap (Included) / Connector cover (Included) Bracket / Air branching joint / Fuse / Mounting screw / Reducer	

# Accessories (Air line kit, etc.)

## AL-C1204 Air line kit



※Recommendation of nominal filtration rating:0.3μm, Pressure range:0.1-1.0MPa  
Recommendation of air filter:M2000-WS (CKD)

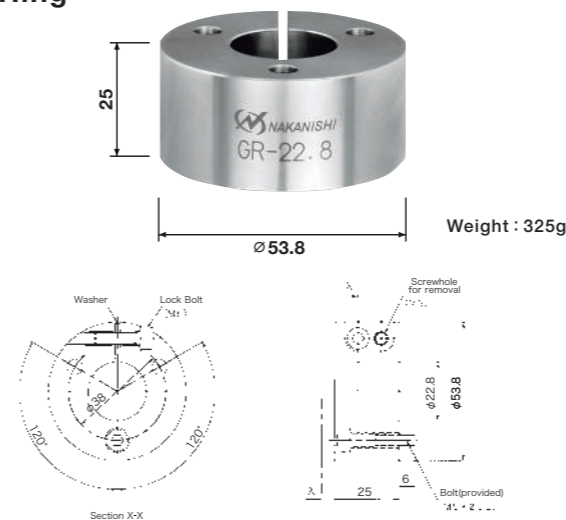
Code No.	<b>4504</b>	Model	<b>AL-C1204</b>
Standard Accessories	Hose pipe (K-260) : 2m		

## Motor cord

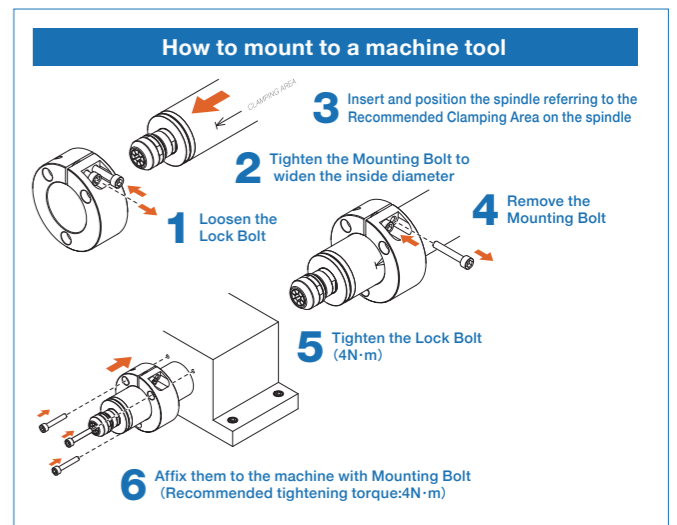
Motor cord	Code No.	Model	Length	Standard Accessories	Compatible model
4M	<b>7722</b>	EMCD-2350J-4M	3.7m	Air hose Connector cap (Included)	EM-2350J
6M	<b>7723</b>	EMCD-2350J-6M	5.7m		
8M	<b>7724</b>	EMCD-2350J-8M	7.7m		
Joint type					

## GR-22.8 Grip Ring

Code No. **1888** Model **GR-22.8**



Standard Accessories Mounting Bolt (GR-22.8) M5 × 25 : 3pcs.



# Accessories (Collet, etc.)

Collet	Code No.	Model	I.D. / Description	Compatible model				
<p>Collet CHK Group</p>	91597	CHK-3.0AA	ø3.0AA*	NR-2351 · NR-303 · NR-311 RAS-101 * High precision type AA (Run-out Accuracy within 2 μm)				
	91598	CHK-3.175AA	ø3.175AA*					
	91599	CHK-4.0AA	ø4.0AA*					
	91600	CHK-6.0AA	ø6.0AA*					
	91601	CHK-6.35AA	ø6.35AA*					
	91592	CHK-2.35	ø2.35					
	91530	CHK-3.0	ø3.0					
	91593	CHK-3.175	ø3.175					
	91540	CHK-4.0	ø4.0					
	91560	CHK-6.0	ø6.0					
	91596	CHK-6.35	ø6.35					
	<p>Collet CHM Group</p>	90992	CHM-2.35		ø2.35	AMH-301		
90930		CHM-3.0	ø3.0					
90993		CHM-3.175	ø3.175					
90916		CHM-1.6	ø1.6					
—		CHM-□□	ø1.0, ø2.0					
<p>Collet CHS Group</p>		90592	CHS-2.35	ø2.35	RA-200			
		90530	CHS-3.0	ø3.0				
		90593	CHS-3.175	ø3.175				
		90516	CHS-1.6	ø1.6				
		—	CHS-□□	ø0.8, ø0.9 ø1.0, ø2.0, ø2.5				
		<p>Collet CH8 Group</p>	91092	CH8-2.35			ø2.35	RA-100
			91030	CH8-3.0			ø3.0	
	91093		CH8-3.175	ø3.175				
	—		CH8-□□	ø0.8, ø0.9 ø1.0, ø1.5, ø2.0, ø2.5				
	<p>Collet nut for CHK collet</p>		2129	K-265		Collet nut for CHK collet	NR-2351 · NR-303 · NR-311 RAS-101	

Metal Saw Arbor · Grindstone Arbor	Code No.	Model	I.D. / Description / Specifications	Compatible model	
	2132	DCH-J0K	Special Arbor for Drill Chuck For drill chuck Jacob's taper No.0 Run-out Accuracy : within 0.05mm	NR-2351 · NR-303 · NR-311 RAS-101	
	2146	KCH-02 (5.0)	ø5.0 (I.D.)	Metal Saw Arbor ød (I.D.) x under ø30mm (O.D.) Run-out Accuracy : within 0.02mm	RA-100
	1077	KCH-02 (6.0)	ø6.0 (I.D.)		
	2147	KCH-02 (8.0)	ø8.0 (I.D.)		
	2148	KCH-03 (5.0)	ø5.0 (I.D.)	Metal Saw Arbor ød (I.D.) x under ø30mm (O.D.) Run-out Accuracy : within 0.02mm	NR-2351 · NR-303 · NR-311 RAS-101
	2130	KCH-03 (6.0)	ø6.0 (I.D.)		
	2149	KCH-03 (8.0)	ø8.0 (I.D.)		
		1029	AGM-01	Grindstone Arbor Run-out Accuracy : within 0.02mm Grindstone I.D. ø5.0mm	AMH-301
		2131	AGM-03	Grindstone Arbor Run-out Accuracy : within 0.02mm Grindstone I.D. ø5.0mm	NR-2351 · NR-303 · RAS-101

\* For right hand (cw) rotation only.

# NAKANISHI Solutions LINE UP

## Electric Motors & Spindles



Application for CNC lathes / Special purpose machines

Application for machining centers and milling machines

### E4000 SERIES

1,000~40,000min<sup>-1</sup> Max.1,200W  
[ ø40mm ]



- World's highest power in this class
- Max. power: 1,200W, Max. torque: 1.0N·m

### E3000 SERIES

1,000~80,000min<sup>-1</sup> Max.350W  
[ ø30/25/20mm ]



- The largest product lines for various processing
- Space-saving solution for small CNC lathe

### HES SERIES

Max.80,000min<sup>-1</sup>  
[ For small diameter endmills and drills only ]



- The most cost effective solution to add high-speed machining capability
- 80,000min<sup>-1</sup>, 6.0cN·m
- BT, HSK A63, ST shanks are available
- Driven by E3000 Controller

### E2000 SERIES

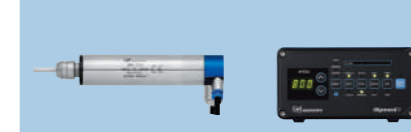
1,000~50,000min<sup>-1</sup> Max.200W  
[ ø22.8/25mm ]



- Small size spindle allows multi-axis installation in limited space

### iSpeed3 SERIES

1,000~80,000min<sup>-1</sup> Max.150W  
[ ø19.05/20/22mm ]



- Super short motor spindle
- High efficiency brushless motor



- 50,000min<sup>-1</sup>, 8.75cN·m
- BT, NT, CAT, IT, HSK A, ST shanks are available
- Driven by E3000 Controller

## Air Motors & Spindles



Application for CNC lathes / Special purpose machines

### Air-Speed SERIES One-piece type

Max.30,000min<sup>-1</sup> Max.130W  
[ ø25/23/20/19.05mm ]



- Short body enables the spindle to mount in a limited space on a small NC/CNC lathe or on a special purpose machine

### Air-Speed SERIES Modular type

Max.30,000min<sup>-1</sup> Max.130W  
[ ø30/25/22.8mm ]



- Separate motor and spindle for flexible application changes
- Adjustable to various application through changing spindles

## Air Turbine Spindles

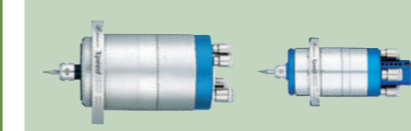


Application for CNC lathes / Special purpose machines

Application for machining centers and milling machines

### Xped SERIES

Max.160,000min<sup>-1</sup>  
[ ø65/40mm ]



- Extreme accuracy-Runout 1μm
- For high precision small diameter drilling, internal grinding of ceramics
- Long life of spindle thanks to contactless rotation mechanism

### PLANET SERIES

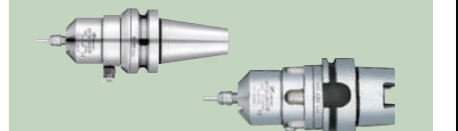
Max.65,000min<sup>-1</sup>



- A milling machine turns into a jig grinder
- For high precision internal grinding

### HTS SERIES

150,000min<sup>-1</sup>  
[ For small diameter endmills and drills only ]



- No thermal expansion on Z axis thanks to air turbine generating little heat
- Ultra high speed 150,000min<sup>-1</sup> with higher rigidity thanks to ceramic bearings
- BT, HSK E and straight (M2040) shanks are available