

NAKANISHI SPINDLE HES

Specifications and design are subject to change without notice.



Headquarters · Factory
700 Shimohinata, Kanuma, Tochigi 322-8666, Japan
TEL +81-289-64-3520 FAX +81-289-62-1135

www.nakanishi-inc.com
NAKANISHI INC. 2018

PR-K314E Ver.5 '18.11.03.Ⓢ

Nature of Tochigi, Japan
Mt.Nasu in Winter

SERIES **HES**

ULTRA-HIGH-SPEED & SUPER-PRECISION

Transformer

Your machining center transforms to the high speed machining center

HES510 Max. rpm 50,000min⁻¹

HES810 Max. rpm 80,000min⁻¹

✔ **Spindle runout within 1μm**

- Optimum for high-precision machining
- Longer tool life

✔ **Ceramic Bearing**

- Longer bearing life
- Higher rigidity for heavy cutting

✔ **Brushless motor**

- Maintenance free
- Longer product life thanks to no dust from carbon brushes to the bearing



[BT]



[NT]



[IT]









[HSK A]

A large variety of shank types are available.











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80,000min⁻¹ Motor Spindle

HES810-BT30 Max.rpm 80,000min ⁻¹		p.7
HES810-BT40 / NT40 Max.rpm 80,000min ⁻¹		p.7
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50,000min⁻¹ Motor Spindle

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Controller

E3000 CONTROLLER
Controller p.19

Motor cord

EMCD-810-4M / 6M / 8M
Motor cord p.20

Accessories

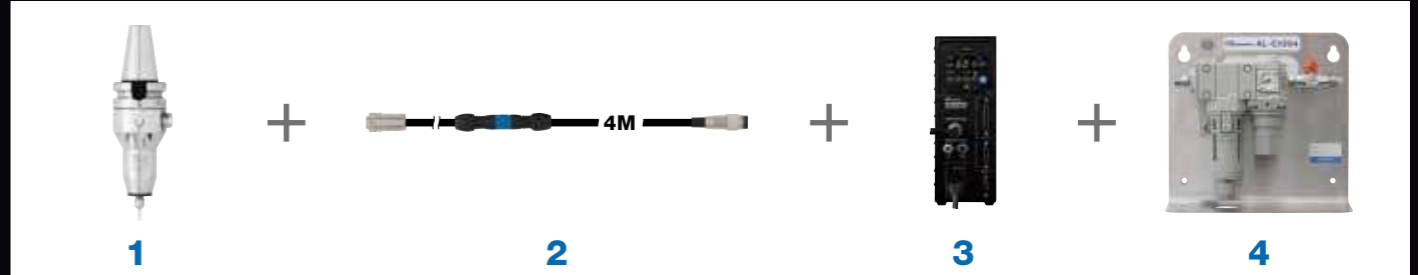
AL-C1204
Air line kit p.20

CHA / CHK
Collet p.21

CHN-A / K-265
Collet nut p.21

Combination Example

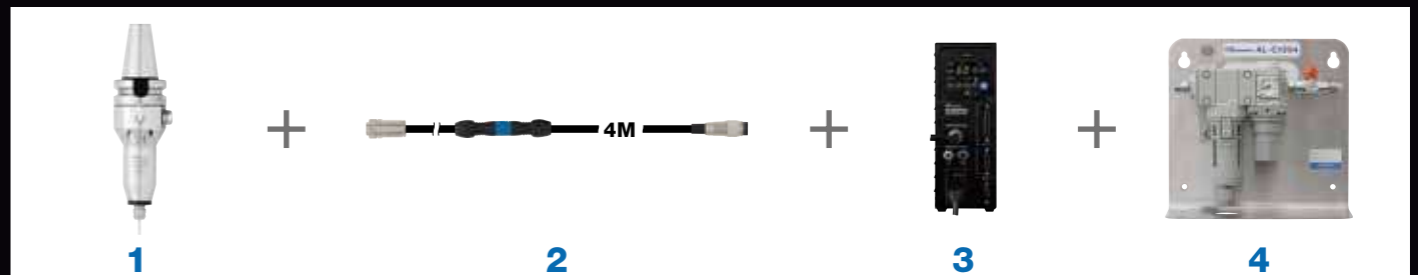
[HES810 SERIES] HES810-BT40 + EMCD-810-4M + E3000 + AL-C1204



[HES810-BT40]

	Code No.	Model	Description
1	9199	HES810-BT40	Motor spindle (One-piece type)
2	9248	EMCD-810-4M	Motor Cord 4m
3	8421	E3000	E3000 Controller
4	4504	AL-C1204	Air line kit

[HES510 SERIES] HES510-BT40 + EMCD-810-4M + E3000 + AL-C1204

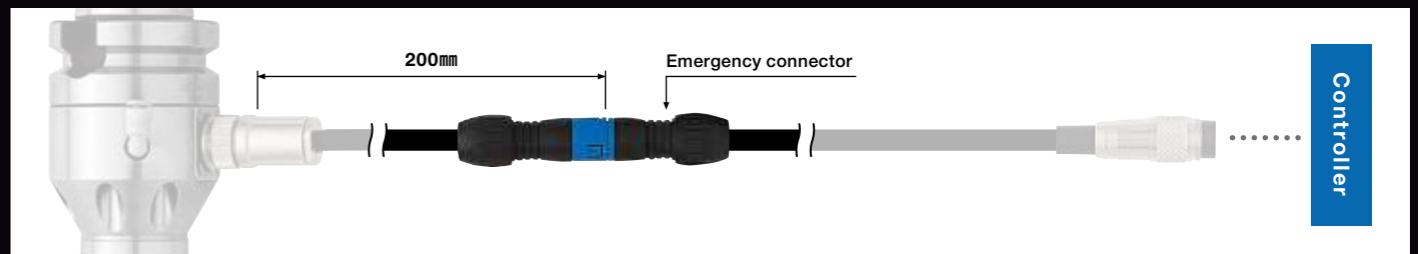


[HES510-BT40]

	Code No.	Model	Description
1	1946	HES510-BT40	Motor spindle (One-piece type)
2	9248	EMCD-810-4M	Motor Cord 4m
3	8421	E3000	E3000 Controller
4	4504	AL-C1204	Air line kit

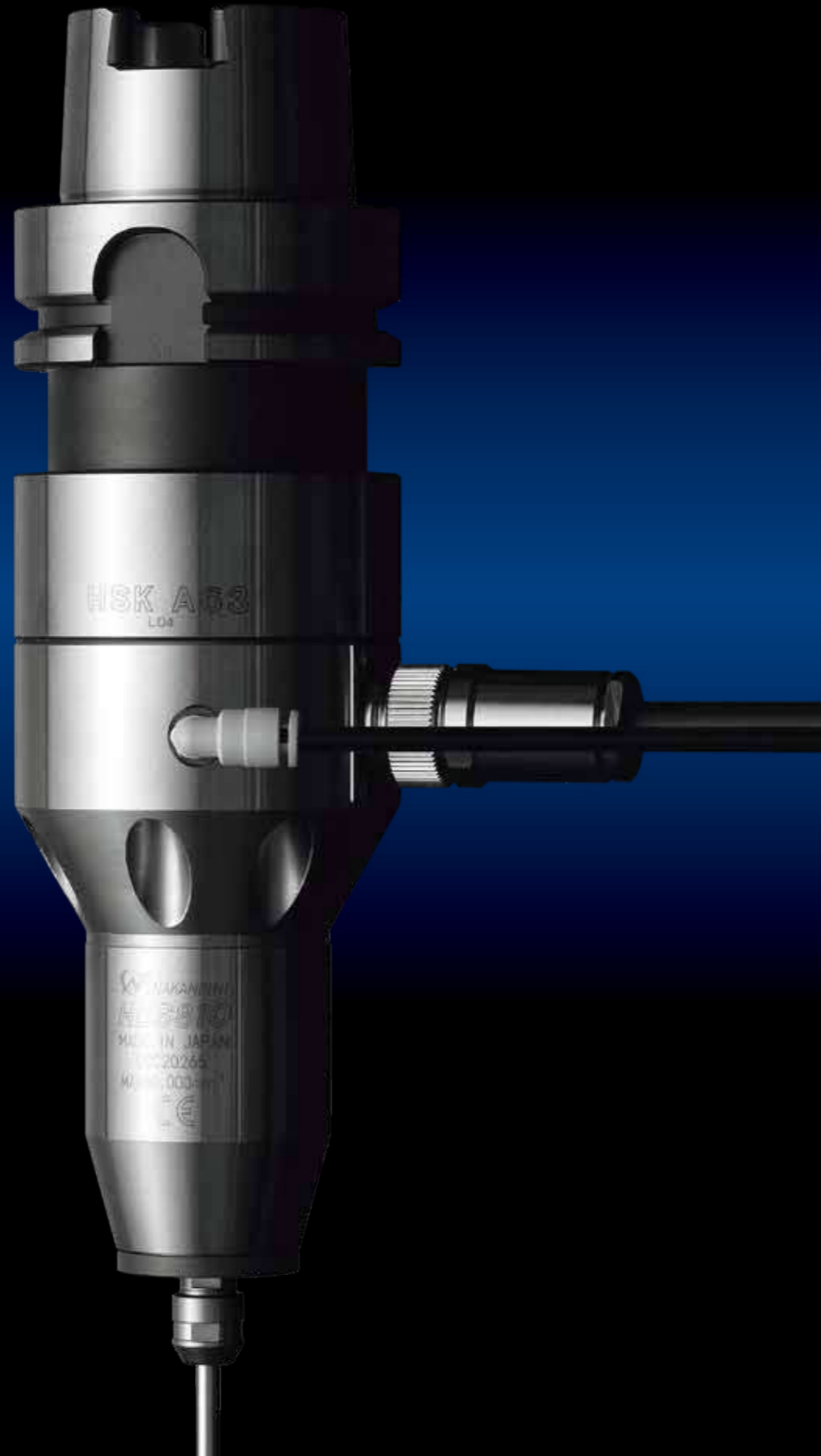
Safety function

HES510/810 have a motor cord with the safety coupling.
In case the machine spindle rotates by accident, the safety coupling disconnects by itself to minimize the damage both the machine and controller.



! It is crucial to install the controller and the cable according to "OPERATION MANUAL" in order to function safety coupling properly.

80,000min⁻¹ Motor Spindle



HES810-BT50

p.9

HES810-HSK A63

p.9

HES810-ST32

p.9

HES810-BT30

p.7

HES810-BT40 / NT40 / IT40

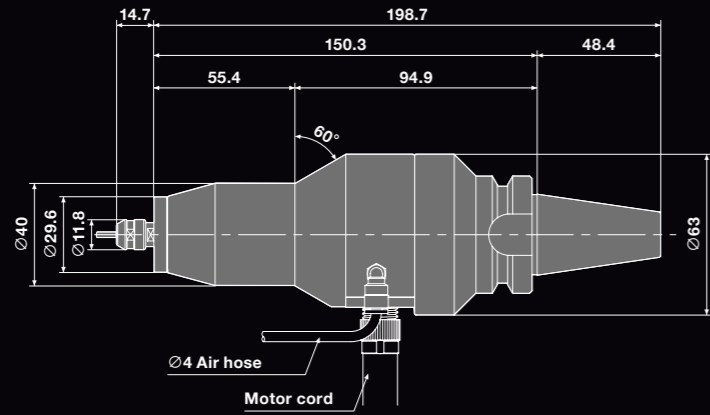
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80,000min⁻¹ Motor Spindle

Order by Code No.

HES810-BT30



HES810-BT30

Code No. **9198** Model **HES810-BT30**

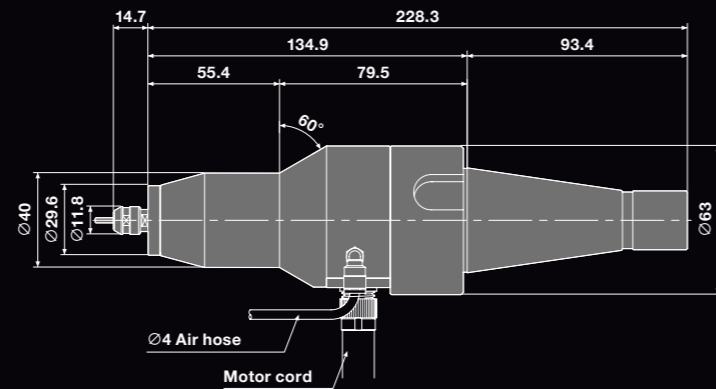
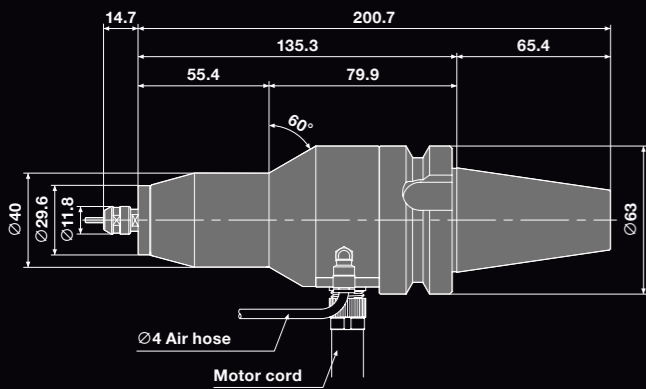


Max. power	Speed Range	Spindle runout	Weight
350w	20,000~80,000min⁻¹ ※Recommended motor speed : 50,000~80,000min ⁻¹	Within 1μm	2.0kg
Standard Accessories	Collet : ø4.0mm (CHA-4.0) / Collet nut (CHN-A) / Spanner (8×5) · (9×11) : 1pc.		
Options	Collet (CHA Group) : ø0.5 ~ ø4.0mm p.21 Motor cord : Length 4m (9248)、6m (9249)、8m (9250) Provided with ø4.0mm Air cooling hose		

HES810-BT40 / NT40

[BT40]

[NT40]



HES810-BT40 / NT40

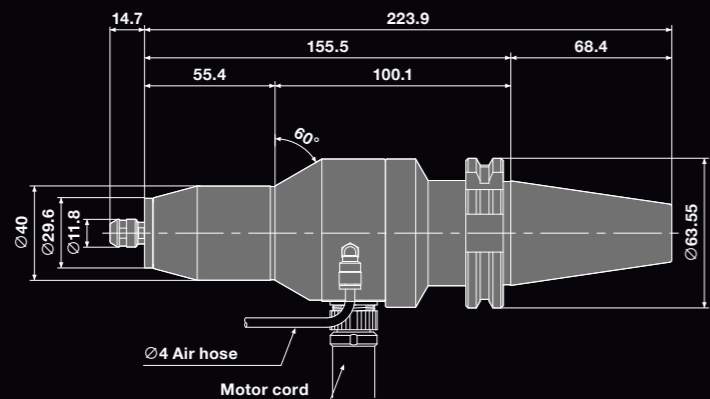
Code No. **9199** Model **HES810-BT40**

Code No. **9200** Model **HES810-NT40**



Max. power	Speed Range	Spindle runout	Weight
350w	20,000~80,000min⁻¹ ※Recommended motor speed : 50,000~80,000min ⁻¹	Within 1μm	BT40 : 2.2kg NT40 : 2.3kg
Standard Accessories	Collet : ø4.0mm (CHA-4.0) / Collet nut (CHN-A) / Spanner (8×5) · (9×11) : 1pc.		
Options	Collet (CHA Group) : ø0.5 ~ ø4.0mm p.21 Motor cord : Length 4m (9248)、6m (9249)、8m (9250) Provided with ø4.0mm Air cooling hose		

HES810-IT40



HES810-IT40

Code No. **9202** Model **HES810-IT40**

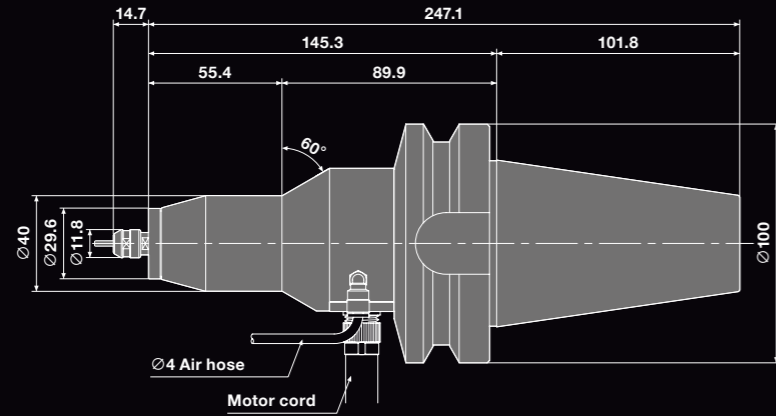


Max. power	Speed Range	Spindle runout	Weight
350w	20,000~80,000min⁻¹ ※Recommended motor speed : 50,000~80,000min ⁻¹	Within 1μm	2.4kg
Standard Accessories	Collet : ø4.0mm (CHA-4.0) / Collet nut (CHN-A) / Spanner (8×5) · (9×11) : 1pc.		
Options	Collet (CHA Group) : ø0.5 ~ ø4.0mm p.21 Motor cord : Length 4m (9248)、6m (9249)、8m (9250) Provided with ø4.0mm Air cooling hose		

80,000min⁻¹ Motor Spindle

Order by Code No.

HES810-BT50



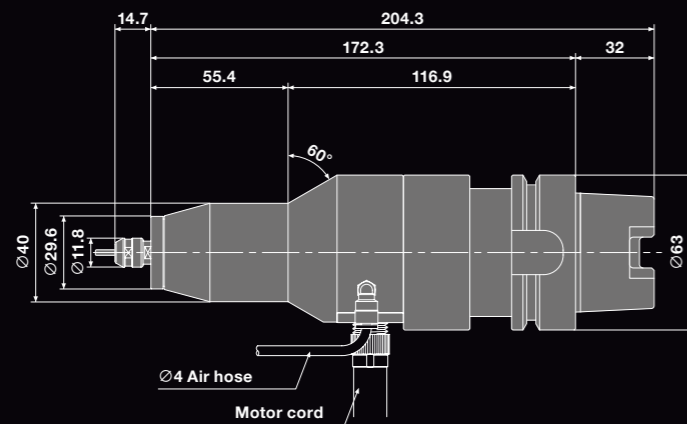
HES810-BT50

Code No. **9203** Model **HES810-BT50**



Max. power	Speed Range	Spindle runout	Weight
350w	20,000~80,000min⁻¹ ※Recommended motor speed : 50,000~80,000min ⁻¹	Within 1μm	4.9kg
Standard Accessories	Collet : ø4.0mm (CHA-4.0) / Collet nut (CHN-A) / Spanner (8×5) · (9×11) : 1pc.		
Options	Collet (CHA Group) : ø0.5 ~ ø4.0mm p.21 Motor cord : Length 4m (9248)、6m (9249)、8m (9250) Provided with ø4.0mm Air cooling hose		

HES810-HSK A63



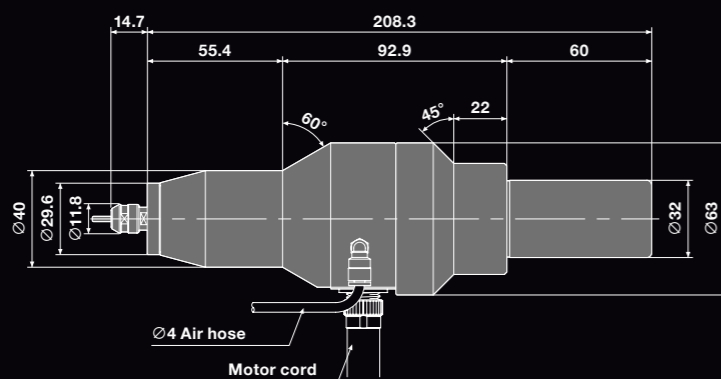
HES810-HSK A63

Code No. **9204** Model **HES810-HSK A63**



Max. power	Speed Range	Spindle runout	Weight
350w	20,000~80,000min⁻¹ ※Recommended motor speed : 50,000~80,000min ⁻¹	Within 1μm	2.6kg
Standard Accessories	Collet : ø4.0mm (CHA-4.0) / Collet nut (CHN-A) / Spanner (8×5) · (9×11) : 1pc.		
Options	Collet (CHA Group) : ø0.5 ~ ø4.0mm p.21 Motor cord : Length 4m (9248)、6m (9249)、8m (9250) Provided with ø4.0mm Air cooling hose		

HES810-ST32



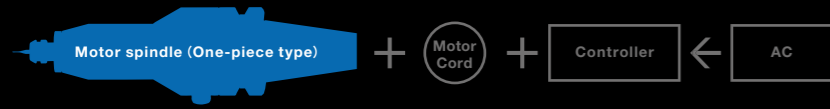
HES810-ST32

Code No. **9205** Model **HES810-ST32**



Max. power	Speed Range	Spindle runout	Weight
350w	20,000~80,000min⁻¹ ※Recommended motor speed : 50,000~80,000min ⁻¹	Within 1μm	2.3kg
Standard Accessories	Collet : ø4.0mm (CHA-4.0) / Collet nut (CHN-A) / Spanner (8×5) · (9×11) : 1pc.		
Options	Collet (CHA Group) : ø0.5 ~ ø4.0mm p.21 Motor cord : Length 4m (9248)、6m (9249)、8m (9250) Provided with ø4.0mm Air cooling hose		

50,000min⁻¹ Motor Spindle



HES510-BT30 / NT30

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HES510-BT40 / NT40 / IT40

p.13

HES510-BT50 / NT50 / IT50

p.15



HES510-ST32

p.15

HES510-HSK A63

p.17

HES510-HSK A100

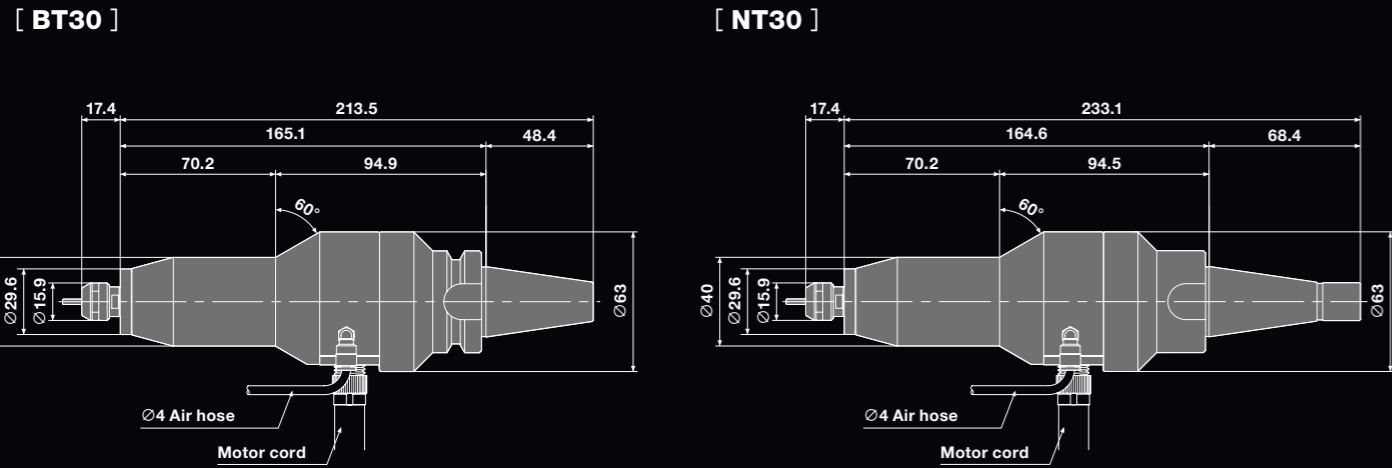
p.17

50,000min⁻¹ Motor Spindle

Specifications

Order by Code No.

HES510-BT30 / NT30 (M)



HES510-BT30 / NT30 (M)

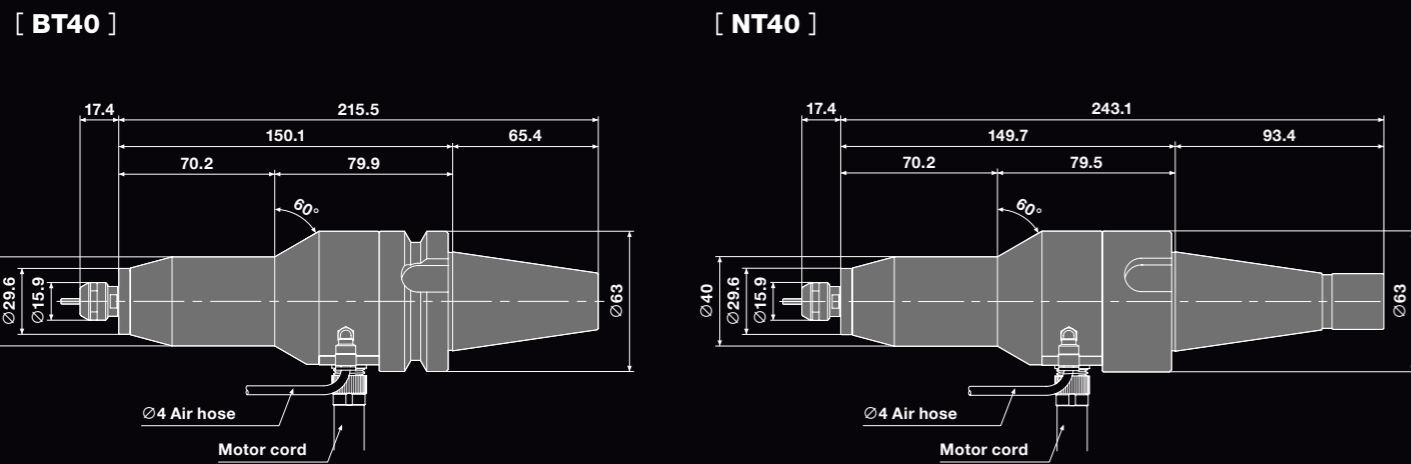


Code No.	1943	Model	HES510-BT30
Code No.	1944	Model	HES510-NT30
Code No.	1945	Model	HES510-NT30M

*NT30M-Retention knob threads are metric.

Max. power	Speed Range	Spindle runout	Weight
340w	5,000~50,000min⁻¹	Within 1μm	BT30 / NT30(M) : 2.2kg
Standard Accessories	Collet : ø4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pcs.		
Options	Collet (CHK Group) : ø0.5 ~ ø6.35mm p.21 Motor cord : Length 4m (9248)、6m (9249)、8m (9250) Provided with ø4.0mm Air cooling hose		

HES510-BT40 / NT40 (M)



HES510-BT40 / NT40 (M)

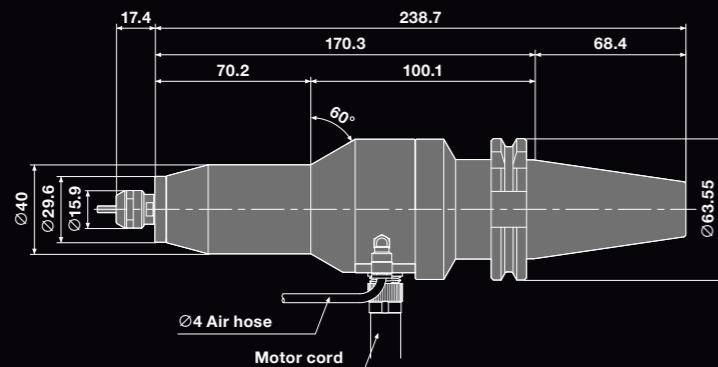


Code No.	1946	Model	HES510-BT40
Code No.	1947	Model	HES510-NT40
Code No.	1948	Model	HES510-NT40M

*NT40M-Retention knob threads are metric.

Max. power	Speed Range	Spindle runout	Weight
340w	5,000~50,000min⁻¹	Within 1μm	BT40 : 2.3kg NT40(M) : 2.4kg
Standard Accessories	Collet : ø4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pcs.		
Options	Collet (CHK Group) : ø0.5 ~ ø6.35mm p.21 Motor cord : Length 4m (9248)、6m (9249)、8m (9250) Provided with ø4.0mm Air cooling hose		

HES510-IT40



HES510-IT40



Code No.	1950	Model	HES510-IT40
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Max. power	Speed Range	Spindle runout	Weight
340w	5,000~50,000min⁻¹	Within 1μm	2.6kg
Standard Accessories	Collet : ø4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pcs.		
Options	Collet (CHK Group) : ø0.5 ~ ø6.35mm p.21 Motor cord : Length 4m (9248)、6m (9249)、8m (9250) Provided with ø4.0mm Air cooling hose		

50,000min⁻¹ Motor Spindle

Specifications

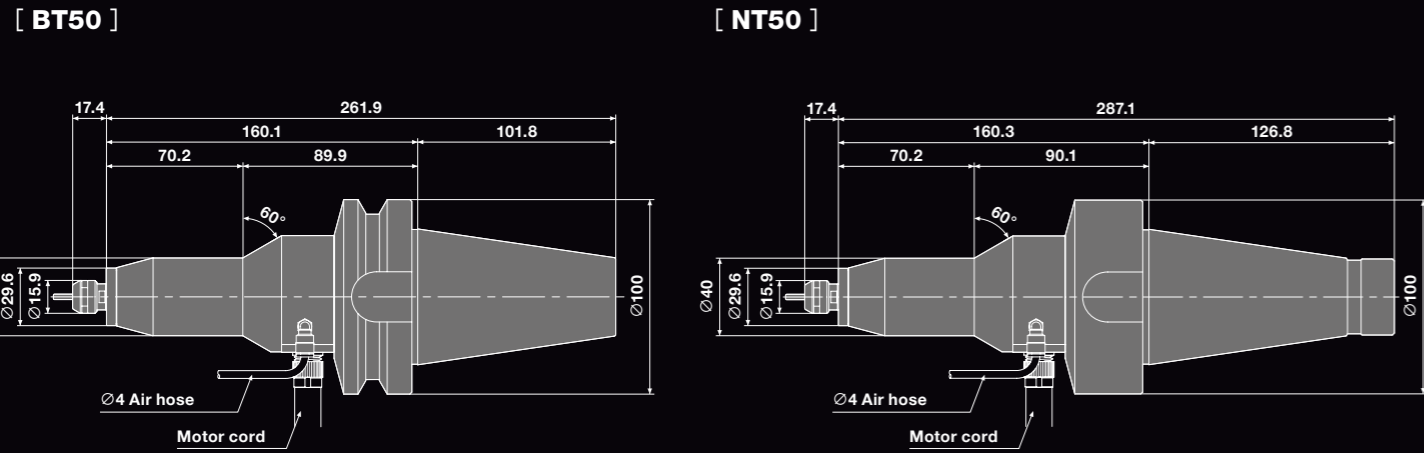
Order by Code No.

HES510-BT50 / NT50 (M)

HES510-BT50 / NT50 (M)

Code No.	1951	Model	HES510-BT50
Code No.	1952	Model	HES510-NT50
Code No.	1953	Model	HES510-NT50M

*NT50M-Retention knob threads are metric.

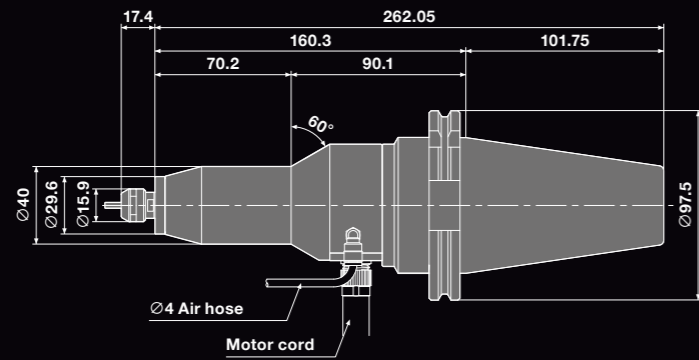


Max. power	Speed Range	Spindle runout	Weight
340w	5,000~50,000min⁻¹	Within 1μm	BT50 : 5.0kg NT50(M) : 5.4kg
Standard Accessories	Collet : ø4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pcs.		
Options	Collet (CHK Group) : ø0.5 ~ ø6.35mm p.21 Motor cord : Length 4m (9248)、6m (9249)、8m (9250) Provided with ø4.0mm Air cooling hose		

HES510-IT50

HES510-IT50

Code No.	1955	Model	HES510-IT50
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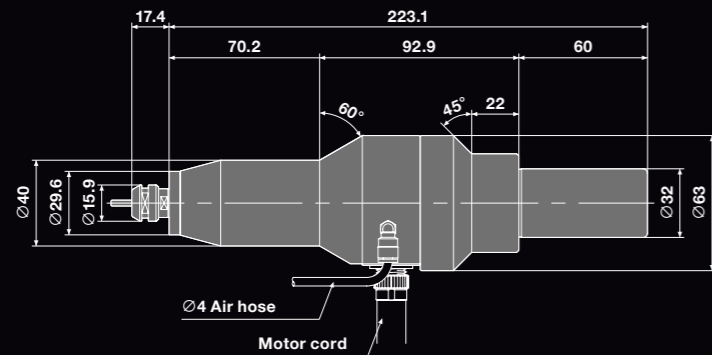


Max. power	Speed Range	Spindle runout	Weight
340w	5,000~50,000min⁻¹	Within 1μm	4.4kg
Standard Accessories	Collet : ø4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pcs.		
Options	Collet (CHK Group) : ø0.5 ~ ø6.35mm p.21 Motor cord : Length 4m (9248)、6m (9249)、8m (9250) Provided with ø4.0mm Air cooling hose		

HES510-ST32

HES510-ST32

Code No.	9197	Model	HES510-ST32
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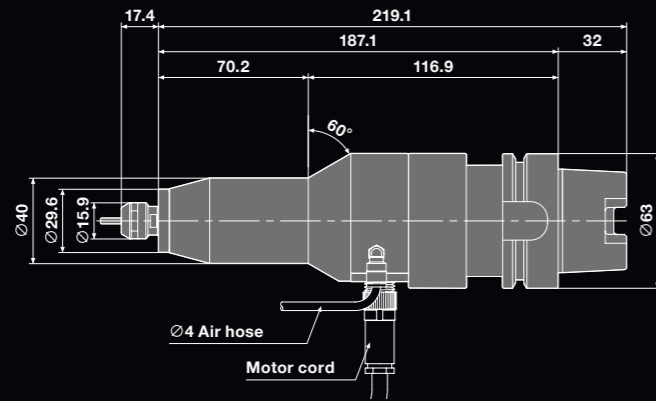


Max. power	Speed Range	Spindle runout	Weight
340w	5,000~50,000min⁻¹	Within 1μm	2.4kg
Standard Accessories	Collet : ø4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pcs.		
Options	Collet (CHK Group) : ø0.5 ~ ø6.35mm p.21 Motor cord : Length 4m (9248)、6m (9249)、8m (9250) Provided with ø4.0mm Air cooling hose		

50,000min⁻¹ Motor Spindle

Order by Code No.

HES510-HSK A63



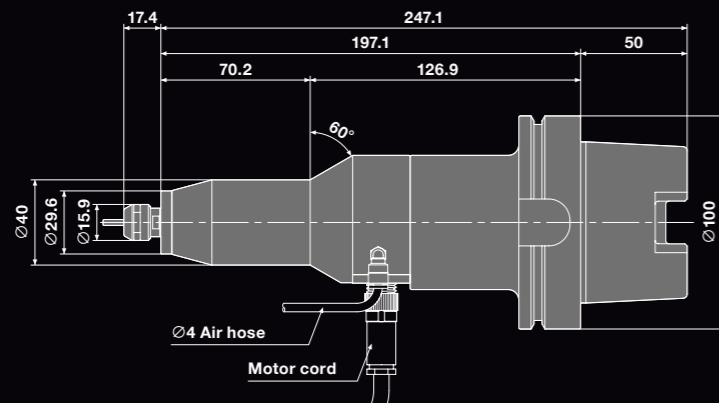
HES510-HSK A63

Code No. **1956** Model **HES510-HSK A63**



Max. power	Speed Range	Spindle runout	Weight
340w	5,000~50,000min⁻¹	Within 1μm	2.7kg
Standard Accessories	Collet : ø4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pcs.		
Options	Collet (CHK Group) : ø0.5 ~ ø6.35mm p.21 Motor cord : Length 4m (9248)、6m (9249)、8m (9250) Provided with ø4.0mm Air cooling hose		

HES510-HSK A100



HES510-HSK A100

Code No. **1957** Model **HES510-HSK A100**

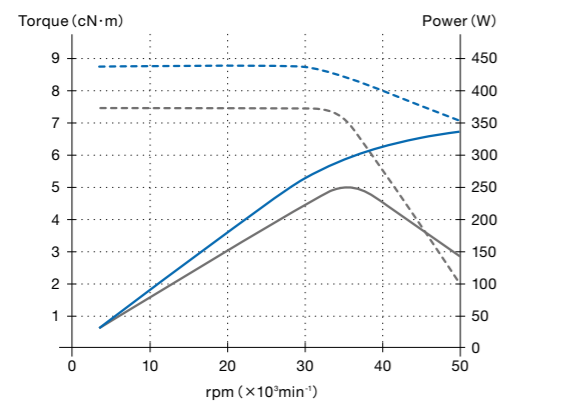


Max. power	Speed Range	Spindle runout	Weight
340w	5,000~50,000min⁻¹	Within 1μm	4.4kg
Standard Accessories	Collet : ø4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pcs.		
Options	Collet (CHK Group) : ø0.5 ~ ø6.35mm p.21 Motor cord : Length 4m (9248)、6m (9249)、8m (9250) Provided with ø4.0mm Air cooling hose		

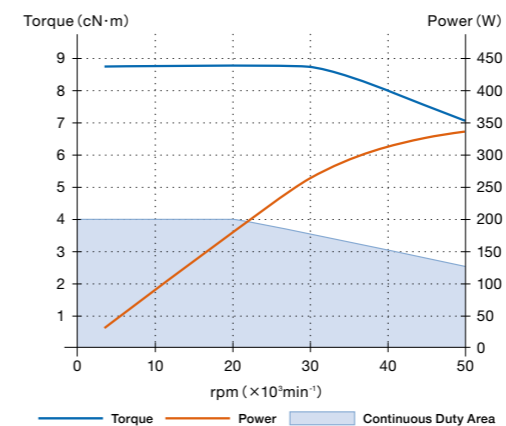
HES510, HES810 Torque & power

On January 2013, HES510 was upgraded by changing its motor from E500 to E3000, and reborn as a super-powerful New HES510.

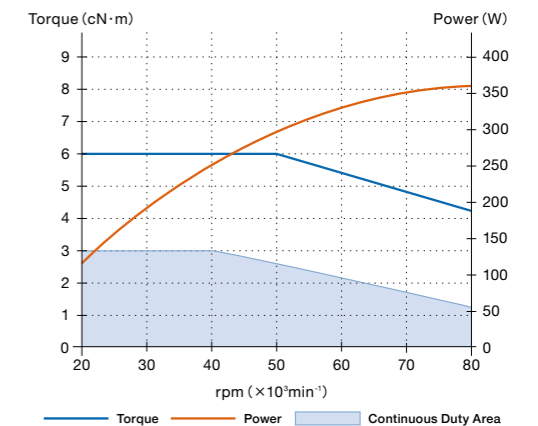
[HES510 Torque & power curve comparison]



[HES510 Torque & power curve]



[HES810 Torque & power curve]



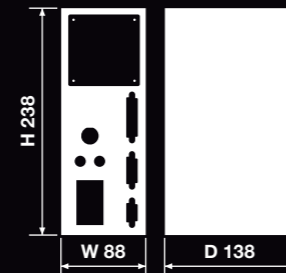
E3000 Controller



E3000 CONTROLLER Controller

Plug type	Code No.
100V (A Type)	8421
120V (B Type)	9775
200V (C Type)	8422
230V (D Type)	9776

Plug type	Area	Product
100v (A Type)	Japan	
120v (B Type)	USA Canada	
200v (C Type)	Without plug	
230v (D Type)	Europe	



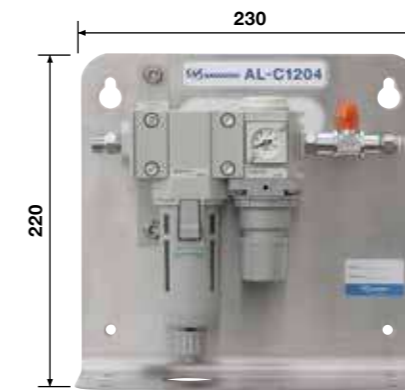
External Input / Output Control Signal Operation

- **External Input**
Motor Rotating / Stopped, 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.
- Equipped with safety relay break and speed point

Speed Range		
1,000~80,000min ⁻¹		
Input Voltage	Max. power	
AC100~240v	350w	
Power consumption	Air consumption	Weight
AC1.8A	30Nℓ/min (at 0.25~0.3MPa)	2.8kg
Standard Accessories		
Power cord : 2m / Air hose with filter / Reducer		
Connector cap (Included)		
Bracket / Nylon Clip / Screw / Rubber pad		
Fuse (T6.3AL) 250V : 2pcs		

Accessories

AL-C1204 Air line kit



1.9kg

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

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

Motor cord	Code No.	Model	Standard Accessories
4M	9248	EMCD-810-4M	Air cooling hose : ø4mm Connector cap (Included)
6M	9249	EMCD-810-6M	
8M	9250	EMCD-810-8M	

Accessories

Collet	Code No.	Model	I.D.	Compatible model		
<p>Collet CHA Group</p>	91492	CHA-2.35	ø2.35	HES810 ※ : High precision type AA (Spindle runout within 2μm)		
	91430	CHA-3.0	ø3.0			
	91493	CHA-3.175	ø3.175			
	91440	CHA-4.0	ø4.0			
	—	CHA-□□	ø0.5,ø0.6,ø0.7,ø0.8,ø0.9 ø1.1,ø1.2,ø1.3,ø1.4,ø1.7,ø1.8,ø1.9 ø2.1,ø2.2,ø2.3,ø2.4,ø2.6,ø2.7,ø2.8,ø2.9 ø3.1,ø3.2,ø3.3,ø3.4,ø3.6,ø3.7,ø3.8,ø3.9 ø1.0,ø1.5,ø2.0,ø2.5,ø3.5 ø1.6			
	91494	CHA-3.0AA	ø3.0AA ※			
	91496	CHA-3.175AA	ø3.175AA ※			
	91495	CHA-4.0AA	ø4.0AA ※			
	<p>Collet CHK Group</p>	91592	CHK-2.35		ø2.35	HES510 ※ : High precision type AA (Spindle runout within 2μm)
		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			
—		CHK-□□	ø0.5,ø0.6,ø0.7,ø0.8,ø0.9 ø1.0,ø1.5,ø2.0,ø2.5,ø3.5,ø4.5,ø4.76,ø5.5 ø1.1,ø1.2,ø1.3,ø1.4,ø1.7,ø1.8,ø1.9 ø2.1,ø2.2,ø2.3,ø2.4,ø2.6,ø2.7,ø2.8,ø2.9 ø3.1,ø3.2,ø3.3,ø3.4,ø3.6,ø3.7,ø3.8,ø3.9 ø4.1,ø4.2,ø4.3,ø4.4,ø4.6,ø4.7,ø4.8,ø4.9 ø5.1,ø5.2,ø5.3,ø5.4,ø5.6,ø5.7,ø5.8,ø5.9 ø1.6,ø5.0			
91597		CHK-3.0AA	ø3.0AA ※			
91598		CHK-3.175AA	ø3.175AA ※			
91599		CHK-4.0AA	ø4.0AA ※			
91600	CHK-6.0AA	ø6.0AA ※				
91601	CHK-6.35AA	ø6.35AA ※				

Collet nut	Code No.	Model	Description	Compatible model
	2102	CHN-A	Collet nut for CHA collet	HES810
	2129	K-265	Collet nut for CHK collet	HES510

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⁻¹ 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⁻¹ Max.350W
 [ø30/25/20mm]

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

HES SERIES
 Max.80,000min⁻¹
 [For small diameter endmills and drills only]

E2000 SERIES
 1,000~50,000min⁻¹ Max.200W
 [ø22.8/25mm]

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

iSpeed3 SERIES
 1,000~80,000min⁻¹ Max.150W
 [ø19.05/20/22/25mm]

- Super short motor spindle
- High efficiency brushless motor

[HES810]

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

[HES510]

- 50,000min⁻¹, 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

Application for machining centers and milling machines

AM SERIES One-piece type
 1,000~60,000min⁻¹ Max.350W
 [ø30/25/20mm]

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

AM SERIES Modular type
 5,000~30,000min⁻¹ Max.125W
 [ø22.8mm]

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

SMS SERIES
 40,000min⁻¹
 [For small diameter endmills and drills only]

- Ceramic bearings for higher rigidity and precision
- Straight and BT,NT shanks are available

Air Turbine Spindles



Application for CNC lathes / Special purpose machines

Application for machining centers and milling machines

Xped SERIES
 Max.160,000min⁻¹
 [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⁻¹

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

HTS SERIES
 150,000min⁻¹
 [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⁻¹ with higher rigidity thanks to ceramic bearings
- BT,HSK E and straight (M2040)shanks are available

Electric spindle

Air spindle