

HES

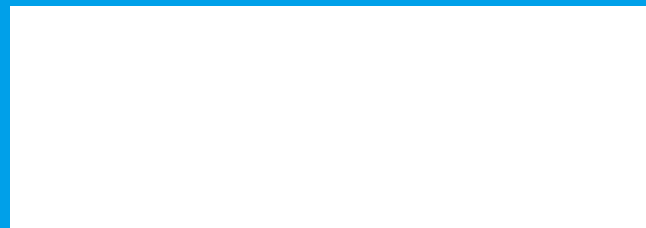
[www.nakanishi-inc.com](http://www.nakanishi-inc.com)

NAKANISHI INC. 2016

PR-K314E Ver.4 '16.11.03.1

**HES**  
ULTRA-HIGH-SPEED & SUPER-PRECISION

Specifications and design are subject to change without notice.



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SERIES **HES**

ULTRA-HIGH-SPEED & SUPER-PRECISION

# Transformer

Your machining center transforms to the high speed machining center

HES510 Max. rpm 50,000min<sup>-1</sup>

HES810 Max. rpm 80,000min<sup>-1</sup>

## ✔ 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.




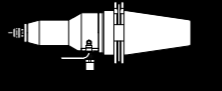
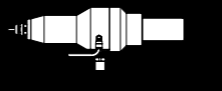

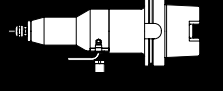


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## 50,000min<sup>-1</sup> Motor Spindle

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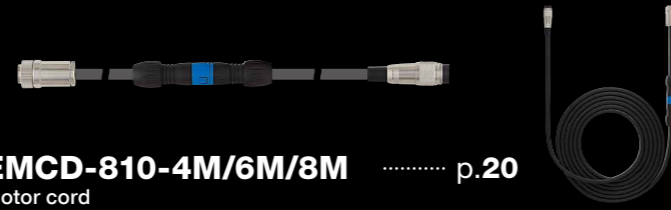
## Controller

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## Motor cord

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## Accessories

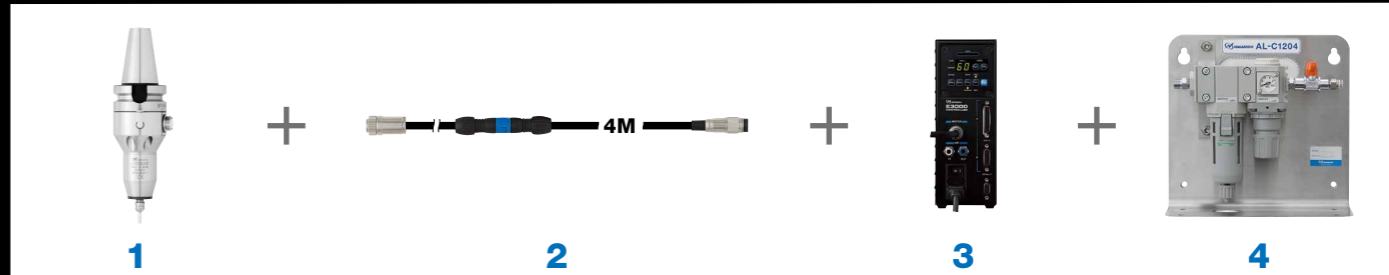
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# Combination Example

## [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

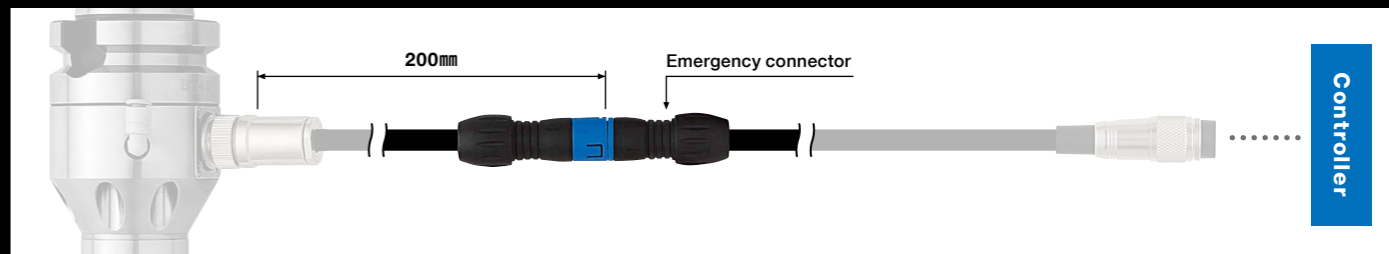


### [HES510-BT40]

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

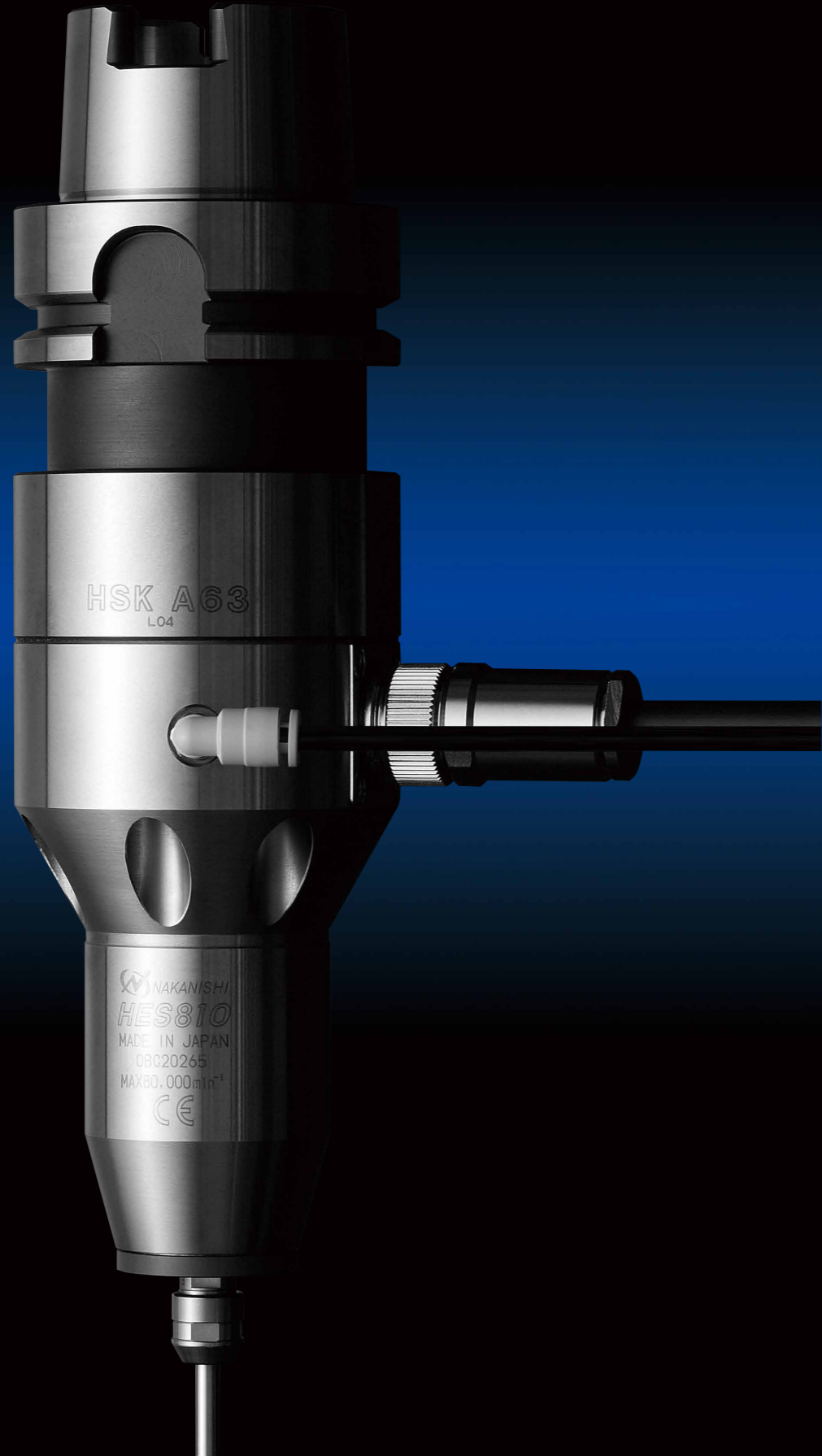
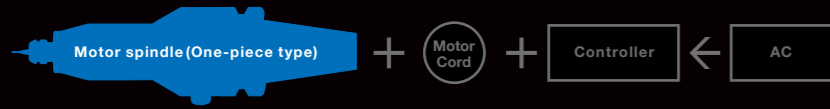
## Safety function

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<sup>-1</sup> Motor Spindle

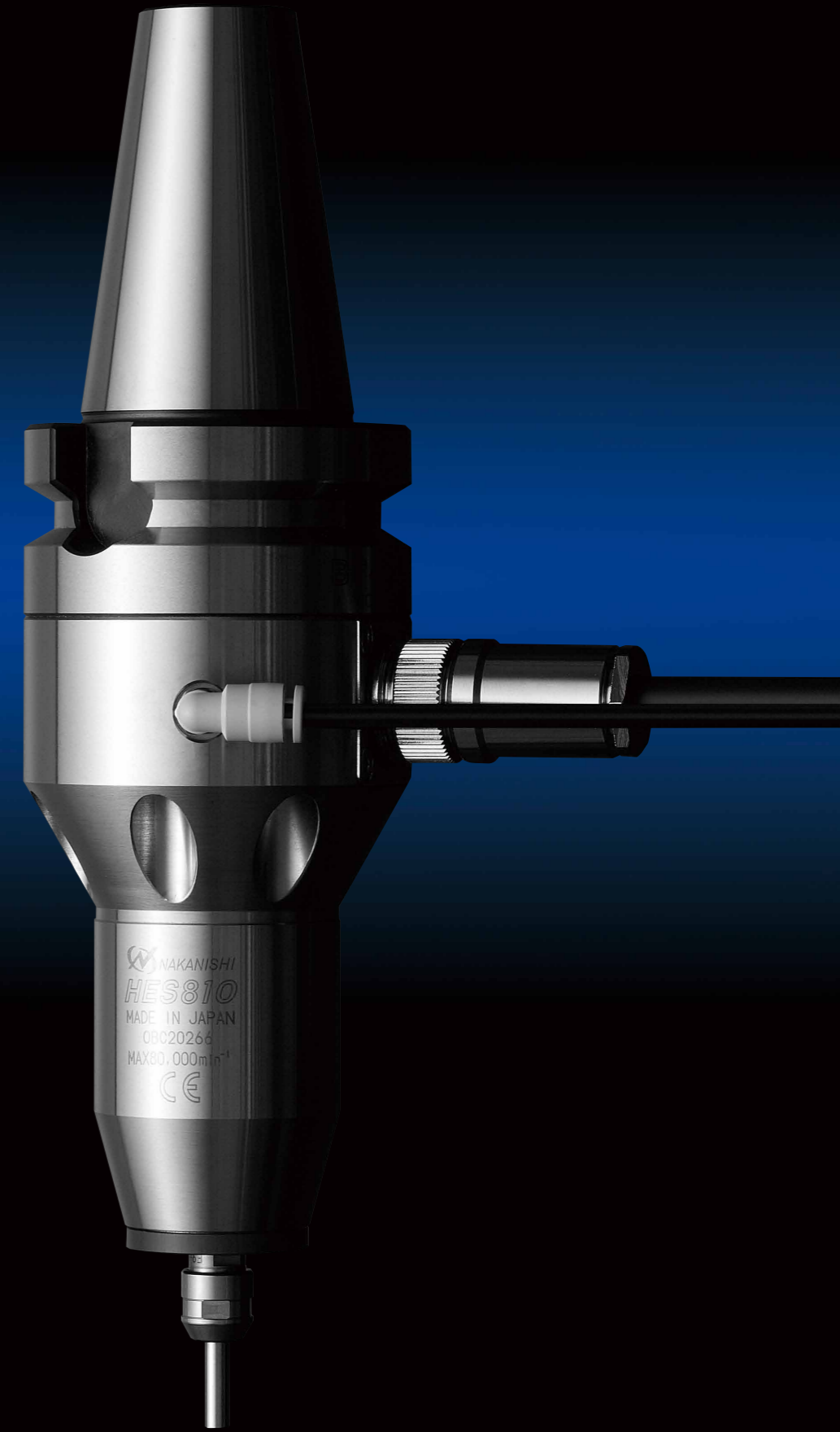


**HES810-BT30**

p.7

**HES810-BT40 / NT40 / IT40**

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**HES810-BT50**

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**HES810-HSK A63**

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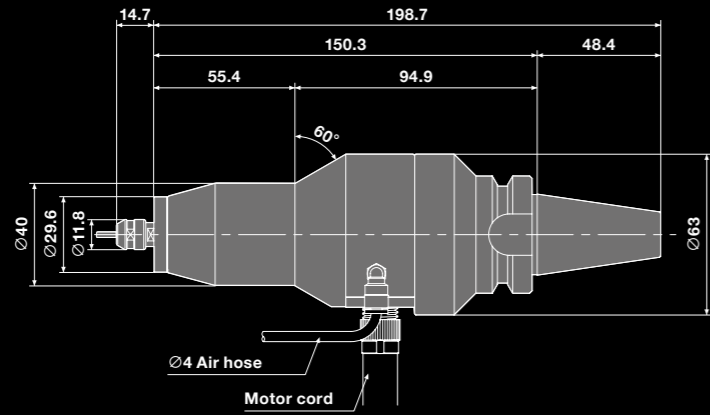
**HES810-ST32**

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# 80,000min<sup>-1</sup> Motor Spindle

Order by Code No.

## HES810-BT30



## Specifications

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

### HES810-BT30

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

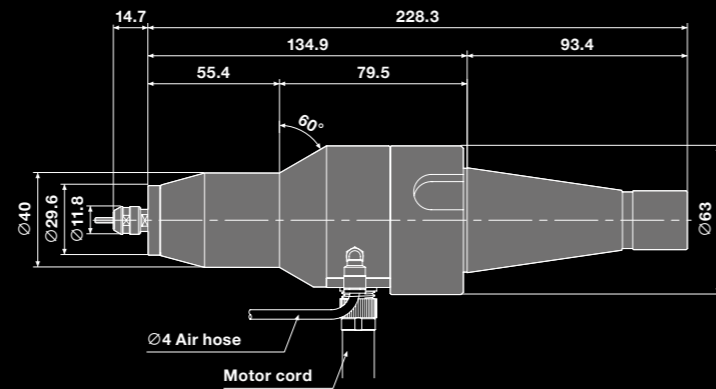
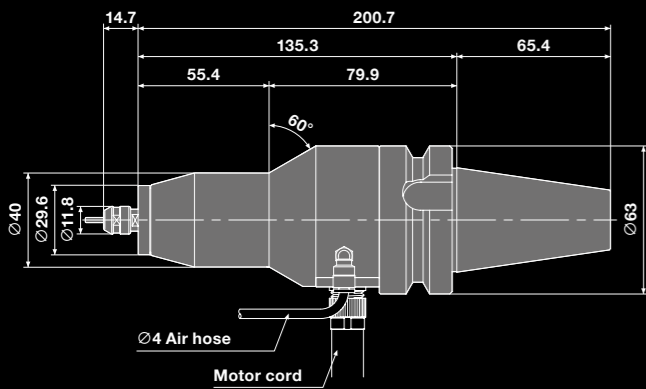


Max. power	Speed Range	Spindle runout	Weight
<b>350W</b>	<b>20,000~80,000min<sup>-1</sup></b> ※Recommended motor speed:50,000~80,000min <sup>-1</sup>	Within <b>1μm</b>	<b>2.0kg</b>
Standard Accessories	Collet : φ4.0mm (CHA-4.0) / Collet nut (CHN-A) / Spanner (8×5)·(9×11): 1pc.		
Options	Collet (CHA Group) : φ0.5~φ4.0mm <b>p.21</b> Motor cord : Length 4m (9248) 、 6m (9249) 、 8m (9250) Provided with φ4.0mm Air cooling hose		

## HES810-BT40 / NT40

[ BT40 ]

[ NT40 ]



### HES810-BT40 / NT40

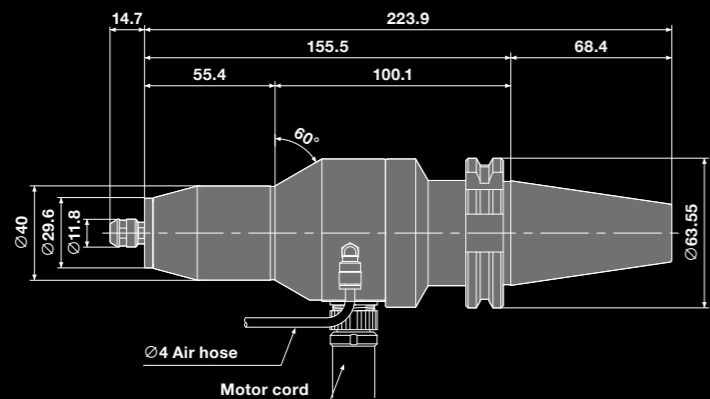
Code No. **9199** Model **HES810-BT40**

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



Max. power	Speed Range	Spindle runout	Weight
<b>350W</b>	<b>20,000~80,000min<sup>-1</sup></b> ※Recommended motor speed:50,000~80,000min <sup>-1</sup>	Within <b>1μm</b>	BT40 : <b>2.2kg</b> NT40 : <b>2.3kg</b>
Standard Accessories	Collet : φ4.0mm (CHA-4.0) / Collet nut (CHN-A) / Spanner (8×5)·(9×11): 1pc.		
Options	Collet (CHA Group) : φ0.5~φ4.0mm <b>p.21</b> Motor cord : Length 4m (9248) 、 6m (9249) 、 8m (9250) Provided with φ4.0mm Air cooling hose		

## HES810-IT40



### HES810-IT40

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

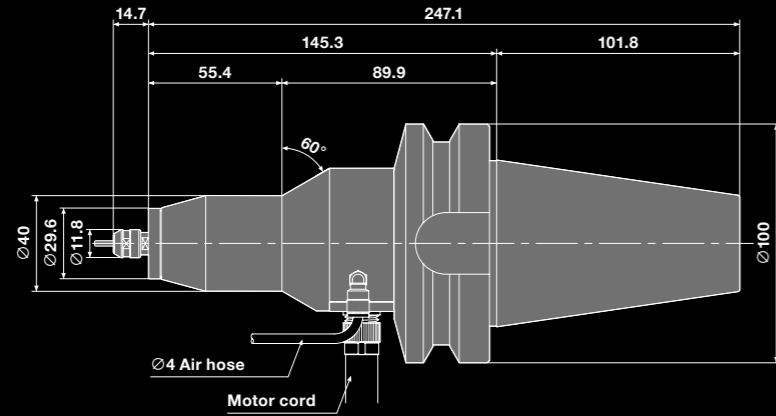


Max. power	Speed Range	Spindle runout	Weight
<b>350W</b>	<b>20,000~80,000min<sup>-1</sup></b> ※Recommended motor speed:50,000~80,000min <sup>-1</sup>	Within <b>1μm</b>	<b>2.4kg</b>
Standard Accessories	Collet : φ4.0mm (CHA-4.0) / Collet nut (CHN-A) / Spanner (8×5)·(9×11): 1pc.		
Options	Collet (CHA Group) : φ0.5~φ4.0mm <b>p.21</b> Motor cord : Length 4m (9248) 、 6m (9249) 、 8m (9250) Provided with φ4.0mm Air cooling hose		

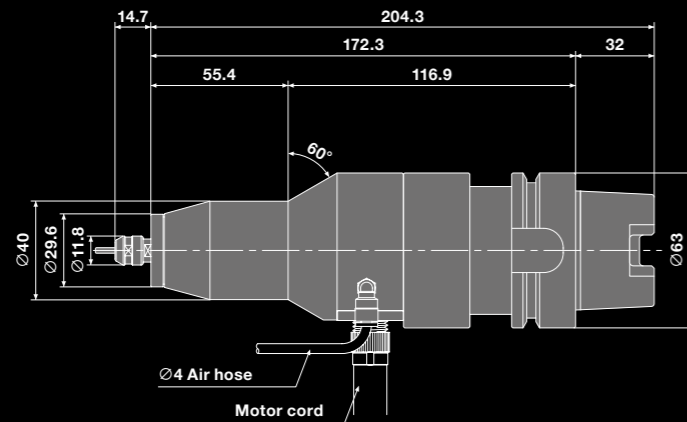
# 80,000min<sup>-1</sup> Motor Spindle

Order by Code No.

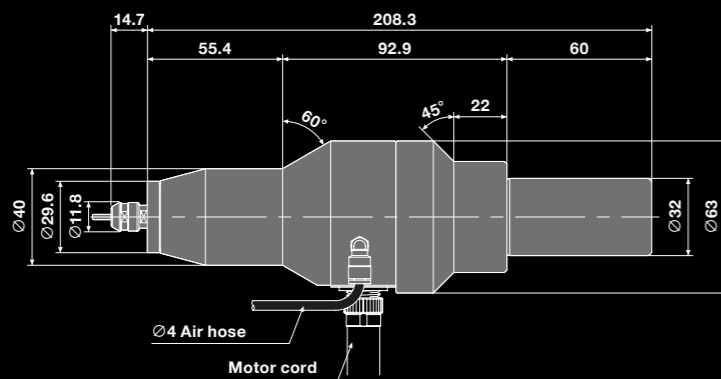
## HES810-BT50



## HES810-HSK A63



## HES810-ST32



## Specifications

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

### HES810-BT50

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



Max. power	Speed Range	Spindle runout	Weight
<b>350W</b>	<b>20,000~80,000min<sup>-1</sup></b> ※Recommended motor speed:50,000~80,000min <sup>-1</sup>	Within <b>1μm</b>	<b>4.9kg</b>
Standard Accessories	Collet : φ4.0mm (CHA-4.0) / Collet nut (CHN-A) / Spanner (8×5)·(9×11): 1pc.		
Options	Collet (CHA Group) : φ0.5~φ4.0mm <b>p.21</b> Motor cord : Length 4m (9248) 、 6m (9249) 、 8m (9250) Provided with φ4.0mm Air cooling hose		

### HES810-HSK A63

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



Max. power	Speed Range	Spindle runout	Weight
<b>350W</b>	<b>20,000~80,000min<sup>-1</sup></b> ※Recommended motor speed:50,000~80,000min <sup>-1</sup>	Within <b>1μm</b>	<b>2.6kg</b>
Standard Accessories	Collet : φ4.0mm (CHA-4.0) / Collet nut (CHN-A) / Spanner (8×5)·(9×11): 1pc.		
Options	Collet (CHA Group) : φ0.5~φ4.0mm <b>p.21</b> Motor cord : Length 4m (9248) 、 6m (9249) 、 8m (9250) Provided with φ4.0mm Air cooling hose		

### HES810-ST32

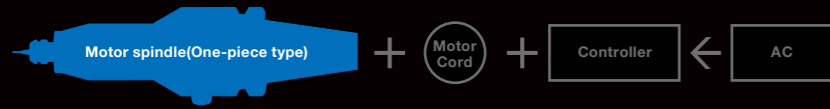
Code No. **9205** Model **HES810-ST32**



Max. power	Speed Range	Spindle runout	Weight
<b>350W</b>	<b>20,000~80,000min<sup>-1</sup></b> ※Recommended motor speed:50,000~80,000min <sup>-1</sup>	Within <b>1μm</b>	<b>2.3kg</b>
Standard Accessories	Collet : φ4.0mm (CHA-4.0) / Collet nut (CHN-A) / Spanner (8×5)·(9×11): 1pc.		
Options	Collet (CHA Group) : φ0.5~φ4.0mm <b>p.21</b> Motor cord : Length 4m (9248) 、 6m (9249) 、 8m (9250) Provided with φ4.0mm Air cooling hose		



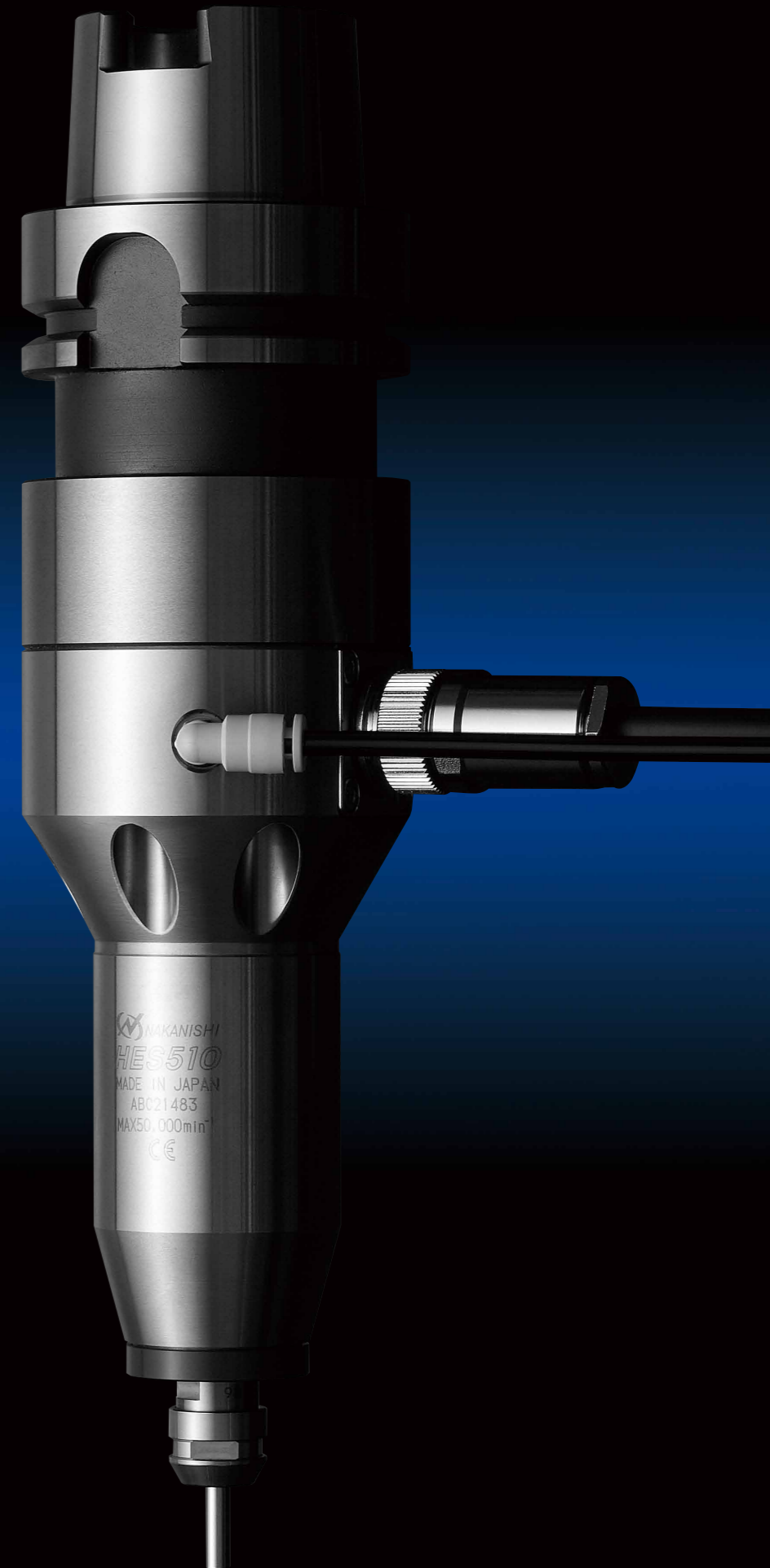
# 50,000min<sup>-1</sup> Motor Spindle



**HES510-BT30 / NT30**  
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**HES510-BT40 / NT40 / IT40**  
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**HES510-BT50 / NT50 / IT50**  
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**HES510-ST32**  
p.15

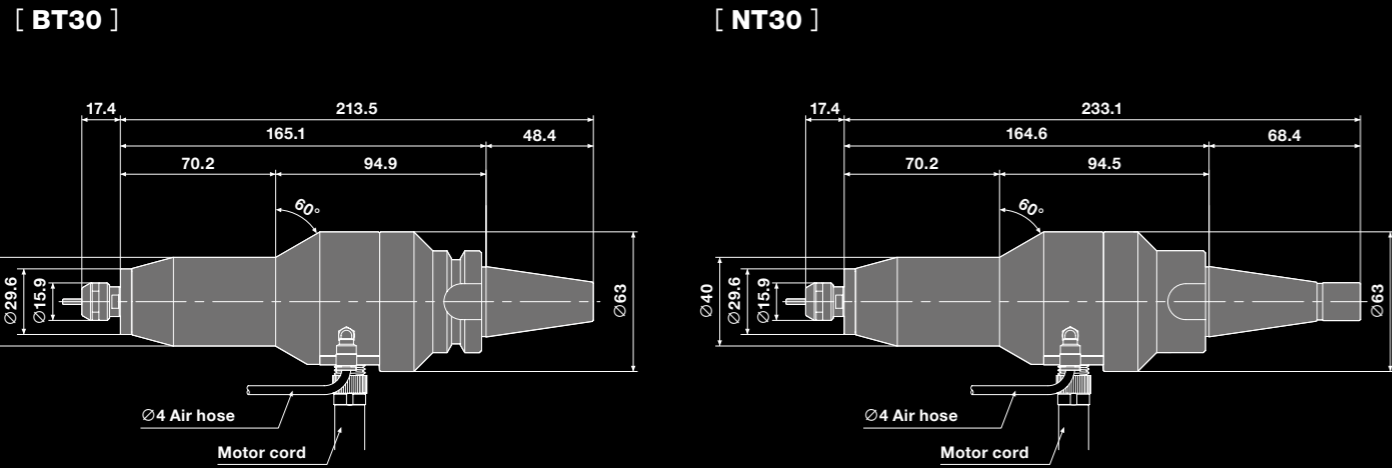
**HES510-HSK A63**  
p.17

**HES510-HSK A100**  
p.17

# 50,000min<sup>-1</sup> Motor Spindle

Order by Code No.

## HES510-BT30 / NT30 (M)



## Specifications

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

### HES510-BT30 / NT30 (M)

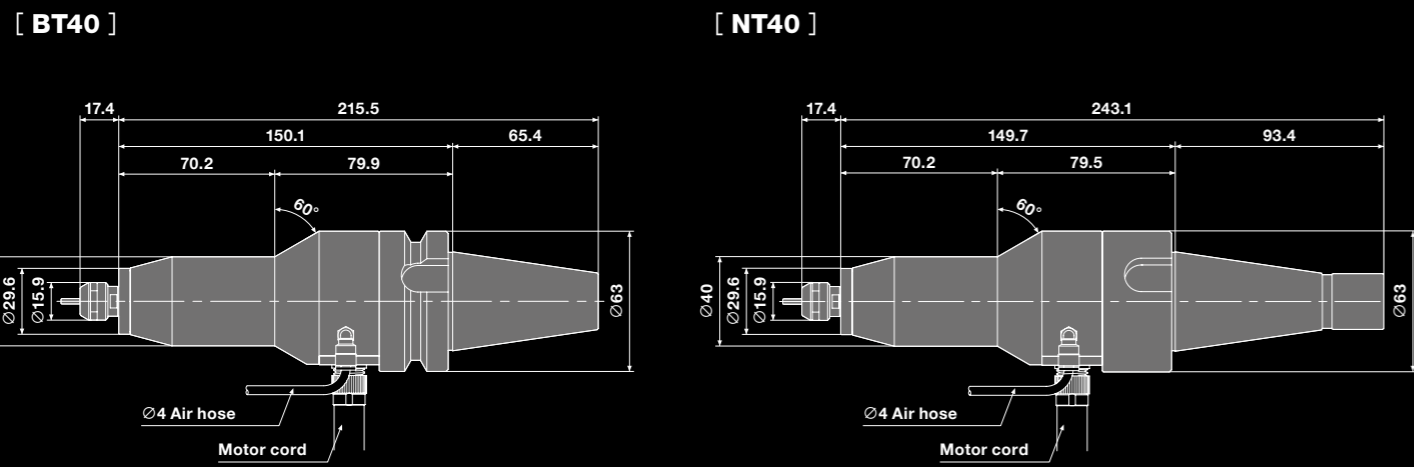


Code No.	<b>1943</b>	Model	<b>HES510-BT30</b>
Code No.	<b>1944</b>	Model	<b>HES510-NT30</b>
Code No.	<b>1945</b>	Model	<b>HES510-NT30M</b>

\*NT30M-Retention knob threads are metric.

Max. power	Speed Range	Spindle runout	Weight
<b>340w</b>	<b>5,000~50,000min<sup>-1</sup></b>	Within <b>1μm</b>	BT30/NT30 (M) : <b>2.2kg</b>
Standard Accessories	Collet : φ4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pc.		
Options	Collet (CHK Group) : φ0.5~φ6.35mm <b>p.21</b> Motor cord : Length 4m (9248) , 6m (9249) , 8m (9250) Provided with φ4.0mm Air cooling hose		

## HES510-BT40 / NT40 (M)



### HES510-BT40 / NT40 (M)

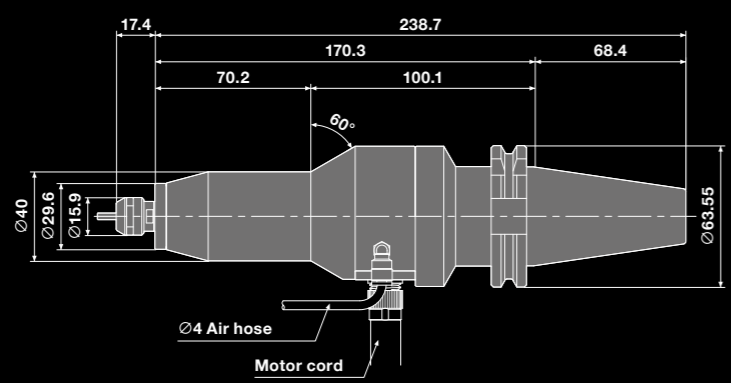


Code No.	<b>1946</b>	Model	<b>HES510-BT40</b>
Code No.	<b>1947</b>	Model	<b>HES510-NT40</b>
Code No.	<b>1948</b>	Model	<b>HES510-NT40M</b>

\*NT40M-Retention knob threads are metric.

Max. power	Speed Range	Spindle runout	Weight
<b>340w</b>	<b>5,000~50,000min<sup>-1</sup></b>	Within <b>1μm</b>	BT40 : <b>2.3kg</b> NT40 (M) : <b>2.4kg</b>
Standard Accessories	Collet : φ4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pc.		
Options	Collet (CHK Group) : φ0.5~φ6.35mm <b>p.21</b> Motor cord : Length 4m (9248) , 6m (9249) , 8m (9250) Provided with φ4.0mm Air cooling hose		

## HES510-IT40



### HES510-IT40



Code No.	<b>1950</b>	Model	<b>HES510-IT40</b>
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Max. power	Speed Range	Spindle runout	Weight
<b>340w</b>	<b>5,000~50,000min<sup>-1</sup></b>	Within <b>1μm</b>	<b>2.6kg</b>
Standard Accessories	Collet : φ4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pc.		
Options	Collet (CHK Group) : φ0.5~φ6.35mm <b>p.21</b> Motor cord : Length 4m (9248) , 6m (9249) , 8m (9250) Provided with φ4.0mm Air cooling hose		



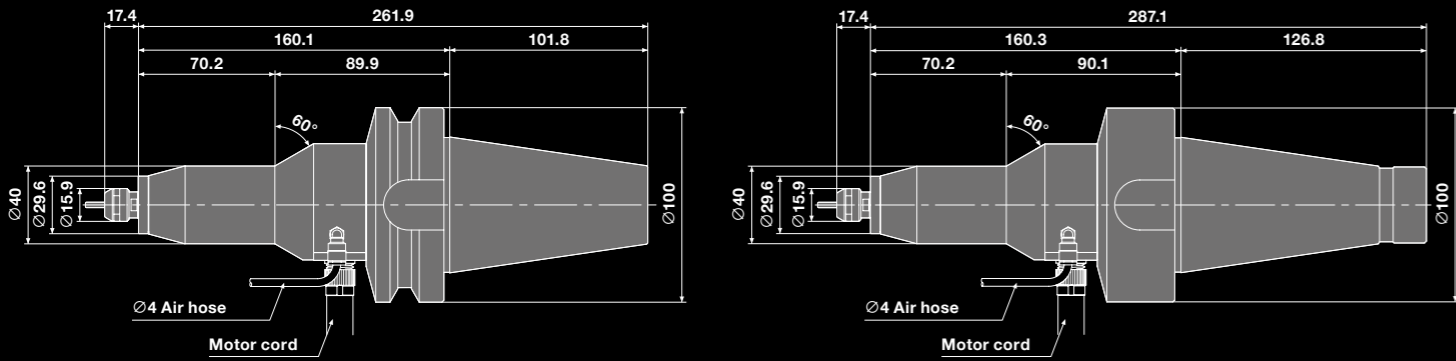
# 50,000min<sup>-1</sup> Motor Spindle

Order by Code No.

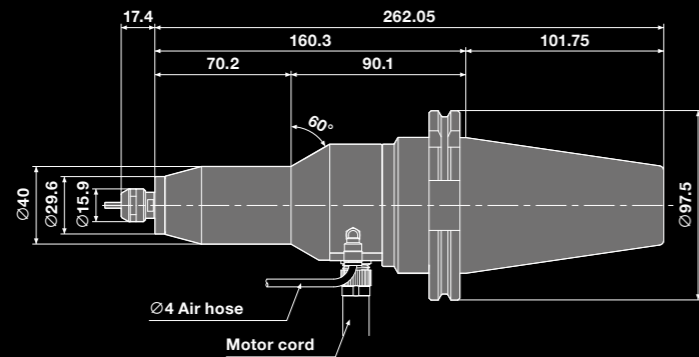
## HES510-BT50 / NT50 (M)

[ BT50 ]

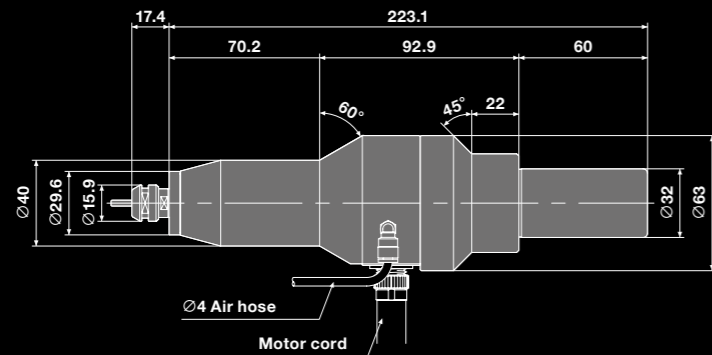
[ NT50 ]



## HES510-IT50



## HES510-ST32



## Specifications

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

### HES510-BT50 / NT50 (M)



Code No.	<b>1951</b>	Model	<b>HES510-BT50</b>
Code No.	<b>1952</b>	Model	<b>HES510-NT50</b>
Code No.	<b>1953</b>	Model	<b>HES510-NT50M</b>

\*NT50M-Retention knob threads are metric.

Max. power	Speed Range	Spindle runout	Weight
<b>340w</b>	<b>5,000~50,000min<sup>-1</sup></b>	Within <b>1μm</b>	BT50 : <b>5.0kg</b> NT50 (M) : <b>5.4kg</b>
Standard Accessories	Collet : φ4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pc.		
Options	Collet (CHK Group) : φ0.5~φ6.35mm <b>p.21</b> Motor cord : Length 4m (9248) , 6m (9249) , 8m (9250) Provided with φ4.0mm Air cooling hose		

### HES510-IT50

Code No.	<b>1955</b>	Model	<b>HES510-IT50</b>
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Max. power	Speed Range	Spindle runout	Weight
<b>340w</b>	<b>5,000~50,000min<sup>-1</sup></b>	Within <b>1μm</b>	<b>4.4kg</b>
Standard Accessories	Collet : φ4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pc.		
Options	Collet (CHK Group) : φ0.5~φ6.35mm <b>p.21</b> Motor cord : Length 4m (9248) , 6m (9249) , 8m (9250) Provided with φ4.0mm Air cooling hose		

### HES510-ST32

Code No.	<b>9197</b>	Model	<b>HES510-ST32</b>
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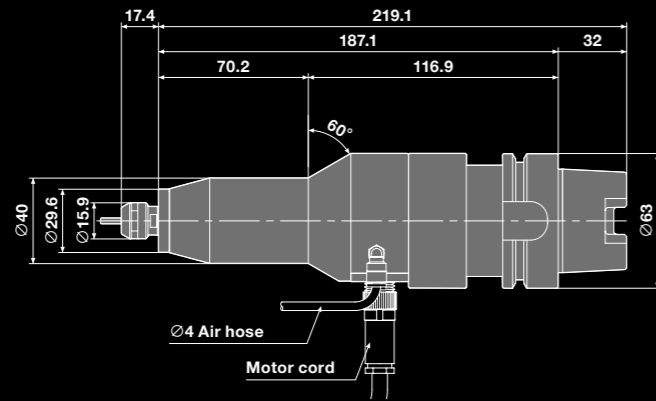


Max. power	Speed Range	Spindle runout	Weight
<b>340w</b>	<b>5,000~50,000min<sup>-1</sup></b>	Within <b>1μm</b>	<b>2.4kg</b>
Standard Accessories	Collet : φ4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pc.		
Options	Collet (CHK Group) : φ0.5~φ6.35mm <b>p.21</b> Motor cord : Length 4m (9248) , 6m (9249) , 8m (9250) Provided with φ4.0mm Air cooling hose		

# 50,000min<sup>-1</sup> Motor Spindle

Order by Code No.

## HES510-HSK A63



## Specifications

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

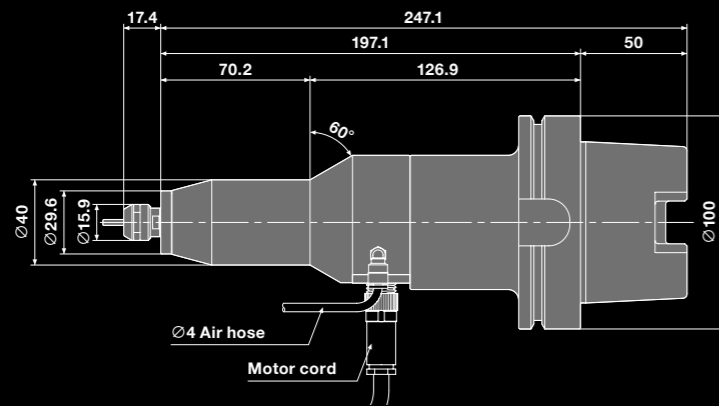
### HES510-HSK A63

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



Max. power	Speed Range	Spindle runout	Weight
<b>340w</b>	<b>5,000~50,000min<sup>-1</sup></b>	Within <b>1μm</b>	<b>2.7kg</b>
Standard Accessories	Collet : φ4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pc.		
Options	Collet (CHK Group) : φ0.5~φ6.35mm <b>p.21</b> Motor cord : Length 4m (9248) , 6m (9249) , 8m (9250) Provided with φ4.0mm Air cooling hose		

## HES510-HSK A100



### HES510-HSK A100

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

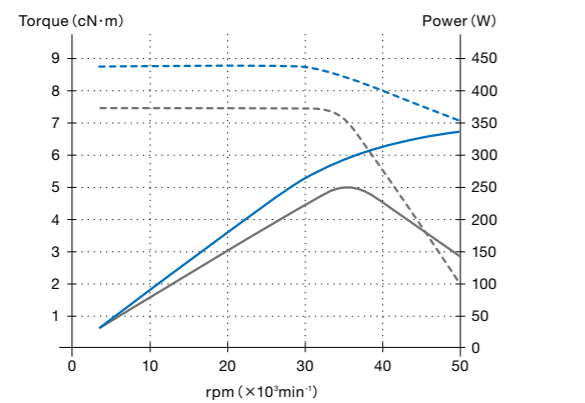


Max. power	Speed Range	Spindle runout	Weight
<b>340w</b>	<b>5,000~50,000min<sup>-1</sup></b>	Within <b>1μm</b>	<b>4.4kg</b>
Standard Accessories	Collet : φ4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pc.		
Options	Collet (CHK Group) : φ0.5~φ6.35mm <b>p.21</b> Motor cord : Length 4m (9248) , 6m (9249) , 8m (9250) Provided with φ4.0mm Air cooling hose		

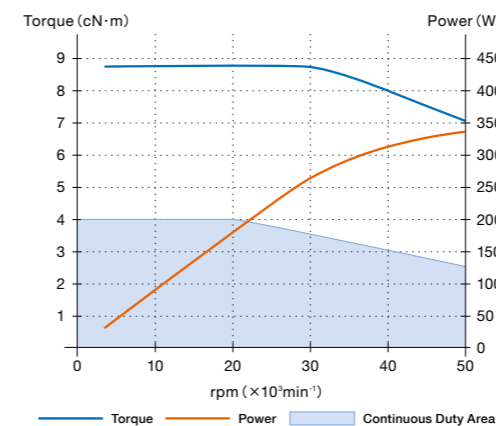
## HES510, HES810 Torque & power

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

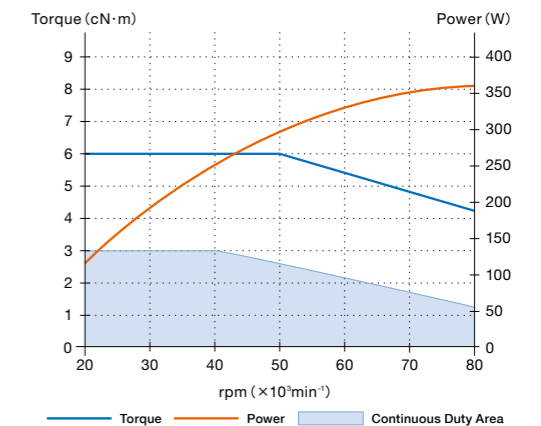
[ HES510 Torque & power curve comparison ]



[ HES510 Torque & power curve ]



[ HES810 Torque & power curve ]



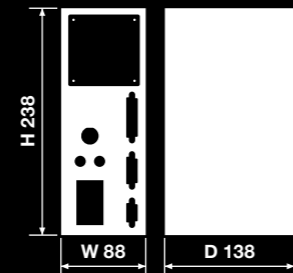
# E3000 Controller



## E3000 CONTROLLER Controller

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

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



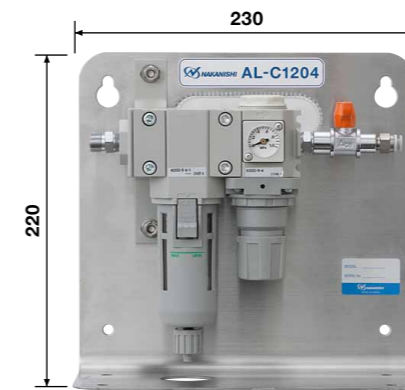
### External Input / Output Control Signal Operation

- 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		
<b>1,000~80,000min<sup>-1</sup></b>		
Input Voltage	Max. power	
<b>AC100~240v</b>	<b>350w</b>	
Power consumption	Air consumption	Weight
<b>AC1.8A</b>	<b>30Nℓ/min</b> (at 0.25~0.3MPa)	<b>2.8kg</b>
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.	<b>4504</b>	Model	<b>AL-C1204</b>
Standard Accessories		Hose pipe(K-275): 2m	

Motor cord	Code No.	Model	Standard Accessories
4M	<b>9248</b>	<b>EMCD-810-4M</b>	Air cooling hose : φ4mm Connector cap(Included)
6M	<b>9249</b>	<b>EMCD-810-6M</b>	
8M	<b>9250</b>	<b>EMCD-810-8M</b>	

# Accessories

Collet	Code No.	Model	I.D.	Compatible model	
<p>Collet CHA Group</p>	<b>91492</b>	CHA-2.35	φ2.35	HES810 ※: High precision type AA (Spindle runout within 2μm)	
	<b>91430</b>	CHA-3.0	φ3.0		
	<b>91493</b>	CHA-3.175	φ3.175		
	<b>91440</b>	CHA-4.0	φ4.0		
	—	CHA-□□	φ0.5, φ0.6, φ0.7, φ0.8, φ0.9 φ1.1, φ1.2, φ1.3, φ1.4, φ1.7, φ1.8, φ1.9 φ2.1, φ2.2, φ2.3, φ2.4, φ2.6, φ2.7, φ2.8, φ2.9 φ3.1, φ3.2, φ3.3, φ3.4, φ3.6, φ3.7, φ3.8, φ3.9 φ1.0, φ1.5, φ2.0, φ2.5, φ3.5 φ1.6		
	<b>91494</b>	CHA-3.0AA	φ3.0AA※		
	<b>91496</b>	CHA-3.175AA	φ3.175AA※		
	<b>91495</b>	CHA-4.0AA	φ4.0AA※		
	<b>91592</b>	CHK-2.35	φ2.35		HES510 ※: High precision type AA (Spindle runout within 2μm)
	<b>91530</b>	CHK-3.0	φ3.0		
<b>91593</b>	CHK-3.175	φ3.175			
<b>91540</b>	CHK-4.0	φ4.0			
<b>91560</b>	CHK-6.0	φ6.0			
<b>91596</b>	CHK-6.35	φ6.35			
—	CHK-□□	φ0.5, φ0.6, φ0.7, φ0.8, φ0.9 φ1.0, φ1.5, φ2.0, φ2.5, φ3.5, φ4.5, φ4.76, φ5.5 φ1.1, φ1.2, φ1.3, φ1.4, φ1.7, φ1.8, φ1.9 φ2.1, φ2.2, φ2.3, φ2.4, φ2.6, φ2.7, φ2.8, φ2.9 φ3.1, φ3.2, φ3.3, φ3.4, φ3.6, φ3.7, φ3.8, φ3.9 φ4.1, φ4.2, φ4.3, φ4.4, φ4.6, φ4.7, φ4.8, φ4.9 φ5.1, φ5.2, φ5.3, φ5.4, φ5.6, φ5.7, φ5.8, φ5.9 φ1.6, φ5.0			
<b>91597</b>	CHK-3.0AA	φ3.0AA※			
<b>91598</b>	CHK-3.175AA	φ3.175AA※			
<b>91599</b>	CHK-4.0AA	φ4.0AA※			
<b>91600</b>	CHK-6.0AA	φ6.0AA※			
<b>91601</b>	CHK-6.35AA	φ6.35AA※			

Collet nut	Code No.	Model	Description	Compatible model
	<b>2102</b>	CHN-A	Collet nut for CHA collet	HES810
	<b>2129</b>	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<sup>-1</sup> Max.1,200W  
 [ φ40mm ]



- 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  
 [ φ30/25/20mm ]



- 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 ]



- [ HES810 ]
- The most cost effective solution to add high-speed machining capability
- 80,000min<sup>-1</sup>; 6.0cN·m
- BT,NT,HSK A63,ST shanks are available
- Driven by E3000 Controller

**E2000 SERIES** **NEW**  
 1,000~50,000min<sup>-1</sup> Max.200W  
 [ φ22.8/25mm ]



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

**iSpeed3 SERIES**  
 1,000~80,000min<sup>-1</sup> Max.150W  
 [ φ19.05/20/22/25mm ]



- Super short motor spindle
- High efficiency brushless motor



- [ HES510 ]
- 50,000min<sup>-1</sup>; 8.75cN·m
- BT,NT,CAT,IT,HSK A,ST shanks are available
- Driven by E3000 Controller

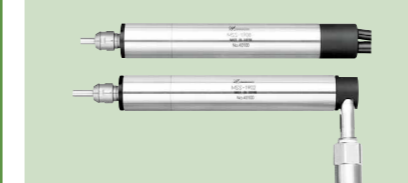
## Air Motors & Spindles



Application for CNC lathes / Special purpose machines

Application for machining centers and milling machines

**AM SERIES One-piece type**  
 1,000~60,000min<sup>-1</sup> Max.350W  
 [ φ30/25/20mm ]



- 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<sup>-1</sup> Max.125W  
 [ φ22.8mm ]



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

**SMS SERIES**  
 40,000min<sup>-1</sup>  
 [ For small diameter endmills and drills only ]



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

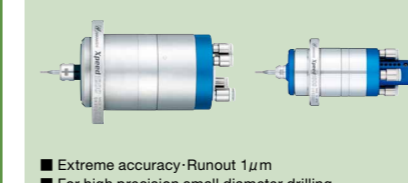
## Air Turbine Spindles



Application for CNC lathes / Special purpose machines

Application for machining centers and milling machines

**Xped SERIES**  
 Max.160,000min<sup>-1</sup>  
 [ φ65/40mm ]



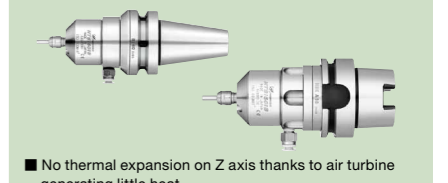
- Extreme accuracy-Runout 1μm
- For high precision small diameter drilling, internal grinding of ceramics
- Long life of spindle thanks to contactless rotation mechanism

**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

Electric spindle

Air spindle