

NAKANISHI SPINDLE HES

Specifications and design are subject to change without notice.



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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

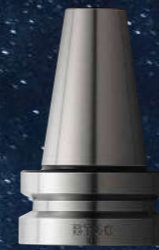
- Optimum for high-precision machining
- Longer tool life

✓ 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]

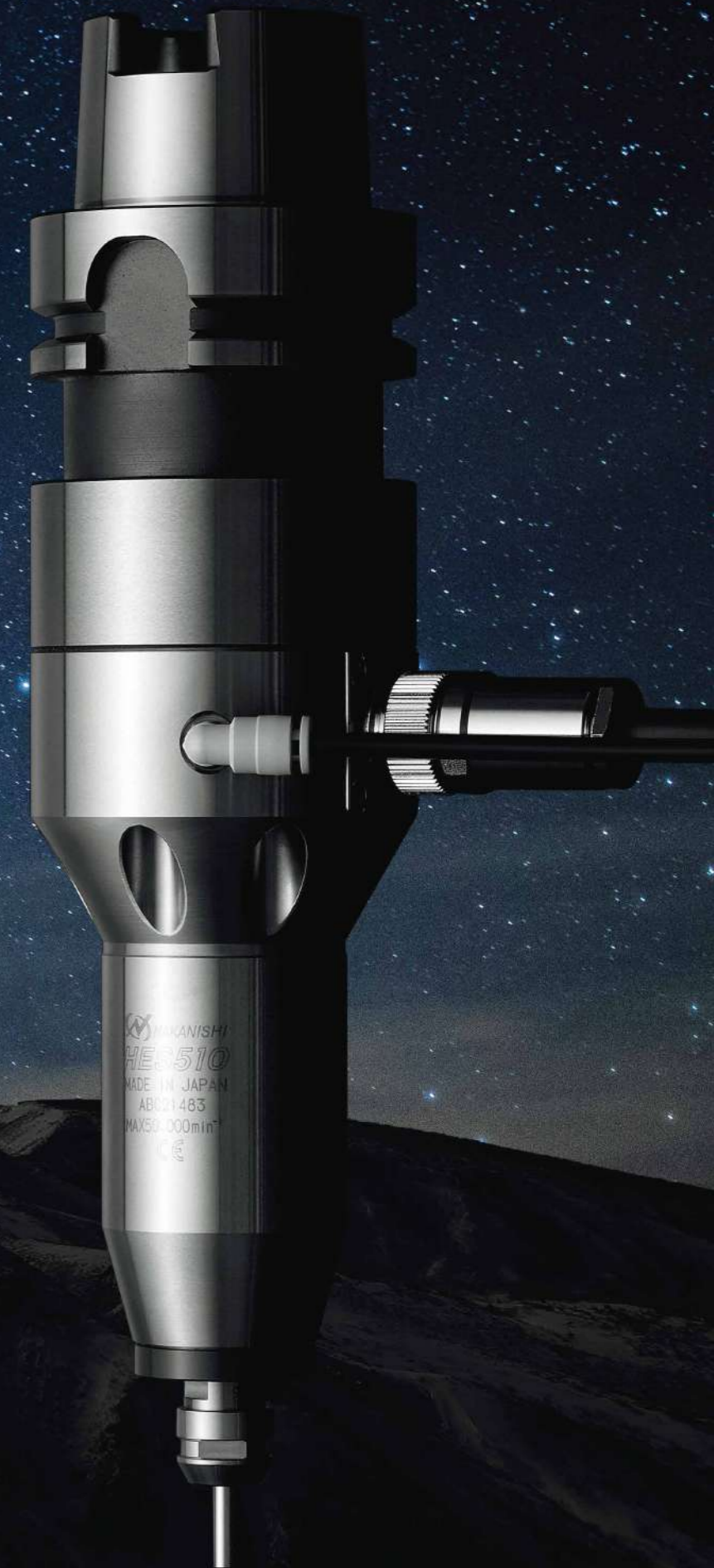


[IT]









[HSK A]

A large variety of shank types are available.











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80,000min⁻¹ Motor Spindle

| | | |
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50,000min⁻¹ Motor Spindle

| | | |
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Motor cord

EMCD-810-4M / 6M / 8M
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Accessories

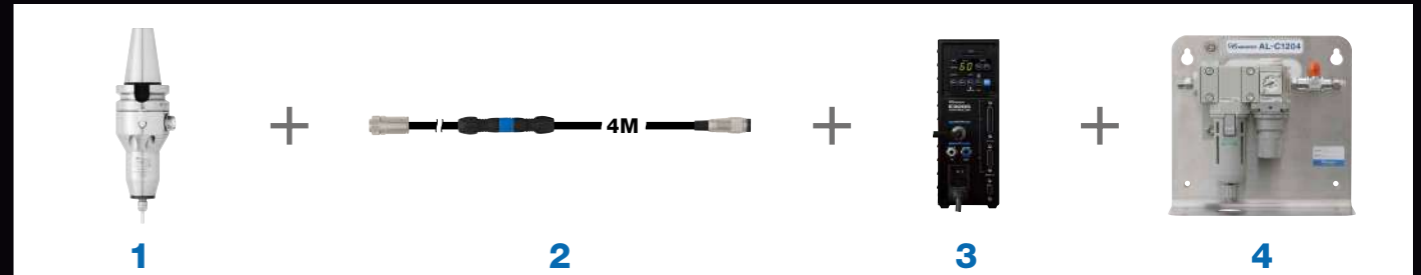
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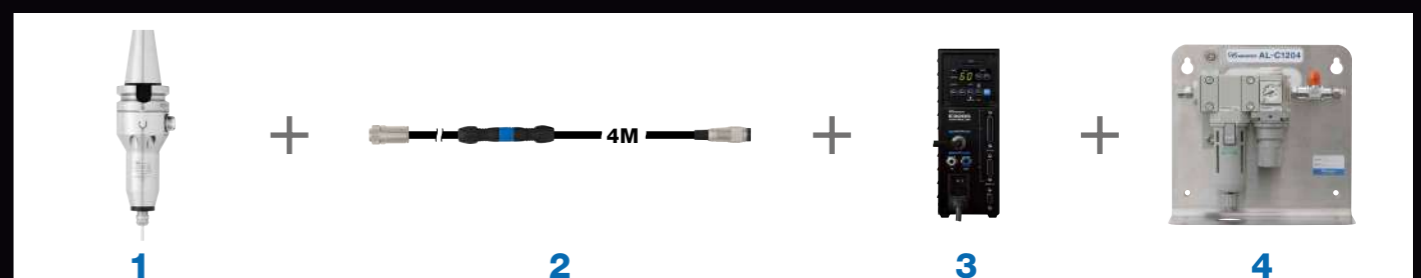
Combination Example

[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 |

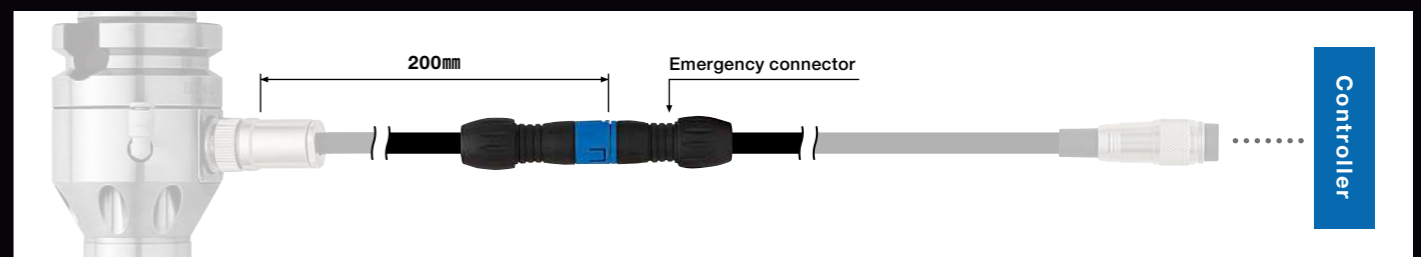
[HES510 SERIES] HES510-BT40 + EMCD-810-4M + E3000 + AL-C1204



| [HES510-BT40] | | | |
|---------------|----------|-------------|--------------------------------|
| | Code No. | Model | Description |
| 1 | 1946 | HES510-BT40 | 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 |

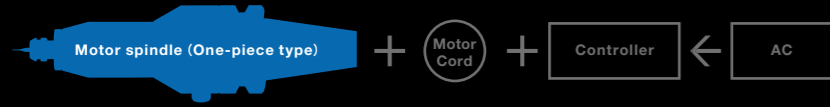
Safety function

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.



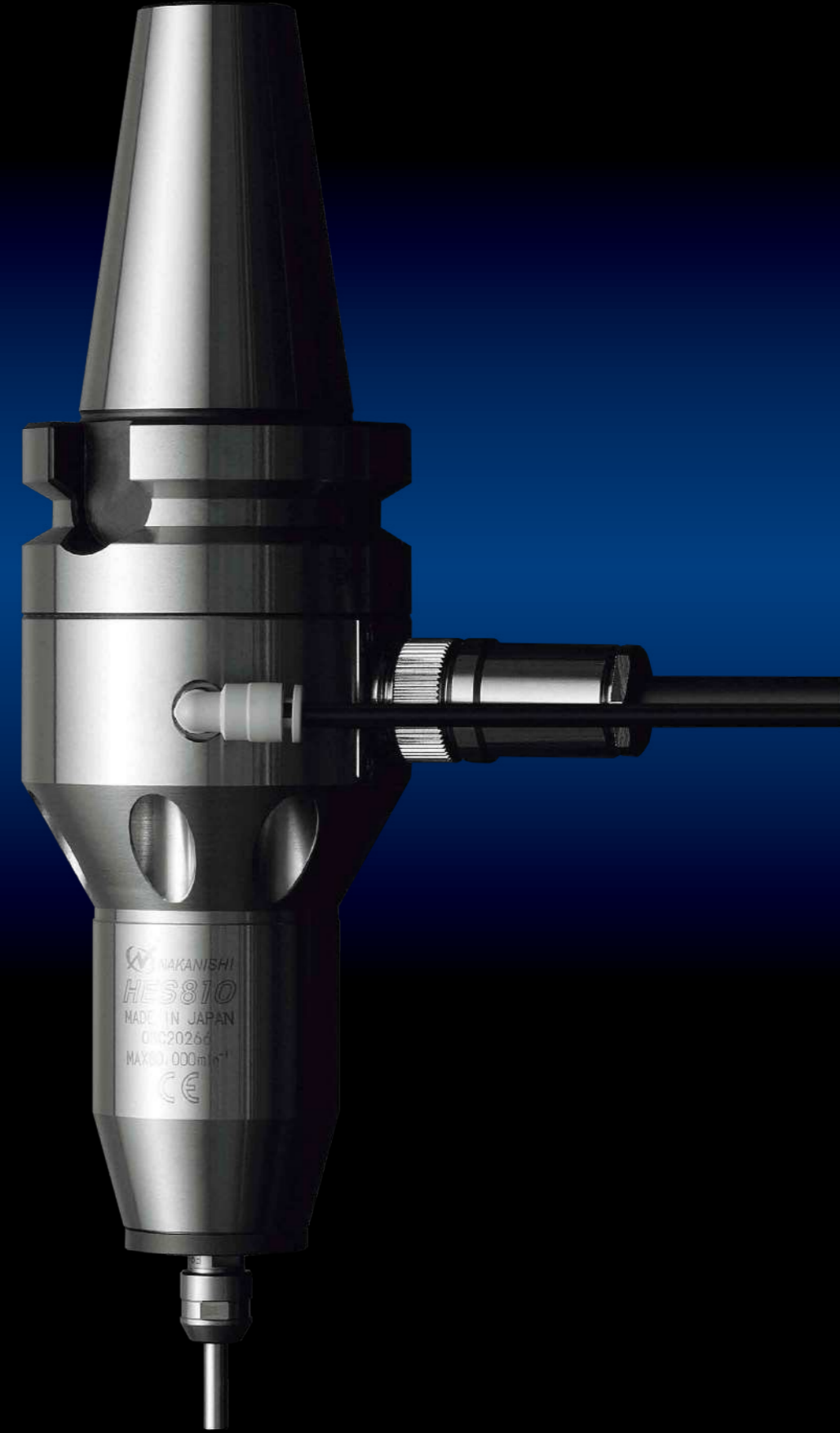
! It is crucial to install the controller and the cable according to "OPERATION MANUAL" in order to function safety coupling properly.

80,000min⁻¹ Motor Spindle



HES810-BT30
p.7

HES810-BT40 / NT40 / IT40
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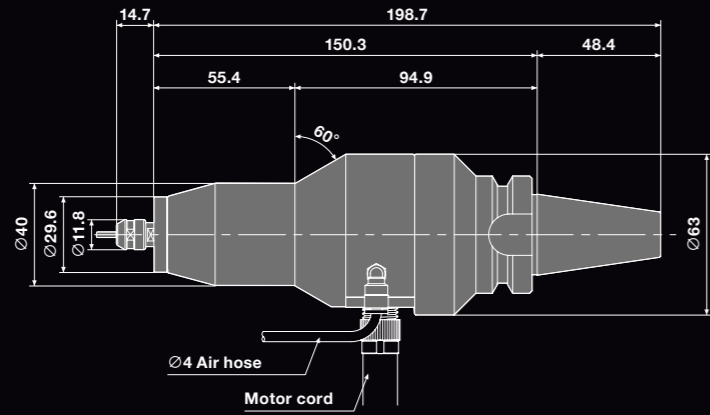
HES810-HSK A63
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p.9

80,000min⁻¹ Motor Spindle

Order by Code No.

HES810-BT30



HES810-BT30

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

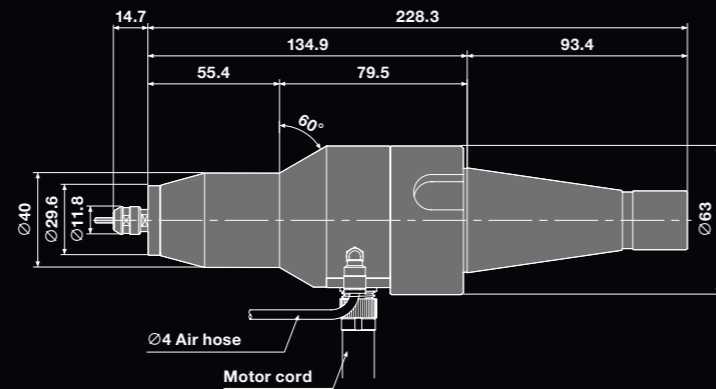
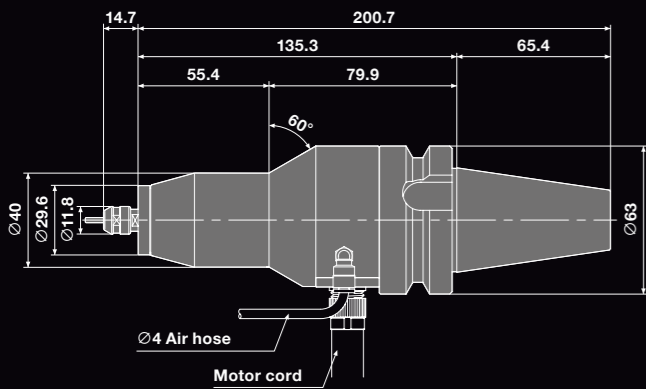


| Max. power | Speed Range | Spindle runout | Weight |
|----------------------|---|-------------------|--------------|
| 350w | 20,000~80,000min⁻¹ ※Recommended motor speed : 50,000~80,000min ⁻¹ | Within 1μm | 2.0kg |
| Standard Accessories | Collet : ø4.0mm (CHA-4.0) / Collet nut (CHN-A) / Spanner (8×5) · (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

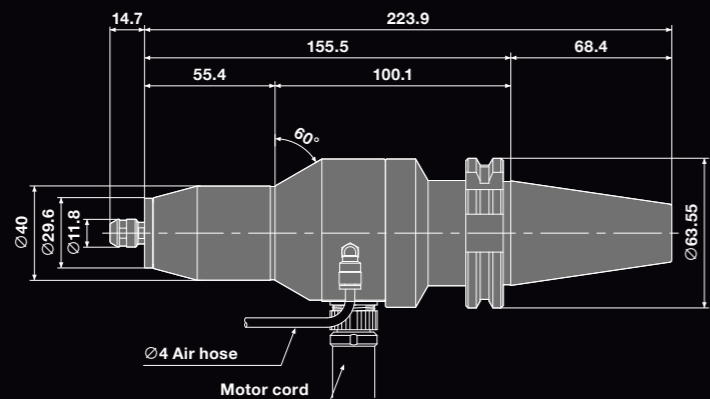
Code No. **9199** Model **HES810-BT40**

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**

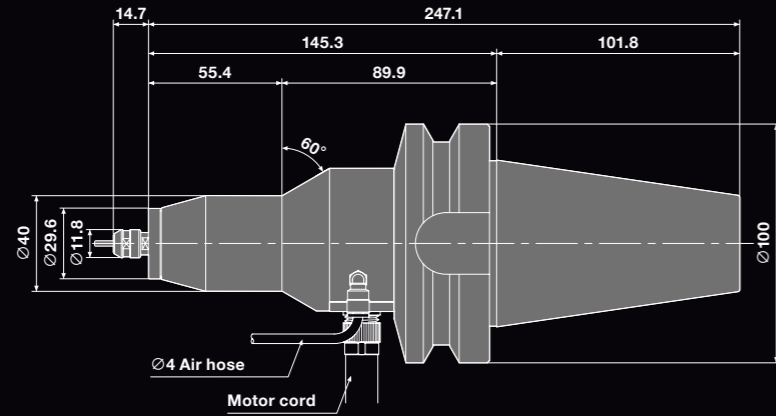


| Max. power | Speed Range | Spindle runout | Weight |
|----------------------|---|-------------------|--------------|
| 350w | 20,000~80,000min⁻¹ ※Recommended motor speed : 50,000~80,000min ⁻¹ | Within 1μm | 2.4kg |
| Standard Accessories | Collet : ø4.0mm (CHA-4.0) / Collet nut (CHN-A) / Spanner (8×5) · (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



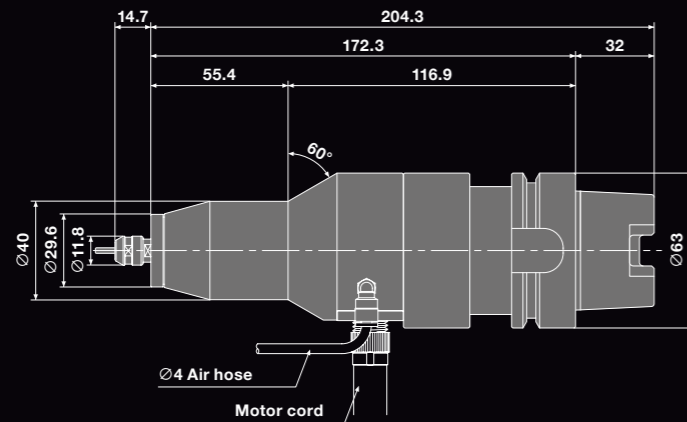
HES810-BT50

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



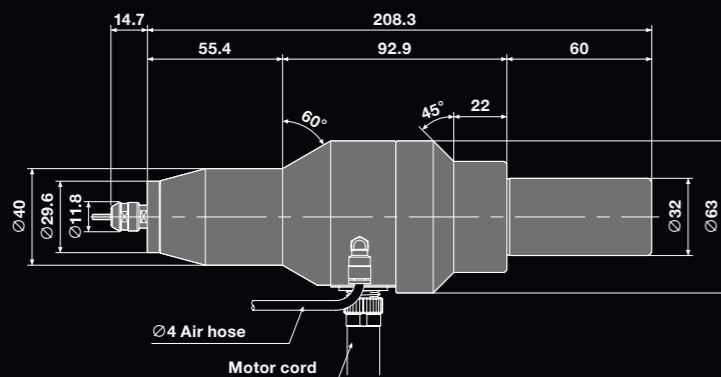
HES810-HSK A63

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

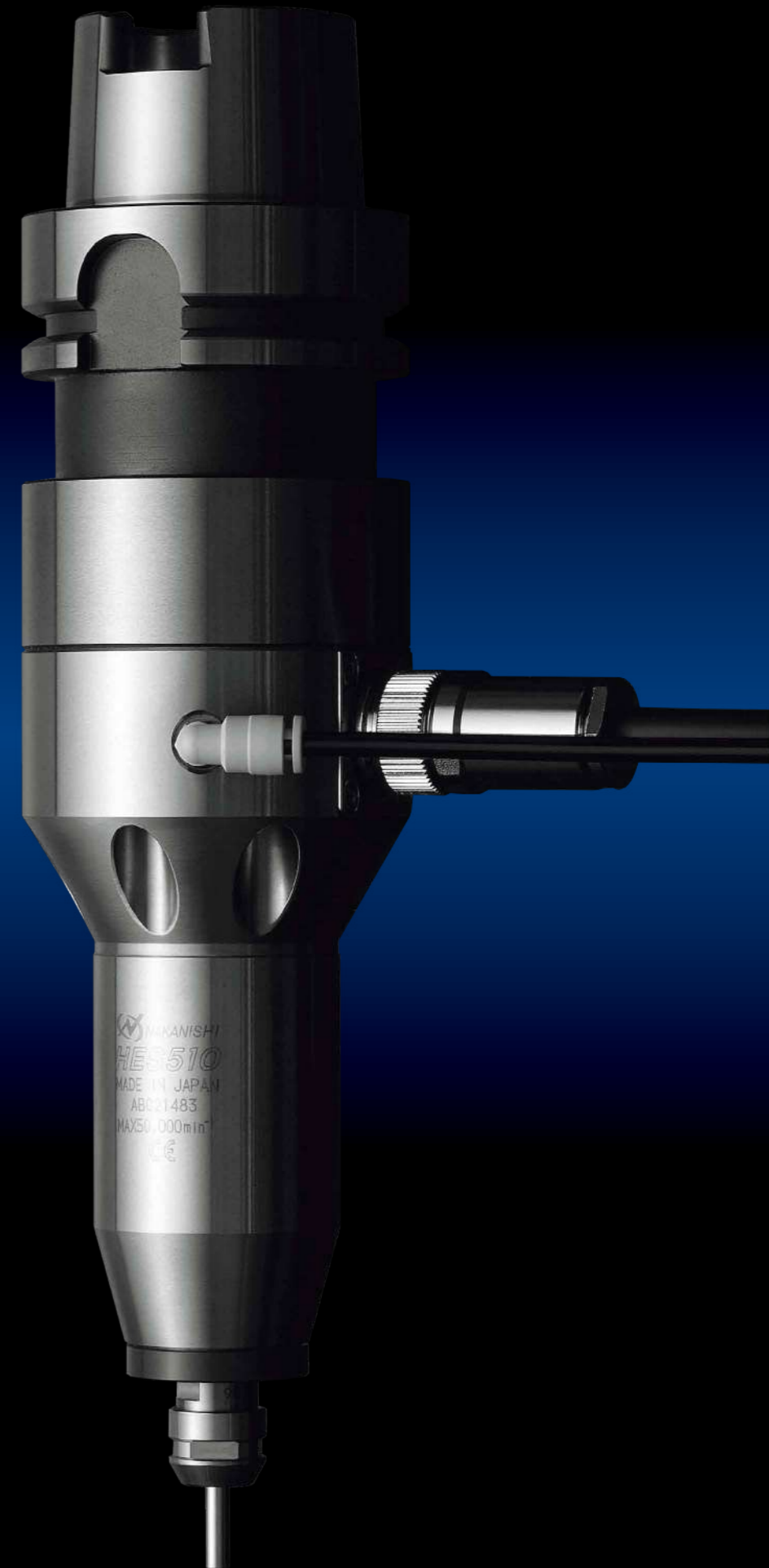
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HES510-BT40 / NT40 / IT40

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HES510-BT50 / NT50 / IT50

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HES510-ST32

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HES510-HSK A63

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HES510-HSK A100

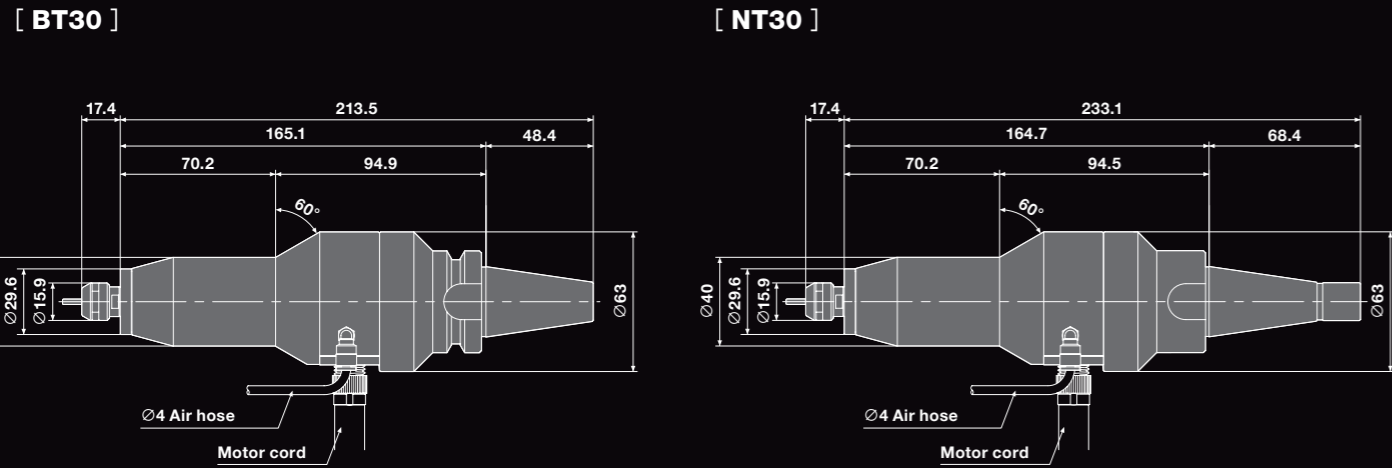
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50,000min⁻¹ Motor Spindle

Specifications

Order by Code No.

HES510-BT30 / NT30 (M)



HES510-BT30 / NT30 (M)

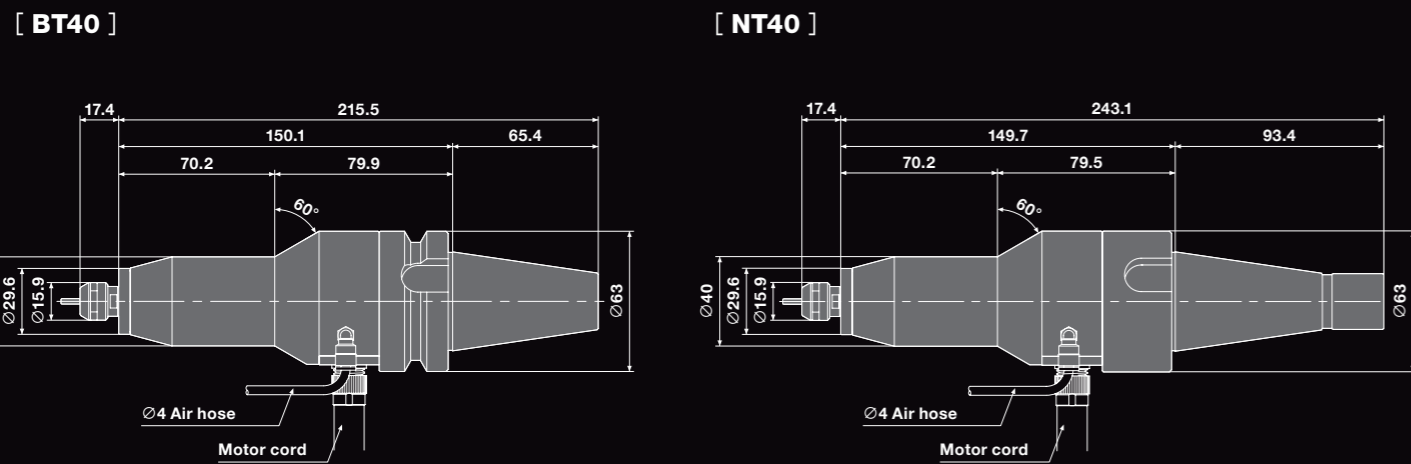


| | | | |
|----------|-------------|-------|---------------------|
| Code No. | 1943 | Model | HES510-BT30 |
| Code No. | 1944 | Model | HES510-NT30 |
| Code No. | 1945 | Model | HES510-NT30M |

*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)

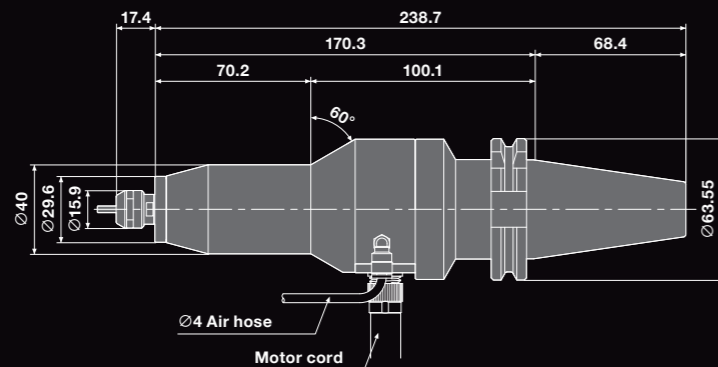


| | | | |
|----------|-------------|-------|---------------------|
| Code No. | 1946 | Model | HES510-BT40 |
| Code No. | 1947 | Model | HES510-NT40 |
| Code No. | 1948 | Model | HES510-NT40M |

*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 |
|----------|-------------|-------|--------------------|

| 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

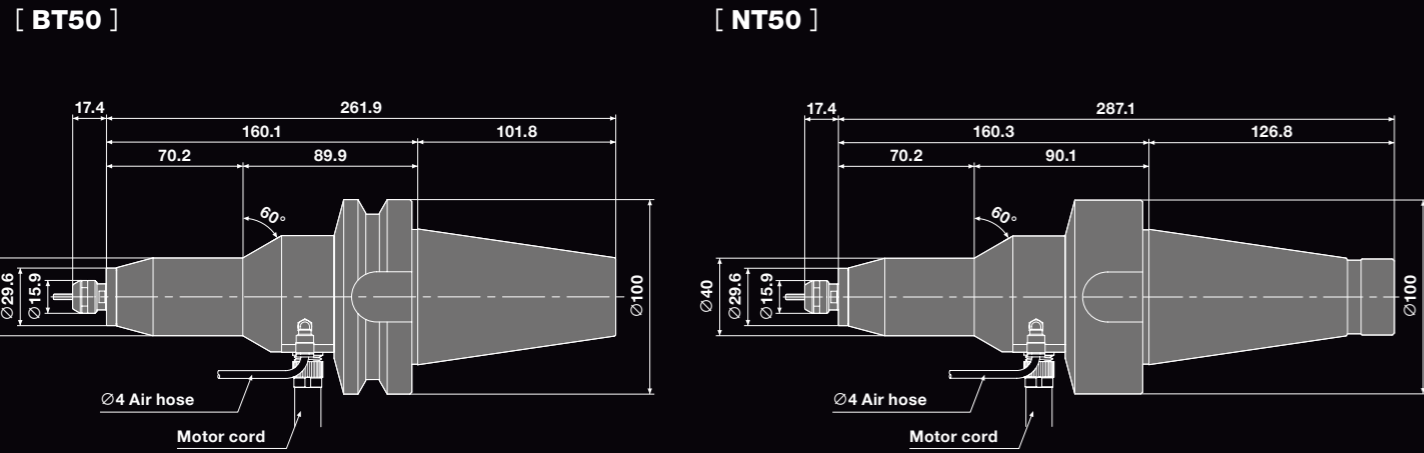
Order by Code No.

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.

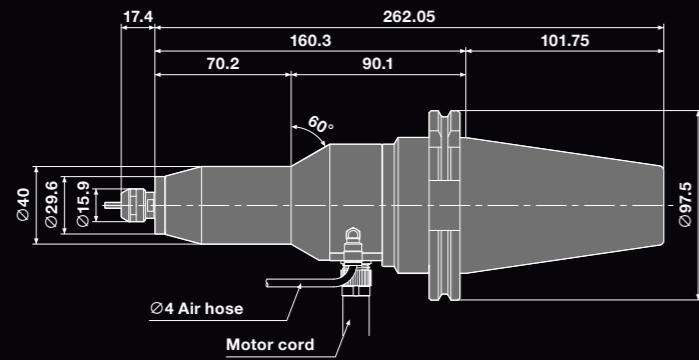


| Max. power | Speed Range | Spindle runout | Weight |
|----------------------|--|-------------------|---|
| 340w | 5,000~50,000min⁻¹ | Within 1μm | BT50 : 5.0kg NT50(M) : 5.4kg |
| Standard Accessories | Collet : ø4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pcs. | | |
| Options | Collet (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 |
|----------|-------------|-------|--------------------|

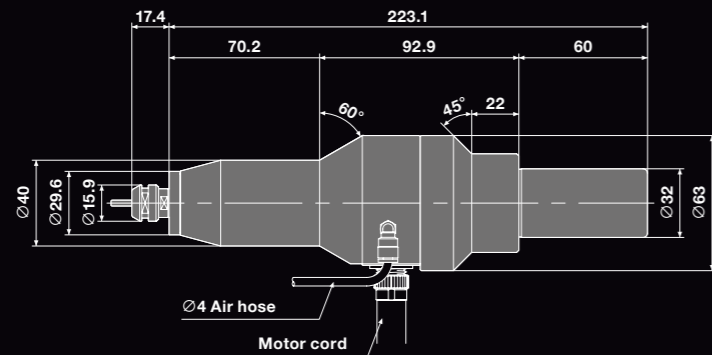


| Max. power | Speed Range | Spindle runout | Weight |
|----------------------|--|-------------------|--------------|
| 340w | 5,000~50,000min⁻¹ | Within 1μm | 4.4kg |
| Standard Accessories | Collet : ø4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pcs. | | |
| Options | Collet (CHK Group) : 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 |
|----------|-------------|-------|--------------------|

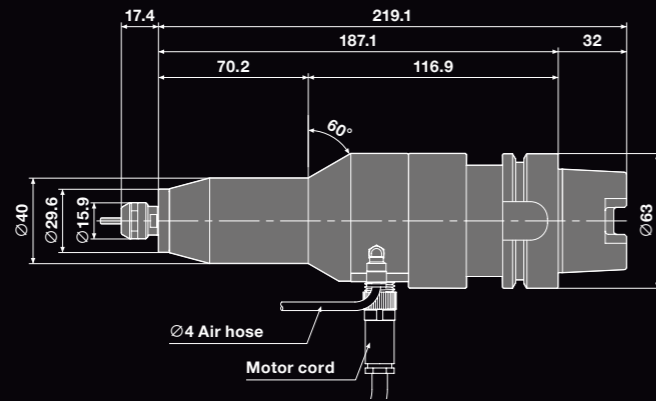


| Max. power | Speed Range | Spindle runout | Weight |
|----------------------|--|-------------------|--------------|
| 340w | 5,000~50,000min⁻¹ | Within 1μm | 2.4kg |
| Standard Accessories | Collet : ø4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pcs. | | |
| Options | Collet (CHK Group) : 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



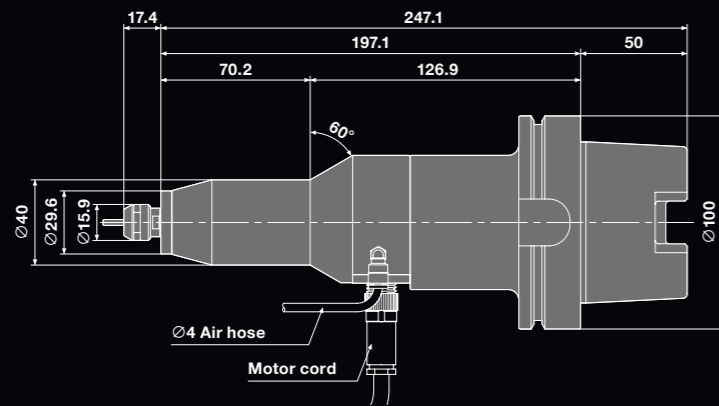
HES510-HSK A63

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**

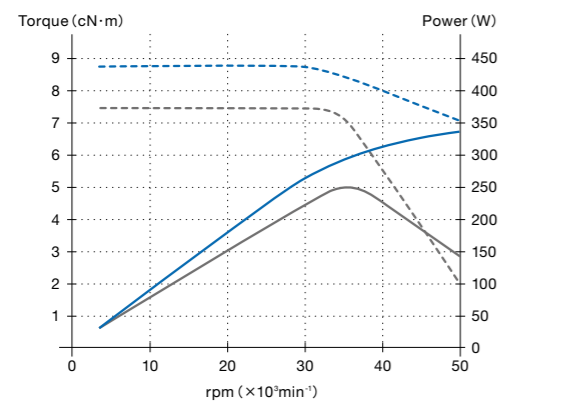


| Max. power | Speed Range | Spindle runout | Weight |
|----------------------|--|-------------------|--------------|
| 340w | 5,000~50,000min⁻¹ | Within 1μm | 4.4kg |
| Standard Accessories | Collet : ø4.0mm (CHK-4.0) / Collet nut (K-265) / Spanner (12×14) : 2pcs. | | |
| Options | Collet (CHK Group)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

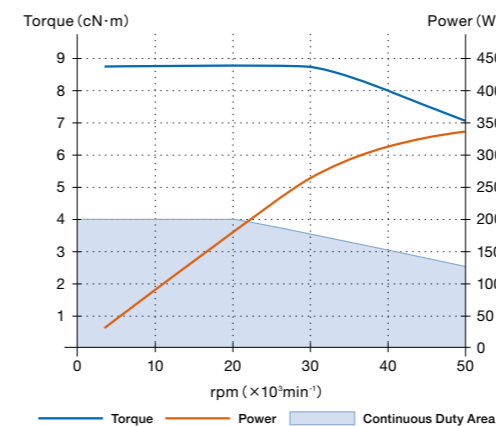
HES510, HES810 Torque & power

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

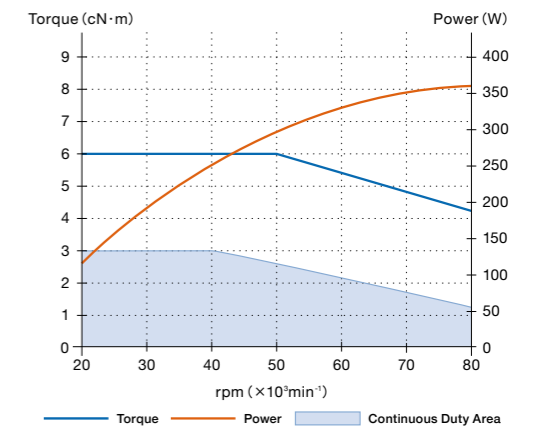
[HES510 Torque & power curve comparison]



[HES510 Torque & power curve]



[HES810 Torque & power curve]



E3000 Controller

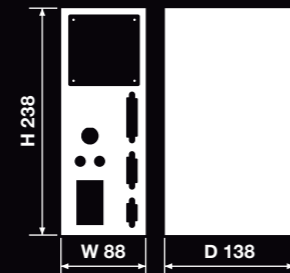


E3000 CONTROLLER

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

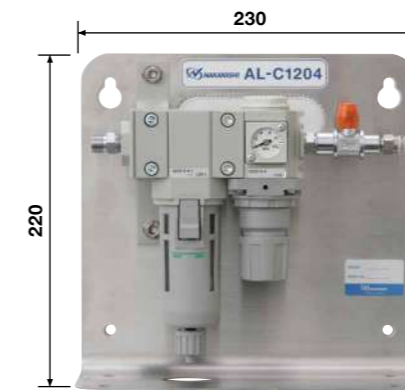
- **External Input**
Motor Rotating / Stopped, Error Released, Rotating Direction, Motor Speed Setting and etc.
- **External Monitor**
Motor Current, Error, Warning, Rotating pulse and etc.
- **Parameter Setting**
Maximum motor speed setting, Fix the motor speed
※For more information, please refer to 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]

[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

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

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