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High-Speed Air Turbine Spindle for Machining Centers

# HTS SERIES

Ultra-high-Speed & Super-Precision

Specifications and design are subject to change without notice.

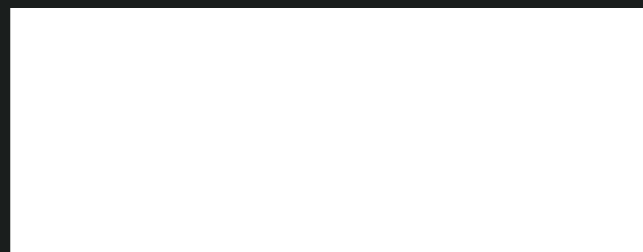
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PR-K328E Ver.1 '15.05.02.Y



AIR TURBINE SPINDLE

# HTS Series



Max. **150,000min<sup>-1</sup>** (0.5MPa)

Max. Power **25W**

## High Speed 150,000min<sup>-1</sup> Suitable for Small Diameter Milling



### Large Variety of Tapers Available

SHANK  
M2040 (Straight), BT30 / 40 / 50  
HSK E25 / 32 / 40 / 50  
HSK A63 / F63

**Air Turbine**  
Air Turbine mechanism has extremely low heat generation.

**Collet**  
Max.  $\phi 4.0\text{mm}$



## ▶ "HTS SERIES" TURBINE SPINDLE

UPGRADE MACHINING CENTERS TO  
HIGH SPEED MACHINES SOLUTION

▼ AIR TURBINE SPINDLE

# HTS Series



Max. **150,000min<sup>-1</sup>** (0.5MPa)

Max. Power **25W**



Air Turbine Spindle  
HTS1501S-BT40



### Negligible spindle expansion

- Air Turbine mechanism has extremely low heat generation.
- Up to cutting tool R x 0.1 depth of cut is possible.

### Highly stable milling conditions are possible even with very small diameter cutting tools

- Usable max. cutting tool diameter :  
Ball End Mill R0.5, Square End Mill  $\phi 1$

### Dramatically shorten mold cavity machining time

Spindle Runout :  
Within 1  $\mu\text{m}$

Collet :  
Max.  $\phi 4.0\text{mm}$

Collet  
CHA-4.0

OPTION → Refer to P.5

\*Other collet sizes are available.

Air Line Kit  
AL-M1202

OPTION → Refer to P.5



### HTS Series Connection Drawing

Clean, lubricated, and regulated air is required for HTS Series spindles. Please refer to the diagram to the right for proper connections. AL-M1202 incorporates a filter, regulator and lubricator to provide the appropriate air.



HTS Series



Air Line Kit AL-M1202

Compressor

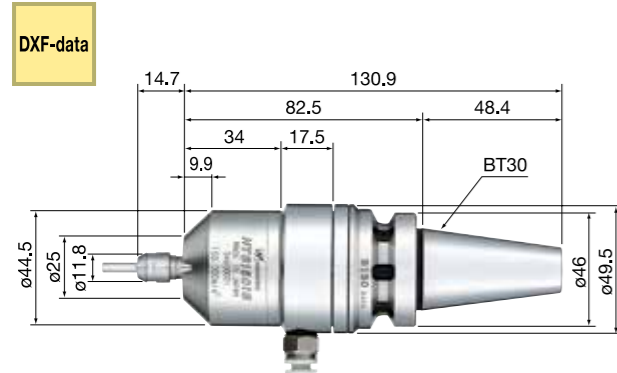
### ⚠ Caution

- Do not rotate the machining center's main spindle with the HTS1501 spindle installed.

\* Please mention "Code Number" upon your order.

**⚠ Caution :** Do not rotate the machining center's main spindle with the HTS1501 spindle installed.

Air Turbine Spindle	Max. Power	Speed	Spindle Runout	Air Consumption	Weight
<b>HTS1501S-BT30</b>	25W	150,000min <sup>-1</sup> (0.5MPa)	Within 1 μm	80Nℓ/min	1,030g



Code No. **8296** Model **HTS1501S-BT30**

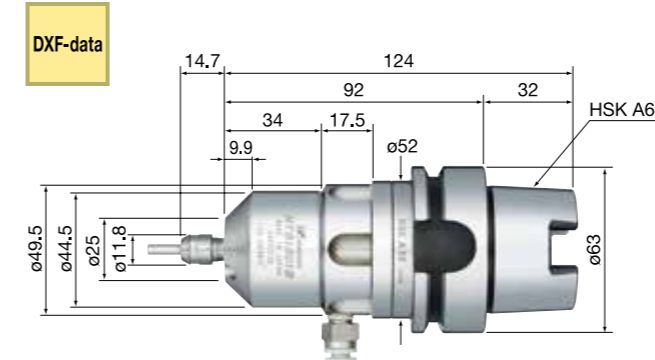
< Standard Equipment Accessories >

- Collet : ø4.0mm (CHA-4.0)
- Collet Nut (CHN-AA) • Spanner (8 x 5), (9 x 11) : 1pc. each
- Filter Joint (FJ-01) • Hose (K-247) : ø6mm x 4m

< Optional >

Collet (CHA Group) : ø0.5~ø4.0mm See Page 5 for details

Air Turbine Spindle	Max. Power	Speed	Spindle Runout	Air Consumption	Weight
<b>HTS1501S-HSK A63</b>	25W	150,000min <sup>-1</sup> (0.5MPa)	Within 1 μm	80Nℓ/min	1,400g



Code No. **8298** Model **HTS1501S-HSK A63**

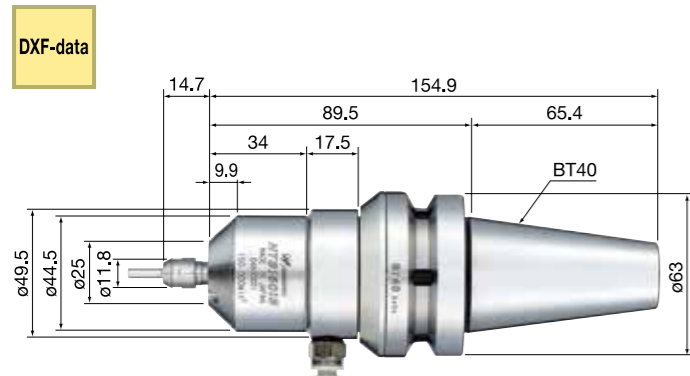
< Standard Equipment Accessories >

- Collet : ø4.0mm (CHA-4.0)
- Collet Nut (CHN-AA) • Spanner (8 x 5), (9 x 11) : 1pc. each
- Filter Joint (FJ-01) • Hose (K-247) : ø6mm x 4m

< Optional >

Collet (CHA Group) : ø0.5~ø4.0mm See Page 5 for details

Air Turbine Spindle	Max. Power	Speed	Spindle Runout	Air Consumption	Weight
<b>HTS1501S-BT40</b>	25W	150,000min <sup>-1</sup> (0.5MPa)	Within 1 μm	80Nℓ/min	1,700g



Code No. **8297** Model **HTS1501S-BT40**

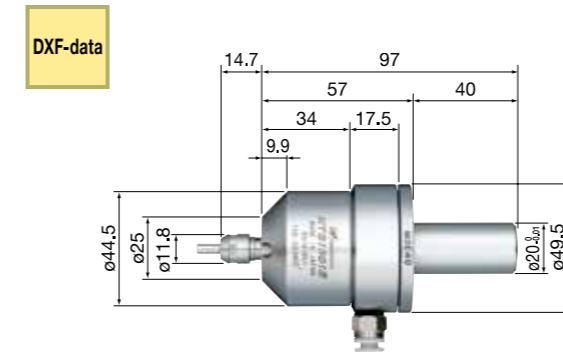
< Standard Equipment Accessories >

- Collet : ø4.0mm (CHA-4.0)
- Collet Nut (CHN-AA) • Spanner (8 x 5), (9 x 11) : 1pc. each
- Filter Joint (FJ-01) • Hose (K-247) : ø6mm x 4m

< Optional >

Collet (CHA Group) : ø0.5~ø4.0mm See Page 5 for details

Air Turbine Spindle	Max. Power	Speed	Spindle Runout	Air Consumption	Weight
<b>HTS1501S-M2040</b> (Straight Type)	25W	150,000min <sup>-1</sup> (0.5MPa)	Within 1 μm	80Nℓ/min	710g



Code No. **8299** Model **HTS1501S-M2040**

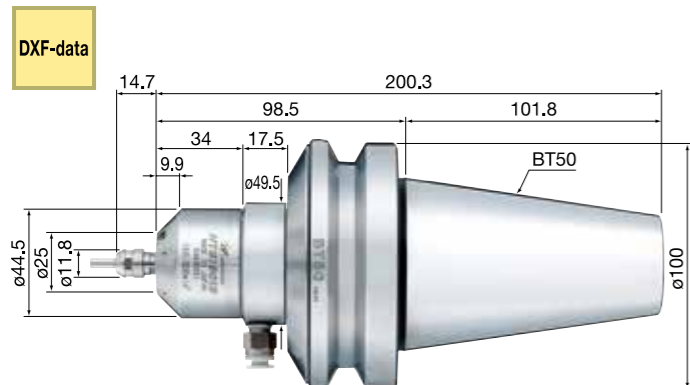
< Standard Equipment Accessories >

- Collet : ø4.0mm (CHA-4.0)
- Collet Nut (CHN-AA) • Spanner (8 x 5), (9 x 11) : 1pc. each
- Filter Joint (FJ-01) • Hose (K-247) : ø6mm x 4m

< Optional >

Collet (CHA Group) : ø0.5~ø4.0mm See Page 5 for details

Air Turbine Spindle	Max. Power	Speed	Spindle Runout	Air Consumption	Weight
<b>HTS1501S-BT50</b>	25W	150,000min <sup>-1</sup> (0.5MPa)	Within 1 μm	80Nℓ/min	4,500g



Code No. **8281** Model **HTS1501S-BT50**

< Standard Equipment Accessories >

- Collet : ø4.0mm (CHA-4.0)
- Collet Nut (CHN-AA) • Spanner (8 x 5), (9 x 11) : 1pc. each
- Filter Joint (FJ-01) • Hose (K-247) : ø6mm x 4m

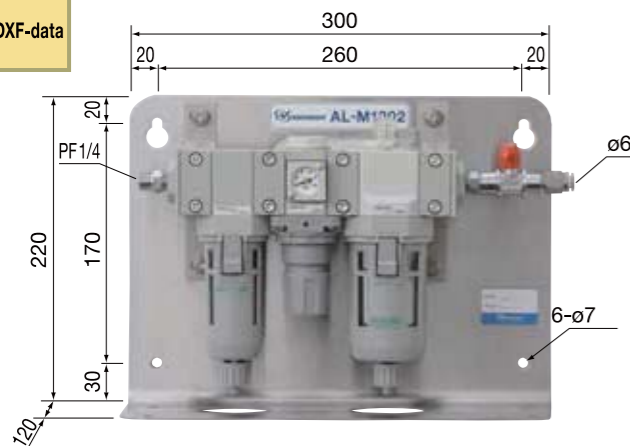
< Optional >

Collet (CHA Group) : ø0.5~ø4.0mm See Page 5 for details

Air Line Kit

**AL-M1202** (ø6mm Air Output One-Touch Connector)

DXF-data



■ 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 to proper air pressure and the lubricator ensures proper oil flow to the motor and spindle. This Air Line Kit is wall mountable.

Filter Mesh 0.3 μm

Code No.	<b>4502</b>	Model	<b>AL-M1202</b>
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< Standard Equipment Accessories >

- Hose for Piping (K-275) : 2m
- Lubricating Oil (K-211) : 1pc.

■ Parts

Product	Inside Diameter : ød	Fit to	Model	Code No.	
<p>Model : CHA-1.0, CHA-3.0, CHA-3.0AA, CHA-3.175, CHA-3.175AA, CHA-4.0, CHA-4.0AA</p> <p>Model : Besides the above</p> <p>CHA Group</p>	ø2.35	HTS series *High precision type	CHA-2.35	<b>91492</b>	
	ø3.0		CHA-3.0	<b>91430</b>	
	ø3.175		CHA-3.175	<b>91493</b>	
	ø4.0		CHA-4.0	<b>91440</b>	
	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				
ø3.0AA*			CHA-3.0AA	<b>91494</b>	
ø3.175AA*			CHA-3.175AA	<b>91496</b>	
ø4.0AA*			CHA-4.0AA	<b>91495</b>	
	Collet Nut for Collet (CHA)	HTS series	CHN-AA	<b>2159</b>	
	Lubricating Oil (70cc)	Air Line Kit (AL-M1202)	K-211	<b>1057</b>	
	Lubricating Oil (1L)	Air Line Kit (AL-M1202)	K-202	<b>1058</b>	

\*: For right hand (cw) rotation only.

HTS1501 Series

**Case Studies** <Rough mill for deep cutting, High-speed feeding> F=2,000mm/min (Rough cutting)



Material	NAK80 (HRC 40)
Motor Speed	150,000min <sup>-1</sup>
Usable Tool	R 0.2 x 2L Ball End Mill
Rough Cutting	Ad 0.03 x Rd 0.04mm
Rough Cutting Work Feed	2,000mm/min
Finishing Cutting	Ad 0.01 x Rd 0.01mm
Finishing Cutting Work Feed	1,500mm/min
Total Time	4h 31min

HTS1501 Series

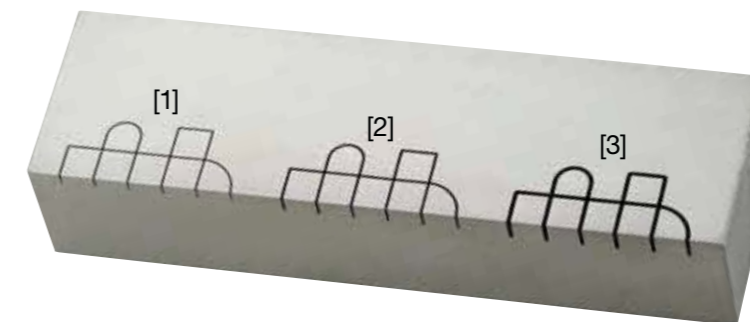
**Case Studies** <High-speed rotation and feeding> F=2,250 mm/min



Material	DC53 (HRC 60)
Motor Speed	150,000min <sup>-1</sup>
Usable Tool	R 0.1 x 0.5 cBN
Work Feed	2,250mm/min
Cutting Depth	Ad 0.005 x Rd 0.01mm
Total Time	3h 30min (42min / 1pc.)

HTS1501 Series

**Case Studies** <Rib processing> F=2,000mm/min



Material	NAK80 (HRC 40)		
Motor Speed	150,000min <sup>-1</sup>		
Sample No.	[1]	[2]	[3]
Usable Tool	ø0.2 x 2	ø0.3 x 3	ø0.4 x 4
Work Feed	2,000mm/min		
Cutting Depth	Ad 0.003mm	Ad 0.005mm	Ad 0.007mm
Total Time	29min. 50sec.	27min. 43sec.	26min. 22sec.