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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.

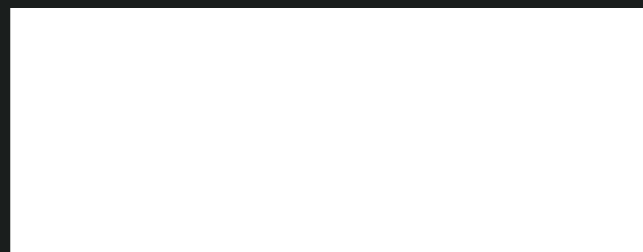
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PR-K328E Ver.1 '15.05.02.Y



AIR TURBINE SPINDLE

HTS Series



Max. **150,000min⁻¹** (0.5MPa)

Max. Power **25W**

High Speed 150,000min⁻¹ 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⁻¹** (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 μm

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

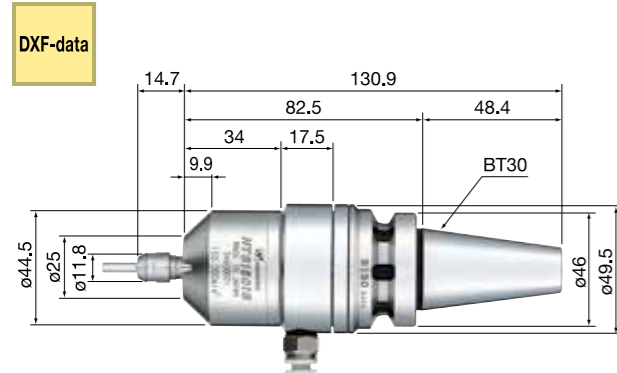
Compressor

⚠ Caution

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

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



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

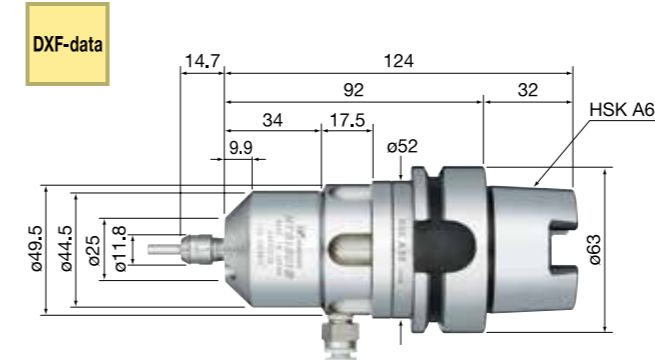
< Standard Equipment Accessories >

- 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
HTS1501S-HSK A63	25W	150,000min ⁻¹ (0.5MPa)	Within 1 μm	80Nℓ/min	1,400g



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

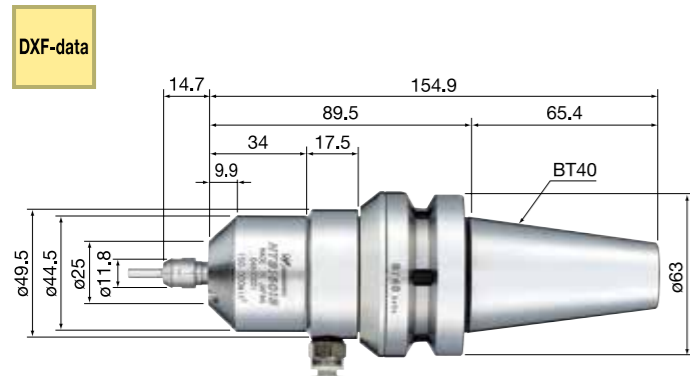
< Standard Equipment Accessories >

- 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
HTS1501S-BT40	25W	150,000min ⁻¹ (0.5MPa)	Within 1 μm	80Nℓ/min	1,700g



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

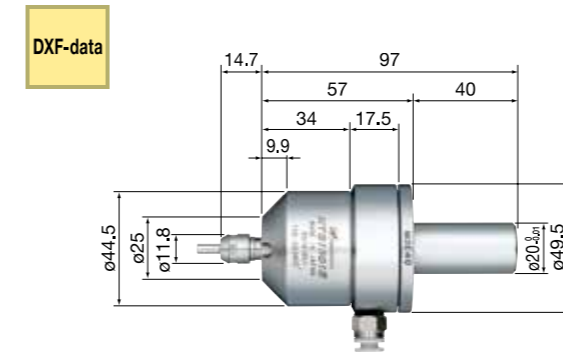
< Standard Equipment Accessories >

- 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
HTS1501S-M2040 (Straight Type)	25W	150,000min ⁻¹ (0.5MPa)	Within 1 μm	80Nℓ/min	710g



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

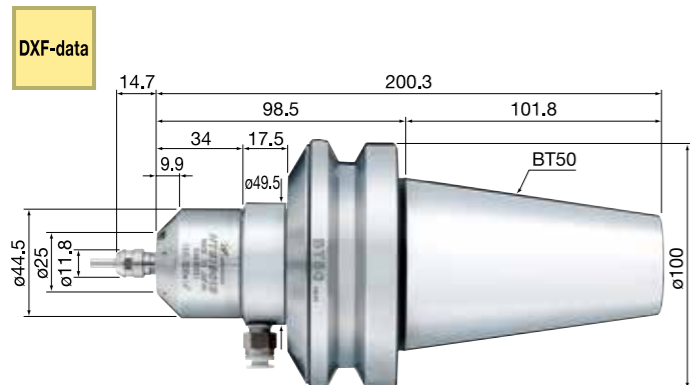
< Standard Equipment Accessories >

- 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
HTS1501S-BT50	25W	150,000min ⁻¹ (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

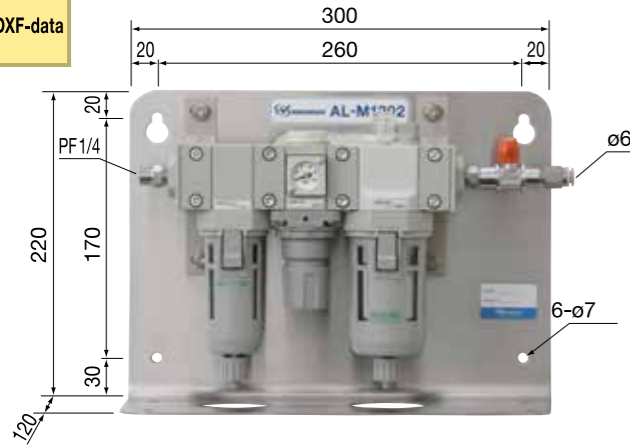
< Optional >

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

Air Line Kit

AL-M1202 (For ø6mm, ø8mm Hose)

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.	4502	Model	AL-M1202
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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	91492
	ø3.0		CHA-3.0	91430
	ø3.175		CHA-3.175	91493
	ø4.0		CHA-4.0	91440
	ø0.5, ø0.6, ø0.7, ø0.8, ø0.9		CHA-[]	—
	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	91494		
ø3.175AA*	CHA-3.175AA	91496		
ø4.0AA*	CHA-4.0AA	91495		
	Collet Nut for Collet (CHA)	HTS series	CHN-AA	2159
	Lubricating Oil (70cc)	Air Line Kit (AL-M1202)	K-211	1057
	Lubricating Oil (1L)	Air Line Kit (AL-M1202)	K-202	1058

*: 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 ⁻¹
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

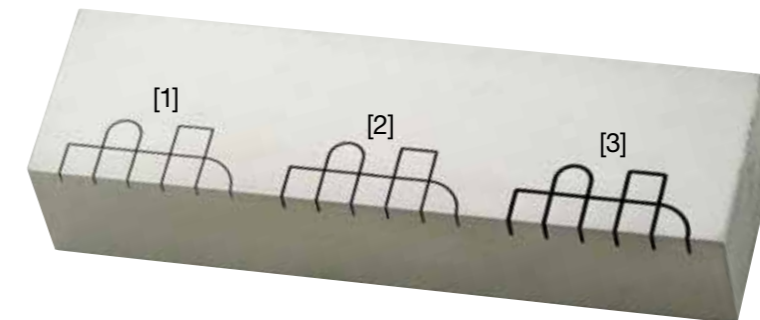
Case Studies <High-speed rotation and feeding> F=2,250mm/min



Material	DC53 (HRC 60)
Motor Speed	150,000min ⁻¹
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 ⁻¹		
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.