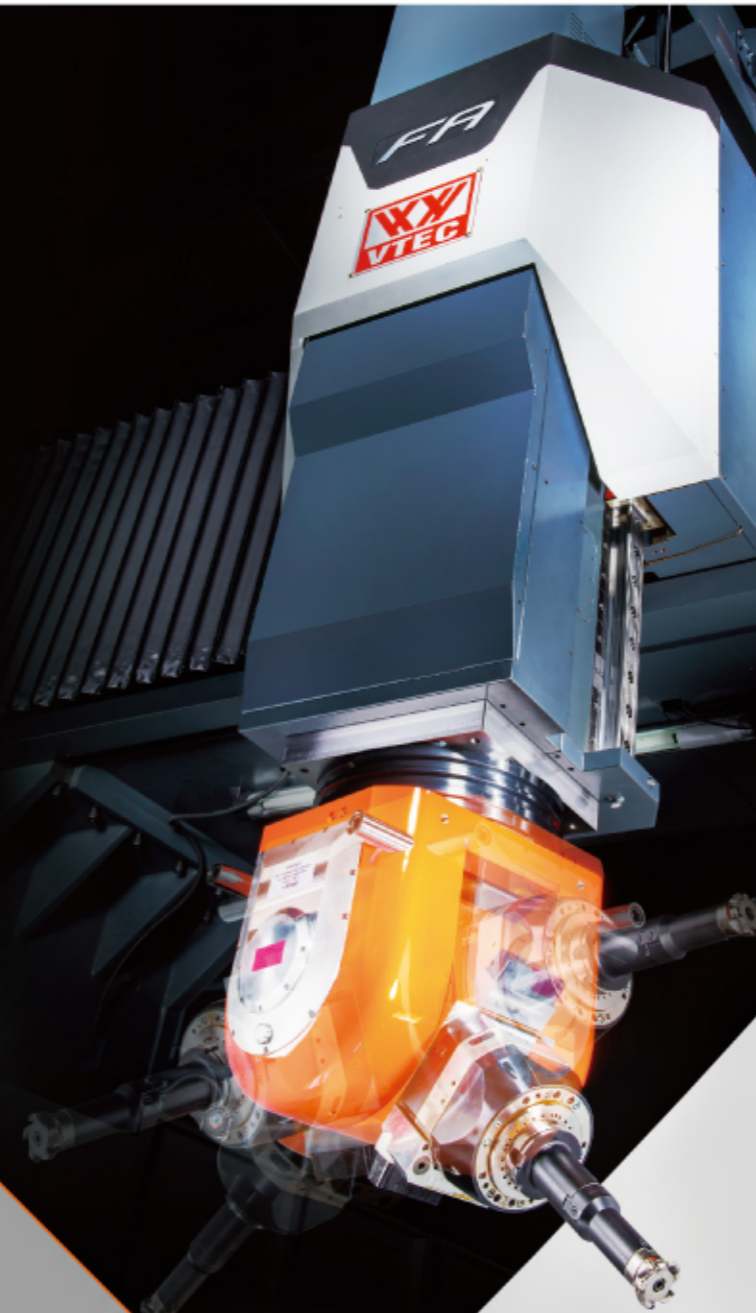


VISION WIDE

widen your cutting vision



FA series
CNC Double Column Vertical Machining Center
High Performance
5-axis Machining Center



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FA series
VISION WIDE

Providing
a wide range on
high performance
5-axis machining



widen your cutting vision

- ▶ 5-axis machining efficiently shortens the paths in machining, considerably reduces the cutting time, and extends the life of cutting tool.
- ▶ Rigid structure designed by double column frame meets wide range of machining requirements.
- ▶ High dynamic performance on XYZ-axis with high accuracy 2-axis head realizes high excellent performance in multi-angle machining with 5-axis machining center.

20,000rpm, HSK A63 spindle achieves high speed requirements.
12,000rpm, HSK A100 spindle achieves high torque requirements.

X-axis travel: 3,100 / 3,200 / 4,100 / 4,200 / 5,200 / 6,200 / 8,200 mm

Y-axis travel: 2,700 / 3,300 mm

Z-axis travel: 1,000 / 1,200 mm

Port width: 2,100 / 2,700 mm

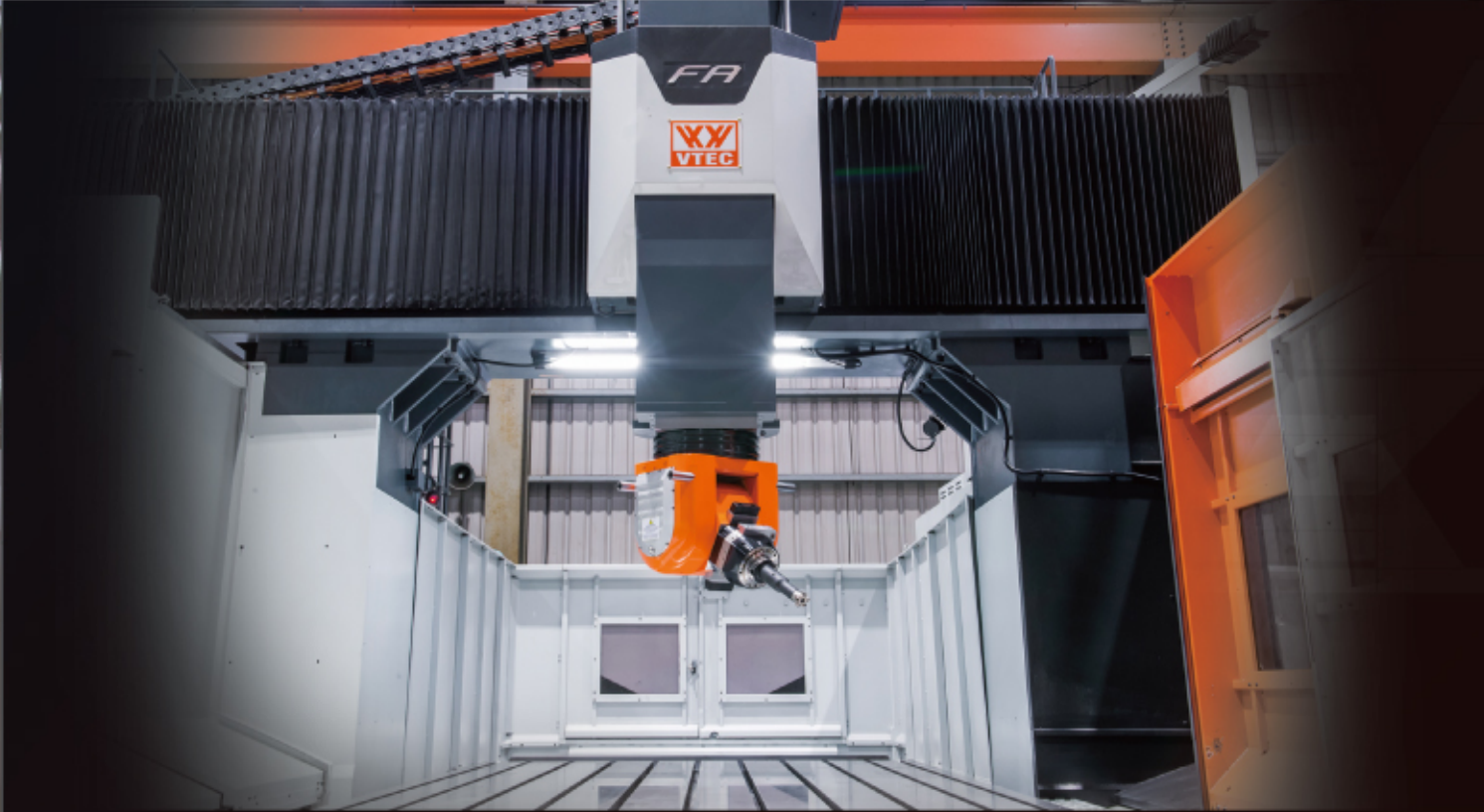


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▶ **FA** series
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Achieving
excellent 5-axis machining
accuracy & performance

- ▶ Rectilinear motion on XYZ-axis, straightness 0.01 mm/m, full travel straightness 0.015mm.
- ▶ Rectilinear motion on XYZ-axis, 0.015mm/m perpendicularity between each axis
- ▶ B Encoder positioning accuracy $\pm 5''$, C Encoder positioning accuracy $\pm 3''$.
- ▶ 5-axis dynamic synchronization accuracy (TCPM) 0.04mm.
- ▶ Auto rotation axis accuracy compensation.
- ▶ Spindle vibration lower than 1mm/sec.
- ▶ Thermal deformation of whole machine is within 0.02mm not affected by thermal variation from spindle operation and environment temperature.



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Spindle made by Germany

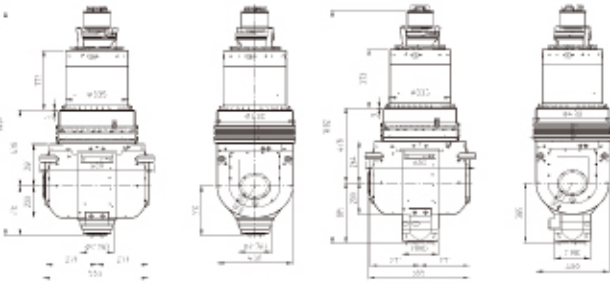


Specification	B-axis	C-axis
Rotation range	± 105°	± 360°
Positioning accuracy	sec ± 5"	± 3"
Rotation speed	rpm 20	20
Rotation torque (continuous)	Nm 700	700
Rotation torque (max.)	Nm 1,000	1,200
Clamping torque	Nm 4,000	4,000

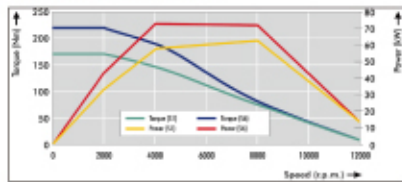
Spindle dimensions and spindle power/torque chart

CYTEC

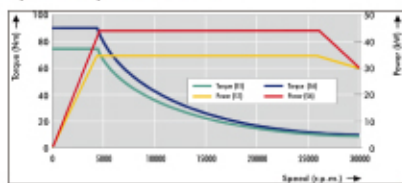
▼ HSK-A100 12000rpm ▼ HSK-A63 20000rpm



CYTEC HSK-A100 12,000rpm Spindle Torque/ Power Chart



CYTEC HSK-A63 20,000rpm Spindle Torque/ Power Chart

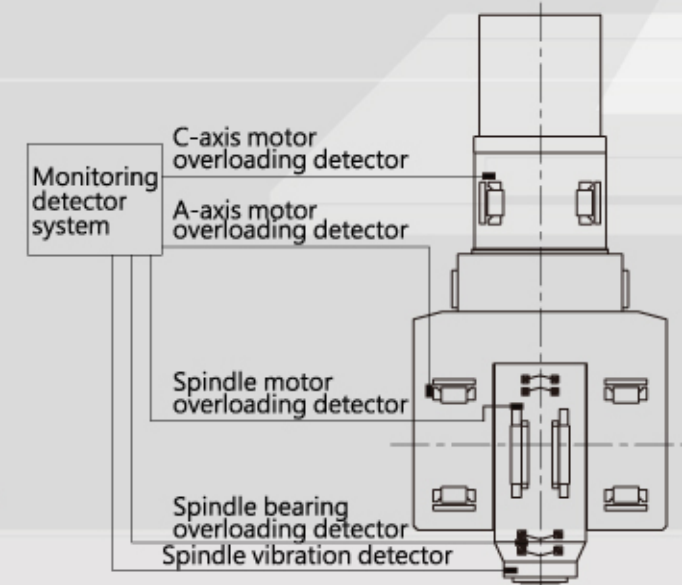


Optimal spindle protection design

Spindle and rotation axis protection system:

1. Spindle lubrication monitoring.
2. Spindle vibration protection.
3. Tool dynamic balance error test.
4. Spindle and motor overloading protection.
5. B/C-axis motor overloading protection.
6. Spindle overloading protected by software.

Tool cutting overloading protection can be set to prevent abnormal machine operation to ensure the machine operation life.

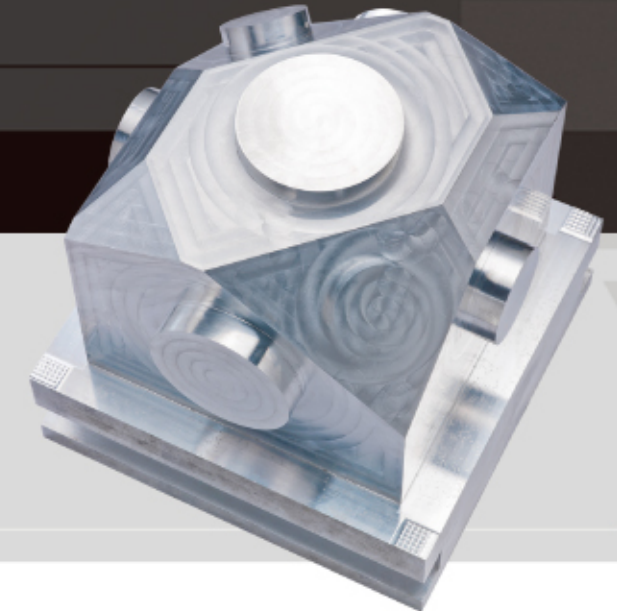
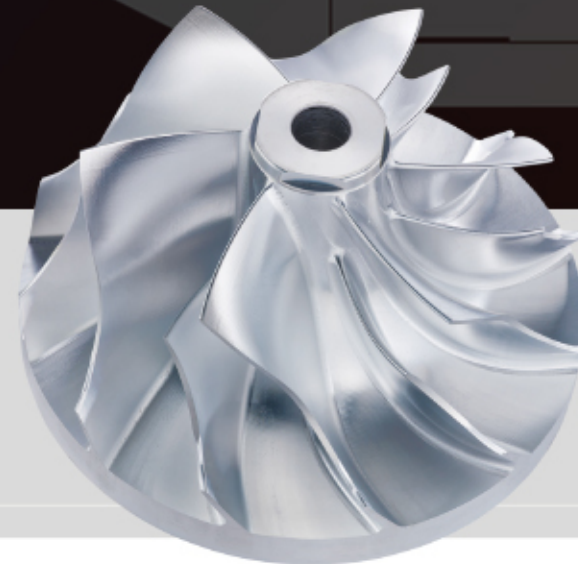


Machine performance through 46 items can be indicated by ISO test workpiece.



▼ Geometric accuracy test of dynamic machining

▼ Contour accuracy test of dynamic machining



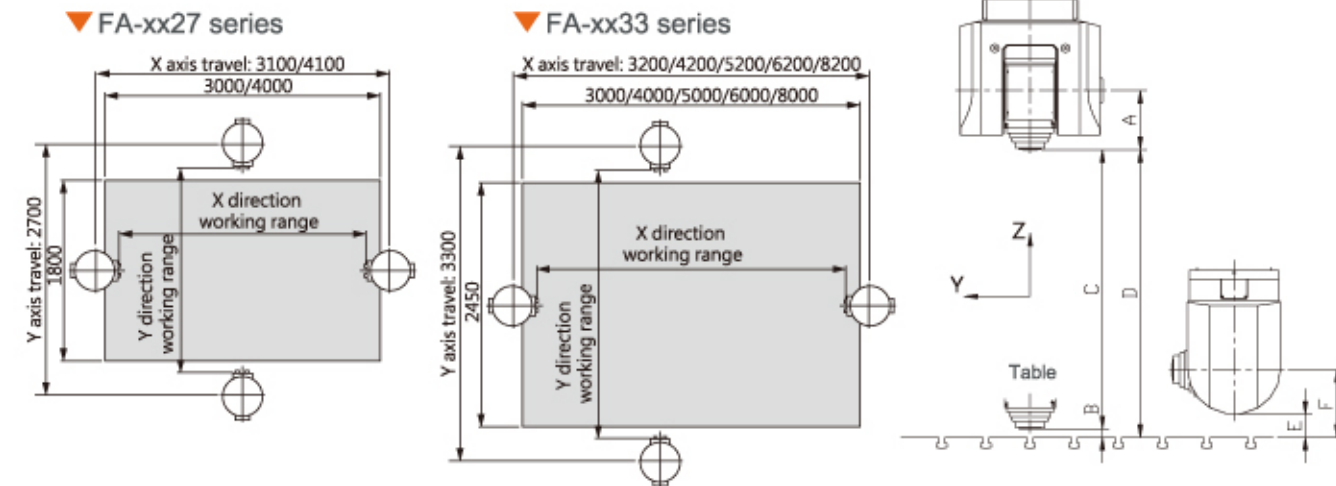
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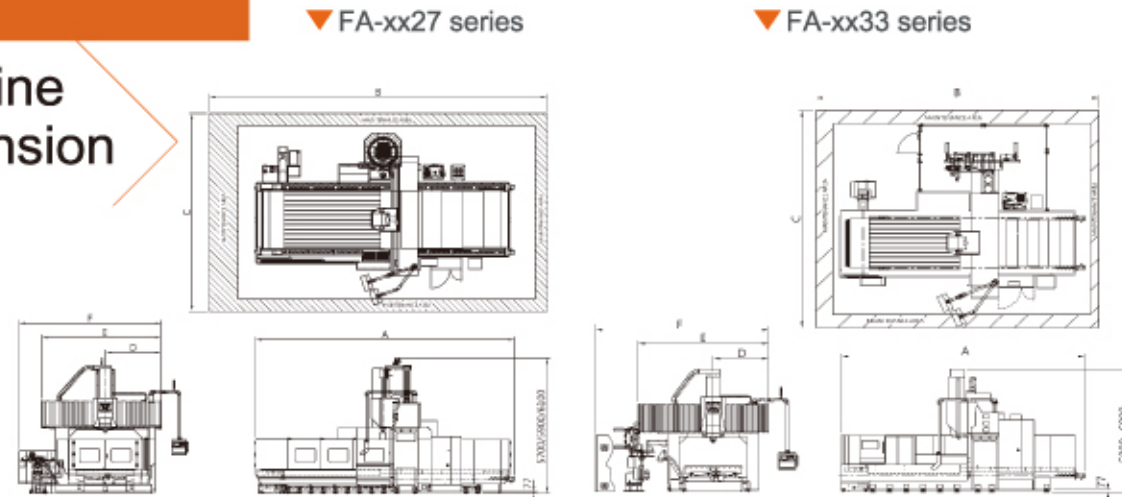
Working Range

Top view of table

Z-axis travel



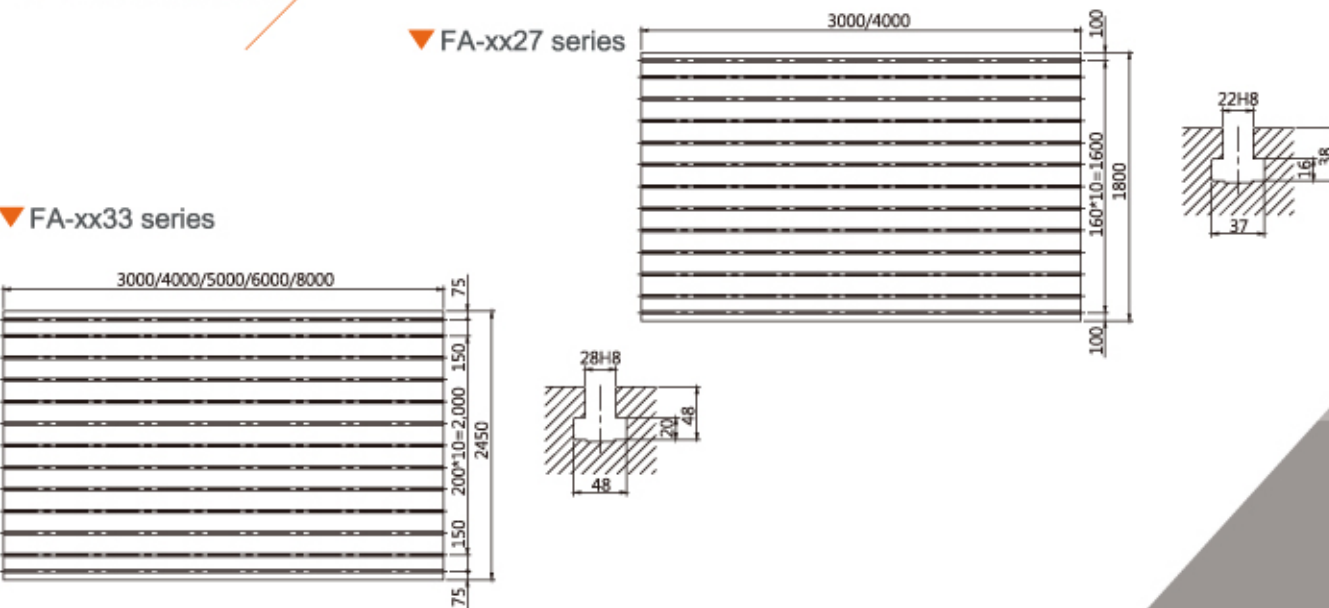
Machine Dimension



MODEL	A	B	C	D	E	F
FA-3127	8,285	11,000	7,800	2,250	5,250	5,850
FA-4127	10,285	12,700				
FA-3233	8,800	11,200	8,500	2,600	6,100	6,550
FA-4233	10,800	13,200				
FA-5233	13,000	15,400				
FA-6233	15,500	17,900				
FA-8233	19,800	22,200				

Unit:mm

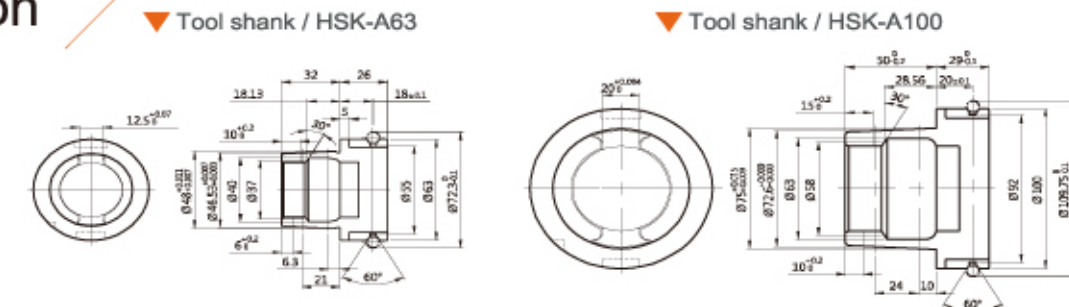
Table Dimension



MODEL	Specification	X	Y	A	B	C	D	E	F
FA-3127	HSK-A63	2480	2080	310	213	1000	1213	323	523
FA-4127		3480							
FA-3233		2580							
FA-4233		3580			200				
FA-5233		4580							
FA-6233		5580							
FA-8233	7580								
FA-3127	HSK-A100	2330	1930	385	138	1000	1138	323	523
FA-4127		3330							
FA-3233		2430			125				
FA-4233		3430							
FA-5233		4430							
FA-6233		5430							
FA-8233		7430							

Unit:mm

Tool Shank Dimension



Tool shank / HSK-A63

Tool shank / HSK-A100

Machine Specification

FA series

Model	Unit	FA-3127	FA-4127	FA-3233	FA-4233	FA-5233	FA-6233	FA-8233
TRAVEL								
X axis	mm	3,100	4,100	3,200	4,200	5,200	6,200	8,200
Y axis	mm	2,700		3,300				
Z axis	mm	1,000/ 1,200(opt.)		1,000/ 1,200(opt.)				
Distance from spindle nose to table	mm	HSK-A100:138~1,138/ HSK-A63: 213~1,213(opt.)		HSK-A100: 125~1,125/ HSK-A63: 200~1,200(opt.)				
Distance from spindle center to column	mm	453		453				
Distance between columns (port width)	mm	2,100		2,700				
TABLE								
Dimension	mm	3,000x1,800	4,000x1,800	3,000x2,450	4,000x2,450	5,000x2,450	6,000x2,450	8,000x2,450
T-slot (Width x Number x Pitch)	mm	22x11x160		28x11x200(150)				
Max. table load	kg	10,000	12,000	13,000	16,000	20,000	22,000	24,000
SPINDLE (A) HSK-A100								
Spindle motor(cont./30 min. rated)	kW	57 / 57		57 / 57				
Spindle speed	rpm	12,000		12,000				
Spindle taper	-	HSK-A100		HSK-A100				
SPINDLE (B) HSK-A63 (OPT.)								
Spindle motor(cont./30 min. rated)	kW	34 / 43		34 / 43				
Spindle speed	rpm	20,000		20,000				
Spindle taper	-	HSK-A63		HSK-A63				
FEED								
Cutting feed rate	mm/min	1-10,000		1-10,000				
Rapid traverse	m/min	X:24,Y:18,Z:15	X:18,Y:18,Z:15	X:24,Y:15,Z:15	X:18,Y:15,Z:15	X:12.5,Y:15,Z:15	X:10,Y:15,Z:15	X:8,Y:15,Z:15
3 axis motor power	kW	X:8.6 ,Y:8.6 ,Z:6.5		X:8.6 ,Y:8.6 ,Z:6.5				
ACCURACY(X,Y,Z)(Measured by laser instrument)								
Positioning accuracy	Refer to JIS B6333	mm	± 0.005/300, ± 0.015 Full travel		± 0.005/300, ± 0.015 Full travel			
	Refer to VDI 3441	mm	P0.018		P0.022	P0.035		
Repeatability	Refer to JIS B6333	mm	± 0.003		± 0.003			
	Refer to VDI 3441	mm	Ps0.015		Ps0.020	Ps0.025		
ATC								
ATC capacity	Floor-standing vertical type tool change	pcs	24 / 32(opt.) / 40(opt.)		24 / 32(opt.) / 40(opt.)			
Max. tool weight	kg	HSK-A100:15/ HSK-A63: 8(opt.)		HSK-A100:15/ HSK-A63: 8(opt.)				
Tool size (DxL) (Full tools)	mm	HSK-A100: φ 125x300L/ HSK-A63: φ 75x300L(opt.)		HSK-A100: φ 125x300L/ HSK-A63: φ 75x300L(opt.)				
Tool shank	-	HSK-A100 / HSK-A63(opt.)		HSK-A100 / HSK-A63(opt.)				
OTHERS								
Power requirement	kVA	HSK-A100:130/HSK-A63:110(opt.)		HSK-A100:130/HSK-A63:110(opt.)				
Pneumatic requirement	kg/cm	6		6				
Machine net weight	kg	31,500	34,500	48,000	54,000	60,000	66,000	78,000
Machine gross weight	kg	35,500	38,500	51,000	58,000	65,000	72,000	86,000
Max. space (LxWxH)	m	10x6x5.7	12x6x5.7	10x8.5x5.7	12x8.5x5.7	14x8.5x5.7	17x8.5x5.7	21x8.5x5.7

Standard Accessory & Function

- HEIDENHAIN i-TNC530 controller
- Spindle 12,000rpm with tool shank HSK-A100
- 2-axis head rotation error compensation device (Blum TC60)
- Heidenhain-DCM (Dynamic Collision Monitoring)
- 2-axis self-monitoring protection system:
Spindle cutting vibration protection
Spindle and motor overloading protection B/C rotating motor overloading protection
Spindle overloading protected by software
- Spindle and structure environment temperature thermal compensation system
- Spindle cooling device
- Twin hydraulic cylinders with pressured air assistance balancing system+
- X axis ball screw supporter(X > 5m)
- 24 tools magazine with ATC
- Centralized auto lubrication system
- Independent lubrication oil collector
- Air blast through spindle
- Wash gun and pneumatic interface
- Spindle ring coolant nozzle
- Cutting fluid cooling system with oil skimmer
- Full type splash guard (without roof)
- Horizontal movement swiveling arm type operation panel
- Screw type chip auger on table side
- Caterpillar type chip conveyor
- Heat exchanger for electrical cabinet
- Working lamp
- Operation cycle finish and alarm light
- Movable manual pulse generator
- Footswitch for tool clamping
- RJ45 interface
- XYZ axis linear scale feedback
- XYZ axis travel hard limits protection
- Remote monitoring software-Standard (Not available for Siemens controller)
- Auto power off function
- Foundation pads and bolts kits
- Adjustment tool and tool kits

Optional Accessory & Function

- Spindle 20,000rpm HSK-A63
- Z-axis travel 1200mm
- 200mm higher column
- Sub working table
- Coolant through spindle system
- Oil mist cooling device
- 32/40 tools magazine with ATC
- Vertical and horizontal movement overhand pendulum type operation panel
- Chip auger on table side
- Chip cart
- Independent manual pulse generator
- Remote monitoring software-Professional (Not available for Siemens controller)
- Auto tool measurement
- Transformer
- Full type splash guard(With roof, including mist dust collector) (X-axis<4m, standard column height)
- VW-Anti-Collision Cutting Monitoring



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