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5-Axis High Performance Vertical Machining Centers





OVERVIEW

The HSM machining centers, JYOTI HURON KX Five nvu series, enable machining operations in 5 simultaneous axis on 5-sides for roughing to finishing operations of all types of complex work pieces such as injection molds, complex aerospace components or high integrity mechanical parts. These machining centers are projected to be at the highest level in 5-Axis HSM Category. A combination of high dynamics and accuracy allows the KX Five to obtain very high surface quality.

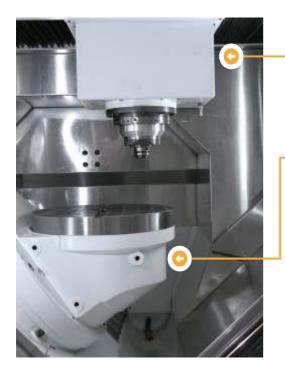
• 5-Axis machining for work pieces up to 500 kg (possible to position up to 750 kg reducing feedrates and acceleration) Hard material machining in minimal time Very high accuracy in contouring and profiles Complete automation of the machine

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STRUCTURE: RIGIDITY AND ACCURACY

- Structure with fixed portal in ribbed cast iron with stiffness wall
- Cast iron with a high mechanical performance which maximizes structure rigidity and allows optimum harmonic stability and maximum damping during demanding cutting conditions
- Machine secured on foundation with weight equally distributed over fixing points enabling extreme rigidity and a very high geometrical stability
- Modular design allows maximum flexibility in machine configuration to adapt to the technical requirements of the customer
- Electrical cabinet protected IP54



SPINDLE

- Powerful spindle with high torque allowing high metal removal rates
- Spindle vibration monitoring allowing a very high level of harmonic stability

TILTING AND ROTATING TABLE

- Table equipped with torque motor : TRIM® technology
- Table on an inclined 55° plane allowing tilting from -30° to +180° for K3X 8 Five
- Table on an inclined 45° plane allowing tilting from -45° to +180° for K2X10 Five
- Tilting angle avoid chips accumulation on table
- Possibility to use all working planes between horizontal and vertical position
- Preloaded bearing with axial and radial combination
- High rate of rotational acceleration
- No backlash
- No wear
- Rigidity: high clamping torque enabling high power during roughing

LINEAR AXIS

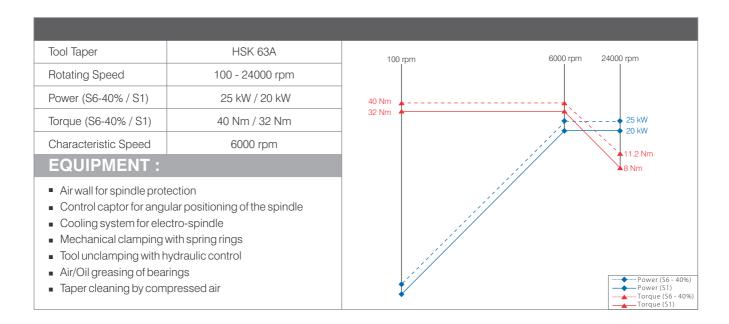
- Preloaded ballscrews with integrated system of compensation for expansion
- Preloaded bearings to remove inversion backlash and axial stress on ballscrews enabling a high quality of surfacing
- Automatic grease lubrication of ballscrews and bearings minimizing the pollution of coolant
- Incremental measurement by optical encoder in conformity with norm VDI/DGQ 3441

NUMERICAL CONTROLLER

- Ergonomic design
- Very high capacity of memory and calculation
- Interactive programming
- Graphic simulation before machining for optimal safety



ELECTRO SPINDLE 24000 RPM



THE TOOL CHANGER

The automatic load/unload of the tool is made vertically						
	K3X 8 Five	K2X 10 Five	Only with 42000 rpm spindle			
Pockets Quantity	20	30	28			
Type of Magazine	Plate	Chain	Plate			
Tool Taper	HSK 63A	HSK 63A	HSK 40E			
Tool Dimensions :						
Max. Ø Adjacent / Non Adjacent Tool	90 mm	90 mm	70 mm			
Max. Length	250 mm	300 mm	300 mm			
Max. Weight	8 kg	8 kg	8 kg			
Max. Weight Admissible in Magazine	80 kg	120 kg	80 kg			
Tool Changing Time :						
Tool to Tool	5 sec	5 sec	5 sec			
Chip to Chip	8.5 sec	15 sec	15 sec			



THE BI-ROTATIONAL TABLE



	K3X 8 Five		K	2X 10 Five
A-Axis Tilting Angle Rotating Speed Measuring Increment	-30° / +180° 50 rpm 0.001°	Angle on 55° plane	-45° / +180° 40 rpm 0.001°	Angle on 45° plane
C-Axis Rotating Angle of Table Rotating Speed Measuring Increment	360° 50 rpm 0.001°	0	360° 90 rpm 0.001°	
Table Area		Ø 500 mm	Q	Ø 630 mm
Admissible Load		250 kg		50 kg if reducing the and accelerations)
Clamping System Referring Centering	20 H	es M12 50/50 mm 1 7 mm – Width 5 7 mm – Width 15	20 H 7	slots 18H12 7 mm – Width 5 mm – Width 15
		orizontal position (0°)	Table in h	orizontal position (0°)
	Table in v	vertical position (-20°)	Table in vertical p	osition (90°)
	2 5 76 0 A 189		2 ta	January Control of the Control of th
	1		1	All dimensions in mm



ALTERNATIVE TO TABLE: PELLETIZED TABLE



A Adia Tilting Angle Tilting Angle Neasuring Increment C-Axis Rotating Angle of Table Rotating Angle of Table Rotating Angle of Table Rotating Speed Measuring Increment Table Area O 500 mm O 001 ⁴ D 500 mm O 001 ⁴ D 500 mm O 001 ⁴ D 500 kg (750 kg if roducing the feedrates and accelerations) Referring O H 7 mm – Width 5 40 H 7 mm – Width 5 40 H 7 mm – Width 15 Table in horizontal position (0') Table in vertical position (90')			K3X 8 Five	K	2X 10 Five
Rotating Angle of Table Rotating Speed Measuring Increment Table Area Ø 500 mm Ø 630 mm Admissible Load Z50 kg S00 kg (750 kg if reducing the feedrates and accelerations) B slots 18H12 20 H 7 mm – Width 15 20 H 7 mm – Width 15 Table in horizontal position (0') Table in horizontal position (9') Table in vertical position (90')	Tilting AngleRotating SpeedMeasuring Increment	50 rpm	Angle on 55° plane	40 rpm	Angle on 45° plane
Admissible Load 250 kg 500 kg (750 kg if reducing the feedrates and accelerations) Clamping System Refering 20 H 7 mm – Width 5 20 H 7 mm – Width 5 40 H 7 mm – Width 15 Table in horizontal position (0°) Table in vertical position (-20°) Table in vertical position (90°)	Rotating Angle of TableRotating Speed	50 rpm	9	90 rpm	
Table in vertical position (-20") Table in vertical position (90")					
Refering Centering 20 H 7 mm – Width 5 40 H 7 mm – Width 15 Table in horizontal position (0°) Table in horizontal position (0°) Table in vertical position (20°) Table in vertical position (90°)	Admissible Load		250 kg		
Table in vertical position (-20°) Table in vertical position (90°)	Refering	20 H	17 mm – Width 5	20 H 7	mm – Width 5
		2253			

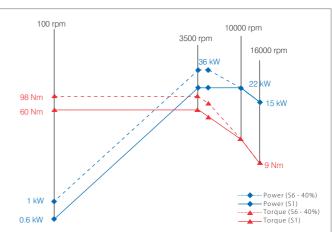


ALTERNATIVE TO TOOL CHANGER

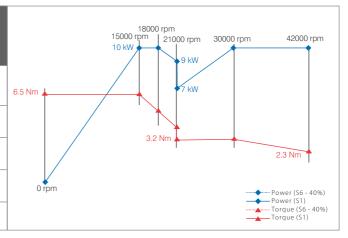
Pockets Quantity	30	40	60	100
Type of Magazine	Pick-Up	Pick-Up	Pick-Up	Transfer Arm
Tool Taper	HSK 63A	HSK 63A	HSK 63A	HSK 63A
TOOL DIMENSIONS:				
Max. Ø Adjacent / Non Adjacent	70 / 80 mm	90 mm	90 mm	90 mm
Tool				
Max. Length	250 mm	250 mm	250 mm	250 mm
Max. Weight	8 kg	8 kg	8 kg	8 kg
Max. Weight Admissible	80 kg	160 kg	240 kg	40 kg
TOOL CHANGING TIME :				
Tool to Tool	5 sec	5 sec	5 sec	5 sec
Chip to Chip	8.5 sec	15 sec	15 sec	30 sec

ALTERNATIVE TO SPINDLE

16000 rpm					
Tool Taper	HSK 63A				
Rotating Speed	16000 rpm				
Power (S6-40% / S1)	36 kW / 22 kW				
Torque (S6-40% / S1)	98 Nm / 60Nm				
Characteristic Speed	3500 rpm				



With 42000 rpm spindle, standard tool magazine = 28 pockets					
Tool Taper	HSK 40E				
Rotating Speed	100 - 42000 rpm				
Power (S6-40% / S1)	12 kW / 10 kW				
Torque (S6-40 / S1)	9 Nm / 6.54 Nm				
Characteristic Speed	15000 rpm				





PELLETIZATION DEVICE

	К	2X 10 Five		
Pallet Area	Ø 500		Ø 630	400000
Admissible Load : Pallet + Workpiece	250 kg		750 kg	
Clamping System	Holes		Holes	
	M12 50/50 mm		M12 50/50 mm	
Referring	Ø 40 H7		Ø 50 H6	
Centering	Slot 20H7		Slot 20H6	

		Bi-pallet device with table or pelletized table
 BI-PALLET DEVICE Pallets Quantity Pallet Changing Time: Pallet to Pallet Loading Station Quantity 	2 12 sec 1	

		Pallet device with 6 pallets with table or pelletized table
PALLET DEVICE Pallets Quantity Pallet Changing Time: Pallet to Pallet Loading Station Quantity	6 12 sec 1	

EROGONOMIC DESIGN

EASY ACCESSIBILITY FROM TOP

With wide door opening from top and front design, loading/unloading of heavy component made much easy ensuring operators safety. Also loading/unloading possible by crane from top of the machine

OPERATOR PANEL POSITION

A operating panel position helps the operator to view the machining area while operating.

AUTOMATIC TOOL CHANGER

Tool magazine outside of working area.



EFFICIENT CHIP FLOW

One side slope of the telescopic cover, helps for efficient chip flow. With such design chips will directly fall down into conveyor with help of flush coolant.

TABLE APPROACH

Easy approach to the table for component loading/unloading.

IMPROVED MAINTENANCE

KX Five nvu series machine are designed with special care for easy approach and access for preventive maintenance check points for lubrication, pneumatics and proximities which makes it operator friendly.



TECHNICAL FEATURES

Linear Axis (X, Y & Z - Axis)		K3X 8	3 Five	K2X 10) Five
Travels	mm	780 x 700 x 500 900 x 900 x 500			0 x 500
Rapid Feedrates	m/min	50			
Acceleration on Axis	m/s²			5	
Structure		Table on	a 55º plane	Table on	a 45º plane
Rotating Axis On Table (A & C - Axis)		A-Axis	C-Axis	A-Axis	C-Axis
		Tilting	Rotation	Tilting	Rotation
Angle		-30° / +180°	360°	-45° / $+180^{\circ}$	360°
Working Positioning		Horizonta	I position = 0°	Horizontal	position = 0°
(Angle Spindle Axis / Table)		Vertical po	osition = 90°	Vertical po	osition = 90°
		Inclined	$d = -20^{\circ}$		
Table					
Area	mm	Ø 5	500	Ø 6	30
Admissible Load on Table	kg	25	50	500 (750 kg if re	educing
				feedrates and a	ccelerations)
Rotating Speeds	rpm	50	50	40	90
Accuracies					
Uncertainty : P		Linear Axis X, Y & Z : 4 μ m – Rotating Axis A & C : 7.2 sec			7.2 sec
Repeatability: Ps Medium		Linear Axi	s X, Y & Z : 2 µm -	- Rotating Axis A & C	3.6 sec
Spindle					
Rotating Speed	rpm		24	1000	
Tool Taper			HSł	< 63A	
Power – Torque (S6-40% / S1)	kW - Nm		25 / 20	- 40 / 32	
Characteristic Speed	rpm	6000			
Tool Magazine	ı				
Pockets Quantity		20			
Tool Taper		HSK 63A			
Tool Dimensions: Length – Diameter – Weight	mm-Ømm-kg	250-90-8			
Coolant					
Flow – Pressure	I/min – bar	30 – 3			
Tank	Liters	230			





ALTERNATIVES

SPINDLE		16000 rpm	42000 rpm
Rotating Speed	rpm	16000	42000
Tool Taper		HSK 63A	HSK 40E
Power – Torque (S6-40% / S1)	kW - Nm	36 / 22 – 98 / 60	12 / 10 – 9 / 6.54
Characteristic Speed	rpm	3500	15000

ROTATING (C-AXIS) – PELLETIZED TABLE					
Table Area	mm	Ø 500	Ø 630		
Admissible Load on Table	kg	250	500		
Rotating Speed	rpm	A - 50, C - 50	A - 40, C - 90		

TOOL MAGAZINE					
Pockets Quantity		30	40	60	100
Tool Taper		HSK 63A	HSK 63A	HSK 63A	HSK 63A
Tool Dimensions: Length - Diameter - Weight	mm-Ømm-kg	250-80-8	250-90-8	250-90-8	250-90-8

OPTIONAL EQUIPMENTS

- Pelletization Device
- Air Blast
- Oil Extraction System
- Coolant Gun

- Micro Spraying Coolant
- Component Probe
- Graphite Dust Removal System
- Sigh Glass

- Coolant Through Spindle 20 or 40 Bar
- Tool Probe
- Pressurization of Measuring Scales
- Oil Separator

JYOTI CNC AUTOMATION LTD.jyoti.co.in

Regd.Works: Plot No.,G-506, Lodhika GIDC, Vill.-Metoda, Dist.-Rajkot - 360 021.

Gujarat (India) T +91-2827-306100-101 F +91-2827-306141

E info@jyoti.co.in, sales@jyoti.co.in

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Note: Specified information are subject to change arising out of continuous product improvement without notice. The description standard accessories/feature conforms to its list; not the photo of machine show in the catalogue. Other controller will have different configuration. Machine images are shown with option.

