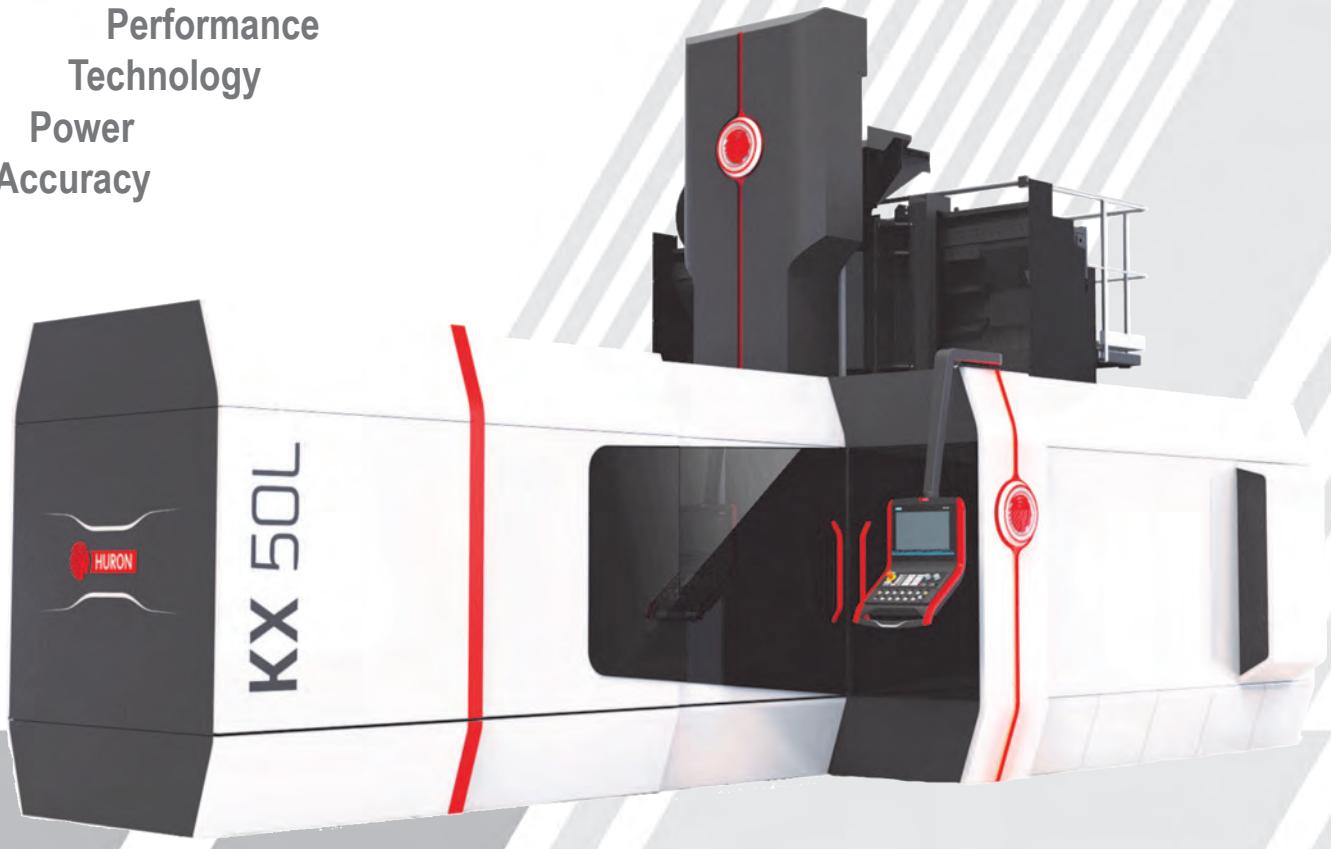
HURON

KX Large Series

Vertical milling centres
5 axes, high speed, fixed portal

Performance
Technology
Power
Accuracy



KX Large Series

KX Large, a range of very high performance milling machines for 5-sided and 5-axes machining of complex parts.

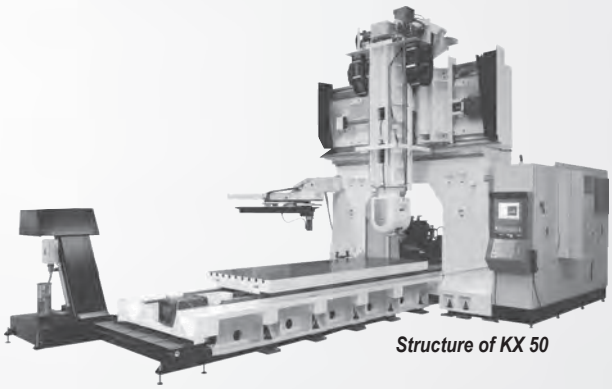
The choice of fixed portal architecture makes it possible to offer a machine with maximum rigidity for extremely accurate machining in various and hard materials.

The working area accept workpieces with weight up to 20 tons and machining volumes up to
4.080 x 2.180 x 1.550 mm on the 5 faces.

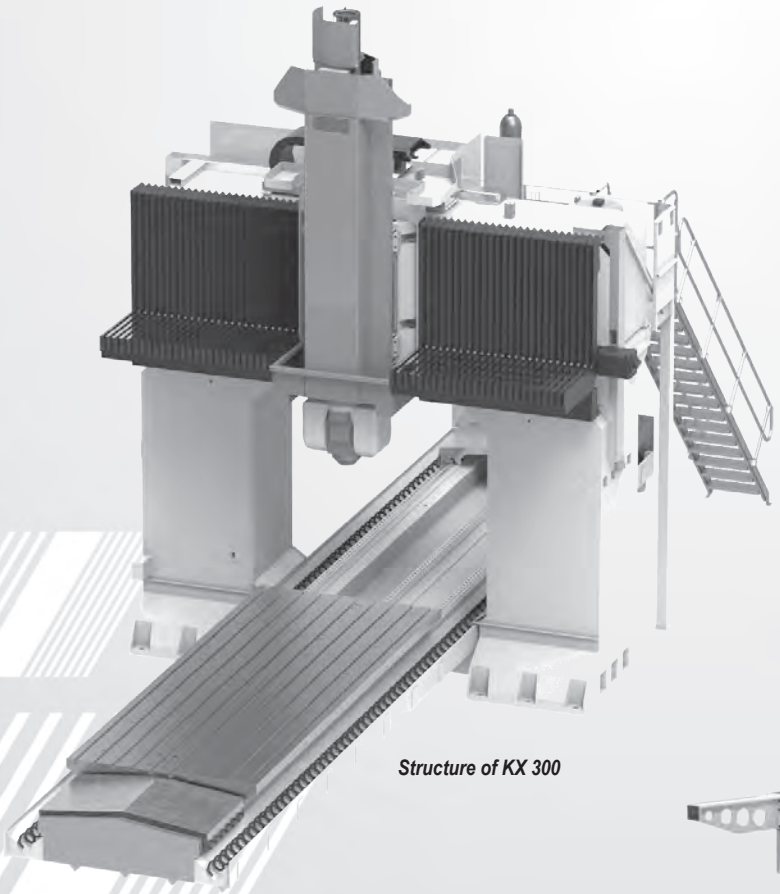
The modular design and the many alternatives and equipments offered make it easy to meet all customer requirements.

This excellence range offers models suitable for the tooling production sectors (molds, dies, models), machining of large parts for general and precision mechanics, or production of complex parts for the Aeronautics or Energy.

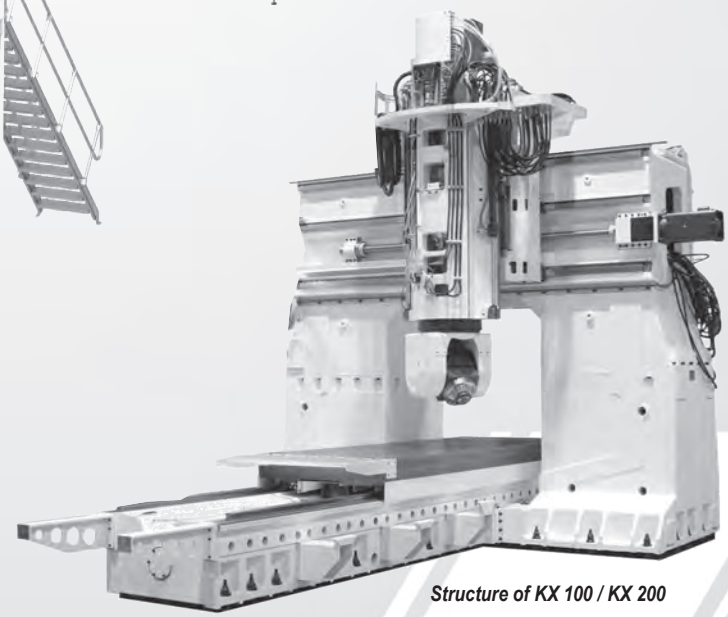
- High performances in roughing as well as in finishing
- High accuracy performance in positioning and in 5 axes contouring
- Wide distance between columns for the maximal exploitation of the part volume
- High performance spindle in roughing as well as in surfacing



Structure of KX 50



Structure of KX 300



Structure of KX 100 / KX 200

Rigid and robustness structure

- Fixed portal
- Mobile parts :
  - KX 50 : slide, saddle, bed/table and portal in melting
  - KX 100/200 : slide and saddle in welded steel ; bed/table in melting
  - KX 300 : slide and saddle in welded steel, bed/table and portal in concrete
- The architecture, structure and materials used are optimized to absorb cutting forces and those induced by the accelerations of moving bodies. This results in high stability and excellent dynamic behavior during machining, which results in optimized cutting and high fidelity in the execution of contours and shapes on all types of materials. The tool life is thus extended.
- Structure with fixed portal reducing torsional stresses, large dimensioning of static parts and the base of the machine. Dynamic parts optimized to limit moving masses.
- The temperature sensors (bed, bearings, spindle) allow to control and to correct the thermal deformations.
- Multiple foundation points to ensure high rigidity and vibration dumping for high geometric accuracy
- Protected electrical cabinet IP54

Environment - Ergonomics

- Chips evacuation channel with washing device and spiral conveyors
- Chips evacuation by coolant liquid
- Tool magazine outside of working area
- Full sefaguard ensuring safety of the machine, the operator and its environment
- Wide accessibility to the table and the workpiece
- Articulated operator control panel for perfect visibility during machining
- The automatic tool changer is placed outside the working area and is protected from the machining area. The tools can be loaded simoultaneously at the machining.
- Complete safeguard with great accessibility from the top and the side allowing an easy positioning of the part. Door with wide opening for hoist loading.

Linear axes

- X axis : moving table on fixed bed
- Y axis : moving saddle on fixed transverse
- Z axis : vertical slide equipped with an adjustable milling head with 2 orthogonal rotational axes and an electro-spindle. This design allows the cutting tool to work on high machining parameters, even with hard materials, and at high speed
- Z-axis balancing cylinders
- Linear guide rails with roller recirculating roller bearings allowing feedrates up to 40 m/min.
- Servo motors: the linear axes are driven by AC motors coupled directly to the end of the precision ball screw.
- Absolute measurement scales on all axes

Rotating axes

- The B & C axes are equipped with a direct mounting angular encoder and offer high positioning accuracy
- Direct drive by torque motors for perfect synchronization with linear movements
- This motorization offers the advantages of continuous high speed, high acceleration, high rigidity, absence of backlash and wear
- High clamping torque in roughing.
- Allows high-speed machining in 4 and 5 simultaneous axes

Numerical controller

- Driving up to 5 continuous axes
- Great ergonomics, color screen and full alfanumeric keyboard
- Connections and communication interfaces integrated and easily accessible
- High memory and calculation capacities
- Interactive programming
- Graphic simulation before machining for optimal safety

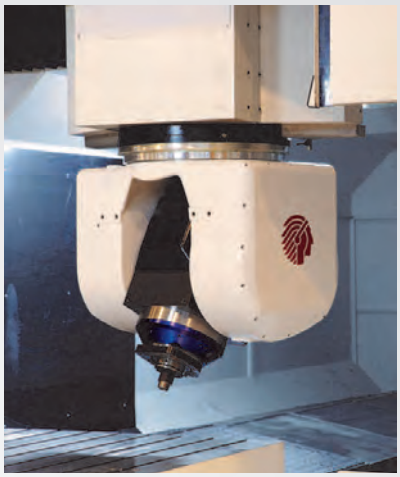
Maintenance

- Very good accessibility to all maintenance points
- Grouping of fluid, pneumatic, electrical components in a common cabinet

KX Large Series

Fork head and electrospindle

- Accurate positioning and repeatability for complex workpieces
- Angular encoders in the axis for accurate positioning and repeatability
- Torque motors for dynamic movements without backlash and wear
- High clamping torque for high roughing
- Possitility of reaching negative angles
- Axial/radial tool stiffness guaranteed
- Machining of deep pockets thanks to the use of long tools
- Spindle and machining secured thanks to vibration monitoring



	KX 50 M/L	KX 100 / 200 / 300
Swivelling of axes	B : +/- 110° C : +/- 360°	B : +/- 105° C : +/- 190°
Rotating speed (B, C)	100 rpm	30 rpm
Clamping torque (B, C)	4.000 Nm	7.000 Nm
Working torque – B axis – C axis	 994 Nm 878 Nm	 1.150 / 750 Nm 1.100 / 500 Nm

Spindles KX 50 M/L

	Standard	Variantes		
Taper	HSK 63-A	HSK 63-A	HSK 63-A	HSK 100-A
Rotating speed	20.000 rpm	18.000 rpm	24.000 rpm	15.000 rpm
Power (S6/S1)	75 / 60 kW	70 / 56 kW	60 / 60 kW	45 / 45 kW
Torque (S6/S1)	75 / 60 Nm	111 / 89 Nm	77 / 60 Nm	145 / 120 Nm
Characteristic speed	9.550 rpm	6.000 rpm	9.550 rpm	3.580 rpm

Spindles KX 100 / 200 / 300

	Standard	Variantes			
				Mechanical spindle	without Hirth-block
Taper	HSK 63-A	HSK 63-A	HSK 100-A	HSK 100-A	HSK 100-A
Rotating speed	18.000 rpm	24.000 rpm	12.000 rpm	4.000 rpm	10.000 rpm
Power (S6/S1)	30 / 20 kW	40 / 30 kW	86 / 70 kW	21 / 14,5 kW	43 / 33 kW
Torque (S6/S1)	240 / 160 Nm	67 / 50 Nm	235 / 190 Nm	810 / 550 Nm	415 / 313 Nm
Characteristic speed	1.200 rpm	5.680 rpm	3.500 rpm	250 rpm	1.000 rpm

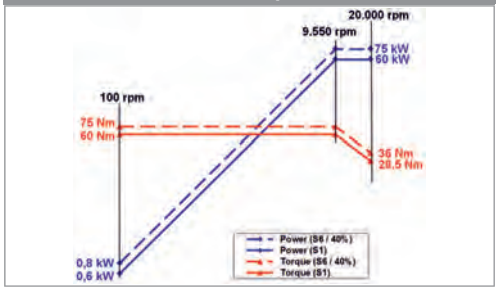
Mechanical fork head (Option)

Suitable for hard material milling. It is associated with a high torque spindle and allows a heavy roughing with a high chip removal rate.
The rotary axes are driven by a wheel and worm gear; that of the spindle by gears.

	KX 100 / 200 / 300
Swivelling of axes	**B** = +/- 95° ; **C** = +/- 200°
Rotating speed (B & C axes)	4,17 rpm
Clamping torque (axes B & C)	10.000 Nm
Working torque	**B** = 4.524 Nm **C** = 2.292 Nm

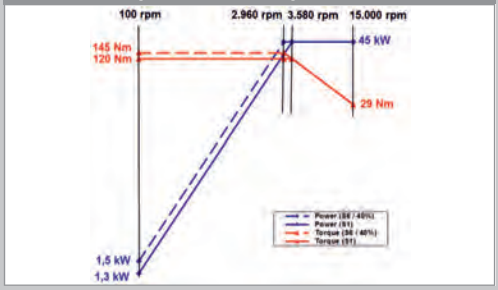
KX 50 M/L

Standard - 20.000 rpm - HSK 63A

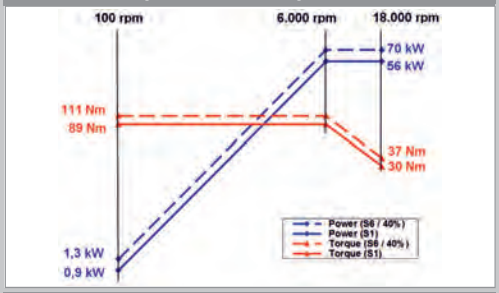


Alternatives

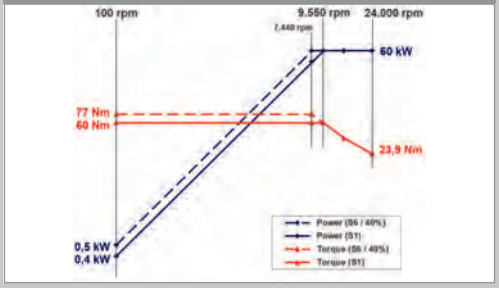
Electrospindle 15.000 rpm - HSK 100A



Electrospindle 18.000 rpm - HSK 63A

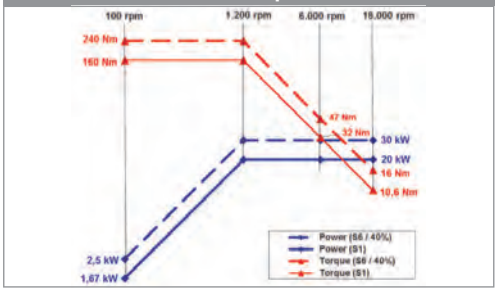


Electrospindle 24.000 rpm - HSK 63A



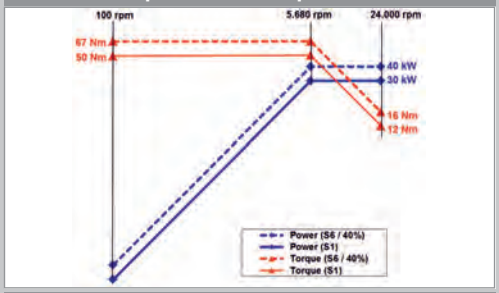
KX 100 / 200 / 300

Standard - 18.000 rpm - HSK 63A

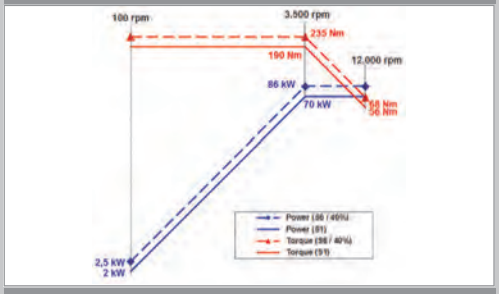


Alternatives

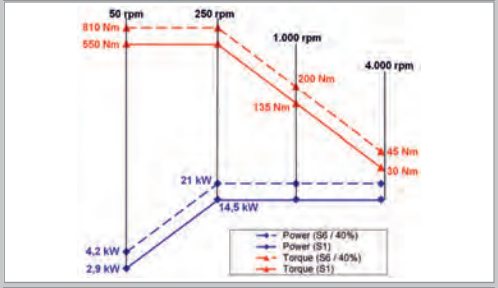
Electrospindle 24.000 rpm - HSK 63A



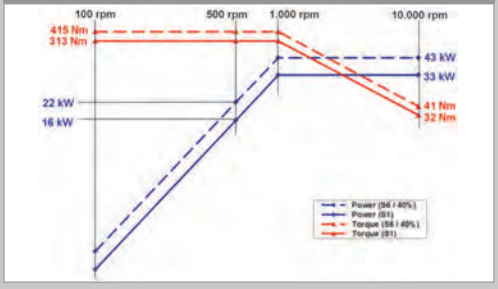
Electrospindle 12.000 rpm - HSK 100A



Mechanical spindle 4.000 rpm - HSK 100A



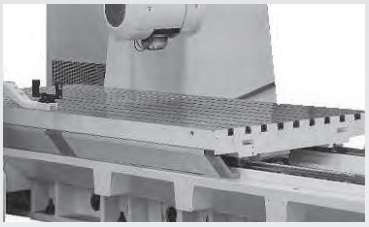
Electrospindle without Hirth-Blocking 10.000 rpm - HSK 100A



KX Large Series

The table

Mobile table with large working area allowing the machining of large parts and the use of a wider range of tool lengths for the same clamping.



		KX 50 M	KX 50 L	KX 100	KX 200	KX 300
Table dimension	mm	2.200 x 1.250	3.300 x 1.250	2.500 x 1.250 ***alternative 2.500 x 1.500***	3.500 x 1.250 ***alternative 3.500 x 1.500***	5.200 x 2.000
Machining volume (**)						
– length x width	mm	1.240 x 940	2.240 x 940	1.380 x 1.380	2.380 x 1.380	4.080 x 2.180
– height	mm	855	855	800	800	1.550
Admissible load	kg	4.000	6.000 (2.500*)	12.000 (6.000*)	12.000 (9.000*)	20.000 (13.000*)
Rapid feedrate X / Y / Z	m/min	40 / 40 / 40	40 / 40 / 40	40 / 40 / 40	25 / 40 / 40	20 / 20 / 20
Qty of slots		9	9	9	9	15
Reference slot Other slots		18H7 18H12	18H7 18H12	22H8 22H12	22H8 22H12	22H8 22H12
Distance between slots	mm	125	125	125	125	125

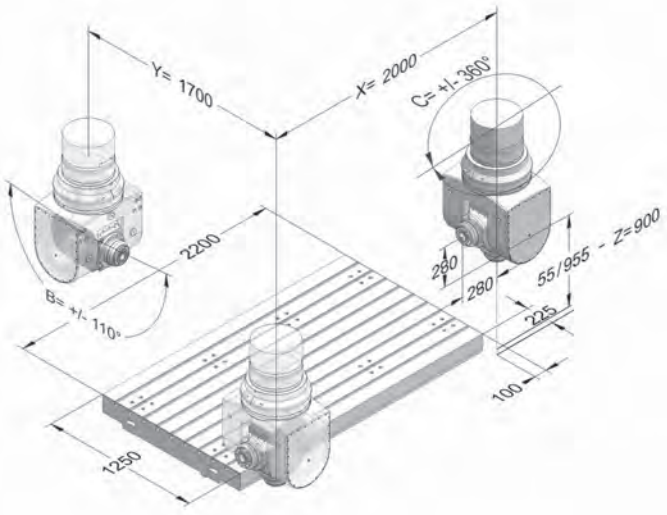
(*) with maximal acceleration
(**) 5-sided machining with a 100 mm tool length

KX 300

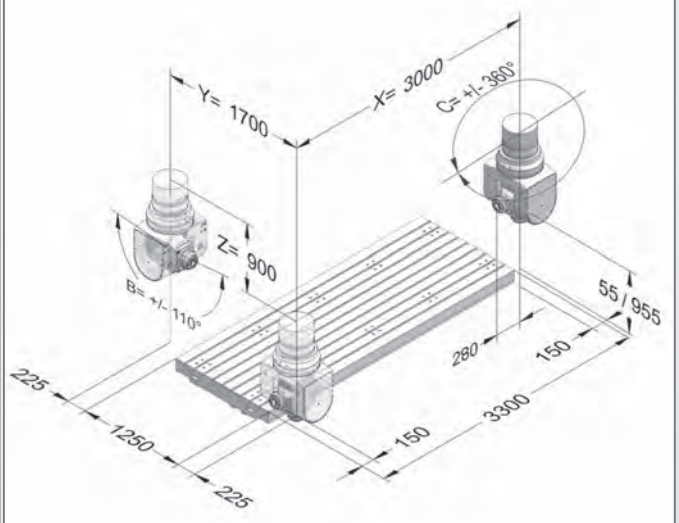
Rack-and-pinion table drive perfectly suited for long strokes and heavy loads.
Increases rigidity.

Interferences diagrams KX 50

KX 50 M - Standard table

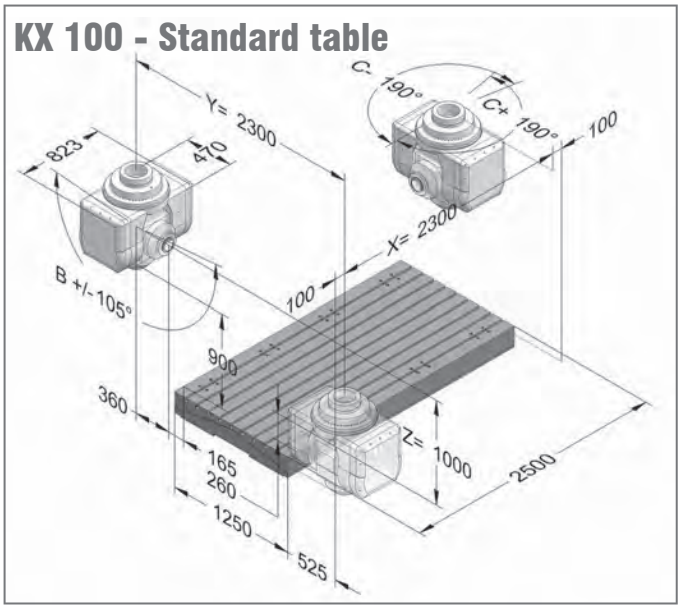


KX 50 L - Standard table

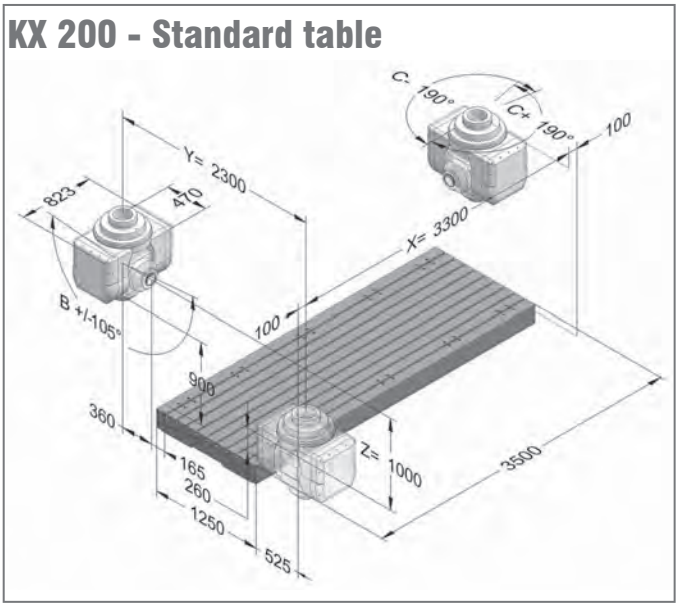


Interferences diagrams KX 100 / 200 / 300

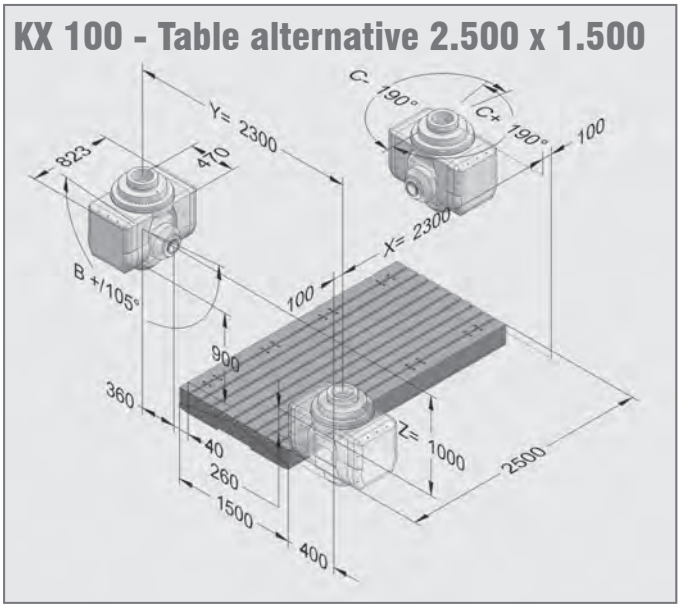
KX 100 - Standard table



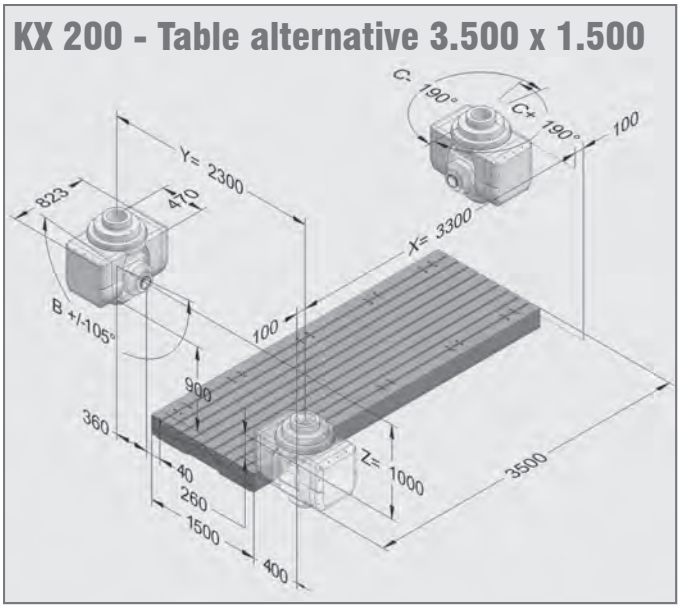
KX 200 - Standard table



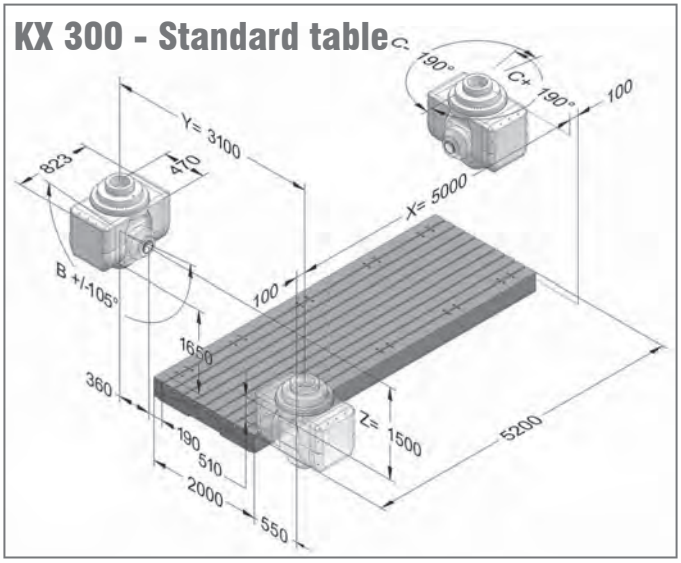
KX 100 - Table alternative 2.500 x 1.500



KX 200 - Table alternative 3.500 x 1.500



KX 300 - Standard table



Tools changers

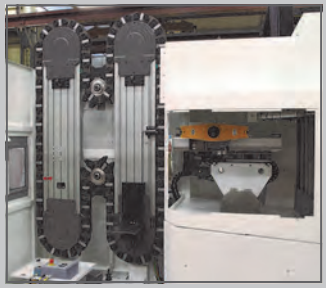
The load/unload of tools is made in vertical position

	KX 50 M/L	KX 100 / 200 / 300
Qty of housings	30	40
Taper	HSK 63-A	HSK 63-A
Tool dimension Ø - length - weight Max. load in magazine	 90 mm - 300 mm - 8 kg 120 kg	 100 / 190 mm - 300 mm - 8 kg 160 kg
Tool changing time : tool/tool - chip/chip	 9 - 18 sec	 6 - 20 sec

Picture of KX 50 tools changer

Alternatives KX 50 M/L

For the machining of deep pockets, the rigidity of the machine allows the use of long tools.(with HSK 100-A taper)
Combined with vibration monitoring, it is possible to obtain finished parts of very high quality.



Qty of housings	60	120	60	120
Taper	**HSK 63-A**		**HSK 100-A**	
Tool dimension : Ø Length Weight	 90 / 120 mm 500 mm 15 kg	 90 / 120 mm 60 tools = 500 mm + 60 tools = 300 mm 15 kg	 125 / 250 mm 500 mm 25 kg	 125 / 250 mm 60 tools = 500 mm + 60 tools = 300 mm 25 kg
Tool changing time : tool/tool - chip/chip	 6 - 15 sec	 6 - 15 sec	 6 - 15 sec	 6 - 15 sec

Alternatives KX 100 / 200 / 300

Qty of housings	60	100	40	60	100
Taper	**HSK 63-A**		**HSK 100-A**		
Tool dimension : Ø Length Weight Max. load in magazine	 90 mm 300 mm 8 kg 240 kg	 90 mm 300 mm 8 kg 400 kg	 120 mm 300 mm 10 kg 120 kg	 120 mm 400 mm 25 kg kg	 120 mm 400 mm 25 kg kg
Tool changing time : tool/tool - chip/chip	 6 - 20 sec	 6 - 20 sec	 6 - 16 sec	 6 - 20 sec	 5 - 20 sec

HURON numerical controller cycles

PRECILIFE *or how to manage tool life automatically ?* (*)

This cycle provides automatic tool checking during machining or at tool change. If critical wear or a broken tool is detected, the system automatically triggers the replacement of the tool at the most appropriate time. It therefore safeguards the integrity of the workpiece and the cutting tools and optimizes tool use. The profitability of the machine is increased by reducing downtime and tooling costs.

MAIN FEATURES

- Automated tool measurement, inspection and replacement done in the machining process
- No change to the NC program
- Implemented by HURON
- Configurable wear and breakage detection tolerance for each tool
- Automatic replacement of tools

(*) *Only with 3 axes machines, spindle in vertical position*

PRECIPOWER *or how to optimise roughing operations ?*

It takes care of optimizing the roughing operation by automatically modulating and adapting the feedrate, in real time, to the value that result in peak material removal.

MAIN FEATURES

- Full use of available spindle power
- Automatic feedrate modulation
- Maximize material removal rate
- Spindle and rotating axes overload protection during roughing

PRECIFIVE *or how to get an accurate and automatic calibration of the machine kinematic ?*

Automate the calibration of the kinematics by carrying out the measurement of the position and the orientation of the rotation axes.
The calibration can be executed directly in an NC program to ensure optimum accuracy during critical machining operations.

MAIN FEATURES

- Quick, accurate, repeatable measuring system
- Optimized machining accuracy
- Compensation of the thermal expansion of the machine
- Reduces rejected parts
- Rapid evaluation following a machine collision
- Control report

PRECIPROTECT *or how to save time while protecting the machine and the workpieces ?*

This cycle allows real-time monitoring of toolpaths and machine movements in order to anticipate any form of collision. The machine and the part are thus preserved.

MAIN FEATURES

- Conserve machine accuracy
- Save time : no simulation required, control is done in real-time
- Save money : No more repair or machine stop due to a collision
- Increase profitability : preserve integrity of the machine and workpiece ; no more delivery delays to customers
- Reliability : detection of an imminent collision triggers an immediate and automatic stop of the movements of the machine
- Peace of mind : let the machine work unsupervised

KX Large Series

Performance

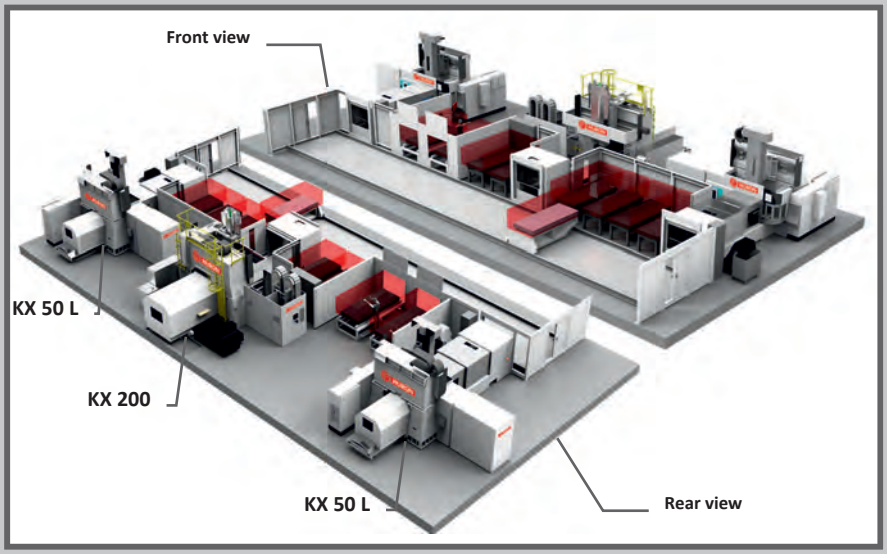
Looking for a simple and effective solution? HURON offers you a complete standard solution to allow you to realize your parts at a competitive price.

- Moving table
- Fork head equipped with electrospindle
- Tools changer
- Chips conveyor and washing device for chips recover channels
- Washing gun
- Low coolant by nozzles
- Operator panel
- Portable electronic handwheel
- Complete safeguard
- Oils for first feeling (excluding emulsion)
- Cylinders for leveling
- 1 set of technical documents
- 12 months warranty

Automation

For higher productivity or greater accuracy in machining, HURON offers the possibility to add optional systems to the machine, such as coolant, micro-spraying, probes, etc…, no to mention HURON NC cycles and our support services.

In order to increase production speeds and optimise machining cycles, we offer a variety of palletizing configurations.
For one, two, three or more machines, your line will become a flexible production unit, allowing you to save valuable time. The processes are independent, safe and reliable.



Example of automated cell with 2 KX50L, 1 KX200, and 8 pallets common to the 3 machines

Technical characteristics

Linear axes X / Y / Z		KX 50 M	KX 50 L	KX 100	KX 200	KX 300
X travel Y travel Z travel	mm mm mm	2.000 1.700 900	3.000 1.700 900	2.300 2.300 1.000	3.300 2.300 1.000	5.000 3.100 1.500
Rapid feedrates	m/min	40	40	40	X : 25 Y / Z : 40	20
Acceleration per axis	m/s²	4	4	4	4	X : 1,5 Y/Z : 2

Rotating axes B, C - Head		KX 50 M / L	KX 100 / 200 / 300
Swivelling of B axis	°	+/- 110°	+/- 105°
Rotation of C axis	°	+/- 360°	+/- 190°
Rotating speed	rpm	100	30
Clamping torque	Nm	4.000	7.000
Working torque	Nm	B : 994 C : 878	B : 1.150 C : 1.100

Table		KX 50 M	KX 50 L	KX 100	KX 200	KX 300
Dimension	mm	2.200 x 1.250	3.300 x 1.250	2.500 x 1.250	3.500 x 1.250	5.200 x 2.000
Max. admissible load	kg	4.000	6.000	12.000	12.000	20.000
Qty of slots		9	9	9	9	15
Reference slot Other slots	mm mm	18H7 18H12	18H7 18H12	22H8 22H12	22H8 22H12	22H8 22H12
Distance between slots	mm	125	125	125	125	125

Spindle		KX 50 M / L	KX 100 / 200 / 300
Spindle speed	rpm	20.000	18.000
Taper		HSK 63-A	HSK 63-A
Power - Torque	kW - Nm	75 - 75	30 - 240
Characteristic speed	rpm	9.550	1.200

Accuracies (VDI DGQ 3441)						
Linear axes (X/Y/Z)						
– Positioning (P)	mm	0,007	0,007	0,007	0,007	X : 0,020 Y / Z : 0,007
– Repeatability (Ps medium)	mm	0,004	0,004	0,004	0,004	X : 0,005 Y / Z : 0,004
Rotating axes (B, C)						
– Positioning (P)	sec	10	10	10	10	10
– Repeatability (Ps medium)	sec	5	5	5	5	5

Tools changer						
Qty of housings		30	30	40	40	40
Tool length Tool Ø Tool weight / Load in magazine	mm mm kg	300 90 8 / 120	300 90 8 / 120	300 100 8 / 160	300 100 8 / 160	300 100 8 / 160
Tool changing time : tool/tool - chip/chip	sec	9 / 18	9 / 18	6 / 20	6 / 20	6 / 20

Coolant		KX 50 M	KX 50 L	KX 100	KX 200	KX 300
Flow - Pressure	l/min - bar	30 - 6	30 - 6	30 - 5	30 - 5	30 - 5
Tank	litres	600	600	1.000	1.000	1.000

Over-all measurements *(Doors opened + conveyor)*		KX 50 M	KX 50 L	KX 100	KX 200	KX 300
Width	mm	6.630	5.820	7.900	8.000	8.890
Depth	mm	8.700	10.450	7.870	10.690	15.000
Height	mm	5.140	5.140	5.410	5.410	6.370
Weight of the machine	kg	31.000	36.000	35.000	41.000	95.000

UPS
United Precision Services