

# KX Five Series

5 axes high performances machining centres



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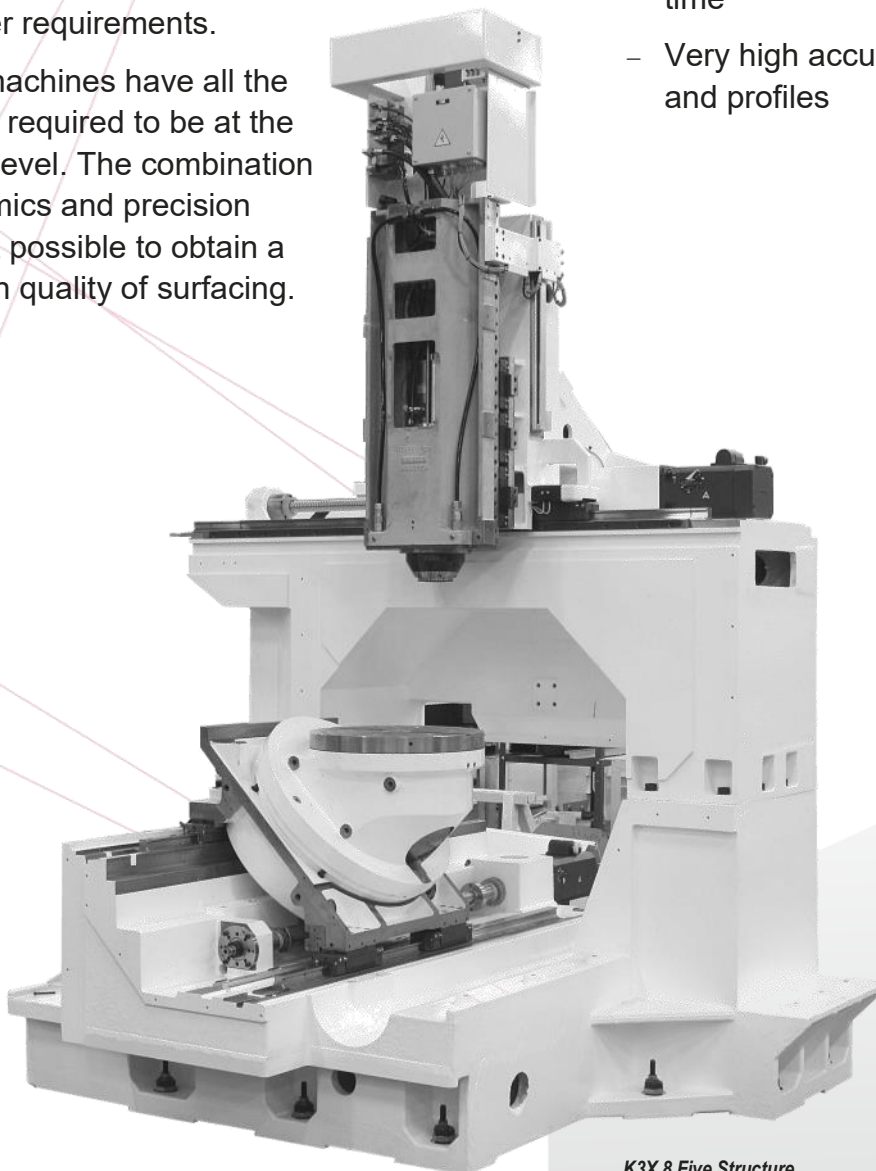
## **KX Five, a range of very high performance machines for the machining of complex parts in 5 axes and on 5 sides.**

The HURON KX Five 5-axis high-speed milling range enables the machining of all complex parts such as injection molds, aeronautical parts or parts of precision mechanics, on 5-sided and in 5 simultaneous axes, from roughing to finishing.

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

These machines have all the qualities required to be at the highest level. The combination of dynamics and precision makes it possible to obtain a very high quality of surfacing.

- High performance both in roughing and finishing
- 5 axes machining for workpieces with weight up to 500 kg (up to 750 kg reducing feedrates and accelerations)
- Hard material machining in minimal time
- Very high accuracy in contouring and profiles



*K3X 8 Five Structure*



## **Structure : rigidity and accuracy**

- Fixed portal structure in ribbed cast iron with stiffeners to reduce the torsional forces, weighed base
- Cast iron with a high mechanical performance which maximises structure rigidity and allows optimum harmonic stability and maximum damping during demanding cutting conditions
- Machine anchored to the ground by several equally loaded fixing points, providing extreme rigidity and very high geometrical stability over time
- The modular design and the alternatives and equipments offered make it easy to meet all customer requirements
- Electrical cabinet protected IP54

## **Environment - Ergonomics**

- Foundry-integrated chips evacuation channels with washing device
- Evacuation of chips by coolant liquid
- The automatic tool changer is placed outside the working area and is protected from the machining area. The tools can be loaded simultaneously at the machining.
- Full safeguard ensuring safety of the machine, the operator and its environment
- Very large accessibility to the table and the workpiece from top and side of the machine thanks to a large opening of doors on the corner and possibility to load with lifting equipment
- Operator panel

## **Maintenance**

- Very good access to all maintenance points all round the machine

## **Linear axes**

- Pre-stressed ball screws with expansion compensation system
- Preloaded drive bearings to eliminate reverse clearance and axial forces on ball screws for high surfacing quality
- Automatic lubrication of ball screws and bearings to reduce the pollution of the cutting fluid

## **Tilting and rotating table**

- Table on inclined plan equipped with torque motors on each rotating axes
- Good clearance of tilting axis to avoid chips accumulation on the table
- Possibility to work continuously from the vertical to the horizontal position
- Combined axial and radial pre-stressed bearing
- High rotation and high acceleration
- No backlash
- No wear
- Rigidity : high clamping torque enabling high power during roughing

## **Numerical controller**

- Ergonomics design
- High memory and calculation capacities
- Interactive programming
- Graphic simulation before machining for optimal safety

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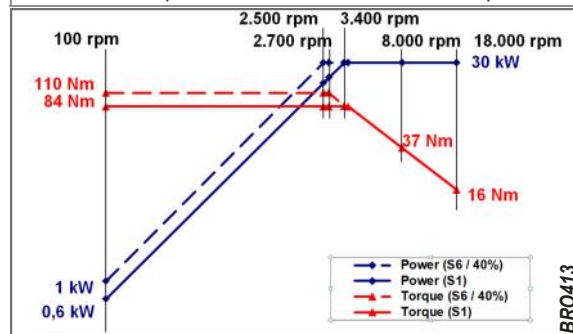
## Standard electrospindle

- Electrospindle combining speed, torque and power for a high chip removal rate
- Possibility of finishing operations thanks to the high rotational speed
- Axial / radial stiffness of the tool guaranteed

## Equipments included

- Coolant by nozzles
- Air wall for spindle protection
- Control sensor for angular positioning of the spindle
- Cooling device
- Mechanical clamping
- Tool release with hydraulic control
- Air/oil greasing of bearings
- Taper cleaning by compressed air

	18.000 rpm
Taper	HSK 63-A
Rotating speed	18.000 rpm
Power (S6/S1)	30 / 30 kW
Torque (S6/S1)	110 / 84 Nm
Characteristic speed	3.400 rpm



BRO413

## Standard tools changer

Automatic load/unload of the tool is made in vertical position.

Quantity of housings	36
Taper	HSK 63-A
Tool dimension :	
Ø	90 mm
Length	8 Five = 250 mm 10 Five = 300 mm
Weight	10 kg
Max weight in the magazine	160 kg
Tool changing time :	
tool to tool - chip to chip	5 - 15 sec



## Alternatives

	K3X 8 Five K2X 10 Five	K3X 8 Five
Quantity of housings	60	90 or 135
Taper	HSK 63-A	HSK 63-A
Tool dimension :		
Ø	90 mm	90 mm
Length	8 Five = 250 mm 10 Five = 300 mm	250 mm
Weight	8 / 240 kg	8 kg
Tool changing time :		
tool to tool - chip to chip	5 - 15 sec	5 - 15 sec



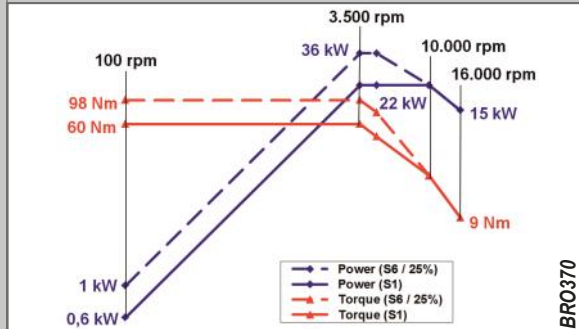
Tools changer with 135 housings





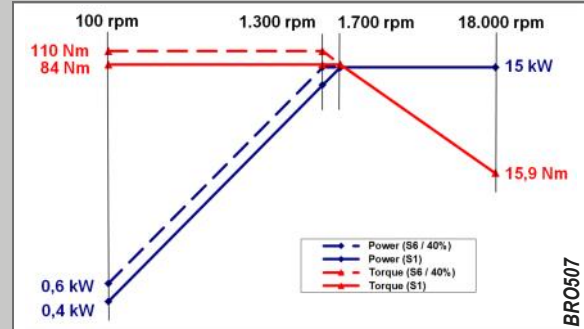
## Spindle alternatives

Electrospindle 16.000 rpm	
Taper	HSK 63-A
Rotating speed	16.000 rpm
Power (S6/S1)	36 / 22 kW
Torque (S6/S1)	98 / 60 Nm
Characteristic speed	3.500 rpm



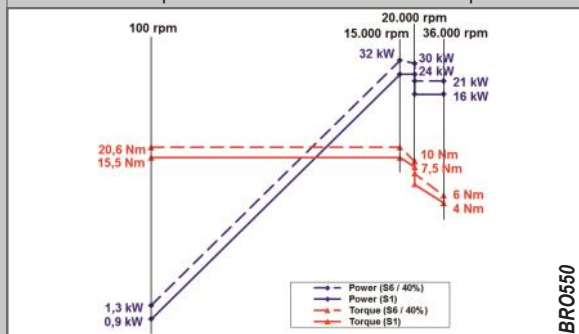
BRO370

Electrospindle 24.000 rpm	
Taper	HSK 63-A
Rotating speed	24.000 rpm
Power (S6/S1)	25 / 20 kW
Torque (S6/S1)	40 / 32 Nm
Characteristic speed	6.000 rpm



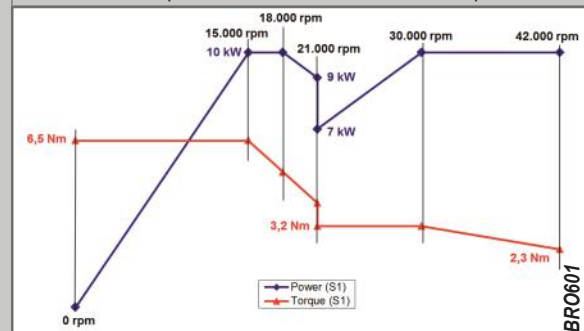
BRO507

Electrospindle 36.000 rpm	
Taper	HSK 50-E
Rotating speed	36.000 rpm
Power (S6/S1)	32 / 24 kW
Torque (S6/S1)	20,5 / 15,5 Nm
Characteristic speed	15.000 rpm



BRO550

Electrospindle 42.000 rpm	
A 28 housings ATC is required	
Taper	HSK 40-E
Rotating speed	42.000 rpm
Power (S6/S1)	12 / 10 kW
Torque (S6/S1)	6,54 / 9 Nm
Characteristic speed	15.000 rpm



BRO607

## Tool clamping system lubrication (as option)

An automatic lubrication system can be installed to ensure that tool clamping systems operate perfectly.

- Fully automated preventive maintenance operation
- Device storage in the tool magazine
- Cycle management by numerical control
- Reduced machine downtime

## Vibrations monitoring

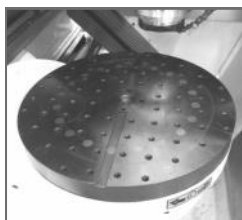
(not included with spindles in option)

Vibration monitoring ensures safe operation of the machine components, tool and workpiece. The system consists of a vibration sensor and an electronic signal processing unit.

# KX Five Series

## Tables for K3X 8 Five

Standard table



Optional table



### Table characteristics

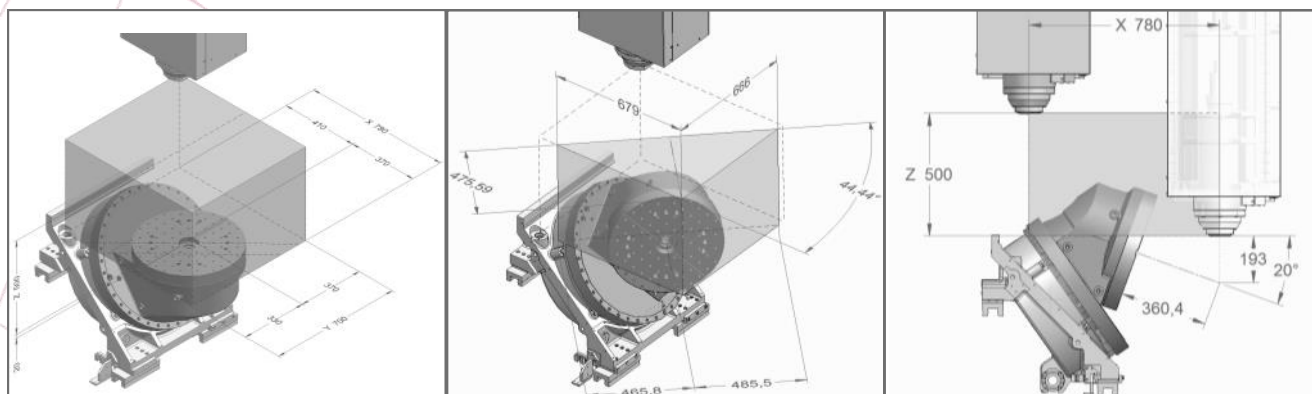
Structure	Table on a 55° inclined plan		
Table size	mm	Ø 500	Ø 630
Admissible load on the table	kg	300 (*)	250
Workpiece size	mm	with max Ø 700, height = 280 mm with Ø 360, height = 360 mm	with max Ø 630, height = 135 mm with Ø 150, height = 245 mm
Workpiece clamping		Holes - M12 50/50 mm	8 slots 18H12
Reference		20H7 - Depth 5	20H7 - Depth 5
Central bore		40H7 - Depth 15	40H7 - Depth 15

(\*) With feedrates and accelerations reduced, standard admissible load on K3X 8 Five table = 250 kg

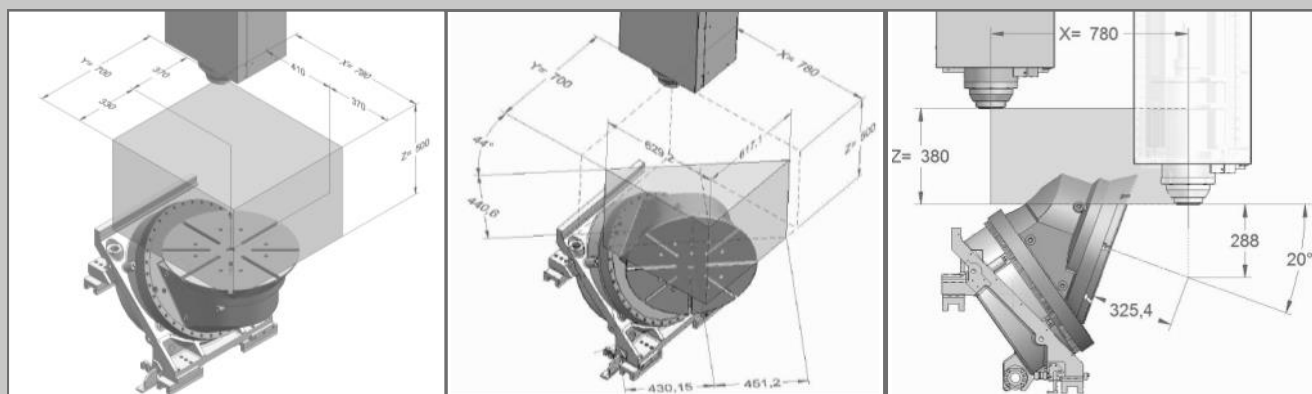
### Characteristics of rotating axes

		A axis : Tilting Clearance : +30° / -180°	C axis : Table rotation Clearance : 360°, continuous
Rotating speed	rpm	50	50
Measuring increment		0,001°	0,001°
Torque : working / clamping	Nm	872 / 1.630	554 / 990

### Interferences layouts : standard table



### Interferences layouts : optional table





## Tables for K2X 10 Five

Table standard

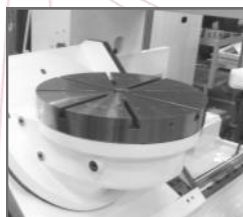
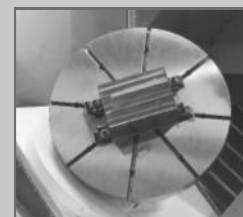


Table en option



### Table characteristics

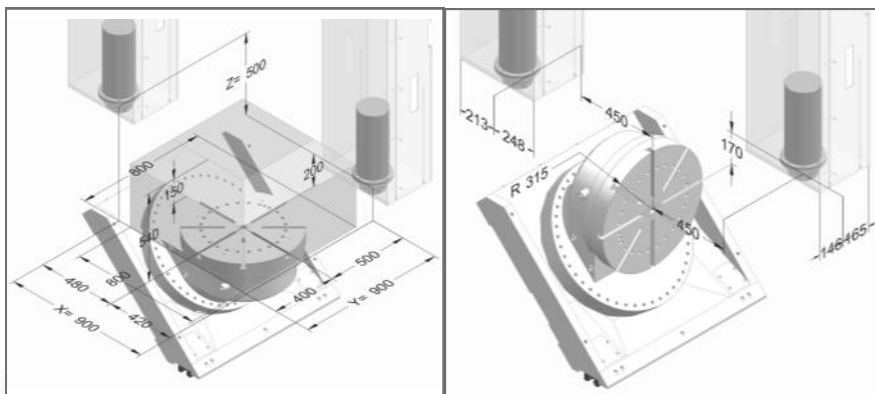
Structure		Table on a 45° inclined plan	
Table size	mm	Ø 630	Ø 800
Admissible load on the table	kg	750 (*)	500
Workpiece size	mm	with max Ø 800, height = 540 mm	with max Ø 800, height = 410 mm
Workpiece clamping		8 slots 18H12	8 slots 18H12
Reference		20H7 - Depth 5	20H7 - Depth 5
Central bore		40H7 - Depth 15	40H7 - Depth 15

(\*) With feedrates and accelerations reduced, standard admissible load on K2X 10 Five table = 500 kg

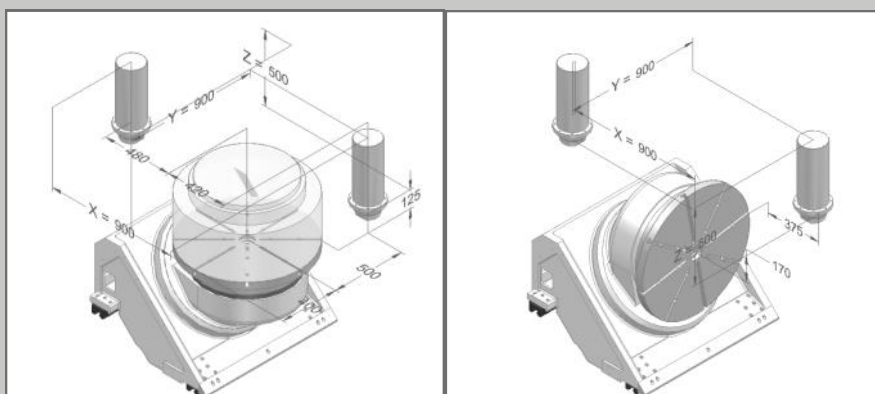
### Characteristics of rotating axes

		A axis : Tilting Clearance : +45° / -180°	C axis : Table rotation Clearance : 360°, continuous
Rotating speed	rpm	50	60
Measuring increment		0,001°	0,001°
Torque : working / clamping	Nm	1.400 / 3.200	850 / 2.500

### Interferences layouts : standard table



### Interferences layouts : optional table



# KX Five Series

## Palletised table for K3X 8 Five (Optional)

The palletisable table is positioned in place of the standard table on a 55° plane.

To enable loading by robot/palletiser or to facilitate operator intervention in the case of manual loading, the machine's front door is automated. (Opening of the lateral door on the operator's side remains manual)



The device includes :

- The palletised table
- One milling pallet
- The automation of the front door

### Characteristics

<b>Structure</b>	Table on a 55° inclined plane	
Dimension of the pallet	mm	Ø 500
Admissible load on pallet	kg	250
Max. workpiece dimension	mm	max Ø 500 x height 285 mm
<b>A axis : Tilting</b>		
		+30° / -180°
Rotating speed	rpm	50
Measurement by incremental encoder		0,001°
Torque : working / clamping	Nm	872 / 1.630
<b>C axis : Table rotation</b>		
		360°, continuous
Rotating speed	tr/min	50
Measurement by absolute encoder		0,001°
Torque : working / clamping	Nm	554 / 990
<b>Workpiece clamping</b>		
		Holes - M12 50/50 mm
Reference		20H7 - Width 5
Central bore	mm	40H7 - Width 15

Table at 0° - Horizontal

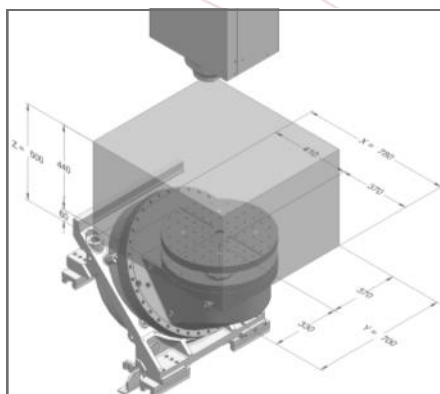


Table at 90° - Vertical

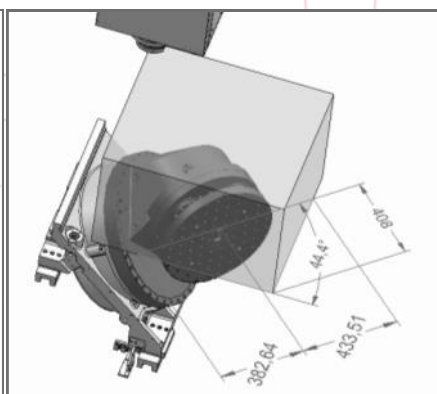
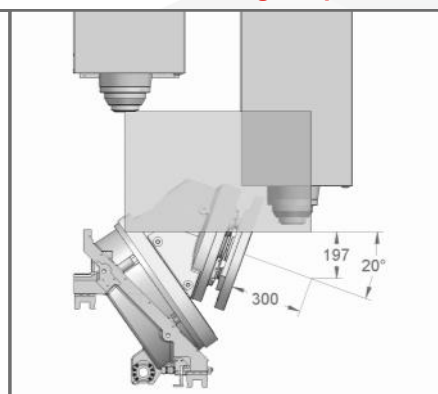


Table at -20° - Negative position







## MP PRO500 palletiser for K3X 8 Five (Optional)

To boost your productivity, optimise your processes or increase your outputs, HURON offers a palletising solution for the K3X 8 Five.

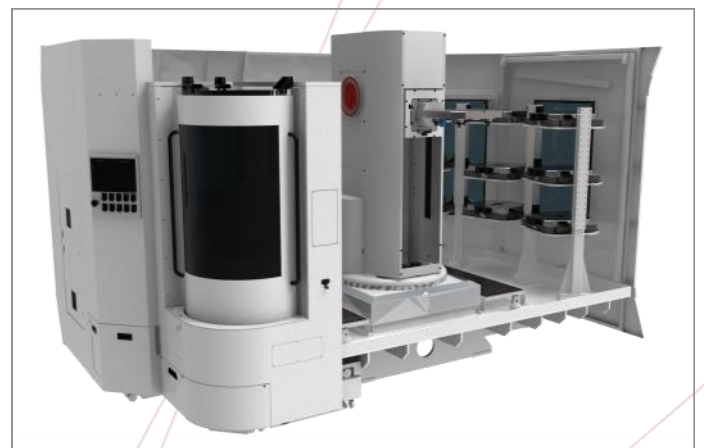
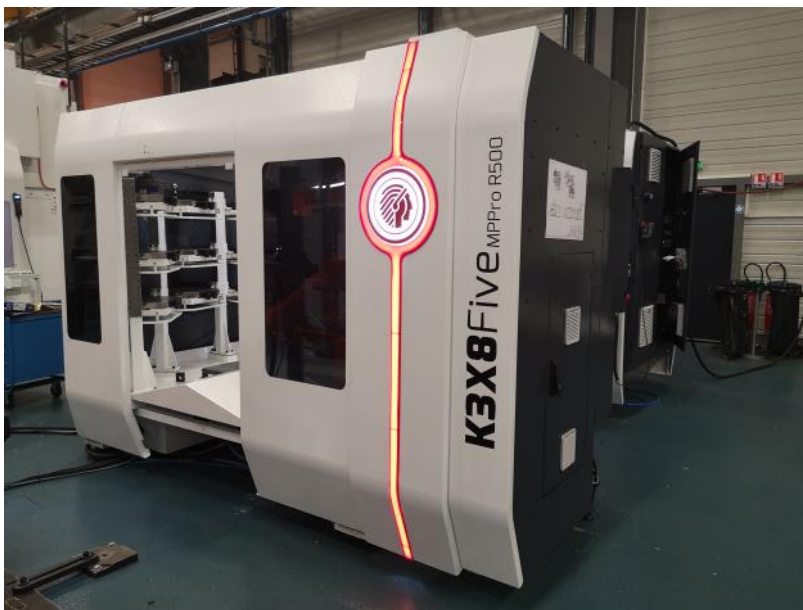
The MP PRO500 palletiser is a fully automated cell that can be easily integrated into the machine. Its one-piece design means it can be commissioned quickly.

The device includes :

- 1 loading/unloading station
- 1 supervision station
- 1 transfert robot
- 5 storage racks with 3 pallets each

### TO REMEMBER

- Increase of the machine's **useful rate**
- **Adaptability** to part changes
- Machine **versatility**
- **Saving time** and reducing downtime
- **Pallet weight capacity** up to 250 kg



# KX Five Series

## HURON numerical controller cycles

### **PRECILIFE** or how to manage tool life automatically? <sup>(\*)</sup>

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

<sup>(\*)</sup> 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



## Technical characteristics

Linear axes X / Y / Z		K3X 8 Five	K2X 10 Five
X travel	mm	780	900
Y travel	mm	700	900
Z travel	mm	500	500
Rapid feedrates	m/min	50	50
Acceleration per axis	m/s <sup>2</sup>	5	5
Vectorial acceleration	m/s <sup>2</sup>	9	9
Roto-tilting table		K3X 8 Five	K2X 10 Five
Structure		on a 55° plane	on a 45° plane
Table size	mm	Ø 500 mm	Ø 630 mm
Max. admissible load	kg	300 kg	750 kg
Distance spindle nose / top table (0°)	mm	525 mm	700 mm
Distance angle spindle / table (0°)	°	0° / 110°	0° / 90°
Negativ angle	°	-20°	-
A axis - Tilting	°	+30° / -180°	+45° / -180°
Rotating speed	rpm	50	50
C axis - Rotation	°	360° continuous	360° continuous
Rotating speed	rpm	50	60
Spindle		K3X 8 Five	K2X 10 Five
Rotating speed	rpm	18.000	18.000
Taper		HSK 63-A	HSK 63-A
Power - Torque	kW - Nm	30 - 110	30 - 110
Characteristic speed	rpm	3.400	3.400
Accuracies (VDI DGQ 3441)		K3X 8 Five	K2X 10 Five
Linear axes (X/Y/Z)			
- Positioning (P)	mm	0,004	0,004
- Repeatability (Ps medium)	mm	0,002	0,002
Rotating axes (A, C)			
- Positioning (P)	sec	7,2	7,2
- Repeatability (Ps medium)	sec	3,6	3,6
Tools changer		K3X 8 Five	K2X 10 Five
Quantity of housings		36	36
Tool length	mm	250	300
Tool Ø	mm	90	90
Tool weight / total weight in magazine	kg	10 / 160	10 / 160
Tool changing time : tool to tool - chip to chip	sec	5 - 15	5 - 15
Coolant		K3X 8 Five	K2X 10 Five
Flow - Pressure	l/min - bar	30 - 3	30 - 3
Tank	litres	230	230
Over-all measurments (Doors opened + conveyor)		K3X 8 Five	K2X 10 Five
Width	mm	5.520	5.700
Depth	mm	3.320	3.650
Height	mm	3.325	3.470
Weight of the machine	kg	10.000	14.500
Numerical controllers		Siemens - Heidenhain	

## Optional equipments

Tables alternatives - Spindles alternatives - Tools changers alternatives - High pressure coolant 70 bar - Coolant by microspraying - Air blast - Workpiece probe - Tool probe - Pallet device - Graphit dust removal system - Oil extraction system - Oil skimmer - Pressurization of measuring scales - Electrical cabinet conditioning - Sight glass

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