

# HURONNEWS

HURON GROUP NEWS ROUND-UP

2018 - 12

*A LEGENDARY  
PASSION*

OUR MACHINES

OUR SOLUTIONS

OUR SERVICES

# EDITORIAL

The EMO fair is almost upon us, and that particular event calls for a new version of HURONEWS.

EMO now sets global standards. It is where ideas, from the simplest to the wildest, take action in the shape of actual products put on display. EMO is and will remain the fertile ground on which the imagination of engineers can produce fruit.

Huron cannot afford to miss such an event. The fair is held every two years, and paces our discoveries, innovations, business assets and treasure troves of know-how and skills.

This particular year, we want to turn the spotlight on the employees who are behind the success and strength of the company. All company departments form integral part of the chain of collaboration, and make a valuable contribution to product excellence. Each in their own area is a strong link, bringing its knowledge, speciality and dedication to the task. All contribute to the end purpose that of manufacturing and offering products that are known throughout the world for their high performance and ruggedness. That dedication is handed down the generations, fostered and nurtured to make what characterises us, namely POWER and PRECISION.

For over 160 years, we have retained our ability to develop and adapt, and are now more motivated than ever. The manufacturing chain is made up of a multitude of links, and each is an important factor for the success of our business and those of our customers.

Our customers trust the added value we provide through our products, which are always designed and calibrated to help them to manufacture more, without compromising quality.

The business we have been operating for 160 years is undergoing a normal generational change. That creates a positive and productive opportunity. It enables newcomers to bring their youth and creativity, to learn from their seniors and take advantage of their experience. Each

employee becomes aware of their involvement and thus plays a responsible part in the success of the company. Work well done will always be a source of pleasure and joy to the individual who puts in their best efforts and skills.

For us, this issue is a way of highlighting the pride and the dynamic and responsible influence of those who produce the equipment our customers use every day.

One important step that we have sought to take on the occasion of EMO is the renewal of our range of machines.

After 20 years of machine bodies with stark geometric lines, we had to give a more modern and graceful look to the equipment our customers install and use in their production units.

Style, figure, usability and beauty are concepts that are part of our

daily lives. Stimulating the senses is of great importance. A user's first visual contact with a product is through its appearance and packaging. That initial impression can make a user relate to the product and may influence their choice. While the outside appearance is not more important than functionality, it is quite clear that a pleasing look does not mean that the product is inferior.

The structures and subassemblies used by Huron continue to meet our quality criteria of the past, and have not changed in any way. Our products have simply been given greater visual appeal, a more modern style and features that make them particularly easy to use.

For over 100 years, Huron has been a specialist of five-axis machining. After inventing the Huron head, which is a must-have for those who care about precision mechanical engineering, we could not evade our duty to continue developing products so as to help customers manufacture better products, at a higher speed and for a lower cost. During

economic recovery, customers are known to start looking for more advanced, rugged and durable manufacturing investments and solutions.

The new UMILL five-axis machine range developed by our design department is affordable, and lives up to our signature of POWER and PRECISION at the same time. Today, we offer a variety of machines using the five-axis system, to allow each customer to find the most suitable product they need to conceptualise the parts to produce.

Lastly, Huron is ready for Industry 4.0! Huron has been very busy in the area, and EMO will provide an opportunity for displaying our range of systems through a number of programs and applications. These have been developed and devised so that the workshop may become a complete work platform made up of smart and connected machines. Our principal concern is to develop systems that prevent risks and control phenomena that can diminish quality or productivity. Prevention is better than cure. The latest development from Huron will be presented for the first time ever in the

world. It is sure to attract manufacturers who want to preserve the integrity of their single parts or small runs, or parts with a very high value. The development, named **PRECIPROTECT**, will give peace of mind while machining complex shapes. We are experts of the making of products devoted to the aviation, injection mould, precision engineering, power and medical engineering industries. We have set ourselves the task of helping our customers and allowing their advance through the use of powerful and smart systems.

We are sure you will like what you will see.

Enjoy your discovery in these pages!

**Bernard Echevard,**  
CEO, Huron Graffenstaden



“ We have set ourselves the task of helping our customers and allowing their advance through the use of powerful and smart systems. ”



*Our DNA*

*Emotion*

*Modernity*

***Power***

*Elegance*

*Design*

***Accuracy***



*Style*

*Stimuli*

***Rigidity***

*Ergonomics*

*Appeal*

# FLEXIBILITY of the highest level

*The MX series, the direct successor to the EX – a groundbreaker in its day in terms of modularity and adaptability – combines flexible multifunctionality with the latest machining and programming technologies, for workpiece milling and turning in a single setup, from roughing to finishing, along five axes and on five sides.*

Twin-pallet palletizer MX8 to MX12



Pallet device with up to 4 pallets for MX 16 and MX 20

## Palletizing for increased productivity

- Twin-pallet palletizer attached to the front of the machine.
- Optimal operator access to the machine and constant visibility over the work area.
- Safeguard for easy, ergonomic pallet loading/unloading from above and from the front of the machine.

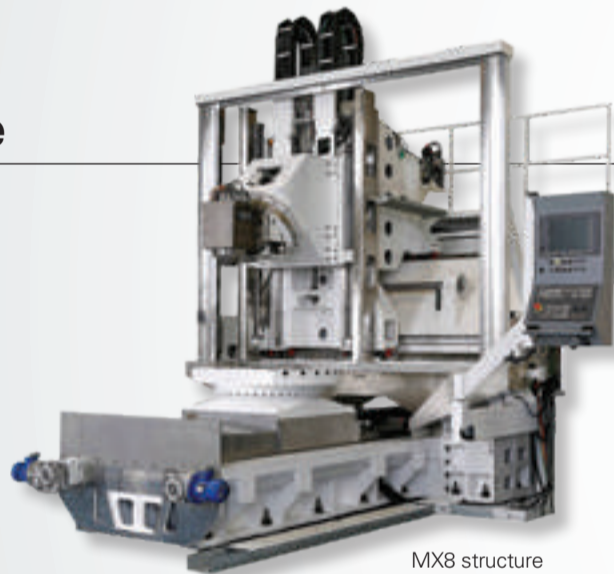


## Ergonomics and environment

- Swarf chute with washing system and spiral conveyors.
- Large glazed panels, with or without palletizer, for improved visibility over the work area.
- Wide-opening doors for easier operator access to the table, workpiece and work area.
- Tilting operator panel.

## Design and structure

- Extremely rigid design.
- Dedicated foundation for improved dynamics.
- Structural design guaranteeing long mechanical life.
- Column guiding system on the crossrail for a high level of stability.
- Balanced Z-axis movement for greater precision and reduced energy consumption.



MX8 structure

## MAIN PROPERTIES

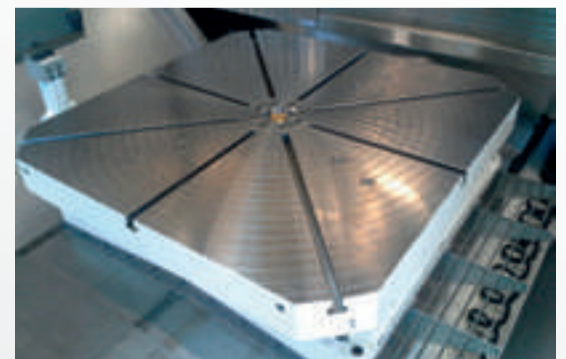
		MX 8 M / MT	MX 10 M / MT	MX 12 M / MT	MX 16 M	MX 20 M
X/Y/Z-axis travel	mm	1.160 x 1.000 x 900	1.200 x 1.200 x 1.000	1.200 x 1.600 x 1.000	2.300 x 2.300 x 1.250	3.000 x 3.100 x 1.600
Fast feedrate	m/min	42			40	20
Tool changer	pockets	60				
Positioning (P)		X / Y / Z : 0,007 mm - A, C : 10 sec				
Repeatability (medium Ps)		X / Y / Z : 0,004 mm - A, C : 5 sec				
Machine weight	kg	22.000	35.000	37.000	60.000	65.000
Width (doors closed + conveyor)	mm	6.250	6.335	6.990	7.500	8.500
Depth	mm	6.150	7.950	8.660	8.500	10.350
Height	mm	3.930	4.870	4.870	6.570	6.750

Main characteristics of the series. Other variants and accessories optionally available.

## VERSION L

### MX 12 M L

X/Y/Z-axis travel	2.000 x 1.600 x 1.000 mm
Table dimensions	Ø 1.600 x 1.250 mm
Max. machining volume (ØxH)	1.600 x 1.130 mm
Max. weight allowed	4.000 kg
Table rotation speed	50 rpm
Torque : Motor / Clamping	4.590 / 12.000 Nm
Clamping system	10 slots
T-slots	22H7 / H12 – 125 mm
Reference bore	Ø 100H7



## SPINDLES

### MX 8 / MX 10 / MX 12 - M VERSION

### MX 8 / MX 10 / MX 12 - MT VERSION

### MX 16 / MX 20 - M VERSION

Spindle speed	14.000 rpm	10.000 rpm	10.000 rpm
Tool taper	HSK 63A	HSK 100A	HSK 100A
Power (S1/S6)	29 kW (S1)	33 / 43 kW (S1/S6)	33 / 43 kW (S1/S6)
Torque (S1/S6)	277 Nm (S1)	313 / 415 Nm (S1/S6)	313 / 415 Nm (S1/S6)

# MX

## WHAT MAKES THE DIFFERENCE

- Suitability for a variety of jobs
- Modularity
- Precise five-axis positioning for general mechanical engineering components
- Volumetric precision in mould making



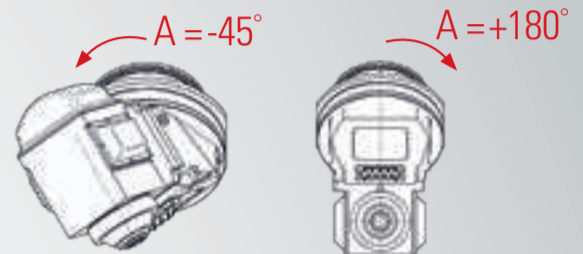
## The universal head, a trump card for productivity

Positioned on a 45° plane, the continuously controlled head is designed to maintain the levels of accuracy in terms of positioning and repeatability, even in high-speed machining.

- Optimum clamping torque for a high roughing capacity.
- Direct drive for backlash-free and wear-free movement.

### A-AXIS = -45° / +180°

Rotating speed	100 rpm
Clamping torque	2.500 Nm
Working torque (S1)	1.200 Nm



## VARIANTS

**Fork head**, for the machining of workpieces requiring negative angles. It is combined with a powerful 8000 rpm spindle (86 kW/235 Nm).

On versions 10/12 M

### B-AXIS = -110° / +10°

Rotating speed	30 rpm
Clamping torque	7.000 Nm
Working torque (S1)	500 Nm

### A-AXIS = -45° / +180°

Rotating speed	25 rpm
Clamping torque	7.000 Nm
Working torque (S1)	2.235 Nm



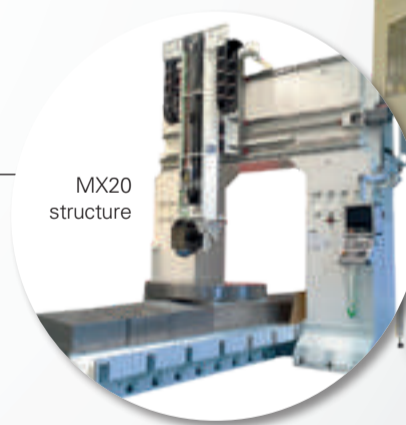
**Mechanical head**, for milling difficult materials such as titanium, Inconel and stainless steel. Combined with a high-torque 6000 rpm spindle (28 kW/1350 Nm), this head is designed for heavy roughing with a high chip removal rate.

On versions 10/12 M/MT



## Range extension

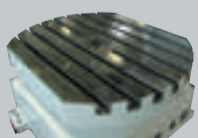
In order to allow our customers to machine extremely large parts, the MX range has been extended to include extra-large models, with MX 16 and MX 20. The larger workpiece clearance will be appreciated by some of our customers, particularly in the aeronautic and energy industries.



## Milling or Turn/Mill table?

- Continuously controlled C-axis.
- Optimum positioning accuracy and repeatability.

- Torque motor drive for backlash-free and wear-free movement.
- Optimum clamping torque.



### VERSION M MILLING

		MX 8 M	MX 10 M	MX 12 M
Rotating speed	rpm	50	65	50
Table dimensions	mm	Ø 1.000 x 800	Ø 1.250 x 900	Ø 1.600 x 1.250
Max. machining volume (ØxH)	mm	Ø 1.000 x 1.035*	Ø 1.000 x 1.130*	Ø 1.600 x 1.130*
Max. weight allowed	kg	2.000	2.500	4.000

	MX 16 M	MX 20 M
Rotating speed	7**	7**
Table dimensions	Ø 1.750	Ø 2.200
Max. machining volume (ØxH)	Ø 1.800 x 1.250	Ø 3.000 x 1.400
Max. weight allowed	10.000	12.000

### VERSION MT MILLING/TURNING

		MX 8 MT	MX 10 MT	MX 12 MT
Rotating speed	rpm	500	500	250
Table dimensions	mm	Ø 800	Ø 1.000	Ø 1.400
Max. machining volume (ØxH)	mm	Ø 800 x 1.035	Ø 1.200 x 1.130*	Ø 1.600 x 1.130*
Max. weight allowed	kg	2.000	2.500	4.000



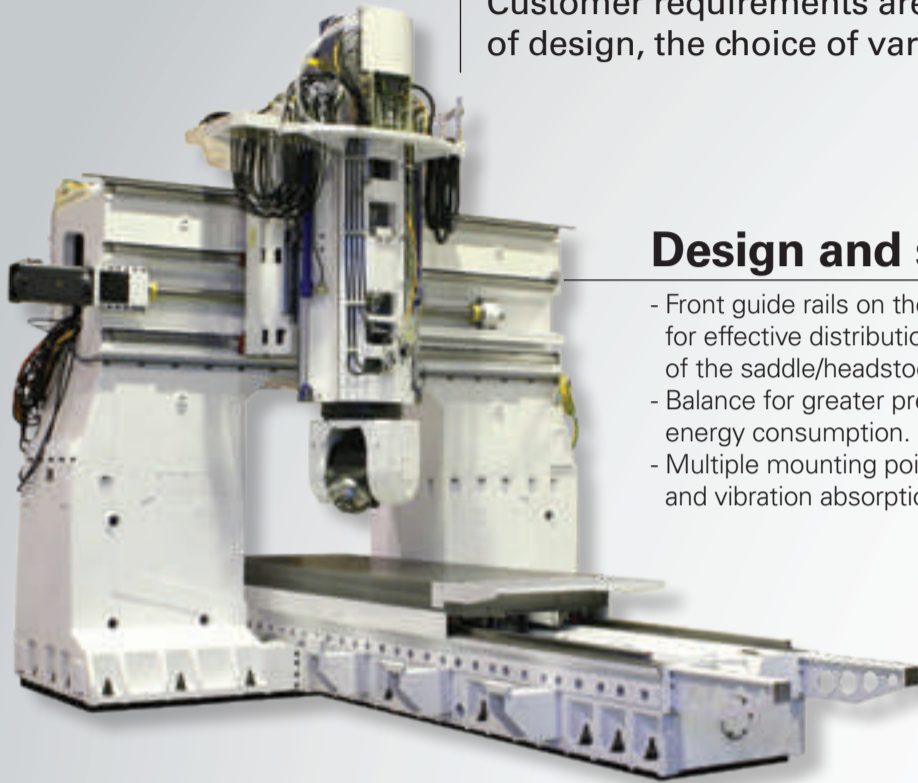
\* X travel reduced

\*\*Other variants and accessories optionally available.

# VERSATILITY to meet all customer requirements

The KX Large series offers a wide selection of machines for continuous five-axis/five-side machining of complex parts.

The fixed-portal architecture and machine design ensure maximum rigidity for extremely precise machining in a variety of difficult materials. Its large work area, capable of supporting up to 20 tons in weight and accommodating machining volumes up to 4080 x 2180 x 1550 mm, is suited to machining large parts for general mechanical and precision engineering, 3D shapes, and the aeronautical and energy sectors. Customer requirements are comfortably met by the modularity of design, the choice of variants, and equipment.



## Design and structure

- Front guide rails on the Y-axis designed for effective distribution of the weight of the saddle/headstock assembly.
- Balance for greater precision and reduced energy consumption.
- Multiple mounting points providing rigidity and vibration absorption.



## MAIN PROPERTIES

		KX 50 M	KX 50 L	KX 100	KX 200	KX 300
X/Y/Z-axis travel	mm	2.000 x 1.700 x 900	3.000 x 1.700 x 900	2.300 x 2.300 x 1.000	3.300 x 2.300 x 1.000	5.000 x 3.100 x 1.500
Fast feedrate	m/min	X / Y / Z : 40	X / Y / Z : 40	X / Y / Z : 40	X : 25 - Y / Z : 40	X / Y / Z : 20
Table dimensions	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
Poids max. admissible	kg	4.000	6.000	6.000 (12.000 max.)	9.000 (12.000 max.)	20.000
Spindle speed/taper	rpm	20.000 / HSK 63-A		18.000 / HSK 63-A		
Puissance - Couple (S1/S6)	kW - Nm	60 / 75 - 60 / 75		20 / 30 - 160 / 240		
Automatic tool changer		30 pockets		40 pockets		
Positioning accuracy (P)		X / Y / Z : 0,007 mm B, C : 10 sec	X / Y / Z : 0,007 mm B, C : 10 sec	X / Y / Z : 0,007 mm B, C : 10 sec	X / Y / Z : 0,007 mm B, C : 10 sec	X / Y / Z : 0,010 mm B, C : 10 sec
Précision de Repeatability (medium Ps)		X / Y / Z : 0,004 mm B, C : 5 sec	X / Y / Z : 0,004 mm B, C : 5 sec	X / Y / Z : 0,004 mm B, C : 5 sec	X / Y / Z : 0,004 mm B, C : 5 sec	X / Y / Z : 0,005 mm B, C : 5 sec
Machine weight	kg	30.000	36.000	37.000	41.000	100.000
Width (doors closed + conveyor)	mm	4.930	4.930	7.280	7.280	7.000
Depth	mm	7.520	9.900	7.890	10.360	15.000
Height	mm	5.140	5.140	5.410	5.410	7.050

Main characteristics of the series. Other variants and accessories optionally available.

## Fork head

- Positioning accuracy and repeatability maintained in high-speed machining, even for complex-shaped parts.
- Angular encoder in the axis for high positioning accuracy and repeatability.
- Torque motors for backlash-free and wear-free movement.
- High clamping torque for high roughing ability.
- Negative angles possible.
- Spindle and machining safeguarded by a vibration monitor.

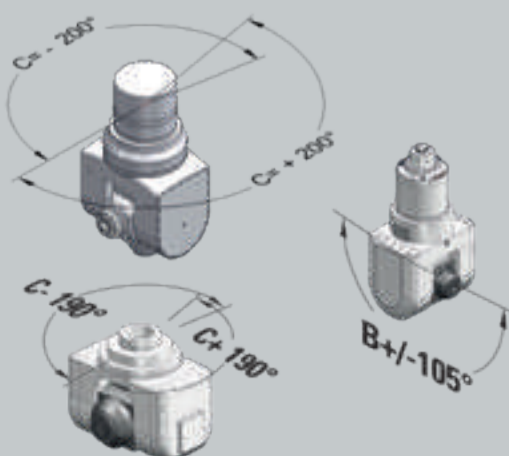


### KX 50

Rotating speed	100 rpm
Clamping torque	4.000 Nm
Working torque (S6)	B : 764 Nm C : 810 Nm

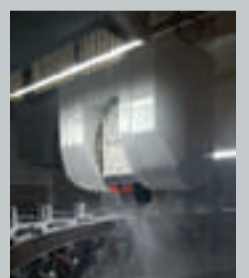
### KX 100 / 200 / 300

Rotating speed	30 rpm
Clamping torque	7.000 Nm
Working torque (S6)	B : 500 Nm C : 750 Nm



## Variant

**Mechanical head,** for milling difficult materials such as titanium, Inconel and stainless steel. Combined with a high-torque 4000 rpm spindle (21 kW/810 Nm), this head is designed for heavy roughing with a high chip removal rate. *On models 100 / 200 / 300.*



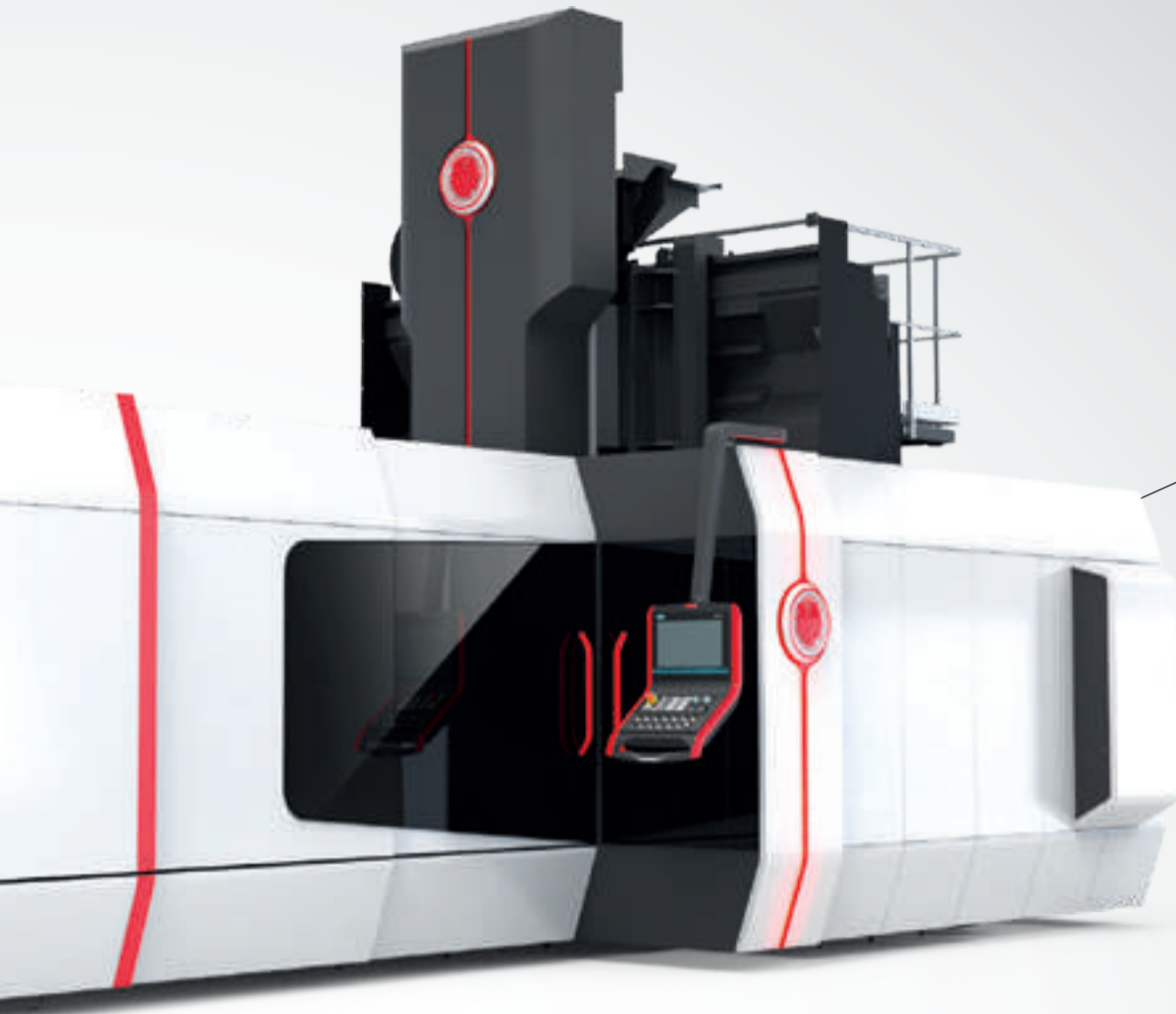
**B-AXIS = ±95° / C-AXIS = ±200°**

Clamping torque	10.000 Nm
Working torque (S6)	B, C : 4.524 Nm



Several spindles available according to the type of application for an excellent compromise between power and torque.

# KX LARGE



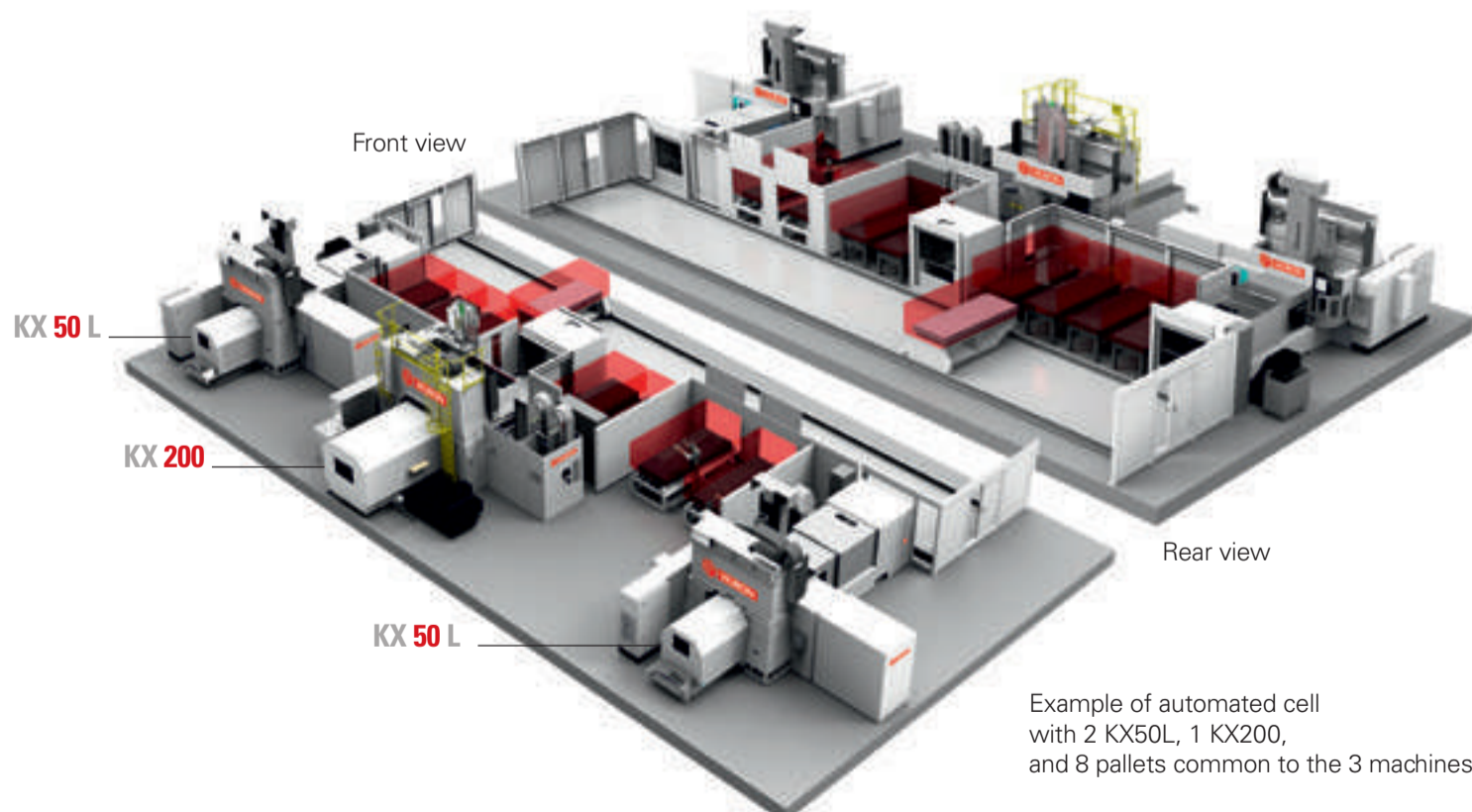
## WHAT MAKES THE DIFFERENCE

- Machine with palletizing function for **increased productivity**
- **Volumetric precision** for making moulds and complex parts
- **Wide clearance between the columns** to exploit the work volume fully
- **Spindle offering optimum performance** for roughing and finishing
- Spindle suited to **high chip rates**
- Structural design guaranteeing **long mechanical life**
- **High degree of precision** due to direct measurement on the linear and rotary axes

## AUTOMATION

*For higher productivity or greater precision in machining, Huron offers the possibility to add a number of supplementary and optional systems to the machine, such as fluid application, micro-spraying, probes, etc., not 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. With 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

# MACHINING PERFORMANCE *enhanced*

**The KXG series comprises gantry milling centres that are particularly effective in machining large, complex parts.**



## Design and structure

- Gantry structure with reinforced, U-type moving crossrail.
- Polymer concrete walls, incorporating a double guiding system.
- X axis driving by linear motor (KXG-L) or rack gear (KXG-P)
- Optimization of the moving axes by finite element structural calculation.
- Dedicated foundation for improved dynamics.

## Ergonomics and environment

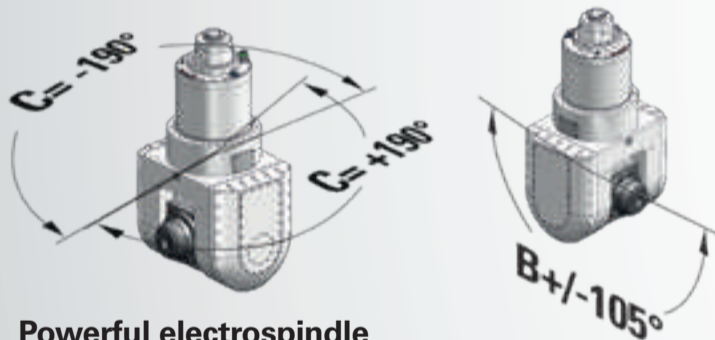
- Retractable roof for easy access to the work area and workpiece.
- Tool magazine outside of the work area.
- Tilting, inclined operator panel.
- Energy efficiency for the production of large-sized parts.

## A winning trio for high productivity

### Continuous two-axis swivel fork head

- Positioning accuracy and repeatability maintained in high-speed machining, even for complex-shaped parts.
- Angular encoder in the axis for high positioning accuracy and repeatability.
- Torque motors for backlash-free and wear-free movement.
- High clamping torque for high roughing capacity.
- Negative angles possible.

Rotating speed	100 rpm
Clamping torque	4.000 Nm
Working torque (S1)	B : 764 Nm C : 810 Nm



### Powerful electrospindle

- Powerful, high-speed electrospindle.
- Several spindles available according to the type of application for an excellent compromise between power and torque.
- Spindle and machining safeguarded by a vibration monitor.

### Tool changer

- Forty-pocket tool changer.



**2 versions: KXG-L (linear motor on X axis) or KXG-P (rack gear on X axis)**

CE QU'IL FAUT RETENIR		KXG 30-15	KXG 45-14	KXG 45-23	KXG 60-23	KXG 90-23
X/Y/Z-axis travel						
KXG-L version	mm		KXG 45L-14 4.500 x 1.400 x 800	KXG 45L-23 4.500 x 2.300 x 800	KXG 60L-23 6.000 x 2.300 x 800	KXG 90L-23 9.000 x 2.300 x 800
KXG-P version		KXG 30P-15 3.000 x 1.500 x 800	KXG 45P-14 4.500 x 1.500 x 800	KXG 45P-23 4.500 x 2.500 x 800	KXG 60P-23 6.000 x 2.500 x 800	KXG 90P-23 9.000 x 2.500 x 800
Fast feedrate	m/min	X / Y : 60 - Z : 45				
Table dimensions	mm	3.000 x 1.500	4.700 x 1.390	4.700 x 2.480	6.200 x 2.480	9.000 x 2.480
Max. weight allowed	kg	13.000	18.000	21.000	25.000	52.000
Spindle speed/taper	rpm	20.000 / HSK 63-A				
Power - Torque (S1/S6)	kW - Nm	60 / 75 - 60/75				
Positioning accuracy (P)		X : 0,025 mm Y / Z : 0,010 mm B, C : 10 sec	X : 0,025 mm Y / Z : 0,010 mm B, C : 10 sec	X : 0,025 mm Y / Z : 0,010 mm B, C : 10 sec	X : 0,035 mm Y / Z : 0,010 mm B, C : 10 sec	X : 0,050 mm Y / Z : 0,010 mm B, C : 10 sec
Repeatability (medium Ps)		X / Y / Z : 0,005 mm B, C : 5 sec	X / Y / Z : 0,005 mm B, C : 5 sec	X / Y / Z : 0,005 mm B, C : 5 sec	X : 0,006 mm Y / Z : 0,005 mm B, C : 5 sec	X : 0,006 mm Y / Z : 0,005 mm B, C : 5 sec
Machine weight	kg	80.000	60.000	75.500	90.000	130.000
Width (doors closed + conveyor)	mm	8.100	7.550	8.940	9.100	10.210
Depth	mm	9.060	9.700	10.000	11.700	13.650
Height	mm	5.735	4.980	4.980	4.980	4.980

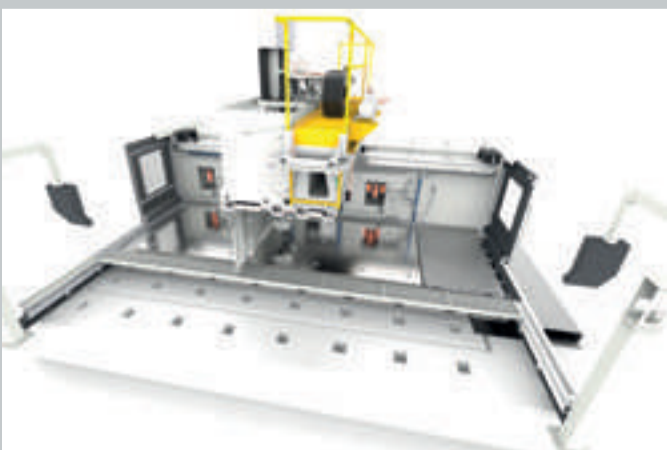
Main characteristics of the series. Other variants and accessories optionally available.



# KXG

## WHAT MAKES THE DIFFERENCE

- **Design suited** to continuous 5-axis machining of very large parts
- **Machining with very high feed speeds**
- **High rigidity** enabling very high metal removal rates



## TWIN pendulum machining (optional), to boost return on investment

- Adaptability and flexibility of the work space to match the customer's production requirements with ease.
- Two independent machining and work areas obtained by a separating wall with three different positions.
  - Retractable shutter for head transfer between areas.
  - Access to each area via sliding doors at the front and rear of the machine.
  - Each area is equipped with a tool changer, an operator panel and all other necessary workpiece machining equipment.

# EXCELLENCE in five-axis precision machining

The KX Five series is a combination of dynamics and precision for continuous five-axis machining of complex parts. Through the excellent standard of machining vibration damping, high-quality surface finishes and optimum precision can be achieved on a variety of materials.

# KX FIVE

TABLE

		K3X 8 FIVE	K2X 10 FIVE
		55° plane	45° plane
Table dimensions	mm	Ø 500	Ø 630
Max. workpiece dia.	mm	Ø 700	Ø 800
Weight allowed	kg	250 (max. 300)	500 (max. 750)
<b>A-axis</b>			
Travel		-30° / +180°	-45° / +180°
Max. orientation		-110°	-90°
Rotating speed	rpm	50	40
<b>C-axis</b>			
Travel		360° (continuous)	
Rotating speed	rpm	50	90



## CE QUI FAIT LA DIFFÉRENCE

- **Direct measurement** on all axes for increased positioning accuracy
- **Large-sized monoblock bed and reinforced portal**
- **Exceptional accessibility and permanent visibility** over the workpiece
- **Performance**
- **High level of precision** in contouring and profiles
- **Compact, dynamic table**, with torque motors
- **Efficient swarf removal**
- **Standard or specific automation device**

MAIN PROPERTIES

		K3X 8 FIVE	K2X 10 FIVE
X/Y/Z-axis travel	mm	780 x 700 x 500	900 x 900 x 500
Fast feedrate	m/min	X / Y / Z : 50	X / Y / Z : 50
Spindle speed/taper	rpm	18.000 / HSK 63-A	24.000 / HSK 63-A
Power - Torque (S1/S6)	kW - Nm	26,7 / 26,7 - 84 / 110	20 / 25 - 32 / 40
Automatic tool changer		30 pockets	
Positioning accuracy (P)		X / Y / Z : 0,004 mm - A, C : 7,2 sec	
Repeatability (medium Ps)		X / Y / Z : 0,002 mm - A, C : 3,6 sec	
Machine weight	kg	10.000	14.500
Width (doors closed + conveyor)	mm	4.710	4.910
Depth	mm	2.685	3.660
Height	mm	3.320	3.470

Main characteristics of the series. Other variants and accessories optionally available.

# QUALITY machining

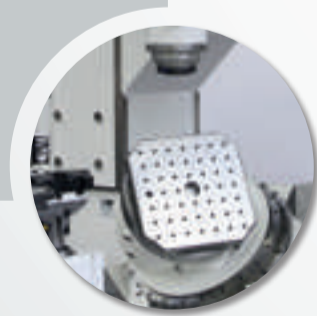
The MX 4 offers outstanding power, precision, rapidity and rigidity for the very high quality machining of complex parts in difficult materials in minimum time.

# MX4

PALLETIZED TABLE

MX 4

		Rotary table on 45° plane
<b>A-axis</b>		-45° / + 180°
<b>C-axis</b>		360°
A/C rotating speed	rpm	100
Palletized table dimensions	mm	Ø 440 x 400
Max. weight allowed	kg	200



## WHAT MAKES THE DIFFERENCE

- **Linear motors on Y and Z axes** to increase speed of movement and boost acceleration and rapid tool change
- **Light, rigid mobile structures** to get the most out of linear motor performance
- **Ballscrew on X-axis** to eliminate the risks of pollution
- **Floor anchoring** for improved rigidity and greater dynamics
- **Excellent positioning accuracy and repeatability**
- **Palletizable concept** for increased productivity
- **Table with torque motors** for backlash-free and wear-free movement

MAIN PROPERTIES

MX 4

		MX 4
X/Y/Z-axis travel	mm	750 x 700 x 500
Fast feedrate	m/min	X : 60 - Y / Z : 120
Spindle speed/taper	rpm	24.000 / HSK 63-A
Power - Torque (S1/S6)	kW - Nm	20 / 25 - 32 / 40
Automatic tool changer		36 pockets
Positioning accuracy (P)		X / Y / Z : 0,004 mm - A, C : 7,2 sec
Repeatability (medium Ps)		X / Y / Z : 0,002 mm - A, C : 3,6 sec
Machine weight	kg	8.700
Width (doors closed + conveyor)	mm	4.170
Depth	mm	4.300
Height	mm	3.020

Main characteristics of the series. Other variants and accessories optionally available.

# THE NEWEST *attractive*

Thanks to our experience in 5-axis roto-tilting machines, the Umill benefits from the benefits of continuous improvement without compromising on the fundamental characteristic of HURON machines: **increased stiffness for efficient and high-quality machining.**

# UMILL

## WHAT MAKES THE DIFFERENCE

- **Structural design** with the aim of limiting vibrations in order to **protect the mechanics** and increase the lifetime of components
- **Excellent approach of the part** on its 5 sides thanks to the profile of the spindle holder
- **Max workpiece diameter up to 820 mm**
- **Modern design**
- **Compactness of the machine**
- **Points of maintenance centralized** at the rear of the machine

## Design and structure

- Portal, bed and saddle of table in cast iron with high mechanical properties.
- Load distribution on 17 ground fixing points to increase rigidity and ensure high geometric stability.
- Excellent vibration damping coefficient generated during machining.
- Direct drive by ball screws on the linear axes for high accuracy and smooth servo-control.
- Axis C, drive by helical gears.
- Axis A, drive by wheel and worm drive.
- Measurement on rotary axes by direct encoder for high angular accuracy.
- Centralized lubrication of axes.
- Optimized clearance between the bed's guide rails in relation with the diameter of the table for a better distribution of the part's weight.
- Roller linear guide rails ensuring high load displacement while guaranteeing high rigidity.

## MAIN PROPERTIES

		UMILL 5	UMILL 6
X/Y/Z-axis travel	mm	500 x 560 x 450	700 x 740 x 550
Fast feedrate	m/min	40	40
Table dimensions	mm	Ø 500	Ø 630
Max. workpiece : Ø x height	mm	500 x 300	780 x 510
A axis swing		+20° / -110°	+20° / -110°
C-axis rotation		360°	360°
Max. weight allowed	kg	450	600
Spindle speed / Taper	rpm	10.000 / ISO 40	10.000 / ISO 40
Power / Torque (S1/S6)	kW - Nm	12 - 18 / 115 - 176	12 - 18 / 115 - 176
Automatic tool changer		30 pockets	30 pockets
Machine weight	kg	11.000	13.000
Width x Depth x Height	mm	4.200 x 3.800 x 3.300	4.450 x 4.200 x 3.540

Main characteristics of the series. Other variants and accessories optionally available.

## Rotary-tilting table

- Large workpiece volume machinable.
- Workpiece accessible at 360° by the operator door.
- Rotation of the C axis to 360° and large angular variation of the A-axis from +20° to -110°.
- High clamping torque for an important roughing during 5-sided machining.
- Reinforced safety: additional mechanical brake in case of power failure.



## Ergonomics and maintenance

- Loading / unloading the workpiece from the side and the top by crane.
- Table and spindle easily accessible thanks to the ergonomic design of the guarding.
- Easy access to the table's saddle for maintenance.
- Large visibility window on the machining area.
- Lighting of the operator station for optimal working comfort.

## Spindle

- Excellent approach of the part on its 5 sides thanks to the profile of the spindle holder.
- Ceramic bearings for a better thermal stability.
- Hollow shaft motor allowing easily to add a rotating joint for coolant by tool center.
- Direct coupling of the motor on the spindle for better transmission of forces.
- Wide range of spindles alternatives to accommodate any type of material.



# THE CHOICE for profitability

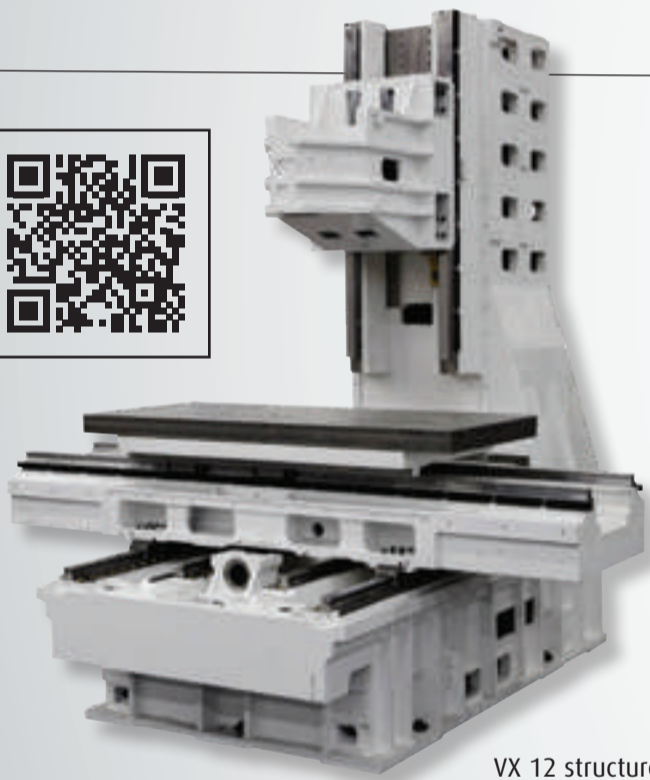
**The VX series, specially designed to meet customers' precision and reliability criteria, is extremely user-friendly and guarantees excellent profitability. Proven rapid return on investment. Compact, ergonomic, powerful and precise, the VX is an ideal investment for the manufacture of tooling and for small to medium-scale production.**

## Ergonomic, accessible layout

- Moving table for easy access to the workpiece.
- Tilting operator panel.
- Improved accessibility to maintenance components, for checking fluid levels and for cleaning the work areas.

## Rigidity and constant precision over time

- C-frame structure in quality ribbed cast iron.
- Broad-based architecture with reinforced column to withstand cutting forces and absorb the effects of machining vibrations.
- Excellent dynamic performance for rapid changes of direction and acceleration.
- Calibrated, pre-stressed ballscrews with direct motor coupling.



VX 12 structure



## A genuine production tool ready for action

The basic version of the VX is a comprehensive, packaged model that is delivered and installed, ready for production

- 10,000 rpm spindle with ceramic ball bearings for improved thermal stability
- Low-pressure cooling nozzles (2 bar)
- Pre-equipped for through-tool cooling
- Air blower nozzles
- 24-pocket tool changer
- Swarf conveyor
- Handwheel
- Electrical cabinet air conditioning
- Wash gun
- Swarf bin

Other optional equipment, available for the machine: various spindles, tool changer with a large number of pockets, workpiece and tool touch probes, 4<sup>th</sup>/4<sup>th</sup>-5<sup>th</sup> axis index plates, encoders for the three axes, etc.

### MAIN PROPERTIES

		VX 6	VX 8	VX 10	VX 12
X/Y/Z-axis travel	mm	600 x 400 x 460	820 x 510 x 510	1.020 x 510 x 510	1.220 x 600 x 610
Fast feedrate X / Y / Z	m/min	24			
Table dimensions	mm	800 x 500	1.000 x 530	1.200 x 530	1.400 x 630
Max. weight allowed	kg	400	500	800	1.200
Spindle speed	rpm	10.000 / ISO 40			
Power - Torque (S1/S6)	kW - Nm	Siemens : 10,5 - 14,5 / 50 - 69 Heidenhain : 10 - 14 / 64 - 89			
Automatic tool changer		24 pockets			
Positioning accuracy (P)	mm	X / Y / Z : 0,015			
Repeatability (medium Ps)	mm	X / Y / Z : 0,003			
Machine weight	kg	5.300	5.300	6.700	8.000
Width (doors closed + conveyor)	mm	3.340	3.700	3.520	3.775
Depth	mm	2.470	4.220	2.595	2.520
Height	mm	2.900	2.900	2.900	3.150

Main characteristics of the series. Other variants and accessories optionally available.



## WHAT MAKES THE DIFFERENCE

- **Versatility and performance in a range of machining operations:** milling, drilling, boring and tapping
- **High chip removal capability** through the rigidity of the machine and a high-torque spindle
- **Machining quality** with a very high degree of precision in contouring and shaping
- **Easy to program with the ergonomic human-machine interface**
- **Excellent price/performance ratio**
- **Compact footprint**



## Big capacities models

### MAIN PROPERTIES

		VX 15	VX 18
X/Y/Z-axis travel	mm	1.510 x 810 x 810	1.810 x 810 x 810
Fast feedrate X / Y / Z	m/min	24	
Table dimensions	mm	1.700 x 810	2.000 x 810
Max. weight allowed	kg	2.000	2.500
Spindle speed	rpm	10.000 / ISO 40	
Power - Torque (S1/S6)	kW - Nm	Siemens : 10,5 - 14,5 / 50 - 69 Heidenhain : 10 - 14 / 64 - 89	
Automatic tool changer		40 pockets	
Positioning accuracy (P)	mm	0,015	0,015
Repeatability (medium Ps)	mm	0,008	0,008
Machine weight	kg	14.500	16.000
Width (doors closed + conveyor)	mm	5.400	6.100
Depth	mm	3.310	3.310
Height	mm	4.000	4.000

Main characteristics of the series. Other variants and accessories optionally available.



VX 18 structure

# DEFYING Time

# KMILL KX K2X

**KX, a timeless name given to the first portal-structured machine and one that still features in the Huron product range. It incarnates the most efficient concept for machining complex parts along three axes, from roughing to finishing.**

This series of machines combines dynamic action and precision for top quality surface finishes, especially for 3D shapes for moulds, forgings and tooling.



## WHAT MAKES THE DIFFERENCE

- **Ribbed cast iron structure** offering high mechanical performance for greater rigidity
- **Excellent absorption of the vibrations** generated by the tough cutting conditions
- **Floor anchoring** to maintain geometric stability and precision over time

## MAIN PROPERTIES

		KMILL 8	KMILL 10	K2X 10	K2X 20	KX 30
X/Y/Z-axis travel	mm	700 x 600 x 500	1.000 x 700 x 600	1.000 x 800 x 500	1.200 x 1.000 x 500	1.800 x 1.000 x 700
Fast feedrate	m/min	X / Y / Z : 40	X / Y : 30 Z : 18	X / Y / Z : 60	X : 50 Y / Z : 60	X / Y : 30 Z : 18
Table dimensions	mm	800 x 600	1.250 x 700	1.150 x 800	1.400 x 1.000	2.000 x 1.000
Max. weight allowed	kg	500	1.500	1.000	2.000	4.000
Spindle speed/taper	tr/min	15.000 / ISO 40		18.000 / HSK 63-A		18.000 / HSK 63-A
Power - Torque (S1/S6)	kW - Nm	26,4 / 26,4 - 84 / 110		25 / 35 - 86 / 120		25 / 35 - 86 / 120
Automatic tool changer		30 logements		24 logements	36 logements	36 logements
Positioning accuracy (P)	mm	X / Y / Z : 0,010	X / Y : 0,015 Z : 0,007	X / Y / Z : 0,004	X / Y / Z : 0,005	X : 0,009 Y / Z : 0,007
Repeatability (medium Ps)	mm	X / Y / Z : 0,005	X / Y : 0,007 Z : 0,005	X / Y / Z : 0,002	X / Y / Z : 0,003	X / Y / Z : 0,005
Machine weight	kg	7.000	10.500	12.500	14.400	17.000
Width (doors closed + conveyor)	mm	4.100	4.590	5.130	4.700	5.480
Depth	mm	2.050	2.840	3.100	4.510	6.310
Height	mm	3.060	3.060	3.400	3.560	3.425

Main characteristics of the series. Other variants and accessories optionally available.

# POWER and rigidity for roughing

# NX

**The NX series of flexible, modular three-axis portal milling centres fulfils the most exacting demands in the field of general mechanical and precision engineering**

Its portal structure, wide distance between uprights and optimized cutting conditions provide an ideal environment for intense, quality machining of large, heavy and complex parts.



## Robust design

- Solid column and portal for greater stability.
- Friction guide ram design for rigidity, stability on machining and the absence of vibration during cutting.
- Balanced Z-axis for fluid axis movement.
- X and Y-axis guide rails for greater productivity and constant precision.

## WHAT MAKES THE DIFFERENCE

- **Robust construction and floor anchoring** to guarantee precision and geometric stability
- **High chip removal capacity on roughing** with the friction guiding system on the vertical axis
- **Large table area and wide distance between uprights** to process the full volume of the workpiece
- **Outstanding accessibility to the table and workpiece** thanks to the tunnel-type shroud
- **Efficient swarf removal**
- **Tilting operator panel**
- **Simpler maintenance**

## MAIN PROPERTIES

		NX 40	NX 50	NX 60
X/Y/Z-axis travel	mm	2.200 x 1.500 x 800	3.200 x 1.500 x 800	3.200 x 2.200 x 800
Fast feedrate	m/min	X / Y : 20 Z : 15	X / Z : 15 Y : 20	X / Y / Z : 15
Table dimensions	mm	2.200 x 1.250	3.000 x 1.250	3.000 x 2.000
Max. weight allowed	kg	6.000	8.000	10.000
Spindle speed/taper	rpm	6.000 / ISO 50		
Power - Torque (S1/S6)	kW - Nm	21,5 / 32,3 - 117 / 170		
Automatic tool changer		24 pockets		
Positioning accuracy (P)	mm	X / Y / Z : 0,020	X / Y / Z : 0,020	X / Y / Z : 0,020
Repeatability (medium Ps)	mm	X / Y / Z : 0,008	X / Y / Z : 0,008	X / Y / Z : 0,008
Machine weight	kg	22.000	25.000	30.000
Width (doors closed + conveyor)	mm	5.200	5.400	6.160
Depth	mm	7.400	9.550	9.550
Height	mm	4.420	4.420	4.420

Main characteristics of the series. Other variants and accessories optionally available.

# Flexible **TURNING**

**The DX 200 two-axis turning centre is ideal for the production of parts in a single setup.**

Particularly flexible and equipped with a turret with tools for drilling, boring and turning operations, the DX turning centre helps to produce with significant time savings. The rigidity and high degrees of positioning accuracy and repeatability make this a cost-effective choice investment that offers excellent value for money.

# DX

## MAIN PROPERTIES

## DX 200

Max. swing over bed	mm	500
Standard/max. turning dia.	mm	200 / 350
Max. turning length	mm	500
Chuck dia.	mm	210
Travel: X/Z	mm	200 / 500
Spindle speed	rpm	50 - 4.500
Spindle nose		A <sub>2</sub> -6
Max. bar capacity	mm	52
Power (S1)	kW	9,2
Torque (S1)	Nm	175
Turret		8 stations - VDI 30

Main characteristics. Other variants and accessories optionally available.



## WHAT MAKES THE DIFFERENCE

- **Robustness and precision**
- Excellent **swarf removal**
- **Electrospindle** with high torque
- **Compact machine**, smaller footprint
- Accessible, **intuitive CNC**
- Simple to program with **ShopTurn**
- Wide range of **productivity boosting options**, such as bar feeder, parts collector, steady rests, etc.

# MULTITASKING *with precision*

**The flexible and rigid AX series has been designed to meet a variety of needs.**

The AX can carry out a number of turning and milling operations. With its driven tools, C axis or Y axis, the AX multitasking centre is perfectly suited to the production of runs of engineering parts for the automotive or hydraulics industries, or precision engineering parts.

# AX

## WHAT MAKES THE DIFFERENCE

- **Rigid, robust monoblock construction** for excellent vibration damping
- Outstanding **surface quality**
- High degree of **accuracy and repeatability**
- **12-station live tool turret**
- **Optimised tool management**
- **High-speed electrospindle** and rigid spindle holder
- **Motorized tailstock**
- **Excellent swarf removal**
- **Compact machine**, smaller footprint
- Accessible, **intuitive CNC**
- Simple to program with **ShopTurn**
- **C-axis and Y-axis**



MAIN PROPERTIES		AX		AX M		AX MY		AX MSY	
		200	300	200	300	200	300	200	300
Max. swing over bed	mm	550	650	550	650	550	650	550	650
Distance over saddle	mm	395	465	395	465	325	375	325	375
Max. turning dia.	mm	370	480	330	420	330	420	330	420
Max. turning length	mm	325 or 625*	600	325 or 625*	600	325 or 625*	600	625	600
X-axis travel	mm	200	250	200	250	200	250	200	250
Z-axis travel	mm	325 or 625*	625	325 or 625*	625	325 or 625*	625	625	625
Z1-axis travel (tailstock or secondary spindle)	mm	330 or 630*	620	330 or 630*	620	330 or 630*	620	630	620
Y-axis travel						+/- 40	+/- 50	+/- 40	+/- 50
Fast feedrate	m/min	X : 24 Z : 35	X : 24 Z : 30	X : 24 Z : 35	X : 24 Z : 30	X / Y : 24 Z : 35	X / Y : 24 Z : 30	X / Y : 24 Z : 35	X / Y : 24 Z : 30
Spindle speed	rpm	5.000	4.000	5.000	4.000	5.000	4.000	5.000	4.000
Spindle nose		A <sub>2</sub> -6	A <sub>2</sub> -8	A <sub>2</sub> -6	A <sub>2</sub> -8	A <sub>2</sub> -6	A <sub>2</sub> -8	A <sub>2</sub> -6	A <sub>2</sub> -8
Max. bar capacity	mm	52	65	52	65	52	65	52	65
Secondary spindle	rpm							5.000	5.000
Spindle nose								A <sub>2</sub> -5	A <sub>2</sub> -6
Turret type		Servo		Live tool		Live tool		Live tool	
Number of stations		12		12		12		12	
Live tool holder				BMT 45	BMT 55	BMT 45	BMT 55	BMT 45	BMT 55
Max. tool speed	rpm			4.500	4.000	4.500	4.000	4.500	4.000
Positioning accuracy (P) X / Z	mm	0,005		0,005		0,005		0,005	
Repeatability (medium Ps) X / Z	mm	0,003		0,003		0,003		0,003	
Machine weight	kg	4.500	6.300	4.600	6.500	4.800	6.500	5.000	6.700
Width (doors closed + conveyor)	mm	2.910	4.770	2.910	4.770	2.910	4.770	3.220	5.050
Depth	mm	1.735	2.050	1.735	2.050	1.735	2.050	1.735	2.050
Height	mm	1.960	2.205	1.960	2.205	1.960	2.205	1.960	2.205

Wide range of productivity boosting options, such as bar feeder, parts collector, steady rests, etc.

\*Depend on clamping, tooling, workpiece



# HURON'S SPINDLES AND ELECTROSPINDLES

## Repair and standard exchange

**HURON, a machine tool manufacturer since over 160 years, has been offering milling centers equipped with spindles and electrospindles for more than 25 years. These are specifically developed for HURON machines.**

Machining operations strongly stress the spindles and electrospindles of your HURON machine tools. To compensate for failures and loss of performance of these working tools, HURON provides a repairing service or a standard exchange of the spindle.

Your equipment thus benefits from the latest improvements and an adapted and quality repair. We guarantee the preservation of productivity through the integration of powerful components of the latest technological generation.

By using our assistance, you are guaranteed to continue to benefit from the high performances of HURON machines. You preserve your productivity and the profitability of your production tools.

Our experts will guide you to the most advantageous solution in terms of price and time for your activity.

### WHAT MAKES THE DIFFERENCE

- **Professional repair by qualified technicians**
- No chrome plating of spindle cone or bearing spans
- No use of non-interchangeable clamps
- Use of last generation spare parts
- Availability of spare spindles for 70% of the spindles equipping HURON KX and VX machine tools
- **Repairing within 10 banking days**
- **Exchange with spindle repaired within 2/3 working days**
- **Total warranty 6 months on complete spindle**, including non-replaced parts (commissioning by an authorized HURON technician)

**HURON has a set of resources, competencies and unique expertise to guarantee the performances of your machines.**

RESOURCES	COMPETENCIES	UNIQUE EXPERTISE
<ul style="list-style-type: none"> <li>• Dedicated environment suitable for repair and maintenance</li> <li>• Complete test bench equipped with a latest-generation NC, specific PLC program, low and medium coolant tank, cooling unit, hydraulic unit</li> <li>• Powerful balancing bench equipped with the latest technologies</li> <li>• Advanced equipment and tools</li> <li>• Stock spare parts supplied directly from the spindle constructor</li> <li>• Permanent storage space for spindles and electrospindles</li> </ul>	<ul style="list-style-type: none"> <li>• Standard procedure in conformity with norms implemented by our experts</li> <li>• Technicians training at spindle manufacturers in their assembly shops and on HURON spindles range</li> <li>• Assembly / disassembly by trained and competent technicians</li> </ul>	<ul style="list-style-type: none"> <li>• Diagnosis expertise</li> <li>• Perfect knowledge of HURON spindles and electrospindles</li> <li>• Repair of known products and controlled processes</li> <li>• Repair according rules of art</li> <li>• Final tests according to manufacturers' control protocols</li> <li>• Geometric compliance according to the manufacturer's standard</li> </ul>

### Sustain your competitiveness with HURON

- Limit downtime and stops of production
- Reduce your maintenance and repair costs
- Optimize the time in production availability of your HURON machine
- Increase the life of your HURON machines
- Reliability of production
- Preserve the legendary accuracy and repeatability of HURON machines
- Strengthen your competitiveness

### HURON, THE INSURANCE TO MAKE THE RIGHT CHOICE



**FAIR PRICE  
GUARANTEED**



**CLEAN AND NEAT  
WORK**



**FREE AND FAST  
QUOTATION**



**MANUFACTURER  
WARRANTY**

- QUALITY**
 **COSTS**
 **DEADLINE**
 **FAST**
 **EFFICIENT**

### Spindle and electrospindle

The spindles and electrospindles that equip HURON milling centers are specifically developed to offer you the **best machining performance**. Performing the repair of the spindles at HURON is the guarantee to benefit from a **unique, durable and reliable expertise**.



Mechanical spindle with belt drive



Mechanical spindle with direct drive



Electrospindle

### WHAT WE DO

- Replacement of wear parts including bearings, pressure gauge and rotary joint (if necessary)
- Check of the clamping force
- Motor steaming and insulation control
- Control of the refrigeration circuit
- Pre-balancing of spindle shafts during assembly
- Lubrication of bearings on test bench, system identical to that in place on our machines
- Encoder control
- Final balancing of assembled spindles on test bench
- Bearings' break-in according to the manufacturer's cycle
- Test of coolant by nozzles on test bench
- Endurance test and vibration control over the entire speed range
- Neat and suitable return packaging, oiled, protective film, dunnage against transport shocks
- Provision of the test and control report, digital archiving and history management

## PRECIPROTECT

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

- Do you simulate your machining process?
- Have you ever damaged clamps, tools or a spindle?
- Do you make complex parts using three or five-axis machining?
- Are you afraid of collisions?

Our machine protection solution allows to conciliate machining efficiency, safety and profitability.

**PRECIPROTECT** is a quick and simple solution that address the day-to-day problem of safe-proofing the machining process, allowing the user to concentrate on producing parts instead of looking for potential collisions.

### Anticipate any form of collision ... the future is now!

Any movement on a NC machine is pre-processed by the look-ahead, which in turns provide the future positions of the axes.

**PRECIPROTECT** uses these future positions to animate a complete virtual model of the machine, thus detecting collisions before they occur, and braking the axes in time before any physical contact.

In concrete terms, the machine cuts in the present while collision-checking the future. Monitoring of tool paths and machine movements is done in real time.

- Real-time monitoring of interference of each axis movement using the current NC program, tool offsets, work offsets and fixture models
- Material removal done on the virtual part with future position, allowing visualization of the machining on the simulation
- High degree of reliability: if a risk of collision is detected, the machine automatically and immediately interrupts any movement

### Efficient and simple

Simple and user-friendly graphical interface combining the Sinumerik Operate operator interface and **PRECIPROTECT** on the same screen, all supporting touch screen gesture.

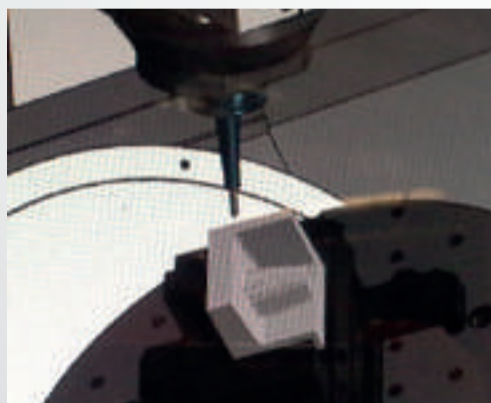
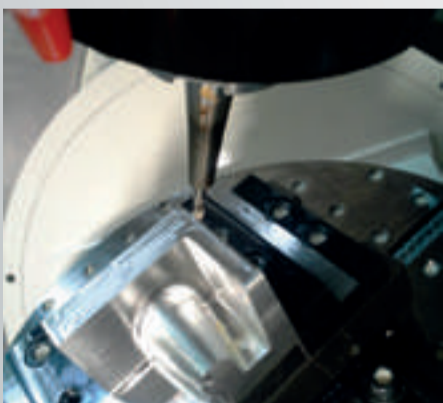
**PRECIPROTECT** comes with the 3D model machine fully implanted and configured.

Automatic loading of data from the NC:

- Tool offsets and geometry
- Work offset
- Kinematic data (calibration can be done with **PRECIFIVE**)

Quick and easy to use:

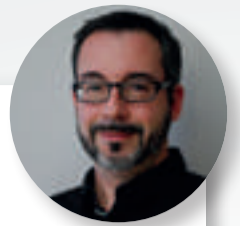
- Import the geometry of tool-holders, blank part and fixturing components
- Position blank part and fixturing components using work offsets (part probe can be used)
- Start machining your part



### WHAT MAKES THE DIFFERENCE

1. **Take advantage of the speed of your machines** without having fear of collision causing a reduction of efficiency
2. **Save time** by starting your machining program straight away without simulation
3. **Increase profitability** while you protect both machine and workpiece
4. **Prevent operator errors** during manual movements
5. **Work with complete peace of mind:** let the machine work unsupervised
6. **Machining of the virtual model of the part:** useful for analysis or to transfer the physical part and its virtual model on a second machine to continue the machining
7. **Get a better view of the matching process:** Orient the virtual machine to get the perfect point of view of the current machining operation.

### IN THE WORDS OF OUR EXPERT



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Increased productivity has become vital for survival in the world of machining. Nowadays, optimizing the machining process calls for knowledge in several areas of engineering, making it complex and costly for businesses.

To give our customers the support they need to face this challenge, we are developing a set of features designed to boost productivity and profitability while optimizing precision. Each cycle developed deals with one complex technical issue. Ultimately, the programmer – or the operator – has an intuitive interface to implement complicated concepts simply and effectively. These cycles combined with our milling centres' capabilities make Huron equipment more efficient and benefit the automation of manufacturing processes.

//

Yan Boutin  
Head of CNC Applications at Huron

### MAIN FEATURES

#### Protect your machine

- No collision
- No repair costs
- No expensive downtime
- No operation loss
- No delivery delays to customers
- Conserve machine accuracy

#### Save time

- No simulation required
- An industrial computer take care of the simulation

#### Protect your workpieces

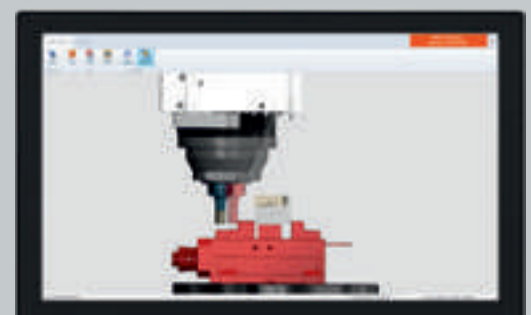
- No scrapped pieces
- Integrity of pieces
- Ideal for both complex, expensive single parts and small runs
- Protect your profits
- Protect your customer

### Real-time computation

- Movements are allowed when no collision is detected in the future



- The detection of an imminent collision, in automatic or manual mode, triggers an immediate and automatic stop of the movements of the machine



## PRECILIFE

### or how to manage tool life automatically ?\*

Provides automatic tool checking and measurement, performed at tool change or at a user specified time intervals. If critical wear or a broken tool is detected, the system automatically triggers the user selected response, either the replacement of the tool or stopping the program.

**PRECILIFE** 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.

\*Only with 3 axes machines, spindle in vertical position

## PRECIPOWER

### or how to optimise roughing operations ?

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. Material removal rate is maximized, resulting in a more efficient machining process. On five axis machines, the feedrate of rotary axis is also adapted to prevent any rotary axis overload.

## 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.

## PRECIBALANCE

### or how to detect unbalance on mill-turn machines during turning operations ?\*

Provides automatic measurement of the unbalance of the part and its clamping devices, and computes the required counterweight that bring the rotating components within the required balance tolerance. Different scenarios of mass and mounting location are offered to allow flexible use. Validation of the resulting is done by repeating the measurement to evaluate the residual unbalance.

\*Available only with MX «MT» with SIEMENS 840D SL.

## TELEDIAGNOSTICS

### or how to improve machine availability and saving significant amounts of time and money ?

Remote maintenance is not a mere gadget – it's a genuine investment! Increase your equipment's uptime by activating remote monitoring, complete with quick, accurate diagnostics and 'online' repair operations.

- All telephone line or systems/Internet connection charges are to be met by the customer.

- This service is provided free of charge during the warranty period. An annual subscription fee applies thereafter.

#### MAIN PROPERTIES

- **Increased machine availability.**
- **Lower hourly rate** (also applies to all other service operations over the year).
- **Rapid remote diagnostics** by our qualified staff, leading to shorter downtime.
- Reduced diagnostic and maintenance times: **lower service costs and increased productivity!**
- **Avoids** machine shutdowns.
- Connection via modem, Internet or telemaintenance (VPN).

#### MAIN FEATURES

- Automated tool measurement, inspection and replacement done in the machining process
- No change to the NC program, only a single cycle call required
- Better surface finish and accuracy as tool is replaced when needed
- Configurable wear and breakage detection tolerance, as well as check intervals and behaviour for out-of-tolerance tools
- Allows for automatic replacement of tools

#### MAIN FEATURES

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

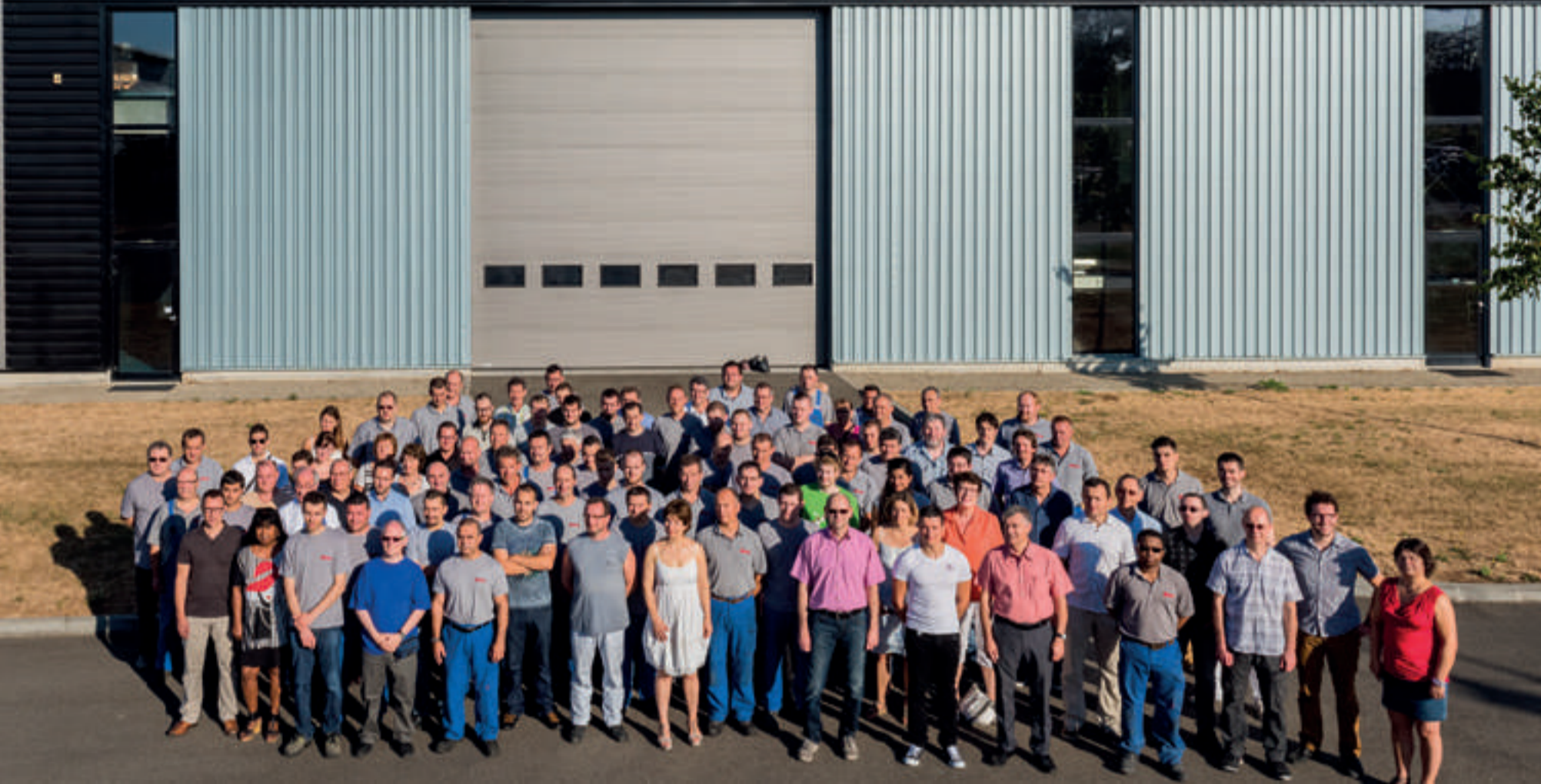
#### MAIN FEATURES

- Quick, accurate, repeatable and automated measuring system
- Optimized machining accuracy
- Compensation of the thermal expansion of the machine
- Reduces rejected parts
- Rapid evaluation following a machine collision (use **PRECIPROTECT** to prevent collisions from happening)
- Control report generated automatically at each use – historical data allows for trend analysis

#### MAIN FEATURES

- Automated balancing of the workpiece and clamping assembly
- Reduction of vibrations from weight distribution providing higher accuracy and better surface finish
- Reduced wear of the mechanical components of the machine





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