

K Range

» High performance milling systems »

KR 199



FIDIA

Why FIDIA



Milling Head

FIDIA Delivers:

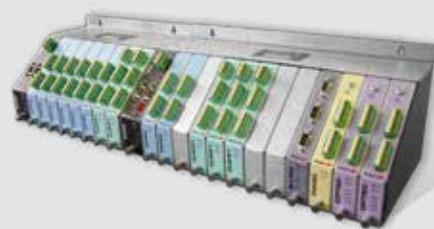
The complete system, designed and made by FIDIA.
Machine, Head, Controls, software and automation from one supplier.

The Customers benefit:

- One Partner in Sales and Service
- Flexibility and Fast reaction time
- Modern, Steady and Reliable design
- All components fits together and perfectly optimized
- Unique CNC and Software Solutions
- Wide Customized engineering on demand



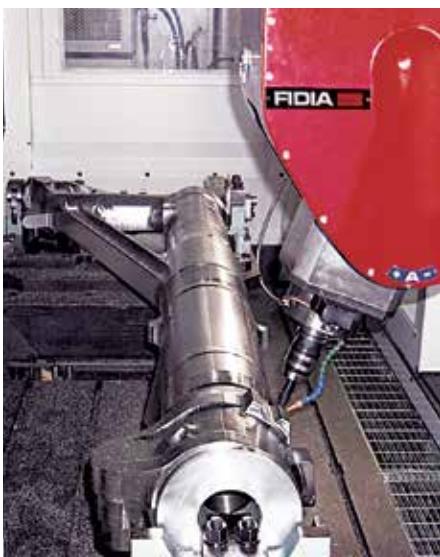
Drives



Module Interface IO-Line



HMS
Head Measuring System



Years of investment in research and development have led to Fidia's success in the high-speed milling sector right from the early 90s.

A reduction in machining times and hand finishing is the most significant result, to which may be added the possibility of working with very hard materials, simplifying production cycles and producing parts just one set-up operation.

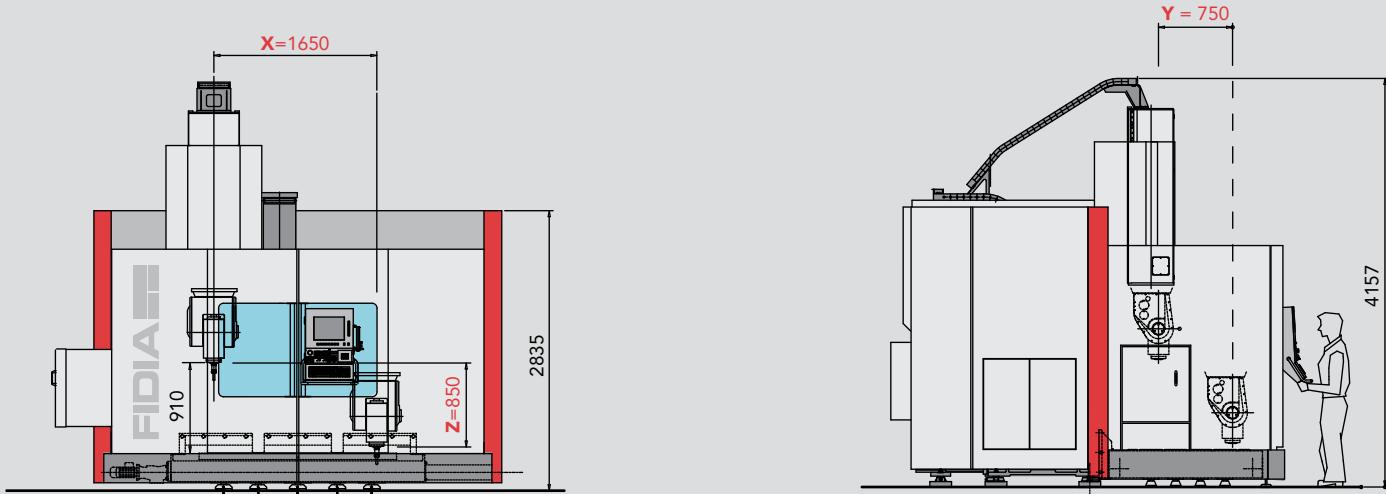
Only specifically designed machine tools can guarantee, at the same time, high feeds, accuracy and surface quality.

The K211 and K411, Fidia's high-speed milling centres, are used in the production of moulds and dies for the automotive industry (body parts and large plastic components, such as dashboards and bumpers); steel dies for tyres and light alloy moulds for prototypes; components for the aeronautical industry, turbines and compressors; complex resin models or for styling applications; ceramic or composite components for the aerospace industry.



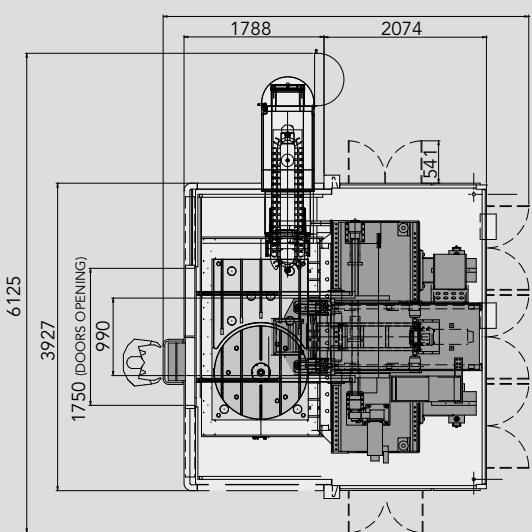
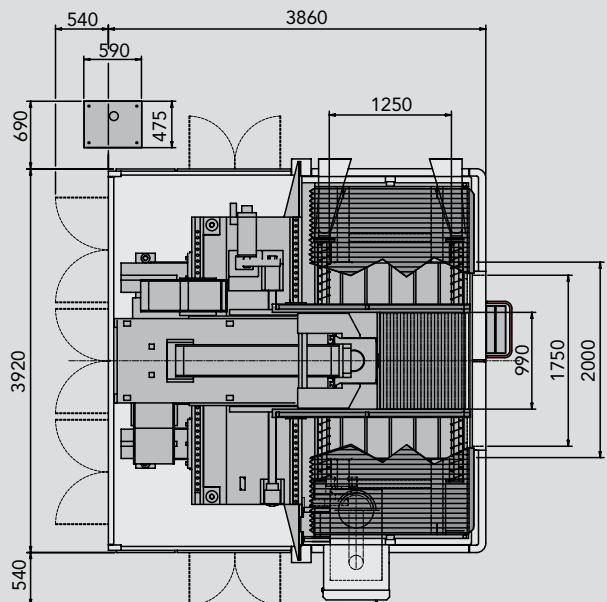
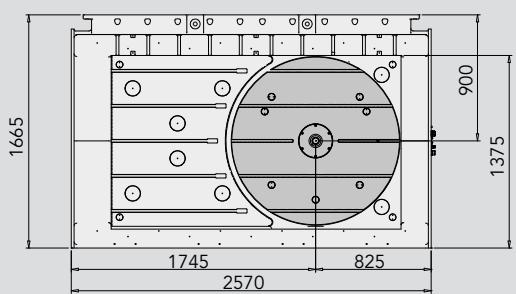
K199 - KR199

K199



Cinematic chains with refrigerated motors, ball-screws and bearings prevent from thermal drift anomalies.

KR199 - 1200



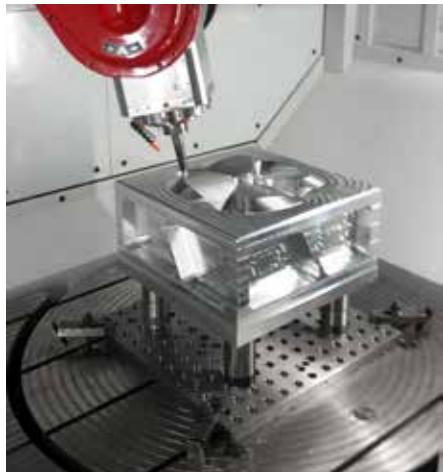
Technical data		K199	KR199	
Linear axis travel				
X (*)			1650 mm (65")	
Y (*)			750 mm (29.5")	
Z			850 mm (33.5")	
Linear axis speed				
X Y Z			30 m/min (1181 ipm)	
Positioning accuracy				
X Y Z		± 0,005	± 0,005	± 0,004 mm ± .0002" ± .0002" ± .00015"
Work-piece table: U axis	2000 x 1250 mm (79" x 49")	Ø 1200 mm (47")	1300 x 1300 mm (51" x 51")	1600 x 1600 mm (63" x 63")
T-Slots	n° 5 - pitch 250 mm (10")	18 mm (0.7")	18 mm (0.7")	22 mm (0.86")
Loading capacity	12000 kg (26455 lbs)	3500 kg (7700 lbs)	6000 kg (13300 lbs)	9000 kg (19900 lbs)
Fixed part	-	1250 x 2000 mm (49" x 79")	-	-
Tool magazine				
No of positions		24 - 42 - 60		

(*) +150 mm (6") rotating the C axis with vertical spindle

KR199

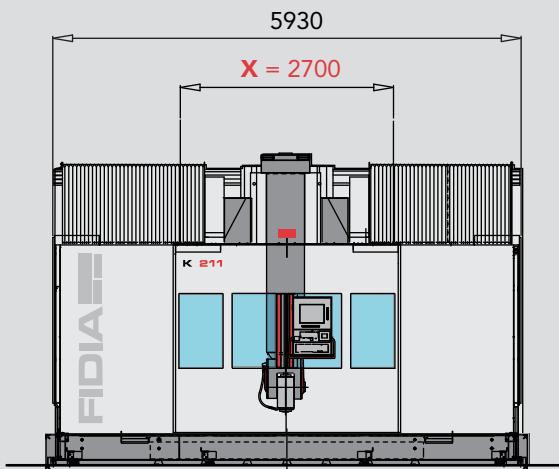
A remarkable increase of the operating volume is obtained by integrating rotary tables guided by a NC management of the 6th and 7th axis. The coordinate systems always refer to the piece being machined in any allowed position.

The 5-side access to the part to be machined, and the prearrangement for pallet systems are KR199 main advantages.

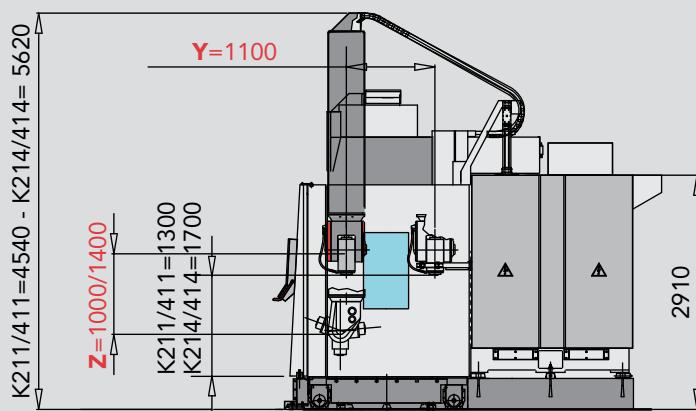
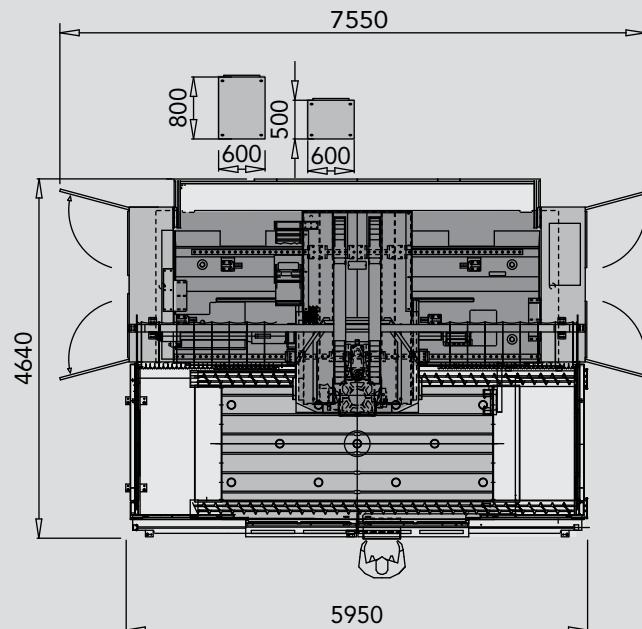


K211/214 - K411/414

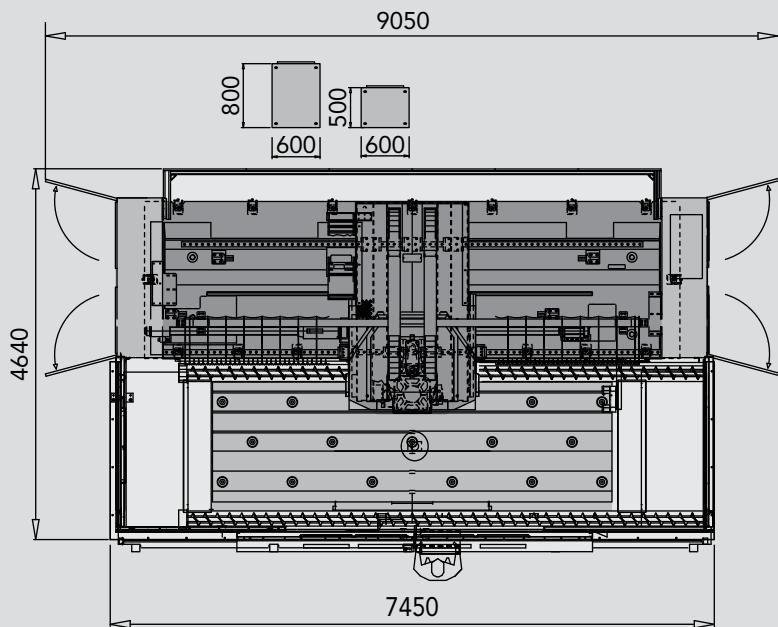
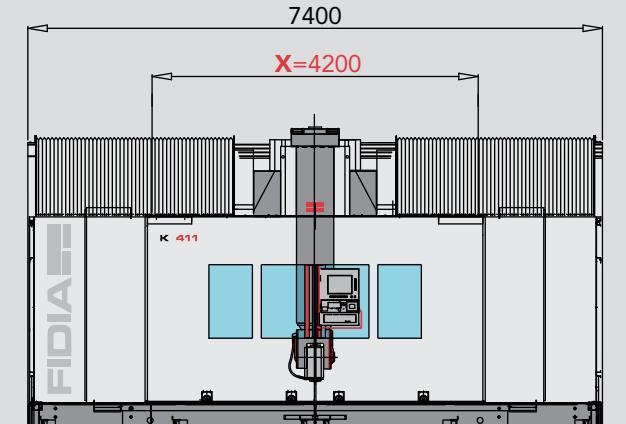
K211 K214



K series with X modular axis can optionally be equipped with Rack and Pinion, driven by two motors preload system.



K411 K414



Technical data	K211/214	K411/414
Linear axis travel		
X (*)	2700 mm (106")	4200 mm (165")
Y (*)		1100* mm (43")
Z		1000/1400 mm (39"/55")
Linear axis speed		
	X	Y
	50 m/min (1968 ipm)	40 m/min (1575 ipm)
		30 m/min (1181 ipm)
Positioning accuracy		
X Y Z	± 0,006 ± 0,005 ± 0,004 mm (± .00024" ± .0002" ± .00015")	± 0,0075 ± 0,005 ± 0,004 mm (±.0003" ±.0002" ±.00015")
Work-piece table:		
Dimensions	3500 x 1500 mm (138"x 59")	5000 x 1500 mm (197"x 59")
T-Slots		n° 6 - pitch 250 mm (10")
Loading capacity	22000 kg (48501 lbs)	32000 kg (70547 lbs)
Tool magazine		
No of positions		42 - 84
Weight		
	26000 kg (57319 lbs)	32000 kg (70547 lbs)

(*) +150 mm (6") rotating the C axis with vertical spindle

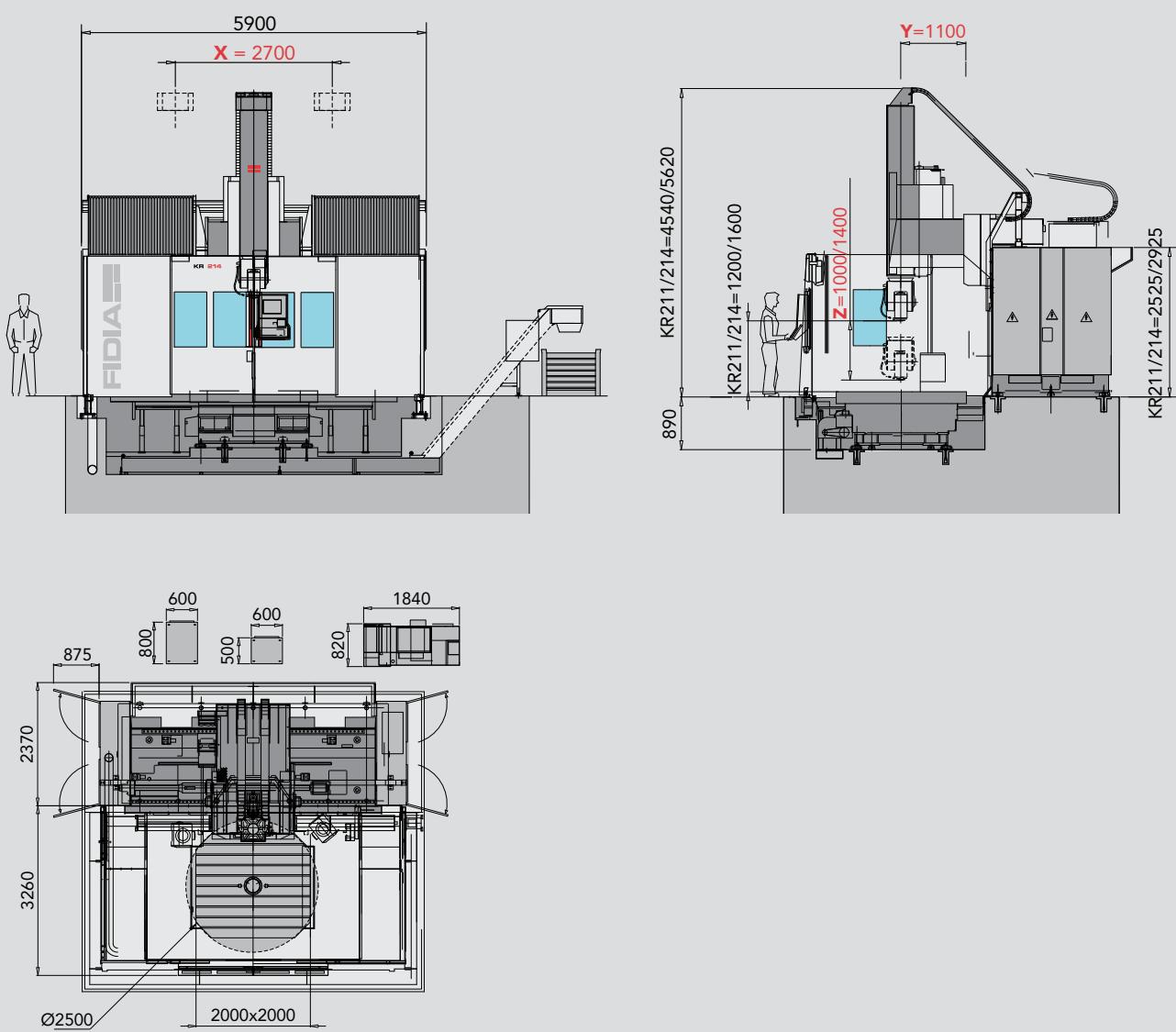




Machining of large dies and extra-dimensioned components are carried out efficiently by the KR configurations.

The use of the 6th axis as rotary workpiece table guarantees max accessibility from all sides. Head and table combined rotations are automatically handled by the NC by rotating the system coordinates.

In just one placement it is possible to operate on a such working area that is usually offered only by bigger gantry machines.



Technical data	KR211	KR214	
Linear axis travel			
X (*)	2700 mm (106")		
Y (*)	1100 mm (43")		
Z	1000 mm (39")	1400 mm (55")	
Linear axis speed			
	X	Y	
	50 m/min (1968 ipm)	40 m/min (1575 ipm)	
		Z	
		30 m/min (1181 ipm)	
Positioning accuracy			
X Y Z	± 0,006	± 0,005	± 0,004 mm
	(± .00024")	(± .0002")	(± .00015")
Rotary table: U axis			
Dimensions	2000 x 2000 mm (78.7" x 78.7")		
T slots	28 mm pitch 200 mm (8")		
Max load	12000 kg (26400 lbs)		
Clamping torque	35000 Nm		
Driving torque	21000 Nm		
Tool magazine			
No of positions	42 - 84		
Weight			
	38000 kg (83774 lbs)	38500 kg (84877 lbs)	

(*) +150 mm (6") rotating the C axis with vertical spindle

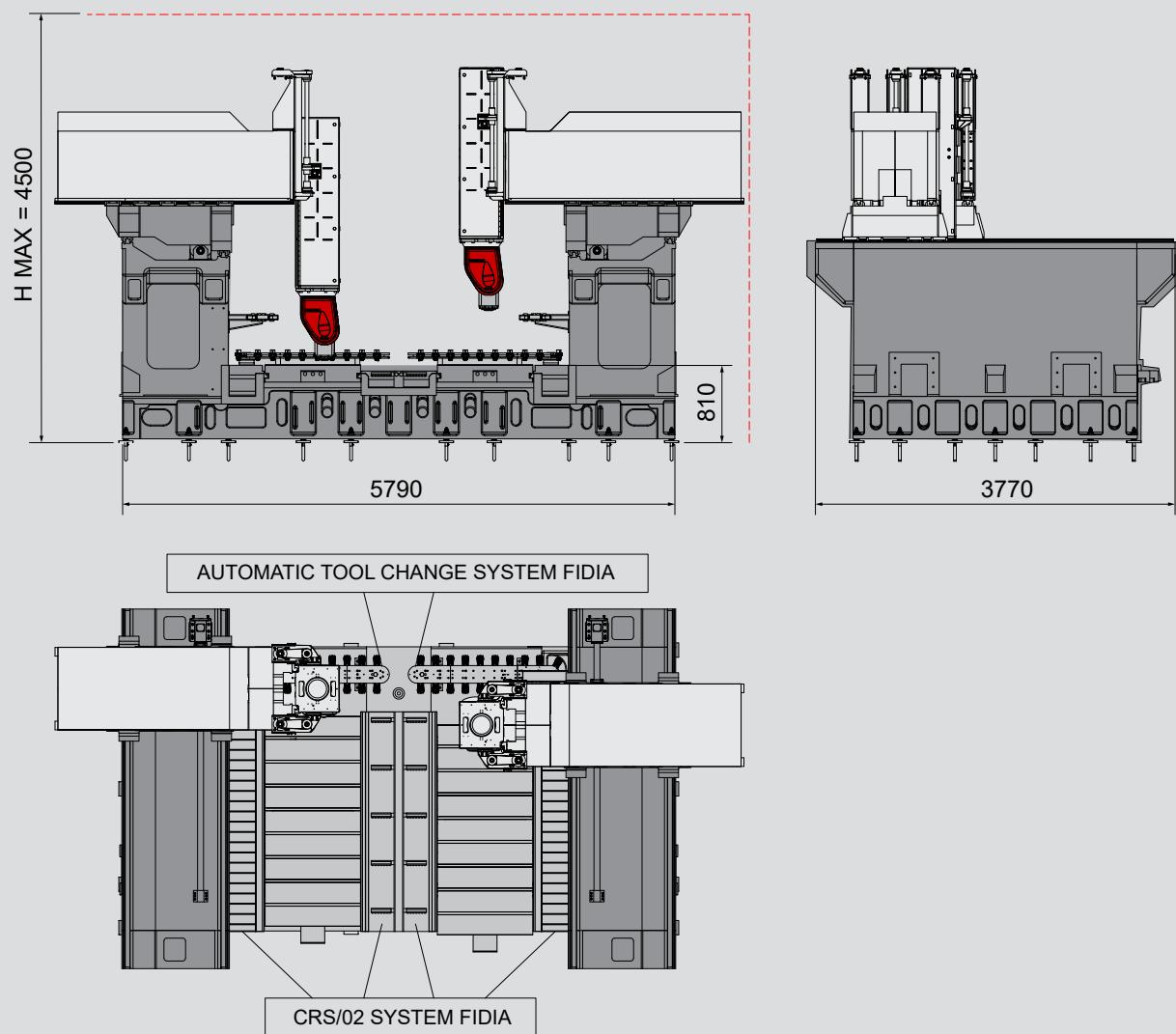


2 - K2010/M



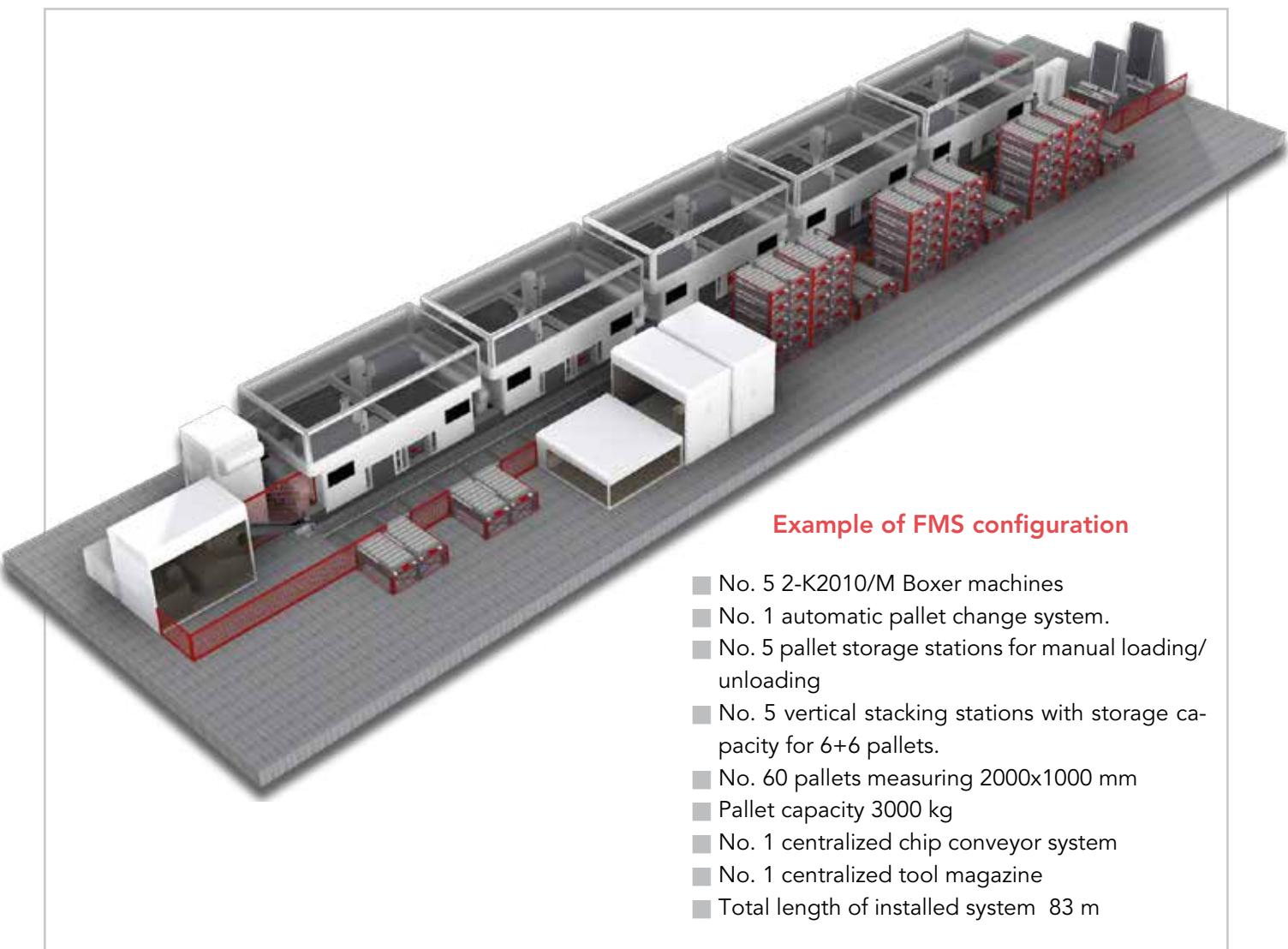
FIDIA's experience as the sole supplier of an overall solution has made possible this particular configuration: two standard systems, with a shared cast iron table, doubling productivity with respect to other gantry systems having a similar work volume.

This Boxer configuration lends itself to optimum integration with FMS. Each K2010 module draws on the features and basic structure of the K Series.

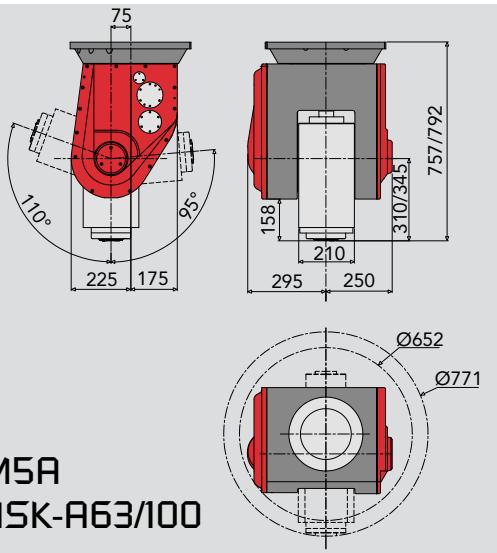


Technical data		K2010/M
Linear axis travel		
X (*)		2000 mm (79")
Y (*)		1000 mm (39")
Z		600 - 850 mm (23" - 33")
Linear axis speed		
X, Y, Z		24 m/min (945 ipm)
Positioning accuracy		
X, Y, Z		± 0,005 mm (± .0002")
Work-piece table:		
dimensions		2000 x 1000 mm (79"x39")
T-Slots		n° 7 passo 250 mm (10")
loading capacity		7000 kg/m ²
Tool magazine		
No of positions		24 - 42

(*) +150 mm (6") rotating the C axis with vertical spindle



Continuous bi-rotary heads



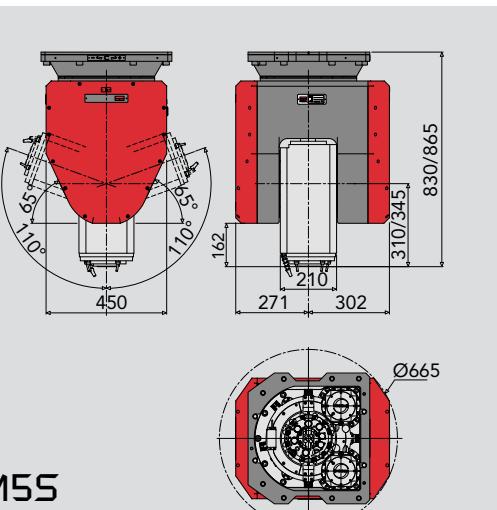
Series K machine tools are provided with continuous, powerful, compact birotary heads. A and C axes can machine both through-high-dynamics-continuous interpolation, and through the positioning mode, with the operator interactive command. In case of heavy duty removal operations, the axes can be stiffly clamped by means of powerful hydraulic brakes.

Fidia head, equipped with a built-in spindle driven through a synchro motor, is provided with servomechanisms (automatic backlash recovery), and it is able to perform 0.001° resolution positionings for any type of machining: both 5-axis roughing and finishing operations. Its compact structure eases the tool access to the most critical surfaces.



M5A - Bi-rotary fork type

	M5A/55-24	M5A/55-20G	M5A/65-15	M5A/65-12G
A axis travel		+95° ÷ -110°		
C axis travel		± 360°		
A, C max continuous speed		5400 °/min		
Max spindle speed	24000 1/min	20000 1/min	15000 1/min	12000 1/min
Max spindle power	55 kW	55 kW	65 kW	65 kW
Max torque	67 Nm	67 Nm	95.5 Nm	95.5 Nm
Toolholder	HSK-A63	HSK-A63	HSK-A100	HSK-A100



M55 - Bi-rotary fork type

	M5A/55-24	M5A/55-20G	M5A/65-15	M5A/65-12G
A axis travel		± 110°		
C axis travel		± 360°		
A, C max continuous speed		7920 °/min		
Max spindle speed	24000 1/min	20000 1/min	15000 1/min	12000 1/min
Max spindle power	55 kW	55 kW	65 kW	65 kW
Max torque	67 Nm	67 Nm	95.5 Nm	95.5 Nm
Toolholder	HSK-A63	HSK-A63	HSK-A100	HSK-A100

Technical solutions

Fixed bed structure

The choice of a fixed bed structure was determined by the following criteria:

- constancy of the forces independently of the weight of the workpiece, allowing for optimum milling quality;
- optimum visibility of the part being machined;
- wide range of possibilities for customization.

The "high bed" version allows for a reduction in the moving masses giving superior dynamic performance.

The bed is made in cast iron, while the mobile parts of the equipment of the 3 axes are made of steel in order to obtain the best mass-rigidity ratio.

The fixed cast iron worktable is suitable to grant high loading capacities.

The components

The generous dimensions of the guides and the high number of rolling shoes give the system a balanced rigidity.

The digital technology used for the axis drives optimizes the machine dynamic behaviour, resolution and machining accuracy.

Maximum accuracy and its maintenance over time are guaranteed by the direct type transducers for both linear and rotary axes.

Thermal stabilization

The significant reduction in thermal drift, ensuring greater accuracy during long finishing and re-machining operations, is achieved thanks to a controlled temperature circuit acting on the machine's most sensitive parts.

Dust suction unit

An adequate cleaning system protects the machine components as well as its working area. The system efficiently captures and removes volatile substances. Specific covers and pressurized solutions allow for the machining of high abrasive materials such as ceramics and carbon fibres.

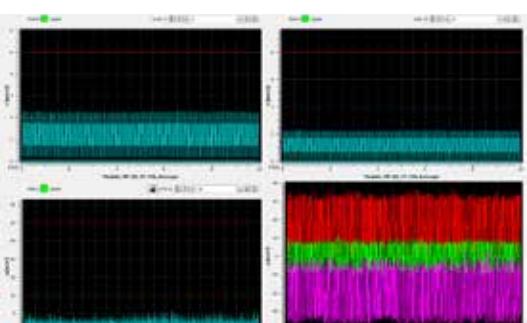
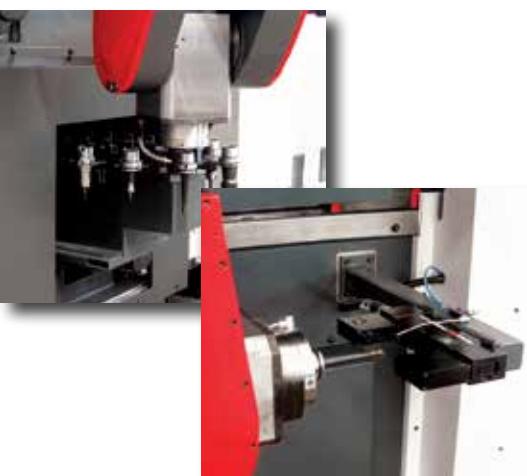
Tool magazine & Presetting laser

The machine is equipped with an automatic tool changer with 24 or 42 positions, an automatic opening safety door and an external opening for the loading and unloading of tools.

A laser measuring system checks length, diameter and tool shape under real operating conditions.

Vibration monitoring system

The spindle is equipped with an accelerometer to measure vibration, in order to check tool unbalancing or breakage. Two vibration speed thresholds are available: warning threshold and alarm threshold. The vibration value is monitored and displayed on the CNC video.



C20 & C40 Numerical Controls

C20

The C20 fulfills the highest demands for complex applications where a 5-axis HSC machining with RTCP and a large number of drives (gantry, tandem, multiple axes) must be managed simultaneously. The C20 controls are always equipped with high-level hardware to continually increase performance. The current version includes multi core processors and Windows® 10 operating system.

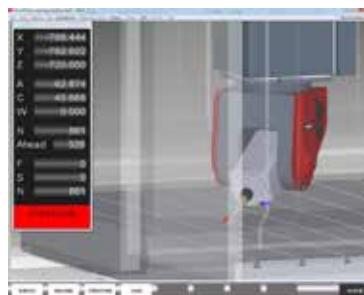
The user interface allows the operator to work with the maximum flexibility in any machining condition: programs coming from CAM systems, 5 axes machining with RTCP function, mechanical machining such as slots, threads and pullers programmed directly on board of the machine by using ISOGRAPH. Velocity Five™ look ahead algorithms and the combination with the Xpower™ drives technology allow the best speed and quality of machining bringing them even closer to excellence.

C40

C40 control, available as an option, is the high-end CNC for 5 axis and HSC machining.

High processing speed allows C40 control to run the standard ViMill® machine protection suite, preventing possible collisions between machine tool components, through a dynamic collision check.

The ViMill® full version with total collision check, including the milling part, is available as an upgrade option to the standard protection.



HPX21 – Portable pushbutton panel

The HPX21 portable pushbutton is the comfortable solution to manually move the machine. One electronic handwheel, 16 pushbuttons and 2 overrides for feed rate and spindle speed are used to operate close to the working area.

HMS™ – Head measuring system

The HMS™ system is a device designed to measure and compensate error on continuous and indexed bi-rotary heads, and on roto-tilting tables. The HMS™ is a device designed for measuring and checking continuous, indexed bi-rotary heads and roto-tilting tables.

HMS™ is a high-precision instrument and provides an alternative to the traditional checking method using dial gauges.

It has many advantages:

- a drastic reduction in checking time;
- measurement of all head and/or table positions;
- measurement of RTCP parameters;
- automatic insertion of correction values in the CNC;
- a full report of the measurements taken and the corrections made.



HiMonitor – Machine Monitoring System

To make the most efficient use of the machine tools in the workshop and to improve the production process, FIDIA has developed two advanced software modules:

- machine Monitoring System, that detects the different machine tool and CNC activities, records them and generates on screen or printed reports;
- monitoring System on WEB, that allows the machine tool status to be checked from a remote device, such as a phone, tablet or PC.

Working jointly, the modules allow for close workshop monitoring, accurate cost calculations, smooth manufacturing and extremely efficient interventions.



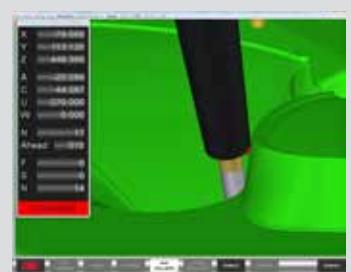
ViMill®

ViMill® is an anti-collision system incorporated in the C40 control that prevents collision between the machine tool components and the part being machined, and consists of two modules.

The standard Machine Protection module prevents any possible collision between machine tool structures, such as the head, tool and table both during automatic machining and manual movements.

The complete ViMill module includes the following features:

- total anti-collision with reference to machine tool components, the part being machined and clamping equipment;
- anti-collision during manual movement by the operator;
- off-line simulation of a part-program checking for any possible collisions;
- automatic management of Numerical Control tool data;
- graphic display of movements in 3D and in real time.



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