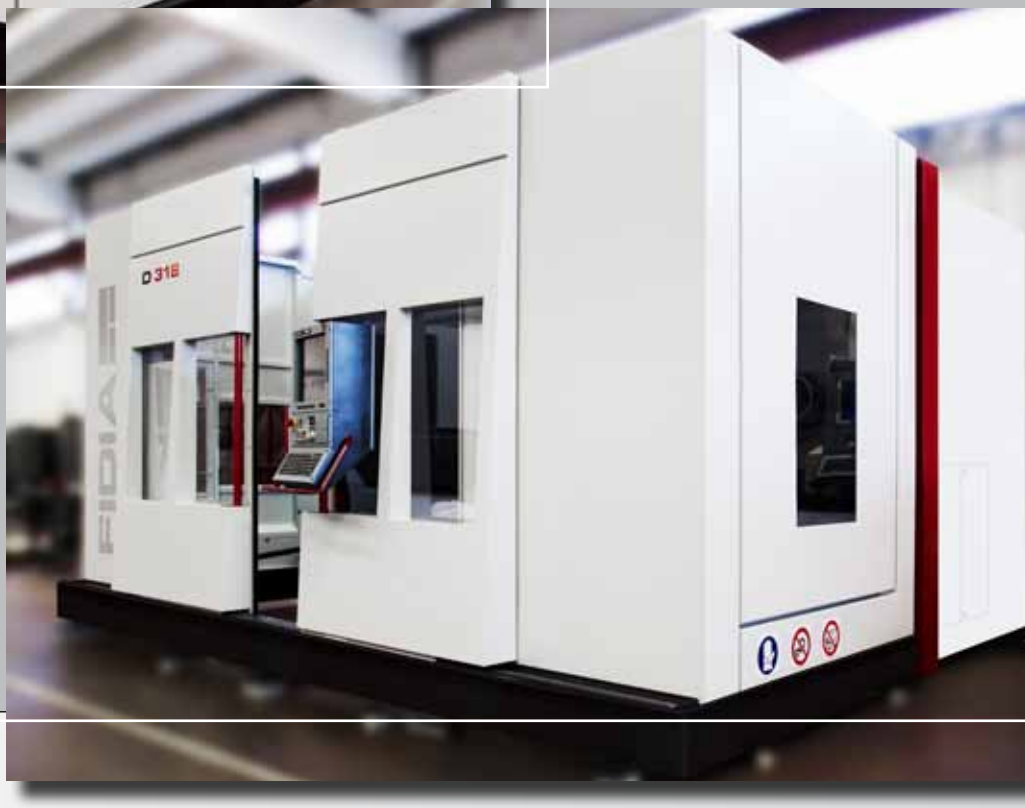
D218/318/418

High speed machining centres

FIDIA

Giving shape to design

D 318



innovative

technology

Counting hundreds of satisfied customers world wide, the D218, D318 and D418 models of Fidia 5-axis high-speed milling centres have been recently renewed to keep granting the best return on investment upon machine size.

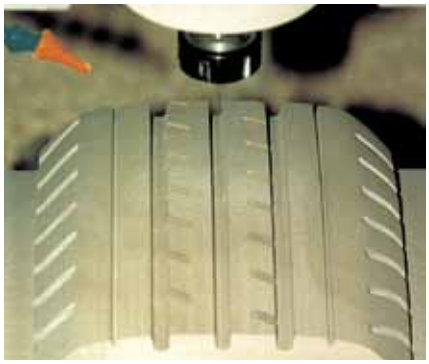
The "D" family offers nowadays an enhanced cinematic delivering up to 22 m/min cutting speed; the new Z axis counter-balance system, together with active cooling system aboard nuts and Y axis motor, grants superior accuracy.

Strongly reliable as usual, the machine structure, system layout and body design delivers high-level dynamic performance, while the proprietary 5 axes continue or 3+2 indexed heads and first class spindles confirms its versatility and its effectiveness.

forward-thinking solutions for demanding applications

Fidia has been a firm believer in high speed milling and has dedicated years of continuous research to the development of machines that have successfully operated worldwide since the early 90s. Continued market growth confirms the validity of the choices made by Fidia.

Whether it's a 5 axes machining or a 3+2 indexed axes operation, high speed means high cutting speeds and fast spindle rotation. The resulting high axis feeds can only be maintained by specially designed machines in order to guarantee precision and surface quality simultaneously. An initial result is a reduction in machining and manual finishing times. But high speed also means being able to machine very hard materials and thus simplify production cycles avoiding those time consuming mid operations imposed by conventional machining.



Designed for high speed machining, the D218, D318 and D418 applies for:

- finishing of plastics injection moulds and die-casting dies
- production of aeronautic structural parts in aluminum
- machining of graphite electrodes and resin models
- accurate machining of part with complex geometries such tyres moulds, jet engine disk slots, …

fixed

bed

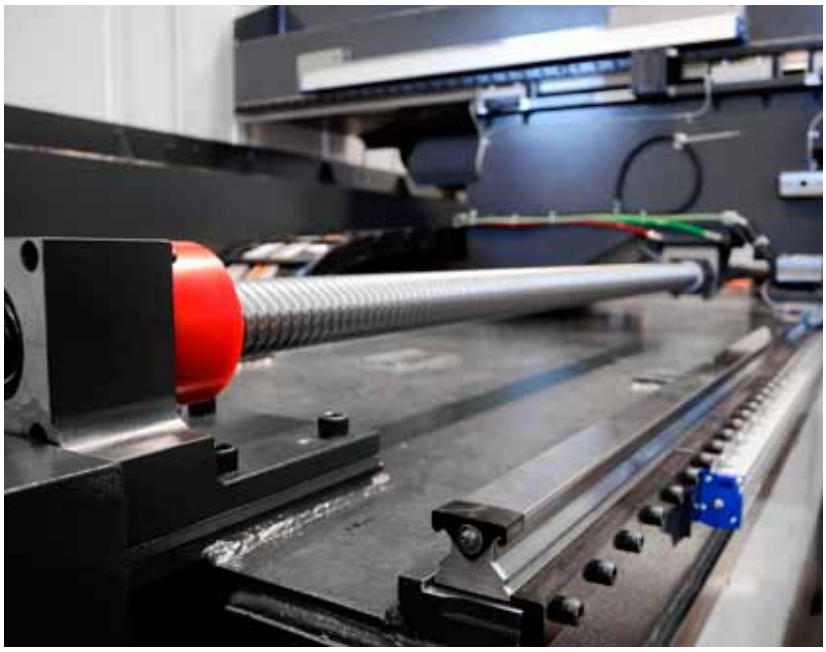
structure

The technical solutions

The criteria that have determined the choice of a fixed bed structure are:

- constancy of the forces at play, that allows the machine to exploit the full potential of motors and drives indipendently of the work-piece weight
- maximum accessibility
- ample scope for customization
- containment of overall machine tool dimensions

The "high bed" solution allows for a reduction in moving masses, particularly of the X axis, and results in superior dynamic performance.



Milling heads

The most suitable configuration for specific requirements can be selected from the different versions available:

- indexed bi-rotary head with high speed spindle and HSK50E toolholder;
- compact continuous bi-rotary head for high speed spindles and HSK40E toolholders.

The full 5 axes continuous head hosts ceramic ball bearings and liquid cooled electro-spindle up to 32,000 rpm. Privileged applications are complete machining of light materials, and finishing operations on steel.

The 3+2 indexed head offers 22kW high torque electro-spindle, allowing higher removal cutting on steel and other iron-based materials.

Spray-mist tool lubrication is provided standard.

Indexed bi-rotary head

continous bi-rotary head

Components

The linear axis slides have roller bearings to allow for high feeds and to reduce friction. Friction can cause errors at inversion of movement, as well as overheating of the machine structures.

The axis drives use digital technology with the following advantages:

- optimization of the dynamic behaviour of the machine tool;
- improvement in resolution and machining accuracy.

The linear axis transducers are the direct type in order to guarantee maximum accuracy and maintain this accuracy over time.

Axis are driven by re-circulating ball screws and brushless motors. Technology for the vectorial control used for the spindle drives gives an excellent performance even at low rotations.

Automatic tool change

The automatic tool changer is incorporated in the machine tool bed and is protected from swarf and coolant. Tools can be loaded in complete safety from the left part of the machine in masked time.

Tool presetting

Automatic presetting of tool length on the machine simplifies tooling procedures for new machining operations or when replacing worn tools.

Indispensable for unmanned operations, tool presetting is available either in a digital probe version or with a focused laser probe. In addition to verifying tool length, the focused laser system checks tool diameter and shape.

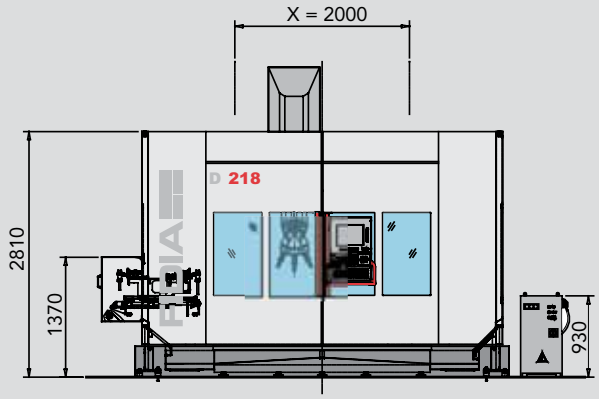
Dust suction unit

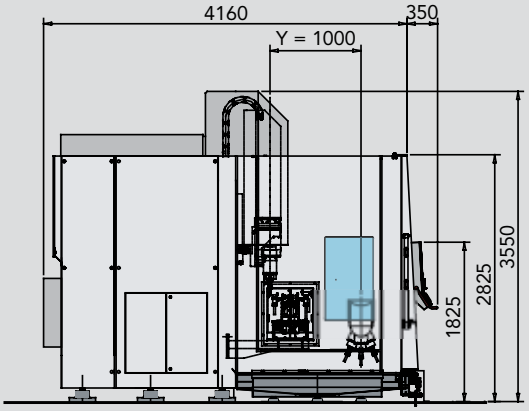
Essential when machining graphite or resins, the dust suction unit consists of a high capacity suction device mounted externally to the machine.

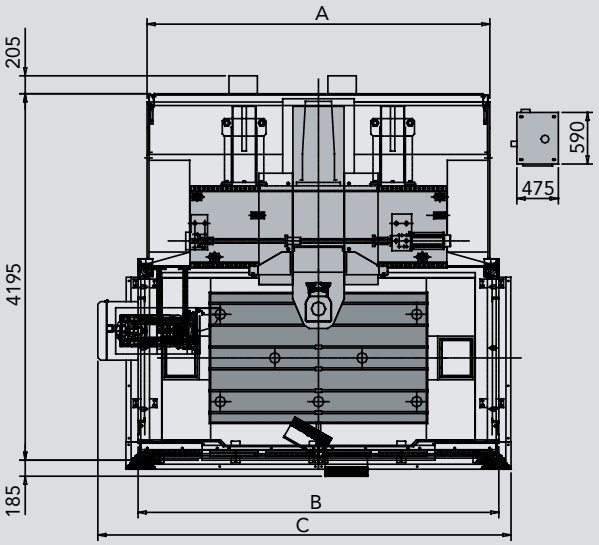
The suction device is equipped with self-cleaning filters, offering a high degree of filtration, that are able to operate in the presence of explosive dust.

The suction device is connected by means of special tubing to the manifold inserted in the basement of the machine.

The machine tool structure, with the slides located far away from the work area and the total absence of moving parts below the work surface, make the D218 and D318 particularly suitable for this application.





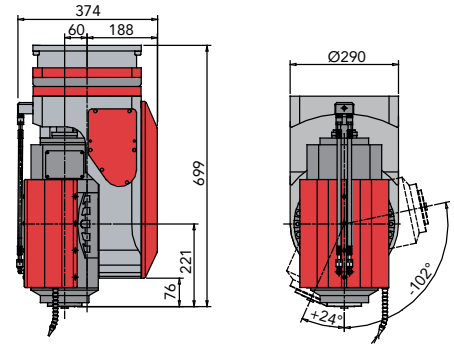


(mm)	D218	D318	D418
A	3925	4925	6075
B	4130	5130	6280
C	4595	5595	6745

Technical data	D218	D318	D418
LINEAR AXIS TRAVEL			
X	2000 mm (78”)	3000 mm (118”)	4150 mm (163”)
Y	1000 mm (39”)		
Z	800 mm (31”)		
LINEAR AXIS FEED			
X	22 m/min (866 ipm)	22 m/min (866 ipm)	22 m/min (866 ipm)
X Y	22 m/min (866 ipm)		
TOOL MAGAZINE			
	20 positions		
MAIN OPTIONS			
	swarf conveyor		
	suction system for graphite dust		
	digitizing		
	ViMill® 3D simulator with Virtual Look Ahead		
WORK TABLE			
LENGTH	2500 mm (98”)	3500 mm (137)”	4500 mm (177”)
WIDTH	1500 mm (59”)		
T SLOTS	n° 6 pitch 250 mm (9.8”)		
MAX. LOAD	10000 kg (22046 lbs)	14000 kg (30864 lbs)	18000 kg (39683 lbs)

Indexed bi-rotary head

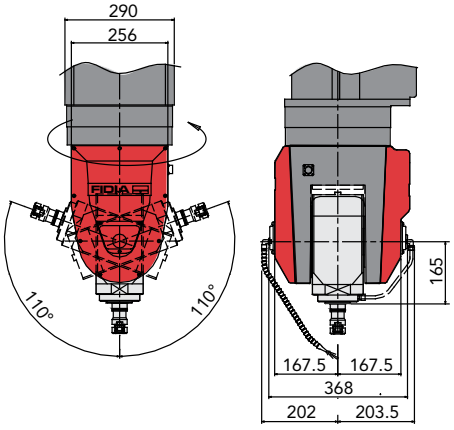
B AXIS TRAVEL	- 102° / +24°
B AXIS PITCH	3°
C AXIS TRAVEL	- 177° / +180°
C AXIS PITCH	3°
MAX. SPINDLE SPEED	30,000 rpm.
CONTINUOUS MAX. POWER (S6)	22 kW
TOOLHOLDER	HSK50E



Indexed bi-rotary head

Continuous bi-rotary head

B AXIS TRAVEL	± 110°
C AXIS TRAVEL	± 360°
MAX. AXIS FEED	5000°/min
MAX. SPINDLE SPEED	32,000 rpm
CONTINUOUS MAX. POWER (S6)	7,5 kW
TOOLHOLDER	HSK40E



Continuous bi-rotary head

The C20 numerical control

The Fidia C20 numerical control takes full advantage of the potential offered by combining the performance of the Dual Core and the RISC Power PC processors. It is conceived to manage the most sophisticated high-speed applications running at 5 axes with RTCP. It is equipped with Windows XP Professional operating system in multitasking mode.

Simple and reliable machining

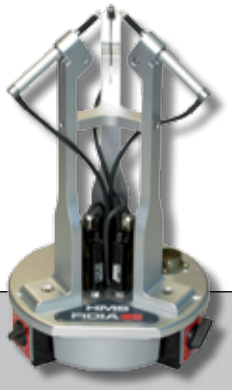
Fidia controls have always been appreciated for their high level performance and for the comprehensive range of features supplied. The user interface environment allows to operate with the maximum flexibility in any machining condition: program coming from CAM systems, 5 axes machining with RTCP function, mechanical machining such as slots, threads and pullers programmed directly on board of the machine by using ISOGRAPH.

High speed milling

Speed and quality of machining of sculptured surfaces are the most well known and appreciated features of Fidia controls.

The combination of Fidia controls with the Xpower technology drives increases more than ever milling performances bringing them towards even closer to excellence.

The direct access to all the drive's parameters enables to control the motors and, therefore, the axes, in the best possible way even in the most critical condition of use.



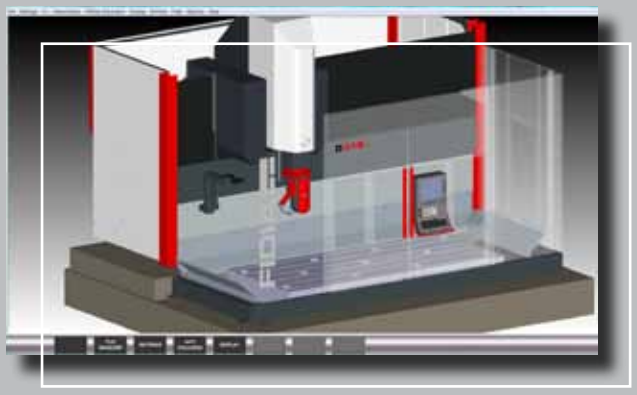
HMS – Head measuring system

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.

Easy to install and use, HMS can also be used by operators with no particular expertise.



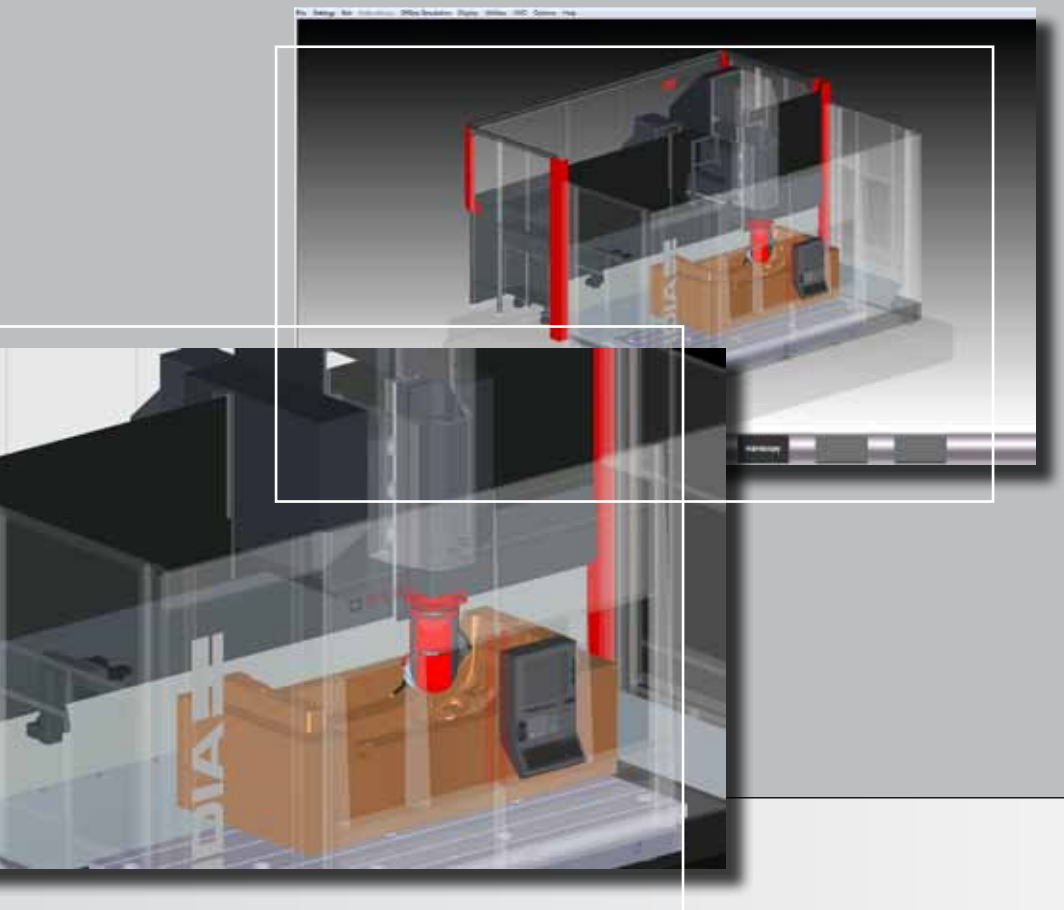
ViMill®

ViMill® system allows the machine operator to visually check any possible collision or unexpected movements between tool, head and machine with the actual workpiece *during the real milling process.*

In fact, even if the part program has been duly verified with off-line simulation solutions, many CNC parameter settings can produce machine movements that are not possible to check using conventional off-line methods.

Using ViMill® function, the operator can visually check all axes and movements at the most critical time, just before pressing start.

Besides, "like in a moviola video", using the CNC handwheel or the jog push buttons, the operator can virtually move the machine, back and forward, according to the selected part program with the actual set of CNC parameters and tools value defined.



ViMill® executes 3, 4 and 5 axis machining with considerable time and cost reduction, as it allows:

- ☐ real time collision check between the tool, the rough model and the reference model (crash detection);
- ☐ over/under cut detection (gouge detection).
- ☐ real time crash prevention during manual movements by jog or handwheel.

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