



# PF



CNC Machining Centres

**C.M.S. S.p.A. Costruzioni Macchine Speciali**

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# CMS: Worldwide Leader in the Construction of Numerically Controlled Machining Centers for the Woodworking Industry

Since 1969, CMS has built special machines for the wood-working industry. CMS was one of the first companies that applied computerized numerical control systems to wood-working machinery, making greater productivity and flexibility possible.

Over the years, CMS has grown to become a large group of many companies, gaining international recognition as a leader in manufacturing CNC machining centers, with production and commercial units both in Italy and abroad. The structural and functional characteristics of CMS machines also make them well-suited for machining plastics, composites, and light non-ferrous metals.

## Innovation and Reliability: a Winning Manufacturing Philosophy



The manufacturing philosophy of CMS is based on simple concepts:

- **A modular de-signed system:** technology groups de-signed to be suitable for different types of machines which guarantees that even "custom-tailored" machines have the reliability of widely proven technologies;
- **Attention to technological evolution:** advanced technologically and innovative choices use components that correspond to the highest market standards;
- **Research to yield the performance, corresponding to client's requirements:** CMS machines are designed to provide high productivity, flexibility, and low operating costs; these machines are built to do complex work, but are easy to use and simple to control always reliable and safe.

## Twenty Years of Experience, More Than 2.500 Machining Centers Installed

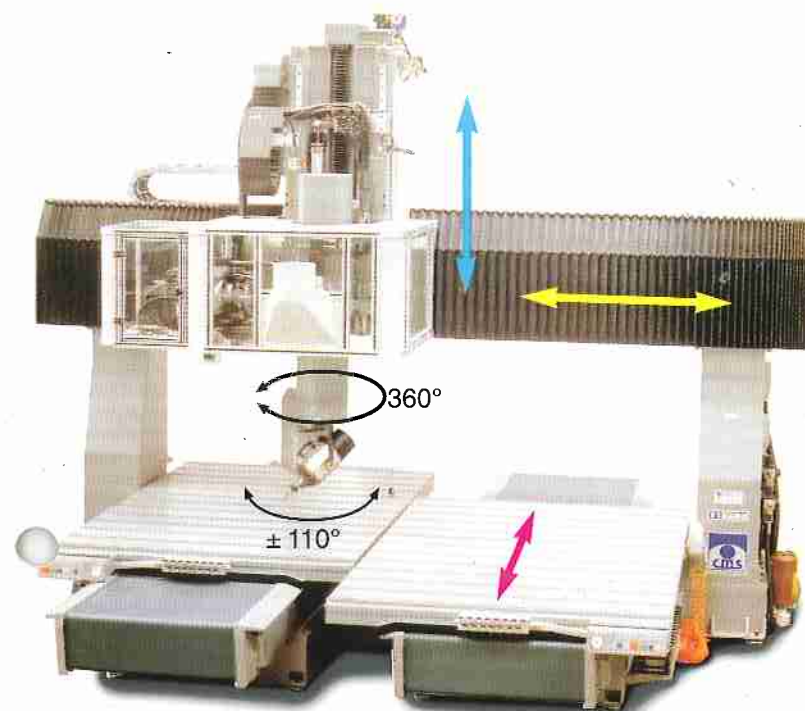
Experience and a strong presence in all the most important international markets attest to the high professional ability of CMS. CMS Group is all inclusive, incorporating design, engineering, software development and programming, installation and full support (independent of outside companies). That's, why CMS can quickly answer any specific customer's requirement and guarantee the quality of a total solution. This forms the foundation of the CMS success, a success confirmed by more than 2.500 installed machining centers in many different fields and for the most diverse applications, a success demonstrated by complete satisfaction of many CMS customers.

## The PF Series: the Solution for Any Requirement

The PF series machining centers are characterized by a fixed bridge structure. The bridge provides X, (longitudinal) and Z, (vertical) axes movements. The Y, (transversal) movement is carried out by the work table.

All building components of CMS machining centers are designed as modular groups. For this reason, the number of configurations that can be obtained using the fundamental elements bases, beams, tables and working units are nearly "infinite". All of these factors enable CMS to cover a wide range of requests for special applications.

CMS can fully satisfy any customer's needs by designing a completely new machine, or simply by designing new individual groups or new configurations that use modules already existing. This allows CMS to offer favorable prices and short delivery times.



## Structure: Absorbs the Highest Vibrations

The rigid and robust machine structure, made of welded and stabilized steel, is able to absorb high vibrations caused from heavy and rapid machining.

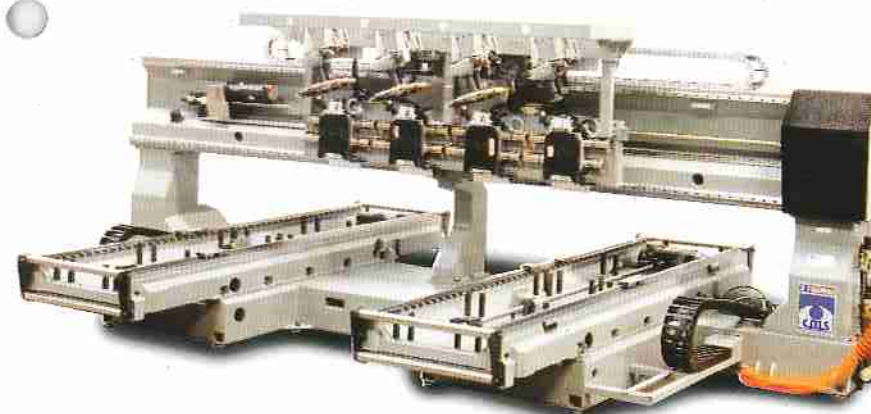
The bridge provides X, (longitudinal), and Z, (vertical), axes movements. The Y (transversal) movement is carried out by the work table. The single piece axis slideways are hardened, ground, and mounted on recirculating ball bearing blocks, guaranteeing optimum movement and precision.

The movement is controlled by AC brushless type servomotors driving preloaded precision recirculating ball screws.

The Z axis movement is supported by pneumatic cylinders and has an automatic braking system in case of electrical failures.

All machines are equipped with:

- a digital, static frequency converter, which allows for continuous adjustment of the machining spindle rpm; this converter is complete with a programming system which has an incorporated keyboard for the best use of the spindle power
- a controlling device, that can be configured for the maximum revolution speed of each tool
- a centralized lubricating system that automatically greases the sliding components
- vacuum pumps of high capacity and high depression
- a dust extraction system, tailored to deliver the best extraction of chips
- a connection for the compressed air, controllable via CNC, for clamping and other functions.





## Automation and Software Integrated Systems

CMS machining centers are driven by numerical controls which represent the best brands available on the market, these control have been specifically designed for diverse applications.

A team of skilled engineers makes and installs the machine logic (PLC) on different selected controls the customer's specifications.

All numerical controls include the following functions:

- graphic visualization (also available in color) and tool path process simulation
- a large user's memory
- spiral interpolation
- a serial interface for external communication including software align bullets
- parameteric functions
- guided menu selection
- tool radius and length compensation
- brief description of the tool path for the simple generation of part programs.



## CMS Software Originates in CMS

CMS has its own Internal Software Division that has developed different software packages (CAD CAM), as well as real support tools for the generation of CNC programs.

The software combined with coordinate measuring machines (digitizing tables, 2D, and 3D) make programming possible for even very complex profiles.

The CMS-TOOLS package has the biggest advantage of any capability of the CMS machining center; it carries out unique machining requirements and capitalizes the customer's technological KNOW-HOW.

Moreover, CMS has created software packages for specific products, such as wooden staircases, kitchen tops, gunstocks, etc.

The Software Division is able to develop personalized software and postprocessors both for CMS machining centers and machinery of other brands.



## Personalized Training

CMS, thanks to its technical instruction staff, offers the customers' personnel personalized training at any level from the basic concepts for machine programming and functioning to advanced programming and use of auxiliary software.

Custom-tailored manuals, available to the customers at no charge, enable the user to work autonomously.



## Skilled and Prompt Customer Service

CMS provides free telephone assistance to permit customers to locate and resolve any eventual problem immediately.

The technical staff will provide assistance to the customer within 48 hours after the call. Modern service is also available to permit the transmission of information from any of our assistance points. The CMS warehouse provides spare parts in a short time. Programming service is also available to provide custom programs for extremely complex parts and to advise the most suitable use of the machines.



## Technological Product Improvement: Quality that Lasts

CMS is Technical and Automation Departments assist the customer in the study and application of new solutions on CMS machines already installed. This permits the technological improvement of a machine to meet new requirements. CMS machines never become obsolete.



## Quality Without compromise

All "PF" machines have a rigid and sturdy structure as well as high quality electronic and mechanical components.

The quality and precision of processing operations, just like the reliability and dependability of the machine, are achieved through widely proven solutions that answer to the essential concepts of functionality, solutions where quality comes before economy. The maximum guaranteed performance is achieved well below the working limit conditions.

## "Special" is Standard

The "PF" series is the starting point for the development of personalized solutions able to meet all the objectives requested by the customers.

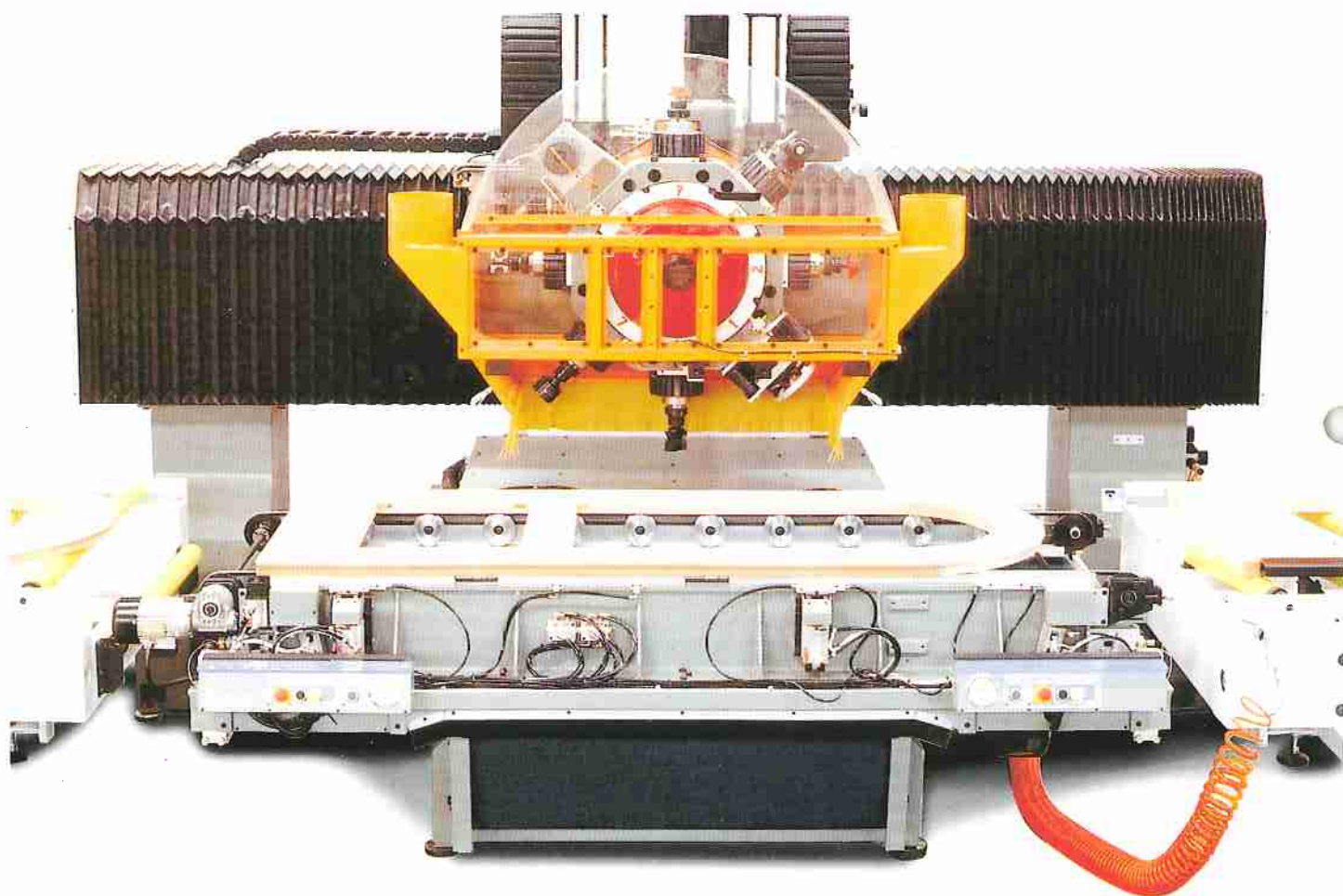
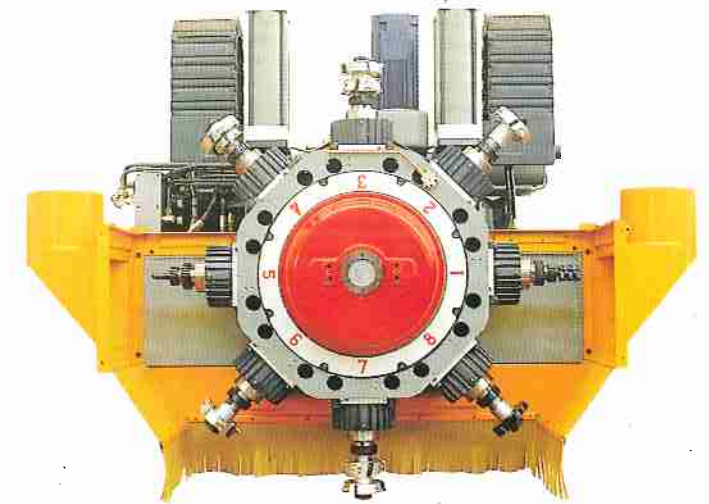
Over the years, many machine configurations which as "special machining centers", have become, to their ability to fulfill the most common user's requirements, this is due "standard" machines.

## Working units

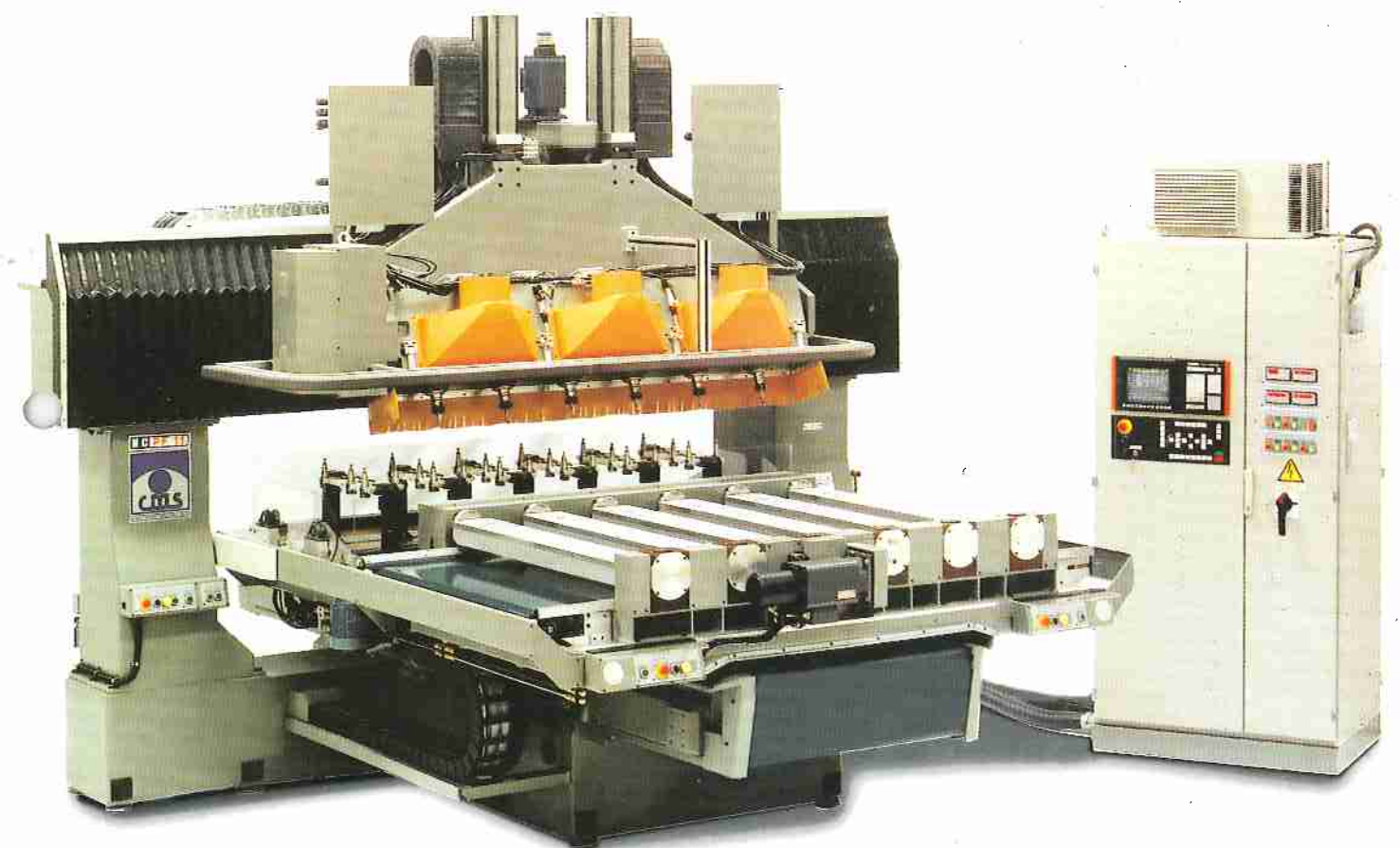
### Revolver: the Quickest Tool-changer

The revolver is a rotating drum having a number of faces (4, 6, and 8 sides), each of this is equipped with an electrospindle.

A revolver is the most rapid, secure, and reliable tool-changer available. Every single tool or aggregate has its own motor with the most suitable power characteristic, torque, and rpm. Moreover, the revolver can have one or more stations with a numerically controlled 4th axis for operating a horizontal unit or vertical copying device.



PF R8



PF 6M



## T12/18

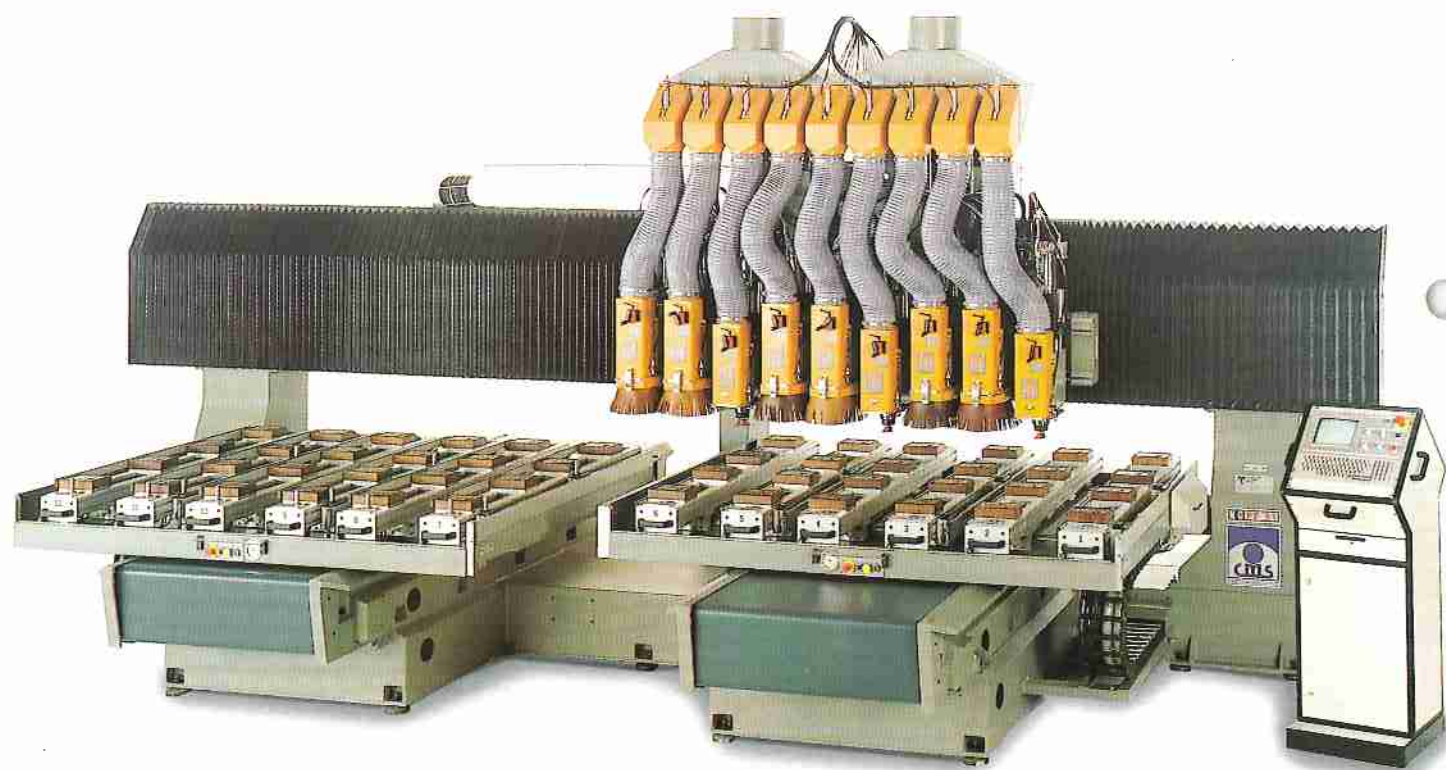
A series of working heads (up to 9), is available to allow the machining of a number of parts at the same time and/or one after the other in combined cycles. Each head has an individual, pneumatically-controlled insertion movement, micrometric adjustment of the working position, hand-adjustable center distance, and the ability to float.



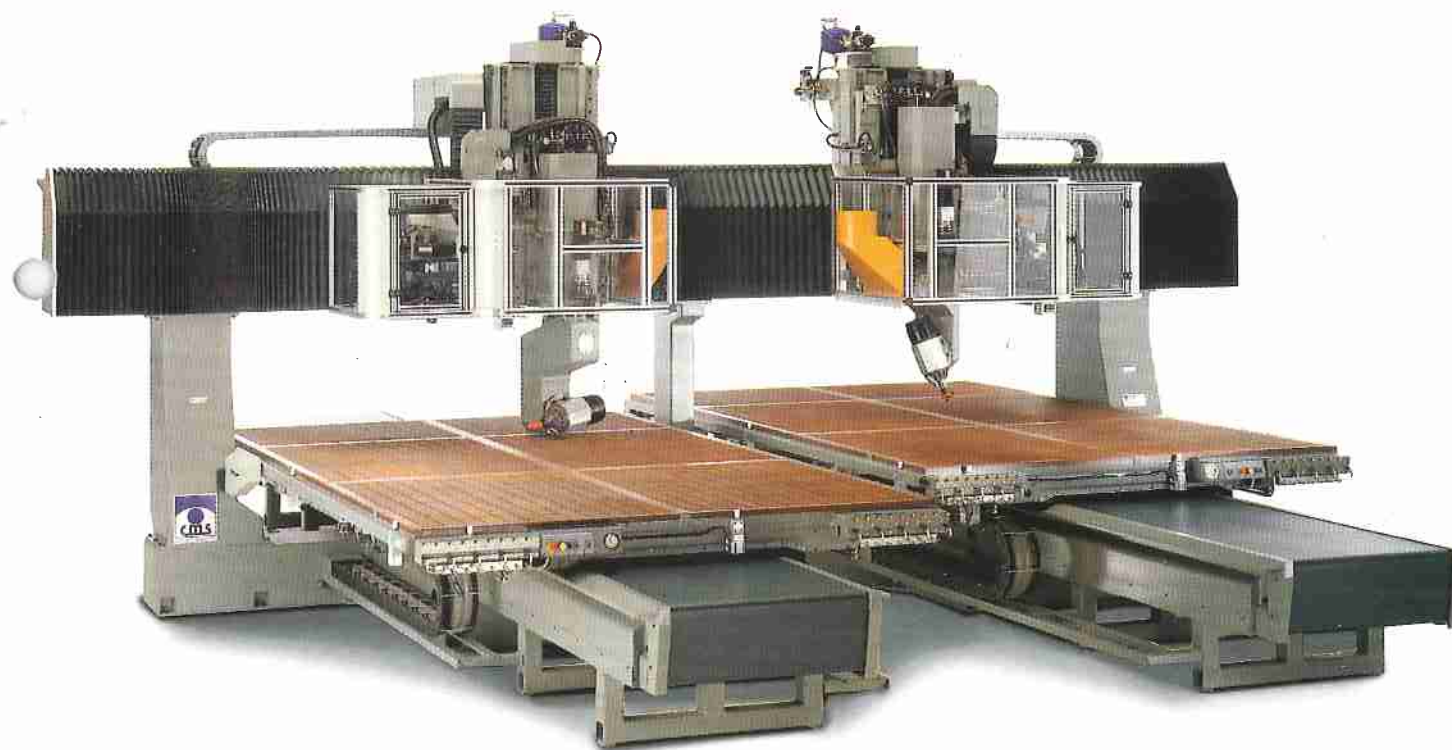
## Universal Head "TU" and "TU-CU": Machining Not Limited by Form

The universal head is a working unit having 5 axes all simultaneously controlled via CNC, providing the inclination and orientation of the cutter throughout any direction. The spindle may come with a double exit or automatic tool-changer, complete with a tool-holder magazine with up to 16 positions.

This unit is indispensable for machining molds, complex shapes, artistic sculptures, and when the spindle must provide specific inclinations and be manageable at the extremes.



PF 9T

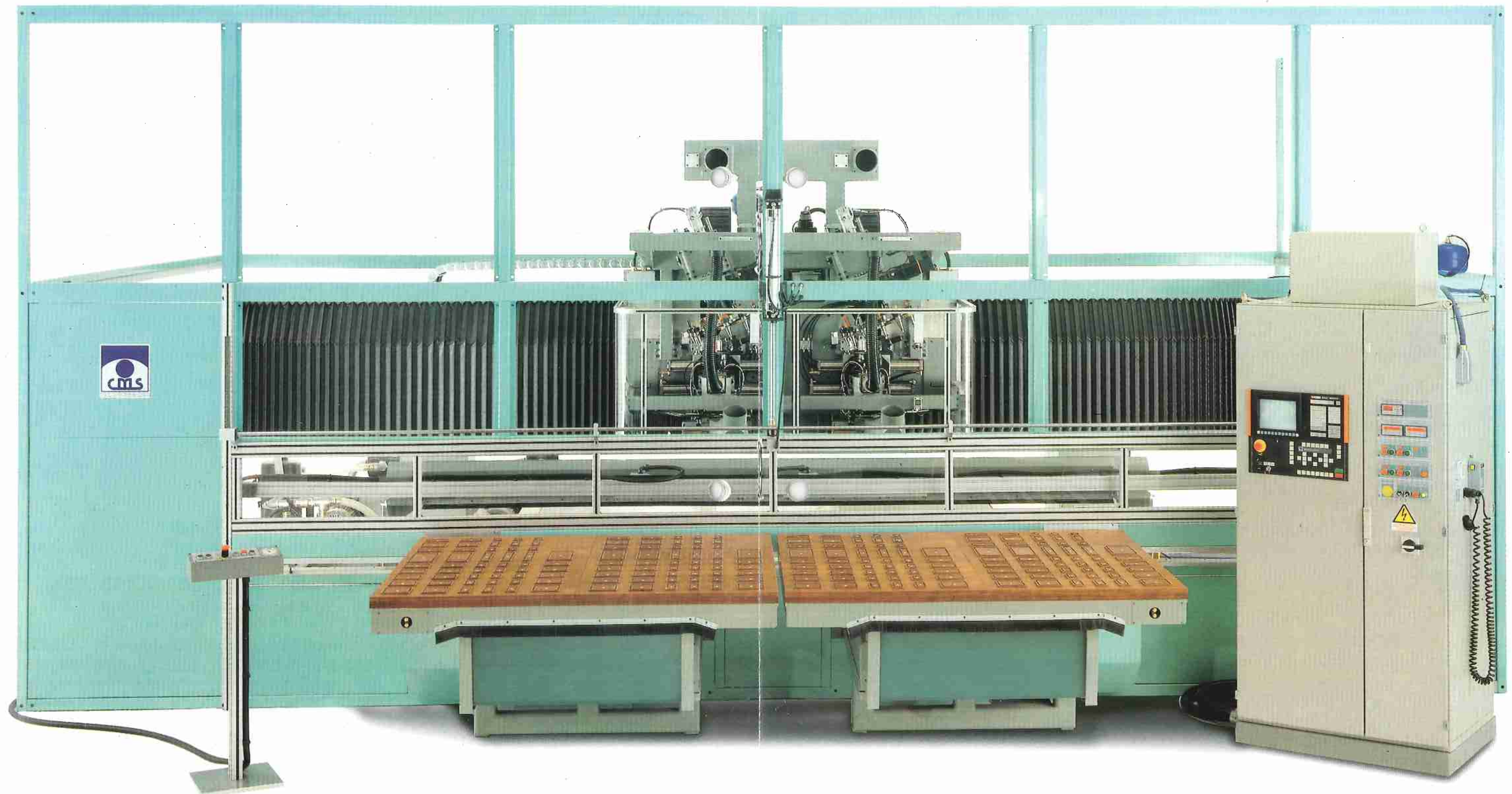


PF 2TUCU



## **SAFETY SAFEGUARDING WORK**

All machining centers can be equipped with a sound-proof safety cabin, which maintains the high level of productivity while ensuring maximum safety and environmental protection.



**PF 2TRCU**

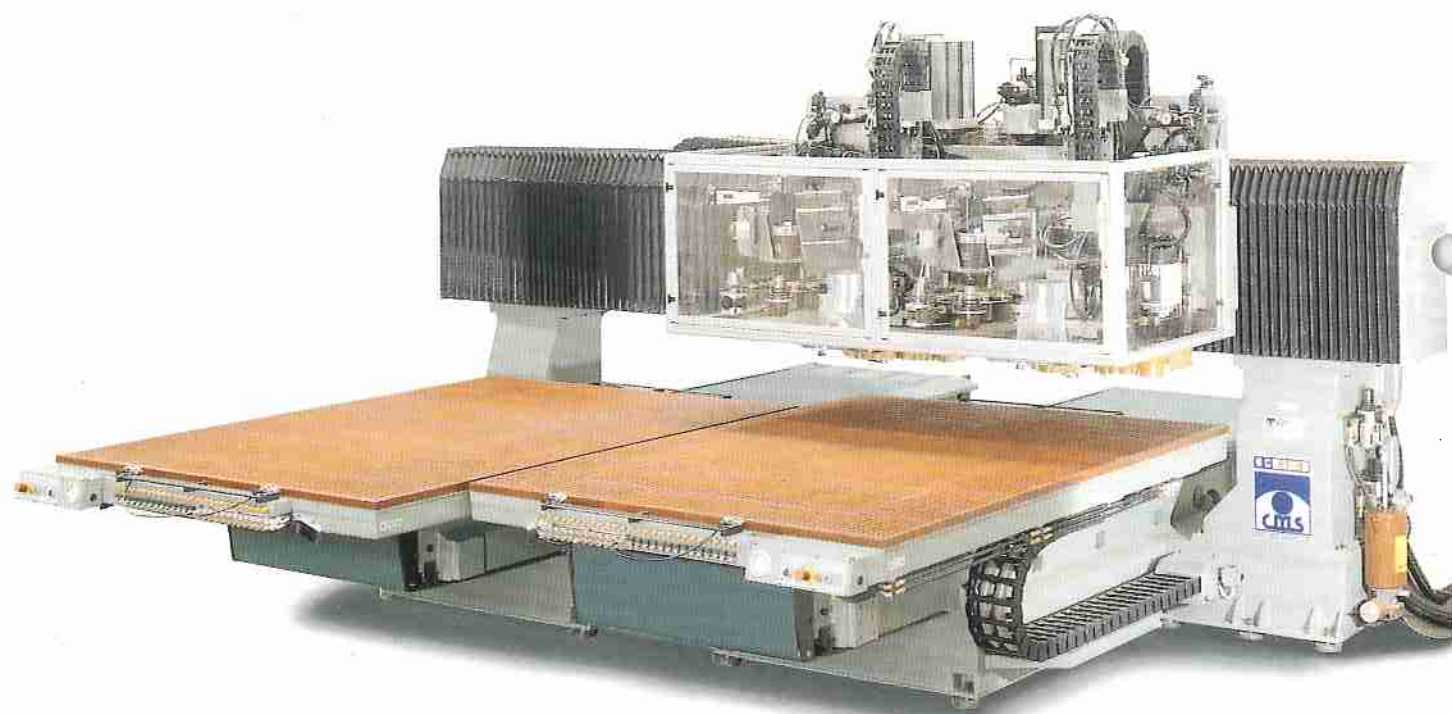
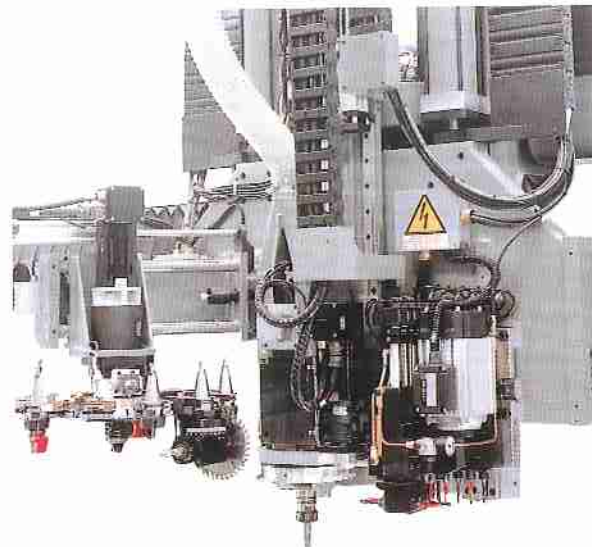


## Automatic Tool Changing Heads: Productivity and Working Capacity

These working groups are characterized by reduced dimensions that permit bringing additional units closer to each other, and thus permitting simultaneous machining of a number of pieces it also has, the advantage of having a wide range of tools available for processing.

### "TCU"

The TCU is working unit supplied with an electrospindle and an automatic tool changer, complete with a portable toolholder magazine with up to 12 stations. Angular transmissions and aggregates may be mounted in the magazine, whether they are fixed or controlled by a supplemental axis, for continuous rotation throughout 360 degrees in the X/Y plane.



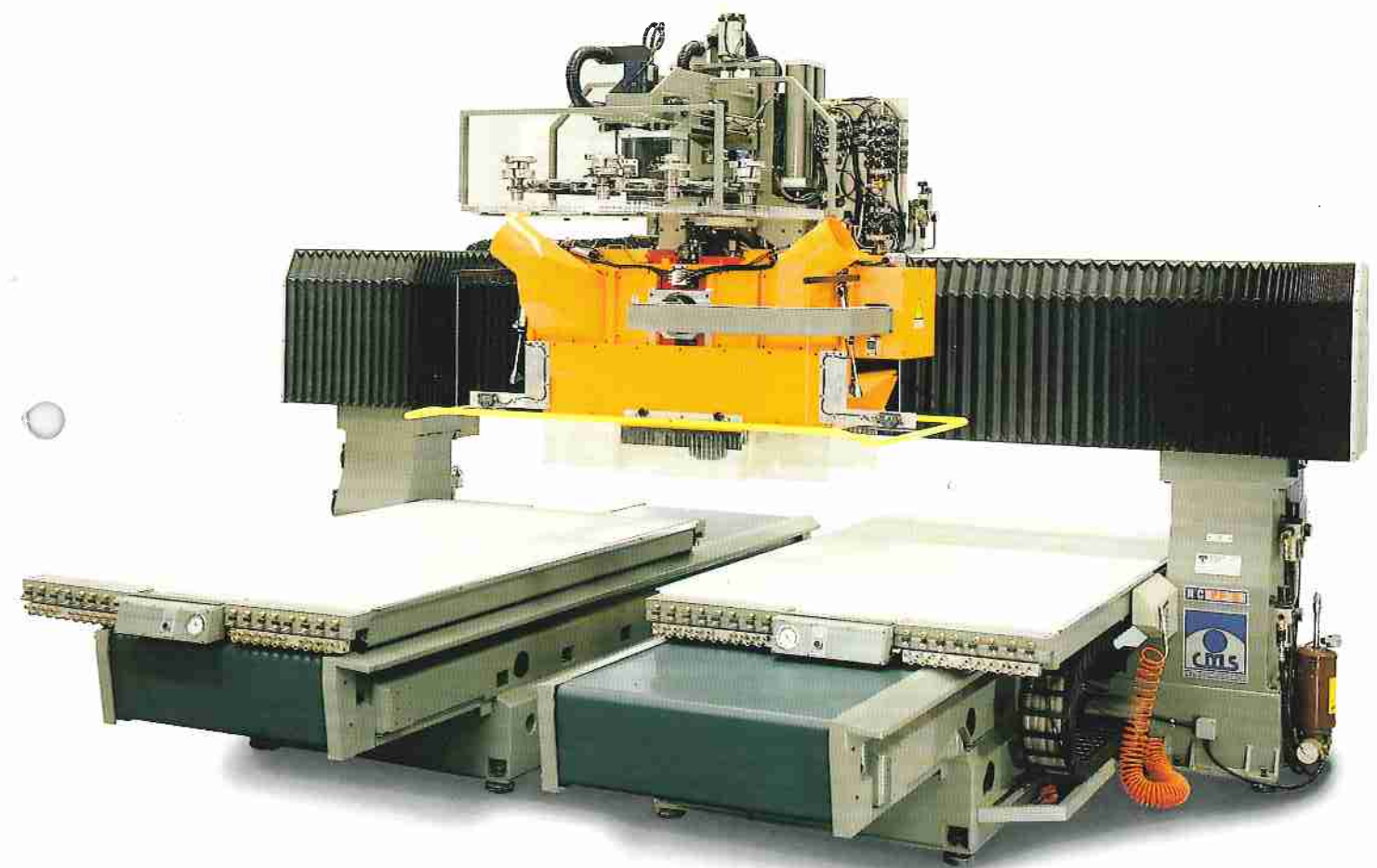
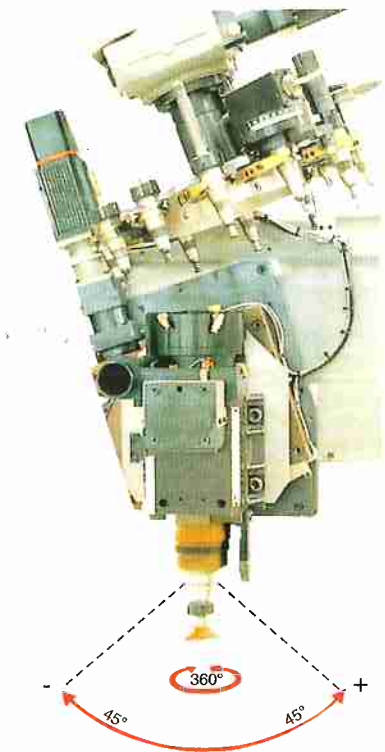
PF 4TCU

### "TRORCU"

An axis controlled by the CNC permits processing of parts that require an inclination of the tools  $\pm 45$  degrees in the vertical axis. Angular transmissions and aggregates that are fixed or controlled by an additional axis may be mounted to the unit.

The combination of these two movements allows 5 axis processing of curved and preformed parts.

The axis that controls the inclination of the head is also utilized for the tool changing operation. The 12 position portable tool holder magazine is positioned above the work group.



PF R4CU

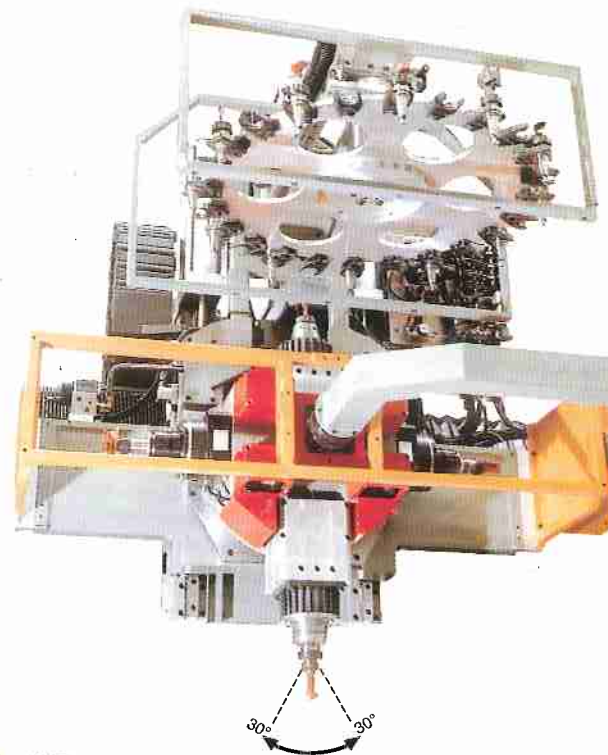


## Revolver "CU": Even More Possibilities

To increase machining capabilities, the revolver group can be equipped with a tool-holder magazine having up to 24 places, positioned above the revolver itself. In this case, two electrospindles with as automatic tool changing function are mounted in opposing revolver positions.

This permits changing the tool on one spindle while machining a part with the other one at the same time. The result is a working unit with an increased number of tools available, reduced us productive time during tool changes and the ability to machine with a NC-controlled, horizontal, rotating axis.

Moreover, all units (including the toolchangers) can be equipped with a 4th axis for running special aggregates by NC. The revolver's rotation can also be controlled by an axis for machining at tool angles of  $\pm 30^\circ$  (o.r.).



PF R4CUOR

## Aggregates

A number of different aggregates are available that broaden the capabilities of CMS machining centers. The characteristics and number of these aggregates are continually expanding. All new developments are passed on to our customers.

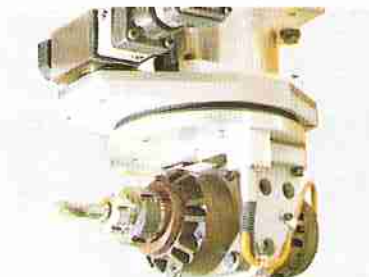
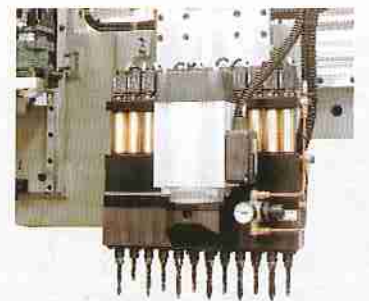
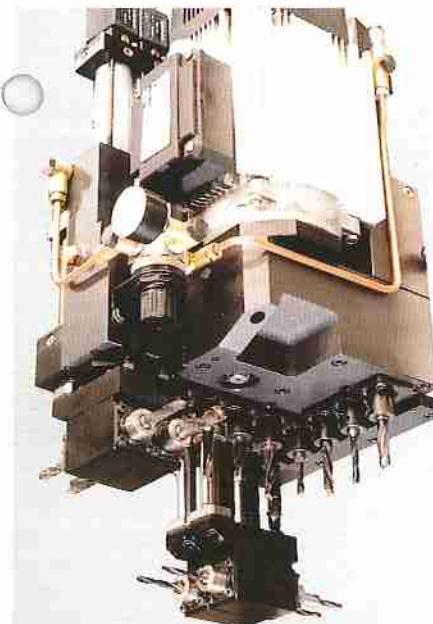
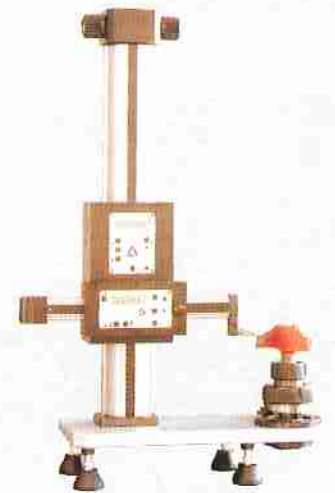
## Drilling Group

Various types of drilling groups are available, arranged in line in "T" form or "L" shape.

The individual machining movement of each drill means that vertical and horizontal drilling can be carried out either in multiples or one drill at a time.

## Presetting

All CMS machines are equipped with preadjustable tool-holders; a digital electronic "presetting" device makes it possible to measure the tool radius and length to a precision of one hundredth of a mm (or one thousandth of an inch).



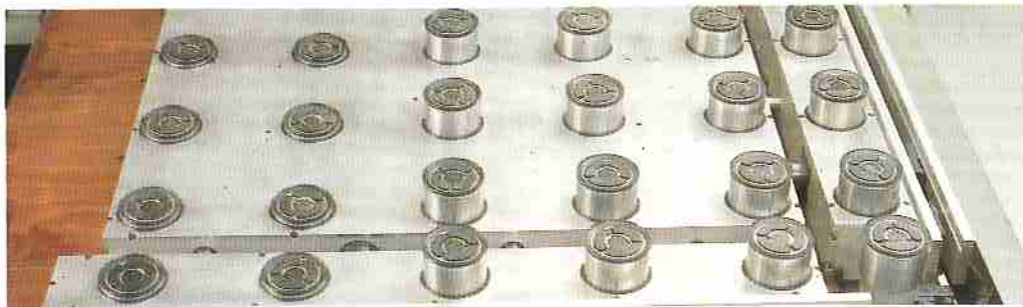


# Technical features

	Single Table	Double Table
AXES STROKES ( in mm )		
X	2,600 - 4,800	3,600 - 5,800
Y	1,600 - 3,200	1,600 - 4,300
Z	250 - 1,250	250 - 1,250
QUICK SPEEDS		
X	up to 54 mt / min	
Y	up to 45 mt / min	
Z	up to 10 mt / min	
TABLE SIZES ( in mm )	from 2,520 x 1,560 from 2,340 x 3,200	synchronized from 3,600 x 1,560 from 5,200 x 4,100
NUMERIC CONTROL	Allen Bradley, Siemens, NUM	

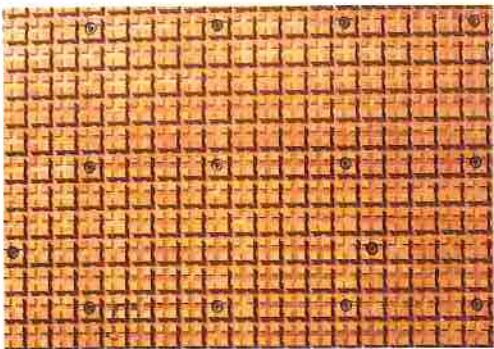
WORKING UNIT	Max. Power	Max. Rotation Speed	Available Compositions
REVOLVER	7.4 Kw	18,000 rpm	up to 2
CU spindles	10 Kw 13 Kw	18,000 rpm 24,000 rpm	
T 12 / 18	8.5 Kw	18,000 rpm	up to 9
"TCU"	8 Kw 10 Kw 13 Kw	18,000 rpm 24,000 rpm	up to 6
"TRORCU"	10 Kw	18,000 rpm 24,000 rpm	up to 4
"TUCU"	10 Kw 13 Kw	18,000 rpm 24,000 rpm	up to 2
"TU"	2 Kw	27,000 rpm 36,000 rpm	up to 2

**VACUUM CUP TABLE**  
This work table is made up of mobile elements with vacuum cups. The movement of these elements is controlled by NC axes so that the vacuum cups will be in the best position for clamping the workpiece. This system allows the workpieces to be loaded using automatic devices for J.I.T. manufacturing.



# Work Tables for Every Clamping Requirement

**LIGNOSTONE VACUUM TABLE**  
Lignostone tables can easily and quickly create vacuum zones for clamping workpieces via subpieces.



**SMOOTH TABLE**  
The smooth table uses the standard subpiece and locator system, thus doing away with specific fixtures.



**MODULAR TABLE**  
This work table is made up of mobile modules mounted on prismatic guides with pneumatically controlled clamps. Workpieces are clamped by means of vacuum cups which can be positioned throughout the entire work area.



**MAT TABLE**  
This system, a mat of wear-proof Elastomer, gives direct vacuum clamping of large sized panels, without subpieces and vacuum gaskets.



# WORKING EXAMPLES

