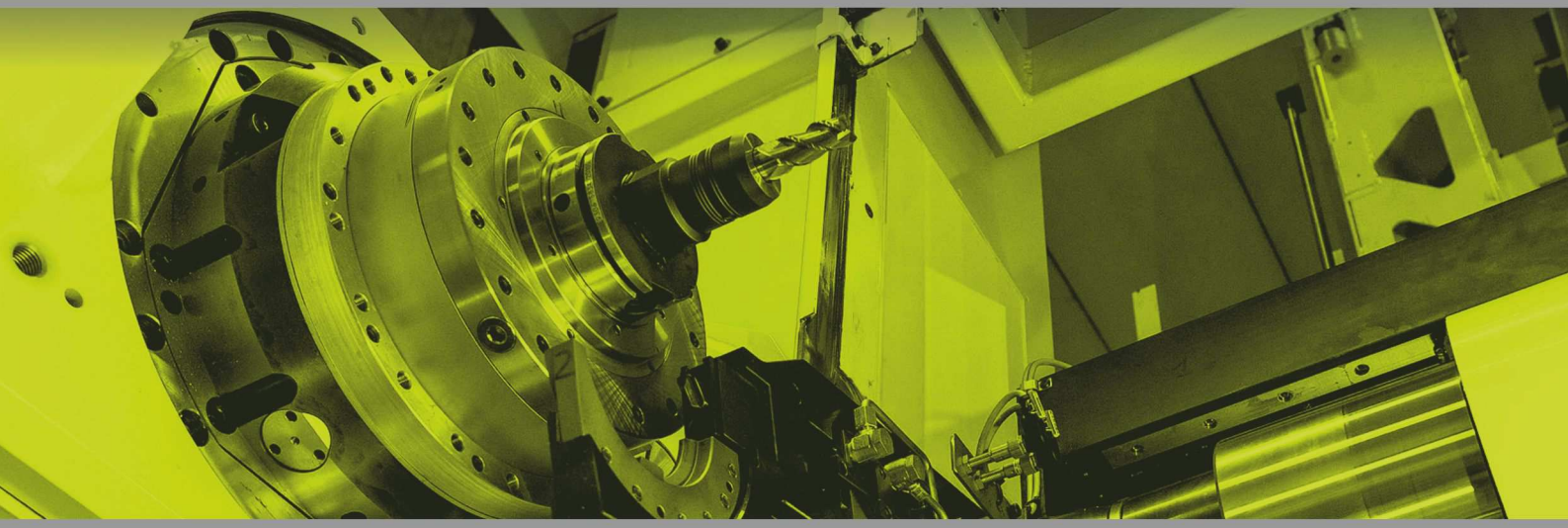
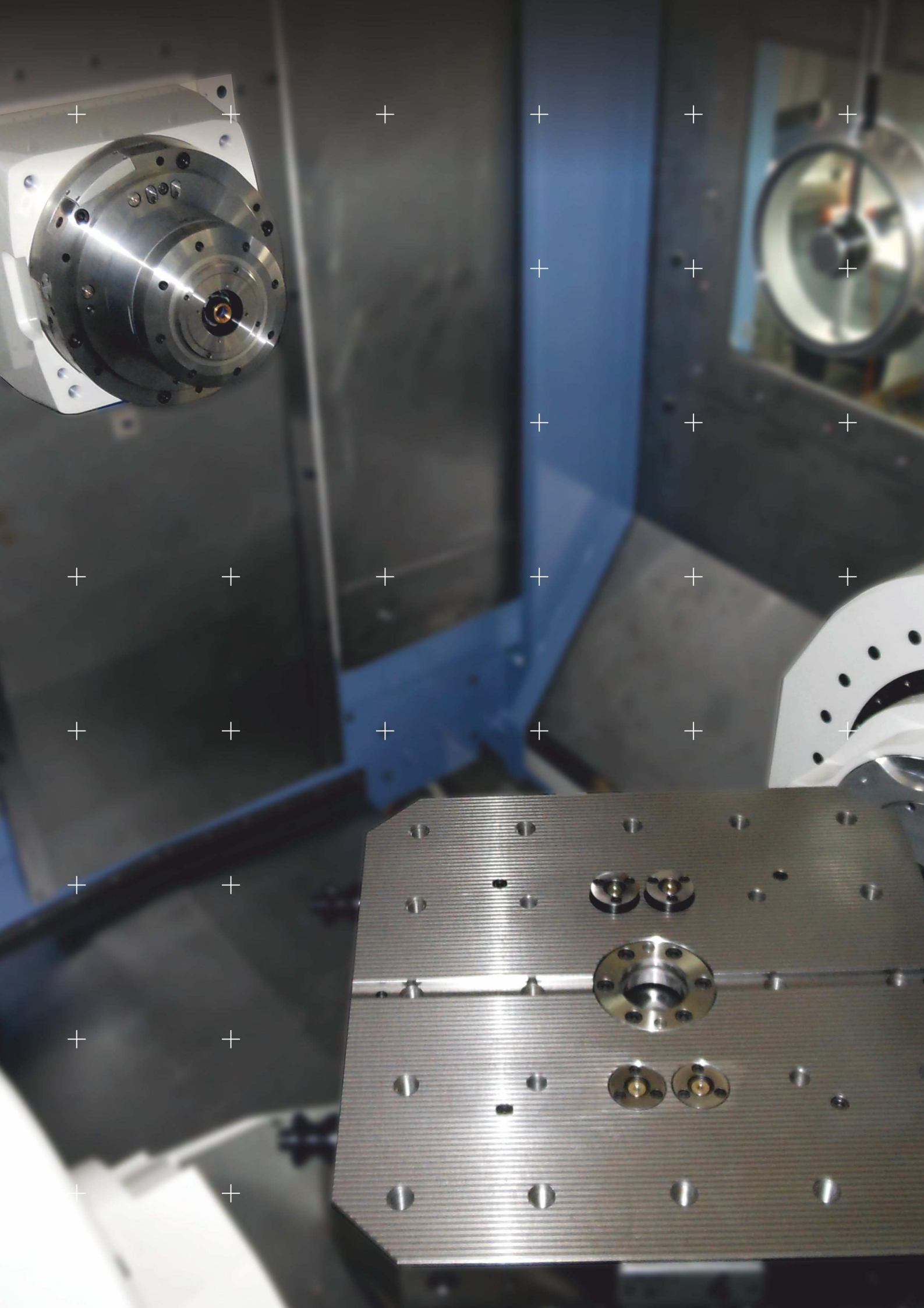
INTEGRATED MANUFACTURING SOLUTIONS

CLOCK 800

HORIZONTAL 4/5-AXIS MACHINING CENTER

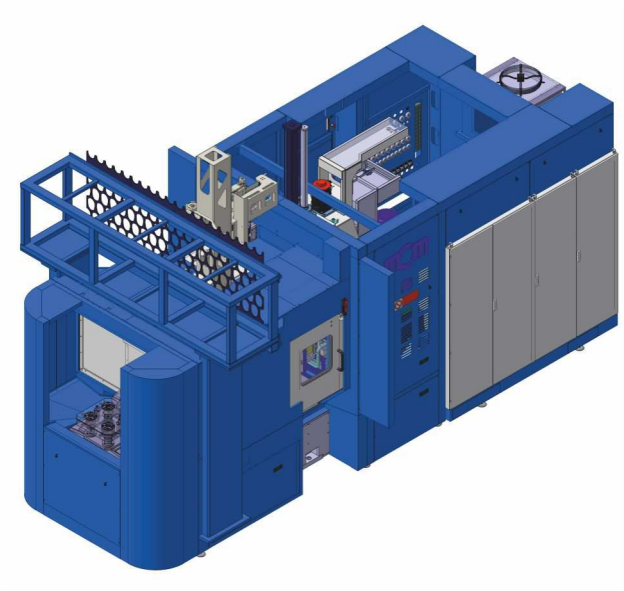


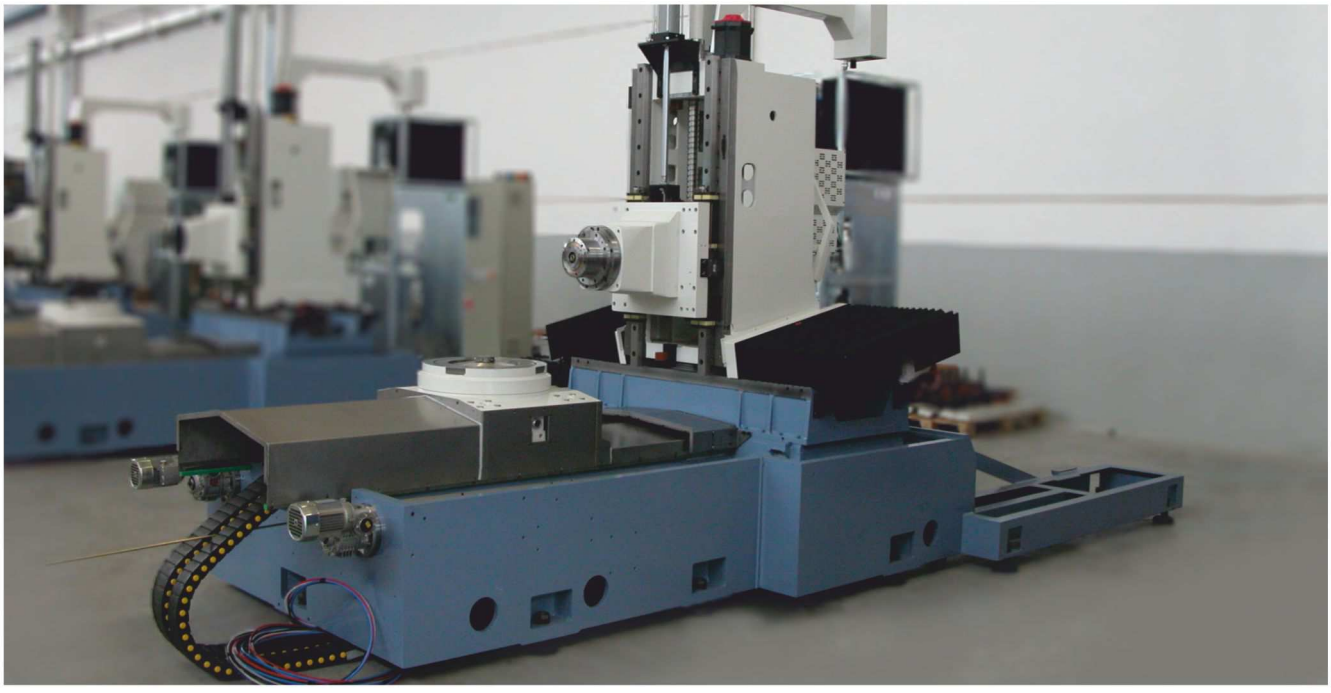


CLOCK **800**

HORIZONTAL 4/5-AXIS MACHINING CENTER

Clock 800 has been designed to match flexibility, high dynamics, rigidity and accuracy.
The machine is based on classical concepts, such as the setting in "T" configuration: upright with transverse movement and work-table with longitudinal movement.
Clock 800 is conceived to be produced in bipallet, multipallet or FMS version. The flexibility features of its configuration allow it to be integrated with most automation systems. The base-unit is a single piece designed to be properly rigid to maintain machine's geometry over time. The design of the axes guarantees slideways and screws in the ideal position to obtain a high degree of rigidity and excellent dynamic qualities. The strongly inclined position of the X-axis slideways, together with the central and barycentric position of the Y-axis screw, are significant examples thereof. Great attention has been paid to the management of temperature behaviour, particularly the thermosymmetric structure aimed at outstanding stability over time. **Clock 800** characteristics ensure its application in many fields from automotive to aerospace





TECHNICAL FEATURES + 4-AXIS / 5-AXIS +

WORK-AREA

X-axis stroke	mm	800
Y-axis stroke	mm	800
Z-axis stroke	mm	800
X/Y/Z axes thrust	daN	800
X/Y/Z rapid feed speed	m/min	75 / 60 / 75
X/Y/Z axes acceleration	m/sec^2	7 / 6 / 7

ACCURACY (As per ISO 230-2 standards)

Linear axis			Circular axis		
Accuracy of positioning (A)	µm	4	Accuracy of positioning (A)	arc sec	4
Sistematic positional deviation (M)	µm	2	Sistematic positional deviation (M)	arc sec	2
Repeatability (R)	µm	3	Repeatability (R)	arc sec	3

PALLET AND ROTARY TABLE (4th CONTINUOUS AXIS)

Pallet dimensions	mm	500x500 / 500x630
Max. load allowed on pallet	kg	800
Max. fixture height	mm	950
Max. fixture rotation diameter	mm	900
Max. table rotation speed	RPM	50
Min. resolution	degrees	0,0001

ROTOTILTING TABLE UNIT (4th+5th CONTINUOUS AXES) OPTION AS AN ALTERNATIVE TO THE ROTARY TABLE UNIT

Pallet dimensions	mm	500x500 / 500x630
Max. load allowed on the pallet	kg	400
Max. equipment height	mm	765
Max. tool rotation diameter	mm	750
A-axis tilting angle	degrees	140 (+ 35 / - 105)
Max. A-axis (Tilting) speed	RPM	40
A-axis min. resolution	degrees	0,0001
Max. B-axis (Table) speed	RPM	60
B-axis min. resolution	degrees	0,0001

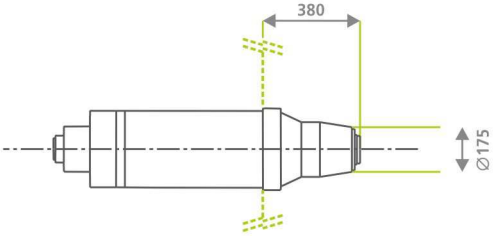
TOOL-MAGAZINE

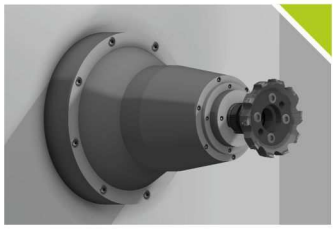
Type		Modular rack with tool movement system and exchange arm	
Tool-taper		HSK 63 / ISO 40	HSK 100 / ISO 50
Number of tools (standard version)		140	80
Number of tools (optional version - .up to):		250 + 500	145 + 399
Tool mass	kg	10	25
Max. length	mm	400	500
Max. diameter	mm	200	300
Tool changing time (TOOL - TOOL)	sec	2	2 (HSK 100) / 2,5 (ISO 50)

SPINDLE

Tool-taper		HSK 100 / ISO 50
Max. speed (standard version)	RPM	10.000 (HSK 100) / 10.000 (ISO 50)
Max. power (standard version)	kW	60
Max. torque (standard version)	Nm	300
OPTIONAL VERSIONS		HSK 63 / ISO 40 / HSK 100 / ISO 50
Max. speed up to	RPM	30.000 (HSK 63) / 18.000 (HSK 100)
Max. power up to	kW	74 (for HSK 63 spindle at 30.000 RPM) 68 (for HSK 100 spindle at 18.000 RPM)
Max. torque up to	Nm	55 (for HSK 63 spindle at 30.000 RPM) 388 (for ISO 50 spindle at 10.000 RPM)

SPINDLE NEW FORM TAPERED IN ORDER TO MAKE THE APPROACH TO THE COMPONENT EASIER





COOLANT TREATMENT UNIT (BASIC VERSION)

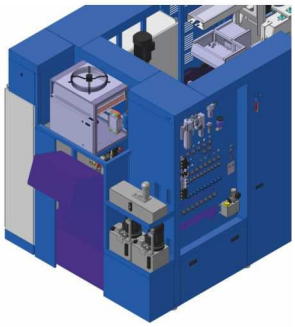
Chip conveyor type			Scraping-type (outlet on back side)
Total capacity		litres	1.250
Filter type			Self-cleaning (40 microns)
Standard low pressure system	Flow rate	litres/min	200 (including the machine various functionalities)
	Pressure	bar	2
Standard high pressure system	Flow rate	litres/min	28
	Pressure	bar	20

CNC

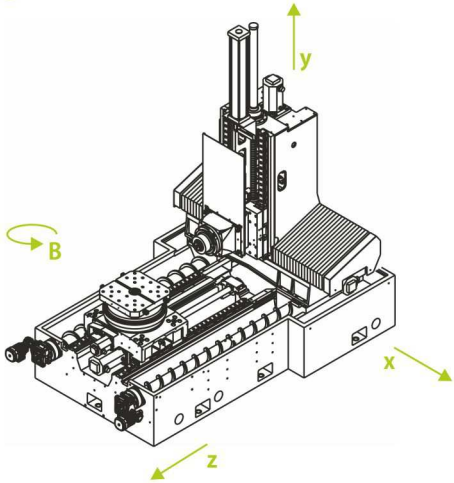
FANUC 31iB5	SIEMENS 840D SL	D.electron CNC Z32

MAINTENANCE

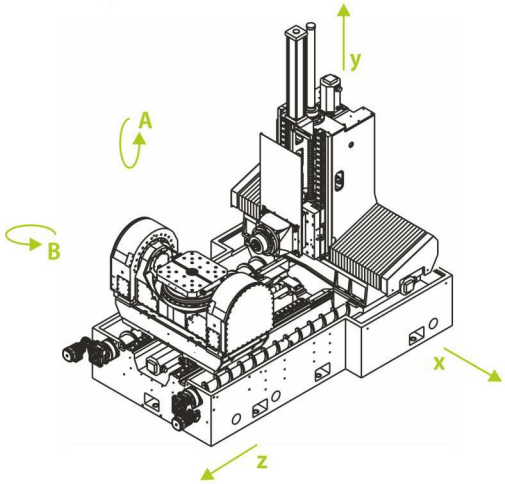
Plant building distribuited so as to improve the maintenance ergonomy

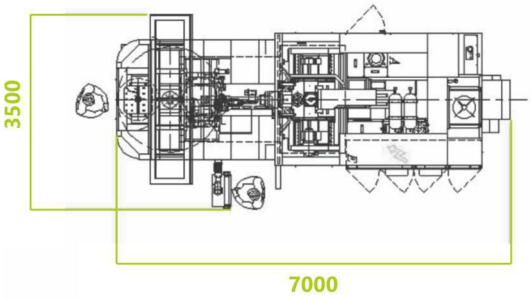


4-AXIS

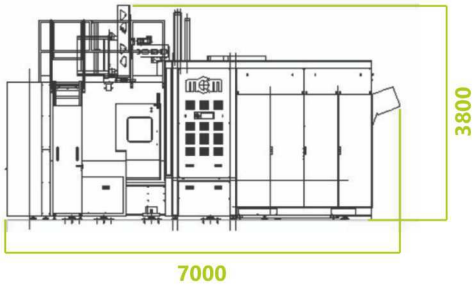


5-AXIS

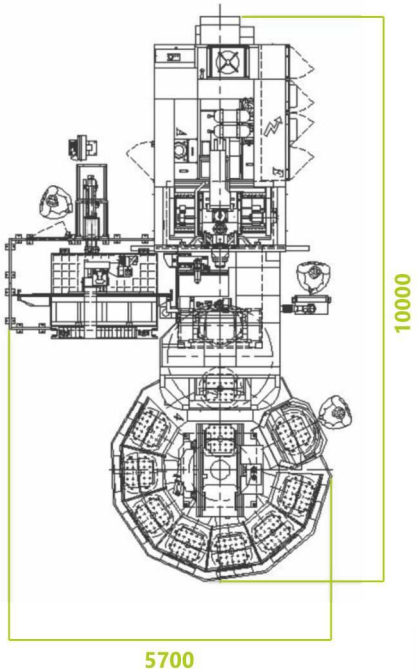




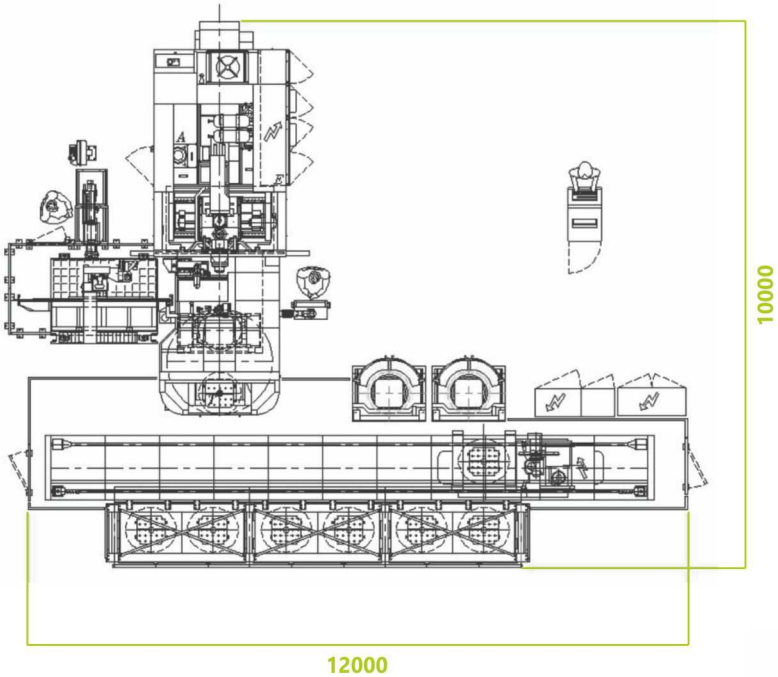
BIPALLET



BIPALLET SIDE VIEW



MULTIPALLET



FMS

CNC ENGINEERING

MCM consolidated experience in designing multitasking machining centres and the application of state-of-the-art scalable control technologies, allow flexible solutions to be developed, in order to meet any customer requirement. Thanks to the experience and the competence acquired over the years, MCM technical department engineers various types of systems, from single cell to complex production lines, with the integration of robotised cells and machines made by other manufacturers. All the software architectures are conceived for a total integration with the manufacturing planning and managing software, jFMX, designed and produced by the software developing dept MCE.

MAIN CNCs FEATURES WITH CONFIGURABLE OPTIONS >

CNC	SIEMENS	FANUC	D. ELECTRON
Name	**Sinumerik 840D SL**	**30i / 31i B5 Series**	**CNC Z32 Florenz Series**
Display	15" to 24" with/without Touch Control	14" to 19" with/without Touch Control	15" colour TFT Flat Panel Touch-screen/21,5" colour TFT LED display
User program memory	From 10 MB to 22 MB (optional)	2 MB (8 MB optional embedded / 2GB external memory)	≥64 GB, SSD
Path / Channels	up to 10	up to 10	up to 6
Controllable CNC axes	up to 93	up to 32	up to 32
Basic configuration	**Hardware** Safety integrated for all the axes and main actuators	**Hardware** Safety Integrated for all the axes and spindles Axis CARD HRV+High-Speed CPU	**Hardware** Safe Torque OFF for all the axes and spindles
	Main Siemens software packages included	**Main Fanuc software packages included**	**Main Software Packages D.electron included**
	_ Remote Tool Center Point _ Advanced Position Control _ SAG compensation _ NURBS _ 3-5-axis MDynamics milling technological package	_ AI Contour Control II _ Tilted Working Plane _ Conical/Spiral Interpolation _ Cylindrical/Helical Interpolation _ Tool Retract and Recover _ Rigid Tapping Retract	_ Milling and turning functionalities _ Geometric transformation (scale, rotation, mirror, metric/inch conversion) _ G114 High speed and superfinishing for moulds _ Up to 10 coordinated contemporaneous axes programmable in one block _ OPZ-G117/G118 RTCP tilting heads and tilting tables

MCM SUPERVISING SOFTWARE jFMX

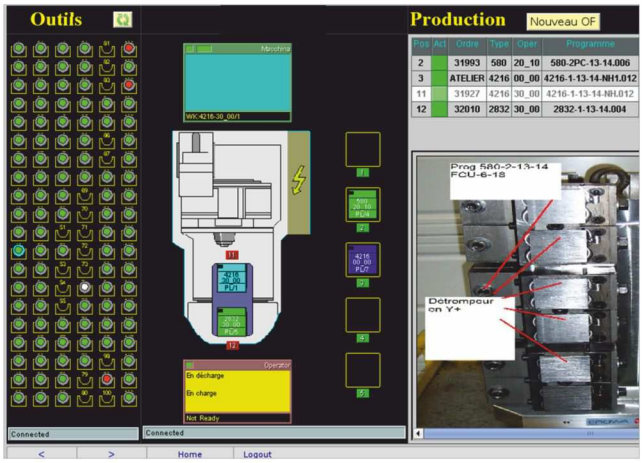
Java Flexible Manufacturing eXecutive

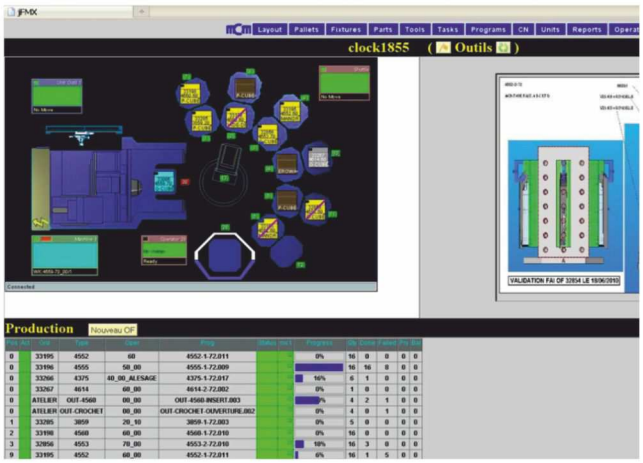
jFMX is the supervising software for planning and managing of flexible manufacturing systems, designed and produced by MCM software developing dept: MCE.
jFMX offers a strategic feature to a centralised coordination and an integrated management of the entire shop floor. Indeed, the machining centers equipped with jFMX, compared with those only managed by CNC, make it possible to:

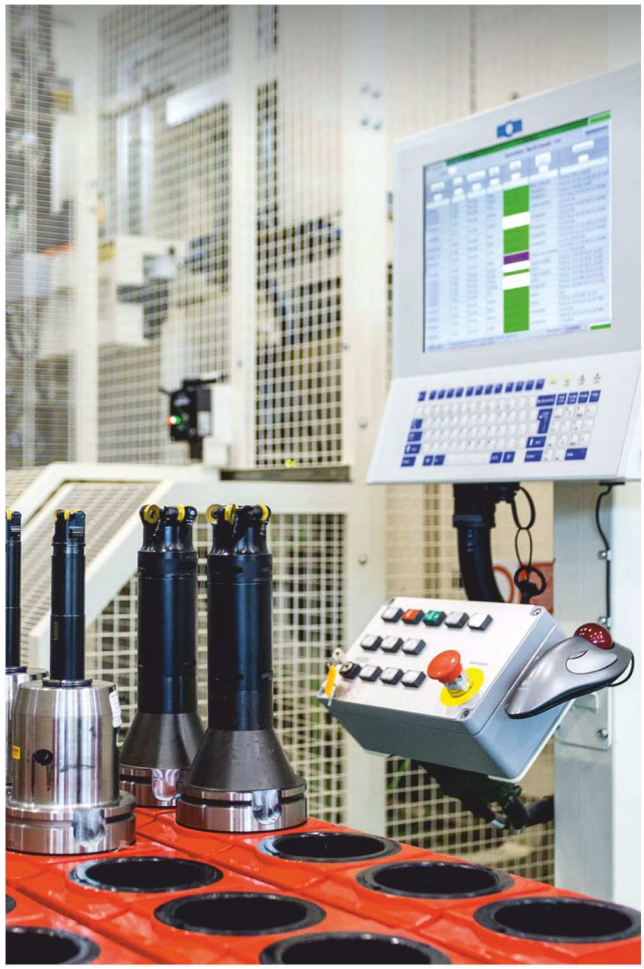
- obtain a greater operational autonomy
- exploit production flexibility
- integrate the machine into a modern shop floor
- reduce the expertise required to the staff
- increase system productivity
- improve machining monitoring and control

thanks to:

- increase of unmanned work
- automatic management and planning of production
- integrated management of process and quality control information
- resource planning and improve timing of delivery schedule
- production monitoring and production cost of each component
- automatic restart of interrupted processes or machining resumption.



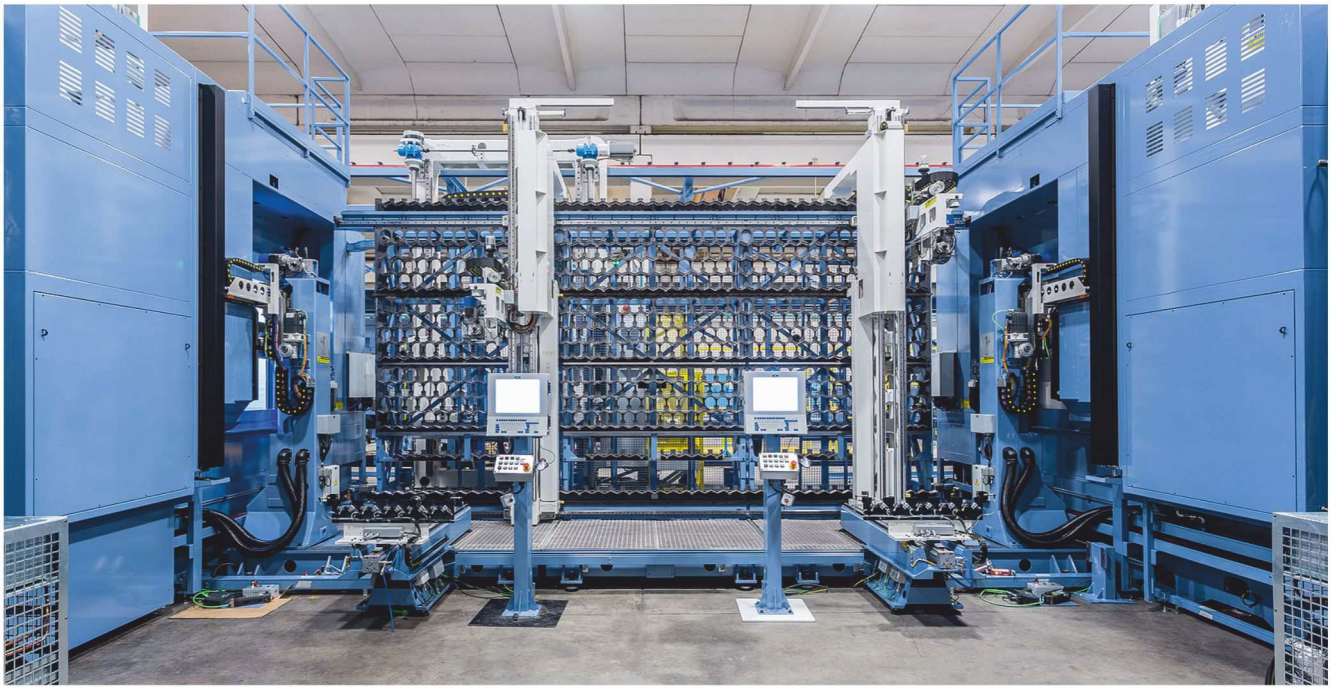




OPTIONAL

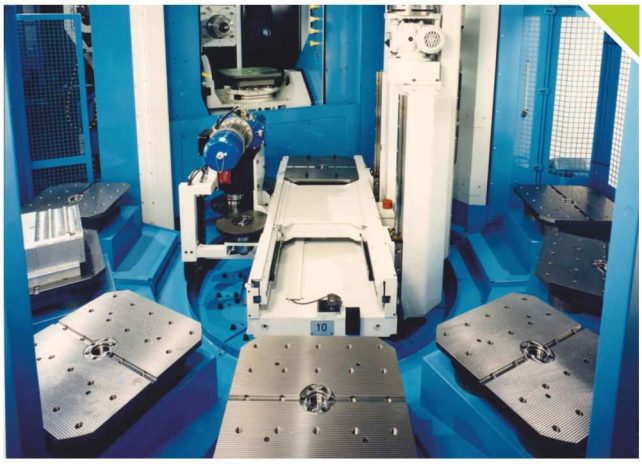
MAIN ADDITIONAL ACCESSORIES AVAILABLE	INCLUDED IN THE BASIC VERSION	OPTIONS ON REQUEST
Workpiece washing	●	
Top protection prearranged for connection to a centralised smoke suction system	●	
Tool taper washing	●	
Prearrangement for inductive sensor for temperature compensation on the electrospindle	●	
MCM tool monitor	●	
Oil separator	●	
High pressure 20 bar	●	
High pressure 80 bar with automatic variator		●
Tool integrity check		●
Coolant conditioning system		●
Renishaw or Marposs or M&H probe		●
Tool-magazine extension		●
Coolant automatic top-up		●
Exhauster		●
Two-line hydraulic feed through the pallet on the loading/unloading station		●
Two-line hydraulic feed through the pallet on the rotary table		●
Four-line hydraulic feed through the pallet on the loading/unloading station		●
Four-line hydraulic feed through the pallet on the rotary table		●
Orbital turning		●

Further customisations are available on request.

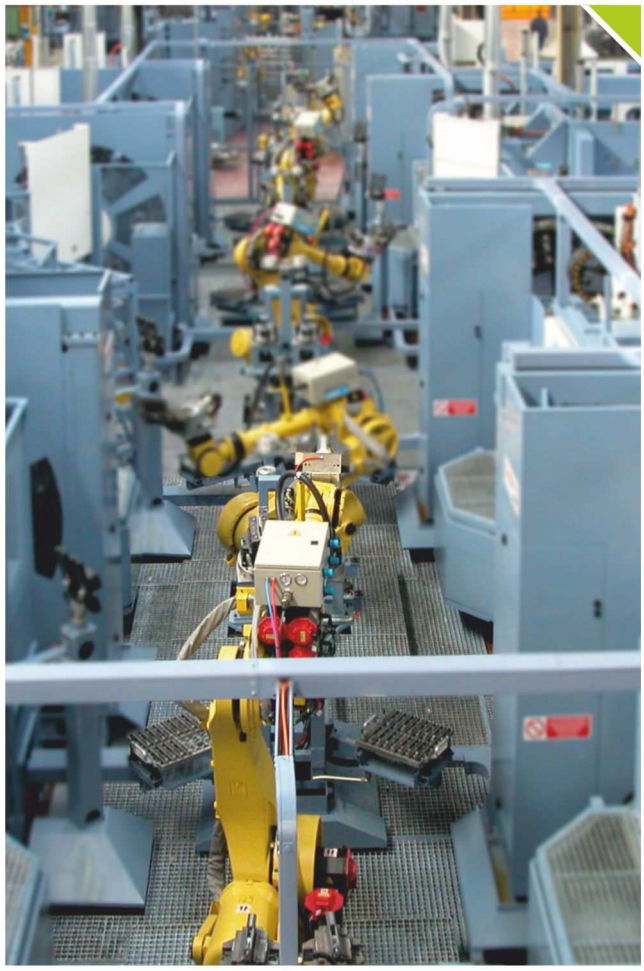


POSSIBLE AUTOMATION SOLUTIONS

MP9 solution



Multipallet solution



Robotised solution

Multi level shuttle solution

ver. **1.0**

CLOCK family

Pallet dimensions

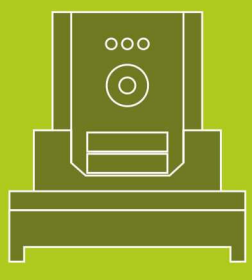
500x500 _
500x630 _
630x630 _
630x800 _

Structures

4-axis _
5-axis _

Configurations

bipallet _
multipallet _
FMS _



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_ FLEXIBLE AUTOMATION
_ SYSTEM INTEGRATION
_ SUPERVISING SOFTWARE
_ MANUFACTURING TECHNOLOGY
_ SERVICE

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