ROVER B FT 1536
Serial: 1000015701
Numerically controlled machining centres ROVER B FT

As guarantee of the quality of its products and services, BIESSE has been certified ISO 9001 since 1995 and works in accordance with the UNI EN ISO 9001:2000 norms.
Most of the technological components assembled on the machining centres is produced by companies of the Biesse Group or by world-wide known companies included in the Biesse "Register of Qualified Suppliers", which have strictly cooperated with Biesse through the years.

The running tests of each machining centre include the following stages:
- ☑ Intermediate control of operating units and pre-assembled components
- ☑ Non-stop running test as machining simulation for a minimum period of 10 hours
- ☑ Control of X and Y axes precision and positioning repeatability by means of an interferometric laser (VDI/3441 norm)
- ☑ Gauging of the X and Y axes through a software function: the values detected during the laser tests are elaborated by the N.C. and transmitted to the axes drives in order to improve the positioning precision
- ☑ Functional tests for routing and boring operations on panels positioned on all the machine origins

Structure
All the machine structural components have been designed with a CAD product for solid modelling which allows to determine the possible structural distortions caused by static and dynamic loads.
The correct dimensions of the most critical components are elaborated by a software for finite elements structural calculation which, by simulating the working conditions, allows to determine the most stressed areas which need strengthening.
The accurate structural design grants to the BIESSE machining centres maximum rigidity, high precision in time and perfect machining finishing even during heavy-duty working cycles.

Machine frame
The machine frame is made of thick electro welded steel sheets, properly strengthened in the most stressed areas.
The mechanical machining are performed in a single setup to ensure maximum accuracy.

Upright beam
The upright beam, mobile in the longitudinal direction (X axis) is made of electro welded steel with gantry structure: thick steel sheets and reinforcing transversal elements grants a higher rigidity and allow to obtain the maximum precision.
The beam is stabilized before metal machining to release the tension accumulated during welding operations.
To achieve the highest precision the mechanical machining are performed in a single setup.

Transversal and vertical carriages
The transversal carriage (Y axis) and the vertical carriage (Z axis) are made of an aluminium light alloy casting which is stabilized and then machined in a single setup for maximum precision.

Movement of controlled axes

Axes drives and motor systems
Biesse uses Brushless motors, controlled by digital axes drives.
The interfacing between axes drives and numerical control is digital.
The digital system Mechatrolink allows the following:
- ☑ Higher machining speed, since a portion of the toolpath is controlled by the axis drive instead of the numerical control
- ☑ Higher working precision, thanks to a faster data processing
- ☑ Higher reliability, thanks to a reduced wiring system which eliminates electrical interferences that may occur on analogue systems

- ☑ Reduced machine stops and downtime, thanks to the errors diagnostic with explanatory messages displayed directly on the N.C.

X and Y axes transmission system
The operating unit moves along the longitudinal axis (X axis) and transversal axis (Y axis) by rack and pinion system (a solution that BIESSE is been using for twenty years) which grants higher acceleration and movement speed.
BIESSE uses a tempered and ground rack with helical teeth and a precision reducer with single pinion.
The preloaded pinion system eliminates backlash and therefore grants smoother movement and maximum positioning precision.
Both rack and pinions are built in accuracy class 6 (DIN 3962 norm).
The mobile upright beam has two independent motors, one on each side of the machine frame.

Z axis transmission
As the operating unit moves in the vertical direction (Z axis) with a relatively short travel, BIESSE uses the ball screw system with preloaded nut for backlash compensation and repeatability in positioning precision. The movement is transmitted to the screw through a flexible joint.
The ball screws are built in accuracy class ISO 5.

Guides of controlled axes

Axes guides
All axes moves on tempered and rectified steel linear guides by preloaded recirculating balls bearings.
Each balls bearing is equipped with 4 sliding gaskets of which 2 internal and 2 external, to protect the bearing from chips and dust intrusion.
The size and the great pitch between the guides grant high precision and perfect machining finishing performed by the operating units.

Manual centralized lubrication system
For an easier maintenance, the machine is equipped with a centralized lubrication system with 2 greasing points. At each time interval set in the numerical control, a message automatically appears on the screen, signalling the need for lubrication. The operator can use the pump supplied with the machine to manually convey the lubricant to 2 distributors, which sends the grease to:
- ☑ Recirculating balls bearings of the X, Y and Z axes
- ☑ Rack and pinions system of the X and Y transmissions
- ☑ Ballscrew nut of the Z axis transmission

Work area

FT Worktable
The worktable is made of stratified phenolic, it includes a vacuum locking system for the pieces and it is machined with a 30mm pitch grid for the rapid placement of gasket or standard vacuum modules through an adaptor. The entire worktable is equipped with vacuum inlets (D=10mm) with 150mm center distance, and is supplied with patented plugs for a quick removal. The worktable can be configured based on need with M8 threaded inserts (pitch 30mm) for jig installation or other clamping equipment.

Working areas
The machine has 1 working area with 2 left origins, 1 front and 1 rear.

Pneumatic reference stops
The machine's origins are determined by a set of stops with pneumatic movement which grants maximum positioning precision.
The base machine includes:
- ☑ 2 pin reference stops for rear LH area
- ☑ 3 pin reference stops for front LH area
- ☑ 2 side stops (LH side)

Vacuum system and locking zones
The vacuum system allow to convey vacuum in the working areas in order to lock the piece in place during machining operations.
A buffer chamber grants a constant and high level of vacuum ensuring a quick spread on the worktable during locking cycle and maximum vacuum force during machining operations.
The worktable is divided in 2 locking zones to optimize locking of panels with smaller dimension.
Vacuum locking is activated by the provided foot pedal.

Prearrangement for the connection of minimum nr. 3 or 4 (only for sizes xx64) 250 m3/h or 300 m3/h vacuum pumps
Allow the electrical and pneumatic connection of the vacuum pumps.
Inclusive of:
- ☑ Hoses for vacuum connection
- ☑ Digital vacuum gauge and vacuum switch connected to the emergency line

Vacuum level control is real time and through digital vacuum gauge which allows the differentiation of the minimum vacuum safety levels during spoil board surfacing cycles or pieces machining cycles
* Max 3 pumps on 1224, 1536, 1836, 2231, 2243
* Max 4 pumps on 1564, 2264
* Pumps not included

Operating unit

Inverter
Inverter for electro spindle and boring head with power output adequate to the selected configuration.
Static frequency converter.
Inclusive of:
- ☑ Display for frequency visualization
- ☑ Display for tool rotation speed visualization
- ☑ Display for diagnostic messages
- ☑ Automatic control of tool rotation deceleration
- ☑ Brake resistor for power dissipation
- ☑ N.C. programmable tool rotation speed

Prearrangement for Electro spindle
Inclusive of electrical wiring to the electrical cabinet and pneumatic connections for the electro spindle.
* Requires the selection of 1 electro spindle among those present in the pricelist

Non EC safety protections
Inclusive of:
- ☑ Front vertical safety photocell
- ☑ Software position control for operator protection
- ☑ Safety fence H=2m on three sides of the machine
- ☑ Operating unit cover, made of structural and protective sheet metal
- ☑ Left safety flaps positioned on machine beam
- ☑ Safety flaps positioned on the machine cover
- ☑ Transparent panel in crushproof polycarbonate allowing operators to work in total safety since it grants maximum visibility
- ☑ Emergency push-button positioned on the front side of the machine frame
- ☑ Emergency push-button positioned on the N.C. electrical cabinet
- ☑ Emergency push button positioned on the hand-held control keyboard

Electric system
The machine is equipped with controlling devices (i.e. electro valves, input/output modules, etc.) which are assembled next to the devices they control, and are provided with the electronic circuits necessary for their interface with the fieldbus; this solution greatly simplifies the electric system, with obvious advantages for diagnostics and maintenance purposes.

Electric cabinet
The machine can be powered at 380/400/415V - 50/60Hz.
The electrical cabinet and the internal components comply with the CEI EN 60204-1 and CEI EN 60439-1 norms.
The auxiliary transformer supplies the connection voltage for the personal computer, the air conditioner and the electro spindle cooling fan, avoiding the use of the middle neutral wire, not always available.
The electronic equipment is powered by a stabilized 24V DC power supply.

Air conditioner for electrical cabinet
It allows:
- ☑ The perfect working of all the electronic components inside the electric cabinet, even at very high temperatures, up to 40°C (104°F);
- ☑ A dust-free environment, since there are no aeration fans.

Control system

Numerical Control
Control cabinet with Windows-based PC and control system card BH660.
Thanks to the new Biesse technology WRT (Windows Real Time) the machine is controlled directly by the PC and any other proprietary hardware component becomes unnecessary. This solution extends the performances of Windows XP by making it work in real time.
Since the software that controls the machine runs directly on a personal computer and not on a dedicated hardware device, the system architecture is greatly simplified, granting greater performance and reliability.

Desktop Personal Computer
Main technical specifications:
- ☑ CPU Intel(R) Core I7
- ☑ 8 GB RAM memory
- ☑ 128 SSD GB hard disk or superior
- ☑ 21.5" LCD
- ☑ Dedicated graphics card
- ☑ Keyboard
- ☑ Mouse
- ☑ DVD burner
- ☑ USB ports
- ☑ Ethernet card for network connection to an office PC

The technical specifications above may be subject to updates without prior notification.
Since the personal computer controls the machine processes BIESSE does not allow the installation of additional non-authorized software, under penalty of losing warranty.

Standard Hand-held control keyboard
Inclusive of:
- ☑ Override for manual control of the programmed axes speed
- ☑ Emergency push button

Prearrangement for controls on remote keyboard
Inclusive of all the wirings inside the electrical cabinet.

Software

Statistic report
Machine statistics is a software environment capable of collecting general information on machine events in order to monitor productivity and reliability over time.
Customers can choose directly which events to be recorded, in example the machine set-up, production, authorized pauses, lubrication cycles, etc.

Emergency recovery procedure
This function allows operators to restart an interrupted working due to a machine emergency stop. The program restarts exactly from where it was interrupted, by following a specific procedure. The working can be restarted when the emergency stop happened during:

- ☑ A routing cycle with the electro spindle
- ☑ A drilling cycle with the boring head
- ☑ A cutting cycle with a blade
- ☑ An automatic tool changing cycle
- ☑ Any ISO instruction programmed movement

The introduction of this functionality avoids to discard half-finished components, which sometimes are made of valuable materials (rare woods, etc.). It also allows operators to save time in case of long programs execution.

Tool life calculation function
The NC memorizes the distance covered by each routing tool and compares it to a value set by the operator.
When this set value is reached, a persistent warning message is displayed on the screen.
This message will be displayed each time a given tool has reached the value set by the operator.
A hardware output (alternate or continuous, chosen by the customer) allows the connection of an external device (for instance a flashing light or a siren) which will be activated when the message appears on the screen.

SERVICE

Teleservice
It allows an immediate and direct access to the machine numerical control via network. In this way it is possible to check machine data, user programs, input/output signals and system variables, and to install software updates, therefore granting:

- ☑ Real-time service intervention
- ☑ Quicker problem solving
- ☑ Consistent reduction of machine downtime
- ☑ Real-time software updates

*The Teleservice support is free of charge for the whole warranty period.

User documentation

- ☑ Installation instructions
- ☑ Machine user manual
- ☑ Software user manual instructions
- ☑ Pneumatic and electrical diagrams
- ☑ InDocs CD containing the spare parts catalogue
- ☑ Factory assembling and testing declaration

Maintenance equipment

- ☑ Device for locking and unlocking tools from tool-holders
- ☑ Set of wrenches
- ☑ Greasing pump
- ☑ Grease for linear guides, rack and pinion lubrication

- ☑ Grease for boring head and aggregates lubrication

Technical specifications

SINGLE Z AXIS AND DOUBLE Z AXIS WITH PNEUMATIC STROKE VERSION		
Maximum axes speed X - Y - Z	85 - 85 - 20	m/min
Z axis stroke	384	mm
Z axis piece passage	180	mm
Z axis piece passage with sweeper arm	120	mm
DOUBLE Z AXIS CONTROLLED BY AN INDEPENDENT AXIS VERSION		
Maximum axes speed X - Y - Z	85 - 85 - 20	m/min
Z axis stroke	405	mm
Z axis piece passage	200	mm
Z axis piece passage with sweeper arm	120	mm
5 AXES VERSION		
Maximum axes speed X - Y - Z	85 - 85 - 35	m/min
Z axis stroke	515	mm
Z axis piece passage	200	mm
Z axis piece passage with sweeper arm	120	mm

* The technical data shall be verified on detailed layout according to the operating units chosen on the machine

Numerically controlled machining center ROVER B FT 1536
FT worktable dimension: X=3765mm; Y=1560mm

Optional units

CODE	QUANTITY
7000059	1

Controls on remote keyboard
Keyboard controlling the main functions available for work area set-up, operating unit tooling and tool changers tooling.
The remote keyboard has an ergonomic shape, an easy-to-read display and is equipped with a magnetic device for its positioning on the panel support handles or the control cabinet.
It includes:

- ☑ Emergency push-button
- ☑ 2 potentiometers
- ☑ Membrane keys to access the menus available on the display

3 programmable keys allow the immediate access to the most used functions

It allows the operator to:

- ☑ Reset the axes
- ☑ Move the axes in manual mode
- ☑ Adjust the axes speed by means of a potentiometer
- ☑ Control the vertical movement of the spindles of the boring unit for tooling purposes

- ☑ Control the vertical movement of the dust extraction hood during the work phases, for the visual control of all the operations being performed on the test panel
- ☑ Display all information relating to the work area set-up: panel supports positioning dimensions along the X axis, sliding bases positioning dimensions along the Y axis, type of vacuum module positioned on each sliding base with the respective orientation
- ☑ Check the state of input and output signals
- ☑ Activate the belt for the removal of chips, if present
- ☑ Perform tool change operations.

* If present, the selectors for the selection of the locking areas are not enabled

7000205	1

Automatic lubrication system
At each set time interval, adjustable in the numerical control, the pump automatically sends the lubricant to the machine moving parts (linear guides and bearings, recirculating ball screws), with no machine downtime and no operator's intervention.
When the quantity of lubricant in the tank reaches the minimum, a warning message appears on the NC screen.

7570033	1

X axis cable-holder chain, closed version
Reduces the possibility that off cuts could damage cables and hoses in the chain.
Highly recommended in case of non ferrous metals machining.
For non ferrous metals, the addition of an air filter for each selected pump is recommended.

Safety devices

CODE	QUANTITY
7022065	1

Upgrade to EC compliant safety systems for Rover B FT 1536
For stand-alone machine.
Upgrade to the safety systems required by the EC norms.
Inclusive of:
- ☐ Repositioning of the safety fence and photocells barrier to a greater distance from any moving part
- ☐ Additional hardware control unit for safety systems
- ☐ Safety fence access control with automatic gates locking and anti-panic system
- ☐ Dynamic control of tool's rotation and unlocking
- ☐ EC declaration of conformity

Working table

CODE	QUANTITY
7350920	1

Reference stops and origins for RIGHT area (does not include pendular machining)
Allows to execute programs with panel's reference side on the right.
Inclusive of:
· 2 rear stops for RIGHT area
· 3 front stops for RIGHT area
· 2 RIGHT side stops
· Supporting column for RIGHT origin program start
· Foot pedal for RIGHT origins vacuum locking activation

The additional stops, with pneumatic lowering, creates 2 additional origins for the correct reference of panels. The stops are automatically raised based on origin selection.
The pieces to be executed on the right origins are locked by pressing the pedal placed near the area to be activated.
* For single machine requires the increment of 7 sensors for the detection of lowered stops, if selected
* For machine with automatic loading and unloading system (Sweeping Arm) includes the increment of 6 or 8 sensors for the detection of lowered stops

7350960	14

Sensor for the detection of lowered stops
One sensor on each stop the machine is equipped with should be selected.
For FT machines with unloading or loading and unloading system and its relative prearrangement the sensors are included.

Vacuum system and devices for vacuum locking

CODE	QUANTITY
7300999	2

300 m3/h rotary claws vacuum pump
Oil-Free operation through non-contacting claws which grants high efficiency without the need of lubrication.
Rotary claws pumps maintain a constant efficiency over-time and it doesn't require expensive maintenance services.
Flow rate:
- 300 m3/h at 50Hz
- 360 m3/h at 60Hz

Cells and prearrangements

CODE	QUANTITY
7022274	1

Pneumatic vertical movement of the safety strips
A pneumatic movement raises the safety strips during movements with the operating units in parking position and during loading and unloading cycles.

* Already included on the automatic loading and unloading system, Sweeping Arm and prearrangement for Sweeping Arm and loading and unloading system

Operating unit

CODE	QUANTITY
7212857	1

16.5 kW (22.5 HP) operating unit with 5 interpolating axes, HSK F63 adaptor and liquid cooling.
This unit allows the numerically controlled interpolation of the electrospindle on 5 axes.
A Brushless motor controlled by a digital drive and an Harmonic Drive reduction unit with no backlashes control the orientation of the operating unit.
The 5-axes operating unit is fixed directly to the vertical carriage (Z axis) with no interposed pneumatic movements, and therefore with no additional tolerances which could negatively influence the group rigidity and the working precision. Thanks to its relatively small dimensions, this unit can reach parts of the pieces to be worked which other types of 5-axes units available on the market cannot reach. The electro spindle is equipped with 4 front ceramic bearings and 2 rear ceramic bearings, which can work at a very high rotation speed, with a pressurization system which protects it from dust and with a blower which cleans the tool-holder during tool change. The dissipation of the heat produced by the electro spindle during machining operations is granted by a liquid cooling unit. The 5-axes operating unit does not require any periodic lubrication, since its components are lubricated for life.
Three veins of compressed air within the operating unit allow to use edgebanding aggregates with 3 air veins, copying units, aggregates with blowers, etc.
The electrospindle is equipped with an internal protection system which includes:

- ☑ A sensor for the control of the vibrations generated by the tool, for the verification of the balancing of the tool and of the stresses during processing;
- ☑ A sensor for monitoring the temperature of the motor;
- ☑ A sensor for monitoring the temperature of the front bearings.

If one of the monitored values exceeds a first threshold of safety, a warning is issued on the monitor. In case of failure of intervention, when exceeding a second threshold, the machine is stopped to prevent damage to the electrospindle.

Technical specifications :

- ☑ 14.0 kW (19.0 HP) from 12.000 rpm to 18.000 rpm in S1 duty
- ☑ 16.5 kW (22.5 HP) from 12.000 rpm to 18.000 rpm in S6 duty
- ☑ Max. rotation speed: 18.000 rpm
- ☑ C axis: 360° non-stop rotation
- ☑ C axis rotation speed: 18 rpm
- ☑ B axis: 360° non-stop rotation
- ☑ Maximum angle undercut: - 10°
- ☑ B axis rotation speed: 18 rpm

The programming of workings which require the angular positioning of the 5-axes operating unit can be performed through bSolid or BiesseWorks Advanced programming system, which allow to:

- ☑ Define a "virtual" face with a specific orientation in space and program the workings to be carried out on that face;
- ☑ Define the unit orientation and perform its angular positioning.

The programming of workings which require the interpolation on 5 axes of the operating unit can be performed through bSolid, with the additional module for 5 Axes Machining, or a specific software to be chosen among those available on the market, to be approved by BIESSE .
This software includes the control of the angular positioning of the unit.
During the programming, bSolid checks the possible collisions between movable parts and working table (included the locked piece).
Since there is no control on the actual working table set-up, the operator however must check the actual possible collisions by himself.

* Requires bSolid or another external software package approved by BIESSE to manage the 5 axes operating unit
* Requires the liquid cooling box
* Requires sensors on all the pneumatic stops
* Requires one automatic tool changer or Pick-up tool changer

7550008	1

Presetter for the measurement of the tool length with diameter up to 130mm
Digital device for tool length measurement by contact plate.
The device checks the tool length and updates the values in the tool schedule of Numerical Control.
The diameter of the contact plate is 130mm.
We recommend the use of the blowing device for the cleaning of the reading surface.
The measurable lengths (min/max) must be verified on the specific layout.
*Includes a special tool holder for the device setting

7210041	1

Flange for the assembly of aggregates on an operating unit with 5 interpolating axis
The Flange is mounted on the operating unit with 5 interpolating axis and is equipped with 4 conical slots for aggregate reference every 90°.

* Aggregates can be used only when the electrospindle is in vertical position
* Requires the operating unit with 5 interpolating axis
* Any use of aggregates not supplied with Biesse pricelist and without evaluation of usability required to Biesse, will compromise the recognition of the guarantee of electro spindles and devices connected.

7570016	1

Liquid chilling unit for liquid cooled systems
The liquid chilling unit is equipped with a visual indicator for liquid level and is capable to chill two electro spindles or one electro spindle and one liquid cooled boring head.
The liquid chilling unit grants a longer life to the units even during the most severe operation by keeping the temperature within the normal levels.
The system has an internal flow control which can pop-up warning message on the N.C. screen if the flow is not sufficient.
Power consumption: 1600W

7212179	1

Additional Z axis carriage for front operating units, controlled by an independent axis
This carriage can fit the boring unit, multifunction unit or both.
The N.C. controls the descent of the carriage, which is performed by means of a Brushless motor and a ball screw.
The boring unit or the multifunction unit are fixed directly to the front Z carriage, which vertical movement is controlled by an independent Z axis, resulting in increased productivity.
* Retrofit NOT possible
* In presence of the Operating unit with 5 interpolating axes is NOT compatible with the multifunction units
* It does NOT allow the subsequent retrofit of a boring head or front operating units

7200087	1

BH10 Boring Head
Working unit which can be equipped with 10 independent tools for single and multiple borings on the top face of the panel.
The spindles have a RH/LH alternated rotation and are driven by precision helical ground teeth gears which grants minimum noise emission and maximum machining accuracy.
The boring head is equipped with a manual lubrication system to be performed at a set time through the greasing pump, and it's reminded by a warning message on the N.C. screen.
The head is air cooled.
The unit is composed of 10 vertical independent spindle with a pitch of 32mm (5 spindles along X axis and 5 spindles along Y axis)
The spindles are driven by 1 inverter controlled motor (motor power 1.7 kW at 2800 rpm - 3 kW at 6000 rpm): the spindles rotation speed is programmable up to 6000 rpm to perform fast drilling cycles and reduce machining time.
Furthermore it is possible to program the correct rotation speed based on the tool and material to be processed.
The boring head is equipped with a dedicated dust collection hood which is automatically activated when the unit is in operation.
* Requires the additional Z carriage with pneumatic stroke (where available) or controlled by an independent axis
* In presence of the Operating unit with 5 interpolating axes is compatible only with the Vertical routing unit and the specific horizontal spindles and blade kit

Tool-carriers for automatic tool change

CODE	QUANTITY
7291167	1

16 positions Revolver Tool changer, positioned on the X axis carriage
On-board of the X axis carriage, allows to store up to 16 tools always available on each position of the machine and to perform tool changing operations in a short time.
Technical specifications:

- Wheelbase between grippers: 114mm
- Maximum loadable tools: 16 with 110mm maximum diameter

- Loadable aggregates: Refer to the tool changer layout
- Maximum tool diameter: Refer to the tool changer layout
- Maximum tool length: Refer to the tool changer layout
- Maximum weight of a tool or aggregate inclusive of the tool: 7.5Kg
- Maximum total weight: 55Kg

If the standard chip deflector is loaded on the tool changer, the two adjacent grippers must be manually removed.
*Incompatible with the 14 or 21 positions chain tool changer, positioned on the X axis carriage

Software

CODE	QUANTITY
7530392	1

bSolid
The software package running in Windows environment allows to design the final product, define its machining's, define working table set-up, simulate the part machining's on the 3D machine model and generate the machine needed programs.

It provides the following functionalities:

- ☑ 2D CAD environment complete of:
  - ☑ Commands for geometries and text designing on planes and 2D faces complete with the typical tools for design (lines, polylines, arcs, circles, ellipses,) and for design modifications (move, rotate, scale, and mirror.)
  - ☑ Dimensioning tools
  - ☑ Design of custom vertical, inclined and curved faces starting from designed geometries
  - ☑ Fully parametric mode (capability to hook objects to the piece with formulas and conditions)
- ☑ General file management tools (copy, paste, undo / redo) and design visualization tools (zoom, view rotation, orthogonal view on customized faces) always available
- ☑ DXF, CIX and BPP file import
- ☑ Commands for routing, boring and cuts design on horizontal, vertical, inclined and curved faces with the capability to work on these faces in a 2D simplified way (therefore the 4 axis machining)
- ☑ Commands for 2D simple pockets design (such as slots on the piece)
- ☑ Program design "Wizard": innovative command for the automatic creation of programs based on rules of automatic association between geometry and tools
- ☑ Independent management of multiple machines
- ☑ Management of 5 axis machining only in positioning
- ☑ Management of probing cycles
- ☑ Customized macro creation
- ☑ 3D workpiece simulation with visualization of material removal
- ☑ Tool management environment complete of:
  - ☑ Custom tool design (routers, drill-bits, saw blades and their 3D shape)
  - ☑ Definition and tooling of aggregates (either price list available as generics)
  - ☑ Chip deflector design
  - ☑ Tool copy and search
  - ☑ Definition of chip deflectors

- ☑ Copy and search for tools (routers, drill-bits and saw blade), aggregates and chip deflectors
- ☑ Working sequence definition
- ☑ Environment for rule definition of automatic machining's

☑ Machine tool changer 3D graphic environment: it allows to equip or take off the machine tool changers with tool, aggregate or chip deflectors immediately showing and checking their dimensions

☑ Working table 3D graphic environment including:
- ☑ Current machine real and faithful 3D model view
- ☑ Vacuum modules and clamps stock management
- ☑ Realistic movement of working tables and carriages
- ☑ Working table semi-automatic positioning and its configuration parameters (**This command is an aid and does not replace the machine tooling, as it has limitations. Therefore you should always run a simulation of the program on the machine before running it**)

☑ Realistic simulation of workpiece on the machine worktable able to:
- ☑ Simulate the real machine dynamics without actually run the machine itself
- ☑ Simulate in 3D graphics the part machining with material removal view
- ☑ Check any kind of collision between all machine components: tools, electro spindles, aggregates, working tables, carriages, vacuum modules, Uniclamp modules and working piece anticipating every possible mistake on the actual process (warning: it doesn't exist any type of control on the actual working table set-up, the kind and position of each locking support are borne by the operator)
- ☑ Calculate the workpiece execution real time on the machine

* Recommended requirements of the PC for installation in office:

☑ PC Intel Core I5 or I7
☑ At least 8 GB RAM
☑ Windows 7 64 bit Operating System
☑ nVidia OpenGL Accelerated Graphic Card with at least 1 GB RAM
☑ Resolution 1440x900 with 16M colours
☑ At least 10 GB of free space on the Hard Disk

CODE	QUANTITY
ASR14255	1

Passage increased to 250mm
* It requires the vertical movement of the strips
* Incompatible with sweeper arm and cell solutions
* To cut Rover B FT 1536