

February 17, 2016

Presented to



Busellato Jet Optima T5 5-Axis 4.5'x10' CNC Machining Center

4.5'x10' chassis shown

Note: The pictures and/or illustrations included in this quotation are for descriptive purposes and intended to aid in understanding certain features of the machine. Some depictions may not reflect the exact construction and may include options that are not part of this offer. In all cases, the written text supersedes any graphic representation. If you have any questions, please consult your Casadei-Busellato product manager.

BUSELLATO *The Workhorse of the Industry*

MACHINE SPECIFICATIONS

Busellato Jet Optima T5 5-Axis 4.5'x10' CNC Machining Center

Busellato uses 3-dimensional solid modeling systems to design its working centers which are built with a mobile beam and stationary basement. The beam moves in a longitudinal direction with respect to the basement (X axis) and supports a pair of carriages which determine the movement of the Y and Z axes. The X and Y axes define a plane parallel to the floor and the Z axis moves up and down perpendicular to this plane. This configuration allows a remarkable reduction in the machine's overall size and improves the machine's performance and functionality. The basement and the beam are made of electrically welded steel and are ribbed and strengthened internally to guarantee maximum rigidity even under intense working. The structures undergo a thermally-controlled normalization cycle.

QUALITY CONTROL

All phases of assembly undergo conformity checks according to special testing procedures. The alignment of all the linear guides is carried out using an electronic level guaranteeing straightness and parallelism tolerances to be within 0.02 mm per linear meter. On all machines, positioning precision and bi-directional repeatability of the axes is checked using an interferometer laser system. Bi-directional positioning precision is guaranteed within a tolerance of ± 0.05 mm. To complete the dynamic tests carried out on the machines, the interpolation of the axes (circularity) is tested with the Ball-Bar Renishaw device. An electrical test of the whole system is carried out on each machine according to CEI EN 60204-1 legislation.



LINEAR MOTION SYSTEMS

X AXIS - Movement of the X axis is by rack and pinion with convex, helicoidal teeth, made of hardened and tempered steel which undergoes a thermal carburizing treatment and successive hardening. A lubricating film is applied to the teeth, eliminating the need for lubrication during the life of the machine. The pinion is splined directly on a high precision planetary gearbox. Precision of the movement along the X axis is guaranteed by a measurement with laser instrumentation and software management of the calibration curve to guarantee an absolute measurement with time. The mobile beam moves on high precision pre-loaded ball runner blocks and linear guides made of rectified and hardened steel. Ball runner blocks for all axes are equipped with a seal guaranteeing maximum protection from dirt and dust.

Y and Z AXES - The carriages for these axes are made from an aluminum alloy with highly rigid mechanical properties. Movement of these axes is by ball nut with pre-loaded lead screw in order to guarantee high speeds with minimal wear. The carriages are mounted on pre-loaded ball runner blocks which slide on very high precision linear guides made of rectified and hardened steel. Z axis motor and ball screws are sized to avoid the need for pneumatic assistance. All axes are driven by AC brushless motor fed and controlled by digital drives.

DUST EXTRACTION

Busellato installs a centralized dust extraction system, with a single large pipe mounted on the head. The system automatically diverts collection between the main electrospindle and drilling head to maximize efficiency.

LUBRICATION

The machine is equipped with an automatic central lubrication system with progressive distribution. The system has a single feeding point for the group of distributors, which send automatically and safely, an adequate volume of lubrication to each lubrication point. The grease reservoir and pump are permanently attached to the machine. The control software alerts the operator when lubrication is taking place.

MACHINE SAFETY

The machine is equipped with front safety mats, rear and lateral fence, and head shroud cover, as well as these additional safety systems: push buttons for emergency stop, software and hardware to monitor the safety distance, check sensors for the vacuum and compressed air level.

ELECTRICAL CABINET

The electrical cabinet is integrated in the left hand side of the machine base and is tested according to the strict international regulations (EN 60204).

INVERTER

The BUSELLATO JET Series employs a heavy duty, digital, programmable frequency static converter (inverter) and includes control that the motor has stopped, braking resistance and automatic reset in case of emergency.

MOBILE PC CONSOLE

Mobile console for PC allows the operator to position the programming and control station according to the workflow of materials at any given time. The control PC consists of:

- Windows 7 operating system
- i5 processor
- 2 Gb RAM memory
- 80 Gb Hard Drive
- High resolution 19" LCD color screen (1280x1024)
- DVD/CD-RW 48X Burner
- 5 USB 2.0 ports, with one externally mounted on the control panel for easy access
- 1 Ethernet RJ45 port for connecting to office network



TELE-SERVICE VIA INTERNET

Allows remote connection between the machine's PC and Casadei-Busellato's Authorized Service Center allowing direct intervention on the control for checking parameters of the whole machine, single programs and installation of eventual software updates. Internet access and connection is the responsibility of the customer.

THE MACHINE IS COMPLETE WITH:

Compressed air connection

- 1 Front-mounted auxiliary compressed air connection for using a blow-off nozzle

Jig locking connections (4)

- auxiliary vacuum connections for use with custom spoilboards

Automatic central lubrication system

- Electric pump delivers grease through a distribution block to all X, Y, and Z guides
- Timing of greasing cycle controlled through software

Partialized dust extraction manifold

- Pneumatic blast gate directs suction to electrospindle or drill head automatically

Multi-function push-button panel for axis control

- Hand-held control for redundant operation of start/stop/pause/e-stop.
- Axis speed control

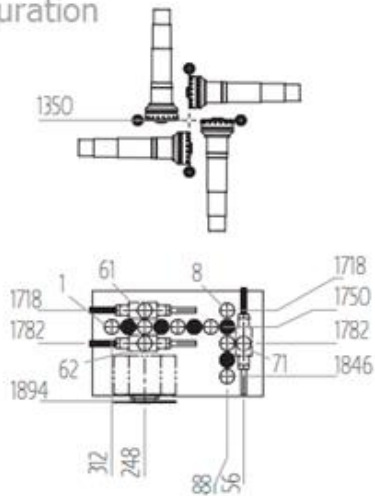
Pneumatic pre-arrangement for clamping devices

- Necessary for operation of manually positioned clamping devices

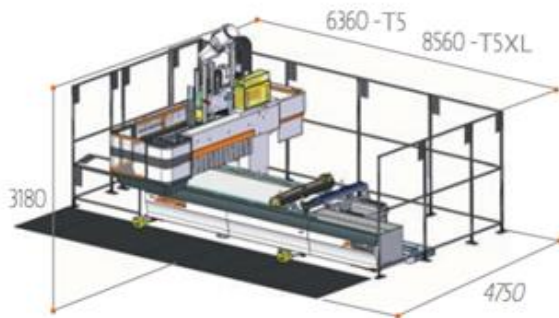
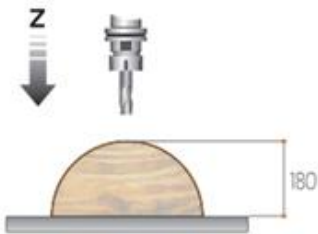
FB0728 Air conditioning for electrical cabinet

TECHNICAL SPECIFICATIONS

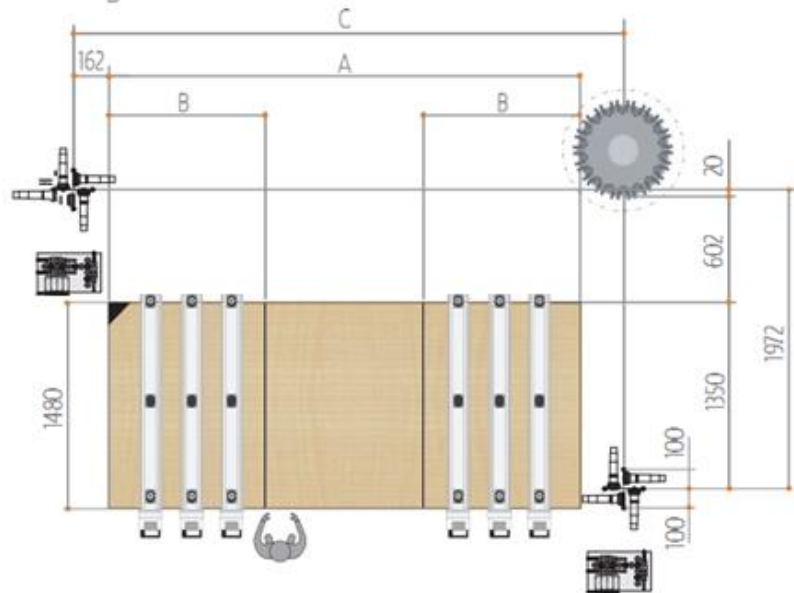
Configuration



Work Clearance



Working Areas



	Jet Optima T5	Jet Optima T5XL
X Axis stroke / A / B	3407 / 3060 / 1000 mm	5607 / 5260 / 2100 mm
Y Axis stroke	1972 mm	
Z Axis stroke	400 mm	
Std electrospindle power (S1)	11 (15)	Kw (Hp)
Max. power installed	29	Kw
Vacuum pump capacity	90 / 250	m ³ /h
Compressed air pressure	6,5	Bar
Compressed air consumption	210	NI/1
Compressed air connection	1/2"	Gas
Dust extraction outlet diameter	250	ø mm
Extraction air consumption	3400/3800	m ³ /h
Extraction air speed	28/30	m/s

Five (5) HSK-F63 cone R.H. rotation for electrospindle with **ERG32** COLLET attachment from 2 to 20 mm. diam. complete with nut and shank for locking cone.

Five (5) ERG32 collets of the following diameters: (2) 3/4", (3) 1/2", unless otherwise specified by customer prior to machine shipment.

FB0176 Transformer for 400/230/115 V 50 HZ – 1.6KVA

FB0698 Auto-transformer for input 208/230/460 V - 50/60Hz – output 400V - 35 kVA.

VACUUM TABLE AND SYSTEM

Two working areas (left and right)

- Left and right work areas to facilitate loading one area while machine works in the other (pendulum processing)
- Reference pins activate automatically in appropriate area
- Includes (2) foot pedals for activating vacuum in each area individually

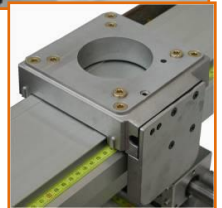
Six (6) "IMC" panel support 1400 mm with double "0" line.

- IMC "Interchangeable Modular Cups" type panel support with pneumatic clamping on both running guides in X and complete with metric line. The panel support slides on hardened and rectified round guides by means of 4 ball bearings.
- Equipped with a reference stop at the rear of the support and a second reference stop (2nd "0" line) 1250mm forward of the rear stop. Front mounted stop is convenient for machining narrow parts.



FB0018 Eighteen (18) Support for cups and clamps for IMC system (Interchangeable Modular Cups)

- Universal base for pods and clamps
- Each base has its own release for pneumatic locking, allowing "one-handed" movement
- All pneumatic and vacuum hoses are concealed
- No hoses to connect or disconnect when changing pods or clamps



FB0023 Eighteen (18) Vacuum cups 80x155 mm (IMC)

- Rectangular pod for a variety of sizes
- Valve to close vacuum flow when not in use
- Can be positioned on IMC support at 0°, 90°, 180 or 270°



FB0027 Six (6) Visual display for panel support and vacuum cup quotas (each panel support)

- Shows the quotas where the panel support (X axis) and each vacuum cup installed on the panel support (Y axis) are to be positioned.
- The quotas are sent automatically from the control to the visual display according to the program to be carried out.



Panel lifting devices on (4) supports

- Smooth phenolic lifting devices provide easy load and unload of large, heavy panels
- Prevents panels from dragging across pod surface
- Pressing foot pedal drops devices, releasing foot pedal activates vacuum cups

105 m³/hr vacuum pump

- Rotating vane pump for generating vacuum
- Capacity of 250 m³/hr
- Engineered for pod and rail applications



FB0730 Belt conveyor for chip evacuation for JET Optima T5

** FB0493 Four (4) Manual IMC clamp ø 158



WORKING UNITS

Electrospindle 11 kW (15Hp)

- Maximum power 11 kW (15Hp) S1 continuous duty
- Rotation speed 1000-20000 rpm.
- Driver three phase motor controlled by inverter
- Rotation sense right and left
- Limit B axis $+185^{\circ}$ -95°
- Limit C axis $\pm 360^{\circ}$
- Tool attachment HSK F63 cone
- Mobile dust extraction hood with pneumatic exclusion



Water-cooling unit for 5 axis electrospindle

- Allows to maintain a constant cooling water temperature of the electrospindle, avoiding overheating. Including:
- Water circulating pump
- Water cooling radiator



FB0737 Rear 12-position rotary tool changer – HSK F63.

- Automatic 12 position rotary tool changer for electrospindle with HSK F63 attachment. The rotary tool changer with collets totally submerged in the metallic structure is situated at the rear on the machine's beam. The unit slides on pre-loaded ball runner blocks and on very high precision linear guides made of rectified and hardened steel. Equipped with an air blower to guarantee that the cone is clean before being loaded in the electrospindle. The especially strong structure allows the use of large sized tools and aggregates.

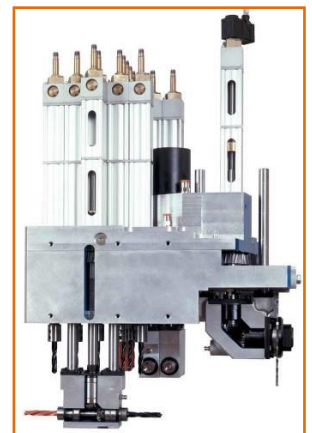


Linear 10-position tool changer – HSK F63

- 10 position linear tool changer located on RH side of machine

M18 boring head with integrated saw unit

- Working unit for vertical drilling with independent spindles.
- Unit is mounted forward of the electrospindle giving complete table coverage
- Made in light aluminum alloy with high mechanical properties, the unit is equipped with:
- 12 spindles with vertical outlets in a "T" shape, 32 mm pitch, of which 8 spindles are along the X axis and 4 spindles along the Y axis.
- 6 horizontal drills, 2+2 in the X direction and 1+1 in Y
- 1 integrated saw unit for 120mm diam. blade in "X" axis.
- Control of the spindles by an electro-valve and cylinder with single thrust chamber for a drilling force of 44kg (97lb) per spindle.
- The working unit is rotated by an asynchronous 2.2 kW electrical motor controlled by "inverter".
- The motor, in turn, activates the transmission made of special steel gears with wide, slanting, rectified and thermally hardened teeth.
- The attachment for vertical tools is designed for threaded M10 shanks, while the attachment for horizontal tools is designed for threaded M8 shanks

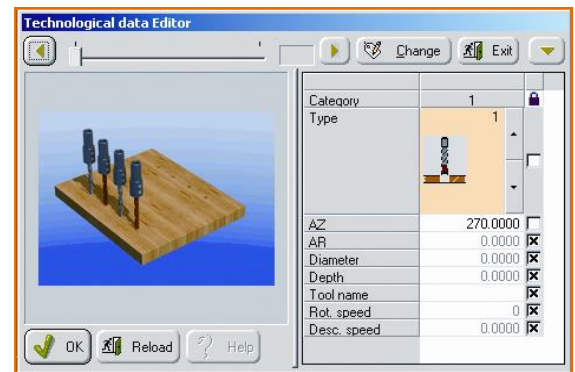


NUMERICAL CONTROL

The Program Editor in Genesis Evolution, standard on all Busellatos, is capable of POSITIONING the 5 axis head at any of its achievable angles and, once positioned, can machine on any plane defined at these angles. The vast majority of 5 axis applications involve angled planes, i.e. 3° beveled edges on doors or angled sills on a window sash and Genesis Evolution provides a powerful programming solution for these situations. For interpolating the 5 axes simultaneously, as would be done on a twisted hand rail for a stair or milling the curved surface of a seat bottom, Alpha Cam Router Ultimate, supplied optionally, is required.

The “Genesis Evolution” Numerical Control incorporates leading-edge, true PC-control on the Busellato, avoiding proprietary PLC control systems. Review major features below and see our website <http://www.casadei-busellato.com/p-344-busellato-genesis-evolution.aspx> for video tutorials on Genesis Evolution.

- **CAD** integrated in the control with mirroring, rotation, repetition functions, etc.
- “**Multitasking**” operating system for using the control even when the machine is working
- Graphical display of the 6 workable faces
- 2D and 3D display of the piece being worked
- **Parametric programming** which permits the use of mathematical, trigonometric, inverse trigonometric and logical formulas and the use of 300 variables.
- Programming on horizontal, vertical faces and **virtual** faces which can be rotated, very helpful for when using aggregates.
- Programming of **linear, circular, oval** and **ellipse** routings on the three Cartesian axes
- Programming of tool radius with automatic correction
- Possibility of excluding the display of some types of machining
- Multi-level zoom function
- **Conditioned programming** (IF/EndIF Blocks) associated with the use of Macros
- Absolute or incremental programming
- Creating of **sub-programs** by the operator with the possibility of multiplication, mirroring and rotation of the above
- Up to **10,000 program lines** (expandable) are programmable
- Customer can personalize error messages
- Easy identification of stored programs using “preview” function
- Archiving of programs with names up to 256 characters long
- In line recall of the machine set-up and tool specifications
- Management of up to **500** tools
- Graphical display of set up of tool changers
- Tool graphical archive with the possibility of parameterizing up to 9000 different types of tools
- **Pocket cycle** in defined planes
- Pocket cycle with three modes- **Simple pocket, relief** and **reverse relief**
- Programming of all **TRUE TYPE ANSI fonts** installed in PC (up to 255)
- **Linear** or **curved text** orientation
- Management of **distances between characters, height, size, bold, italics**
- Built-in oscilloscope capable of monitoring the logical input/output status and the dynamic axes’ parameters
- Visualization of the rpm and absorbed current of the aggregates and spindle
- Importation of files from previous Busellato CNC versions (Genesis, Winner90, CNC 90)
- Bar code reading software
- **Calculation of time** required for program execution
- **Program simulation** of working cycle
- Manual and machine diagnostic functions in real time with graphic help
- Management and **diagnostic synoptics** which makes using the machine easier
- **Program list management and variable control from the list**
- Automatic control of the working speed to optimize the routing path.
- ** **One additional USB license key for Genesis Evolution. (one for machine, two for office)**
- ** **AUTOLINK** Software for converting 2D DXF/DWG files to CNC files.



TRAINING

GENESIS EVOLUTION SOFTWARE TRAINING

** Online software training with up to 6 hours of training in sessions of approximately 2 hours each.

ON-SITE TRAINING

The entire installation and on-site training process will be completed within 32 labor hours, unless otherwise agreed in writing. Our technicians use a comprehensive checklist to commission the machine and train your operators on the operation. Some of the topics covered:

- Machine safety and operation
- Lubrication procedures and maintenance schedule
- Tooling installation and parameters
- Review of electrical, parts and instruction manuals
- Control cabinet layout and major electrical components
- Processing of your programmed parts

MACHINE PRICE & LEASING INFORMATION

MACHINE LIST PRICE WITH INSTALLATION AND TRAINING

FOB Brighton MI 48116