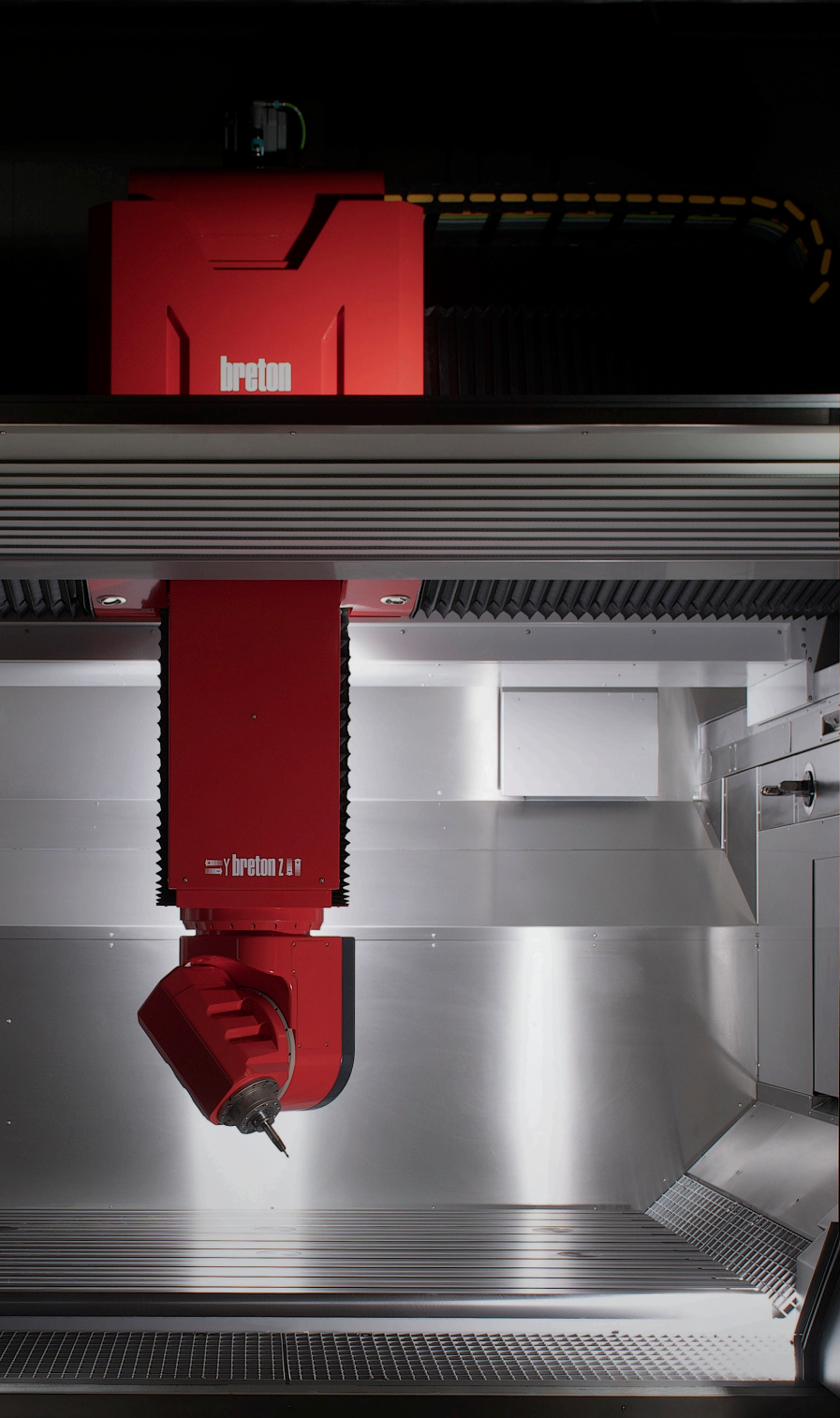


**breton**  
Machine Tools



# MATRIX 800



## ↓ TECHNOLOGIES



HIGH DYNAMICS



THERMOSTABLE



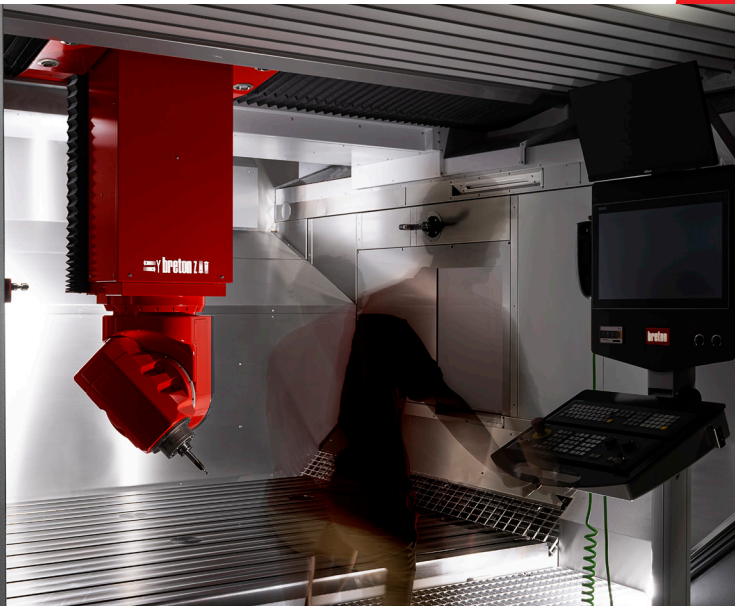
THERMAL SHIELD



DIRECT DRIVE

High-precision 5-axis vertical machining centre with 2000 x 2500 x 800 mm travel, particularly suitable for hi-feed roughing, finishing and semi-finishing operations on medium applications made of composites, light alloys and steel. It has been designed, developed and optimized through the most advanced Digital twin simulation technologies that, besides guaranteeing excellent working performances, it allows using this technology to speed up all simulation and machine configuration phases. The high degree of stiffness guaranteed by the monobloc structure is combined with technological solutions like the High Dynamic technology which can maintain high dynamics and reduce friction factors, thus allowing to obtain higher jerk, acceleration and speed.

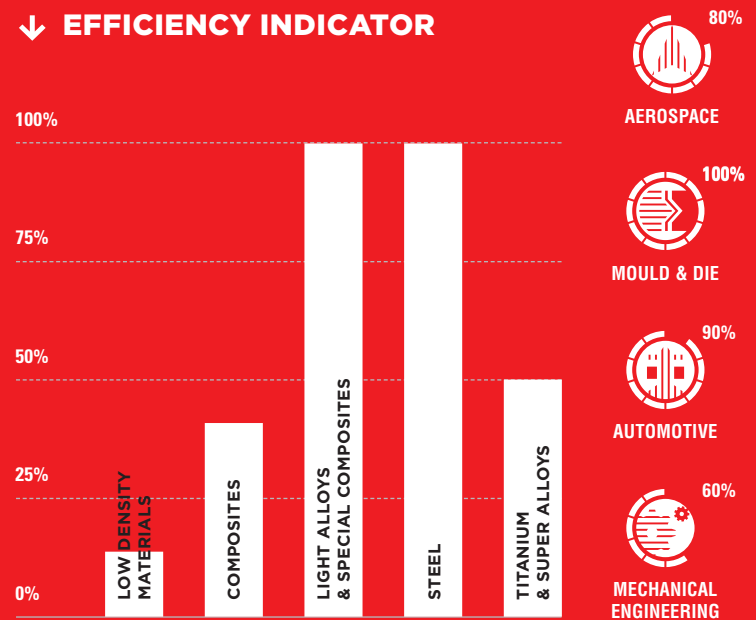
The thermo-symmetric structure along with the Thermal Shield technology ensure the total control of thermal expansions, the direct motors used for the axes movements remove the backlash and the vibrations and the A and C-axis are motorized by Direct Drive motors: all these features make possible to halve the commissioning times and to reduce Customer's operative costs.



# 5

## REASONS WHY

### ↓ EFFICIENCY INDICATOR



#### COMPACTNESS

Best optimization of the ratio between machine size and axis stroke, i.e. the footprint efficiency ratio. The transversal development (the 2500 mm Y-axis stroke exceeds the 2000 mm X-axis stroke) allows to push the machine rear side against the wall, improve the machine visibility to the operator and deliver the machine to the customer already assembled.

#### HIGH PRECISION

The thermo-symmetric structure along with the Thermal Shield technology considerably improve the thermal expansions control and allows reducing structural deformations without using expensive cooling systems. The direct motors for the axes movement remove the backlash and the vibrations caused by the belts; the Direct Drive motors for A and C-axis guarantee the necessary power when required.

The head is equipped with large bearings to ensure the outmost vibration damping and the best positioning precision provided by the high-resolution integrated encoders; moreover, both torque motors and electrospindle are coolant-refrigerated.

#### VERSATILITY

This machining centre guarantees enough thrusts and rigidity to perform high-feed roughing and top-of-the range semi-finishing and finishing operations. At the same time, it offers the ideal dynamics, speed and accelerations for those who are looking for the highest production performances even on the most demanding parts made of aluminum or composite.

#### REDUCTION OF INSTALLATION TIME AND COST

Installation times and costs have been halved. The monobloc structure allows delivering the machine to the customer already assembled, considerably simplifying installation time on site. The structural rigidity just requires simple flat foundations, thus minimizing the use of anti-shrinkage cement and chemicals for ground anchoring.

#### MINIMIZED OPERATING COSTS

The reduction of operating costs represents, of course, an added value. The kinematics and mechanisms lubrication has been completely reconceived, replacing the traditional systems with an advanced plant for lubricant control and distribution. In this way, the most common such as dirt, stains, dangerous vapors and high-maintenance costs are solved. Any variations in temperature are stabilized thanks to thermo-symmetrical structures and the patented ThermalShield.

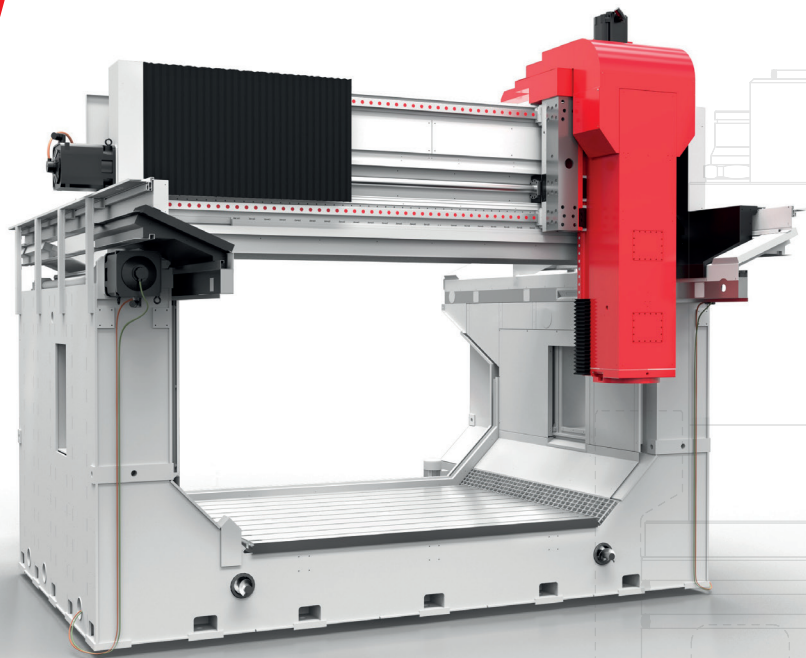
The working area is covered with modular stainless steel panels which, combined with the chip discharging system, allow keeping it clear and safe for the operators and also to extend the machine life.

## → MONOBLOC STRUCTURE

A rigid **monobloc structure** made of electro-welded steel has been **designed to guarantee stiffness and vibration damping** during the most demanding operations. Since columns and table are made of a single structure, remachining or readjustments at the installation site are no longer necessary. The structure incorporates a **complete series of chip conveyors** which can be replaced by a convenient **dust extraction system** when working on composites. Both bridge and RAM, among the sturdiest in their category, ensure **greater stability in roughing operations** while maintaining **high dynamics and accuracy in finishing operations**.

# 28.3

**FOOTPRINT EFFICIENCY RATE**



Machine dimensions (mm)  
**6.500w x 4.350l x 5.000h** /  
 Machine axes stroke (mm)  
**2.500Y x 2.000X x 800Z**

| MATRIX 800                           |                 |                                       |
|--------------------------------------|-----------------|---------------------------------------|
| <b>X stroke</b>                      | mm<br>in        | 2.000<br>79                           |
| <b>Y stroke</b>                      | mm<br>in        | 2.500<br>98                           |
| <b>Z stroke</b>                      | mm<br>in        | 800<br>32                             |
| <b>X / Y / Z axes rapid feedrate</b> | m/min<br>ipm    | 50 / 50 / 40<br>1,969 / 1,969 / 1,575 |
| <b>A axis rotation</b>               |                 | -105° +120° – ±115°                   |
| <b>A axis rapid feedrate</b>         | rpm             | 30                                    |
| <b>C axis rotation</b>               |                 | ±305° - endless                       |
| <b>C axis rapid feedrate</b>         | rpm             | 30                                    |
| <b>Milling tool taper</b>            |                 | HSK - A63                             |
| <b>Milling table dimension</b>       | mm<br>in        | 2.500 x 2.000<br>98 x 79              |
| <b>Max. table payload</b>            | Kg/m2<br>lb/ft2 | 5.000<br>1,024                        |

| MATRIX 1000                            | MATRIX 1300/1500                                      |
|--|---|
| 2.500 - 4.000<br>98 - 158              | 3.000 - 8.000<br>118 - 315                            |
| 2.500<br>98                            | 3.000 - 4.000<br>118 - 158                            |
| 1.000<br>39                            | 1.300 - 1.500<br>51 - 59                              |
| 50 / 50 / 40<br>1,969 / 1,969 / 1,575  | 50 / 50 / 40<br>1,696 / 1,696 / 1,575                 |
| ±115°                                  | ±115°   |
| 30                                     | 30  |
| ±305° - endless                        | ±305° - endless                                       |
| 30                                     | 30  |
| HSK - A63 – HSK - A100                 | HSK - A63 – HSK - A100                                |
| 2.000 - 4.000 x 2.500<br>79 - 158 x 98 | 2.500 - 3.500 x 3.000 - 8.000<br>98 - 138 x 118 - 315 |
| 15.000<br>3,072                        | 15.000<br>3,072                                       |



→ HEADS

↓ ELECTROSPINDLES

**M 52/16**

POWER S6/S1 → 31/25 kW  
 TORQUE S6/S1 → 65/52 Nm  
 SPEED → 16.000 rpm  
 HSK - A63

**M 48/28**

POWER S6/S1 → 22/20 kW  
 TORQUE S6/S1 → 60/48 Nm  
 SPEED → 28.000 rpm  
 HSK - A63

**M 62/28**

POWER S6/S1 → 41/37 kW  
 TORQUE S6/S1 → 89/62 Nm  
 SPEED → 28.000 rpm  
 HSK - A63

**M 87/24**

POWER S6/S1 → 115/87 kW  
 TORQUE S6/S1 → 110/83 Nm  
 SPEED → 24.000 rpm  
 HSK - A63

**M 100/18**

POWER S6/S1 → 40/40 kW  
 TORQUE S6/S1 → 137/100 Nm  
 SPEED → 18.000 rpm  
 HSK - A63



**GHIBLI**

|                                |          |                        |
|--------------------------------|----------|------------------------|
| <b>Type</b>                    |          | FORK HEAD              |
| <b>Transmission</b>            |          | HIGH PRECISION GEARBOX |
| <b>A axis rotation</b>         |          | ± 115°                 |
| <b>C axis rotation</b>         |          | ± 270° - ENDLESS       |
| <b>A axis rapid feedrate</b>   | rpm      | 12                     |
| <b>C axis rapid feedrate</b>   | rpm      | 18                     |
| <b>Pivot distance</b>          | mm<br>in | 250<br>9.8             |
| <b>Interchangeable spindle</b> |          | -                      |

**Compatible electrospindles**  
 M 52/16 - M 48/28 - M 62/28



**PHOENIX**

|                                |          |                  |
|--------------------------------|----------|------------------|
| <b>Type</b>                    |          | FORK HEAD        |
| <b>Transmission</b>            |          | DIRECT DRIVE     |
| <b>A axis rotation</b>         |          | -105° +120°      |
| <b>C axis rotation</b>         |          | ± 305° - ENDLESS |
| <b>A axis rapid feedrate</b>   | rpm      | 30               |
| <b>C axis rapid feedrate</b>   | rpm      | 30               |
| <b>Pivot distance</b>          | mm<br>in | 265<br>10.4      |
| <b>Interchangeable spindle</b> |          | -                |

**Compatible electrospindles**  
 M 48/28 - M 62/28



**TORNADO**

|                                |          |                  |
|--------------------------------|----------|------------------|
| <b>Type</b>                    |          | FORK HEAD        |
| <b>Transmission</b>            |          | DIRECT DRIVE     |
| <b>A axis rotation</b>         |          | -105° +120°      |
| <b>C axis rotation</b>         |          | ± 305° - ENDLESS |
| <b>A axis rapid feedrate</b>   | rpm      | 30               |
| <b>C axis rapid feedrate</b>   | rpm      | 30               |
| <b>Pivot distance</b>          | mm<br>in | 320<br>12.6      |
| <b>Interchangeable spindle</b> |          | -                |

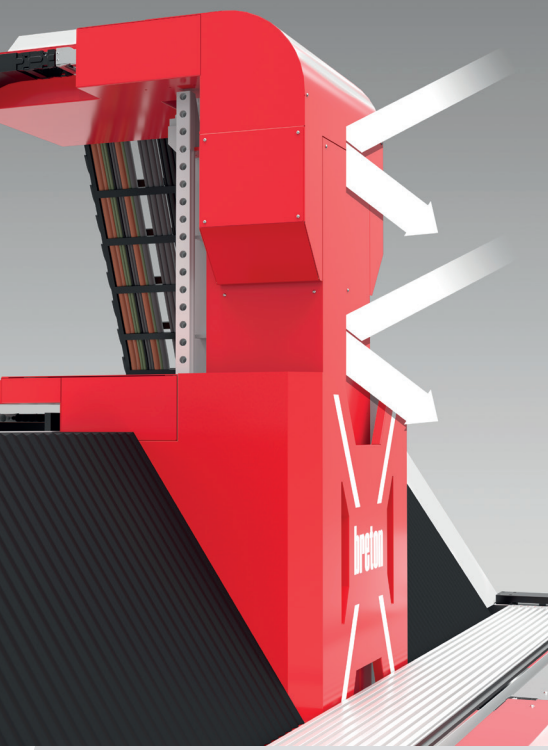
**Compatible electrospindles**  
 M 87/24 - M 100/18



**TYPHOON**

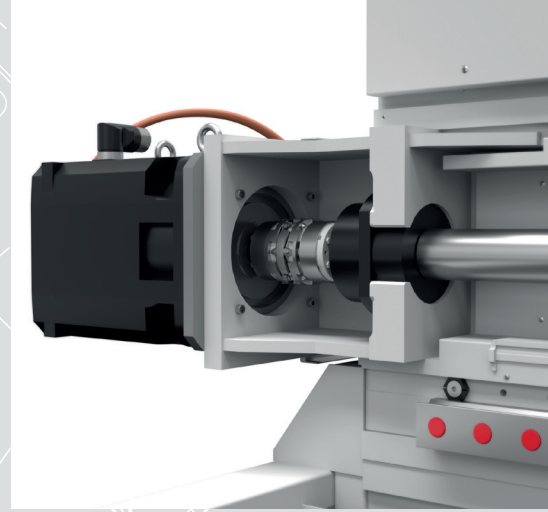
|                                |          |                      |
|--------------------------------|----------|----------------------|
| <b>Type</b>                    |          | ORTHOGONAL           |
| <b>Transmission</b>            |          | DIRECT DRIVE         |
| <b>A axis rotation</b>         |          | ± 115°               |
| <b>C axis rotation</b>         |          | ± 305° - ENDLESS     |
| <b>A axis rapid feedrate</b>   | rpm      | 30                   |
| <b>C axis rapid feedrate</b>   | rpm      | 30                   |
| <b>Pivot distance</b>          | mm<br>in | 260 350<br>10.2 13.8 |
| <b>Interchangeable spindle</b> |          | OPTIONAL             |

**Compatible electrospindles**  
 M 48/28 - M 62/28 - M 87/24 - M 100/18



## → DIRECT MOTORS

The use of direct motors for the axis movement **allows removing the backlash and the vibrations** caused by the transmission belts, thus obtaining a **much greater dynamic response**. Moreover, by removing the driving belts we eliminate "noisy frequencies" thus achieving **higher finishing qualities** even on complex surfaces.

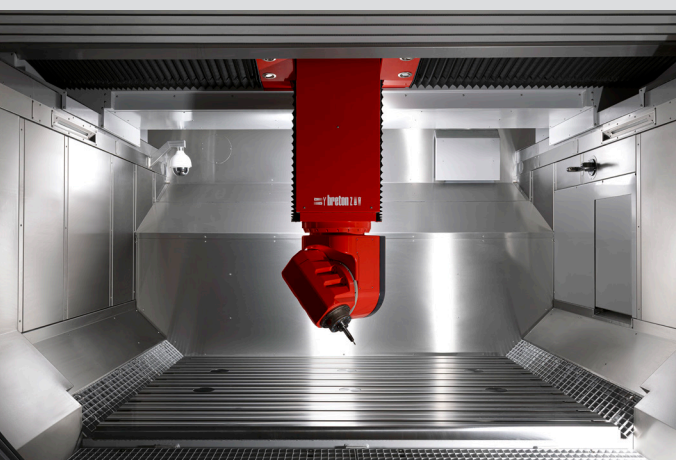
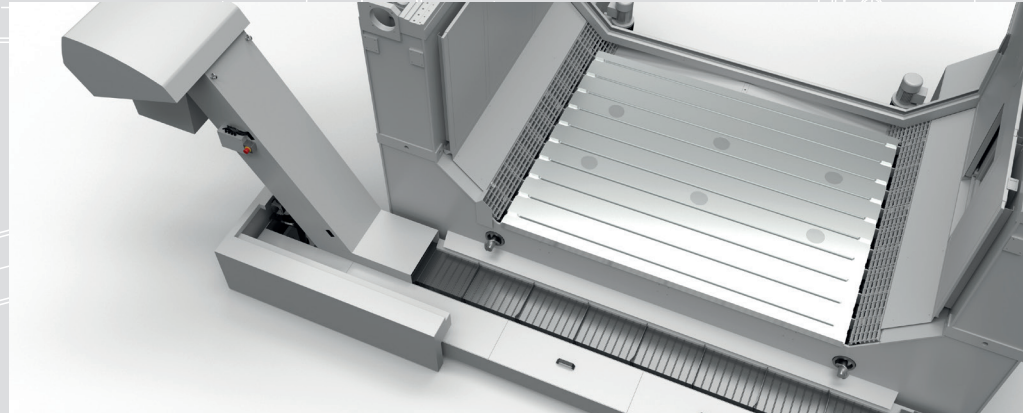


## ← THERMAL SHIELD

Our patented Thermal Shield technology considerably **improves thermal expansion control and reduces structural deformations** without using expensive cooling systems. This technology creates an **advanced thermal coat** that keeps the temperature between structures and workpieces as stable as possible. The maximum difference in temperature among various points of each machine structures is of 0.2°C, avoiding the risk of angular deviations or excessive expansions.

## → CHIP DISCHARGE

An efficient chip discharging system consisting of **screw and belt conveyors positioned around the table**, allows to keep the working area free from accumulations of chips and safe for the operators who will be able to devote their time to more profitable activities than cleaning.



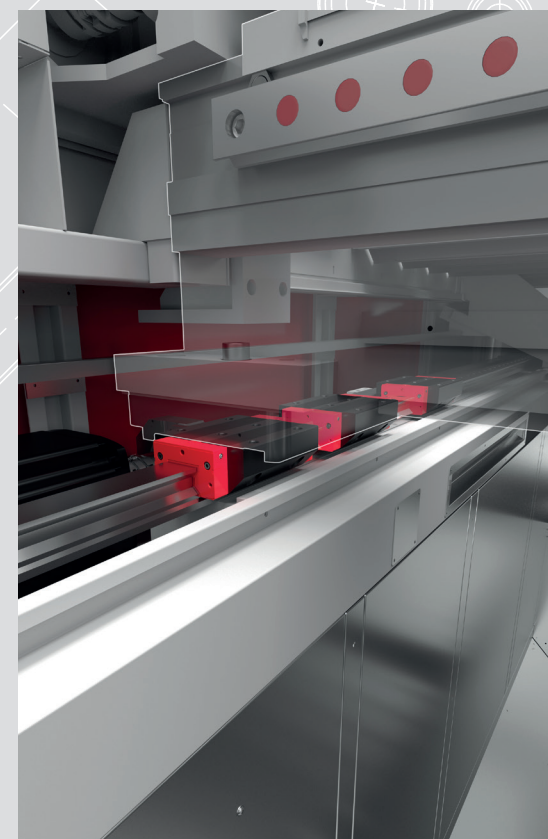
## ← WORKING AREA

A clean machine lasts much longer. For this reason, the working area is covered with **modular stainless steel panels** that not only keep themselves cleaner, but also remain virtually **unchanged over time** even if continuously exposed to swarf and chips.

## → ROLLER PADS

To provide the bridge with maximum rigidity, we use **3 roller pads on each shoulder guideway** in order to more effectively contrast the thrust forces and facilitate the vibration damping while maintaining a high dynamism.

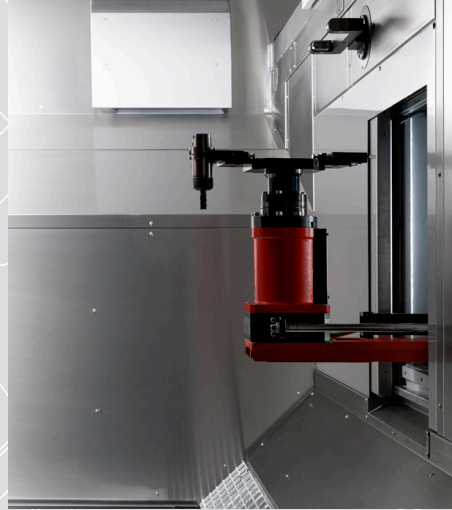
The RAM, with a **section of 450 x 450 mm** among the sturdiest in its category, is fixed to the carriage by means of **6 roller pads**, 3 per side, in order to support all the efforts and ensure a high movement speed.





## → TOOL CHANGE

Matrix 800 can integrate various types of tool stores, all perfectly compatible with the new **exchanging arm**, **even more compact and faster**. This choice allowed for the design of more rigid shoulder, and open to expand or modify the store over time as needed.



## → CONTROL PANELS

Matrix 800 has been designed and tested together with the suppliers of the most advanced CNC systems so that its features can enhance the functions provided by electronics and improve the precision and finish of machined parts.

This machining centre can therefore be equipped with both the **latest version of the Heidenhain numerical control** and the **brand new Siemen Sinumerik One**, of which we have been **co-developers and partners selected for the launch**.



## ← MAINTENANCE AREA

On the machine side, we have dedicated an area to hydraulic and pneumatic utilities. Here, in an tidy and compact panel, **all the modules required for diagnostics and maintenance are grouped at sight**. The **modular upper part** is prearranged for possible future expansions of the machine with new accessories and/or automations.

For cleaning and safety purposes, the lower part of the panel is fitted with a tray dedicated to the collection of fluids so as not to disperse polluting liquids into the environment.

## → POSITIONING TABLE

It is possible to configure the machine with a rotary positioning table, available with a **diameter ranging from 1000 to 1600 mm**, to perform polar milling operations on cylindrical elements or on complex geometries, obtaining higher precision. In this way, we can also load parts with a larger volume, as we maintain the required space for head and tool on one side only, using the rotation of the part to process it in any direction.

The **Direct Drive motorization of the table** allows to have a sufficient number of revolutions also to carry out turning operations.





# breton

Machine Tools

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