

modulo

The fully automated manufacturing solution with modular linear transfer.
Your machine tool for the manufacturing of main plates and bridges for the watchmaking industry.



Fleury SA has over 50 years' experience in machine construction for the complete production of main plates and bridges in the watchmaking industry. There are currently over 300 **modulo** units in use.

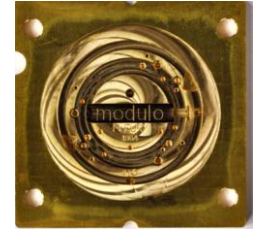
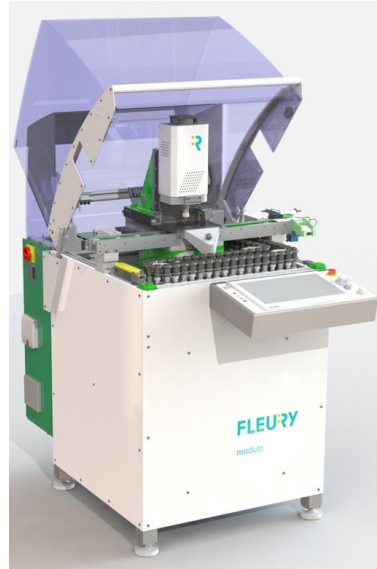
modulo enables you to manufacture your main plates and bridges in a single operation without stamping, 24 hours a day, 7 days a week. The production capacity of your production line is always adjustable to your batch sizes. Competitively placed for batch sizes of 100 to 500,000 parts, **modulo** guarantees a minimal reaction time with minimal investment.

The different modules with one or two machining units form the basis of the **modulo** concept. All modules can work either individually or grouped. You can reconfigure your production line in the shortest possible time and adjust production capacity to suit your requirements – all you need is a pallet truck.

modulo ATC 70, THE MACHINING CENTRE

With its 70 tool storage positions, the modulo ATC 70 is the most flexible machining centre in the entire modulo line.

- Maximum spindle speed 35,000 rpm
- Ideal for manufacturing complex parts and for small batch sizes
- From prototype to mass production with one and the same manufacturing solution
- Equipped with tool breakage laser
- Extensive options:
 - spindle 45,000 rpm
 - internal tool cooling
 - automatic laser tool setting
 - 3D-measurement touch probe
 - indexed tools HSK-A25



modulo RE FOR VERTICAL MACHINING

The modulo RE is equipped with 20 spindles and guarantees extremely fast, precise and reliable tool changing.

- Highest levels of precision and production output
- Fast and accurate spindle indexing
- Inexpensive maintenance of spindles
- Max. spindle speed 24,000 rpm (35,000 rpm planned)
- Equipped with tool breakage laser
- Indexed spindles for reaming (optional)
- Controlled-angle tool for cutting edges (optional)
- Fixed tool holder for diamond-cutting (optional)



modulo AL FOR PRECISION HOLE BORING

The modulo AL with its CNC boring head allows to true up the holes, pivots and other shapes with just a single tool with only one clamping. You will achieve unrivalled precision.

- Hole diameters from \varnothing 0.35 to \varnothing 4.5 mm
- Pivot diameters max. \varnothing 2mm
- Dynamic balancing
- Holes, pivots and others shapes without stamping
- Turning all diameters with a single tool while clamping only once
- Diameter tolerance $\pm 2 \mu\text{m}$ for 72 h
- Localisation tolerance $8 \mu\text{m}$ for 72 h
- Equipped with tool breakage laser



modulo HO FOR HORIZONTAL MACHINING AND SEPARATION

The **modulo HO** for horizontal machining is equipped with lathe tool holders and with tool spindles. The rapidly rotating fourth axis (C-axis) allows turning operations and milling, drilling and thread-cutting work in indexed mode. Thanks to a special mechanism, you can separate the finished part from the blank fully automatically.

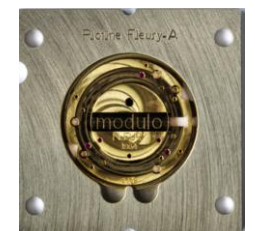
- Horizontal machining with 4 axes
- 10 tools, fixed or rotating
- Turning, drilling, thread-cutting, milling
- Automatic separation and palletisation
- Equipped with tool breakage laser



modulo SP FOR JEWEL- AND PIN-SETTING, AS WELL AS PREASSEMBLY

The **modulo SP** jewel and pin-setting module presses in rubies, pins, eccentric pin, brass tube and other components. A great many assembly steps in your watchmaking operation can be fully automated.

- 20 pressing-in tools/embossing punches
- 20 component magazines
- Preassembly of mechanisms, wheels, bridges, springs, etc.
- Inspection camera
- Measures height, force and component presence
- Pressing in to stop/height/force/iterative, etc.
- CAM and HMI integrated



modulo PE FOR DECORATION WITH CIRCULAR GRAINING

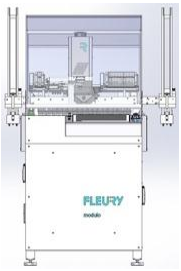
The **modulo PE** circular graining module is equipped with a system for the automatic tool length setting and reshaping of corundum rubber tools. You can store sufficient replacement tools in the tool magazine to facilitate a high level of autonomy. Thanks to a CNC-controlled circular graining head, you can achieve an incomparable degree of glossy circular graining.

- Fully automatic circular graining
- 2 parts are machined simultaneously
- Automatic height-compensation for wear and tear corundum rubber tool
- Automatic tool magazine for reloading corundum rubber tools
- Clamping with free workpiece surface



modulo INFEED TYPES

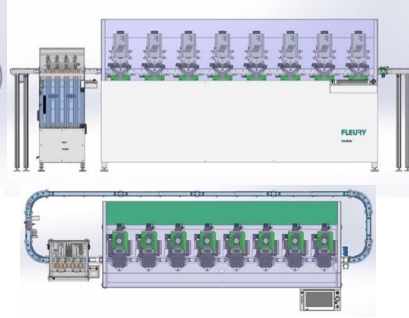
Raw plates
50 mm x 50 mm



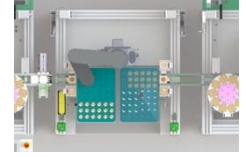
Strip



Palletised parts with
circular transport



Part sets in
container



SWIVEL UNIT

- The swivel unit enables machining of the top and bottom in one pass.
- Before turning, the machined surface is brushed off to guarantee perfect reclamping condition without burrs. This results in the narrowest height and thickness tolerances.

EJECTOR

- There is always an ejector unit between two modules as standard.
- It facilitates the easy removal and infeeding of individual trial parts at any point in the line and removes faulty parts, therefore preventing blockage of the line.

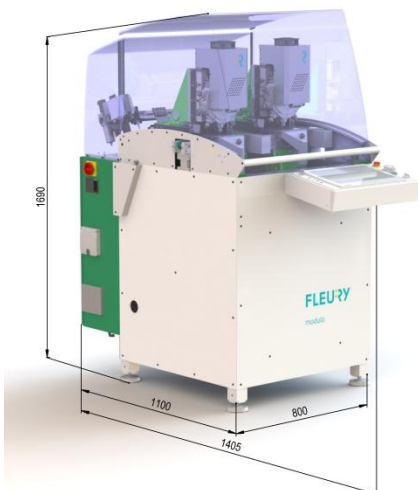
MACHINING WITHOUT CUTTING OIL

- Chips are removed by a vacuum cleaner system for dry machinable materials such as brass and aluminium or dry machining steels.
- The **KV500** vacuum cleaner can be used on up to four machining stations. The suction power can be adjusted.
- The exhaust air from the **KV500** is blown out via a fitting that can be connected to an exhaust system. This enables you to prevent harmful heat and noise emissions.

MACHINING WITH CUTTING OIL

- The oil unit allows you to machine with oil lubrication
- It is equipped with a coarse filter, micro-filter and a chip drawer and air filter for the oily air
- Fitted with a cooling unit for stabilising the oil temperature

Give us a call! We'll draw up a production study for your parts on the modulo. We look forward to discussing your future projects with you.



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FLEURY

machines et composants

Fleury SA
Rue de Granges 11
CH-2504 Bienne

Phone +41 (0)32 328 03 03
info@fleury.ch
www.fleury.ch