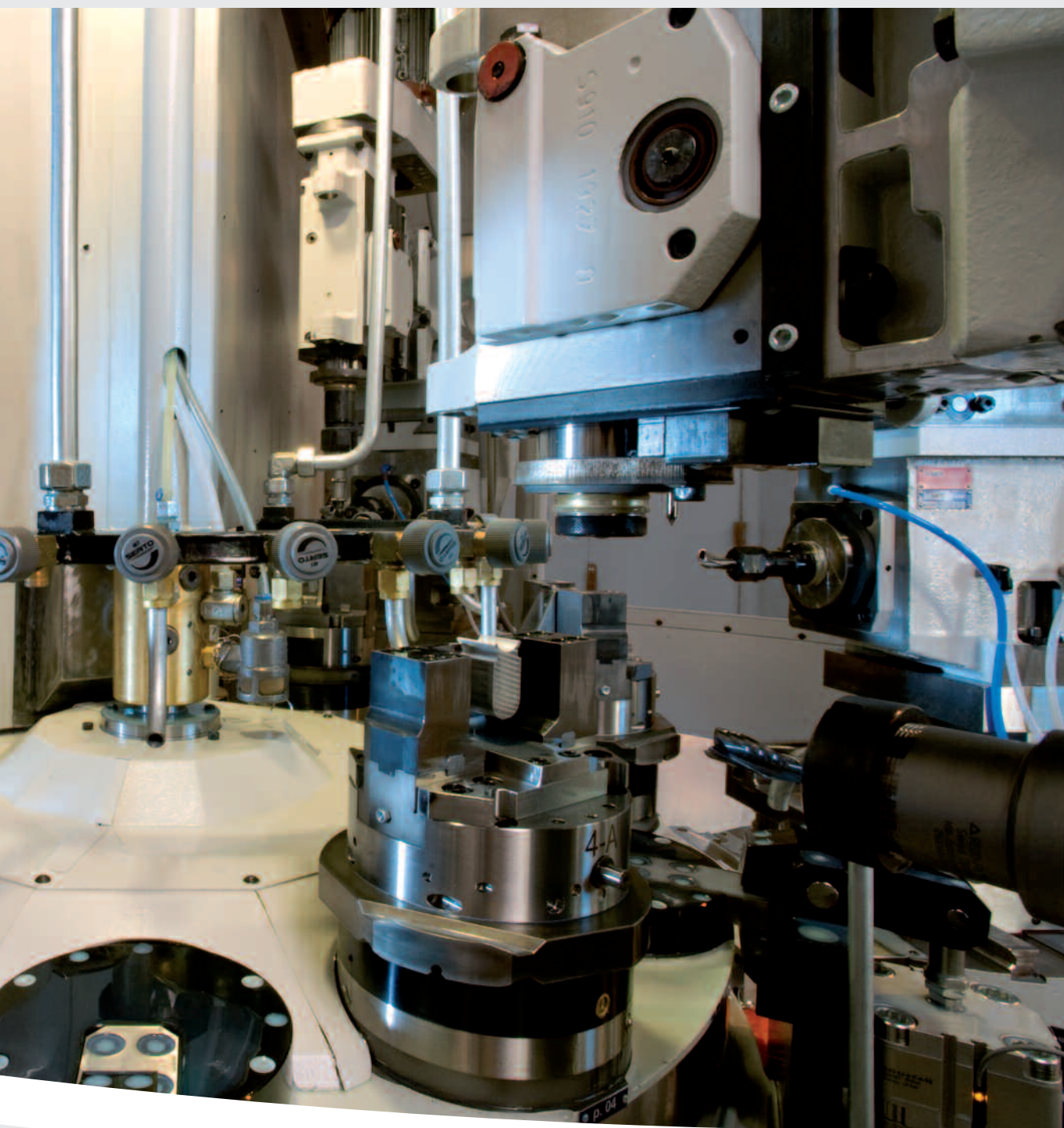


Multifactor™

**MIKRON**



Efficient, reliable, flexible!



# Multifactor

## Technology and know-how for the ideal solution

Looking for a high-performance, low-cost production system? Are your work piece size requirements approx. 100 x 100 x 100mm (4x4")? If you need to machine materials such as steel, non-ferrous metals and aluminium – from wire, bar or forged – Multifactor is the ideal solution.

The Multifactor transfer cleverly combines high-precision with low-cost productive performance. At the same time, the machine's modular structure guarantees a long-term universal use. With Multifactor you have a highly-productive system that doesn't lose value over time. A decisive advantage!

Multifactor's versatility can be seen from its countless applications in various industrial sectors: from the automobile sector to locks, from electrical appliances to plumbing fittings and gas valves.

### Convincing success factors:

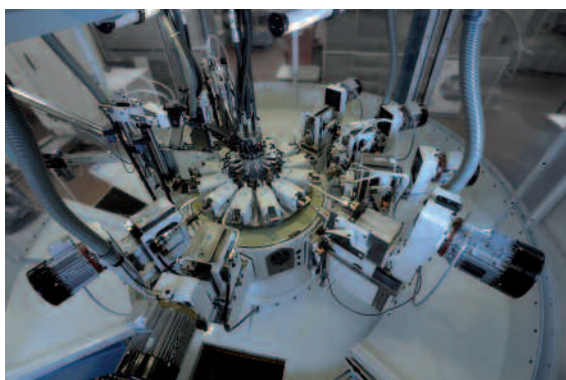
- Cost efficient production of large volume components
- Reconfiguration of system at a reasonable investment today and also tomorrow
- Complete machining without reclamping
- Reliable and robust system
- Outstanding repeatability and high precision machining
- Cycle speed of up to 30 parts per minute



Multifactor with convenient circular cabin and sliding doors for easy access to stations



Typical work pieces machined with Multifactor in steel, brass and aluminium



Internal view of a Multifactor

### Multifactor advantages at a glance

#### Precision

- Compact, precise construction
- Table-position repeatability  $\pm 0.004\text{mm}$

#### Productivity

- Up to 24 units operating simultaneously
- Minimal non-productive times
- Rotation of the clamping systems during table movement
- Double cycles and multiple clamping devices

#### Flexibility

- Expandable, modular system structure for easy reconfiguration
- Can be equipped with mechanical or CNC units

#### Versatility

- Drilling, milling, threading, turning, cutting-off, deep-hole drilling, rolling, grinding, knurling, etc.
- Measuring and checking during the work cycle
- Horizontal, vertical or tilted machining

## Precision

# Multifactor For your most stringent requirements

Multifactor guarantees high-precision machining of small and mid-size components in the three axes X, Y and Z. With a maximum rate of 30 cycles per minute, work pieces that require either precision or heavy machining are produced. The main prerequisites for this kind of precision are: a solid machine base, high precision table indexing, perfectly dimensioned clamping and machining units and an optimized use of mechanical and CNC controls – built-in features with Multifactor.

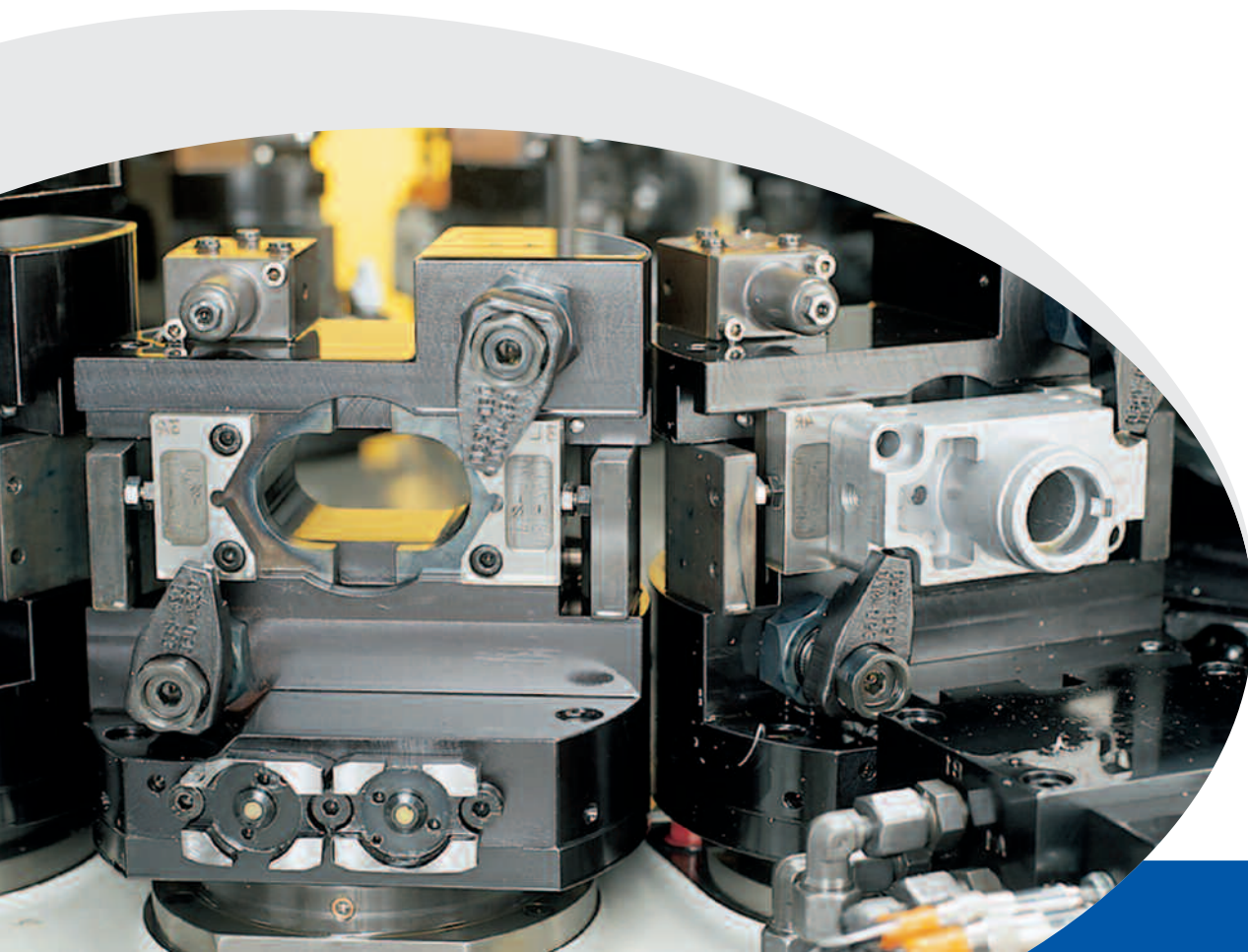
### Relax with Multifactor

The precision of the Multifactor system also relies on the positioning of the rotary table. An ingeniously constructed table-base and an adjustable index disc, guarantee excellent table-positioning repeatability for very long production periods. Additionally, a perfect combination of all the elements ensures precision machining. Multifactor, your reliable partner for trouble-free, mass production.

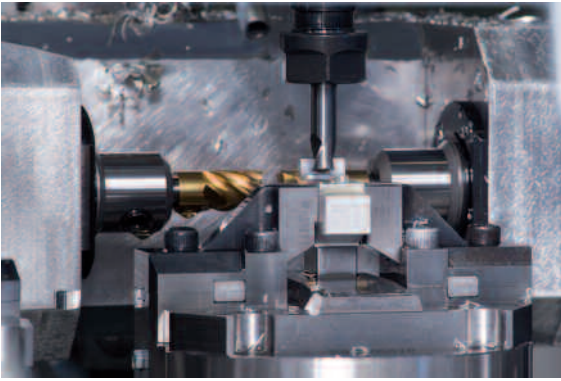
### Multifactor precision stands out through

- Rigid structure
- Precise table indexing  $\pm 0.004\text{mm}$
- Robust machining units
- High-precision spindles and clamping devices
- The ability of in process gauging and tool compensation

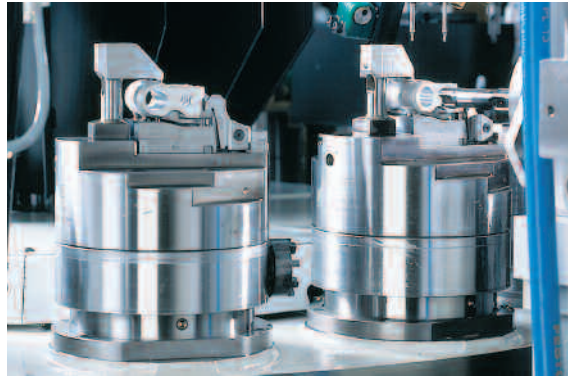
Typical work pieces  
machined with  
Multifactor



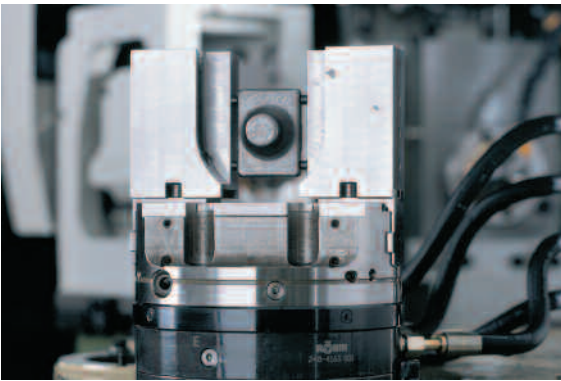
Hydraulic clamping  
system with and without  
the working piece



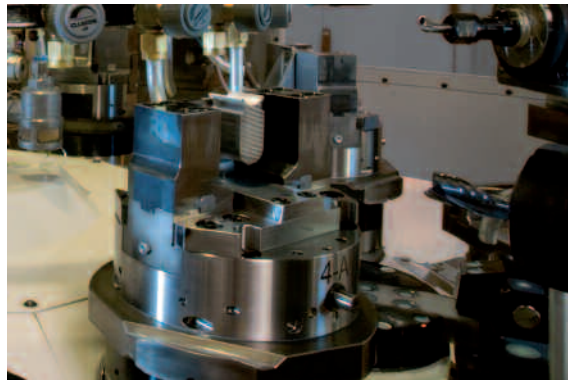
Mechanical clamping system (fixed/mobile concentric)



Clamping system with jaws



Hydraulic clamping system



Concentric mechanical clamping system (here with EROVA pallet)

### Multifactor clamping systems

#### When know-how makes all the difference

It is in clamping devices that the experience and know-how hiding behind every Multifactor reveals itself. For years, Mikron engineers have been dealing with a wide range of materials, forms and geometric features of components to be machined. Every Multifactor customer can therefore immediately access an invaluable wealth of experience and competence for standard or specialised clamping devices. Mikron's experience takes you to the ideal clamping system, reliably and fast.

### Features that mean quality

- Mechanical or hydraulic controls according to needs
- Quick actuated mechanical fixtures for single or multiple clamping
- Component shape is never a problem, for every work piece an ideal solution

## Productivity

# Multifactor The large-volume specialist

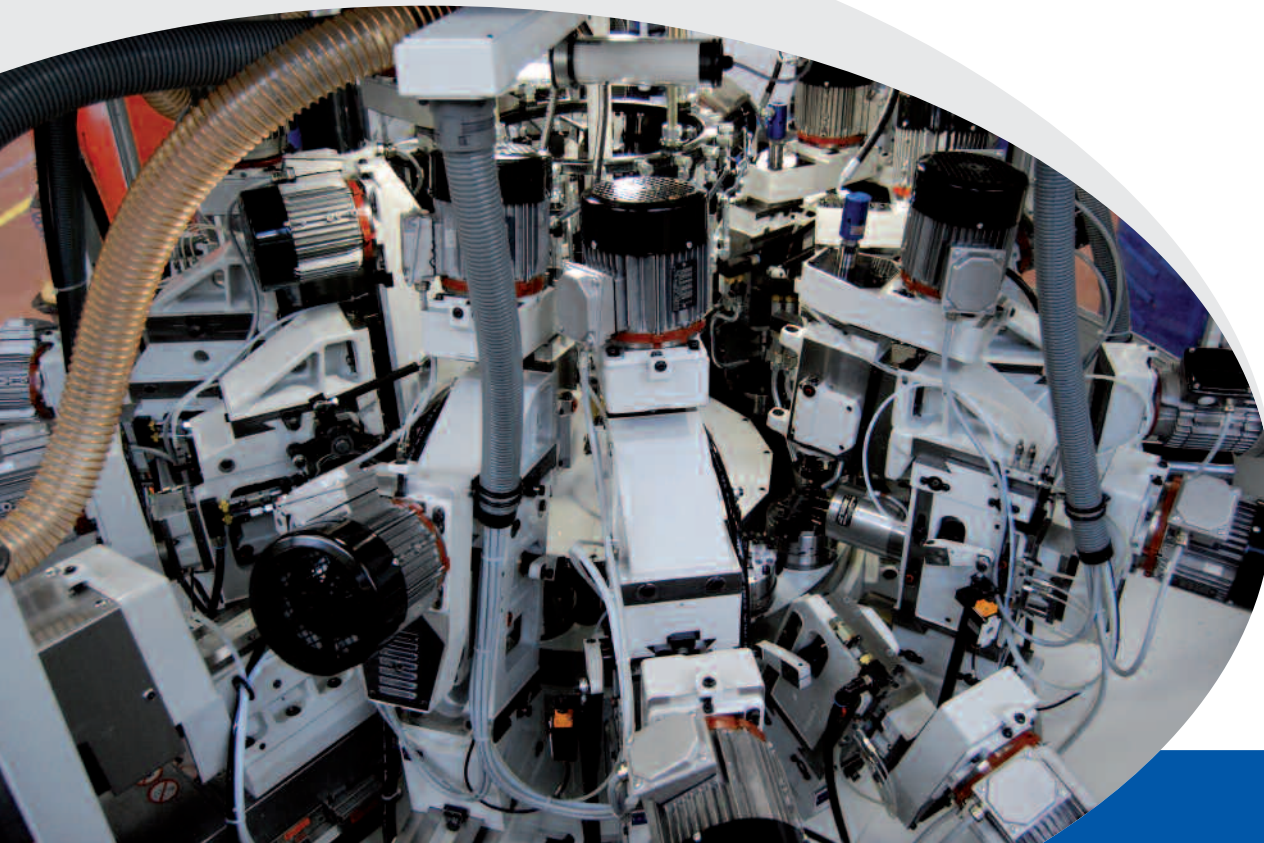
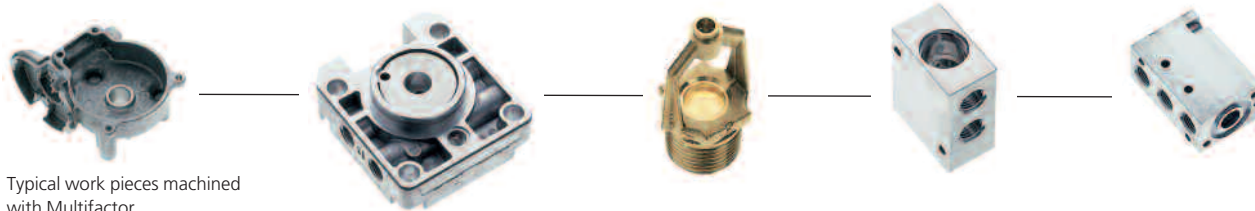
Low-cost production of quantities ranging from a few hundred thousand to several million pieces per year requires a perfect combination of various elements. The trick is to skilfully combine the right number of machining stations, types of spindles and special cutting tools, numerical controls and peripheral systems. A maximum efficiency and a simple-to-use machining system is needed. You can expect all of this – and more – from Mikron.

### Simple but efficient

Multifactor's structure is as versatile as it is simple and robust. Mechanical and electronic components and machine structure guarantee reliability, precision and ease of use. All of this translates into outstanding productivity.

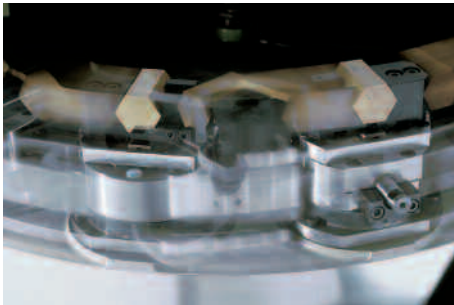
### A brief of productivity features:

- From 5 to 14 machining stations
- Up to 24 units in simultaneous operation
- Solid drive, up to 30 pieces per minute
- Simultaneous machining on two sides of the component on every station
- Fast table rotation at 0.8" for minimal non-productive times
- Units mechanically operated via cams (for repetitive machining)
- Double cycles (also for different components)
- Multiple clamping device
- Multi-spindle heads for multiple operations with one spindle



Internal view  
with numerous  
machining units

Precise,  
high-performance  
machining



Orientation of the clamping system occurs during the table rotation



Machining with vertical multiple spindle

#### Other strategic elements

As a bona-fide specialist in large volumes, Multifactor makes use of various strategic elements to guarantee productivity that is always low-cost.

- To ensure minimal non-productive times, the fixturing system with the clamped work piece is indexing during the table rotation
- To optimise operations during the cycle, Multifactor has stations available with multiple spindles
- For fast feed and deep holes, the cutting tools can be equipped with internal cooling
- For heavy machining, spindles with motors up to 4 kW are available.

## Flexibility

# Multifactor Adaptable to all needs of today and tomorrow

### Flexible construction

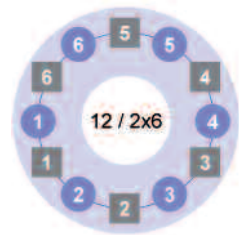
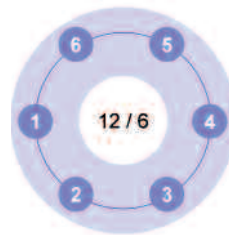
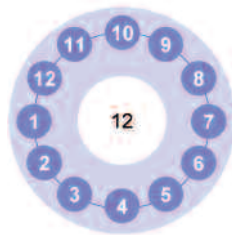
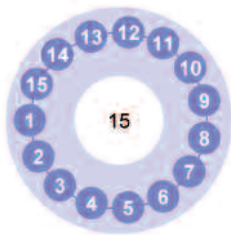
Built according to the modular principle, the Multifactor system can be adapted to your requirements. Different machining modules can be mounted on a number of stations that varies over time.

### Two main models, four basic combinations

To be able to fulfil any type of machining with the utmost precision and at low cost, the Multifactor system is available with 12 or 15 stations. For components with light machining requiring a lesser number of operations, Multifactor 12 can be equipped with only six stations. Need to produce two components simultaneously? No problem. We supply you with a 12 station double-tooled Multifactor.

### Multifactor's strong points

- Highly modular machine
- Special machine with standard modular elements
- The right units for each type of machining
- Mechanical or CNC units or a combination of both
- Simple retooling for long-term use
- Possibility to machine with up to 4 axes (including CNC) based on the work pieces production requirement



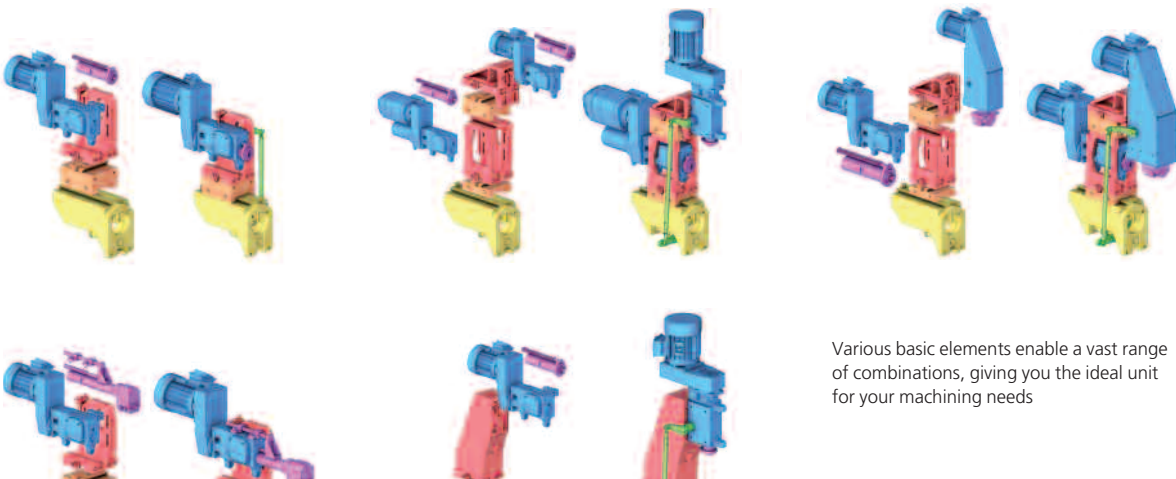
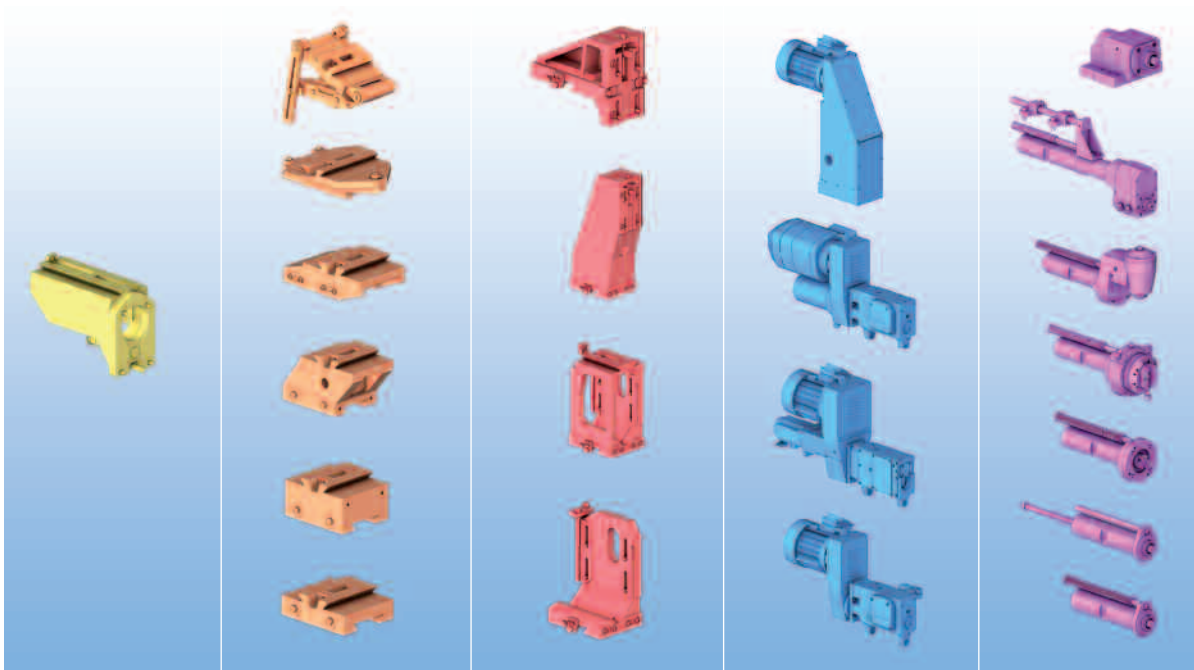
Internal view of a single-cycle Multifactor 12/6

### Machining modules

The Multifactor system offers a vast range of machining modules. Thanks to the modular system, the ideal combination is chosen for each specific need. With the right combination, the ideal solution is obtained when buying the equipment – and the assurance is there that it is an easily expandable and transformable system.

### Advantages

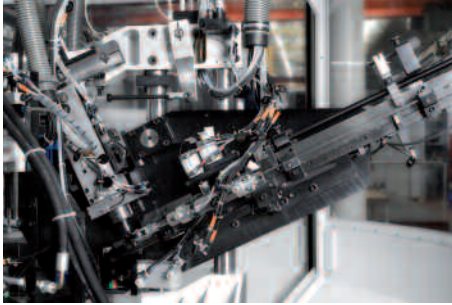
- Ideal, tailor made solutions
- System adaptable to future needs



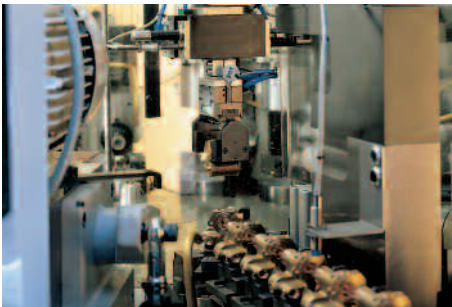
Various basic elements enable a vast range of combinations, giving you the ideal unit for your machining needs

## Flexibility

# Multifactor Many demands, one solution



Standard mechanical feed



Pneumatic pick & place



Feed with 6-axis robot



Mikron TB-600 enables bar loading with possibility of pre-machining (milling, turning)

### Numerous feeding systems, like the various components to be machined

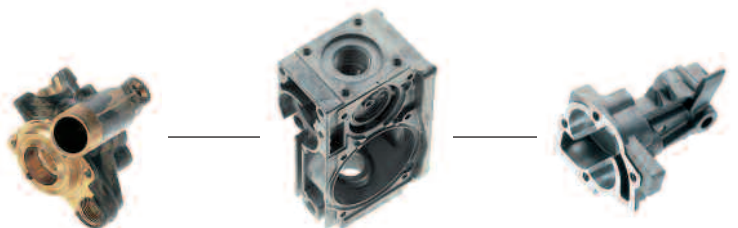
Specifically studied feeding systems bring a defining touch to the efficiency and reliability of this transfer system. The best solution is assessed at the engineering stage. All Multifactor models can be fed automatically or semi-automatically.

### A vast choice of feed options

- From conveyor belt
- With wire directly into the machine following straightening, or with pre-turning and cutting units
- Bar, with pre-machining option using Mikron TB-600 (milling, turning)
- Via vibratory feed bowl

### Other loading/unloading systems

- Pick & place with cam or pneumatic control
- Robot of up to 6 axes for complex movements and vision system



Control panel  
with easy accessibility  
around the system



Interface with practical touch-screen monitor

### Fanuc Numerical Control Brilliant human-machine interface

Multifactor control up to the latest technological standards. The human-machine interface offers a practical, straight forward and easy-to learn dialogue. Whether with purely mechanical or CNC stations, the decentralised structure control remains constantly flexible and easily expandable.

Options such as host connection, remote diagnostics, remote assistance, etc. can be integrated without problem or completed at a later stage.

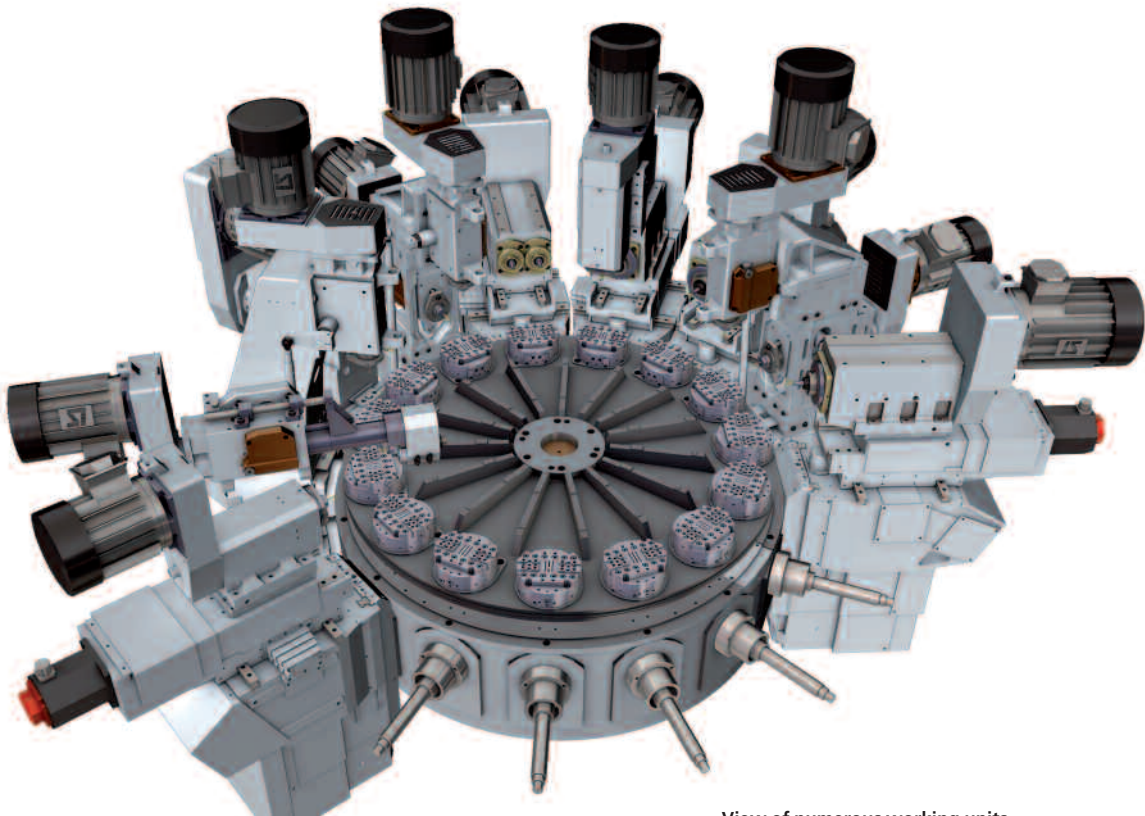


Versatility

## Multifactor From the simple to the complex

Multifactor's modular structure makes a customised set-up possible. The standard version comes with mechanical driven station, for production that doesn't require frequent retooling. Additionally, CNC stations are available and/or adjustable clamping systems that later increase system flexibility.

The vast range of machining stations include horizontal, vertical and tilted mechanical units, units for light and heavy machining, CNC units for deep-hole drilling, as well as one- to four-axis CNC units.

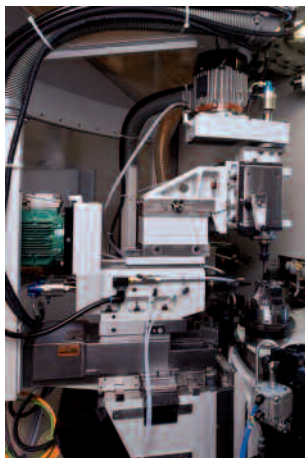


**View of numerous working units**

Number, type and set up for machining modules on the basis of customer requirements: mechanical or CNC units, with vertical and/or horizontal spindles (including working from center) and with multiple spindles



Horizontal mechanical unit



Three-axis CNC unit with horizontal and vertical spindles



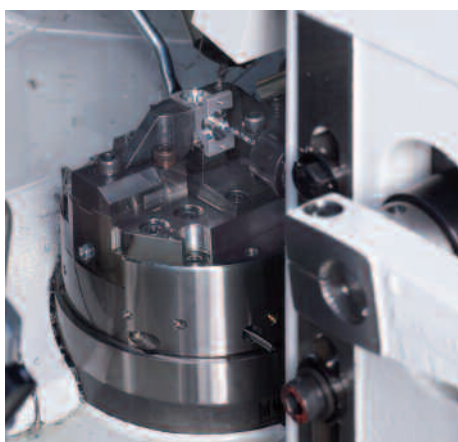
Combined machining: vertical and horizontal drilling with double spindle

### No-limit machining

CNC units are ideal for milling complex shapes or for machining sets of pieces with multiple operations such as components for locks, pipe fittings, automotive industry, electrical and electronic components and die castings of varying sizes. If, conversely, repetitive machining operations are required, use of mechanical units is preferable.

### Multifactor's versatility at a glance

- simultaneous machining on two sides
- Complex machining on CNC stations
- Vast range of machining options: milling, drilling, threading, deburring, chamfering, recess turning, knurling, turning and deep-hole drilling
- Various possible options: measuring during the work cycle, assembly of simple components (screws, pins etc.)



Combined machining: lateral drilling and tilted drilling from above



Combined machining: vertical and horizontal milling simultaneously with two tools

# Mikron Service Solutions

## Flexible, modular, customer oriented



Professional and efficient assistance! We guarantee quick, competent and uncomplicated Service and Support. Mikron Service Solutions offers with 4 levels a mix of reactive, preventive and predictive service plans.

Together with you we design a "Service Solution" profile, tailored to your individual needs. Thus each customer is assured to receive exactly the service and support, best suited for his system and individual requirements.

### Mikron Service Concept:



#### Spare Part Service



#### Xchange Service



#### Product Support



#### Business Support

### 4 Service levels

#### Level 1: For a dependable supply of spare parts

With this service level we guarantee continuous spare part support.

#### Level 2: To minimize downtime

With Xchange Service, Mikron offers modules for immediate delivery.

#### Level 3: For the optimum maintenance of your equipment.

With service options from Product Support you maintain your Mikron System in top condition.

#### Level 4: To guarantee continuous use of your investment.

Business Support offers, beyond Product Support, service options to improve your efficiency and investment.

**Select service options from each level and create your specific service solution. We are ready to support you!**



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Global Support – Ready for you.



**Mikron Service Center**  
www.mikron.com



**24h Global Serviceline +41 91 610 63 26**  
Outside office hours. Problem notification 24h,  
7 days a week.



## Mikron Tool

### A strong team

Transfer machines and their cutting tools from one partner, this is a unique concept and only offered by Mikron Machining Technology. Many production companies have experienced a considerable productivity boost and have been able to lower their „costs per part“ due to this cooperation.

#### **Precision tools from Mikron Tool – a success factor**

Tools are important performers in the chip removal process. Among experts, Mikron Tool SA Agno has an excellent reputation as a manufacturer of small and medium size cutting tools. The offer is including: Multifunctional special tools, the CrazyDrill line, the MiquDrill line and profile milling cutters.

**Special tools** are more than ever in the focus of customer specific applications. The advantage of higher process reliability as well as the reduced testing effort by far negates higher costs for special tools.

**CrazyDrill** is synonymous for maximum drill performance. They have been developed especially for the high volume production of precision parts on transfer systems. Different executions in the diameter range 0.4 to 6 mm are available from stock, as well as special sizes on request.

**MiquDrill** offer the proven Mikron quality when machining small and medium sizes batch quantities and a rich variety of work pieces. The offer in the diameter range from 0.1 to 3 mm includes: MiquDrill Centro for chamfering and centering; the short MiquDrill 200 for pilot holes of up to 2-3 x d; as well as MiquDrill 210 which guarantees precise follow-up drilling.

**Profile milling cutters** are all designed and produced for customer's special applications. Their strength is their high precision with tolerances of 0.01 mm. Tools with a constant profile guarantee an optimum cost-efficiency even for high volume production.

#### **Two competences – one partner**

The customer has in Mikron (transfer machines) and Mikron Tool (cutting tools) an extremely competent partner at his side who will support him from the product development stage with metal removal tests to the continuing process optimization for his high volume production.

## Mikron Machining Your contacts

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