A multi-talented machining system

Mikron Multistar
Multistar
A multi-talented machining system for small precision parts

Would you like to get into high volume manufacturing, or is this your specialty? Either way, you can give your manufacturing productivity a boost with Multistar. You can rely on Mikron Machining and take advantage of our solid mass production expertise of small precision parts!

Where small parts come out big
Productivity, accuracy and quality have the highest priority at Mikron. When you buy a Multistar you acquire production machinery, which completely fulfills these requirements and proves itself as a worthwhile investment from day one on. Multistar – the ideal solution for profitable complete machining of small precision parts in large production volumes.

Available Multistar Types
- LX: 12 or 24 stations
- CX: 24 stations, monoblock or adjustable stations
- NX: 24 stations, full CNC controlled

At home almost anywhere
The Multistar transfer machine is well known for its wide range of applications. Parts for injection systems and gas burners, connectors for the electronics and electrical industry as well as components in the area of surgery, communication and audio-video are ideal Multistar workpieces. Multistar machines parts made from materials such as steel, non-ferrous metals or aluminium, in the diameter range from 0.4 to 30 mm with maximum lengths up to 60 mm.

Convincing success factors
- Complete machining in one setting
- Highly accurate manufacturing and repeatability
- Very short cycle times
- System solution for economical high volume series production
- Production expertise and machining technology from a single source

Typical Multistar workpieces in brass, beryllium-bronze and copper
The advantages of Multistar at a glance

Precision
• Compact precise design
• Stiff and thermally symmetric indexing plate
• Indexing plate positioning accuracy ±2.5µm

Productivity
• Up to 2 machining units per station
• Up to 44 perfectly synchronized units in use
• Single or multiple cycle (maximum 600 parts/minute)

Flexibility
• Modular construction
• Simple and fast tool changes
• Optional CNC controlled units

Versatile machining
• Drilling, milling, thread cutting, turning, recessing, deep-hole drilling, burnishing, grinding, edging
• Chiseling, stamping, bending and assembly
• Measuring and testing on intermediate stations
• Complex machining on CNC controlled stations
Mikron used all its knowledge and many years of experience when designing the Multistar. High quality manufacturing of the basic machine, compact, thermally symmetric design and perfect conformity of station supports and indexing plate are special Multistar features. Tight fitting spindles and spring chuck sets fitted with bearings and optimized cutting tools layout complete the perfect Mikron-precision concept.

Repeated precision in the µm range
Multistar provides unrivalled accuracy even when it comes to positioning of the turntable after rotation. Two diametrically opposite indexing pins, which guarantee a rigid blocking, lock the turntable in place during the machining phase. The table indexing accuracy is ±2.5µm.

Relax with Multistar
The perfect interaction between all elements guarantees excellent machining quality even at high speeds and after long running periods. Multistar, your reliable partner for carefree high volume series production!
Spring chucks, a strategic element
Developed and manufactured by Mikron, the Multistar spring chucks fit perfectly to the machine concept.

Special features
- Safety: The chuck clamping force which is equally distributed on the parts outer edges, always ensures that the workpieces will not become deformed.
- Precision: Precise and compact spring chucks guarantee highly accurate repeatability.
- Productivity: Compact construction allows for a higher concentration of spring chuck in a tight space.
- Versatility: Ideal for round and randomly profiled parts with precise outer edges, up to a diameter of 30 mm.
- Orientation: The spring chucks can be turned to any position for transverse machining.
- Rotation: Rotating spring chucks with CNC drive ensure perfect concentricity for turning and plunge cutting operations.

Typical Multistar workpieces made from steel and aluminum
Multistar is outstanding due to its high productivity. Simultaneous double sided machining on 12 or 24 stations, at a cadence of 150 cycles per minute, guarantees an exceptional high output.

**Fastest transfer machine in the world:**
**Multistar from Mikron**
Multistar reaches turbo performance. How? The answer lies in the mechanical schematics: The drive motor propels a Geneva cross mechanism which, in turn, "clocks" the turntable. A frequency converter enables adjustment of the cycle times between 12 and 150 switching cycles per minute in order to match the particular requirements of each workpiece. The Mikron patented mechanical accelerator ensures maximum speed for the shortest cycle times.

**prodigious + sensational = professional**
The centrally located drive allows for excellent access to the tools and to the work space. The tooling change can be made simply and quickly, machine stoppages are reduced to a minimum. No doubt about it! Your plans work out with Multistar: It produces continuously and thus economically.

**The productivity features at a glance**
- High number of stations, 12 or 24
- Up to 44 perfectly synchronous units in use
- Simultaneous double sided machining on one station
- High cutting power thanks to the machining spindles rotation speed of 32,000 rpm
- Short approach paths, optimized synchronization of the movement processes and quicker table feed, minimize dead time
- Allowed mechanical kinematics up to 150 cycles / minute
- Production performance for multiple cycles up to 600 parts per minute (4 x 150)
- Machining of different workpieces possible during dual cycle
Multistar tooling change as fast as a formula 1 tire change
The working spindles can be inserted into or released from the machining stations with very few steps. This allows practical tool setting to be carried out away from the machine with maximum accessibility. A second set of spindles optimizes use of the rapid tooling change. The operator can set the additional set, while the production with Multistar continues running. When reinstalling the spindles the precise positioning is equally quick and easy. Pre-loaded spherical liners ensure tight fitting guidance of the spindles. A fixed stop, which can be adjusted via a micrometer screw, limits the spindle feed. Multistar, your “racing car” which always runs at full speed and reduces “pit stops” to a minimum.

The Multistar can be fitted with different spindles
**Flexibility**

**Multistar**

To serve your needs

**Flexible in design**
Multistar has a modular design and can be tailored to individual customer needs. The Mikron engineers set the highest possible standards. Special designs for stamping, bending and assembly tasks for insertion of bolts, balls and screws are daily challenges for our experts. Special measuring and testing units are also often developed for our customers and integrated into the manufacturing process.

**Flexible for re-tooling**
CNC units expand the Multistar field of application. The plant with the CNC units is more flexible, re-tooling is greatly simplified. When are CNC units particularly useful? For demanding cutting tasks or for the production of “families” of parts. The Multistar™ NX-24 is a worthwhile investment even for lot sizes of a few thousand workpieces per version.

**Up to 4 CNC-axes on one station**
CNC controlled working units are combined with rotating spring chucks for 4-axis interpolation. The workpiece can be positioned for machining or rotated for turning, at random.

**The control, your loyal friend and servant**
The specially developed user friendly “Human Machine Interface” (HMI) from Mikron allows for simple and clear management of the installation. Management of the diagnostics and production data is greatly simplified. Faults are quickly localized once errors are indicated and the necessary corrective measures are carried out rapidly.
Flexibility

**Multistar**

To serve your needs

**Part specific handling**
An optimized feed or unloading system belongs to a turnkey production installation. The feeding and unloading systems are as diverse as the blanks that have to be machined.

**Some examples of Multistar loading systems are:**
- Vibratory, linear or inclined conveyor
- Pick-and-Place-System from feed belt or pallet
- Directly from the wire

**Some advantages, an overview**
- Continuous production
- Large loading capacity ideal for continuous operation around the clock
- Guaranteed production control with ejection into selectors
- Integrated electronic quality control for selection of good/rejected parts

*Feed with vibratory conveyor*

*Feed via pallets and robot arm*

*Feed directly from the wire*
Multistar permits a wide variety of machining operations. It is possible to carry out simple machining processes such as drilling or complex milling operations with 4-axis interpolation, depending on the machine model and configuration. And still another unique plus: You can completely finish your workpieces, starting from blanks and ending with ready to install components.

That’s what sets Multistar apart
• Efficient, part specific feed
• Complete machining of the workpiece
• Integrated, automatic separation of defective parts

Multistar machining and handling to get your attention
• Outside diameter pre and final turning
• Axial and radial holes
• Inside and outside thread cutting, milling and chamfering
• Turning over or re-positioning of the workpiece
• Testing of shear and tensile forces when attaching and detaching plug and connector
• Manufacturing of complete connectors using dual cycle (plug and connector)

The combination of manufacturing, part assembly and quality checks provides you with peace of mind at the highest productivity and creates the best conditions for economical production. Do you want quality quantities? Multistar is the right solution.
Versatility

**Multistar**
for quantity with quality!

From blank to completely machined workpiece (on the right a cutaway view)

4  Final turning

5  Chamfering

8  Sideways milling

9  Sideways drilling and thread cutting
Multistar does not shy away from difficult machining. Demanding tasks such as deep-hole drilling to a bore depth of $30 \times D$ are not a problem. Does your workpiece require complicated milling operations? No problem! Multistar NX-24 “chips” any required milling contour.

Even more: The workpieces that come off the turntable are ready for installation, thanks to de-burring and checking processes.

**Multistar machining variations to catch your eye**

- Simultaneous dual sided machining
- Drilling
- Milling
- Deep-hole drilling
- Thread cutting
- Complex grooving

... all with mechanical or CNC controlled units and all of this in any arbitrary position. With Multistar you have a competent, reliable and very cost effective multi talented partner at your side. Bring your products into the limelight, put them on Multistar, the Superstar!
Cutaway view of a workpiece with Mikron Tool cutting tools

- Drilling from below
- Milling the chamfer on contour
- Sideways drilling
- Inclined deep-hole drilling from above
- Inclined deep-hole drilling from below
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 0.1 to 6 mm are available from stock, as well as special sizes on request.

MiQuDrill offers 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.

The CrazyMill range meets highest standards of chamfering. Whether it concerns front or backside chamfering or even the deburring of complex shapes, the three differently designed milling tools comply with highest requirements.

**Two competences – one partner**
The customer has in Mikron (transfer machines) and Mikron Tool (cutting tools) an extremely competent partner at his side which will support him from the product development stage with metal removal tests and in the continuing process optimization for his high volume production.
Mikron Service Solutions
Flexible, modular, customer oriented

GLOBAL SUPPORT
Ready for you

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.

4 Service levels

Spare Part Service

Original Mikron precision collets

Xchange Service

Mikron Xchange Modules

Product Support

1. Helpdesk
2. Service Assignment
3. Overhaul
4. Preventive Maintenance
5. Teleservice

Business Support

1. Training Services
2. Retooling

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