Outstanding flexibility, Cost effective & high precision

Mikron Multistep XT-200
For both small and large production runs, with Multistep XT-200 customisation, you can produce your precision parts economically. Allows to switch easily between demanding processing steps and short run orders effectively. Maximum size workpieces up to 200 mm x 200 mm edge length (depending on setup situation and processing tasks).
Brilliant machine design

The Multistep XT-200 combines perfectly the productivity of a transfer machine with the retooling flexibility of a machining centre perfectly. The design of this high precision machining system is based on individual, two-spindle modules fitted to each another.

The integrated loading and unloading module feeds all of the machining modules. Any expansion with additional machining modules (up to 4) results in a direct increase in productivity, providing a demand-oriented investment. With up to 4 spindles operating independently, up to 144 tools afford excellent flexibility.

REVOLUTIONARY
• 100% system integrity
  - A single, integrated loading/unloading module feeds all of the machining modules, eliminating error-prone interfaces
  - Additional tasks can be performed in parallel in the main loading module with no downtime.
  - Only 1 chip conveyor and one coolant system, integrated for all machining modules.
  - Significant space saving, as well as a reduction in the number of operators required in comparison to traditional machining centres

• Ingenious workpiece flow through all machining modules – without repositioning and reclamping – thanks to the double grip (gripper arm) positioned by the EROWA-zero point system

• Two independent working spindles per module, allowing a very short chip-to-chip time of < 1 second (at maximum spindle speed)

Case Study
At 4 tool changes per minute, in one year the Mikron Multistep XT-200 saved 480 machine hours when compared to its competitors (3.4 s / tool changes).

Two -shift operation (16h) x 0.8, 220 days/year. Spindle speed: 15 000 1/min
Mikron Multistep XT-200
Loading and Unloading Module – One for All!

Material flow of blank and finished work-pieces can be managed optimally. Either by manual loading, or an integrated robot! Thanks to systems integration, fault prone interfaces, as is so often the case with conventional machining centres, are omitted. Additional tasks can be processed in parallel, without any downtime.

Loading system during machining with
- 3-axis handling
- Robot
- Manual

Variable part loading and unloading
- Paternoster pallets
- Pallet stacking magazine
- Vibratory feeder belt-conveyor
- Stop/Go conveyor belt

Anytime parallel processing
- Blank part testing & blank part measurement, with direct out of tolerance discharge from the system. Measurement results sent to control for automatic coordinated clearing
- Deburring, cleaning, engraving
- Turning and measurement
- Positioning
- Cleaning
  ... and much more

For fully automated, 6-side machining, turning of workpieces – processed in parallel to operations in the loading module.

Loading and unloading module
Super-efficient machining modules

Each machining module is equipped with two working spindles which are used alternatively. While one spindle is machining, the other is changing the cutting tool. The ingenious work-piece flow through the directly connected machining modules allows complete machining of the work-pieces – with no downtime!

Overview of a working module

- 2x tool magazine discs with 18 tool slots, up to 36 tools per module. When stacked to the maximum level (4 modules), the Multistep XT-200 can accommodate 144 tools
- 2x alternately operating spindles, chip-to-chip time under 1 second at full spindle speed
- 1x B/C- axis: The extremely stable table guarantees stable machining even with heavy load operations
- Twin gripper transfer arm for transporting work-pieces (clamped in the fixture) between the machining modules
- Slanted machine bed for optimal chip removal
- Options: electronic tool wear detector – tool breakage detection with mechanical sensor – tool coding with chip and reader

Individual machining of 5½ sides in a single clamping with 5 interpolated axes achieving a chip-to-chip time of under 1 second.
Mikron Multistep XT-200
Clamping approaches…. There is always a good solution!

For years our engineers have encountered a wide range of materials, shapes and geometries of workpieces. You benefit from vast knowledge and skills regardless of whether you are using standard clamping devices or special clamping chucks. Multiple clamping possible: more than 70 dedicated clamping solutions are developed every year!

**Gripping moments**
An EROWA interface ensures perfect clamping repetition precision. Air pressure barrier ensures a clean interface when re-clamping. The clamping force of 18 kN guarantees stability while machining. You can stay calm even during the most gripping moments.

Clamping concepts: mechanical / hydraulic / pneumatic or combined - single or multiple.
Spindle types & Control

The Multistep XT-200 is available with two spindle options. The spindle MS 140 is part of the standard equipment. A high frequency spindle is available as an option for high speed machining. Both types have standard internal coolant feed pressure of 120 respectively 150 bar.

The tool holder with HSK A-40 interface holds the tools. Tool change occurs outside of the machining area. Interface cleaning and air pressure barriers prevent dirt and chips from entering. A very tidy solution!

<table>
<thead>
<tr>
<th>Working spindle</th>
<th>Standard</th>
<th>High speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tool holder</td>
<td>HSK A - 40</td>
<td>HSK A - 40</td>
</tr>
<tr>
<td>Outside diameter</td>
<td>140 mm</td>
<td>140 mm</td>
</tr>
<tr>
<td>RPM</td>
<td>15’000 1/min</td>
<td>40’000 1/min</td>
</tr>
<tr>
<td>Torque (S6 45% ED)</td>
<td>36 Nm</td>
<td>9 Nm</td>
</tr>
<tr>
<td>Power (S6 45% ED)</td>
<td>18 kW</td>
<td>13.5 kW</td>
</tr>
<tr>
<td>Internal coolant feed</td>
<td>150 bar</td>
<td>120 bar</td>
</tr>
<tr>
<td>Spindle distance</td>
<td>290 mm</td>
<td>290 mm</td>
</tr>
</tbody>
</table>

Advantages of IndraMotion MTX

Multistep XT-200 is equipped with the "IndraMotion MTX" control from Bosch Rexroth. The control makes system management effortless and easy-to-follow in programming, diagnostics, production data management and 3D simulation.

- Extremely quick and super precise
- Simple and easy-to-follow screen display
- Large NC programming memory
- 1000 “Look Ahead” records
- Open architecture compatible with NC programming systems
- Multilingual menus
- Not clear control cycle of 0.25 ms for assured precision
- 3D simulation for secure programming
**Mikron Multistep XT-200**
Measurement – runtime parallel & in-process

**Measuring without wasting time**
Optionally with a button already in the loading module runtime parallel measurement of the blank parts. Out of tolerance blank parts are ejected directly from the system directly. Measurement results are automatically sent to the Control for automatic coordinated clearing.

**For impeccable precision**
Perfect μ-precision with the “In-Process Measurement” option. The measuring sensor, like any other working tool, can be loaded in just 1 second.

- For detecting reference areas, drill holes, contours, etc.
- For automatic correction of the workpiece zero points or to confirm the proper state of the machine.

By using efficient measurement cycles, the spatial orientation and position of the workpieces can be determined accurately.

The management of multiple voltages, as well as several clamping devices is therefore massively simplified. Differences in the dimensions of individual clamping nests can be balanced with ultra-high precision without compromise.

For you, this means: enormous savings in clamps and fittings!
Precision

Multistep XT-200 owes its high manufacturing quality to the perfect interaction of its various elements:

- Runtime parallel measurements in the loading/unloading module. Automatic ejection of blank parts outside of the tolerance range.
- In-process measurement in the machining modules
- High positioning accuracy of the clamping device thanks to the EROWA interface
- Rigid machine construction
- Extremely stable B/C Axis

Gripping moments
An EROWA interface ensures perfect clamping repetition precision. Air pressure barrier ensures a clean interface when re-clamping.

B/C Axis a strategic element
The B/C axis of the Multistep XT-200 can handle feeds up to 2500 N. The extremely stable table guarantees stable machining even with heavy duty chip removal.

Precision in re-clamping: Workpiece clamping system with the EROWA interface
In less than 30 minutes the machine is changed over and ready for the production of a new workpiece. And here’s how:

**Clamping fixture changes**
The EROWA interface makes it possible: Changing the clamping chuck in only 30 seconds with a positioning accuracy of ± 2µm.

**Tool changes**
Quickly remove the tool from the tool holder disk and replace it with a different tool right in the machine. The standard two-spindle module can have a maximum of 36 tools (2x18).

**Program changes**
Quick and easy. Just choose a program on the machine control platform and go.
User-friendly maintenance and servicing design

Do you want a production machine with minimal downtime?
With Multistep XT-200 the technical availability can be used optimally because the service and maintenance times are reduced to a minimum. Maintenance is easy and convenient. Benefit from the numerous advantages!

The advantages at a glance
• Easy and rapid access to central structural elements
• Servicing corridor between the modules and the electrical cabinets
• Visual maintenance inspection of all valves during production processes
• Self-diagnostics of the entire system
• Maintenance status displayed via HMI
• Central power unit for the control system, centralised lubrication, hydraulics and pneumatics
Mikron Multistep XT-200

Typical workpieces

Multistep XT-200 is practically limitless. The machining range of the Multistep XT-200 transfer system is very broad: It extends from simple drilling processes to complex milling operations.

- Machining on 5 ½ sides with five CNC axes and interpolation
- The loading module can perform parallel tasks such as fully automated repositioning of work-pieces – for 6th-side machining, dimensional checking of blanks, deburring, cleaning and much more.
- Chip-to-chip in less than one second

AUTOMOTIVE INDUSTRY

PNEUMATICS & HYDRAULICS

PHARMA / MEDICAL EQUIPMENT

MISCELLANEOUS
Case History: Compressor Housing

The challenge

- 5 different housings made from cast AlMgSiCu-alloys
- Turning, milling, drilling on 6 sides of the workpieces. Depending on the part, 30 to 40 processes. Variable batch sizes from 500 to 10,000 parts.
- Tolerance: ± 25μm PFU1.67. (Acceptance sampling 10%)
- Annual requirement approx. 500’000 pieces (in a 3-shift operation)

The traditional solution

- Machines required: 4
- Production area: 300 m²
- Processing work in 2 setups:
  - Milling on a multi spindle-processing centre, followed by
  - Turning on automatic lathes
- Manual loading/unloading
- Preparation time: 80 mins
- 12 employees

The innovative solution

- Equipment required: 2 Mikron Multistep XT-200
- Manufacturing area: 165 m²
- All machining processes completed on one processing system
- Intelligent, integrated, automated loading/unloading module
- Preparation time: 20 min
- 6 employees

Cost-per-part less 35%
Mikron Multistep XT-200
The benefits at a glance

PRODUCTIVITY
• Chip-to-chip in 1 second at full spindle speed: Whilst a tool is being changed on one spindle, the workpiece is being processed on the second spindle in a machining module. As a result, unproductive time is significantly reduced.
• Multiple voltages possible.
• 1 integrated loading/unloading system feeds 1 to 4 machining modules. Additional tasks can be processed in parallel with no downtime: inspecting the workpieces, testing and measuring blank parts, deburring, cleaning and much more...
• Significant space requirement savings, as well as a reduction in the number of operators required when compared to traditional machining centres.
• Up to 4 independent spindles which can be used simultaneously.

VERSATILITY
• 5-axis interpolation on 5 1/2 working sides in one clamping.
• For fully automated 6-side processing operations, automated tilting of the workpieces - runtime parallel for processing in the loading module.
• Up to 144 tools in 4 modules.
• Cutting and free form milling, drilling, deep hole drilling, plunge cutting, threading, deburring, reaming, chamfering, engraving, countersinking, knurling, turning or honing, grooving with U-axis.
• Integration of assembly tasks (parallel runtime) in the loading module.

PRECISION
• Compact and rigid machine design with an extremely stable B/C-axis.
• Direct distance measurement system for achieving the highest positioning accuracy.
• Perfect clamping accuracy with the EROWA interface.
• Automatic measuring of reference position and offset through wireless communication with machine control computer (blank part in loading module and during processing in the machining modules).

FLEXIBILITY
• Increase of the production volume through an addition of more machining modules is possible at any time.
• Short set-up times, ideal for the production of different workpieces (ideal when changing batch sizes).
• Quick change-over of tools and tool carrier palettes.
Mikron Service Solutions
Flexible and modular

We ensure quick, competent and uncomplicated service and support for our customers. We work together with you to design a service solution profile tailored to your individual needs.

Mikron’s service palette:

For a dependable supply of spare parts
Genuine Mikron spare parts are manufactured to the latest materials specifications and by the latest methods, resulting in reduced machine downtime and a longer life expectancy for your equipment.

Minimizing downtime
Original Mikron Xchange Modules are ready for immediate installation. 100% reliability and 100% quality, but at up to 50% lower investment and without losing any time waiting for an overhaul. All you need to do is call us when you need to replace a defective module, and we’ll immediately send a replacement module in perfect condition.

Maintain your equipment
Service options from Product Support keep your Mikron system in top condition. Our highly skilled experts offer you a complete portfolio of comprehensive service options to keep your equipment up and running.

Help Desk / Field Service / Overhaul / Preventive Maintenance / Teleservice

Guaranteed continuous use of your investment
Mikron offers professional services based on our experience and resources to help you successfully manage today’s complex manufacturing processes...
Training Services / Retooling

GLOBAL SUPPORT
Ready for you

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