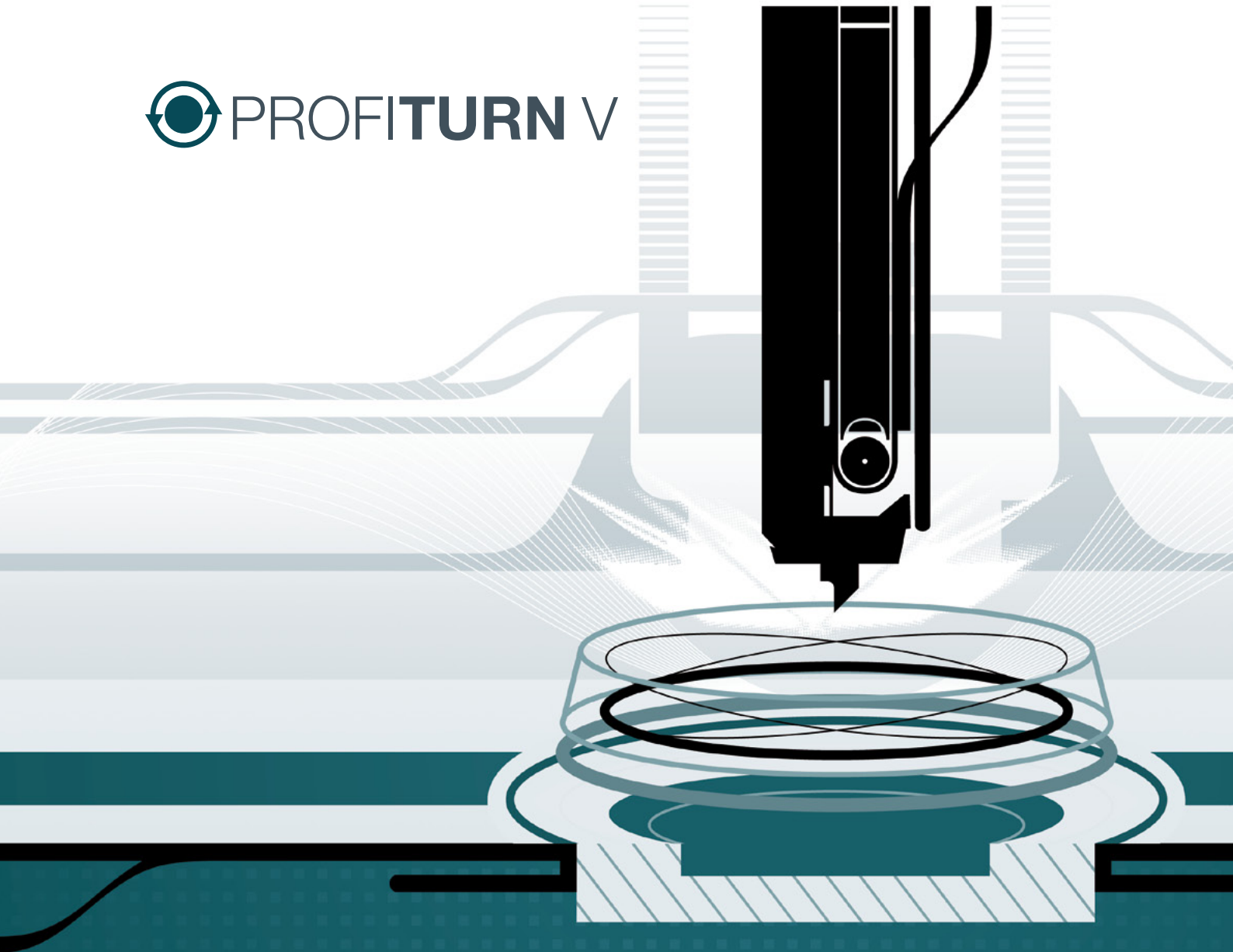
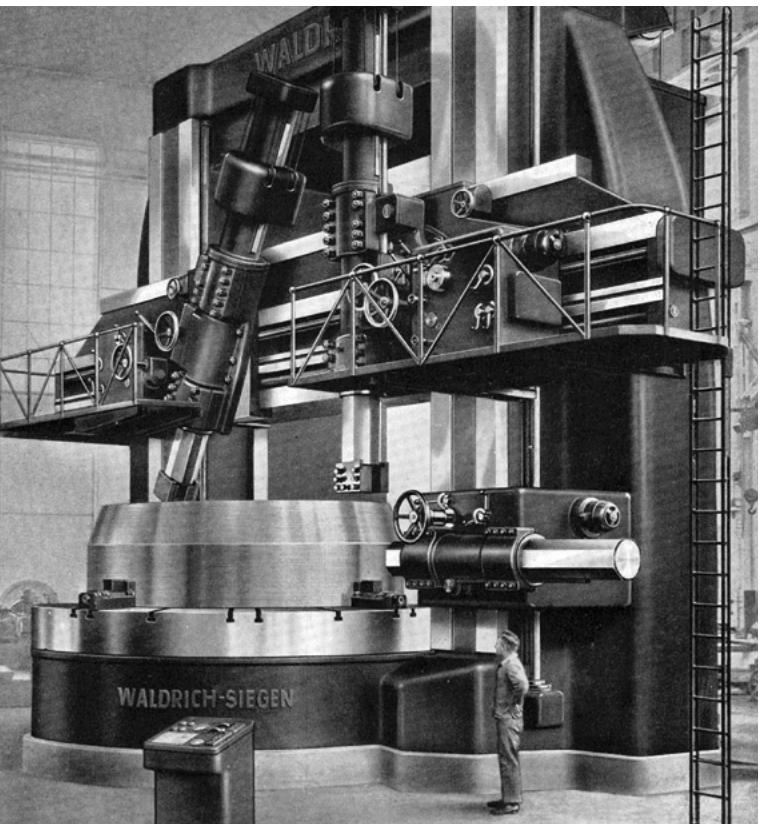
WALDRICHSIEGEN

PROFITURN V





WaldrichSiegen vertical lathe of the 1930's

Tradition and Innovation

Trendsetting high-performance technology

WaldrichSiegen has been building vertical turning lathes since the early 1930's. In the 1970's turning diameters far exceeding 10.000 mm no longer presented much of a challenge for WaldrichSiegen. Based on this tradition and the experience WaldrichSiegen has gained in the many years of building state-of-the-art horizontal lathes, portal-type milling machines and horizontal boring mills, we have now developed a new, innovative vertical lathe.

With the precision and reliability WaldrichSiegen machines are known for, the new vertical lathe ProfiTurn V sets new benchmarks in the market. The ProfiTurn V excels with the following features:

- a significant increase in precision and performance as compared to all other concepts currently available in the market
- integration of a variety of technologies for carrying out demanding machining tasks on challenging workpieces
- fully hydrostatic design in all main axes for ultimate cutting performance
- optimal static and dynamic behavior throughout the complete operating range
- modular design enables custom machine configuration to ideally suit customer requirements
- maximum degree of standardization for cost-efficient machine operation
- maximum availability while reducing maintenance and repair cost
- high degree of energy efficiency

ProfiTurn V – innovative portal-type machine concept

Modular Machine Concept

Rugged design for utmost precision

The clear-cut modular machine program covers the complete range of standard machine configurations for machining a broad spectrum of complex workpieces. WaldrichSiegen offers the optimum solution for every machining task:

- turning diameters of up to 12.000 mm
- turning heights of up to 10.000 mm
- ram travel of up to 4.000 mm
- ram cross section from 300 x 300 mm to 600 x 600 mm
- high-performance main drives integrated in the ram for milling, boring and grinding operations
- rotary table power up to 300 kW
- rotary table torque up to 800.000 Nm
- table load up to 500 t
- fully hydrostatic design in all main axes
- all main axes including W-axis are CNC controlled
- no counter balance required for vertical axes
- machines with Y-axis in table or gantry design (optional)
- attachment units for turning, milling, boring and grinding
- fully automatic exchange of attachment units
- different types of tool change systems (disk, chain, rack or tool arena)

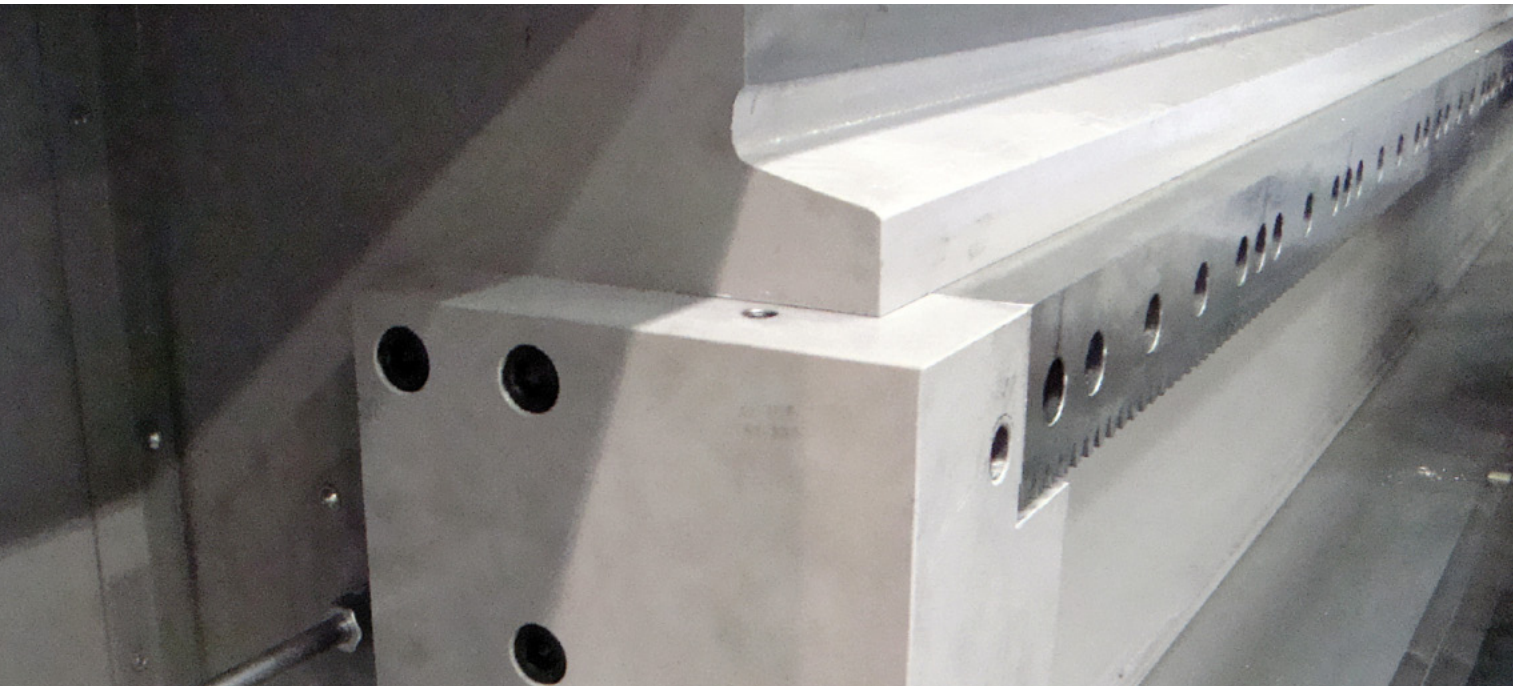
For customer requirements (e.g. in terms of machine dimensions) beyond the scope of our modular program, we offer machines in special design upon request.

All major components of the ProfiTurn V are made of high-quality cast iron and are machined in-house at Waldrich-Siegen to the highest accuracies. Furthermore, bending correction profiles milled into the guideways of the portal and cross-rail compensate for physically induced minimal deflections of the system and thus guarantee high-precision machining of workpieces.

The fully hydrostatic design of all main machine axes and of the rotary table guarantees:
- maximum static and dynamic stiffness
- unsurpassed damping characteristics
- zero backlash
- almost unlimited lifetime of guideways
- maximum rotary table load

All machine axes are equipped with absolute measuring systems and thus ensure the highest dynamic performance and excellent positioning accuracy. Master-slave anti-backlash type drives for the X-axis of the carriage, the optional Y-axis of the traversing rotary table or the portal on machines in a gantry design further add to the overall high dynamic stiffness of the ProfiTurn V machines.

Ball screws guarantee for highly precise positioning of the hydrostatically guided cross rail. To yet further increase the machining accuracy, the W-axis is equipped with a fully automatic sag compensation.



Cross rail with Master-slave drive

Solid Technology

Rotary table

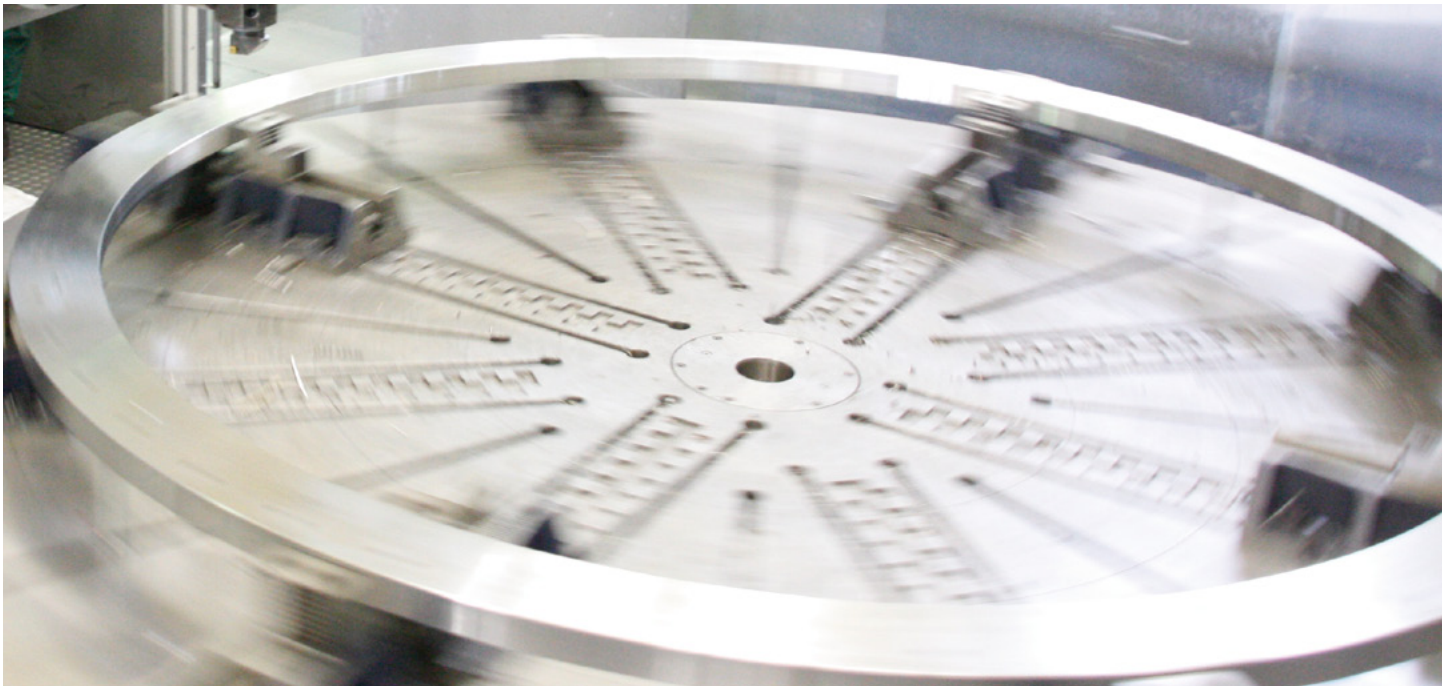
The base as well as the faceplate of the ProfiTurn V rotary table are made of high-quality cast iron. The hydrostatically guided faceplate is equipped with a well-dimensioned main bearing and is driven by a backlash-free 2-step Master-slave drive.

Characteristic and convincing design features:
- hydrostatically guided rotary table
- excellent properties in terms of static and dynamic features
- high maximum workpiece weight
- high-performance drives
- extremely high driving torque for optimal cutting performance
- high positioning accuracies during milling operations
- high degree of energy efficiency

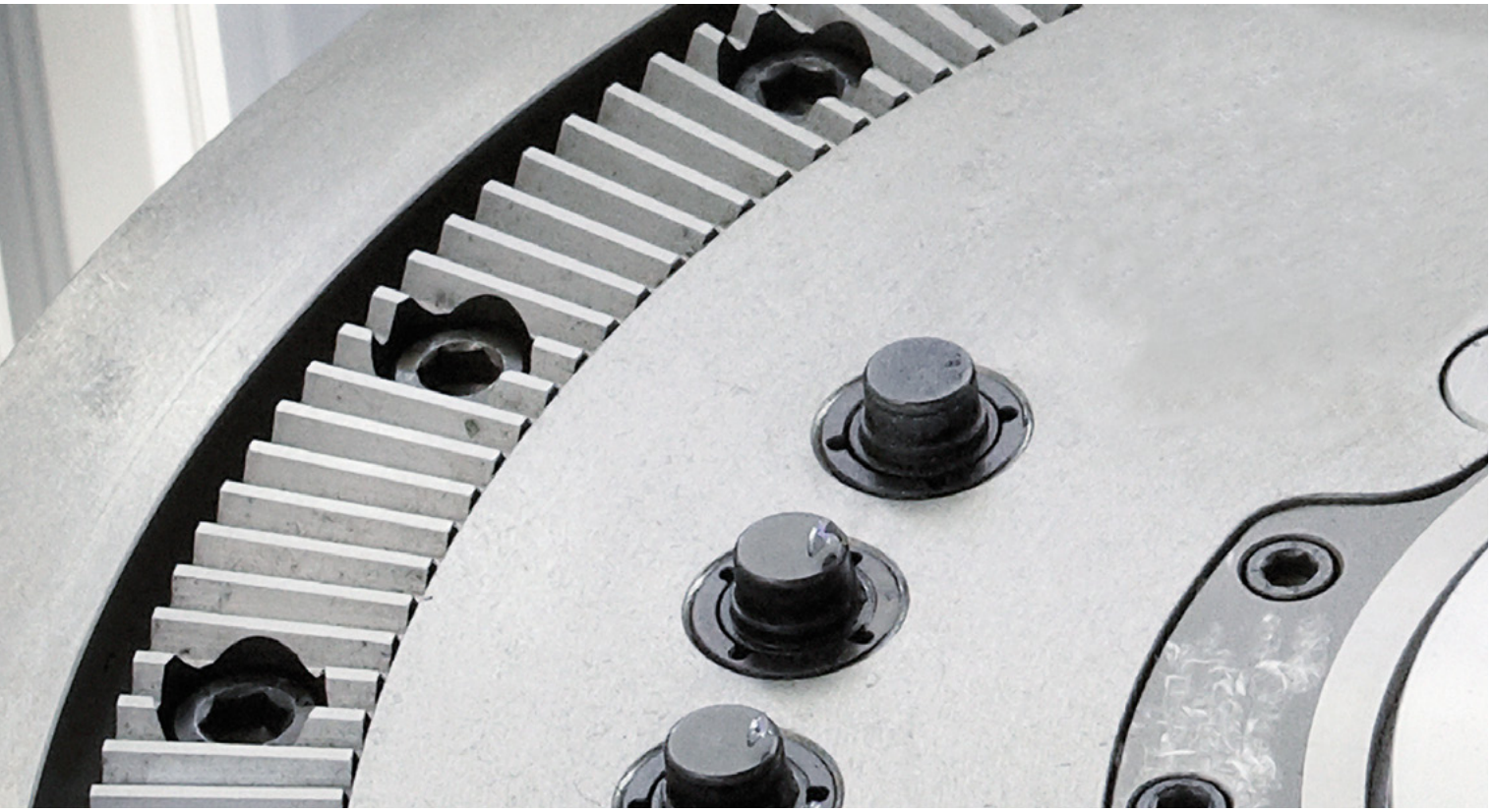
The rotary table is available in different designs with faceplate diameters between 4.000 and 12.000 mm and with driving powers between 180 and 300 kW for high-precision machining of workpiece weights between 80 and 500 tons.

As an option, the rotary table can be equipped with a longitudinal displacement (Y-axis). Consistent with all other axes, the Y-axis is fully hydrostatically guided. It is driven by means of a Master-slave drive.

In case of a possible power failure, an emergency power supply ensures the safe stopping of the rotary table under full workpiece load, without causing any damage.



Hydrostatically guided rotary table



Masterhead interface with Hirth serration

Masterhead Concept

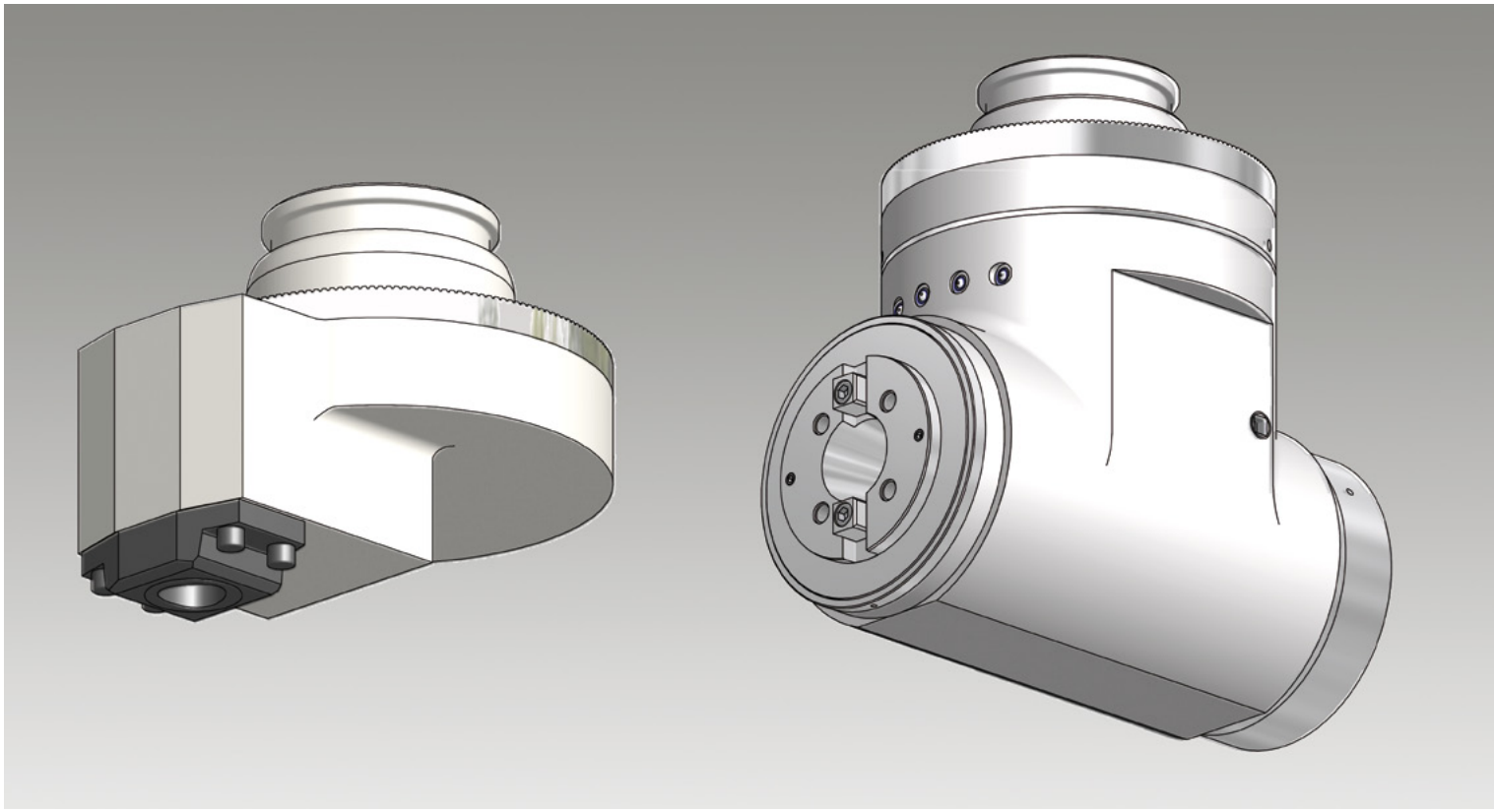
WaldrichSiegen was the first manufacturer worldwide to use the Masterhead concept for high-performance milling attachments on large portal-type milling machines. To name just one of the advantages: only the drive shaft is integrated in the ram while the well-dimensioned bearings and milling spindles are located in the attachments.

Taking into consideration the special requirements of vertical turning, this proven design was translated to and implemented in the new WaldrichSiegen ProfiTurn V series.

The Masterhead concept features the following advantages:

- high rigidity of Masterhead interface
- no heat generation and thus no geometrical problems within the ram
- long lifetime of bearings supporting the drive shaft
- no slip rings or rotary transmissions required in the ram
- low noise level
- exchangeable spindle units for highest performance
- improved overall efficiency
- maximum availability
- low maintenance cost

All attachments for turning, milling, boring and grinding operations are adapted through the Masterhead interface by means of a central clamping system integrated into the ram. Characteristic features of this innovative system are high clamping forces and secure clamping of the attachments even in cases of power or pressure drops. Force flux from the attachments into the ram is via a Hirth serration coupling, which provides for safe transmission of the highest cutting forces.



Milling units for different applications

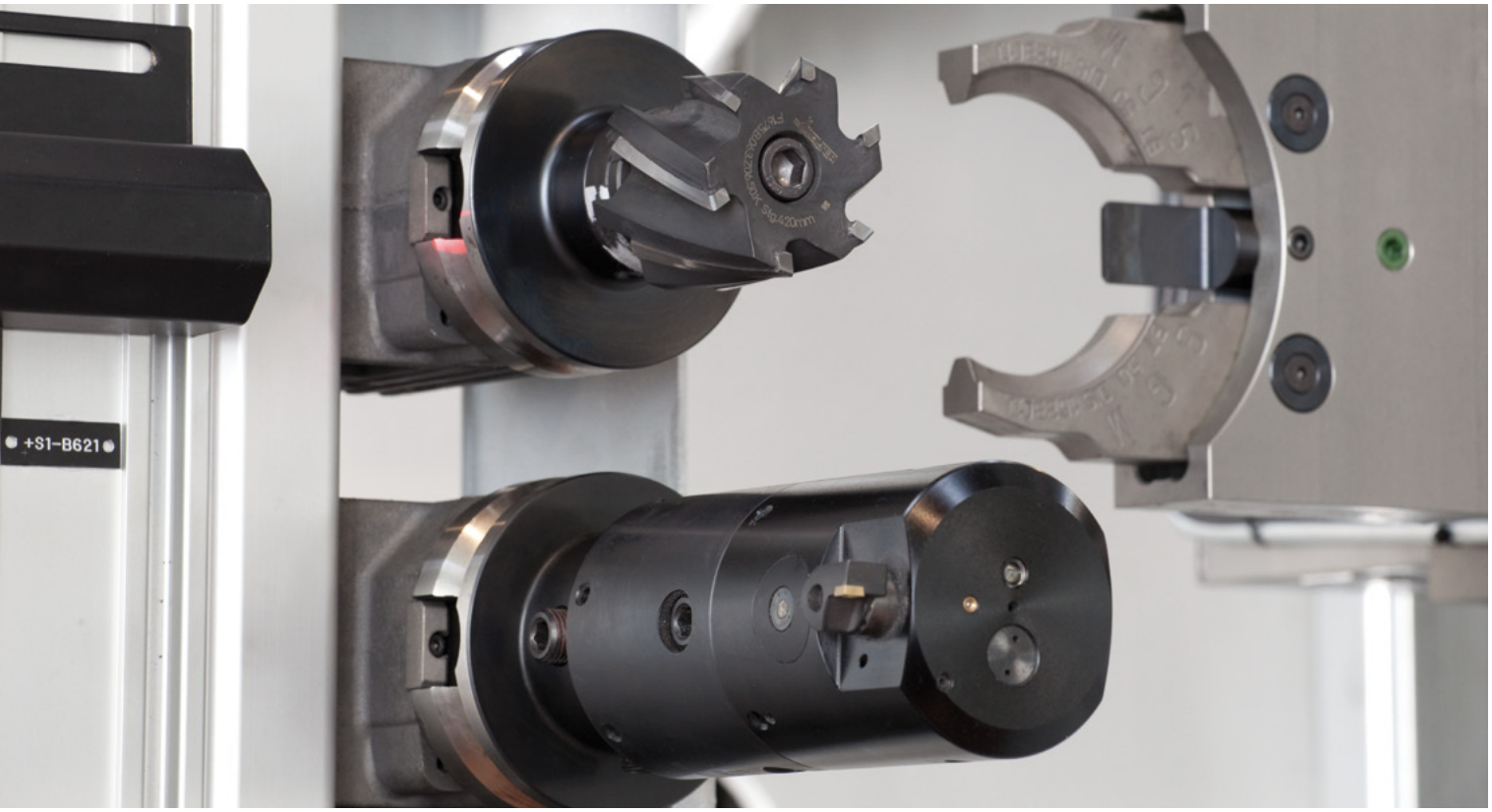
Attachments

WaldrichSiegen offers a wide range of optional units for turning, milling, boring and grinding applications. All units feature a well-balanced speed/torque ratio with speeds ranging up to 3.000 rpm.

Furthermore, based on the many years of experience WaldrichSiegen has gained in building lathes and milling machines, we also offer specially designed attachments which are tailor-made to the individual machining tasks of our customers.

The attachments of the ProfiTurn V are characterized by:
- maximum precision
- optimal speed/torque ratio
- long lifetime
- grease lubricated bearings
- interfaces for all common tool systems (SK, HSK, HSK-T, Capto®,…)
- demand-oriented coolant supply

Due to their ideally attuned design and layout, all attachments can be equipped with grease lubrication; additional lubrication and cooling circuits are not required. As such, the number of media transfers at the Masterhead interface is reduced, which impacts positively on availability, operation and maintenance cost.



Automatic tool changer for different turning and milling tools

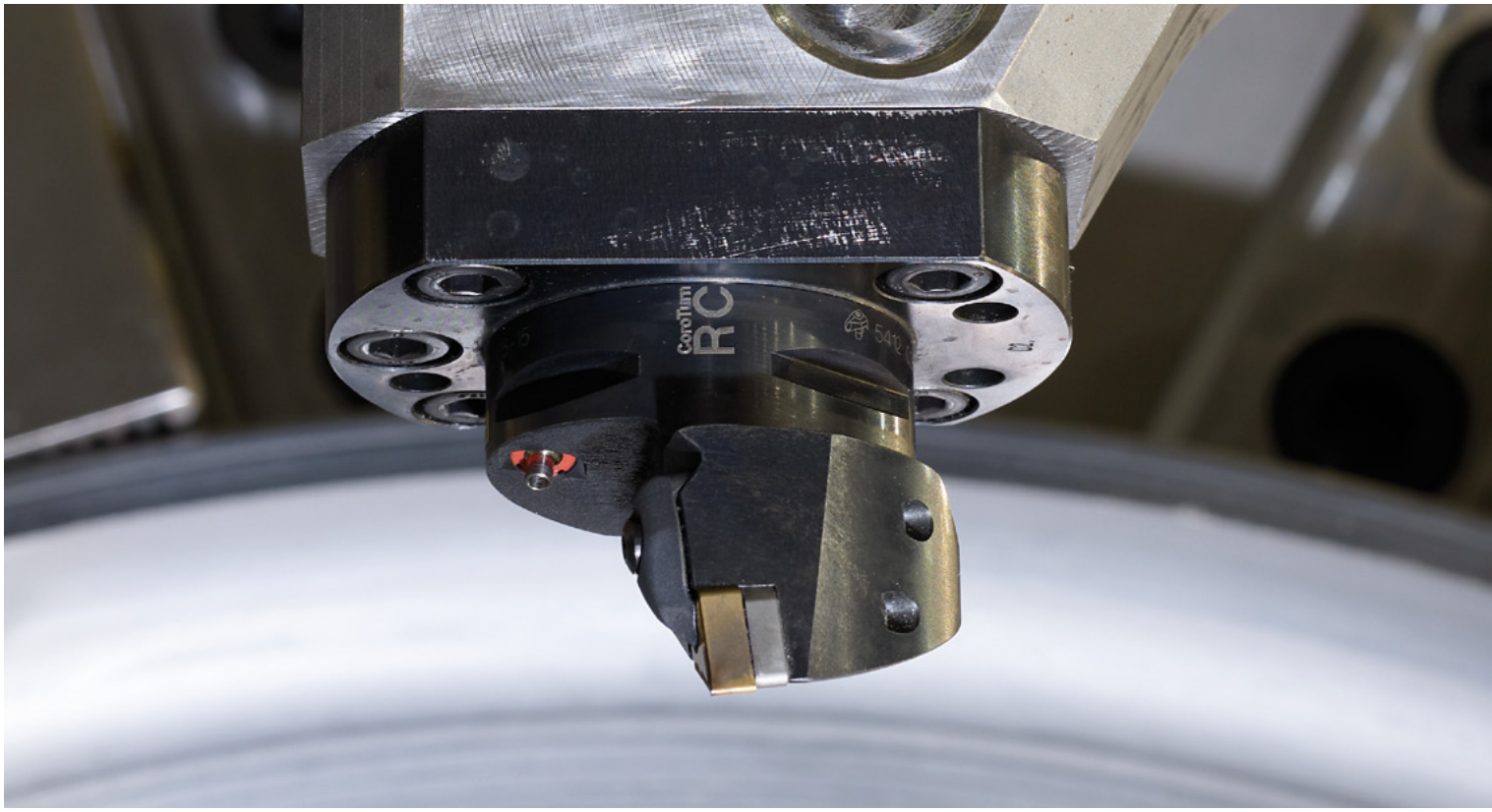
Tool Changer

Today, the fast and reliable change of multiple different turning, milling and boring tools is a decisive factor for the economic and efficient manufacture of complex workpieces on large, highly productive machine tools. Depending on space availability and the number of tools required, WaldrichSiegen offers different tool changing systems for machines of the ProfiTurn V series which guarantee minimum chip-to-chip times.

According to individual customer requirements, we offer the following systems:

- pick-up tool changer
- disk-type tool changer
- chain-type tool changer
- rack-type tool changer
- tool arena with integrated robot

Type and layout of the tool change system are defined in close consultation with our customers, depending on individual machining tasks and space availability. The tool change systems offered by WaldrichSiegen allow for tool management and tool loading parallel to the production process.



Interface for all common tool systems

Tool Management

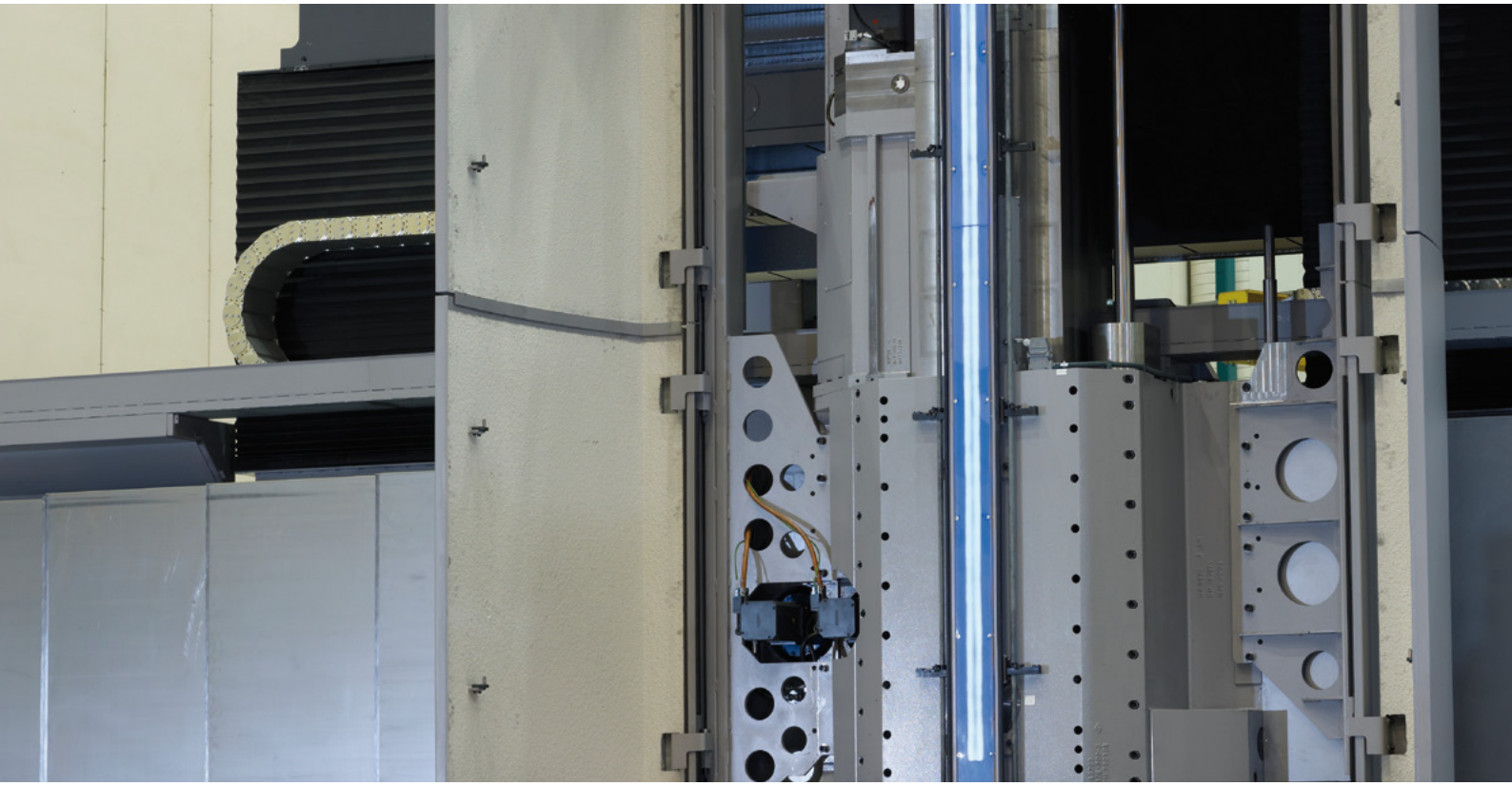
State-of-the-art tool management systems considerably add to reducing machine downtimes. The result is an essential increase of overall machine productivity and efficiency.

Independent of the control system, the WaldrichSiegen Tool Management System manages all relevant technical data of the tools in use. In addition to merely managing the technical tool data, the system can also be interfaced with a company's production planning system. As such, the machine can be efficiently integrated into the overall production process.

Some characteristic features of the tool management system:

- user-friendly handling
- power monitoring
- highly precise tool interference monitoring allows to make optimal use of space available in tool magazine
- control of tool lifetime
- broken tool detection (optional)
- monitoring the storage capacity of tool changer
- direct link to tool presetting devices
- various interfaces to external working stations

As an option, the WaldrichSiegen Tool Management System can be equipped with a barcode or chip card reader for automatic reading of tool data.



ProfiTurn V – easy-to-maintain machine design

High Availability

When developing and designing the ProfiTurn V, WaldrichSiegen attached great importance to ensure that all components provided a maximum degree of availability and convenient ease of maintenance.

Centralized transfer blocks for different media of the hydraulic and cooling systems reduce the maintenance-intensive piping to a minimum. The valves, pumps, pressure and temperature switches as well as the terminal boxes of all components are located in such a way as to allow easy access for operators and maintenance personnel.

All pumps and motors – including the main drive of carriage and rotary table – can be easily exchanged; time-consuming dismantling of parts is not necessary. As a result, machine downtimes for maintenance or repair work are considerably reduced.

Both the main drive of the carriage as well as the gear box of the rotary table are designed, manufactured and assembled in-house at WaldrichSiegen. This guarantees for excellent availability of spare parts and service.

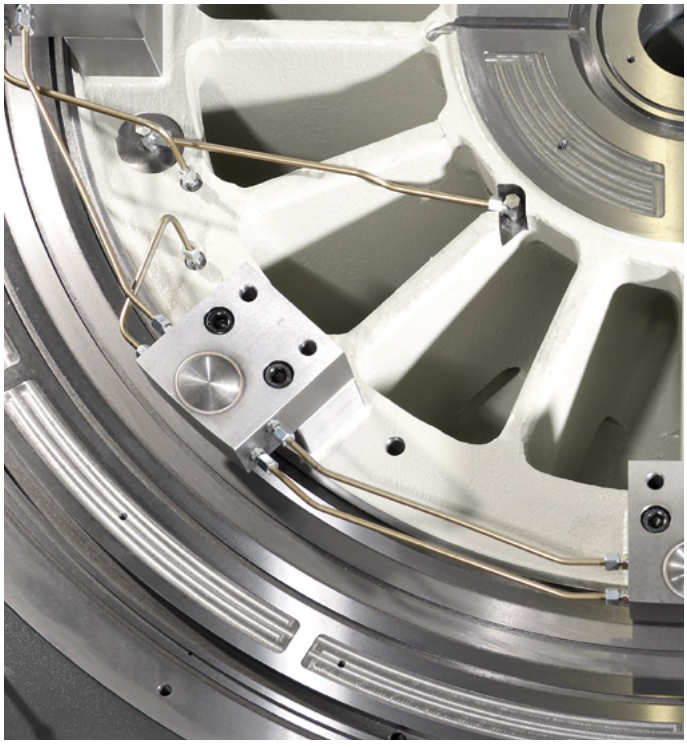
Due to the consistent implementation of the Masterhead concept, it is no longer necessary to integrate the main spindle, tool taper interface or pre-loaded spindle bearings into the ram; thus possible sources of interference within the ram are eliminated.

Energy Efficiency

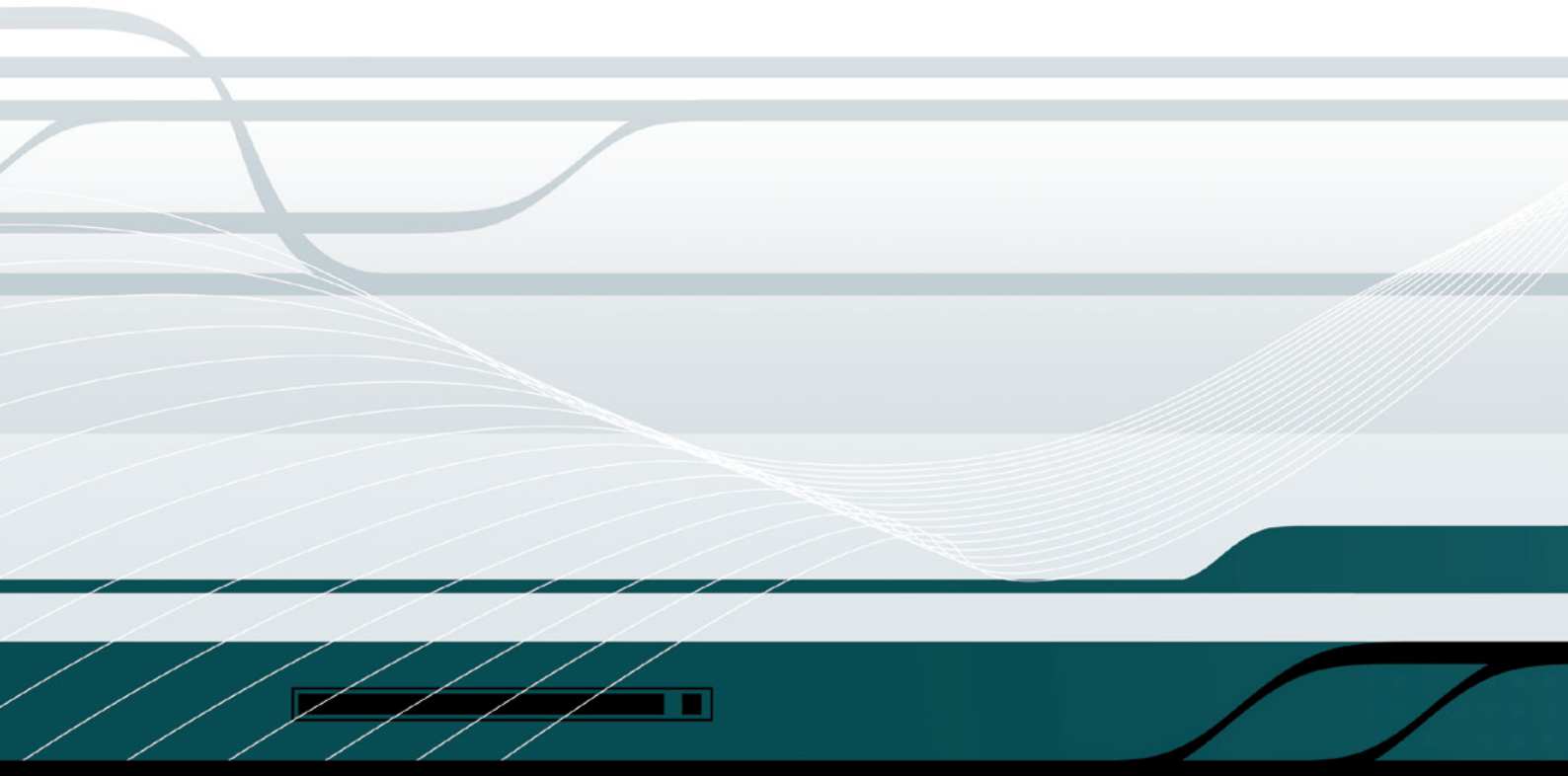
Numerous design features provide for a significant reduction in the power consumption of the ProfiTurn V. All drives of the axes have been optimized in terms of a high electrical and mechanical efficiency. In particular the WaldrichSiegen faceplate hydrostatics are characterized by minimum power dissipation and thus achieves maximum energy efficiency. Some advantages are:

- improved oil supply
- optimized pocket geometry
- optimized flow rate
- optimized hydraulic power loss
- efficient oil cooling

The consistent use of efficient motors and control devices minimizes the energy consumption in all axes of the ProfiTurn V. Project-related and demand-oriented optimization of other main power consumers, e.g. coolant supply or cooling systems in terms of their energy efficiency can further add to reducing the overall energy consumption of the machine tool.



Energy-efficient faceplate hydrostatics



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