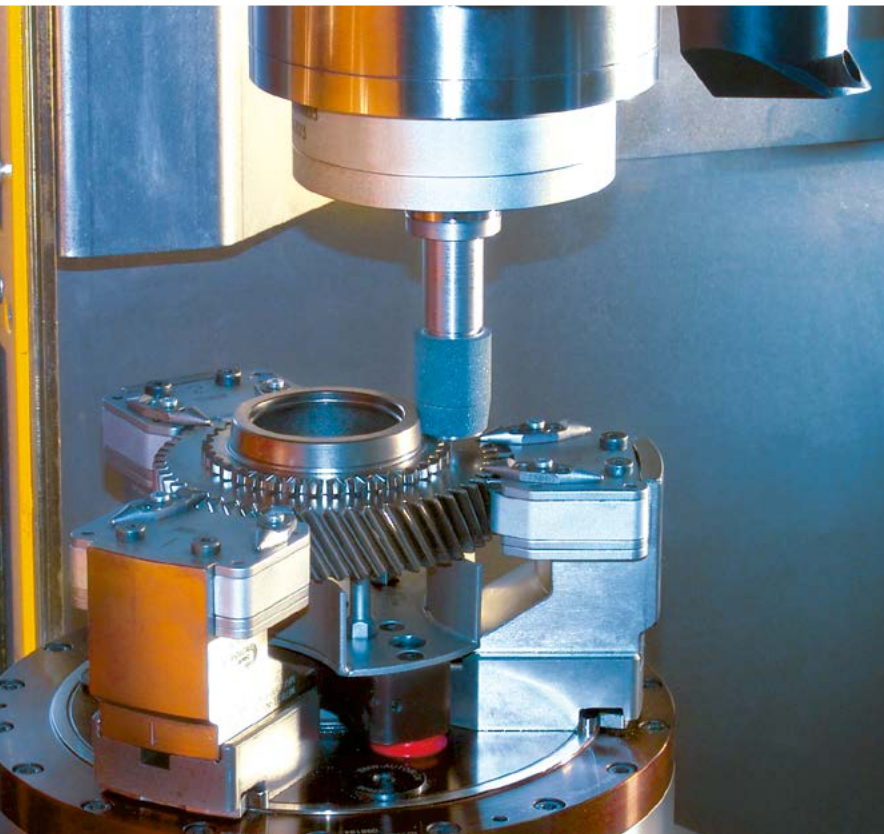


TURNING WITH
HIGHEST EFFICIENCY

FTC 180 Flexible Turning Center





FTC 180 Flexible Turning Center

The "Hauptzeit" Machine for maximum economic advantage

Lowest cost per piece, highest reliability and continuous accuracy (within microns) the FTC sets new economic and quality standards in green and precision hard turning. It is especially designed for high performance processes and for eco-friendly dry processing of chucking work pieces. The FTC reduces existing costs by up to 50% per piece, achieving turning results never witnessed before: High precision turned parts equal to grinding quality.

The FTC is a modular machine which is produced in series and is operator and maintenance friendly, utilizing standard cutting tools. With its high efficiency pendular processing on two fixed, vertical, completely independent motor spindles, the FTC presents new production perspectives. While the main processing is done on one spindle the other work piece is unloaded and loaded on the parallel spindle. The short traverse path of the tool changer between the two work piece spindles minimizes the resultant idle times.



FTC 180 for versatile manufacturing technologies

Complete green machining of sophisticated chucking work pieces

With the FTC 180, we lead the way in high volume stock removal performance. Even in the power consuming machining of forgings like turning, drilling or milling, the solid and high-performance machine structure ensures maximum process reliability and the shortest production time per piece in top quality due to its two-spindle pendular machining.

- ▶ Elimination of spindle idle times in 2-side machining with different processing times
- ▶ Elimination of idle times by simultaneous unloading/loading of the work piece

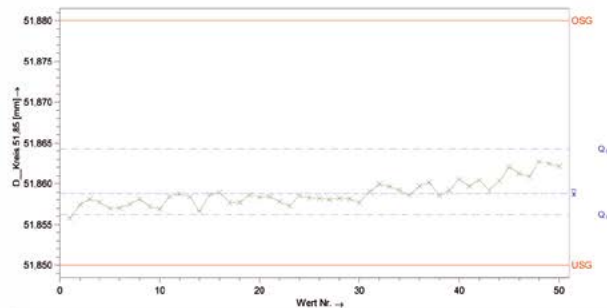
Precision hard turning – replaces the process combination of hard turning and grinding

The FTC 180 was specifically designed for flexible precision turning of hardened gears to replace the cost-intensive grinding process with coolant. The high rigidity, stability and maximum damping characteristics have been proven by multiple field-testing done in high precision final cutting with high volume production.

Precision hard turning and finish grinding

Precision hard turning and finish grinding for fine machining can be combined where the function of the surface microstructure requires it (eg. seats of needle bearings, oil seals and synchronisers) – Due to the minimal stock removal rate the surface wave profile and potential existent partial damages of the edge zone, by inducted heat of the hard turned surface profile, are eliminated by the use of dry in-feed grinding with a CBN cutting edge.

Bore diameter

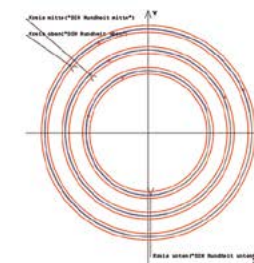


Modell-Verteilung		Johnson-Transformation	
Berechnungsart		M4: Percentil (0,135%-2-99,865%)	
potenzieller Fähigkeitsindex	C_{pk}	3,00 \leq 3,74 \leq 4,47	1,67
kritischer Fähigkeitsindex	C_{pk}	2,89 \leq 3,36 \leq 4,03	1,67

Die Anforderungen sind erfüllt (C_{pk}, C_{pk})

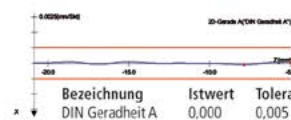
Feldmat_A_5Telle

Roundness

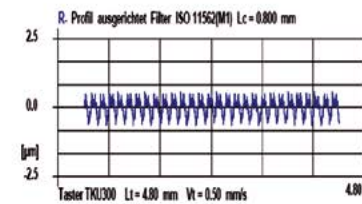


Bezeichnung	Istwert	Toleranz
DIN Rundheit oben	0,002	0,010
DIN Rundheit Mitte	0,002	0,010
DIN Rundheit unten	0,002	0,010

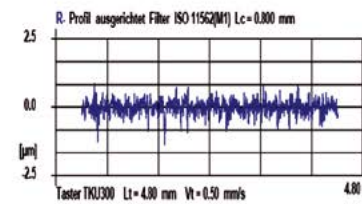
Straightness



Hard turned



Finish grinded



Cutting edge machine technology

Machine base:

- ▶ Maximum rigidity and optimal damping characteristics with a solid, horizontal base made of concrete with enclosed steel frame.
- ▶ Form-fit mounting surface for work piece spindle and guide rails on high-tensile steel, machined in one chucking with high geometric accuracy.
- ▶ Thermo-stable by way of the free chip fall into a temperature isolated chip funnel with inclined areas, which avoids generation of chip nest.

2-spindle module for more productivity:

- ▶ Both spindles are designed as production spindles with a wide constant performance range in robust construction for durability. The 2 spindles are direct drive and liquid cooled, in vertical cartridge design mounted for stability in the machine base.

Strong machine base made of concrete with enclosed steel frame:

- ▶ Ensures a longer tool life and a respectable stock removal volume.
- ▶ The extremely short flow of forces, the distance between spindle center and Z-guidance, the distances between the slide way pairs and also the reduction of section points of components which are aligned directly in the flow of force guarantees minimum distortion with the engaged cutting edge.

Direct absolute measuring systems:

- ▶ A resolution of 0.1 micron in the X- and Y-axis is achieved through short and precise ball screws with process capable and significant measurable repetitive accurate machining within tolerances, which can only be produced through grinding.

FTC 180 Flexible Turning Center – Top efficiency in facts

- ▶ Chip-to-chip time < 1 second due to loading/unloading parallel to the processing in pendular machining with 2 spindles
- ▶ Finish cutting with considerable smaller tolerances
- ▶ Consistent lowest costs per piece and longer tool life
- ▶ Easy retooling with outstanding accessibility and ergonomic tool and chucking changeover < 10 minutes
- ▶ Double life cycle time by two spindles with lower drive-away and slow-down accelerations
- ▶ Compact Single Box Machine with 6 sqm footprint to allow for easy relocation
- ▶ Comfortable easy operation with intelligent technology software

The control: Siemens 840 D SolutionLine

The applied control and drive technology of the newest generation of Siemens (840 D) enables along with the Felsomat technology software:

- ▶ Comfortable tool organization masks
- ▶ Easy set-up programming
- ▶ Enhanced help functions for intuitive diagnosis
- ▶ Part programming

All security-relevant functions are monitored by Safety Integrated. Options:

- ▶ Total Production Maintenance (TPM)
- ▶ Machine Data Acquisition (MDA)
- ▶ Remote diagnosis via modem or network

With that functions as remote support and automatic error notification per SMS or e-mail are available.



Combination and automation – as the task demands

The stand-alone single machines can be connected in any quantity, due to their modular concept, to create highly efficient manufacturing systems. You have the choice to configure your machines either technology oriented, completely decoupled as parallel or process chain oriented, serial one-piece-flow manufacturing systems. The machine tools can be moved, exchanged or extended for increased manufacturing capacity at any time without rebuilding.

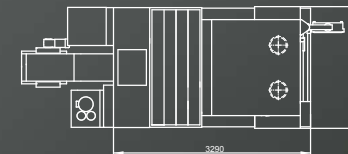
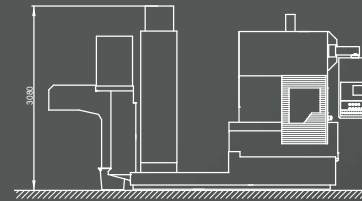
For the multiplicity of different work pieces, differing batch sizes, internal work piece logistics and potential additional peripheral systems, components which have to be integrated for inverting, pressing or cleaning of the work piece and several work piece buffer systems, including universal work piece grippers, are available.



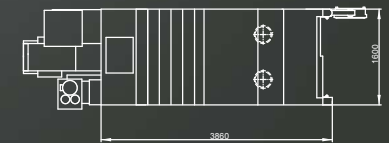
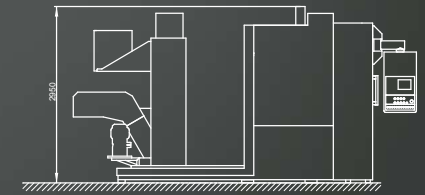
Technical Data FTC

Working area		Turret	
Swing diameter over bed covers	320 mm	No. of tools	8
Turning diameter	240 mm	Tooling system	Capto C5
Slide travel X-axis	450 mm	Option: 2 driven tools HSK 40	
Slide travel Z-axis	300 mm	Performance 25% ED	28 Nm, 4,500 min ⁻¹
Chuck size max.	315 mm		
Distance between spindles	750 mm		
Main spindle		Dimensions/weight	
Spindle head to DIN55026	A 6	Length	3,600 mm
Spindle diameter in front bearing	120 mm	Length incl. chip conveyor (optional)	3,950 mm
Spindle bore	52 mm	Width	1,600 mm
Performance at 40%/100% duty cycle	26.8 / 20.9 kW	Height	2,850 mm
Torque at 40%/100% duty cycle	256 / 200 Nm	Area, approx.	6 m ²
Speed, max.	4,500 min ⁻¹	Weight, approx.	10,000 kg
		Noise emission, approx.	78 dB(A)
Feed drive		Electrical connection	
Rapid traverse rate X/Z	45 / 40 m/min	Voltage	400 V
Feed rate X/Z	45 / 40 m/min	Main fuse	3 x 100 A
Feed force X/Z at 100% duty cycle	7.7 / 10.5 kN	Frequency	50 Hz
		Power connection	55 kW
		Control: Siemens 840 D with dynamic drive technology	
		Siemens Simatics	

FTC 180 L



FTC 180



Flexline: highest efficiency, cost-effectiveness and quality

The Future of Gear Manufacturing

Machines, tooling and automation, including intergrated quality assurance for every individual process: REISHAUER and FELSOMAT are redefining the integration of gear manufacturing technologies.

The task

Combining all process technologies into one complete system. Every process step is integrated into the seamless, continuous-flow production process, thereby streamlining the production line and drastically reducing throughput time and work in process.

The result

A highly efficient integrated production system, consisting of interchangeable technology modules and automation components. This results in lowest cost per part and maximum return on investment, without compromising process reliability or quality.



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GROUP

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